
OWNER'S MANUAL SUPPLEMENT

ELECTRIC CHAIN HOIST NER2 / MR2 / TS2 FOOD GRADE MODEL

1/4 Ton through 2 Ton Capacities

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.



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IMPORTANT INFORMATION ON HOW TO USE THIS MANUAL

This OWNER'S MANUAL SUPPLEMENT for Food Grade Hoists is intended for use *in combination* with:

"Owner's Manual for Electric Chain Hoist ER2 and NER2 Series 1/8 through 5 Ton Capacity"

"Owner's Manual for Motorized Trolley MR2 Series 1 Ton through 20 Ton Capacity"

"Owner's Manual for Manual Trolley TS2/TF2 Series ½ Ton through 5 Ton Capacity"

Refer to the Main Table of Contents below to determine the location(s) of information pertaining to your hoist. References to the Owner's Manuals listed above will be designated by the use of the acronym "ER2OM", "MR2OM", "TF2TS2OM".

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I Conformance Clarification Statement

1.1 Food Grade Options

NOTICE

Harrington ER2 Food Grade hoists are designed for applications which require food grade hoists. All products should be tested for suitability on a particular application prior to actual use. The occupational Safety and Health Act of 1970 places the burden of compliance with the owner/employer, not the manufacturer. Many OSHA requirements are not concerned or connected with the manufactured product but are associated with the final installation. It is the owner's and user's responsibility to determine the suitability of a product for any particular use. It is recommended that all applicable industry, trade association, federal, state and local regulations be checked. Read all operating instructions and warnings before operation.

1.2 Corrosion Resistance:

Standard Product Features and Benefits

- Nickel plated load chain
- The formulation of NEVASTANE HT/AW WHITE greases complies with the FDA chapter 21 CFR, 178.3570.
- The formulation of NEVASTANE SL oils complies with the FDA chapter 21 CFR, 178.3570.
- White epoxy painted hoist body, hooks, and suspenders
- ASME H4 classification
- Stainless steel and nickel plated components

Optional Product Features and Benefits

- Nickel Diffused Load Chain
- Stainless Steel Trolley Wheels
- Nickel Plated shafts and suspenders
- NEMA 4 pendant
- Pendant Cover
- Stainless Steel bottom hook
- Stainless Steel chain spring and limiting plate
- Stainless Steel chain container

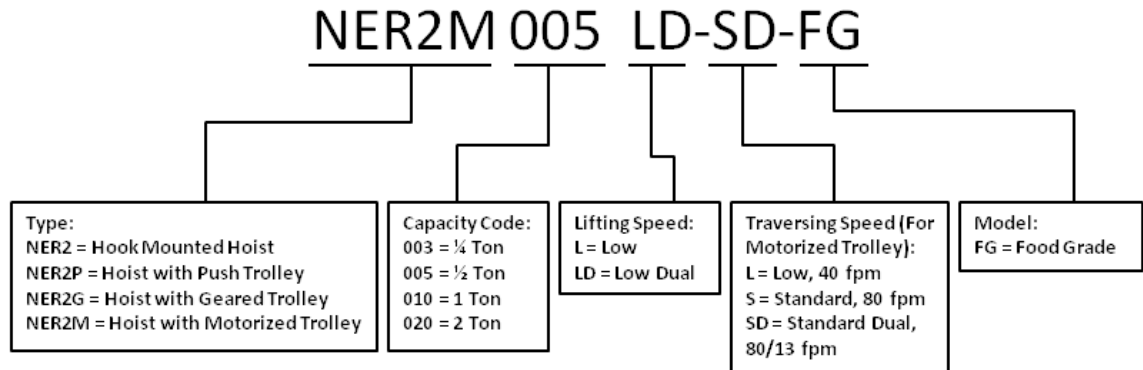
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2.1 Specifications

2.1.1 Product Code



2.1.2 Operating Conditions and Environment

Temperature range: -4° to +104°F (-20° to +40°C)
 Humidity: 85% or less
 Noise Level: 85 dB or less (A scale: measured 1 meter away from electric chain hoist)
 Enclosure Rating: Hoist Meets IP 55
 Supply Voltage: Single Speed Standard: Reconnectable 208/230-3-60 & 460V-3-60
 Dual Speed Standard: 208/230V-3-60 or 460V-3-60

	Single Speed	Dual Speed
Hoist Duty Rating:	ISO M4/M5; ASME H4	
Intermittent Duty Rating:	60% ED 360 starts per hour	40/20% ED 120/240 starts per hour
Short Time Duty Rating:	60 min.	30/10 min.

	Table 2-1 Hoist Specifications										
	Cap. (Tons)	Product Code	Standard Lift (ft)	Push Button Cord L (ft)	Lifting Speed (ft/min)	Lifting Motor 3 Phase 60 Hz			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			
Single Speed	1/4	NER2003L-FG	10	8.2	15	0.75	3.4	1.7	6.0 x 1	71	0.54
	1/2	NER2005L-FG									
	1	NER2010L-FG			14	1.2	4.8	2.5	7.7 x 1	104	0.89
	2	NER2020L-FG									
Dual Speed	1/4	NER2003LD-FG			15/2.5	0.75	3.6	1.8	6.0 x 1	68	0.54
	1/2	NER2005LD-FG									
	1	NER2010LD-FG			14/2.5	1.2	5.1	2.7	7.7 x 1	99	0.89
	2	NER2020LD-FG									

2.2 Dimensions

Table 2-2 Hoist Dimensions

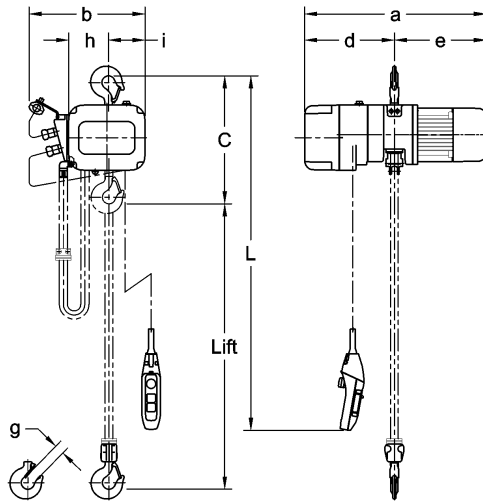


Figure 2-1 Single Speed Hoist Dimensions

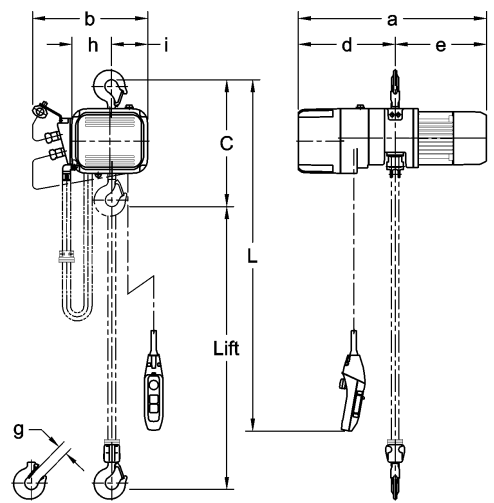
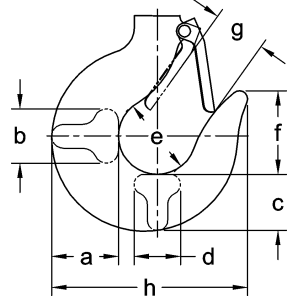


Figure 2-2 Dual Speed Hoist Dimensions

	Capacity (Tons)	Product Code	Headroom C (in)	Headroom w/Stainless Hook C (in)	a (in)	b (in)	d (in)	e (in)	g (in)	g w/Stainless Hook (in)	h (in)	i (in)
Single Speed	1/4	NER2003L-FG	14.6	17.7	20.2	13.7	9.5	10.6	1.1	1.2	4.4	4.2
	1/2	NER2005L-FG										
	1	NER2010L-FG	16.9	21.2	23.2	14.8	11.4	11.7	1.2	1.5	5.1	4.6
	2	NER2020L-FG	22.6	23.4	25.4	16.8	12.1	13.3	1.6	1.7	6.3	5.4
Dual Speed	1/4	NER2003LD-FG	14.6	17.7	22.4	13.7	11.8	10.6	1.1	1.2	4.4	4.2
	1/2	NER2005LD-FG										
	1	NER2010LD-FG	16.9	21.3	24.1	14.8	12.4	11.7	1.2	1.5	5.1	4.6
	2	NER2020LD-FG	22.6	23.4	27.9	16.8	14.6	13.3	1.6	1.7	6.3	5.4

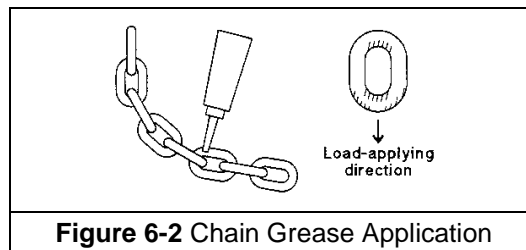
Table 2-3 Hook Dimensions

 <p>T = Top Hook B = Bottom Hook</p>	Capacity Code	Hook	a (in)	b (in)	c (in)	d (in)	e (in)	f (in)	g (in)	h (in)
	003L, 005L, 003LD, 005LD	Stainless Bottom	1.5	0.9	1.2	0.9	1.7	1.8	1.2	4.3
		Epoxy Painted Top & Bottom	1.1	0.7	0.9	0.7	1.4	1.5	1.1	3.7
	010L, 010LD	Stainless Bottom	1.9	1.1	1.6	1.1	2.0	2.2	1.5	5.4
		Epoxy Painted Top & Bottom	1.5	0.9	1.2	0.9	1.7	1.8	1.2	4.3
	020L, 020LD	Stainless Bottom	2.2	1.4	1.9	1.4	2.4	2.5	1.7	6.3
		Epoxy Painted Top & Bottom	2.0	1.3	1.7	1.3	2.1	2.2	1.5	5.7

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 only Harrington Hoist, Inc. food grade lubricant (Part No. 2AFG003S1951) to the bearing surfaces of the load chain links as indicated by the shaded areas in Figure 6-2. Also apply the lubricant to the areas of the load chain (shaded areas in Figure 6-2) that contact the load sheave. Ensure that the lubricant is applied to the contact areas in the load sheave pockets.



- The load chain should be lubricated every 3 months (more frequently for heavier usage or severe conditions).

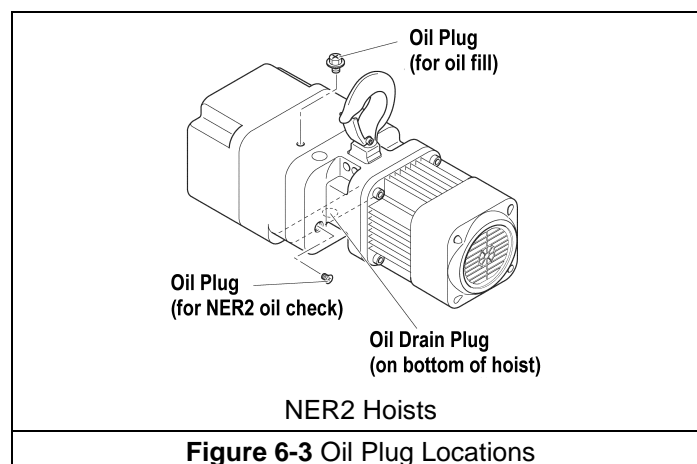
6.2.2 Hooks and Suspension Components

- Hooks – Bearings should be cleaned and lubricated at least once per year for normal usage. Use only Nevastane HT/AW 2 White Drum food grade lubricating grease. 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

6.3.2 **DETERMINING OIL LIFE** - Refer to Section 6.1.3 in the ER2OM when estimating gear oil life based on operations.

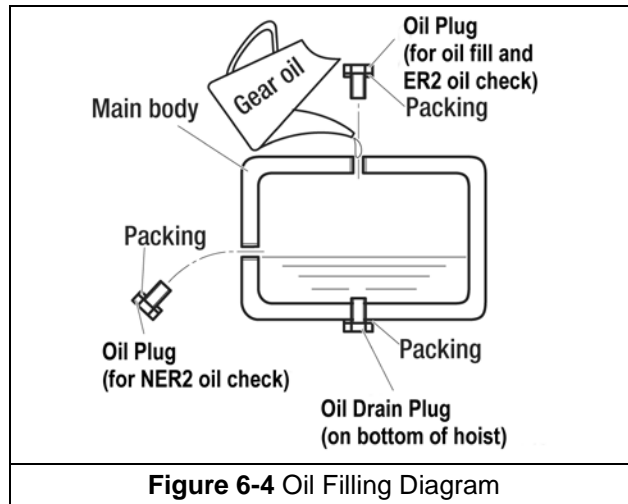
6.3.3 **NER2 OIL LEVEL** – The oil level is checked by removing the oil plug on the side of the hoist as shown in Figure 6-3 for NER2 hoists. The oil level should be just below the hole when the hoist is level.



6.3.5 **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.



- 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 6-6. Refer to Figure 6-4.

Table 6-6 Amount of Gear Oil		
Capacity Code	Quarts	Liters
	NER2	NER2
003L/005L	0.57	0.54
010L	0.66	0.62
020L	1.37	1.30

- **⚠ 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. Only lubricants with NSF H1 compliance may be used in food grade hoists. Refer to the following for the correct type of gearbox oil:

NER Gear Oil:

- Harrington standard: Nevastane SL 320 (Total Lubricants)

6.5 Load Chain

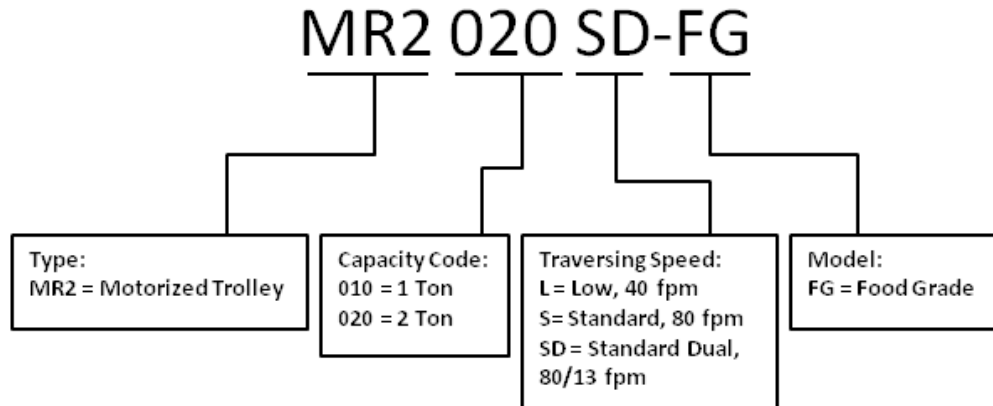
- 6.5.2 After chaining a unit, be sure to clean any exposed portions of bottom yoke bolts that have been treated with thread locking compound. Conduct a thorough inspection of these bolts after torquing to ensure there is no excess thread locking compound on the exposed portions. Failure to do so could affect the hoist's compliance with the application's food grade requirements.

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2.0 Specifications

2.1.1 Product Code for MR2 Trolley Alone:



2.1.2 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 the electric chain hoist)

Enclosure Rating: Trolley Meets IP55, Pendant Meets IP 65

Supply Voltage: Standard 208-230/460V-3-60, Optional 575V-3-60, Special Voltages Available

Intermittent Duty Rating: Single Speed – 40% ED 240 starts per hour
Dual Speed – 27/13% ED with 78/162 starts per hour

Trolley Duty Rating: ISO M4/5; ASME H4

Table 2-1 Trolley Specifications

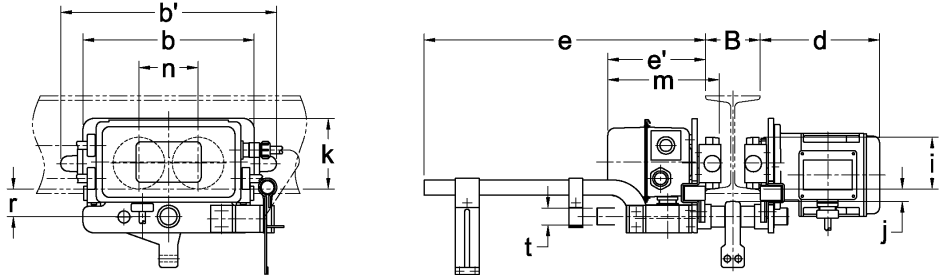
	Table 2-1 Trolley Specifications								
	Capacity (Ton)	Product Code	Standard Beam Flange Range (in)	Optional Beam Flange Range (in)	Min. Allowable Radius for Curve (in)	Motor***			Approx. Net Weight (lbs)
						Output (Hp)	Current Draw (amps)		
							208V or 230V	460V	
Single Speed	1	MR2010L/S-FG	2.28 to 5.00	5.01 to 6.02 <u>OR</u> 6.03 to 12.00	31.5*	0.54	3.0	1.5	68
	2	MR2020L/S-FG	3.23 to 6.02	6.03 to 7.02 <u>OR</u> 7.03 to 12.00	31.5**	0.54	3.0	1.5	84
Dual Speed	1	MR2010SD-FG	2.28 to 5.00	5.01 to 6.02 <u>OR</u> 6.03 to 12.00	31.5	0.54	3.0	1.5	75
	2	MR2020SD-FG	3.23 to 6.02	6.03 to 7.02 <u>OR</u> 7.03 to 12.00	31.5	0.54	3.0	1.5	93

*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.

*** Although both 208/230 & 460 Volts are shown together, the dual speed motors are **NOT** reconnectable.

2.2 Dimensions

Table 2-2 Trolley Dimensions													
For NER2003L-FG to NER2020L-FG													
		Product Code	b	b'	d	e	e'	i	j	k	m	n	r
Single Speed	MR2010L/S-FG	12.4	15.6	8.7	20.3	7.1	3.74	0.9	5.1	8.1	4.3	2.0	1.22
	MR2020L/S-FG	12.8	16.4	8.9	20.5	7.2	4.33	1.1	4.9	8.4	4.7	2.4	1.42
Dual Speed	MR2010SD-FG	12.4	15.6	8.7	20.3	7.1	3.74	0.9	5.1	8.1	4.3	2.0	1.22
	MR2020SD-FG	12.8	16.4	8.9	20.5	7.2	4.33	1.1	4.9	8.4	4.7	2.4	1.42

6.2 Lubrication

- 6.1.1 Lubricate the following trolley components with only Nevastane HT/AW 2 White Drum food grade lubricating grease.
- 6.1.2 Track Wheel Gear – Clean and re-grease the Track Wheel gears and motor output pinion every three months (more frequently for heavier usage or severe conditions). Do not use an excessive amount of grease and avoid getting any grease on the running surfaces of the Track Wheels or the beam.
- 6.1.3 Gear Box – The reduction gearing in the motor should be cleaned and lubricated at least once per year for normal usage. Clean and lubricate the reduction gear assembly more frequently for heavier usage or severe conditions. Gain access to the gears by removing the four bolts that mount the motor assembly to the trolley Side Plate. Make sure to properly orient and reuse the neoprene gasket between the motor and Side Plate.
- 6.1.4 Suspension Pins, Bolts and Shafts – Grease at least twice per year for normal usage (more frequently for heavier usage or severe conditions).

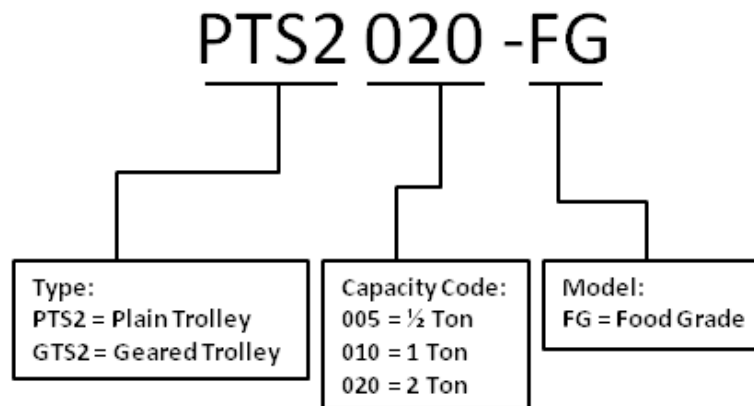
IV TS2 Manual Trolley

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2.1 Specifications

Product Code for TS2 Trolley Alone:



Operating Conditions and Environment

Temperature Range: -4° to +104°F (-20° to +40°C)

Humidity: 85% or less

Table 2-1 PTS2 Trolley Specifications

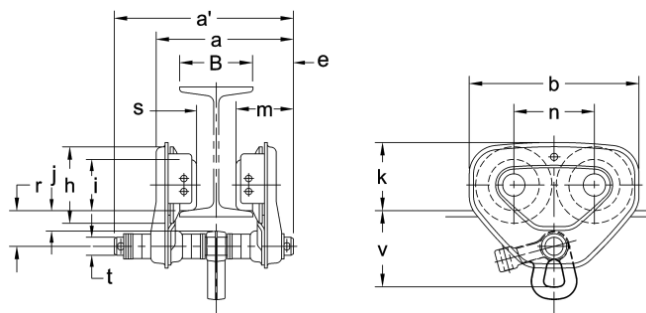
Cap. (Tons)	Product Code	Min. Radius for Curve (in)	Flange Width Adjustability B (in)		Approx. Net Weight (lbs)
			Standard	Option	
1/2	PTS2005-FG	43.3	2.28 to 4.00	4.01 to 8.00 or 8.01 to 12.00	10
1	PTS2010-FG	51.2	2.28 to 5.00	5.01 to 8.00 or 8.01 to 12.00	18
2	PTS2020-FG	59.1	3.23 to 6.02	6.03 to 12.00	31

Table 2-2 GTS2 Trolley Specifications

Cap. (Tons)	Product Code	Min. Radius for Curve (in)	Flange Width Adjustability B (in)		Approx. Net Weight (lbs)
			Standard	Option	
1	GTS2010-FG	51.2	2.28 to 5.00	5.01 to 8.00 or 8.01 to 12.00	27
2	GTS2020-FG	59.1	3.23 to 6.02	6.03 to 12.00	42

2.2 Dimensions

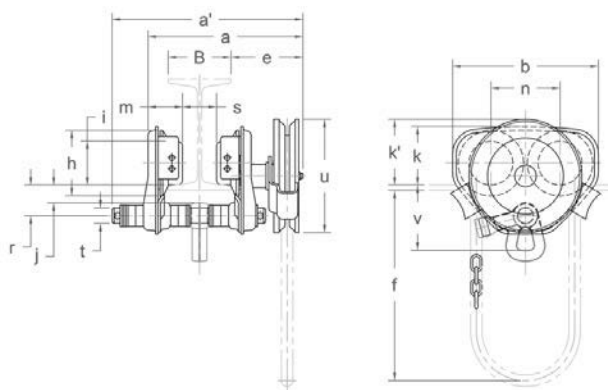
Table 2-3 PTS2 Trolley Dimensions



PTS2005 to PTS2020

Cap. (Tons)	Product Code	a max (in)	a' (in)	b (in)	e (ft)	h (in)	i (in)	j (in)	k (in)	m (in)	n (in)	r (in)	s (in)	t (in)	v (in)
1/2	PTS2005-FG	6.8	8.0	7.2	1.8	3.2	2.36	0.7	3.0	2.7	3.3	1.5	B-1.8	0.87	3.7
1	PTS2010-FG	8.5	9.8	9.3	2.2	4.2	2.80	1.1	3.7	3.1	4.4	2.0	B-1.9	0.98	4.2
2	PTS2020-FG	10.4	11.8	11.0	2.7	5.0	3.35	1.3	4.4	3.8	5.2	2.4	B-2.3	1.26	5.1

Table 2-4 GTS2 Trolley Dimensions



GTS2010 to GTS2020

Cap. (Tons)	Product Code	a max* (in)	a' max (in)	b (in)	e (in)	f (ft.)	h (in)	i (in)	j (in)	k (in)	k' (in)	m (in)	n (in)	r (in)	s (in)	t (in)	u (in)	v (in)
1/2-1	GTS2010-FG	10.8	13.6	9.3	6.0	10.5	4.2	2.80	1.1	3.7	4.2	2.2	4.4	2.0	B-1.8	0.98	7.2	4.2
2	GTS2020-FG	13.7	15.2	11.0	6.1		5.0	3.35	1.3	4.4	4.3	2.8	5.2	2.4	B-1.9	1.26		5.1

6.1 Lubrication

- 6.1.1 Lubricate the following trolley components with only Nevastane HT/AW 2 White Drum food grade lubricating grease.
- 6.1.2 Track Wheel Gear – Clean and re-grease the Track Wheel gears and Hand Wheel output pinion every three months (more frequently for heavier use). Do not use an excessive amount of grease and avoid getting any grease on the running surfaces of the Track Wheels or the beam.
- 6.1.3 Trolley Wheel Bearings do not need to be lubricated and must be replaced if worn or damaged.
- 6.1.4 Suspension Pins, Bolts, and Shafts – Grease at least twice per year for normal usage (more frequently for heavier usage or severe conditions).

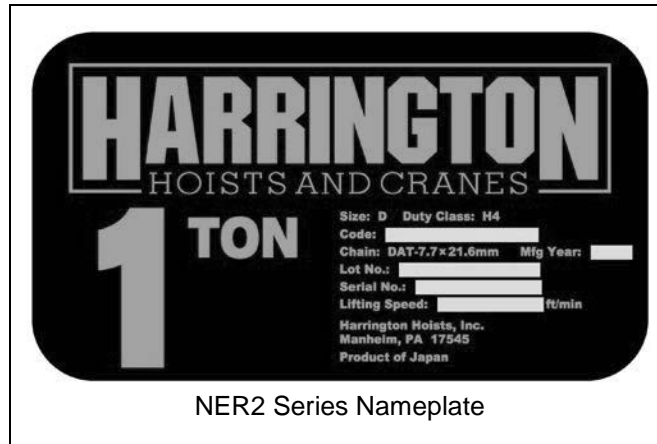
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V Parts List

1.0 NER2 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.



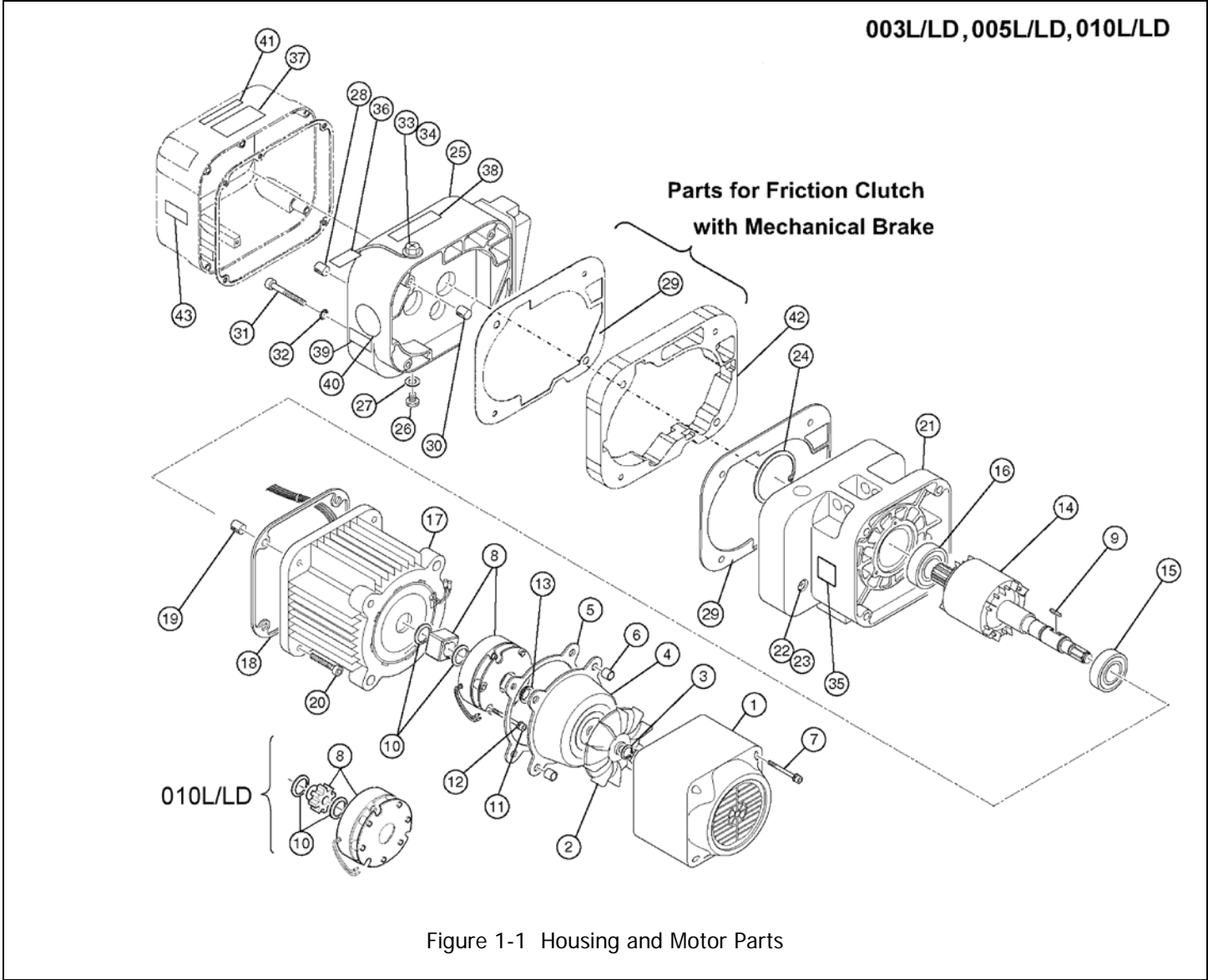
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In the column "Parts Per Hoist" a designator is used for parts that apply only to a particular model or option. Refer to Chapter 2, Section 2 for hoist model numbers and additional descriptions. The designators are:

- S = Single Speed
- D = Dual Speed
- 2V = 208/230 Volt Models
- 4V = 460 Volt Models

1.1 Housing and Motor Parts



1.1 Housing and Motor Parts

Figure No.	Part Name	Parts Per Hoist	003L/LD	005L/LD	010L/LD
1	Fan Cover	1	2AFG005L9107		2AFG010L9107
2	Fan	1	ER2CL9108		ER2CS9108
3	Snap Ring	1	9047113		9047113
4	Brake Cover	1	ER2CL9115		ER2CS9115
5	Packing B	1	ER2CL9119		ER2CS9119
6	Set Pin S	2	ES120003		
7	Socket Bolt	4	J1BEE0504522		
8	Electromagnetic Brake Assembly	1	MBABB0ENA		MBABB09NA
9	Key B	1	ER2CL9360		ER2CS9360
10	Snap Ring	2	9047116		9047124
11	Socket Bolt	3	9091254		
12	Spring Lock Washer	3	J1WB07420080		J1WB07420100
13	V Ring	1	ER2CS9210		ER2CS9210
14	Motor Shaft With Rotor	1	ER2CL5502		ER2DL5502
15	Ball Bearing	1	9000904		9000905
16	Ball Bearing	1	9000904		9000922
17	Motor Frame With Stator	1	3AFG005L5501		3AFG010L5501
18	Packing M	1	ER2CS9118		ER2DS9118
19	Set Pin S	2	ES120010S		ER1DS9138
20	Socket Bolt	4	J1BEE0803535		J1BEE1003535
21	Body B Assembly	1	3AFG005S6101		3AFG010S6101
22	Oil Plug	1	E3S111003		
23	Plug Packing	1	E3S112003		
24	Snap Ring	1	9047262		9047268
25	Gear Case	1	3AFG005S6103		3AFG010S6103
26	Oil Plug	1	E3S111003		
27	Plug Packing	1	E3S112003		
28	Spring Pin	1	E3S129005S		
29	Packing G	1	ER2CS9116		ER2DS9116
30	Set Pin S	2	ES120003		
31	Socket Bolt	4	9091262		
32	Toothed Lock Washer	4	9679709		
33	Oil Fill Plug	1	ER1BS9135		
34	Eyebolt Packing	1	ES127005S		
35	Name Plate Load Side E	1	ER1BS9960		
36	Oil Full Tag	1	ER1BS9953		
37	Warning Sticker E (Disconnect Power)	1	ER2CS9936		
38	Name Plate OF (Correct Oil Required)	1	2AFG003S9845		
40	Name Plate AD (Speed Letter)	1	ER1BL9868		ER1BL9868
41	Warning Sticker HW (Hot Surface)	D	1	ER2CI9806	
43	Check Voltage Label	S,2 V	1	ECP99NVVB	
		S,4 V		ECP99NVVA	
		D,2 V		ECP99NVWB	
		D,4 V		ECP99NVWA	

1.1 Housing and Motor Parts

020L/LD

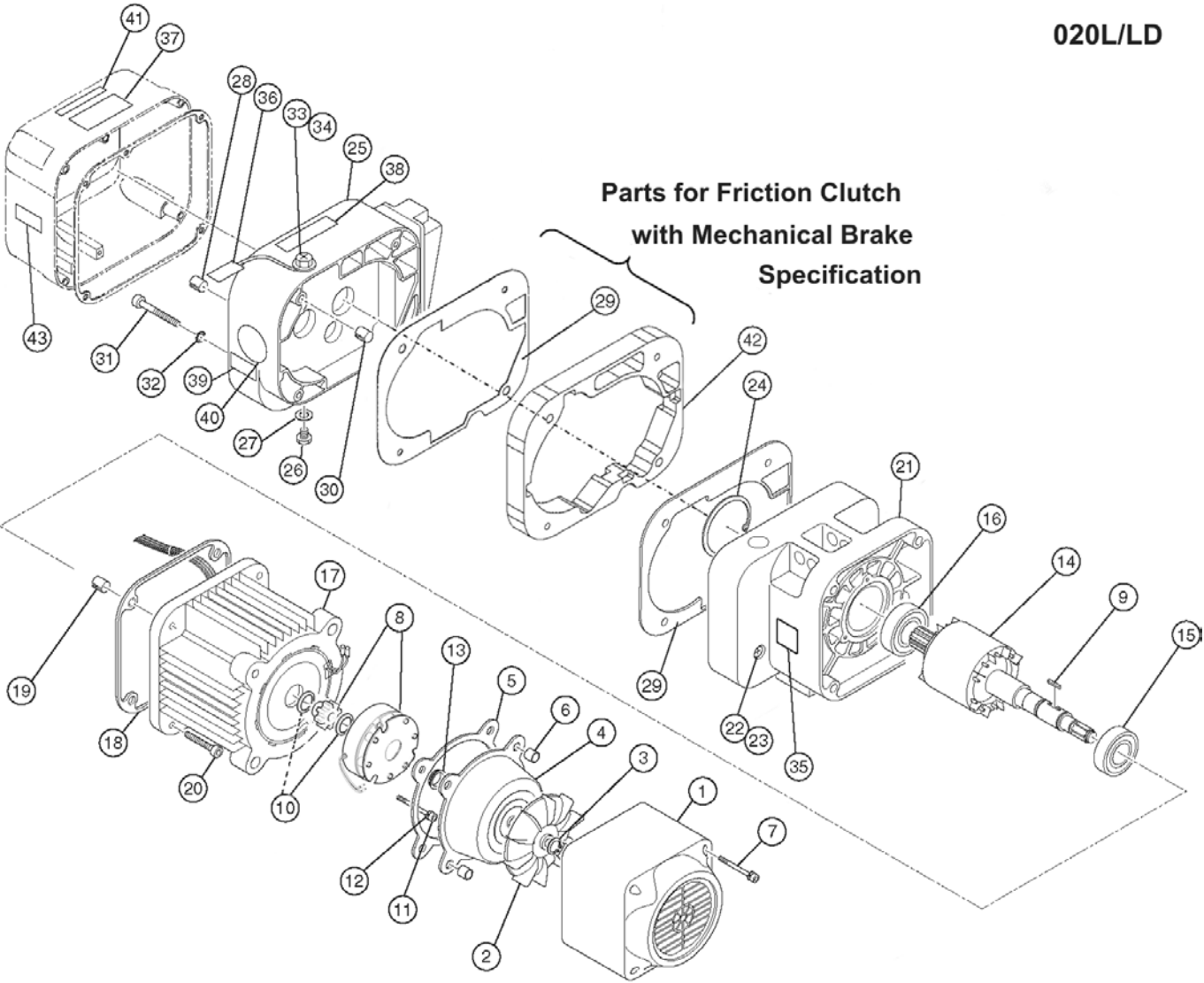
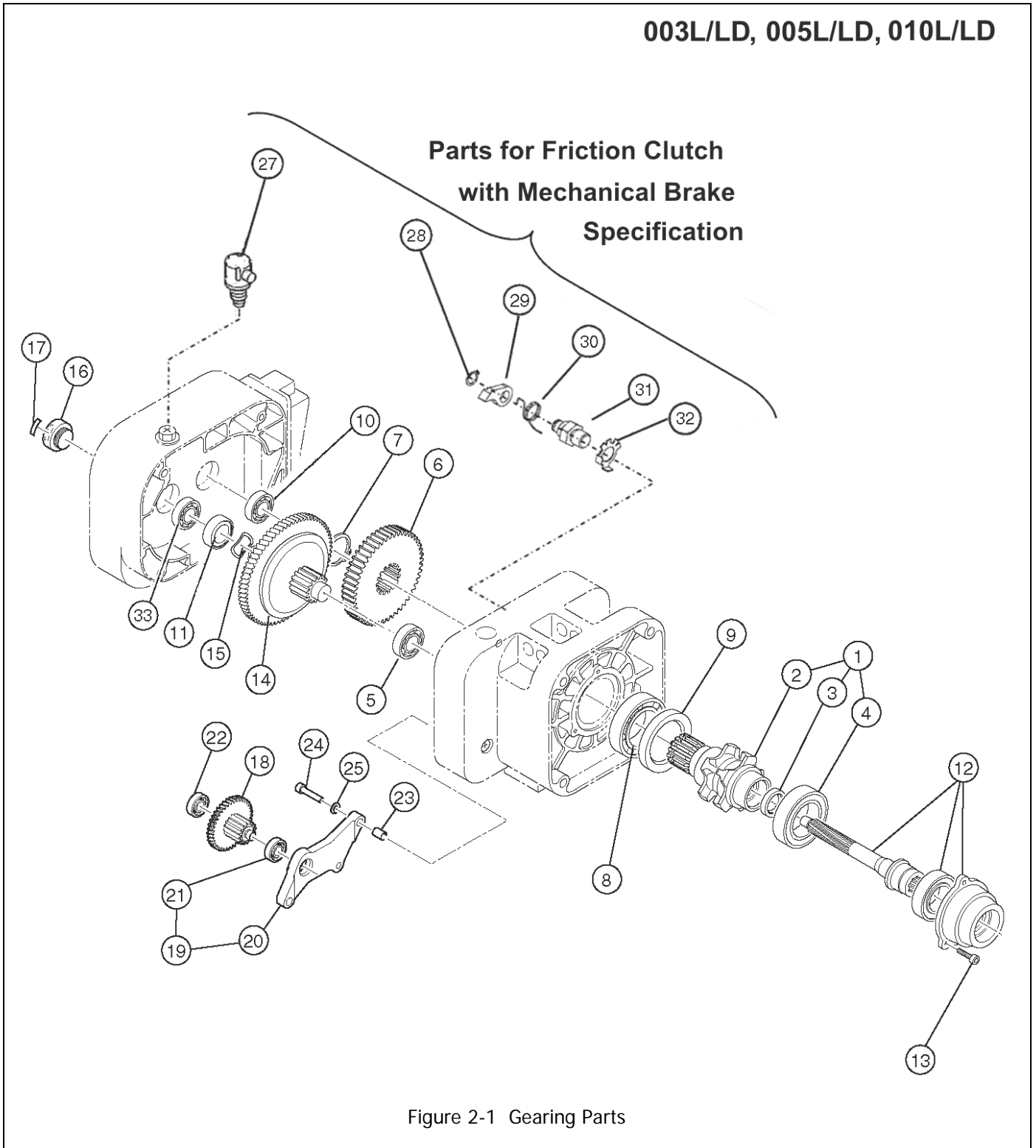


Figure 1-2 Housing and Motor Parts

1.1 Housing and Motor Parts

Figure No.	Part Name	Parts Per Hoist		020L/LD
1	Fan Cover		1	2AFG020L9107
2	Fan		1	ER2DS9108
3	Snap Ring		1	9047116
4	Brake Cover		1	ER2DS9115
5	Packing B		1	ER2DS9119
6	Set Pin S		2	ES120003
7	Socket Bolt		4	J1BEE0504522
8	Electromagnetic Brake Assembly		1	MBABB18NA
9	Key B		1	ER2DS9360
10	Snap Ring		2	9047124
11	Socket Bolt		3	9091254
12	Spring Lock Washer		3	J1WB07420120
13	V Ring		1	ER2DS9210
14	Motor Shaft With Rotor		1	ER2EL5502
15	Ball Bearing		1	9000905
16	Ball Bearing		1	9000906
17	Motor Frame With Stator		1	3AFG020L5501
18	Packing M		1	ER2ES9118
19	Set Pin S		2	ER2ES9138
20	Socket Bolt		4	J1BEE1204040
21	Body B Assembly		1	3AFG020S6101
24	Snap Ring		1	9047280
25	Gear Case		1	3AFG020L6103
26	Oil Plug		1	E3S111003
27	Plug Packing		1	E3S112003
28	Spring Pin		1	E3S129005S
29	Packing G		1	ER2ES9116
30	Set Pin S		2	ES120010S
31	Socket Bolt		4	9091286
32	Toothed Lock Washer		4	9679711
33	Oil Fill Plug		1	ER1BS9135
34	Eyebolt Packing		1	ES127005S
35	Name Plate Load Side E		1	ER1BS9960
36	Oil Full Tag		1	ER1BS9953
37	Warning Sticker E (Disconnect Power)		1	ER2CS9936
38	Name Plate OF (Correct Oil Required)		1	2AFG003S9845
40	Name Plate AD (Speed Letter)		1	ER1BL9868
41	Warning Sticker HW (Hot Surface)	D	1	ER2CI9806
43	Check Voltage Label	S,2V	1	ECP99NVVB
		S,4V		ECP99NVVA
		D,2V		ECP99NVWB
		D,4V		ECP99NVWA

1.2 Gearing Parts



1.2 Gearing Parts

Figure No.	Part Name	Parts Per Hoist	003L/LD	005L/LD	010L/LD
1	Load Sheave Assembly	1	ER2CS6241		ER2DS6241
2	Load Sheave	1	ER2DS9241		ER2DS9241
3	Oil Seal	1	ES221010S		ES221010S
4	Ball Bearing	1	9000508		
5	Ball Bearing	1	9000302		9000304
6	Load Gear	1	ER2CL9240		ER2DS9240
7	Snap Ring	1	9047135		
8	Ball Bearing	1	9000107		9000108
9	Oil Seal	1	ES232005S		ES232010S
10	Ball Bearing	1	9000201		9000301
11	Oil Seal	1	E6F235003S		
12	Pinion Assembly	1	ER2CS5220		ER2DS5220
13	Socket Bolt	3	90912149		
14	Friction Clutch Complete Assembly	1	ER2CL1223		ER2DL1223
15	Wave Washer	1	E1DBX20S9311		
16	Nut Cover	1	ER1CS9235		
17	Name Plate FP (Adjustment Of Friction Clutch Prohibited)	1	ER1BS9892		
18	Gear B Assembly	1			ER2DL5262
19	Gear Holder Plate Assembly	1			ER2DL6261
20	Gear Holder Plate	1			ER2DL9261
21	Ball Bearing	1			9000101
22	Ball Bearing	1			9000100
23	Set Pin S	2			ES120003
24	Socket Bolt	3			9091252
25	Spring Lock Washer	3			9012709

1.2 Gearing Parts

020L/LD

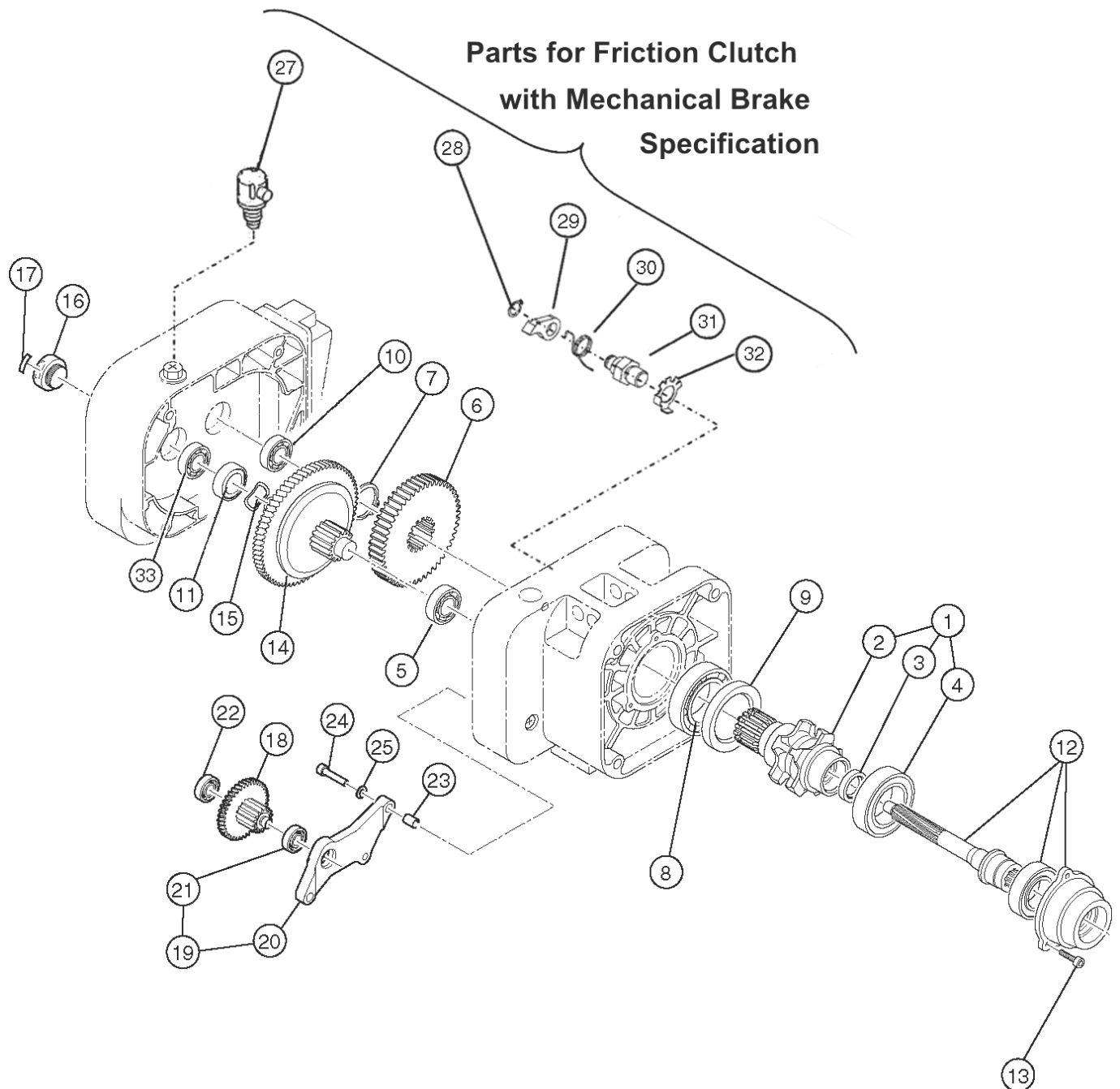


Figure 2-2 Gearing Parts

1.2 Gearing Parts

Figure No.	Part Name	Parts Per Hoist	020L/LD
1	Load Sheave Assembly	1	ER2ES6241
2	Load Sheave	1	ER2ES9241
3	Oil Seal	1	ER2ES9221
4	Ball Bearing	1	9000609
5	Ball Bearing	1	9000405
6	Load Gear	1	ER2EL9240
7	Snap Ring	1	9047150
8	Ball Bearing	1	9000110
9	Oil Seal	1	ER2ES9244
10	Ball Bearing	1	9000303
11	Oil Seal 22	1	ER1DS9233
12	Pinion Assembly	1	ER2EL5220
13	Socket Bolt	3	90912149
14	Friction Clutch Complete Assembly	1	ER2EL1223
15	Wave Washer	1	ER1DS9234
16	Nut Cover	1	ER1DS9235
17	Name Plate FP (Adjustment Of Friction Clutch Prohibited)	1	ER1BS9892
18	Gear B Assembly	1	ER2EL5262
19	Gear Holder Plate Assembly	1	ER2EL6261
20	Gear Holder Plate	1	ER2EL9261
21	Ball Bearing	1	9000202
22	Ball Bearing	1	9000201
23	Set Pin S	2	ES120010S
24	Socket Bolt	3	9091275
25	Spring Lock Washer	3	9012711

1.3 Hook and Chain Parts

003L/LD, 005L/LD

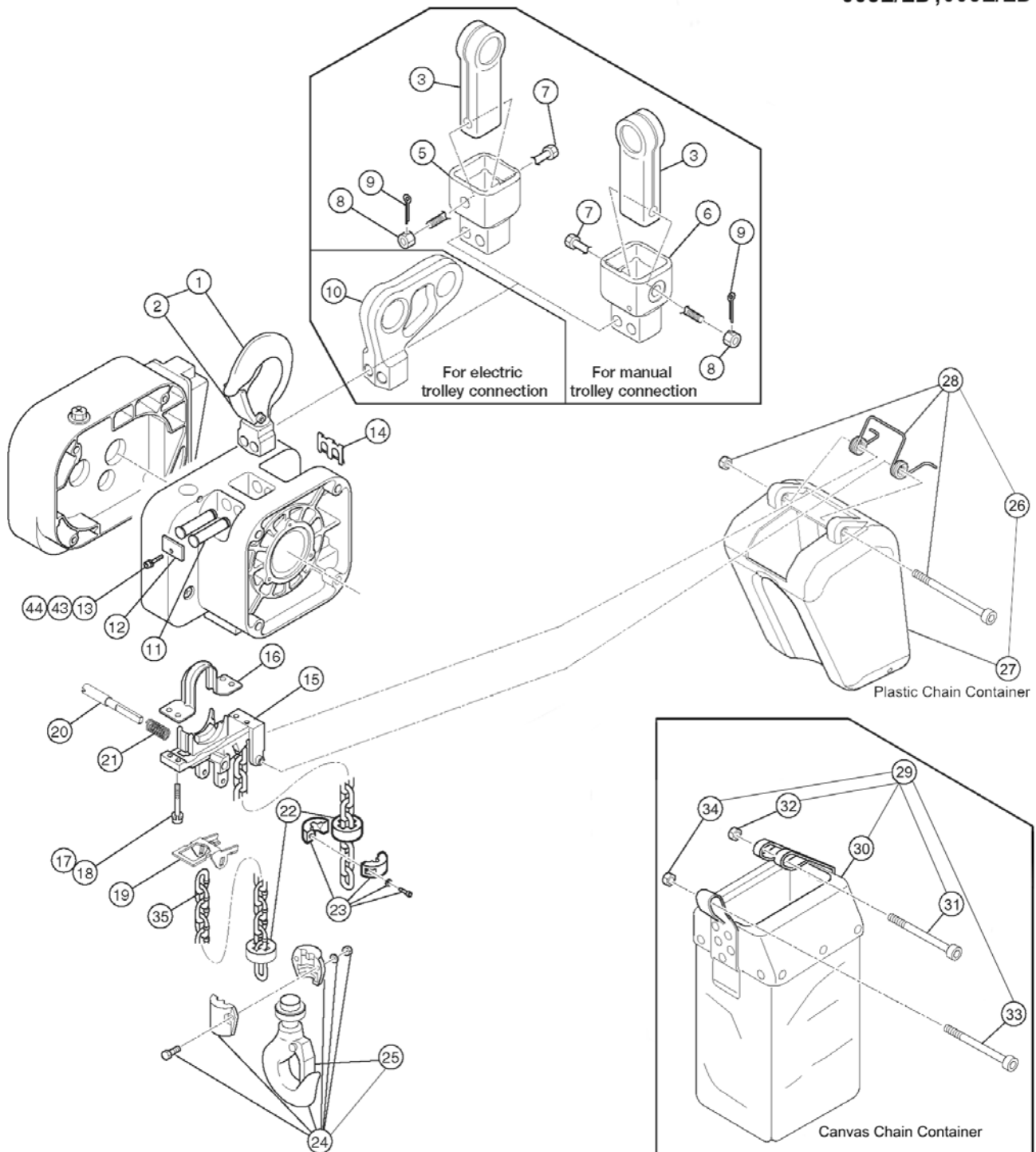


Figure 3-1 Hook and Chain Parts

*Optional stainless steel chain container assembly not shown. See Figure No. 45 on part number chart for ordering information.

1.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist	003L/LD	005L/LD
1	Top Hook Assembly	1	2ASF005S5101	
2	Hook Latch	1	2ASF005S1103	
3	Suspender E (For Push Trolley) – White Epoxy Paint	1	36FG0059004	
	Suspender E (For Push Trolley) – Nickel Plated		37FG0059004	
	Suspender E (For Geared Trolley) – White Epoxy Paint		36FG0109004	
	Suspender E (For Geared Trolley) – Nickel Plated		37FG0109004	
5	Connection Yoke P (For Push Trolley) – White Epoxy Paint	1	2AFG005S9027	
6	Connection Yoke G (For Geared Trolley) – White Epoxy Paint	1	2AFG005S9029	
7	Yoke Bolt	1	2AFG005S9032	
8	Slotted Nut	1	J1NL00910100	
9	Split Pin	1	J1PW06025018	
10	Suspender T (For Motorized Trolley) – White Epoxy Paint	1	2AFG010S9031	
	Suspender T (For Motorized Trolley) – Nickel Plated		2AFG010S9831	
11	Top Pin	2	WR2CS9121	
12	Plate A	1	ER2CS9123	
13	Socket Bolt	1	J1BEE0601414	
14	Shaft Clip	1	ER2CS9186	
15	Chain Guide A	1	ER2CS9331	
16	Chain Guide B	1	ER2CS9332	
17	Socket Bolt	4	J1BEE0602525	
18	Spring Lock Washer	4	J1WS07420060	
19	Limit Lever	1	ER2CS9337	
20	Limit Lever Pin	1	ER2CS9338	
21	Limit Lever Spring	1	WR2CS9357	
22	Cushion Rubber – Standard	2	ER1CS9053	
	Cushion Rubber – Stainless Steel	2	27SF005S9117	
23	Stopper Assembly – Standard	1	ER1CS1041	
	Stopper Assembly – Nickel Plated		2AFG005S1041	
24	Bottom Hook Complete Assembly – White Epoxy Paint	1	2AFG005S1011	
	Bottom Hook Complete Assembly – Stainless Steel		2ASF005S5211	
25	Hook Latch	1	2ASF005S1103	
26	Plastic Chain Container Assembly (Max. Lifting Height 20ft)	1	PBK2-C-FG	
27	Plastic Chain Container	1	ER2CS1401	
28	Plastic Container Spring Assembly	1	2AFG005S1416	
29	Canvas Chain Container Assembly (Max. Lift Height 50ft)	1	BK2C2-FG	
30	Canvas Chain Container	1	ER2CS5405	
31	Socket Bolt	1	J1BEB0807528	
32	Lever Nut	1	J1NU00920080	
33	Socket Bolt	1	J1BEB0604508	
34	Lever Nut	1	J1NU00920080	
35	NP Load Chain	1	LCER2005NP-FG	
35	ND Load Chain	1	LCER2005ND-FG	
43	Washer	1	J1WB07420060	
44	Spring Lock Washer	1	J1WS07420060	
45	Stainless Steel Chain Container Assembly – maximum 23 ft. lift	1	7042201	
	Stainless Steel Chain Container Assembly – maximum 49 ft. lift		7042202	

1.3 Hook and Chain Parts

010L/LD

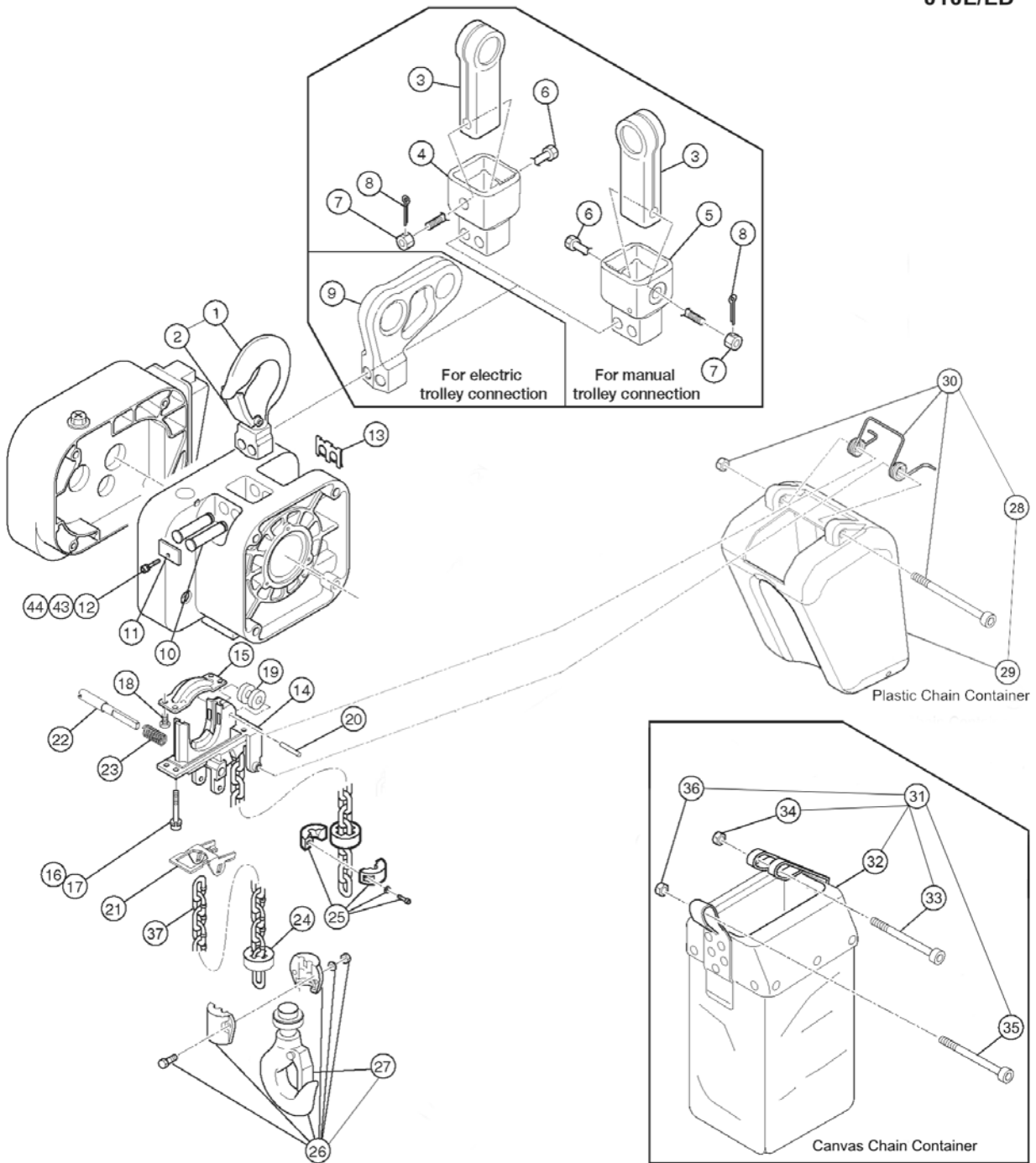


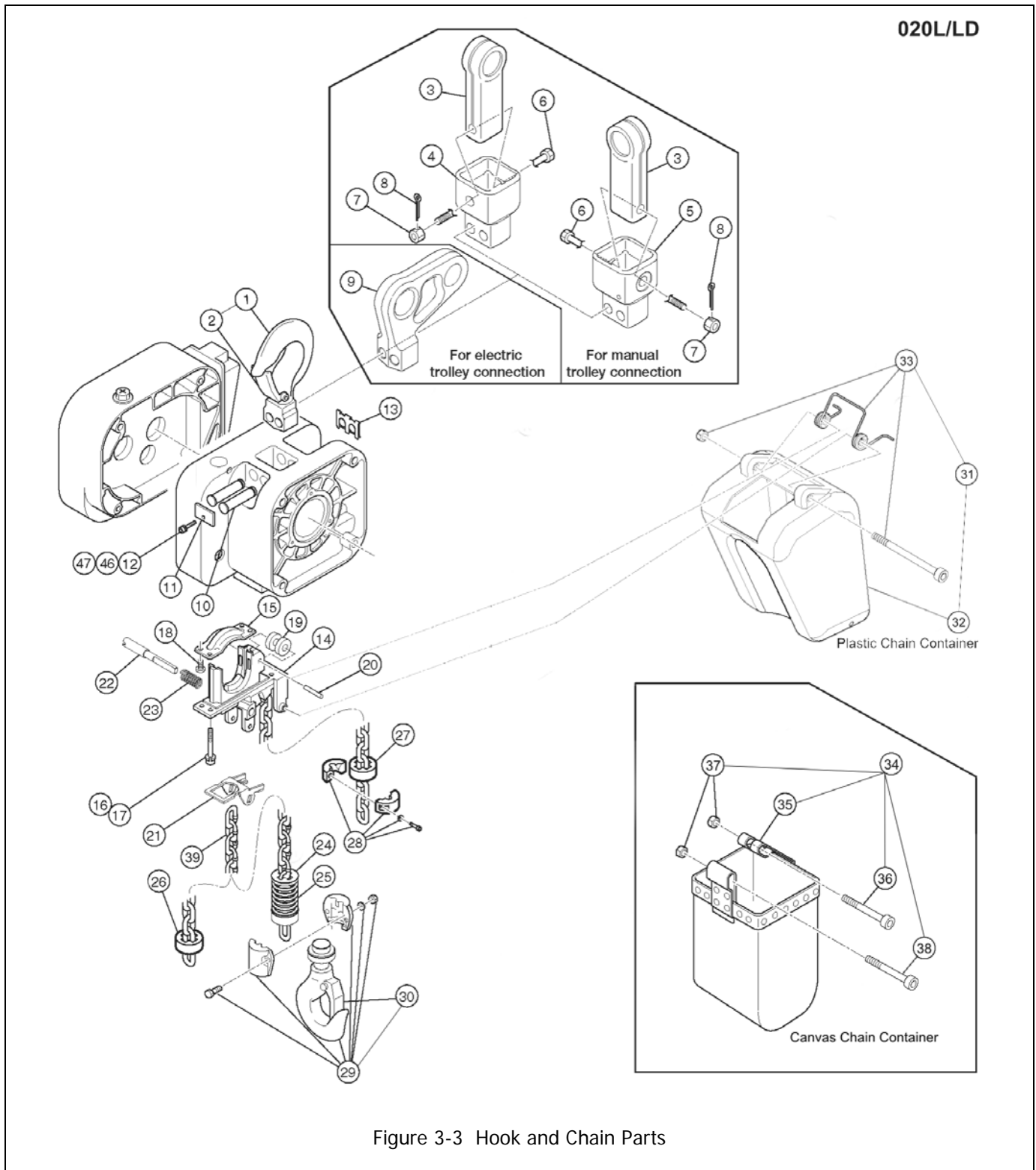
Figure 3-2 Hook and Chain Parts

*Optional stainless steel chain container assembly not shown. See Figure No. 45 on part number chart for ordering information.

1.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist	010L
1	Top Hook Assembly	1	2ASF010S5101
2	Hook Latch	1	2ASF010S1103
3	Suspender E (For Manual Trolley) – White Epoxy Paint	1	36FG0109004
	Suspender E (For Manual Trolley) – Nickel Plated		37FG0109004
4	Connection Yoke P (For Push Trolley) – White Epoxy Paint	1	2AFG005S9027
5	Connection Yoke G (For Geared Trolley) – White Epoxy Paint	1	2AFG005S9029
6	Yoke Bolt	1	2AFG005S9032
7	Slotted Nut	1	J1NL00910100
8	Split Pin	1	J1PW06025018
9	Suspender T (For Motorized Trolley) – White Epoxy Paint	1	2AFG010S9031
	Suspender T (For Motorized Trolley) – Nickel Plated		2AFG010S9831
10	Top Pin	2	WR2CS9121
11	Plate A	1	ER2CS9123
12	Socket Bolt	1	J1BEE0601414
13	Shaft Clip	1	ER2CS9186
14	Chain Guide A	1	ER2DS9331
15	Chain Guide B	1	ER2DS9332
16	Socket Bolt	4	J1BEE0802525
17	Spring Lock Washer	4	J1WS07420080
18	Machine Screw With Spring Washer	4	J1AP45001212
19	Guide Roller	1	ER2DS9333
20	Roller Pin	1	ER1CS9334
21	Limit Lever	1	ER2DS9337
22	Limit Lever Pin	1	ER2DS9338
23	Limit Lever Spring	1	WR2CS9357
24	Cushion Rubber – Standard	2	ER1DS9053
	Cushion Rubber – Stainless Steel	2	27SF010S9117
25	Stopper Assembly – Standard	1	ER1DS1041
	Stopper Assembly – Nickel Plated		2AFG010S1041
26	Bottom Hook Complete Assembly – White Epoxy Paint	1	2AFG010S1011
	Bottom Hook Complete Assembly – Stainless Steel		2ASF010S5211
27	Hook Latch	1	2ASF010S1103
28	Plastic Chain Container Assembly (Max. Lifting Height 20ft)	1	PBK2-D-FG
29	Plastic Chain Container	1	ER2DS1401
30	Plastic Container Spring Assembly	1	2AFG010S1416
31	Canvas Chain Container Assembly (Max. Lifting Height 50ft)	1	BK2D2-FG
32	Canvas Chain Container	1	ER2DS5405
33	Socket Bolt	1	J1BEB0809028
34	Lever Nut	1	J1NU00920080
35	Socket Bolt	1	J1BEB0604508
36	Lever Nut	1	J1NU00920060
37	NP Load Chain	1	LCER2010NP-FG
37	ND Load Chain	1	LCER2010ND-FG
43	Washer	1	J1WB07420060
44	Spring Lock Washer	1	J1WS07420060
45	Stainless Steel Chain Container Assembly – maximum 26 ft. lift	1	7042203
	Stainless Steel Chain Container Assembly – maximum 49 ft. lift		7042205

1.3 Hook and Chain Parts

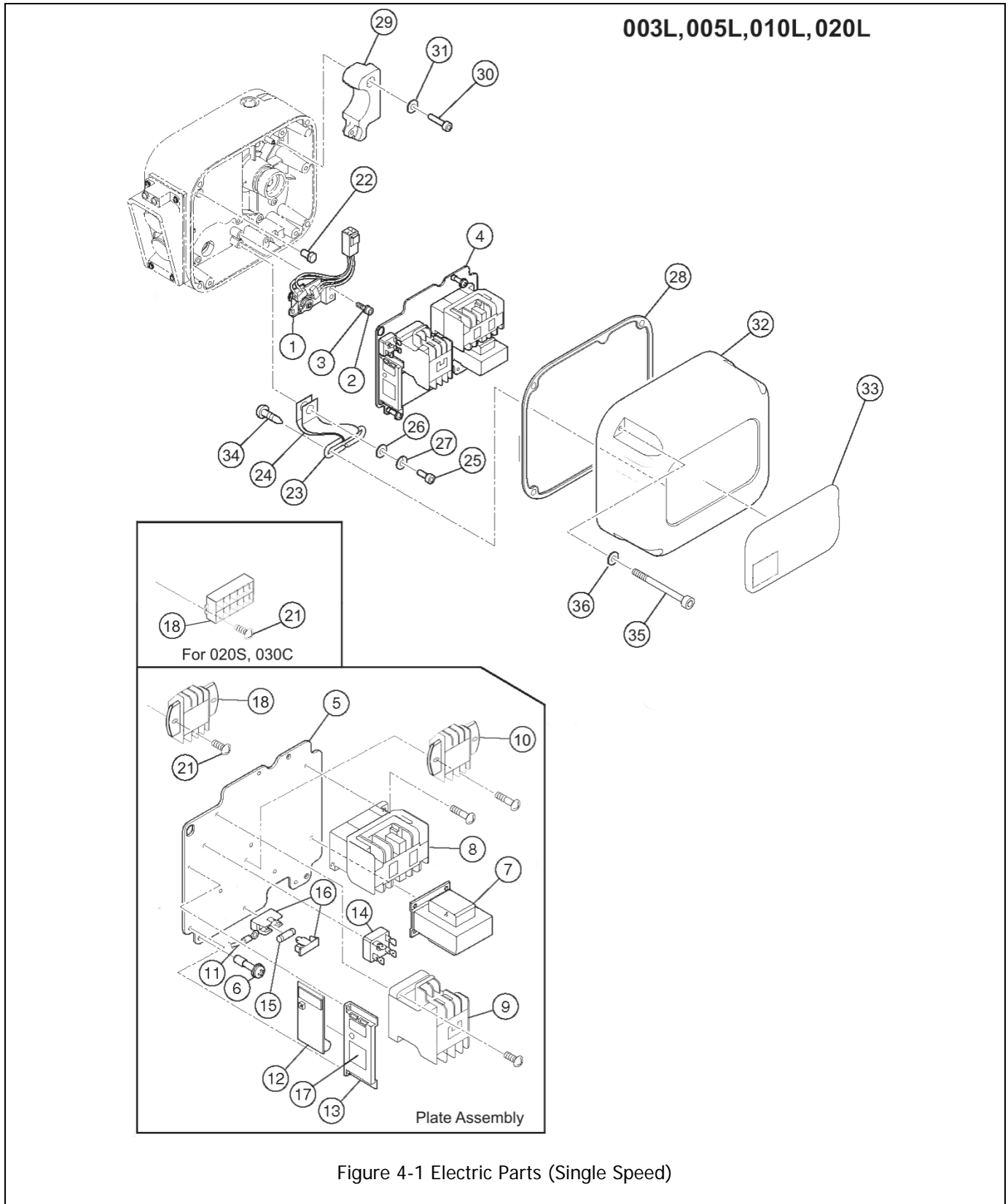


*Optional stainless steel chain container assembly not shown. See Figure No. 45 on part number chart for ordering information.

1.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist	020L
1	Top Hook Assembly	1	2ASF020S5101
2	Hook Latch	1	2ASF020S1103
3	Suspender E (For Manual Trolley) – White Epoxy paint	1	36FG0209004
	Suspender E (For Manual Trolley) – Nickel Plated		37FG0209004
4	Connection Yoke P (For Push Trolley) – White Epoxy Paint	1	2AFG020S9027
5	Connection Yoke G (For Geared Trolley) – White Epoxy Paint	1	2AFG020S9029
6	Yoke Bolt	1	2AFG020S9032
7	Slotted Nut	1	J1NL00920160
8	Split Pin	1	J1PW06040030
9	Suspender T (For Motorized Trolley) – White Epoxy Paint	1	2AFG020S9031
	Suspender T (For Motorized Trolley) – Nickel Plated		2AFG020S9831
10	Top Pin	2	2AFG020S9121
11	Plate A	1	ER2ES9123
12	Socket Bolt	1	J1BEE0601414
13	Shaft Clip	1	ER2ES9186
14	Chain Guide A	1	ER2ES9331
15	Chain Guide B	1	ER2ES9332
16	Socket Bolt	4	J1BEE0803030
17	Spring Lock Washer	4	J1WS07420080
18	Machine Screw With Spring Washer	4	J1AP46001212
19	Guide Roller	1	ER1DL9333
20	Roller Pin	1	ER1DL9334
21	Limit Lever	1	ER2ES9337
22	Limit Lever Pin	1	ER2EL9338
23	Limit Lever Spring	1	WR2CS9357
24	Limiting Plate – Standard	1	ER1ES9054
	Limiting Plate – Stainless Steel		27SF020S9118
25	Chain Spring – Standard	1	ER1DL9051
	Chain Spring – Stainless Steel		2AFG020L9112
27	Cushion Rubber – Standard	1	ER1ES9053
	Cushion Rubber – Stainless Steel		27SF020S9117
28	Stopper Assembly – Standard	1	ER1ES1041
	Stopper Assembly – Nickel Plated		2AFG020S1041
29	Bottom Hook Complete Assembly – White Epoxy Paint	1	2AFG020S1011
	Bottom Hook Complete Assembly – Stainless Steel		2ASF020S5211
30	Hook Latch	1	2ASF020S1103
31	Plastic Chain Container Assembly (Max. Lifting Height 13ft)	1	PBK2-E-FG
32	Plastic Chain Container	1	ER2ES1401
33	Plastic Container Spring Assembly	1	2AFG020S1416
34	Canvas Chain Container Assembly (Max. Lifting Height 60ft)	1	BK2E2-FG
35	Canvas Chain Container	1	ER2ES5405
36	Socket Bolt	1	J1BEB1010032
37	Lever Nut	2	J1NU00920100
38	Socket Bolt	1	J1BEB1007532
39	NP Load Chain	1	LCER2020NP-FG
39	ND Load Chain	1	LCER2020ND-FG
45	Stainless Steel Chain Container Assembly – maximum 20 ft. lift	1	7042204
	Stainless Steel Chain Container Assembly – maximum 39 ft. lift		7042206
46	Washer	1	J1WB07420060
47	Spring Lock Washer	1	J1WS07420060

1.4 Electric Parts (Single Speed)



1.4 Electric Parts (Single Speed)

Figure No.	Part Name	Parts Per Hoist	003L	005L	010L	020L
1	Limit Switch Complete Assembly	1	ER2C11060			
2	Socket Bolt	3	9091247			
3	Spring Lock Washer	3	9012709			
4	Plate Assembly	1	ER2GHM05L5A2	ER2GHM10S5A2	ER2GHM20L5A2	
5	Plate	1	ER2CS9441	ER2DS9441	ER2ES9441	
6	Plate Screw	3	ER1BS9445			
7	Transformer	1	TRF72V611	TRF73V611		
8	Electromagnetic Contactor	1	MGC23406C			
9	E-Stop Contactor	1	MGC13306F**			
			MGC14306C**			
10	Terminal Block 3P	1	ECP1303AB		ECP1303AB	
	Terminal Block 9P			ECP1309AB		
11	Lead Wire	1	ER2GHM05L9A2	ER2GHM05S9A2	ER2GHM20S9A2	
12	CH Meter	1	ECP91CHAE			
13	CH Meter Support	1	ECP99BKBA			
14	Rectifier	1	ECP93DIAA			ECP94DIAA
15	Fuse	1	9006275			
16	Fuse Holder	1	ECP92FZAA			
17	Name Plate CH	1	ECP99CHAA			
18	Terminal Block 6P	1	ECP1306AD		ECP1306AD	
22	Fulcrum Pin	1	ER2CS9449			
23	Cover Suspender	1	ER2CS9456			
24	Cover Belt	1	ER2CS9457			
25	Socket Bolt	1	9091249			
26	Plain Washer	1	ER1BS9436			
27	Spring Lock Washer	1	9012709			
28	Packing C	1	ER2CS9117	ER2DS9117	ER2ES9117	
32	Controller Cover	F 1	2AFG005S9104	2AFG010S9104	2AFG020S9104	
33	Name Plate B	1	ER2BHM05S9A5	ER2BHM10S9A5	ER2BHM20S9A5	
34	Pan Head Mach. Screw	2	9798534			
35	Socket Bolt	4	J1BEE0504022	J1BEE0604024		
36	Washer	1	J1WB07420050	J1WB07420060		

**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.

1.5 Electric Parts (Dual Speed)

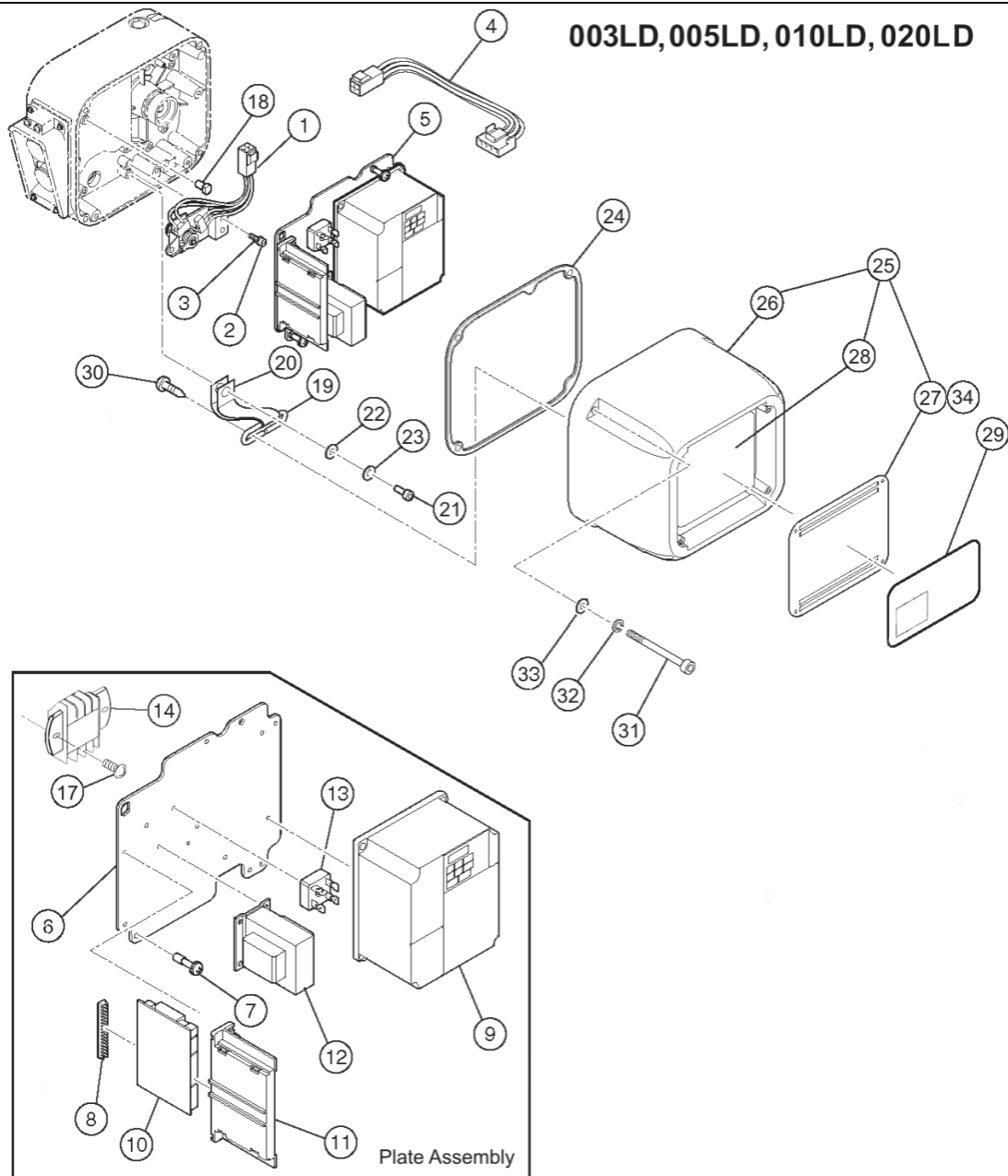


Figure 5-1 Electric Parts (Dual Speed)

1.5 Electric Parts (Dual Speed)

Figure No.	Part Name	Parts Per Hoist		005LD	010LD	020LD
1	Limit Switch Complete Assembly		1	ER2C11060		
2	Socket Bolt		3	9091247		
3	Spring Lock Washer		3	9012709		
4	LS Harness		1	ER2C19554		
5	Plate Assembly	M, 2V	1	ER2LHE05J5A2	ER2LHE10J5A2	ER2LHE20J5A2
		F, 2V	1	ER2BHE05J5A2	ER2BHE10J5A2	ER2BHE20J5A2
		M, 4V	1	ER2LHN05J5A2	ER2LHN10J5A2	ER2LHN20J5A2
		F, 4V	1	ER2BHN05J5A2	ER2BHN10J5A2	ER2BHN20J5A2
6	Plate		1	ER2C19441	ER2DI9441	ER2E19441
7	Plate Screw		3	ER1BS9445		
8	Bushing		1	ECP99JBAC		
9	Inverter Assembly	M, 2V	1	INV60FH24	INV615H24	INV622H24
		F, 2V		INV60FH21	INV615H21	INV622H21
		M, 4V		INV60FM24	INV615M24	INV622M24
		F, 4V		INV60FM21	INV615M21	INV622M21
10	Interface Board		1	ECP91KB02		
11	Board Support		1	ECP99BKAA		
12	Transformer	2V	1	TRF32C612		
		4V		TRF32N612		
13	Rectifier		1	ECP93DIAA		
14	Terminal Block 6P		1	ECP1306AD		
17	Machine Screw		2	9798512		
18	Fulcrum Pin		1	ER2CS9449		
19	Cover Suspender		1	ER2CS9456		
20	Cover Belt		1	ER2CS9457		
21	Socket Bolt		1	9091249		
22	Plain Washer		1	ER1BS9436		
23	Spring Lock Washer		1	9012709		
24	Packing C		1	ER2CS9117	ER2DS9117	ER2ES9117
25	Controller Cover Assembly	2V	1	2AFG005I2104	2AFG010I2104	2AFG020I2104
		4V		2AFG005I1104	2AFG010I1104	2AFG020I1104
26	Controller Cover		1	2AFG005I9104	2AFG010I9104	2AFG020I9104
27	Resistor Cover		1	2AFG005I9185	2AFG010I9185	2AFG020I9185
28	Braking Resistor	2V	1	INV70EE16	INV718E16	INV718E16
		4V		INV70EY16	INV718Y16	INV718Y16
34	Mach. Screw w/Spring Washer		4	JAW44001212		
29	Name Plate B		1	ER2BHM05I9A5	ER2BHM10I9A5	ER2BHM20I9A5
30	Pan Head Machine Screw		2	9798534		
31	Socket Bolt		4	J1BEE0504022	J1BEE0604024	
32	Toothed Lock Washer		4	J1WS07420050	J1WS07420060	
33	Washer		4	J1WB07420050	J1WB07420060	

1.6 Power Supply and Pendant Parts

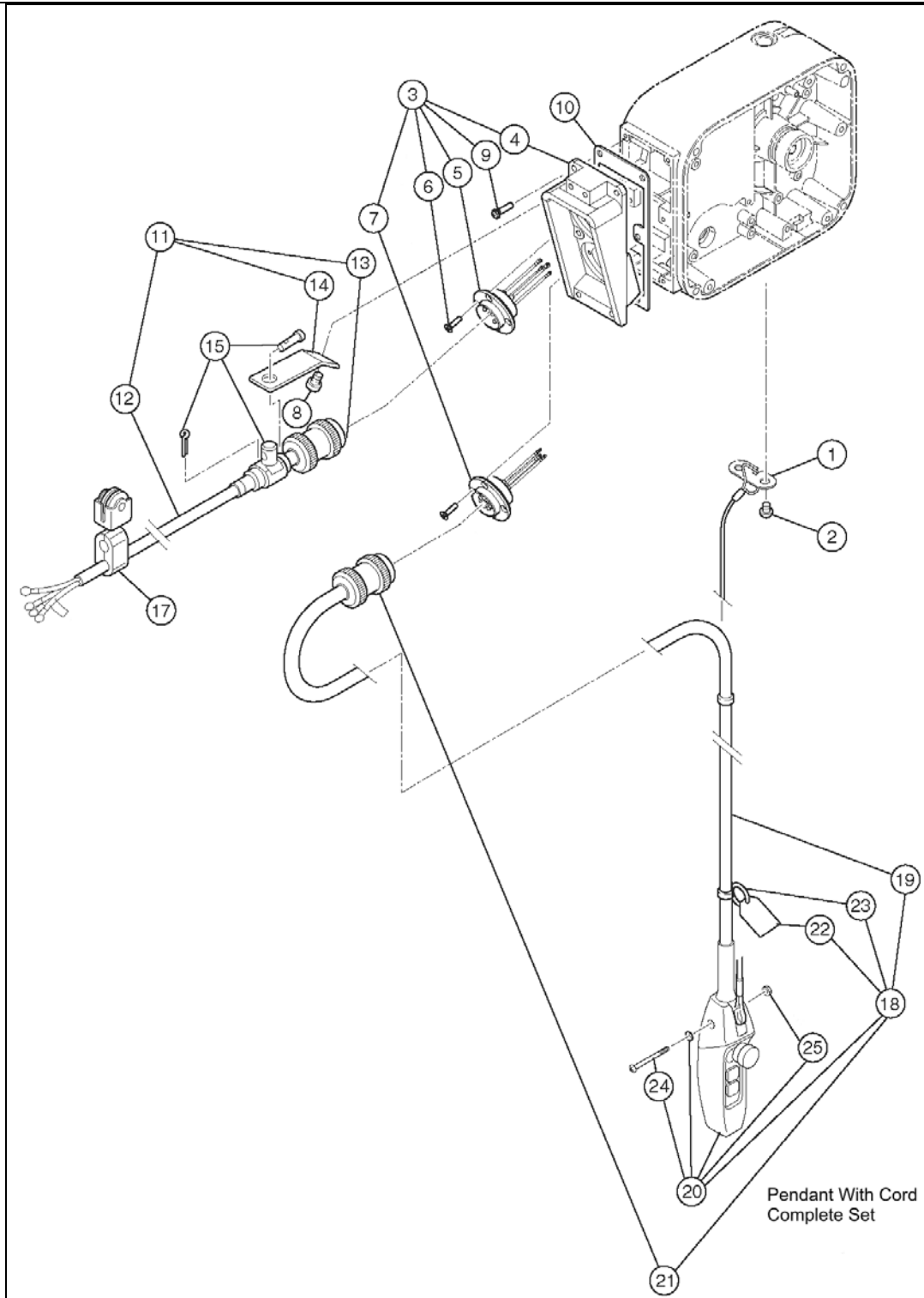


Figure 6-1 Power Supply and Pendant Parts (Plug Connection)

1.6 Power Supply and Pendant Parts

Figure No.	Part Name	Parts Per Hoist	005L/LD	010L/LD	020L/LD
1	Cord Support (Wire Stop)	1	ER1BS9534		
2	Mach. Screw W/Spring Washer	2	J1AP45001212		
3	Socket Frame Complete Assembly	S	2AFG005S4511		2AFG020S4511
		D	2AFG005I4511	2AFG010I4511	2AFG020I4511
	4 Socket Frame	1	2AFG005S9511		
	5 Socket 4P Assembly	S	ER2CS2523		ER2ES2523
		D	ER2CI2523	ER2CS2523	ER2EI2523
	6 Tapping Flat Head Mach. Screw	8	ES558003		
	7 Socket 8P Assembly	S	ER2CS2564		
		D	ER2CI2564		ER2EI2564
	8 Mach. Screw W/Spring Washer	2	ES650005S		
	9 Mach. Screw W/ Spring Washer	6	J1AP45002020		
10	Socket Frame Packing	1	ER2CS9512		
11	Power Supply Cable 4C Assembly	1	ZBZA12CH1000		
	12 Power Supply Cable 4C	ft	16/4		
	13 Plug 4P	1	ECP2304AD		
	14 Cable Support Arm	1	ER1BS9541		
15	Cable Support 12 Assembly	1	ES822003		
17	Cable Hanger 14 Assembly	A/R	ES1527003		
18	Pendant W/Cord Complete Assembly	S	ZB10025H1000		
		D	ZB20025I1000		
	19 Pendant Cord	S	16/4P		
		D	16/6P		
	20 Pendant Assembly	S	SWD1100AAH		
		D	SWD2200AAH		
	21 Plug 8P	S	ECP2108AA		
		D	ECP2108AB		
	22 Warning Tag PB	1	WTAG7		
	23 Tag Holder	1	E3S787003		
	24 Machine Screw	1	J1AP24002608		
	25 Nut	1	9093414		

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

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2.0 MR2 Parts List

When ordering parts, please provide the trolley 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 trolley code number, lot number and serial number in the space provided on the cover of this manual.



The parts list is arranged into the following sections:

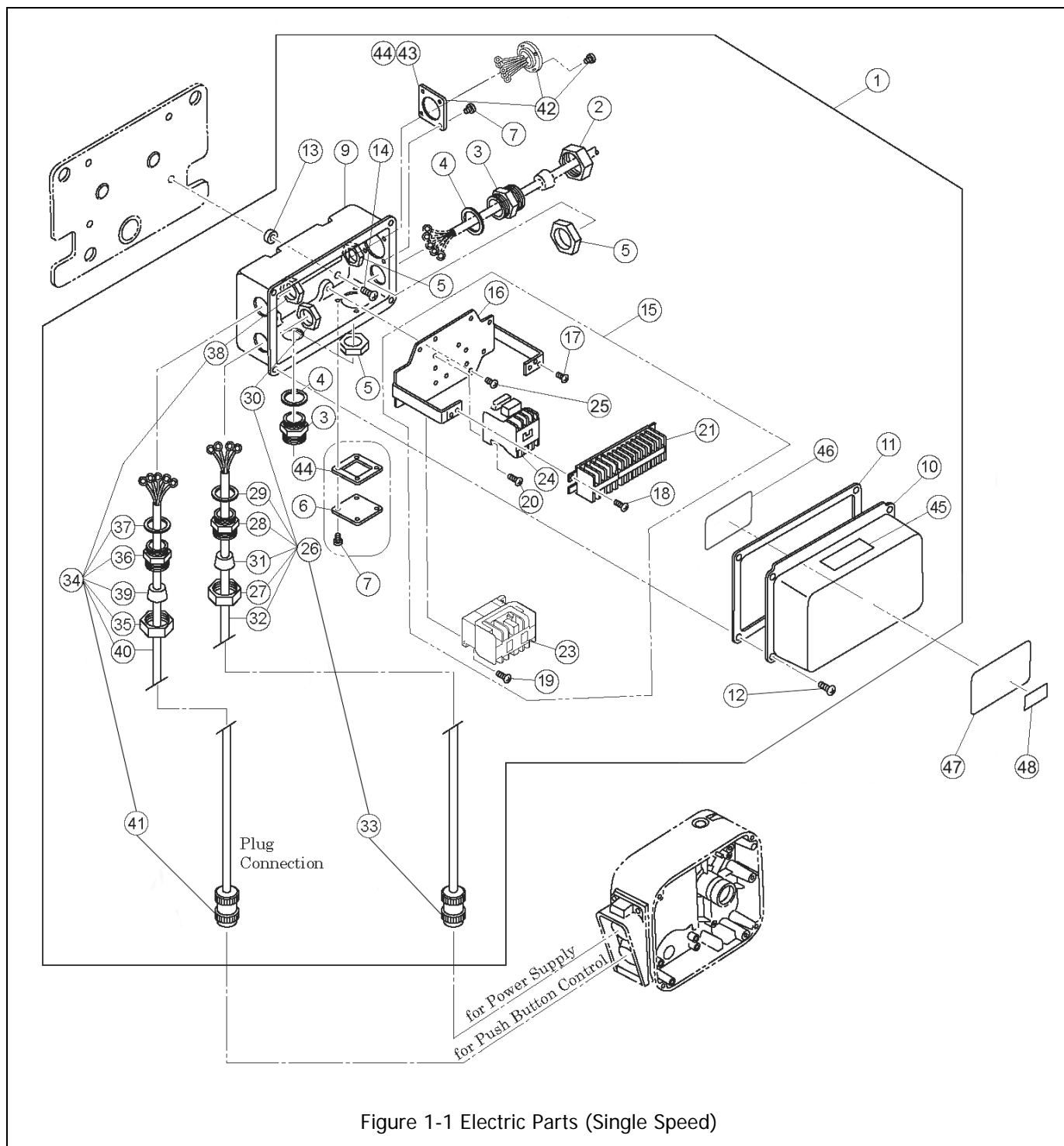
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Section 1/4 to 2 Ton	
2.1 Electric Parts – 1/4 to 2 Ton.....	44
2.2 Pendant Parts – 1/4 to 2 Ton	48
2.3 Power Supply Parts – 1/4 to 2 Ton	50
2.4 Side Plates and Suspension Parts – 1/4 to 2 Ton	52
2.5 Motor Parts – 1/4 to 2 Ton	54

In the column "Parts Per Trolley" a designator is used for parts that apply only to a particular model or option. Refer to Chapter 3, Section 2 for MR2 trolley model numbers and additional descriptions.

The designators are:

- | | |
|--------------------------|--|
| S = Single Speed | W = SS/SS = Single Speed Hoist, Single Speed Trolley |
| D = Dual Speed | X = SS/DS = Single Speed Hoist, Dual Speed Trolley |
| PC = Plug Connection | Y = DS/SS = Dual Speed Hoist, Single Speed Trolley |
| 2V = 208/230 Volt Models | Z = DS/DS = Dual Speed Hoist, Dual Speed Trolley |
| | 4V = 460 Volt Models |

2.1 Electric Parts – 1/4 to 2 Ton (Single Speed)



2.1 Electric Parts– 1/4 to 2 Ton (Single Speed)

Figure No.	Part Name	Parts Per Trolley	1 Ton	2 Ton
1	Connection Box Assembly	1	7038101	7038102
2	Holder A	1	ECP5924AA	
3	Holder B	2	ECP5924AB	
4	Packing	2	ECP5924AC	
5	Holder Nut	2	ECP5924AD	
6	Cord Cover	1	E6F630010S	
7	Machine Screw With Spring Washer	8	J1AP45001010	
9	Connection Box	1	3AFG010S9401	
10	Connection Box Cover	1	3AFG010S9411	
11	Connection Box Packing	1	MR1DS9421	
12	Machine Screw With Spring Washer	4	J1AP45001010	
13	Spacer	4	MS517010	
14	Machine Screw With Spring Washer	4	J1AP48002020	
15	Complete Plate Assembly	1	MR2RHM10M1A5	
16	Plate	1	MR2DS5445	
17	Machine Screw With Spring Washer	3	MS555010	
18	Machine Screw With Spring Washer	2	MS556010	
19	Machine Screw With Spring Washer	2	MS556010	
20	Machine Screw With Spring Washer	2	MS556010	
21	Terminal 16P	1	ECP1416AA	
23	Electromagnetic Contactor	1	MGC22306B	
24	E-Stop Contactor	1	MGC12306B	
25	Machine Screw With Spring Washer	4	MS554010	
26	Power Supply Cable Assembly	1	MR2DS1759	MR2ES1759
27	Holder A	1	ECP5924AA	
28	Holder B	1	ECP5924AB	
29	Packing	1	ECP5924AC	
30	Holder Nut	1	ECP5924AD	
31	Cable Packing	1	ECP6912AA	ECP6916AA
32	S.O. Cord 4C	1	16/4	14/4
33	Plug 4P	1	ECP2304AD	ECP2304AF
34	Control Cable Assembly	1	MR2DS1768	MR2ES1768
35	Holder A	1	ECP5924AA	
36	Holder B	1	ECP5924AB	
37	Packing	1	ECP5924AC	
38	Holder Nut	1	ECP5924AD	
39	Cable Packing	1	ECP6916AA	
40	S.O. Cord 6C	1	16/6P	
41	Plug 8P	1	ECP2108AC	
42	Socket 8P Assembly	1	MR2DS2811	
43	Plate P	1	ECP5924AH	
44	Cord Cover Packing	2	MS527010	
45	Warning Seal E (Electric Shock)	1	ER2CS9936	
46	Wiring Diagram	1	EWG3110H01	
47	Name Plate B	1	MR2SHM10S9A8	
48	Name Plate C	1	MR2SHM10S9A7	MR2SHM20S9A7

Name Plates for 1/8, 1/4, 1/2 & 1 1/2 Ton Capacities

Figure No.	Part Name	Parts Per Trolley	1/8 Ton	1/4 Ton	1/2 Ton	1 1/2 Ton
48	Name Plate C	1	MR2SHM01S9A7	MR2SHM03S9A7	MR2SHM05S9A7	MR2SHM15S9A7

2.1 Electric Parts – 1/4 to 2 Ton (Dual Speed)

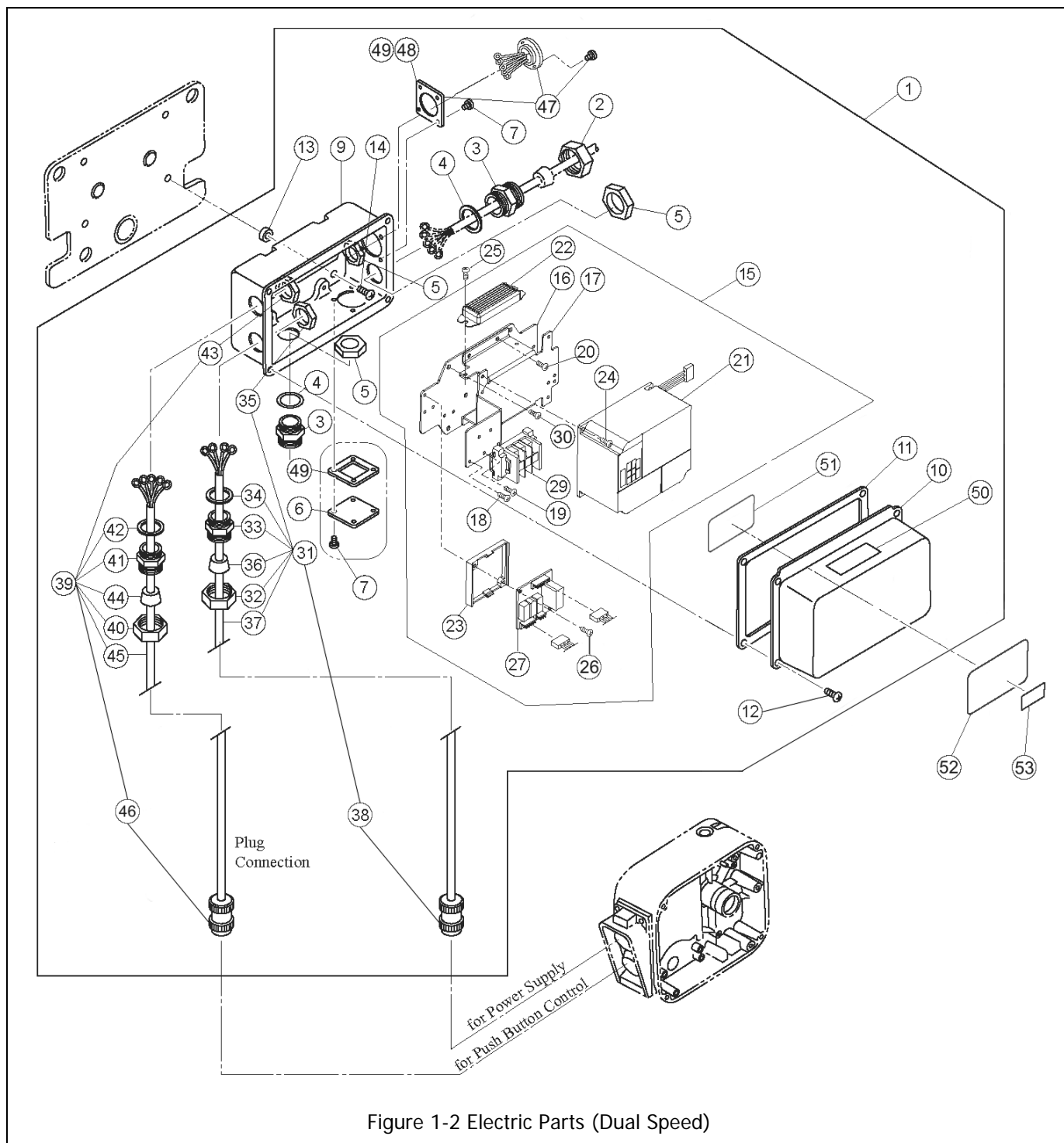


Figure 1-2 Electric Parts (Dual Speed)

2.1 Electric Parts– 1/4 to 2 Ton (Dual Speed)

Figure No.	Part Name	Parts Per Trolley		1 Ton	2 Ton
1	Connection Box Assembly	2V	1	7038201	7038202
		4V		7038203	7038204
2	Holder A	ECP5924AA			
3	Holder B	ECP5924AB			
4	Packing	ECP5924AC			
5	Holder Nut	ECP5924AD			
6	Cord Cover	E6F630010S			
7	Machine Screw With Spring Washer	J1AP45001010			
9	Connection Box	3AFG010S9401			
10	Connection Box Cover	3AFG010S9411			
11	Connection Box Packing	MR1DS9421			
12	Machine Screw With Spring Washer	J1AP45001010			
13	Spacer	MS517010			
14	Machine Screw With Spring Washer	J1AP48002020			
15	Complete Plate Assembly	2V	1	MR2IHE10R1A5	MR2IHE20R1A5
		4V		MR2IHN10R1A5	MR2IHN20R1A5
16	Plate	MR2DI9441			
17	Plate B	MR2DI9443			
18	Machine Screw With Spring Washer	MS555010			
19	Machine Screw With Washers	J1AW24000808			
20	Machine Screw With Spring Washer	MS555010			
21	VFD Assembly	2V	1	INV604E31	
		4V		INV604N31	
22	Braking Resistor	2V	1	INV904E34	
		4V		INV904Y34	
23	Board Support	ECP99BKAB			
24	Machine Screw With Spring Washer	MS555010			
25	Machine Screw With Washers	J1AW24000808			
26	Machine Screw With Spring Washer	MS556010			
27	Interface Board	ECP91KB12			
29	Terminal 3P	ECP1403AA			
30	Machine Screw With Spring Washer	MS554010			
31	Power Supply Cable Assembly	MR2DS1759			MR2ES1759
32	Holder A	ECP5924AA			
33	Holder B	ECP5924AB			
34	Packing	ECP5924AC			
35	Holder Nut	ECP5924AD			
36	Cable Packing	ECP6912AA		ECP6916AA	
37	S.O. Cord 4C	16/4		14/4	
38	4P Plug	ECP2304AD		ECP2304AF	
39	Control Cable Assembly	MR2DI1768			MR2EI1768
40	Holder A	ECP5924AA			
41	Holder B	ECP5924AB			
42	Packing	ECP5924AC			
43	Holder Nut	ECP5924AD			
44	Cable Packing	ECP6916AA			
45	S.O. Cord 6C	16/6P			
46	8P Plug	ECP2108AC			
		MR2DI1811			
47	Socket 8P Assembly	2V	1	MR2DI2811	
		4V		ECP5924AH	
48	Plate P	ECP5924AH			
49	Cord Cover Packing	MS527010			
50	Warning Seal E (Electric Shock)	ER2CS9936			
51	Wiring Diagram	EWG3DD0H01			
52	Name Plate B	MR2SHM10S9A8			
53	Name Plate C	MR2SHM10S9A7		MR2SHM20S9A7	

Name Plates for 1/8, 1/4, 1/2 & 1 1/2 Ton Capacities

Figure No.	Part Name	Parts Per Trolley	1/8 Ton	1/4 Ton	1/2 Ton	1 1/2 Ton
53	Name Plate C	1	MR2SHM01S9A7	MR2SHM03S9A7	MR2SHM05S9A7	MR2SHM15S9A7

2.2 Pendant Parts – 1/4 to 2 Ton

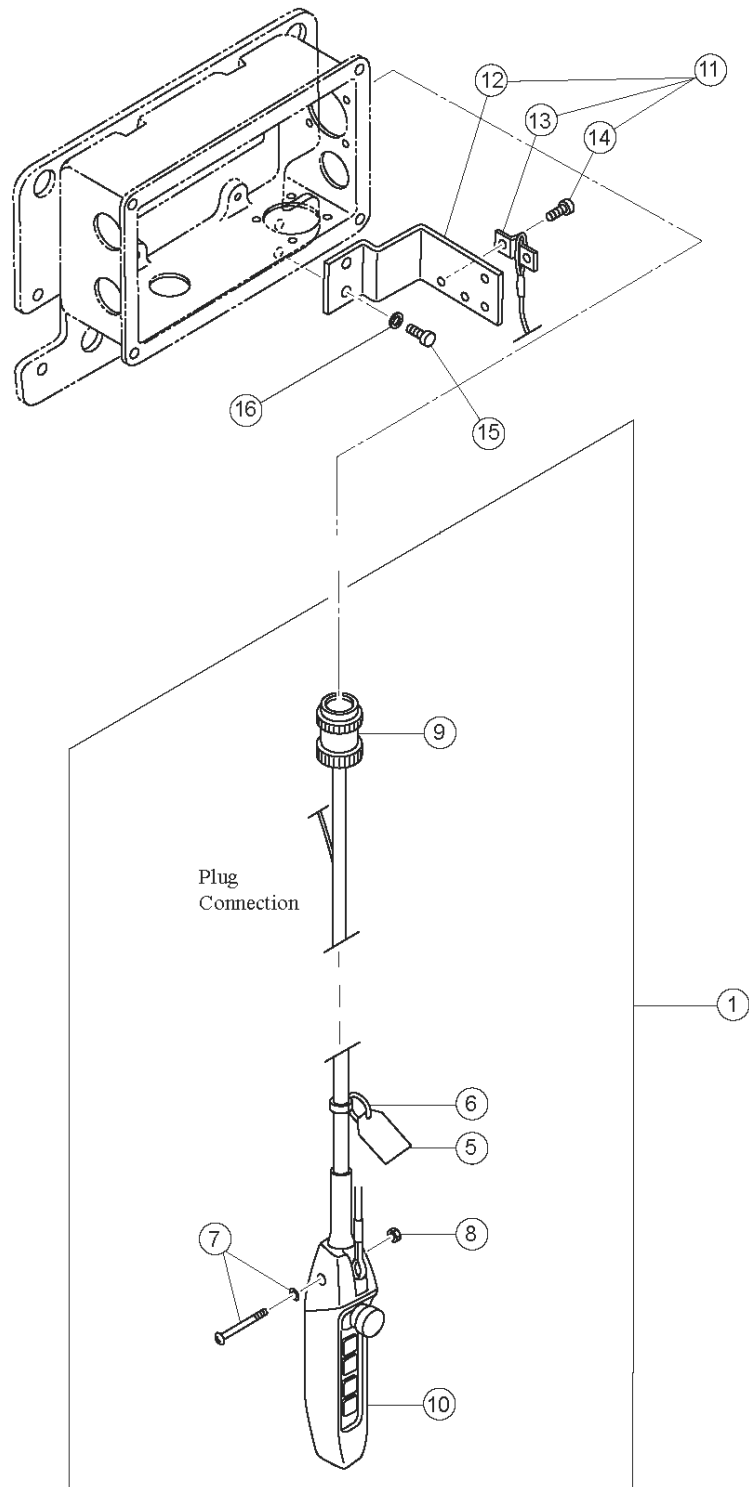


Figure 2-1 Pendant Parts

2.2 Pendant Parts – 1/4 to 2 Ton

Figure No.	Part Name	Parts Per Trolley		1 Ton	2 Ton	
1	Push Button Cord 6C/7C/8C Complete Assembly	W	1	ZB1102AI1000		
		X		ZB1202AI1000		
		Y		ZB2102AI1000		
		Z		ZB2202AI1000		
	4	Push Button Cord 6C	W	1	16/6P	
		Push Button Cord 8C	X, Y, Z		16/8P	
	5	Warning Tag PB	1		WTAG7	
	6	Tag Holder	1		E3S787003	
	7	Machine Screw With Spring Washer	1		J1AP24002608	
	8	Nut	1		9093414	
	9	Plug 8P	W, PC	1	ECP2108AB	
			X, Y, Z, PC		ECP2108AD	
10	5 Push Button Switch Assembly	W	1	SWD2110ABH		
		X		SWD2120ABH		
		Y		SWD2210ABH		
		Z		SWD2220ABH		
11	Bar Holder Assembly	1		MR1DS1481		
	12	Bar Holder	1		MR1DS9481	
	13	Cord Strain Relief Stopper	1		E6L614010S	
	14	Machine Screw w/Spring Washer	2		E6F151003	
15	Socket Bolt	2		J1BEE1002828		
16	Spring Washer	2		J1WS07420100		

2.3 Power Supply Parts – 1/4 to 2 Ton

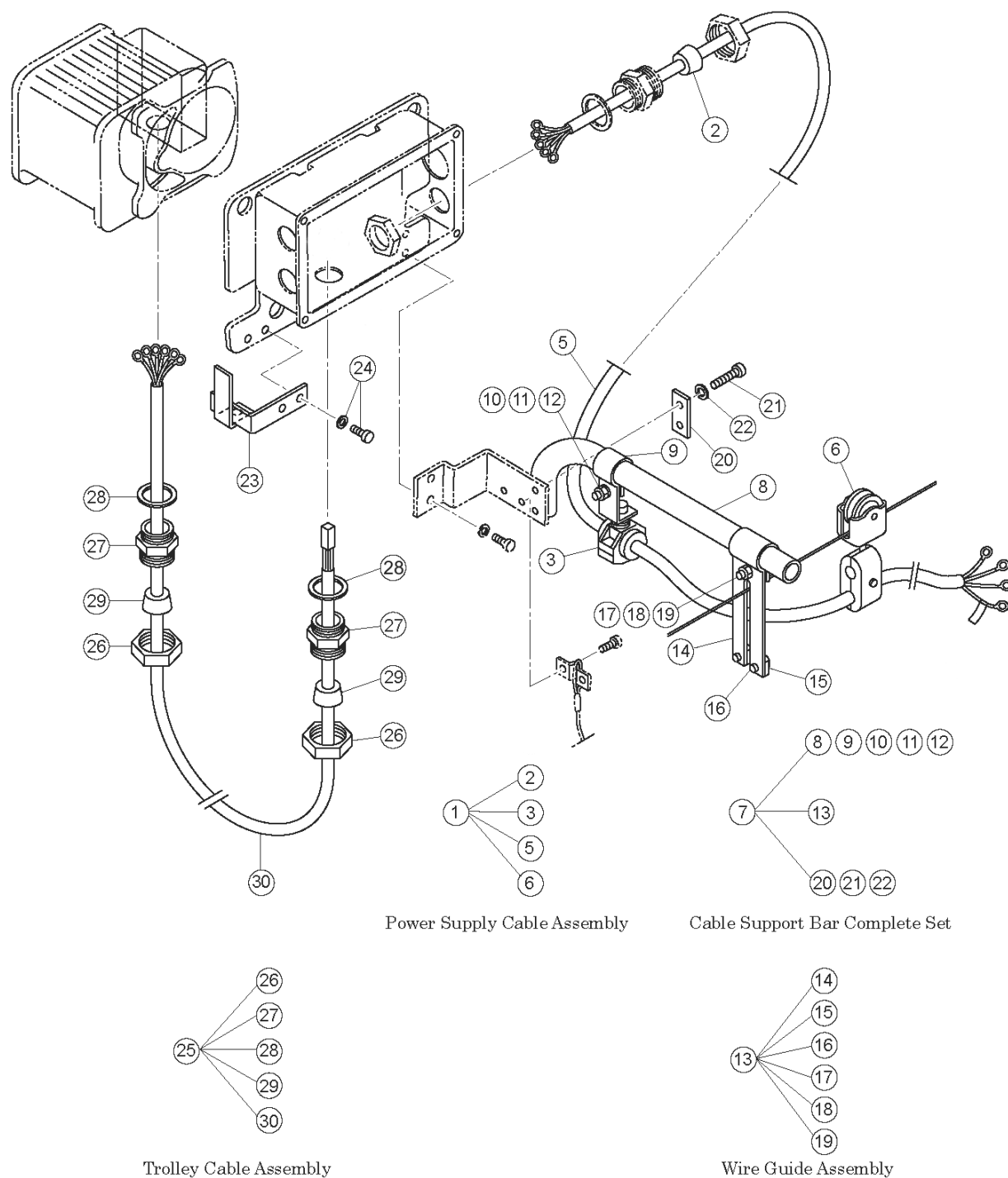


Figure 3-1 Power Supply Parts

2.3 Power Supply Parts – 1/4 to 2 Ton

Figure No.	Part Name	Parts Per Trolley	1 Ton	2 Ton
1	Power Supply Cable 4C Assembly	1	ZBZC12AH1100	ZBZC12BH1100
2	Cable Packing	1	ECP6914AA	ECP6916AA
3	Cable Support 14 Assembly	1	M3ES0101724	
5	Power Supply Cable 4C	1	14/4	12/4
6	Cable Hanger 14 Assembly	A/R	ES1527003	MS1733020
7	Cable Support Bar Assembly	1	MR1DS1491	
8	Cable Support Bar	1	MR1DS9491	
9	Cable Support Arm	1	MR1DS9492	
10	Bolt	1	9093328	
11	Spring Lock Washer	1	9012711	
12	Nut	1	9093424	
13	Wire Guide Assembly	1	MR1DS1493	
14	Wire Guide	1	MR1DS9493	
15	Wire Stopper	1	MR1DS9496	
16	Machine Screw With Spring Washer	2	M6F554010	
17	Bolt	1	9093328	
18	Spring Lock Washer	1	9012711	
19	Nut	1	9093424	
20	Support Bar Holder (Plate)	1	MR1DS9501	
21	Bolt	2	9093329	
22	Spring Lock Washer	2	9012711	
23	Cable Hanger Pusher (Beam 75mm)	1	3AFG010S9511	
	Cable Hanger Pusher (Beam 100-150mm)	1	3AFG010S9512	
24	Socket Bolt With Spring Washer	2	J1BGE1002828	
25	Trolley Cable 6C Assembly	1	MR2DS1793	
26	Holder A	2	ECP5924AA	
27	Holder B	2	ECP5924AB	
28	Packing	2	ECP5924AC	
29	Cable Packing	2	ECP6912AA	
30	Trolley Cable 6C	1	16/6	

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

2.4 Side Plates and Suspension Parts – 1/4 to 2 Ton

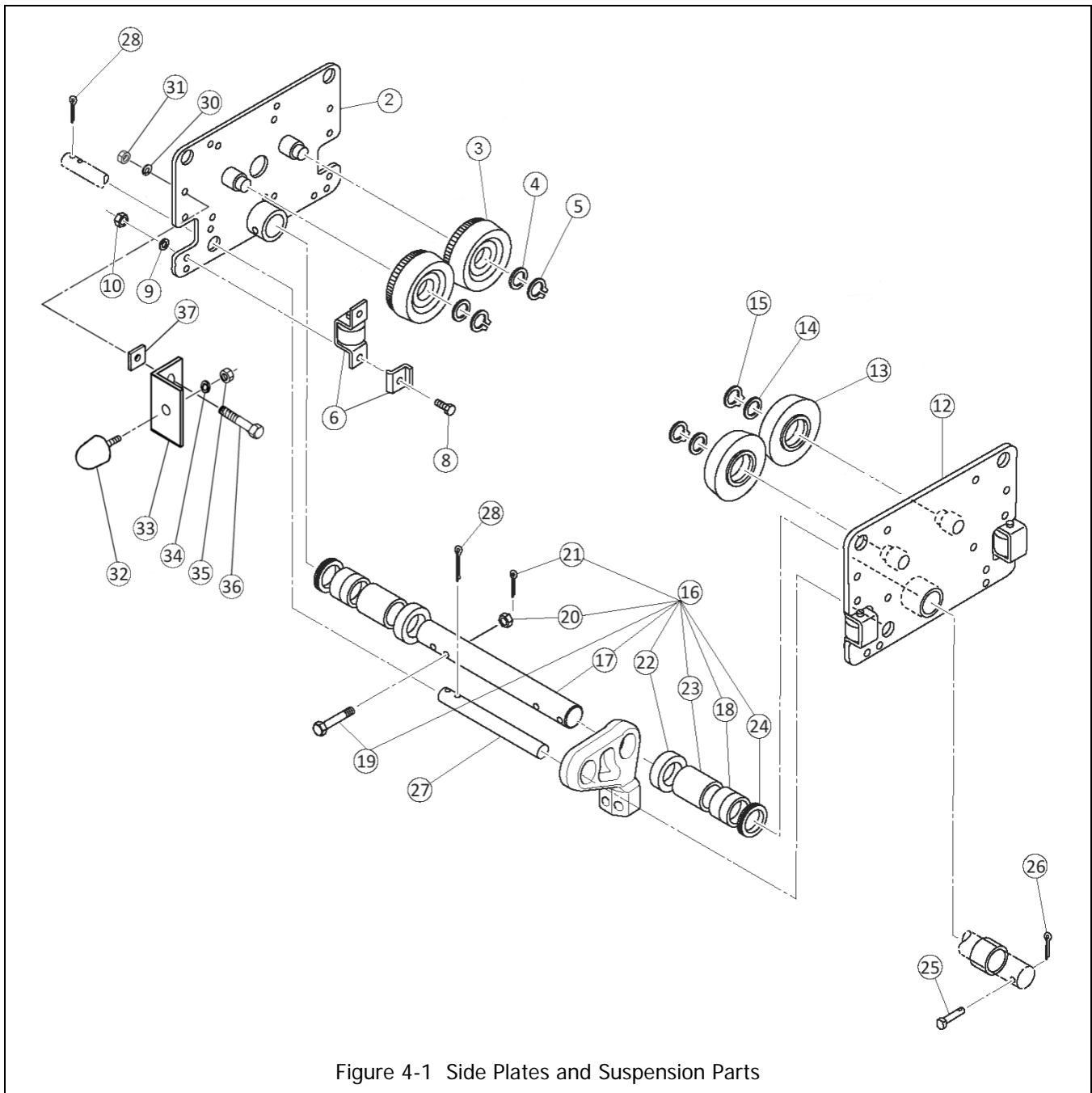


Figure 4-1 Side Plates and Suspension Parts

2.4 Side Plates and Suspension Parts– 1/4 to 2 Ton

Figure No.	Part Name	Parts Per Trolley	1 Ton	2 Ton
2	Side Plate G Assembly – Standard Wheels	1	3AFG010S5201	3AFG020S5201
	Side Plate G Assembly – Stainless Steel Wheels		3AFG010S5801	3AFG020S5801
3	Track Wheel G Assembly – Standard	2	MS1101010	MS1101020
	Track Wheel G Assembly – Stainless Steel		35MW0105101	35MW0205101
4	Washer	2	MS104010	MS104020
5	Snap Ring – Standard	2	9047115	9047120
	Snap Ring – Stainless Steel		J1SS10000015	J1SS10000020
6	Side Roller Assembly – Standard	4	MR1DS1211	MR1ES1211
	Side Roller Assembly – Stainless Steel		3AFG010S2211	3AFG020S2211
8	Bolt	4	J1BAE0803030	J1BAE1003535
9	Spring Lock Washer	4	J1WS07420080	J1WS07420100
10	Nut	4	J1NA00920080	J1NA00920100
12	Side Plate S Assembly – Standard Wheels	1	3AFG010S5202	3AFG020S5202
	Side Plate S Assembly – Stainless Steel Wheels		3AFG010S5802	3AFG020S5802
13	Track Wheel S Assembly – Standard	2	MS1102010	MS1102020
	Track Wheel S Assembly – Stainless Steel		35MW0105102	35MW0205102
14	Washer	2	J1WB07410080	J1WB07410100
15	Snap Ring – Standard	2	9047115	9047120
	Snap Ring – Stainless Steel		J1SS10000015	J1SS10000020
16	Suspension Shaft Assembly – Standard Shaft	1	3AFG010S2101	3AFG020S2101
	Suspension Shaft Assembly – Nickel Plated Shaft		3AFG010S3101	3AFG020S3101
17	Suspension Shaft – Standard	1	MSF115010	MSF115020
	Suspension Shaft – Nickel Plated		3AFG010S9115	3AFG020S9115
18	Thick Spacer	3	MSF116010	T7G116030
19	Bolt	1	3AFG010S9103	3AFG020S9103
20	Slotted Nut	1	J1NL00910100	
21	Split Pin	1	J1PW06025018	
22	Thick Spacer L	2	MR1DS9110	MR1ES9110
24	Thin Spacer	8	MSF117010	MSF117020
25	Shaft Stopper	1	T6G156020	MS164020
26	Split Pin	1	J1PW06040020	
27	Fixing Shaft – Standard	1	MR1DS9131	MR1ES9131
	Fixing Shaft – Nickel Plated		3AFG010S9131	3AFG020S9131
28	Split Pin	2	J1PW06050040	
30	Spring Washer	8	J1WS07420080	
31	Nut	8	J1NA00920080	J1NA00920100
32	Bumper	4	MR1DS9631	
33	Bumper Lug	4	3AFG010S9361	3AFG020S9361
34	Spring Washer	4	J1WS07420080	
35	Nut	4	J1NA00920080	
36	Bolt	8	J1BEB0803535	J1BEB1004526
37	Square Spacer	4	MS006010	MS006020

Extended Suspension Shaft Assemblies

Figure No.	Part Name	Parts Per Trolley	1 Ton	2 Ton
16	Extended Suspension Shaft Assembly – Standard Shaft	1	37FG010S1121	37FG020S1121
	Extended Suspension Shaft Assembly – Nickel Plated Shaft	1	37FG010S3121	37FG020S3121
17	Extended Suspension Shaft – Standard	1	MSF181010	MSF181020
	Extended Suspension Shaft – Nickel Plated		3AFG010S9181	3AFG020S9181
18	Thick Spacer	9	MSF116010	T7G116030
19	Bolt	1	3AFG010S9103	3AFG020S9103
20	Slotted Nut	1	J1NL00910100	
21	Split Pin	1	J1PW06025018	
22	Thick Spacer L	2	MR1DS9110	MR1ES9110
23	Fixing Spacer	2	M7SE010S9182	M7SE020S9182
24	Thin Spacer	8	MSF117010	MSF117020
27	Fixing Shaft – Standard	1	MR1DS9141	MR1ES9141
	Fixing Shaft – Nickel Plated		3AFG010S9141	3AFG020S9141
28	Split Pin	2	J1PW06050040	

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2.5 Motor Parts – 1/4 to 2 Ton

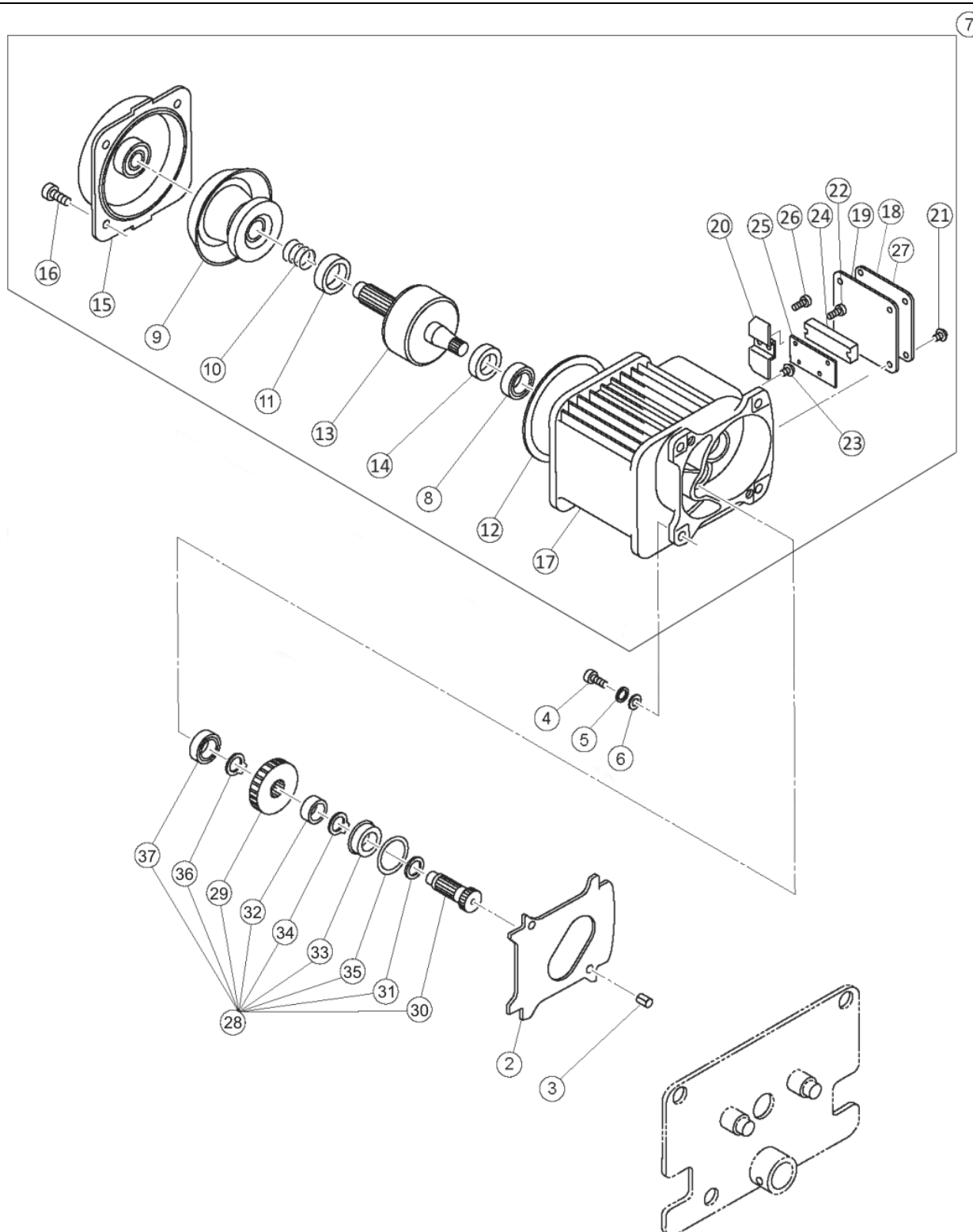


Figure 5-1 Motor Parts

2.5 Motor Parts – 1/4 to 2 Ton

Figure No.	Part Name	Parts Per Trolley	1 Ton	2 Ton
2	Gear Box Packing	1	MR1DS9248	
3	Set Pin	2	MR1DS9249	
4	Bolt	4	J1BAE0802525	
5	Spring Lock Washer	4	J1WS07420080	
6	Washer	4	J1WB07400080	
7	Motor Assembly	1	3AFG010S1321	
8	Ball Bearing	1	9001004	
9	Brake Drum Assembly	1	MR1DS5261	
10	Brake Spring	1	MS304010	
11	Bumper	1	MR1DS9265	
12	Guard	1	MR1DS9281	
13	Motor Shaft With Rotor	1	MR1DS5291	
14	Oil Seal	1	MR1DS9293	
15	Motor Cover Assembly	1	3AFG010S1301	
16	Socket Bolt	4	J1BEE0802222	
17	Motor Frame With Stator	1	3AFG010S5321	
18	Terminal Cover	1	3AFG010S9324	
19	Terminal Cover Packing	1	MR1DS9325	
20	Coil Cover	1	MR1DS9326	
21	Machine Screw With Spring Washer	4	J1AP45001010	
22	Machine Screw With Spring Washer	2	MS556010	
23	Machine Screw With Spring Washer	1	MS555010	
24	Terminal 6P	1	ECP1306AB	
25	Terminal Plate Holder	1	MR1DS9855	
26	Flat Head Tapping Screw	2	9096529	
27	Motor Data Plate	1	IMNBH04VT	
38	Washer	1	J1WD07420050	

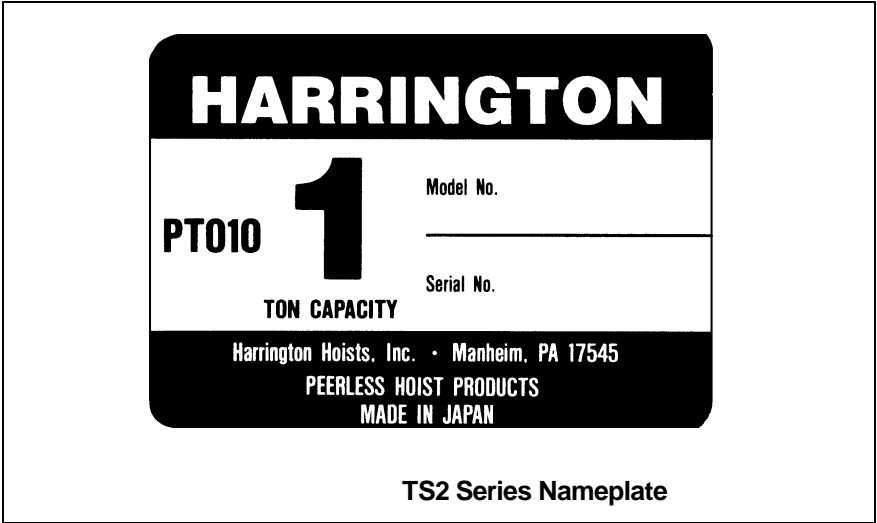
Figure No.	Part Name	Parts Per Trolley	1 Ton S/SD	1 Ton L/LD	2 Ton S/SD	2 Ton L/LD
28	Gear Assembly	1	MR1DS1241	MR1DL1241	MR1ES1241	MR1EL1241
29	Gear #2	1	MR1DS9241	MR1DL9241	MR1DS9241	MR1DL9241
30	Gear #3	1	MR1DS9242		MR1ES9242	
31	O Ring	1	9013316			
32	Spacer	1	MR1DS9244			
33	Ball Bearing	1	9001211			
34	Snap Ring	2	9047120			
35	O Ring	1	MR1DS9254			
36	Snap Ring	1	9047120			
37	Ball Bearing	1	E2D238125			

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3.0 TS2 Parts List

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

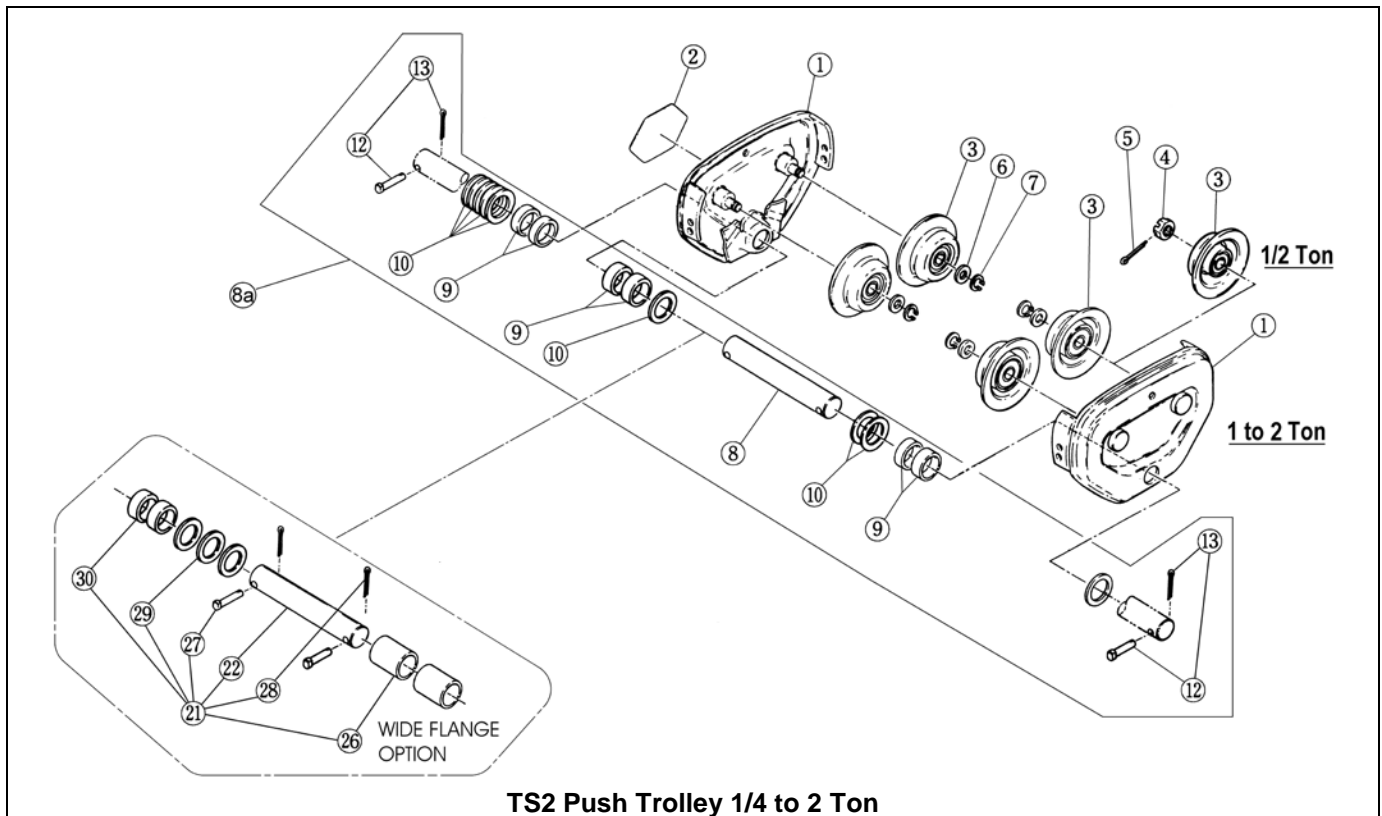
Reminder: To aid in ordering parts and product support, record the hoist code number, lot number and serial number in the space provided on the cover of this manual.



The parts list is arranged into the following sections:

Section ½ to 2 Ton	Page
3.1 TS2 Push Trolley Parts – 1/4 to 2 Ton.....	60
3.2 TS2 Geared Trolley Parts – 1/4 to 2 Ton.....	62

3.1 TS2 Push Trolley Parts – 1/4 to 2 Ton

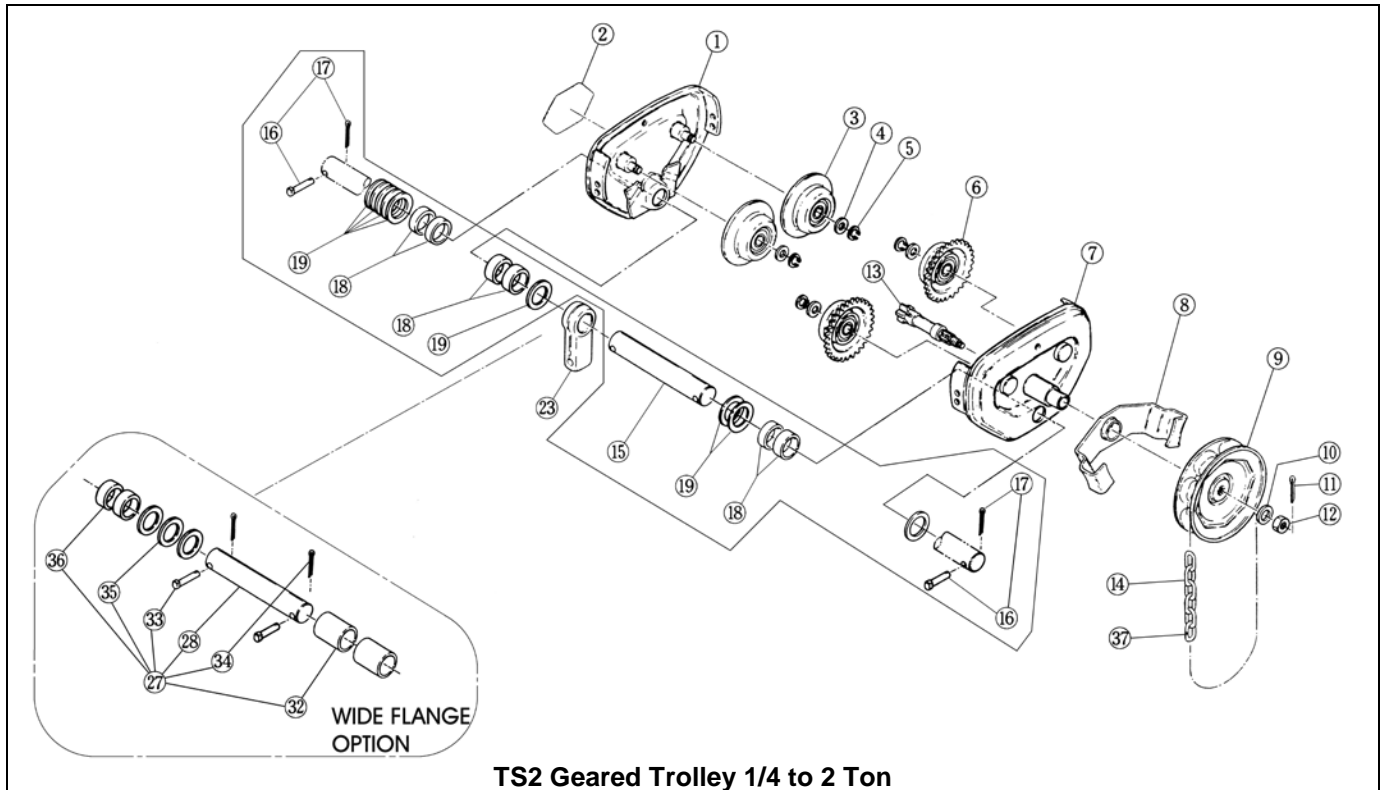


3.1 TS2 Push Trolley Parts – 1/4 to 2 Ton

[illegible]

*Quantity is 1 for 2 Ton.

3.2 TS2 Geared Trolley Parts – 1/4 to 2 Ton



3.2 TS2 Geared Trolley Parts – 1/4 to 2 Ton

Figure No.	Part Name	Parts Per Trolley	1 Ton	2 Ton
1	Side Plate S Assembly – Standard Wheels	1	37FG0105112	37FG0205112
	Side Plate S Assembly – Stainless Steel Wheels		37FG0105812	37FG0205812
2	Name plate B**	1	T6G800010G	T6G800020G
3	Track wheel S Assembly – Standard	2	T6G5102010	T6G5102020
	Track wheel S Assembly – Stainless Steel		37TW0105102	37FG0205812
4	Track wheel washer	4	MS104010	MS104020
5	Snap ring	4	J1SS10000015	J1SS10000020
6	Track wheel G Assembly – Standard	2	T6G5101010	T6G5101020
	Track wheel G Assembly – Stainless Steel		37TW0105101	37TW0205101
7	Side Plate G Assembly	1	37FG0105111	37FG0205111
	Side Plate G Assembly – Stainless Steel Wheels		37FG0105811	37FG0205811
8	Hand chain guide Assembly	1	37FG0105125	
9	Hand wheel - Standard	1	T6G123010	
	Hand Wheel – Nickel Plated		37FG0109123	
10	Washer	1	J1WB07410120	
11	Split pin	1	J1PW06030018	
12	Lever nut	1	J1NU00920120	
13	Pinion	1	T7GC121010	T7GB121020
14	Hand chain	1	K7RA0500000	
15a	Suspension Shaft Assembly – Standard Shaft	1	36FG0101115	36FG0201115
	Suspension Shaft Assembly – Nickel Plated Shaft		37FG0101115	37FG0201115
15	Suspension Shaft – Standard	1	T7G115010	T7G115020
	Suspension Shaft – Nickel Plated		37FG0109115	37FG0209115
16	Shaft stopper pin	2	T6G156010	T6G156020
17	Split pin	2	T6GA0109117(9)	T6GA0209117(8)
18	Thick spacer (qty)	X	T7G116010(6)	T7G116020(6)
19	Thin spacer (qty)	X	T7G117010(9)	T7G117020(8)
23	Suspender E – White Epoxy Paint	1	36FG0109004	36FG0209004
	Suspender E – Nickel Plated		37FG0109004	37FG0209004
27	Suspension Shaft Assembly Extended – Standard Shaft	1	36FG0101136 {4.01 to 8.00"} 36FG0101181 {8.01 to 12.00"} 	36FG0201181 {6.03 to 12.00"}
	Suspension Shaft Assembly Extended – Nickel Plated Shaft		37FG0101136 {4.01 to 8.00"} 37FG0101181 {8.01 to 12.00"} 	37FG0201181 {6.03 to 12.00"}
28	Suspension Shaft – Standard	1	T7PA0109136 {4.01 to 8.00"} T7PA0109181 {8.01 to 12.00"} 	T7GA0209181 {6.03 to 12.00"}
	Suspension Shaft – Nickel Plated		37FG0109136 {4.01 to 8.00"} 37FG0109181 {8.01 to 12.00"} 	37FG0209181 {6.03 to 12.00"}
32	Fixing Spacer	2	T7GA0109137 {5.01 to 8.00"} T7GA0109182 {8.01 to 12.00"} 	T7GA0209182
33	Shaft Stopper pin	*2	T6G156010	T6G156020
34	Split Pin	*2	J1PW06032020	J1PW06040020
35	Thin Spacer	X	T7G117010 (10)	T7G117020 (10)
36	Thick Spacer	X	T7G116010 {5.01 to 8.00"} - (5) {8.01 to 12.00"} - (7)	T7G116020 (11)
37	Hand Chain Master Link	1	C1FA0159843N	

* Quantity is 1 for 2 Ton.

** For ¼ and ½ Ton capacities, Name Plate B will be relabeled at the factory.



Harrington Hoists, Inc.
401 West End Avenue
Manheim, PA 17545

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www.ErgonomicPartners.com
Tel: 314-884-8884

ER2FGSUP-ENG

OWNER'S MANUAL

ELECTRIC CHAIN HOIST NER2 and ER2 SERIES

1/8 Ton through 5 Ton Capacity

Code, Lot and Serial Number

⚠ WARNING

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



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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".

Dual speed units incorporate a VFD as well as a Capacitor. Therefore, DO NOT perform ANY mechanical or electrical maintenance within 5 minutes of powering down to allow time for the capacitor inside the VFD to discharge. DO NOT perform any voltage or insulation resistance tests with a meg ohmmeter when the VFD is connected to the electrical circuit.

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.

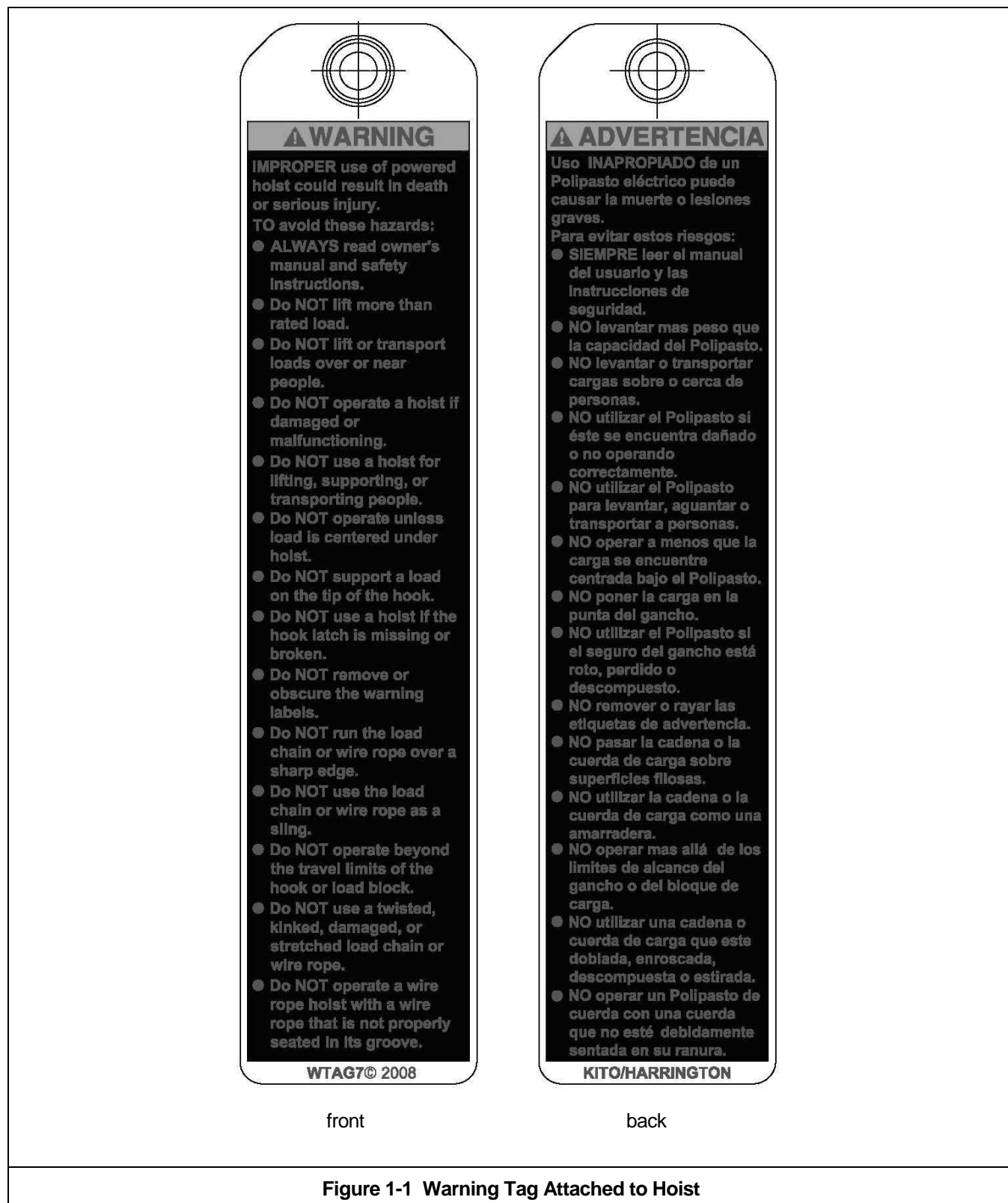
It is the responsibility of the owner/user to have all personnel that will install, inspect, test, maintain, and operate a hoist read the contents of this manual and applicable portions of ANSI/ASME B30.16, "Safety Standard for Overhead Hoists", OSHA Regulations and ANSI/NFPA 70, "National Electric Code". 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.



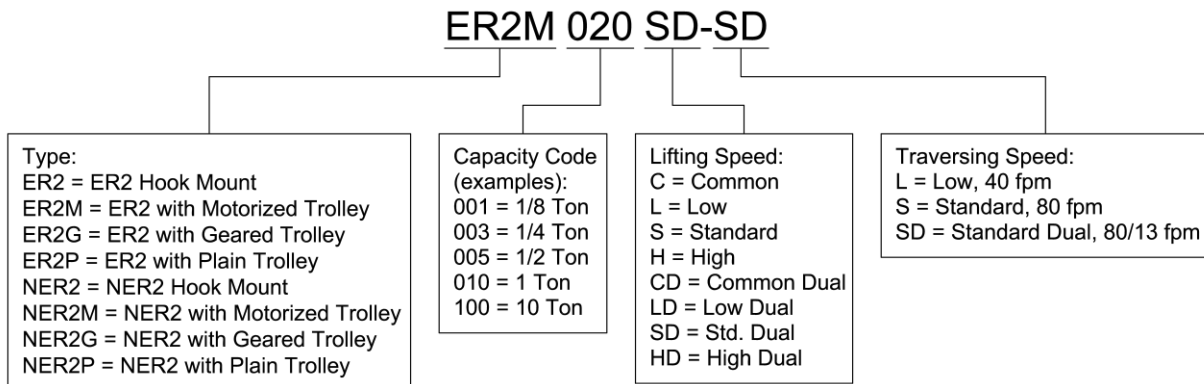
2.0 Technical Information

2.1 Specifications

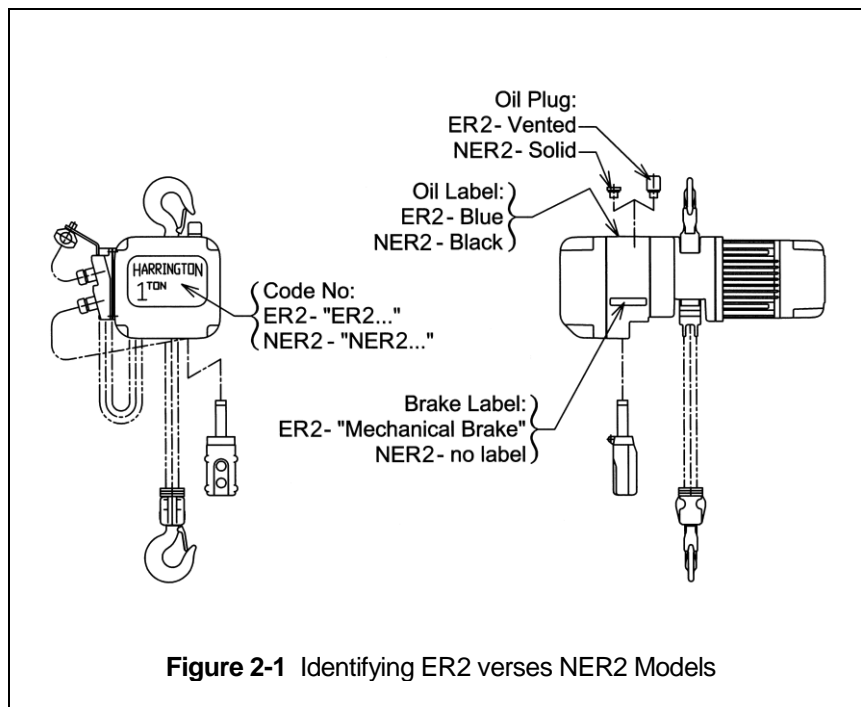
Note: This Owners Manual is for the *Enhanced Features Model* ER and NER. This *Enhanced Features Model* is referred to as the ER2 and NER2 in this Owners Manual.

Pendants are shown with optional *Emergency Stop* button.

2.1.1 Product Code



2.1.2 ER2 and NER2 Models - Harrington ER2 series hoists are available in two versions, the ER2 and NER2. These two versions differ with the presence of a mechanical load brake as standard equipment. The ER2 has a mechanical load brake/friction clutch combination while the NER2 has a friction clutch mechanism that provides over winding protection. Refer to Figure 2-1 for the visual differences between the ER2 and NER2.



2.1.3 Operating Conditions and Environment

Temperature range: -4° to +104°F (-20° to +40°C)
 Humidity: 85% or less
 Noise Level: 85 dB or less (A scale: measured 1 meter away from electric chain hoist)
 Enclosure Rating: Hoist Meets IP55, Pendant Meets IP65
 Supply Voltage: Single Speed Standard: Reconnectable 208/230 & 460V-3-60
 Single Speed Optional: 575V-3-60 or Special Voltages/Frequencies Available
 Dual Speed Standard: 208/230V-3-60 or 460V-3-60
 Dual Speed Optional: 575V-3-60 or Voltages/Frequencies Voltages Available

	Single Speed	Dual Speed
Hoist Duty Rating:	ISO M4/M5/M6; ASME H4	
Intermittent Duty Rating:	60% ED 360 starts per hour	40/20% ED 120/240 starts per hour
Short Time Duty Rating:	60 min.	30/10 min.

Table 2-1 Hoist Specifications

Table 2-1 Hoist Specifications											
Capacity (Ton)	Product Code	Lifting Speed (ft/min)	Motor		Load Chain Wire Diameter (mm) x Chain Fall Lines	Load Sheave Pockets	Net Weight (lbs)		Weight for One Addnl. FT. of Lift (lbs)		
			Output (Hp)	Current Draw (amps)							
				208V or 230V			460V				
SINGLE SPEED	1/8	(N)ER2001H	55	0.75	3.4	1.7	4.3 x 1	6	60	62	0.28
	1/4	(N)ER2003S	36	0.75	3.4	1.7	4.3 x 1	6	60	62	0.28
	1/4	(N)ER2003H	53	1.2	4.8	2.5	6.0 x 1	5	79	82	0.54
	1/2	(N)ER2005L	15	0.75	3.4	1.7	6.0 x 1	5	71	79	0.54
	1/2	(N)ER2005S	29	1.2	4.8	2.5	6.0 x 1	5	79	82	0.54
	1	(N)ER2010L	14	1.2	4.8	2.5	7.7 x 1	5	104	110	0.89
	1	(N)ER2010S	28	2.4	8.6	4.2	7.7 x 1	5	119	119	0.89
	1 1/2	(N)ER2015S	18	2.4	8.6	4.2	10.2 x 1	5	159	170	1.6
	2	(N)ER2020C	7	1.2	4.8	2.5	7.7 x 2	5	130	134	1.8
	2	(N)ER2020L	14	2.4	8.6	4.2	10.2 x 1	5	161	174	1.6
	2	(N)ER2020S	28	4.7	16.4	7.9	10.2 x 1	5	201	198	1.6
	2 1/2	(N)ER2025S	22	4.7	16.4	7.9	11.2 x 1	5	227	225	1.9
	3	(N)ER2030C	17	4.7	16.4	7.9	10.2 x2	5	234	234	3.2
	5	(N)ER2050L	11	4.7	16.4	7.9	11.2 x 2	5	289	284	3.8
DUAL SPEED	1/8	(N)ER2001HD	55/9	0.75	3.6	1.8	4.3 x 1	6	60	64	0.28
	1/4	(N)ER2003SD	36/6	0.75	3.6	1.8	4.3 x 1	6	60	64	0.28
	1/4	(N)ER2003HD	53/9	1.2	5.1	2.7	6.0 x 1	5	77	82	0.54
	1/2	(N)ER2005LD	15/2.5	0.75	3.6	1.8	6.0 x 1	5	68	79	0.54
	1/2	(N)ER2005SD	29/5	1.2	5.1	2.7	6.0 x 1	5	77	82	0.54
	1	(N)ER2010LD	14/2.5	1.2	5.1	2.7	7.7 x 1	5	99	108	0.89
	1	(N)ER2010SD	28/4.5	2.4	9.1	4.5	7.7 x 1	5	115	117	0.89
	1 1/2	(N)ER2015SD	18/3	2.4	9.1	4.5	10.2 x 1	5	159	172	1.6
	2	(N)ER2020CD	7/1	1.2	5.1	2.7	7.7 x 2	5	123	132	1.8
	2	(N)ER2020LD	14/2.5	2.4	9.1	4.5	10.2 x 1	5	161	174	1.6
	2	(N)ER2020SD	28/4.5	4.7	17.3	8.3	10.2 x 1	5	196	203	1.6
	2 1/2	(N)ER2025SD	22/3.5	4.7	17.3	8.3	11.2 x 1	5	218	231	1.9
	3	(N)ER2030CD	17/3	4.7	17.3	8.3	10.2 x 2	5	229	238	3.2
	5	(N)ER2050LD	11/2	4.7	17.3	8.3	11.2 x 2	5	280	293	3.8

2.2 Dimensions

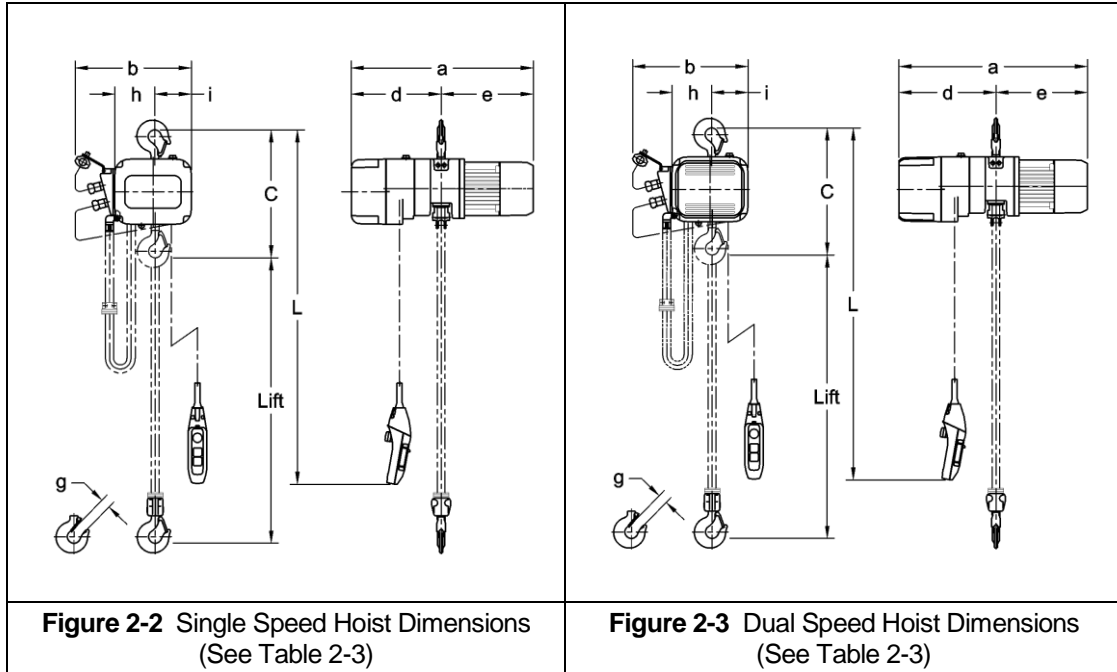


Table 2-2 Hook Dimension*							
<div style="display: flex; align-items: center; justify-content: space-between;"> <div> <p>T = Top Hook B = Bottom Hook Units = inch</p> </div> </div>							
Capacity Code	Hook	a	b	c	d	e	g
001H, 003S, 003H, 005L, 005S	T & B	1.1	0.7	0.9	0.7	1.4	1.1
001HCC, 003SCC	T	1.1	0.7	0.9	0.7	1.4	1.1
	B	0.8	0.5	0.7	0.5	1.4	1.1
010L, 010S	T & B	1.5	0.9	1.2	0.9	1.7	1.2
020C	T & B	1.9	1.1	1.6	1.1	2.0	1.5
015S	T	2.0	1.3	1.7	1.3	2.1	1.5
	B	1.7	1.1	1.5	1.1	1.9	1.4
020L, 020S	T & B	2.0	1.3	1.7	1.3	2.1	1.6
025S	T	2.0	1.3	1.7	1.3	2.4	1.7
	B	2.0	1.3	1.7	1.3	2.1	1.6
030L, 030C	T & B	2.2	1.4	1.9	1.4	2.4	1.8
050L	T & B	2.6	1.7	2.2	1.7	2.5	1.9

*Refer to Section 5.7 for inspection dimensions and limits.

Table 2-3 Hoist Dimensions

	Product Code	Minimum Headroom C (in)	L* (ft)	a (in)		b (in)		d (in)		e (in)		g (in)	h (in)	i (in)	
				NER	ER	NER	ER	NER	ER	NER	ER			NER	ER
SINGLE SPEED	(N)ER2001H	13.8	8.2	18.8	22.2	12.6	13.6	8.6	12.0	10.2	10.2	1.1	3.9	3.7	4.6
	(N)ER2003S	13.8	8.2	18.8	22.2	12.6	13.6	8.6	12.0	10.2	10.2	1.1	3.9	3.7	4.6
	(N)ER2003H	14.6	8.2	20.0	23.3	13.7	13.7	9.5	12.8	10.5	10.5	1.1	4.4	4.2	4.2
	(N)ER2005L	14.6	8.2	20.2	23.5	13.7	13.7	9.5	12.8	10.6	10.7	1.1	4.4	4.2	4.2
	(N)ER2005S	14.6	8.2	20.0	23.3	13.7	13.7	9.5	12.8	10.5	10.5	1.1	4.4	4.2	4.2
	(N)ER2010L	16.9	8.2	23.2	24.9	14.8	14.8	11.4	13.1	11.7	11.8	1.2	5.1	4.6	4.6
	(N)ER2010S	16.9	8.2	23.5	25.2	14.8	14.8	11.4	13.1	12.1	12.1	1.2	5.1	4.6	4.6
	(N)ER2015S	20.1	8.2	25.4	29.0	16.8	16.8	12.1	15.6	13.3	13.4	1.4	6.3	5.4	5.4
	(N)ER2020C	27.8	8.2	23.2	24.9	14.8	14.8	11.4	13.1	11.7	11.8	1.5	7.0	2.7	2.7
	(N)ER2020L	22.6	8.2	25.4	29.0	16.8	16.8	12.1	15.6	13.3	13.4	1.6	6.3	5.4	5.4
	(N)ER2020S	23.2	8.2	27.6	30.8	16.8	16.8	13.6	16.8	14.0	14.0	1.6	6.3	5.4	5.4
	(N)ER2025S	24.6	8.2	28.9	32.5	17.5	17.5	13.2	16.8	15.7	15.7	1.6	6.9	5.6	5.6
	(N)ER2030C	32.9	9.2	27.6	30.8	16.8	16.8	13.6	16.8	14.0	14.0	1.8	8.5	3.2	3.2
	(N)ER2050L	33.5	9.2	28.9	32.5	17.5	17.5	13.2	16.8	15.7	15.7	1.9	9.1	3.3	3.3
DUAL SPEED	(N)ER2001HD	13.8	8.2	21.0	22.2	13.6		10.8	12.0	10.2	10.2	1.1	3.9	4.6	
	(N)ER2003SD	13.8	8.2	21.0	22.2	13.6		10.8	12.0	10.2	10.2	1.1	3.9	4.6	
	(N)ER2003HD	14.6	8.2	22.3	23.3	13.7		11.8	12.8	10.5	10.5	1.1	4.4	4.2	
	(N)ER2005LD	14.6	8.2	22.4	23.5	13.7		11.8	12.8	10.6	10.7	1.1	4.4	4.2	
	(N)ER2005SD	14.6	8.2	22.3	23.3	13.7		11.8	12.8	10.5	10.5	1.1	4.4	4.2	
	(N)ER2010LD	16.9	8.2	24.1	24.9	14.8		12.4	13.1	11.7	11.8	1.2	5.1	4.6	
	(N)ER2010SD	16.9	8.2	24.5	25.2	14.8		12.4	13.1	12.1	12.1	1.2	5.1	4.6	
	(N)ER2015SD	20.1	8.2	27.9	29.0	16.8		14.6	15.6	13.3	13.4	1.4	6.3	5.4	
	(N)ER2020CD	27.8	8.2	24.1	24.9	14.8		12.4	13.1	11.7	11.8	1.5	7.0	2.7	
	(N)ER2020LD	22.6	8.2	27.9	29.0	16.8		14.6	15.6	13.3	13.4	1.6	6.3	5.4	
	(N)ER2020SD	23.2	8.2	30.2	30.8	16.8		16.2	16.8	14.0	14.0	1.6	6.3	5.4	
	(N)ER2025SD	24.6	8.2	31.5	32.5	17.5		15.8	16.8	15.7	15.7	1.6	6.8	5.6	
	(N)ER2030LD	TBD	TBD	TBD	TBD	TBD		TBD	TBD	TBD	TBD	TBD	TBD	TBD	
	(N)ER2030CD	32.9	9.2	30.2	30.8	16.8		16.2	16.8	14.0	14.0	1.8	8.5	3.2	
	(N)ER2050LD	33.5	9.2	31.5	32.5	17.5		15.8	16.8	15.7	15.7	1.9	9.1	3.4	

*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. The ER2 and NER2 hoists have different checking procedures. Refer to Section 6.3 for specific checking procedures.
- 3.1.2 Refer to Section 6.3 when replacing the gear oil.
- 3.1.3 All ER2, mechanical load brake equipped hoists, are shipped with a separate air vented oil cap. This vented oil cap must be installed prior to use. To install, remove an existing oil plug and replace with the vented oil cap (refer to Figure 3-1).
- 3.1.4 There are two oil fill holes located in the top of the gear case on the ER2 hoist. For ER2 coupled to MR2 trolley, there are some flange widths that make it necessary to relocate the oil cap assembly to the other oil fill hole. This will prevent interference with trolley side plate. Refer to Figure 3-1.

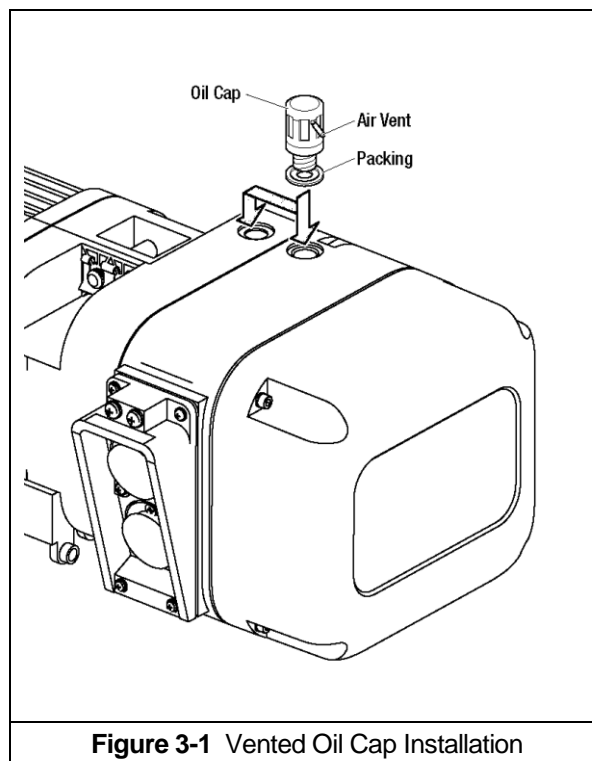


Figure 3-1 Vented Oil Cap Installation

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 limits 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 3-2, 3-3. 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 3-4. Connect the no load end of the chain to Chain Guide A with the End Suspenders 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 3-1 for proper placement of Stopper.

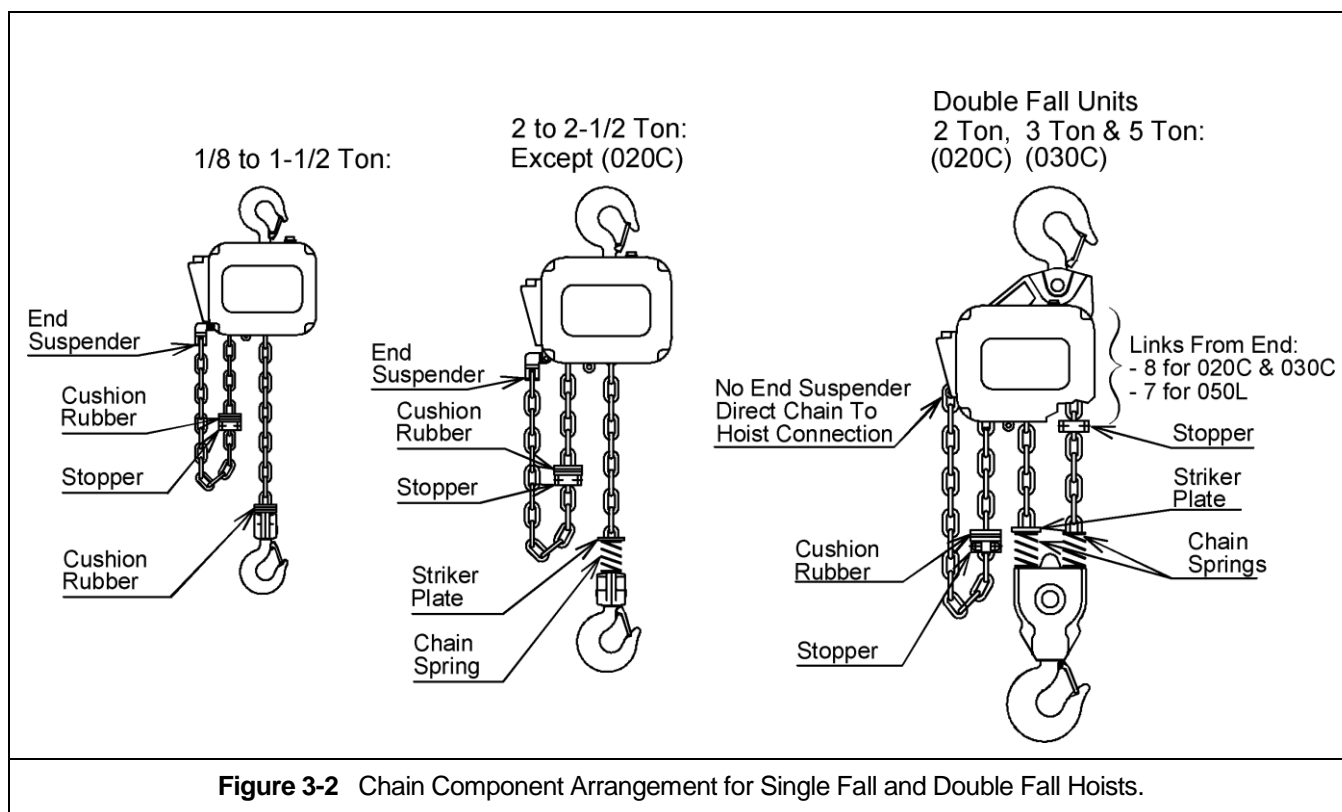
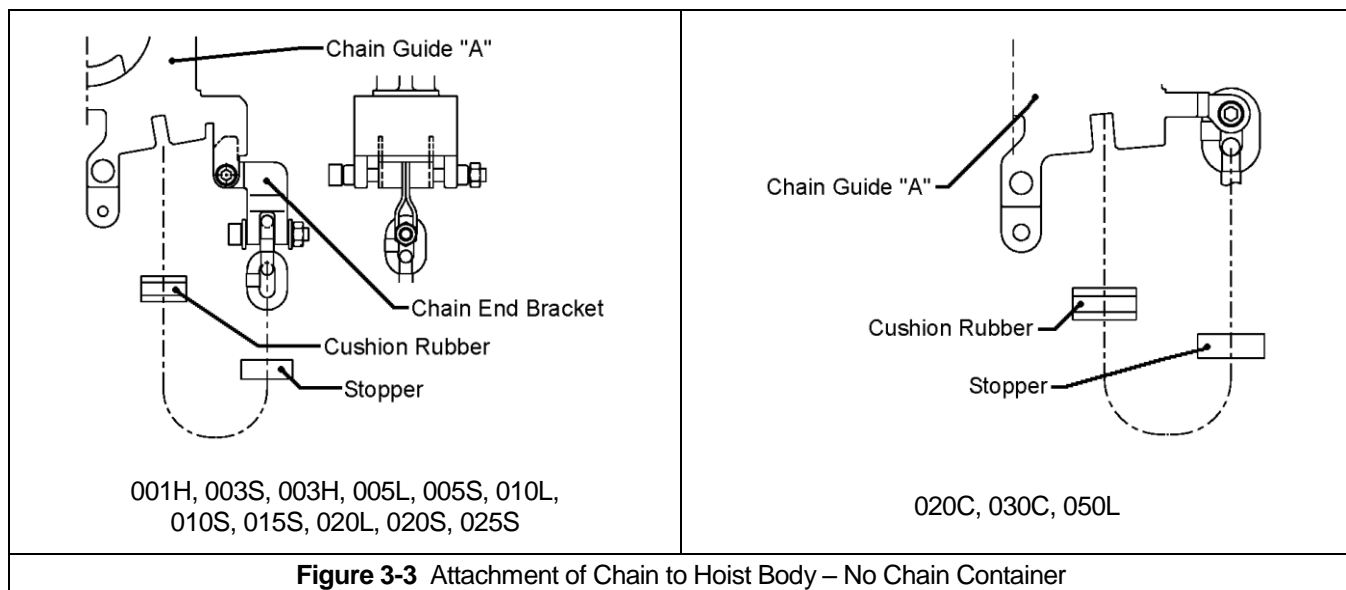


Figure 3-2 Chain Component Arrangement for Single Fall and Double Fall Hoists.

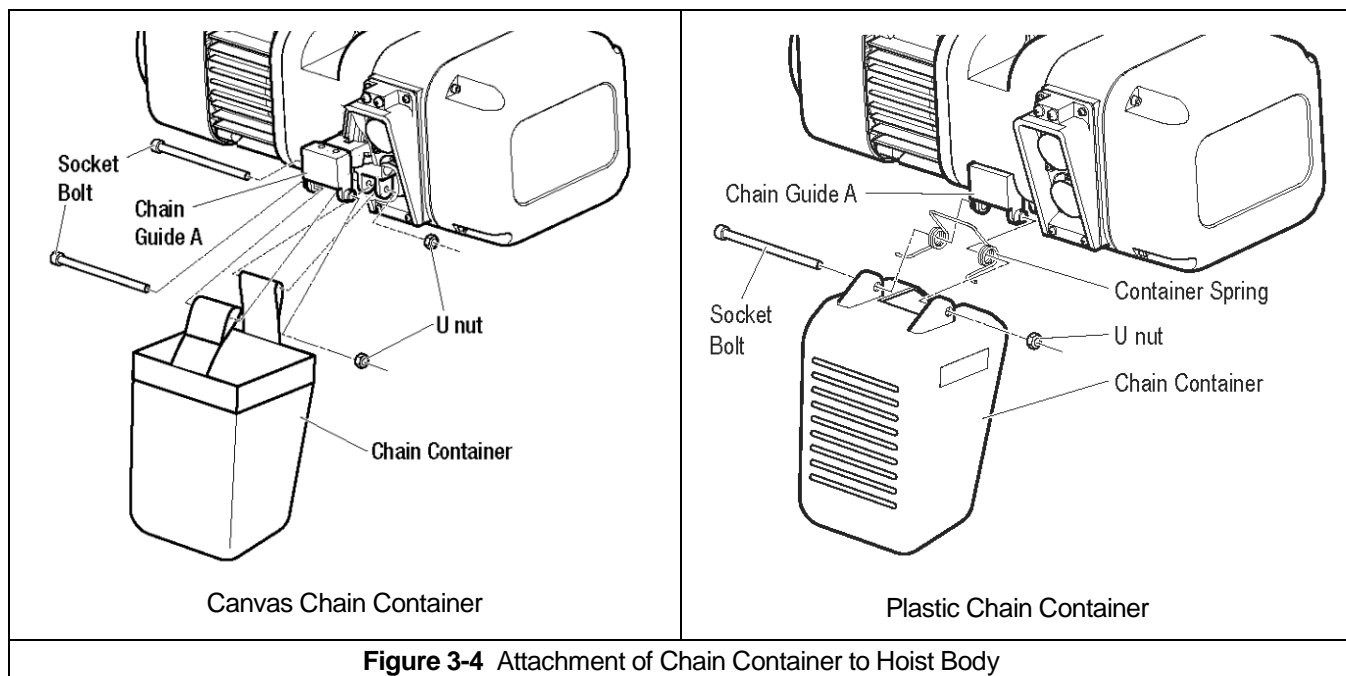
Table 3-1 Chain Stopper Placement		
Capacity Code	Without Chain Container	With Chain Container
001H & 003S	21 st link from the free end	3 rd link from the free end
003H, 005L, 005S, 010L, 010S, 015S, 020C, 020L, 020S, 025S, 030L, 030C, 050L	15 th link from the free end	3 rd link from the free end

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



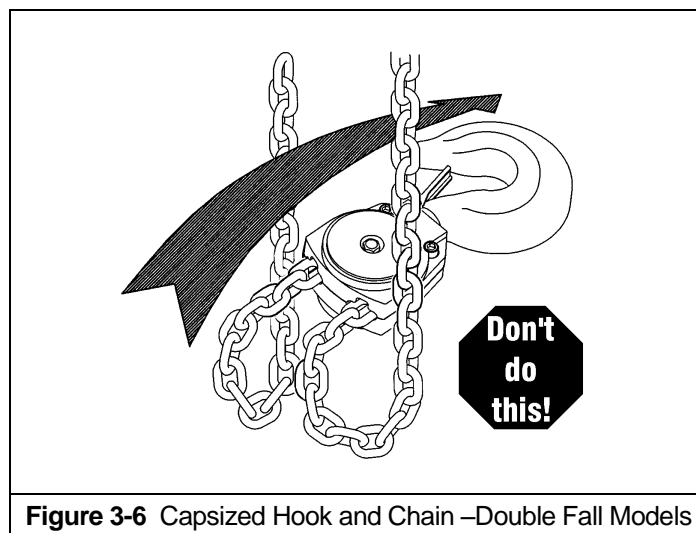
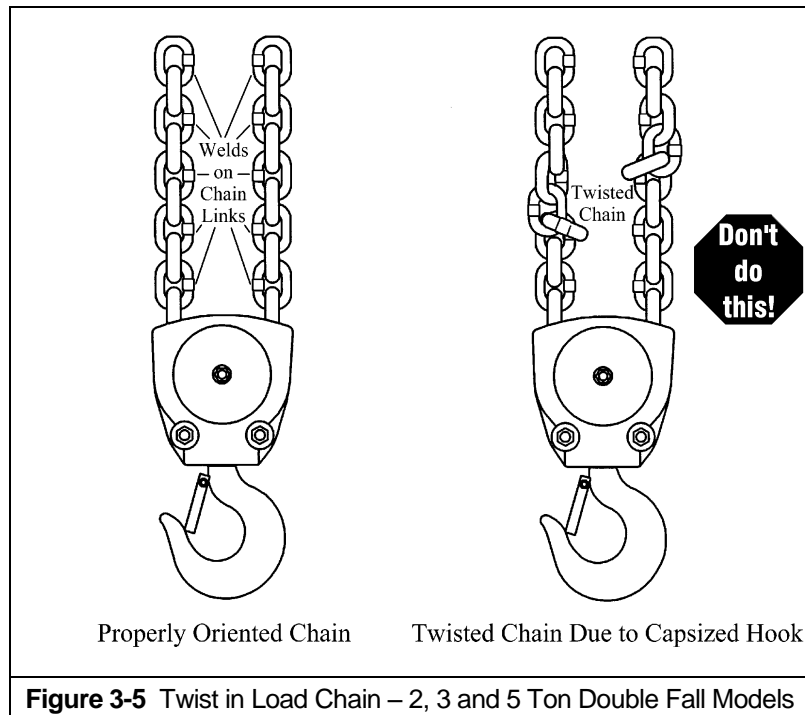
3.2.3 **Optional Canvas or Plastic Chain Container** - When the optional canvas chain container is selected, fully unfold and install it on the hoist body as shown in Figure 3-4. When installing the optional plastic chain container, pass the socket bolt through the holes in this order: the chain container, the bucket spring, the chain guide A, the bucket spring, and the chain container. Be sure to mount the bucket spring in correct direction as shown in Figure 3-4. 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.

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



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

3.2.6 **⚠ WARNING** Verify that the load chain is not twisted or tangled prior to operating the hoist. Make sure the bottom hook on 2, 3 and 5 Ton double fall models is not capsized. See Figures 3-5 and 3-6. Correct all chain irregularities before conducting the first hoist operation.



3.3 Mounting Location

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

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

3.4 Mounting the Hoist

- 3.4.1 Manual Trolley - Follow instructions in Owner's Manual provided with the trolley.
- 3.4.2 Motorized Trolley - Follow instructions in Owner's Manual provided with the trolley.
- 3.4.3 Hook Mounted to a Fixed Location - Attach the hoist's top hook to the fixed suspension point.
- 3.4.4 **⚠ WARNING** Ensure that the fixed suspension point rests on the center of the hook's saddle and that the hook's latch is engaged.

3.5 Electrical Connections

- 3.5.1 **⚠ CAUTION** Ensure that the voltage of the electric power supply is proper for the hoist or trolley.
- 3.5.2 **⚠ CAUTION** Do NOT apply electronic soft-start control or voltage varying controls to the ER2 or NER2 hoist. Use of such devices may cause the motor brake and other electrical components to malfunction. Variable frequency drives MAY be used with the single speed ER2/NER2 hoists, contact Harrington Hoists, Inc. for more information.
- 3.5.3 **⚠ DANGER** Before proceeding, ensure that the electrical supply for the hoist or trolley has been de-energized (disconnected). Lock out and tag out in accordance with ANSI Z244.1 "Personnel Protection -Lockout/Tagout of Energy Sources".
- 3.5.4 **⚠ DANGER** To avoid a shock hazard, **DO NOT** perform **ANY** mechanical or electrical maintenance on the dual speed (VFD control) trolley or hoist within 5 minutes of de-energizing (disconnecting) the trolley or hoist. This time allows the internal VFD capacitor to safely discharge.
- 3.5.5 **⚠ DANGER** Do NOT remove power to the dual speed (VFD control) hoist or trolley during operation.
- 3.5.6 **⚠ CAUTION** All dual speed hoists are equipped with a VFD. The VFD is used to control the high and low lifting speeds. The speeds come preset from the factory (See Table 3-6). Speed (frequency) can be customized. Refer to Section 3.6.10 for hoist specific speed ranges and instructions.
- 3.5.7 The following instructions apply when the hoist is hook mounted to a fixed suspension point or installed on a manual trolley. The hoist is controlled by a pendant with two push buttons – one for raising and one for lowering. Refer to the appropriate trolley Owner's Manual if the hoist is installed on a motorized trolley. Special wiring considerations must be taken if the trolley is used with a trolley other than an MR2 model.

Pendant Cord

The Pendant Cord connects to the hoist via an 8-pin (8P) Plug and Socket. Make this connection as follows:

- Refer to Figure 3-7.
- Insert the 8P Plug into the 8P Socket on the hoist and hand-tighten the Lock Ring.
- Attach the Cord Strain Relief Cable to the Cord Support on the bottom of the hoist.

Power Supply Cable - Hoist Connection

The Power Supply Cable connects to the hoist via a 4-pin (4P) Plug and Socket. Make this connection as follows:

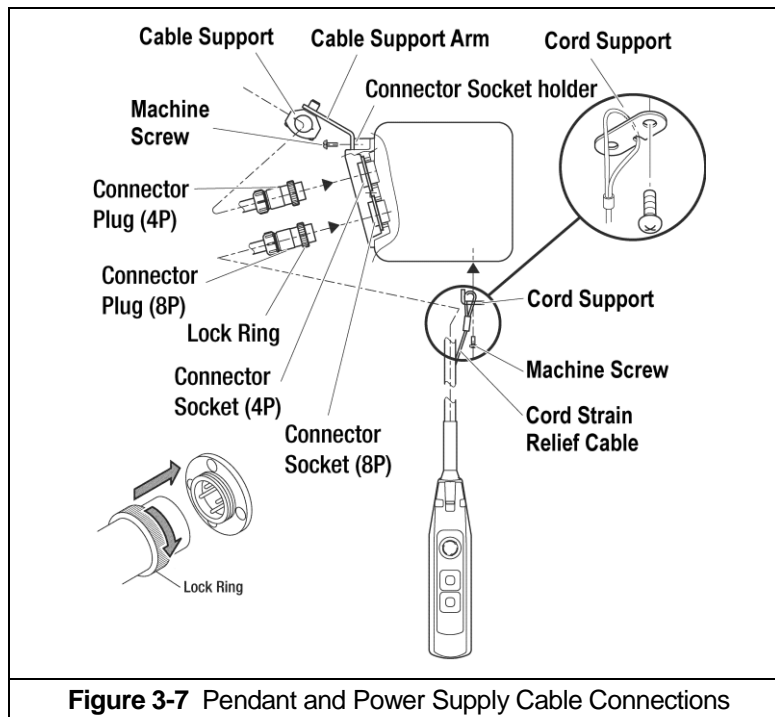
- Refer to Figure 3-7.
- Insert the 4P plug of the Power Supply Cable into the 4P Socket on the hoist and hand-tighten the Lock Ring.
- Install the Cable Support Arm (pre-installed on the Power Supply Cable) on to the Socket Holder using the pre-installed Machine Screws and Lock Washers.
- Use care to avoid twisting or kinking the Power Supply Cable.

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 as shown in Figure 3-7.
- 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.



- 3.5.8 Connection to Electrical Power Source - The red, blue and black wires of the Power Supply Cable should be connected to an Electric Power Disconnect Switch or Circuit Breaker. This connection should be made so that the hoist is phased properly. Refer to Section 3.7.11 for instructions on how to check for correct power supply phase connection.
- 3.5.9 Fuse/Breaker Capacity -The hoist's power supply should be equipped with current overload protection such as fuses, which should be selected for 110% to 120% of total listed full load amperage, and should be dual element time-delay fuses. Refer to the motor nameplate for the full load amperage draw.
- 3.5.10 **⚠ DANGER** Grounding - An improper or insufficient ground connection creates an electrical shock hazard when touching any part of the hoist or trolley. In the Power Supply Cable the ground wire will be either Green with Yellow stripe or solid Green. It should always be connected to a suitable ground connection. Do not paint the trolley wheel running surfaces of the beam as this can affect grounding.

3.6 VFD Setup (Dual Speed Only)

- 3.6.1 **⚠ DANGER** To avoid a shock hazard, **DO NOT** perform **ANY** mechanical or electrical maintenance on the dual speed (VFD control) trolley or hoist within 5 minutes of de-energizing (disconnecting) the trolley or hoist. This time allows the internal VFD capacitor to safely discharge.
- 3.6.2 **⚠ WARNING** Do Not remove power to the dual speed (VFD control) hoist or trolley during operation.
- 3.6.3 All dual speed hoists are equipped with a VFD. The VFD is used to control the high and low lifting speeds. The speeds come preset from the factory (Table 3-6). Speed (frequency) can be customized. Refer to Section 3.6.10 for hoist specific speed ranges and instructions.
- 3.6.4 The VFD is controlled by a Keypad/Display Interface. Refer to Figure 3-8 for Keypad/Display Interface functions and descriptions.

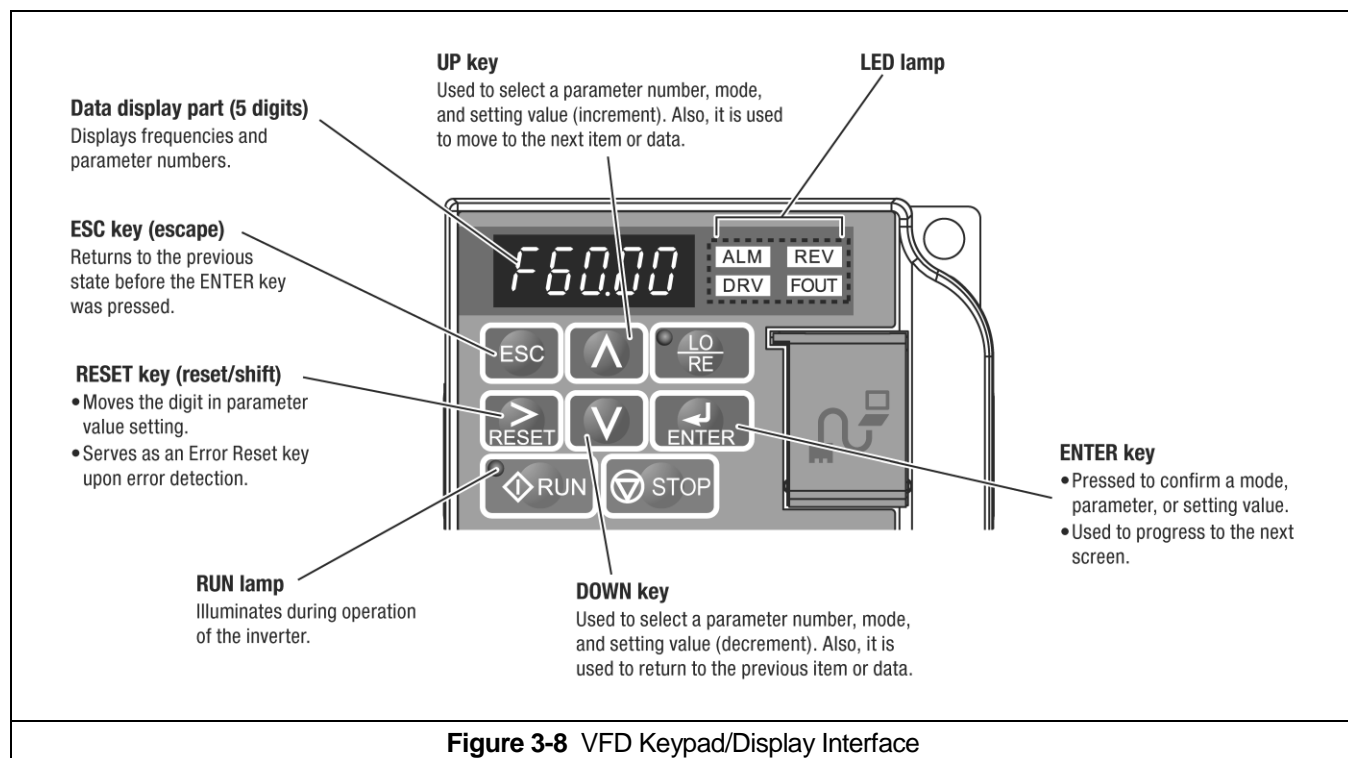




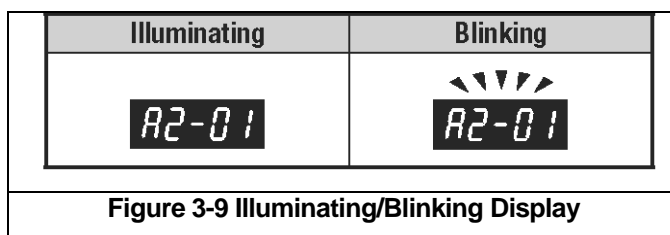
Figure 3-8 VFD Keypad/Display Interface

- 3.6.5 When power is supplied to the hoist the VFD LED operator display will illuminate as shown Table 3-2.

Table 3-2 LED Operator Display

No	Name	Description
Normal		The frequency command monitor is displayed in the data display part. DRV illuminates.
Error	 Example: Main circuit low voltage	The display varies depending on the error. ALM and DRV illuminate.




3.6.6 During operation the data display will exhibit illuminating or blinking data as shown in Figure 3-9.








3.6.7 The digital display uses a seven segment character to form the specific characters used in the display. Table 3-3 shows the corresponding digital characters to its English equivalent.

Table 3-3 Digital Character Key							
Character	Digital Display	Character	Digital Display	Character	Digital Display	Character	Digital Display
0	0	9	9	I	l	R	ρ
1	1	A	A	J	9	S	Σ
2	2	B	β	K	τ	T	Γ
3	3	C	X	L	Λ	U	Υ
4	4	D	δ	M	π	V	ω
5	5	E	E	N	N	W	υ
6	6	F	Φ	O	o	X	No Display
7	7	G	Γ	P	Π	Y	Ψ
8	8	H	H	Q	θ	Z	No Display

3.6.8 The LED Lamp display provides hoist status. Table 3-4 shows some of the status displays.

Table 3-4 LED Lamp Display			
Lamp	Illuminating	Blinking	Off
ALM	Upon error detection	<ul style="list-style-type: none"> • Upon detection of minor failure • Upon detection of an OPE (operation error) 	Normal
REV	Inputting a reverse rotation command	—	Inputting a forward rotation command
DRV	In the drive mode	—	In the program mode
FOUT	Displaying output frequency (Hz)	—	—
Description in this document			

3.6.9 The Run Lamp display provides hoist “RUN” status. Table 3-5 shows the various “RUN” displays.

Table 3-5 Run Lamp				
Lamp	Illuminating	Blinking	Short blinking	Off
	During operation	<ul style="list-style-type: none"> During deceleration/ stop Inputting a driving command with the frequency command 0 	<ul style="list-style-type: none"> During deceleration due to an emergency stop During deceleration During a stop due to driving interlock operation 	During a stop
Description in this document				

3.6.10 All of the hoists have speed/frequency ranges that can be customized to a specific application. Refer to Table 3-6 for specific hoist speed/frequency ranges. To set custom speeds for an application, follow the procedure listed in Table 3-7.

Table 3-6 VFD Speed & Frequency Ranges											
Product Code	Hoist Speed (ft/min)			VFD Frequency (Hz)							
	Range*	Low	High	NER2				ER2			
				Low (d1-01)		High (d1-02)		Low (d1-01)		High (d1-02)	
				230V	460V	230V	460V	230V	460V	230V	460V
(N)ER2001HD	Low	4.5	55	3.2	3.3	57.0	57.0	4.9	3.3	57.5	57.0
	Std	9.0	55	8.3	8.2	57.0	57.0	9.7	7.8	57.5	57.0
(N)ER2003SD	Low	3.0	36	3.2	3.3	57.0	57.0	4.9	3.3	57.5	57.0
	Std	6.0	36	8.3	8.2	57.0	57.0	9.7	7.8	57.5	57.0
(N)ER2003HD	Low	4.3	53	2.6	2.5	53.5	54.0	2.8	2.5	55.0	54.0
	Std	9.0	53	7.3	7.3	53.5	54.0	8.0	7.2	55.0	54.0
(N)ER2005LD	Low	1.2	15	3.2	3.3	57.0	57.0	4.9	3.3	57.5	57.0
	Std	2.5	15	8.3	8.2	57.0	57.0	9.7	7.8	57.5	57.0
(N)ER2005SD	Low	2.3	29	2.6	2.5	53.5	54.0	2.8	2.5	55.0	54.0
	Std	5.0	29	7.3	7.3	53.5	54.0	8.0	7.2	55.0	54.0
(N)ER2010LD	Low	1.1	14	2.6	2.5	53.5	54.0	2.8	2.5	55.0	54.0
	Std	2.5	14	7.3	7.3	53.5	54.0	8.0	7.2	55.0	54.0
(N)ER2010SD	Low	2.2	28	2.3	2.1	53.0	53.5	2.7	3.0	53.0	53.5
	Std	4.5	28	7.3	7.0	53.0	53.5	8.2	7.5	53.0	53.5
(N)ER2015SD	Low	1.4	18	2.3	2.1	53.0	53.5	2.7	3.0	53.0	53.5
	Std	3.0	18	7.3	7.0	53.0	53.5	8.2	7.5	53.0	53.5
(N)ER2020CD	Low	0.5	7.0	2.6	2.5	53.5	54.0	2.8	2.5	55.0	54.0
	Std	1.0	7.0	7.3	7.3	53.5	54.0	8.0	7.2	55.0	54.0
(N)ER2020LD	Low	1.0	14.0	2.3	2.1	53.0	53.5	2.7	3.0	53.0	53.5
	Std	2.5	14.0	7.3	7.0	53.0	53.5	8.2	7.5	53.0	53.5
(N)ER2020SD	Low	2.2	28	2.6	3.0	54.0	55.0	2.8	3.0	52.0	55.0
	Std	4.5	28	7.9	7.7	54.0	55.0	8.0	7.7	52.0	55.0
(N)ER2025SD	Low	1.8	22	2.6	3.0	54.0	55.0	2.8	3.0	52.0	55.0
	Std	3.5	22	7.9	7.7	54.0	55.0	8.0	7.7	52.0	55.0
(N)ER2030LD	Low	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Std	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
(N)ER2030CD	Low	1.4	17	2.6	3.0	54.0	55.0	2.8	3.0	52.0	55.0
	Std	3.0	17	7.9	7.7	54.0	55.0	8.0	7.7	52.0	55.0
(N)ER2050LD	Low	0.9	11	2.6	3.0	54.0	55.0	2.8	3.0	52.0	55.0
	Std	2	11	7.9	7.7	54.0	55.0	8.0	7.7	52.0	55.0

*Low = The minimum and maximum speed/frequency range (12:1 ratio).

Std = The factory standard minimum and maximum speed/frequency range (6:1 ratio).

Table 3-7 Dual Speed Hoist (w/VFD) Speed/Frequency Change Procedure

⚠ CAUTION

- Each dual speed hoist model has a range of available speeds/frequencies (upper and lower limits). Any value outside the range listed in Table 3-6 for your specific hoist is strictly prohibited.
- Speeds must be set such as Low [d1-01] and High [d1-02].
- After parameters are changed, a “no load” operational check must be performed.





























Operational Step	VFD Display
1. Energize the hoist.	
2. Press  until the “Setup Mode” screen is displayed (blinking).	
3. Press  to display the parameter setting screen (blinking).	
4. Press  or  until the desired parameter is displayed (blinking). (Low Speed: d1-01, High Speed: d1-02)	
5. When you press  , the current setting value is displayed (digit selected blinks). (Example Value: 9 Hz)	
6. Press  to move the blinking digit to the desired digit. (Example Value: 9 blinks)	
7. Press  or  until the desired setting is displayed and press  .	
8. Press  to confirm the new setting.	
9. The display will automatically return to the parameter screen (blinking). (As in Step 4.)	
10. Press  until the display returns to the initial screen. (As in Step 1.)	

Table 3-8 Hoist VFD 2-Step/3-Step Infinitely Variable Parameter Setup Procedure

<div style="text-align: center;">⚠ CAUTION</div> <ul style="list-style-type: none"> Each VFD controlled hoist model has a range of available speeds/frequencies (upper and lower limits). Refer to Table 3-6 for a list of acceptable speeds/frequencies. Any value outside the range listed in Table 3-6 for your specific hoist is strictly prohibited. Speeds must be set such as Low [d1-01] and High [d1-02]. After parameters are changed, a “no load” operational check must be performed. 		
Operational Step		VFD Display
Change Mode to 2 Step or 3 Step.		
1. Press  or  until the “Setup Mode” screen is displayed (blinking).		
2. Press  to display “d1-01”.		
3. Table 3-6 lists the values that may be changed.		
Title	Parameter	Description
Min. Frequency (Hz) – Low Speed	d1-01	Default setting, dependant upon hoist. (Refer to Table 3-7)
Max. frequency (Hz) – High Speed	d1-02	Default setting, dependant upon hoist. (Refer to Table 3-7)
Mode	S1-25	1. Standard 2 Speed (default)
		2. 2 Step Infinitely Variable
		3. 3 Step Infinitely Variable (Requires optional hardware)
Acceleration Time (sec.) (0 to 120 Hz) in 2 or 3 Step Mode.	S1-26	Apply for frequency range between d1-01 and d1-02.
Deceleration Time (sec.) (0 to 120 Hz) in 3 Step Mode.	S1-27	Apply for frequency range between d1-01 and d1-02.
4. Press  several times.		

- 3.6.11 “Hbb” will appear on the dual speed unit’s VFD display when the Emergency Stop Button is depressed. Turn the Emergency Stop Button clockwise to unlock the controls and allow hoist operation.

3.7 Preoperational Checks and Trial Operation

- 3.7.1 **⚠️ 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.
- 3.7.2 **⚠️ WARNING** Verify and correct all chain irregularities prior to operating the hoist. Refer to Section 3.2.
- 3.7.3 Measure and record the “k” dimension of all hooks on hoist. See Table 5-4 under Section 5, “Inspection”.
- 3.7.4 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.
- 3.7.5 Ensure that the hoist is properly installed to either a fixed point, or trolley, whichever applies.
- 3.7.6 If hoist is installed on a trolley, ensure that
- trolley is properly installed on the beam, and
 - stops for the trolley are correctly positioned and securely installed on the beam.
- 3.7.7 Ensure that all nuts, bolts and split pins (cotter pins) are sufficiently fastened.
- 3.7.8 Pull down on the Pendant and ensure that the Cord Strain Relief Cable takes the force, not the Pendant Cord.
- 3.7.9 **⚠️ CAUTION** Check supply voltage before everyday use. If the voltage varies more than 10% of the rated value, electrical devices may not function normally.
- 3.7.10 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.
- 3.7.11 **⚠️ 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.

NOTICE

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

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

4.2 Shall's and Shall Not's for Operation

WARNING

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

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

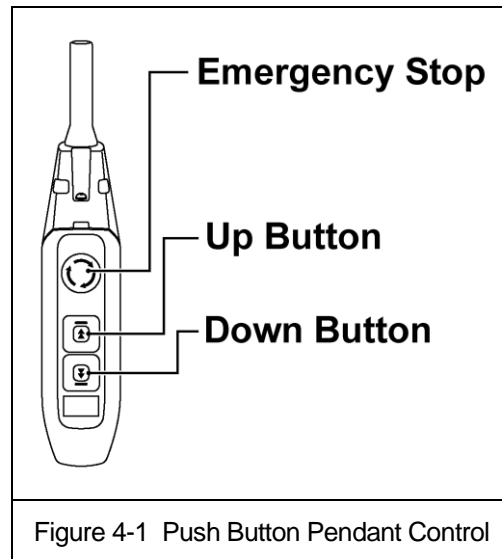
CAUTION

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

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

4.3 Hoist Controls

- 4.3.1 For hoists mounted to motorized trolleys follow the control instruction included in the trolley's Owner's Manual.
- 4.3.2 Emergency Stop Button – Press the Emergency Stop Button to perform an emergency stop and lock-out of hoist motion controls or to reset the VFD as shown in Figure 4-1. Turn the Emergency Stop Button clockwise to unlock the controls and allow hoist operation. “Hbb” will appear on the dual speed unit's VFD display when the Emergency Stop Button is depressed.
- 4.3.3 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.
- 4.3.4 Dual Speed Pendant Control – Pendant controls supplied with dual speed hoists have two step control buttons. For low speed depress the button to the first step and for high speed depress the button fully to the second step. Use the UP button to raise the hoist 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.
- 4.3.5 **⚠ CAUTION** Make sure the motor completely stops before reversing direction.



5.0 Inspection

5.1 General

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

5.2 Inspection Classification

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

5.3 Frequent Inspection

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

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

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

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.
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. <u>Note</u> : DO NOT attempt to adjust or dis-assemble the Brake Assembly.
Hub Joint	Visual	Hub Joint should have no apparent deformation and abrasion. Must be fully seated. Refer to Figure 5-4 .	Replace. <u>Note</u> : 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 6.1.7 .	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.
VFD (Dual Speed only)	Visual, Function	There should be no fault codes (Reference Section 3.6 .)	Replace as needed.

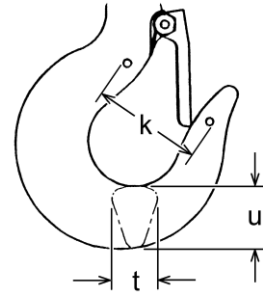
Load Sheave	Visual	Pockets of Load Sheave should be free of significant wear. Refer to Table 5-8 for Load Sheave wear dimensions.	Replace.
Pendant - Housing	Visual	Pendant housing should be free of cracks and mating surfaces of parts should seal without gaps.	Replace.
Pendant - Wiring	Visual	Wire connections 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 Capacity Label	Visual	The label that indicates the capacity of the hoist 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.

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
001H, 003S, 003H, 005L, 005S	1.77 (45.0)	0.93 (23.5)	0.88 (22.3)	0.69 (17.5)	0.65 (16.6)
010L, 010M, 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)
020C	2.46 (62.5)	1.57 (40.0)	1.42 (36.0)	1.14 (29.0)	1.02 (26.0)
020L, 020M, 020S, 025S	2.72 (69.0)	1.71 (43.5)	1.63 (41.3)	1.24 (31.5)	1.18 (29.9)
030L, 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".

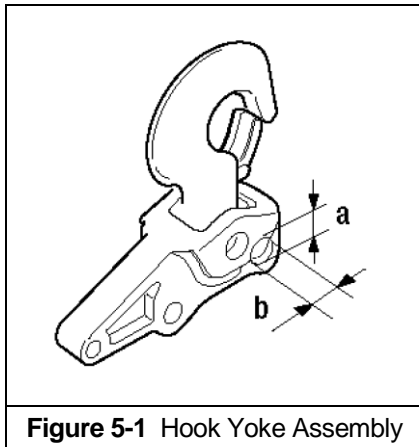


Figure 5-1 Hook Yoke Assembly

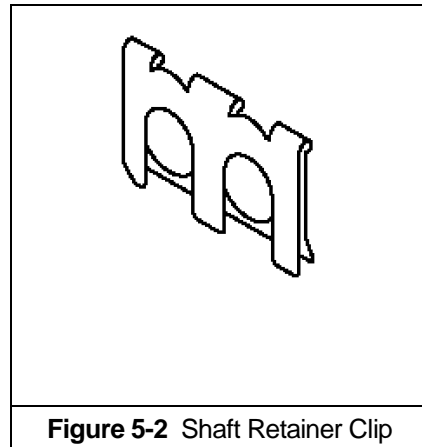


Figure 5-2 Shaft Retainer Clip

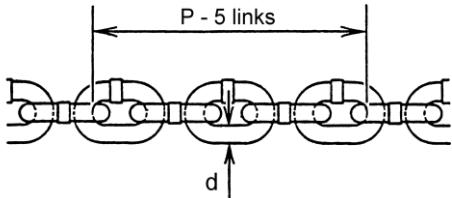
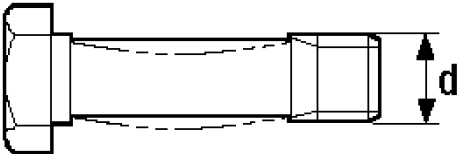
Table 5-5 Chain Wear Dimensions				
				
Capacity Code	“P” Dimension inch (mm)		“d” Dimension inch (mm)	
	Standard	Discard	Standard	Discard
001H, 003S	2.38 (60.5)	2.46 (62.5)	0.17 (4.3)	0.15 (3.9)
003H, 005L, 005S	3.31 (84.0)	3.41 (86.5)	0.24 (6.0)	0.21 (5.4)
010L, 010S, 020C	4.25 (108.0)	4.38 (111.2)	0.30 (7.7)	0.27 (6.9)
015S, 020L, 020S, 030C	5.63 (143.0)	5.80 (147.2)	0.40 (10.2)	0.36 (9.2)
025S, 030L, 050L	6.18 (157.0)	6.37 (161.7)	0.44 (11.2)	0.40 (10.1)

Table 5-6 Chain Pin Wear Dimensions		
		
Capacity Code	“d” - inch (mm)	
	Standard	Discard
020C	0.31 (8.0)	.30 (7.6)
030C	0.43 (10.8)	0.41 (10.3)
050L	0.51 (12.9)	0.48 (12.3)

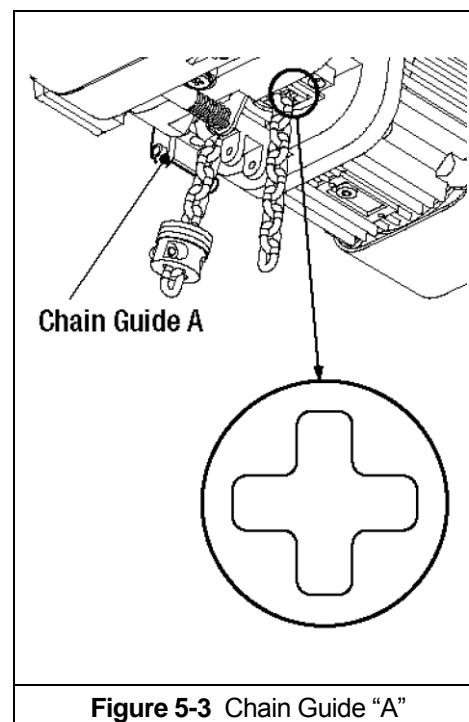
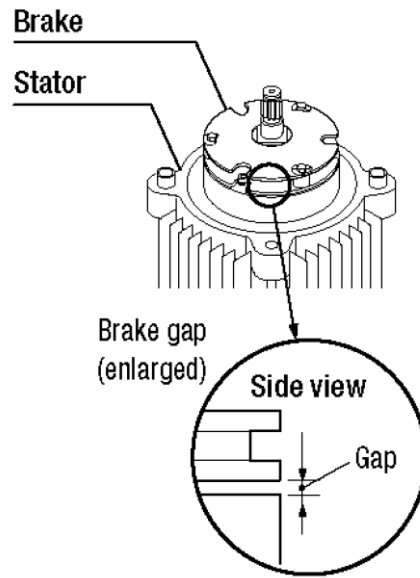


Figure 5-3 Chain Guide “A”

Table 5-7 Motor Brake Wear/Gap Dimensions



Hoist Speed	Capacity Code	"Gap" Dimension - inch (mm)
		Discard
Single	001H to 020L	0.030 (0.75)
	020S to 050L	0.043 (1.10)
Dual	001HD, 003SD, 005LD	0.024 (0.60)
	003HD, 005SD to 020LD	0.016 (0.40)
	020SD to 050LD	0.020 (0.50)

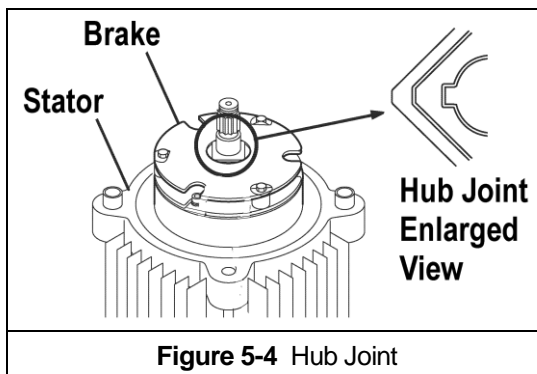


Figure 5-4 Hub Joint

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

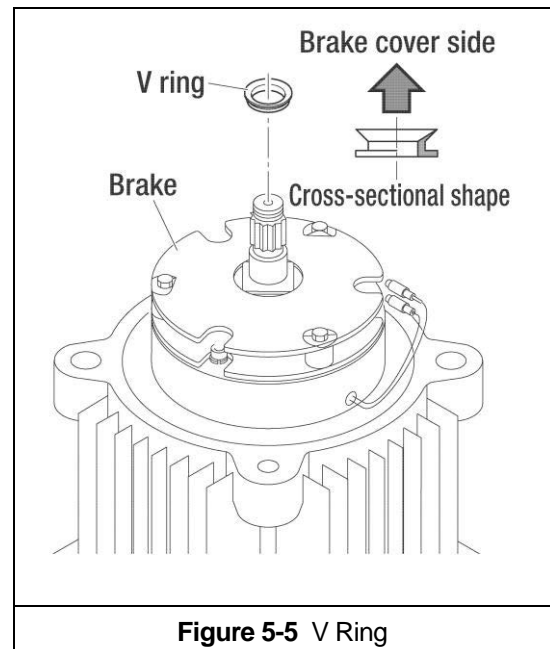
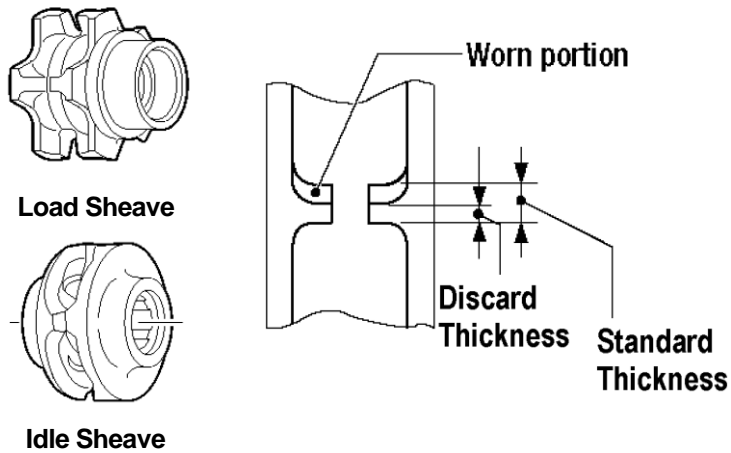


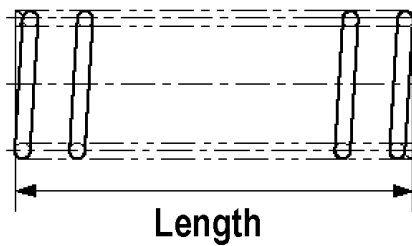
Figure 5-5 V Ring

Table 5-8 Load and Idle Sheave Wear Dimensions



Capacity Code	"Thickness" - inch (mm)	
	Standard	Discard
001H, 003S, 003H	0.06 (1.5)	0.04 (1.0)
005L, 005S	0.12 (3.0)	0.08 (2.0)
010L, 010S, 020C	0.18 (4.5)	0.12 (3.0)
015S, 020L, 020S, 030C	0.26 (6.5)	0.17 (4.3)
025S, 030L, 050L	0.29 (7.3)	0.19 (4.9)

Table 5-9 Chain Spring Length Dimensions



Capacity Code	"Length" - inch (mm)	
	Standard	Discard
020C	3.94 (100)	3.74 (95)
020L	2.76 (70)	2.64 (67)
020S	3.35 (85)	3.19 (81)
025S	2.95 (75)	2.83 (72)
030L	TBD	TBD
030C	3.35 (85)	3.19 (81)
050L	2.95 (75)	2.83 (72)

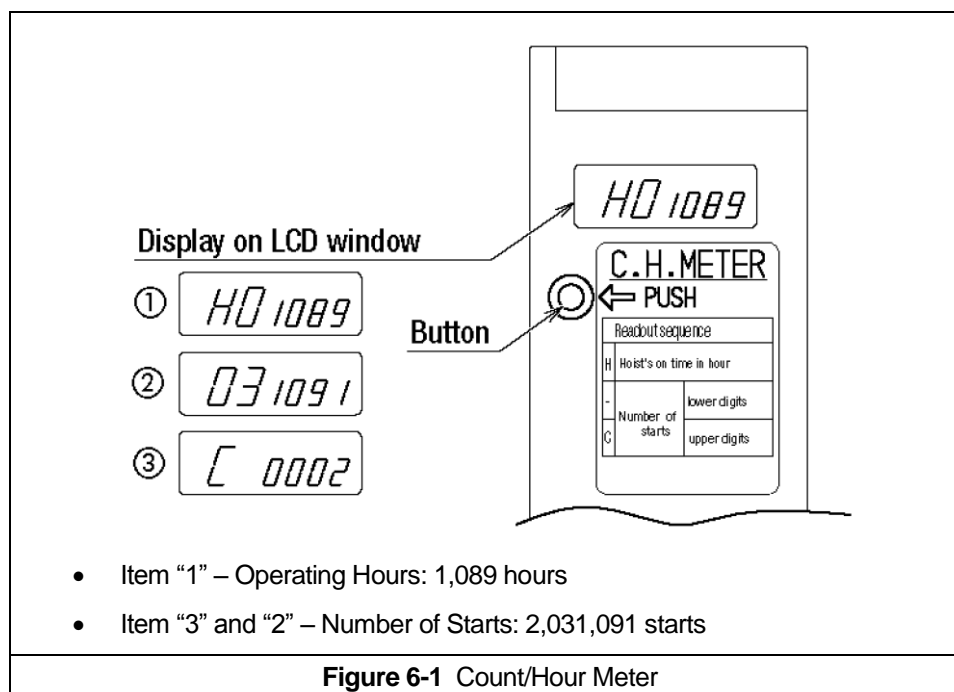
6.0 Maintenance and Handling

6.1 Count/Hour Meter

A count/hour function is included in all NER2/ER2 hoists. A Count/Hour Meter is included in the single speed hoists and a count/hour function is one of the VFD parameters in the dual speed hoists.

- 6.1.1 Single Speed – 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:



- 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: (starts)
Rating	Approximate Jogging Frequency	
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 Dual Speed – On dual speed models, the VFD has Count/Hour functions built into the parameters. Refer to Table 6-2 for parameter identification. Refer to Table 6-3 for Count/Hour access procedure.

Table 6-2 VFD Count/Hour Parameter Identification		
Parameter	Name	Discription
U7-01	Number of Starts (Higher Order)	The number of starts in the down direction x 1,000. Up to 10,000 units are displayed. Display of “1” = 1,000 starts. Display of “10,000” = 10,000,000 starts
U7-02	Number of Starts (Lower Order)	The number of starts in the down direction under 1,000 starts (1 to 999). One start will register a “1” in the display. When 1,000 starts are reached, the value of U7-01 is incremented by 1 and the value of U7-02 is reset to 0.
U7-03	Hours of Operation	The number of hours of operation in both the up and down directions. One hour will register a “1” in the display. Up to 65535 hours are displayed.

The example using Table 6-2:

- U7-01 displays “81”, U7-02 displays “567”, U7-03 displays “122”
- Number of Starts (down) = 81,567
- Number of Operated Hours = 122

Table 6-3 VFD Count/Hour Access Procedure	
Operational Step	VFD Display
1. Energize the hoist.	
2. Press until the “Monitor” screen is displayed (blinking).	
3. Press to display the parameter setting screen an then press to move from “01” to “U1”.	
4. Press or until the display reads “U7” (left value blinking).	
5. Press and or to select the specific “Monitor” parameter (right vlaue blinking). (Example: U7-03 –Hours of Operation)	
6. Press to display the current parameter value. (Example: 75 Hours)	
7. Press until the diplay returns to the initial screen. (As in Step 1.)	

- 6.1.4 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

- 6.1.5 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 5-7 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

- 6.1.6 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.

- 6.1.7 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.

- 6.1.8 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. Insure that the grease is applied to the contact areas in the load sheave pockets.
- Machine or gear oil (grade ISO VG 46 or 68 oil or equivalent) may be used as an alternative lubricant but must be applied more frequently.

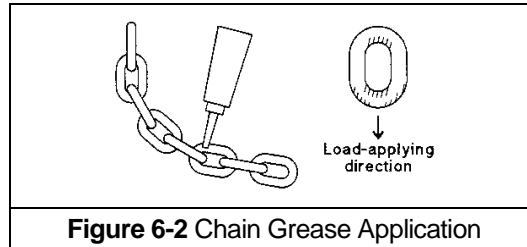


Figure 6-2 Chain Grease Application

- 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** The ER2 (with mechanical load brake/friction clutch) uses different gear oil than the NER2 (with friction clutch). 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 **NER2 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 NER2 hoists. The oil level should be just below the hole when the hoist is level.

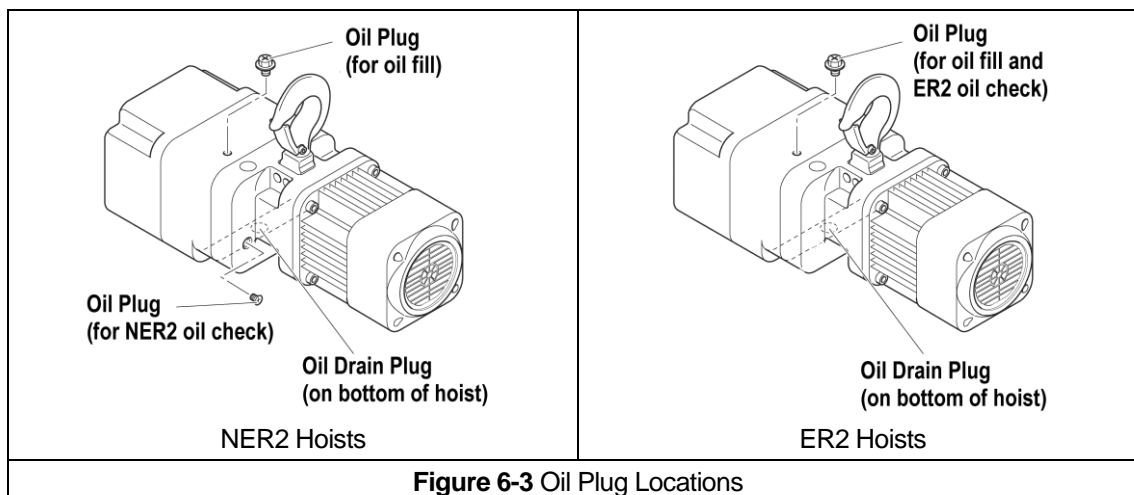


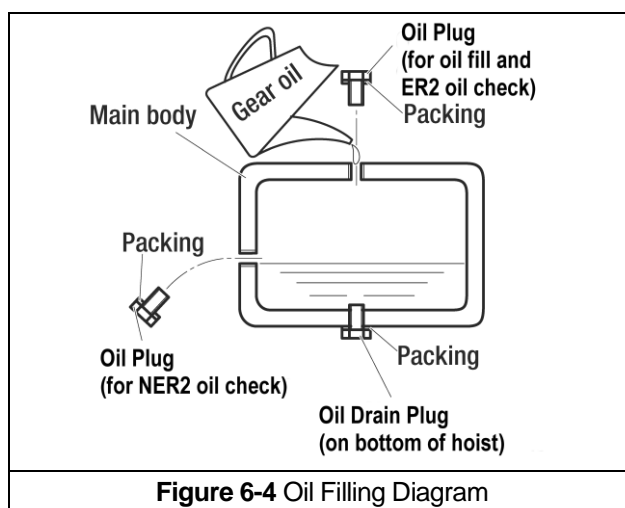
Figure 6-3 Oil Plug Locations

- 6.3.4 **ER2 OIL LEVEL** – For hoists equipped with a Mechanical Load Brake/Friction Clutch, the oil level is checked through the oil check hole at the top of the hoist. **DO NOT** remove the oil plug exposing the oil level check hole on the side of the hoist. The oil level will be above the hole and will leak out. A dip stick should be used to check the oil level through the top hole as shown in the in Figure 6-3 for ER2 hoists. Reference Table 6-7 for check distances from the top of the hoist body.

Table 6-7 ER (Mechanical Load brake Equipped) Gear Oil Check Distances		
Capacity Code	Check Distance (inches)	Check Distance (millimeters)
001H, 003S	2.95	75
003H, 005L, 005S	3.94	100
010L, 010S, 020C	3.94	100
015S, 020L, 020S, 030C	4.72	120
025S, 030L, 050L	5.12	130

6.3.5 **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.



- 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 6-7. Refer to Figure 6-4. Note that the NER2 & ER2 models have different oil quantity requirements.

Table 6-8 Amount of Gear Oil				
Capacity Code	Quarts		Liters	
	NER2	ER2	NER2	ER2
001H, 003S	0.55	0.72	0.52	0.68
005L	0.57	0.87	0.54	0.82
003H, 005S	0.57	0.95	0.54	0.90
010L, 020C	0.66	1.11	0.62	1.05
010S	0.72	1.16	0.68	1.10
015S, 020L	1.37	2.11	1.30	2.00
020S, 030C	2.01	2.64	1.90	2.50
025S, 030L, 050L	2.01	2.85	1.90	2.70

- **⚠ 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:

NER2 Gear Oil:

- Harrington standard: Bonnoc M260 (NIPPON OIL); Harrington Part Numbers:
 - ER1BS1855 – 1 Quart
 - ER1CS1855 – 2 ½ Gallons
- Acceptable equivalent: Meropa 320 (TEXACO)
- Acceptable equivalent: Meropa 320 (CALTEX)

ER2 Gear Oil:

- Harrington standard: Farm Gear B (NIPPON OIL); Harrington Part Numbers:
 - 7019801 – 1 Quart
 - 7019802 – 2 ½ Gallons

6.4 Motor Brake

6.4.1 The motor brake on the NER2/ER2 hoist is not adjustable.

6.4.2 Refer to Section 5.7 and Table 5-7 for Brake Gap/Wear criteria.

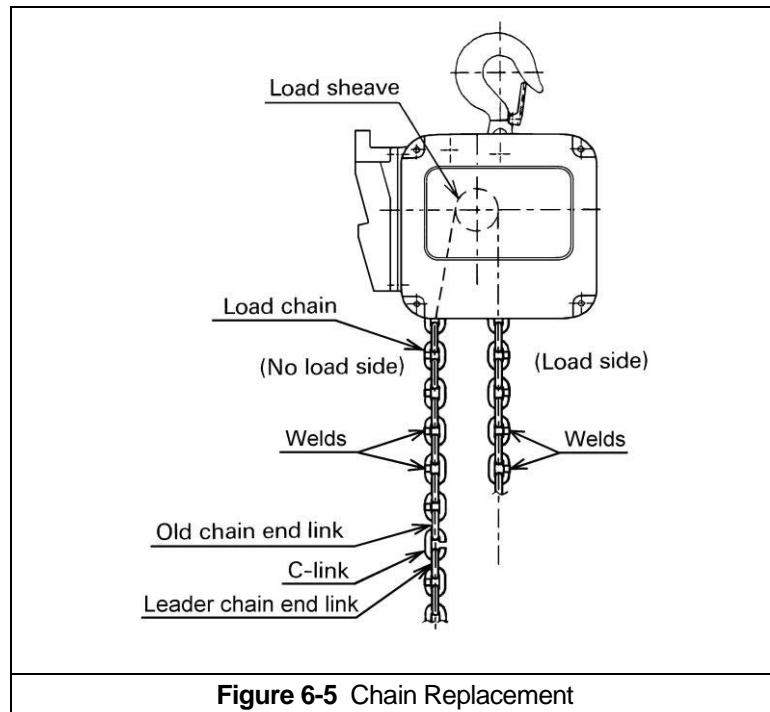
6.5 Load Chain

6.5.1 Lubrication and Cleaning – refer to Section 6.2.

6.5.2 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.

- 4) 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.
- 5) 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.
- 6) Operate the hoist down to move the chain through the hoist body. Stop when a sufficient amount of new chain is accumulated on the load side.
- 7) Single fall hoists - Attach the chain components (step 4 above) to the chain. Refer to Section 3.2 for the proper locations.
- 8) Double falls (020C, 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. Refer to Section 3.2.6.
- 9) **⚠ WARNING** Make sure Stoppers, Cushion Rubbers, Chain Springs and Striker Plates are properly installed. Refer to Section 3.2.
- 10) After installation has been completed, perform steps outlined in Section 3.7, "Preoperational Checks and Trial Operation".



6.6 Friction Clutch and Mechanical Load Brake with Friction Clutch

- 6.6.1 Friction Clutch (NER2 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.

- 6.6.2 Mechanical Load Brake with Friction Clutch (ER2 Models) – If abnormal operation or slippage occurs do NOT attempt to disassemble or adjust the Mechanical Load Brake with Friction Clutch. Replace the worn or malfunctioning Mechanical Load Brake with Friction Clutch as an assembly with a new, factory adjusted part.

6.7 Storage

- 6.7.1 ER2 models with vented oil cap assemblies should be stored with the cap oriented up to prevent oil leakage.
- 6.7.2 The storage location should be clean and dry.

6.8 Outdoor Installation

- 6.8.1 For hoist installations that are outdoors, the hoist MUST BE covered and protected from the weather at all times.
- 6.8.2 Possibility of corrosion on components of the hoist increases for installations where salt air and high humidity are present. The hoist may require more frequent lubrication. Make frequent and regular inspections of the unit's condition and operation.
- 6.8.3 For hoist installations where temperature variations introduce condensation into the hoist additional inspection and more frequent lubrication may be required.
- 6.8.4 Refer to Section 2.1.3 for allowable environmental conditions.

6.9 Operational Environment

- 6.9.1 Non-conforming environment

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

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

7.0 Troubleshooting

WARNING

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

Before performing ANY 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."

To avoid a shock hazard, **DO NOT** perform **ANY** mechanical or electrical maintenance on the dual speed (or VFD control) hoist within 5 minutes of de-energizing (disconnecting) the trolley or hoist. This time allows the internal VFD capacitor to safely discharge.

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

NOTICE

Do Not perform "withstand voltage" test or "insulation resistance" measurement (megger) with the VFD connected.

Do Not remove power to the hoist or trolley during operation.

Do Not connect power to the output of the VFD.

When handling VFD provide ESD protection.

Table 7-1 Troubleshooting Guide

Symptom	Cause	Remedy
Hoist moving in wrong direction	Power supply reversed phased	Switch 2 of the 3 power supply cord wires at the power source. (Refer to Section 3.7.11 for instructions on how to check for correct power supply phase connection.)
	Improper electrical connections	Refer to wiring diagram and check all connections.
Hoist 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 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 VFD (dual speed only)	Check fault codes (Reference Section 3.6). Reset VFD by pressing the Emergency Stop Button on pendant. Replace as needed.
	Faulty Interface Board	Replace Interface Board.
	Emergency Stop Depressed on Push Button Pendant Control	“Hbb” will appear on the dual speed unit’s VFD display when the Emergency Stop Button is depressed. Turn the Emergency Stop Button clockwise to unlock the controls and allow hoist operation.
	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 VFD (dual speed only)	Check fault codes (Reference Section 3.6). Reset VFD by pressing Emergency Stop Button on pendant. 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 VFD (dual speed only)	Check fault codes (Reference Section 3.6). Reset VFD by pressing Emergency Stop Button on pendant. Replace as needed.
	Faulty switch in pendant	Check electrical continuity. Check electrical connections. Replace or repair as needed.
	Faulty friction clutch	Replace.

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.
	Brake drags/chatters	Check VFD for fault codes. Replace VFD or Interface Board if needed.
	Faulty friction clutch	Replace.
	Faulty VFD (dual speed only)	Check fault codes (Reference Section 3.6). Reset VFD by pressing Emergency Stop Button on pendant. Replace as needed.
Load drifts excessively when hoist is stopped	Motor brake not holding	Check brake for proper "Brake Gap" dimension. (Reference Table 5-7). Replace if needed.
	Mechanical Load brake not holding (ER2 only)	Replace as needed. (ER2 only, NER2 has no load brake.)
	Faulty VFD (dual speed only)	Check fault codes (Reference Section 3.6). Reset VFD by pressing Emergency Stop Button on pendant. Replace as 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.
	Brake drags/chatters	Check VFD for fault codes. Replace VFD or Interface Board if needed.
	Extreme external heating	Above an ambient temperature of 140°F, the frequency of hoist operation must be reduced to avoid overheating of the motor. Special provisions should be made to ventilate the hoist or otherwise shield it from the heat.
Hoist operates intermittently	Collectors making poor contact	Check movement of spring loaded arm, weak spring, connections, and shoe. Replace as needed.
	Contactor contacts arcing	Check for burned contacts. Replace as needed.
	Loose connection in circuit	Check all wires and terminals for bad connections. Replace as needed.
	Broken conductor in Pendant Cord	Check for intermittent continuity in each conductor the Pendant Cord. Replace entire Pendant Cord if continuity is not constant.
	Faulty VFD (dual speed only)	Check fault codes (Reference Section 3.6). Reset VFD by pressing Emergency Stop Button on pendant. Replace as needed.

8.0 Warranty

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

- 1 year – Electric and Air Powered Hoists (excluding (N)ER2 Enhanced Features Models), 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 Enhanced Features Model Hoists**
- 5 years – Manual Tiger Track Jibs and Gantries, TNER Pull - Rotor Motor Brake**
- 10 years – (N)ER2 “The Guardian” Smart Brake**

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

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

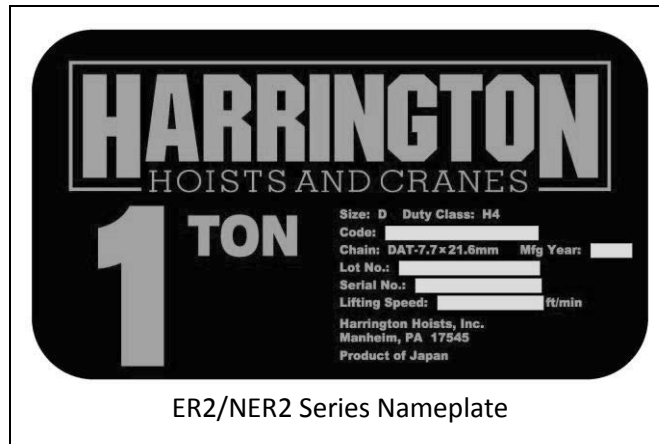
Customer must obtain a Return Goods Authorization as directed by Harrington or Harrington’s published repair center prior to shipping product for warranty evaluation. An explanation of the complaint must accompany the product. Product must be returned freight prepaid. Upon repair, the product will be covered for the remainder of the original warranty period. Replacement parts installed after the original warranty period will only be eligible for replacement (not including installation) for a period of one year from the installation date. If it is determined there is no defect, or that the defect resulted from causes not within the scope of Harrington’s warranty, the customer will be responsible for the costs of returning the product.

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

9.0 Parts List

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

Reminder: Per sections 1.1 and 3.7.4 to aid in ordering Parts and Product Support, record the Hoist code number, lot number and serial number in the space provided on the cover of this manual.



The parts list is arranged into the following sections:

Section	Page
9.1 Housing and Motor Parts.....	52
9.2 Gearing Parts.....	56
9.3 Hook and Chain Parts.....	60
9.4 Electric Parts (Single Speed).....	78
9.5 Electric Parts (Dual Speed).....	84
9.6 Power Supply and Pendant Parts.....	90

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

S = Single Speed

D = Dual Speed

F = NER Models

M = ER Models

2V = 208/230 Volt Models

4V = 460 Volt Models

9.1 Housing and Motor Parts

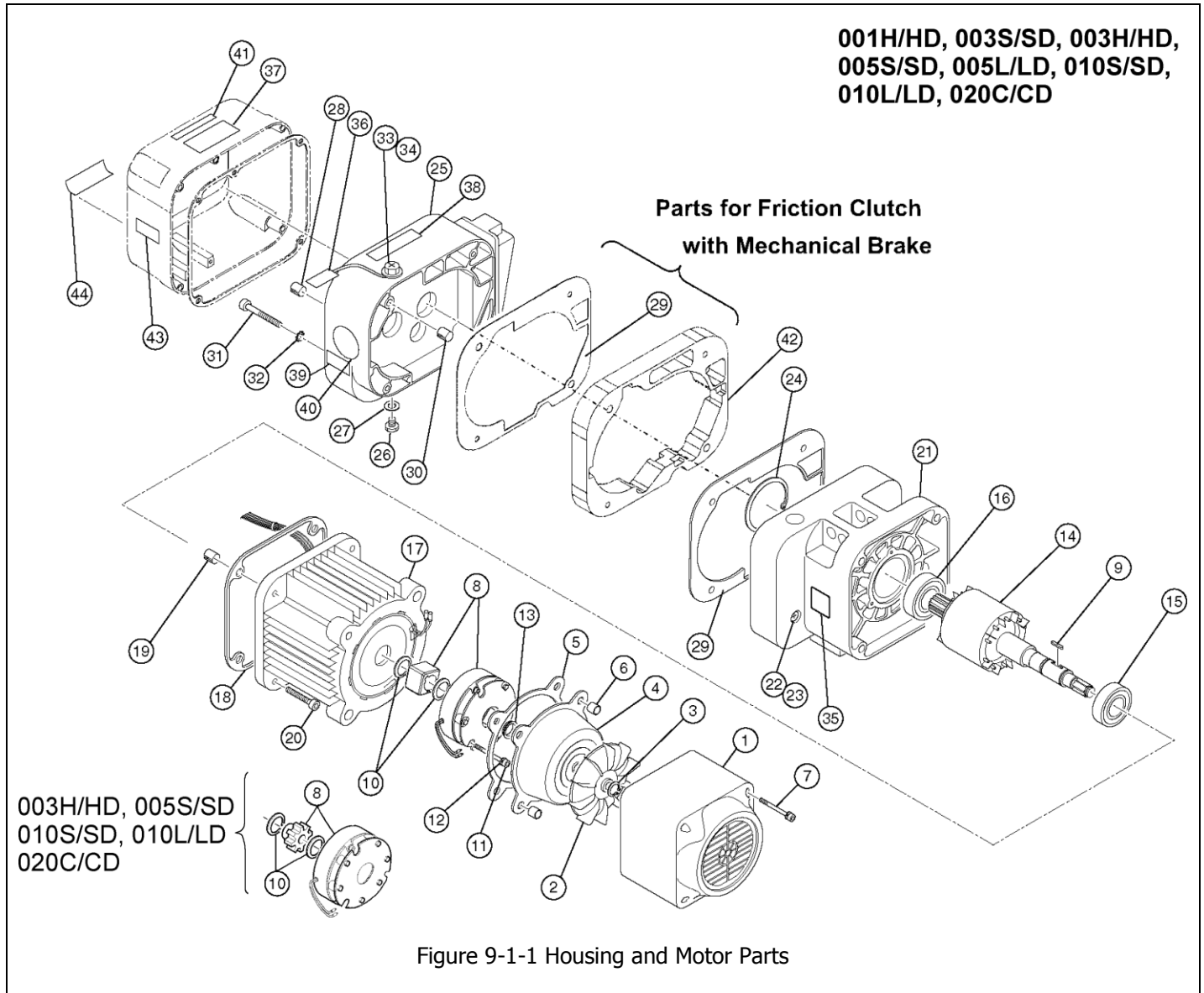


Figure No.	Part Name	Parts Per Hoist	001H	003S	003H	005S	005L	010S	010L	020C
1	Fan Cover	1	ER2BS9107		ER2CS9107		ER2CL9107	ER2DS9107		ER2CS9107
2	Fan	1	ER2BS9108		ER2CS9108		ER2CL9108	ER2DS9108		ER2CS9108
3	Snap Ring	1			9047113			9047116		9047113
4	Brake Cover	F M	ER2BS9115		ER2CL9115 ER2CL9149	ER2CS9115	ER2CL9115 ER2CL9149	ER2DS9115		ER2CS9115 ER2DL9149
5	Packing B	1	ER2BS9119		ER2CS9119		ER2CL9119	ER2DS9119		ER2CS9119
6	Set Pin S						ES120003			
7	Socket Bolt	4					9091234			
8	Electromagnetic Brake Assembly	1	MBABB0ENA		MBABB09NA		MBABB0ENA	MBABB18NA		MBABB09NA
9	Key B	1	ER2CL9360		ER2CS9360		ER2CL9360	ER2DS9360		ER2CS9360
10	Snap Ring	2	9047119		9047124		9047116		9047124	
11	Socket Bolt	3					9091254			
12	Spring Lock Washer	3					9012709			
13	V Ring	1			ER2CS9210			ER2DS9210		ER2CS9210

9.1 Housing and Motor Parts

Figure No.	Part Name	Parts Per Hoist		001H	003S	003H	005S	005L	010S	010L	020C	
14	Motor Shaft With Rotor		1	ER2BS5502		ER2CS5502		ER2CL5502	ER2DS5502	ER2DL5502		
15	Ball Bearing		1	9000904		9000905		9000904	9000905			
16	Ball Bearing		1	9001003		9000904		9000922				
17	Motor Frame With Stator		1	ER2BKV03S5A1		ER2BKV05S5A1		ER2BKV05L5A1	ER2BKV10S5A1	ER2BKV10L5A1		
18	Packing M		1	ER2BS9118		ER2CS9118		ER2DS9118				
19	Set Pin S		2	ES120003		ES120010S		ER1DS9138				
20	Socket Bolt		4	9091252		9091275		9091296				
21	Body B Assembly* Lot No. ER2A-...	F	1	ER2BS6101		ER2CS6101		ER2DS6101*				
	Body B Assembly Lot No. ER2B-...	F	1					ER2DS6101R4				
	Body C Assembly* Lot No. ER2A-...	M	1	ER2BS6099		ER2CS6099		ER2DS6099*				
	Body C Assembly Lot No. ER2B-...	M	1					ER2DS6099R4				
16	Ball Bearing		1	9001003		9000904		9000922				
22	Oil Plug		1	E3S111003								
23	Plug Packing		1	E3S112003								
24	Snap Ring		1	9047255		9047262		9047268				
25	Gear Case	F, S	1	ER2BS6103		ER2CS6103		ER2DS6103				
		F, D		ER2BI6103								
		M		ER2BS6102								ER2CS6102
26	Oil Plug		1	E3S111003								
27	Plug Packing		1	E3S112003								
28	Spring Pin		1	9148128		E3S129005S						
29	Packing G	F	1	ER2BS9116		ER2CS9116		ER2DS9116				
		M	2									
30	Set Pin S	F	2	ES120003								
		M	4									
		F	4									
31	Socket Bolt	F	4	9091256								
		M	4									
32	Toothed Lock Washer		4	9679709								
33	Oil Fill Plug		1	ER1BS9135								
34	Eyebolt Packing		1	ES127005S								
35	Name Plate Load Side E		1	ER1BS9960								
36	Oil Full Tag		1	ER1BS9953								
37	Warning Sticker E (Disconnect Power)		1	ER2CS9936								
38	Name Plate OF (Correct Oil Required)	F	1	ER2CS9845								
	Name Plate OM (Correct Oil Required)	M		ER2CS9846								
39	Name Plate AA (With Mechanical Brake)	M	1	ER1BS9893								
40	Name Plate AD (Speed Letter)		1	ER1BH 9868	ER1BS 9868	ER1BH9868	ER1BS 9868	ER1BL9868	ER1BS9868	ER1BL 9868	ER1DR 9868	
41	Warning Sticker HW (Hot Surface)	D	1	ER2CI9806								
42	Spacer M	M	1	ER2BS9296		ER2CS9296			ER2DS9296			
43	Check Voltage Label	S,2V	1	ECP99NVVB								
		S,4V		ECP99NVVA								
		D,2V		ECP99NVWB								
		D,4V		ECP99NVWA								
44	Check Hook Movement Label (bottom front of cover)	S	1	ER1BS9957								

*010L, 010S and 020C Body B and C have been discontinued for lot ER2A. Replace with lot ER2B body B or C and ER2B Top Pins (see pages 63 and 67)

9.1 Housing and Motor Parts

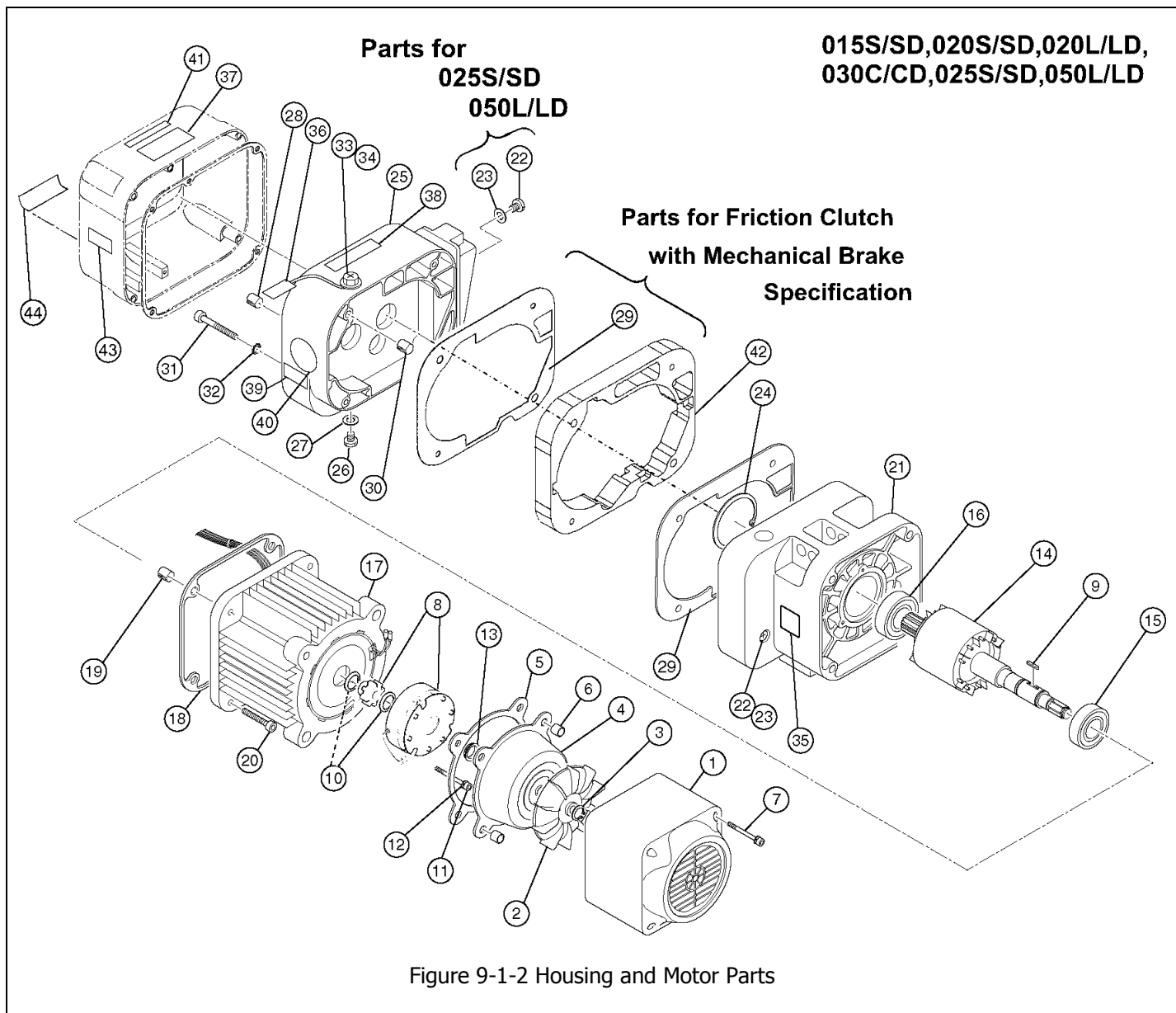


Figure No.	Part Name	Parts Per Hoist	015S	020L	020S	030C	025S	050L
1	Fan Cover	1	ER2DS9107			ER2ES9107		
2	Fan	1	ER2DS9108			ER2ES9108		
3	Snap Ring	1	9047116			9047122		
4	Brake Cover	F M	ER2DS9115 ER2EL9149			ER2ES9115		
5	Packing B	1	ER2DS9119			ER2ES9119		
6	Set Pin S	2			ES120003			
7	Socket Bolt	4	9091234			9091255		
8	Electromagnetic Brake Assembly	1	MBABB18NA			MBABB35NA		
9	Key B	1	ER2DS9360			ER2ES9360		

9.1 Housing and Motor Parts

Figure No.	Part Name	Parts Per Hoist		015S	020L	020S	030C	025S	050L
10	Snap Ring		1			9047130			
			2	9047124					
11	Socket Bolt		3	9091254		9091278			
12	Spring Lock Washer		3	9012709		9012711			
13	V Ring		1	ER2DS9210		ER2ES9210			
14	Motor Shaft With Rotor		1	ER2EL5502		ER2ES5502		ER2FS5502	
15	Ball Bearing		1	9000905		9000907			
16	Ball Bearing		1			9000906			
17	Motor Frame w/Stator		1	ER2BKV20LSA1		ER2BKV20S5A1		ER2BKV25S5A1	
18	Packing M		1			ER2ES9118		ER2FS9118	
19	Set Pin S		2			ER2ES9138			
20	Socket Bolt		4			90912116			
21	Body B Assembly	F	1			ER2ES6101		ER2FS6101	
	Body C Assembly	M		ER2EL6099		ER2ES6099		ER2FS6099	
16	Ball Bearing		1			9000906			
22	Oil Plug		1					E3S111003	
23	Plug Packing		1					E3S112003	
24	Snap Ring		1			9047280			
25	Gear Case	F	1	ER2EL6103		ER2ES6103		ER2FS6103	
		M		ER2EL6102		ER2ES6102		ER2FS6102	
26	Oil Plug		1			E3S111003			
27	Plug Packing		1			E3S112003			
28	Spring Pin		1			E3S129005S			
29	Packing G	F	1			ER2ES9116		ER2FS9116	
		M	2						
30	Set Pin S	F	2			ES120010S			
		M	4						
31	Socket Bolt	F	4 (5)	9091280	9091286	9091280	9091286		
		M	4 (5)	90912147				90912155	
32	Toothed Lock Washer		4 (5)			9679711			
33	Oil Fill Plug		1			ER1BS9135			
34	Eyebolt Packing		1			ES127005S			
35	Name Plate Load Side E		1			ER1BS9960			
36	Oil Full Tag		1			ER1BS9953			
37	Warning Sticker E (Disconnect Power)		1			ER2CS9936			
38	Name Plate OF (Correct Oil Required)	F	1			ER2CS9845			
	Name Plate OM (Correct Oil Required)	M				ER2CS9846			
39	Name Plate AA (With Mechanical Brake)	M	1			ER1BS9893			
40	Name Plate AD (Speed Letter)		1	ER1BS9868	ER1BL9868	ER1BS9868	ER1DR9868	ER1BS9868	ER1BL9868
41	Warning Sticker HW (Hot Surface)	D	1			ER2CI9806			
42	Spacer M	M	1	ER2EL9296		ER2ES9296		ER2FS9296	
43	Check Voltage Label	S,2V	1			ECP99NVVB			
		S,4V				ECP99NVVA			
		D,2V				ECP99NVWB			
		D,4V				ECP99NVWA			
44	Check Hook Movement Label (bottom front of cover)	S	1			ER1BS9557			

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

9.2 Gearing Parts

001H/HD, 003S/SD, 003H/HD,
005S/SD, 005L/LD, 010S/SD,
010L/LD, 020C/CD

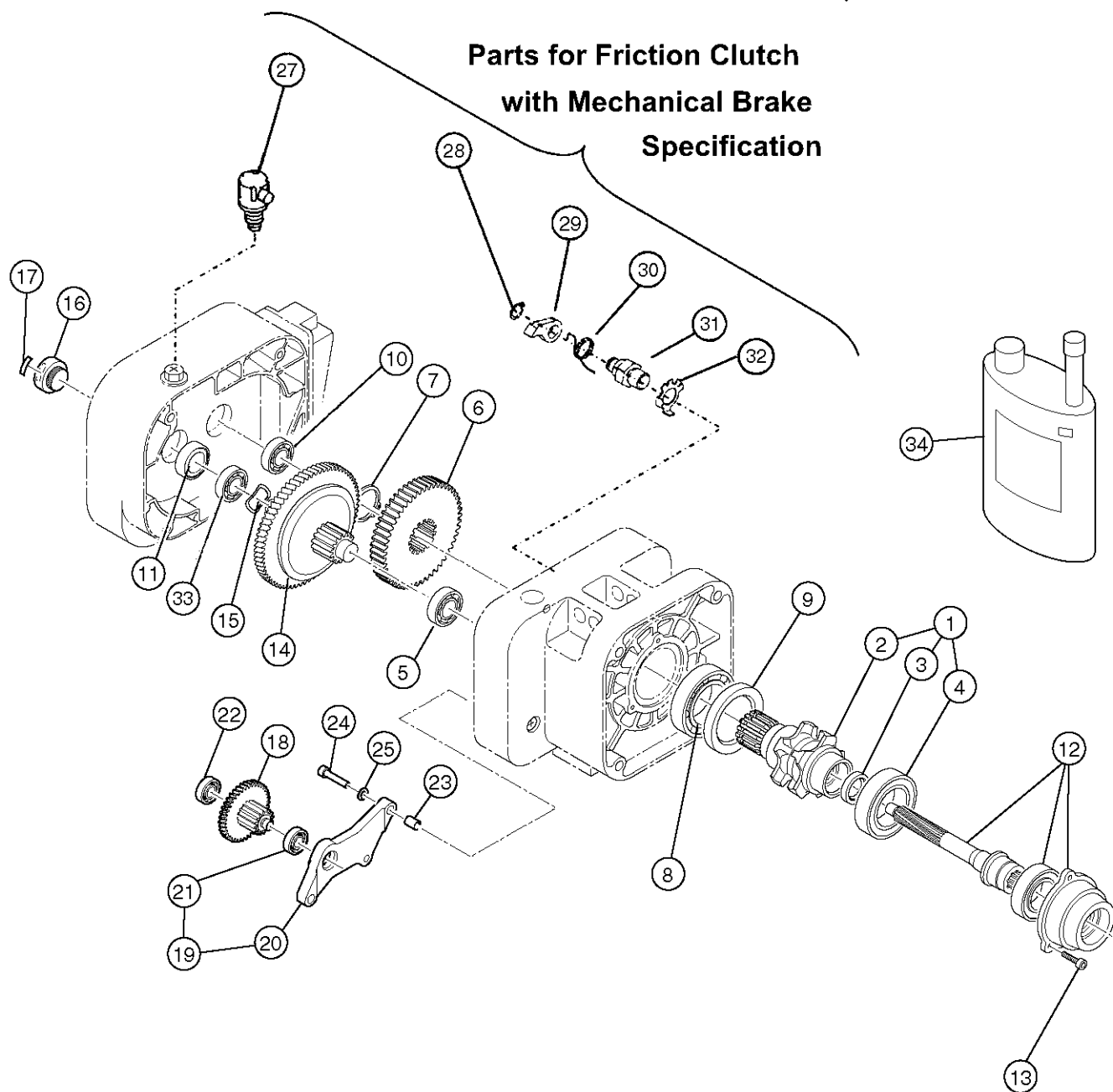


Figure 9-2-1 Gearing Parts

9.2 Gearing Parts

Figure No.	Part Name	Parts Per Hoist	001H	003S	003H	005S	005L	010S	010L/020C
1	Load Sheave Assembly	1	ER2BS6241		ER2CS6241			ER2DS6241	
2	Load Sheave	1	ER2BS9241		ER2CS9241			ER2DS9241	
3	Oil Seal	1	ER2BS9221		ER2CS9221			ES221010S	
4	Ball Bearing	1	9000506		9000508			9000509	
5	Ball Bearing	1	9000202		9000104		9000302	9000104	9000304
6	Load Gear	F M	ER2BH9240	ER2BS9240	ER2CH9240	ER2CS9240	ER2CL9240 ER2CS9240	ER2DS9240	
7	Snap Ring	1	9047130		9047135				
8	Ball Bearing	1	9000106		9000107			9000108	
9	Oil Seal	1	ER2BS9244		ES232005S			ES232010S	
10	Ball Bearing	1	9000200		9000201			9000301	
11	Oil Seal	F	E6F235003S						
12	Pinion Assembly	F M	ER2BS5220 ER2BS5304		ER2CS5220 ER2CS5304			ER2DS5220 ER2DS5304	
13	Socket Bolt	3	90912149						
14	Friction Clutch Complete Assembly	F	ER2BH1223	ER2BS1223	ER2CH1223	ER2CS1223	ER2CL1223	ER2DS1223	ER2DL1223
	Friction Clutch With Mechanical Brake Complete Assembly	M	ER2BH1274	ER2BS1274	ER2CH1274	ER2CS1274	ER2CL1274	ER2DS1274	ER2DL1274
15	Wave Washer	F	E1DBX20S9311						
16	Nut Cover	F	ER1CS9235						
17	Name Plate FP (Adjustment Of Friction Clutch Prohibited)	F	ER1BS9892						
18	Gear B Assembly	F M				ER2CL5306		ER2DL5262 ER2DL5306	
19	Gear Holder Plate Assembly	F M				ER1CL6261		ER2DL6261	
20	Gear Holder Plate	F M				ER1CL9261		ER2DL9261	
21	Ball Bearing	F M				9000100		9000101	
22	Ball Bearing	F M				9000100		9000100	
23	Set Pin S	F M				ES120003		ES120003	
24	Socket Bolt	F M				9091252		9091252	
25	Spring Lock Washer	F M				9012709		9012709	
27	Vent Cap	M	ER1BS1175						
28	Snap Ring	M	9047111						
29	Pawl	M	L4155015						
30	Pawl Spring	M	ER1BS9290						
31	Pawl Shaft	M	ER2CS9289						
32	Pawl Shaft Washer	M	ER2CS9294						
33	Ball Bearing	M	9000300		9000202				
34*	NER2 Gear Oil 1qt	F	ER1BS1855*						
	NER2 Gear Oil 2.5 gal	F	ER1CS1855*						
	ER2 Gear Oil 1qt	M	7019801*						
	ER2 Gear Oil 2.5 gal	M	7019802*						

*Refer to Section 2.1.1 to for how to identify NER2 verse ER2. Refer to Section 6.3 for the amount of gear oil required and for the method to check the oil level.

9.2 Gearing Parts

**015S/SD, 020S/SD, 020L/LD,
030C/CD, 025S/SD, 050L/LD**

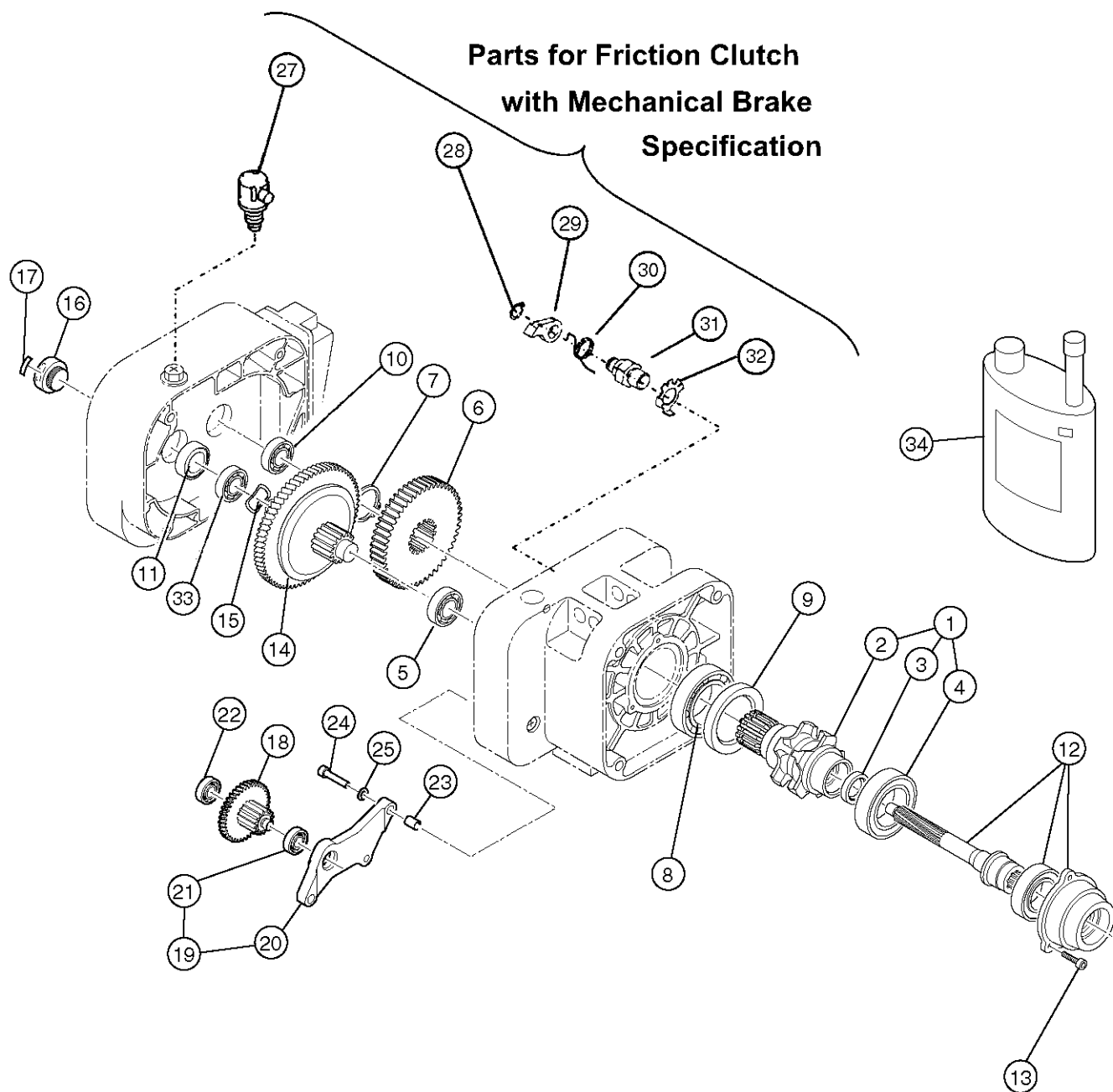


Figure 9-2-2 Gearing Parts

9.2 Gearing Parts

Figure No.	Part Name	Parts Per Hoist		015S	020L	020S	030C	025S	050L	
1	Load Sheave Assembly		1	ER2ES6241				ER2FS6241		
	2	Load Sheave		1	ER2ES9241				ER2FS9241	
	3	Oil Seal		1	ER2ES9221					
	4	Ball Bearing		1	9000609				9000610	
5	Ball Bearing		1	9000405						
6	Load Gear		1	ER2EM9240	ER2EL9240	ER2ES9240	ER2ER9240	ER2FS9240		
7	Snap Ring		1	9047150						
8	Ball Bearing		1	9000110						
9	Oil Seal		1	ER2ES9244						
10	Ball Bearing		1	9000303						
11	Oil Seal 22	F	1	ER1DS9233						
12	Pinion Assembly	F	1	ER2EL5220		ER2ES5220		ER2FS5220		
		M	1	ER2EL5304		ER2ES5304		ER2FS5304		
13	Socket Bolt		3	90912149						
14	Friction Clutch Complete Assembly	F	1	ER2EM1223	ER2EL1223	ER2ES1223	ER2ER1223	ER2FS1223	ER2FR1223	
	Friction Clutch With Mechanical Brake Complete Assembly	M	1	ER2EM1274	ER2EL1274	ER2ES1274	ER2ER1274	ER2FS1274	ER2FR1274	
15	Wave Washer	F	1	ER1DS9234		ER2ES9234				
16	Nut Cover	F	1	ER1DS9235		ER2ES9235				
17	Name Plate FP (Adjustment Of Friction Clutch Prohibited)	F	1	ER1BS9892						
18	Gear B Assembly	F	1	ER2EM5262	ER2EL5262			ER2FS5262		
		ER2EM5306		ER2EL5306			ER2FS5306			
19	Gear Holder Plate Assembly		1	ER2EL6261				ER2FS6261		
	20	Gear Holder Plate		1	ER2EL9261				ER2FS9261	
	21	Ball Bearing		1	9000202				9000203	
22	Ball Bearing		1	9000201				9000202		
23	Set Pin S		2	ES120010S				ES120010S		
24	Socket Bolt		3	9091275				9091275		
25	Spring Lock Washer		3	9012711				9012711		
27	Vent Cap	M	1	ER1BS1175						
28	Snap Ring	M	1	9047116						
29	Pawl	M	1	ER2FS9288						
30	Pawl Spring	M	1	ER2FS9290						
31	Pawl Shaft	M	1	ER2FS9289						
32	Pawl Shaft Washer	M	1	ER2CS9294						
33	Ball Bearing	M	1	9000303		9000304				
34	NER2 Gear Oil 1qt	F	1	ER1BS1855*						
	NER2 Gear Oil 2.5 gal	F	1	ER1CS1855*						
	ER2 Gear Oil 1qt	M	1	7019801*						
	ER2 Gear Oil 2.5 gal	M	1	7019802*						

*Refer to Section 2.1.1 to for how to identify NER2 verse ER2. Refer to Section 6.3 for the amount of gear oil required and for the method to check the oil level.

9.3 Hook and Chain Parts

001H/HD,003S/SD,003H/HD,
005S/SD,005L/LD

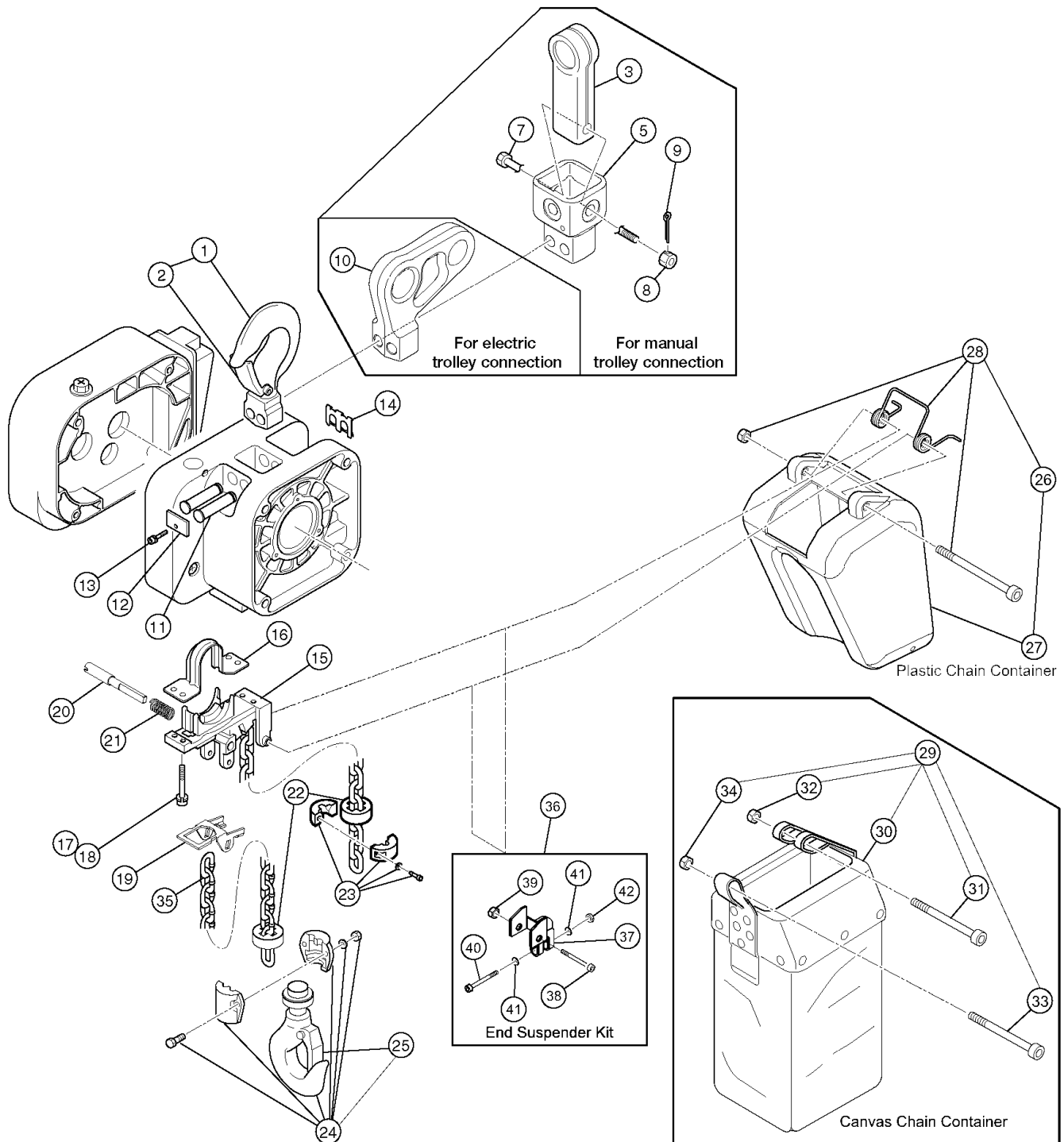


Figure 9-3-1 Hook and Chain Parts

9.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist	001H	003S	003H	005S	005L
1	Top Hook Assembly	1	ER2CS1001				
2	Hook Latch	1	ER2CS1002				
3	Suspender E (For Manual Trolley)	1	T7GB004010				
5	Connection Yoke PG* (For Manual Trolley)	1	ER2CS5027*				
7	Yoke Bolt	1	ER1CS9032				
8	Slotted Nut	1	L3183008				
9	Split Pin	1	9009414-5				
10	Suspender T (For Motorized Trolley)	1	ER2DS9031				
11	Top Pin	2	ER2CS9121				
12	Plate A	1	ER2CS9123				
13	Socket Bolt With Spring Washer	1	J1BG10601212				
14	Shaft Clip	1	ER2CS9186				
15	Chain Guide A	1	ER2BS9331		ER2CS9331		
16	Chain Guide B	1	ER2BS9332		ER2CS9332		
17	Socket Bolt	4	9091251				
18	Spring Lock Washer	4	9012709				
19	Limit Lever	1	ER2BS9337		ER2CS9337		
20	Limit Lever Pin	1	ER2BS9338		ER2CS9338		
21	Limit Lever Spring	1	ER2CS9357				
22	Cushion Rubber	2	ER2BS9053		ER1CS9053		
23	Stopper Assembly	1	ES1045003		ER2CS1041		
24	Bottom Hook Complete Assembly	1	ER2BH1011	ER2BS1011	ER2CH1011	ER2CS1011	
25	Hook Latch	1	ER2CS1002				
26	Plastic Chain Container Assembly (Max. Lifting Height 20ft)	1	PBK2-B		PBK2-C		
27	Plastic Chain Container	1	ER2BS1401		ER2CS1401		
28	Plastic Container Spring Assembly	1	ER2BS1416		ER2CS1416		
29	Canvas Chain Container Assembly (Max. Lift Height 50ft)	1	BK2C1		BK2C2		
30	Canvas Chain Container	1	ER2CS5403		ER2CS5405		
31	Socket Bolt	1	9091283				
32	Lever Nut	1	ES857005S				
33	Socket Bolt	1	ER419001				
34	Lever Nut	1	ES855003				
35	NP Load Chain	1	LCER2003NP		LCER2005NP		
36	End Suspender Kit	1	ENDS2B		ENDS2C		
37	End Suspender	1	ER2BS9408		ER2CS9408		
38	Socket Bolt	1	9091281		9091283		
39	Lever Nut	1	ES857005S				
40	Socket Bolt	1	90912150		90912151		
41	Flat Washer	2	9012510		9012511		
42	Lever Nut	1	E2D853125		ES855003		

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

9.3 Hook and Chain Parts

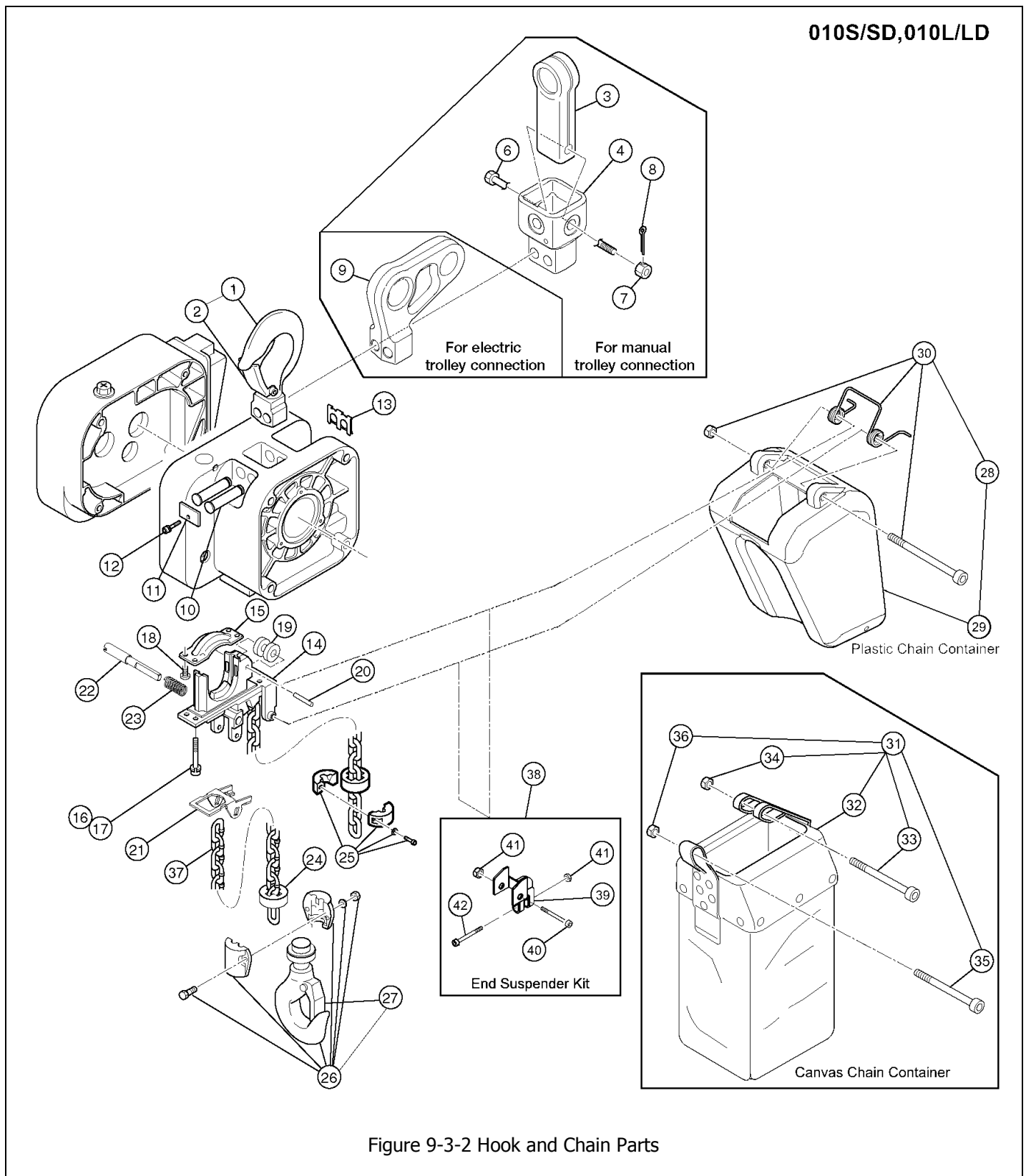


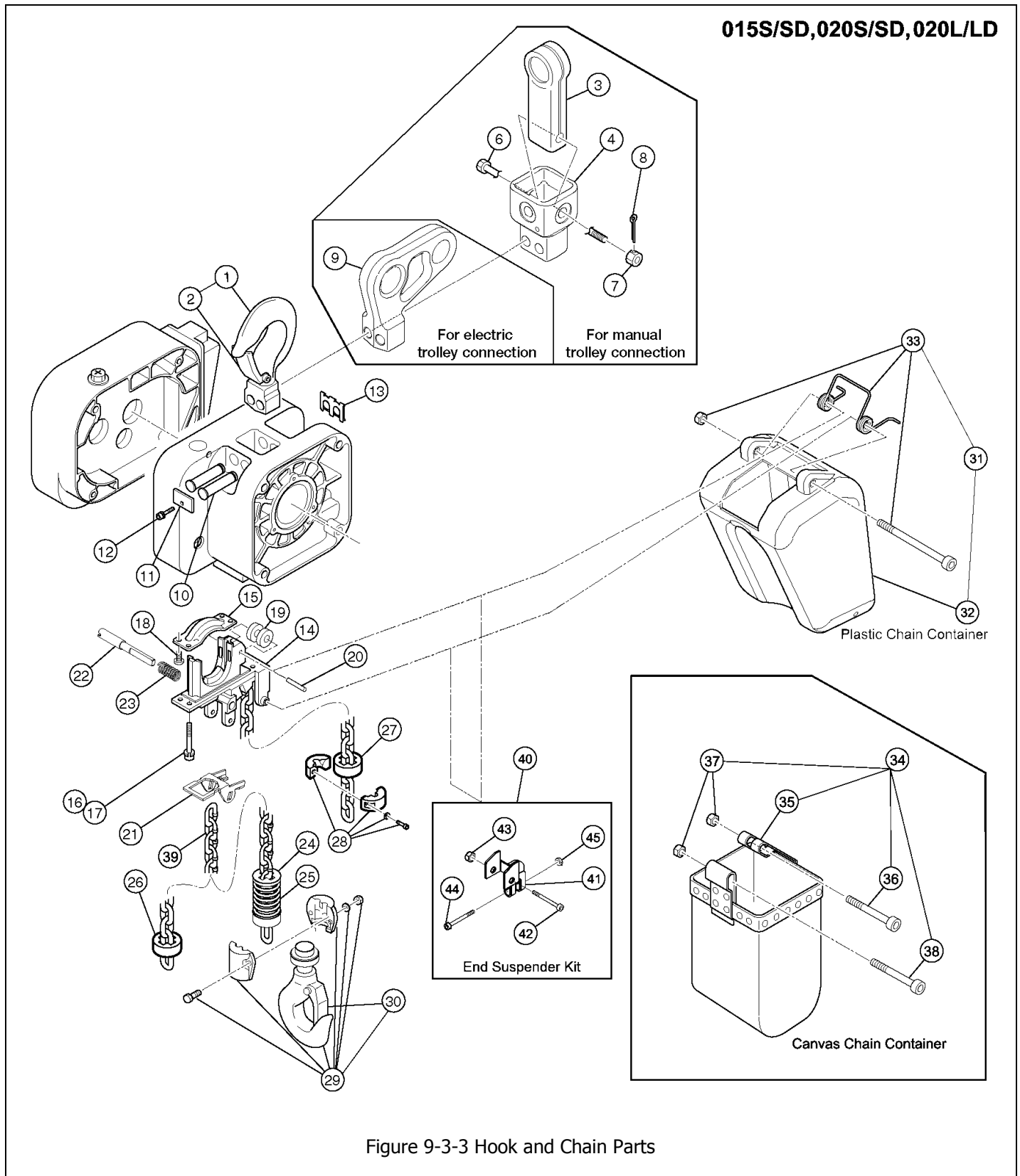
Figure 9-3-2 Hook and Chain Parts

9.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist	010S	010L
1	Top Hook Assembly	1	ER2DS1001	
2	Hook Latch	1	ER2DS1002	
3	Suspender E (For Manual Trolley)	1	T7GB004010	
4	Connection Yoke PG* (For Manual Trolley)	1	ER2CS5027*	
6	Yoke Bolt	1	ER1CS9032	
7	Slotted Nut	1	L3183008	
8	Split Pin	1	9009414-5	
9	Suspender T (For Motorized Trolley)	1	ER2DS9031	
10	Top Pin, Lot No. ER2A-..., 2.7in (69mm) Long	2	ER2CS9121	
	Top Pin, Lot No. ER2B-..., 3.7in (95mm) Long	2	ER2DS9121	
11	Plate A	1	ER2CS9123	
12	Socket Bolt With Spring Washer	1	J1BG10601212	
13	Shaft Clip	1	ER2CS9186	
14	Chain Guide A	1	ER2DS9331	
15	Chain Guide B	1	ER2DS9332	
16	Socket Bolt	4	9091274	
17	Spring Lock Washer	4	9012711	
18	Machine Screw With Spring Washer	4	M6F554010	
19	Guide Roller	1	ER2DS9333	
20	Roller Pin	1	ER1CS9334	
21	Limit Lever	1	ER2DS9337	
22	Limit Lever Pin	1	ER2DS9338	
23	Limit Lever Spring	1	ER2CS9357	
24	Cushion Rubber	2	ER1DS9053	
25	Stopper Assembly	1	ER1DS1041	
26	Bottom Hook Complete Assembly	1	ER2DS1011	
27	Hook Latch	1	ER2DS1002	
28	Plastic Chain Container Assembly (Max. Lifting Height 20ft)	1	PBK2-D	
29	Plastic Chain Container	1	ER2DS1401	
30	Plastic Container Spring Assembly	1	ER2DS1416	
31	Canvas Chain Container Assembly (Max. Lifting Height 50ft)	1	BK2D2	
32	Canvas Chain Container	1	ER2DS5405	
33	Socket Bolt	1	9091286	
34	Lever Nut	1	ES857005S	
35	Socket Bolt	1	ER419001	
36	Lever Nut	1	ES855003	
37	NP Load Chain	1	LCER2010NP	
38	End Suspender Kit	1	ENDS2D	
39	End Suspender	1	ER2CS9408	
40	Socket Bolt	1	90912153	
41	Lever Nut	2	ES857005S	
42	Socket Bolt	1	90912152	

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

9.3 Hook and Chain Parts



9.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist	015S	020S	020L
1	Top Hook Assembly	1		ER2ES1001	
2	Hook Latch	1		ER2ES1002	
3	Suspender E (For Manual Trolley)	1		T7GB004020	
4	Connection Yoke PG* (For Manual Trolley)	1		ER2ES5027*	
6	Yoke Bolt	1		ER1ES9032	
7	Slotted Nut	1		ES088020L	
8	Split Pin	1		9009436	
9	Suspender T	1		ER2ES9031	
10	Top Pin	2		ER2ES9121	
11	Plate A	1		ER2ES9123	
12	Socket Bolt With Spring Washer	1		J1BG10601212	
13	Shaft Clip	1		ER2ES9186	
14	Chain Guide A	1		ER2ES9331	
15	Chain Guide B	1		ER2ES9332	
16	Socket Bolt	4		9091274	
17	Spring Lock Washer	4		9012711	
18	Machine Screw With Spring Washer	4		E6F151003	
19	Guide Roller	1		ER1DL9333	
20	Roller Pin	1		ER1DL9334	
21	Limit Lever	1		ER2ES9337	
22	Limit Lever Pin	1	ER2EL9338	ER2ES9338	ER2EL9338
23	Limit Lever Spring	1		ER2CS9357	
24	Limiting Plate	1		ER1ES9054	
25	Chain Spring	1		E7SS020S9047	ER1DL9051
26	Cushion Rubber	1	ER1ES9053		
27	Cushion Rubber	1		ER1ES9053	
28	Stopper Assembly	1		ER1ES1041	
29	Bottom Hook Complete Assembly	1	ER2EM1011	ER2ES1011	
30	Hook Latch	1	ER2EM1002	ER2ES1002	
31	Plastic Chain Container Assembly (Max. Lifting Height 13ft)	1		PBK2-E	
32	Plastic Chain Container	1		ER2ES1401	
33	Plastic Container Spring Assembly	1		ER2ES1416	
34	Canvas Chain Container Assembly (Max. Lifting Height 60ft)	1		BK2E2	
35	Canvas Chain Container	1		ER2ES5405	
36	Socket Bolt	1		90912107	
37	Lever Nut	2		ES066075	
38	Socket Bolt	1		90912104	
39	NP Load Chain	1		LCER2020NP	
40	End Suspender Kit	1		ENDS2E	
41	End Suspender	1		ER2ES9408	
42	Socket Bolt	1		90912107	
43	Lever Nut	1		ES066075	
44	Socket Bolt	1		90912152	
45	Lever Nut	1		ES857005S	

*Connection Yoke PG replaces Connection Yoke P (ER2ES9027) and Connection Yoke G (ER2ES9029)

9.3 Hook and Chain Parts

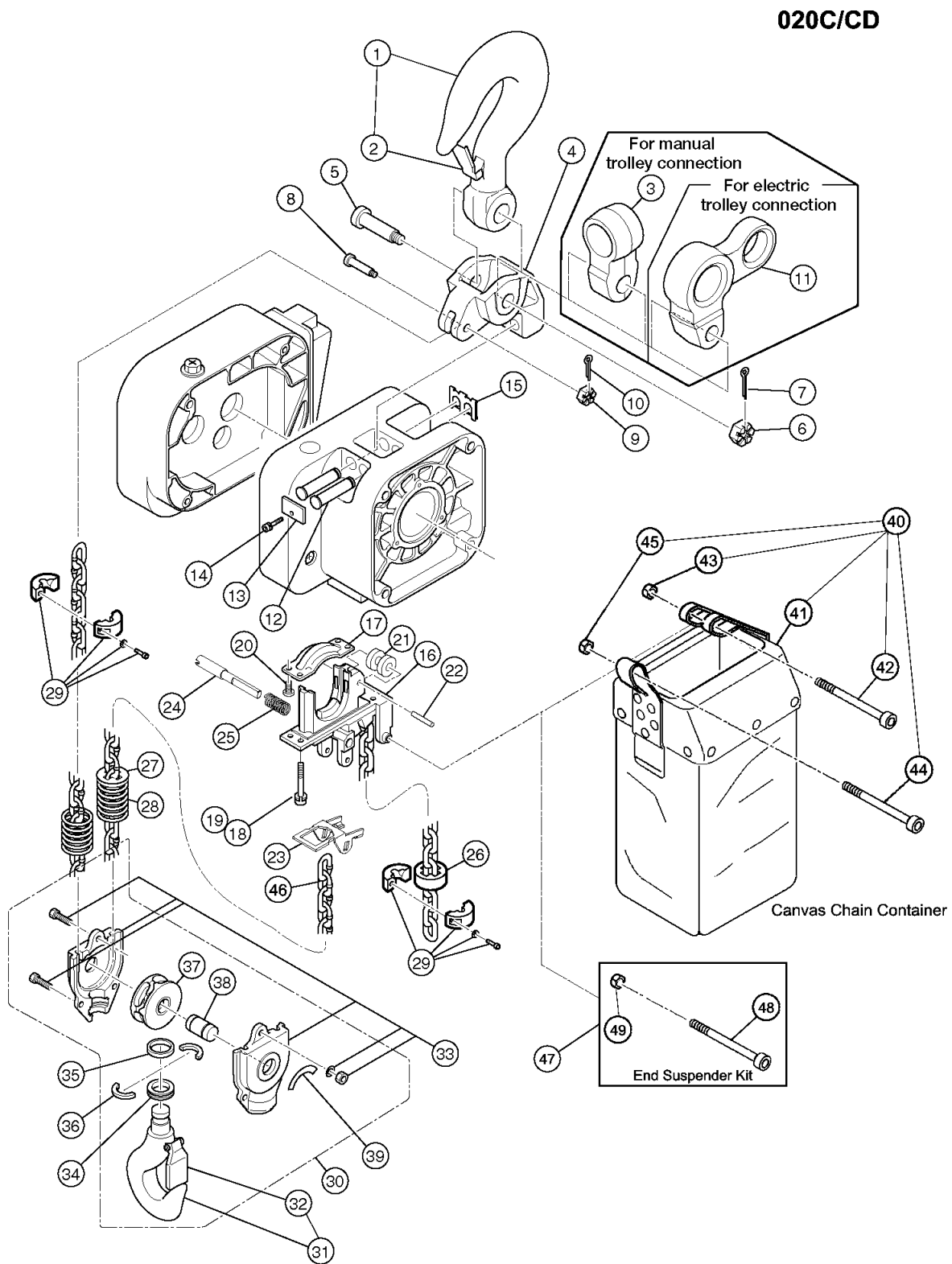


Figure 9-3-4 Hook and Chain Parts

9.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist	020C
1	Top Hook Assembly	1	ER2DR1001
2	Hook Latch	1	ER2DS1002
3	Suspender E (For Manual Trolley)	1	T7GB004020
4	Connection Yoke D	1	ER2DR9030
5	Yoke Bolt	1	ER1ES9032
6	Slotted Nut	1	ES088020L
7	Split Pin	1	9009436
8	Chain Pin	1	M2041010
9	Slotted Nut	1	M2049010
10	Split Pin	1	9009412
11	Suspender T (For Motorized Trolley)	1	ER2DR9031
12	Top Pin, Lot No. ER2A-..., 2.7in (69mm) Long	2	ER2CS9121
	Top Pin, Lot No. ER2B-..., 3.7in (95mm) Long	2	ER2DS9121
13	Plate A	1	ER2CS9123
14	Socket Bolt With Spring Washer	1	J1BG10601212
15	Shaft Clip	1	ER2CS9186
16	Chain Guide A	1	ER2DS9331
17	Chain Guide B	1	ER2DS9332
18	Socket Bolt	4	9091274
19	Spring Lock Washer	4	9012711
20	Machine Screw With Spring Washer	4	E6F151003
21	Guide Roller	1	ER1DS9333
22	Roller Pin	1	ER1DL9334
23	Limit Lever	1	ER2DS9337
24	Limit Lever Pin	1	ER2DS9338
25	Limit Lever Spring	1	ER2CS9357
26	Cushion Rubber	2	ER1DS9053
27	Limiting Plate	1	ER2DR9054
28	Chain Spring	2	ER1DS9051
29	Stopper Assembly	2	ER1DS1041
30	Bottom Hook Complete Assembly	1	ER2DR1011
31	Bottom Hook Assembly	1	ER2DR2011
32	Hook Latch	1	ER2DS1002
33	Bottom Yoke Assembly	1	ER2DR2015
34	Thrust Bearing	1	ES022015
35	Thrust Collar A	1	ES026015
36	Hook Stopper A	2	ES027015
37	Idle Sheave Assembly	1	ER2DR6021
38	Bottom Shaft Assembly	1	ER2DR6023
39	Name Plate C	1	80173
40	Canvas Chain Container Assembly (Max. Lifting Height 26ft)	1	BK2D2
41	Canvas Chain Container	1	ER2DS5405
42	Socket Bolt	1	9091286
43	Lever Nut	1	ES857005S
44	Socket Bolt	1	ER419001
45	Lever Nut	1	ES855003
46	NP Load Chain	1	LCER2010NP
47	End Suspender Kit	1	ENDS2D2
48	Socket Bolt	1	90912153
49	Lever Nut	1	ES857005S

9.3 Hook and Chain Parts

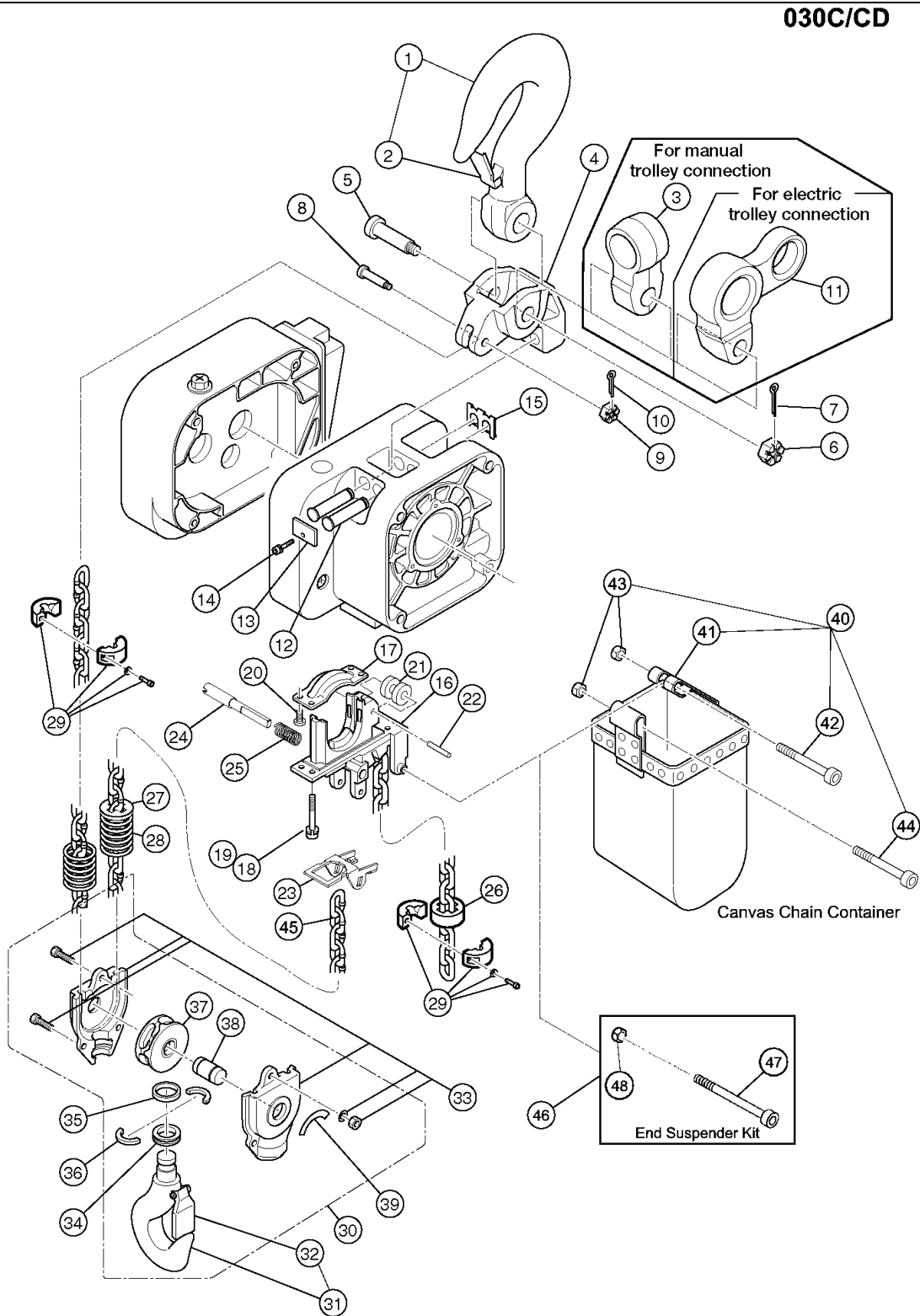


Figure 9-3-5 Hook and Chain Parts

9.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist	030C
1	Top Hook Assembly	1	ER2ER1001
2	Hook Latch	1	ER2ER1002
3	Suspender E (For Manual Trolley)	1	T7GB004030
4	Connection Yoke D	1	ER2ER9030
5	Yoke Bolt	1	ER1ES9032
6	Slotted Nut	1	L3183008
7	Split Pin	1	9009436
8	Chain Pin	1	ES041030
9	Slotted Nut	1	M2049020
10	Split Pin	1	9009416
11	Suspender T (For Motorized Trolley)	1	ER2ER9031
12	Top Pin	2	ER2ES9121
13	Plate A	1	ER2ES9123
14	Socket Bolt With Spring Washer	1	J1BG10601212
15	Shaft Clip	1	ER2ES9186
16	Chain Guide A	1	ER2ES9331
17	Chain Guide B	1	ER2ES9332
18	Socket Bolt	4	9091274
19	Spring Lock Washer	4	9012711
20	Machine Screw With Spring Washer	4	E6F151003
21	Guide Roller	1	ER1DL9333
22	Roller Pin	1	ER1DL9334
23	Limit Lever	1	ER2ES9337
24	Limit Lever Pin	1	ER2ES9338
25	Limit Lever Spring	1	ER2CS9357
26	Cushion Rubber	1	ER1EM9053
27	Limiting Plate	1	ER1ES9054
28	Chain Spring	2	ES047015
29	Stopper Assembly	2	ER1ES1041
30	Bottom Hook Complete Assembly	1	ER2ER1011
31	Bottom Hook Assembly	1	ER2ER2011
32	Hook Latch	1	ER2ER1002
33	Bottom Yoke Assembly	1	ER2ER2015
34	Thrust Bearing	1	ES022025
35	Thrust Collar A	1	ES026025
36	Hook Stopper A	2	ES027025
37	Idle Sheave Assembly	1	ER2ER6021
38	Bottom Shaft Assembly	1	ER2ER6023
39	Name Plate C	1	80173
40	Canvas Chain Container Assembly (Max. Lifting Height 20ft)	1	BK2E1
41	Canvas Chain Container	1	ER2ES5403
42	Socket Bolt	1	90912107
43	Lever Nut	2	ES066075
44	Socket Bolt	1	90912104
45	NP Load Chain	1	LCER2020NP
46	End Suspender Kit	1	ENDS2E2
47	Socket Bolt	1	90912107
48	Lever Nut	1	ES066075

9.3 Hook and Chain Parts

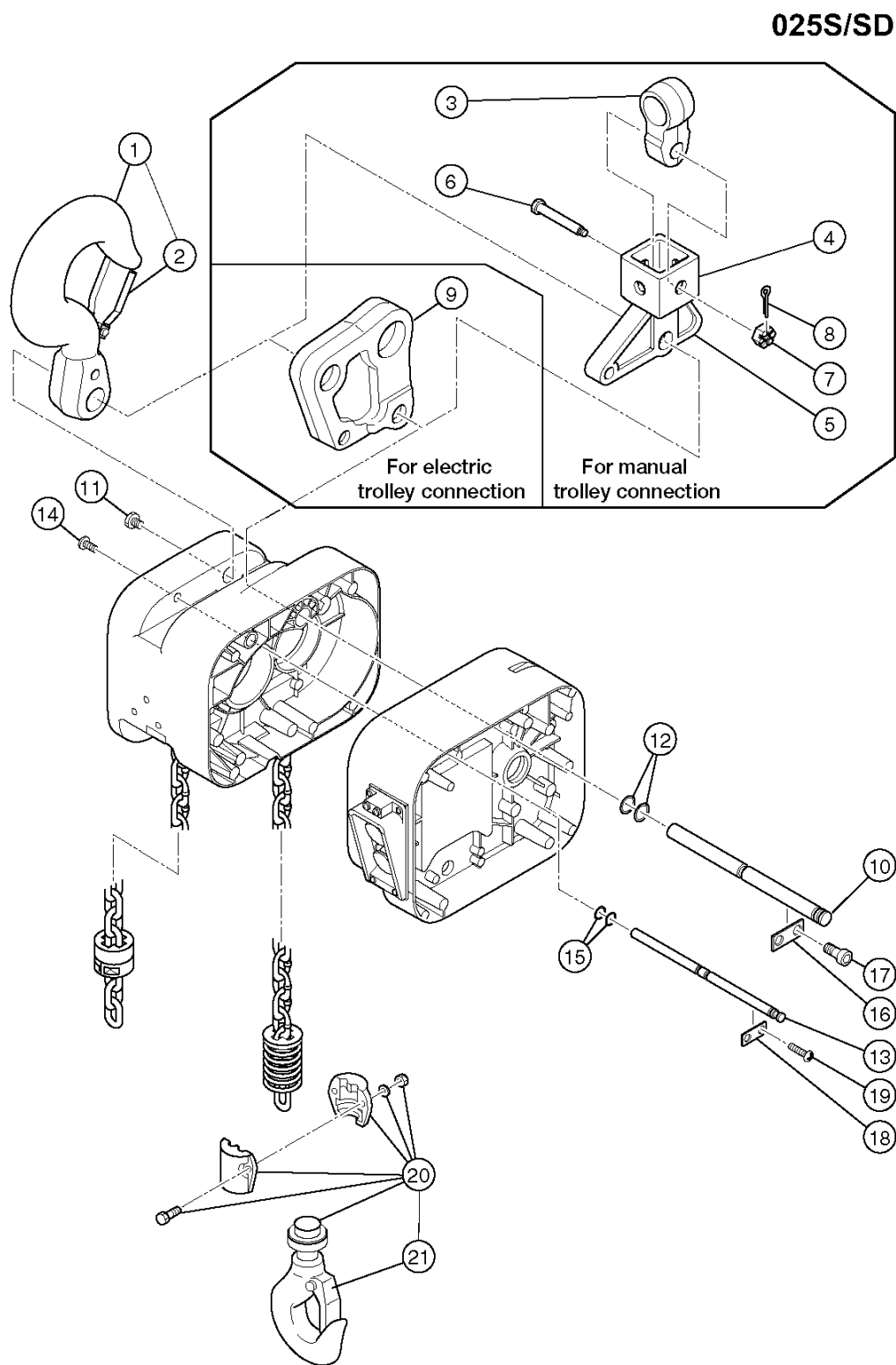


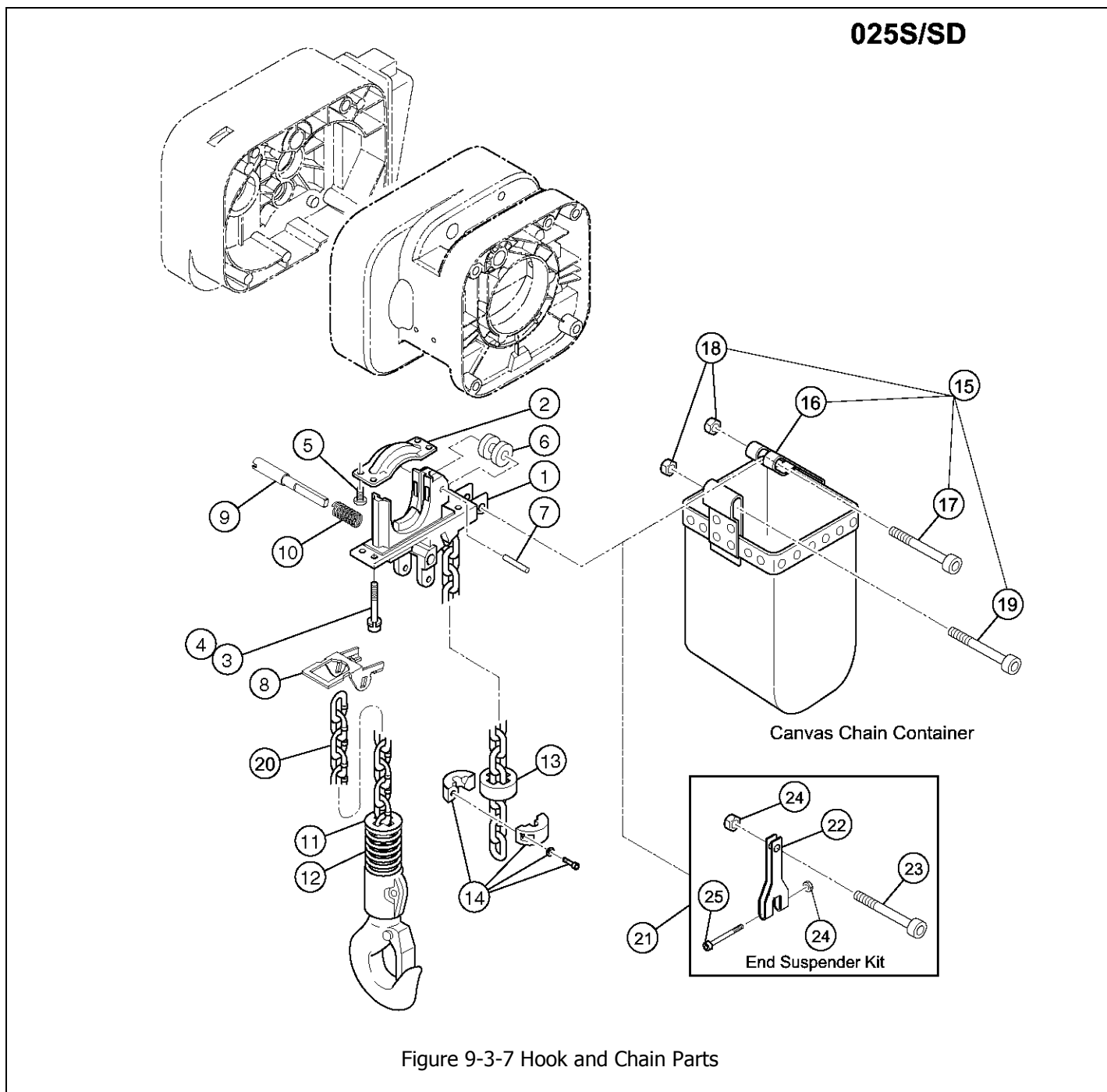
Figure 9-3-6 Hook and Chain Parts

9.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist	025S
1	Top Hook Complete Assembly	1	ER2FS1001
2	Hook Latch	1	ER2FS1002
3	Suspender E (For Manual Trolley)	1	T7GB004030
4	Connection Yoke PG* (For Manual Trolley)	1	ER2FS5027*
6	Yoke Bolt	1	ER2FS9032
7	Slotted Nut	1	ES088020L
8	Split Pin	1	9009436
9	Suspender T (For Motorized Trolley)	1	ER2FS9031
10	Connection Shaft Assembly	1	ER2FS6121
11	Shaft Plug	1	ER2FS9128
12	O Ring	2	9013317
13	Fixing Shaft Assembly	1	ER2FS6122
14	Fixing Shaft Plug	1	ER2FS9131
15	O Ring	2	9013307
16	Connection Shaft Plate A	1	ER1ES9123
17	Socket Bolt With Spring Washer	2	J1BG10601616
18	Fixing Shaft Plate A	1	ER1BS9123
19	Machine Screw With Spring Washer	2	M6F554010
20	Bottom Hook Complete Assembly	1	ER2FS1011
21	Hook Latch	1	ER2ES1002

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

9.3 Hook and Chain Parts



9.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist	025S
1	Chain Guide A	1	ER2FS9331
2	Chain Guide B	1	ER2FS9332
3	Socket Bolt	4	9091274
4	Spring Lock Washer	4	9012711
5	Machine Screw With Spring Washer	4	E6F151003
6	Guide Roller	1	ER1EM9333
7	Roller Pin	1	ER2FS9334
8	Limit Lever	1	ER2FS9337
9	Limit Lever Pin	1	ER2FS9338
10	Limit Lever Spring	1	ER2CS9357
11	Limiting Plate	1	ER1FH9054
12	Chain Spring	1	ER1EM9051
13	Cushion Rubber	1	ER1EM9053
14	Stopper Assembly	1	ER1ES1041
15	Canvas Chain Container Assembly (Max. Lifting Height 40ft)	1	BK2F2
16	Canvas Chain Container	1	ER2FS5405
17	Socket Bolt	1	90912140
18	Lever Nut	2	ES066075
19	Socket Bolt	1	90912104
20	NP Load Chain	1	LCER2025NP
21	End Suspender Kit	1	ENDS2F
22	End Suspender	1	ER1ES9408
23	Socket Bolt	1	90912101
24	Lever Nut	1	ES066075
25	Socket Bolt	1	90912140
26	Lever Nut	1	ES066075

9.3 Hook and Chain Parts

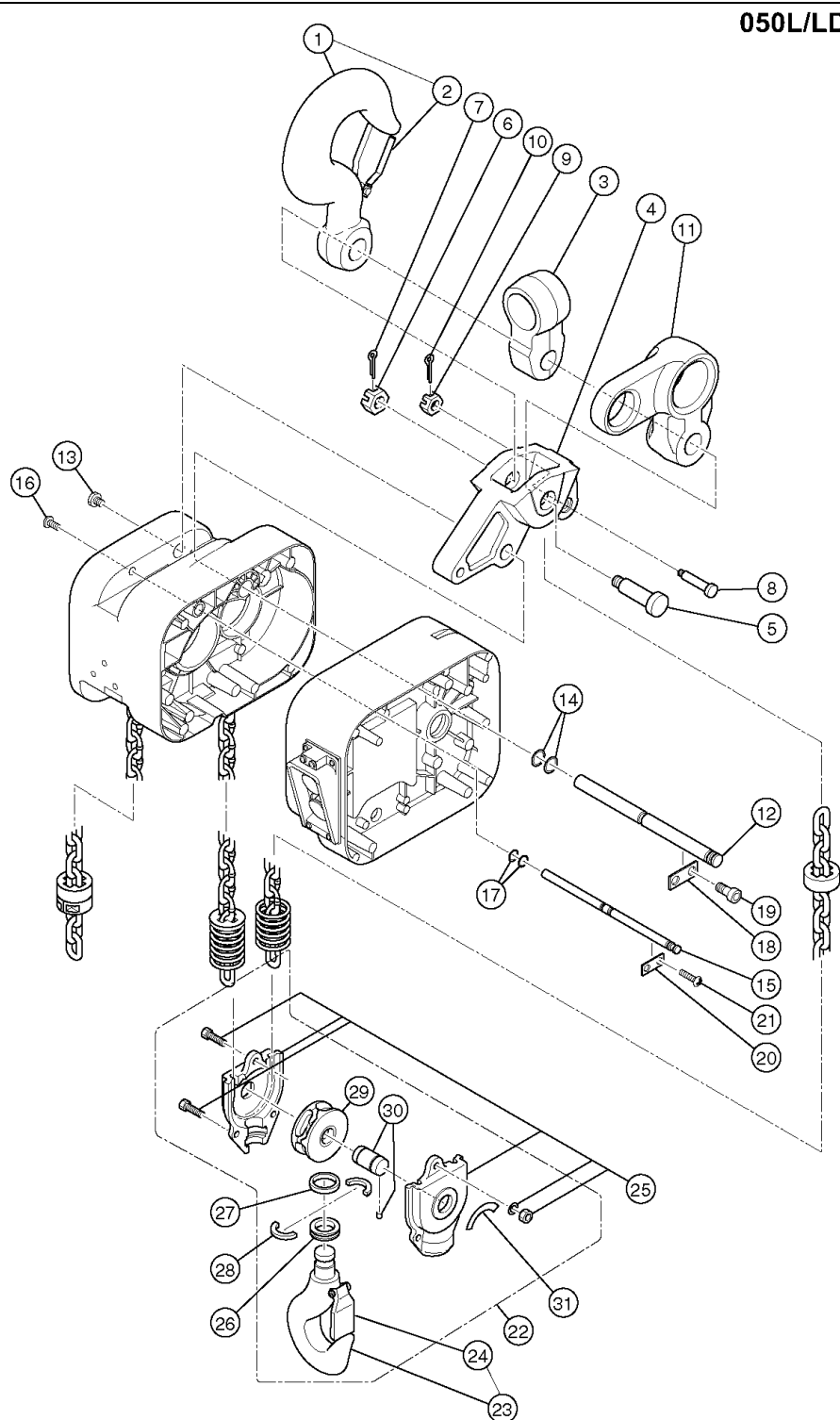
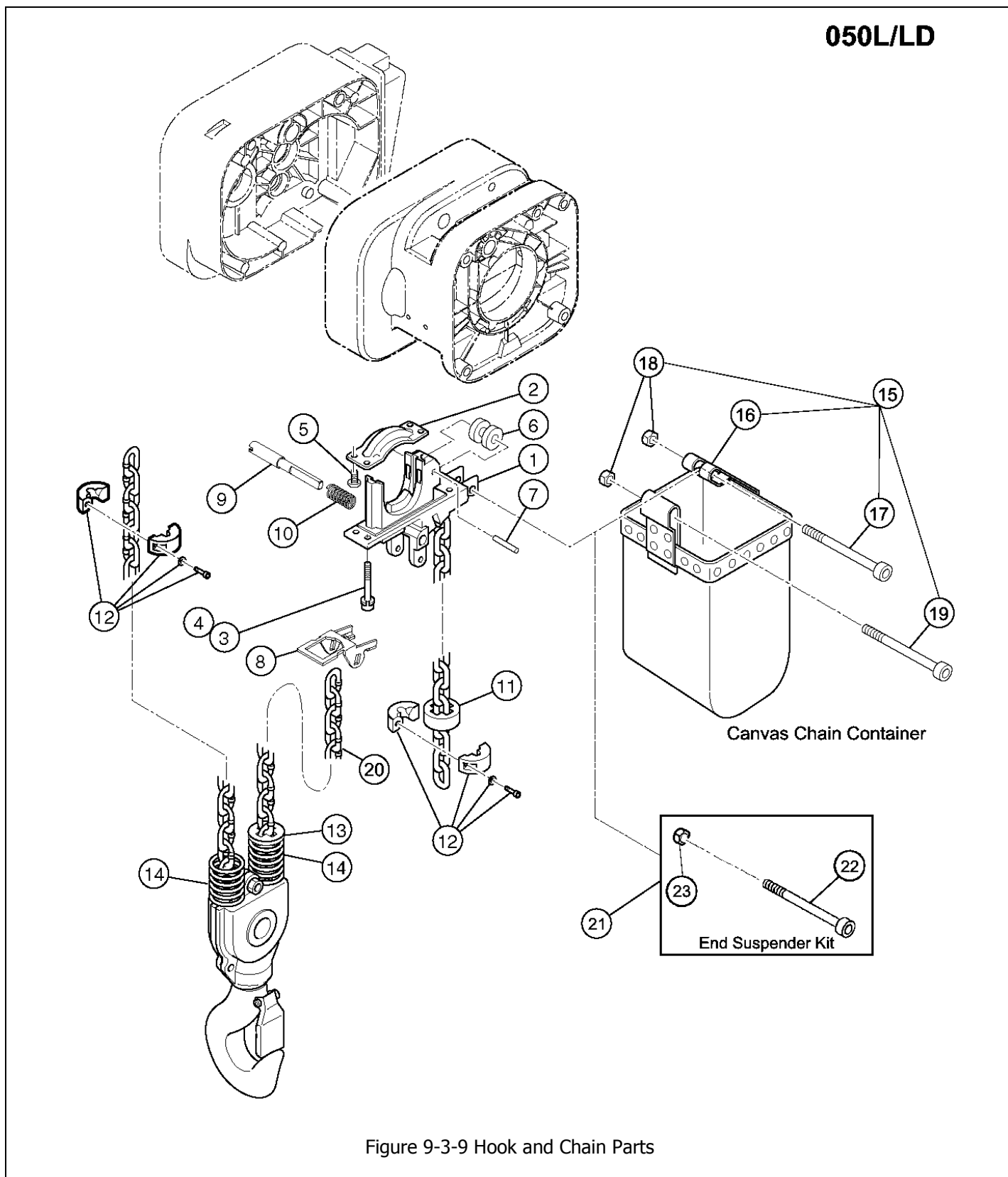


Figure 9-3-8 Hook and Chain Parts

9.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist	050L
1	Top Hook Assembly	1	ER2FR1001
2	Hook Latch	1	ER2FR9002
3	Suspender G (For Manual Trolley)	1	MR1GS9001
4	Connection Yoke D	1	ER2FR9030
5	Yoke Bolt	1	ES006050
6	Slotted Nut	1	J1NL00120200
7	Split Pin	1	9009437
8	Chain Pin	1	ES041050
9	Slotted Nut	1	M2049030
10	Split Pin	1	9009424
11	Suspender T (For Motorized Trolley)	1	ER1FR9031
12	Top Pin Assembly	1	ER2FS6121
13	Top Pin Plug Assembly	1	ER2FS6128
14	O Ring	2	9013317
15	Fixing Shaft Assembly	1	ER2FS6122
16	Fixing Shaft Plug Assembly	1	ER2FS6131
17	O Ring	2	9013307
18	Plate A	1	ER1ES9123
19	Socket Bolt With Spring Washer	2	J1BG10601616
20	Plate A	1	ER1BS9123
21	Machine Screw With Spring Washer	2	M6F554010
22	Bottom Hook Complete Assembly	1	ER2FR1011
23	Bottom Hook Assembly	1	ER2FR2011
24	Hook Latch	1	ER2FR9002
25	Bottom Yoke Assembly	1	ER2FR2015
26	Thrust Bearing	1	ES022050
27	Thrust Collar A	1	ES026050
28	Hook Stopper A	2	ES027050
29	Idle Sheave Assembly	1	ER2FR6021
30	Bottom Shaft Assembly	1	ES5054050
31	Name Plate C	1	80173

9.3 Hook and Chain Parts



9.3 Hook and Chain Parts

Figure No.	Part Name	Parts Per Hoist	050L
1	Chain Guide A	1	ER2FS9331
2	Chain Guide B	1	ER2FS9332
3	Socket Bolt	4	9091274
4	Spring Lock Washer	4	9012711
5	Machine Screw With Spring Washer	4	E6F151003
6	Guide Roller	1	ER1EM9333
7	Roller Pin	1	ER2FS9334
8	Limit Lever	1	ER2FS9337
9	Limit Lever Pin	1	ER2FS9338
10	Limit Lever Spring	1	ER2CS9357
11	Cushion Rubber	1	ER1EM9053
12	Stopper Assembly	2	ER1ES1041
13	Limiting Plate	1	ER1FH9054
14	Chain Spring	2	ER1EM9051
15	Canvas Chain Container Assembly (Max. Lifting Height 20ft)	1	BK2F2
16	Canvas Chain Container	1	ER2FS5405
17	Socket Bolt	1	90912140
18	Lever Nut	2	ES066075
19	Socket Bolt	1	90912104
20	NP Load Chain	1	LCER2025NP
21	End Suspender Kit	1	ENDS2F2
22	Socket Bolt	1	90912140
23	Lever Nut	1	ES066075

9.4 Electric Parts (Single Speed)

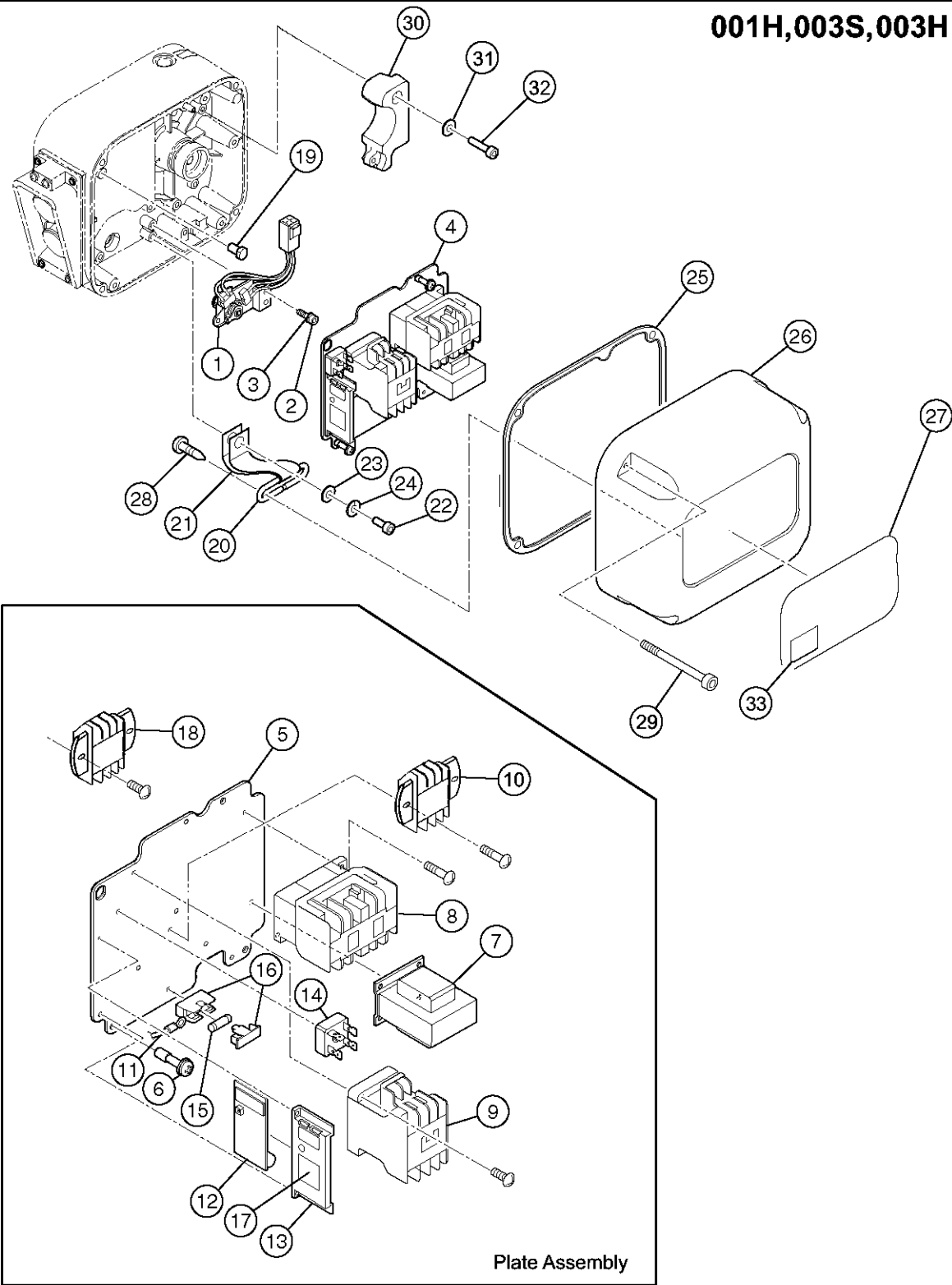


Figure 9-4-1 Electric Parts (Single Speed)

9.4 Electric Parts (Single Speed)

Figure No.	Part Name	Parts Per Hoist		001H	003S	003H
1	Limit Switch Complete Assembly		1	ER2CI1060		
2	Socket Bolt		3	9091247		
3	Spring Lock Washer		3	9012709		
4	Plate Assembly		1	ER2GHM03S5A2		ER2GHM05S5A2
5	Plate		1	ER2BS9441		ER2CS9441
6	Plate Screw		3	ER1BS9445		
7	Transformer		1	TRF72V611		TRF73V611
8	Electromagnetic Contactor		1	MGC23406C		MGC23406A
9	E-Stop Contactor*		1	MGC13306F*		
				MGC14306C*		
10	Terminal Block 3P		1	ECP1303AB		
11	Lead Wire		1	ER2GHM03S9A2		ER2GHM05S9A2
12	CH Meter		1	ECP91CHAF		ECP91CHAE
13	CH Meter Support		1	ECP99BKBA		
14	Rectifier		1	ECP93DIAA		
15	Fuse		1	9006275		
16	Fuse Holder		1	ECP92FZAA		
17	Name Plate CH		1	ECP99CHAA		
18	Terminal Block 6P		1	ECP1306AD		
19	Fulcrum Pin		1	ER2CS9449		
20	Cover Suspender		1	ER2CS9456		
21	Cover Belt		1	ER2BI9457		ER2CS9457
22	Socket Bolt		1	9091249		
23	Plain Washer		1	ER1BS9436		
24	Spring Lock Washer		1	9012709		
25	Packing C	F	1	ER2BS9117		ER2CS9117
		M		ER2BI9117		
26	Controller Cover	F	1	ER2BS9104		ER2CS9104
		M		ER2BS2302		ER2CS2302
27	Name Plate B		1	ER2BHM03S9A5		ER2BHM05S9A5
28	Pan Head Mach. Screw		2	9798534		
29	Socket Bolt With Spring Washer		4	J1BG10504022		
33	Name Plate D		1	ER2BHM01H9A6		ER2BHM03H9A6

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

9.4 Electric Parts (Single Speed)

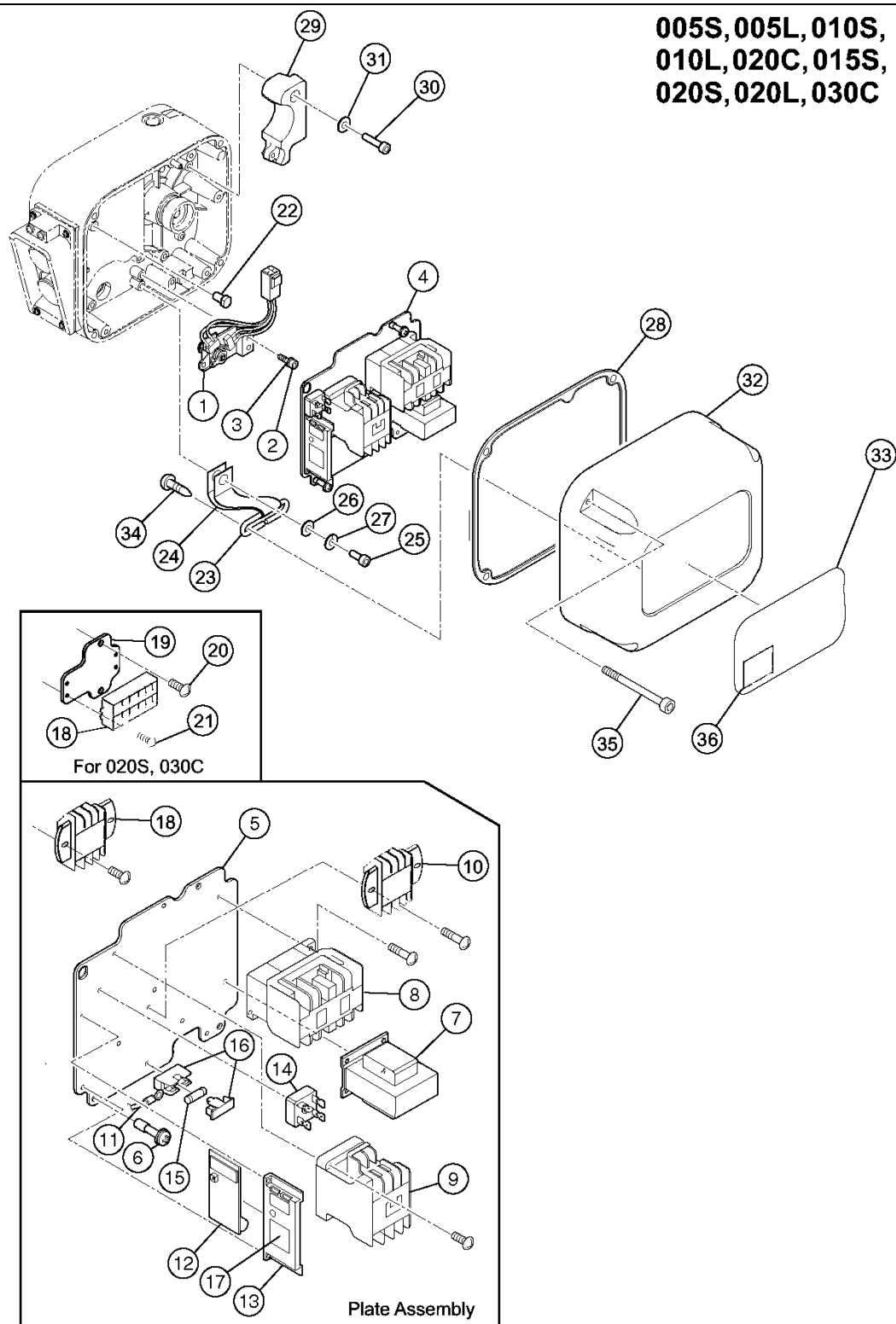


Figure 9-4-2 Electric Parts (Single Speed)

9.4 Electric Parts (Single Speed)

Figure No.	Part Name	Parts Per Hoist		005S	005L	010S	010L/020C	015S	020L	020S	030C	
1	Limit Switch Complete Assembly		1	ER2CI1060								
2	Socket Bolt		3	9091247								
3	Spring Lock Washer		3	9012709								
4	Plate Assembly		1	ER2GHM05S 5A2	ER2GHM05L 5A2	ER2GHM10S5A2		ER2GHM20L5A2		ER2GHM20S5A2		
5	Plate		1	ER2CS9441		ER2DS9441		ER2ES9441				
6	Plate Screw		3	ER1BS9445								
7	Transformer		1	TRF73V611	TRF72V611	TRF73V611						
8	Electromagnetic Contactor		1	MGC23406A	MGC23406C	MGC23406A				MGC23406B		
9	E-Stop Contactor**		1	MGC13306F**							MGC13306H**	
10	Terminal Block 3P		1	ECP1303AB				ECP1303AB				
	Terminal Block 9P					ECP1309AB						
11	Lead Wire		1	ER2GHM05S 9A2	ER2GHM05L 9A2	ER2GHM05S9A2				ER2GHM20S9A2		
12	CH Meter		1	ECP91CHAE								
13	CH Meter Support		1	ECP99BKBA								
14	Rectifier		1	ECP93DIAA							ECP94DIAA	
15	Fuse		1	9006275								
16	Fuse Holder		1	ECP92FZAA								
17	Name Plate CH		1	ECP99CHAA								
18	Terminal Block 6P		1	ECP1306AD				ECP1306AD		ECP1306AF		
21	Machine Screw		2								9798512	
22	Fulcrum Pin		1	ER2CS9449								
23	Cover Suspender		1	ER2CS9456								
24	Cover Belt		1	ER2CS9457								
25	Socket Bolt		1	9091249								
26	Plain Washer		1	ER1BS9436								
27	Spring Lock Washer		1	9012709								
28	Packing C		1	ER2CS9117		ER2DS9117		ER2ES9117				
29	Balancer	F M	1			ER2DS9109					ER2ES9109	
30	Socket Bolt		2	90912154		90912154						
			3								9091273	
31	Spring Lock Washer		2	9012709		9012709						
			3								9012711	
32	Controller Cover	F M	1	ER2CS9104		ER2DS9104		ER2ES9104				
				ER2CS2302		ER2DS2302		ER2ES2302				
33	Name Plate B		1	ER2BHM05S9A5		ER2BHM10S9A5		ER2BHM20S9A5				
34	Pan Head Mach. Screw		2	9798534								
35	Socket Bolt With Spring Washer		4	J1BG10504022		J1BG10604024						
36	Name Plate D		1				ER2BHM20S9A6	ER2BHM15 M9A6			ER2BHM30 R9A6	

*Name Plate D for 020C ONLY

**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.

9.4 Electric Parts (Single Speed)

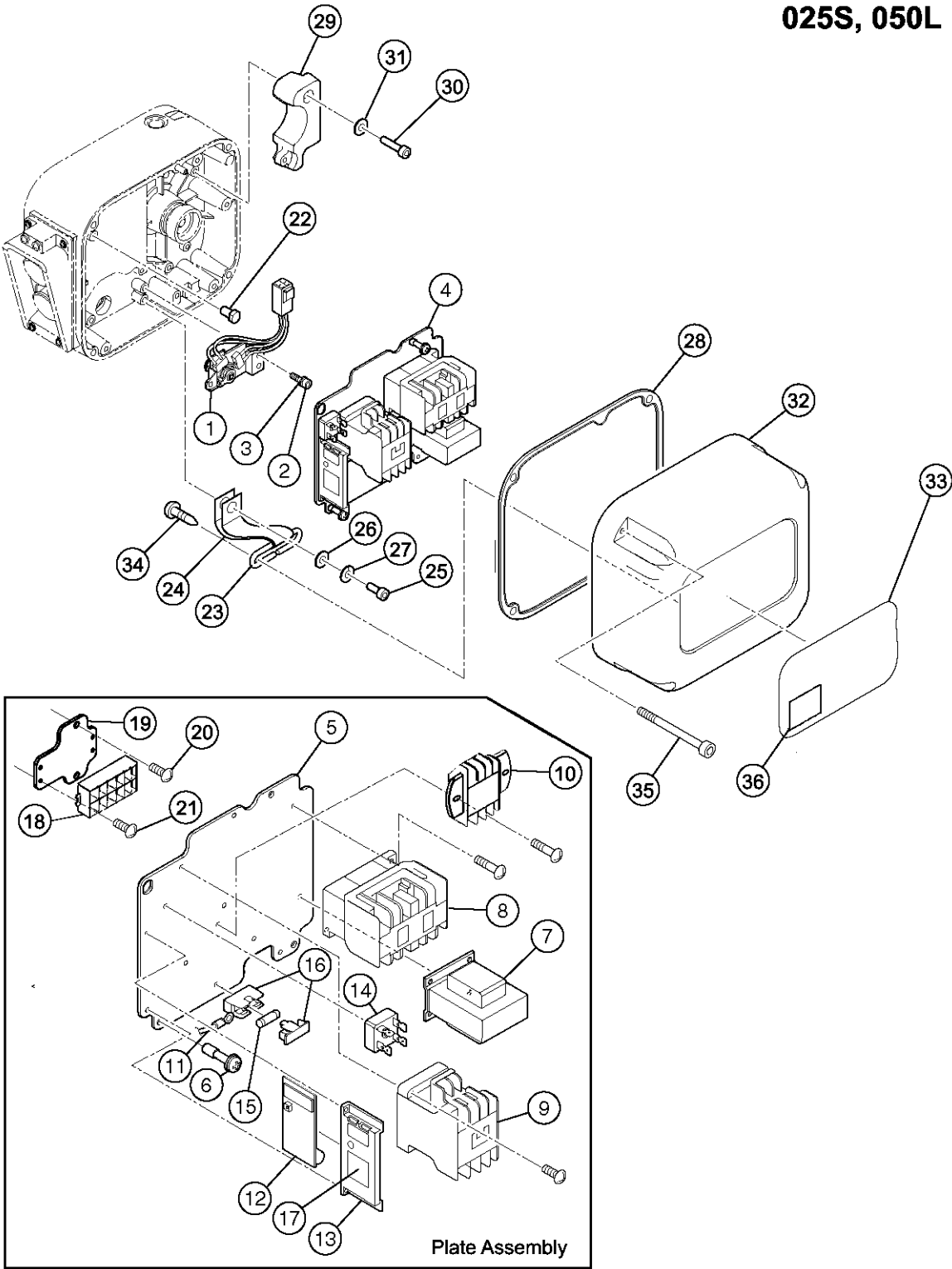


Figure 9-4-3 Electric Parts (Single Speed)

9.4 Electric Parts (Single Speed)

Figure No.	Part Name	Parts Per Hoist	025S	050L
1	Limit Switch Complete Assembly	1	ER2CI1060	
2	Socket Bolt	3	9091247	
3	Spring Lock Washer	3	9012709	
4	Plate Assembly	1	ER2GHM20S5A2	
5	Plate	1	ER2ES9441	
6	Plate Screw	3	ER1BS9445	
7	Transformer	1	TRF73V611	
8	Electromagnetic Contactor	1	MGC23406B	
9	E-Stop Contactor*	1	MGC13306H* MGC14306C*	
10	Terminal Block 3P	1	ECP1303AB	
11	Lead Wire	1	ER2GHM020S9A2	
12	CH Meter	1	ECP91CHAE	
13	CH Meter Support	1	ECP99BKBA	
14	Rectifier	1	ECP94DIAA	
15	Fuse	1	9006275	
16	Fuse Holder	1	ECP92FZAA	
17	Name Plate CH	1	ECP99CHAA	
18	Terminal Block 6P	1	ECP1306AF	
21	Machine Screw	2	9798512	
22	Fulcrum Pin	1	ER2CS9449	
23	Cover Suspender	1	ER2CS9456	
24	Cover Belt	1	ER2CS9457	
25	Socket Bolt	1	9091249	
26	Plain Washer	1	ER1BS9436	
27	Spring Lock Washer	1	9012709	
28	Packing C	1	ER2FS9117	
29	Balancer	1	ER2FS9109	
30	Socket Bolt	3	9091273	
31	Spring Lock Washer	3	9012711	
32	Controller Cover	F M	ER2FS9104 ER2FS2302	
33	Name Plate B	1	ER2BHM25S9A5	
34	Pan Head Mach. Screw	2	9798534	
35	Socket Bolt With Spring Washer	4	J1BG10604040	
36	Name Plate D	1		ER2BHM50R9A6

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

9.5 Electric Parts (Dual Speed)

001HD, 003SD, 003HD

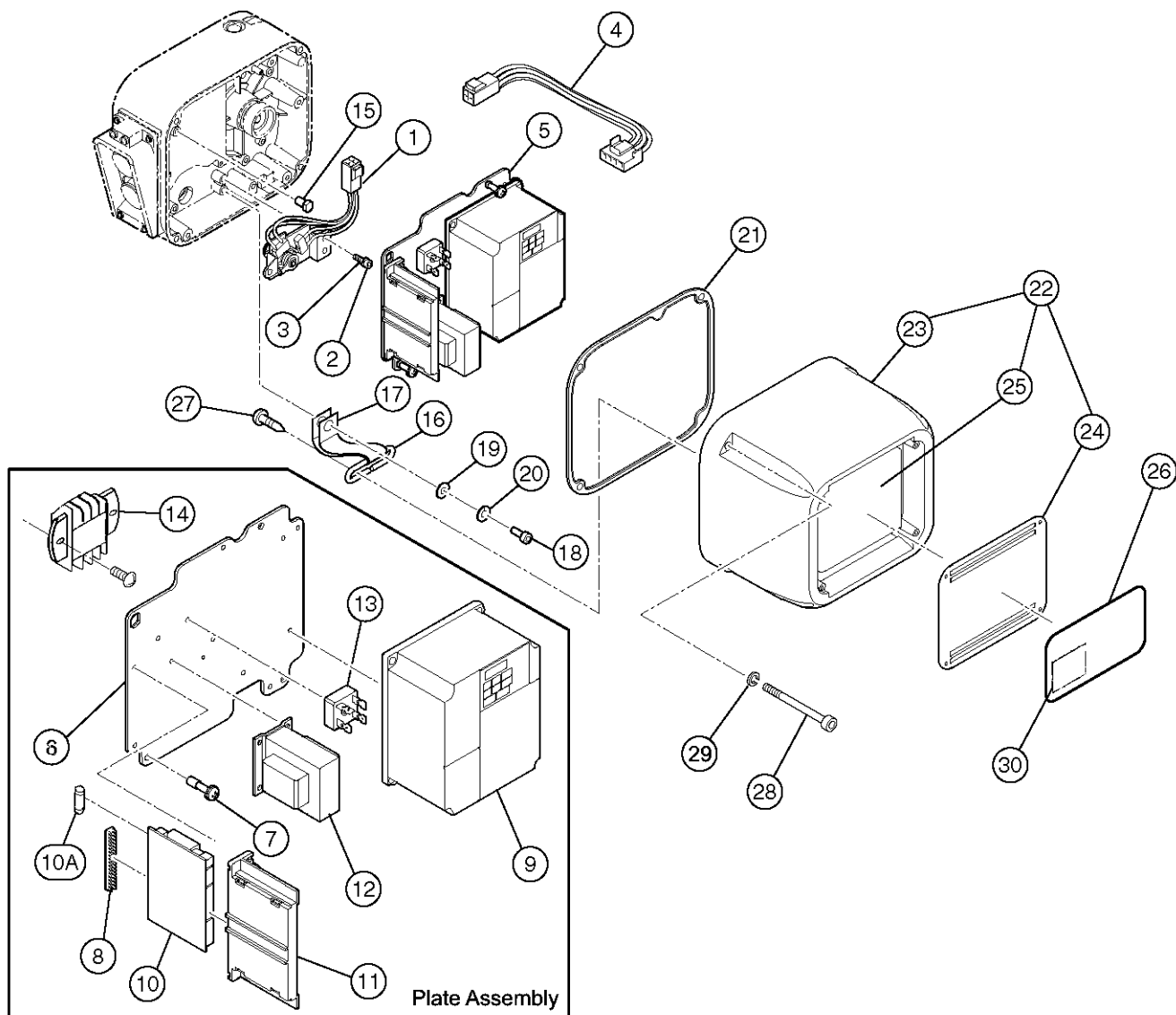


Figure 9-5-1 Electric Parts (Dual Speed)

9.5 Electric Parts (Dual Speed)

Figure No.	Part Name	Parts Per Hoist		001HD	003SD	003HD
1	Limit Switch Complete Assembly		1	ER2CI1060		
2	Socket Bolt		3	9091247		
3	Spring Lock Washer		3	9012709		
4	LS Harness		1	ER2CI9554		
5	Plate Assembly	M, 2V	1	ER2LHE03I5A2		ER2LHE05I5A2
		F, 2V		ER2BHE03I5A2		ER2BHE05I5A2
		M, 4V		ER2LHN03I5A2		ER2LHN05I5A2
		F, 4V		ER2BHN03I5A2		ER2BHN05I5A2
6	Plate		1	ER2BI9441		ER2CI9441
7	Plate Screw		3	ER1BS9445		
8	Bushing		1	ECP99JBAC		
9	VFD Assembly	M, 2V	1	INV60FH24		INV615H24
		F, 2V		INV60FH21		INV615H21
		M, 4V		INV60FM24		INV615M24
		F, 4V		INV60FM21		INV615M21
10	Interface Board		1	ECP91KB02		
10A	Fuse		1	9006275		
11	Board Support		1	ECP99BKAA		
12	Transformer	2V	1	TRF32C612		
		4V		TRF32N612		
13	Rectifier		1	ECP93DIAA		
14	Terminal Block 6P		1	ECP1306AD		
15	Fulcrum Pin		1	ER2CS9449		
16	Cover Suspendr		1	ER2CS9456		
17	Cover Belt		1	ER2CS9457		
18	Socket Bolt		1	9091249		
19	Plain Washer		1	ER1BS9436		
20	Spring Lock Washer		1	9012709		
21	Packing C	M	1	ER2BI9117		ER2CS9117
22	Controller Cover Assembly	2V	1	ER2BI2104		ER2CI2104
		4V		ER2BI1104		ER2CI1104
23	Controller Cover		1	ER2BI9104		ER2CI9104
24	Resistor Cover		1	ER2BI9185		ER2CI9185
25	Braking Resistor	2V	1	INV70EE16		INV709E16
		4V		INV70EY16		INV709Y16
26	Name Plate B		1	ER2BHM03I9A5		ER2BHM05I9A5
27	Pan Head Mach. Screw		2	9798534		
28	Socket Bolt		4	9091233		
29	Toothed Lock Washer		4	9679708		
30	Name Plate D		1	ER2BHM01H9A6		ER2BHM03H9A6

9.5 Electric Parts (Dual Speed)

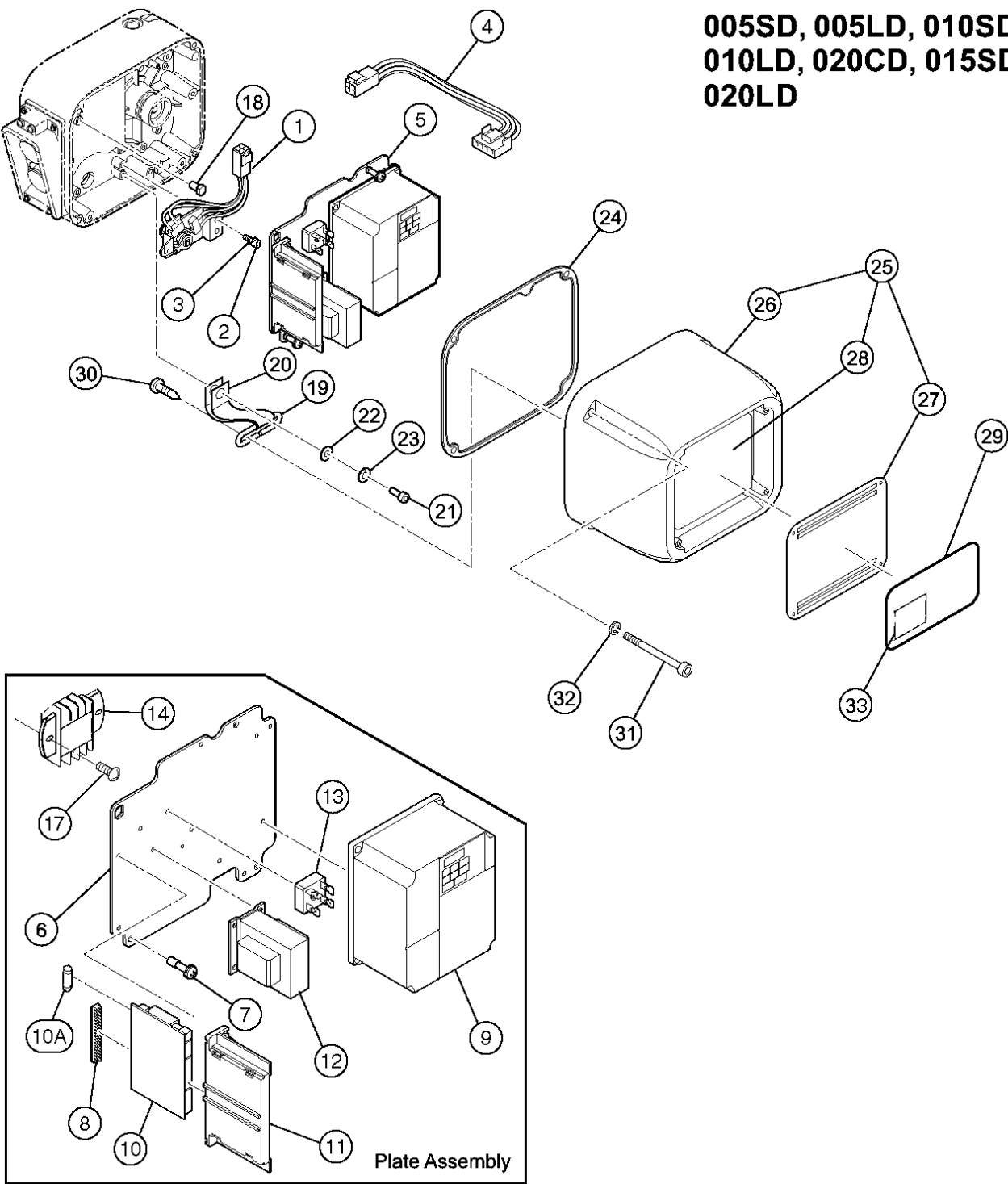


Figure 9-5-2 Electric Parts (Dual Speed)

9.5 Electric Parts (Dual Speed)

Figure No.	Part Name	Parts Per Hoist		005SD	005LD	010SD	010LD/020CD	015SD	020LD
1	Limit Switch Complete Assembly		1	ER2CI1060					
2	Socket Bolt		3	9091247					
3	Spring Lock Washer		3	9012709					
4	LS Harness		1	ER2CI9554					
5	Plate Assembly	M, 2V	1	ER2LHE05I5A2	ER2LHE05J5A2	ER2LHE10I5A2	ER2LHE10J5A2	ER2LHE20J5A2	
		F, 2V	1	ER2BHE05I5A2	ER2BHE05J5A2	ER2BHE10I5A2	ER2BHE10J5A2	ER2BHE20J5A2	
		M, 4V	1	ER2LHN05I5A2	ER2LHN05J5A2	ER2LHN10I5A2	ER2LHN10J5A2	ER2LHN20J5A2	
		F, 4V	1	ER2BHN05I5A2	ER2BHN05J5A2	ER2BHN10I5A2	ER2BHN10J5A2	ER2BHN20J5A2	
6	Plate		1	ER2CI9441		ER2DI9441		ER2EI9441	
7	Plate Screw		3	ER1BS9445					
8	Bushing		1	ECP99JBAC					
9	Inverter Assembly	M, 2V	1	INV615H24	INV60FH24	INV622H24	INV615H24	INV622H24	
		INV615H21		INV60FH21	INV622H21	INV615H21	INV622H21		
		INV615M24		INV60FM24	INV622M24	INV615M24	INV622M24		
		INV615M21		INV60FM21	INV622M21	INV615M21	INV622M21		
10	Interface Board		1	ECP91KB02					
10A	Fuse		1	9006275					
11	Board Support		1	ECP99BKAA					
12	Transformer	2V	1	TRF32C612					
		4V		TRF32N612					
13	Rectifier		1	ECP93DIAA					
14	Terminal Block 6P		1	ECP1306AD					
17	Machine Screw		2	9798512					
18	Fulcrum Pin		1	ER2CS9449					
19	Cover Suspender		1	ER2CS9456					
20	Cover Belt		1	ER2CS9457					
21	Socket Bolt		1	9091249					
22	Plain Washer		1	ER1BS9436					
23	Spring Lock Washer		1	9012709					
24	Packing C		1	ER2CS9117		ER2DS9117		ER2ES9117	
25	Controller Cover Assembly	2V	1	ER2CI2104	ER2CJ2104	ER2DI2104	ER2DJ2104	ER2EJ2104	
		4V		ER2CI1104	ER2CJ1104	ER2DI1104	ER2DJ1104	ER2EJ1104	
26	Controller Cover		1	ER2CI9104		ER2DI9104		ER2EI9104	
27	Resistor Cover		1	ER2CI9185		ER2DI9185		ER2EI9185	
28	Braking Resistor	2V	1	INV709E16	INV70EE16	INV718E16	INV709E16	INV718E16	
		4V		INV709Y16	INV70EY16	INV718Y16	INV709Y16	INV718Y16	
29	Name Plate B		1	ER2BHM05I9A5		ER2BHM10I9A5		ER2BHM20I9A5	
30	Pan Head Machine Screw		2	9798534					
31	Socket Bolt		4	9091233		9091254			
32	Toothed Lock Washer		4	9679708		9679709			
33	Name Plate D		1				ER2BHM20S9A6*	ER2BHM15M9A6	

*Name Plate D for 020C ONLY

9.5 Electric Parts (Dual Speed)

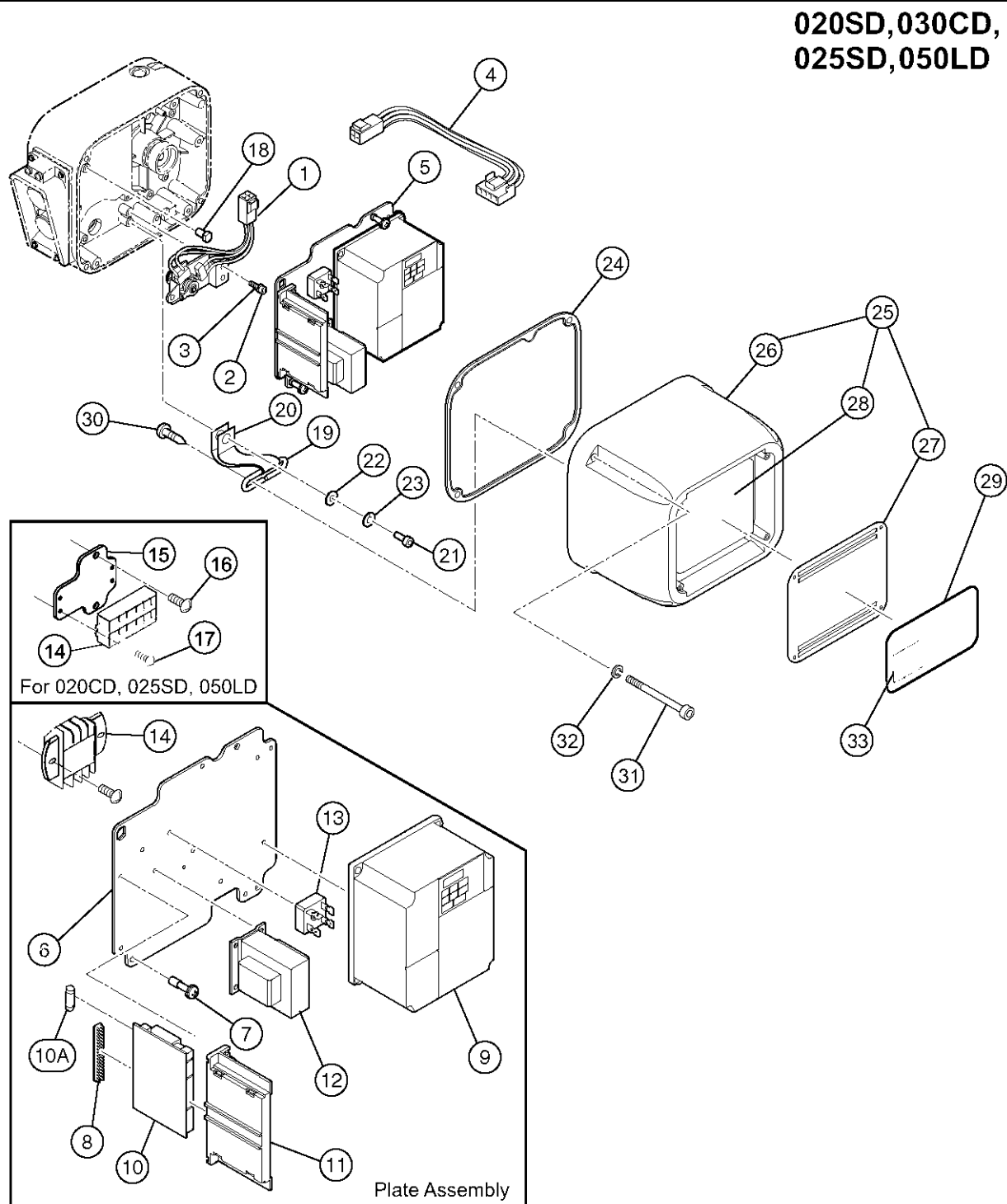


Figure 9-5-3 Electric Parts (Dual Speed)

9.5 Electric Parts (Dual Speed)

Figure No.	Part Name	Parts Per Hoist		020SD	030CD	025SD	050LD
1	Limit Switch Complete Assembly		1	ER2CI1060			
2	Socket Bolt		3	9091247			
3	Spring Lock Washer		3	9012709			
4	LS Harness		1	ER2CI9554			
5	Plate Assembly	M, 2V	1	ER2LHE20I5A2			
		F, 2V	1	ER2BHE20I5A2			
		M, 4V	1	ER2LHN20I5A2			
		F, 4V	1	ER2BHN20I5A2			
6	Plate		1	ER2EI9441			
7	Plate Screw		3	ER1BS9445			
8	Bushing		1	ECP99JBAC			
9	Inverter Assembly	M, 2V	1	INV637H24			
		F, 2V		INV637H21			
		M, 4V		INV637M24			
		F, 4V		INV637M21			
10	Interface Board		1	ECP91KB02			
10A	Fuse		1	9006275			
11	Board Support		1	ECP99BKAA			
12	Transformer	2V	1	TRF32C612			
		4V		TRF32N612			
13	Rectifier		1	ECP94DIAA	ECP94DIAA		
14	Terminal Block 6P		1	ECP1306AF	ECP1306AF		
17	Machine Screw		2	9798512			
18	Fulcrum Pin		1	ER2CS9449			
19	Cover Suspender		1	ER2CS9456			
20	Cover Belt		1	ER2CS9457			
21	Socket Bolt		1	9091249			
22	Plain Washer		1	ER1BS9436			
23	Spring Lock Washer		1	9012709			
24	Packing C		1	ER2ES9117		ER2FS9117	
25	Controller Cover Assembly	2V	1	ER2EI2104		ER2FI2104	
		4V		ER2EI1104		ER2FI1104	
26	Controller Cover		1	ER2EI9104		ER2FI9104	
27	Resistor Cover		1	ER2EI9185			
28	Braking Resistor	2V	1	INV735E16			
		4V		INV735Y16			
29	Name Plate B		1	ER2BHM20I9A5			
30	Pan Head Machine Screw		2	9798534			
31	Socket Bolt		4	9091254			
32	Toothed Lock Washer		4	9679709			
33	Name Plate D		1		ER2BHM30R9A6	ER2BHM25I9A6	ER2BHM50K9A6

9.6 Power Supply and Pendant Parts

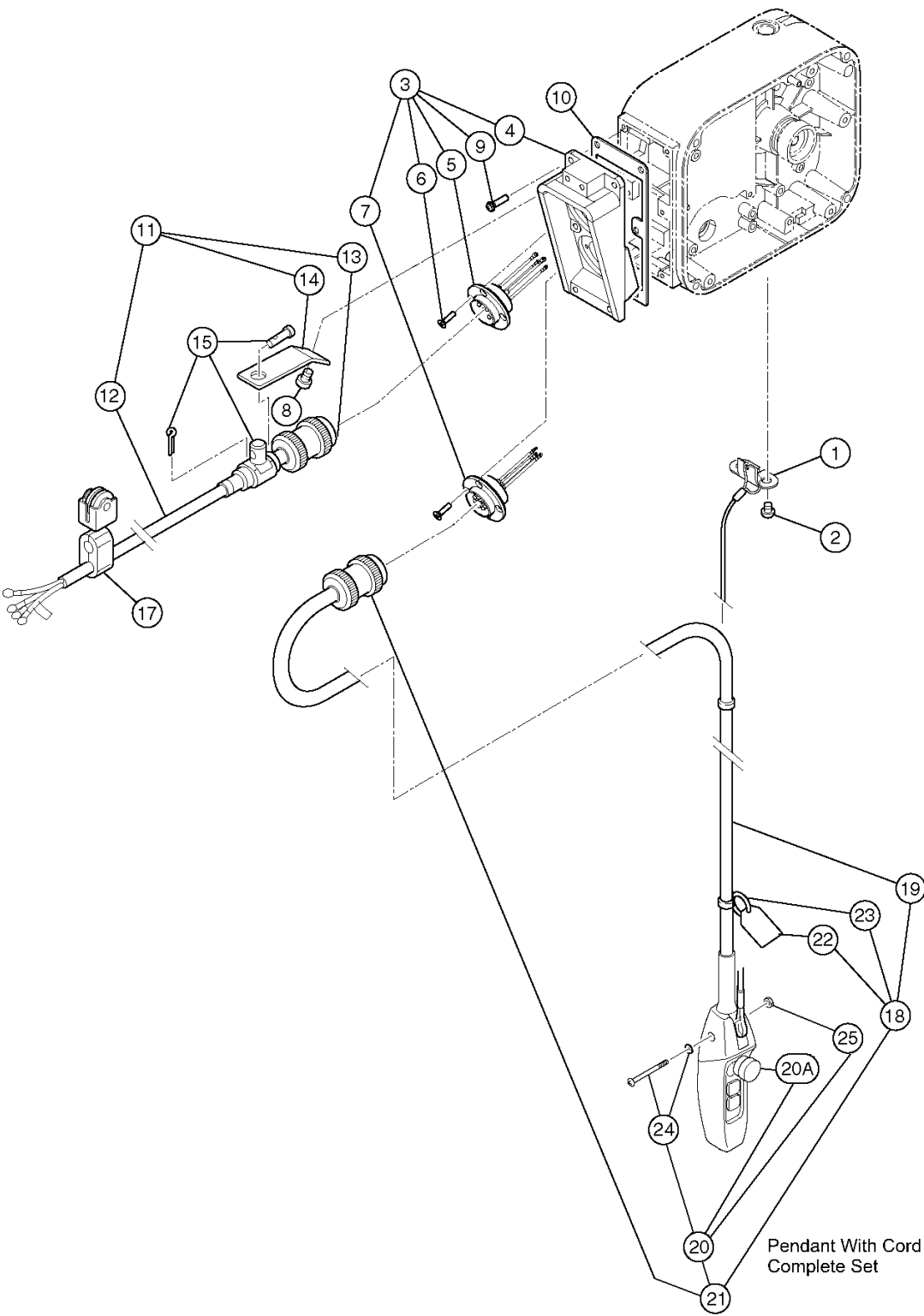


Figure 9-6-1 Power Supply and Pendant Parts (Plug Connection)

9.6 Power Supply and Pendant Parts

Figure No.	Part Name	Parts Per Hoist		001H	003S	003H	005L	005S	010L/ 020C	010S	015S	020L	020S	030C	025S	050L	
1	Cord Support (Wire Stop)		1	ER1BS9535													
2	Mach. Screw W/Spring Washer		2	M6F554010													
3	Socket Frame Complete Assembly	S	1	ER2CS4511							ER2ES4511						
		D		ER2CI4511				ER2DI4511		ER2EI4511							
	4	Socket Frame		1	ER2CS9511												
	5	Socket 4P Assembly	S	1	ER2CS2523							ER2ES2523					
			D		ER2CI2523				ER2CS2523		ER2EI2523						
	6	Tapping Flat Head Mach. Screw		8	ES558003												
	7	Socket 8P Assembly	S	1	ER2CS2564												
			D		ER2CI2564							ER2EI2564					
	8	Mach. Screw W/Spring Washer		2	ES650005S												
9	Mach. Screw W/Spring Washer		6	MS561010													
10	Socket Frame Packing		1	ER2CS9512													
11	Power Supply Cable 4C Assembly		1	ZBZA12CH1000									ZBZA12AH1000				
	12	Power Supply Cable 4C		ft	16/4									14/4			
	13	Plug 4P		1	ECP2304AD									ECP2304AF			
	14	Cable Support Arm		1	ER1BS9541												
15	Cable Support 12 Assembly		1	ES822003													
	Cable Support 14 Assembly												MS1724010				
17	Cable Hanger 14 Assembly		A/R	ES1527003													
18	Pendant W/Cord Complete Assembly	S	1	ZB10025H1000													
		D		ZB20025I1000													
19	Pendant Cord	S	ft	16/4P													
		D		16/6P													
20	Pendent Assembly	S	1	SWD1100AA													
		D		SWD2200AA													
20A	E-Stop Button and Switch Assembly		1	SWD9024AA													
21	Plug 8P	S	1	ECP2108AA													
		D		ECP2108AB													
22	Warning Tag PB		1	WTAG7													
23	Tag Holder		1	E3S787003													
24	Machine Screw w/Spring Washer		1	J1AP24002608													
25	Nut		1	9093414													

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

9.6 Power Supply and Pendant Parts

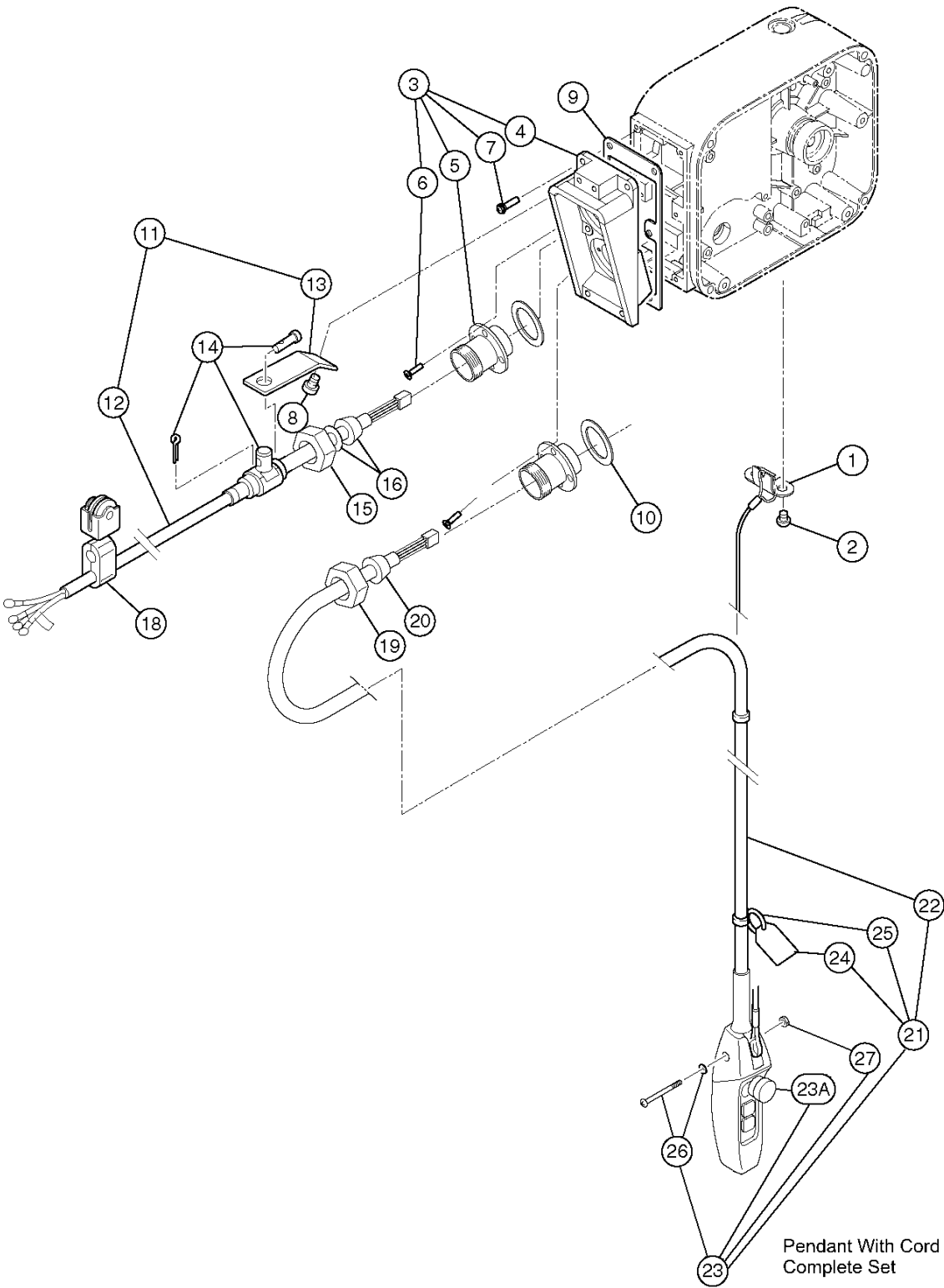


Figure 9-6-2 Power Supply and Pendant Parts (Direct Connection)

9.6 Power Supply and Pendant Parts

Figure No.	Part Name	Parts Per Hoist		001H	003S	003H	005L	005S	010L/ 020C	010S	015S	020L	020S	030S	025S	050L
1	Cord Support (Wire Stop)		1	ER1BS9535												
2	Mach. Screw W/Spring Washer		2	M6F554010												
3	Socket Frame Complete Assembly	S	1	ER2CS4511							ER2ES4511					
		D		ER2CI4511							ER2EI4511					
4	Socket Frame		1	ER2CS9511												
5	Holder C		2	ECP5924AL												
6	Tapping Mach. Screw		8	ER1BS9517												
7	Mach. Screw W/Spring Washer		6	MS561010												
8	Mach. Screw W/Spring Washer		2	ES650005S												
9	Socket Frame Packing		1	ER2CS9512												
10	Holder Packing		2	ECP5924AM												
11	Power Supply Cable 4C Assembly		1	ZBZA12CH1000									ZBZA12AH1000			
	12	Power Supply Cable 4C	ft	16/4									14/4			
	13	Cable Support Arm	1	ER1BS9541												
14	Cable Sup. 12 Assembly		1	ES822003												
	Cable Sup. 14 Assembly												MS1724010			
15	Holder A		1	ECP5924AA												
16	Cable Packing		1	ECP6912AA									ECP6914AA			
18	Cable Hanger 14 Assembly		A/R	ES1527003												
19	Holder A		1	ECP5924AA												
20	Cable Packing		1	ECP6912AA												
21	Pendant W/Cord Complete Assembly	S	1	ZB10025H1000DW												
		D		ZB20025I1000DW												
22	Pendant Cord	S	ft	16/4P												
		D		16/6p												
23	Pendant Assembly	S	1	SWD1100AA												
		D		SWD2200AA												
23A	E-Stop Button and Switch Assembly		1	SWD9024AA												
24	Warning Tag PB		1	WTAG7												
25	Tag Holder		1	E3S787003												
26	Machine Screw w/Spring Washer		1	J1AP24002608												
27	Nut		1	9093414												

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

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ER20M-ENG