



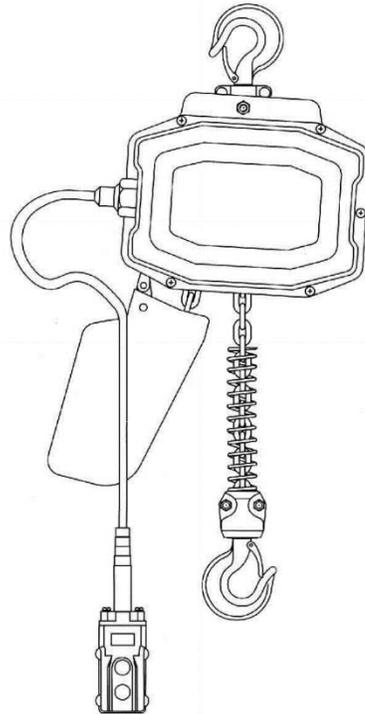
BISON
LIFTING EQUIPMENT

ELECTRIC CHAIN HOIST

OPERATING AND MAINTENANCE MANUAL

(Capacity: 1/4~5T)

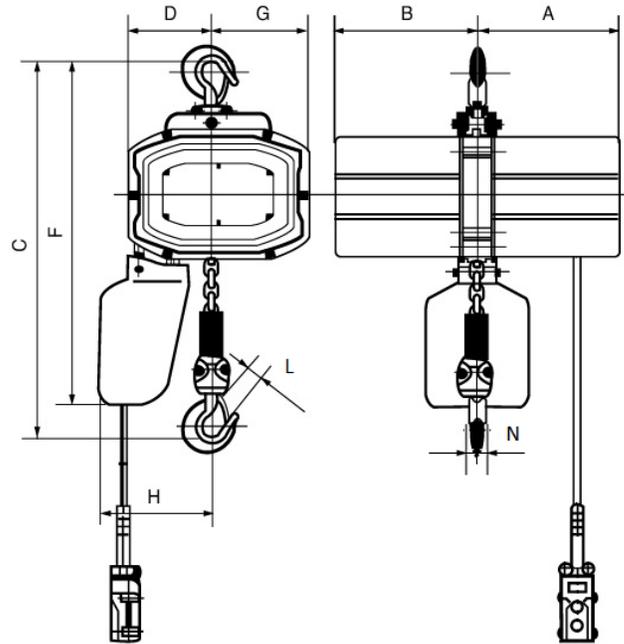
Single Phase/115~230V 60HZ





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1/4, 1/2, 1 TON

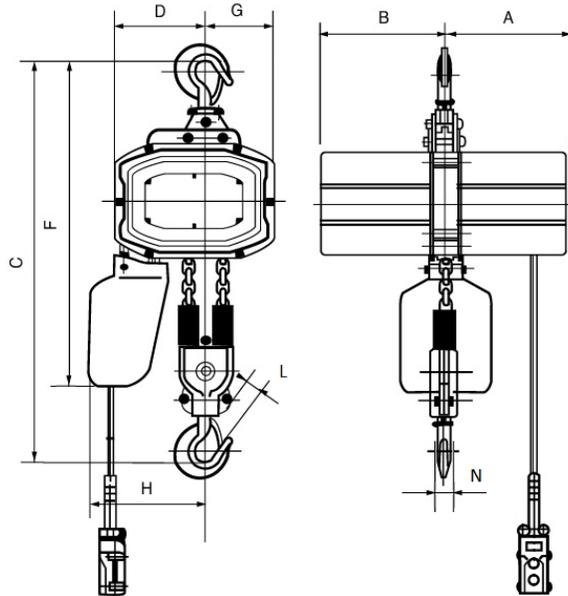
Product Code:	Cap.	Standard Lift Height	Lifting Speed	Motor Output	Power Supply	Control Voltage	Rated Current (amps)		Load Chain Size	Chain Fall Lines	Pendant Cord Length	Total Net Weight
	Tons	Ft.	Ft./min	Hp.	Volts (1-Phase)	Volts	@115v	@230v	mm		Ft.	Lbs.
HH-B025	1/4	20	21	1.3	115/230V	24	9.8	4.9	7.1	1	17	148
HH-B05	1/2	20	21	1.3	115/230V	24	9.8	4.9	7.1	1	17	148
HH-B10	1	20	21	2	115/230V	24	14.2	7.1	7.1	1	17	150

Product Code	Cap.	Head Room (C)	A	B	G	D	L	F	H	N
	Ton	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
HH-B025	1/4	21.5	10	10	7	6	1.47	22	8	0.73
HH-B05	1/2	21.5	10	10	7	6	1.47	22	8	0.73
HH-B10	1	22.8	10	10	7	6	1.47	24	8	0.73



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2 TON

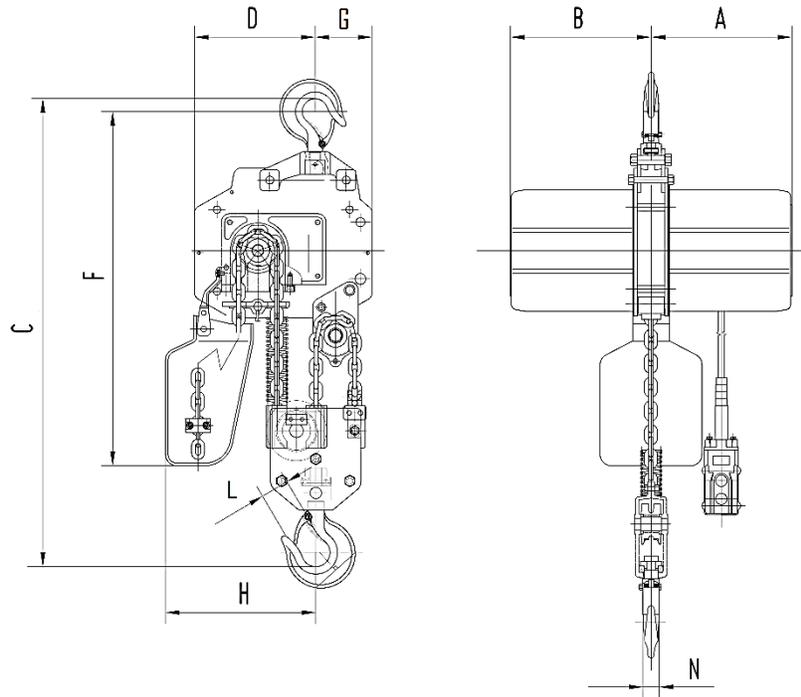
Product Code:	Cap.	Standard Lift Height	Lifting Speed	Motor Output	Power Supply	Control Voltage	Rated Current (amps)		Load Chain Size	Chain Fall Lines	Pendant Cord Length	Total Net Weight
	Tons	Ft.	Ft./min	Hp.	Volts (1-Phase)	Volts	@115v	@230v	mm		Ft.	Lbs.
HH-B20	2	20	10.5	2	115/230V	24	14.2	7.1	7.1	2	17	173

Product Code	Cap.	Head Room (C)	A	B	G	D	L	F	H	N
	Ton	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
HH-B20	2	29.1	10	10	7	5	1.65	26	9	0.83



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3 TON

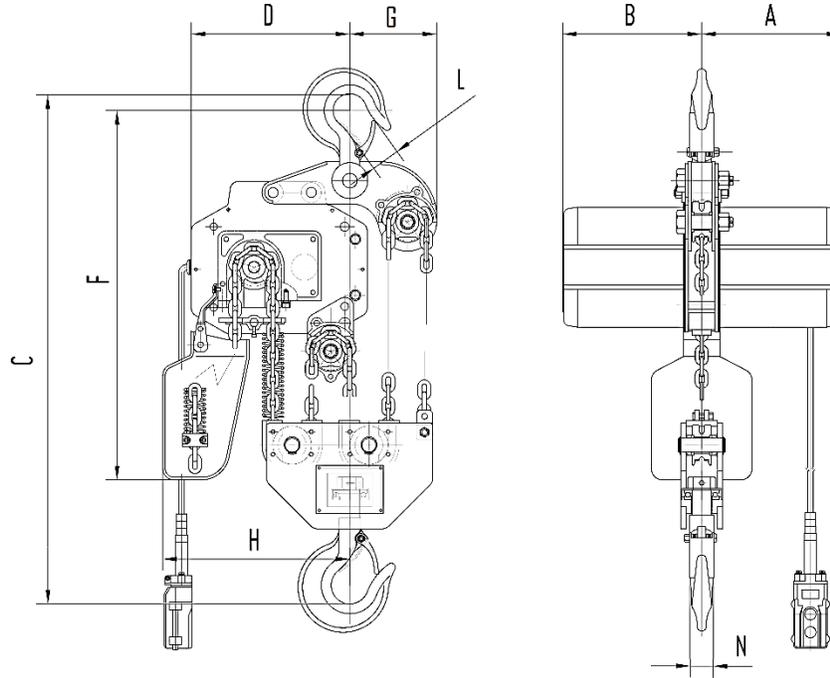
Product Code:	Cap.	Standard Lift Height	Lifting Speed	Motor Output	Power Supply	Control Voltage	Rated Current (amps)		Load Chain Size	Chain Fall Lines	Pendant Cord Length	Total Net Weight
	Tons	Ft.	Ft./min	Hp.	Volts (1-Phase)	Volts	@115v	@230v	mm		Ft.	Lbs.
HH-B30	3	20	7	2	115/230V	24	14.2	7.1	7.1	3	17	198

Product Code	Cap.	Head Room (C)	A	B	G	D	L	F	H	N
	Ton	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
HH-B30	3	31	10	10	4	8	1.69	28	11	0.90



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5 TON

Product Code:	Cap.	Standard Lift Height	Lifting Speed	Motor Output	Power Supply	Control Voltage	Rated Current (amps)		Load Chain Size	Chain Fall Lines	Pendant Cord Length	Total Net Weight
	Tons	Ft.	Ft./min	Hp.	Volts (1-Phase)	Volts	@115v	@230v	mm		Ft.	Lbs.
HH-B50	5	20	4.2	2	115/230V	24	14.2	7.1	7.1	5	17	333

Product Code	Cap.	Head Room (C)	A	B	G	D	L	F	H	N
	Ton	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
HH-B50	5	37	10	10	4	11	2.20	29	13	1.89



Introduction

This manual is provided by Bison Lifting Equipment covering the safe operation and maintenance procedures for the Electric Chain Hoist. This manual contains instructions on installation, general operating procedures and maintenance instructions.

Contents

1. Electric Chain Hoist
2. Operators Manual
3. Warning Page
4. Test Certificate

Set-Up

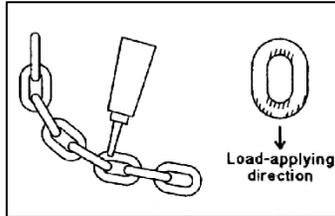
Pre-Operation Inspection

After opening the crate, carefully inspect the hoist, load chain and chain container for damage that may have occurred during shipment.



Installation

1. Install the hoist to a support structure. It is the user/ owner's responsibility to ensure the chosen support structure has the sufficient strength to support the hoist and the rated working load.
2. Connect the hoist to the appropriate power supply.
3. Before using the hoist, apply oil to the chain for easier operation and to prolong the life span.



4. To attach the chain bag/ container run the hoist until it is fully extended (DOWN) and then fasten the bag/ container to the hoist. Once the bag is securely fastened feed the slack chain (non-load bearing) into the bag/ container. Then run the hoist in the reverse motion (UP), guiding the slack chain into the bag/ container (only applicable for those models supplied with the bag/ container)
5. Before proceeding to hoist an application to a dangerous height, test the hoist brake to ensure the hoist can suspend and hold the weight from a safe height.



Operation

Hoisting: Install the hoist to a support structure. It is the user/ owner's responsibility to ensure the chosen support structure has the sufficient strength to support the hoist and the rated working load.

Do not attempt to lengthen the load chain in any way.

Do not attempt to repair the hooks as this could weaken them.

General:

1. The friction-clutch is designed to allow the first reduction gear to slip on an excessive overload. An overload is indicated when the hoist will not raise the load. Also, some clutching noise may be heard if the hoist is loaded beyond rated capacity. Should this occur, immediately release the raising control to stop operation of the hoist. At this point, the load should be reduced to the rated hoist capacity or the hoist should be replaced with one of the proper capacity. When the excessive load is removed, normal hoist operation is automatically restored. [CAUTION: the friction clutch is susceptible to overheating and wear when slipped for extended periods. Under no circumstance should the protector be allowed to slip for more than a few seconds.]
2. Before picking up a load, check to see that the hoist is directly overhead. Avoid off-center loading of any kind.
3. Take up a slack load chain carefully and start hoisting load gently to avoid shock and jerking of the load chain. If there is any evidence of overloading, immediately lower the load and remove the excess load.
4. Do not allow the load to swing or twist while hoisting.
5. Do not allow the load to bear against the hook latch or the tip of hook.
6. Make sure the pendant cord is straight and is not tangled in the chain. Be careful not to snag the cord on any sharp edges or objects.
7. When handling material that is being immersed in water, baths or any liquid, use a chain sling to prevent the hook block from having to be submerged- this will stop any liquid from penetrating the bearing.

Precautions

- During overhead lifting operations, personnel should NOT stand beneath the suspended load.
- Prevent the load chain from dragging over sharp edges or corners.
- Be cautious of having fingers caught in the mechanisms.
- Do NOT leave a suspended load unattended.
- Do NOT attempt to lift people.
- Do NOT use the load chain to basket or choke a load.
- Do NOT drag or drop the hoist.
- Do NOT put the bottom hook through the loop of the chain. (only applicable on 2; 3 and 5-fall models)



Maintenance

The inspection procedure advised is based on ANSI/ASME B30.16. The following definitions are from ANSI/ASME B30.16.

Inspection Classification

The inspection procedure is divided into two general grades based upon the intervals at which inspection should be performed.

Hoist Service Duty	
Duty	Average % of rated capacity
Normal	0 to 33%
Heavy	33 to 67%
Severe	67 to 100%
Special	Special Conditions

Frequent: Operators are to make visual inspections as often as required.

- Normal Duty Service – monthly
- Heavy Duty Service – weekly to monthly
- Severe Duty Service – daily to weekly
- Special Duty Service – recommend being inspected by a qualified individual before and after each operation.

Periodic: Qualified individuals are to make visual inspections as often as required.

- Normal Duty Service – annually
- Heavy Duty Service – semiannually (twice a year)
- Severe Duty Service – quarterly
- Special Duty Service – recommend being inspected by a qualified individual before and after each operation.

Frequent Inspection

The following is required to be inspected frequently:

- All functional operating mechanisms.
- Functionality of limit switch
- Hoist braking system
- Hooks in accordance with ANSI/ASME B30.10
- Hook latches
- Load chain
- Load chain reeving



Periodic Inspection

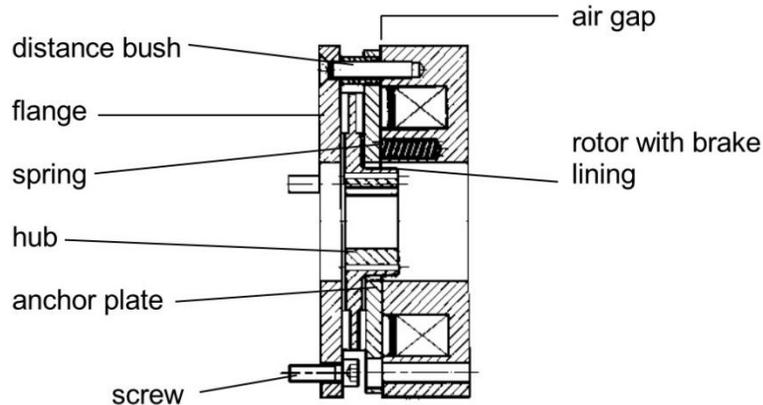
The following is required to be inspected periodically:

ANSI/ASME B30.16 requires all hoists subject to disassembly of load suspension parts, to undergo a load test after re-assembly to pass full inspection.

Requirements of frequent inspection:

- Evidence of loose bolts, nuts, or rivets.
- Evidence of wear, corrosion, cracks, or distortion to parts such as load blocks, suspension housing, chain attachments, clevises, coupling, suspension bolts, shafts, gears, bearings, pins and rollers.
- Evidence of damage to bottom block assembly.
- Evidence of excessive wear on motor or load brake.
- Evidence of damage of supporting structure/ trolley.
- Direction labels on pendant control stations.
- Warning label properly attached to the hoist.
- Load chain end connections.
- Evidence of wear, cracks or stretching on the load chain.

Brake Adjustment



- Brake Device: Should be checked and cleared of all dust and oil every three months. The air gap should be no smaller than 0.3mm and no larger than 0.5mm. If the brake will not adjust, the brake should be replaced before further damage or failure of the hoist occurs.

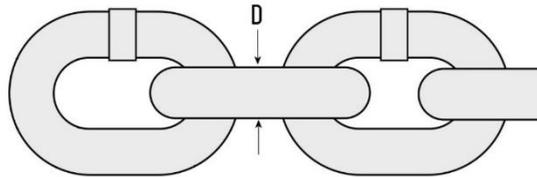


Chain Inspection

Inspect the chain for excessive wear, corrosion, or any cracks. If the load chain shows any of these signs, the chain must be replaced immediately.

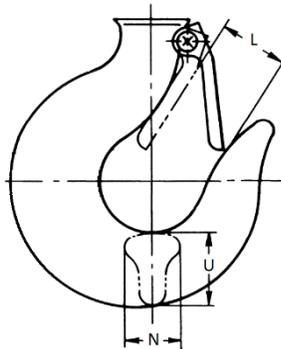
Using a Metric Vernier caliper, measure the distance of D to assess whether the wear of the load chain is within the allowed tolerance. Refer to chart below.

It is vital that the chain be lubricated after every inspection.



Load Chain Wear			
Hoist Capacities:	Inspection link intervals	Standard Size	Tolerance limit
¼, ½, 1, 2, 3, 5 Ton	5	7.1mm	6.4mm

Hook Inspections



Inspect the hook for damage such as cracks, bends and excessive wear. While inspecting the hook, measure points L, N and U. Refer to the table below to judge whether the measurement is within the tolerance or not. If the measurement reads the value in the “Replace” column or lower, the hook needs to be replaced immediately.

Ensure the hook has a safety latch and that it is not bent or damaged that could result in an application to slip off or out the hook.

Capacity:	Size of: L (inches)		Size of: U (inches)		Size of: N (inches)	
	Standard	Replace:	Standard	Replace:	Standard	Replace:
¼ T	1	1.47	1.10	1.03	0.73	0.65
½ T	1	1.47	1.10	1.03	0.73	0.65
1 T	1	1.47	1.10	1.03	0.73	0.65
2 T	1	1.65	1.30	1.22	0.83	0.75
3 T	2	1.69	1.37	1.28	0.90	0.83
5 T	2	2.20	2.68	2.60	1.89	1.81



Contactor Inspections

Recommended Contactor Replacement	
Frequency of Jogging	Replace contactor after: (Starts)
Jogging is rare	1,000,000
during 25% of operations	500,000
During 50% or more of operations	200,000

Refer to the chart above for the recommend work rating of the hoist's contactors. (Jogging: when the pendant control buttons are pressed quickly and repetitively in to move the hook in small increments)

Records

Reports of hoist maintenance and inspections should be kept on record for reference and maintenance scheduling.

General Maintenance:

- Gearing should be cleaned, and grease lubricated at least twice a year.
- Hooks: should be checked periodically for deformation and wear. Hooks should be replaced immediately if signs of excessive rust, wear, cracks or deformation are shown.
- Ensure the load chain is kept straight and untangled when storing to prevent the chain from kinking or twisting.
- Any hoists used out-doors should be covered up or stored in a clean dry environment when not in use.



Troubleshooting

HOIST NOT RESPONDING TO PUSHBUTTON/ PENDANT CONTROLLER

Possible Cause	Remedy
No voltage at hoist-main line or emergency stop is not released; fuse blown, or circuit breaker tripped	Release emergency stop; replace fuse or reset breaker
Open or shorted wiring in the transformer; loose connection or broken wire in circuit; mechanical binding in contactor relay; pendant station (pushbutton) contacts not closing or opening	Using a multimeter, test for electrical continuity and repair or replace defective part.
Brake not releasing	Check input & output voltage of brake rectifier, check brake airgap settings, if necessary, replace rectifier and or brake coil.
Wrong voltage or frequency.	Be sure power supply corresponds to the hoists required electrical specifications
Excessive overload	Reduce hoist load.

INCORRECT HOISTING DIRECTIONS

Possible Cause	Remedy
Connections reversed at either the control station or terminal block.	Check connections with the wiring diagram

HOOK LOWERS BUT WILL NOT RAISE

Possible Cause	Remedy
Excessive Load	Reduce Hoist Load
Loose connection or broken wire in the circuit; pendant station contacts not being made; Upper limit switch contacts are open.	Check the connections and contacts for sticking or damage.
Start Capacitor damage	Replace the running capacitor

HOOK RAISES BUT WILL NOT LOWER

Possible Cause	Remedy
Excessive Load	Reduce Hoist Load
Loose connection or broken wire in the circuit; pendant station contacts not being made; Upper limit switch contacts are open.	Check the connections and contacts for sticking or damage.
Start Capacitor damage	Replace the running capacitor



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HOOK DOES NOT STOP PROMPTLY

Possible Cause	Remedy
Brake Slipping	Check brake mechanism
Excessive Load	Reduce hoist load
Incorrect wiring of brake leads.	Check connectors with wiring diagram

HOIST OPERATES SLUGGISHLY

Possible Cause	Remedy
Excessive load	Reduce hoist load
Low Voltage	Correct low voltage condition
Brake is not fully releasing	Check brake mechanism & air gap
Damaged run capacitor	Replace the damaged run capacitor

HOIST MOTOR OVERHEATS

Possible Cause	Remedy
Excessive load	Reduce loading to the capacity of hoist
Low Voltage	Correct low voltage condition
Brake is not fully releasing	Check brake mechanism & air gap
Frequent jogging	Prevent frequent jogging
Excessive run cycles	Only operate the hoist within the duty cycle of the motor: 40% ED
Unsuitable ambient temperature	Hoist must be operated in conditions no hotter 104°F

HOIST IS NOISY

Possible Cause	Remedy
Noisy gears- excessive wear of gear; insufficient quantity of grease.	Inspect gears. Replace gears or re-grease if necessary
Incorrect incoming power supply	Check the voltage at the hoist for voltage consistency, voltage spikes or drops can cause damage to the hoist.
Noisy chain -damaged pocket wheel, excessive wear. Twisted chain	Inspect the chain and pocket wheels for excessive damage. Straighten the chain



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LOAD CHAIN JUMPS ON SHEAVE

Possible Cause	Remedy
Worn Chain	Inspect chain wear
Worn chain pocket wheel or sheaves	Replace parts
Twisted or kinked chain	Straighten and line up chain links

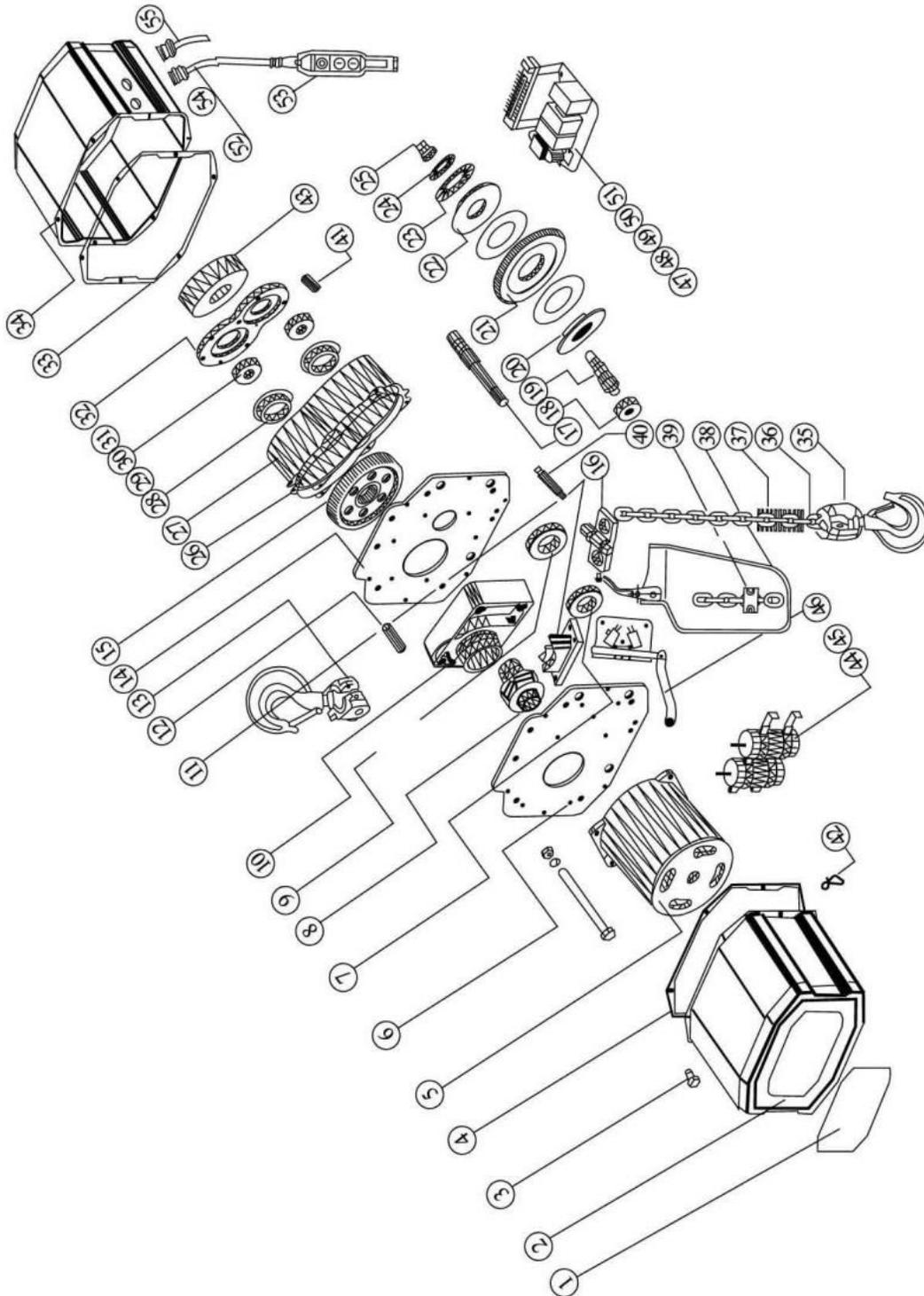
ELECTRICAL SHOCK WHEN TOUCHING THE HOOK OR CHAIN

Possible Cause	Remedy
No grounding	Ground the grounding line in the power supply
Incorrect grounding	Check grounding terminal
Live part contacting to grounded part	Check electrical wiring and correct grounding if necessary
Capacitor damage	Replace capacitor



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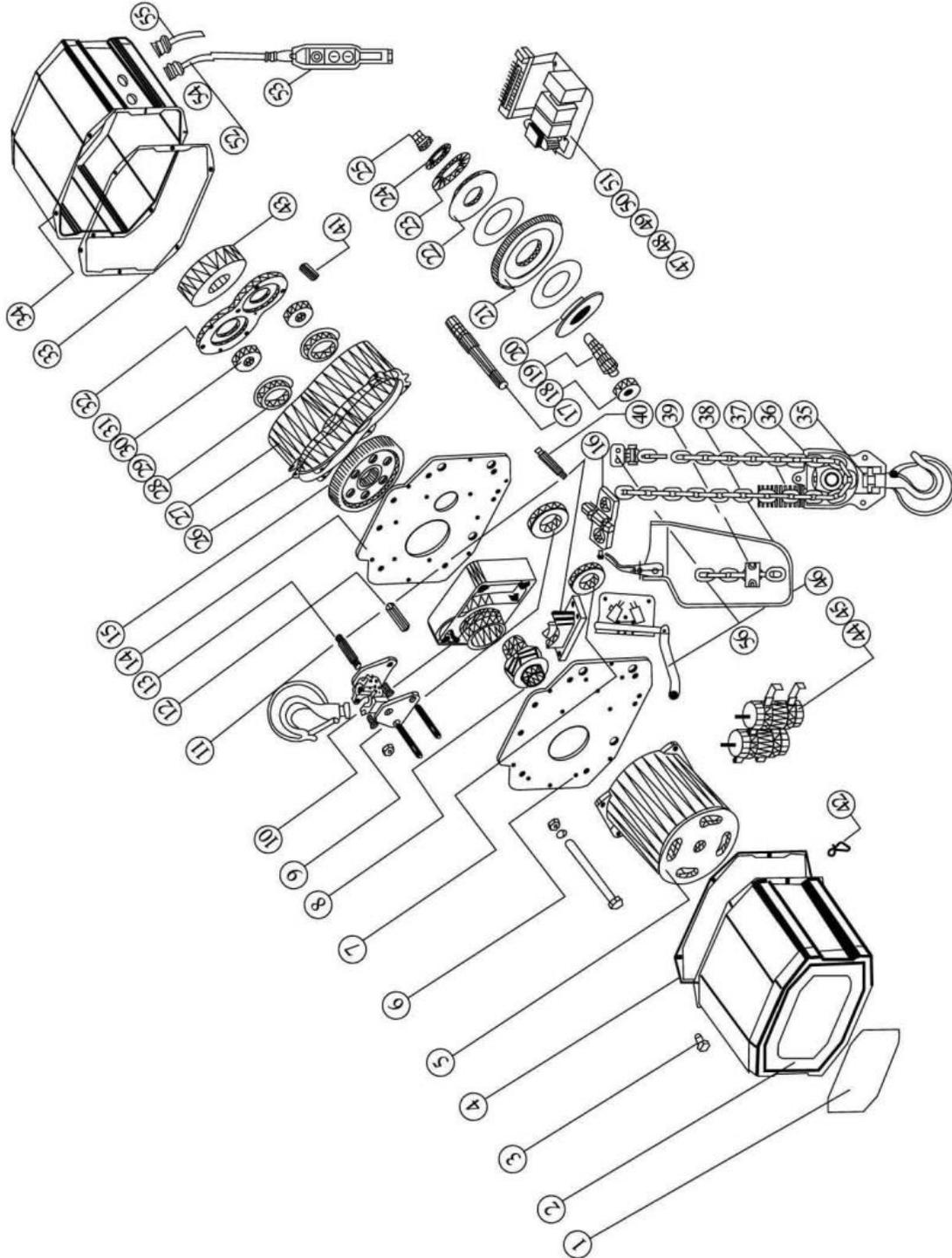
Electric Chain Hoist Drawings (1/4T, 1/2T, 1T)





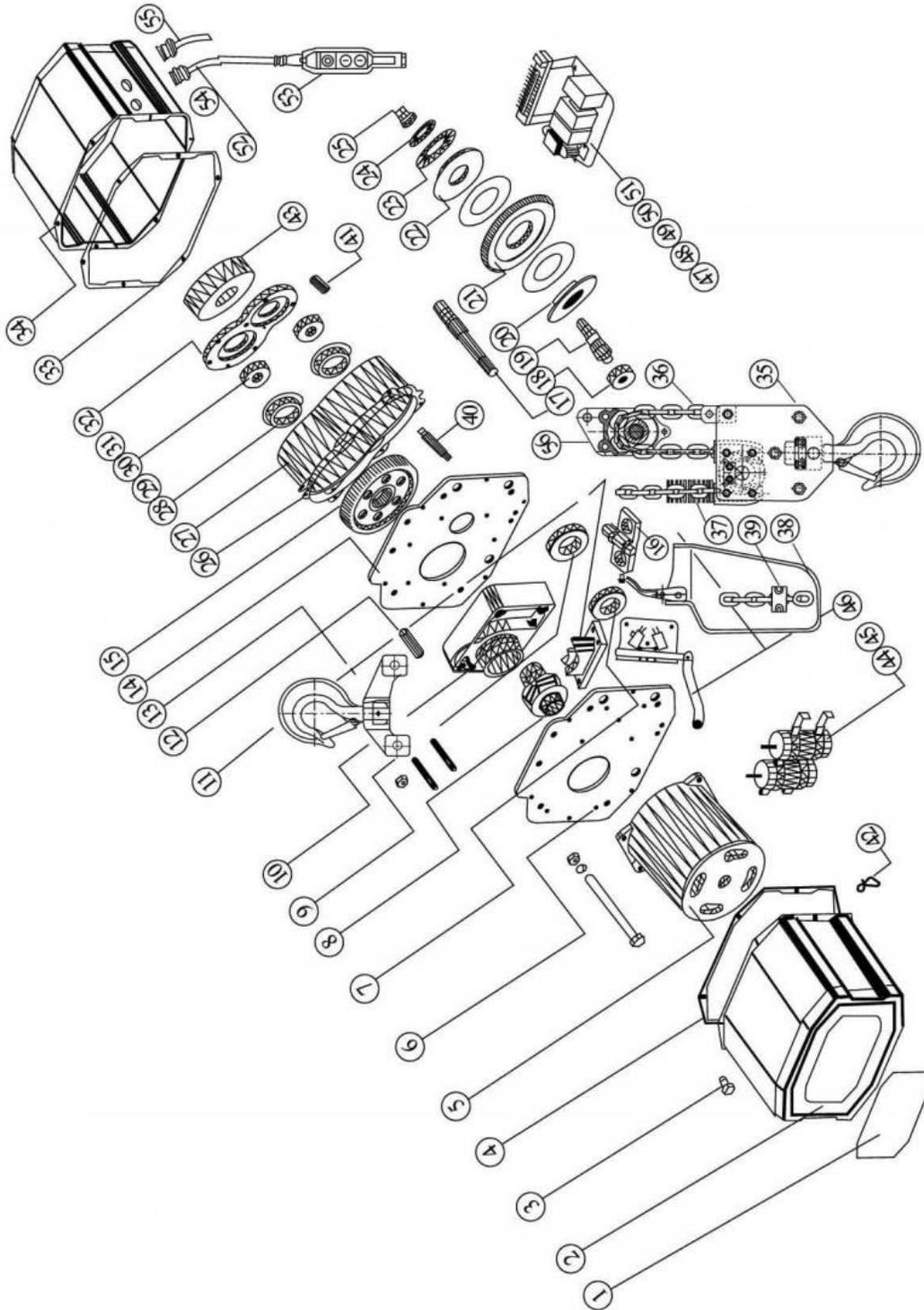
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Electric Chain Hoist Drawings (2T)





Electric Chain Hoist Drawings (3T)

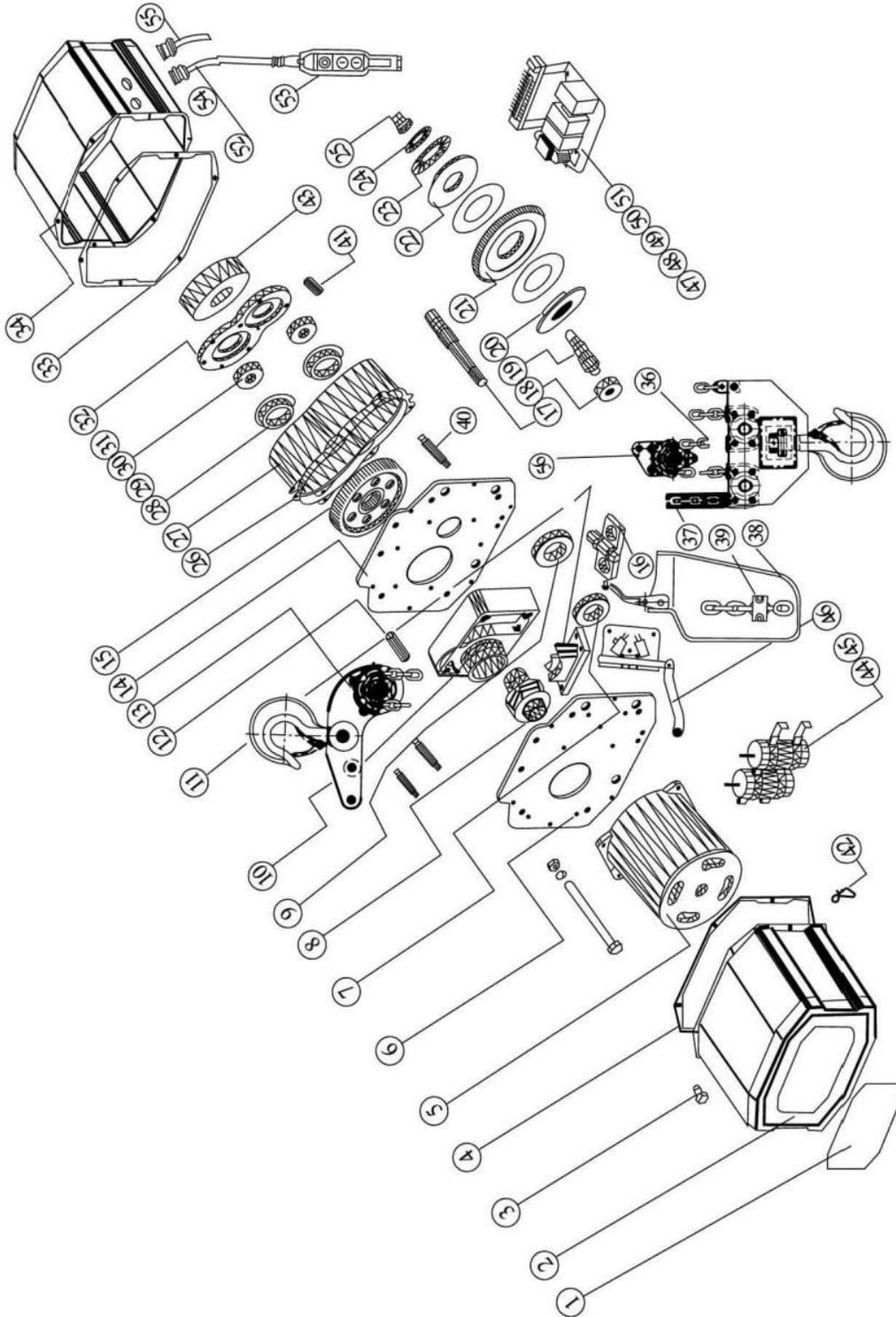




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Electric Chain Hoist Drawings (5T)





Parts List

1	Name plate	31	Bearing
2	Cover	32	Coupling Plate
3	Hex Bolt	33	Hoist Gearbox Cover Gasket
4	Hoist Motor Cover Gasket	34	Cover
5	Motor	35	Bottom Hook Subassembly
6	Motor Mounting Plate	36	Load Chain
7	Bearing	37	Spring Buffer
8	Sprocket Wheel / Pocket Wheel	38	Chain Container
9	Bearing	39	Load Chain End Stop Clamp
10	Sprocket Wheel Housing	40	Connecting Pin
11	Chain Guide	41	Gearbox Housing Bolt
12	Conduit	42	Pendant Cord Strain Relief Clip
13	Top Hook Set Subassembly	43	Arrester Assembly
14	Gearbox Mounting Plate	44	Start Capacitor
15	Spline Gear	45	Run Capacitor
16	Limit Switch Actuator	46	Limit Switch Assembly
17	Driving Gear Shaft	47	Contactors
18	Bearing	48	Transformer
19	Gear Pin	49	Electrical Terminal
20	Clutch Set Plate	50	Brake Rectifier
21	Drive Gear Subassembly	51	Electrical Panel
22	Spacer	52	Control Cord
23	Spring Disk	53	Pendant Controller
24	Spring Seat	54	Cord Gland
25	Adjustable Nut	55	Power Cord
26	Gear Housing Spacer	56	Chain Fall Suspender
27	Gear Housing		
28	Bearing Set A		
29	Bearing Set B		
30	Bearing		



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Electric Chain Hoist (Stop + Up + Down)

