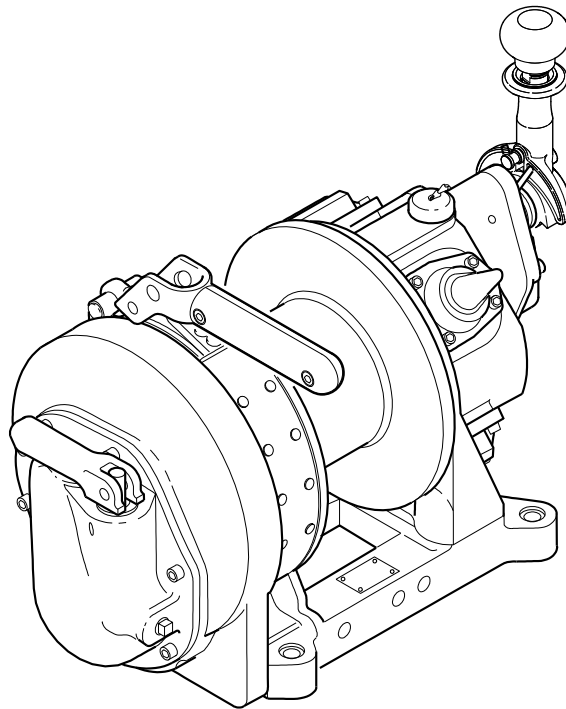




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## BU7A AIR WINCH



(Dwg. MHP1233)



**Save These Instructions**

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 Table 1 'Product Information Manuals' on page 2. Manuals can be downloaded from [www.ingersollrandproducts.com](http://www.ingersollrandproducts.com).

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.

Table 1: Product Information Manuals

Publication	Part/Document Number	Publication	Part/Document Number
Product Safety Information Manual	MHD56250	Product Maintenance Information Manual	MHD56461
Product Parts Information Manual	MHD56382		

## PRODUCT DESCRIPTION

The **BU7A** winch is powered by a radial piston air motor. The output from the motor is transferred through the drum by the drive shaft. The drive shaft rotates a series of connected spur gears which form a reduction assembly. Output from the reduction assembly drives the wire rope drum. Spur gears are not inherently self-locking as other types of gears are, therefore the brake must be applied whenever there is a load attached to the load line. The winch is also equipped with a free spool feature.

### CAUTION

- The free spool feature must only be used with a manual brake. Use of a manual brake is the only way to maintain control of the load line.

The free spool feature consists of a spring detented clutch jaw connecting the final drive shaft and final spur gear in the reduction assembly. When the clutch jaw is disconnected, the drum becomes disconnected from the reduction gear assembly and motor and is free to rotate in either direction.

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## SPECIFICATIONS

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### Model Code Explanation

Example: BU7APTAB

#### Model:

<b>BU7A</b>	=	<b>1000 lbs (454 kg) Air Winch</b>
AB	=	Automatic Drum Band Brake
RC	=	Remote Full Flow Control
RCAB	=	Remote Full Flow Control and Automatic Brake
<b>PTAB</b>	=	<b>Remote Full Flow Pendant Control and Automatic Brake</b>
AB/PT	=	Remote Pilot Pendant and Automatic Band Brake
AB/PLT	=	Remote Pilot Lever Throttle and Automatic Band Brake
E	=	Construction Cage
G	=	Drum Guard
J	=	Air Line Accessories
L	=	Extended Warranty
P	=	Marine 812 Finish
P1	=	Marine 812-X Paint System
R	=	Natural Gas Operation
W	=	Client Witness of Load Test
X	=	Special Testing
Z	=	Sandblast and Carbozinc Primer

BU7A

PTAB

### Notes:

- (1) Remote full flow throttles are provided with 6 feet (2 metres) of hose. Specify hose lengths greater than 6 feet. For lengths greater than 20 feet (6 metres) with the Remote Full Flow Throttle, or 66 feet (20 metres) with the Remote Pilot Lever and Remote Pilot Pendant Throttles contact your **Ingersoll Rand** distributor or the factory for control acceptability. Metric lengths are provided for reference only, order lengths in feet. (Used with Auto Band Brake only.)
- (2) RC without AB is for pulling applications only. Do not use for lifting or lowering, as the operator may be too far away to operate a manual brake.
- (3) Free spool clutches are standard on **BU7A** winches. A disengaging clutch, however, will not be supplied on units ordered with automatic brakes (AB).

**Table 2: Specifications**

General Specifications		Model				
		BU7A		BU7APTAB		
Air System	Rated Operating Pressure	90 psig (6.3 bar)				
	Consumption Volume (at rated pressure)	50 scfm	1.4 cu. m/min	50 scfm	1.4 cu. m/min	
Rated Performance (at rated pressure/volume)	Mid Drum Line Pull	1,000 lbs	454 kgs	1,000 lbs	454 kgs	
	Mid Drum Line Speed	43 fpm	13 m/min	37 fpm	11 m/min	
	Max Stall Pull - 1st Layer	1,950 lbs	886 kgs	1,950 lbs	886 kgs	
Net Weight		75 lbs	34 kgs	108 lbs	49 kgs	
Air Motor Pipe Inlet Size		1/2 inch	13 mm	1/2 inch	13 mm	
Air System Hose Size (inside diameter)		3/4 inch	19 mm	3/4 inch	19 mm	
Wire Rope Anchor Hole Diameter		11/32 inch	8.7 mm	11/32 inch	8.7 mm	
Drum Flange Diameter		8-1/2 inch (216 mm)				
Drum Length (between flanges)		4-1/2 inch (114 mm)				
Motor HP		1.6				
Drum Wire Rope Storage Capacity * (feet/metres)		Wire Rope Diameter				
		1/4 inch **	6 mm	5/16 inch	8 mm	
		158 ft *	48 m *	105 ft *	32 m *	
Factors for determining STALL and LINE PULL at various air pressure. To obtain performances at operating pressures other than 90 psi, select the load or speed rating required from the applicable performance graph and multiply that value by the factor corresponding to the operating pressure from the table. Example: Model BU7A at 750 lbs with 70 psi and drum half full. To determine speed from curve: 50 fpm x 0.72 = 36 fpm.		Air Pressure (psi)	Stall Factor		Wire Rope Speed Factor	
		60	0.67		0.58	
		70	0.78		0.72	
		80	0.89		0.86	
		90	1.00		1.00	
		100	1.11		1.14	

\* Based on ASME B30.7 standards which require top layer to be at least 1/2 in. (13 mm) below drum flange diameter. Recommended drum working storage capacity is 80% of values shown.  
 \*\* Recommended wire rope size.

## INSTALLATION

Prior to installing the product, carefully inspect it for possible shipping damage. Products are supplied fully lubricated from the factory. Check oil levels and adjust as necessary before operating product. Refer to "LUBRICATION" section on page 8 for recommended oils and lubrication intervals.

### ⚠ 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 product to use.

### NOTICE

- Prior to installation refer to Product Safety Information Manual for all sections of installation.

### ■ Mounting

Mount winch with longitudinal center line horizontal and vent cap at top vertical center. The winch will not function properly if the longitudinal center line is tilted more than 10° or if winch is rotated so that vent cap is more than 20° off top vertical center.

For mounting on a vertical surface or for inverted mounting, the motor case can be rotated on the motor mounting bracket to any one of four different positions. This feature allows the motor assembly to be positioned with the vent cap on top. To change the position of the motor assembly, drain the oil from the motor case, unscrew the eight motor case capscrews and rotate the motor assembly to suit the mounting. Ensure clear unrestricted access is always available to control and brake levers.

- Do not weld to any part of winch.
- The winch mounting surface must be flat and of sufficient strength to handle the rated load plus the weight of the winch and attached equipment. An inadequate foundation may cause distortion or twisting of the winch resulting in winch damage.
- Make sure mounting surface is flat to within 1/16 inch (2.0 mm). Shim if necessary.
- Mounting bolts must be Grade 8 or better. Use self-locking nuts or nuts with lockwashers. Refer to Table 3 'Mounting Bolts' on page 4.
- Tighten mounting bolts evenly and torque to specification in torque chart. Refer to 'Torque Chart' in Product Maintenance Manual.
- 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.

**Table 3: Mounting Bolts**

Model	Mounting Bolts	
	inch	mm
BU7A	1/2	13

Refer to Dwg. MHP0548 on page 9, A. Center Line; B. Brake Cylinder BU7APTAB Only.

### ■ 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.
- Install wire rope to come off drum for overwind operation (normal application).

### ■ 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. Refer to Table 4 'Minimum and Maximum Wire Rope Size' on page 4 for recommended size.

**Table 4: Minimum and Maximum Wire Rope Size**

Model	Minimum		Maximum	
	inch	mm	inch	mm
BU7A	1/4	6	5/16	8

**Note:** Maximum wire rope diameter is limited by size of wire rope anchor hole.

**Table 5: Breaking Strength\***

Rope Size (in.)	lbs	kgs	Weight per ft (lbs)	Weight per metre (kgs)
1/4 (0.25)	6,800	3084	0.11	0.15
5/16 (0.31)	10,540	4781	0.18	0.25

\* Based on extra improved plow steel wire rope with independent wire rope core. ASME B30.7 requires a minimum of 3.5:1 design factor with 15:1 wire rope diameter to drum diameter for most applications (e.g. pulling/hauling and anchor handling). For lifting and lowering, a 5:1 design factor with an 18:1 wire rope diameter to drum diameter is required.

For winches used in **lifting** applications, ensure that the top layer of the wire rope is a distance from the top of the drum flange that is equal to at least twice the diameter of the wire rope. For example: the top layer of a 8 mm wire rope must be at least 16 mm below the drum flange edge.

As a general rule for **lifting** applications, a minimum of 5:1 wire rope design factor is required with an 18:1 wire rope to drum diameter ratio. For **pulling** applications, a 3:1 wire rope design factor is required with a 15:1 wire rope to drum diameter ratio.

### ■ Installing Wire Rope

Refer to Dwg. MHP1288 on page 9, **A.** Anchor Setscrew; **B.** Wire Rope End; **C.** Winch Base.

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 fused end of the wire rope into the wire rope anchor hole, past the two anchor screws, and position the end just beneath the drum surface.
3. Apply the wire rope so that it winds over the top when the drum is rotated in a direction that is clockwise when facing the gear end of the winch. This is indicated by an arrow on the gear case.
4. Secure by tightening both anchor screws. Make sure the anchor screws are below the surface of the drum when tightened.



- **Make sure first wrap of wire rope is tight and lies flush against the drum flange.**
- **The wire rope should be applied to the drum so that it overwinds when the drum rotates in a clockwise direction when facing the gear end of the winch. This is indicated by an arrow on the gear case.**

### ■ 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.

### ■ Drum Guard

Use of a drum guard is recommended on all winches. Refer to the Product Parts Information Manual.

Install drum guard and remove the minimum amount of mesh from the guard to provide clearance for wire rope travel.



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

## ■ 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 product performance and reduce unscheduled downtime. Refer to Dwg. MHP0191 on page 9, **A.** Air Out; **B.** Lubricator; **C.** Regulator; **D.** Air In; **E.** Filter.

Refer to Table 2 'Specifications' on page 4 for motor air consumption and rated operating pressure. If air supply varies from what is recommended, product 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 Lines

Inside diameter of air supply lines must not be less than size specified in Table 2 'Specifications' on page 4. Before making final connections, all air supply lines should be purged with clean, moisture free air or nitrogen before connecting to main air 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.



- **Lubricator must be located no more than 10 ft (3 m) from motor.**
- **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 control valve when air line lubricator is functioning properly.

### ■ Air Line Filter

It is recommended that an air line 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.



- **When air filter is used ensure it allows air to pass through at products rated scfm. Refer to "SPECIFICATIONS" on page 3.**

### ■ Air Pressure Regulator

If an air pressure regulator is used, install between lubricator and filter.

### ■ 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 mufflers are installed in winch exhaust manifold and control valve exhaust port. Check mufflers periodically to ensure they are functioning correctly.

### ■ Shut Off Valve

Refer to the Product Safety Information Manual for information.

## ■ Air Systems Connections

### ■ Remote Full Flow Pendant Throttle (optional feature)

Refer to Dwg. MHP1241 on page 9 for hose connection positions. **A.** Payout Yellow; **B.** Haul-in Green; **C.** Supply Red; **D.** Winch Air Supply.

## ■ Motor

For optimum performance and maximum durability of parts, provide recommended air supply as measured at motor inlet. Refer to Table 2 'Specifications' on page 4. The air motor should be installed as near as possible to compressor or air receiver.

## ■ Natural Gas Operation (optional feature)

### WARNING

- Ensure all fittings and connections are tight. Inspect all connections with suitable leak detection equipment.
- At first notice of any unusual odors or noticeable leaks, cease winch operation until source is identified and corrected.
- Natural gas exhaust must be piped away from the winch.

The winch may be run using natural gas. However, motor and valve modifications are required for this usage. Refer to Product Parts Information manual for additional information. Use of natural gas will reduce motor life. Natural gas exhausting from the winch must be piped away.

## ■ 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 and gear case grease are correct. Top off levels as required before operation as described in "LUBRICATION" section on page 8.
3. Operate winch in both directions with no load for one to two minutes.
4. New brake band Lining Run-in Procedure: All new 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.
6. Check operation of limit switches, locking mechanisms and all safety devices when equipped.
7. Check foundation mounting fasteners are secure.
8. Install drum 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' on page 7.
2. Pour a small amount of ISO VG 32 (SAE 10W) oil in motor inlet port.
3. Operate motor for 15 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 Product Safety Information Manual before operating product.

The four most important aspects of product operation are:

1. Follow all safety instructions when operating the product.
2. Allow only people trained in safety and operation of this winch to operate this equipment.
3. Subject each product to a regular inspection and maintenance procedure.
4. Be aware of product capacity and weight of load at all times.

### WARNING

- Do not lift loads over people.

### NOTICE

- Refer to Product Parts Information Manual for drawings unless specified elsewhere.

## ■ 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 "SPECIFICATIONS" 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. MHP1239 on page 10, **A.** Haul-in; **B.** Payout.

The winch control throttle valve is spring loaded, full flow air and mounts to the motor rotary housing.

To operate control valve, place palm of hand on control knob and wrap fingers around flange of sliding handle. Squeeze fingers, lifting sliding handle up to unlock control handle. 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. When released, handle will return to neutral or center position, sliding handle will drop down to engage and lock control handle in place.

### ■ Remote Full Flow Air Pendant Throttle (optional feature)

Refer to Dwg. MHP1319 on page 10, **A.** Haul-in; **B.** Payout.

Provides for remote winch control at distances of up to 20 feet\* (6 metres) away from the winch. The pendant control throttle is a two lever movable control station for winch operation. The winch control valve, located on the winch motor, controls the motor speed and direction of drum rotation. Direction of rotation is determined by the pendant lever depressed.

\* For distances greater than 20 feet (6 metres) contact Technical Sales for control acceptability.

### ■ Remote Pilot Pendant Throttle (optional feature)

Refer to Dwg. MHP1546 on page 10.

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.

\* For distances greater than 66 feet (20 metres) contact Technical Sales for control acceptability.

## ■ Winch Brakes

### ■ Manual Drum Brake (standard)

The manual drum band 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 for instructions.

### ■ Automatic Drum Band Brake (optional feature)

The automatic drum band 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.

### NOTICE

- Extended exposure to corrosive atmospheres can cause the band brake lining to adhere to the drum. It is recommended when winch is not in operation and in a no load condition that the band brake be left in a released position.

For winches equipped with an automatic brake, always ensure that clutch jaw spacers are installed.

## ■ Free Spool Clutch

### WARNING

- Do not engage clutch when motor is running or drum is spinning, as this produces a severe strain on parts.
- Do not disengage clutch when winch is loaded. Be sure clutch is fully engaged before operating winch.

A jaw type clutch connects the gearing and drum. The function of the clutch is to disengage the wire rope drum from the motor so that the wire rope can be unwound from the drum by hand without working against the gearing and the compression of the motor. The clutch is engaged or disengaged by the clutch lever which is located on the top of the gear case cover. When clutch is engaged the lever is locked by a detent to prevent disengagement. Detent is released by pressing down (toward base) on lever, after which the end can be swung outward from the winch, disengaging the clutch jaws. When clutch is in disengaged position it can be engaged by moving end of lever toward winch. It may be necessary to open the throttle a slight amount to position the jaws for engagement.

### WARNING

- Do not use free spool clutch feature in combination with automatic brake. Use of winches with free spool clutch and automatic brake can result in severe injury, death or property damage.



## INSPECTION

Inspection information is based in part on American Society of Mechanical Engineers Safety Codes (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 regular service, frequent inspections should be made by operators at the beginning of each shift. In addition, visual and audible inspections should be conducted during regular operation for indications of damage or evidence of malfunction (such as abnormal noises).

Disassembly may be required as a result of frequent inspection findings or in order to properly inspect the individual components. Disassembly steps are described in the Product Maintenance Information Manual.

1. **Surrounding Area.** Visually check for winch oil leaks. Do not operate winch if leaking oil is found. Ensure surrounding area has no slippery surfaces and is obstruction free.
2. **Hoses and Fittings.** Visually inspect for damage, air leaks and loose connections. Repair all leaks or damage and tighten loose connections prior to starting daily tasks.
3. **Muffler.** Visually check for restrictions or external damage. Clear restrictions or replace if damaged.
4. **Manual Shut-Off Valve.** Test shut-off valve to ensure proper operation and free movement.
5. **Guards.** Verify wire rope does not contact guard during winch operation and that guards are secure and undamaged.
6. **Winch.** Visually inspect winch housings, control(s), external brake, siderails and drum for damage. Check that all external bolts are in place and secure. Report damage to supervisor and request additional inspection by an Ingersoll Rand trained Technician.
7. **Winch Operation.** Power winch in both directions. Winch must operate smoothly without sticking, binding or abnormal noises and have minimal vibration.

### NOTICE

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

8. **Pendant (optional feature).** Ensure operation of pendant levers is smooth and winch is responsive to pendant control. Pendant levers must spring return to the neutral position when released.
9. **Manual Throttle Lever.** Ensure operation of manual throttle lever is smooth and winch is responsive to lever movement. Lever must return to neutral and lock in place when released. If winch responds slowly or controls stick, do not operate winch until all problems have been corrected.
10. **Wire Rope.** Visually inspect all wire rope 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.
11. **Wire Rope Spooling.** Visually check reeving and ensure wire rope feeds on and off the drum smoothly. Verify spooling direction (overwind or underwind) is correct for winch and application.
12. **Brake(s).** Lift and lower the load a short distance to test brake(s). Brake(s) must hold load without slipping. Automatic brake must release when winch control throttle is operated. If brake(s) do not hold load or do not release properly, they must be adjusted or repaired.

### WARNING

- **Worn or improperly functioning brakes may cause excessive heat buildup and sparks.**
13. **Lubrication.** Refer to "LUBRICATION" on page 8 for recommended procedures and lubricants.
  14. **Labels and Tags:** Check for presence and legibility of labels. Refer to Product Parts Information Manual for correct labels and placement. Replace if damaged or missing.

### ■ 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' on page 7 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' on page 7.
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 on page 8. 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. To prevent rust buildup from internal condensation, open lubricator to allow more oil into winch and operate with no load. If winch is being stored from air source place small amount of 20 weight oil at air inlet port.
4. Oil the wire rope.
5. Place in a dry location.
6. Before returning winch to service, follow instructions for 'Winches Not in Regular Use' in the "INSPECTION" section on page 7.
7. **Mufflers and Breathers.** All mufflers and breathers must be removed and replaced with threaded plugs to prevent dust and moisture from entering motor and valve assemblies.
8. **Drum Brake.** Product equipped with a manual band brake must be stored with the brake in its disengaged position.

# LUBRICATION

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

Refer to 'Maintenance Interval' chart in Product Maintenance Information Manual for recommended lubrication intervals. Use only those lubricants recommended. Other lubricants may affect product 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 6: Lubrication Intervals**

Component	Interval
Check Air Line Lubricator	Daily
Check Motor Oil Level	
Check Gear Case Grease	Weekly
Change Motor Oil	1 year or 1000 hours of winch operation
Change Gearbox Grease	

## ■ General Lubrication

Correct lubrication is one of the most important factors in maintaining efficient product 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 8.
- It is recommend that the first oil change be done after approximately 50 hours of initial operation. Thereafter, drain and replace oil according to Table 6 'Lubrication Intervals' on page 8.
- 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 product operation, allow oil to settle before topping off.
- Always collect lubricants in suitable containers and dispose of in an environmentally safe manner.



**WARNING**

- Pneumatic products use oil to prevent excessive heat buildup and to prevent wear that could cause sparks. Oil levels must be properly maintained.

## ■ Recommended Lubricants

**Table 7: Ingersoll Rand Lubricants**

Where Used	Size	Part Number
Wire Rope	16 oz	Lubri-Link-Green®
Bearings and Gear Case	1 lb	70 1 LB
Air Line Lubricator	1 Qt	29665

**Table 8: Air Motor Recommended Lubricant Grade**

Temperature	Grade Type
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 shipped from factory with this lubricant.

**Table 9: Recommended Grease Grade**

Temperature	Grade Type
-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

**Note:** Units are shipped from factory with EP 2 grease.

## ■ Motor



**CAUTION**

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

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. Refer to 'Recommended Lubricants' on page 8.

Add oil through filler opening until oil flows from level plug hole. Add oil slowly to prevent spilling. Refer to Table 10 'Motor Oil Capacity' on page 8.

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.

**Table 10: Motor Oil Capacity**

Capacity	
pints	litres
0.5	0.24

## ■ Gear Case

Check grease in gear chamber weekly by removing lower grease plug in gear case cover. If grease is below this opening, remove grease plug from top of gear case cover and add a sufficient quantity to bring grease level in chamber up to the side opening.

## ■ Seals and Bearings

If product is disassembled, clean all parts thoroughly and coat bearings and seals with clean grease. Refer to 'Recommended Lubricants' section on page 8. 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) grade oil.
- Brush, drip or spray lubricant weekly, or more frequently, depending on severity of service.

## ■ Natural Gas Lubrication



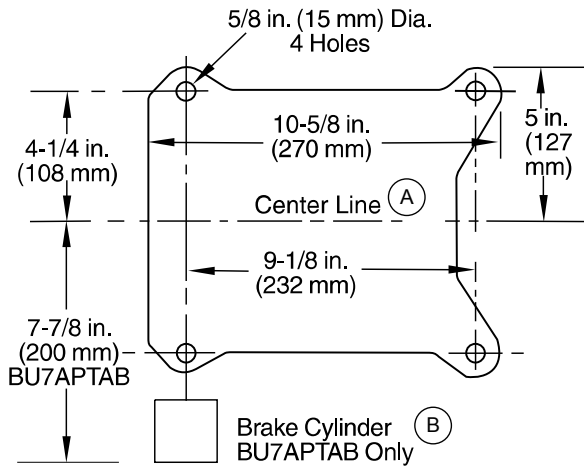
**CAUTION**

- Use of other than PAG Synthetic oils can cause premature seal failure, which could cause damage to the motor. Refer to caution label part number 71470744.

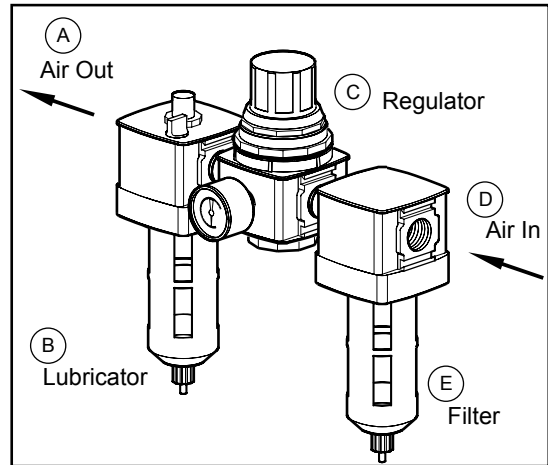


**PRODUCT INFORMATION GRAPHICS**

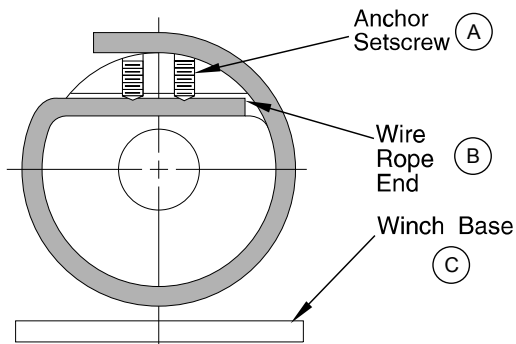
**Bolt Hole Dimensions**



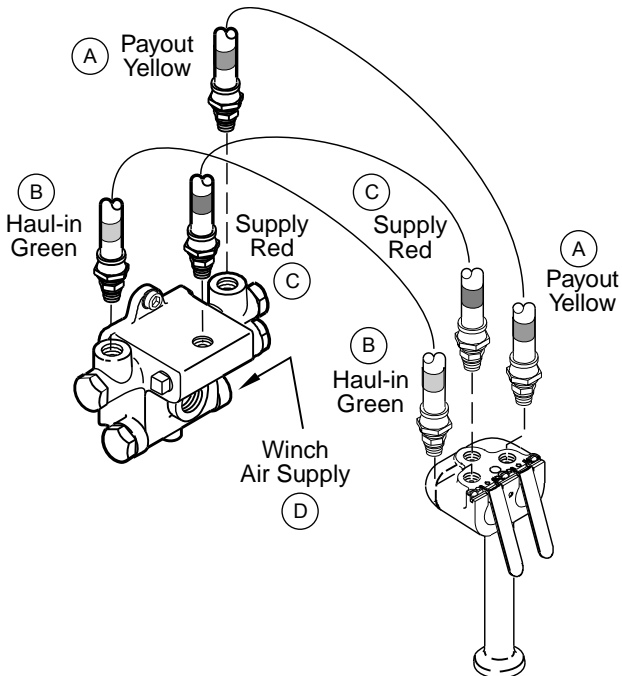
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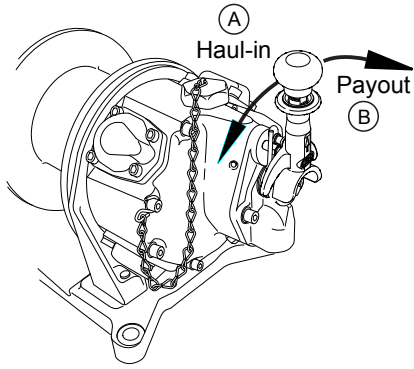


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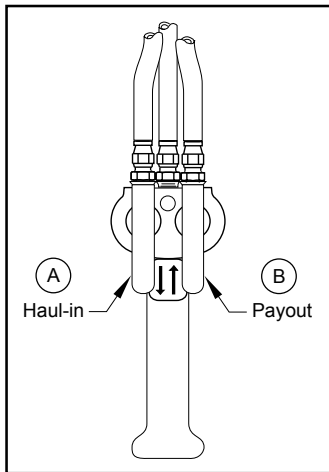
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**PRODUCT INFORMATION GRAPHICS (CONTINUED)**

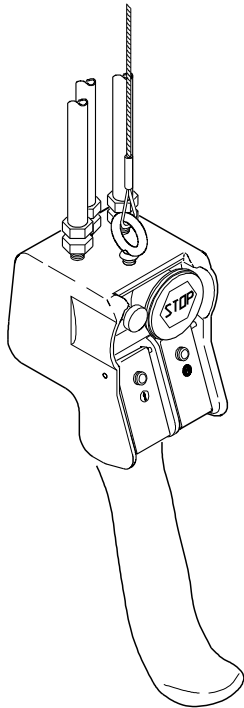
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## WARRANTY

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### **Ingersoll Rand Limited Warranty**

**Ingersoll Rand Company** ("IR") warrants to the original user its material handling products ("Products") to be free of defects in material and workmanship for a period of one year from the date of purchase. IR will, at its option either (1) repair, without cost, any Product found to be defective, including parts and labor charges, or (2) replace such Products or refund the purchase price, less a reasonable allowance for depreciation, in exchange for the Product. Repairs or replacements are warranted for the remainder of the original warranty.

If any Product proves defective within its original one-year warranty period, it should be returned to any Authorized Product Service Distributor, transportation prepaid with proof of purchase or warranty card. This warranty does not apply to Products which IR has determined to have been misused or abused, improperly maintained by the user, or where the malfunction or defect can be attributed to the use of non-genuine IR repair parts.

**IR MAKES NO OTHER WARRANTY, CONDITION OR REPRESENTATION OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, STATUTORY OR OTHERWISE, AND ALL IMPLIED WARRANTIES AND CONDITIONS RELATING TO MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED.**

IR's maximum liability is limited to the purchase price of the Product and in no event shall IR be liable for any consequential, indirect incidental or special damages of any nature arising from the sale or use of the Product, whether in contract, tort or otherwise.

Note: Some states do not allow limitations on incidental or consequential damages, so that the above limitations may not apply to you. This warranty gives you specific legal rights and you may also have other rights which may vary from state to state.

Fulcrum series electric winch, product code 405-002: 2 year warranty.

Winch and Hoist Solutions Extended Warranty This option provides a price for extending the **Ingersoll Rand** Winch and Hoist Solutions Warranty from the standard one (1) year to two (2) years from the date of purchase. All other provisions of the standard warranty to remain in effect.

For additional information or quotations for warranties falling outside of these parameters, please contact your Client Services Representative with your requirements.

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