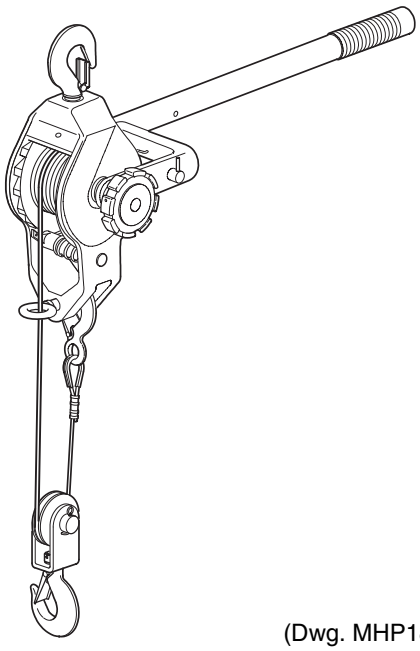
# PARTS, OPERATION AND MAINTENANCE MANUAL
# for
# RATCHET PULLER MODELS

**C225H (Wire Rope)**
**1000 lb (450 kg) Single Line**
**2000 lb (900 kg) Double Line**

**C300H (Wire Rope)**
**1400 lb (635 kg) Single Line**
**2800 lb (1270 kg) Double Line**

**C400H (Wire Rope)**
**1700 lb (770 kg) Single Line**
**3400 lb (1540 kg) Double Line**

**C400S (Synthetic Strap)**
**2000 lb (900 kg) Single Strap**
**4000 lb (1800 kg) Double Strap**



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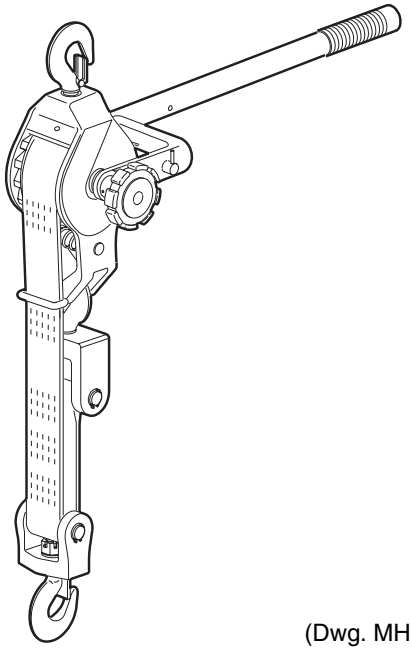

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**READ THIS MANUAL BEFORE USING THESE PRODUCTS. This manual contains important safety, installation, operation and maintenance information. Make this manual available to all persons responsible for the operation, installation and maintenance of these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

**⚠WARNING**

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

**Always operate, inspect and maintain this puller in accordance with ASME B30.21 and any other applicable safety codes and regulations.**

**Form MHD56011**
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**INGERSOLL-RAND**
**MATERIAL HANDLING**

# SAFETY INFORMATION

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

## Danger, Warning, Caution and Notice

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

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

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

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

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

## Safety Summary

**⚠ WARNING**

**• Do not use this puller for lifting, supporting, or transporting people or lifting or supporting loads over people.**
**• Pullers are designed to provide a 4 to1 safety factor and are factory tested to 125% of the rated load. The supporting structures and load-attaching devices used in conjunction with this puller must provide adequate support to handle all puller operations, plus the weight of the puller and attached equipment. This is the customer's responsibility. If in doubt, consult a registered structural engineer.**

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

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

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

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

## SAFE OPERATING INSTRUCTIONS

The following warnings and operating instructions have been adapted in part from American National Standard ASME B30.21 and are intended to avoid unsafe operating practices which might lead to injury or property damage.

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 to operate the puller.
2. Only operate puller if you are physically fit to do so.
3. When a **"DO NOT OPERATE"** sign is placed on the puller, do not operate puller until sign has been removed by designated personnel.
4. Before use, the operator should inspect puller for wear or damage.
5. Never use a puller which inspection indicates is worn or damaged.
6. Do not use puller if hook latch has been sprung or is broken.
7. Check that the hook latches are engaged before using.
8. Only pull or lift loads less than or equal to the rated capacity of the puller. Refer to capacity labels attached to the puller.
9. When using two pullers on one load, select two pullers both having a rated capacity equal to or more than the load. This provides adequate safety in the event of a sudden load shift.
10. Never use the puller wire rope or strap as a sling.
11. Position load correctly. Do not place load on hooks except in a straight pulling line. Do not "side pull" or "yard".
12. Never operate a puller with twisted, kinked, or damaged wire rope or frayed or cut strap.
13. Do not force a hook into place by hammering.
14. Be certain load is properly seated in saddle of hook and hook latch is engaged.
15. Do not support load on tip of hook.
16. Never run the wire rope or strap over a sharp edge.
17. Pay attention to load at all times when operating puller.
18. Always ensure that you, and all other people, are clear of the path of the load. Do not lift a load over people.
19. Never use puller for lifting or lowering people, and never allow anyone to stand on a moving or suspended load.
20. Ease slack out of wire rope or strap when starting a lift or pull. Do not jerk load.
21. Do not swing a suspended load.
22. Do not leave a load suspended when puller is unattended or not in use.
23. Never weld or cut a load suspended by puller.
24. Never use puller wire rope as a welding electrode.
25. Do not operate puller if jamming, overloading, or binding occurs.
26. Do not use a cheater bar or extended handle.
27. Always use gloves when handling wire rope.
28. When tensioning heavy loads allow for stretch in the strap.

## WARNING LABEL

Each puller is supplied from the factory with warning label shown. The self adhesive label must be clearly visible on puller at all times. If label is not attached to your puller, order new label and install it.

Refer to the parts list for part number. Read and obey all warnings and other safety information attached to this puller. Warning labels may be shown smaller than actual size.

# SPECIFICATIONS

**Table 1**

| Model No. | | Rated Capacity* | | Pulling Distance | | Max Wire Rope Dia. | | Min. Distance Between Hooks | | Net Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | lb | kg | feet | m | inch | mm | inch | cm | lb | kg |
| C225H | Single Line | 1000 | 450 | 38 | 11.6 | 0.187 | 5 | 17 | 43 | 14 | 6.4 |
| | Double Line | 2000 | 900 | 19 | 5.8 | | | 22 | 56 | | |
| C300H | Single Line | 1400 | 635 | 30 | 9.1 | 0.218 | 6 | 17 | 43 | 15 | 6.8 |
| | Double Line | 2800 | 1270 | 15 | 4.6 | | | 22 | 56 | | |
| C400H | Single Line | 1700 | 770 | 20 | 6.1 | 0.250 | 6 | 17 | 43 | 16 | 7.3 |
| | Double Line | 3400 | 1540 | 10 | 3 | | | 22 | 56 | | |
| | | | | | | **Strap Size** | | | | | |
| C400S | Single Strap | 2000 | 900 | 12 | 3.7 | 1-7/8 x 3/32 | 47.8 x 2.4 | 17 | 43 | 10.8 | 4.9 |
| | Double Strap | 4000 | 1800 | 6 | 1.8 | | | 22 | 56 | 17.4 | 7.9 |

* Based on first layer of drum. Rated capacity decreases as drum fills with wire rope / synthetic strap.

# OPERATION

## Puller Loading Methods

The **'C' Series** Ratchet Puller can be used in any position provided it is rigged to pull in a straight line from top hook to bottom hook.

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

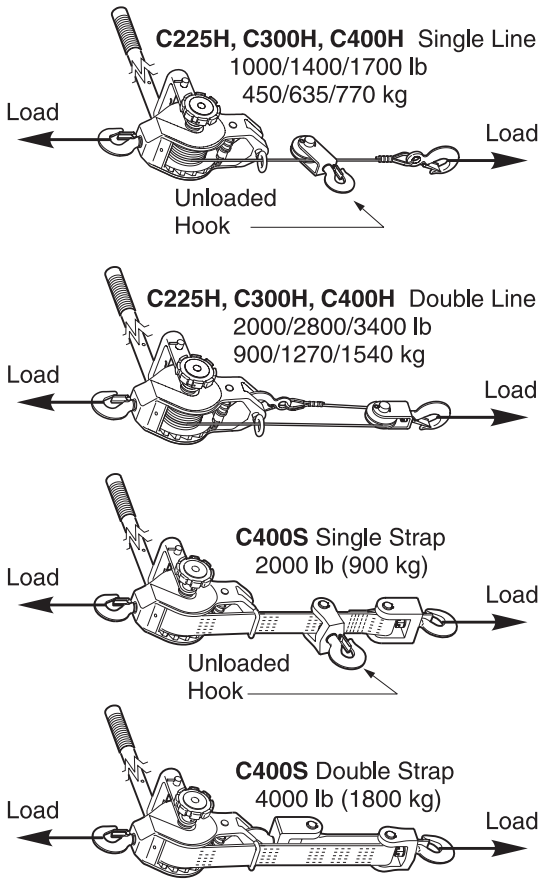
**⚠WARNING**

**• Always maintain three or more wraps of wire rope or two or more wraps of strap on the drum.**
**• Do not use a "cheater bar" or extended handle.**

To double capacity of puller when rigged with a single line, connect wire rope/strap and hook assembly (19) to spacer (39) and attach pulley block assembly (46) to load.
(Refer to Dwg. MHP1881on page 4.

### Installing and Removing Handle

1. Handle (21) may be installed into either end of "U" frame (9).
2. Insert spring (22) loop, on end of handle (21), into "U" frame (9) and press in handle. Align projection of spring (22) with small cutout in "U" frame (9) and press until handle (21) locks into place.
3. To remove handle (21), press loop on spring (22) until it clears "U" frame (9). Pull out handle (21).

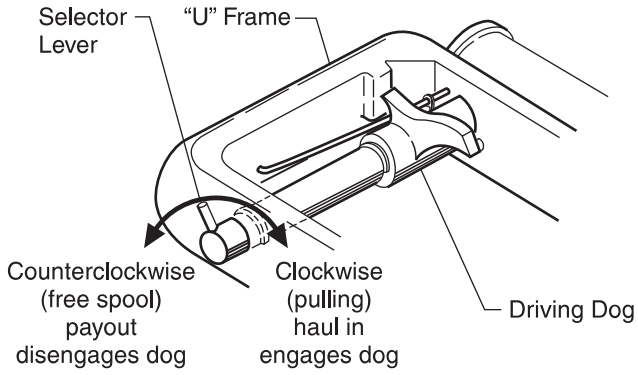



(Dwg. MHP1881)

### Positioning Unloaded Hook (Free Spooling)

1. Before positioning hook, ensure puller is in a no-load condition.

2. To disengage driving dog (10) from drum (13) teeth, face knob (15) and rotate selector lever (28) counterclockwise to the payout position.

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**NOTICE**

**• Selector lever (28) is located on "U" frame (9) near drum (13).**

3. Disengage holding dog (6) from drum teeth by pressing lever on holding dog towards drum.
4. Pull on wire rope/strap assembly (19) hook and move to desired location.
5. Release lever on holding dog.
6. Take up wire rope/strap slack by rotating knob (15) clockwise.

### Tensioning the Load

1. To engage driving dog (10) with drum (13) teeth, face knob (15) and rotate selector lever (28) clockwise to haul-in position.
2. Ratchet handle back and forth. Ratching handle towards holding dog (6) moves drum.

### Releasing the Load

1. To disengage driving dog (10) from drum teeth, face knob (15) and rotate selector lever (28) counterclockwise to payout position.
2. Move handle towards holding dog (6) until driving dog (10) disengages holding dog (6), allowing load to be released one drum tooth at a time. Repeat short ratchet movement until load is in desired location.

**NOTICE**

**• Holding dog is engaged when paying out or hauling in loaded wire rope / strap.**

### Rewinding Wire Rope or Strap

When puller is in a no-load condition, use knob (15) to wind wire rope or strap back onto drum.

1. To disengage driving dog from drum teeth, face knob (15) and rotate selector lever (28) counterclockwise to payout position.
2. Rotate knob (15) clockwise to rewind wire rope or strap.

**NOTICE**

**• When rewinding wire rope or strap, apply tension to prevent slack. This will help achieve level and tight spooling of wire rope or strap onto drum.**

### Storing Puller

1. Always store puller in a no-load condition.
2. Wipe off all dirt and water.
3. Oil wire rope, hook pins and hook latch pins.
4. On strap puller clean and dry strap material.
5. Store in a dry place.

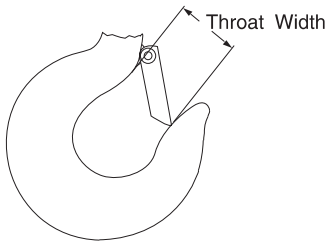
## INSPECTION

There are two types of inspection, frequent inspection performed by operator and more thorough periodic inspections performed by personnel trained in operation and repair of this puller. Careful inspection on a regular basis will reveal potentially dangerous conditions while still in early stages, allowing corrective action to be taken before condition becomes dangerous. Any deficiency revealed through inspection must be corrected before resuming operation of the puller. A determination must be made as to whether a deficiency constitutes a safety hazard.

### Frequent Inspection

The ratchet puller should be inspected prior to each use. Visual observations should be conducted during regular operation for any evidence of damage or malfunction.

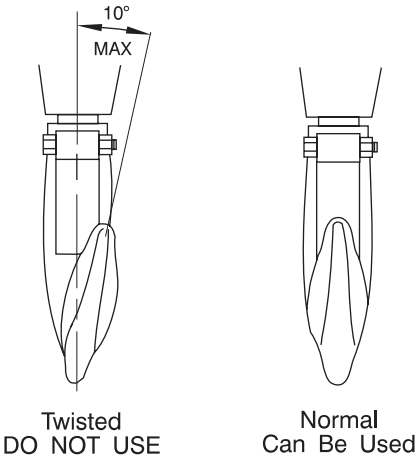
1. OPERATION. Check for visual signs or abnormal noises which could indicate a potential problem. Ensure handle mechanism, driving dog and holding dog function properly. Repair or replace if damaged.
2. HOOKS. Check for wear or damage, increase throat width, bent shank or twisting of hook. Replace hooks which exceed throat opening discard width specified in Table 2 (refer to Dwg. MHP0040 on page 5) or exceed a 10° twist (refer to Dwg. MHP0111 on page 6). If hook latch snaps past tip of hook, hook is sprung and must be replaced.




(Dwg. MHP0040)

**Table 2**

| Hook (All Models): | Throat Width | | Discard Width | |
|---|---|---|---|---|
| | in | mm | in | mm |
| Top Swivel | 0.98 | 24.9 | 1.13 | 28.7 |
| Yoke | | | | |
| Eye (On Cable) | 0.96 | 24.4 | 1.1 | 27.9 |




(Dwg. MHP0111)

3. HOOK LATCHES. Check operation of hook latches. Replace if broken or missing.
4. WIRE ROPE. Lubricate if necessary. Replace the wire rope if damaged or excessively worn. Consult the wire rope manufacturer's inspection information or a recognized safety source, such as the latest edition of National Safety Council, Accident Prevention Manual for Industrial Operations or ASME B30.21. The following list is a users' guide to the accepted standards by which wire rope must be judged and is not presented as a substitute for an experienced inspector.
   a. Damage, such as bird cages, kinking, core protrusion, crushing, heat damage, and main strand displacement.
   b. Corrosion and nicking.
   c. Wear of crown wires. Replace at 1/3 wear of the original diameter of any crown wire.
   d. Broken wires or strands, particularly at connections. Replacement is necessary if one wire is broken at a connection; twelve wires broken within one lay; four broken wires in one strand within one lay.
5. SYNTHETIC STRAP. Strap should be clean and dry. Remove any lubricant or dirt. Replace strap if frayed or cut.
6. WIRE ROPE/STRAP REEVING. Check reeving and ensure wire rope or strap is properly secured to the drum. Refer to "Installing Wire Rope" or "Installing Synthetic Strap" in "MAINTENANCE" section.
7. HANDLE. Check for cracks, bending and other damage. Replace if necessary.

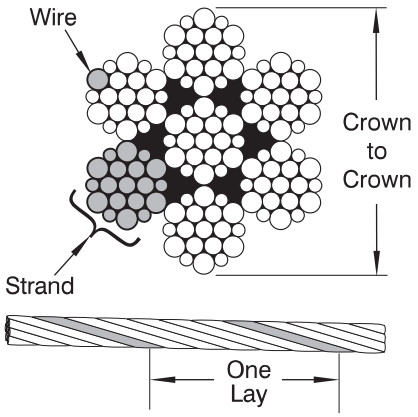
## Periodic Inspection

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

| NORMAL | HEAVY | SEVERE |
|---|---|---|
| yearly | semiannually | quarterly |

Disassembly may be required for HEAVY or SEVERE usage. Keep accumulative records of periodic inspections to provide a basis for continuing evaluation. Inspect all items in "Frequent Inspection". Also inspect the following:

1. FASTENERS. Check rivets, capscrews, nuts, cotter pins, and other fasteners on hooks and puller frame. Replace if missing and tighten or secure if loose.
2. ALL COMPONENTS. Inspect for wear, damage, distortion and cleanliness. If external evidence indicates the need, disassemble. Check teeth, frame, shafts, drum, sheaves, guides, springs and covers. Replace worn or damaged parts. Clean, lubricate and reassemble.
3. HOOKS. Inspect hooks for cracks. Use magnetic particle or dye penetrant to check for cracks. Inspect hook retaining parts. Tighten, repair or replace if necessary. Refer to latest edition of ASME B30.10 (Hooks) for additional hook inspection information.
4. DRUM AND SHEAVES. Check for excessive wear or damage. Replace if necessary.
5. DOG MECHANISMS. Check dogs engage drum teeth. Check holding dog pawl, driving dog pawl and drum teeth for cracks, wear or damage. Check springs for distortion or damage. Repair or replace parts as necessary.
6. LABELS. Check for presence and legibility. Replace if necessary.
7. WIRE ROPE. Besides the items in a frequent inspection, inspect for the following:
   a. Build-up of dirt and corrosion. Clean if necessary.
   b. Loose or damaged end connection. Replace if loose or damaged.
   c. Check wire rope anchor is secure.
   d. Changes in size of the wire rope diameter. Periodically measure diameter of wire rope from crown-to-crown throughout life of wire rope. The actual diameter should be recorded when wire rope is under equivalent loading and in the same operating section. If actual diameter of wire rope has decreased more than 1/64 in. (0.4 mm) a thorough examination of wire rope should be conducted by an experienced inspector to determine the suitability of wire rope to remain in service. Refer to Dwg. MHP0056 on page 6.

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8. SYNTHETIC STRAP. Inspect material surface. Replace if torn, cut, frayed or worn.

# LUBRICATION

### Pivot Points and Bearings

As required by severity of usage, lubricate hook latch pins, hook pins, driving and holding dog pivot points, and the drum and sheave bearings with **Ingersoll-Rand** LUBRI-LINK-GREEN or SAE 30W oil. If puller is disassembled, lubricate pivot points and bearings with grease.

### Wire Rope

1. Clean with a brush or steam if there is dirt or other foreign material on the surface of the wire rope.

**⚠ CAUTION**

**• Do not use an acid-based solvent or other cleaning fluid.**

2. Apply **Ingersoll-Rand** LUBRI-LINK-GREEN or SAE 30W oil.
3. Brush, drip or spray lubricant weekly, or more frequently, depending on severity of service.

### Synthetic Strap

1. Synthetic strap should not be lubricated. Keep strap clean and dry.

# MAINTENANCE

**⚠ WARNING**

**• Never perform maintenance on the puller when there is a load on the wire rope or strap.**
**• Before performing maintenance, tag puller:**
**WARNING - DO NOT OPERATE -**
**EQUIPMENT BEING REPAIRED.**
**• Only allow personnel trained in operation and service of this product to perform maintenance.**
**• After performing maintenance test puller to 125% of its rated capacity before returning to service.**

### Removing Wire Rope

1. Free spool wire rope off drum. Refer to "Positioning Unloaded Hook (Free Spooling)" in "OPERATION" section.
2. Remove shield cotter pin (31), retainer ring (38), retainer pin (25) and shield (20).

**⚠ CAUTION**

**• Do not loosen drum retainer screw (23) located underneath the wire rope lock screw (24).**

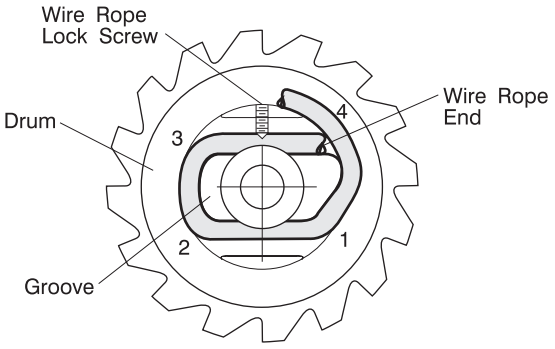
3. Loosen lock screw (24) and remove wire rope assembly (19).
4. Push wire rope through hole 1 until there is a small loop between holes 2 and 3.
5. Loosen lock screw (24) and pull wire rope end free of drum. Pull rope through holes 2 and 1 and discard.

### Removing Synthetic Strap

1. Free spool strap off drum. Refer to "Positioning Unloaded Hook (Free Spooling)" in "OPERATION" section.
2. Remove drum from frame. Refer to "Drum Removal" in "MAINTENANCE" section.
3. Remove setscrew (61) and push strap shaft (62) out of drum. Remove and discard strap.

### Installing Wire Rope

1. Cut wire rope to length and fuse end to prevent fraying of strands in accordance with wire rope manufacturer's instructions.
2. Insert end of wire rope through eye bolt (2).
3. Feed end of wire rope into drum (13) Hole 1, out Hole 2, along drum groove and back into Hole 3. Refer to Dwg. MHP0081 on page 7.
4. Position wire rope end just beneath surface of drum near Hole 4. Secure by tightening lock screw (24).
5. Pull on hook end of wire rope until wire rope is seated in drum groove.

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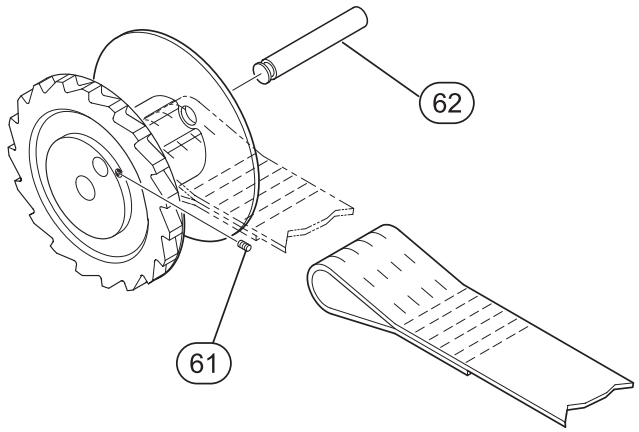
6. Install shield (20) and secure with retainer pin (25), retainer ring (38) and cotter pin (31).
7. While keeping wire rope under tension, rewind wire rope onto drum.

### Installing Synthetic Strap

Refer to Dwg. MHP1880 on page 8.

1. Refer to “Removing Synthetic Strap” in “MAINTENANCE” section.
2. Remove setscrew (61) and pin (62).
3. Insert new strap. Replace pin and setscrew.
4. Install drum. Refer to “Drum Replacement” in “MAINTENANCE” section.
5. Replace shield (20) and secure.

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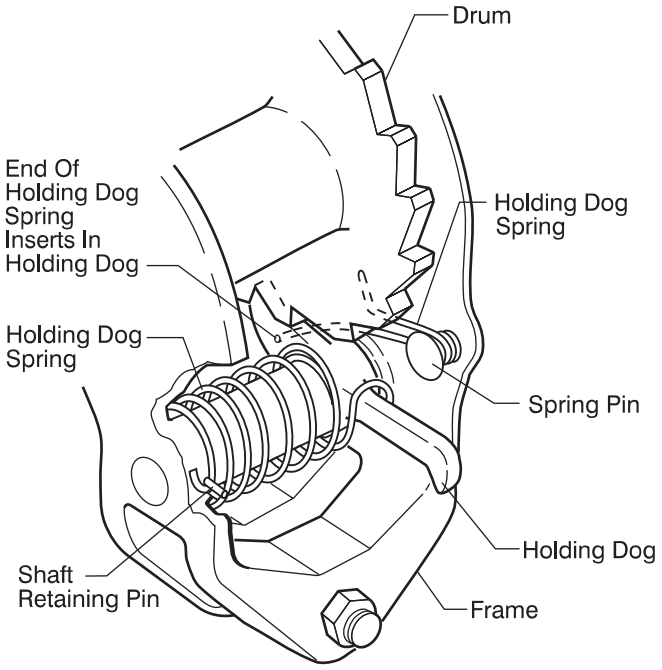
### Holding Dog Spring Replacement

Refer to Dwg. MHP0164 on page 12.

1. Cut off head of spring pin (4) and remove from frame (1).
2. Drive out retainer pin (36) with a 1/8 in. (3 mm) diameter pin punch.
3. Tap or push holding dog shaft (7) through frame from lever side just far enough to clear holding dog (6).
4. Remove holding dog (6).
5. Remove old holding dog spring (8) from holding dog (6) and replace with a new spring (8).
6. Position holding dog (6) so that it engages teeth of drum (13) and prevents drum rotation. Ensure that spring (8) can be rotated into position.
7. Tap holding dog shaft (7) back through holding dog (6) and into frame (1). Align holes for retainer pin (36) in frame (1) and holding dog (6).
8. Install retainer pin (36). To give holding dog spring (35) a place to attach, leave part of retainer pin (36) sticking out of frame (1) on same side of puller as holding dog lever.
9. Install spring (35) by placing small “hook” end over retainer pin (36) and other end over holding dog (6). The spring (35) should keep holding dog engaged in drum teeth.
10. Position loop in holding dog spring (8) over spring pin hole in frame (1).
11. Install new spring pin (4) with large head on inside of frame (1). Support large head and secure pin (4) by mushrooming out small end.

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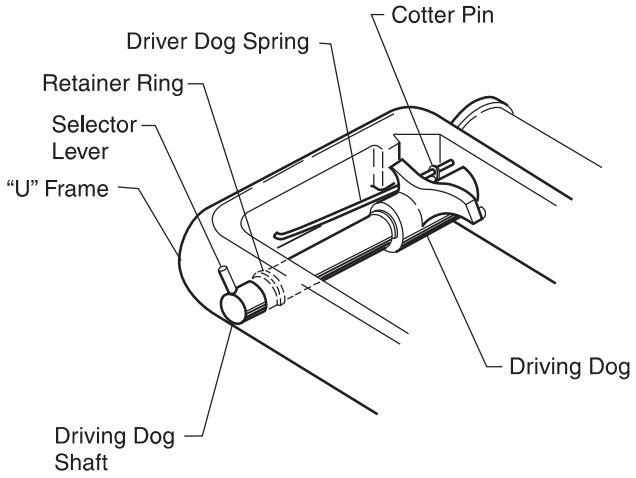
### Driving Dog Spring Replacement

**⚠ CAUTION**

**• The driving dog spring (12) is under tension. Exercise caution while removing to avoid injury.**

1. To remove driving dog spring (12), insert a screwdriver blade between spring (12) and “U” frame (9) and pry out.

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To install a new spring, use the following procedure:

1. Remove retainer ring (32) which is flush against driving dog (10).
2. Slide driving dog (10) towards center of drum (13).
3. When facing knob (15), rotate selector lever (28) clockwise so end of spring (12) can be inserted into driving dog pin (27).
4. Insert end of spring (12) into pin (27).
5. While pulling out on selector lever (28), rotate it counterclockwise 90 degrees.

6. Slide driving dog (10) back into position. It should engage drum teeth. If you are unable to position the dog (10), try rotating “U” frame to make room.
7. Install retainer ring (32) onto driving dog shaft (11).

### “U” Frame or Drum Removal

1. Remove handle (21) if attached.
2. Remove wire rope from drum. Refer to “Removing Wire Rope ” in “MAINTENANCE” section.
3. To access screw (23), remove lock screw (24).
4. Loosen screw (23). Do not remove.
5. Remove drum shaft retainer ring (41).
6. Remove knob (15) and drum shaft (14) as a unit, by rotating knob (15) back and forth and pulling.
7. Pull out “U” frame (9).
8. Remove drum (13).

### “U” Frame or Drum Replacement

1. Install drum (13) with drum teeth engaging holding dog (6).

**NOTICE**

**• If drum is difficult to install, try installing it from opposite side of frame (1) and hold holding dog release spring (8) out of the way.**

2. Align holes in “U” frame (9) with holes in frame (1). Orientate “U” frame (9) so that driving dog (10) engages drum teeth and can operate spring (8) on holding dog (6).
3. Note position of dimple in drum shaft (14) in relationship to knob (15) or retainer pin (29). Align dimple with drum shaft retaining screw (23) during drum shaft installation.

**NOTICE**

**• Place a mark on knob (15) in line with drumshaft (14) dimple to aid alignment.**

4. Insert knob (15) and drum shaft (14) as an assembly.
5. Install retainer ring (41) to fix position of drum shaft (14).
6. Check alignment of dimple with screw (23), realign if necessary.
7. Tighten screw (23). The screw (23) attaches drum (13) to drum shaft (14).
8. Install wire rope or strap. Refer to “Installing Wire Rope” or “Installing Synthetic Strap” in “MAINTENANCE” section.
9. Check driving dog (10) operation by moving selector lever to haul in and payout positions.

### Removing Hook

1. Switch selector lever to DOWN and move “U” frame (9) out of the way by rotating towards hook on wire rope assembly (19).
2. Rotate hook (5) to give the most room on back side.
3. Remove retainer pin (29).
4. Remove hook (5) by holding nut (26) with either a screwdriver in one of the slots or a wrench, and rotating hook counterclockwise.

### Installing Hook

1. Align nut (26) and thrust washer (33) with hole in frame (1) for hook (5).
2. Hold nut (26) in place and install hook (5). Make sure hook (5) is loose enough to swivel freely and that hole in hook shank aligns with one of the slots in nut (26).
3. Secure nut (26) by installing retainer pin (29). Center pin (29) in hook shank and nut (26).

### Adding a Pulley Yoke Assembly

To double capacity (the operating speed will be halved) of a puller rigged for single line, install a pulley block assembly (46) and rig puller for **wire rope** double line.

To install a pulley block assembly, remove wire rope or strap. Refer to “Removing Wire Rope” in “MAINTENANCE” section. Slide pulley block assembly over end of wire rope or strap and reinstall wire rope.

### Synthetic Strap

1. Remove one retainer ring (41), press shaft (66) out of swivel block (67). Catch washers (63) and puller hook roller (64).
2. Place strap (19) in swivel block.
3. Insert shaft through swivel block, washer, pulley hook roller and washer and secure with retainer ring.

### Replacing a Hook Latch

1. Using an air or hand file, remove head of hook latch pin (44).
2. Drive out hook latch pin and remove latch (42) and spring (43).

### Installing New Hook Latch

1. Position spring (43) in latch (42) so long free ends of the spring are under latch.
2. Hold spring loop compressed and place spring and latch onto hook.
3. Insert a new pin (44) and mushroom head to secure latch.
4. Check latch moves freely and end of latch does not go past tip of hook.

**NOTICE**

**• Use only genuine Ingersoll-Rand parts.**

# TROUBLESHOOTING

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

| SYMPTOM | CAUSE | REMEDY |
|---|---|---|
| Puller does not ratchet. | Broken ratchet tooth on drum. | Replace drum. |
| | Broken spring. | Replace spring. |
| | Distorted dog. | Replace dog. |
| | Bent or damaged frame. | Replace frame. |
| Puller will not unload. | Driving dog not in correct position. | Move selector lever to down or unload. |
| | Driving dog spring damaged. | Replace driving dog spring. |
| | Holding dog spring damaged. | Replace holding dog spring. |
| Puller will not pull. | Driving dog not in correct position. | Move selector lever to haul in or pull position. |
| | Driving dog spring damaged. | Replace driving dog spring. |
| | Holding dog spring damaged. | Replace holding dog spring. |

# PARTS ORDERING INFORMATION

The use of replacement parts other than **Ingersoll-Rand** Material Handling 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 model number as it appears on the capacity label: C225H, C300H, C400H or C400S, plus capacity.
2. Part number and part description as shown in manual.
3. Quantity required.

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

**Puller Model Number**_____

**Date Purchased** _____

The model and capacity label is located on the puller frame. Sample label is shown smaller than actual size.


## 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.

Pullers returned with opened, bent or twisted hooks, or without wire rope/strap and hooks, will not be repaired or replaced under warranty.

**NOTICE**

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

## Disposal

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

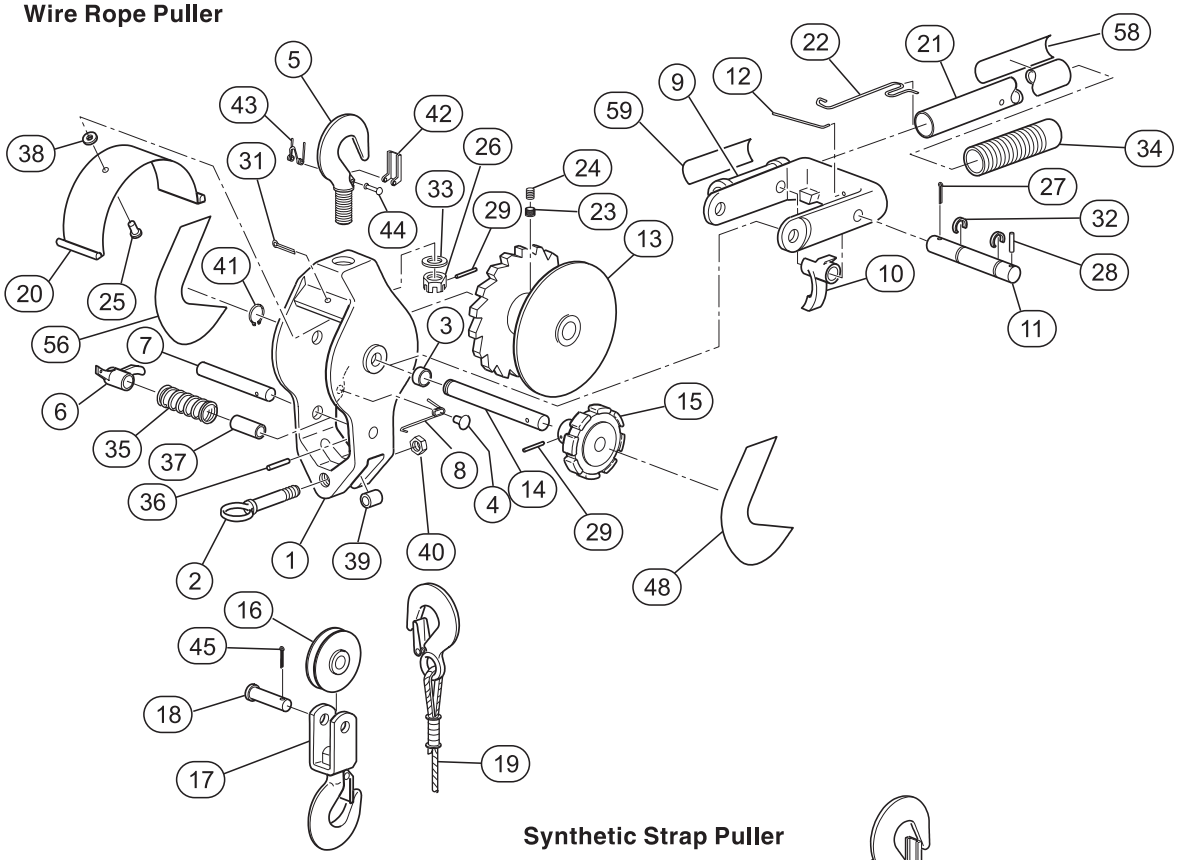
For additional information contact:
**Ingersoll-Rand Technical Support**
P.O. Box 618
510 Hester Drive
White House, TN 37188
Phone: (615) 672-0321
Fax: (615) 672-0801

or

**Ingersoll-Rand International Sales**
**Douai Operations**
111, avenue Roger Salengro
59450 Sin Le Noble, France
Phone: (33) 3-27-93-08-08
Fax: (33) 3-27-93-08-00

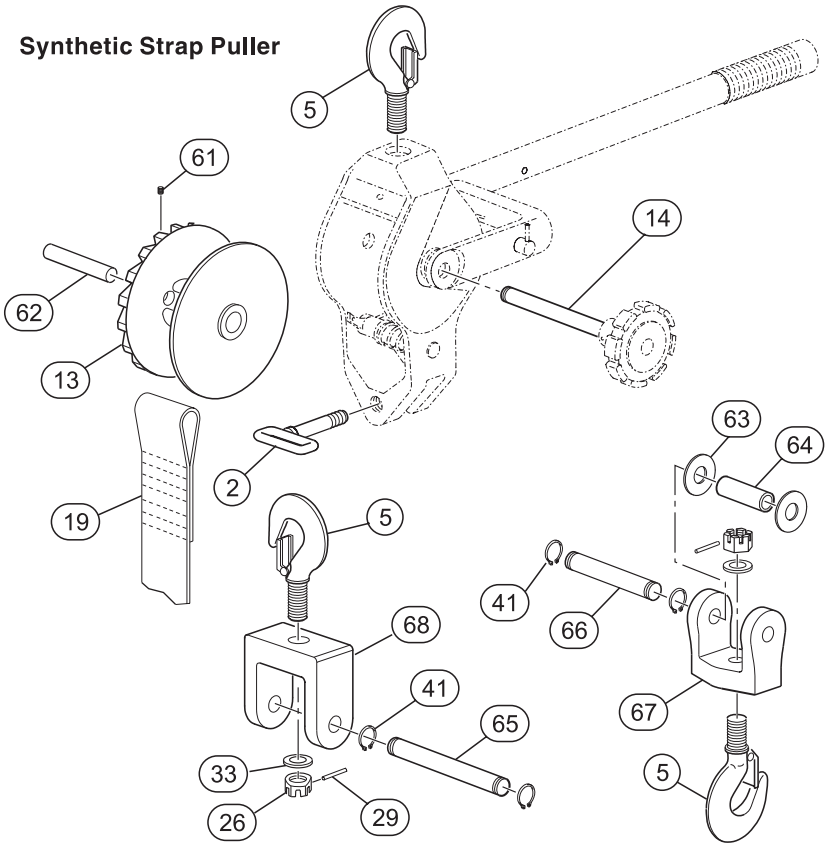
# C-SERIES PULLER ASSEMBLY PARTS DRAWING

**Wire Rope Puller**




(Dwg. MHP0164)

**Synthetic Strap Puller**




(Dwg. MHP1877)

# C-SERIES PULLER ASSEMBLY PARTS LIST

| ITEM NO. | DESCRIPTION OF PART | QTY. TOTAL | PART NO. | |
|---|---|---|---|---|
| | | | Strap | Wire Rope |
| 1 | Frame | 1 | Order item 47 | |
| 2 | Wire Rope or Strap Guide | 1 | 71487425 | 4744 |
| 3 | Bearing | 2 | 115A | |
| 4 | Spring Pin | 1 | 4288-5 | |
| 5 | Hook | 1 | Order item 51 | |
| 6 | Holding Dog | 1 | 47 | |
| 7 | Holding Dog Shaft | 1 | 4278 | |
| • 8 | Holding Dog Spring | 1 | 4280 | |
| 9 | "U" Frame | 1 | 70 | |
| 10 | Driving Dog | 1 | 46 | |
| 11 | Driving Dog Shaft | 1 | 30 | |
| • 12 | Driving Dog Spring | 1 | 55 | |
| 13 | Drum | 1 | 71487433 | 71 |
| 14 | Drum Shaft | 1 | 71487466 | 29 |
| 15 | Knob | 1 | 51 | |
| 16 | Pulley | 1 | - - - | 66 |
| 17 | Hook Assembly | 1 | - - - | Order item 46 |
| 18 | Shaft | 1 | - - - | 230 |
| • 19 | Wire Rope Assembly Model C225H | 1 | - - - | 3156-1 |
| | Wire Rope Assembly Model C300H | | | 3156-2 |
| | Wire Rope Assembly Model C400H | | | 3156-3 |
| | Synthetic Strap Model C400S | | 71487516 | - - - |
| 20 | Wire Rope Shield | 1 | Order Shield Assembly item 52 | |
| 21 | Handle Assembly (Incl's items 21, 22, 34 and 48) | 1 | 62 | |
| | Handle Assembly (Optional) Steel, zinc plated (Incl's Items 21, 22, 34 and 48) | | 62-S | |
| 22 | Handle Spring | 1 | 56 | |
| 23 | Screw | 1 | - - - | 52642 |
| 24 | Lock Screw | 1 | - - - | 52643 |
| 25 | Pin | 1 | Order item 52 | |
| 26 | Nut | 1 | Order item 51 | |
| 27 | Driving Dog Pin | 1 | 8000-27 | |
| 28 | Selector Lever | 1 | 8000-28 | |
| 29 | Retainer Pin | 2 | 8000-29 | |
| 31 | Cotter Pin | 1 | 8000-31 | |
| 32 | Retainer Ring | 2 | 8000-32 | |
| 33 | Thrust Washer | 1 | Order item 51 | |
| 34 | Handle Grip | 1 | 51845 | |
| 35 | Holding Dog Spring | 1 | 4282 | |
| • 36 | Retainer Pin | 1 | 8000-36 | |
| 37 | Holding Dog Spacer | 1 | 4332 | |
| 38 | Retainer Ring | 1 | 52641 | |
| 39 | Spacer | 1 | 4745 | |
| 40 | Nut | 1 | 50176 | |
| 41 | Retainer Ring | see ( ) | 8000-41 (5) | 8000-41 (1) |
| • | Recommended Spare | | | |

# C-SERIES PULLER ASSEMBLY PARTS LIST

| ITEM NO. | DESCRIPTION OF PART | QTY. TOTAL | PART NO. | |
|---|---|---|---|---|
| | | | Strap | Wire Rope |
| 42 | Hook Latch | 1 | Order item 54 | |
| 43 | Hook Latch Spring | 1 | | |
| 44 | Hook Latch Rivet | 1 | | |
| 45 | Cotter Pin | 1 | - - - | 8000-45 |
| 48 | Model Label C225H | 1 | - - - | 71106348 |
| | Model Label C300H | | | 71106355 |
| | Model Label C400H | | | 71106330 |
| | Model Label C400S | | 71487276 | - - - |
| 56 | Warning Label | 1 | 71106371 | |
| 58 | Warning Label | 1 | 71106363 | |
| 59 | Handle Label | 1 | 71106389 | |
| 60 | Lubricant (optional) | As Req'd. | LUBRI-LINK-GREEN | |
| 61 | Strap Anchor Pin Setscrew | 1 | 71487458 | - - - |
| 62 | Strap Anchor Pin | 1 | 71487441 | |
| 63 | Washer | 2 | 71487508 | |
| 64 | Pulley Hook Roller | 1 | 71487490 | |
| 65 | Bottom Hook Shaft | 1 | 71487532 | |
| 66 | Pulley Hook Shaft | 2 | 71487482 | |
| 67 | Pulley Hook Frame | 1 | 71487474 | |
| 68 | Bottom Hook Frame | 1 | 71487524 | |

**Assemblies**

| ITEM NO. | DESCRIPTION OF PART | PART NO. | |
|---|---|---|---|
| | | Strap | Wire Rope |
| • 46 | Pulley Block Assembly (Incl's items 16 thru 18 and 45) | 2911-SLH | |
| 47 | "U" Frame Assembly (Incl's items 9 thru 12, 27, 28 and 32) | 294 | |
| 50 | Frame Assembly (Incl's items 1, 2, 3, 39 and 40) | 4287 | |
| 51 | Hook Assembly (Incl's items 5, 26, 29, 33 and 42 thru 44) | 58-SLH | |
| 52 | Shield Assembly (Incl's items 20, 25, 31 and 38) | 4425 | |
| • 54 | Hook Latch Assembly (Incl's items 42, 43 and 44) | 7328-A | |
| • | Recommended Spare | | |

# 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 en route is not due to any action or conduct of the manufacturer.

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

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

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

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

## United States Office Locations

**For Order Entry, Order Status and Technical Support**

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

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www.ingersoll-rand.com

**Regional Sales Offices**

**Chicago, IL**
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Fax: (562) 948-1828

**Philadelphia, PA**
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Fax: (610) 337-5912

## International Office Locations

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

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

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

**Regional Sales Offices**

**Edmonton, Alberta**
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Fax: (780) 437-3145

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Kirkland, Quebec
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Fax: (514) 695-0963

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