EFFECTIVE: June 26, 2025

OWNER'S MANUAL

ELECTRIC CHAIN HOIST RNER2 SERIES

1 Ton - 5 Ton Capacity Class II Division 2

Code, Lot and Serial Number

⚠ WARNING

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

HARRINGTON®
HOISTS AND CRANES

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1.0 Important Information and Warnings

1.1 Terms and Summary

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

Danger, Warning, Caution and Notice

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

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

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

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

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

⚠ CAUTION

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

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

Record your hoist's Code, Lot and Serial Number (see section 10) on the front cover of this manual for identification and future reference to avoid referring to the wrong manual for information or instructions on installation, operation, inspection, maintenance, or parts.

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

⚠ WARNING

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

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

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

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

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

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

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

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

⚠ DANGER

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

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

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

NOTICE

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

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

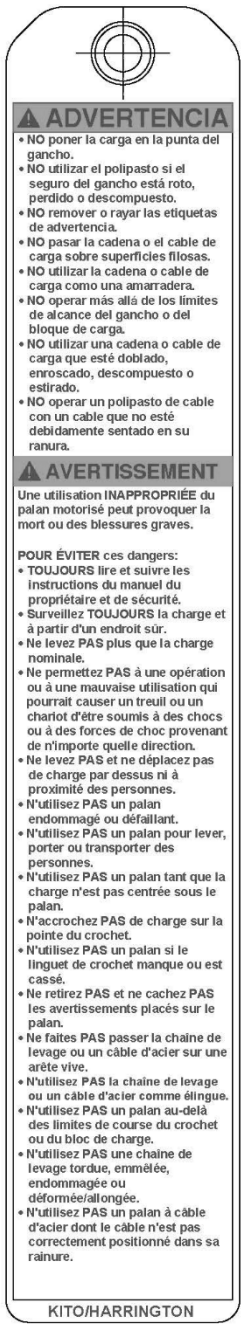
If the hoist owner/user requires additional information, or if any information in the manual is not clear, contact Harrington or the distributor of the hoist. Do not install, inspect, test, maintain, or operate this hoist unless this information is fully understood.

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

1.2 Warning Tags and Labels

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

Front



Back

Figure 1-1 Warning Tag Attached to Hoist

2.0 Technical Information

2.1 Product Code

RNER2M 020 S-L/S

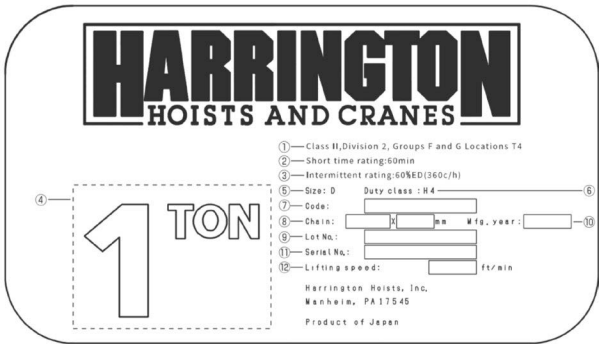
Type:
RNER2 = C Ⅱ D2 RNER2 Hook Mount
RNER2M = C Ⅱ D2 RNER2 with Motorized Trolley
RNER2G = C Ⅱ D2 RNER2 with Geared Trolley
RNER2P = C Ⅱ D2 RNER2 with Plain Trolley

Capacity Code:
010 = 1 Ton
015 = 1 1/2 Ton
020 = 2 Ton
025 = 2 1/5 Ton
030 = 3 Ton
050 = 5 Ton

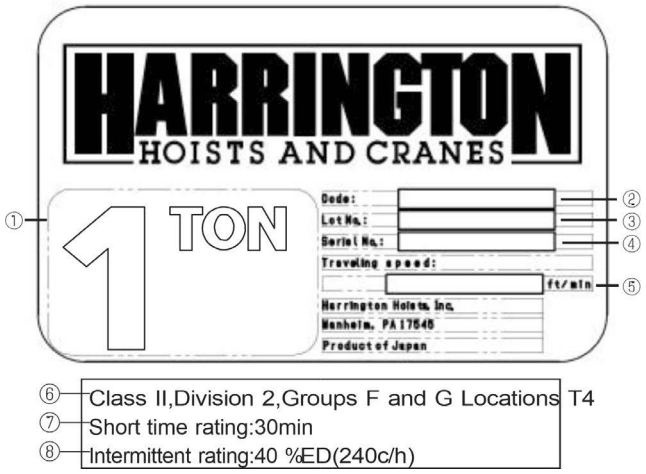
Lifting Speed:
C = Common
L = Low
S = Standard

Traversing Speed:
L = Low
S = Standard

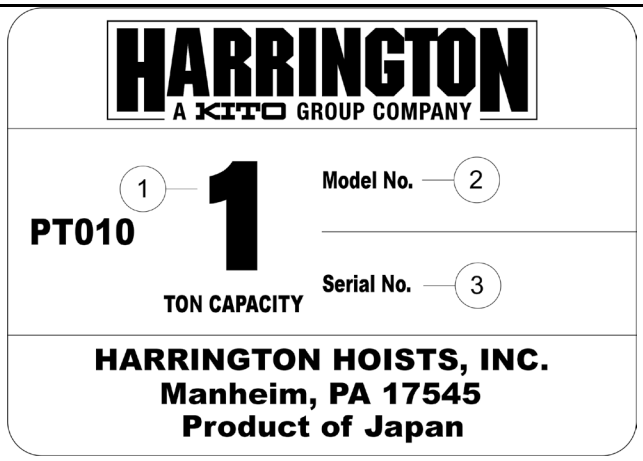
2.2 Nameplate Breakdown



#		Hoist nameplate marking description
1	Operational environment Class II, Division 2, Groups F and G Locations T4	Class II: Dust classification Division 2: Usage location Groups F and G locations: Both dust types F and G can be used. T4: Temperature rating (surface temperature of 135°C / 275°F)
2	Short time rating	The amount of time the product can be used at the rated output and within the temperature increase limit (120°C / 248°F) for motor winding with insulation class B as specified in IEC60034-1.
3	Intermittent rating	A ratio of loading time to the sum of loading time and downtime is expressed in a loading time factor (%ED), and a combination of each loading time factor and maximum starting frequency is defined as intermittent rating.
4	Capacity	The maximum rated load a hoist is designed to lift. The weight of the hook is excluded.
5	Size (Example 1t)	The size of the electric chain hoist body to support the load. Three models of D, E and F are provided.
6	Duty Class – H4	The grade of an electric chain hoist specified by ASME. A guideline of durability.
7	Code	Product model (Ex. RNER2010S) A code to indicate the model No. of the product capacity and
8	Chain Size	Load chain size. Ex. T-7.7 x 21.4mm. The alphabet and the figures indicate the JIS grade, wire diameter and chain pitch respectively.
9	Lot No.	Manufacturer number to identify the time of manufacture and Production Lot
10	Mfg. Year	Year manufactured
11	Serial No.	Serial number to indicate the manufacturing sequence of the product.
12	Lifting speed	Hoist lifting speed delineated by feet per minute. (Ft/min)



#		Motorized trolley nameplate marking description
1	Capacity	The maximum rated load a trolley is designed to lift.
2	Code	Product model (Ex. RMR2010S) A code to indicate the model number of the product, capacity, and lifting speed.
3	Lot No	Manufacturer number to identify the time of manufacture and the production lot.
4	Serial No.	Serial number to indicate the manufacturing sequence of the product.
5	Traveling speed	Speed of trolley travel measured by feet per minute (ft/min).
6	Class II, Division 2, Groups F and G Locations T4	Class II: Dust classification Division 2: Usage location Groups F and G locations: Both dust types F and G can be used. T4: Temperature rating (surface temperature of 135°C / 275°F)
7	Short time rating	The amount of time the product can be used at the rated output and within the temperature increase limit (120°C / 248°F) for motor winding with insulation class B as specified in IEC60034-1.
8	Intermittent rating	A ratio of loading time to the sum of loading time and downtime



#		Manual trolley (push or geared) nameplate marking description
1	Capacity	The maximum rated load a trolley is designed to lift. The mass of the hook is excluded.
2	Model No	Product model (Ex. RMR2-010S) A code to indicate the model number of the product, capacity, and lifting speed.
3	Serial No	Manufacturer number to identify the time of manufacture and the production lot.

2.3 Hoist Parts Breakdown

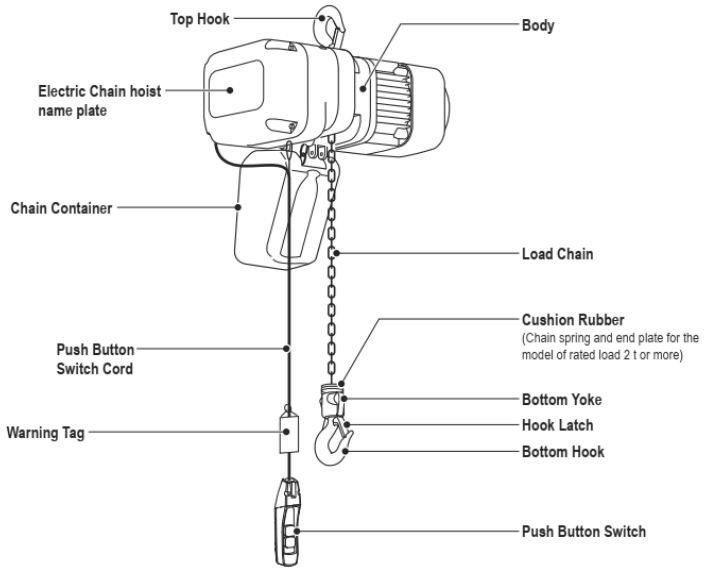


Figure 2-1 RNER2 (Hoist Only)

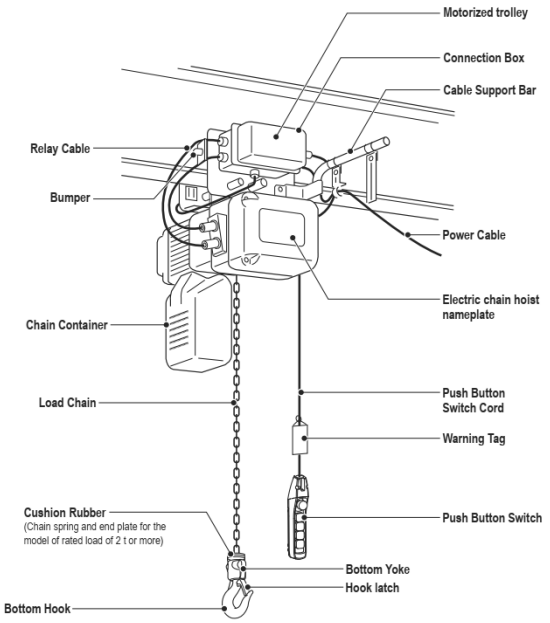


Figure 2-2 RNER2M (Hoist w/ motorized trolley)

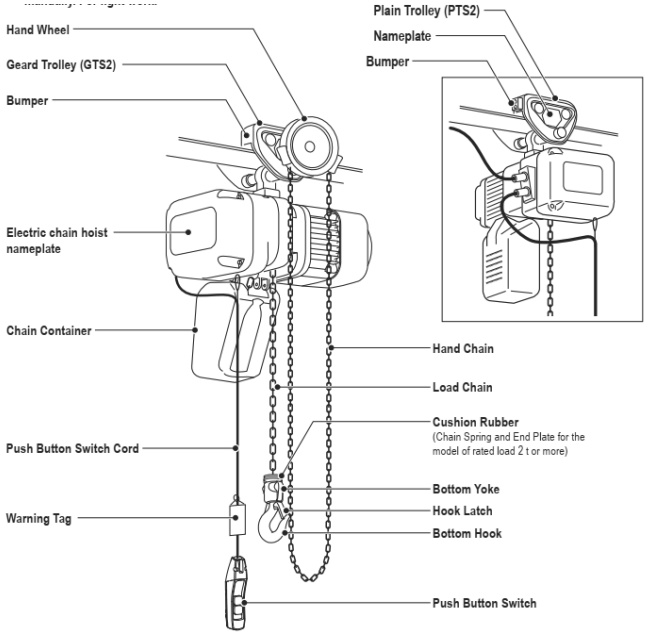


Figure 2-3 RNER2G/RNER2P (Hoist w/ push or geared manual trolley)

2.4 CII D2 Description

Harrington RNER2 series hoists are available in several different Classes and Divisions. The product described here is intended solely for use in standard conditions or under Class II, Division 2, Group F and Group G locations with T4 temperature environments. The RNER2 has a friction clutch mechanism that provides over winding protection.

RNER2 Hazardous Dust Locations ONLY
Dust: Class II Division 2
Group F: (ex: Coal dust)
Group G: (ex: Grain dust)

⚠ WARNING Always consult a Qualified Person regarding hazardous locations and selection of equipment suitable for your specific application.

⚠ WARNING Do not operate hoist in an environment where flammable or explosive gas is present.

2.5 Operational Environment – Class II, Division 2 (CIID2)

Operating Conditions and Environment

Temperature range:	-4° to +104°F (-20° to +40°C)
Humidity:	85% or less (No condensation)
Noise Level:	85 dB or less (A scale: measured 1 meter away from electric chain hoist
Enclosure Rating:	Hoist Meets IP55, Pendant Meets IP65
Supply Voltage:	Single Speed Standard: Reconnectable 208/230 & 460V-3-60
Operating Voltage:	110V
Usage Location:	Class II Division 2 Groups F & G
Temperature Rating:	T4

	Single Speed
Hoist Duty Rating:	ISO M4/M5; ASME H4
Intermittent Duty Rating:	60% ED 360 starts per hour
Short Time Duty Rating:	60 min.

2.6 Duty Rating Explanations - ISO, FEM, ASME

ISO 4301 specifies the total operating hour (service life) of gears and bearings according to the loading status. For example, the total operating hour (service life) of the mechanism when it is constantly applied with the capacity is 1,600 hours for M5. The total operating hour is 6,300 hours when operated with a medium load.

Loading status*	**Total operating hours**					
	800	**1600**	**3200**	**6300**	**12500**	**25000**
Light				M4	M5	M6
Medium			M4	M5	M6	
Heavy		M4	M5	M6		
Ultra heavy	M4	M5	M6			

* **Rate of loading**

Light: A case where the capacity is rarely applied. Usually the hoist is used with a light load.
Medium: A case where the capacity is applied considerably frequently. Usually the hoist is used with a medium load.
Heavy : A case where the capacity is applied considerably frequently. Usually the hoist is used with a heavy load.
Ultra heavy : A case where the capacity is applied constantly.

ASME HST					
Hoist duty class	Typical areas of application	Operation time ratings at K=0.65			
		Uniformly distributed work periods		Infrequent work periods	
		Max. on time, min / hr	Max. No. starts / hr	Max. on time from cold start, min	Max. No. of starts
H2	Light machine shop fabricating, service, and maintenance; loads and utilization randomly distributed; capacities infrequently handled.	7.6 (12.5%)	75	15	100
H3	General machine shop fabricating,assembly, storage, and warehousing; loads and utilization randomly distributed.	15 (25%)	150	30	200
H4	High volume handling in steel warehouses, machine shops, fabricating plants, mills, and foundries; manual or automatic cycling operations in heat treating and plating; loads at or near capacity frequently handled.	30 (50%)	300	30	300

*The grade symbols are identical to those of ASME HST-1M. (Performance standard for Electric Chain Hoist)

FEM Relation between ISO-and FEM-Denominations

1 Dm	1 Cm	1 Bm	1 Am	2 m	3 m	4 m	5 m
M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8

Class of operating time		Average operating time per day (in hours)	Calculated total operating time (in hours)
V0.06	T0	<0.12	200
V0.12	T1	<0.25	400
V0.25	T2	<0.5	800
V0.5	T3	<1	1,600
V1	T4	<2	3,200
V2	T5	<4	6,300
V3	T6	<8	12,500
V4	T7	<16	25,000
V5	T8	>16	50,000

Load spectrum	Cubic mean value	Class of operation time								
		V0.06	V0.02	V0.25	V0.5	V1	V2	V3	V4	V5
		T0	T1	T2	T3	T4	T5	T6	T7	T8
		Average operation time per day in hours								
		≤0.12	<0.25	<0.5	<1	<2	<4	<8	<16	>16
1 L1	K<0.50	–	–	1 Dm	1 Cm	1 Bm	1 Am	2 m	3 m	4 m
2 L2	0.50<K< 0.63	–	1 Dm	1 Cm	1 Bm	1 Am	2 m	3 m	4 m	5 m
3 L3	0.63<K< 0.80	1 Dm	1 Cm	1 Bm	1 Am	2 m	3 m	4 m	5 m	–
4 L4	0.80<K< 1.00	1 Cm	1 Bm	1 Am	2 m	3 m	4 m	5 m	–	–

*The grade symbols are identical to those of FEM 9.511.
(Rules for Design of Serial Lifting Equipment: Classification of Mechanisms)

2.7 Specifications

RNER2 Hoist Specifications - Imperial

Cap. (Tons)	Product Code	Std. Lift (ft)	Pendant Drop L (ft)	Lifting Speed (ft/min)	Lifting Motor* 3 Phase 60Hz			Load Chain Diameter (mm) x Chain Fall Lines	Net Weight (lbs)	Weight for Additional One Foot of Lift (lbs)
					Output (Hp)	Rated Current (amps)				
						@208 - 230V	@460V			
1	RNER2010L	10	8.2	14	1.2	4.8	2.5	7.7 x 1	104	0.89
1	RNER2010S			28	2.4	8.6	4.2	7.7 x 1	119	0.89
1 1/2	RNER2015S			18	2.4	8.6	4.2	10.2 x 1	159	1.6
2	RNER2020L			14	2.4	8.6	4.2	10.2 x 1	161	1.6
2	RNER2020S			28	4.7	16.4	7.9	10.2 x 1	201	1.6
2 1/2	RNER2025S			22				11.2 x 1	227	1.9
3	RNER2030C		9.2	17				10.2 x 2	234	3.2
5	RNER2050L			11				11.2 x 2	289	3.8

*Although 208/230 & 460 Volts are shown, voltage can **NOT** be changed, due to electrical components being voltage specific.

RNER2 Hoist Specifications - Metric										
Cap. (Tons)	Product Code	Std. Lift (m)	Pendant Drop L (m)	Lifting Speed (m/min)	Lifting Motor* 3 Phase 60Hz			Load Chain Diameter (mm) x Chain Fall Lines	Net Weight (kg)	Weight for Additional One Meter of Lift (kg)
					Output (kW)	Rated Current (amps)				
						@208 - 230V	@460V			
1	RNER2010L	3.0	2.5	4.3	0.9	4.8	2.5	7.7 x 1	47	1.33
1	RNER2010S			8.5	1.8	8.6	4.2	7.7 x 1	54	1.33
1.5	RNER2015S			5.5	1.8	8.6	4.2	10.2 x 1	72	2.3
2	RNER2020L			4.3	1.8	8.6	4.2	10.2 x 1	73	2.3
2	RNER2020S			8.5	3.5	16.4	7.9	10.2 x 1	91	2.3
2.5	RNER2025S			6.7				11.2 x 1	103	2.8
3	RNER2030C		2.8	5.2				10.2 x 2	106	4.7
5	RNER2050L			3.4				11.2 x 2	131	5.6

*Although 208/230 & 460 Volts are shown, voltage can **NOT** be changed, due to electrical components being voltage specific.

RNER2P/G Hoist w/ Push or Geared Trolley Specifications - Imperial												
Cap. (Tons)	Product Code	Std. Lift (ft)	Pendant Drop L (ft)	Lifting Speed (ft/min)	Lifting Motor* 3 Phase 60Hz			Flange Width Adjustability B (in.)		**Minimum Allow. Radius for Curve (in.)	Load Chain (mm) x Chain Fall Lines	***Net Weight (lbs)	***Weight for Additional One Foot of Lift (lbs)
					Output (Hp)	Rated Current (amps)		Standard	Optional				
						@208 - 230V	@460V						
1	RNER2P(G)010L	10	8.2	14	1.2	4.8	2.5	2.28 – 5.00	5.01 – 8.00 OR 8.01 – 12.00	51.2	7.7 x 1	121 (130)	0.89 (1.6)
1	RNER2P(G)010S			28	2.4	8.6	4.2				7.7 x 1	137 (146)	0.89 (1.6)
1 1/2	RNER2P(G)015S			18	2.4	8.6	4.2	3.23 – 6.02	6.03 – 12.00	59.1	10.2 x 1	187 (196)	1.6 (2.2)
2	RNER2P(G)020L			14	2.4	8.6	4.2				10.2 x 1	190 (198)	1.6 (2.2)
2	RNER2P(G)020S			28	4.7	16.4	7.9				10.2 x 1	231 (240)	1.6 (2.2)
2 1/2	RNER2P(G)025S			22						66.9	11.2 x 1	280 (289)	1.9 (2.5)
3	RNER2P(G)030C		9.2	17							10.2 x 2	284 (293)	3.2 (3.8)
5	RNER2P(G)050L			11				3.94 – 7.02	7.03 – 12.00	90.6	11.2 x 2	399 (415)	3.8 (4.4)

*Although 280/230 & 460 Volts are shown, voltage can **NOT** be changed, due to electrical components being voltage specific. **Minimum Flange Width for curved beam: 1 Ton Push/Geared = 2.87 in. 3 Ton Push/Geared = 3.50 in. ***Figures in parentheses are specifications for geared trolley.

RNER2P/G Hoist w/ Push or Geared Trolley Specifications - Metric											
Cap. (Tons)	Product Code	Std. Lift (m)	Pendant Drop L (m)	Lifting Speed (m/min)	Lifting Motor* 3 Phase 60Hz		Flange Width Adjustability B (mm)		**Minimum Allow. Radius for Curve (mm)	Load Chain (mm) x Chain Fall Lines	***Net Weight (kg)	***Weight for Additional One Meter of Lift (kg)
					Output (kW)	Rated Current (amps)	Standard	Optional				

						@208 - 230V	@460V						
1	RNER2-P(G)010L	3.0	2.5	4.3	0.9	4.8	2.5	58 – 127	128 – 203 OR 204 – 305	1300	7.7 x 1	55 (59)	1.33 (2.3)
1	RNER2-P(G)010S			8.5	1.8	8.6	4.2				7.7 x 1	62 (66)	1.33 (2.3)
1.5	RNER2-P(G)015S			5.5	1.8	8.6	4.2	82 – 153	154 – 305	1500	10.2 x 1	85 (89)	2.3 (3.2)
2	RNER2-P(G)020L			4.3	1.8	8.6	4.2				10.2 x 1	86 (90)	2.3 (3.2)
2	RNER2-P(G)020S			8.5	3.5	16.4	7.9				10.2 x 1	105 (109)	2.3 (3.2)
2.5	RNER2-P(G)025S			6.7						1700	11.2 x 1	127 (131)	2.8 (3.7)
3	RNER2-P(G)030C		2.8	5.2							10.2 x 2	129 (133)	4.7 (5.6)
5	RNER2-P(G)050L			3.4				100 – 178	179 – 305	2300	11.2 x 2	181 (188)	5.6 (6.5)

*Although 280/230 & 460 Volts are shown, voltage can **NOT** be changed, due to electrical components being voltage specific. **Minimum Flange Width for curved beam: 1 Ton Push/Geared = 2.87 in. 3 Ton Push/Geared = 3.50 in.***Figures in parentheses are specifications for geared trolley.

RNER2M Hoist w/ Motorized Trolley Specifications - Imperial

Cap. (Tons)	Product Code	Std. Lift (ft)	Push Button Cord L (ft)	Lifting Speed (ft/min)	Traversing Speed (ft/min)	Lifting Motor* 3 Phase 60 Hz			Traversing Motor* 3 Phase 60 Hz			Flange Width Adjustability B (in.)		Minimum Allow. Radius for Curve (in.)	Load Chain Diameter (mm) x Chain Fall Lines	Net Weight (lbs)	Weight for Additional One Foot of Lift (lbs)
						Output (Hp)	Rated Current (amps)		Output (Hp)	Rated Current (amps)							
							@208 - 230V	@460V		@208 - 230V	@460V	Standard	Optional				
1	RNER2-M010L-L/S	10	8.2	14	L = 40 S = 80	1.2	4.8	2.5	0.54	3.2	1.6	2.28 – 5.00	5.01 – 6.02 OR 6.03 – 12.00	31.5**	7.7 x 1	170	0.89
1	RNER2-M010S-L/S			28		2.4	8.6	4.2							7.7 x 1	185	0.89
1 1/2	RNER2-M015S-L/S			18								3.23 – 6.02	6.03 – 7.02 OR 7.03 – 12.00	31.5***	10.2 x 1	243	1.6
2	RNER2-M020L-L/S			14											10.2 x 1	245	1.6
2	RNER2-M020S-L/S			28		4.7	16.4	7.9							10.2 x 1	284	1.6
2 1/2	RNER2-M025S-L/S			22										39.4	11.2 x 1	333	1.9
3	RNER2-M030C-L/S		9.2	17											10.2 x 2	340	3.2
5	RNER2-M050L-L/S			11					1.0	5.1	2.5	3.94 – 7.01	7.02 – 7.60 OR 7.61 – 12.00	70.9	11.2 x 2	443	3.8

*Although 208/230 & 460 Volts are shown, voltage can **NOT** be changed, due to electrical components being voltage specific. **Flange widths smaller than 4 inches will have a minimum radius of 137.8 inches. ***Flange widths smaller than 5 inches will have a minimum radius of 39.4 inches.

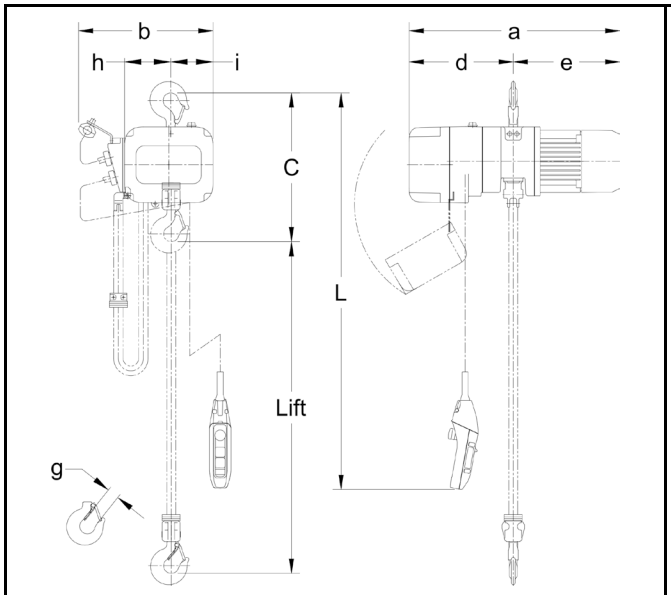
RNER2M Hoist w/ Motorized Trolley Specifications - Metric

Cap. (Tons)	Product Code	Std. Lift (m)	Push Button Cord L (m)	Lifting Speed (m/min)	Traversing Speed (m/min)	Lifting Motor* 3 Phase 60 Hz			Traversing Motor* 3 Phase 60 Hz			Flange Width Adjustability B (mm.)		Minimum Allow. Radius for Curve (mm.)	Load Chain Diameter (mm) x Chain Fall Lines	Net Weight (kg)	Weight for Additional One Foot of Lift (kg)
						Output (kW)	Rated Current (amps)		Output (kW)	Rated Current (amps)							
							@208 - 230V	@460V		@208 - 230V	@460V	Standard	Optional				
1	RNER2-M010L-L/S	3.0	2.5	4.3	L = 12.2	0.9	4.8	2.5	0.4	3.2	1.6	58 - 127	128 – 153	800**	7.7 x 1	77	1.33

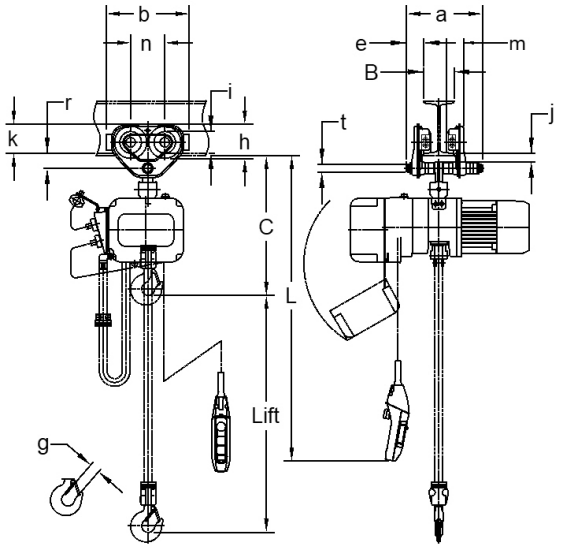
1	RNER2-M010S-L/S			8.5	S = 24.4								OR 154 – 305		7.7 x 1	84	1.33
1.5	RNER2-M015S-L/S			5.5		1.8	8.6	4.2							10.2 x 1	110	2.3
2	RNER2-M020L-L/S			4.3									154 – 178 OR 179 – 305	800***	10.2 x 1	111	2.3
2	RNER2-M020S-L/S			8.5								82 – 153			10.2 x 1	129	2.3
2.5	RNER2-M025S-L/S			6.7											11.2 x 1	151	2.8
3	RNER2-M030C-L/S			5.2		3.5	16.4	7.9						1000	10.2 x 2	154	4.7
5	RNER2-M050L-L/S		2.8	3.4					0.75	5.1	2.5	100 - 178	179 – 193 OR 194 – 305	1800	11.2 x 2	201	5.6

*Although 208/230 & 460 Volts are shown, voltage can **NOT** be changed, due to electrical components being voltage specific.**Flange widths smaller than 4 inches will have a minimum radius of 137.8 inches.***Flange widths smaller than 5 inches will have a minimum radius of 39.4 inches.

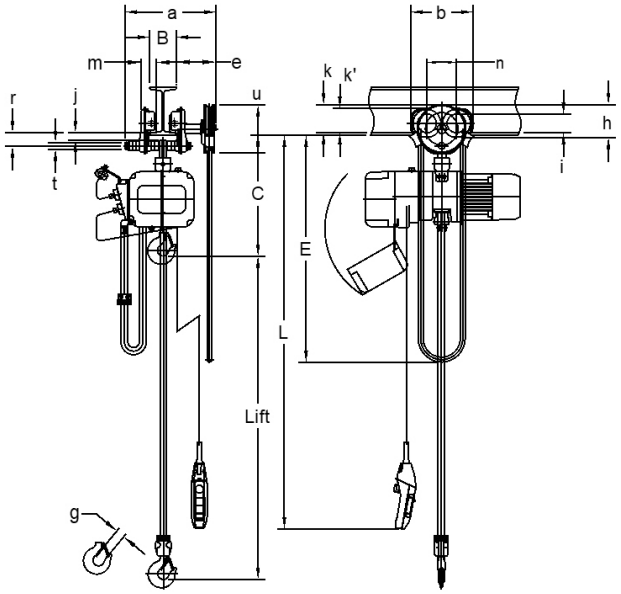
2.8 Dimensions



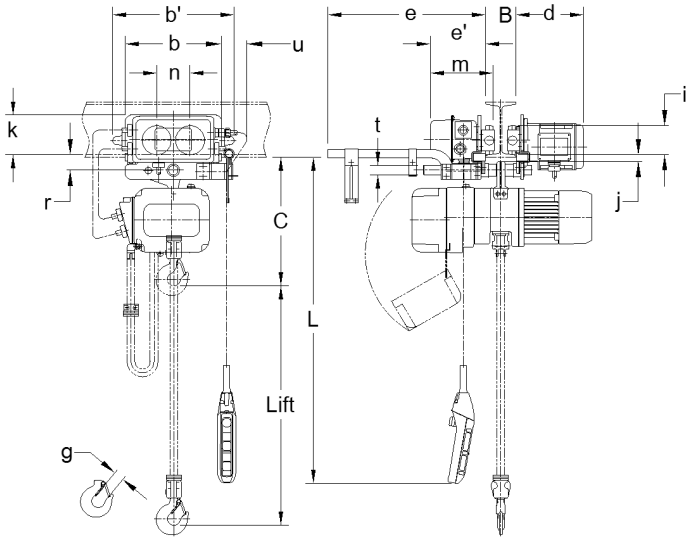
RNER2 Hoist only



RNER2P Hoist w/ push trolley



RNER2G Hoist w/ geared trolley



RNER2M Hoist w/ motorized trolley

Figure 2-4 Hoist Dimensions (See Table 2-3)

Table 2-1 RNER2 Hoist - Imperial & Metric Dimensions

Cap. (Tons)	Product Code	Headroom C in. (mm)	a in. (mm)	b in. (mm)	d in. (mm)	e in. (mm)	g in. (mm)	h in. (mm)	i in. (mm)
1	RNER2010L	16.9 (430)	23.2 (589)	14.8 (376)	11.4 (291)	11.7 (298)	1.2 (31)	5.1 (129)	4.6 (118)
1	RNER2010S	16.9 (430)	23.5 (598)	14.8 (376)	11.4 (291)	12.1 (307)	1.2 (31)	5.1 (129)	4.6 (118)
1 1/2	RNER2015S	20.1 (510)	25.4 (646)	16.8 (427)	12.1 (308)	13.3 (338)	1.4 (35)	6.3 (161)	5.4 (138)
2	RNER2020L	22.6 (575)	25.4 (646)	16.8 (427)	12.1 (308)	13.3 (338)	1.6 (40)	6.3 (161)	5.4 (138)
2	RNER2020S	23.2 (590)	27.6 (702)	16.8 (427)	13.6 (347)	14.0 (356)	1.6 (40)	6.3 (161)	5.4 (138)
2 1/2	RNER2025S	24.6 (625)	28.9 (735)	17.5 (445)	13.2 (337)	15.7 (399)	1.6 (40)	6.8 (174)	5.6 (143)
3	RNER2030C	30.9 (785)	27.6 (702)	16.8 (427)	13.6 (347)	14.0 (356)	1.8 (45)	8.5 (216)	3.2 (82)
5	RNER2050L	33.5 (850)	28.9 (735)	17.5 (445)	13.2 (337)	15.7 (399)	1.9 (47)	9.1 (232)	3.3 (85)

Table 2-2 RNER2P Hoist w/ Push Trolley - Imperial and Metric Dimensions

Cap. (Tons)	Product Code	Headroom C in. (mm)	a in. (mm)	b in. (mm)	e in. (mm)	g in. (mm)	h in. (mm)	i in. (mm)	j in. (mm)	k in. (mm)	m in. (mm)	n in. (mm)	r in. (mm)	t in. (mm)
1	RNER2P010L	18.5 (470)	9.8 (249)	10.7 (272)	2.2 (56)	1.2 (31)	4.2 (106)	2.80 (71)	1.1 (28)	3.7 (95)	2.2 (56)	4.4 (112)	2.0 (50)	0.98 (25)
1	RNER2P010S	18.5 (470)	9.8 (249)	10.7 (272)	2.2 (56)	1.2 (31)	4.2 (106)	2.80 (71)	1.1 (28)	3.7 (95)	2.2 (56)	4.4 (112)	2.0 (50)	0.98 (25)
1 1/2	RNER2P015S	22.4 (570)	11.8 (300)	12.4 (316)	2.7 (69)	1.4 (35)	5.0 (127)	3.35 (85)	1.4 (35)	4.4 (112)	2.8 (71)	5.2 (131)	2.4 (62)	1.26 (32)
2	RNER2P020L	25.0 (635)	11.8 (300)	12.4 (316)	2.7 (69)	1.6 (40)	5.0 (127)	3.35 (85)	1.4 (35)	4.4 (112)	2.8 (71)	5.2 (131)	2.4 (62)	1.26 (32)
2	RNER2P020S	25.6 (650)	11.8 (300)	12.4 (316)	2.7 (69)	1.6 (40)	5.0 (127)	3.35 (85)	1.4 (35)	4.4 (112)	2.8 (71)	5.2 (131)	2.4 (62)	1.26 (32)
2 1/2	RNER2P025S	26.8 (680)	12.6 (320)	14.7 (374)	3.1 (79)	1.6 (40)	5.8 (148)	3.94 (100)	1.4 (35)	5.3 (134)	3.1 (80)	6.0 (152)	2.7 (68)	1.42 (36)
3	RNER2P030C	32.7 (830)	12.6 (320)	14.7 (374)	3.1 (79)	1.8 (45)	5.8 (148)	3.94 (100)	1.4 (35)	5.3 (134)	3.1 (80)	6.0 (152)	2.7 (68)	1.42 (36)
5	RNER2P050L	33.1 (840)	11.7 (297)	17.7 (450)	2.1 (53)	1.9 (47)	6.7 (169)	4.65 (118)	1.8 (47)	5.6 (144)	3.2 (81)	7.0 (178)	3.4 (88)	2.13 (54)

Table 2-3 RNER2G Hoist w/ Geared trolley - Imperial and Metric Dimensions

Cap. (Tons)	Product Code	Headroom C in. (mm)	E ft. (m)	a in. (mm)	b in. (mm)	e in. (mm)	g in. (mm)	h in. (mm)	i in. (mm)	j in. (mm)	k in. (mm)	k' in. (mm)	m in. (mm)	n in. (mm)	r in. (mm)	t in. (mm)	u in. (mm)
1	RNER2G010L	18.5 (470)	10.5 (3.2)	13.6 (345)	9.3 (236)	6.0 (152)	1.2 (31)	4.2 (106)	2.80 (71)	1.1 (29)	3.7 (95)	4.2 (106)	2.2 (56)	4.4 (112)	1.9 (50)	0.98 (25)	7.2 (183)

1	RNER2G010S	18.5 (470)	10.5 (3.2)	13.6 (345)	9.3 (236)	6.0 (152)	1.2 (31)	4.2 (106)	2.80 (71)	1.1 (29)	3.7 (95)	4.2 (106)	2.2 (56)	4.4 (112)	1.9 (50)	0.98 (25)	7.2 (183)
1 1/2	RNER2G015S	22.4 (570)	10.5 (3.2)	15.2 (385)	11.0 (280)	6.1 (154)	1.4 (35)	5.0 (127)	3.35 (85)	1.4 (35)	4.4 (112)	4.3 (109)	2.8 (71)	5.2 (131)	2.4 (62)	1.26 (32)	7.2 (183)
2	RNER2G020L	25.0 (635)	10.5 (3.2)	15.2 (385)	11.0 (280)	6.1 (154)	1.6 (40)	5.0 (127)	3.35 (85)	1.4 (35)	4.4 (112)	4.3 (109)	2.8 (71)	5.2 (131)	2.4 (62)	1.26 (32)	7.2 (183)
2	RNER2G020S	25.6 (650)	10.5 (3.2)	15.2 (385)	11.0 (280)	6.1 (154)	1.6 (40)	5.0 (127)	3.35 (85)	1.4 (35)	4.4 (112)	4.3 (109)	2.8 (71)	5.2 (131)	2.4 (62)	1.26 (32)	7.2 (183)
2 1/2	RNER2G025S	26.8 (680)	11.0 (3.4)	15.7 (398)	12.8 (324)	6.2 (157)	1.6 (40)	5.8 (148)	3.94 (100)	1.4 (35)	5.3 (134)	4.5 (114)	3.1 (80)	6.0 (152)	2.7 (68)	1.42 (36)	7.2 (183)
3	RNER2G030C	32.7 (830)	11.0 (3.4)	15.7 (398)	12.8 (324)	6.2 (157)	1.8 (45)	5.8 (148)	3.94 (100)	1.4 (35)	5.3 (134)	4.5 (114)	3.1 (80)	6.0 (152)	2.7 (68)	1.42 (36)	7.2 (183)
5	RNER2G050L	33.1 (40)	11.5 (3.5)	15.8 (401)	15.7 (400)	6.2 (157)	1.9 (47)	6.7 (169)	4.65 (118)	1.8 (46)	5.6 (144)	5.1 (130)	3.2 (81)	7.0 (178)	3.4 (88)	2.13 (54)	7.2 (183)

Table 2-4 RNER2M Hoist w/ Motorized trolley - Imperial and Metric Dimensions

Cap. (Tons)	Product Code	Headroom C in (mm)	b in. (mm)	b' in. (mm)	d in. (mm)	e in. (mm)	e' in. (mm)	g in. (mm)	i in. (mm)	j in. (mm)	k in. (mm)	m in. (mm)	n in. (mm)	r in. (mm)	t in. (mm)	u in. (mm)
1	RNER2M010L-L/S	17.1 (435)	12.4 (315)	15.6 (397)	8.7 (220)	20.3 (515)	7.1 (179)	1.2 (31)	3.74 (95)	0.9 (22)	5.1 (130)	8.1 (205)	4.3 (109)	2.0 (51)	1.22 (31)	3.3 (83)
1	RNER2M010S-L/S	17.1 (435)	12.4 (315)	15.6 (397)	8.7 (220)	20.3 (515)	7.1 (179)	1.2 (31)	3.74 (95)	0.9 (22)	5.1 (130)	8.1 (205)	4.3 (109)	2.0 (51)	1.22 (31)	3.3 (83)
1 1/2	RNER2M015S-L/S	19.9 (505)	12.8 (325)	16.4 (417)	8.8 (225)	20.5 (520)	7.3 (185)	1.4 (35)	4.33 (110)	1.1 (27)	4.9 (125)	8.3 (212)	4.6 (118)	2.4 (60)	1.42 (36)	3.0 (76)
2	RNER2M020L-L/S	22.4 (570)	12.8 (325)	16.4 (417)	8.8 (225)	20.5 (520)	7.3 (185)	1.6 (40)	4.33 (110)	1.1 (27)	4.9 (125)	8.3 (212)	4.6 (118)	2.4 (60)	1.42 (36)	3.0 (76)
2	RNER2M020S-L/S	23.0 (585)	12.8 (325)	16.4 (417)	8.8 (225)	20.5 (520)	7.3 (185)	1.6 (40)	4.33 (110)	1.1 (27)	4.9 (125)	8.3 (212)	4.6 (118)	2.4 (60)	1.42 (36)	3.0 (76)
2 1/2	RNER2M025S-L/S	24.4 (620)	13.4 (340)	17.4 (442)	8.9 (226)	20.5 (520)	7.3 (185)	1.6 (40)	4.92 (125)	1.1 (27)	5.2 (131)	8.5 (215)	5.2 (132)	2.7 (68)	1.69 (43)	2.8 (70)
3	RNER2M030C-L/S	32.9 (835)	13.4 (340)	17.4 (442)	8.9 (226)	20.5 (520)	7.3 (185)	1.8 (45)	4.92 (125)	1.1 (27)	5.2 (131)	8.5 (215)	5.2 (132)	2.7 (68)	1.69 (43)	2.8 (70)
5	RNER2M050L-L/S	33.1 (840)	15.7 (400)	19.8 (502)	11.0 (281)	20.8 (528)	7.6 (192)	1.9 (47)	5.51 (140)	1.7 (44)	5.7 (145)	9.2 (233)	5.9 (150)	3.4 (86)	2.13 (54)	2.2 (56)

Table 2-5 Hook Dimension*

Product Code	Hook**	a (in)	b (in)	c (in)	d (in)	e (in)	f (in)	g (in)	h (in)
RNER2-010S	T & B	1.5	0.9	1.2	0.9	1.7	1.8	1.2	4.3
RNER2-020C	T & B	1.9	1.1	1.6	1.1	2.0	2.2	1.5	5.4
RNER2-015S	T	2.0	1.3	1.7	1.3	2.1	2.2	1.5	5.7
	B	1.7	1.1	1.5	1.1	1.9	2.0	1.3	4.9
RNER2-020L, 020S	T & B	2.0	1.3	1.7	1.3	2.1	2.2	1.5	5.7
RNER2-025S	T	2.0	1.3	1.7	1.3	2.4	2.4	1.7	6.1
	B	2.0	1.3	1.7	1.3	2.1	2.2	1.5	5.7
RNER-030C	T & B	2.2	1.4	1.9	1.4	2.4	2.5	1.7	6.3
RNER2-050L	T & B	2.6	1.7	2.2	1.7	2.5	2.9	1.9	7.4

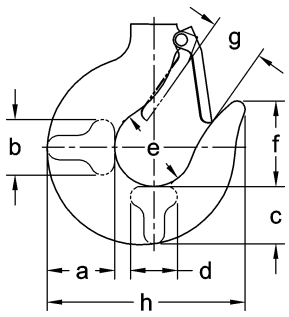


Figure 1 – Hook Dimensions

*Refer to Section 5.7 for inspection dimensions and limits.*The "L" dimensions are based on the standard lift of 10 feet.

3.0 Preoperational Procedures

3.1 Gearbox

3.1.1 The gearbox is filled with the correct amount of oil at the time of shipment. The oil level must be verified prior to operation. Refer to Section 6.3 for specific checking procedure.

3.1.2 Refer to Section 6.3 when replacing the gear oil.

3.2 Chain

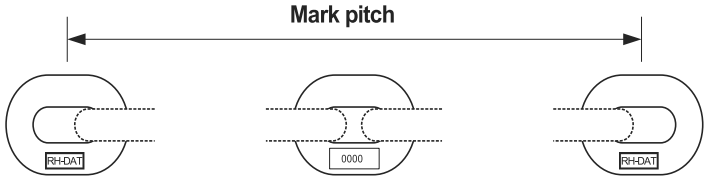
3.2.1 The quantity and location of the chain components including cushion rubbers, chain springs, and striker plates depend on the hoist model, capacity, and limit switches. Never operate the hoist with incorrect, missing, or damaged chain components. Refer to the hoist's nameplate, **Table 3-1**, as well as **Figures 3-1** and **3-2.** Ensure that all chain components are in the correct location and properly installed.

3.2.2 When the hoist is used without a chain container, the free end of the chain is attached to the hoist body as shown in **Figure 3-2**. Connect the no load end of the chain to Chain Guide A with the End Suspender provided. For 5 ton hoist, connect the no load end of the chain directly to Chain Guide A if Chain Guide A is notched to accept the chain. Make sure the chain remains free of twists and the chain Stopper is installed on the correct link. Refer to **Table 3-2** for proper placement of Stopper.

⚠ WARNING Please confirn the Load Chain is marked with either 'RH-DAT' or 'FT-DAT' and that the chain size is suitable for the RNER2 model you are using (Refer to **Table 3-1** below). Chains from other models (such as ES or ER) or with different ratings are not compatible with RNER2 models. Use of incorrect load chain may result serous injury or death.

Table 3-1 Chain Dimensions

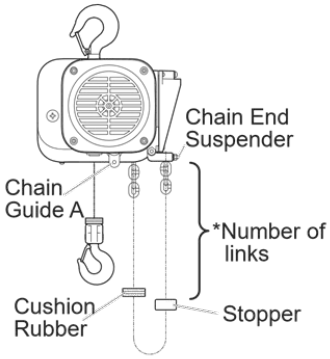
Code	Load Chain size : diameter (mm)	Mark pitch
RNER2010S	7.7	20 Links
RNER2010L		
RNER2015S	10.2	16 Links
RNER2020L		
RNER2020S		
RNER2025S	11.2	12 Links
RNER2030C	10.2	16 Links
RNER2050L	11.2	12 Links



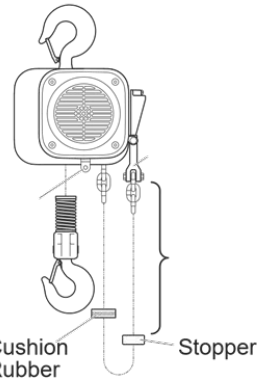
Body size	Number of Links
D	15
E	15
F	15

* Tightening torque for the Stopper Bolt: 10 N·m

2) Mount the End Link of the no load side of



Body size F



<Double Chain Fall type>

Chain End Suspender is not used for double chain fall type due to the orientation of the chain.
Attach the terminal chain link directly to Chain Guide A.

* When ordering a Chain End Suspender, please refer to the part codes. (P115)

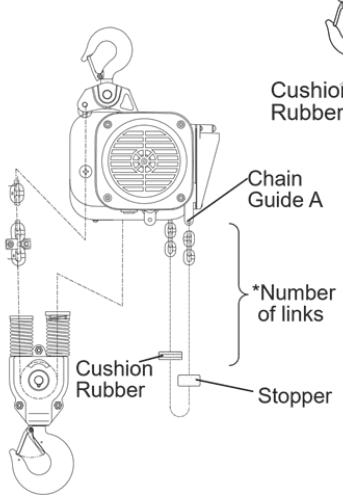
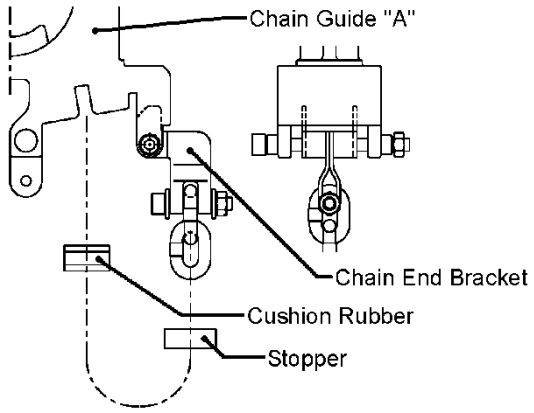


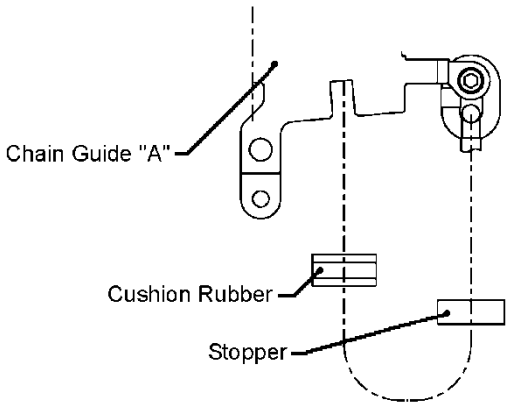
Figure 3-1 Chain Component Arrangement for Single Fall and Double Fall Hoists

Table 3-2 Chain Stopper Placement		
Capacity Code	**Without Chain Container**	**With Chain Container**
010L, 010S, 015S, 020L, 020S, 025S, 030C, 050L	15th link from the free end	3rd link from the free end

*Tightening torque for the Stopper Bolt: 10 N-m (7 lb-ft)



010L, 010S, 015S, 020L, 020S, 025S



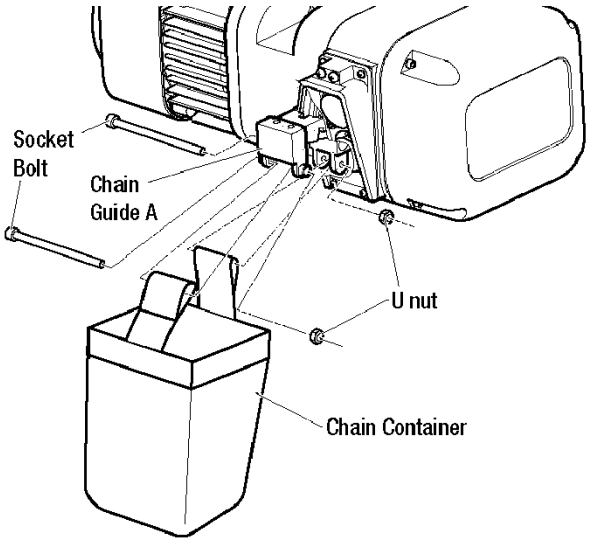
030C, 050L

Figure 3-2 Attachment of Chain to Hoist Body – No Chain Container

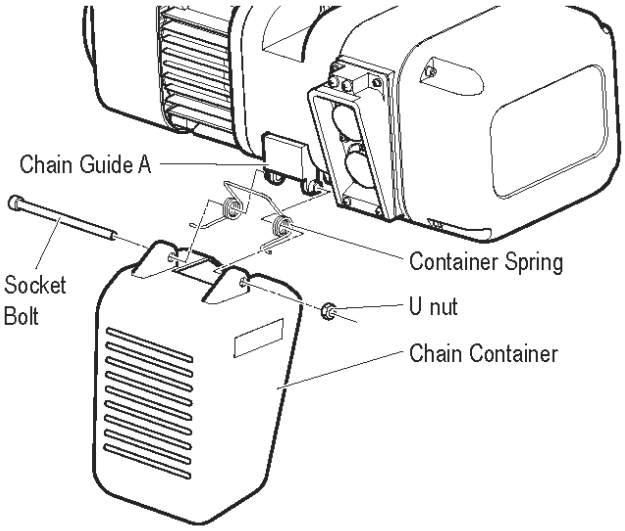
3.3 Optional Canvas or Plastic Chain Container

When the optional canvas chain container is selected, fully unfold and install it on the hoist body as shown in **Figure 3-3**. When installing the optional plastic chain container, pass the socket bolt through the holes in this order: the chain container, the bucket spring, the chain guide A, the bucket spring, and the chain container. Be sure to mount the bucket spring in the correct direction as shown in **Figure 3-3**. The free end of the chain is not attached to the hoist body and the chain stopper is installed on the third link from the free end. To place the chain into the chain container, feed the free end of the chain into the container. Take care to avoid twisting or tangling the chain. NEVER put all the chain into the container at once. Lumped or twisted chain may activate the down limit switch and stop the hoist during lowering.

⚠ CAUTION Each chain container indicates the maximum length of the load chain that can be stored in the container. The amount of chain the container must hold is equal to the lift on the hoist. DO NOT use a chain container with a storage capacity less than the lift length on the hoist. If all the chain cannot be stored in the container, the limit switch will not operate properly.



Canvas Chain Container

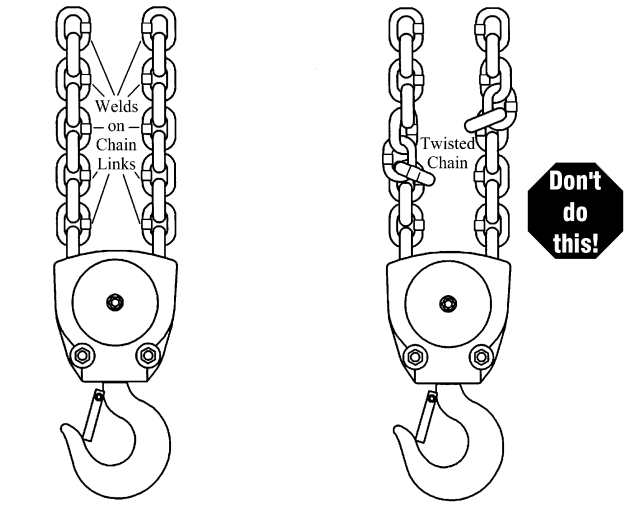


Plastic Chain Container

Figure 3-3 Attachment of Chain Container to Hoist Body

3.3.1 When using an optional steel chain container, refer to the assembly drawing and instructions provided with the container for correct assembly and attachment.

3.3.2 **⚠ WARNING** Verify that the load chain is not twisted or tangled prior to operating the hoist. Make sure the bottom hook on 2T, 3T and 5 Ton double fall models is not capsized. See **Figures 3-4** and **3-5**. Correct all chain irregularities before conducting the first hoist operation.



Properly Oriented Chain Twisted Chain Due to Capsized Hook

Figure 3-4 Twist in Load Chain – 2, 3, and 5 Ton Double Fall Models

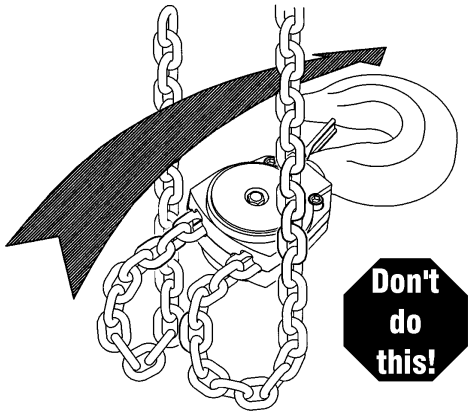


Figure 3-5 Capsized Hook and Chain –Double Fall Models

3.4 Assembly and Adjustment – Trolley and Hoist Connection

Hoist and Trolley Preparation

1/8 to 3 Ton RNER2 (EXCEPT 030C) – Assuming the hoist has an existing Top hook

1) Refer to **Figure 3-6**.

2) Remove the four Controller Cover socket head bolts and allow the cover to swing fully open.

3) Loosen the three or four captive screws holding the electrical component mounting Plate against the main body of the hoist and swing the plate out to access the required components.

4) Loosen one of two Machine Screws attaching Plate A and remove the second Machine Screw. Allow Plate A to rotate out from the retaining slot in the bottom side of the Connection Shaft. Pull out the Connection Shaft and remove the Top Hook Assembly.

5) Remove the Hoist Fixing Shaft.

6) Installing the Connection Yoke, place the Connection Yoke Rubber and Suspender E in the top of the Connection Yoke. Attach Suspender E to the Connection Yoke with the Yoke Bolt, Slotted Nut and Split Pin (cotter pin).

7) Place Connection Yoke with Suspender E on the top of the hoist. Line up the holes for the Connection Shaft and the Hoist Fixing Shaft and reinsert the shafts.

8) Reassemble the remaining hoist components in reverse order of disassembly.

3 Ton (030C) and 5 Ton RNER2 – The 3 Ton (030C) and 5 Ton RNER hoists (double fall) always use a Connection Yoke. Remove the Top Hook Assembly from the Connection Yoke and install the Suspender E shown in **Figure 3-7** and **3-8.**

Prepare RNER2 hoists for use with a trolley for the following hoists:

010L, 010S, 015S, 020C, 020L, 020C, 030C

1) Refer to **Figure 3-6**.

2) Remove the Shaft Retainer Clip from the two Connection Shafts.

3) Remove the Socket Bolt from the Shaft Retainer.

4) Remove the two Connection Shafts.

5) Remove the Top Hook and replace it with the Connection Yoke.

6) Re-insert the two Connection Shafts, so that both pass through the main body and the shaft holes of Connection Yoke.

7) Re-install the Shaft Retainer, Socket Bolt, and Shaft Retainer Clip.

8) Install the appropriate Suspender for the application, securing it to the Connection Yoke with the Yoke Bolt, Slotted Nut, and Split Pin. **Note: (See Figure 3-6) Double Fall applications require a Chain Pin, small Slotted Nut, and small Split Pin, in addition to the Yoke Bolt, Slotted Nut, and Split Pin.**

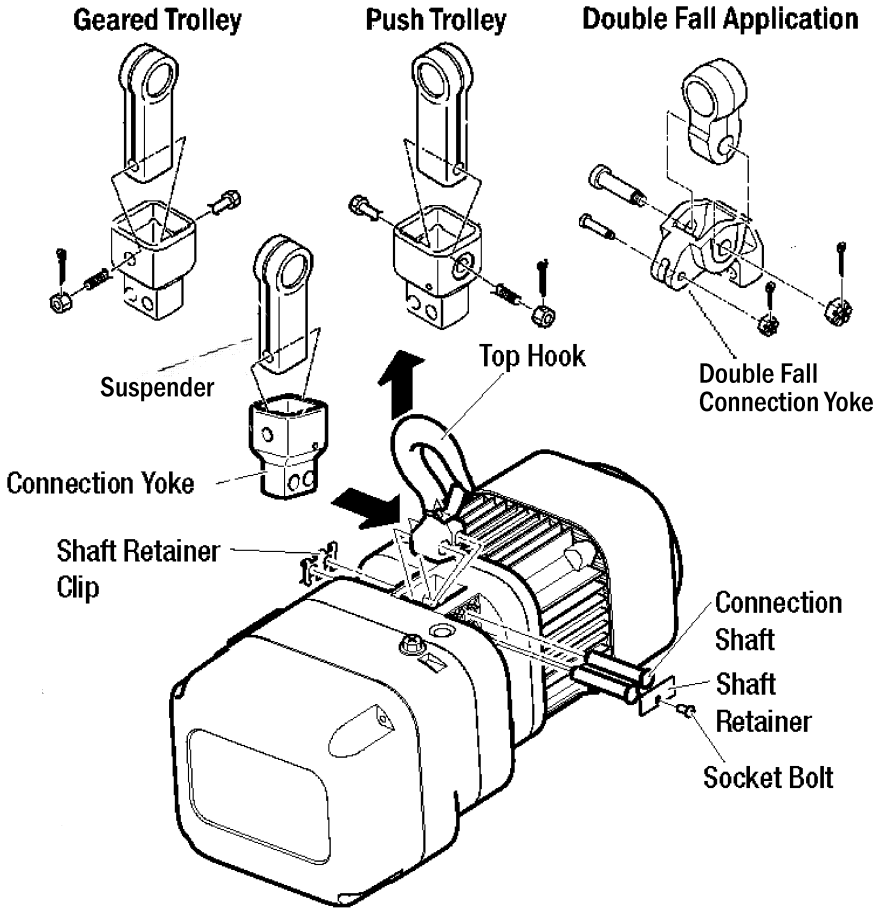


Figure 3-6 RNER2 Top Suspender Assembly

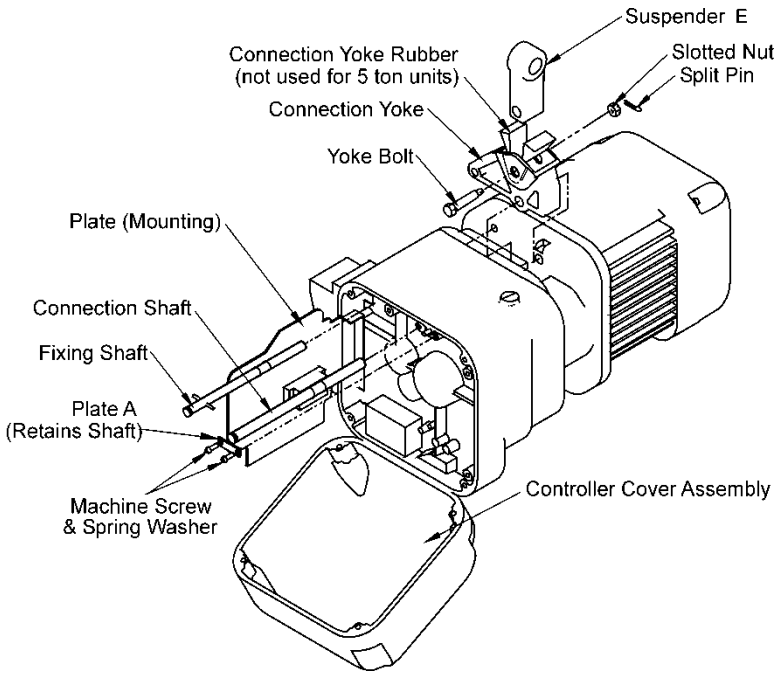
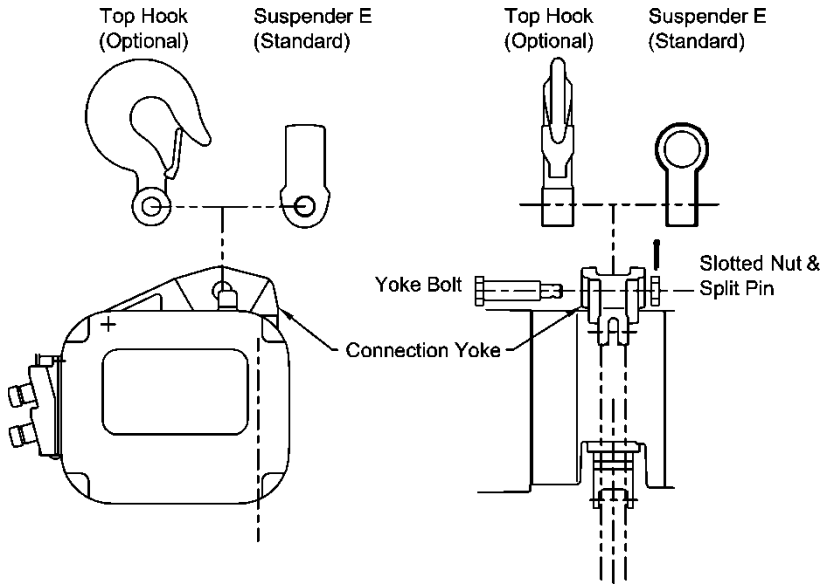


Figure 3-7 Installing Connection Yoke with Suspender E on RNER2 Hoists – Connection Yoke standard on 030C & 050 models



Note: Unlike 3 Ton (Single Fall) and below (see **Figure 3-12**), Suspender G for 3 Ton (030C) and 5 Ton connects directly to the Connection Yoke without the Connection Yoke Rubber.

Figure 3-8 Installing Suspender E or G on 3 Ton (030C) and 5 Ton RNER2 Hoists

Prepare RNER2 hoists for use with a trolley for the following hoist sizes:

025S and 050L RNER2

1) Refer to **Figure 3-9**.

2) Remove the four Socket Bolts that hold the Controller Cover to the hoist body. Now the Controller Cover can be lowered and left to hang by the cover belt.

3) Remove the four pan head screws and the two Shaft Retainers. This will allow the Bracing Shaft and the Connection Shaft to be removed by sliding them out of the hoist body.

4) With the Connection Shaft and Bracing Shaft removed, the Top Hook can be removed and replaced with the appropriate Connection Yoke.

5) Re-insert the Connection Shaft and Bracing Shaft ensuring both pass through the Connection Yoke flange.

6) Fix the Connection Shaft and Bracing Shaft with their respective Shaft Retainer and pan head screws.

7) Install appropriate Suspender for the application, securing it to the Connection Yoke with the Yoke Bolt, Slotted Nut, and Slit Pin. **Note: (See Figure 3-9) Double Fall applications require a Chain Pin, small Slotted Nut, and small Split Pin, in addition to the Yoke Bolt, Slotted Nut, and Split Pin.**

8) Re-install Controller Cover with the four Socket Bolts.

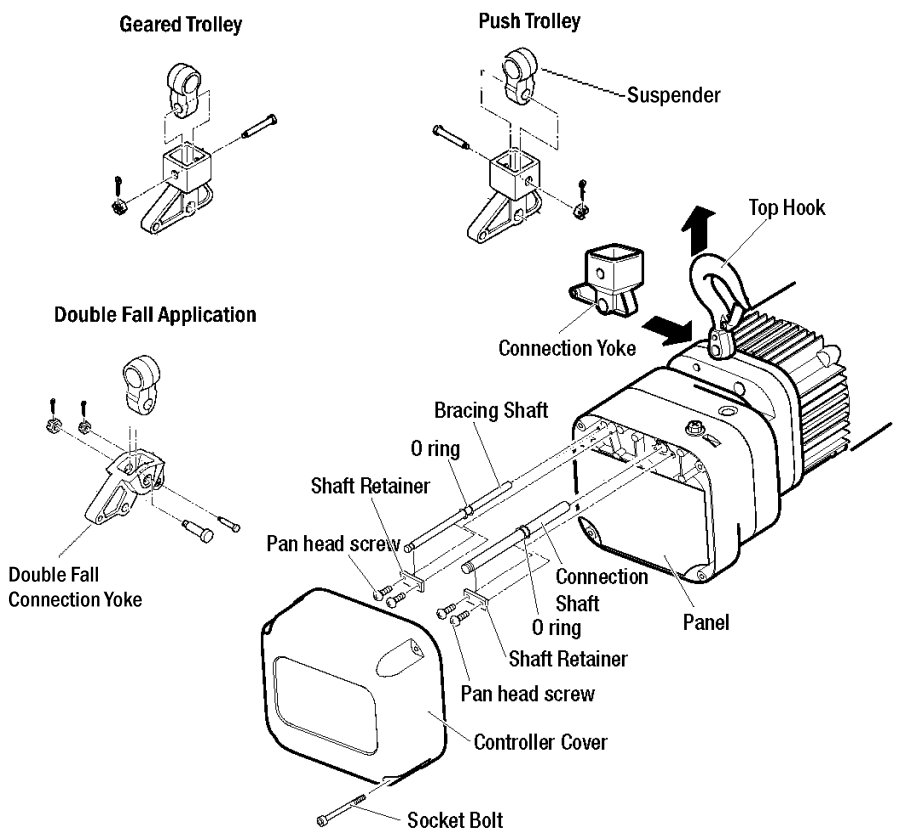


Figure 3-9 RNER2 (025S & 050L Only)

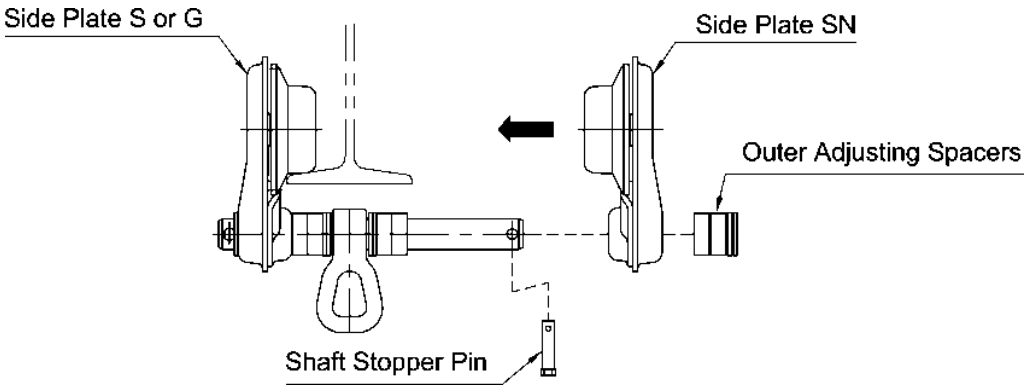


Figure 3-10 Optional trolley installation method (½-5 Ton)

Refer to **Figure 3-11** for 1/8 through 3 Ton.

Refer to **Figure 3-12** for 5 Ton.

1) Remove the Shaft Stopper Pin, Side Plate SN, and Spacers from the Suspension Shaft. For beam flanges that are wider than the standard range, different suspension shaft and/or spacer arrangements are provided. Refer to **Table 3-5** and **Table 3-6**.

2) Insert the Suspension Shaft to Side Plate G or S and attach it with the Shaft Stopper Pin and Split Pin (cotter pin). **Refer to Figure 3-14** to ensure that the correct Suspension Shaft holes are used. Securely bend both branches of the Split Pin after insertion.

3) Referring to **Figure 3.016**, **Table 3-4**, **Table 3-5**, and **Table 3-6** install the inner adjusting Spacers and Suspender on the Suspension Shaft. Use all of the Spacers provided with the trolley. If the beam width is not listed in the Table, use the next size smaller and make adjustments, refer to **Figure 3-15**.

4) Place other Side Plate into the Suspension Shaft.

5) Install the outer adjusting Spacers on the Suspension Shaft outside of Side Plate SN. Insert the Shaft Stopper Pin into Suspension Shaft. Temporarily install the split pin in the Shaft Stopper Pin and bend the split pin slightly to hold it in place. The split pin should be fully bent after checking and attaining the proper beam flange adjustment

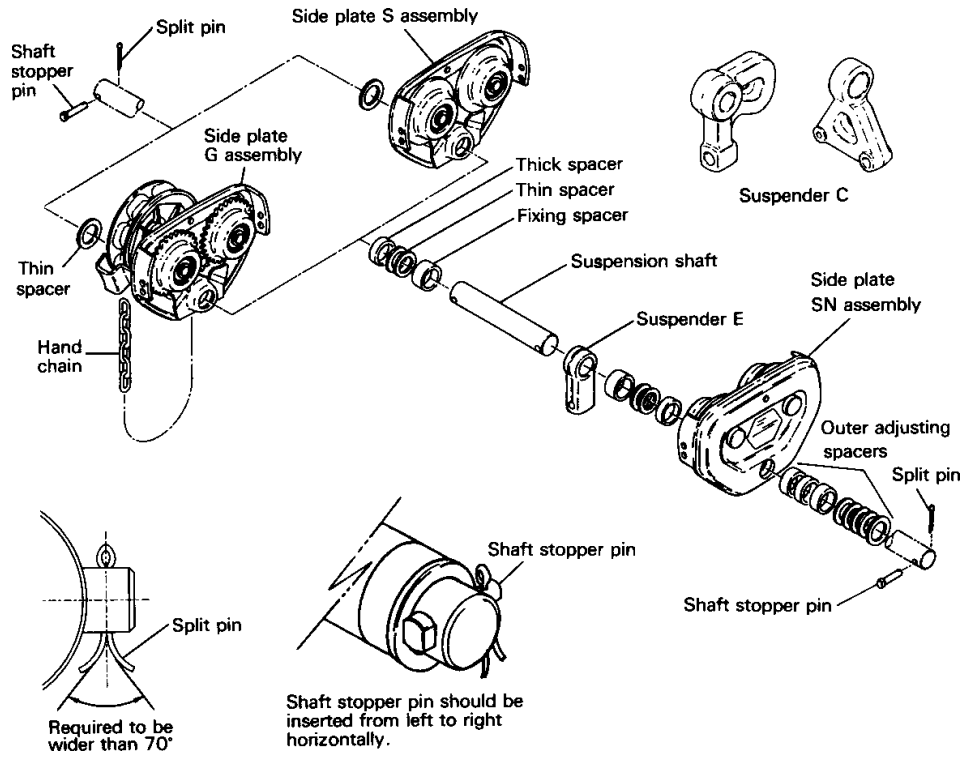


Figure 3-11 Assembling the Trolley – 1/8 - 3 Ton Capacity

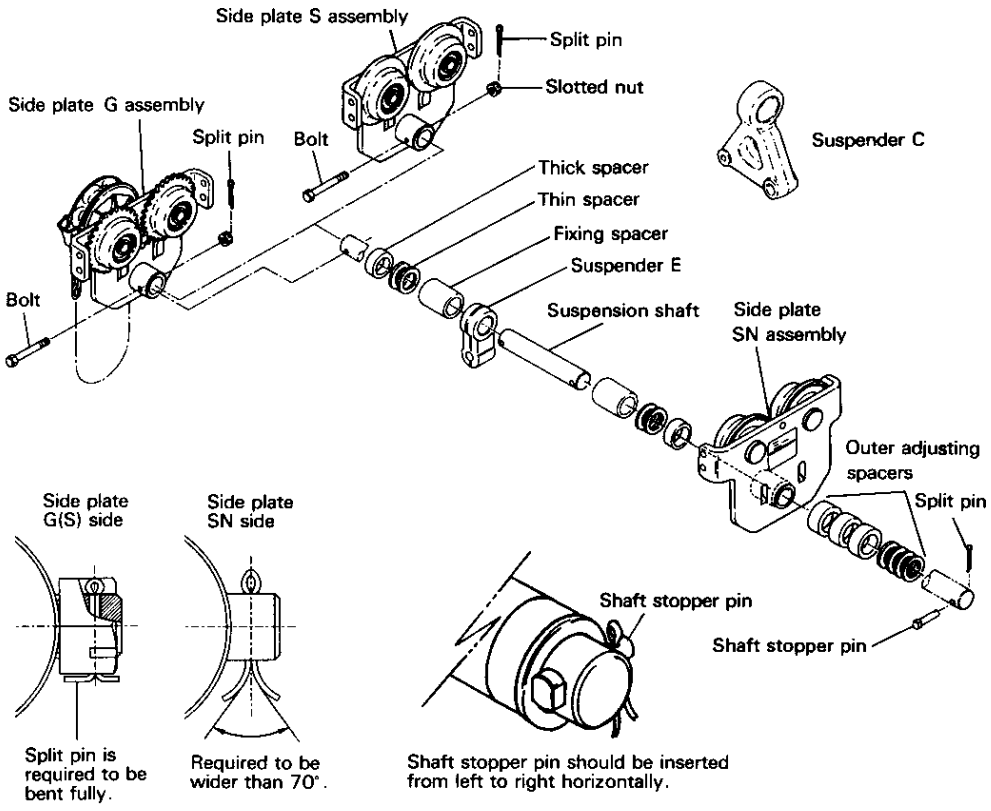


Figure 3-12 Assembling the Trolley – 5 Ton Capacity

3.5 Installation of Trolley onto Beam

Assemble and adjust the trolley before attempting to install the trolley on the beam.

Preferred Method – Sliding the trolley connected with an electric chain hoist onto the traversing beam from the beam end is the most convenient and recommended method. If the trolley can be mounted from the end of the beam then: Remove the trolley end-stop from the beam and set the trolley on the beam from the end. Securely re-install the trolley end stop on the beam.

Optional Method for Trolleys Up to 5 Ton – If the trolley cannot be mounted from the end of the beam, complete the installation as follows:

1) Move the Shaft Stopper Pin to Hole B (see **Figure 3-14**).

2) Spread the trolley side plates apart.

3) Lift the trolley onto the beam so that the geared wheels (motor side of a motorized trolley) rest on the beam's flange.

4) Hold Side Plate G securely so that it does not come off the beam then push the side plates together so that all four wheels rest on the beam's flange.

5) Remove the Shaft Stopper Pin from Hole B and re-install in Hole A (see **Figure 3-14**). Bend the Split Pin securely. Never use trolley with Shaft Stopper Pin in Hole B. Hole B is ONLY used when installing the trolley on the beam.

⚠ DANGER

HAZARDOUS VOLTAGES ARE PRESENT IN THE HOIST CONTROL BOX, IN THE SUPPLY OF ELECTRICAL POWER TO THE HOIST MOTOR.

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.

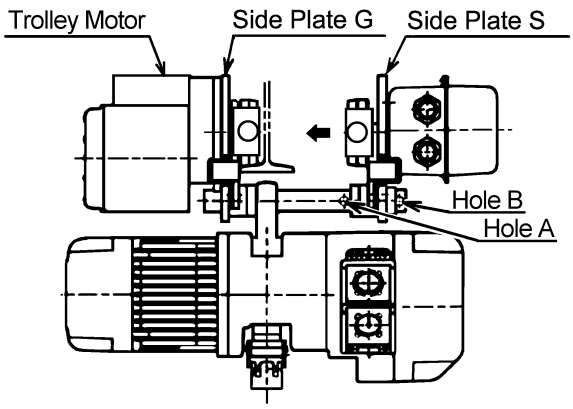


Figure 3-13 Optional trolley installation method – up to 5 Ton

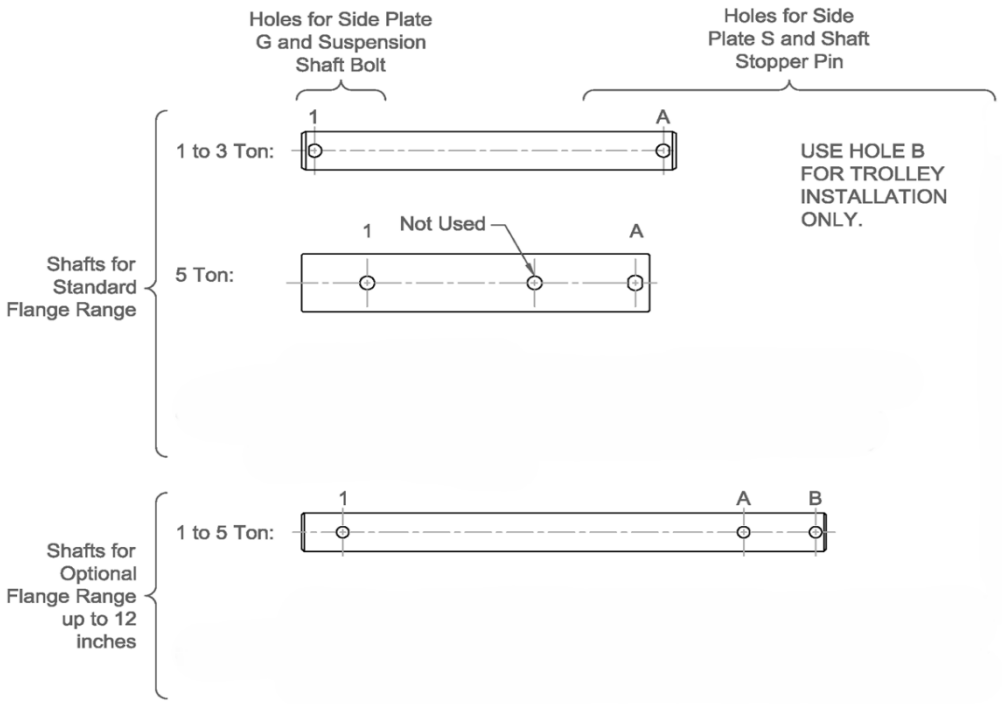


Figure 3-14 Suspension shafts

Adjusting the Trolley Width

After assembling trolley per **Section 3.4**, check the adjustment as follows:

1) Refer to **Figure 3-15**.

2) Make sure both side plates are spread fully outward and measure dimension “A”. Compare dimension “A” with the following values:

- For trolleys up through 5 Ton, “A” must be 3/32” to 5/32” greater than “B”.

3) If “A” does not fall within the specified range, move spacers from inner to outer or from outer to inner as necessary to obtain the proper “A” dimension, irrespective of the numbers in **Table 3.0-Tables 3-5** and **3-6**.

4) After obtaining the proper adjustment, install the Shaft stopper Pin, insert the Split Pin into the Stopper Shaft Pin, and securely bend both branches of the Split Pin.

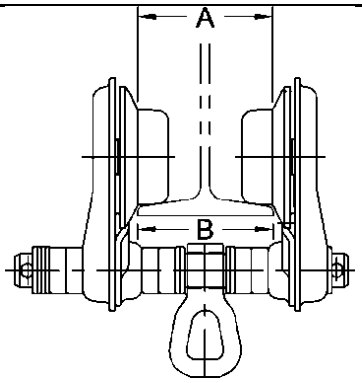
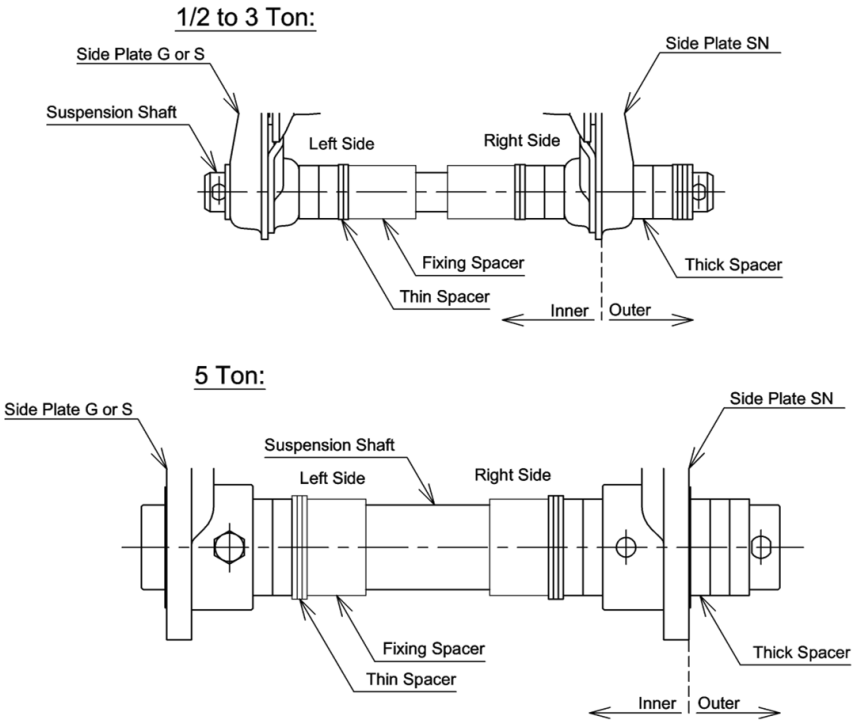
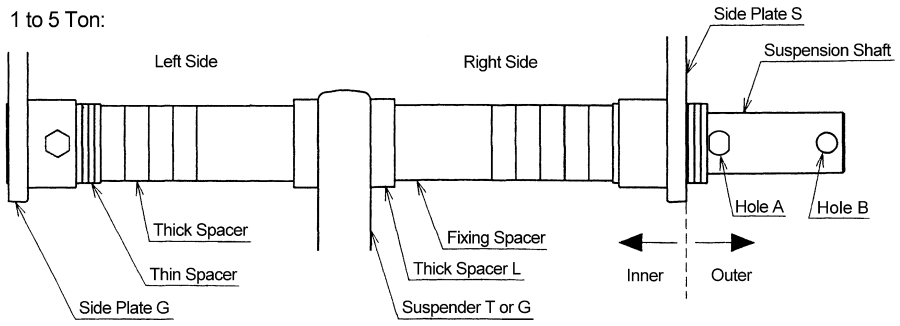


Figure 3-15 Adjusting the Trolley



Manual Trolley



Motorized Trolley

Figure 3.0-16 Spacers Arrangement

Table 3.0-3 Suspension Shaft Adjusting Spacers - Manual trolley				
Capacity (Tons)	Flange Range (in)	Total Number of Spacers Supplied		
		Thin	Thick	Fixing
1/2	2.28 to 4.00	10	4	—
	4.01 to 8.00	10	7	2
	8.01 to 12.00	10	7	2
1	2.28 to 5.00	9	6	—
	5.01 to 8.00	10	5	2
	8.01 to 12.00	10	7	2
2	3.23 to 6.02	8	6	—
	6.03 to 12.00	10	11	2
3	3.23 to 6.02	11	9	—
	6.03 to 12.00	10	11	2
5	3.94 to 7.02	5	—	—
	7.03 to 12.00	9	2	2

Table 3-4 Suspension Shaft Adjusting Spacers – Motorized Trolley						
CAPACITY (Tons)	Flange Range (in)	Total Number of Spacers Supplied				Suspension Shaft Bolt Location
		Thin	Thick	Fixing	Thick L	
1	2.28 to 5.00	8	3	—	2	Hole 2
	5.01 to 6.02	8	5	—	2	Hole 1
	6.03 to 12.00	8	9	2	2	Hole 1
2 & 3	3.23 to 6.02	8	3	—	2	Hole 2
	6.03 to 7.02	8	5	—	2	Hole 1
	7.03 to 12.00	8	9	2	2	Hole 1
5	3.94 to 7.01	8	3	—	2	Hole 2
	7.02 to 7.60	8	4	—	2	Hole 1
	7.61 to 12.00	8	13	—	2	Hole 1

Table 3.0-5 Number of Adjusting Spacers, Push and Geared Trolley

Beam Flange Width		(in)	2	2 5/16	2 1/2 / 2 5/8	2 7/8 / 2 15/16	3	3 1/4	3 9/16	3 7/8	3 15/16	4	4 3/16	4 15/16	4 7/16	4 11/16 / 4 3/4	4 15/16	5	5 3/16	5 5/16	5 3/8	5 1/2	5 5/8	5 7/8 / 5 15/16	6	6 1/8	6 5/16	6 7/16
Cap (Ton)	Spacer Type	(mm)	50	58	64 / 66	73 / 74	75 / 76	82	90 / 91	98	100	102	106	110	113	119 / 120	125	127	131	135	137	140	143	149 / 150	153	155	160	163
I	Thin	Inner		3+3	0+0	1+1	1+2	2+3	0+0	1+1	1+2	1+2	2+3	3+3	3+4	0+1	1+2	2+2	1+1	1+2	2+2	2+3	3+3	0+0	0+1	1+1	1+2	2+2
		Outer		2	8	6	5	3	8	6	5	4	3	2	1	7	5	4	7	6	5	4	3	9	8	7	6	5
	Thick	Inner		0+0	1+1	1+1	1+1	1+1	2+2	2+2	2+2	2+2	2+2	2+2	2+2	3+3	3+3	3+3	0+0	0+0	0+0	0+0	0+0	1+1	1+1	1+1	1+1	1+1
		Outer		6	4	4	4	4	2	2	2	2	2	2	2	0	0	0	5	5	5	5	5	3	3	3	3	3
	Fixing	Inner		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1+1	1+1	1+1	1+1	1+ 1	1+1	1+1	1+1	1+1	1+1
2	Thin	Inner						2+2	3+4	6+1	1+1	1+2	2+2	2+3	3+3	0+0	1+1	1+2	2+2	2+3	3+3	3+4	0+0	1+1	1+2	1+1	1+2	2+2
		Outer						3	0	6	5	4	3	2	I	7	5	4	3	2	I	0	7	5	4	7	6	5
	Thick	Inner						0+0	0+0	1+1	1+1	1+1	1+1	1+1	1+1	2+2	2+2	2+2	2+2	2+2	2+2	2+2	3+3	3+3	3+3	0+0	0+0	0+0
		Outer						6	6	4	4	4	4	4	4	2	2	2	2	2	2	2	0	0	0	11	11	11
	Fixing	Inner									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1+1	1+1	1+1
3	Thin	Inner						1+2	3+3	0+0	0+1	1+1	1+2	2+2	2+3	3+4	0+1	1+1	1+2	2+2	2+3	3+3	3+4	1+4	1+5	1+1	1+2	2+2
		Outer						7	4	10	9	8	7	6	5	3	9	8	7	6	5	4	3	5	4	7	6	5
	Thick	Inner						2+2	2+2	3+3	3+3	3+3	3+3	3+3	3+3	3+3	4+4	4+4	4+4	4+4	4+4	4+4	4+4	5+4	5+4	0+0	0+0	0+0
		Outer						5	5	3	3	3	3	3	3	3	I	I	I	I	I	1	I	0	0	11	11	11
	Fixing	Inner						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1+1	1+1	1+1
5 (TS)	Thin	Inner										0+0	0+1	1+1	1+2	2+2	3+3	0+0	0+1	1+1	1+2	2+2	3+3	0+0	0+1	1+1	1+2	2+2
		Outer										8	7	6	5	4	2	8	7	6	5	4	2	8	7	6	5	4
	Thick	Inner										0+0	0+0	0+0	0+0	0+0	0+0	1+1	1+1	1+1	1+1	1+1	1+1	2+2	2+2	2+2	2+2	2+2
		Outer										5	5	5	5	5	5	3	3	3	3	3	3	1	1	1	1	1
	Fixing Spacer	Inner										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 3-5 Number of Adjusting Spacers – Push and Geared Trolley

Beam Flange Width		(in)	6 11/16	6 7/8	7	7 1/16 / 7 1/8	7 1/4 / 7 5/16	7 7/8	8	8 7/8	8 11/16	9	9 1/8	9 7/8	10	10 1/8	10 1/4	10 3/8	10 1/2	11	11 1/8	11 1/4	11 3/8	11 5/8	11 3/4	11 13/16	11 7/8	12
Cap (Ton)	Spacer Type	(mm)	170	175	178	180 / 181	184 / 185	200	203	215.	220	229	232	250	254	257	260	264	267	279	283	286	289	295	298	300	302	305
I	Thin[q]	Inner	3+3	0+0	0+1	1+1	1+2	4+4	4+5	2+3	3+3	4+5	1+1	0+0	0+1	1+1	1+2	2+2	2+3	4+5	1+1	1+2	2+2	3+3	3+4	4+4	4+5	1+5
		Outer	3	9	8	7	6	1	0	4	3	0	7	9	8	7	6	5	4	0	7	6	5	3	2	1	0	3
	Thick	Inner	1+1	2+2	2+2	2+2	2+2	2+2	2+2	0+0	0+0	0+0	1+1	2+2	2+2	2+2	2+2	2+2	2+2	2+2	3+3	3+3	3+3	3+3	3+3	3+3	3+3	4+3
		Outer	3	1	I	1	1	1	1	7	7	7	5	3	3	3	3	3	3	3	1	1	1	1	1	1	1	0
	Fixing	Inner	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
2	Thin	Inner	3+3	0+0	0+1	1+1	1+2	0+0	0+1	2+3	3+3	4+5	1+1	0+0	0+1	1+1	1+2	2+2	2+3	4+5	1+1	1+2	2+2	3+3	3+4	4+4	4+5	1+5
		Outer	3	9	8	7	6	9	8	4	3	0	7	9	8	7	6	5	4	0	7	6	5	3	2	1	0	3
	Thick	Inner	0+0	1+1	1+1	1+1	1+1	2+2	2+2	2+2	2+2	2+2	3+3	4+4	4+4	4+4	4+4	4+4	4+4	4+4	5+5	5+5	5+5	5+5	5+5	5+5	5+5	6+5
		Outer	11	9	9	9	9	7	7	7	7	7	5	3	3	3	3	3	3	3	1	1	1	1	1	1	1	0
	Fixing	Inner	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
3	Thin	Inner	3+3	0+0	0+0	1+1	1+2	0+0	0+1	2+3	3+3	4+5	1+1	0+0	0+1	1+1	1+2	2+2	2+3	4+5	1+1	1+2	2+2	3+3	3+4	4+4	4+5	1+5
		Outer	3	9	8	7	6	9	8	4	3	0	7	9	8	7	6	5	4	0	7	6	5	3	2	1	0	3
	Thick	Inner	0+0	1+1	1+1	1+1	1+1	2+2	2+2	2+2	2+2	2+2	3+3	4+4	4+4	4+4	4+4	4+4	4+4	4+4	5+5	5+5	5+5	5+5	5+5	5+5	5+5	5+6
		Outer	11	9	9	9	9	7	7	7	7	7	5	3	3	3	3	3	3	3	1	1	1	1	1	1	1	0
	Fixing	Inner	1+1	1+1	1+ 1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
5 – (TS)	Thin	Inner	3+3	0+4	1+4	1+1	1+2	0+0	0+1	2+3	3+3	0+1	1+1	0+0	0+1	1+1	1+2	2+2	2+3	0+1	1+1	1+2	2+2	3+3	3+4	4+4	1+4	1+5
		Outer	2	4	3	6	5	8	7	3	2	7	6	8	7	6	5	4	3	7	6	5	4	2	1	0	3	2
	Thick	Inner	2+2	3+2	3+2	0+0	0+0	1+1	1+1	1+1	1+1	2+2	2+2	3+3	3+3	3+3	3+3	3+3	3+3	4+4	4+4	4+4	4+4	4+4	4+4	4+4	5+4	5+4
		Outer	1	0	0	9	9	7	7	7	7	5	5	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1
	Fixing Spacer	Inner	-	-	-	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1

Table 3-6 Number of Adjusting Spacers – Motorized Trolley

Beam Flange Width		(in)	2 5/16	2 1/2 2 5/8	2 7/8 2 15/16	3	3 1/4	3 9/16	3 7/8	3 15/16	4	4 3/16	4 5/16	4 7/16	4 11/16 4 3/4	4 15/16	5	5 3/16	5 5/16	5 3/8	5 1/2	5 5/8	5 7/8 5 15/16	6	6 1/8	6 5/16	6 7/16	6 11/16	6 7/8	7
Cap. (Ton)	Spacer Type	(mm)	58	64 66	73 74	75 76	82	90 91	98	100	102	106	110	113	119 120	125	127	131	135	137	140	143	149 150	153	155	160	163	170	175	178
1	Thin	Inner	1+2	2+3	4+4	1+0	1+2	2+3	0	1+0	1+0	1+2	2+2	2+3	3+4	4+4	4+1	5+1	2+2	2+2	2+3	3+3	4+4	4+1	1+1	2+2	2+3	3+0	4+4	4+1
		Outer	5	3	0	7	5	3	8	7	7	5	4	3	1	0	3	2	4	4	3	2	0	3	6	4	3	5	0	3
	Thick	Inner	0+0	0+0	0+0	0+0	0+0	0+0	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+2	1+2	2+2	2+2	2+2	2+2	2+2	2+2	3+3	3+3	3+3	3+4	3+3	3+4
		Outer	3	3	3	3	3	3	1	1	1	1	1	1	1	1	0	2	1	1	1	1	1	1	3	3	3	2	3	2
	Fixing	Inner	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	----	—	—	—	0	0	0	0	0	0
		Outer	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	----	—	—	—	2	2	2	2	2	2
	Thick L	Inner	0+0	0+0	0+0	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
		Outer	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 and 3	Thin	Inner					1+2	2+3	3+4	0	1+0	1+1	1+2	2+2	3+3	4+4	1+0	1+1	1+2	2+2	2+3	3+3	4+0	4+1	1+1	1+2	2+2	3+3	4+4	1+4
		Outer					5	3	1	8	7	6	5	4	2	0	7	6	5	4	3	2	4	3	6	5	4	2	0	3
	Thick	Inner					0+0	0+0	0+0	0+0	0+0	0+0	0+0	0+0	0+0	0+0	1+1	1+1	1+1	1+1	1+1	1+1	1+2	1+2	2+2	2+2	2+2	2+2	2+2	3+2
		Outer					3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	0	0	1	1	1	1	1	0
	Fixing	Inner					—	—	—	—	—	—	—	—	—	—	—	—	—	—	----	—	—	—	—	—	—	—	—	—
		Outer					—	—	—	—	—	—	—	—	—	—	—	—	—	—	----	—	—	—	—	—	—	—	—	—
	Thick L	Inner					0+0	0+0	0+0	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
		Outer					2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Thin	Inner								0+0	1+0	1+1	1+2	2+2	3+3	0	1+0	1+1	2+2	2+2	2+3	3+3	4+0	4+1	1+1	2+2	2+3	3+0	4+4	4+1
		Outer								8	7	6	5	4	2	8	7	6	4	4	3	2	4	3	6	4	3	5	0	3
	Thick	Inner								0+0	0+0	0+0	0+0	0+0	0+0	0+0	0+0	0+0	0+0	0+0	0+0	0+0	0+1	0+1	1+1	1+1	1+1	1+2	1+1	1+2
		Outer								3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	1	1	1	0	1	0
	Thick L	Inner								0+0	0+0	0+0	0+0	0+0	0+0	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
		Outer								2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3-6 Number of Adjusting Spacers – Motorized Trolley

Beam Flange Width		(in)	7 1/16	7 1/4	7 7/8	8	8 7/16	8 11/16	9	9 1/8	9 7/8	10	10 1/8	10 1/4	10 3/8	10 1/2	11	11 1/8	11 1/4	11 3/8	11 5/8	11 3/4	11 13/16	11 7/8	12
			7 1/8	7 5/16																					
Cap. (Ton)	Spacer Type	(mm)	180	184	200	203	215	220	229	232	250	254	257	260	264	267	279	283	286	289	295	298	300	302	305
			181	185																					
1	Thin	Inner	1+1	1+2	4+4	5+0	2+3	3+4	1+1	1+2	4+0	1+1	1+2	2+2	2+3	3+3	1+1	1+2	2+2	2+3	3+0	4+0	4+1	4+1	4+2
		Outer	6	5	0	3	3	1	6	5	4	6	5	4	3	2	6	5	4	3	5	4	3	3	2
	Thick	Inner	0+0	0+0	0+0	0+1	1+1	1+1	2+2	2+2	2+3	3+3	3+3	3+3	3+3	3+3	4+4	4+4	4+4	4+4	4+5	4+5	4+5	4+5	4+5
		Outer	9	9	9	8	7	7	5	5	4	3	3	3	3	3	1	1	1	1	0	0	0	0	0
	Fixing	Inner	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
		Outer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thick L	Inner	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
		Outer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 and 3	Thin	Inner	1+1	1+2	4+4	1+0	2+3	3+3	4+1	1+1	4+4	4+1	5+1	4+3	2+3	3+3	4+1	1+2	2+2	2+3	3+3	3+4	4+4	4+1	5+1
		Outer	6	5	0	7	3	2	3	6	0	3	2	1	3	2	3	5	4	3	2	1	0	3	2
	Thick	Inner	0+0	0+0	0+0	1+1	1+1	1+1	1+2	2+2	2+2	2+3	2+3	2+3	3+3	3+3	3+4	4+4	4+4	4+4	4+4	4+4	4+4	4+5	4+5
		Outer	9	9	9	7	7	7	6	5	5	4	4	4	3	3	2	1	1	1	1	1	1	0	0
	Fixing	Inner	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
		Outer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thick L	Inner	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
		Outer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Thin	Inner	1+0	1+1	4+4	1+0	2+3	3+4	1+1	1+2	4+4	1+1	1+2	2+2	2+3	3+3	5+1	1+2	2+2	2+3	4+3	4+4	4+0	4+1	5+1
		Outer	7	6	0	7	3	1	6	5	0	6	5	4	3	2	2	5	4	3	1	0	4	3	2
	Thick	Inner	2+2	2+2	2+2	3+3	3+3	3+3	4+4	4+4	4+4	5+5	5+5	5+5	5+5	5+5	5+6	6+6	6+6	6+6	6+6	6+6	6+7	6+7	6+7
		Outer	0	0	9	7	7	7	5	5	5	3	3	3	3	3	2	1	1	1	1	1	0	0	0
	Thick L	Inner	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
		Outer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3.6 Mounting Location

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

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

3.7 Electrical Connections

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

3.7.2 **⚠ CAUTION** Do NOT apply electronic soft-start control or voltage varying controls to the RNER2 hoist. Use of such devices may cause the motor brake and other electrical components to malfunction.

3.7.3 **⚠ 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”.

Pendant Cord

The Pendant Cord connects to the hoist via a hardwired cord connection. Make this connection as follows:

- Refer to **Figures 3-21. 3-22, and 3-23**.
- Attach the Cord Strain Relief Cable to the Cord Support on the bottom of the hoist.

Power Supply Cable - Hoist Connection

1. **Connect the Power Cable**

   Insert the Power Cable into Holder C (upper side) of Socket Frame. Tighten Holder A to securely connect cable. Connect Power Supply, reference the wiring diagram under control cover as well as **Option 1** (**See Figure 3-17 and 3-19**) or **Option 2** (**See Figure 3-18 and 3-20**).

⚠ WARNING If hoist or trolley hoist was supplied without Power Supply Cable, the installer must use a UL Listed power supply cable designed for Extra-Hard use suitable for hazardous locations in CII D2 environments, as required by NEC® (ANSI/NFPA 70, "National Electric Code"). This includes Type SO, SOO, SOOW, ST, STO cable rated 90°C, 600V minimum with an outer diameter compatible with provided cable packing Part# ECP6916AA (14.1mm-16mm) or ECP6912AA (10.1mm-12mm). Refer to total AMP draw and NEC® (ANSI/NFPA 70, "National Electric Code") guidelines when sizing appropriate Power Supply Cable gauge. Always consult with a qualified person when appropriate Power Supply Cable sizing is in question.

Refer to the following tables for the permissible length and the size of the standard Power Cable. When using a cable of any size other than those described in the table, determine acceptable cable length using the following formula.

$$\text{Permissible length (m)} = \frac{1000}{30.8} * \frac{\text{Cross section of one core (mm}^2\text{)} * \text{Rated voltage (V)} * 0.02}{\text{Rated current (A)}}$$

Table 3-7: 230V Power Supply Cable Sizes

Code	RNER2 only (230V)		RNER2M combination	
	Wire size (mm^2/AWG)	Permissible length(m) 60Hz 208-230V	Wire size (mm^2/AWG)	Permissible length(m) 60Hz 208-230V
RNER2010L	1.25/16 (2/14)	35 (56)	2/14 3.5/12	33 (59)
RNER2010S		19 (31)		22 (40)
RNER2015S				
RNER2020L				
RNER2020S	2/14 (3.5/12)	16 (28)	3.5/12 (5.5/10)	24 (37)
RNER2025S				
RNER2030C				
RNER2050L				21 (34)

*Note: The numbers in parentheses indicate the cable one step larger than the standard size.

Table 3-8: 460V Power Supply Cable Sizes

Code	RNER2 only (460V)		RNER2M combination	
	Wire size (mm^2/AWG)	Permissible length(m) 60Hz 460V	Wire size (mm^2/AWG)	Permissible length(m) 60Hz 460V
RNER2010L	1.25/16 (2/14)	134 (215)	2/14 3.5/12	131 (229)
RNER2010S		80 (128)		92 (162)
RNER2015S				
RNER2020L				
RNER2020S	2/14 3.5/12	68 (119)	3.5/12 (5.5/10)	99 (155)
RNER2025S				
RNER2030C				
RNER2050L				90 (142)

*Note: The numbers in parentheses indicate the cable one step larger than the standard size.

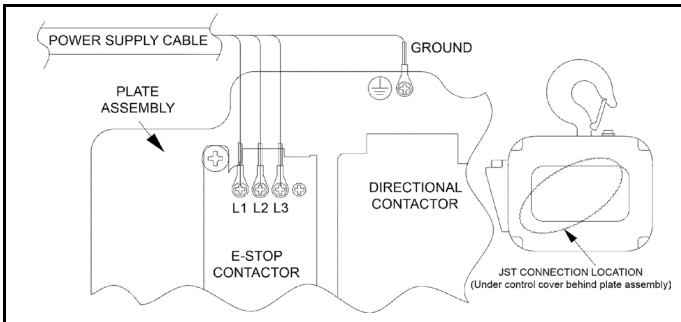


Figure 3-17 Power Supply Cable Connection: Option 1

Direct Wire w/ Ring Terminals

Note: Remove Harness (ER2BI95551 or ER2EI95551). Power Supply Cable and Ring Terminals provided and/or installed by customer. See **Figure 3-19** for Cable assembly instructions. Please refer to **Table 3-7** and **3-8** for applicable cable sizes.

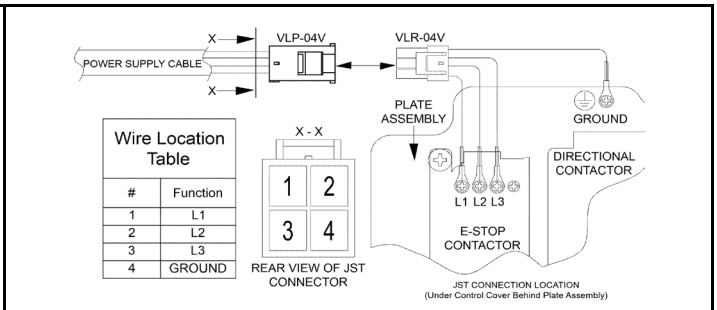


Figure 3-18 Power Supply Cable Connection: Option 2

Power Supply Cable/Hoist Connection with JST Connectors

Note: Power Supply Cable with JST connector (VLP-04V) provided and/or installed by customer. See **Figure 3-20** for Cable assembly instructions. Please refer to **Table 3-7** and **3-8** for applicable cable sizes.

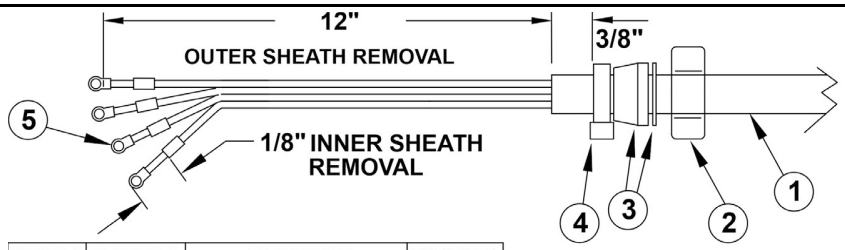


FIGURE #	HHI PART #	DESCRIPTION	CRIMP TOOL
1	14/4 or 16/4	Power Cable	YRF-590
2	ECP5924AA	Cable Holder A (14/4 & 16/4)	
3	ECP6916AA	14/4 Cable Packing w/ Washer	
3	ECP6912AA	16/4 Cable Packing w/ Washer	
4	9006604	Cable Tie	
5	9012306	Ring Terminal 14 - 16 AWG	YRF-590

NOTE: PROPER DIRECTION OF CABLE PACKING.

NOTE: ALL COMPONENTS SHALL BE UL LISTED / UL RECOGNIZED.

Figure 3-19 Power Supply with Ring Terminals (Hoist Only, Hoist with Motorized Trolley, Hoist with Manual Trolley)

CONDUCTOR TERMINATION	
TERMINAL	CONDUCTOR
1	BLACK
2	RED
3	WHITE
4	GREEN

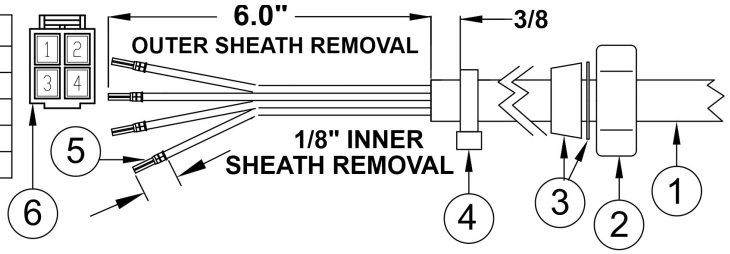


FIGURE #	HHI PART #	DESCRIPTION	CRIMP TOOL
1	14/4 or 16/4	14/4 & 16/4 Power Cable	YRF-590
2	ECP5924AA	Cable Holder A	
3	ECP6916AA	14/4 Cable Packing w/ Washer	
	ECP6912AA	16/4 Cable Packing w/ Washer	
4	9006604	Cable Tie	
5	83534	Connector Pin BVF-61T-P2.0	YRF-590
6	9012362	4P Contact Housing (VLP-04V)	

NOTE: PROPER DIRECTION OF CABLE PACKING.

NOTE: ALL COMPONENTS SHALL BE UL LISTED / UL RECOGNIZED.

Figure 3-20 Power Supply with JST (Hoist Only or Hoist with Manual Trolley)

2. **Connecting the Pendant/Control Cord**
   Insert the Pendant/Control Cord into Holder C (lower side) of the Socket frame. Tighten Holder A to securely connect the cable. Connect Pendant/Control Cord referencing the wiring diagram under control cover as well as **Figure 3-21, 3-22 and 3-23**.

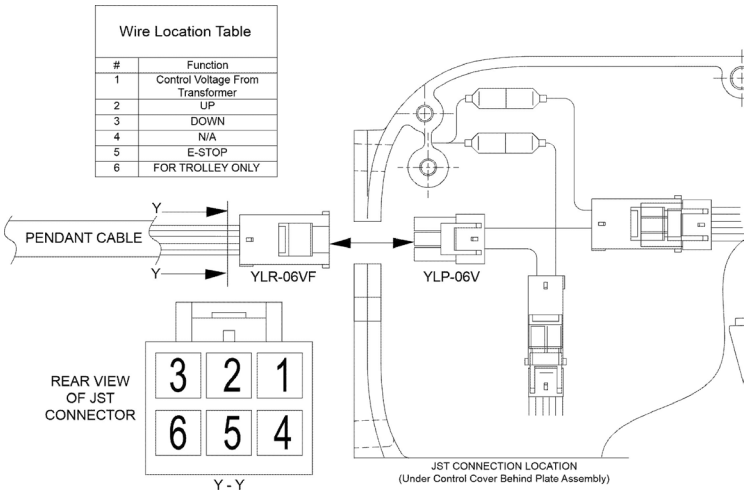


Figure 3-21 Pendant/Control Connection

Cable Connection with JST Connector

Note: Pendant/Control Cable with JST connector (YLR-06VF) provided and/or installed by customer. See **Figure 3-23** for Control cable preparation instructions.

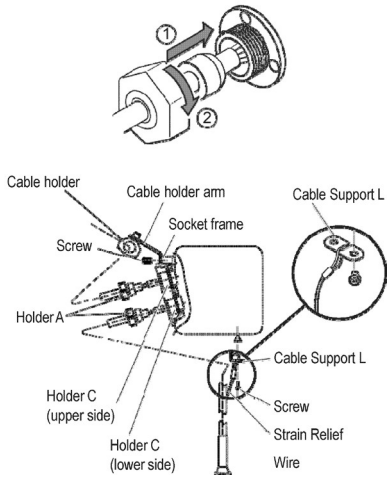
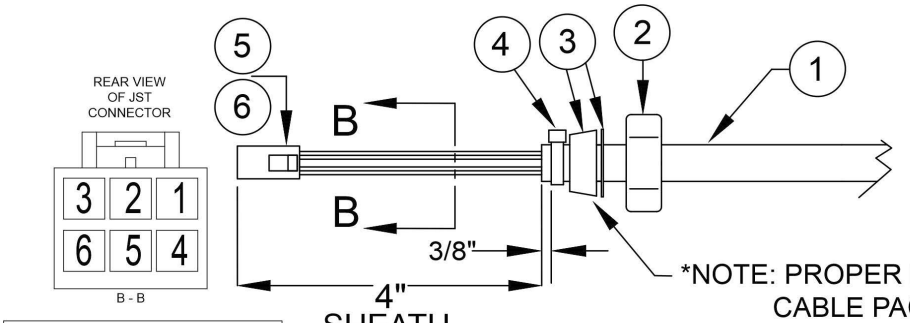


Figure 3-22 Cable Holder & Components

Note: Part# ECP6916AA: Cable packing for cable diameter (14.1-16mm).

Part# ECP6912AA: Cable packing for cable diameter (10.1-12mm).

⚠ WARNING If hoist or trolley hoist was supplied without Pendant/Control Cable, the installer must use a UL Listed Pendant/Control cable designed for Extra-Hard Use suitable for hazardous locations in CII D2 environments, as required by NEC®(ANSI/NFPA 70), “National Electric Code”. The installer must use a UL listed Pendant/Control assembly along with a UL listedPendant cord/Control cable type SO, SOO, SOOW, ST, STO cables rated 60°C, 600V minimum with an outer diameter compatible with provided cable packing Part# ECP6912AA (10.1mm-12mm).



Wire Location Table	
#	Function
1	Control Voltage From Transformer
2	UP
3	DOWN
4	N/A
5	E-STOP
6	N/A

FIGURE #	HHI PART #	DESCRIPTION	CRIMP TOOL
1	16/4P	Pendant Cable	N/A
2	ECP5924AA	Cable Holder A	N/A
3	ECP6912AA	Cable Packing w/ Washer	N/A
4	9006603	11" Cable Tie	N/A
5	9015013	JST Contact Housing 6P	YRF-590
6	9015003	JST YL Connector Pin	YRF-590

*NOTE: ALL COMPONENTS SHALL BE UL LISTED / UL RECOGNIZED.

Figure 3-23 Control Cable with JST

Power Supply Cable - Installation

If the hoist is hook mounted to a fixed support, ensure that the Power Supply Cable is properly installed and supported between the hoist and the electrical power supply.

If the host is installed on a manual trolley, then the Power Supply Cable must be installed along the beam that the trolley runs on. For curved beams a special cable suspension system will be needed, and this instruction does not apply. For straight beams install the Power Supply Cable as follows:

- Install a guide wire system parallel to the beam.
- For a manual trolley the guide wire should be positioned slightly outside the hoist's Cable Support.
- Use the Cable Trolleys supplied with the hoist to suspend the Power Supply Cable from the guide wire. Space the Cable Trolleys every 5 feet.

3.7.4 Connection to Electrical Power Source - The red, blue and black wires of the Power Supply Cable should be connected to an Electric Power Disconnect Switch or Circuit Breaker. This connection should be made so that the hoist is phased properly.

3.7.5 **⚠ WARNING** Check that the rating of the breaker satisfies the specification required by the electric chain hoist. Confirm the source voltage satisfies the rated voltage of the electric chain hoist. Be sure to use a breaker that conforms with the product specifications.

3.7.6 Fuse/Breaker Capacity -The hoist's power supply should be equipped with current overload protection such as fuses, which should be selected for 110% to 120% of total listed full load amperage, and should be dual element time-delay fuses. Refer to the motor nameplate for the full load amperage draw.

3.7.7 **⚠ 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.

Table 3-9: 230V Fuse/Breaker Specifications

<table>
<tr><th rowspan="2">Code</th><th colspan="2">RNER2 230V only</th><th colspan="2">RNER2M 230V combination</th></tr>
<tr><th>Wire size (mm²/AWG)</th><th>Capacity of fuse and circuit breaker (A)</th><th>Wire size (mm²/AWG)</th><th>Capacity of fuse and circuit breaker (A)</th></tr>
<tr><td>RNER2-010L</td><td rowspan="4">1.25/16</td><td>10</td><td rowspan="4">2/14</td><td rowspan="4">15</td></tr>
<tr><td>RNER2-010S</td><td rowspan="3">15</td></tr>
<tr><td>RNER2-015S</td></tr>
<tr><td>RNER2-020L</td></tr>
<tr><td>RNER2-020S</td><td rowspan="4">2/14</td><td rowspan="4">30</td><td rowspan="4">3.5/12</td><td rowspan="4">30</td></tr>
<tr><td>RNER2-025S</td></tr>
<tr><td>RNER2-030C</td></tr>
<tr><td>RNER2-050L</td></tr>
</table>

Table 3-10: 460V Fuse/Breaker Specifications

Code	RNER2 460V only		RNER2M 460V combination	
	Wire size (mm^2/AWG)	Capacity of fuse and circuit breaker (A)	Wire size (mm^2/AWG)	Capacity of fuse and circuit breaker (A)
RNER2-010L	1.25/16	5	2/14	10
RNER2-010S		10		
RNER2-015S				
RNER2-020L				
RNER2-020S	2/14	10	3.5/12	15
RNER2-025S				
RNER2-030C				
RNER2-050L				

Motorized Trolley Hoist

- **Connect the Relay Cable (See Figure 3-26 and 3-27)**
  - Insert the Relay Cable for Power into Holder C (upper side) of Socket Frame on hoist. Tighten Holder A to securely connect cable.
  - Insert the Relay Cable for operation (Hoist Control) into Holder C (lower side) of Socket Frame on hoist. Tighten Holder A to securely connect cable.
- **Connect Power Supply Cable (See Figure 3-19, 3-26, and 3-27)**
  - Remove Holder A mounted to the Trolley Connection Box.
  - Pass the Power Supply Cable through Holder A supported by the cable holder and cable packing.
  - Take note of the direction of the cable packing as the tapered end must face toward the hoist and the widest end facing the Cable Holder A.
  - Insert Power Supply Cable into Holder B of Connection Box and securely tighten Holder A.
  - Mount the cable holder, which the Power Supply Cable has passed through, to the cable holder arm using a chain hanging pin B, slotted nut, and split pin.
  - Connect Power Supply Cable to terminal strip in Connection Box
  - Reference wiring diagram within Connection Box as well as **Figure 3-24**.

⚠ WARNING If hoist or trolley hoist was supplied without Power Supply Cable, the installer must use a UL Listed power supply cable designed for Extra-hard use suitable for hazardous locations in CII D2 environments, as required by NEC® (ANSI/NFPA 70, "National Electric Code"). This includes Type SO, SOO, SOOW, ST, STO cables rated 90°C, 600V minimum with an outer diameter compatible with provided cable packing part # ECP6916AA (14.1mm – 16mm) or part # ECP6912AA (10.1 – 12mm). Refer to total AMP draw and NEC® (ANSI/NFPA 70, "National Electric Code") guidelines when sizing appropriate Power Supply cable gauge. Always consult with a qualified person when appropriate Power Supply Cable sizing is in question.

- **Connect Pendant/Control Cable**
  - Install Holder A onto Pendant/Control Cable and pass cable through Holder B in the Connection Box.
  - Take note of the direction of the cable packing as the tapered end must face toward the hoist.
  - Connect the Pendant/Control Cable to terminal strip in Connection Box.
  - Reference wiring diagram within Connection Box as well as **Figure 3-24**
  - Proper Torque Values for Terminal block: Power Supply side (1.2 ~ 2 Nm), Control Cable side: (0.8 ~ 1.2 Nm).
  - Pass Chain Retainer through hoop located at the end of the Strain Relief, securing it with the pan head screw.

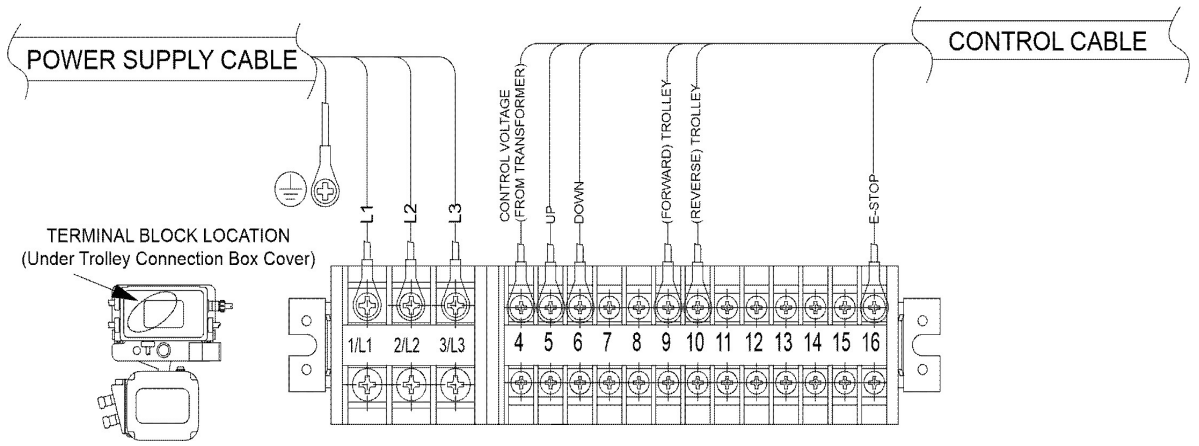


Figure 3-24 Trolley Hoist Terminal Block – Power Cable and Pendant/Control Cable Connections

See **Figure 3-19** for Power Supply Cable assembly instructions. Refer to **Page 41** for applicable cable size. See **Figure 3-25** for Control Cable assembly instructions.

⚠ WARNING If hoist or trolley hoist was supplied without Pendant/Control Cable, the installer must use a UL Listed Pendant/Control cable designed for Extra-Hard Use suitable for hazardous locations in CII D2 environments, as required by NEC® (ANSI/NFPA 70, "National Electric Code"). The installer must use a UL listed Pendant/Control assembly along with a UL listed Pendant cord/Control cable type SO, SOO, SOOW, ST, STO cables rated 60°C, 600V minimum with an outer diameter compatible with provided cable packing Part# ECP6912AA (10.1mm-12mm).

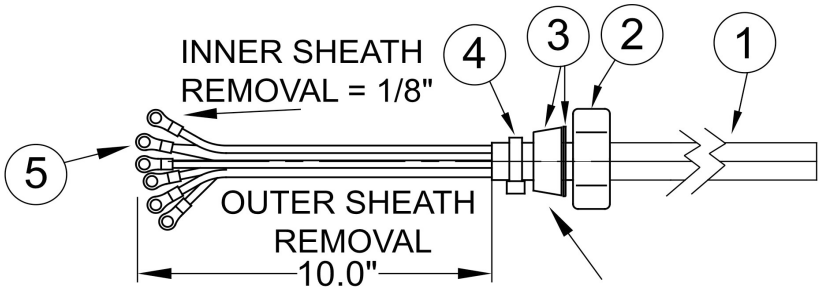


FIGURE #	HHI PART #	DESCRIPTION	CRIMP TOOL
1	16/6P	Pendant Cable	YRF-590
2	ECP5924AA	Cable Holder A	
3	ECP6914AA	Cable Packing w/ Washer	
4	9006603	Cable Tie - 11"	
5	9012306	Ring Terminal 14 - 16 AWG	YRF-590

NOTE:
PROPER DIRECTION OF CABLE PACKING.

NOTE:
ALL COMPONENETS SHALL BE UL LISTED / UL RECOGNIZED.

Figure 3-25 Pendant/Control Cable with Ring Terminals

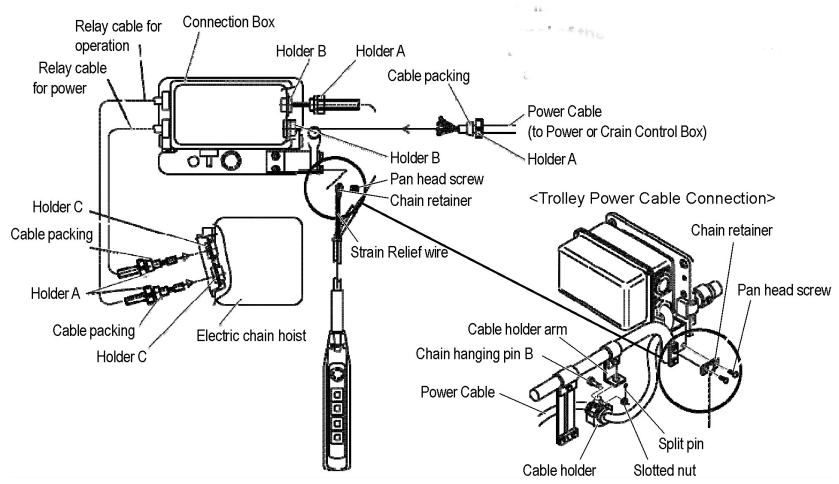


Figure 3-26 Cables and Components

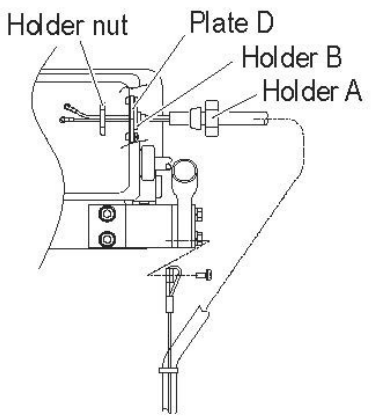


Figure 3-27 Holder A and Holder B Assembly

Hoist with Manual Trolley (Hoist Coupled to Push or Geared Trolley)

1. Connect the Power Cable

Insert the Power Cable into Holder C (upper side) of Socket Frame. Tighten Holder A to securely connect cable. Connect Power Supply, reference the wiring diagram under control cover as well as **Option 1** (**See Figure. 3-28**) or **Option 2** (**See Figure 3-29**).

- Proper Tightening torque for L1, L2, L3, and Ground is 1.2 ~ 1.8 Nm.
- Refer to Page 41 for suitable cable core information.

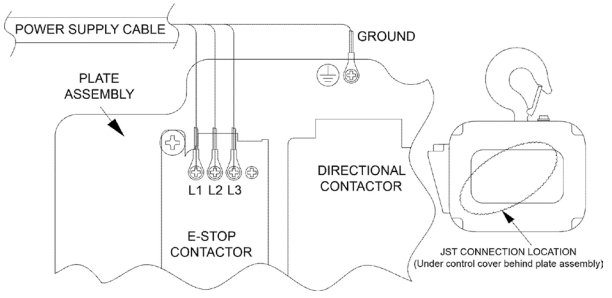


Figure 3-28 Power Supply Cable Connection - Option 1

Direct Wire w/ Ring Terminals

Note: Remove Harness (ER2BI95551 or ER2EI95551). Power Supply Cable and Ring Terminals provided and/or installed by customer. Refer to **Tables 3-7** and **3-8** for applicable cable size.

See **Figure 3-19** for Cable assembly instructions.

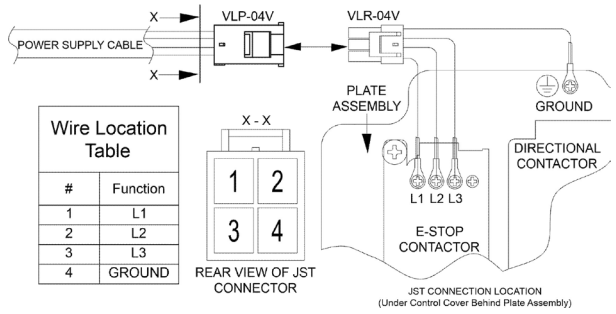


Figure 3-29 Power Supply Cable Connection - Option 2

Power Supply Cable/Hoist Connection with JST Connectors

Note: Power Supply Cable with JST connector (VLP-04V) provided and/or installed by customer. See **Figure 3-20** for cable assembly instructions. Refer to **Tables 3-7** and **3-8** for applicable cable size.

- Applicable cable wire sizes for VLP-04V are: 12ga – 20ga.
- Appropriate tool for connecting Power supply cable and VLP-04V is Tool (YRF-590).

⚠ WARNING If hoist or trolley hoist was supplied without Power Supply Cable, the installer must use a UL Listed power supply cable designed for Extra-Hard use suitable for hazardous locations in CII D2 environments, as required by NEC® (ANSI/NFPA 70, "National Electric Code"). This includes Type SO, SOO, SOOW, ST, STO cable rated 90°C, 600V minimum with an outer diameter compatible with provided cable packing Part# ECP6916AA (14.1mm-16mm) or ECP6912AA (10.1mm-12mm). Refer to total AMP draw and NEC®

(ANSI/NFPA 70, "National Electric Code") guidelines when sizing appropriate Power Supply Cable gauge. Always consult with a qualified person when appropriate Power Supply Cable sizing is in question.

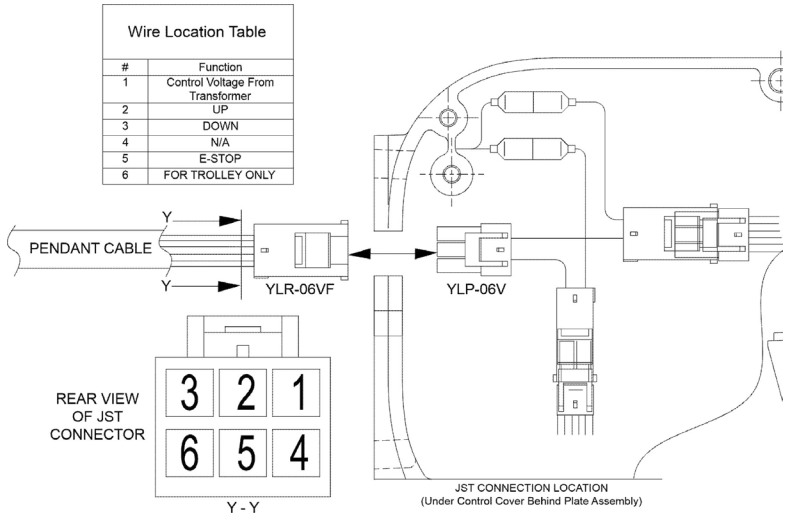


Figure 3-30 Pendant/Control Connection – Cable Connection with JST Connector Note: Pendant/Control Cable with JST connector (YLR-06VF) provided and/or installed by customer. See **Figure 3-23** for Control cable preparation instructions.

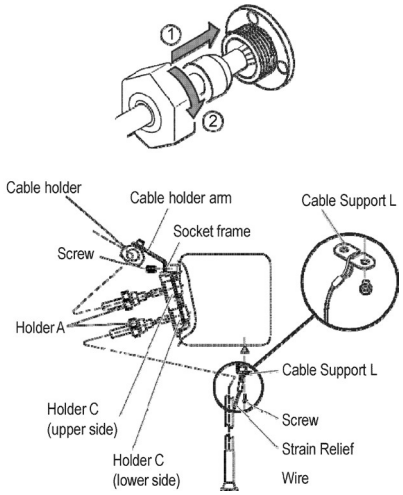


Figure 3-31 Cable Holder & Components Part# ECP6916AA: Cable packing for cable diameter (14.1-16mm). Part# ECP6912AA: Cable packing for cable diameter (10.1-12mm).

⚠ WARNING If hoist or trolley hoist was supplied without Pendant/Control Cable, the installer must use a UL Listed Pendant/Control cable designed for Extra-Hard Use suitable for hazardous locations in CII D2 environments, as required by NEC®(ANSI/NFPA 70, “National Electric Code”). The installer must use a UL listed Pendant/Control assembly along with a UL listed Pendant cord/Control cable type SO, SOO, SOOW, ST, STO cables rated 60°C, 600V minimum with an outer diameter compatible with provided cable packing Part# ECP6912AA (10.1mm-12mm).

3.8 Preoperational Checks and Trial Operation

3.8.1 **⚠ WARNING** Confirm the adequacy of the rated capacity for all slings, chains, wire ropes and all other lifting attachments before use. Inspect all load suspension members for damage prior to use and replace or repair all damaged parts.

3.8.2 **⚠ WARNING** Verify and correct all chain irregularities prior to operating the hoist. Refer to Section 3.2.

3.8.3 Measure and record the “k” dimension of all hooks on hoist. See **Table 5-4** under Section 5, “Inspection”.

3.8.4 Record the hoist's Code, Lot and Serial Number (from the name plate on the hoist; see Section 10) in the space provided on the cover of this manual.

3.8.5 Ensure that the hoist is properly installed to either a fixed point, or trolley, whichever applies.

3.8.6 If hoist is installed on a trolley, ensure that

- trolley is properly installed on the beam
- stops for the trolley are correctly positioned and securely installed on the beam.

3.8.7 Ensure that all nuts, bolts and split pins (cotter pins) are sufficiently fastened.

3.8.8 Pull down on the Pendant and ensure that the Cord Strain Relief Cable takes the force, not the Pendant Cord.

3.8.9 **⚠ CAUTION** Check supply voltage before everyday use. If the voltage varies more than 10% of the rated value, electrical devices may not function normally.

3.8.10 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.

3.8.11 **⚠ WARNING** The hoist must be connected to the power source such that its direction of operation corresponds to the up-and-down commands issued from the pendant control; i.e. pushing the UP button must cause the hoist to lift the load chain and hook. If the hoist does not operate correctly, shut off and lockout /tagout the main power source to the hoist. Disconnect and switch any two of the three input power leads at the power source to correct the hoist's motor phasing.

4.0 Operation

4.1 Introduction

⚠ DANGER

DO NOT WALK UNDER A SUSPENDED LOAD

⚠ WARNING

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

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

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

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

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

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

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

HOIST OPERATORS SHOULD HAVE A FULL UNDERSTANDING OF THE NATURE OF THE HAZARDOUS LOCATION IN WHICH THE HOIST IS TO BE OPERATED, AS WELL AS THE INTENDED USE OF THE HOIST.

NOTICE

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

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

4.2 Shall's and Shall Not's for Operation

⚠ WARNING

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

- **NOT** operate a damaged, malfunctioning or unusually performing hoist.
- **NOT** operate a hoist until you have thoroughly read and understood Manufacturer's Operating and Maintenance Instructions or Manuals.
- Be familiar with operating controls, procedures, and warnings.
- **NOT** operate a hoist that has been modified without the manufacturer's approval or without certification that it is in conformity with ANSI/ASME B30 volumes.
- **NOT** lift more than rated load for the hoist.
- **NOT** use hoist with twisted, kinked, damaged, or worn load chain.
- **NOT** use the hoist to lift, support, or transport people.
- **NOT** lift loads over people.
- **NOT** operate a hoist unless all persons are and remain clear of the supported load.
- **NOT** operate unless load is centered under hoist.
- **NOT** attempt to lengthen the load chain or repair damaged load chain.
- Protect the hoist's load chain from weld splatter or other damaging contaminants.
- **NOT** operate hoist when it is restricted from forming a straight line from hook to support in the direction of loading.
- **NOT** use load chain as a sling or wrap load chain
- **NOT** operate the hoist in a hazardous location outside of the specification of its intended use.

around load.

- **NOT** apply the load to the tip of the hook or to the hook latch.
- **NOT** apply load unless the load chain is properly seated in its grooves.
- **NOT** apply load if bearing prevents equal loading on all load-supporting chain.
- **NOT** operate beyond the limits of the load chain travel.
- **NOT** leave load supported by the hoist unattended unless specific precautions have been taken.
- **NOT** allow the load chain or hook to be used as an electrical or welding ground.
- **NOT** allow the load chain or hook to be touched by a live welding electrode.
- **NOT** remove or obscure the warnings on the hoist.
- **NOT** operate a hoist on which the safety placards or decals are missing or illegible
- **NOT** operate a hoist unless it has been securely attached to a suitable support.
- **NOT** operate a hoist unless load slings or other approved single attachments are properly sized, and seated in the hook saddle.
- **NOT** use the hoist in such a way that could result in shock or impact loads being applied to the hoist.
- Take up slack carefully – make sure load is balanced and load-holding action is secure before continuing.
- Shut down a hoist that malfunctions or performs unusually and report such malfunction.
- Make sure hoist limit switches function properly.
- Warn personnel before lifting or moving a load.
- Warn personnel of an approaching load.

⚠ CAUTION

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

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

4.3 Hoist Controls

4.3.1 Emergency Stop Button – Press the Emergency Stop Button to perform an emergency stop and lock-out of hoist motion controls as shown in **Figure 4-1**. Turn the Emergency Stop Button clockwise to unlock the controls and allow hoist operation.

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

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

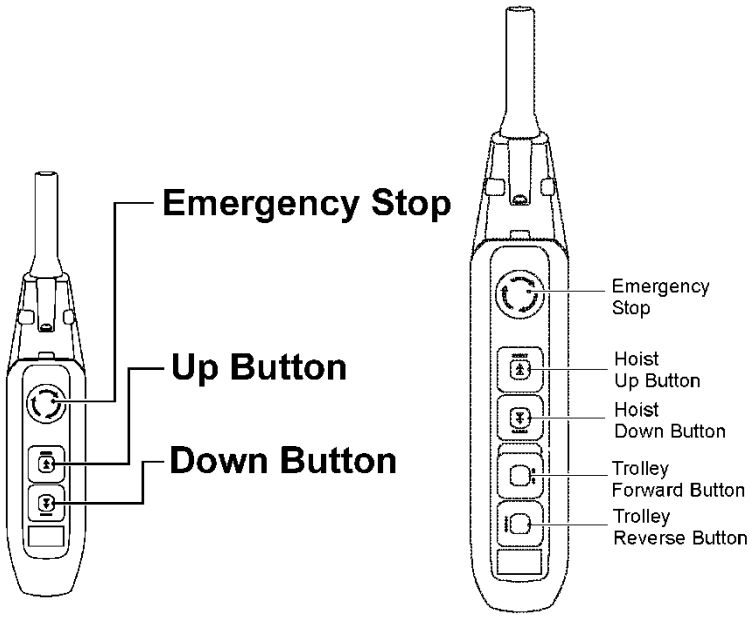


Figure 4-1 Push Button Pendant Control

4.4 Push and Geared Trolley Controls

4.4.1 For Plain Trolley, movement is controlled by pushing/pulling on the load or the hook of the attached hoist.

4.4.2 For Geared Trolley, when facing Trolley Hand Wheel:

- Pull down on the right side of Hand Chain (Clockwise Rotation) to move the Trolley left.
- Pull down on the left side of Hand Chain (Counterclockwise Rotation) to move the Trolley right.

4.4.3 **⚠ CAUTION** Avoid collisions with the end stops or other Trolleys. Damage may result.

4.5 Motorized Trolley Controls

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

4.4.5 Single Speed Pendant Control - When using the pendant control depress 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.

4.4.6 Trolley with Two Button Pendant – When a motorized trolley is supplied with a two button pendant, the pendant buttons control the trolley's horizontal motion in the forward and reverse directions. Single and dual speed buttons function identical to the four button pendant described above.

4.4.7 **⚠ CAUTION** Make sure the hoist and/or trolley motor completely stops before reversing direction.

5.0 Inspection

5.1 General

5.1.1 The inspection procedure herein is based on ANSI/ASME B30.16. The following definitions are from ANSI/ASME B30.16 and pertain to the inspection procedure below.

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

5.2 Inspection Classification

5.2.1 Initial Inspection – prior to initial use, all new, altered, or modified hoists shall be inspected by a designated person to ensure compliance with the applicable provisions of this manual.

5.2.2 Inspection Classification – the inspection procedure for hoists in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the critical components of the hoist and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as FREQUENT and PERIODIC, with respective intervals between inspections as defined below.

5.2.3 FREQUENT Inspection – visual examinations by the operator or other designated personnel with intervals per the following criteria:

- Normal service – monthly
- Heavy service – weekly to monthly
- Severe service – daily to weekly
- Special or infrequent service – as recommended by a qualified person before and after each occurrence.

5.2.4 PERIODIC Inspection – visual inspection by a designated person with intervals per the following criteria:

- Normal service – yearly
- Heavy service – semiannually
- Severe service – quarterly
- Special or infrequent service – as recommended by a qualified person before the first such occurrence and as directed by the qualified person for any subsequent occurrences.

5.3 Frequent Inspection

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

Table 5-1 Frequent Inspection
All functional operating mechanisms for maladjustment and unusual sounds.
Operation of limit switch and associated components
Hoist braking system for proper operation
Hooks in accordance with ANSI/ASME B30.10
Hook latch operation
Load chain in accordance with Section 5.7
Load chain reeving for compliance with Section 3.2 and 6.5

5.4 Periodic Inspection

5.4.1 Inspections should be made on a PERIODIC basis in accordance with **Table 5-2,** "Periodic Inspection." Evaluation and resolution of the results of PERIODIC Inspections shall be made by a designated person such that the hoist is maintained in safe working condition.

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

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

5.5 Occasionally Used Hoists 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.

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

5.7 Inspection Methods and Criteria

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

Table 5-3 Hoist Inspection Methods and Criteria

Item	Method	Criteria	Action
Functional operating mechanisms.	Visual, Auditory	Mechanisms should be properly adjusted and should not produce unusual sounds when operated.	Repair or replace as required.
Limit Switches (upper and lower)	Function	Proper operation. Actuation of limit switch should stop hoist.	Repair or replace as required.
Limit Lever Assembly	Visual, Function	Lever should not be bent or significantly worn and should be able to move freely.	Replace.
Braking System Operation	Function	Braking distance with rated capacity should not exceed 3% of the lifting speed (approximately two chain links).	Repair or replace as required.
Hooks - Surface Condition	Visual	Should be free of significant rust, weld splatter, deep nicks, or gouges.	Replace.
Hooks - Fretting wear	Measure	The "u" and "t" dimensions should not be less than discard value listed in **Table 5-4.**	Replace.
Hooks - Stretch	Measure	The "k" dimension should not be greater than 1.05 times that measured and recorded at the time of purchase (See **Section 3.7**). If recorded "k" values are not available for hooks when new, use nominal "k" values from **Table 5-4.**	Replace.
Hooks - Bent Shank or Neck	Visual	Shank and neck portions of hook should be free of deformations.	Replace.

Table 5-3 Hoist Inspection Methods and Criteria			
Item	**Method**	**Criteria**	**Action**
Hooks - Swivel Bearing	Visual, Function	Bearing parts and surfaces should not show significant wear, and should be free of dirt, grime and deformations. Hook should rotate freely with no roughness.	Clean/lubricate, or replace as required.
Hooks - Yoke Assembly	Visual	Should be free of significant rust, weld splatter, nicks, and gouges. Holes should not be elongated. The difference between dimensions “a” (vertical) and “b” (horizontal) must be within .020” (0.5mm), refer to **Figure 5-1**. Fasteners should not be loose, and there should be no gap between mating parts.	Measure, tighten, or replace as required.
Hooks – Top Shaft Retainer Clip	Visual	Should not have any deformation, abrasion, or damage. Refer to **Figure 5-2**.	Replace.
Hooks - Idle Sheave and Axle (Bottom Hook on Double Fall Hoist)	Visual, Function	Pockets of Idle Sheave should be free of significant wear. Idle Sheave surfaces should be free of nicks, gouges, dirt, and grime. Bearing parts and surfaces of Idle Sheave and Axle should not show significant wear. Idle Sheave should rotate freely with no roughness or significant free play.	Clean/lubricate, or replace as required.
Hooks - Hook Latches	Visual, Function	Latch should not be deformed. Attachment of latch to hook should not be loose. Latch spring should not be missing and should not be weak. Latch movement should not be stiff - when depressed and released latch should snap smartly to its closed position.	Replace.
Load Chain - Surface Condition	Visual	Should be free of rust, nicks, gouges, dents and weld splatter. Links should not be deformed, and should not show signs of abrasion. Surfaces where links bear on one another should be free of significant wear.	Replace.
Load Chain - Pitch and Wire Diameter	Measure	The “P" dimension should not be greater than maximum value listed in **Table 5-5.** The “d" dimension should not be less than minimum value listed in **Table 5-5.**	Replace. Inspect Load Sheave (and Idle Sheave for double fall hoist).
Load Chain - Lubrication	Visual, Auditory	Entire surface of each chain link should be coated with lubricant and should be free of dirt and grime. Chain should not emit cracking noise when hoisting a load.	Clean/lubricate (see **Section 6.0**).
Load Chain - Reeving	Visual	Chain should be reeved properly through Load Sheave (and Idle Sheave for double fall hoist) - refer to **Section 6.5**. Chain, Chain Springs, Cushion Rubbers, Striker Plates, and Stoppers should be installed properly - refer to **Section 3.2**.	Reeve/Install chain properly.

Table 5-3 Hoist Inspection Methods and Criteria			
Item	**Method**	**Criteria**	**Action**
Load Chain – Connection Yoke Chain Pin (Double Reeved Hoists Only)	Measure	The Connection Yoke Chain Pin should not have and apparent deformation. The “d” dimension should not be less than the discard value listed in **Table 5-6**.	Replace.
Cushion Rubber	Visual	Should be free of significant deformation.	Replace.
Chain Springs	Visual	Chain springs should not be deformed or compressed. Refer to **Table 5-9** for Chain Spring dimensions.	Replace.
Chain Guide	Visual	Chain Guide should be free of significant wear. Chain Guide surfaces should be free of deformation by nicks, gouges, and abrasion. Refer to **Figure 5-3**.	Replace.
Chain Container (optional)	Visual	Container should not be damaged. Brackets should not be deformed or missing.	Replace.
Housing and Mechanical Components	Visual, Auditory, Vibration, Function	Hoist components including load blocks, suspension housing, chain attachments, clevises, yokes, suspension bolts, shafts, gears, bearings, pins and rollers should be free of cracks, distortion, significant wear and corrosion. Evidence of same can be detected visually or via detection of unusual sounds or vibration during operation.	Replace.
Gaskets and Sealing Enclosures	Visual	Gaskets and sealing enclosures must be in good condition and installed properly to preserve the IP rating of the hoist.	Replace.
Bolts, Nuts and Rivets	Visual, Check with Proper Tool	Bolts, nuts and rivets should not be loose.	Tighten or replace as required.
Electromagnetic Brake Assembly	Measure, Visual	The electromagnetic motor brake gap is directly related to brake disk wear. As the disk wears, the brake gap will increase. The brake gap/wear dimension should not be more than discard value listed in **Table 5-7.** Bolts and screws should not be loose.	Tighten bolts and screws as required or replace Brake Assembly. Note: DO NOT attempt to adjust or dis-assemble the Brake Assembly.

Table 5-3 Hoist Inspection Methods and Criteria			
Item	**Method**	**Criteria**	**Action**
Hub Joint	Visual	Hub Joint should have no apparent deformation and abrasion. Must be fully seated. Refer to **Figure 5-4**.	Replace. Note: Electromagnetic Brake Assembly may also need to be replaced.
V Ring	Visual	The V Ring should not be worn or show any abnormality. It should be well lubricated. Refer to **Figure 5-5** and **Section 6.1.6.**	Clean/lubricate or replace as required.
Contactor Contacts	Visual	Contacts should be free of significant pitting or deterioration. On hoists equipped with Count/Hour Meter check the contactor cycles – refer to **Section 6.1**.	Replace.
Load Sheave	Visual	Pockets of Load Sheave should be free of significant wear. Refer to **Table 5-10** for Load Sheave wear dimensions.	Replace.
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 - 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 energization of circuits for opposing motions (e.g. up and down).	Repair or replace as necessary.
Pendant - Cord	Visual, Electrical Continuity	Surface of cord should be free from nicks, gouges, and abrasions. Each conductor in cord should have 100% electrical continuity even when cord is flexed back-and-forth. Pendant Cord Strain Relief Cable should absorb 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/Trolley Capacity Label	Visual	The label that indicates the capacity of the hoist/trolley should be legible and securely attached to the hoist.	Replace.
Nameplates	Visual	The nameplates that indicate the hoist model, speed and motor data should be legible and securely attached to the hoist.	Replace.
Braking System Operation	Function	Trolley must come to a smooth stop within 10% of its traveling speed when the pendant button is released.	Repair or replace as required.

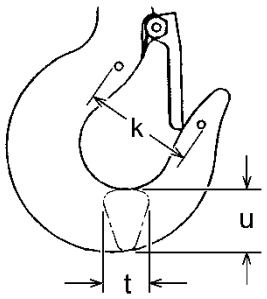
Table 5-3 Hoist Inspection Methods and Criteria			
Item	**Method**	**Criteria**	**Action**
Housing and Mechanical Components	Visual, Auditory, Vibration, Function	Trolley components including, suspension shafts, track wheels, track wheel axles, clevises, connection yokes, suspension bolts, shafts, gears, 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.
Side Plates	Visual	Must be free of significant deformation	Replace.
Track Wheel - Tread	Visual, Measure	Diameter of the inside and outside tread surface should not be less than the discard value shown in **Table 5-12**.	Replace.
Track Wheel - Gear	Visual	Teeth should not be cracked, damaged, or excessively worn.	Replace.
Side Rollers - Wear	Visual, Measure	Diameter should not be less than the discard value shown in **Table 5-15**.	Replace.
Suspension Shaft	Visual, Measure	Suspension shaft should not be bent. Diameter should not be worn by 10% or more.	Replace.
Motor Brake	Visual, Measure	Brake lining dimension “A” should not be less than discard value listed in **Table 5-8.** Refer to **Section 6.3** for gaining access to motor brake and inspection procedures. Braking surfaces should be clean, free of grease/oil and should not be glazed.	Replace.
Cable Hangers	Visual	Cable Hangers should not be damaged or significantly worn. Movement should be smooth and should not cause the Power Supply Cable to twist or kink.	Repair or replace as necessary.

Table 5-4 Top Hook & Bottom Hook Dimensions

"k" Measured When New:

Top: _____

Bottom: _____



Capacity Code	Nominal "k" Dimension* inch (mm)	"u" Dimension inch (mm)		"t" Dimension inch (mm)	
		Standard	Discard	Standard	Discard
010L, 010S	1.97 (50.0)	1.22 (31.0)	1.16 (29.5)	0.89 (22.5)	0.84 (21.4)
015S	2.36 (60.0)	1.44 (36.5)	1.37 (34.7)	1.04 (26.5)	0.99 (25.2)
020L, 020S, 025S	2.72 (69.0)	1.71 (43.5)	1.63 (41.3)	1.24 (31.5)	1.18 (29.9)
030C	2.87 (73.0)	1.87 (47.5)	1.78 (45.1)	1.36 (34.5)	1.29 (32.8)
050L	3.27 (83.0)	2.20 (56.0)	2.09 (53.2)	1.67 (42.5)	1.59 (40.4)

*These values are nominal since the dimension is not controlled to a tolerance. The **"k"** dimension should be measured when the hook is new - this becomes a reference measurement. Subsequent measurements are compared to this reference measurement in order to determine hook deformation/stretch. See **Table 5-3**, "Hooks - Stretch".

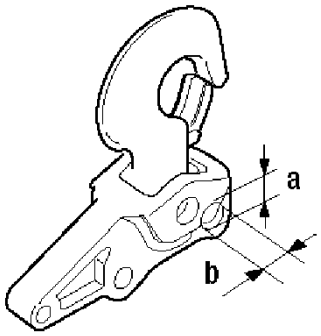


Figure 5-1 Hook Yoke Assembly

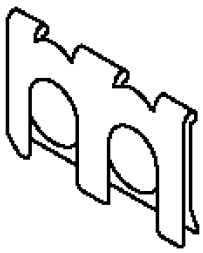
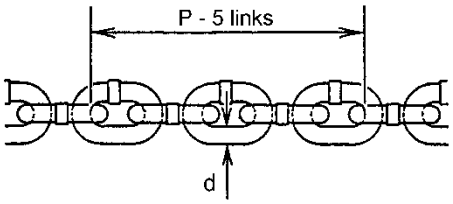


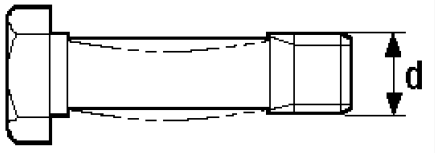
Figure 5-2 Shaft Retainer Clip

Table 5-6 Chain Wear Dimensions



Code	Capacity (Ton)	Load Chain diameter (mm)	Sum of 5 Links (inch (mm))		Load Chain diameter (inch (mm))	
			Do not exceed the limit		Do not fall under the limit	
			Standard	Limit	Standard	Limit
RNER2-010L/S	1	ϕ7.7×1	4.25 (108.0)	4.38 (111.2)	0.30 (7.7)	0.27 (6.9)
RNER2-015S	1 1/2	ϕ10.2×1	5.63 (143.0)	5.80 (147.2)	0.40 (10.2)	0.36 (9.2)
RNER2-020L	2	ϕ10.2×1	5.63 (143.0)	5.80 (147.2)	0.40 (10.2)	0.36 (9.2)
RNER2-020S						
RNER2-025S	2 1/2	ϕ11.2×1	6.18 (157.0)	6.37 (161.7)	0.44 (11.2)	0.40 (10.1)
RNER2-030C	3	ϕ10.2×2	5.63 (143.0)	5.80 (147.2)	0.40 (10.2)	0.36 (9.2)
RNER2-050L	5	ϕ11.2×2	6.18 (157.0)	6.37 (161.7)	0.44 (11.2)	0.40 (10.1)

Table 5-7 Chain Pin Wear Dimensions



Capacity Code	"d" - inch (mm)	
	Standard	Discard
030C	0.43 (10.8)	0.41 (10.3)
050L	0.51 (12.9)	0.48 (12.3)

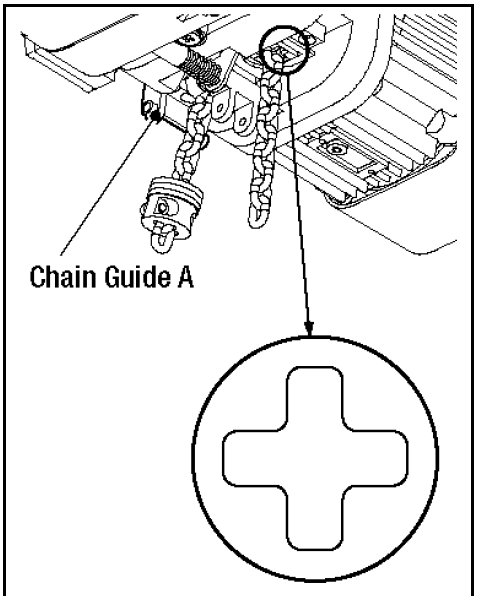
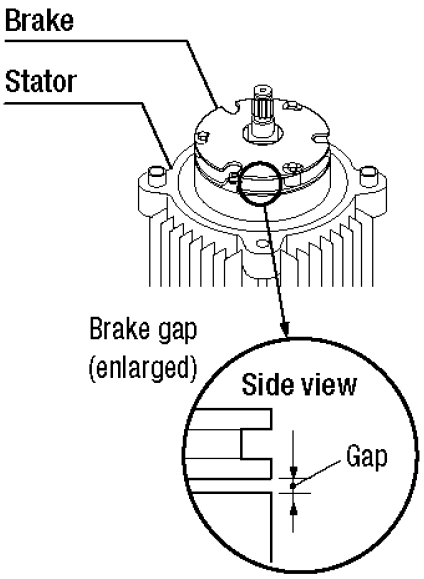


Figure 5-3 Chain Guide "A"

Table 5-8 Motor Brake Wear/Gap Dimensions



Hoist Speed	Capacity Code	"Gap" Dimension - inch (mm)
		Discard
Single	010L to 020L	0.030 (0.75)
	020S to 050L	0.043 (1.10)

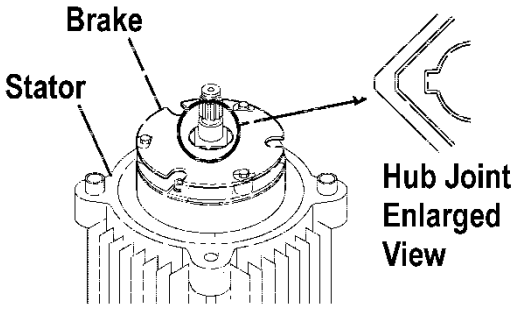


Figure 5-4 Hub Joint

Note: Hub Joint shown for 0.75HP motor. All other motors use splined Hub Joint.

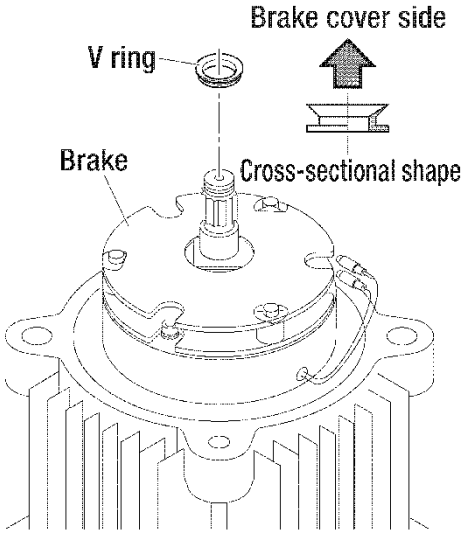
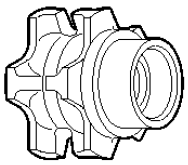
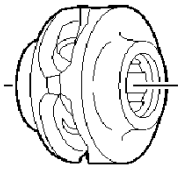


Figure 5-5 V Ring

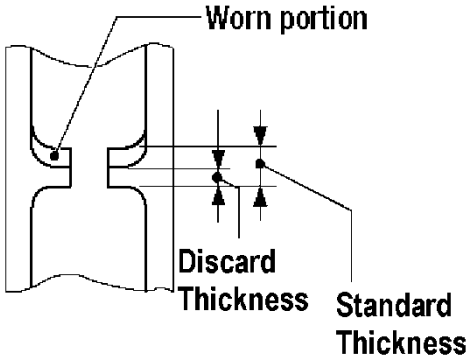
Table 5-10 Load and Idle Sheave Wear Dimensions



Load Sheave

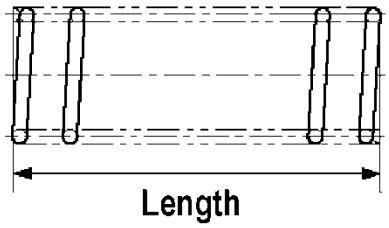


Idle Sheave



Code	Capacity (Ton)	Thickness (in. (mm))	
		Standard	Limit
RNER2-010L/S	1	0.18 (4.5)	0.12 (3.0)
RNER2-015S	1 1/2	0.26 (6.5)	0.17 (4.3)
RNER2-020L	2		
RNER2-020S			
RNER2-030C	3		
RNER2-025S	2 1/2	0.29 (7.3)	0.19 (4.9)
RNER2-050L	5		

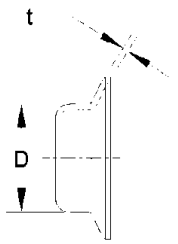
Table 5-11 Chain Spring Length Dimensions



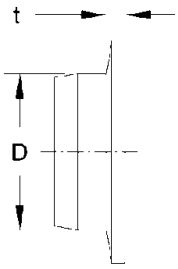
Capacity Code	"Length" - inch (mm)	
	Standard	Discard
020L	2.76 (70)	2.64 (67)
020S	3.35 (85)	3.19 (81)
025S	2.95 (75)	2.83 (72)
030C	3.35 (85)	3.19 (81)
050L	2.95 (75)	2.83 (72)

Table 5-12 Track Wheel Wear Dimensions – Manual Trolleys

1 to 3Ton

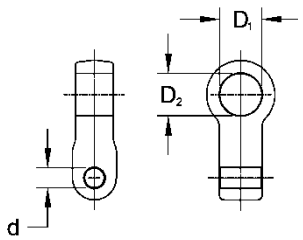


5 Ton



Capacity (Ton)		"D" Dimension inch (mm)		"t" Dimension inch (mm)	
		Standard	Discard	Standard	Discard
1/2	Tapered	2.36 (60)	2.30 (58.5)	0.126 (3.2)	0.098 (2.5)
	Flat				
1	Tapered	2.80 (71)	2.74 (69.5)	0.157 (4.0)	0.130 (3.3)
	Flat				
2	Tapered	3.35 (85)	3.29 (83.5)	0.177 (4.5)	0.150 (3.8)
	Flat				
3	Tapered	3.94 (100)	3.88 (98.5)	0.197 (5.0)	0.169 (4.3)
	Flat				
5	Tapered	4.65 (118)	4.41 (112)	0.378 (9.6)	0.264 (6.7)
	Flat				

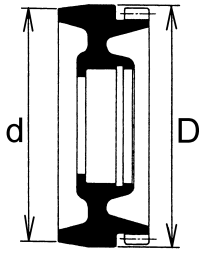
Table 5-13 Suspender Wear Measurements – Manual Trolleys



TROLLEY CAPACITY	D2 – D1 LIMIT	H		D	
		STANDARD IN. (MM)	LIMIT IN. (MM)	STANDARD IN. (MM)	LIMIT IN. (MM)
1/2	0.04 (1)	0.40 (10)	0.33 (8.5)	0.48 (12.2)	0.51 (13)
1		0.51 (13)	0.45 (11.5)	0.49 (12.5)	
2		0.75 (19)	0.67 (17)	0.80 (20.2)	0.83 (21)
3	0.06 (1.5)	0.87 (22)	0.79 (20)		
5		–	–	1.11 (28.2)	1.18 (30)

Table 5-14 Track Wheel Wear Dimensions – Motorized Trolley

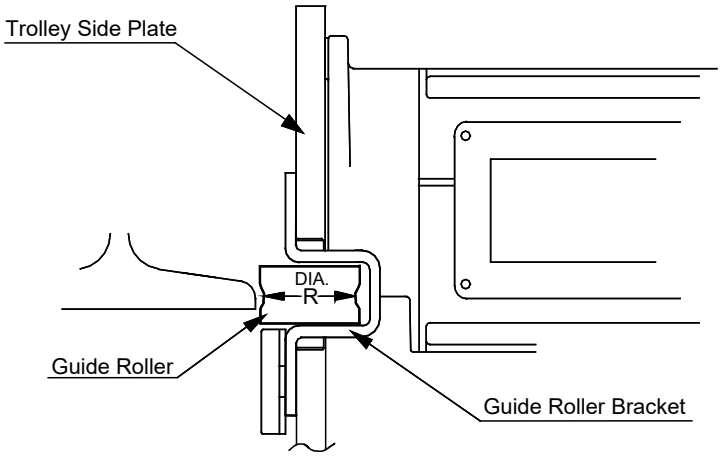
1 to 5 Ton:



Note: Track wheels are for flat and tapered flanges.

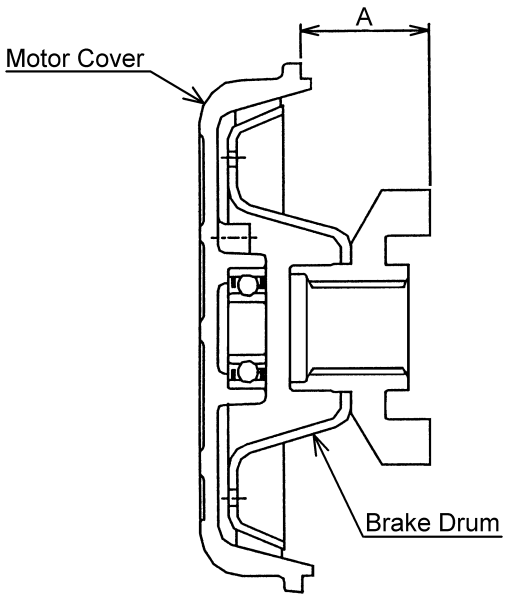
Capacity (Ton)	"d" Dimension inch (mm)		"D" Dimension inch (mm)	
	Standard	Discard	Standard	Discard
1	3.60 (91.5)	3.44 (87.5)	3.74 (95)	3.58 (91)
2	4.17 (106)	3.98 (101)	4.33 (110)	4.13 (105)
3	4.76 (121)	4.49 (114)	4.92 (125)	4.65 (118)
5	5.31 (135)	5.00 (127)	5.51 (140)	5.20 (132)

Table 5-15 Side Roller Wear Dimensions – Motorized Trolley



Capacity (Ton)	"R" Dimension inch (mm)	
	Standard	Discard
1	1.50 (38)	1.46 (37)
2 and 3	1.69 (43)	1.65 (42)
5	2.17 (55)	2.13 (54)

Table 5-16 Motorized Trolley Motor Brake Wear Dimensions



Capacity (Ton)	"A" Dimension - inch (mm)			
	Single or Dual Speed w/VFD Control		Dual Speed Contactor Control (*legacy design*)	
	Standard	Discard	Standard	Discard
1 and 2	1.28 (32.5)	1.22 (31.0)	1.45 (36.8)	1.43 (36.3)
3 to 5	1.28 (32.5)	1.22 (31.0)	1.45 (36.8)	1.41 (35.8)

6.0 Maintenance and Handling

⚠ WARNING

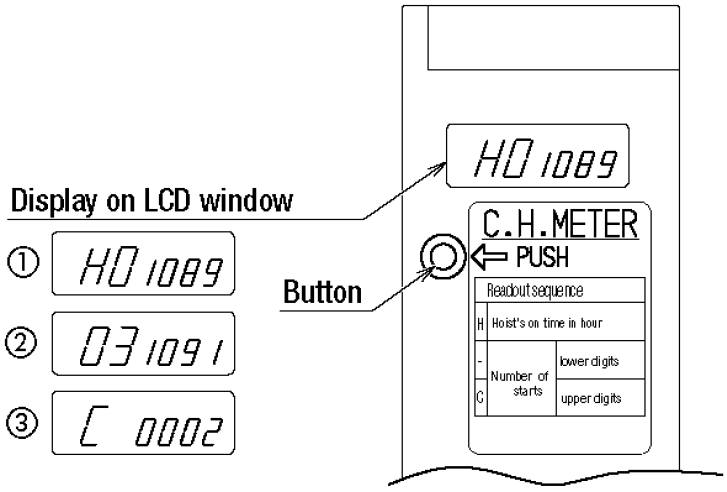
RNER2 HOIST MAINTENANCE SHALL NOT BE CONDUCTED IN A HAZARDOUS ENVIRONMENT. FAILURE TO DO SO MAY RESULT IN SERIOUS INJURY OR DEATH.

6.1 Count/Hour Meter

A count/hour function is included in all RNER2 hoists.

6.1.1 The Count/Hour (C/H) Meter located on the electrical control panel records the hoist's "ON" time and number of starts. To view these values, press the button on the C/H Meter one time. The display will then show a total of 3 values. The first value will show an "H" and a 5 digit number which is the hoist's total "ON" time (up and down) in hours (item "1" in **Figure 6-1**). After 3 seconds, the display will automatically change to a 6 digit number which is the number of starts of the hoists "DOWN" contactor, through 999,999 starts (item "2" in **Figure 6-1**). After 3 seconds, the display will automatically change to a 4 digit number prefaced by a "C". This is the number of hoist starts through 9,999,000,000 (item "3" in **Figure 6-1**).

The example in **Figure 6-1** is as follows:



- Item "1" – Operating Hours: 1,089 hours
- Item "3" and "2" – Number of Starts: 2,031,091 starts

Figure 6-1 Count/Hour Meter

6.1.2 Contactor – The C/H Meter can be used in conjunction with the amount of jogging to estimate when the contactor(s) should be replaced. Jogging is when the pendant control buttons are pressed quickly and repetitively to move the hook in small increments. Refer to **Table 6-1**.

Table 6-1 Criteria for Recommended Contactor Replacement

Jogging During Normal Operation		Change Contactor After:
Rating	**Approximate Jogging Frequency**	**(starts)**
Low	Jogging is rare.	1,000,000
Medium	During 25% of operations/lifts.	500,000
High	During 50% or more of operations/lifts.	200,000

6.1.3 Gear Oil – The C/H Meter can be used in conjunction with the average load lifted by the hoist to estimate when the gear oil should be changed. Refer to **Table 6-4**.

Table 6-4 Criteria for Recommended Gear Oil Replacement		
Loading During Normal Operation		Change Gear Oil After: (hours)
Rating	Average % of Rated Capacity	
Light	0 to 33%	360
Medium	33 to 67%	240
Heavy	67 to 100%	120

6.1.4 Electromagnetic Brake – The C/H Meter can be used to determine when the Electromagnetic Brake should be monitored or replaced. Refer to **Table 6-5.**

- When 1 Million starts have been achieved, inspect brake gap referring to **Table 6-5** criteria.
- When 2 Million starts have been achieved, replace brake assembly regardless of brake gap.

Table 6-5 Criteria for Electromagnetic Brake Replacement	
Condition of Electromagnetic Brake Gap (Ref. **Table 5-8** for Gap Wear Dimension)	**Action**
Brake gap is less than 50% of the limit.	Check the Brake at every 200,000 starts.
Brake gap reaches 50 to 100% of the limit.	Check the Brake at every 100,000 starts until the brake gap reaches at the limit gap.
Brake gap reaches the limit.	Replace whole Brake

6.1.5 Hook and Yoke – The C/H Meter can be used to determine when the Top/Bottom Hook and Yoke should be replaced. Refer to **Table 6-6.**

Table 6-6 Criteria for Top/Bottom Hook and Yoke Replacement	
Rate of Loading	**Number of Starts to replace Hook and Yoke**
Light - The hoist is mostly used with a light load. Rated capacity rarely applied.	Every 2 million starts.
Medium – The hoist is mostly used with a medium load. Rated capacity frequently applied.	Every 1.5 million starts.
Heavy – The hoist is mostly used with a heavy load. Rated capacity frequently applied.	Every 1 million starts.
Ultra-Heavy – Rated capacity constantly applied.	Every 1 million starts.

6.1.6 V Ring – The C/H Meter can be used to determine when the V Ring should be lubricated. Several grams of MOLITHERM No. 2 grease should be applied to the V Ring every 200 hours of operation.

6.1.7 You are encouraged to use the Count/Hour Meter in conjunction with your experience with the hoist's application and usage to develop a history upon which to gage and fine tune your maintenance program for the hoist.

6.2 Lubrication – Load Chain, Hooks and Suspension

6.2.1 Load Chain

- For longer life, the load chain should be lubricated.
- The load chain lubrication should be accomplished after cleaning the load chain with an acid free

cleaning solution. Apply Harrington Hoist, Inc. lubricating grease (Part No. ER2CS1951) or an equivalent to industrial general lithium grease, NLGI No. 0, to the bearing surfaces of the load chain links as indicated by the shaded areas in **Figure 6-2**. Also apply the grease to the areas of the load chain (shaded areas in **Figure 6-2**) that contact the load sheave. Ensure the grease is applied to the contact areas in the load sheave pockets.

- Machine or gear oil (grade ISO VG 46 or 68 oil or equivalent) may be used as an alternative lubricant but must be applied more frequently.

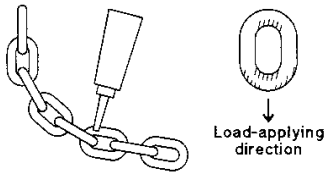


Figure 6-2 Chain Grease Application

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

6.2.2 Hooks and Suspension Components:

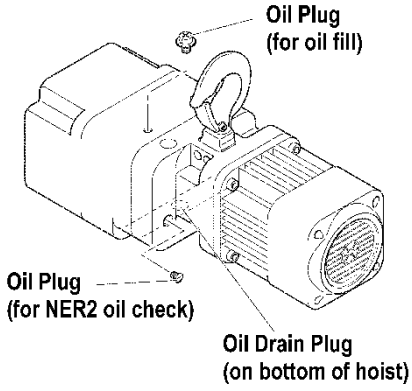
- Hooks - Bearings should be cleaned and lubricated at least once per year for normal usage. Clean and lubricate more frequently for heavier usage or severe conditions.
- Suspension Pins - Lubricate at least twice per year for normal usage; more frequently for heavier usage or severe conditions.

6.3 Lubrication - Gearbox

6.3.1 **⚠ CAUTION** DO NOT use any oil or quantity other than that listed below. New hoists are prefilled with the correct type and amount of oil.

6.3.2 **DETERMINING OIL LIFE** - Refer to **Section 6.1.3** when estimating gear oil life based on operations.

6.3.3 **RNER2 OIL LEVEL** – For hoists equipped with a Friction Clutch, the oil level is checked by removing the oil plug on the side of the hoist as shown in **Figure 6-3** for RNER2 hoists. The oil level should be just below the hole when the hoist is level.



RNER2 Hoists

Figure 6-3 Oil Plug Locations

6.3.4 **REPLACING OIL** – Change gear oil at least once every 5 years. The oil should be changed more frequently depending on the hoist's usage and operating environment. Refer to **Section 6.1.3.** Follow the procedure below for replacing the gearbox oil for your hoist:

- To drain the current oil from the hoist remove “Oil Plug” on top of the hoist and the “Oil Drain plug” on the bottom of the hoist. Allow the old oil to drain completely. Refer to **Figure 6-4** for oil plug locations.
- **NOTICE** Dispose of the used oil in accordance with local regulations.

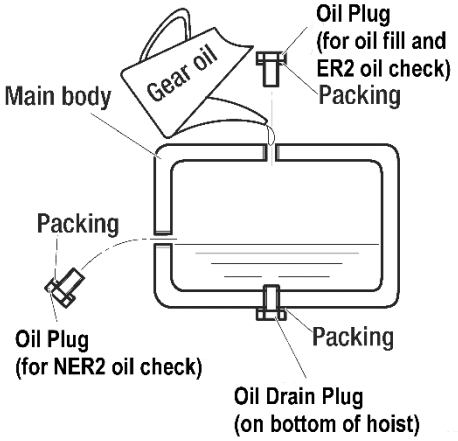


Figure 6-4 Oil Filling Diagram

- Ensure that the oil plugs for the oil level check holes and the drain hole are reinstalled and secured into the hoist body.
- Refill the gear case with the correct quantity and type of new oil or until the oil level is within the range shown in **Table 6-8**. Refer to **Figure 6-4.**

Table 6-8 Amount of Gear Oil

Capacity Code	Quarts	Liters
	RNER2	RNER2
010L/S	0.72	0.68
015S, 020L	1.37	1.30
020S, 030C	2.01	1.90
025S, 030L, 050L	2.01	1.90

- **⚠ WARNING** Using an incorrect type/grade of gearbox oil or the wrong quantity of oil may prevent the friction clutch from working properly and may affect the ability of the hoist to hold the load. Refer to the following for correct types/grades of gearbox oil:

RNER2 Gear Oil:

- Harrington standard: KITO HOIST OIL FC; Harrington Part Numbers:
  - ER1BS1855 – 1 Quart
  - ER1CS1855 – 2 ½ Gallons
- Acceptable equivalent: Meropa 320 (TEXACO)
- Acceptable equivalent: Meropa 320 (CALTEX)

6.4 Motor Brake

6.4.1 The motor brake on the RNER2 hoist is not adjustable.

6.4.2 Refer to **Table 5-8** for Brake Gap/Wear criteria.

6.5 Trolley Brake

6.5.1 The trolley motor brake is NOT adjustable.

6.5.2 Motor Brake Removal – Remove the four Bolts that attach the Motor Cover to the Motor Frame. Carefully remove the Motor Cover, brake components, and Stator.

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

1) Refer to **Table 5-16.**

2) Measure the distance "A" using calipers and a straight edge. Make sure the Brake Drum is square against the Motor Cover. Place the straight edge across the edge of the Brake Drum and measure from the straight edge to the mounting face of the Motor Cover.

3) Compare the measurement with the values listed in **Table 5-16**. Replace the Brake Drum and/or Motor Cover if the "A" measurement is smaller than the discard limit.

6.5.4 Motor Brake Installation - After the brake is inspected, carefully place the Stator and brake components into the Motor Frame. Be sure to reseal the Motor Cover to Motor Frame surface using a small bead of liquid (hi-temperature) sealant. Install the Motor Cover attachment bolts.

6.6 Load Chain

6.6.1 Lubrication and Cleaning – refer to **Section 6.2.**

6.6.2 Load Chain Replacement:

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

2) **⚠ WARNING** Be certain that the replacement chain is obtained from Harrington Hoists, Inc. and is the exact size, grade and construction as the original chain. The new load chain must have an odd number of links so that both its end links have the same orientation. If the load chain is being replaced due to damage or wear out, destroy the old chain to prevent its reuse.

3) **⚠ CAUTION** When replacing load chain, check for wear on mating parts, i.e. Load Sheave, Chain Guides and Idle Sheaves, and replace parts if necessary. Remove all chain components including the Bottom Hook Set Assembly, Stoppers, Cushion Rubbers, Chain Springs, Striker Plates, Chain Pin and End Wire (or End Suspender) from the chain for reuse on new chain. Inspect and replace any damaged or worn parts.

4) Using a C-link, attach the new chain to the end link of the old chain on the no-load side. The end link of the new load chain should be connected so that the welded portions of the load chain's standing links are oriented to the outside as they pass over the sheave. Refer to **Figure 6-5.**

5) Operate the hoist down to move the chain though the hoist body. Stop when a sufficient amount of new chain is accumulated on the load side.

6) Single fall hoists - Attach the chain components (step 4 above) to the chain. Refer to **Section 3.2** for the proper locations.

7) Double falls (030C, 050L) - Feed the end link on the load side of the new chain through the required chain components (step 4 above) and the bottom hook's Idle Sheave. Attach the remaining chain components to the chain referring to **Section 3.2** for the proper locations. Connect the end link to the top connection yoke with the chain pin, slotted nut, and cotter pin. Ensure that chain remains free of twists.

8) **⚠ WARNING** Make sure Stoppers, Cushion Rubbers, Chain Springs and Striker Plates are properly installed. Refer to **Section 3.2.**

9) After installation has been completed, perform steps outlined in **Section 3.8,** "Preoperational Checks and Trial Operation".

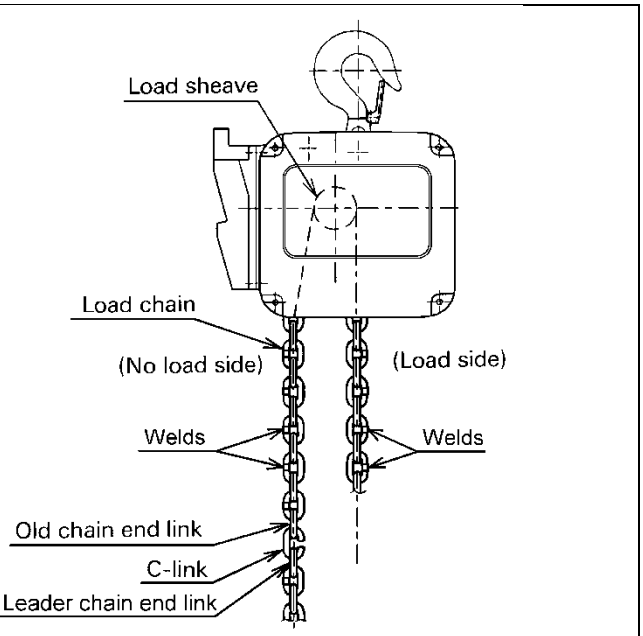


Figure 6-5 Chain Replacement

6.7 Friction Clutch

6.7.1 Friction Clutch (RNER2 Models) – If abnormal operation or slippage occurs do NOT attempt to disassemble or adjust the Friction Clutch. Replace the worn or malfunctioning Friction Clutch as an assembly with a new, factory adjusted part.

6.8 Storage

6.8.1 RNER2 models with vented oil cap assemblies should be stored with the cap oriented up to prevent oil leakage.

6.8.2 The storage location should be clean and dry.

6.9 Outdoor Installation

6.9.1 The hoist/trolley should be covered when not in use.

6.9.2 The hoist/trolley MUST BE inspected and maintained according to the 'Severe Service' Inspection Classification. **Refer to Section 5.0.**

6.9.3 When reinstalling the control cover, the gasket MUST BE in good condition and installed properly to preserve the IP55 rating of the hoist.

6.9.4 When using a steel chain container, remove the plug to allow for the drainage of pooling water. When using a plastic chain container, drill a 1/8" hole in the plastic to allow for drainage. Canvas

chain containers are not recommended for outdoor use.

6.9.5 Possibility of corrosion on components of the hoist/trolley increases for installations where salt air and high humidity are present. For installations where temperature variations introduce condensation/corrosion into the hoist, more frequent lubrication may be required.

6.9.6 NEMA 4 Pendants are recommended for outdoor use.

6.9.7 Refer to **Section 2.1.3** for allowable environmental conditions.

7.0 Troubleshooting

⚠ WARNING

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

Before performing ANY maintenance 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/trolley moving in wrong direction	Power supply reversed phased	Switch 2 of the 3 power supply cord wires at the power source. (Refer to **Section 3.8.11** for instructions on how to check for correct power supply phase connection.)
	Improper electrical connections	Refer to wiring diagram and check all connections.
Hoist/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 overloaded	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 coil for continuity. Replace brake if needed.

Table 7-1 Troubleshooting Guide		
Symptom	**Cause**	**Remedy**
Hoist/trolley will not operate (continued)	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 Interface Board	Replace Interface Board.
	Defect in control transformer	Check transformer coil for signs of overheating. Disconnect transformer and check for open winding.
	Motor burned out	Replace motor frame/stator, shaft/rotor, and any other damaged parts.
Hoist lifts but will not lower	Down circuit open	Check circuit for loose connections. Check down side of limit switch for malfunction.
	Broken conductor in pendant cord	Check the continuity for each conductor in the cable. If one is broken, replace entire cable.
	Faulty magnetic contactors	Check coils for open or short circuit. Check all connections on motor circuit. Check for burned contacts. Replace as needed.
	Faulty switch in pendant	Check electrical continuity. Check electrical connections. Replace or repair as needed.
Hoist lowers but will not lift	Hoist overloaded	Reduce load to within rated capacity of hoist.
	Low voltage in hoist's power supply	Determine cause of low voltage and bring to within plus or minus 10% of the voltage specified on the motor nameplate. The voltage should be measured at the hoist contactor.
	Up circuit open	Check circuit for loose connections. Check up side of limit switch for malfunction.
	Broken conductor in pendant cord	Check the continuity of each conductor in the cable. If one is broken, replace entire cable.
	Faulty magnetic contactor	Check coils for open or short circuit. Check all connections on motor circuit. Check for burned contacts. Replace as needed.
	Faulty switch in pendant	Check electrical continuity. Check electrical connections. Replace or repair as needed.
	Faulty friction clutch	Replace.
Trolley drifts excessively when stopping	Motor brake not holding	Clean and inspect brake lining. Replace if necessary

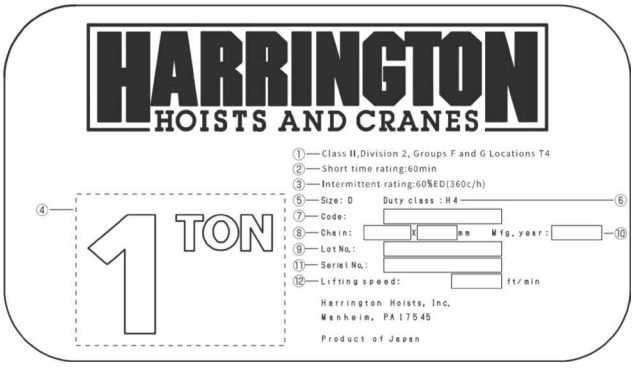
Table 7-1 Troubleshooting Guide		
Symptom	**Cause**	**Remedy**
Hoist will not lift rated load or does not have the proper lifting speed	Hoist overloaded	Reduce load to within rated capacity.
	Low voltage in hoist's power supply	Determine cause of low voltage and bring to within plus or minus 10% of voltage specified on the motor nameplate. The voltage should be measured at the hoist contactor.
	Faulty friction clutch	Replace.
Load drifts excessively when hoist is stopped	Motor brake not holding	Check brake for proper “Brake Gap” dimension. (Reference **Table 5-8**). Replace if needed.
Motor or brake overheating	Excessive load	Reduce load to within rated capacity of hoist.
	Excessive duty cycle	Reduce frequency of lifts.
	Wrong voltage or frequency	Check voltage and frequency of power supply against the rating on the nameplate on the motor.
	Extreme external heating	Above an ambient temperature of 140°F/60°C, 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/trolley operates intermittently	Collectors making poor contact	Check movement of spring loaded arm, weak spring, connections, and shoe. Replace as needed.
	Contactor contacts arcing	Check for burned contacts. Replace as needed.
	Loose connection in circuit	Check all wires and terminals for bad connections. Replace as needed.
	Broken conductor in Pendant Cord	Check for intermittent continuity in each conductor the Pendant Cord. Replace entire Pendant Cord if continuity is not constant.

8.0 Parts List

RNER2 Hoist Parts List

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

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



RNER2 Series Nameplate

The parts list is arranged into the following sections:

8.1.1 Hoist Housing and Motor Parts

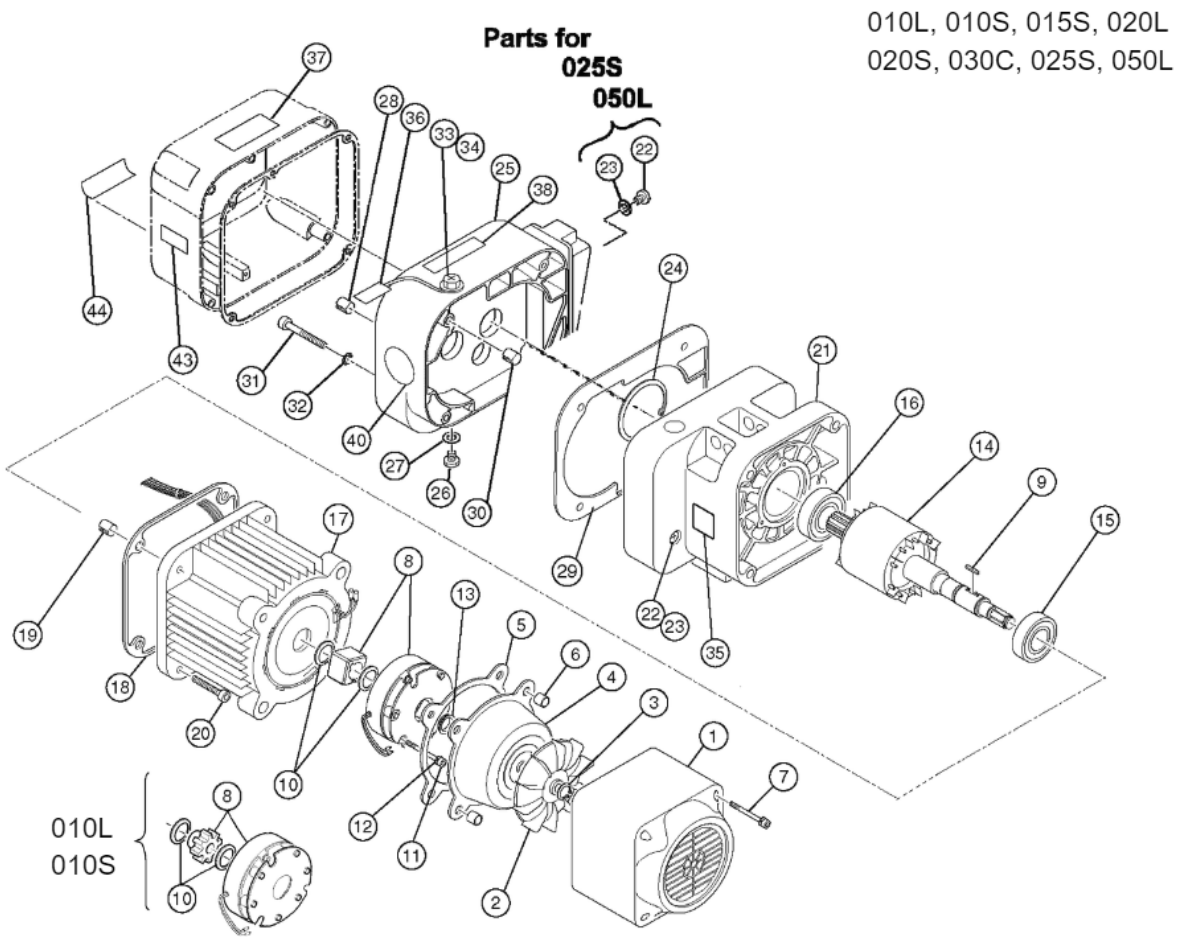


Figure 8.1.1 Housing and Motor Parts

8.1.1 Hoist Housing and Motor Parts

Figure No.	Part Name	Parts Per Hoist
1	Fan Cover	1
2	Fan	1
3	Snap Ring	1
4	Brake Cover	1
5	Packing B	1
6	Set Pin S	2
7	Socket Bolt	4
8	Electromagnetic Brake Assembly	1
9	Key B	1
10	Snap Ring	1
		2
11	Socket Bolt	3
12	Spring Lock Washer	3
13	V Ring	1
14	Motor Shaft With Rotor	1
15	Ball Bearing	1
16	Ball Bearing	1
17	Motor Frame With Stator	1
18	Packing M	1
19	Set Pin S	2
20	Socket Bolt	4
21	Body B Assembly	1
16	Ball Bearing	1
22	Oil Plug	1
23	Plug Packing	1
24	Snap Ring	1
25	Gear Case	1
26	Oil Plug	1
27	Plug Packing	1
28	Spring Pin	1
29	Packing G	1
30	Set Pin S	2
31	Socket Bolt	4 (5)
32	Toothed Lock Washer	4 (5)
33	Oil Fill Plug	1
34	Eyebolt Packing	1
35	Name Plate Load Side E	1
36	Oil Full Tag	1
37	Warning Sticker E (Disconnect Power)	1
38	Name Plate OF (Correct Oil Required)	1
40	Name Plate AD (Speed Letter)	1
43	Check Voltage Label	2V: 1 / 4V: 1
44	Check Hook Movement Label (bottom front of cover)	1

*Quantities in "( )" are for 025 and 050 hoists.

8.1.2 Hoist Gearing Parts

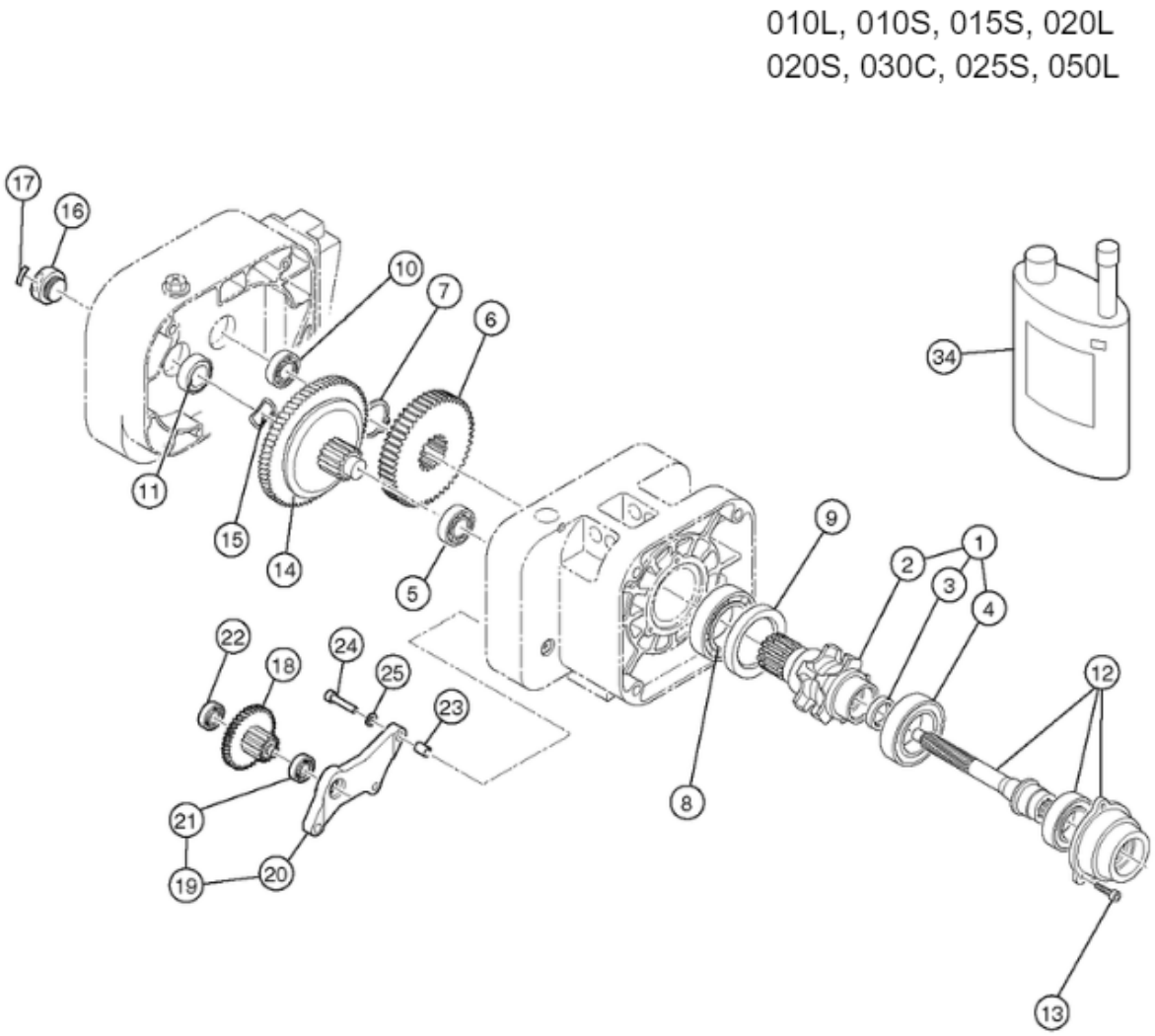


Figure 8.1.2 Gearing Parts

8.1.2 Hoist Gearing Parts

Figure No.	Part Name	Parts Per Hoist
1	Load Sheave Assembly	1
2	Load Sheave	1
3	Oil Seal	1
4	Ball Bearing	1
5	Ball Bearing	1
6	Load Gear	1
7	Snap Ring	1
8	Ball Bearing	1
9	Oil Seal	1
10	Ball Bearing	1
11	Oil Seal	1
12	Pinion Assembly	1
13	Socket Bolt	3
14	Friction Clutch Complete Assembly	1
15	Wave Washer	1
16	Nut Cover	1
17	Name Plate FP (Adjustment Of Friction Clutch Prohibited)	1
18	Gear B Assembly	1
19	Gear Holder Plate Assembly	1
20	Gear Holder Plate	1
21	Ball Bearing	1
22	Ball Bearing	1
23	Set Pin S	2
24	Socket Bolt	3
25	Spring Lock Washer	3
34*	NER2 Gear Oil 1qt	1
	NER2 Gear Oil 2.5 gal	1

*Refer to Section 6.3 of RNER2 Owner's Manual for the amount of gear oil required and for the method to check the oil level.

8.1.3.1 Hook and Chain Parts

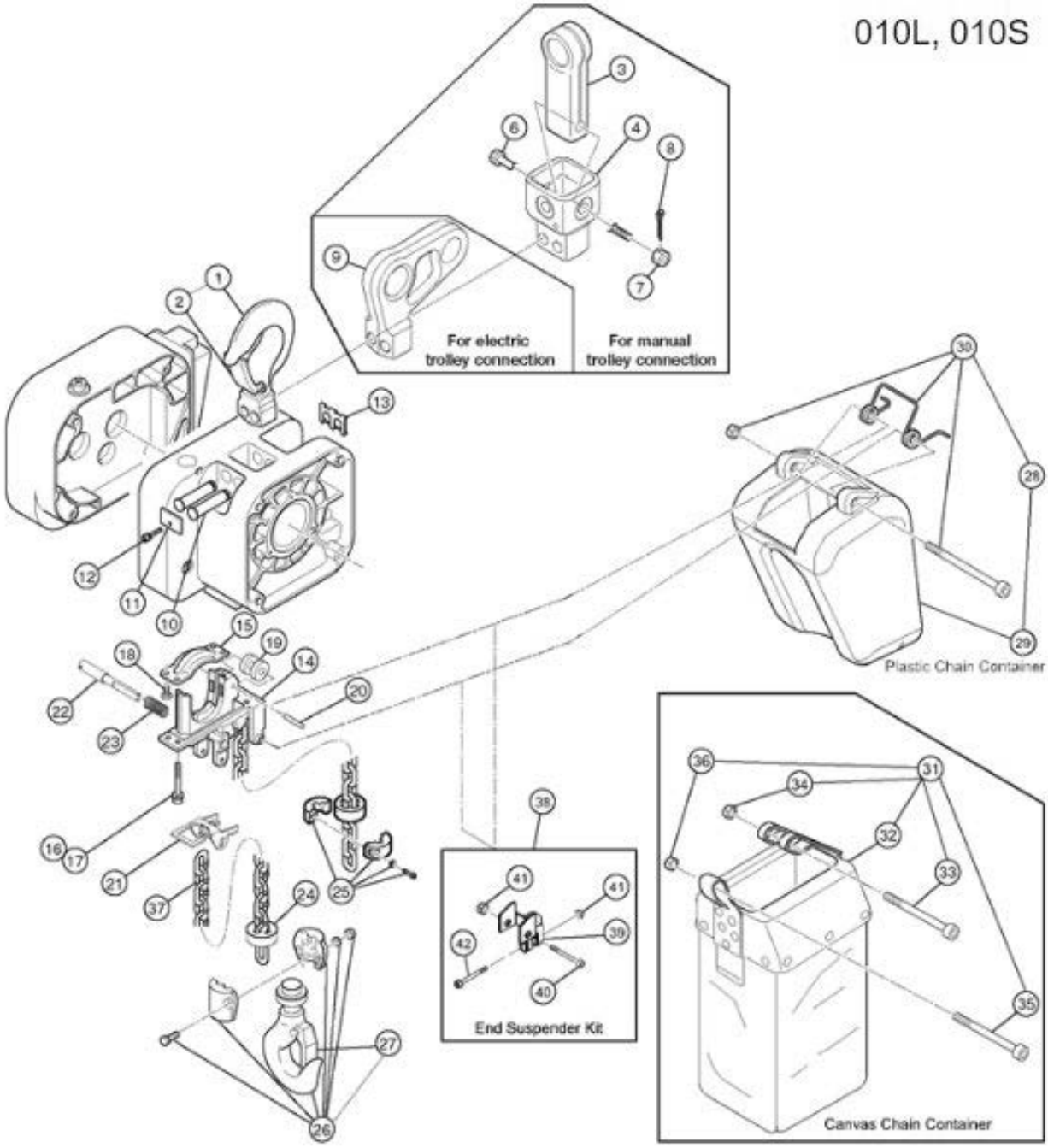


Figure 8.1.3.1 Hook and Chain Parts

8.1.3.1 Hook and Chain Parts

	Part Name	Parts Per Hoist
1	Top Hook Assembly	1
2	Hook Latch	1
3	Suspender E (For Manual Trolley)	1
4	Connection Yoke PG* (For Manual Trolley)	1
6	Yoke Bolt	1
7	Slotted Nut	1
8	Split Pin	1
9	Suspender T (For Motorized Trolley)	1
10	Top Pin, Lot No. ER2A-..., 2.7in (69mm) Long	2
	Top Pin, Lot No. ER2B-..., 3.7in (95mm) Long	2
11	Plate A	1
12	Socket Bolt With Spring Washer	1
13	Shaft Clip	1
14	Chain Guide A	1
15	Chain Guide B	1
16	Socket Bolt	4
17	Spring Lock Washer	4
18	Machine Screw With Spring Washer	4
19	Guide Roller	1
20	Roller Pin	1
21	Limit Lever	1
22	Limit Lever Pin	1
23	Limit Lever Spring	1
24	Cushion Rubber	2
25	Stopper Assembly	1
26	Bottom Hook Complete Assembly	1
27	Hook Latch	1
28	Plastic Chain Container Assembly (Max. Lifting Height 20ft)	1
29	Plastic Chain Container	1
30	Plastic Container Spring Assembly	1
31	Canvas Chain Container Assembly (Max. Lifting Height 50ft)	1
32	Canvas Chain Container	1
33	Socket Bolt	1
34	Lever Nut	1
35	Socket Bolt	1
36	Lever Nut	1
37	NP Load Chain	1
38	End Suspender Kit	1
39	End Suspender	1
40	Socket Bolt	1
41	Lever Nut	2
42	Socket Bolt	1

*Connection Yoke PG replaces Connection Yoke P (ER2CS9027) and Connection Yoke G (ER2CS9029)

8.1.3.2 Hook and Chain Parts

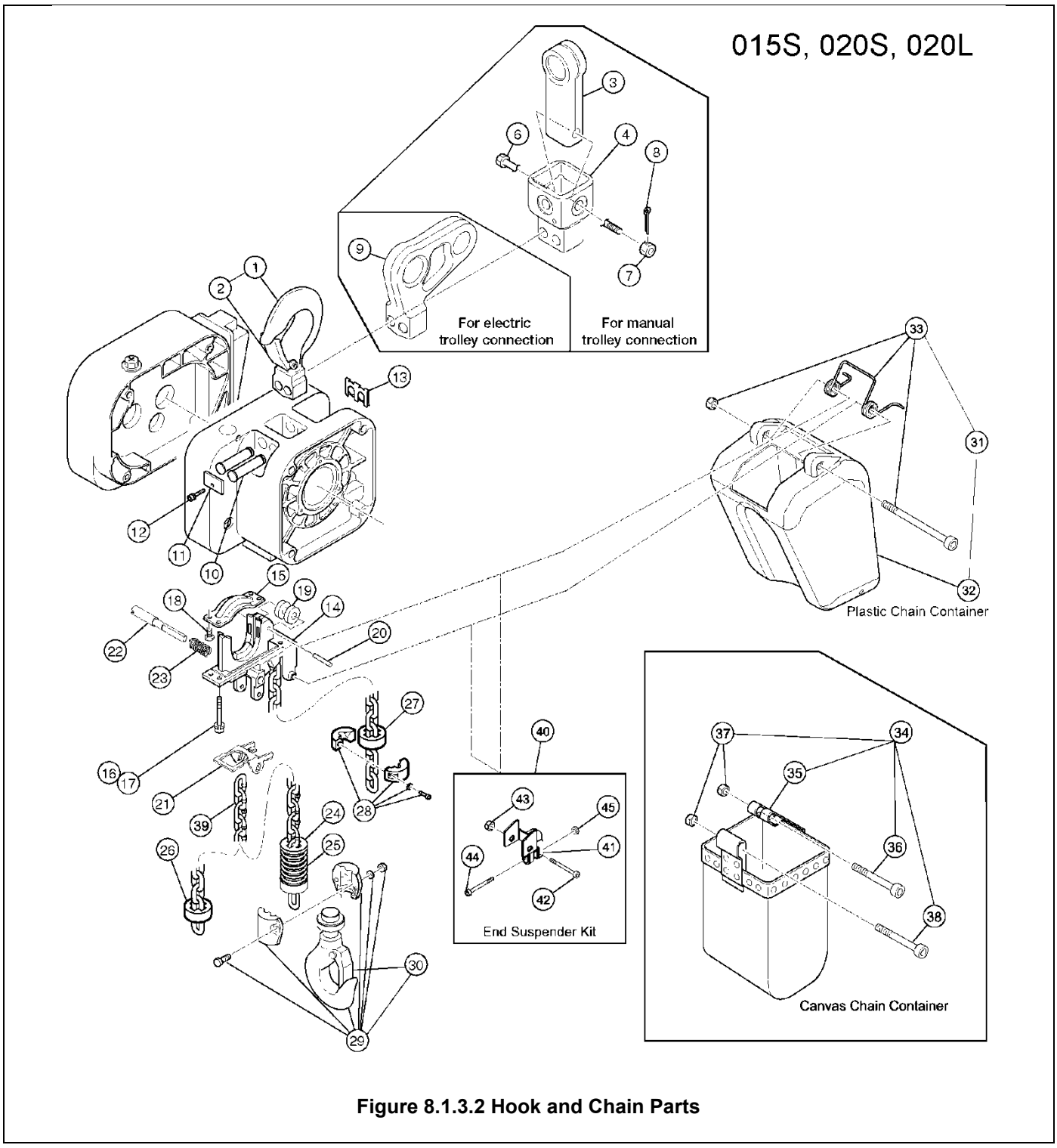


Figure 8.1.3.2 Hook and Chain Parts

8.1.3.2 Hook and Chain Parts

	Part Name	Parts Per Hoist
1	Top Hook Assembly	1
2	Hook Latch	1
3	Suspender E (For Manual Trolley)	1
4	Connection Yoke PG* (For Manual Trolley)	1
6	Yoke Bolt	1
7	Slotted Nut	1
8	Split Pin	1
9	Suspender T	1
10	Top Pin	2
11	Plate A	1
12	Socket Bolt With Spring Washer	1
13	Shaft Clip	1
14	Chain Guide A	1
15	Chain Guide B	1
16	Socket Bolt	4
17	Spring Lock Washer	4
18	Machine Screw With Spring Washer	4
19	Guide Roller	1
20	Roller Pin	1
21	Limit Lever	1
22	Limit Lever Pin	1
23	Limit Lever Spring	1
24	Limiting Plate	1
25	Chain Spring	1
26	Cushion Rubber	1
27	Cushion Rubber	1
28	Stopper Assembly	1
29	Bottom Hook Complete Assembly	1
30	Hook Latch	1
31	Plastic Chain Container Assembly (Max. Lifting Height 13ft)	1
32	Plastic Chain Container	1
33	Plastic Container Spring Assembly	1
34	Canvas Chain Container Assembly (Max. Lifting Height 60ft)	1
35	Canvas Chain Container	1
36	Socket Bolt	1
37	Lever Nut	2
38	Socket Bolt	1
39	NP Load Chain	1
40	End Suspender Kit	1
41	End Suspender	1
42	Socket Bolt	1
43	Lever Nut	1
44	Socket Bolt	1
45	Lever Nut	1

8.1.3.3 Hook and Chain Parts

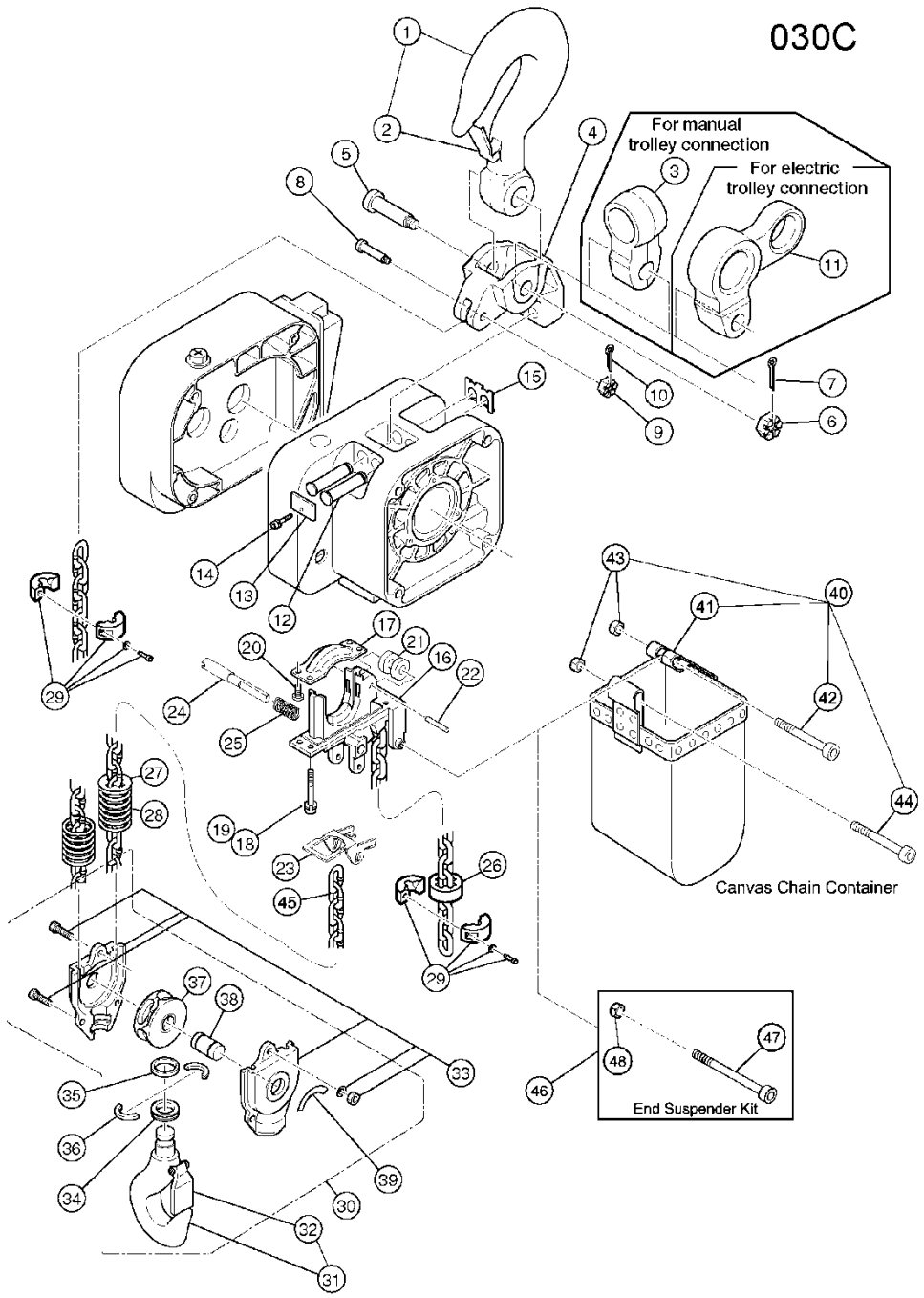


Figure 8.1.3.3 Hook and Chain Parts

8.1.3.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist
1	Top Hook Assembly	1
2	Hook Latch	1
3	Suspender E (For Manual Trolley)	1
4	Connection Yoke D	1
5	Yoke Bolt	1
6	Slotted Nut	1
7	Split Pin	1
8	Chain Pin	1
9	Slotted Nut	1
10	Split Pin	1
11	Suspender T (For Motorized Trolley)	1
12	Top Pin	2
13	Plate A	1
14	Socket Bolt With Spring Washer	1
15	Shaft Clip	1
16	Chain Guide A	1
17	Chain Guide B	1
18	Socket Bolt	4
19	Spring Lock Washer	4
20	Machine Screw With Spring Washer	4
21	Guide Roller	1
22	Roller Pin	1
23	Limit Lever	1
24	Limit Lever Pin	1
25	Limit Lever Spring	1
26	Cushion Rubber	1
27	Limiting Plate	1
28	Chain Spring	2
29	Stopper Assembly	2
30	Bottom Hook Complete Assembly	1
31	Bottom Hook Assembly	1
32	Hook Latch	1
33	Bottom Yoke Assembly	1
34	Thrust Bearing	1
35	Thrust Collar A	1
36	Hook Stopper A	2
37	Idle Sheave Assembly	1
38	Bottom Shaft Assembly	1
39	Name Plate C	1
40	Canvas Chain Container Assembly (Max. Lifting Height 20ft)	1
41	Canvas Chain Container	1
42	Socket Bolt	1
43	Lever Nut	2
44	Socket Bolt	1
45	NP Load Chain	1
46	End Suspender Kit	1
47	Socket Bolt	1
48	Lever Nut	1

8.1.3.4 Hook and Chain Parts

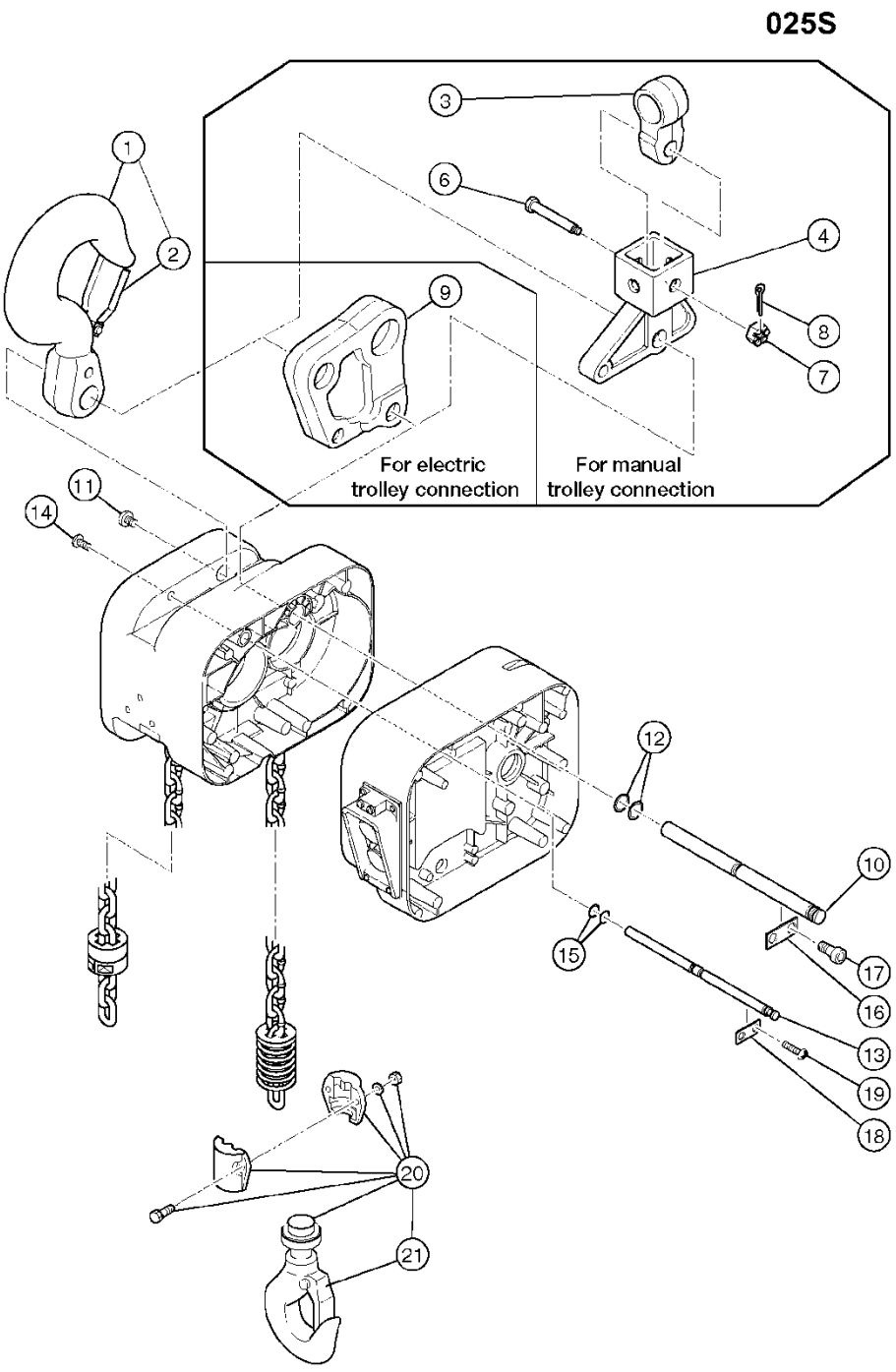


Figure 8.1.3.4 Hook and Chain Parts

8.1.3.4 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist
1	Top Hook Complete Assembly	1
2	Hook Latch	1
3	Suspender E (For Manual Trolley)	1
4	Connection Yoke PG* (For Manual Trolley)	1
6	Yoke Bolt	1
7	Slotted Nut	1
8	Split Pin	1
9	Suspender T (For Motorized Trolley)	1
10	Connection Shaft Assembly	1
11	Shaft Plug	1
12	O Ring	2
13	Fixing Shaft Assembly	1
14	Fixing Shaft Plug	1
15	O Ring	2
16	Connection Shaft Plate A	1
17	Socket Bolt With Spring Washer	2
18	Fixing Shaft Plate A	1
19	Machine Screw With Spring Washer	2
20	Bottom Hook Complete Assembly	1
21	Hook Latch	1

*Connection Yoke PG replaces Connection Yoke P (ER2FS9027) and Connection Yoke G (ER2FS9029)

8.1.3.5 Hook and Chain Parts

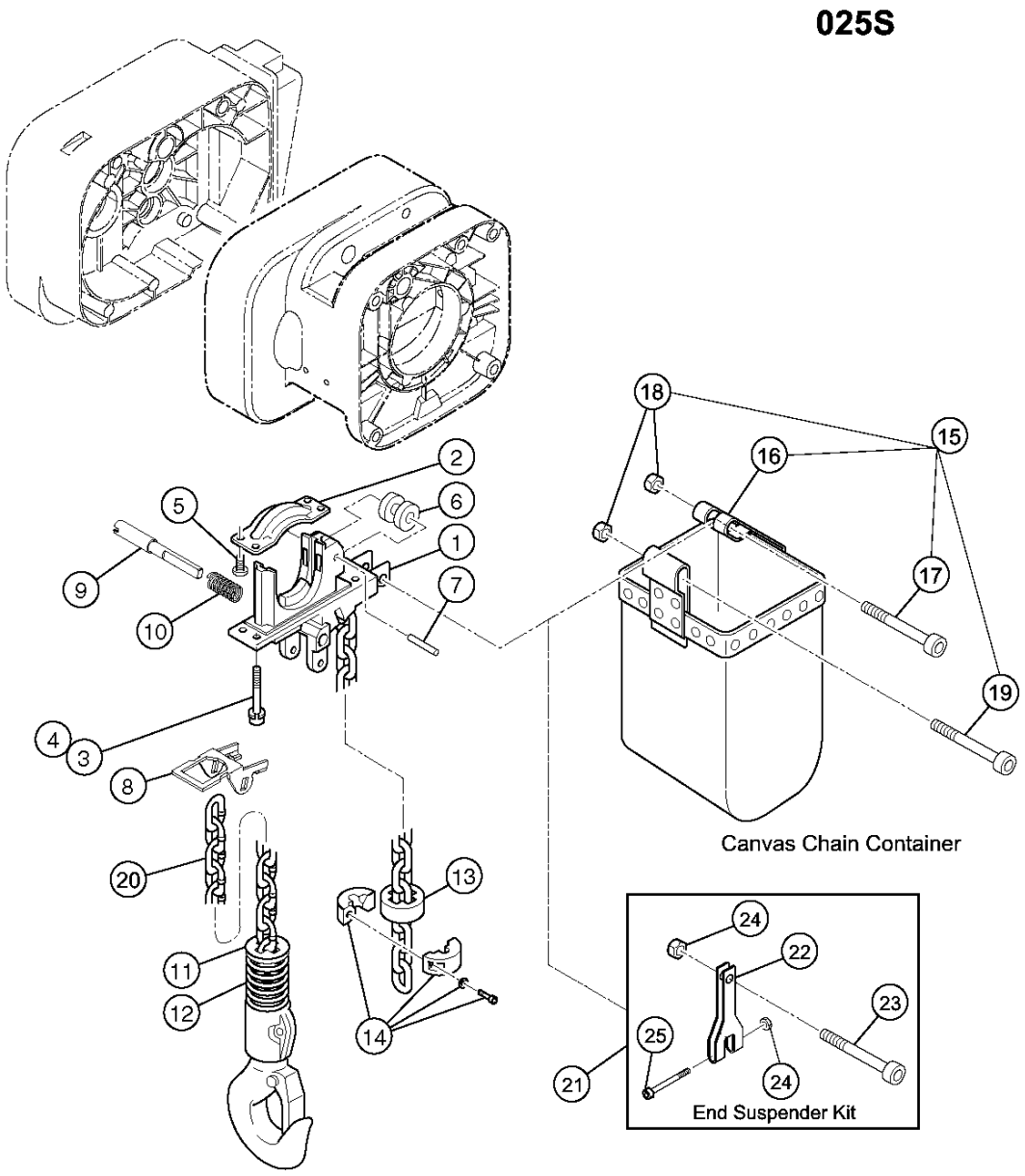


Figure 8.1.3.5 Hook and Chain Parts

8.1.3.5 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist
1	Chain Guide A	1
2	Chain Guide B	1
3	Socket Bolt	4
4	Spring Lock Washer	4
5	Machine Screw With Spring Washer	4
6	Guide Roller	1
7	Roller Pin	1
8	Limit Lever	1
9	Limit Lever Pin	1
10	Limit Lever Spring	1
11	Limiting Plate	1
12	Chain Spring	1
13	Cushion Rubber	1
14	Stopper Assembly	1
15	Canvas Chain Container Assembly (Max. Lifting Height 40ft)	1
16	Canvas Chain Container	1
17	Socket Bolt	1
18	Lever Nut	2
19	Socket Bolt	1
20	NP Load Chain	1
21	End Suspender Kit	1
22	End Suspender	1
23	Socket Bolt	1
24	Lever Nut	2
25	Socket Bolt	1

8.1.3.6 Hook and Chain Parts

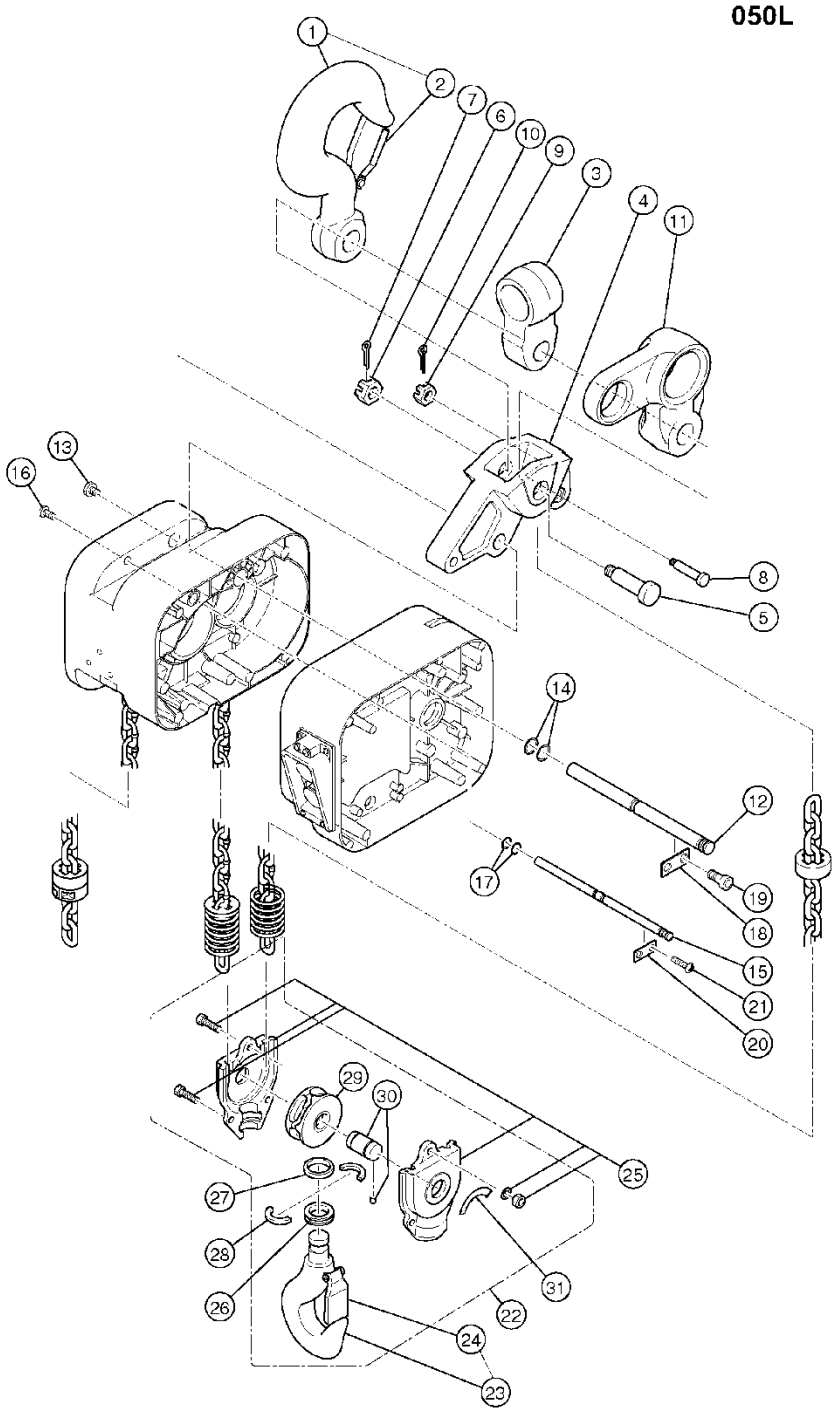


Figure 8.1.3.6 Hook and Chain Parts

8.1.3.6 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist
1	Top Hook Assembly	1
2	Hook Latch	1
3	Suspender G (For Manual Trolley)	1
4	Connection Yoke D	1
5	Yoke Bolt	1
6	Slotted Nut	1
7	Split Pin	1
8	Chain Pin	1
9	Slotted Nut	1
10	Split Pin	1
11	Suspender T (For Motorized Trolley)	1
12	Top Pin Assembly	1
13	Top Pin Plug Assembly	1
14	O Ring	2
15	Fixing Shaft Assembly	1
16	Fixing Shaft Plug Assembly	1
17	O Ring	2
18	Plate A	1
19	Socket Bolt With Spring Washer	2
20	Plate A	1
21	Machine Screw With Spring Washer	2
22	Bottom Hook Complete Assembly	1
23	Bottom Hook Assembly	1
24	Hook Latch	1
25	Bottom Yoke Assembly	1
26	Thrust Bearing	1
27	Thrust Collar A	1
28	Hook Stopper A	2
29	Idle Sheave Assembly	1
30	Bottom Shaft Assembly	1
31	Name Plate C	1

8.1.3.7 Hook and Chain Parts

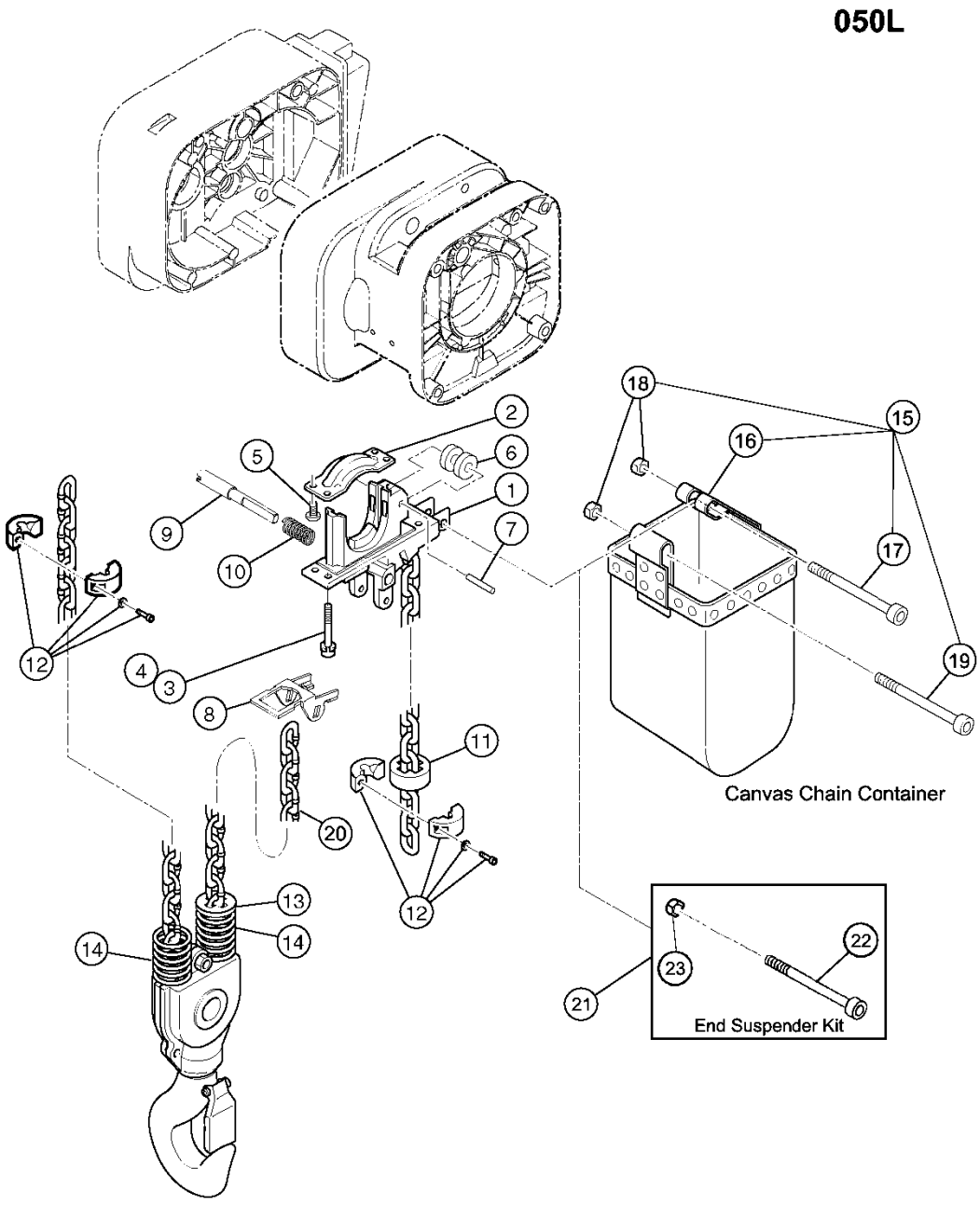


Figure 8.1.3.7 Hook and Chain Parts

8.1.3.7 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist
1	Chain Guide A	1
2	Chain Guide B	1
3	Socket Bolt	4
4	Spring Lock Washer	4
5	Machine Screw With Spring Washer	4
6	Guide Roller	1
7	Roller Pin	1
8	Limit Lever	1
9	Limit Lever Pin	1
10	Limit Lever Spring	1
11	Cushion Rubber	1
12	Stopper Assembly	2
13	Limiting Plate	1
14	Chain Spring	2
15	Canvas Chain Container Assembly (Max. Lifting Height 20ft)	1
16	Canvas Chain Container	1
17	Socket Bolt	1
18	Lever Nut	2
19	Socket Bolt	1
20	NP Load Chain	1
21	End Suspender Kit	1
22	Socket Bolt	1
23	Lever Nut	1

8.1.4 Electric Hoist Parts

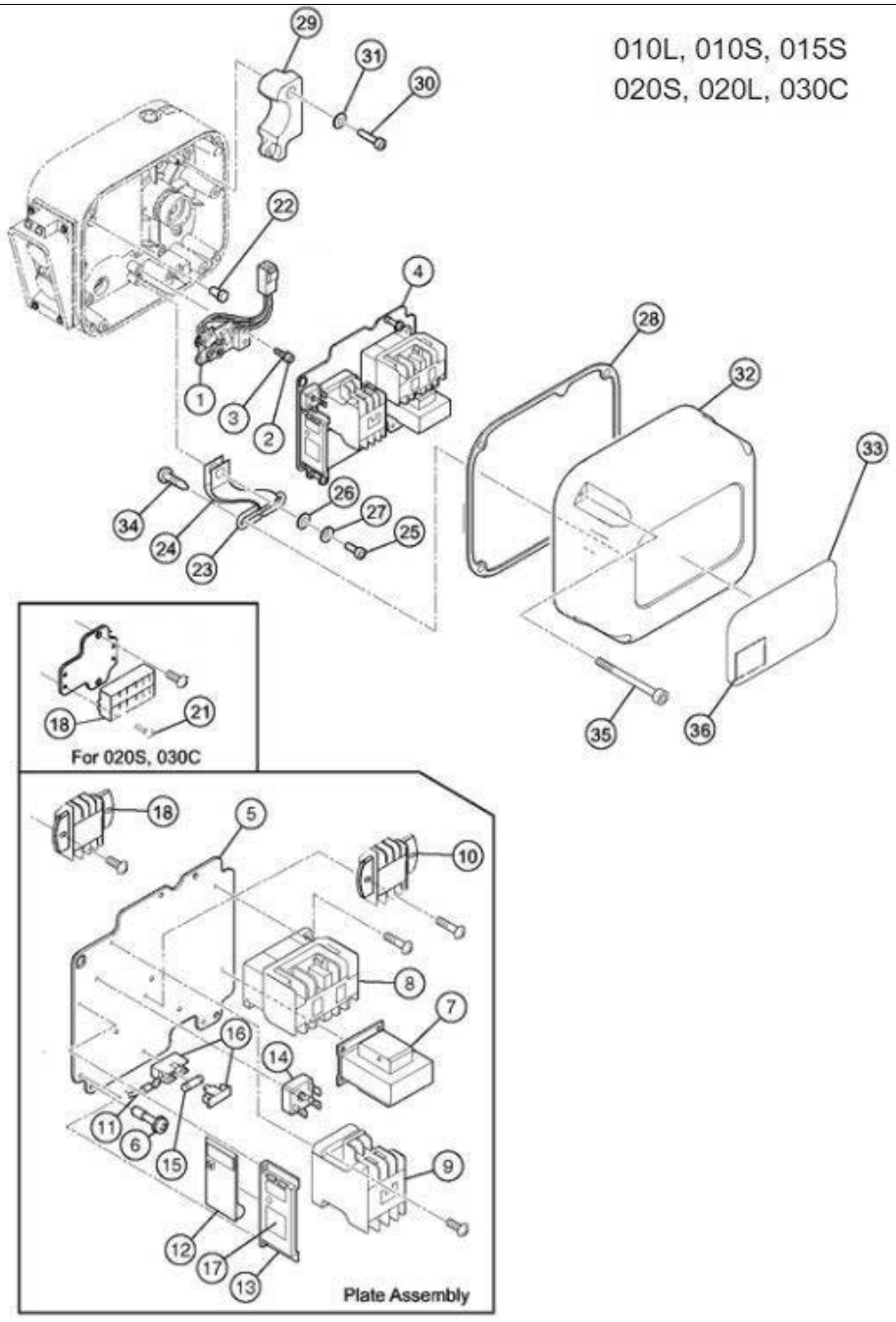


Figure 8.1.4.1 Electric Parts

8.1.4.1 Electric Hoist Parts

Figure No.	Part Name	Parts Per Hoist
1	Limit Switch Complete Assembly	1
2	Socket Bolt	3
3	Spring Lock Washer	3
4	Plate Assembly	1
5	Plate	1
6	Plate Screw	3
7	Transformer	1
8	Electromagnetic Contactor	1
9	E-Stop Contactor**	1
10	Terminal Block 3P	1
	Terminal Block 9P	
11	Lead Wire	1
12	CH Meter	1
13	CH Meter Support	1
14	Rectifier	1
15	Fuse	1
16	Fuse Holder	1
17	Name Plate CH	1
18	Terminal Block 6P	1
21	Machine Screw	2
NS	DW Control Harness	1
NS	DW Power Supply Harness	1
22	Fulcrum Pin	1
23	Cover Suspender	1
24	Cover Belt	1
25	Socket Bolt	1
26	Plain Washer	1
27	Spring Lock Washer	1
28	Packing C	1
29	Balancer	1
30	Socket Bolt	2
		3
31	Spring Lock Washer	2
		3
32	Controller Cover	1
33	Name Plate B	1
34	Pan Head Mach. Screw	2
35	Socket Bolt With Spring Washer	4
36	Name Plate D	1
NS	CII/D2 Nameplate Sticker	1

**Refer to the alpha-numeric code on contactor. The code “S-U12” corresponds to MGD13306F. The code “S-N11” corresponds to MGC13306H. The code “CLK-25J3” corresponds to MGC14306C.

8.1.4.2 Electric Hoist Parts

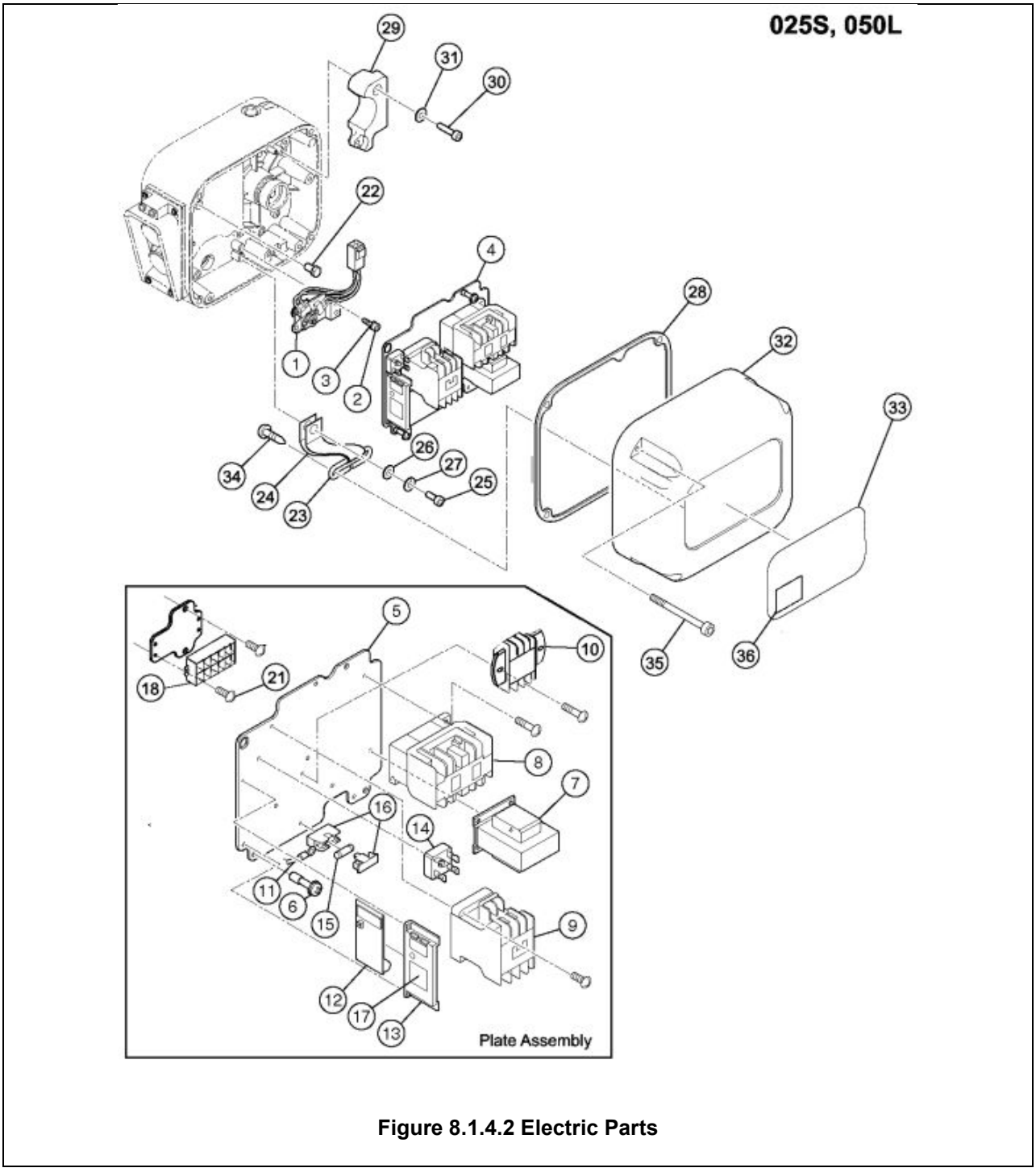


Figure 8.1.4.2 Electric Parts

8.1.4.2 Electric Hoist Parts

Figure No.	Part Name	Parts Per Hoist
1	Limit Switch Complete Assembly	1
2	Socket Bolt	3
3	Spring Lock Washer	3
4	Plate Assembly	1
5	Plate	1
6	Plate Screw	3
7	Transformer	1
8	Electromagnetic Contactor	1
9	E-Stop Contactor*	1
10	Terminal Block 3P	1
11	Lead Wire	1
12	CH Meter	1
13	CH Meter Support	1
14	Rectifier	1
15	Fuse	1
16	Fuse Holder	1
17	Name Plate CH	1
18	Terminal Block 6P	1
21	Machine Screw	2
39	DW Control Harness	1
40	DW Power Supply Harness	1
22	Fulcrum Pin	1
23	Cover Suspender	1
24	Cover Belt	1
25	Socket Bolt	1
26	Plain Washer	1
27	Spring Lock Washer	1
28	Packing C	1
29	Balancer	1
30	Socket Bolt	3
31	Spring Lock Washer	3
32	Controller Cover	1
33	Name Plate B	1
34	Pan Head Mach. Screw	2
35	Socket Bolt With Spring Washer	4
36	Name Plate D	1
NS	CII/D2 Nameplate Sticker	1

*Refer to the alpha-numeric code on contactor. The code “S-N11” corresponds to MGC13306H. The code “CLK-25J3” corresponds to MGC14306C.

8.1.5 Power Supply and Pendant Parts

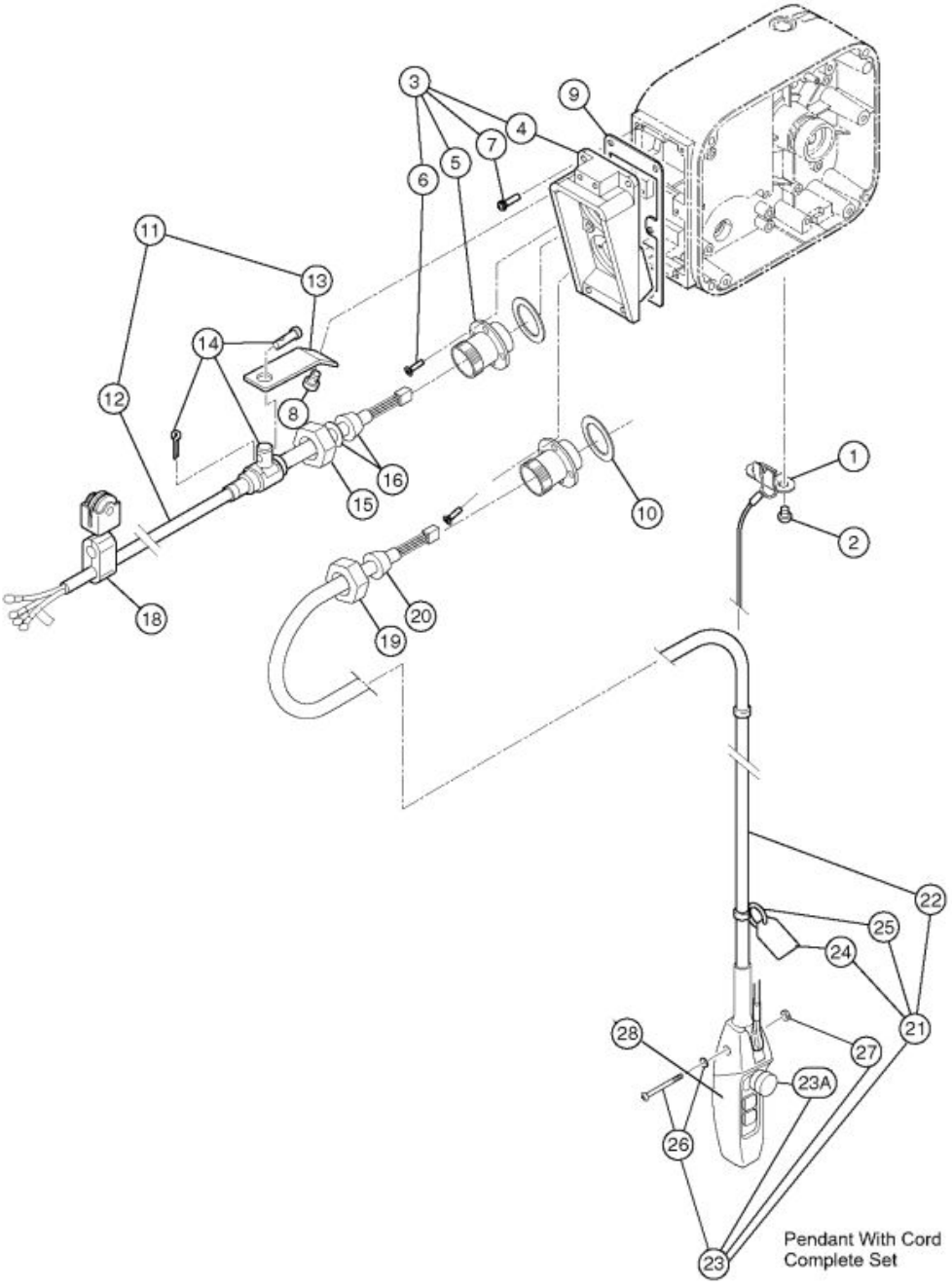


Figure 8.1.5 Power Supply and Pendant Parts

8.1.5 Power Supply and Pendant Parts

Figure No.	Part Name	Parts Per Hoist
1	Cord Support (Wire Stop)	1
2	Mach. Screw W/Spring Washer	2
3	Socket Frame Complete Assembly	1
4	Socket Frame	1
5	Holder C	2
6	Tapping Mach. Screw	8
7	Mach. Screw W/Spring Washer	6
8	Mach. Screw W/Spring Washer	2
9	Socket Frame Packing	1
10	Holder Packing	2
11	Power Supply Cable 4C Assembly	1
12	Power Supply Cable 4C	ft
13	Cable Support Arm	1
14	Cable Sup. 12 Assembly	1
	Cable Sup. 14 Assembly	
15	Holder A	1
16	Cable Packing	1
18	Cable Hanger 14 Assembly	A/R
19	Holder A	1
20	Cable Packing	1
21	Pendant w/Cord 4C Complete Assembly	1
22	Pendant Cord	ft
23	Pendant Assembly	1
23A	E-Stop Pendant	1
24	Warning Tag PB	1
25	Tag Holder	1
26	Machine Screw w/Spring Washer	1
27	Nut	1
28	CII/D2 Pendant Sticker	1

Note: A/R = As required, one every 5 ft. of Power Supply Cable.
Note: XXX = Custom Length

• 8.2 RMR2 Motorized Trolley Parts List

RMR2 Series Nameplate

The parts list is arranged into the following sections:

Sections **Page**

8.2.1 Electric Parts – 1 to 5 Ton (Single Speed)

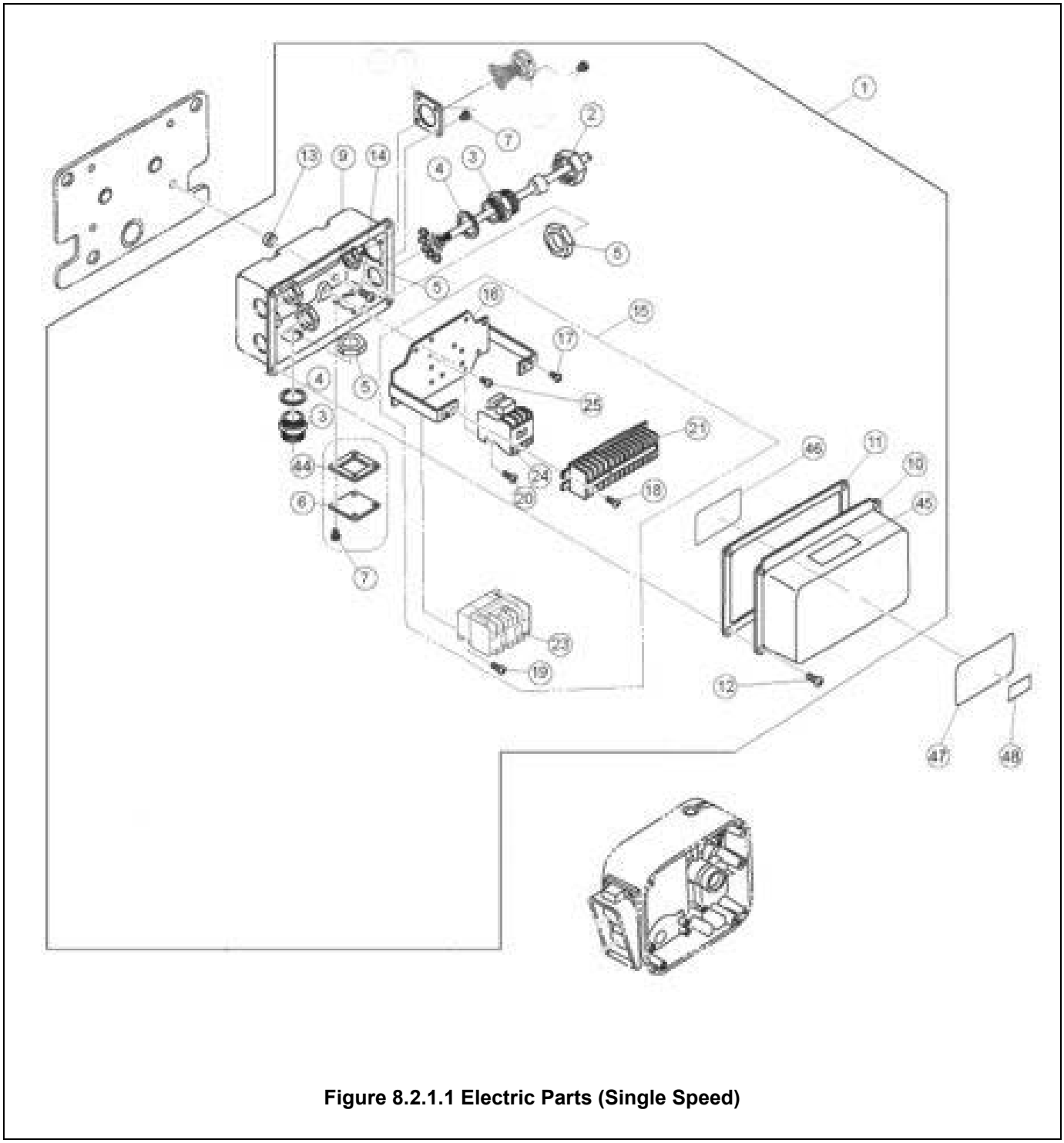


Figure 8.2.1.1 Electric Parts (Single Speed)

8.2.1.1 Electric Parts– 1 to 5 Ton (Single Speed)

Figure No.	Part Name	Parts Per Trolley
1	Connection Box Assembly	1
2	Holder A	1
3	Holder B	2
4	Packing	2
5	Holder Nut	2
6	Cord Cover	1
7	Machine Screw With Spring Washer	8
9	Connection Box	1
10	Connection Box Cover	1
11	Connection Box Packing	1
12	Machine Screw With Spring Washer	4
13	Spacer	4
14	Machine Screw With Spring Washer	4
15	Complete Plate Assembly	1
16	Plate	1
17	Machine Screw With Spring Washer	3
18	Machine Screw	2
	Spring Washer	2
	Flat Washer	2
19	Machine Screw	2
	Spring Washer	2
20	Machine Screw	2
	Spring Washer	2
21	Terminal 16P	1
23	Electromagnetic Contactor	1
24	E-Stop Contactor	1
25	Machine Screw With Spring Washer	4
	Toothed Lock Washer	4
45	Warning Seal E (Electric Shock)	1
46	Wiring Diagram	1
47	Name Plate B	1
48	Name Plate C	1
49	CII/D2 Trolley Nameplate Sticker	1

Name Plates for 1 1/2 & 2 1/2 Ton Capacities

Figure No.	Part Name	Parts Per Trolley
48	Name Plate C	1

8.2.1.2 Electric Parts – 1 to 5 Ton (Direct Connection)

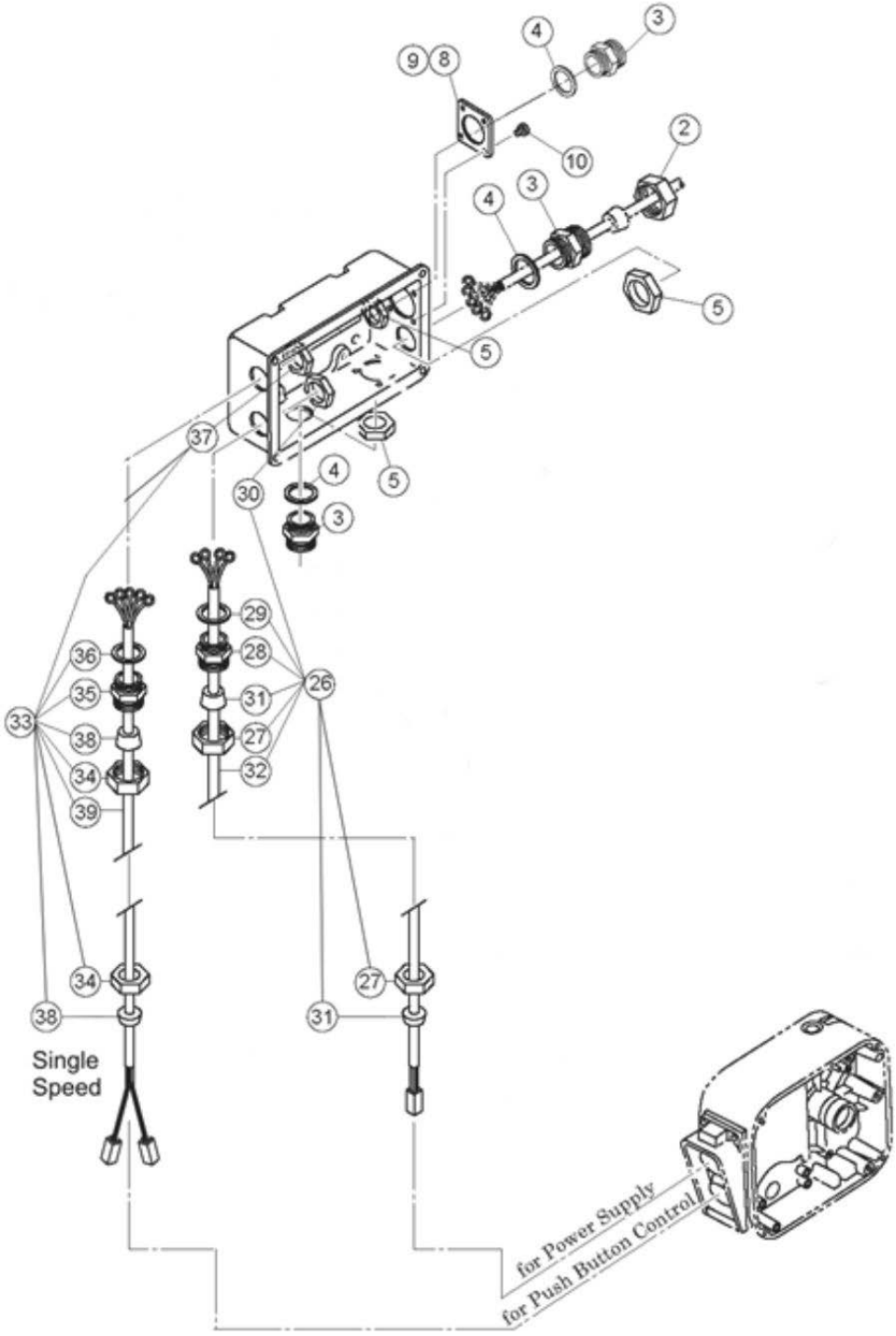


Figure 8.2.2 Electric Parts (Direct Connection)

8.2.1.2 Electric Parts– 1 to 5 Ton (Direct Connection)

Figure No.	Part Name	Parts Per Trolley
2	Holder A	1
3	Holder B	3
4	Packing	3
5	Holder Nut	3
8	Plate D	1
9	Cord Cover Packing	2
10	Machine Screw With Spring Washer	4
26	Power Supply Cable Assembly	1
27	Holder A	2
28	Holder B	1
29	Packing	1
30	Holder Nut	1
31	Cable Packing	2
32	S.O. Cord 4C	1
33	Control Cable Assembly	1
34	Holder A	2
35	Holder B	1
36	Packing	1
37	Holder Nut	1
38	Cable Packing	2
39	S.O. Cord 6C	1

8.2.2 Pendant Parts – 1 to 5 Ton

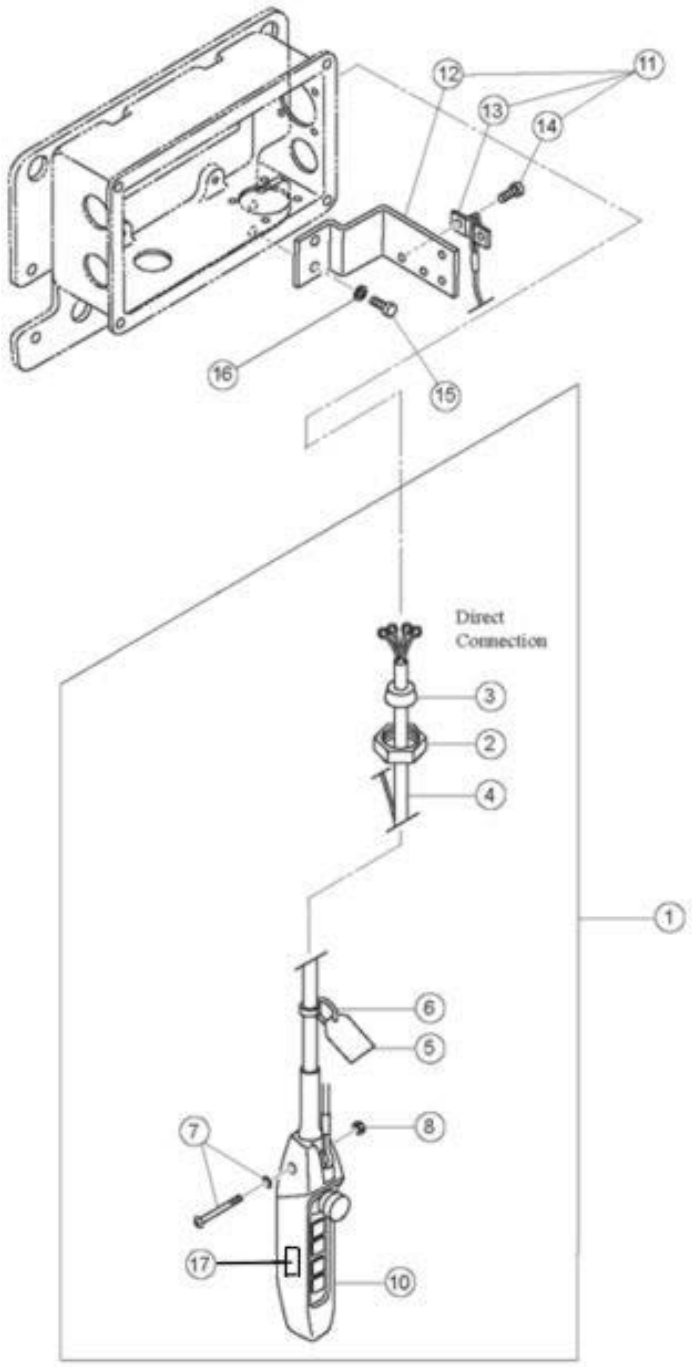


Figure 8.2.2 Pendant Parts (Direct Connection)

8.2.2 Pendant Parts – 1 to 5 Ton

Figure No.	Part Name	Parts Per Trolley
1	Push Button Cord 6C Complete Assembly	1
2	Holder A	1
3	Cable Packing	1
4	Push Button Cord 6C	1
5	Warning Tag PB	1
6	Tag Holder	1
7	Machine Screw With Spring Washer	1
8	Nut	1
10	4 Push Button Switch Assembly	1
17	C2D2 Sticker	1
11	Bar Holder Assembly	1
12	Bar Holder	1
13	Cord Strain Relief Stopper	1
14	Machine Screw With Spring Washer	2
15	Socket Bolt	2
16	Spring Washer	2

Note: XXX = Custom Length

8.2.3 Power Supply Parts – 1 to 5 Ton

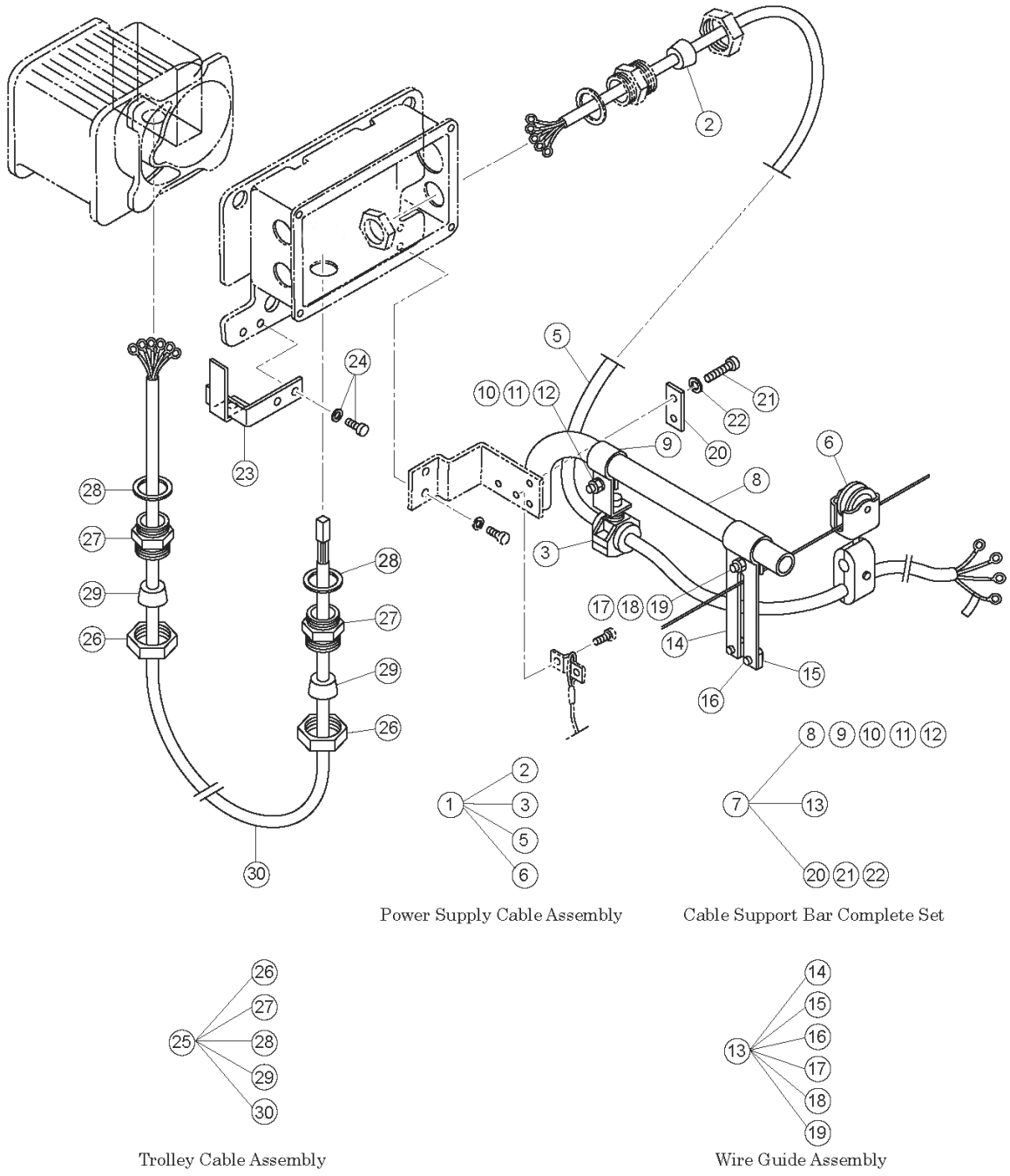


Figure 8.2.3 Power Supply Parts

8.2.3 Power Supply Parts – 1 to 5 Ton

Figure No.	Part Name	Parts Per Trolley
1	Power Supply Cable 4C Assembly	1
2	Cable Packing	1
3	Cable Support 14 Assembly	1
5	Power Supply Cable 4C	1
6	Cable Hanger 14 Assembly	A/R
7	Cable Support Bar Assembly	1
8	Cable Support Bar	1
9	Cable Support Arm	1
10	Bolt	1
11	Spring Lock Washer	1
12	Nut	1
13	Wire Guide Assembly	1
14	Wire Guide	1
15	Wire Stopper	1
16	Machine Screw With Spring Washer	2
17	Bolt	1
18	Spring Lock Washer	1
19	Nut	1
20	Support Bar Holder (Plate)	1
21	Bolt	2
22	Spring Lock Washer	2
23	Cable Hanger Pusher (Beam 75mm)	1
	Cable Hanger Pusher (Beam 100-150mm)	1
	Cable Hanger Pusher (Beam 125-175mm)	1
24	Socket Bolt With Spring Washer	2
25	Trolley Cable 6C Assembly	1
26	Holder A	2
27	Holder B	2
28	Packing	2
29	Cable Packing	2
30	Trolley Cable 6C	1

*A/R = As Required, one for every 5 ft of power Supply Cable.

8.2.4 Side Plates and Suspension Parts – 1 to 5 Ton

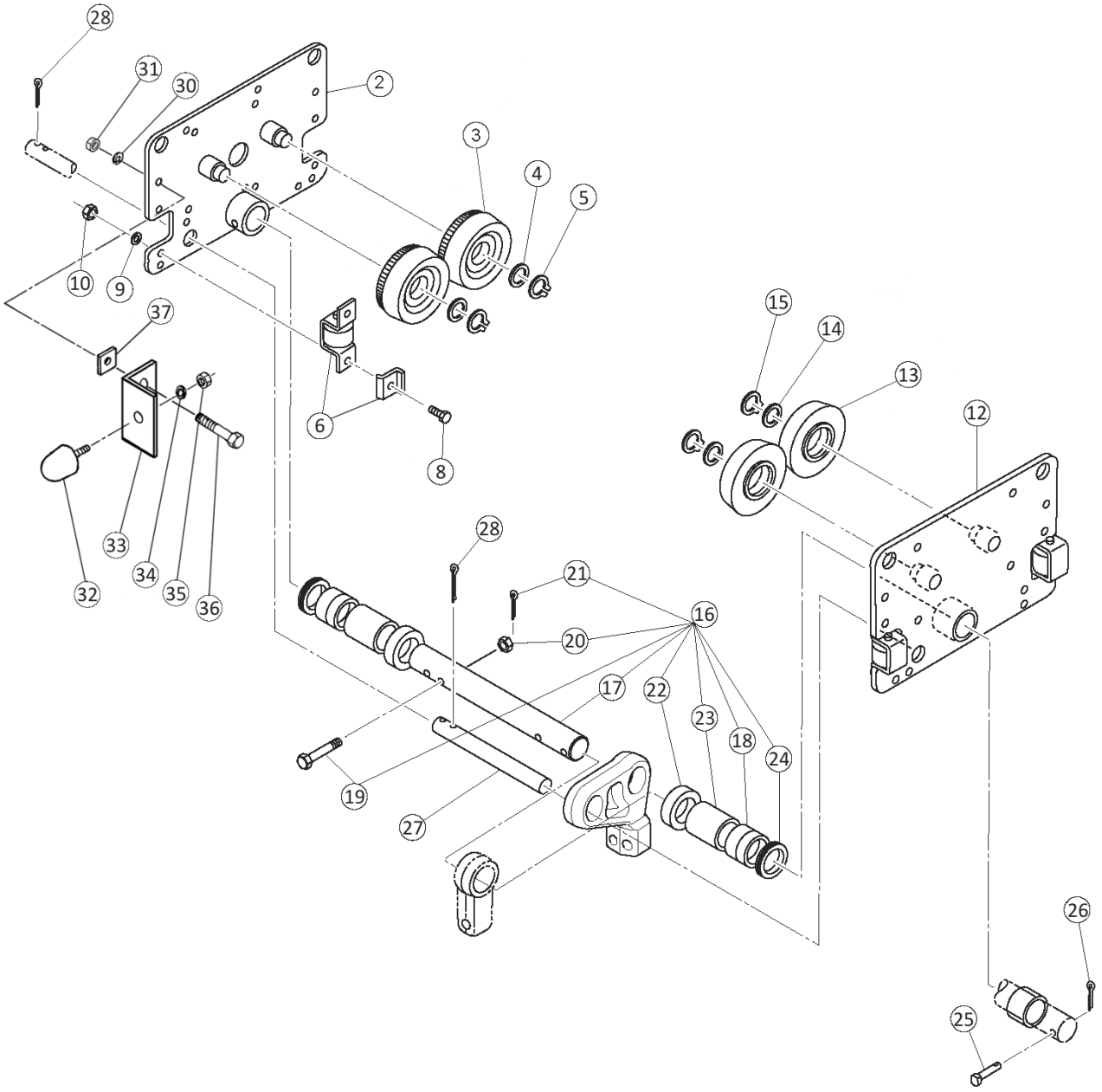


Figure 8.2.4 Side Plates and Suspension Parts

8.2.4 Side Plates and Suspension Parts– 1 to 5 Ton

Figure No.	Part Name	Parts Per Trolley
2	Side Plate G Assembly	1
3	Track Wheel G Assembly	2
4	Washer	2
5	Snap Ring	2
6	Side Roller Assembly	4
8	Bolt	4
9	Spring Lock Washer	4
10	Nut	4
12	Side Plate S Assembly	1
13	Track Wheel S Assembly	2
14	Washer	2
15	Snap Ring	2
16	Suspension Shaft Assembly	1
17	Suspension Shaft	1
18	Thick Spacer	3
19	Bolt	1
20	Slotted Nut	1
21	Split Pin	1
22	Thick Spacer L	2
24	Thin Spacer	8
25	Shaft Stopper	1
26	Split Pin	1
27	Fixing Shaft	1
28	Split Pin	2
30	Spring Washer	8
31	Nut	8
32	Bumper	4
33	Bumper Bracket	4
34	Spring Washer	4
35	Nut	4
36	Bolt	8
37	Square Spacer	4

Extended Suspension Shaft Assemblies

Figure No.	Part Name	Parts Per Trolley
16	Suspension Shaft Assembly	1
17	Suspension Shaft	1
18	Thick Spacer	9 (13)
19	Bolt	1
20	Slotted Nut	1
21	Split Pin	1
22	Thick Spacer L	2
23	Fixing Spacer	2
24	Thin Spacer	8
27	Fixing Shaft	1
28	Split Pin	2

*Quantity in parentheses is for 5 Ton Trolley.

8.2.5 Motor Parts – 1 to 5 Ton

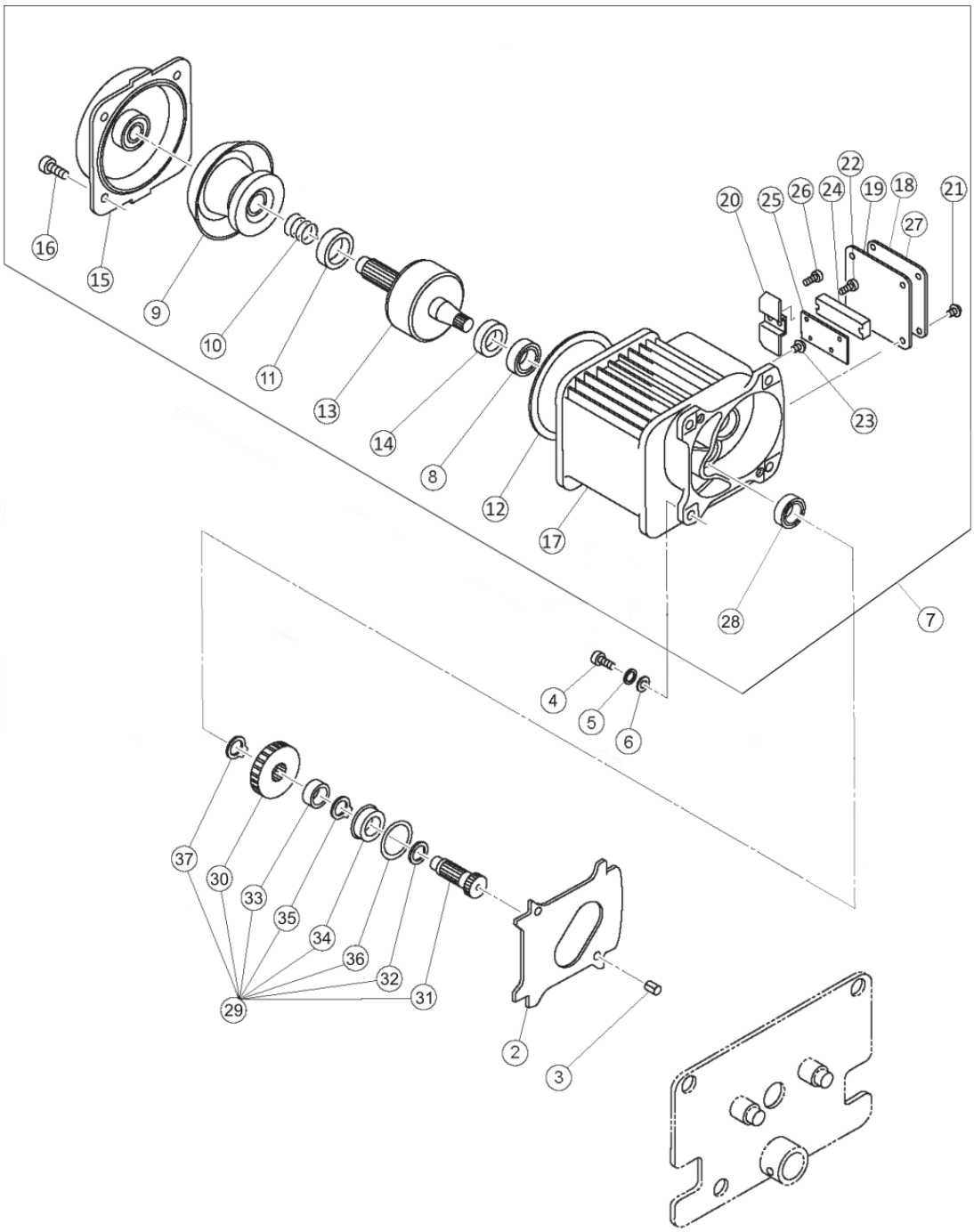


Figure 8.2.5 Motor Parts

8.2.5 Motor Parts – 1 to 5 Ton

Figure No.	Part Name	Parts Per Trolley
2	Gear Box Packing	1
3	Set Pin	2
4	Bolt	4
5	Spring Lock Washer	4
6	Washer	4
7	Motor Assembly	1
8	Ball Bearing	1
9	Brake Drum Assembly (Standard)	1
	Brake Drum Assy (Corrosion Resistant Option)	1
10	Brake Spring	1
11	Bumper	1
12	Guard	1
13	Motor Shaft With Rotor	1
14	Oil Seal	1
15	Motor Cover Assembly	1
16	Socket Bolt	4
17	Motor Frame With Stator	1
18	Terminal Cover	1
19	Terminal Cover Packing	1
20	Coil Cover	1
21	Machine Screw With Spring Washer	4
22	Machine Screw With Spring Washer	2
23	Machine Screw With Spring Washer	1
24	Terminal 6P	1
25	Terminal Plate Holder	1
26	Flat Head Tapping Screw	2
27	Motor Data Plate	1
28	Ball Bearing	1

Figure No.	Part Name	Parts Per Trolley
29	Gear Assembly	1
30	Gear #2	1
31	Gear #3	1
32	O Ring	1
33	Spacer	1
34	Ball Bearing	1
35	Snap Ring	2
36	O Ring	1
37	Snap Ring	1

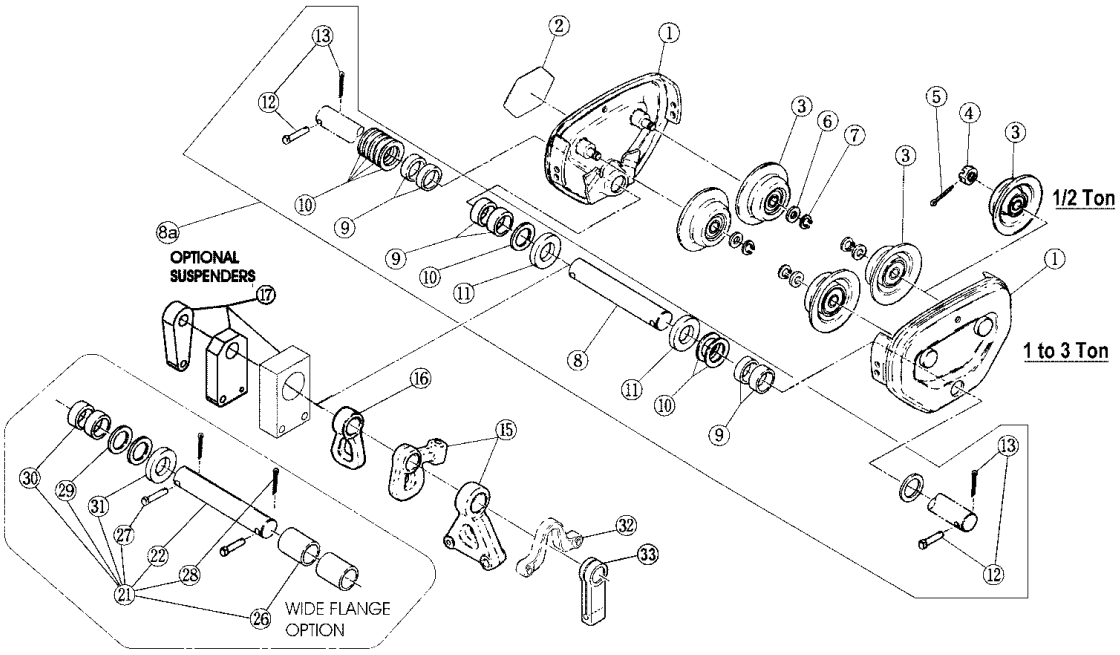
8.3 TS2 Manual Trolley Parts List

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

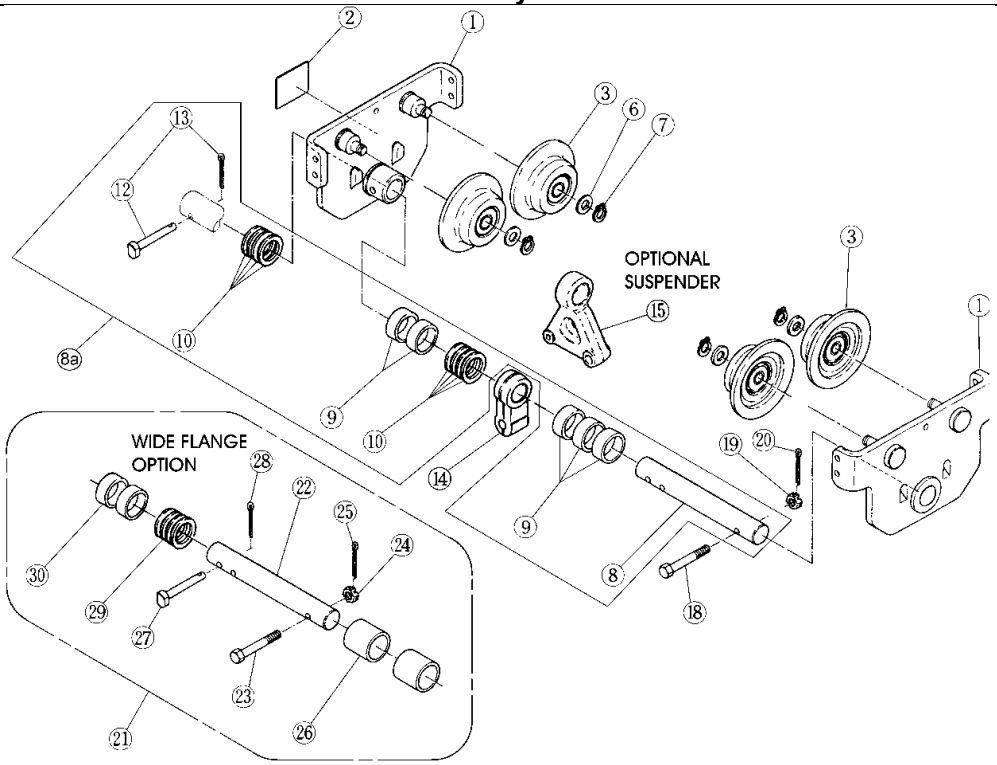
TF2/TS2 Series Nameplate

The parts list is arranged into the following sections:

8.3.1 TS2 Push Trolley Parts – 1/8 to 5 Ton



TS2 Push Trolley 1/2 to 3 Ton



TS2 Push Trolley 5 Ton

Figure 8.3.1

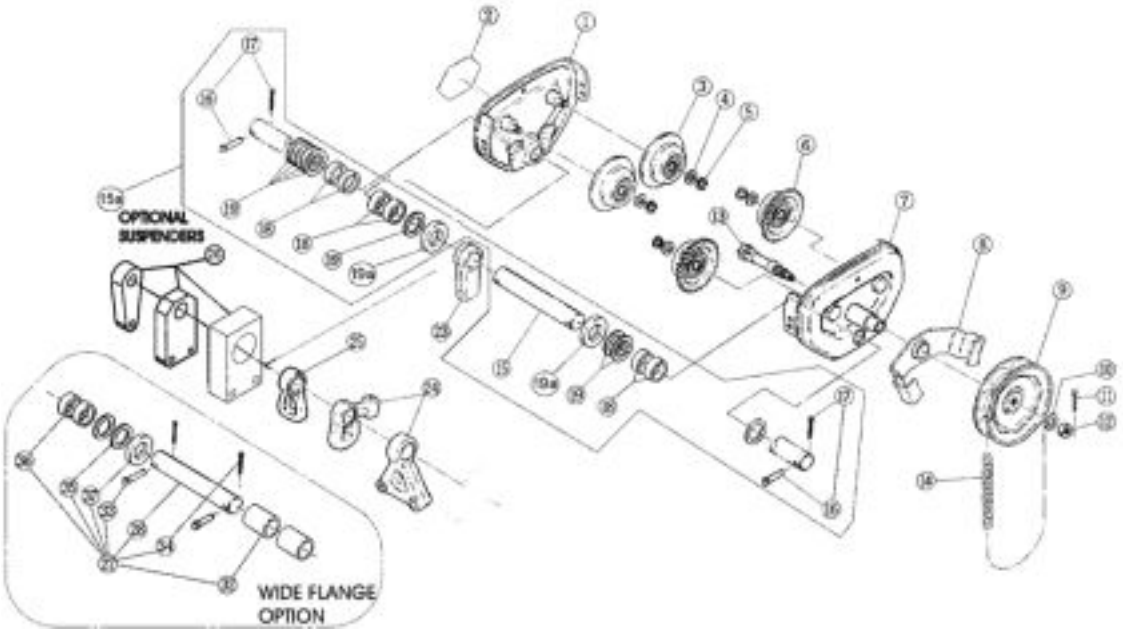
8.3.1 TS2 Push Trolley Parts – 1/8 to 5 Ton

Figure No.	Part Name	Parts Per Trolley
1	Side Plate S Assembly	2
2	Name plate B	1
3	Track wheel S Assembly	4
4	Slotted nut	4
5	Split pin	4
6	Track wheel washer	4
7	Snap ring	4
8a	Suspension shaft assembly Standard	1
8	Suspension shaft	1
9	Thick spacer (qty)	X
10	Thin spacer (qty)	X
11	Thin spacer L (qty)	X
12	Shaft stopper pin	2
13	Split pin	2
14	Suspender E & G	1
15	Suspender C	1
16	Suspender H	1
17	TCR Suspender	1
	TCK/L Suspender	
	TCS/L Suspender	
	AH Suspender	
18	Bolt Assembly	1
19	Split pin	1
20	Slotted nut	1
21	Suspension Shaft Assembly Extended	1
22	Suspension Shaft	1
23	Bolt	1
24	Nut	1
25	Split Pin	1
26	Fixing Spacer	2
27	Shaft Stopper Pin	*2
28	Split Pin	*2
29	Thin Spacer	X
30	Thick Spacer	X
31	Thin Spacer L (qty)	X
32	EQ/SEQ Suspension Bar	1
33	EM/SEM Suspender P	1

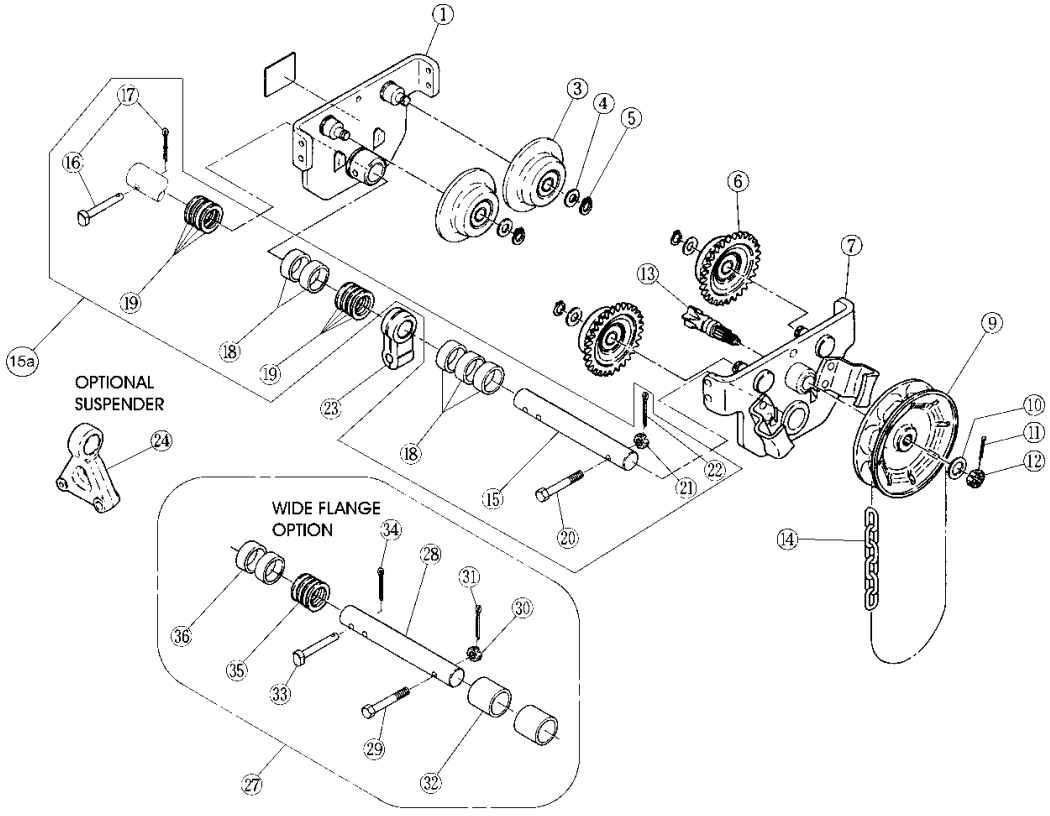
* Quantity is 1 for 5 Ton.

q – These spacers are only provided with EQ/SEQ hoists with suspension bar

8.3.2 TS2 Geared Trolley Parts – 1/8 to 5 Ton



TS2 Geared Trolley 1/2 to 3 Ton



TS2 Geared Trolley 5 Ton

Figure 8.3.2

8.3.2 TS2 Geared Trolley Parts – 1/8 to 5 Ton

Figure No.	Part Name	Parts Per Trolley
1	Sideplate S Assembly	1
2	Name plate B	1
3	Track wheel S Assembly	2
4	Track wheel washer	4
5	Snap ring	4
6	Track wheel G Assembly	2
7	Sideplate G Assembly	1
8	Hand chain guide Assembly	1
9	Hand wheel	1
10	Washer	1
11	Split pin	1
12	Lever nut	1
13	Pinion	1
14	Hand chain	1
15a	Suspension shaft assembly Standard	1
15	Suspension shaft	1
16	Shaft stopper pin	2
17	Split pin	2
18	Thick spacer (qty)	X
19	Thin spacer (qty)	X
19a	Thin Spacer L (qty)	X
20	Bolt Assembly	1
21	Slotted nut	1
22	Split pin	1
23	Suspender E	1
24	Suspender C	1
25	Suspender H	1
26	TCR Suspender	1
	TCK/L Suspender	
	TCS/L Suspender	
	AH Suspender	
27	Suspension Shaft Assembly Extended	1
28	Suspension Shaft	1
29	Bolt	1
30	Nut	1
31	Split Pin	1
32	Fixing Spacer	2
33	Shaft Stopper pin	2
34	Split Pin	2
35	Thin Spacer	X
36	Thick Spacer	X
37	Thin Spacer L (qty)	X

*See owner's manual for placement of thick and thin spacers.
**These parts come with the hoist and are not included with the trolley

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9.0 Warranty

Buyer must notify HHI in writing within sixty (60) days of discovery of any alleged defect, if within the applicable warranty period.

All products sold by HHI are warranted to be free from defects in material and workmanship from date of shipment by HHI for the following periods:

1 year – Electric and Air Powered Hoists (excluding (N)ER2 Hoists and EQ/SEQ Hoists), Powered Trolleys, Powered Tiger Track Jibs and Gantries, Crane Components, Below the Hook Devices, Spare / Replacement Parts

2 years – Manual Hoists & Trolleys, Beam Clamps

3 years – (N)ER2 Hoists, EQ/SEQ Hoists, (T)EM/(T)SEM hoists, and RY Hoists

5 years – Manual Tiger Track Jibs and Gantries, Hoist Motor Brakes for EQ/SEQ, (T)EM/(T)SEM, and RY

10 years – (N)ER2 Brake, TNER Hoist Motor Brake, Tiger Track Workstation Cranes and Monorails

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 HHI's inspection of the product, HHI agrees, at its discretion, either to replace (not including installation) or repair the part or product free of charge. For customers in the U.S., delivery shall be made F.O.B. HHI's place of business. For international customers, delivery shall be made FCA HHI place of business, United States of America (Incoterms 2010).

No warranty claim will be honored without a valid proof of purchase. Customer must obtain a Return Goods Authorization as directed by HHI or its 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 HHI's warranty, the customer will be responsible for the costs of returning the product.

HHI DISCLAIMS ANY AND ALL OTHER WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, AS TO THE PRODUCT'S MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HHI 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 MISUSE OF THE PRODUCTS, REGARDLESS OF WHETHER THE DAMAGE, LOSS OR EXPENSE RESULTS FROM ANY ACT OR FAILURE TO ACT BY HHI, WHETHER NEGLIGENT OR WILLFUL, OR FROM ANY OTHER CAUSE.

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