



EFFECTIVE: November 1, 2013

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# OWNER'S MANUAL

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## THEATRICAL CHAIN HOIST TNER SERIES

1/2 Ton through 2 Ton Capacity

Code, Lot and Serial Number

### WARNING

This equipment should not be installed, operated, or maintained by any person who has not read and understood all the contents of this manual. Failure to read and comply with the contents of this manual can result in serious bodily injury or death, and/or property damage.

**HARRINGTON**  
HOISTS AND CRANES

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## 1.0 Important Information and Warnings

### 1.1 Terms and Summary

**This manual provides important information** for personnel involved with the installation, operation and maintenance of this product. Although you may be familiar with this or similar equipment, it is strongly recommended that you read this manual before installing, operating or maintaining the product.

#### **Danger, Warning, Caution and Notice**

Throughout this manual there are steps and procedures that can present hazardous situations. The following signal words are used to identify the degree or level of hazard seriousness.

**⚠ DANGER** Danger indicates an imminently hazardous situation which, if not avoided, **will** result in **death or serious injury**, and property damage.

**⚠ WARNING** Warning indicates an imminently hazardous situation which, if not avoided, **could** result in **death or serious injury**, and property damage.

**⚠ CAUTION** Caution indicates a potentially hazardous situation which, if not avoided, **may** result **minor or moderate injury** or property damage.

**NOTICE** Notice is used to notify people of installation, operation, or maintenance information which is important but not directly hazard-related.

### **⚠ CAUTION**

These general instructions deal with the normal installation, operation, and maintenance situations encountered with the equipment described herein. The instructions should not be interpreted to anticipate every possible contingency or to anticipate the final system, crane, or configuration that uses this equipment. For systems using the equipment covered by this manual, the supplier and owner of the system are responsible for the system's compliance with all applicable industry standards, and with all applicable federal, state and local regulations/codes.

This manual includes instructions and parts information for a variety of hoist types. Therefore, all instructions and parts information may not apply to any one type or size of specific hoist. Disregard those portions of the instructions that do not apply.

Record your hoist's Code, Lot and Serial Number on the front cover of this manual for identification and future reference to avoid referring to the wrong manual for information or instructions on installation, operation, inspection, maintenance, or parts.

Use only Harrington authorized replacement parts in the service and maintenance of this hoist.

## **WARNING**

Equipment described herein is not designed for and **MUST NOT** be used for lifting, supporting, or transporting people, or for lifting or supporting loads over people.

Equipment described herein should not be used in conjunction with other equipment unless necessary and/or required safety devices applicable to the system, crane, or application are installed by the system designer, system manufacturer, crane manufacturer, installer, or user.

Modifications to upgrade, rerate, or otherwise alter this equipment shall be authorized only by the original equipment manufacturer.

Equipment described herein may be used in the design and manufacture of cranes or monorails. Additional equipment or devices may be required for the crane and monorail to comply with applicable crane design and safety standards. The crane designer, crane manufacturer, or user is responsible to furnish these additional items for compliance. Refer to ANSI/ASME B30.17, "Safety Standard for Top-Running Single Girder Cranes"; ANSI/ASME B30.2 "Safety Standard for Top-Running Double-Girder Cranes"; and ANSI/ASME B30.11 "Safety Standard for Underhung Cranes and Monorails".

If a below-the-hook lifting device or sling is used with a hoist, refer to ANSI/ASME B30.9, "Safety Standard for Slings" or ANSI/ASME B30.20, "Safety Standard for Below-the-Hook Lifting Devices".

Hoists and cranes, used to handle hot molten material may require additional equipment or devices. Refer to ANSI Z241.2, "Safety Requirements for Melting and Pouring of Metals in the Metal Casting Industry".

Electrical equipment described herein is designed and built in compliance with Harrington's interpretation of ANSI/NFPA 70, "National Electrical Code". The system designer, system manufacturer, crane designer, crane manufacturer, installer, or user is responsible to assure that the installation and associated wiring of these electrical components is in compliance with ANSI/NFPA 70, and all applicable Federal, State and Local Codes.

Failure to read and comply with any one of the limitations noted herein can result in serious bodily injury or death, and/or property damage.

## **DANGER**

**HAZARDOUS VOLTAGES ARE PRESENT IN THE CONTROL BOX, OTHER ELECTRICAL COMPONENTS, AND CONNECTIONS BETWEEN THESE COMPONENTS.**

Before performing ANY mechanical or electrical maintenance on the equipment, de-energize (disconnect) the main switch supplying power to the equipment; as well as lock and tag the main switch in the de-energized position. Refer to ANSI Z244.1, "Personnel Protection – Lockout/Tagout of Energy Sources".

Only trained and competent personnel should inspect and repair this equipment.

## **NOTICE**

It is the responsibility of the owner/user to install, inspect, test, maintain, and operate a hoist in accordance with ANSI/ASME B30.16, "Safety Standard for Overhead Hoists", OSHA Regulations and ANSI/NFPA 70, National Electric Code. If the hoist is installed as part of a total lifting system, such as an overhead crane or monorail, it is also the responsibility of the owner/user to comply with the applicable ANSI/ASME B30 volume that addresses that type of equipment.

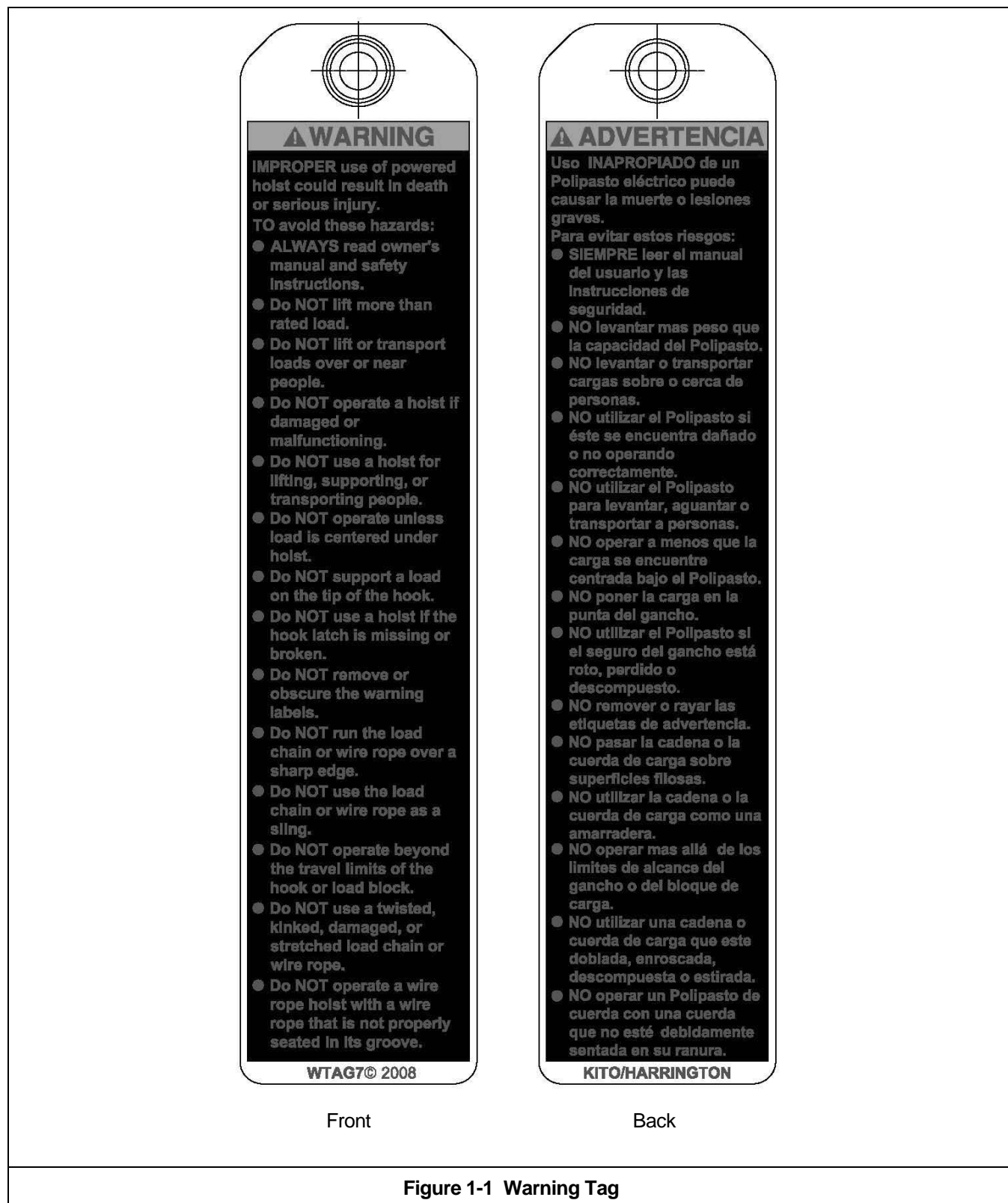
It is the responsibility of the owner/user to have all personnel that will install, inspect, test, maintain, and operate a hoist read the contents of this manual and applicable portions of ANSI/ASME B30.16, "Safety Standard for Overhead Hoists", OSHA Regulations and ANSI/NFPA 70, "National Electric Code". If the hoist is installed as part of a total lifting system, such as an overhead crane, the applicable ANSI/ASME B30 volume that addresses that type of equipment must also be read by all personnel.

If the hoist owner/user requires additional information, or if any information in the manual is not clear, contact Harrington or the distributor of the hoist. Do not install, inspect, test, maintain, or operate this hoist unless this information is fully understood.

A regular schedule of inspection of the hoist in accordance with the requirements of ANSI/ASME B30.16 should be established and records maintained.

## 1.2 Warning Tags and Labels

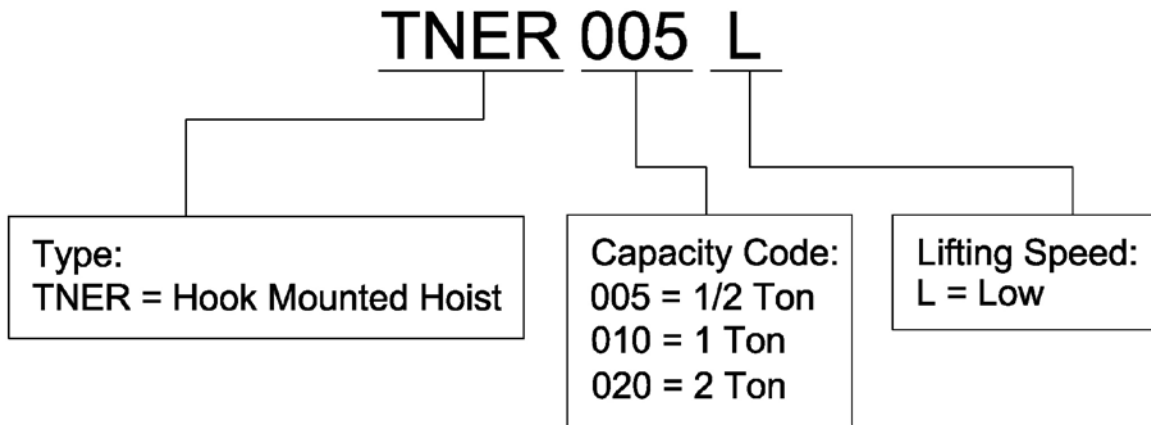
The warning tag illustrated below in Figure 1-1 is supplied with each hoist shipped from the factory. If the tag is not attached to your hoist or hoist's pendant cord, order a tag from your dealer and install it. Read and obey all warnings attached to this hoist. Tag is not shown actual size.



## 2.0 Technical Information

### 2.1 Specifications

#### 2.1.1 Product Code



#### 2.1.2 Operating Conditions and Environment

Temperature range: -4° to +104°F (-20° to +40°C)  
 Humidity: 85% or less  
 Noise Level: 85 dB or less (A scale: measured 1 meter away from electric chain hoist)  
 Enclosure Rating: Hoist Meets IP55, Optional Pendant Meets NEMA 4X  
 Supply Voltage: Single Speed Standard: Reconnectable 208/230 & 460V-3-60

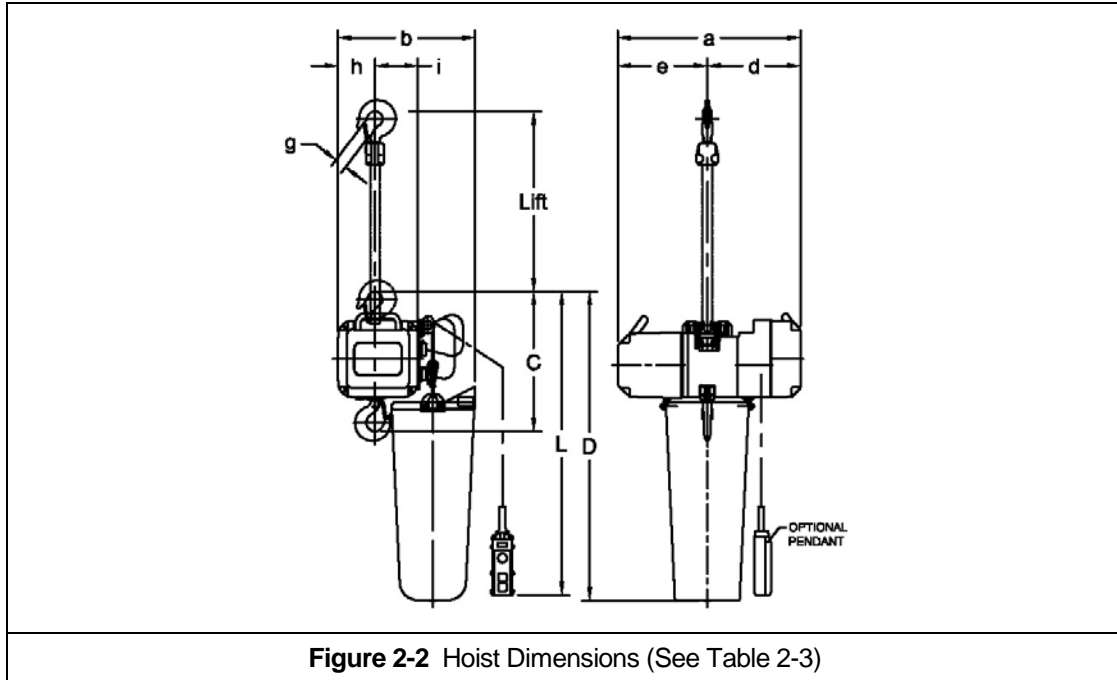
|                           | Single Speed                  |
|---------------------------|-------------------------------|
| Hoist Duty Rating:        | ISO M3; ASME H3               |
| Intermittent Duty Rating: | 25% ED<br>150 starts per hour |
| Short Time Duty Rating:   | 30 min.                       |

**Table 2-1 Hoist Specifications**

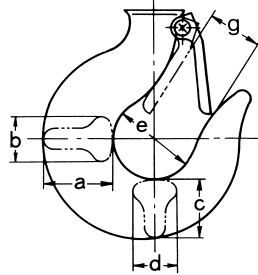
| Table 2-1 Hoist Specifications |                 |                              |                |                        |      |  |                           |  |  |
|--------------------------------|-----------------|------------------------------|----------------|------------------------|------|--|---------------------------|--|--|
| Capacity<br>(Ton)              | Product<br>Code | Lifting<br>Speed<br>(ft/min) | Motor          |                        |      | Load<br>Chain<br>Wire<br>Diameter<br>(mm) x<br>Chain Fall<br>Lines | Load<br>Sheave<br>Pockets | Net Weight<br>with 60 Feet<br>of Lift<br>(lbs) | Weight<br>for One<br>Addnl.<br>FT. of<br>Lift<br>(lbs) |
|                                |                 |                              | Output<br>(Hp) | Current Draw<br>(amps) |      |  |                           |  |  |
|                                |                 |                              |                | 208V or<br>230V        | 460V |  |                           |  |  |
| 1/2                            | TNER005L        | 16                           | 0.65           | 4.2                    | 2.1  | 6.3 x 1  | 4                         | 99   | 0.57   |
| 1                              | TNER010L        |                              | 1.3            | 7.1                    | 3.6  | 8.0 x 1  |                           | 135  | 0.93   |
| 2                              | TNER020L        | 8                            |                |                        |      | 8.0 x 2  |                           | 209  | 1.9  |



## 2.2 Dimensions



**Table 2-2 Hook Dimension\***



C = Chain Hook

B = Body Hook

Units = inch

| Capacity Code | Hook | a   | b   | c   | d   | e   | g   |
|---------------|------|-----|-----|-----|-----|-----|-----|
| 005L          | C    | 1.1 | 0.7 | 0.9 | 0.7 | 1.4 | 0.9 |
|               | B    | 1.0 | 0.6 | 0.9 | 0.6 | 1.7 | 1.1 |
| 010L          | C    | 1.4 | 0.9 | 1.2 | 0.9 | 1.7 | 1.2 |
|               | B    | 1.2 | 0.8 | 1.0 | 0.8 | 1.9 | 1.3 |
| 020L          | C    | 1.9 | 1.1 | 1.6 | 1.1 | 2.0 | 1.5 |
|               | B    | 1.6 | 1.0 | 1.3 | 1.0 | 2.1 | 1.6 |

\*Refer to Section 5.7 for inspection dimensions and limits.

**Table 2-3 Hoist Dimensions**

| Product Code | Minimum Headroom C (in) | L* (ft) | a (in) | b (in) | d (in) | e (in) | g (in) | h (in) | i (in) | D (in) |
|--------------|-------------------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| TNER005L     | 13.2                    | 2.5     | 18.7   | 14.2   | 9.6    | 9.2    | 0.9    | 3.9    | 4.0    | 35.4   |
| TNER010L     | 16.1                    | 2.5     | 20.0   | 15.0   | 10.2   | 9.8    | 1.2    | 4.1    | 4.7    | 37.0   |
| TNER020L     | 22.8                    | 2.5     |        |        |        |        | 1.6    |        |        | 48.8   |

\*The hoist is supplied with 2.5 feet of power supply cable and 2.5 feet of pendant cord.  
A pendant is optional.

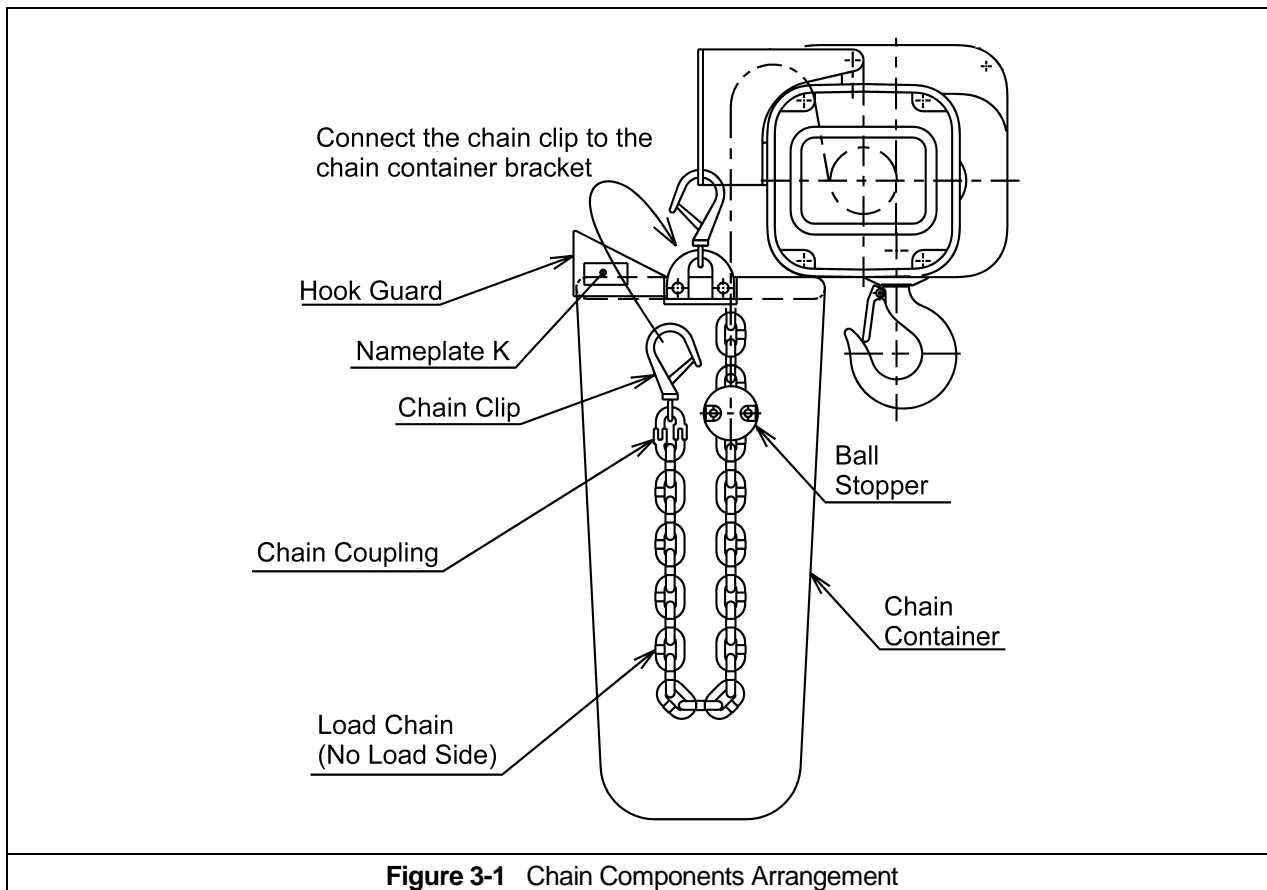
## 3.0 Preoperational Procedures

### 3.1 Gearbox

- 3.1.1 The gearbox is filled with the correct amount of grease at the time of shipment.
- 3.1.2 Refer to Section 6.3 when replacing the gear grease.
- 3.1.3 Gear grease for TNER is Sumiplex L-Mo No.1 (Part No. SA1BS1855). 1 oz (30 milliliter) of grease is used to lubricate the gears.

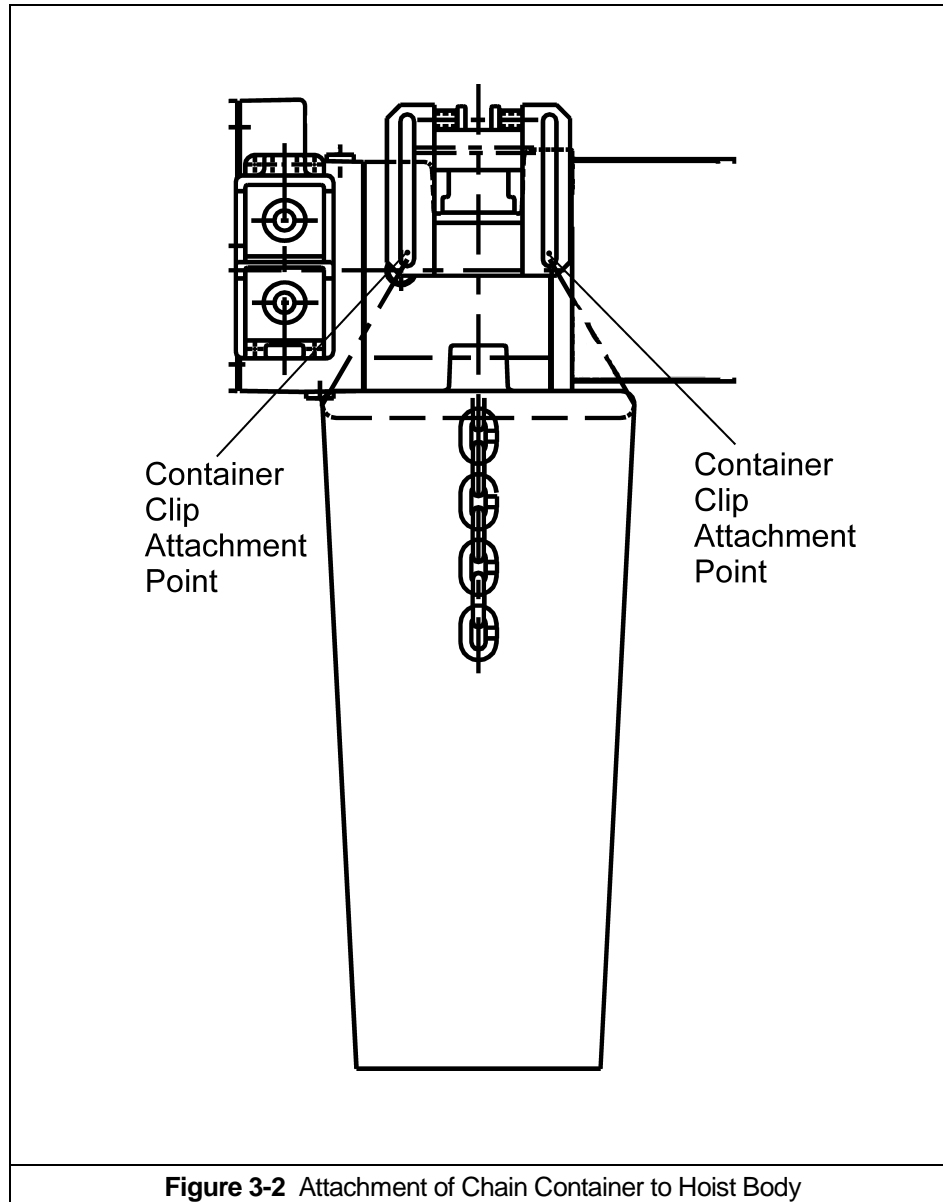
### 3.2 Chain

- 3.2.1 The chain components include Ball Stopper, Chain Coupling, Chain Clip and Chain Container Assembly. Never operate the hoist with incorrect, missing, or damaged chain components. Ensure that all chain components are in the correct location and properly installed as shown in Figure 3-1.



- 3.2.2 The Ball Stopper must be installed at least 40 inches away from the no load end of the chain. Tightening torque for the Ball Stopper Bolt is 10 N-m (7 lb-ft).
- 3.2.3 The Chain Coupling and the Chain Clip are installed at the no load end of the chain.
- 3.2.4 Canvas Chain Container - fully unfold and install it on the hoist body as shown in Figure 3-2. Be sure to mount the chain container in the orientation where the hook guard is away from the hoist body as shown in Figure 3.1. The no load end of the chain is attached to the chain container bracket by the Chain Clip as shown in Figure 3.1. To place the chain into the chain container, feed the no load end of the chain into the container gradually. Take care to avoid twisting or tangling the chain. NEVER put all the chain into the container at once.

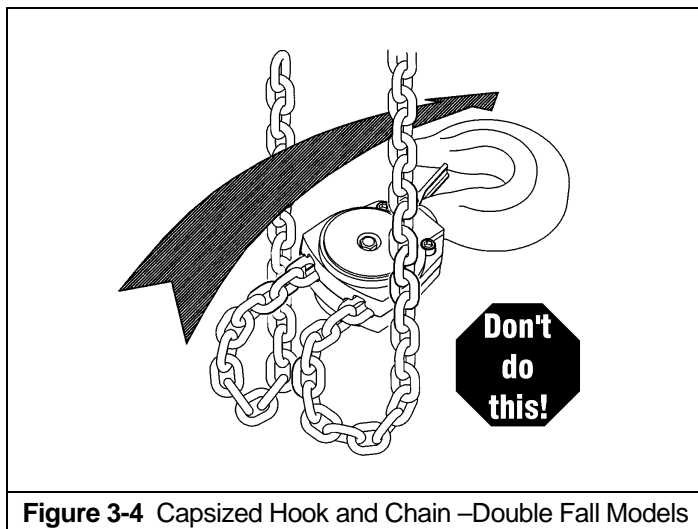
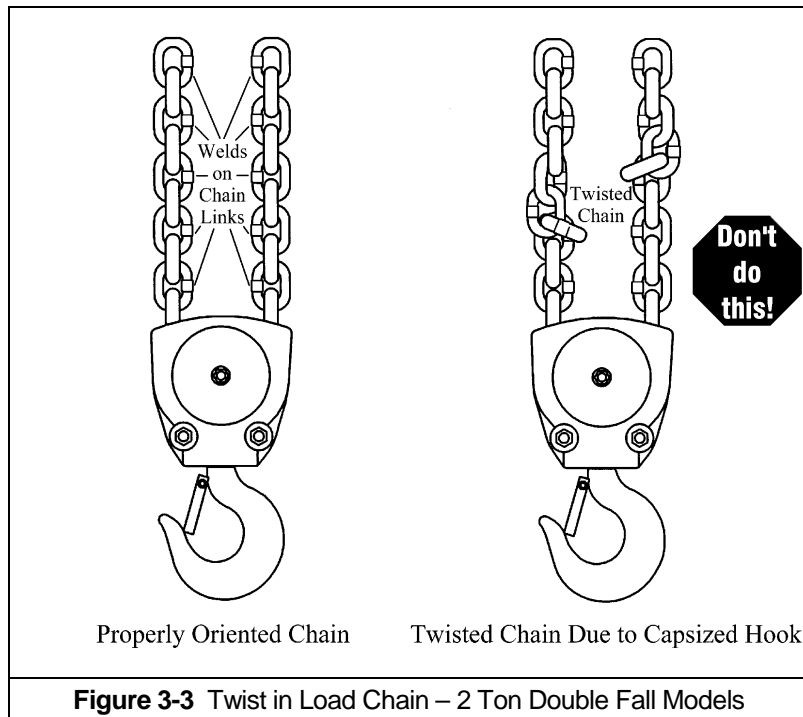
- 3.2.5 **⚠ WARNING** Operating this hoist without the correct Harrington chain container may create a potentially hazardous situation. To avoid this potentially hazardous situation, always operate this hoist with the correct chain container installed.
- 3.2.6 **⚠ CAUTION** Each chain container indicates the maximum length of the load chain that can be stored in the container. The amount of chain the container must hold is equal to the lift on the hoist. DO NOT use a chain container with a storage capacity less than the lift length on the hoist. If all of the chain cannot be stored in the container, the limit switch will not operate properly.



3.2.7

**⚠️WARNING**

Verify that the load chain is not twisted or tangled prior to operating the hoist. Make sure the chain hook on 2 Ton double fall models is not capsized. See Figures 3-3 and 3-4. Correct all chain irregularities before conducting the first hoist operation.



### 3.3 Mounting Location

3.3.1

**⚠️WARNING**

Prior to mounting the hoist ensure that the suspension and the supporting structure are adequate to support the hoist and its loads. If necessary consult a professional that is qualified to evaluate the adequacy of the suspension location and its supporting structure.

3.3.2

**NOTICE**

See Section 6.6 for outdoor installation considerations.

### 3.4 Mounting the Hoist

3.4.1 Hook Mounted to a Fixed Location - Attach the hoist's hook to the fixed suspension point.

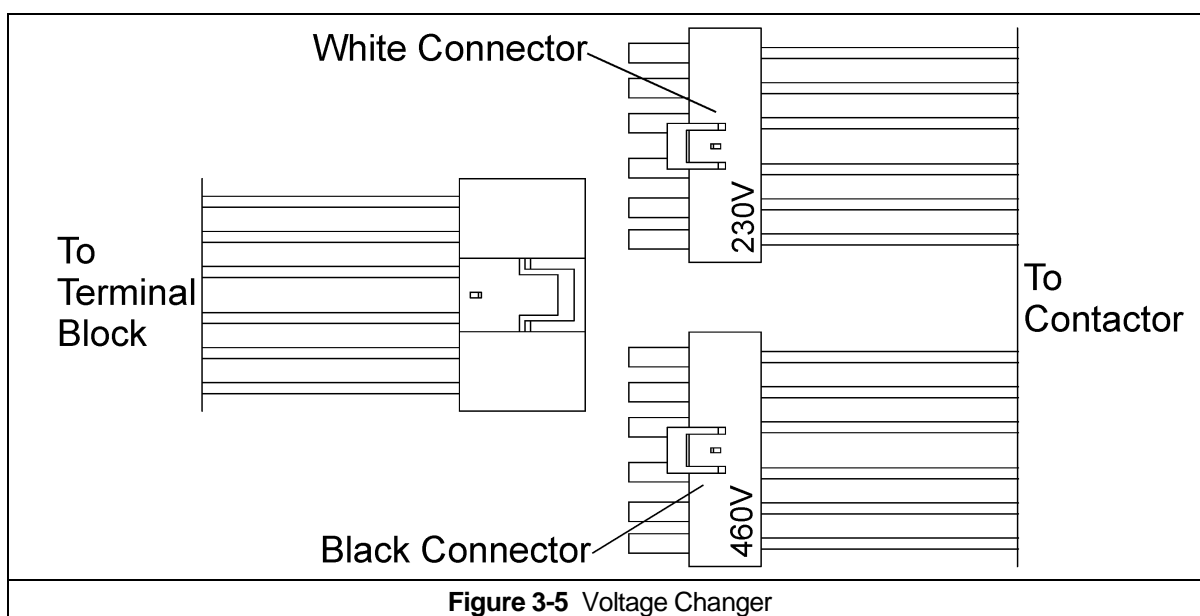
3.4.2 The hoist may be mounted by the chain hook or the body hook to a fixed suspension point.

3.4.3 **⚠ WARNING** Ensure that the fixed suspension point rests on the center of the hook's saddle and that the hook's latch is engaged.

### 3.5 Electrical Connections

3.5.1 **⚠ WARNING** Supplying this hoist with the incorrect power source can lead to serious damage and/or injury. This hoist is reconnectable and is equipped with a quick voltage change device. Check to make sure the power source matches the voltage configuration of the hoist before supplying power to the hoist.

3.5.2 The hoist is equipped with a quick voltage changer inside the controller cover. To configure the hoist to proper voltage configuration, connect the plug from the terminal block to one of the plugs from the contactor marked with the desired voltage configuration.



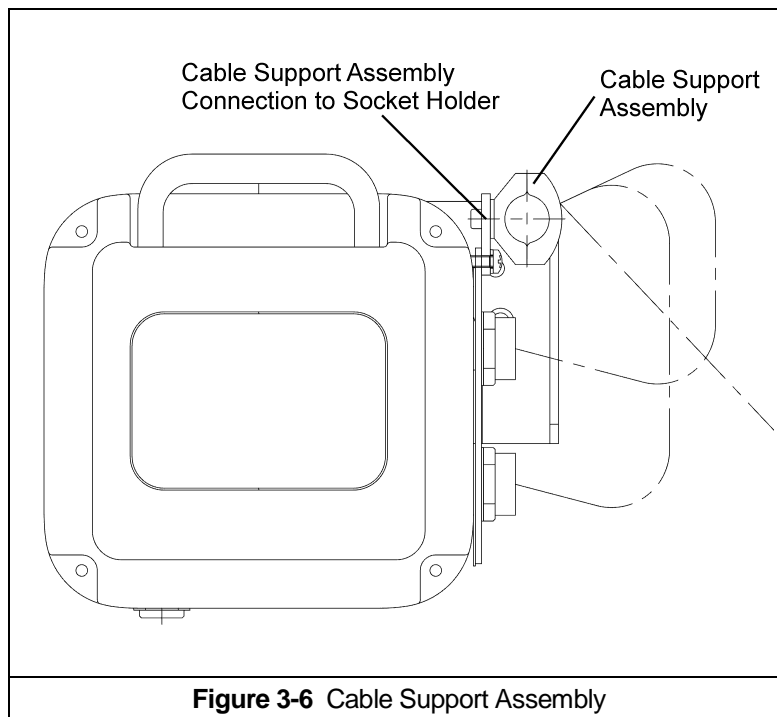
3.5.3 **⚠ CAUTION** Do NOT apply electronic soft-start control or voltage varying controls to the TNER hoist. Use of such devices may cause the motor brake and other electrical components to malfunction.

3.5.4 **⚠ DANGER** Before proceeding, ensure that the electrical supply for the hoist has been de-energized (disconnected). Lock out and tag out in accordance with ANSI Z244.1 "Personnel Protection -Lockout/Tagout of Energy Sources".

3.5.5 The hoist is supplied with 2.5 feet of power supply cable and 2.5 feet of control cable in a standard configuration. Power supply cable and control cable are directly wired into the hoist.

3.5.6 A pendant is optional. In a case where an optional pendant is used, the hoist is controlled by a pendant with two push buttons – one for raising and one for lowering.

3.5.7 Ensure that the power supply cable and the control cord are supported by the Cable Support Assembly and connected to the Socket Holder as shown in Figure 3-6. Use care to avoid twisting or kinking the cables.



- 3.5.8 Connection to Electrical Power Source - The red, blue and black wires of the Power Supply Cable should be connected to an Electric Power Disconnect Switch or Circuit Breaker. This connection should be made so that the hoist is phased properly. Refer to Section 3.6.10 for instructions on how to check for correct power supply phase connection.
- 3.5.9 Fuse/Breaker Capacity -The hoist's power supply should be equipped with current overload protection such as fuses, which should be selected for 110% to 120% of total listed full load amperage, and should be dual element time-delay fuses. Refer to the motor nameplate for the full load amperage draw.
- 3.5.10 **⚠ DANGER** Grounding - An improper or insufficient ground connection creates an electrical shock hazard when touching any part of the hoist or trolley. In the Power Supply Cable the ground wire will be either Green with Yellow stripe or solid Green. It should always be connected to a suitable ground connection.

## 3.6 Preoperational Checks and Trial Operation

- 3.6.1 **⚠ WARNING** Confirm the adequacy of the rated capacity for all slings, chains, wire ropes and all other lifting attachments before use. Inspect all load suspension members for damage prior to use and replace or repair all damaged parts.
- 3.6.2 **⚠ WARNING** Verify and correct all chain irregularities prior to operating the hoist. Refer to Section 3.2.
- 3.6.3 Measure and record the “k” dimension of all hooks on hoist. See Table 5-4 under Section 5, “Inspection”.
- 3.6.4 Record the hoist's Code, Lot and Serial Number (from the name plate on the hoist) in the space provided on the cover of this manual.
- 3.6.5 Ensure that the hoist is properly installed to a fixed point.
- 3.6.6 Ensure that all nuts, bolts and split pins (cotter pins) are sufficiently fastened.
- 3.6.7 If applicable, pull down on the Pendant and ensure that the Cord Strain Relief Cable takes the force, not the Pendant Cord.
- 3.6.8 **⚠ CAUTION** Check supply voltage before everyday use. If the voltage varies more than 10% of the rated value, electrical devices may not function normally.
- 3.6.9 Confirm proper operation.
- Before operating read and become familiar with Section 4 - Operation.
  - Before operating ensure that the hoist (and trolley) meets the Inspection, Testing and Maintenance requirements of ANSI/ASME B30.16.
  - Before operating ensure that nothing will interfere with the full range of the hoist's operation.
- 3.6.10 **⚠ WARNING** The hoist must be connected to the power source such that its direction of operation corresponds to the up-and-down commands issued from the pendant control; i.e. pushing the UP button must cause the hoist to lift the hook. If the hoist does not operate correctly, shut off and lockout /tagout the main power source to the hoist. Disconnect and switch any two of the three input power leads at the power source to correct the hoist's motor phasing.

## 4.0 Operation

### 4.1 Introduction

#### **DANGER**

DO **NOT** WALK UNDER A SUSPENDED LOAD

#### **WARNING**

HOIST OPERATORS SHALL BE REQUIRED TO READ THE OPERATION SECTION OF THIS MANUAL, THE WARNINGS CONTAINED IN THIS MANUAL, INSTRUCTION AND WARNING LABELS ON THE HOIST OR LIFTING SYSTEM, AND THE OPERATION SECTIONS OF ANSI/ASME B30.16 and ANSI/ASME B30.10. THE OPERATOR SHALL ALSO BE REQUIRED TO BE FAMILIAR WITH THE HOIST AND HOIST CONTROLS BEFORE BEING AUTHORIZED TO OPERATE THE HOIST OR LIFTING SYSTEM.

HOIST OPERATORS SHOULD BE TRAINED IN PROPER RIGGING PROCEDURES FOR THE ATTACHMENT OF LOADS TO THE HOIST HOOK.

HOIST OPERATORS SHOULD BE TRAINED TO BE AWARE OF POTENTIAL MALFUNCTIONS OF THE EQUIPMENT THAT REQUIRE ADJUSTMENT OR REPAIR, AND TO BE INSTRUCTED TO STOP OPERATION IF SUCH MALFUNCTIONS OCCUR, AND TO IMMEDIATELY ADVISE THEIR SUPERVISOR SO CORRECTIVE ACTION CAN BE TAKEN.

HOIST OPERATORS SHOULD HAVE NORMAL DEPTH PERCEPTION, FIELD OF VISION, REACTION TIME, MANUAL DEXTERITY, AND COORDINATION.

HOIST OPERATORS SHOULD **NOT** HAVE A HISTORY OF OR BE PRONE TO SEIZURES, LOSS OF PHYSICAL CONTROL, PHYSICAL DEFECTS, OR EMOTIONAL INSTABILITY THAT COULD RESULT IN ACTIONS OF THE OPERATOR BEING A HAZARD TO THE OPERATOR OR TO OTHERS.

HOIST OPERATORS SHOULD **NOT** OPERATE A HOIST OR LIFTING SYSTEM WHEN UNDER THE INFLUENCE OF ALCOHOL, DRUGS, OR MEDICATION.

OVERHEAD HOISTS ARE INTENDED ONLY FOR VERTICAL LIFTING SERVICE OF FREELY SUSPENDED UNGUIDED LOADS. DO **NOT** USE HOIST FOR LOADS THAT ARE NOT LIFTED VERTICALLY, LOADS THAT ARE NOT FREELY SUSPENDED, OR LOADS THAT ARE GUIDED.

#### **NOTICE**

- Read ANSI/ASME B30.16 and ANSI/ASME B30.10.
- Read the hoist manufacturer's Operating and Maintenance Instructions.
- Read all labels attached to equipment.



The operation of an overhead hoist involves more than activating the hoist's controls. Per the ANSI/ASME B30 standards, the use of an overhead hoist is subject to certain hazards that cannot be mitigated by engineered features, but only by the exercise of intelligence, care, common sense, and experience in anticipating the effects and results of activating the hoist's controls. Use this guidance in conjunction with other warnings, cautions, and notices in this manual to govern the operation and use of your overhead hoist.

## 4.2 Shall's and Shall Not's for Operation

### **WARNING**

Improper operation of a hoist can create a potentially hazardous situation which, if not avoided, could result in death or serious injury, and substantial property damage. To avoid such a potentially hazardous situation **THE OPERATOR SHALL:**

- **NOT** operate a damaged, malfunctioning or unusually performing hoist.
- **NOT** operate a hoist until you have thoroughly read and understood Manufacturer's Operating and Maintenance Instructions or Manuals.
- Be familiar with operating controls, procedures, and warnings.
- **NOT** operate a hoist that has been modified without the manufacturer's approval or without certification that it is in conformity with ANSI/ASME B30 volumes.
- **NOT** lift more than rated load for the hoist.
- **NOT** use hoist with twisted, kinked, damaged, or worn load chain.
- **NOT** use the hoist to lift, support, or transport people.
- **NOT** lift loads over people.
- **NOT** operate a hoist unless all persons are and remain clear of the supported load.
- **NOT** operate unless load is centered under hoist.
- **NOT** attempt to lengthen the load chain or repair damaged load chain.
- Protect the hoist's load chain from weld splatter or other damaging contaminants.
- **NOT** operate hoist when it is restricted from forming a straight line from hook to support in the direction of loading.
- **NOT** use load chain as a sling or wrap load chain around load.
- **NOT** apply the load to the tip of the hook or to the hook latch.
- **NOT** apply load unless the load chain is properly seated in its grooves.
- **NOT** apply load if bearing prevents equal loading on all load-supporting chain.
- **NOT** operate beyond the limits of the load chain travel.
- **NOT** leave load supported by the hoist unattended unless specific precautions have been taken.
- **NOT** allow the load chain or hook to be used as an electrical or welding ground.
- **NOT** allow the load chain or hook to be touched by a live welding electrode.
- **NOT** remove or obscure the warnings on the hoist.
- **NOT** operate a hoist on which the safety placards or decals are missing or illegible
- **NOT** operate a hoist unless it has been securely attached to a suitable support.
- **NOT** operate a hoist unless load slings or other approved single attachments are properly sized, and seated in the hook saddle.
- **NOT** use the hoist in such a way that could result in shock or impact loads being applied to the hoist.
- Take up slack carefully – make sure load is balanced and load-holding action is secure before continuing.
- Shut down a hoist that malfunctions or performs unusually and report such malfunction.
- Make sure hoist limit switches function properly.
- Warn personnel before lifting or moving a load.
- Warn personnel of an approaching load.

## **CAUTION**

Improper operation of a hoist can create a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, or property damage. To avoid such a potentially hazardous situation **THE OPERATOR SHALL:**

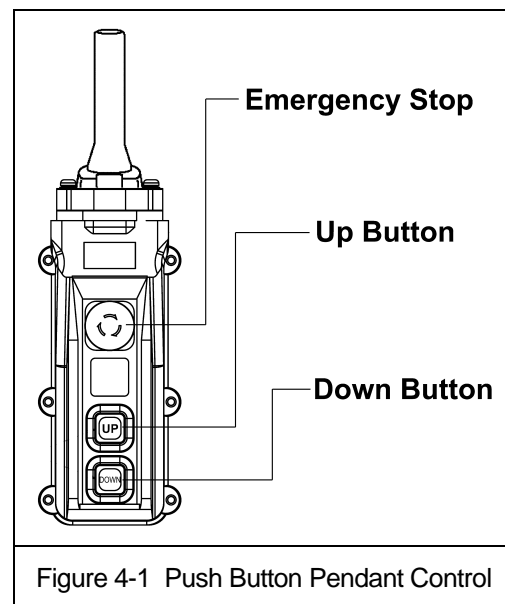
- Maintain a firm footing or be otherwise secured when operating the hoist.
- Check brake function by tensioning the hoist prior to each lift operation.
- Use hook latches. Latches are to retain slings, chains, etc. under slack conditions only.
- Make sure the hook latches are closed and not supporting any parts of the load.
- Make sure the load is free to move and will clear all obstructions.
- Avoid swinging the load or hook.
- Make sure hook travel is in the same direction as shown on controls.
- Inspect the hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
- Use the hoist manufacturer's recommended parts when repairing the unit.
- Lubricate load chain per hoist manufacturer's recommendations.
- **NOT** use the hoist load limiting or warning device to measure load.
- **NOT** use limit switches as routine operating stops. They are emergency devices only.
- **NOT** allow your attention to be diverted from operating the hoist.
- **NOT** allow the hoist to be subjected to sharp contact with other hoists, structures, or objects through misuse.
- **NOT** adjust or repair the hoist unless qualified to perform such adjustments or repairs.

### 4.3 Hoist Controls

4.3.1 Emergency Stop Button – Press the Emergency Stop Button to perform an emergency stop and lock-out of hoist motion controls. Turn the Emergency Stop Button clockwise to unlock the controls and allow hoist operation.

4.3.2 When using the pendant control depress the UP button to raise the hoist load chain/hook or the DOWN button to lower the hoist load chain/hook as shown in Figure 4-1. To stop motion release the buttons.

4.3.3  **CAUTION** Make sure the motor completely stops before reversing direction.



## 5.0 Inspection

### 5.1 General

- 5.1.1 The inspection procedure herein is based on ANSI/ASME B30.16. The following definitions are from ANSI/ASME B30.16 and pertain to the inspection procedure below.
- **Designated Person** – a person selected or assigned as being competent to perform the specific duties to which he/she is assigned.
  - **Qualified Person** – a person who, by possession of a recognized degree or certificate of professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.
  - **Normal Service** – that distributed service which involves operation with randomly distributed loads within the rated load limit, or uniform loads less than 65% of rated load for not more than 25% of the time.
  - **Heavy Service** – that service which involves operation within the rated load limit which exceeds normal service.
  - **Severe Service** – that service which involves normal or heavy service with abnormal operating conditions.

### 5.2 Inspection Classification

- 5.2.1 Initial Inspection – prior to initial use, all new, altered, or modified hoists shall be inspected by a designated person to ensure compliance with the applicable provisions of this manual.
- 5.2.2 Inspection Classification – the inspection procedure for hoists in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the critical components of the hoist and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as FREQUENT and PERIODIC, with respective intervals between inspections as defined below.
- 5.2.3 FREQUENT Inspection – visual examinations by the operator or other designated personnel with intervals per the following criteria:
- Normal service – monthly
  - Heavy service – weekly to monthly
  - Severe service – daily to weekly
  - Special or infrequent service – as recommended by a qualified person before and after each occurrence.
- 5.2.4 PERIODIC Inspection – visual inspection by a designated person with intervals per the following criteria:
- Normal service – yearly
  - Heavy service – semiannually
  - Severe service – quarterly
  - Special or infrequent service – as recommended by a qualified person before the first such occurrence and as directed by the qualified person for any subsequent occurrences.

### 5.3 Frequent Inspection

- 5.3.1 Inspections should be made on a FREQUENT basis in accordance with Table 5-1, "Frequent Inspection." Included in these FREQUENT Inspections are observations made during operation for any defects or damage that might appear between Periodic Inspections. Evaluation and resolution of the results of FREQUENT Inspections shall be made by a designated person such that the hoist is maintained in safe working condition.

| Table 5-1 Frequent Inspection   |
|---|
| All functional operating mechanisms for maladjustment and unusual sounds. |
| Operation of limit switch and associated components                       |
| Hoist braking system for proper operation                                 |
| Hooks in accordance with ANSI/ASME B30.10                                 |
| Hook latch operation  |
| Load chain in accordance with Section 5.7                                 |
| Load chain reeving for compliance with Section 3.2 and 6.3                |

### 5.4 Periodic Inspection

- 5.4.1 Inspections should be made on a PERIODIC basis in accordance with Table 5-2, "Periodic Inspection." Evaluation and resolution of the results of PERIODIC Inspections shall be made by a designated person such that the hoist is maintained in safe working condition.
- 5.4.2 For inspections where load suspension parts of the hoist are disassembled, a load test per ANSI/ASME B30.16 must be performed on the hoist after it is re-assembled and prior to its return to service.

| Table 5-2 Periodic Inspection   |
|---|
| Requirements of frequent inspection.  |
| Evidence of loose bolts, nuts, or rivets.   |
| Evidence of worn, corroded, cracked, or distorted parts such as load blocks, suspension housing, chain attachments, clevises, yokes, suspension bolts, shafts, gears, bearings, pins and rollers. |
| Evidence of damage to hook retaining nuts or collars and pins, and welds or rivets used to secure the retaining members.  |
| Evidence of damage or excessive wear of load and idler sheaves.   |
| Evidence of excessive wear on motor or load brake.  |
| Electrical apparatus for signs of pitting or any deterioration of visible controller contacts.  |
| Evidence of damage of supporting structure or trolley, if used.   |
| Function labels on pendant control stations for legibility.   |
| Warning label properly attached to the hoist and legible (see Section 1.2).   |
| End connections of load chain.  |

## 5.5 Occasionally Used Hoists

5.5.1 Hoists that are used infrequently shall be inspected as follows prior to placing in service:

- Hoist Idle More Than 1 Month, Less Than 1 Year: Inspect per FREQUENT Inspection criteria in Section 5.3.
- Hoist Idle More Than 1 Year: Inspect per PERIODIC Inspection criteria in Section 5.4.

## 5.6 Inspection Records

5.6.1 Dated inspection reports and records should be maintained at time intervals corresponding to those that apply for the hoist's PERIODIC interval per Section 5.2.4. These records should be stored where they are available to personnel involved with the inspection, maintenance, or operation of the hoist.

5.6.2 A long range chain inspection program should be established and should include records of examination of chains removed from service so a relationship can be established between visual observation and actual condition of the chain.

## 5.7 Inspection Methods and Criteria

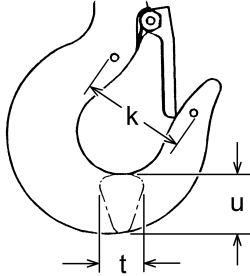
5.7.1 This section covers the inspection of specific items. The list of items in this section is based on those listed in ANSI/ASME B30.16 for the Frequent and Periodic Inspection. In accordance with ANSI/ASME B30.16, these inspections are not intended to involve disassembly of the hoist. Rather, disassembly for further inspection would be required if frequent or periodic inspection results so indicate. Such disassembly and further inspection should only be performed by a qualified person trained in the disassembly and re-assembly of the hoist.

**Table 5-3 Hoist Inspection Methods and Criteria**

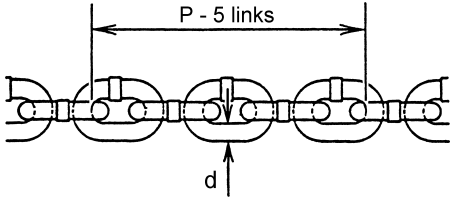
| Item                             | Method           | Criteria  | Action                         |
|----------------------------------|------------------|---|--------------------------------|
| Functional operating mechanisms. | Visual, Auditory | Mechanisms should be properly adjusted and should not produce unusual sounds when operated.   | Repair or replace as required. |
| Limit Switch                     | Function         | Proper operation. Actuation of limit switch should stop hoist.  | Repair or replace as required. |
| Limit Lever Assembly             | Visual, Function | Lever should not be bent or significantly worn and should be able to move freely.   | Replace.                       |
| Braking System Operation         | Function         | Braking distance with rated capacity should not exceed 3% of the lifting speed (approximately two chain links).   | Repair or replace as required. |
| Hooks - Surface Condition        | Visual           | Should be free of significant rust, weld splatter, deep nicks, or gouges.   | Replace.                       |
| Hooks - Fretting wear            | Measure          | The "u" and "t" dimensions should not be less than discard value listed in <b>Table 5-4</b>   | Replace.                       |
| Hooks - Stretch                  | Measure          | The "k" dimension should not be greater than 1.15 times that measured and recorded at the time of purchase (See <b>Section 3.6</b> ). If recorded "k" values are not available for hooks when new, use nominal "k" values from <b>Table 5-4</b> . | Replace.                       |
| Hooks - Bent Shank or Neck       | Visual           | Shank and neck portions of hook should be free of deformations.   | Replace.                       |

| <b>Table 5-3 Hoist Inspection Methods and Criteria</b>          |                                       |   |   |
|---|---------------------------------------|---|---|
| <b>Item</b>   | <b>Method</b>                         | <b>Criteria</b>   | <b>Action</b>   |
| Hooks - Yoke Assembly   | Visual                                | Should be free of significant rust, weld splatter, nicks, gouges. Holes should not be elongated, fasteners should not be loose, and there should be no gap between mating parts.  | Tighten or replace as required.                                       |
| Hooks - Swivel Bearing  | Visual, Function                      | Bearing parts and surfaces should not show significant wear, and should be free of dirt, grime and deformations. Hook should rotate freely with no roughness.   | Clean/lubricate, or replace as required.                              |
| Hooks - Idle Sheave and Axle (Bottom Hook on Double Fall Hoist) | Visual, Function                      | Pockets of Idle Sheave should be free of significant wear. Idle Sheave surfaces should be free of nicks, gouges, dirt and grime. Bearing parts and surfaces of Idle Sheave and Axle should not show significant wear. Idle Sheave should rotate freely with no roughness or significant free play.  | Clean/lubricate, or replace as required.                              |
| Hooks - Hook Latches  | Visual, Function                      | Latch should not be deformed. Attachment of latch to hook should not be loose. Latch spring should not be missing and should not be weak. Latch movement should not be stiff - when depressed and released latch should snap smartly to its closed position.  | Replace.  |
| Load Chain - Surface Condition                                  | Visual                                | Should be free of rust, nicks, gouges, dents and weld splatter. Links should not be deformed, and should not show signs of abrasion. Surfaces where links bear on one another should be free of significant wear.   | Replace.  |
| Load Chain - Pitch and Wire Diameter                            | Measure                               | The "P" dimension should not be greater than maximum value listed in <b>Table 5-5</b> . The "d" dimension should not be less than minimum value listed in <b>Table 5-5</b> .  | Replace. Inspect Load Sheave (and Idle Sheave for double fall hoist). |
| Load Chain - Lubrication  | Visual, Auditory                      | Entire surface of each chain link should be coated with lubricant and should be free of dirt and grime. Chain should not emit cracking noise when hoisting a load.  | Clean/lubricate (see <b>Section 6.0</b> ).                            |
| Load Chain - Reeving  | Visual                                | Chain should be reeved properly through Load Sheave (and Idle Sheave for double fall hoist) - refer to <b>Section 6.3</b> . Chain, Chain Coupling, Chain Clip and Ball Stopper should be installed properly - refer to <b>Section 3.2</b> .   | Reeve/Install chain properly.   |
| Chain Container   | Visual                                | Container should not be damaged. Brackets should not be deformed or missing.  | Replace.  |
| Housing and Mechanical Components                               | Visual, Auditory, Vibration, Function | Hoist components including load blocks, suspension housing, chain attachments, clevises, yokes, suspension bolts, shafts, gears, bearings, pins and rollers should be free of cracks, distortion, significant wear and corrosion. Evidence of same can be detected visually or via detection of unusual sounds or vibration during operation. | Replace.  |

| <b>Table 5-3 Hoist Inspection Methods and Criteria</b> |                                |  |  |
|--|--------------------------------|--|--|
| <b>Item</b>  | <b>Method</b>                  | <b>Criteria</b>  | <b>Action</b>                          |
| Bolts, Nuts and Rivets                                 | Visual, Check with Proper Tool | Bolts, nuts and rivets should not be loose.  | Tighten or replace as required.        |
| Motor Brake  | Measure, Visual                | Motor brake gap should be adjusted to the distance shown in <b>Table 6-1</b> before measuring the brake wear. Brake lining dimension "A" should not be less than discard value listed in <b>Table 5-6</b> . Refer to <b>Section 6.2</b> for gaining access to motor brake and for adjustment and inspection procedures. Braking surfaces should be clean, free of grease/oil and should not be glazed. | Adjust, Repair or Replace as required. |
| Contactor Contacts                                     | Visual                         | Contacts should be free of significant pitting or deterioration.   | Replace.                               |
| Load Sheave  | Visual                         | Pockets of Load Sheave should be free of significant wear.   | Replace.                               |
| Pendant – Switches (Optional)                          | Function                       | Depressing and releasing push-buttons should make and break contacts in switch contact block and result in corresponding electrical continuity or open circuit. Push-buttons should be interlocked either mechanically or electrically to prevent simultaneous energization of circuits for opposing motions (e.g. up and down).   | Repair or replace as necessary.        |
| Pendant - Housing (Optional)                           | Visual                         | Pendant housing should be free of cracks and mating surfaces of parts should seal without gaps.  | Replace.                               |
| Pendant - Wiring (Optional)                            | Visual                         | Wire connections to switches in pendant should not be loose or damaged.  | Tighten or repair                      |
| Pendant - Cord   | Visual, Electrical Continuity  | Surface of cord should be free from nicks, gouges, and abrasions. Each conductor in cord should have 100% electrical continuity even when cord is flexed back-and-forth. Pendant Cord Strain Relief Cable should absorb all of the load associated with forces applied to the pendant.   | Replace.                               |
| Pendant - Labels                                       | Visual                         | Labels denoting functions should be legible.   | Replace.                               |
| Warning Labels   | Visual                         | Warning Labels should be affixed to the hoist (see <b>Section 1.2</b> ) and they should be legible.  | Replace.                               |
| Hoist Capacity Label                                   | Visual                         | The label that indicates the capacity of the hoist should be legible and securely attached to the hoist.   | Replace.                               |

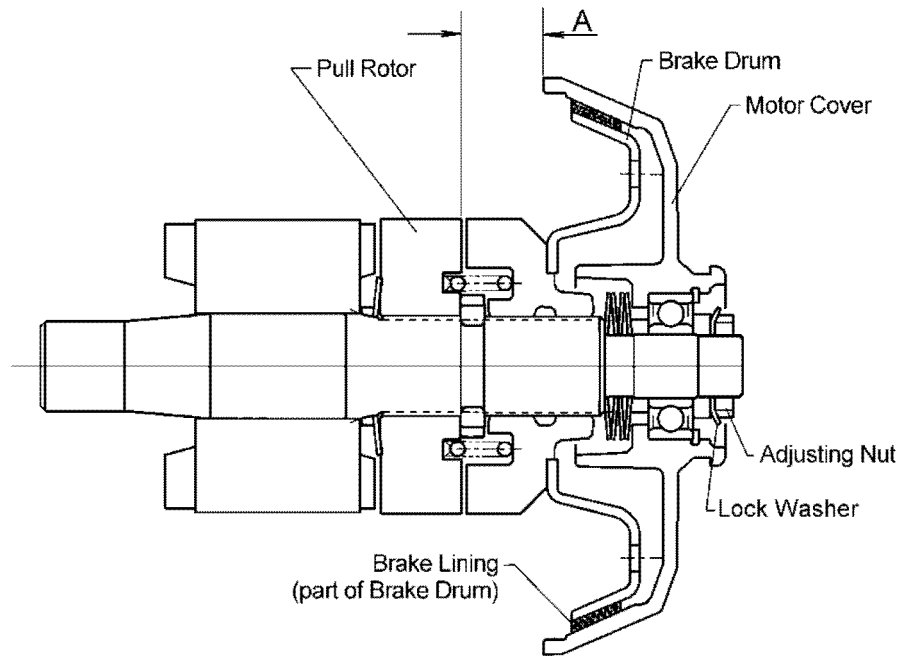
| Table 5-4 Chain Hook & Bottom Hook Dimensions  |   |                                  |                         |             |                         |             |
|--|---|----------------------------------|-------------------------|-------------|-------------------------|-------------|
| <p>"k" Measured When New:</p> <p>Chain: _____</p> <p>Body: _____</p> <p>C = Chain Hook</p> <p>B = Body Hook</p>  |   |                                  |                         |             |                         |             |
| Capacity Code  |   | Nominal "k" Dimension* inch (mm) | "u" Dimension inch (mm) |             | "t" Dimension inch (mm) |             |
|  |   |                                  | Standard                | Discard     | Standard                | Discard     |
| 005L   | C | 1.65 (42)                        | 0.93 (23.5)             | 0.83 (21)   | 0.69 (17.5)             | 0.63 (16)   |
|  | B | 1.92 (48.8)                      | 0.86 (21.8)             | 0.77 (19.6) | 0.63 (16.0)             | 0.57 (14.4) |
| 010L   | C | 1.97 (50)                        | 1.22 (31)               | 1.10 (28)   | 0.89 (22.5)             | 0.79 (20)   |
|  | B | 2.22 (56.3)                      | 1.04 (26.5)             | 0.94 (23.9) | 0.77 (19.5)             | 0.69 (17.6) |
| 020L   | C | 2.46 (62.5)                      | 1.57 (40)               | 1.42 (36)   | 1.14 (29)               | 1.02 (26)   |
|  | B | 2.52 (64.1)                      | 1.32 (33.5)             | 1.19 (30.2) | 0.96 (24.3)             | 0.86 (21.9) |

\* These values are nominal since the dimension is not controlled to a tolerance. The "k" dimension should be measured when the hook is new - this becomes a reference measurement. Subsequent measurements are compared to this reference to make determinations about hook deformation/stretch. See Section 5.7, "Hooks - Stretch".

| Table 5-5 Chain Wear Dimensions  |                         |              |                         |            |
|--|-------------------------|--------------|-------------------------|------------|
|  |                         |              |                         |            |
| Capacity Code  | "P" Dimension inch (mm) |              | "d" Dimension inch (mm) |            |
|  | Standard                | Discard      | Standard                | Discard    |
| 005L   | 3.76 (95.5)             | 3.82 (96.9)  | 0.25 (6.3)              | 0.22 (5.7) |
| 010L, 020L   | 4.76 (121.0)            | 4.91 (124.6) | 0.31 (8.0)              | 0.28 (7.2) |



**Table 5-6 Motor Brake Wear Dimensions**



**NOTICE**

Brake must be properly adjusted before measuring "A". See Section 6.3

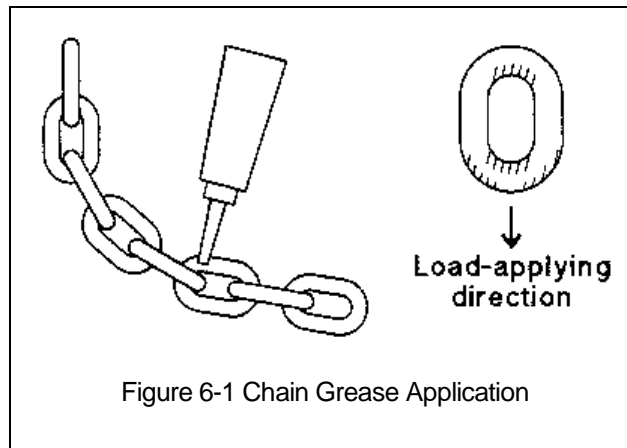
| Capacity Code | "A" Dimension - inch (mm) |             |
|---------------|---------------------------|-------------|
|               | Standard                  | Discard     |
| 005L          | 0.67 (17)                 | 0.61 (15.5) |
| 010L, 020L    | 0.85 (21.5)               | 0.79 (20)   |

## 6.0 Maintenance and Handling

### 6.1 Lubrication

#### 6.1.1 Load Chain

- For longer life, the load chain should be lubricated.
- The load chain lubrication should be accomplished after cleaning the load chain with an acid free cleaning solution.
- Apply Harrington lubricating grease (Part No. ER1BS1951) or an equivalent to industrial general lithium grease, NLGI No. 0, to the bearing surfaces of the load chain links as indicated by the shaded areas in Figure 6-1. Also apply the grease to the areas of the load chain (shaded areas in Figure 6-1) that contact the load sheave. Insure that the grease is applied to the contact areas in the load sheave pockets.
- Machine or gear oil (grade ISO VG 46 or 68 oil or equivalent) may be used as an alternative lubricant but must be applied more frequently.



- The chain should be lubricated every 3 months (more frequently for heavier usage or severe conditions).
- For dusty environments, it is acceptable to substitute a dry lubricant.

#### 6.1.2 Hooks and Suspension Components:

- Hooks - Bearings should be cleaned and lubricated at least once per year for normal usage. Clean and lubricate more frequently for heavier usage or severe conditions.
- Suspension Pins - Lubricate at least twice per year for normal usage; more frequently for heavier usage or severe conditions.
- Idle Sheave Bearing - Bearings should be cleaned and lubricated at least twice per year for normal usage. Clean and lubricate more frequently for heavier usage or severe conditions.

### 6.1.3 Gear Box:

- **⚠ WARNING** Using an incorrect type/grade of gearbox grease or the wrong quantity of grease may prevent the friction clutch from working properly and may affect the ability of the hoist to hold the load. Refer to Section 3.1 for the correct grease and quantity.
- If experiencing abnormal noise or unusual gearbox operation, have the gearbox serviced by a qualified individual.
- Always replace the gearbox grease when servicing the gearbox.
- **NOTICE** Dispose of the used grease in accordance with local regulations.

## 6.2 Motor Brake

6.2.1 To keep your hoist working in optimum condition and prevent possible down time, it is recommended to check your motor brake lining and adjustment at regular intervals.

6.2.2 Motor Brake Unit Removal - Adjustment and inspection of the motor brake requires removal of the motor brake unit from the hoist as an assembly.

- 1) **⚠ CAUTION** Before proceeding disconnect the power supply and make sure the hoist is unloaded. To keep the load chain from moving secure it by tying together the load and no-load sides directly under the hoist using a cord or wire.
- 2) Refer to Figure 6-3.
- 3) Remove the four Frame Cover Bolts (A), Frame Cover (B), Nut (C), Lock Washer (D), and Spacer (E).
- 4) Remove the four Motor Cover Assembly bolts (F) and carefully pull the motor brake unit (G) out of the hoist.

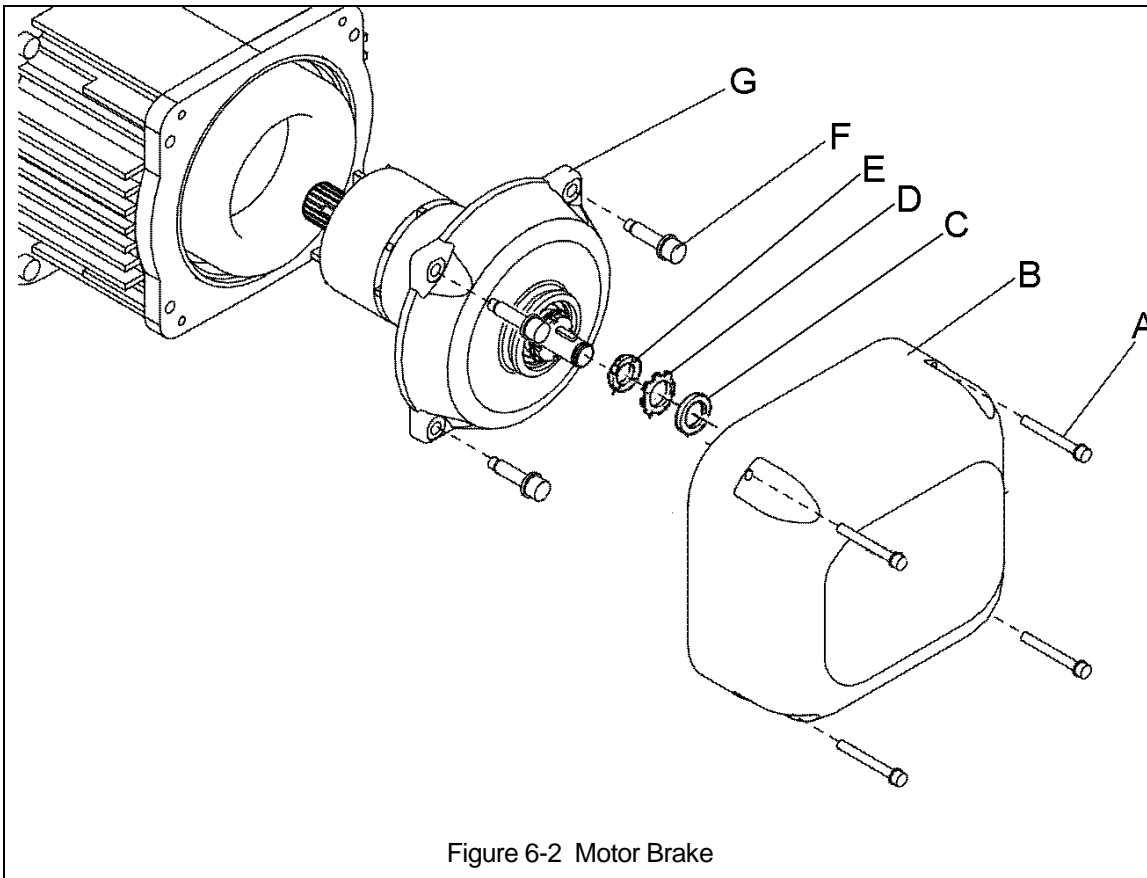
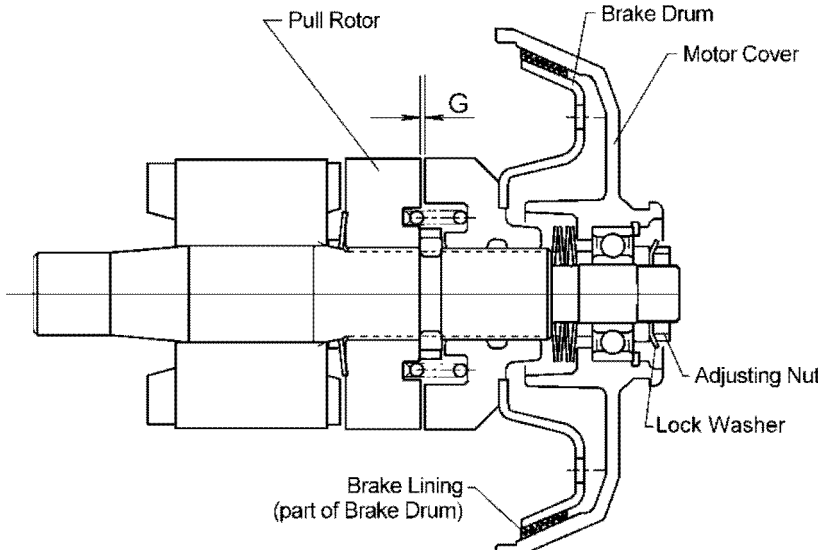


Figure 6-2 Motor Brake

- 6.2.3 Brake Gap (G) - The Brake Gap should be measured between the Brake Drum and Pull Rotor. Adjustment of the Brake Gap is accomplished by turning the Adjusting Nut in the center of the Motor Cover as shown in the figure with Table 6-1. Do this as follows:
- 5) Bend the tab of the Lock Washer away from the Adjusting Nut so that the Adjusting Nut can be rotated.
  - 6) Using a spanner wrench and a feeler gauge, rotate the Adjusting Nut to attain the proper Brake Gap per Table 6-1.
  - 7) After the Brake Gap is set, secure the Adjusting Nut by bending one of the tabs of the Lock Washer into a slot in the Adjusting Nut. If necessary rotate the Adjusting Nut clockwise (tightening) to line up the tab with the slot.
  - 8) If the proper brake adjustment cannot be achieved, disassemble the motor brake and inspect all motor brake parts. Replace the Brake Drum and/or Motor Cover if necessary.

| Table 6-1 Motor Brake Gap  |             |
|--|-------------|
|  |             |
| <b>Brake Gap (G)</b><br>inch (mm)  | 0.020 (0.5) |

6.2.4 Brake Lining Inspection –The brake lining is designed for a long life and should provide years of trouble-free service. If the brake lining is being inspected due to excessive load chain drift during operation (see Section 5.7), disassemble the motor brake and inspect all motor brake parts. Braking surfaces should be clean, free of grease/oil and should not be glazed. Replace the Brake Drum and/or Motor Cover if necessary. For normal inspections, the Brake Lining and Motor Cover wear should be measured as follows.

- 1) Adjust the Brake Gap per Section 6.2.3 before measuring the Brake Lining and Motor Cover wear.
- 2) Refer to Table 5-6.
- 3) Measure the distance "A" using calipers and a straight edge. Place the straight edge across the edge of the motor cover and measure from the straight edge to the face of the Pull Rotor.
- 4) Compare the measurement with the values listed in Table 5-6. Replace the Brake Drum and/or Motor Cover if the "A" measurement is smaller than the discard limit.

6.2.5 Motor Brake Unit Installation - After the brake is properly adjusted and inspected, carefully replace the motor brake unit back into the hoist. Be sure to reseal the Motor Cover to motor frame surface using a small bead of liquid (hi-temperature) sealant. Refer to Section 6.2.2 and reassemble the parts in reverse order of removal.

## 6.3 Load Chain

6.3.1 Lubrication and Cleaning – refer to Section 6.1.

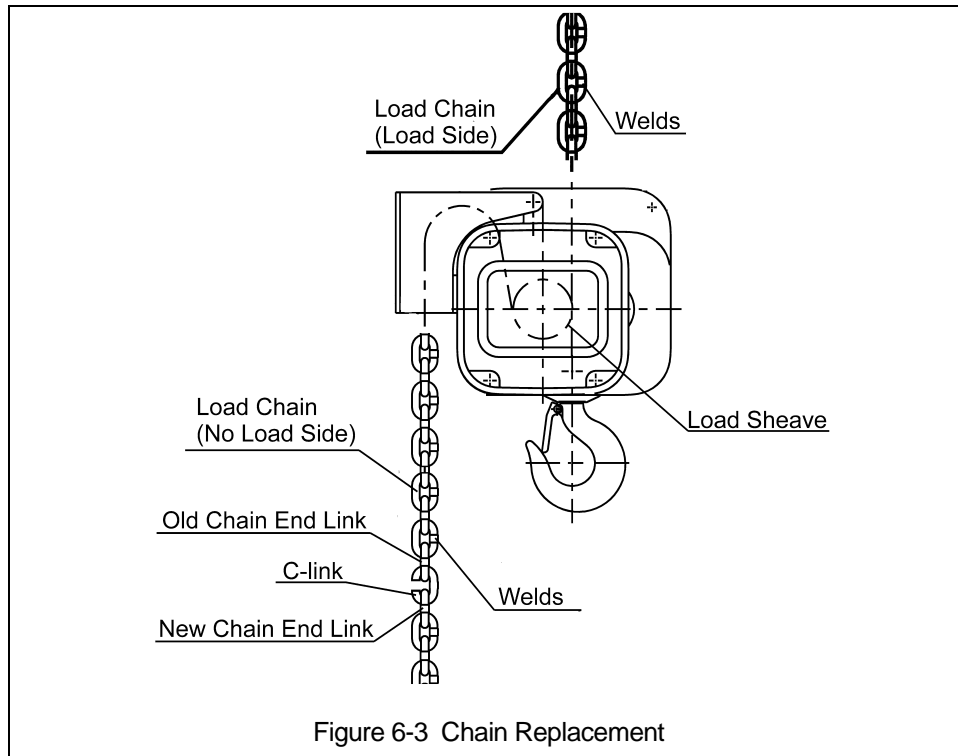
6.3.2 Load Chain Replacement:

- 1) **⚠ CAUTION** The hoist must be properly powered and operational in order to perform the following procedures.

6.3.3 **⚠ WARNING** Be certain that the replacement chain is obtained from Harrington and is the exact size, grade and construction as the original chain. The new load chain must have an odd number of links so that

both its end links have the same orientation. If the load chain is being replaced due to damage or wear out, destroy the old chain to prevent its reuse.

- 1) **⚠ CAUTION** When replacing load chain, check for wear on mating parts, i.e. Load Sheave, Chain Guides and Idle Sheaves, and replace parts if necessary.
- 2) Remove all chain components including the Chain Hook Set Assembly, Ball Stoppers, Chain Pin, Chain Coupling and Chain Clip from the chain for reuse on new chain. Inspect and replace any damaged or worn parts.
- 3) Using a C-link, attach the new chain to the end link of the old chain on the no-load side. The end link of the new load chain should be connected so that the welded portions of the load chain's standing links are oriented to the outside as they pass over the sheave. Refer to Figure 6-3.
- 4) Operate the hoist down to move the chain through the hoist body. Stop when a sufficient amount of new chain is accumulated on the load side.
- 5) Single fall hoists - Attach the chain components (step 4 above) to the chain. Refer to Section 3.2 for the proper locations.
- 6) Double falls (020L) - Feed the end link on the load side of the new chain through the required chain components (step 4 above) and the bottom hook's Idle Sheave. Attach the remaining chain components to the chain referring to Section 3.2 for the proper locations. Connect the end link to the top connection yoke with the chain pin, slotted nut and cotter pin. Ensure that chain remains free of twists. Refer to Figures 3-3 and 3-4.
- 7) **⚠ WARNING** Make sure Ball Stopper, Chain Coupling and Chain Clip are properly installed. Refer to Section 3.2.
- 8) After installation has been completed, perform steps outlined in Section 3.6 "Preoperational Checks and Trial Operation".



## **6.4 Friction Clutch**

- 6.4.1 Friction Clutch – If abnormal operation or slippage occurs do NOT attempt to disassemble or adjust the Friction Clutch. Replace the worn or malfunctioning Friction Clutch as an assembly with a new, factory adjusted part.

## **6.5 Storage**

- 6.5.1 The storage location should be clean and dry.

## **6.6 Outdoor Installation**

- 6.6.1 For hoist installations that are outdoors, the hoist should be covered when not in use.
- 6.6.2 Possibility of corrosion on components of the hoist increases for installations where salt air and high humidity are present. Make frequent and regular inspections of the unit's condition and operation.

## 7.0 Troubleshooting

### **WARNING**

#### **HAZARDOUS VOLTAGES ARE PRESENT IN THE HOIST AND IN CONNECTIONS BETWEEN COMPONENTS.**

Before performing ANY troubleshooting on the equipment, de-energize the supply of electricity to the equipment, and lock and tag the supply device in the de-energized position. Refer to ANSI Z244.1, "Personnel Protection - Lockout/Tagout of Energy Sources."

Only Trained and competent personnel should inspect and repair this equipment.

**Table 7-1 Troubleshooting Guide**

| Symptom                         | Cause   | Remedy  |
|---------------------------------|---|---|
| Hoist moving in wrong direction | Power supply reversed phased                                | Switch 2 of the 3 power supply cord wires at the power source.  |
|                                 | Improper electrical connections                             | Refer to wiring diagram and check all connections.  |
| Hoist will not operate          | Loss of power   | Check circuit breakers, switches, fuses and connections on power lines/cable.   |
|                                 | Wrong voltage or frequency                                  | Check voltage and frequency of power supply against the rating on the nameplate of the motor.                                     |
|                                 | Hoist overload  | Reduce load to within rated capacity of hoist.  |
|                                 | Motor overheated and thermal overload protector has tripped | See Trouble Shooting Problem "Motor or brake overheating".  |
|                                 | Improper, loose, or broken wire in hoist electrical system  | Shut off power supply, check wiring connections on hoist control panel and inside push-button pendant.                            |
|                                 | Brake does not release                                      | Check motor brake adjustment for proper clearance.  |
|                                 | Faulty magnetic contactor                                   | Check coil for open or short circuit. Check all connections in the control circuit. Check for open contactors. Replace as needed. |
|                                 | Defect in control transformer                               | Check transformer coil for signs of overheating. Disconnect transformer and check for open winding.                               |
|                                 | Motor burned out  | Replace motor frame/stator, shaft/rotor, and any other damaged parts.   |



**Table 7-1 Troubleshooting Guide**

| <b>Symptom</b>   | <b>Cause</b>                        | <b>Remedy</b>  |
|--|-------------------------------------|--|
| Hoist lifts but will not lower   | Down circuit open                   | Check circuit for loose connections. Check down side of limit switch for malfunction.  |
|  | Broken conductor in pendant cord    | Check the continuity for each conductor in the cable. If one is broken, replace entire cable.  |
|  | Faulty magnetic contactors          | Check coils for open or short circuit. Check all connections on motor circuit. Check for burned contacts. Replace as needed.   |
|  | Faulty switch in pendant            | Check electrical continuity. Check electrical connections. Replace or repair as needed.  |
| Hoist lowers but will not lift   | Hoist overloaded                    | Reduce load to within rated capacity of hoist.   |
|  | Low voltage in hoist's power supply | Determine cause of low voltage and bring to within plus or minus 10% of the voltage specified on the motor nameplate. The voltage should be measured at the hoist contactor. |
|  | Up circuit open                     | Check circuit for loose connections. Check up side of limit switch for malfunction.  |
|  | Broken conductor in pendant cord    | Check the continuity of each conductor in the cable. If one is broken, replace entire cable.   |
|  | Faulty magnetic contactor           | Check coils for open or short circuit. Check all connections on motor circuit. Check for burned contacts. Replace as needed.   |
|  | Faulty switch in pendant            | Check electrical continuity. Check electrical connections. Replace or repair as needed.  |
|  | Faulty friction clutch              | Replace.   |
| Hoist will not lift rated load or does not have the proper lifting speed | Hoist overloaded                    | Reduce load to within rated capacity.  |
|  | Low voltage in hoist's power supply | Determine cause of low voltage and bring to within plus or minus 10% of voltage specified on the motor nameplate. The voltage should be measured at the hoist contactor.     |
|  | Brake drags                         | Check motor brake adjustment for proper clearance.   |
|  | Faulty friction clutch              | Replace.   |
| Load drifts excessively when hoist is stopped                            | Motor brake not holding             | Clean and inspect brake lining. Check brake adjustment for proper clearance.   |

| Table 7-1 Troubleshooting Guide |                                  |   |
|---------------------------------|----------------------------------|---|
| Symptom                         | Cause                            | Remedy  |
| Motor or brake overheating      | Excessive load                   | Reduce load to within rated capacity of hoist.  |
|                                 | Excessive duty cycle             | Reduce frequency of lifts.  |
|                                 | Wrong voltage or frequency       | Check voltage and frequency of power supply against the rating on the nameplate on the motor.   |
|                                 | Brake drags                      | Check brake adjustment for proper clearance.  |
|                                 | Extreme external heating         | Above an ambient temperature of 140°F, the frequency of hoist operation must be reduced to avoid overheating of the motor. Special provisions should be made to ventilate the hoist or otherwise shield it from the heat. |
| Hoist operates intermittently   | Collectors making poor contact   | Check movement of spring loaded arm, weak spring, connections, and shoe. Replace as needed.   |
|                                 | Contactor contacts arcing        | Check for burned contacts. Replace as needed.   |
|                                 | Loose connection in circuit      | Check all wires and terminals for bad connections. Replace as needed.   |
|                                 | Broken conductor in Pendant Cord | Check for intermittent continuity in each conductor the Pendant Cord. Replace entire Pendant Cord if continuity is not constant.  |

## 8.0 Warranty

Warranty explanation and terms.

All products sold by Harrington Hoists, Inc. are warranted to be free from defects in material and workmanship from date of shipment by Harrington for the following periods:

**Manual Hoists & Trolleys – 2 years**

**NER/ER Hoists Enhanced Features Models – 3 Years**

**NER/ER, TNER, SNER and ED Electric Hoists, Air Hoists & Trolleys, Crane Components – 1 year**

**Spare / Replacement Parts – 1 year**

**NER/ER Enhanced Feature DC Current Brake – 10 years**

**TNER Pull-Rotor Motor Brake – 5 years**

The product must be used in accordance with manufacturer's recommendations and must not have been subject to abuse, lack of maintenance, misuse, negligence, or unauthorized repairs or alterations.

Should any defect in material or workmanship occur during the above time period in any product, as determined by Harrington Hoist's inspection of the product, Harrington Hoists, Inc. agrees, at its discretion, either to replace (not including installation) or repair the part or product free of charge and deliver said item F.O.B. Harrington Hoists, Inc. place of business to customer.

Customer must obtain a Return Goods Authorization as directed by Harrington or Harrington's published repair center prior to shipping product for warranty evaluation. An explanation of the complaint must accompany the product. Product must be returned freight prepaid. Upon repair, the product will be covered for the remainder of the original warranty period. If it is determined there is no defect, or that the defect resulted from causes not within the scope of Harrington's warranty, the customer will be responsible for the costs of returning the product.

Harrington Hoists, Inc. disclaims any and all other warranties of any kind expressed or implied as to the product's merchantability or fitness for a particular application. Harrington will not be liable for death, injuries to persons or property or for incidental, contingent, special or consequential damages, loss or expense arising in connection with the use or inability whatever, regardless of whether damage, loss or expense results from any act or failure to act by Harrington, whether negligent or willful, or from any other reason.

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## 9.0 Parts List

When ordering Parts, please provide the Hoist code number, lot number and serial number located on the Hoist nameplate (see fig. below).

Reminder: Per sections 1.1 and 3.6.4 to aid in ordering Parts and Product Support, record the Hoist code number, lot number and serial number in the space provided on the cover of this manual.



ER/NER Series Nameplate

The parts list is arranged into the following sections:

|   | Section |    |
|---|---------|----|
| 9.1 Housing and Motor Parts.....        |         | 38 |
| 9.2 Gearing Parts.....                  |         | 42 |
| 9.3 Hook Parts.....                     |         | 44 |
| 9.4 Chaining Parts.....                 |         | 46 |
| 9.5 Electric Parts.....                 |         | 48 |
| 9.6 Power Supply and Pendant Parts..... |         | 50 |

In the column "Parts Per Hoist" a designator is used for parts that apply only to a particular model or option. Refer to Section 2 for hoist model numbers and additional descriptions. The designators are:

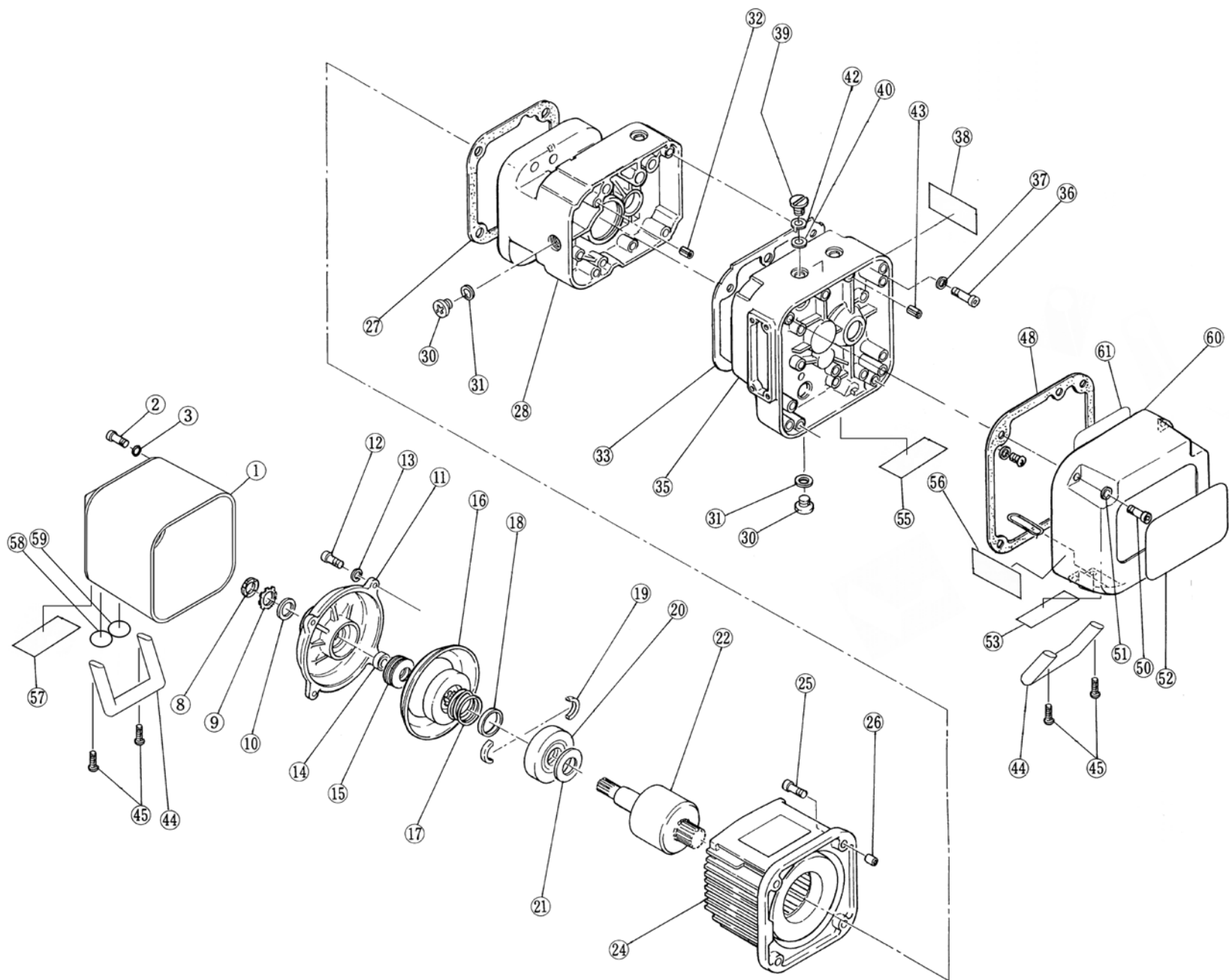


Figure 9-1 Housing and Motor Parts

| Figure No. | Part Name              | Parts Per Hoist | 005L       | 010L      | 020L |
|------------|------------------------|-----------------|------------|-----------|------|
| 1          | Frame Cover            | 1               | SA1BL9207  | SA1CL9207 |      |
| 2          | Socket Bolt            | 4               | 9091233    |           |      |
| 3          | Toothed Lock Washer    | 4               | 9679708    |           |      |
| 8          | Nut                    | 1               | ES217005S  |           |      |
| 9          | Lock Washer            | 1               | ES218005S  |           |      |
| 10         | Spacer                 | 1               | SA1BL9313  | ES216S005 |      |
| 11         | Motor Cover Assembly   | 1               | ER1BS2106  | ER1CS2106 |      |
| 12         | Socket Bolt            | 4               | 9091251    | 9091273   |      |
| 13         | Spring Washer          | 4               | 9012709    | 9012711   |      |
| 14         | Collar M               | 1               | ES192005S  |           |      |
| 15         | Coned Disc Spring M    | 4               | E3S191005S |           |      |
| 16         | Brake Drum Assembly    | 1               | ER1BS5212  | ER1CS5212 |      |
| 17         | Brake Spring           | 1               | ES214003   | ES214005S |      |
| 18         | Thrust Collar          | 1               | ES506003   | ES506005S |      |
| 19         | Thrust Disc            | 2               | ES505003   | ES505005S |      |
| 20         | Pull Rotor             | 1               | ES503003   | ES503005S |      |
| 21         | Coned Disc Spring      | 1               | ES504003   | ES504005S |      |
| 22         | Motor Shaft with Rotor | 1               | SA1BL5502  | SA1CL5502 |      |

| Figure No. | Part Name                                    | Parts Per Hoist | 005L         | 010L          | 020L         |
|------------|--|-----------------|--------------|---------------|--------------|
| 24         | Motor Frame with Stator<br>208-230/460V-3-60 | 1               | SA1DHM05L5A1 | SA1DHM010L5A1 |              |
| 25         | Socket Bolt                                  | 4               | 90912138     | 9091275       |              |
| 26         | Set Pin S                                    | 2               | ES120003     | ES120010S     |              |
| 27         | Packing M                                    | 1               | ER1BS9118    | ER1CS9118     |              |
| 28         | Body B                                       | 1               | SA1BL9101    | SA1CL9101     |              |
| 30         | Oil Plug                                     | 2               | E3S111003    |               |              |
| 31         | Plug Packing                                 | 2               | E3S112003    |               |              |
| 32         | Set Pin S                                    | 2               | ES1200035    |               |              |
| 33         | Packing G                                    | 1               | ER1BS9116    | ER1CS9116     |              |
| 35         | Gear Case F                                  | 1               | SA1BL9103    | SA1CL9103     |              |
| 36         | Socket Bolt                                  | 4               | 9091259      |               |              |
| 37         | Toothed Lock Washer                          | 4               | 9679709      |               |              |
| 38         | Name Plate SP                                | 1               | SA1DHM05I9B6 | SA1DHM10I9B6  | SA1DHM20I9B6 |
| 39         | Oil Plug B                                   | 2               | SA1BS9135    |               |              |
| 40         | Eyebolt Packing                              | 1               | ES127005S    |               |              |
| 42         | Bending Washer                               | 1               | SA1BS9983    |               |              |
| 43         | Spring Pin                                   | 1               | E3S129005S   |               |              |
| 44         | Handle                                       | 2               | SA1CL9963    |               |              |
| 45         | Socket Bolt                                  | 4               | 9091250      |               |              |
| 48         | Packing C                                    | 1               | ER1BS9117    | ER1CS9117     |              |
| 50         | Socket Bolt                                  | 4               | 9091238      | 9091239       |              |
| 51         | Toothed Lock Washer                          | 4               | 9679708      |               |              |
| 52         | Name Plate B                                 | 1               | SA1CHM05L9A3 | SA1CHM10L9A3  |              |
| 53         | Warning Sticker E<br>(Disconnect Power)      | 1               | ER2CS9936    |               |              |
| 55         | Grease Warning Label                         | 1               | 80470        |               |              |
| 56         | Voltage Changer Warning<br>Label             | 1               | 80485        |               |              |
| 57         | TNER Logo Label                              | 1               | 80483        |               |              |
| 58         | BGV-D8 Logo Label                            | 1               | 80486        |               |              |
| 59         | CE Mark Label                                | 1               | 80487        |               |              |
| 60         | Controller Cover                             | 1               | SA1BL9104    | SA1CL9104     |              |
| 61         | Wiring Diagram                               | 1               | EWE4A00H1    |               |              |



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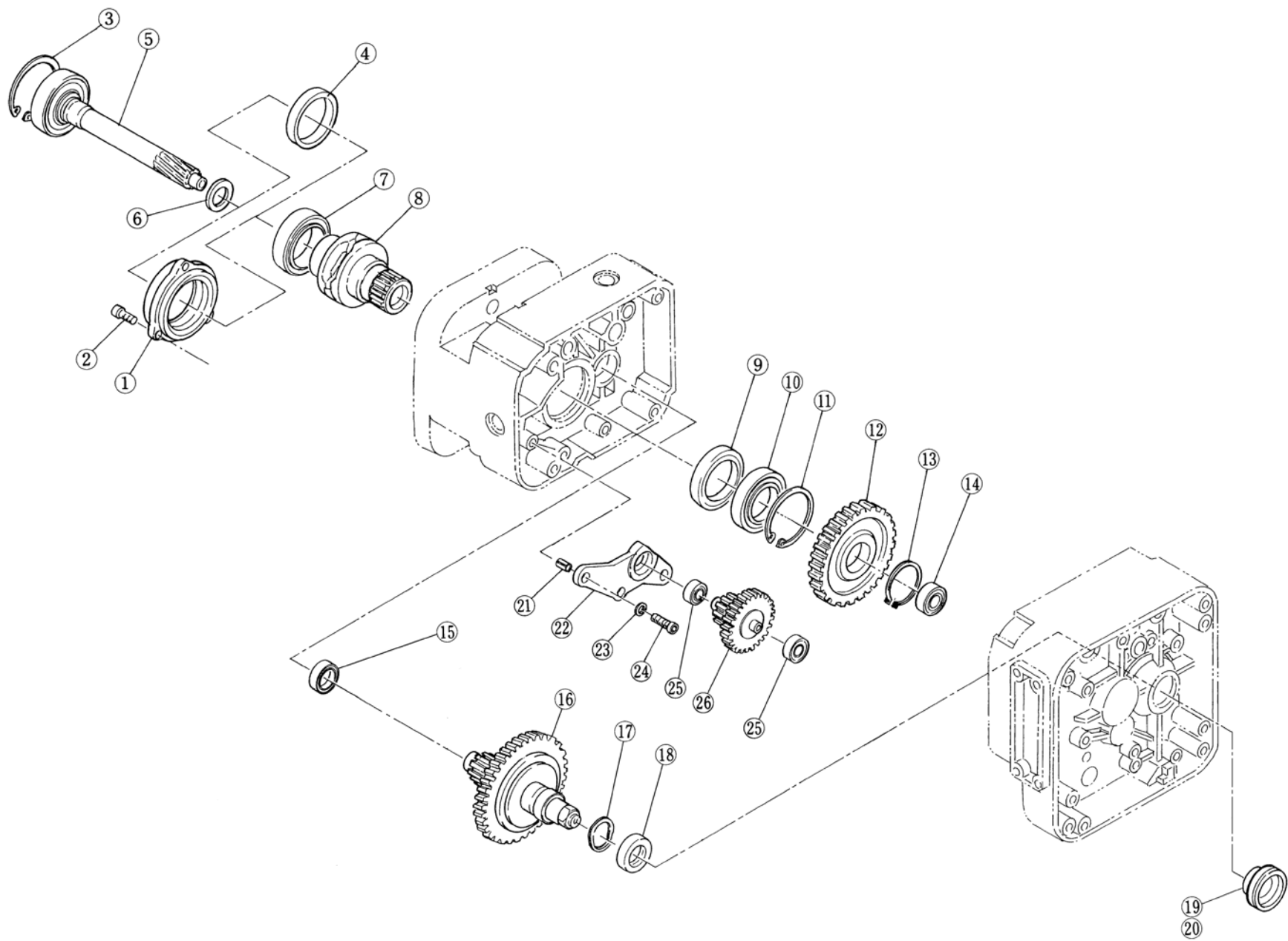


Figure 9-2 Gearing Parts

| Figure No. | Part Name           | Parts Per Hoist | 005L         | 010L       | 020L |
|------------|---------------------|-----------------|--------------|------------|------|
| 1          | Bearing Holder      | 1               |              | ER1CS9110  |      |
| 2          | Socket Bolt         | 3               |              | 90912133   |      |
| 3          | Snap Ring           | 1               | 9047262      | 9047262    |      |
| 4          | Collar B            | 1               | ER1BS9111    |            |      |
| 5          | Pinion Assembly     | 1               | ER1BS5220    | SA1CL5220  |      |
| 6          | Oil Seal            | 1               | ES221003     | ES221010S  |      |
| 7          | Ball Bearing        | 1               | 9000907      | 9000909    |      |
| 8          | Load Sheave         | 1               | ER1BL9241    | ER1CL9241  |      |
| 9          | Oil Seal            | 1               | ES232005S    | ES232005S  |      |
| 10         | Ball Bearing        | 1               | 9000907      |            |      |
| 11         | Snap Ring           | 1               | 9047262      | 9047262    |      |
| 12         | Load Gear           | 1               | ER1BL9240    | ER1CS9240  |      |
| 13         | Snap Ring           | 1               | 9047130      | 9047135    |      |
| 14         | Ball Bearing        | 1               | 9001001      | 9001101    |      |
| 15         | Ball Bearing        | 1               | 9000301      | 9000204    |      |
| 16         | Friction Clutch Set | 1               | SA1BL1626    | SA1CL1626  |      |
| 17         | Wavy Washer         | 1               | E1DBX20S9311 |            |      |
| 18         | Oil Seal            | 1               | ES221005S    | E6F235003S |      |
| 19         | Friction Plug       | 1               | ER1BS9235    | ER1CS9235  |      |
| 20         | Nameplate FP        | 1               | ER1BS9892    |            |      |
| 21         | Set Pin S           | 2               |              | ES120003   |      |
| 22         | Gear Plate          | 1               |              | ER1CL9261  |      |
| 23         | Spring Washer       | 3               |              | 9012709    |      |
| 24         | Socket Bolt         | 3               |              | 90912138   |      |
| 25         | Ball Bearing        | 2               |              | 9000900    |      |
| 26         | Gear B Assembly     | 1               |              | SA1CL5262  |      |

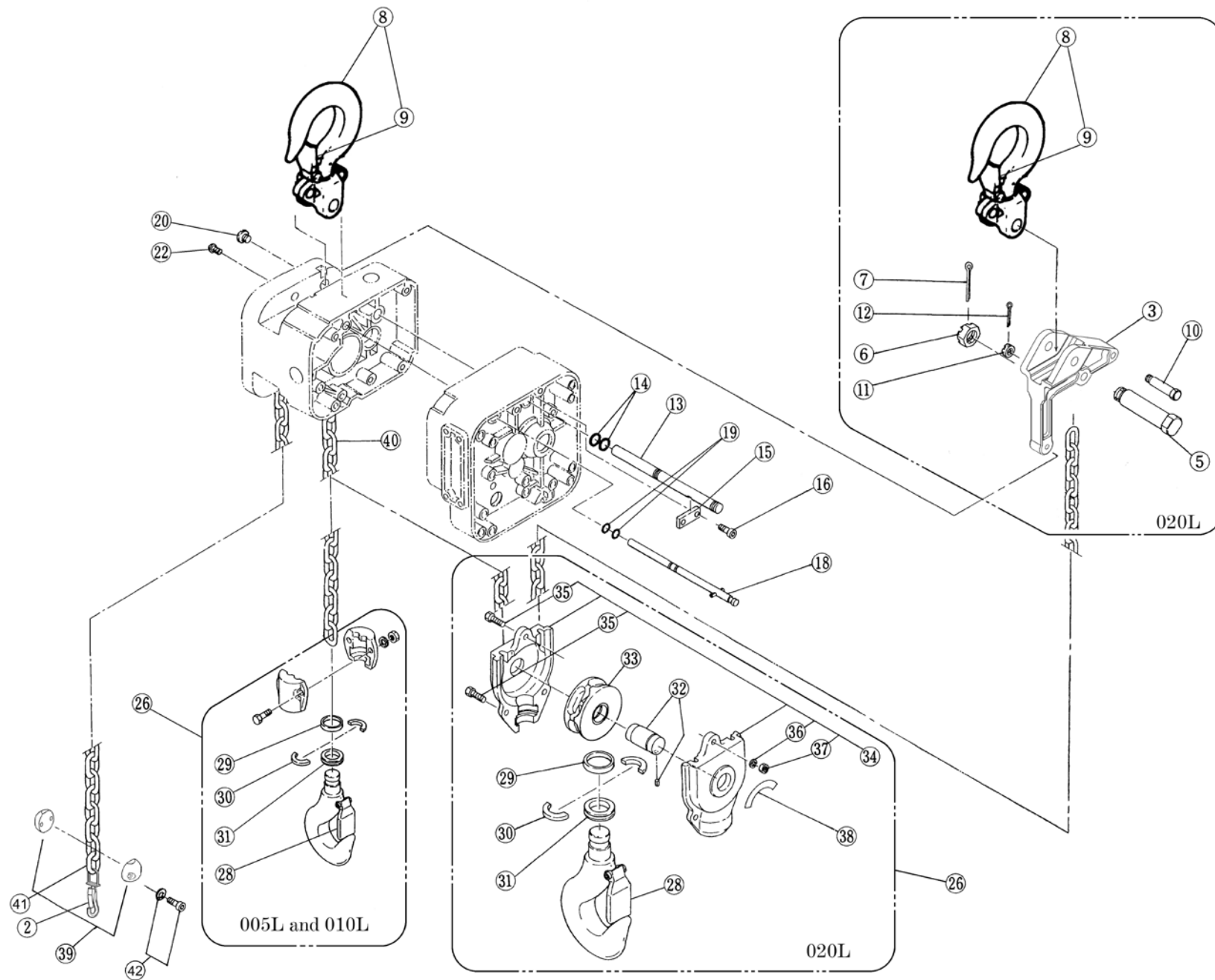


Figure 9-3 Hook Parts

| Figure No. | Part Name                      | Parts Per Hoist | 005L          | 010L          | 020L      |
|------------|--------------------------------|-----------------|---------------|---------------|-----------|
| 2          | Chain Clip                     | 1               | SA1BS9422     |               |           |
| 3          | Suspender D                    | 1               | SA1CR9030     |               |           |
| 5          | Yoke Bolt                      | 1               | SA1CR9032     |               |           |
| 6          | Slotted Nut                    | 1               | ES088020L     |               |           |
| 7          | Split Pin                      | 1               | 9009436       |               |           |
| 8          | Body Hook Complete Assembly    | 1               | SA1BS1001     | SA1CS1001     | SA1CR1001 |
| 9          | Hook Latch Assembly            | 1               | CF071010      | CF071015      | CF071030  |
| 10         | Chain Pin                      | 1               | M2041010      |               |           |
| 11         | Slotted Nut                    | 1               | M2049010      |               |           |
| 12         | Split Pin                      | 1               | 9009412       |               |           |
| 13         | Connection Shaft               | 1               | ER1BS9121     | ER1CS9121     |           |
| 14         | O Ring                         | 2               | 9013306       | 9013309       |           |
| 15         | Plate A                        | 1               | ER1BS9123     |               |           |
| 16         | Machine Screw w/ Spring Washer | 2               | J1AP25001212  |               |           |
| 18         | Fixing Shaft Assembly          | 1               | ER1BS1122     | ER1CS1122     |           |
| 19         | O Ring                         | 2               | 9013305       |               |           |
| 20         | Shaft Plug                     | 1               | ER1BS9128     | ER1CS9128     |           |
| 22         | Machine Screw                  | 1               | 9798543       |               |           |
| 26         | Chain Hook Complete Assembly   | 1               | SA1BL1011     | SA1CL1011     | SA1CR1011 |
| 28         | Hook Latch Assembly            | 1               | ER1BS1002     | ER1DS1002     | ER1ES1002 |
| 29         | Thrust Collar A                | 1               | ES026003      | ES026010L     |           |
| 30         | Hook Stopper                   | 2               | ES027003      | ES027010L     |           |
| 31         | Thrust Bearing                 | 1               | ES022003      | ES022010L     |           |
| 32         | Bottom Shaft Assembly          | 1               | ER2DR6023     |               |           |
| 33         | Idle Sheave Assembly           | 1               | 27SH010S1103  |               |           |
| 34         | Bottom Yoke Assembly           | 1               | SA1CR2015     |               |           |
| 35         | Bolt                           | 2               | 90931215      |               |           |
| 36         | Spring Washer                  | 2               | 9012711       |               |           |
| 37         | Nut                            | 2               | 9093424       |               |           |
| 38         | Name Plate C                   | 1               | M3805030      |               |           |
| 39         | Ball Stopper Set               | 1               | SA1CS9041     | SA1CL9041     |           |
| 40         | Load Chain (Nickel Plated DIN) | 1               | LCER005NP-DIN | LCER010NP-DIN |           |
|            | Load Chain (Black)*            | 1               | LCER005C      | LCER010C      |           |
| 41         | Chain Coupling                 | 1               | P2HC0051121   |               |           |
| 42         | Socket Bolt w/ Spring Washer   | 2               | J1BG10602020  | J1BG10602525  |           |

\*The black load chain is optional. The hoist will not have CE Conformance with the black chain installed.

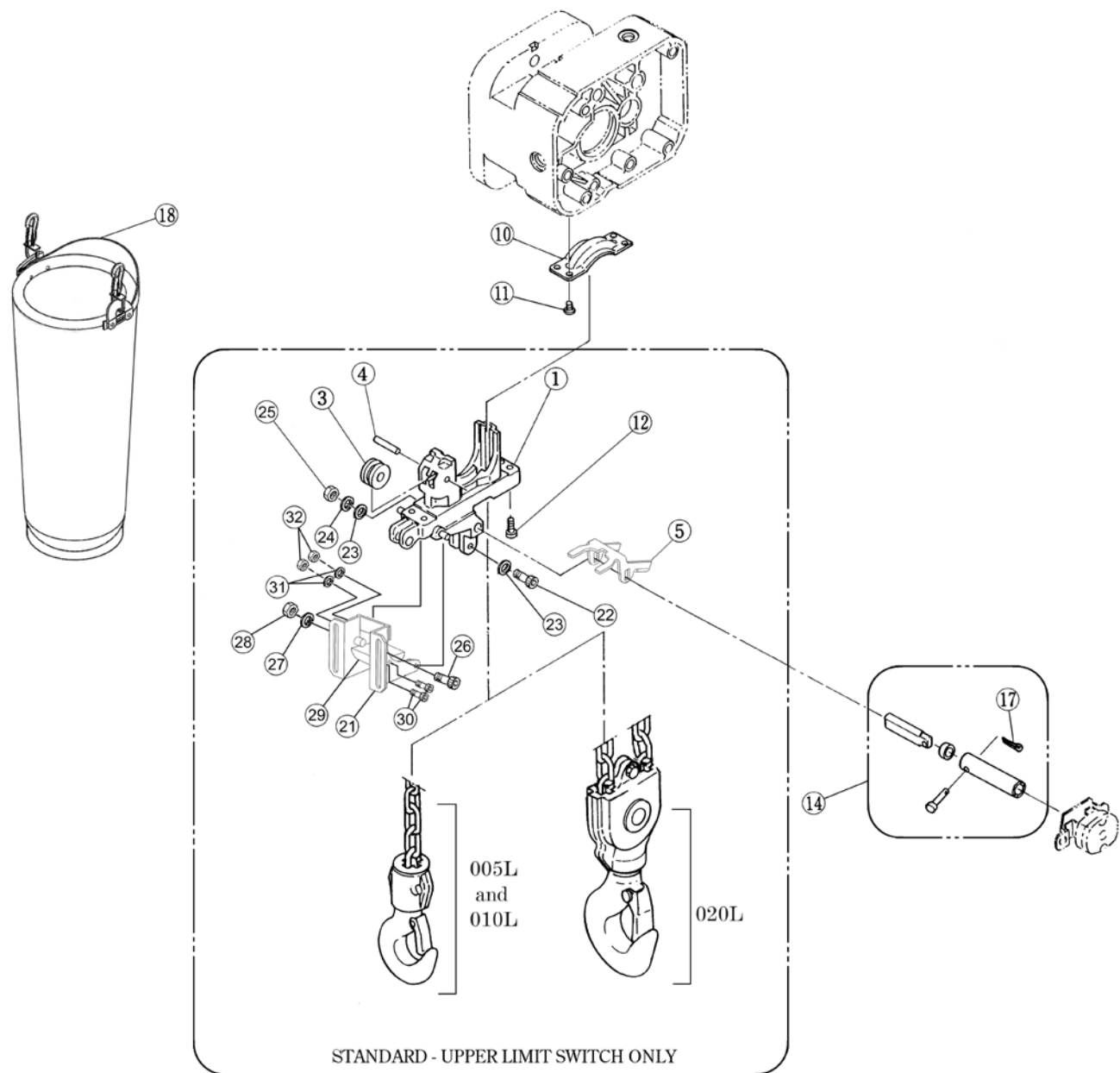


Figure 9-4 Chaining Parts

| Fig No | Part Name                    | Parts Per Hoist | 005L              | 010L             | 020L             |
|--------|------------------------------|-----------------|-------------------|------------------|------------------|
| 1      | Chain Guide A                | 1               | SA1BL9331         | SA1CL1331        |                  |
| 3      | Guide Roller                 | 1               |                   | ER1DS9333        |                  |
| 4      | Roller Pin                   | 1               |                   | ER1CS9334        |                  |
| 5      | Limit Lever S                | 1               | SA1BL9337         | SA1CL9337        |                  |
| 24     | Chain Guide B                | 1               | ER1BL9332         | ER1CL9332        |                  |
| 11     | Mach. Screw w/ Spring Washer | 4               |                   | J1AP25001212     |                  |
| 12     | Socket Bolt                  | 4               | J1BG10602525      | J1BG10603535     |                  |
| 14     | Limit Lever Pin Assembly     | 1               | SA1BS1338         | SA1CS1338        |                  |
| 17     | Split Pin                    | 1               | 9009410           |                  |                  |
| 18     | Chain Container Assembly (S) | 1               | SA1BS6404 (49ft)  | SA1BS6404 (32ft) | SA1BS6404 (16ft) |
|        | SA1BS6405 (100ft)            |                 | SA1BS6405 (65ft)  | SA1BS6405 (32ft) |                  |
|        |                              |                 | SA1BS6406 (120ft) | SA1BS6406 (60ft) |                  |
| 21     | Body Plate                   | 1               | SA1BL9961         | SA1CL9961        |                  |
| 22     | Socket Bolt                  | 1               | 9091262           | 9091263          |                  |
| 23     | Flat Washer                  | 2               | 9012511           |                  |                  |
| 24     | Spring Washer                | 1               | 9012709           |                  |                  |
| 25     | Nut                          | 1               | 9093420           |                  |                  |
| 26     | Socket Bolt                  | 1               | 9091286           |                  |                  |
| 27     | Spring Washer                | 1               | 9012711           |                  |                  |
| 28     | Nut                          | 1               | 9093424           |                  |                  |
| 29     | Chain Guide C                | 1               | SA1BS9962         | SA1CL9962        |                  |
| 30     | Socket Bolt                  | 2               | 9091262           | 9091286          |                  |
| 31     | Spring Washer                | 2               | 9012709           | 9012711          |                  |
| 32     | Nut                          | 2               | 9093420           | 9093424          |                  |

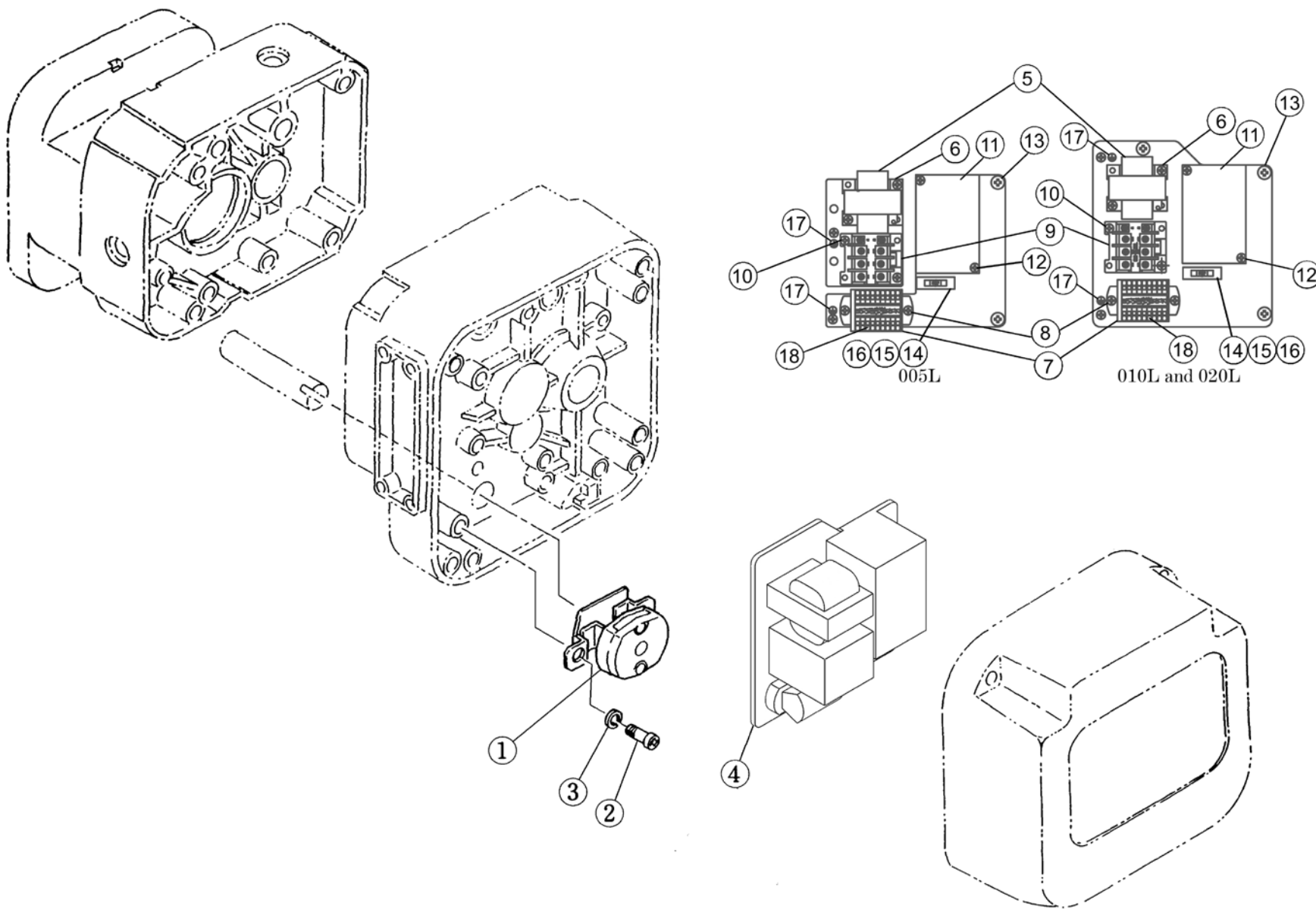


Figure 9-5 Electric Parts



| Fig No | Part Name                    | Parts Per Hoist | 005L         | 010L         | 020L |
|--------|------------------------------|-----------------|--------------|--------------|------|
| 1      | Limit Switch Assembly        | 1               | ER1BS1551    |              |      |
| 2      | Socket Bolt                  | 3               | 9091247      |              |      |
| 3      | Spring Washer                | 3               | 9012709      |              |      |
| 4      | Plate Assembly               | 1               | SA1DHM05L5A2 | SA1DHM10L5A2 |      |
| 5      | Transformer                  | 3               | TRF62M611    |              |      |
| 6      | Machine Screw                | 2               | MS555010     |              |      |
| 7      | Terminal Plate               | 1               | ECP1309AD    |              |      |
| 8      | Mach. Screw w/ Spring Washer | 2               | J1AW24001010 |              |      |
| 9      | E-Stop Contactor             | 1               | MGC14306C    |              |      |
| 10     | Mach. Screw w/Spring Washer  | 2               | MS556010     |              |      |
| 11     | Electromagnetic Contactor    | 1               | MGC23406C    |              |      |
| 12     | Machine Screw                | 2               | J1AP24001212 |              |      |
| 13     | Plate Screw                  | 2 (3)           | ER1BS9445    |              |      |
| 14     | Fuse                         | 1               | ECP91FZ06    |              |      |
| 15     | Fuse Holder                  | 1               | ECP92FZAA    |              |      |
| 16     | Mach. Screw w /Spring Washer | 1               | E2D667125    |              |      |
| 17     | Mach. Screw w /Spring Washer | 2               | MS555010     |              |      |
| 18     | Lead Wire Assembly           | 1               | SA1DHM05L9A2 | SA1CHM10L9A2 |      |

\*Quantities in "( )" are for 010L and 020L hoists.

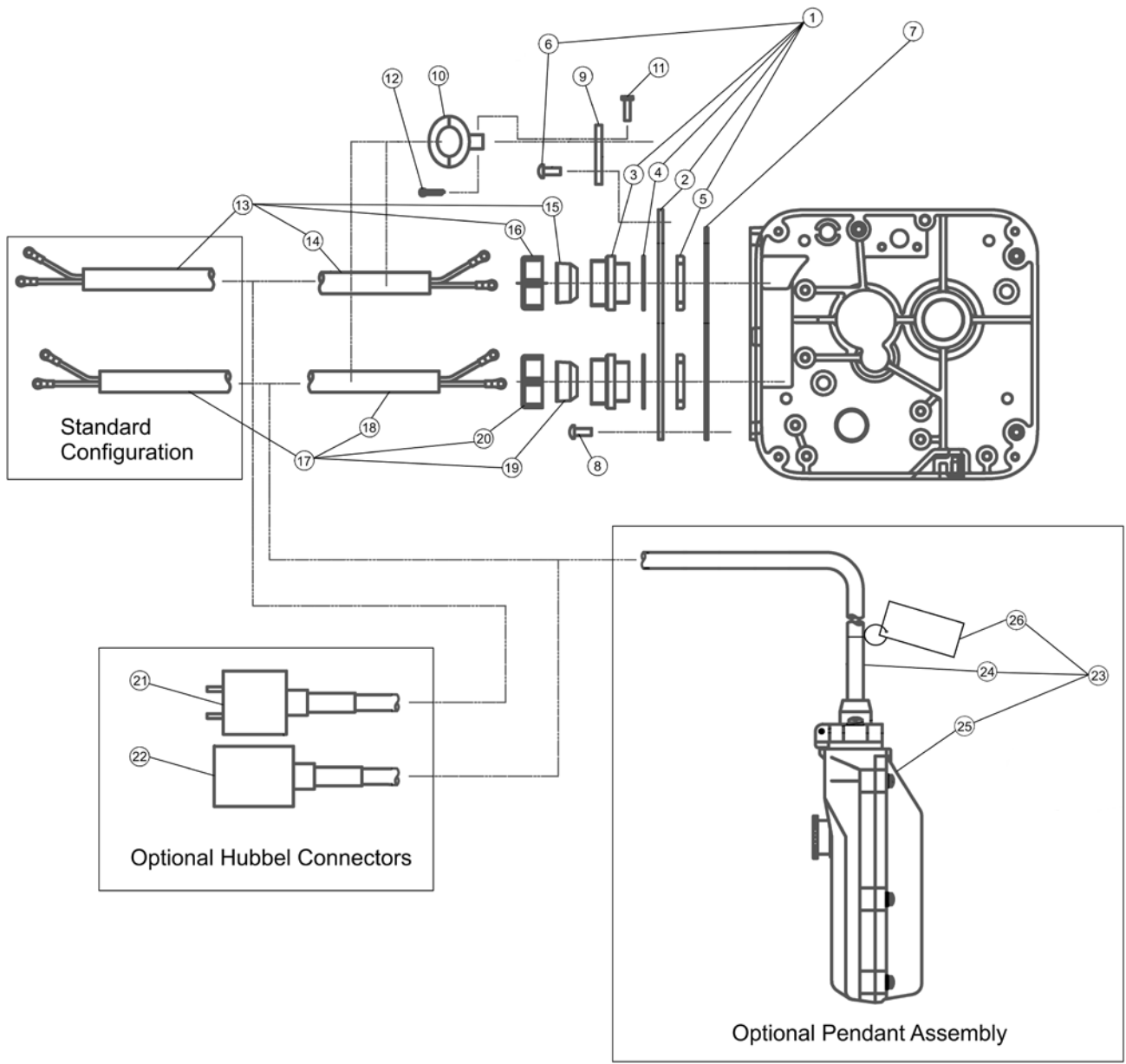
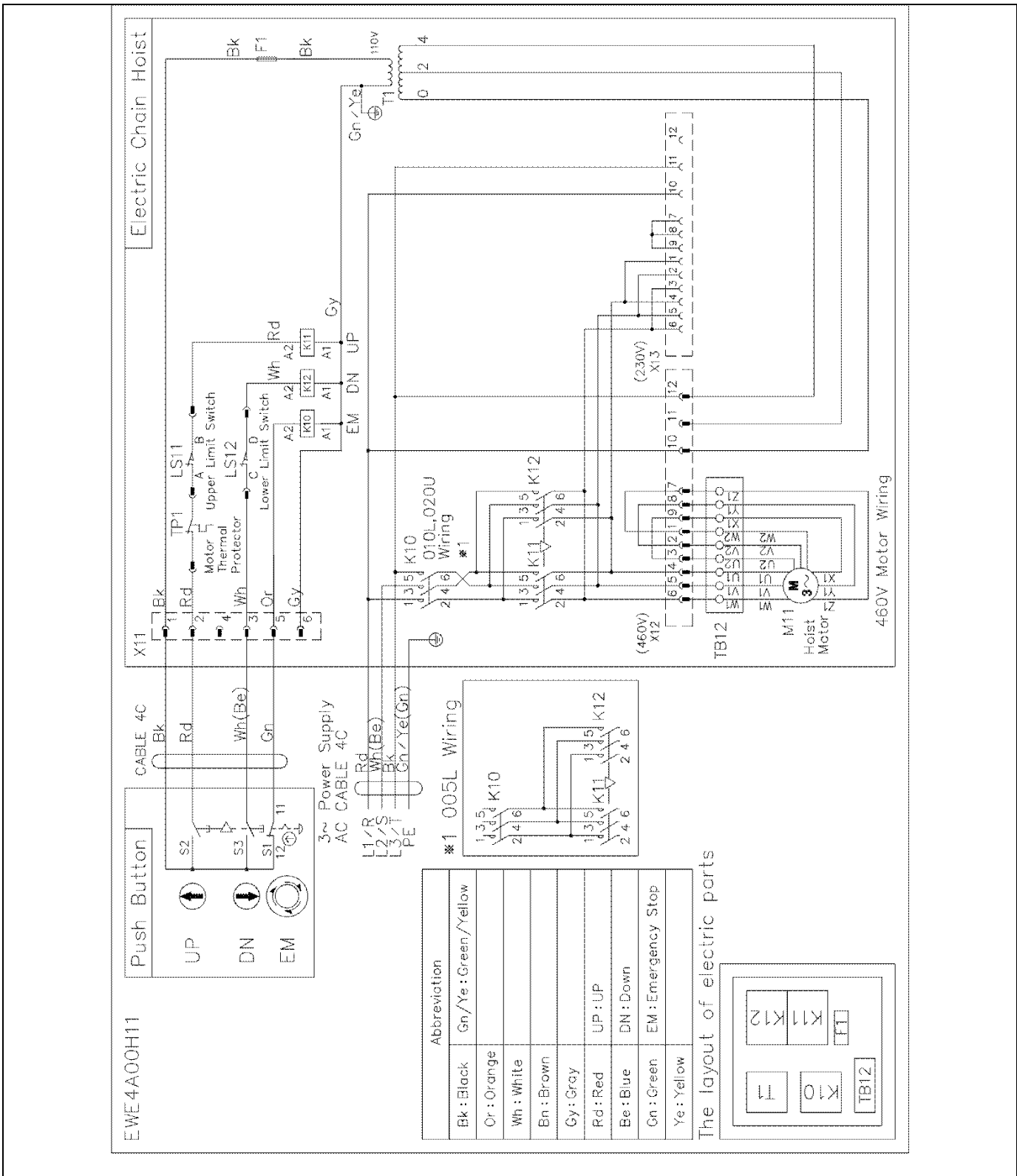


Figure 9-6 Power Supply and Pendant Parts

| Fig No | Part Name  | Parts Per Hoist | 005L         | 010L | 020L |
|--------|--|-----------------|--------------|------|------|
| 1      | Socket Holder Assembly   | 1               | SA1CL1511    |      |      |
| 2      | Socket Holder  | 1               | SA1CL9511    |      |      |
| 3      | Holder B   | 2               | ECP5924AB    |      |      |
| 4      | Holder Packing   | 2               | ECP5924AC    |      |      |
| 5      | Holder Nut   | 2               | ECP5924AD    |      |      |
| 6      | Machine Screw w/ Spring Washer   | 2               | J1AP26001212 |      |      |
| 7      | Socket Holder Packing  | 1               | ER1BS9512    |      |      |
| 8      | Machine Screw w/ Spring Washer   | 4               | MS561010     |      |      |
| 9      | Cable Support Arm  | 1               | SA1BS9541    |      |      |
| 10     | Cable Support  | 1               | E4YS0059822  |      |      |
| 11     | Cable Support Pin B  | 1               | E3ES0029541  |      |      |
| 12     | Split Pin  | 1               | 9009402      |      |      |
| 13     | Power Supply Cable 4C Complete Assembly                                  | 1               | 8050095      |      |      |
| 14     | Power Supply Cable 4C  | ft              | 14/4         |      |      |
| 15     | Cable Packing  | 1               | ECP6916AA    |      |      |
| 16     | Holder A   | 1               | ECP5924AA    |      |      |
| 17     | Control Cord Complete Assembly   | 1               | 8050295      |      |      |
| 18     | Control Cord   | ft              | 16/4P        |      |      |
| 19     | Cable Packing  | 1               | ECP6912AA    |      |      |
| 20     | Holder A   | 1               | ECP5924AA    |      |      |
| 21     | Power Supply Cable 4C Complete Assembly with Hubbell Connector (HBL2431) | 1               | 8049695      |      |      |
| 22     | Control Cord Complete Assembly with Hubbell Connector (HBL2433)          | 1               | 8049595      |      |      |
| 23     | Pendant with Cord Complete Assembly                                      | 1               | 8049895      |      |      |
| 24     | Pendant Cord   | 1               | 16/4P        |      |      |
| 25     | Pendant Assembly   | 1               | 9012877      |      |      |
| 26     | Warning Tag  | 1               | WTAG7        |      |      |

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## Appendix A: Wiring Diagram



## Appendix B: CE Declaration of Conformity



**EC DECLARATION OF CONFORMITY**



We, **Harrington Hoists, Inc.**,  
401 West End Ave.,  
Manheim, PA 17545, USA

declare under our sole responsibility that the products:

**Electric chain hoist**

**TNER**

for use with or without the relevant serial trolleys in capacity range of 1/2 ton up to 2 ton,  
to which this declaration relates is in conformity with the following EC directives and standards.

EC directives:

|                              |                    |
|------------------------------|--------------------|
| <b>Machinery Directive</b>   | <b>2006/42/EC</b>  |
| <b>EMC Directive</b>         | <b>2004/108/EC</b> |
| <b>Low Voltage Directive</b> | <b>2006/95/EC</b>  |

Harmonized standards:

|                                |   |
|--------------------------------|---|
| <b>EN ISO 12100: 2010</b>      | <b>Risk assessment and risk reduction</b>       |
| <b>EN 14492-2: 2006</b>        | <b>Power driven hoists</b>                      |
| <b>EN 818-7: 2002+A1: 2008</b> | <b>Short link chain for lifting purposes</b>    |
| <b>EN ISO 13850: 2006</b>      | <b>Emergency stop</b>                           |
| <b>EN 60204-1: 2006</b>        | <b>Electrical equipment of machines</b>         |
| <b>EN 60204-32: 2008</b>       | <b>Electrical equipment of machines</b>         |
| <b>EN 61000-6-4: 2007</b>      | <b>Electromagnetic compatibility - Emission</b> |
| <b>EN 61000-6-2: 2005</b>      | <b>Electromagnetic compatibility - Immunity</b> |

National standards:

|                         |   |
|-------------------------|---|
| <b>FEM 9.511: 1986</b>  | <b>Classification of mechanisms</b>           |
| <b>FEM 9.683: 1995</b>  | <b>Section of lifting and travel motors</b>   |
| <b>BGV-D8: 1980</b>     | <b>Winch, Hoist and pulling device</b>        |
| <b>VPLT.SR2.0: 2005</b> | <b>Codes of practice for event technology</b> |

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**TNEROM**