










Warnings and Cautions



As you read these instructions, you will see WARNINGS, CAUTIONS, NOTICES and NOTES. Each message has a specific purpose. WARNINGS are safety messages that indicate a potentially hazardous situation, which, if not avoided could result in serious injury. CAUTIONS are safety messages that indicate a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. A CAUTION may also be used to alert against unsafe practice. CAUTIONS and WARNINGS identify the hazard, indicate how to avoid the hazard, and advise of the probable consequence of not avoiding the hazard. NOTICES are messages to avoid property damage. NOTES are additional information to help you complete a procedure. **PLEASE WORK SAFELY!**

 WARNING		
		
 $\geq 1/2"$ (13mm)		
MOVING PARTS ENTANGLEMENT HAZARD		
Failure to observe these instructions could lead to severe injury or death.		
To avoid injury to hands or fingers:		
<ul style="list-style-type: none"> • Always keep hands clear of rope, hook loop, hook and fairlead opening during installation, operation and when spooling in or out. • Always use extreme caution when handling hook and rope during spooling operations. • Always use supplied hook strap whenever spooling rope in or out, during installation, and during operation. • Always use a hook marked 1/2" (13 mm) or larger with Series 15 or 8 fairlead. 		

 WARNING	
	
CHEMICAL AND FIRE HAZARD	
Failure to observe these instructions could lead to severe injury or death.	
<ul style="list-style-type: none"> • Always remove jewelry and wear eye protection. • Never lean over battery while making connections. • Always verify area is clear of fuel lines, fuel tank, brake lines, electrical wires, etc. when drilling. • Never route electrical cables: <ul style="list-style-type: none"> - Across any sharp edges. - Through or near moving parts. - Near parts that become hot. • Always insulate and protect all exposed wiring and electrical terminals. • Always install terminal boots as directed in installation instructions. 	

 WARNING	
Failure to observe these instructions could lead to property damage, severe injury, or death	
<ul style="list-style-type: none"> • Never exceed the maximum recommended hydraulic pressure or flow for any of the components used. • Always use a tandem-center type control valve (A & B work ports blocked) to insure proper brake operation. • Always make sure all hydraulic system components are functioning correctly. • Never use a standard motor valve. • Never use a relief valve that exceeds the hydraulic motor pressure rating. 	

 **CAUTION**

MOVING PARTS ENTANGLEMENT HAZARD


Failure to observe these instructions could lead to minor or moderate injury.

General Safety:

- **Always** know your winch. Take time to fully read the *Installation and Operations Guide* in order to understand your winch and its operation.
- **Never** operate this winch if you are under 16 years of age.
- **Never** operate this winch when under the influence of drugs, alcohol or medication.
- **Never** exceed winch or rope capacity listed on product data sheet. Double line using a snatch block to reduce winch load.

Installation Safety:

- **Always** choose a mounting location that is sufficiently strong to withstand the maximum pulling capacity of your winch.
- **Always** use factory approved mounting hardware, components, and accessories.
- **Always** use grade 5 or better mounting hardware.
- **Never** weld mounting bolts.
- **Always** use care when using longer bolts than those supplied from factory. Bolts that are too long can damage the base and/or prevent the winch from being mounted securely.
- **Always** mount the hoist and attach the hook to the rope's end loop before connecting the electrical wiring.
- **Always** position fairlead with WARNING label on top.
- **Always** spool the rope onto the drum in the direction specified by the drum rotation label on the winch and/or documentation. This is required for the automatic brake to function properly.
- **Always** prestretch wire rope and respool under load before use. Tightly wound wire rope reduces chances of "binding", which can damage the rope.

 **CAUTION**

MOVING PARTS ENTANGLEMENT HAZARD

Failure to observe these instructions could lead to minor or moderate injury.

- **Always** inspect, rope, hook, and slings before operating winch. Damaged components must be replaced before operation. Protect parts from damage.
- **Never** leave remote control plugged into winch when free spooling, rigging, or when the winch is not being used.
- **Never** hook rope back onto itself. This damages the rope.
- **Always** use a choker chain, choker rope, or tree trunk protector on the anchor.
- **Always** remove any element or obstacle that may interfere with safe operation of the winch.
- **Always** take time to use appropriate rigging techniques for a winch pull.
- **Always** be certain the anchor you select will withstand the load and the strap or chain will not slip.
- **Never** engage or disengage clutch if winch is under load, rope is in tension or drum is moving.
- **Always** double line or pick distant anchor point when rigging. This maximizes pulling power and avoids overloading the winch.
- **Never** winch with less than 5 wraps of rope around the drum. The rope could come loose from the drum.
- **Never** touch rope or hook while in tension or under load.
- **Never** touch rope or hook while someone else is at the control switch or during winching operation.
- **Never** touch rope or hook while remote control is plugged into winch.
- **Always** stand clear of rope and load and keep others away while winching.
- **Always** be aware of stability of vehicle and load during winching. Alert all bystanders of any unstable condition.

 **CAUTION**



CUT AND BURN HAZARD

Failure to observe these instructions could lead to minor or moderate injury.

To avoid injury to hands and fingers:

- **Always** wear heavy leather gloves when handling a wire rope.
- **Never** let rope slip through your hands.
- **Always** be aware of possible hot surface at winch motor, drum or rope during or after winch use.

 **CAUTION**

MOVING PARTS ENTANGLEMENT HAZARD

Failure to observe these instructions could lead to minor or moderate injury.

- **Always** keep remote control lead clear of the drum, rope and rigging. Inspect for cracks, pinches, frayed wires or loose connections. Replace remote control if damaged.
- **Always** pass remote control through a window to avoid pinching lead in door, when using remote inside a vehicle.


 **WARNING**

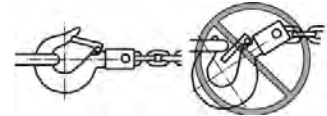


FALLING OR CRUSHING HAZARD

Failure to observe these instructions could lead to severe injury or death.

- **Never** use winch to lift or move persons.
- **Never** use winch as a hoist or to suspend a load.

 **CAUTION**



MOVING PARTS ENTANGLEMENT HAZARD

Failure to observe these instructions could lead to minor to moderate injury.

- **Always** use a hook with a latch
- **Always** insure hook latch is closed and not supporting load.
- **Never** apply load to hook tip or latch. Apply load only to the center of hook.
- **Never** use a hook whose throat opening has increased, or whose tip is bent or twisted.

NOTICE

AVOID WINCH AND EQUIPMENT DAMAGE

- **Always** avoid side pulls which can pile up rope at one end of the drum. This can damage rope or winch.
- **Always** ensure the clutch is fully engaged or disengaged.
- **Never** use winch to tow other vehicles. Shock loads can momentarily exceed capacity of rope and winch.
- **Always** use care to not damage the vehicle frame when anchoring to a vehicle during a winching operation.
- **Never** "jog" rope under load. Shock loads can momentarily exceed capacity of rope and winch.
- **Never** use winch to secure a load during transport.
- **Never** submerge winch in water.
- **Always** store the remote control in a protected, clean, dry area.

What is a Winch?

WARN Industries produces a large family of winches and hoists. But what makes a winch different than a hoist?

Winches and hoists look alike. Both consist of a motor, a rotating drum with rope, reduction gears, a base, and usually an electrical control system. However, winches and hoists are used for different purposes.

Winches are used to pull a load horizontally across the ground, while hoists are used to lift a load into the air. Unlike hoists, the operator of a winch may unwind cable by "free spooling" or disengaging the motor from the gear train using the built-in clutch. Then the operator reverses the position of the clutch to connect the motor to the gears and pull the load.

Mechanical Brake

The mechanical brake generates heat when loads are lowered and the wire rope is powered out. Care must be taken to avoid overheating the mechanical brake.

When using a winch to lower a heavy load, allow more time for the brake to cool between uses.

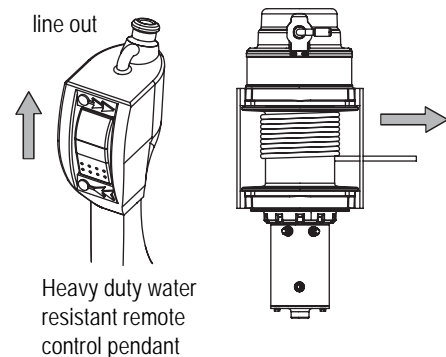
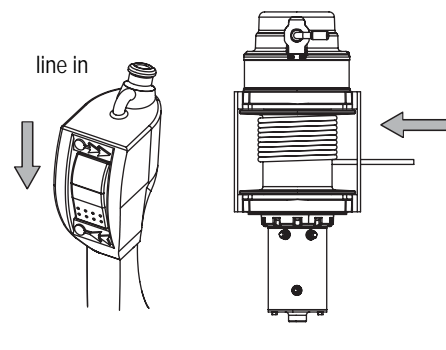
Whine or chatter associated with a new mechanical brake is normal and typically disappears with use.

OVERHEATING THE MECHANICAL BRAKE MAY RESULT IN PERMANENT DAMAGE TO, OR FAILURE OF, THE BRAKE. REPLACE ANY DAMAGED BRAKE COMPONENTS BEFORE RESUMING USE OF THE WINCH.

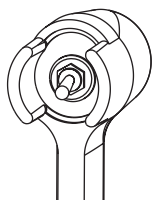
Remote Control

Switch operation

Do not leave the remote plugged into the winch when not in use. Leaving the remote plugged in may result in unexpected winch activation and/or battery drain.



Heavy duty water resistant remote control pendant



Standard remote control pendant

Pre-Install Checklist

- 1 Check to see that you have received the following:
 - The winch
 - The controller
 - The remote control pendant
 - The winch mounting hardware
- 2 Upon removing winch from packaging, check for damage including bent or cracked tie rods, tie bars, or housings. Correct any damage before installing winch.
- 3 Make sure the environment surrounding winch and controller is free of :
 - Combustible vapors
 - Chemical fumes
 - Oil vapors
 - Corrosive material
- 4 Make sure that the air temperature surrounding the winch and controller stays within 120° F (49° C) and -20° F (-29° C).
- 5 Make sure that the mounting structure can withstand the full rated pull of the winch.

Mounting the Winch

Use the supplied fasteners whenever possible or SAE Grade 5 (8.8 metric) bolts of the same thread size. Both tie rods or tie bars must be in place. Flat washers and lock washers should be used between the bolt heads and mounting surface.

For thru bolt drum supports:

There should be 1 to 4 threads protruding above the square nut. Bolts that are too long may damage drum supports while bolts that are too short will not provide adequate strength. Flat washers and lock washers should be used between bolt heads and mounting surface.


For threaded drum supports:

Bolts that are too long may damage the drum supports and/or fail to anchor the winch tightly. Bolts that are too short will not provide adequate strength. The length of the bolt must allow it to extend between 15/16 inch (24 mm) and 1-3/8 inch (35 mm) into the base of the winch.

- 1 Make sure that the mounting surface is flat within +/-0.020 in. (0.50 mm). If the surface is not flat, use shim stock as needed to avoid straining the winch.
- 2 Torque all mounting bolts to the recommended values on the product data sheet.
- 3 Use the mounting hole locations provided on the product data sheet.

Mounting the Controller (electric winches)

- 1 Remove the screws holding cover to controller bracket.
- 2 Mount the controller in an upright or vertical orientation so that water will not collect in the cover.
- 3 Mount controller in a location free of excessive vibration. Use lock washers to prevent mounting nuts from loosening.
- 4 Mount controller so it is protected from damage by tools or heavy objects.
- 5 The controller can be mounted in a location exposed to the weather; but it should be protected from the possibility of damage from tools or heavy objects.
- 6 Use the mounting dimensions shown.

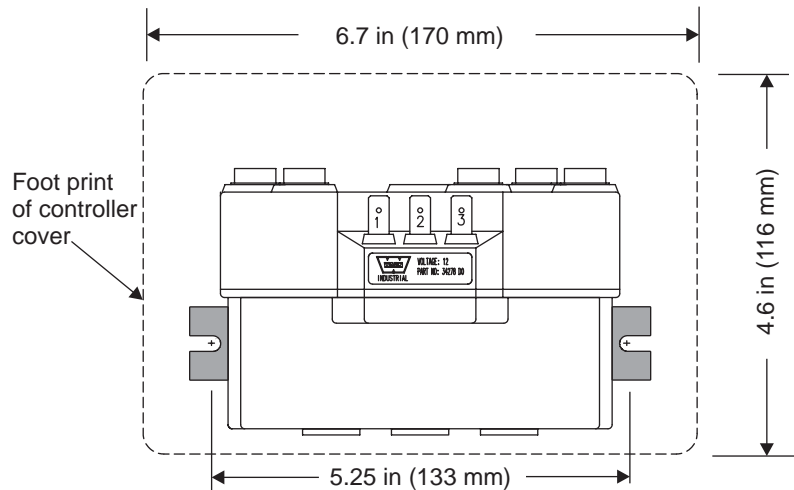


WARNING

FIRE HAZARD

Failure to observe these instructions could lead to severe injury or death.

- Never mount controller in an area where it may be used as a step or where tools will be hung or placed on it.
- **Always** avoid damage to terminals located on top surface of the enclosure.
- **Always** keep tools and other electrically conductive equipment away from terminals at all times.




Mounting dimensions for typical controller

Electric Cable Connections



See illustrations on following page.

Connection guidelines:

- Use #2 gauge battery cable for all power connections. Excess cable length can result in a voltage drop causing poor winch operation.
- Minimize cable length where possible. When cables longer than 10 feet (3m) are needed, use size #0 cable.
- Route cables along protected areas to avoid wear and damage.
- Use insulating boots on all exposed terminal connections to prevent electrical shorting. Slide terminal boots onto cables before connecting cables to terminals.
- Use splice connectors to attach the motor thermal-switch wires.
- Connect the F1, F2, A and ground cables as shown for clockwise models. For counterclockwise models, the F1 controller terminal must be connected to the F2 motor terminal, and the F2 controller terminal must be connected to the F1 motor terminal.
- Make sure all electrical connections are clean and tight.
- It is recommended that a power-cut off switch be installed in an easily accessible location. This will provide power shut-off during servicing and act as an added safety feature. Use a 300 amp switch.
- It is recommended that a 300 amp circuit breaker be installed in the positive (+) cable near the battery to protect against short circuits.



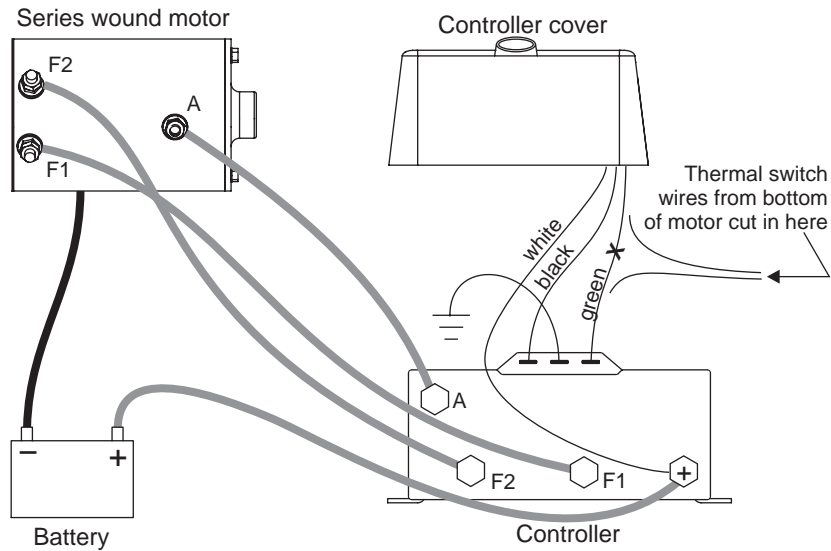
WARNING

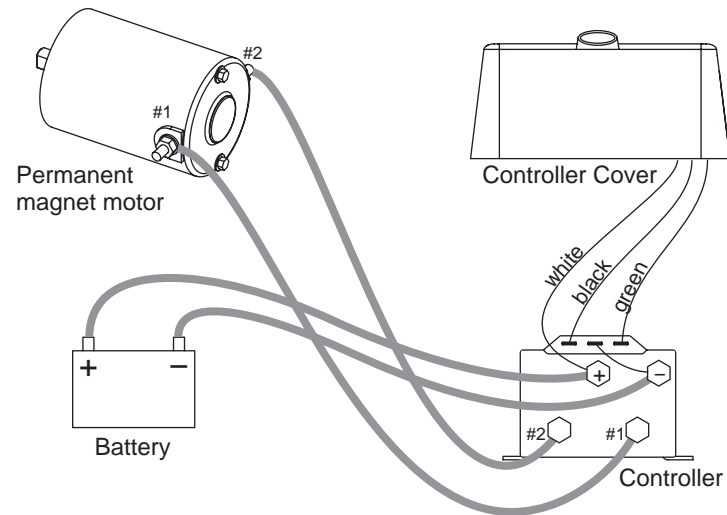
CHEMICAL AND FIRE HAZARD

Failure to observe these instructions could lead to severe injury or death.

- **Never** route electrical cables:
 - Across any sharp edges.
 - Through or near moving parts.
 - Near parts that become hot.



Connections for series wound DC motors (3 terminals)



Connections for permanent-magnet DC motors (2 terminals)

Hydraulic Winches: general information

NOTE: The hydraulic system diagram and component descriptions are provided for general reference. Consult a knowledgeable hydraulics representative for specific recommendations on component selection, interconnection, layout, and best practice.

The pressure rating of the winch motor is determined by (a) the maximum allowable pressure at the motor inlet port and (b) the maximum allowable pressure drop across the motor. Pressure drop is defined as the difference between the inlet pressure (P1) and the outlet pressure (P2) at the winch motor. Exceeding the maximum inlet pressure may damage the motor.

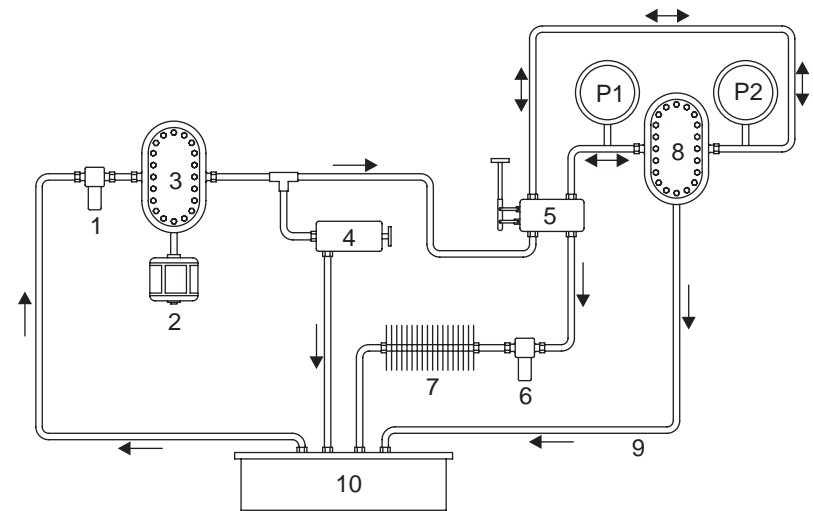
Exceeding the maximum pressure drop may cause failure of winch components.

WARNING

Failure to observe these instructions could lead to property damage, severe injury, or death

- **Never** exceed the maximum recommended hydraulic pressure or flow for any of the components used.
- **Always** use a tandem-center type control valve (A & B work ports blocked) to insure proper brake operation.
- **Always** make sure all hydraulic system components are functioning correctly.
- **Never** use a standard motor valve.

HYDRAULIC FLUID: The hydraulic fluid used with the winch must be an extreme pressure, anti-wear hydraulic oil with oxidation and corrosion inhibitors. It must contain a foam suppressant, and have a viscosity rating of 100-300 SSU at 15-45 °C.



Typical hydraulic system components

Typical hydraulic system components:

These descriptions apply to the numbered components on the previous page.

- 1 **STRAINER:** removes larger particles from the hydraulic fluid.
- 2 **POWER SOURCE:** provides input power to the hydraulic system. It must be rated to supply the required power. It can be a power take-off (PTO), belt drive from a combustion engine, a large electric motor, etc.
- 3 **HYDRAULIC PUMP:** converts the energy from the power source into hydraulic fluid power. It must be adequately rated to supply the system with enough power for proper performance. See the product data sheet for hydraulic specifications.
- 4 **PRESSURE RELIEF VALVE:** limits the system pressure to a safe level, one which will not exceed the maximum pressure rating of any of the components.
- 5 **THREE POSITION VALVE:** three-position tandem valve with a center-off configuration. In the off position, the pressure and tank ports (P and T) are interconnected, and the output ports (A and B) are blocked. The blocked ports prevent hydraulic motor rotation. This valve type is required for proper brake operation and to control power-in and power-out. The valve may be actuated manually or electrically. Ensure that the valve is rated for sufficient pressure and flow rate.
- 6 **FILTER:** removes the smaller particles and insoluble contaminants from the hydraulic fluid. Ensure that it is rated for an adequate flow rate. The recommended nominal filtration level is 10 microns or finer.
- 7 **HEAT EXCHANGER:** removes excess heat from the hydraulic fluid. This is an optional device required only if high temperatures are a problem due to small reservoir size, restricted hydraulic fluid flow, extended operating periods, etc.
- 8 **HYDRAULIC MOTOR:** supplies power to the winch. The recommended operating temperature range is 100°F to 150°F (38°C to 66°C). The maximum operating temperature range is -6°F to 180°F (-21°C to 82°C). **DO NOT EXCEED THE FLOW RATING OF THE HYDRAULIC MOTOR.** See the product data sheet for hydraulic specifications.
- 9 **MOTOR CASE DRAIN LINE:** only required when the back pressure on the outlet side of the motor exceeds 700 psi (50 bar). Check the pressure on the outlet side of the motor in both power in and power out valve positions.
- 10 **RESERVOIR:** container for storing the hydraulic fluid. It helps to moderate fluid temperature, holds solid contaminants, provides viscosity control in cold weather using a heating element, and contains baffles to reduce sloshing.

Installation Final Check

- Recheck mounting hardware for loose bolts, etc.
- Be sure all hydraulic system components and connections are correct
- Be sure all connections are tight and secure
- Check motor rotation: Winch should power in and rotate the direction indicated by the drum rotation label on top of the drum support. If winch rotates in opposite direction, recheck hydraulic or electrical connections.

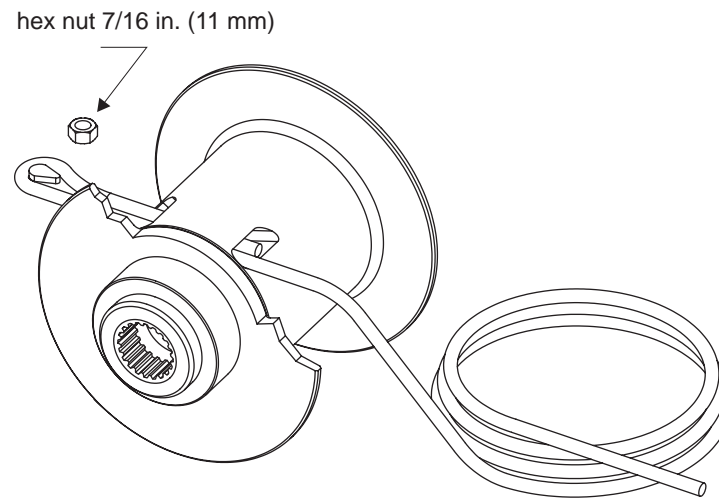
Installing the Wire Rope

- 1 Insert rope though slot in drum as shown.
- 2 Form a loop and reinsert end into slot. The "live" or load carrying portion of rope must be closest to drum flange.
- 3 Insert the wedge or hex nut (7/16 in.) supplied with the winch into loop and pull live end of rope to seat wedge or hex nut into slot. The end of the rope must remain visible in the slot as shown. The wedge locks the rope in the slot.
- 4 With end of rope securely installed, carefully wind rope evenly onto drum. Keep rope under tension at all times.
- 5 Always maintain a minimum of five (5) wraps of rope on the drum. Fewer wraps may cause the end of the rope to pull free of the drum and drop the load.

CAUTION

Failure to observe these instructions could lead to moderate injury and property damage.

- **Always** install rope in the direction specified on the drum rotation label, or brake will not function.
- **Always** use wire rope specified on the product data sheet.
- **Always** install rope according to the illustration below.



Anchoring wire rope on drum

Operating Instructions



WARNING

Failure to observe these instructions could lead to property damage, severe injury or death.

Always watch for hazards from the cable, drum pinch points, uncontrolled loads, and rope or rigging under tension.

Safe operating procedures

NEVER:

- **Never** place any part of your body or clothing near rotating or moving parts. Rotating drum with rope under tension can create a pinch point.
- **Never** handle ropes or operate winch without wearing eye protection and heavy gloves.
- **Never** stand close to winch when operating. If rope breaks it can fly back with tremendous force.
- **Never** lift, pull, or otherwise transport people with winch.
- **Never** lift, pull, support or otherwise transport loads over people.
- **Never** attempt to pull loads greater than rated capacity of the winch.
- **Never** pull a load until it jams and causes the drum and motor to stall.

Note: The two conditions above produce excess load on the winch. Excess loads may cause winch, rope or structural failure. Excess loads can create undetectable damage, which may cause the winch to fail even when pulling loads within its rated capacity.

- **Never** allow hydraulic system, electric motor or mechanical brake to overheat.

- **Never** touch rope or rigging while pulling a load, while anyone is at controls, or while operating winch.
- **Never** put rope around an object and hook it back on itself. This will damage the rope.
- **Never** use winch with less than five (5) wraps of rope around winch drum. The cable anchor is not designed to hold the rated load. The rope may pull free and release the load with fewer than five wraps of rope on the winch drum.
- **Never** let the rope slip through your hands.

ALWAYS:

- **Always** make sure the rope spools in the right direction. Winches are equipped with an automatic brake and will not function if the rope spools off the drum in the wrong direction. **NOTE:** The rope spooling direction will accidentally be reversed if rope is run all the way out and re-spoiled in with control switch in power out" direction.
- **Always** inspect and carefully rewind rope after each use. Cuts, kinks, or frayed areas reduce the tensile strength of rope. Replace rope if damaged.
- **Always** keep the remote control away from drum, rope, or rigging.
- **Always** inspect the remote control pendant and cable for damage before using winch.
- **Always** inspect hydraulic system or electrical connections before using winch.
- **Always** stand clear of the rope and load during winch operation.
- **Always** make sure that other winch operators understand the potential hazards and have been trained in proper use of the winch.
- **Always** make sure that the controller and winch assembly are installed, operated, adjusted, and serviced by qualified personnel familiar with its construction and operation.

Spooling Guidelines

Stretching wire rope

The life of a wire rope directly relates to its use and to the care it receives. A new wire rope must be "stretched" or spooled onto the drum under a load of at least 500 lb. (227 kg.). The objective of "stretching" is to produce tight even wraps on the inner and outer layers of the rope, thus preventing damage to the rope from binding and kinking.

To accomplish the stretching operation, follow the guidelines and safety precautions in the Basic Guide to Winching Techniques. Set up your vehicle and winch for a straight-line pull on flat ground. Spool out all but the last five wraps. Attach the rope to an anchor point or load. Operate the winch using the remote switch as you sit in the driver's seat keeping light pressure on the brake. Spool the final few feet of rope while gripping the hook with a hook strap.

Spooling out

Freespooling is generally the quickest and easiest way to spool out wire rope. Before freespooling, power out enough rope to remove any tension the rope may be under. Disengage the clutch. Now freespool by manually pulling out enough wire rope for the winching operation. Always leave at least 5 wraps on the drum.

Spooling in under load

Never exceed the rated line pull of the winch.

Power in the wire rope evenly and tightly on the drum. This prevents the outer wire wraps from drawing into the inner wraps, binding, and damaging the wire rope.

Avoid shock loads when spooling by using the control switch intermittently to take up wire rope slack. Shock loads can momentarily far exceed the winch and wire rope ratings.

Spooling in under no load

Assisted - Have your assistant hold the hook with the hook strap putting as much constant tension on the wire rope as possible. While keeping tension, the assistant should walk toward the winch while you operate the control switch. Release the switch when the hook is 8 ft. (2.4 m.) from the fairlead opening. Spool in the remainder for storage.

Unassisted - Arrange the wire rope to be spooled so it will not kink or tangle when spooled. Be sure any wire rope on the drum is tightly and evenly layered. Spool enough wire rope to complete the next full layer on the drum. Tighten and straighten the layer. Repeat the process until the hook is 8 ft. (2.4 m) from the fairlead opening. Spool in the remainder for storage.

Spooling remainder for storage

Secure the hook to a suitable anchor point near the winch. Carefully power in the remaining wire rope, jogging the control switch to take up the last of the slack. Be careful to not over tighten or damage may occur to the wire rope or anchor point.

Periodic Preventive Maintenance

- Keep winch free of dirt, oil, grease, water and other substances. Remove any overflow grease from bearings.
 - Check all mounting bolts and make sure they are tightened to proper torque. Replace any damaged fasteners.
 - Periodically check all connections to be sure they are tight and free of corrosion
 - Check rope for visible damage every time winch is operated. Examples of damage are: cuts, knots, mashed or frayed portions, and broken strands. Replace rope immediately if damaged. Failure to replace a damaged rope could result in breakage.
 - If winch drum continues to turn after controls are released, brake may need to be replaced.
 - Periodically clean and grease brake assembly. This will ensure proper performance and extend the life of the winch. If winch seems to labor or get excessively hot during the lowering of loads, the brake will need to be serviced or replaced.
 - Check motor brushes periodically and replace when necessary.
- NOTE:** only the motor bushes and brake assembly require periodic replacement

Preventive maintenance schedule

Maintenance activity	After first operation	Before each use	Semi-annually or after each 25 hours of operation
Check fasteners	X		X
Check electrical or hydraulic connections	X		X
Spool out and check rope		X	
Check motor brushes			X
Visual check of hoist and control	X	X	X

NOTE: Hydraulic system failures typically follow the same pattern: a gradual or sudden loss of pressure or flow resulting in a loss of motor power. Any one of the system components may be at fault. Refer to the table for general recommendations. If necessary, consult a knowledgeable hydraulics representative.

NOTE: See product data sheet for hydraulic specifications.

Trouble Shooting:

Note: These trouble shooting tips apply to both electrical and hydraulic winches except where notes.

WARNING

PERSONAL INJURY

Failure to observe these instructions could lead to severe injury or death.

Never use a relief valve that exceeds the hydraulic motor pressure rating. Use of this valve can overload the winch.

WARNING

PERSONAL INJURY

Failure to observe these instructions could lead to severe injury or death.

- Never lean over battery while making connections
- Always disconnect all wires from battery, before beginning work.
- Always disconnect negative terminal first and reconnect negative terminal last.
- Always remove jewelry and wear eye protection.

Problem	Possible cause	Corrective action
Winch does not hold load when stopped	Rope is wound backwards on drum.	Remove all rope and respool in the direction indicated by the drum rotation label.
	Load exceeds winch rating.	Refer to the product data sheet for the correct line pull rating for your winch.
	Brake is badly worn or broken	Replace brake. NOTE: Entire brake assembly must be replaced.
Difficulty unspooling rope	Bent flange on drum	Rotate drum and inspect for bent flanges. Bent drum must be removed and repaired.
	Worn drum bushings	Remove drum. Inspect bushings and replace if necessary.
	Clutch is damaged.	Remove and inspect clutch ring gear, clutch shaft, & gear housing for burrs and rub marks. Remove burrs with file or grinder. Replace parts if necessary.
	Rope is bound up on the drum.	Connect the winch to a load and alternately power-in and power-out. The rope will usually work itself free. USE EXTREME CAUTION
	Drum binds, because improper mounting causes the winch to twist.	Remount the winch following specifications and procedures in this manual. Be sure mounting surface is flat to within .020 inch. Use shims if necessary. Be sure all mounting bolts are tight.
	Ring gear does not rotate smoothly due to corrosion	Disassemble gear train. Inspect and clean sliding ring gear. Replace if necessary. Apply light oil to machined surfaces.
	Ring gear does not rotate smoothly due to grease contamination	Disassemble gear train. Clean all grease from machined surface of gear housing and ring gear. Apply light oil on machined surfaces.

Problem	Possible cause	Corrective action
Winch lacks power, pulls slowly, stalls or will not run at all.	Ground cable not connected correctly	Connect ground cable to threaded hole in motor housing and to negative pole of battery - NOT to the contactor.
	Cables incorrectly sized	Replace power leads and ground lead with larger sized cable (larger gauge wire).
	Loose connections on battery or motor terminals.	Be sure all connections are tight.
	Vehicle battery not fully charged.	Charge battery.
	Battery terminals are corroded.	Clean terminals.
	Battery is too small or defective.	Replace with conventional automotive battery - 650 cold cranking amps minimum.
	Contactor mounting plate is not adequately attached to winch motor or winch mounting plate	Attached contactor mounting plate to winch motor, winch motor plate or other locations grounded to same electrical source as winch.
	Short circuit in winch power supply or wiring.	Check all battery and motor cable leads for loose connections, worn or cracked insulation, fraying or bare spots. Replace cable if necessary.
	Remote control switch or cord is damaged or defective.	Use a multimeter to check remote control switch for continuity in both the IN and OUT position.
Hydraulic fluid pressure too low or flow rate too low	Check fluid level, filter, valves and other components. Consult a hydraulic specialist.	
Operation of the remote switch produces only a "clicking sound"	Faulty electrical grounding	Connect ground cable to motor housing and to negative pole of battery - NOT to the contactor. Mount contactor to winch motor, winch motor plate or other locations grounded to the DC power source.
	Faulty battery, battery cable or cable connections.	Inspect and replace as needed
	Electrical short in motor caused by water, improper installation, or lack of motor vent fitting.	Replace motor.
	Worn or damaged motor brushes	Replace motor brush assembly.

Problem	Possible cause	Corrective action
Electrical sparks appear around the motor adapter or screw heads.	See electrical problems already listed	See corresponding Corrective Action.
	Electrical ground is not sufficient. Ground wire was not installed, or the battery ground wires and wire terminals are corroded	Install a ground wire to the motor housing, and attach to the negative terminal of the battery.
Winch operates only in one direction.	Remote control switch is damaged	Use multimeter to check continuity of remote control switch and cable in all switch positions. Replace remote control pendent if necessary. Check all connections inside control pack. Check all pins in plug and receptacle to be sure that they are the same length.
	One of the contactors in the control pack is sticking or is damaged from prolonged use	Replace contactor.

Customer Support

Should you have any questions about this product or these instructions, please call WARN's customer service through the numbers below, Monday thru Friday between 7:00 AM and 4:00 PM Pacific Time for assistance. Or for e-mail support, visit our web site www.WARN.com and click on customer service section.

Note: Only qualified persons should undertake repair activities on WARN winches.

United States	International
Phone: 503-722-1200 or 800-543-9276 (US only)	Phone 503-722-3008
FAX: 503-722-3000	FAX: 503-722-3005

Warranty

WARN® Commercial Products Limited One (1) Year Warranty Statement

Warn Industries, Inc. (WARN) warrants to the original purchaser that the mechanical components and electrical components of the "WARN" Products specified below will be free of defects in material and workmanship for a period of one (1) year from the original date of purchase. This Warranty applies only to the original purchaser of the Products. To obtain any warranty service, you must provide WARN with proof of purchase and date of purchase acceptable to WARN, such as a copy of your purchase receipt. This warranty does not cover the removal or reinstallation of the Product. WARN will, at its option, repair, replace or refund the purchase price of a defective Product or component, provided you return the defective Product or component during the warranty period, transportation charges prepaid, to Warn Industries Service Department or a Factory Authorized Service Center. Attach your name, address, telephone number, a description of the problem, and a copy of your receipt and original bill of sale bearing the WARN serial number of the defective Product and date of purchase.

This warranty does not apply (i) to parts or components excluded below, or (ii) if the Product has been damaged by accident, abuse, misuse, collision, overloading, modification, misapplication, improper installation, or improper service. This warranty is void if any WARN serial number has been removed or defaced.

THE WARRANTY SET FORTH ABOVE IS THE ONLY WARRANTY. THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

ANY IMPLIED WARRANTY WHICH BY LAW MAY NOT BE EXCLUDED IS LIMITED IN DURATION TO ONE (1) YEAR FROM THE DATE OF ORIGINAL RETAIL PURCHASE OF THE PRODUCT.

WARN SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, DOWN TIME OR LOSS OF USE) UNDER ANY LEGAL THEORY, EVEN IF WARN WAS ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some states do not allow the exclusion of implied warranties or the exclusion or limitation of liability for incidental or consequential damages, or 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. You may also have other rights that vary from state to state.

WARN reserves the right to change Product design without notice. In situations in which WARN has changed a Product design, WARN shall have no obligation to upgrade or otherwise modify previously manufactured Products.

No WARN dealer, agent or employee is authorized to make any modification, extension or addition to this warranty.

Warranty inquires and Products returned for warranty service should be sent to:

WARN INDUSTRIES, INC.
 Customer Service Department
 12900 SE Capps Road
 Clackamas, OR 97015
 1-800-543-WARN (1-800-543-9276)

Products covered by this warranty

Commercial winch products
 Commercial hoist products
 Commercial accessory products

Products not covered by this warranty

Finish and wire rope for commercial winches
 Finish and wire rope for commercial hoist products
 Finish and wire rope

Erklärung über die begrenzte Garantie für 1 Jahr für kommerzielle Produkte von WARN®

Warn Industries, Inc. (WARN) garantiert dem Erstkäufer, dass die mechanischen und elektrischen Komponenten des im Folgenden näher bezeichneten „WARN“-Produkts für die Frist eines (1) Jahres ab Datum des Erstkaufs frei von Material- und Herstellungsfehlern sind. Diese Garantie gilt ausschließlich für den Erstkäufer der Produkte. Für den Erhalt von Serviceleistungen im Rahmen dieser Garantie muss WARN ein Nachweis des Kaufs und Kaufdatums (z.B. Beispiel eine Kopie der Quittung) vorgelegt werden, der von WARN akzeptiert wird. Diese Garantie deckt weder den Aus- noch den Einbau des Produkts. WARN wird das defekte Produkt nach eigenem Ermessen reparieren oder ersetzen bzw. den Kaufpreis des defekten Produkts bzw. der defekten Komponente rückerstatten, wenn das defekte Produkt bzw. die defekte Komponente innerhalb der Garantiefrist mit freigemachter Sendung an die Kundendienstabteilung von Warn Industries bzw. an ein von WARN zugelassenes Kundendienstzentrum eingeschickt wird. Der Sendung müssen Name, Anschrift und Telefonnummer des Käufers sowie eine Beschreibung des Problems und eine Kopie des Belegs und der Original-Kaufquittung (mit WARN-Seriennummer des defekten Produkts und Kaufdatum) beiliegen.

Diese Garantie erstreckt sich nicht auf (i) Teile oder Komponenten, die im Folgenden ausgeschlossen sind, oder (ii) ist ungültig, wenn das Produkt durch Unfall, Missbrauch, falschen Gebrauch, Kollision, Überladung, Modifikation, falsche Anwendung, falschen Einbau oder unsachgemäße Wartung beschädigt wurde. Diese Garantie ist nichtig, wenn die WARN-Seriennummer entfernt oder unkenntlich gemacht wurde.

DIE BESCHRIEBENE GARANTIE IST DIE EINZIGE GARANTIE. ES GELTEN KEINE ANDEREN GARANTIEEN, WEDER AUSDRÜCKLICH NOCH STILLSCHWEIGEND, EINSCHLIESSLICH, JEDOCH NICHT AUSSCHLIESSLICH, STILLSCHWEIGENDER GARANTIEEN DER MARKTGÄNGIGKEIT ODER DER EIGNUNG FÜR EINEN BESTIMMTEN ZWECK.

ALLE STILLSCHWEIGENDEN GARANTIEEN, DIE VON GESETZ WEGEN NICHT AUSGESCHLOSSEN WERDEN DÜRFEN, SIND AUF DIE FRIST VON EINEM (1) JAHR AB DATUM DES ERSTKAUFS DES PRODUKTS BESCHRÄNKT.

WARN HAFTET UNTER KEINEN RECHTSMUMSTÄNDEN FÜR BESONDERE, INDIREKTE, ZUFÄLLIGE ODER FOLGESCHÄDEN (EINSCHLIESSLICH, JEDOCH NICHT AUSSCHLIESSLICH, ENTGANGENER GEWINNE, AUSFALLZEITEN ODER NUTZUNGS-AUSFÄLLE). DIESE HAFTUNG ERFOLGT AUCH DANN NICHT, WENN WARN VON DER MÖGLICHKEIT SOLCHER SCHÄDEN UNTERRICHTET WURDE.

In manchen Ländern ist der Ausschluss stillschweigender Garantien bzw. der Ausschluss oder die Beschränkung der Haftung für zufällige oder Folgeschäden bzw. Beschränkungen der Dauer einer solchen stillschweigenden Haftung gesetzlich nicht zulässig, so dass die oben beschriebene Beschränkung bzw. der entsprechende Ausschluss auf den Käufer u.U. nicht zutrifft. Der Käufer hat im Rahmen dieser Garantie spezifische Rechte. Er kann je nach Land weitere Rechte haben.

WARN behält sich das Recht vor, Änderungen am Produktdesign ohne vorherige Mitteilung vorzunehmen. In Fällen, in denen WARN das Design eines Produkts geändert hat, ist WARN nicht verpflichtet, früher hergestellte Produkte aufzurüsten oder anderweitig zu modifizieren.

WARN-Händler, -Vertreter und -Mitarbeiter sind nicht befugt, diese Garantie auf irgendeine Weise zu ändern, zu erweitern oder auszudehnen.

Fragen zur Garantie und zur Reparatur eingeschickter Produkte sollten per Post an die folgende Anschrift eingereicht werden:

WARN INDUSTRIES, INC.
Customer Service Department
12900 SE Capps Road
Clackamas, OR 97015, USA
+1 800-543-9276

Von dieser Garantie abgedeckte Produkte

Kommerzielle Windenergieprodukte
Kommerzielle Hebevorrichtungen
Kommerzielles Zubehör

Von dieser Garantie nicht abgedeckte Produkte

Lackierungen und Drahtseile für kommerzielle Windenergie
Lackierungen und Drahtseile für kommerzielle Hebevorrichtungen
Lackierungen und Drahtseile