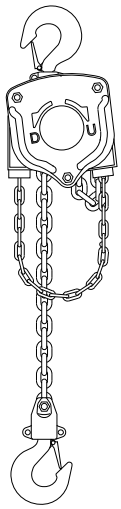
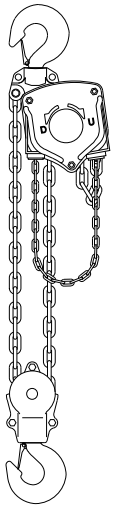
PARTS, OPERATION AND MAINTENANCE MANUAL
for
MANUAL CHAIN HOIST MODELS

VL2-005	**VL2-010**	**VL2-015**	**VL2-020**	**VL2-030**
1/2 ton	**1 ton**	**1-1/2 ton**	**2 ton**	**3 ton**
VL2-050	**VL2-080**	**VL2-100**	**VL2-150**	**VL2-200**
5 ton	**8 ton**	**10 ton**	**15 ton**	**20 ton**

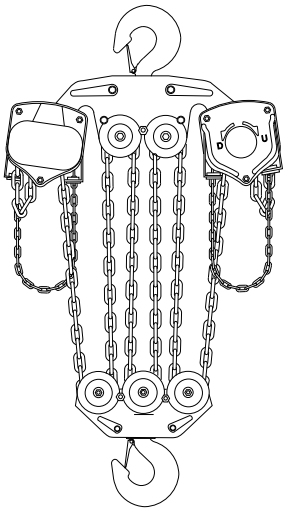
Including **S•COR•E** (Spark and Corrosion Resistant) Features
Unless otherwise noted, tons in this manual are metric tons (2,200 lbs.)



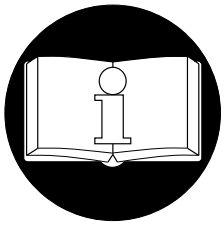
1/2, 1, 1-1/2 and 2 ton



3 and 5 ton



15 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 B30.16) and any other applicable safety codes and regulations.

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

Form MHD56012
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November 1996
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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 ***minor*** 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.
• The supporting structures and load-attaching devices used in conjunction with this hoist must provide an adequate safety factor to handle the rated load, plus the weight of the hoist and attached equipment. This is the customer's responsibility. If in doubt, consult a registered structural engineer.

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

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. Refer to 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 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 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 unsafe 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 to operate the hoist.
2. Only operate a hoist if you are physically fit to do so.
3. When a "**DO NOT OPERATE**" sign is placed on the hoist, do not operate the hoist until the sign has been removed by designated personnel.
4. Before each shift, the operator should inspect the hoist for wear or damage.
5. Never use a hoist which inspection indicates is worn or damaged.
6. Periodically, inspect the hoist thoroughly and replace worn or damaged parts. Refer to "INSPECTION" Section.
7. Lubricate the hoist regularly. Refer to "LUBRICATION" Section.
8. Do not use hoist if hook latch has been sprung or broken.
9. Check that the 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 the rated capacity of the hoist. Refer to capacity labels attached to the hoist.
12. Never use the hoist chain as a sling.
13. Never operate a hoist when the load is not centered under the 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 the point of the hook into a chain link.
17. Be certain the load is properly seated in the saddle of the hook, and the hook latch is engaged.
18. Do not support the load on the tip of the hook.
19. Never run the 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 the hoist.
22. Always ensure that you, and all other people, are clear of the path of the load. Do not lift a load over people.
23. Never use the hoist for lifting or lowering people, and never allow anyone to stand on a suspended load.
24. Ease the slack out of the 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 the hoist is unattended or not in use.
27. Never weld or cut a load suspended by the hoist.
28. Never use the hoist chain as a welding electrode.
29. Do not operate hoist if chain jumping, excessive noise, jamming, overloading, or binding occurs.
30. Keep the load from hitting the load chain.
31. Only operate the hoist with manual power.
32. After use, or when in a non-operational mode, the hoist should be secured against unauthorized and unwarranted use.

WARNING TAG

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

SPECIFICATIONS

General

The VL2 Manual 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 effort.

To determine your hoist configuration refer to the capacity and serial number nameplate for serial and model number information.

Model Code Explanation

Model Code Example: **LV2-050-10-8V** **VL2 - 050 - 10 - 8 V**

Series: **VL2**

Hoist Capacity:

= 005, 010, 015, 020, 030, **050**, 080, 100, 150 and 200

S•COR•E:

- = **Standard**
CP = Copper Plated
SB = Solid Bronze

Lift: (Hoist load chain/hook travel)

10 = Hook travel, **10 std**, 15 and 20 ft., XX = specify length
F = Hoist without chain

Hand Chain Drop: (Hand chain is 2 ft. (0.6 m) less than lift)

8 = **Lift 10 ft. chain drop 8 ft. (standard)**
13 = Lift 15 ft. chain drop 13 ft.
18 = Lift 20 ft. chain drop 18 ft.
XX = Specify length

Options:

V = **Overload Clutch**
H = Zinc Plated hand chain
N = Nickel diffused load chain
Z = Sand blast/carbozinc
P = Marine 812 top coat
S = Chain Container (fabric)

Table 1: Specifications

Model No.	Rated Capacity metric tons*	Pull to lift rated load		Load Chain size (mm)	Hand Chain O'Hauled to lift load 1 ft (0.3 m)		No. of chain falls	Hoist Net Weight (std. 10 ft. lift)	
		lb	kg		ft	m		lb	kg
VL2-005	1/2	55	25.0	5.0	25	7.6	1	20	9.0
VL2-010	1	73	33.2	6.3	38	11.6	1	26	11.8
VL2-015	1-1/2	75	34.1	7.1	57	17.4	1	45	20.4
VL2-020	2			8.0	73	22.3	1	50	22.7
VL2-030	3	77	35.0	7.1	112	34.1	2	52	23.6
VL2-050	5	86	39.1	9.0	181	55.2	2	94	42.6
VL2-080	8	90	40.9		272	82.9	3	150	68.0
VL2-100	10				362	110.3	4	188	85.3
VL2-150	15	2 x 90	2 x 41		2 x 272	2 x 82.9	6	395	179.2
VL2-200	20				2 x 362	2 x 110	8	485	220.0

* One metric ton equals 2200 lbs.

INSTALLATION

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

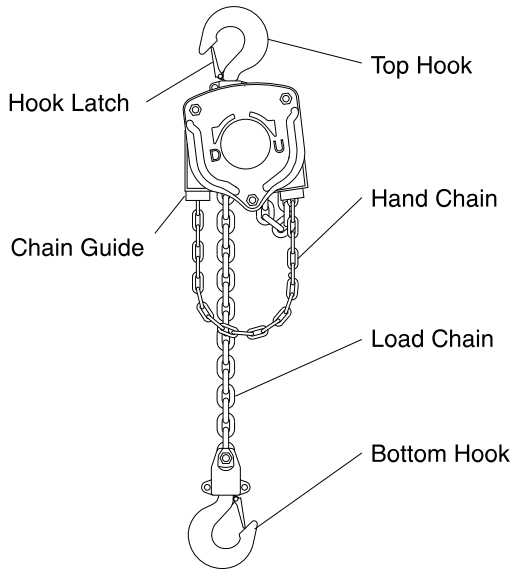
⚠ CAUTION

• 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.

⚠ WARNING

• A falling load can cause injury or death. Before installing, read "SAFE OPERATING INSTRUCTIONS".
• Depending on the model selected, the hoist may weigh up to 485 lbs. (220 kg). If parts of the hoist are dropped, they can cause injury, death or property damage. Adequately support the hoist during installation.

Hoists are designed to provide a 4 to 1 safety factor. 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. If in doubt, consult a registered structural engineer.
The VL2 manual chain hoist must be used in a vertical position to provide a straight line pull from the top hook to the bottom hook. The hoist must be positioned so that it does not contact the support members when in use. When operating in limited areas suitable lifting attachments or slings must be used to prevent the hoist body and hand chain from being obstructed.



(Dwg. MHP0436)

Initial Operating Checks

Operate the hoist with a test load (10% of rated capacity) by raising and lowering this load several times. Verify the brake operation with this light load prior to applying heavier loads.

NOTICE

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

Familiarize operators and people responsible for hoist installation and service with ASME B30.16 specifications prior to placing the unit into service. All the requirements of this specification, including testing should be met before approving the hoist for operation.

Installing Chain Container
Refer to Dwg. MHP0321
Position chain container to ensure minimum contact with the handchain. On larger CC-8 and CC-9 style chain containers which use S-Hooks to support the chain container, ensure hook ends are bent closed.

OPERATION

The four most important aspects of hoist operation are:
1. Follow all safety instructions when operating the hoist.
2. Allow only personnel trained in safety and the operation of this hoist to operate the hoist.
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.

Hoist Operation

When facing the hand chain side of the hoist:

Pull down on the right hand chain (clockwise) to raise load.
Pull down on the left hand chain (counterclockwise) to lower load.

On 15 and 20 ton hoists, use two operators, one on each of the two hand chains. To keep the load chain centered in the block assemblies, operate the hoist units simultaneously and at the same speed. An equal amount of unloaded chain must be maintained under each hoist body.

⚠WARNING

• Do not allow load chain, on 15 and 20 ton hoists, to accumulate on one side (under one hoist body). Excessive loading to load chain anchor may occur resulting in a falling load which can cause death, injury or property damage.

NOTICE

• The clicking sound of the pawl on the ratchet gear is normal when a load is being raised.

Storing the Hoist
1. Always store the hoist in a no load condition.
2. Wipe off all dirt and water.
3. Oil the chain, hook pins and hook latch pins.
4. Hang in a dry place.
5. Before returning hoist to service follow instructions for Hoists not in Regular Service in the “INSPECTION” section.

INSPECTION

⚠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 B30.16 states 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 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 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

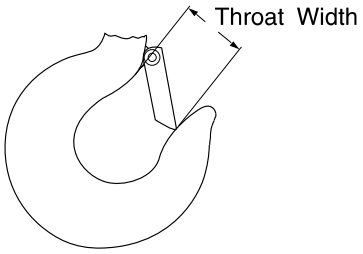
Records should be maintained documenting the condition of load chain removed from service as part of a long-range load chain inspection program. Accurate records will establish a relationship between visual observations noted during frequent inspections and the actual condition of the load chain as determined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

Frequent Inspection

The Manual 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. Do not operate a hoist unless the chain feeds through the hoist and hook block smoothly. Listen for “clicking”, binding or malfunctioning. The clicking sound of the pawl on the

ratchet gear is normal when a load is being raised. If chain binds, jumps, or is excessively noisy, clean and lubricate the chain. If problem persists, replace the chain. Do not operate the hoist until all problems have been corrected. Check that hand chain moves freely and without binding or excessive drag. Hook should stop moving when hand chain stops moving.

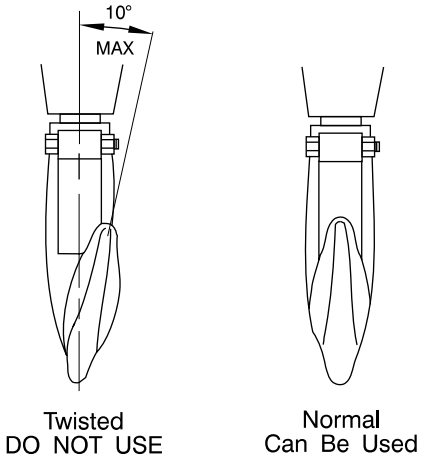
2. HOOKS. Check for wear or damage, increased throat width, bent shank or twisting of hook. Replace hooks which exceed the throat opening discard width (15%) shown in Table 2 (refer to Dwg. MHP0040) or exceed a 10° twist (refer to Dwg. MHP0111). If the hook latch snaps past the tip of the hook, the hook is sprung and must be replaced. Check hook support bearings for lubrication and damage. Check hooks swivel easily and smoothly. Repair or lubricate as necessary.



(Dwg. MHP0040)

Table 2: Hook Throat Dimension

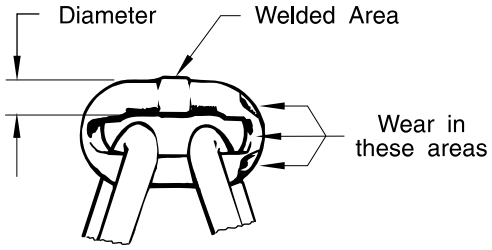
Model No.	Throat Width		Discard Width	
	in.	mm	in.	mm
VL2-005	1.22	31	1.40	35.6
VL2-010	1.33	34	1.54	39.1
VL2-015	1.50	38	1.72	43.7
VL2-020	1.61	41	1.86	47.2
VL2-030	1.85	47	2.12	54.0
VL2-050	2.01	51	2.31	58.6
VL2-080	2.80	71	3.21	81.6
VL2-100				
VL2-150	3.54	90	4.07	103.5
VL2-200				



(Dwg. MHP0111)

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

4. CHAIN. Refer to Dwg. MHP0102. Examine each of the links 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 the load sheave. Inspect the load sheave and replace if damaged or worn.

5. LOAD CHAIN REEVING. Make sure 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.

Periodic Inspection

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

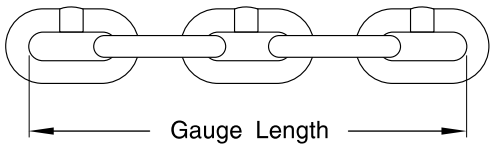
NORMAL	HEAVY	SEVERE
yearly	semiannually	quarterly

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

1. FASTENERS. Check rivets, capscrews, nuts, cotter pins and other fasteners on hooks, hoist body and chain bucket, if used. Replace if missing and tighten or secure 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 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.
4. CHAIN SHEAVES. Check for damage or excessive wear. Replace damaged parts.
5. BRAKES. Ensure proper operation. Brake should not slip with test load (rated capacity). If load test indicates the need, disassemble. Brake discs must be free of excess oil, any grease, unglazed, uniform in thickness and at least 5/64 in. (2 mm) thick. Check all other brake surfaces for wear, deformation or foreign deposits. Inspect pawl brake. Teeth of ratchet gear should be undamaged, and should stop gear

rotation in the counterclockwise direction. Check pawl spring for damage. Clean and replace components as necessary.

6. SUPPORTING STRUCTURE. If a permanent structure is used inspect for continued ability to support load.
7. LABELS AND TAGS. Check for presence and legibility. Replace if necessary.
8. END ANCHOR. Ensure end anchor on chain hoist is engaged and unbent. Repair if damaged, replace if missing. Refer to "Attaching End of Load Chain" in "MAINTENANCE" section.
9. LOAD CHAIN. Measure the chain for stretching by measuring across five link sections all along the chain. Refer to Dwg. MHP0041. When any five links in the working length reach or exceed the discard length shown in Table 3, replace the entire chain. Always use a genuine **Ingersoll-Rand** Material Handling replacement chain.



(Dwg. MHP0041)

Table 3: Load Chain Length Inspection

Model No.	Part No.	Chain Size	Normal Length		Discard Length	
		mm	in.	mm	in.	mm
VL2-005	LCCF005	5.0	2.95	75.0	3.03	77.0
VL2-010	LCCF010	6.3	3.76	95.5	3.85	97.9
VL2-015	LCCF015	7.1	4.17	106.0	4.28	108.7
VL2-020	LCCV020	8.0	4.72	120.0	4.84	123.0
VL2-030	LCCF015	7.1	4.17	106.0	4.28	108.7
VL2-050	LCCF025	9.0	5.35	136.0	5.47	139.0
VL2-080						
VL2-100						
VL2-150						
VL2-200						

Note: Zinc plated chain for the **VL2** is designated by "ZP" at the end of the part number.

Hoists not in Regular Service

1. A hoist that has been idle for a period of one month or more, but less than one year should be given an inspection conforming with the requirements of "Frequent Inspection" before being placed in service.
2. A hoist that has been idle for a period of more than one year should be given a complete inspection conforming with the requirements of "Periodic Inspection" before being placed in service.
3. Standby hoists should be inspected at least semiannually in accordance with the requirements of "Frequent Inspection." In abnormal operating conditions equipment should be inspected at shorter intervals.

TROUBLESHOOTING

This section provides basic troubleshoot 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 lift load.	Hoist is overloaded.	Reduce load to within hoist rated capacity.
Hoist will not hold load.	Brake may be slipping.	Inspect brake. Replace brake discs or repair brake as described in the "MAINTENANCE" section.
	Hoist is overloaded.	Reduce load to within hoist rated capacity.
Load Chain Binds.	Damaged load chain, pinion shaft, gears or sheaves.	Disassemble hoist, inspect and repair or replace damaged components.
	Load chain not installed properly (twisted, kinked or "capsized").	Remove load chain and re-install.
Hand Chain Binds.	Damaged hand chain, hand chain wheel, pinion shaft, gears, load chain, sheaves.	Disassemble hoist, inspect and repair or replace damaged components.
	Hand chain not installed properly (twisted or kinked).	Remove load chain and re-install.
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.

LUBRICATION

General

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

Gears (11 and 14)

Remove U-nuts (40), on the opposite side of the hoist as the hand chain, and remove gear cover (17) and support plate (16). Remove old grease and replace with new. For temperatures -20° to 50° F (-29° to 10° C) use EP 1 grease or equivalent. For temperatures 30° to 120° F (-1° to 49° C) use EP 2 grease or equivalent.

Load Chain

⚠WARNING

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

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

MAINTENANCE

⚠WARNING

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

Installing New Load Chain

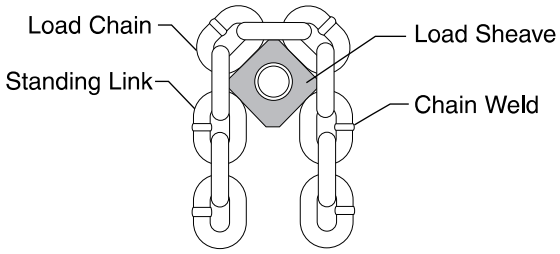
NOTICE

• Do not remove the old load chain from the hoist. The old load chain can be used to install the new load chain.

⚠WARNING

• To prevent a falling load which can cause death, injury or property damage the hook (42) must be on left fall of load chain (47) and right fall must be attached to hoist body with end anchor (21 and 22). Right and left are designated when viewed from the hand chain side of the hoist.

1. Remove end of load chain from end anchor (21 and 22).
2. Make a “C” link in new load chain by grinding through one side of the end link. Refer to Dwg. MHP0016. On 1/2 to 2, 8, 15 and 20 ton hoists the load chain must have an even number of links, not counting the “C” link, to avoid twisting. On 3, 5 and 10 ton hoists the load chain must have an odd number of links, not counting the “C” link, to avoid twisting.
3. Using a “C” link, join old load chain to new load chain. (If the old load chain was installed correctly, the “C” link assures end link of new load chain will be correctly reeved through the hoist.) Be sure welds of “standing” links on the new load chain are facing away from the hoist load sheave(s) (6). Refer to Dwg. MHP0042.

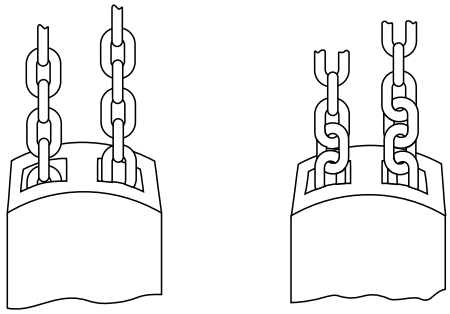


(Dwg. MHP0042)

4. Run the new load chain to its anchor point. On smaller units, use the hand chain (46) to move the load chain. On larger units, load chain (47) installation can be speeded up by unscrewing U-nuts (40), removing gear cover (17), support plate (16) and taking out 2nd gear set (14). With the gear set (14) removed, the load chain (47) can be pulled by hand through the hoist body and hook blocks.
5. Remove “C” link and old load chain.
6. Anchor load chain:
   a. On 1/2 to 2 ton and 8 ton hoists, the load end of the load chain (47) is attached to the bottom hook block.
   b. On 3, 5 and 10 ton hoists the load end of the load chain (47) is attached to the top hook frame.
   c. On 15 and 20 ton hoists, the load end of the load chain (47) to attached to the end anchor (21 and 22) of the second hoist body.

   For information on connecting unloaded end of load chain (47) refer to “Attaching End of Load Chain” section.
7. Check for the following:
   a. The load chain did not become twisted, when reeving the load chain (47) between the idler sheaves on the bottom and top hook assembly. Refer to Dwg. MHP0020.

b. Make sure load chain (47) is reeved between load sheave (6) and chain guides (7).

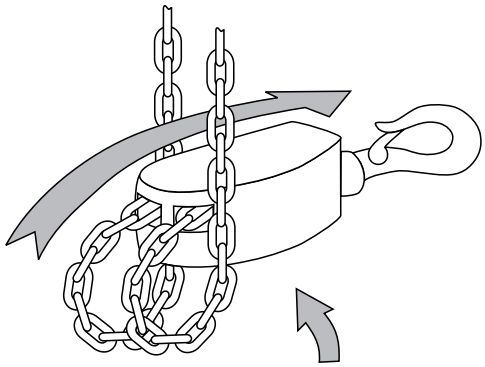


Appearance of chain that is Not Twisted

Appearance of chain that Is Twisted

(Dwg. MHP0020)

Capsized Hook



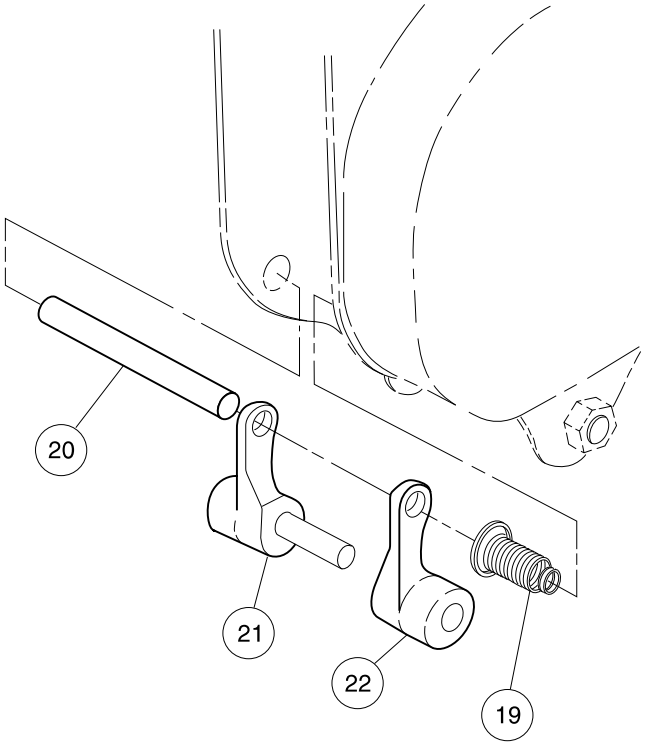
Make certain the bottom block has NOT been flipped through the chain falls

(Dwg. MHA0043)

Attaching End of Load Chain

Refer to Dwg. MHP0410

1. Push end pin (20) "in", towards end spring (19). Remove end anchor A (21).
2. Slide end link of load chain (47) on end anchor A (21) shaft.
3. Place end anchor A (21) shaft into end anchor B (22) guide hole.
4. Reinstall end anchor A (21) on end pin (20). Depress and align end pin (20) in side plate 1 (1) hole. When released end pin (20) should spring into position and slide into hole in side plate (1). Ensure load chain (47) is not twisted, kinked or "capsized." Refer to Dwg. MHP0043.
5. Connect other end of load chain (47) as described in "Installing New Load Chain" section.



(Dwg. MHP0410)

Brake Adjustment

1. Unscrew nuts (40) and remove wheel cover (38) so that handwheel (31) is exposed.
2. Remove cotter pin (34) and tighten pinion nut (33) (clockwise). Hold load chain (47), if necessary, to keep pinion shaft (13) from rotating.
3. Back off pinion nut (33) approximately 1/8th of a turn (counterclockwise) and reinsert cotter pin (34).

Overload Clutch Adjustment (optional feature)

1. Suspend the VL2 hoist.
2. Remove the wheel cover (38), cotter pin (34), pinion nut (33) and washer (32).
3. Apply the adjusting load shown in Table 4 to the hoist.

Table 4: Overload Clutch Test Loads

Model No.	Adjustment Load (150% of rated capacity)	
	lbs.	kgs.
VL2-005	1,650	750
VL2-010	3,300	1,500
VL2-015	4,950	2,250
VL2-020	6,600	3,000
VL2-030	9,900	4,500
VL2-050	16,500	7,500
VL2-080	26,400	12,000
VL2-100	33,000	15,000
VL2-150	49,500	22,500
*VL2-200	33,000 each hoist	15,000 each hoist

* Each hoist body must be tested separately.

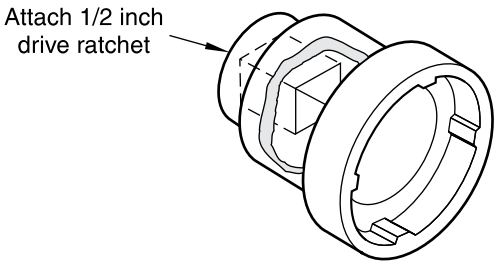
4. Remove all slack from the load chain.
5. Pull on the hand chain to lift the load approximately 2 feet (0.6 m) off the floor.

6. Using overload clutch adjusting socket part number 71112064 (refer to Dwg. MHP0225) adjust overload clutch to required setting.
   a. Tightening nut (82) will increase clutch overload limit.
   b. Loosen nut (82) to decrease clutch overload limit.

   Overload clutch should begin to slip with loads shown in Table 4.

NOTICE

• Proper adjustment of overload clutch requires the use of a special tool (Part Number 71112064). Refer to Dwg. MHP0225.



(Dwg. MHP0225)

7. When the desired clutch overload limit has been achieved bend one of the outer tabs on washer (81) into a slot in nut (82). Install washer (32) and pinion nut (33).
8. Tighten pinion nut (33).

General Disassembly

The following instructions provide the necessary information to disassemble, inspect, repair, and assemble the hoist. Parts drawings of the hoist assembly are provided in the 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 the hoist be performed on a bench.

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

1. Never disassemble the hoist any further than is necessary to accomplish the 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 heat a part with a flame to free it for removal unless the part being heated is already worn or damaged beyond repair and no additional damage will occur to other parts. In general, the hoist is designed to permit easy disassembly and assembly. The use of heat or excessive force should not be required.
4. Keep the 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 the removal of that part is necessary for repairs or replacement.

Disassembly

Brake Disc Replacement

1. Unscrew U-nuts (40). Remove wheel cover (38).
2. Lift hand chain guides (35) off stay bolts on side plate 1 (1). Remove hand chain (46) from handwheel (31).
3. Remove cotter pin (34), unscrew pinion nut (33) and remove washer (32).
4. Remove handwheel (31) by holding the load chain (46) and rotating handwheel (31) counterclockwise until it can be lifted off pinion shaft (13).
5. Remove brake cover (30) and brake disc A (27).
6. Remove ratchet gear (29) and brake disc B (28).

Overload Clutch Disassembly

1. Refer to previous instructions for removal of wheel cover (38).
2. Use a small punch to bend tab on washer (81) out of slot in nut (82).
3. Firmly grip the outside of the overload clutch assembly then use clutch adjusting socket part number 71112064 to remove nut (82) from supporter (78).
4. Separate the remaining parts of the overload clutch assembly.

Cleaning, Inspection and Repair

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

Cleaning

Clean all hoist component parts in an acid free solvent (except for the brake disc). The use of a stiff bristle brush will facilitate the removal of accumulated dirt and sediments on the gears and frames. Dry each part using low pressure, filtered compressed air.

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 the shaft.
3. Inspect all threaded items and replace those having damaged threads.
4. Measure the thickness of the brake discs. If brake discs do not have uniform thickness or are less than 5/64 in. (2 mm) thick replace brake discs.

Repair

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

1. Worn or damaged parts must be replaced. Refer to the 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 nicks, burrs, or galled spots on shafts, bores, pins, and bushings.
4. Examine all gear teeth carefully, and remove nicks and burrs.
5. Polish the edges of all shaft shoulders to remove small nicks which may have been caused during handling.
6. Remove all nicks and burrs caused by lockwashers.

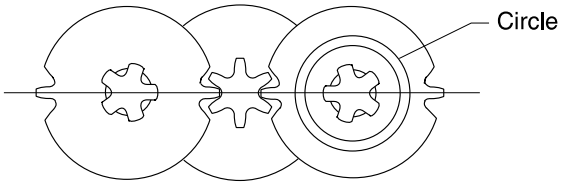
Assembly

⚠ CAUTION

• The brake will not operate properly if there is too much oil on the brake discs (27 and 28). Excessive oil or grease on brake components could cause the load to slip.

1. Dip replacement brake discs (27 and 28) in ISO VG32 hydraulic oil or SAE 10 oil for two seconds. Wipe off excess oil.
2. Place brake disc B (28) over hub (26). Brake disc B (28) has a smaller outside diameter than brake disc A (27).
3. Install ratchet gear (29) on hub (26) so recessed face fits over brake disc B. Teeth of ratchet gear (29) must engage pawl (24). Ratchet gear (29) should not rotate counterclockwise and should "click" when rotated clockwise.
4. Place brake disc A (27) on ratchet gear (29).
5. Place brake cover (30) over stay bolts on side plate 1 assembly (1).
6. With brake surface of handwheel (31) towards the brake disc A (27), place handwheel (31) on pinion shaft (13). Rotate handwheel (31) clockwise until clicking occurs. Hold load chain (47) if necessary.
7. Place washer (32) over pinion (13). Install pinion nut (33) and cotter pin (34) using "Brake Adjustment."
8. Install hand chain (46) in handwheel (31). Make sure hand chain (46) is seated properly.
9. Install "looped" end of a hand chain guide (35) over each of the two upper stay bolts on side plate 1 (1). The hand chain guides (35) must be positioned like two "Ls" pointing inward ("[_ _]").
10. Place wheel cover (38) over stay bolts. Free ends of chain guides (35) go on the outside of wheel cover (38).
11. Install U-nuts (40).

Gears (14)
On 1-1/2, 3, 5, 8, 10, 15 and 20 ton units, each hoist body must have one gear without a "circle" and one gear with a "circle." The 1/2, 1 and 2 ton units do not use gears with a circle. Refer to Dwg. MHP0044.



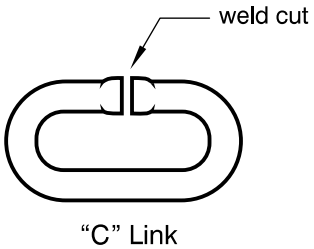
Note: The 1/2 ton hoist has a center pinion gear with only five teeth.

(Dwg. MHP0044)

Hand Chain Adjustment or Replacement

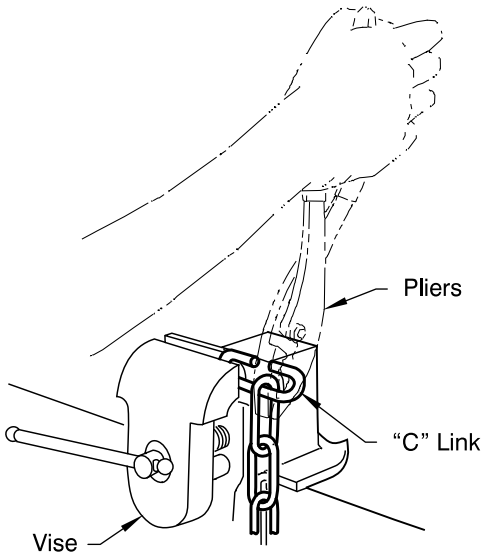
⚠ CAUTION

• When cutting the weld side of a hand chain link, do not cut or nick the opposite side. A damaged link must be replaced to prevent premature failure. A falling hand chain can cause injury.



(Dwg. MHP0016)

1. To create a "C" link, cut the welded side of the link with a hack saw. Clamp one side of the "C" link in a vise and bend it open by using a pliers to grip the exposed part of the link. Refer to Dwgs. MHP0014 and MHP0016.



(Dwg. MHP0014)

2. If you are replacing the hand chain, disconnect it at the "C" link and carefully remove the hand chain.
3. When replacing a hand chain, cut a length 2 times the required hand chain drop plus about one foot (305 mm). For adjustments, remove or add a length of chain twice the difference in hand chain height. To prevent the hand chain from twisting, maintain an even number of links, by removing or adding an even number of links.
4. If you are replacing the hand chain, run the new hand chain up through the left hand chain guide, around the handwheel, making sure the hand chain is seated in the handwheel pockets, and back down through the right hand chain guide.
5. Connect the hand chain ends with the 'C' link(s), making the total number of links even, and bend the 'C' link(s) shut.
6. Make sure the hand chain is not twisted. If twisted, untwist or open a 'C' link and remove one hand chain link if necessary.

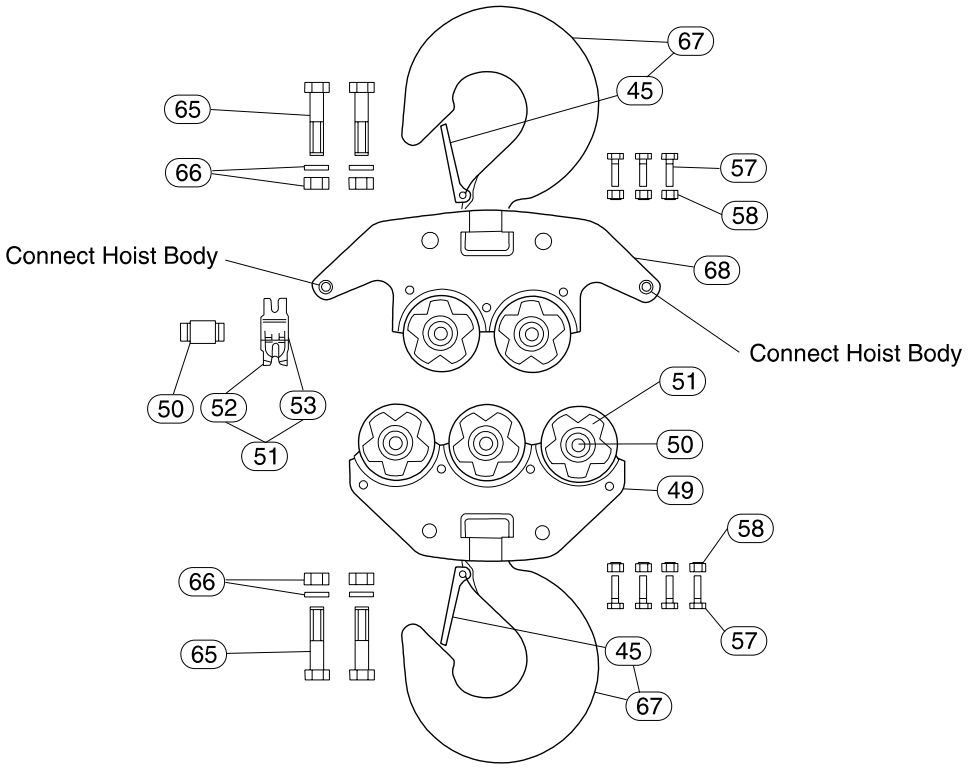
Overload Clutch Assembly (optional feature)
1. Install supporter (78) on pinion shaft (13). Set cone wheel (79) in handwheel (31) and position on supporter (78).
2. Install cone spring (80) with dished surface towards the brake discs (27) and (28).
3. Install washer (81) on hub of supporter (78) so tab locates in supporter slot. Outer tabs on washer (81) must face outward away from cone spring (80).
4. Install nut (82) on supporter (78) until finger tight.
5. Install washer (32) and nut (33) on pinion shaft (13).
6. Adjust overload clutch as described in the "Overload Clutch Adjustment" section.

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 the rating of the hoist. Test hoist to 125% of its rated capacity. Testing to more than 125% of the rated hoist capacity may be necessary to comply with standards and regulations set forth in areas outside of the USA.

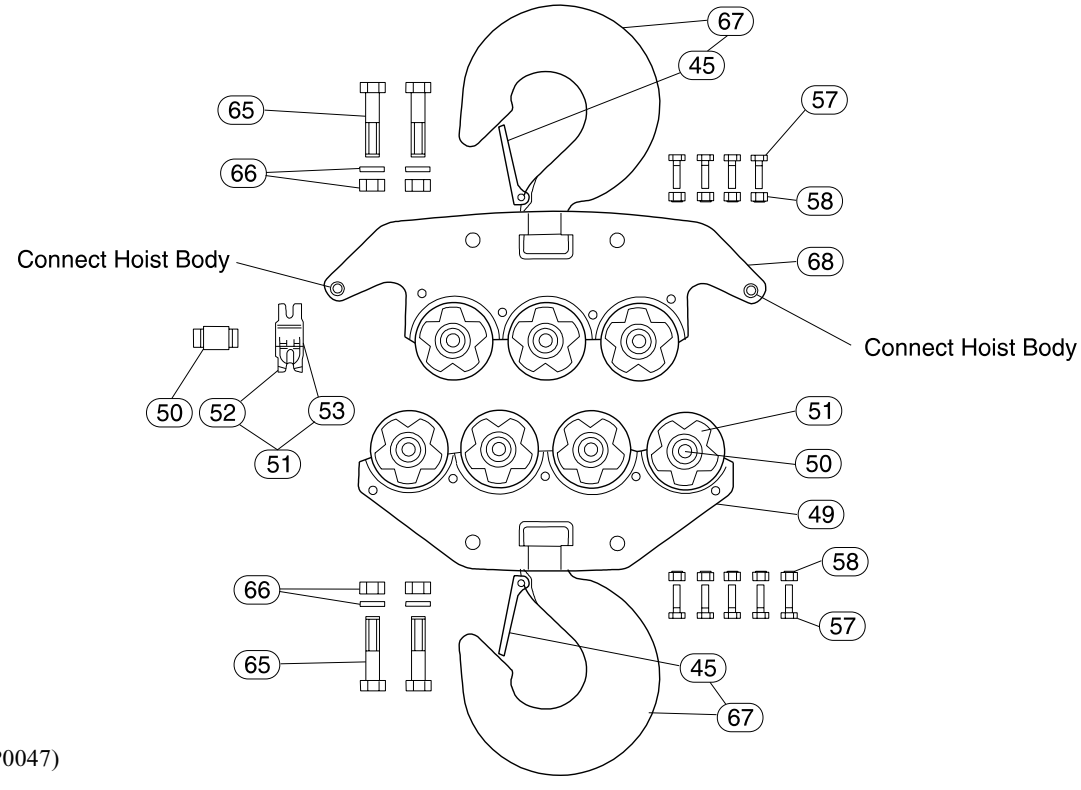
15 AND 20 TON TOP AND BOTTOM HOOK ASSEMBLY DRAWING

15 ton VL2
Top and Bottom Hook



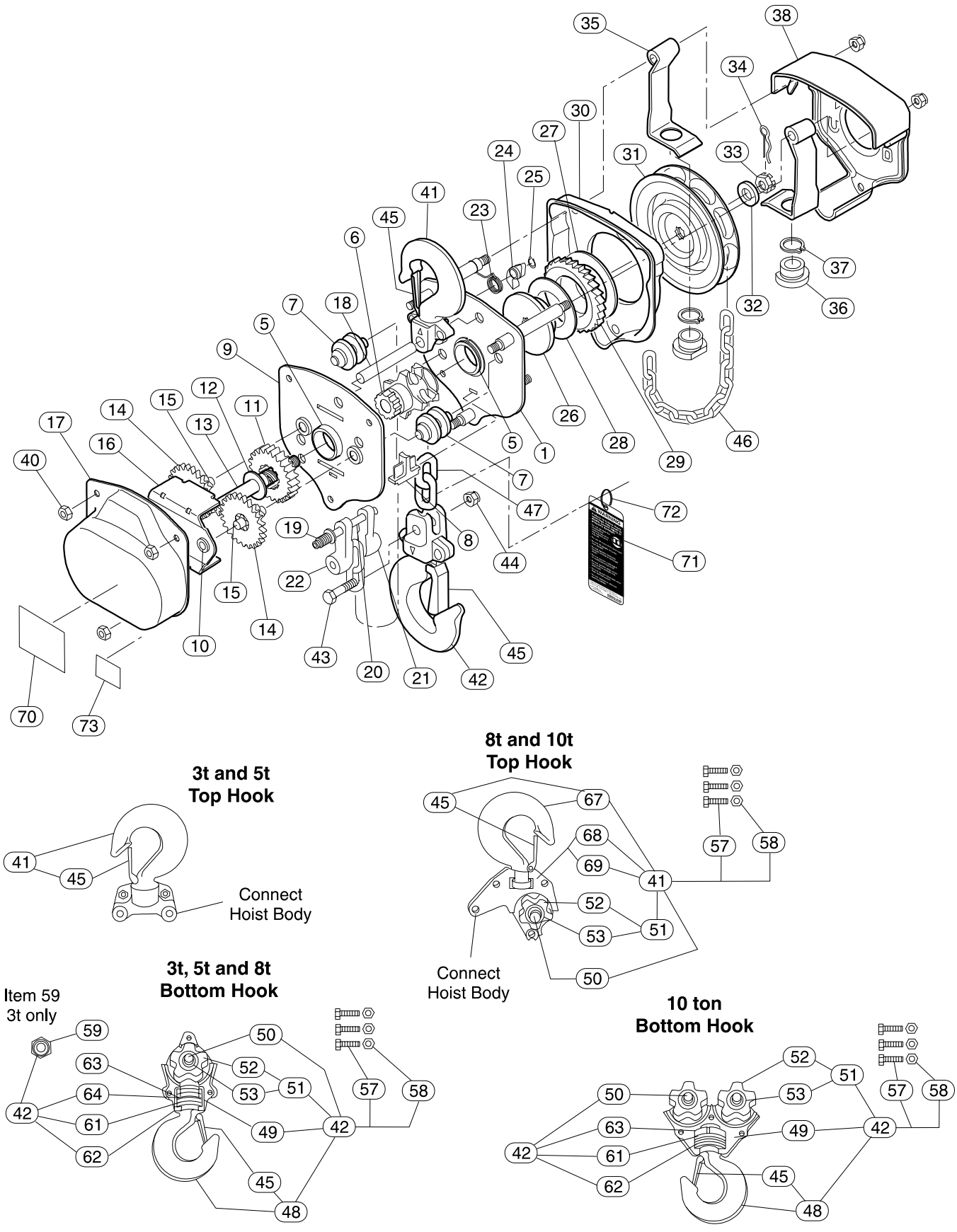
(Dwg. MHP0046)

20 ton VL2
Top and Bottom Hook



(Dwg. MHP0047)

HOIST ASSEMBLY PARTS DRAWING



(Dwg. MHP0045)

HOIST ASSEMBLY PARTS LIST

Item No.	Description of Part	Qty. Total	Part No.					
			1/2 ton	1 ton	1-1/2 ton	2 ton	3 ton	5, 8, 10, 15 & 20 ton
1	Side Plate 1 Assembly (Incl's item 5)	1(2)	71029169	71029201	71029177	71029185	71029177	71029193
5	Needle Bearing w/Snap Ring	2(4)	2372782	2372824		2372869	2372824	2372903
6	Load Sheave	1(2)	2372784	2372826	2372852	2372871	2372852	2372905
7	Load Chain Guide	2(4)	2372785	2372827		2372872	2372827	2372872
8	Chain Stripper	1(2)	2372786	2372828		2372873	2372828	2372873
9	Side Plate 2 Assembly	1(2)	2372787	2372829	2372853	2372874	2372853	2372906
10	Gear Bushing	4(8)	2372788			2372875	2372788	2372875
11	1st Gear	1(2)	2372789	2372830	2372854	2372876	2372854	2372907
12	Pinion Washer	1(2)	2372790	---				
13	Pinion Shaft	1(2)	2372791	2372831		2372877	2372831	2372877
14	2nd Gear Set (Plain/Plain)	1(2) Set(s)	2372792	2372832	---	2372878	---	
	2nd Gear Set (Plain/Circle)	1(2) Set(s)	---		2372855	---	2372855	2372908
15	3rd Gear	2(4)	2372793	2372833		2372879	2372833	2372909
16	Support Plate	1(2)	2372794	2372834	2372856	2372880	2372856	2372910
17	Gear Cover	1(2)	2372795	2372835	2372857	2372881	2372857	2372911
18	Hook Pin	1(2)	2372796	2372836		2372882	2372836	2372912
19	End Spring	1(2)	2372797					
20	End Pin	1(2)	2372798	2372837		2372883	2372837	2372883
21	End Anchor A	1(2)	2372799	2372838		2372884	2372838	2372884
22	End Anchor B	1(2)	2372800	2372839		2372885	2372839	2372885
23	Spring	1(2)	2372801	2372840	2372858	2372886	2372858	2372913
24	Pawl	1(2)	2372802			2372887	2372802	2372887
25	Snap Link	1(2)	2372803			2372888	2372803	2372888
26	Hub	1(2)	2372804	2372841		2372889	2372841	2372889
• 27	Brake Disc	1 set	71112353			71112361	71112353	71112361
• 28								
29	Ratchet Gear	1(2)	2372807			2372891	2372807	2372891
30	Brake Cover	1(2)	2372808	2372842	2372859	2372892	2372859	2372914
31	Handwheel	1(2)	2372809	2372843	2372860	2372893	2372860	2372915
	Handwheel, Copper Plated **	1(2)	2372809-CP	2372843-CP	2372860-CP	2372893-CP	2372860-CP	2372915-CP
	Handwheel (Overload Clutch)	1(2)	71108914	71108922	71108930	71108948	71108930	71108955
	Handwheel Assembly with Overload Clutch* (Incl's items 31 thru 34 and 78 thru 82)	1(2)	2373079	2373080	2373081	2373082	2373081	2373083
	Handwheel Assembly with Overload Clutch, Copper Plated *,** (Incl's items 31 thru 34 and 78 thru 82)	1(2)	2373079-CP	2373080-CP	2373081-CP	2373082-CP	2373081-CP	2373083-CP
32	Washer	1(2)	2372810					
33	Pinion Nut	1(2)	2372811					
34	Cotter Pin	1(2)	2372812					

* Optional.

** S•COR•E (Spark and Corrosion Resistant) feature.

• Recommended spare.

( ) Quantities in parentheses are for 15 and 20 ton hoists, which use two manual chain hoist bodies.

HOIST ASSEMBLY PARTS LIST (CONTINUED)

Item No.	Description of Part	Qty. Total	Part No.					
			1/2 ton	1 ton	1-1/2 ton	2 ton	3 ton	5, 8, 10, 15 & 20 ton
35	Hand Chain Guide (2 piece)	2(4)	71026546	71026553		71026561	71026553	71026579
	Hand Chain Guide (1 piece)	1(2)	12901			9967	12901	9967
• 36	Nylon Ring	2(4)	71026595					
	Bushing**	2(4)	2982-1					
37	Snap Ring	2(4)	51398					
38	Wheel Cover	1(2)	71028955	71028963	71028971	71028989	71028971	71028997
	Wheel Cover **		12545-4	12545-3		12545-2	12545-1	12545
40	U-Nut	6(12)	2372814			2372895	2372814	2372895
• 41	Top Hook Set (Incl's Item 45)	1	2372815	2372845	2372862	2372896	2372922	Refer to Parts List Continuation
	Top Hook Set, Copper Plated (Copper Plated Hook and Hook Frames)**		2372815-CP	2372845-CP	2372862-CP	2372896-CP	2372922-CP	
	Top Hook Set, Solid Bronze (Solid Bronze Hook and Copper Plated Hook Frames)**		2372815-SB	2372845-SB	2372862-SB	2372896-SB	2372922-SB	
• 42	Bottom Hook Set (Incl's item 45)	1	2372817	2372847	2372864	2372898	2372924	
	Bottom Hook Set, Copper Plated (Copper Plated Hook and Hook Frames) **		2372817-CP	2372847-CP	2372864-CP	2372898-CP	2372924-CP	
	Bottom Hook Set, Solid Bronze (Solid Bronze Hook and Copper Plated Hook Frames)**		2372817-SB	2372847-SB	2372864-SB	2372898-SB	2372924-SB	
• 43	Chain Bolt	1	2372818	2372848		2372899	2372848	
• 44	U-Nut	1	2372819	2372849		2372900	2372849	
• 45	Hook Latch for Regular (Copper Plated Hook)	2	2372820	2372850	2372865	2372901	2372925	
	Hook Latch (Solid Bronze Hook)	2	51502	51502	52377	52377	51202	
46	Hand Chain	As Req'd	HCCB005			HCCV020	HCCB005	HCCV020
	Hand Chain, Zinc Plated**		HCCB005ZP			HCCV020ZP	HCCB005ZP	HCCV020ZP
47	Load Chain	As Req'd	LCCF005	LCCF010	LCCF015	LCCV020	LCCF015	LCCF025
	Load Chain, Nickel Diffused**		LCCF005ND	LCCF010ND	LCCF015ND	LCCF020ND	LCCF015ND	LCCF025ND
57	Yoke Bolt (Copper Plated and solid bronze only)	1	54560	71069033	54560	71069033	Refer to Parts List Continuation	
58	Yoke Nut (Copper Plated and solid bronze only)	2	50852					
70	Model Label	1	Order Label Kit item 92					Refer to Parts List Continuation
71	Warning Tag	1(2)	Order Label Kit item 92					
72	Tag Ring	1(2)	50040					
73	Chain Installation Label	1(2)	Order Label Kit item 92					
75	Bolt**	1	71031314					
76	Washer**	1	12632					
77	Nut**	1	71061584					
92	Label Kit (Incl's items 70, 71, 72 and 73)	1	71112437	71112445	71112452	71112460	71112478	Refer to Parts List Continuation

* Optional. ** S•COR•E (Spark and Corrosion Resistant) feature.

( ) Quantities in parentheses are for 15 and 20 ton hoists, which use two manual chain hoist bodies.

• Recommended spare.

HOIST ASSEMBLY PARTS LIST (CONTINUED)

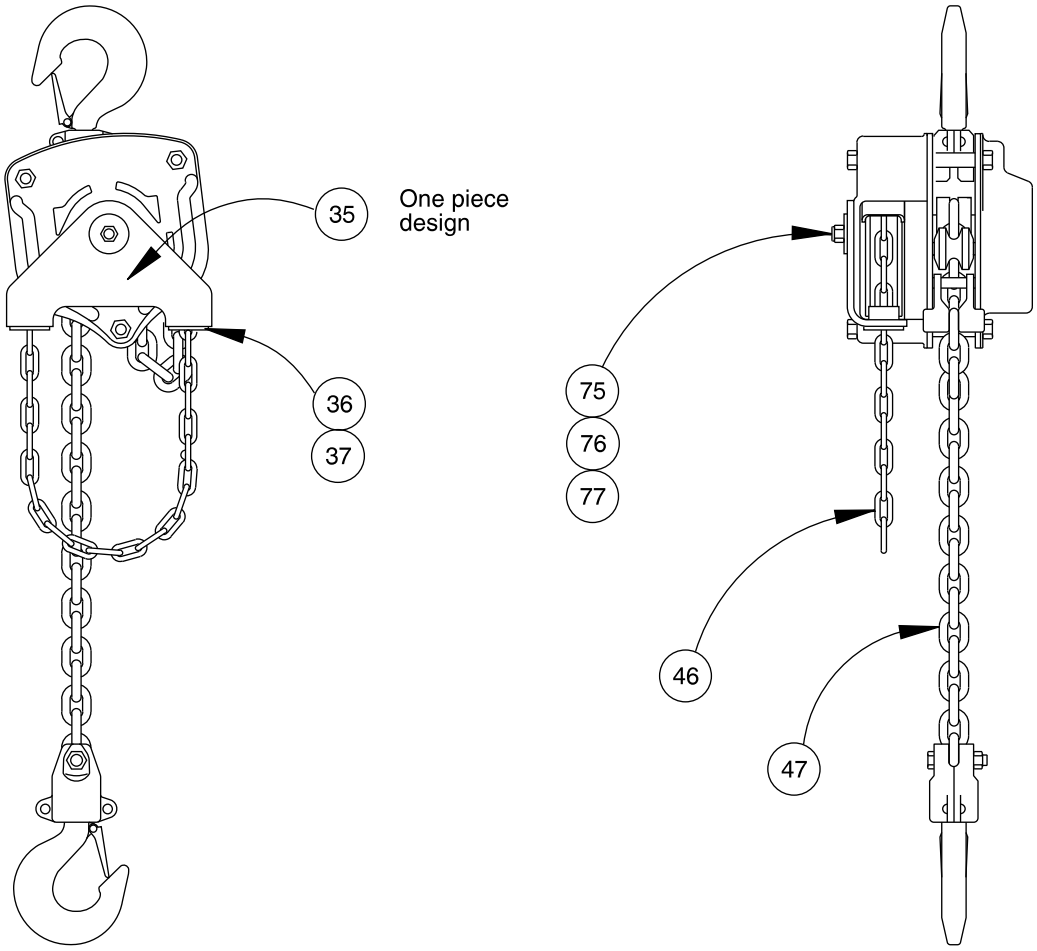
Item No.	Description of Part	Qty. Total	Part Number					
			3 ton	5 ton	8 ton	10 ton	15 ton	20 ton
• 41	Top Hook Set (Incl's items 50, 51, 57, 58 and 65 thru 69)	1	Refer to Previous Parts List	2372938	2372954	2372966	71037089	71037097
	Top Hook Set, Copper Plated (Copper Plated Hook) **			2372938-CP	2372954-CP	2372966-CP	71037089-CP	71037097-CP
	Top Hook Set, Solid Bronze (Solid Bronze Hook) **			2372938-SB	2372954-SB	2372966-SB	71037089-SB	71037097-SB
• 42	Bottom Hook Set (Incl's items 48, 49, 50, 51, 57, 58, 59, 61 thru 67)	1		2372940	2372956	2372968	71037105	71037113
	Bottom Hook Set, Copper Plated (Copper Plated Hook)**			2372940-CP	2372956-CP	2372968-CP	71037105-CP	71037113-CP
	Bottom Hook Set, Solid Bronze (Solid Bronze Hook)**			2372940-SB	2372956-SB	2372968-SB	71037105-SB	71037113-SB
• 43	Chain Bolt	1		2372920			---	
• 44	U-Nut	1		2372900			---	
• 45	Hook Latch Kit for Regular and Copper Plated Hook	2		2372941	2372957	2372969	71029045	
	Hook Latch Kit for Solid Bronze Hook			50597	50779		---	
48	Bottom Hook Only	1	2372928	2372944	2372960	2372972	---	
49	Bottom Frame	2	2372930	2372946	2372962	2372974	71029078	71029086
	Bottom Frame, Copper Plated**		2372930-CP	2372946-CP	2372962-CP	2372974-CP	---	
50	Axle	See ( )	2372931 (1)	2372947 (1)	2372947 (2)	2372947 (3)	2372947 (5)	2372947 (7)
51	Idler Sheave with Needle Bearing (Incl's items 52 and 53)	See ( )	2372932 (1)	2372948 (1)	2372948 (2)	2372948 (3)	2372948 (5)	2372948 (7)
52	Idler Sheave (no Bearing)	See ( )	Order item 51					
53	Needle Bearing for Axle	See ( )	2372933 (1)	2372949 (1)	2372949 (2)	2372949 (3)	2372949 (5)	2372949 (7)
57	Yoke Bolt	See ( )	2372783 (2)	2372825 (3)	2372870 (5)	2372904 (6)	71029136 (7)	71029136 (9)
	Additional Yoke Bolt (Copper Plated and Solid Bronze only)**	2	54558	54561	---			
58	Yoke Nut	See ( )	2372816 (2)	2372846 (3)	2372863 (5)	2372897 (6)	2372897 (7)	2372897 (9)
	Additional Yoke Nut (Copper Plated and Solid Bronze only)**	2	54559	54562	---			
60	Axle Washer	2	2373137	---				
61	Thrust Bearing	1	2372934	2372950	2372963	2372975	---	
62	Thrust Washer	1	2372935	2372951	2372964	2372976	---	
63	C-Link	2	2372936	2372952	2372965	2372977	---	
64	O-Link	1	2372937	2372953	---			
65	Bolt B (for Clevis)	4	---				71029102	
66	Nut and Washer (for item 65)	4	---				71029144	
67	Hook	1	---				71108815	71108823
68	Top Hook Frame A	1	Not Sold Separately		2372959	2372971	71029227	71029129
	Top Hook Frame A, Copper Plated**				2372959-CP	2372971-CP	---	
69	Top Hook Frame B	1			2372980	2372981	71029227	71029129
	Top Hook Frame B, Copper Plated**				2372980-CP	2372981-CP	---	
70	Model Label	1(2)	Refer to Previous Parts List	Order Label Kit item 92				
71	Warning Tag	1						
92	Label Kit (incl's items 70 thru 73)	1		71112486	71112494	71112502	71112510	71112528

* Optional. ** S•COR•E (Spark and Corrosion Resistant) feature.

( ) Quantities in parentheses are for 15 and 20 ton hoists, which use two manual chain hoist bodies.

• Recommended spare.

HAND CHAIN GUIDE ASSEMBLY DRAWING AND PARTS LIST



(Dwg. MHP0320)

Refer to Hoist Assembly Parts List on pages 15 and 16 for items shown on drawing.

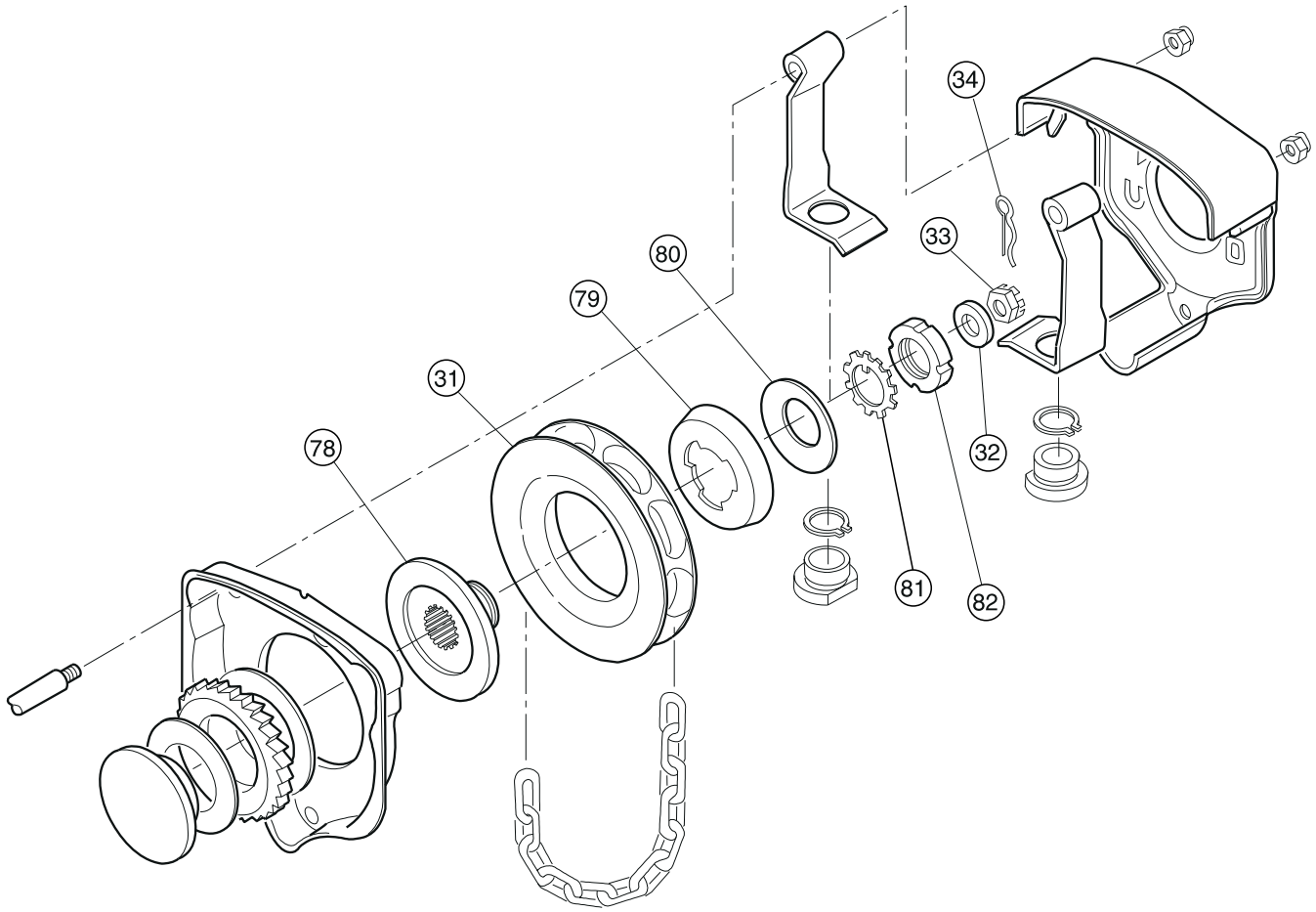
Hand Chain Guide Kits

Hoist Model	Part Number	
	Two Piece Design*	One Piece Design**
VL2-005	71051130	71057251
VL2-010	71051148	71057269
VL2-015	71051155	71057277
VL2-030		
VL2-020	71051163	71057285
VL2-050	71051171	71057293
VL2-080		
VL2-100		
VL2-150		
VL2-200		

* Standard units, Refer to MHP0045. Kits consist of items 35 through 38.

** S•COR•E (Spark and Corrosion Resistant) Refer to Dwg. MHP0320. Kits consist of items 35 thru 38 and 75 thru 77. Refer to Hoist Assembly Parts List.

HOIST OVERLOAD CLUTCH ASSEMBLY DRAWING AND PARTS LIST



(Dwg. MHP0322)

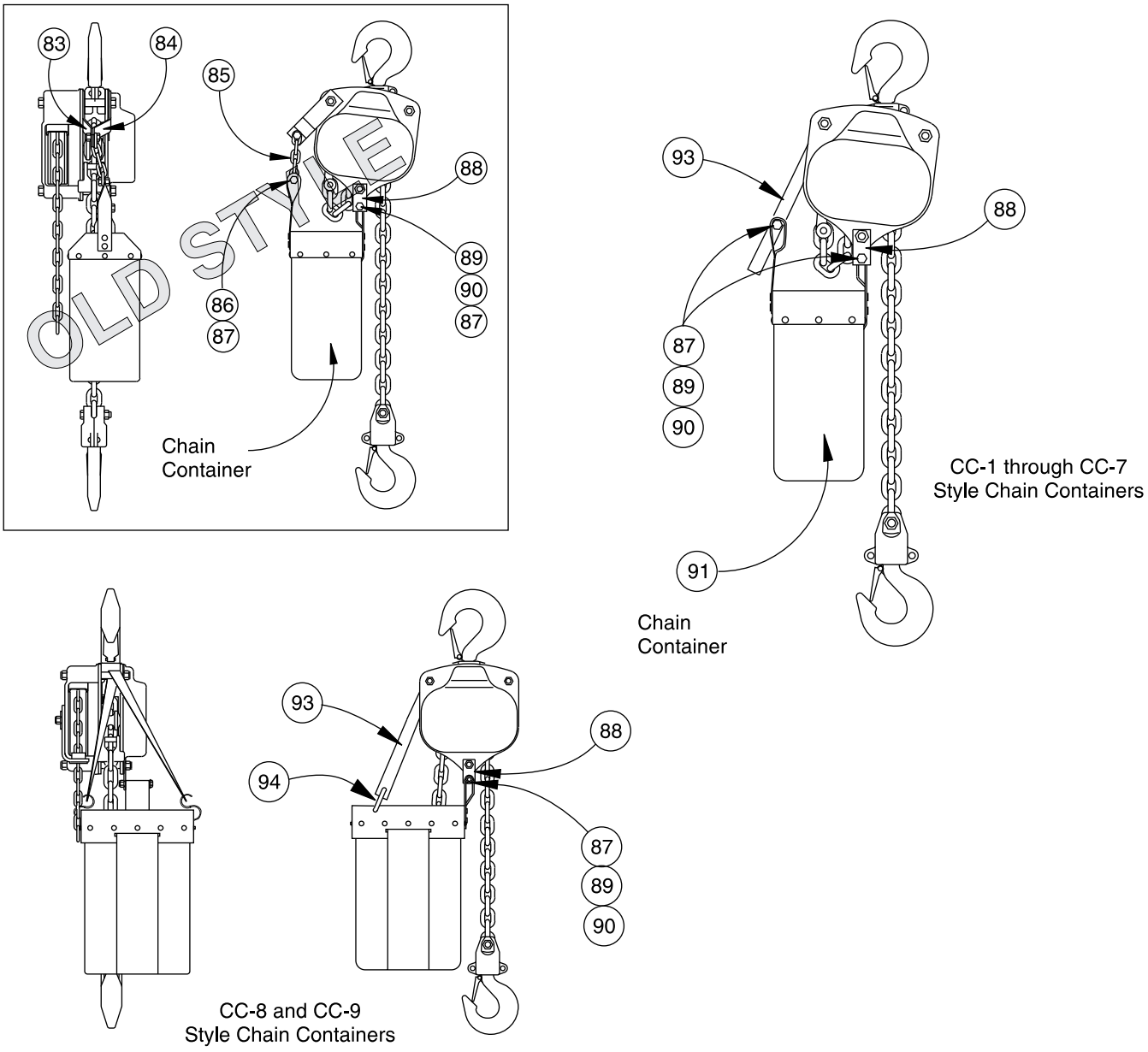
Refer to Hoist Assembly Parts List on pages 15 and 16 for items shown on drawing.

Item No.	Description of Part	Qty. Total	Part Number					
			1/2 ton	1 ton	1-1/2 ton	2 ton	3 ton	5, 8, 10, 15 & 20 ton
31	Handwheel Assembly with Overload Clutch * (Incl's items 31 thru 34 and 78 thru 82)	1(2)	2373079	2373080	2373081	2373082	2373081	2373083
	Handwheel Assembly with Overload Clutch, Copper Plated *,** (Incl's items 31 thru 34 and 78 thru 82)	1(2)	2373079-CP	2373080-CP	2373081-CP	2373082-CP	2373081-CP	2373083-CP
	Handwheel (Overload Clutch)	1(2)	Not sold separately					
78	Supporter	1	Not sold separately order item 31					
79	Cone Wheel	1	71108963	71108971				
80	Cone Spring	1	71108989					
81	Washer	1	71076491					
82	Nut	1	71076509					

* Optional. ** S•COR•E (Spart and Corrosion Resistant) feature.

( ) Quantiites in parentheses are for 15 and 20 ton hoist, which use two manual chain hoist bodies.

CHAIN CONTAINER ASSEMBLY (OPTIONAL)



(Dwg. MHP0321)

Item No.	Description of Part	Part Number			
		All Hoist Capacities			
		Qty. Total	Low Capacity Chain Containers	Qty. Total	High Capacity Chain Containers CC-6, CC-8 and CC-9
---	Bracket Kit	1	22863*	1	22864**
87	Nut	2	71125439	2	71125439
88	Bracket	1	12064-2	1	12064-2
89	Capscrew	2	71125413	1	71125413
90	Washer	5	53978	3	53978
91	Chain Container	1	Refer to Chain Container Chart	1	Refer to Chain Container Chart
93	Strap	1	22862	1	22865
94	S-Hook	---	---	2	52120

* Includes items 87 through 90 and 93.

** Includes items 87 through 90, 93 and 94.

Old Style

Parts for this style chain container assembly may be obsolete or out of production and may not be available.

Item No.	Description of Part	Qty. Total	Part Number						
			1/2 ton	1 ton	1-1/2 ton	2 ton	3 ton	5 ton	8, 10, 15 & 20 ton
---	Bracket Kit (Incl's items 83 and 86 through 90)	1	12586-1				12586-2	12586-3	12586-4
83	Bracket	1	8725-3						
84	Bracket	1	8725-2						
85	Chain	As Req'd	HCCB005						
86	Capscrew	2	52303						
87	Nut	3	51682						
88	Bracket	1	12064-1			12064-2	12064-1	12064-2	
89	Capscrew	1	53546						
90	Washer	1	53978						
91	Chain Container	1	Refer to Chain Container Chart						

Chain Container Chart

Model Number	Chain Container Part Number and Chain Length Capacity																	
	Low Capacity												High Capacity					
	71128029		71128037		71128052		71128045		71128060		71128078		CC-8		CC-6		CC-9	
	ft.	m	ft.	m	ft.	m	ft.	m	ft.	m	ft.	m	ft.	m	ft.	m	ft.	m
VL2-005	20	6	41	12.5	53	16	77	23.5	101	30.8	167	51	214	65.2	250	76.2	428	130.
VL2-010	13	4	26	8	34	10.4	49	15	64	19.5	105	32	111	33.8	158	48	261	79.6
VL2-015	10	3	20	6	26	8	38	11.6	50	15.2	82	25	95	29	124	37.8	202	61.6
VL2-020	---	---	16	5	21	6.4	30	9	40	12.2	66	20	78	23.8	98	29.8	165	50.3
VL2-030	---	---	10	3	13	4	19	5.8	25	7.6	41	12.5	47	14.3	62	19	101	30.8
VL2-050	---	---	---	---	---	---	12	3.7	15	4.6	25	7.6	29	8.8	38	11.6	62	19
VL2-080	---	---	---	---	---	---	---	---	10	3	17	5.2	19	5.8	25	7.6	41	12.5
VL2-100	---	---	---	---	---	---	---	---	---	---	12	3.7	14	4.3	19	5.8	31	9.4

ACCESSORIES

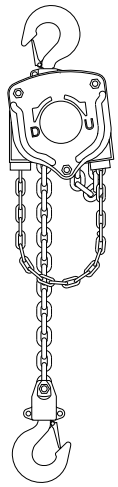
Accessories

Orange Touch-Up Paint	MHD-OR
Chain Lubricant	LUBRI-LINK-GREEN
Overload Clutch Adjusting Socket	71112064

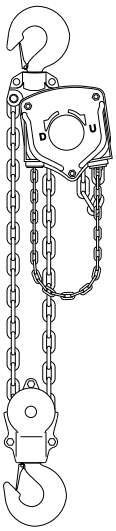
VL2 HOIST REVISIONS

VL2 Hoists manufactured prior to 1990 were supplied with a clip which was installed on the wheel cover (38) and was held in position by nut (40). The clip is not required and is no longer offered as a replacement part. The lack of this part will not affect the performance of the hoist.

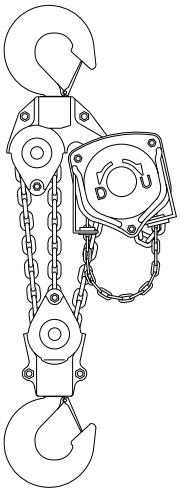
CHAINING INFORMATION



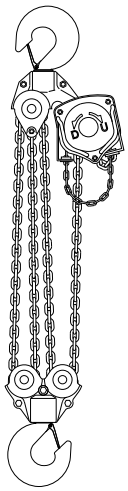
1/2, 1, 1-1/2 and 2 ton Hoists
Single chain fall
(Dwg. MHP0037)



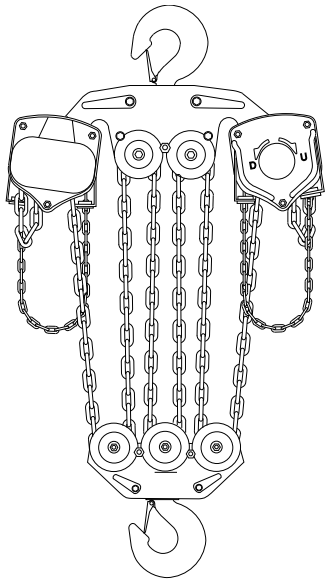
3 and 5 ton Hoists
Two chain falls
(Dwg. MHP0038)



8 ton Hoist
Three chain falls
(Dwg. MHP0443)



10 ton Hoist
Four chain falls
(Dwg. MHP0444)



15 ton Hoist
Six chain falls
(Dwg. MHP0039)

Note:
The 20 ton hoist is similar to the 15 ton hoist but uses one extra idle sheave on the top and bottom hook frames and has eight chain falls.

PARTS ORDERING INFORMATION

Use of other than **Ingersoll-Rand** Material Handling replacement parts may result in decrease performance.
For prompt service and genuine **Ingersoll-Rand** Material Handling parts provide your nearest Distributor with the following:

1. Complete model number as it appears on the nameplate: **VL2 plus capacity** (VL2-XXX).
2. Part number and part name as shown in manual.
3. Quantity required.

The hoist nameplate is located on the gear cover. Example shown is for a 3 ton VL2 hoist.

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

Hoist Model Number: _____

Hoist Serial Number: _____

Date Purchased: _____

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 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 the manual edition number on the front cover for the latest issue.
• If your hoist has special finish requirements for painted parts, please specify when ordering.
• Using other than genuine Ingersoll-Rand Material Handling parts may void the warranty.

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.

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.

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