

EFFECTIVE: August 27, 2003

OWNER'S (OPERATOR'S) MANUAL AND SAFETY INSTRUCTIONS

FOR

HARRINGTON CUMALONG LEVER PULLER

3/4, 1, 1 1/2, 2, 3, 6 and 9
Ton Capacity

Model L4

BEFORE USING THIS PRODUCT:

ALWAYS SAVE THIS BOOK FOR FUTURE REFERENCE

ALWAYS READ OWNER'S (OPERATOR'S) MANUAL AND SAFETY INSTRUCTIONS

- ⚠ WARNING**: IMPROPER lever hoist use could result in death or serious injury. To avoid these hazards:
- : NEVER hoist loads over or near people.
 - : NEVER work under or near hoisted loads.
 - : ALWAYS operate, inspect and maintain this hoist in accordance with applicable safety codes and regulations.

These safety instructions contain important information to help you use the chain hoist in a safe manner.

HARRINGTON
HOISTS AND CRANES

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DEFINITIONS

⚠ WARNING : indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

1. BEFORE USE

1.1 Safety Summary

Danger exists when heavy loads are transported, particularly when the equipment is not being used properly or is poorly maintained. Because accidents and serious injury could result, special safety precautions apply to the operation, maintenance and inspection of the Model L4 Lever Hoist.

Following these simple rules can help to avoid hoisting accidents:

⚠ WARNING : **IMPROPER** lever hoist use could result in death or serious injury. **TO** avoid these hazards:

NEVER use a hoist for lifting, supporting or transporting people.

NEVER lift or transport loads over or near people.

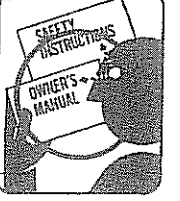
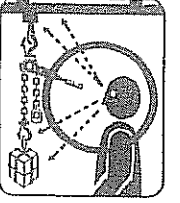
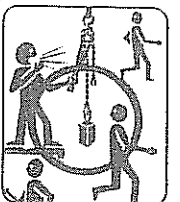
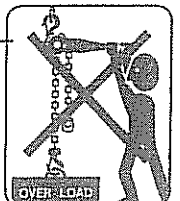
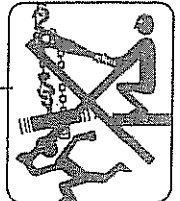
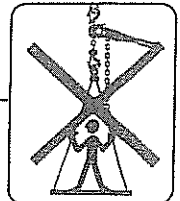
NEVER work near or under hoisted loads.

NEVER lift more than rated load.

ALWAYS let people around you know when a lift is about to begin.

ALWAYS make sure that the supporting structures and load attaching device are strong enough to hold the weight of the load and hoist.

ALWAYS read owner's manual and safety instructions. It is the owner's responsibility to see that every operator reads this manual before operating the hoist.



Remember, proper rigging and lifting techniques are the responsibility of the operator. Be sure to read and understand the instructions contained in this manual before using your hoist. Check all applicable safety codes, regulations and other applicable laws for further information about the safe use of your hoist.

More detailed safety information is contained in the following pages. For additional information, please contact Harrington Hoists, Inc. or your local authorized Harrington Dealer.

1.2 Safety Instructions

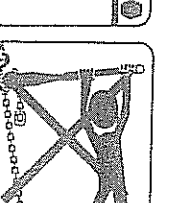
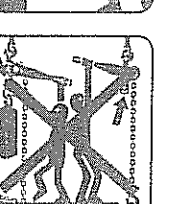
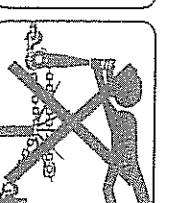
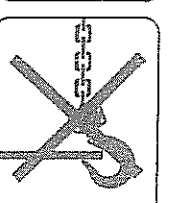
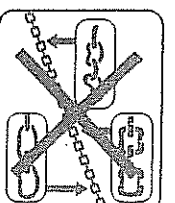
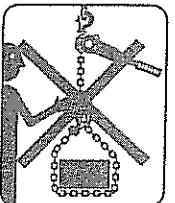
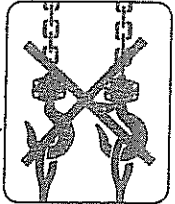
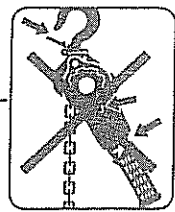
Serious injury could result if the following safety instructions are not followed.

⚠ WARNING : IMPROPER lever hoist use could result in death or serious injury. TO avoid these hazards:

- ALWAYS** allow only qualified (trained in safety and operation) people to operate the hoist.
- ALWAYS** operate a hoist only if you are physically fit.
- ALWAYS** check the hoist before daily use according to the Daily Inspection. (Refer to section 4.2)
- ALWAYS** let authorized personnel inspect the hoist periodically. (Refer to section 4.3).
- ALWAYS** make sure that the chain length is long enough for the intended job.
- ALWAYS** check that the hook latches are in proper working order before use. (Refer to section 4.3)
- ALWAYS** replace all missing or broken hook latches.
- ALWAYS** use a hoist with a rated capacity well in excess of the weight of the load and see the hoist's label for the hoist's rated capacity.
- ALWAYS** make sure that you and others are clear of the load before lifting begins.
- ALWAYS** be sure that the load is properly seated in the saddle of the hook.
- ALWAYS** keep the load from hitting the chain.
- ALWAYS** use two hoists which have rated capacities equal to or more than the load to be lifted whenever you must use two hoists to lift a load. This will provide adequate protection in the event that a sudden load shift or failure of one hoist occurs.
- ALWAYS** check the brake and the free rotation area before use. (Refer to section 4.3)
- ALWAYS** check for loose or missing parts before use.
- ALWAYS** lubricate the hoist regularly. (Refer to section 5.1)
- ALWAYS** pay attention to the load at all times when operating the hoist.
- ALWAYS** ease the slack out of the chain and sling when starting a lift to prevent a sudden loading.
- ALWAYS** use a hoist only between the allowable ambient temperature -20° C (-4° F) and +60° C (140° F).
- ALWAYS** secure a hoist and loads properly after use.
- ALWAYS** consult the manufacturer or your dealer if you plan to use a hoist in a dusty, moist or greasy environment.
- ALWAYS** consult the manufacturer or your dealer if you plan to use a hoist in an excessively corrosive environment.
- ALWAYS** destroy worn out load chain.

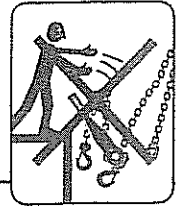
⚠ WARNING : **IMPROPER lever hoist use could result in death or serious injury. TO avoid these hazards:**

- NEVER use the hoist to transport people.
 - NEVER lift a load over people.
 - NEVER work near or under hoisted loads.
 - NEVER operate a hoist if damaged or malfunctioning.
-
- NEVER use a hoist which has been taken out of service until the hoist has been properly repaired or replaced.
-
- NEVER use a hoist if the hook latch is missing or broken.
 - NEVER lift a load unless it is directly under the hook.
 - NEVER splice a hoist chain.
 - NEVER use the hoist chain as a sling.
 - NEVER force a chain or hook into place by hammering.
 - NEVER jerk a load and cause sudden loading.
-
- NEVER use a twisted, kinked, damaged or stretched load chain.
 - NEVER swing a suspended load.
-
- NEVER support a load on the tip of the hook.
 - NEVER suspend a load for an extended period of time.
 - NEVER leave a suspended load unattended.
-
- NEVER run the load chain over a sharp edge.
 - NEVER weld or cut a load suspended by a hoist.
 - NEVER use the hoist chain as a welding electrode.
-
- NEVER operate so far that the hook or chain stopper link touches the hoist body.
-
- NEVER operate a hoist if chain jumping, excessive noise, jamming, overloading or binding occurs.
 - NEVER kick the lever handle.
-
- NEVER use an extended pipe or bar on handle.
-
- NEVER use a hoist without a chain stopper link at the end of no load side chain.



NEVER

throw a hoist. -----

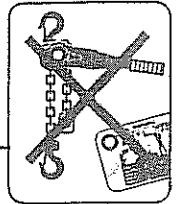


NEVER

use a hoist without a nameplate or warning labels or with illegible nameplate or labels.

NEVER

remove or obscure the warning tags. -----



NEVER

use a hoist with a loose grip of lever handle.

NEVER

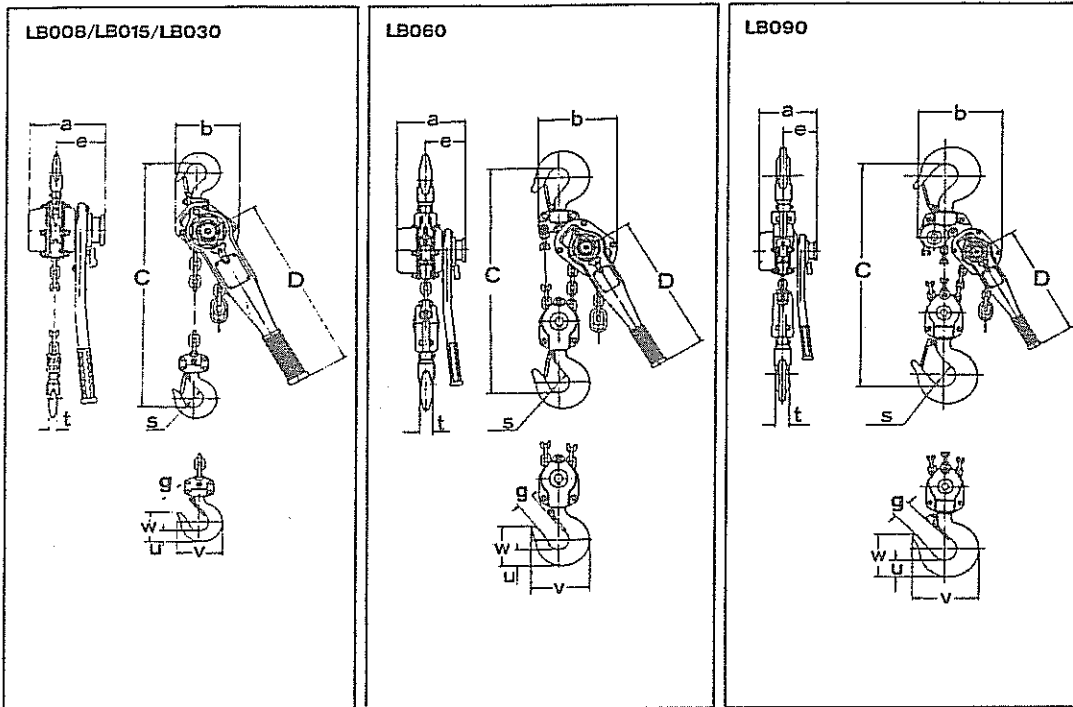
use modified or deformed hooks.

NEVER

apply mechanical power to the lever (during winding or unwinding).

WARNING TAGS are installed on the chain stopper link.

2. Main Specifications



Specifications

Product Code	Capacity (Tons)	Standard Lift (ft.)*	Hand Pull to Lift Full Load (lbs.)**	Test Load (lbs.)	Net Wt. (lbs.)	Shipping Weight (Approx) (lbs.)	Load Chain Diameter (mm) x Fall lines	Weight For Additional One Foot of Lift (lbs.)
L4LB008	3/4	5	58	1875	13.6	14.3	5.6 x 1	0.4
L4LB010	1		77	2500				
L4LB015	1 1/2		58	3750	21.2	22.0	7.1 x 1	0.8
L4LB020	2		77	5000				
L4LB030	3		70	7500				
L4LB060	6		72	15000	59.5	61.7	9.0 x 2	2.4
L4LB090	9		74	22500	92.6	97	9.0 x 3	3.6

*Any lift of chain is available on request. No addition to the chain to increase the length is possible as Load Chain is heat treated. When ordering, specify the length of chain in advance or consult your local distributor.

**Hand pulls are chosen in consideration of operator power and past experience to avoid overloading.

Dimensions (inches)

Product Code	Capacity (Tons)	Min. Distance Between Hooks C	Lever Length D	a	b	e	g	s	t	u	v	w
L4LB008	3/4	11.0	10.4	6.0	4.8	4.0	0.9	1.4	0.6	0.8	3.1	2.2
L4LB010	1											
L4LB015	1 1/2	13.8	16.3	6.7	5.6	4.3	1.3	1.7	0.7	1.0	3.9	2.7
L4LB020	2											
L4LB030	3	16.5		7.7	7.0	4.5	1.6	2.0	1.0	1.3	5.0	3.5
L4LB060	6	22.4			8.7		2.0	2.4	1.4	1.9	6.6	4.8
L4LB090	9	27.8	11.1	2.9	3.3	1.9	2.5	9.1	6.3			

3. OPERATION

3.1 Principle and Operation of Free Chain Adjusting System

3.1.1. Free Chain Adjusting Principle

⚠ WARNING : IMPROPER lever hoist use could result in death or serious injury. TO avoid these hazards:

⚠ WARNING : NEVER operate the free chain adjusting device while load is applied to hoist.

⚠ WARNING : NEVER touch the free knob during lifting or lowering of the load.

⚠ WARNING : ALWAYS check that the change-over knob is placed in the proper position.

NOTE: If hand lever movement does not produce lifting, pull down the load chain while ratcheting until slack is removed.

NOTE: The brake is engaged during lowering or lifting the load. below, pulling the free knob actuates the internal spring and loosens the tightened screw, releasing the brake. In this manner, free chain adjusting can be achieved.

3.1.2 Operation Method

Step	Action
1	Set the change-over knob to "N". The change-over knob is located under the free knob on the hand lever.
2	Pull the free knob. The free knob turns counterclockwise and "snaps" out.
3	Pull the load chain to move the hook to the desired location.
4	Rotate the free knob clockwise. Once slack is removed, the free knob "snaps" in. This resets the brake and allows the hoist to be operated with the hand lever.

3.2 Principle of Lifting and Lowering Operation

3.2.1 Lifting and Lowering Principle

By setting the change-over knob to "UP" or "DN", and operating the lever, the female thread and the change-over pawl inside the hoist engage and the female thread rotates in either the lifting or lowering direction. The brake (threaded type) works instantly after the lever operation stops and holds the load.

3.2.2 Lifting and Lowering

Select direction of movement and ratchet hand lever back and forth, see below:

Chain movement	Change-over knob	Hand lever rotation that produces movement:
Raise	"UP"	Clockwise
Lower	"DN"	Counterclockwise

3.3 Hoist Storage

- ⚠ WARNING** : IMPROPER lever hoist use could result in death or serious injury. TO avoid these hazards:
- ALWAYS** store the hoist in no load condition.
 - ALWAYS** wipe off all dirt and water.
 - ALWAYS** oil the chain, hook pins and hook latches.
 - ALWAYS** hang in a dry place.
 - ALWAYS** check the hoist for abnormalities when using the hoist after a period of non-use according to the regular inspection procedures (Refer to 4.3).

3.4 Principle and Operation of the Load Signal (LOAD SIGNAL IS OPTIONAL)

- ⚠ WARNING** : IMPROPER lever hoist use could result in death or serious injury. TO avoid these hazards:
- ⚠ WARNING** : It is dangerous to attempt to lift more weight than the rated load. The Load Signal (optional) is designed to inform the operator of an overload condition. Upon finding an overload, immediately stop all operation and inform all others to stay away from the load until the overload condition is corrected.
- ⚠ WARNING** : Immediately stop lifting a load if the signal handle indicates an overload. Continued operation could lead to injury of personnel or equipment damage.
- ⚠ WARNING** : Rough handling of the lever hoist may damage mechanical parts or change the detection rating. This may cause a false overload indication or a false normal condition.
- ⚠ WARNING** : NEVER use the lever hoist if there is an indication of dust or other foreign matter having entered the load signal assembly.
- ⚠ WARNING** : NEVER disassemble or attempt to adjust the load signal assembly. Any attempt to do so will void the warranty. Contact your closest Harrington Distributor.

3.4.1 Load Signal Principle

When the load exceeds the preset value, the grip pivots to show the operator that there is an overload. When the grip pivots, the signal plate window on the lever changes in color and a "click" will be heard so that the operator can become aware of the overload. An overload condition exists when the operator exceeds the hand pull required to lift the rated capacity of the hoist. The signal plate window on the lever handle will indicate one of the following:

Condition:	Indicator Colors	Comment
Normal	"Green"	Continue operation
Overload	"Red"	ALWAYS stop operation

3.4.2 Operation of the Load Signal Handle

- (1) Hold the central part of the grip when lifting or lowering.
- (2) An overload is indicated by one or more of the following:
 - (a) Bending of the grip.
 - (b) A "clicking" sound.
 - (c) "RED" will appear in the signal plate window.
- (3) ALWAYS lower the load when an overload occurs. The grip and the signal plate will return to normal when the overload condition is corrected.

4. INSPECTION

4.1 Outline

There are two types of inspection, the frequent inspection performed by the operator while using the hoist, and the more thorough periodic inspections performed by qualified personnel who have the authority to remove the unit from service.

4.2 Daily Inspection

Before each work shift, check the following points:

- (1) Check that the nameplate showing the hoist capacity is attached and clearly legible.
- (2) Check that the handling labels are attached and clearly legible.
- (3) With no load, set the change-over knob to "UP" and operate the lever. The brake is normal if the chain winds with a clicking sound of the brake pawl for clockwise lever rotation and without a clicking sound for counterclockwise rotation.
- (4) With no load, set the change-over knob to "N" and pull the free knob so that the load chain can be moved freely. Hold the chain with both hands and pull it with each hand alternately. If the chain moves smoothly, the free chain adjusting mechanism is normal. Make sure the free knob returns to the home position.
- (5) Check that the upper and lower hook latches are in place and in proper condition.
- (6) Make sure the openings of the upper and lower hooks are not too wide, that the swivel rotates freely and that the hook latch is in position and works normally.
- (7) Check that the chain does not have excessive rust or corrosion and that it is not dry due to lack of lubricant.
- (8) Check that the chain is assembled normally and that there is no twisting.
- (9) Check for loose or missing nuts and for missing split pins.
- (10) Check that the lever grip is attached tightly.

If hoist is deficient on any point above tell your supervisor and do not use the hoist until it is properly operating.

4.3 Regular Inspection

Regular inspections should be made at the interval shown below and should follow the given procedures.

¹ NORMAL (Normal use):	Semiannual inspection
² HEAVY (Frequent use):	Quarterly inspection
³ SEVERE (Excessively frequent use):	Monthly inspection

Regular Inspection Procedure

Figures in parentheses are Figure Nos. in Parts List.

Item	Inspection Method	Discard Limit/Criteria	Measures
Name Plates	Check visually	Type indication is not clear.	Attach the name plate.
Hook (1,11) (Upper and Lower)			
1. Deformation/ twist of hook, opening of hook.	Measure "a" and "b" (shown below) with slide calipers. Visual check.	Dimensions are greater than those in the following table. Twist is large enough to be detected visually.	Replace the hook.
2. Wear	Measure "c" and "d" with slide calipers.	The dimensions are more than 10% greater than those just after purchase.	Replace the hook.

Table 1

Type (U.S. ton)	a Normal mm(in)	b Normal mm(in)	c		d	
			Normal mm(in)	Discard mm(in)	Normal mm(in)	Discard mm(in)
3/4	28.0(1.102)	23.5(0.925)	19.6(0.772)	17.6(0.693)	14.0(0.551)	12.6(0.496)
1	28.0(1.102)	23.5(0.925)	19.6(0.772)	17.6(0.693)	14.0(0.551)	12.6(0.496)
1 1/2	35.0(1.378)	32.0(1.260)	25.7(1.012)	23.1(0.909)	19.0(0.748)	17.1(0.673)
2	35.0(1.378)	32.0(1.260)	25.7(1.012)	23.1(0.909)	19.0(0.748)	17.1(0.673)
3	43.0(1.693)	39.5(1.555)	33.5(1.319)	30.1(1.185)	24.3(0.957)	21.8(0.858)
6	53.5(2.106)	50.0(1.969)	48.7(1.917)	43.8(1.724)	36.5(1.437)	32.8(1.291)
9	79.5(3.130)	72.5(2.854)	63.0(2.480)	53.9(2.122)	47.5(1.870)	42.7(1.681)

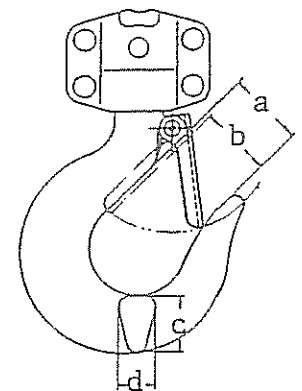


Fig. 1

Item	Inspection Method	Discard Limit/Criteria	Measures
3. Hook flaws	Check visually.	Deep flaws.	Replace the hook.
4. Hook movement.	Turn hook.	Hook does not turn smoothly.	Replace the hook.
5. Upper/lower fixture damage (Fittings of 1 & 10)	Check visually.	Loose or missing rivets, nuts or bolts.	Replace the hook.
6. Idle sheave rotation (15)	Hold the load chain with both hands and turn the idle sheave by moving the chain up and down.	Rotation is not smooth.	Repair.
7. Hook Latch (3)	Check visually.	Improper positioning and does not work smoothly.	Replace the latch or hook.

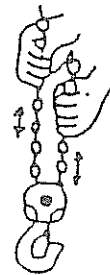


Fig. 2

LOAD CHAIN (66)			
1. Wear	Measure with slide calipers.	Measure the sum of pitches of five chain links and check that the maximum length is not exceeding the values shown below in Table 2.	Replace the chain.

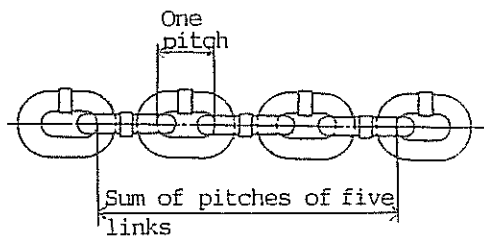


Fig. 3

Table 2

Type (U.S. ton)	Sum of pitches of five links mm(in)	Discard limit mm(in)
3/4, 1	85.5 (3.366)	87.6(3.449)
1 1/2, 2	106.0 (4.173)	108.6(4.276)
3, 6, 9	136.0 (5.354)	139.4 (5.488)

2. Rust, damage, deformation	Check visually.	Obvious rust (apply oil as necessary). Twists or cracks, nicks, dents or gouges.	Remove rust. Replace load chain. Destroy old load chain.
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Item	Inspection Method	Discard Limit/Criteria	Measures
HOOK YOKE Top set (1) Bottom set (10) Joint of upper/ lower fixtures with top pin and chain pin.	Measure hole dia- meter of joint area in two directions at right angle.	Deformation not permitted (if each measured value differs more than 0.5 mm (.020 in.), it is not a circle.	Replace the part.
CHAIN PIN (19)	Check visually.	<div data-bbox="760 646 1052 756" data-label="Image"> </div> <p data-bbox="867 789 948 823">Fig. 4</p> <p data-bbox="743 856 1159 932">Do not use pins with visually detectable bends or dents.</p> <p data-bbox="743 974 1110 1045">Deformation or cracks on the thread.</p>	Replace the chain pin.
2. Wear	Measure with slide calipers.	Dimension "d" should not exceed the limit. (The chain pin should be replaced when the load chain is replaced.)	Replace the chain pin.
3. Rust	Check visually.	Obvious rust.	

Table 3 Chain Pin Diameter

Type (U.S. ton)	Normal Diameter mm(in)	Discard Diameter mm(in)
3/4, 1	6.8 (0.268)	6.5 (0.256)
1 1/2, 2	8.7 (0.343)	8.3 (0.327)
3, 6, 9	11.1 (0.437)	10.6 (0.417)

Item	Inspection Method	Discard Limit/Criteria	Measures
FUNCTION			
1. Lifting and	Lift and lower a light load.	Abnormal difficulties in lifting or lowering.	Disassemble and service.
2. Brake		Confirm that none of the problems listed below occur during lifting and lowering: <ul style="list-style-type: none"> •Lifting impossible. •Load falls when the operator removes his hands. •Load fall during unwinding. •Load slips down slowly. 	Disassemble and service.
BRAKE (Inside mechanism)	Disassemble and check.		

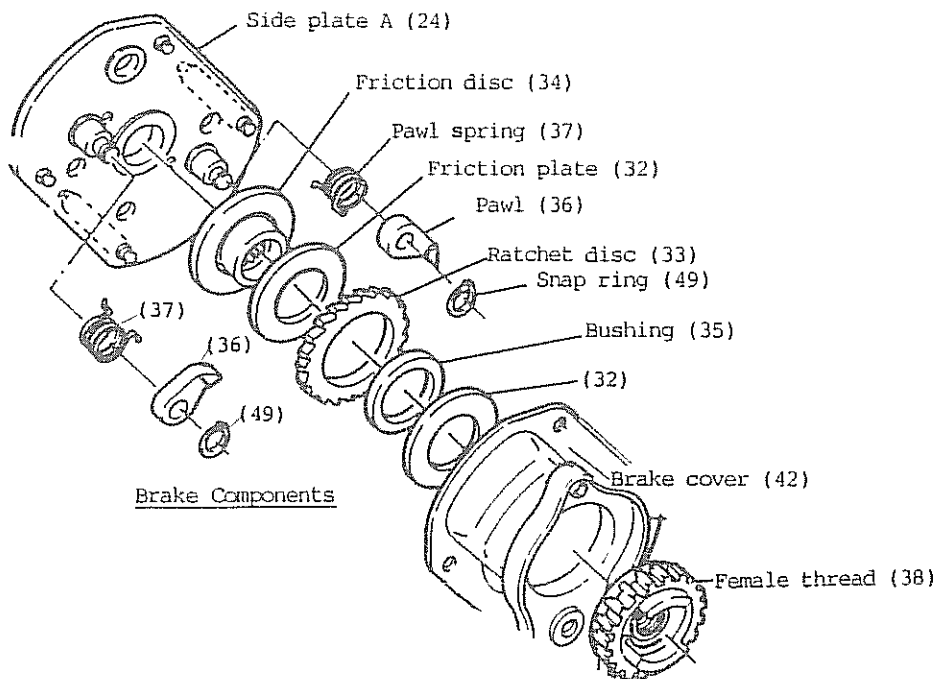

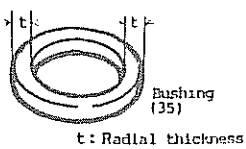
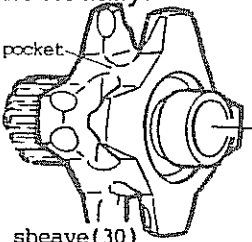
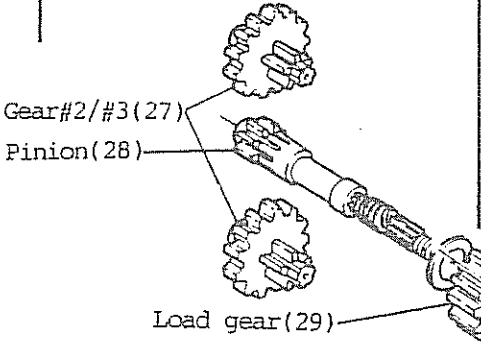
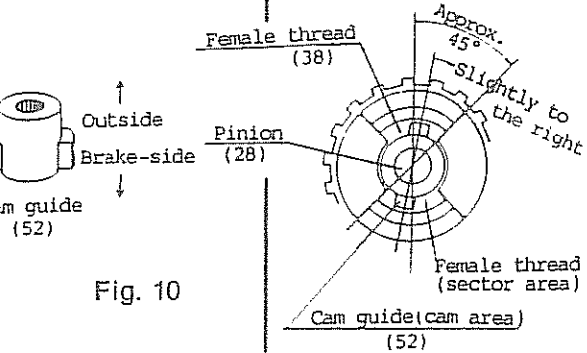


Fig. 5

Item	Inspection Method	Discard Limit/Criteria	Measures
1. Damage to brake surface (32, 33, 34)	Check visually.	Damage due to scratching or gouging by foreign matter.	Replace the part.
2. Damage on friction disc (34)	Check visually.	Damage due to scratching or gouging by foreign matter.	Replace the part.
3. Wear on friction plate (32)	Measure with slide calipers.	Thickness is not uniform and friction plate is worn more than 0.5mm(.020 in). For all types - Normal thickness: 3.5mm (.138 in) Discard limit: 3.0mm(.118 in)	Replace the part.
4. Flatness of friction plate (32)	Check clearance with straight edge.	Clearance is not uniform. Internal parts are thicker than external part.	Replace the part.
			
5. Bushing (35); wear and oil.	Check radial thickness (t) with caliper and oil existence.  Fig. 7	Radial thickness (t) is not uniform. Oil should be contained. For all types - Normal thickness (t): 4.0mm(.157 in) Discard limit: 3.0mm(.118 in)	Replace the part.
6. Ratchet disc (33); wear and rust	Check visually.	The tooth wear exceeds 1.5mm(.060 in). Any rust.	Replace the part.
7. Pawl (36); wear	Check visually.	Wear on pawl tip.	Replace the part.
8. Pawl spring (37); deformation and rust.	Check visually.	Bend or deformation. Any rust.	Replace the part.

Item	Inspection Method	Discard Limit/Criteria	Measures
9. Female thread (38); wear, rust and deformation.	Check visually.	Brake surface is shiny. Deformation such as tight engagement or burr. Any rust. Obvious tooth deformation.	Replace the part.
LIFTING SYSTEM			
1. Load sheave (30); wear and deformation	Check visually.	Large amount of wear or deformation on the surface of load chain pocket or burr due to load chain contact.	Replace the part.
Fig. 8			
2. Gears (27,28, and 29); wear and flaw.	Check visually.	Teeth show excessive wear or damage.	Replace the part.
			
3. Cam guide (52); positioning.	Check visually.	When tightening the female thread, the cam guide should be in the center or slightly to the right as shown.	Orient and reassemble.
Fig. 10			

Item	Inspection Method	Discard Limit/Criteria	Measures
4. Lever (56); deformation	Check visually.	Reduction in fit. No caulking permitted. Bends or no cracks.	Replace the part.
5. Change-over pawl (60); deformation.	Check visually.	Teeth are worn so as to cause rough surface.	Replace the part.
6. Spring shaft (62); deformation.	Check visually.	Deformation or bend. Excessive rust.	Replace the part.
<p data-bbox="496 1163 581 1192">Fig. 11</p>			
7. Springs • Change-over spring (63); • Brake spring (54); • Idle spring (53); deformation.	Measure with slide calipers.	Free height (h_1) of change- over spring should not vary.	Replace the part.

Table 4

Normal height (h_1)	3/4, 1 Ton	37mm (1.457 in)
	1 1/2 Ton & up	42mm (1.654 in)

Angle α between both bent tips of brake spring.

Item	Inspection Method	Discard Limit/Criteria	Measures
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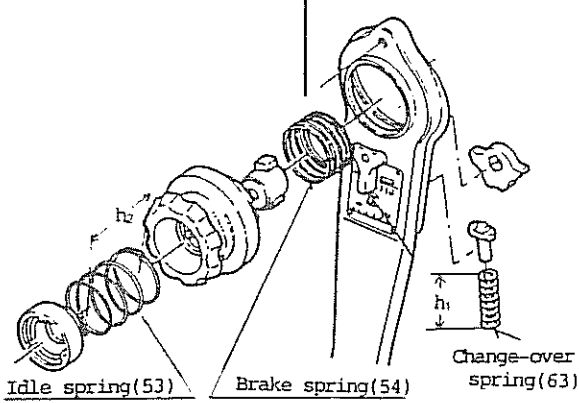


Fig. 12

Table 5

	Normal	Discard
3/4, 1 Ton	30°	45°
1 1/2 Ton & over	25°	40°

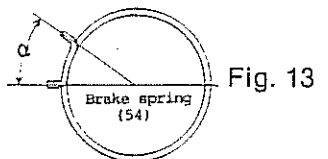


Fig. 13

Free height (h_2) and angle β between both bent tips of idle spring.

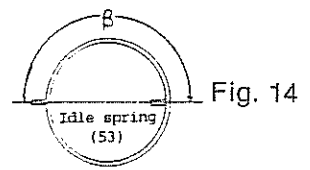


Fig. 14

Table 6

	Normal	Discard
(h_2) 3/4, 1 Ton	56mm (2.204 in)	59 mm(2.323 in)
1 1/2 Ton & over	71mm (2.795 in)	64mm (2.520 in)
(Angle) 3/4, 1 Ton	180°	165°
1 1/2 Ton & over	180°	165°

FRAME (24 & 25)

1. Deformation of top pin hole.
2. Slack stay bolt restraint.

Check visually.
Tap.

Hole is oval.
Any slack.

Replace part.
Replace part.

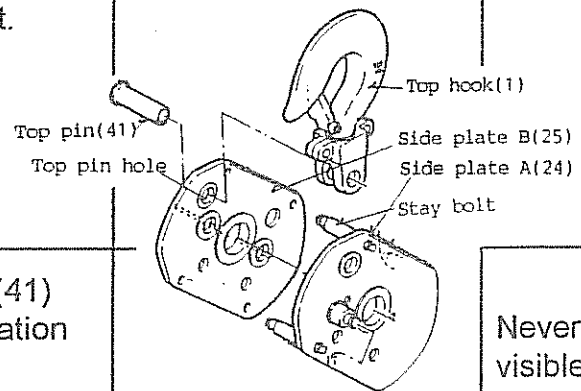


Fig. 15

TOP PIN (41)

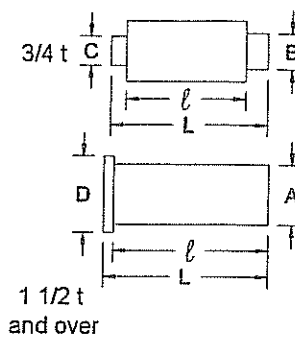
1. Deformation
2. Wear

Never use parts with visible bend.
Tight engagement is not permitted.
Discard limit should be followed.

Replace top pin.
Replace top pin.

Table 7

Type (U.S. ton)	A mm(in)		B mm(in)		C mm(in)		Normal dimensions mm(in)		
	Normal	Discard	Normal	Discard	Normal	Discard	D	L	ℓ
3/4, 1	12(.47)	11(.43)	10(.39)	9(.35)	6(.24)	5(.20)	-	39.5(1.56)	29.9(1.18)
1 1/2, 2	12(.47)	11(.43)	-	-	-	-	16(.63)	45.5(1.79)	43.5(1.71)
3,6,9	16(.63)	15(.59)	-	-	-	-	22.5(.89)	55(2.17)	53(2.09)



Item	Inspection Method	Discard Limit/Criteria	Measures
MISCELLA-NEOUS			
1. Deformation of stripper(40)	Check visually.	Large dents or damage on stripper tip.	Replace part.
2. Chain stopper link (20)	Check visually.	Deformation such that the load chain or the warning tag detaches.	Replace part.
3. Assembly of load chain (66)	Check visually.	See Section 5.2.2.	

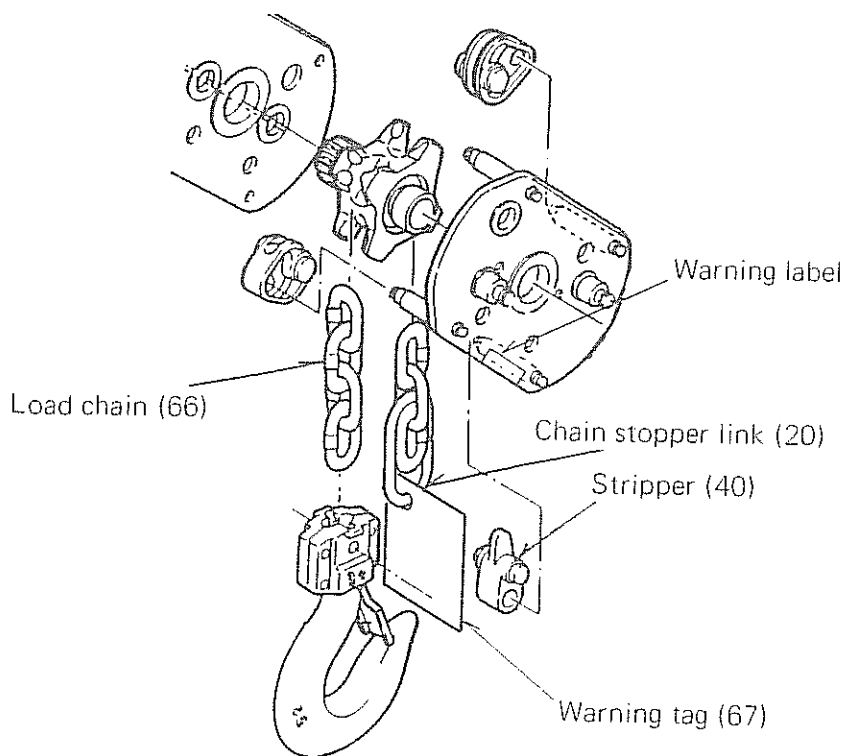


Fig. 17

Item	Inspection Method	Discard Limit/Criteria	Measures
4. Nameplate (59); legibility	Check visually.	Rated load, Model-lot No., Serial No. and manufacturer should be legible. NOTE: When nameplate is replaced, Model-lot No. and Serial No. of the old nameplate should be marked on the new nameplate.	Replace part.
5. Warning label	Check visually.	Every warning label should be legible.	Replace part.
6. Warning tag (67)	Check visually.	The tag should be attached to the proper position. Every warning should be visible and legible.	Attach correctly. Replace part.

¹ Normal Service is defined as operation with random loading at or below rated capacity or uniform loading not exceeding 65% of rated capacity for not more than 15% of the time.

² Heavy Service is defined as operation with loads less than or equal to rated capacity which exceed normal service limits.

³ Severe Service is defined as operation with loads less than or equal to rated capacity involving normal or heavy service with abnormal conditions.

5. Maintenance

⚠ WARNING : IMPROPER lever hoist use could result in death or serious injury. To avoid these hazards:

⚠ WARNING : NEVER perform maintenance on the hoist while it is supporting a load.

⚠ WARNING : Before performing maintenance, attach the tag: "DANGER: EQUIPMENT BEING REPAIRED, DO NOT OPERATE".

⚠ WARNING : Only allow qualified service personnel to perform maintenance.

⚠ WARNING : After performing any maintenance on the hoist, check operation and load to rated capacity before returning to service.

5.1 Lubrication

5.1.1 Applying Grease to Gears

Remove the nuts holding the gear case.

Remove the old grease from the gear case and apply new grease (standard grease*) at annual inspection.

Temperature range of standard grease is -20° C (-4° F) to 60° C (140° F). If the hoist is used at temperatures below -20° C (-4° F) or above 60° C (140° F), consult the manufacturer or dealer since some parts should be changed.

*Shell cup grease #2 equivalent of NLGI (National Lubricating Grease Institute)/#2

5.1.2 Load Chain

⚠ WARNING : Failure to maintain clean and well lubricated load chain will void the manufacturer's warranty.

⚠ WARNING : **IMPROPER** lever hoist use could result in death or serious injury. TO avoid these hazards:

- ALWAYS:** lubricate load chain weekly, or more frequently, depending on severity of service.
- ALWAYS:** lubricate more frequently than normal in a corrosive environment.
- ALWAYS:** use machine oil equivalent to ISO VG46 or 68.
- ALWAYS:** clean chain with an acid free solvent only to remove rust or abrasive dust build-up. After cleaning, lubricate the chain.
- ALWAYS:** lubricate each link of the chain and apply new lubricant over existing layer.

Harrington has available as an option a corrosive-resistant chain. For information on the capabilities and limitations of Harrington's regular corrosion-resistant chain, please ask your Harrington Hoists, Inc. distributor.

5.2 Disassembly, Assembly and Adjustment

5.2.1 Disassembly

Figures in parentheses are Figure Numbers in Parts List.

Disassembly Procedures	Remarks
<ol style="list-style-type: none"> 1. Remove the split pin [48], slotted nut [45], spring holder [55], idle spring [53], free knob [50], brake knob [50], brake spring [54] and cam guide [52] from the pinion [28]. 2. Remove nuts [46] and spring washers [47] (4 each) holding the brake cover and the lever assembly [56] (one unit with brake cover assembly [42]). Turn the female thread [38] counterclockwise and remove from the pinion [28]. 3. Remove the friction disc [34], friction plates [32] (2), ratchet disc [33] and bushing [35] from the pinion [28]. 4. Remove snap rings [49] (2) of the pawl shaft (one unit with side plate A assembly) using snap ring pliers and remove the pawls [36] and pawl springs [37]. 5. Remove the nuts [43] and spring washers [44] (4 each) holding the gear case [26] and remove the gear case [26]. 	<p>See parts list for part names, figure numbers and assembling positions.</p>

Disassembly Procedures	Remarks
<p>6. Remove gear #2 [27] (2), the pinion [28], washer [31], load gear [29], top pin [41], and top hook [1].</p> <p>7. Remove side plate B assembly [25] and remove the chain guide [39] (2), stripper [40], load chain [66] and load sheave [30].</p> <p>8. Remove the screw [61] holding the lever (with the spring washers [65]) and the two nuts [64] holding the brake cover assembly (with the spring washers [65]) and separate the lever assembly [56] from the brake cover assembly [42].</p> <p>9. Remove the change-over pawl [60], change-over spring [63], spring shaft [62] and female thread [38] from the lever assembly.</p>	<p>Remove old grease.</p> <p>Remove side plate B assembly by tapping it with a wooden/ plastic/rubber hammer. Turn the load sheave to the position where the chain guide can be removed.</p>
<p>5.2.2 Assembly and Adjustment</p>	
Assembly Procedures	Remarks
<p>1. Set the change-over knob of the lever assembly [56] to neutral position and turn over. Put the change-over pawl [60] into the hexagonal shaft area of the change-over shaft and insert the change-over spring [63] and spring shaft [62] in the change-over spring holder (See Fig. 18).</p>	

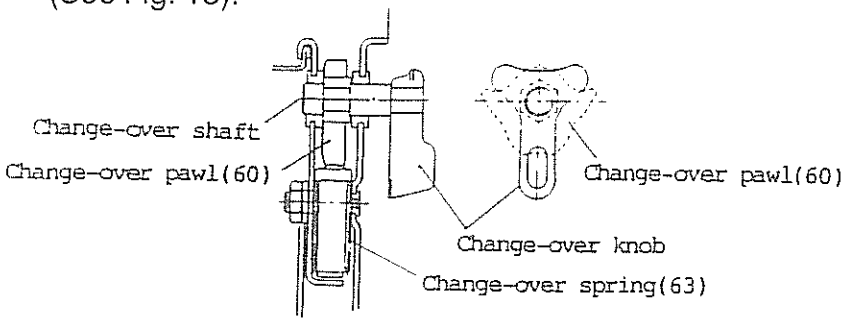


Fig. 18

Assembly Procedures

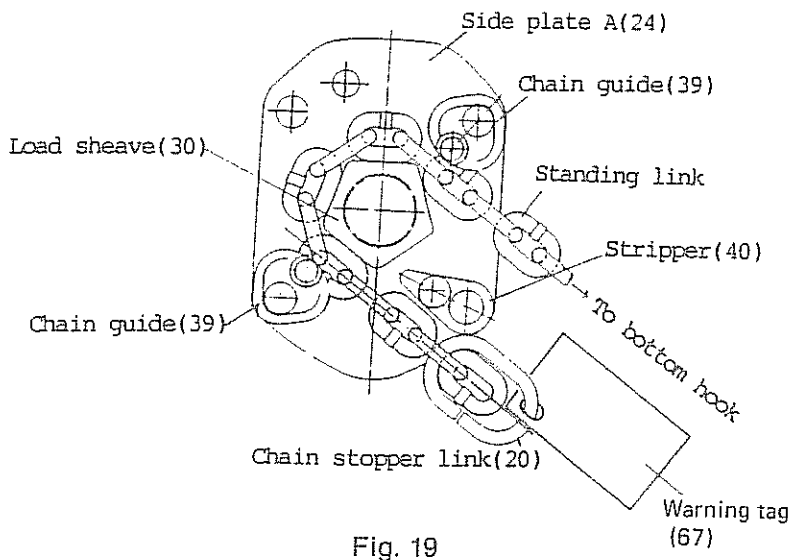
Remarks

2. With the braking surface upward, place the female thread [38] near the center of the pinion [28] and fit the brake cover assembly [42] into the lever assembly [56]. Tighten it with the nuts [64] and spring washers [65] (2 each). Then, turn the lever assembly [56] over to the front side and tighten it with screw [61] (with spring washer [65]).

3. Place the longer side of the stay bolts of side plate A assembly [24] up and fit the load sheave [30] (serration part facing up) with load chain [66], chain guides [39] (2) and stripper [40] (see Figure 19 for direction of assembly). Then place side plate B assembly [25] on the stay bolts. Assemble chain stopper link [20] with warning tag [67] to the next link of the end link as shown in Figs. 19 & 20. Then close the opening of the chain stopper link. The proper way to assemble the load chain is shown in Fig. 19.

▲ WARNING

NEVER apply grease or oil to the braking surface of the female thread.



Assembly Procedures

Remarks

The total number of load chain links should be an odd number.
The end links must be standing links after assembling, as shown in Fig. 20.

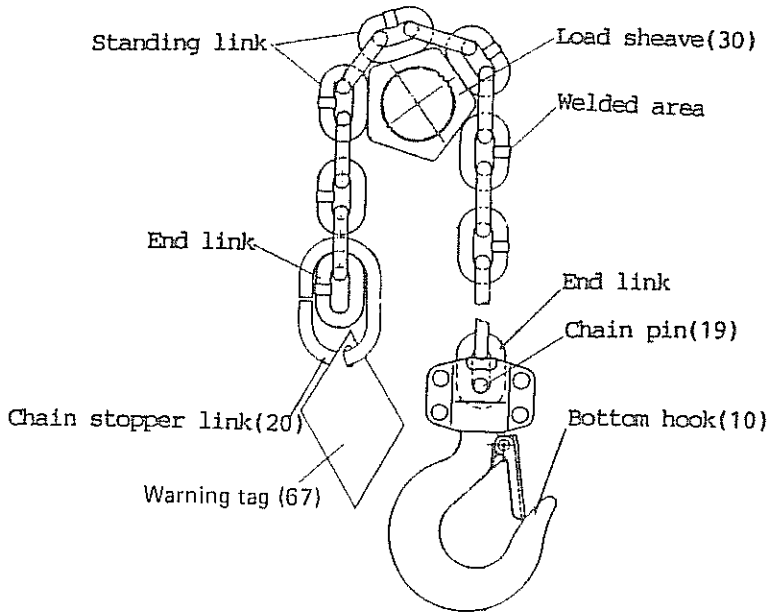


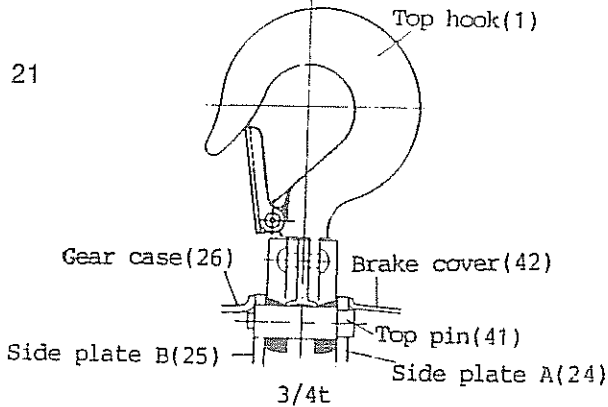
Fig. 20

4. Fit the top hook [1] and the top pin [41] in between side plate assemblies A [24] and B [25] (See Figs. 21 & 22). Fit the load gear [29], washer [31], pinion [28] and gear #2 [27] (2) onto side plate B assembly [25]. Apply new grease sufficiently and place the gear case [26] on the stay bolts. Tighten it with the nuts [43] and spring washers [44] (4 each) and turn it over.

NOTE:
Remove or attach only the load chain from the chain stopper link side.
Fix one end of the mating area of the chain stopper link with a vise and hold the other end with a wrench.
Twist the link so that a gap equal to the diameter of the load chain can be made, then remove or adjust the load chain. Close the chain stopper link following the same procedure as that used to open it. Adjust so that opening or shaft shift is within 0 to 3 mm (0 to .12 in).

For the assembly direction of the top pin, see Fig. 21 and 22.

Fig. 21



Assembly Procedures

Remarks

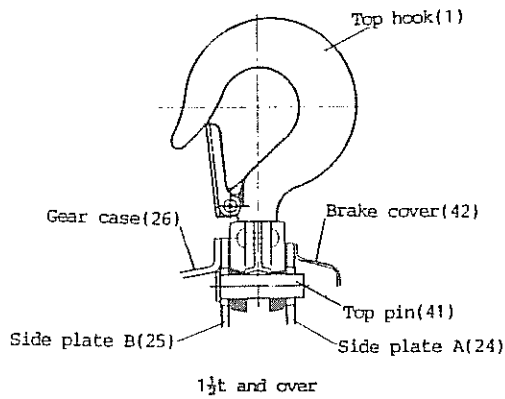


Fig. 22

NOTE: With the pinion in the center, line up the two "O" marks, as shown in Fig. 23 and 24.

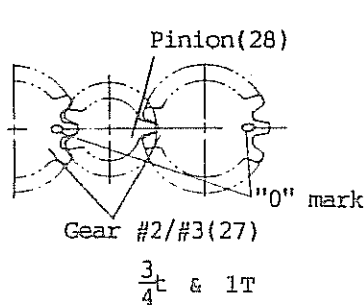


Fig. 23

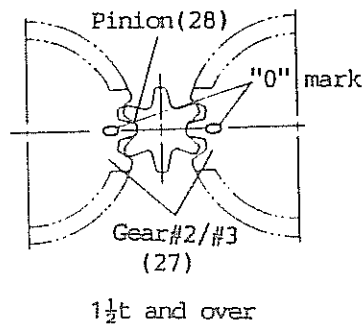


Fig. 24

- Place the pawl spring [37] and pawl [36] (2 each) on the side plate A assembly [24] with snap rings [49], and mesh the friction disc [34] (on which the friction plates [32] (2), bushing [35] and ratchet disc [33] have been attached), with the pinion [28] serration.

Apply anti-rust grease to the inside of the pawl. Since the brake is a dry type, **NEVER** apply grease or oil to the braking surfaces of the friction plate or the ratchet disc.

Assembly Procedures

Remarks

NOTE: The fitting direction for the ratchet disc, pawl and pawl spring is shown in Fig. 25.

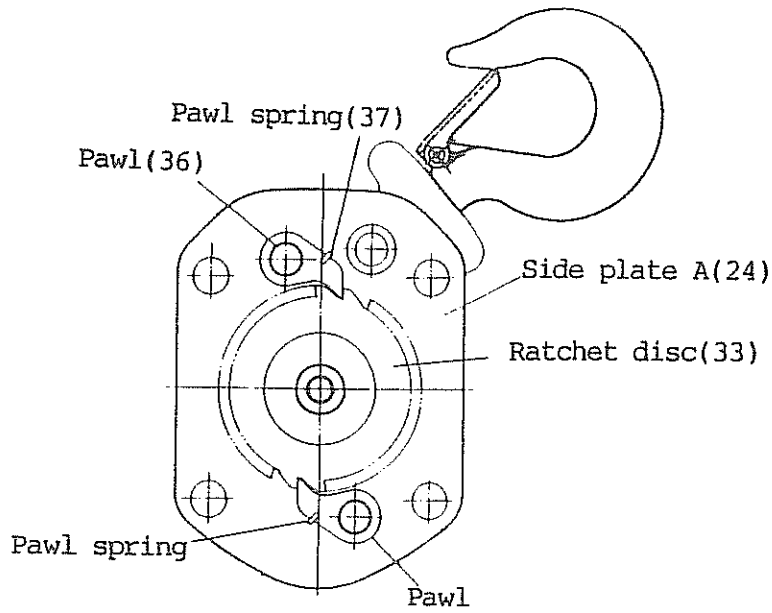


Fig. 25

If the bushing needs oil, dip it into turbine oil for one day and then wipe it off and fit it into place.

6. Fit the female thread [38] of the lever assembly (on which the assembling has proceeded up to Procedure Item 2) into the pinion [28] thread, place the brake cover (one unit with the lever assembly) onto the stay bolts (one unit with side plate A assembly) and tighten with nuts [46] (with spring washers [47] (4).

Apply sufficient molybdenum disulfide grease to the female thread.

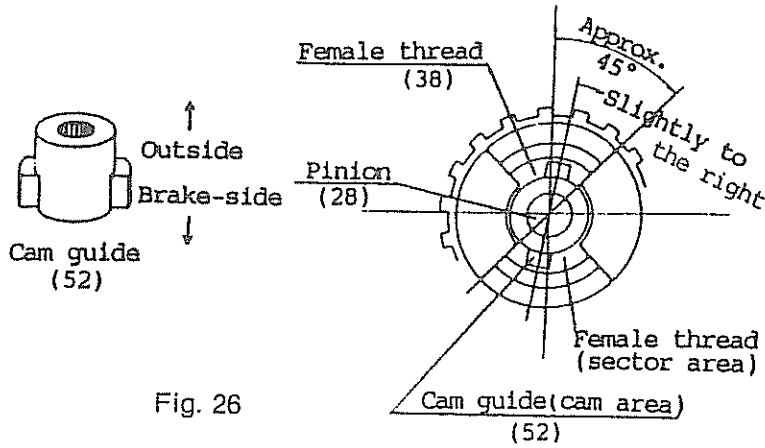
7. Fix the load sheave [30] so that it does not rotate, set the change-over knob to UP and turn the lever assembly in the winding direction to slightly tighten the brake.

8. Mesh the cam guide [52] with the pinion [28] so that cam area comes in the center or slightly to the right side of the female thread sector area, as shown in Fig. 26.

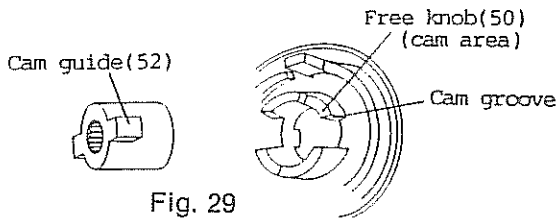
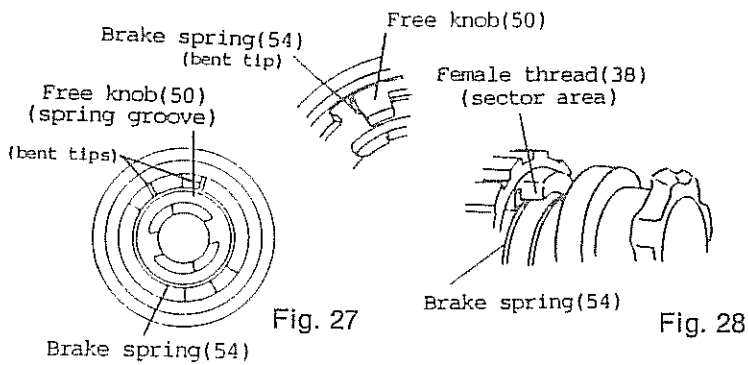
If it is impossible to mesh the cam guide in the center of the female thread sector area or slightly to the right side, replace the cam guide.

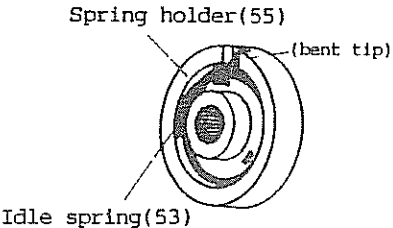
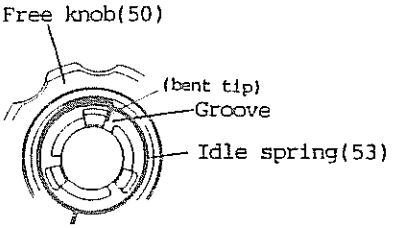
Assembly Procedures

Remarks



Fit the brake spring in the spring groove of the free knob as shown in Fig. 27. (Check that the brake spring has properly entered the spring groove). Fix the load sheave so that it does not rotate, and catch the brake spring on the sector area of the female thread, as shown in Fig. 28. Then rotate the free knob clockwise approximately 120 degrees and fit the cam groove into the cam of the cam guide (See Fig. 29).



Assembly Procedures	Remarks
<p>9. Fit the idle spring [53] by catching one bent tip (facing out) on the groove of the spring holder [55] (See Fig. 30). Catch the other bent tip (facing in) on a protrusion of the free knob (See Fig. 31). Rotate the spring holder [55] counterclockwise approximately 120 degrees. Mesh the spring holder [55] with the pinion [28] serrations and fit the slotted nut [45], fixing it with a split pin [48].</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>Fig. 30</p> </div> <div style="text-align: center;">  <p>Fig. 31</p> </div> </div> <p>10. Set the change-over knob to N (neutral), and pull the free knob to create the free-chain state, then pull the load chain and check the free-chain mechanism.</p>	<p>If it is difficult to line up with the split pin hole, fully tighten the nut first, then slacken it slightly and put the pin in.</p>

6. WARRANTY

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

Manual Hoists & Trolleys - 2 years
Electric Hoist & Trolleys, Crane Components - 1 year
Spare/Replacement Parts - 1 year

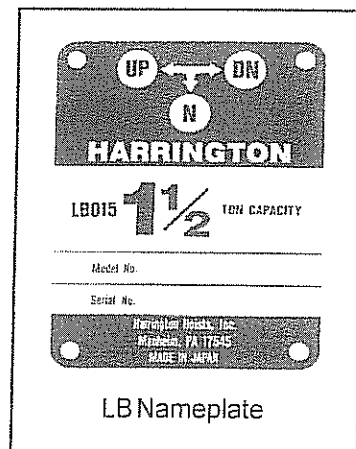
The product must be used in accordance with manufacturer's recommendations and must not have been subject to abuse, lack of maintenance, misuse, negligence, or unauthorized repairs or alterations.

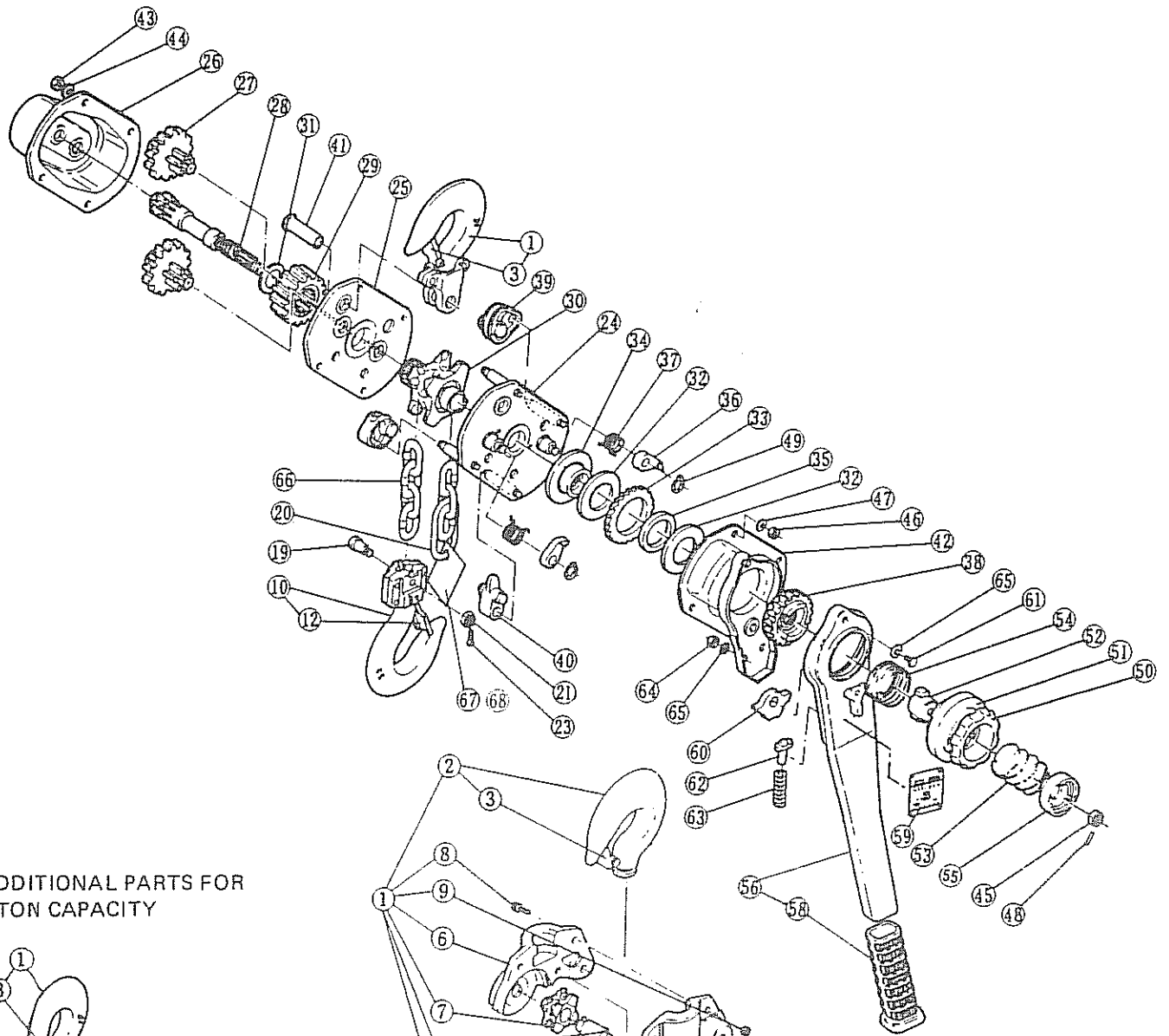
Should any defect in material or workmanship occur during the above time period in any product, as determined by Harrington Hoist's inspection of the product, Harrington Hoists, Inc. agrees, at its discretion, either to replace (not including installation) or repair the part of product free of charge and deliver said item F.O.B. Harrington Hoists, Inc. place of business to customer. Customer must obtain a Return Goods Authorization as directed by Harrington or Harrington's published repair center prior to shipping product for warranty evaluation. An explanation of the complaint must accompany the product. Product must be returned freight prepaid. Upon repair, the product will be covered for the remainder of the original warranty period. If it is determined there is no defect, or that the defect resulted from causes not within the scope of Harrington's warranty, the customer will be responsible for the costs of returning the product.

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

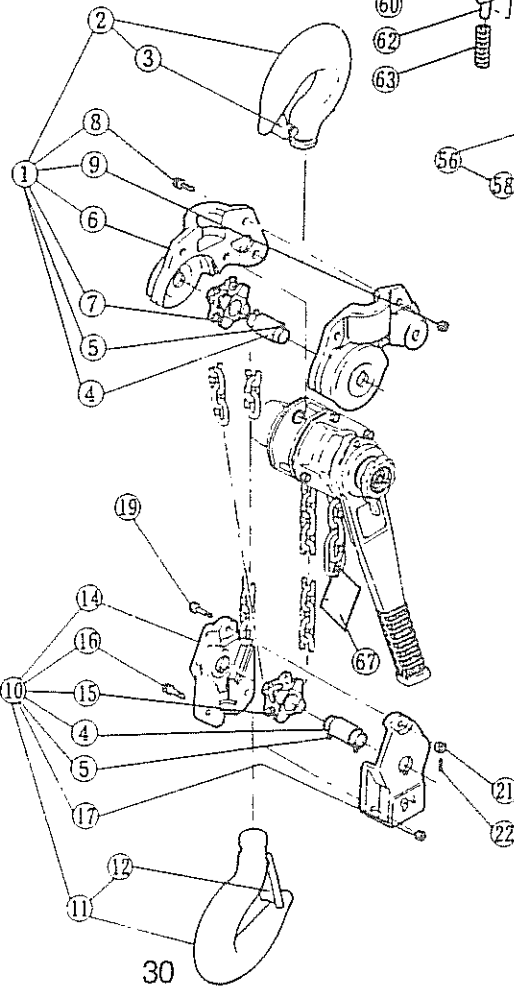
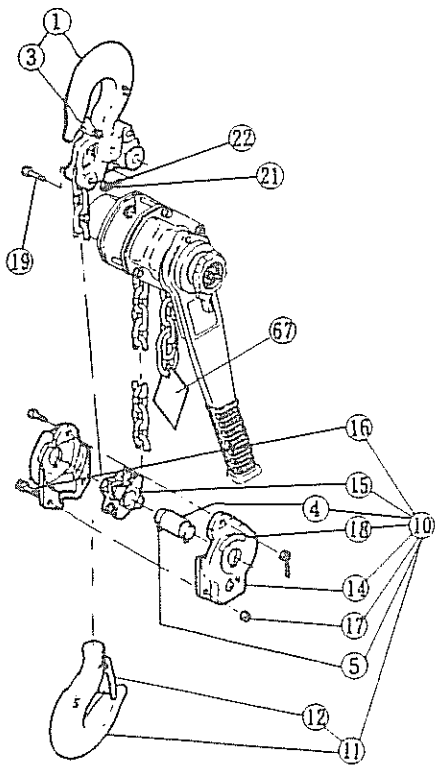
7. PARTS LIST

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





**ADDITIONAL PARTS FOR
6 TON CAPACITY**



**ADDITIONAL PARTS FOR
9 TON CAPACITY**

Fig. No.	Part Name	Parts per Hoist	Capacity						
			3/4T	1T	1 1/2T	2T	3T	6T	9T
1	Top Hook Complete Set	1							L41001090
	Top Hook Assembly		L41001008	L41001010	L41001015	L41001020	L41001030	L41001060	
2	Hook Assembly	1							L42001090
3	Latch Assembly	1	L41071008		L41071015		L41071030	L41071060	L41071090
4	Shaft	1							L4053060
5	Shaft Stopper Pin	2							L4083060
6	Top Yoke A, B Set	1							L45011090
7	Idle Sheave	1							L4051060
8	Socket Bolt	3							90912116
9	Lever Nut	3							L4082090
10	Bottom Hook Complete	1						L41021060	L41021090
	Bottom Hook Assembly		L41021008	L41021010	L41021015	L41021020	L41021030		
11	Hook Assembly	1						L42001060	L42001090
12	Latch Assembly	1	L41071008		L41071015		L41071030	L41071060	L41071090
4	Shaft	1						L4053060	
5	Shaft Stopper Pin	2						L4083060	
14	Bottom Yoke Set	1						L45031060	L45031090
15	Idle Sheave	1						L4051060	
16	Socket Bolt	3(2)						9091296	90912116
17	Lever Nut	3(2)						L4082060	L4082090
18	Name Plate C	1						L4805060	
19	Chain Pin	1	L4041008		M3041015		M3041025	M3041075	
20	Chain Stopper Link	1	L4045008		L4045015		L4045030		
21	Slotted Nut for Fig. No. 19	1	M3049005		M2049010		M2049020		
22	Split Pin for Fig. No. 19	1					9009412		
23	Split Pin for Fig. No. 19	1	9009402		9009411		9009412		
24	Side Plate A Assembly	1	L45101008		L45101015		L45101030		
25	Side Plate B Assembly	1	L45102008		L45102015		L45102030		
26	Gear Case	1	L45103008		L45103015		L45103030		
27	Gear #2	2	L45112008		L45112015		L45112030		
28	Pinion	1	L4111008		L4111015		L4111030		
29	Load Gear	1	L4114008		L4114015		L4114030		
30	Load Sheave	1	L4116008		L4116015		L4116030		
31	Washer	1	L4117008		L4117015		L4117030		
32	Friction Plate	2	L4151008		L4151015				
33	Ratchet Disc	1	L4152008		L4152015				
34	Friction Disc	1	L4153008		L4153015				
35	Bushing	1	L4154008		L4154015				
36	Pawl	2	L4155008		L4155015		L4155030		
37	Pawl Spring	2	L4158008		L4158015				

Figures in parenthesis show the number for 9 ton capacity.

Fig. No.	Part Name	Parts per Hoist	Capacity						
			3/4T	1T	1 1/2T	2T	3T	6T	9T
38	Female Thread	1	L4160008			L4160015			
39	Chain Guide	2	L4161008		L4161015		L4161030		
40	Stripper	1	L4162008		L4162015		L4162030		
41	Top Pin	1	L4163008		L4163015		L4163030		
42	Brake Cover Assembly	1	L45214008		L45214015		L45214030		
43	Nut for Fig. No. 26	4	9093424				9093427		
44	Spring Washer for Fig. No. 26	4	9012711				9012712		
45	Slotted Nut for Fig. No. 28	1	M2049010		M2049020				
46	Nut for Fig. No. 42	4	9093424				9093427		
47	Spring Washer for Fig. No. 42	4	9012711				9012712		
48	Split Pin for Fig. No. 28	1	9009411		9009413				
49	Snap Ring for Fig. No. 36	2	L4188008		L4188015				
50	Free Knob	1	L4201008		L4201015				
51	Name Plate U	1	L4810008						
52	Cam Guide	1	L4203008		L4203015				
53	Idle Spring	1	L4205008		L4205015				
54	Brake Spring	1	L4207008		L4207015				
55	Spring Holder	1	L4208008		L4208015				
56	Lever Assembly	1	L46211008		L46211015				
58	Grip	1	L4231008		L4231015				
59	Name Plate with Rivets	1	L4800008	L4800010	L4800015	L4800020	L4800030	L4800060	L4800090
60	Change-Over Pawl	1	L4218008		L4218015				
61	Machine Screw with Spring Washer for Fig. No. 56	1	L4221008						
	Screw for Fig. No. 56	1			L4221015				
62	Spring Shaft	1	L4222008		L4222015				
63	Change-Over Spring	1	L4223008		L4223015				
64	Nut for Fig. No. 42	2	9093420		9093424				
65	Spring Washer for Fig. No. 42	2	9012709						
		3			9012711				
66	Load Chain	FT	LCLB010		LCCF015		LCC3025		
67	Warning Tag*	1	WTAG3						

Any lift of chain available on request. The load chain is heat treated. No addition to the chain to increase the length is possible. The chain must be replaced with a new one of desired length. Specify the length of chain when ordering. Example length is equal to desired lift (L) times the number of chain falls plus free end length (FT).

LB008	L + 1 FT	LB030	L + 1 FT
LB010	L + 1 FT	LB060	2L + 2 FT
LB015	L + 1 FT	LB090	3L + 2.5 FT
LB020	L + 1 FT		

LEVER ASSEMBLY FOR LOAD SIGNAL TYPE

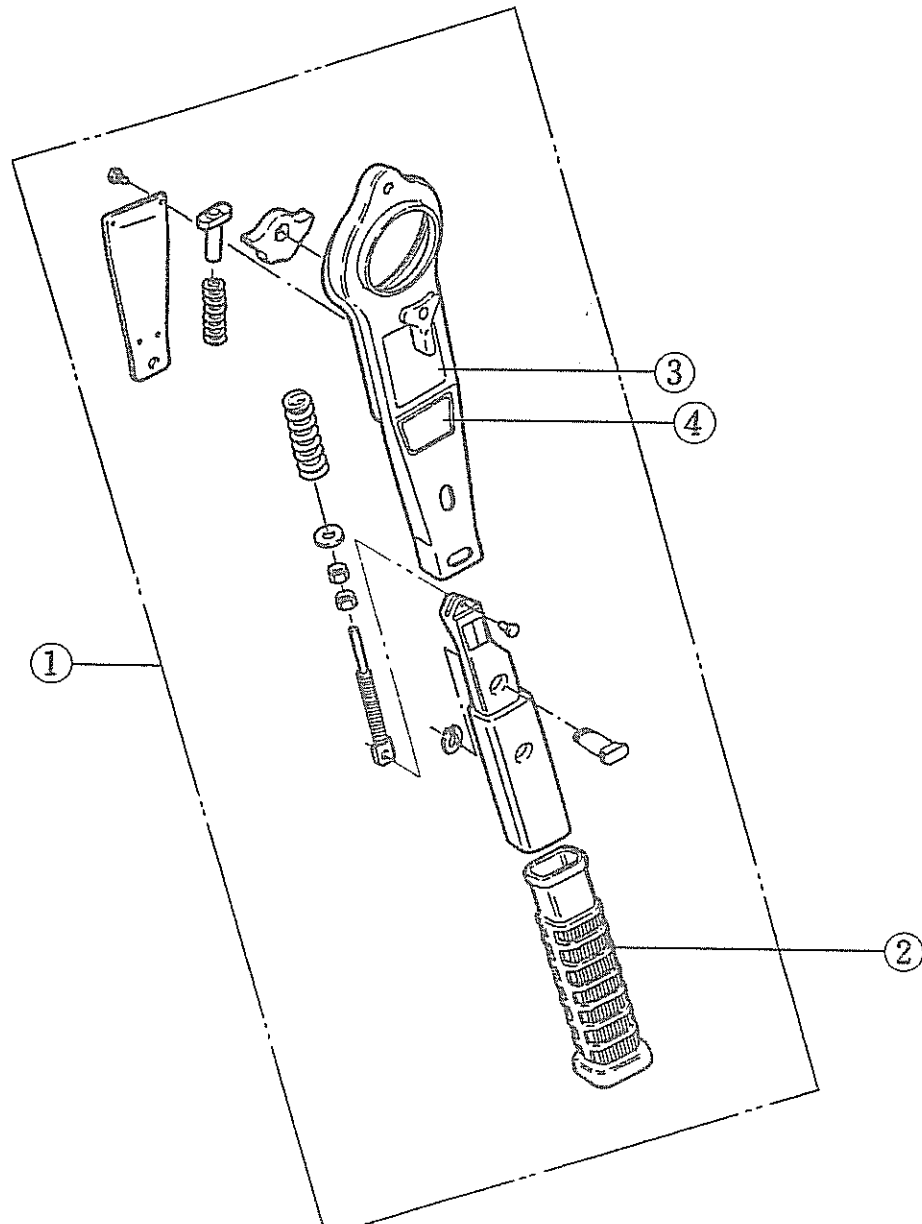


Fig. No.	Part Name	Parts per Hoist	Capacity						
			3/4T	1T	1 1/2T	2T	3T	6T	9T
1	Lever Complete Set	1	Y2SE008-6211	Y2SU010-6211	Y2SE015-6211	Y2SU020-6211	Y2SE0306211		
	2 Grip	1	L4231S008						
3	Name Plate with Rivets	1	L4800008	L4800010	L4800015	L4800020	L4800030	L4800060	L4800090
4	Name Plate B	1	L4801S008						



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