



OPERATOR'S MANUAL

ELECTRIC CHAIN HOISTS
1/4 TON TO 10 TON CAPACITY



WARNING

DO NOT INSTALL, OPERATE OR PERFORM MAINTENANCE ON THIS EQUIPMENT BEFORE READING ALL THE CONTENT 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. Important information and warning

THIS MANUAL CONTAINS IMPORTANT SAFETY, INSTALLATION, OPERATION AND MAINTENANCE INFORMATION. MAKE THIS MANUAL AVAILABLE TO ALL PERSONS RESPONSIBLE FOR THE OPERATION, INSTALLATION AND MAINTENANCE OF THESE PRODUCTS. UNLESS OTHERWISE NOTED, TONS IN THIS MANUAL ARE US TONS; (2,000 LBS).

Danger, Warning, Caution and Notice

Throughout this manual, there are steps and procedures which, if not followed, may result in an injury, death, or substantial property damage if the warning is ignored.



DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation, which, if not avoided, could result in minor or moderate injury or property damage.

NOTICE

Indicates information or a company policy that relates directly or indirectly to the safety of personnel or protection of property.

For any questions or comments:

Phone: 514 728-4527

E-mail: info@vulcanhoist.com



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 applicable and/or required safety devices relevant to the system, crane, or application have been properly 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 larger machines like cranes or monorails. In those cases, additional equipment or devices may be required for the crane and monorail to comply with applicable design and safety standards. The crane designer, crane manufacturer, or user is responsible for furnishing said equipment. Refer to AISI/ASME B30.17, "Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)"; AISI/ASME B30.2 "Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)"; and AISI/ASME B30.11 "Monorails and Underhung Cranes".

If a below the hook lifting device or a sling is used with the hoist, the user is responsible for their proper use and maintenance and should refer to ANSI/ASME B30.9 "Slings" or ANSI/ASME B30.20 "Below-The-Hook Lifting Devices".

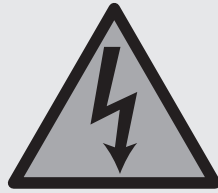
Hoists and cranes used to handle molten material may require additional equipment or devices. Refer to ANSI Z241.2, "Safety Requirements for Melting and pouring of Metals in the Metal Casting Industry".

Electrical equipment described herein is designed and built in compliance with Vulcan Hoist's interpretation of ANSI/NFPA 70, "National Electric Code" and CSA C22.1, "Canadian Electric Code". The system designer, system manufacturer, crane designer, crane manufacturer, installer or user is responsible to ensure that the installation and associated wiring of these electrical components is in compliance with and all applicable Federal, State, Provincial and Local Codes.

FAILURE TO 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 electrical components and connections between these components.

Before performing ANY mechanical or electrical maintenance on the equipment, disconnect the main switch supplying power to the equipment and lock and tag the main switch in the position.

Refer to ANSI Z244.1, "Personal Protection — Lockout/Tag out of Energy Sources".

Only trained and competent qualified 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, "Overhead Hoists (Underhung)". If the hoist is installed as part of a larger 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 volumes that address that type of equipment.

It is the responsibility of the owner/user to have all personnel involved with the installation, inspection, testing, maintenance and operation of a hoist read the content of this manual and applicable portions of ANSI/ASME B30.16, "Overhead Hoists (Underhung)". If the hoist is installed as part of a larger lifting system, such as an overhead crane or monorail the applicable ANSI/ASME B30 volumes that address that type of equipment must also be read by all personnel involved.



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

Inspection of the hoist must be performed on a regular basis in accordance with the ANSI/ASME B30.16 standard by a qualified individual. The owner/user is responsible for maintaining a record of all inspections performed on the hoist. A regular schedule of inspection of the hoist in accordance with the requirements of ANSI/ASME B30.16 should be established and records maintained.

Warning labels

The warning label illustrated below is supplied with each hoist shipped from the factory. If the label is not on your hoist, order a label from the factory or the distributor and install it.

Read and follow all warnings attached to this hoist.

 VULCAN		VULCAN HOIST - PALAN WWW.VULCANHOIST.COM 3435, boul. Crémazie Est Montréal (QC) H1Z 2J2	
MODEL/MODÈLE	ENCLOSURE NEMA		BOITIER NEMA
SERIAL #/# SÉRIE			
CAPACITY(LB)	SPEED (FPM)		
CAPACITÉ (LB)	VITESSE (PPM)		
VOLTAGE	PHASE	CYCLE	
FULL LOAD CURRENT RATING	SCCR		
COURANT À PLEINE CHARGE			
MOTOR TABLE / TABLEAU DES MOTEURS			
#1 DUTY CYCLE	HP	FLA	
CYCLE D'UTILISATION			
#2 DUTY CYCLE	HP	FLA	
CYCLE D'UTILISATION			
WARNING DO NOT EXCEED RATED CAPACITY DO NOT OPERATE HOIST WHEN HOOK IS NOT CENTERED UNDER HOIST DO NOT OPERATE HOIST WITH TWISTED, KINKED OR DAMAGED CHAIN DO NOT OPERATE DAMAGED OR MALFUNCTIONING EQUIPMENT DO NOT LIFT PEOPLE NOR LIFT LOADS OVER PEOPLE DO NOT REMOVE OR OBSCURE THIS LABEL READ AND FOLLOW USER MANUAL, ASME B30.16 GUIDELINES AND OTHER APPLICABLE INDUSTRY STANDARDS SEPARATE MOTOR OVERCURRENT PROTECTION IS REQUIRED TO BE PROVIDED IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE, PART 1, THE NATIONAL ELECTRICAL CODE AND ANY ADDITIONAL LOCAL CODES		AVERTISSEMENT NE PAS DÉPASSER LA CAPACITÉ NOMINALE NE PAS FAIRE FONCTIONNER LE PALAN LORSQUE LE CROCHET N'EST PAS CENTRÉ SOUS LE PALAN NE PAS TRAVAILLER AVEC UNE CHAÎNE TORDUE, PINCÉE OU ENDOMMAGÉE NE PAS FAIRE FONCTIONNER DE L'ÉQUIPEMENT ENDOMMAGÉ OU DÉFECTUEUX NE PAS LEVER DES PERSONNES ET/OU LEVER DES CHARGES AU-DESSUS D'AUTRES PERSONNES NE PAS ENLEVER NI CACHER CETTE ÉTIQUETTE VEUILLEZ LIRE ET SUIVRE LE MANUEL DE L'UTILISATEUR, LES DIRECTIVES DE ASME B30.16 ET DES AUTRES NORMES DE L'INDUSTRIE APPLICABLES LA PROTECTION CONTRE LES SURINTENSITÉS DU MOTEUR DOIT ÊTRE FOURNIE CONFORMÉMENT AU CODE CANADIEN DE L'ÉLECTRICITÉ PARTIE 1, AU CODE ÉLECTRIQUE NATIONAL ET À TOUT CODE LOCAL SUPPLÉMENTAIRE CERTIFIED TO CSA STD. C22.2 NO. 14 & NO. 33 CONFORMS TO UL STD. 508A, 1340 & 1004-1 CONTROL NO. 5011062	
 LISTED US		Intertek	

IMPORTANT - IMPORTANT - IMPORTANT

HUILER LA CHAÎNE
RÉGULIÈREMENT



OIL CHAIN
REGULARLY

***** ATTENTION ***** ATTENTION *****



ELECTRIC CONNECTION



3 PHASE HOIST

| BE SURE WHEN YOU PUSH "UP" BUTTON ↑ HOOK GOES

UP. IF HOOK GOES DOWN, REVERSE 2 POWER LEADS ONLY

(RED & BLACK) AT THE WALL. NEVER IN PUSH BUTTON

2. Technical Information

2.1 Product Identification

Model number

L 4 V 15 22 X2

Type of chain	Capacity	Voltage	Lifting speed	Gear ratio	Number of speed
L= Link chain R= Roller chain	0.5= ¼ ton 1= ½ ton 2= 1 ton 3= 1.5 tons 4= 2 tons 6= 3 tons 10= 5 tons 20= 10 tons	A= 115 V. 1 Ph. F= 230 V. 1 Ph. H= 230 V. 3 Ph. T= 460 V. 3 Ph. V= 575 V. 3 Ph.	3 ft/min to 50 ft/min	Primary: 1 to 6 Secondary: blank or 2	Blank : 1 Speed X2 : 2 Speeds

Serial number

(L) 39777 E V A XXXZZ

	Sequential Number	Motor Brand	Brake Brand	Limit Switch	Date
Blank = Std. hook L = Low headroom		E = Emerson D = Doerr N = Nidec A = AGI	V = Vulcan S = Supplier	Blank = Mechanical A = Adjustable	XXX = Year ZZ = Month

Operating Conditions and Environment

Temperature range	- 20° C to 40° C
Humidity	85% or less
Enclosure Rating	Optional NEMA 4 Hoist and pendant
Duty rating	HST - 1

2.2 Hoist applicable standards

- a. All Vulcan hoists are manufactured in compliance with Vulcan Hoist's interpretation of the applicable sections of ANSI/ASME B30.16 "Overhead Hoists (Underhung)" standard.
- b. The user is responsible for installing the equipment in accordance with all provincial/state and local regulations applicable to the location where the equipment will be used.
- c. Hoists accompanied by this manual meet ANSI/ASME HST - 1M "Performance Standard for Electric Chain Hoists" hoist duty class ratings.
- d. Vulcan Hoist hoists meet the following standards according to Intertek approval:
 - CSA C22.2 no. 33 Electrical safety requirements for cranes and hoists
 - UL 1340 Standard for Hoists
 - UL 1004-1 Standard for Rotating Electrical Machines - General Requirements
- e. In addition, Vulcan Hoist is part of Intertek's control panel manufacturer program, which covers the hoist control.
 - CSA C22.2 no 14 Industrial control equipment
 - UL508A Industrial Control Panels

3. Unpacking and installation

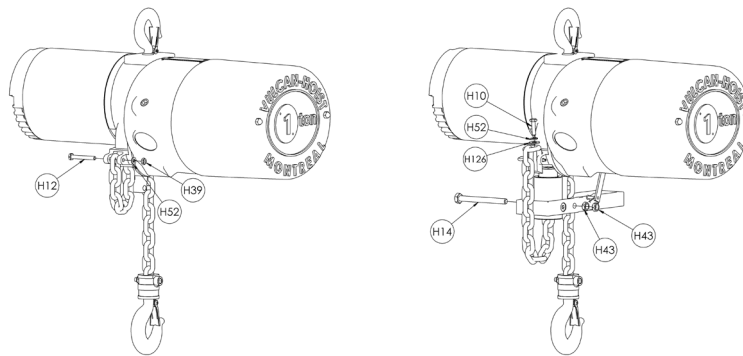
3.1 Unpacking

After opening the box, carefully remove the cardboard tray and set the control cables to the side of the box. Using an external lifting device, use the upper hook of the hoist to raise it until it is completely out of the box. It may be necessary to hold the box down.

Once the hoist is out of the box, carefully break off the packaging foam from the hoist. Do not use tools like a hammer or an axe to remove foam as this could damage and/or break the hoist.

Ensure that all parts of the hoist, including the chain, are free of any debris or packaging material. Inspect hoist for any scratches, dents or other damage that may have occurred during transport. When hoist is used without a chain container, the loose end of chain must be attached to the hoist as shown below.

Figure 3 - 1



3.2 Chain container installation



DANGER

Improper installation of chain container could result in chain and hoist damage leading to a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

Follow installation instructions below.

3.2.1 Without chain guide

1. Run the load hook down, so that there are 2 feet of chain left on the unloaded side.
2. Shut off and lockout/tag out the main power source to the hoist.
3. Bolt chain container to the link on the bottom of the hoist casting. Pass bolt H14 through the chain container and the link with one 116A bushing on each side of the link. Tighten the two H43 nuts: see Figure 3-2 below.

4. Remove bolt H12 & nut H39. Place load chain end in chain container. Connect chain from chain container to hoist with bolt H12 & nut H39.
5. Re - connect the power.
6. Verify if load chain is rubbing on chain container; this would cause premature chain container wear. If chain is rubbing on container, adjust chain on chain container by one link.
7. A) Run hoist **WITHOUT** load and verify that chain falls properly in chain container.
B) Run hoist **WITH** load, verifying that chain falls properly in chain container.
8. Ensure load is not hitting the chain container. A load that is hitting the chain container may cause chain to knot or break and/or cause serious injury to operator and others. Adjust limit switch to stop load before it comes in contact with chain container.
9. Install supporting chain to the side of the hoist body.
10. Once the chain container is securely in place, feed the free end of the load chain gradually into the chain container to prevent the chain from bundling.
11. When using a Vulcan steel chain container, refer to the instructions provided with the container for correct assembly and attachment.

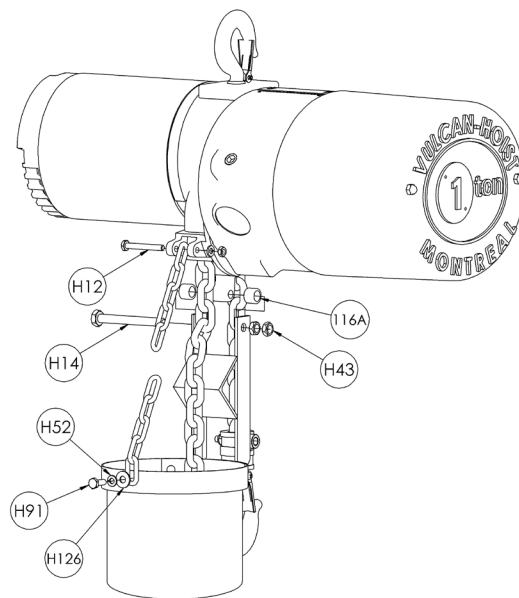


Figure 3 - 2

3.2.2 With chain guide

1. Run the load hook down, so that there are 2 feet of chain left on the slack side.
2. Disconnect the power.
3. Remove bolt H14 from limit lever # 25, install chain container arms on outside of limit lever # 25. Install bolt H14 through chain container arms and limit lever # 25. Install 2 nuts H43 lock nuts together (do not tighten to limit lever # 25). (See Figure 3-3 below.)
4. Install end of chain attached to chain container into designated hole on # 45 casting with bolt H91 and washers H52 & h16.
5. Manually verify if limit lever # 25 moves freely. This is your safety limit switch control.

6. Adjust chain container level.
7. Connect the power.
8. A) Run hoist **WITHOUT** load; verify that chain falls in chain container.
B) Run hoist **WITH** load; verify that chain falls in chain container.
9. Ensure load is not hitting the chain container. A load that is hitting the chain container may cause chain to knot or break and/or cause serious injury to operator and others. Adjust limit switch to stop load before it comes in contact with chain container.
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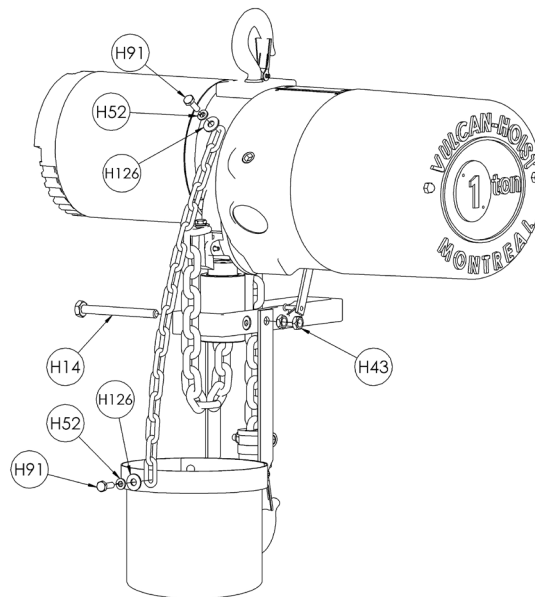


Figure 3 - 3



DO NOT modify or install a homemade chain container. Use only the Vulcan Hoist chain container.

NEVER knot chain or attach foreign objects to the chain to act as limits or chain holders. This could cause serious injury and/or serious damage to chain and hoist.

3.3 Mounting the hoist

Manual trolley — Follow the instructions in the operator's Manual provided with the trolley.

Motorized trolley — Follow the instructions in the operator's Manual provided with the trolley.

Hook mounted to a fixed location — Attach the hoist's top hook to the fixed suspension point.



WARNING

Ensure the fixed suspension point rests on the center of the hook's saddle and that the hook's safety latch is engaged.



3.4 Chain

The number of chain links depends on the hoist model, capacity and options. Never operate the hoist with incorrect, missing, or damaged chain links. Refer to figure below to identify components.

1 chain fall



2 chain falls



3 chain falls



When the hoist is used without a chain container, the free end of the chain is attached to the hoist body. Make sure it remains free of twists before operating the hoist.



WARNING

Verify that the load chain is not twisted or tangled prior to operating the hoist. Make sure bottom hook on 2 and 3 fall models (2 ton and over) is not capsized. Always ensure that the welds on the chain links are properly oriented. Correct all chain irregularities before operating hoist.



3.5 Electrical connection



WARNING

If motor rotation is incorrect (power phases have been reversed), the limit switch will not function properly, which may cause serious damage to the hoist and/or serious injury to the operator and others.

All electrical wiring of the hoist should be performed by a qualified electrician. Verify current draw of hoist and distance to electrical inlet when hoist is at the **FURTHEST POSITION** from the inlet. Inadequate wiring may cause the motor to burn, **EVEN IF THERE IS NO LOAD ON THE HOIST.**

The hoist should be connected to a branch circuit which complies with the requirements of the National Electrical Code and applicable local codes.

3.5.1 Wiring of hoist to local power source

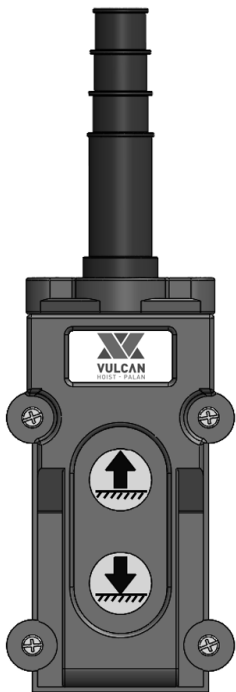


Figure 3 - 4

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 moves the load chain up and pushing the DOWN button moves the load chain down. Please follow the steps below to wire the hoist:

1. Make a temporary connection at the power supply and make sure supply to the hoist can be quickly disconnected in case of a problem.
2. Push the up button momentarily and observe movement of the hook:
 - a. If hook rises up, connections are correct and can be made permanent.
 - b. If hook lowers down, the motor phasing must be changed. To do so, turn the power off and:
 - i. If your model uses a 3-phase motor (208, 230, 380, 460, or 575 volts), switch the position of any two of the three phases **at the power source**.
 - ii. If your model uses a 1-phase motor (115 or 230 volts), please contact Vulcan for additional details.

The hoist is equipped with upper and lower limit switches whose proper operation is dependent on the correct motor phasing, rotation and pendant signal:

- Limit switches are factory preconfigured – when required, always reverse phasing at the power source, never in the pendant.
- If the phasing is incorrect, the limit switches will not function properly which could result in serious damage to the hoist and/or serious injury to the operator and others.

NOTICE

115 V motors: do not plug the hoist into a standard household outlet. Although some models will work with these outlets, they may draw more current and exceed the capacity of the electrical circuit, or interfere with other devices on the same circuit. Always do the connections in a junction box. Always consult a qualified electrician when you wired one or more hoists to the electrical network.



3.5.2 Checking for adequate voltage at hoist

The hoist must be supplied with adequate electrical power in order to operate properly. For proper operation, the voltage (measured at the hoist end of the standard power cord with the hoist operating in the up direction with full load) must be within 5 % of nominal voltage.

SIGNS OF INADEQUATE ELECTRICAL POWER (LOW VOLTAGE) ARE:

- Noisy hoist operations due to brake and/or contactor chattering.
- Dimming of lights or slowing of motors connected to the same circuit.
- Heating of the hoist motor and other internal components as well as heating of the wires and connectors in the circuit feeding the hoists.
- Failure of the hoist to lift the load due to motor stalling.

COPPER CONDUCTOR SIZES FOR 2% DROP IN POTENTIAL ON 110-120 VOLTS 2 CONDUCTORS

CURRENT AMPERES	Approximate Distance in Feet to Center of Distribution																	
	20	30	40	50	60	70	80	90	100	120	140	160	180	200	240	280	320	360
	Copper Conductor Sizes in AWG. Calculated for Conductor Temperature of 60C and Ambient 30C																	
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-
1,5	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	14	-	-
2	-	-	-	-	-	-	-	-	-	16	-	-	-	14	-	-	12	-
3	-	-	-	-	-	-	16	-	-	-	14	-	-	12	-	-	-	10
4	-	-	-	-	16	-	-	-	14	-	-	12	-	-	10	-	-	-
5	-	-	-	16	-	-	14	-	-	12	-	-	-	10	-	-	8	-
6	-	-	16	-	-	14	-	-	12	-	-	-	10	-	-	8	-	-
7	-	-	-	-	14	-	-	12	-	-	10	-	-	-	8	-	-	6
8	-	16	-	14	-	-	12	-	-	-	-	-	-	8	-	-	6	-
9	-	-	-	-	-	12	-	-	-	10	-	-	8	-	-	6	-	-
10	-	-	14	-	12	-	-	-	10	-	-	8	-	-	6	-	5	-
12	16	-	-	12	-	-	10	-	-	-	8	-	-	6	-	5	-	4
14	-	14	-	-	-	10	-	-	-	8	-	-	6	-	5	4	-	3
16	-	-	12	-	10	-	-	-	8	-	-	6	-	5	-	-	3	-
18	-	-	-	-	-	-	-	8	-	-	6	-	5	-	4	3	-	2
20	14	12	-	10	-	-	8	-	-	6	-	5	-	4	3	-	2	-
25	-	-	10	-	8	-	-	-	6	-	5	4	-	3	2	-	1	-
30	12	-	-	8	-	-	-	6	5	-	4	-	3	2	-	1	1/0	-
35	-	10	-	-	-	6	-	5	-	4	3	-	2	-	1	1/0	-	2/0
40	-	-	8	-	-	-	5	-	4	-	-	2	-	1	1/0	-	2/0	-
45	-	-	-	-	6	5	-	4	-	3	2	-	1	-	-	2/0	-	3/0
50	-	8	-	6	5	-	-	-	3	2	-	1	-	1/0	2/0	-	3/0	-
60	-	-	6	5	-	4	-	3	2	-	1	-	1/0	2/0	-	3/0	-	4/0
70	-	-	-	-	4	3	-	2	-	1	1/0	-	2/0	-	3/0	4/0	-	-
80	-	6	5	4	-	-	-	-	1	-	-	2/0	-	3/0	-	-	-	-
90	-	-	-	-	3	2	-	1	-	1/0	2/0	-	3/0	-	4/0	-	-	-
100	-	5	-	3	2	-	1	-	1/0	2/0	-	3/0	-	4/0	-	-	-	-
125	-	-	-	2	1	-	1/0	-	2/0	3/0	-	4/0	-	-	-	-	-	-
150	-	-	-	1	-	1/0	2/0	-	3/0	-	4/0	-	-	-	-	-	-	-
175	-	-	-	-	1/0	2/0	-	3/0	-	4/0	-	-	-	-	-	-	-	-
200	-	-	-	-	2/0	-	-	-	-	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	3/0	4/0	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	4/0	-	-	-	-	-	-	-	-	-	-	-	-

- This Table is calculated for wire sizes No. 16 to No. 4/0 AWG and gives for each size specified, the approximate maximum distance in feet of the distribution center for a 2% drop in potential at a given current. Inductive reactance has not been included since it is a function of conductor size and spacing.
- This Table is based on conductor resistance at 60C. For conductor temperatures above 60C, multiply distances in feet in the column headings by a factor as follows to retain 2% drop in potential.

Conductor Temperature	Distance Correction Factor
75C	0.94
85-90C	0.9
110C	0.83
125C	0.79
200C	0.64
- For 220-240 volts, multiply the distance in feet in the column headings by two, for the same percentage drop.
- Example on use of Table:
Consider a 2-conductor circuit carrying 10 amperes at 110-120 volts. From the Table opposite "10 amperes", it will be found that a No. 14 AWG circuit can be run 40 feet from the distribution center to the load without exceeding a 2% drop. Beyond this distance, a larger size of conductor is required (i.e. No. 12 AWG beyond 40 feet up to and including 60 feet).

- Blowing of fuses or tripping of circuit breakers.

3.6 Functional verification and trial operations

- 3.6.1** Confirm the adequacy of the rated capacity for all slings, chains, wire ropes and all other lifting attachments before use. Inspect all load suspension members for damage prior to use and replace or repair all damaged parts.
- 3.6.2** Verify and correct all chain irregularities prior to operating the hoist. Refer to Section 3.4.
- 3.6.3** Measure and record the “k” dimension of all hooks on back cover of this manual. See Table 5 - 4 under Section 5, “Inspection”.
- 3.6.4** Record the hoist’s model and Serial Number (from the name plate on the hoist, see page 9) in the space provided on the cover of this manual.
- 3.6.5** Ensure that the hoist is properly installed to either a fixed point or trolley, whichever applies.
- 3.6.6** If hoist is installed on a trolley, ensure that:
- The trolley is properly installed on the beam.
 - Drop Stop for the trolley are correctly positioned and securely installed on the beam.
- 3.6.7** Ensure that all nuts, bolts, and split pins (cotter pins) are sufficiently fastened.
- 3.6.8** Pull down on the pendant and ensure that the Cord Strain Relief Cable takes the force, not the Pendant Cord.
- 3.6.9** Check supply voltage before everyday use. If the voltage is lower than 5% below nominal voltage for the motor, do not operate the hoist.
- 3.6.10** 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 and ANSI/ASME B30.16.
 - Before operating, ensure that nothing will interfere with the full range of the hoist’s (and trolley’s) operation.
- 3.6.11** 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 moves the load chain up and pushing the DOWN button moves the load chain down. If the hoist does not operate correctly, refer to section 3.5 for proper wiring of the motor. Failure to do so could result in serious damage to the equipment and/or serious injury to the operator and others.
- 3.6.12** After hoist is connected, ALWAYS test limit switches by raising the hook until it stops about 4 - 6” from the hoist body. Then lower the hook until it stops, leaving about 12” of loose chain on the unloaded side.

4. Operation

4.1 Introduction

The operation of an overhead hoist involves more than activating the hoist's controls. As 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.



WARNING

Hoist operators shall be required to read the operation section of this manual, the warnings contained in this manual and warning labels on the hoist or lifting system, and the operation section 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 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 operations if such malfunctions occur, and to immediately advise their supervisor so corrective actions can be taken.

Hoist operators should have adequate 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, emotional instability or operate 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.

4.2 Instructions for operation

Taking precedence over any specific rule, however, is the most important rule of all: "USE COMMON SENSE".

It is the responsibility of the hoist owner/user to establish programs to:

1. Train and designate hoist operators.
2. Train and designate hoist inspection and maintenance personnel.

The words **shall** and **should** are used throughout this manual in accordance with definitions in the ANSI/ASME B30 standards as follows:

shall this word indicates that a rule is mandatory and must be followed.

should this word indicates that a rule is a recommendation, the advisability of which depends on the facts in each situation.

Hoist operator and hoist inspection and maintenance personnel training programs should be based on requirements in accordance with the latest edition of ANSI/ASME B30.16, "Overhead Hoists (Underhung)".



WARNING

Improper operation of a hoist can create a potentially hazardous situation which, if not avoided, could result in death, serious injury or substantial property damage. To avoid such a potentially hazardous situation, the operator must be familiar with the instructions listed in this section.

THE OPERATOR SHALL:

1. **NOT** operate a damaged, malfunctioning or abnormally performing hoist.
2. **NOT** operate a hoist until he has thoroughly read and understood Manufacturer's Operating and Maintenance Instructions or Manuals.
3. **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.
4. **NOT** lift more than the rated load for the hoist.
5. **NOT** use hoist with twisted, kinked, damaged, or worn load chain.
6. **NOT** use the hoist to lift, support, or transport people.
7. **NOT** lift loads over people.
8. **NOT** operate a hoist unless all persons are and remain clear of the supported load.
9. **NOT** operate unless load is centered under hoist.
10. **NOT** attempt to lengthen the load chain or repair a damaged load chain.

11. **NOT** operate hoist when it is restricted from forming a straight line from hook to support in the direction of loading.
12. **NOT** use load chain as a sling or wrap load chain around load.
13. **NOT** apply the load to the tip of the hook or to the hook latch.
14. **NOT** apply load unless the load chain is properly seated in its grooves.
15. **NOT** lift any load if the weight of the load is not evenly distributed across all the chain falls.
16. **NOT** operate beyond the limits of the load chain travel.
17. **NOT** allow the load chain or hook to be used as an electrical or welding ground.
18. **NOT** allow the load chain or hook to be touched by a live welding electrode.
19. **NOT** remove or obscure the warning label on the hoist.
20. **NOT** operate a hoist on which the safety plates or decals are missing or illegible.
21. **NOT** use the hoist in such a way that could result in shock or impact loads being applied to the hoist.
22. **NOT** use the hoist load limiting or warning device to measure load.
23. **NOT** use limit switches as routine operating stops. They are emergency devices only.
24. **NOT** allow the hoist to be subjected to sharp contact with other hoists, structures, or objects through misuse.
25. **NOT** adjust or repair the hoist unless qualified to perform such adjustments or repairs.
26. **NOT** "jerk" the hoist in position to tighten the grip on the load or to facilitate the unloading process.

THE OPERATOR SHALL:

1. Protect the hoist's load chain from weld splatter or other damaging contaminants.
2. Be familiar with operating controls, procedures, and warnings.
3. Take up slack carefully – make sure load is balanced and load-holding action is secure before continuing.
4. Shut down a hoist that malfunctions or performs abnormally and report such malfunction.
5. Make sure hoist limit switches function properly.
6. Warn personnel before lifting or moving a load.
7. Warn personnel of an approaching load.
8. Maintain firm footing when operating the hoist.
9. Check brake function by tensioning the hoist prior to each lift operation.
10. Use hook latches. Latches are to retain slings chains, etc. under slack conditions only.
11. Make sure the load is free to move and will clear all obstructions.

12. Make sure hook travel is in the same direction as shown on controls.
13. Inspect the hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
14. Use the hoist manufacturer's recommended parts when repairing the unit.
15. Lubricate the load chain as per Vulcan's recommendations.
16. Make sure the hook latches are closed and not supporting any parts of the load.
17. Avoid swinging the load or hook.

4.3 Daily or prestart inspection

In accordance with the requirements of ANSI/ASME B30.16, the hoist operator should perform daily (prestart) inspections at the start of each shift or at the time of the hoist's first use during each shift. The daily inspection is a visual and audible examination of the hoist. Records of the daily inspection are not required except as required by the hoist owner/user. Daily inspection items that should be performed include the following:

TABLE 4 - 1: HOIST DAILY INSPECTION

Inspection item	Description of inspection
Tagged Hoist	Check that hoist is not tagged with an out-of-order sign.
Control Devices	Check that all travel motions agree with control device markings. When checking hoist travel motion, always use the lifting or up control first.
Brakes	Check that all travel motions do not have excessive drift and that stopping distances are normal.
Hook	Check for damage, cracks, nicks, gouges, deformation of the throat opening, wear on saddle or load bearing point, and twist.
Hook Latch	Check that hook latch is not missing and that it operates properly.
Load Chain	Check for nicks, gouges, and any type of deformation or damage to the chain. Check for lubrication of load chain.
Reeving	Check that load chain is properly reeved, that load chain is not kinked or twisted, and that load chain parts are not twisted about each other.
Limit Devices	Check that the primary upper limit device stops lifting motion of the hoist load block at the upper limit of travel. Then, check that the lower limit device stops lowering motion of the hoist load back at the lower limit of travel.
Oil Leakage	Check for any sign of oil leakage on the hoist and on the floor area beneath the hoist.
Unusual Sounds	Check for any unusual sounds from the hoist and hoist mechanism while operating the hoist.
Warning Labels	Check that warning and other safety labels are not missing and that they are legible.

4.4 Hoist control

- 4.4.1** For hoists mounted to motorized trolleys follow the control instruction included in the trolley's Owner's Manual.
- 4.4.2** Single Speed Pendant Control – When using the pendant control depress the UP button to raise the hoist load chain/hook or the DOWN button to lower the hoist load chain/hook as shown in Figure 4 - 2. To stop motion release the buttons.
- 4.4.3** Dual Speed 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 - 2. To stop motion, release the buttons.
- 4.4.4** **OPTIONAL** Emergency Stop Button – Press the Emergency Stop Button to perform an emergency stop and lock-out of hoist motion controls. Turn the Emergency Stop Button clockwise to unlock the controls and allow hoist operation.

CAUTION! Make sure the hoist completely stops before reversing direction.

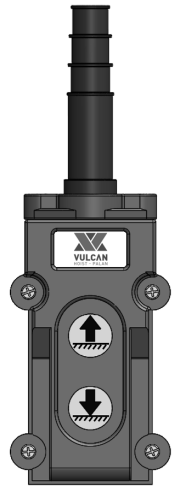


Figure 4 - 2

5.0 Inspection

5.1 General

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

- **Designated Person** – a person selected or assigned as being able to perform the specific duties to which he/she is assigned.
- **Qualified Person** – a person who, by possession of a recognized degree or certified 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** – service that 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** – service which involves operation within the rated load limit which exceeds normal service.
- **Severe Service** – 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 as 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 designated person with intervals as per the following criteria:

- Normal service : yearly
- Heavy service : semi-annually
- Severe service : quarterly

- Special or infrequent service : as recommended by 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 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 switches and associated components.
Hoist braking system for proper operation.
Hooks are compliant with Section 5.7.3 and ANSI/ASME B30.10.
Hook latch operation .
Load chain is compliant with Section 5.7.2.
Idle sprocket does not show signs of excessive wear.
Check for any loose parts or fasteners on the hoist structure.

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 a safe working condition.

5.4.2 For inspections where load suspension parts of the hoist are disassembled, a load test as 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 [see Table 5-1].
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 or excessive wear of load and idler sprocket.
Evidence of excessive wear on brake.
Electrical contactors for signs of pitting or any deterioration of visible controller contact.
Evidence of damage of supporting structure or trolley, if used.
Legible function labels on pendant control stations.
Legible warning label properly attached to the hoist
End connections of load chain.

5.5 Occasionally used hoists

- Hoist Idle More Than 1 Month, Less Than 1 Year: Inspect following FREQUENT Inspection criteria in Section 5.3.
- Hoist Idle More Than 1 Year: Inspect following 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 intervals as per Section 5.4. 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-term 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 Inspections. In accordance with ANSI / ASME B30.16, these inspections are not intended to involve disassembly of the hoist. Disassembly for further inspection would be required if frequent or periodic inspection results indicate so. Such disassembly and further inspection should be performed by a Vulcan Hoist qualified technician.

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.	Adjust or replace as required.
Braking System Operation	Function	Should stop the load without significant travel after motor is turned off.	Adjust or replace.
Hooks – Fretting wear	Measure	Excessive wear of original hook dimensions resulting in reduction of the load bearing cross section area of 10% or more. Refer to section 5.7.3 for details.	Replace
Hooks – Stretch	Measure	Any distortion resulting in throat opening larger than 5% of the original dimension. For additional details, refer to section 5.7.3.	Replace
Hooks – Bent Shank or Neck	Visual	Shank and neck portions of hook should be free of deformations.	Replace

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.	Measure, tighten, or replace as required.
Hooks – Idle Sprocket and Bearings (Bottom Hook on 2 & 3 Fall Hoist)	Visual Function	Pockets of Idle Sprocket should be free of significant wear. Idle Sprocket surfaces should be free of nicks, gouges, dirt, and grime. Bearing parts and surfaces of Idle Sprocket should not show significant wear. Idle Sprocket 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 quickly 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 touch 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 section 5.7.2. The “d” dimension should not be less than minimum value listed in section 5.7.2.	Replace. Inspect Load Sprocket (and Idle Sprocket for 2 & 3 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 6.2).
Load Chain – Reeving	Visual	Chain should be reeved properly through Load Sprocket (and Idle Sprocket for 2 & 3 fall hoist).	Reeve/Install chain properly (refer to section 6.4).
Load chain – Connection Yoke Chain Pin (2 & 3 Fall Hoists Only)	Measure	The Connection Yoke Chain Pin should not have any apparent deformation. The “d” dimension should not be less than the discard value listed at the bottom of Section 5.7.2.	Replace
Chain Container	Visual	Container should not be damaged. Brackets should not be deformed or missing.	Replace
Bolts, Nuts, and Rivets	Visual	Bolts, nuts, and rivets should not be loose.	Tighten or replace as required.

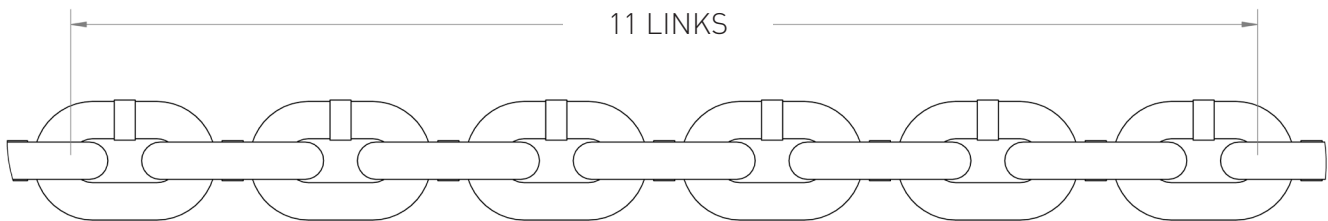
Electromagnetic Brake Assembly	Measure Visual	The electromagnetic motor brake gap is directly related to brake disk wear. As the disk wears, the brake gap will increase. The brake gap/wear dimension should not be more than 0.050". Bolts and screws should not be loose.	Section 6.6 for disc brake adjustment.
Contactors	Visual	Contact should be free of significant pitting or deterioration.	Replace
Load Sprocket	Visual	Pockets of Load Sprocket should be free of excessive wear.	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.	Replace
Pendant – Switches	Function	Depressing and releasing push-button should make and break contact 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. (up and down).	Replace
Pendant –Cable	Visual Electrical Continuity	Surface of cable 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.	Replace
Pendant - Cable Strain Relief Cable	Visual Functional	Pendant Cable 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) and they should be legible.	Replace
Hoist Capacity Tag	Visual	The tag that indicates the capacity of the hoist should be legible and securely attached to the hoist cover.	Replace
Nameplates	Visual	The nameplates that indicate the hoist model, speed and motor data should be legible and securely attached to the hoist.	Replace

5.7.2 Load Chain Discard Criteria

The load chain used on VULCAN HOISTS is heat treated. No link or links can be added or welded after leaving factory. **DO NOT USE** hoist, even if there is only one (1) link worn out or elongated beyond the permissible dimensions listed below:

Capacity	Diameter	Length of 11 Links	
		Nominal	Permissible
ALL	7.9 mm	9.961" (253 mm)	10.157" (258 mm)

The sketch below shows the method of measuring the pitch in eleven (11) links.



5.7.3 Hook Measurements and Discard Criteria

As per the ASME B30.10 guidelines, Vulcan recommends changing any hook that exhibits the following signs of wear:

1. Missing or illegible hook identification and/or working load limit.
2. Excessive pitting, corrosion, cracks, nicks, or gouges on the hook body or retaining pin.
3. Any signs of welding or heat damage on the hook body or retaining pin.
4. Any wear, resulting in dimension change of more than 10% the original value on the hook body or retaining pin.
5. Permanent deformation resulting in throat opening exceeding the original value by 5%.

Note: if there is excessive throat opening, DO NOT attempt to repair by closing the hook. The strength of the hook will not be the same as the original.

The user is responsible for measuring the exact initial dimensions of the hook for future maintenance purposes. The following table can be used as a reference; please note that the dimensions provided are nominal and the actual hook dimensions may vary.

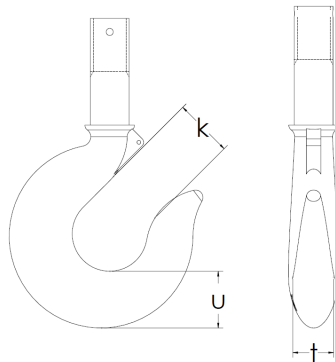


TABLE 5-4: HOOK DEFORMATION

Hook Capacity	k		t		u	
	Initial	Discard	Initial	Discard	Initial	Discard
1/4T - 1T	1.29	≥ 1.35	0.79	≤ 0.71 ≥ 0.87	0.96	≤ 0.86 ≥ 1.06
1/4T - 1 1/2T	1.10	≥ 1.16	0.87	≤ 0.78 ≥ 0.96	1.11	≤ 1.00 ≥ 1.22
2T, 3T and 5T	1.28	≥ 1.34	1.15	≤ 1.04 ≥ 1.27	1.45	≤ 1.31 ≥ 1.60

* All dimensions are in inches.

6.0 Maintenance

6.1 Maintenance schedule and records

Maintenance schedule should be based on inspection results and any maintenance procedure should be recorded in a log book for future reference.

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.
- Machine or gear oil (grade ISO VG 46 or 68 or equivalent) may be used as an alternative lubricant but must be applied more frequently.
- The chain should be lubricated every 3 months (more frequently for heavier usage or severe conditions).
- For dusty environments, it is acceptable to use 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 — transmission

6.3.1 Oil level – The oil level should be just below the hole when the hoist is leveled.

6.3.2 Replacing oil – Change gear oil once after the first 6 months of purchase and once every 2 years afterwards. The oil should be changed more frequently depending on the hoist's usage and operating environment. Follow the procedure below for replacing the gearbox oil for your hoist:

- To drain the current oil from the hoist, remove the "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.
- NOTICE: Dispose of the used oil in accordance with local regulations.
- Refill the reducer with Meropa 320 (regular), Meropa EP 220 (synthetic) or equivalent oil until the oil level is just below the hole when the hoist is leveled.
- Warning! Using the incorrect type, grade and/or volume of oil and/or mixing different types of oil may cause serious damage to the reducer gearing.

6.4 Load chain

6.4.1 Lubrication and Cleaning – see Section 6.2.1.

6.4.2 Load Chain Replacement:



DANGER

The hoist must be properly powered and operational in order to perform the following procedures.

Be certain that the replacement chain is obtained from Vulcan Hoist Co. Ltd. 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, destroy the old chain to prevent its reuse.

When replacing load chain, check for wear on mating parts, i.e. Load Sprocket, Chain Guides and Idle Sprocket, and replace parts if necessary.

1. Remove all chain components including the Bottom Hook Set Assembly and Stoppers from the chain for reuse on new chain. Inspect and replace any damaged or worn parts.
2. Activate the down button until there is approximately 12” of chain on the no load side.
3. Using a C-link, attach the new chain to the end link of the old chain on the no-load side. The end link of the new load chain should be connected so that the welded portions of the load chain’s standing links are oriented to the outside as they pass over the sprocket.
4. Operate the hoist down to move the chain through the hoist body. Stop when a sufficient amount of new chain is accumulated on the load side.
5. Single fall hoists – Attach the components (step 4 above) to the chain. See sections 3.2, 3.3, and 3.4 for the proper locations.
6. 2 & 3 falls– 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 Sprocket. Attach the remaining chain components to the chain referring to the sections 3.2, 3.3, and 3.4 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 3.4.
7. After installation has been completed, perform steps outlined in Section 3.6, “Functional verification and trial operations”.

6.5 Adjusting your Vulcan limit switches



DO NOT suspend a load on the hook when adjusting the limit switches.

1. Remove the bolts holding the plastic cover in place.
2. Remove the plastic cover, revealing the limit switch assembly.

Lower limit adjustment

To make your hoist stop at a certain height when lowering the hook:

3. Bring the hook to the desired height using the pendant control.
4. Loosen the two screws (9) on the limit switch without removing them.
5. Pull back the adjustment bar (10) so that the adjustment wheels can turn freely.
6. Turn on the lower limit adjustment wheel (7) towards the micro limit switch (12) until it clicks (see Figure 6-1 below).
7. Put back the adjustment bar (10) in place and tighten both screws (9).
8. Test the lower limit a few times until the hoist stops at the desired height. If not, repeat steps 3 to 8 for finer tuning. Test the lower limit a few times until the hoist stops at the desired height.

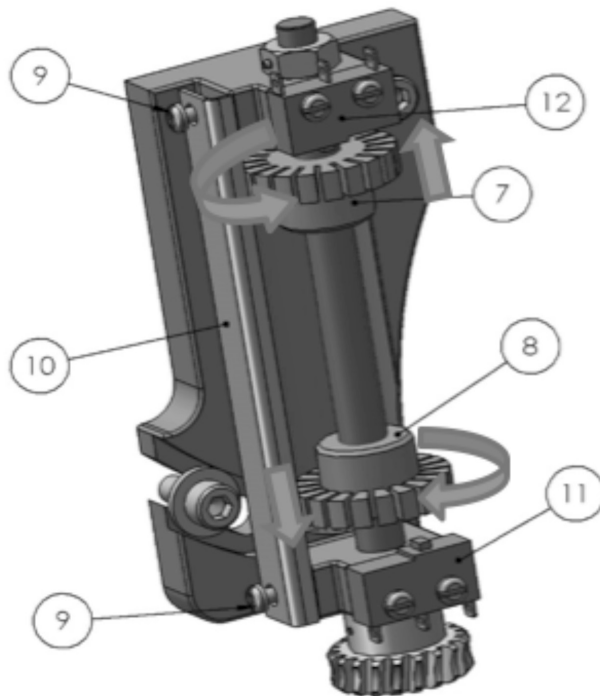


Figure 6-1

Upper limit adjustment

To make your hoist stop at a certain height when raising the hook:

10. Bring the hook to the desired height using the pendant control.
11. Loosen the two screws (9) on the limit switch without removing them.
12. Pull back the adjustment bar (10) so that the adjustment wheels can turn freely.
13. Turn on the upper limit adjustment wheel (8) towards the micro limit switch (11) until it clicks (see Figure 6-1 above).
14. Put back the adjustment bar (10) in place and tighten both screws (9).
15. Test the upper limit a few times until the hoist stops at the desired height. If not, repeat steps 10 to 15 for finer tuning.

Note: 2 to 3 teeth on the adjustment wheel represent approximately 1 foot of chain. Putting the adjustment wheel (7) closer to the micro switch (12) will reduce (restrain) the lower limit. Putting it further will increase it.

NOTICE

The limit switch is not 100% accurate, which means that the height calibrated for either upper or lower limit WILL vary up to 6 inches every time. Keep that in mind while adjusting your limit switch and make sure you test it a few times before operating the hoist.

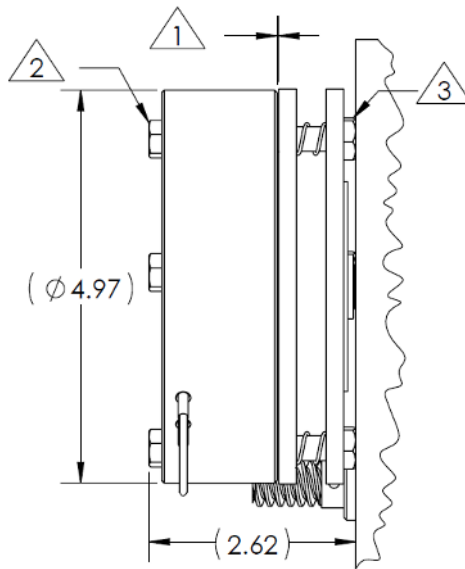


WARNING

When adjusting the lower limit, always make sure that there is no tension in the free end of the chain. Failure to adjust the lower limit properly will damage your hoist and /or your chain.

When adjusting the upper limit, always make sure that you have a safe distance between the hook and the hoist body. Failure to adjust the upper limit properly will damage your hoist and or your chain.

6.6 Disc brake adjustment



ADJUSTMENT PROCEDURE

1	Tighten all three mounting bolts (2) to snug, 3-4 N-m / 2.2-3.0 ft-lb
2	Adjust the gap (1) to .010 in by tightening or loosening the three bolts (3). Use a thickness gauge to check the gap at all three bolts (3)
3	Tighten all three mounting bolts (2) to 5-6 N-m / 3.7-4.4 ft-lb
4	Recheck the gap (1) with a thickness gauge. Repeat steps 2, 3 and 4 until the gap is adjusted to .010 in



CAUTION

Check the brake gap regularly and/or during the periodic maintenance of the equipment hoist. **Readjust the brake if the gap is larger than .030 in.**

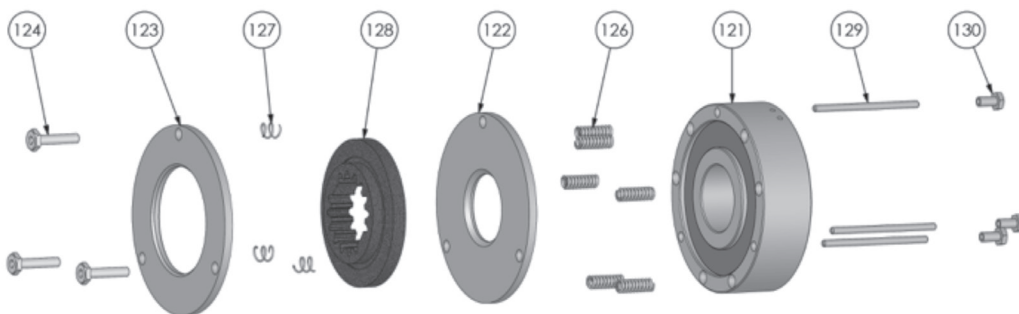


Figure 6-2

6.7 Storage

- 6.7.1** All hoists equipped with a vented oil cap should be stored with the cap oriented upwards 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 installation 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 for allowable environmental conditions.

6.9 Operational environment

Unless otherwise specified, the hoist does not conform to the following operational environments and should therefore not be used for any such applications:

- Explosive gases or vapor.
- Organic solvents or volatile power.
- 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.

De-energize equipment before performing ANY maintenance. Refer to ANSIZ244.1, “Personnel Protection – Lockout/Tag out 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.

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

TABLE 7-1: TROUBLESHOOTING GUIDE

Symptom	Cause	Remedy
Hoist moving in wrong direction	Power supply reversed phased	Switch 2 of the 3 power supply cords wired at the power source. (see Section 3.5 for instructions on how to check for correct power supply phase connections).
	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.
	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.
	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 Troubleshooting Problem “Motor or brake overheating”.
	Improper, loose, or broken wire in hoist electrical system	Shut off power supply, check wiring connection on hoist control panel and inside push - button pendant.
	Brake does not release	Check motor brake coil for continuity. Replace brake if needed.
	Faulty magnetic contractor	Check coil for open or short circuit. Check all connections in the control circuit. Check for open contactors. Replace as needed.
	Emergency Stop Depressed on Push Button Pendant Control	Turn the Emergency Stop Button Clockwise to unlock the control and allow hoist operation.
	Defect in control transformer	Check transformer coil for signs of overheating. Disconnect transformer and check for open winding.

TABLE 7-1 TROUBLESHOOTING GUIDE (CONT'D)

Symptom	Cause	Remedy
Hoist Will not Operate	Motor burned out	Replace motor frame/stator, shaft/rotor, and any other damaged parts.
	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 contact. Replace as needed.
Hoist lifts but will not lower	Faulty switch in pendant	Check electrical continuity. Check electrical connections. Replace or repair as needed.
	Hoist overloaded	Reduce load within rated capacity.
	Up circuit	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.
Hoist lowers but will not lift	Faulty magnetic contactor	Check coils for open or short circuit. Check all connections on motor circuit. Check for burned contacts. Replace as needed.
	Faulty switch in pendant	Check electrical continuity. Check electrical connections. Repair or replace as needed.
Hoist will not lift rated load or does not have the proper lifting speed	Hoist overloaded	Reduce load to within rated capacity.
	Low voltage in hoist's power supply.	Determine cause of low voltage and bring to within plus or minus 5% of voltage specified on the motor nameplate. The voltage should be measured at the hoist contactor.
Load drifts excessively when hoist is stopped	Motor brake not holding	Check brake for proper "Brake Gap" dimension (section 6.6). Replace if needed.
Motor or brake overheating	Excessive load	Reduce load to within rated capacity of hoist.
	Excessive duty cycle	Reduce frequency of lifts.
	Wrong voltage or frequency	Check voltage and frequency of power supply against the rating on the nameplate on the motor.
	Extreme external heating	Above an ambient temperature of 40°C, the frequency of hoist operation must be reduced to avoid overheating of the motor. Special provisions should be made to ventilate the hoist or otherwise shield it from the heat.
Hoist operates intermittently	Connectors making poor contact	Check movement of spring loaded arm, weak spring, connections and shoe. Replace as needed.
	Contactors 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 in the Pendant Cord. Replace entire Pendant Cord if continuity is not constant.

8.0 Part list

Please consult our website vulcanhoist.com for the complete parts list.

9.0 Warranty

Warranty explanation and terms

All product sold by the Vulcan Hoist Company Ltd. (hereinafter referred to as, Vulcan) are warranted to be free from defects in material and workmanship from date of shipment by Vulcan for the following periods:

Vulcan Manual products – 2 years

Nova Manual products – 1 year

Electric Hoists & Trolleys– 2 years

Spare/Replacement Parts – 1 year

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 Vulcan's inspection of the product, Vulcan 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. Vulcan place of business to customer.

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

Vulcan disclaims any and all other warranties of any kind expressed or implied as to the product's merchantability or fitness for a particular application. Vulcan will not be liable for any deaths or injuries to people, any property damages, or any additional expenses resulting from failure to follow the guidelines (intentionally or due to negligence) for safe installation, use, maintenance and inspection described in this manual and all applicable standards.

APPENDIX

DEFINITIONS OF VARIOUS HOIST TERMS

Abnormal operating conditions - Environmental conditions that are unfavorable, harmful, or detrimental to or for the operation of a hoist, such as excessively high or low ambient temperatures, exposure to weather, corrosive fumes, dust laden or moisture laden atmospheres, and hazardous locations.

Below - the - hook lifting devices - Devices that are not normally reeved onto the hoist chain, such as hook - on buckets, magnets, grabs, and other supplemental devices used for ease of handling certain types of loads. The weight of these devices is to be considered part of the load to be lifted.

Block loads - An action that facilitates the removal of slings or other lifting devices from under the load, accomplished by bringing the load to rest on wood, metal, or other spacers between the floor and load.

Brake, holding - A friction brake for a hoist that is automatically applied and prevents motion when power to the brake is removed.

Chain, load - Welded link chain rated for lifting.

Chain, roller - A series of alternately assembled roller links and pin links in which the pins articulate inside the bushings and the rollers are free to turn on the bushings. Pins and bushings are press fit in their respective link plates.

Chain, welded link - A chain consisting of a series of interwoven links formed and welded.

Designated person - A person selected or assigned by the employer or the employer's representative as being competent to perform specific duties.

Guide, chain - A means to guide the load chain at the load sprocket.

Hoist - A machinery unit that is used for lifting or lowering a freely suspended (unguided) load.

Lifting devices - Devices that are not normally reeved onto the hoist chain, such as hook - on buckets, magnets, grabs, and other supplemental devices used for ease of handling certain types of loads. The weight of these devices is to be considered part of the load to be lifted.

Limit device - A device that is operated by some part or motion of a power driven hoist to limit motion.

Limit device, primary upper - See primary upper - limit device.

Load - The total superimposed weight on the load block or hook.

Load, rated - The maximum load for which a hoist is designated by the manufacturer or a qualified person.

Load block - The assembly of hook, swivel, bearing, sprockets, pins, and frame suspended by the hoisting load chain. This shall include any appurtenances reeved in the hoisting load chain.

Load chain - See chain, load.

Load suspension parts - The load suspension parts of the hoist are the means of suspending the hoist structure and load such as hooks, lugs, load blocks, drum and rope/cable, or sprocket and chain.

Normal operating conditions - Conditions during which a hoist is performing functions within the scope of the original design.

Overload - Any load greater than the rated load.

Over travel restraint - A device used to prevent the slack load chain from inadvertently being lowered out of the load sprocket.

Parts (lines) - Number of lines of chain supporting the load blocks or hook.

Pendant station - Controls suspended from the hoist for operating the unit from the floor.

Power transmission parts - The machinery components including the gears, shafts, clutches, couplings, bearings, motors, and brakes.

Primary upper - limit device - The primary upper - limit device is the first limit device that will be activated to control the upper limit of travel of the load block when a hoist is equipped with more than one upper - limit device.

Qualified person - A person who, by possession of a recognized degree in an applicable field or a 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.

Rated load - See load, rated.

Reeving - A system in which a chain travels around sprockets, roller chain - See chain, roller.

Sheave - A grooved wheel or sprocket used with a chain to change direction and point of application of a pulling force.

Sprocket, idler - A freely rotating device that changes the direction of the load chain.

Sprocket, load - A hoist component that transmits motion to the load chain. This component is sometimes called load wheel, load sheave, pocket wheel, or chain wheel.

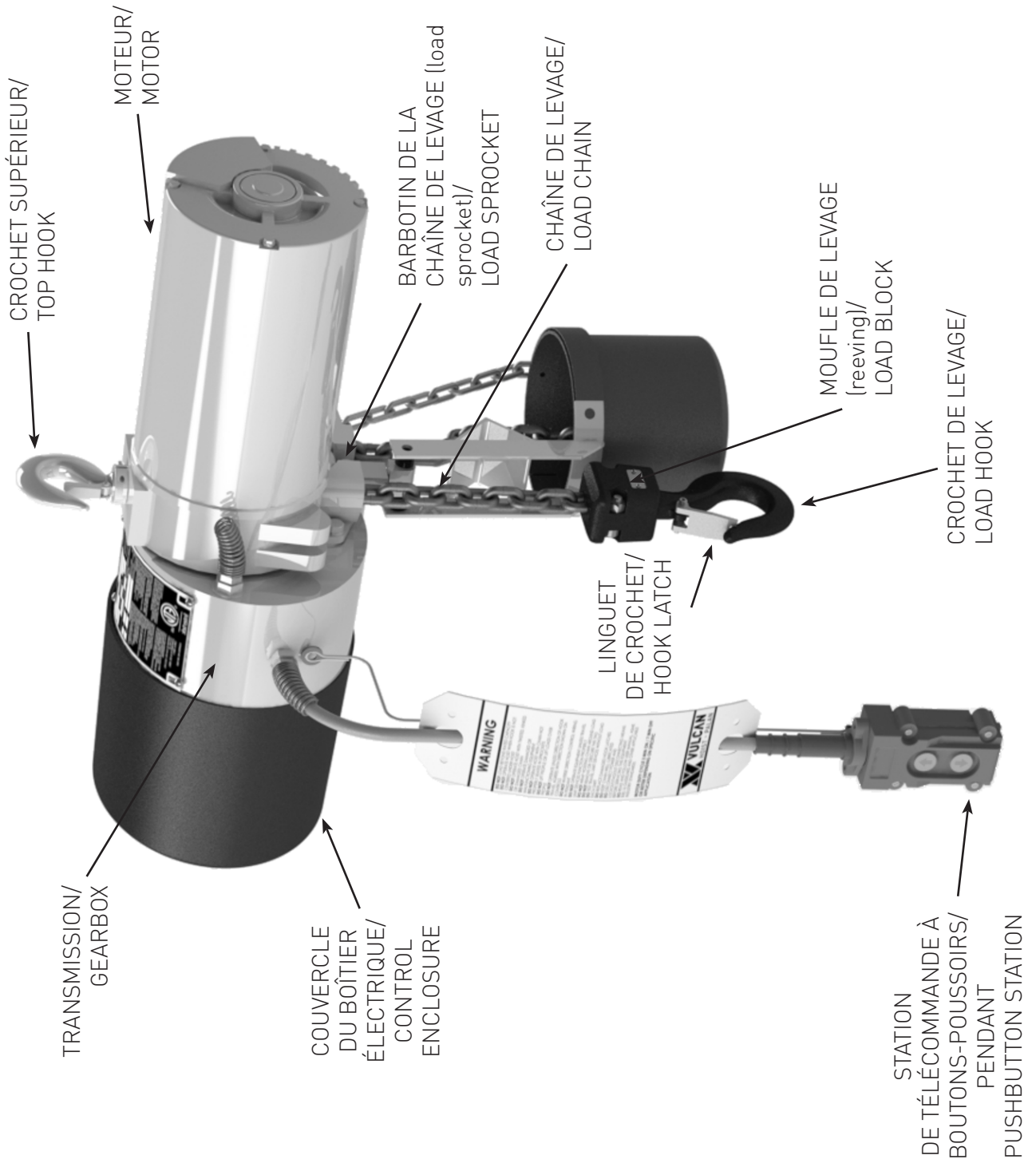
Switch - A device for making, breaking, or changing the connections in an electric or pneumatic circuit (valve).

Trolley - A machine unit that travels on a monorail track or crane bridge girder.

Trolley hoist - A hoist and trolley unit consisting of a hoist suspended from or mounted to a trolley, or a hoist with an integral trolley.

Welded link chain - See chain, welded link.

Nomenclature



Spécifications des produits / Product specifications

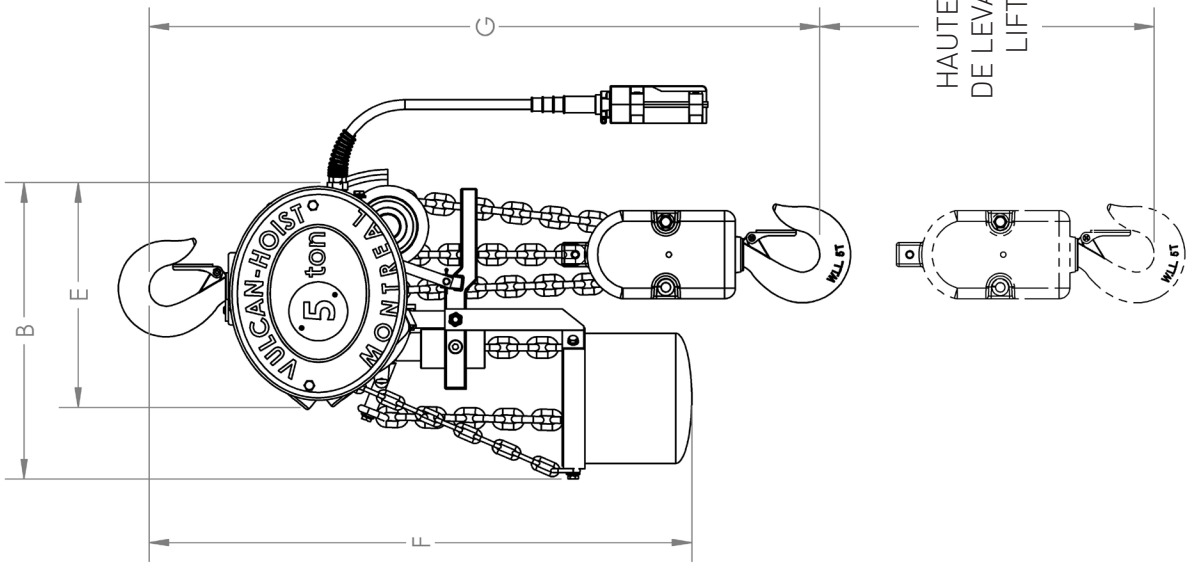
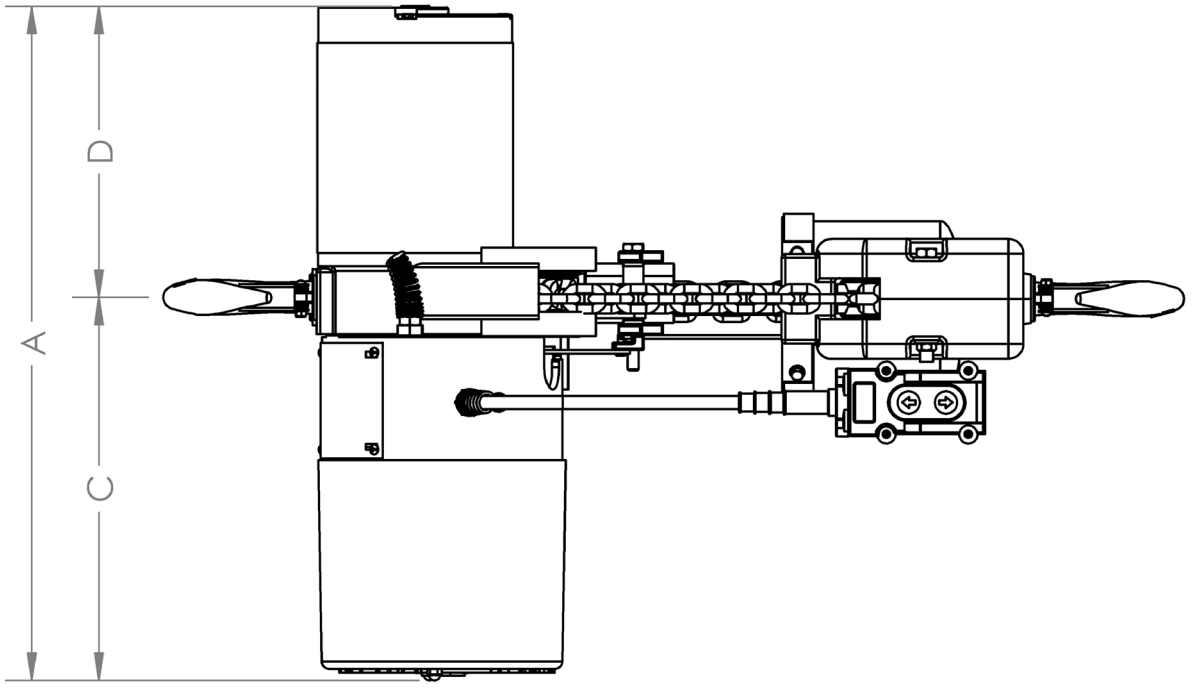


TABLEAU 2 - 1: MODÈLES À UNE VITESSE / TABLE 2 - 1: SINGLE SPEED MODELS

Capacité Capacity	Volt	Phase	Modèle Model	Vitesse de levage (ppm) Lifting speed (rpm)	Hp	Retom- bées(s) Chain fall(s)	Poids (lbs) incluant crochets et 10' de chaîne Weight (lbs) including hooks and chain for 10ft lift	Dimensions en pouces (in) Dimensions in inches (in)						
								A	B	C	D	E	F	G
MODÈLES À UNE VITESSE / SINGLE SPEED MODELS														
1/4 TONNE / TON	115	1	L05A08	8	3/4	1	100	23 1/4	13 1/2	12 7/8	10 3/8	10	23 7/8	18 7/8
			L05A14	14	3/4	1	100	23 1/4	13 1/2	12 7/8	10 3/8	10	23 7/8	18 7/8
			L05A20	20	1 1/2	1	105	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L05A26	26	1 1/2	1	105	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L05A33	33	1 1/2	1	105	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
	230	1	L05A40	40	1 1/2	1	105	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8
			L05A52	52	1 1/2	1	105	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8
			L05F10	10	3/4	1	100	23 1/4	13 1/2	12 7/8	10 3/8	10	23 7/8	18 7/8
			L05F16	16	3/4	1	100	23 1/4	13 1/2	12 7/8	10 3/8	10	23 7/8	18 7/8
			L05F20	20	1 1/2	1	105	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
	230	3	L05F26	26	1 1/2	1	105	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L05F33	33	1 1/2	1	105	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8
			L05F40	40	1 1/2	1	105	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8
			L05F52	52	1 1/2	1	105	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8
			L05H16	16	1	1	103	23 1/4	13 1/2	12 7/8	10 3/8	10	23 7/8	18 7/8
230	3	L05H20	20	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8	
		L05H28	28	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8	
		L05H33	33	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8	
		L05H40	40	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8	
		L05H52	52	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8	

1/4 TONNE / TON	460	3	L05T16	16	1	1	94	22 3/4	13 1/2	12 7/8	9 7/8	10	23 7/8	18 7/8
			L05T20	20	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L05T28	28	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L05T33	33	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8
			L05T40	40	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8
			L05T52	52	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8
	575	3	L05V10	10	1	1	94	22 3/4	13 1/2	11 3/8	9 7/8	10	23 7/8	18 7/8
			L05V16	16	1	1	94	22 3/4	13 1/2	11 3/8	9 7/8	10	23 7/8	18 7/8
			L05V20	20	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	18 7/8
			L05V28	28	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	18 7/8
			L05V33	33	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	21 7/8
			L05V40	40	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	21 7/8
1/2 TONNE / TON	115	1	L05V52	52	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	21 7/8
			L1A08	8	3/4	1	100	23 1/4	13 1/2	11 3/8	10 3/8	10	23 7/8	18 7/8
			L1A14	14	3/4	1	100	23 1/4	13 1/2	11 3/8	10 3/8	10	23 7/8	18 7/8
			L1A20	20	1 1/2	1	105	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	18 7/8
			L1A26	26	1 1/2	1	105	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	18 7/8
			L1A33	33	1 1/2	1	105	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	21 7/8
	230	1	L1F10	10	3/4	1	100	23 1/4	13 1/2	11 3/8	10 3/8	10	23 7/8	18 7/8
			L1F16	16	3/4	1	100	23 1/4	13 1/2	11 3/8	10 3/8	10	23 7/8	18 7/8
			L1F20	20	1 1/2	1	105	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	18 7/8
			L1F26	26	1 1/2	1	105	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	18 7/8
			L1F33	33	1 1/2	1	105	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	21 7/8
			L1F40	40	2	1	111	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	21 7/8
230	3	L1H10	10	1	1	94	22 3/4	13 1/2	11 3/8	9 7/8	10	23 7/8	18 7/8	
		L1H13	13	1	1	94	22 3/4	13 1/2	11 3/8	9 7/8	10	23 7/8	18 7/8	
		L1H16	16	1	1	94	22 3/4	13 1/2	11 3/8	9 7/8	10	23 7/8	18 7/8	
		L1H20	20	2	1	103	24 1/4	13 1/2	11 3/8	11	10	23 7/8	18 7/8	
		L1H28	28	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	18 7/8	
		L1H33	33	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	21 7/8	
L1H40	40	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	21 7/8			
L1H52	52	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	21 7/8			

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Capacité Capacity	Volt	Phase	Modèle Model	Vitesse de levage (ppm) Lifting speed (fpm)	Hp	Retom- bées(s) Chain fall(s)	Poids (lbs) incluant crochets et 10' de chaîne Weight (lbs) including hooks and chain for 10ft lift	Dimensions en pouces (in) Dimensions in inches (in)						
								A	B	C	D	E	F	G
MODÈLE À UNE VITESSE / SINGLE SPEED MODELS														
1/2 TONNE / TON	460	3	L1T10	10	1	1	94	24 1/4	13 1/2	11 3/8	9 7/8	10	23 7/8	18 7/8
			L1T13	13	1	1	94	24 1/4	13 1/2	11 3/8	9 7/8	10	23 7/8	18 7/8
			L1T16	16	1	1	94	24 1/4	13 1/2	11 3/8	9 7/8	10	23 7/8	18 7/8
			L1T20	20	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	18 7/8
			L1T28	28	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	18 7/8
			L1T33	33	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	21 7/8
			L1T40	40	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	21 7/8
			L1T52	52	2	1	103	24 1/4	13 1/2	11 3/8	11 3/8	10	23 7/8	21 7/8
			L1V10	10	1	1	94	22 3/4	13 1/2	12 7/8	9 7/8	10	23 7/8	18 7/8
			L1V13	13	1	1	94	22 3/4	13 1/2	12 7/8	9 7/8	10	23 7/8	18 7/8
			L1V16	16	1	1	94	22 3/4	13 1/2	12 7/8	9 7/8	10	23 7/8	18 7/8
			L1V20	20	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L1V28	28	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L1V33	33	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8
L1V40	40	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8			
L1V52	52	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8			
1 TONNE / TON	115	1	L2A07	7	3/4	1	H100	23 1/4	13 1/2	12 7/8	10 3/8	10	23 7/8	18 7/8
			L2F07	7	3/4	1	100	23 1/4	13 1/2	12 7/8	10 3/8	10	23 7/8	18 7/8
			L2F14	14	1 1/2	1	105	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
1 TONNE / TON	230	1	L2F20	20	2	1	111	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L2H10	10	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L2H14	14	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L2H20	20	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L2H33	33	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8

1 TONNE / TON	230	3	L2H40	40	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L2H52	52	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L2T10	10	1	1	94	22 3/4	13 1/2	12 7/8	9 7/8	10	23 7/8	18 7/8
			L2T14	14	1	1	94	22 3/4	13 1/2	12 7/8	9 7/8	10	23 7/8	18 7/8
		3	L2T33	33	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L2T40	40	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L2T52	52	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L2V14	14	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L2V20	20	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
		3	L2V26	26	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	18 7/8
			L2V33	33	3	1	107	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8
			L2V40	40	3	1	107	24 1/4	13 1/2	12 7/8	11 3/8	10	23 7/8	21 7/8
		L2V52	52	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	24 3/8	24 1/2	
1 1/2 TONNE / TON	230	1	L3F07	7	1 1/2	1	105	24 1/4	13 1/2	12 7/8	11 3/8	10	24 3/8	21 1/2
			L3F13	13	2	1	111	24 1/4	13 1/2	12 7/8	11 3/8	10	24 3/8	21 1/2
			L3H13	13	2	1	103	24 1/4	13 1/2	12 7/8	11 3/8	10	24 3/8	21 1/2
		3	L3H20	20	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	24 3/8	21 1/2
			L3H26	26	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	24 3/8	21 1/2
			L3H33	33	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	24 3/8	24 1/2
			L3T20	20	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	24 3/8	21 1/2
		3	L3T26	26	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	24 3/8	21 1/2
			L3T33	33	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	24 3/8	24 1/2
			L3V20	20	3	1	107	24 1/4	13 1/2	12 7/8	11 3/8	10	24 3/8	21 1/2
		3	L3V26	26	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	24 3/8	21 1/2
			L3V33	33	4 1/2	1	114	24 7/8	13 1/2	12 7/8	12	10	24 3/8	24 1/2

TABLEAU 2 - 1: MODÈLES À UNE VITESSE / TABLE 2 - 1: SINGLE SPEED MODELS

Capacité Capacity	Volt	Phase	Modèle Model	Vitesse de levage (ppm) Lifting speed (fpm)	Hp	Retom- bées(s) Chain fall(s)	Poids (lbs) incluant crochets et 10' de chaîne Weight (lbs) including hooks and chain for 10ft lift	Dimensions en pouces (in) Dimensions in inches (in)								
								A	B	C	D	E	F	G		
MODÈLES À UNE VITESSE / SINGLE SPEED MODELS																
2 TONNES / TONS	115	1	L4A04	4	3/4	2	122	23 1/4	13 1/2	12 7/8	10 3/8	10	31 3/8	25 1/4		
	230	1	L4F04	4	3/4	2	128	23 1/4	13 1/2	12 7/8	10 3/8	10	31 3/8	25 1/4		
			L4F10	10	2	2	133	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4		
			L4F13	13	2	2	133	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4		
	230	3	L4H06	6	2	2	126	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4		
			L4H10	10	2	2	126	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4		
			L4H15	15	2	2	126	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4		
			L4H20	20	4 1/2	2	137	24 7/8	13 1/2	12 7/8	12	10	31 3/8	28 1/4		
	460	3	L4H26	26	4 1/2	2	137	24 7/8	13 1/2	12 7/8	12	10	31 3/8	28 1/4		
			L4T06	6	2	2	126	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4		
			L4T20	20	4 1/2	2	137	24 7/8	13 1/2	12 7/8	12	10	31 3/8	28 1/4		
	575	3	L4T26	26	4 1/2	2	137	24 7/8	13 1/2	12 7/8	12	10	31 3/8	28 1/4		
			L4V06	6	2	2	126	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4		
			L4V10	10	2	2	126	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4		
			L4V15	15	2	2	126	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4		
			L4V20	20	3	2	130	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	28 1/4		
L4V26			26	4 1/2	2	137	24 7/8	13 1/2	12 7/8	12	10	31 3/8	28 1/4			

3 TONNES / TONS	230	1	L6F04	4	2	2	131	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4
			L6F07	7	2	2	137	24 1/4	14 3/8	11 3/8	10 7/8	10	37 3/8	30 1/2
	230	3	L6H05	5	2	2	129	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4
			L6H09	9	4 1/2	2	140	24 7/8	13 1/2	12 7/8	12	10	31 3/8	25 1/4
			L6H15	15	4 1/2	2	140	24 7/8	13 1/2	12 7/8	12	10	31 3/8	25 1/4
			L6H20	20	4 1/2	2	140	24 7/8	13 1/2	12 7/8	12	10	31 3/8	28 1/4
	460	3	L6T05	5	2	2	129	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4
			L6T09	9	4 1/2	2	140	24 7/8	13 1/2	12 7/8	12	10	31 3/8	25 1/4
			L6T15	15	4 1/2	2	140	24 7/8	13 1/2	12 7/8	12	10	31 3/8	25 1/4
			L6T20	20	4 1/2	2	140	24 7/8	13 1/2	12 7/8	12	10	31 3/8	28 1/4
	575	3	L6V05	5	2	2	129	24 1/4	13 1/2	12 7/8	11 3/8	10	31 3/8	25 1/4
			L6V09	9	4 1/2	2	140	24 7/8	13 1/2	12 7/8	12	10	31 3/8	28 1/4
L6V15			15	4 1/2	2	140	24 7/8	13 1/2	12 7/8	12	10	31 3/8	28 1/4	
L6V20			20	4 1/2	2	140	24 7/8	13 1/2	12 7/8	12	10	31 3/8	28 1/4	
5 TONNES / TONS	115	1	L10A02	2	1 1/2	3	165	24 1/4	14 3/8	12 7/8	11 3/8	10 7/8	37 3/8	30 1/2
	230	1	L10F02	2	1 1/2	3	165	24 1/4	14 3/8	12 7/8	11 3/8	10 7/8	37 3/8	30 1/2
			L10F04	4	2	3	170	24 1/4	14 3/8	12 7/8	11 3/8	10 7/8	37 3/8	30 1/2
	230	3	L10H05	5	4 1/2	3	173	24 7/8	14 3/8	12 7/8	12	10 7/8	37 3/8	30 1/2
			L10H10	10	4 1/2	3	173	24 7/8	14 3/8	12 7/8	12	10 7/8	37 3/8	30 1/2
			L10H13	13	4 1/2	3	173	24 7/8	14 3/8	12 7/8	12	10 7/8	37 3/8	30 1/2
			L10T05	5	4 1/2	3	173	24 7/8	14 3/8	12 7/8	12	10 7/8	37 3/8	30 1/2
	460	3	L10T10	10	4 1/2	3	173	24 7/8	14 3/8	12 7/8	12	10 7/8	37 3/8	30 1/2
			L10T13	13	4 1/2	3	173	24 7/8	14 3/8	12 7/8	12	10 7/8	37 3/8	30 1/2
			L10V05	5	3	3	167	24 1/4	14 3/8	12 7/8	11 3/8	10 7/8	37 3/8	30 1/2
	575	3	L10V10	10	4 1/2	3	173	24 7/8	14 3/8	12 7/8	12	10 7/8	37 3/8	30 1/2
			L10V13	13	4 1/2	3	173	24 7/8	14 3/8	12 7/8	12	10 7/8	37 3/8	30 1/2

TABEAU 2 - 2: MODÈLES À DEUX VITESSES / TABLE 2 - 1: SINGLE SPEED MODELS

Capacité Capacity	Volt	Phase	Modèle Model	Vitesse de levage (ppm) Lifting speed (fpm)	Hp	Retom- bée(s) Chain fall(s)	Poids (lbs) incluant crochets et 10' de chaîne Weight (lbs) including hooks and chain for 10ft. lift	Dimensions en pouces (in) Dimensions in inches (in)						
								A	B	C	D	E	F	G
1/4 TONNE / TON	230	3	L05H13X2	13	4.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L05H20X2	20	6.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L05H26X2	26	8.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L05H33X2	33	11.0	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L05H40X2	40	13.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L05H52X2	52	17.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
	460	3	L05T13X2	13	4.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L05T20X2	20	6.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L05T26X2	26	8.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L05T26X2	33	11.0	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L05T40X2	40	13.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L05T52X2	52	17.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L05V13X2	13	4.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L05V20X2	20	6.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
575	3	L05V26X2	26	8.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8	
		L05V33X2	33	11.0	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8	
		L05V40X2	40	13.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8	
		L05V52X2	52	17.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8	
		L1T07X2	7	2.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8	
		L1H13X2	13	4.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8	
1/2 TONNE / TON	230	3	L1H20X2	20	6.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L1H26X2	26	8.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L1H33X2	33	11.0	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L1H40X2	40	13.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L1H52X2	52	17.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8

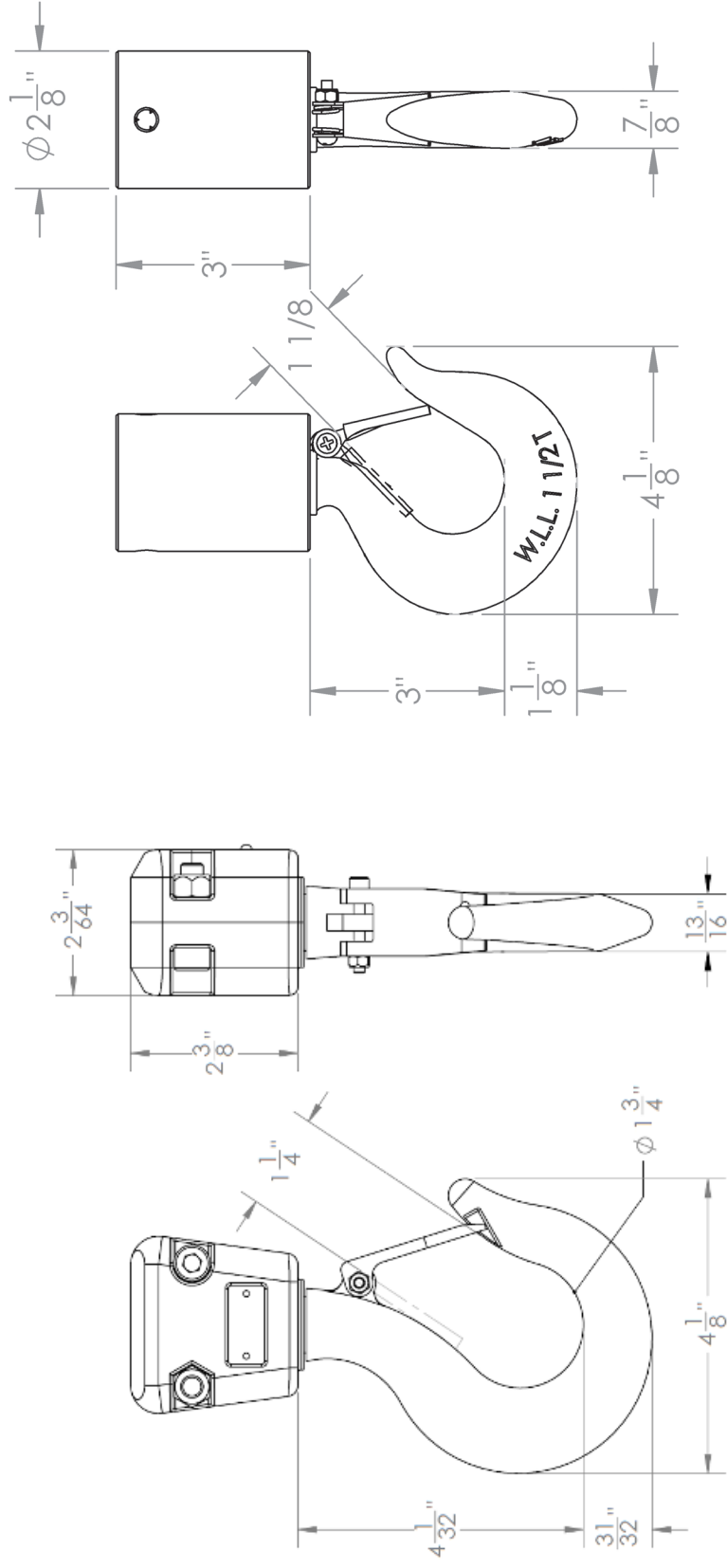
1/2 TONNE / TON	460	3	L1T07X2	7	2.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L1T13X2	13	4.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L1T20X2	20	6.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L1T26X2	26	8.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L1T33X2	33	11.0	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L1T40X2	40	13.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L1T52X2	52	17.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L1V07X2	7	2.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L1V13X2	13	4.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L1V20X2	20	6.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
1 TONN / TON	575	3	L1V26X2	26	8.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L1V33X2	33	11.0	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L1V40X2	40	13.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L1V52X2	52	17.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	21 7/8
			L2H07X2	7	2.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L2H13X2	13	4.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L2H20X2	20	6.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L2H26X2	26	8.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L2T07X2	7	2.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L2T13X2	3	4.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
1/2 TONNE / TONS	460	3	L2T20X2	20	6.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L2T26X2	26	8.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L2V07X2	7	2.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L2V13X2	3	4.3	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L2V20X2	20	6.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L2V26X2	26	8.7	1	114	24 7/8	13 1/2	12 7/8	12	10	23 7/8	18 7/8
			L3H13X2	13	4.3	1	114	24 7/8	13 1/2	12 7/8	12	10	24 3/8	21 1/2
			L3T13X2	13	4.3	1	114	24 7/8	13 1/2	12 7/8	12	10	24 3/8	21 1/2

TABLEAU 2 - 2: MODÈLES À DEUX VITESSES / TABLE 2 - 1: SINGLE SPEED MODELS

Capacité Capacity	Volt	Phase	Modèle Model	Vitesse de levage (ppm) Lifting speed (fpm)	Hp	Retom- bées(s) Chain fall(s)	Poids (lbs) incluant crochets et 10' de chaîne Weight (lbs) including hooks and chain for 10ft lift	Dimensions en pouces (in) Dimensions in inches (in)						
								A	B	C	D	E	F	G
1 1/2 TONNE / TONS	575	3	L3V13X2	13	4.3	1	114	24 7/8	13 1/2	12 7/8	12	10	24 3/8	21 1/2
	2 TONNES / TONS	230	3	L4H10X2	10	3.3	2	137	24 7/8	13 1/2	12 7/8	12	10	31 3/8
L4H13X2				13	4.3	2	137	24 7/8	13 1/2	12 7/8	12	10	31 3/8	25 1/4
460		3	L4T10X2	10	3.3	2	137	24 7/8	13 1/2	12 7/8	12	10	31 3/8	25 1/4
			L4T13X2	3	4.3	2	137	24 7/8	13 1/2	12 7/8	12	10	31 3/8	25 1/4
3 TONNES / TONS	575	3	L4V10X2	10	3.3	2	137	24 7/8	13 1/2	12 7/8	12	10	31 3/8	25 1/4
			L4V13X2	13	4.3	2	137	24 7/8	13 1/2	12 7/8	12	10	31 3/8	25 1/4
	230	3	L6H07X2	7	2.3	2	140	24 7/8	13 1/2	12 7/8	12	10	31 3/8	25 1/4
			L6T07X2	7	2.3	2	140	24 7/8	13 1/2	12 7/8	12	10	31 3/8	25 1/4
575	3	L6V07X2	7	2.3	2	140	24 7/8	13 1/2	12 7/8	12	10	31 3/8	25 1/4	

MODÈLES À DEUX VITESSES

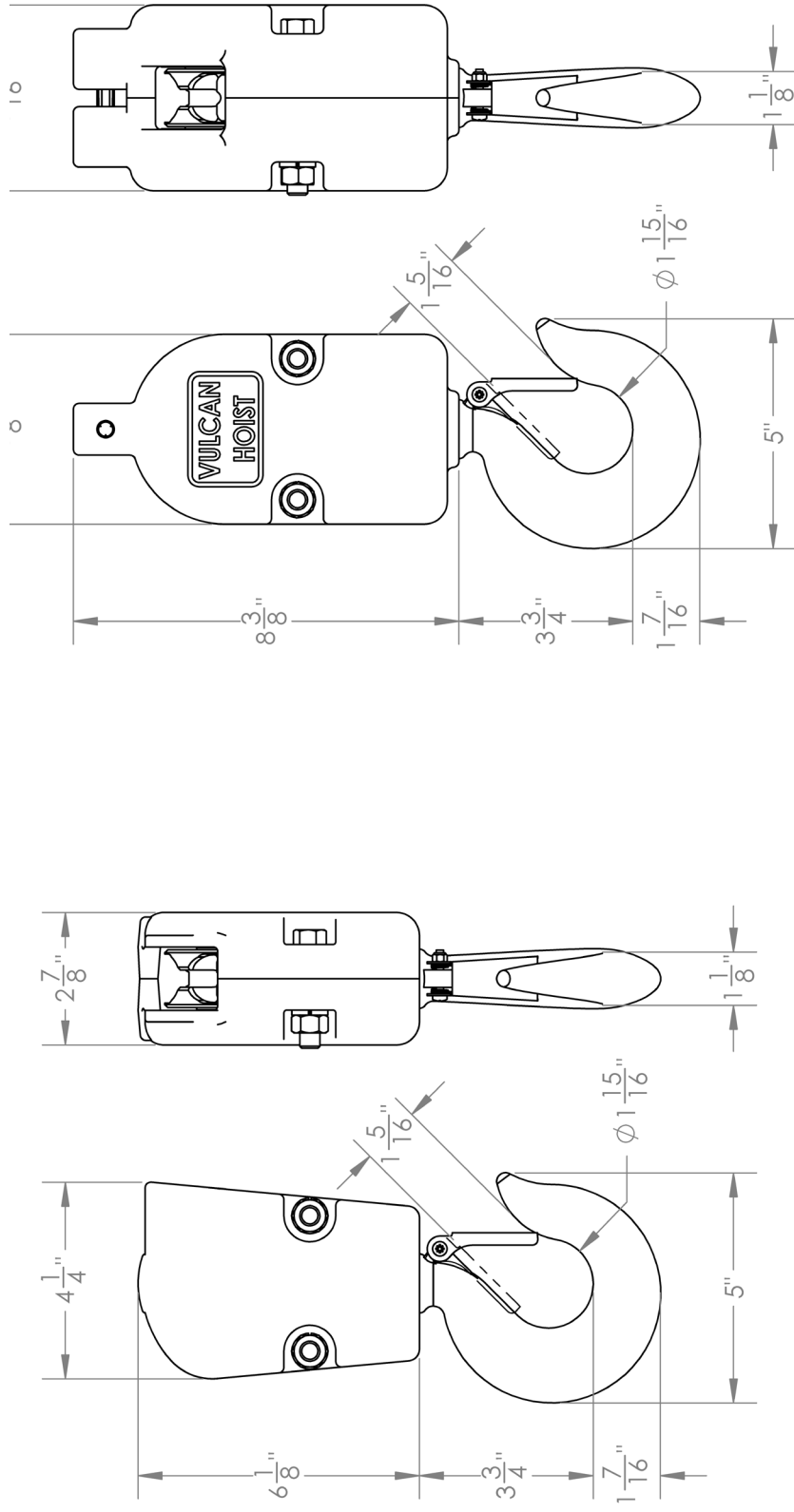
Dimensions des crochets / Hook dimensions



Une retombée (1/4T - 1 1/2 T)
1 chain fall (1/4T - 1 1/2 T)

Une retombée (1/4T - 1T)
1 chain fall (1/4T - 1T)

Dimensions des crochets / Hook dimensions



**2 retombées (2T - 3T)
2 chain falls (2T - 3T)**

**3 retombées (3T et 5T)
3 chain falls (3T and 5T)**

Caractéristiques techniques du palan / Hoist specifications

NUMÉRO DE COMMANDE / ORDER NUMBER: _____

NUMÉRO DE MODÈLE / MODEL NUMBER: _____

NUMÉRO DE SÉRIE / SERIAL NUMBER: _____

DATE D'ACHAT / PURCHASE DATE: _____

TENSION / VOLTAGE: _____

CHARGE NOMINALE / RATED LOAD: _____

HAUTEUR DE LEVAGE / LIFT HEIGHT: _____

TAILLE DU PANIER DE CHÂÎNE / CHAIN CONTAINER SIZE: _____

TRAITEMENT DE LA CHÂÎNE (AUCUN OU ZINC) / CHAIN TREATMENT (BARE OR ZINC): _____

IMPORTANT

AVANT D'UTILISER LE PALAN, MESURER LES TROIS DIMENSIONS INDIQUÉES
CI-DESSOUS ET PRENEZ-LES EN NOTE : /
BEFORE USING, TAKE AND RECORD THE FOLLOWING 3 DIMENSIONS AS SHOWN BELOW:

