



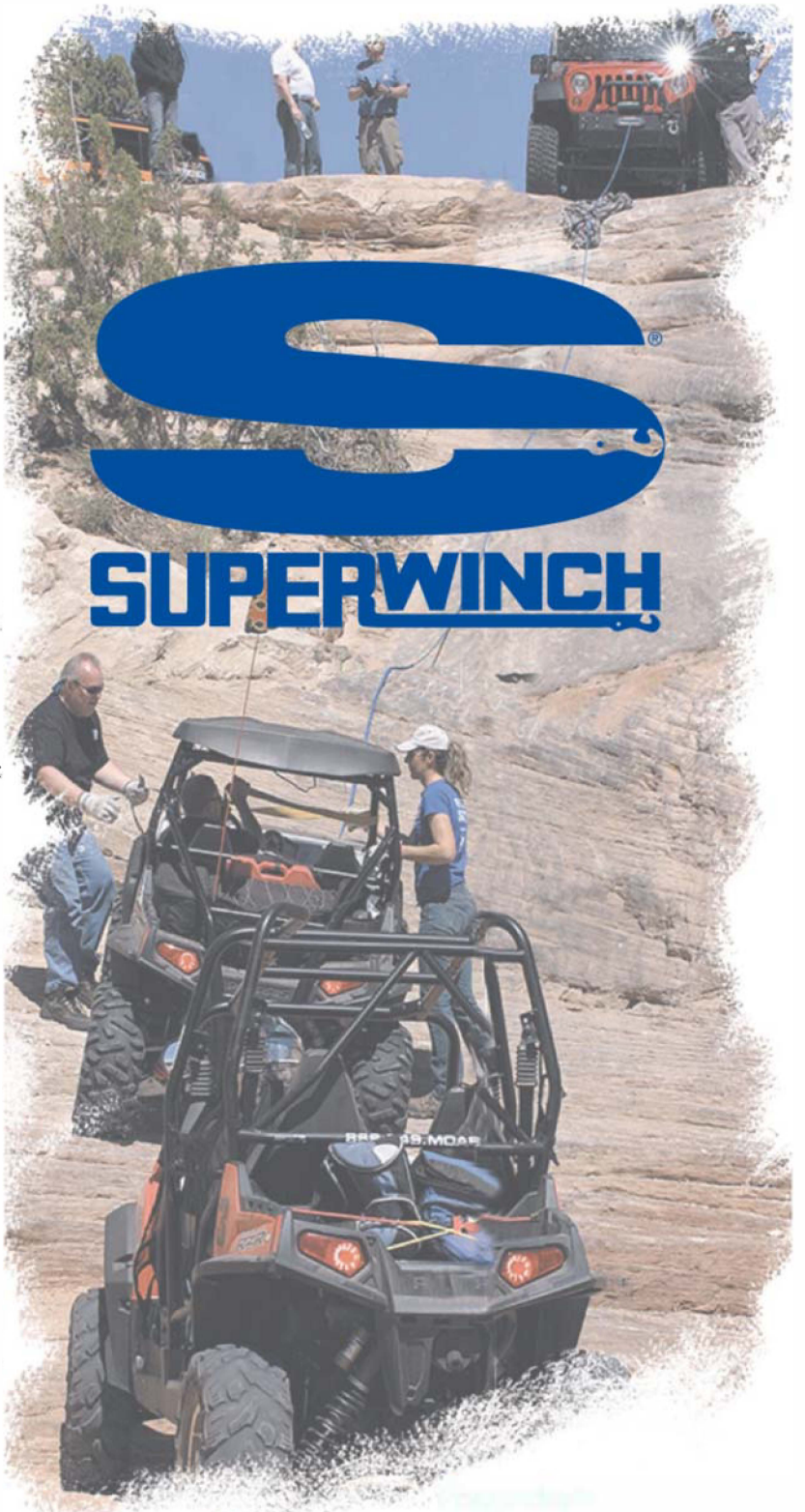
ELECTRIC WINCH USER'S GUIDE

"Introduction to winching"



Utility
& Multi

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S
SUPERWINCH

1. SAFETY

Every winching situation has the potential for serious personal injury. To minimize that risk, read this User's Guide carefully. Familiarize yourself with the operation of your winch before using it. Your constant focus on good judgment and winch safety are of great importance. This section of your User's Guide contains, in one place, the safety icons, warnings and cautions contained throughout this User's Guide. Please read it carefully and refer to it often. The winch contains moving parts and sharp edges which can result in cuts, burns, lacerations and/or amputations.

A. Symbols





B. Icons

C. Dangers

D. Warnings

E. Cautions & Notices

A. Symbols:

1.  Indicates an imminently hazardous situation, which if not avoided, will result in death or serious injury.
2.  Indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.
3.  Indicates a potentially hazardous situation or unsafe practice, which if not avoided, could result in injury.
4.  Indicates an unsafe practice, which if not avoided, could result in property damage.

B. Icons:

The following icons are used throughout this Users Guide as visual reminders to avoid potentially hazardous situations.



1. Read Owners Manual



2. Electric Shock Hazard



3. Fire and Burn Hazard



4. Hot Surface Hazard



5. Moving Parts Hazard



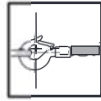
6. Sharp Edge Hazard



7. Always Use a Handsaver Strap



8. Always Keep Clear of Winch, Rope and Load



9. Always Properly Seat Load in Throat of Hook.



10. Always Use a Shackle or Strap When Attaching the Hook to an Anchor Point



11. Always Wear Personal Protection Gear.



12. Always Wear Heavy Protective Gloves.



13. Never Apply Load to Hook Tip or Latch.



14. Never Attach the Hook Back Onto the Rope.



15. Never Put Your Fingers Into the Hook.



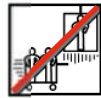
16. Never Touch the Rope When in Tension or Under Load



17. Never Use a Winch as a Hoist.



18. Never Use a Winch to Secure a Load in Place



19. Never Use a Winch to Lift or Move People



20. Never Wind Rope Over Top of Drum



21. Risk of Explosion



Every winching situation is different and incorporates safety challenges. Risks commonly associated with winching include those listed in the following tables:

C. Dangers:

⚠ DANGER



1. Vehicle batteries contain gasses that are flammable and can explode violently.
Always wear eye protection.
Always remove all jewelry.
Always keep spectators away.
Always follow wiring diagrams.
Always disconnect winch from power source when working on the winch.
Never install winch or electrical connections while vehicle is running.
Never lean over the battery while making connections.

⚠ DANGER



2. Improper wiring can result in fire or electrical shock.
Always follow wiring diagrams.
Always remove all jewelry.
Always inspect the switch and wiring for cracks, pinched spots, and frayed or loose connections. Damaged components must be replaced before operation.
Always insulate and protect all exposed wiring and electrical terminals.
Always place supplied terminal boots on wires and terminals as directed by installation instructions.
Never connect DC Powered winches to AC current.
Never route electrical cables across sharp edges; near parts that get hot, nor through or around moving parts.
Never operate an AC winch outdoors or in a corrosive or explosive environment.
Never operate an DC winch in an explosive environment.

⚠ DANGER



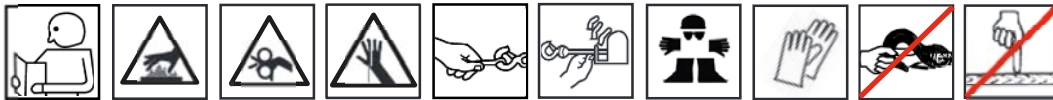
3. Improper use or overloading of the winch can result in a release of load or rope failure.
Before winching a load, be sure the freespool is fully in the engaged position.
Always apply load to the throat (center) of the hook.
Always be certain anchor will withstand load.
Always ensure hook latch is closed and not supporting load.
Always operate the winch with an unobstructed view of the winching operation.
Always seat load in throat of hook.
Always take your time when rigging and include a reasonable factor for safety.
Always use a hook with a latch.
Never apply load to hook tip or latch.
Never disengage the freespool while winch is under load.

C. 3 continued

- Always mount winch so that rope feeds through fairlead on front of winch parallel to the mounting surface and does not rub across housing or base.
- Always use tackle, hooks, pulley blocks, straps, etc. rated in excess of the load capability of the winch.
- Never exceed the winch rated capacity.
- Never hook the rope back onto itself, use a sling or strap to secure to anchor point.
- Never mount the winch inverted (base upward) or put the winch mounting hardware in a direct tension condition.
- Never allow a child to operate a winch.
- Never operate a winch while under the influence of alcohol, drugs or medicine.
- Never operate a winch with less than 5 turns of wire rope around the winch drum.
- Never operate a winch with less than 8 turns of synthetic rope around the winch drum.
- Never use a winch to secure a load in place. Secure load and detach hook from load when transporting the load.
- Never weld or machine any part of the winch.
- Never mount winch in overhead hoisting position or use for overhead hoisting
- Never wind rope over top of drum.
- Never use to raise, suspend, lower or secure horizontally hinged doors or ramps without additional counter balance springs, centrifugal locking devices, or other secondary means of supporting the moving ramp or door.
- Never use a winch to lift or move people.

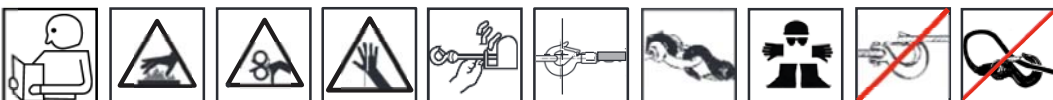
D. Warnings:

⚠ WARNING



1. The winch contains moving parts and sharp edges which can result in cuts, burns, lacerations amputations.
Always keep helpers and spectators at a safe distance.
Always keep clear of rope and load while winching.
Always wear heavy protective gloves.
Always use a hand saver.
Never let the rope slip through your hands, even with gloves on.
Never put your fingers into the hook.
Never touch the rope or hook while they are in tension, under load, or when someone else is at the control switch.
Never obscure warning and instruction labels.

⚠ WARNING



2. The snap back of a broken wire rope can cause serious injury; sharp edges and abrasions significantly shorten rope life.
Always immediately replace any hook that is visibly damaged. Visible damage includes widened throat opening, bent or twisted tip, bent or twisted latch.
Always immediately replace any rope that is visibly damaged. Visible damage includes cut strands, fused or melted fibers, inconsistent stiffness, chemical contamination, flat areas or lumps not eliminated by flexing the rope.

D. 2 continued

Always inspect entire length of rope, protective sleeve and hook before each use.

Always keep helpers and spectators at safe distance.

Always pass remote lead through window when used in vehicle.

Always raise the hood to protect the windshield.

Always stand clear of rope and load while winching.

Always use a rope dampener over the wire rope near the hook end.

Never expose the rope to heat sources or chemicals.

Never knot or tie the rope to secure a load or repair a broken rope.

Never pull the rope around non-rotating sheaves or rollers.

Never pull the rope over rough surfaces or sharp edges.

Never allow rope to tangle or jam while winching. Rope could break before winch stalls.

Never subject rope, tackle or winch to shock loads.

E. Cautions and Notices:

⚠ CAUTION



Proper winching techniques will extend product life and avoid injuries.

Always use factory approved switches, controls, accessories and components.

Always assure that the equipment such as tackle, hooks, pulley blocks, straps, etc. are properly sized and rated.

Always inspect equipment for wear or damage prior to use: immediately replace worn or damaged equipment.

Always store the remote control in a protected, clean dry area.

Always use care to not damage the vehicle frame when anchoring to a vehicle for winching operation.

Use a pulley block to avoid winching at sharp angles.

Always apply load in the throat of the hook.

Always use a shackle or strap when attaching the hook to an anchor point.

Always wear personal protection gear.

Never apply load to hook tip or latch.

Never attach the hook back onto the rope.

Never put your finger into the hook.

NOTICE



Never submerge a winch in water.



2. INTRODUCTION

This guide is intended to be a General Purpose document to introduce customers to proper electric winch use, technique, and safety. It is not intended to be an all-inclusive training exercise that will alert you to every type of winching scenario that will come up on the trail. Proper safety precautions and equipment, good technique, practice, and common sense are all required. You should be observant and alert at all times, considerate of others, and protective of the environment.

The responsibility for safe operation and understanding of winching ultimately rests with you, the operator. Read and understand all safety precautions and operating instructions before installing and operating your winch. Careless winch operation can result in serious injury and/or property damage.

Superwinch® publishes numerous documents to assist in installation, operation, troubleshooting, and winching safety, which can be downloaded from; www.superwinch.com or obtained by contacting the company directly. Correct installation of your winch is a requirement for proper operation. For technical data on your specific winch, and complete installation instructions, please see the technical and installation manual provided with your winch.

The following symbols are used throughout this User's Guide to bring attention to potentially hazardous situations:

⚠ DANGER Indicates an imminently hazardous situation, which if not avoided, will result in death or serious injury.

⚠ WARNING Indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.

⚠ CAUTION Indicates a potentially hazardous situation or unsafe practice, which if not avoided, could result in injury.

NOTICE Indicates an unsafe practice, which if not avoided, could result in property damage.

A. Application Information

A winch is designed to move a load at ground level or up an incline. It is neither designed nor intended for hoisting. A winch is not to be used to lift or move people.

A winch is for intermittent use due to heat buildup characteristics of various components, a winch is not intended to pull for long durations at or near its rated capacity.

Like an electric hand drill, if the winch is slowing down it is working harder. During operation, if the winch motor becomes hot, allow the winch motor to cool before continuing to winch.

If the winch stalls (stops pulling) DO NOT continue to apply power to the winch. This can damage your winch and your electrical system. Re-evaluate the rigging, and double-line if possible.

⚠ DANGER



- Always keep clear of winch, rope and load.
- Always wear personal protective gear.
- Always wear heavy protective gloves.
- Always properly seat load in throat of hook.
- Never use a winch to lift or move people.
- Never allow a child to operate a winch.
- Never operate a winch under the influence of alcohol or medication.

⚠ WARNING



- Never obscure warning and instruction labels.
- Read Owners Manual.

⚠ DANGER



- Never use a winch as a hoist.
- Never use a winch to lift move people.
- Never use to raise, suspend, lower or horizontally hinged doors or ramps without additional counter balance springs centrifugal locking devices, or other secondary means of supporting the moving ramp door.

⚠ WARNING



- Hot surface hazard

B. Winch Construction

1. Brake

The purpose of a winch is to pull a load out of an undesired position and therefore the presence of a brake is not essential to a winch fulfilling its purpose. It is possible to have a winch that does not contain a braking mechanism. If a winch is equipped with a brake, the brake is intended to minimize either coast or drift.

A single braking mechanism may not address both coast and drift and therefore some winches will have two (2) braking mechanisms. Winches with a single braking mechanism will have either a dynamic brake or a mechanical brake. Some winches may have both a dynamic and a mechanical brake. The actuation of a brake in a winch, dynamic or mechanical, is automatic and occurs when you let off the control switch.

Coast refers to the take in or pay out of additional rope after you have let off the control switch. Coast is similar to the “slowing down” of a power drill or a circular saw. Drift refers to the effect of gravity on the load after you have let off the control switch. This often takes the form of the load “moving backward” during a pause in winch operation.

A dynamic brake is braking provided by the winch motor. The dynamic brake applies a force from the motor that is intended to stop the momentum of the motor. The purpose of the dynamic brake is to limit coast. A dynamic brake is not designed to limit drift. Even with a dynamic brake, winches may coast. More experience with your winch will help you anticipate coast and learn to use the winch safely.

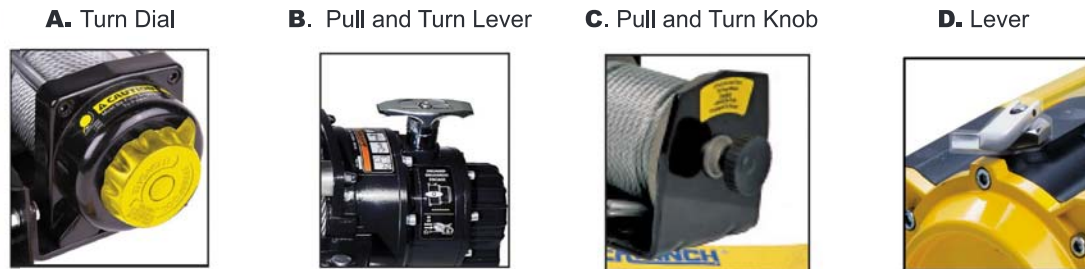
A mechanical brake can be a disc brake or a drum brake like in your car or pickup, or a different type of friction pad or spring-applied brake. The mechanical brake works by applying a force to the winch drum or gearing and is intended to limit drift. The capacity of the mechanical brake varies and may be less than the capacity of your winch. Even with a mechanical brake, winches may drift. A winch is not intended to and never should be used to hold a load in place. More experience with your winch will help you anticipate drift and learn to use the winch safely.

The brake on a winch is a wear item. Coast or drift beyond what is customary is an indication of brake wear. When replacing your brake or motor, be sure to use only Superwinch® recommended replacement parts. Section 7, Winch Storage and Maintenance, of this Users Guide provides tips on how to recognize winch wear and extend the life of your winch. The Technical Installation Manual that accompanies this User’s Guide provides details as to the installation, specifications and replacement part numbers for your winch.



2. Freespool

Many winches are equipped with a freespool mechanism. A control lever/knob on the winch is pulled and/or turned, to disengage the winch drum from the winch gearbox. This disengagement allows the hook and rope to be pulled out by hand. Winches that do not come equipped with a freespool mechanism require the user to power out to spool enough rope to reach the anchor point. Common Freespool mechanisms shown below include:



The Technical Installation Manual that accompanies this Users Guide provides information concerning operation of the freespool mechanism, if present in your winch.

3. Gearing

Winches use a series of gears to transfer the power from the motor to the drum. This power is used to rotate the drum resulting in the spooling out or spooling in of the rope. Winches may use multiple stage planetary gear sets, a single stage planetary gear set, or a worm gear set.

In a planetary gear winch, there can be a single planetary gear set, or often 2, 3, or even 4 “stages” of planetary gear sets all grouped together. A “stage” is a single collection of sun gear, planet gears, and a ring gear. One stage will feed the sun gear of the next stage, and the overall gear ratio will be a collection of all the stages working together. This is a common way to have a large gear ratio (a high number) in a small physical size.

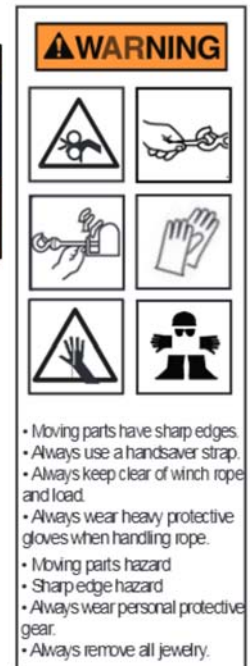
In a Worm Gear winch, there is often only the single two-piece worm gear set “worm and worm-wheel” assembly; however it can be paired with other gearing such as simple spur gears. Figure 1. shows examples of a worm gear set, a planetary gear set and a spur gear set.

Figure 1.



Gear arrangements are generally described by the gear ratio and the number and/or style of the gears used. The gear ratio is a measure of the number of motor rotations required to have the drum rotate one time. For example, in a winch with a gear ratio of 148 to 1 (written 148:1) the winch motor will rotate 148 times to rotate the winch drum 1 time.

The Technical Installation Manual that accompanies this User’s Guide provides details as the gearing type and specifications of your winch.



4. Motor

Electrical winches are powered with an electrical motor requiring either a DC (direct current) or AC (alternating current) power source. The power source for DC motors is usually the battery of the vehicle to which the winch is mounted. AC motors are designed to be plugged into an indoor electrical receptacle; or hard-wired into an indoor electrical panel.

The Standard vehicle battery in North America is 12 Volts, and can provide up to 500 amps or more to power your winch. In Europe, 12V batteries are common in passenger cars, while 24V batteries are common in larger trucks and specialty vehicles.

The two most common DC winch motors are Permanent Magnet motors and Series Wound motors. In a Permanent Magnet motor, the magnetic force that creates the ζ eld for the armature is created by actual Permanent Magnets mounted inside the motor, around the armature. In a Series Wound motor, the magnetic force that creates the ζ eld for the armature is created by windings of wire mounted inside the motor. When the electric current flows through the windings, a magnetic ζ eld is created. It is important that the power source used with your motor is consistent with the requirements of the motor.

Motors are not designed to last indefinitely. However, proper use of your winch can greatly extend the life of the motor. Section 7 of this Users Guide provides helpful hints for the proper maintenance of your winch, including the winch motor.

The Technical Installation Manual that accompanies this User's Guide provides details as to the motor utilized by your winch and its power source requirements.

5. Solenoid/Electrical

Electrical Control:

DC winches may have a solenoid, heavy duty relay, or a direct switch to control the power going to the winch motor. Each of these devices is basically a high-current switch that is wired between the vehicle battery and the winch motor, which allows the winch to be controlled Power-in and Power-out.

If a direct switch is used, it may be mounted to the winch or it may be a handheld switch. If a solenoid or heavy duty relay is used, it is controlled by the winch operator with a smaller low-current hand-held switch that is plugged into the winch, or mounted on a handlebar such as on an ATV. The solenoid or heavy duty relay is often mounted inside the winch housing, or mounted remotely near the winch on the vehicle frame. The solenoid, heavy duty relay, and switch are wear items in a winch, and how you control the winch can have an impact on component life.

⚠ DANGER



- Read owners manual.
- Always disconnect winch from power source when working on the winch.
- Always wear eye protection.
- Never connect DC power winches to AC current.
- Never operate an AC winch outdoors or in a corrosive or explosive environment.
- Never operate a DC winch in an explosive environment.

⚠ WARNING




- Read owners manual
- Always inspect the switch and wiring for cracks, pinched spots, and frayed or loose connections. Damaged components must be replaced before operation.
- Always insulate and protect all exposed wiring and electrical terminals.
- Always place supplied terminal boots on wires and terminals as directed by installation instructions.
- Always follow wiring diagrams.
- Always store the remote control in a protected clean dry area.
- Never route electrical cables across sharp edges; near parts that get hot, nor through or around moving parts.

⚠ CAUTION

- Always use factory approved switches, controls, sensors and component.

NOTICE



- Read Owners Manual.

5. continued

- Never “quick-reverse” the winch (meaning, do not power the winch in the opposite direction when the winch motor is still rotating in one direction).
- Never “Jog” the winch quickly (meaning, pulse the winch in or out rapidly, in bursts of power).
- Always allow the winch to come to a stop after releasing the control switch, before powering in the opposite direction.
- If the winch stalls (meaning, stops pulling) DO NOT continue to apply power to the winch. This can damage your winch and your electrical system.
- Avoid long-duration pulls at high winch loads. Allow the winch to rest, or reduce the winch load by modifying your rigging.

CAUTION



- Reads owners manual.
- Always inspect equipment for wear or damage prior to use; immediately replace worn or damaged equipment.
- Always use factory approved switches, controls, sensors and components.

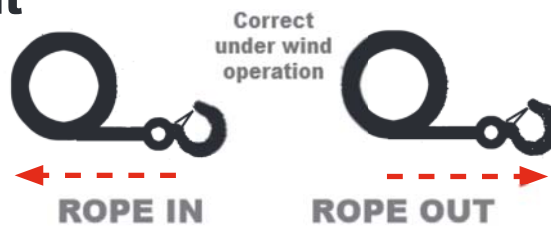
The section of this guide titled “WINCH OPERATION” will provide you with additional guidelines that will help extend the life of your winch.

When replacing your solenoid, heavy duty relay or a direct switch be sure to use only Superwinch® recommended replacement parts. Section 7. Winch Storage and Maintenance of the Users Guide provides tips on how to recognize winch wear and extend the life of your winch.

3. WINCH INSTALLATION

A. Rope in and Rope out

Your winch is designed to: ROPE IN and ROPE OUT in one direction. DO NOT attempt to reverse the orientation of the winch.



Winches are generally designed to be operated from an under wound rope orientation; however, in rare cases a winch may be operated from an over wound orientation. The under wound or over wound orientation refers to the direction the rope spools off the drum (from the bottom = under wound, from the top = over wound). Figure 2., provides illustration of an under wound and over wound winch orientation. Remember, whether operated from an under wound or over wound orientation, the rope must always spool onto the drum as indicated in the Technical Installation Manual or on the drum rotation decal.

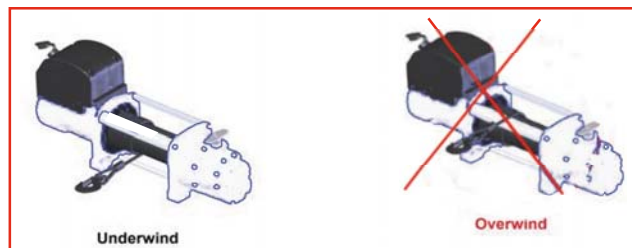


Figure 2.

DANGER

- Read owners manual.
- Never wind rope over top of drum
- Moving parts hazard
- Always wear heavy protective gloves.
- Never obscure warning and instruction labels
- Never install winch or electrical connections while vehicle is running
- Never lean over battery while making connections.

Only the mounting orientations shown in the Technical Installation Manual are possible for safe winching operation.

B. Mounting the Winch

The mounting position of a winch refers to the position of the mounting holes relative to the winch drum. Winches can generally be mounted in two basic positions, foot down and foot forward. In a foot down position, the mounting threads are underneath the winch drum. In a foot forward position, the mounting threads are in front of the drum. The most common mounting position is foot down with an under wound rope orientation. A winch should never be mounted foot backward or foot up (vertical). The mounting positions discussed above are illustrated in, Figure 3.

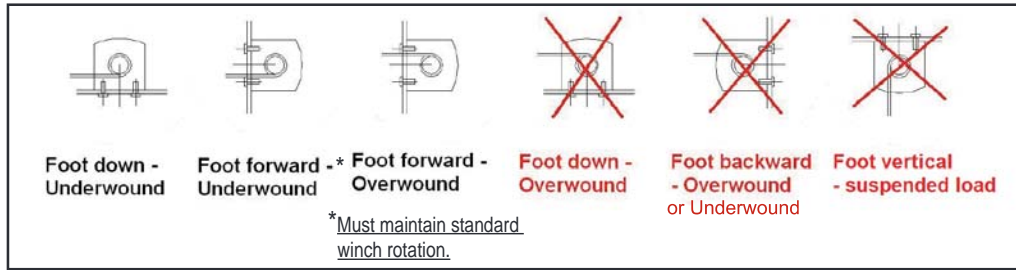


Figure 3.

Mount the winch to a firm base. Be sure that your structural support is strong enough to support the rated pulling forces of the winch. Always use supplied or recommended mounting hardware. The use of recommended bolt and lock washer combinations will minimize vibration during operation.

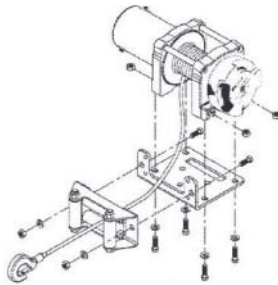
For trailer winching applications, choose an installation site accessible to you. Mount the winch close enough to the trailer's front to pull the vehicle completely on. If it is mounted under something, such a toolbox leave enough space to access the winch.

The, Technical Installation Manual that accompanies this Users Guide provides mounting information for your specific winch.

WARNING

- Moving parts hazard.
- Always wear personal protective gear.
- Always wear heavy protective gloves.
- Always mount the winch so that the rope feeds through the fairlead at the front of the winch parallel to the mounting surface and does not rub across the housing or base.
- Always be certain anchor will withstand load.
- Never mount winch in an overhead hoisting position or use for overhead hoisting.
- Never use to raise, suspend, lower or secure horizontally hinged doors or ramps without additional counter balance springs, centrifugal locking devices, or other secondary means of supporting the moving ramp or door.
- Never weld or machine any parts of the winch.



4. WINCH CABLE / ROPE

The winch rope is an important load bearing part of the winch. The rope that comes with your winch is specifically selected to accommodate the load rating and drum of the winch. In selecting the rope three (3) primary variables were considered: rope strength, rope length and the rope diameter.

The rope strength is obviously critical as the rope must be stronger than the maximum rated load of the winch. The strength of the rope is influenced by the material it is made from, the production processes used in combining the rope strands and the diameter of the rope.

When choosing a rope length, the expected distance between the load being pulled and the winch is a primary consideration. The flexibility provided by longer rope needs to be balanced with the fact that the winch pull strength is optimized on the first layer of rope around the drum. As a result, shorter rope generally provides a more efficient pull.

In addition to the consideration of rope strength and pulling distance, the rope storage capacity of the winch is limited by the drum length and drum flange height. Hence, as the rope diameter becomes larger, the rope length must be reduced. It is important that the fully spooled rope never protrude to the top of the drum flange. This could result in the rope “hopping” off the drum and damaging the winch or rope.

Rope is a wear item. A worn rope under load can result in a broken rope and a fatal accident. Rope should be inspected before each use and regularly between each use. Mashed, pinched, frayed or kinked areas severely reduce the load-carrying capability and should be replaced immediately.

When replacing your rope, please be sure to use only Superwinch® recommended replacement parts. Section 7, Winch Storage and Maintenance, of this Users Guide provides tips on how to recognize winch wear and extend the life of your winch. The Technical Installation Manual that accompanies this User’s Guide provides details as to the installation, specifications and replacement part numbers of your winch rope.

A. Wire Rope

If your winch has a wire rope, the rope is likely already spooled onto the drum. Although already spooled, you will need to re-spool the rope to assure safe winch use. The wire rope on a new winch, and any replacement ropes, should be re-spooled under a minimum of 100 lbs (45.3 kg) load before using the winch. Failure to do this will result in rope damage.

To re-spool the rope:

1. Payout the rope until there is only five (5) wraps of rope around the drum.
2. Attach the hook to a load of 100 lbs (45.3 kg) or more.
3. Activate the winch by holding the switch in the ROPE IN position and paying in several feet of rope.
4. Be sure the rope is distributed evenly and tightly on the drum.
5. Repeat the process.

⚠ WARNING




- Read Owners Manual.
- Always assure that the equipment such as tackle, hooks, pulley blocks, straps, ect. are properly sized and rated.
- Always inspect equipment for wear or damage prior to use: immediately replace worn or damaged equipment.
- Always use care to not damage the vehicle frame when anchoring to a vehicle for winching.
- Always wear heavy protective gloves if handling rope.
- Always use factory approved switch, controls, accessories and components.
- Always inspect entire length of rope, protective sleeve and hook before each use.










- Moving parts hazard.
- Sharp edge hazard.
- Always use a handsaver strap.
- Always keep clear of winch, rope and load while winching.
- Always wear heavy protective gloves.
- Never allow a child to operate a winch.
- Ne laissez jamais la corde glisser entre les mains, même en portant des gants.

From time to time, it may be necessary to respool the rope under no load after use. To do this, hold the remote switch (if equipped) in one hand and the rope in the other. Start from as far from the vehicle as possible, activate the winch and walk in several feet of rope while applying tension to the rope then release the switch. Repeat the process until the rope is fully spooled on the drum. Always release the switch before your hand comes within four feet from the fairlead or rope drum (the physical opening through which the rope passes). Be sure the rope is distributed evenly and tightly on the drum. A loosely wound drum allows the rope to work its way down into the lower layers of rope on the drum and become wedged.

Rope is a wear item and will eventually need to be replaced. A worn rope under load can result in a broken rope and a fatal accident. Rope should be inspected before each use and regularly between each use.

Mashed, pinched, frayed or kinked areas severely reduce the load-carrying capability and should be replaced immediately.

There are several common methods of attaching wire rope to the rope drum depending on winch model. Wire rope may be installed through a hole in the drum, coming from underneath the drum with a set screw or plug to anchor the end of the wire rope; for wire ropes with a stop sleeve, pass the sleeve through the hole, Figure 4.

Insert through the hole and fasten with set screw or plug



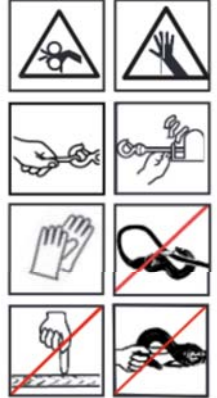
Figure 4.

After the wire rope is inserted through the hole, securely install/tighten plug or setscrew, Figure 4. Another attachment means is a wire rope end lug and screw in the drum. The screw should be tightened securely. The Technical Installation Manual that accompanies this Users Guide provides detailed technical information for your specific winch.

In all cases, the plug or set screw is not intended to and WILL NOT hold the rope on the drum under load. Rather, the pressure of the tightly wound rope around the drum will hold the load on the drum. Because the rope is holding itself on the drum, the winch should never be operated with less than 2 (5) wraps of rope around the drum.

When replacing your rope, use only Superwinch® recommended replacement parts. Do not replace wire rope with rope made with any other material before checking with Superwinch®. Section 7, Winch Storage and Maintenance, of this Users Guide provides tips on how to recognize winch wear and extend the life of your winch. The Technical Installation Manual that accompanies this User's Guide provides details as to the installation, specifications and replacement part numbers of your winch rope.

WARNING



- Moving parts hazard.
- Sharp edge hazard.
- Always use a handsaver strap.
- Always keep clear of winch, rope and load while winching.
- Always wear heavy protective gloves.
- Always pass remote lead through window when used in vehicle.
- Always immediately replace any hook that is visibly damaged. Visible damage includes widened throat opening, bent or twisted tip, bent or twisted latch.
- Always inspect entire length of rope, protective sleeve and hook before use.
- Always raise the hood to protect the windshield.
- Always use a rope dampener.
- Never pull the rope over rough surfaces or sharp edges.
- Never expose a rope to heat or chemicals.
- Never knot or tie the rope to secure a load or repair a broken rope.
- Never pull the rope around non-rotating sheaves or rollers.
- Never allow rope to tangle or jam while winching. Rope could break before winch stalls.
- Never subject rope, tackle or winch to shock loads.
- Never operate a winch with less than, 5 turns of wire or 8 turns of synthetic rope around the winch drum.
- Never hook the rope back onto itself, use a strap to secure to anchor point.
- Never put your finger into the hook.
- Never let the rope slip through your hands, even with gloves on.
- Never touch the rope or hook while they are in tension, under load, or when someone else is at the control switch.

NOTICE



- Read owners manual.
- Always inspect entire length of rope, protective sleeve and hook before each use.
- Never exceed the winch rated capacity.

B. Synthetic Rope

If your winch has a synthetic rope, the rope is not always spooled onto the drum. You will want to attach the rope to the winch drum and spool the rope on the drum under tension.

A common method of installing a synthetic rope is through a hole in the drum coming from underneath the drum using enough line so it reaches opposite end of drum. Position the inserted line lengthwise down the drum as shown in Figure 5.



Figure 5.

Using duct tape or similar, secure the end of line to drum, taping around drum. A plug or setscrew is not used in this installation. Be sure that line is wound on from underneath drum, line should come off the drum on bottom.

You are ready to spool the line on the winch drum.

To do this:

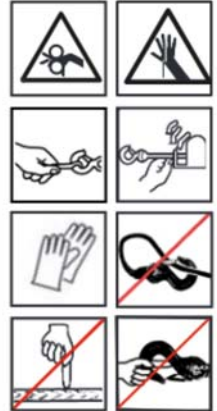
1. Wind eight (8) wraps of rope around the drum.
2. Extend the rope as far as possible while maintaining the eight (8) wraps of rope around the drum
3. Attached the hook to a load of 100 lbs (45.3 kg) or more.
4. Activate the winch by holding the switch in the ROPE IN position and paying in several feet of rope.
5. Be sure the rope is distributed evenly and tightly on the drum.
6. Repeat the process.

The tape on the drum is not intended to and WILL NOT hold the rope on the drum under load. Rather, the pressure of the tightly wound rope around the drum will hold the load on the drum. Because the rope is holding itself on the drum, the winch should never be operated with less than eight (8) wraps of rope around the drum.

From time to time, it may be necessary to re-spool the rope under no load after use. To do this, hold the remote switch (if equipped) in one hand and the rope in the other. Start from as far from the vehicle as possible, activate the winch and walk in several feet of rope while applying tension to the rope then release the switch. Repeat the process until the rope is fully spooled on the drum. Always release the switch before your hand comes within four feet from the fairlead or rope drum (the physical opening through which the rope passes). Be sure the rope is distributed evenly and tightly on the drum. A loosely wound drum allows the rope to work its way down into the lower layers of rope on the drum and become wedged.

Rope is a wear item and will eventually need to be replaced. A worn rope under load can result in a broken rope and a fatal accident. Rope should be inspected before each use and regularly between each use. Mashed, pinched, frayed or kinked areas severely reduce the load-carrying capability and should be replaced immediately.

⚠️ WARNING



- Moving parts hazard.
- Sharp edge hazard.
- Always use a handsaver strap.
- Always keep clear of winch, rope and load while winching.
- Always wear heavy protective gloves.
- Always pass remote lead through window when used in vehicle.
- Always immediately replace any hook that is visibly damaged. Visible damage includes widened throat opening, bent or twisted tip, bent or twisted latch.
- Always inspect entire length of rope, protective sleeve and hook before use.
- Always raise the hood to protect the windshield.
- Never expose a rope to heat or chemicals.
- Always use a rope dampener.
- Never pull the rope over rough surfaces or sharp edges.
- Never knot or tie the rope to secure a load or repair a broken rope.
- Never pull the rope around non-rotating sheaves or rollers.
- Never allow rope to tangle or jam while winching. Rope could break before winch stalls.
- Never subject rope, tackle or winch to shock loads.
- Never operate a winch with less than, 5 turns of wire or 8 turns of synthetic rope around the winch drum.
- Never hook the rope back onto itself, use a strap to secure to anchor point.
- Never put your finger into the hook.
- Never let the rope slip through your hands, even with gloves on.
- Never touch the rope or hook while they are in tension, under load, or when someone else is at the control switch.

When replacing your rope, please be sure to use only Superwinch® recommended replacement parts. Section 7, Winch Storage and Maintenance, of this Users Guide provides tips on how to recognize winch wear and extend the life of your winch. The Technical Installation Manual that accompanies this User’s Guide provides details as to the installation, specifications and replacement part numbers of your winch rope.



5. UNDERSTANDING WINCHING

A. Intermittent Use

DC powered electric winches are designed for intermittent use. This means the motor is designed to operate under load for a short period of time (generally less than one minute) and then to rest or cool for several minutes. Cool down time is most affected by the ambient temperature (it takes less time to cool in colder weather). Even under no load, a DC powered electric winch should never be run continuously for more than two to three minutes.

The heavier the load, the harder your winch motor works. Your winch motor will also get hotter as it works harder. As the load increases, the period of time the motor can run without a rest decreases and the period of rest required increases. Generally, as the stress on the motor increases the speed of the winch pull will decrease. Learn to recognize when the winch is pulling easily and when it is working harder. Avoid long-duration pulls.



While it is possible from general observations and common sense to estimate when your winch motor needs a rest, you need sophisticated measurements and equipment to be certain as to the degree of stress on your winch or winch motor. The amp draw of the motor, the motor temperature and winch speed are all indicators of winch performance and stress. Most Superwinch® winches can be fitted with the revolutionary Superwinch® ROAM™ system that allows you to operate your winch and receive real time winch performance data using your smart phone, tablet or other wireless device. Using ROAM™, you can be certain as to when it is time to give your winch motor a rest.

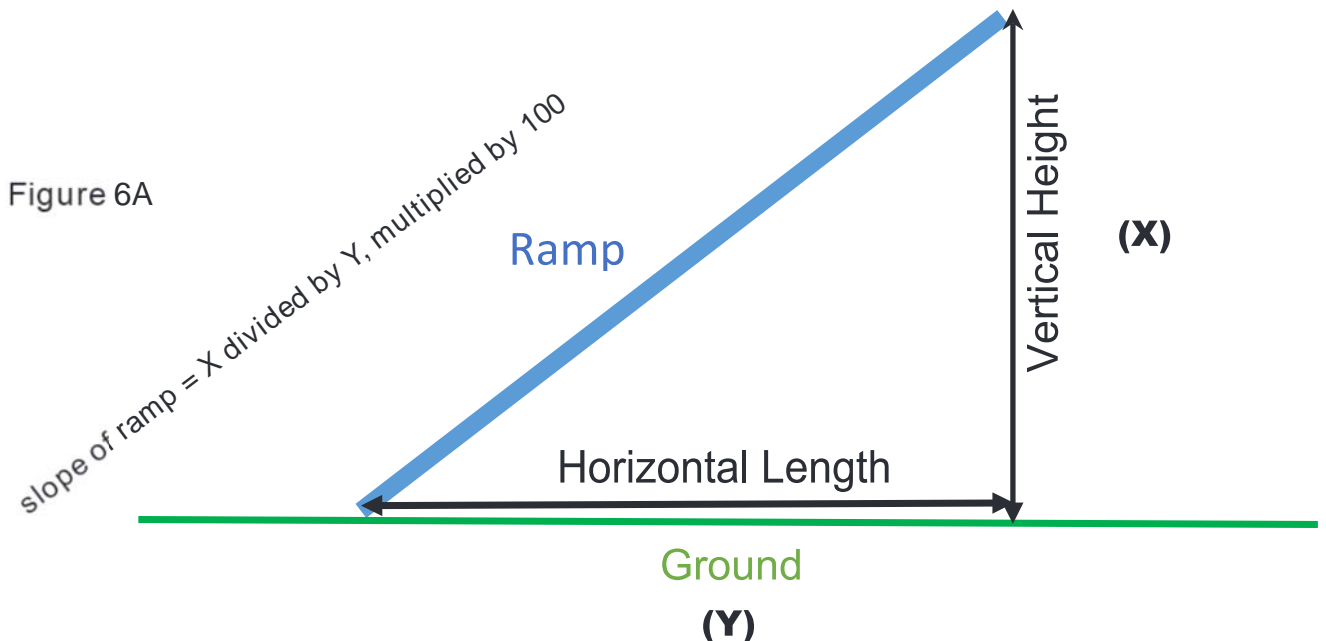


B. Trailer Applications

When choosing a winch for a trailer there is more to consider than simply the weight of the load. You can avoid paying for more winch than you need by keeping in mind that the force needed to pull a load on wheels is less than the force needed to pull the same load that is not on wheels. You must also keep in mind that the force required to pull a rolling load up an incline increases as the slope of the incline increases. In any event, the winch capacity you'll need for trailer applications is generally lower than the gross weight of your vehicle.

While the fundamental physics referred to above makes sense, you still have to relate these fundamentals to the specifics of your application. Fortunately, Superwinch® has developed a chart that can be used to determine the winch capacity needed for most trailer applications. That chart is provided below and requires you to know two values:

1. The Gross Vehicle Weight (GVW) of the vehicle to be pulled. This is the weight of your vehicle alone (curb weight) plus the weight of any items in and on the vehicle. The GVW of your vehicle (before any aftermarket add-ons) is generally available from your vehicles owner's manual.
2. The slope over which the vehicle has to travel. This can be calculated by dividing the vertical height of the ramp you are using by the horizontal length of the ramp and multiplying by 100. See chart, Figure 6A.



With this information, you may now use the chart below, Figure 6B. to determine the winch capacity needed to pull your rolling load. Locate the GVW of your load on the left side of the chart and the slope of the ramp on the top. The intersection of these two points within the chart provides the winch rating (rounded up to the nearest 1,000 lbs (453.6 kg) needed to move your vehicle up the ramp and onto your trailer.

		Slope of Ramp				
		10%	20%	40%	60%	80%
GVW (in pounds)	Not exceeding	Rolling Weight				
	1,500	1,000	1,000	1,000	1,000	1,500
	2,500	1,000	1,000	1,500	2,000	2,000
	5,000	1,000	1,500	2,500	3,500	4,000
	10,000	2,000	3,000	3,500	5,000	9,000
	15,000	3,000	6,000	9,000	10,000	12,000
	20,000	4,000	6,000	12,000	14,000	14,000
	25,000	5,000	9,000	12,000	15,000	18,000
	30,000	6,000	9,000	14,000	18,000	22,000
	35,000	9,000	12,000	18,000	22,000	25,000
	40,000	9,000	12,000	18,000	25,000	30,000
	45,000	9,000	14,000	18,000	28,000	32,000

Figure 6B

The winch selected should have a rated capacity of 1.5 to 2 times the rolling weight.

Selecting the proper winch capacity is obviously very important. However, in trailer applications, winch speed and braking attributes should also be considered. General purpose winches can do the job, but are not designed for the demands of high recurrence trailer winching. Trailer winches are used repeatedly for the same pull to get your special purpose vehicle, boat or machine on the trailer.

General purpose winches are designed for non-recurring situations. Therefore, while a two to three feet per minute line pull is adequate for tricky recovery pulls, waiting 15 minutes for a routine trailer pull may not be tolerable. If you are going to use a general purpose or recovery winch in your trailer application, you'll benefit by selecting a winch with a full load line speed of at least 4 feet per minute. In a trailer application it is highly desirable to have both a mechanical and dynamic brake (see section 2 Introduction) as you do not want to take the chance of your valuable cargo drifting down the ramp or coasting unexpectedly. Trailer applications also benefit from a softer yet more durable brake. You do not want to jerk your prized vehicle, boat, or machine around while loading and unloading. You also do not want a brake that wears quickly because it is not designed for the same repetitive pull.

Superwinch® is the only company that builds a winch line specifically for trailer applications, the S series winch line. Superwinch® does this because it understands and recognizes the unique demands of trailer applications. These S series winches are tailored to trailer applications in that they provide faster line speeds, comfortable safety factors to minimize down time, and high durability brakes designed to bring the load to a soft stop. If the vehicle you are moving is important to you, you'll do well to consider a winch designed specifically for trailers. The Superwinch® S series winch line is designed to accommodate vehicles with a GVW of up to 20,000 lbs (9071.8 kg).

WARNING

- Read Owners Manual
- Before winching a load be sure the freespool is fully in the engaged position.
- Sharp edge hazard
- Always properly seat load in throat of hook.
- Always use a handsaver strap
- Always keep helpers and spectators at a safe distance.
- Always be sure anchor will withstand the load.
- Always ensure hook latch is closed and not supporting load.
- Always operate the winch with an unobstructed view of the winching operation.
- Always use a hook with a latch.
- Never apply load to hook tip or latch.
- Never use a winch to secure a load in place.
- Never exceed the winch rated capacity.
- Never use to raise, suspend, lower or secure horizontally hinged doors or ramps without additional counter balance springs, centrifugal locking devices, or other secondary means of supporting the moving ramp or door.
- Never use winch as a hoist.
- Never use winch to lift or move people.
- Never put your finger in the hook.

6. RIGGING and WINCHING

A. Rigging

Rigging is the act of connecting the pulling mechanism to the anchor point. Rigging often involves materials such as tree saver straps, nylon straps, pulley blocks, and shackles. The use of these materials is discussed later in this section. Regardless of the materials used, selecting the anchor point is vital.

In some circumstances the vehicle on which the winch is mounted is the anchor point. In these situations the vehicle with the winch is not stuck. It is being used to move another object. When anchoring the pulling vehicle, set the parking brake and block or chock the wheels. Keep the vehicle's foot brake depressed and place the automatic or manual transmission in neutral. Always consult vehicle's owner's manual for load capacity and other specifications of your vehicle.

In a vehicle recovery situation where a winch equipped vehicle is NOT being used as the anchor point, always select a solid object that is more than adequate to resist the winch loads applied. This could be a tree, rock or other vehicle. If hooking to a tree or rock always use a tree-saver strap. If using a second vehicle as an anchor point, always be sure that the tow point on the vehicle is securely mounted to the vehicle's frame and will fully resist the winch load.

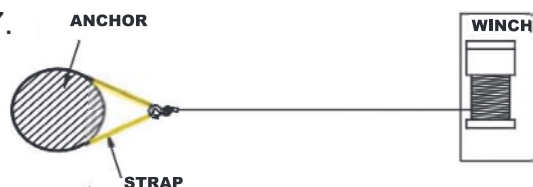
The anchor point selected should create a straight pull for the winch, as much as possible in the given situation. Long pulls at side angles can damage your winch or rope. In all cases, NEVER wrap the winch rope around a load or anchor point and connect the hook back to the rope. ALWAYS use a strap or tow point to connect the winch hook to the load or anchor point.

For trailering applications, always be sure that the tow point on the vehicle or item to be winched will resist the winch load applied, and will not damage the vehicle, item, or winch rope. Align an unobstructed path to the car that you are loading. Minimize contact with the wire or synthetic rope and the trailer or other objects.











Now that you have selected an anchor point you can begin rigging. No two winching situations are the same. Always wear proper safety equipment suitable to your unique situation.

Figure 7., illustrates one of the most commonly used rigging methods. The winch is mounted to a vehicle, and a nylon strap is used to protect the tree when it is used as an anchor and the rope is attached to the strap. The use of a chain or rope is not recommended due to the damage it could cause to the tree.

Figure 7.



⚠ DANGER

- Read owners manual.
- Before winching a load, be sure the freespool is fully in the engaged position.
- Always be certain anchor will withstand load.
- Always operate the winch with an unobstructed view of the winching operation.
- Always take your time when rigging and include a reasonable factor for safety.
- Always mount winch so that rope feeds through fairlead on front of winch parallel to the mounting surface and does not rub across housing or base.
- Always use a shackle or strap when attaching the hook to an anchor point.
- Always apply load to the throat (center) of the hook.
- Always use a hook with a latch.
- Always ensure hook latch is closed and not supporting load.
- Never apply load to hook tip or latch.
- Never fasten the hook back onto the rope.
- Never put your finger into the hook.
- Never wind rope over top of drum.
- Never let rope slip through your hands even with heavy gloves.

⚠ WARNING



- Use a pulley block to avoid winching at sharp angles.
- Always inspect entire length of rope, protective sleeve and hook before each use.
- Never exceed the winch rated capacity.
- Never operate winch in overwound orientation.
- Never touch rope when under tension.

⚠ CAUTION

- Use a pulley block to avoid winching near sharp edges.

Figure 8. illustrates a method of rigging to obtain a mechanical advantage. The use of a pulley block in this way will approximately double overall pulling ability. The winch hook is secured to a secure frame-mounted point on the vehicle (NOT on the winch.) The increase in pulling ability comes from 2 lines now pulling with the same winch tension. (Never exceed rated winch capacity. Always use a pulley block if more pulling ability is required.) Figure 8.

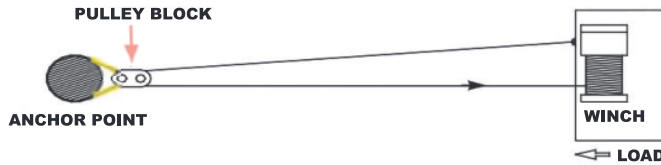


Figure 9. illustrates the use of a pulley block to change the direction of the pull. The pulley block is attached to an anchor point with a nylon strap and shackle, and the winch rope is redirected to the load. Figure 9.

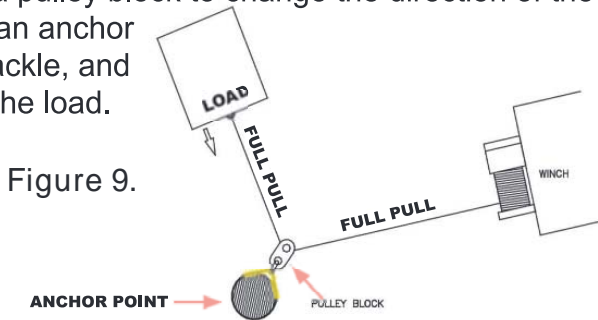
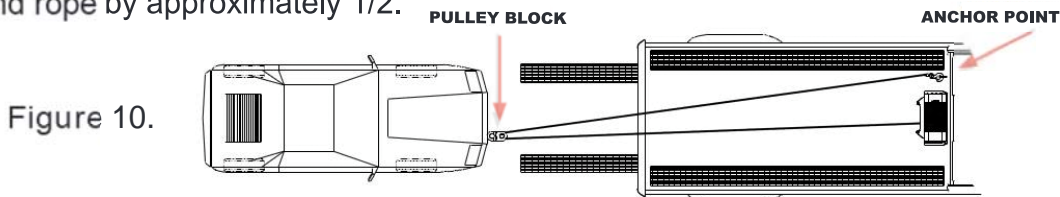


Figure 10. illustrates using a pulley block also to reduce the load on the winch, rope and battery. Double-lining also reduces line speed, which can be useful for more delicate operations. The reduction in load is accomplished by there now being 2 lines in tension. Compared to single-line, this will reduce the load on the winch and rope by approximately 1/2.

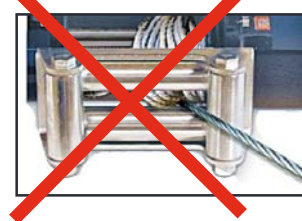


Be sure all rigging equipment used meets the winch's maximum line pull rating. When double-lining, pulley blocks should be rated to a minimum of two-times (2X) the winch's line pull rating. Always note the winch's rated capacity and do not exceed it.

If you install a tow hook for double-lining, it should be attached/anchored to the vehicle or trailer frame.

Figure 11. illustrates proper fairlead use. Equipping the winch with a fairlead will reduce wear on the rope during angle pulls. Rollers reduce rubbing and abrasion to the rope. Always pull as straight as possible to reduce the buildup of rope on one end of the drum. The vehicle's engine should be running during winch operation. If considerable winching is performed with the engine off, the battery may be too weak to restart the engine.

Figure 11.



⚠ DANGER

- Read owners manual.
- Before winching a load, be sure the freespool is fully in the engaged position.
- Always be certain anchor will withstand load
- Always operate the winch with an unobstructed view of the winching operation.
- Always take your time when rigging and include a reasonable factor for safety.
- Always mount winch so that rope feeds through fairlead on front of winch parallel to the mounting surface and does not rub across housing or base.
- Always use a shackle or strap when attaching the hook to an anchor point.
- Always apply load to the throat (center) of the hook.
- Always use a hook with a latch.
- Always ensure hook latch is closed and not supporting load
- Never apply load to hook tip or latch.
- Never fasten the hook back onto the rope.
- Never put your finger into the hook.
- Never wind rope over top of drum
- Never let rope slip through your hands even with gloves on.

Figure 12. illustrates the proper use of a winch dampener, blanket, or heavy jacket placed over the winch rope, to protect people and property. This is done to direct energy to the ground in case of winch rope breakage. Monitor your rigging during winching to be sure that your dampener is not caught up in fairleads or pulley blocks. Always keep safety your top priority during winching.



Figure 12.



B. Winching

Once the Rigging is set, you are ready to Winch. Always keep safety in mind during winching. Keep all observers a distance from the winching operation equal to the length of rope that is in use.

For recovery applications, understand how the load you're winching will move. If the vehicle is stuck, understand why. Is the vehicle simply in slippery mud? Is an axle or skid plate caught on a rock? Understanding why the vehicle is stuck is a key point. If there is a large rock right in front of your axle, frame, or skid plate, you can winch all day and the only thing you'll accomplish is bending something, or burning out your winch.



Check for obstructions. Sometimes no amount of winching forward will pull the vehicle up and over an obstacle. If the winch is struggling, re-evaluate. Remember—Sometimes the correct path out is back the way you got in.

C. Hand Signals

When winching, you may choose to have another person to assist you. One person directs the operation and watches the winch from outside the vehicle while the other person controls the vehicle and winch. The directing person may Freespool the winch, do the rigging, and watch the winch during operation. During these times, it is imperative that both people agree on and understand the basic winch signals. Be sure to review hand signals before ANY winching begins. See, Figure 13.

WINCH OUT: Upper arm straight out, lower arm pointing DOWN, index finger moving in circles.

WINCH IN: Upper arm straight out, lower arm pointing UP, index finger moving in circles.

STOP: Arm raised, hand in a fist, motionless.

⚠ DANGER

- Always inspect equipment from wear or damage prior to use; immediately replace worn or damaged equipment.
- Always keep helpers and spectators at a safe distance.
- Always wear heavy protective gloves when handling rope.
- Always keep clear of rope and load when winching.
- Always ensure hook latch is closed and not supporting load.
- Always operate the winch with an unobstructed view of the winching operation.
- Always use a hook with a latch.
- Never touch the rope or hook when they are in tension, under load, or when someone else is at the control switch.
- Never knot or tie the rope to secure a load or repair a broken rope.
- Never pull the rope around non-rotating sheaves or rollers.
- Never pull the rope over rough surfaces or sharp edges.
- Never allow rope to tangle or jam while winching. Rope could break before winch stalls.
- Never subject rope, tackle or winch to shock loads.

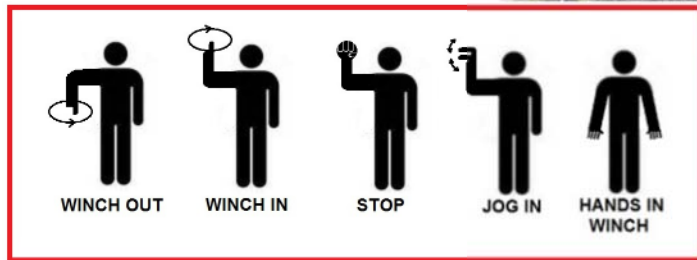
⚠ WARNING

- Hot Surface Hazard
- Moving parts hazard
- Before winching a load, be sure the freespool is fully in the engaged position.
- Always keep clear of winch and load while winching.
- Always wear personal protective gear.
- Always keep helpers and spectators at a safe distance.
- Always use handsaver
- Never touch the rope or hook while they are in tension, under load, or when someone else is at the control switch.

JOG IN: Upper arm straight out, lower arm pointing UP, move thumb and fingers in a clam-shell motion repeatedly, for operator to run the winch IN in quick 1-second intervals.

HANDS IN WINCH: Both arms held out, fingers extended, in the direction of the winch. Operator to secure controller to be sure it is not accidentally operated while the winch is freespooled or the winch hook is stowed.

Figure 13.



Take up slack in the rope and rigging slowly. Once the rope and rigging are taut, carefully review the rigging again to check for binding or obstructions.

During winching, apply power to the winch smoothly, and observe all parts of the winching operation while the winch is running. Watch the winch, rigging, rope, and vehicles involved. Listen to the winch for signs that the winch is pulling easily or if it is heavily loaded. Do not play loud music, or talk with friends during winching. Be attentive and observant at all times.

If the winch appears to slow considerably or change its sound, stop powering the winch and review the situation. Check the winch motor to be sure that the winch does not overheat. Allow time for the winch to rest or re-evaluate your rigging. With more practice and experience you will learn to recognize the winch's sounds and ability.

D. Securing and De-Rigging

When the vehicle has been recovered or the load has been moved to a stable position and winching is complete, secure the vehicle or load and release the tension on the rope by powering cable out just enough to slacken the rope. **DO NOT USE THE WINCH TO SECURE LOADS DURING TRANSPORT.** Disassemble the rigging, and return components to their storage area.



Power the winch IN until the hook is approximately 3 feet (1 meter) from the winch. **NEVER** hold the hook with your hand—**ALWAYS** use the handsaver. Secure the hook to its stowed position (a shackle or tow hook) and jog the winch in slowly, approximately 1 second at a time, until the winch cable is snug.



WARNING

- Always use handsaver
- Always wear personal protective gear.
- Always wear heavy protective gloves when handling rope.
- Never use a winch to secure a load in place.
- Never disengage the freespool while winch is under load.
- Never put your finger in the hook.
- Never apply load to hook tip or latch.

DO NOT CONTINUE TO WINCH. Simply snug up the rope to a secure position. Do not attach the hook to any part of the winch, such as a tie bar, freespool control, etc.

Use caution if pulling the thimble or hook all the way to the fairlead, Fairlead damage, leading to rope damage may occur, a better practice is to secure the hook off to a side tow hook or other structure.

7. WINCH STORAGE and MAINTENANCE

A. Inspect the Winch

After winch use, always prepare your winch for storage. Inspect the installation, rope, rigging, and accessories for any damage that may have occurred during use.

Inspect the winch by checking the tightness of mounting bolts and checking the winch for any loose components or fasteners.

B. Inspect the Rope

Inspect the rope by pulling it off the winch drum with the Freespool mechanism. Look for any kinks or cuts, broken strands, or other physical damage. Clean your winch rope by removing dirt and debris. It is your responsibility to provide proper care to prolong the life of your winch rope.

After inspecting your rope, re-spool it neatly onto your winch. This should be done evenly, with some tension on the rope, to ensure a uniform and tight wrap onto the winch drum.

You can extend the life of your wire rope with proper maintenance and knowing how to prevent kinks before they occur. The chart in Figure 14. shows the progression of a kink.

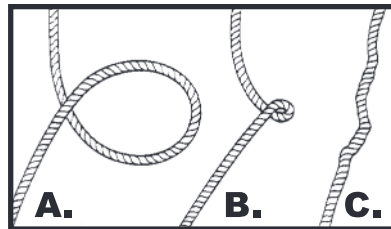


Figure 14.

- A. This is the start of a kink. At this time, the wire rope should be straightened.
- B. The wire rope was pulled and the loop has tightened to a kink. The rope is now permanently damaged and must be replaced.
- C. Kinking causes wire strands under the greatest tension to break and thus reduces the load capacity of the wire rope. The rope must be replaced.

Minimize wire rope abrasion. Minimize wire rope abrasions by pulling in a straight line and keeping rigging clear of obstacles. Avoid dragging the rope over sharp rocks or broken tree branches or other sharp objects. For trailer winches avoid metal to metal contact between the rope and the trailer and or other sharp objects. Abrasion will reduce rope life.

Keep the rope clean. Allowing dirt and debris to enter the rope will lead to abrasion of the rope.



Avoid sharp bends. A sharp bend in the rope decreases its strength substantially under load and may cause rope damage or failure.

Synthetic rope care is different than wire rope care, In order to properly care for your synthetic rope you must understand the appearance of synthetic rope as it ages.

When synthetic rope is new, it has a smooth finish (a.). When the rope is first used, the outer filaments of the rope will roughen and give the rope a slightly, “fuzzy” appearance (b.). This condition of the outer filaments creates a rougher rope surface and actually helps to protect the fibers underneath. Rope must be replaced when approximately 25% of the visible outer fibers exhibit abrasion (c.).



Examine both inner and outer fibers. Open the strands of the rope by compressing the rope length-wise (e.) and look for powdered fiber and abrasion- this is a sign of internal wear of the rope. Estimate internal fiber loss to include in your determination of overall abrasion fiber loss of the rope.



Glossy or glazed areas in the rope (d.) can be the result of two different conditions. The most common form of glossing or glazing is caused by compression, when the rope is wound on the winch drum or through a pulley block. Compressing the rope length-wise (e.) will generally make the rope more pliable and begin to resemble normal rope. If the glazed section remains hardened, this can be a sign of heat damage, and the rope must be replaced. It is your responsibility to exercise proper care to prolong the life of your synthetic winch rope.

Minimize synthetic rope abrasion. Use the movable abrasion sleeve whenever the rope comes in contact with rocks or other objects. Slide the sleeve up and down the rope as required. Abrasion will reduce rope life.

Keep the rope clean. Allowing dirt and debris to enter the rope will lead to abrasion of the rope.

Avoid sharp bends. A sharp bend in the rope decreases its strength substantially under load and may cause rope damage or failure.

C. Inspect the Rigging Gear

Inspect your rigging - tree-saver straps, pulley blocks, shackles, hook, etc., for physical damage such as tears, cuts, bending, etc. Clean any dirt or debris from your equipment. Check to make sure that your hook safety latch is operational. Pulley blocks can be wiped with a towel sprayed with a water displacement lubricant.

Inspect your fairlead. If you have a roller fairlead, inspect the rollers for damage, and ensure that all rollers roll smoothly. If you have a hawse fairlead, inspect the smooth surface of the hawse for nicks, burrs, or other damage. Repair or replace any damaged components.

D. Inspect the Freespool

The Technical Installation Manual that accompanies this Users Guide provides information for your specific winch.

E. STORAGE

When not using your winch for extended periods, store in a clean, dry location free from a corrosive atmosphere. Avoid large changes in temperature and humidity. It is a good idea to clean the winch prior to storage. Your winch should withstand storage temperatures from -30° to $+130^{\circ}$ F (-35 to $+55^{\circ}$ C). If winch is mounted to a vehicle, it may be covered with a Superwinch® Neoprene winch cover. Although the neoprene covers can “breathe” to some degree, if subjected to changes in temperature and humidity, you should occasionally remove the cover to minimize condensation buildup which can corrode metal components of the winch. Disable power to the winch by disconnecting the battery positive lead and unplug any controls.

Electrical controls should be stored in a clean, dry area such as a glove box, tool box, or cargo shelf inside a truck. Remove any batteries from the control if it will not be used for extended periods.

After removal from storage, make sure winch and controls are stabilized to temperature ranges between -20° and $+100^{\circ}$ F (-30 to $+38^{\circ}$ C) prior to operating.

⚠ DANGER	
	
	
	
<ul style="list-style-type: none">• Always follow wiring diagrams.• Always disconnect winch from power source when working on the winch.• Always store the remote control in a protected, clean dry area.• Never lean over the battery while making connections.	

8. WINCH TIP & TROUBLE SHOOTING CHART

No basic guide to winching techniques can cover all scenarios that may come up in the real world. The safety of you, the people around you, and your vehicle are, ultimately, your responsibility.

WINCH TIPS

- Inspect your equipment regularly, and before each use.
- Use only genuine Superwinch® accessories and replacement parts when servicing your winch.
- Do not use damaged equipment.
- Do not use a winch with damaged equipment, or a winch that does not appear to be operating properly.
- Practice rigging and winching, and refresh your knowledge by reading your winch documentation regularly, so that your skills and equipment will be ready for use when you need them.
- Listen to your winch. Learn to recognize when the winch is pulling easily, and when it is working harder.
- Recognize your winch's speed, which is also an indication of how much load your winch is pulling.
- Avoid long-duration pulls at high loads. Allow the winch to rest, or re-think your rigging.
- Always keep safety a top priority, and be considerate of others and the environment.
- Lend a hand if one is needed.

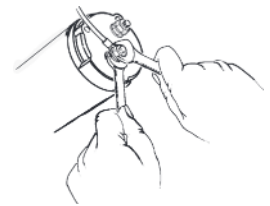


Figure 15

TROUBLE SHOOTING CHART

Symptoms	Possible Cause(s)	Corrective Actions
Motor will not operate or runs in one direction only	<ol style="list-style-type: none"> 1. Bad connections or broken wires. Most often, winch problems can be traced to loose connections, corrosion, or broken wires. 2. Damaged or stuck solenoid. This is most likely caused by not holding the inner nut to keep the stud from turning when attaching wire to solenoid. 3. Handheld switch inoperative. 4. Damaged motor. 5. Solenoid is not grounded. 6. Weak or dead battery. 	<ol style="list-style-type: none"> 1. Check all wiring. Look for loose connections, corrosion, and broken or damaged wires. Any wires that appear damaged must be replaced. Check handheld controller for damaged wiring or damaged or corroded plug and socket connections. CAUTION: Always use two wrenches (spanners) when loosening or tightening motor and solenoid connections. (See Figure.15 Otherwise motor or solenoid damage can occur. 2. CAUTION: Disengage freespool before performing this test to prevent powering the winch drum. If a solenoid sticks once, it is likely to stick again and must be replaced immediately. Tap solenoid to free stuck contacts. For individual single-coil solenoids, check by applying voltage to the small solenoid terminal. Be sure solenoid is grounded back to battery. For multiple-coil block-style solenoids, disconnect existing connections, ground center terminal, and apply voltage to outer terminals one at a time. A solenoid that is not stuck will make an audible "click" when first energized. 3. Replace switch. 4. Replace or repair motor. Review brushes. Brushes may be sticking or worn. Brush kits are available for some models. 5. Check ground path between battery negative and solenoid. 6. Recharge or replace battery. Check charging system.
Winch will not shut off	<ol style="list-style-type: none"> 1. Solenoid stuck "on". 	<ol style="list-style-type: none"> 1. If solenoid sticks on, reverse direction and hold trigger switch on until the power lead can be disconnected. A safety on-off switch is available as an accessory.
Motor runs extremely hot	<ol style="list-style-type: none"> 1. Long period of operation. 2. Damaged motor. 3. Damaged brake. 	<ol style="list-style-type: none"> 1. Allow to cool. 2. Replace or repair motor. 3. Replace or repair brake.
Motor runs but with insufficient power or line speed	<ol style="list-style-type: none"> 1. Weak battery. 2. Battery to winch wire too long. 3. Poor battery connection. 4. Poor ground. 5. Damaged brake. 	<ol style="list-style-type: none"> 1. Recharge or replace battery. Check charging system. 2. Use larger gauge wire. 3. Check battery terminals for corrosion. Clean as required. 4. Check and clean connections. 5. Repair or replace brake.
Motor runs but drum does not turn	<ol style="list-style-type: none"> 1. Freespool not engaged. 	<ol style="list-style-type: none"> 1. Engage Freespool.
Winch runs backwards	<ol style="list-style-type: none"> 1. Motor wires reversed. 2. Solenoid wired incorrectly. 	<ol style="list-style-type: none"> 1. Recheck wiring. 2. Recheck wiring.
Will not hold load	<ol style="list-style-type: none"> 1. Excessive load. 2. Worn or damaged brake. 	<ol style="list-style-type: none"> 1. Reduce load or double line. 2. Repair or replace brake.