

Product Information



FORCE 5iTM Man Rider[®] Winches

Model FA2i-MRA (ANSI) Man RiderTM



Save These Instructions

 Ingersoll-Rand[®]

Form MHD56331
Edition 1
September 2005
71468110

© 2005 Ingersoll-Rand Company

Only allow **Ingersoll-Rand** trained Technicians to perform maintenance on this winch. For additional information contact **Ingersoll-Rand** or nearest Distributor.

Refer to Product Safety Information Manual for Man Rider Winches Form MHD56251, contact factory for the Product Maintenance Manual Form MHD56332 and Product Parts Information.

Manuals can be downloaded from www.winchandhoistsolutions.com

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

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

PRODUCT DESCRIPTION

NOTICE

- This winch was designed to meet ANSI A10.22-1990 which limits its use as part of a system for personnel lifting. For information defining the Personnel Lifting System requirements read ANSI A10.22 and all associated manufacturer's component literature. A copy of ANSI A10.22-1990 is provided with this product.

The **FA2i (ANSI) Man Rider** Winch Series are air powered, planetary geared units designed for transporting personnel. Winches are provided with an internal automatic disc brake and either a manual or automatic band brake.

The output from an externally mounted piston air motor is transmitted through a coupling and shaft to the planetary reduction gear assembly.

The output from planetary reduction gear assembly is connected to the wire rope drum through the output shaft.

FA2i-MRA Winch disc brake assembly consists of friction plates splined to a hub which in turn is connected to the drive shaft from the air motor. Brake friction plates are clamped to the drum shaft through a spring applied piston. The brake remains applied until the winch control valve is operated and winch payout or haul-in occurs. Air is introduced into the chamber, which is formed between brake piston and brake housing, causing the brake piston to react, compressing brake springs and releasing friction plates allowing motor shaft to rotate. A power failure or sudden loss of air will immediately cause the spring applied brake to engage.

The drum band brake operates by applying a friction force between drum brake band and winch drum. The manual brake requires an operator to engage and disengage brake using a lever located on top of brake band. The automatic drum band brake operation is similar to disc brake operation; they are both fully disengaged in the haul-in and payout direction.

SPECIFICATIONS

Model Code Explanation

Example: FA2i-MRA2MK1G

FA2i - MRA 24 M K 1 G

Series (Capacity):

FA2i = Infinity Winch Personnel Lifting - 1,000 kgs / 2,200 lbs

Designation:

* MRA = Man Rider™ ANSI A10.22-1990

Drum Length (Distance between drum flanges):

- 12 = 12 inch (305 mm)
- 16 = 16 inch (406 mm)
- 24 = **24 inch (610 mm) Standard (Refer to Table 4 on page 4 for drum lengths)**
- 30 = 30 inch (762 mm)
- 36 = 36 inch (914 mm)

Brake:

- M = **Manual Band Brake [Standard]**
- A = Automatic Band Brake
- K = **Automatic Disc Brake [Standard]**

Control:

- 1 = **Winch mounted lever throttle (Standard)**
- 3XX = Remote pilot pendant throttle with warning light [XX = Specify hose length (feet). Maximum 66 ft. (20 metres)] **
- 5XXX = Remote electric-over air throttle [XXX = Specify control cable length (feet)] **

Options:

- 7 = Drum Grooving (Number = wire rope size in sixteenths, e.g. 7/16 inch)
- A = Winch guard with manual level wind (only available with Auto Band Brake)
- B = Extended Warranty
- F1 = Filter, lubricator, regulator mounted on winch in position 1
- F2 = Filter, lubricator, regulator mounted on winch in position 2 (opposite of 1)
- G = **Winch Guard**
- J = Air Line Accessories
- P = Marine 812 finish
- P1 = Marine 812-X paint system
- R = Slack wire rope detector
- V = Press Roller
- W = Client witness of load test
- X = Special testing; specify
- Z = Sand blast and Carbozinc primer only

Notes:

- * Standard Features:
 - (1) Line Speed Monitor
 - (2) Adjustable upper and lower rotary limit switches.
 - (3) Piped away exhaust with muffler and 10 feet (3 metres) of exhaust hose.
 - (4) Copy of Operation and Maintenance Manual and ANSI A10.22 Standard supplied in container attached to winch.
 - (5) Dual brakes (manual band brake and automatic disc brake).
 - (6) Winch mounted throttle lever with automatic return.

** Remote throttles are provided with 6 feet (2 metres) of hose. Specify hose lengths greater than 10 feet. For lengths greater than 66 ft (20 m) please contact your **Ingersoll-Rand** distributor or the factory for control acceptability. Metric lengths are provided for reference only, order lengths in feet.
FA2i-MRA winches are shipped with a muffler, 6 feet (2 m) of exhaust hose and the necessary assembly attachments to install the muffler at a distance far enough away from the operator to ensure noise level exposure of less than 90 dBA over an eight hour period [Time Weighted Average (TWA)]. The recommended distance is based on noise levels recorded during factory testing. Refer to the "INSTALLATION" section for additional information.

Table 1: Specifications

Model	Air System		Air Motor Pipe Inlet Size		Minimum Air System Hose Size (inside diameter)		Drum Barrel Diameter		Drum Flange Diameter		Net Weight *		
	Rated Operating Pressure	Air Consumption (at rated pressure and load)		inch	mm	inch	mm	inch	mm	inch	mm	lbs	kgs
		scfm	cu.m/min										
FA2i-MRA	90 psig (630 kPa/6.3 bar)	335	10	1.0	25	1.25	32	9.25	235	17	432	720	327

* Weight of standard winch without wire rope. Shipping weight 1,087 lbs (493 kg).

Table 2: Rated Performance (at Rated Pressure/Volume)

Model	Full Drum Lifting Capacity *				Stall Pull		Required Rope Size **		Drum Rope Storage Capacity ***			
	Personnel		Utility		lbs	kg	in	mm	Personnel		Utility	
	lbs	kgs	lbs	kgs					ft	m	ft	m
FA2i-MRA	2,200	1,000	3,520	1,600	9,000	4,090	7/16	12	808	246	1,000	305

* Man Rider rating of 2,200 lbs (1,000 kg) is based on requirements of ANSI A10.22 [8:1 design factor with 7/16 inch (11 mm) wire rope]. Utility rating of 3,500 lbs (1,558 kg) is based on requirements of ASME B30.7 [5:1 design factor with 7/16 inch (11 mm) wire rope].

** Rope construction: Only 6 x 19, 6 x 37 classification, or rotation-resistance ropes, all with IWRC, shall be used.

*** Man Rider wire rope storage is based on a winch with a 19 inch (483 mm) diameter drum flange and on ANSI A10.22 standards which require the top layer to be at least 2 inches (51 mm) below the drum flange diameter. Utility wire rope storage is based on a winch with a 19 inch (483 mm) diameter drum flange and on ASME/ANSI B30.7 standards which require the top layer to be at least 1/2 inch (13 mm) below the drum flange diameter.

Capacities shown may vary from those published elsewhere.

Table 3: Drum Speed at Third layer (half drum)

Model	At 330 lbs / 136 kg				At Personnel Rating				At Utility Rating			
	Up		Down		Up		Down		Up		Down	
	fpm	m/min	fpm	m/min	fpm	m/min	fpm	m/min	fpm	m/min	fpm	m/min
FA2i-MRA	95	29.3	52	15.8	91	28	71	22	66	20	120	37

Table 4: Available Drum Lengths

in	mm	in	mm	in	mm	in	mm	in	mm
12	305	16	406	24*	610*	30	762	36	914

* Standard Length; Refer to sales literature for winch drum wire rope storage capacities.

INSTALLATION

Prior to installing the winch, carefully inspect it for possible shipping damage. Winches are supplied fully lubricated from the factory. Check oil levels and adjust as necessary before operating winch. Refer to "LUBRICATION" section for recommended oils and lubrication intervals.



• Owners and users are advised to examine specific, local or other regulations, including American National Standards Institute and/or OSHA Regulations which may apply to a particular type of use of this product before installing or putting winch to use.

■ Mounting

Refer to Dwg. MHP0133 on page 11, A. Drum; Table 5 on page 4 and Table 6 on page 4. Care must be taken when moving, positioning or mounting the winch. In most cases, lifting lugs have been provided to assist in handling the winch. If lug locations are improper for your specific installation, great care should be taken to ensure that winch, when lifted, will be properly balanced. Determine weight of your winch by referring to "SPECIFICATIONS" section. Lift winch 3 to 4 inches (75 to 100 mm) off ground. Verify winch is balanced and secure before continuing lift. Mount winch so axis of drum is horizontal and that motor vent cap is not more than 15° off top vertical center. If winch is to be mounted in an inverted position, motor case must be rotated to position vent cap to the top.

- The winch mounting surface must be flat and of sufficient strength to handle rated load plus weight of winch and attached equipment. An inadequate foundation may cause distortion or twisting of winch uprights and side rails resulting in winch damage.
- Make sure mounting surface is flat to within 0.005 inch (0.127 mm) per inch of drum length. Shim if necessary. Refer to Table 5 on page 4.

Table 5: Mounting Surface Tolerance

Drum Length	Mounting Surface Minimum Flatness	
	inch	mm
12	0.06	1.52
16	0.08	2.03
20	0.10	2.54
24	0.12	3.05

- Mounting bolts must be Grade 8 or better. Use self-locking nuts or nuts with lockwashers. Refer to Table 6, "Mounting Bolts," on page 4.
- Tighten mounting bolts evenly and torque to specification in torque chart. Refer to 'Torque Chart' in Product Maintenance Information Manual Form MHD56332.
- Maintain a fleet angle between sheave and winch of no more than 1-1/2°. The lead sheave must be on a center line with drum and, for every inch (25 mm) of drum length, be at least 1.6 feet (0.5 metre) from the drum. Refer to Product Safety Information Manual Form MHD56251.
- Do not weld to any part of winch.

Table 6: Mounting Bolts

inch	mm
5/8	16

Table 7: Bolt Hole Dimensions

Dimension		Drum Length				
		12 in. (305 mm)	16 in. (406 mm)	24 in. (610 mm)	30 in. (762 mm)	36 in. (914 mm)
"A"	in.	20				
	mm	508				
"B"	in.	9.00*	7.50	10.00	Contact Factory	
	mm	229*	190	254		
"C"	in.	0.6875				
	mm	17.5				

Table 8: Winch Foundation Bolt Forces

Force Acting on Bolt		Drum Length				
		12 in. (305 mm)	16 in. (406 mm)	24 in. (610 mm)	30 in. (762 mm)	36 in. (914 mm)
Maximum Shear Force at One Foundation Bolt Connection	lbf	Contact Factory			2,050	Contact Factory
	N				9,188	
Maximum Tensile Force Shared by Rear Foundation Bolts	lbf				10,270	
	N				46,032	

■ Wire Rope



- Use only 7/16 inch (11 mm) wire rope on a winch designed to conform with ANSI A10.22 standards.
- Maintain at least 4 tight wraps of wire rope on the drum at all times. Ensure wire rope top layer is a minimum of 2 inches (50 mm) below drum flange edge. Refer to Dwg. MHP2449 in Product Safety Information Manual "Winch Safe Operating Practices" for Man Rider Winches Form MHD56251.
- Do not use wire rope as a ground (earth) for welding.
- Do not attach a welding electrode to winch or wire rope.
- Install wire rope to come off drum for overwind operation (normal application). Refer to Dwg. MHP2450 in Product Safety Information Manual "Winch Safe Operating Practices" for Man Rider Winches Form MHD56251.

■ 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



- When installing wire rope, pressurize brake with a minimum of 45 psi (3.1 bar) air from an auxiliary source.

Refer to Dwg. MHP2686 on page 11, A. Anchor; B. Wire Rope.

1. Cut wire rope to length in accordance with wire rope manufacturer's instructions.
2. Feed end of wire rope through drum anchor pocket hole.
3. Forming a loop, wrap loop around anchor, approximately 22 inches (559 mm) of wire rope.
4. Pull wire rope anchor into position in drum anchor pocket. Ensure no extra (open end) of wire rope is extending out of drum anchor pocket.



- Make sure first wrap of wire rope is tight and lays flush against drum flange.

■ 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 diameter of wire rope. Refer to Dwg. MHP0498 in Product Safety Information Manual Form MHD56251.
5. Always maintain at least four full, tight wraps of wire rope on drum.

■ Electrical Grounding



- The Personnel Lifting System must be properly grounded to conform to ANSI A10.22 standards. Ensure electrical grounding is conducted by licensed electricians in accordance with the latest edition of the National Electric Code (ANSI/NFPA 70) and any applicable local, state and national electric codes and ordinances.

An electrical grounding lug is attached to the winch siderail. Ensure winch is correctly grounded to the Personnel Lifting System before using winch.

■ Wire Rope Line Speed Monitor

To adjust line speed monitor, contact nearest distributor or factory. It is not recommended to change settings from preset factory ones.

■ Motor Exhaust and Muffler

Refer to Dwg. MHP0646.



- Operator exposure to noise levels shall not exceed 90 dBA over an 8 hour period [Time Weighted Average (TWA)]. Ensure motor and pilot valve air is properly exhausted and muffled.

Winch noise level ratings under factory test conditions:

1. 83 dBA during operation of winch without load in the haul-in direction.
2. 87 dBA during operation of winch without load in the payout direction.

These levels were achieved when the motor and pilot valve air was exhausted through a 10 foot (3 metre) length of hose and attached to a muffler.

■ Winch Guard

Use of a winch guard is recommended on all winches.



WARNING

- Do not allow wire rope to come in contact with winch guard panels during winch operation. Wire rope could become worn and damaged. Adjust winch guard panels to clear wire rope travel angle.

Refer to Product Parts Information Manual.

Drum guard panels must be adjusted to suit wire rope departure angle. To reposition winch guard panels remove nuts and slide out crossbar. Position panels to avoid wire rope contact and install crossbar and nuts.

■ 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 an air filter, lubricator and moisture separator will improve overall winch performance and reduce unscheduled downtime.

Refer to Table 1, "Specifications," on page 4 for motor air consumption and rated operating pressure. If air supply varies from what is recommended, winch performance will change.

Install air line lubricator, filter and regulator as close as possible to air inlet on motor. Lubricator must be located no more than 10 ft (3 m) from motor. Air line accessories package can also be mounted to the winch guard panel on either side of winch.

Refer to Dwg. MHP0191 on page 11, **A.** Air Out; **B.** Lubricator; **C.** Regulator; **D.** Air In; **E.** Filter.

■ Air Lines

Inside diameter of winch air supply lines must not be less than size specified in Table on page 4. 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.



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

It is recommended that an airline strainer/filter be installed before the lubricator to prevent dirt from entering the motor. The strainer/filter should provide 20 micron filtration and include a moisture trap. Clean the strainer/filter periodically to maintain its operating efficiency.

■ Air Pressure Regulator

If an air pressure regulator is used, install between lubricator and filter. Set pressure regulator to 90 psi (6.2 bar).

■ 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.

■ Mufflers

Ensure muffler is installed in winch piped away exhaust manifold and control valve exhaust port. Check mufflers periodically to ensure they are functioning correctly.

■ Motor

For optimum performance and maximum durability of parts, provide recommended air supply as measured at motor inlet. Refer to Table 1, "Specifications," on page 4. The winch should be installed as near as possible to compressor or air receiver.

■ Limit Switch

Pre-set limit switch settings prevent winch wire rope payout and haul-in by stopping air flow to the winch motor when a defined set point has been reached. It is the owner's and operator's responsibility to adjust winch operating limits prior to using winch.

NOTICE

- Settings for limit switch are for an overwound operation only.

To adjust set points:

Follow instructions in the order they appear for limit switch adjustment (**use two people to make adjustments**). Refer to Dwg. MHP2688 on page 12, **A.** Center Nut; **B.** Payout; **C.** Haul-In:

1. Remove cap from limit switch cover.
2. Partially unscrew center nut.
3. **PAYOUT:** Rotate (#1) screw (counterclockwise) while slowly paying out until winch shuts off.
4. **HAUL-IN:** Rotate (#2) screw (clockwise) while slowly hauling in until winch shuts off.
5. Tighten center nut.
6. Reinstall cap on limit switch cover and tighten.



WARNING

- Ensure limit switch setpoints are established and operating properly before using winch.

■ 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. Refer to "INSPECTION" section on page 8.

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. New drum brake band Lining Run-in Procedure: All new drum brake band linings require a 'run-in' period. Operate the winch without load in the payout direction while gradually applying the brake. Allow the brake to slip for approximately one minute. Winch motor may stall as drum brake band lining fully engages. Do not allow brake to overheat.
5. Check operation of brakes. Adjust if necessary as described in "MAINTENANCE" section in the Product Maintenance Information Manual Form MHD56332.
6. Check operation of limit switch, locking mechanisms and all safety devices when equipped.
7. Verify line speed monitor and overspeed alarm operation as described in "Winch Testing" in the "INSPECTION" section on page 9.
8. Check foundation mounting fasteners are secure.
9. 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" in the "INSPECTION" section on page 8.
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.

OPERATION

■ Safety Summary

The following warnings and operating instructions have been adapted in part from American National (Safety) Standards ASME B30.7 and ANSI A10.22, and are intended to avoid unsafe operating practices which might lead to injury or property damage.

1. Prior to use, inspect and test the personnel lifting system to the requirements of ANSI A10.22 Section 13 (Inspection and Tests). The winch operator shall be

instructed in the operation of this winch and the personnel lifting system per ANSI A10.22 Section 5 (Operation of Hoist).

Winch only: Refer to 'System Inspections and Testing' procedures in the "INSPECTION" section on page 8.

NOTICE

- Refer to Product Safety Information Manual for Man Rider Winches Form MHD56251 for essential safety information not covered in this manual.
- There are other components required to complete the system. It is the user's responsibility to supply all other components necessary to properly complete the lifting system in accordance with the regulations that pertain to the lifting application.

2. Installation of the winch must be specially arranged and approved for personnel handling as a component in a Personnel Handling System as described and defined in ANSI A10.22. Refer to the "INSTALLATION" section on page 4. All bolts and foundations for winch attachment must have a higher load carrying capacity rating than the maximum capacity of the winch.

WARNING

- Operate this winch ONLY if wire rope is installed to come off the drum for overwind operation. Refer to Dwg. MHP0661.
- Operation of this winch in a safe manner, as part of a Personnel Lifting System, requires that supervisors, operators, and personnel being transported be thoroughly instructed in the potential dangers involved and the safety procedures established to minimize the risks of accident, injury and property damage.
- Do not transport personnel and materials at the same time. Safe operation, according to established standards, require that personnel and materials are to be transported separately.
- Visual inspections of the winch and entire Personnel Lifting System must be conducted by designated personnel instructed in safety, operation and maintenance of this product before using the winch to transport personnel. Any visual indication of damage must be inspected, repaired and actions documented in accordance with component manufacturer's instructions to ensure the safety of personnel is not compromised.

To prevent wire rope "line run" ensure a weight greater than the total weight of the longest "wire rope payout to sheave" length is attached to the end of the wire rope.

Training

Program

The employer shall provide and implement a training program for all supervisors and employees engaged in the operation of raising, lowering or suspending personnel platforms from a winch load line so that they are familiar with the requirements of the hoisting system and are able to recognize the associated hazards and take appropriate measures. Records of training programs shall be maintained. Establishment of safe operating procedures for the Personnel lifting System should be based on ANSI A10.22 specifications, OSHA regulations, all applicable local, state and national standards, system component manufacturer's recommendations, and system designer recommendations.

Planning Meeting

A meeting attended by the winch operator, signal persons, persons to be lifted and the person in charge of the task to be performed is required to be held to plan and review the procedures to be followed, including procedures for entering and leaving the man riding device, the use of safety equipment, signals, and the lift chart information.

NOTICE

- This meeting shall be held prior to the beginning of personnel hoisting operations at each new work location and thereafter for any new employees assigned to the operation.

Personnel Lifting System

Owners are responsible for establishing, implementing and ensuring that supervisors, operators, and personnel being transported are instructed in operation and safety procedures. Refer to 'Training' in the "WINCH OPERATION" section.

1. Supervisors, operators and personnel being lifted should check that winch, wire rope, working platform, lifelines, safety belts (harnesses), etc. are present and functional prior to authorizing personnel lifting.
2. Personnel being transported must be instructed in and adhere to the safety procedures established including, but not limited to, the following list:
 - a. Emergency Escape Procedures in accordance with ANSI A10.22 Section 11.
 - b. Use of safety belts (harnesses) and rope grabs (lifelines) in accordance with ANSI A10.22 Sections 11, 12.4 and 12.5.
3. Winch operators must be instructed in and adhere to the procedures established to ensure proper and safe operation of this winch as a component in a Personnel Lifting System.
 - a. Winch operators must remain at the winch controls at all times when handling personnel and materials.
 - b. At any indication of winch, or system, damage or impending danger the winch operator must place the winch in a safe condition and notify designated personnel. Winch and system operation must be suspended until all discrepancies noted have been inspected, repaired and system tested to ensure safe operation.

- c. Voice communication must be established and maintained between winch operator, personnel being lifted and personnel located at each landing (as applicable).
- d. Winch operators must maintain at least 4 tight wraps of wire rope on the drum at all times.
- e. Wire rope shall be weighted on the end to prevent line run when spooling onto the drum.

NOTICE

- Initial operating checks specific to the entire Personnel Lifting System should be established to ensure component compatibility.

Line Speed Monitor and Overspeed Alarm

The Line Speed Monitor is a battery powered wire rope line speed indicator system which determines line speed by sensing drum rotation.

The Line Speed Monitor provides a visual alarm (flashing red light) and digital readout (in feet) to allow the operator to adjust throttle control to maintain wire rope line speed at 100 feet per minute (30.5 metres per minute) or less.

Line Speed Monitors are factory pre-set to match the winch installed on and cannot be adjusted. The overspeed indicator light flashes when drum speed exceeds wire rope line speeds of 100 feet per minute (+/- 10 feet) (30.5 metres per minute; +/- 3 metres) in either direction of drum rotation.

The Line Speed Monitor battery should be recharged every two weeks by connecting the battery charger unit to the monitor and a 110 volt (ac) electrical source.

Winch Emergency Lowering Procedure

Refer to Dwg. MHP0210 and MHP0636.

CAUTION

- ANSI A10.22-1900 Section 11 defines the Personnel Lifting System requirements for establishing emergency escape methods and procedures. The following procedure describing the use of the winch to lower personnel or loads when the supply air to the winch has been interrupted should only be used after all other established methods have been exhausted.

The lowering speed of the load using the winch descent procedure is dependent upon the weight of the load, amount of wire rope on the drum, and position of the load in the lifting system.

Emergency Lowering Precautions

1. Emergency lowering operations must be performed by a minimum of two personnel trained in the operation of the winch.
2. Communication must be established between lifted person and winch operators. Operators should be able to visually monitor lifted person until landed.
3. If line of sight between operators and lifted person is not possible, signals must be conveyed to the operators.
4. The winch must be isolated from the supply air system during emergency lowering operations.

To use the winch to lower the load when the air supply has been interrupted conduct the following:

1. Engage the manual band brake.
2. Attach auxiliary air supply to automatic disc brake port. A minimum of 45 psi (310 kPa/3.10 bar) is required to disengage brake.
3. Depress the automatic band brake clevis and remove cotter pin and pin to disconnect cylinder from brake lever.
4. Slowly disengage manual band brake using the brake lever. Regulate speed of load using manual band brake. If load does not lower, engage band brake and then conduct the following step.
5. Remove capscrews from motor adapter valve and remove pilot valve/adaptor assembly from winch motor.
6. Using manual band brake to throttle lowering speed (if required) lower the load.

Winch Controls

The spring loaded, motor mounted, live air manual throttle control valve is supplied as a standard feature on this winch. Optional remote throttle controls are available. Reference model code on the winch data (name) plate and compare it to the "SPECIFICATIONS" section on page 3 to determine your configuration. The throttle controls provide operator control of motor speed and direction of drum rotation.

Winch Mounted Air Throttle (standard feature)

Refer to Dwg. MHP0447 on page 12, **A.** Counterclockwise Direction: Wire Rope Haul-In; **B.** View: Facing Air Motor; **C.** Clockwise Direction: Wire Rope Payout; **D.** With lever at neutral position, fold down to prevent accidental winch operation.

The spring loaded, live air, manual control throttle valve mounts to the motor adapter valve.

When viewed from the air motor end, move the control throttle handle to the right (clockwise) to PAYOUT wire rope and to the left (counterclockwise) to HAUL-IN wire rope.

To ensure smooth operation of the winch, sudden movements of the control valve should be avoided.

When released, handle will return to the neutral or center position. Fold the handle down to engage and lock the control handle in place.

■ Remote Live Full Flow Air Throttle (optional feature)

Provides for remote mounting of winch control at a fixed location at up to 20 feet (6 metres) away from winch motor. Air hoses connect throttle to winch motor to provide winch operation.

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 control valve to ensure smooth operation of winch.

■ Remote Pilot Pendant Throttle (optional feature)

Refer to Dwg. MHP0204.

Provides for remote winch control at distances of up to 66* feet (20 metres) away from winch. The pilot pendant control throttle is a two function movable control station for winch operation. Pilot pressure from pendant control activates winch control valve. The winch control valve, located on winch motor, controls motor speed and direction of drum rotation. Direction of drum rotation is determined by the pendant lever/button depressed.

■ Remote Pilot Lever Throttle (optional feature)

Provides for remote winch control at distances of up to 66* feet (20 metres) away from winch. The lever pilot control throttle is a fixed mounted lever control station for winch operation. Pilot pressure from lever pilot control throttle activates winch control valve. The winch control valve, located on winch motor, controls motor speed and direction of drum rotation. Direction of drum rotation is determined by the direction in which lever is shifted.

* For distances greater than 66 feet (20 metres) contact **Ingersoll-Rand** Technical Sales for control suitability.

■ Winch Brakes

■ Manual Band Brake

Refer to Dwg. MHP0152 and MHP0209.

The manual brake may be applied by pushing down on handle and released by pulling up. If handle is pushed down fully, it should lock in that position and prevent drum

rotation, until released by operator. The brake must be kept properly adjusted to hold required load. Refer to 'Adjustments' in "MAINTENANCE" section in Product Maintenance Information Manual Form MHD56332 for adjustment instructions.

■ Automatic Band Brake (optional feature)

The automatic brake is a spring applied, air released brake which utilizes an air actuated, spring loaded cylinder, that automatically disengages brake when motor is operated. Air pressure in cylinder overcomes spring pressure to release brake. When control valve is placed in neutral position, air in cylinder is vented and spring automatically engages brake to prevent drum rotation.

The cylinder clevis must be kept properly adjusted to hold required load.

■ Automatic Disc Brake

The automatic brake is a spring applied, air released brake. Using an air actuated, spring loaded piston, the brake automatically disengages when motor is operated and engages when throttle is returned to neutral position.

Air pressure ported through brake housing overcomes spring pressure and moves piston which releases brake. When control valve is placed in neutral position, air is vented, spring pressure overcomes air pressure and spring pressure moves piston, engages brake and prevents drum rotation.

■ Limit Switch

Pre-set limit switch settings prevent winch wire rope payout and haul-in by stopping air flow to the winch motor when a set point has been reached. It is the owner's and operator's responsibility to adjust winch operating limits prior to using the winch. To adjust the limit switch set points, refer to "INSTALLATION" section on page 4.

■ Press Roller (optional feature)

Ensure wire rope is positioned between press roller and drum barrel and springs keep press roller in tight contact with wire rope.

■ Slack Wire Rope Detector (optional feature)

Contact factory for information.

INSPECTION

Inspection information is based in part on American National Standards Institute Safety Codes A10.22 and American Standards of Mechanical Engineers Safety Codes B30.7.

WARNING

- All new or repaired equipment should be inspected and tested by **Ingersoll-Rand trained Service 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 Service 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 Form MHD56332 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.

■ Records and Reports

■ Personnel Lifting System

Owners are responsible for establishing and implementing operation and safety procedure training for all personnel involved in the use and operation of a Personnel Lifting System.

1. PERSONNEL TRAINING. Records of training provided to supervisors, operators, service personnel and personnel being transported should be maintained and made available to designated personnel for review.

2. SYSTEM MAINTENANCE. Records of all service, maintenance and testing performed on the Personnel Lifting System should be maintained and made available to designated personnel for review.

■ Winch Records and Reports

Inspection records, listing all points requiring inspection, should be maintained for all load bearing equipment. Written reports, based on **Initial, Weekly and Quarterly** inspections, should be made on the condition of critical parts as a method of documenting inspections. These reports should be dated, signed by the person who supervised the performance of the inspection, and kept on file where they are readily available for review. A sample winch 'Inspection and Maintenance Report' has been provided in the Product Maintenance Information Manual Form MHD56332.

■ Wire Rope Reports

Records should be maintained as part of a long-range 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.

Personnel Lifting System wire rope records should be maintained and made available to designated personnel for review.

■ System Inspections and Tests

WARNING

- Information provided by **Ingersoll-Rand** is applicable only to the winch to assist in determining the condition of the winch components described. References to other Personnel Lifting System components are made with respect to their relationship to the winch. For specific information on system components other than the winch, reference the manufacturer's literature and ANSI A10.22.

Personnel Lifting System inspections and tests of installed components, functions and safety devices should be established based on procedures derived from ANSI A10.22 specifications, OSHA regulations, manufacturer's literature and recommendations, system designer recommendations and all applicable local, state and national standards.

1. SYSTEM. Frequency of inspections:
 - a. Initial system inspection.
 - b. Daily checks and Weekly inspections.

- c. Quarterly inspections.

■ System Initial and Quarterly Inspections

In addition to established Daily and Weekly inspections conduct the following:

NOTICE

- **The static drop test is only required for guided cage systems.**
1. INITIAL INSPECTION. With the cage **at rated load, on a guided cage system**, using dead weights, conduct a static drop test. This test is designed to ensure the cage safety clamps engage and stop the cage from falling. Perform requirements of the weekly inspection.
 2. QUARTERLY INSPECTION. With the cage **empty, on a guided cage system**, conduct a static drop test. This test is designed to ensure the cage safety clamps engage and stop the cage from falling. Perform requirements of the weekly inspection.

■ System Testing

Personnel Lifting System testing should be conducted in accordance with the system specific instructional manual and component manufacturer's recommendations. A system specific instruction manual must be compiled to conform to the requirements of ANSI A10.22, and detail the operation, maintenance and safety requirements of the various components comprising the personnel lifting system.

■ Winch Inspections

The following listed inspections apply only to the winch. These inspections should be conducted when scheduled, when indicated by winch performance and when the winch is disassembled for repair.

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.

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

WARNING

- **All new, altered or modified 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.**
- **Prior to using the winch to lift personnel, an initial inspection should be conducted after assembly, major repairs or alteration, and when the system has been idle for periods of longer than one month.**

Daily checks, weekly and quarterly inspections should be performed on equipment in regular use.

1. **Daily checks** are visual examinations performed by operators or personnel instructed in safety and operation of this equipment and include observations made during routine equipment operation.
2. **Weekly inspections** are thorough inspections conducted by **Ingersoll-Rand** trained inspectors. Weekly inspections are also required prior to personnel lifting if the system has been idle for periods in excess of one week, but less than one month.
3. **Quarterly inspections** are a combination of weekly inspection requirements and the performance of a static drop test **on guided cage systems only** to verify operation of the cage's safety clamp.

■ Winch Daily Checks and Weekly Inspections

On equipment in continuous service, weekly inspections are required. Maintain written records of weekly inspections to provide an accumulative basis for continuing evaluation. Disassembly may be required as a result of inspection findings.

In addition, daily checks, or visual inspections should be conducted by operators during regular operation for damage or evidence of malfunction.

1. WINCH (DAILY). At the beginning of the shift, prior to operation, visually inspect winch housings, controls, brakes, siderails and drum for indications of damage. Do not operate the winch until all discrepancies noted have been reviewed, inspected further and corrected by personnel instructed in the operation, safety and maintenance of this winch.

WINCH (WEEKLY). Inspect the following:

- a. SIDE RAILS AND END UPRIGHTS. Check for deformed, cracked or corroded main components. Replace damaged parts.
 - b. FASTENERS. Check external retainer rings, split pins, capscrews, nuts, and other fasteners on winch, including mounting bolts. Replace if missing or damaged and tighten if loose.
 - c. DRUM AND SHEAVES. Check for cracks, wear or damage. Replace damaged parts.
2. WIRE ROPE (DAILY). 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 an experienced wire rope inspector.

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 the following instructions.**

WIRE ROPE (WEEKLY).

- a. Ensure wire rope is spooled onto the drum for overwind operation only and that a minimum of 2 inches (50 mm) clearance is maintained between the outside edge of the drum flange and the outermost layer of wire rope.
 - b. Buildup of dirt and corrosion. Clean with steam or a stiff wire brush to remove dirt and corrosion if necessary.
 - c. Loose, frayed or damaged end connection. Replace if loose, frayed or damaged. Ensure ends will not catch on personnel.
 - d. Ensure the wire rope is securely anchored in the winch drum.
 - e. Verify wire rope diameter. Measure the diameter of the wire rope from crown-to-crown throughout the life of the wire rope. Recording of the actual diameter should only be done with the wire rope under equivalent loading and in the same operating section as accomplished during previous inspections. If the actual diameter of the wire rope has decreased more than 1/64 inch (0.4 mm) a thorough examination of the wire rope should be conducted by an experienced inspector to determine the suitability of the wire rope to remain in service.
3. AIR SYSTEM (WEEKLY). Visually inspect all connections, fittings, hoses and components for indication of air leaks. Repair any leaks and replace damaged components.
 4. CONTROLS (DAILY AND WEEKLY). 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.
 5. BRAKES (WEEKLY). Ensure proper operation. Verify each brake system will hold a 150% rated load with full drum (as applicable to normal use) without slipping. If indicated by poor operation or visual damage, disassemble and repair brake(s). Check all brake surfaces for wear, deformation or foreign deposits. If drum brake lining thickness is 0.062 inch (2 mm) or less anywhere along its edge replace brake bands or linings. Clean and replace components as necessary. Test each brake system independently.
 6. LIMIT SWITCHES (WEEKLY). Verify winch limit switches operate at the set limits. When actuated, limit switches interrupt air flow to the motor in the direction of winch operation only. Adjust limit settings or repair to correct all noted discrepancies.
 7. ALL COMPONENTS (WEEKLY). Inspect for wear, damage, distortion, deformation and cleanliness. If external evidence indicates damage, disassemble as required to conduct a detailed inspection. Inspect gears, shafts, bearings, springs and covers. Replace worn or damaged parts. Clean, lubricate and reassemble.
 8. SUPPORTING STRUCTURE (WEEKLY). Check for distortion, wear and continued ability to support winch. Ensure winch is firmly mounted and that fasteners are in good condition and tight.
 9. LABELS AND TAGS (WEEKLY). Check for presence and legibility of labels. Replace if damaged or missing.
 10. WIRE ROPE LINE SPEED MONITOR. Verify Line Speed Monitor displays line speed and overspeed alarm lights at 100 feet per minute (+/- 10 feet) (30.5 metres per minute; +/- 3 metres). If battery charge light is on, charge battery.
 11. WINCH EXHAUST AND MUFFLER. Visually inspect exhaust hoses, connections and muffler for damage. Ensure piping and muffler are correctly installed and direct exhaust away from winch operator. Operator noise levels must not exceed 90 dBA over an 8 hour period (Time Weighted Average (TWA)).
 12. Ensure electrical ground (earth) is firmly connected and that wire is in good condition. Replace wire if corroded or damaged.

■ Winch Initial and Quarterly Inspections

Disassembly may be required as a result of inspection findings or in order to properly inspect the individual components. Maintain written records of initial and quarterly inspections to provide an accumulative basis for continuing evaluation. Inspect all items listed in "Weekly Inspection." Also conduct the following:

1. INITIAL INSPECTION. Conduct all requirements of 'Winch Daily and Weekly Inspection' and 'Winch Testing'.
2. QUARTERLY INSPECTION. Conduct all requirements of 'Winch Daily and Weekly Inspection' and 'Winch Testing'.

■ 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 "Weekly 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 Form MHD56332.
3. Standby equipment shall be inspected at least semi-annually in accordance with the requirements of "Weekly Inspection". In abnormal operating conditions equipment should be inspected at shorter intervals.

■ Storing The Winch

1. Always store the winch in a no load condition.
2. Wipe off all dirt and water.

- Lubricate the wire rope.
- Place in a dry location.

- Before returning winch to service, follow instructions for "Winches Not In Regular Use" in the "INSPECTION" section on page 9.

LUBRICATION

To ensure continued satisfactory operation of winch, all points requiring lubrication must be serviced with correct lubricant at proper time interval as indicated for each assembly.

Refer to Table 9, "Lubrication Intervals," on page 10 for recommended lubrication intervals. Use only those lubricants recommended. Other lubricants may affect winch performance. Approval for use of other lubricants must be obtained from your **Ingersoll-Rand** distributor. Failure to observe this precaution may result in damage to winch and/or its associated components.

Table 9: Lubrication Intervals

Component	Interval
Check Air Line Lubricator	Daily
Check Motor Oil level	Daily
Change Motor Oil	1 Year or 1,000 hrs of Winch Operation
Change Gearbox Oil	
Change Disc Brake Oil	

■ General Lubrication

Correct lubrication is one of the most important factors in maintaining efficient winch operation.

- The recommended grade of oil must be used at all times. Use of unsuitable oil may result in excessive temperature rise, loss of efficiency and possible damage to lubricated components. Refer to "Recommended Lubricants" section on page 10.
- It is recommended that the first oil change be done after approximately 50 hours initial operation. Thereafter, drain and replace oil according to Table 9, "Lubrication Intervals," on page 10.
- Always inspect removed oil for evidence of internal damage or contamination (metal shavings, dirt, water, etc.). If indications of damage are noted, investigate and correct before returning winch to service.
- After winch operation, allow oil to settle before topping off.
- Always collect lubricants in suitable containers and dispose of in an environmentally safe manner.

■ Recommended Lubricants

Table 10: Reduction Gear Recommended Lubricants

Temperature	Type Oil
Below 32° F (0° C)	2 EP (ISO VG 68)
32° to 80° F (0° to 27° C)	3 EP (ISO VG 100) *
Above 80° F (27° C)	4 EP (ISO VG 150)

* Units are shipped from factory with 3 EP (ISO VG 100) lubricant. Refer to Table 13 on page 10 for reduction gear oil capacities

Table 11: Air Motor and Disc Brake Recommended Lubricants

Temperature	Type Oil
Below 32° F (0° C)	ISO VG 32 (SAE 10W)
32° to 80° F (0° to 27° C)	ISO VG 68 (SAE 20W) *
Above 80° F (27° C)	ISO VG 100 (SAE 30W)

* Units are shipped from factory with ISO VG 68 (SAE 20W) lubricant.

Table 12: Recommended Grease

Temperature	Type Oil
-20° to 50° F (-30° to 10° C)	EP 1 multipurpose lithium based grease
30° to 120° F (-1° to 49° C)	EP 2 multipurpose lithium based grease

NOTICE

- Do NOT use synthetic lubricants in air motor. Synthetic lubricants will result in oil blowing by piston rings.

■ Motor

Refer to Dwg. MHP0222 on page 12, **A.** Level Plug; **B.** Drain Plug; **C.** Fill Plug and Table 11, "Air Motor and Disc Brake Recommended Lubricants," on page 10. The motor is splash lubricated by oil in motor housing and has no other means of lubrication. It is therefore important to use only good quality, non-detergent motor oil to ensure maximum performance and minimum downtime for repairs.

Oil capacity for the motor is 3/8 quarts (0.35 litres). Add oil through filler opening until oil flows from level plug hole. Add oil slowly to prevent spilling.

The motor should be level-checked daily or at the start of each shift after any accumulated water has been drained off. When motors are operated in temperatures below freezing, wait long enough at the end of shift for water to separate from oil but not long enough for it to freeze. Drain water then refill to level plug, located on side of motor housing. If desired, all oil may be drained at end of shift and motor refilled with new oil.

■ Reduction Gear Assembly

Refer to Dwg. MHP0140 on page 11, **A.** Fill Plug Position; **B.** Drum; **C.** Reduction Gear Assembly; **D.** Inboard Upright; **E.** Level Plug Position and Table 10, "Reduction Gear Recommended Lubricants," on page 10.

The reduction gear is filled to the correct levels prior to shipment from the factory. Check oil level before initial winch operation. This component is splash lubricated by oil in the housing and has no other means of lubrication. It is therefore important to use high quality Extreme Pressure (EP) rust and oxidation inhibited gear oil to ensure maximum performance and minimum down time for repair.

CAUTION

- Do not over fill. Excess oil will reduce operating efficiency and increase oil temperature.

To ensure correct performance, highest efficiency and long life, it is essential that lubricating oil be maintained at correct level. Rotate drum until fill plug is located at top dead center then add oil up to level plug hole. Refer to Table 13, "Reduction Gear Capacities," on page 10 for reduction gear oil capacities.

Table 13: Reduction Gear Capacities

Capacity	
quarts	litres
1-1/2	1.4

■ Disc Brake

Refer to Dwg. MHP1348 on page 12, **A.** Breather Plug; **B.** Drain Plug and Table 11, "Air Motor and Disc Brake Recommended Lubricants," on page 10.

The friction plates and drive plates are in a self contained oil bath and have no other means lubrication. After an oil change or winch overhaul remove the breather plug and pour a small amount of oil [4 to 6 ounces (0.2 litres)] through breather hole in brake housing. Allow oil to fully settle between fillings.

NOTICE

- If too much oil is added excess oil will be discharged through breather plug when control valve is actuated.

■ Seals and Bearings

If winch is disassembled, clean all parts thoroughly and coat bearings and seals with clean grease. Refer to Table 12, "Recommended Grease," on page 10. Use sufficient grease to provide a good protective coat. Lubricate grease fittings monthly with 2 or 3 pumps of a grease gun.

■ Wire Rope

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

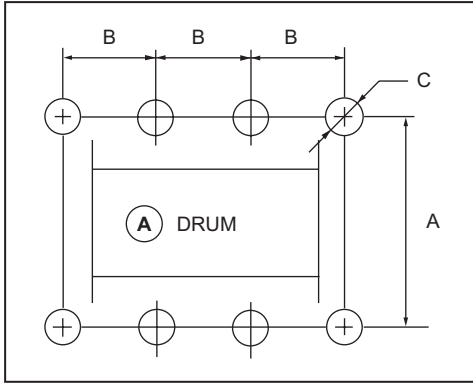
- Clean with a brush or steam to remove dirt, rock dust or other foreign material on the surface of the wire rope.

CAUTION

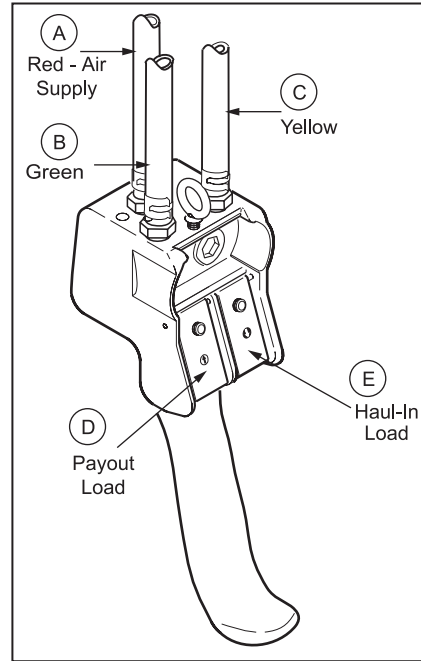
- Do not use an acid-based solvent. Only use cleaning fluids specified by the wire rope manufacturer.

- Apply a wire rope lubricant, **Ingersoll-Rand LUBRI-LINK-GREEN®** or ISO VG 100 (SAE 30W) oil.
- Brush, drip or spray lubricant weekly, or more frequently, depending on severity of service.

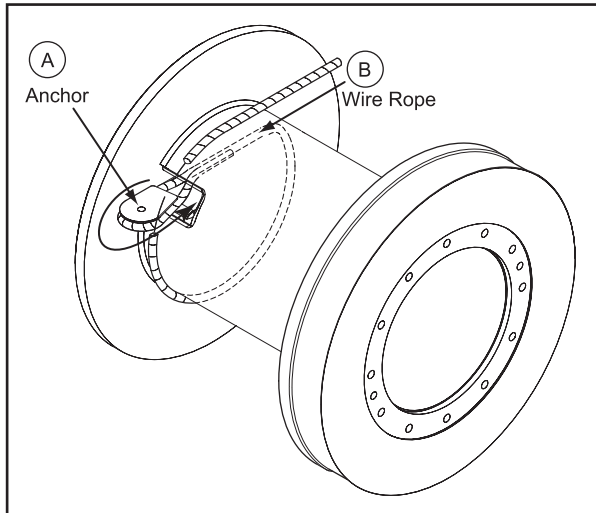
PRODUCT INFORMATION GRAPHICS



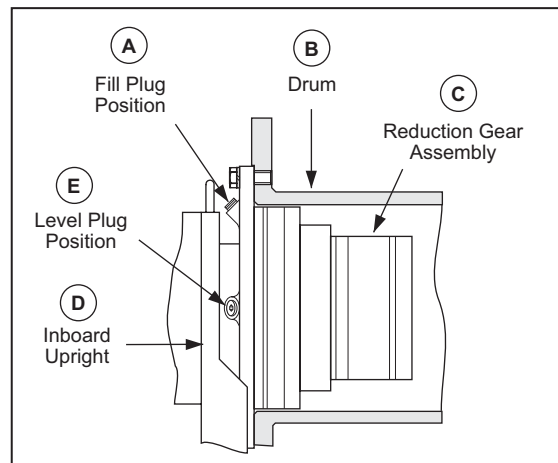
(Dwg. MHP0133)



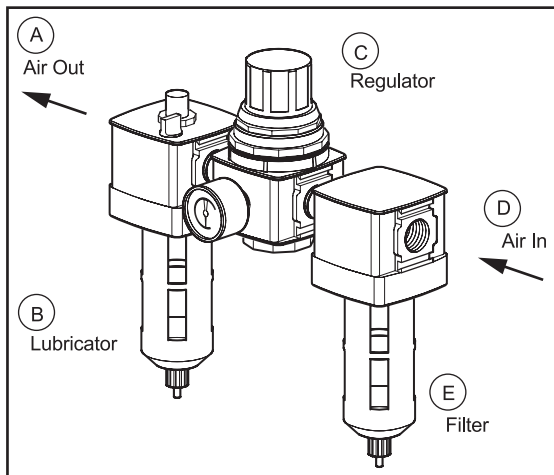
(Dwg. MHP2398)



(Dwg. MHP2686)

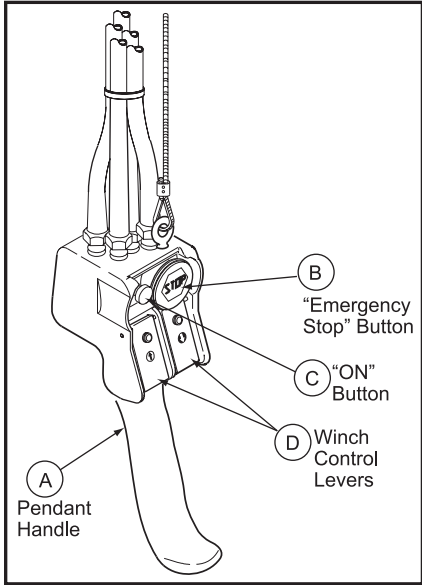


(Dwg. MHP0140)

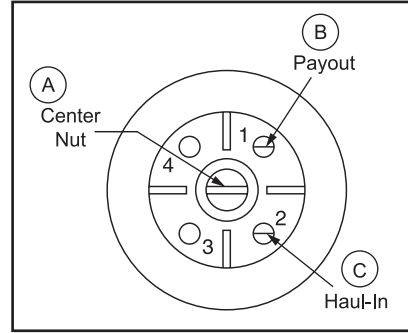


(Dwg. MHP0191)

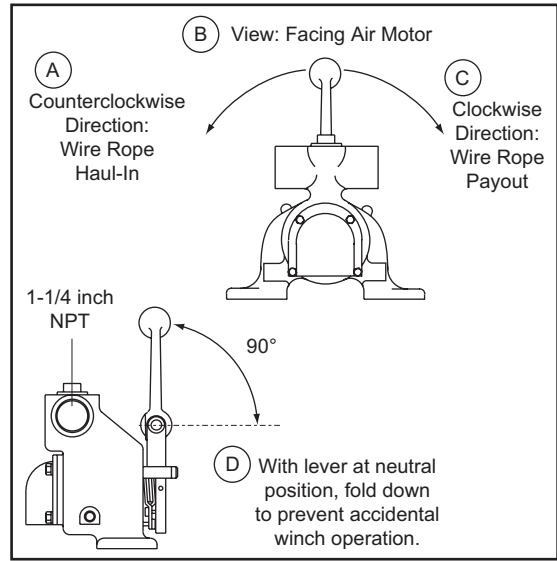
PRODUCT INFORMATION GRAPHICS CONTINUED



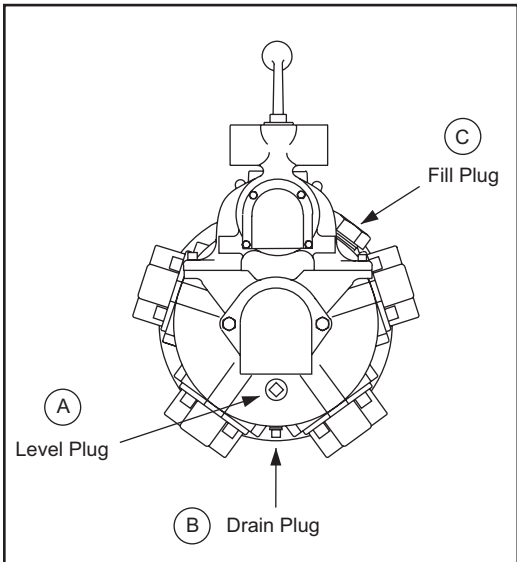
(Dwg. MHP1892)



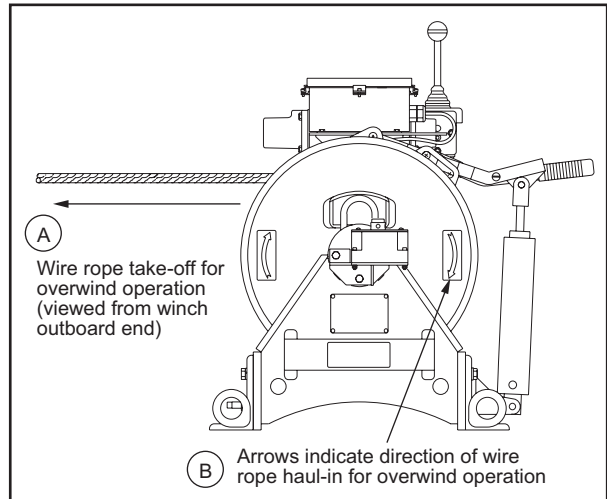
(Dwg. MHP2688)



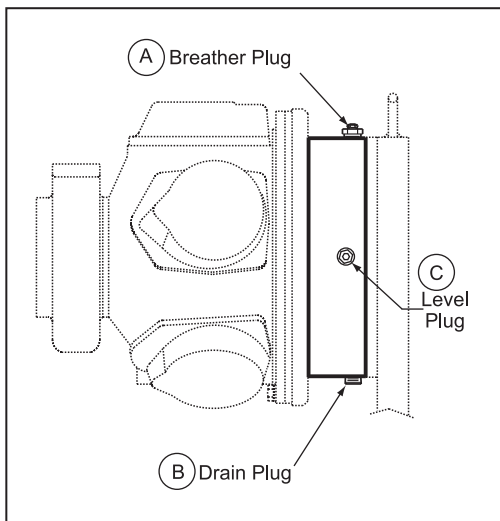
(Dwg. MHP0447)



(Dwg. MHP0222)

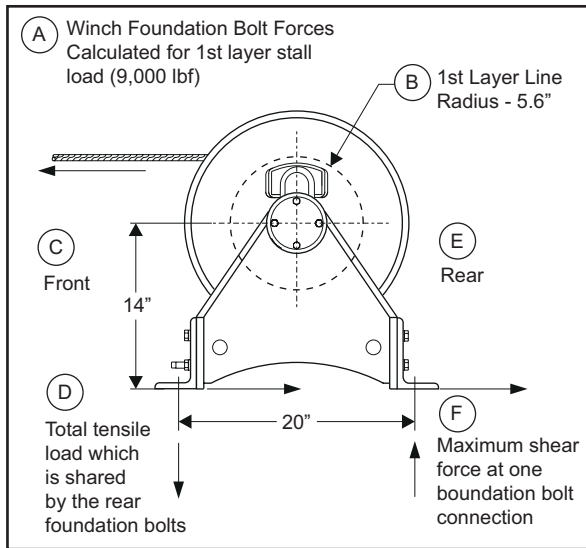


(Dwg. MHP0661)

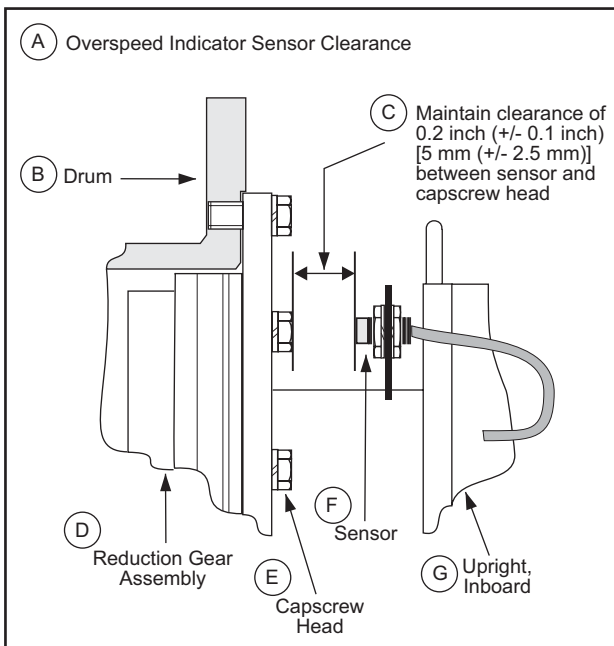


(Dwg. MHP1348)

PRODUCT INFORMATION GRAPHICS CONTINUED



(Dwg. MHP0606)



(Dwg. MHP0602)

SERVICE NOTES

DECLARATION OF CONFORMITY



(CS) PROHLÁŠENÍ O SHODĚ (DA) FABRIKATIONSERKLÆRING (DE) KONFORMITÄTSEKTLÄRUNG (EL) ΔΗΛΩΣΗ ΑΝΑΓΝΩΡΙΣΗΣ (ES) DECLARACIÓN DE CONFORMIDAD (FI) VAKUUTUS NORMIEN TÄYTTÄMISESTÄ (FR) CERTIFICAT DE CONFORMITÉ (HU) MEGFELELŐSÉGI NYILATKOZAT (IT) DICHIARAZIONE DI CONFORMITÀ (NL) SCHRIFTELIJKE VERKLARING VAN CONFORMITEIT (NO) KONFORMITETSEKTLÆRING (PT) DECLARAÇÃO DE CONFORMIDADE (PL) DEKLARACJA ZGODNOŚCI (SK) PREHLÁSENIE O ZHODE (SL) IZJAVA O SKLADNOSTI (SV) FÖRSÄKRAN OM ÖVERENSSTÄMMELSE

Ingersoll-Rand

529, Avenue Roger Salengro, 59450 Sin Le Noble, France

Declare under our sole responsibility that the product: Pneumatic Winches

(CS) Prohlašujeme na svou zodpovědnost, že produkt: Pnevmatické Navijáky (DA) Erklærer som eneansvarlig, at nedenstående produkt: Pnevmatiske spil (DE) Erklären hiermit, gemäß unserer alleinigen Verantwortung, daß die Geräte: Druckluftbetrie bene winden (EL) Δηλώνουμε ότι με δική μας ευθύνη το προϊόν: Πνευματικά βίντσια (ES) Declaramos que, bajo nuestra responsabilidad exclusiva, el producto: Cabrestantes neumáticos (FI) Vakuutamme ja kannamme yksin täyden vastuun siitä, että tuote: Paineilmakäyttöiset Vintturit (FR) Déclarons sous notre seule responsabilité que le produit: Treuils pneumatiques (HU) Kizárólagos felelősségünk tudatában kijelentjük, hogy a termék: Pnevmatikus csörlőkab (IT) Dichiaro sotto la nostra unica responsabilità che il prodotto: Argani pneumatici (NL) Verklaren, onder onze uitsluitende aansprakelijkheid, dat het product: Pnevmatische lieren (NO) Erklærer på ære og samvittighet at produktet: Pnevmatiske vinsjer (PL) Przyjmując pełną odpowiedzialność, oświadczamy, że produkt: Wciągarci pneumatyczne (PT) Declaramos sob a nossa exclusiva responsabilidade que o produto: Guinchos pneumático (SK) Závazne prehlasujeme, že výrobok: Pnevmatické navijaky (SL) Pod polno odgovornostjo izjavljamo, da je izdelek: Pnevmatiski vitli (SV) Intygat enligt vårt ansvar att produkten: Tryckluftsdrevna lyftdon

Model: FA2i-MRA / Serial Number Range: A003029 and up

(CS) Model: / Rozsah výrobních čísel: (DA) Model: / Seriennummerområde: (DE) Modell: / Seriennummernbereich: (EL) Μοντέλο: / Κλίμακα σειριακών αριθμών: (ES) Modelo: / Números de serie: (FI) Malli: / Sarjanumeroaue: (FR) Modèle: / Gamme de numéros de série: (HU) Modell: / Gyártási szám-tartomány: (IT) Modello: / Gamma delle matricole: (NL) Model: / Seriennummer: (NO) Modell: / Serienr: (PL) Model: / Zakres numerów serii: (PT) Modelo: / Gama de Nos de Série: (SK) Model: / Rozsah výrobných čísel: (SL) Model: / Območje serijskih števil: (SV) Modell: / Seriennummer, mellan:

To which this declaration relates, is in compliance with provisions of Directive(s): 98/37/EC (machinery), 94/9/EC (ATEX)

(CS) Ke kterým se toto prohlášení vztahuje, odpovídají ustanovením směrnic: (DA) som denne erklæring vedrører, overholder bestemmelserne i følgende direktiv(er): (DE) auf das sich diese Erklärung bezieht, der folgenden Richtlinie entspricht: (EL) στο οποίο αναφέρεται αυτή η δήλωση, πληροί τις διατάξεις της Οδηγίας: (ES) a los que se refiere la presente declaración, cumplen con todo lo establecido en las directivas: (FI) johon tämä vakuutus viittaa, täyttää direktiiveissä: (FR) Objet de ce certificat, est conforme aux prescriptions des Directives: (HU) Amelyekre ezen nyilatkozat vonatkozik, megfelelnek a következő irányelvek előírásainak: (IT) a cui si riferisce la presente dichiarazione è conforme alle normative delle direttive: (NL) waarop deze verklaring betrekking heeft overeenkomt met de bepalingen van directieven: (NO) som denne erklæringen gjelder for, oppfyller bestemmelsene i direktivene: (PL) Którego dotyczy niniejsza deklaracja, jest zgodny z wymogami dyrektyw: (PT) Ao qual se refere a presente declaração, está de acordo com as prescrições das Directiva: (SK) Na ktorý sa toto prehlásenie vztáhuje, je v súlade s ustanoveniami Smernice (Smerníc): (SL) Na katerega se ta izjava o skladnosti nanaša, v skladu z določili smernic: (SV) Som detta intyg avser, överensstämmer med följande direktiv:

By using the following Principle Standards: EN 292-1; EN 292-2; EN 418; EN 983; F.E.M. 1.001; F.E.M. 9.511; EN 13463-1; pr EN 13463-5; EN 1127-1

(CS) Použitím následujících zákonných norem: (DA) ved at være i overensstemmelse med følgende hovedstandard(er): (DE) Unter Anlehnung an die folgenden Grundnormen entsprechen: (EL) Χρησιμοποιώντας τα παρακάτω κύρια πρότυπα: (ES) conforme a los siguientes estándares: (FI) esitetty vaatimukset seuraavia perusnormeja käytettäessä: (FR) En observant les normes de principe suivantes: (HU) A következő elvi szabványok alkalmazása mellett: (IT) Seguendo i principi standard indicati di seguito: (NL) overeenkomstig de volgende hoofdstandaards: (NO) Ved å bruke følgende prinsipielle standarder: (PL) Spełniając wymogi następujących głównych norm: (PT) observando as seguintes Normas Principais: (SK) Pri dodržaní nasledovných noriem: (SL) Uporabljeni osnovni standardi: (SV) Genom att använda följande principstandard:

Date: February, 2005

(CS) Datum: Únor 2005: (DA) Dato: Februar, 2005: (DE) Datum: Februar, 2005: (EL) Ημερομηνία: Φεβρουάριος, 2005: (ES) Fecha: Febrero, 2005: (FI) Päiväys: Helmikuu, 2005: (FR) Date: Février, 2005: (HU) Dátum: 2005 Február: (IT) Data: Febbraio, 2005: (NO) Dato: Februar, 2005: (NL) Datum: Februari, 2005: (PT) Data: Fevereiro, 2005: (PL) Data: luty 2005: (SK) Dátum: Február 2005: (SL) Datum: februar 2005: (SV) Datum: Februari, 2005:

Approved By:

(CS) Schválil: (DA) Godkendt af: (DE) Genehmigt von: (EL) Εγκρίθηκε από: (ES) Aprobado por: (FI) Hyväksyttty: (FR) Approuvé par: (HU) Jóváhagyta: (IT) Approvato da: (NL) Goedgekeurd door: (NO) Godkjent av: (PL) Zatwierdzone przez: (PT) Aprovado por: (SK) Schválil: (SL) Odobril: (SV) Godkänt av:

Daniel S. Munko - IREP - Seattle, WA USA

Engineering Product Manager

www.winchandhoistsolutions.com



To Buy Ingersoll Rand Products Online visit AirToolPro.com
Brought to you by Zampini Industrial Group - Factory Authorized Distribution Since 1987 - 1-800-353-4676