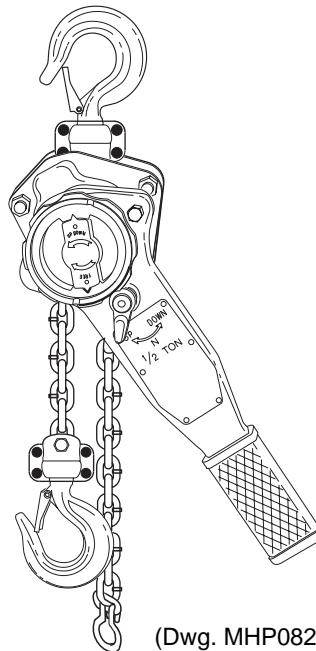


PARTS, OPERATION AND MAINTENANCE MANUAL for LEVER CHAIN HOIST MODELS

SL100
1/2 ton

SL150
3/4 ton

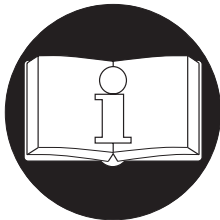
SL200
1 ton



SL300
1 1/2 ton

SL600
3 ton

SL1200
6 ton



READ THIS MANUAL BEFORE USING THESE PRODUCTS. This manual contains important safety, installation, operation 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 this hoist in accordance with American National Standards Institute Safety Code (ASME B30.21) and any other applicable safety codes and regulations.

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

Ingersoll-Rand Material Handling hoists are manufactured in accordance with the latest ASME B30.21 standards.

WARNING

- **Do not use this hoist for lifting, supporting, or transporting people or lifting or supporting loads over people.**
- **Hoists are designed to provide a 4 to 1 safety factor. 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 hoist and attached equipment. This is the customer's responsibility. If in doubt, consult a registered structural engineer.**

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 cranes 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.

The Occupational Safety and Health Act of 1970 generally places the burden of compliance with the user, 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. See ASME B30.9 for rigging information, American National Standards Institute, 1430 Broadway, New York, NY 10018.

WARNING TAG

Each hoist is supplied from the factory with the warning tag shown. If the tag is not attached to your unit, order a new tag and install it. Refer to parts list for part number. Read and obey all warnings and other safety information attached to this hoist. Tag may be shown smaller than actual size.

WARNING

Failure to follow these warnings may result in death, severe injury or property damage:

- Do not operate this hoist before reading operation and maintenance manual. 
- Do not lift more than rated load.
- Do not lift people or loads over people.
- Do not operate hoist with twisted, kinked or damaged chain.
- Do not operate a damaged or malfunctioning hoist.
- Do not operate when chain cannot form straight line with load.
- Do not operate lever hoist with handle extension.
- Do not operate hoist with other than manual power.
- Do not remove or obscure warning labels.

SAFE OPERATING INSTRUCTIONS

The following warnings and operating instructions have been adapted in part from American National Standard ASME B30.21 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 in their plants. In the event 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 dangerous practices to avoid and are not necessarily limited to the following list. Refer to specific sections in the manual for additional safety information.

1. Only allow personnel trained in safety and operation of this product to operate hoist.
2. Only operate a hoist if you are physically fit to do so.
3. When a **“DO NOT OPERATE”** sign is placed on hoist, do not operate hoist until sign has been removed by designated personnel.
4. Before each shift, the operator should inspect hoist for wear or damage.
5. Never use a hoist which inspection indicates is worn or damaged.
6. Periodically, inspect hoist thoroughly and replace worn or damaged parts. Refer to “INSPECTION” Section.
7. Lubricate hoist regularly. Refer to “LUBRICATION” Section.
8. Do not use hoist if hook latch has been sprung or broken.
9. Check that hook latches are engaged before using.
10. Never splice a hoist chain by inserting a bolt between links.
11. Only lift loads less than or equal to rated capacity of hoist. Refer to “SPECIFICATIONS” section.
12. Never use hoist load chain as a sling.
13. Never operate a hoist when load chain is not centered under top hook. Do not “side pull” or “yard.”
14. Never operate a hoist with twisted, kinked, “capsized” or damaged load chain.
15. Do not force a chain or hook into place by hammering.
16. Never insert point of hook into a chain link.
17. Be certain load is properly seated in saddle of hook and hook latch is engaged.
18. Do not support load on tip of hook.
19. Never run load chain over a sharp edge. Use a sheave.
20. When using two hoists to suspend one load, select two hoists each having a rated capacity equal to or more than the load. This provides adequate safety in the event of a sudden load shift.
21. Pay attention to the load at all times when operating hoist.
22. Always ensure that you, and all other people, are clear of load path. Do not lift a load over people.
23. Never use hoist for lifting or lowering people, and never allow anyone to stand on a suspended load.
24. Ease slack out of chain and sling when starting a lift. Do not jerk the load.
25. Do not swing a suspended load.
26. Do not leave a load suspended when hoist is unattended or not in use.
27. Never weld or cut on a load suspended by the hoist.
28. Never use hoist chain as a welding electrode.
29. Do not operate hoist if chain jumping, excessive noise, jamming, overloading, or binding occurs.
30. Keep load from hitting load chain.
31. Do not use a cheater bar or extended handle.
32. Never place your hand inside throat area of a hook.
33. After use, or when in a non-operational mode, hoist should be secured against unauthorized and unwarranted use.
34. Only operate hoist with manual power.

SPECIFICATIONS

General

The Lever Chain Hoist can be mounted to the suspension shaft of a trolley or a permanent mounting structure. The hoist is designed to lift and lower loads up to rated capacity with minimal lever effort.

To determine your basic hoist configuration refer to capacity and lot number nameplate located on hand lever for model number information.

Model Code Explanation

Example: **SL** - **300** - **10** - **E**

Series _____
 Hoist Capacity _____
 Lift (Hoist load chain/hook travel) _____
 Compliance _____

Series	Hoist Capacity	Lift	Compliance
SL = Silver Lever Hoist	100 = 1/2 metric ton / 500 kg 150 = 3/4 metric ton / 750 kg 200 = 1 metric ton / 1,000 kg 300 = 1-1/2 metric ton / 1,500 kg 600 = 3 metric ton / 3,000 kg 1200 = 6 metric ton / 6,000 kg	10 = 3 m (standard) 15 = 5 m 20 = 6 m XX = Specify length F = Hoist without load chain	E = Meets European Machinery Directives N = S•COR•E Load Chain*

* Available only on SL100 and SL300 hoists

Specifications Table

Model No.	Capacity (metric tons)	Lever Pull to lift rated load (kg)	Load Chain size (mm)	Wt. of chain per 0.3 m of lift (kg)	No. of chain falls	Hoist Net Weight with standard 1.5 m of lift (kg)
SL100	1/2	35	5 x 15	0.16	1	5
SL150	3/4	31	6 x 19	0.24	1	7.3
SL200	1	29			1	
SL300	1-1/2	33	7.1 x 21	0.34	1	11.8
SL600	3	34	10 x 30	1.66	1	20.9
SL1200	6	37		1.32	2	31.3

INSTALLATION

Prior to installing hoist, carefully inspect it for possible shipping damage. Hoists are supplied fully lubricated from the factory. Ensure load chain is lubricated prior to hoist operation.

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.

The SL lever chain hoist can be used in any position provided it is rigged to pull in a straight line from top hook to bottom hook.

The hoist body must be positioned so that it does not contact the load or support members when in use. Ensure hand lever movement is unrestricted.

When operating in limited areas suitable lifting attachments or slings must be used to prevent hoist body and hand lever from being obstructed.

CAUTION

• Ensure hoist top and bottom hooks are properly rigged and hook latches are engaged, prior to use.

Initial Operating Checks

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

OPERATION

The four most important aspects of hoist operation are:

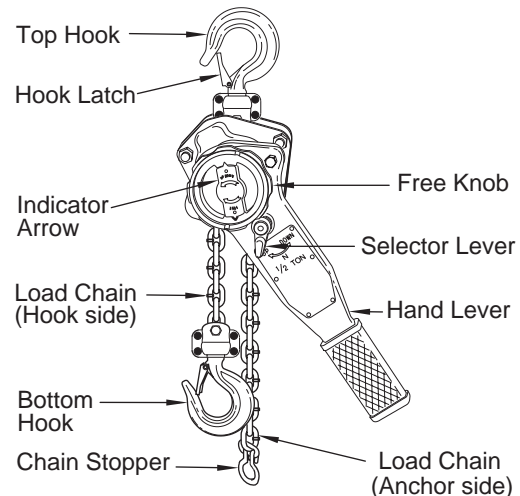
1. Follow all safety instructions when operating hoist.
2. Allow only personnel trained in safety and operation of this hoist to operate hoist.
3. Subject each hoist to a regular inspection and maintenance procedure.
4. Be aware of hoist capacity and weight of load at all times.

WARNING

• The hoist is not designed or suitable for lifting, lowering or moving persons. Never lift loads over people.

NOTICE

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



(Dwg. MHP0830)

Familiarize operators and personnel responsible for hoist installation and service with ASME B30.21 specifications and this manual prior to placing unit into service. All requirements of this specification, including testing should be met before approving hoist for operation.

Positioning Unloaded Hook (Neutral Position)

Refer to Dwg. MHP0830 on page 4.

Check that load chain stopper (44) is securely fastened in last link of load chain free end. The load chain stopper is intended to prevent load chain from becoming disengaged from the hoist and is not intended to support the load.

⚠ CAUTION

- To prevent injury or property damage always remove load from hoist before shifting indicator arrow.
- Ensure load is properly seated in saddle of bottom hook.

In NEUTRAL “N” position hand lever does not engage ratchet gear. The hand lever free-wheels until selector lever is shifted to UP or DOWN position.

1. Set selector lever to NEUTRAL (center) position.
2. Ensure indicator arrow is pointing to free chain notch in free knob.
3. Grasp and pull one side of load chain or turn free knob until desired hook location is achieved.
4. Connect hook to load. Pull anchor side of load chain or turn free knob until chain slack is removed.

If indicator arrow does not easily move to free chain notch, switch selector lever to DOWN position and turn indicator arrow. Additionally, it may be necessary to move selector lever to DOWN position and pull on unloaded end of chain while turning indicator arrow.

Lifting Load (UP Position - Haul-In)

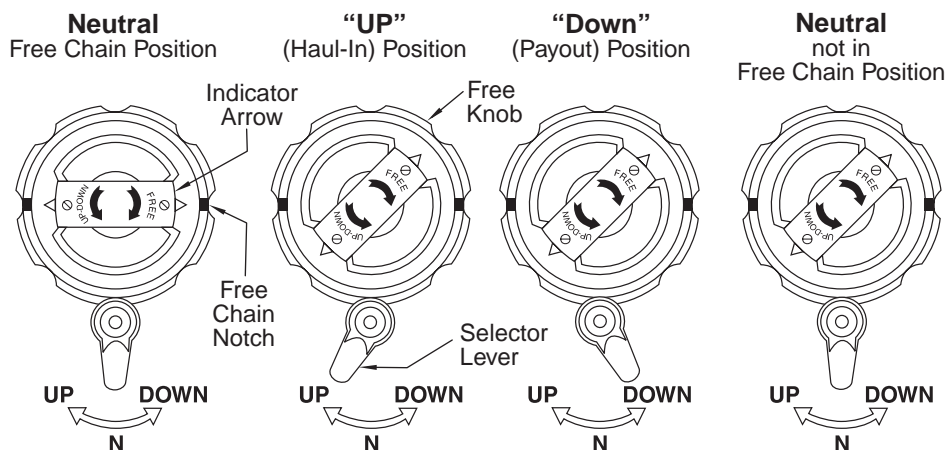
Refer to Dwg. MHP0825 on page 5.

The following procedure assumes hoist is in NEUTRAL (center) position and hook is attached to a load, but hoist is not supporting the load.

⚠ WARNING

- **ALWAYS** ensure that indicator arrow is pointing away from FREE chain notch whenever shifting selector lever to NEUTRAL position.

1. Place selector lever in UP position. Turn indicator arrow to point away from free chain notch.
2. Rotate free knob clockwise.
3. Pull anchor end of load chain until slack is removed.
4. Rotate (ratchet) hand lever in **clockwise** direction to raise (haul-in) load.



(Dwg. MHP0825)

NOTICE

- Ratchet may not engage and raise (haul-in) load until all chain slack is removed and hoist is supporting load weight. If hand lever movement does not produce lifting, apply tension to anchor side of load chain while ratcheting until slack is removed and hoist begins lifting load. If hoist does not operate properly under load, remove load, inspect and repair hoist.

Lowering Load (DOWN Position - Payout)

Refer to Dwg. MHP0825 on page 5.

⚠ WARNING

- Do not continue lowering load after chain stopper has contacted hoist body as damage may occur to hoist resulting in a falling load which can cause severe injury, death or property damage.

The following procedure assumes hoist selector lever is in UP position, hoist is holding a load and the operator wants to lower (payout) the load:

1. Place selector lever in DOWN position. Indicator arrow will continue to point away from free chain notch.
2. Rotate (ratchet) hand lever in **counterclockwise** direction to lower (payout) load.

⚠ CAUTION

- To prevent injury or property damage always lower loads until load chain becomes slack before shifting to NEUTRAL position.

Storing the Hoist

1. Always store hoist in a no load condition.
2. Switch selector lever to NEUTRAL (center position).
3. Wipe off all dirt and water.
4. Oil the chain, hook pins and hook latch pins.
5. Hang in a dry place.
6. Before returning hoist to service follow instructions for 'Hoists not in Regular Use' in "INSPECTION" section.

⚠ WARNING

• **All new, altered or modified equipment should be inspected and tested by personnel trained in safety, operation and maintenance of this equipment to ensure safe operation at rated specifications before placing equipment in service.**

Frequent and periodic inspections should be performed on equipment in regular service. Frequent inspections are visual examinations performed by operators or service personnel and include observations made during routine equipment operation. Periodic inspections are thorough inspections conducted by personnel trained in the safety, operation and maintenance of this equipment. ASME B30.21 states inspection intervals depend upon the nature of the critical components of the equipment and 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 trained 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 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

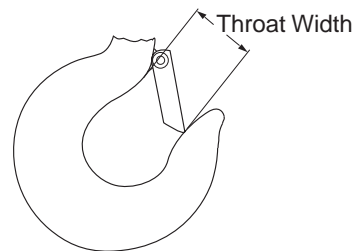
Records should be maintained documenting the condition of load chain removed from service as part of a long-range load chain inspection program. Accurate records will establish a relationship between visual observations noted during frequent inspections and the actual condition of the load chain as determined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

Frequent Inspection

The lever chain hoist should be inspected at the beginning of each shift. Visual inspections should also be conducted during regular

service for any damage or evidence of malfunction which appears between regular inspections.

1. **OPERATION.** Check for visual signs or abnormal noises which could indicate a potential problem. Check chain feed through hoist and on 6 ton units the hook idler sheave. If chain binds, jumps, or is excessively noisy or “clicks,” clean and lubricate the chain. If problem persists, chain and load sheave may have to be replaced. Do not operate hoist until all problems have been determined and corrected.
2. **HOOKS.** Check for wear or damage, increased throat width, bent shank or twisting of hook. Replace hooks that exceed the throat opening discard width (15%) shown in Table 1 (refer to Dwg. MHP0040 on page 6) or exceed a 10° twist (refer to Dwg. MHP0111 on page 6). If hook latch snaps past tip of hook, hook is sprung and must be replaced. Check hooks swivel easily and smoothly. Repair or lubricate as necessary.

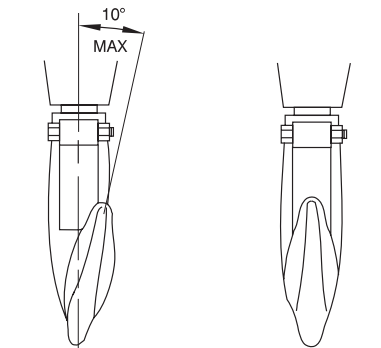


(Dwg. MHP0040)

Table 1

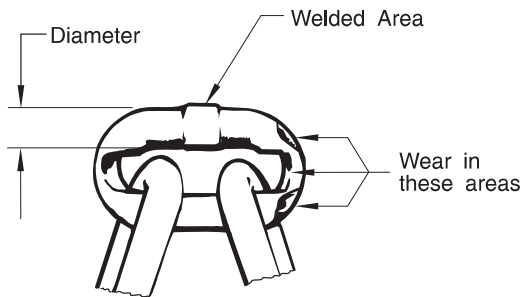
Model No.	Throat Width (mm)	Discard Width (mm)
SL100	26	30
SL150	27	31
SL200	30	34
SL300	34	39
SL600	42	48.3
SL1200	47	53.8

3. **HOOK LATCHES.** Check operation of hook latches. Replace if broken or missing.



(Dwg. MHP0111)

- CHAIN. Refer to Dwg. MHP0102 on page 7. Examine each link for bending, cracks in weld areas or shoulders, transverse nicks and gouges, weld splatter, corrosion pits, striation (minute parallel lines) and chain wear, including bearing surfaces between chain links. Replace a chain that fails any of the inspections. Check lubrication and lubricate if necessary. Refer to "Load Chain" in "LUBRICATION" section.



(Dwg. MHP0102)

CAUTION

• The full extent of chain wear cannot be determined by visual inspection. At any indication of chain wear, inspect chain and load sheave in accordance with instructions in "Periodic Inspection."

• A worn load chain may cause damage to load sheave. Inspect load sheave and replace if damaged or worn.

- LOAD CHAIN REEVING. Refer to Dwg. MHP0042 on page 9. Make sure welds on standing links are away from load sheave. Reinstall chain if necessary. On 6 ton hoists, make sure chain is not capsized, twisted or kinked. Ensure chain stopper is installed in last link of load chain. Adjust as required.
- HAND LEVER. Check for cracks, bending and other damage. Replace if necessary.

Periodic Inspection

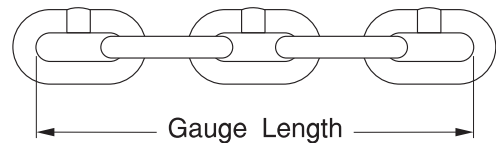
According to ASME B30.21, frequency of periodic inspection depends on the severity of usage:

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

- FASTENERS. Check rivets, capscrews, nuts, cotter pins and other fasteners on hooks and hoist body. Replace if missing and tighten or secure if loose.
- ALL COMPONENTS. Inspect for wear, damage, distortion, deformation and cleanliness. Disassemble and check gears, shafts, bearings, sheaves, chain guides, springs and covers. Replace worn or damaged parts. Clean, lubricate and reassemble.
- HOOKS. Inspect hooks for cracks. Use magnetic particle or dye penetrant to check for cracks. Inspect hook retaining parts. Tighten, repair or replace if necessary. Refer to the latest edition of ASME B30.10 (Hooks) for additional hook inspection information.
- CHAIN SHEAVES. Check for excessive wear or damage. Replace if necessary.

- BRAKE. Ensure proper operation. Brake must hold hoist rated capacity. If load test indicates the need, disassemble. Brake discs must be free of oil, any grease, unglazed and uniform in thickness. Refer to "MAINTENANCE" section for allowable brake disc wear. Check all other brake surfaces for wear, deformation or foreign deposits. Inspect gear teeth, pawl and pawl spring for damage. Check that brake pawl stops counterclockwise rotation of ratchet gear. Clean and replace damaged components as necessary.
- SUPPORTING STRUCTURE. If a permanent structure is used, inspect for continued ability to support load.
- LABELS AND TAGS. Check for presence and legibility. Replace if necessary.
- LOAD CHAIN. Measure chain for stretching by measuring across five link sections all along chain length (refer to Dwg. MHP0041 on page 7). When any five links in the working length reach or exceed discard length shown in Table 2, replace entire chain. Always use a genuine **Ingersoll-Rand** Material Handling replacement chain.



(Dwg. MHP0041)

Table 2

Model No.	Chain Size (mm)	Normal Length (mm)	Discard Length (mm)
SL100	5 x 15	75	77
SL150	6 x 19	90	92.3
SL200			
SL300	7.1 x 21	105	107.6
SL600	10 x 30	150	153.7
SL1200			

- CHAIN STOPPER. Ensure chain stopper is installed in last link of free end of load chain. Replace if missing or damaged. Refer to 'Attaching End of Load Chain' in "MAINTENANCE" Section.

Hoists Not in Regular Use

- Hoists which have been idle for a period of one month or more, but less than one year shall be given an inspection conforming with requirements of "Frequent Inspection" before being placed into service.
- Hoists which have been idle for a period of over one year shall be given a complete inspection conforming with requirements of "Periodic Inspection" before being placed into service.
- Standby hoists shall be inspected at least semiannually in accordance with requirements of "Frequent Inspection". In abnormal operating conditions, equipment should be inspected at shorter intervals.

LUBRICATION

General

Thread lubricant or an anti-seize compound use is recommended for threaded shafts, capscrews and nuts. Unless otherwise stated, remove old lubricant, clean part with an acid free solvent and apply a new coating of lubricant to part before assembly.

Gears (56)

Remove nuts (22) and lockwashers (23) on side of hoist opposite hand lever and remove gear cover (57). Remove old grease and replace with new. For temperatures -29° to 10° C use EP 1 grease or equivalent. For temperatures -1° to 49° C use EP 2 grease or equivalent.

Load Chain



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

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

TROUBLESHOOTING

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

SYMPTOM	CAUSE	REMEDY
Hoist will not hold rated load.	Brake may be slipping.	Inspect and adjust or repair as described in “INSPECTION” and “MAINTENANCE” sections.
Hoist will not lift load.	Excess slack in load chain.	Pull down on load chain while ratcheting until slack is removed and hoist begins lifting load. Refer to “OPERATION” section.
	Hoist is overloaded.	Reduce load to within rated capacity.
	Hoist is in NEUTRAL (N) mode.	Ensure selector lever is in UP position. Refer to “OPERATION” section.
Load chain binds.	Damaged load chain, pinion shaft, gears or sheaves.	Disassemble and inspect components as described in “MAINTENANCE” and “INSPECTION” sections.
	Load chain not installed properly (twisted, kinked or “capsized”).	Inspect and adjust or repair as described in “INSPECTION” and “MAINTENANCE” sections.
Load hook latch does not work.	Latch broken.	Replace hook latch.
	Load hook bent or twisted.	Inspect load hook as described in “INSPECTION” section. Replace if necessary.
Hoist will not free chain.	Indicator arrow may not be aligned with free chain notch.	Rotate indicator arrow counterclockwise. Refer to “OPERATION” section.

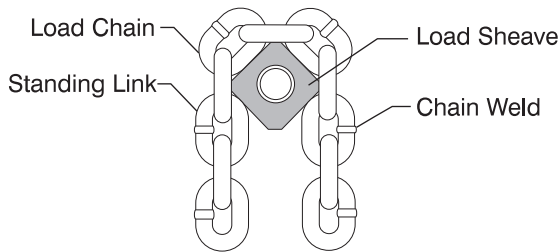
⚠ WARNING

- Never perform maintenance on hoist while it is supporting a load.
- Before performing maintenance, tag hoist:
DANGER - DO NOT OPERATE - EQUIPMENT BEING REPAIRED.
- Only allow personnel trained in the operation and service of this product to perform maintenance.
- After performing any maintenance on hoist, test to 125% of its rated capacity before returning to service. (Testing to 150% of rated capacity might be required to comply with standards and regulations set forth in areas outside of the USA.)

Installing New Load Chain

Refer to Dwg. MHP0042 on page 9.

1. Ensure welds of “standing” links on new load chain are facing away from load sheave (38).
2. Ensure load chain (43) is reeved between load sheave (38) and chain guides (41).
3. Bottom hook assembly (48) must be on left fall of load chain (43) and right fall must have a chain stopper (44) attached to end link.



(Dwg. MHP0042)

NOTICE

- Right and left designations are as viewed from hand lever side of hoist.

4. On 6 ton hoists feed load chain through bottom block assembly and secure to top hook bracket with capscrew (58), nut (60) and cotter pin (59). Ensure load chain is straight and not twisted. Chain weld on standing links will be to the inside of bottom hook idle sheave (65). Refer to Dwg. MHP0834 on page 9.
5. Lubricate new load chain before using hoist. Refer to “LUBRICATION” section for recommended lubricants.

General Disassembly

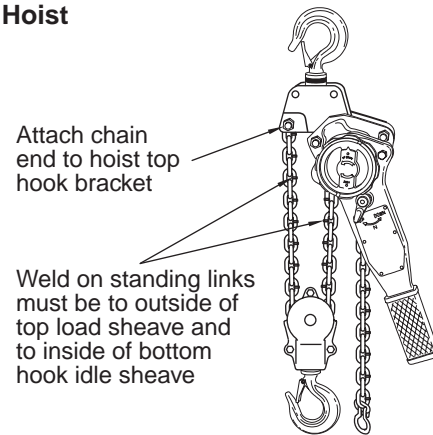
The following instructions provide necessary information to disassemble, inspect, repair, and assemble hoist. Hoist assembly parts drawings are provided in “PARTS” section.

If a hoist is being completely disassembled for any reason, follow the order of the topics as they are presented. It is recommended that all maintenance work on hoist be performed on a bench in a clean dust free area.

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

1. Never disassemble hoist any further than is necessary to accomplish needed repair. A good part can be damaged during the course of disassembly.
2. Never use excessive force when removing parts. Tapping gently around the perimeter of a cover or housing with a soft hammer, for example, is sufficient to break the seal.
3. Do not apply heat to a part to free it for removal, unless part being heated is already worn or damaged beyond repair and no additional damage will occur to other parts. In general, hoist is designed to permit easy disassembly and assembly. The use of heat or excessive force should not be required.
4. Keep work area as clean as practical, to prevent dirt and other foreign matter from getting into bearings or other moving parts.
5. When grasping a part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members, machined surfaces and housings.
6. Do not remove any part which is press fit in or on a subassembly unless removal of that part is necessary for repairs or replacement.

6 ton Hoist



(Dwg. MHP0834)

Hoist Disassembly

Refer to Dwg. MHP0773 on page 12.

Accessing Brake End

1. Remove retainer ring (1) and lift off indicator arrow (2).
2. Remove cotter pin (3) and nut (4) from pinion shaft (53).
3. Carefully remove adjustment block (5) to avoid dropping or loosening balls (6) and springs (7).
4. Remove screws (8) and (10) with lockwashers (9) and (11). Lift off free knob (12) and cover (13).
5. Remove two capscrews (14) and lockwashers (15) from lever (17). Remove two nuts (27) and lockwashers (15) from opposite side of lever. Lift off lever (17).
6. Remove change pawl (18), spring shaft (19) and spring (20) from lever (17).
7. Carefully pry change wheel (21) from hub (25).
8. Remove three nuts (22) and lockwashers (23) from threaded side plate spacers (46). Remove brake cover assembly (24).
9. Secure pinion shaft (53) to prevent rotation and unscrew hub (25).

10. Remove brake discs (28) and ratchet (29).
11. Remove retainer ring (30).
12. Secure pinion shaft (53) to prevent rotation and unscrew brake hub (31).
13. Remove retainer rings (32) from posts on side plate assembly (35). Remove pawls (33) and springs (34).

Accessing Gear End

1. Remove three nuts (22) and lockwashers (23) from side plate threaded spacers (46).
2. Remove gear cover (57).
3. Remove gears (56).
4. Remove retainer ring (55) from load sheave (38) if complete hoist is to be disassembled.

Accessing Load Sheave

Follow steps 1 through 13 in 'Accessing Brake End' and steps 1 through 4 in 'Accessing Gear End'.

1. Slide out pinion shaft (53) from gear end.
2. Carefully remove side plate assembly (brake side) (35) to avoid loosening rollers (37).
3. Remove rollers (37), guide roller (41), chain stripper (45), guide block (42) and top hook (39) with anchor pin (36).
4. Pry gear (54) from load sheave (38). Remove load sheave from side plate assembly (gear side) (52).
5. If necessary tap side plate threaded spacers (46) from side plate assembly (gear side) (52).

Bottom Hook Disassembly

1. On single fall hoists remove cotter pin (71), nut (72) and capscrew (73). Separate load chain from hook. On older design hoists remove coil retainer (49) from hook (48) shank and slide out pin (47). Use a pick or narrow bladed screwdriver to lift the end of the last wire coil of coil retainer. Carefully uncoil retainer over end of hook.
2. On double fall hoists remove two capscrews (68), lockwashers (63) and nuts (62).
3. Separate hook block (64) and remove hook (61).
4. Lift out axle and idler sheave assembly. Carefully slide idler sheave shaft (67) from idler sheave (65) and remove rollers (66) from recessed groove in idler sheave.

Cleaning, Inspection and Repair

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

Cleaning

Clean all hoist component parts in solvent (except for brake discs). Use of a stiff bristle brush will facilitate removal of accumulated dirt and sediments on gears, shafts and housings. Dry each part using low pressure, filtered compressed air. If brake discs are oil-soaked, they must be replaced.

Inspection

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

1. Inspect all gears for worn, cracked, or broken teeth.
2. Inspect shafts for ridges caused by wear. If ridges caused by wear are apparent on shafts, replace shaft.

3. Inspect all threaded items and replace those having damaged threads.
4. Inspect brake discs for oil. If brake discs are oil-soaked, replace brake discs.
5. Measure thickness of brake discs. New brake disc thickness is 2 mm. Discard brake discs if thickness is 1.5 mm or less.

Repair

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

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

Hoist Assembly

Refer to Dwg. MHP0773 on page 12.

Load Sheave Assembly

1. Install side plate threaded spacers (46) in side plate assembly (gear side) (52).
2. Install load sheave in side plate assembly (52).
3. Apply grease to rollers (37) and position them in groove of bearing race located on plain end of load sheave (38).
4. Install guide roller (41), chain stripper (45), guide block (42) and top hook (39) on anchor pin (36) in side plate assembly (52).
5. Carefully install side plate assembly (brake end) (35) to engage locating diameters of parts installed in step 4. Ensure all rollers (37) remain in position.
6. Push side plates together to ensure all parts are located and secure.

Gear End Assembly

Follow steps 1 through 6 described in 'Load Sheave Assembly'.

1. Install gear (54) on load sheave (38). Install retainer ring (55) on load sheave (38) to secure gear (54).
2. Install pinion shaft (53) through center of load sheave (38).
3. Install gears (56) so gear teeth are correctly timed and spigots locate in bearing sleeves in side plate (52). Refer to 'Gear Timing' section.
4. Apply a thick coat of grease as recommended in "LUBRICATION" section to all gear teeth. Install gear cover (57) over gears (56) to locate and engage gear spigots.
5. Secure gear cover with three nuts (22) and lockwashers (23).

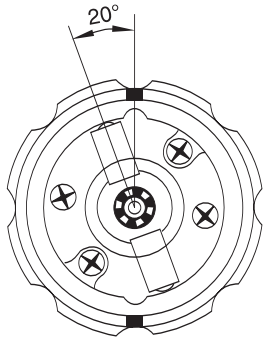
Brake End Assembly

Follow steps 1 through 6 described in 'Load Sheave Assembly' and steps 1 through 5 described in 'Gear End Assembly'.

⚠ CAUTION

• The brake will not operate properly if there is oil or grease on brake discs (18).

1. Thread brake hub (31) onto pinion shaft (53) until snug. Stepped side of brake hub must face out. Install retainer ring (30).
2. Install springs (34) and pawls (33) on side plate assembly (brake end) (35) posts and secure with retainer rings (32).
3. Install first brake disc (28) followed by ratchet disc (29) and second brake disc (28). Ratchet disc teeth must engage two pawls (33) mounted on side plate assembly (35). Counterclockwise rotation of ratchet disc must be possible.
4. Secure load sheave (38) to prevent rotation and thread hub (25) onto pinion shaft (53) until snug.
5. Install brake cover assembly (24) on side plate assembly (35). Brake cover assembly will locate on threaded spacers (46). Secure with lockwashers (23) and nuts (22).
6. Install change wheel (21) on hub (25). Tapered bore side of change wheel must be toward hub.
7. Install spring (20), spring shaft (19) and change pawl (18) in lever (17).
8. Install lever assembly on brake cover assembly (24). Threaded posts on lever must engage holes in brake cover assembly. Secure with lockwashers (23) and nuts (22).
9. Install capscrews (14) and lockwashers (15). Position cover (13) on change wheel (21).
10. To assist further assembly move selector lever to UP position. Install free knob (12) and install screws (8) and (10) and lockwashers (9) and (11). Longer screws must be used in holes located in two raised areas in free knob.
11. Install springs (7) and balls (6) in adjustment block (5). Position adjustment block assembly on pinion shaft. Set adjustment block at 20° from free chain notch in free knob. Refer to Dwg. MHP0828 on page 11.



(Dwg. MHP0828)

12. Install and tighten nut (4) until snug and then back nut off 3/4 turn align slot with pin hole in pinion shaft (53). Install cotter pin (3) but do not bend ends apart. Test to ensure adjustment block will freely move to free chain position. If not back off nut one more slot and retest. Install and bend cotter pin ends apart.
13. Install indicator arrow (2) and secure in position with retainer ring (1).

NOTICE

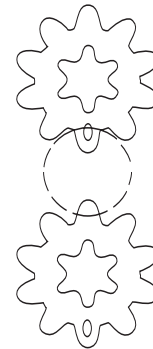
• Ensure hoist will properly shift from UP, DOWN and NEUTRAL positions using selector lever. With selector lever in NEUTRAL (center) position, and indicator arrow pointing to free chain notch, ensure brake disengages and load chain can be pulled in both directions without sticking or binding.

Bottom Hook Assembly

1. On double fall hoists grease and install twenty eight rollers (66) in groove provided in bore of idler sheave (65).
2. Install idler sheave shaft (67) through idler sheave (65) bore. Ensure rollers (66) remain in position.
3. Carefully place assembled parts between hook block (64).
4. Install hook (61) between hook block (64) and clamp halves together with capscrews (68), lockwashers (63) and nuts (62).
5. Install a retainer ring (69) on both ends of idler sheave shaft (67).
6. On single fall hoists install last link of load chain in hook shank and install capscrew (73), nut (72) and cotter pin (71). For older design hoists slide coil retainer (49) onto end of load chain (43). Place last link of load chain in slot of hook shank and install pin (47) to anchor, load chain. Starting with one end of coil retainer gradually coil retainer onto hook shank so that it locates in recess provided.

Gear Timing

For proper operation, timing marks on gears (56) must be in correct positions. Timing marks are circular impressions near center of gear (56). Refer to Dwg. MHP0827 on page 11.



3/4 ton

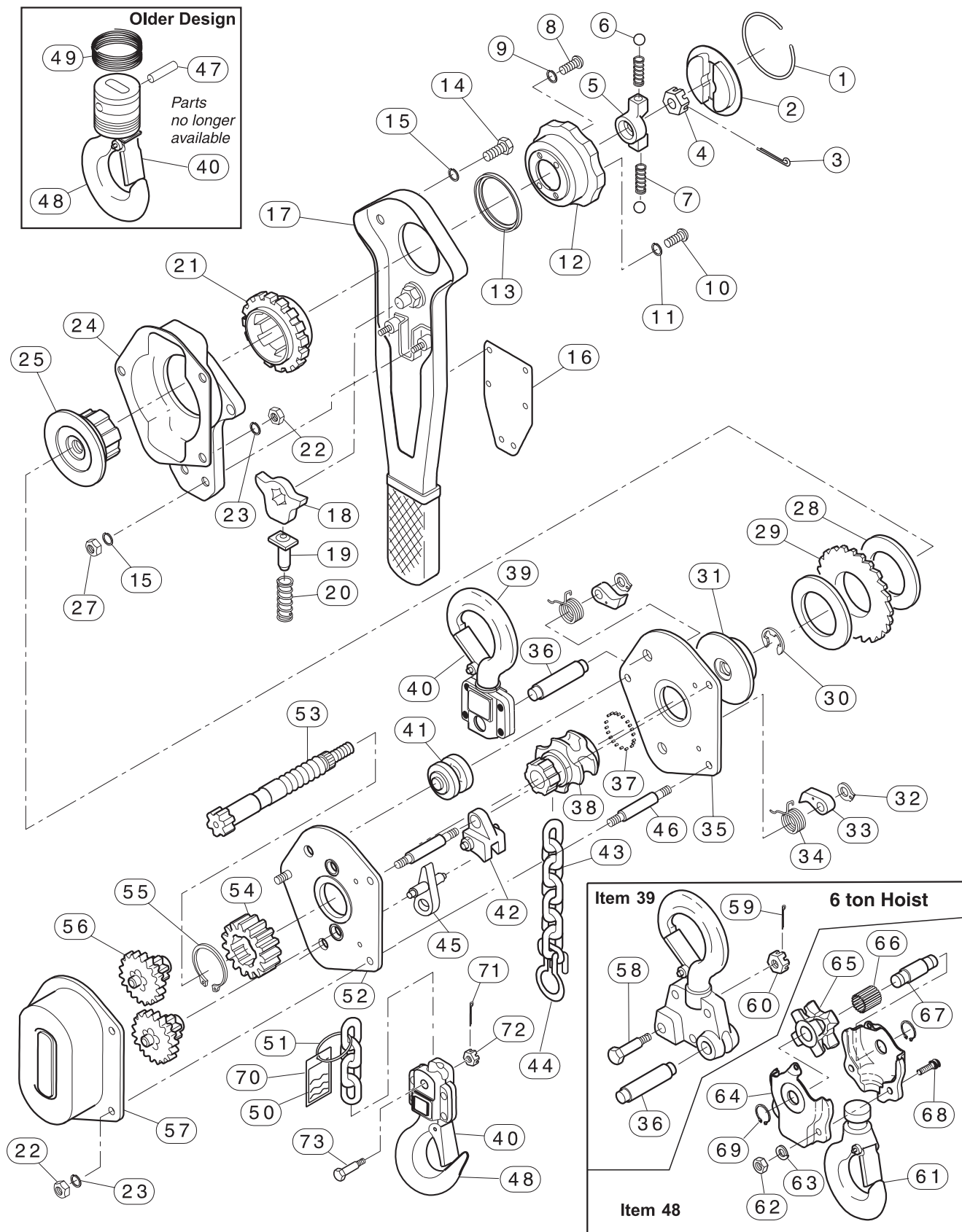
(Dwg. MHP0827)

(3/4 ton shown) timing marks typical for 1/2 - 6 ton

Load Test

Prior to initial use, all new, extensively repaired, or altered hoists shall be load tested by or under the direction of a person trained in the operation and maintenance of this hoist, and a written report furnished confirming rating of hoist. Test hoist to 125% of rated hoist capacity. Testing to more than 125% may be necessary to comply with standards and regulations set forth in areas outside of the USA.

HOIST ASSEMBLY PARTS DRAWING



(Dwg. MHP0773)

HOIST ASSEMBLY PARTS LIST

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.					
			1/2 ton	3/4 ton	1 ton	1-1/2 ton	3 ton	6 ton
• 1	Retainer Wire	1	71291439					
2	Indicator Arrow	1	71291298					
3	Cotter Pin	1	71291280					
4	Nut	1	71291454					
5	Adjustment Block	1	71291264					
• 6	Ball	2	71291470					
• 7	Spring	2	71291488					
8	Screw	2	71291256			71480750		
9	Lockwasher	2	71291249					
10	Screw	2	71291504					
11	Lockwasher	2	71291512					
12	Free Knob	1	71291223			71291231		
13	Cover	1	71291207			71291215		
14	Capscrew	2	71291520			71291538		
15	Lockwasher	4	71291546			71480768		
16	Capacity Label	1	71480636	71292338	71480644	71292320	71292312	71292304
17	Lever	1	71486922	71291181	71486922	71291199		
18	Change Pawl	1	71291645			71291652		
19	Spring Shaft	1	71291629			71291637		
• 20	Spring	1	71291603			71291611		
21	Change Wheel	1	71486336	71291165		71291173		
22	Nut	6	71291579			71291587	71480792	
23	Lockwasher	6	71291595			71480800	71480818	
24	Brake Cover Assembly	1	71480826	71291140		71291157	71291132	
25	Hub	1	--	71291116		71291124	71292171	
27	Nut	2	71291553			71291561		
• 28	Brake Disc	2	71480834	71291058		71291066	71291074	
• 29	Ratchet	1	71480842	71291082		71291090	71291108	
30	Retainer Ring	1	71291033			71291041		
31	Brake Hub	1	71480859	71291660		71480867	71291678	
32	Retainer Ring	2	71291017			71291025		
33	Pawl	2	71480875	71290985		71290993		
34	Pawl Spring	2	71290951			71290969		
35	Side Plate Assembly, Brake End	1	Check hoist lot number to determine correct part. Refer to page 14.					
36	Pin	1	71480891	71291835		71291843	71291850	
• 37	Roller	()	--	71290860 (34)		71290878 (37)	71290886 (24)	
38	Load Sheave Assembly incls. Bearing Inner Races	1	71480909	71290837		71290845	71290852	
• 39	Top Hook Assembly	1	71480719	71480651	71480735	71480669	71480677	71291801
• 40	Hook Latch Kit	2	71480917	71293658	71480925	71293666	71293674	7123682
41	Guide	1	Check hoist lot number to determine correct part. Refer to page 14.					
42	Guide Block	1	71480933	71291710		71291728	71291736	
43	Load Chain	1	LCCF005	LC618-G10		LCCF015	LC1030-G10	
• 44	Chain Stopper	1	71291686			71291694	71291702	
45	Stripper	1	71480941	71291744		71291751	71291769	
46	Threaded Spacer	3	71291546			71480768		
47	Pin (older design)	1	71480966	71291876		71291884	71291892	--
• 48	Bottom Hook Assembly incls. items 40, 71 thru 73	1	71480727	71480685	71480743	71480693	71480701	71292940
49	Coiled Retainer (older design)	2	--	71291819	--	71480560	71291827	--
50	Warning Label	1	71301097					
51	Ring	2	HRE20A-283					
52	Side Plate Assembly, Gear End	1	Check hoist lot number to determine correct part. Refer to page 14.					
• 53	Pinion Shaft	1	--	71289896		71289904	71289912	
54	Gear	1	--	71290787	71481006	71280795	71290779	
55	Retainer Ring	1	71480974	71289953		71290761	71292163	
56	Gear	2	--	71289920	71480982	71289938	71289946	
57	Gear Cover	1	71480990	71289862		71289870	71289888	

• Recommended Spare

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.					
			1/2 ton	3/4 ton	1 ton	1-1/2 ton	3 ton	6 ton
58	Capscrew	1				--		71291942
59	Cotter Pin	1				--		71291959
60	Nut	1				--		71291967
61	Bottom Hook	1				--		71291934
62	Nut	3				--		71292049
63	Lockwasher	3				--		71292031
64	Hook Block	2				--		*
65	Idler Sheave	1				--		71291975
66	Roller	28				--		71291983
67	Idler Sheave Shaft	1				--		71292007
68	Capscrew	3				--		71292023
69	Retainer Ring	2				--		71297451
70	Bag (ziplock)	1	71302582					
71	Cotter Pin (0.06 x 1.00 inch)	1	*					
72	Nut	1	71481576	71481584	71481592	71481600	71481618	---
73	Capscrew	1	71481527	71481535	71481543	71481550	71481568	---

For Hoists Lot Number H10688 and below, use the following non-interchangeable parts:

35	Side Plate Assembly (Brake End) incls. Bearing Outer Race	1	71480883	71290928	71290936	71290944
41	Guide, Small	1	---	71290894	71290902	71290910
52	Side Plate Assy (Gear End) incls. Gear Bushings and Bearing Outer Race	1	71480958	71290803	71290811	71290829

For Hoists above Lot Number H10688, use the following non-interchangeable parts:

35	Side Plate Assembly (Brake End) incls. Bearing Outer Race	1	71481626	71481634	71481642	71481659
41	Guide, Large	1	---	71481709	71481717	71481725
52	Side Plate Assy (Gear End) incls. Gear Bushings and Bearing Outer Race	1	71481667	71481675	71481683	71481691

* Not available as a replacement part

PARTS ORDERING INFORMATION

The use of other than genuine **Ingersoll-Rand** Material Handling replacement parts may adversely affect safe operation of this product. For prompt service and genuine **Ingersoll-Rand** Material Handling parts, provide your nearest distributor with the following:

1. Complete model number and lot number as it appears on nameplate.
2. Part number(s) and part description as shown in this manual.
3. Quantity required.



Capacity and lot number nameplate for **SL** Hoists is located on hand lever, under selector lever. Model and lot number nameplate shown is for a 1-1/2 ton **SL** Hoist, model **SL300-E**.

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

Hoist Model Number:

Hoist Lot Number:

Date Purchased:

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.

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 manual edition number on front cover for the latest issue.**

Disposal

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

For additional information contact:

Ingersoll-Rand Company
510 Hester Drive
White House, TN 37188 U.S.A.
Phone: (615) 672-0321
Fax: (615) 672-0801

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

Return Goods 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

ACCESSORIES

Description of Part	Part Number
Chain Lubricant	LUBRI-LINK-GREEN

WARRANTY

HOIST 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 en route 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 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) 530-3873
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
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 Distribution Center

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

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
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