



RL Manual Lever Puller

1/4 ton to 3 ton Capacity



Operation and Maintenance Manual

Job Number: _____

Serial Number: _____

(RECORD MANUAL LEVER PULLER SERIAL NUMBER FOR FUTURE REFERENCE)



R&M Materials Handling, Inc
Springfield, Ohio USA
☎: 800 955-9967
web: www.rmhoist.com

RL Manual Lever Puller
RL Manual
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Before proceeding with the operation or maintenance of the equipment it is important that the operating, and maintenance personnel read this bulletin carefully in order to ensure the safe and efficient use of the equipment.

Also, it is strongly recommended that the personnel responsible for the operation, inspection, and servicing of this hoist, read and follow the Safety Standard ASME B30.21-1999 (or current revised edition). This standard covers Manually Lever Operated Hoists as promulgated by the American National Standards Institute and is published by the American Society of Mechanical Engineers. Copies of this publication are available from the Society at United Engineering Center, 345 East 47th St., New York, NY 10017.

If any instructions are unclear, contact the manufacturer or distributor of the equipment before attempting to install or use the manual lever puller.

[R&M Materials Handling, Inc](http://www.rmhoist.com)
4501 Gateway Boulevard
Springfield, OH 45502
Tel. [937-328-5100](tel:937-328-5100)
Fax [937-325-5319](tel:937-325-5319)

Visit our website: www.rmhoist.com



FOREWORD

This manual has been prepared to acquaint you of the procedures necessary for the operation and maintenance of the equipment you have purchased.

Proper use is important to the ultimate performance of this equipment. Careful study of and adherence to the instructions will help ensure safe, dependable operation. It is also recommended that you keep this manual readily accessible to operators as well as maintenance and safety personnel.

Information in this manual is subject to change without notice.

Standard Guarantee and Warranty

[R&M Materials Handling, Inc.](#), hereinafter called the Company, will repair or replace, at its option, equipment or parts with defects in material and/or workmanship identified within one year of shipment from [R&M](#) for manual chain hoists, manual lever pullers, trolleys and beam clamps. Should a problem develop, contact the Warranty Administrator.

The Warranty Administrator will provide a Return Goods Authorization (RGA) form for return of the equipment. The form must be completed and returned before any warranty is authorized. All equipment shall be returned freight prepaid to the factory or authorized repair center; the RGA number should be clearly indicated on the outside of the package. If the problem is covered under warranty, the equipment will be repaired or replaced and returned freight prepaid. If inspection reveals that the problem is not warranty related, the purchaser will be provided a quotation for repairs. If no purchase order is provided for repairs, the equipment will be returned freight collect. The purchaser is responsible for removal and installation. In event that replacement parts are issued for warranty related field repairs, parts will be invoiced at net value; original parts must be returned (freight collect) for failure evaluation. If evaluation reveals a warranty situation, a credit will be issued against the replacement parts invoice.

This warranty does not cover failure due to normal operating wear and tear or labor to diagnose, troubleshoot or repair. All products shall be regularly maintained and operated in accordance to the equipment's Installation, Operation and Instruction manual. The original warranty period is not renewed or extended by repair work or parts supplied after the original ship date.

This warranty does not cover damage due to abuse from side pulling of load, lack of preventative maintenance, eccentric loading, chemical exposure not specified in order, damage resulting from an accident, or damage resulting from improper storage or handling prior to placing the equipment in service. Failure of equipment to meet published performance specifications due to abnormal operating conditions beyond [R&M's](#) knowledge or control shall not be considered defective workmanship and/or material unless [R&M's](#) examination discloses such a defect. Correction of such defects shall constitute fulfillment of this warranty.

This warranty is void if parts or materials used in the repair or maintenance of [R&M's](#) equipment are not supplied or approved by [R&M](#). Any modification or change made by the Purchaser without [R&M's](#) written approval will void the warranty.

How to Order Repair Parts Correctly

The Spare Parts section of this manual covers replacement parts required for [R&M](#) equipment. To ensure prompt service, each repair parts order must contain the following information:

1. Equipment serial number
2. Capacity
3. Reference number from applicable bulletin or spare parts identification sheet
4. Quantity
5. Description
6. Correct shipping destination.



The serial number of your equipment is on the nameplate affixed to the equipment. Without this serial number, we cannot be sure of sending you the correct parts, so always mention the serial number for prompt service.

Minimum Charges

All orders for repair parts are subject to a minimum charge.

Claims for Damage in Shipment

All shipments are carefully inspected and are delivered to the carrier in good order. Upon receipt of shipment caution should be exercised so that there is no loss or damage. If damage has occurred, refuse to accept the shipment until the carrier makes the proper notation to that effect.

In the event of concealed loss or damage, notify the carrier immediately. By following these suggestions you will encounter less difficulty collecting your claim.

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1 General

Check that the equipment furnished corresponds with the details on the packing slip attached to the packaging.

Limit loads to half of the nominal load capacity during periods of extreme cold weather where the ambient temperature is less than 5°F [-15 °C].

1.1 Description



1.2 Start-up

Before operating the new unit, carry out the following start-up procedures:

- ❑ Read the attached WARNING tag or other legends affixed to the unit that includes cautionary language AGAINST:
 - 1) Lifting or pulling more than rated load;
 - 2) Operating unit when it is restricted from forming a straight line with the direction of loading;
 - 3) Operating unit with a lever extender;
 - 4) Operating damaged or malfunctioning unit;
 - 5) Lifting people or loads over people;
 - 6) Operating unit with twisted, kinked, or damaged chain;
 - 7) Removing or obscuring warning information.
- ❑ With a brush, oil the chain generously along the entire length.
- ❑ Make sure that the load chain is not twisted or kinked. If so, untwist the load chain before using.
- ❑ Grease the swivel joints of the hooks.
- ❑ Without load, carry out several raising and lowering operations using the entire length of the load chain.
- ❑ With load, carry out several raising and lowering operations using the entire length of the load chain.

1.3 Operating Procedures

The control functions (UP-NEUTRAL-DOWN) are clearly identified on the unit. The unit has a free-chaining (wheeling) capability, which allows the operator to adjust the load hook position when the unit is not under load. Free-chaining capability is activated when the operating control lever is in the neutral position.



1.4 Operating Practices

In addition to the Safe Operating Practices – Dos and Don'ts, it recommended that the following operating practices (taken in part from American National Standards ASME HST-3M) be adhered to when using a lever-operated puller.

- ❑ The supporting structure or anchoring means shall have a load rating at least equal to that of the hoist.
- ❑ The operator shall familiarize himself with the operation of the equipment and its proper care. If adjustments are necessary or damage is known, the unit must be removed from service and not used until corrections are made.
- ❑ Hoists shall be used only in locations that will allow the operator to be free of the load.
- ❑ The operator shall make sure that all people in the area are clear of the load.
- ❑ The operator shall not engage in any activity, which will divert his attention while operating the equipment.
- ❑ The operator shall not attempt to use free-chaining feature with any load on the unit. A load shall not be applied with the control function in the neutral position.
- ❑ The unit shall always be operated by hand power only and never operated with an extension on the lever.

1.5 Handling the Load

- ❑ The rated load shall not be exceeded.
- ❑ The load chain shall not be wrapped around the load.
- ❑ The load shall be attached to the load hook or attached by means of slings or other approved apparatus.
- ❑ Slings or other approved apparatus shall be seated properly in the saddle of the hook.
- ❑ Hook safety latch shall be closed before operating the unit.
- ❑ Hooks shall not be tip loaded
- ❑ Before lifting or pulling, the operator must be certain that
 1. Load chain is not twisted, kinked and is properly seated in the load wheel.
 2. Load is not caught on any obstructions,
 3. Clearance is available to avoid personal injury or property damage.
- ❑ Unit shall not be operated until the load block; chain and unit body are directly inline with the direction of loading to avoid side pull.
- ❑ Do not leave a loaded lever puller unattended at any time.

2 Packaging

The various models are delivered assembled and packed in cardboard boxes.



3 SAFE OPERATING PRACTICES - DOS AND DON'TS

3.1 DOS:

3.1.1 General

Read the manual carefully and always follow the recommendations, instructions, warning information, and make all people who will operate the equipment aware of these. Only use "original parts" when repairing or maintaining. Keep the manual near the equipment and readily available to the operator and the maintenance personnel at all times.

3.1.2 Transport / Storage

Handle the equipment by its structure either using the fittings provided for this purpose or in its original packaging. Store the equipment in a non-aggressive environment away from sources of dust or dampness etc. Regularly clean and protect from corrosion (oil, etc.).

3.1.3 Installation / Maintenance / Servicing

- Only trained and competent personnel may install and operate equipment.
- Ensure that safety regulations are complied with (safety harness, evacuation of work areas, warning signs, etc.).
- Verify the strength of the structure to which the equipment is to be attached.
- Carefully follow the installation instructions provided in the equipment's instruction manual.
- Establish an inspection program and maintain records of all maintenance carried out. Pay particular attention to hooks, pulley blocks, the chain, the brake, the end stops, etc.
- Replace any worn or suspect parts.
- Verify that all safety items are in good working order (brake, end stop, etc.) in accordance with the instruction manual.
- Regularly check the condition of the chain and hooks (joints, swivels, etc.).
- If any distortion or abnormal wear is observed, the parts concerned must be replaced.
- Keep the chain clean of debris and properly lubricated.
- Periodically check tightness of bolts and mounting hardware.
- Check that the chain is not twisted or damaged in any way.

3.1.4 During Use

- Before lifting ensure that the load is adequately attached to the hook. The hook safety latch must be properly closed. Balance the load before moving it. Avoid lifting the load from a single point, use appropriate accessories (slings, cross struts, etc.). Balance the load properly before handling.
- Make sure load clears neighboring stockpiles, machinery or other obstructions when moving the load. Take up slack slowly. Avoid swinging the load or load hook when traveling.
- Avoid hook tip loading.
- Be aware of and observe the safety rules while operating the equipment.
- Operate the equipment in normal environmental conditions.
- Equipment used outside should be adequately protected against the weather.
- Oil the chain regularly under no-load conditions.
- Inform maintenance personnel following any dangerous or unsafe operation of the equipment (strange noise, abnormal behavior, etc.).



3.2 DON'TS:

3.2.1 Transport / Storage

Do not put the equipment on anything without suitable support otherwise parts on the underside may become damaged.

3.2.2 Installation / Maintenance / Servicing

- Never modify the equipment without the authorization of the manufacturer.
- Never modify the values and adjustments of the safety devices beyond the ranges specified in the instruction manual or without the manufacturer's approval.
- Never override limiting or safety equipment.

3.2.3 During Use

- Do not allow the hook, whether its loaded or not, to pass over the heads of people below.
- Never attempt to move a load greater than the capacity indicated on the equipment.
- Remember that accidental impacts or snagging of the load being handled with surrounding objects may provoke an overload of the equipment.
- Never remove the safety latches.
- Never use the equipment to transport people.
- Do not touch any inappropriate moving parts.
- Never use the equipment if it is in an unsatisfactory condition (worn, bent, etc.).
- Do not use spare parts of unknown or doubtful origin.
- Never intentionally allow the load to tip over.
- Do not shock load the equipment.
- Do not constantly use the end stops as a means of stopping.
- Never use the lifting chain as a sling.
- Never attach a sling on the point of the hook (risk of hook being damaged and load falling).
- Never use the hook in a slanting position.
- Never twist the lifting chain (risk of pulley block turning over, etc.).
- Do not leave a load suspended unattended.
- Never use the equipment as a ground for welding.
- Do not use the equipment for a purpose or in a situation for which it is not designed.
- Do not use the safety devices as a means of measuring loaded weight.
- Do not jerk the load as this causes deterioration of the equipment.
- Never pull the load sideways, always center equipment over the load before moving it.

4 Inspections

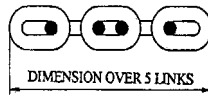
4.1 Load Chain Inspection

Check the condition of the load chain regularly. Never use the equipment if any of its links are cracked or deformed. Link wear must not exceed 10 % of the specified diameter of the load chain.

Measure the load chain over 5 links + 2 diameters as shown below in the Load Chain Technical Specification section. Compare the measurement with the appropriate value of the Dimension over 5 links + 2 diameters for a new load chain.

Replace the unit if the link wear exceeds 10 %.

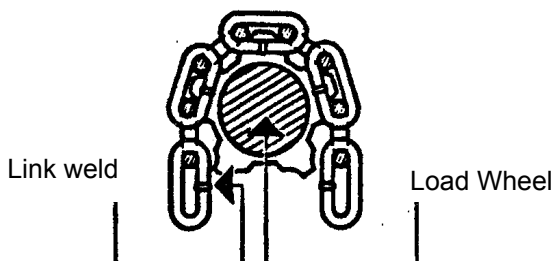
4.1.1 Load Chain Certificate



Capacity	¼ Ton	¾ Ton	1 ½ Ton	3 Ton
	250 kg	750 kg	1500 kg	3000 kg
Chain diameter x pitch	4 x 12	6 x 18	7.1 x 21	10x30
Grade	80	80	80	80
Class	T	T	T	T
Minimum breaking strain (N/mm ²)	900	900	900	900
Standard	DIN 5684-5	DIN 5684-5	DIN 5684-8	DIN 5684-8
Safe load limit on 1 fall (kg)	250	750	1500	3000
Breaking load (kN)	32.8	49	63.5	147
Min. total elongation over 7 links	10%	10%	10%	10%
Dimension over 5 links + 2 diameters (mm) / (inch)	68 (+0/-0.16) 2.677 (+0/0.006)	102 (+0/-0.6) 4.016 (+0/-0.0236)	119.2 (+0/- 0.8) 4.693 (+0/-0.0315)	170 (+0.74/- 0.37) 6.693 (+0.0291/-0.0146)
Weight (kg) per meter	0.235	0.78	1.09	2.17
Weight (lb) per foot	0.16	0.52	0.73	1.46

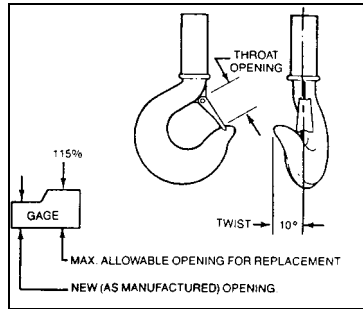
4.1.2 Load Chain Installation

- 1) Release the control lever.
- 2) Take a flexible wire of about 20 inches (50 cm) in length and insert it into the lifting head axle until it comes out on the other side.
- 3) Hook the chain onto the end of the wire on the load side.
- 4) Pull the wire to bring the chain in contact with the load wheel while checking the position of the vertical links. **The link weld must be on the inside.** (See figure)
- 5) Regulate the chain tension.
- 6) Engage the control lever.
- 7) Adjust the chain.
- 8) Reinstall the end stop ring.



4.2 Hook Inspection

Check the hooks for deformation or cracks. The hooks must be replaced if the throat opening has increased by more than 15%, or if the throat opening has more than 10-degree twist from the plane of the unbent hook.



Due to many types and sizes of hooks that can be furnished and specified by the user, it is recommended that the user measure the actual throat opening of the hook as originally furnished and record it on the above sketch and retain for a permanent record. This record can then be used for determining when the hook must be replaced due to deformation or excessive throat opening.

Note: Any hook that is twisted or has a throat opening in excess of normal indicates abuse or overloading of the unit. Other load bearing components shall be checked for damage.

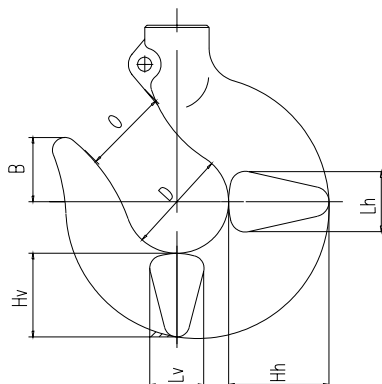
Safety latches shall be replaced if bent or broken to the extent that they no longer provide proper closure of the throat opening of the hook.

CAUTION

Repairing hooks by welding or reshaping is strictly forbidden.

4.3 Hook Certificate

Hook I.D.	Load Capacity		Load Test	Minimum Breaking Load	D	O	B	H _h	L _h	H _v	L _v
	Ton	kg	lbs [kg]	lbs [kg]	in [mm]	in [mm]	in [mm]	in [mm]	in [mm]	in [mm]	in [mm]
13S	¼	250	1102 [500]	2204 [1000]	1.043 [26.5]	0.835 [21.2]	0.669 [17]	0.787 [20]	0.476 [12.1]	0.669 [17]	0.429 [10.9]
19S	¾	750	4409 [2000]	8818 [4000]	1.476 [37.5]	1.181 [30]	0.929 [23.6]	1.319 [33.5]	0.811 [20.6]	1.102 [28]	0.728 [18.5]
21S	1 1/2	1500	6614 [3000]	13228 [6000]	1.673 [42.5]	1.319 [33.5]	1.043 [26.5]	1.575 [40]	0.957 [24.3]	1.319 [33.5]	0.858 [21.8]
24S	3	3000	13228 [6000]	26456 [12000]	1.968 [50]	1.575 [40]	1.240 [31.5]	2.028 [51.5]	1.240 [31.5]	1.720 [43.7]	1.102 [28]





5 Preventative Maintenance

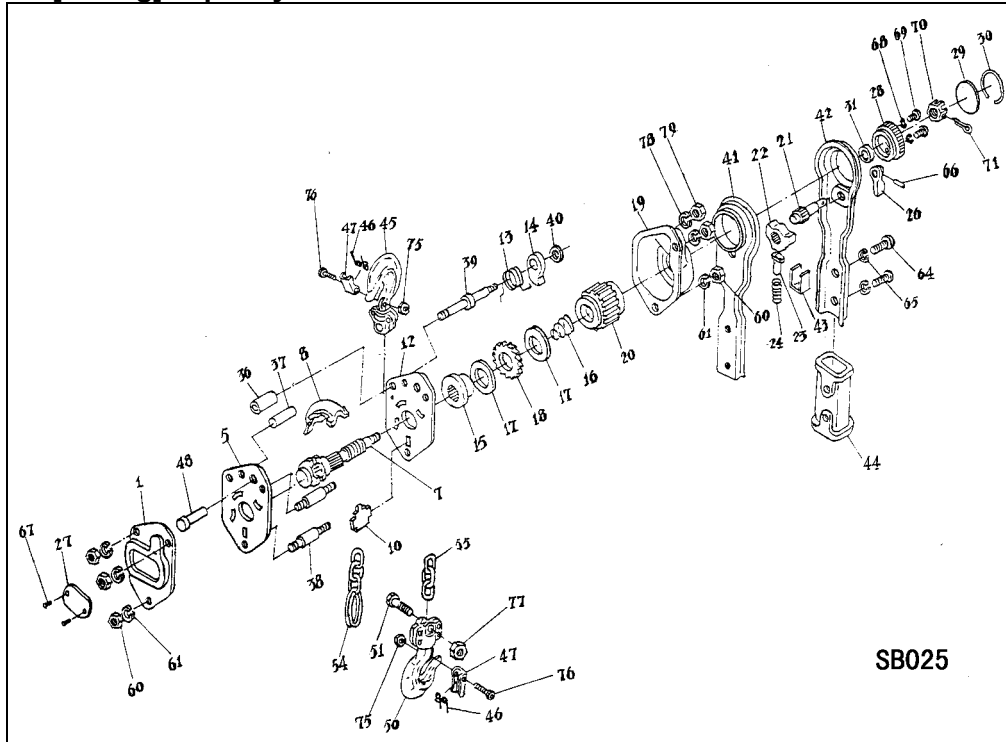
The maintenance and inspection intervals are based on normal duty under normal operating conditions (free from excessive dust, moisture, and corrosive fumes). If the duty is heavier or the environment more severe, the maintenance and inspection intervals should be more frequent.

Interval	Type of Check	Inspection / Maintenance
1 month	Visual examination	<ul style="list-style-type: none">✓ Check the external condition of the unit✓ Check the condition of mechanism✓ Check the condition of the load chain and the attachments✓ Check the condition of the hooks✓ Check the condition of the hook safety latch✓ Check the condition of accessories✓ Clean the dust from the equipment✓ Check the greasing:✓ Lubricate the load chain with a brush (oil grade SAE 80)✓ Use oil to lubricate the heads of the hooks
6 month	In-depth examination	<ul style="list-style-type: none">✓ Check the operation of the brake✓ Check the condition of the load wheel✓ Inspect the load chain for wear or distortion✓ Inspect the hooks for wear or distortion
12 month	Maintenance	<ul style="list-style-type: none">✓ Open the gear cover and grease the gears

Always keep the chain clean and free of debris. Clean as necessary with paraffin or diesel, drain and re-oil. Do not clean the chain with thinners or degreasing agents under any circumstances.

6 Spare Parts

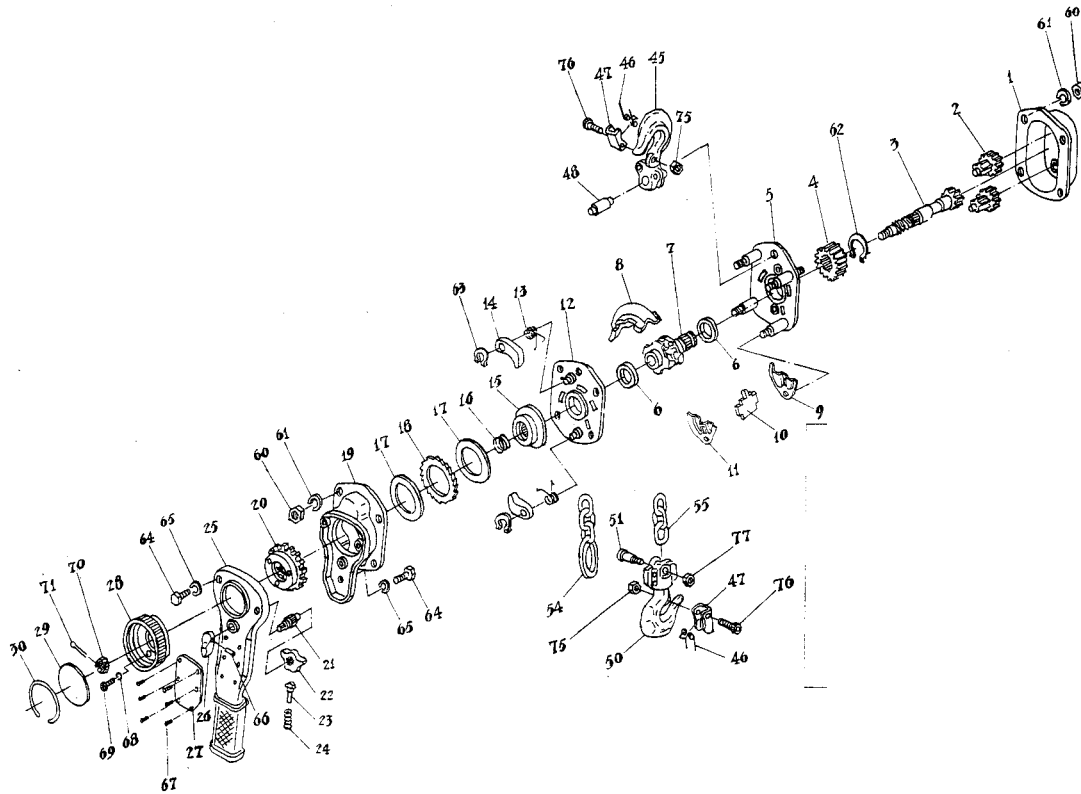
6.1 ¼ ton [250 kg] capacity unit



Item	Description	Part Number	Qty	Item	Description	Part Number	Qty
1	Cover		1	40	Washer		1
5	Side Plate A		1	41	Lever handle assembly A		1
7	Load shaft		1	42	Lever handle assembly B		1
8	Guide plate		1	43	Spring seat		1
10	Stripper		1	44	Handle rubber grip		1
12	Side plate B		1	45	Top hook assembly	52291854	1
13	Pawl spring		1	46	Double spring		1 / hook
14	Pawl		1	47	Safety latch	52308671	1 / hook
15	Disk hub		1	48	Top pin		1
16	Free spring		1	50	Load hook assembly	52291849	1
17	Friction disk		2	51	Chain pin		1
18	Ratchet disk		1	54	Chain ring		1
19	Brake cover		1	55	Load chain 4 x 12	52288022	Specify lift
20	Change over gear		1	60	Hexagon nut M6		5
21	Selector shaft		1	61	Spring washer 6		5
22	Change over pawl		1	64	Screw M6×20		2
23	Spring shaft		1	65	Spring washer 6		2
24	Change over spring		1	66	Spring pin 2×12		1
26	Selector lever		1	67	Rivet 2×5		2
27	Name plate		1	68	Spring washer 4		3
28	Hand wheel		1	69	Screw M4×10		3
29	Indicator cap		1	70	Castle nut M8		1
30	Retainer wire		1	71	Split pin 2×16		1
31	Bushing		1	75	Prevailing torque type nut M3		2
36	Bushing		1	76	Screw M3×18		2
37	Special pin		1	77	Prevailing torque type nut M5		1
38	Stay bolt A		2	78	Spring washer 5		1
39	Stay bolt B		1	79	Hexagon nut M5		1

Items without part numbers are non-stock replacement items.

6.2 3/4 ton [750 kg] and higher capacity units



Item	Description	Part Number	Qty	Item	Description	Part Number	Qty
1	Gear case assembly		1	45	Top hook assembly 1 1/2 ton 1500 kg]	52291857	1
2	Driven shaft assembly		2	45	Top hook assembly 3 ton [3000 kg]	52291858	1
3	Drive shaft		1	46	Double spring		1/ hook
4	Splined gear		1	47	Safety latch 3/4 ton [750 kg]	52308673	1/ hook
5	Side Plate assembly A		1	47	Safety latch 1 1/2 ton [1500 kg]	52308674	1/ hook
6	Bushing		2	47	Safety latch 3 ton [3000 kg]	52308676	1/ hook
7	Load sheave		1	48	Top pin		1
8	Guide plate		1	50	Load hook assembly	52291851	1
9	Chain leader A		1	50	Load hook assembly	52291697	1
10	Stripper		1	50	Load hook assembly	52291853	1
11	Chain leader B		1	51	Chain pin		1
12	Side plate assembly B		1	54	Chain ring		1
13	Pawl spring		2	55	Load chain 6 x 18	900545	
14	Pawl		2	55	Load chain 7.1 x 21	52288023	
15	Disk hub		1	55	Load chain 10 x 30	52288024	
16	Free spring		1	60	Hexagon nut M8		8
17	Friction disk		2	61	Spring washer 8		8
18	Ratchet disk		1	62	Snap ring 26		1
19	Brake cover assembly		1	63	Snap ring 8		2
20	Change over gear		1	64	Screw M6x10		3
21	Selector shaft		1	65	Spring washer 6		3
22	Change over pawl		1	66	Spring pin 2.5x18		1
23	Spring shaft		1	67	Rivet 2.5x6		6
24	Change over spring		1	68	Spring washer 5		3
25	Lever handle assembly		1	69	Screw M5x10		3
26	Selector lever		1	70	Castle nut M10		1
27	Name plate		1	71	Split pin 2.5x20		1
28	Hand wheel		1	75	Prevailing torque type nut M3		2
29	Indicator cap		1	76	Screw M3x18		2
30	Retainer wire		1	77	Prevailing torque type nut M8		1
45	Top hook assembly 3/4 ton [750 kg]	52291855	1				

Items without part numbers are non-stock replacement items.