



By Columbus McKinnon

BATTERYSTAR™

BATTERY POWERED CHAIN HOIST



BatteryStar™



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INSTALLATION, OPERATING, & MAINTENANCE MANUAL

BATTERY POWERED, VARIABLE SPEED ELECTRIC CHAIN HOIST



BATTERYSTAR™

BATTERY POWERED CHAIN HOIST

Before installing hoist, fill in the information below

Model Number _____
Serial No. _____
Purchase Date _____
Voltage _____ 18 VDC _____
Rated Load _____ 1 Tonne (2204 lbs) (1000 kg) _____



WARNING



Follow all instructions and warning for inspecting, maintaining, and operating this hoist.

The use of any hoist presents some risk of personal injury or property damage. That risk is greatly increased if proper instructions and warnings are not followed. Before using this hoist, each operator should become thoroughly familiar with all warnings, instructions, and recommendations in this manual. **Retain this manual for future reference and use.**

Forward this manual to operator. Failure to operate equipment as directed in manual may cause injury.



WARNING

Improper operation of a hoist can create a potentially hazardous situation which, if **NOT** avoided, could result in death, or serious injury. To avoid such a potentially hazardous situation, the operator shall:

1. **NOT** operate a damaged, malfunctioning or unusually performing hoist.
2. **NOT** operate the hoist until you have thoroughly read and understood this Installation, Operating, & Maintenance Manual.
3. **NOT** operate a hoist which has been modified.
4. **NOT** lift more than rated load for the hoist.
5. **NOT** use hoist with twisted, kinked, damaged, or worn load chain.
6. **NOT** use the hoist to lift, support, or transport people.
7. **NOT** lift loads over people.
8. **NOT** operate a hoist unless all persons are and remain clear of the supported load.
9. **NOT** operate unless load is centered under hoist.
10. **NOT** attempt to lengthen the load chain or repair damaged load chain.
11. Protect the hoist's load chain from weld splatter or other damaging contaminants.
12. **NOT** operate hoist when it is restricted from forming a straight line from hook to hook in the direction of loading.
13. **NOT** use load chain as a sling or wrap load chain around load.
14. **NOT** apply the load to the tip of the hook or to the hook latch.
15. **NOT** apply the load unless load chain is properly seated in the chain wheel(s) or sprocket(s).
16. **NOT** apply load if bearing prevents equal loading on all load supporting chains.
17. **NOT** operate beyond the limits of the load chain travel.
18. **NOT** leave load supported by the hoist unattended unless specific precautions have been taken.
19. **NOT** allow the load chain or hook to be used as an electrical or welding ground.
20. **NOT** allow the load chain or hook to be touched by a live welding electrode.
21. **NOT** remove or obscure the warnings on the hoist.
22. **NOT** operate a hoist on which the safety placards or decals are missing or illegible.
23. **NOT** operate a hoist unless it has been securely attached to a suitable support.
24. **NOT** operate a hoist unless load slings or other approved single attachments are properly sized and seated in the hook saddle.
25. Take up slack carefully - make sure load is balanced and load holding action is secure before continuing.
26. Shut down a hoist that malfunctions or performs unusually and report such malfunction.
27. Make sure hoist limit switches function properly.
28. Warn personnel of an approaching load.

CAUTION

Improper operation of a hoist can create a potentially hazardous situation which, if **NOT** avoided, could result in minor or moderate injury. To avoid such a potentially hazardous situation, the operator shall:

1. Maintain a firm footing or be otherwise secured when operating the hoist.
2. Check brake function by tensioning the hoist prior to each lift operation.
3. Use hook latches. Latches are to retain slings, chains, etc. under slack conditions only.
4. Make sure the hook latches are closed and not supporting any parts of the load.
5. Make sure the load is free to move and will clear all obstructions.
6. Avoid swinging the load or hook.
7. Make sure hook travel is in the same direction as shown on the controls.
8. Inspect the hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
9. Use the hoist manufacturer's recommended parts when repairing the unit.
10. Lubricate load chain per hoist manufacturer's recommendations.
11. **NOT** use the hoist load limiting or warning device to measure load.
12. **NOT** use limit switches as routine operating stops unless allowed by manufacturer. They are emergency devices only.
13. **NOT** allow your attention to be diverted from operating the hoist.
14. **NOT** allow the hoist to be subjected to sharp contact with other hoists, structures, or objects through misuse.
15. **NOT** adjust or repair the hoist unless qualified to perform such adjustments or repairs.

SAFETY PRECAUTIONS



This symbol points out important safety instructions which if not followed could endanger the personal safety and/or property of yourself and others.

Read and follow all instructions in this manual and any provided with the equipment before attempting to operate your hoist.

HOIST SAFETY IS UP TO YOU...

WARNING

Do not lift more than rated load.

CHOOSE THE RIGHT HOIST FOR THE JOB...

Choose a hoist with the capacity for the job. Know the capacities of your hoists and the weight of your loads. Then match them.

The application, the size and type of load, the attachments to be used, period of use and capacity of supporting structures must also be taken into consideration in selecting the right hoist for the job.

Remember, the hoist was designed to ease our burden. Carelessness not only endangers the operator, but in many cases, a valuable load.

WARNING

Do not operate damaged or malfunctioning hoist.

Do not operate with twisted, kinked, or damaged chain.

INSPECT

All hoists should be visually inspected before use, in addition to regular, periodic maintenance inspections.

Inspect hoists for operations warning notices and legibility.

Deficiencies should be noted and brought to the attention of supervisors. Be sure defective hoists are tagged and taken out of service until repairs are made.

Under no circumstances should you operate a malfunctioning hoist.

Check for gouged, twisted, distorted links and foreign material. Do not operate hoists with twisted, kinked, or damaged chain links.

Load chain should be properly lubricated.

Hooks that are bent, worn, or whose openings are enlarged beyond normal throat opening should not be used. If latch does not engage throat opening of hook, hoist should be taken out of service.

Chains should be checked for deposits of foreign material which may be carried into the hoist mechanism.

Check brake for evidence of slippage under load.

WARNING

Do not pull at an angle. Be sure hoist and load are in a straight line.

Do not use load chain as a sling.

Violations of any of the warnings listed may result in serious personal injury to the operator or nearby personnel by nature of released load or broken hoist components.

LIFTING OF HAZARDOUS LOADS

This hoist is not recommended for use in lifting or transporting hazardous loads or materials which could cause widespread damage if dropped. The lifting of loads which could explode or create chemical or radioactive contamination if dropped requires fail-safe redundant supporting devices which are not incorporated into this hoist.

LIFTING OF GUIDED LOADS

LIFT PROPERLY

Do not lift people with a hoist.

Make sure everyone is clear of the load when you lift.

Do not remove or obscure operational warning notices.

USE HOIST PROPERLY

Be sure hoist is solidly held in the uppermost part of the support hook arc.

Be sure hoist and load are in a straight line. Do not pull at an angle.

Be sure load is hooked securely. Do not tip load the hook. Do not load hook latch. Hook latch is to prevent detachment of load under slack chain conditions only.

Do not use load chain as a sling. Such usage damages the chain and lower hook.

Do not operate with hoist head resting against any object. Lift the load gently. Do not jerk it.

WARNING

Do not lift people or loads over people.

MAINTAIN PROPERLY

Cleaning

Hoists should be kept clean and free of dust, dirt, moisture, etc., which will in any way affect the operation or safety of the equipment.

Lubrication

Chain should be properly lubricated.

After repairs

Carefully operate the hoist before returning it to full service.

FOREWORD

This manual contains important information to help you properly install, operate, and maintain your hoist for maximum performance, economy and safety.

Please study its contents thoroughly before putting your hoist into operation. By practicing correct operating procedures and by carrying out the recommended preventive maintenance suggestions, you will experience long, dependable, and safe service. After you have completely familiarized yourself with the contents of this manual, we recommend that you carefully file it for future reference.

The information herein is directed to the proper installation, use, care, and maintenance of the hoist and does not comprise a handbook on the broad subject of rigging.

Rigging can be defined as the process of lifting and moving heavy loads using hoists and other mechanical equipment. Skill acquired through specialized experience and study is essential to safe rigging operations. For rigging information, we recommend consulting a standard textbook on the subject.

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GENERAL INFORMATION

SPECIFICATIONS

This hoist is a highly versatile materials handling device that can be used to lift loads that are within rated capacity. The mechanical features of these hoists include an alloy steel liftwheel, Load Limiter, hardened steel gear train, lifetime lubrication, standard chain container, forged steel hooks, and lightweight aluminum frame. The electrical features include battery-powered, brushless DC motor with variable speed and wireless remote control. This product is intended for Industrial and Commercial use.

Operating Conditions	
Temperature	0°F – 104°F (-18°C – 40°C)
Elevation	Max 3280 ft (1000 m)
Relative Humidity	Max 95%

Storage Conditions	
Temperature	-4°F – 140°F (-20°C – 60°C)
Relative Humidity	Max 95%

WIRELESS COMMUNICATION

Table 1. Wireless Communication

Cat. No	2980-20
ONE-KEY™ FCC ID	QQQ11
ONE-KEY™ IC	5123A-11
Remote Cat. No.	192092302
Volts	3V DC (1.5V AA X2)
FCC ID	SQGBL654
IC	3147A-BL654

Chemical Burn Hazard. Keep coin cell battery away from children.



Federal Communications Commission

Pursuant to part 15.21 of the FCC Rules, you are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the product.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed, and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

ISED COMPLIANCE STATEMENT

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device.

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Certified Products for
US and Canada



802655



INSTALLATION

UNPACKING INFORMATION

When received, the hoist should be carefully inspected for damage that may have occurred during shipment or handling. Check the hoist frame for dents or cracks, the remote control for cut or damaged enclosure, and inspect the load chain for nicks and gouges.

INSTALLING BATTERIES

CAUTION

Ensure battery door on the hoist is latched and the remote battery chamber cover is securely fastened to maintain proper ingress protection.

INSTALLING REMOTE CONTROL BATTERIES



Figure 1. Installing Remote Control Batteries

1. Replace battery chamber cover and tighten the retaining screw.

INSTALLING HOIST BATTERY

CHECKING LIMIT SWITCH OPERATION

Operate hoist over the entire length of its rated lift, checking upper and lower limit switches for correct operation as follows:

1. Press Directional Button UP in Remote Control and cautiously raise the hook until the upper limit switch stops the upward motion.
2. Press Directional Button DOWN in Remote Control and cautiously lower hook until lower limit switch stops the downward motion.

WARNING

If the hook block or load comes in contact with the chain container/bag, the chain container/bag assembly may be damaged.

TO AVOID INJURY:

Make sure the chain bag is no more than 75% filled when the hook is at the upper limit.

INITIAL CHAIN OILING

WARNING

The load chain must be thoroughly oiled before use. Failure to do so can result in accelerated wear and possible damage to the hoist.

The load chain must be lubricated with appropriate oil (see "Hoist Lubrication", page 16) prior to use. Ensure oil reaches all areas of the chain, including the interlink area.

OPERATING INSTRUCTIONS

GENERAL

1. The load limiter is designed to slip on an excessive overload. An overload is indicated when the hoist will not raise the load. Also, a clutching noise may be heard if the hoist is loaded beyond rated capacity. Should this occur, immediately release the (UP) control to stop the operation of the hoist. At this point, the load should be reduced to the rated hoist capacity or the hoist should be replaced with one of the proper capacity. When the excessive load is removed, normal hoist operation is automatically restored.

CAUTION

The load limiter is susceptible to overheating and wear when slipped for extended periods. Under no circumstance should the clutch be allowed to slip for more than a few seconds.

2. All hoists are equipped with limit switches, which automatically stop the hook at travel limits of the chain.
3. If material being handled must be immersed in water, pickling baths, any liquid, or dusty or loose solids, use a sling chain of ample length so that the hook is always above the surface. Bearings in the hook block are shielded only against ordinary atmospheric conditions.

HOIST

1. Before picking up a load, check to see that the hoist is directly over the load.

WARNING

Load must be placed directly under the hoist or trolley. Avoid off-center loading of any kind.

2. Take up the slack in the load chain prior to lifting to avoid jerking the load. If there is any evidence of overloading, immediately lower the load and assess.
3. **DO NOT** allow the load to swing, or twist while hoisting.
4. **DO NOT** allow the load to bear against the hook latch.

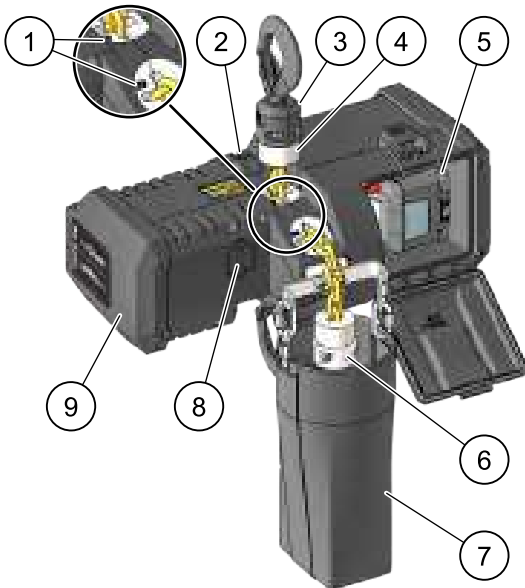


Figure 2. Hoist Features

- | | |
|-----------------------|--------------------------|
| 1 Limit Switches | 6 Chain Stop |
| 2 Brake Dust Caps | 7 Chain Bag |
| 3 Swivel Hook | 8 Coin Cell Battery Door |
| 4 Chain Stop Bumper | 9 Hoist End Cap |
| 5 Battery Compartment | |

BATTERIES AND CHARGERS

- Only use MILWAUKEE M18 batteries and chargers with this hoist.
 - 12.0 Ah battery is recommended for best performance.

The table below contains estimates of amount of lift at different load capacities. Note that these are estimates and actual performance will depend on the battery pack state of health.

Table 2. Batteries and Chargers

Battery	Load (Tonne)	Load (kg)	* Hook travel [ft]	* Hook travel [m]
12.0 Ah	1/4	250	480	146
	1/2	500	300	91
	3/4	750	220	67
	1	1000	180	55

* Estimated total travel with equal lifting and lowering

REMOTE CONTROL

Power ON

- To power the Remote Control ON:
- Push and release the Power Button (2).
 - Remote Control searching for Hoist:
 - Power LED Indicator (1) intermediately flashes green
 - Remote Control and Hoist are linked:
 - Power LED Indicator (1) is solid green
 - Hoist buzzer sounds for 3 seconds
 - Connection Error
 - Power LED Indicator (1) quickly flashes green for 4 seconds
 - Remote Control turns OFF

Power OFF

- To power the Remote Control OFF:
- Push and release Power Button (2).
 - Power LED Indicator (1) turns OFF
 - Remote Control powers OFF
 - Hoist remains ON and goes to sleep after 30 minutes

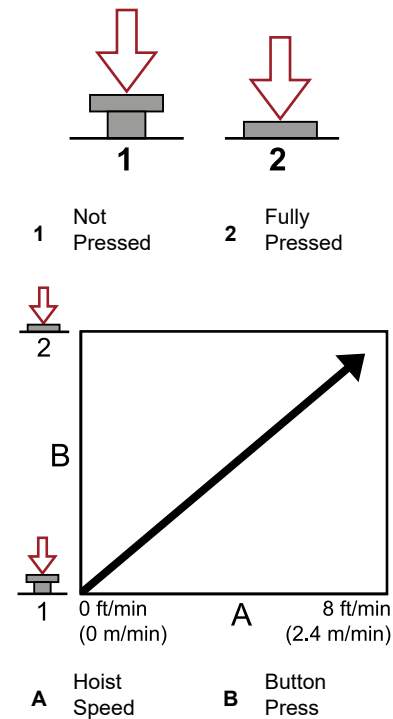
Auto-OFF

- 5 minutes after non-use:
- Remote Control powers OFF

Lift or Lower Hoist Load

- To lift the hoist load, press and hold the Directional Button UP (4).
- To lower the hoist load, press and hold the Directional Button DOWN (3).

The button-press is proportionally variable. The depth of the button-press controls the speed of the hoist.



The chain hoist stops when the direction button is released.

If both Directional Buttons UP (4) and DOWN (3) are pressed and held simultaneously, the hoist stops movement. Both buttons must be released before the load movement can continue.

Stop

- To activate Stop:
- Hoist receives Stop signal
 - Movement stops immediately
 - Remote Control turns OFF

To reset the Stop:

- To turn the Remote Control back ON, press the Power Button,
 - Remote Control links with the hoist
 - Normal functionality resumes

NOTE: Turn the Remote Control off using the STOP button to preserve the Remote Control battery life.

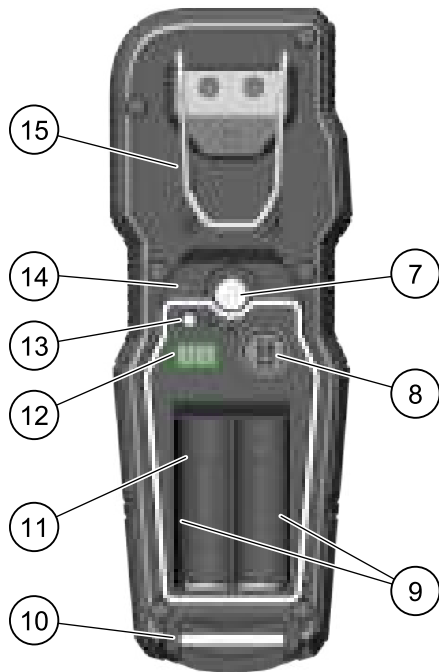


Figure 3. Back of Remote Control

- | | |
|---|----------------------------------|
| 7 Knurled Screw Attachment | 12 Diagnostic Port |
| 8 Removable Electrical Disconnect Key | 13 Pairing Button and Icon |
| 9 Label Location (Sides of Battery Chamber) | 14 Pairing/Linking LED Indicator |
| 10 Door Hinge and Lanyard Attachment | 15 Belt Clip |
| 11 AA Battery Chamber | |

NOTE: The Remote Control is paired with the hoist at factory. If re-pairing is required, follow the steps below.



Pairing Remote Control and Hoist

1. Ensure a battery is inserted in the desired hoist.
2. Remove batteries from all other hoists in the area during the pairing process.
3. Press and hold the Pairing Button for 6 seconds.

Successful Hoist and Remote Control pairing:

 - Pairing/Linking LED Indicator is solid green for 5 seconds and turns OFF
 - Power LED Indicator is solid green for 5 seconds and turns OFF

If pairing does not occur after 5 seconds:

 - Pairing/Linking LED Indicator quickly flashes green for 1 minute
 - Power LED Indicator quickly flashes green for 1 minute
 - Remote Control powers OFF

REMOTE CONTROL LED INDICATORS AND ALERTS

Power LED Indicator

- Remote Control ON and connected to the hoist
 - Indicator is solid green
- Low Battery in Remote Control (approx. 4 hours of runtime)
 - Indicator is slowly flashing green
- Pairing/Linking Mode
 - Indicator is intermediately flashing green
- Pairing/Linking unsuccessful
 - Indicator is quickly flashing green for 1 minute
- Remote Control is OFF
 - Indicator is off
- Hoist enters Sleep Mode
 - Remote Control turns OFF
 - Indicator is OFF
- Low Battery (12.0 Ah battery at 25% SOC)
 - Indicator is slowly flashing red
- Dead battery
 - Indicator is solid red
 - Hoist does not operate until battery is replaced
 - Indicator is solid red
 - Hoist does not operate until battery is within normal operating temperature

Weight Overcapacity Indicator



- Directional Button UP (4) is pressed while the hoist load is over weight capacity
 - Indicator is solid red
 - Hoist buzzer sounds

Operator Indicator



- Hoist is above or below the safe operating temperature
 - Indicator is solid red
 - Hoist does not operate until operating temperature or conditions with product specifications are reached
- Hoist electronics error
 - Indicator is solid red
 - Hoist does not operate

Inspection Indicator



- If hoist inspection is due based on 365 day interval after initial ONE-KEY™ Configuration
 - Indicator is solid red
 - Hoist does still operate
- Hoist inspection is due within 30 days
 - Indicator is slowly flashing red
- After inspection
 - Indicator must be cleared via ONE-KEY™ app while connected to the hoist

NOTE: Inspection indicator will illuminate 365 days after initial ONE-KEY™ configuration indicating that the yearly inspection is due. Yearly inspection is based on normal use. For normal operation requirements, see "Inspection", page 12. If hoist is used in heavy or severe applications then inspections may need to be performed more frequently which may be configured via the ONE-KEY™ app.

Pairing/Linking LED Indicator (located behind battery door)

- Pairing/Linking Mode
 - Indicator is immediately flashing green
- Successful Pairing/Linking
 - Indicator is solid green for 5 seconds
- Pairing/Linking Error
 - Indicator is quickly flashing green for 1 minute

Security Lockout Indicator



Hoist is locked via ONE-KEY™

- All alert indicators are solid red
- Refer to ONE-KEY™ section for instructions on unlocking tool.

ONE-KEY™

WARNING

CHEMICAL BURN HAZARD
This device contains a lithium button/coin cell battery. A new or used battery can cause severe internal burns and lead to death in as little as 2 hours if swallowed or enters the body

TO AVOID INJURY:
Always secure the battery cover. If it does not close securely, stop using the device, remove the batteries, and keep it away from children. If you think batteries may have been swallowed or entered the body, seek immediate medical attention.

Internal Coin Cell Battery

An internal coin cell battery is used to facilitate full ONE-KEY™ functionality.

To replace the coin cell battery:

1. **WARNING!** Remove tool's battery to avoid starting the tool.
2. Loosen the screw(s) and open the coin cell battery door.
3. Remove the old coin cell battery, keep it away from children, and dispose of it properly.
4. Insert the new coin cell battery (3V CR2032), with the positive side facing up.
5. Close the battery door and tighten the screw/the screws securely.

ONE-KEY™

To learn more about the ONE-KEY™ functionality for this tool, go to milwaukeeetool.com/One-Key.
To download the ONE-KEY™ app, visit the App Store® or Google Play™ from your smart device.

ONE-KEY™ Indicator	
Solid Blue	Wireless mode is active and ready to be configured via the ONE-KEY™ app.
Blinking Blue	Tool is actively communicating with the ONE-KEY™ app.
Blinking Red	Tool is in security lockout and can be unlocked by the owner via the ONE-KEY™ app.

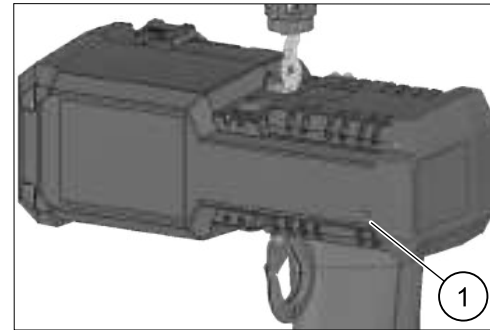


Figure 4. ONE-KEY™ Indicator

- 1 ONE-KEY™ Indicator

ELECTRICAL DISCONNECT KEY

Locking Remote Control

To lock Remote Control:

1. Remove the battery door via the knurled screw.
2. Pull and remove the Electrical Disconnect Key.
3. Ensure the Electrical Disconnect Key does not become misplaced.
 - Attaching a key ring to the Electrical Disconnect Key is recommended.

Unlocking Remote Control

To unlock Remote Control:

1. Remove the battery door via the knurled screw.
2. Insert the Electrical Disconnect Key into its location ensuring proper alignment.

CAUTION

The Electrical Disconnect Key should be removed and securely stored when leaving hoist unattended.

SAFE OPERATING INSTRUCTIONS AND PROCEDURES

For safety precautions and a list of Do's and Do Not's for safe operation of hoists, *see page 3*.

1. Permit only competent personnel to operate unit.
2. When preparing to lift a load, be sure that the attachments to the hook are firmly seated in hook saddle. Avoid off-center loading of any kind, especially loading on the point of hook.
3. **DO NOT** allow the load to bear against the hook latch. The latch is to help maintain the hook in position while the chain is slack before taking up slack chain.

WARNING

Allowing the load to bear against the hook latch and/or hook tip can result in loss of load.

TO AVOID INJURY:
Do not allow the load and/or attachments to bear against the hook latch and/or hook tip. Apply load to hook bowl or saddle only.

4. **DO NOT** wrap the load chain around the load and hook onto itself as a choker chain.
Doing this will result in:
 - The loss of the swivel effect of the hook, which could result in twisted chain and a jammed liftwheel.
 - The upper limit switch is bypassed and the load could hit the hoist.
 - The chain could be damaged at the hook.
5. Before lifting load, check for twists in the load chain.
6. Stand clear of all loads and avoid moving a load over the heads of other personnel. Warn personnel of your intentions to move a load in their area.
7. **DO NOT** leave the load suspended in the air unattended.
8. **DO NOT** use this or any other overhead materials handling equipment for lifting persons.
9. **DO NOT** load hoist beyond the rated capacity shown on ID plate.
10. Warn personnel of your intention to lift a load in the area. Tie off the load with auxiliary chains, or cables before access to the area beneath the load is permitted.
11. Take up a slack load chain carefully and start load easily to avoid shock and jerking of hoist load chain. If there is any evidence of overloading, immediately lower the load, and remove the excess load.
12. When lifting, raise the load only enough to clear the floor or support, and check to be sure that the attachments to the hook and load are firmly seated. Continue lift only after you are assured the load is free of all obstructions.
13. **DO NOT** allow the load to swing or twist while hoisting.
14. Never operate the hoist when flammable materials or vapors are present. Electrical devices produce arcs or sparks that can cause a fire or explosion.
15. **STAY ALERT!** Watch what you are doing and use common sense. Do not use the hoist when you are tired, distracted, or under the influence of drugs, alcohol or medication causing diminished control.

INSPECTION

To maintain continuous and satisfactory operation, a regular inspection procedure must be initiated to replace worn or damaged parts before they become unsafe. Inspection intervals must be determined by the individual application and are based on the type of service to which the hoist will be subjected.

The type of service to which the hoist is subjected can be classified as "Normal", "Heavy", or "Severe".

Normal Service

Involves operation with randomly distributed loads within the rated load limit, or uniform loads less than 65% of rated load for not more than 25% of the time.

Heavy Service

Involves operating the hoist within the rated load limit which exceeds normal service.

Severe Service

Normal or heavy service with abnormal operating conditions or constant exposure to the elements of nature.

Two classes of inspection - frequent and periodic - must be performed.

Frequent Inspections

These inspections are visual examinations by the operator or other designated personnel. Records of such inspections are not required. The frequent inspections are to be performed monthly for normal service, weekly to monthly for heavy service, and daily to weekly for severe service, and they should include those items listed, see "Table 4: Minimum Frequent Inspections", page 13.

Periodic Inspections

These inspections are visual inspections of external conditions by an appointed person. Records of periodic inspections are to be kept for continuing evaluation of the condition of the hoist.

Periodic inspections are to be performed yearly for normal service, semi-annually for heavy service and quarterly for severe service, and they are to include those items listed, see "Table 5: Minimum Periodic Inspections", page 14.

CAUTION

Any deficiencies found during inspections are to be corrected before the hoist is returned to service. Also, the external conditions may show the need for disassembly to permit a more detailed inspection, which, in turn, may require the use of nondestructive-type testing.

PREVENTIVE MAINTENANCE

In addition to the above inspection procedure, a preventive maintenance program should be established to prolong the useful life of the hoist and maintain its reliability and continued safe use. The program should include the periodic and frequent inspections with particular attention being paid to the lubrication of the various components using the recommended lubricants.

SUSPENSION INSPECTION CRITERIA

1. Ensure the suspension pin retainer (1) is free from cracks and defects and that the screw is present and tight.

If reinstalling the retaining screw:

1. Ensure the threads are clean and dry.
2. Apply medium strength threadlocker to the retainer screw (2).



Figure 5. Suspension Pin Retainer/Retainer Screw

- 1 Suspension Pin Retainer 2 Retainer Screw

HOOK REMOVAL CRITERIA

- a) Missing or illegible rated load identification, or illegible hook manufacturer's identification, or secondary manufacturer's identification.
- b) Excessive pitting or corrosion.
- c) Cracks, nicks, or gouges.
- d) Wear – any wear exceeding 10% of the original section dimension of the hook, or its load pin.
- e) Deformation – any visibly apparent bend, or twist from the plane of the unbent hook.

- f) Throat opening – any distortion causing an increase in the throat opening of 5%, not to exceed 1/4" (6 mm).
- g) Inability to lock – any self-locking hook that does not lock.
- h) Inoperative latch – any damaged latch, or malfunctioning latch that does not close the hook's throat.
- i) Thread wear, damage, or corrosion.
- j) Evidence of excessive heat exposure, or unauthorized welding.
- k) Evidence of unauthorized alterations such as drilling, machining, grinding, or other modifications.

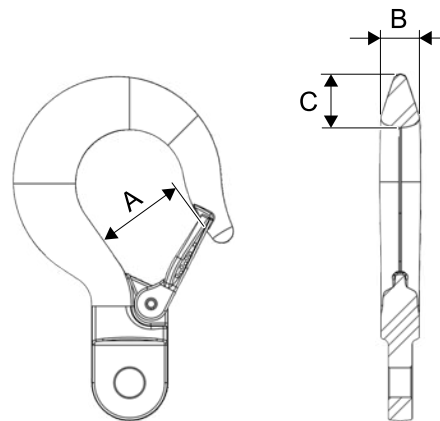


Figure 6. Hook Removal Criteria

Table 3. Hook Removal Criteria

Hook Dimension	Criteria (mm)	
A	Nominal: 38	Max: 39.9
B	Nominal: 15	Min: 13.5
C	Nominal: 22	Min: 19.8

Table 4. Minimum Frequent Inspections

Type of Service			Item
Normal	Heavy	Severe	
Monthly	Week-ly to Monthly	Daily to Weekly	a) Brake for evidence of slippage or rollback.
			b) Control functions for proper operation.
			c) Hooks for damage, cracks, twists, excessive throat opening, latch engagement, and latch operation, <i>see "Hook Removal Criteria", page 12.</i>
			d) Load chain for adequate lubrication, as well as for signs of wear, damaged links, or foreign matter, <i>see "Inspecting the Load Chain", page 14.</i>
			e) Load chain for proper reeving and twists.

Table 5. Minimum Periodic Inspections

Type of Service			Item
Normal	Heavy	Severe	
Yearly	Every 6 Months	Every 3 Months	a) All items listed for frequent inspections, see "Table 4: Minimum Frequent Inspections", page 13.
			b) External evidence of loose screws, bolts, or nuts.
			c) External evidence of worn, corroded, cracked, or distorted hook block, suspension screws, gears, bearings, and dead end block.
			d) External evidence of damage to lower hook assembly. Also check the upper suspension making sure the retaining screw is present and tight.
			e) External evidence of damage, or excessive wear of the liftwheel pockets. Widening and deepening of the pockets may cause the chain to lift-up in the pocket, and result in binding between liftwheel, and chain guides. Also check the chain guide for wear, or burring where the chain enters the hoist. Severely worn, or damaged parts should be replaced.
			f) External evidence of excessive wear of brake parts, see <i>"Brake Cleaning and Replacement"</i> , page 16.
			g) Check the operation of the Remote Control making sure the buttons operate freely, and do not stick in any position.
			h) Inspect the Remote Control enclosure for damaged insulation.
			i) Inspect suspension components for damage, cracks, wear, and operation. Also check hook retainer screw and ensure it is properly torqued.
			j) Inspect the loose end chain stop and bumper. Replace worn, or distorted parts.
			k) Inspect the suspension lug, or hook for excess free play, or rotation. Replace worn parts as evidenced by excess free play, or rotation.
			l) Inspect for signs of lubricant leakage at the gearbox.

INSPECTING THE LOAD CHAIN

The chain must be inspected at regular intervals, with a minimum of once annually. As the frequency of use increases, the time intervals between inspections must be reduced. During inspection, the chain link must be examined along its entire length, including the hidden parts. If the lifting equipment is frequently used with a constant lifting distance, or in other words the switch from upward to downward often takes place in the same area, a particularly thorough inspection, and lubrication is required in that area. Worn chain can also be an indication of worn hoist components. For this reason, the hoist's chain guides, hook blocks and liftwheel (sprocket) should be examined for wear and replaced as necessary when replacing chain.

1. Check to see if chain is dirty or poorly lubricated, see *"Hoist Lubrication"*, page 16.
2. Clean the chain with a non-caustic/non-acid-type solvent and perform a link-by-link inspection for wear, or cracks, twisting or deformation. Replace chain that shows any of these defects.
3. Slack the portion of the chain that normally passes over the liftwheel (sprocket). Examine the chain links for wear (see Fig. 7). If the wire diameter anywhere on the link measures less than 90% of the nominal wire diameter, replace the chain.

NOTE: Nominal pitch over 11 links is 8.25 inches (209.5 mm). However, comparing the pitch of worn sections to unworn sections is considered best practice and recommended by the manufacturer.

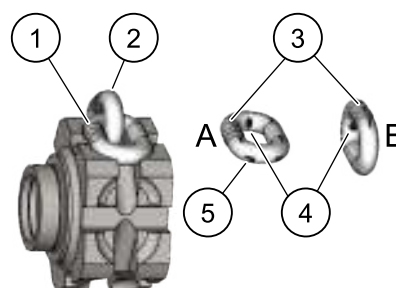


Figure 7. Chain Wear Areas

- | | |
|-------------------------------|----------------------------|
| A Flat lay marks | 3 Chain guide marks |
| B Upstanding link mark | 4 Interlink marks |
| 1 Flat lay link | 5 Wear areas |
| 2 Upstanding link | |

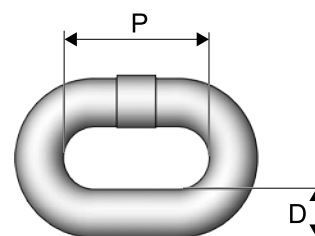


Figure 8. Chain Dimensions

- | | |
|------------------------|--------------------------------|
| P Nominal pitch | D Nominal wire diameter |
|------------------------|--------------------------------|

Table 6. Chain Dimensions

P	D
0.750" (19.05 mm)	0.250" (6.3 mm)

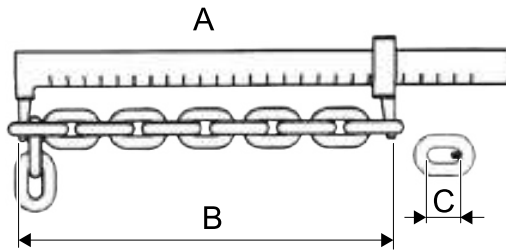


Figure 9. Gaging Load Chain Wear

- A** Vernier caliper
B Measure 11 pitches
C One pitch

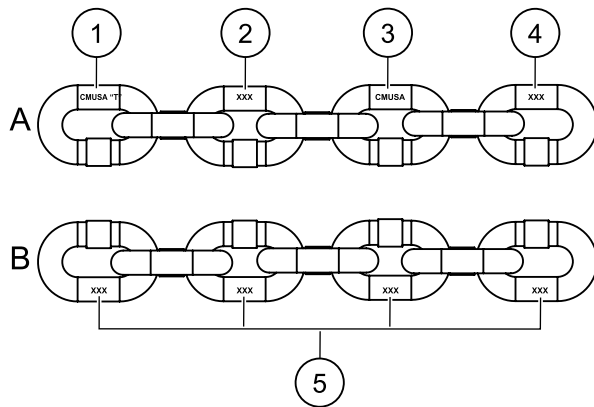


Figure 10. Chain Embossing

- A** Front
B Back
1 CMUSA "T"
2 Clock Number (3 Digits)
3 CMUSA
4 Trace Code (3 Digits)
5 Julian Date (3 Digits)

Use only original Grade T load chains and original spare parts from the manufacturer. Use of other chain and parts may be dangerous and voids factory warranty.

NOTE: Do not use replaced chain for other purposes such as lifting or pulling. Load chain may break suddenly without visual deformation. For this reason, cut replaced chain into short lengths to prevent use after disposal.

WARNING	
Use of commercial or other manufacturer's chain, and parts to repair hoists may cause load loss.	
TO AVOID INJURY:	
Use only manufacturer-supplied replacement load chain and parts. Chain and parts may look similar, but manufacturer chain and parts are made of specific material, or processed to achieve specific properties.	

REMOVAL AND INSTALLATION OF LOAD CHAIN

WARNING

Improper installation (reeving) of the load chain can result in a dropped load.

TO AVOID INJURY/DAMAGE:

- Verify use of proper size and type of hoist load chain for specific hoist.
- Install load chain properly as indicated below.

The first method is recommended when replacing severely worn load chain and requires disassembling the hoist. Method two does not require hoist disassembly.

NOTE: When replacing the chain, it is crucial that the chain is oriented with the welds on the upstanding links AWAY from the liftwheel.

Method #1

- Remove battery from the hoist.
- Detach loose end chain stop and lower hook block from the chain.
- Continue to disassemble the hoist and inspect the liftwheel, chain guides, motor housing and gear housing. If any of these components are worn or damaged, premature failure of the new chain may result. Parts can be easily identified by accessing the Parts List.
- If the liftwheel pockets, particularly the ends, are worn or scored, replace liftwheel. If chain guides and housings are worn, cracked, or damaged, these parts should also be replaced.
- Reassemble hoist with the new load chain inserted over the liftwheel. Position chain with the weld on upstanding links away from liftwheel and leave approximately 1 foot (0.3 m) of chain hanging free on loose end side.

NOTE: To simplify handling when reassembling the hoist, a short undamaged piece of the old chain may be used as a "starter chain". Position this piece of chain in the same manner as explained above for the "new chain" and complete the reassembly of the hoist. See Method #2 below for more details on using starter chain.

- Reinstall the loose end chain stop and bumper.
- Attach the hook block and bumper to new load chain.

Method #2

- Detach loose end chain stop and lower hook block from the chain.
- Treat the old load chain in hoist as a "starter chain", and use the loose end link to serve as a temporary coupling link.
- Connect the starter chain in the hoist, and the new load chain to be installed. Ensure proper orientation of the new chain with the welds facing away from the liftwheel.
- Under power, reeve the new load chain through the liftwheel area, replacing the starter chain in unit. Run enough chain through to attach loose end chain stop.
- Reinstall the loose end chain stop and bumper.
- Attach the hook block and bumper to new load chain.

MAINTENANCE

LOAD LIMITER

The load limiter should operate for the normal life of the hoist without service. The device has been calibrated at the factory for a specific model of hoist.

WARNING

The lubricants used in and recommended for the hoist may contain hazardous materials that mandate specific handling and disposal procedures.

TO AVOID CONTACT AND CONTAMINATION:

Handle and dispose of lubricants only as directed in applicable material safety data sheets and in accordance with applicable local, state and federal regulations.

HOIST LUBRICATION

GEARS

NOTE: To assure extra-long life and top performance, be sure to lubricate the various parts of the hoist using the lubricants specified. If desired, these lubricants may be purchased from the manufacturer. See online Parts list for required lubricants.

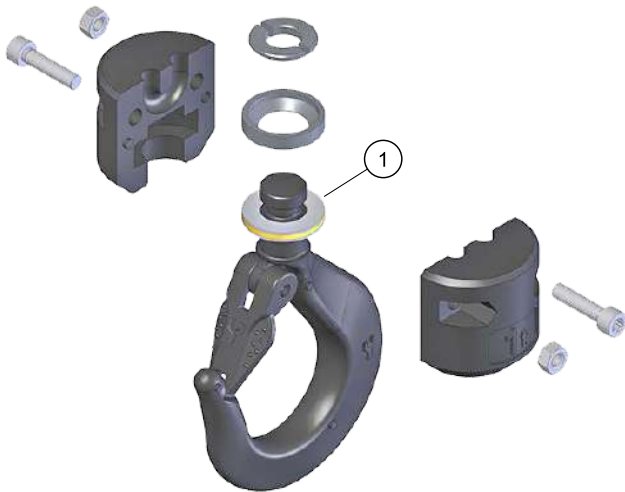
The gearbox is packed with grease during assembly and should not need to be replaced unless the gears have been removed from the housing and degreased. **Do not attempt to repair or service the planetary gearbox.**

If the gears are removed from the housing, wipe off the excess grease with a soft cloth and degrease the gears and housings. Upon reassembly, add grease to gears and housing.

- Required grease type: Fuchs Lubricants Co. Stabyl HT 100 or equivalent
- Required grease volume: 1.5 fl.oz (44 ml)

BEARINGS

All bearings and bushings, except the lower hook thrust bearing, are pre-lubricated and require no lubrication. The lower hook thrust bearing should be lubricated at least once a month with Dow Corning Molykote BR-2-5 grease or equivalent. Apply a thin film to both sides of the bearing. Do not allow grease on fastener threads.



1 Thrust bearing

CHAIN GUIDES AND LIFTWHEEL

When the hoist is disassembled for inspection and/or repair, the chain guides and liftwheel must be lubricated with Lubriplate Rock Drill Oil 10-R (Fiske Brothers Refining Co.), Citgo Rock Drill Oil 46, or equivalent prior to reassembly. The lubricant must be applied in sufficient quantity to obtain natural runoff and full coverage of these parts.

LOAD CHAIN

A small amount of lubricant will greatly increase the life of the load chain. Do not allow the chain to run dry.

Keep the chain clean and lubricate it at regular intervals with Lubriplate Rock Drill Oil 10-R (Fiske Brothers Refining Co.), Citgo Rock Drill Oil 46, or equivalent. Normally, weekly lubrication and cleaning is satisfactory, but under hot and dirty conditions, it may be necessary to clean the chain at least once a day and lubricate it several times between cleanings.

When lubricating the chain, apply sufficient lubricant to obtain natural runoff and full coverage, especially in the interlink area.

WARNING

Used motor oils contain known carcinogenic materials.

TO AVOID HEALTH PROBLEMS:

- Never use used motor oils as a chain lubricant.
- Only use recommended lubricant for the load chain.

EXTERIOR FINISH

The exterior surfaces of this hoist are made of a durable polymer that requires no maintenance. Exterior surfaces can be cleaned by wiping with a cloth.

BRAKE CLEANING AND REPLACEMENT

BRAKE CLEANING

To prevent excess buildup of brake dust, follow the procedure below every 20 hours of operation.

Remove dust caps from the outer housing and use a suitable vacuum to remove excess brake dust.

NOTE: Use a suitable dust extraction device with a minimum of a HEPA filter and appropriate PPE to avoid exposure to dust particles.

BRAKE ADJUSTMENT/REPLACEMENT

The hoist brake may require periodic adjustment over the life of unit. The distance the load drifts downward immediately after lifting is referred to as rollback. If the rollback when lifting rated load exceeds two inches, a brake adjustment is necessary. A qualified technician can follow the steps below to disassemble and adjust the brake assembly to restore performance.

Disassemble the unit to access the brake components. Refer to Fig. 11 below, and remove the snap ring and the brake hub driver. For adjustment, hand tighten the brake hub to fully seat all components. Re-install the hub driver, making sure the hub driver pointer is inside the alignment zone as shown below in Fig. 12. The brake hub must remain tight during the alignment process for proper orientation.

For replacement, remove all existing brake parts shown in Fig. 11. Ensure all parts are clean, and all four springs are installed in the frame during reassembly. Carefully apply a thin coat of Molykote® 41 Extreme High Temperature Grease to the threads of the Brake Hub (item 5). Make sure no grease comes in contact with the friction surfaces. Follow the brake adjustment procedure outlined above after installing the remaining brake parts.

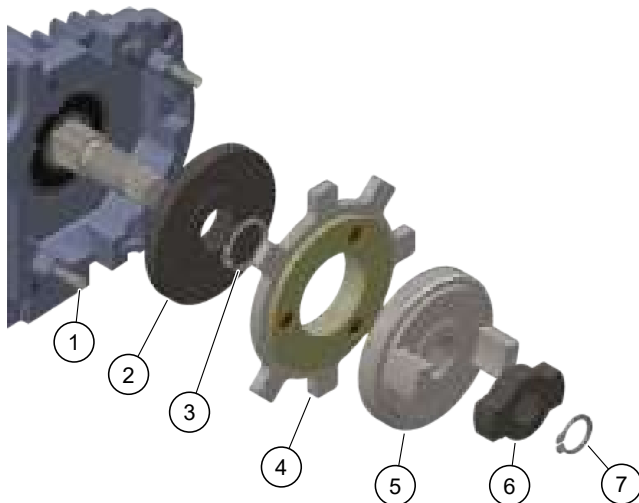


Figure 11. Brake Assembly

Table 7. Brake Assembly

ITEM NO.	DESCRIPTION	QTY.
1	BRAKE SPRING	4
2	COUNTER DISC	1

ITEM NO.	DESCRIPTION	QTY.
3	RETAINING RING – 19x1.2	1
4	LOCK DISC	1
5	BRAKE HUB	1
6	HUB DRIVER	1
7	RETAINING RING - 14x1	1

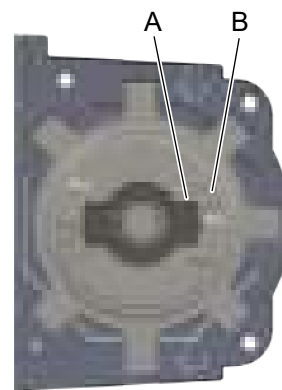


Figure 12. Brake Alignment

A Brake driver pointer

B Alignment zone

TROUBLESHOOTING

Table 8. Troubleshooting

Trouble	Probable Cause	Remedy
Hook does not respond to the Remote Control device.	Low or no hoist battery voltage	Check “M18 Battery Indicator” on Remote Control
	Low or no Remote Control battery voltage	Check/replace Remote Control batteries
	Remote Control is not connected to the hoist	Press the Power Button to connect the Remote Control to its hoist
	The upper or lower limits have stopped the hoist motion	This is expected operation
	Excessive load	Check “Weight Overcapacity Indicator” on Remote Control
	Loose connections in hoist	Inspect connections
Hook moves in wrong direction.	Remote Control is held upside down	
Hook lowers but will not raise	Excessive load (load limiter active)	Check “Weight Overcapacity Indicator” on Remote Control
	Chain knot	Disentangle chain
	Upper limit position has been reached	This is expected operation
	Open hoisting circuit - open; Remote Control contacts faulty	Replace Remote Control
Hook raises but will not lower	Open hoisting circuit - open; Remote Control contacts faulty	Replace Remote Control
	Chain knot	Disentangle chain
	Lower limit position has been reached	This is expected operation
Hook lowers when hoisting control is not operated	Excessive load applied from the outside	Ensure hoist load is known and below the rated capacity
	Brake has reached end of life	Inspect and replace brake
Hook does not stop promptly	Brake slipping due to contamination	Open inspection caps and check for fluids etc.
	Brake has reached end of life	Check load displacement after stopping from lifting

Trouble	Probable Cause	Remedy
Hoist operates sluggishly	Excessive load	Check "Weight Overcapacity Indicator" on Remote Control
	Brake dragging	Inspect and adjust brake
	Load chain worn out	Check chain wear
Operator Indicator illuminates	Excessive load	Check "Weight Overcapacity Indicator" on Remote Control
	Ratio idle to running time is less than 4 (exceeding 20% duty cycle rating)	Increase idle time
	Hoist is used continuously for more than 7.5 min (exceeding short time rating)	Reduce continuous run time (from cold state) to 7.5 minutes or less
Hook fails to stop at either or both ends of travel	Missing, loose, or damaged components	Inspect
Hook stopping point varies	Missing, loose, or damaged components	Inspect
	Brake not holding	Inspect brake

MANUAL LOWERING PROCEDURE

The hoist may be operated manually by using an electric drill and an SAE 3/16" socket.

1. Remove the hoist end cap (1) on the motor side of the hoist by removing the four screws (2) as shown below.
2. Remove the motor shaft cover (3) held on by the two screws (4).
3. Use a drill and a socket to spin the motor shaft (5) counter-clockwise to lower the load, or clockwise to raise the load.
4. Replace the motor shaft cover (3) and hoist end cap (1).

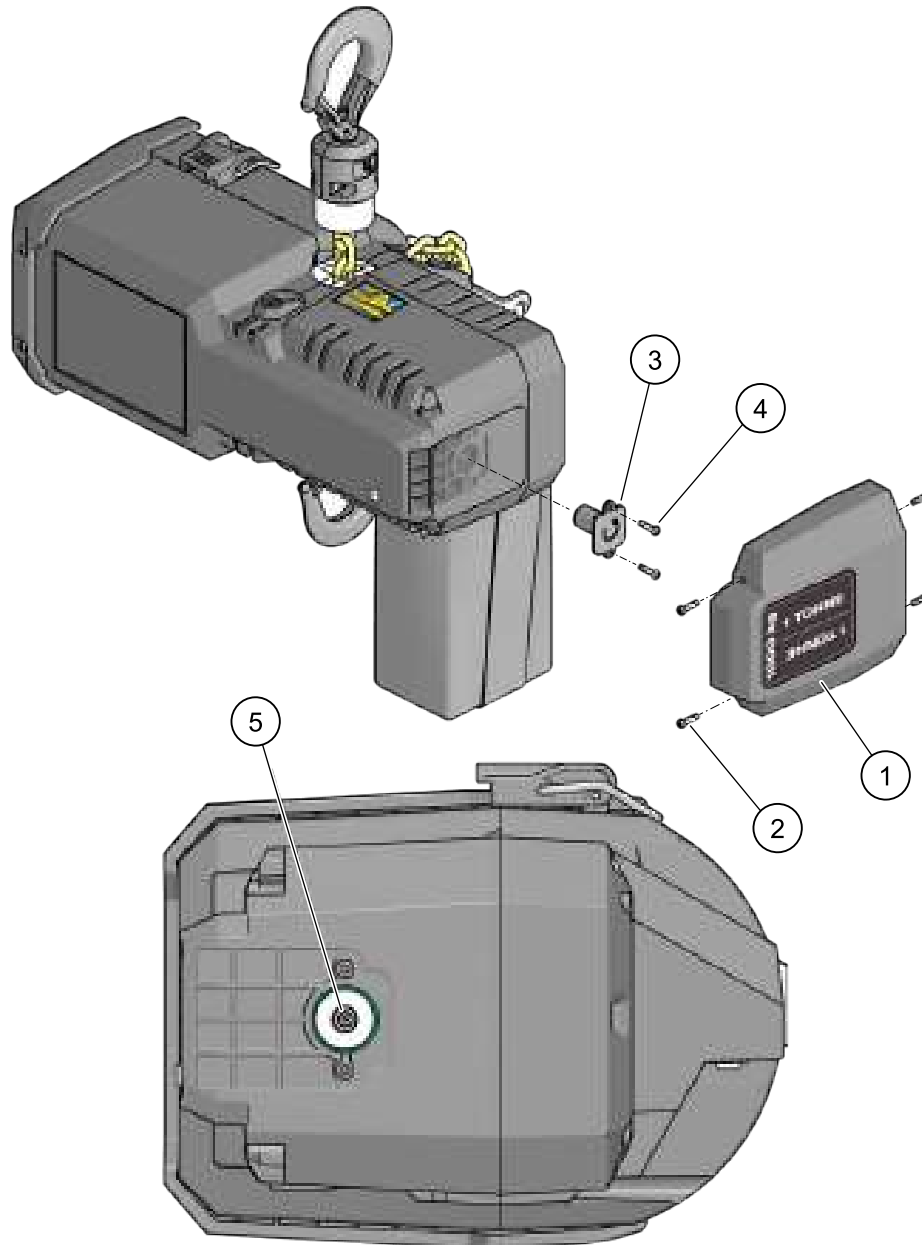


Figure 13. Manual Lowering Procedure

TECHNICAL DATA

TORQUE SPECIFICATION

Table 9. Torque Specification

Fastener	Fastener Description	Tool Required	* Recommended Seating Torque	
			in-lbs	Nm
Center Housing Screws	M6 TORX Head Cap Screw	T30 TORX Driver	89	10
Suspension Bolt Screw	M4 TORX Head Cap Screw	T20 TORX Driver	30	3.5
Bottom Hook Block Screws	M6 TORX Head Cap Screw	T30 TORX Driver	89	10
Chain Stop	M6 TORX Head Cap Screw	T30 TORX Driver	89	10
Chain Bag Bracket	M6 TORX Head Cap Screw	T30 TORX Driver	89	10
Brake Dust Caps	M6 TORX Button Head Screw	T30 TORX Driver	89	10
Plastic Housing Screws	M4 TORX Head Cap Screw	T20 TORX Driver	17	2
Hoist End Cap Bumpers	M4 TORX Head Cap Screw	T20 TORX Driver	7	1
Motor Shaft Cover	M4 TORX Head Cap Screw	T20 TORX Driver	7	1
Coin Cell Battery Cover	M4 TORX Head Cap Screw	T20 TORX Driver	9	1

* All torque values are for clean, dry fasteners with pre-applied threadlocker.
DO NOT apply oil or any other lubricant to the fastener threads.
Torque value should be reduced by 20% when applying a liquid threadlocker.



Follow all instructions and warnings for inspecting, maintaining, and operating this hoist.

HOIST PARTS AND SERVICES

PARTS LIST

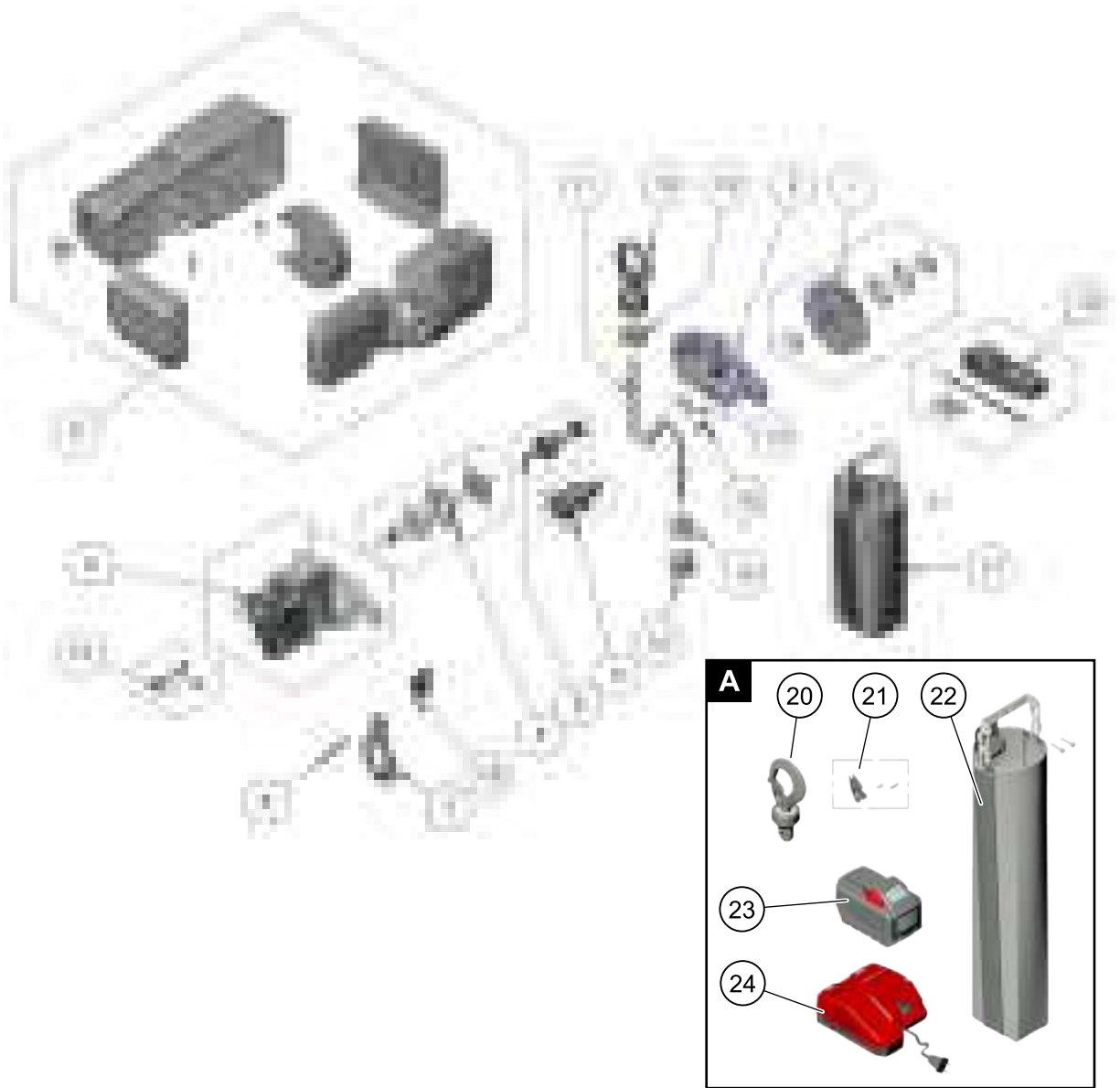


Figure 14. Hoist Parts

Table 10. Parts List

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	192098915	CLUTCH KIT	1
2	192087948	CENTER HOUSING GEAR SIDE	1
3	192098916	DRIVESHAFT KIT	1
4	192098918	LIFTWHEEL KIT	1
5	192098917	BRAKE PARTS KIT	1
6	192098913	MOTOR SIDE ASSEMBLY KIT	1
7	192087967	TOP HOOK ASSEMBLY	1
8	192098905	HOOK PIN KIT	1
9	192098903	PLASTICS KIT	1
10	192094186	SLIDE NUT	1

ITEM NO.	PART NO.	DESCRIPTION	QTY.
11	636224	LOAD CHAIN 0.250 T GRADE	21
12	192098906	REMOTE CONTROL KIT	1
13	192087964	CHAIN STRIPPER	1
14	192089989	BOTTOM BLOCK ASSEMBLY	1
15	192089493	CHAIN STOP BUMPER	2
16	192091312	CHAIN STOP KIT	1
17	192098908	CHAIN BAG KIT, 11"	1
18	192098912	HOIST PCB KIT	1
19	192098918	LIMIT SWITCH KIT	1
OPTIONAL PARTS A			
20	192095276	SWIVEL HOOK	1
21	00400450	LATCH KIT 1 TONNE	1
22	192098911	CHAIN BAG KIT, 23"	1
23	192098605	M18 FUEL 12 AH - BATTERY PACK	1
24	192098607	M18 RAPID CHARGER	1

PARTS FOR YOUR HOIST ARE AVAILABLE FROM YOUR LOCAL AUTHORIZED REPAIR STATION.
FOR THE NAME OF THE NEAREST PARTS OR SERVICE CENTER, VISIT OUR WEBSITE
www.cmco.com

ORDERING INSTRUCTIONS

The following information must accompany all correspondence orders for replacement parts:

- Hoist Model and serial numbers from the product ID label.

NOTE: When ordering replacement parts, it is recommended that consideration be given to the need for also ordering such items as gaskets, screws and straps, etc. These items may be damaged or lost during disassembly or just unfit for future use because of deterioration from age or service


WARRANTY

LIMITATION OF WARRANTIES, REMEDIES, AND DAMAGES

Indemnification and safe operation

Buyer shall comply with and require its employees to comply with directions set forth in instructions and manuals furnished by Seller and shall use and require its employees to follow such instructions and manuals and to use reasonable care in the use and maintenance of the Goods and any Replacement Parts. Buyer shall not remove or permit anyone to remove any warning or instruction signs on the Goods or Replacement Parts. In the event of personal injury or damage to property or business arising from the use of the Goods or Replacement Parts, Buyer shall within 48 hours thereafter give Seller written notice of such injury or damage. Buyer shall cooperate with Seller in investigating any such injury or damage and in the defense of any claims arising therefrom.

If Buyer fails to comply with this section or if any injury or damage is caused, in whole or in part, by Buyer's failure to comply with applicable federal or state laws, rules or regulations safety requirements, Buyer shall indemnify and hold Seller harmless against any claims, loss or expense for injury or damage arising from the use of the Goods and/or Replacement Parts.

<div> WARNING</div>
Alterations or modifications of equipment and use of non-Seller replacement parts can lead to dangerous operation and injury.
<div>TO AVOID INJURY:<ul style="list-style-type: none">• Do not alter or modify equipment.• Do use only replacement parts manufactured by seller.</div>