

OPERATION MANUAL

This operation manual is intended as an instruction manual for trained personnel who are in charge of installation, maintenance, repair etc.



Before equipment use, please read this operation manual carefully.

Serial Number: _____

Date Purchased: _____

TABLE OF CONTENTS

1.0 WARRANTY	3
2.0 SAFETY PRECAUTIONS	4
2.1 Safety Alert Symbols	4
3.0 GENERAL DESCRIPTION	5
3.1 Hoist Construction	5
4.0: PREPARATION & PROCEDURES	6
4.1 Prepare for use	6
4.2 Attachment Points	6
4.3 Mounting the Hoist.....	6
4.4 Pre-Operational Checks & Trial Operation	6
5.0 OPERATING INSTRUCTIONS	6
5.1 Hoisting (Pulling & Lifting) and Lowering.....	6
5.2 Hoist Operation: Free Chain.....	7
5.2.1 Principle.....	7
5.2.2: Operation.....	7
6.0: PRECAUTIONS WHILE OPERATING	8
6.1 Warnings.....	8
6.2 Attaching the Load.....	8
7.0: ROUTINE CARE, INSPECTION, AND MAINTENANCE	8
7.1 General	8
7.2 Inspection Classification	9
7.2.1 Frequent/Visual Inspection.....	9
7.3 Frequent Inspection.....	10
7.4 Periodic Inspection	10
7.5 Inspection Schedule.....	10
7.6 Chain Inspection	11
7.7 Hook Inspection	11
7.8 Reject Opening.....	11
7.9 Storage.....	11
7.10 Lubrication	11
7.10.1: Recommended Lubricants	12
8.0: TROUBLESHOOTING GUIDE	13
9.0 DIMENSIONS & SPECIFICATIONS	14
10.0: EXPLODED VIEW & PARTS LIST	15
10.1 Exploded View	15
10.2 Parts List.....	16

1.0 WARRANTY

Every product is thoroughly inspected and tested before it is shipped from the factory. If any problem develops within one year, return the product prepaid to the factory. If an inspection reveals that the problem is caused by defective workmanship or material, repairs will be made without charge and the product will be returned with the shipping prepaid.

Excluded Items

This warranty does not cover:

- Deterioration caused by normal wear, abuse, chemical or abrasive actions, improper maintenance or excessive heat.
- Problems resulting from repairs, modifications, or alterations made by people other than factory or ACI representatives.
- If the product has been abused or damaged due to an accident.
- If repair parts or accessories other than ACI equipment are used on the product; they are warranted only to the extent that they are warranted by the manufacturer of said parts or accessories.

Remarks

EXCEPT AS STATED HERE, ACI MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES FOR A PARTICULAR PURPOSE.



Alterations or modifications of equipment and use of non-factory repair parts can lead to dangerous operation and injury.

To avoid injury:

DO NOT alter or modify equipment.

DO NOT use equipment to lift, support or otherwise transport people.





DO NOT suspend unattended loads over people.

2.0 SAFETY PRECAUTIONS

2.1 Safety Alert Symbols

Throughout this manual are steps and procedures that can prevent hazardous situations, the following symbols are used to identify the degree or level of hazard seriousness.

DANGER, WARNING AND CAUTION NOTICE

Symbol	Description
	Danger Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury and property damage.
	Warning Indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury and property damage.
	Caution Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.
	Notice Notifies people of installation, operation or maintenance information which is important but not directly hazard related.



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

3.0 GENERAL DESCRIPTION

This document provides information and maintenance of ACI Lever Hoist/ Puller. Operators and persons maintaining the hoist should be familiar with this manual. Following the precautions, procedures and maintenance practices in this manual should ensure long and reliable operation.

People responsible for the installation operation, and or maintenance of the hoisting equipment should be familiar with the American National Standard ANSI B30.21 for guidelines on the safe operation of lever hoists. That document contains rules on inspection requirements and records that may be required by some of the regulatory agencies.

3.1 Hoist Construction

The Steel Body Lever Hoist/ Puller is a dependable way to accurately position heavy loads, loading and lifting freely suspended loads within the hoist's rated load. The reversing lever and free-chain wheel provide an ease of control, even with work gloves. The hoist can be used in confined spaces due to the short handle and low handle chair.

4.0: PREPARATION & PROCEDURES

4.1 Prepare for use

When unpacking the hoist, inspect carefully for any damage that may have occurred during shipping. Check for loose, missing, or damaged parts.

Lubricate the chain along the whole length with a good quality chain and wire rope lubricant. Make sure the structures supporting the hoist are strong enough to support the entire rated load.

4.2 Attachment Points

WARNING: Prior to attaching the hoist ensure that all attachment points, suspension components and supporting structure are adequate to support the hoist and its load. If necessary consult a professional that is qualified to evaluate the adequacy of the suspension location and its supporting structure.

4.3 Mounting the Hoist

- Hook Mounted to a Fixed Location – Attach the hoist’s top hook to the fixed suspension point.
- Ensure that the fixed suspension point resets on the center of the hook’s saddle and that the hook’s latch is engaged.

4.4 Pre-Operational Checks & Trial Operation

- 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 damage prior to use and replace or repair all damages parts.
- Verify and correct all chain irregularities prior to operating the hoist.
- Record the hoist’s Model Number & Serial Number (from the plate on the hoist).
- Ensure that the hoist is properly installed to a fixed point.
- Ensure that all nuts, bolts, and split pins (cotter pins) are sufficiently fastened.
- Confirm proper operation
 - Before operating read and become familiar with Operation.
 - Before Operating ensure that the hoist meets the Inspection, Testing, and Maintenance requirements of ANSI/ASME B30.21.
 - Before operating ensure that nothing will interfere with the full range of the hoist’s operation.

5.0 OPERATING INSTRUCTIONS

5.1 Hoisting (Pulling & Lifting) and Lowering

To lift or pull a load, turn the reversing lever to the UP position and move the handle in a clockwise direction. To lower a suspended load, turn the reversing lever to the DOWN position and move the handle in a counterclockwise direction.

CAUTION: With no load on the hoist, reciprocating the handle may result in only a back and forth movement of the chain with no overall hook movement. When this happens, the chain may be positioned by applying a light pull in the chain with the free hand, or by using the free chain feature.

5.2 Hoist Operation: Free Chain

5.2.1 Principle

- Free chaining allows the load chain to be moved freely because the brake is released under no load situations.
- Pulling the free knob actuates the internal spring to release the mechanical brake allowing the load chain to be pulled in either direction to the desired length.
- The brake is engaged during lowering or lifting the load.

5.2.2: Operation

- **DO NOT** operate the hoist Free Knob while a load is applied to the hoist.
- **DO NOT** touch the hoist Free Knob during lifting or lowering of the load.
- **ALWAYS** check that the selector is placed in the proper position.
- Set the Selector to the “N” position. The Selector is located under the Free Knob on the hand lever.
- Pull the Free Knob out. The Free Knob turns counterclockwise and “snaps” out.
- Pull the load chain to move the hook to the desired position.
- **DO NOT** pull the chain suddenly in the free chain mode. Excessive pulling may set the brake and not allow the load chain to move. If this occurs the hoist must be reset.
- To reset the hoist to operate, rotate the Free Knob clockwise while pulling lightly on the load side chain. Once slack is removed, the Free Knob “snaps” in. This resets the brake and allows the hoist to be operated with the hand lever.
- **DO NOT** attempt to use the free-chain feature while there is any load on the hoist.

Table 5.2.2.1
Lever Hoist Operation

Selector Position	Lever Rotation	Load Movement
UP	Clockwise	Lift
DOWN	Counterclockwise	Lower

Table 5.2.2.2
Signal Warnings

Signal Color	Load Status	Instructions
Green	Safe Load	Continue Operation
Red	Overload	DO NOT Continue Operation

6.0: PRECAUTIONS WHILE OPERATING

6.1 Warnings

- Do not lift or pull more than the rated capacity.
- Do not use a handle extension (cheater bar). The hoist is designed to pull rated loads with low handle effort. If a cheater bar seems necessary to lift the load, the hoist is overloaded.
- Stand clear of the load at all times. The operator should have sufficient room to use the hoist without endangering himself.

6.2 Attaching the Load

1. Be sure there are no twists in the load chain as it enters the hoist. This condition should be constantly checked on double chain hoists because it is possible for the load block to be "capsized" or flipped over one or more times, putting twists in the chain. The presence of a twist may not be obvious when the hook block is in the lowered position, but can cause serious chain binding when the hook is in its fully raised position.
2. Never load on the end of the hook. Use attachments that will seat in the saddle of the hook
3. Make sure that slings and other rigging are in good condition and have sufficient capacity. Never wrap the hoist chain around a load.

****DO NOT OPERATE THE HOIST FROM AN OFF-BALANCE POSITION.
OPERATOR SHOULD HAVE FIRM FOOTING OR BE OTHERWISE SECURED BEFORE OPERATING THE HOIST.**

Check the hoist each time it is used by lifting the load just clear of its supports and checking to be sure that the load is secure in the hook and that the hoist brake is holding the load without slipping.

- Never raise the hook block into the bottom of the hoist or run the hook down until the slack chain is pulled tight.
- Never attempt to free-chain the hoist with any load on the hook.
- Do not leave a suspended load unattended.
- Do not throw or drop the hoist, or drag it along the ground.
- Do not use a damaged or malfunctioning hoist.

Lifting a load with two hoists is not recommended. If unavoidable, care must be taken that neither hoist is overloaded.

7.0: ROUTINE CARE, INSPECTION, AND MAINTENANCE

7.1 General

The inspection procedure herein is based on ANSI/ASME B30.21. The following definitions are from ANS/ASME B30.21 and pertain to the inspection procedure below.

- *Designated Person*: a person selected or assigned as being competent to perform the specific duties to which he/she is assigned.
- *Qualified Person*: a person who, by possession of a recognized degree or certificate of professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.

- *Normal Service*: that distributed service which involves operation with randomly distributed loads within the related load limit, or uniform loads less than 65% of rated load for not more than 15% of the time.
- *Heavy Service*: that service which involves operation within the rated load limit which exceeds normal service.
- *Severe Service*: that service which involves normal or heavy service with abnormal operating conditions.

7.2 Inspection Classification

Table 7.2.1
Inspection Classification

TYPE	DESCRIPTION
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
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 dependant 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.

7.2.1 Frequent/Visual Inspection

Frequent inspections are visual examinations by the operator or other designated personnel with interval 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.

Visual inspection will be performed by a qualified person who will make records of apparent external conditions to provide the basis for a continuing evaluation.

A qualified person shall determine whether conditions found during inspection constitute a hazard and whether maintenance of the equipment is required.

- Normal Service – Yearly
- Heavy Service – Semi-Annually
- Severe Service – Quarterly
- Special or Infrequent Service – As recommended by a qualified person before and after each occurrence.

Written, dated and signed inspection reports should be maintained on all critical items; such as safety devices, brakes, hooks, ropes, chains, etc. All worn, damaged or malfunctioning parts should be repaired or replaced to maintain a SAFE operating hoist. Warning labels affixed to the hoist or trolley should be kept clean and visible at all times. Warning labels should be replaced if loose or illegible.

7.3 Frequent Inspection

- All functional operating mechanisms for proper operation and adjustment, maladjustment and unusual sounds.
- Hoist braking system for proper operation
- Hooks and latches in accordance with ANSI/ASME B30.10
- Hook latch operation
- Load chain reeving for compliance
- Hoist Lever for bends and cracks
- Hoist support for damage

7.4 Periodic Inspection

- Requirement of frequent inspection
- Evidence of loose, bolts, nuts, or rivets.
- Evidence of worn, corroded, cracked, or distorted parts such as load blocks, suspension housing, chain attachments, clevises, yokes, suspension bots, shafts, gears, bearings, pins, rollers and locking and clamping devices.
- Evidence of damage to hook retaining nuts or collars and pins, and welds or rivets used to secure the retaining members.
- Evidence of damage or excessive wear of load and idler sheaves
- Evidence or worn, glazed or oil contaminated friction disks; worn pawls, cams or ratchet; corroded, stretched, or broken pawl springs in brake mechanism.
- Evidence of damage to supporting structure
- Function label on hoist for legibility
- Warning label properly attached to the hoist and legible
- End connections of load chain stopper link

7.5 Inspection Schedule

Table 7.5.1
Inspection Schedule

Interval	Inspection
Daily	<ul style="list-style-type: none"> a. Check the hooks and the hook latches for cracks or deformities. Twisted hooks or hooks with throat openings more than the reject openings listed in Table 5-1 should be replaced. b. Check chain for wear and twisting. c. Check brake for drift.
Quarterly	<ul style="list-style-type: none"> a. Check for loose screws, nuts, etc. b. Check load sprocket and hand chain wheel for wear.
Annually	<ul style="list-style-type: none"> a. Inspect for worn gears, pawl, spring, ratchet and shafts. b. Check for worn break discs. c. Inspect chain in kerosene or other non-corrosive solvent and inspect for wear, nicks, or distortion of any kind.

7.6 Chain Inspection

Inspect the chain for wear or corrosion. Push Links together and inspect the mating surface between the links. Pay special attention to the links that most often through the hoist.

CAUTION

If the chain is worn or damaged, replace the entire chain with new chain supplied by the hoist manufacturer. Do not substitute. Do not attempt to weld chain or use connecting links.

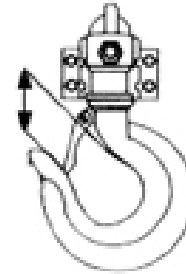
7.7 Hook Inspection

Inspect the hooks for deformation, chemical damage and cracks. Hooks damaged having a throat opening greater than the reject opening (shown below) must be replaced.

7.8 Reject Opening

Table 7.8.1
Reject Opening Sizes

Capacity (ton)	Standard dimension (in)	Reject Opening (in)
3/4	1.10	> 1.21
1 1/2	1.32	> 1.45
3	1.57	> 1.73
6	1.67	> 1.84



7.9 Storage

- Never leave or store the hoist with the brake locked. Loosen the brake by operating the hoist as if lowering a load.
- Avoid leaving the hoist in a wet or corrosive environment. Clean and dry the hoist before storage whenever it has been exposed to dirt or water.
- Inspect the hoist for signs of wear, damage, or malfunctioning parts. Do not return a defective hoist to a storage area without clearly marking it as defective.

7.10 Lubrication

- a. Good lubrication is vital to long chain life. The chain should be kept well oiled with chain Lubricant. Be sure that the oil is worked into the area between the links.
- b. If the hoist is disassembled for inspection or repair re-lubricate the moving parts according to the Lubricant table.

Table 7.10.1
Lubrication Schedule

PART	DESCRIPTION	FREQUENCY
Gears, bearings	Check operation of the part	Annually
Pawl pivot pin, guide roller pin and hook shanks	Check operation of the part	Annually
Chain wheel treads	Check operation of the part	Quarterly
Chain	Lubricate chain, under normal usage Lubricate chain, under heavy usage require to be lubricated more frequently	Weekly



The brake surfaces must be kept free of any trace of oil or grease. Apply lubricant sparingly to the parts near the brake to avoid oil contamination of the brake.

7.10.1: Recommended Lubricants

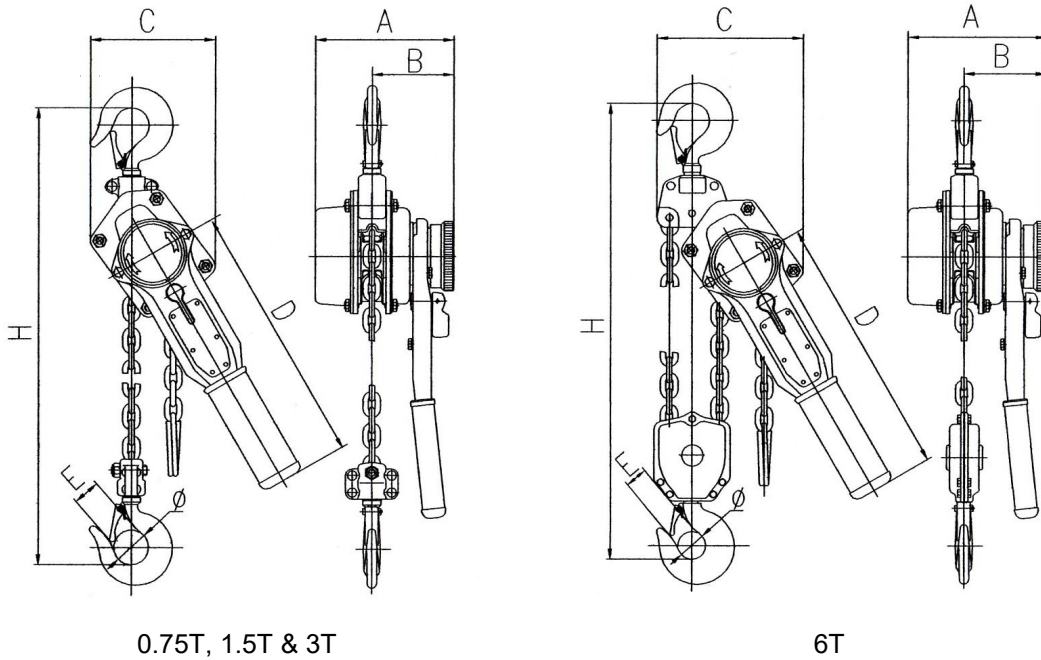
Table 7.10.1.1
Recommended Lubricants

Part	Lubricant
Gears, bearings, pawl pivot pin, guide roller pin, hook shanks, and chain wheel treads	Any good quality gear grease
Chain	Chain Lube
Brake parts, ratchet teeth	Do not Lubricate

8.0: TROUBLESHOOTING GUIDE

Problem	Possible Causes	Corrective Action
Pinion shaft does not return to position after free chaining.	<ol style="list-style-type: none"> 1. Wear of the spline section of the pinion shaft. 2. Deformation or damage of the return spring. 3. Mechanism fouled with foreign matter such as dirt and dust. 	<p>Replace with new parts. Replace with new parts. Disassemble and clean.</p>
Slip caused by ineffective braking.	<ol style="list-style-type: none"> 1. Worn out friction discs. 2. Oil on the braking surface. 3. Incorrect assembly of the brake system. 	<p>Replace with new ones. Disassemble and clean. Assemble correctly.</p>
Load dropped while lowering.	<ol style="list-style-type: none"> 1. Damaged friction discs. 2. Foreign matter in the braking system. 	<p>Replace with new ones. Disassemble and clean.</p>
Jammed operating handle.	Over-tightening of the brake.	Operate the lever hoist as if lowering a load.
Noises during hoisting and lowering operation.	Wear or deformation of the load chain and load sheave.	Replace with new parts.
Operating handle becomes difficult to operate during lifting or lowering operation.	<ol style="list-style-type: none"> 1. Over-hoisting or over-lowering. 2. Twist in the load chain causing it to get caught between load sheave and from the load chain. 	<p>Operate the hoist in opposite direction. Operate the hoist in opposite direction and remove the twist load chain guide.</p>

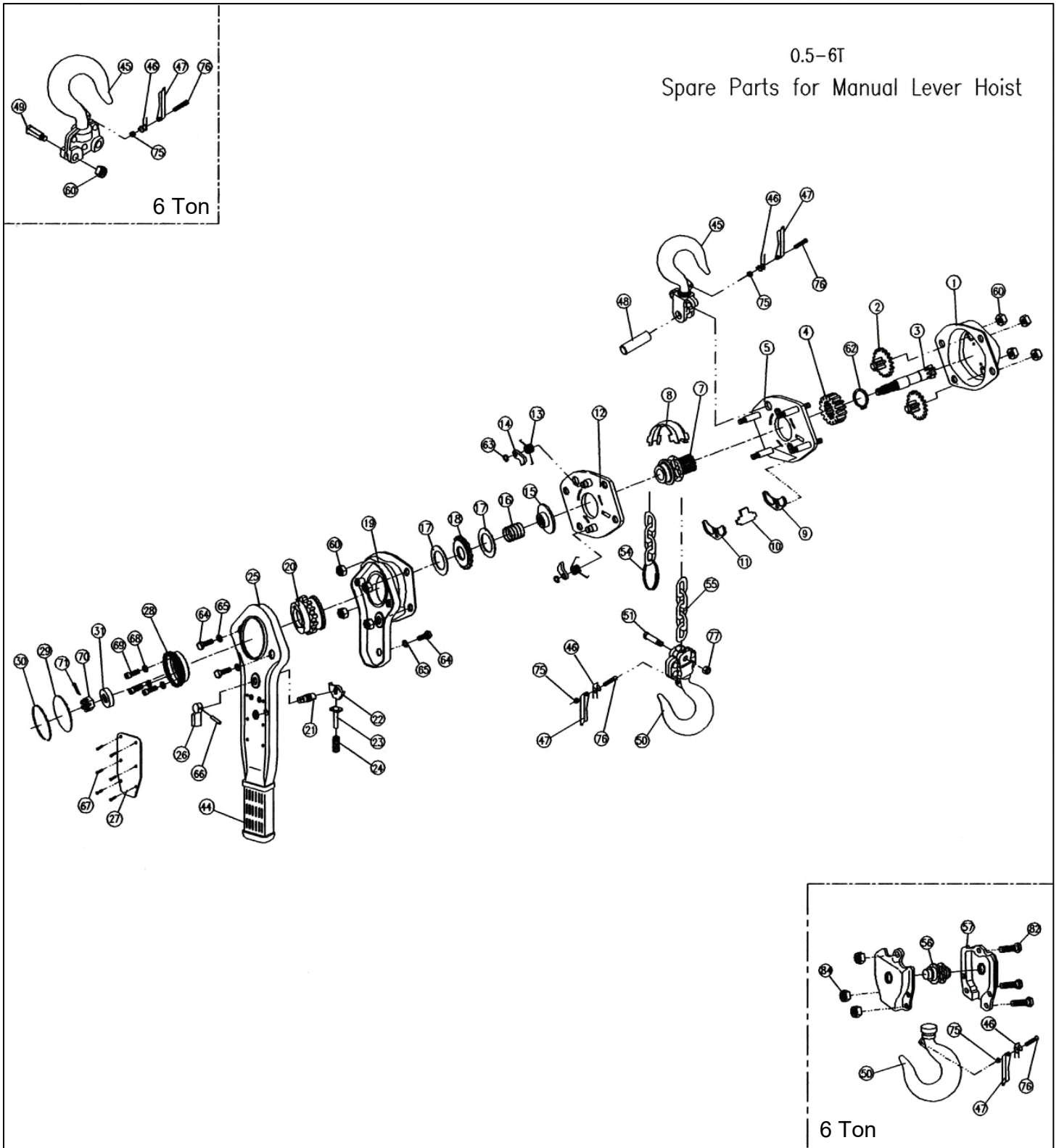
9.0 DIMENSIONS & SPECIFICATIONS



Model		LH-015	LH-030	LH-060	LH-120
Capacity (tons)		3/4	1 1/2	3	6
No. of columns of load chain		1	1	1	2
Handle pull rated loads (lbs)		60	66	75	83
Distance (in)	A	5.83	6.81	7.87	7.87
	B	3.43	3.90	4.41	4.41
	C	5.20	5.71	7.83	9.06
	D	10.94	14.88	15.28	15.28
	E	1.1	1.3	1.6	1.7
	Ø	1.40	1.67	1.97	2.09
	H	13.0	15.7	20.5	25.2
Net weight (lbs.) for 5 ft lift		15.21	24.0	45.6	62.0
Packing measurement (in)		15 x 5 x 6.7	18.9 x 5.1 x 7.9	21.8 x 7.3 x 8.9	21.8 x 7.9 x 8.9
Extra weight per feet of extra lift (lbs.)		0.53	0.94	1.48	2.96

10.0: EXPLODED VIEW & PARTS LIST

10.1 Exploded View



10.2 Parts List

Item #	Part Name/Description
1	Gear case assembly
2	Drive shaft assembly
3	Drive shaft
4	Splined gear
5	Side plate assembly A
7	Load sheave
8	Guide plate
9	Chain Leader A
10	Stripper
11	Chain Leader B
12	Side plate assembly B
13	Pawl spring
14	Pawl
15	Disk hub
16	Free Spring
17	Friction disk
18	Ratchet disk
19	Lever cover assembly
20	Change over gear
21	Selector shaft
22	Change over pawl
23	Spring shaft
24	Change over spring
25	Lever handle assembly
26	Selector lever
27	Name plate
28	Hand wheel
29	Cover
30	Retainer wire

Item #	Part Name/Description
31	Bushing
44	Lever handle cover
45	Hook assembly
46	Double spring
47	Safety latch
48	Top pin
49	Top Chain pin
50	Bottom hook assembly
51	Chain pin
54	Chain ring
55	Load chain
56	Idler sheave assembly
57	Hook block component
60	Prevailing torque type nut
62	Snap ring
63	Snap ring
64	Screw
65	Washer
66	Spring pin
67	Rivet
68	Spring washer
69	Screw
70	Castle nut
71	Split pin
75	Prevailing torque type nut
76	Screw
77	Prevailing torque type nut
82	Screw
84	Prevailing torque type nut