# INSTALLATION AND OPERATION SUPPLEMENT
# for
# BOP HOIST HANDLING SYSTEMS
# MODELS

**BHS30APT16**
**30 ton**

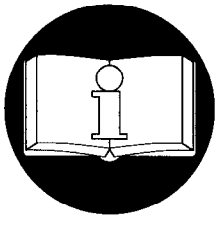
**BHS40APT16**
**40 ton**

**BHS50APT22**
**50 ton**

**BHS75APT22**
**75 ton**

**BHS100APT22**
**100 ton**

Tons in this manual are metric tons (2,200 lbs.)



**READ THIS MANUAL BEFORE USING A HOIST SYSTEM. This supplement contains important safety, installation and operation 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 Products Office or Distributor.**

**Form MHD56081**
**Edition 1**
**April 1994**
**71145783**


**INGERSOLL-RAND®**
**MATERIAL HANDLING**

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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 injury. 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.**

**• Air powered hoists are designed to provide a 5 to 1 safety factor and are factory tested to 125% of the rated load. The supporting structures and load-attaching devices used in conjunction with this hoist must provide adequate support to handle all hoist operations plus the weight of the hoist and attached equipment. This is the customer's responsibility. If in doubt, consult a registered structural engineer.**

**NOTICE**

**• Lifting equipment is subject to different regulations in each country. These regulations may not be specified in this manual.**

The National Safety Council, Accident Prevention Manual for Industrial Operations, Eighth Edition and other recognized safety sources make a common point: Employees who work near 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.

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

The Occupational Safety and Health Act of 1970 generally places the burden of compliance with the owner/employer, not the manufacturer. Many OSHA requirements are not concerned or connected with the manufactured product but are, rather, connected with the final installation. It is the owner's responsibility 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.

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** can not know of, nor provide all the procedures by which product operations or repairs may be conducted and the hazards and/or results of each method. If operation or maintenance procedures not specifically recommended by the manufacturer are conducted, it must be ensured that product safety is not endangered by the actions taken. If unsure of an operation or maintenance procedure or step, personnel should place the product in a safe condition and contact supervisors and/or the factory for technical assistance.

# SAFE OPERATING INSTRUCTIONS

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

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

Safe Operating Instructions are provided to make an operator aware of 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 on this product to operate and maintain 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 controls, do not operate the hoist until the sign has been removed by designated personnel.
4. Before each shift, the operator should check the hoist for wear or damage.
5. Never use a hoist which inspection indicates is warn or damaged.
6. Do not use hoist if hook latch on a hook has been sprung or broken.
7. Check that the hook latches are engaged before using.
8. Never splice a hoist chain by inserting a bolt between links.
9. Only lift loads less than or equal to the rated capacity of the hoist. See warning labels attached to the hoist.
10. Never place your hand inside the throat area of a hook.
11. Never use the hoist chain as a sling.
12. Only operate a hoist when the load chain is centered over the hook. Do not "side pull" or "yard".
13. Never operate a hoist with twisted, kinked, "capsized" or damaged load chain.
14. Do not force a chain or hook into place by hammering.
15. Never insert the point of the hook into a chain link.
16. Be certain the load is properly seated in the saddle of the hook.
17. Do not support the load on the tip of the hook.
18. Never run the load chain over a sharp edge. Use a sheave.
19. Pay attention to the load at all times when operating the hoist.
20. Make sure all people are clear of the load path. Do not lift a load over people.
21. Never use the hoist for lifting or lowering people, and never allow anyone to stand on a suspended load.
22. Ease the slack out of the chain and sling when starting a lift. Do not jerk the load.
23. Do not swing a suspended load.
24. Never suspend a load for an extended period of time.
25. Never leave a suspended load unattended.
26. Never weld or cut a load suspended by the hoist.
27. Never use the hoist chain as a welding electrode.
28. Do not operate hoist if chain jumping, excessive noise, jamming, overloading, or binding occurs.
29. Keep the load from hitting the load chain.
30. Do not use the up and down emergency stop limit protection as a normal means of stopping the hoist.
31. Avoid unnecessary jogging of hoist and/or trolley controls.
32. Always rig the hoist properly and carefully.
33. Shut off air supply before performing any maintenance.
34. Avoid collision or bumping of hoist.
35. After use, properly secure hoist and all loads.

# SPECIFICATIONS

**Table 1**

| Model No. | System Capacity (metric tons) | Total No. of Trolley Wheels | Std. Lift | | Hoist Speed | | | | Trolley Speed | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ft | m | Lift (fpm) | Lift (m/min) | Lower (fpm) | Lower (m/min) | fpm | m/min |
| BHS30APT16 | 30 | 4 | 30 | 9 | 3-1/4 | 1 | 5 | 1.52 | 20 | 6 |
| BHS40APT16 | 40 | 8 | 30 | 9 | 2-1/2 | 0.76 | 3-3/4 | 1.14 | 20 | 6 |
| BHS50APT22 | 50 | 8 | 30 | 9 | 4 | 1.22 | 6 | 1.83 | 20 | 6 |
| BHS75APT22 | 75 | 8 | 30 | 9 | 2-1/2 | 0.76 | 3-3/4 | 1.14 | 20 | 6 |
| BHS100APT22 | 100 | 8 | 30 | 9 | 2 | 0.61 | 3 | 0.91 | 20 | 6 |

**Table 2**

| Model No. | HP | CFM at each Hoist | No. of Chain Falls | Load Chain Size (mm) | Head Room | | System Weight | | Single Hoist and Trolley Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ins | cm | lbs | kgs | lbs | kgs |
| BHS30APT16 | 3.8 | 165 | 3 | 16 | 35-1/4 | 895 | 2630 | 1193 | 1315 | 596 |
| BHS40APT16 | 3.8 | 165 | 4 | 16 | 35-1/2 | 902 | 3750 | 1701 | 1875 | 850 |
| BHS50APT22 | 9.4 | 280 | 2 | 22 | 41 | 104 | 4170 | 1891 | 2085 | 946 |
| BHS75APT22 | 9.4 | 280 | 3 | 22 | 49 | 124 | 7400 | 3357 | 3700 | 1678 |
| BHS100APT22 | 9.4 | 280 | 4 | 22 | 53 | 134 | 9330 | 4232 | 4665 | 2116 |

Performance is based on 100 psi minimum running pressure.
Optional 4 wheel trolley available on BHS40APT16 Hoist system.

# INTRODUCTION

This supplement should be used in conjunction with HA1 and HA2 Hercu-Link Hoist Parts, Operation and Maintenance Manuals.

| Model | Form Number |
|---|---|
| HA1 Hercu-Link Hoist Manual | MHD56075 |
| HA2 Hercu-Link Hoist Manual | MHD56055 |
| Accu-trol Pendant Manual | MHD56014 |

The BOP System consists of two Hercu-Link Hoists operated in unison.
The HA1 and HA2 Hercu-Link Parts, Operation and Maintenance Manuals provide information on assemblies and options which are not supplied on a BOP System.
Hoists used in BOP Systems are equipped with the following standard features:

1. Accu-trol Pendant with emergency stop.
2. Limit switch for upper and lower hook travel.
3. Mufflers.
4. Air preparation package which includes the filter and lubricator.
5. Trolley bumpers.
6. Trolley guide rollers.
7. Galvanized steel chain container.
8. "Carbo-zinc" corrosion resistant primer and "Marine 812" top coat finish.

Always check hoist model and serial number provided on the nameplate to verify configuration.
The item numbers that appear in parenthesis after a component part name refer to the item numbers in the HA1 and HA2 Hercu-Link Hoist Parts, Operation and Maintenance Manuals.

Installation and initial start-up are most critical to a safe and reliable system and deserve utmost care to achieve maximum performance and long life.

# BOP SYSTEM INSTALLATION CHECK LIST

| **Model Number:** | **Date:** |
|---|---|
| **Serial Number:** | **Inspected by:** |

Refer to the Parts, Operation and Maintenance Manual "INSTALLATION" and "OPERATION" Sections for detailed information. Refer to applicable component and unit National and Local Safety Codes. If in doubt about installation or operating procedures contact the nearest Ingersoll-Rand Distributor or the factory for technical assistance.

| REQUIREMENTS | CONDITION | | CORRECTIVE ACTION | NOTES |
|---|---|---|---|---|
| | Acceptable | Unacceptable | | |
| **Installation** | | | | |
| Trolley Beam Requirements | | | | |
| Beam Size | | | | |
| Beam Lower Flange Thickness | | | | |
| Beam Splice Alignment | | | | |
| Clean Beam Flange Surfaces | | | | |
| Beam Spacing | | | | |
| Hoist Running Clearance | | | | |
| BOP Annular Clearance | | | | |
| Hoist Vertical Lifting | | | | |
| Hoist and Trolley Installation | | | | |
| Hoist Orientation | | | | |
| Trolley Installation | | | | |
| Mounting on Beam | | | | |
| Wheel Spacing | | | | |
| Air Supply | | | | |
| Air Line (Size) | | | | |
| Lubricator/Filter/Water Separator | | | | |
| Moisture in Air Lines | | | | |
| Hoist Pendant | | | | |
| Emergency Air Shutoff | | | | |
| Manifold Air Shutoff Valve | | | | |
| Installation Checks | | | | |
| Shipping Plugs | | | | |
| Chain Container | | | | |
| Load Chain Attachment (free end) | | | | |
| Oil Levels | | | | |
| Running Clearance/Hose Lengths | | | | |
| **Operation** | | | | |
| Freedom of Movement | | | | |
| Lifting Point above BOP Center of Gravity | | | | |
| Lifting Height | | | | |
| Control Functions | | | | |
| **Testing** | | | | |
| Operational (No Load) | | | | |
| Operational (10% of rated load) | | | | |
| Operational (Maximum test load) | | | | |

Use the BOP System Installation Check List to review each installation step. Ensure all requirements are met prior to approving the system for use.

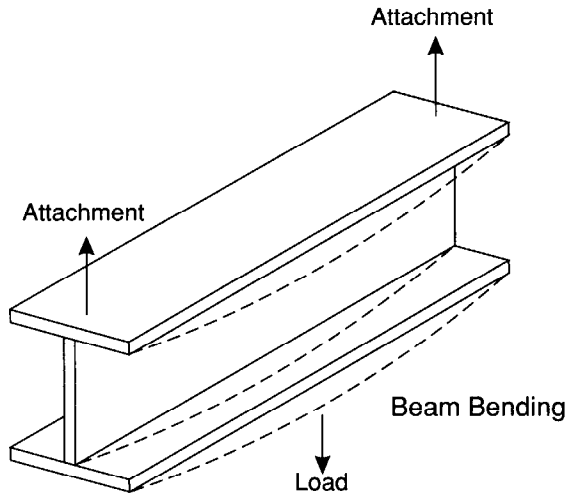
**⚠ CAUTION**

**• 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.**

## Trolley Beam Requirements

### Beam Size

Be sure beam has adequate bending strength to support hoist with capacity load. Beam strength is indeterminate, and can be seriously deficient if improperly attached. Ensure sure both beam size and means of attachment are correct. The trolley beam is the rig builders or owners responsibility. If in doubt consult a registered structural engineer. (See Dwg. MHTPA0468)



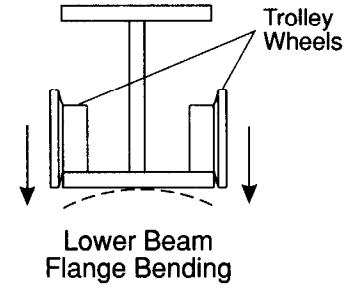

(Dwg. MHTPA0468)

### Beam Lower Flange Thickness

Beam lower flange thickness requirement is independent of beam bending strength and must be analyzed separately. (See Dwg. MHTPA0469). Beam lower flange must support the trolley wheel loading. Suggested flange thickness requirements are give in Table 3.

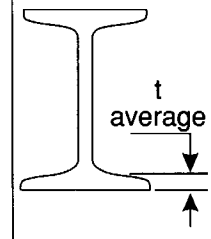
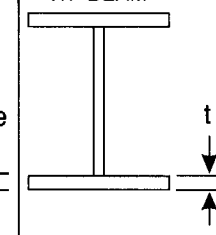
The minimum lower flange thickness is provided as a guide to prevent the flange from bending only. It does not consider the depth, width or web thickness of the beam. The beam must be sized based on loads, support spacing, deflection, and stresses. The beam and attachments should be designed by a registered structural engineer. **Ingersoll-Rand** is not familiar with each installation and does not make specific recommendations for beam sizes.

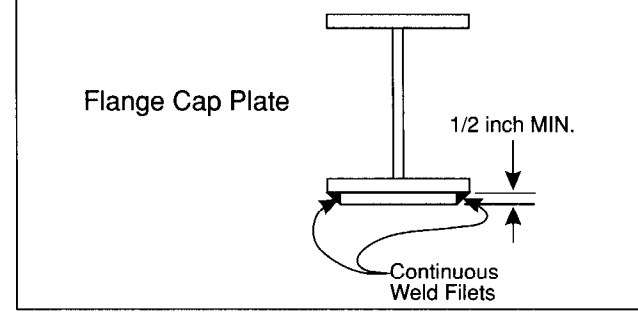
The available trolley widths are sizes that have become standard based on customer requests and do not imply beam selection. A beam's lower flange may need to be modified to match standard widths with the approval of a registered structural engineer.




(Dwg. MHTPA0469)

**Table 3**

| Minimum Lower Beam Flange Thickness for Vertical Lifting only. | "S" BEAM   | WF BEAM   |
|---|---|---|
| 30 ton System<br>15 ton each Hoist<br>4 Wheel Trolley | $t_{MIN}$ = 1 inch | $t_{MIN}$ = 1.28 inch |
| 40 ton System<br>20 ton each Hoist<br>8 Wheel Trolley | $t_{MIN}$ = 1 inch | $t_{MIN}$ = 1.16 inch |
| 50 ton System<br>25 ton each Hoist<br>8 Wheel Trolley | $t_{MIN}$ = 1 inch | $t_{MIN}$ = 1.16 inch |
| 75 ton System<br>37-1/2 ton each Hoist<br>8 Wheel Trolley | $t_{MIN}$ = 1.3 inch | $t_{MIN}$ = 1.42 inch |
| 100 ton System<br>50 ton each Hoist<br>8 Wheel Trolley | $t_{MIN}$ = 1.5 inch | $t_{MIN}$ = 1.64 inch |

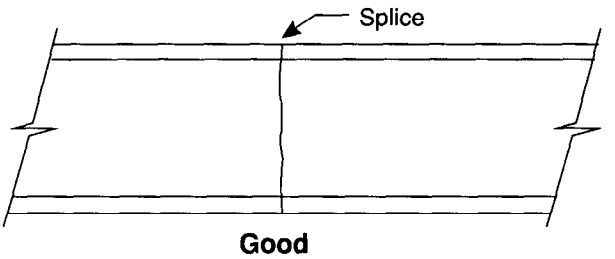



(Dwg. MHTPA0467)

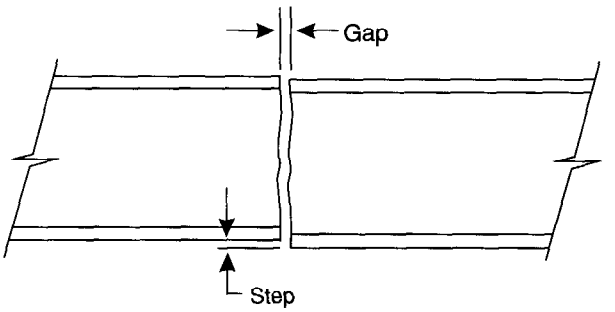
A cap plate welded to the beam lower flange to provide flange thickness is acceptable. Minimum cap plate thickness is 1/2 inch (13 mm). Cap plate must be narrower than beam flange to allow for weld filets. Cap plates must be seal welded.

**Beam Splice Alignment**
If trolley beams have been made of more than one beam section and spliced together, the top surface of the lower flange ***must be flush and without gaps***. Poor splices will impair trolley operation and impose unnecessary shock loads on the system. The operating life of the system will be shortened if splices are not flush. (See Dwg. MHTPA0466)

**Beam Splice**




**Good**



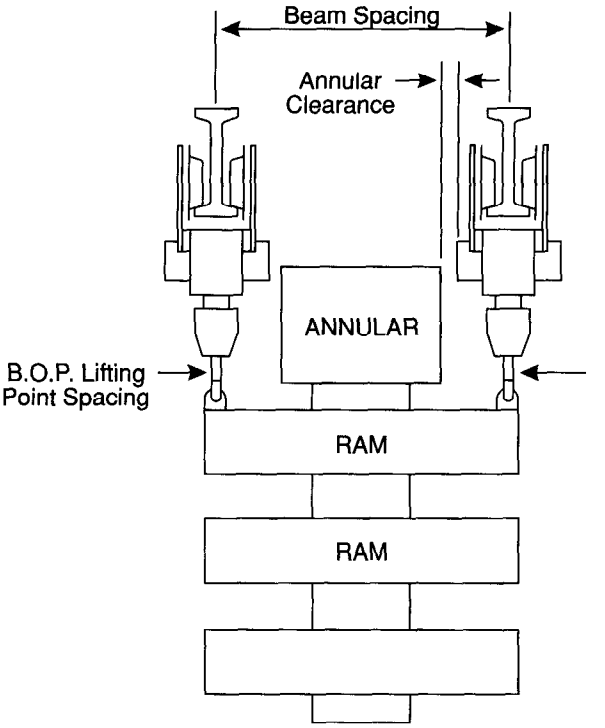

**Not Acceptable**

(Dwg. MHTPA0466)

**Clean Beam Flange Surfaces**
Top surface of lower beam flanges must be free of weld spatter, grease etc. that will impair trolley operation. Dress flanges with grinder as required.

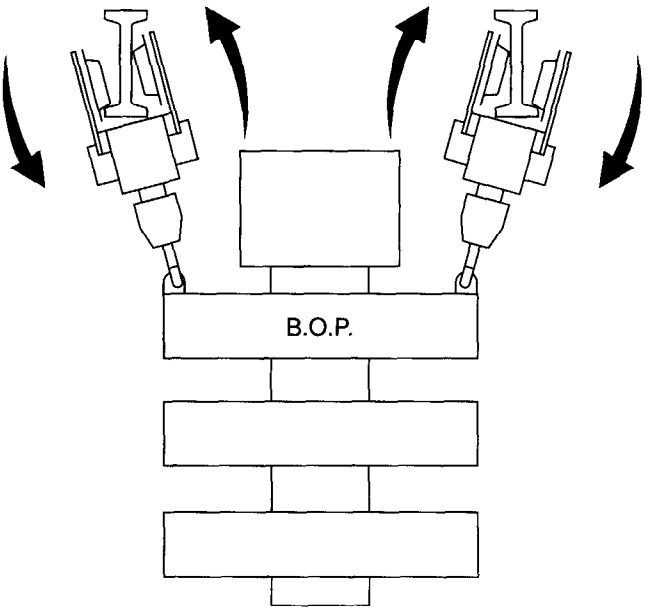
**Beam Spacing**
Trolley beam spacing is critical to trouble free and safe operation of the BOP handling system. Refer to Dwg. MHTPA0465. Check beam spacing for:

a. Hoist Running Clearance
   Ensure hoists and trolley will clear all rig appurtenances over entire length of trolley beams.
b. BOP Annular Clearance
   In low headroom situations, ensure the beam spacing allows the annular to be drawn up between the hoist bodies.




(Dwg. MHTPA0465)

**Hoist Vertical Lifting**
Beam spacing should be the same as the spacing between lifting attachment points on the BOP stack such that the hoists will lift vertically. Check to see that these two dimensions are the same. (Refer to Dwg. MHTPA0464). Particular attention to vertical lifting is required on 30 ton and 4 wheel trolley 40 ton BOP hoist systems. On these models the hoist assembly is rigidly positioned and does not pivot (articulate) with the trolley.



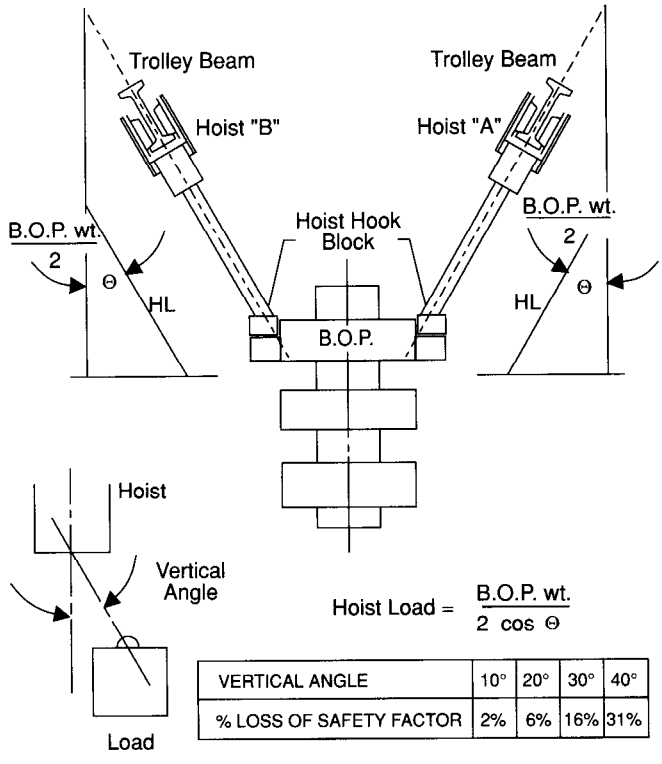

(Dwg. MHTPA0464)

**⚠WARNING**

**• Off vertical lifting increases loads on hoists, trolleys, and beams. Safety factors are reduced. Traction of trolley drives may be impaired.**

BOP handling systems are designed to articulate on the trolley pinions and can accommodate limited off-vertical lifts. However, trolleys and beams must be specifically designed to take the serious imbalance of loads imposed by off-vertical lifting. Ensure trunnion bushings are lubricated to ensure smooth articulation.
Compatibility of all aspects of BOP handling system is ***extremely important*** to safe operation. Be sure system has been properly engineered and is being installed as intended. (Refer to Dwg. MHTPA0463).

**Off-Vertical Lifting Increases Hoist, Trolley and Beam Loads**




| VERTICAL ANGLE | 10° | 20° | 30° | 40° |
|---|---|---|---|---|
| % LOSS OF SAFETY FACTOR | 2% | 6% | 16% | 31% |

(Dwg. MHTPA0463)

## Trolley and Hoist Installation

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

**⚠WARNING**

**• Before installing system read the "SAFE OPERATING INSTRUCTIONS" section.**

Hoists are supplied from the factory with the correct grade and quantity of lubricating oil. Before operation all oil levels must be checked and/or topped off with the proper type of oil recommended in the "LUBRICATION" section of the HA1 or HA2 Hercu-Link Parts, Operation and Maintenance Manual.
Lubricate load chain before operating hoist.

**⚠WARNING**

**• A falling load can cause injury or death. Before installing trolley and hoist, read "SAFE OPERATING INSTRUCTIONS".**
**• Depending on the size of system selected each hoist could weigh as much as 4,665 lbs. (2116 kg). If parts of the trolley or hoist are dropped, they could cause injury or damage property. Adequately support the hoist and trolley when lifting them into place on the beam.**

Remove cover from the shipping crate. Carefully remove steel straps. Attach wire rope sling to the suspender lugs on the hoist trolley side plates and slowly lift into position. Attach chain container to hoist with chain container pin and connect the container suspension hook as required.

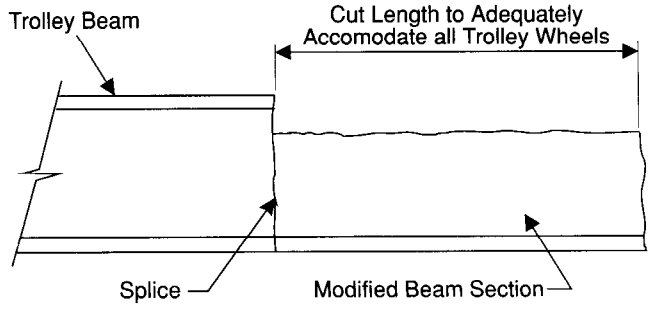
## Hoist Orientation

In most cases the BOP Handling System should be orientated to position the hoist motor, trolley drive and controls, outboard of the trolley beams. This orientation provides the following advantages:

a. Achieves maximum clearance between beams.
b. Keeps air lines outboard of the beams and away from the BOP.
c. Positions pendant control lines nearest the operator where they do not need to loop under the beams.
d. Positions trolley drive wheels on the outboard beam flange where there is probably less drilling mud accumulation (improved traction).

## Installing Over the End of the Beam

Pre-adjust trolley width for the beam flange measurement. Refer to "Installing from Underneath the Beam." Remove the rail stop and slide trolley on end of the beam. Reinstall rail stop.
If space permits, a modified section of beam can be spliced to one end of the main beam. The beam extension section must be modified with the top flange removed. With the modified beam section in place the complete hoist and trolley unit can be lowered directly onto the beam. Refer to Dwg. MHTPA0563. Roll trolley and hoist unit forward onto main beam section.

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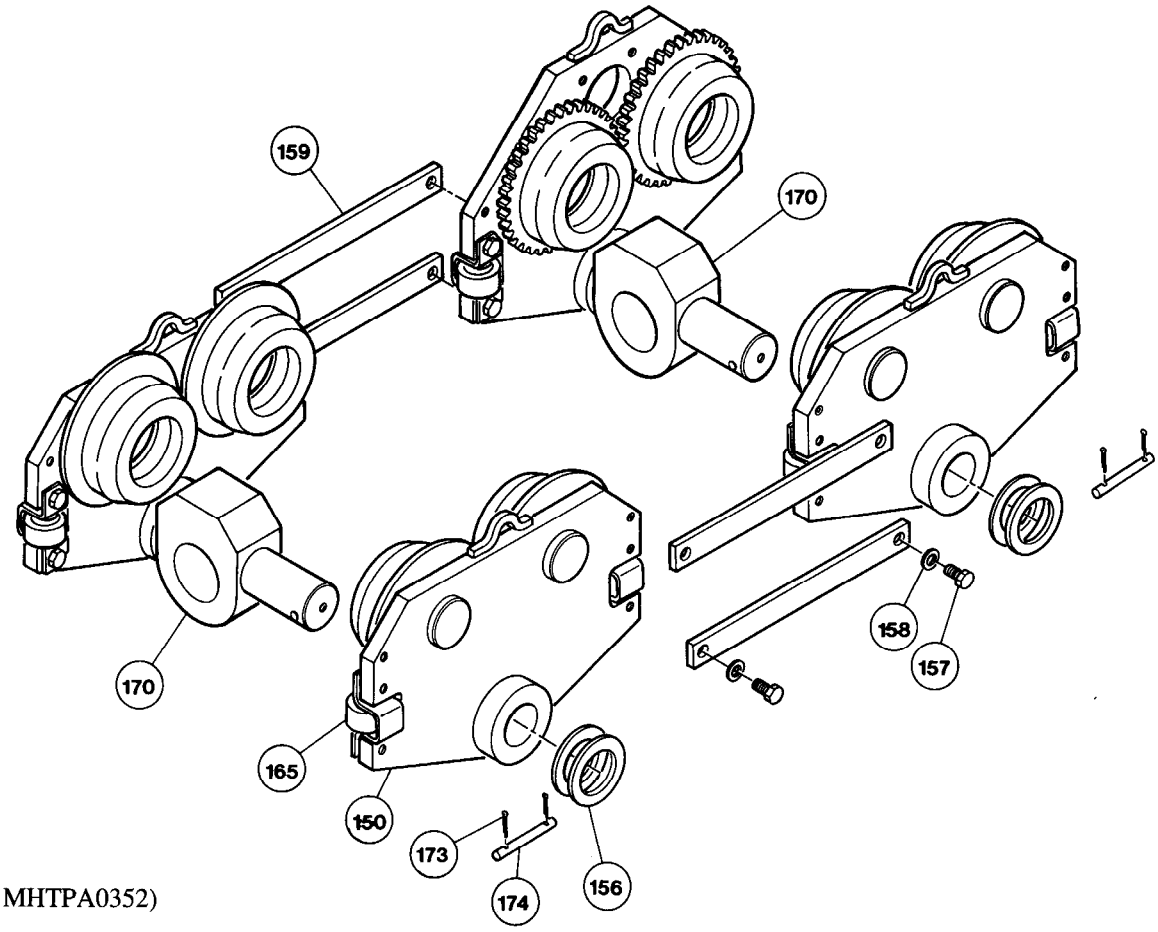



(Dwg. MHTPA0352)

This method of installing the hoist and trolley must only be used for initial installation.

**⚠WARNING**

**• When modified beam sections are added they must never be used to support the unit when lifting, lowering or supporting loads.**

When hoist and trolley is in place on the beam, trolley stops must be installed and positioned to prevent the hoist and trolley unit from inadvertently travelling onto the modified beam section during operation.

If these procedures cannot be used, due to insufficient space or fixed limit stops, the trolley must be installed from underneath the beam using the procedure which follows.

## Installing from Underneath the Beam

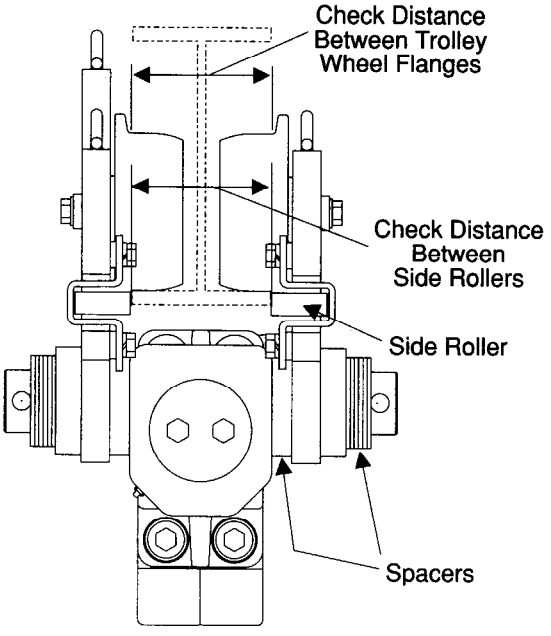
(Ref. Dwg. MHTPA0352)

1. Measure beam flange width and compare with measurement between trolley wheel flanges. The correct total clearance between the beam and the trolley wheel flanges is 1/16 to 3/16 in. (2 to 5 mm). To adjust trolley wheel spacing remove cotter pins (173) and pins (174) at each side plate (150). Remove adjusting spacers (156) and side plates (150) and add or subtract an equal number of adjusting spacers (156) between suspension yokes (170) and side plates (150).
2. When desired trolley wheel spacing measurement is achieved, install remaining adjusting spacers (156) on the outside of one pair of side plates (150). Install suspension yoke pins (174) and cotter pins (173) on ends of suspension yokes (170). Use lifting lugs on trolley side plates (150) to adequately support the hoist and side plates and raise into place beneath the beam flange.

**⚠CAUTION**

**• To avoid an unbalanced load which may damage the trolley, the hoist must be centered under the trolley by the spacers (156).**

4. Using lifting lugs on second pair of trolley side plates raise into place beneath the beam flange. Slide side plates onto the suspension yokes and push side plates together.
5. Slide extra spacers (156) over the free end of the suspension yoke (170). Insert shaft stopper pin (174) into the hole in the suspension yoke (170). Secure by installing cotter pin (173) and bending ends apart.




(Dwg. MHTPA0340)

**⚠WARNING**

**• Trolley wheels ride on the top of the lower flange of the beam.**

6. The pin (174) and outside spacers (156) must hold the trolley to the adjustment in step 1. If the side plates can be spread farther apart, install more outside spacers (156) between side plate (150) and the pin (174).
7. Measure beam flange width and compare with measurement between rollers. Side roller spacing measurement should be 1/16 to 3/16 in. (2 to 5 mm) greater than beam flange width.
8. Prior to using, test the trolley. Check that the trolley side plates are vertical. Raise a load equal to the rated capacity of the hoist a 6 to 7 ins. (130 to 180 mm) off the floor and operate the trolley along the entire length of the beam.

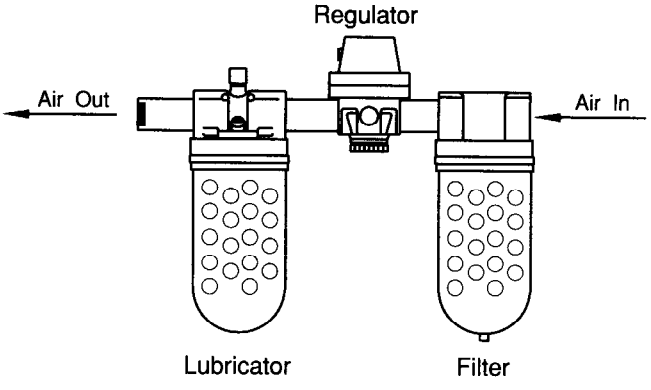
Ensure beam stops are installed prior to operating hoist and trolley.

## Air Supply

The air supply must be clean and free from moisture. Due to efficiency losses in the air lines and air line components, air pressures should be checked at the hoist motor. Refer to the "SPECIFICATIONS" section for the SCFM required by each hoist. Hoists require a constant 105 psi (7.2 bar/ 724 Kpa) at the hoist motor to provide rated system operation. Due to efficiency losses in air lines, pressures of up to 130 psi (8.9 bar/896 Kpa) at the air supply may be required to achieve the required operating pressure.

**Air Lines**

The inside diameter of the hoist air supply lines must not be smaller than 1 in. (25 mm) based on a maximum of 50 ft. (15 m) between the air supply and the hoist. Contact the factory for recommended air line sizes for distances greater than 50 ft. (15 m). Before making final connections, all air supply lines should be purged before connecting to unit inlet. Supply lines should be as short and straight as installation conditions will permit. Long transmission lines and excessive use of fittings, elbows, tees, globe valves etc. cause a reduction in pressure due to restrictions and surface friction in the lines.




(Dwg. MHTPA0191)

**Air Line Lubricator**

(Ref. Dwg. MHTPA0191)

Always use an air line lubricator with these motors. Use a lubricator having an inlet and outlet at least as large as the inlet on the motor. Install the air line lubricator as close to the air inlet on the motor as possible.

**⚠CAUTION**

**• Lubricator must be located no more than 10 ft. (3 m) from the motor.**

The air line lubricator should be replenished daily and set to provide 4 to 6 drops per minute of SAE 10W oil. A fine mist will be exhausted from the throttle control valve when the air line lubricator is functioning properly.

**Air Line Filter**

(Ref. Dwg. MHTPA0191)

It is recommended that an air line strainer/filter be installed as close as practical to the motor air inlet port to prevent dirt from entering the motor. The strainer/filter should provide 20 micron filtration and include a moisture trap. Clean the strainer/filter periodically to maintain its operating efficiency.

### Moisture in Air Lines

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

## Hoist Pendant

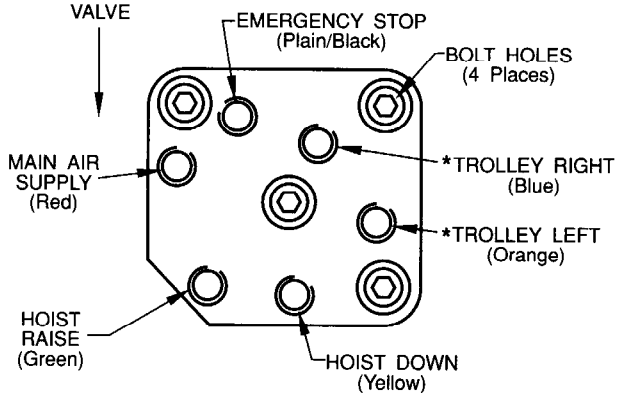
Pendant control is installed at the factory. Hose fittings are color coded to ensure correct assembly. Check all hose connections are tight and that hoses are not twisted or crimped. Refer to Dwg. MHTPA0094 for correct hose connections to the hoist. Refer to the Accu-trol Pendant Parts, Operation and Maintenance manual form number MHD56014 for correct hose to pendant connections.

**⚠WARNING**

**• Disconnect air supply before performing any maintenance.**

**• Do not attempt to reverse air lines either at the pendant station or hoist. This will give a false indication of operation which may result in serious damage to the hoist.**

**MANIFOLD PENDANT BLOCK**
**(Looking at Bottom of Manifold)**




* PLUG FOR HOOK MOUNTED UNITS

(Dwg. MHTPA0094)

Check each pendant control to assure it functions as labelled, and that it promptly shuts off when released. Check strain relief chain is properly connected to the hoist and pendant body. Ensure pendant is supported by the chain and not the hose assemblies.

**⚠CAUTION**

**• To avoid damaging the pendant hose, make sure the strain relief chain, not the pendant hose, is supporting the weight of the pendant.**

### Emergency Air Shutoff

If supply air is wet and unfiltered, and/or the hoist is operated in a dirty environment, the hoist or trolley control valves may malfunction and become stuck "on". As a safeguard, an emergency main line shutoff valve is provided at the pendant. The emergency valve shuts off the air supply to the entire unit when the red pull/push button is depressed (pushed in).

### Manifold Air Shutoff Valve

A shutoff valve immediately upstream of the manifold separator/filter is required to permit proper servicing of the separator/filter. This also serves as a secondary emergency shutoff. If is in necessary to use the emergency air shut off valve, then the malfunctioning control valve should be disassembled, cleaned, and/or repaired as required to clear the malfunction before resuming operation.

## Brake and Reducer Assembly

Remove shipping plugs from brake housing and reducer assembly before operating hoist.

**⚠WARNING**

**• Failure to remove shipping plugs in the brake housing may result in brake malfunction.**

## Chain Container

**⚠CAUTION**

**• Do not pile chain carelessly in the chain container. Piling the chain carelessly into the container by hand may lead to kinking or twisting that will jam the hoist.**

1. Check the chain container size to make sure the length of load chain is within the capacity of the chain container. Replace with a larger chain container, if required.
2. Ensure chain stopper is attached to the last link of the load chain free end.
3. Check that the chain container is securely attached to the hoist.
4. Run bottom block to lowest point and run hoist in up direction to feed the chain back into the container.

**NOTICE**

**• When feeding chain into the chain container begin with the chain stopper end of the chain so that it piles naturally.**

## Attaching Free End of Load Chain

1. Ensure chain stopper is installed on the end of the load chain.
2. Check that the free end of the load chain is securely attached to the hoist or bottom hook assembly. See Chaining Drawings in the "MAINTENANCE" section of the HA1 or HA2 Hercu-Link Parts, Operation and Maintenance Manual.

After installing load chain, make sure it is not twisted or kinked. Fix before using hoist.

## Lubrication

Hoists are supplied from the factory with the correct grade and quantity of lubricating oil. Oil leakage may occur during shipping. Before operation all oil levels must be checked and/or topped off with the proper type of oil recommended in the "LUBRICATION" section of the HA1 or HA2 Hercu-Link Parts, Operation and Maintenance Manual.

## Running Clearance/Hose Lengths

Operate trolleys along the full length of the beam to check running clearance, and that supply hose and control pendants are of adequate length. To avoid overstressing the supply hose, hose sag between connecting points or supports should be at least 25% of the distance between supports.
Example: If distance between connecting points or supports is 16 feet (5 m) the hose sag should be at least 4 feet (1 m) below an imaginary line drawn between the connecting points or supports.

## Initial Operating Checks

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

1. After installation of trolley mounted hoists, check to ensure the hoist is centered below the trolley.
2. Check for air leaks in the supply hose and fittings to pendant, and from pendant to manifold.
3. When first running the hoist or trolley motors some light oil should be injected into the inlet connection to allow good lubrication.
4. When first operating the hoist and trolley it is recommended that the motors be driven slowly in both directions for a few minutes.
5. Operate the trolley along the entire length of the beam.
6. Inspect hoist and trolley performance when raising, moving and lowering test load(s). Hoist and trolley must operate smoothly and at rated specifications prior to being placed in service.
7. Check that trolley (if equipped) and hook movement is the same direction as arrows or information on the pendant control.
8. Raise and lower a light load to check operation of the hoist brake.
9. Check hoist operation by raising and lowering a load equal to the rated capacity of the hoist a 4 to 6 inches (100 to 150 mm) off the floor.
10. Check operation of limit devices.
11. On trolley units check 'O' ring on breather plug in trolley drive piston motor has been removed.
12. Check that the solid plug (used for shipping) is removed from the power head reduction gear assembly and replaced with breather attached to notice tag supplied with hoist.

### Trolley Drive Assembly Run In Period

Maximum efficiency of the trolley drive worm gear is obtained after a "run-in" period. The length of time required will depend on the load applied and will be two to four hours at rated load and considerably longer at lighter loads. (Overloading will not decrease the "run-in" time and it may damage the worm gear.)
During "run-in" higher than normal temperature rise, and lower efficiency and output torque can be expected.

### Storing the Hoist

For BOP Systems that have been in storage for a period of more than one month the following start-up procedure is required.

1. Give the hoist an inspection conforming to the requirements of "Hoists Not in Regular Use" in the "INSPECTION" section of the HA1 or HA2 Hercu-Link Parts, Operation and Maintenance Manual.
2. Pour a small amount of 10W oil in the hoist and trolley motor inlet ports.
3. Operate the motors for 10 seconds to flush out any impurities.
4. The system is now ready to work.

The four most important aspects of hoist operation are:

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

**⚠WARNING**

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

### Special Precautions that apply to the operation of BOP Systems

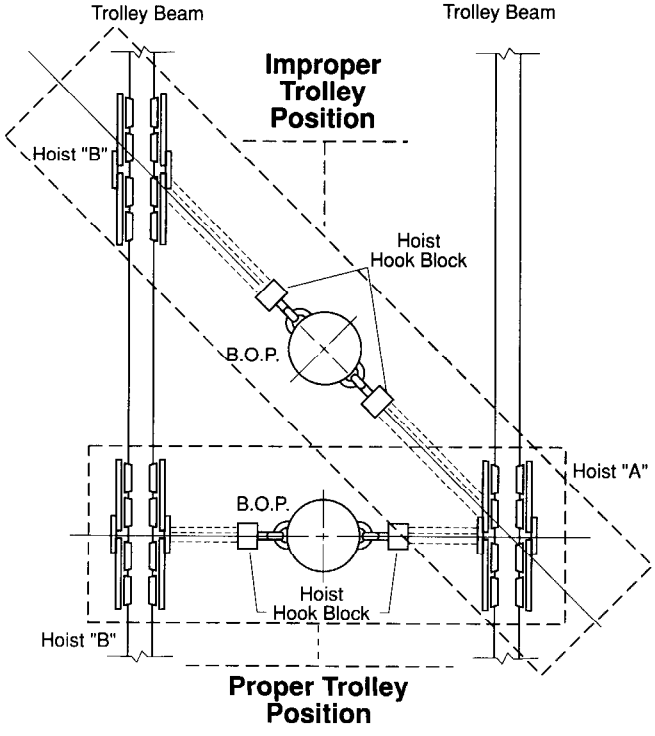
The use of two hoists to handle a single load requires special care to prevent two potential problems:

- Uneven loading of hoists.
- Unequal loading of chain on one or both hoists.

### Uneven Loading of Hoists

(Ref. Dwg. MHTPA0459)

1. A substantial spreader bar with lifting eyes at each end should be used.
2. Spreader bar length and lifting eye placement should allow for unrestricted vertical lift at each hoist hook.



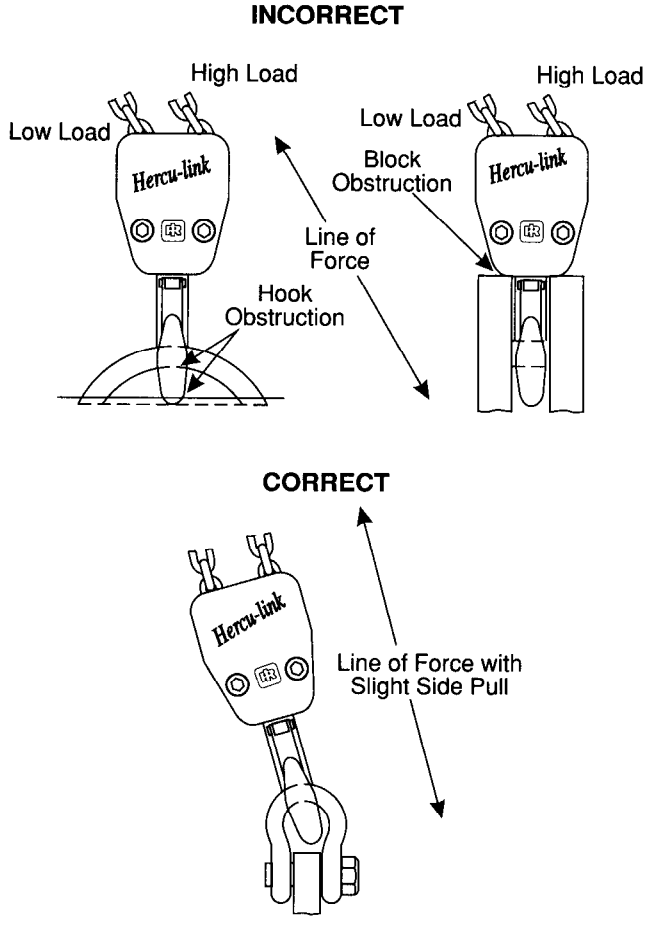

(Dwg. MHTPA0459)

3. Care must be taken to insure that spreader bar remains horizontal when load is being moved. Otherwise, one hoist is being loaded more than the other.
4. Lift only 4 to 6 inches (100 to 150 mm) at first to check loading, brake holding, freedom of movement, etc. Keep all personnel away from line of force of load and out from underneath load.
5. Always move trolleys simultaneously and together (lined up on opposing beams) to keep chains vertical.

### Unequal Loading of Chain

(Ref. Dwg. MHTPA0462)

1. May occur if hoist and block are not completely free to align with natural line of force.
2. Possible obstructions to hook from:
   a. Attachment of hook is restricted and hook cannot align itself freely with line of force.
   b. Bottom block jams against spreader bar or stack or other obstruction.




(Dwg. MHTPA0462)

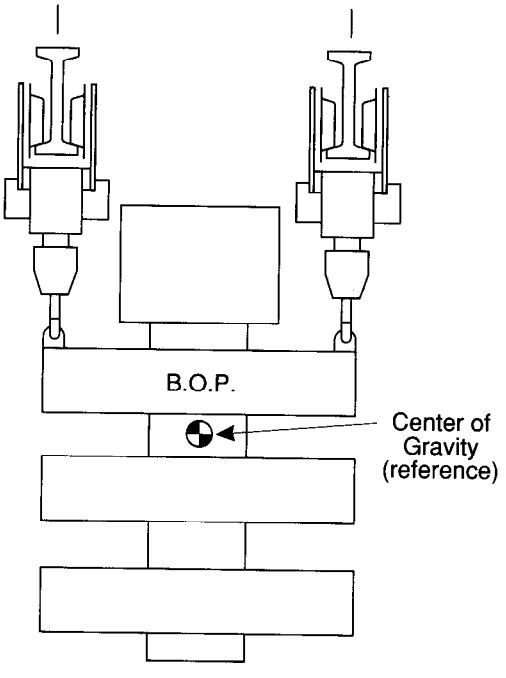
Hoists are designed for limited side pull. Side pull reduces the safety factor of load chain and may cause additional stress in other parts of system and/or beam.

**Freedom of Movement**
Check to ensure that the hoist hook block is not restricted in any direction. Refer to Dwg. MHTPA0462. Hook block must be free to align itself with the line-of-pull direction.

**⚠ DANGER**

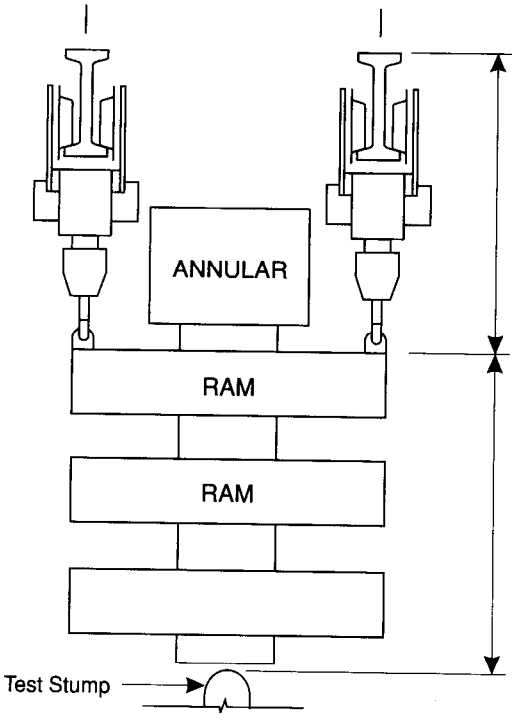
**• Hook block must be free to align itself with line-of-pull in any direction. Overloading of the hook block and chain can result.**

**Lifting Point above BOP Center Of Gravity**
Attach hoist hooks (lowest flexible connections) to BOP stack well above its center of gravity. Refer to Dwg. MHTPA0460.




(Dwg. MHTPA0460)

**Lifting Height**
Make sure BOP lifting attachment will allow stack to be lifted to sufficient height to clear BOP stump. Refer to Dwg. MHTPA0461.




(Dwg. MHTPA0461)

Lubricate chain before and after each use.

**⚠ WARNING**

**• Never leave hoists connected to the BOP stack or loaded in any way during drilling operation.**

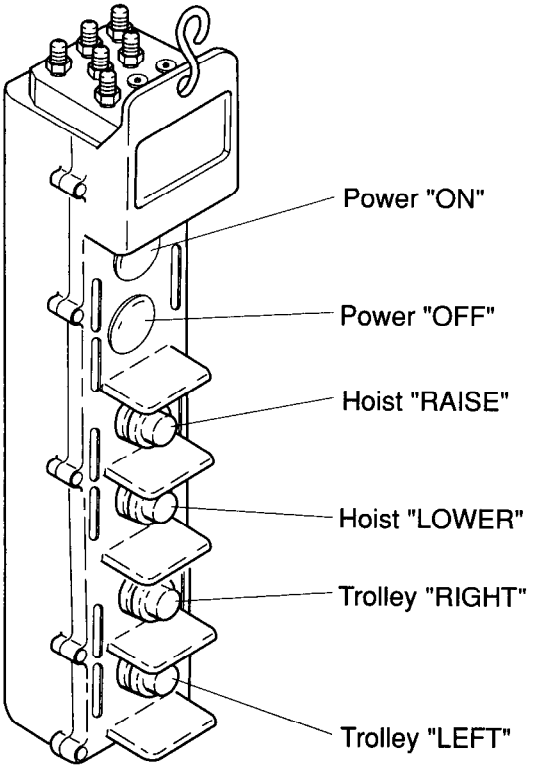
Normal rig and BOP movement during drilling can cause hoist overloads. Structural vibration of the drill floor during drilling imposes cyclic loading that will result in fatigue damage which leads to premature failure. The hoists can see the equivalent of years of normal operation in a few hours if loaded in a vibrating structure.

## Hoist Controls

Refer to Dwg. MHTPA0094 in the "INSTALLATION" section for correct pendant hose to hoist connections.

**Accu-Trol® Pendant (Push Button Type)**

Refer to Accu-Trol® Pendant Parts, Operation and Maintenance Manual form number MHD56014 for additional information.




(Dwg. MHTPB0434)

Check each pendant control to assure it functions as labelled, and that it promptly shuts off when released.

Detailed Inspection, Lubrication and Maintenance information is provided in the following manuals:

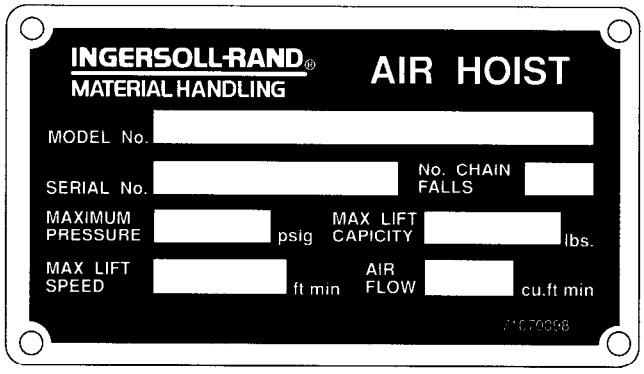
| Model | Form Number |
|---|---|
| HA1 Hercu-Link Hoist Manual | MHD56075 |
| HA2 Hercu-Link Hoist Manual | MHD56055 |
| Accu-trol Pendant Manual | MHD56014 |

To ensure continued satisfactory operation of the trolley and hoist follow the instructions provided in the manuals.

The use of other than **Ingersoll-Rand** Material Handling replacement parts may invalidate the Company's warranty. For prompt service and genuine **Ingersoll-Rand** Material Handling parts, provide your nearest Distributor with the following:

1. Complete hoist model number and serial number as it appears on the nameplate.
2. Part number and part description as shown in this manual.
3. Quantity required.

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




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

**Hoist Model Number**.....

**Hoist Serial Number**.....

**Date Purchased**.....

## 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**

**• Using other than genuine Ingersoll-Rand Material Handling parts may void the warranty.**

**• 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.**

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. For additional information contact:

**Ingersoll-Rand Material Handling**
2724 Sixth Avenue South
Seattle, Wa 98124 USA
Phone: (206) 624-0466
Fax: (206) 624-6265
or
**Ingersoll-Rand Material Handling**
**Samiia, Douai Operations**
111, avenue Roger Salengro
59450 Sin Le Noble, France
Phone: (33) 27-93-08-08
Fax: (33) 27-93-08-00

**NOTICE**

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

# HOIST AND WINCH 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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**Philadelphia, PA**
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King of Prussia, PA 19406
Phone: (215) 337-5930

## International

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:

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**Material Handling**
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Phone: (206) 624-0466
Telex: 786573
Fax: (206) 624-6265

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