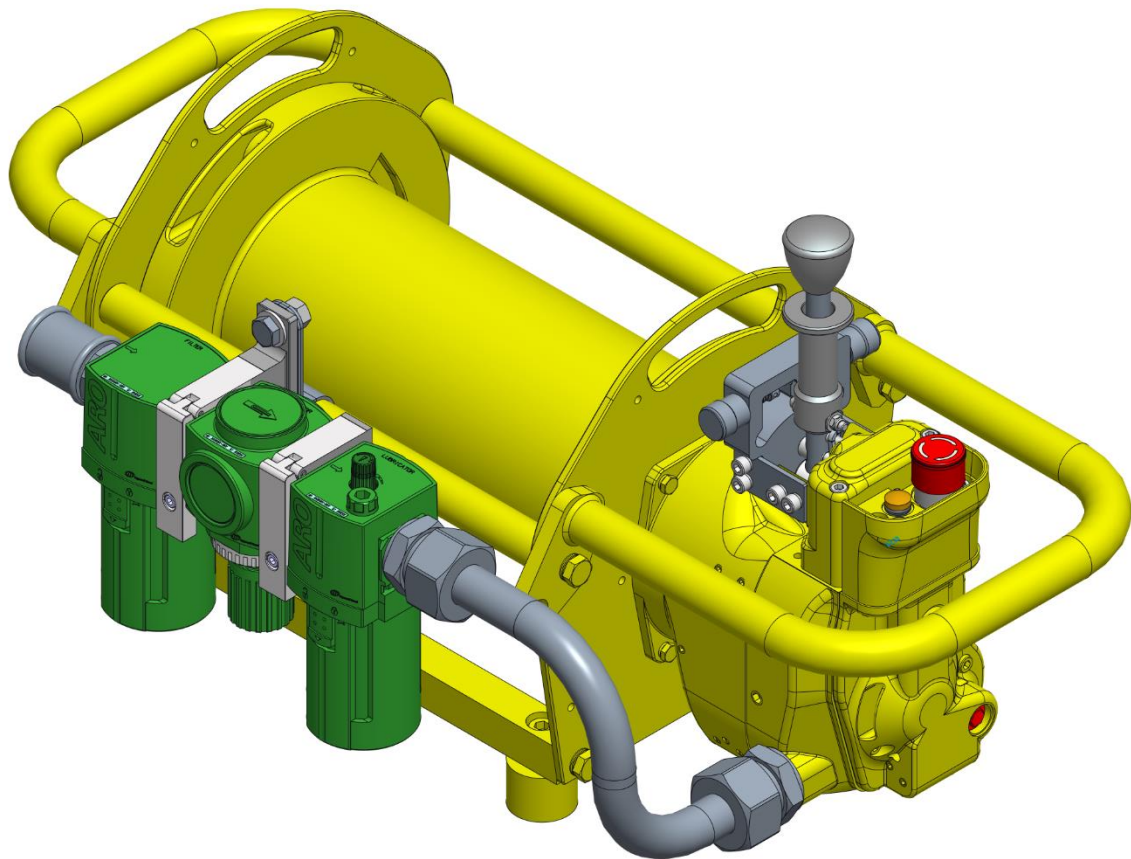


Pullstar Air Winch PS2-220RGC-L-JF123QZ-CK092016A



Product & Parts Information



Form SAM0414
Edition 1
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CCN 47756545001

Only allow Ingersoll Rand trained technicians to perform maintenance on this product. For additional information contact Ingersoll Rand factory or nearest Distributor.

For additional supporting documentation, refer to:

- Product Safety Information Manual MHD56250 (71402598)
- Product Maintenance Information Manual MHD56276 (71432298)

The use of other than genuine Ingersoll Rand replacement parts may result in safety hazards, decreased performance and increased maintenance and will invalidate all warranties.

Original instructions are in English. Other languages are a translation of the original instructions. Refer all communications to the nearest Ingersoll Rand Office or Distributor.


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Product Description

This winch is an air powered planetary gear-designed for pulling applications. The winch utilizes a multi-disc brake which is automatically applied if there is a lack of air pressure. The output from the externally mounted air gear motor is transmitted through a coupling and shaft to the planetary reduction. The planetary reduction drives a ring gear which is connected to the wire rope drum through the output shaft. The brake is spring applied and released by air pressure when the winch is operated. In the event of a loss of air pressure the brake automatically applies.

 This Pullstar winch is in conformity with the most recent European Standards, Classification FEM 1 Bm.

Specification

See the technical data sheet 22-01-04.

This Pullstar winch is designed for pulling with a 3,5:1 minimum safety factor at rated line pull.

The minimum ratio of drum to wire rope diameter is 18:1.

Installation

Prior to installing the winch, carefully inspect it for possible shipping damage. Winches are supplied fully lubricated from the factory. Refer to "Lubrication" section for recommended oils and lubrication intervals.

! WARNING !

Product not installed properly may fall or cause a load to fall resulting in sever injury or death. Before installation, refer to Product Safety Manual and all safety warnings pertaining to this product.

! CAUTION !

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

Mounting

1. Winch mounting surface must be flat and of sufficient strength to handle the rated load plus the weight of winch and attached equipment. An inadequate foundation can cause distortion or twisting of the winch uprights and spacers resulting in winch damage.
2. Make sure the mounting surface is flat to within 0.005 in (0.127 mm) per inch (25 mm) of drum length. Shim if necessary.
3. Mounting bolts must be 3/8 in (10 mm) diameter, Grade 8 or better (class 8.8 or 10.9 for metric bolts). Use selflocking nuts or nuts with lockwashers.
4. Tighten mounting bolts evenly and torque to 50 ft lbs (68 Nm) for dry thread fasteners. If the fasteners are plated, lubricated or a thread locking compound is used, torque to 35 ft lbs (47 Nm).
5. When a lead sheave is used, it must be aligned with the center of the drum. The diameter of the lead sheave must be at least 18 times the diameter of the wire rope.
6. Do not weld to any part of the winch.

Wire Rope

! CAUTION !

- *Maintain at least 3 tight wraps of wire rope on the drum at all times.*
- *Do not use wire rope as a ground (earth) for welding.*
- *Do not attach a welding electrode to winch or wire rope.*

Wire Rope Selection

Consult a reputable wire rope manufacturer or distributor for assistance in selecting the appropriate type and size of wire rope and, where necessary, a protective coating. Use a wire rope which provides an adequate safety factor to handle the actual working load and meets all applicable industry, trade association, federal, state and local regulations.

When considering wire rope requirements the actual working load must include not only the static or dead load but also loads resulting from acceleration retardation and shock load. Consideration must also be given to the size of the winch wire rope drum, sheaves and method of reeving. Maximum wire rope diameter is limited by the wire rope anchor. It is recommended that wire rope construction be 6 X 19 or 6 X 37 IWRC right lay.

Installing Wire Rope

Wire rope storage capacity based on wire rope top layer located a minimum of 1/2 inch (13 mm) below drum flange and meets ASME Standards B30.7. Refer to Dwg. MHP2636.

1. Cut wire rope to length and fuse end to prevent fraying of strands in accordance with the wire rope manufacturer's instructions.
2. Feed the end of the wire rope into the wire rope anchor hole in the drum and pull through approximately one foot (0.3 m) of wire rope.
3. Forming a large loop with the wire rope, insert the end back into the top of the anchor hole.
4. Place the wire rope wedge into the wire rope anchor pocket in the drum. Install the wedge such that the wire rope will wrap around the wedge as shown in Dwg. MHP2636.

5. Pull the wire rope into position in the drum anchor pocket. Use of a copper drift or similar tool may be required to fully insert wire rope and wedge into the anchor pocket. Ensure the loop in the wire rope is below the surface of the drum flange diameter.

! CAUTION !

- *Make sure the first wrap of wire rope is tight and lays flush against the drum flange.*
- *Ensure the correct wire rope anchor is used.*
- *Install wire rope to come off the drum in an overwind position as indicated on the direction of rotation label. Safe Wire Rope Handling Procedure*
- *Always use gloves when handling wire rope.*
- *Never use wire rope that is frayed or kinked.*
- *Never use wire rope as a sling.*
- *Always ensure wire rope is correctly spooled and the first layer is tight against drum.*
- *Always follow wire rope manufacturer's recommendation on use and maintenance of wire rope.*

Wire Rope Spooling

To compensate for uneven spooling and the decrease in line pull capacity as the drum fills up, use as short a wire rope as practical. When rewinding apply tension to the end of the wire rope to eliminate line slack. This helps achieve level winding and tight spooling.

Rigging

Make sure all wire rope blocks, tackle and fasteners have a sufficient safety margin to handle required load under all conditions. Do not allow wire rope to contact sharp edges or make sharp bends which will cause damage to wire rope, use a sheave. Refer to wire rope manufacturer's instructions for proper sizing, use and care of wire rope.

Safe Installation Procedures

1. Do not use wire rope as a ground (earth) for welding.
2. Do not attach a welding electrode to winch or wire rope.

3. Never run wire rope over a sharp edge. Use a correctly sized sheave.

4. When a lead sheave is used, it must be aligned with center of drum. The diameter of lead sheave must be at least 18 times the diameter of wire rope. Refer to Dwg. MHP2449 in Product Safety Information Manual.

5. Always maintain at least three full, tight wraps of wire rope on drum.

Air Supply

The air supply must be clean, free from moisture and lubricated to ensure optimum motor performance. Foreign particles, moisture and lack of lubrication are the primary causes of premature motor wear and breakdown. Using the built-in air filter, lubricator and moisture separator will improve overall winch performance and reduce unscheduled downtime. The compressed air temperature must not exceed 149° F (65° C) at the motor air inlet. Contact the factory for higher temperature use.

Air Lines

Inside diameter of winch air supply lines must not be less than size specified in specification section. Flexible lines should have connectors larger than inside diameter, ie. 1 inch connector to 3/4 inch (19 mm) line. Before making final connections, all air supply lines should be purged with clean, moisture free air or nitrogen before connecting to winch 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 lines.

Air Line Lubricator

Always use an air line lubricator with these motors. The lubricator must have an inlet and outlet at least as large as inlet on motor. The air motor may be operated without lubrication. If an air line lubricator is used, it should be replenished daily and set to provide 2 to 3 drops per minute of ISO VG100 (SAE 30W) oil [minimum viscosity 135 Cst at 104° F (40° C)]. The lubricator must have an inlet and outlet at least as large as the inlet on the motor. Install the lubricator as close to the air inlet on the motor as possible.

! CAUTION !

Shut off air supply before filling air line lubricator.

The air line lubricator should be replenished daily and set to provide 6 to 9 drops per minute of ISO VG 32 (SAE 10W) oil. A fine mist will be exhausted from throttle control valve when air line lubricator is functioning properly.

Air Line Filter

The strainer/filter provides 20 micron filtration and include a moisture trap. Clean the strainer/filter periodically to maintain its operating efficiency.

Air Pressure Regulator

It is a built-in device, set to 6,3 bar in factory.

Moisture in Air Lines

Moisture that reaches the air motor through air supply lines is a primary 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 motor, or an aftercooler at compressor that cools air to condense and collect moisture prior to distribution through supply lines, are also helpful.

Exhaust

Check exhaust outlets periodically to ensure they are functioning correctly (free from dust and dirt).

Motor

For optimum performance and maximum durability of parts, provide a lubricated air supply with flow and pressure as described in the technical data sheet. The winch should be installed as near as possible to the compressor or air receiver.

Emergency Stop and Overload System

Refer to Dwg. MHP2637. Air supply line is connected to air control valve. When emergency stop or overload valve is activated, all winch movement will stop.

Initial Winch Operating Checks

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

1. When first running the motor inject a small amount of light oil into the inlet connection to provide initial lubrication.
2. Check oil level in motor, reduction gear assembly and disc brake are correct. Top off levels as required before operation as described in the "Lubrication" section.
3. Operate winch in both directions with no load for one to two minutes.
4. Check operation of brakes. Adjust if necessary as described in "MAINTENANCE" section in the Product Maintenance Information Manual.
5. Check foundation mounting fasteners are secure.
6. Install winch guard when provided.

For winches that have been in storage, the following start-up procedures are required:

1. Give the winch an inspection conforming to requirements of "Winches Not in Regular Use" section.
2. Pour a small amount of ISO VG 32 (SAE 10W) oil in motor inlet port.
3. Operate motor for 10 seconds in both directions to flush out any impurities.
4. The winch is now ready for normal use.

Start-Up Procedures

For winches that have been in storage the following start-up procedures are required.

1. Give the winch an inspection conforming to the requirements of "Winches Not in Regular Use" section.
2. Inject a small amount of ISO VG 32 (SAE 10W) oil in the motor inlet port.
3. Operate the motor for 10 seconds in both directions to flush out any impurities.
4. The winch is now ready for normal use.

Operation

It is recommended that the user and owner check all appropriate and applicable regulations before placing this product into use. Refer to the Product Safety Information Manual.

! WARNING !

The winch is not designed or suitable for lifting, lowering or moving people. Never lift loads over people. The winch operator must be carefully instructed in his duties and must understand the operation of the winch, including a study of the manufacturer's literature. It is the operator's responsibility to refuse to operate the winch under unsafe conditions.

Winch control

The spring loaded, motor mounted, live air manual throttle control valve is supplied as a standard feature. The throttle control provides operator control of the motor speed and direction of drum rotation.

Winch throttle

Refer to Dwg. MHP2623.

The winch control throttle valve is spring loaded, full flow air and mounts to the motor rotary housing. To operate control valve, shift control handle in desired direction to payout or haul-in wire rope. As viewed from air motor end, move control throttle handle to the right (clockwise) to payout wire rope and to the left (counterclockwise) to haul-in wire rope. Avoid sudden movements of handle to ensure smooth operation of winch.

To lock the lever for low speed operation, lift up the slider and engage it behind the cleat. You can adjust the speed by turning the setting buttons. See drawing page 23.

To stop the operation, slide down the slider and released the handle, it will return to neutral or center position.

Emergency Stop

Refer to Dwg. MHP2623 and MHP1892. The emergency stop button is located at air inlet of winch on local control models. When activated, winch drum rotation will immediately cease.

1. To start winch operation depress the "ON" button.

2. To operate winch, operate appropriate 'Haul-in' or 'Payout' lever.

3. In event of an emergency all winch operation can be stopped by pushing the emergency stop button. This will prevent air from reaching winch motor, engage winch automatic brake(s) and stop winch haul-in or payout movement.

4. To reset Emergency Stop Valve:

a. Rotate emergency stop button clockwise, till emergency stop button 'pops up'.

b. Depress emergency stop valve 'ON' button.

Inspection

1. Check winch for oil leaks daily. Immediately repair any leaks.
2. Inspect drum brakes for wear daily, if equipped. Replace brake bands that are worn or have metal to metal contact between the drum and the band.
3. At the beginning of each shift operate the winch in both directions without a load. Ensure the motor runs free, and that the brake(s) do not drag.
4. Keep winch housings clean of dust and dirt build up which can cause heat build up. Inspection information is based in part on American Society of Mechanical Engineers (ASME B30.7).

! WARNING !

- *All new or repaired equipment should be inspected and tested by Ingersoll Rand trained Technicians to ensure safe operation at rated specifications before placing equipment in service.*
- *Never use a winch that inspection indicates is damaged.*

Frequent and periodic inspections should be performed on equipment in regular service. Frequent inspections are visual examinations performed by operators or Ingersoll Rand trained Inspectors and include observations made during routine equipment operation. Periodic inspections are thorough inspections conducted by Ingersoll Rand trained Technicians. ASME B30.7 states inspection intervals depend upon the nature of the critical components of the equipment and the severity of usage. Refer to 'Inspection Classifications' chart and 'Maintenance Intervals' chart in Product Maintenance Information Manual for recommended maintenance intervals. Careful inspection on a regular basis will reveal potentially dangerous conditions while still in the early stages, allowing corrective action to be taken before the condition becomes dangerous. Deficiencies revealed through inspection, or noted during operation, must be reported to designated personnel to ensure corrective action is taken. A determination as to whether a condition constitutes a safety hazard(s) must be decided, and the correction of noted safety hazard(s) accomplished and documented by written

report before placing the equipment in service.

Wire Rope Reports

Records should be maintained as part of a long-term wire rope inspection program. Records should include the condition of wire rope removed from service. Accurate records will establish a relationship between visual observations noted during frequent inspections and the actual condition of wire rope as determined by periodic inspections.

Frequent Inspection

On equipment in continuous service, frequent inspection should be made by operators at the beginning of each shift. In addition, visual inspections should be conducted during regular operation for indications of damage or evidence of malfunction.

1. Winch: Prior to operation, visually inspect winch housings, control, spacers and drum for indications of damage. Any discrepancies noted must be reviewed and inspected further by an Ingersoll Rand Certified Service Technician.
2. Wire Rope: Visually inspect all wire rope which can be expected to be in use during the day's operations. Inspect for wear and damage indicated by distortion of wire rope such as kinking, "birdcaging," core protrusion, main strand displacement, corrosion, broken or cut strands. If damage is evident, do not operate winch until the discrepancies have been reviewed and inspected further by personnel knowledgeable on wire rope safety and maintenance procedures.

! NOTICE !

The full extent of wire rope wear cannot be determined by visual inspection. At any indication of wear inspect the wire rope in accordance with instructions in "Periodic Inspection." Refer to Product Maintenance Information Manual.

3. Wire Rope Reeving: Check reeving and ensure wire rope is properly secured to the drum. Do not operate the winch unless the wire rope feeds onto and off of the drum smoothly.

4. Air System: Visually inspect all connections, fittings, hoses and components for indication of air leaks. Repair any leaks or damaged components.
5. Controls: During operation of winch, verify response to control is quick and smooth. If winch responds slowly or movement is unsatisfactory, do not operate winch until all problems have been corrected. Lever must return to neutral when released.
6. Brake: During winch operation test brake. Brake must be capable of supporting the load without slipping. Brake must release when winch motor throttle is operated. If brake does not hold load, or does not release properly, the brake must be inspected further by Ingersoll Rand Certified Service Technicians.

! WARNING !

Worn or improperly functioning brakes may cause excessive heat build up or sparks.

7. Lubrication: Refer to the “Lubrication” section for recommended procedures and lubricants.
8. Labeling / Marking: Data (name) plate is attached and legible. Warning tags and labels are attached, legible and in correct places on winch.

Winches Not in Regular Use

1. Equipment which has been idle for a period of one month or more, but less than six months, shall be given an inspection conforming to the requirements of ‘Frequent Inspection’ before being placed in service.
2. Equipment 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 in service. Refer to Product Maintenance Information Manual.
3. Standby equipment shall be inspected at least semi-annually in accordance with the requirements of ‘Frequent Inspection’.
4. All oils must be drained and replaced with new, and all grease cavities shall be packed to the prescribed limit. Refer to “Lubrication” section. Product must be operated for at least 15 seconds in both directions with well lubricated, dry air.

Storing The Winch

1. Always store the winch in a no load condition.
2. Wipe off all dirt and water.
3. Oil the wire rope.
4. Place in a dry location.
5. Before returning winch to service, follow instructions for “Winches Not in Regular Use” section.

Lubrication

To ensure continued satisfactory operation of the winch, all points requiring lubrication must be serviced with correct lubricant at the proper time interval as indicated for each assembly. Lubrication intervals recommended in this manual are based on intermittent operation of winch, eight hours each day, five days per week. If winch is operated almost continuously or more than eight hours each day, more frequent lubrication will be required. Also, lubricant types and change intervals are based on operation in an environment relatively free of dust, moisture, and corrosive fumes. Use only those lubricants recommended. Other lubricants may affect performance of winch. Approval for the use of other lubricants must be obtained from your Ingersoll Rand distributor. Failure to observe this precaution may result in damage to the winch and its associated components.

Interval	Lubrication Checks
Start of each shift	If used, check flow and level of air line lubricator (approximately 2 to 3 drops per minute required at maximum motor speed).
Monthly	Lubricate components supplied by grease fittings. Inspect and clean or replace air line filter.
Yearly	Drain and refill winch reduction gear oil (winch disassembly required).

Note: Intervals are based on winch operation in a normal environment as described in "Inspection" section. In 'Heavy' or 'Severe' operating conditions adjust lubrication intervals accordingly.

General

! WARNING !

Pneumatic Winches use oil to prevent excessive heat build up and to prevent wear that could cause sparks. Oil levels must be properly maintained.

Always collect lubricants in suitable containers and dispose of in an environmentally safe manner.

Reduction Gear Assembly

Replace the oil in the reduction housing once every year. If the winch is used at a normal frequency, the oil in the reduction housing is suitable for one year's operation without being changed. However, when the winch is used at a high frequency, the oil may need to be changed more often. To replace oil, disassemble winch and reduction gear assembly as described in the Product Maintenance Information manual. To ensure correct performance, highest efficiency and long life, it is essential that the lubricating oil be maintained at the correct level. The recommended grade of oil must be used at all times since the use of unsuitable oil may result in excessive temperature rise, loss of efficiency and possible damage to the gears.

! NOTICE !

Use only synthetic oil, Mobil SHC 629.

To replace oil remove plug and add 0.12 litres (4.05 oz) of oil to the reduction gear assembly, replace plug.

The gear box is filled in factory with MOTUL TECH GEAR SY150, use the same or equivalent.

Drum Wear Rings

Before re-assembling winch, apply a small amount of grease on inner edge of drum where the wear rings will sit. Use Mobilgrease XHP 222 or equivalent.

Seals and Bearings

If winch is disassembled, clean all parts thoroughly and coat bearings and seals with clean grease. Use sufficient grease to provide a good protective coat.

Wire Rope

Follow the wire rope manufacturer's instructions. At a minimum, observe the following guidelines.

1. Clean with a brush or steam to remove dirt, rock dust or other foreign material on the surface of the wire rope.

! CAUTION !

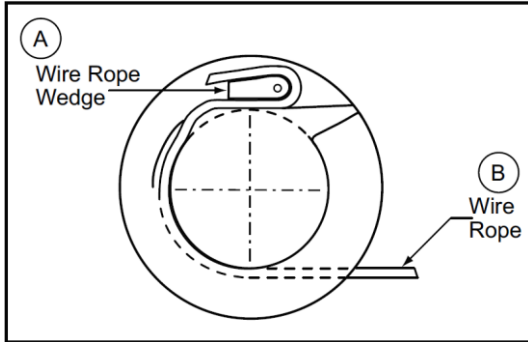
Do not use an acid-based solvent. Only use cleaning fluids specified by the wire rope manufacturer.

2. Apply a wire rope lubricant, Ingersoll Rand LUBRILINK-GREEN® or ISO VG 100 (SAE 30W) oil.

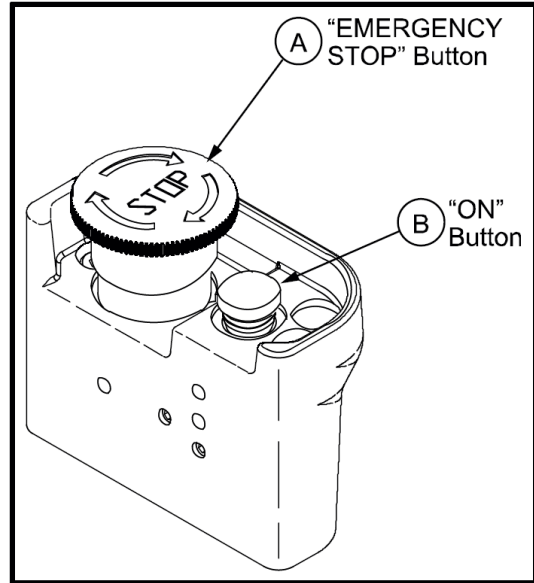
3. Brush, drip or spray lubricant weekly, or more frequently, depending on severity of service.

Product Information Graphics

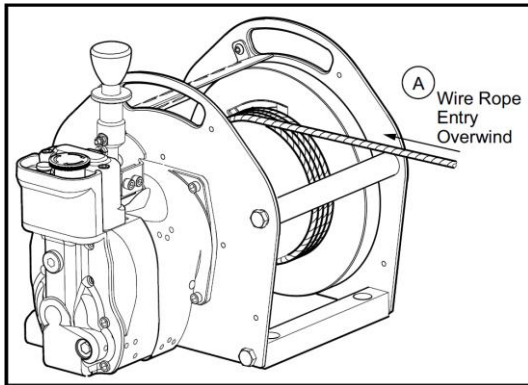
MHP2636



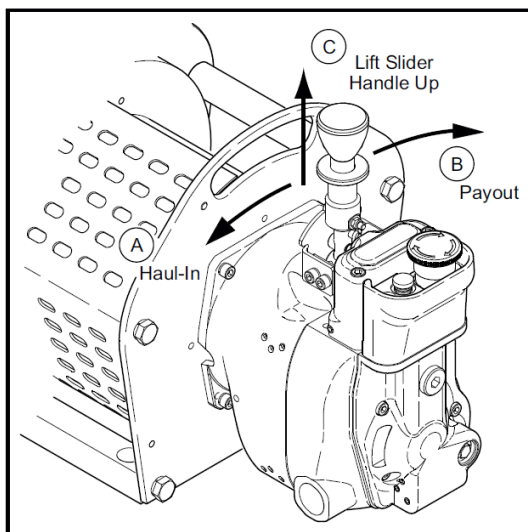
MHP2637



MHP2624



MHP2623



Parts ordering information

These products are designed and constructed to provide long, trouble-free service. In time it may be necessary to order and install new parts to replace those that have been subjected to wear. For your convenience and future reference, it is recommended that the following information be recorded.

Model Number _____

Serial Number _____

Date Purchase _____

When ordering replacement parts, please specify the following:

1. Complete model number and serial number as it appears on the data (name) plate.
2. Part number(s) and part description as shown in this manual.
3. Quantity required.

The data (name) plate is located on the product.

! NOTICE !

Continuing improvement and advancement of design may cause changes to this equipment which are not included in this manual. Manuals are periodically revised to incorporate changes.

The use of other than genuine Ingersoll Rand replacement parts may result in safety hazards, decreased performance and increased maintenance, and will invalidate all warranties.

Return Goods Policy

Ingersoll Rand will not accept any returned goods for warranty or service unless prior arrangements have been made and written authorization has been provided from the location the goods were purchased. Products that have been modified without Ingersoll Rand approval, mishandled or overloaded will not be repaired or replaced under warranty. A printed copy of the warranty that applies to this product is provided inside the back cover of the product information manual or in some cases the parts manual.

Disposal



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

Ingersoll Rand Douai Operations

529, Avenue Roger Salengro

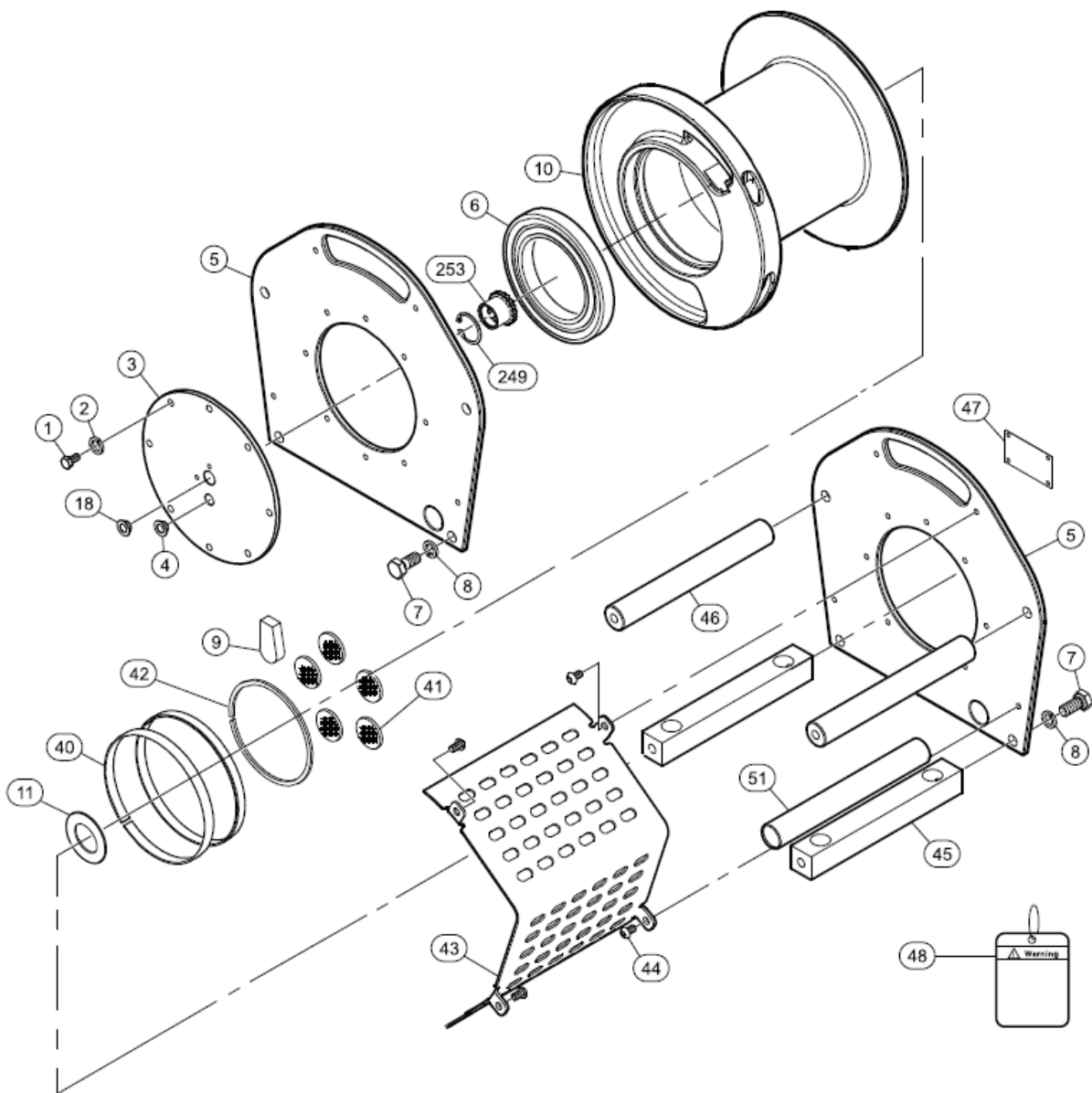
59450 Sin Le Noble, France

Phone: (33) 03-27-93-08-08

Fax: (33) 03-27-93-08-00

Winch assembly (parts list)

Drawing MHP2618



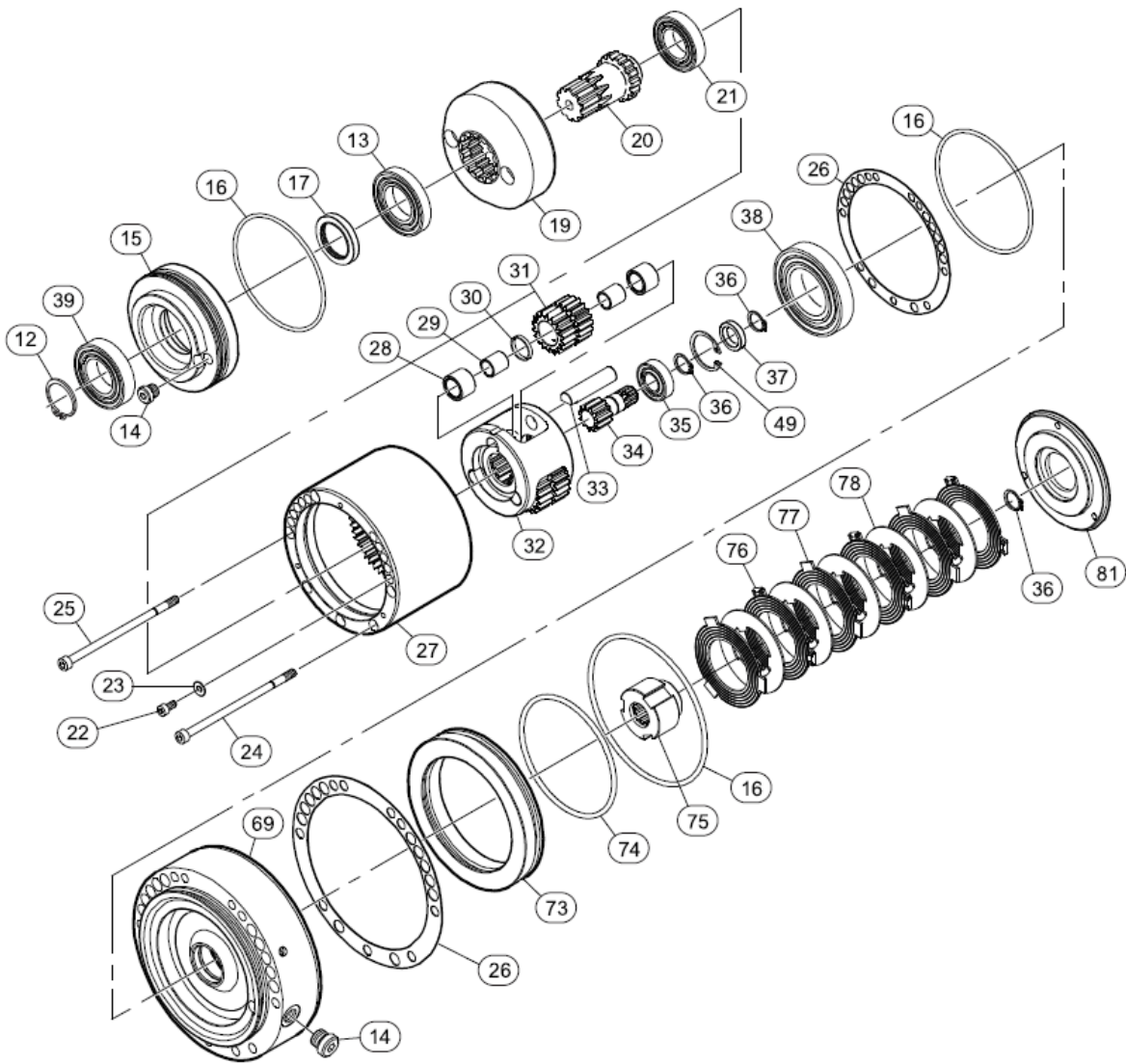
Item No.	Description of Part	Total Qty	Part Number (CCN)
1	Capscrew	8	4102-2301 (38598546)
2	Lockwasher	8	4520-1006 (38540142)
3	End cover	1	9644-2058 (38578829)
4	Plug	1	6696-2941 (38603684)
5	Upright	2	9644-2054 (38593745)
6	Bearing	1	5080-0016 (38637286)
7	Capscrew	8	4102-2501 (38605218)
8	Lockwasher	8	4520-1010 (38634226)
9	Wedge for \varnothing 4 nylon rope	1	9652-3527 (47719650001)
10	Long drum	1	9644-2089 (38594727)
11	Spacer	1	9644-2059 (38578837)
18	Plug	1	6696-2841 (38603676)
40(a)	Wear ring	2	9618-0058 (38522108)
41(a)	Exhaust washer	5	6760-0303 (38535621)
42	Retainer ring	1	4782-9332 (38636049)
43	Guard (Long Drum)	1	Not supplied
44	Capscrew	4	Not supplied
45	Spacer	2	9644-2144 (38597639)
46	Spacer	2	9644-2143 (38597621)
47	Data (name) plate	1	6676-3141-R (38605994)
48	Warning tag	1	7106-0529 (71424782)
249	Retainer ring	1	4770-3050 (38748844)
253	Gear	1	9644-2060 (38578845)
*(b)	Drum guard tag	1	Not supplied

(a) Recommended spares

(b) Item is not illustrated.

Brake and reduction gear assembly (parts list)

Drawing MHP2647

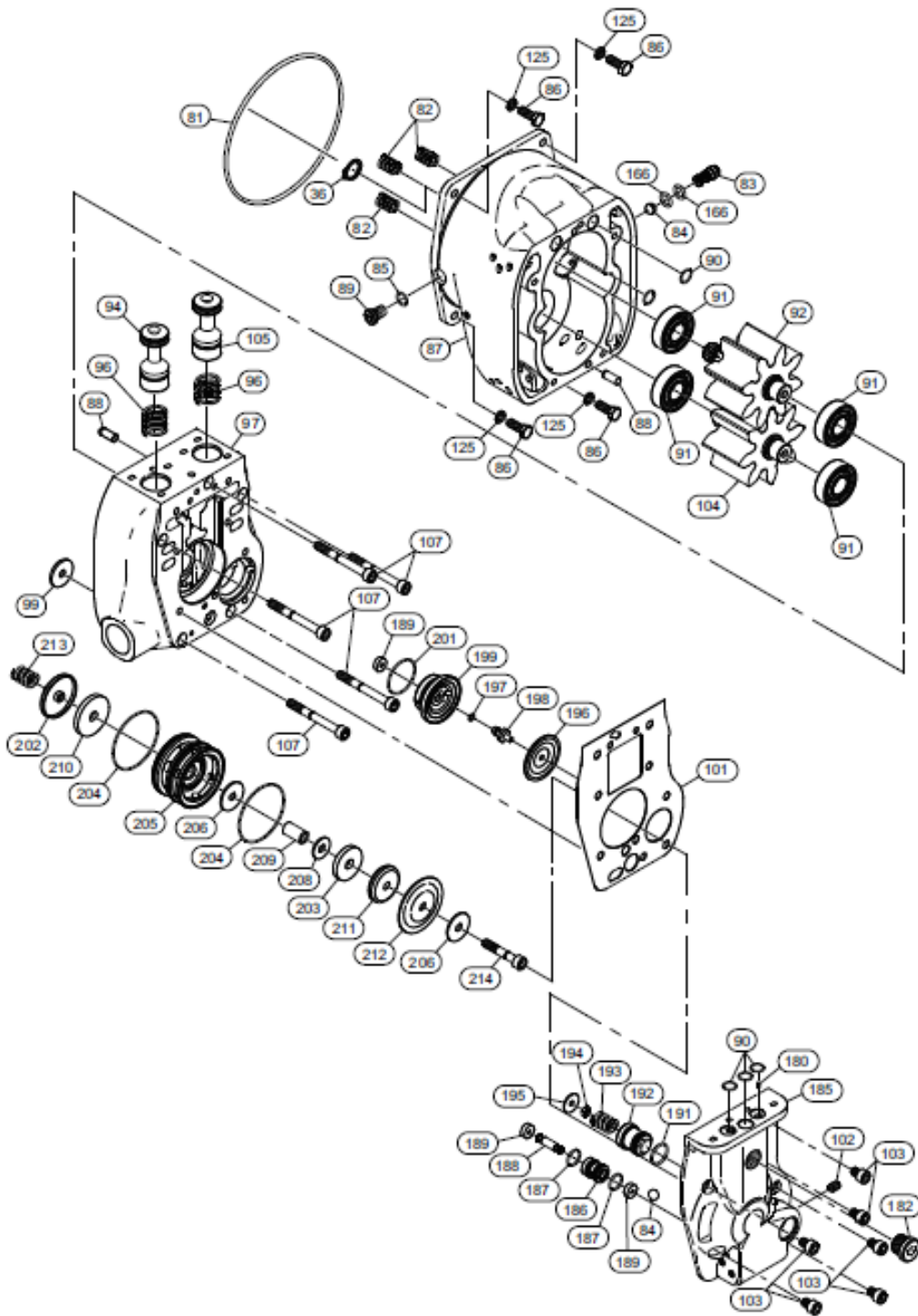


Item No.	Description of Part	Total Qty	Part Number (CCN)
12	Retainer Ring	1	4770-0029 (38522272)
13	Bearing	1	5080-0006 (38522157)
14	Plug	2	6511-0441 (38648184)
15	Reduction Gear End Cover	1	9644-2010 (38577854)
16	'O' Ring	3	5823-5229 (38548236)
17	Oil Seal	1	5801-3430 (38533212)
19	Ring Gear (47t) (LS2-300R)	1	9644-1200 (38750121)
	Ring Gear (48t) (LS2-600R/PS2-1000R)	1	9644-1003 (38577698)
20	Sliding Gear	1	9644-2011 (38577862)
21	Bearing	1	5080-0005 (38522140)
22	Capscrew	3	4132-6306 (38543427)
23	Washer	3	4500-1105 (38633806)
24	Capscrew	1	4133-2506 (38597563)

Item No.	Description of Part	Total Qty	Part Number (CCN)
25	Capscrew	5	4133-2406 (38597548)
26	Gasket	2	9644-1048 (38578258)
27	Reducer Housing	1	9644-1007 (38577714)
28	Needle Bearing	6	5656-2141 (38597225)
29	Bearing Ring	6	5636-2041 (38597217)
30	Spacer	3	9644-1047 (38578134)
31	Planet Gear (19-17t) (LS2-300R)	3	9644-1201 (38750139)
	Planet Gear (48t) (LS2-600R/PS2-1000R)	3	9644-1002 (38577672)
32	Planet Gear Support	1	9644-1006 (38577706)
33	Gear Shaft	3	9644-1046 (38578126)
34	Sun Gear	1	9644-2004 (38577847)
35	Bearing	1	5000-0002 (38522116)
36	Retainer Ring	3	4770-0015 (38522264)
37	Oil Seal	1	5801-9830 (38540456)
38	Bearing	1	5080-0009 (38522165)
39	Bearing	1	5005-0006 (38522124)
49	Retainer Ring	1	4770-3032 (38522280)
69	Brake Housing	1	9644-1012 (38577722)
73	Piston	1	9644-1014 (38578274)
74	'O' Ring	1	5823-5129 (38548228)
75	Splined Hub	1	9644-1013 (38577748)
76	Friction Plate with Springs	3	9644-1552 (38774139)
77	Friction Plate	3	6302-8241 (38548186)
78	Drive Plate	5	6302-8341 (38548194)
81	Brake Reaction Plate	1	9644-1015 (38577763)

Motor assembly (parts list)

Drawing MHP2812

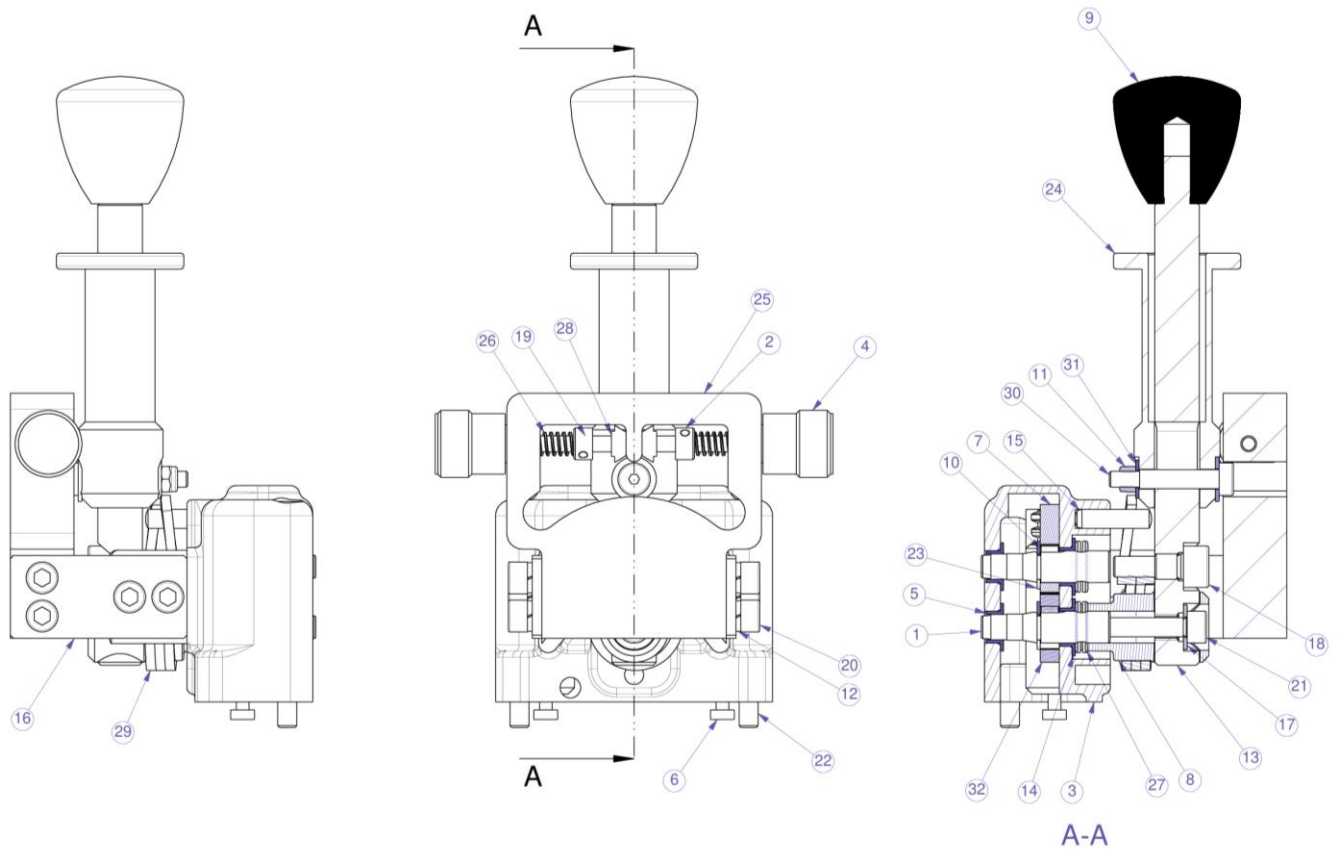


Item No.	Description of Part	Total Qty	Part Number (CCN)
36	Retainer ring	1	4770-0015 (38522264)
82	Spring	3	6913-5142 (47719652001)

Item No.	Description of Part	Total Qty.	Part Number (CCN)
83	Check Valve	1	9647-0229 (38776522)
84	Ball	2	6940-1625 (38542924)
86	Capscrew	4	4102-3001 (38749602)
88	Pin	2	4600-1116 (38522231)
89	Plug	1	Contact Factory
90	'O' Ring	5	5823-7429 (38597241)
91	Bearing	4	5010-0002 (38636742)
92(x)	Drive Gear	1 set	7644-1256 (38760880)
94	Valve, Lowering (Includes 'O' rings)	1	7647-0064 (38759742)
96	Spring	2	6919-0341 (38758272)
97	Motor Cover	1	9647-0044 (DNM38757670)
99	Exhaust Washer	1	9647-0236 (38778304)
101	Gasket	1	9644-1188 (38634770)
102	Screw	1	4200-9207 (38597266)
103	Capscrew	7	4133-2306 (38597506)
104(x)	Idle Gear	1 set	7644-1256 (38760880)
105	Valve, Lifting (includes 'O' rings)	1	7647-0063 (38759734)
107	Capscrew	5	4133-2206 (38597498)
125	Washer	4	4500-1106 (38543468)
166	'O' Ring	2	5820-9229 (38534517)
180	Setscrew	1	9644-1187 (38634762)
182	Plug	1	6512-8928 (38648291)
185	Emergency Stop End Cover	1	9644-1077 (38593554)
186	Valve Seat	1	9644-1106 (38593562)
187	'O' Ring	2	5820-5029 (38522645)
188	Axle	1	9644-1105 (38593638)
189	Seal	3	9644-1103 (38593653)
191	'O' Ring	1	5821-1729 (38524401)
192	Regulating Screw	1	9644-1096 (38593588)
193	Spring	1	6913-7041 (38570743)
194	Nut	1	4300-1111 (38633046)
195	Washer	1	4570-1004 (38570792)
196	Diaphragm	1	9644-1097 (38593679)
197	'O' Ring	1	5822-2329 (38522702)
198	Plunger	1	9636-0017 (38745626)
199	Base Plate	1	9644-1095 (38593620)
201	'O' Ring	1	5823-7029 (38570750)
202	Cap	1	9644-1101 (38593604)
203	Seal	1	9617-0056 (38544300)
204	'O' Ring	2	5823-7129 (38570768)
205	Valve Seat	1	9644-1098 (38593570)

Item No.	Description of Part	Total Qty.	Part Number (CCN)
206	Washer	2	4570-1006 (38570784)
208	Washer	1	4560-1006 (38570800)
209	Sleeve	1	9644-1102 (38593661)
210	Seal	1	9644-1104 (38593596)
211	Cap	1	9644-1100 (38593612)
212	Diaphragm	1	9644-1099 (38593646)
213	Spring	1	6915-8732 (38525333)
214	Capscrew	1	4130-1106 (38535779)
81	'O' Ring	1	5823-9129 (38767380)
85	Seal	2	9644-1503 (38767372)
87(a)	Motor Housing	1	9647-0228 (38776514)

Control valve assembly (parts list)

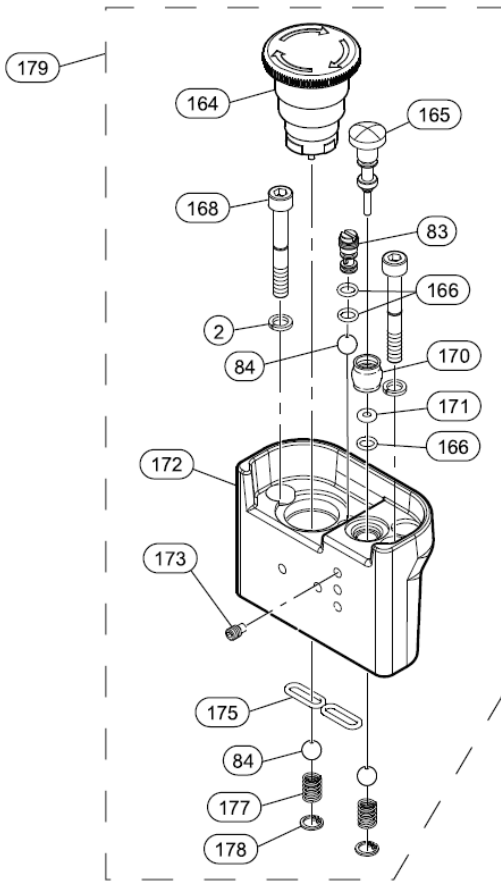


Item No.	Description of part	Total Qty	Part Number (CCN)
1	AXLE	2	9644-0413 (38760435)
2	STOPPER	2	6293-70424 (7756393001)
3	BODY	1	9647-0038 (38757506)
4	SETTING BUTTON	2	6953-69424 (7756392001)
5	BUSHING	2	5900-8826 (38592770)
6	BUTTON	2	9644-0414 (38760443)
7	CAM	1	8644-0411 (38760419)
8	RING	1	9644-1422 (38760526)
9	HANDLE	1	6956-1841 (38597001)
10	KEY	2	9644-0415 (38760450)
11	LOCKNUT	1	4370-7211 (38540688)
12	LOCKWASHER	10	4520-1006 (38540142)
13	LEVER	1	9652-26054 (7755419001)
14	PAD	2	5900-8726 (38592291)
15	PIN	1	4600-1216 (38522835)
16	PLATE	2	9652-26074 (7755421001)
17	WASHER	2	4500-1106 (38543468)
18	SCREW	1	9644-1108 (38595492)
19	SCREW	2	4132-6106 (38540654)

20	SCREW	8	4132-4306 (38632089)
21	SCREW	1	4132-2306 (38540183)
22	SCREW	2	4133-2106 (38597233)
23	COLLAR	2	4783-7241 (38592341)
24	SLIDER	1	9652-26064 (7755420001)
25	BODY	1	9652-26084 (7755422001)
26	SPRING	2	6912-8541 (38553889)
27	PIN	2	4650-8320 (38592333)
28	CLEAT	2	6293-71424 (7756394001)
29	SPRING	1	9644-1421 (38760518)
30	SCREW	1	6520-4942 (38795464)
31	WASHER	3	4500-1105 (38633806)
32	WHEEL	1	8644-0412 (38760427)

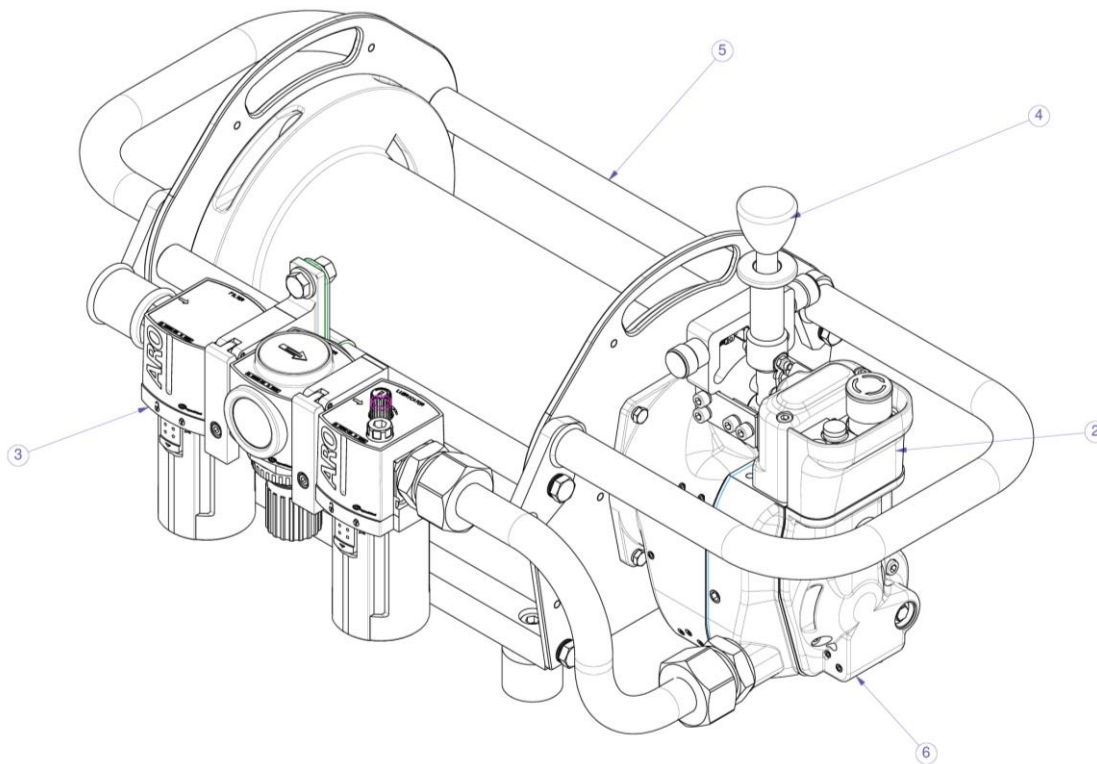
Emergency STOP (parts list)

Drawing MHP4062



Item No.	Description of Part	Total Qty	Part Number (CCN)
179	Emergency Stop Assembly (includes items 2, 83, 84, 164-166, 168, 170-175, 177 and 178)	1	7644-1116 (38767315)
2	Lockwasher	2	4520-1006 (38540142)
83	Check Valve	1	9579-0106 (38551198)
84	Ball	4	6940-1625 (38542924)
164	Valve, Emergency Stop	1	9579-0108 (38551180)
165	Valve	1	9579-0104 (38550190)
166 ^(a)	'O' Ring	3	5820-9229 (38534517)
168	Capscrew	2	4132-1706 (38631917)
170	Protector	1	9579-0107 (38554580)
171	'O' Ring	1	5823-5329 (38550208)
172	Emergency Stop Housing	1	9644-2091 (38592390)
173	Screw	1	4200-8307 (38633004)
175	'O' Ring	2	5821-6529 (38640629)
177	Spring	2	6912-8541 (38553889)
178	Retainer Ring	2	4771-3009 (38592408)

Air inlet and regulator (parts list)



Item No.	Description of part	Total Qty	Part Number (CCN)
1	CIRCLIP (hidden)	1	4770-3050 (38748844)
2	EMERGENCY STOP SYSTEM	1	3644-1116 (38592382)
3	FRL SUB-ASSEMBLY	1	3652-2602 (47755416001)
4	LEVER CONTROL WITH SPEED ADJUSTMENT	1	3652-2604 (47755418001)
5	LONG DRUM SUB-ASSEMBLY	1	3652-2597 (47755411001)
6	MOTOR BRAKE PS2-220	1	3652-3526 (47719649)
7	PLUG (hidden)	1	6696-2841 (38603676)
8	PLUG (hidden)	1	6696-2941 (38603684)
9	GEARBOX (hidden)	1	3644-1152 (38599205)
10	ADD-ON COMPONENTS FOR GEARBOX (hidden)	1	3644-2121 (38592184)

NOTES

PARTS ORDERING INFORMATION

The use of replacement parts other than INGERSOLL-RAND Material Handling will 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 and serial number as it appears on the nameplate.
2. Part number and part description as shown in this manual.
3. Quantity required.

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

Hoist Model Number
Hoist Serial Number
Date Purchased

Return Goods Policy

INGERSOLL-RAND will not accept returned goods for warranty or service unless prior arrangements have been made and written authorization has been provided from the location the goods were purchased.

NOTICE

- 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.

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.

For additional information contact :

INGERSOLL-RAND Material Handling
529, avenue Roger Salengro
59450 Sin-le-Noble - France
Phone : (33) 03 27-93-08-08
Fax : (33) 03 27-93-08-00

NOTICE

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

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 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
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P.O. Box 618
510 Hester Drive
White House, TN 37188
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Fax: (615) 672-0801

For Technical Support:

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Seattle, WA 98124-0046
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Fax: (206) 624-6265

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Order Desk
Fax: (416) 674-6549

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Fax: (403) 437-3145

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