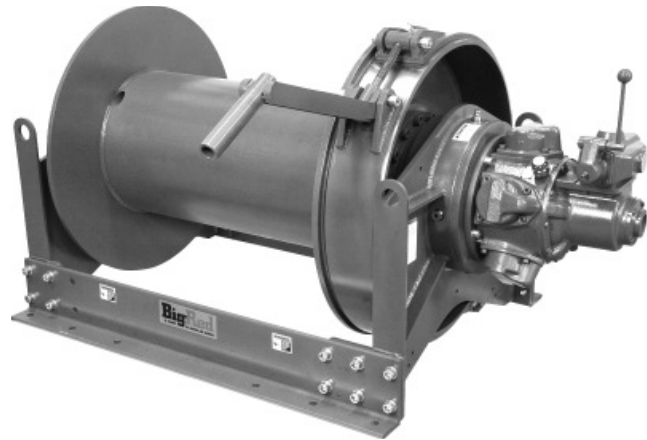




Read this Owner's Manual thoroughly before operating the equipment. Keep it with the equipment at all times. Replacements are available from Thern, Inc.



IMPORTANT: Please record product information on page 2. This information is required when calling the factory for service.

BigRed

Owner's Manual

For TA10 Series Planetary Gear Air Winches



Warranty Statement

Please record the following:

Date Purchased: _____

Model No.: _____

Serial No.: _____

This information is required when calling the factory for service.

Thern, Inc. warrants each new products to be free from defects in material and workmanship under normal use and service for a period of 24 months from the date of purchase by the original using buyer. Genuine Thern, Inc. replacement parts and components will be warranted for 30 days from the date of purchase, or the remainder of the original equipment warranty period, whichever is longer.

Under no circumstances will this warranty cover an product or component thereof, which, in the opinion of the company, has been subjected to misuse, unauthorized modifications, alteration, an accident or shipping damage. This warranty also shall not apply to products that are operated improperly, improperly maintained or improperly stored.

This warranty does not cover any costs for removal of our product, downtime, or any other incidental or consequential costs or damages resulting from the claimed defects. Brake discs, wire rope or other wear components are not covered under this warranty, as their life is subject to use conditions which vary between applications. Any alteration, repair or modification of the product outside the Thern, Inc. factory shall void this warranty.

Thern, Inc. in no way warrants pneumatic, hydraulic or electric motors and control valves or other trade accessories since these items are warranted separately by their respective manufacturers.

FACTORY AUTHORIZED REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY TO THE CONSUMER. THERN, INC. SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PRODUCT. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

To make a claim under this warranty, contact the factory for an RGA number. The product must be returned, prepaid, directly to Thern, Inc. or to an authorized service center. A completed warranty claim form must accompany the product. If the product is found to be defective, it will be repaired or replaced free of charge, and Thern, Inc. will reimburse the shipping costs.

Note: Thern, Inc. reserves the right to change the design or discontinue the production of any product without prior notice.

About This Manual

The Occupational Safety and Health Act of 1970 states that it is the employer's responsibility to provide a workplace free of hazard. To this end, all equipment should be installed, operated, and maintained in compliance with applicable trade, industrial, federal, state, and local regulations. It is the equipment owner's responsibility to obtain copies of these regulations and to determine the suitability of the equipment to its intended use.

This Owner's Manual, and warning labels attached to the equipment, are to serve as guidelines for hazard-free installation, operation, and maintenance. They should not be understood to prepare you for every possible situation.

The information contained in this manual is applicable only to the Thern TA10 Series Planetary Gear Air Winches. Do not use this manual as a source of information for any other equipment.

The following symbols are used for emphasis throughout this manual:

▲WARNING

Failure to follow 'WARNING!' instructions may result in equipment damage, property damage, and/or serious personal injury.

▲CAUTION

Failure to follow 'CAUTION!' instructions may result in equipment damage, property damage, and/or minor personal injury.

Important!

Failure to follow 'important!' instructions may result in poor performance of the equipment.



Figure 1 – Serial Tag


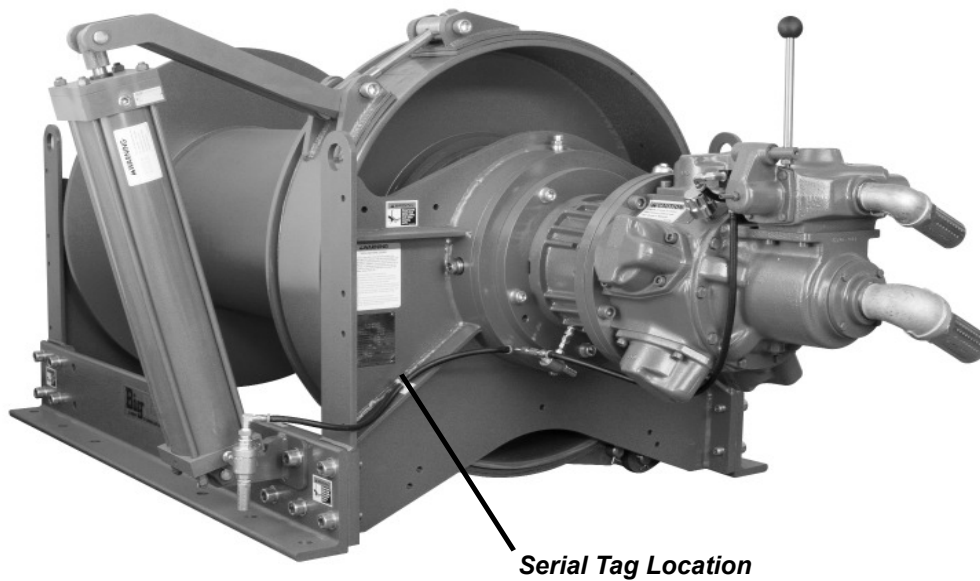
THERN, INC.	
PO BOX 347	
WINONA, MN 55987	
(507) 454-2996	
MODEL #	<input type="text"/>
SERIAL #	<input type="text"/>
1ST LAYER RATING (LBS)	<input type="text"/>
MID DRUM RATING (LBS)	<input type="text"/>
FULL DRUM RATING (LBS)	<input type="text"/>
1ST LAYER SPEED (FPM)	<input type="text"/>
MID DRUM SPEED (FPM)	<input type="text"/>
FULL DRUM SPEED (FPM)	<input type="text"/>
DRUM SIZE (IN.) ID	<input type="text"/>
OD	<input type="text"/>
W	<input type="text"/>
ROPE SIZE (IN.)	<input type="text"/>
VOLTAGE	<input type="text"/>
PRESSURE	<input type="text"/>
FLOW	<input type="text"/>
CODE #	<input type="text"/>
 WARNING READ OWNERS MANUAL NOT FOR LIFTING PEOPLE OR THINGS OVER PEOPLE	
PART # A5923	

Figure 1A - Serial Tag Location



Suggestions for Safe Operation



⚠WARNING

DO the following:

Read and comply with the guidelines set forth in this Owner's Manual. Keep this manual, and all labels attached to the winch, readable and with the equipment at all times. Contact Thern, Inc. for replacements.

Check lubrication before use.

Install the wire rope securely to the winch drum.

Keep at least 5 wraps of wire rope wound on the drum at all times, to serve as anchor wraps. With less than 5 wraps on the drum the wire rope could come loose, causing the load to escape.

Keep hands away from the drum, gears, wire rope, and other moving parts of the equipment.

Ensure brakes hold prior to making complete lift by lifting load a short distance and releasing control.

If there is slack wire rope condition, the hoisting mechanisms shall be inspected to ensure all wire ropes are properly seated on drums and in sheaves, before resuming winch operation.

Disconnect air supply before servicing the equipment.

Suggestions for Safe Operation

⚠WARNING**DO NOT do the following:**

Do not lift loads over people. Do not walk or work under a load or in the line of force of any load.

Do not exceed the load rating of the winch or any other component in the system. To do so could result in failure of the equipment.

Do not use more than one winch to move a load unless each winch was designed for use in a multiple winch system.

Do not use damaged or malfunctioning equipment. To do so could result in failure of the equipment.

Do not modify the equipment in any way. To do so could cause equipment failure.

Do not wrap the wire rope around the load. This damages the wire rope and could cause the load to escape. Use a sling or other approved lifting device.

Do not operate the winch with drive guards or gear covers removed or improperly installed.

Do not divert your attention from the operation. Stay alert to the possibility of accidents, and try to prevent them from happening.

Do not jerk or swing the load. Avoid shock loads by starting and stopping the load smoothly. Shock loads overload the equipment and may cause damage.

Do not leave a suspended load unattended unless specific precautions have been taken to secure the load and keep people away from the winch and out from under the load.

Do not adjust the brake with the load suspended.

Do not disassemble the air cylinder for the automatic band brake, improper disassembly could cause personal injury. Contact factory.



1.1 Installing the Winch

Important!

- Inspect the winch immediately following installation according to the Instructions for Periodic Inspection. This will give you a record of the condition of the winch with which to compare future inspections.
- A qualified professional should inspect or design the foundation to insure that it will provide adequate support.
- Locate the winch so it will be visible during the entire operation.
- When moving and positioning the winch, lift using the lifting eyes in the frame or with a sling wrapped around drum.
- Do not weld the winch frame to the foundation or support structure. Welding the frame may void warranty, contact Thern, Inc. Use fasteners as instructed.

⚠WARNING

All supporting structure, mounting hardware and attaching hardware must be in accordance with all applicable standards codes and regulations.

Ensure proper selection and installation of wire rope and sheaves. Sheaves and sheave mounting must be designed and selected in accordance with all applicable standards, codes, and regulations. Improper installation of wire rope or sheave can cause uneven spooling and wire rope damage that could cause a load to escape.

Do not install the winch in an area defined as hazardous by the National Electric Code, unless installation in such an area has been thoroughly approved.

Do not install the winch near corrosive chemicals, flammable materials, explosives, or other elements that may damage the winch or injure the operator. Adequately protect the winch and the operator from such elements.

Position the winch so the operator can stand clear of the load, and out of the path of a broken wire rope that could snap back and cause injury.

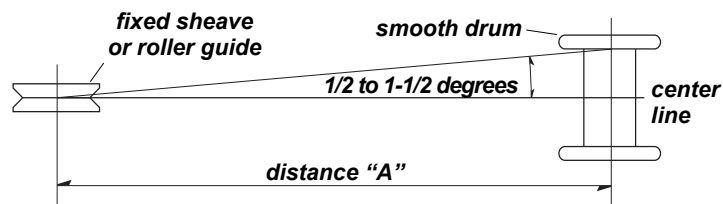
Attach the winch to a rigid and level foundation that will support the winch and its load under all load conditions, including shock loading.

Important!

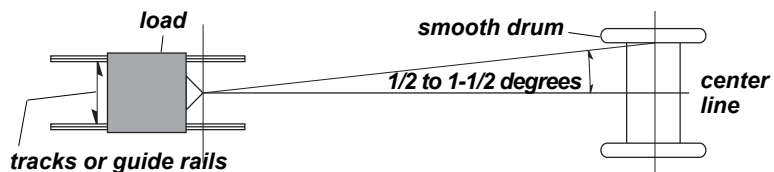
- Use a sheave or roller guide to direct the wire rope to the drum whenever possible.
- Install sheaves, tracks and other equipment so they will remain fixed under all load conditions. Follow the recommendations of the equipment manufacturer.
- Use sheaves of proper diameter to minimize wear on the wire rope. Follow the recommendations of the sheave manufacturer.

Figure 2 – Maintaining the Fleet Angle

- *When wire rope travels over a sheave or through a roller guide – maintain fleet angle by locating the sheave or guide an appropriate distance from the drum, shown as distance “A”.*



- *When wire rope travels directly to the load – maintain fleet angle by controlling side-to-side movement of the load with tracks or guide rails. Allowing the load to move too far to one side causes stress on the drum flange which may cause damage.*



- 1.1.1 CONSULT APPLICABLE CODES AND REGULATIONS for specific rules on installing the equipment.
- 1.1.2 LOCATE THE WINCH in an area clear of traffic and other obstacles. Make sure the winch is accessible for maintenance and operation.
- 1.1.3 LOCATE THE WINCH in an area with adequate temperatures. Check the motor and reducer manufacturer's information for ambient temperature ratings.
- 1.1.4 INSTALL THE WINCH on a horizontal surface. The winch is designed and assembled for horizontal base mounting. Special consideration must be taken if mounting vertically or upside-down. Please contact Thern, Inc.
- 1.1.5 MAINTAIN A FLEET ANGLE between 1/2 and 1-1/2 degrees. The proper fleet angle minimizes wire rope damage by helping the wire rope wind uniformly onto the drum. See Figure 2.
- 1.1.6 FASTEN THE WINCH SECURELY to the foundation.
 - a FOR STANDARD PRODUCTS referred to in this manual, use coarse thread fasteners, grade 8 or better. Be sure to check the torque required for your fastener selection before mounting winch. Make sure the winch is secured to a solid foundation able to support the winch and the load under all conditions with design factors based on accepted engineering practices.
 - b NON-STANDARD PRODUCTS that vary from the original design may have different fastening requirements. Contact a structural engineer or Thern, Inc. for this information.

CONTACT A QUALIFIED PROFESSIONAL FOR MOUNTING INSTRUCTIONS TO COMPLY WITH LOCAL CODES.



1.2 Installing the Breather Plug

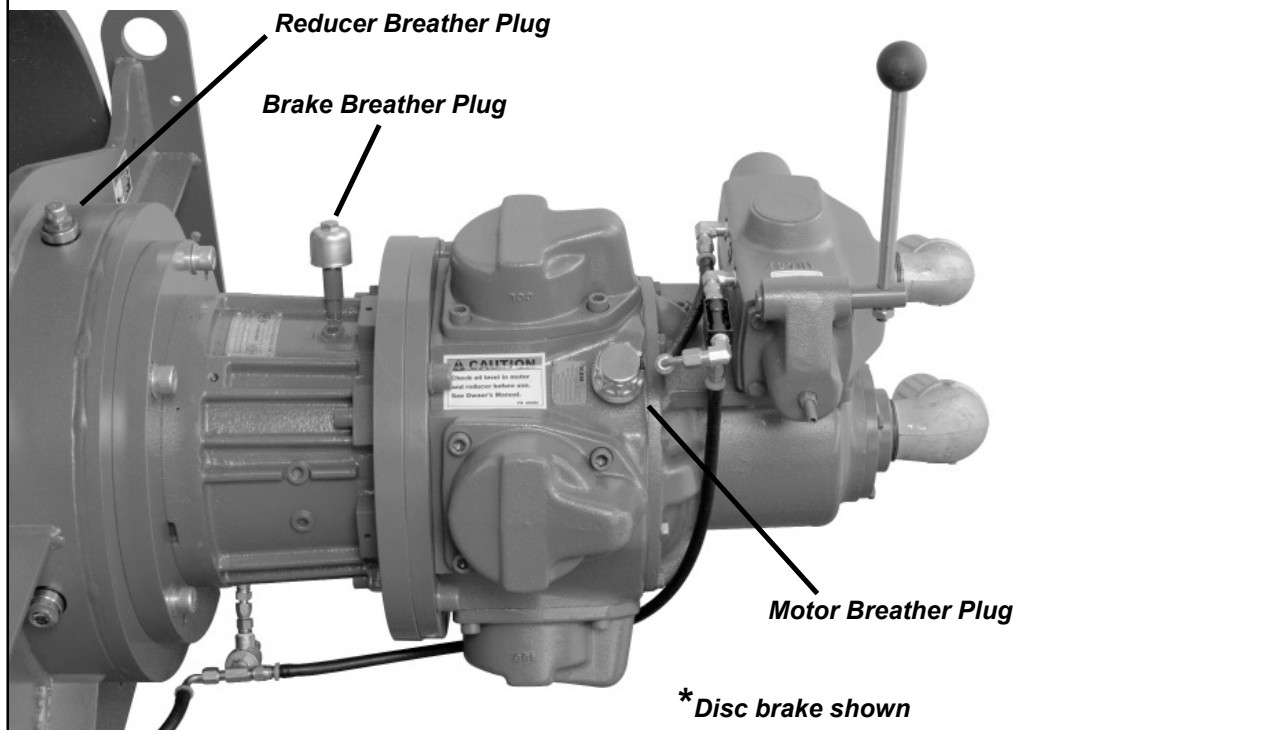
CAUTION

Make sure the breather plugs are clean and open to vent heat and pressure. Poor ventilation will cause overheating and result in damage to oil seals and other equipment. See Figure 3.

For shipment, the winch motor, disc brake and reducer are filled with lubricant and have breather plugs installed.

- 1.2.1 VERIFY THE BREATHER PLUGS are installed on the motor, disc brake and reducer. Refer to the manufacturer's information.
- 1.2.2 CHECK THE LUBRICANT LEVEL in the motor, brake and reducer to make sure no lubricant was lost during shipment. See section 3.2 - Lubricating the Winch.

Figure 3 – Installing the Breather Plug(s) - TA10



1.3 Connecting the Air Supply

Important!

- Use components rated for the power supply you will be using.
- Always disconnect the air supply when the winch is not in use.
- The F-R-L must be compatible with the required air supply.

⚠WARNING

All control devices must be momentary type. Install all control devices so the winch motor will stop when the operator releases the device.

Locate control devices so the operator will be able to view the load through the entire operation.

Locate control devices so the operator will be clear of the load, the wire rope, and the path of a broken wire rope that could snap back and cause injury.

Check that the direction indicators on control match load direction.

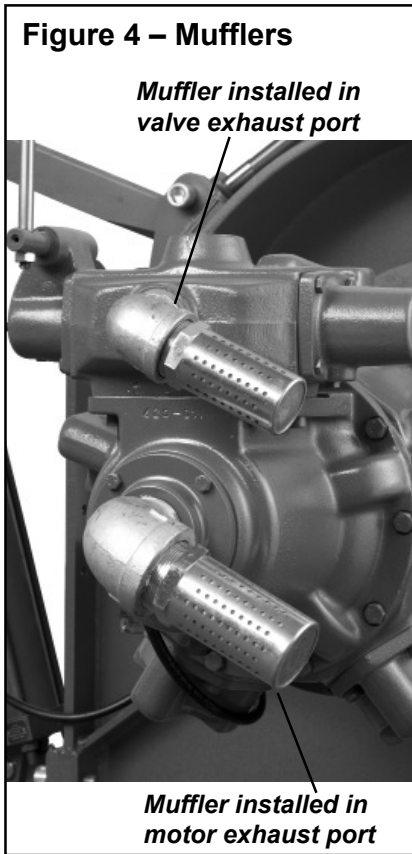
Remove port caps from exhaust ports for operation. Failure to do so may result in equipment damage and limit performance. See Figure 10 on page 20.

It is the responsibility of the owner to provide equipment for controlling the winch, The following guidelines are supplied as a reference for the installer.

INSTALL A F-R-L ON YOUR UNIT BEFORE WINCH OPERATION. A FILTER-REGULATOR-LUBRICATOR UNIT MUST BE USED WHILE OPERATING EQUIPMENT TO MAINTAIN WARRANTY. THERN WILL NOT COVER ANY DAMAGE TO EQUIPMENT CAUSED BY DIRTY, POOR OR CONTAMINATED AIR SUPPLY. SEE FIGURE 5.

- 1.3.1 CONSULT APPLICABLE CODES AND REGULATION for specific instructions regarding power supply installation and backup.
- 1.3.2 CHECK THE COMPONENT MANUFACTURER'S INSTRUCTIONS for installing and connecting the motor, brake and other equipment.
- 1.3.3 ENSURE an accessible shut off valve has been installed in the air supply line and make sure others are aware of its location.
- 1.3.4 THE AIR SUPPLY must be clean and free from moisture.
 - a ALL AIR SUPPLY LINES should be purged with clean, moisture free air or nitrogen before connecting to winch inlet.
 - b SUPPLY LINES should be as short and straight as installation conditions will permit. Long transmission lines and excessive use of fittings, elbows, tees, globe valves etc. cause a reduction in pressure due to restrictions and surface friction in the lines.
- 1.3.5 ALWAYS USE an air line lubricator with these motors.
 - a THE LUBRICATOR must have an inlet and outlet at least as large as the inlet on the motor. Install the air line lubricator as close to the air inlet on the motor as possible.
 - b LUBRICATOR must be located no more than 10 ft. (3 m) from the motor.
 - c AIR LINE LUBRICATOR should be replenished daily and set to provide 6 to 9 drops per minute of SAE 10W oil. A fine mist will be exhausted from the throttle control valve when the air line lubricator is functioning properly.
- 1.3.6 INSTALL REGULATOR to regulate air pressure to the winch. Too high or low air pressure may result in equipment damage and limit performance.

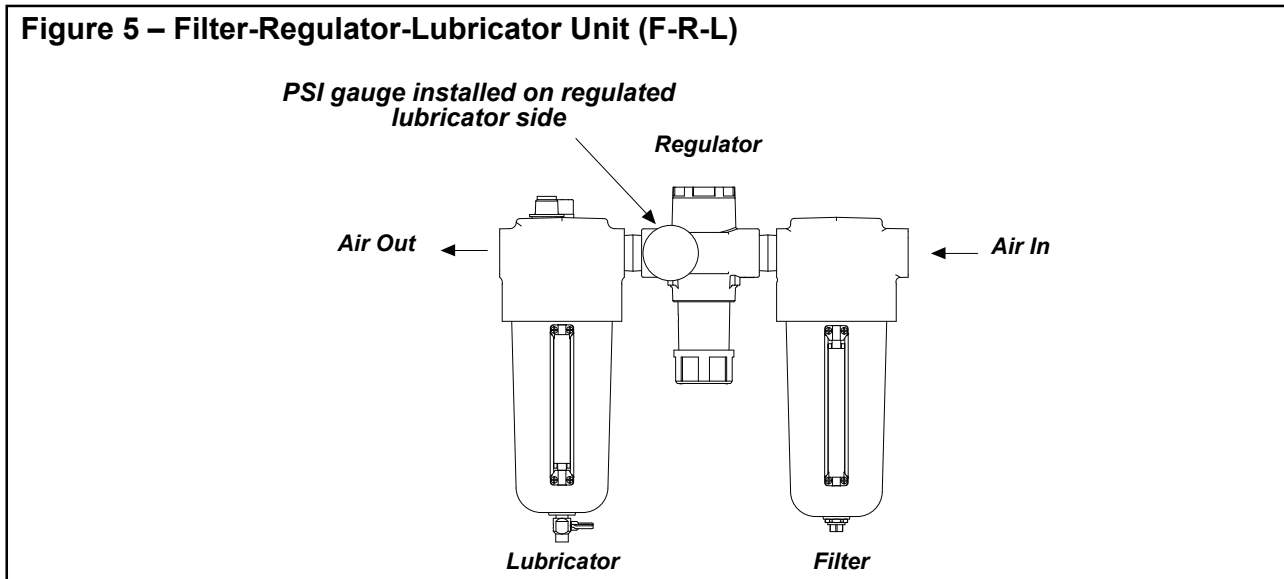
Figure 4 – Mufflers



- 1.3.7 IT IS RECOMMENDED that an air line strainer/filter be installed as close as practical to the motor air inlet port, but 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.
- 1.3.8 MOISTURE THAT REACHES THE AIR MOTOR through air supply lines is a primary factor in determining the length of time between service overhauls.
 - a MOISTURE TRAPS can help to eliminate moisture.
 - b AIR RECEIVERS collect moisture before it reaches the motor.
 - c INSTALLING AN AFTERCOOLER at the compressor that cools the air to condense and collect moisture prior to distribution through the supply lines is also helpful.
- 1.3.9 THE AIR MOTOR SHOULD BE INSTALLED as near as possible to the compressor or air receiver. Recommended pressures and volumes are measured at the point of entry to the air motor.
- 1.3.10 INSTALL MUFFLERS in both exhaust ports to reduce noise. For operation, remove port caps from exhaust ports. See Figure 4.
- 1.3.11 CHECK THE AIR PRESSURE at the motor and make sure it agrees with the pressure rating marked on the winch nameplate. Adjust regulator as necessary
- 1.3.12 TEST AIR CONNECTIONS by operating the winch.
 - a ROTATION OF THE DRUM must agree with the labels on the control device, either UP and DOWN, or FORWARD and REVERSE.
 - b CHECK THE AUTOMATIC LOAD BRAKE(S), make sure it releases when the motor is ON, and engages when the motor is OFF.

CONTACT THE FACTORY OR A QUALIFIED PROFESSIONAL FOR HELP.

Figure 5 – Filter-Regulator-Lubricator Unit (F-R-L)



1.4 Reversing the Air Valve Handle

⚠WARNING

Disconnect air power before disassembling valve handle to keep from damaging equipment and prevent injury.

Make sure to check the adjustment of the air valve flow restrictor screw if winch operating speeds differ from performance specifications during lowering or pay out of wire rope. See section 2.5 Air Valve Adjustment.

- 1.4.1 TO REVERSE AIR VALVE HANDLE, do the following. See figure 6.
 - a REMOVE THE AIR VALVE HANDLE END CAP.
 - b REMOVE THE AIR VALVE END CAP.
 - c PUSH VALVE SPOOL ASSEMBLY, and remove from the valve body.
 - d RE-INSTALL VALVE SPOOL ASSEMBLY, in the opposite direction.
 - e RE-INSTALL THE AIR VALVE END CAP on the spring side of the valve body.
 - f ALIGN BALL FROM INSIDE OF END CAP with hole on valve spool assembly. This allows the handle to operate the valve shaft assembly movement.
 - g RE-INSTALL THE AIR VALVE HANDLE END CAP.
- 1.4.2 VERIFY CABLE WRAPPING agrees with handle operation when lifting.

1.5 Installing the Wire Rope

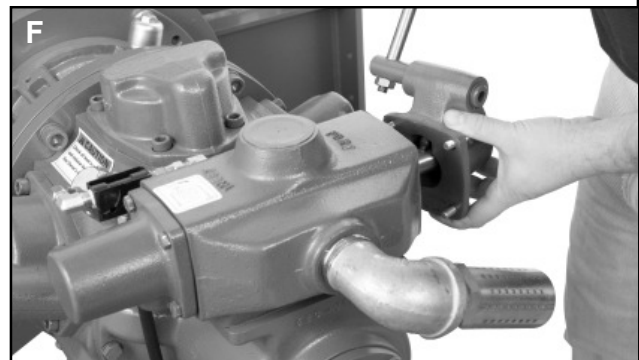
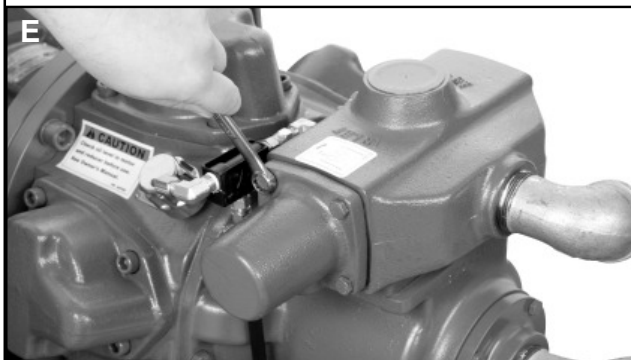
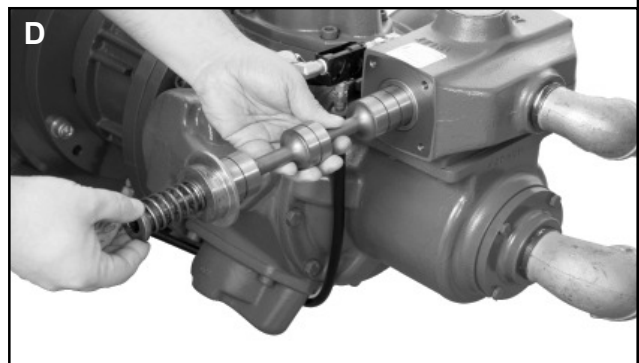
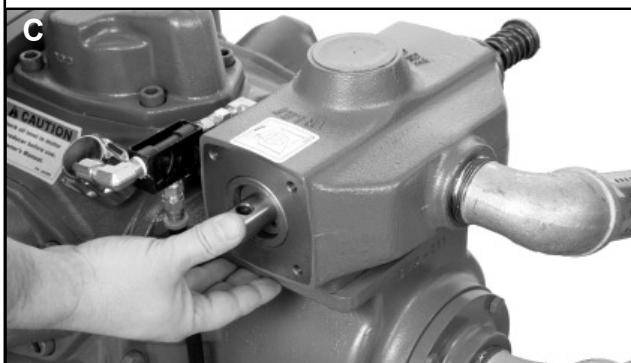
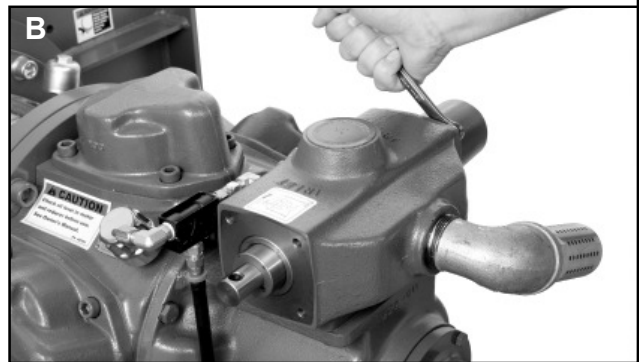
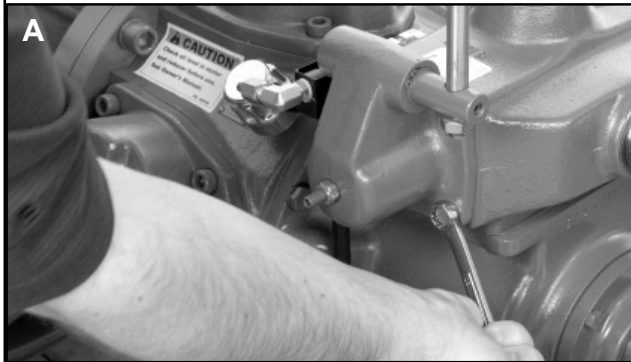
⚠WARNING

Install the wire rope securely to the winch drum. A poorly secured wire rope could come loose from its anchor and allow the load to escape.

- 1.5.1 DETERMINE WHICH DIRECTION the drum must rotate to wind and unwind wire rope.
- 1.5.2 PURCHASE THE PROPER WIRE ROPE for your application. Keep the following in mind when selecting a wire rope. Contact a reputable wire rope supplier for help.
 - a BREAKING STRENGTH of new wire rope should be at least 3 times greater than the largest load placed on the winch. If loads are lifted or pulled on an incline, the breaking strength must be at least 5 times greater than the largest load. These are minimum values and will vary with the type of load and how you are moving it.
 - b WIRE ROPE LAY must agree with the winding direction of the drum to help insure proper winding.

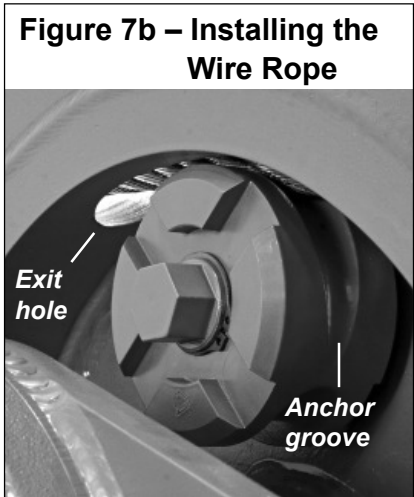
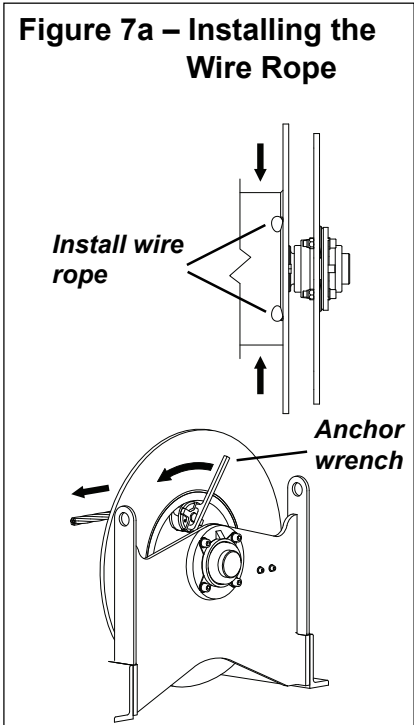


Figure 6 – Reversing the Air Valve Handle



Important!

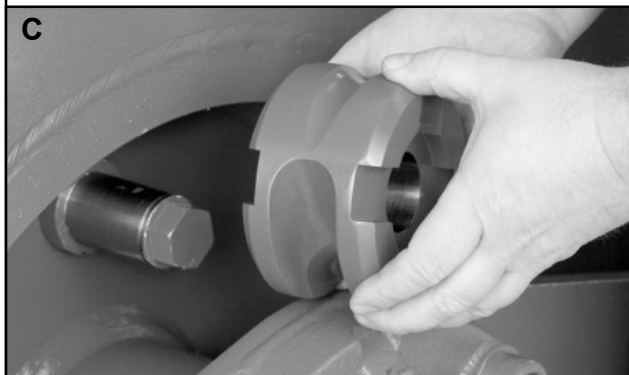
- Use wire rope and other rigging equipment rated for the size of the largest load you will be moving.
- Do not drag the wire rope through dirt or debris that could cause damage, or poor operation.
- Always wear protective clothing when handling wire rope.



- c WE RECOMMEND 6 x 37 IWRC improved plow steel (IPS) or extra improved plow steel (EIPS) wire rope.
- 1.5.3 ANCHOR THE WIRE ROPE to the drum using the cable anchor. See Figure 7.
 - a PASS THE WIRE ROPE through the hole in the drum and over the groove on the cable anchor. Make sure at least 1/2 inch of wire rope extends past the cable anchor, and the end of the wire rope does not protrude out where it will hit other components as the drum is turning.
 - b ROTATE THE CABLE ANCHOR and pull wire rope slightly to engage the cable anchor.
 - c USE THE CABLE ANCHOR WRENCH TO TIGHTEN ANCHOR.
- 1.5.4 WIND FIVE FULL WRAPS of wire rope onto the drum by operating the winch while holding the wire rope taught. These wraps serve as anchor wraps and must remain on the drum at all times.
- 1.5.5 WIRE ROPE MUST BE SPOOLED on drum so that the anchor groove tapers away from the wire rope exit hole.
- 1.5.6 TO REVERSE WIRE ROPE SPOOLING DIRECTION, do the following. See figure 8.
 - a COMPLETELY REMOVE the wire rope from the drum.
 - b REMOVE THE CABLE ANCHOR. Flip the anchor so that the grooving runs in the opposite direction.
 - c RE-ATTATCH THE CABLE ANCHOR.
 - d SPOOL THE WIRE ROPE onto the drum from the new side.



Figure 8 – Reversing the Cable Anchor



2.1 General Theory of Operation

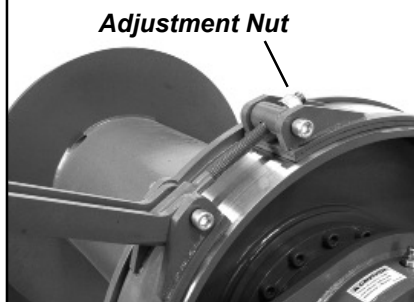
Important!

- Limit nonuniform winding by keeping tension on the wire rope and by maintaining the proper fleet angle.
- To help insure rated performance, make sure the air pressure at the motor is equal to the motor's pressure rating.
- It is your responsibility to detect and account for different factors affecting the condition and performance of the equipment.
- When determining whether the load will exceed the load rating, consider the total force required to move the load.

- 2.1.1 THE PULL REQUIRED to move the load must not exceed the load rating of the winch. Consider the total force required to move the load, not the weight of the load.
- 2.1.2 THIS EQUIPMENT CAN develop forces that will exceed the load rating. It is the responsibility of the equipment user to limit the size of the load. Inspect the equipment regularly for damage according to the instructions contained in this manual and in the component manufacturer's information.
- 2.1.3 USE A LOAD BRAKE on all winches used to lift loads or drag loads on an incline. Brakes are of two basic types, band brake and disc brake. The band brake can be either manually or automatically engaged and the disc brake is automatically engaged. When engaged, they lock the drive train to the winch frame, thereby stopping drum rotation when the control is released or placed in the neutral position.
- 2.1.4 PERFORMANCE RATINGS of the equipment are affected by the amount of wire rope wound on the drum, the way in which it is wound, air power supply, and the way the winch is used.
- a DRUM CAPACITY depends on how tightly and evenly the wire rope is wound on the drum. Actual drum capacities are usually 25-30% less than values shown in performance tables, due to loose winding and overlapping.
 - b LINE SPEED increases with each additional layer of wire rope wound onto the drum. Line speed will also vary with load weight and air power supply.
 - c LOAD RATING represents the maximum pull that can be placed on new equipment. Load ratings are assigned values for specific amounts of load travel or wire rope accumulation. The load rating decreases as layers of wire rope accumulate on the drum.
- 2.1.5 DUTY RATINGS refer to the type of use the equipment is subject to. Consider the following when determining duty rating.
- a ENVIRONMENT: harsh environments include hot, cold, dirty, wet, corrosive, or explosive surroundings. Protect the equipment from harsh environments when possible.
 - b MAINTENANCE: poor maintenance, meaning poor cleaning, lubrication, or inspection, leads to poor operation and possible damage of the equipment. Minimize poor maintenance by carefully following the instructions contained in this manual.
 - c LOADING: severe loading includes shock loading and moving loads that exceed the load rating of the equipment. Avoid shock loads, and do not exceed the load rating of the equipment.
 - d FREQUENCY OF OPERATION: frequent start and stop functions increase wear and shorten the life span of the gear train and load brake components. Lengthy operations cause lubrication to become hot, which also decreases the life span of the gear train and brakes. Increase maintenance of the equipment if used in frequent operations.

2.2 Inspecting/Adjusting the Brakes

Figure 9 – Band Brake Adjustment



⚠WARNING

Do not adjust brakes with the winch holding a load. Accidental release of the brake could allow the load to escape.

Keep hands away from the drum, gears, wire rope and other moving parts of the equipment.

Do not disassemble the air cylinder for the automatic band brake, improper disassembly could cause personal injury. Contact factory.

2.2.1 INSPECTING THE BAND BRAKE

- a DRUM BAND BRAKE should be inspected for oil, grease and glazing. These occurrences are not uncommon but need to be fixed before operation continues. If the brake lining is oil-soaked, replace the brake bands as a set. A fine grit emery cloth should be used to sand any glazed area to remove them.
- b MEASURE BAND THICKNESS to maintain brake effectiveness. The set of brake bands must be replaced if they measure less than .125 inch thickness anywhere on the band.

2.2.2 INDIVIDUALLY TEST BRAKES installed to ensure proper operation. Brakes must hold a 125% rated load with full drum without slipping. If indicated by poor operation or visual damage, contact factory and have brake(s) repaired. Check all brake surfaces for wear, deformation or foreign deposits.

2.2.3 ADJUSTING THE MANUAL BRAKE

- a MAKE SURE THERE IS NO LOAD on the winch.
- b RELEASE WIRE ROPE TENSION on the drum.
- c RELEASE TENSION OF BRAKE BANDS by disengaging the brake band handle.
- d ROTATING THE ADJUSTMENT NUT clockwise will tighten the brake band. Adjustments should be made in increments of 1/2 rotation. See Figure 9.
- e CHECK THE ADJUSTMENT by engaging the band brake. The brake is properly adjusted when it can be pushed into the lock position (with the handle over center) with 50 to 100 lbs of force being applied to the handle and holding the rated load for that model winch. If not, repeat step "d" until correct.

2.2.4 ADJUSTING THE AUTOMATIC BAND BRAKE

- a MAKE SURE THERE IS NO LOAD on the winch.
- b RELEASE WIRE ROPE TENSION on the drum.
- c RELEASE TENSION ON BRAKE BANDS by applying air to the brake cylinder.
- d ROTATE THE ADJUSTMENT NUT clockwise will tighten the brake band. Adjustments should be made in increments of 1/2 rotation. See Figure 9.
- e CHECK THE ADJUSTMENT by engaging the band brake. The brake is properly adjusted when it holds the rated load for that model winch. If not, repeat step "d" until correct.

2.2.5 AUTOMATIC DISC BRAKE ADJUSTMENT is not required. If the disc brake does not hold the rated load contact the factory for repair instructions.

2.3 Breaking-In The Winch

⚠WARNING

Remove exhaust port caps for operation. Failure to do so may result in equipment damage and limit performance. See Figure 10.

- 2.3.1 BEFORE THE WINCH IS PLACED INTO SERVICE or for winches that have been in storage for a period of more than one month, the following start-up procedure is required. See Figure 10.
- a INSPECT THE WINCH and other equipment according the Instructions for Periodic Inspection.
 - b WHEN FIRST RUNNING THE MOTOR pour a small amount of 10W oil in the motor inlet port and operate the motor slowly in both directions for a few minutes to flush out any impurities.
 - c WHEN FIRST OPERATING THE WINCH it is recommended that the motor be driven slowly in both directions for a few minutes.
 - d ENSURE BRAKES HOLD prior to making complete lift by lifting load a short distance and releasing control.
- 2.3.2 PRIOR TO INITIAL USE, all new, altered or repaired winches shall be tested to ensure proper operation. See Figure 10.
- a CHECK THAT THE OIL LEVEL in motor, reduction gear assembly and disc brake are correct.
 - b TO INITIALLY "BREAK-IN" NEW OR OVERHAULED MOTORS operate without load, in both directions, for 2 hours at 100-200 RPM.
 - c 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. Check operation of brakes following run-in. See section 2.2 - Inspecting/Adjusting the Brakes**
- 2.3.3 INSPECT THE WINCH following the break-in according to the Instructions for Periodic Inspection. See section 3.3 - Inspecting the Equipment.

2.4 Preparing for Operation

⚠WARNING

Read and comply with the guidelines set forth in this Owner's Manual. Keep this manual, and all labels attached to the winch, readable and with the equipment at all times. Contact Thern, Inc. for replacements.

Do not lift loads over people. Do not walk or work under a load or in the line of force of any load.

Do not exceed the load rating of the winch or any other component in the system. To do so could result in failure of the equipment.

The winch must be equipped with a load brake if it is used to lift loads or drag loads on an incline.

Do not use more than one winch to move a load unless each winch was designed for a multiple winch system.

Do not use damaged or malfunctioning equipment. To do so could result in failure of the equipment.

Do not modify the equipment in any way. To do so could cause equipment failure.

Do not operate the winch with guards removed or improperly installed.

Check lubrication before use.

- 2.4.1 **CONSIDER THE OPERATION.** Do not begin until you are sure you can perform the entire operation without hazard.
- 2.4.2 **A PRE-OPERATION MEETING** attended by the winch operator, ground crew, signal person, persons to be lifted and the person in charge of the task to be performed shall be held to plan and review the procedure to be followed, including:
- Signals.
 - Appropriate number of signal persons and ground crew.
 - Designate responsibility.
- a **THIS MEETING SHALL BE HELD** prior to the beginning of operations at each new work location and thereafter for any new employees assigned to the operation.
- b **DURING THIS MEETING** it is recommended that a comprehensive plan to cover emergency procedures be worked out prior to exercising the winch capabilities of this winch.
- 2.4.3 **INSPECT ALL COMPONENTS** of the system.
- a **INSPECT THE WINCH** and other equipment according to the Instructions for Frequent Inspection.

- b OPERATORS shall be physically competent and have no health condition which might affect their ability to act, and they must have good hearing. Operators who are fatigued or have exceeded their normal shift period shall check all related regulations regarding approved work periods prior to operation. Refer to training program - See section 2.3.1. The operator must thoroughly understand proper methods of rigging and attaching loads and should have a good attitude regarding safety.
 - c THE LOAD must be clear of other objects and free to move. Make sure the load will not tip, spin, roll away, or in any way move uncontrollably.
- 2.4.4 KNOW YOUR LOAD and make sure you do not exceed the load rating of the winch or any other equipment in the system.



2.5 Air Valve Adjustment

⚠WARNING

Remove port caps from exhaust ports for operation. Failure to do so may result in equipment damage and limit performance. See Figure 10.

Make sure to check the adjustment of the air valve flow restrictor screw if winch operating speeds differ from performance specifications during lowering or pay out of wire rope.

Do not adjust the flow restrictor while suspending or hoisting a load.

2.5.1 ADJUSTMENT FOR LIFTING APPLICATIONS - SEE FIGURE 10

NOTE: This adjustment setting is only a recommendation for initial startup in order to prevent over speeding while lowering. The actual adjustment required is dependent on the load and the specific unit purchased.

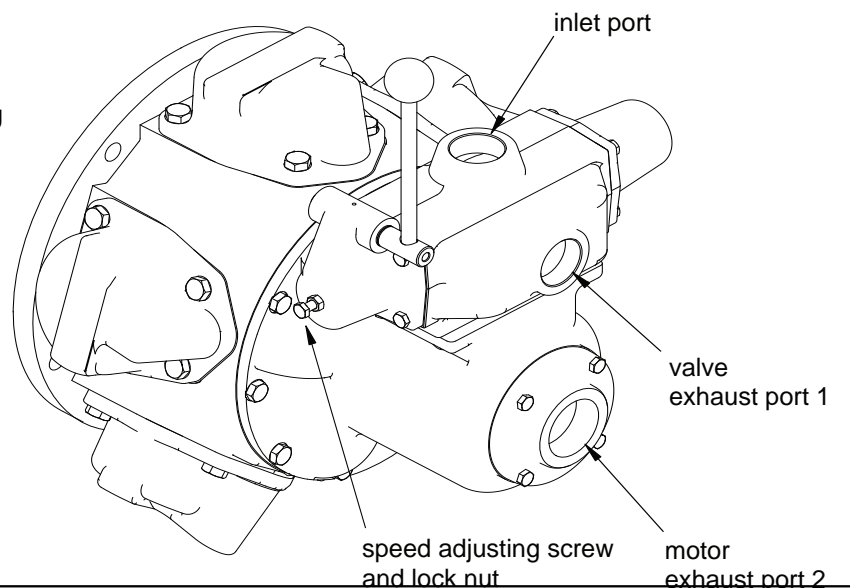
- a LOOSEN NUT AND ADJUST SCREW located in the valve end cap.
- b ADJUST UNTIL DRUM SPEED for full load payout is equal to or less than the drum speed for no-load haul in.
- c TIGHTEN THE NUT when drum speed is adjusted.

2.5.2 ADJUSTMENT FOR PULLING APPLICATIONS - See Figure 10

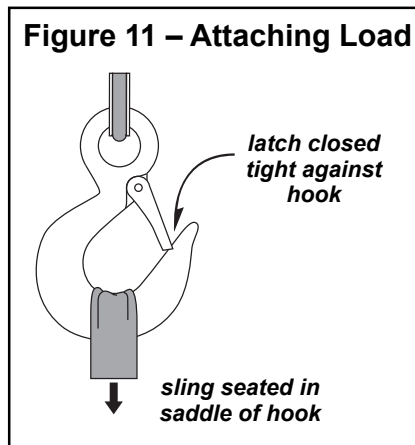
- a LOOSEN NUT AND ADJUST SCREW located in the valve cap end.
- b ADJUST UNTIL DRUM SPEED for no-load payout equals the drum speed for no-load haul in.
- c TIGHTEN NUT when drum speed is adjusted.

Figure 10 – Motor and Valve

NOTE: Thern recommends installing mufflers in exhaust ports to reduce noise. For operation remove port caps from exhaust ports.



2.6 Attaching the Load

**⚠WARNING**

Do not wrap the wire rope around the load. This damages the wire rope and could cause the load to escape. Use a sling or other approved lifting device.

- 2.6.1 CLEAR OBJECTS from the path of the load so you can move it freely and observe it at all times during the operation.
- 2.6.2 ATTACH THE LOAD using a nylon sling, or other approved lifting device. Follow the recommendations of the sling manufacturer.
 - a SEAT THE SLING in the saddle of the hook with the hook latch completely closed. See Figure 11. Always make sure the load is properly seated in the saddle of the hook. Do not tip load the hook as this may allow the load to slip out of engagement and leads to spreading and eventual failure of the hook.
 - b CENTER THE LOAD on the hook so it will remain balanced and not tip or rotate to one side.

2.7 Moving the Load

Important!

- Obey a stop signal from anyone.
- Maintain tension on the wire rope to keep it tightly and evenly wound on the drum.
- If the winch and load are not visible during the entire operation, get help from another person.
- Appoint a supervisor if more than one person is involved in the operation. This will reduce confusion and increase safety.
- When lifting a load, use a tag line to keep the load from swinging or twisting, while keeping yourself away from the load.
- Lifting and lowering speeds shall be operator-controlled and be as slow as practical.
- The winch operator shall remain at the controls at all times.

⚠WARNING

Keep at least 5 wraps of wire rope wound on the drum at all times, to serve as anchor wraps. With less than 5 wraps on the drum the wire rope could come loose, causing the load to escape.

Keep all unnecessary personnel away from the winch. Keep out of the path of the load, and out of the path of a broken wire rope that might snap back and cause injury.

Keep hands away from the drum, gears, wire rope, and other moving parts of the equipment.

Winches must use controls that spring return to neutral and stop all motion when released. Various controls are available with the winches and are dependent on air supply, location to winch and degree of control required.

Operators must maintain visual or audio contact with personnel and the load at all times. Operators must remain at the controls at all times.

Monitor surrounding conditions to prevent the load from contacting hazardous obstructions.

Use spotters or signal person to assist with positioning the load in confined or limited visibility areas.

Do not divert your attention from the operation. Stay alert to the possibility of accidents, and try to prevent them from happening.

Do not jerk or swing the load. Avoid shock loads by starting and stopping the load smoothly. Shock loads overload the equipment and may cause damage.

Do not leave a suspended load unattended unless specific precautions have been taken to secure the load and keep people away from the winch and out from under the load. Remain at the controls when the personnel platform is occupied.

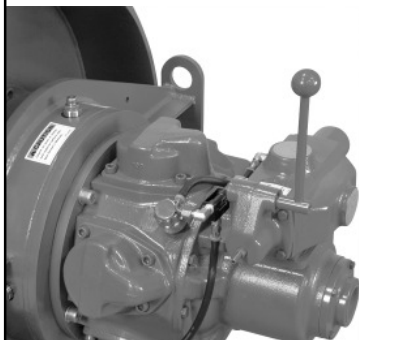
2.7.1 MOVE THE LOAD slowly and smoothly, only a small distance at first. Make sure the load is balanced and securely attached before continuing.

Before operating, the following conditions shall exist:

- a WIRE ROPE shall be free of kinks.
- b MULTIPLE PART LINES shall not be twisted around each other.
- c THE PRIMARY POINT of wire rope attachment shall be centered over the load so that the load will not tilt and remain level.
- d IF THERE IS SLACK wire rope condition, the hoisting mechanisms shall be inspected to ensure all wire ropes are properly seated on drums and in sheaves, before resuming winch operation.

2.7.2 USE THE CONTROL DEVICE to operate the winch. The control device must be momentary type, so the winch will stop when the operator releases the control. See Figure 12.

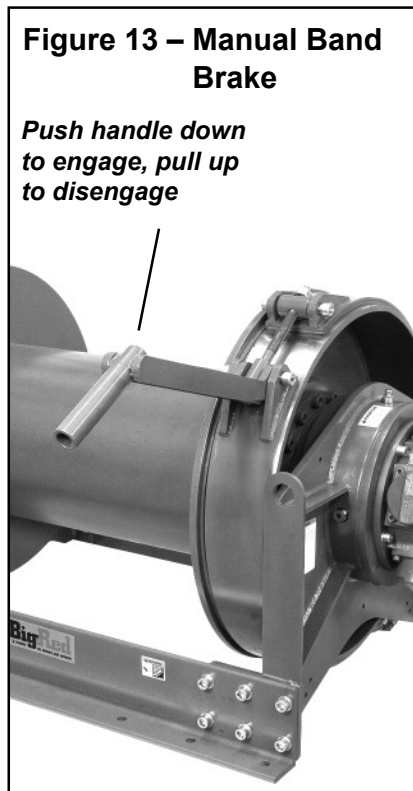
Figure 12 – Control Valve



- 2.7.3 THE MANUAL BAND BRAKE is engaged by pushing down on the handle and disengaged by pulling up. If the handle is pushed down fully, it should lock in that position and prevent drum rotation, until disengaged by the operator. The brake must be kept properly adjusted to hold the required load. See Figure 13.
- 2.7.4 THE AUTOMATIC BAND BRAKE is engaged and disengaged by the cylinder. When engaged it should lock in that position and prevent drum rotation, until disengaged by the operator. The brake must be kept properly adjusted to hold the required load.
- 2.7.5 THE AUTOMATIC DISC BRAKE is a spring applied, air released brake. The brake automatically disengages when the motor is operated. When the control valve is placed in the neutral position, the brake automatically engages preventing drum rotation.
- 2.7.6 OBSERVE THE WIRE ROPE as it winds onto the drum. If it becomes loose, uneven, or overlapped, stop the operation and rewind the wire rope before continuing. Continued operation with overlapped or uneven wire rope can damage the wire rope and shorten its life.
- 2.7.7 OBSERVE THE REDUCER, MOTOR AND BRAKE during operation for signs of overheating. Frequent overheating may be a sign of damage, or may indicate the need for a larger power winch.
- a WATCH FOR SMOKE, the smell of burnt lubricant, and other signs of overheating. Use a thermocouple or other device to monitor reducer temperature.
 - b STOP THE OPERATION if the reducer, motor or brake overheats, and allow the winch to cool. Continued operation may cause damage.
- 2.7.8 IN CASE OF AIR SUPPLY FAILURE, shut off the air supply line valve and DISCONNECT the air supply line from the winch. Leave the air supply DISCONNECTED. See section 2.8 - Emergency Operation.



2.8 Emergency Operation



⚠ WARNING

Emergency lowering operations must be performed by a minimum of two personnel trained in the operation of the winch.

Communication must be established between personnel and the winch operator. The operator should be able to visually monitor the load through its full range of travel.

2.8.1 EMERGENCY OPERATION PROCEDURE for air winch with manual band brake.

- a THE MANUAL BAND BRAKE is engaged by pushing down the handle and disengaged by pulling up. If the handle is pushed down fully, it should lock in that position and prevent drum rotation, until disengaged by the operator. The brake must be kept properly adjusted to hold the required load. See Figure 13.
- b STEPS FOR EMERGENCY LOWERING:
 - Engage the manual band brake to hold the load.
 - In case of air supply failure, turn the control device to off and disconnect the air supply. Leave the air supply disconnected.
 - Supply a secondary source of air to the inlet port of the control valve.
 - By operating the control valve and the manual band brake, gradually disengage the band brake to slowly lower the load.
 - Remove the load from the load line.

2.8.2 EMERGENCY OPERATION PROCEDURE for air winch with two automatic brakes.

- a THE AUTOMATIC BAND BRAKE is engaged by energizing the cylinder and disengaged by releasing the energized air pressure to the cylinder. When engaged it should lock in that position and prevent drum rotation, until disengaged by the operator.
- b THE BRAKE must be kept properly adjusted to hold the required load. The automatic disc is a spring applied, air released brake. The brake automatically disengages when the motor is operated. When the control valve is placed in the neutral position, the brake automatically engages preventing drum rotation.
- c STEPS FOR EMERGENCY LOWERING:
 - Engage the automatic band brake to hold the load,
 - In case of air supply failure, turn the control device to off and disconnect the air supply. Leave the air supply disconnected.
 - Supply a secondary source of air to the inlet port of the control valve.
 - By operating the control valve, gradually disengage the band brake to slowly lower the load.
 - Remove the load from the load line.

2.8.3 ALTERNATIVE SECONDARY AIR SUPPLY CONNECTION

- a DISENGAGE THE AUTOMATIC DISC BRAKE AND AUTOMATIC BAND BRAKE (if equipped) by attaching an air supply and pressurizing the brake(s), causing the load to lower.
- b IN THE AIR SUPPLY LINES install a valve capable of releasing the air pressure. This valve will allow the operator to release air pressure, causing the brake(s) to engage and the load to stop. In this manner the operator can slow or stop the lowering of the load.
- c STEPS FOR EMERGENCY LOWERING:
 - Engage the band brake to hold the load.
 - In case of air supply failure, turn the control device to off and disconnect the air supply. Leave the air supply disconnected.
 - Supply a secondary source of air to the inlet port of the disc brake and automatic band brake (if equipped). **Do not pressurize until ready to lower the load.**
 - Install a valve capable of releasing the air pressure to actuate the brake(s).
 - With air pressure supplied to the brake(s), control line speed with the band brake. If equipped with an automatic band brake, control line speed using the installed valve to regulate air pressure supplied to the brake(s).
 - Remove the load from the load line.

ANY QUESTIONS ON OPERATION OR WINCH APPLICATION CALL
THERN, INC.

Important!

Increase the frequency of maintenance procedures if the winch is:

- Operated for long periods.
- Used to pull heavy loads.
- Operated in wet, dirty, hot or cold surroundings.

3.1 Cleaning the Winch

Clean the winch to remove dirt and help prevent rust and corrosion.

- 3.1.1 CLEAN THE WINCH every six months or whenever it is dirty.
 - a WIPE ALL EQUIPMENT to remove dirt and grease.
 - b LEAVE A LIGHT FILM of oil on all surfaces to protect them against rust and corrosion.
 - c WIPE OFF excessive amounts of oil to avoid the accumulation of dirt.
- 3.1.2 REMOVE ALL UNNECESSARY OBJECTS from the area around the winch.

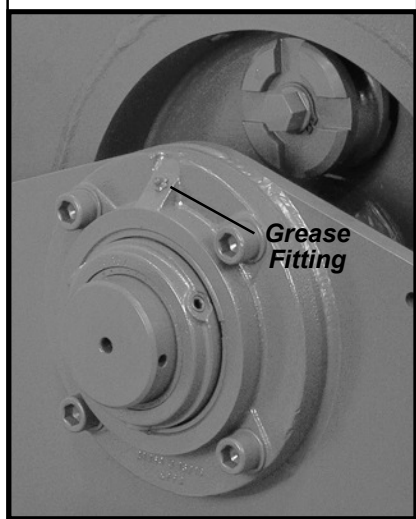


3.2 Lubricating the Winch

Important!

- Do not leave plug holes in the reducer or motor open. Open plug holes will allow dirt and moisture to contaminate the lubrication.
- Make sure lubricant has a temperature rating appropriate for the ambient temperatures of the operation.
- Lubricate the winch properly to help protect it from wear and rust. Read the following instructions carefully.

Figure 14 - Bearing



⚠CAUTION

Make sure the breather plugs are clean and open to vent heat and pressure. Poor ventilation will cause overheating and result in damage to oil seals and other equipment.

Fill the reducer, disc brake and motor to the proper level without overfilling. Too much or too little lubricant will cause overheating and result in damage to equipment.

For shipment, the winch motor, disc brake and reducer are filled with lubricant and have breather plugs installed.

- 3.2.1 LUBRICATE THE REDUCER, DISC BRAKE AND MOTOR according to the manufacturer's instructions.
 - a FILL THE REDUCER, DISC BRAKE AND MOTOR with oil before operating the winch. Fill the reducer, disc brake and motor until oil reaches the level check plug. **Do not mix different lubricants.** See Tables 1 & 2.
 - b CHECK OIL LEVEL before every operation and every 10 hours during operation. Remove the level plug and make sure oil is even with the plug hole. See Figure 15.
 - c CHANGE REDUCER, DISC BRAKE AND MOTOR LUBRICANT at least every 2 years, or whenever it is dirty or contaminated. See Figure 15.
 - d THE REDUCER is equipped with a breather plug.
- 3.2.2 LUBRICATE THE WIRE ROPE by following the wire rope manufacturer's recommendations.
- 3.2.3 IF WINCH IS DISASSEMBLED, clean all parts thoroughly and coat bearings and seals with clean grease. Use sufficient grease to provide a good protective coat.
- 3.2.4 OIL DRAIN/FILL PROCESS
 - a LOCATE THE DRAIN AND FILL PLUGS. See Figures 15a and 15b.
 - b REMOVE APPROPRIATE DRAIN PLUG.
 - c ALLOW OIL TO COMPLETELY DRAIN.
 - d INSTALL DRAIN PLUG and remove the fill plug. Fill with oil until the oil shows at the check level hole. See Figures 15a and 15b.
 - e FINISH BY INSTALLING FILL PLUG.
- 3.2.5 LUBRICATE FLANGE BEARINGS at least every 10 hours of operation. Insert NLGI #2 EP (Extreme Pressure) grease through the grease zerk. Refer to the bearing manufacturer's information for specific instructions. See Figure 14 and Table 3.

Figure 15a – Lubricating the Winch

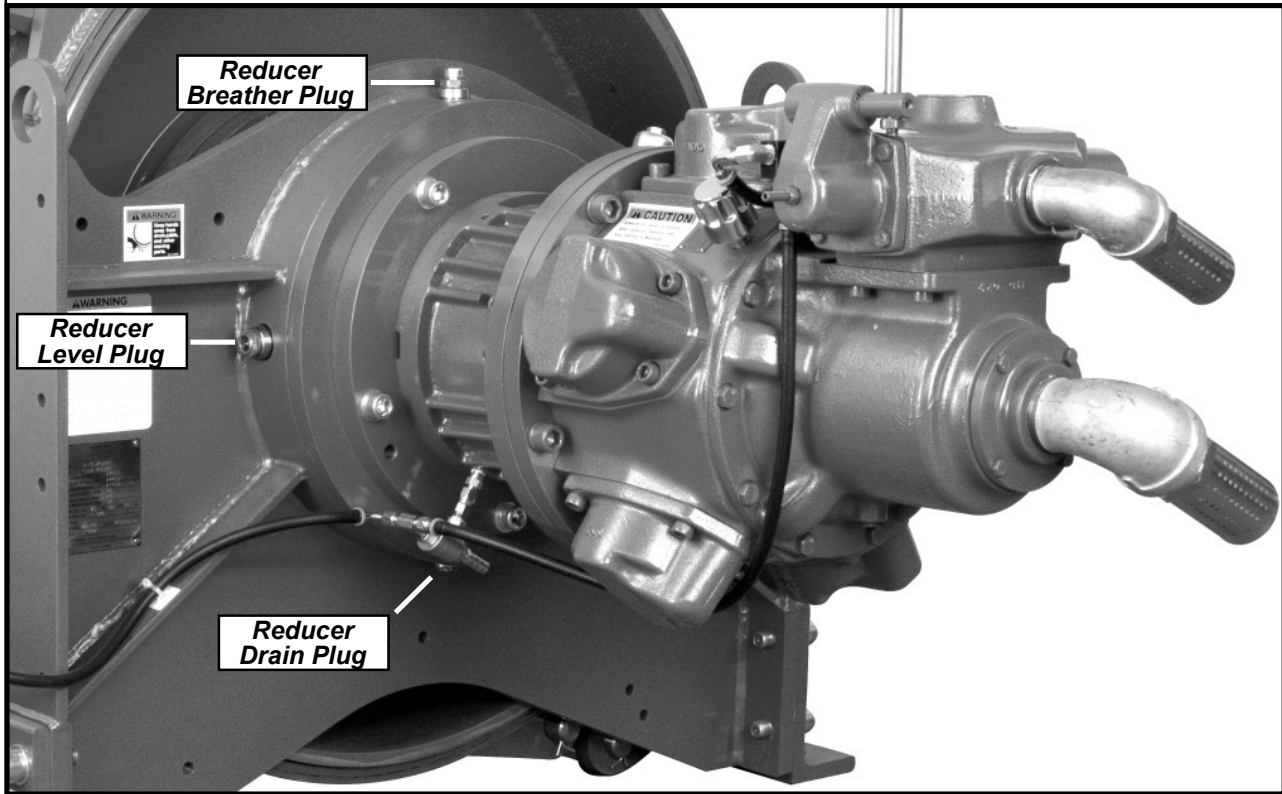


Table 1 – Motor and Reducer Lubrication Table

SERIES	OIL TYPE OR EQUIVALENT	MOTOR (FL OZ)	REDUCER (FL OZ)
TA10 SERIES	MOBIL SHC 630	38	186

Table 2 – Disc Brake Lubrication Table

SERIES	OIL TYPE OR EQUIVALENT	DISC BRAKE (FL OZ)
TA10 SERIES	MOBIL 424	110

Table 3 – Roller Bearing Lubrication Table

SERIES	GREASE	FLANGE BEARING (OZ)
TA10 SERIES	NLGI #2EP	5

3.3 Inspecting the Equipment

Important!

- Start an inspection program as soon as you put the winch into use.
- Appoint a qualified person to be responsible for regularly inspecting the equipment.
- Keep written records of inspection. This allows comparison with comments from previous inspections so you can see changes in condition or performance.
- Make sure all labels and plates are readable, firmly attached, free of damage and clean. Replacements are available from the factory.

Perform frequent inspections:

- Before each operation.
- Every 3 hours during operation.
- Whenever you notice signs of damage or poor operation.

Perform periodic inspections:

- Every 6 months except for as noted below.
- Whenever there is noticeable damage, loose fasteners, or poor operation during frequent inspection.
- Whenever you return the winch to service from storage.
- Whenever the winch has, or may have been, overloaded or shock loaded.
- Internal or inaccessible fasteners have been designed such that inspection is only required every 2 years.

▲WARNING

Do not use damaged or malfunctioning equipment. Place an “OUT OF ORDER” sign on the winch. Do not use the winch until the sign is removed by a qualified maintenance person who has completely corrected the problem.

Inspect the winch to detect signs of damage or poor operation before they become hazardous. See Table 4 - Inspection Checklist.

3.3.1 CONSULT APPLICABLE CODES AND REGULATIONS for specific rules on inspecting the winch and other equipment.

3.3.2 CHECK COMPONENT MANUFACTURER’S INSTRUCTIONS for inspecting the motor, brake, reducer, bearings, wire rope, and other equipment.

3.3.3 Instructions for Frequent Inspection

a VISUALLY INSPECT the entire winch and all other equipment involved in the operation.

- Check all equipment for cracks, dents, bending, rust, wear, corrosion and other damage.
- Make sure the wire rope is installed correctly and anchored securely to the drum.
- Check the reducer, motor and disc brake for signs of leakage.
- Make sure the entire winch is properly lubricated.
- Make sure the motor and disc brake breather plugs are clean, open, and installed correctly.
- Make sure mounting fasteners are tightened securely.
- Make sure the foundation is in good condition, and capable of supporting the winch and its load under all load conditions.
- Check air supply and connections for wear, corrosion, cuts, and other damage.

b TEST WINCH PERFORMANCE by operating the winch with a load not exceeding the load rating.

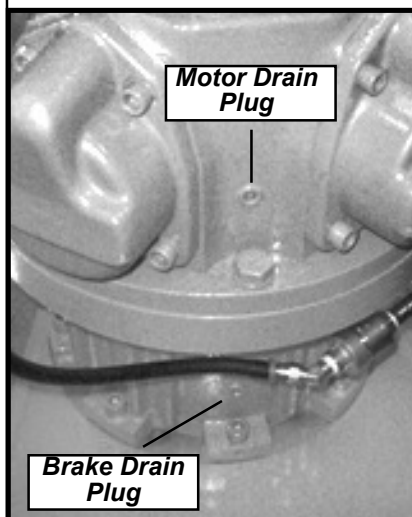
- Listen for unusual noises, and look for signs of damage as you operate the winch.
- Make sure the wire rope winds evenly and tightly onto the drum. If it is loose or uneven, rewind it before continuing.
- Make sure the load moves smoothly, without hesitation or strain.
- Make sure the winch responds to the control device. It must rotate as shown on the control labels, and it must turn off when you release the control.
- Check the brake(s). Raise the load, then lower it and stop it a few feet off the ground. If the load continues to coast or creep under normal operating conditions, the brake(s) needs adjustment. See section 2.2 - Inspecting/ Adjusting the Brakes.

Completely correct all problems before continuing. Use the Troubleshooting Chart to help determine the cause of certain problems. See Table 5.

Frequent Wire Rope Inspection:

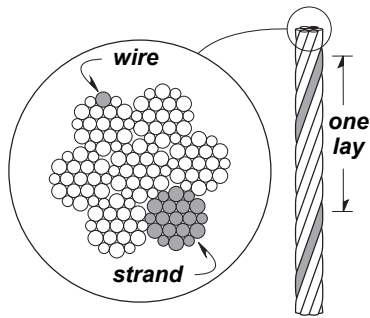
- Use ASME B30.7 as a guideline for rope inspection, replacement and maintenance.
- Check the wire rope, end connections and end fittings for corrosion, kinking, bending, crushing, bird-caging or other signs of damage.
- Check the number, distribution and type of visible broken wires. See paragraph 3.3.4 c and Figure 16.
- Check the wire rope for reduction of rope diameter from loss of core support, or wear of outside wires. See Figure 17.
- Take extra care when inspecting sections of rapid deterioration such as sections in contact with saddles, sheaves, repetitive pickup points, crossover points and end connections.

Figure 15b - Lubricating the Winch

3.3.4 **Instructions for Periodic Inspection, See Table 4.**

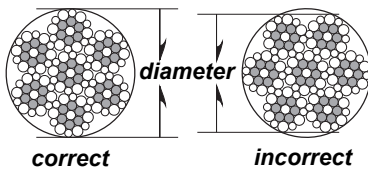
- a VISUALLY INSPECT the winch and all other equipment.
- Disassembly may be required in order to properly inspect individual components. Contact factory for assembly/disassembly instructions. Disassembly before contacting Thern, Inc. voids all warranties.
 - Check the finish for wear, flaking, or other damage.
 - Check all equipment for cracks, dents, bending, rust, wear, corrosion and other damage. If the equipment was overloaded, or if you notice cracks and other signs of overloading and damage, promptly remove equipment from use and have it repaired or replaced. **DO NOT CONTINUE TO USE DAMAGED OR OVERLOADED EQUIPMENT OR WIRE ROPE.**
 - Check all fasteners for stripped threads, wear, bends, and other damage.
 - Check all fasteners for proper torque levels. Some fasteners will require disassembly of the winch in order to inspect and retorque. **NOTE: those fasteners inside the drum (i.e. reducer fasteners) need to be checked every 2 years. Contact Thern, Inc. for instructions on Assembly and Disassembly. See Table 6.**
 - Check the reducer, motor and disc brake for signs of leakage.
 - Make sure the motor breather plug is clean, open and installed correctly.
 - Make sure all labels and plates are readable, firmly attached, free of damage and clean. Replacements are available from the factory.
- b DRAIN A SMALL AMOUNT OF LUBRICANT from the reducer, motor and disc brake into a clean container.
- Check the lubricant for dirt, metal particles, water, and other signs of contamination. Completely drain the reducer and motor if lubricant is contaminated.
 - Make sure the winch is completely lubricated. See section 3.2 - Lubricating the winch.
- c INSPECT THE WIRE ROPE according to the wire rope manufacturer's recommendations, or follow accepted industry standards for wire rope inspection.
- Always wear protective clothing when handling wire rope.
 - Check the entire length of wire rope for bent wires, crushed areas, broken or cut wires, corrosion, and other damage. Carefully inspect areas that pass over sheaves or through roller guides.
 - Note the location and concentration of broken wires. Replace wire rope if more than 6 wires are broken in one lay, or more than 3 wires are broken in one strand in one lay. See Figure 16.
 - Make sure the load hook or other device is securely attached to the wire rope, and the wire rope where it is attached is not frayed, corroded, broken, or otherwise damaged.
 - Measure the throat opening, thickness, and twist of the hook. Replace the hook if it shows signs of damage. See Figure 18.
 - Make sure hook latch opens without binding and closes when released.
 - Check the anchor holes in the drum and the surrounding area for signs of wear or distortion.

Figure 16 – Broken Wires



Wire rope assembly must be replaced if more than 6 wires are broken in one lay, or if more than 3 wires are broken in one strand in one lay.

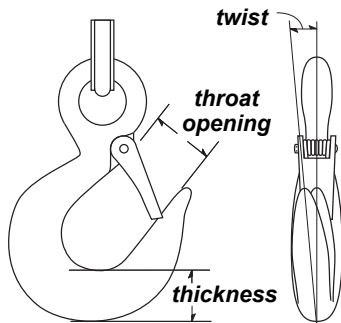
Figure 17 – Rope Diameter



The wire rope assembly must be replaced if the diameter measures less than the minimum diameter at any point.

nominal wire rope diameter	maximum allowable reduction from nominal diameter
up to 5/16 in	1/64 in (.0156 in)
up to 1/2 in	1/32 in (.0313 in)
up to 3/4 in	3/64 in (.0469 in)
up to 1-1/8 in	1/16 in (.0625 in)
up to 1-1/2 in	3/32 in (.0938 in)

Figure 18 – Load Hook Inspection



The wire rope assembly must be replaced if the throat opening is 15% wider than nominal, if the thickness is 10% less than nominal, or if the hook is twisted 10° or more.

- d MOVE THE DRUM with your hands. Check for excessive movement indicating worn or loose gears or bearings. Excessive movement is caused by overloading or overheating, and is a sign that your application may require a larger power winch. Disassemble the winch if necessary. Inspect gears, keys, bearings, seals, and shafts for wear, distortion, and other damage.
- e PLACE enough weight to keep the wire rope straight and tightly drawn.
 - Measure the diameter of the wire rope, especially in areas where wear is noticeable. Replace the wire rope if the diameter measures below the minimum diameter at any point. See Figure 17.
- f INSPECT THE FOUNDATION AND RIGGING.
 - Check mounting fasteners for stripped threads, wear, and other damage.
 - Check the foundation for cracks, corrosion, and other damage.
- g TEST WINCH PERFORMANCE by operating the winch with a load equal to the load rating.
 - Listen for unusual noises, and look for signs of damage as you operate the winch.
 - Make sure the wire rope winds evenly and tightly onto the drum. If it is loose or uneven, rewind it before continuing.
 - Observe the rotating drum, look for signs of loose or misaligned bearings.
 - Make sure the winch responds to the control device. It must rotate as shown on the control labels, and it must turn off when you release the control.
 - Make sure the load moves smoothly without hesitation or strain.
 - Check the brake(s). Raise the load, then lower it and stop it a few feet off the ground. If the load continues to coast or creep under normal operating conditions, the brake(s) needs adjustment. See section 2.2 - Inspecting/ Adjusting the Brakes.
- h DISCONNECT AIR SUPPLY and inspect equipment.
 - Check air supply and connections for wear, corrosion, cuts and other damage.
- i CONNECT AIR SUPPLY.

Completely correct all problems before continuing. Use the troubleshooting chart to help determine the cause of certain problems. See table 5.

Table 4 – Inspection Checklist

checked boxes indicate damage or problem in need of repair

	damages	problems
general	<input type="checkbox"/> finish weathered, flaking, otherwise damaged <input type="checkbox"/> parts cracked, bent, rusted, worn, otherwise damaged	<input type="checkbox"/> winch jerks or hesitates during operation <input type="checkbox"/> unusual noises, other signs of malfunction
fasteners	<input type="checkbox"/> stripped threads, bent, worn, otherwise damaged	<input type="checkbox"/> loose, not tightened to proper torque
reducer	<input type="checkbox"/> gears, bearings, or shafts loose, worn, otherwise damaged <input type="checkbox"/> lubricant leakage	<input type="checkbox"/> not properly lubricated <input type="checkbox"/> lubricant contaminated
wire rope	<input type="checkbox"/> bent, crushed, otherwise damaged <input type="checkbox"/> broken wires, see Figure 16 replace if more than 6 wires in one lay, or 3 wires in one strand in one lay, are broken <input type="checkbox"/> diameter reduced, see Figure 17 replace if diameter is excessively worn	<input type="checkbox"/> wire rope loosely or unevenly wound number per strand = _____ number per lay = _____ diameter = _____
end connections	<input type="checkbox"/> corroded, rusted, worn, otherwise damaged	<input type="checkbox"/> not securely attached
hook or other device	<input type="checkbox"/> twisted, bent, worn, otherwise damaged, see Figure 18 replace if twist is 10 degrees or more replace if throat width is 15% larger than nominal replace if thickness is 10% less than nominal	<input type="checkbox"/> hook latch fails to close when released twist = _____ throat width = _____ thickness = _____
drum	<input type="checkbox"/> anchor worn, distorted, otherwise damaged	<input type="checkbox"/> excessive movement or backlash
motor	<input type="checkbox"/> motor corroded, worn out, otherwise damaged	<input type="checkbox"/> motor is sluggish, or operates poorly
brake	<input type="checkbox"/> brake worn, corroded, otherwise damaged	<input type="checkbox"/> brake does not operate properly
control device	<input type="checkbox"/> control components corroded, worn out, otherwise damaged	<input type="checkbox"/> fails to control winch properly
air supply	<input type="checkbox"/> air lines cracked, cut, corroded, otherwise damaged <input type="checkbox"/> connections loose, corroded, otherwise damaged	<input type="checkbox"/> wires unprotected, obstructing traffic pressure at motor = _____
labels and plates	<input type="checkbox"/> dirty, illegible, otherwise damaged	<input type="checkbox"/> loosely attached or missing

comments

authorized signature _____ **date** _____



Table 5 – Troubleshooting Chart

Contact the factory for assembly/disassembly instructions. Disassembly before contacting Thern, Inc. voids all warranties.

problem	cause	correction
motor won't run	<ul style="list-style-type: none"> • no air supply to winch • load too heavy. • motor damaged. 	<ul style="list-style-type: none"> check air supply line connections and hoses lighten load repair or replace as necessary
winch runs slow correct	<ul style="list-style-type: none"> • improper hose or fitting size • load too heavy • motor may be damaged • bearing seized up • exhaust ports restricted. 	<ul style="list-style-type: none"> check fittings, connections for size and length. Replace parts that may restrict air flow. Inspect air line filter. Make sure both exhaust ports are not restricted. lighten load inspect and replace as necessary inspect and replace as necessary remove cap and install mufflers
motor runs, drum doesn't turn	<ul style="list-style-type: none"> • loose or broken gear keys or splines • loose, stripped or broken gears 	<ul style="list-style-type: none"> inspect and replace as necessary inspect and replace as necessary
motor tries to turn but can't	<ul style="list-style-type: none"> • unit overheated • load too heavy. • motor may be damaged • insufficient air supply. • brake may not be released • gears or bearings broken or locked 	<ul style="list-style-type: none"> allow to cool lighten load inspect and repair as necessary verify air supply pressure and volume at winch inlet meet the requirements listed inspect and repair as necessary inspect and replace as necessary
air lines freeze	<ul style="list-style-type: none"> • water in air supply 	<ul style="list-style-type: none"> install or drain air system moisture traps, moisture collecting air receivers and compressor aftercoolers. After corrective actions have been taken, disconnect lines at winch inlet and purge with clean, dry air or nitrogen prior to attaching load and operating winch.
brake does not operate properly	<ul style="list-style-type: none"> • brake release lever in release position • low air supply pressure on disc brake • brake adjusted incorrectly. • brake worn or damaged • brake components seized up or damaged • load too heavy. 	<ul style="list-style-type: none"> move to lock position ensure air pressure at the inlet to disc brake is 50 psi inspect and adjust brake inspect and replace as necessary inspect and repair as necessary lighten load
lubricant leakage	<ul style="list-style-type: none"> • worn bearings • damaged oil seals or gaskets • cracked or damaged reducer or motor 	<ul style="list-style-type: none"> inspect and replace as necessary inspect and replace as necessary inspect and repair as necessary
excessive end play on drive shaft	<ul style="list-style-type: none"> • loose or damaged keys, keyways or splines. • excessively worn gears. 	<ul style="list-style-type: none"> inspect and replace as necessary inspect and repair as necessary
excessively worn gears or bearings	<ul style="list-style-type: none"> • load too heavy. • poor lubrication of reducer or bearings 	<ul style="list-style-type: none"> lighten load inspect and lubricate as necessary



3.4 Repairing the Winch

Important!

- It is your responsibility to determine when to replace parts. When considering whether to continue using a part or to replace it, remember that replacing it is the best way to avoid further equipment damage.
- Replace spring pins, retaining rings, and oil seals whenever the winch is disassembled for inspection or repair.
- Appoint a qualified person to be responsible for all repairs to the equipment.
- Turn off air system and depressurize air lines before performing any maintenance.

- 3.4.1 GET FACTORY AUTHORIZATION for all repairs. Unauthorized repairs will void the warranty, and may lead to damage or failure of the winch.
- 3.4.2 REPLACE DAMAGED OR POORLY OPERATING PARTS with Thern repair parts.
- 3.4.3 CLEAN THE DRUM BRAKE BAND using a wire brush or emery cloth. Do not wash the drum brake band in liquid. If the drum brake band lining is oil soaked, it must be replaced.
 - a INSPECT THE DRUM BAND BRAKE LINING for oil, grease and glazing. If the drum band brake lining is oil-soaked replace the brake bands as a set. Remove glazed areas of band brake lining by sanding lightly with a fine grit emery cloth.
 - b MEASURE THE THICKNESS OF THE DRUM BAND BRAKE LINING. If the drum brake band linings are less than .125 inch thick anywhere along the edges replace the brake bands as a set.
- 3.4.4 REFINISH AREAS where the paint is worn or flaking. A good finish helps to protect against corrosion and weather damage.
 - a REMOVE THE FINISH from damaged areas, down to the bare metal.
 - b CLEAN THE AREA thoroughly.
 - c REPAINT with a high quality primer and finishing coat.
- 3.4.5 TO ORDER REPAIR PARTS, contact your local dealer. Include the following information when ordering:
 - model number (**See Figure 1**)
 - **serial number** (or code number) (**See Figure 1**)
 - part number
 - date purchased, and from whom
 - description of what happened, or what is wrong
 - your name and return address



Important!

- Keep a record of what you ship and when you send it.

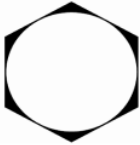

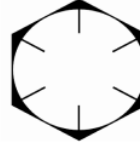
4.1 Transporting the Winch

- 4.1.1 REMOVE THE BREATHER PLUG and install a sealed plug to prevent the loss of lubrication during shipment.
- 4.1.2 PACK THE WINCH in an upright position for transport, using the original packaging materials, if possible.
- a FASTEN THE WINCH to a wooden base using bolts, to keep it from moving during transport.
 - b SEAL THE WINCH in plastic with a desiccant to help protect it from rust, corrosion, and other damage.
 - c CONSTRUCT WOODEN SIDES and top to enclose the winch in a solid protective crate.
 - d PACK LOOSE PARTS in small boxes or ship separately.
- 4.1.3 INSPECT THE WINCH according to the Instructions for Periodic Inspection before installing it in a new location.

4.2 Storing the Winch

- 4.2.1 FILL THE REDUCER, DISC BRAKE AND MOTOR with lubricant, and make sure the breather plugs are clean and properly installed. Add a rust preventative for long term storage. Follow the reducer and motor manufacturer's instructions.
- 4.2.2 SEAL THE WINCH in plastic with a desiccant to help protect it from rust, corrosion, and other damage.
- 4.2.3 STORE THE WINCH upright, in a cool clean place away from corrosive chemicals and moisture.
- 4.2.4 ROTATE THE DRUM PERIODICALLY to keep bearing and gears surfaces from becoming lacquered. Release the brake to rotate the drum.
- 4.2.5 INSPECT THE WINCH according to the Instructions for Periodic Inspection before installing it for operation.
- 4.2.6 DRAIN THE REDUCER, DISC BRAKE AND MOTOR and fill with proper lubricant prior to operation.

Table 6 - Suggested Bolt Torque

SIZE	SAE GRADE 2 		SAE GRADE 5 		SAE GRADE 8 	
	DRY	LUBRICATED	DRY	LUBRICATED	DRY	LUBRICATED
1/4 - 20	5.5	4.1	8	6.3	12	9
1/4 - 28	6.3	4.7	10	7.2	14	10
5/16 - 18	11	8	17	13	25	18
5/16 - 24	12	9	19	14	27	20
3/8 - 16	20	15	31	23	44	33
3/8 - 24	23	17	35	26	50	37
7/16 - 14	32	24	50	37	70	50
7/16 - 20	36	27	55	41	75	55
1/2 - 13	50	37	75	55	105	80
1/2 - 20	55	41	85	65	120	90
9/16 - 12	70	50	110	80	150	115
9/16 - 18	75	60	120	90	170	125
5/8 - 11	95	70	150	110	210	160
5/8 - 18	110	80	170	125	240	180
3/4 - 10	170	130	260	200	370	280
3/4 - 16	190	145	300	220	420	310
7/8 - 9	170	125	430	320	600	450
7/8 - 14	180	135	470	350	670	500
1 - 8	250	190	640	480	910	680
1 - 12	270	200	700	530	990	740
1 1/8 - 7	350	260	790	590	1290	960
1 1/8 - 12	400	300	890	670	1440	1080
1 1/4 - 7	500	370	1120	840	1820	1360
1 1/4 - 12	550	410	1240	930	2010	1510
1 3/8 - 6	650	490	1470	1100	2380	1780
1 3/8 - 12	740	560	1670	1250	2710	2030
1 1/2 - 6	870	650	1950	1460	3160	2370
1 1/2 - 12	980	730	2190	1640	3560	2670

NOTE: M16-2 X 260MM FOR TA7 REDUCER ARE TORQUED TO 269 FT-LBS.

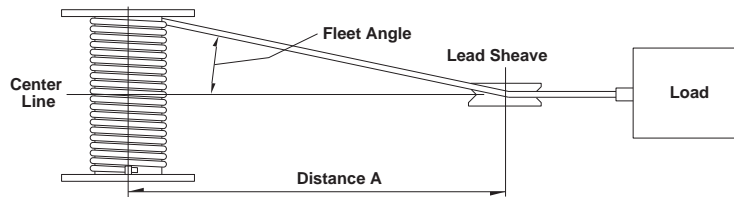
- * THIS CHART OF ESTIMATED TORQUE VALUES IS OFFERED ONLY AS GUIDE. CONDITIONS WILL VARY.
- * TORQUE VALUES ARE GIVEN IN FOOT POUNDS (FT-LBS), MULTIPLY BY 12 FOR INCH POUNDS (IN-LBS).
- * REFERENCE LUBRICATED VALUES WITH LIQUID THREAD LOCK, OILS, OR OTHER LUBRICANTS.
- * REFERENCE 'GRADE 2' VALUES WHEN USED IN ALUMINUM OR OTHER SOFT METALS.
- * TORQUE = COEFFICIENT x NOMINAL DIAMETER x CLAMP LOAD
- * CLAMP LOADS ARE BASED ON 75% OF MINIMUM PROOF LOADS.
- * ESTIMATED DRY COEFFICIENT = 0.20 , LUBRICATED COEFFICIENT = 0.15



TA10 Performance Characteristics

	TA10 Series	
	Standard	Metric
Load Rating 1st Layer	37,000 lb	16,783 kg
Load Rating Mid-Drum	27,400 lb	12,428 kg
Load Rating Full Drum	21,800 lb	9,888 kg
Line Speed 1st Layer*	20 fpm	6.1 m/min
Line Speed Mid-Drum*	27 fpm	8.2 m/min
Line Speed Full Drum*	34 fpm	10.4 m/min
Input HP	27 hp	27 hp
Max. Stall Pull 1st Layer	47,000 lb**	21,320 kg
Pressure	90 psi	6.3 kgf/cm ²
Flow	900 scfm	25 m ³ /min
Pipe Inlet Size	1.5 in	38.1 mm
Hose Size	1.25 in	31.8 mm
Minimum Design Temp	(-4°)F	(-20°)C

Model	Drum Diameter		Flange Diameter		Drum Width		Fleet Angle Dist.	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)
TA10-30	20.00	508	38.00	965	30.00	762	48	15
TA10-40	20.00	508	38.00	965	40.00	1016	64	20
TA10-60	20.00	508	38.00	965	60.00	1524	95	29



* Line speeds vary based on conditions of air supply.

** Estimated Value.

TA10 Drum Capacities*

Drum Width	30 in (762 mm)			40 in (1016 mm)			60 in (1524 mm)					
	Rope Diameter	Breaking Strength**		1st Layer	Mid Drum	Full Drum	1st Layer	Mid Drum	Full Drum	1st Layer	Mid Drum	Full Drum
	(in) (mm)	(lb) (kg)	(ft) (m)	(ft) (m)	(ft) (m)	(ft) (m)	(ft) (m)	(ft) (m)	(ft) (m)	(ft) (m)	(ft) (m)	(ft) (m)
TA10 Series	1.13 28.7	130,000 58,968	120 36	620 115	1,390 259	160 48	830 252	1,850 563	260 79	1,250 381	2,780 847	

* Drum capacity is based on 0.5 inch flange clearance at top layer per ASME B30.7.

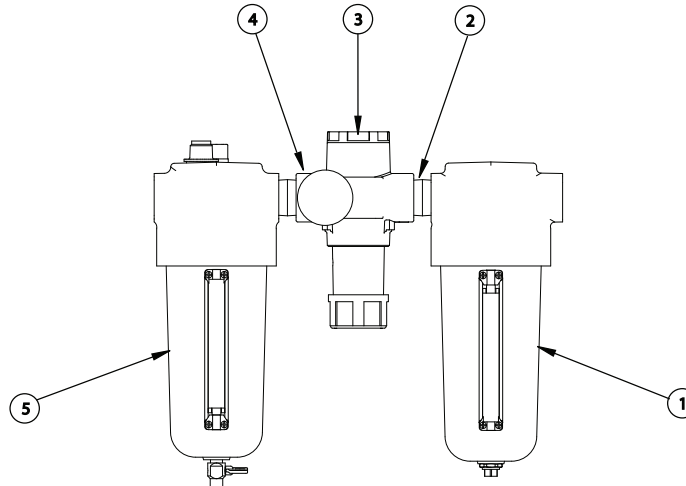
** Values based on 6x37 IWRC EIPS wire rope.



FILTER-REGULATOR-LUBRICATOR (F-R-L) ¹		C4203	
item	description	part number	qty
1	FILTER	B4575	1
2	FITTING NIPPLE 1-1/2 NPT X 3.00 LNG GALV	A8825	2
3	REGULATOR	B4576	1
4	PRESSURE GAUGE	A7378	1
5	LUBRICATOR	B4577	1

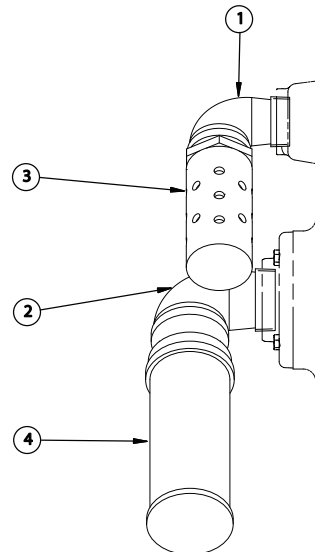
¹ C4203 used on all units.

F-R-L Assembly

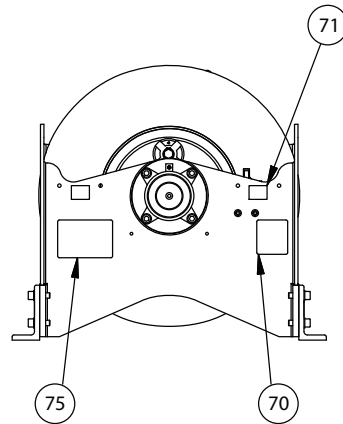
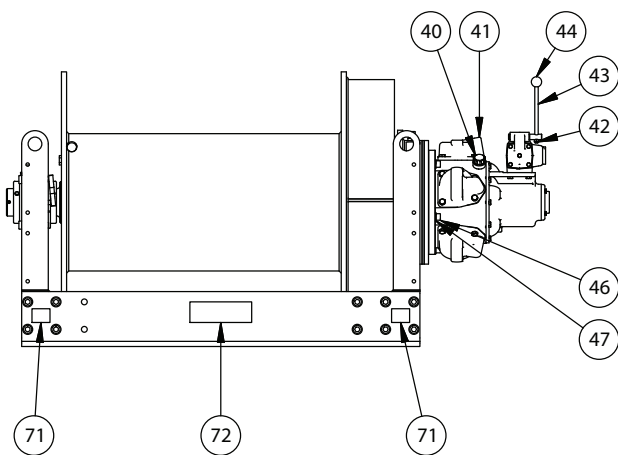
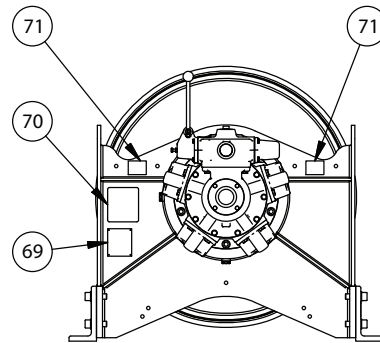
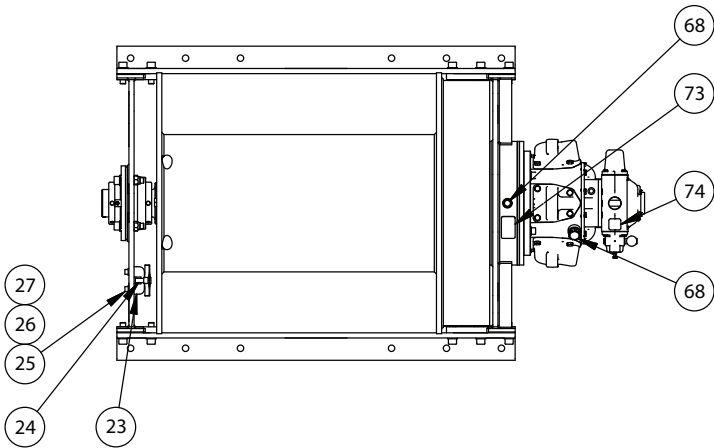
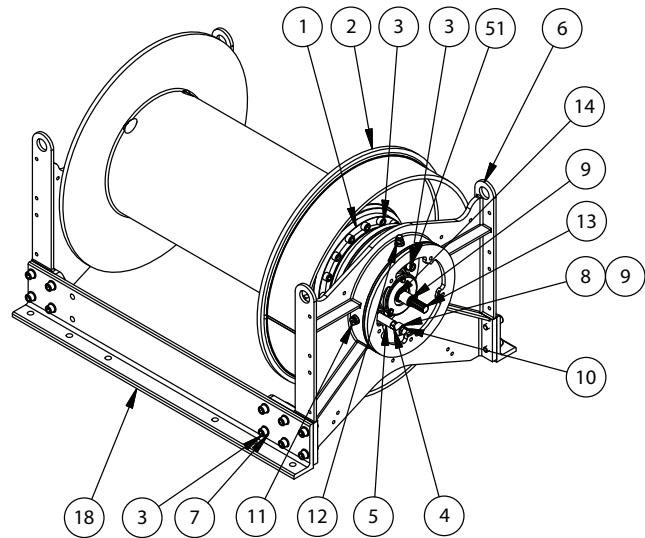
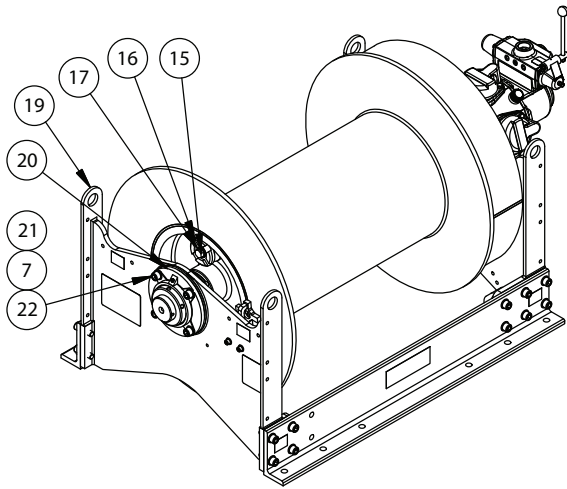


MUFFLER ASSEMBLY		C4506	
item	description	part number	qty
TA10			
1	FITTING 90° STREET ELBOW 1.5 NPT	A9907	1
2	FITTING 90° STREET ELBOW 2 NPT	A9908	1
3	MUFFLER SHELL TYPE 1.50 NPT MALE	A8820	1
4	MUFFLER SHELL TYPE 2. NPT MALE	A9673	1

Muffler Assembly



TA10 Series Air Winch



TA10 SERIES AIR WINCH PARTS LIST			CONFIGURATION			
item	description	part number	AK1 qty	AX1 qty	MK1 qty	MX1 qty
ALL UNITS						
1	REDUCER PWD3500	D3169	1	1	1	1
2	DRUM WELDMENT/MACHINING*	-	SEE SUPPLEMENTAL LIST ON PAGE 37			
3	CAPSCR SOKHD M20-2.5 X 60MM 12.9 ZNPL	A9620	57	57	57	57
4	SEALING RING .500 BSPP	A9616	12	12	12	12
5	DRAIN PORT EXTENSION	A9617	3	3	3	3
6	WELDMENT/MACHINING REDUCER END PLATE	D3215	1	1	1	1
7	WASHER FLT 21MM X 37MM X 3.3MM ZNPL	A9623	24	24	24	24
8	BANJO	A9619	3	3	3	3
9	O-RING -216	A9615	7	7	7	7
10	BANJO BOLT	A9618	3	3	3	3
11	PLUG HEX 1/2 BSPP	A9628	2	2	2	2
12	BREATHER 1/2 BSPP	A9627	1	1	1	1
13	INPUT SHAFT	B4889	1	1	1	1
14	RING RETAINING 1.968	A8297	1	1	1	1
15	CABLE ANCHOR PIVOT PIN	B4881	1	1	1	1
16	CABLE ANCHOR	D3189	1	1	1	1
17	RING RET EXT 1.500 SPRSTL	A3829	1	1	1	1
18	FRAME ANGLE TA10*	-	SEE SUPPLEMENTAL LIST ON PAGE 37			
19	WELDMENT/MACHINING BEARING END PLATE	D3216	1	1	1	1
20	BEARING 4.00" TYPE E PILOTED	A9587	1	1	1	1
21	NUT HEX NYLK M20-2.5 ZNPL	A9622	4	4	4	4
22	CAPSCR SOKHD M20-2.5 X 90MM 12.9 ZNPL	A9621	4	4	4	4
23	CABLE ANCHOR WRENCH HOLDER	A9860	1	1	1	1
24	CABLE ANCHOR WRENCH	A9764	1	1	1	1
25	CAPSCR SOKHD M12-1.75 X 50MM ZNPL	A9383	2	2	2	2
26	WASHER FLT 13MM X 24MM X 2.7MM ZNPL	A9879	4	4	4	4
27	NUT HEX NYLK M12 1.75 ZNPL	A9878	2	2	2	2
28	TOP LINK PIN	A9761	1	1	1	1
29	BRAKE BAND ASSEMBLY	D3183	2	2	2	2
30	PIN COTTER .187 X 1.750 STL ZNPL	A4766	6	6	4	4
31	CLEVIS PIN	A9502	4	4	4	4
32	BRAKE LINK	A9610	2	2	2	2
33	BRAKE ANCHOR LINK	A9609	2	2	2	2
34	ADJUSTMENT BLOCK	A9631	1	1	1	1
35	BRAKE PIVOT SPACER	A9632	4	4	4	4
36	CAPSCR SOKHD M20-2.5 X 45MM 12.9 ZNPL	A9633	4	4	4	4
37	WASHER FLT 25MM X 44MM X 4.3MM ZNPL	A9635	1	1	1	1
38	BRAKE ADJUSTING BOLT	A9611	1	1	1	1
39	NUT HEX NYLK M24-3.0 ZNPL	A9562	1	1	1	1
40	BREATHER	A9009	1	1	1	1
41	MOTOR VALVE ASSEMBLY RM610	C4385	1	1	1	1
42	NUT HEX M10-1.5 SST	A9749	1	1	1	1
43	HANDLE SHAFT	A9747	1	1	1	1
44	HANDLE KNOB 38MM DIA M10X1.5	A9748	1	1	1	1
45	WELDMENT/MACHINING BRAKE LEVER	C4397	0	0	1	1
46	CAPSCR SOKHD M16-2 X 50MM 12.9 ZNPL	A9630	10	5	10	5
47	WASHER FLT 17MM X 30MM X 3.3MM ZNPL	A9629	10	5	10	5
48	FITTING BARBED .25 HOSE -4 JIC SWIVEL FEMALE	A8348	4	3	3	0
49	FITTING NIPPLE HEX 1/4 NPT X -4 JIC	A8846	2	1	2	0
50	VALVE SHUTTLE 1/4"	A8770	1	1	1	0
51	WASHER NORD-LOCK NL20 21.4 X 30.7 X 3.4	A12231	37	37	37	37

* Items 2 and 18 vary based on drum length. See Supplemental Parts List on page 37.



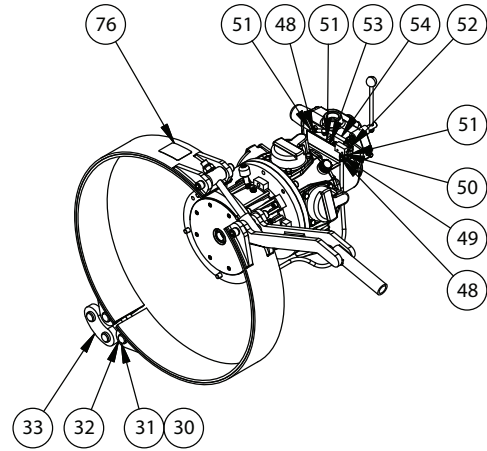
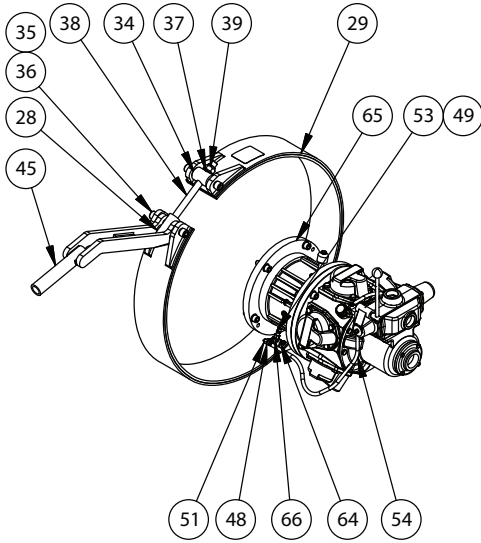
TA10 SERIES AIR WINCH PARTS LIST			CONFIGURATION			
item	description	part number	AK1 qty	AX1 qty	MK1 qty	MX1 qty
ALL UNITS						
51	FITTING ELBOW MALE 1/4 NPT X -4 JIC	A8449	4	4	4	0
52	FITTING ELBOW BARBED 14" ID HOSE X -4 JIC FEMALE	A9639	2	1	1	0
53	FITTING 1/4" NPT MALE X -4 JIC SWIVEL FEMALE	A8847	2	1	2	0
54	HOSE PUSH ON .25ID X .50OD	A8350	52.911 in	47.711 in	33.911 in	0.000 in
55	CYLINDER MOUNT WELDMENT / MACHINING	A9626	1	1	0	0
56	CLEVIS PIN	A6885	2	2	0	0
57	MUFFLER SHELL TYPE 1/2" NPT MALE	A6976	1	1	0	0
58	FITTING HEX REDUCER 1/2" NPTM X 1/4"NPTF	A8844	1	1	0	0
59	NIPPLE HEX 1/2" NPT	A5280	1	1	0	0
60	VALVE QUICK EXHAUST 1/2"	B4586	1	1	0	0
61	FITTING PLUG PIPE 1/2 NPT	A5287	1	1	0	0
62	AUTOMATIC BRAKE LEVER	C4396	1	1	0	0
63	CYLINDER SPRING RETURN	C4395	1	1	0	0
64	MUFFLER SHELL 1/4"	A8826	1	0	1	0
65	BRAKE PNEUMATIC 165 FT/LB	C4398	1	0	1	0
66	VALVE QUICK EXHAUST 1/4"	B4585	1	0	1	0
67	FITTING TEE MALE BRANCH -4 JIC - 1/4NPT	A8968	1	0	0	0
68	LUBRICANT SHC 630	A6939	1.781 gal	1.781 gal	1.781 gal	1.781 gal
69	LABEL NAMEPLATE FOR WINCHES	A5923	1	1	1	1
70	LABEL WARNING FOR POWER WINCHES	A1980	2	2	2	2
71	LABEL WARNING KEEP HANDS AWAY FROM DRUM	A2659	8	8	8	8
72	LABEL BIG RED	A9451	2	2	2	2
73	LABEL CAUTION LUBRICATION	A8382	1	1	1	1
74	LABEL VALVE OPERATION	A9875	1	1	1	1
75	LABEL WARNING CABLE ANCHOR OPERATION TA10	A9876	1	1	1	1
76	LABEL WARNING ADJUST BRAKE	A8385	1	1	1	1
77	LABEL WARNING NO AUTOMATIC BRAKE	A2692	0	0	0	1
78	ANCHOR PAD	A6608	1	1	0	0
79	CABLE TIE	A5049	1	1	0	0

TA10 SERIES SUPPLEMENTAL PARTS LIST			TA10-30	TA10-40	TA10-60
item	description	part number	qty	qty	qty
ALL UNITS					
2	DRUM WELDMENT/MACHINING TA10-30	D3208	1	-	-
2	DRUM WELDMENT/MACHINING TA10-40	D3210	-	1	-
2	DRUM WELDMENT/MACHINING TA10-60	D3212	-	-	1
18	FRAME ANGLE TA10-30	B4894	2	-	-
18	FRAME ANGLE TA10-40	B4896	-	2	-
18	FRAME ANGLE TA10-60	B4898	-	-	2

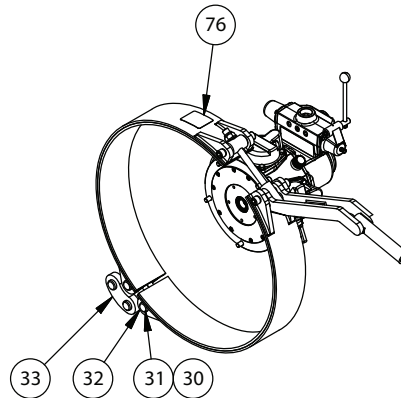
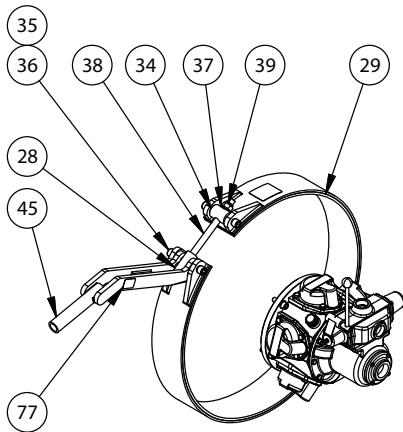


TA10 Series Manual Band Brake Plumbing

TA10 MK1

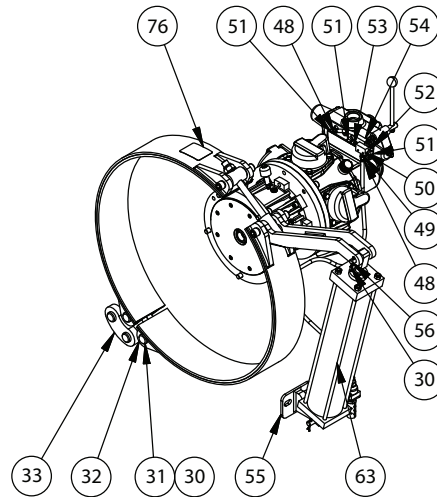
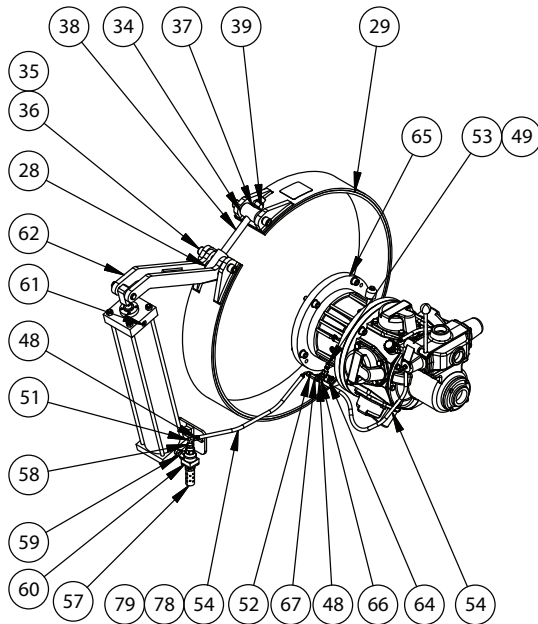


TA10 MX1

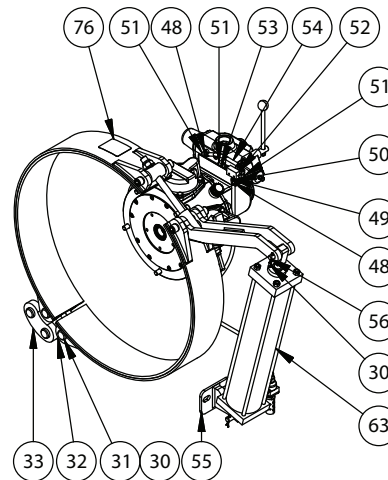
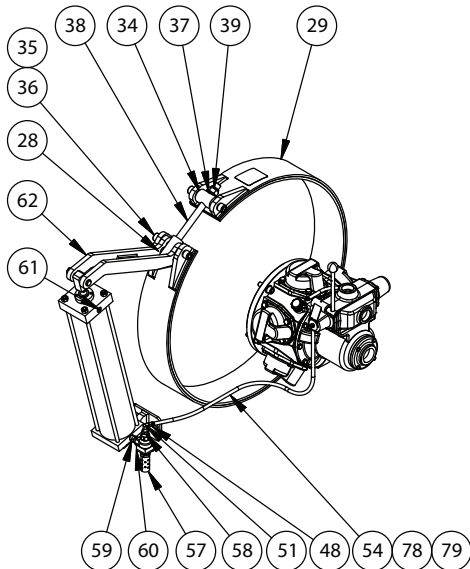


TA10 Series Automatic Band Brake Plumbing

TA10 AK1



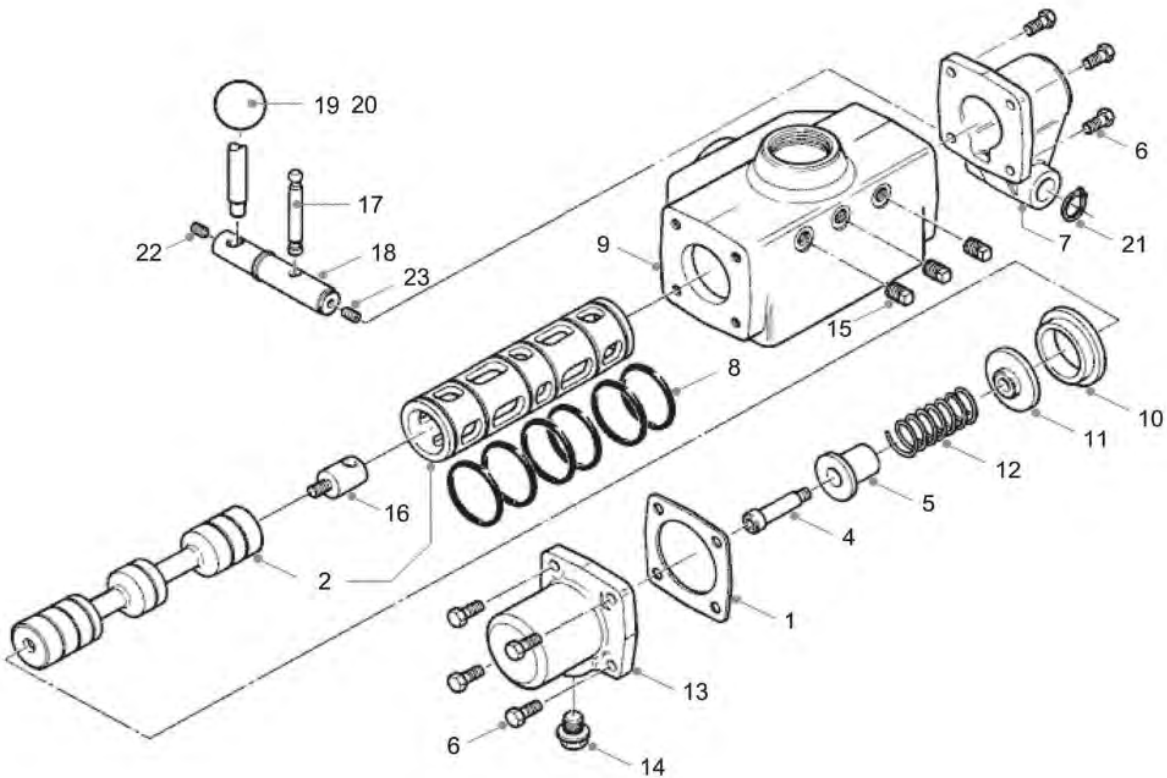
TA10 AX1



TA10 SERIES - CONTROL VALVE			
Part No. B4676			
item	description	part number	qty
1	END CAP GASKET	521-066	2
2	MATCHED SPOOL AND SLEEVE	521-913	1
4	SHOULDER SCREW 10 MM	817-002	1
5	CENTERING SHAFT GUIDE	521-071	1
6	SET SCREW M8 X 20	802-032	6
7	LEVER CAP	523-043	1
7*	SPEED ADJUSTING SCREW	815-036	1
7*	SEAL	808-093	1
7*	NUT	801-009	1
8	O RING 2 X 2 1/8	808-013	6
9	VALVE BODY	521-060	1
10	VALVE SLEEVE SPACER	521-068	1
11	WASHER, SPRING CENTERING	521-072	1
12	SPRING FLEXO 403824	814-020	1
13	END CAP - SPRING END	521-064	1
14	VENT PLUG	113-050	1
15	PLUG 1/4 BSPT SQ. HEAD	816-061	3
16	TOGGLE SHAFT	523-024	1
17	TOGGLE PIN	A9370	1
18	HAND LEVER PIVOT	B4795	1
19	HAND LEVER	B4558	1
20	CAPSCREW HEXHD M10-1.5 X 35MM 8.8	A8282	
21	CIRCLIP 20MM EXTERNAL	804-013	2
22	GRUB SCREW M8 X 10	815-010	1
23	GRUB SCREW M8 X 16	815-002	1

* Item not shown.

TA10 Series Control Valve



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TA10 SERIES - PISTON AIR MOTOR				
Part No. C4385				
item	description	part number	qty	kit no.
1	ROTARY VALVE BEARING	807-056	1	
2	ROTARY VALVE	620-006	1	
3	ROTARY VALVE HOUSING	620-011	1	
4	ROTARY VALVE BEARING (INNER)	807-055	1	
5	ROTARY VALVE BEARING CIRCLIP	804-070	1	
6	ROTARY VALVE HOUSING GASKET	-	1	629-912
7	CYLINDER GASKET	-	5	639-912
8	CYLINDER	510-082	5	
9	PISTON ASSEMBLY	520-902A	5	
10	COMPRESSION RING	-	5	629-912
11	OIL CONTROL RING	-	5	629-912
12	KING ROD	520-077	1	
13	CRANKSHAFT SPACER	520-052	2	
17	CRANKSHAFT BEARING	807-062	2	
18	CRANKSHAFT BEARING CIRCLIP	804-068	2	
19	CRANKSHAFT OILSEAL	-	1	629-912
20	STD CRANKSHAFT ASSEMBLY	520-901	1	
21	CRANK BOLT	510-088	1	
22	CRANK NUT	801-009	1	
23	SPRING DOWEL	806-013	2	
24	STD FLANGE PLATE	520-076	1	
26	PLUG	816-071	3	
27	ENGINE CASE	620-012	1	
28	ENGINE CASE GASKET	-	1	629-912
29	QUEEN ROD PIVOT	520-081	4	
30	QUEEN ROD	520-078	4	
37	CYLINDER BOLTS	802-074	20	
38	VALVE HOUSING BOLTS	802-054	10	
39	WASHER (for item 38)	803-001	10	
40	ADAPTOR PLATE BOLTS	809-002	5	
41	EXHAUST COVER BOLTS	802-033	4	
42	FLANGE PLATE PLUGS	815-008	5	
45	SEAL (transit only)	808-004	1	
46	BREATHER PLUG	130-066	1	
48	NEEDLE BEARING	807-047	1	
50	KEY	811-030	1	
51	ROTARY VALVE EXHAUST COVER	620-042	1	
55	OUTPUT SHAFT BRG (OUTER)	807-063	1	
56	OUTPUT SHAFT BRG (INNER)	807-012	1	
57	FLANGE PLATE CAP SCREWS	809-001	10	
58	OUTPUT HOUSING BOLTS	809-002	5	
59	OUTPUT HOUSING COVER BOLTS	802-016	5	
61	DRIVE PIN (dia 10 mm)	806-001	1	
62	DRIVE PIN (dia 12 mm)	806-002	1	
63	OUTPUT SHAFT BEARING SPACER	518-001	1	
64	OUTPUT SHAFT SPRING RING	518-004	1	
65	OUTPUT SHAFT CIRCLIP	804-017	1	
66	OUTPUT SHAFT SEAL	-	1	629-912
67	OUTPUT SHAFT	518-003	1	
68	OUTPUT SHAFT HOUSING	518-005	1	
69	OUTPUT SHAFT OILSEAL	808-042	1	
70	OUTPUT SHAFT HOUSING COVER	518-002	1	
71	OUTPUT SHAFT GREASE NIPPLE	816-015	1	
72	INLET ADAPTOR PLATE	620-046	1	
73	INLET ADAPTOR PLATE GASKET	-	1	629-912
78	BEARING CLIP	620-045	1	
79	C/SK SCREW M5 X 8 LG	810-016	4	
	RM610 SEAL KIT	629-912		

TA10 Series Motor Assembly for C4385

