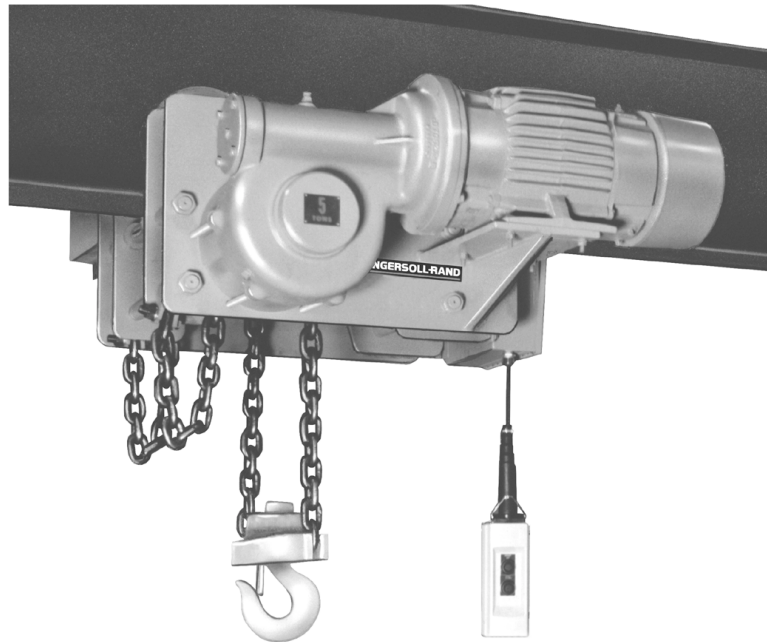
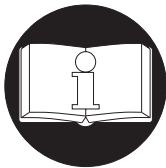


OPERATION AND MAINTENANCE MANUAL
for
ULE2 “Lo-Pro”
CHAIN HOISTS
1 to 24 Ton Capacities



(Dwg. MHP1701)



READ THIS MANUAL BEFORE USING THESE PRODUCTS. This manual contains important safety, installation, and maintenance information. Make this manual available to all persons responsible for the operation, installation and maintenance of these products.

⚠ WARNING

Do not use this hoist for lifting, supporting, or transporting people or lifting or supporting loads over people.

Always operate, inspect and maintain the chain hoists in accordance with American National Standards Institute Safety Code ASME B30.16, ASME HST-1M Performance Standard and any other applicable safety codes and regulations.

Refer all communications to the nearest Ingersoll-Rand Material Handling Office or Distributor.

SAFETY INFORMATION

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

Danger, Warning, Caution and Notice

Throughout this manual there are steps and procedures which, if not followed, may result in a hazard. The following signal words are used to identify the level of potential hazard.

DANGER

Danger is used to indicate the presence of a hazard which **will** cause **severe** injury, death, or substantial property damage if the warning is ignored.

WARNING

Warning is used to indicate the presence of a hazard which **can** cause **severe** injury, death, or substantial property damage if the warning is ignored.

CAUTION

Caution is used to indicate the presence of a hazard which **will** or **can** cause injury or property damage if the warning is ignored.

NOTICE

Notice is used to notify people of installation, operation, or maintenance information which is important but not hazard-related.

Safety Summary

WARNING

- **Do not use this hoist for lifting, supporting, or transporting people or lifting or supporting loads over people.**
- **These hoists are designed to provide a 5 to 1 safety factor and are factory tested to 125% of the rated load. 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.**
- **Electrical installation should be performed by licensed electricians in accordance with the latest edition of the National Electrical Code (ANSI/NFPA 70) and any applicable local, state and national electrical codes and ordinances.**
- **Lifting equipment is subject to different regulations in each country. These regulations may not be specified in this manual.**

The National Safety Council, Accident Prevention Manual for Industrial Operations, Eighth Edition and other recognized safety sources make a common point: Employees who work near suspended loads or assist in hooking on or arranging a load should be instructed to keep out from under the load. From a safety standpoint, one factor is paramount: conduct all lifting operations in such a manner that if there were an equipment failure, no personnel would be injured. This means keep out from under a raised load and keep out of the line of force of any load.

Ingersoll-Rand Material Handling hoists are manufactured in accordance with the latest ASME B30.16 standards.

The Occupational Safety and Health Act of 1970 generally places the burden of compliance with the owner/employer, not the manufacturer. Many OSHA requirements are not concerned or connected with the manufactured product but are, rather, connected with the final installation. It is the owner's and user's responsibility to determine the suitability of a product for any particular use. It is recommended that all applicable industry, trade association, federal, state and local regulations be checked. Read all operating instructions and warnings before operation.

Rigging: It is the responsibility of the operator to exercise caution, use common sense and be familiar with proper rigging techniques. Consult ASME B30.9 for rigging information, American National Standards Institute, 1430 Broadway, New York, NY 10018.

This manual has been produced by **Ingersoll-Rand** to provide dealers, mechanics, operators and company personnel with the information required to install, operate, maintain and repair the products described herein.

It is extremely important that mechanics and operators be familiar with the servicing procedures of these products, or like or similar products, and are physically capable of conducting the procedures. These personnel shall have a general working knowledge that includes:

1. Proper and safe use and application of mechanics common hand tools as well as special **Ingersoll-Rand** or recommended tools.
2. Safety procedures, precautions and work habits established by accepted industry standards.

Ingersoll-Rand cannot know of, or provide all the procedures by which product operations or repairs may be conducted and the hazards and/or results of each method. If operation or maintenance procedures not specifically recommended by the manufacturer are conducted, it must be ensured that product safety is not endangered by the actions taken. If unsure of an operation or maintenance procedure or step, personnel should place the product in a safe condition and contact supervisors and/or the factory for technical assistance.

SAFE OPERATING INSTRUCTIONS

The following warnings and operating instructions have been adapted in part from American National (Safety) Standard ASME B30.16 and are intended to avoid unsafe operating practices which might lead to injury or property damage.

Ingersoll-Rand recognizes that most companies who use hoists have a safety program in force at their facility. If you are aware that some conflict exists between a rule set forth in this publication and a similar rule already set by an individual company, the more stringent of the two should take precedence.

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

This hoist is designed for safe operation within the limits of its rated capacity. There are safety features built into the hoist to protect the operator and others from injury due to failure of the hoist itself. However, listed below are safety pointers which must be followed in order to protect personnel and property.

1. Avoid side pull or end pull at all times.
2. Limit switches are emergency devices. Do not use limit switches to stop the hoist in normal operation. Do not leave load block in contact with limit switch at end of operation.
3. Do not operate hoist with twisted, kinked or damaged chain.
4. Do not operate hoist with a chain that is not properly seated in all pockets.
5. Do not operate a damaged or malfunctioning hoist until necessary adjustments or repairs have been made.
6. Do not use hoist to lift, support, transport people or to carry loads over people. Make sure all people are clear of the load path.
7. Make sure all supporting structures are strong enough to hold the intended load.
8. Do not lift more than the rated capacity of the hoist.
9. Do not use the chain as a substitute for slings.
10. Only allow personnel trained in the safety and operation of this product to operate and maintain the hoist.
11. Do not leave a suspended load unattended.
12. Avoid jogging controls or quick reversals of load.
13. Always disconnect hoist from power supply before making electrical connections or repairs. The main disconnect to the hoist should be locked out during repairs.
14. Do not use PB cable to move either hoist or load along rail.
15. Do not remove or obscure warning labels, capacity labels or tags.
16. Do not use load chain as a ground for welding.
17. When a **“DO NOT OPERATE”** sign is placed on the hoist controls, do not operate the hoist until the sign has been removed by designated personnel.
18. Do not use hoist if hook latch has been sprung or broken.
19. Check that the hook latches are engaged before using hoist.
20. Never splice a hoist chain by inserting a bolt between links.
21. Do not force a chain or hook into place by hammering.
22. Never insert the point of the hook into a chain link.
23. Be certain the load is properly seated in the saddle of the hook.
24. Never run the load chain over a sharp edge.
25. Pay attention to the load at all times when operating the hoist.
26. Ease the slack out of the chain and sling when starting a lift. Do not jerk the load.
27. Do not swing a suspended load.
28. After use, or when in a non-operational mode, the hoist should be secured against unauthorized and unwarranted use.
29. Do not operate hoist if chain jumping, excessive noise, jamming, overloading or binding occurs.
30. Always rig the hoist properly and carefully.

WARNING LABELS AND TAGS

Each hoist is supplied from the factory with the warning tags and labels shown. If the tags or labels are not attached to your hoist, order new tags or labels and install them. Refer to Labels and Tags parts list in parts section. Read and obey all warnings and other safety information attached to this hoist. Tags and labels may not be actual size.

WARNING:
*HIGH VOLTAGE
TURN OFF POWER
BEFORE SERVICING*

WARNING DO NOT

1. LIFT MORE THAN RATED LOAD.
2. OPERATE HOIST WHEN HOOK IS NOT CENTERED UNDER HOIST.
3. OPERATE HOIST WITH TWISTED, KINKED OR DAMAGED CHAIN OR ROPE.
4. OPERATE DAMAGED OR MAL-FUNCTIONING HOIST.
5. OPERATE HOIST WITH CHAIN OR ROPE NOT PROPERLY SEATED IN SPROCKETS, DRUM OR SHEAVE GROOVES.
6. LIFT PEOPLE OR LIFT LOADS OVER PEOPLE.
7. OPERATE UNLESS DIRECTION OF HOOK TRAVEL AGREES WITH DIRECTION SHOWN ON CONTROL.
8. OPERATE HOIST UNLESS HOOK TRAVEL LIMIT DEVICES FUNCTION.
9. WRAP HOISTING ROPE OR CHAIN AROUND LOAD.
10. REMOVE OR OBSCURE THIS TAG.

READ

A.N.S.I. B30.16 SAFETY CODE FOR HOISTS, AND HOIST MANUFACTURER'S INSTRUCTIONS.

ADVERTISSEMENT NE PAS

1. SOULEVER PLUS QUE LA CHARGE NOMINALE.
2. UTILISER LE PALAN LORSQUE LE CROCHET N'EST PAS AU CENTRE SOUS LE PALAN.
3. UTILISER LE PALAN LORSQUE LE CÂBLE OU LA CHAÎNE EST ENDOMMAGÉ, ENTORTILLÉ OU EMMÊLÉ.
4. UTILISER LE PALAN DÉFECTUEUX OU ENDOMMAGÉ.
5. UTILISER LE PALAN AVEC UNE CHAÎNE OU UN CÂBLE QUI N'EST PAS BIEN ASSIS SUR LES TAMBOURS, POULIES OU POULIES À GORGES USINÉES.
6. SOULEVER DES PERSONNES OU SOULEVER DES CHARGES PARDESSUS DES PERSONNES.
7. UTILISER À MOINS QUE LE SENS DE DÉPLACEMENT DU CROCHET SOIT LE MÊME QUE CELUI MONTRÉ SUR LA COMMANDE.
8. UTILISER LE PALAN À MOINS QUE LES DISPOSITIFS LIMITEURS DU CROCHET FONCTIONNENT.
9. ENROULER LE CÂBLE OU LA CHAÎNE SUR LA CHARGE.
10. ENLEVER OU MASQUER CETTE ÉTIQUETTE.

LIRE

LE CODE DE SÉCURITÉ A.N.S.I. B30.16 SUR LES PALANS ET LES INSTRUCTIONS DU FABRICANT DE PALANS.

SPECIFICATIONS

Description of Hoist Operation

ULE2 “Lo-Pro” Series Electric Chain Hoists are designed for low headroom applications requiring heavy duty load lifting and moving. Lifting is accomplished using an attached electric chain hoist integrated into the trolley assembly to provide a balanced lifting platform.

Trolley movement is accomplished either manually, using a hand chain operated manual gear system, or by the use of an electric motor-reducer combination.

Model Code Explanation

ULE2MT010-10-6TW **ULE2** **MT** **010** - **10** - **6** **TW**

Series							
ULE2	= Ultra-Low Electric						
Trolley and Flange							
PT	= Plain Tapered						
PF	= Plain Flat						
MT	= Motorized Tapered						
MF	= Motorized Flat						
GT	= Geared Tapered						
GF	= Geared Flat						
Capacity							
010	= 1 U.S. Ton (910 kg)						
015	= 1-1/2 U.S. Ton (1365 kg)						
020	= 2 U.S. Ton (1820 kg)						
030	= 3 U.S. Ton (2730 kg)						
040	= 4 U.S. Ton (3640 kg)						
050	= 5 U.S. Ton (4550 kg)						
060	= 6 U.S. Ton (5460 kg)						
080	= 8 U.S. Ton (7280 kg)						
100	= 10 U.S. Ton (9100 kg)						
120	= 12 U.S. Ton (10,920 kg)						
160	= 16 U.S. Ton (14,560 kg)						
200	= 20 U.S. Ton (18,200 kg)						
240	= 24 U.S. Ton (21,840 kg)						
Lift							
10	= 10 feet (3 m) - Standard						
X	= Specify length in feet						
Control Drop							
6	= 6 feet (2 m) - Standard						
X	= Specify length in feet						
Options							
C	= Chain container						
E	= Electric motor fuses - single speed hoist						
F	= Electric motor fuses - single speed hoist and trolley						
L	= Electric fused control per leg of transformer secondary						
T	= Electric thermal overload relays - each single speed motor						
W	= Electric (NEMA 4) watertight control box, limit switches and pendant						
X	= Electric mainline power interrupt and pendant buttons						

Notes

1. Power cord **is not** supplied.
2. Electric hoists are standard 230/460 VAC, 3 phase @ 60Hz.
3. **S•COR•E** Options and Marine Finish are available; contact the factory for additional information.
4. ULE2 Hoists are not adjustable for varying beam sizes.

Model Number	Rated Capacity		Standard Lift		**Minimum Radius Curve		Minimum Distance Bottom of I-Beam to Hook		Hoist Speed					
	U.S. Tons	kg	Feet	Metres	Feet	Metres	Inches	mm	ft/min.	m/min.				
ULE2__010	1	910	10	3	6.5	1.98	7	178	10	3				
ULE2__015	1-1/2	1365					8	2.3						
ULE2__020	2	1820					8.5	216						
ULE2__030	3	2730					8.5	2.59	9.5	241	7	2.1		
ULE2__040	4	3640							9.5	2.9	12	305	4	1.2
ULE2__050	5	4550							10	3.0	12.5	318	3.5	1.1
ULE2__060	6	5460			*	*	14.5	368	2	0.6				
ULE2__080	8	7280					18	457	1.7	0.5				
ULE2__100	10	9100												
ULE2__120	12	10,920												
ULE2__160	16	14,560												
ULE2__200	20	18,200												
ULE2__240	24	21,840												

Model Number	Motorized Trolley Speed		Motor HP @ RPM	Net Weight								
	ft/min.	m/min.		Plain		Hand Geared		Motorized				
			lbs.	kg.	lbs.	kg.	lbs.	kg.				
ULE2__010	35	10.7	2 @ 1800	440	200	470	213	480	218			
ULE2__015				540	245	570	259	580	263			
ULE2__020				1280	581	1340	608	1310	594			
ULE2__030				20	6.1	4 @ 1200	1350	612	1480	671	1400	635
ULE2__040							1730	785	1810	821	1780	807
ULE2__050							2300	1043	2380	1080	2350	1066
ULE2__060	2650	1202	2810				1275	2750	1247			
ULE2__080												
ULE2__100												
ULE2__120												
ULE2__160												
ULE2__200												
ULE2__240												

* Straight track operation recommended for these units. However, curve radius must be specified on order to allow for wheel modification to negotiate curves.

** Curves less than minimum may be fitted by special construction. Contact factory.

INSTALLATION

Prior to installing the hoist, carefully inspect it for possible shipping damage.

WARNING

• **Before installing hoist read “SAFETY INFORMATION” section.**

Hoists are supplied from the factory with the correct grade and quantity of lubricating oil. Before operation, all oil levels must be checked and/or topped off with the proper type of oil recommended in the “LUBRICATION” section. Lubricate load chain before operating hoist.

CAUTION

• **Owners and users are advised to examine specific, local or other regulations, including American National Standards Institute and/or OSHA Regulations which may apply to a particular type of use of this product before installing or putting hoist to use.**

Remove cover from the shipping crate. Carefully remove steel straps. Attach wire rope sling to the suspender lugs on the hoist trolley side plates and slowly lift into position.

General Instructions

WARNING

• **Electrical installation or adjustments should only be performed by licensed electricians in accordance with the latest edition of the National Electrical Code (ANSI/NFPA 70) and any applicable local, state and national electrical codes and ordinances.**

The power supply should be within plus or minus 10% of the voltage specified on the hoist nameplate.

Supporting structure, including trolleys, monorail, etc. must have a load rating at least equal to that of the hoist plus weight of hoist and an adequate safety factor. Check lubrication level in the gear case and trolley gear case (if supplied with the hoist).

Check chain for damage and improper seating in load or idler sheaves.

After installation the following items should be checked:

1. Hoist hook motion and trolley motion for agreement with control indication direction and prompt return of actuators to the “OFF” position.
2. Hoist load chain free from twists, damage, and improper seating in pockets.
3. Lift and travel limiting devices for proper operation.
4. Braking system for proper operation.
5. Load chain for proper lubrication.
6. Hoist and trolley for proper lubrication.

Installation on Beam

The hoist is custom sized at the factory to fit on a specific beam size. ULE2 Hoists are not adjustable for varying beam sizes.

WARNING

• **Before installing trolley hoist, make certain that the trolley wheel contour is correct for the type of beam the unit will operate on and that the trolley wheel spacing is correct for the beam flange width. Flat flange beams should have flat tread or universal tread wheels and tapered flange beams should have tapered or universal tread wheels.**

Installing Over the End of the Beam

Remove the rail stop and slide trolley on end of the beam. Reinstall rail stop. If this procedure cannot be used, due to insufficient space or fixed limit stops, the trolley must be installed from underneath the beam using the following procedure.

Installing from Underneath the Beam

Refer to Dwg. MHP0393, on Page 8.

Removable wheels* are provided which enables the unit to be fitted on a beam with obstructed ends.

* Feature not available on units operating on patented monorail tracks.

Measure beam flange width and compare with measurement between trolley wheel flanges. The total distance between trolley wheel flanges (measured at the tread diameter) should be 1/8 to 3/16 inch (3.2 to 4.7 mm) greater than the beam flange width for proper running clearance. This clearance should be checked before operating the hoist with a load. The hoist should be traversed the entire length of the beam to check for beam interference points, proper side clearance and effectiveness of the beam stops. If everything is satisfactory, the procedure should be repeated with a capacity load as a functional installation test.

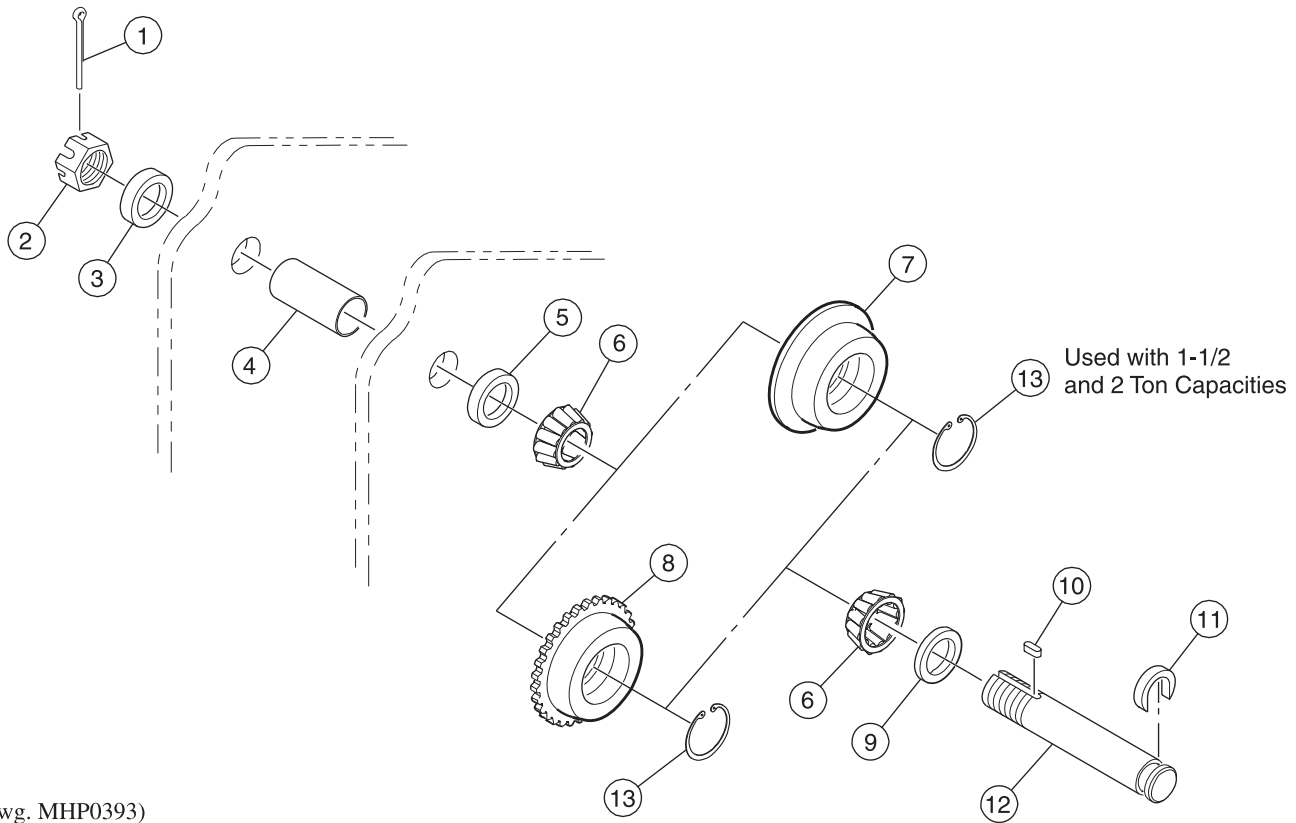
WARNING

• **Always make sure all end stops are securely in place before operating a hoist on a runway beam to prevent the hoist from falling from the open beam end.**

Trolley Wheel Removal

Refer to Dwg. MHP0393, on Page 8.

1. Remove cotter pin (1) and back off nut (2).
2. Tap axle (12) toward center of hoist to free up ‘C’ washer (11).
3. Remove ‘C’ washer and retainer cup (9).
4. Remove axle and trolley wheel.



(Dwg. MHP0393)

Electrical Installation

After installation, the hoist should be connected by a licensed electrician who is knowledgeable with NEC article 430 and local regulations. Ensure that the voltage and frequency of the electrical supply correspond with the data stamped on the nameplate before making final connections.

Load Hook Direction (Phasing)

⚠ CAUTION

• **Failure to follow these instructions may cause immediate and severe damage to this hoist.**

When installing your hoist, make only temporary connections at the power source. Push the "UP" button and observe the direction of the load block. If the load block raises, the phasing is correct and permanent connection may be made at the power source. If the load block lowers, release the button immediately. To correct load block direction, reverse any two wires (except the green ground (earth) wire) at the power source only.

⚠ CAUTION

• **Do not change connections at any other location.**

Limit Switch Operation (Paddle)

Before placing the hoist in operation, check for proper upper limit switch operation. Push the "UP" button and, while the hoist is moving upward, raise the limit switch lever (paddle). The hook should stop immediately.

⚠ CAUTION

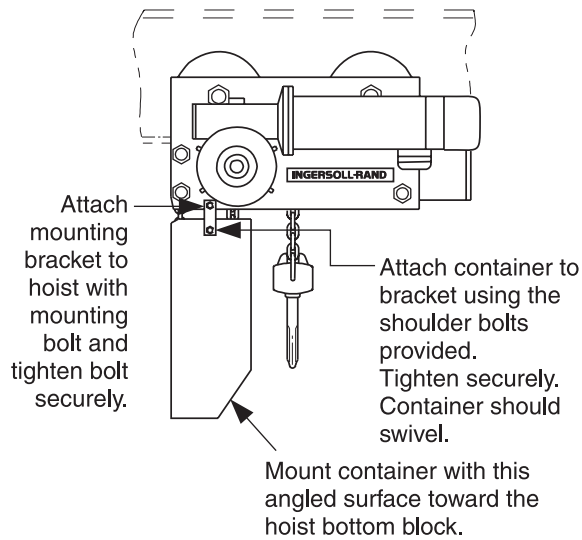
• **Do not operate the hoist if the limit switch(es) are not operating properly.**

Brake Operation

Run in hoist with a light load a few times before lifting the rated load. After lifting a light load a few times, test the hoist as described in "Testing" in the "MAINTENANCE" section. Check for load block drift with the maximum rated capacity load on the hook. If hook does not stop within one to two inches (25-50 mm) when push button is released, it may be necessary to adjust the brake. Refer to "Brake Adjustment" in the "MAINTENANCE" section.

Chain Container

Installing the Chain Container



(Dwg. MHP1601)

CAUTION

- **Disconnect the hoist from the electrical supply before installing chain container.**

The chain container for this hoist has been shipped loose. Follow these instructions to install the container and to load the chain into the container. Refer to Dwg. MHP1601, on Page 9.

1. 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 bucket, if required.
2. Attach the mounting bracket to the hoist with mounting bolt and tighten securely.
3. Attach the container to the bracket using the shoulder bolts provided and tighten securely. The container should swivel.

NOTICE

- **Mount the container with the angled surface toward the hoist bottom block.**
- **Ensure the chain container does not contact the load chain or hook.**

Chain Loading

Lower load block as far as possible. After installing the chain container run the load block up, allowing the hoist mechanism to fill the container. Verify the chain is loading properly into the container.

WARNING

- **Never load chain into the container by hand. Hand loading will cause the chain to tangle which will jam and damage the hoist.**

NOTICE

- **The mounting bolts for the container should be checked each time the hoist is inspected to ensure they remain tight.**

OPERATION

The four most important aspects of hoist operation are:

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

⚠ WARNING

- **The hoist is not designed or suitable for lifting, lowering or moving persons. Never lift loads over people.**
- **Never attempt to lift a load which exceeds the hoist rated capacity.**

Good Operating Practices

1. The operator should not engage in any practice which will divert his attention while engaged in operating the hoist.
2. When a “**DO NOT OPERATE**” sign is on the starting controls, the operator should not power the unit or start operations until the sign has been removed by a designated person.
3. Before starting the hoist, the operator should be certain that all personnel are clear of the load portion.
4. Prior to operation, the operator become familiar with the equipment and its proper care. If adjustments or repairs are necessary or any damage known, or suspected, the operator should report the same promptly to the appointed person and should also notify the next operator of the hoist condition upon changing shifts.
5. All controls, such as push button stations, brakes and limit switch(es) should be tested by the operator before lifting a load. If any controls do not operate properly, they should be adjusted or repaired before operations are started.
6. The load should not be moved or lifted until it is balanced on a sling or lifting device. Raise load 2 to 3 inches (6 to 8 cm). Ensure hoist holds load and that load is properly balanced before continuing lift.
7. Care should be taken when hoisting to be certain that:
 - a. Hoist chain is not kinked or twisted.
 - b. Load does not contact any obstructions.
 - c. Multiple part chains are not twisted about each other.
8. No hoist should be operated until the hoist unit is centered over the load.
9. The operator should test the brake each time a load approaching the rated load is handled by raising the load just enough to clear the floor or supports, and check for brake action. The lift should be continued only after the operator is assured the brake is operating properly.
10. The operator should slowly raise the hoist into engagement with a load, and avoid unnecessary stops and starts.

Handling The Load

Size of Load

Do not lift a load beyond the rated capacity of the hoist, except during authorized testing.

Attaching the Load

1. The hoist chain must not be wrapped around the load.
2. The load should be attached to the hook by means of slings or other approved devices.
3. The slings or other approved devices shall be seated properly in the saddle of the hook before operation.

⚠ CAUTION

- **Any device used to connect load to hook must be rated to handle the load.**

Moving the Load

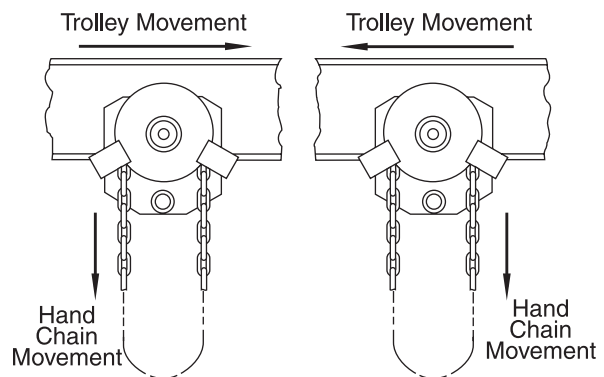
Plain Trolley

1. To move an unloaded hoist/trolley, push on the hoist load chain.
2. To move a loaded hoist/trolley, push on the load or the hoist load hook shank.
3. When operating the trolley keep load as close to the floor as practical.

G geared Trolley

Refer to Dwg. MHP0100, on Page 10.

1. When facing the trolley hand wheel:
 - d. Pull down on right side of hand chain (Clockwise rotation) to move left.
 - e. Pull down on left side of hand chain (Counterclockwise rotation) to move right.



(Dwg. MHP0100)

Motorized Trolley

Standard pendants provide push button control for the following functions:

Hoist	up/down
Trolley	left/right (optional)

Ensure hoist and motorized trolley operation matches direction of pendant button indicators.

INSPECTION

Inspection procedures are divided into three general classifications based upon the intervals at which inspection should be performed. Deficiencies should be carefully examined and corrected. The intervals between inspection will vary due to operating conditions and amount of use. The following inspection intervals are based on intermittent use under normal environmental conditions. If the hoist is used more than intermittently or under adverse environmental conditions, it should be inspected more frequently.

Daily Inspections

Inspect the following items daily before operating hoist:
Refer to “Frequent Inspection” on Page 11 for additional detailed information.

1. Check all controls and operating mechanisms for proper operation.
2. Check limit switches and brake for proper operation.
3. Check hooks for deformations, chemical damage or cracks. Replace any hook showing any of these signs.
4. Check chain for wear, twist or distortion.
5. Check for damaged or improperly working hook latch.

Quarterly Inspections

Inspect the following items at 90-day intervals:
Refer to “Periodic Inspection” on Page 12 for additional detailed information.

1. Check all items under daily inspection.
2. Check for loose bolts, screws and nuts.
3. Inspect load chain wheels for cracks and excessive wear.
4. Inspect for worn, corroded, cracked or distorted parts.
5. Check for proper operation of brake, refer to “Brake Adjustment” in the “MAINTENANCE” section.
6. Inspect for excessive wear of chain, refer to “Chain Inspection” in this section.
7. Check electrical parts for signs of pitting or any deterioration of controls, limit switches and push button station, refer to “Electrical” in the “MAINTENANCE” section.
8. Check chain container, refer to “Chain Container” in the “INSTALLATION” section.

Annual Inspections

Inspect the following items annually:
Refer to “Periodic Inspection” on Page 12 for additional detailed information.

1. Check all items under daily and quarterly interval inspection.
2. Check hooks for cracks by means of a magnetic particle test or other suitable crack detecting test.
3. Inspect supporting structure for continued ability to support the imposed loads.
4. Check brake for worn linings and discs, refer to “Brake Adjustment” in the “MAINTENANCE” section.

WARNING

- All new, altered or modified equipment should be inspected and tested by personnel instructed in safety, operation and maintenance of this equipment to ensure safe operation at rated specifications before placing equipment in service.
- Never use a hoist that inspection indicates is damaged.

Frequent and periodic inspections should be performed on equipment in regular service. Frequent inspections are visual examinations performed by operators or personnel trained in safety and operation of this equipment and include observations made during routine equipment operation. Periodic inspections are thorough inspections conducted by personnel trained in safety, operation and maintenance of this equipment. ASME B30.16 states that inspection intervals depend upon the nature of the critical components of the equipment and the severity of usage.

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

Deficiencies revealed through inspection, or noted during operation, must be reported to designated personnel instructed in safety, operation and maintenance of this equipment. A determination as to whether a condition constitutes a safety hazard must be decided, and the correction of noted safety hazards accomplished and documented by written report before placing the equipment in service.

Records and Reports

Inspection records, listing all points requiring periodic inspection should be maintained for all load bearing equipment. Written reports, based on severity of service, should be made on the condition of critical parts as a method of documenting **periodic** inspections. These reports should be dated, signed by the person who performed the inspection, and kept on file where they are readily available for review.

NOTICE

- The external placement of coded marks on equipment identifying completed inspections and operationally certified equipment is an acceptable method of documenting periodic inspections in place of written records.

Load Chain Reports

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

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.

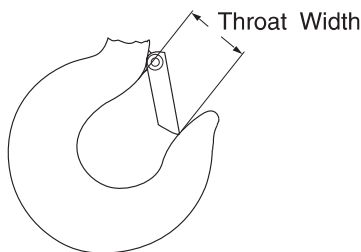
1. OPERATION. Check for visual signs or abnormal noises (grinding, etc.) which could indicate a problem. Make sure all controls function properly and return to neutral when released. Check chain feed through the hoist and bottom block. If chain binds, jumps, is excessively noisy or “clicks”, clean and lubricate the chain. If problem persists, replace the corrected.

- HOOKS. Check for wear or damage, increased throat width, bent shank or twisting of hook. Replace hooks which exceed the throat opening discard width specified in Table 1 (refer to Dwg. MHP0040, on Page 12) or exceed a 10° twist (refer to Dwg. MHP0111, on page 12). If the hook latch snaps past the tip of the hook, the hook is sprung and must be replaced. Refer to the latest edition of ASME B30.10 "HOOKS" for additional information.

NOTICE

• Any hook that is twisted or has throat opening in excess of normal, indicates abuse or overloading of the hoist. When a hook is found to be in this condition, other load bearing components of the hoist should be inspected for damage.

- UPPER AND LOWER LIMIT DEVICE. Test operation with no load. Travel must stop when the bottom block or stop buffer on chain hits hoist limit arm.
- ELECTRICAL SYSTEM. Visually inspect all connections and components for indication of damage or loose connections. Repair any damage and tighten connections.
- CONTROLS. During operation of hoist, verify response to controls is quick and smooth. If hoist responds slowly or movement is unsatisfactory, do not operate hoist until all problems have been corrected.
- HOOK LATCH. Make sure the hook latch is present and operating. Replace if necessary.

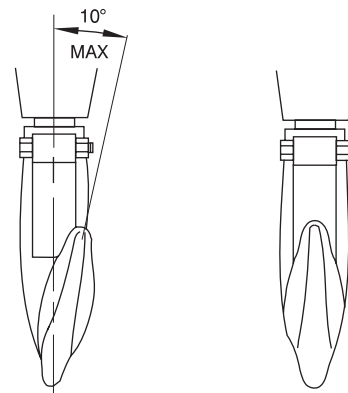


(Dwg MHP0040)

Table 1

Capacity Tons	Throat Width		Discard Width	
	in.	mm	in.	mm
1	1.13	28.7	1.3	33.0
1-1/2				
2	1.34	34.0	1.54	39.1
3				
4				
5	1.69	43.0	1.94	49.3
6				
8	2.06	52.3	2.37	60.2
10	2.25	57.2	2.59	65.8
12				
16	3.0	76.2	3.45	87.6
20	3.63	92.1	4.17	105.9
24				

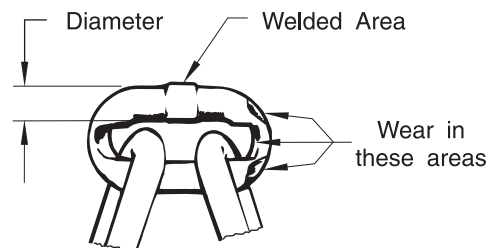
The throat width dimensions given are manufacturer's nominal and may vary due to forging tolerances. The dimensions given are for reference. Measure and record the throat opening of the load hook before placing the unit into service.



Twisted DO NOT USE Normal Can Be Used

(Dwg. MHP0111)

- 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 (refer to Dwg. MHP0102, on Page 12). Replace a chain that fails any of the inspections. Check chain lubrication and lubricate if necessary. Refer to "Load Chain" in "LUBRICATION" section.



(Dwg. MHP0102)

NOTICE

• Excessive wear or stretching may not be apparent from visual observation. Inspect chain by measuring five links in accordance with instructions under "Periodic Inspection". A worn load chain may cause the load sheave to wear rapidly. Inspect the load sheave and replace if damaged or worn.

- CHAIN REEVING. Ensure welds on standing links are away from load sheave. Reinstall chain if necessary. Make sure chain is not capsized, twisted or kinked. Adjust as required.
- CHAIN CONTAINER. Ensure mounting bolts for the container are tight and are not elongating. Replace worn or damaged mounting bolts.

Periodic Inspection

According to ASME B30.16, frequency of periodic inspection depends on the severity of usage:

NORMAL	HEAVY	SEVERE
yearly	semiannually	quarterly

Disassembly may be required for HEAVY or SEVERE usage. Keep accumulative written records of periodic inspections to provide a basis for continuing evaluation.

Inspect all the items in "Frequent Inspection". Also inspect the following:

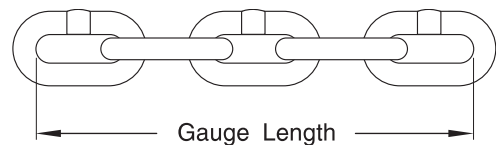
1. **FASTENERS.** Check all rivets, split pins, capscrews and nuts. Replace if missing or tighten if loose.
2. **ALL COMPONENTS.** Inspect for wear, damage, distortion, deformation and cleanliness. If external evidence indicates the need, disassemble. Check gears, shafts, bearings, sheaves, chain guides, springs and covers. Replace worn or damaged parts. Clean, lubricate and reassemble.
3. **HOOKS.** Inspect hooks carefully for cracks using magnetic particle or other suitable non-destructive method. Inspect hook retaining parts. Tighten or repair, if necessary.
4. **CHAIN SHEAVES.** Check for damage or excessive wear. Replace if necessary.
5. **MOTOR.** If performance is poor, disassemble the motor and check for wear or damage to bearings and shafts. The parts should be cleaned and reassembled. Replace worn or damaged parts. Refer to "MAINTENANCE" section for additional information.
6. **BRAKE.** Raise a load equal to the rated capacity of the hoist 12 inches (305 mm) off the floor and check ability of hoist to hold the load without drift. Lower the load 6 inches (150 mm) and check the ability of the hoist to stop the load without drift. If drift occurs, refer to "Brake Adjustment" in the "MAINTENANCE" section.
7. **SUPPORTING STRUCTURE.** Check for distortion, wear and continued ability to support load.
8. **TROLLEY.** Check that the trolley wheels track the beam properly and total clearance between trolley wheel flanges is correct, 1/8 to 3/16 inches (3.2 to 4.7 mm) greater than the beam flange width. Refer to "INSTALLATION" section. Check side plates for spreading due to bending.
9. **LABELS AND TAGS.** Check for presence and legibility. Replace if necessary.
10. **END ANCHORS (Load Chain).** Ensure both ends of load chain are securely attached. Secure if loose, repair if damaged, replace if missing. Check chain stopper is correctly installed and functional.

11. **LOAD CHAIN.** Measure the chain for stretching by measuring across five link sections all along the chain, paying particular attention to the most frequently reeved links. When any five links in the working length reaches or exceeds the discard length listed in Table 2, replace the entire chain (refer to Dwg. MHP0041, on Page 13). Always use genuine **Ingersoll-Rand** Material Handling replacement load chain.

Table 2

Capacity Tons	Load Chain Size (diameter)		Normal Length		Discard Length	
	in.	mm	in.	mm	in.	mm
1	9/32 [0.281]	7.14	3.98	101.1	4.08	103.6
1-1/2						
2						
3						
4	17/32 [0.531]	13.49	8.75	222.2	8.97	227.8
5						
6	3/8 [0.375]	9.53	5.73	145.5	5.87	149.1
8						
10	17/32 [0.531]	13.49	8.75	222.2	8.97	227.8
12						
16	3/8 [0.375]	9.53	5.73	145.5	5.87	149.1
20						
24	17/32 [0.531]	13.49	8.75	222.2	8.97	227.8

Note: Zinc plated hoist chain is designated by the letter "ZP" at the end of the part number.



(Dwg. MHP0041)

12. **CHAIN CONTAINER.** Check for damage or excessive wear and that chain container is securely attached to the hoist. Secure or replace if necessary.
13. **LIMIT ASSEMBLY.** Check limit arm moves freely.

INSPECTION AND MAINTENANCE REPORT

Ingersoll Rand ULE2 "Lo-Pro" Series Chain Hoist

Model Number:		Date:			
Serial Number:		Inspected by:			
Reason for Inspection: (Check Applicable Box)					
	1. Scheduled Periodic Inspection (___ Quarterly ___ Semiannually ___ Yearly)	Operating Environment: Normal ___ Heavy ___ Severe ___			
	2. Discrepancy(s) noted during Frequent Inspection				
	3. Discrepancy(s) noted during Maintenance				
	4. Other: _____				
Refer to the Parts, Operation and Maintenance Manual "INSPECTION" section for general inspection criteria. Also, refer to appropriate National Standards and codes of practice. If in doubt about an existing condition, contact the nearest Ingersoll-Rand distributor or the factory for technical assistance.					
COMPONENT	CONDITION		CORRECTIVE ACTION		NOTES
	Pass	Fail	Repair	Replace	
Fasteners					
Shafts					
Bearings			---		
Chain Guides			---		
Brake			---		
Covers					
Controls					
Limit Switch					
Motor					
Electrical System					
Hooks:			---		
Top	Actual Hook Throat Width: ___ inches/___ mm (refer to Table 1 for minimum/maximum acceptable widths).				
	Hook Twist		---		
	Hook Crack Test Method Used: Dye Penetrant ___ Magnetic Particle ___ Other: _____				
Bottom	Actual Hook Throat Width: ___ inches/___ mm (refer to Table 1 for minimum/maximum acceptable widths).				
	Hook Twist		---		
	Hook Crack Test Method Used: Dye Penetrant ___ Magnetic Particle ___ Other: _____				
Hook Latch			---		
Load Chain:			---		
	Working length(s) maximum stretch: _____ inches/ _____ mm (refer to Table 2)				
Chain Stopper					
Supporting Structure					
Trolley Wheels					
Labels and Tags			---		
Other Components					

This page may be photocopied and used by inspectors or maintenance personnel.

LUBRICATION

To ensure continued satisfactory operation of the hoist, all points requiring lubrication must be serviced with the correct lubricant at the proper time interval as indicated for each assembly. Correct lubrication is one of the most important factors in maintaining efficient operation.

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.

1. Lubricate each link of the load chain weekly. Apply new lubricant over existing layer.
2. In severe applications or corrosive environments, lubricate more frequently than normal.
3. Lubricate hook latch pivot point with the same lubricant used on the load chain.
4. To remove rust or abrasive dust build-up, clean chain with an acid free solvent. After cleaning, lubricate the load chain.
5. Use **Ingersoll-Rand** LUBRI-LINK-GREEN® or ISO VG 220 (50W-90W) oil.

Pivot Points, Seals, Bearings and Bushings

Lubricate grease fittings monthly with 2 or 3 pumps from a grease gun or more frequently, depending on severity of service. If hoist is disassembled, clean all parts thoroughly and coat bearings and seals with clean grease. Use sufficient grease to provide a good protective coat. Use a multipurpose lithium-based EP1 grease.

Load Chain

⚠ WARNING

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

PARTS TO BE LUBRICATED	LUBRICANT	INSTRUCTIONS	FREQUENCY
Transmission	Mobilgear #634 or equivalent (Refer to parts manual for quantity)	To Drain: Remove drain plug in bottom of housing.	After initial 50 hours operation, then every 3 months or 500 hours.
Motorized Trolley Gear Box		To Fill: Replace drain plug, remove level plug on side of housing, fill until oil comes out level plug hole. Re-install level plug.	
Load Block	NLGI No. 2 Grease	Lubrication is required only if sheave pin contains grease fittings.	30 days
Load Chain	Intermediate oils preferably with E.P. Additives	Immerse in oil or swab with oil soaked rag. Wipe off excess oil. Maintain chain rust-free.	Daily
	Bonded Lubricants such as Dow Molykote M-88	Use in place of oil, if oil residue is objectionable.	
Trolley wheels	NLGI No. 2 Grease	Wheels will have grease fittings.	After prolonged use or reassembly
Spur Gears		Brush on exposed gears.	Weekly

* Not required on units equipped with sealed ball bearings. (Wheels on these units do not have grease fittings.)

TROUBLESHOOTING

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

SYMPTOM	CAUSE	REMEDY
Hook fails to stop at end of travel.	Improperly adjusted brake.	Adjust per "Brake Adjustment" in the "MAINTENANCE" section.
	Worn brake linings.	Replace when worn excessively.
	Magnetic reversing controller malfunction.	Inspect and test reversing controller.
Hoist does not respond to push button.	Power failure in supply lines.	Check circuit breakers, switches and connections in power lines.
	Wrong voltage or frequency.	Check voltage and frequency of power supply against the rating on the hoist nameplate.
	Brake does not release.	Check brake adjustment. Refer to "Brake Adjustment" in the "MAINTENANCE" section. Check connections to brake coils for open or short circuit.
	Improper connections in hoist or push button station.	Check all connections at line connectors and on terminal block.
	Faulty magnetic controller.	Check coils for open or short circuit. Check all connections in control circuit. Check for burning contacts. Replace as needed.
Hook does not stop promptly.	Hoist overloaded.	Reduce load to within rated capacity of hoist.
	Brake not holding.	Check brake adjustment (refer to "Brake Adjustment" in the "MAINTENANCE" section). Check brake linings for excessive wear. Replace as needed.
Hook moves in wrong direction.	Three-phase reversal.	Reverse any two wires (except the green ground (earth) wire) at the power source.
	Improper connections.	Check all connections against Wiring Diagram.
Hook raises but will not lower.	"DOWN" circuit open.	Check circuit for loose connections. Check "DOWN" limit switch for malfunction.
	Broken conductor in push button cable.	Check each conductor in the cable. If one is broken, replace entire cable.
	Faulty magnetic controller.	Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.
Hook lowers but will not raise.	Hoist overloaded.	Reduce load to within rated capacity.
	Low voltage.	Determine cause of low voltage and increase to within plus or minus 10% of the voltage specified on the hoist.
	"UP" circuit open.	Check circuit for loose connections. Check "UP" limit switch for malfunction.
	Broken conductor in push button cable.	Check each conductor in the cable. If one is broken, replace entire cable.
	Faulty magnetic controller.	Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.
Lack of proper lifting speed.	Hoist overloaded.	Reduce load to within rated capacity of hoist.
	Brake not releasing fully.	Check brake adjustment. Refer to "Brake Adjustment" in the "MAINTENANCE" section.
	Low Voltage.	Increase voltage to plus or minus 10% of voltage specified on hoist.

MAINTENANCE

⚠ WARNING

- Never perform maintenance on the hoist while it is supporting a load.
- Before performing maintenance, tag controls with:
DANGER - DO NOT OPERATE - EQUIPMENT BEING REPAIRED.
- Only allow personnel trained in service and repair on this hoist to perform maintenance.
- After performing any maintenance on the hoist, dynamically test hoist to 125% of its rated capacity, in accordance with ASME B30.16 standards, before returning hoist to service.
- Disconnect and lock out electrical power source before performing any maintenance. Accidental operation or contact with exposed power supply could cause death, injury or property damage.

INTERVAL	MAINTENANCE CHECKS
Start of each shift	Make a thorough visual inspection of the hoist for damage. Do not operate the hoist if damage is found. Check the operation of the pendant control and brake
Every 6 months	Inspect the disc brake friction linings. Clean or replace parts as required.
Annually	Inspect the gearing, shafts and bearings for damage or wear. Check all of the supporting members, including the trolley if used.

A preventive maintenance program should be established for the hoist. It is recommended that detailed records be kept and made available to appointed personnel. Refer to the "Inspection and Maintenance Report."

Adjustments

Adjustments should be made to assure correct functioning of components after replacements or when malfunctions are detected.

Geared Limit Switch

Adjust geared limit switch according to instructions contained in the maintenance and parts lists included in the "PARTS" section.

NOTICE

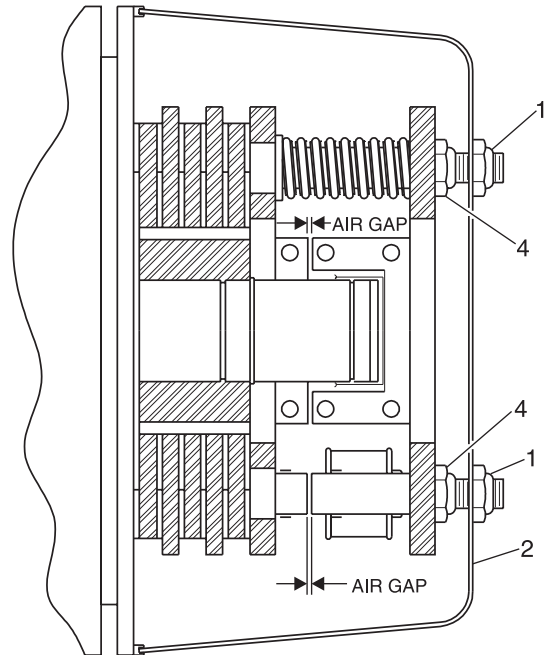
- The lower limit switch should be set so that a small loop of loose chain remains when the geared limit switch prevents further travel. The paddle limit switch only acts if this switch fails.

Brake Adjustment

Refer to Dwg. MHP1602, on Page 17.

1. Remove nuts (1) and cover (2).

2. Adjust air gap adjusting nuts (4) until the air gap at all four coils is 0.020 inch (0.5 mm) for single disc brakes or 0.035 inch (0.9 mm) for double disc brakes and 0.050 inch (1.3 mm) for triple disc brakes.
3. Replace cover (2) and nuts (1).



(Dwg. MHP1602)

For brakes not of **Ingersoll-Rand** manufacture, refer to the "PARTS" section.

230/460V	230V	460V	200/208 OR 575V
(115V COILS) SINGLE SPEED	(115V COILS) TWO SPEED	(230V COILS) TWO SPEED	200/208V 200V COIL 575V/575V COIL SINGLE SPEED

(Dwg. MHP1603)

Repairs or Replacements

Repairs or replacements should be handled promptly as needed for correct operation. The following are examples:

1. Replace all critical parts which are cracked, broken, bent or excessively worn.
2. Replace pitted or burned electrical contacts. Replace as complete set only.

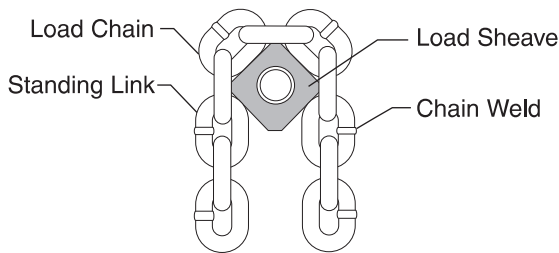
3. Keep push button control stations clean and function labels legible.
4. Replace hooks showing wear or damage.
5. Replace chain showing wear or damage.
6. Replace missing or illegible warning labels.
7. Replace brake linings when worn excessively.

Chain Maintenance

Load chain must be kept well lubricated and free of foreign matter to insure proper service. Refer to "LUBRICATION" section for specific lubricants.

Chain Replacement

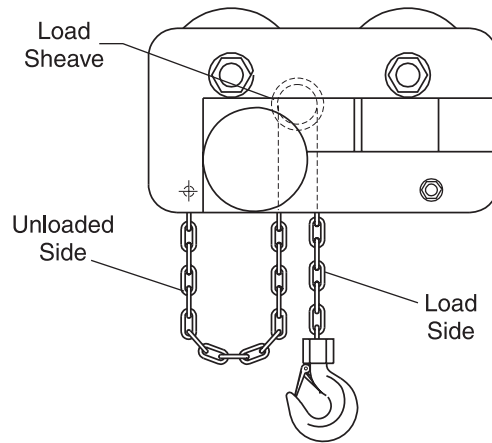
1. When replacing load chain, the two chains must be exactly the same length.
2. The starting chain link on each chain must be simultaneously fed into two lifting load sheaves.
3. The starting links must pass over the top of the load sheave in a horizontal position to permit end attachment without twisting the chain.
4. The second link of chain will be a standing link of chain; this link should have the weld furthest away from the center of the load sheave. Refer to Dwg. MHP0042, on Page 18.



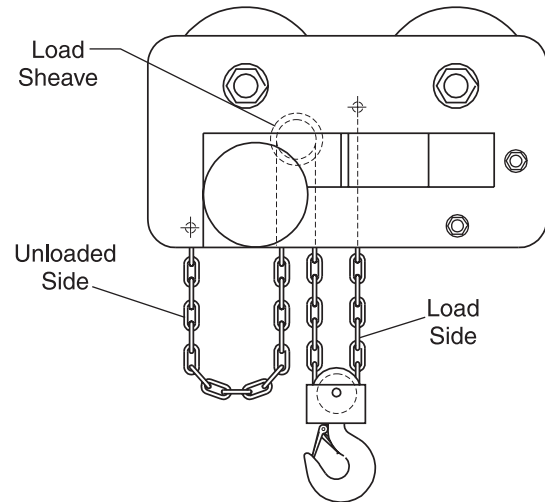
(Dwg. MHP0042)

5. Refer to Dwg. MHP1604, on Page 18, for chain reeving.
6. Use only chain supplied by **Ingersoll-Rand**.
7. Refer to "INSTALLATION" section for instructions for loading chain into a chain container.

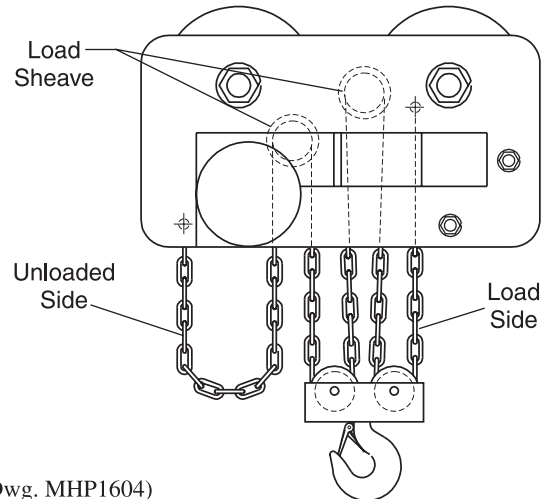
1, 1-1/2, 2, 5 and 6 Ton hoists



3, 4, 8, 10 and 12 Ton hoists



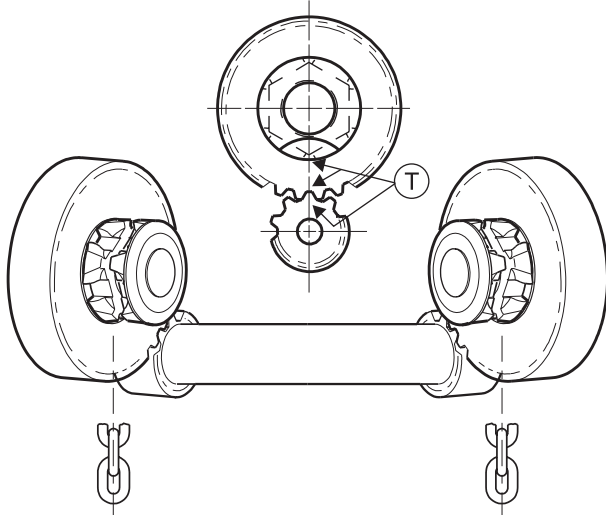
16, 20 and 24 Ton hoists



(Dwg. MHP1604)

Load Sheave Timing

To enable the two independent chains to lift the bottom block evenly, the large gears and load sheaves must first be timed as illustrated. Then both gears must be timed simultaneously with the shaft pinions. This timing procedure is required if the gears have been disengaged during disassembly, refer to Dwg. MHP0374, on Page 19.



Ⓣ Indicates three timing marks in alignment

(Dwg. MHP0374)

Testing

Prior to initial use, all new, extensively repaired, or altered hoists shall be tested by, or under the direction of, personnel instructed in the safe operation and maintenance of this product. A written report should be maintained as a permanent record confirming the satisfactory testing and rating of the hoist.

Ensure this product is installed correctly and that it operates properly **without** a load. Raise and lower hoist fully and operate trolley along the entire length of the beam. There should be no indication of sticking, binding or abnormal noise.

Raise a load equal to approximately 10% of rated capacity 2 to 3 inches (50 to 75 mm) off the floor. Test that hoist brake holds load without slipping. Operate trolley along entire length of beam. Raise load to highest position. There should be no indication of sticking, binding or abnormal noise.

Dynamically load test to 125% of its rated capacity in accordance with ASME B30.16 standards. Testing to more than 125% may be necessary to comply with standards and regulations set forth in areas outside of the USA.

PARTS ORDERING INFORMATION

This hoist is designed and constructed to provide long and trouble-free service. In time it may become necessary to order and install new parts to replace those that have been subjected to wear.

The use of other than **Ingersoll-Rand** Material Handling replacement parts may result in decreased hoist performance, and may, at the company's option, invalidate the warranty.

The model and serial number plate is located on the trolley side plate.

For your convenience and future reference it is recommended that the following information be recorded.

Hoist Model Number _____

Hoist Serial Number _____

Date Purchased _____

General

The illustrated parts lists is designed to help you identify replacement parts for your **Ingersoll-Rand** hoist. In addition to exploded illustrations which cover a large part of your hoist, some manufacturers' sheets are included for such items as geared limit switches, magnetic reversing controllers, relays and other items. If assistance is required please contact your **Ingersoll-Rand** representative.

How To Use The Parts Lists

To identify a part from your hoist, locate the illustration for the specific section. Study the illustration and locate the part you wish to find. An arrow will be pointing to the part from a number. This figure number will be found in the accompanying parts list with the part name, part number and quantity required.

For prompt service and genuine **Ingersoll-Rand** Material Handling replacement parts, provide your nearest Distributor with the following:

1. Serial Number of your hoist.
2. Your power supply (voltage, phase and cycles).
3. Title of illustration (for example, 3-4 Ton bottom block assembly).
4. Figure Number, Part Name, Quantity Required and Part Number.
5. Any additional information required by notes at the bottom of parts lists.

Return Policy

Ingersoll-Rand will not accept any returned goods for warranty or service work unless prior arrangements have been made and written authorization has been provided from the location where the goods were purchased.

Hoists returned with opened, bent or twisted hooks, or without chain and hooks, will not be repaired or replaced under warranty.

Hoists that have been modified without **Ingersoll-Rand** approval, mishandled or overloaded will not be repaired or replaced under warranty. A printed copy of the warranty that applies to this hoist is provided inside the back cover of this manual.

NOTICE

• **Continuing improvement and advancement of design may cause changes to this hoist which are not included in this manual. Manuals are periodically revised to incorporate changes. Always check the manual edition number on the front cover for the latest issue.**

Disposal

When the life of the hoist has expired, it is recommended that the hoist be disassembled, degreased and parts separated as to materials so that they may be recycled.

NOTICE

• **Mineral based oils are recyclable, however, some oils such as glycols may be extremely toxic and must be identified and disposed of at an approved waste or disposal site in accordance with all local, state and federal laws and regulations.**

For additional information contact:
Ingersoll-Rand Material Handling
P.O. Box 24046
2724 Sixth Avenue South
Seattle, WA 98124-0046 USA
Phone: (206) 624-0466
Fax: (206) 624-6265

or

Ingersoll-Rand Material Handling
Douai Operations
111, avenue Roger Salengro
59450 Sin Le Noble, France
Phone: (33) 03-27-93-08-08
Fax: (33) 03-27-93-08-00

SERVICE NOTES

SERVICE NOTES

LIMITED WARRANTY

Ingersoll-Rand Company (I-R) warrants to the original user its Hoists and Winches (Products) to be free of defects in material and workmanship for a period of one year from the date of purchase. **I-R** will repair, without cost, any Product found to be defective, including parts and labor charges, or at its option, will replace such Products or refund the purchase price less a reasonable allowance for depreciation, in exchange for the Product. Repairs or replacements are warranted for the remainder of the original warranty period.

If any Product proves defective within its original one year warranty period, it should be returned to any Authorized Hoist and Winch Service Distributor, transportation prepaid with proof of purchase or warranty card.

This warranty does not apply to Products which **I-R** has determined to have been misused or abused, improperly maintained by the user, or where the malfunction or defect can be attributed to the use of non-genuine **I-R** parts.

I-R makes no other warranty, and all implied warranties including any warranty of merchantability or fitness for a particular purpose are limited to the duration of the expressed warranty period as set forth above. I-R's maximum liability is limited to the purchase price of the Product and in no event shall I-R be liable for any consequential, indirect, incidental, or special damages of any nature rising from the sale or use of the Product, whether based on contract, tort, or otherwise.

Note: Some states do not allow limitations on incidental or consequential damages or how long an implied warranty lasts so that the above limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which may vary from state to state.

IMPORTANT NOTICE

It is our policy to promote safe delivery of all orders.

This shipment has been thoroughly checked, packed and inspected before leaving our plant and receipt for it in good condition has been received from the carrier. Any loss or damage which occurs to this shipment while enroute is not due to any action or conduct of the manufacturer.

VISIBLE LOSS OR DAMAGE

If any of the goods called for on the bill of lading or express receipt are damaged or the quantity is short, do not accept them until the freight or express agent makes an appropriate notation on your freight bill or express receipt.

CONCEALED LOSS OR DAMAGE

When a shipment has been delivered to you in apparent good condition, but upon opening the crate or container, loss or damage has taken place while in transit, notify the carrier's agent immediately.

DAMAGE CLAIMS

You must file claims for damage with the carrier. It is the transportation company's responsibility to reimburse you for repair or replacement of goods damaged in shipment. Claims for loss or damage in shipment must not be deducted from the **Ingersoll-Rand** invoice, nor should payment of **Ingersoll-Rand** invoice be withheld awaiting adjustment of such claims as the carrier guarantees safe delivery.

You may return products damaged in shipment to us for repair, which services will be for your account and form your basis for claim against the carrier.

United States Office Locations

For Order Entry, Order Status and Technical Support

**Ingersoll-Rand
Material Handling**
P.O. Box 24046
2724 Sixth Avenue South
Seattle, WA 98124-0046
Phone: (206) 624-0466
Fax: (206) 624-6265

**Ingersoll-Rand
Distribution Center**
P.O. Box 618
510 Hester Drive
White House, TN 37188
Phone: (615) 672-0321
Fax: (615) 672-0801

Web Site:
www.ingersoll-rand.com

Regional Sales Offices

Chicago, IL
888 Industrial Drive
Elmhurst, IL 60126
Phone: (630) 530-3800
Fax: (630) 530-3891

Detroit, MI
23192 Commerce Drive
Farmington Hills, MI 48335
Phone: (248) 476-6677
Fax: (248) 476-6670

Houston, TX
450 Gears Road
Suite 210
Houston, TX 77067-4516
Phone: (281) 872-6800
Fax: (281) 872-6807

Los Angeles, CA
11909 E. Telegraph Road
Santa Fe Springs,
CA 90670-0525
Phone: (562) 948-4189
Fax: (562) 948-1828

Philadelphia, PA
P.O. Box 425
900 E. 8th Ave., Suite 103
King of Prussia, PA 19406
Phone: (610) 337-5930
Fax: (610) 337-5912

International Office Locations

Offices and distributors in principal cities throughout the world. Contact the nearest **Ingersoll-Rand** office for the name and address of the distributor in your country or write/fax to:

**Ingersoll-Rand
Material Handling**
P.O. Box 24046
2724 Sixth Avenue South
Seattle, WA 98124-0046
USA
Phone: (206) 624-0466
Fax: (206) 624-6265

**Canada
National Sales Office
Regional Warehouse
Toronto, Ontario**
51 Worcester Road
Rexdale, Ontario
M9W 4K2
Phone: (416) 213-4500
Fax: (416) 213-4510
Order Desk
Fax: (416) 213-4506

**Regional Sales Offices
Edmonton, Alberta**
1430 Weber Center
5555 Calgary Trail N.W.
Edmonton, Alberta
T6H 2P9
Phone: (403) 438-5039
Fax: (403) 437-3145

Montreal, Quebec
3501 St. Charles Blvd.
Kirkland, Quebec
H9H 4S3
Phone: (514) 695-9040
Fax: (514) 695-0963

British Columbia
1200 Cliveden Avenue
Delta, B.C.
V3M 6G4
Phone: (604) 523-0803
Fax: (604) 523-0801

**Latin America Operations
Ingersoll-Rand
Production Equipment Group**
730 N.W. 107 Avenue
Suite 300, Miami, FL USA
33172-3107
Phone: (305) 559-0500
Fax: (305) 222-0864

**Europe, Middle East and
Africa
Ingersoll-Rand
Material Handling
Douai Operations**
111, avenue Roger Salengro
59450 Sin Le Noble, France
Phone: (33) 3-27-93-08-08
Fax: (33) 3-27-93-08-00

**Asia Pacific Operations
Ingersoll-Rand**
Suite 1201-3 12/F
Central Plaza
18 Harbour Road
Wanchai, Hong Kong
Phone: (852) 9794 1673
Fax: (852) 9794 7895

**Russia
Ingersoll-Rand**
Kuznetsky Most 21/5
Entrance 3
Moscow 103895
Russia
Phone: (7) 501 923 9134
Fax: (7) 501 924 4625