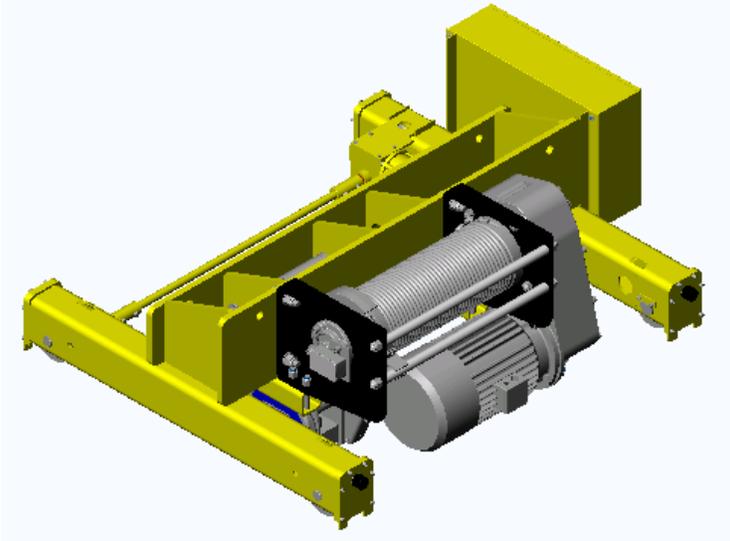


# DOUBLE GIRDER TROLLEY OPERATION, SERVICE & PARTS MANUAL



Before installing hoist, fill in the information below. Refer to the Hoist and Motor data plates.

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

Purchase Date \_\_\_\_\_

Voltage \_\_\_\_\_

Rated Load \_\_\_\_\_

**Follow all instructions and warnings for inspecting, maintaining, and operating this hoist.** The use of any hoist presents some risk of personal injury or property damage. That risk is greatly increased if proper instructions and warnings are not followed. Before using this hoist, each operator should become thoroughly familiar with all warnings, instructions, and recommendations in this manual. **Retain this manual for future reference and use.**

Forward this manual to operator. Failure to operate equipment as directed in manual may cause injury.

**Yale<sup>®</sup>**  
**GLOBAL KING<sup>™</sup>**  
**WIRE ROPE HOISTS**  
**RATED THRU 10 METRIC TONNE**



**YALE • LIFT-TECH**  
division of Columbus McKinnon Corporation

**Yale<sup>®</sup>**  
**HOISTS**

PRINTED IN U.S.A.

## FORWARD

This book contains important information to help you install, operate, maintain and service your new Yale electric hoist. We recommend that you study its contents thoroughly before putting the hoist into use. Read design specification CMAA Specification #70, "Specifications for Top Running Bridge & Gantry Type Multiple Girder Electric Overhead Traveling Cranes" prepared by the Crane Manufacturers Association of America, Inc. and ASME B30.2 "Overhead and Gantry Cranes, Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist." Then, through proper installation, application of correct operating procedures, and by practicing the recommended maintenance suggestions you can expect maximum lifting service from the hoist.

It will likely be a long time before parts information found in Section X is needed. Therefore, after the hoist is installed and you have completely familiarized yourself with operation and preventative maintenance procedures, we suggest that this book be carefully filed for future reference.

When ordering replacement parts from this book, it will be necessary that you include with your order: the Hoist Serial Number and Model Number that are found on the nameplate attached to the motor end of hoist. For your convenience, a space has been provided on the front cover of this Manual for entering this information. We recommend that you fill it out immediately so it is readily at hand when needed.

The contents of this manual are of necessity, general in nature and may cover features not incorporated on your hoist; or, you may have ordered features not covered by this manual. Therefore, the user must exercise care in applying instructions given in this manual. If specific information not in this manual is required, contact the factory.

THE INFORMATION CONTAINED IN THIS BOOK IS FOR INFORMATIONAL PURPOSES ONLY AND YALE•LIFT-TECH DOES NOT WARRANT OR OTHERWISE GUARANTEE (IMPLIEDLY OR EXPRESSLY) ANYTHING OTHER THAN THE COMPONENTS THAT YALE•LIFT-TECH MANUFACTURERS AND ASSUMES NO LEGAL RESPONSIBILITY (INCLUDING, BUT NOT LIMITED TO, CONSEQUENTIAL DAMAGES) FOR INFORMATION CONTAINED IN THIS MANUAL.

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**NOTICE:** Information contained in this book is subject to change without notice.

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## **SECTION I – GENERAL DESCRIPTION**

**1-1.GENERAL.** Yale “Global King” electric hoists are wire rope and drum type hoists that are manufactured with an integral trolley. These hoists are all low headroom models with the drum and upper block (or dead-end anchor depending on the reeving type) on opposite sides of the beam suspending the trolley. There are two basic frame sizes each with two standard lifts: the “B” Frame handles capacities up to 5 tonne; and the “C” Frame handles capacities up to 10 tonne. The “B” Frame Trolley Hoist is suitable for 60” thru 96” gage with 25’ lift or 78” thru 96” gage with 40’ lift. The “C” Frame Trolley Hoist is suitable for 66” thru 96” gage with 25’ lift or 84” thru 96” gage with 40’ lift. The hoist motor is 2-speed with a 6:1 ratio between high and low speeds as standard. The Motor Driven trolley has two available speeds with 1-speed, 2-speed, or Variable Frequency control.

Throughout this manual you will see references to the “B” or “C” frame hoists. If you are unsure about which frame size you have, see Section IV, Paragraph 4-2 for a simple gearcase measurement to easily determine the size of your hoist.

**1-2.BASIC CONSTRUCTION.** Yale “Global King” hoists consist of a rugged steel frame which houses a lifting drum and serves as the platform for carrying the entire hoist load. An aluminum gearcase, attached to one end of the drum frame, houses a triple-reduction gear train. The first two reductions are helical with the third being spur. Attached to the gearcase is a 2-speed hoisting motor with a 6:1 ratio between the high and low speeds. A 200% torque DC motor brake is attached to the motor. A single NEMA 4/12 control enclosure contains both the hoist and trolley electrical system controls. Hoisting cable and a covered lower block assembly are used for lifting loads. A rotary geared limit switch is used to limit travel both up and down. A secondary block operated limit switch is used to limit the travel of the lower block when raising. When a pendant pushbutton control station is provided for operation of the equipment it is suspended on a wire strain cable for attachment to the hoist or festoon system.

## **SECTION II – INSTALLATION**

### **▲WARNING**

**Only qualified personnel properly supervised shall mount the trolley on the bridge and perform final pre-operation inspection.**

We recommend that you study the contents of this manual thoroughly before putting the hoist into use. Also Read CMAA Specification #70 design specifications prepared by the Crane Manufacturers Association of America, Inc. and ASME B30.2 safety standard for top running trolley hoists.

**2-1.GENERAL.** Yale “Global King” electric hoists are lubricated and tested before being shipped from the factory. To place a hoist in service, connect to electrical service (Paragraph 2-4) and perform pre-operation tests and checks (Paragraph 2-5).

### **▲WARNING**

**Working in or near exposed energized electrical equipment presents the danger of electric shock.**

**TO AVOID INJURY:  
DISCONNECT POWER AND IMPLEMENT  
LOCKOUT/TAGOUT PROCEDURE BEFORE  
REMOVING COVER OR SERVICING THIS  
EQUIPMENT.**

**2-2.BRIDGE REQUIREMENTS.** The successful operation of a double girder trolley depends upon a properly installed bridge. The bridge should be checked for adequacy of the following:

- a) Trolley rail should be 40 # ASCE rail.
- b) Trolley rails are to be securely fastened to the supporting girder.
- c) The rails shall be straight, parallel, level and at the same elevation. The distance (gage) center to center of bridge rails as well as the rail elevation shall be within a tolerance of plus or minus 1/8”.
- d) Rail joints must be smooth and held in tight alignment by properly fitted rail joint bars so that the ends are held tightly with no crack or opening.
- e) The bridge should be designed in accordance with specifications outlined by the Crane Manufacturers Association of America for maximum wheel loads involved.
- f) Size and placement of trolley bumper stops should be checked to insure that they are of the proper height and width to fully contact the trolley bumpers and also placed so as to stop the trolley with sufficient

clearance between any portion of the trolley and the building.

## **⚠️ WARNING**

**Failure to use proper end stops on the crane bridge may result in serious injury, death and/or damage to equipment and property.**

### **TO AVOID INJURY:**

**Once the trolley has been installed on the rails, end stops suitable for the application must be installed at both ends of each rail to prevent the trolley from running off the ends of the rails.**

**2-3.LUBRICATION.** All YALE trolley hoists are completely lubricated at the factory. It is important that all components requiring lubrication be checked. Complete instructions concerning initial lubrication are to be found in SECTION IV. Refer to the manufacturer's manuals on purchased equipment (those components not built by Yale•Lift-Tech). The manufacturer's lubrication instructions supercede instructions given in this manual for similar equipment.

**2-4.CONNECTING HOIST TO ELECTRICAL SERVICE.** Electrical service to the hoist may be power cable or a guarded system having sliding shoe or wheel type collectors.

## **⚠️ WARNING**

**Be certain that electrical power supply is OFF and locked in the open position before attempting any electrical connections to the hoist. This equipment must be effectively grounded according to the National Electric Code ANSI/NFPA 70, or other applicable codes. If the grounding method used is through the trolley wheels, then each section of track must be grounded by metal-to-metal connection to the building ground. Certain environments may prevent proper grounding by this means. In this case a separate grounding conductor should be provided.**

a) Follow ANSI/NFPA 70, state, and local electrical codes including the grounding provisions thereof when providing electrical service to the hoist.

b) Make electrical connections using the appropriate wiring diagrams furnished with the hoist. All electrical connections, including connections to collectors or power cord, shall be made only by qualified journeyman electricians.

## **⚠️ CAUTION**

**Power supply to hoist and trolley must be the same voltage, frequency, and phase that are specified on the hoist and trolley nameplate.**

### **2-5. PRE-OPERATION CHECKS.**

a) Check Oil Level. (Figure 2-1) The gearcase has been filled with oil to the proper level. However this should be re-checked before operating the hoist.

Check oil level by removing the plug indicated in Figure 4-1. When properly filled, oil should be level with the bottom of the tapped hole. Fill to this level with oil as specified in Paragraph 4-2.d.

b) Check trolley wheel engagement to the rail for float clearance. Make visual as well as measurement checks.

c) Check all connections for tightness of bolts, inclusion of lock washers or other type fasteners to insure correct material has been used. This check must be made for all connections: mechanical, structural, and electrical including both field and factory made connections.

d) Check to ensure that all shipping supports, tie downs, brackets or other items that were used only for shipping or storage purposes are removed from the trolley.

e) Check to be certain that the trolley and bridge is clear and free of all obstructions.

f) Check Push Button Operation and Phasing.

To properly check the phase of the hoist, follow these steps:

(1) With "POWER OFF" operate all the push buttons and determine that they do not bind or stick in any position.

## **▲WARNING**

If any push button binds or sticks in any position – DO NOT TURN POWER ON – determine the cause and correct the malfunction before operating.

- (2) Connect hoist to power source.

## **▲WARNING**

On three phase hoists it is possible to have “Reverse Phasing” causing the block to lower when the “UP” button is depressed. When this condition exists the automatic limit switch is inoperative and hoist operation will be dangerous.

- (3) Operate “UP” button briefly to determine direction of hook travel.
- (4) If hook raises when “UP” button is depressed, phasing is correct.
- (5) If hook **lowers** when “UP” button is depressed, **hoist is “Reverse Phased.”** TURN AND LOCK POWER OFF and check the pushbutton wiring. If the pushbutton was wired properly, correct the problem by interchanging any two leads at power source connection. Do not change internal wiring of hoist.
- g) Check Limit Switch Operation.

## **▲WARNING**

Damage to the hoist, a dropped load, and injury may result if limit switches fail due to improper use.

**TO AVOID INJURY:  
UNDER NORMAL OPERATING  
CONDITIONS, STOP HOIST TRAVEL  
BEFORE ENGAGING LIMIT SWITCHES.  
LIMIT SWITCHES ARE SAFETY DEVICES  
AND SHOULD NOT BE USED AS NORMAL  
OPERATING CONTROL.**

- (1) A block operated upper limit stop is furnished as standard equipment on all YALE “Global King” hoists. This limit stop is factory set to stop the lower block at the safest high position, guarding against over travel and possible damage to hoist. No adjustment can be made. However, the hoist should be tested by jogging the lower block against the limit weight to be

sure the limit switch is functioning properly. When lower block lifts the limit weight, the hoist will automatically stop. If lower block coasts through the limit switch when lifting a reversing switch will automatically close and reverse direction of motion to lowering.

## **▲WARNING**

Some hoists may be shipped with the electrical controls loose (disconnected) and will not have the upper and lower limit switches connected. **DO NOT OPERATE HOIST UNTIL LIMIT SWITCHES ARE PROPERLY CONNECTED AND ADJUSTED.** Failure to do so may allow hoist to be operated beyond proper travel limits, which can cause load to drop, resulting in damage to equipment or injury.

- (2) A geared rotary type upper and lower limit switch is also provided as standard. This switch is adjustable and although roughly preset by the factory, it should be adjusted at time of installation to the desired high and low limits of lower block travel. Refer to SECTION VII, Paragraph 7-3.
- h) Check Lower Block and Hoisting Cable. Depress “DOWN” push button and run lower block to its lowest position. No less than two wraps shall remain on the drum with the loaded hook in its lowest position. Also check to see that the lower block and rope do not twist excessively. If it does twist to the extent that two ropes rub against each other, disengage the swaged rope end from the frame anchor and twist the rope four or five turns in a direction opposite to that which the block turns. Reconnect rope to the frame anchor, holding firmly to eliminate rope twisting back to its original position. Operate hoist up and down a few times. If lower block still rotates excessively repeat process until twisting is corrected.
- i) Lubricate Hoisting Cable. For longer cable life, it is recommended that the cable be lubricated at time of installation by applying a heavy coating of lubricant **CL** (Paragraph 4-7) as outlined in SECTION IV, Paragraph 4-3.

- j) When first using the hoist and trolley, operate with lighter loads through full travel before applying maximum load.

### **SECTION III – OPERATION**

**3-1.GENERAL.** Operation of YALE “Global King” hoists is controlled by a convenient pendant push button station. With it, the hoist can be controlled to give fast lifting and lowering; or controlled to lift or lower the load in small increments, providing accurate spotting. The push button station has a built-in interlock to prevent depressing opposing buttons simultaneously.

When first using the hoist, break in by operating under lighter loads to full travel before applying maximum load.

#### **3-2. PUSH BUTTON OPERATION.**

- a) Depress push button marked “UP” to raise load.
- b) Depress push button marked “DOWN” to lower load.
- c) Depress push button marked “RIGHT” to traverse one direction.
- d) Depress push button marked “LEFT” to traverse in the opposite direction.

 <b>CAUTION</b>
<p><b>Excessive “jogging” will cause premature burning of contact tips, motor overheating, and premature brake wear.</b></p>

- e) On two-speed hoist or trolley motions, partial depression of a button operates hoist or trolley at slow speed; depressing button completely operates hoist or trolley at full speed.

**3-3.OPERATING PRECAUTIONS.** Safe operation of an overhead hoist is the operator’s responsibility. Listed below are some basic rules that can make an operator aware of dangerous practices to avoid and precautions to take for his own safety and the safety of others. Observance of these rules in addition to frequent examinations and periodic inspection of the equipment may save injury to personnel and damage to equipment.

- a) **DO** read ASME B30.2 “Overhead and Gantry Cranes, Top Running Bridge, Single

or Multiple Girder, Top Running Trolley Hoist” and this “Operation, Service and Parts Manual.” ASME B30.2 may be obtained from:

**ASME  
22 Law Drive  
Fairfield, NJ 07007  
Or by calling: 1-800-843-2763.**

- b) **DO** be familiar with hoist operating controls, procedures, and warnings.
- c) **DO** make sure hook travel is in the same direction as shown on the controls. If opposite direction occurs, see Pre-Operation Checks, Section II, Paragraph 2-5.f.
- d) **DO** make sure hoist limit switches function properly.
- e) **DO** maintain firm footing when operating hoist.
- f) **DO** make sure that the load slings or other approved single attachments are properly sized and seated in the hook saddle.
- g) **DO** make sure that the hook latch is closed and not supporting the load.
- h) **DO** make sure that load is free to move and will clear all obstructions.
- i) **DO** take up slack carefully, check load balance, lift a few inches and check load’s holding action before continuing.
- j) **DO** avoid swinging of load or load hook.
- k) **DO** make sure that all persons stay clear of the suspended load.
- l) **DO** warn personnel of an approaching load.
- m) **DO** protect wire rope from weld splatter or other damaging contaminants.
- n) **DO** promptly report any malfunction, unusual performance, or damage of the hoist.
- o) **DO** inspect hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
- p) **DO** use the hoist manufacturer’s recommended parts when repairing a hoist.

- q) **DO** use hook latches.
- r) **DO** apply lubricant to the wire rope as recommended.
- s) **DO NOT** lift more than rated load.
- t) **DO NOT** use the hoist load-limiting device to measure the load.
- u) **DO NOT** use damaged hoist or hoist that is not working properly.
- v) **DO NOT** use the hoist with twisted, kinked, damaged, or worn wire rope.
- w) **DO NOT** lift a load unless wire rope is properly seated in its groove(s).

## ▲WARNING

**DO NOT operate hoist with the hoisting rope out of the drum grooves. Such operation may result in damage to the rope and/or the rope breaking. This may result in dropping the load that can cause damage to equipment and injury to operator or other personnel. Hoist rope will remain in the drum grooves during operation under normal operating conditions, however, slack or kinked rope, excessive side pulls, swinging or jerking of load, or similar abuse, may cause the rope to leave the grooves.**

- x) **DO NOT** use wire rope as a sling or wrap rope around the load.
- y) **DO NOT** lift a load if any binding prevents equal loading on all supporting ropes.
- z) **DO NOT** apply the load to the tip of the hook.
- aa) **DO NOT** operate unless load is centered under hoist.
- bb) **DO NOT** allow your attention to be diverted from operating the hoist.
- cc) **DO NOT** operate the hoist beyond limits of wire rope travel.
- dd) **DO NOT** use limit switches as routine operating stops unless recommended. They are emergency devices only.

## ▲WARNING

**Equipment covered herein is not designed or suitable as a power source for lifting or lowering persons.**

- ee) **DO NOT** use hoist to lift, support, or transport people.
- ff) **DO NOT** lift loads over people.
- gg) **DO NOT** leave a suspended load unattended unless specific precautions have been taken.
- hh) **DO NOT** allow sharp contact between two hoists or between hoist and obstructions.
- ii) **DO NOT** allow the rope or hook to be used as a ground for welding.
- jj) **DO NOT** allow the rope or hook to be touched by a live welding electrode.
- kk) **DO NOT** remove or obscure the warnings on the hoist.
- ll) **DO NOT** adjust or repair a hoist unless qualified to perform hoist maintenance.
- mm) **DO NOT** attempt to lengthen the wire rope or repair damaged wire rope.
- nn) Personnel not physically fit or properly qualified, shall **not** operate hoist.
- oo) **DO NOT** operate hoists unless hook moves in the same direction as indicated on the push button. If opposite direction occurs, see pre-operation checks, Section II Paragraph 2-5.f.
- pp) **DO NOT** operate hoist unless limit switch is operating properly.
- qq) **DO** avoid operating hoist when hook is not centered under hoist. Avoid side pulls and swinging of load or load hook when traveling hoist.
- rr) **DO** operate hoist within recommended duty cycle and do not "jog" unnecessarily.
- ss) **DO** conduct regular visual inspections for signs of damage and wear.



## SECTION IV – LUBRICATION

### ▲WARNING

Avoid skin contact with all lubricants in this product. Follow the manufacturers directions when handling oil and grease.

**4-1.GENERAL** The lubrication services outlined in Paragraphs 4-3 thru 4-6 should be performed before initial operation of the hoist. The lubrication services outlined in Paragraphs 4-2 thru 4-6 should be performed at regular intervals at least every six (6) months, coinciding with spring and fall seasons is recommended. The reason for this is that on hoists installed outside or in unheated areas a “cold test” oil is required in such (below freezing) climates making seasonal changes necessary. Refer to lubricant chart Section 4-7 for the appropriate oils and greases.

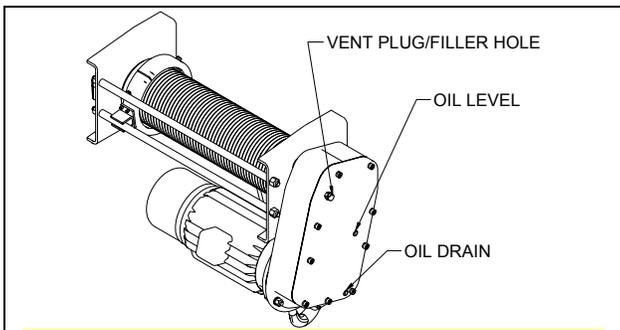


FIGURE 4-1. Location of Oil Plugs.

#### 4-2. CHANGING GEARCASE OIL.

### ▲WARNING

Avoid skin contact with Mobilsol A. In case of skin contact: dry wipe the skin, cleanse the area with a waterless hand cleaner and follow by washing thoroughly with soap and water.

- Add 5% solution of Mobilsol A (or equivalent) to the oil and run for a short time. This will clean components and hold particles in suspension for draining.
- Remove oil drain plug from bottom of gearcase and drain oil out. Dispose of oil in accordance with local environmental codes.
- Reinstall drain plug.
- Refill through filler hole to proper level (bottom of oil level plug hole) using **GC0H** (Paragraph 4-7). The amount of oil required depends on overall size of

gearcase; two sizes are used for “Global King” hoists. To determine size and amount of oil to add, measure width of hoist gearcase (see Figure 4-2). The “B” Frame measures 11-3/4” and requires approximately 6 quarts of oil. The “C” Frame’s width is 14-1/2” and requires approximately 12 quarts of oil.

- Check oil level by removing the plug indicated in Figure 4-1. When properly filled, oil should be level with the bottom of the tapped hole. Fill to this level with oil.

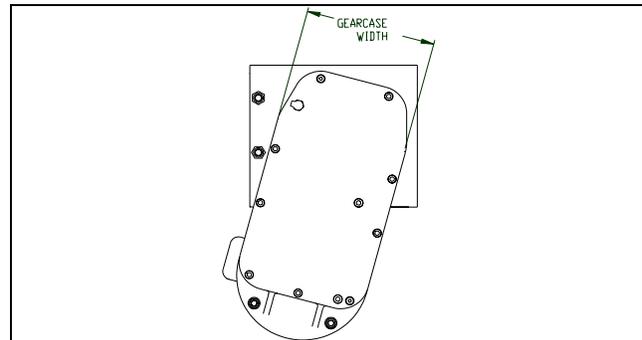


FIGURE 4-2. Gearcase Width Illustration.

**4-3.LUBRICATION OF HOISTING CABLE.** Hoists are shipped from the factory without an exterior coating of grease on hoisting cable. It is recommended, where conditions permit, that the cable be thoroughly coated at installation and kept well lubricated with **CL** (Paragraph 4-7).

**4-4.LUBRICATION OF LIMIT SWITCH.** Provide a light film of grease **MPG** (Paragraph 4-7) on bevel gear of rotary geared limit switch.

**4-5.LUBRICATION OF GEARED TROLLEY WHEELS AND PINIONS.** At installation and periodically apply grease **WG** (Paragraph 4-7) to the traverse drive pinions and the gears of the trolley wheels.

#### 4-6.LUBRICATION OF ROPE GUIDE

- Maintenance. Once properly installed the following actions are required:
  - Periodically re-grease with **MPG** (Paragraph 4-7) using the grease fitting provided (Figure 5-3, Item 6).
  - Every 6 months the rope guide should be removed per Section V, Paragraph 5-5, cleaned and inspected. When the rope guide is reassembled, it should be thoroughly greased with **MPG** (Paragraph 4-7) and the hoist should be run up and down to lubricate both the drum and the wire rope.



**4-7. LUBRICANT SPECIFICATIONS  
CONT'D.**

<b>AMBIENT TEMPERATURE</b>		
<b>15° to 60°F</b>	<b>50° to 125°F</b>	<b>125° to 250°F</b>
<b>(-9° to +16°C)</b>	<b>(10° to 52°C)</b>	<b>(52° to 121°C)</b>

<b>GCOT</b>	<b>AGMA Lubricant</b>	<b>No. 7</b>	<b>No. 8 Compounded</b>	<b>Refer to YALE Hoist Field Service Department for Gearcase <b>Operating Temperatures</b> above <b>125°F.</b></b>
Gear Case Oil.	ISO Viscosity Grade	460	680	
	Amoco Oil ® Co.	Worm Gear Oil	Cylinder Oil #680	
Traverse Gear Case.	Chevron USA, Inc ®	Cylinder Oil #460X	Cylinder Oil #680X	
	Exxon Co. ®	Cylesstic ® TK-460	Cylesstic ® TK-680	
	Gulf Oil® Co.	Senate ® 460	Senate ® 680D	
	Mobil Oil ® Corp.	600W Super	Extra Helca Super OR Mobilgear ® 636	
	Shell ® Oil Co.	Valvata ® Oil J460	Valvata ® Oil J680	
	Sun ® Oil Co.	Gear Oil 7C	Gear Oil 8C	
	Texaco ® Inc.	Meropa ® 460	Meropa ® 680	
	Union Oil ®Co. of California	Steaval ® A	Worm Gear Lube 140	

**SECTION V – INSPECTION AND PREVENTATIVE MAINTENANCE**

**5-1.GENERAL.** All YALE “Global King” hoists are inspected and tested at the factory. Regular in-service inspection and preventative maintenance programs not only help reduce overall maintenance costs but may also prevent service shutdowns by forewarning of problems that could cause these shutdowns. Regular inspections, periodic minor adjustments, regular cleaning and lubrication and replacement of worn parts can help preserve good performance and operation of your hoist.

Many factors influence the inspection and preventative maintenance program required for your hoist. Frequency and severity of service and material handled, local environmental conditions and various applicable codes are some of the factors that the user must consider to adjust inspection and maintenance program outlined in this section to meet his specific conditions.

The inspection and maintenance services outlined in this section are considered minimum. Recommended in the schedule are minimum inspection and maintenance intervals based on average daily use in a normal environment. Average daily use is based on 1000 total operational hours per year maximum and intermittent operation of the hoist eight hours per day, five days per week with a maximum 50 percent “on” time and the average loading not exceeding 65 percent of rated load. For more details regarding hoist duty cycles, please reference ASTM HST-4-1999 “Performance Standard for Overhead Electric Wire Rope Hoists” which may be obtained from: ASME, 22 Law Drive, Fairfield, NJ 7007 or by calling: 1-800-843-2763.

Environmental conditions in which the hoist operates are also important considerations for the user when adjusting hoist inspection and maintenance programs to local conditions. Frequency of inspection and maintenance must be increased if hoist is subjected to severe atmospheric environmental conditions, such as corrosive vapors, extreme heat or cold, cement or dust and other airborne contaminants. The user should carefully consider all environmental conditions and adjust frequency and degree of maintenance for his local conditions. Consult the factory’s Field Service Department for advice regarding unusual environmental conditions.

Various codes also regulate inspection and maintenance programs. Attention must be given to applicable federal standards, OSHA regulations, national standards, state and local codes which may include mandatory rules relating to hoist inspection and maintenance. The user should become familiar with all applicable codes for his area and be guided accordingly.

Listed on the Recommended Inspection and Maintenance Schedule are inspection frequencies and requirements. Perform these inspections regularly as scheduled and additional inspections as may be required for activity, service, and environment of your hoist. A qualified person must be responsible for determining the operating conditions and severity of service.

Inspection Schedule and Maintenance Report Form.

Shown on page 14 of this manual is a recommended Inspection Schedule and Maintenance Report form that lists various components of the hoist. The form also includes trolley components, runway com-

ponents, and miscellaneous items. This form is suggested as a guide for written inspection reports. Inspections are recommended each month and should be performed thoroughly enough to inform the hoist user of deficiencies for any item listed. This form does not supersede the Recommended Inspection and Maintenance Schedule listed on page 13 of this manual but may be used to record scheduled inspection and maintenance services required.

The user should revise the inspection interval, add additional units or provide a similar form to suit particular conditions that may exist. However, written, dated and signed inspection reports should be maintained particularly on critical items such as hoist hooks, hoisting rope, sheaves, drums and brakes. Periodic review of old inspection reports can point out service life of hoist components, forecasting need for adjustment, repair or replacement of these components.

As a matter of expedience, appointed maintenance personnel inspecting hoist can also take care of minor adjustments, repairs and cleaning, where required. Note column on Inspection Schedule and Maintenance Report form headed Corrective Action and Notes. When corrective action is made during inspection, note condition of part or unit as inspected in appropriate Condition column with a check mark (✓). Note “during inspection” corrective action taken and date in space provided. In this manner, items requiring further attention will be checked (✓)

without showing corrective action. This will advise the designated person responsible for hoist operation and safety, who reviews the reports that deficiencies exist. The designated person will check all deficiencies as listed and re-examine or otherwise determine whether they constitute a safety hazard.

<b>⚠ WARNING</b>
<b>Deficiencies may be hazardous to persone. Do not operate a hoist having deficiencies unless a designated qualified person has determined that these deficiencies DO NOT constitute a safety hazard.</b>

Written, dated and signed inspection reports for many items are mandatory under OSHA regulations, and many state safety codes. It is strongly recommended that the Inspection Schedule and Maintenance Report, shown herein, be completed by a qualified person designated with the responsibility for hoist operation and safety or an inspector appointed by this person.

Inspection records can point out the service life of hoist components and help forecast the need for adjustments, repairs, and ordering of replacement parts. File and review these reports after each inspection.

<b>RECOMMENDED INSPECTION AND MAINTENANCE SCHEDULE</b>	
<b>TIME INTERVAL</b>	<b>INSPECTION OR MAINTENANCE</b>
Daily or start of each shift (visual)	* Check operation of all functional mechanisms including limit switch operation, brakes and control. Check hoist cable for kinks, abrasions, corrosion or broken wires or evidence of improper spooling on drum. Inspect hooks, upper and lower blocks, and all load bearing components for damage.
1 Month	* HOIST CABLE – Inspect per Paragraph 5-6 and lubricate per Paragraph 4-3.
1-3 Months	* ELECTRICAL CONTROLS – Inspect per Paragraph 5-4. Check hoist gearcase oil level – add oil as required per Paragraph 4-2.e.
6 Months	* LOWER BLOCK –Inspect per Paragraph 5-2. * UPPER BLOCK –Inspect per Paragraph 5-3. * ROPE GUIDE-Inspect per Paragraph 5-5. * BLOCK OPERATED LIMIT SWITCH-Test per Paragraph 5-12.
6 Months or 500-750 hours “on” time	* Inspect electrical controls per Paragraph 5-4. Drain hoist gearcase oil and re-fill with oil per Paragraph 4-2. Lubricate hoist cable per Paragraph 4-3. Lubricate limit stop lever & add a light film of <b>MPG</b> grease (Paragraph 4-7) to the bevel gear in the screw type limit switch per Paragraph 4-4.
Annually	* Motor brake and actuating mechanisms. Inspect and adjust per Paragraph 5-10. Inspect hooks with crack detecting procedures per Paragraph 5-2. Drain and refill hoist gearcase per Paragraph 4-2.
5 years elapsed time or 5000 hours “on” time	* Complete inspection, disassembly, and maintenance required. It is recommended that your YALE repair Station be contacted for this service.

# INSPECTION SCHEDULE AND MAINTENANCE REPORT

HOIST SERIAL NO. (Manufacturer's) \_\_\_\_\_ CUSTOMER CRANE IDENTITY NO. \_\_\_\_\_  
 RATED LOAD \_\_\_\_\_ LOCATION IN PLANT \_\_\_\_\_  
 TYPE \_\_\_\_\_ THIS INSPECTION IS: MONTHLY  ANNUAL   
 VOLTAGE \_\_\_\_\_ SEMI-ANNUAL   
 INSPECTED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

COMPONENT, UNIT OR PART and location		*Recom- mended Inspection Interval			CONDITION (Check column best indicating condition when part or unit is inspected. Use note column to the right if condition is not listed below.)						CORRECTIVE ACTION NOTES
		MONTHLY	SEMI-ANNUAL	ANNUAL	GOOD	ADJUSTMENT REQUIRED	REPAIR REQUIRED (Loose Parts or Wires)	REPLACEMENT REQUIRED (Worn or Damaged)	LUBRICATION REQUIRED (Low Oil or Grease, Rust or Corrosion)	CLEANING OR PAINTING REQUIRED	
HOIST	Motor	<input type="checkbox"/>									
	Motor Brake	<input type="checkbox"/>									
	Couplings	<input type="checkbox"/>									
	Gears, Shafts, & Bearings	<input type="checkbox"/>									
	Upper Block	<input type="checkbox"/>									
	Lower Block	<input type="checkbox"/>									
	Hook & Throat Opening	<input checked="" type="checkbox"/>		X							Record Hook Throat Opening:
	Hoist Rope	<input checked="" type="checkbox"/>									
	Rope Drum		<input type="checkbox"/>								
	Rope Guide		<input type="checkbox"/>								
	Guards		<input type="checkbox"/>								
	Limit Switches	<input type="checkbox"/>									
CONTROL STATION OR PUSHBUTTON	Pushbutton		<input type="checkbox"/>								
	Wiring		<input type="checkbox"/>								
TROLLEY	Motor	<input type="checkbox"/>									
	Brake (when so equipped)	<input type="checkbox"/>									
	Couplings	<input type="checkbox"/>									
	Gears, Shafts, & Bearings	<input type="checkbox"/>									
	Frame			<input type="checkbox"/>							
	Wheels		<input type="checkbox"/>								
	Bumpers		<input type="checkbox"/>								
	Guards		<input type="checkbox"/>								
	Conductors	<input type="checkbox"/>									
	Collectors	<input type="checkbox"/>									
RESISTORS	Hoist		<input type="checkbox"/>								
	Trolley		<input type="checkbox"/>								
RUNWAYS	Monorail Joints		<input type="checkbox"/>								
	Monorail		<input type="checkbox"/>								
	Main Conductors	<input type="checkbox"/>									
	Main Collectors	<input type="checkbox"/>									
MISC.	General Condition		<input type="checkbox"/>								
	Load Attachment Chains	<input checked="" type="checkbox"/>									
	Rope Slings & Connections	<input checked="" type="checkbox"/>									
	Change Gearcase Lubricant			<input type="checkbox"/>							
	Grounding Faults		<input type="checkbox"/>								

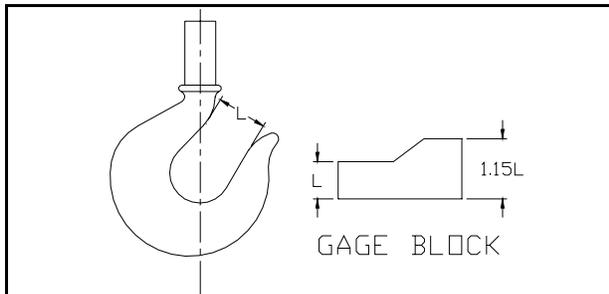
\* See text for DAILY & WEEKLY REQUIREMENTS.      ● SIGNED & DATED REPORT - OSHA.  
 ○ INSPECTION INTERVAL.      X MAGNETIC PARTICLE OR EQUIVALENT EXAMINATION REQUIRED.

## **⚠️ WARNING**

**Do not operate a hoist having unusual vibrations, sounds, or with anything wrong or apparently wrong. Danger may be present that the hoist operator cannot see. Determine and correct the cause of unusual conditions and make certain hoist can be operated safely.**

### **5-2.INSPECTION OF LOWER BLOCK.**

- a) Check lubrication of all parts. Also lubricate the shank of the hook that passes through the crosshead. If the thrust bearing is removed, apply **MPG** grease (Section IV, Paragraph 4-7).
- b) Check each sheave to insure rope groove is smooth and free from burrs, or other surface defects.
- c) Check each sheave for freedom of rotation; replace bearings if defective.
- d) Make certain that the spring pin holding the hook nut to the hook is securely in position.
- e) If hook is equipped with a hook latch or rotational lock, check to determine that they are in good operating condition.
- f) Check throat opening of the hook. (Refer to Figure 5-2.) It is recommended that upon receipt of the hoist, a measurement be made and recorded of the hook throat opening. OSHA regulations require that the hook be replaced if the throat opening exceeds 15 percent of the original opening, or if the hook is twisted more than 10 degrees from the unbent plane. We suggest that a gage block properly identified to the hoist, similar to the one shown in Figure 5-2, be made for each hook for use in these measurements.



**FIGURE 5-2 Gage Block.**

- g) Hooks showing signs of cracks must be replaced. Hooks should be inspected at least once per year using dye penetrants, magnetic particle, or other suitable non-destructive test methods.
- h) Check wear of the hook, especially at the saddle and replace if worn more than 10% of original dimensions.

### **5-3.INSPECTION OF UPPER BLOCK.**

- a) Check upper block sheaves (when hoist is so equipped) for wear, damage and freedom of rotation.  
  
If sheaves do not rotate freely, disassemble block and inspect bearings. Replace worn or damaged bearings, washers, pins, or sheaves.
- b) Make certain that all sheaves, bearing and hanger pins are free of foreign material. Bearings without grease fittings are lubricated for the life of the bearing and require no further lubrication.
- c) Make certain that the rope retention bolts are not bent, loose or otherwise distorted; bolts must have close clearance to sheave flange to keep rope in sheave grooves.

### **5-4.INSPECTION OF ELECTRICAL CONTROLS.**

## **⚠️ WARNING**

**Working in or near exposed energized electrical equipment presents the danger of electric shock.**

**TO AVOID INJURY:  
DISCONNECT POWER AND IMPLEMENT LOCKOUT/TAGOUT PROCEDURE BEFORE REMOVING COVER OR SERVICING THIS EQUIPMENT.**

Arrangement of electrical control equipment varies with the type of control, physical space and the optional control features ordered with the hoist.

Note the location in the electrical enclosure of the control circuit fuse, transformer, limit stop switches and the hoist contactors. Trolley contactors and optional hoist and trolley fuses are also located in this enclosure.

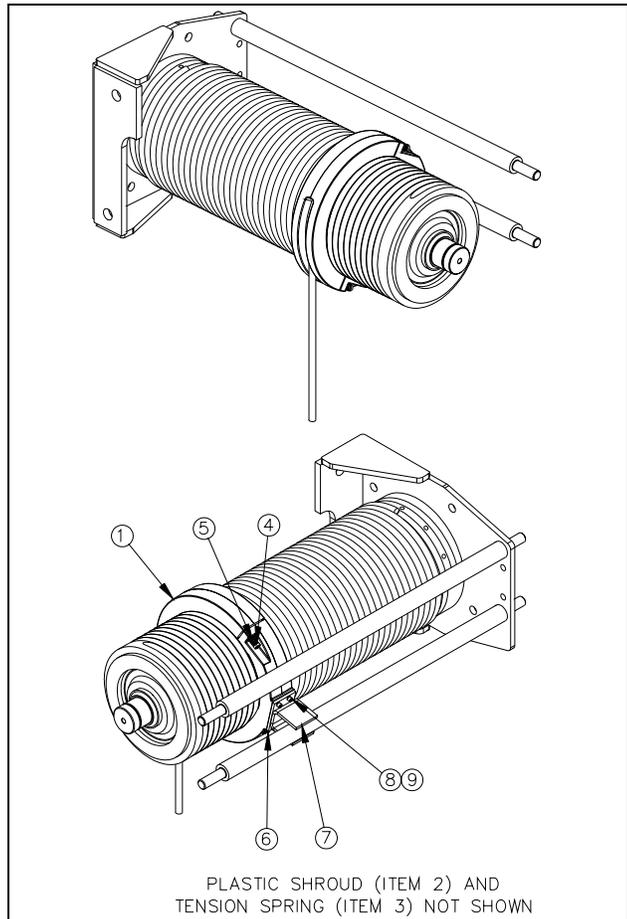
Use wiring diagrams furnished with hoist to determine electrical components on your hoist; then determine component location and identity on your hoist.

- a) Open hinged control panel enclosure cover and inspect wiring and terminals. Terminals should be securely crimped to wires and insulation sound. Terminal screws should be tight.
- b) Check condition of contactor assembly, transformer, and upper limit switches.
- c) Close and secure electrical cover before placing hoist back in service.

**5-5.INSPECTION OF ROPE GUIDE.**

- a) General. The rope guide is intended to help prevent the rope from “back-winding” and to hold the rope in the proper groove. Side pulling and excessive load swing will severely damage the rope guide and must be avoided.

<b>▲WARNING</b>
<b>Side pulling and excessive load swing will severely damage the rope and rope guide. Failure of these components may result in injury.</b>



**Figure 5-3. Rope Guide Assembly.**

- b) Disassembly. Refer to Figure 5-3. For further assistance in locating components refer to the parts list in Section X.
  - (1) Remove socket head cap screws and lock washers (Items 8 and 9). Take off mounting clip (Item 7).
  - (2) Remove shoulder bolts (Item 4) and compression springs (Item 5). The two halves of the rope guide body (Item 1) can now be pulled off the drum separately. When reassembling be sure that the half with the rope slot is on the top half of the drum.

<b>▲WARNING</b>
<b>Once shoulder bolts are removed, the halves will separate and, if not properly supported, the halves could fall.</b>

- (3) Carefully unhook the rope tensioning spring (Item 3), which is under tension.

<b>▲WARNING</b>
<b>The rope tensioning spring is under considerable tension; use caution when unhooking to avoid injury.</b>

- (4) Remove the split plastic shroud (Item 2, Figure 10-9) from the drum. When reassembling the rope guide be sure the plastic shroud (Item 2) fits snugly in the rope guide body groove.
- (5) Thoroughly clean and inspect all components.
- (6) Follow steps in reverse to reassemble. Be sure to re-grease the rope guide with **MPG** (Paragraph 4-6) after assembling.

**5-6.ROPE INSPECTION, MAINTENANCE AND REPLACEMENT.**

<b>▲WARNING</b>
<b>Wire Rope improperly handled or abused can create a SAFETY HAZARD. Always wear suitable leather gloves when handling wire rope. Read and comply with inspection, maintenance and replacement information given herein.</b>

a) Inspection. Wire rope on your hoist is one of the most important components requiring frequent inspection and maintenance. All wire ropes will eventually deteriorate to a point where they are not safe and will require replacement. Wire rope should be thoroughly inspected at regular monthly intervals by an authorized person and a determination made when further use of the rope would constitute a safety hazard. Each inspection should include a written dated and signed report of rope condition. Reports should be filed and reviewed each month and any rope deterioration carefully noted. Inspections revealing but not limited to the following conditions should cause inspector to question remaining strength of rope and consider replacement: Also, refer to ASME B30.2 "Overhead and Gantry Cranes, Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist."

- (1) Twelve randomly distributed broken wires in one rope lay or four broken wires in one strand. (See Figure 5-4.)

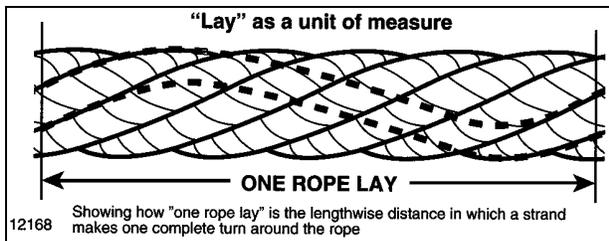


Figure 5-4. Description of One Rope Lay.

- (2) Wear of one-third of the original diameter of outside individual wires.
- (3) Kinking, crushing, or birdcaging.
- (4) Heat damage from any cause.
- (5) Reductions from nominal diameter of more than 1/32" for 7/16" diameter rope or 3/64" for 9/16" rope. See figure 5-5 for proper measurement techniques.

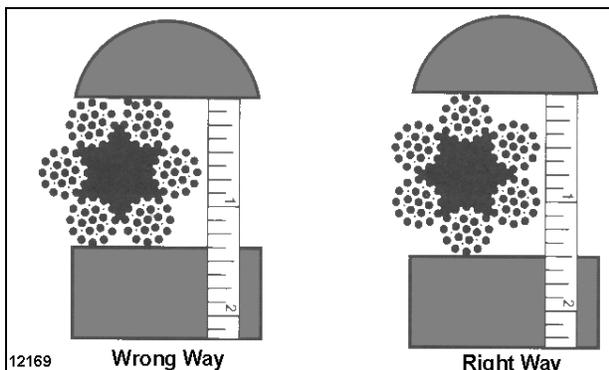


Figure 5-5. Correct Method of Measuring Rope.

- (6) Rope corrosion, internal or external.
- (7) Effects from improper lubrication.
- (8) Rope being idle for one month or more due to shutdown or inactivity.

Special attention should be exercised when inspecting rope normally hidden during inspecting procedures.

Please refer to the "Wire Rope Users Manual" –for illustrations and definitions when following the above guidelines for rope inspection. This manual may be obtained from:

WRTB Fulfillment  
609 North Second Street  
St. Joseph, MO 64502  
Or by calling: 1-888-BUY-WRTB (289-9782).

- b) Maintenance. Keep rope well lubricated to help reduce internal friction and prevent corrosion. Lubricant, as described in Paragraph 4-3, should be applied as a part of the regular maintenance program. Special attention is required to lubricate sections of rope over equalizing sheaves and other hidden areas.

Avoid dragging ropes in dirt or around sharp objects that will scrape, nick, crush, or induce sharp bends in the rope.

⚠ **WARNING**

**Use only factory-approved rope with swaged wire rope socket.**

- c) Replacement. When recommended by an authorized inspector, the rope should be replaced. Replacement rope assemblies are shipped from the factory carefully coiled to prevent damage by kinking. Care must be taken to avoid twisting or kinking when uncoiling and handling during reeving.

Before replacing rope, check condition of grooves in sheaves and drums to determine if they are excessively worn.

When first using hoist after rope replacement, break in rope by operating under lighter loads to full travel before applying maximum load.

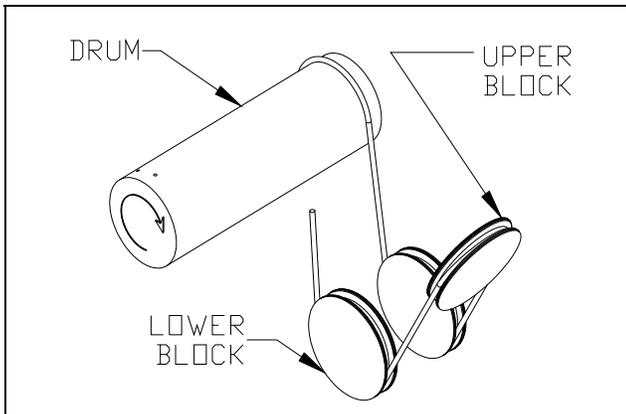
## 5-7. ROPE REEVING.

- a) General. Place reel on stand with shaft through the center of reel so rope can be pulled straight out with reel rotating.

### ⚠ CAUTION

It is imperative that rope reel or coil rotates as rope unwinds. If coil or reel does not rotate the wire will be twisted as it is uncoiled and kinking will result. A kinked rope may be damaged and unsafe for maximum service.

- b) Before removing the old rope, refer to reeving diagram, Figure 5-6. To assist with re-reeving your hoist, refer to the reeving diagram and corresponding paragraph that describes the reeving procedure.



**FIGURE 5-6. Reeving Diagram – 4 Part Single-Reeved. (Note: Arrow on Drum Indicates Direction of Drum when Lowering.)**

- c) Removing old rope. Please, refer to the Section X Parts lists to assist in locating components referred to in the following paragraphs.

- (1) Lower the lower block to a scaffold 6 to 7 feet below hoist to relieve tension on wire rope. (Lower block may be lowered to the floor if desired; however, to handle less weight and for ease of reeving, adequate scaffold below the hoist is recommended.)

### ⚠ CAUTION

Be certain all personnel are clear of hoist as components, hardware, and wire rope are removed from hoist.

- (2) Remove block operated limit switch weight from rope.
- (3) Remove retaining rings from lower block sheave pin.
- (4) Remove outer lower block sheave covers.
- (5) Remove lower block sheaves and wire rope.
- (6) Remove two (2) rope retention bolts and nuts from upper block yoke.
- (7) Remove two (2) bolts and key plate to allow removal of upper block sheave pin.
- (8) Securely grasp the upper block sheave before carefully sliding the sheave pin out. Note that two spacers will also be released as the pin is removed.
- (9) Remove wire rope from sheave.
- (10) Remove retaining rings or cotter pins from dead end anchor pin. Securely grasp the swaged wire rope and, in some cases, spacers before removing the pin.
- (11) Remove Rope Guide.
- (12) Make certain all personnel are clear of hoist and operate hoist "DOWN" to completely unwind all wire rope from drum. Stop hoist so all (3) rope clamps are accessible. Remove rope clamps and wire rope from drum.

### ⚠ WARNING

Winding rope on rope drums with power can be hazardous. Keep hands safe distance from drum; wear gloves and use extreme care when winding rope.

- d) Installing new rope.

- (1) Thread rope to drum from trolley frame side then secure with rope clamps as follows:
- (a) Make sure that the rope clamp groove size utilized as marked directly above the groove matches the rope size for your hoist (7/16" on the "B" Frame and 9/16" on the "C" Frame).
- (b) With the rope lying in the bottom of the drum groove, begin by tightening

the rope clamp at the tail end of the rope. Torque to 50 ft-lbs.

- (c) With tension on the rope keeping it properly seated in the drum groove, torque the remaining two (2) rope clamps in sequence to 50 ft-lbs.
- (2) With all personnel clear of hoist – TURN ON POWER.
- (3) Operate hoist “UP” guiding six (6) wraps of new rope into drum grooves with gloved hand.
- (3) Re-install rope guide over rope in rope drum grooves as shown in Figure 5-3. and outlined in Section V, Paragraph 5-6. Continue lubricating as rope is spooled onto the drum until about 28’-0” remain unwound.
- (4) With outer lower block covers removed, thread the wire rope through the sheaves of the upper and lower block as shown in Figure 5-6.
- (5) Attach swaged rope end to the dead end anchor pin fastening cotter pins or retaining rings as required.
- (6) Replace the lower block sheave covers.
- (7) Lubricate cable per Paragraph 4-3. See Figure 10-4 (“B” Frame components) for lower block parts with 3/8” diameter wire rope.

See Figure 10-4 (“C” Frame components) for lower block parts with 1/2” diameter wire rope.

c) Checking for and removal of rope twisting.

- (1) To remove rope twist in four part single reeved hoists:
  - (a) Observe direction block tends to rotate.
  - (b) Lower the block to a low position and TURN OFF (lock out) POWER.
  - (c) Remove swaged fitting from anchor pin and rotate rope several turns in a direction tending to correct block rotation.
  - (d) TURN ON POWER; raise and lower the block several times to feed the correcting twist in the rope through the reeving.

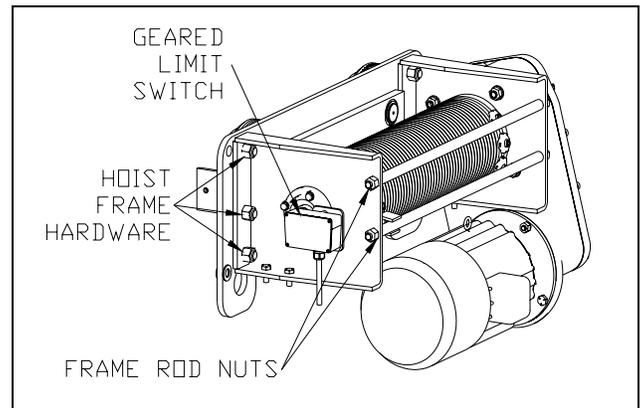
(e) Repeat steps (a) thru (d) as required until twist is removed.

**5-8.INSPECTION OF ROPE DRUM AND SHAFT.**

<h1>⚠ WARNING</h1>
<b>Working in or near exposed energized electrical equipment presents the danger of electric shock.</b>
<b>TO AVOID INJURY: DISCONNECT POWER AND IMPLEMENT LOCKOUT/TAGOUT PROCEDURE BEFORE REMOVING COVER OR SERVICING THIS EQUIPMENT.</b>

- a) To remove the rope drum, remove the rope guide and hoisting cable, as outlined in Section V, Paragraphs 5-5. and 5-7.c. respectively.

<h1>⚠ WARNING</h1>
<b>The hoist must be removed from service and placed on the ground for any maintenance that requires removal of the output shaft assembly or drum.</b>

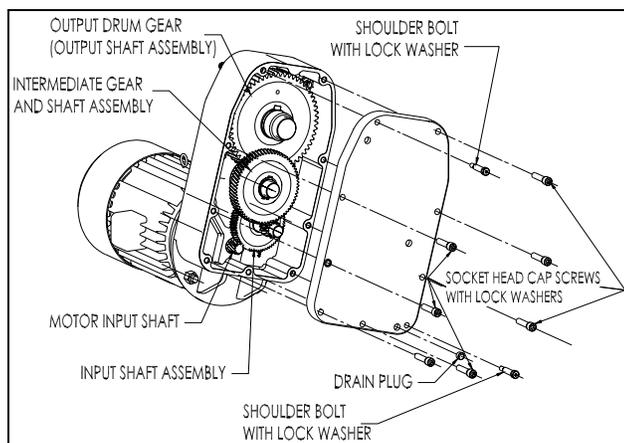


**Figure 5-7. Drum Frame & Geared Limit Switch.**

- b) Remove the Geared Limit Switch or disconnect the wires so that the electrical cable will not inhibit removal of the drum. (See Figure 5-7).
- c) Remove the unit from service, place it on the ground, and provide adequate means to support the drum before removing the frame rod nuts at the outboard drum frame end (Figure 5-7). The hardware attaching the drum frame to the hoist and trolley frame may then be removed.
- d) Keeping the drum level, remove the drum from the splined output shaft at the gear case end.

## 5-9. INSPECTION OF HOIST GEARING.

- a) General. The hoist gear case is a triple reduction splash lubricated vertically split cast aluminum case and cover. The first two high-speed reductions are helical and the third low speed output reduction is spur. The gear shafts are supported with ball bearings housed in the back of the case and in the cover. The input helical pinion is cut directly into the motor shaft. An oil seal housed in the gear case at the motor input seals the motor shaft as it passes into the gear case. Since the entire motor shaft is submerged in oil, anytime the motor is removed, the oil must be drained from the gear case. All pinions are integral with their shafts while the gears are keyed and pressed onto their shafts. The output shaft passes through an oil seal in the back of the gear case and drives the drum by means of a crowned spline. One end of the rope drum is supported on this output shaft.



**Figure 5-8. Hoist Gear Case Assembly.**

- b) Inspection and Disassembly.

**Gearcase.** (See Figure 5-8.)

- (1) Lower hook block to the floor and relieve all load from ropes.
- (2) Make sure power to hoist is off and locked out.

### **▲WARNING**

**Before disassembly, prevent rope drum from free spinning by wedging drum in place with a block of wood, and resting lower block on work surface so all weight is off rope drum. Rope may also be removed from hoist drum.**

- (3) Drain the oil from the gear case per Section IV, Paragraph 4-2.
- (4) Provide adequate means to support the gear case cover. Once the cover is supported, remove the two (2) shoulder bolts, seven (7) socket head cap screws, and nine (9) lock washers holding the cover to the gear case. Carefully draw the cover directly away from the gear case, as damage to this surface will prevent the gasket from sealing properly. As the cover is removed, ensure that all gear and shaft assemblies remain in the case.

Only once the output shaft is free of the rope drum, can the output shaft assembly be safely removed from the gear case. Provide an adequate means to support this shaft and gear assembly before removing, as it weighs approximately 80 lbs. ("C" Frame Hoist).

### **▲WARNING**

**If output shaft assembly is pulled out of the gear case with the cover, it will disengage from the drum allowing the drum to drop. Be certain all shaft assemblies stay in the case.**

- (5) If it is necessary to remove the output shaft assembly from the gear case, the rope drum must first be removed from the hoist. See Section V, Paragraph 5-8.

### **▲WARNING**

**The hoist must be removed from service and repaired on the ground for any maintenance that requires removal of the output shaft assembly or drum.**

- (6) The pinion shaft and gear assemblies may be removed as necessary.
- (7) Inspect all gears, pinions, bearings, and the output shaft spline for wear, pitting, or mechanical damage. Replace as necessary. See Section X, Figure 10-2 for replacement parts. It is recommended that gears and pinions only be replaced as sets. Thoroughly clean the output shaft external spline teeth before reassembly.
- (8) Assembly is opposite of removal. Use a new gasket. Do not attempt to assemble

the cover to the gear case without a gasket, as the spacing between bearings will be reduced. Severe damage to the hoist will occur if no gasket or the wrong gasket is used. Refill gear case with new lubricant per Section IV, Paragraph 4-2 before use. Using **SG** (Paragraph 4-7), grease the spline teeth on the output shaft before reinstalling rope drum.

- (9) Test hoist per Section V, Paragraph 5-13 to ensure proper operation.

#### **Hoist Motor.**

- (1) Lower hook block to the floor and relieve all load from ropes.
- (2) Make sure power to hoist is off and locked out.
- (3) Drain the oil from the gear case per Section IV, Paragraph 4-2.
- (4) Disconnect the wiring and conduit from the motor junction box.
- (5) Provide a means to support the hoist motor. The hoist motor weighs approximately 250 lbs. And must be held level while removing and installing.
- (6) Once the motor is properly supported, remove the hardware fastening it to the gear case. Carefully withdraw the motor horizontally straight out from the gear case. Do not tip or move the motor from side to side.
- (7) Replace the motor shaft seal using an appropriate seal driver. It is recommended that a new seal be installed each time the motor is removed from the case.

#### **IMPORTANT!**

- (8) Before installing the motor, pack the gear teeth with **MPG** grease (Paragraph 4-7) and wrap the gear teeth with a number of layers of Teflon tape to protect the seal lip from being damaged by the gear teeth. Coat the seal lip and the motor shaft with **MPG** grease.

## **▲ NOTICE**

**Failure to use a factory replacement seal will cause premature seal failure due to specific lip material requirements that must be met.**

- (9) Install the motor to the gear case. The motor shaft must be in line with the seal bore and perpendicular to the mounting surface before attempting to insert the shaft through the seal. The motor shaft must remain horizontal and not rock up and down or side-to-side while installing the motor or seal damage will occur. It may be necessary to rotate the rope drum slightly to align the gear teeth to mesh with the teeth on the motor shaft. Ensure that the motor seats properly into the rabbet fit machined in the gear case. Fasten the motor to the gear case.

- (10) Reconnect the conduit and power leads to the motor. See Section VIII and refer to the specific wiring diagrams shipped with your hoist.

- (11) Refill gear case with lubricant per Section IV, Paragraph 4-2.

- (12) Test hoist to ensure proper operation per Section V, Paragraph 5-13.

#### **5-10. INSPECTION OF MOTOR BRAKE AND ACTUATING MECHANISM.**

- a) General Operation. The hoist brake is an electro-magnetically released, spring set non-adjustable-torque brake. Torque is generated by compressing a friction disk between the stationary motor end bell and the spring loaded brake armature. The friction disk is fixed to the motor shaft and rotates with the motor shaft. When the magnet coil is energized, the armature plate is pulled across the air gap. The friction disk is carried by a splined hub that permits axial movement when the brake is released. This axial movement releases both sides of the friction disk from their mating stationary surfaces and allows the friction disk to rotate freely when the brake is energized. When power is removed from the magnetic coil, the compression springs push the armature against the friction disk and the other side of the friction disk against the motor end bell generating the torque necessary to stop the hoist machinery and hold the load.

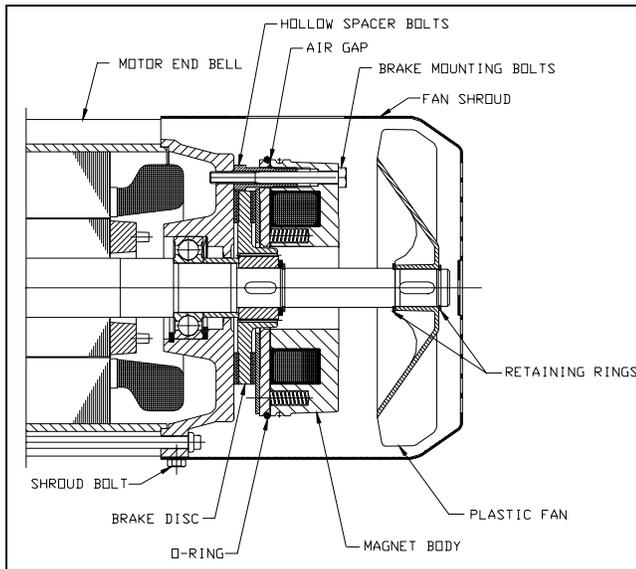
It will be necessary to compensate for the friction disk wear when a greater amount of hook movement (drift) is noticed when stopping. There is no torque adjustment of the brake. Friction disk wear can only be compensated for by resetting air gap.

- b) Friction Disk Inspection and Air Gap Resetting.

- (1) Lower hook block to the floor and relieve

all load from ropes.

- (2) Make sure power to the hoist is off and locked out.



**Figure 5-9. Motor Brake.**

- (3) Remove the four (4) bolts attaching the fan shroud to the motor and remove the fan shroud. See Figure 5-9.
- (4) Carefully roll the large O-ring from the groove over the air gap back toward the magnet body. Do not excessively stretch this O-ring.
- (5) Measure the air gap using feeler gages. If the air gap exceeds the maximum value shown in Table 5-1, the air gap must be reset.

Hoist	"B" Frame	"C" Frame
Mounting Bolt Torque	18 ft-lbs.	18 ft-lbs.
Nominal Air Gap	0.016 in.	0.016 in.
Maximum Air Gap	0.031 in.	0.035 in.
Minimum Brake Disk Thickness	0.453 in.	0.472 in.

**Table 5-1. Motor Brake Data.**

- (6) To measure the thickness of the friction disk, it is necessary to remove the brake body from the motor end bell. Remove the three (3) brake mounting bolts and draw the brake body away from the friction disk. Carefully set the brake body down on the motor shaft directly in front of the fan. Draw the friction disk away from the end bell and measure the thickness over the friction surfaces. If the friction disk thickness is less than the

minimum shown in Table 5-1, it must be replaced. See Section X, Figure 10-10. If the friction disk thickness is within the allowable, reassemble the brake body to the motor end bell and torque the mounting bolts to the value shown in Table 5-1. Whenever the friction disk is replaced, it is necessary to reset the air gap.

- (7) To reset the air gap, begin by releasing the (3) mounting bolts 1/2 turn. Turn the hollow spacer bolts into the magnet body approximately 1/4 turn. Retighten all three mounting screws. Measure the air gap at a minimum of three places around the circumference. Threading the hollow spacer bolts into the magnet body will decrease the air gap while backing these spacer bolts out of the magnet body will increase the air gap. Repeat this step as necessary until the required air gap is achieved. The air gap must be the same all the way around the brake. Once the air gap is correct, torque the mounting bolts to the value shown in Table 5-1.
- (8) Replace the large O-ring over the air gap and reassemble the fan shroud to the motor.
- (9) Test hoist per Section V, Paragraph 5-13 to ensure proper brake operation.

c) Brake Disassembly.

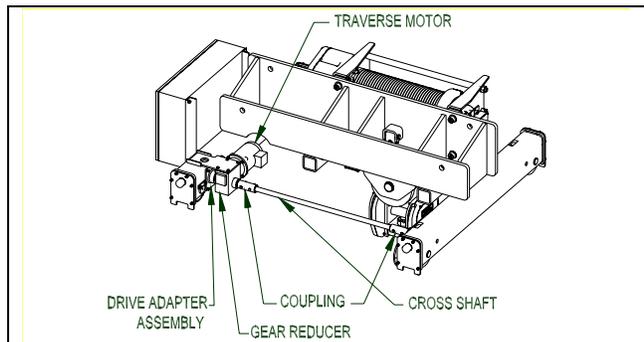
- (1) Lower hook block to the floor and relieve all load from ropes.
- (2) Make sure power to the hoist is off and locked out.
- (3) Remove the four (4) bolts attaching the fan shroud to the motor and remove the fan shroud. See Figure 5-9.
- (4) Remove the snap ring behind the plastic fan. Carefully remove the fan from the motor shaft. Remove the snap ring in front of where the fan was mounted.
- (5) Disconnect the two wires from the terminal block on the magnetic body.
- (6) Remove the three mounting bolts that attach the brake body to the motor end bell and remove the brake body from the motor. Remove the friction disk from the motor shaft.
- (7) Clean and inspect all components and

working surfaces. Replace all damaged or worn components as necessary. Measure friction disk thickness and replace if less than the minimum thickness shown in Table 5-1.

d) Brake Re-assembly.

- (1) Install the friction disk on the splined hub. The friction disk must slide on the splined hub and seat against the end bell of the motor.
- (2) Install the brake body to the motor end bell using the three (3) mounting bolts. The air gap must be reset as described in Section V, Paragraph 5-10.b. Torque the mounting bolts to the values shown in Table 5-1. Install the large O-ring in the groove over the air gap. Ensure this O-ring is not pinched in the air gap.
- (3) Connect the brake leads to the terminal block on the brake body.
- (4) Install the forward fan mounting retaining ring and install the fan. Install the rear retaining ring. Install the fan shroud and bolts.
- (5) Test hoist per Section V, Paragraph 5-13.

**5-11. INSPECTION OF HOIST TRAVERSE DRIVE**



**Figure 5-10. Traverse Drive Arrangement.**

- a) General. The traverse drive consists of two double flanged, geared trolley wheels driven by a single motor and hollow bore worm gear reducer. This reducer is keyed to an adapter shaft at one end and connected to a cross shaft by a coupling to drive the opposite end. The wheels rotate on sealed ball bearings supported by fixed axles.
- b) Inspect wheel treads, flanges, and gear teeth for wear. Check for adequate lubrication (**WG**, Section IV, Paragraph 4-7)

on the wheel gear and pinion mesh. Check wheel bearings for any signs of wear, including rough rotation and signs of lubricant leakage. Replace all damaged or missing items. Wheels must always be changed in opposing pairs and drive wheels should be changed when the drive pinions are replaced.

- c) Examine the drive pinions, cross shaft, and cross shaft bearings. Check pinions for gear tooth wear and proper alignment with wheel gear. Drive pinions must be replaced as sets and should be replaced along with the drive wheels. The cross shaft bearings are sealed for life and should be replaced at any sign of mechanical wear or lubricant leakage.

**▲ CAUTION**

**Ensure that the cross shaft is properly positioned and locked into place by means of the clamp collars. Failure to do so may allow the drive shaft to contact the rope on the rope drum (B frame) or the hoist gearcase (C frame hoist).**

- d) Inspect the traverse gearbox and motor. Look for signs of rough operation, mechanical damage or lubricant leaks. Inspect the hollow bore and hexagonal drive shaft for wear. Verify that the four bolts that hold the gearbox to the trolley frame and the four bolts that hold traverse motor to the gearbox are all present and tight. Replace and tighten as necessary. The factory recommends complete replacement of the traverse gearbox. However, gearbox service may be available from you local authorized YALE repair center.

**5-12. TESTING BLOCK OPERATED LIMIT SWITCH.**

- a) General. The block operated limit switch is a secondary upper limit switch actuated when the lower block contacts the limit switch weight. The rotary geared limit switch (screw type limit switch) is the primary upper limit switch and must be temporarily disconnected to allow the block operated limit switch to be tested.
- b) Procedure. Remove load from the hook. To disconnect the geared limit switch refer to Figure 7-2. Remove the limit switch cover then loosen the two (2) screws holding the

locking plate in place. Allow the locking plate to slide down and disengage from the adjustment discs. Do not rotate the adjustment discs.

cover when testing and adjusting is complete.

### 5-13. TESTING HOIST.

<b>⚠ CAUTION</b>
<b>Damage to the hoist may occur if the block operated limit switch fails during testing.</b>
<b>Damage can be avoided by immediately releasing the pushbutton once the lower block has traveled through the limit switch weight.</b>

The block operated limit switch may now be tested by slowly and carefully raising the hook until the limit switch weight contacts the lower block. If the hook does not stop when the limit switch weight is lifted, immediately release the pushbutton before damage to your hoist occurs. If the block operated switch functions properly, proceed by testing in the same manner with rated load on the hook.

Once it has been determined that the block operated limit switch is functioning properly, the geared limit switch must be reconnected and tested.

Position the lower block three inches (3") below the point where the block operated limit switch is activated. The geared limit switch shall be reconnected by sliding the locking plate back into position ensuring slots on adjustment discs are fully engaged and tightening locking plate screws to 4 in-lbs. (See Figure 7-2). The geared limit switch must then be tested.

<b>⚠ WARNING</b>
<b>Check limit switch operation carefully, without load, before placing hoist in service. If misadjusted, <u>SEVERE DAMAGE AND/OR A DROPPED LOAD COULD RESULT.</u> Allow 3" for hook drift in both directions. Never allow less than two (2) complete wraps of rope on drum with hook in lowest position.</b>

Test the geared limit switch by raising the lower block until it stops. Ensure that the geared limit switch stopped the hoist before the block operated limit switch was activated. If this is not the case see Section VII, Paragraph 7-3 for adjusting the geared limit switch. Replace geared limit switch

a) General. Testing shall be performed in accordance with ANSI B30.16-2 and this manual. Before placing hoist in service, hoist should be tested to insure safe operation when hoist has been disassembled and reassembled. To test, place the trolley hoist on an overhead supporting structure of sufficient strength to support the weight of the hoist and the rated load. Connect hoist to power supply as shown on hoist nameplate and perform the checks listed in b) and c) below.

b) Check hoist as outlined in PRE-OPERATION CHECKS, SECTION II, Paragraph 2-5.

c) Check hoist with rated load.

(1) Attach rated load to lower hook.

(2) Depress "UP" push button and raise load. When push button is released, hoist should stop immediately and hold load at that level.

(3) Depress "DOWN" push button, lower load a short distance and release button. Hoist should stop immediately and hold load at that level.

#### NOTE:

If load drifts downward slowly in step 2 or 3 above, motor brake requires adjustment – see Motor Brake Adjustment – SECTION VII, Paragraph 7-1



## **SECTION VI – TROUBLE SHOOTING**

**6-1.GENERAL.** This section contains possible causes and solutions to common hoist problems. Please attempt to remedy your hoist problems by following these steps before contacting the factory.

Whenever servicing electrical components be sure to shut off and lock out power following proper lockout/tagout procedures.

<b> WARNING</b>
<b>Working in or near exposed energized electrical equipment presents the danger of electric shock.</b>
<b>TO AVOID INJURY: DISCONNECT POWER AND IMPLEMENT LOCKOUT/TAGOUT PROCEDURE BEFORE REMOVING COVER OR SERVICING THIS EQUIPMENT.</b>

<b>SECTION VI – TROUBLE SHOOTING</b>		
<b>TROUBLE</b>	<b>PROBABLE CAUSE</b>	<b>REMEDY</b>
6-1 Hoist Will Not Operate.	<ul style="list-style-type: none"> <li>a.No power to hoist.</li> <li>b.Wrong Voltage.</li> <li>c.Loose or broken wire connections in hoist electrical system.</li> <li>d.Contactor assembly not functioning.</li> <li>e.No control voltage.</li> <li>f. Motor burned out.</li> </ul>	<ul style="list-style-type: none"> <li>a.Check switches, circuit breakers or fuses and connections in power supply lines. Check power collectors.</li> <li>b. Check voltage required on motor data plate against power supply.</li> <li>c.Shut off and lock out power supply; remove electrical cover on hoist and check wiring connections. Also check connections in push button station and limit switches.</li> <li>d.See that necessary jumper wires are properly installed. Verify that the contactor armatures are free to move. If binding occurs, replace contactor. Check for burned out contactor coils.</li> <li>e.Check transformer fuse. If blown, check for grounding and/or shorts in the push button station. Check the transformer coil for signs of overheating. Replace transformer if burned out. Verify the transformer secondary is the same voltage as the coils to which it is connected.</li> <li>f. Replace motor. Check input power supply. Check hoist motor connections.</li> </ul>
6-2 Hook Moves in Wrong Direction.	<ul style="list-style-type: none"> <li>a.Reverse phasing on three-phase hoists.</li> <li>b.Hoist wired incorrectly.</li> </ul>	<ul style="list-style-type: none"> <li>a.Interchange any two power supply line leads. Refer to Section II, Paragraph 4.b.</li> <li>b.Check wiring connections with appropriate wiring diagram.</li> </ul>
6-3 Hook Will Raise But Not Lower.	<ul style="list-style-type: none"> <li>a.Lower electrical circuit open.</li> <li>b.Contactor assembly not functioning</li> <li>c.Down, push button is inoperative.</li> </ul>	<ul style="list-style-type: none"> <li>a.Check for loose connections. See that necessary jumper wires are properly installed on contactor.</li> <li>b.See that necessary jumper wires are properly installed. Verify that the contactor armatures are free to move. If binding occurs, replace contactor. Check for burned out contactor coils.</li> <li>c.Check push button contacts and wires.</li> </ul>

<b>SECTION VI – TROUBLE SHOOTING</b>		
<b>TROUBLE</b>	<b>PROBABLE CAUSE</b>	<b>REMEDY</b>
6-4 Hook Will Lower, But Not Raise.	<ul style="list-style-type: none"> <li>a. Excessive load.</li> <li>b. Hoist electrical circuit open.</li> <li>c. Contactor assembly not functioning.</li> <li>d. Up, down button inoperative.</li> </ul>	<ul style="list-style-type: none"> <li>a. Reduce loading to rated load of hoist as shown on nameplate.</li> <li>b. Check for loose connections. See that necessary jumper wires are properly installed on contactor.</li> <li>c. See that necessary jumper wires are properly installed. Verify that the contactor armatures are free to move. If binding occurs, replace contactor. Check for burned out contactor coils.</li> <li>d. Check push button contacts and wires.</li> </ul>
6-5 Hoist Will Not Lift Rated Load.	<ul style="list-style-type: none"> <li>a. Low voltage.</li> </ul>	<ul style="list-style-type: none"> <li>a. See that the power supply current is the same voltage listed on motor data plate. Check hoist motor connections. Check size of power supply lines.</li> </ul>
6-6 Hoist Motor Overheats.	<ul style="list-style-type: none"> <li>a. Excessive load.</li> <li>b. Excessive duty-cycle.</li> <li>c. Wrong voltage or frequency.</li> <li>d. Defective motor or worn bearings in hoist frame.</li> <li>e. Brake not adjusted properly.</li> </ul>	<ul style="list-style-type: none"> <li>a. Reduce loading to rated load as shown on nameplate.</li> <li>b. Reduce frequency of lifts or amount of jogging.</li> <li>c. Check current rating on motor data plate against power supply. Check hoist and inspect for defective, worn or damaged parts.</li> <li>d. Disassemble hoist and inspect for defective, worn or damaged parts.</li> <li>e. Adjust brake per Section VII, Paragraph 7-1.</li> </ul>
6-7 Load Drifts Excessively When Hoist is Stopped.	<ul style="list-style-type: none"> <li>a. Excessive Load.</li> <li>b. Motor brake not holding.</li> </ul>	<ul style="list-style-type: none"> <li>a. Reduce loading to rated load as shown on nameplate.</li> <li>b. With No Load, check hoist for drift. If drifting is excessive, inspect motor brake (Section V, Paragraph 5-10) and adjust as outlined in Section VII, Paragraph 7-1.</li> </ul>
6-8 Hoist Operates Intermittently.	<ul style="list-style-type: none"> <li>a. Collectors make poor contact.</li> <li>b. Loose connections.</li> </ul>	<ul style="list-style-type: none"> <li>a. Check collectors for free movement of spring arm, weak spring or electrical connections.</li> <li>b. Check all wiring for loose connections.</li> </ul>

## **SECTION VII – ADJUSTMENTS**

**7-1. MOTOR BRAKE ADJUSTMENT.** These brakes are designed so that adjustment is seldom required. If, after a period of service, the load hook “drifts” downward more than usual for your hoist before coming to a stop, the motor brake may require adjustment to compensate for brake disc wear.

Refer to Figure 5-9 and proceed as outlined in Section V, Paragraph 5-10.

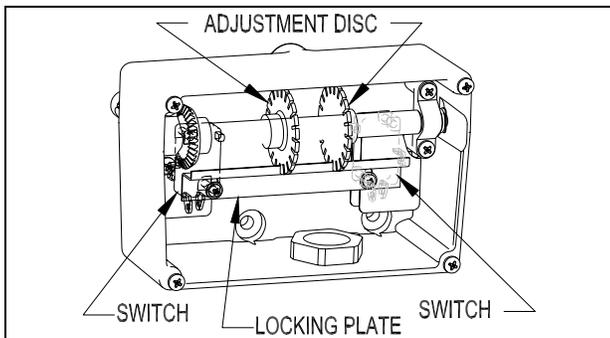
**7-2. BLOCK OPERATED LIMIT SWITCH.** The block operated limit stop, furnished as standard equipment, is non-adjustable and designed to stop the lower block at the safest high point of travel to eliminate any possibility of double-blocking. When the safest high point is reached, the limit switch automatically stops hook travel.

### **⚠ WARNING**

**Check to be certain main power switch is locked in open position (OFF) before removing brake cover.**

**7-3. GEARED ROTARY LIMIT SWITCH ADJUSTMENT.** The geared rotary type limit switch is standard equipment and is located on the drum end opposite the gearcase end.

This limit switch has a rotary screw driven by a gear reduction that is coupled to the end of the drum shaft. Adjustment discs operate the contacts of separate switches, one for the hoisting circuit and one for the lowering circuit. The switch assembly must be wired in accordance with the appropriate wiring diagram, which is shipped with the hoist. Instructions for adjusting limit switch are inside cover and are repeated below (see Figure 7-2).



**Figure 7-2. Screw-Type Limit Switch Adjustment (Wires Not Shown For Clarity.)**

## ⚠️ WARNING

**Be certain that electrical power supply is OFF and locked in the open position before removing limit switch cover.**

- a) Remove four screws and lift off switch cover.
- b) Loosen locking plate screws. Slide locking plate away from adjustment disc.
- c) Turn proper adjustment disc (right for up, left for down) toward switch to reduce hook travel or away from switch to increase hook travel.
- d) Slide locking plate back into position ensuring slots on adjustment discs are fully engaged, tighten locking plate screws to 4 in-lbs.
- e) Replace cover.
- f) Carefully check limit switch operation without load before placing hoist in service. If misadjusted, repeat steps above. Allow 3" for hook drift in both directions. Never allow less than two (2) complete wraps of rope on drum with hook in lowest position.

## ⚠️ WARNING

**Check limit switch operation carefully, without load, before placing hoist in service. If misadjusted, SEVERE DAMAGE AND/OR A DROPPED LOAD COULD RESULT. Allow 3" for hook drift in both directions. Never allow less than two (2) complete wraps of rope on drum with hook in lowest position.**

Provide a light film of **MPG** grease (Paragraph 4-7) on gear of both limit switches.

### 7-4. SHORTENING OF PUSHBUTTON CABLE.

## ⚠️ WARNING

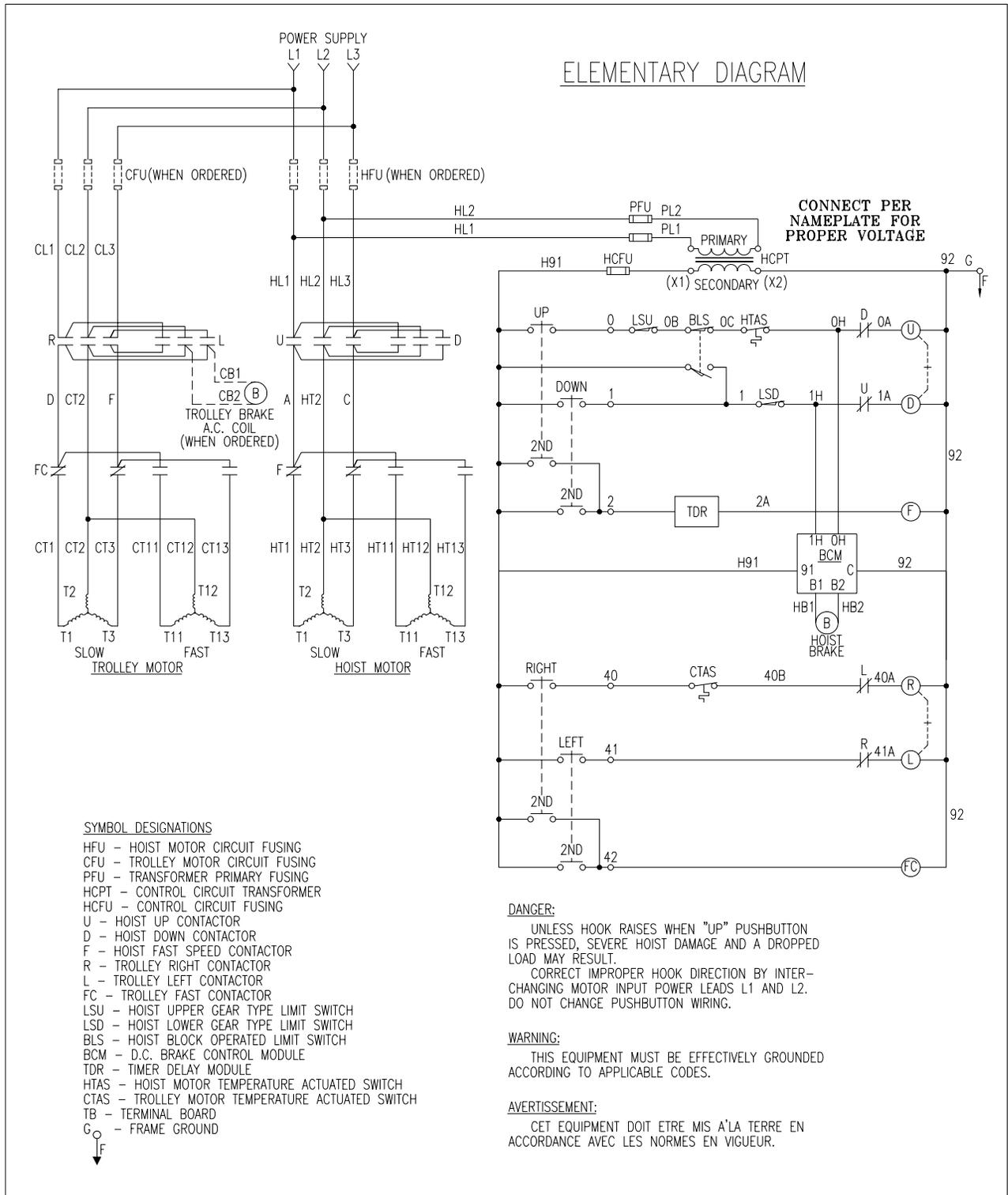
**Be certain that electrical power supply is OFF and locked in the open position before attempting shortening of push button cable.**

- a) Loosen screws at cable connectors and clamps at top of cable.
- b) Adjust steel support cable to proper length and tighten screws.
- c) Loosen upper cable grip and pull excess cable into connection box at hoist.
- d) Tighten cable grip and cut off excess cable.
- e) Strip cable sheath and connect wires with the same type of terminals previously furnished (care must be taken to match previous wire color coding with wire markers in accordance with wiring diagram furnished with hoist.)

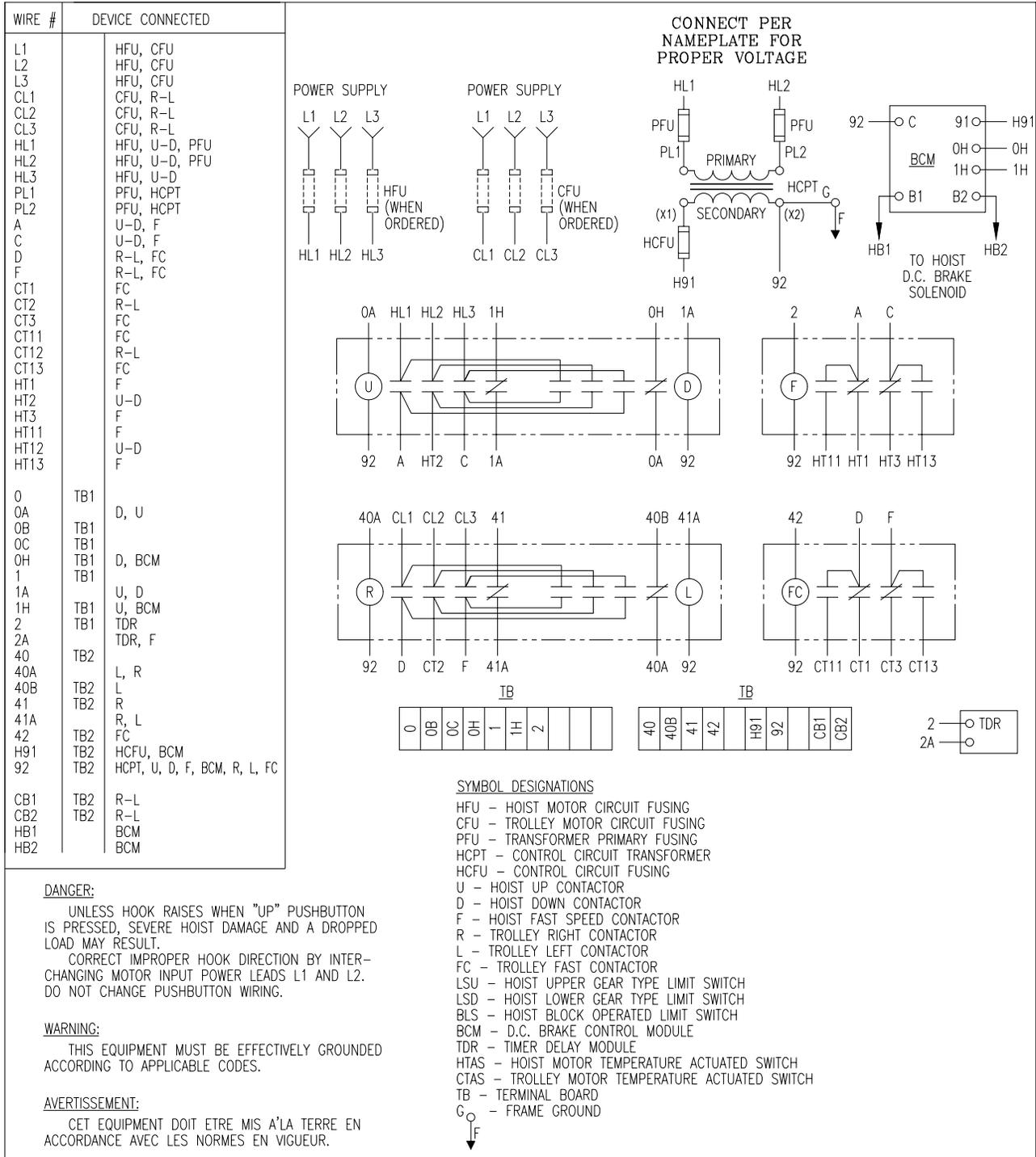
## SECTION VIII – WIRING DIAGRAMS

**8-1. GENERAL.** Comprehensive wiring diagrams for YALE electric hoists have been omitted from this book because of the many possible variations. This is due to different currents and types of electrical components used in their construction. Figures 8-1 and 8-2 are examples of typical two-speed hoist and trolley wiring diagrams respectively. However, please consult the exact wiring diagrams for your hoist. A print of the correct wiring diagram for each hoist is furnished as a separate insert and shipped with the hoist. We suggest you carefully file the wiring diagram with this book for future reference.

**Figure 8-1. Elementary Wiring Diagram for a Two-Speed Hoist and Two-Speed Trolley with TAS, Hoist Block Operated Limit Switch, Geared Upper & Lower Limit Switches, and Optional Fuses.**



**Figure 8-2. Component Diagram for a Two-Speed Hoist and Two-Speed Trolley with TAS, Hoist Block Operated Limit Switch, Geared Upper & Lower Limit Switches, and Optional Fuses.**



**SECTION IX – (SECTION RESERVED  
FOR FUTURE USE)**

**SECTION X – PARTS LIST**

**10-1. GENERAL.** The parts lists and illustrations in this section of the manual cover parts for models of YALE “Global King” Electric hoists. A typical hoist is shown as the basis for the exploded parts illustrations; therefore, certain variations may occur from the information given. For this reason, always give the Hoist Serial Number, Catalog Number, Motor Horsepower, Voltage, Phase, Frequency and Capacity of Hoist when ordering parts.

YALE “Global King” Hoists are built in two basic frame sizes, “B” Frame and “C” Frame. To determine the size of your hoist, measure the width of the gearcase (see Figure 4-2.) The “B” Frame’s Certain parts of your hoist will, in time, require replacement under normal wear conditions. It is suggested that these parts be purchased for your hoist as spares for future use. These parts are indicated by a (†) symbol at the side of the parts reference numbers.

The numbers assigned to parts of our various assemblies in our parts list are not the part numbers used in manufacturing the part. They are identification numbers, that when given with the model number, permit us to identify, select or manufacture, and ship the correct part needed.

gearcase has a width of 11 3/4” and the “C” Frame has a gearcase width of 14 1/2”.

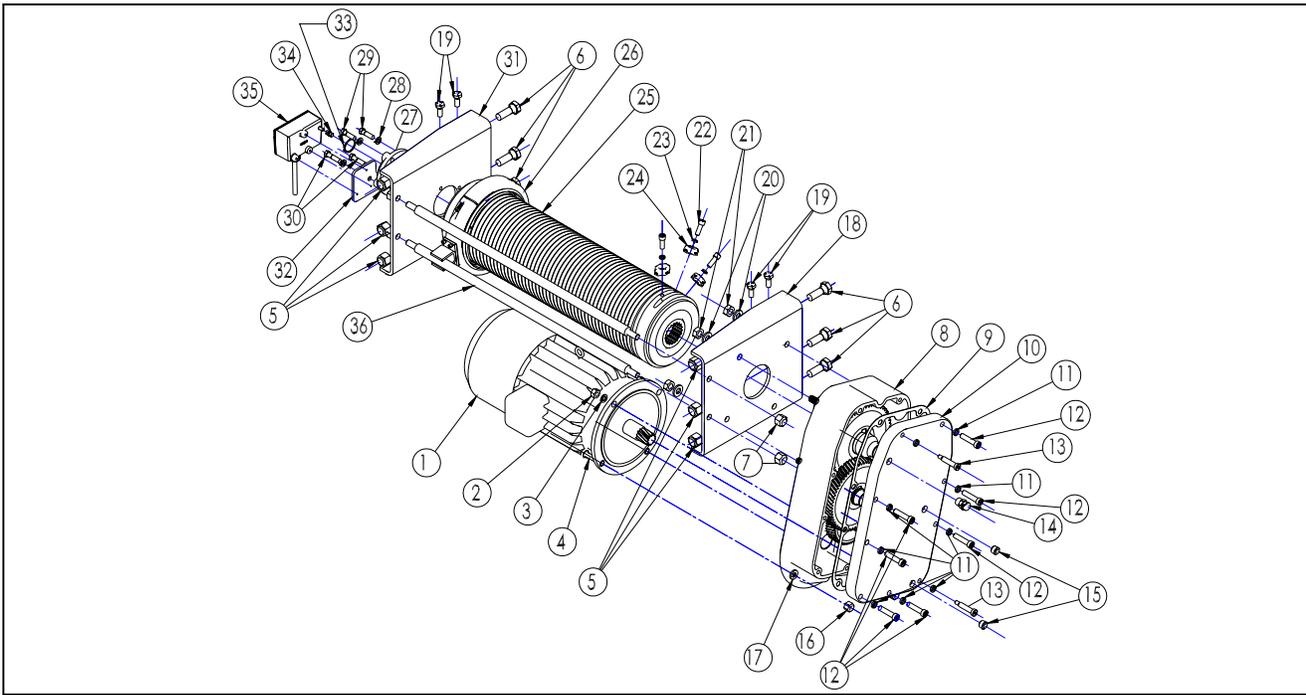
**WHEN ORDERING PARTS OR INFORMATION ON THIS EQUIPMENT, ALWAYS INCLUDE MODEL AND SERIAL NUMBER ON ORDER.**

** WARNING**

**Using “Commercial” or other manufacturer’s parts to repair Global King Hoists may cause load loss.**

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

<b>10-2. LIST OF PART ILLUSTRATIONS</b>		
<b>TITLE</b>	<b>FIGURE No.</b>	<b>PAGE No.</b>
Hoist Drum, Drum Frame, Gearcase, Motor, Rope Guide, and Limit Switch	10-1	32, 33
Hoist Gearing	10-2	34, 35
Traverse Drive Components	10-3	36, 37
Lower Block Assembly	10-4	38, 39
Upper Block Assembly	10-5	40
Rope and Dead End Assembly	10-6	41
Block Operated Limit Switch Assembly	10-8	42
Rope Guide Assembly	10-10	43
Hoist Motor Brake	10-10	44, 45
Trolley Truck Components	10-13	46
Drive Adapter Components	10-14	47



**FIGURE 10-1. Hoist Drum, Drum Frame, Gearcase, Motor, Rope Guide, and Screw Type Limit Switch.**

<b>“B” Frame: Hoist Components for Figure 10-1.</b>			
<b>Ref. No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty. Req'd.</b>
1	-	7 ½ HP Hoist Motor (2-Speed with Brake and Fan) Note: See Figure 10-10 for Parts.	1
	GHB-101A	230 volt, 3-phase, 60 Hertz	
	GHB-101B	460 volt, 3-phase, 60 Hertz	
	GHB-101C	575 volt, 3-phase, 60 Hertz	
2	GHB-102	Heavy Hex Nut (1/2-13)	2
3	GHB-103	Lock-Washer (1/2)	2
4	GHB-104	High Strength Hex Head Bolt – ASTM A325 (1/2-13 x 2 1/2)	2
5	GHB-105	Self-Locking Nut, ESNA (3/4-10)	6
6	GHB-106	High Strength Hex Head Bolt – Grade 5 (3/4-10 x 2 1/2)	6
7	GHB-107	Heavy Hex Self-Locking Nut (5/8-11)	4
8	GHB-108	Gearcase	1
9	GHB-109	Gearcase Gasket	1
10	GHB-110	Gearcase Cover	1
11	GHB-111	Lock-Washer, Hi-Collar (1/2)	9
12	GHB-112	Socket Head Cap Screw (1/2-13 x 2 1/4)	7
13	GHB-113	Hex Shoulder Bolt (3/8-16 x 2 Long, 1/2 shoulder)	2
14	GHB-114	Vent Plug with Sealant (1/2-14 NPT)	1
15	GHB-115	Pipe Plug (1/2-14 NPT)	2
16	GHB-116	Heavy Hex Lock Nut (1/2-13)	2
17	GHB-117	Hardened Flat Washer (1/2)	2
18	GHB-118	Gearcase End Drum Frame	1
19	GTB-119	Socket Head Cap Screw, Plated (1/2-13 x 4 1/2) – (USE WITH GTB-137)	4
20	GHB-120	Hardened Flat Washer (5/8)	8
21	GHB-121	Thin Hex Self-Locking Nut – Grade 5 (5/8-18)	4
22	GHB-122	Socket Head Cap Screw, Plated (7/16-14 x 1 1/4)	3
23	GHB-123	Lock-Washer, Hi-Collar (7/16)	3
24	GHB-124	Rope Clamp	3
25	-	Drum	1
	GHB-125A	Drum 25' Lift	
	GHB-125B	Drum 40' Lift	
26	GHB-900	Rope Guide (See Figure 10-9 for Rope Guide and its components.)	1
27	GHB-127	Flange Mounted Ball Bearing	1

<b>"B" Frame: Hoist Components for Figure 10-1.</b>			
<b>Ref. No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty. Req'd.</b>
28	GHB-128	Lock-Washer (7/16)	4
29	GHB-129	High Strength Hex Head Bolt – Grade 5 (7/16-14 x 1 1/2)	2
30	GHB-130	High Strength Hex Head Bolt – Grade 5 (7/16-14 x 1 3/4)	2
31	GHB-131	Outboard End Drum Frame	1
32	GHB-132	Limit Switch Bracket	1
33	GHB-133	Retaining Ring	1
34	GHB-134	Drum Shaft Insert for Geared Limit Switch	1
35	GHB-135	Geared Limit Switch	1
36	-	Drum Frame Rod	
	GHB-136A	Drum Frame Rod, 25' Lift	2
	GHB-136B	Drum Frame Rod, 40' Lift	2
37	GTB-137	Heavy Hex Self-Locking Nut (1/2-13) – (USE WITH GTB-119)	4

<b>"C" Frame: Hoist Components for Figure 10-1.</b>			
<b>Ref. No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty. Req'd.</b>
1	-	15 HP Hoist Motor (2-Speed with Brake and Fan) Note: See Figure 10-10 for Parts.	1
	GHC-101A	230 volt, 3-phase, 60 Hertz	
	GHC-101B	460 volt, 3-phase, 60 Hertz	
	GHC-101C	575 volt, 3-phase, 60 Hertz	
2	GHC-102	Heavy Hex Nut (3/4-10)	2
3	GHC-103	Lock-Washer (3/4)	2
4	GHC-104	High Strength Hex Head Bolt – Grade 5 (3/4-10 x 3 1/4)	2
5	GHC-105	Self-Locking Nut, ESNA (1-8)	6
6	GHC-106A	Socket Head Cap Screw (1-8 x 3)	2
7	GHC-107	Heavy Hex Self-Locking Nut (7/8-9)	4
8	GHC-108	Gearcase	1
9	GHC-109	Gearcase Gasket	1
10	GHC-110	Gearcase Cover	1
11	GHC-111	Lock-Washer, Hi-Collar (5/8)	9
12	GHC-112	Socket Head Cap Screw (5/8-11 x 2 3/4)	7
13	GHC-113	Hex Shoulder Bolt (1/2-13 x 2 1/4 Long, 5/8 shoulder)	2
14	GHC-114	Vent Plug with Sealant (1/2-14 NPT)	1
15	GHC-115	Pipe Plug (1/2-14 NPT)	2
16	GHC-116	Heavy Hex Self-Locking Nut (3/4-10)	2
17	GHC-117	Hardened Flat Washer (3/4)	8
18	GTC-118	Gearcase End Drum Frame	1
19	GTC-119	High Strength Hex Head Bolt – Grade 5 (3/4-10 x 6) – (USE WITH GTC-137)	4
20	GHC-117	Hardened Flat Washer (3/4)	4
21	GHC-121	Thin Hex Self-Locking Nut – Grade 5 (3/4-16)	4
22	GHC-122	Socket Head Cap Screw, Plated (7/16-14 x 1 1/4)	3
23	GHC-123	Lock-Washer, Hi-Collar (7/16)	3
24	GHC-124	Rope Clamp	3
25	-	Drum	1
	GHC-125A	Drum, 25' Lift	
	GHC-125B	Drum, 40' Lift	
26	GHC-900	Rope Guide (See Figure 10-9 for Rope Guide and its components.)	1
27	GHC-127	Flange Mounted Ball Bearing	1
28	GHC-128	Lock-Washer, Hi-Collar (5/8)	4
29	GHC-129	Hex Head Bolt – Grade 5 (5/8-11 x 2 1/4) *Includes Ref. No. 30*	4
31	GTC-131	Outboard End Drum Frame	1
32	GHC-132	Limit Switch Bracket	1
33	GHC-133	Retaining Ring	1
34	GHC-134	Drum Shaft Insert for Geared Limit Switch	1
35	GHC-135	Geared Limit Switch	1
36	-	Drum Frame Rod	
	GHC-136A	Drum Frame Rod, 25' Lift	2
	GHC-136B	Drum Frame Rod, 40' Lift	2
37	GTC-137	Heavy Hex Self-Locking Nut (3/4-10) – (USE WITH GTC-119)	4

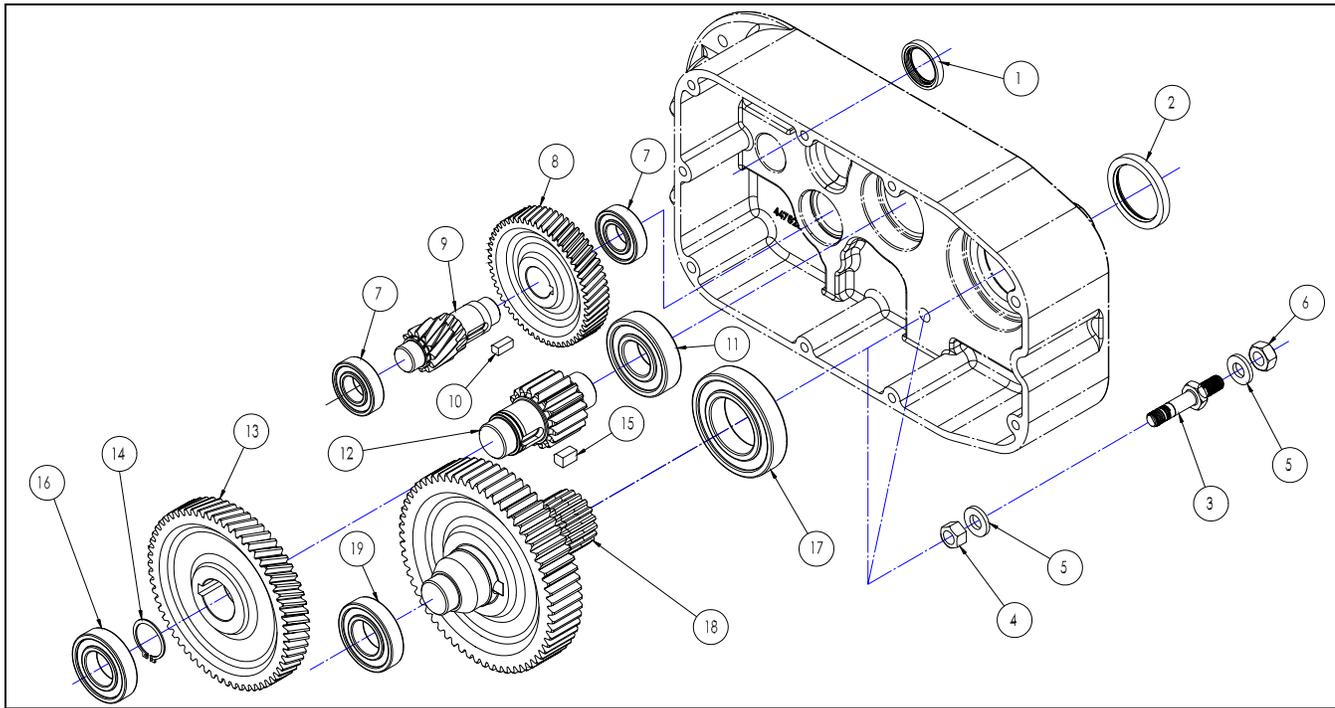


Figure 10-2. Hoist Gearing.

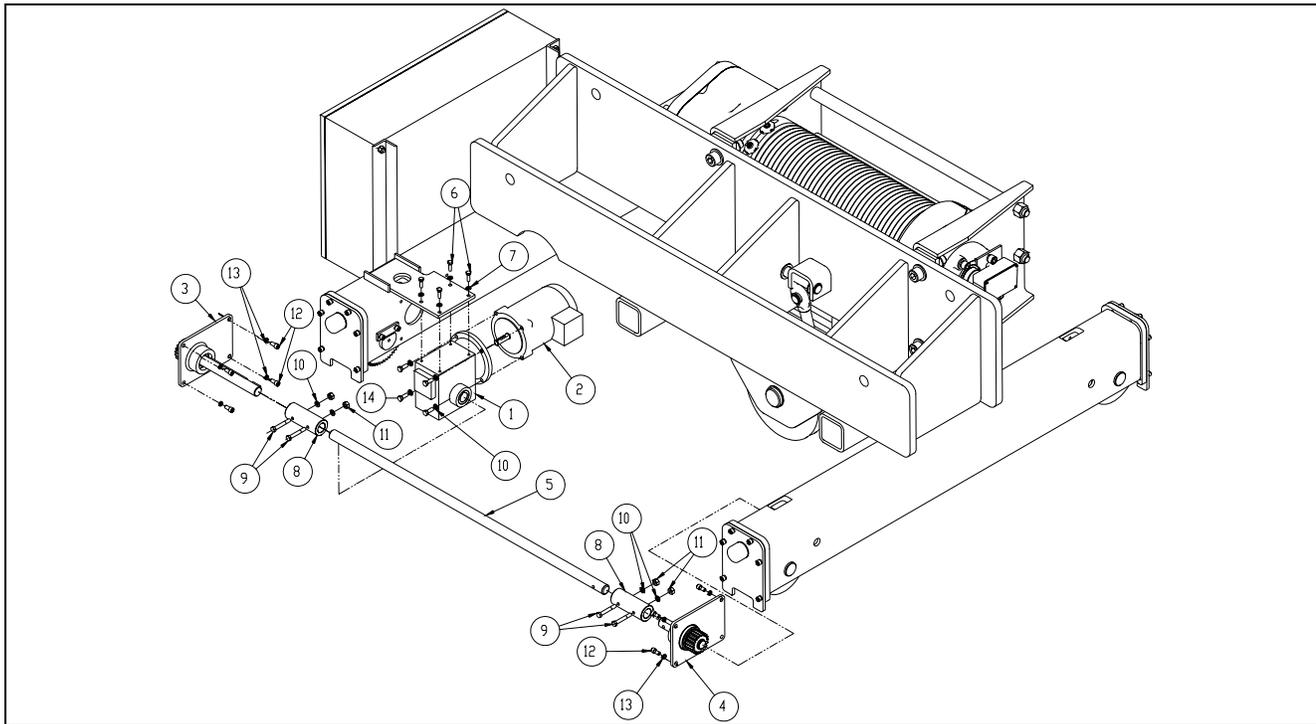
“B” Frame: Hoist Gearing for Figure 10-2.

Ref. No.	Part Number	Description	Qty. Req'd.
	GHB-200	Complete Hoist Gearcase Ass'y. - 94.4:1 Ratio (Incl. Ref Nos. 1-19+)	
1	GHB-201	Oil Seal	1
2	GHB-202	Oil Seal	1
3	GHB-203	Stud	4
4	GHB-204	Nut - Hex (5/8-18)	4
5	GHB-205	Washer - Hardened (5/8)	8
6	GHB-206	Lock Nut - Hex, Thin, Grade 5 (5/8-18)	4
7	GHB-207	Ball Bearing	2
8	GHB-208	Motor Gear - 56 Teeth	1
9	GHB-209	Intermediate Pinion Shaft	1
10	GHB-210	Key - Chamfered	1
11	GHB-211	Ball Bearing	1
12	GHB-212	Drum Pinion Shaft	1
13	GHB-213	Intermediate Gear	1
14	GHB-214	Retaining Ring	1
15	GHB-215	Key - Hardened, Chamfered	2
16	GHB-216	Ball Bearing	1
17	GHB-217	Ball Bearing	1
18	GHB-218	Output Shaft and Drum Gear Assembly	1
19	GHB-216	Ball Bearing	1

“C” Frame: Hoist Gearing for Figure 10-2.

Ref. No.	Part Number	Description	Qty. Req'd.
	GHC-200A	Complete 10t Hoist Gearcase Ass'y. – 124.5:1 Ratio (Incl. Ref Nos. 1-19+)	
	GHC-200B	Complete 7.5t Hoist Gearcase Ass'y. – 104.6:1 Ratio (Incl. Ref Nos. 1-19+)	
1	GHC-201	Oil Seal	1
2	GHC-202	Oil Seal	1
3	GHC-203	Stud	4
4	GHC-204	Nut - Hex (3/4-16)	4

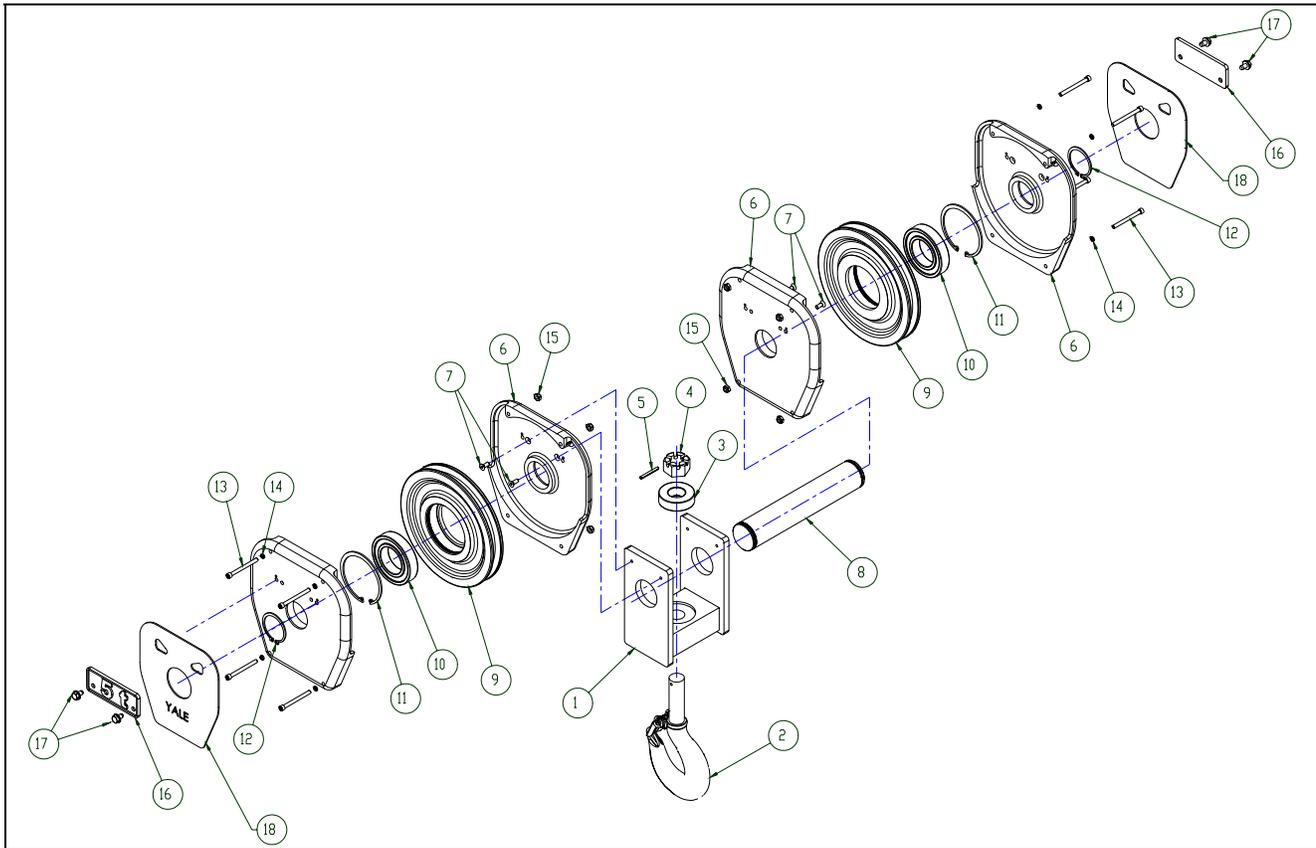




**Figure 10-3. Traverse Drive Components.**

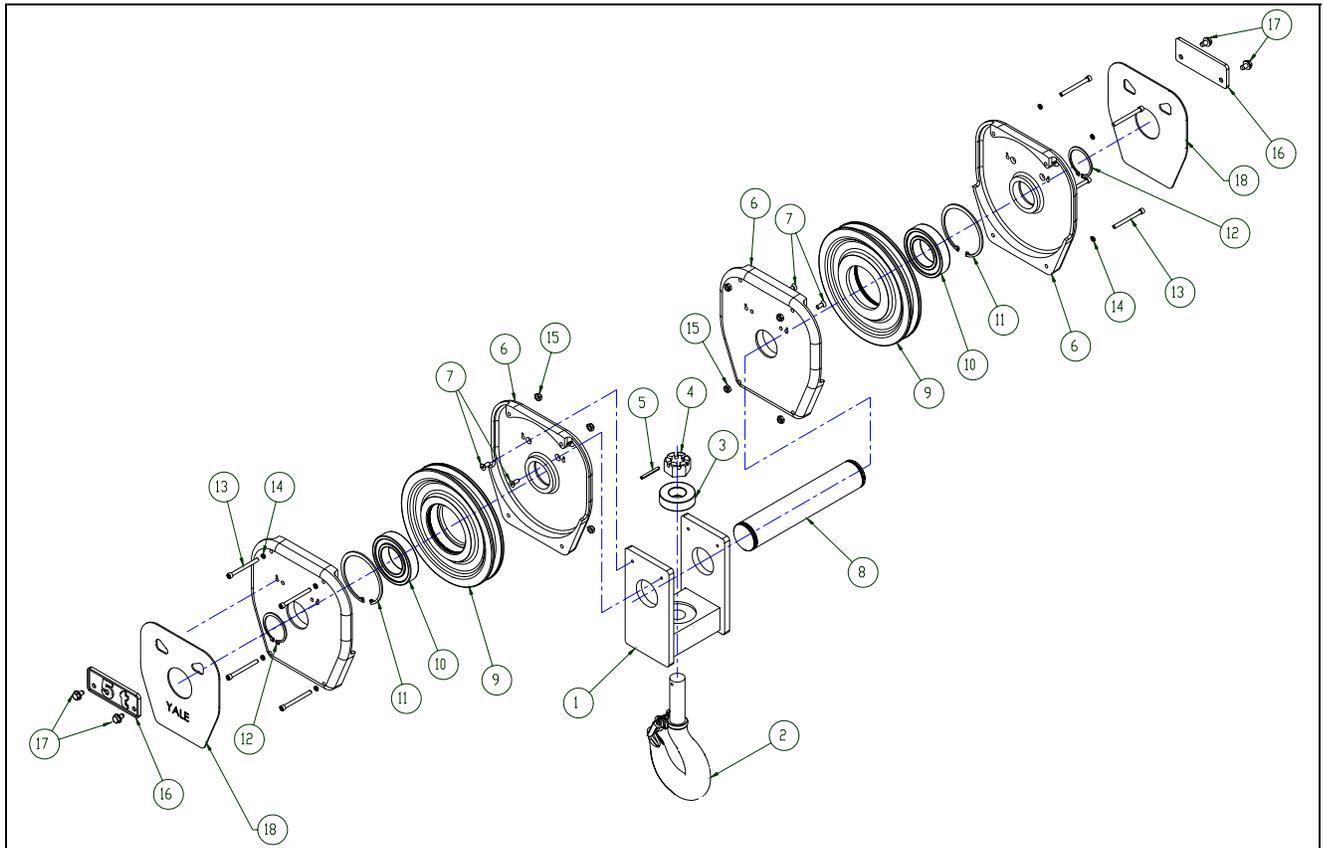
<b>Traverse Drive Components for Figure 10-3.</b>			
<b>Ref. No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty. Req'd</b>
1	-	Traverse Gear Reducer	1
	GTB-301A	20:1 (45 FPM)	
	GTB-301B	15:1 (60 FPM)	
2	-	Motor (Specify HP, Phase, Voltage, Frequency, & Number of Speeds)	1
		Single Speed, Single Shaft (Without Brake):	
	GTB-302A	1/2 HP, 1800 RPM, 200-230/460-3-60	
	GTB-302B	1/2 HP, 1800 RPM, 575-3-60	
	GTC-302C	3/4 HP, 1800 RPM, 200-230/460-3-60 (10 Tonne Hoist Only)	
	GTC-302D	3/4 HP, 1800 RPM, 575-3-60 (10 Tonne Hoist Only)	
		Two Speed, Single Shaft (Without Brake):	
	GTB-302E	.5/ .17 HP, 1800 RPM, 200-3-60	
	GTB-302F	.5/ .17 HP, 1800 RPM, 230-3-60	
	GTB-302G	.5/ .17 HP, 1800 RPM, 460-3-60	
	GTB-302H	.5/ .17 HP, 1800 RPM, 575-3-60	
	GTC-302J	.75/ .25 HP, 1800 RPM, 200-3-60	
	GTC-302K	.75/ .25 HP, 1800 RPM, 230-3-60	
	GTC-302L	.75/ .25 HP, 1800 RPM, 460-3-60	
	GTC-302M	.75/ .25 HP, 1800 RPM, 575-3-60	
		Single Speed, Double Shaft (Order Brake 108461F1 Separately):	
	GTB-302N	1/2 HP, 1800 RPM, 200-3-60	
	TRK-613	1/2 HP, 1800 RPM, 230/460-3-60	
	TRK-622	1/2 HP, 1800 RPM, 575-3-60	
	GTC-302P	3/4 HP, 1800 RPM, 200-3-60 (10 Tonne Hoist Only)	
	TRK-614	3/4 HP, 1800 RPM, 230/460-3-60 (10 Tonne Hoist Only)	
	TRK-623	3/4 HP, 1800 RPM, 575-3-60 (10 Tonne Hoist Only)	
		Two Speed, Double Shaft (Order Brake 108461F1 Separately):	
	GTB-302R	.5/ .17 HP, 1800 RPM, 200-3-60	
	TRK-631	.5/ .17 HP, 1800 RPM, 230-3-60	
	TRK-640	.5/ .17 HP, 1800 RPM, 460-3-60	
	TRK-649	.5/ .17 HP, 1800 RPM, 575-3-60	
	GTC-302S	.75/ .25 HP, 1800 RPM, 200-3-60 (10 Tonne Hoist Only)	
	TRK-632	.75/ .25 HP, 1800 RPM, 230-3-60 (10 Tonne Hoist Only)	





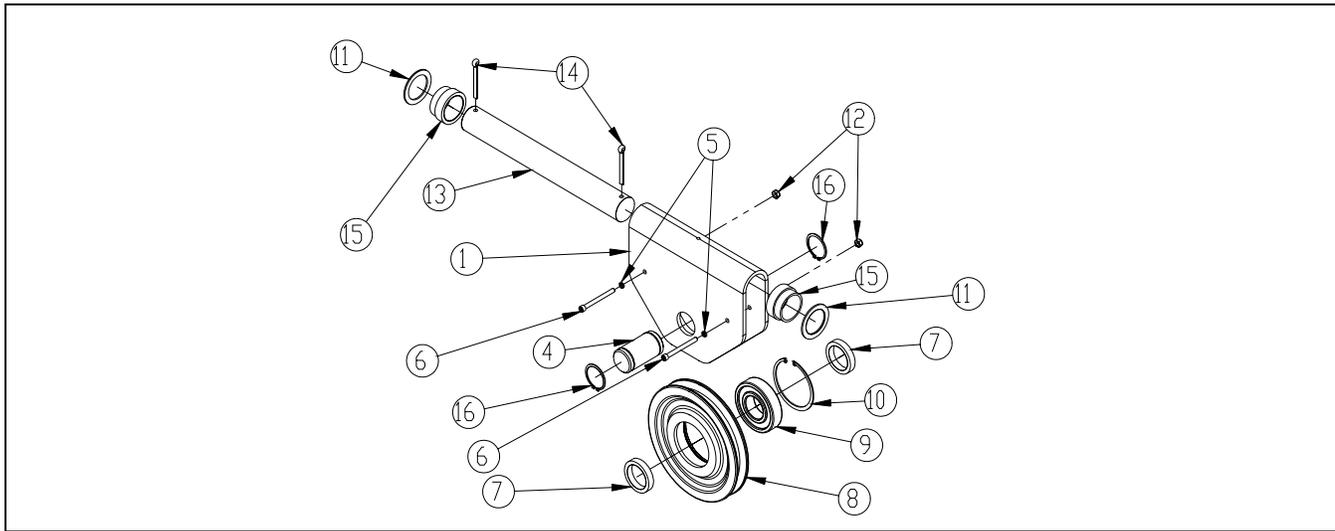
**Figure 10-4a. Lower Block Assembly.**

<b>"B" Frame: Lower Block Components for Figure 10-4a.</b>			
<b>Ref. No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty. Req'd</b>
	GHB-400B	Lower Block Assembly (Includes Ref. Nos. 1-17)	1
1	GHB-401	Lower Block Frame – Hook Beam	1
2	GHB-402	Hook	1
3	GHB-403	Thrust Bearing	1
4	GHB-404	Castle Nut	1
5	GHB-405	Spring Pin	1
6	GHB-406	Sheave Covers	4
7	GHB-407	Flat Head Socket Cap Screws (1/4-20 x 1/2)	4
8	GHB-408	Sheave Pin	1
9	GHB-409	Sheaves	2
10	GHB-410	Ball Bearings	2
11	GHB-411	Internal Retaining Rings	2
12	GHB-412	External Retaining Rings	2
13	GHB-413	Socket Head Cap Screws (1/4-20 x 2 3/4 Long)	8
14	GHB-414	Hi-Collar Lock-Washers (1/4)	8
15	GHB-415	Self-Locking Nuts (1/4-20)	8
16	GHB-416	Capacity Plates	2
17	GHB-417	Hex Washer Head Self-Tapping Screws (5/16-18 x 1/2)	4
18	GHB-418Y	YALE Lower Block Label	2



**Figure 10-4b. Lower Block Assembly.**

<b>"C" Frame: Lower Block Components for Figure 10-4b.</b>			
<b>Ref. No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty. Req'd</b>
	GHC-400B10	10t Lower Block Assembly (Includes Ref. Nos. 1-17)	1
	GHC-400B7.5	7 1/2t Lower Block Assembly (Includes Ref. Nos. 1-17)	1
1	GHC-401	Lower Block Frame – Hook Beam	1
2	GHC-402	Hook	1
3	GHC-403	Thrust Bearing	1
4	GHC-404	Castle Nut	1
5	GHC-405	Spring Pin	1
6	GHC-406	Sheave Covers	4
7	GHC-407	Flat Head Socket Cap Screws (1/4-20 x 1/2)	4
8	GHC-408	Sheave Pin	1
9	GHC-409	Sheaves	2
10	GHC-410	Ball Bearings	2
11	GHC-411	Internal Retaining Rings	2
12	GHC-412	External Retaining Rings	2
13	GHC-413	Socket Head Cap Screws (1/4-20 x 3 1/4 Long)	8
14	GHC-414	Hi-Collar Lock-Washers (1/4)	8
15	GHC-415	Self-Locking Nuts (1/4-20)	8
16	-	Capacity Plates	2
	GHC-416A	10t Capacity Plates	
	GHC-416B	7 1/2t Capacity Plates	
17	GHC-417	Hex Washer Head Self-Tapping Screws (5/16-18 x 1/2)	4
18	GHC-418Y	YALE Lower Block Label	2



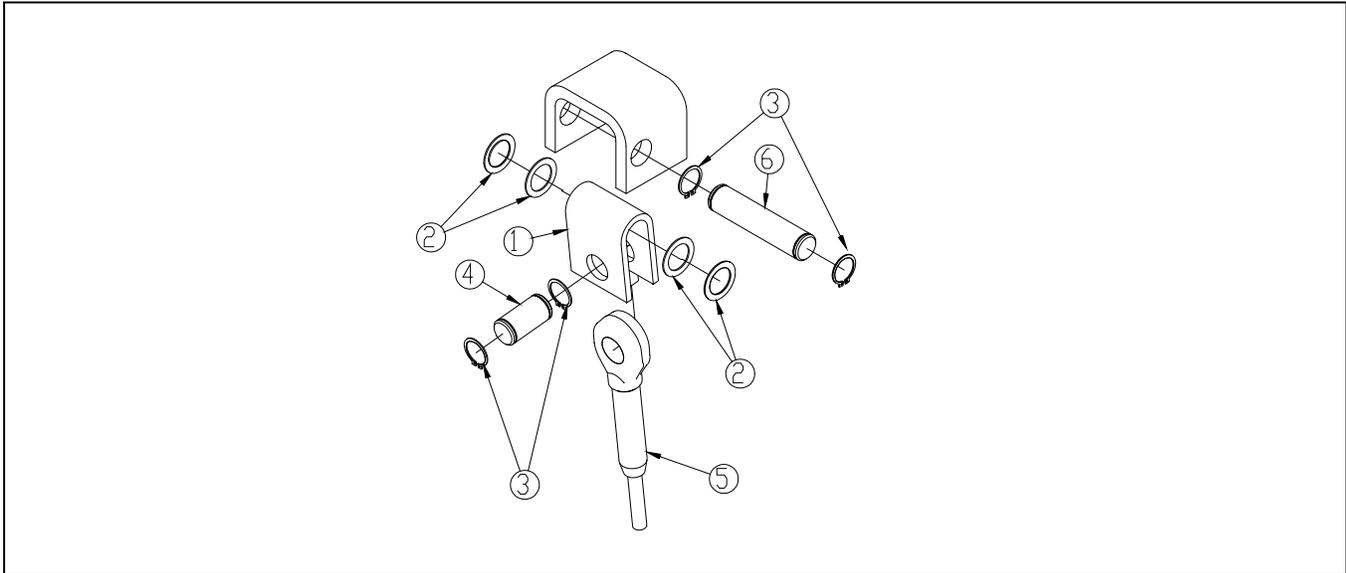
**Figure 10-5. Upper Block Assembly.**

**“B” Frame: Upper Block Components for Figure 10-5.**

Ref. No.	Part Number	Description	Qty. Req'd
	GHB-500	“B” Frame Hoist Upper Block Assembly (Includes Ref. Nos. 1-10 & 16)	1
1	GHB-501	Upper Block Yoke	1
4	GHB-504	Sheave Pin	1
5	GHB-505	Lock-Washer (3/8)	4
6	GHB-506	Hex Head Bolt, Grade 5 (3/8-16 x 3)	2
7	GHB-507	Spacer Washer	2
8	GHB-508	Sheave	1
9	GHB-509	Ball Bearing	1
10	GHB-510	Internal Retaining Ring	1
11	GHB-511	Spacer Washer (Qty. (10) required when Optional OLS is Ordered.)	7
12	GHB-512	Self-Locking Nut (3/8)	2
13	GHB-513	Yoke Pin (Standard: Without Overload Limit Switch)	1
	GHB-513B	Yoke Pin (When Optional Overload Limit Switch is Ordered)	1
14	GHB-514	Cotter Pin	2
15	GHB-515	Flanged Bushing (Omit with Optional OLS)	1
16	GHB-516	External Retaining Ring	2

**“C” Frame: Upper Block Components for Figure 10-5.**

Ref. No.	Part Number	Description	Qty. Req'd
	GTC-500	“C” Frame Hoist Upper Block Assembly (Includes Ref. Nos. 1-10 & 16)	1
1	GTC-501	Upper Block Yoke	1
4	GHC-504	Sheave Pin	1
5	GHC-505	Lock-Washer (3/8)	4
6	GHC-506	Hex Head Bolt, Grade 5 (3/8-16 x 4)	2
7	GHC-507	Spacer Washer	2
8	GHC-508	Sheave	1
9	GHC-509	Ball Bearing	1
10	GHC-510	Internal Retaining Ring	1
11	GTC-511	Spacer Washer (Qty. (8) required when Optional OLS is Ordered.)	7
12	GHC-512	Self-Locking Nut (3/8)	2
13	GTC-513	Yoke Pin (Standard: Without Overload Limit Switch)	1
	GTC-513B	Yoke Pin (When Optional Overload Limit Switch is Ordered)	1
14	GHC-514	Cotter Pin	2
15	GTC-515	Flanged Bushing (Qty. (1) required when Optional OLS is Ordered.)	2
16	GTC-516	External Retaining Ring	2



**Figure 10-6. Rope and Dead End Assembly.**

<b>"B" Frame: Rope and Dead End Assembly Components for Figure 10-6.</b>			
<b>Ref. No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty. Req'd</b>
	-	"B" Frame Hoist Rope and Dead End Assembly	
1	GHB-601	Dead End Yoke	1
2	GHB-602	Washer (1" Diameter, #18 Gauge)	4
3	GHB-603	External Retaining Ring	4
4	GHB-604	Dead End Swage Socket Pin	1
5	-	Wire Rope and Swaged End Assembly	1
	GTB-605A	Rope Assembly for 25' Lift	
	GTB-605B	Rope Assembly for 40' Lift	
6	GTB-606	Dead End Pin	1

<b>"C" Frame: Rope and Dead End Assembly Components for Figure 10-6.</b>			
<b>Ref. No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty. Req'd</b>
	-	"B" Frame Hoist Rope and Dead End Assembly	
1	GHB-601	Dead End Yoke	1
2	GHB-602	Washer (1" Diameter, #18 Gauge)	4
3	GHB-603	External Retaining Ring	4
4	GHB-604	Dead End Swage Socket Pin	1
5	-	Wire Rope and Swaged End Assembly	1
	GTC-605A	Rope Assembly for 25' Lift	
	GTC-605B	Rope Assembly for 40' Lift	
6	GTB-606	Dead End Pin	1

**NOTES**

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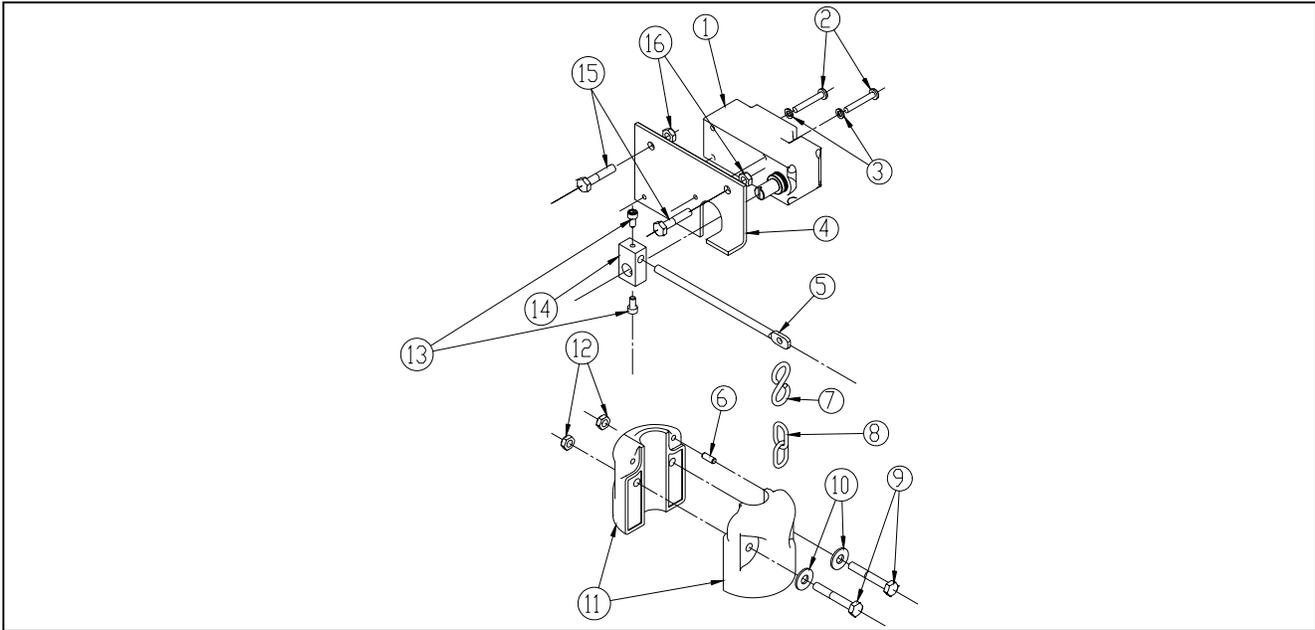
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**Figure 10-8. Block Operated Limit Switch Assembly**

<b>"B" Frame Block Operated Limit Switch Components for Figure 10-8.</b>			
<b>Ref. No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty. Req'd</b>
	GHB-800	"B" Frame Hoist Limit Switch Assembly (Includes Ref. Nos. 1-16)	
1	GHB-801	Limit Switch	1
2	GHB-802	Pan Head Machine Screw, Phillips (#10-32 x 1 1/4 Long)	2
3	GHB-803	Lockwasher (#10)	2
4	GHB-804	Limit Switch Bracket	1
5	GHB-805	Limit Switch Rod	1
6	GHB-806	Dowel Pin (3/16 Diameter x 1/2 Long)	1
7	GHB-807	S-Hook (1/2 Eye)	1
8	GHB-808	Coil Chain	1
9	GHB-809	Hex Head Bolt (1/4-20 x 1 3/4)	2
10	GHB-810	1/4 Diameter Flat Washer	2
11	GHB-811	Limit Switch Weight Half	2
12	GHB-812	Self-Locking Nut (1/4-20)	2
13	GHB-813	Hex Socket Head Cap Screw (#10-32)	2
14	GHB-814	Limit Switch Hub	1
15	GHB-815	Hex Head Bolt (1/4-20 x 1 1/4)	2
16	GHB-812	Self-Locking Nut (1/4-20)	2

**NOTES**

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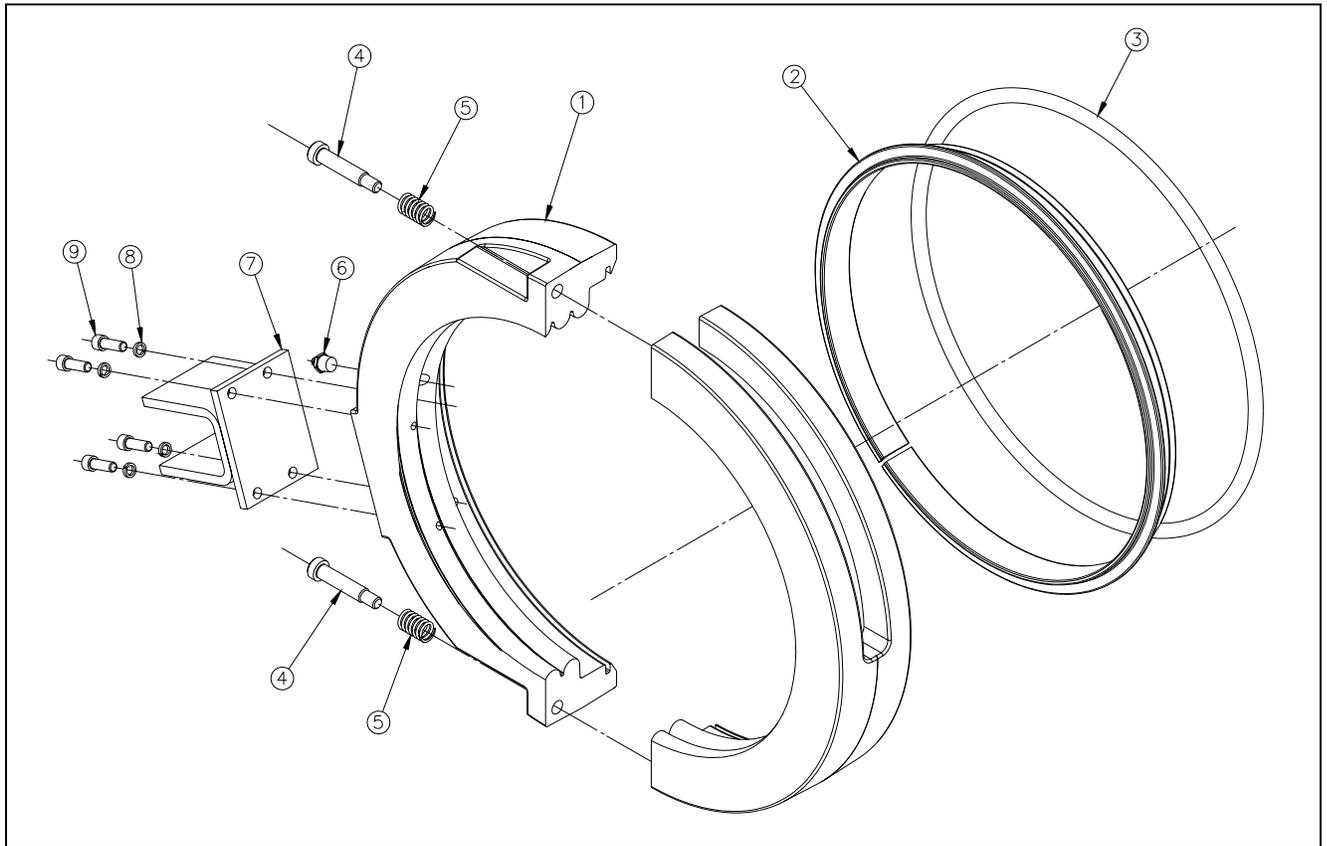
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**Figure 10-9. Rope Guide Assembly.**

<b>"B" Frame Rope Guide Components for Figure 10-9.</b>			
<b>Ref. No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty. Req'd</b>
	GHB-900	"B" Frame Rope Guide Assembly (Includes Ref. Nos. 1-9)	1
1	GHB-901	Rope Guide Frame (Machined)	1
2	GHB-902	Plastic Shroud	1
3	GHB-903	Extension Spring	1
4	GHB-904	Shoulder Bolt (1/4-20 x 1 1/2 Long, 5/16 Shoulder)	2
5	GHB-905	Compression Spring	2
6	GHB-906	Grease Fitting	1
7	GHB-907	Anti-Rotation Clip	1
8	GHB-908	Lockwasher (1/4)	4
9	GHB-909	Socket Head Cap Screw (1/4-20 x 3/4)	4

<b>"C" Frame Rope Guide Components for Figure 10-9.</b>			
<b>Ref. No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty. Req'd.</b>
	GHC-900	"C" Frame Rope Guide Assembly (Includes Ref. Nos. 1-9)	1
1	GHC-901	Rope Guide Frame (Machined)	1
2	GHC-902	Plastic Shroud	1
3	GHC-903	Extension Spring	1
4	GHC-904	Shoulder Bolt (5/16-18 x 1 1/2 Long, 3/8 Shoulder)	2
5	GHC-905	Compression Spring	2
6	GHC-906	Grease Fitting	1
7	GHC-907	Anti-Rotation Clip	1
8	GHC-908	Lockwasher (1/4)	4
9	GHC-909	Socket Head Cap Screw (1/4-20 x 3/4)	4

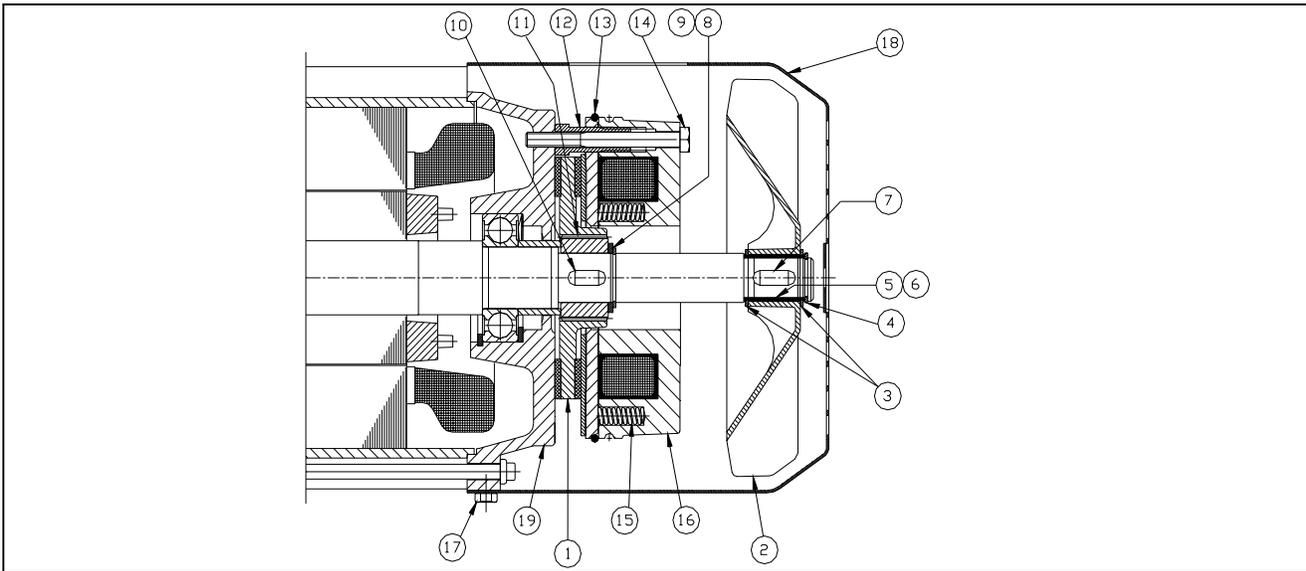


Figure 10-10a. Hoist Motor Brake.

<b>"B" Frame: Hoist Brake Components for Figure 10-10a.</b>			
<b>Ref. No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty. Req'd.</b>
1	GHB-1001†	Brake Disc	1
	GHB-1002*	Brake Fan Kit (Includes items 2 thru 7)	1
2		Fan	1
3		External Retaining Rings (Fan)	2
4		External Retaining Ring (Fan Hub)	1
5		Fan Hub	1
6		Key (Hub)	1
7		Key (Fan)	1
	GHB-1008*	Brake Hub Kit (Includes items 8 thru 11)	1
8		External Retaining Ring (Brake Hub)	1
9		Spacer	1
10		Key (Brake Hub)	1
11		Brake Hub	1
	GHB-1012*	Brake Hardware Kit (Includes items 12 thru 15)	1
12		Hollow Core Bolts	3
13		O-Ring	1
14		Bolts (Brake Mounting)	3
15		Springs	3
16	GHB-1016	Magnet Body (Includes GHB-1012 Hardware Kit)	1
	GHB-1017*	Fan Shroud Kit Includes items 17 and 18)	1
17		Bolt (Brake and Fan Shroud)	4
18		Fan Shroud	1
19	GHB-1019	Brake End Bell Assembly for 7.5/1.25 HP Motor	1
20	GHB-1020	Gearcase End Bell Assembly for 7.5/1.25 Motor (Not Shown)	1
21		Rotor Assembly for 7.5/1.25 HP Motor (Not Shown)	1
	GHB-1021A	230 volt, 3-phase, 60 Hertz	
	GHB-1021B	460 volt, 3-phase, 60 Hertz	
	GHB-1021C	575 volt, 3-phase, 60 Hertz	
22		Stator Assembly for 7.5/1.25 HP Motor (Not Shown)	1
	GHB-1022A	230 volt, 3-phase, 60 Hertz	
	GHB-1022B	460 volt, 3-phase, 60 Hertz	
	GHB-1022C	575 volt, 3-phase, 60 Hertz	

† Recommended Spare Part

\*Duplicate part numbers indicate parts only sold together as a kit.

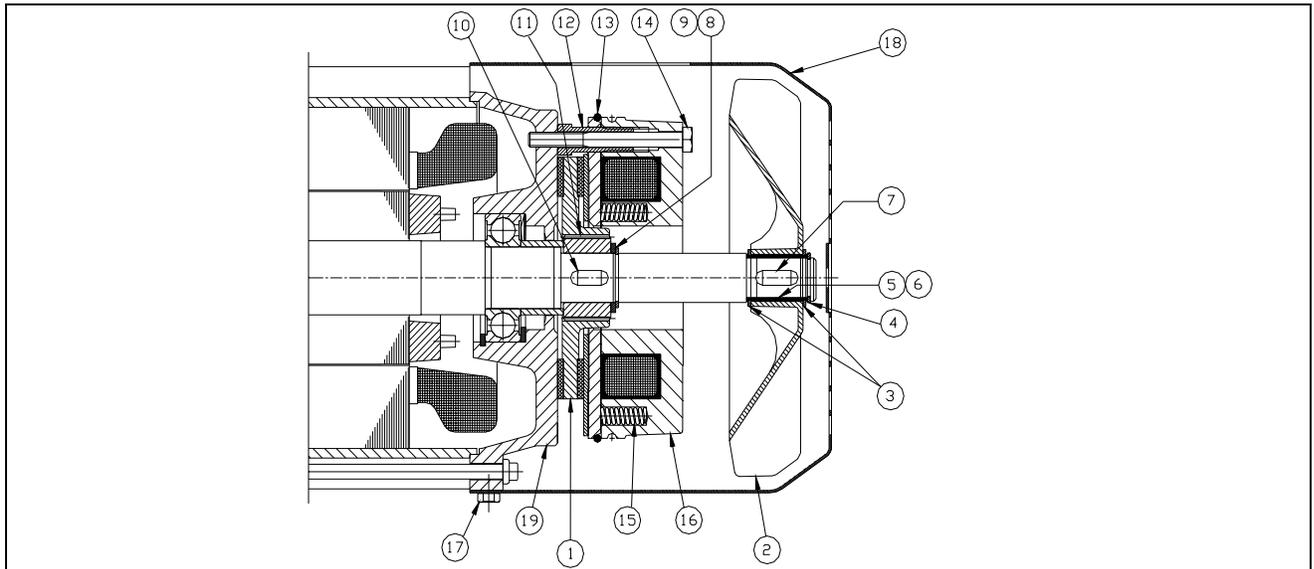


Figure 10-10b. Hoist Motor Brake.

"C" Frame: Hoist Brake Components for Figure 10-10b.			
Ref. No.	Part Number	Description	Qty. Req'd.
1	GHC-1001†	Brake Disc	1
	GHC-1002*	Brake Fan Kit (Includes items 2,4 & 7)	1
2		Fan	1
3		N/A	
4		External Retaining Ring (Fan Hub)	1
5		N/A	
6		N/A	
7		Key (Fan)	1
	GHC-1008*	Brake Hub Kit (Includes items 8 thru 11)	1
8		External Retaining Ring (Brake Hub)	1
9		Spacer	1
10		Key (Brake Hub)	1
11		Brake Hub	1
	GHC-1012*	Brake Hardware Kit (Includes items 12 thru 15)	1
12		Hollow Core Bolts	3
13		O-Ring	1
14		Bolts (Brake Mounting)	3
15		Springs	3
16	GHC-1016	Magnet Body (Includes GHC-1012 Hardware Kit)	1
	GHC-1017*	Fan Shroud Kit Includes items 17 and 18)	1
17		Bolt (Brake and Fan Shroud)	4
18		Fan Shroud	1
19	GHC-1019	Brake End Bell Assembly for 15 HP Motor	1
20	GHC-1020	Gearcase End Bell Assembly for 15 HP Motor (Not Shown)	1
21		Rotor Assembly for 15 HP Motor (Not Shown)	1
	GHC-1021A	230 volt, 3-phase, 60 Hertz	
	GHC-1021B	460 volt, 3-phase, 60 Hertz	
	GHC-1021C	575 volt, 3-phase, 60 Hertz	
22		Stator Assembly for 15 HP Motor (Not Shown)	1
	GHC-1022A	230 volt, 3-phase, 60 Hertz	
	GHC-1022B	460 volt, 3-phase, 60 Hertz	
	GHC-1022C	575 volt, 3-phase, 60 Hertz	

† Recommended Spare Part

\* Duplicate part numbers indicate parts only sold together as a kit.

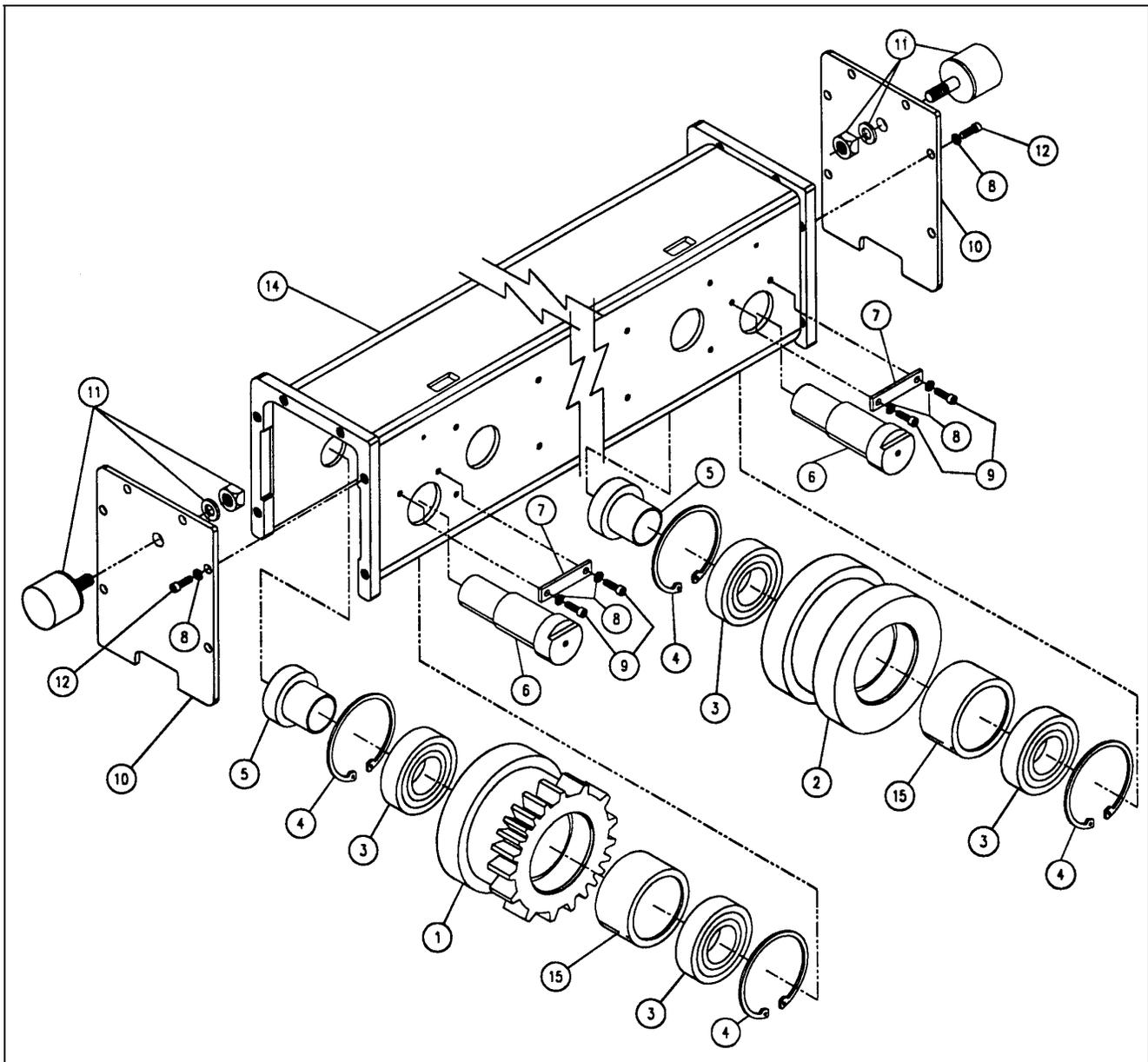


Figure 10-13. Trolley Truck Components.

Trolley Truck Components for Figure 10-13.

Ref. No.	Part Number	Description	Qty. Req'd
1	TRK-101	Drive Wheel – Geared – 2 5/8” Tread	1
2	TRK-105	Trailer Wheel – Geared – 2 5/8” Tread	1
3	TRK-109	Ball Bearing	4
4	TRK-112	Internal Retaining Ring - Plated	4
5	TRK-115	Flanged Bushing	2
6	TRK-118	Fixed Axle	2
7	TRK-121	Key Plate	2
8	TRK-123	Hi-Collar Spring Lock Washer (3/8) – Plated	16
9	TRK-124	Socket Head Cap Screw (3/8-16 x 3/4) – Plated	4
10	TRK-151	Rail Sweep	2
11	TRK-129	Bumper	2
12	TRK-154	Socket Head Cap Screw (3/8-16 x 1) – Plated	12
14	N/A	N/A	
15	TRK-147	Wheel Bearing Spacer	2

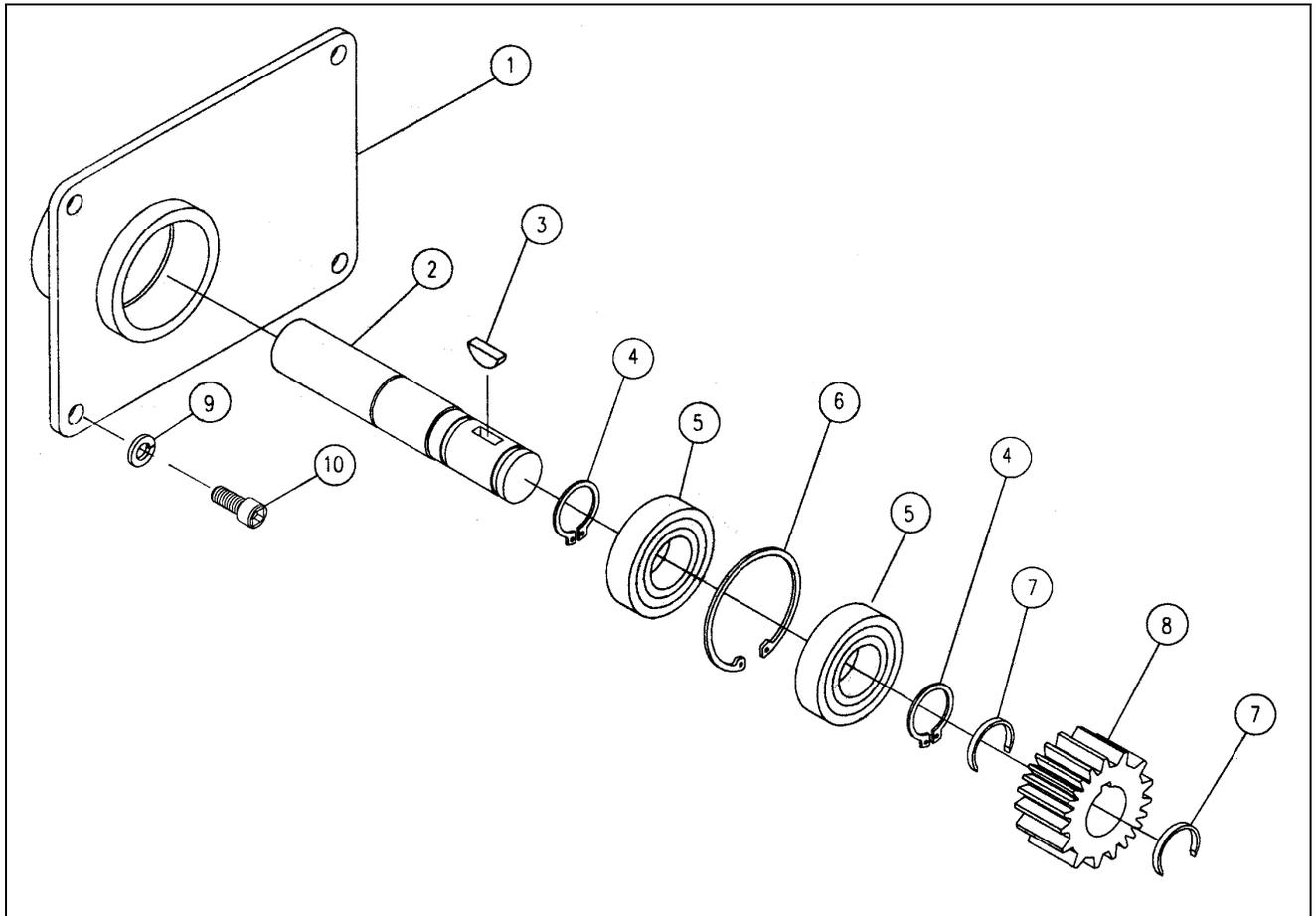


Figure 10-14. Drive Adapter Components.

Drive Adapter Components for Figure 10-14.			
Ref. No.	Part Number	Description	Qty. Req'd
	GTB-303	Drive Adapter Assembly for Traverse Gear Reducer End (See Fig. 10-3)	
	GTB-304	Drive Adapter Assembly for Opposite End (See Fig. 10-3)	
1	TRK-501	Machined Housing Weldment	1
2	TRK-502	Output Shaft for GTB-303 Assembly	1
	GTB-1402	Output Shaft for GTB-304 Assembly	1
2B	GTB1403	Reducer Key (1/4 x 1/4 x 6) for GTB-1402 Shaft (Not Shown)	1
3	TRK-503	Woodruff Key	1
4	TRK-504	External Retaining Ring	2
5	TRK-505	Ball Bearing	2
6	TRK-506	Internal Retaining Ring	1
7	TRK-511	Open Square Section Retaining Ring	2
8	TRK-508	Output Pinion – 19 Teeth	1
9	TRK-509	Hi-Collar Lock Washer (3/8) – Plated	4
10	TRK-510	Socket Head Cap Screw (3/8-16 x 3/4) – Plated	4
11	TRK-512	Wheel Gear Grease (Not Shown)	1

## Recommended Spare Parts

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

One Brake Friction Disc  
One Brake Module  
One Set of Contactors  
One Transformer  
One Wire Rope Assembly

Note: When ordering parts always furnish Hoist Serial Number, Catalog Number, Motor Horsepower, Voltage, Phase, Frequency and Rated Load of Hoist on which the parts are to be used.

Parts for your hoist are available from your local authorized Yale repair station. For the location of your nearest repair station, write:

Yale•Lift-Tech  
414 West Broadway Avenue  
P.O. Box 0769  
Muskegon, Michigan 49443-0769

Phone: (800) 999-6318  
Fax: (800) 766-0223

# WARRANTY

## *WARRANTY AND LIMITATION OF REMEDY AND LIABILITY*

A. Seller warrants that its products and parts, when shipped, and its work (including installation, construction and start-up), when performed, will meet applicable specifications, will be of good quality and will be free from defects in material and workmanship. All claims for defective products or parts under this warranty must be made in writing immediately upon discovery and, in any event, within two (2) years (or as otherwise provided) from shipment of the applicable item unless Seller specifically assumes installation, construction or start-up responsibility. All claims for defective products or parts when Seller specifically assumes installation, construction or start-up responsibility, and all claims for defective work must be made in writing immediately upon discovery and, in any event, within two (2) years (or as otherwise provided) from completion of the applicable work by Seller, provided, however, all claims for defective products and parts must be made in writing no later than thirty (30) months after shipment. Defective items must be held for Seller's inspection and returned to the original f.o.b. point upon request. THE FOREGOING IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES WHATSOEVER, EXPRESS, IMPLIED AND STATUTORY, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS.

B. Upon Buyer's submission of a claim as provided above and its substantiation, Seller shall, at its option, either (i) repair or replace its product, part or work at either the original f.o.b. point of delivery or at Seller's authorized service station nearest Buyer or (ii) refund an equitable portion of the purchase price.

C. This warranty is contingent upon Buyer's proper maintenance and care of Seller's products, and does not extend to normal wear and tear. Seller reserves the right to void warranty in event of Buyer's use of inappropriate materials in the course of repair or maintenance, or if Seller's products have been dismantled prior to submission to Seller for warranty inspection.

D. The foregoing is Seller's only obligation and Buyer's exclusive remedy for breach of warranty, and is Buyer's exclusive remedy hereunder by way of breach of contract, tort, strict liability or otherwise. In no event shall Buyer be entitled to or Seller liable for incidental or consequential damages. Any action for breach of this warranty must be commenced within two (2) years (or as otherwise provided) after the cause of action has accrued.