# SUBMITTAL SHEET

**Dondlinger Construction**
**119005-530 - COW NWWTP - Maintenance Bldg.**

**Project:** 119005-530
COW NWWTP - Maintenance Bldg.
5232 West 21st Street North Attn: Tim Helten 316-650-2029
Wichita, KS
67205

**Spec Section Num:** 41.22.00
**Submittal:** 412200-02
**Revision:** 1

**Package:** Cranes and Hoists
**Date:** 10/27/2023 UTC

**Received From:**

**Submittal Title:** Bridge Crane O&M
**Submittal Detail:**
**Response Due By:** 10/5/2023 UTC

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**Contractor:**
Brian Erickson
DONDLINGER & SONS CONSTRUCTION

Contractor's Stamp

DONDLINGER AND SONS CONST. CO., INC.

[ ] Reviewed
[ X ] Reviewed as Noted Brian Erickson
[ ] Revise and Resubmit
[ X ] Date 10/27/2023
[ X ] Submittal No. 412200-02.1_Maint. Bldg. -Bridge Crane O&M

REVIEW OF ITEMS DOES NOT RELIEVE VENDOR FROM COMPLYING WITH REQUIREMENTS OF CONTRACT PLANS AND SPECIFICATIONS, CONTRACT AND CITY, STATE AND LOCAL CODES.

**Architect:**
Jenny Dooley
Dondlinger Construction

Architect's Stamp

**Response:**
**Comment:**

**EFFECTIVE: December 20, 2012**

# Owner's Manual

# ELECTRIC WIRE ROPE HOIST and TROLLEY RHN SERIES

2 Ton through 20 Ton Capacity

Hoist Code and Serial Number
RHN03U33A20DD4
S/N: 11679814

**⚠ 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 the RH Advantage trolley hoist. Therefore, all instructions and parts information may not apply to any one type or size of specific trolley hoist. Disregard those portions of the instructions that do not apply.

Record your trolley hoist's Product Code 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 trolley.

# ⚠ 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”.

Hoists, trolleys 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 Metalcasting 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; and 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 trolley hoist in accordance with ANSI/ASME B30.16, “Safety Standard for Overhead Hoists”, OSHA Regulations and ANSI/NFPA 70, "National Electric Code". If the trolley 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 trolley 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 trolley 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 trolley hoist owner/user requires additional information, or if any information in the manual is not clear, contact Harrington or the distributor of the trolley. Do not install, inspect, test, maintain, or operate this trolley hoist unless this information is fully understood.

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

## 1.2 Warning Tag and Labels

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

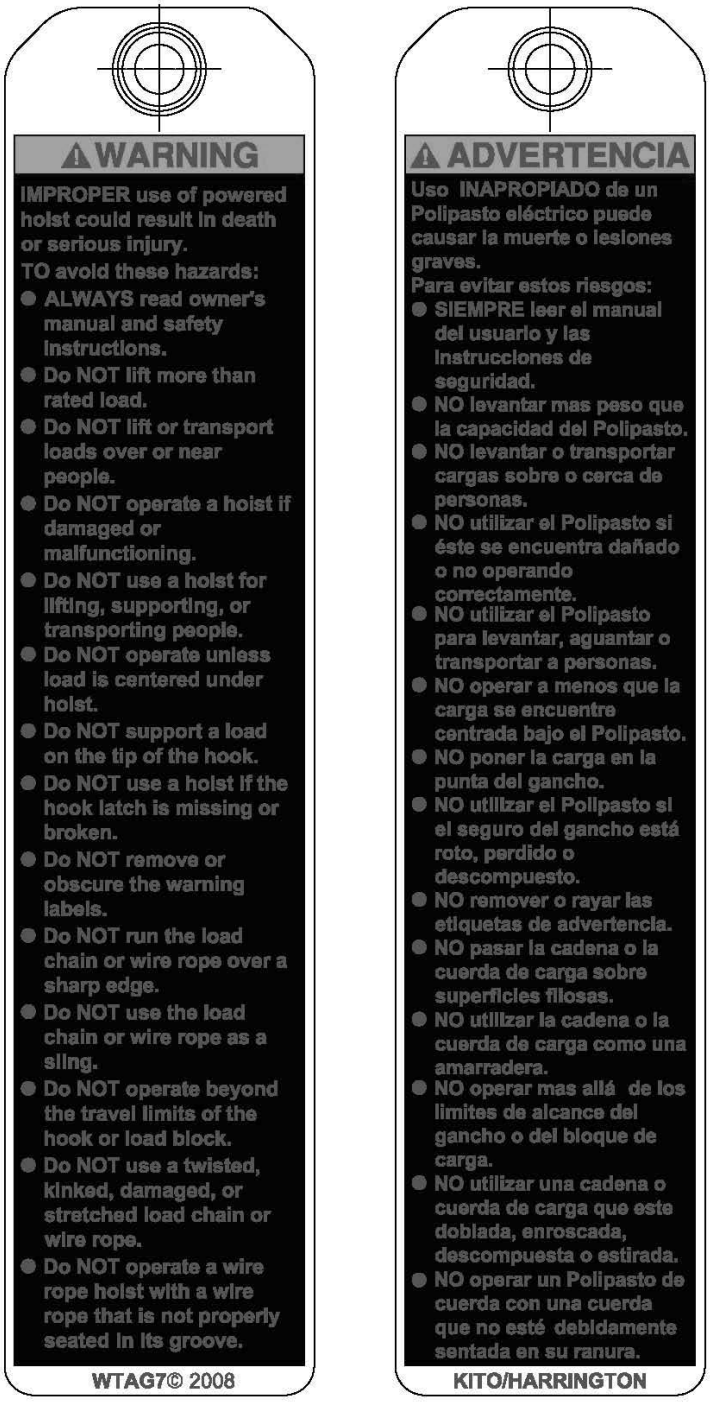
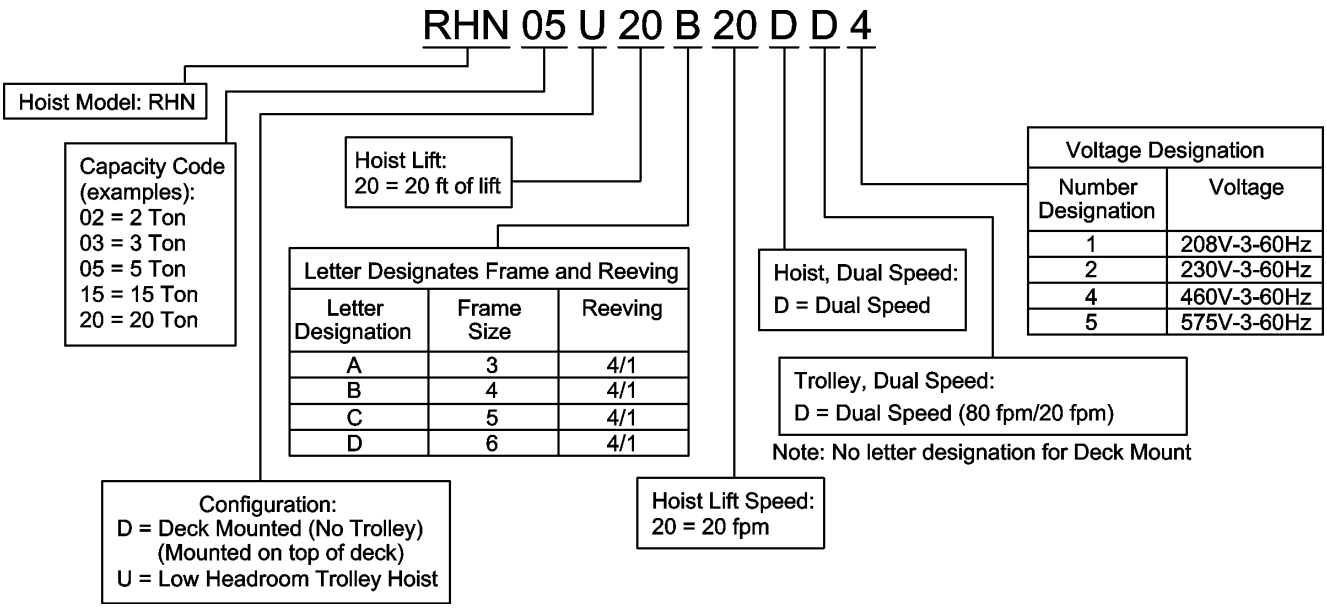



**Figure 1-1** Warning Tag Attached to Trolley Hoist

# 2.0 Technical Information

## 2.1 Specifications

### 2.1.1 Product Code:




### 2.1.2 Operating Conditions and Environment

| | |
|---|---|
| Temperature Range: | +14° to +104°F (-10° to +40°C) |
| Humidity: | 80% or less |
| Electrical Enclosure Rating: | IP55 |
| Brake Enclosure Rating: | IP66 |
| Supply Voltage: | 208V or 230V or 460V or 575V-3ph-60Hz |
| Control Voltage: | 110V-1ph-60Hz |
| Noise Rating: | less than 85 dba at full speed (A scale: measured 1 meter away from electric wire rope hoist) |

| Table 2-1 **Deck Mounted Hoist Specifications** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Capacity (Ton) | Product Code* | Lift (ft.) | Reeving (Parts/ reeving) | Rope Dia. (mm) | Lifting Speed (ft/min) | Dual Speed Hoist Lifting Motor 3 Phase, 60 Hz | | | | Net Weight (lbs) |
| | | | | | | Output (Hp) | Current Draw (amps) - Hi/Low | | | |
| | | | | | | Hi/Low | 208&230V | 460V | 575V | |
| 2 | RHN02D-20A-20D-① | 20 | 4/1 | 7 | 20/3.5 | 5.8/0.9 | 17.0/8.4 | 8.3/4.0 | 6.6/3.2 | 353 |
| | RHN02D-33A-20D-① | 33 | | | | | | | | 375 |
| 3 | RHN03D-20A-20D-① | 20 | 4/1 | 7 | 20/3.5 | 5.8/0.9 | 17.0/8.4 | 8.3/4.0 | 6.6/3.2 | 353 |
| | RHN03D-33A-20D-① | 33 | | | | | | | | 375 |
| 5 | RHN05D-20B-20D-① | 20 | 4/1 | 9 | 20/3.5 | 7.2/1.2 | 22.0/11.0 | 10.0/5.4 | 8.2/4.3 | 452 |
| | RHN05D-33B-20D-① | 33 | | | | | | | | 485 |
| 7 ½ | RHN08D-20C-20D-① | 20 | 4/1 | 12.5 | 20/3.5 | 14.8/2.1 | 42.0/21.0 | 20.0/10.0 | 16.0/8.0 | 1025 |
| | RHN08D-33C-20D-① | 33 | | | | | | | | 1102 |
| 10 | RHN10D-20C-20D-① | 20 | 4/1 | 12.5 | 20/3.5 | 14.8/2.1 | 42.0/21.0 | 20.0/10.0 | 16.0/8.0 | 1025 |
| | RHN10D-33C-20D-① | 33 | | | | | | | | 1102 |
| 15 | RHN15D-20D-16D-① | 20 | 4/1 | 20 | 16/2.5 | 24.1/4.0 | 67.0/27.0 | 32.0/13.0 | 25.6/10.4 | 2271 |
| | RHN15D-33D-16D-① | 33 | | | | | | | | 2436 |
| 20 | RHN20D-20D-16D-① | 20 | 4/1 | 20 | 16/2.5 | 24.1/4.0 | 67.0/27.0 | 32.0/13.0 | 25.6/10.4 | 2271 |
| | RHN20D-33D-16D-① | 33 | | | | | | | | 2436 |

*See Section 2.1.1 for place holder ① designation

**Table 2-2 Ultra-Low Headroom Trolley Hoists Hoist Specifications**

| Capacity (Ton) | Product Code* | Lift (ft.) | Reeving (Parts/ reeving) | Rope Dia. (mm) | Lifting Speed (ft/min) | Dual Speed Hoist Lifting Motor 3 Phase, 60 Hz | | | | Net Weight (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Output (Hp) Hi/Low | Current Draw (amps) - Hi/Low | | | |
| | | | | | | | 208&230V | 460V | 575V | |
| 2 | RHN02U-20A-20DD-① | 20 | 4/1 | 7 | 20/3.5 | 5.8/0.9 | 17.0/8.4 | 8.3/4.0 | 6.6/3.2 | 617 |
| | RHN02U-33A-20DD-① | 33 | | | | | | | | 650 |
| 3 | RHN03U-20A-20DD-① | 20 | 4/1 | 7 | 20/3.5 | 5.8/0.9 | 17.0/8.4 | 8.3/4.0 | 6.6/3.2 | 617 |
| | RHN03U-33A-20DD-① | 33 | | | | | | | | 650 |
| 5 | RHN05U-20B-20DD-① | 20 | 4/1 | 9 | 20/3.5 | 7.2/1.2 | 22.0/11.0 | 10.0/5.4 | 8.2/4.3 | 767 |
| | RHN05U-33B-20DD-① | 33 | | | | | | | | 831 |
| 7 ½ | RHN08U-20C-20DD-① | 20 | 4/1 | 12.5 | 20/3.5 | 14.8/2.1 | 42.0/21.0 | 20.0/10.0 | 16.0/8.0 | 1766 |
| | RHN08U-33C-20DD-① | 33 | | | | | | | | 1872 |
| 10 | RHN10U-20C-20DD-① | 20 | 4/1 | 12.5 | 20/3.5 | 14.8/2.1 | 42.0/21.0 | 20.0/10.0 | 16.0/8.0 | 1766 |
| | RHN10U-33C-20DD-① | 33 | | | | | | | | 1872 |
| 15 | RHN15U-28C-12DD-① | 28 | 4/1 | 14 | 12/2.0 | 14.8/2.1 | 42.0/21.0 | 20.0/10.0 | 16.0/8.0 | 3086 |
| | RHN15U-46C-12DD-① | 46 | | | | | | | | 3439 |

*See Section 2.1.1 for place holder ① designation.

**Table 2-3 Ultra-Low Headroom Trolley Hoists Trolley Specifications**

| Capacity (Tons) | Product Code | Standard Flange Range B* (in) | Dual Speed Traversing Motor 80 and 20 ft/min | | | | |
|---|---|---|---|---|---|---|---|
| | | | Output (Hp) Hi/Low | Current Draw (amps) - Hi/Low | | | |
| | | | | 208V | 230V | 460V | 575V |
| 2 | RHN02U-20A-20DD-① | 3.25-12 | 0.59/0.15 | 3.0/2.3 | 2.6/2.0 | 1.3/1.0 | 1.0/0.8 |
| | RHN02U-33A-20DD-① | | | | | | |
| 3 | RHN03U-20A-20DD-① | 3.25-12 | 0.59/0.15 | 3.0/2.3 | 2.6/2.0 | 1.3/1.0 | 1.0/0.8 |
| | RHN03U-33A-20DD-① | | | | | | |
| 5 | RHN05U-20B-20DD-① | 3.63-12 | 0.59/0.15 | 3.0/2.3 | 2.6/2.0 | 1.3/1.0 | 1.0/0.8 |
| | RHN05U-33B-20DD-① | | | | | | |
| 7 ½ | RHN08U-20C-20DD-① | 4.63-12 | 0.89/0.21 | 3.7/2.8 | 3.2/2.4 | 1.6/1.2 | 1.3/1.0 |
| | RHN08U-33C-20DD-① | | | | | | |
| 10 | RHN10U-20C-20DD-① | 4.63-12 | 0.89/0.21 | 3.7/2.8 | 3.2/2.4 | 1.6/1.2 | 1.3/1.0 |
| | RHN10U-33C-20DD-① | | | | | | |
| 15 | RHN15U-28D-12DD-① | 8.75-12 | 2.01/0.48 | 6.9/3.2 | 6.0/2.8 | 3.0/1.4 | 2.4/1.1 |
| | RHN15U-46D-12DD-① | | | | | | |

*Optional wider flange ranges available up to 19.7 inches. Consult factory.

## 2.2 Dimensions

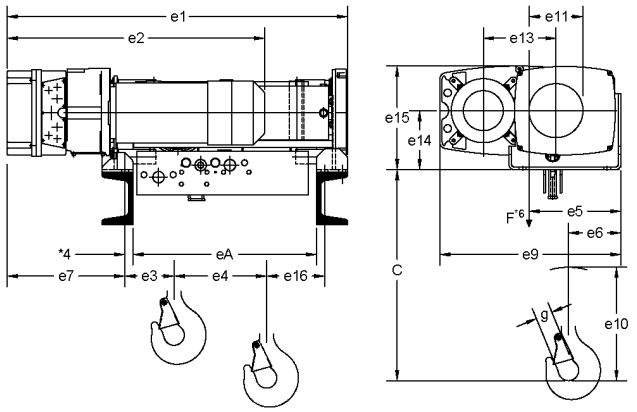



**Figure 2-1** 2-10 ton Deck Mounted Hoist Dimensions (See Table 2-4)

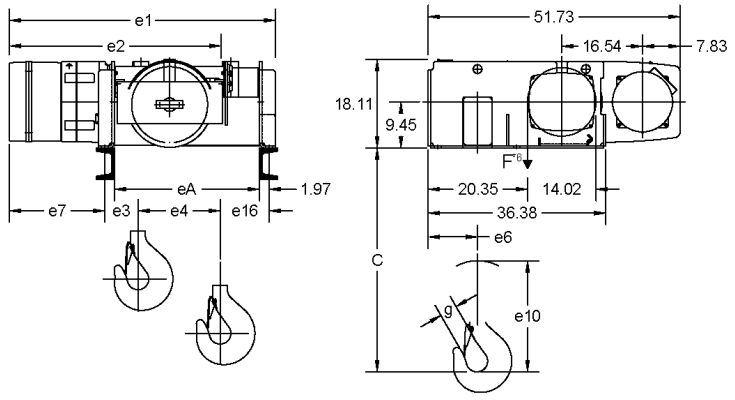



**Figure 2-2** 15-20 ton Deck Mounted Hoist Dimensions (See Table 2-5)

**Table 2-4 Deck Mounted Hoist Dimensions (2-10 ton)****

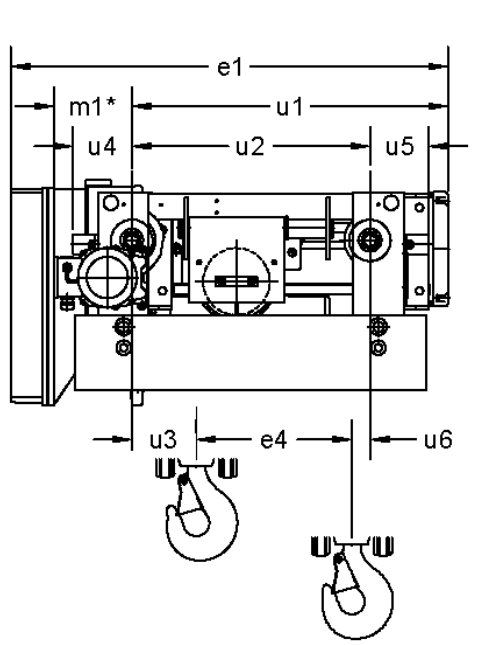
| Capacity (Tons) | Product Code* | Min. Headroom C (in) | e1 (in) | e2 (in) | e3 (in) | e4 (in) | e5 (in) | e6 (in) | e7 (in) | e9 (in) | e10 (in) | e11 (in) | e13 (in) | e14 (in) | e15 (in) | e16 (in) | eA (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | RHN02D-20A-20D-① | 22.6 | 40.9 | 29.6 | 6.3 | 4.6 | 9.0 | 4.8 | 13.9 | 21.3 | 11.5 | 4.9 | 7.2 | 6.3 | 11.0 | 13.3 | 22.2 |
| | RHN02D-33A-20D-① | | 52.5 | | 6.2 | 7.6 | | | | | | | | | | 22.1 | 33.8 |
| 3 | RHN03D-20A-20D-① | 22.6 | 40.9 | 29.6 | 6.3 | 4.6 | 9.0 | 4.8 | 13.9 | 21.3 | 11.5 | 4.9 | 7.2 | 6.3 | 11.0 | 13.3 | 22.2 |
| | RHN03D-33A-20D-① | | 52.5 | | 6.2 | 7.6 | | | | | | | | | | 22.1 | 33.8 |
| 5 | RHN05D-20B-20D-① | 25.6 | 41.3 | 31.2 | 6.4 | 4.3 | 11.2 | 5.9 | 14.3 | 22.0 | 13.8 | 6.6 | 8.8 | 7.2 | 12.9 | 13.5 | 22.2 |
| | RHN05D-33B-20D-① | | 52.9 | | | 7.2 | | | | | | | | | | 22.2 | 33.8 |
| 7 ½ | RHN08D-20C-20D-① | 32.5 | 48.0 | 39.3 | 9.5 | 4.6 | 14.1 | 7.5 | 17.2 | 28.6 | 18.2 | 8.6 | 11.7 | 9.4 | 16.9 | 12.6 | 24.6 |
| | RHN08D-33C-20D-① | | 60.4 | | | 7.8 | | | | | | | | | | 21.8 | 37.0 |
| 10 | RHN10D-20C-20D-① | 32.5 | 48.0 | 39.3 | 9.5 | 4.6 | 14.1 | 7.5 | 17.2 | 28.6 | 18.2 | 8.6 | 11.7 | 9.4 | 16.9 | 12.6 | 24.6 |
| | RHN10D-33C-20D-① | | 60.4 | | | 7.8 | | | | | | | | | | 21.8 | 37.0 |

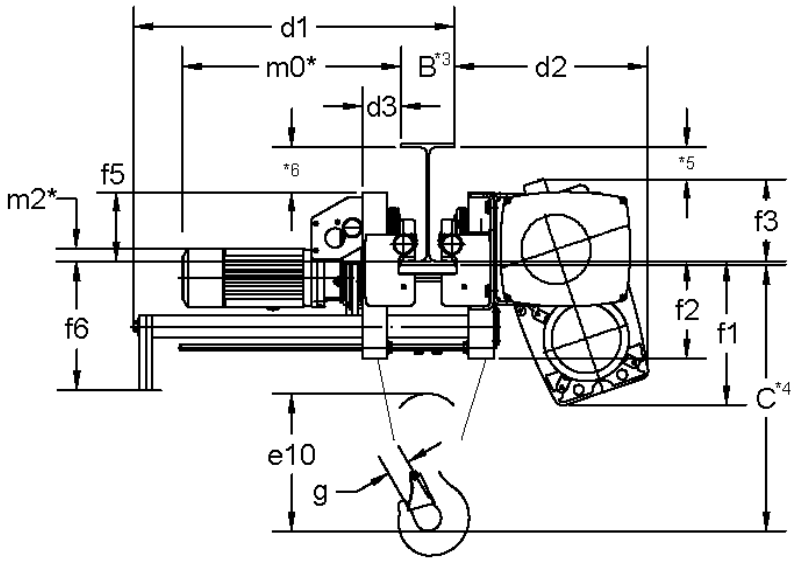
**Table 2-5 Deck Mounted Hoist Dimensions (15 & 20 ton)****

| Capacity (Tons) | Product Code* | Min. Headroom C (in) | e1 (in) | e2 (in) | e3 (in) | e4 (in) | e6 (in) | e7 (in) | e10 (in) | e16 (in) | eA (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | RHN15D-20D-16D-① | 37.0 | 54.4 | 43.7 | 13.4 | 4.6 | 10.9 | 19.5 | 29.7 | 15.7 | 29.7 |
| | RHN15D-33D-16D-① | | 66.6 | | | 7.6 | | | | 24.9 | 41.9 |
| 20 | RHN20D-20D-16D-① | 37.0 | 54.4 | 43.7 | 13.4 | 4.6 | 10.9 | 19.5 | 29.7 | 15.7 | 29.7 |
| | RHN20D-33D-16D-① | | 66.6 | | | 7.6 | | | | 24.9 | 41.9 |

Notes:
*See Section 2.1.1 for place holder ① designation
** See **Table 2-10** and **Table 2-11** for attachment point dimensions

## Table 2-6 Ultra-Low Headroom Trolley Hoist Dimensions




| Capacity (Tons) | Product Code *1 | e1 (in) | e4 (in) | e10 (in) | d1 (in) | d2 (in) | d3 (in) | f1 (in) | f2 (in) | f3 (in) | f5 (in) | f6 (in) | u1 (in) | u2 (in) | u3 (in) | u4 (in) | u5 (in) | u6 (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | RHN02U-20A-20DD-① | 40.3 | 4.6 | 11.5 | 28.6 | 18.0 | 3.7 | 13.9 | 8.9 | 6.5 | 6.1 | 11.9 | 30.0 | 22.4 | 9.1 | 5.1 | 5.9 | 8.7 |
| | RHN02U-33A-20DD-① | 51.9 | 7.6 | | | | | | | | | 10.7 | 41.6 | 34.1 | 9.0 | | | 17.4 |
| 3 | RHN03U-20A-20DD-① | 40.3 | 4.6 | 11.5 | 28.6 | 18.0 | 3.7 | 13.9 | 8.9 | 6.5 | 6.1 | 11.9 | 30.0 | 22.4 | 9.1 | 5.1 | 5.9 | 8.7 |
| | RHN03U-33A-20DD-① | 51.9 | 7.6 | | | | | | | | | 10.7 | 41.6 | 34.1 | 9.0 | | | 17.4 |
| 5 | RHN05U-20B-20DD-① | 41.2 | 4.3 | 13.8 | 30.8 | 18.2 | 3.7 | 13.5 | 9.1 | 7.7 | 6.5 | 12.1 | 29.8 | 22.4 | 9.9 | 5.6 | 5.6 | 8.3 |
| | RHN05U-33B-20DD-① | 54.6 | 7.2 | | | | | | | 8.1 | 8.1 | 10.9 | 47.3 | 40.0 | 15.8 | | | 17.0 |
| 7 ½ | RHN08D-20C-20DD-① | 47.2 | 4.6 | 18.2 | 37.0 | 22.9 | 4.5 | 16.1 | 11.4 | 10.7 | 9.8 | 15.7 | 33.7 | 24.6 | 12.6 | 6.7 | 6.7 | 7.4 |
| | RHN08U-33C-20DD-① | 59.6 | 7.8 | | | | | | | | | 15.0 | 46.1 | 37.0 | 12.6 | | | 16.6 |
| 10 | RHN10U-20C-20DD-① | 47.2 | 4.6 | 18.2 | 37.0 | 22.9 | 4.5 | 16.1 | 11.4 | 10.7 | 9.8 | 15.7 | 33.7 | 24.6 | 12.6 | 6.7 | 6.7 | 7.4 |
| | RHN10U-33C-20DD-① | 59.6 | 7.8 | | | | | | | | | 15.0 | 46.1 | 37.0 | 12.6 | | | 16.6 |
| 15* | RHN15U-28D-12DD-① | 65.6† | 4.6 | 23.0 | 44.4 | 25.2 | 6.6 | 24.5 | 11.8 | 10.0 | 10.0 | 16.7 | 49.4† | 40.7 | 15.9 | 8.7 | 8.7 | 20.3 |
| | RHN15U-46D-12DD-① | 79.7† | 7.7 | | | | | | | | | 15.2 | 69.5† | 60.8 | 23.7 | | | 29.4 |

Notes:

* Refer to **Table 2-7** for motor dimensions m0, m1, and m2. Motor dimension m0 may extend past the counterweight depending on the hoist model and flange width B.

*1 - See Section 2.1.1 for place holder ① designation

*3 - Refer to **Table 2-8** for flange range dimension B (Trolleys are suitable for use on S or W shaped beams)

*4 - Refer to **Table 2-8** for headroom dimension C

*5/*6 – Observe clearance dimensions

† - For the 15t trolley hoist model, this measurement is to the end of the trolley frame because it extends past the drum cover shown in the figure.

| Table 2-7 Ultra-Low Headroom Trolley Motor Dimensions | | | | |
|---|---|---|---|---|
| **Capacity (Tons)** | **Product Code*** | **m0 (in)** | **m1 (in)** | **m2 (in)** |
| 2 | RHN02U-20A-20DD-①<br>RHN02U-33A-20DD-① | 20.6 | 7.4 | 1.3 |
| 3 | RHN03U-20A-20DD-①<br>RHN03U-33A-20DD-① | 20.6 | 7.4 | 1.3 |
| 5 | RHN05U-20B-20DD-①<br>RHN05U-33B-20DD-① | 20.6 | 7.4 | 1.3 |
| 7 ½ | RHN08U-20C-20DD-①<br>RHN08U-33C-20DD-① | 22.4 | 9.5 | 0.8 |
| 10 | RHN10U-20C-20DD-①<br>RHN10U-33C-20DD-① | 22.4 | 9.5 | 0.8 |
| 15 | RHN15U-28D-12DD-①<br>RHN15U-46D-12DD-① | 26.5 | 10.1 | 1.3 |

*See Section 2.1.1 for place holder ① designation

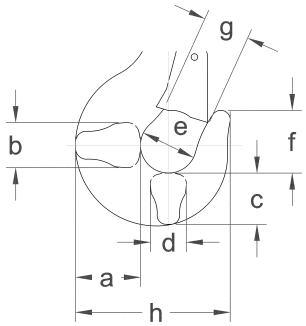
| Table 2-8 Ultra-Low Headroom Trolley Hoist Headroom Dimensions | | | |
|---|---|---|---|
| Capacity (Tons) | Flange Range, B (in) | Headroom, C* (in) | Headroom, C for 6 inch Flange (in) |
| 2<br>3 | 3.25-4.69 | 22.0 | 21.7 |
| | 4.69-6.69 | 23.4-(0.29*T) | |
| | 6.69-12 | 17.6+(0.58*T) | |
| 5 | 3.625-4.69 | 26.2 | 26.0 |
| | 4.69-6.69 | 26.6-(0.10*T) | |
| | 6.69-12 | 27.5-(0.23*T) | |
| 7 ½<br>10 | 4.625-6.69 | 33.1-(0.29*T) | 31.4 |
| | 6.69-12 | 33.4-(0.35*T) | |
| 15 | 8.75-12 | 40.8-(0.31*T) | 38.0** |

*T in formulas is the exact beam flange width in inches.

**Headroom value for 9 inch flange.

## 2.3 Miscellaneous

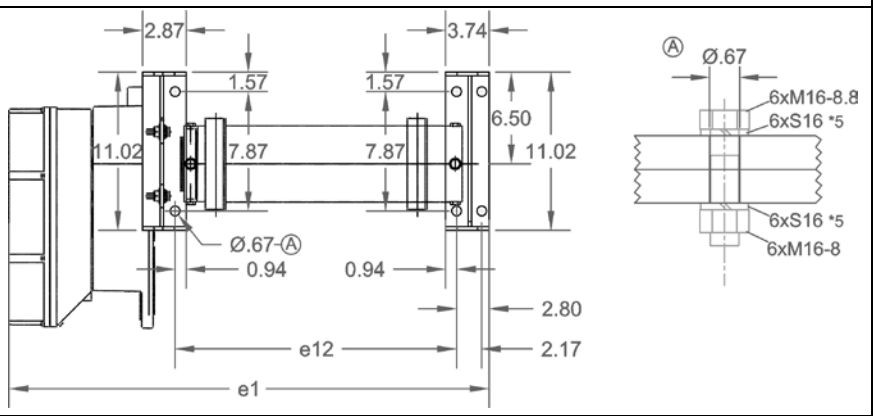
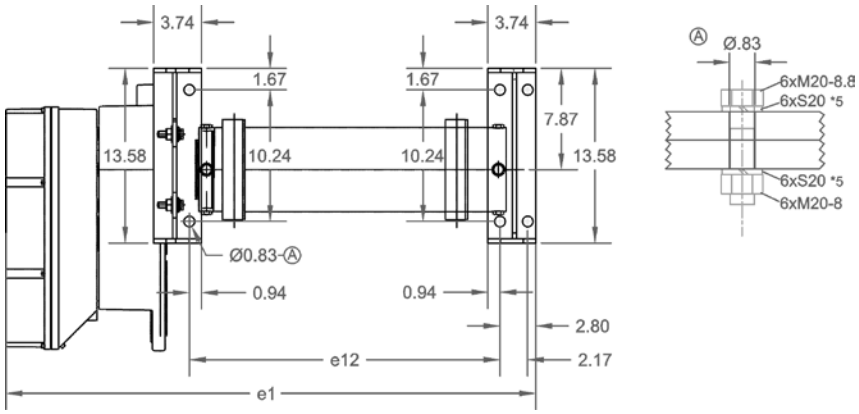
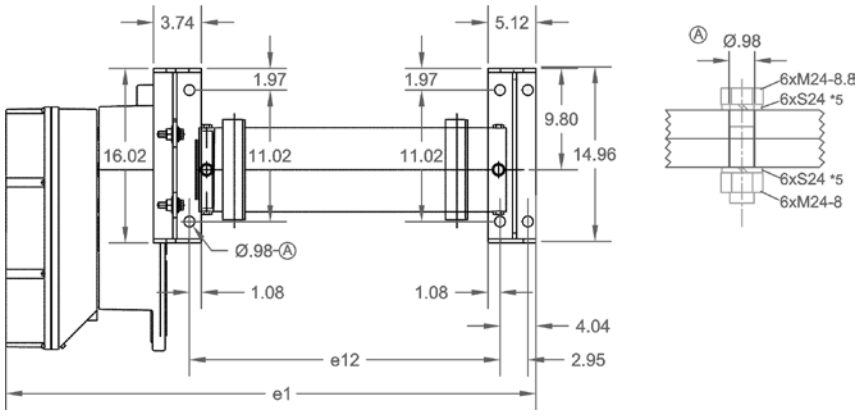
**Table 2-9 Hook Dimension***




Units = inch

| Capacity (Tons) | Product Code** | a | b | c | d | e | f | g | h |
|---|---|---|---|---|---|---|---|---|---|
| 2 | RHN02D-20A-20D-① | 2.2 | 1.8 | 1.9 | 1.5 | 2.2 | 2.5 | 1.6 | 5.8 |
| | RHN02D-33A-20D-① | | | | | | | | |
| 3 | RHN03D-20A-20D-① | 2.2 | 1.8 | 1.9 | 1.5 | 2.2 | 2.5 | 1.6 | 5.8 |
| | RHN03D-33A-20D-① | | | | | | | | |
| 5 | RHN05D-20B-20D-① | 2.6 | 2.1 | 2.3 | 1.8 | 2.5 | 2.8 | 1.7 | 6.6 |
| | RHN05D-33B-20D-① | | | | | | | | |
| 7 ½ | RHN08D-20C-20D-① | 3.1 | 2.5 | 2.6 | 2.1 | 2.8 | 3.1 | 1.9 | 7.7 |
| | RHN08D-33C-20D-① | | | | | | | | |
| 10 | RHN10D-20C-20D-① | 3.1 | 2.5 | 2.6 | 2.1 | 2.8 | 3.1 | 1.9 | 7.7 |
| | RHN10D-33C-20D-① | | | | | | | | |
| 15 | RHN15U-28D-12DD-① | 3.9 | 3.1 | 3.3 | 2.6 | 3.5 | 4.0 | 2.4 | 10.1 |
| | RHN15U-46D-12DD-① | | | | | | | | |
| | RHN15D-20D-16D-① | 4.9 | 3.9 | 4.2 | 3.3 | 4.4 | 5.0 | 3.2 | 12.0 |
| | RHN15D-33D-16D-① | | | | | | | | |
| 20 | RHN20D-20D-16D-① | 4.9 | 3.9 | 4.2 | 3.3 | 4.4 | 5.0 | 3.2 | 12.0 |
| | RHN20D-33D-16D-① | | | | | | | | |

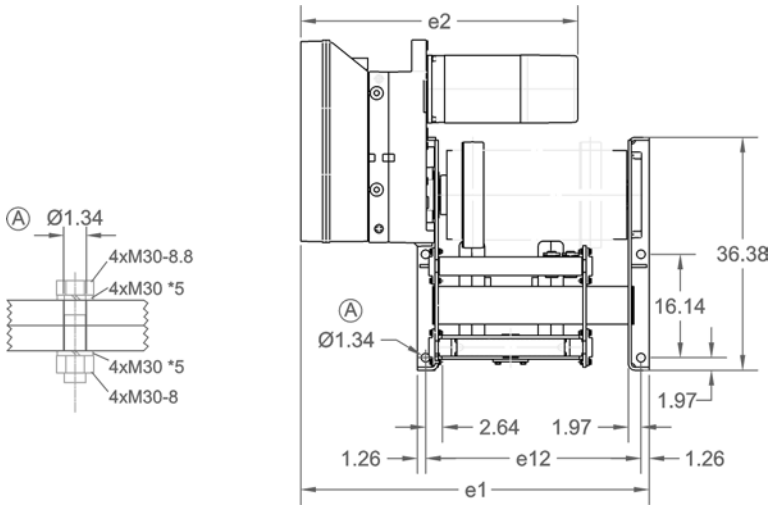
*Refer to Section 5.6 for inspection dimensions and limits.
**Product codes represent deck/base mounted hoists (except RHN15U), but hook dimensions also apply to ultra-low trolley hoists. See Section 2.1.1 for place holder ① designation

| Table 2-10 Deck Mounted Hoist Attachment Point Dimensions (2-10 ton) | | | | |
|---|---|---|---|---|
| **Capacity (Tons)** | **Product Code*** | **e1 (in)** | **e12 (in)** | **Deck/Base Mounted** |
| 2 | RHN02D-20A-20D-① | 40.9 | 24.2 |  |
| | RHN02D-33A-20D-① | 52.5 | 35.8 | |
| 3 | RHN03D-20A-20D-① | 40.9 | 24.2 | |
| | RHN03D-33A-20D-① | 52.5 | 35.8 | |
| 5 | RHN05D-20B-20D-① | 41.3 | 24.2 |  |
| | RHN05D-33B-20D-① | 52.9 | 35.8 | |
| 7 1/2 | RHN08D-20C-20D-① | 48.0 | 26.8 |  |
| | RHN08D-33C-20D-① | 60.4 | 39.2 | |
| 10 | RHN10D-20C-20D-① | 48.0 | 26.8 | |
| | RHN10D-33C-20D-① | 60.4 | 39.2 | |

Notes:

*See Section 2.1.1 for place holder ① designation

*5 – Lock washer

| Table 2-11 Deck Mounted Hoist Attachment Point Dimensions (15 & 20 ton) | | | | | |
|---|---|---|---|---|---|
| **Capacity (Tons)** | **Product Code*** | **e1 (in)** | **e2 (in)** | **e12 (in)** | **Deck/Base Mounted** |
| 15 | RHN15D-20D-16D-① | 54.4 | 43.7 | 33.7 |  |
| | RHN15D-33D-16D-① | 66.6 | | 45.9 | |
| 20 | RHN20D-20D-16D-① | 54.4 | 43.7 | 33.7 | |
| | RHN20D-33D-16D-① | 66.6 | | 45.9 | |



Notes:

*See Section 2.1.1 for place holder ① designation

*5 – Lock washer (Schnorr)

**Table 2-12 Reaction Forces at Rated Load, Deck Mounted**

| Capacity (Tons) | Product Code | F1 (lbs) | F2 (lbs) | F3 (lbs) | F4 (lbs) | Q1 (lbs) | Q2 (lbs) | Q3 (lbs) | Q4 (lbs) | Moment*, $M_T$ (ft-lbs) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | RHN02D-20A-20D-① | 1817 | 1902 | 654 | 1292 | 295 | 169 | 393 | 393 | 232* |
| | RHN02D-33A-20D-① | 1950 | 2149 | 582 | 1122 | 328 | 147 | 393 | 393 | |
| 3 | RHN03D-20A-20D-① | 2700 | 3043 | 1038 | 2067 | 472 | 270 | 629 | 629 | 372* |
| | RHN03D-33A-20D-① | 2906 | 3439 | 916 | 1795 | 524 | 235 | 629 | 629 | |
| 5 | RHN05D-20B-20D-① | 4171 | 4683 | 1618 | 3151 | 736 | 415 | 984 | 984 | 770* |
| | RHN05D-33B-20D-① | 4480 | 5272 | 1435 | 2744 | 814 | 362 | 984 | 984 | |
| 7 ½ | RHN08D-20C-20D-① | 6989 | 5019 | 3625 | 5051 | 978 | 741 | 1475 | 1475 | 1514* |
| | RHN08D-33C-20D-① | 7758 | 6054 | 3112 | 4278 | 1129 | 627 | 1475 | 1475 | |
| 10 | RHN10D-20C-20D-① | 9041 | 6692 | 4763 | 6735 | 1304 | 988 | 1967 | 1967 | 2019* |
| | RHN10D-33C-20D-① | 10042 | 8072 | 4076 | 5703 | 1506 | 836 | 1967 | 1967 | |
| 15 | RHN15D-20D-16D-① | 9297 | 14086 | 5835 | 13988 | 1894 | 1684 | 3147 | 3147 | ** |
| | RHN15D-33D-16D-① | 10384 | 16989 | 4931 | 12154 | 2227 | 1445 | 3147 | 3147 | |
| 20 | RHN20D-20D-16D-① | 12088 | 16707 | 7449 | 17186 | 2367 | 2105 | 3934 | 3934 | ** |
| | RHN20D-33D-16D-① | 13494 | 20243 | 6316 | 14899 | 2784 | 1807 | 3934 | 3934 | |

See Section 2.1.1 for place holder ① designation

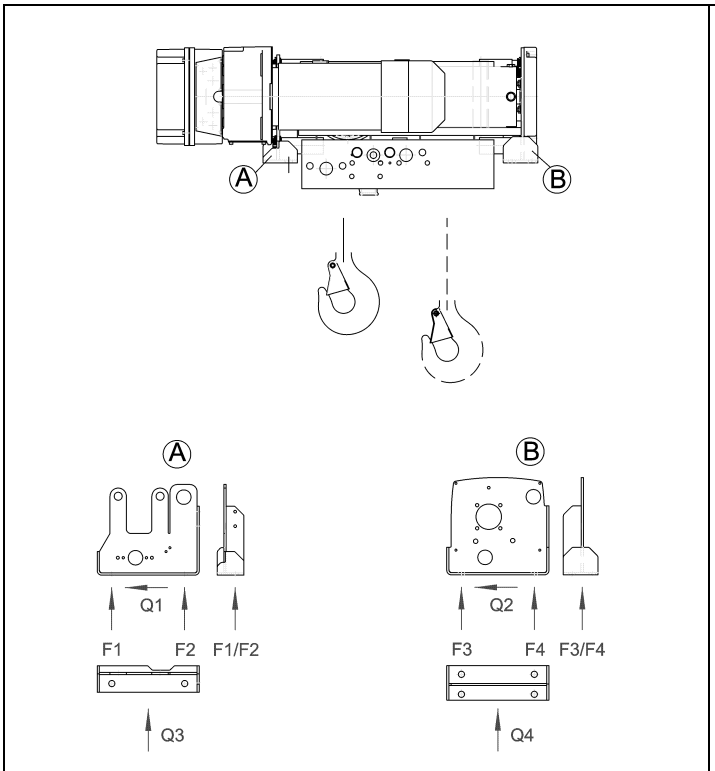



**Figure 2-5** Deck Mounted Hoist, 2-10 Ton Reaction Forces (See Table 2-12)

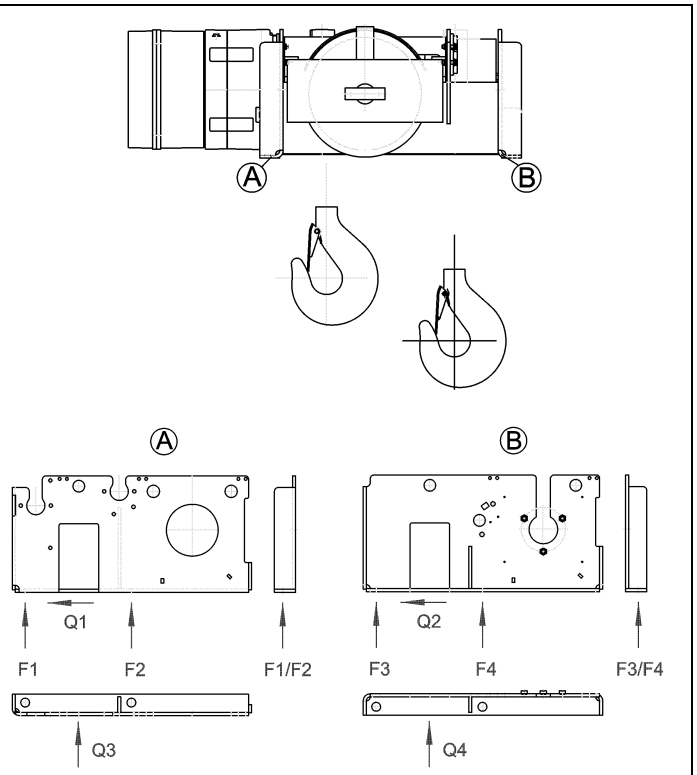



**Figure 2-6** Deck Mounted Hoist, 15-20 Ton Reaction Forces (See Table 2-12)

**For 2-10t capacities, the customer's substructure must account for the moment MT (torque) from the rope drum. Therefore it must be torsion resistant and level, (max permissible offset, Y = .0787in.)*

***For 15-20t capacities, the design structure accounts for the moment, and the forces are diverted to the fixation points.*

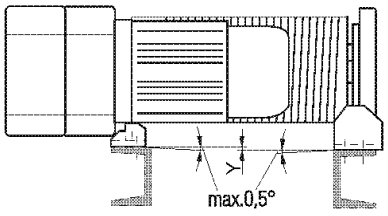
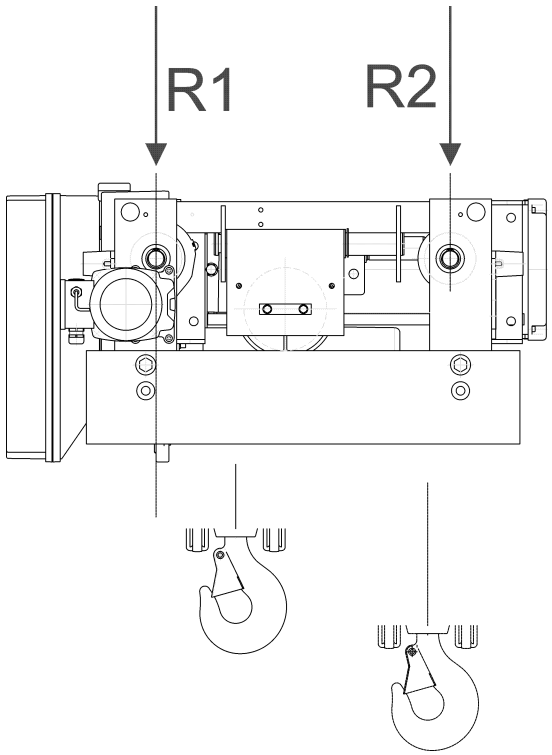


**Table 2-13 Wheel Pair Reaction Forces at Rated Load, Ultra-Low Headroom Monorail Trolley**

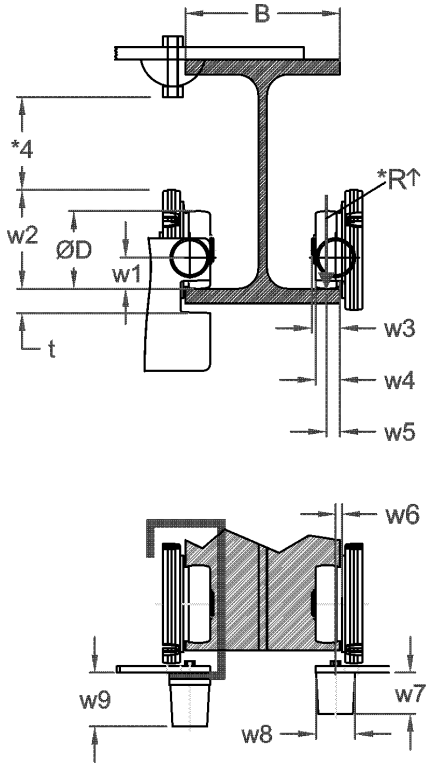


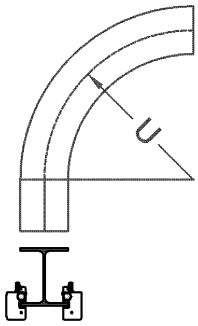

| Capacity (Tons) | Product Code* | R1 (lbs) | R2 (lbs) |
|---|---|---|---|
| 2 | RHN02U-20A-20DD-① | 2985 | 2939 |
| | RHN02U-33A-20DD-① | 3632 | 2411 |
| 3 | RHN03U-20A-20DD-① | 4292 | 4285 |
| | RHN03U-33A-20DD-① | 5253 | 3487 |
| 5 | RHN05U-20B-20DD-① | 6629 | 7288 |
| | RHN05U-33B-20DD-① | 7167 | 6675 |
| 7 1/2 | RHN08D-20C-20DD-① | 9102 | 12320 |
| | RHN08U-33C-20DD-① | 12011 | 9860 |
| 10 | RHN10U-20C-20DD-① | 11783 | 16192 |
| | RHN10U-33C-20DD-① | 15641 | 12898 |
| 15 | RHN15U-28D-12DD-① | 22045 | 17881 |
| | RHN15U-46D-12DD-① | 22226 | 18478 |
| 20 | N/A | | |
| | N/A | | |

Notes:

*See Section 2.1.1 for place holder ① designation

## Table 2-14 Trolley Wheel Dimensions




| Capacity (Tons) | Product Code *5 | Wheel Dia. Ø D (in) | w1 (in) | w2 (in) | w3 (in) | w4 (in) | w5 (in) | w6 (in) | w7 (in) | w8 (in) | w9 (in) | U*2 (ft) | Maximum Flange Thickness t (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | RHN02U-20A-20DD-① | 3.1 | 1.6 | 4.1 | 1.2 | 1.1 | 0.5 (0.6)** | 0.2 | 2.1 | 2.0 | 2.5 | 37.4* | 0.96 |
| | RHN02U-33A-20DD-① | | | | | | | | | | | 56.8* | |
| 3 | RHN03U-20A-20DD-① | 3.1 | 1.6 | 4.1 | 1.2 | 1.1 | 0.5 (0.6)** | 0.2 | 2.1 | 2.0 | 2.5 | 37.4* | 0.96 |
| | RHN03U-33A-20DD-① | | | | | | | | | | | 56.8* | |
| 5 | RHN05U-20B-20DD-① | 3.9 | 1.6 | 5.1 | 1.5 | 1.2 | 0.7 (0.9)** | 0.2 | 2.1 | 2.0 | 2.5 | 37.4* | 1.04 |
| | RHN05U-33B-20DD-① | | | | | | | | | | | 56.8* | |
| 7 1/2 | RHN08D-20C-20DD-① | 5.5 | 1.5 | 6.9 | N/A | 1.8 | 0.9 (1.3)** | 0.5 | 2.1 | 2.5 | 2.5 | 41.0* | 1.46 |
| | RHN08U-33C-20DD-① | | | | | | | | | | | 61.7* | |
| 10 | RHN10U-20C-20DD-① | 5.5 | 1.5 | 6.9 | N/A | 1.8 | 0.9 (1.3)** | 0.5 | 2.1 | 2.5 | 2.5 | 41.0* | 1.46 |
| | RHN10U-33C-20DD-① | | | | | | | | | | | 61.7* | |
| 15 | RHN15U-28D-12DD-① | 7.9 | 1.7 | 10.5 | N/A | 1.8 | 0.9 (1.3)** | 0.5 | 2.1 | 2.5 | 2.5 | N/A | 1.81 |
| | RHN15U-46D-12DD-① | | | | | | | | | | | N/A | |

Notes :

* Smaller bend radius upon request

** – ( ) with sloping flange

*R – See page 18 for reaction forces R1 and R2

*2 – only up to B $\leq$7.9 inches

*4 – Observe clearance dimensions

*5 – See Section 2.1.1 for place holder ① designation

# 3.0 Pre-operational Procedures

## 3.1 General Information

3.1.1 When the RHN trolley hoist or deck mounted hoist is incorporated into lifting systems utilizing other equipment, follow and complete all pre-operational procedures and instructions provided with the equipment. Special wiring considerations must also be taken to complete the integration of the RHN trolley hoist or deck mounted hoist into the system.

3.1.2 The RHN hoist is delivered pre-assembled on a pallet with a wooden frame. The frame is wrapped in plastic for additional protection. (see Figure 3-1). During shipment and storage prior to installation, the trolley hoist should be kept between –4° and +140°F (-20° and +60°C) and the relative humidity must not exceed 80%. The standard packaging is not watertight and rainproof.



**Figure 3-1** Packaged as delivered

3.1.3 The RHN trolley hoist or deck mounted hoist is shipped pre-lubricated and the gear box(s) are filled with the correct amount and type of oil. Follow the lubrication requirements in Section 6.1 after the trolley hoist is placed into service.

## 3.2 Handling

3.2.1 Transportation – When moving the hoist or trolley hoist prior to installation, do not remove hoist from crate. Always move hoist/trolley hoist utilizing a fork lift, pallet jack or hoist/crane system. Do NOT stack or place anything on top of the trolley hoist or crate. Avoid swinging and unbalanced conditions.

3.2.2 Lift points – When a pallet/crate is not practical, use of RHN lifting location is acceptable. The RHN deck mounted hoist is equipped with lifting lugs to facilitate lifting, while the RHN trolley hoist is equipped with openings in the vertical tubes to accept hooks or slings (see Figures 3-2 and 3-3). While lifting do NOT support the deck mount hoist or trolley hoist any other way.

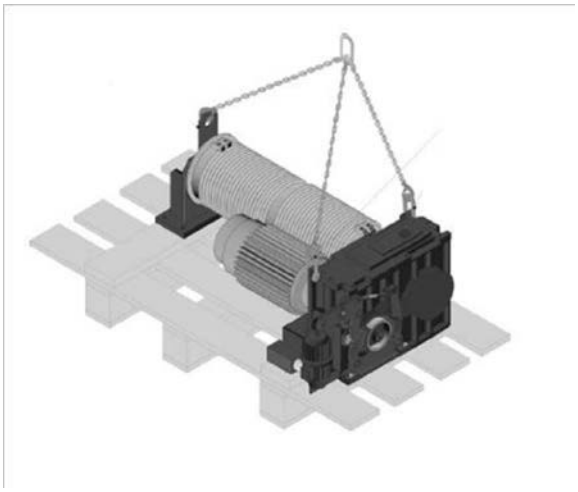


**Figure 3-2** Lift Point for Deck Mount

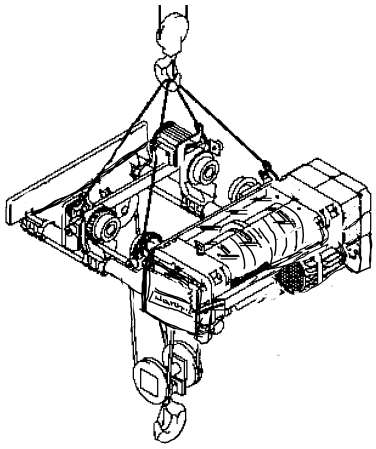


**Figure 3-3** Lift Point for Trolley Hoist

## 3.3 Mounting Location

3.3.1 **⚠WARNING** Prior to mounting the RHN deck mounted hoist, ensure that the substructure is adequate and capable of withstanding the forces generated by the hoist and the load. Therefore, the substructure must be torsion resistant and level (See Table 2-12 for more details). Prior to mounting the RHN trolley hoist ensure that the trolley beam and its supporting structure are adequate to support the trolley hoist and its load. (See Table 2-13). If necessary consult a professional that is qualified to evaluate the adequacy of the suspension location and its supporting structure.

3.3.2 Ensure that there is adequate vertical and horizontal clearance along the entire range of the trolley hoist's motion.

3.3.3 **NOTICE** See Section 6.8 for outdoor installation considerations.

## 3.4 Assembly, Adjustments and Mounting

**⚠WARNING** When installing the trolley hoist on a beam, ALWAYS raise the hoist into position with the trolley assembled together and securely attached to a pallet. Raise the trolley hoist with a forklift, lifting platform, or other similar means. NEVER use slings to raise and install the trolley hoist onto the beam (see Figure 3-4). Using a forklift or another suitable means, position the pallet so that the horizontal axis of the beam is parallel to the horizontal axis of the hoist (see Figure 3-5)

Note: Unless specified when ordered, the RHN Trolley hoist is factory set to accommodate a 12 inch (306mm) beam flange. If a smaller flange width is necessary, the driveshaft position and/or length may require a change as well (See Table 3-1). If the supplied trolley drive shaft is too long for the desired flange, a short trolley drive shaft can be ordered, or the existing shaft can be cut down to the appropriate length. Use caution and always wear eye protection when cutting the trolley drive shaft with a powered saw or a manual saw. Deburr the cut end of shaft before reinstalling. The RHN is equipped with the maximum number of counterweights necessary for the standard (advertised) flange range for each capacity. If the flange range exceeds 12 inches (306mm), some counter weight may need to be removed to achieve proper balance.

3.4.1 RHN Trolley Hoist Installation

**1)** Make sure the mounting location complies with Section 3.3.

**2)** Before attempting to install the trolley hoist, verify beam width and the "c" dimension (see Figure 3-6). See Table 3-1 for dimensions respective values. If adjustment is not necessary, move onto section Section 3.4.1 (step 8). If adjustment is necessary move onto step 3, below.

**3)** Determine the correct driveshaft length for your application.

a. If a shorter driveshaft length is required, it is necessary to replace or cut the existing driveshaft to the appropriate length. (See Table 3-2)

b. If a longer driveshaft length is required, it is necessary to replace the existing driveshaft with one of the appropriate length. (See Table 3-2)

**4)** Determine the correct Snap Ring Position on the driveshaft, for your application. (2 ton – 10 ton) Each driveshaft has multiple Snap Ring positions shown as X3 and X4. These different positions allow the Trolley Driveshaft to be inserted at two different depths within the motor housing. This gives the drive shaft the ability to accommodate a range of beam flange widths before it necessary to change the shaft length.(See Table 3-2)

**5)** Accessing the Drive Shaft for replacement, shortening and/or Snap Ring relocation.

a. Carefully remove the trolley motor by loosening and removing the 4 trolley motor mounting bolts. It may be necessary to disconnect the trolley motor cable, if there is not enough slack to allow for the motor to be safely supported, as work is being performed. With the bolts removed, the motor can slide off of the drive shaft.

b. With the motor removed and safely placed out of the way, the driveshaft can pulled out of the trolley assembly.

**6)** Adjust the trolley flange to fit beam width.

a. Working on the trolley motor side of the hoist, (the side closest to the large rectangular counter weights), loosen the nuts (2) on the two threaded shafts (1) of the trolley hoist. **DO NOT** loosen the nuts closest to the hoist. **NEVER** move the hoist side of the trolley. (See Figure 3-6 and Figure 3-11)

b. With the nuts (2) loosened enough to allow the trolley frame to move, slide the trolley motor side of the hoist outward or inward to meet the desired flange width. Tighten nuts (2) with a torque wrench, to 155 ft lbs (210 Nm). (See Figure 3-6 and Figure 3-11.)

**7)** Installing the Drive Shaft

a. **2Ton – 10Ton Trolley Hoist**

Install Snap Rings (S) on to Driveshaft (D) in position X3 or X4 depending on flange width (B) of the runway beam and length (L) of drive shaft (D). Slide Drive Shaft through drive pinions and install trolley motor. (See Figures 3-8, and 3-9. Also see Tables 3-2 and 3-3.)

b. **15 Ton Trolley Hoist**

Insert drive shaft (5) into the two drive pinions (6) from the counterweight side, then assemble spacer tube (7) and adjusting ring (8). (See Figure 3-11).

Adjust drive shaft (5) so that on the hoist side of the shaft end projects between “min. 0in. (0mm)” and “max. 4.72 in.(120mm)” beyond the drive pinion (6) and on the counterweight side the shaft end projects between “min. 1.89 in. (48 mm)” and “max. 6.30in. (160 mm)” beyond the trolley frame (10). (See Figure 3-11).

Lock adjusting ring (8) with the adjusting screw so that there is approximately "3 mm” space between spacer tube (7) and the adjusting ring (8) when spacer tube (7) is against drive pinion (6). After fitting travel drive, check drive shaft (5) for ease of movement. (See Figure 3-11).

**8)** Mounting the Trolley Hoist to the beam.

a. Install any additional devices, if any (power supply cords or pendants, for instance – see Section 3.5), onto the trolley hoist. If the trolley hoist is not secured to a pallet, place and secure it to one making sure that the trolley hoist is completely stable.

b. Before attempting to install the trolley hoist, verify beam width and the “c” dimension (see Figure 3-6). See Table 3-1 for dimensions respective values. Adjust flange width if necessary. (See Section 3.4.1 Step 6)

c. If the end of the runway beam is accessible, slide the trolley hoist onto the end of the runway beam. Check clearance f/2 ( Figure 3-7 and Table 3-1). Adjust if necessary. (See Section 3.4.1 Step 6).

If the end of the runway beam is not accessible, the trolley flange width will need to be opened up to allow the Trolley Hoist to fit around the beam. (See Section 3.4.1 Step 6).

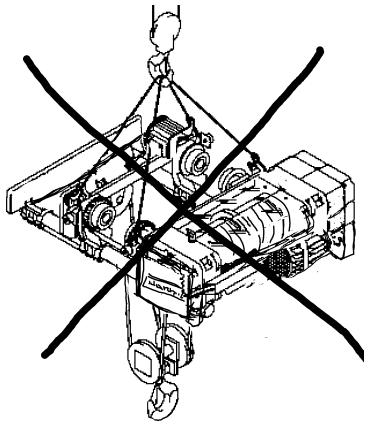


**Figure 3-4** Lift Point for Deck Mount

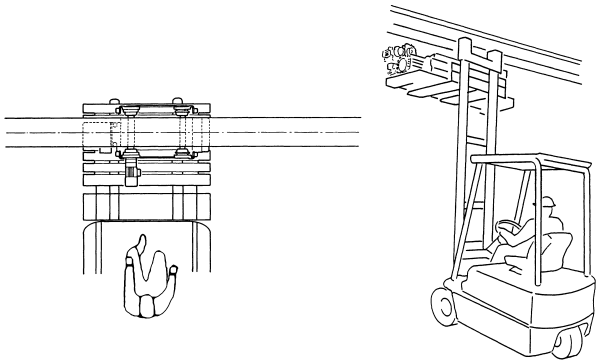


**Figure 3-5** Lift Point for Trolley Hoist

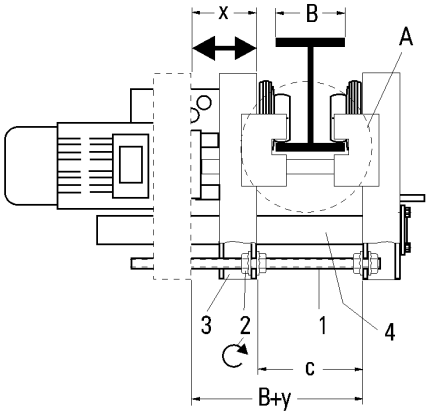



**Figure 3-6** Trolley Hoist Clearances 2 Ton – 10 Ton

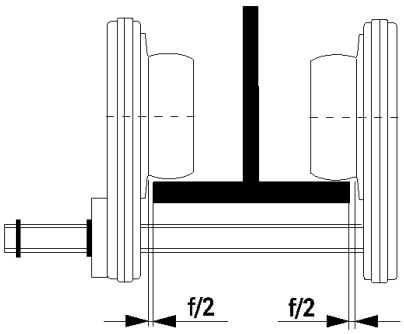



**Figure 3-7** Trolley Hoist Clearances

Table 3-1 Trolley Clearances and Wheel Diameters

| Hoist | Wheel Diameter | | c | | f/2 | | y | |
|---|---|---|---|---|---|---|---|---|
| | in | mm | in | mm | in | mm | in | mm |
| RHN02<br>RHN03 | 3 1/8 | 80 | B+2 5/8 | B+67 | 1/16 | 1.5 | 5 3/8 | 137 |
| RHN05 | 4 | 100 | B+2 5/8 | B+67 | 1/16 | 1.5 | 5 3/4 | 147 |
| RHN08<br>RHN10 | 5 1/2 | 140 | B+2 5/8 | B+67 | 1/16 | 1.5 | 6 3/8 | 162 |
| RHN15 | 8 | 200 | B+3 5/8 | B+67 | 1/16 | 1.5 | 7 3/8 | 187 |

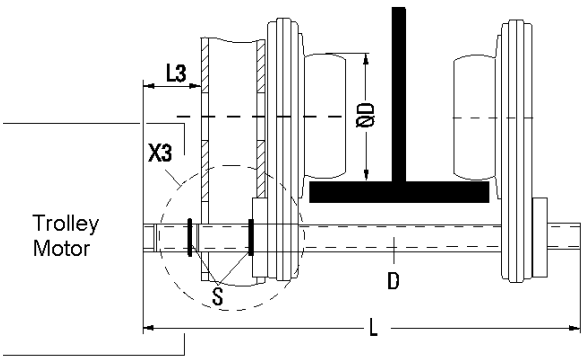



**Figure 3-8**

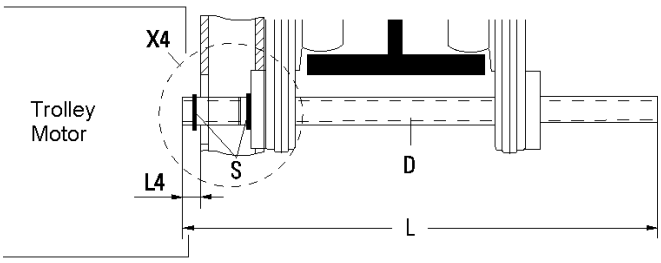



**Figure 3-9**

Table 3-2 Drive Shaft Length and Positions for Fig 3-8, 3-9 and 3-11

| Hoist | Beam Flange Width in. (mm) | Drive Shaft | | |
|---|---|---|---|---|
| | | Shaft Length "L" (mm) | Snap Ring Position "S" | |
| RHN02 RHN03 | 3.25-5.71 (82-145) | 15.35 (390) | X3 | |
| | 5.75-7.68 (146-195) | | | X4 |
| | 7.72-9.84 (196-250) | 19.49 (495) | X3 | |
| | 9.88-12.05 (251-306) | | | X4 |
| | 12.09-13.78 (307-350) | 23.43 (595) | X3 | |
| | 13.82-15.71 (351-399) | | | X4 |
| | 15.75-17.72 (400-450) | 27.36 (695) | X3 | |
| | 17.76-19.69 (451-500) | | | X4 |
| RHN05 | 3.63-5.71 (92-145) | 15.35 (390) | X3 | |
| | 5.75-7.68 (146-195) | | | X4 |
| | 7.72-9.84 (196-250) | 19.49 (495) | X3 | |
| | 9.88-12.05 (251-306) | | | X4 |
| | 12.09-13.78 (307-350) | 23.43 (595) | X3 | |
| | 13.82-15.71 (351-399) | | | X4 |
| | 15.75-17.72 (400-450) | 27.36 (695) | X3 | |
| | 17.76-19.69 (451-500) | | | X4 |
| RHN08 RHN10 | 4.63-7.87 (117-200) | 19.88 (505) | X3 | |
| | 7.91-12.20 (201-310) | | | X4 |
| | 12.24-15.75 (311-400) | 27.95 (695) | X3 | |
| | 15.79-19.69 (401-500) | | | X4 |
| RHN15 | 6.69-8.66 (170-220) | 20.08 (510) | See Figure 3-11 | |
| | 8.70-15.75 (221-400) | 29.13 (740) | | |
| | 15.79-19.69 (401-500) | 30.71 (780) | | |

| Table 3-3 L3 and L4 Dimensions from Fig 3-8 and 3-9 | | |
|---|---|---|
| Hoist | L3+/- 2 in. (mm) | L4+/-2 in. (mm) |
| RHN02, RHN03, RHN05 | 3.8 (96.4) | 1.82 (46.4) |
| RHN08, RHN10 | 4.9 (124.6) | 1.82 (46.4) |
| RHN15 | See Figure 3-11 | |

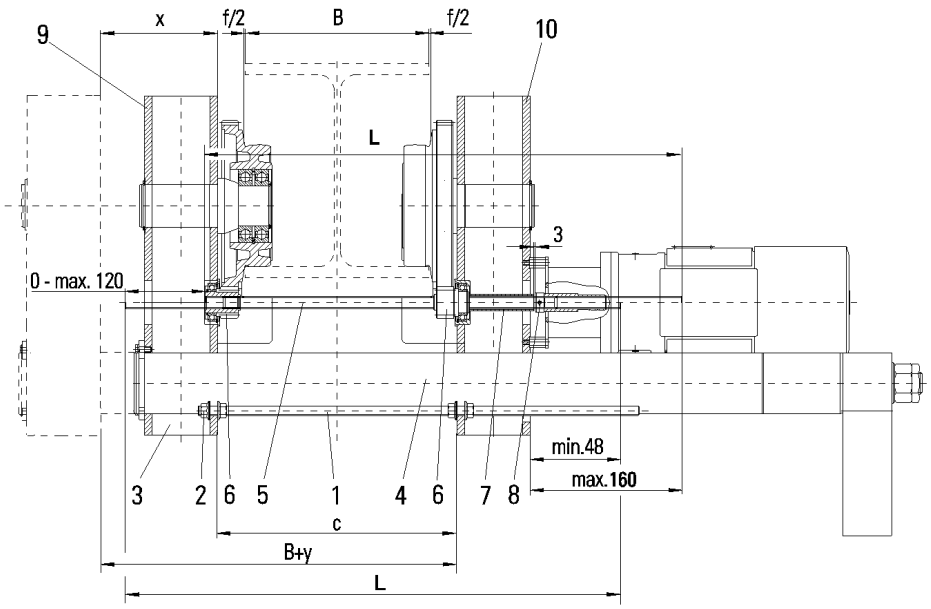



**Figure 3-11** Trolley Hoist Clearances 15 Ton

## 3.5 Electrical Connections

3.5.1 **⚠ CAUTION** Ensure that the voltage of the electric power supply is proper for the trolley hoist.

3.5.2 **⚠ CAUTION** Do NOT apply electronic soft-start control or voltage varying controls to the RHN lifting or traversing motors. Use of such devices may cause the motor brake and other electrical components to malfunction. For variable frequency drives contact Harrington for more information.

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

3.5.4 Installing Power Supply Cord

**1)** Refer to Figure 3-12, Figure 3-13 and the wiring diagram provided with the Hoist.

**2)** Remove Control Cover.

**3)** Loosen the cable fitting located on the lower side of the electrical enclosure and insert the Power Supply Cable. Pull through enough cable to reach the power supply terminal and securely tighten the cable fitting.

**4)** Connect the 3 phase power leads (L1, L2 and L3) and the ground lead of the Power Supply Cable to the power supply terminal. Make sure the terminals are securely tightened and each lead is completely isolated.

**5)** Replace the Control Cover. Be careful to not damage the seal or sealing surfaces and make sure to securely tighten all fasteners or latches.

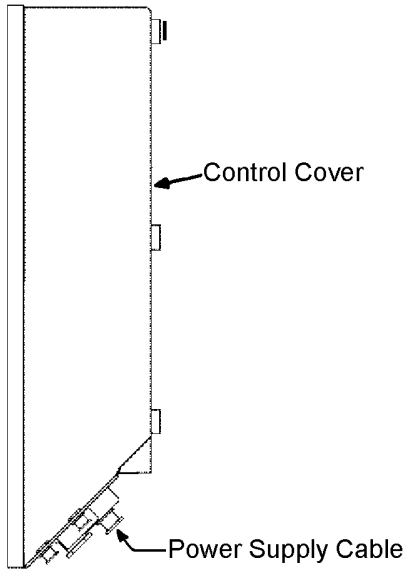



Figure 3-12

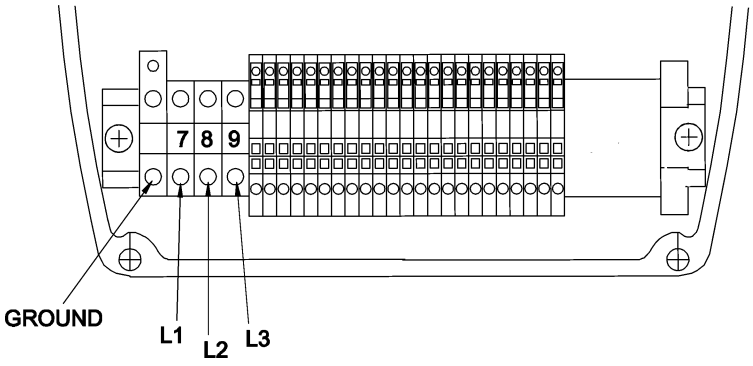



Figure 3-13

## 3.6 Pendant Installation

**1)** Refer to Figure 3-14, Figure 3-15 and the wiring diagram and the interconnection diagram provided with the Hoist.

**2)** Remove Control Cover.

**3)** Loosen the cable fitting located on the lower side of the electrical enclosure and insert the Pendant Cable. Pull through enough cable to reach the terminals then securely tighten the cable fitting.

**4)** Attach a strain relief cable or chain between the pendant and hoist. The cable should attach to the small plate located at the bottom of the electrical enclosure under the gear box.

**5)** Access to terminal strip: The terminal strip is mounted on DIN rail, located on the lower portion of the control box.

**6)** Connect the individual pendant leads to the correct terminals as shown on the interconnection diagram. Make sure the terminals are securely tightened and each lead is completely isolated.

**7)** Reinstall the Control Cover. Be careful to not to pinch any wires wire closing and tightening down the Control Cover.

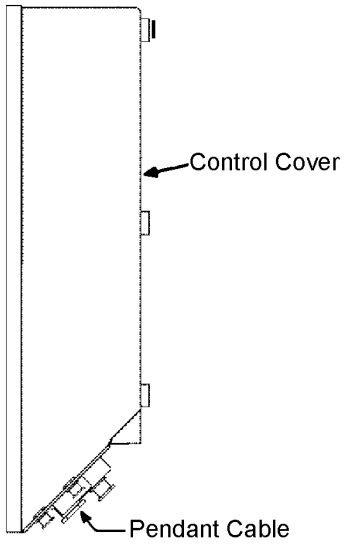



**Figure 3-14**

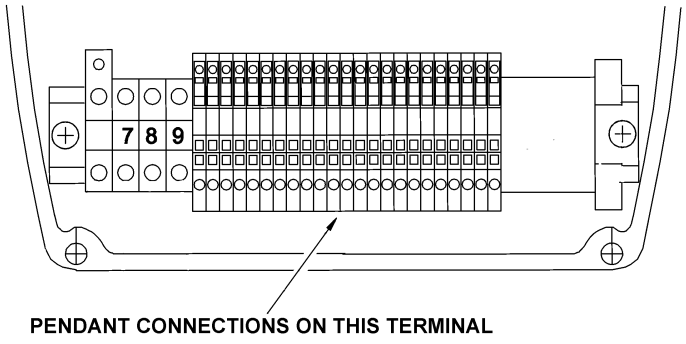



**Figure 3-15**

3.6.1 Connection to Electrical Power Source - The 3 power leads of the Power Supply Cable (normally red, white, and black wires) 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 3.9.4 for instructions on how to check for correct power supply phase connection.

3.6.2 Fuse/Breaker Capacity - The trolley and hoist's power supply should be equipped with overcurrent 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. For the total full load amperage draw, add the amperage draws shown on the motor nameplates of ALL lifting and traversing motors.

3.6.3 **⚠ 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. Do not paint the trolley wheel running surfaces of the beam as this can affect grounding.

## 3.7 RPU Load Monitor Device

The RHN hoist is equipped with the RPU Load Monitor Device. The RPU version (SLE21 or SLE22) is located on the front cover of the RPU unit. The main function of this device is to evaluate the load conditions of the hoist (overload protection, temperature monitoring of the hoist and trolley motors, and displaying the operating hours of the hoist.

3.7.1 Monitoring of Load Conditions – After powering up the hoist, the RPU will run through an internal test cycle, for approximately 4 seconds. The test will be finalized when the user initially operates the hoist in the up or down direction. At this time the "err" light will illuminate temporarely as well as the LEDs II and III. If the internal test cycle was completed successfully without resulting in error, the hoist will function.

3.7.2 Temperature Monitoring – The hoist and trolley motors are equipped with PTC thermistors that are directly linked to the RPU. If an excessive motor temperature condition has developed, the RPU will not allow the load to be lifted or lowered until the excessive temperature condition is no longer present. The LED display on the RPU will display and "err". See Table 7-2.

3.7.3 Count/Hour Meter – See section 6.1 for Count/Hour meter details.

3.7.4 Load Testing RHN – The RPU Load Monitoring device is designed to sense an overload of the hoist and cut-off power when subjected to a lifting load of 110% of the rated RHN capacity. Due to this load monitoring feature, a Crane Test function is used when conducting a load test of 125% of the rated capacity. The crane test function temporarily changes the overload cut-off from 110% rated capacity to 137.5% rated capacity. This temporary load test override for both RPU versions (SLE21 or SLE22) is accomplished by following the applicable instructions below:

**For Model SLE21:**

1. Remove RPU cover.
2. Press the S5 button, hold for more than 3 seconds, and release. (The S5 button is located directly below the red "err" LED). Figure 3-16.
3. Notice the "err" LED is flashing. This will continue to flash for 30 minutes. After 30 minutes, the RPU reboots and the overload cut-off returns to 110% of the rated capacity.

**For Model SLE22:**

1. Loosen the screw on the RPU cover and remove the cover.
2. Execute the following steps in less than 12 seconds:
   a. Press the S5 button for more than 3 seconds. (The S5 button is located directly below the red "err" LED). See Figure 3-16.
   b. Release the S5 button for 1 second.
   c. Press the S5 button for more than 3 seconds.
3. If an error occurs in the sequence of step 2, the "err" LED flashes 3 times. After this error signal, the crane test function can be activated again by following the sequence in step 2.
4. If the sequence in step 2 is followed correctly, then the "err" LED will flash for 30 minutes. After 30 minutes, the RPU reboots and the overload cut-off returns to 110% of the rated capacity.
5. To deactivate the crane test, either press the S5 button until the red LED no longer flashes or reboot the device.

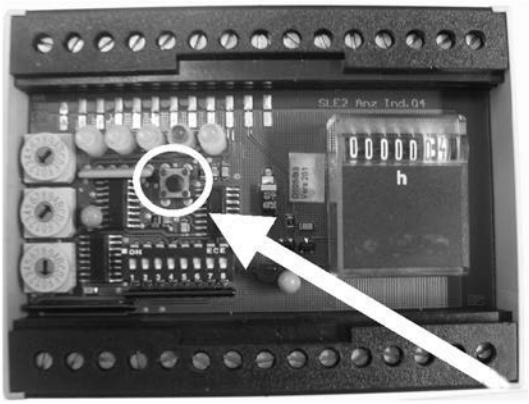


Figure 3-16

## 3.8 Hoist Limit Switches and Adjustment

The RHN wire rope hoist is equipped with a geared limit switch in the hoist control panel box. The limit switch is equipped with four switches, all of which are utilized for standard hoist functions. The four limit switch positions are as follows: S1 (Upper Safety Limit), S2 (Lower Limit), S3 (Upper Limit), and S4 (Speed Transition Limit).

The wire rope hoist is also equipped with a BLS (Block Limit Switch) as a standard feature.

3.8.1 Description and order of the limit switch function, including BLS as hook travels in the UP direction – See **Figure 3-17.**

**S4↑↑ (Speed Transition Geared Limit** ): As the hook travels in the up direction, the first switch position to activate will be S4↑↑. If the hoist is being operated in the up direction, high speed will be deactivated when the S4↑↑ switch is activated. The hoist will then remain in low speed until reaching the switch position S3↑(Upper Limit).

**S3↑** (**Upper Geared Limit**): When the S3↑switch position is activated, hook travel is disabled in the up direction. The hoist can still be operated in down direction.

**BLS↑** (**Block Operated Upper Limit Switch**): See also **Figure 3-19.**
In addition to the geared limit switch, there is also a block operated upper limit switch (BLS↑) installed on the hoist. The BLS↑ switch opens when the hook block lifts a weight and releases the tension from the cable that holds the switch in the closed position. The BLS↑ is adjusted so that the S3↑(Upper Geared Limit) switch position activates first and the BLS↑ second as a "back-up" safety.

**S1↑**(**Upper Safety Geared Limit**): In the event of a major malfunction where the upper limit switch (S3↑) and the block operated upper limit switch **(**BLS↑) are overrun, the S1↑switch position is activated and disables all directional movement and control. The only way to operate the hoist after the S1↑ switch has been activated is to eliminate the source of the problem and bridge (jumper) terminals 110 to 116 on the terminal strip located at the bottom of the hoist control panel box. **WARNING: If the S1 Geared Limit Switch position has been activated, a major malfunction has occurred. Therefore, the equipment should be inspected by a qualified individual before attempting to resume hoist operation.**

3.8.2 Description and order of the limit switch function as the hook travels in the DOWN direction – See **Figure 3-18.**

**S4↓↓(Speed Transition Geared Limit**): When the hook is located at the S3 (Upper Geared Limit) position, and moving in the down direction, the hoist will remain at low speed until the hook is below the

S4↓↓ location and the switch on the geared limit is no long activated. The hoist high speed function is now enabled and will function if high speed if desired by the operator.

**S2↓(Lower Geared Limit)**: When the S2 ↓switch position is activated, hook travel is disabled in the down direction. The hoist can still be operated in the up direction

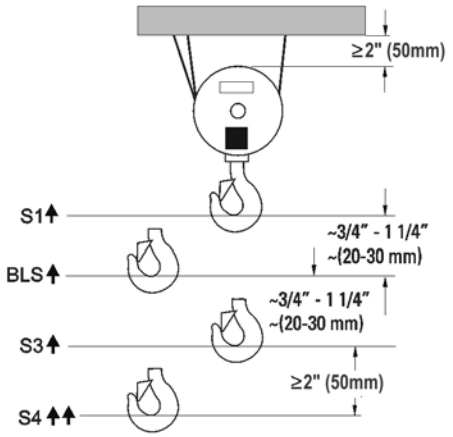



**Figure 3-17** Geared Limit Up Direction

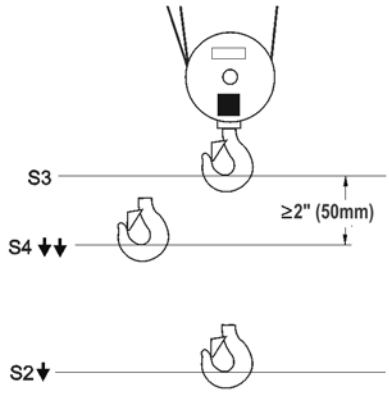



**Figure 3-18** Geared Limit Down Direction

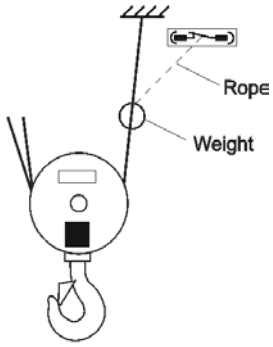



**Figure 3-19** Block Operated Limit Switch

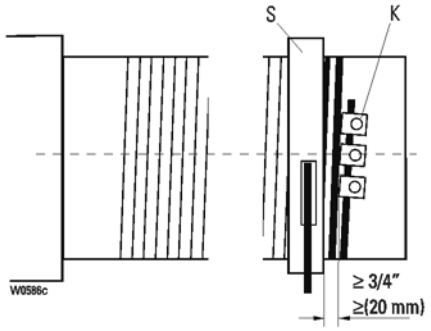



**Figure 3-20** Guide to Anchor Block Dimension

3.8.3 Testing the upper and lower limit switch, S3↑(Upper Geared Limit) and S2↓(Lower Geared Limit).

**1)** Test at high and low speed without load.

**2)** Activate the "up" button on the control pendant carefully, observing the hoisting motion, until the S3↑ upper geared limit switch disables hook motion in the up direction.

**3)** The upper geared limit switch S3↑ should activate before the BLS↑ limit switch. If this is not the case, reset the S3↑ limit switch according to Section 3.8.7

**4)** Observe that the distance between the top of the hook block and the next obstacle is greater than 3.5". This distance is the minimum clearance dimension (2") plus the minimum distance between S3↑ and BLS↑ (¾") plus the minimum distance between BLS↑ and S1↑ (¾"), see Figure 3-17. If the clearance dimension is less than 3.5", reset the upper limit switch, see Section 3.8.7.

**5)** Activate the "down" button on the control pendant carefully, observing the hoisting motion, until the S2↑ lower geared limit switch disables hook motion in the down direction.

**6)** Observe minimum clearance between rope guide (S) and the rope anchor clamps (K). There clearance between the should be equal to or greater than 3/4" (20mm), see Figure 3-17. If necessary, reset the lower limit switch, see Section 3.8.7

3.8.4 Testing the high to low and low to high speed transition limit switch, S4↑↑ and S4↓↓.

**1)** Activate the "up" button on the control pendant. Carefully observing the hoisting motion.

**2)** Ensure that the S4↑↑ (low speed transition limit), activates at least 2.0 in. (50mm) before the upper limit, S3↑, see Figure 3-17. This means that the hook motion should transition from high to low speed at least 2.0 in. (50mm) before the hook motion completely stops at S3↑.

**3)** Lower the hook block from S3↑ and ensure that the hook motion is at low speed until S4↓↓. Once switch S4↓↓ is no longer activated, the hoist will have the ability to run at high speed in the down direction see Figure 3-18**.**

**4)** Reset the limit switch if necessary, see Section 3.8.7.

3.8.5 Testing the S1↑(Safety Limit Switch)

The safety limit switch, S1↑, is tested at the factory and does not require on site testing. **If replacing the geared limit switch, consult the factory for proper adjustment.**

3.8.6 Testing the BLS↑ (Block Operated Limit Switch).

**⚠WARNING** The hoist is being operated while testing the BLS. Keep away from all moving parts to ensure your safety and the safety of others.

3.8.6.1 Lower the hook 2-3 feet below the S3↑ switching position.

3.8.6.2 Begin raising the hook at slow speed and manually lift the ball weight of the BLS that is located above the hook block. Lifting the weight removes the tension from the rope that is holding the switch closed. The hoist should be inoperable in the up direction as long as the switch remains open, but should be operable in the down direction.

3.8.6.3 Adjust the limit switch if necessary, see Section 3.8.7

3.8.7 Setting hoist limit switch (Figure 3-17, Figure 3-18, Figure 3-19, Figure 3-20, and Figure 3-21).

**1)** **⚠WARNING** The cover of the limit switch must be removed to set the contacts. This exposes live contact connections. There is a danger of contact with electrically live parts!

**2)** **⚠WARNING** The limit switch is state of the art construction and is safe in operation. However dangers may arise if it is used incorrectly and not for its intended purpose.

**3)** The limit switch can be adjusted at the setscrews (S1), (S2), (S3), and (S4) see **Figure 3-21.**

- Turning to the left: switching point is moved "downwards".

- Turning to the right: switching point is moved “upwards”.

**4)** Adjusting the gear limit switch

- All the cam discs can be moved together with the aid of the black setscrew (SO), Figure 3-21. The settings of the individual contacts relative to one another remain unchanged. The gear ratio inside the limit switch is very high and in some instances it might require many revolutions of the set screws to adjust the proper position.
- **Set the limit switch using a screwdriver and without using excessive force. Do not use a power screwdriver or similar tool.**
- Set the switching points in the following sequence:

  1. BLS↑ (**Set at Factory, only adjust if completely necessary**).
  2. S1↑ (**Set at factory, only adjust if installing a new limit switch**)
  3. S3↑
  4. S4↑↑
  5. S2↓

- The safety limit (S1↑), the block operated upper limit (BLS↑), the upper limit (S3↑), and the high to slow speed transition limit (S4↑↑) are all adjusted at the factory according to the procedure below. **The only limit that needs to be adjusted at “start-up” in the field is the lower limit S2↓.** The lower limit S2↓ should be set so the bottom block stops approximately 3” above the ground (load platform).

**5)** Block Operated Upper Limit, BLS↑

- Lift bottom hook block to a distance of >2 ¾ ” (55mm) from the top of the hook block to the bottom of the clearance object.
- If necessary, turn setscrew (S2) to the right beforehand.
- Set BLS rope length so that switch is activated in this position

**6)** Safety Limit, S1↑

- Raise bottom hook block until BLS is activated
- Turn setscrew (S1) to the left until contact S1↑ switches audibly
- Turn set screw (S1) back to the right approx. ½ turn.

**7)** Upper Limit, S3 ↑

- Raise bottom hook block until BLS is activated
- Turn set screw S3 to the left until contact S3 switches audibly
- Turn setscrew S3 approx. ½ turn to the left
- Lower and raise bottom hook block until S3↑ is activated

**8)** High to Low Speed Transition Limit, S4↑↑

- After the upper limit S3↑ has been activated, lower bottom hook block by at least 2.0in (50mm)
- Turn setscrew S4 to the left until contact S4 switches audibly
- Check disconnect by operating hoist in the ”up” direction point in high speed.

**9)** Lower Limit, S2↓

- Minimum clearance between rope guide (S) and rope anchorage clamps (K) should be equal to or greater than 3/4” (20mm)
- Set bottom hook position so that the bottom block does not touch the ground, approximately 3 inches above ground or platform level.(do not allow the formation of slack rope).
- Make sure there are at least 3 wraps of wire rope left on the drum when adjusting for the lowest hook position

- Lower bottom hook block to desired hook position, if necessary turn setscrew (S2) to the left before hand.
- Turn setscrew (S2) to the right until contact S2 switched audibly
- Check disconnect point

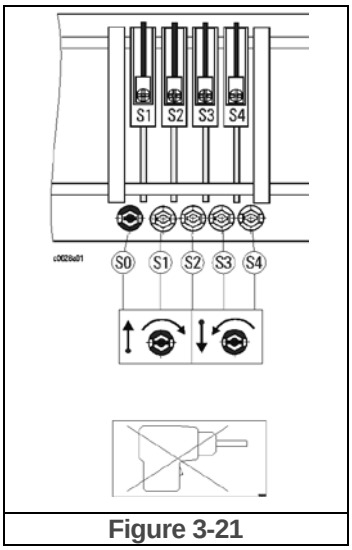



**Figure 3-21**

3.8.8 Servicing limit switch

- Maintenance work is restricted to checking the cut-off points. No maintenance or inspection is necessary for the gear limit switch itself
- Any dust deposits that may be visible when the housing is opened must on no account be removed with compressed air as this would force the dust into the contacts and impair the switching function
- **Benzene or other solvents MUST NOT be used to clean the limit switch!**

## 3.9 Pre-operational Checks and Trial Operation

3.9.1 Refer to the trolley hoist's nameplate and record the Product Code, and Serial Numbers in the space provided on the cover of this manual.

3.9.2 Perform pre-operational checks for the trolley hoist:

- **⚠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.
- **⚠WARNING** Verify and correct all wire rope irregularities prior to operating the hoist. Refer to Section 3.6.
- Measure and record the "k" dimension of the bottom hook on the hoist. See Table 5-5 under Section 5.
- Ensure that trolley is properly installed on the beam, and stops for the trolley are correctly positioned and securely installed on the beam.
- Ensure that all nuts, bolts and split pins (cotter pins) are sufficiently fastened.
- Pull down on the Pendant and ensure that the Cord Strain Relief Cable takes the force, not the Pendant Cord.
- **⚠ CAUTION** Check supply voltage before everyday use. If the voltage varies more than 10% of the rated value, electrical devices may not function normally.

3.9.3 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 (and trolley's) operation.

3.9.4 Proceed with trial operation to confirm proper operation.

- Verify that the controls agree with hoist direction. Make sure that depression of the Up button lifts the Bottom Block and depression of the Down button lowers the Bottom Block. If the Bottom Block does not move in the correct direction when the push buttons are pushed, the power supply is phased incorrectly. In this case, turn off the power source or breaker switch then reverse any two of the three wires at the power source. The hook will then move in accordance with the directions of the push button.
- Operate the trolley through its full range of motion. Make sure the trolley runs smoothly and does not bind. Check the power supply and festoon system for proper operation
- **NOTICE** Ensure that wire rope is not allowed to go "slack".
- Perform inspections per Section 5.3, "Frequent Inspections".

# 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 wire rope.
- **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 wire rope or repair damaged wire rope.
- Protect the hoist's wire rope 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 hoist's wire rope as a sling or wrap load wire rope around load.
- **NOT** apply the load to the tip of the hook or to the hook latch.
- **NOT** apply load unless the wire rope is properly seated in its grooves.
- **NOT** apply load if bearing prevents equal loading on all load-supporting wire ropes.
- **NOT** operate beyond the limits of the load wire rope travel.
- **NOT** leave load supported by the hoist unattended unless specific precautions have been taken.
- **NOT** allow the load wire rope or hook to be used as an electrical or welding ground.
- **NOT** allow the load wire rope 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 wire rope 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 and Trolley Controls

4.3.1 Dual Speed Pendant Control – Pendant controls supplied with dual speed trolley hoists have two-step control buttons. For low speed depress the button to the first step and for high speed depress the button fully to the second step. Use the Up button to raise the hoist's hook or the Down button to lower the hoist's hook as shown in Figure 4-1. Depress the Forward and Reverse buttons to move the trolley horizontally. To stop motion release the buttons.

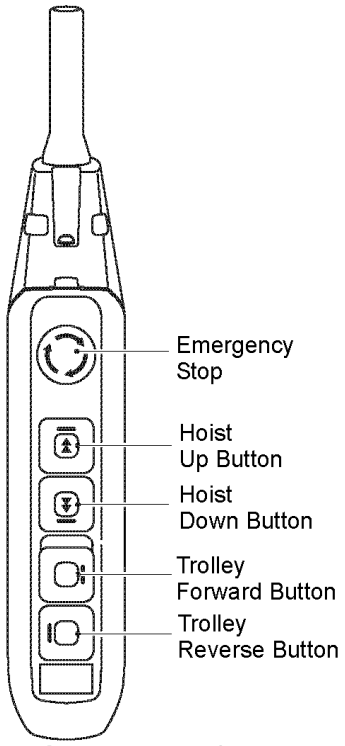



**Figure 4-1** Push Button Pendant Control

# 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 by the employer or employer's representative as being competent to perform the specific duties.

**Qualified Person** – a person who, by possession of a recognized degree in an applicable field, 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 that exceeds normal service.

**Severe Service** – that service which involves normal or heavy service with abnormal operating conditions.

## 5.2 Inspection Classification

5.2.1 The Initial Inspection –prior to initial use all new, re-installed, altered, or modified hoists/trolleys 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/trolleys 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 hoists/trolleys 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:

**Table 5-1 Frequent Inspection Intervals**

| Service | Hoist and Trolley Interval | Rope Inspection Interval |
|---|---|---|
| Normal Service | Monthly | Start of Every Shift |
| 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:

**Table 5-2 Periodic Inspection Intervals**

| Service | Hoist and Trolley Interval | Rope Inspection Interval |
|---|---|---|
| Normal Service | Yearly | 1) At Least monthly (per OSHA), AND<br>2) Determined by a qualified person and based on such factors as expected rope life as determined by experience on the particular or similar installations; severity of environment; percentage of capacity lifts; frequency rates of operation; and exposure to shock loads. Inspections need not be at equal calendar intervals and should be more frequent as the rope approaches the end of its useful life. (per ANSI B30.16-2.4.1) |
| 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 5-3, "Frequent Inspection." Included in these FREQUENT Inspections are observations made during operation for any defects or damage that might appear between Periodic Inspections. A designated person shall evaluate and resolve the results of FREQUENT Inspections such that the hoist/trolley is maintained in safe working condition.

**Table 5-3 Frequent Inspection**

| |
|---|
| All functional operating mechanisms for maladjustment and unusual sounds. |
| Hoist and trolley in accordance with ANSI/ASME B30.16 |
| Operation of all limit switches and associated components |
| Upper limit devices in accordance with ANSI/ASME B30.16 |
| Hoist/trolley braking system for proper operation |
| Hooks and hook latches in accordance with ANSI/ASME B30.10 |
| Hook latch operation |
| Wire rope in accordance with Section 5.7 |
| Wire rope reeving for compliance with Section 3.6 and 6.4 |
| Proper function of pendant controls. |

## 5.4 Periodic Inspection

5.4.1 Inspections should be made on a PERIODIC basis in accordance with Table 5-4, "Periodic Inspection." A designated person shall make evaluation and resolution of the results of PERIODIC Inspections such that the hoist is maintained in safe working condition.

5.4.2 For inspections where load suspension parts of the hoist/trolley are disassembled, a load test per ANSI/ASME B30.16 must be performed on the hoist/trolley after it is re-assembled and prior to its return to service.

| **Table 5-4 Periodic Inspection** |
|---|
| Requirements of frequent inspection. |
| Evidence of loose bolts, nuts, or rivets. |
| Evidence of worn, corroded, cracked, or distorted parts such as suspension bolts, mounting eye bolts, stirrup bolts, stiffening plate bolts, gears, pins, bearings, pins, rollers. |
| Evidence of worn or damaged hook block, hook, clevises, yokes, shafts, wire rope and wire rope attachments. |
| Evidence of damage to hook retaining nuts or collars and pins, and welds or rivets used to secure the retaining members. |
| Evidence of worn or damaged rope-drum, rope guide and pulleys (sheaves). |
| End connections of wire rope. |
| Evidence of damage or excessive wear of load and idler sheaves. |
| Evidence of excessive wear on hoist or trolley motor parts. |
| Evidence of excessive wear on hoist or trolley brake system parts. |
| Evidence of excessive wear or damage to trolley wheels, gears and guide rollers. |
| Evidence of damage to supporting structure or trolley, if used. |
| Evidence of stress cracks on trolley stirrup plate welds. |
| Electrical apparatus for signs of pitting or any deterioration of visible controller contacts and electrical components, such as, switches, contacts and pushbuttons. |
| Proper function of motion limit devices that interrupt power or cause a warning to be activated. |
| Proper function of load limiter device. |
| Evidence of damage to all cables, including festooned cables. |
| Function labels on pendant control stations for legibility. |
| Function, instruction and warning labels properly attached to the hoist/trolley and legible (see Section 1.2). |
| Verify proper lubrication of gears, rope drum, rope guide, rope, sheaves and all other parts requiring lubrication. |

## 5.5 Occasionally Used Hoists and Trolleys

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/trolley.

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

## 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 or trolley.

**Table 5-5 Hoist (and Trolley) 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. |
| Hoist Braking System Operation | Function | The brake disc (brake rotor) should not exceed the maximum permissible air gap (S) values listed in **Table 5-8**. | Replace as required (see **Section 6.3**). |
| Hook – Surface Condition | Visual | Should be free of significant rust; weld splatter, deep nicks, or gouges. | Replace. |
| Hook – Fretting wear | Measure | The "u" and "t" dimensions should not be less than discard value listed in **Table 5-6** | Replace. |
| Hook – Stretch | Measure | The "k" dimension should not be greater than 1.1 times that measured and recorded at the time of purchase (See **Section 3.9** and **Table 5-6)**. | Replace. |
| Hook – Bent Shank or Neck | Visual | Shank and neck portions of hook should be free of deformations. | Replace. |
| Hook Block 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. |
| Hook Block – 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. |

| Table 5-5 **Hoist (and Trolley) Inspection Methods and Criteria (continued)** | | | |
|---|---|---|---|
| **Item** | **Method** | **Criteria** | **Action** |
| Hook Block – Sheave(s) and Shaft | Visual, Function | Sheave(s) should be free of significant wear. Sheave surfaces should be free of nicks, gouges, dirt and grime. Bearing parts and surfaces of Sheave and Shaft should not show significant wear. Sheave should rotate freely with no roughness or significant free play. | Clean/lubricate, or replace as required. |
| Hook – 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. |
| Hoist – Housing and Mechanical Components | Visual, Auditory, Vibration, Function | Hoist components including load blocks, suspension housing, wire rope 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 |
| Trolley – Housing and Mechanical Components | Visual, Auditory, Vibration, Function | Trolley components including load bars, trolley wheels, trolley wheel axles, eye bolts, hex shafts, gears, bearings, pins, rollers, and bumpers 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. |
| Bolts, Nuts and Rivets | Visual | Bolts, nuts and rivets should not be loose. | Tighten or replace as required. |
| Wire Rope Wedge | Visual | The fixing (anchorage with wedge) must be replaced if it shows deformation, wear, cuts, or necking. | Replace |
| Wire Rope Drum | Visual, Function | Entire surface of the drum should be coated with lubricant and should be free of dirt and grime. Rope should fit in drum grooves. | Clean/lubricate (see **Section 6.2**). |
| Wire Rope Guide | Visual, Function | Rope Guide should be free of significant wear, cracks, nicks, gouges, dirt and grime. Rope Guide should take up rope play and move with the rope on the drum during rope unwinding and winding. | Replace |
| Wire Rope – Reeving | Visual | The wire rope should be reeved properly through Hook Block Sheave (and Crossbar Sheave for 4/1hoist) – refer to **Section 6.6**. Wire rope should be installed properly – refer to **Section 6.5**. | Reeve/Install properly. |

**Table 5-5 Hoist (and Trolley) Inspection Methods and Criteria (continued)**

| Item | Method | Criteria | Action |
|---|---|---|---|
| | | **⚠WARNING** The full length of the Wire Rope must be inspected for rope diameter, broken strands or wires, and condition. The rope must be free of load for testing to detect any broken wires when bending the rope by hand (especially by radius of rope sheeve). Special care should be taken when inspecting sections of rapid deteriation, such as the following:<br>▪ sections in contact with saddles, equalizer sheaves, or other sheaves where the rope travel is limited;<br>▪ sections of the rope at or near terminal ends where corroded or broken wires may protrude;<br>▪ sections subject to reverse bends;<br>▪ sections of rope that are normally hidden during visual inspection, such as parts passing over sheaves.<br>**⚠WARNING** In certain applications (constant deadweight, recurrent stopping position, automatic operation, etc.) wire fractures may occur inside the rope without being visible from outside.<br>Any condition that could degrade the strength and performance of the wire rope must be reported to a qualified person for evaluation and disposition. | |
| | Wire Rope Diameter | Measure, Visual | Any reduction in the diameter of the wire rope must not be reduced due to corrosion, wear or core collapse more than the discard value in **Table 5-7**. The outer wires should not be worn more than 10% of their original diameter. | Replace. Inspect drum and all sheaves. |
| | Wire Rope – Broken Wires or Strands | Visual | The wire rope should be inspected for broken wires or strands, paying close attention to end connection and sections that frequently pass over sheaves. The rope must NOT have:<br>▪ More than the Maximum number of broken wires listed in **Table 5-7**.<br>▪ More than 4 broken wires in 1 strand in one lay (one full revolution of a strand around the rope).<br>▪ Any broken strands. | Replace |
| | Wire Rope – Condition | Visual | ▪ Any wire rope deformation with permanent bends, flattening, unraveling, birdcaging, etc.<br>▪ General corrosion.<br>▪ Rope core exposure.<br>▪ One or more loose or protruding strands or wires from rope.<br>▪ Severely corroded or broken wires at end connections.<br>▪ Severely corroded, cracked, bent, worn or improperly applied end connections<br>▪ Any evidence of heat damage of any kind. (Wire rope exhibits any heat discoloration or localized loss of lubrication). | Replace |

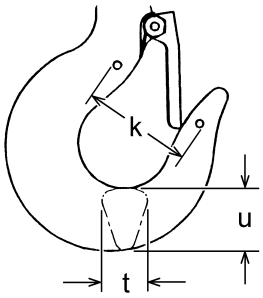
| Table 5-5 Hoist (and Trolley) Inspection Methods and Criteria (continued) | | | | |
|---|---|---|---|---|
| **Item** | | **Method** | **Criteria** | **Action** |
| | Wire Rope - Twisting | Visual | ▪ Run the hoist into the highest and lowest hook positions without load.<br>▪ If any twisting is detected , untwist the rope immediately. See Section 6.6 "Reeving and Adjustments" and Section 6.5 "Wire Rope Removal"<br>▪ Inspect the condition of the rope (especially near pulleys and rope anchorage. See Table 5-5 "Wire Rope- Condition", "Wire Rope – Diameter", "Wire Rope-Broken Wires or Strands") | Replace as required. |
| | Wire Rope - Lubrication | Visual | The wire rope must be maintained in a clean and well lubricated condition. | Clean/lubricate (see **Section 6.2**). |
| Trolley Side Plates | | Visual | Must be free of significant deformation | Replace |
| Trolley Wheel – Condition | | Visual | Trolley Wheel should be free of significant wear, cracks, nicks and gouges. | Replace. |
| Trolley Wheel – Tread | | Visual, Measure | The diameter and width of the tread surface should not be less than the values listed in **Table 5-10**. The diameter should not be less than 5% of its original diameter as new. | Replace. |
| Trolley Wheel – Gear | | Visual | Teeth should not be cracked, damaged, or excessively worn. | Replace. |
| Load Bar | | Visual, Measure | Load Bar should be free of significant wear, cracks, nicks and gouges. Load Bar should not be bent. | Replace. |
| Trolley Motor Brake | | Visual | Braking action should not be overly abrupt and should not allow excessive drift. The brake disc (brake rotor) should not exceed the maximum permissible air gap (S) values listed in **Table 5-11.** | Replace. |
| Contactor Contacts | | Visual | Contacts should be free of significant pitting or deterioration. | Replace. |
| Sheaves | | Visual | Sheave should be free of significant wear. The wall thickness, t, should not be less than the "t min" values in **Table 5-9**. The groove depth, h, should not be greater than the "h max" values listed in **Table 5-9**. They should also be checked for easy running, indicating that the ball bearings are in good condition. | Replace. |
| Pendant – Switches | | 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 energizing of circuits for opposing motions (e.g. up and down, forward and reverse). | Repair or replace as necessary. |

| Table 5-5 Hoist (and Trolley) Inspection Methods and Criteria (continued) | | | |
|---|---|---|---|
| **Item** | **Method** | **Criteria** | **Action** |
| Pendant - Housing | Visual | Pendant housing should be free of cracks and mating surfaces of parts should seal without gaps. | Replace |
| Pendant - Wiring | Visual | Wire connections to switches in pendant should not be loose or damaged. | Tighten or repair |
| Pendant and Power Cords | 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 the entire 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 **Section 1.2**) 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 5-6 Bottom Hook Dimensions**

**k Measured When New*:**

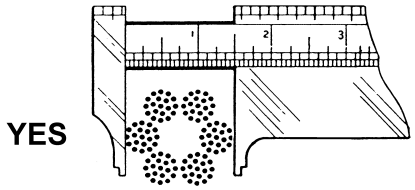
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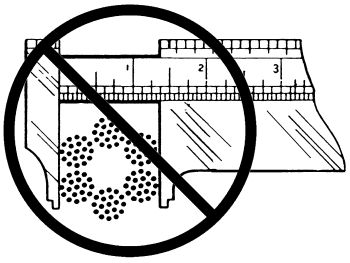

| Hook Capacity Code | (u) Dimension inch (mm) | | (t) Dimension inch (mm) | |
|---|---|---|---|---|
| | **Standard** | **Discard** | **Standard** | **Discard** |
| RHN02(D/U) | 1.89 (48) | 1.80 (45.6) | 1.50 (38) | 1.42 (36.1) |
| RHN03(D/U) | 1.89 (48) | 1.80 (45.6) | 1.50 (38) | 1.42 (36.1) |
| RHN05(D/U) | 2.28 (58) | 2.17 (55.1) | 1.77 (45) | 1.68 (42.75) |
| RHN08(D/U) | 2.64 (67) | 2.51 (63.65) | 2.09 (53) | 1.98 (50.35) |
| RHN10(D/U) | 2.64 (67) | 2.51 (63.65) | 2.09 (53) | 1.98 (50.35) |
| RHN15U | 3.35 (85) | 3.18 (80.75) | 2.64 (67) | 2.51 (63.65) |
| RHN15D | 4.17 (106) | 3.96 (100.7) | 3.35 (85) | 3.18 (80.75) |
| RHN20D | 4.17 (106) | 3.96 (100.7) | 3.35 (85) | 3.18 (80.75) |

* 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”.

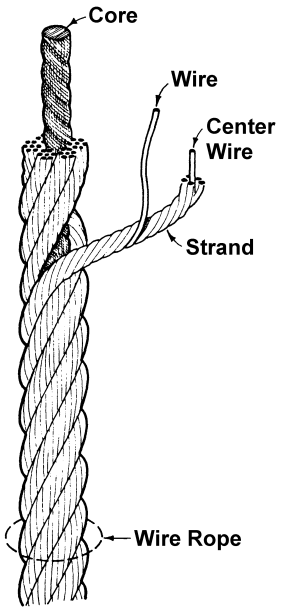
## Table 5-7 Wire Rope Wear Dimensions



YES

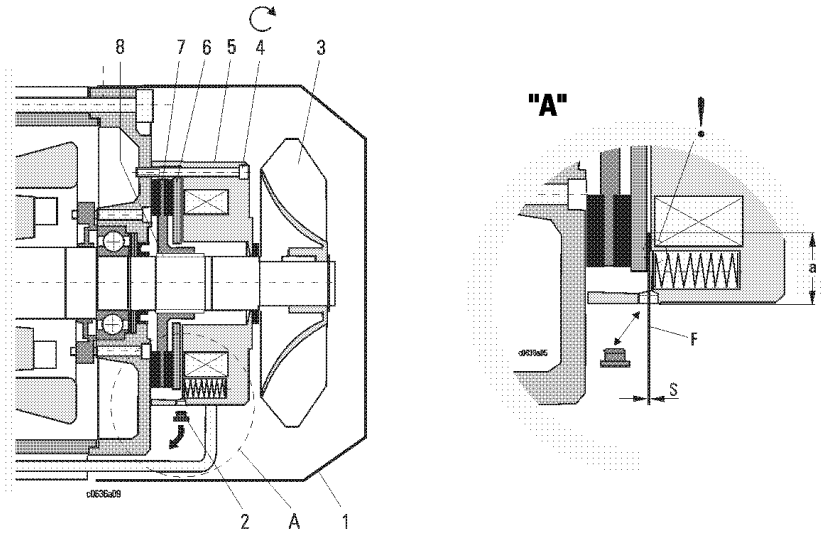


NO




| Hoist Capacity (tons) | Rope Diameter | | | Maximum Allowable Number of Broken Wires | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Rope Diameter (mm) | For 6xDia. Length | | For 30xDia. Length | |
| | Standard (mm) | Discard (mm) | Discard (in) | | No. Broken Wires | Length in. (mm) | No. Broken Wires | Length in. (mm) |
| RHN02(D/U) | 7 | 6.3 | 0.25 | 7 | 13 | 1.65 (42) | 26 | 8.27 (210) |
| RHN03(D/U) | 7 | 6.3 | 0.25 | 7 | 13 | 1.65 (42) | 26 | 8.27 (210) |
| RHN05(D/U) | 9 | 8.1 | 0.32 | 9 | 13 | 2.13 (54) | 26 | 10.63 (270) |
| RHN08(D/U) | 12.5 | 11.25 | 0.44 | 12.5 | 13 | 2.95 (75) | 26 | 14.76 (375) |
| RHN10(D/U) | 12.5 | 11.25 | 0.44 | 12.5 | 13 | 2.95 (75) | 26 | 14.76 (375) |
| RHN 15U | 14 | 12.6 | 0.50 | 14 | 6 | 3.31 (84) | 13 | 16.54 (420) |
| RHN 15D | 20 | 18 | 0.71 | 20 | 24 | 4.72 (120) | 48 | 23.62 (600) |
| RHN 20D | 20 | 18 | 0.71 | 20 | 24 | 4.72 (120) | 48 | 23.62 (600) |

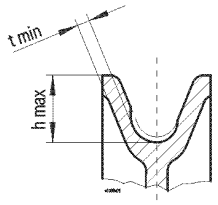
**Table 5-8 - Hoist Motor Brake**



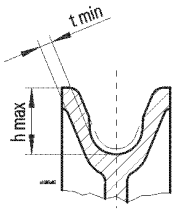

| Hoist Capacity Code | Motor Type | S max. in. (mm) | a in. (mm) | Screw Torque ft-lbs (Nm) |
|---|---|---|---|---|
| RHN02(D/U) | Dual speed | .031 (0.8) | .98 (25) | 6.6 (9) |
| RHN03(D/U) | Dual speed | .031 (0.8) | .98 (25) | 6.6 (9) |
| RHN05(D/U) | Dual speed | .035 (0.9) | .98 (25) | 6.6 (9) |
| RHN08(D/U) | Dual speed | .071 (1.8) | 1.18 (30) | 16 (22) |
| RHN10(D/U) | Dual speed | .071 (1.8) | 1.18 (30) | 16 (22) |
| RHN15U | Dual speed | .071 (1.8) | 1.18 (30) | 16 (22) |
| RHN15D | Dual speed | .071 (1.8) | 1.18 (30) | 16 (22) |
| RHN20D | Dual speed | .071 (1.8) | 1.18 (30) | 16 (22) |

**Table 5-9 Rope Sheave Dimensions**

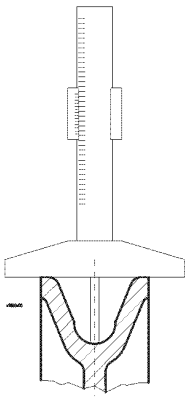
on one side and at base



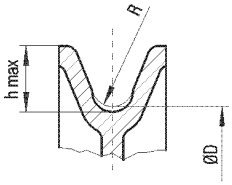

on both sides and at base



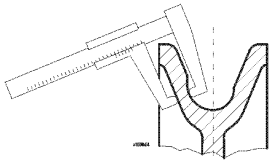

Measuring depth of base of groove with depth gauge



on both sides and at base

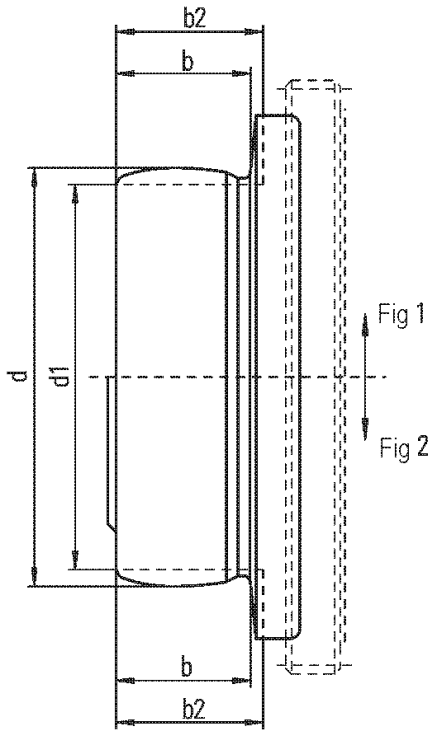



Measuring thickness of wall with special caliper gauge



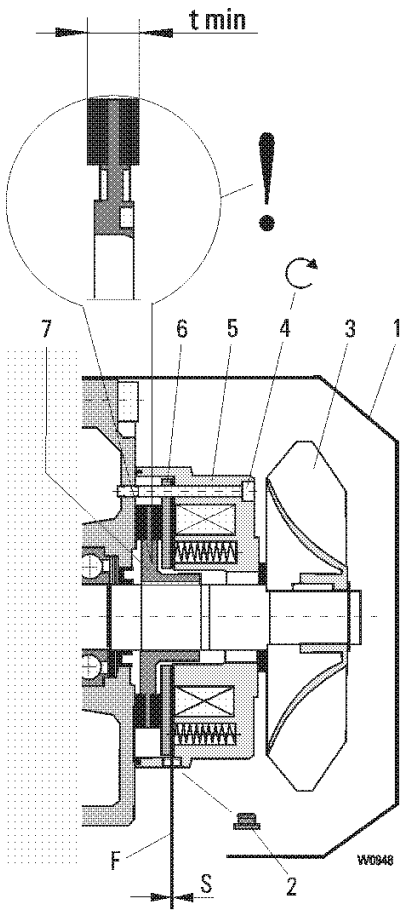
| Part Number | Diameter (mm) | t min in. (mm) | h max in. (mm) | h new in. (mm) |
|---|---|---|---|---|
| RHN0032 | 125 | 0.16 (4) | 0.55 (14) | 0.47 (12) |
| RHN0129 | 160 | 0.16 (4) | 0.75 (19) | 0.65 (16.5) |
| RHN0191 | 225 | 0.22 (5.5) | 0.94 (24) | 0.83 (21) |
| RHN0327 | 250 | 0.22 (5.5) | 1.10 (28) | 0.98 (25) |
| RHN0260 | 375 | 0.26 (6.5) | 1.48 (37.5) | 1.34 (34) |

**Table 5-10 Wheel Dimensions**




| Hoist Capacity Code | Fig. | Nominal value | | Limit for wear | |
|---|---|---|---|---|---|
| | | d in. (mm) | b in. (mm) | d1 in. (mm) | b2 in. (mm) |
| RHN02 RHN03 | 1 | 3.15 (80) | 1.08 (27.5) | 2.99 (76) | 1.16 (29.5) |
| RHN05 | 1 | 3.94 (100) | 1.30 (33) | 3.74 (95) | 1.38 (35) |
| RHN08 RHN10 | 1 | 5.51 (140) | 1.75 (44.5) | 5.24 (133) | 1.85 (47) |
| | 2 | | 1.67 (42.5) | | 1.77 (45) |
| RHN15U | 2 | 7.87 (200) | 1.67 (42.5) | 7.48 (190) | 1.77 (45) |

**Table 5-11- Travel Motor Brake**




| Hoist Capacity Code | Motor Type | Motor Speed (fpm) | S min. in. (mm) | S max. in. (mm) | t in. (mm) | Screw Torque ft-lbs (Nm) |
|---|---|---|---|---|---|---|
| RHN02U | Dual speed | 80/20 | .008 (0.2) | .079 (2.0) | .22 (5.7) | 2.2 (3) |
| RHN03U | Dual speed | 80/20 | .008 (0.2) | .079 (2.0) | .22 (5.7) | 2.2 (3) |
| RHN05U | Dual speed | 80/20 | .008 (0.2) | .079 (2.0) | .22 (5.7) | 2.2 (3) |
| RHN08U | Dual speed | 80/20 | .008 (0.2) | .063 (1.6) | .24 (6.1) | 2.2 (3) |
| RHN10U | Dual speed | 80/20 | .008 (0.2) | .063 (1.6) | .24 (6.1) | 2.2 (3) |
| RHN15U | Dual speed | 80/20 | .012 (0.3) | .079 (2.0) | .35 (8.8) | 7.4 (10) |

# 6.0 Maintenance and Handling

## 6.1 Hour Meter

The RHN Hoist is equipped with a Counter, located on the face of the RPU Load Monitor Device. This counter registers and displays the total operating hours of the hoist (See Figure 6-1).

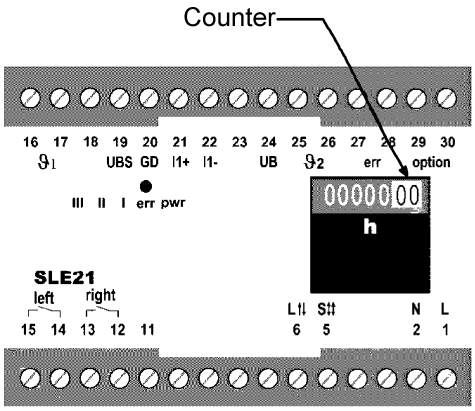



**Figure 6-1** Hour Meter

## 6.2 Lubrication

6.2.1 Wire Rope:

- For proper performance the Wire Rope must be maintained in a clean and well lubricated condition.
- The rope should be lubricated every 3 months (more frequently for heavier usage or severe conditions).
- To lubricate the rope, first remove any dirt, grime, moisture or other accumulations of contaminates. Then coat the Wire Rope with grease in Table 6-1. Ensure that the lubricant is applied to the entire surface of the rope over its entire length.

6.2.2 Wire Rope Drum, Hook Block and Sheaves:

- The drum and hook block should be lubricated every 3 months (more frequently for heavier usage or severe conditions).
- Lubricate the Drum, Hook Block and Sheaves with grease in Table 6-1.

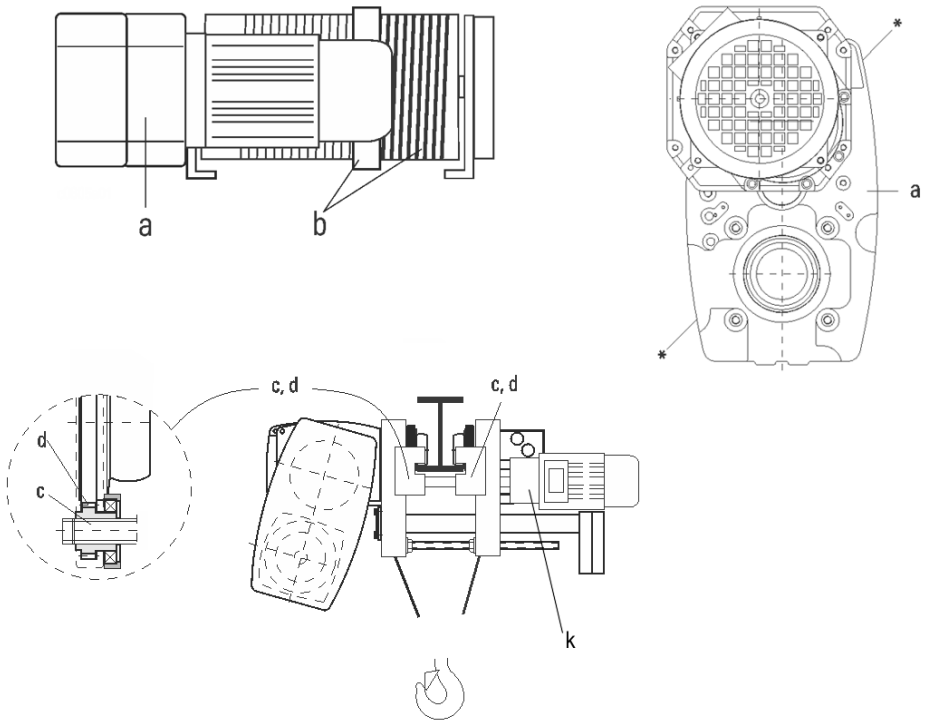
6.2.3 Trolley Wheels and Gears:

- The Trolley Wheels and Gears should be lubricated every 3 months (more frequently for heavier usage or severe conditions).
- Lubricate the Trolley Wheels and Gears with grease in Table 6-1.

6.2.4 Hoist and Trolley Gearboxes – The hoist and trolley gearboxes are lubricated for life and should not need any lubricant replacement.

- If necessary, replace according to Table 6-1.

Table 6-1




| Lubrication Point | | Type of Lubricant | Quantity of Lubricant<br>Oil - US quarts (ml)<br>Grease - Ounces (g) | | Characteristics, Makes | |
|---|---|---|---|---|---|---|
| a | Hoist Gear Box | Oil | RHN02, RHN03 | 1.7 (1500) | 1 | 1 Viscosity: 460 /s/40°C (220/s/40°C), pour point: -20°C (-40°C) flash point: +265°C (+320°C), e.g.: Fuchs Renolin CLP 460[2], Aral Degol BG 460,BP Energol GR-XP 460, Esso Spartan EP 460, Mobil Gear 634, Tribol 1100/460, (Shell Tivela Oil WB)<br>2 Soap base: Lithium + MoS2, dripping point: approx. 185°C penetration: 310-340, operating temperature: -20°to +120°C e.g.: Aralub PMD1[2], BP Multi-purpose Grease L21M, Esso Multi-purpose Grease M, Mobilith SHC 460, Shell Retinax AM, STABYL L-TS 1 Mo<br>3 Soap base: Synthetic (lithium), dripping point: approx 150°C penetration: 400-430 (400-430), operating temperature: -20°to +80°C (-35°to +130°C), e.g.: Aralub FDP00, BP Energrease HT-00 EP, Esso Liquid Gear Grease, Shell Special, Gear grease H[2], Mobilux Liquid grease EP 004, (Tivela Compound A)<br>4 Soap base: Lithium + MoS2 (Synthetic + lithium), dripping point: approx. +180°C, penetration: 355-385 (400-430), operating temperature: -30°to +120°C (-35°to +130°C), e.g.: Aralub LFZ 0, Renolit FLM 0[2], Tribol Molub-Aloy MPG 00, (Tivela Compound A)<br>5 Soap base: Lithium, dripping point: approx. +170°C (+260°), penetration: 220-250 (265-290), operating temperature: -20°to +120°C (-40°to + 120°C), e.g.: Aralub HL3, BP Energrease RBB3, ESSO Roller Bearing Grease Andak C AC 205, Mobilux 3[2] (Mobil Mobilgrease 28)<br>6 Soap base: Lithium + MoS2, dripping point: ca. +180°C, penetration: 355-385, operating temperature: -30°to +130°C, e.g.: Aral Grease P64037[2], Aralub PMD0, Tribol Molub-Aloy Multi-purpose grease |
| | | | RHN05 | 2.1 (2000) | | |
| | | | RHN08,RHN10 | 6.3 (6000) | | |
| | | | RHN15, RHN20 | 16.9 (16000)<br>19 (18000)[1] | | |
| b | Rope/Rope Guide/Drum | Grease | All Models | 21-88 (600-2500) | 3 | |
| c | Drive Shaft | Grease | All Models | 3.5 (100) | 2 | |
| d | Pinion | Grease | All Models | 18-35 (500-1000) | 5 | |
| k | Trolley Gear Box | Grease | RHN02U-RHN05U | 3.5 (100) | 6 | |
| | | | RHN08U-RHN15U | 7.1 (200) | | |

* - Oil filling/oil drainage screw. Depending on the installation position of gear, the filling screw is “at the top” and the drainage screw is “at the bottom.”

1 - If motor at top

2 – Factory filled

## 6.3 Hoist Motor Brake

6.3.1 To keep your hoist working in optimum condition and prevent possible down time, it is recommended to check your motor brake at regular intervals. Intervals must be adapted in accordance with the application.

6.3.2 **⚠ DANGER** Before proceeding, ensure that the electrical supply for the hoist or trolley has been de-energized (disconnected). Lock out and tag out in accordance with ANSI Z244.1 “Personnel Protection –Lockout/Tagout of Energy Sources”. The hoist must be unloaded and the bottom hook block set down.

6.3.3 Motor Brake Check:

**1)** Remove fan cover (1). See **Figure 6-1**.

**2)** Remove plug (2). See **Figure 6-1**.

**3)** Measure air gap (S) with feeler gauge (F). When measuring, ensure that the feeler gauge is pushed in at least as far as depth "a" and does not catch on shoulder. See **Table 5-8** for max. permissible air gap (S). See **Figure 6-2**.

**4)** The brake is not adjustable. If the max. permissible air gap (S) has been reached, the brake disc (brake rotor)must be replaced. See **Figure 6-2**.

6.3.4 Brake Rotor Replacement - See **Figure 6-1**.

**1)** Remove fan cover (1).

**2)** Pull off fan wheel (3), remove feather key

**3)** Disconnect brake

**4)** Unscrew fixing screws (4)

**5)** Remove magnet piece (5) together with armature disc (6)

**6)** Remove brake disc (brake rotor) (7)

**7)** Clean brake (wear a dust protection mask)

**8)** Check friction surfaces for wear

**9)** Push new brake disc (brake rotor) (7) onto hub (8) and check radial play. If there is increased play in the gearing between brake disc (7) and hub (8) the hub (8) must be pulled off the motor shaft and replaced.

**10)** **⚠ CAUTION** Danger of damage - Always contact the manufacturer before removing the hub (8).

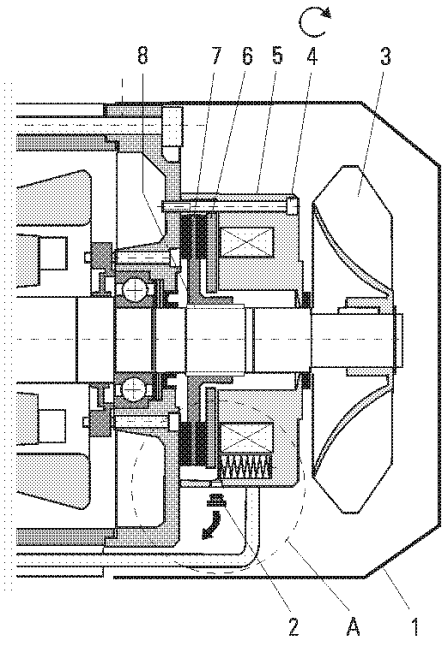



Figure 6-1

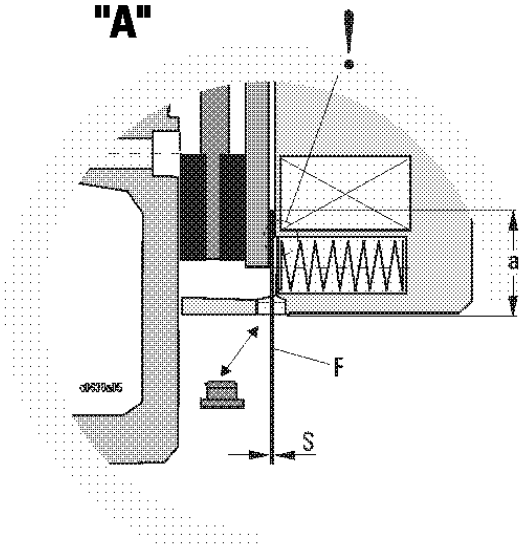



Figure 6-2

6.3.5 Motor Brake Re-assembly – Reassemble the parts in reverse order of removal. Ensure that the check hole for measuring the air gap is underneath. Observe tightening torques in **Table 5-8**.

## 6.4 Trolley Motor Brake

6.4.1 To keep your hoist working in optimum condition and prevent possible down time, it is recommended to check your motor brake at regular intervals. Intervals must be adapted in accordance with the application.

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

6.4.3 Motor brake Check - See **Figure 6-3**.

1) Move carriage into a safe position
2) Remove fan cover (1)
3) Remove plug (2)
4) Measure air gap (S) with feeler gauge (F). See **Table 5-11** for max. permissible air gap (S).
5) The travel motor brake needs no adjustment. If the max. permissible air gap (S) has been reached, the brake disc (brake rotor) must be replaced.

6.4.4 Brake Rotor Replacement - See **Figure 6-3**.

1) Remove fan cover (1)
2) Pull off fan wheel (3), remove feather key
3) Disconnect brake
4) Unscrew fixing screws (4)
5) Remove magnet piece (5) together with armature disc (6)
6) Remove brake disc (brake rotor) (7).

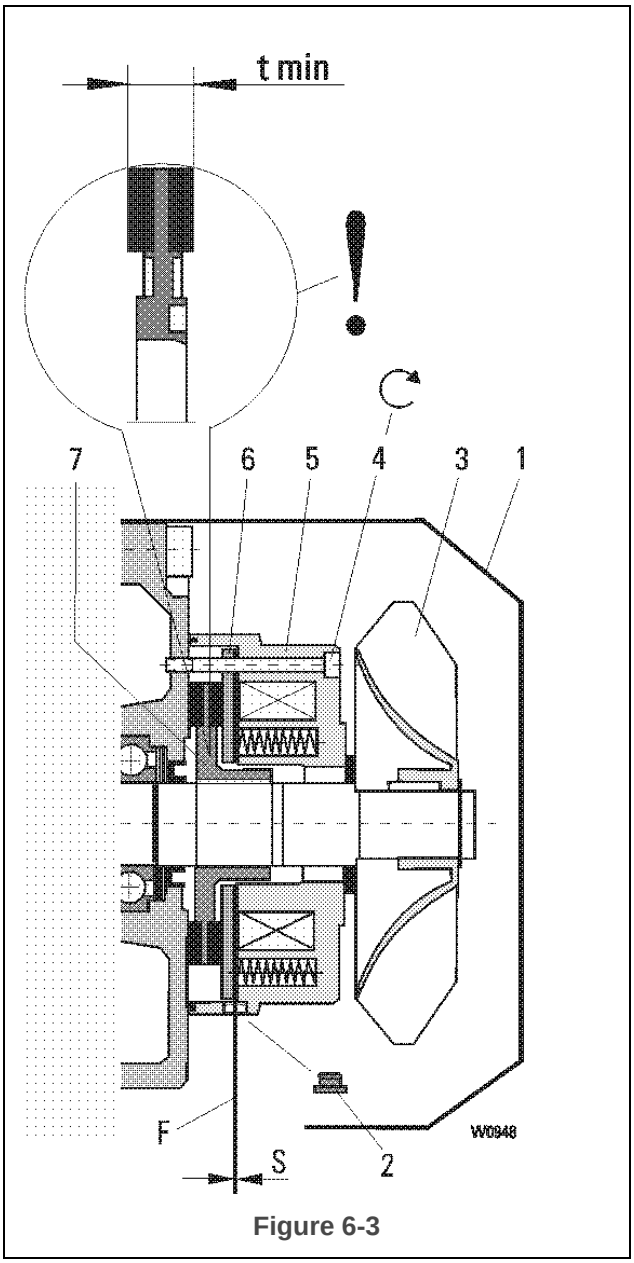



**Figure 6-3**

6.4.5 Motor brake reassembly – Reassemble the parts in reverse order of removal. Ensure that the check hole for measuring the air gap is underneath. Observe tightening torques in Table 5-11.

## 6.5 Wire Rope

6.5.1 Lubrication and Cleaning – Refer to Section 6-2.

6.5.2 **⚠WARNING** Be certain that the replacement wire rope is obtained from Harrington Hoists, Inc. and is the correct wire rope for the hoist. See factory certificate for part number of rope. Rope must be replaced as required by DIN 15020, FEM 9.661 and ISO 4309. If the wire rope is being replaced due to damage or wear out, destroy the old rope to prevent its reuse.

6.5.3 After commissioning a new wire rope hoist, or after replacing the rope, the rope of multi-fall hoists may twist. This can be seen from the bottom hook block turning, particularly when unloaded.

**⚠WARNING** Twisting in the rope prejudices safety and service life. Remove any twists!

Regularly inspect the rope for twisting and follow the procedure in Table 5-5 "Wire Rope-Twisting" and other corresponding Wire Rope sections in Table 5-5.

6.5.4 Wire Rope Removal/Rope Guide Replacement

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

**2)** **⚠ CAUTION** When replacing Wire Rope, check for wear on mating parts, i.e. Drum, Sheaves, Hook Block Sheaves and replace if necessary.

**3)** Lower the Hook Block to the lowest possible position without touching the floor or ground.

**4)** Remove the Wire Rope Clamp (G) and loosen the Wire Rope until the Terminal Wedge (H) can be removed from the Anchorage Assembly (F) (see Figure 6-4).

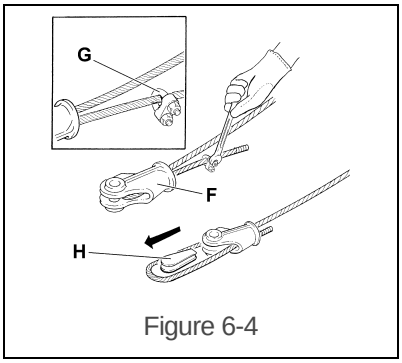


Figure 6-4

**5)** Remove (unreeve) the Wire Rope from the Bottom Block and all Sheaves.

**6)** Remove the rope guide

- Unscrew protective plate (1) under the rope drum at points (a). The rope guide can then be rotated freely. For RHN02-RHN10 models see Figure 6-5 ; for RHN15 & RHN20 models see Fig 6-6.
- **⚠WARNING** Danger of bodily injury or material damage - Do not unscrew stop with bearing (2)! The stop with bearing (2) is locked with a conical spring washer. This must be refitted correctly. See Figure 6-5.
- Unscrew screws (3). See Figure 6-7.
- Remove half-rings.
- Unhook rope tensioning spring.

**7)** Unscrew the fixing screws in the clamping plates on the rope drum (see Figure 6-8)

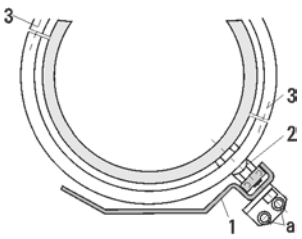



Figure 6-5




Fig 6-6

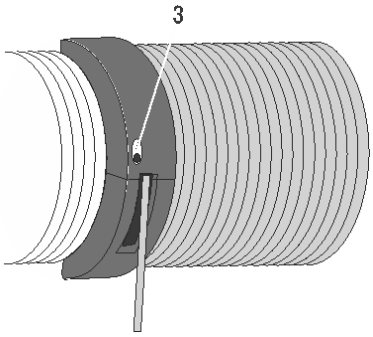



Figure 6-7

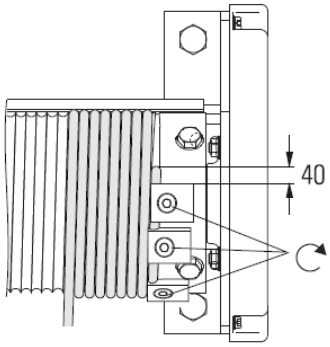



Figure 6-8

6.5.5 Wire Rope Installation/Rope Guide Installation

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

**2)** **⚠ CAUTION** When replacing Wire Rope, check for wear on mating parts, i.e. Drum, Sheaves, Hook Block Sheaves, and replace if necessary.

**3)** **⚠ WARNING** ALWAYS unwind the roll of the new Wire Rope without kinks or bends (see Figure 6-9). Protect the rope from dirt.

**4)** Examine the Wire Rope Guide Ring Halves and the Drum after cleaning/degreasing thoroughly.

**5)** Verify proper fit of the Wire Rope Guide Ring Halves with the Drum, matching up the respective grooves and check that there is no excessive clearance. Check for pointed or sharp crests and heavy wear and tear. Where necessary assess the need for replacing the wire rope guides and the Drum.

**6)** Secure the end of the Wire Rope to the Drum with 3 Wire Rope Clamps (do not forget the lock washers!). Allow the rope end to project by approximately 30-40mm, see Figure 6-8.

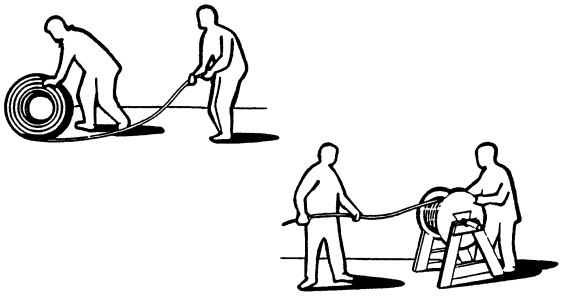


Figure 6-9

**7)** Press the “UP” button on the Pendant to wind the Wire Rope onto the Drum. Tightly wind about 5-10 turns onto the drum (see Figure 6-8). Let the rope run through a greased rag. See Section 6.1 for grease type.

**8)** Without loosening the tension on the Wire Rope, clamp a weight onto the Wire Rope below the Rope Guide, taking care not to damage the Wire Rope. Replacing the manual tension with the weight will prevent the Wire Rope from unrolling off the Drum.

**9)** Fit the rope guide:

- Grease thread and rope guide groove thoroughly.
- Place the half-ring (1) with the short window section onto the rope drum next to the last rope winding so that the rope exits from the region of the window (x) (see Figure 6-10).
- Push rope tensioning spring (2) into the guide groove of the half-ring (1) and hook the ends of the spring together (see Figure 6-11). The special spring tool will make this easier (see “a” in Figure 6-12).
- Place the second half-ring (3) with the long rope exit window on the rope drum so that the rope exits from the drum groove through the window straight and without kinking. The second half-ring must lie flush against the first (see Figure 6-13).
- Bolt the two half-rings together with pressure screws and bolts (5) (see Figure 6-13).
- **The rope guide must rest lightly on the drum and be able to be turned by hand. If this is not the case the guide has been fitted incorrectly or the rope drum is damaged.**
- Bolt stop with bearing and conical spring washer (6) to the rope guide (see Figure 6-14).
- Bolt on protective plate (8) (see Figure 6-15).

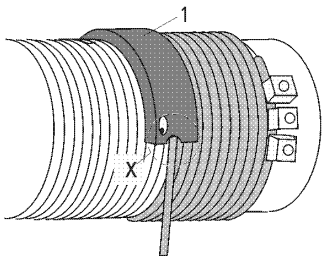



Figure 6-10

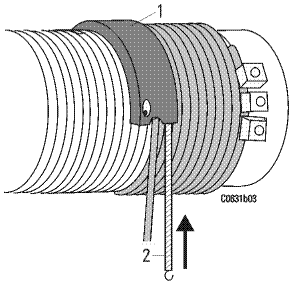



Figure 6-11

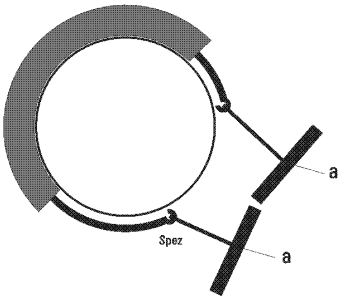



Figure 6-12

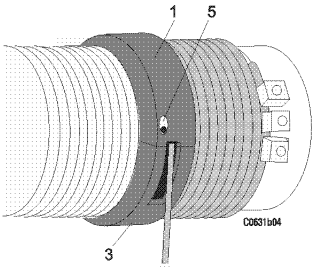



Figure 6-13

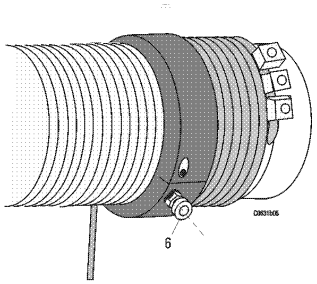



Figure 6-14

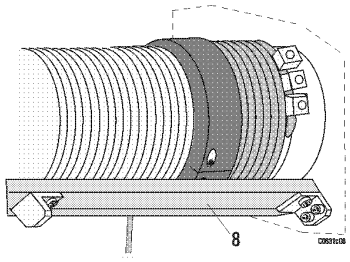



Figure 6-15

**10)** Carry out again all the sequences described in Section 6.6 "Reeving and Adjustments". Lubricate the Wire Rope, the Rope Guide and Drum (see Section 6.2).

**11)** Retighten clamping plates. Torque the Screws to the value shown in Table 6-1 for your hoist (see Figure 6-8).

**12)** Run rope in with a partial load.

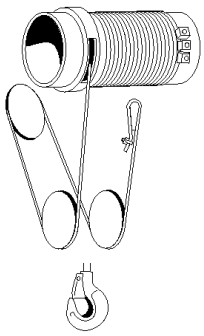
| Table 6-1 Rope Clamp Torque Values | | | | |
|---|---|---|---|---|
| Hoist Capacity Code | RHN02, RHN03 | RHN05 | RHN08, RHN10 | RHN15, RHN20 |
| Screw Dia (mm) | M10 | M10 | M12 | M16 |
| Screw Torque | 30 ft-lbs. (40Nm) | 39 ft-lbs. (50Nm) | 64 ft-lbs. (87Nm) | 155 ft-lbs (210Nm) |

## 6.6 Reeving and Anchorage

6.6.1 Reeving the bottom block

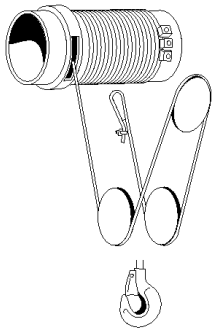
Use a pliers to hold the rope securely.

1. The hoist must be energized in order to complete the reeving of the rope. Take extreme caution while performing this operation.
2. Lay out the end of the rope that is not wound on the drum. Let this end hang freely.
3. Make certain that the wire rope lies snuggly on the rope drum. Avoid wire rope slack at all times. Slack will cause premature rope guide wear as well wire rope wear.
4. Make paint mark on side of the wire rope. This mark will assist in detecting the presence of rope twist.
5. Reeve the end of the rope into the rope sheaves of the bottom block and return pulleys. (Figure 6-16 and 6-17) Do not allow rope to twist.



Deck Mount Hoist Reeving

**Figure 6-16**



Trolley Hoist Reeving

**Figure 6-17**

6. With the rope recess assembly removed, the rope can be installed on the rope wedge.
7. Place rope around rope wedge (2) and pull it into the tapered rope recess (1) until the loose end of the rope projects approx. 100mm.
8. Secure loose end of rope with rope clamp (3) approx. 50mm from the end of the rope. See Table 6-2 for torque specification.
9. Verify the maximum projection of the rope wedge “x” dimension. (See Figure 6-17 and Table 6-1).
10. Reinstall rope recess assembly according to the anchorage configuration determined by the hoist model. Refer to Figures 6-19 through Figures 6-23 for a visual aid. Replace split pin (4) with a new split pin.

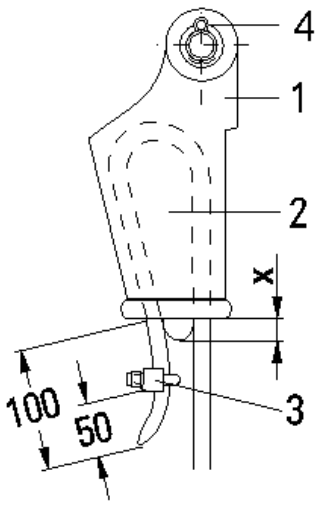



Figure 6-18

**Table 6-2** Anchorage Specifications

| Deck Mount Hoist | Rope Clamp Torque Setting ft lbs (Nm) | Rope Wedge Projection "x" |
|---|---|---|
| RHN02<br>RHN03 | 7.4 (10.0) | 6 mm |
| RHN05 | 14.8 (20.0) | |
| RHN08<br>RHN10 | 29.7 (40.0) | 15 mm |
| RHN15 | 70.5 (95.0) | |
| **Trolley Hoist** | **Rope Clamp Torque Setting ft lbs (Nm)** | **Rope Wedge Projection "x"** |
| RHN02<br>RHN03 | 7.4 (10.0) | 6 mm |
| RHN05 | 14.8 (20.0) | |
| RHN08<br>RHN10 | 29.7 (40.0) | 15 mm |
| RHN15<br>RHN20 | 96.5 (130.0) | |

Anchorage Configurations

RHN02 Deck Mount and RHN03 Deck Mount

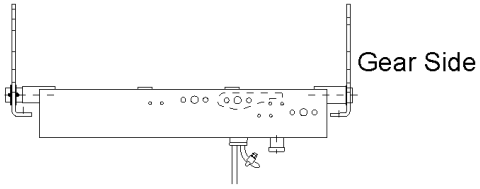



Figure 6-19

RHN05 Deck Mount

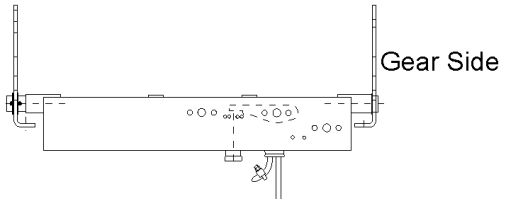



Figure 6-20

RHN08 Deck Mount and RHN10 Deck Mount

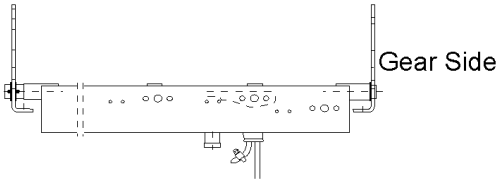



Figure 6-21

RHN15 Deck Mount and RHN20 Deck Mount
RHN15 Trolley Hoist

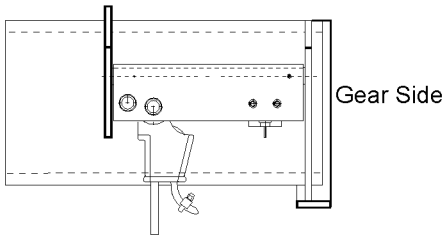



Figure 6-22

Anchorage Configurations (Continued)

RHN02, RHN03,RHN05, RHN08, RHN10 Trolley Hoist

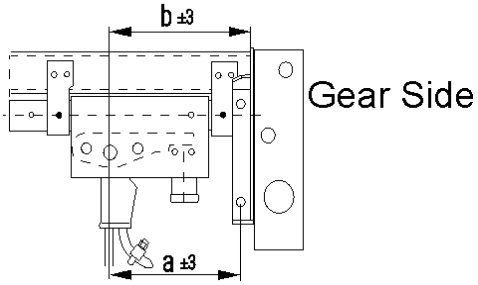



Figure 6-23

**Table 6-3**

"a" and "b" dimensions (mm)

| Hoist Model | a | b |
|---|---|---|
| RHN02 | 216 | 241 |
| RHN03 | | |
| RHN05 | 265 | 290 |
| RHN08 | 334 | 366 |
| RHN10 | | |
| RHN15 | | |

11. Operate the hoist several times up and down (without a load) for the entire length of the lift.
12. Repeat with increasing loads
13. Inspect for twist while operating the hoist. Severe twist will cause the bottom block to turn. This is easily noticeable when there is no load on the hook. **Always make sure that the rope is free of twist prior to lifting a load to prevent permanent distortion, rope damage, or rope guide damage.**
14. If the wire rope has twisted, repeat steps 1-10 until twist is no longer present.

## 6.7 Storage

6.7.1 The storage location should be clean and dry.

6.7.2 Care should be take to not damage any of the electrical power cords or fittings.

## 6.8 Outdoor Installations

6.8.1 For trolley and hoist installations that are outdoors, the trolley and hoist MUST be covered and protected from the weather at all times.

6.8.2 Avoid trolley hoist oxidation by using suitable treatment and lubricating all mechanisms.

6.8.3 Possibility of corrosion on components of the trolley increases for installations where salt air and high humidity are present. The hoist and trolley may require more frequent lubrication. Make regular inspections of the unit's condition and operation.

6.8.4 For hoist installations where temperature variations introduce condensation into the hoist additional inspection and more frequent lubrication may be required.

6.8.5 Refer to Section 2.1.3 for allowable environmental conditions.

## 6.9 Operational Environment

6.7.1 Non-conforming environment
A non-conforming environment is defined as one with any or all of the following.

- Explosive gases or vapor.
- Organic solvents or volatile powder
- Excessive amounts of powder and dust of general substances
- Excessive amount of acids or salts

# 7.0 Troubleshooting

**⚠ WARNING**

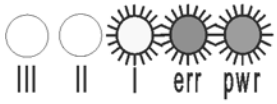
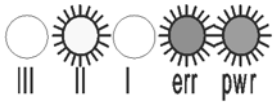
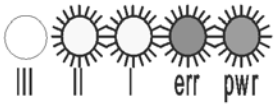
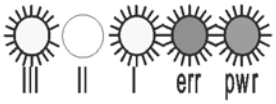
HAZARDOUS VOLTAGES ARE PRESENT IN THE HOIST AND IN CONNECTIONS BETWEEN COMPONENTS.
Before performing ANY troubleshooting on the equipment, de-energize the supply of electricity to the equipment, and lock and tag the supply device in the de-energized position. Refer to ANSI Z244.1, "Personnel Protection - Lockout/Tagout of Energy Sources."
Only Trained and competent personnel should inspect and repair this equipment.

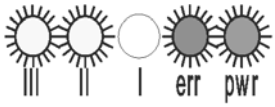
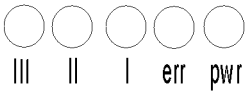
**Table 7-1 Troubleshooting Guide**

| Symptom | Cause | Remedy |
|---|---|---|
| Hoist and/or Trolley moving in wrong direction | Power supply reversed phased | Switch two (2) of the three (3) power supply cord wires at the power source. |
| | Improper electrical connections | Refer to wiring diagram and check all connections. |
| Hoist and/or Trolley 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. |
| | Defect in control transformer | Check transformer coil for signs of overheating. Disconnect transformer and check for open winding. |
| | Faulty magnetic contactor | Check coil for open or short circuit. Check all connections in the control circuit. Check for open contactors. Replace as needed. |
| | Faulty Up or Down Limit Switch | Replace the Up and/or Down Limit Switch |
| | Motor burned out | Replace motor frame/stator, shaft/rotor, and any other damaged parts. |

| Table 7-1 **Troubleshooting Guide** | | |
|---|---|---|
| **Symptom** | **Cause** | **Remedy** |
| Hoist lifts but will not lower | Down circuit open | Check circuit for loose connections. Check down 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. |
| | Faulty operational/ emergency limit switch. | Check hoist limit switch. |
| | Hoist is in bottom hook position. | |
| Hoist lowers but will not lift | RPU load monitor has been actuated or is faulty. | See **Table 7-2** for error codes. Actions to eliminate an error may only be performed by trained personnel. |
| | 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 limit switch for malfunction. |
| | Faulty magnetic contactors | Check coils for open or short circuit. Check all connections on motor circuit. Check for burned contacts. Replace as needed. |
| | Broken conductor in pendant cord | Check the continuity of each conductor in the cable. If one is broken, replace entire cable. |
| | Faulty switch in pendant | Check electrical continuity. Check electrical connections. Replace or repair as needed. |
| 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. |
| Load drifts excessively when hoist is stopped | Motor brake not holding | Clean and inspect brake lining. Check motor brake tolerances. Replace if necessary |
| Trolley drifts excessively when stopping | Motor brake not holding | Clean and inspect brake lining. Check motor brake tolerances. Replace if necessary |
| Hoist and/or Trolley Motor or brake | Excessive load | Reduce load to within rated capacity of hoist. |
| | Excessive duty cycle | Reduce frequency of lifts and/or trolley movement. |

| Table 7-1 **Troubleshooting Guide** | | |
|---|---|---|
| **Symptom** | **Cause** | **Remedy** |
| Overheating | Wrong voltage or frequency | Check voltage and frequency of power supply against the rating on the nameplate on the motor. |
| | Brake drags | Check motor brake adjustment for proper clearance. |
| | Extreme external heating | Above an ambient temperature of 104°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 and/or Trolley operates intermittently | 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 of the Pendant Cord. Replace entire Pendant Cord if continuity is not constant. |
| Trolley making loud noise. | Trolley wheel maladjusted on beam | Readjust the gap between the trolley wheel flange and the beam flange. |
| Trolley will not move | Trolley wheel spacing on beam too tight | Readjust the gap between the trolley wheel flange and the beam flange. |
| | Hoist is in highest hook position | Lower bottom hook block until motion is possible again. |
| Abnormal noise from wire rope and/or drum | Lack of lubrication, worn wire rope/drum/sheaves | Lubricate or replace wire rope/drum/sheaves |

| Table 7-2 Load Monitoring Device Error Code Guide | | |
|---|---|---|
| **LED Error Code** | **Cause** | **Remedy** |
|  | Sensor current <1mA or >24mA | • Check voltage supply<br>• Check sensor current (terminal 21)<br>• Check sensor cable<br>• Replace sensor |
|  | Overload | • Remove load from hoist |
|  | Over temperature (hoisting motion not possible) | • Allow motor to cool down – check PTC thermistors |
|  | Control error | • Check wiring (Lifting terminal 3 and lowering terminal 4 are activated simultaneously) |

| | | |
|---|---|---|
|  | System error | • Check voltage (terminal 6)<br>• Switch RPU off/on<br>• Replace RPU |
|  | No control voltage, faulty fuse, faulty Load Monitor | • Check voltage (terminal 6)<br>• Switch RPU off/on<br>• Replace RPU |

## 8.0 Warranty

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, & Beam Clamps – 2 years**
**NER2/ER2 Hoists Enhanced Features Models – 3 Years**
**(N)ER030L(D), All Other Electric and Air Hoists, Trolleys, Crane Components – 1 year**
**Spare / Replacement Parts – 1 year**
**NER2/ER2 "The Guardian" Smart Brake – 10 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.

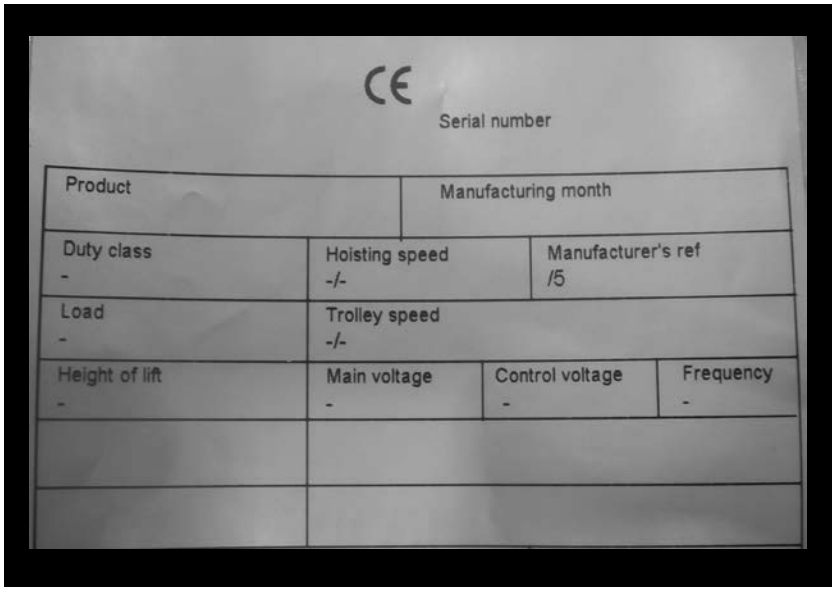
Customer must obtain a Return Goods Authorization as directed by Harrington or Harrington's published repair center prior to shipping product for warranty evaluation. An explanation of the complaint must accompany the product. Product must be returned freight prepaid. Upon repair, the product will be covered for the remainder of the original warranty period. Replacement parts installed after the original warranty period will only be eligible for replacement (not including installation) for a period of one year from the installation date. 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.

# 9.0 Parts List

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

Reminder: Per **Sections 1.1** and **3.9.1** to aid in ordering Parts and Product Support, record the Hoist product number and serial number in the space provided on the cover of this manual.




The parts list is arranged into the following sections:


**Section** **Page**

9.1 Hoist Motor Parts ..... 71
9.2 Gearing Parts ..... 73
9.3 Rope Drum Parts ..... 77
9.4 Rope Suspension Parts ..... 81
9.5 Hook Block Parts ..... 87
9.6 Terminal Box Parts ..... 93
9.7 Trolley Parts ..... 105
9.8 Trolley Motor & Gear Box Assembly Parts ..... 107


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:

1V = 208 Volt Models
2V = 230 Volt Models
4V = 460 Volt Models
5V = 575 Volt Models

## 9.1 Hoist Motor Parts

**RHN02, RHN03, RHN05, RHN08, RHN10, RHN15, RHN20**

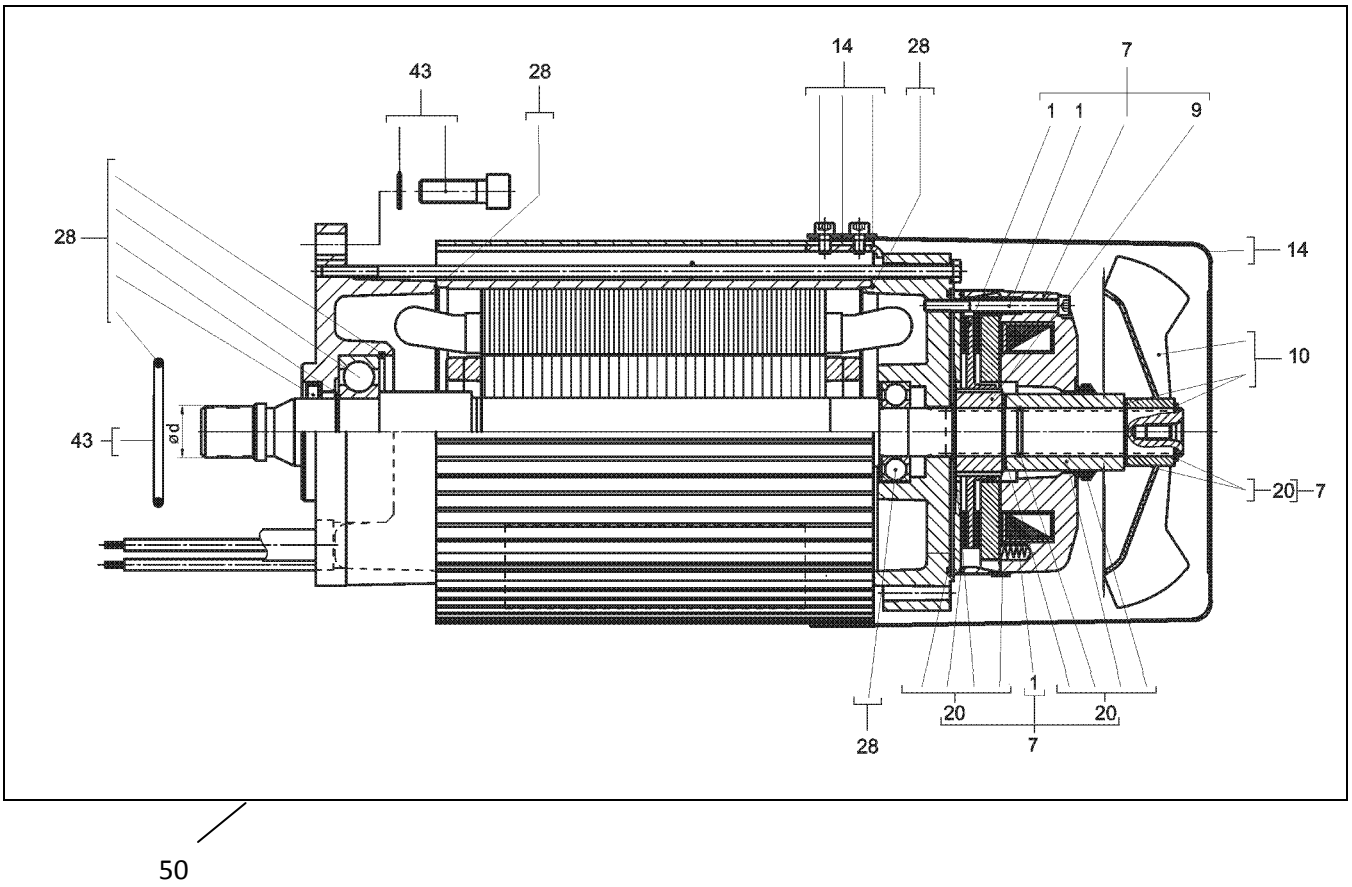



**Figure 9-1-1** Hoist Motor Parts (Dual Speed)

## 9.1 Hoist Motor Parts

| Figure No. | Part Name | Parts Per Hoist | | RHN02 | RHN03 | RHN05 | RHN08 | RHN10 | RHN15U | RHN15D | RHN20D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| 50 | **HOIST MOTOR, Dual Speed**[1] | 1V, 2V | 1 | RHN0702 | | RHN0705 | RHN0708 | | RHN0711 | RHN0714 | |
| | | 4V | | RHN0356 | | RHN0366 | RHN0371 | | RHN0381 | RHN0382 | |
| | | 5V | | RHN0703 | | RHN0706 | RHN0709 | | RHN0712 | RHN0715 | |
| 7 | Brake assembly | 1V<br>2V<br>4V | 1 | RHN0358 | | RHN0368 | RHN0373 | | | RHN0384 | |
| | | 5V | | RHN0359 | | RHN0369 | RHN0374 | | | RHN0385 | |
| 1 | Brake rotor kit[2] | 1 | | RHN0357 | | RHN0367 | RHN0372 | | | | |
| 9 | Hub | 1 | | RHN0360 | | RHN0370 | RHN0375 | | | | |
| 20 | Brake seal kit[3] | 1 | | RHN0363 | | | RHN0378 | | | | |
| 10 | Fan wheel kit[4] | 1 | | RHN0361 | | | RHN0376 | | | | |
| 14 | Fan cover kit[5] | 1 | | RHN0362 | | | RHN0377 | | | | |
| 28 | Bearing kit[6] | 1 | | RHN0364 | | | RHN0379 | | | | |
| 43 | Gear motor screw kit[7] | 1 | | RHN0365 | | | RHN0380 | | | | |

1 Item #43 should be ordered with this part
2 Item #20 should be ordered with this part
3 Brake seal kit includes o-rings, bushing, snap rings, plug
4 Fan wheel kit includes fan wheel and snap rings
5 Fan cover kit includes fan cover, lock washers, screws, and tread block
6 Bearing kit includes bearings, o rings, snap rings
7 Gear motor screw includes screws, lock washers, and o-ring

## Gearing Parts

**RHN02, RHN03, RHN05, RHN08, RHN10**

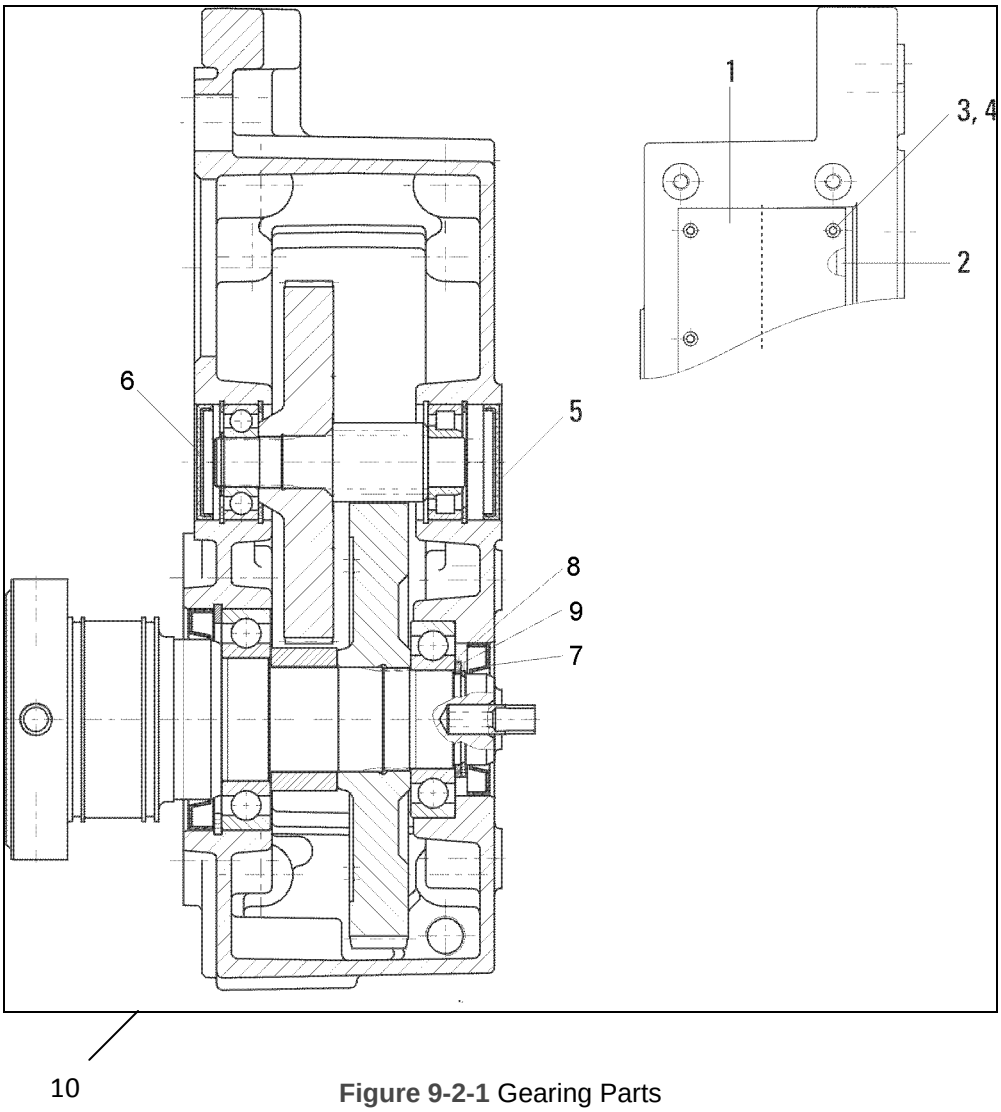



**Figure 9-2-1** Gearing Parts

## 9.2 Gearing Parts

| Figure No. | | Part Name | Parts Per Hoist | RHN02 | RHN03 | RHN05 | RHN08 | RHN10 |
|---|---|---|---|---|---|---|---|---|
| 10 | | **2-10 Ton Gear Assembly, Standard** | 1 | RHN0304 | | RHN0306 | RHN0308 | |
| | 1 | Cover | 1 | RHN0001 | | RHN0085 | RHN0146 | |
| | 2 | Seal | 1 | RHN0002 | | RHN0086 | RHN0147 | |
| | 3 | Socket head cap screw | 8 | 9691201 | | | | |
| | 4 | Lock washer | 8 | 9012709 | | | | |
| | 5 | End cap | 1 | RHN0003 | | RHN0045 | RHN0132 | |
| | 6 | End cap | 1 | RHN0003 | | RHN0088 | RHN0149 | |
| | 7 | Shaft seal | 1 | RHN0004 | | RHN0089 | RHN0150 | |
| | 8 | Snap Ring, external | 1 | 9047120 | | 9047148 | 9047175 | |
| | 9 | Supporting ring | 1 | 9098801 | | 9098803 | 9098805 | |

## 9.2 Gearing Parts

**RHN15, RHN20**

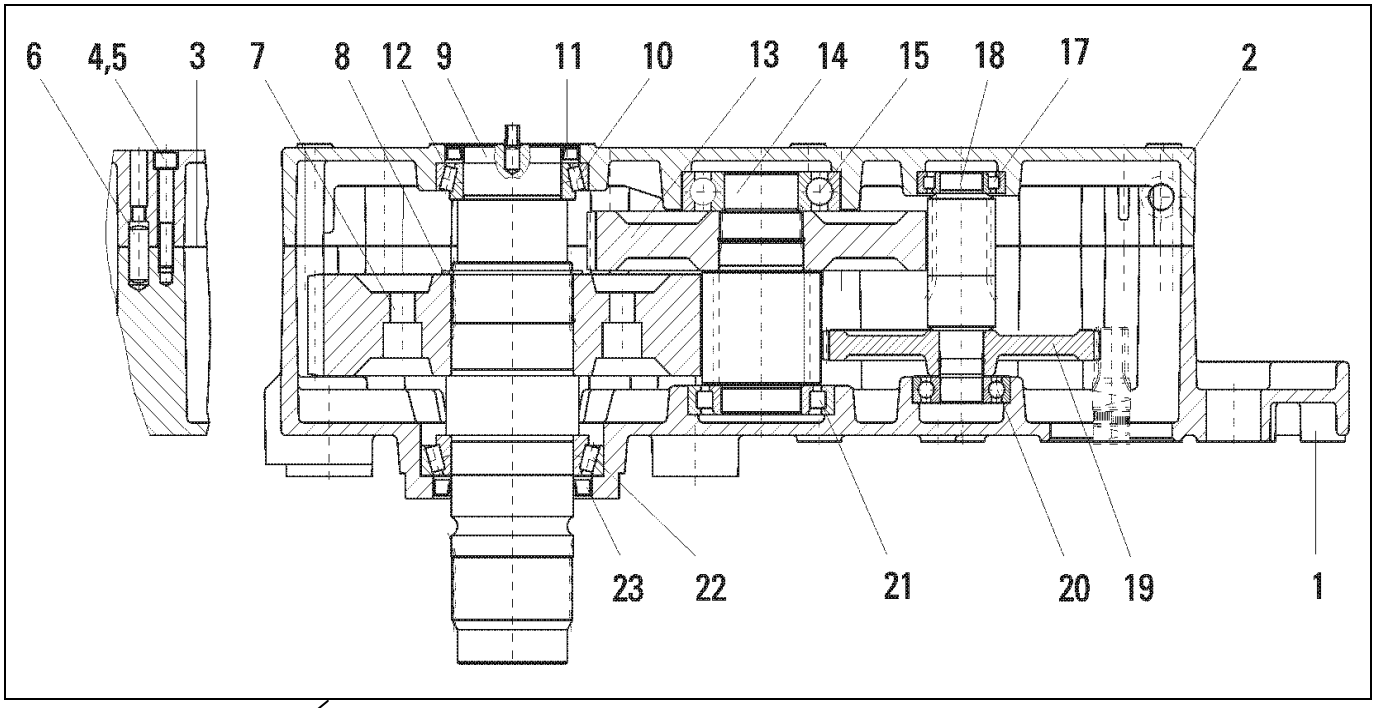



**Figure 9-2-2** Gearing Parts

## 9.2 Gearing Parts

| Figure No. | Part Name | Parts Per Hoist | RHN15U | RHN15D | RHN20D |
|---|---|---|---|---|---|
| 25 | **GEAR BOX ASSEMBLY** [1] | 1 | RHN0310 | RHN0312 | |
| 1 | Gear box | 1 | RHN0223 | | |
| 2 | Gear cap | 1 | RHN0224 | | |
| 3 | Seal | 1 | RHN0225 | | |
| 4 | Socket head cap screw | 12 | 90912124 | | |
| 5 | Lock washer | 12 | 9098511 | | |
| 6 | Dowel pin | 2 | RHN0226 | | |
| 7 | Gear wheel | 1 | RHN0227 | | |
| 8 | Retainer ring | 1 | 9047192 | | |
| 9 | Drive shaft | 1 | RHN0228 | | |
| 10 | Bearing | 1 | 9001223 | | |
| 11 | Shaft seal | 1 | RHN0229 | | |
| 12 | Shim[2], 110 x 125 x 0.3 mm | 1 | RHN0230 | | |
| | Shim[2], 110 x 125 x 0.2 mm | | RHN0252 | | |
| 13 | Gear | 1 | RHN0231 | | |
| 14 | Pinion shaft | 1 | RHN0232 | | |
| 15 | Grooved ball bearing | 1 | 9000313 | | |
| 17 | Cylindrical roller bearing | 1 | RHN0233 | | |
| 18 | Pinion shaft | 1 | RHN0315 | RHN0234 | |
| 19 | Gear wheel | 1 | RHN0316 | RHN0235 | |
| 20 | Grooved ball bearing | 1 | 9000307 | | |
| 21 | Cylindrical roller bearing | 1 | RHN0236 | | |
| 22 | Bearing | 1 | 9001224 | | |
| 23 | Shaft seal | 1 | RHN0237 | | |

1 Gear oil is not included – see Owner's Manual for required amount.

2 As required/measured

## 9.2 Rope Drum Parts

**RHN02, RHN03, RHN05, RHN08, RHN10**

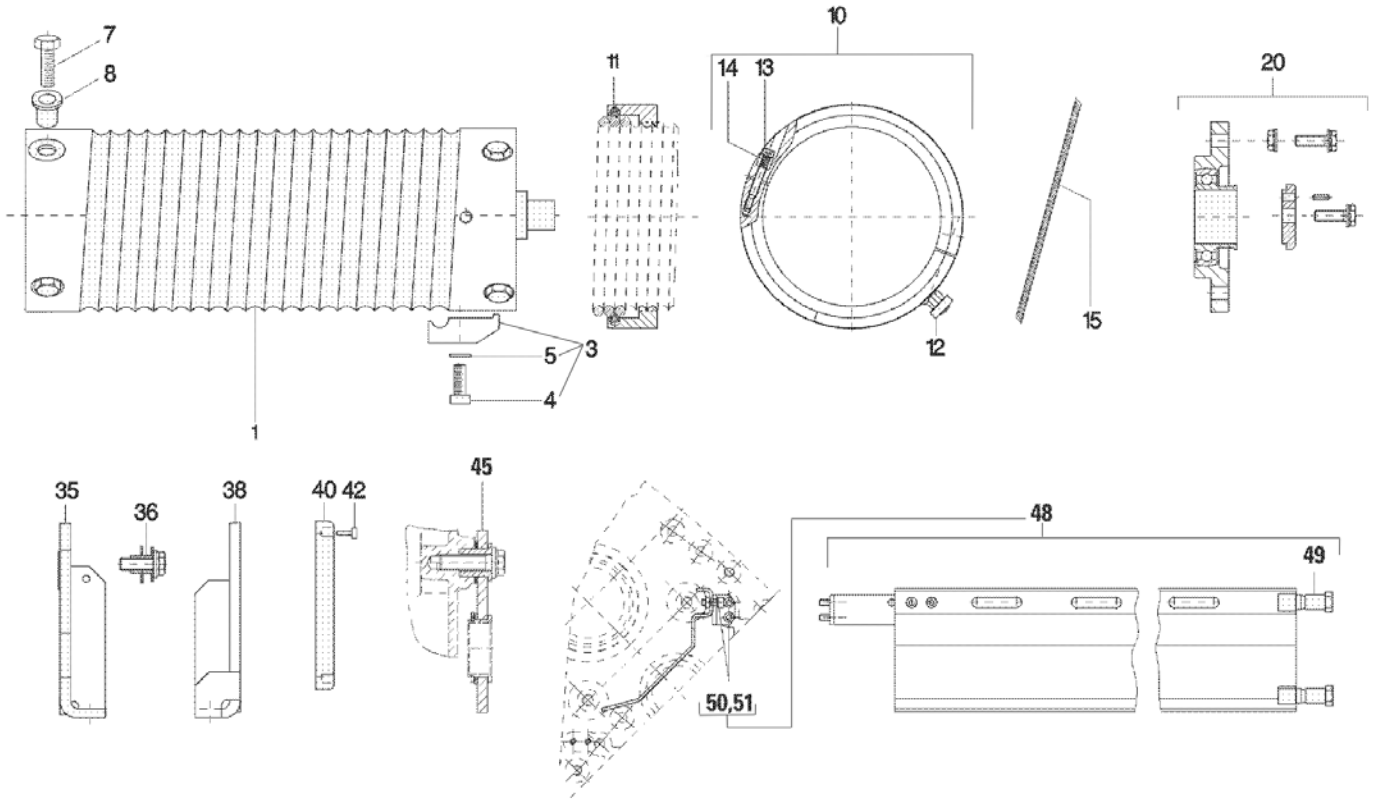



**Figure 9-3-1** Rope Drum Parts

## 9.3 Rope Drum Parts

| Figure No. | Part Name | Parts Per Hoist | RHN02 | RHN03 | RHN05D | RHN05U | RHN08 | RHN10 |
|---|---|---|---|---|---|---|---|---|
| 1 | Rope Drum[1] – 20 ft. lift | 1 | RHN0005 | | RHN0090 | | RHN0151 | RHN0153 |
| | Rope Drum[1] – 33 ft. lift | | RHN0006 | | RHN0091 | | RHN0152 | RHN0154 |
| 3 | Clamping Plate | 3 | RHN0007 | | RHN0092 | | RHN0155 | |
| 4 | Socket head cap screw | 3 | 9691202 | | | | 9091204 | |
| 5 | Lock washer | 3 | 9012712 | | | | 9012713 | |
| 7 | Screw | 8* | 9796801 | | | | RHN0156 (*Qty=6) | |
| 8 | Bushing | 6 | | | | | RHN0157 | |
| 10 | Rope Guide | 1 | RHN0008 | | RHN0093 | | RHN0158 | |
| 11 | Tension spring | 1 | RHN0009 | | RHN0094 | | RHN0159 | |
| 12 | Guide part | 1 | RHN0010 | | | | RHN0160 | |
| 13 | Screw | 2 | RHN0011 | | | | | |
| 14 | Pressure spring | 2 | RHN0012 | | | | | |
| 15 | Wire rope[2] – 20ft. lift | 1 | RHN0013 | | RHN0098 | RHN0095 | RHN0161 | |
| | Wire rope[2] – 33ft. lift | | RHN0016 | | RHN0096 | RHN0097 | RHN0164 | |
| 20 | Flange bearing[3] | 1 | RHN0014 | | RHN0099 | | RHN0162 | |
| 35 | Support plate gear side (Deck/Base Mount) | 1 | RHN0015 | | RHN0100 | | RHN0163 | |
| 36 | Bushing | 2 | RHN0017 | | RHN0102 | | RHN0165 | |
| 38 | Support plate bearing side (Deck/Base Mount) | 1 | RHN0018 | | RHN0103 | | RHN0166 | |
| 40 | End cover | 1 | RHN0020 | | RHN0168 | | RHN0170 | |
| 42 | Screw | 4 | 9750001 | | | | | |
| 45 | Bearing plate[4] | 1 | | | RHN0106 | | RHN0169 | |
| 48 | Grease box – 20 ft. lift | 1 | RHN0021 | | RHN0107 | | RHN0171 | |
| | Grease box – 33 ft. lift | | RHN0022 | | RHN0108 | | RHN0172 | |
| 49 | Screw | 2 | RHN0023 | | | | - | |
| 50 | Socket head cap screw | 4* | 9091249 | | | | 9091249 (*Qty=8) | |
| 51 | Lock washer | 4* | 9012709 | | | | 9012709 (*Qty=8) | |

1 Item #20 should be ordered with this part

2 See test certificate

3 Flange bearing includes screws, nuts, holding disc, and clamping sleeve

4 Bearing plate includes bushings

## 9.3 Rope Drum Parts

**RHN15, RHN20**

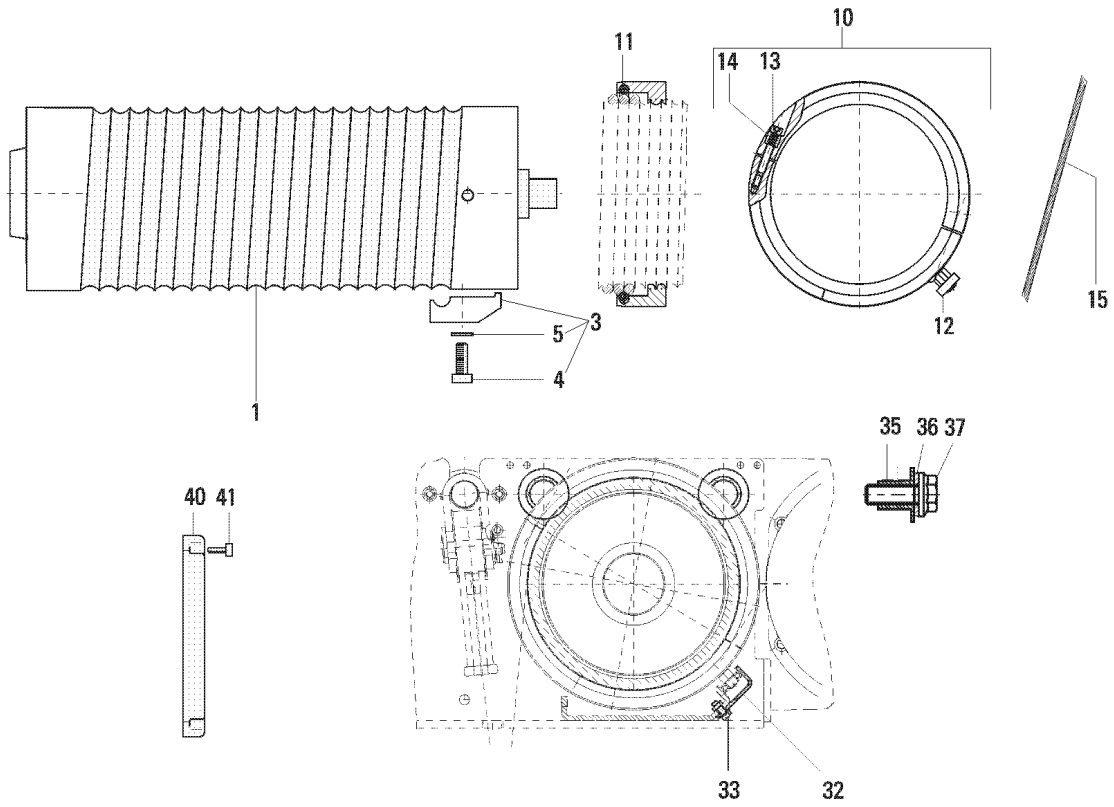



**Figure 9-3-2** Rope Drum Parts

## 9.3 Rope Drum Parts

| Figure No. | Part Name | Parts Per Hoist | RHN15U | RHN15D | RHN20D |
|---|---|---|---|---|---|
| 1 | Rope Drum[1]– 20ft lift (*28 ft. lift) | 1 | RHN0317* | RHN0238 | |
| | Rope Drum[1]– 33ft lift (*46 ft. lift) | | RHN0318* | RHN0239 | |
| 3 | Clamping Plate | 3 | RHN0319 | RHN0240 | |
| 4 | Socket head cap screw | 3 | 9691207 | 90912142 | |
| 5 | Lock washer | 3 | 9012715 | | |
| 10 | Rope Guide | 1 | RHN0322 | RHN0241 | |
| 11 | Tension spring | 1 | RHN0242 | | |
| 12 | Guide part | 1 | RHN0243 | | |
| 13 | Screw | 2 | RHN0244 | | |
| 14 | Pressure spring | 2 | RHN0245 | | |
| 15 | Wire rope[2]– 20ft lift (*28 ft. lift) | 1 | RHN0323* | RHN0246 | |
| | Wire rope[2]– 33ft lift (*46 ft. lift) | | RHN0321* | RHN0256 | |
| 20 | Drum bearing[3] | 1 | RHN0247 | | |
| 32 | Guide rail – For 20ft* length (*28 ft. - RHN15U) | 1 | RHN0248 | | |
| | Guide rail – For 33ft* length (*46 ft. - RHN15U) | | RHN0249 | | |
| 33 | Safety bolt | 9 | RHN0250 | | |
| 35 | Bushing | 2 | RHN0251 | | |
| 36 | Lock washer | 2 | 9012730 | | |
| 37 | Hexagon head cap screw | 2 | 90933178 | | |
| 40 | End cover | 1 | RHN0170 | | |
| 41 | Screw | 4 | 9750001 | | |

1 Item #20 should be ordered with this part

2 See test certificate

3 Drum bearing includes o-rings, snap rings, dowel pins, safety bolt, holding disc, safety plugs

## 9.3 Rope Suspension Parts

**RHN02, RHN03, RHN05, RHN08, RHN10**

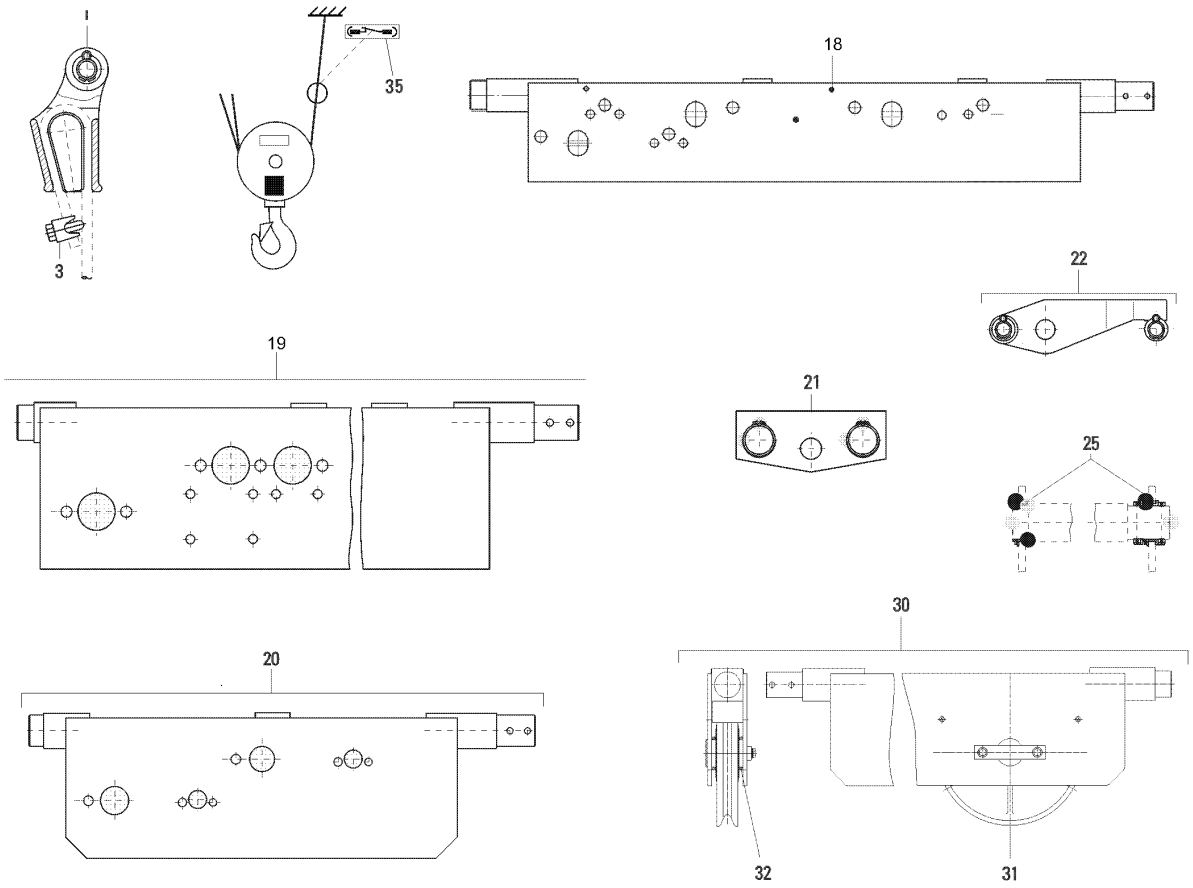



**Figure 9-4-1** Rope Suspension Parts (Deck/Base Mounted)

## 9.4 Rope Suspension Parts

| Figure No. | Part Name | Parts Per Hoist | RHN02 | RHN03 | RHN05 | RHN08 | RHN10 |
|---|---|---|---|---|---|---|---|
| 1 | Clamp | 1 | RHN0024 | | RHN0110 | RHN0173 | |
| 3 | Wire rope clamp | 1 | RHN0025 | | RHN0111 | RHN0174 | |
| 18 | Suspension traverse (20 ft lift), Deck Mounted | 1 | RHN0026 | | | | |
| | Suspension traverse (33 ft lift), Deck Mounted | | RHN0027 | | | | |
| 19 | Suspension traverse (20 ft lift), Deck Mounted | 1 | | | RHN0112 | | |
| | Suspension traverse (33 ft lift), Deck Mounted | | | | RHN0113 | | |
| 20 | Suspension traverse (20 ft lift), Deck Mounted | 1 | | | | RHN0177 | |
| | Suspension traverse (33 ft lift), Deck Mounted | | | | | RHN0178 | |
| 21 | Suspension | 1 | | | RHN0114 | | |
| 22 | Suspension | 1 | RHN0028 | | | RHN0179 | |
| 25 | Bushing | 1 | RHN0029 | | RHN0115 | RHN0180 | |
| 30 | Deflection cross bar – 20ft lift | 1 | RHN0030 | | RHN0116 | RHN0181 | |
| | Deflection cross bar – 33ft lift | | RHN0031 | | RHN0117 | RHN0182 | |
| 31 | Rope pulley | 1 | RHN0032 | | RHN0118 | RHN0191 | |
| 32 | Bushing | 2 | RHN0034 | | RHN0120 | RHN0186 | |
| 35 | Block operated limit switch (BLS) | 1 | RHN0550 | | | | |

## 9.4 Rope Suspension Parts

**RHN02, RHN03, RHN05, RHN08, RHN10**

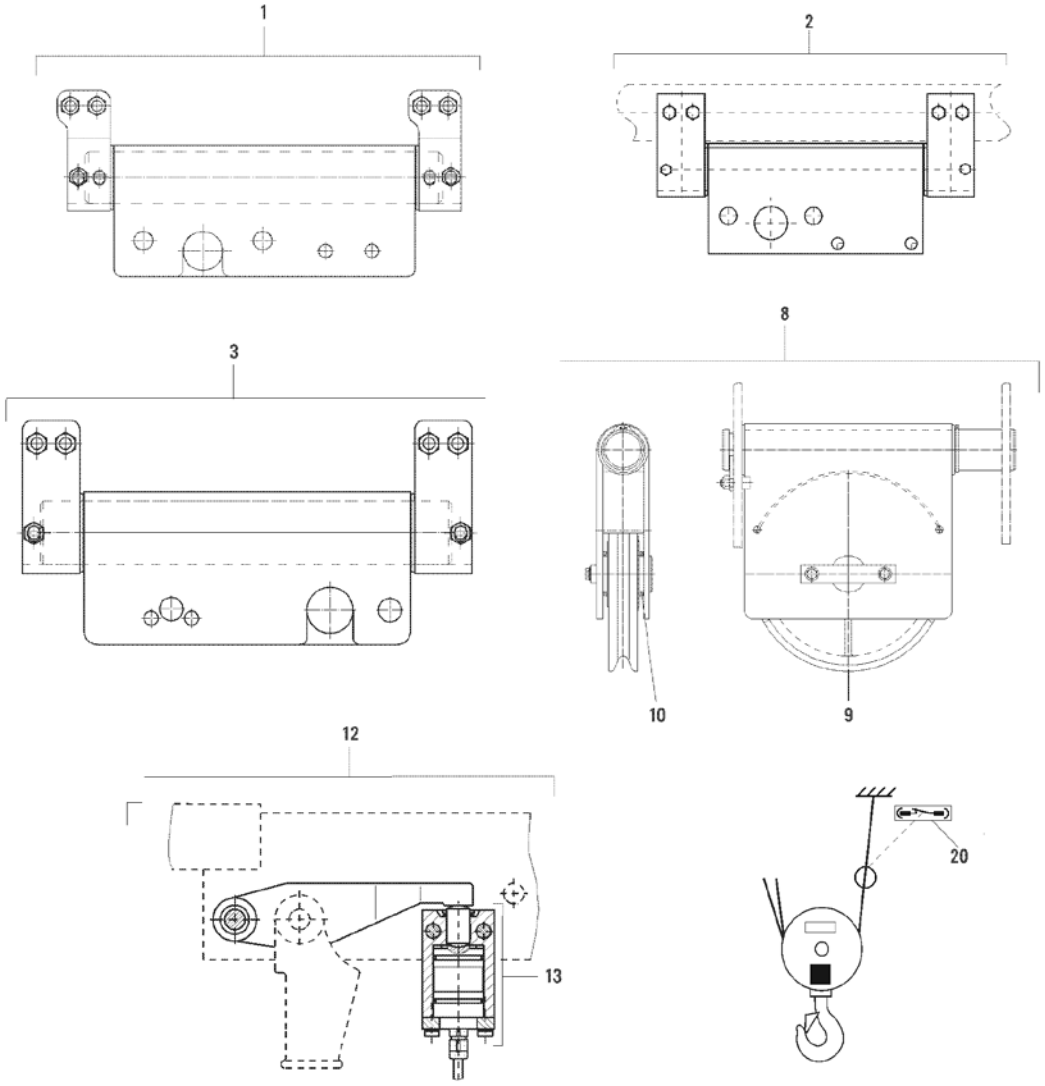



**Figure 9-4-2** Rope Suspension Parts (Trolley)

## 9.4 Rope Suspension Parts

| Figure No. | Part Name | Parts Per Hoist | RHN02 | RHN03 | RHN05 | RHN08 | RHN10 |
|---|---|---|---|---|---|---|---|
| 1 | Suspension, 4/1 | 1 | RHN0033 | | | | |
| 2 | Suspension, 4/1 | 1 | | | RHN0119 | | |
| 3 | Suspension, 4/1 | 1 | | | | RHN0187 | |
| 8 | Deflection cross bar | 1 | RHN0035 | | RHN0121 | RHN0189 | |
| 9 | Rope pulley | 1 | RHN0032 | | RHN0118 | RHN0191 | |
| 10 | Bushing | 2 | RHN0034 | | RHN0120 | RHN0186 | |
| 12 | Load sensor assembly | 1 | RHN0037 | | RHN0123 | RHN0194 | |
| 13 | Load sensor (SLE21 ONLY) | 1 | RHN0552 | | RHN0553 | RHN0556 | |
| | Load sensor (SLE22 and SLE21[1]) | | RHN0562 | | RHN0563 | RHN0566 | |
| 20 | Block operated limit switch (BLS) | 1 | RHN0550 | | | | |

1 Not all leads utilized on SLE21

## 9.4 Rope Suspension Parts

**RHN15U, RHN15D, RHN20D**

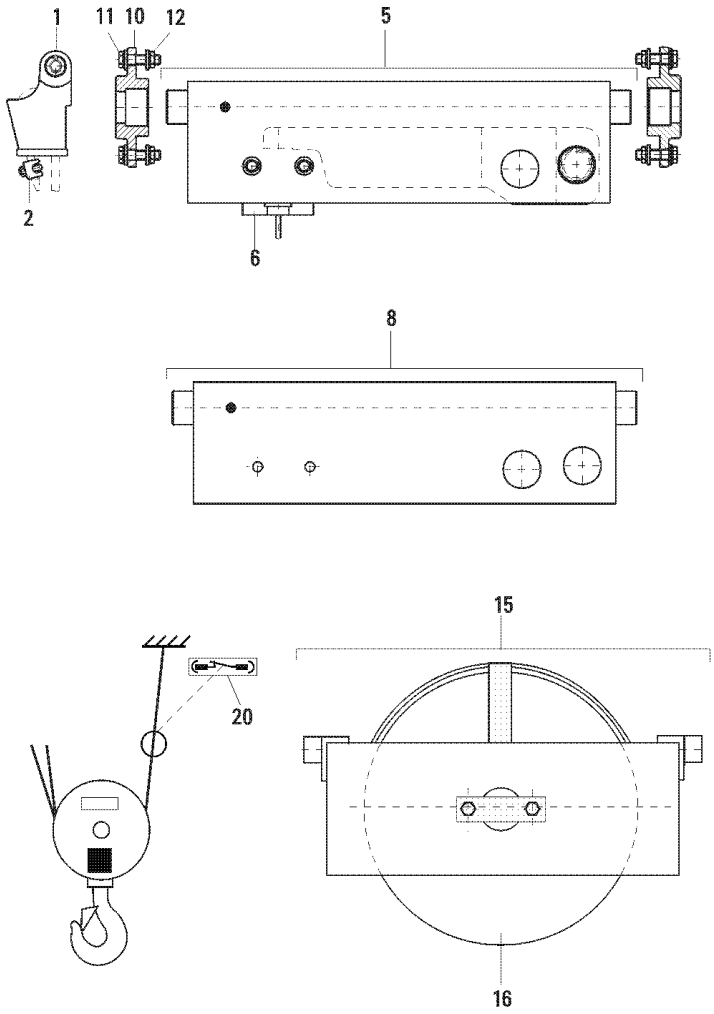



**Figure 9-4-3** Rope Suspension Parts

## 9.4 Rope Suspension Parts

| Figure No. | Part Name | Parts Per Hoist | RHN15U | RHN15D | RHN20D |
|---|---|---|---|---|---|
| 1 | Clamp | 1 | RHN0324 | RHN0253 | |
| 2 | Wire rope clamp | 1 | RHN0329 | RHN0254 | |
| 5 | Load sensor assembly | 1 | RHN0332 | RHN0255 | |
| 6 | Load sensor (SLE21 ONLY) | 1 | RHN0559 | | |
| 6 | Load sensor (SLE22 and SLE21[1]) | 1 | RHN0569 | | |
| 8 | Rope suspension | 1 | RHN0334 | RHN0257 | |
| 10 | Bearing pedestal | 4 | RHN0325 | RHN0258 | |
| 11 | Safety bolt | 8 | 9093372 | | |
| 12 | Locknut | 8 | 9098511 | | |
| 15 | Deflection cross bar | 1 | RHN0326 | RHN0259 | |
| 16 | Rope pulley | 1 | RHN0327 | RHN0260 | |
| 20 | Block operated limit switch | 1 | RHN0550 | | |

1 Not all leads utilized on SLE21

## 9.4 Hook Block Parts

**RHN02, RHN03, RHN05, RHN08, RHN10**

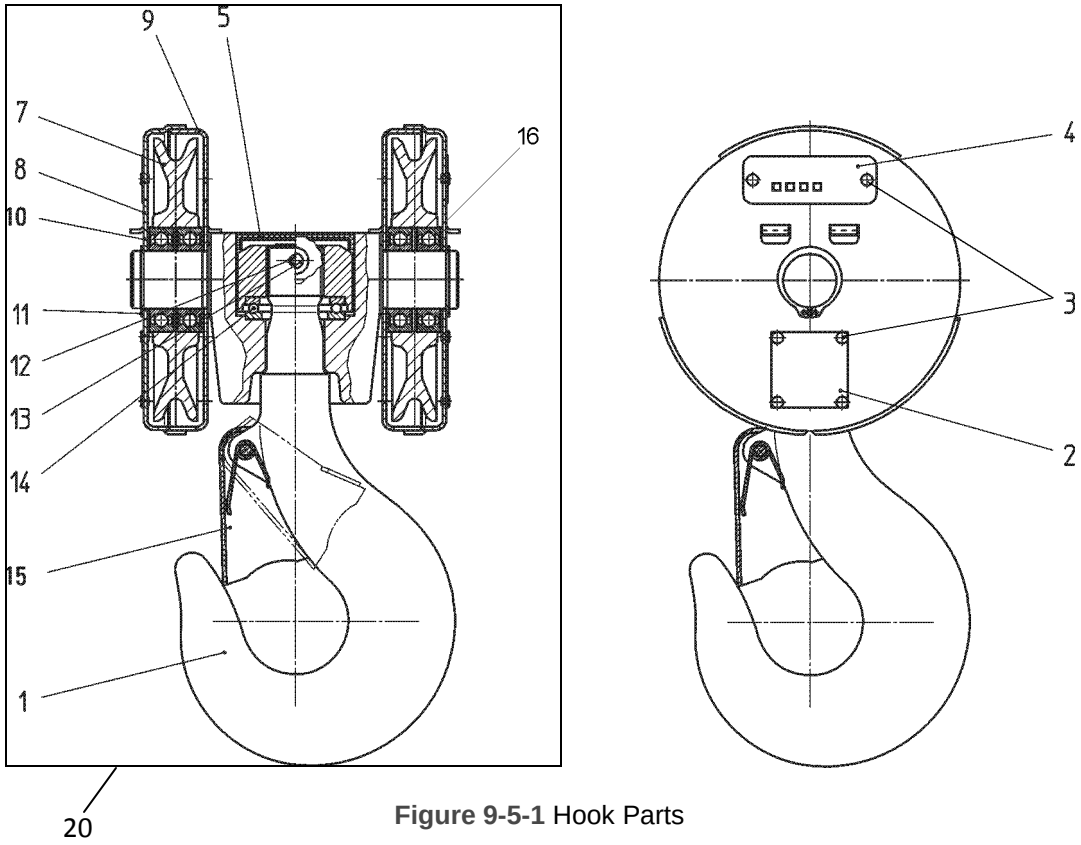



**Figure 9-5-1** Hook Parts

## 9.5 Hook Block Parts

| Figure No. | Part Name | Parts Per Hoist | RHN02 | RHN03 | RHN05 | RHN08 | RHN10 |
|---|---|---|---|---|---|---|---|
| 20 | **2-10 Ton Hook Block** | 1 | RHN0053 | | RHN0128 | RHN0197 | |
| 1 | Load hook | 1 | RHN0054 | | RHN0130 | RHN0201 | |
| 5 | End cap | 1 | RHN0057 | | RHN0132 | | |
| 7 | Rope pulley | 2 | RHN0032 | | RHN0118 | RHN0191 | |
| 8 | Protection hood | 2 | RHN0059 | | RHN0133 | RHN0198 | |
| 9 | Protection hood | 2 | RHN0060 | | RHN0134 | RHN0199 | |
| 10 | Washer | 4 | 9098802 | | 9098804 | | |
| 11 | Snap Ring | 2 | 9047130 | | 9047145 | 9047150 | |
| 12 | Dowel sleeve* | 1 | 91481172 | | 91481173 | *Included in Item #1 | |
| 13 | Plug | 2 | RHN0061 | | RHN0125 | | |
| 14 | Axial bearing* | 1 | 9001219 | | 9001220 | *Included in Item #1 | |
| 15 | Safety catch | 1 | RHN0062 | | RHN0131 | | |
| 16 | Grooved ball bearing | 4 | RHN0063 | | 9000509 | 9001226 | |
| 2 | Name plate | 2 | RHN0620 | | | RHN0640 | |
| 3 | Blind rivet | 8 | RHN0050 | | | | |
| 4 | Capacity plate | 2 | RHN0049 | RHN0056 | RHN0135 | RHN0202 | RHN0203 |

## 9.5 Hook Block Parts

**RHN15D, RHN20D**

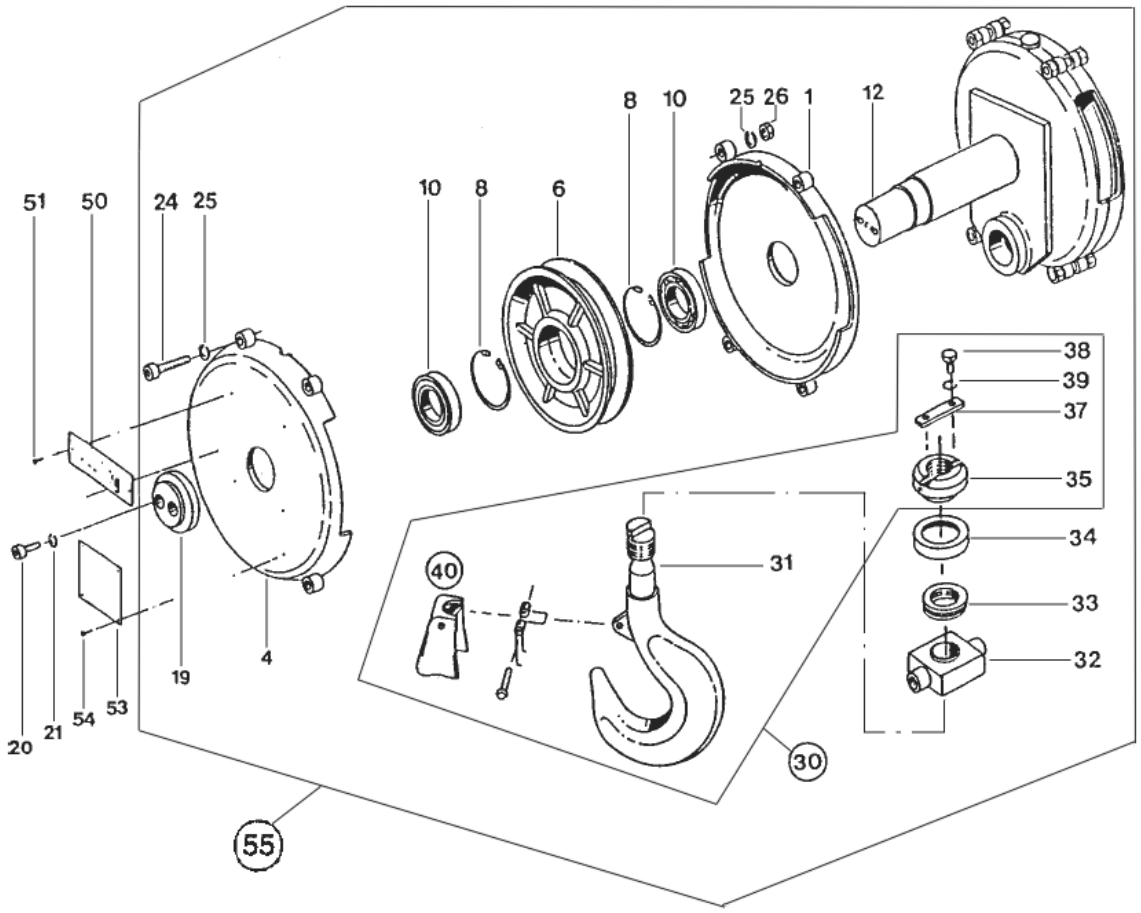



**Figure 9-5-2** Hook Parts

## 9.5 Hook Block Parts

| Figure No. | Part Name | Parts Per Hoist | RHN15 | RHN20 |
|---|---|---|---|---|
| 55 | **RHN15D and RHN20D Bottom Hook Block** | 1 | RHN0271 | |
| 1 | Side cheek | 2 | RHN0272 | |
| 4 | Protection hood | 2 | RHN0273 | |
| 6 | Rope pulley | 2 | RHN0260 | |
| 8 | Locking ring | 4 | RHN0275 | |
| 10 | Grooved ball bearing | 4 | 9001225 | |
| 12 | Axle | 1 | RHN0276 | |
| 19 | Retaining disc | 2 | RHN0277 | |
| 20 | Socket head cap screw | 4 | 90912112 | |
| 21 | Spring washer | 4 | 9798007 | |
| 24 | Socket head cap screw | 8 | 9691206 | |
| 25 | Spring washer | 16 | 9798007 | |
| 26 | Hexagonal nut | 8 | 9093433 | |
| 32 | Traverse | 1 | RHN0280 | |
| 33 | Axial bearing | 1 | 9001222 | |
| 34 | Guard plate | 1 | RHN0281 | |
| 30 | Load hook assembly | 1 | RHN0278 | |
| 31 | Load hook attachment | 1 | RHN0279 | |
| 35 | Nut | 1 | RHN0282 | |
| 37 | Locking plate | 1 | RHN0283 | |
| 38 | Hexagon head cap screw | 2 | 9093348 | |
| 39 | Spring washer | 2 | 9012712 | |
| 40 | Safety catch | 1 | RHN0284 | |
| 50 | Capacity Plate | 2 | RHN0285 | |
| 51 | Blind rivet | 4 | RHN0050 | |
| 53 | Name plate | 2 | RHN0620 | |
| 54 | Blind rivet | 8 | RHN0050 | |

## 9.5 Hook Block Parts

**RHN15U**

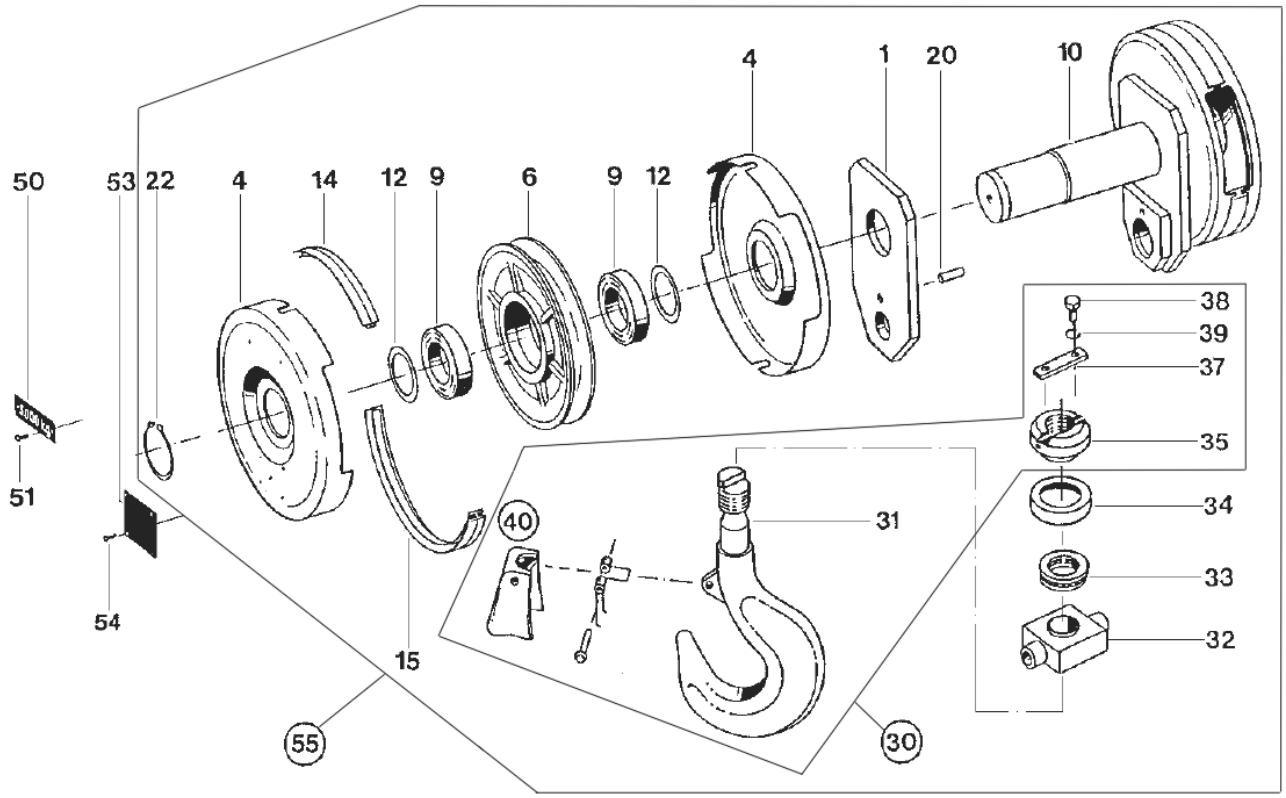



**Figure 9-5-3** Hook Parts

## 9.5 Hook Block Parts

| Figure No. | Part Name | Parts Per Hoist | RHN15U |
|---|---|---|---|
| 55 | **RHN15U Bottom Hook Block** | 1 | RHN0335 |
| 1 | Side cheek | 2 | RHN0336 |
| 4 | Protection hood | 4 | RHN0337 |
| 6 | Rope pulley | 2 | RHN0327 |
| 9 | Grooved ball bearing | 4 | 9000612 |
| 10 | Axle | 1 | RHN0338 |
| 12 | Adjusting washer | 4 | 9098807 |
| 14 | Joining element | 2 | RHN0340 |
| 15 | Joining element | 2 | RHN0341 |
| 20 | Pin | 2 | RHN0342 |
| 22 | Locking ring | 2 | 9047193 |
| 32 | Traverse | 1 | RHN0346 |
| 33 | Axial bearing | 1 | 9001227 |
| 34 | Guard plate | 1 | RHN0347 |
| 30 | Load hook assembly | 1 | RHN0345 |
| 31 | Load hook attachment | 1 | - |
| 35 | Nut | 1 | - |
| 37 | Locking plate | 1 | RHN0350 |
| 38 | Hexagon head cap screw | 2 | 9093347 |
| 39 | Spring washer | 2 | 9012712 |
| 40 | Safety catch | 1 | RHN0353 |
| 50 | Capacity Plate | 2 | RHN0354 |
| 51 | Blind rivet | 4 | RHN0050 |
| 53 | Name plate | 2 | RHN0620 |
| 54 | Blind rivet | 8 | RHN0050 |

## 9.5 Terminal Box Parts

**RHN02, RHN03, RHN05, RHN08, RHN10, RHN15, RHN20**

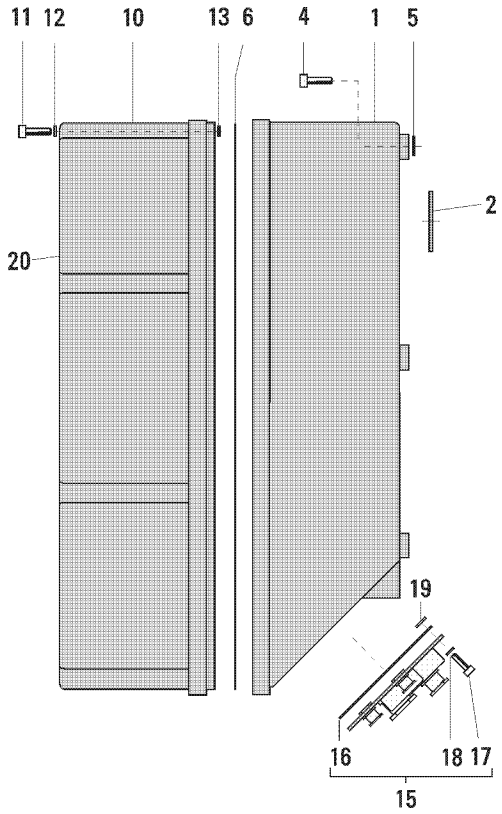



**Figure 9-6-1** Terminal Box Parts

## 9.6 Terminal Box Parts

| Figure No. | Part Name | Parts Per Hoist | RHN02 | RHN03 | RHN05 | RHN08 | RHN10 | RHN15 | RHN20 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Terminal box | 1 | RHN0065 | | | RHN0205 | | RHN0287 | |
| 2 | Sealing ring | 1 | RHN0066 | | | RHN0206 | | RHN0288 | |
| 4 | Socket head cap screw | 4 * | 9093307 | | | 9091274 (*Qty=6) | | 9091273(*Qty=8) | |
| 5 | Round sealing ring | 6 | | | | RHN0207 | | RHN0289 | |
| 6 | Seal | 1 | RHN0067 | | | RHN0208 | | RHN0290 | |
| 10 | Box cover | 1 | RHN0068 | | | RHN0209 | | RHN0291 | |
| 11 | Socket head cap screw | 8 | 9091229 | | | | | | |
| 12 | Lock washer | 8 | 9012708 | | | | | | |
| 13 | Round sealing ring | 8 | RHN0069 | | | | | | |
| 15 | Flange plate | 1 | RHN0070 | | RHN0136 | RHN0211 | | RHN0293 | |
| 16 | Seal | 1 | RHN0071 | | | RHN0212 | | RHN0288 | |
| 17 | Socket head cap screw | 7 | 9691203 | | | | | 9691205 | |
| 18 | Washer | 7 | 9012510 | | | | | 9012513 | |
| 19 | Locking nut | 7 | 9098503 | | | | | 9098506 | |
| 20 | Capacity label | 1 | RHN0630 | RHN0631 | RHN0632 | RHN0633 | RHN0634 | RHN0635 | RHN0636 |

## 9.6 Terminal Box Parts

RHN02, RHN03

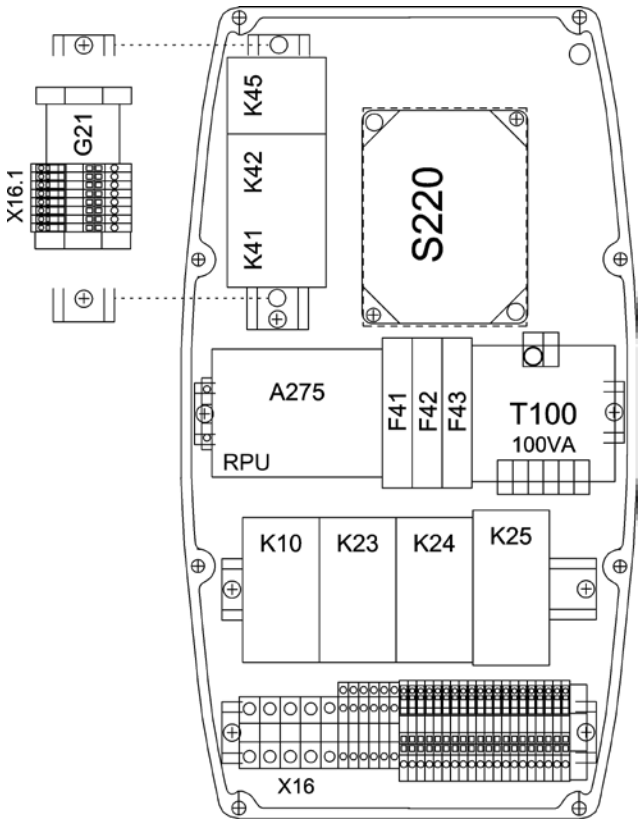



**Figure 9-6-2a** Terminal Box Layout – 208V, 230V

RHN02, RHN03

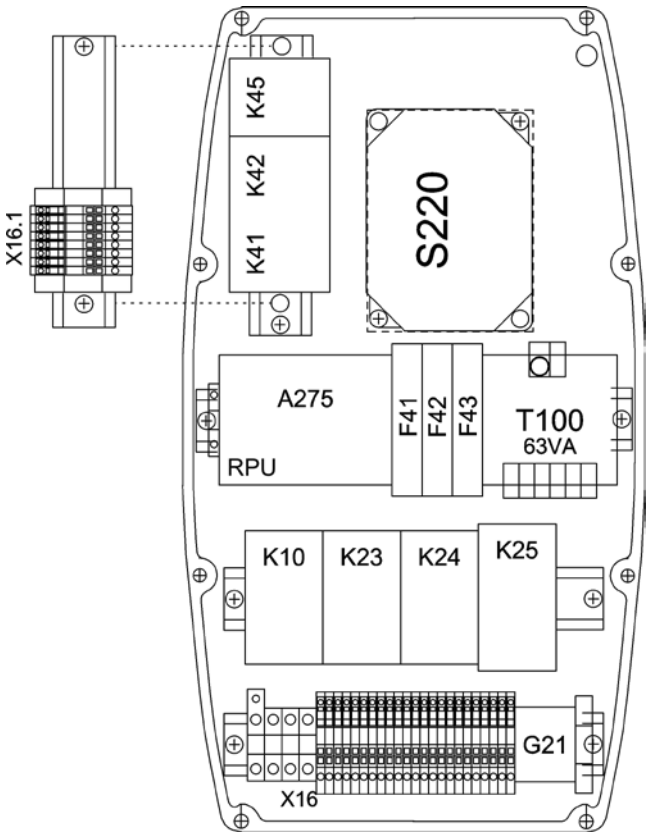



**Figure 9-6-2b** Terminal Box Layout – 460V, 575V

## 9.6 Terminal Box Parts

| Component No. | Part Name | Parts Per Hoist | RHN02, RHN03 | |
|---|---|---|---|---|
| | | | 208, 230V | 460, 575V |
| A275 | RPU Overload Device (SLE21) | 1 | RHN0500 | RHN0500 |
| | RPU Overload Device (SLE22) | | RHN0575 | RHN0575 |
| F41-F43 | Fuse Holder | 3 | RHN0501 | RHN0501 |
| | Fuse Link | 3 | RHN0529 | RHN0502 |
| G21 | Rectifier | 1 | RHN0503 | RHN0503 |
| K10 | Contactor, Mainline | 1 | RHN0519 | RHN0506 |
| | Auxiliary Contact Block | 1 | RHN0505 | RHN0505 |
| K23-K24 | Contactor, Hoist Directional | 2 | RHN0519 | RHN0506 |
| | Auxiliary Contact Block | 2 | RHN0507 | RHN0507 |
| K25 | Contactor, Hoist Speed | 1 | RHN0520 | RHN0508 |
| K41-K42 | Contactor, Trolley Directional | 1 | RHN0509 | RHN0509 |
| K45 | Contactor, Trolley Speed | 1 | RHN0510 | RHN0510 |
| S220 | Gear-Type Limit Switch | 1 | RHN0511 | RHN0511 |
| T100 | Transformer* | 1 | RHN0539 | RHN0512 (*460V) |
| | | | | RHN0513 (*575V) |
| N/A | Transformer Fuse | 1 | 9006279 | |
| X16 | PE-Terminal | 1 | RHN0527 | RHN0514 |
| | Terminal | 3 | RHN0526 | RHN0515 |
| | PE -Terminal | 1 | RHN0525 | |
| | Terminal | 6 | RHN0540 | |
| | PE -Terminal | 4* | RHN0516 (*Qty=3) | RHN0516 |
| | Terminal | 19* | RHN0517 (*Qty=17) | RHN0517 |
| X16.1 | PE -Terminal | 2 | RHN0516 | RHN0516 |
| | Terminal | 6 | RHN0517 | RHN0517 |

## 9.6 Terminal Box Parts

RHN05

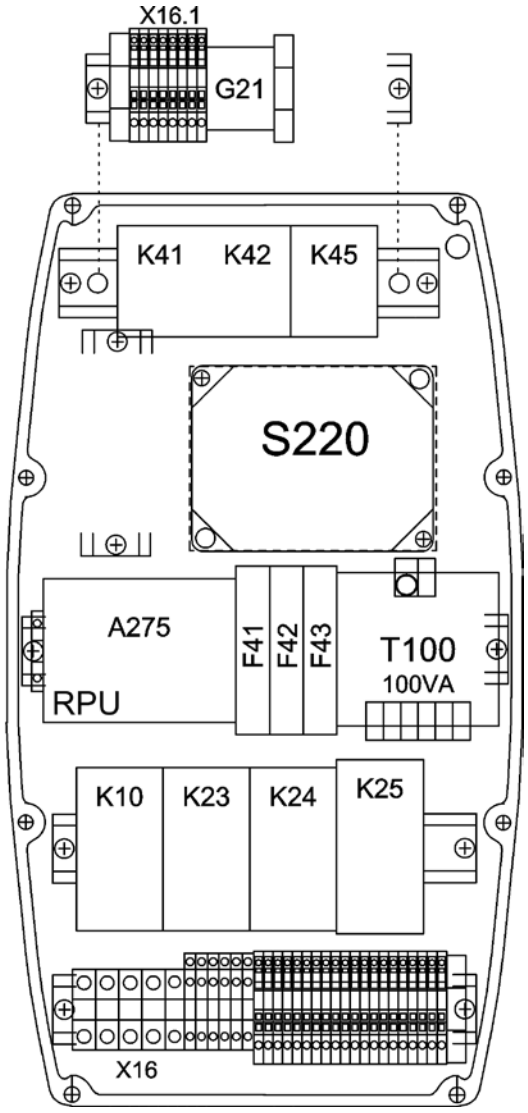



**Figure 9-6-3a** Terminal Box Layout – 208V, 230V

RHN05

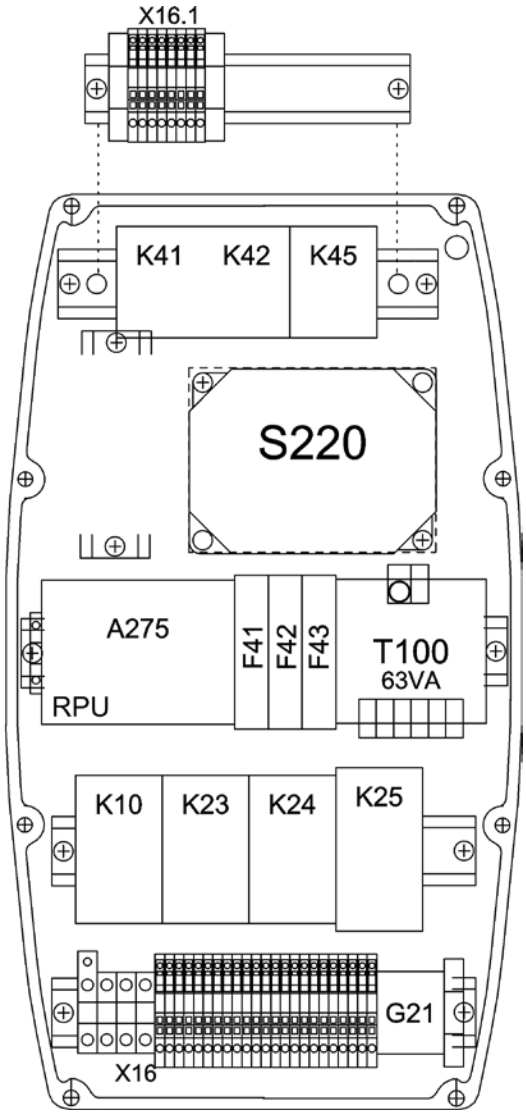



**Figure 9-6-3b** Terminal Box Layout – 460V, 575V

## 9.6 Terminal Box Parts

| Component No. | Part Name | Parts Per Hoist | RHN05 | |
|---|---|---|---|---|
| | | | 208, 230V | 460, 575V |
| A275 | RPU Overload Device (SLE21) | 1 | RHN0500 | RHN0500 |
| | RPU Overload Device (SLE22) | | RHN0575 | RHN0575 |
| F41-F43 | Fuse Holder | 3 | RHN0501 | RHN0501 |
| | Fuse Link | 3 | RHN0529 | RHN0502 |
| G21 | Rectifier | 1 | RHN0503 | RHN0503 |
| K10 | Contactor, Mainline | 1 | RHN0519 | RHN0506 |
| | Auxiliary Contact Block | 1 | RHN0505 | RHN0505 |
| K23-K24 | Contactor, Hoist Directional | 2 | RHN0519 | RHN0506 |
| | Auxiliary Contact Block | 2 | RHN0507 | RHN0507 |
| K25 | Contactor, Hoist Speed | 1 | RHN0520 | RHN0508 |
| K41-K42 | Contactor, Trolley Directional | 1 | RHN0509 | RHN0509 |
| K45 | Contactor, Trolley Speed | 1 | RHN0510 | RHN0510 |
| S220 | Gear-Type Limit Switch | 1 | RHN0511 | RHN0511 |
| T100 | Transformer* | 1 | RHN0546 | RHN0512 (*460V) |
| | | | | RHN0513 (*575V) |
| N/A | Transformer Fuse | 1 | 9006202 | 9006279 |
| X16 | PE -Terminal | 1 | RHN0527 | RHN0514 |
| | Terminal | 3 | RHN0526 | RHN0515 |
| | PE -Terminal | 1 | RHN0525 | |
| | Terminal | 6 | RHN0540 | |
| | PE -Terminal | 4* | RHN0516 (*Qty=3) | RHN0516 |
| | Terminal | 19* | RHN0517 (*Qty=17) | RHN0517 |
| X16.1 | PE -Terminal | 2 | RHN0516 | RHN0516 |
| | Terminal | 6 | RHN0517 | RHN0517 |

## 9.6 Terminal Box Parts

**RHN08, RHN10**

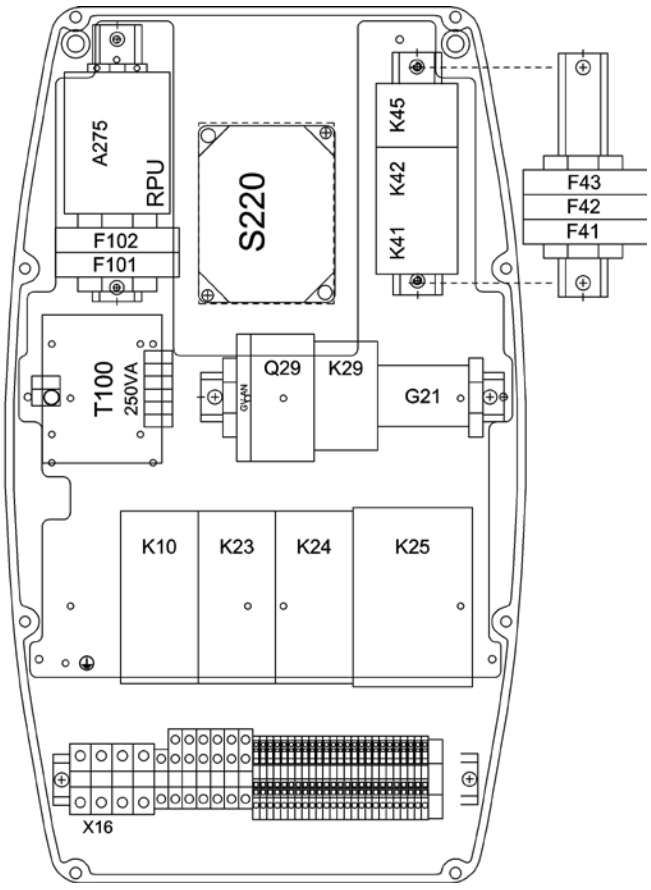



**Figure 9-6-4a** Terminal Box Layout – 208V, 230V

**RHN08, RHN10**

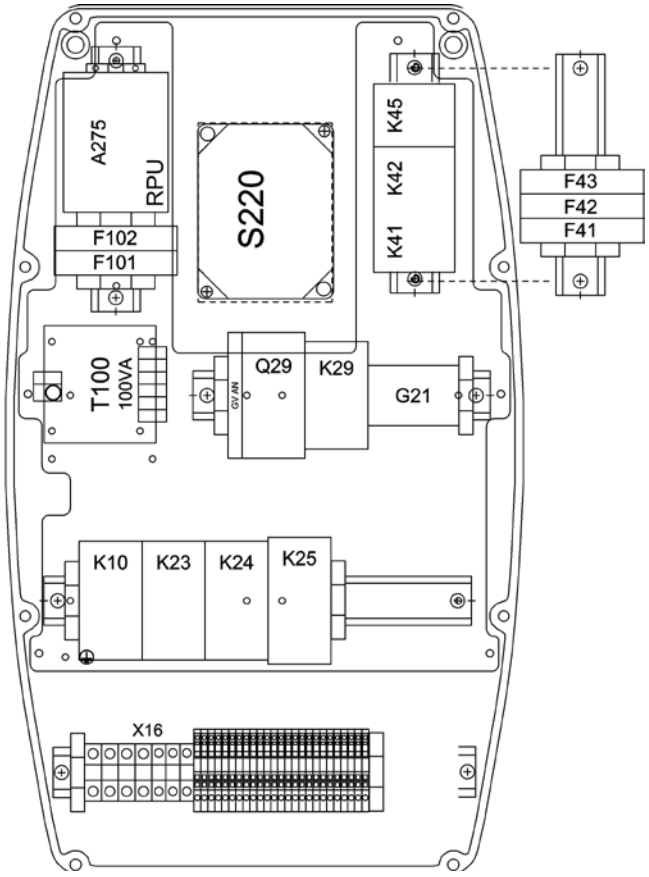



**Figure 9-6-4b** Terminal Box Layout – 460V, 575V

## 9.6 Terminal Box Parts

| Component No. | Part Name | Parts Per Hoist | RHN08, RHN10 | |
|---|---|---|---|---|
| | | | 208, 230V | 460, 575V |
| A275 | RPU Overload Device (SLE21) | 1 | RHN0500 | RHN0500 |
| | RPU Overload Device (SLE22) | | RHN0575 | RHN0575 |
| F41-F43 | Fuse Holder | 3 | RHN0501 | RHN0501 |
| | Fuse Link | 3 | RHN0529 | RHN0502 |
| F101-F102 | Fuse Holder | 2 | RHN0501 | RHN0501 |
| | Fuse Link | 2 | RHN0541 | RHN0518 |
| G21 | Rectifier | 1 | RHN0542 | RHN0504 |
| K10 | Contactor, Mainline | 1 | RHN0543 | RHN0519 |
| K23-K24 | Contactor, Hoist Directional | 2 | RHN0543 | RHN0519 |
| | Auxiliary Contact Block | 1 | RHN0505 | RHN0505 |
| K25 | Contactor, Hoist Speed | 1 | RHN0537 | RHN0520 |
| K29 | Contactor, Hoist Brake | 1 | RHN0528 | RHN0528 |
| K41-K42 | Contactor, Trolley Directional | 1 | RHN0509 | RHN0509 |
| K45 | Contactor, Trolley Speed | 1 | RHN0510 | RHN0510 |
| Q29 | Circuit Breaker | 1 | RHN0544 | RHN0521 |
| | Auxiliary Contact Block | 1 | RHN0521 | RHN0522 |
| S220 | Gear-Type Limit Switch | 1 | RHN0511 | RHN0511 |
| T100 | Transformer* | 1 | RHN0545 | RHN0523 (*460V) |
| | | | | RHN0524 (*575V) |
| N/A | Transformer Fuse | 1 | 9006278 | 9006202 |
| X16 | PE -Terminal | 1 | RHN0530 | RHN0527 |
| | Terminal | 3 | RHN0531 | RHN0526 |
| | PE -Terminal | 1 | RHN0525 | RHN0525 |
| | Terminal | 2* | RHN0533 (*Qty=6) | RHN0515 |
| | PE -Terminal | 5 | RHN0516 | RHN0516 |
| | Terminal | 20 | RHN0517 | RHN0517 |

## 9.6 Terminal Box Parts

RHN15U

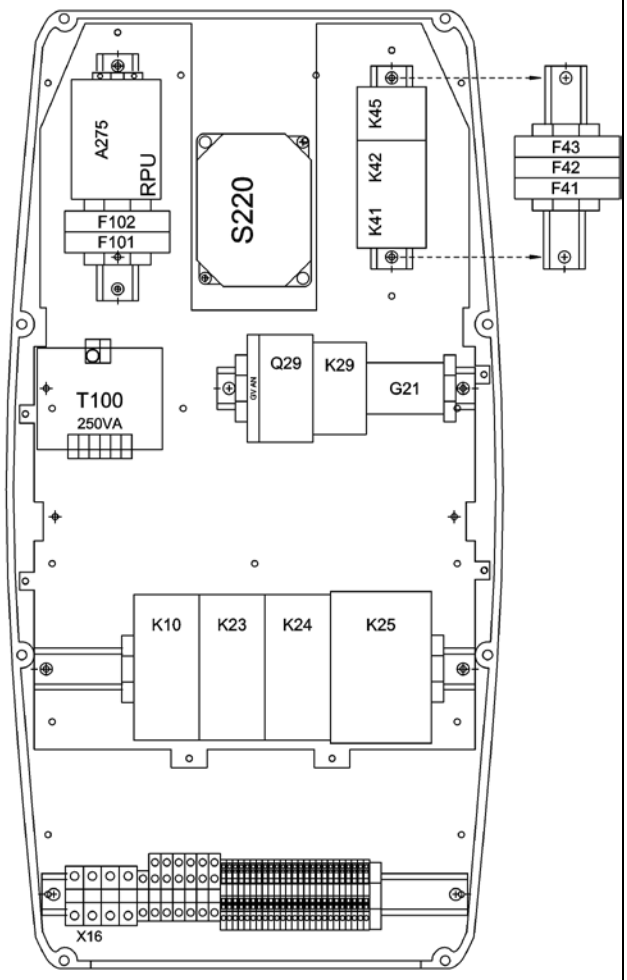



**Figure 9-6-5a** Terminal Box Layout – 208V, 230V

RHN15U

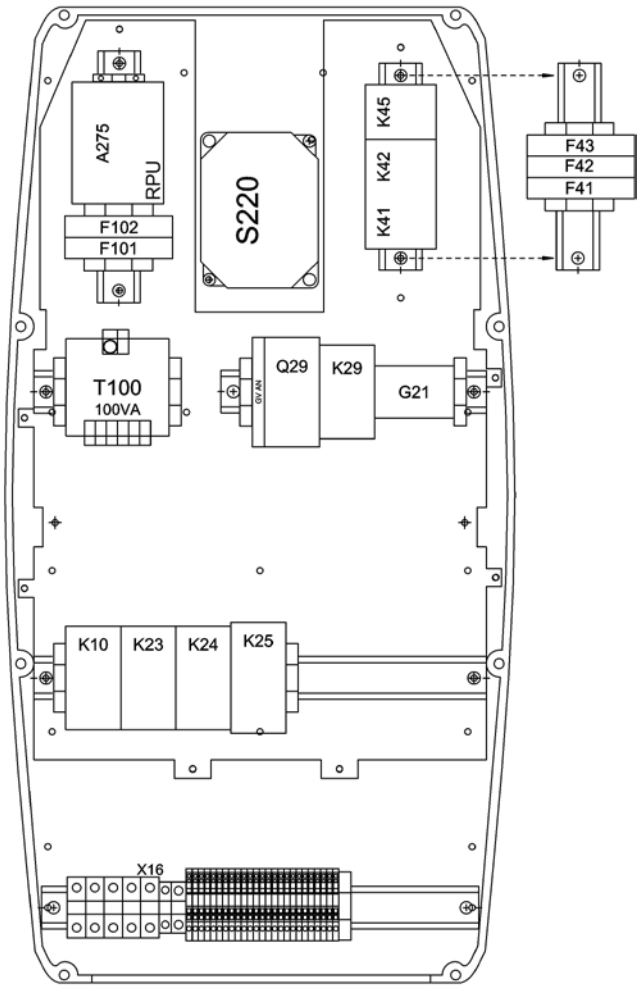



**Figure 9-6-5b** Terminal Box Layout – 460V, 575V

## 9.6 Terminal Box Parts

| Component No. | Part Name | Parts Per Hoist | RHN15U | |
|---|---|---|---|---|
| | | | 208, 230V | 460, 575V |
| A275 | RPU Overload Device (SLE21) | 1 | RHN0500 | RHN0500 |
| | RPU Overload Device (SLE22) | | RHN0575 | RHN0575 |
| F41-F43 | Fuse Holder | 3 | RHN0501 | RHN0501 |
| | Fuse Link | 3 | RHN0529 | RHN0529 |
| F101-F102 | Fuse Holder | 2 | RHN0501 | RHN0501 |
| | Fuse Link | 2 | RHN0541 | RHN0518 |
| G21 | Rectifier | 1 | RHN0542 | RHN0504 |
| K10 | Contactor, Mainline | 1 | RHN0543 | RHN0519 |
| K23-K24 | Contactor, Hoist Directional | 2 | RHN0543 | RHN0519 |
| | Auxiliary Contact Block | 1 | RHN0505 | RHN0505 |
| K25 | Contactor, Hoist Speed | 1 | RHN0537 | RHN0520 |
| K29 | Contactor, Hoist Brake | 1 | RHN0528 | RHN0528 |
| K41-K42 | Contactor, Trolley Directional | 1 | RHN0509 | RHN0509 |
| K45 | Contactor, Trolley Speed | 1 | RHN0510 | RHN0510 |
| Q29 | Circuit Breaker | 1 | RHN0544 | RHN0522 |
| | Auxiliary Contact Block | 1 | RHN0521 | RHN0521 |
| S220 | Gear-Type Limit Switch | 1 | RHN0511 | RHN0511 |
| T100 | Transformer | 1 | RHN0545 | RHN0523 (*460V) |
| | | | | RHN0524 (*575V) |
| N/A | Transformer Fuse | 1 | 9006278 | 9006202 |
| X16 | PE -Terminal | 1 | RHN0530 | RHN0530 |
| | Terminal | 3 | RHN0531 | RHN0531 |
| | PE -Terminal | 1 | RHN0525 | RHN0527 |
| | Terminal | 2* | RHN0533 (*Qty=6) | RHN0515 |
| | PE -Terminal | 5 | RHN0516 | RHN0516 |
| | Terminal | 20 | RHN0517 | RHN0517 |

## 9.6 Terminal Box Parts

**RHN15D, RHN20D**

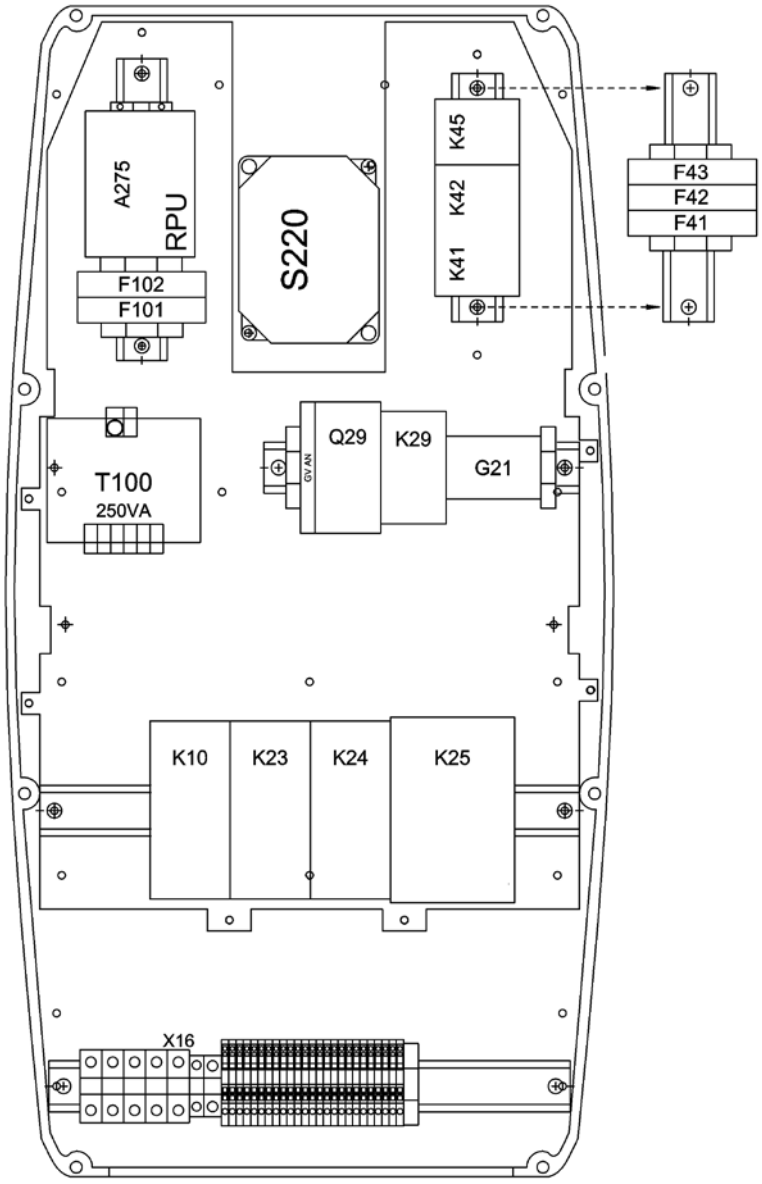



**Figure 9-6-6** Terminal Box Layout – 460V, 575V

## 9.6 Terminal Box Parts

| Component No. | Part Name | Parts Per Hoist | RHN15D, RHN20D |
|---|---|---|---|
| A275 | RPU Overload Device (SLE21) | 1 | RHN0500 |
| | RPU Overload Device (SLE22) | | RHN0575 |
| F41-F43 | Fuse Holder | 3 | RHN0501 |
| | Fuse Link | 3 | RHN0529 |
| F101-F102 | Fuse Holder | 2 | RHN0501 |
| F101-F102 | Fuse Link | 2 | RHN0502 |
| G21 | Rectifier | 1 | RHN0504 |
| K10 | Contactor, Mainline | 1 | RHN0536 |
| K23-K24 | Contactor, Hoist Directional | 2 | RHN0536 |
| | Auxiliary Contact Block | 1 | RHN0505 |
| K25 | Contactor, Hoist Speed | 1 | RHN0537 |
| K29 | Contactor, Hoist Brake | 1 | RHN0528 |
| K41-K42 | Contactor, Trolley Directional | 1 | RHN0509 |
| K45 | Contactor, Trolley Speed | 1 | RHN0510 |
| Q29 | Circuit Breaker | 1 | RHN0522 |
| Q29 | Auxiliary Contact Block | 1 | RHN0521 |
| S220 | Gear-Type Limit Switch | 1 | RHN0511 |
| T100 | Transformer | 4V 1 | RHN0534 |
| | | 5V | RHN0535 |
| N/A | Transformer Fuse | 1 | 9006278 |
| X16 | PE-Terminal | 1 | RHN0532 |
| | Terminal | 3 | RHN0533 |
| | PE-Terminal | 1 | RHN0527 |
| | Terminal | 2 | RHN0515 |
| | PE-Terminal | 5 | RHN0516 |
| | Terminal | 20 | RHN0517 |

## 9.6 Trolley Parts

**RHN02, RHN03, RHN05, RHN08, RHN10, RHN15**

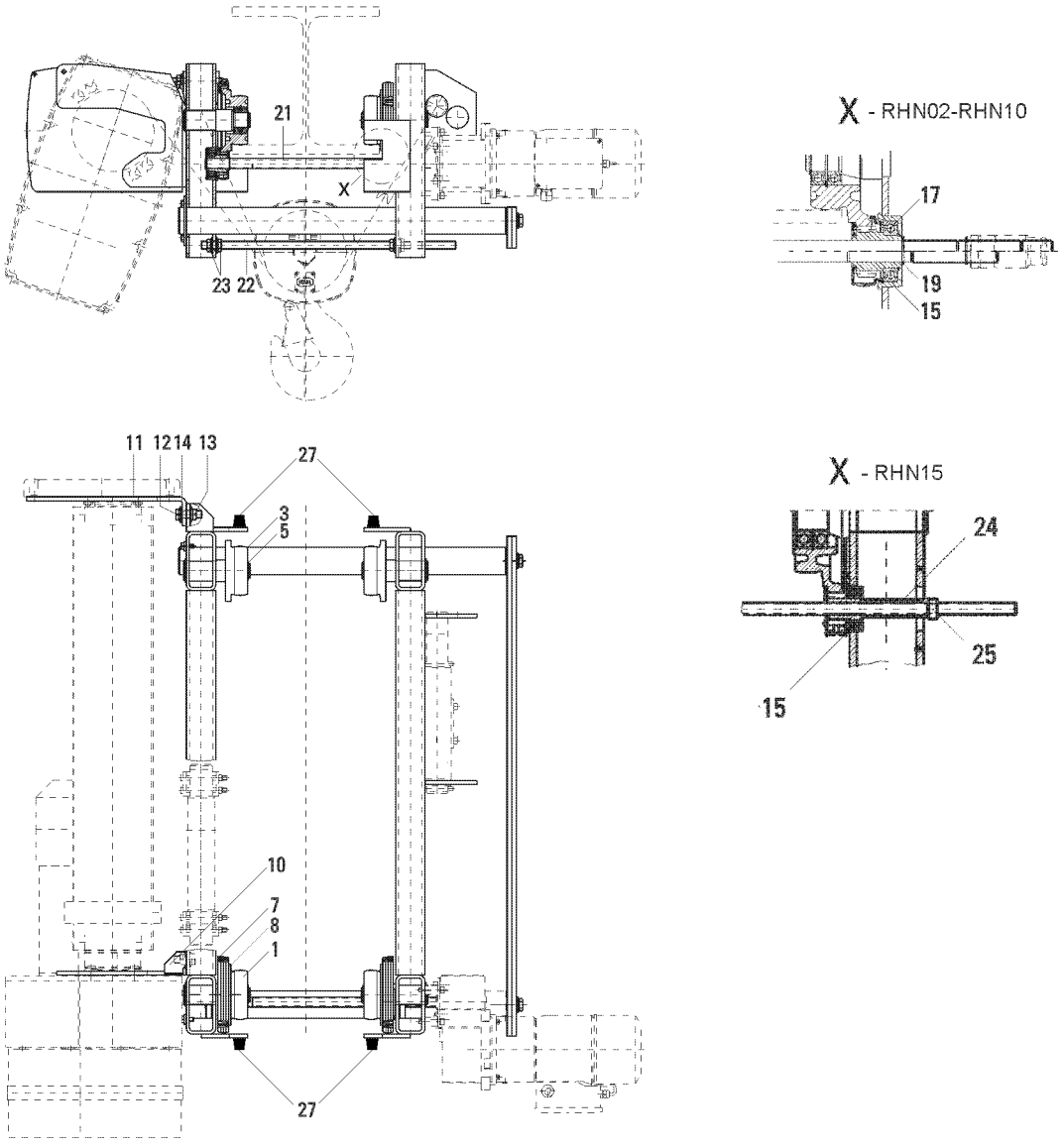


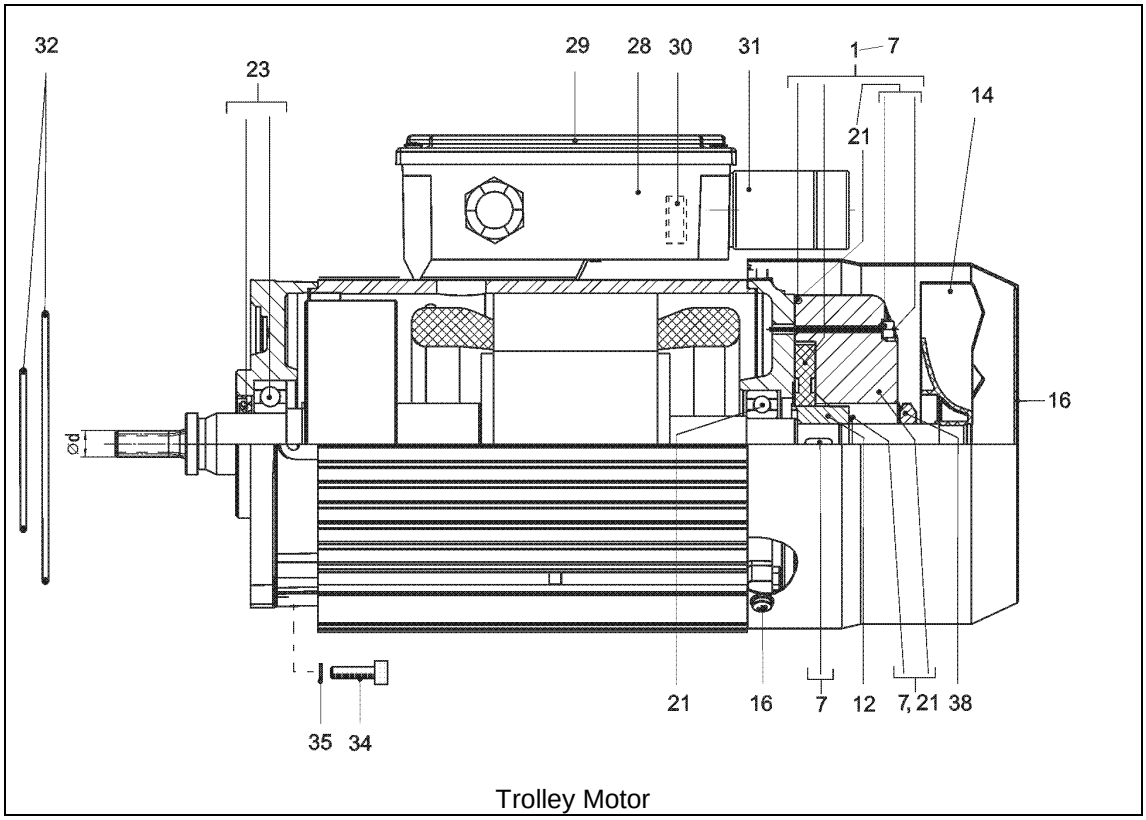

**Figure 9-7-1** Trolley Parts

## 9.7 Trolley Parts

| Figure No. | Part Name | Parts Per Hoist | RHN02 | RHN03 | RHN05 | RHN08 | RHN10 | RHN15 |
|---|---|---|---|---|---|---|---|---|
| 1 | Wheel, Drive | 2 | RHN0072 | | RHN0138 | RHN0213 | | RHN0295 |
| 5 | Snap ring, external | 2 | 9047120 | | 9047130 | 9047140 | | 9047165 |
| 3 | Wheel, Non Drive | 2 | RHN0073 | | RHN0139 | RHN0214 | | RHN0296 |
| 5 | Snap ring, external | 2 | 9047120 | | 9047130 | 9047140 | | 9047165 |
| 7 | Wheel cover | 2 | RHN0074 | | RHN0140 | RHN0215 | | RHN0297 |
| 8 | Wheel cover* | 2 | RHN0075 | | RHN0141 | RHN0216 | | *Included in #7 |
| 10 | Support plate | 1 | RHN0076 | | RHN0142 | RHN0217 | | - |
| 11 | Support plate | 1 | RHN0077 | | RHN0143 | RHN0218 | | - |
| 12 | Screw | 4 | RHN0078 | | RHN0144 | RHN0219 | | |
| 13 | Nut | 4 | 9098516 | | | 9093452 | | |
| 14 | Lock washer | 8 | | | | 9012719 | | |
| 15 | Flange bearing complete | 2 | RHN0079 | | | | | RHN0298 |
| 17 | Grooved ball bearing | 2 | 9000506 | | | | | |
| 19 | Snap ring, external | 4 | 9047191 | | | | | |
| 21 | Drive shaft, length:390mm; flange:82-195mm (3.25-7.68”) | 1 | RHN0080 | | | | | |
| | Drive shaft, length:390mm; flange:92-195mm (3.63-7.68”) | | | | RHN0080 | | | |
| | Drive shaft, length 495mm; flange:196-306mm (7.72”-12.05”) | | RHN0081 | | | | | |
| | Drive shaft, length 595mm; flange: 307-400mm (12.09-15.71”) | | RHN0082 | | | | | |
| | Drive shaft, length 695mm; flange: 401-500mm (15.75-19.69”) | | RHN0083 | | | | | |
| | Drive shaft, length:505mm; flange:117-310mm (4.63-12.20”) | | | | | RHN0221 | | |
| | Drive shaft, length:710mm; flange:311-500mm (12.24-19.69”) | | | | | RHN0222 | | |
| | Drive shaft, length 510mm; flange:170-220mm (6.69”-15.75”) | | | | | | | RHN0301 |
| | Drive shaft, length 740mm; flange: 221-400mm (8.70”-15.75”) | | | | | | | RHN0302 |
| | Drive shaft, length:780mm; flange:401-500mm (15.79-19.69”) | | | | | | | RHN0303 |
| 22 | Threaded bolt | 2 | RHN0084 | | | | | |
| 23 | Locking nut | 8 | 9098516 | | | | | |
| 24 | Distance pipe | 1 | | | | | | RHN0299 |
| 25 | Adjusting ring | 1 | | | | | | RHN0300 |
| 27 | Trolley bumper | 4 | RHN0145 | | | RHN0204 | | RHN0314 |

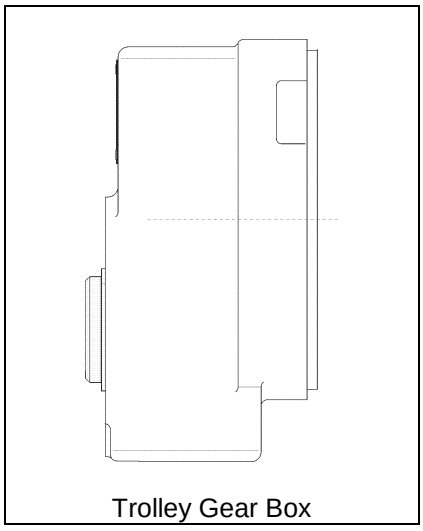
## 9.7 Trolley Motor & Gear Box Assembly Parts

**RHN02, RHN03, RHN05, RHN08, RHN10, RHN15U**




Trolley Motor

50



Trolley Gear Box

**Figure 9-8-1** Trolley Motor & Gear Box Assembly (Dual Speed-80/20 fpm)

## 9.8 Trolley Motor & Gear Box Assembly Parts

| Figure No. | Part Name | Parts Per Hoist | | RHN02 | RHN03 | RHN05 | RHN08 | RHN10 | RHN15 |
|---|---|---|---|---|---|---|---|---|---|
| 50 | **TROLLEY MOTOR & GEAR BOX ASSEMBLY[1], DUAL SPEED – 80/20 fpm** | 1V | 1 | RHN0725 | | | RHN0728 | | RHN0731 |
| | | 2V | | RHN0726 | | | RHN0729 | | RHN0732 |
| | | 4V | | RHN0425 | | | RHN0426 | | RHN0427 |
| | | 5V | | RHN0727 | | | RHN0730 | | RHN0733 |
| 7 | Brake kit[2] | 1V 2V 4V | 1 | RHN0388 | | | RHN0403 | | RHN0407 |
| | | 5V | | RHN0389 | | | RHN0404 | | RHN0408 |
| 1 | Brake rotor kit[3] | 1 | | RHN0387 | | | | | |
| 12 | Nut | 1 | | RHN0390 | | | | | RHN0409 |
| 14 | Fan wheel | 1 | | RHN0391 | | | | | RHN0410 |
| 16 | Fan cover kit[4] | 1 | | RHN0392 | | | | | RHN0411 |
| 21 | Bearing kit (Inc. 3-5,8,9) | 1 | | RHN0393 | | | | | RHN0412 |
| 23 | Bearing kit[5] | 1 | | RHN0394 | | | | | RHN0413 |
| 28 | Terminal box | 1 | | RHN0395 | | | | | |
| 29 | Terminal box lid | 1 | | RHN0396 | | | | | |
| 30 | Rectifier | 1V | 1 | RHN0397 | | | | | |
| | | 2V 4V 5V | | RHN0398 | | | | | |
| 31 | Plug connector | 1 | | RHN0399 | | | | | |
| 32 | Round sealing ring | 1 | | RHN0400 | | | | | |
| 34 | Socket head cap screw | 4 | | 9091250 | | | | | 9091294 |
| 35 | Lock washer | 4 | | 9012709 | | | | | 9012712 |
| 38 | Sealing ring | 1 | | RHN401 | | | | | RHN0414 |

1 Lubricant included
2 Brake kit includes brake rotor kit, brake, snap ring, and key
3 Brake rotor kit includes brake rotor, screws, and o-rings
4 Fan cover kit includes fan cover, screws, and lock washers
5 Bearing kit includes bearing and shaft seal

## NOTES

## NOTES

## NOTES

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