

# Product Safety Information



Информация за безопасност на продукта  
Bezpečnostní informace o produktu  
Produktsikkerhedsinformation  
Produktsicherheit Informationen  
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Produktsäkerhetsinformation  
产品信息

## Pneumatic, Hydraulic and Electric Hoists



**Save These Instructions**

Only allow **Ingersoll Rand** trained technicians to perform maintenance on these products. For additional information contact **Ingersoll Rand** or nearest Distributor.

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

**Manuals can be downloaded from [www.ingersollrandproducts.com](http://www.ingersollrandproducts.com)**

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

## SAFETY INFORMATION

### WARNING

- **Failure to follow these warnings may result in death or severe injury.**

Additional information available on page 5.

### ■ General

- **Do not operate before reading manual(s) supplied with this product**
  - Read all documentation supplied with the product.
  - Contact factory if in doubt about installation, operation, inspection and maintenance instructions.
  - Do not discard manuals. Keep manuals readily available for all personnel.
- **Always install, operate, inspect and maintain this product in accordance with all applicable standards and regulations (local, state, country, federal, etc.). In the USA, for example the applicable standards are ASME/ANSI B30.16 and National Electric Code (ANSI/NFPA 70)**

### ■ Hoist Installation

- **Ensure product is correctly installed**
  - Never weld on any part of the product.
  - All supporting structure, mounting hardware and load attaching hardware must be in accordance with all applicable standards, codes and regulations.
  - When moving the hoist ensure that proper rigging is used and do not lift hoist over personnel.
  - Power supplied to the hoist must meet **Ingersoll Rand** specifications. All connections must be tight and installation made with hoses, cables and fittings that are new or in good condition and rated for the power supplied. Use in a well ventilated area.
  - Use a muffler to reduce noise level to acceptable limits.
  - Installation personnel should be trained and knowledgeable in hoist installation.
- **Do not remove or obscure any warning label or tag**
  - Ensure warning label(s) or tag(s) are visible to the personnel in the area.
  - If warning label(s) or tag(s) are damaged, illegible or become lost, contact your nearest distributor or the factory for replacements.
- **Use only approved rigging methods**
  - Do not make unauthorized modifications.
  - Alterations are not permitted to the hoist without factory approval.
- **Ensure an accessible shut off valve has been installed in the air supply line and make others aware of its location**
  - Always install an emergency shut off switch or valve and instruct all personnel in its location and purpose.

### ■ Before Operating Hoist

- **Do not operate this hoist before reading Product Information Manuals**
  - Read all documentation supplied with the product.
  - Contact factory if in doubt about installation, operation, inspection and maintenance instructions.
  - Do not discard manuals. Keep manuals readily available for all personnel.

### ■ When Operating Hoist

- **Handling people with this equipment can cause severe injury or death**
  - Do not use for lifting, lowering or transporting people.
- **Do not lift people or loads over people**
  - Be aware of the location of all other personnel in the job area.
  - Cordon off area and install warning signage around lift areas and along load paths.
  - Never allow anyone to stand under or on a suspended load.
  - **For trolley mounted hoists** - Make sure everyone is clear of the intended load path and there are no objects in the way of the load.
- **Do not lift more than rated load**
  - Refer to "SPECIFICATIONS" section in the Product Information Manual for maximum load rating.
  - Check data (name) plate for maximum load rating.
  - Exceeding the maximum rated hoist load can cause hoist or rigging failure allowing the load to drop.
  - Operator must be aware of weight of load being moved.
  - Always rig loads properly and carefully.
- **Do not operate unless load is centered under hoist**
  - Check hoist is directly above load. Do not side pull or "yard" a load. Refer to Dwg. MHP2649 on page 9, **A**. 10 degree maximum angle in any direction; **B**. Correct.
  - Check load is securely inserted in the saddle of the hook, and that hook latch is engaged.
  - Do not tipload the hook as this may allow the load to slip out of engagement and leads to spreading and eventual failure of the hook.
  - Pay attention to the load at all times when operating the hoist.
- **Do not operate with twisted, kinked or damaged chain**
  - Do not attempt to repair load chains or hooks. Replace them when they become worn or damaged.

- **Do not operate a wire rope hoist when rope is not properly seated in its grooves**

### ■ Additional Safety Procedures

- **Inspect hoist, chain and rigging prior to every shift**
  - These inspections are to identify equipment problems that must be repaired prior to hoist use.
  - Perform all steps in "Frequent Inspection" procedure described in Product Information Manual supplied with the hoist.
  - Additionally perform "Periodic Inspection" procedure described in Product Maintenance Manual at recommended frequency based on use conditions.
- **Ensure all hoist components and attachments are functioning and properly adjusted**
  - Run hoist slowly in each direction with no load and check operation of each attachment or option prior to application use.
- **Ensure hoist supporting structure is secure and in good condition**
  - Supporting structure - Check for distortion, wear, rigidity and continued ability to support hoist and rated load. Ensure hoist is securely mounted to beam or trolley.
- **Ensure hoist supply cables and hoses are in good condition and connections are tight**
  - Failure of electric cables or their disconnection while power is supplied can result in electrocution.
  - Failure of air or hydraulic hoses or their disconnection while pressurized can result in hazardous situations including the whipping of hoses.
  - Keep clear of whipping hoses. Shut off the compressed air or hydraulic pressure before approaching the whipping hose.
- **Do not operate if malfunctioning or damage is found**
  - Notify supervisory or maintenance personnel of any malfunction or damage.
  - Trained and authorized personnel must determine if repairs are required prior to operating hoist.
  - Hoist should never be operated with damaged chain and controls or guard.
- **Use caution when operating in extremely cold temperatures**
  - Extremely cold temperatures can affect the performance of some materials. Operate with no load to lubricate parts and warm-up prior to applying a load.
  - Ensure lubricants or hydraulic oil is suitable for operating temperatures.
  - Optional low temperature hoist are available. Refer to model number on the date (name) plate and hoist model code for approved operating temperature ranges.
- **Be aware of load position at all times to avoid moving load into hazardous situations**
  - Operators must maintain visual contact with the load at all times.
  - Monitor surrounding conditions to prevent load from contacting hazardous obstructions.
  - Use spotters or signal-person to assist with positioning a load in confined or limited visibility areas.
  - Continually monitor load movement through all phases of operation.
- **Immediately stop operation if load does not respond to hoist control**
  - Check direction indicators on control match load direction.
  - Ensure all controls function smoothly and do not stick or bind when operated.
  - Keep controls dry and clean to avoid hand slippage resulting in loss of hoist control.
  - Test control functions prior to applying load to hoist.
- **Ensure brakes hold prior to making complete lift by lifting load a short distance and releasing control**
  - Check load does not slip back when hoist control handle or pendant is released or returned to neutral.
- **Always shut off air or power supply before servicing or leaving hoist unattended**
  - Shut off, lock out power supply and activate control(s) several times to completely de-energize system.

## Warning Symbol Identification



A Safety Alert Warning



B Read Manuals Before Operating Product



C Pinching, Crushing Hazard



D Wear Eye Protection



E Wear Hearing Protection



F Do Not Lift People

(Dwg. MHP2585)

A. Safety Alert Warning; B. Read Manuals Before Operating Product; C. Pinching, Crushing Hazard; D. Wear Eye Protection; E. Wear Hearing Protection; F. Do Not Lift People.

## Special Conditions for ATEX

### WARNING

- Non-compliance with any of these "Special Conditions" could result in ignition of potentially explosive atmospheres.
- Refer to Ingersoll Rand's specification supplied with the pneumatic hoist or trolley for proper filtering and lubrication in air supply line.
- Proper lubrication and maintenance are required to prevent premature component failures. Follow the recommendations in the lubrication and maintenance sections of the manual supplied with the hoist or trolley.
- Do not operate the hoist or trolley with the air pressure at the inlet below 5.5 bar (550 kPa / 80 psig). Low air pressure to the hoist or trolley may cause the brake to partially engage during operation resulting in elevated temperatures.

### NOTICE

- To safely use this product and conform with the provisions of the most current Machinery Directive and applicable standards and regulations, all instructions given in the Operation Manuals, in addition to all conditions, notices and warnings given herein, must be followed.

## INTRODUCTION

Ingersoll Rand provides this manual to inform installers, operators, maintenance personnel, supervisors and management of safe practices that must be followed. Operation involves more than operating the controls of the product. Therefore, it is important for the operator to be instructed in the correct operation of products and the severe consequences that may result from careless use.

This document supports all Ingersoll Rand hoists and therefore may contain information that is not applicable to your unit.

It is not intended that the recommendations in this manual take precedence over existing plant safety rules and regulations or OSHA regulations. 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. A thorough study of the information in this manual should provide a better understanding of safe operating procedures and afford a greater margin of safety for people and equipment.

### WARNING

- Failure to read and comply with any of the limitations noted in this manual and the Ingersoll Rand Operation Manuals can result in death or serious injury.

When following specific rules always:

"USE COMMON SENSE"

Even if you feel you are familiar with this or similar equipment, you should read this manual and appropriate Operation Manuals before operating the product.

### NOTICE

- It is a responsibility of the owner/user to install, operate, inspect and maintain product in accordance with all applicable Standards and Regulations. If the product is installed as part of a lifting system, it is also the responsibility of the owner/user to comply with the applicable standards that address other types of equipment used.

Only those Authorized and Qualified Personnel who have read and demonstrated comprehension of this manual and any other supporting documentation, and that are knowledgeable in the proper operation and use of the hoist should be permitted to operate the product.

- Air pressure above 6.3 bar (630 kPa / 90 psig) at the hoist motor inlet may result in a source of ignition caused by premature failure of bearings or other components due to excessive speed, output torque or force.
- The entire hoist system, from the trolley or load hook to the bottom hook, the control pendant and the payload shall be earth grounded at all times to prevent ignition hazards from electrostatic discharge. A resistance to earth of less than 10000 Ohms is required. Do not disconnect or insulate any grounding or strain relief cables. When using a non-conductive sling or harness or a non-conductive link or barrier, an independent ground must be applied.
- Never use a pneumatic hoist or trolley when there is any possibility that a gas in Group C (acetylene, carbon disulfide, and hydrogen, as defined in EN 50014), hydrogen sulfide, ethylene oxide, light metal dusts or dusts sensitive to impact may be present. These atmospheres cause a high probability of explosion.
- Do not allow hard contact of the bottom block, hook, load chain or pendant control against other objects. The impact of any hoist or trolley component beyond normal use may cause an ignition hazard from sparks.
- The maximum expected surface temperature of the hoist or trolley is 135° C measured during brake malfunction. Inspect the hoist or trolley for air leaks and proper brake engagement, prior to operation.
- Check for abnormally elevated temperatures during operation that may be an indication of overload or potential failure of bearings, brake or other mechanical components.
- If elevated temperatures or elevated vibration levels are detected, shut the hoist and/or trolley off and discontinue its use until it can be inspected and/or repaired.
- Do not use a pneumatic hoist or trolley that exhibits rust or rust films that may come in contact with aluminum, magnesium or their corresponding alloys.
- Do not perform maintenance or repairs in an area where explosive atmospheres are present.
- Do not clean or lubricate a pneumatic hoist or trolley with flammable or volatile liquids such as kerosene, diesel or jet fuel. A potentially explosive atmosphere may be created.
- Hoists and trolleys with ATEX certification are intended for general industrial material handling use in conformance to their labeled designation and these special conditions. Special assessments, for other specific applications requiring increased protection, should be requested by written inquiry to Ingersoll Rand.

### NOTICE

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

## Alert Signals

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

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

### WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

### CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.

### NOTICE

Indicates information or a company policy that relates directly or indirectly to the safety of personnel or protection of property.

The words **shall** and **should** are used throughout this manual in accordance with definitions in the ASME B30 standards as follows:

- Shall** - this word indicates that the requirement is mandatory and must be followed.
- Should** - this word indicates that the requirement is a recommendation. The advisability of the recommendation depends on the facts in each situation.

Also used in this manual and other manuals are the following words with definitions: **Owners/users** - these words also refer to operators.

**Signal-person** - person who observes load and relays directions to operator.

**Operation Manuals** - documentation that is provided with the product that contains installation, parts information, maintenance, lubrication and related service instructions.

## ■ Pneumatic Hoists and Trolleys Intended for use in Potentially Explosive Atmospheres (ATEX)

The EC Declaration of Conformity in the Product Information Manual states that these Pneumatic Hoist and Trolley models are in compliance with European Community Directive 94/9/EC for equipment intended for use in potentially explosive atmospheres, commonly referred to as the ATEX Directive.

Refer to labeling on product, located near or on data (name) plate, for specific ATEX designation. Product not marked as such, are not suitable for use in any potentially explosive atmosphere (ATEX). Refer to Product Information Manual for further model descriptions.

Standard Pneumatic Hoist and Trolley models conform to and are marked for use as defined by ATEX designation:

 II 3 GD c IIB 135°C X

Pneumatic Hoist and Trolley models with the addition of the **Ingersoll Rand** "ATEX" package of spark protection conform to and are marked for use as defined by ATEX designation:

 II 2 GD c IIB 135°C X

These ATEX designations define the applications, the type and duration of the potentially explosive atmospheres, the type of protection, and the maximum surface temperature.

Hoists intended to be used in underground parts of mines as well as those parts of surface installations of such mines endangered by firedamp and/or combustible dust are marked for use as defined by ATEX designation:

 I M2 c IIB 135°C X

The X indicates that additional special conditions are required for safe application, operation and/or maintenance of these tools when used in potentially explosive atmospheres. Refer to "Special Conditions for ATEX" section on page 3.

These ATEX designations define the applications, type and duration of the potentially explosive atmospheres, type of protection, and the maximum surface temperature.



This symbol indicates certification for use in an explosive atmosphere and is followed by other symbols indicating the details of that certified use.

- I- Indicates Equipment Group I - Mine Use.
- II- Indicates Equipment Group II - Non-Mine Use.

- 2- Indicates Equipment Category 2 - is intended for use in areas in which explosive atmospheres caused by gases, vapors, mists or air/dust mixtures are only occasionally likely to occur. Protection is ensured during normal use and in the event of frequently occurring disturbances or equipment faults.
- 3- Indicates Equipment Category 3 - is intended for use in areas in which explosive atmospheres are less likely to occur, are infrequent or for short periods.
- M2- These products are intended to be de-energized in the event of an explosive atmosphere. Protection methods must be incorporated to provide a high level of safety.
- c- Indicates type of explosion protection per standard EN 13463-5 in which constructional measures are applied so as to provide safety against the possibility of ignition.
- IIB- Indicates certification for use in Group B which covers gases with an MIC ratio of 0.45 to 0.8 and MESG value of 0.55 to 0.9 mm. If certified for Group B it would be safe in Group A, which covers gases with MIC ratio above 0.8 and MESG above 0.9 mm.
- Tmax- Indicates the maximum surface temperature in degrees Centigrade.
- X- Indicates that there are special conditions for safe application, installation, operation and maintenance which must be followed for the certification to apply.

## ■ Training Programs

It is a responsibility of the hoist owner/user to make personnel aware of all federal, state and local rules, codes and company safety rules, regulations and instructions and to establish programs to:

1. Train and designate hoist operators.
2. Train and designate hoist inspection and maintenance personnel.
3. Ensure personnel, frequently involved in rigging the load, are trained in attaching the load to the hoist and other tasks related to load handling.
4. Ensure safety procedures are followed.
5. Ensure all accidents or safety violations are properly reported, and appropriate corrective action is taken prior to further use.
6. Ensure that all hoist warning tags, labels and the Operation Manuals supplied with the hoist are read.

### Applications in the USA

Training programs should include reading information contained in the latest edition of: ASME B30.16 - Safety Standard for Overhead Hoists (underhung). American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016. Also the, Hoist Inspection and Hoist Maintenance Personnel Manual published by the Hoist Manufacturers Institute, 8720 Red Oak Blvd., Suite 201, Charlotte, NC 28217-3992.

It is recommended that applicable US National Safety Council (NSC) and US Occupational Safety and Health Act (OSHA) standards be reviewed along with other recognized safety sources to provide safe hoist installation and operation.

Training programs should also include requirements in accordance with the latest edition of: ASME B30.9 - Safety Standards for Slings.

### Applications outside the USA

Follow all country or regional specific rules, regulations and standards that apply to operator/user training.

## WARNING LABELS AND TAGS

READ and OBEY all Danger, Warning, Caution, and Operating Instructions on the hoist and in all **Ingersoll Rand** Manuals.

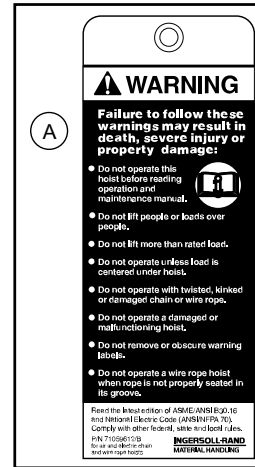
Check that all labels, tags and data (name) plates are in place and legible. Failure to comply with safety precautions described in the manuals supplied with the hoist, this manual or any of the labels and tags attached to the hoist is a safety violation that may result in death, serious injury, or property damage.

Each hoist is shipped from the factory with the warning label and tag shown. If the label and tag is not attached to your hoist, contact your nearest distributor or the factory for free replacement and attach it. Part number for the tag used on the hoists is 71059612. Tag is shown smaller than actual size.



(Dwg. 71289326)

**A.** Handling people with this equipment. Can cause severe injury or death. Do not use for lifting, lowering or transporting people.



(Dwg. 71059612)

**A.** Failure to follow these warnings may result in death, severe injury or property damage: • Do not operate this hoist before reading operation and maintenance manual. • Do not lift people or loads over people. • Do not lift more than rated load. • Do not operate unless load is centered under hoist. • Do not operate with twisted, kinked or damaged chain. • Do not operate a damaged or malfunctioning hoist. • Do not remove or obscure warning labels. • Do not operate a wire rope hoist when rope is not properly seated in its grooves.

## HOIST GENERAL INFORMATION

**Ingersoll Rand** hoists can be powered pneumatically, hydraulically or electrically. All powered hoists share common features that include a suspension system, motor, brake, gear reducer and chain sprocket. Hoists can be hook-mounted to the suspension shaft of a trolley, permanent mounting structure or any mounting point capable of supporting both load and hoist.

### ■ Hoist Brake

Disc brakes are internal and connected to the drive train. They are automatically engaged, locking the drive train to the hoist frame, thereby stopping chain movement when the control is released or placed in the neutral position.

### ■ Hoist Controls

The location of controls and features varies between hoists and is dependent on application requirements. Be familiar with location of controls and features.

Users and operators should not assume that all hoists operate the same. Although there are many similarities, every hoist should be reviewed for different characteristics. Each hoist has specific characteristics that the operator must understand and be familiar with.

### ⚠ CAUTION

- It is the responsibility of the owner/user to require that all personnel that will install, inspect, test, maintain, and operate the hoist read the contents of this manual and the Operation Manuals furnished by Ingersoll Rand and become thoroughly familiar with the location and operation of the controls and features.

**Ingersoll Rand** hoists are operated by applying power to a motor, which is connected through a drive train to the chain sprocket. The direction of lower hook movement and speed is managed by the control. Controls shall be clearly marked for direction of hoist hook movement.

Various controls are available with the hoists and are dependent on power source, location to hoist and degree of control required.

For air hoists, pilot pendant controls are normally used which are connected directly to the hoist motor. Pendants use levers or buttons to control directional load movement. The degree of lever movement controls hoist hook speed.

Pendant controls send a signal back to a valve or control panel mounted to the hoist.

Hoist controls are available with an emergency stop button which when activated will stop all hoist movement.

## INSTALLATION

Inspect shipping package for any signs of shipping damage. Remove shipping material carefully and inspect product for any damage. Pay close attention to hoses, fittings, brackets, handles, valves, or any other items that attach or protrude from product. Any item that appears damaged no matter how slight shall be inspected and a determination made as to its suitability for use prior to product being placed into service.

Ensure that warning and operation labels and tags are not removed or covered during or after the installation process. Contact the factory for replacement labels if labels become damaged or unreadable.

Ensure that data (name) plate is attached and readable. Refer to the Product Information Manual for additional information. Replacement data (name) plates are available when complete product serial number is provided.

If products are repainted, ensure labels and tags are protected and the protection is removed after painting.

Hoists are supplied fully lubricated from the factory. Lubrication of the load chain is recommended before initial product operation. Refer to Product Information Manual for product lubrication information.

### ⚠ CAUTION

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

It is the owner's and user's responsibility to determine the suitability of a product for any particular use. Review all applicable industry, trade association, federal and state regulations.

### ■ Site Survey

Inspect site where product will be mounted. Ensure that mounting surface will be big enough for product and operator. Refer to Product Information Manuals for specific information on mounting surface requirements, attaching hardware and power supply requirements. Survey site to ensure operator ability to reach all controls comfortably and observe loads during operation.

**⚠ WARNING**

- **Supporting structures and load-attaching devices used in conjunction with this product must meet or exceed the design safety factor to handle the rated load, plus the weight of the product and attached equipment. This is the customer's responsibility. If in doubt, consult a registered structural engineer.**

When installing the product ensure that installation personnel are trained and factory certified to perform the tasks. The use of licensed electricians or registered structural engineers may be required. Use of trained, certified personnel will ensure safe installation and that all items used in the installation will meet federal, state and local code requirements.

**■ Moving the Hoist**

**⚠ WARNING**

- **During movement of the hoist, ensure that hoist does not pass over personnel. Hoists raised higher than 5 ft (2.5 m) during move should use "tag lines". These lines should be long enough to allow personnel to be a safe distance from the hoist. Attach them, opposite each other, to help stabilize load during movement.**

Once the hoist is ready to move to the mounting site, weight of complete hoist must be determined. This will ensure that lifting equipment with enough capacity is used. The basic weight of the hoist is found in the hoist Product Information Manuals, however, the addition of a chain container, air preparation packages or other owner added items can cause the finished weight to be much greater.

Lift hoist using hoist top hook or lifting eyes.

**⚠ CAUTION**

- **The addition of items to the hoist can affect the CENTER of GRAVITY, even if the hoist is equipped with lifting eyes. On the initial lift, ensure hoist does not "roll", "tilt" or "shift".**

To rig a hoist for moving, use nylon slings or hooks of the correct capacity in the lifting eyes. Rig the hoist in a manner to prevent any "rolling" or "shifting" during movement. Ensure that lifting equipment has clear access and can easily reach the mounting site.

With hoist rigged to move and the correct lifting equipment attached, on the initial lift, only lift hoist a couple of inches (50 - 75 mm) and determine stability of rigging before continuing. If hoist is stable, continue with installation.

**■ Mounting**

Make certain your hoist is properly installed. A little extra time and effort in doing so can contribute a lot toward preventing accidents or injuries and will help achieve the best service possible.

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

**■ Hook Mounted Hoist**

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

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

**■ Trolley Mounted Hoist**

When installing a trolley on a beam, measure the beam flange width and temporarily install the trolley on the hoist to determine the exact distribution and arrangement of the spacers. Refer to trolley manufacturer's Product Information Manual for correct distance between the trolley wheel flanges and beam. Typically, the number of spacers between the trolley side plate and the mounting lug on the hoist must be the same in all locations in order to keep the hoist centered under the I-beam. The remaining spacers must be equally distributed on the outside of the side plates. (For additional information refer to the trolley manufacturer's literature.) Ensure rail stops are installed.

Ensure trolley bolts and/or nuts are torqued in accordance with manufacturer's specifications. When installing hoist and trolley on the beam, make certain the side plates are parallel and vertical.

After installation, ensure hoist is centered below trolley then operate trolley over entire length of beam with a capacity load suspended 4 to 6 inches (10 to 15 cms) off the floor.

**⚠ CAUTION**

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

**NOTICE**

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

**■ Ergonomics**

Operator's position at the controls should allow the operator to maintain a comfortable, well-balanced posture. The position should also allow easy access to all controls without reaching. In this position, the operator should be able to view the load during entire cycle of movement. This position along with recommended guards should provide the maximum protection to operator.

The operator's position should also be free of obstructions both overhead and on the sides. The operators area must be well ventilated, kept oil free and clear of unnecessary equipment/tools etc. and be provided with a non-skid surface.

**■ Power Supply**

For all types of this product there is a recommended power supply input for the best performance, refer to the Product Information Manuals. A power supply of less than recommended will result in reduced product performance and may cause some items such as brakes, overload valves or limit switches to function incorrectly.

Exceeding the power supply can cause product to exceed rated performance. Brakes, overload sensors, limit switches/valves may not function correctly.

**⚠ WARNING**

- **Ensure that all power supply connections are tight.**
- **Check electrical grounding (earth) is complete.**

Comply with any other safety precautions to ensure a good, safe, power source connection at the product.

Air and hydraulic powered products require filtration before the control valve. Refer to Product Information Manuals for specific filtration level, type and location. Without filtration, contaminants can enter the system and cause components to malfunction.

Electric products can also be affected by contamination. Keep motor and controls clean. Ensure phase, cycle and voltage of motor magnetic reversing starter and controls all match the electrical service being used.

**■ Exhaust**

On pneumatic powered products, careful consideration must be given to the exhaust. Make sure products are positioned in a well ventilated area. Do not allow personnel to stand in the exhaust stream as this can result in injury.

1. **Noise.** Using piping or tubing to move exhaust away from operator can reduce this. The addition of a muffler is also recommended to reduce noise level.
2. **Misting.** Clean and remove any build-up of oily residue in area.
3. **Natural/Sour Gas.** For air powered products that use natural/sour gas as the power source, pipe away exhaust from the product. Exhaust system shall provide safe removal or recirculation of gas and meet all applicable federal, state, and local safety rules, codes and regulations.

## ■ Electrical Disconnect

Refer to the latest edition of the National Electrical Code (NFPA 70), Article 610-31.

### Conductor Disconnecting Means

A disconnecting means that has a continuous ampere rating not less than that computed in Sections 610-14(e) and (f) of NFPA 70 shall be provided between the hoist contact conductors and the power supply. Such disconnecting means shall consist of a motor-circuit switch, circuit breaker, or molded case switch. This disconnecting means shall be as follows:

1. Readily accessible and operable from the ground or floor level.
2. Arranged to be locked in the open position.
3. Open all ungrounded conductors simultaneously.
4. Placed within view of the products contact conductors.

## ■ Shut-off Valve

On all air products installations an emergency shut-off valve/switch should be installed within easy range of the operator to provide a positive way of stopping product operation in the event of an emergency.

The valve should be positioned so that activation can occur quickly, and any person in the area of the product can also activate the valve. Train people to its location and use.

Refer to typical air powered product installation Dwg. MHP2459 on page 9, A. Ball Valve; B. Fitting Nipple; C. Air Flow; D. Open; E. Closed.

## ■ Chain Container

1. Check the chain container size to make sure the length of the load chain is within the capacity of the chain container. Replace with a larger chain container if required.

2. When a chain container is used, always connect the free end of the chain to the hoist. Install a chain buffer on the chain as described in the Product Information Manual.
3. Attach the chain container to the hoist.
4. Run bottom block to the lowest point and run hoist in the "UP" direction to feed the chain back into the container.

### NOTICE

- **Make certain to adjust the balance chain so that the chain container does not contact the load chain.**
- **Allow chain to pile naturally in the chain container. Piling the chain carelessly into the container by hand may lead to kinking or twisting that will jam the hoist.**

## ■ Attaching Limit Stop

1. On hoists without a chain container, slide buffer and washer onto chain.
2. Install limit stop as described under "Load Chain Replacement." Refer to the Product Maintenance Information Manual.
3. Run hoist slowly in the "DOWN" direction to verify limit stop activates cutout.

## ■ Pendant

Check that all hose connections are tight and that hoses are not twisted or crimped. Do not exceed maximum pendant length recommendations.

### CAUTION

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

## HOIST OPERATORS DUTIES AND RESPONSIBILITIES

When operating the product, operators should always use personal protective equipment appropriate to the operation. As a minimum this should include safety glasses, hearing protection, gloves, safety shoes and hard hat. Other safety items as required by individual companies should also be used.

The use of non-slip footwear is recommended if the product is located in an area that may be muddy, wet or have slippery surfaces.



(Dwg. MHP2452)



(Dwg. MHP2455)



(Dwg. MHP2594)



(Dwg. MHP2596)



(Dwg. MHP2595)

## ■ Inspections

Daily (Frequent) visual inspections should be performed by the operator at the start of each shift, or at the time the product is first used during each shift. Refer to "INSPECTION" section of the Product Information Manuals provided with the product. The operator shall not perform periodic inspections, or maintenance on the product unless the operator has been trained to perform such inspections or maintenance, and is designated by the owner to perform such inspections or maintenance.

## ■ Operators Responsibilities

The operator must be carefully instructed in his or her duties and must understand the operation of the product, including a study of the manufacturer's literature. The operator must thoroughly understand proper methods of rigging and attaching loads and should have a good attitude regarding safety. It is the operator's responsibility to refuse to operate the product under unsafe conditions.

Participate in any product training programs and be familiar with topics outlined in "Training Programs" on page 4.

It is the responsibility of the operator to exercise caution, use common sense and be familiar with operating procedures and duties.

Operators are not required to maintain the product however, they are responsible for operation and visual inspection of the product.

Operators who are fatigued or have exceeded their normal shift period shall check all related regulations regarding approved work periods prior to operating the product. Refer to "Training Programs" on page 4.

### Operators Shall:

1. Be physically competent and have no health condition which might affect their ability to act.
2. Be trained on product controls and load movement direction before operating the product.
3. Watch for potential product malfunctions that may require adjustment or repair.
4. Stop operation if malfunctions occur, and immediately advise their supervisor so corrective action can be taken.
5. Check brake operation, by lifting load a short distance and releasing control.
6. Be aware of shut-off valve or electrical disconnect location and proper operation.
7. Confirm that the product inspections and lubrication checks have been completed.

### Operators Should:

1. Have normal depth perception, field of vision, hearing, reaction time, manual dexterity, and coordination for the work being performed.
2. NOT be subject to seizures, loss of physical control, physical defects, or emotional instability that could result in actions of the operator being a hazard to the operator or others.
3. NOT operate the product when under the influence of alcohol or drugs.
4. NOT operate the product when under the influence of medication that could result in actions of the operator being a hazard to the operator or others.

The operator must know the product capacity during all operations. It is the operator's responsibility to ensure that the load does not exceed the product rating. On **Ingersoll Rand** data (name) plates the capacities of the product to which it is attached are listed. The data (name) plate information used in conjunction with the Product Information Manuals will give the operator the specific capacities of the product.

Items to consider as part of the load:

- All rigging items.
- Shock loads that could cause the load to exceed product rated capacity.
- If using this product in a multi-lift application, ensure both are in unison and one is not going faster or slower thereby putting an over load on the other.
- Load gaining weight due to snow, ice or rain.

## HOIST OPERATION

## ■ General Operating Instructions

The following 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. Refer to specific sections in the Product Information Manuals for additional safety information.

The four most important aspects of hoist operation are:

1. Follow all safety instructions when operating hoist.
2. Allow only people trained in safety and operation of this hoist to operate this equipment. Refer to "Training Programs" on page 4.
3. Subject each hoist to a regular inspection and maintenance program.

- Be aware of hoist capacity and weight of load at all times. Ensure load does not exceed hoist or rigging ratings.

**⚠ CAUTION**

- If a problem is detected, immediately STOP operation and notify supervisor. DO NOT continue operation until problem is corrected.

**■ Additional Important Hoist Operating Procedures**

- When a "DO NOT OPERATE" sign is placed on the hoist, or controls, do not operate the hoist until the sign has been removed by designated personnel.
- Keep hands, clothing, jewelry, etc. away from chain and other moving parts.
- Operate the hoist with smooth control movements. Ease the slack out of the chain when starting a lift. Do not jerk the load.
- Do not lift or pull load into support structure or hoist.
- Immediately stop operation if load does not respond to hoist control.
- Before each shift, visually check hoist for wear and damage. Never use a hoist that inspection indicates is worn or damaged.
- Never place your hand in the throat area of a hook.
- Never use the load chain as a sling.
- Make sure everyone is clear of the intended load path and there are no objects in the way of the load.
- Never suspend a load for an extended period of time.
- Never leave a suspended load unattended.
- Never splice a hoist chain by inserting a bolt between links or by any other means.
- Do not force a chain or hook into place by hammering. Do not insert the point of the hook into a chain link.
- Do not use load chain as a ground (earth) for welding. Do not attach a welding electrode to a hoist or chain.
- Ensure load block is not flipped (capsized) on hoists with two or more chain falls. Refer to Dwg. MHP0043 on page 9.
- Ensure brake(s) hold prior to making complete lift by lifting load a short distance and releasing control.

Operators must maintain visual contact with the load at all times.

At the completion of hoist operation or when in a non-operational mode the following actions should occur:

- Remove load from hook.
- Turn off/shut off or disconnect power supply.
- Secure hoist against unauthorized and unwarranted use.

**■ Operating In Cold Weather**

Cold weather operation can present additional hazards. At very cold temperatures metal can become brittle. Use extreme care to ensure that load movements are smooth and even. Lubricating fluids do not flow as readily. Make every effort to warm all fluids and components before operation. Run product slowly in both directions with no load to initially lubricate components.

Operators will also be wearing increased clothing so operation, feel of controls, field of vision and hearing could be impaired. Ensure that additional personnel/signal person are used to maintain a safe operation.

**⚠ WARNING**

- Avoid sudden loading and erratic control operation.

Whenever temperature is below freezing, 32° F (0° C), extreme caution must be exercised to ensure that no part of product, supporting structure or rigging is shock loaded or impacted as brittle fracture of steel may result.

Optional low temperature products are available. Refer to model number on data (name) plate and model code for approved operating temperature ranges.

**■ Initial Operating Checks**

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

- Ensure power supply connections are tight and connected correctly.
- When first running the hoist or trolley motors, some light oil should be injected into the inlet connection to allow good lubrication.
- When first operating the hoist and trolley it is recommended that the motors be driven slowly in both directions for a few minutes.
- Inspect hoist and trolley performance when raising, moving and lowering test loads. Hoist and trolley must operate smoothly and at rated specifications prior to being placed in service. Do not jerk the load.
- Check that trolley and hook movement is in the same direction as arrows and pendant control labels.
- Raise and lower a light load to check operation of hoist brake.
- Check hoist operation by raising and lowering a load equal to the rated capacity of the hoist 3 to 4 inches (7 to 10 cm) off the floor.
- Check operation of limit devices.
- Ensure hoist is securely connected to overhead crane, monorail, trolley or supporting member.
- Check that load is securely inserted in hook, and that hook latch is engaged.

**⚠ WARNING**

- Allow only personnel trained in safety and operation of this product to operate hoist and trolley.
- The hook latch is intended to retain loose slings or devices under slack conditions. Use caution to prevent the latch from supporting any of the load.

**■ Operating Hoist**

During all hoist operations, operator must be aware of load and its path. Load must have a free unobstructed path from pick up to set down. This awareness is to ensure that load does not contact any hazards. Some of the hazards to watch for and avoid are:

- power lines, telephone lines and electrical cables.
- guide wires, other load lines, strung hoses.
- personnel in the path or under the load as it is moved. Personnel shall NEVER be under or in the path of a moving load.
- lifting loads in wind gusts or high winds. Avoid swinging a suspended load.
- erratic control valve operation (can cause a sudden jerk on load which could create an overload condition).
- bumping an obstacle such as buildings, support member, another load etc.

**■ Controls**

**■ Pendant Operation**

The pendant is a remote control that allows the operator to control the positioning of a load. The pendant can have from two to six functions. The two-function pendant will control hoist movement in the UP and DOWN direction. A four-function pendant will control trolley movement along the support beam and hoist operation. A six-function pendant would include the above movements plus control a bridge assembly allowing hoist movement in four directions. Always apply smooth even pressure to pendant levers/buttons, avoid quick starts and abrupt stops. This will allow smoother control of suspended loads and reduce undue stress on components.

**■ Operating Optional Items**

**■ Rope Control (optional feature)**

The rope control provides the operator with a local hoist operating station. The following directions are as viewed from the motor end of the hoist, facing the rope control.

- To lift a load, pull down on the right rope.
- To lower a load, pull down on the left rope.
- Pull rope to full travel for maximum speed. Pull rope partially for slower speeds.
- To stop lifting or lowering, release rope. Hoist motor will stop.

**■ Overload Device (optional feature)**

Overload protection is integrated into the motor body and is standard on -E versions. The overload system is based on detection of the difference in air pressure between the inlet and outlet ports. It consists of a valve which is normally closed. The valve senses pressure at the motor inlet and outlet and compares the difference between the two pressures to the index value established by spring adjustment. A difference in pressure greater than the index value causes the emergency stop to be activated. This then exhausts the air and hoist operation stops.

Overload protection is adjusted at the factory to 100% of the safe working load (SWL). It is also able to operate on both sides for mining versions with two bottom hooks. Refer to the Product Maintenance Manual for adjustment procedures.

**■ Rigging**

For the purpose of this manual, rigging is considered any component that assists the attachment of the load hook to the load and hoist as part of the application. Use only approved rigging methods.

If visibility of riggers or hoist crew is impaired by dust, darkness, smoke, snow, fog or rain, strict supervision of operation must be exercised and, if necessary, it should be suspended.

**⚠ DANGER**

- Electrocution caused by contact of load with electric power lines must be avoided.

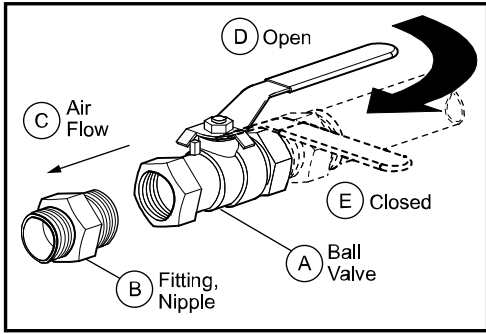
Never carry out any rigging or hoisting operation when the weather conditions are such that hazards to personnel or property are created. The size and shape of the loads being lifted must be carefully examined to determine if a safety hazard exists during high wind speeds. Avoid handling loads presenting large wind catching surfaces which could result in loss of control of the load during times of high or gusting winds, even though the weight of the load is within the normal capacity of the equipment. Wind loading can be critical on the manner in which the load is landed and the safety of personnel handling it.

Personnel trained in safe rigging procedures must accomplish all rigging. All items used in rigging should be certified for this use and sized for the load and application. Personnel trained in safe load handling procedures should supervise moving of loads that are rigged.

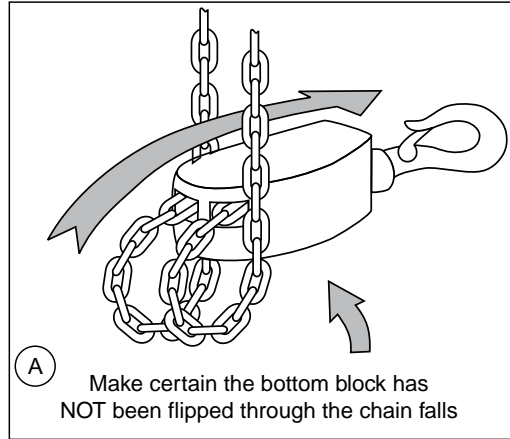
When moving a rigged load, there should be one person designated as being the signal-person. The signal-person shall be the only person authorized to give signals that will control the move and must maintain visual contact with hoist operator, load and area under the load. Operator shall only obey the signal-person EXCEPT to obey a stop signal regardless of who gives it.



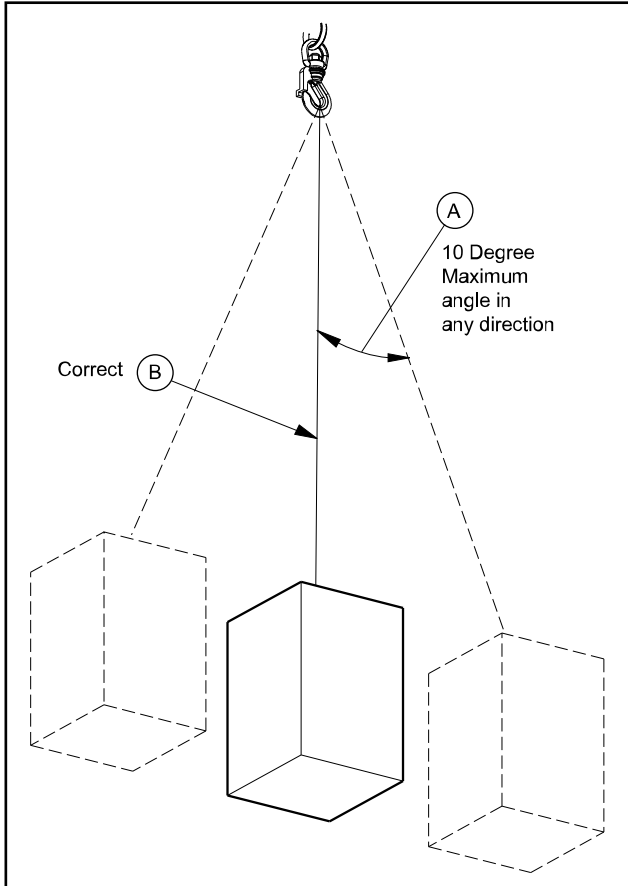
PRODUCT INFORMATION GRAPHICS



(Dwg. MHP2459)



(Dwg. MHP0043)



(Dwg. MHP2649)

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**SERVICE NOTES**

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