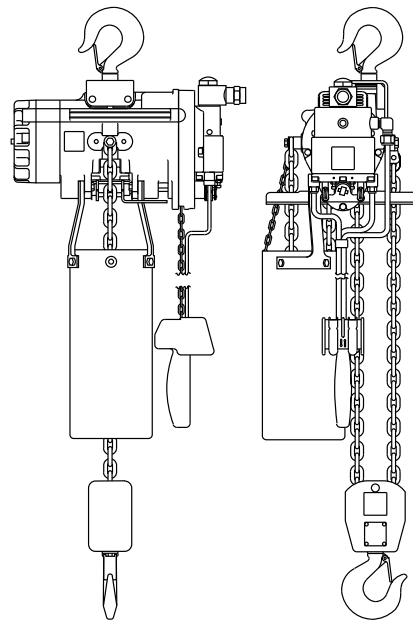




Air Chain Hoist MLK Series



(Dwg. MHP0456)



Save These Instructions

Only allow **Ingersoll Rand** trained technicians to perform maintenance on this product. For additional information contact **Ingersoll Rand** factory or nearest Distributor.

For additional supporting documentation refer to Table 1 'Product Information Manuals' on page 2.

Manuals can be downloaded from <http://www.ingersollrandproducts.com>.

The use of other than genuine **Ingersoll Rand** replacement parts may result in safety hazards, decreased performance and increased maintenance and will invalidate all warranties.

Original instructions are in English. Other languages are a translation of the original instructions.

Refer all communications to the nearest **Ingersoll Rand** Office or Distributor.

Table 1: Product Information Manuals

Publication	Part/Document Number	Publication	Part/Document Number
Product Safety Information Manual	MHD56295	Product Maintenance Information Manual	47099007
Product Parts Information Manual	47112669		

PRODUCT DESCRIPTION

MLK Series Chain hoists are powered by compressed air and are designed to lift and lower loads. They are operated through manual Pull-Chain or Lever-Actuated pendant control. MLK Series chain hoists utilize a rotary vane air motor to drive a chain wheel, that lifts and lowers the load. Epicyclic gearing is employed to reduce the motor speed and multiply the torque. Each hoist is equipped with a spring operated, Air-Release disc brake to hold a suspended load. The hoist can be bolted or hook mounted to a trolley or permanent mounting structure.

The MLK Series hoists are suitable for A5 (ASME HST-5), severe duty use in the 0.25 to 1 metric ton range. The MLK series is designed to be used as a high speed production hoist. The MLKS is designed with reduced chain speed for optimal control. MLKR Spark-Resistant hoists are equipped with stainless steel chain, and or bronze hooks, for maximum protection.

SPECIFICATIONS

Table 2: MODEL CODE

Example:	M	L	500K	S	2	C	10 -	C	6	U
Series:										
M										
Link Chain Type:										
L										
Hoist Capacity:										
250K	= 250 kg - 1/4 metric ton (550 lb)									
500K	= 500 kg - 1/2 metric ton (1100 lb)									
1000K	= 1000 kg - 1 metric ton (2200 lb)									
Base Model Option †:										
R	= Spark Resistant (ML250K and ML500K Only)									
S	= Slow Speed Spotting									
Control:										
0	= No Controls									
1	= Pull Chain									
2	= Pendant									
3	= 2 Motor Pendant									
4	= 3 Motor Pendant									
Upper Suspension:										
A	= Lug Adapter									
B	= Bullard Hook (Self Closing)									
C	= Steel Snap Hook									
R	= Bronze Snap Hook									
DA	= Plain Rigid Trolley (Universal wheels "A" flange)									
DD	= Plain Rigid Trolley (Universal wheels "D" flange)									
FXXA	= Hand Chain (XX-Drop)									
FXXD	= Hand Chain (XX-Drop)									
HA	= Powered Trolley (Universal wheels "A" flange)									
HD	= Powered Trolley (Universal wheels "D" flange)									
Length of Lift (Feet):										
10	= 10 ft (3 m) Standard									
XX	= Specify Length									
Lower Suspension:										
B	= Bullard Hook									
C	= Steel Snap Hook									
R	= Bronze Snap Hook									
Control Drop (Feet):										
6	= 6 ft (1.8 m) Standard									
XX	= Specify Length									
Option:										
E	= Epoxy Coating									
M	= Manual Brake Release									
P	= Piped Away Exhaust									
S	= Steel Chain Container									
U	= Fabric Chain Container									

Note:

1. Pull chain length available – 0 ft to 125 ft max.
2. Pendant control length available – 0 ft to 75 ft max.
3. Maximum available lifts :

ML250K, ML250KS	100 ft
ML250KR	200 ft
ML500K, ML500KR, ML500KS	200 ft
ML1000K, ML1000KS	200 ft

Table 3:

Hoist Model No.	Rated Capacity (kg)	No. Chain Falls	Speed with Rated Load				Speed with Half Load				Speed with No Load			
			fpm		m/m		fpm		m/m		fpm		m/m	
			up	down	up	down	up	down	up	down	up	down	up	down
ML250KS	250	1	40	90	12.2	27.4	53	71	16.1	21.6	71	53	21.6	16.1
ML250K			101	117	30.8	35.7	145	111	44.2	33.8	171	99	52.1	30.1
ML250KR			26	38	7.9	11.6	34	36	10.4	11	42	30	12.8	9.1
ML500KS	500	1	22	66	6.7	20.1	30	44	9.1	13.4	44	32	13.4	9.7
ML500K			55	97	16.8	29.6	80	72	24.4	22	106	59	32.3	18.0
ML500KR			13	20	4.0	6.1	17	18	5.2	5.5	21	15	6.4	4.6
ML1000KS	1000	2	11	33	3.4	10	15	22	4.6	6.7	22	16	6.7	4.9
ML1000K			28	49	8.5	14.9	40	36	12.2	11	53	30	16.1	9.1

Note:

Performance figures based on 70 SCFM (45 SCFM for MLKS and MLKR Hoists) at 90 psig (630 kPa) air supply at hoist inlet. Pendant control models use approximately 4 SCFM more air.

INSTALLATION

Prior to installing the hoist, carefully inspect it for possible shipping damage. Hoists are supplied fully lubricated from the factory. Lubrication of the load chain is recommended before initial hoist operation.

WARNING

- A falling load can cause injury or death. Before installing, read "Product Safety Information Manual".
- 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. This is the customer's responsibility. If in doubt, consult a registered structural engineer.

CAUTION

- Owners and users are advised to examine specific, local or other regulations, including American Society of Mechanical Engineers and/or OSHA Regulations which may apply to a particular type of use of this product before installing or putting hoist to use.

Hoist

Make certain your hoist is properly installed. A little extra time and effort in so doing can contribute a lot toward preventing accidents and helping you get the best service possible.

Always make certain the supporting member from which the hoist is suspended is strong enough to support the weight of the hoist plus the weight of a maximum rated load plus a generous factor of at least 500% of the combined weights.

If the hoist is suspended by a top hook, the supporting member should rest completely within the saddle of the hook and be centered directly above the hook shank. Do not use a supporting member that tilts the hoist to one side or the other.

Hook Mounted Hoist Installation

Place hook over mounting structure. Make sure hook latch is engaged.

Trolley Mounted Hoist Installation

When installing a trolley on a beam, measure the beam flange and temporarily install the trolley on the hoist to determine the exact distribution and arrangement of the spacers. The distance between the wheel flanges should be 3/16 in. to 1/4 in. (4.76 mm to 6.35 mm) greater than the width of the beam flange. The number of spacers (257) between the trolley side plate (250) and the mounting lug on the hoist must be the same in all four locations in order to keep the hoist centered under the I-beam. The remaining spacers must be equally distributed on the outside of the side plates. (For additional information refer to Installation and Maintenance Manual Form P6609 for Vane Motor Driven Trolleys.)

Refer to Dwg. MHP0866 on page 7, **A**. Minimum of one spacer required;

Note: Ensure X-Y=3/16 to 1/4 in. (5 to 6 mm)

WARNING

- At least one Mounting Spacer (257) must be used between the head of each Trolley Bracket Bolt (255) and the Trolley Bracket (250) and between each Trolley Bolt Nut (256) and the Trolley Bracket. Failure to do this could cause the hoist to fall when used improperly.

Torque the Trolley Bolt Nuts (256) to 150 ft-lb (203 Nm).

When installing the hoist and trolley on the beam, make certain the side plates are parallel and vertical. After installation, operate the trolley over the entire length of the beam with a capacity load suspended 4 to 6 inches (10 to 15 cms) off the floor.

CAUTION

- To avoid an unbalanced load which may damage the trolley, the hoist must be centered under the trolley.

NOTICE

- Trolley wheels ride on the top of the lower flange of the beam.

Chain Container

When installing a fabric chain container on an MLK hoist, refer to drawings MHP3236 and MHP3237 in the Product parts information manual.

NOTICE

- Make certain to adjust the balance chain so that the chain container does not contact the load chain.
 - Allow chain to pile naturally in the chain container. Piling the chain carelessly into the container by hand may lead to kinking or twisting that will jam the hoist.
- Check the chain container size to make sure the length of load chain is within the capacity of the chain container. Replace with a larger chain container, if required.
 - Attach the chain container to the hoist.
 - Run bottom block to lowest point and run hoist in up direction to feed the chain back into the container.

Air System

The supply air must be clean, lubricated and free from water or moisture. A minimum of 90 psig (6.3 bar/630 Kpa) at the hoist motor is required to provide rated hoist capacity.

Refer to Dwg. MHP0191 on page 7, **A**. Air Out; **B**. Lubricator; **C**. Regulator; **D**. Air In; **E**. Filter.

Air Lines

The inside diameter of the hoist air supply lines must not be smaller than 1/2 in. (13 mm) based on a maximum of 50 ft (15 m) between the air supply and the hoist. Contact the factory for recommended air line sizes for distances greater than 50 ft (15 m). Before making final connections, all air supply lines should be purged before connecting to unit inlet. Supply lines should be as short and straight as installation conditions will permit. Long transmission lines and excessive use of fittings, elbows, tees, globe valves etc. cause a reduction in pressure due to restrictions and surface friction in the lines. If quick-disconnect fittings are used at the inlet of the hoist, they must have at least a 3/8 in. (9.5 mm) air passage. Use of smaller fittings will reduce performance.

NOTICE

- Always use an air line filter and lubricator.

Air Line Lubricator

Always use an air line lubricator with these hoists. Use a lubricator having an inlet and outlet at least as large as the inlet on the hoist motor. Install the air line lubricator as close to the air inlet on the hoist motor as possible. Refer to "ACCESSORIES" in the Product parts information manual.



CAUTION

- **Shut off air supply before filling air line lubricator.**
- **Lubricator must be located no more than 10 ft (3 m) from the motor.**
- **The air line lubricator should be replenished daily and set to provide lubrication at a minimum rate of 1 to 3 drops per minute, and adjusted at maximum hoist speed. Use of SAE 10W oil or a good grade of hydraulic oil is recommended. A fine mist will be exhausted from the throttle control valve when the air line lubricator is functioning properly.**
- **Do not use automotive type detergent oil. Detergents will delaminate the motor vanes and cause premature failure.**

Air Line Filter

It is recommended that an air line strainer/filter be installed as close as practical to the motor air inlet port to prevent dirt from entering the motor. The strainer/filter should provide 10 micron filtration and include a moisture trap. Clean the strainer/filter monthly to maintain its operating efficiency.

Moisture in Air Lines

Moisture that reaches the air motor through the supply lines is a primary factor in determining the length of time between service overhauls. Moisture traps can help to eliminate moisture. Other methods, such as an air receiver which collects moisture before it reaches the motor or an aftercooler at the compressor that cools the air prior to distribution through the supply lines, are also helpful.

The inlet strainer (42) must be installed on the hoist. Failure to do so may result in a hoist malfunction. The bleed adjustment screws (35 or 336) used on hoists with a pendant control are factory adjusted to provide optimum control at 90 psig (6.3 bar/630 kPa) air pressure. If the hoist is used with other air supply pressures, the bleed adjustment screws may require readjustment.

Adjustment of Bleed Screws on Pendant Control Models

For maximum performance and control, adjust the bleed screws (35 or 336) as follows:

1. Loosen the adjustment screw locknut (36 or 337).
2. Back out the adjustment screw (35 or 336) approximately one third (1/3) of a turn.
3. While fully depressing the pendant throttle lever (205) and holding it in that position, turn in the adjustment screw until the piston rod fully retracts. This adjustment will provide a good balance of spotting control and maximum hoist speed. If better spotting control is desired, slowly back out the adjustment screw a little at a time until the spotting control is suitable.
4. Tighten the adjustment screw locknut (36 or 337).

Storing the Hoist

1. Always store the hoist in a no load condition.
2. Wipe off all dirt and water.
3. Oil the chain, hook pins and hook latch.
4. Place in a dry location.
5. Plug hoist air inlet port.
6. Before returning hoist to service, follow instructions for 'Hoists Not In Regular Use'. Refer to the "INSPECTION" section on page 5.

OPERATION

The four most important aspects of hoist operation are:

1. Follow all safety instructions when operating hoist.
2. Allow only people trained in safety and operation on this product to operate hoist.
3. Subject each hoist to a regular inspection and maintenance program.
4. Be aware of hoist capacity and weight of load at all times. Ensure load does not exceed hoist or rigging ratings.

Operators must be physically competent. Operators must have no health condition which might affect their ability to act, and they must have good hearing, vision and depth perception. The hoist operator must be carefully instructed in his duties and must understand the operation of the hoist, including a study of the manufacturer's literature. The operator must thoroughly understand proper methods of hitching loads and should have a good attitude regarding safety. It is the operator's responsibility to refuse to operate the hoist under unsafe conditions.

Initial Operating Checks

Hoists are tested for proper operation prior to leaving the factory. Before the hoist is placed into service the following initial operating checks should be performed.

1. After installation of trolley mounted hoists, check to ensure the hoist is centered below the trolley.
2. Check for air leaks in the supply hose and fittings to pendant, and from pendant to manifold.
3. When first running the hoist or trolley motors some light oil should be injected into the inlet connection to allow good lubrication.
4. When first operating the hoist and trolley it is recommended that the motors be driven slowly in both directions for a few minutes.
5. Operate the trolley along the entire length of the beam.
6. Inspect hoist and trolley performance when raising, moving and lowering test load(s). Hoist and trolley must operate smoothly and at rated specifications prior to being placed in service.
7. Check that trolley (if equipped) and hook movement is the same direction as arrows or information on the pendant control.
8. Raise and lower a light load to check operation of the hoist brake.
9. Check hoist operation by raising and lowering a load equal to the rated capacity of the hoist a few inches (cm) off the floor.

10. Check operation of limit devices.
11. Check to see that the hoist is directly over the load. Do not lift the load at an angle (side pull or "yard").
12. Check to see that the hoist is securely connected to the overhead crane, monorail, trolley or supporting member.
13. Check to see that the load is securely inserted in the hook, and that the hook latch is engaged.



WARNING

- **Only allow personnel trained in safety and operation of this product to operate the hoist and trolley.**
- **This Hoist is not designed or suitable for lifting, lowering or moving persons. Never lift loads over people.**

Hoist Controls

Two Lever Pendant

Refer to Dwg. MHP0427 on page 7, **A.** Lower Load; **B.** Raise Load;

A two lever pendant provides operation of the hoist. For units with powered trolleys a four lever pendant is required.



WARNING

- **The hook latch is intended to retain loose slings or devices under slack conditions. Hook latches are not intended to be an anti-fouling device, so caution must be used to prevent the latch from supporting any of the load.**

Refer to Form P6778 for information on Pendant Throttle Handle Assemblies for two and three motor functions.

INSPECTION

There are two types of inspection, the frequent inspection performed by the operator and periodic inspections performed by personnel trained in the operation and repair of this hoist.

Careful inspection on a regular basis will reveal potentially dangerous conditions while still in the early stages, allowing corrective actions to be taken before the condition becomes dangerous.

Any deficiency revealed through inspection must be reported to an appointed person. A determination must be made as to whether a deficiency constitutes a safety hazard before resuming operation of the hoist.

Frequent Inspection

On hoists in continuous service, frequent inspection should be made at the beginning of each shift. In addition, visual inspections should be conducted during regular service for any damage or evidence of malfunction.

1. **Operation.** Check for visual signs or abnormal noises (grinding etc.) which could indicate a potential problem. Make sure all controls function properly and return to neutral when released. Check chain feed through the hoist and bottom block. If chain binds, jumps, is excessively noisy or "clicks", clean and lubricate the chain. If problem persists, replace the chain. Do not operate the hoist until all problems have been corrected.
2. **Hooks.** Check for wear or damage, increased throat width, bent shank or twisting of the hook. Check hooks swivel freely. Replace hooks which exceed the throat opening. Refer to Dwg. MHP0040 on page 7, **A.** Throat Width. Replace hooks which exceed a 10° twist. Refer to Dwg. MHP0111 on page 7, **A.** Twisted DO NOT USE; **B.** Normal Can Be Used. Refer to the latest edition of ASME B30.10 'HOOKS' for additional information. Refer to Product Maintenance Information Manual.

Table 4:

Hoist Model	Throat Opening			
	New Hook		Discard Hook	
	in.	mm	in.	mm
MLK250K, ML250KS, ML500K and ML500KS	1-1/16	27	1-5/32	29
ML1000K and ML1000KS	1-1/4	31.8	1-11/32	34.1
ML250KR and ML500KR	1-7/32	31.0	1-5/16	33.4

3. **Hook Latch.** Make sure the hook latch is present and operating. If hook latch snaps past tip of hook, the hook is sprung and must be replaced. Replace if necessary.

CAUTION

- **Do not use hoist if hook latch is missing or damaged.**
- 4. **Upper and Lower Limit Device.** Test operation with no load slowly to both extremes of travel. Upward travel must stop when the bottom block or stop buffer on chain hits hoist limit arm. Downward travel must stop when the loop at the unloaded end of the chain decreases and activates the limit arm.
- 5. **Limit Assembly.** Check limit arm moves freely.
- 6. **Air System.** Visually inspect all connections, fittings, hoses and components for indication of air leaks. Repair any leaks found. Check and clean the filter in the Inlet Nipple, if equipped, and the strainer in the Inlet Strainer (42).
- 7. **Controls.** During operation of hoist, verify response to pendant is quick and smooth. See that the controls return to neutral when released. If hoist responds slowly or movement is unsatisfactory, do not operate hoist until all deficiencies have been corrected.
- 8. **Load Chain.** Examine each of the links for bending, cracks in weld areas or shoulders, traverse nicks and gouges, weld splatter, corrosion pits, striation (minute parallel lines) and chain wear, including bearing surfaces between chain links Dwg. MHP0102 on page 7, **A.** Diameter; **B.** Welded Area; **C.** Visually inspect as much of the chain as is possible. Inspect for wear, damage and corrosion. If damage is evident, do not operate hoist until the damage has been reviewed and inspected further by an **Ingersoll Rand** trained inspector. Refer to Product Maintenance Information Manual.

NOTICE

- **The full extent of chain wear cannot be determined by visual inspection. At any indication of wear inspect chain in accordance with instructions in the "Periodic Inspection". Refer to Product Maintenance Information Manual.**
- 9. **Load Chain Reeving.** Ensure welds on standing links are away from the powered chain wheel. Reinstall chain if necessary. Make sure chain is not capsized, twisted or kinked. Adjust as required.
- 10. **Chain Container.** Check for damage or excessive wear and that chain container is securely attached to the hoist. Secure or replace if necessary.
- 11. **Labels and Tags.** Check for present and legibility of labels. Refer to Product Parts information manual for correct labels and placement. Replace if damaged or missing.

Hoists Not in Regular Use

1. Equipment which has been idle for a period of one month or more, but less than six months, shall be given an inspection conforming to the requirements of "Frequent Inspection" section on page 5 before being placed in service.
2. Equipment which has been idle for a period of over six months shall be given a complete inspection conforming with requirements of 'Periodic Inspection' before being placed in service. Refer to Product Maintenance Information Manual.
3. Standby equipment shall be inspected at least semiannually in accordance with requirements of 'Frequent Inspection'.

LUBRICATION

The lubrication intervals recommended in this manual are based on intermittent operation of the hoist eight hours each day, five days per week. If the hoist is operated almost continuously or more than the eight hours each day, more frequent lubrication will be required. Also, the lubricant types and change intervals are based on operation in an environment relatively free of dust, moisture, and corrosive fumes. Use only those lubricants recommended. Other lubricants may affect the performance of the hoist. Approval for the use of other lubricants must be obtained from your **Ingersoll Rand** Technical Support Department or distributor. Failure to observe this precaution may result in damage to the hoist and/or its associated components.

Whenever a Series MLK Hoist is disassembled for overhaul or replacement of parts, lubricate as follows:

1. Coat all motor parts with a light film of **Ingersoll Rand** Pneu-Lube® Medium Oil No. 50 or a good quality hydraulic oil before assembling.

CAUTION

- **Do not use automotive type detergent oil. Detergents will delaminate the motor vanes and cause premature failure.**
- 2. Apply a coating of **Ingersoll Rand** No. 11 Grease to the Planet Gear Bearings (83), the Brake Driver Bearing (87), and gearing before assembly.
- 3. The top and bottom hooks are supported by thrust bearings. These bearings must be packed with **Ingersoll Rand** No. 68 grease or a standard No. 2 multi-purpose grease at regular intervals. Neglect of proper lubrication will lead to bearing failure.

Load Chain

WARNING

- **Failure to maintain clean and well lubricated load chain will result in rapid load chain wear that can lead to chain failure which can cause severe injury, death or substantial property damage.**

1. Lubricate load chain weekly, or more frequently, depending on severity of service.
2. In a corrosive environment, lubricate more frequently than normal.
3. Lubricate each link of the load chain and apply new lubricant over existing layer.
4. If required, clean chain with acid free solvent to remove rust or abrasive dust buildup and lubricate the chain.
5. Use **Ingersoll Rand** LUBRI-LINK® or a SAE 50 to 90 EP oil.

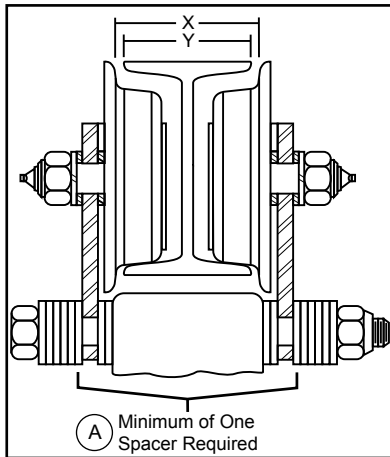
Hook Assemblies

1. Lubricate the hook and hook latch pivot points. Hook and latch should swivel / pivot freely.
2. Use **Ingersoll Rand** LUBRI-LINK® or a SAE 50 to 90 EP oil.

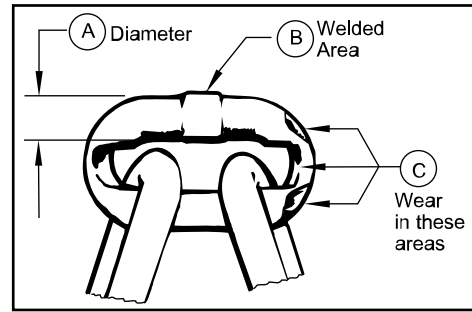
Trolley (if equipped)

Periodically, grease the wheel bearings with **Ingersoll Rand** No. 68 grease or a standard No.2 multi-purpose grease. A grease fitting is provided on the end of each wheel axle.

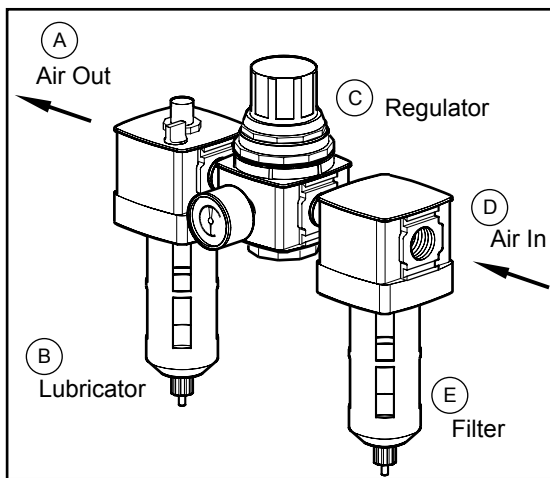
PRODUCT INFORMATION GRAPHICS



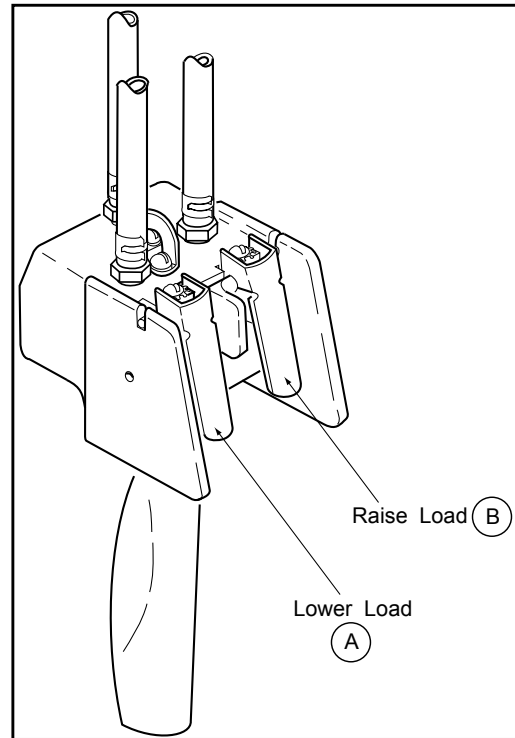
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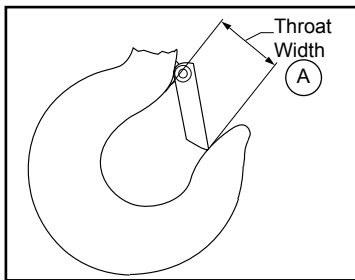
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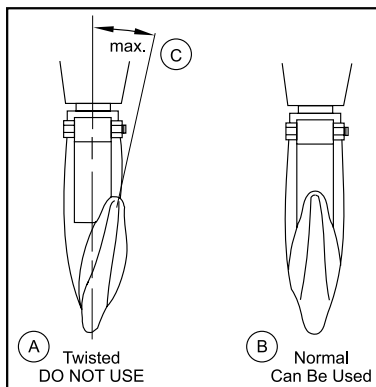
(Dwg. MHP0191)



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(Dwg. MHP0040)



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