

15122023-2.0



MANUAL GEAR HOIST TRSH type C OPERATING MANUAL



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1. Precautions

This manual provides important information for all personnel involved with the safe installation, operation and proper maintenance of this product. Even if you feel you are familiar with this or similar equipment, you should read this manual before operating the product.

Safe Operating Instructions are provided to make an operator aware of unsafe practices to avoid and are not necessarily limited to the following list. Refer to specific sections in the manual for additional safety information.

1. Only allow people, trained in safety and operation of this product, to operate the hoist.

2. Only operate a hoist if you are physically fit to do so.

3. When a "DO NOT OPERATE" sign is placed on the hoist, do not operate the hoist until the sign has been removed by designated personnel.

4. Before each shift, the operator should inspect the hoist for wear or damage.

5. Never use a hoist which inspection indicates is worn or damaged.

6. Periodically, inspect the hoist thoroughly and replace worn or damaged parts.

Refer to the "INSPECTION" section on page

7. Lubricate the hoist regularly. Refer to the "LUBRICATION" section on page 7.

8. Do not use hoist if hook latch has been sprung or broken.

9. Check that the hook latches are engaged before using.

10. Never splice a hoist chain by inserting a bolt between links.

11. Only lift loads less than or equal to the rated capacity of the hoist. Refer to the "SPECIFICATIONS" section on page 3. When using two hoists to suspend one load, select two hoists each having a rated capacity equal to or more than the load. This provides adequate safety in the event of a sudden load shift.

13. Never place your hand inside the throat area of a hook.

14. Never use the hoist load chain as a sling.

15. Never operate a hoist when the load is not centered under the hook. Do not "side pull" or "yard."

16. Never operate a hoist with twisted, kinked, "capsized" or damaged load chain.

17. Do not force a chain or hook into place by hammering.

18. Never insert the point of the hook into a chain link.

19. Be certain the load is properly seated in the saddle of the hook and the hook latch is engaged.

20. Do not support the load on the tip of the hook.

21. Never run the load chain over a sharp edge. Use a sheave.

22. Pay attention to the load at all times when operating the hoist.

23. Always ensure that you, and all other people, are clear of the path of the load.

Do not lift a load over people.

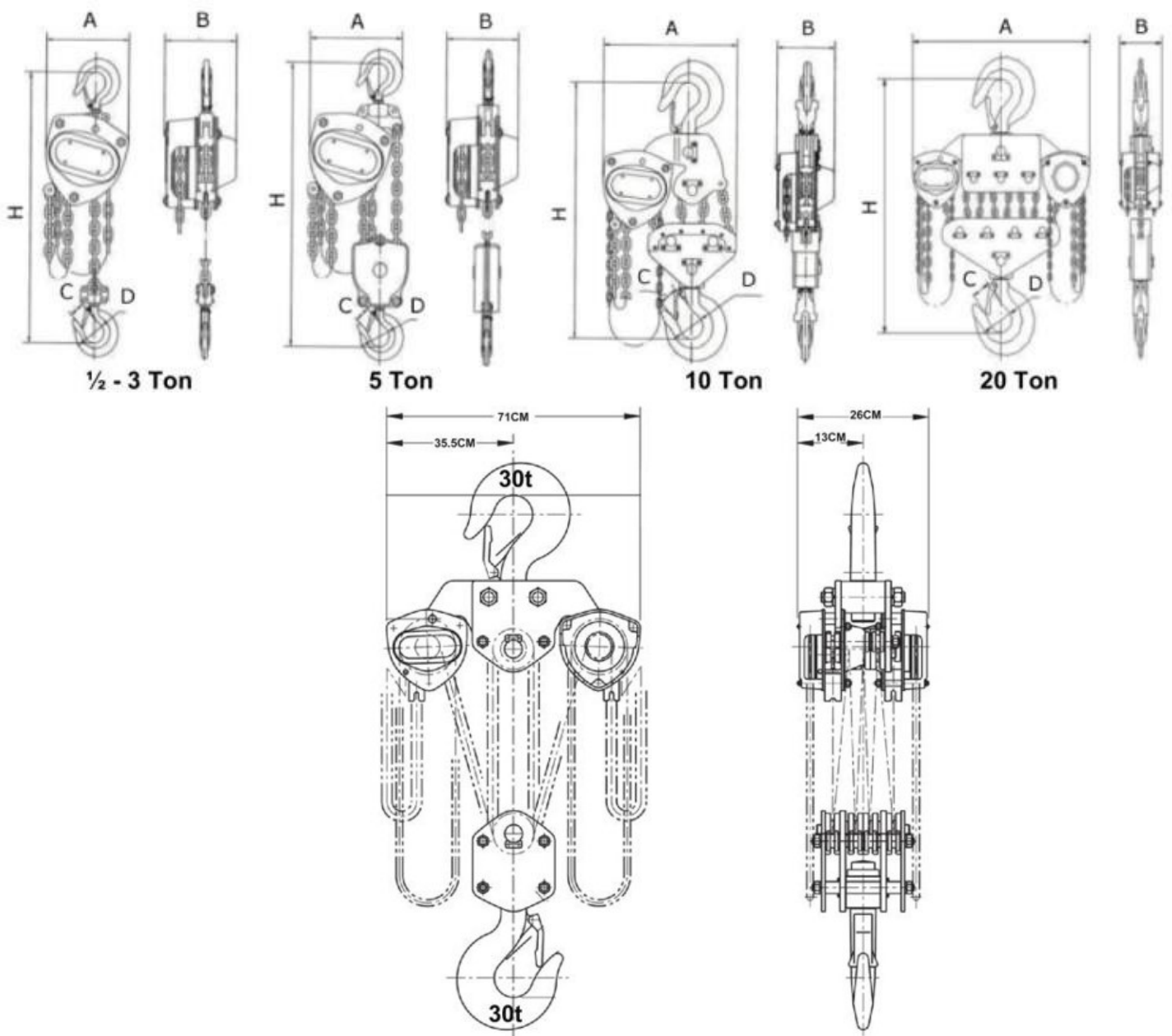
24. Never use the hoist for lifting or lowering people, and never allow anyone to stand on a suspended load.

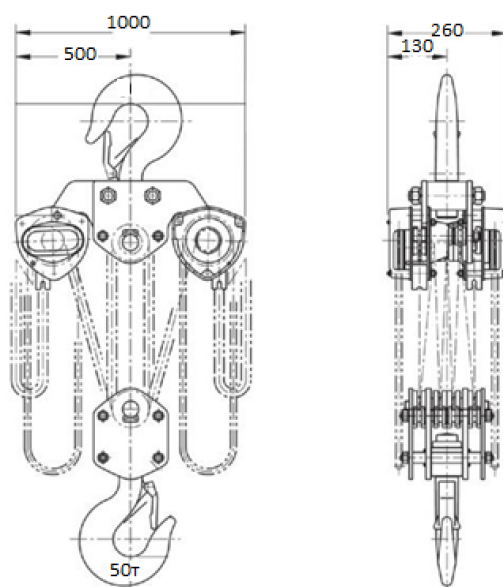
25. Ease the slack out of the chain and sling when starting a lift. Do not jerk the load.

26. Do not swing a suspended load.
27. Never weld or cut on a load suspended by the hoist.
28. Never use the hoist chain as a welding electrode.
29. Do not operate hoist if chain jumping, excessive noise, jamming, overloading, or binding occurs.
30. Only operate the hoist with manual power.
31. After use, or when in a non-operational mode, the chain hoist should be secured against unauthorized and unwarranted use.
32. Do not leave a load suspended when the hoist is unattended or not in use.

2. Description of the Product

2.1 Main characteristics





Item No.	Lifting capacity, t	Lifting height, m	Dimensions, mm			Arm force, kg	Thickness of power chain, mm	Pitch of the power chain link, mm	Weight, kg
			H	B	A				
1010531	0,5	3	242	130	152	17	6	18	10,4
1010561		6							15,5
1010591		9							20,6
10105121		12							25,7
101051218		18							30,8
-----		24							35,9
1006404	1,0	2,5	242	130	152	34	6	18	9,9
101131		3							10,4
101161		6							15,5
101191		9							20,6
1011121		12							25,7
1011181		18							30,8
-----	24	35,9							
1006405	1,5	6	370	130	152	34	6	18	19,9
101231	2,0	3	370	130	152	34	6	18	13,4
101261		6							20,9
101291		9							28,4
1012121		12							35,9
1012181		18							43,4
-----		24							50,9
101331	3,0	3	455	143	183	39	8	24	22,5
101361		6							33,6
101391		9							44,7
1013121		12							55,8
1013181		18							66,9
-----		24							78,0
101531	5,0	3	570	165	216	42	10	30	36,0
101561		6							51,9
101591		9							67,8

Item No.	Lifting capacity, t	Lifting height, m	Dimensions, mm			Arm force, kg	Thickness of power chain, mm	Pitch of the power chain link, mm	Weight, kg
			H	B	A				
1015121		12							83,7
1015181		18							99,6
-----		24							115,5
1011031	10,0	3	700	165	360	42	10	30	68,0
1011061		6							97,1
1011091		9							126,2
10110121		12							155,3
10110181		18							184,4
1012031	20,0	3	1000	173	625	42x2	10	30	150,0
1012061		6							208,2
1012091		9							266,4
10120121		12							324,6
1002191	30	6	1000	260	710	44x2	10	30	258,0
1002193		9							343,0
1002194		12							435,0
1002192	50,0	6	1900	260	1000	44x2	10	30	790,0
1002195		9							1080,0
1002196		12							1350,0

2.2 Description

Hoists are designed to provide a 4:1 safety factor. The supporting structures and load-attaching devices used in conjunction with this hoist must provide adequate support to handle all hoist operations, plus the weight of the hoist and attached equipment. If in doubt, consult a registered structural engineer. The manual chain hoist must be used in a vertical position to provide a straight line pull from top hook to bottom hook. The hoist must be positioned so that it does not contact the support members when in use. When operating in limited areas suitable lifting attachments or slings must be used to prevent the hoist body and hand chain from being obstructed

- Ensure the hoist top hook is properly installed on the support member and the hook latch is engaged.

Operate the hoist with a test load (10% of rated capacity) by raising and lowering this load several times. Verify the brake operation by lowering the same load to check load does not slip when lowering stops.

NOTICE

- Each time a load is lifted, the operation of the load brake should be checked by raising the load slightly and stopping to ensure the brake will hold the load before proceeding to lift the load.

Familiarize operators and people responsible for hoist installation and service with ASME B30.16 specifications prior to placing the unit into service. All the requirements of this specification, including testing should be met before approving the hoist for operation.

3. Operation

The four most important aspects of hoist operation are:

1. Follow all safety instructions when operating the hoist.
2. Allow only personnel trained in safety and operation of this hoist to operate hoist.
3. Subject each hoist to a regular inspection and maintenance procedure.
4. Be aware of hoist capacity and weight of load at all times.

WARNING

- Hoist is not designed or suitable for lifting, lowering or moving persons. Never lift loads over people.

Hoist Operation

When facing hand chain side of hoist:

1. Pull down on the right hand chain (clockwise) to raise load.
2. Pull down on the left hand chain (counterclockwise) to lower load.

NOTICE

- The clicking sound of the pawl on the ratchet gear is normal when a load is being raised.

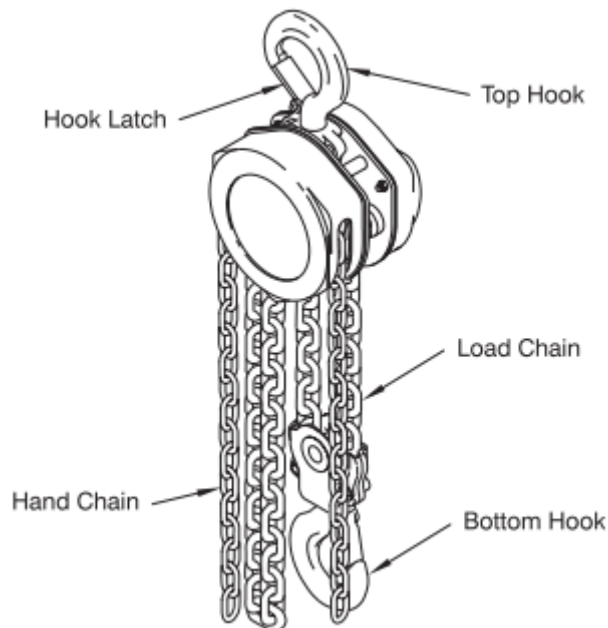
Slip Clutch Operation

Hoists are equipped with a slip clutch. When trying to lift a load that exceeds capacity of hoist the hand chain will rotate in the hoist body but the load will not be lifted.

It is important to keep the slip clutch properly adjusted. Refer to the "MAINTENANCE" section for the proper procedure.

Storing the Hoist

1. Always store hoist in a no load condition.
2. Wipe off all dirt and water.
3. Oil the chain, hook pins and hook latch pins.
4. Hang in a dry place.
5. Before returning hoist to service follow instructions for "Hoists Not in Regular Use" in the "INSPECTION" section.



Records should be maintained documenting the condition of load chain removed from service as part of a long-range load chain inspection program. Accurate records will establish a relationship between visual observations noted during frequent inspections and the actual condition of the load chain as determined by periodic inspection methods.

4. Inspection

4.1 Frequent Inspection

Manual Chain Hoists should be inspected at the beginning of each shift. Visual inspections should also be conducted during regular service for any damage or evidence of malfunction which appears between regular inspections.

1. Operation. Check for visual signs or abnormal noises which could indicate a potential problem. Do not operate a hoist unless the load chain feeds through the hoist and hook block smoothly. Listen for "clicking", binding or malfunctioning.

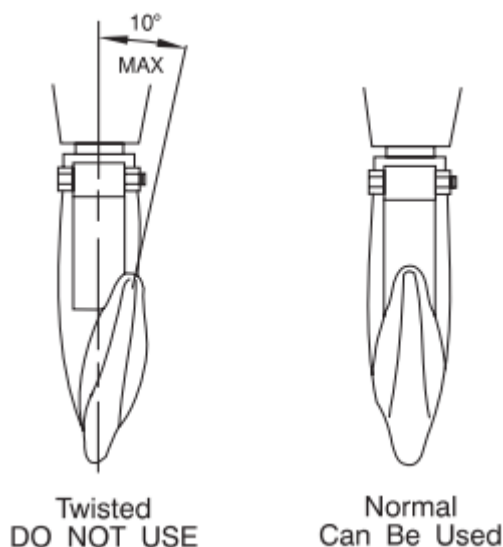
The clicking sound of the pawl on the ratchet gear is normal when a load is being raised. If chain binds, jumps, or is excessively noisy, clean and lubricate the chain. If problem persists, the chain and load sheave may have to be replaced.

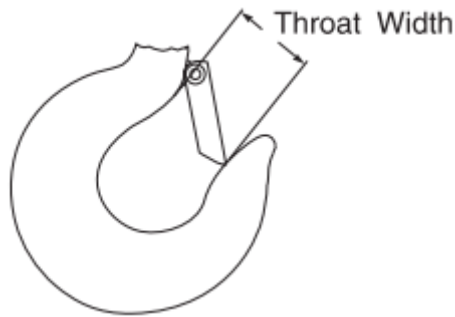
Do not operate the hoist until all problems have been corrected. Check that hand chain moves freely without binding or excessive drag. Load chain travel should stop when hand chain stops moving.

2. Hooks. Check for wear or damage, increased throat width, bent shank or twisting of hook. Replace hooks which exceed the throat opening discard width (15%) shown in Table 1 (refer to Dwg.) or exceed a 10° twist (refer to Dwg.). If the hook latch snaps past the tip of the hook, the hook is sprung and must be replaced. Check hooks swivel easily and smoothly. Repair or lubricate as necessary.

3. Hook Latches. Check operation of the hook latches. Replace if broken or missing.

4. Chain. Refer to Dwg. Examine each link for bending, cracks in weld areas or shoulders, transverse nicks and gouges, weld splatter, corrosion pits, striation (minute parallel lines) and chain wear, including bearing surfaces between chain links. Replace a chain that fails any of the inspections. Check lubrication and lubricate if necessary. Refer to "Load Chain" in "LUBRICATION" section.





Model No.	Normal		Discard	
	in	mm	in	mm
0,5	0.94	24	1.09	27.6
1,0	1.00	26	1.18	30
1,5	1.10	33	1.50	38
2,0				
3,0	1.50	39	1.76	44.8
5,0	1.89	48	2.17	55.2

4.2 Periodical inspection

1. Fasteners. Check rivets, capscrews, nuts, cotter pins and other fasteners on hooks and hoist body. Replace if missing and tighten or secure if loose.

2. All Components. Inspect for wear, damage, distortion, deformation and cleanliness. If external evidence indicates the need, disassemble. Check gears, shafts, bearings, sheaves, chain guides, springs and covers. Replace worn or damaged parts. Clean, lubricate and reassemble.

3. Hooks. Inspect hooks for cracks. Use magnetic particle or dye penetrant to check for cracks. Inspect hook retaining parts. Tighten, repair or replace if necessary.

4. Chain Sheaves. Check for damage or excessive wear. Replace if necessary.

5. Brake. Ensure proper operation. Brake must hold hoist rated capacity. If load test indicates the need, disassemble. Brake discs must be free of oil, any grease, unglazed and uniform in thickness. Refer to "MAINTENANCE" section for allowable brake disc wear. Check all other brake surfaces for wear, deformation or foreign deposits. Inspect gear teeth, pawl and pawl spring for damage. Check that brake pawl stops counterclockwise rotation of ratchet gear. Clean and replace damaged components as necessary.

6. Supporting Structure. If a permanent structure is used, inspect for continued ability to support load.

7. Labels and Tags. Check for presence and legibility. Replace if necessary.

8. End Anchor. Ensure end anchor is installed and unbent. Replace if missing or damaged. Refer to "Attaching End of Load Chain" in the "MAINTENANCE" section.

9. Load Chain. Measure the chain for stretching by measuring across five link sections all along the chain length. Refer to Dwg. When any five links in the working length reach or exceed the discard length shown in Table 2, replace the entire chain. Always use a genuine

Ingersoll Rand replacement chain.

Chain Size	Normal Length		Discard Length	
	in	mm	in	mm
5 x 15	2.95	75	3.03	77
6 x 18	3.54	89.9	3.63	92.2
7 x 21	4.17	106	4.28	108.7
8 x 24	4.72	119.9	4.84	122.9
10 x 30	5.91	150.1	6.03	153.2
9 x 27.2	5.35	136	5.47	139

4.3 Hoists not in regular use

1. Hoists which have been idle for a period of one month or more, but less than one year should be given an inspection conforming with the requirements of "Frequent Inspection" before being placed in service.

2. Hoists which have been idle for a period of over one year should be given a complete inspection conforming with the requirements of "Periodic Inspection" before being placed in service.

3. Standby hoists should be inspected at least semiannually in accordance with the requirements of "Frequent Inspection".

Remove nuts on gear cover.

2. Remove old grease and replace with new. For temperatures -20° to 50° F (-29° to 10° C) use EP 1 grease or equivalent.

For temperatures 30° to 120° F (-1° to 49° C) use EP 2 grease or equivalent.

Load Chain

WARNING

• Failure to maintain clean and well lubricated load chain may result in chain failure causing injury, death or substantial property damage.

1. Lubricate each link of the load chain weekly. Apply new lubricant over existing layer.

2. In severe applications or corrosive environments, lubricate more frequently than normal.

3. Lubricate hook and hook latch pivot points with the same lubricant used on the load chain.

4. To remove rust or abrasive dust build-up, clean chain with acid free solvent. After cleaning, lubricate the chain.

5. Use Ingersoll Rand LUBRI-LINK-GREEN®.

5. Troubleshooting

This section provides basic troubleshooting information. Specific causes to problems are best identified by thorough inspections performed by personnel instructed in safety, operation and maintenance of this equipment. The chart below provides a brief guide to common hoist symptoms, probable causes and remedies.

Malfunction	Cause	Remedy
Hoist will not operate.	Hoist is overloaded.	Reduce load to within rated capacity.
Slip clutch not adjusted.	Adjust slip clutch. Refer to "MAINTENANCE" section.	
Load continues to move when hoist is stopped.	Brake is slipping.	Check brake adjustment and brake disc wear. Check brake discs are clean.
Hoist is overloaded.	Reduce load to within rated capacity.	
Load chain binds.	Damaged load chain, pinion shaft, gears or sheaves.	Disassemble hoist, inspect and repair or replace damaged components. Refer to "MAINTENANCE" section.
Load chain not installed properly (twisted, kinked or "capsized")	Remove load chain and reinstall.	
Hand chain binds.	Damaged hand chain, hand chain wheel, pinion shaft, gears, load chain, sheaves.	Disassemble hoist, inspect and repair or replace damaged components.
Hand chain not installed properly (twisted or kinked).	Remove hand chain and reinstall.	
Load hook latch does not work.	Latch broken.	Replace hook latch.
Load hook bent or twisted.	Inspect load hook as described in "INSPECTION" section. Replace if necessary	

6. Maintenance

Never perform maintenance on the hoist while it is supporting a load.

- Before performing maintenance, tag hoist:

DANGER - DO NOT OPERATE - EQUIPMENT BEING REPAIRED.

- Only allow personnel trained in the operation and service of this product to perform maintenance.

Installing New Load Chain

WARNING

- To prevent a falling load, which can cause death, injury or property damage, the hook must be on left fall of load chain and right fall must be attached to hoist body with anchor pin and anchor hanger. Right and left designations are as viewed from the hand chain side of the hoist.

NOTICE

- Do not remove the old load chain from the hoist. The old load chain can be used to install the new load chain.

1. Remove end of load chain from anchor pin.

- a. 1/2 to 3 ton units are single fall hoists. The load end of the load chain is anchored to the bottom hook assembly.

To disconnect the load chain from the bottom hook assembly, remove anchor pin and nut. On bottom hook remove spring and pin.

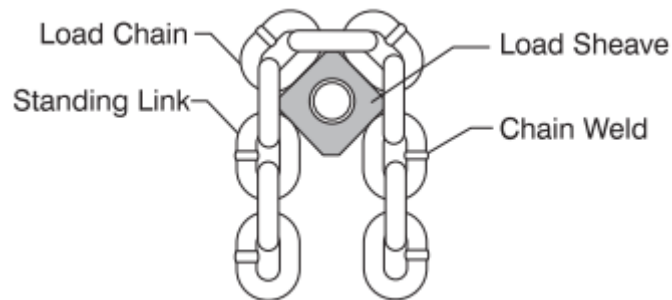
- b. 5 ton units are double chain fall hoists. The load end of the load chain is anchored to suspension plates. To disconnect load chain from suspension plates remove anchor bolt assembly.

2. Make a "C" link in new load chain by grinding through one side of the end link. Refer to Dwg. To avoid twisting, the load chain on 2, 3 and 5 ton units must have an odd number of links, not counting the "C" link.



"C" Link

3. Using a "C" link, join the old load chain to the new load chain. (If the old load chain was installed correctly, the "C" link assures end link of new load chain will be correctly reeved through the hoist.) Be sure welds of "standing" links on the new load chain are facing away from the hoist load sheave.



4. Run the new chain to its anchor point. On smaller units, use the hand chain to move the load chain. On larger units, load chain installation can be speeded up by removing gear cover, support plate and taking out gears. With the gears removed, the load chain can be pulled by hand through the hoist body and hook blocks. Reinstall gears, support plate, and gear cover.

5. Remove "C" link and old chain.

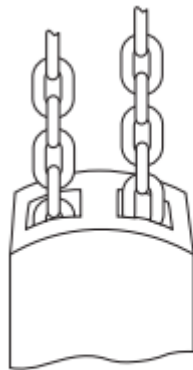
6. On 1/2, 1 and 1-1/2 ton hoists, anchor load chain to bottom hook assembly. On 2, 3 and 5 ton units, secure load chain to suspension plates using anchor bolt assembly. For information on connecting unloaded end of load chain, refer to 'Attaching End of Load Chain' section.

7. Check for the following:

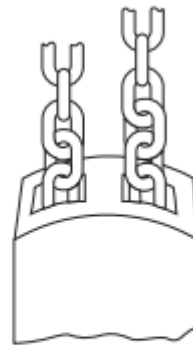
- a. Load chain did not become twisted, when reeving the load chain between the

idler sheave on the bottom hook assembly and the hoist load sheave. Refer to Dwg.

b. Make sure load chain is reeved between load sheave and chain guides



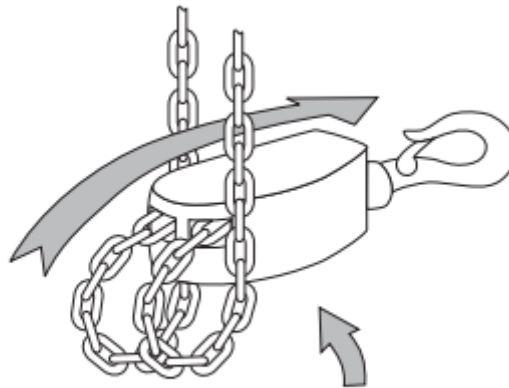
Appearance of chain that is Not Twisted



Appearance of chain that Is Twisted

On 2, 3 and 5 ton hoists, ensure load chain is not twisted, kinked or "capsized".

Capsized Hook



Make certain the bottom block has NOT been flipped through the chain falls

General Disassembly

The following instructions provide the necessary information to disassemble, inspect, repair, and assemble the hoist. Parts drawings of the hoist assembly are provided in the parts section. If a hoist is being completely disassembled for any reason, follow the order of the topics as they are presented. It is recommended that all maintenance work on the hoist be performed on a bench.

In the process of disassembling the hoist, observe the following:

1. Never disassemble the hoist any further than is necessary to accomplish the needed repair. A good part can be damaged during the course of disassembly.
2. Never use excessive force when removing parts. Tapping gently around the perimeter of a cover or housing with a soft hammer, for example, is sufficient to break the seal.
3. Do not heat a part with a flame to free it for removal, unless the part being heated is already worn or damaged beyond repair and no additional damage will occur to other parts. In general, the hoist is designed to permit easy disassembly and assembly. The use of heat or excessive force should not be required.

4. Keep the work area as clean as practical, to prevent dirt and other foreign matter from getting into bearings or other moving parts.

5. When grasping a part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members, machined surfaces and housings.

6. Do not remove any part which is press fit in or on a subassembly unless the removal of that part is necessary for repairs or replacement.

Disassembly

Accessing Gear End

1. Remove the three nuts from gear cover.
2. Remove gear cover.
3. Remove nuts along with lockwashers from support plate .
4. Remove support plate, gears and bearings.
5. Remove retainer ring from load sheave and pry off gear.

Accessing Brake End

1. Remove the three nuts and screws from handwheel cover.
2. Remove handwheel cover.
3. Remove cotter pin and nut from pinion shaft.
4. Secure load sheave to prevent rotation and unscrew handwheel from pinion shaft.

Handwheel is left hand (counterclockwise) threaded.

5. Remove brake discs and ratchet disc.
6. Secure load sheave to prevent rotation and unscrew brake hub from pinion shaft.

NOTICE

• If ratchet pawls or springs are damaged or not functioning then remove retainer ring and replace damaged parts.

Slip Clutch Disassembly

1. Remove cotter pin and nut.
2. Pull handwheel/slip clutch assembly off of pinion shaft.
3. Remove nut from support and separate support, spring and single cone.
4. Remove screws and carefully pry double cone off of handwheel.

Accessing Load Sheave

Follow steps 1 through 5 in 'Accessing Gear End' and steps 1 through 6 in 'Accessing Brake End', then steps below.

1. Remove nuts and lockwashers from side plate.
2. Pull side plate away from studs in side plate.
3. Remove the top hook assembly, roller bearings, two-chain guides, chain stripper, and anchor hanger.
4. Lift load sheave from side plate. Being careful to catch roller bearings as they become free.

Bottom Hook Disassembly (2, 3 and 5 ton)

1. Remove three capscrews, lockwashers and nuts.
2. Separate plates and remove hook.
3. Lift out sheave assembly. Carefully slide idler sheave shaft from idler sheave and

remove rollers.

Cleaning, Inspection and Repair

Use the following procedures to clean and inspect the components of the hoist.

Cleaning

Clean all hoist component parts in an acid free solvent (except for the brake disc). The use of a stiff bristle brush will facilitate the removal of accumulated dirt and sediments on the gears and frames. Dry each part using low pressure, filtered compressed air.

Inspection

All disassembled parts should be inspected to determine their fitness for continued use. Pay particular attention to the following:

1. Inspect all gears for worn, cracked, or broken teeth.
2. Inspect shafts for ridges caused by wear. If ridges caused by wear are apparent on shafts, replace the shaft.
3. Inspect all threaded items and replace those having damaged threads.
4. Measure the thickness of the brake discs. If brake discs do not have uniform thickness or are less than the discard dimension shown in Table 3: Brake Disc Chart, replace brake discs.

Table 3: Brake Disc Chart

	1/2 - 5 ton	
	in	mm
Normal	0.10	2.5
Discard	0.075	1.875

5. Inspect ratchet pawls and springs on side plate assembly. Replace parts if pawls and or springs are damaged or fail to operate.

Repair

Actual repairs are limited to the removal of small burrs and other minor surface imperfections from gears and shafts. Use a fine stone or emery cloth for this work.

1. Worn or damaged parts must be replaced. Refer to the applicable parts listing for specific replacement parts information.
2. Inspect all remaining parts for evidence of damage. Replace or repair any part which is in questionable condition. The cost of the part is often minor in comparison with the cost of redoing the job.
3. Smooth out all nicks, burrs, or galled spots on shafts, bores, pins, and bushings.
4. Examine all gear teeth carefully, and remove nicks and burrs.
5. Polish the edges of all shaft shoulders to remove small nicks which may have been caused during handling.
6. Remove all nicks and burrs caused by lockwashers.

Assembly

Load Sheave Assembly

1. Apply grease to roller bearings and position them in the groove of the bearing

race located on the gear end of the load sheave.

2. Install load sheave in side plate, ensure roller bearings remain in position.

3. Install two-chain guides, chain stripper assembly, anchor hanger assembly, and top hook assembly in side plate.

4. Apply grease to the second set of roller bearings and position them in groove of the bearing race located on the plain end of the load sheave. The same number of roller bearings must be used on either side of the load sheave.

5. Carefully install side plate assembly to engage the locating diameters of parts installed in steps 3 and 4. Ensure all roller bearings remain in position.

6. Install lockwashers and nuts and tighten. Slip Clutch Assembly

1. Place double cone onto pins in handwheel and press until seated.

2. Insert screws through double cone and tighten.

3. Insert single cone into double cone along with spring.

4. Insert support through backside of double cone. Thread nut onto support loosely.

5. Slide this assembly onto pinion shaft and secure with nut and cotter pin.

6. Refer to 'Adjusting Slip Clutch' for adjustment procedures. Gear End Assembly
Follow steps 1 through 6 described in 'Load Sheave Assembly'.

1. Install gear on load sheave. Ensure recessed side of gear face is outward. Install retainer ring on load sheave to secure gear.

2. Install pinion shaft through the center of load sheave.

3. Install gears so gear teeth are correctly timed and end shafts are located in bearing sleeves in side plate. Refer to 'Gear Timing' section on page 11.

4. Apply a thick coat of grease as recommended in the "LUBRICATION" section to all gear teeth. Install support plate over gears to engage gear end shafts.

5. Secure support plate with nuts and lockwashers.

6. Install the gear cover. Secure with three nuts and screws. Brake End Assembly
Follow steps 1 through 6 described in 'Load Sheave Assembly' and steps 1 through 6 described in 'Gear End Assembly', then below steps.

CAUTION

- The brake will not operate properly if there is oil on the brake discs.

1. Thread brake hub onto pinion shaft until snug. Stepped side of brake hub must face out.

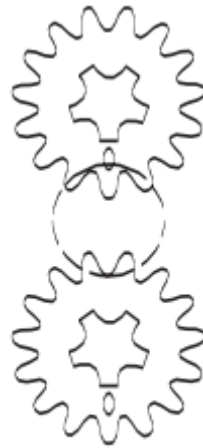
2. Install first brake disc followed by ratchet disc and second brake disc. Ratchet disc teeth must engage the two pawls mounted on side plate assembly. Counterclockwise rotation of the ratchet disc must be possible.

3. Secure load sheave to prevent rotation and thread handwheel onto pinion shaft and secure with nut. Tighten nut until snug and then back nut off until first slot is aligned with pin hole in pinion shaft. Install cotter pin and bend ends apart.

4. Wrap hand chain around handwheel and feed ends through slots provided in hand chain wheel cover. Install the handwheel cover. Secure with three nuts and screws. Bottom Hook Assembly (2, 3 and 5 ton hoists only)

1. Grease and install the rollers in the groove provided in the bore of the idler sheave.

2. Install idler sheave shaft through the idler sheave bore. Ensure rollers remain in position.
3. Carefully place the assembled parts between the plates.
4. Install hook between plates and clamp plate halves together with capscrews, lockwashers and nuts. Gear Timing For proper operation, timing marks on the gears must be in the correct positions. The timing marks are circular impressions on the faces of gears. Refer to Dwg.

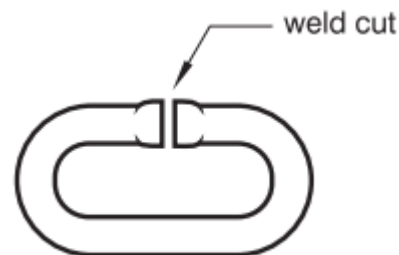


All Models

Hand Chain Adjustment or Replacement

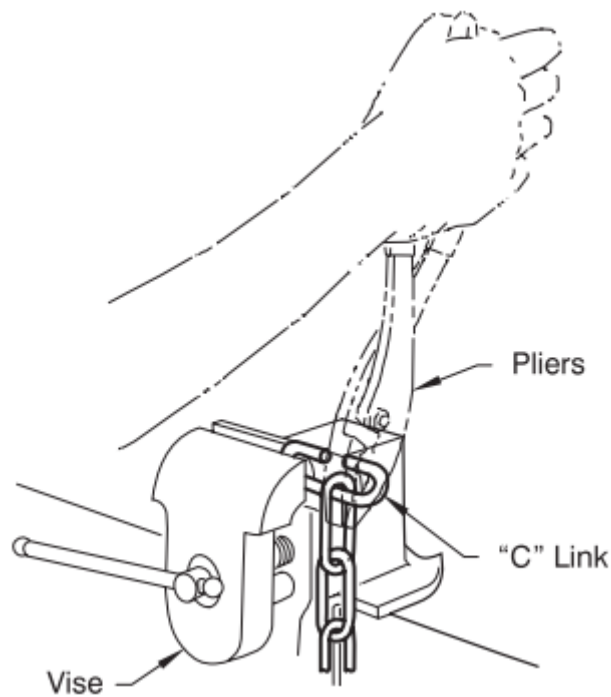
CAUTION

- When cutting the weld side of a hand chain link, do not cut or nick the opposite side. A damaged link must be replaced to prevent premature failure. A falling hand chain can cause injury.



"C" Link

1. To create a "C" link, cut the welded side of the link with a hack saw. Clamp one side of the "C" link in a vise and bend it open by using a pliers to grip the exposed part of the link.



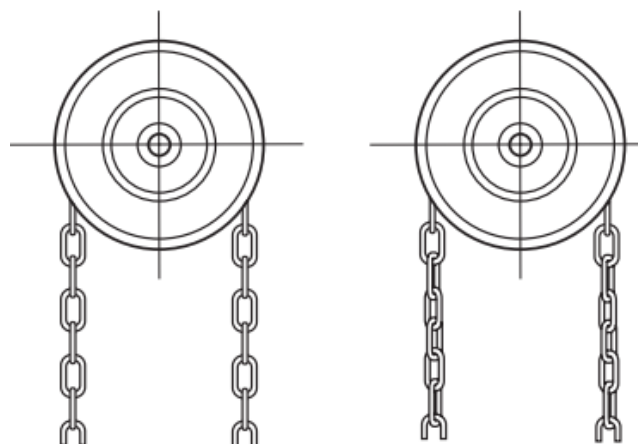
2. If the hand chain is being replaced, disconnect it at the "C" link and carefully remove the hand chain.

3. When replacing a hand chain, cut a length 2 times the required hand chain drop plus about one foot (305 mm). For adjustments, remove or add a length of chain twice the difference in hand chain height. To prevent the hand chain from twisting, maintain an even number of links, by removing or adding an even number of links.

4. If you are replacing the hand chain, run the new hand chain up through the left hand chain guide, around the handwheel, making sure the hand chain is seated in the handwheel pockets, and back down through the right hand chain guide.

5. Connect the hand chain ends with the "C" link(s), making the total number of links even, and bend the "C" link(s) shut.

6. Make sure the hand chain is not twisted. If twisted, untwist or open a "C" link and remove one hand chain link. Refer to Dwg.



Untwisted

Twisted
Do Not Use

7. WARRANTY

The warranty period is 12 months from the date of sale to the end customer.

LIMITATION OF LIABILITY:

- Seller will not be liable for product failures caused by use and normal wear and tear.

- The Seller is not responsible for product malfunctions caused by non-observance of operating rules or use of the Product under unacceptable environmental conditions.

- The warranty will be voided if the Product is not regularly serviced and if it is improperly stored.

- This warranty will not be extended to any Product that has been subject to misuse, neglect or accident or which will have been altered or repaired by elements other than Seller's in such a manner as to adversely affect its performance, stability or reability.

- The warranty does not cover the Product that has suffered any mechanical damage.

- The warranty does not apply to a Product that has been altered in any way.

In order to determine the causes of failure, a technical check is carried out for a period of 10 working days from the date of receipt of the Product for diagnosis.

Claims filing:

- Claims concerning found defects can be issued by the Buyer to the Seller within the guarantee period. The Buyer may request a claim form and instructions for filing a claim from the Seller.

- All risks associated with delivery of the Product to the dealer or service center are borne by the owner of the Product.

- Claims related to incompleteness and appearance of the Product will not be accepted after it has been put into operation.



The information in this paragraph is current at the time of printing of this manual. Up-to-date information on warranty service rules is published on the official website of the group of companies TOR INDUSTRIES **www.tor-industries.com** ("Service" section).

PRODUCT PASSPORT

Product Information:

Model			
Serial No.			
Sale Date		/	
Warranty Period			

Seller Information:

Company			
Address			
Phone			

SERVICE MARKS

Place for Stamp	All control operations and tests have been carried out. The product is fully equipped, serviceable and ready for use.
Dated: <input type="text"/>	

Maintenance and repair

Type of Maintenance						
Type of Maintenance						
Type of Maintenance						
Type of Maintenance						
Warranty Repair						
Repair						
Date of Maintenance						
Contractor						

The customer confirms that he has familiarized himself with the rules of use of the product. The customer received the manual in English. The customer has no claims to the serviceability, appearance and completeness of the product.

Customer
Signature

Place for Stamp
