VULCAN
HOIST - PALAN

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USER MANUAL

MINI XT RATCHET PULLER

¼ to 3 Tonnes

XPU0.25T à XPU03T

Manuel en français de l'autre côté

KEEP THIS MANUAL

WARNING

DO NOT INSTALL, OPERATE, OR PERFORM MAINTENANCE ON THIS EQUIPMENT BEFORE READING AND UNDERSTANDING THIS MANUAL IN ITS ENTIRETY. FAILURE TO READ AND COMPLY WITH THE CONTENTS OF THIS MANUAL COULD RESULT IN SERIOUS BODILY INJURY OR DEATH AND / OR PROPERTY DAMAGE.

Important Information, Warnings and Safety

This manual contains important safety, installation, operation, and maintenance information. Make this manual available to every person designated for the operation, installation, and maintenance of these products. Unless otherwise noted, tons in this manual are metric tonnes (1000kg, 2204 lbs, or 1.102 US short ton). MINI XT products are metric. Equivalent imperial (inches, pounds) measurements are provided for informational purposes only.

Danger, Warning, Caution and Notice

Throughout this manual, there are procedures which, if not followed, may result in injury, death, or substantial property damage.

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

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

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

NOTICE Indicates information or company policy which relates directly or indirectly to the safety of personnel or property.

Safety Framework and General Rules

WARNING

This manual cannot cover every possible installation, operation, maintenance, circumstance and situation. You, the owner or operator of the equipment covered in this manual, are responsible for the safe and proper installation, operation, inspection, and maintenance of this equipment in accordance with ASME B30.21 and all applicable laws, regulations and codes.

Anybody interacting with the ratchet puller must have read and understood the instructions laid out in this manual.

Vulcan Hoist will not be liable for any loss, damage, injury, death or compensation if caused, even if partially, by disregarding or misinterpreting an instruction from this manual.

Repairs must only be done with original equipment manufacturer parts by a qualified person. Any modification, including re-rating the ratchet puller, must be authorised by the original equipment manufacturer.

CAUTION

Every safety and identification label and plate that came with the ratchet puller, including the nameplate which displays the ratchet puller's serial number, capacity, and manufacturer, must be securely fastened and legible. If any safety or identification label or plate is missing or no longer legible, contact Vulcan Hoist for a replacement.

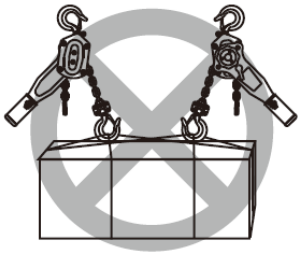
NOTICE

This manual covers a wide range of ratchet pullers with different capacities and options, and as such not all instructions in this manual apply to every ratchet puller. Disregard instructions that do not apply.

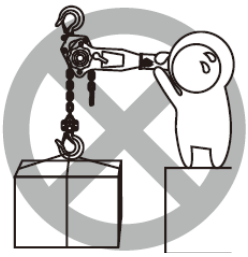
DANGER

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

NEVER apply pressure on a puller.



NEVER use two or more pullers together to lift beyond a puller's rated capacity.



NEVER lift a load heavier than a puller's rated capacity.

NEVER lift or move a load over or near people.

Safety Rules Before Operation

WARNING

Do not ever extend the lever.

Do not use this ratchet puller if you notice deep nicks, gouges, bends or significant stretching in the hooks, load chain, or other load bearing parts.

CAUTION

Ensure that you have read and understood this manual in its entirety.

Ensure that the nameplate and safety warning labels and plates are present, securely fastened and legible.

Perform the daily inspection described in the Daily Inspection section of this manual if it is the ratchet puller's first use of the shift.

Be certain that the weight of the load to be lifted is lower or equal to the ratchet puller's rated capacity.

Estimate how much you plan to move the hook. Make sure that the chain is long enough to reach the furthest point without the ring in the last chain link entering the ratchet puller's body and distance Hmin (see section Technical Specifications) is short enough for the hook to reach the closest point.

Make sure that the planned lift or pull won't interfere with other operations going on and won't go over people.

Make sure that the load's centre of gravity and attachment point are aligned with the ratchet puller.

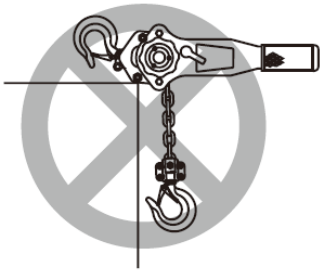
Make sure that you have somewhere to safely lower the load before you lift it. Don't leave a raised load unattended.

Safety Rules During Operation

DANGER

NEVER use a twisted, kinked, damaged or stretched load chain.

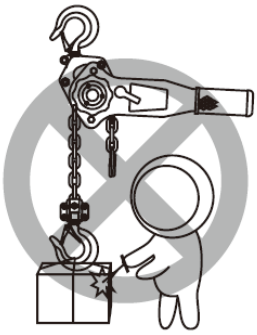
NEVER use the chain as a sling



NEVER support or use the ratchet puller as a support

NEVER support a load on the tip of the hook

NEVER run the load chain over a sharp edge



NEVER weld or cut a load suspended by a ratchet puller

Make sure that the load's attachment point sits in the hook's bowl and that the latch is closed.

Start lifting or pulling the load. When the load chain is under tension, check that the lever is still turning smoothly and that the load does not fall or pull away on its own.

NEVER use a damaged ratchet puller or a ratchet puller that is not working properly or requires excessive force to work.

NEVER use a ratchet puller if it makes excessive or unusual noise.

NEVER use a ratchet puller with a chain that makes harsh, jerking moves.

NEVER swing a suspended load.

NEVER use the ratchet puller as a welding electrode.

NEVER move the hook so far that it collides with the ratchet puller or that the lifting ring at the free end of the chain pulls on the ratchet puller's body.

NEVER allow your attention to be diverted from operating the ratchet puller.

Safety Rules After Operation

CAUTION

Land the load and unload the chain slowly and safely.

NEVER suspend a load for an extended period of time.

Operation – 0.25 to 3 t Models

Selector	Action	Result
N	Pull on either end of the unloaded chain	The chain will move quickly in the direction it is pulled
	Turn the handwheel in either direction	The chain will move slowly in the same direction than the hand wheel
	Move the lever	The lever will move freely, and the chain won't move
In/Up	Pull on the dead end of the chain	The hook will move quickly towards the ratchet puller
	Turn the handwheel clockwise	The hook will move slowly towards the ratchet puller
	Turn the lever clockwise with no or little load on the hook	The hook may not move if it is not preloaded
	Turn the lever clockwise while the hook is loaded	The load will be pulled/hoisted towards the ratchet puller
Out/Down	Pull on the unloaded hook (not recommended)	The hook may move away from the ratchet puller but will be working against the disengaged brake
	Turn the handwheel counterclockwise	The hook will move slowly away from the ratchet puller
	Turn the lever counterclockwise with no or little load on the hook	The hook may not move if it is not preloaded
	Turn the lever counterclockwise while the hook is loaded	The load will be pulled/lowered away from the ratchet puller

Flipping the selector switch while the hook is loaded will not cause any movement of the chain or the load to drop.

Inspection

WARNING

If a ratchet puller fails any one of the following inspection items, do not use it and remove it from service immediately. Do not put it back into service until every issue has been resolved.

Failure to inspect the ratchet puller as instructed may result in damage, injury, or death.

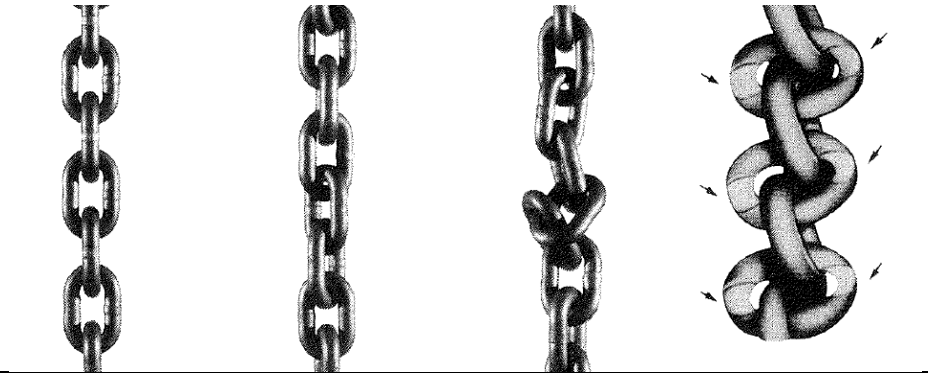
Contact Vulcan Hoist for spare parts. Do not use non-OEM parts.

These instructions are based on ASME B30.21. Also observe any other regulation that may apply.

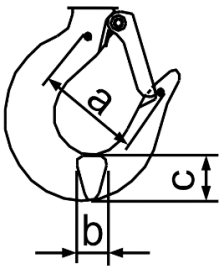
There are two types of inspection: daily and periodic. A daily inspection must be done by the ratchet puller's operator, or a person qualified to do so at the beginning of each working shift or the first time the ratchet puller is used in a shift. A periodic inspection must be done by a qualified person at intervals determined by the ratchet puller's service severity.

Service Severity and Periodic Inspection Frequency		
Service	Description	Periodic Inspection Frequency
Normal Service	Randomly distributed loads within the rated load limit, or uniform loads less than 65% of rated load for no more than 15% of the time	monthly to yearly
Heavy Service	Within the rated load limit but exceeds normal service	weekly to monthly
Severe Service	Normal or heavy service with abnormal operating conditions (high humidity, extreme temperatures, salty air, etc.)	daily to weekly

Daily Inspection

Part	Items to Inspect
Tags, labels, nameplate	-Warning labels and tags must be present, securely fastened and legible -The nameplate and the ratchet puller's capacity tags must be securely fastened and legible
Hook latches	Hook latches must be present on both hooks and close on their own
Load chain	-The load chain must be lubricated. Apply oil if it appears dry -Especially for ratchet pullers with multiple chain falls (6 t), make sure that the load chain is not twisted. Make sure that it will enter the ratchet puller straight in both directions -Eliminate kinks and twists. Do not use the ratchet puller if they keep reoccurring -Look for excessive wear. Do not use the ratchet puller even if a single chain link appears worn Normal Twisted Kinked Worn out 
Hooks and load chain	-The hooks and load chain must be free of deep nicks, gouges, bends, kinks or significant stretching
Hooks	Both hooks must swivel freely
Function	The handwheel and the lever must turn smoothly
Lever	-The lever must not be bent or damaged -The lever must not have been extended longer than its original length
Chain ring	-The chain ring or handle must be present in the last free chain link and in good condition
Overall	-There must not be any missing nut, bolt, or pin -There must not be any sign of major damage such as bumps or burns
Selector switch	Must move smoothly and hold still in each of the three positions (in, neutral, out)

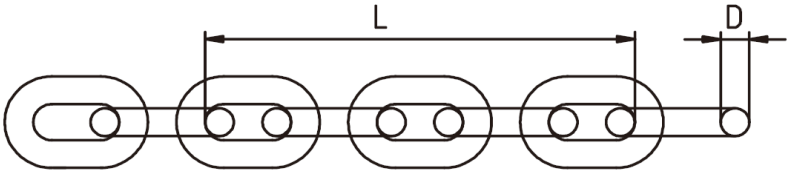
Periodic Inspection

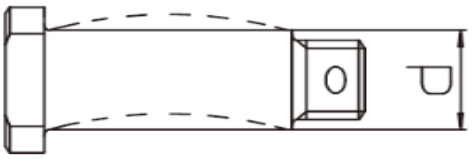
Item	Discard Criteria
	Hooks (lower and upper)
Hook stretch and wear	

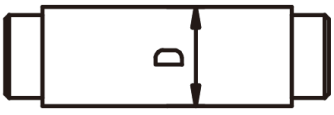
Capacity (t)	A* mm [in]	B, mm [in]		C, mm [in]	
	Normal	Standard	Discard	Standard	Discard
0.25	35.5 [1.398]	11 [0.433]	9.9 [0.39]	13 [0.512]	11.7 [0.461]
0.5	41.7 [1.642]	12 [0.472]	10.8 [0.425]	15.6 [0.614]	14.04 [0.553]
0.75	41.6 [1.638]	14.2 [0.559]	12.78 [0.503]	20 [0.787]	18 [0.709]
1.5	52 [2.047]	19 [0.748]	17.1 [0.673]	26.6 [1.047]	23.94 [0.943]
3	62 [2.441]	24.4 [0.961]	21.96 [0.865]	31.2 [1.228]	28.08 [1.106]

*These values are nominal. **The A dimension must be measured when the hook is new. The hook must be discarded when the A dimension is 1.05 times greater than when new**. Top and bottom hooks have the same dimensions.

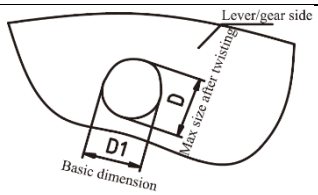
Flaws and wear	Must be free from significant rust, welds, weld splatter, deep nicks, and gouges
Rotation	Must rotate freely without rough spots
Hook yokes	Must not miss rivets or bolts. Must have no slack between yoke halves
Latches	Latches must be present and stay closed when not forced open

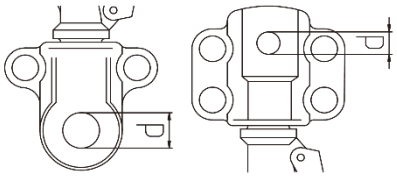
<table>
<tr><th>Item</th><th>Discard Criteria</th></tr>
<tr><td colspan="2">Load Chain</td></tr>
<tr><td>Wear and stretch</td><td>


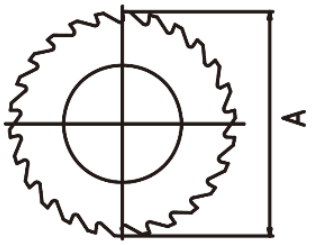
<table>
<tr><th rowspan="2">Capacity (t)</th><th colspan="2">L, mm [in]</th><th colspan="2">D, mm [in]</th></tr>
<tr><th>Standard</th><th>Discard</th><th>Standard</th><th>Discard</th></tr>
<tr><td>0.25</td><td>45 [1.772]</td><td>46.35 [1.825]</td><td>3.2 [0.126]</td><td>2.88 [0.113]</td></tr>
<tr><td>0.5</td><td>60 [2.362]</td><td>61.8 [2.433]</td><td>4.3 [0.169]</td><td>3.87 [0.152]</td></tr>
<tr><td>0.75</td><td>75 [2.953]</td><td>77.25 [3.041]</td><td>5 [0.197]</td><td>4.5 [0.177]</td></tr>
<tr><td>1.5 ; 3</td><td>99.5 [3.917]</td><td>102.48 [4.035]</td><td>7.1 [0.280]</td><td>6.39 [0.252]</td></tr>
</table>
Measure the pitch of 5 chain links at different places on the load chain</td></tr>
<tr><td>Flaws</td><td>Must be free from welds, weld splatter, nicks and gouges</td></tr>
<tr><td>Rust</td><td>Only surface rust is acceptable. No pitting from rust, rust flakes or rust bubbles</td></tr>
<tr><td>Lubrification</td><td>Must be oiled</td></tr>
<tr><td colspan="2">Hook Pins</td></tr>
<tr><td>Bottom hook pin wear and deformation</td><td>


<table>
<tr><th rowspan="2">Capacity (t)</th><th colspan="2">d, mm [in]</th></tr>
<tr><th>Standard</th><th>Discard</th></tr>
<tr><td>0.25</td><td>5.0 [0.197]</td><td>4.6 [0.181]</td></tr>
<tr><td>0.5</td><td>6.5 [0.256]</td><td>5.98 [0.235]</td></tr>
<tr><td>0.75</td><td>7.5 [0.295]</td><td>6.9 [0.272]</td></tr>
<tr><td>1.5 ; 3</td><td>10.2 [0.402]</td><td>9.38 [0.369]</td></tr>
</table>
-Discard the hook pin if there is obvious bend or deformation
-Screw thread must be in good condition</td></tr>
<tr><td>Top hook pin wear and deformation</td><td>


Discard the hook pin if there is obvious bend

or deformation
<table>
<tr><th rowspan="2">Capacity (t)</th><th colspan="2">D, mm [in]</th></tr>
<tr><th>Standard</th><th>Discard</th></tr>
<tr><td>0,25</td><td>8 [0.315]</td><td>7.36 [0.290]</td></tr>
<tr><td>0,5</td><td>10 [0.394]</td><td>9.2 [0.362]</td></tr>
<tr><td>0,75</td><td>12 [0.472]</td><td>11.04 [0.435]</td></tr>
<tr><td>1,5 ; 3</td><td>12 [0.472]</td><td>11.04 [0.435]</td></tr>
</table></td></tr>
<tr><td>Top hook pin holes in the side plates</td><td>


Measure the holes' maximum diameter
<table>
<tr><th rowspan="2">Capacity (t)</th><th colspan="2">D, mm [in]</th></tr>
<tr><th>Standard</th><th>Discard</th></tr>
<tr><td>0,25</td><td>8.4 [0.331]</td><td>9.24 [0.364]</td></tr>
<tr><td>0,5</td><td>10.4 [0.409]</td><td>11.44 [0.450]</td></tr>
<tr><td>0,75</td><td>12.5 [0.492]</td><td>13.75 [0.541]</td></tr>
<tr><td>1,5 ; 3</td><td>12.5 [0.492]</td><td>13.75 [0.541]</td></tr>
</table></td></tr>
<tr><td>Top and bottom hook pin holes</td><td>

*Measure the holes' maximum diameter
<table>
<tr><th rowspan="2">Capacity (t)</th><th colspan="2">Bottom Hook Pin Diameter, mm [in]</th><th colspan="2">Top Hook Pin Diameter (mm)</th></tr>
<tr><th>Standard</th><th>Discard*</th><th>Standard</th><th>Discard*</th></tr>
<tr><td>0.25</td><td>8.2 [0.323]</td><td>9.02 [0.355]</td><td>5.1 [0.201]</td><td>5.61 [0.221]</td></tr>
<tr><td>0.5</td><td>10.5 [0.413]</td><td>11.55 [0.455]</td><td>7 [0.276]</td><td>7.7 [0.303]</td></tr>
<tr><td>0.75</td><td>12.5 [0.492]</td><td>13.75 [0.541]</td><td>7.8 [0.307]</td><td>8.58 [0.338]</td></tr>
<tr><td>1.5</td><td>15 [0.591]</td><td>16.5 [0.65]</td><td>10.7 [0.421]</td><td>11.77 [0.463]</td></tr>
<tr><td>3</td><td>12.5 [0.492]</td><td>13.75 [0.541]</td><td>10.5 [0.413]</td><td>11.55 [0.455]</td></tr>
</table></td></tr>
</table>

<table>
<tr><th colspan="3">Braking System</th></tr>
<tr><td>Rust</td><td colspan="2">All parts should be rust-free</td></tr>
<tr><td>Item</td><td colspan="2">Discard Criteria</td></tr>
<tr><td>Pawls</td><td colspan="2"> 
-Pawls must have no surface wear
-Pawl springs must push the pawl into the ratchet</td></tr>
<tr><td>Friction disc</td><td>The friction disc must have the same thickness throughout. Its surfaces must be clean, flat and free from cracks and gouges.</td><td>
<table>
<tr><th rowspan="2">Capacity (t)</th><th colspan="2">Thickness friction disc, mm [in]</th></tr>
<tr><th>Standard</th><th>Discard</th></tr>
<tr><td>0,25</td><td>3 [0.118]</td><td>2.5 [0.098]</td></tr>
<tr><td>0,5</td><td>2.5 [0.098]</td><td>2 [0.079]</td></tr>
<tr><td>0,75</td><td>2.5 [0.098]</td><td>2 [0.079]</td></tr>
<tr><td>1,5 ; 3</td><td>3.5 [0.138]</td><td>3 [0.118]</td></tr>
</table>
</td></tr>
<tr><td>Ratchet</td><td> 
</td><td>
<table>
<tr><th rowspan="2">Capacity (t)</th><th colspan="2">External Diameter A, mm [in]</th></tr>
<tr><th>Standard</th><th>Discard</th></tr>
<tr><td>0.25</td><td>36 [1.417]</td><td>35.4 [1.394]</td></tr>
<tr><td>0.5</td><td>40 [1.575]</td><td>39.4 [1.551]</td></tr>
<tr><td>0.75</td><td>45 [1.772]</td><td>43.4 [1.709]</td></tr>
<tr><td>1.5 ; 3</td><td>60 [2.362]</td><td>59.4 [2.339]</td></tr>
</table>
</td></tr>
<tr><td>Free spring #26</td><td colspan="2">Place the lever in neutral position and move the chain manually, If the chain does not move, place the lever to up or down position to move the chain. Then place the lever in its neutral position again and manually move the chain at normal speed. If the chain still does not move, it is time to change the free spring# 26.</td></tr>
<tr><th colspan="3">Pulling System and Body</th></tr>
<tr><td>Load Chain Sprocket</td><td colspan="2">Must not show significant wear or deformation</td></tr>
<tr><td>Gears</td><td colspan="2">-Must not show significant wear or deformation especially on teeth and bearing surface
-Must be greased</td></tr>
<tr><td>Gearcase</td><td colspan="2">Must not show deformation. Must not show significant wear on bearing surface</td></tr>
<tr><td>Side plates</td><td colspan="2">Must be straight. See Hook Pins for the side plates' top hook pin hole dimensions</td></tr>
<tr><th colspan="3">Lever Handle System</th></tr>
<tr><td>Ratchet spring</td><td colspan="2">Replace the spring if the roller ball #46 cannot bounce on the change over pawl.</td></tr>
<tr><th colspan="3">Function</th></tr>
<tr><td>Pulling and slackening</td><td colspan="2">No difficulty, abnormality, roughness in pulling and slackening with loads</td></tr>
<tr><td>Brake</td><td colspan="2">No braking resistance when lifting or pulling. Loads must not slip down slowly when suspended. Loads must not slip after the lever is jerked suddenly in the lowering direction</td></tr>
<tr><td>Brake</td><td>A minimum load is required to activate the brake mechanism.</td><td>
<table>
<tr><th>Capacity (t)</th><th>Brake Activation kg [lb]</th></tr>
<tr><td>0,25</td><td>7.5 [16.5]</td></tr>
<tr><td>0,50</td><td>15 [33.1]</td></tr>
<tr><td>0,75</td><td>22.5 [49.6]</td></tr>
<tr><td>1,5</td><td>45 [99.2]</td></tr>
<tr><td>3</td><td>90 [198.4]</td></tr>
</table>
</td></tr>
</table>

Maintenance

WARNING

After performing maintenance, test the ratchet puller and perform a daily inspection.

NEVER perform maintenance while the ratchet puller is being used or supporting a load.

NEVER grease or oil the braking mechanism.

Failure to perform maintenance as instructed may result in damage, injury, or death.

It is recommended to perform maintenance at the same frequency as periodic inspections. Only qualified personnel must perform maintenance. Vulcan Hoist offers inspection, maintenance, and repair services.

1. Clean the ratchet puller and load chain without getting water inside the gearcase and the braking mechanism.

2. Open the gearcase. Wipe off excess worn grease. Apply new grease directly on gear teeth and bearing surfaces. Re-fasten the gearcase. NLGI No. 2 grease is recommended.

3. Oil the hook pins, hook shanks (for rotation), load chain and load chain sprockets. An ISO 68 oil is recommended.

Storing

Always store above freezing temperatures in a dry environment.

Do not use a ratchet puller in storage to hold or support a load.

Perform a periodic inspection before using a ratchet puller which is coming out of storage.

Allowable Operating Conditions

1. -10°C to 60°C

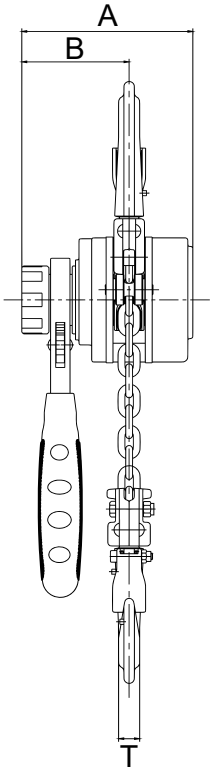
2. Can work in up to 100% relative humidity, but must not be used under water.

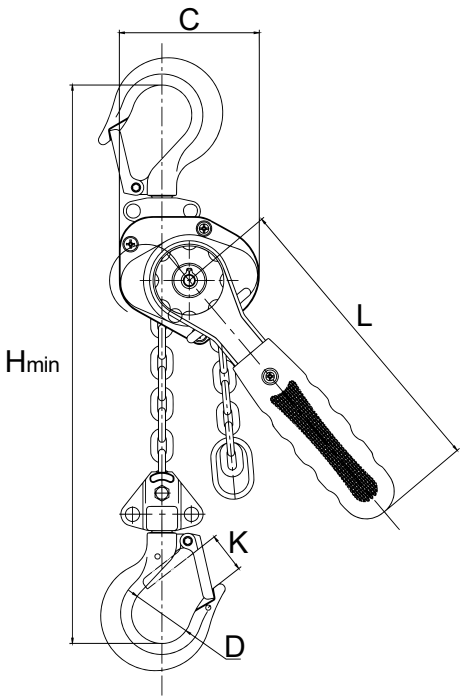
Outdoor Installations

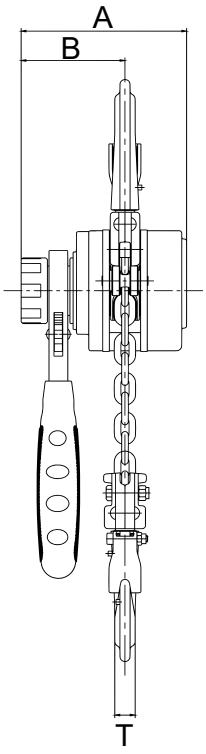
1. Outdoor ratchet pullers should be sheltered from rain and snow or brought inside when not in use.

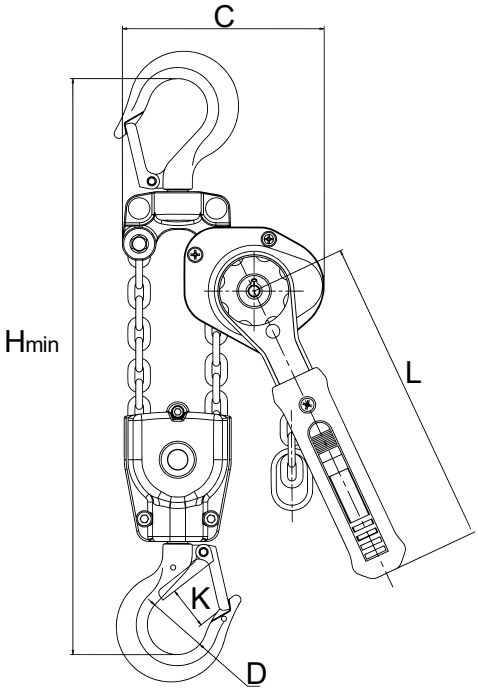
2. If the ratchet puller is exposed to salty air, extreme temperature, high humidity environments or exposure to rain or snow, increase the inspection and maintenance frequency.

Technical Specifications









0,25t; 0,5t; 0,75t; 1,5t

3t

Model	Capacity	Force to lift capacity, lb	Load chain ø (mm) x nb. falls	Pull / lever rotation, mm [in]	Net weight* (lb)	Extra weight/ ft (lb)	Dimensions, mm [in]							
	Metric tonnes [lb]						A	B	C	D	Hmin	K	L	T
XPU0.25T	0,25 [551]	65	3,2 x 1	32 [1.26]	3.2	0.15	87 [3.43]	55.5 [2.19]	68 [2.68]	32 [1.26]	200 [7.87]	21 [0.83]	145 [5.71]	11 [0.43]
XPU0.5T	0,5 [1102]	60	4,3 x 1	28.4 [1.12]	5.5	0.25	100.5 [3.96]	62.5 [2.46]	81 [3.19]	34.5 [1.36]	250 [9.84]	24.5 [0.96]	160 [6.30]	12 [0.47]
XPU0.75T	0,75 [1653]	74	5,0 x 1	27.69 [1.09]	7.5	0.36	105 [4.13]	64 [2.52]	92 [3.62]	35.5 [1.40]	260 [10.24]	28.5 [1.12]	180 [7.09]	14 [0.55]
XPU01.5T	1,5 [3306]	94	7,1 x 1	18.86 [0.74]	13.8	0.74	122 [4.80]	68.5 [2.70]	109 [4.29]	42.5 [1.67]	330 [12.99]	35 [1.38]	220 [8.66]	21.5 [0.85]
XPU03T	3,0 [6613]	96	7,1 x 2	9.43 [0.37]	20	1.48	122 [4.80]	68.5 [2.70]	160 [6.30]	50 [1.97]	432 [17.01]	43 [1.69]	220 [8.66]	24.5 [0.96]

*For a ratchet puller with 5' of lift or pull distance.

Troubleshooting

Symptom	Cause	Solution
The puller will not pull and the ratchet doesn't click	The pawl doesn't engage the ratchet due to foreign materials or corrosion	Clean foreign materials and corrosion. Lubricate the pawl's pivot
	The pawl spring is damaged or disengaged	Replace the pawl spring. Assemble it properly
	The ratchet spring is loose or damaged	Tighten or replace
	The overload protection mechanism is engaged	Pull or lift loads below the ratchet puller's capacity. If overload protection is engaged with loads within the capacity, it must be replaced or recalibrated by a qualified person.
	The load is too light	Start by tensioning the chain by using the handwheel
The load slips away from the ratchet puller	The brake is slipping due to lubricant	Replace the friction disc. Clean adjacent parts.
	Worn out friction disc due to overloading, misuse or long-term wear	Replace. See the Periodic Inspection section
	Foreign materials are disrupting the ratchet puller's mechanisms	Clean
The chain cannot be slackened under load	The brake is stuck closed, maybe due to being loaded too long, shock loaded, or extensively corroded	Place the selector in out/down and pull hard on the lever. If this does not reset the brake, unload the ratchet puller and replace the braking system.
The lever is tight when pulling, even without a load, may be squeaking	Worn gear teeth or worn bearing surfaces	Replace worn parts and grease regularly

Warranty

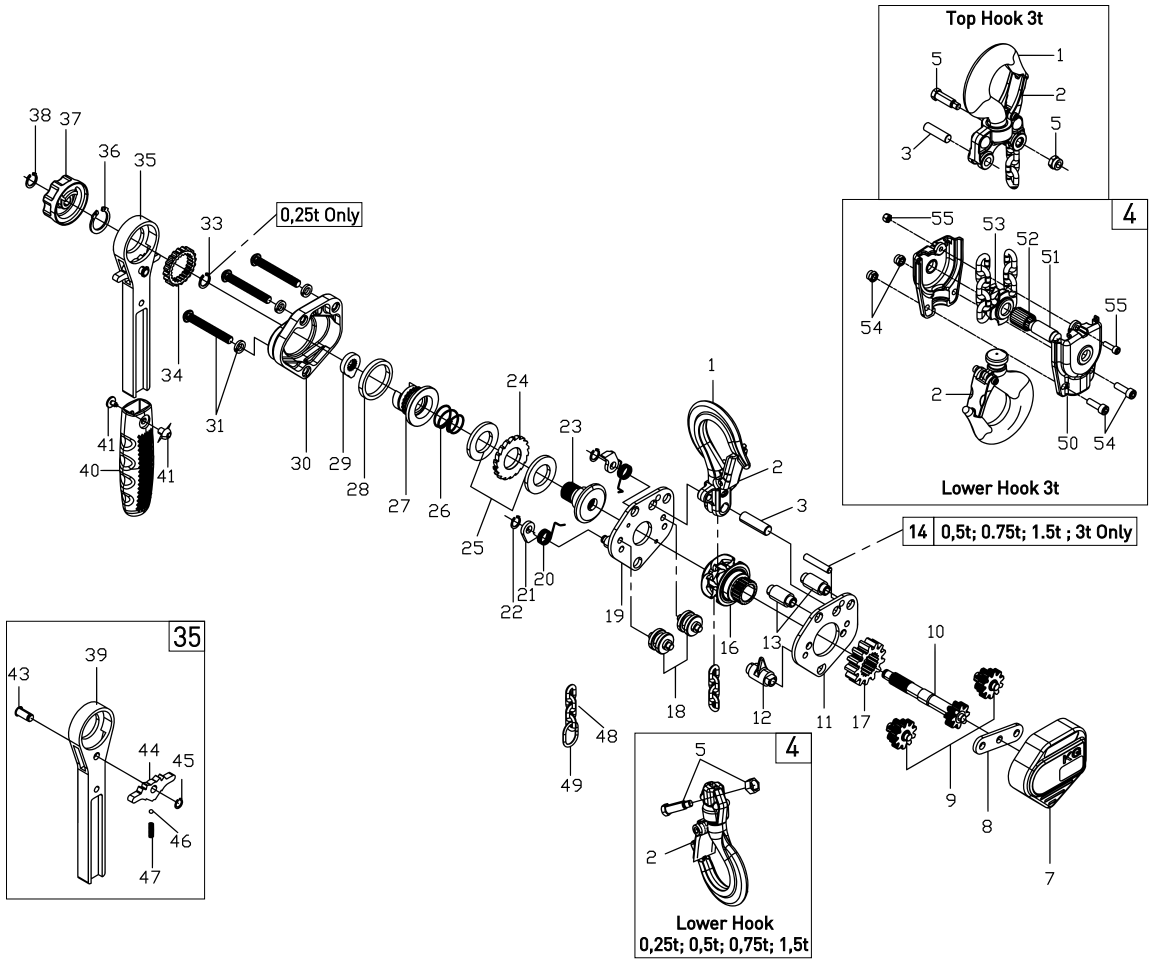
Your MINI XT Ratchet puller is guaranteed against defects in materials and workmanship **for 2 year** from the date of purchase if all the following conditions are met:

1. Any part replacement or modification of the MINI XT Ratchet puller **must** be approved in writing by Vulcan Hoist.

2. No credit will be issued for defective parts. Vulcan Hoist will ship only replacement parts, subject to warranty inspection.

3. For major problems, the MINI XT Ratchet puller must be returned prepaid to Vulcan Hoist for inspection and repair. If the repairs are under warranty, the Ratchet puller will be returned prepaid.

Parts (0.25t ; 0,5t ; 0,75t ; 1,5t ; 3,0t Models)



No.	English Description	Quantity	No.	English Description	Quantity
1	Top Hook Assembly	1	29	Stop Knob	1
2	Safety Latch Assembly	2	30	Brake cover	1
3	Top Hook Load Pin	1	31	Screw With Lock Washer	3
4	Lower Hook Assembly	1	33	Snap Ring	1
5	Anchor bolt and nut	1	34	Change Over Ratchet	1
7	Gear Case	1	35	Lever Handle Assembly	1
8	Reinforced Plate for gear	1	36	Snap Ring	1
9	Gears	2	37	Handwheel	1
10	Drive Shaft	1	38	Snap Ring	1
11	Gear Side Plate	1	39	Lever Handle	1
12	Chain Stripper	1	40	Rubber Lever Handle	1
13	Stay Bolt	2	41	Screw for lever hangle	1
14	Pin	1	43	Selector lever	1
16	Load Sheave	1	44	change over pawl	1
17	Splined Gear	1	45	snap ring for change over pawl	1
18	Chain Guide	2	46	roller ball	1
19	Brake Side Plate	1	47	change over spring	1
20	Pawl Spring	2	48	Load Chain	1
21	Pawl	2	49	Chain End Ring	1
22	Snap Ring For The Pawl Spring	2	50	3t Bot. Hook Reeve Sides	2
23	Brake Seat	1	51	3t Hook Sprocket Shaft	1
24	Ratchet Disc	1	52	3t quill roller for Sprocket Shaft	22
25	Friction Disc	2	53	3t Hook Free Sprocket	1
26	Free Spring	1	54	Screw	2
27	Brake Ring	1	55	Nut	1
28	Bushing	1			