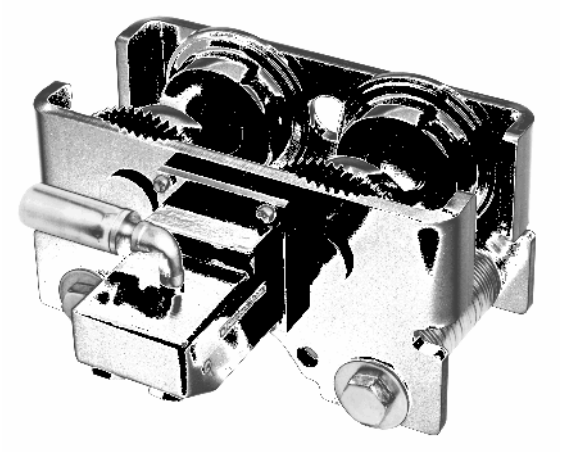
PARTS, OPERATION AND MAINTENANCE MANUAL*
for
PLAIN and AIR POWERED S•COR•E PREMIUM RIGID TROLLEY
MODEL SCR3



* This manual is a supplement to, and must be accompanied by, the appropriate hoist manual to make up a complete hoist and trolley manual.

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 trolley for lifting, supporting, or transporting people or lifting or supporting loads over people.

Always operate, inspect and maintain this trolley in accordance with American National Standards Institute safety code (ASME B30.16) and any other applicable safety codes and regulations.

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

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INGERSOLL-RAND
MATERIAL HANDLING

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SAFETY INFORMATION

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

Danger, Warning, Caution and Notice

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

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

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

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

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

Safety Summary

⚠WARNING

• Do not use this trolley or attached equipment for lifting, supporting, or transporting people or lifting or supporting loads over people.

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

The National Safety Council, Accident Prevention Manual for Industrial Operations, Eighth Edition and other recognized safety sources make a common point: Employees who work near suspended loads 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 owner/employer, not the manufacturer. Many OSHA requirements are not concerned or connected with the manufactured product but are, rather, associated with the final installation. It is the owner's and user's responsibility to determine the suitability of a product for any particular use. It is recommended that all applicable industry, trade association, federal, state and local regulations be checked. Read all operating instructions and warnings before operation.

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

This manual has been produced by **Ingersoll-Rand** to provide dealers, mechanics, operators and company personnel with the information required to install, operate, maintain and repair the products described herein.
It is extremely important that mechanics and operators be familiar with the servicing procedures of these products, or like or similar products, and are physically capable of conducting the procedures. These personnel shall have a general working knowledge that includes:

1. Proper and safe use and application of mechanics common hand tools as well as special **Ingersoll-Rand** or recommended tools.
2. Safety procedures, precautions and work habits established by accepted industry standards.

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

SAFE OPERATING INSTRUCTIONS

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

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

Safe Operating Instructions are provided to make an operator aware of dangerous practices to avoid and are not necessarily limited to the following list. Refer to specific sections in the manual for additional safety information.

Refer to the hoist manual for additional precautions and instructions.

1. Only allow personnel trained in safety and operation of this product to operate and maintain this trolley.
2. Only operate a trolley if you are physically able to do so.
3. When a "**DO NOT OPERATE**" sign is placed on the trolley or controls, do not operate the trolley until the sign has been removed by designated personnel.
4. Before each shift, the operator should inspect the trolley for wear or damage.
5. Never use a trolley that inspection indicates is worn or damaged.
6. Periodically, inspect the trolley thoroughly and replace worn or damaged parts.
7. When using an attached hoist, only lift loads less than or equal to the lower rated capacity of the trolley or hoist.
8. Only attach a hoist having a rated capacity equal to or less than the capacity of the trolley.
9. When using two hoists to suspend one load, select two trolleys each 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 place your hand inside the throat area of a hook.
11. Only operate a trolley when the load is centered under the trolley. Do not "side pull" or "yard."
12. Pay attention to the load at all times when operating the trolley.
13. Make sure all people are clear of the load path. Do not lift a load over people.
14. Never use the trolley for lifting or lowering people, and never allow anyone to stand on a suspended load.
15. Do not swing a suspended load.
16. Do not leave a load suspended when the hoist is unattended or not in use.
17. Never weld or cut a load suspended by the trolley.
18. Always rig the load properly and carefully.
19. Remove all loads before performing any maintenance.
20. Avoid collision or bumping of trolley.
21. After use, or when in a non-operational mode, the hoist and trolley should be secured against unauthorized and unwarranted use.

WARNING LABEL

Each trolley is supplied from the factory with the warning label shown. If the label is not attached to your unit, order a new label and install it. Refer to the parts list for the part number. Label may be shown smaller than actual size.

NOTICE

• Trolley warning label is located on side plate.

SPECIFICATIONS

Model Code Explanation

Example: SCR3B-M2-06AP — **SCR3 B - M2 - 06 A P**

Series: SCR3 S•COR•E 3 ton Trolley 6,600 lbs (3,000 kg) max. capacity

Wheels:
- **B = Solid Bronze Wheels**
- N = Electroless Nickel

Trolley Type and Drive Options:
- P = Plain Rigid
- M = Motorized, no Pendant
- **M2 = Motorized with two Motor Pendant**

Pendant Hose Length:
- 00 = No Pendant
- **06 = 6 ft (1.8 m) Pendant Hose (standard)**
- XX = Specify pendant hose length (ft)

Beam Flange Width:
- **A = 3.25 to 6.00 inches (83 to 152 mm)**
- B = 6.01 to 12.00 inches (153 to 305 mm)

Lug Mount Adapter:
- **P = Palair Premium Hoist**

Performance Specifications

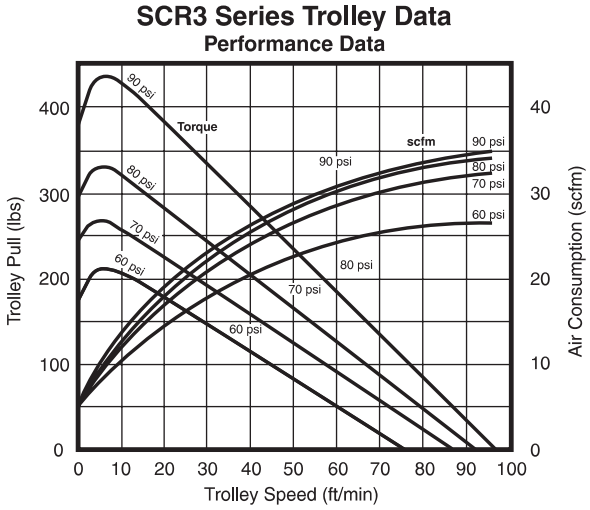
Maximum Load Capacity		6,600 lbs	3,000 kg
Beam Size	**Minimum Width**	3-1/4 in	83 mm
	Maximum Width	12 in	305 mm
	Minimum Height	6 in	152 mm
Minimum Turning Radius		42 in	1.1 m
Working Pressure *		70 - 90 psig	5 - 6.3 bar/500 - 630 kPa
Trolley Travel Speed **	**Rated Load**	71 ft/min	21 m/min
	No Load	95 ft/min	29 m/min
Rated Air Consumption at 90 psi		35 scfm	1 cu. m/min
Average Sound Level at a Distance of 13 feet (4 metres)		90 dBa	
Trolley Weight		35 lbs	16 kg

The following air supply specifications should be maintained at the trolley air motor inlet:

Air Pressure	90 psig	6.3 bar/630 kPa
Air Filtration	20 micron	
Inlet Hose Size	1/2 inch inside dia.	13 mm inside dia.

* Recommended operating pressure: 90 psig (6.3 bar/630 kPa).

** Speed variable depending on amount of pendant lever depression.



Performance based on 90 psig at the motor inlet.

Suspended Load (metric tons) Beam Conditions		Maximum Trolley Speed	
Flat Dry Good	Curved Slick Poor	ft/min	m/min
- - -	3	44	13.4
- - -	2	63	19.2
3	1.5	71	21.6
2	1.0	80	24.4
1.50	0.75	84	25.6
1	0.50	88	26.8
0.50	0.25	93	28.3
0.25	0.13	95	28.9

INSTALLATION

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

Make certain your trolley is properly installed. A little extra time and effort in so doing can contribute toward preventing accidents and helping you get the best service possible.

⚠WARNING

• Before installing read "SAFETY INFORMATION".
• Avoid an unbalanced load which may damage the trolley. Spacers (105) must be installed equally between side plates (106) and hoist bracket (213) to ensure hoist is centered on trolley.

NOTICE

• Trolley wheels ride on the top of the lower flange of the beam.
• During assembly lubricate gears, nuts, capscrews, and all machined threads with applicable lubricants. Use of antiseize compound and/or thread lubricant on capscrew and nut threaded areas will assist future disassembly.

Trolley Installation Over the Open End of the Beam

When installing a trolley on a beam, measure the beam flange and temporarily assemble the trolley on the hoist to determine the exact distribution and arrangement of the spacers. The distance between each wheel flange and the beam should be 3/32 to 5/32 in. (2 to 4 mm). The number of spacers (105) between the trolley side plate (106) and the hoist adapter (213) must be the same in all four locations in order to keep the trolley and hoist centered under the beam. The remaining spacers must be equally distributed on the outside of the side plates.

1. Measure beam flange width and establish required position for spacers (105). Install required outside spacers on suspender bolts (104).
2. Insert suspender bolts (104) through side plate (106).
3. Install an equal number of adjusting spacers (105) to each side of hoist adapter (213), on suspender bolts (104).
4. Install second side plate (106) on suspender bolts (104).
5. Install remaining adjusting spacers (105) equally to the outside of side plate (106) on suspender bolts.
6. Loosely install nuts (107) and lockwashers (127) on suspender bolts (104). Do not tighten nuts to final torque.
7. Remove the beam stop and slide assembled trolley onto the beam.
8. Torque nuts (107) to 25 - 30 ft. lbs. (34 - 40 Nm).
9. Verify trolley flange to beam total clearance.
10. Upon completion of installation, install trolley beam stops and conduct initial operating checks as described in "OPERATION" section. Check that side plates are vertical and parallel to each other.

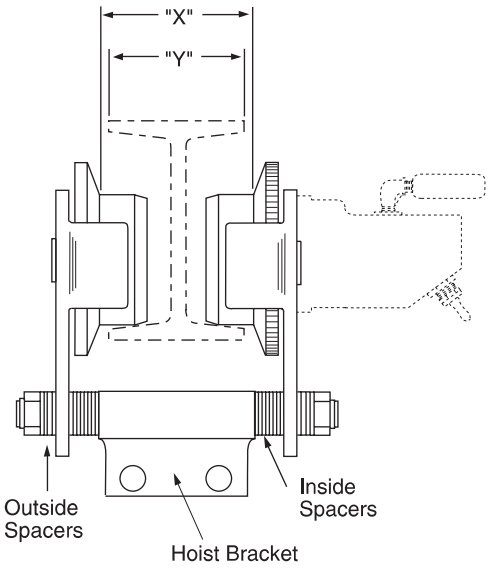
Trolley Installation from Underneath the Beam

1. Pre-adjust trolley for installation using Dwg. MHP0651 and the following instructions.
2. Install outside spacers on suspender bolts (104) and insert suspender bolts through side plate (106).
3. Install an equal number of adjusting spacers (105) to each side of hoist adapter (213), on suspender bolts (104).
4. Support the assembled portion of trolley on the beam track.
5. Install second side plate (106).
6. To the outside of the side plate (106) place the remaining adjusting spacers (105) in equal numbers along with lockwashers (127) and nuts (107) on the suspender bolts (104).
7. Torque nuts (107) to 25 - 30 ft. lbs. (34 - 40 Nm).

NOTICE

• The total clearance between the beam and the trolley wheel flanges is 3/16 to 5/16 inches (4 to 6 mm) when trolley is installed correctly. As shown in Dwg. MHP0651, the difference between dimensions "X" and "Y" equals the total clearance.

8. Verify trolley flange to beam total clearance.
9. Upon completion of installation, ensure trolley beam stops are installed and conduct initial operating checks as described in "OPERATION" section. Check that side plates are vertical and parallel to each other.



(Dwg. MHP0651)

Hoist Installation

Rigid Mount

1. Remove nut (107) from one end of suspension bolts (104). Record position of spacers (105) for later reassembly.
2. Pull side plate assembly from suspension bolts (104).
3. Remove hoist adapter, if supplied, from suspension bolts.
4. Install hoist adapter on hoist.
5. Install hoist adapter and hoist assembly on suspension bolts.
6. Install side plate assembly on suspension bolts.
7. Install spacers (105), lockwashers (127) and nuts (107) on suspension bolts in position noted in step 1. Verify spacers are positioned to provide correct trolley to beam clearance.

Power Unit Installation

NOTICE

• To prevent damage to the power unit, install trolley to beam and hoist to trolley before installing power unit to trolley.

1. Prior to installing trolley to beam, ensure studs (115) are installed and tight in the side plate on which the power unit will be mounted. If studs are not installed or are loose, remove wheels and press four studs (115) into the sideplate until heads are seated on the inside of the sideplate.
2. Reassemble wheel assemblies to sideplate and install trolley to beam.
3. Align trolley assembly geared wheels (114) and pinion gear (214).
4. Secure power unit to trolley by installing lockwashers (116) and nuts (117) on studs (115).
5. To connect pendant air hoses to hose adapters (259).

⚠ CAUTION

• To avoid damaging the pendant hoses, make sure the strain relief cable or chain, not the pendant hoses, is supporting the weight of the pendant.
• Check all hose connections are tight and that hoses are not twisted or crimped.

Air System Requirements

Air Supply

The air supply must be clean and free from moisture. The air consumption for the trolley air motor is 35 scfm (1 cu. m/min) at rated operating pressure of 90 psig (6.3 bar/630 kPa) at the trolley air motor inlet.

Air Lines

The inside diameter of the trolley air supply hoses must not be smaller than 1/2 in. (13 mm) and 7/16 in. (11 mm) for hose fittings. Before making final connections, all air supply lines should be purged with moisture-free air before connecting to trolley air motor inlet. Supply lines should be as short and straight as installation conditions will permit. Long transmission lines and excessive use of fittings, elbows, tees, globe valves (etc.) cause a reduction in pressure due to restrictions and surface friction in the lines.

Air Line Lubricator (optional feature)

Use a lubricator having an inlet and outlet size at least as large as the inlet size to the power unit. Install the lubricator as close to the air inlet on the trolley power unit as possible. The air line lubricator should be replenished daily and set to provide 2 to 3 drops per minute of SAE 10W oil. The use of an air line lubricator is not required for Palair Premium hoists. The trolley power unit may be run without in line lubrication, however, accelerated vane and cylinder wear may be experienced.

Air Line Filter

If trolley is to be used in corrosive or moist atmospheres it is recommended that an air line strainer/filter be installed as close as practical to the motor. The strainer/filter should provide 20 micron filtration and include a moisture trap. Clean strainer/filter periodically to maintain its operating efficiency.

Moisture in Air Lines

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

Power Unit (Air Motor)

For optimum performance and maximum durability of parts, operate the trolley air motor within the operating ranges provided in the “SPECIFICATIONS” section.

Muffler

On powered trolleys, the air motor is supplied standard with a muffler (253). An optional elbow fitting is available to accommodate a piped away exhaust.

Storing The Trolley

1. Always store the trolley in a no load condition.
2. Wipe off all dirt and water.
3. Oil the hand chain.
4. Place in a dry location.
5. Before returning trolley to service follow instructions for Trolleys Not In Regular Service in the “INSPECTION” section.

OPERATION

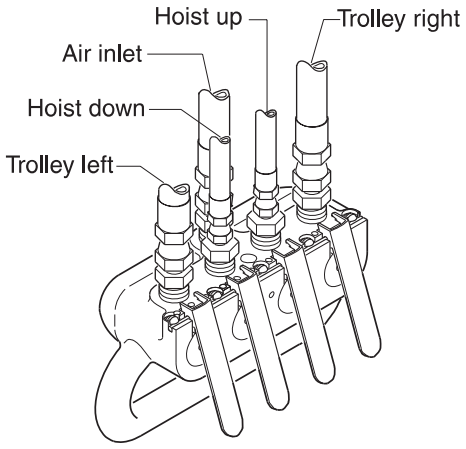
The **four most important** aspects of trolley operation are:
1. Follow all safety instructions when operating trolley.
2. Allow only personnel trained in safety and operation of this product to operate and maintain this equipment.
3. Subject each trolley to a regular inspection and maintenance procedure.
4. Be aware of the hoist and trolley capacity and weight of load at all times.

General Operating Information
Operate the trolley from a position that allows you to observe the load and the intended path of movement of the load.
Do not walk in the path of a moving trolley, or walk backwards when moving a trolley.
Always look in the direction you are moving.

Plain Trolley
1. To move an unloaded hoist/trolley, push on the hoist load chain.
2. To move a loaded hoist/trolley, push on the load or the hoist load hook shank.

Powered Trolley
Direction of trolley travel and speed is controlled by the pendant throttle. Ensure direction arrows on pendant throttle match trolley movement.

Pendant Operation
Refer to Dwg. MHP1008.
The pendant control throttle is equipped with separate levers for each trolley and hoist function. Two lever pendants provide trolley only operation and four lever pendants provide both hoist and trolley operation. Direction of trolley travel is controlled by whichever lever is depressed.



(Dwg. MHP1008)

Initial Operating Checks
1. After installation, check trolley is centered on the beam, side plates are vertical and beam to wheel flange clearance is correct. Ensure the hoist is centered below the trolley.
2. On powered trolleys, check for air leaks in supply hose and fittings to pendant and drive unit.
3. Raise a load equal to the lower of the rated capacities of either the trolley or hoist 3 to 4 inches (75 to 100 mm) off the floor.
4. Operate the trolley along the entire length of the beam.
5. Inspect trolley performance when moving test load(s). Trolley must operate smoothly and at rated specifications prior to being placed in service for general use.
6. Check that trolley movement complies with the pendant arrows, on air powered trolley units.

INSPECTION

⚠WARNING

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

Frequent and periodic inspections should be performed on equipment in regular service. Frequent inspections are visual examinations performed by operators or personnel trained in safety and operation of tis equipment and include observations made during routine equipment operation. Periodic inspections are thorough inspections conducted by personnel trained in the safety, operation and maintenance of this equipment. ASME B30.16 states inspection intervals depend upon the nature of the critical components of the equipment and the severity of usage.

Careful inspection on a regular basis will reveal potentially dangerous conditions while still in the early stages, allowing corrective action to be taken before the condition results in a hazard.

Deficiencies revealed through inspection, or noted during operation, must be reported to designated personnel trained in safety, operation and maintenance of this equipment. A determination as to whether a condition constitutes a safety hazard must be decided, and the correction of noted safety hazards accomplished and documented by written report before placing the equipment in service.

Records and Reports
Inspection records, listing all points requiring periodic inspection should be maintained for all load bearing equipment. Written reports, based on severity of service, should be made on the condition of critical parts as a method of documenting **periodic** inspections. These reports should be dated, signed by the person who performed the inspection, and kept on file where they are readily available for review.

NOTICE

• The external placement of coded marks on equipment identifying completed inspections and operationally certified equipment is an acceptable method of documenting periodic inspections in place of written records.

NOTICE

• During assembly/disassembly visually inspect each component for distortion, wear and damage. Replace items indicating damage, distortion and/or excessive wear. Proper use, inspections and maintenance will increase the life and usefulness of your Ingersoll-Rand equipment.

Frequent Inspection

On trolleys in continuous service, frequent inspections should be made at the beginning of each shift. In addition, visual inspections should be conducted during regular service for any damage or evidence of malfunction.

1. OPERATION. Operate the trolley so that it travels a few feet (1 metre). During trolley travel, check for visual signs or abnormal noises which could indicate wear or damage. Check for smooth operation. Do not operate the trolley until all problems have been corrected.
2. AIR SYSTEM. (Powered Trolleys only) Visually inspect all connections, fittings, hoses and components for indication of air leaks. Repair any leaks found.
3. CONTROLS. (Powered Trolleys only) During operation of trolley, verify trolley response to pendant use is quick and smooth. If trolley responds slowly or movement is unsatisfactory, do not operate the trolley until all problems have been corrected.

Periodic Inspection

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

NORMAL	HEAVY	SEVERE
yearly	semiannually	quarterly

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

1. FASTENERS. Check retainer rings, cotter pins, studs, capscrews and nuts. Replace if missing or damaged and tighten if loose.
2. ALL COMPONENTS. Inspect for wear, damage, distortion, deformation and cleanliness. If external evidence indicates the need, disassemble. Check gears, shafts and bearings. Replace worn or damaged parts. Clean, lubricate and reassemble.
3. SUPPORTING STRUCTURE. Check for distortion, wear and continued ability to support load.
4. WHEELS. Check that the trolley wheels track the beam properly and total clearance between wheels and beam equals 3/32 to 5/32 in. (2 to 4 mm). Adjust as necessary.
5. SIDEPLATES. Check side plates for spreading due to bending. Replace if spreading has occurred.
6. AIR MOTOR. (Powered Trolleys only) Check that loaded and unloaded operation of trolley is within specifications. Verify air connections do not leak, and hoses are in good condition. Verify that trolley air motor operates smoothly, and responds quickly to pendant commands.
7. LABELS. Check for presence and legibility. Replace if necessary.

Trolleys Not In Regular Use

1. A trolley which has been idle for a period of one month or more, but less than six months, shall be given an inspection conforming with the requirements of "Frequent Inspection" before being placed into service.
2. A trolley which has been idle for a period of over six months shall be given a complete inspection conforming with the requirements of "Periodic Inspection" before being placed into service.
3. Standby trolleys shall be inspected at least semiannually in accordance with the requirements of "Frequent Inspection". If abnormal operating conditions apply trolleys may require more frequent inspections.

LUBRICATION

Proper use, inspections and maintenance increase the life and usefulness of your **Ingersoll-Rand** equipment. Care must be exercised to ensure only U.S.D.A. approved lubricants are used.

Additional information regarding "Food Grade" lubricants is contained in U.S.D.A. Miscellaneous Publication No. 1419. Contact:

USDA, FSIS, Science Program, FIAD
300 12th Street SW, 3rd Mezzanine
Washington, DC 20250

Trolley Wheel Bearings

Wheel bearings are sealed and permanently lubricated. They do not require additional lubrication.

Geared Trolley Wheels and Pinion Shaft

Lubrication of the exposed gear teeth on the trolley wheel teeth and drive pinion is not essential. If light lubrication is desired, use an approved lubricant suitable for food industry and clean room applications. DO NOT OVER LUBRICATE and ensure any excess grease is cleaned off. For temperatures:

-20° to 50° F (-29° to 10° C) use EP 1 grease or equivalent.
30° to 120° F (-1° to 49° C) use EP 2 grease or equivalent.

⚠ CAUTION

• When greasing pinion and geared wheels make sure excess grease is cleaned off trolley wheel riding surface and track or beam. Failure to keep beam and wheel contact surfaces clean could affect the safe operation of the trolley.

Power Unit (air motor)
An in-line air lubricator is recommended for long life and optimum performance and should be checked/replenished daily and set to provide 2 to 3 drops per minute at full throttle of good quality hydraulic oil. In clean room applications, that prevent the use of lubricated air, the trolley power unit may be operated without an in-line lubricator for oil-free exhaust operation.

When the trolley power unit is operated without lubricated air, motor life and performance will be reduced. It is recommended that the motor be inspected and, if necessary, repaired after ever 50 hours of operation. Wear or damage, to the power unit, resulting from the use of nonlubricated air is not covered by the **Ingersoll-Rand** Limited Warranty. Refer to "ACCESSORIES" section for lubricator and air filter information.

⚠ CAUTION

• Shut off air supply before filling air line lubricator.

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 trolley symptoms, probable causes and remedies.

SYMPTOM	CAUSE	REMEDY
Trolley will not operate.	Trolley is overloaded.	Reduce load to within rated capacity.
	Trolley wheel bearings are damaged.	Replace trolley wheel bearings.
	Pinion shaft damaged.	Replace pinion shaft.
	Geared wheel(s) damaged.	Replace geared wheel(s).
	Motor damaged or worn.	Disassemble, inspect and repair or replace damaged or worn air motor parts.
	Low supply air pressure.	Check air supply line pressure is 90 psig at 35 scfm (6.3 bar/630 kPa at 1 cu. m/min) for efficient operation.
	Loose hose connections.	Check all hose fitting connections. Repair all leaking connections and damaged hose sections.
	Pendant malfunction.	Troubleshoot and repair or replace damaged or worn pendant parts.
	Track or beam is contaminated.	Check beam for foreign matter or contamination. Clean beam as required.
Trolley will not stop or trolley wheels slip.	Oil or grease on trolley wheels or beam.	Clean beam track and trolley wheels.
	Damaged brake lining.	Disassemble air motor and replace brake lining.
	Pendant malfunction.	Inspect and repair or replace damaged or worn pendant parts.
Poor motor performance or loss of power.	Low supply air pressure.	Check air supply line pressure is 90 psig at 35 scfm (6.3 bar/630 kPa at 1 cu. m/min) at trolley air motor inlet for efficient operation.
	Loose hose connections.	Check all hose fitting connections. Repair all leaking connections and damaged hose sections.
	Worn or broken rotor blades.	Disassemble air motor assembly. Repair or replace motor or rotor blades.
	Worn or broken motor rotor bearings.	Disassemble air motor assembly. Replace bearings.
	Foreign contaminants building up in motor.	Disassemble power unit, clean parts carefully and reassemble. Install a 20 micron filter, in supply air line, to protect the air motor.

⚠WARNING

• Never perform maintenance on the trolley while it is supporting a load. A falling load can cause injury or death and damage to property.
• Before starting maintenance, tag controls:
DANGER - DO NOT OPERATE - EQUIPMENT BEING REPAIRED.
• Only allow personnel trained in service and repair on this equipment to perform maintenance.
• After performing any maintenance on the trolley, test trolley to 125% of its rated capacity before returning to service. Testing to more than 125% of rated capacity may be required to comply with standards outside the USA.
• Disconnect air supply from trolley and hoist prior to conducting maintenance.

Proper use, inspections and maintenance increase the life and usefulness of your **Ingersoll-Rand** equipment. During assembly lubricate gears, nuts, capscrews and all machined threads with applicable lubricants. Use of antiseize compound and/or thread lubricant on capscrew and nut threaded areas prevents corrosion and allows for ease of disassembly of component.

Maintenance Intervals

The Maintenance Interval chart is based on intermittent operation of the trolley eight hours each day, five days per week. If trolley operation is more than eight hours per day, or in severe applications or environments, more frequent maintenance should be performed.

INTERVAL	MAINTENANCE CHECK
Start of each shift (Operator or Maintenance Personnel)	Make a thorough visual inspection of the trolley for damage. Do not operate the trolley if damaged.
	Operate the trolley slowly in both directions. Trolley must operate smoothly without sticking, binding or abnormal noises.
Yearly (Maintenance Personnel)	Inspect the trolley motor, wheels, shafts and bearings for wear and damage. Repair or replace as necessary.
	Check all supporting members, for indications of damage or wear. Repair or replace as required.

General Assembly/Disassembly Instructions

1. During assembly/disassembly steps for installation and/or repair visually inspect components for distortion, wear and damage. Replace any item indicating damage, distortion and/or excessive wear.
2. **Do not** disassemble further than required to accomplish repair. A good part can be damaged during the course of disassembly.
3. **Do not** use excessive force to remove or install parts. Use proper tools for the installation of press fit parts. During disassembly, use a soft hammer to carefully tap around the outside of parts that resist removal.
4. **Do not** use a flame to heat a part for ease in installation. During disassembly, only use a flame to heat a part that is damaged beyond repair; use a procedure that will not result in damage to other parts; and, use this option only after all other reasonable measures have been attempted.
5. **Always** use leather or copper-covered vise jaws to protect threaded and machined surfaces of parts being placed in the vise.
6. When installing bearings, **only** press on the bearing race contacting the component to be installed on or into. For shafts, press on the inner bearing race; for housings, press on the outer bearing race.
7. **Do not** damage seating surfaces during gasket and “O” ring removal. Use wood, plastic or brass removal tools to prevent scoring of machined sealing surfaces.
8. **Always** use only genuine **Ingersoll-Rand** replacement parts. When ordering specify part number, part description, unit model and serial number.
9. **Do not** perform repairs to trolleys in place. It is recommended that trolleys be removed and repaired in a clean, safe work area.
10. On powered trolleys, after any air system repair, purge the air system with moisture-free air before connecting to motor inlet. Ensure air lines are disconnected from the trolley air motor and hoist during purge.

Trolley Disassembly

NOTICE

• Prior to disassembly note the arrangement of the adjusting spacers (105). Install adjusting spacers (105), during assembly, in the same configuration recorded during disassembly to ensure beam flange width and hoist position are retained.
• Prior to disassembly of trolley, first remove trolley power unit and then remove hoist.

1. Remove nuts (107), lockwashers (127) and adjusting spacers (105) from the outside of side plates (106).
2. Remove side plate (106).
3. Remove adjusting spacers (105), suspender bolts (104) and hoist adapter (213) from remaining side plate.
4. To remove wheels, remove retainer ring (103) from wheel stud and slide wheel off.

If wheel is difficult to remove, gently tap wheel shaft with soft hammer to loosen.

5. To remove wheel bearings. Remove retainer ring (100) and tap out bearings.
6. Reassemble trolley as described in the “INSTALLATION” section.
7. Test trolley and hoist operation as described in the “MAINTENANCE” section under “Testing”, prior to returning to general use.

Power Unit Disassembly

1. Disconnect air hoses from power unit.
2. Remove nuts (117) and lockwashers (116).
3. Remove power unit assembly from trolley side plate (106).
4. Remove capscrews (220) and lockwashers (221).
5. Remove plate (222). Remove keys (218) from spindle shaft (217).
6. Remove gears (226, 227, 229), washers (223) and thrust race (228) from motor housing (254).

Spindle assembly (214 through 219) should not be removed from plate (222) unless repair is required.

7. To remove spindle assembly from plate:
   a. Remove retaining ring (219).
   b. Tap end of spindle shaft (217) to remove from plate (222).
8. To disassemble spindle assembly:
   a. Remove retaining ring (219), pinion gear (214), keys (218) and bearing (216) from spindle shaft (217).
9. To remove motor assembly (items 239 through 251):
   a. Remove capscrews (238) from brake cone (237).
   b. Grasping pinion shaft (231) pull assembly free of motor housing (254).
10. To disassemble motor assembly (items 239 through 251):
    a. Remove nut (230) and separate components (231 through 251) using Dwg. MHP0673 as a guide.

Cleaning, Inspection and Repair

Use the following procedures to clean, inspect, and repair the components of the trolley.

Cleaning

⚠ CAUTION

• Bearings that are loose, worn or rotate in the housing must be replaced. Failure to observe this precaution will result in additional component damage.
• Do not use trichloroethylene to clean parts.

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

Inspection

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

1. Inspect all gears for worn, cracked, or broken teeth.
2. Inspect shafts for ridges caused by wear. If ridges caused by wear are apparent on shafts, replace the shaft.
3. Inspect all threaded items and replace those having damaged threads.
4. Check mufflers for damage or excessive dirt.
5. Check bearings for freeness of rotation and wear. Replace bearings if rotation is rough or bearings are excessively worn.

Repair

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

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

Power Unit Assembly

1. Slide end plate (249) on rotor (244) shaft.
2. Install bearing (251) on rotor (244) shaft.

Lubricate gears lightly with EP#1 grease.
Coat rotor blades (245) and inside of cylinder (243) with SAE10W oil. Refer to “LUBRICATION” section for suitable lubricants.

NOTICE

• During assembly make sure housing and components are clean.
• During installation of bearings (239 and 251) on rotor (244) shaft, press only on the inner race of bearing.

3. Insert rotor blades (245) into blade slots of rotor (244). Insert with blade straight side facing out.
4. Slide cylinder (243) over rotor (244). Align air inlet slots of cylinder (243) and end plate (249).
5. Install spacer (241) and end plate (240) to rotor (244).
6. Install bearing (239) on rotor (244) shaft.

Lubricate gears lightly with EP #1 grease.

7. Check motor assembly (items 239 to 245 and 249 to 251) operation. Rotor should turn easily in cylinder without binding. If rotor binds, tap splined end lightly to loosen.
8. Install locating pin (250) in end plate (240) and install motor assembly in motor housing (254). Align the locating pin (250) with groove in housing (254).
9. Install brake cone (237) in motor housing (254) and secure with capscrews (238).
10. Install brake lining (236) to brake cone (237).
11. Install spacer (if required) (232), washer (233) and “O” ring (234) on pinion shaft (231).

NOTICE

• A torque of 2 to 3 inch-lbs. (0.225 - 0.34 Nm) to rotate spindle in both directions is required for proper installation of brake components. The use of the 0.010 inch (0.25 mm) spacer (232) may or may not be necessary to achieve required torque.

12. Install finger spring (235). Assemble with fingers facing out (toward pinion shaft (231) splines).
13. Slide pinion shaft (231) over rotor (244) shaft and secure with nut (230).

Lightly lubricate needle bearings in plate (222) with EP #1 grease prior to installing gears.

14. Install washers (223), thrust race (228) and gears (226, 227, 229) into motor housing (254).
15. If required, reassemble spindle components as follows:
    a. Install bearing (216), key (218), pinion gear (214) and retaining ring (219) on spindle shaft (217).

Lightly lubricate pinion gear with EP #1 grease.

16. Install spindle assembly in plate (222). Lock in place with retaining ring (215).
17. Install key (218) on spindle shaft (217).
18. Slide gear (227) onto spindle shaft (217).

Make sure key (218) is properly installed on spindle shaft (217) to hold gear (227).

19. Install plate (222) to motor housing (254) and secure with lockwashers (221) and capscrews (220).
20. Install power unit assembly to trolley side plate (106). Secure with lockwashers (116) and nuts (117).
21. Test trolley and hoist operation as described in the "MAINTENANCE" section under "Testing", prior to returning to general use.

Trolley Assembly

Assemble trolley as described in the "INSTALLATION" section.

Testing

Prior to initial use, all new, extensively repaired, or altered trolleys shall be tested by, or under the direction of a person trained in maintenance and repair of this trolley and a written report furnished confirming the rating of the tested equipment.

⚠WARNING

• Only attach a hoist having a rated capacity equal to or less than the capacity of the trolley.

Trolley Operational Test

To ensure proper operation of the trolley conduct the following:

1. On powered trolleys, verify that pendant to trolley hoses are properly attached and that trolley movement agrees with the pendant lever arrows.
2. Operate trolley **without** a load. Verify trolley operates smoothly along entire length of the beam.
3. Operate trolley **with** a load. Verify trolley operates smoothly along entire length of the beam.

Trolley Load Test

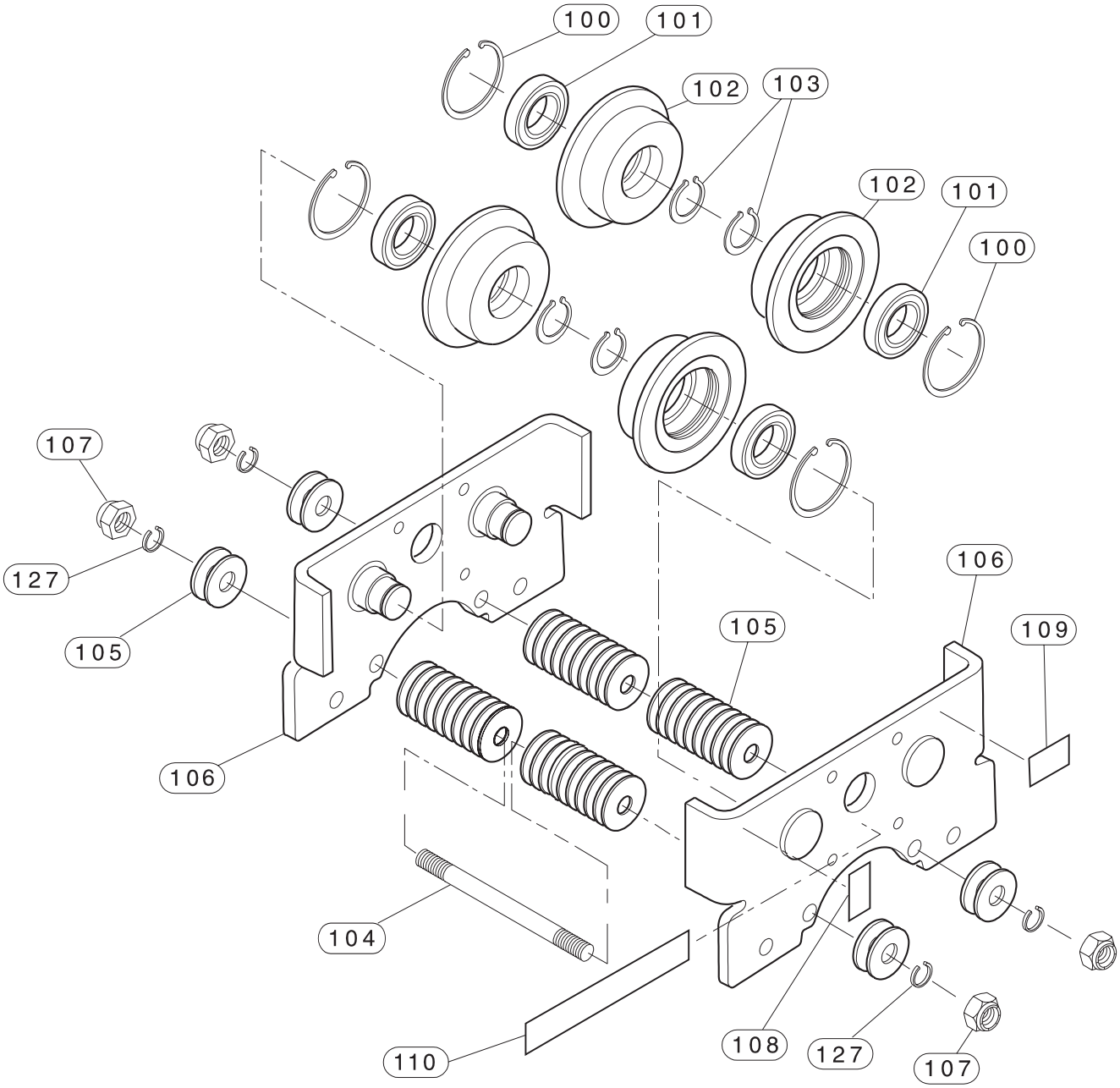
NOTICE

• Conduct load test with hoist attached to trolley. Refer to "SPECIFICATIONS" section in hoist manual for applicable maximum hoist load capacity.

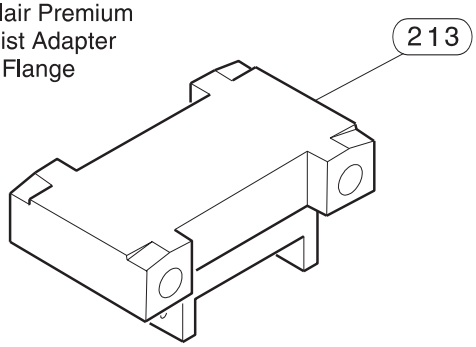
With the hoist properly attached, conduct a load test to 125% of the **rated trolley capacity**.

Testing to more than 125% may be necessary to comply with standards and regulations set forth in areas outside of the USA.

PLAIN TROLLEY ASSEMBLY PARTS DRAWING



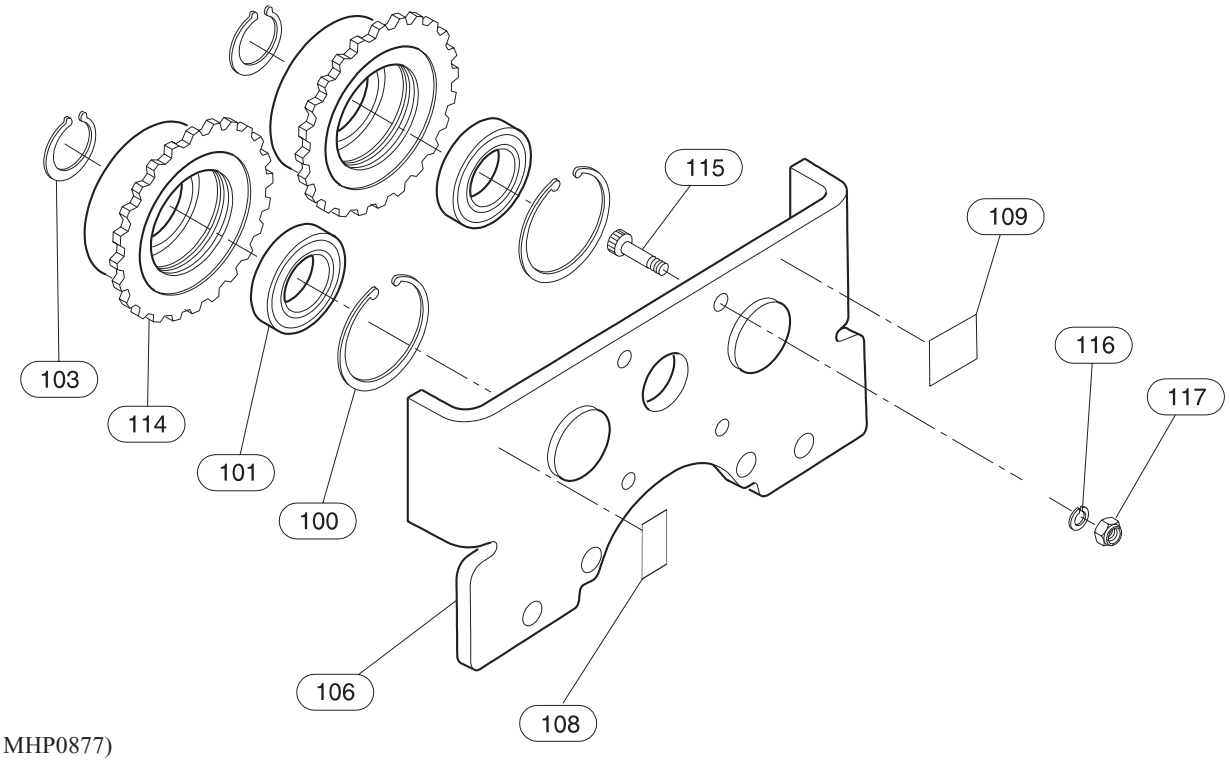
Palair Premium
Hoist Adapter
'A' Flange



Part No. PAL-444TIR-EN* (Palair Premium)
(*Qty. 2 roll pins included)

(Dwg. MHP0876)

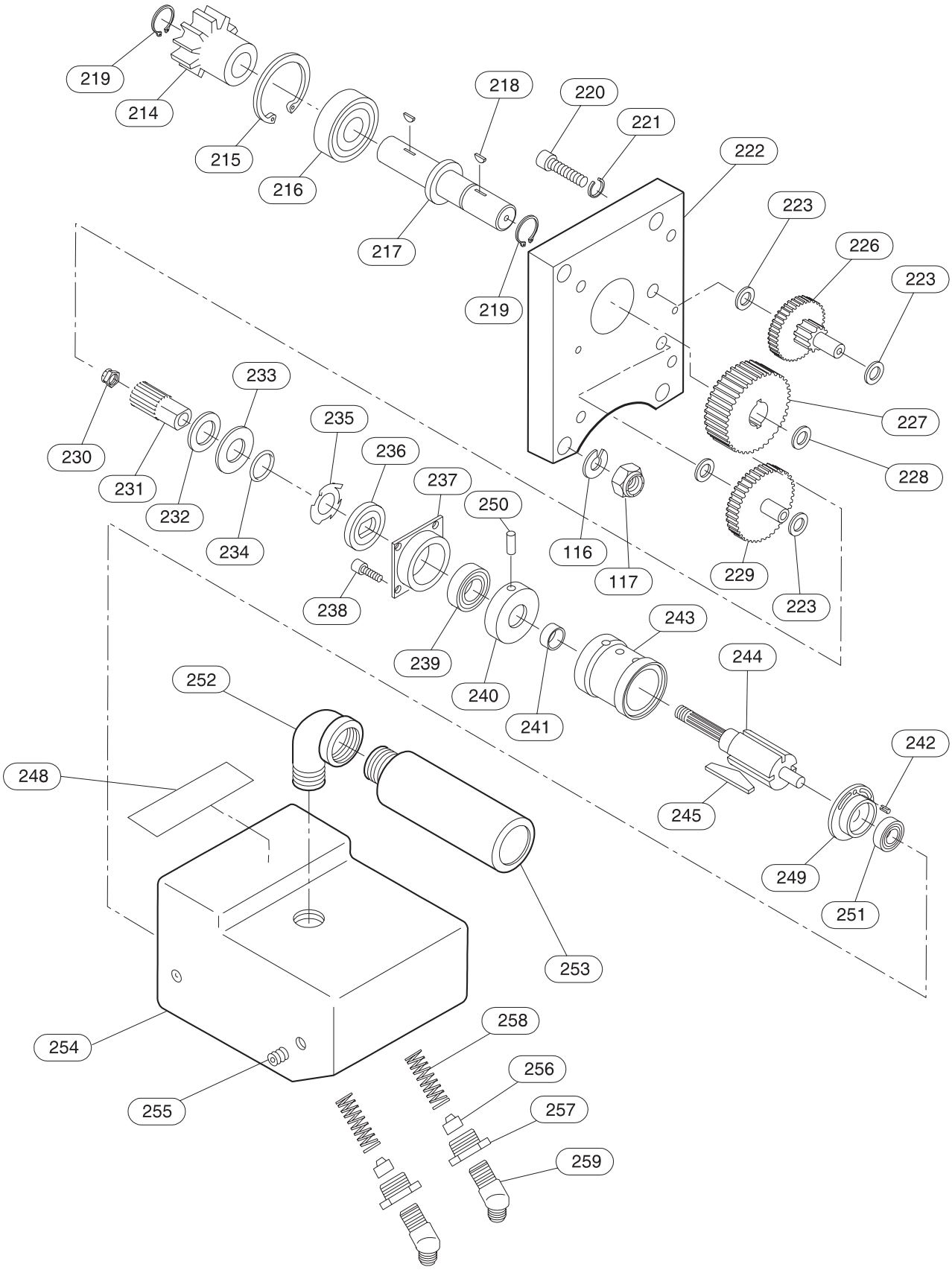
POWERED TROLLEY ASSEMBLY DRAWING AND TROLLEY PARTS LIST



(Dwg. MHP0877)

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.
100	Retainer Ring	4	TP223A-160
101	Bearing	4	150BM-677
102	Wheel Assembly Plain, (incls. items 100, 101 and 102)	4	TR-A431U-EN
	Wheel Assembly Plain, Bronze (incls. items 100, 101 and 102)		TR-A1431U-EN
	Wheel, Plain (wheel only) (electroless nickel)		TR-431U-EN
	Wheel, Plain (wheel only) (Bronze)		TR-1431U-EN
103	Retainer Ring	4	CE210-209-EN
104	Suspender Bolt Kit (incls. items 105 and 107)	2	49558
	Suspender Bolt		43009
105	Spacer	84	43014
106	Side Plate	2	TR-SIDEPLATE-EN
107	Nut	4	Y12-12
108	Warning Label	1	04306445
109	Nameplate	1	71307516-R
110	Ingersoll-Rand Label	1	71106249
114	Wheel Assembly Geared, (incls. items 100, 101 and 114)	2	TR-A472U-EN
	Wheel Assembly Geared, Bronze (incls. items 100, 101 and 114)		TR-A1472U-EN
	Wheel, Geared (wheel only)		Order Wheel Assembly
	Wheel, Geared, (wheel only) Bronze		
115	Stud	4	TR-STUD
116	Lockwasher	4	T11-58
117	Nut	4	VRH-169
127	Lockwasher	4	Y14-750
213	Hoist Adapter	1	PAL-444TIR-EN

POWER UNIT ASSEMBLY PARTS DRAWING



(Dwg. MHP0673)

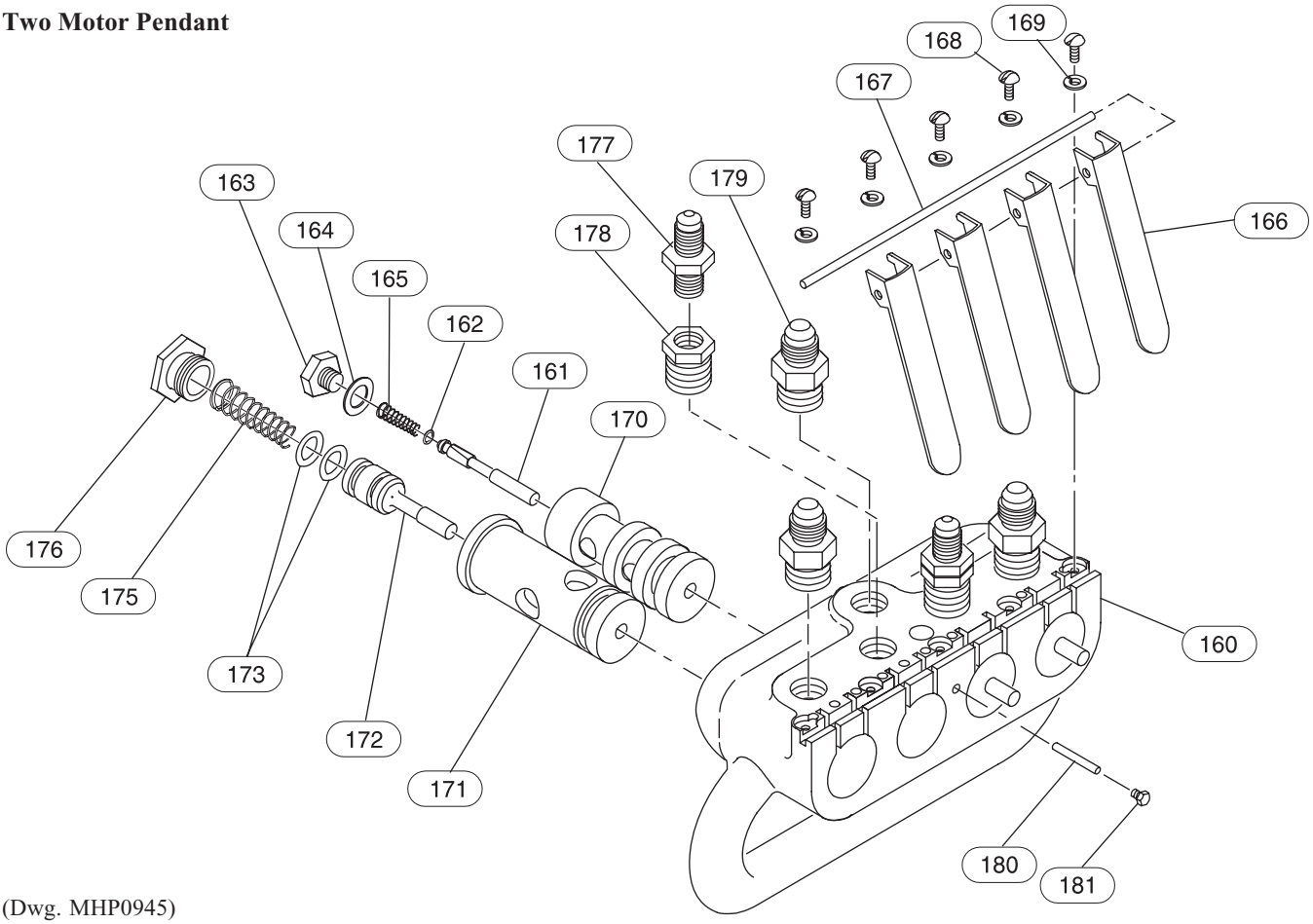
POWER UNIT ASSEMBLY PARTS LIST

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.
- - -	Power Unit Assembly (items 214 thru 259)	1	49574
- - -	Motor Assembly (items 239 to 245 and 249 to 251)	1	45612
116	Lockwasher	4	T11-58
117	Nut	4	VRH-169
214	Pinion Gear	1	45624
• 215	Retaining Ring	1	Y147-16
• 216	Bearing	1	39163
217	Spindle Shaft	1	45606
218	Key	2	37142
219	Retaining Ring	2	Y145-18
220	Capscrew	4	Y99-42
221	Lockwasher	4	Y14-416-C
222	Plate Assembly (incls. 42866 needle bearings (2))	1	49573
223	Washer	4	Y48-14
226	Gear	1	44768
227	Gear	1	44020-1
228	Thrust Race	1	42384
229	Gear	1	44767
230	Nut	1	Y192-1-Z
231	Pinion Shaft	1	45608
232	Spacer	1	37128
233	Washer	1	73473
• 234	"O" Ring	1	Y325-13
• 235	Finger Spring	1	30297
• 236	Brake Lining	1	45619
237	Brake Cone	1	45617
238	Capscrew	4	Y154-52
• 239	Bearing	1	30469
240	End Plate	1	45620
241	Spacer	1	30437
242	Roll Pin (included with cylinder, item 243)	2	Y178-20
243	Cylinder (incls. roll pin, item 242)	1	37683
244	Rotor	1	45605
• 245	Rotor Blade	4	30741
248	Label Plate	1	71079867
249	End Plate	1	31601
250	Pin	1	32814
• 251	Bearing	1	Y65-7
252	Elbow	1	Y43-3-C
253	Muffler	1	43874-1
254	Motor Housing	1	45613
255	Pipe Plug	2	Y227-2
256	Piston	2	45603
257	Inlet Adapter	2	45609
• 258	Spring	2	45793
259	Hose Adapter	2	TR-2023-4-6S

• Recommended spare.

TROLLEY AND HOIST PENDANT CONTROL PARTS DRAWING

Two Motor Pendant



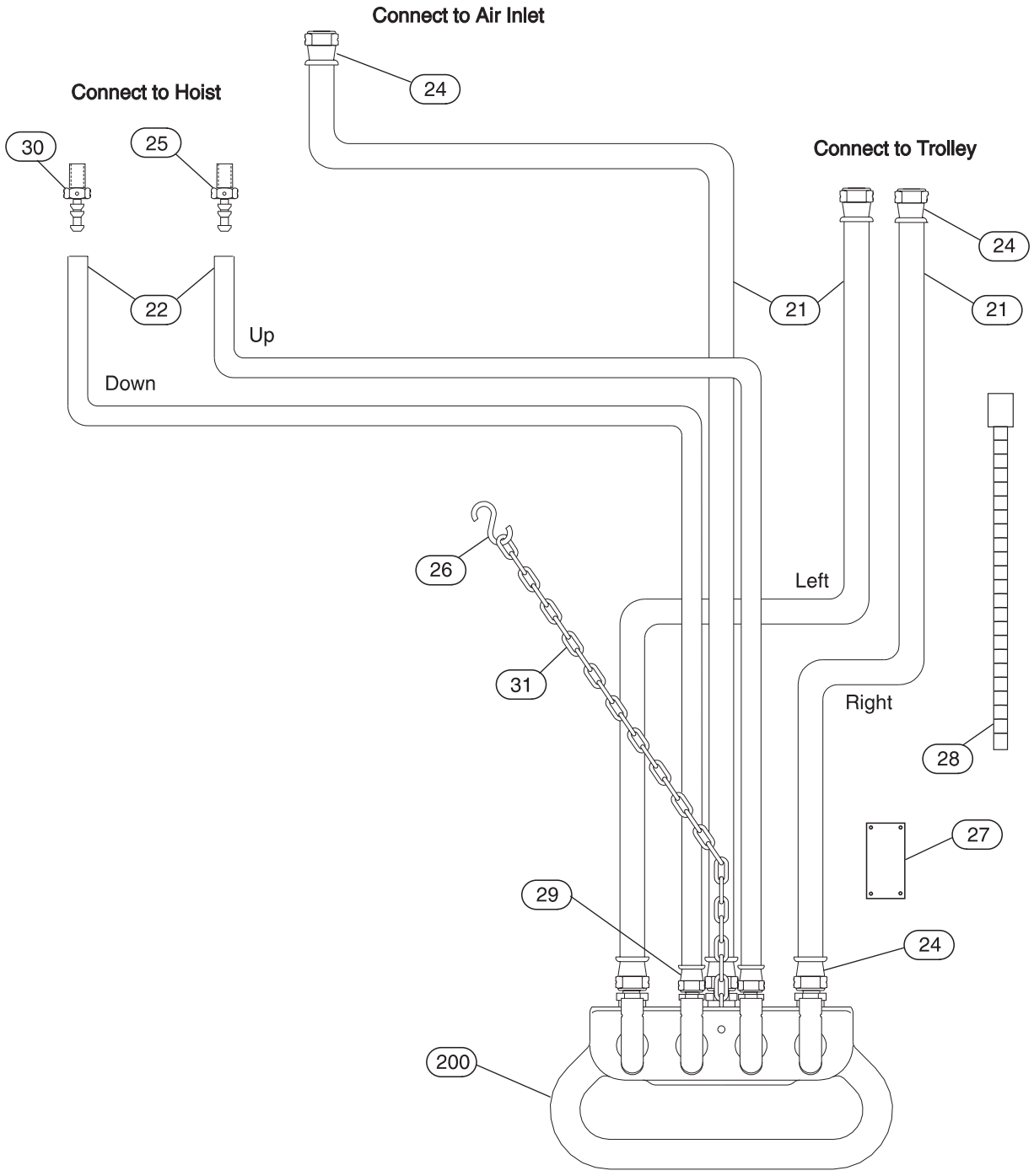
(Dwg. MHP0945)

TROLLEY AND HOIST PENDANT CONTROL PARTS LIST

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.
200	Trolley Pendant Control Assembly (Four Lever)	1	HRA-A122C-EN
160	Pendant Housing	1	D02-122X-EN
161	Throttle Valve	2	MLK-264B
• 162	"O" Ring	2	R000BR1C-283
163	Valve Cap	2	MLK-266A
• 164	Cap Gasket	2	MLK-504
165	Spring	2	MLK-51A
166	Lever	4	MR-273
167	Pin	1	D02-125A
168	Screw	5	MLK-SR662
169	Lockwasher	5	D02-138
170	Bushing	2	PILOT-263
171	Bushing	2	D02-263A
172	Throttle Valve	2	MR-264
• 173	"O" Ring	4	AF120-289
175	Spring	2	D01-51A
176	Valve Cap	2	D02-180A
177	Fitting (Hoist Signal Hose)	2	UWD-170
178	Fitting	2	HRA-802
179	Fitting (Pendant Supply and Trolley Signal Hose)	3	71009815
180	Pin	1	MR-15
181	Screw	1	H54U-561

• Recommended Spare

PENDANT HOSE ASSEMBLY PARTS DRAWING



(Dwg. MHP0878)

PENDANT HOSE ASSEMBLY PARTS LIST

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.
200	Pendant Assembly (Four Lever)	1	HRA-A122C-EN
*	Exhaust Valve Assembly (50 ft)	2	20417
21	Hose (Trolley Supply) 3/8 in. I.D.	specify length	BH6C
22	Hose (Hoist Signal) 1/4 in. I.D.		50923
24	Hose Fitting	6	53954
25	Fitting	1	22812-1
26	S-Hook	2	D02-421
27	Warning Tag (Four Lever)	1	71059612
28	Tie Strap	6	HRE20A-283
29	Hose Fitting	2	51029
30	Fitting	1	22812-2
31	Strain Relief Chain (Specify Length)	1	CA110-B240

* Not Shown

KITS AND ACCESSORIES

DESCRIPTION	PART NO.
Lubricant	LUBRI-LINK-GREEN
Grease (EP#1)	ARO 33153
Lubricator (1/2 inch NPT inline)	L20-04-000
Lubricator (1/2 inch BSP inline)	L26-04-A29
Air Filter (NPT)	F20-04-000
Air Filter (BSP)	F26-C4-A29
Power Unit Mounting Kit (incls. items 115, 116 and 117)	TR-KSTUDA
Pendant Kit (4 Lever) (incls. items 24, 26, 27, 28, 29 and 200)	MLK-K122B-EN

Additional Parts, Operation and Maintenance Manuals which may be used with these trolleys.

DOCUMENT	FORM NO.
Palair Premium Air Hoist Manual	SAM0040

PARTS ORDERING INFORMATION

The use of other than **Ingersoll-Rand** Material Handling replacement parts may invalidate the Company's warranty. For your convenience and future reference it is recommended that the following information be recorded.

Trolley Model Number_____

Trolley Serial Number _____

Air Motor Serial Number _____

Date Purchased _____

When ordering replacement parts, please specify the following:
1. Complete model number and serial number as it appears on the nameplate.
2. Part number(s) and part description as shown in this manual.
3. Quantity required.

Continuing improvement and advancement of design may cause changes to this trolley 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 trolley has expired, it is recommended that the trolley be disassembled, degreased and parts separated as to materials so that they may be recycled.

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.

NOTICE

• Ingersoll-Rand Replacement Parts are specifically designed to ensure optimum performance of your equipment.
• The use of other than genuine Ingersoll-Rand Material Handling parts specifically manufactured for this product may adversely affect approvals to operate this trolley in clean room environments.

For additional information contact:

Ingersoll-Rand Material Handling
P.O. Box 24046
2724 Sixth Avenue South
Seattle, WA 98124-0046 USA
Phone: (206) 624-0466
Fax: (206) 624-6265

or

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

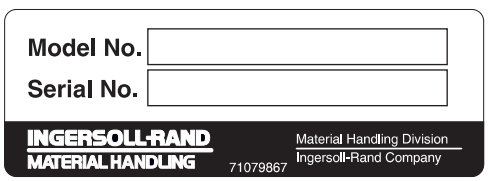
TROLLEY AND AIR MOTOR LABELS

NOTICE

• Trolley label is located on side plate. Air motor label is located on air motor housing.

Each trolley is supplied from the factory with the trolley and air motor labels shown. If a label is not attached to your unit, order a new label and install it. Refer to the parts list for the part numbers. Labels may not be shown actual size.

Trolley Air Motor Label:



Trolley Label:

HOIST AND WINCH LIMITED WARRANTY

Ingersoll-Rand Company (**I-R**) warrants to the original user its Hoists and Winches (Products) to be free of defects in material and workmanship for a period of one year from the date of purchase. **I-R** will repair, without cost, any Product found to be defective, including parts and labor charges, or at its option, will replace such Products or refund the purchase price less a reasonable allowance for depreciation, in exchange for the Product. Repairs or replacements are warranted for the remainder of the original warranty period.

If any Product proves defective within its original one year warranty period, it should be returned to any Authorized Hoist and Winch Service Distributor, transportation prepaid with proof of purchase or warranty card.

This warranty does not apply to Products which **I-R** has determined to have been misused or abused, improperly maintained by the user, or where the malfunction or defect can be attributed to the use of non-genuine **I-R** parts.

I-R makes no other warranty, and all implied warranties including any warranty of merchantability or fitness for a particular purpose are limited to the duration of the expressed warranty period as set forth above. I-R's maximum liability is limited to the purchase price of the Product and in no event shall I-R be liable for any consequential, indirect, incidental, or special damages of any nature rising from the sale or use of the Product, whether based on contract, tort, or otherwise.

Note: Some states do not allow limitations on incidental or consequential damages or how long an implied warranty lasts so that the above limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which may vary from state to state.

IMPORTANT NOTICE

It is our policy to promote safe delivery of all orders.

This shipment has been thoroughly checked, packed and inspected before leaving our plant and receipt for it in good condition has been received from the carrier. Any loss or damage which occurs to this shipment while enroute is not due to any action or conduct of the manufacturer.

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

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

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

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

United States Office Locations

For Order Entry and Order Status

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

For Technical Support

Ingersoll-Rand
Material Handling
P.O. Box 24046
2724 Sixth Avenue South
Seattle, WA 98124-0046
Phone: (206) 624-0466
Fax: (206) 624-6265

Regional Sales Offices

Chicago, IL
888 Industrial Drive
Elmhurst, IL 60126
Phone: (708) 530-3800
Fax: (708) 530-3891

Detroit, MI
23192 Commerce Drive
Farmington Hills, MI 48335
Phone: (810) 476-6677
Fax: (810) 476-6670

Houston, TX
Suite 150
2500 East T.C. Jester
Houston, TX 77008
Phone: (713) 864-3700
Fax: (713) 864-2244

Los Angeles, CA
11909 E. Telegraph Road
Santa Fe Springs, CA 90670
Phone: (310) 948-4189
Fax: (310) 948-1828

Philadelphia, PA
P.O. Box 425
900 E. 8th Ave., Suite 103
King of Prussia, PA 19406
Phone: (610) 337-5930
Fax: (610) 337-5912

International Office Locations

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

Ingersoll-Rand
Material Handling
P.O. Box 24046
2724 Sixth Avenue South
Seattle, WA 98124-0046
USA
Phone: (206) 624-0466
Fax: (206) 624-6265

Canada
National Sales Office
Regional Warehouse
Toronto, Ontario
51 Worcester Road
Rexdale, Ontario
M9W 4K2
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