



The Basic Guide to Winching Techniques

Every winching situation has the potential for personal injury. In order to minimize that risk, it is important that you read this Basic Guide carefully, familiarize yourself with the operation of your winch before having to use it, and be constantly safety oriented. In this Guide, we will set forth many of the basic rules of safe winch operation. However, because every winching situation is different, your constant good judgment and consistent focus on safety are of great importance.

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GENERAL SAFETY PRECAUTIONS





As you read these instructions, you will see WARNINGS, CAUTIONS, NOTES 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, may 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 hazard, and advise of the probable consequence of not avoiding the hazard. NOTES are messages to avoid property damage. NOTES are additional information to help you complete a procedure. **PLEASE WORK SAFELY!**


	WARNING
<p>CHEMICAL AND FIRE HAZARD Failure to observe these instructions could lead to severe injury or death.</p> <ul style="list-style-type: none"> • Always remove jewelry and wear eye protection. • Never lean over battery while making connections. • Always verify area when drilling is clear of fuel lines, fuel tank, brake lines, electrical wires, etc • 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
<p>MOVING PARTS ENTANGLEMENT HAZARD Failure to observe these instructions could lead to severe injury or death.</p> <p>To avoid injury to hands or fingers.</p> <ul style="list-style-type: none"> • Always keep hands clear of wire rope, hook loop, hook and fairlead opening during installation, operation, and when spooling in or out. • Always use extreme caution when handling hook and wire rope during spooling operations. • Always use supplied hook strap whenever spooling wire rope in or out, during installation or operation to avoid injury to hands or fingers. 	




	WARNING
<p>FALLING OR CRUSHING HAZARD Failure to observe these instructions could lead to severe injury or death.</p> <ul style="list-style-type: none"> • Never use as an overhead hoist, or to suspend a load. • Never use to lift or move persons. 	

 <p>CAUTION</p>	<p>MOVING PARTS ENTANGLEMENT HAZARD Failure to observe these instructions could lead to minor or moderate injury.</p> <p>General Safety:</p> <ul style="list-style-type: none"> • Always Know Your Winch: Take time to fully read and understand the included Installation and Operations guide, and Basic Guide to Winching Techniques, in order to understand your winch and the winching 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 wire rope rated capacity. Double line using a snatch block to reduce winch load. <p>Installation Safety:</p> <ul style="list-style-type: none"> • Always choose a mounting location that is sufficiently strong to withstand the maximum pulling capacity of your winch. • Always use factory approved switches, remote controls, accessories and installation components. • Always use grade 5 or better hardware, never weld bolts and never use longer bolts than those supplied from factory. • Always complete winch mounting and attachment of hook to hook loop before wiring winch during installation. • Always position fairlead with WARNING label on top. • Always spool the wire rope onto the drum as indicated by the drum rotation label on the winch. Required for automatic brake to work (if winch is so equipped) and for correct installation orientation. • Always prestretch wire rope and respool under load before use. Tightly wound wire rope reduces chances of "binding", which is wire rope working its way down into a loosely wound wire rope layer, and catching or damaging itself.
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 <p>CAUTION</p>	<p>MOVING PARTS ENTANGLEMENT HAZARD Failure to observe these instructions could lead to minor or moderate injury.</p> <p>Winching Safety:</p> <ul style="list-style-type: none"> • Always inspect winch installation and wire rope condition before operating winch. Frayed, kinked or damaged wire rope must be replaced immediately. Loose or damaged winch installation must be corrected immediately. • Never leave remote control plugged into winch while free spooling, rigging, or sitting idle. • Never hook wire rope back onto itself. This damages the wire rope. Always use a choker chain, wire choker rope or tree trunk protector on the anchor. • Always prior to winching, remove any element that may interfere with safe winch operation. • Always take your time when rigging 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, wire rope is in tension or wire rope drum is moving. • Always unspool as much wire rope as possible when rigging. Double line or pick distant anchor point. • Never winch with less than 5 wraps of wire rope around the drum, the wire rope could come loose from the drum. • Always stand clear of wire rope and load during operation. • Never touch wire rope or hook while in tension or under load. • Never touch wire rope or hook while someone else is at the control switch or during winching operation. • Never touch wire rope or hook while remote control is plugged into winch. • Always stand clear of wire rope and load and keep others away while winching.
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 <p>CAUTION</p>	<p>MOVING PARTS ENTANGLEMENT HAZARD Failure to observe these instructions could lead to minor or moderate injury.</p> <p>Winching Safety:</p> <ul style="list-style-type: none"> • Always require operator and bystanders to be aware of stability during winching of vehicle and/or load. • Always keep remote control lead clear of the drum, wire rope and rigging. Inspect for cracks, pinches, frayed wires or loose connections. Replace if damaged. • Always pass remote control through a window to avoid pinching lead in door, when using remote inside a vehicle.
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<p>NOTICE</p>	<p>AVOID WINCH AND EQUIPMENT DAMAGE</p> <ul style="list-style-type: none"> • Always avoid continuous side pulls which can pile up wire rope at one end of the drum. This can damage your wire 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 wire rope and winch. • Always use care to not damage your frame when anchoring your vehicle during a winching operation. • Never "jog" wire rope under load. Shock loads can momentarily exceed capacity of wire 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.
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 <p>CAUTION</p>	 	<p>CUT AND BURN HAZARD Failure to observe these instructions could lead to minor or moderate injury.</p> <p>To avoid injury to hands or fingers:</p> <ul style="list-style-type: none"> • Always wear heavy leather gloves when handling a wire rope. • Never let wire rope slip through your hands. <p>To avoid injury to hands or fingers:</p> <ul style="list-style-type: none"> • Always be aware of possible hot surface at winch motor, drum or wire rope during or after winch use.
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ELECTRIC WINCH BASICS

So, you have your Warn winch and you're ready to get out on the trails: climb a few boulders, splash a little mud, traverse the occasional stream. Basically, you're ready to explore the backcountry and otherwise have a great time.

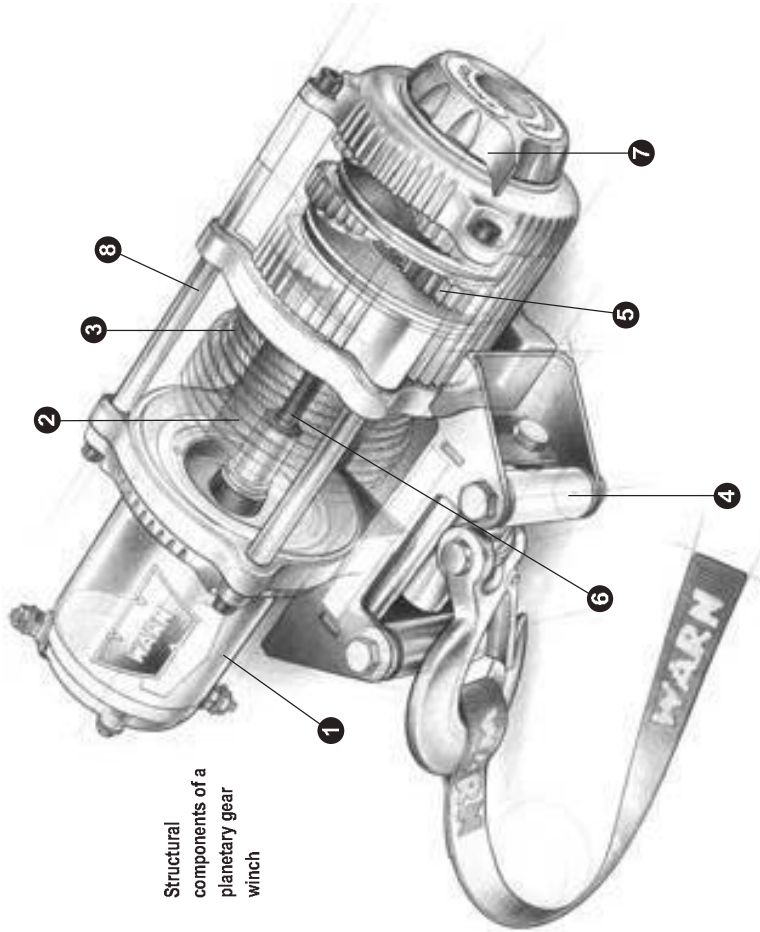
Well, if you're smart enough to go prepared with the best, you're probably smart enough to know that to keep having a great time, you need to fully understand your winch and the winching operation.

That's exactly what this guide intends to do: provide you with a basic understanding of your winch and teach you the basics of proper winching techniques. But before we get started, we must

emphasize that the information in this guide is general in nature. Because no two situations are alike, it would be nearly impossible to review them all. We can, however, provide you with the general principles and techniques. Then it is up to you to take the time to analyze the situation and apply the proper technique.

Along with a little common sense, the guidelines laid out in this book can help you keep off-roading fun. Just remember to think through each situation before you act and **TREAD LIGHTLY!**

⚠ WARNING
Never operate or install a winch without reading or understanding the operator's manual



Structural components of a planetary gear winch



Rocker Switch

Remote Control Switch

Dial Switch

Mini Rocker Switch

To start, you should familiarize yourself with your Warn winch and each of its components: Practice using your winch before using it on the trail.

1 Motor Typically the winch motor is powered by the vehicle's battery. The motor provides power to the gear mechanism, which turns the winch drum and winds the wire rope.

2 Winch Drum The winch drum is the cylinder onto which the wire rope feeds. The drum is driven by the motor and drive train. Its direction can be changed using the winch switch.

3 Wire Rope The wire rope's diameter and length are determined by the winch's load capacity and design. Wrapped around the winch drum and fed through the fairlead, the wire rope is looped at the end to accept the hook's clevis pin.

4 Fairlead When using the winch at an angle, the fairlead (or wire lead) acts to guide the wire rope onto the spooling drum. It minimizes damage to the wire rope while it goes through the winch mount or bumper.

5 Gear Train The reduction gear converts the winch motor power into a large pulling force. The gear train design makes it possible for the winch to be lighter and more compact.

6 Braking System Braking action is automatically applied to the winch drum when the winch motor is stopped and there is load on the wire rope. The braking action is applied by the motor or a separate mechanical brake, depending on the winch construction.

7 Clutch The clutch allows the operator to manually disengage the spooling drum from the gear train, enabling the drum to rotate freely (known as "freespooling"). Engaging the clutch "locks" the winch drum back onto the gear train.

8 Tie Rods Ties the end housings together as a structural unit.

⚠ CAUTION
Never engage or disengage the clutch if winch is under load, wire rope is in tension, or wire rope drum is moving.

HOW THE WINCH WORKS

Winch Mechanics

Now that you've familiarized yourself with your Warn winch and its components, we can begin reviewing how it works. The major advantage of an electric-powered winch is that it can provide reliable service for intermittent utility and recreational use even while the vehicle's engine is stalled — assuming, of course, that sufficient battery current is available. Your winch can operate at high current loads, and, for this reason, uses a high current switch system to safely handle the current flow.

It is important to understand that the longer the pull, the more heat that is created, just like a hot plate. Prolonged winching without cooling the winch motor will damage the motor. Also, even if the engine is idling during winching, the battery may drain faster than it is charging. So pay close attention to make sure you aren't draining your battery too low to start your vehicle.

This winch is controlled by the hand held remote control to allow the operator to stand clear during the winching process.



Rocker switch control

Control Of Your Winch

The winch is controlled by a switch mechanism that provides control of the forward or reverse rotation of the spooling drum.

How the Winch Reacts to Load

Warn winches are rated by pulling capacity. The maximum pulling capacity occurs on the first layer of wire rope on the drum. As the layers increase, the pulling power decreases. It's the mathematics of winching. Exceeding the winch capacity could cause the winch to fail or the wire rope to break. Thinking through how you intend to use your winch now, could save you a big headache later.

In addition, you'll also want to make sure that your winch's mounting system and your vehicle's frame can accommodate the rated load of your winch.

WINCH ACCESSORIES YOU'LL WANT TO HAVE WITH YOU

Alone, the winch is not much more than a simple tool. But when used with certain accessories and enhancements, your Warn winch can become a versatile and productive tool. In this section, we'll review several of these items. Some are vital to the safe operation of your winch, while others offer added versatility and convenience.



Snatch Block Used properly, the multi-purpose snatch block allows you to: (1) increase your winch's pulling power; and (2) change your pulling direction without damaging the wire rope. Proper use of the snatch block is covered in "Before You Pull".



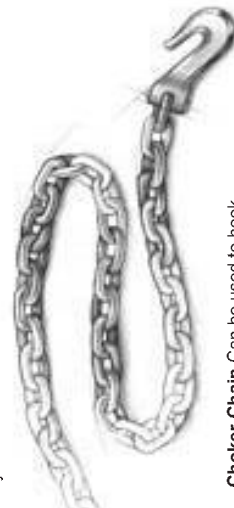
Gloves Wire rope, through use, will develop "barbs" which can slice skin. It is extremely important to wear protective gloves while operating the winch or handling the wire rope. Avoid loose fitting clothes or anything that could become entangled in the wire rope and other moving parts.

Hook Strap Use to hold the hook and keep fingers away from the fairlead as the wire rope is being spooled in.

Winches develop tremendous pulling forces and can easily remove fingers and limbs that are placed in pinch points. Put the hook into the loop and hold the strap between the thumb and forefingers.



Clevis/D-Shackles The D-Shackle is a safe means for connecting the looped ends of cables, straps and snatch blocks. The shackle's pin is threaded to allow easy removal.



Choker Chain Can be used to hook-up to another vehicle or sharp objects for an anchor point. Chains, however, will damage or kill trees.

BEFORE YOU PULL

Practice using your winch before you get stuck. A real situation is no time to be learning how to use your winch.

Make sure new wire rope is stretched before it is first used. Unspool the full length of the wire rope, leaving 5 wraps on the drum. Apply at least 500 pounds of tension. You can do this by setting up an anchor point and pulling your vehicle to it on a slightly inclined, flat surface and letting the vehicle roll.

Whether you're recovering another vehicle or pulling a stump from the ground, knowing the proper winching techniques can help keep you and others around you safe. And perhaps the most important part of the winching process, regardless of the situation, is what you do before you pull.

In this section, we'll show you the basic fundamentals for effective winching. However, it is up to you to analyze the situation and make the decisions necessary for the proper use of your winch. Apply your knowledge of your winch and the basic fundamentals you've practiced and adjust your techniques to your unique situation. Some keys to remember when using your Warn winch:

1. Always take your time to assess your situation and plan your pull carefully.
2. Always take your time when using a winch.
3. Use the right equipment for your situation.
4. Always wear leather gloves and do not allow the wire rope to slide through your hands.
5. You and only you should handle the wire rope and operate the remote control switch.
6. Think safety at all times.
7. Practice. Practice and practice the steps.



Single line pull

Rigging for the Pull

The following steps describe how to recover your vehicle with rigging a single line pull. Double or multiple line rigging techniques follow the same basic steps, but use a snatch block to assist the process.

Step 1: PUT ON GLOVES.



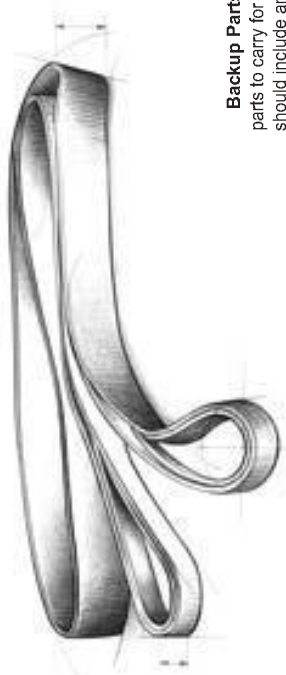
▲ WARNING
Always use supplied hook strap to hold hook when spooling wire rope in or out.

Step 2: DISENGAGE CLUTCH. To allow free spooling of the winch drum, rotate the clutch lever on the winch to Disengage. Freespooling conserves battery power.



▲ WARNING
Always keep hands and clothing clear of the wire rope, hook and fairlead opening during operation and when spooling.

Step 3: FREE THE WINCH HOOK AND ATTACH HOOK STRAP. Free the winch hook from its anchor point. Attach hook strap to the hook (if not attached).



Tree Trunk Protector Typically made of tough, high-quality nylon, it provides the operator an attachment point for the winch rope to a wide variety of anchor points and objects, as well as protect living trees.

Backup Parts Important backup parts to carry for backcountry travel should include an extra screw-pin shackle, snatch block, and remote control unit. For severe and continued winch use, consider including an extra wire rope and winch hook.

Toolbox Items Items to bring along include hand wrenches, screwdrivers, pliers and tools to change wire rope.



▲ CAUTION
Never attach a recovery strap to the winch hook to increase the length of a pull. Never attempt to tow a vehicle with the recovery strap attached directly to the winch hook. Never use "bungee" straps that develop tremendous and potentially dangerous amounts of force when stretched.

Recovery Strap Never use a recovery strap in a winching operation. Because it is designed to stretch, it stores energy and could react like a rubber band should your rigging fail. Use the recovery strap to "snatch" out a stuck vehicle.

Shovels & Hand Tools Quite often during winching activities, you'll find yourself in need of some additional help. You may want to carry equipment such as a shovel and an axe.

Battery Recommendations A fully charged conventional ATV battery is recommended to obtain peak performance from your winch. Make sure all electrical connections are clean and tight.

CAUTION
 Never attempt to disengage the clutch while wire rope is under tension. Never engage the clutch while the drum is rotating. Always make sure the clutch is fully engaged or disengaged.

CAUTION
 Never leave remote control plugged into winch while free spooling, rigging or sitting idle.

CAUTION
 Never hook wire rope back onto itself. This damages the wire rope.

CAUTION
 Never winch when there are less than 5 wraps of wire rope around the winch drum.



How to choose an anchor point:

A secure anchor is critical to winching operations. An anchor must be strong enough to hold while winching. Natural anchors include trees, stumps, and rocks. Hook the cable as low as possible. If no natural anchors are available, when recovering another vehicle, your vehicle becomes the anchor point. In this case, be sure to put the transmission in neutral, apply the hand brake and block its wheels to prevent your vehicle from moving.

Ideally, you'll want an anchor point that will enable you to pull straight in the direction the vehicle will move. This allows the wire rope to wind tightly and evenly onto the spooling drum. An anchor point as far away as possible will provide the winch with its greatest pulling power.

Stakes driven in at an angle and tied together.

Buried log with chain secured around the log.



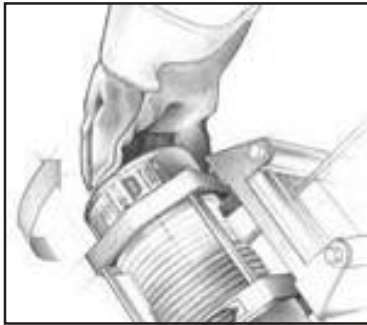
Step 4: PULL WIRE TO ANCHOR POINT. Pull out enough wire rope to reach your anchor point. Be sure to keep a certain amount of tension in the wire. It can become twisted and overwrap when slackened, leading to wire rope damage. To prevent losing the end, hold the winch hook in the hook strap while you work.



Step 5: SECURE TO THE ANCHOR POINT. Once you've established your anchor point, secure the tree trunk protector or choker chain around the object.



Step 6: ATTACH THE CLEVIS/D-SHACKLE AND HOOK STRAP. Attach the shackle to the two ends of the strap or chain and through the hook loop, being careful not to over tighten (tighten and back-off 1/2 turn).



Step 8: CONNECT THE REMOTE CONTROL (if so equipped). Be careful not to let the remote control cord dangle in front of the winch.

Always disconnect the remote control when not in use.

Step 9: PUT WIRE ROPE UNDER TENSION. Using the winch switch, slowly wind the wire rope until no slack remains. Once the wire rope is under tension, stand well clear, and never step over it.

Step 10: CHECK YOUR ANCHOR. Make sure all connections are secured and free of debris before continuing with the winching procedure.

Step 7: LOCK THE CLUTCH. Lock the winch drum by rotating the clutch lever on the winch to Engage.

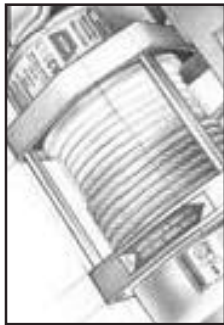


PULLING

As you probably have already noticed, there are many things to do and consider before you actually begin pulling. Think through what you're doing and you can keep yourself and those around you out of harm's way.

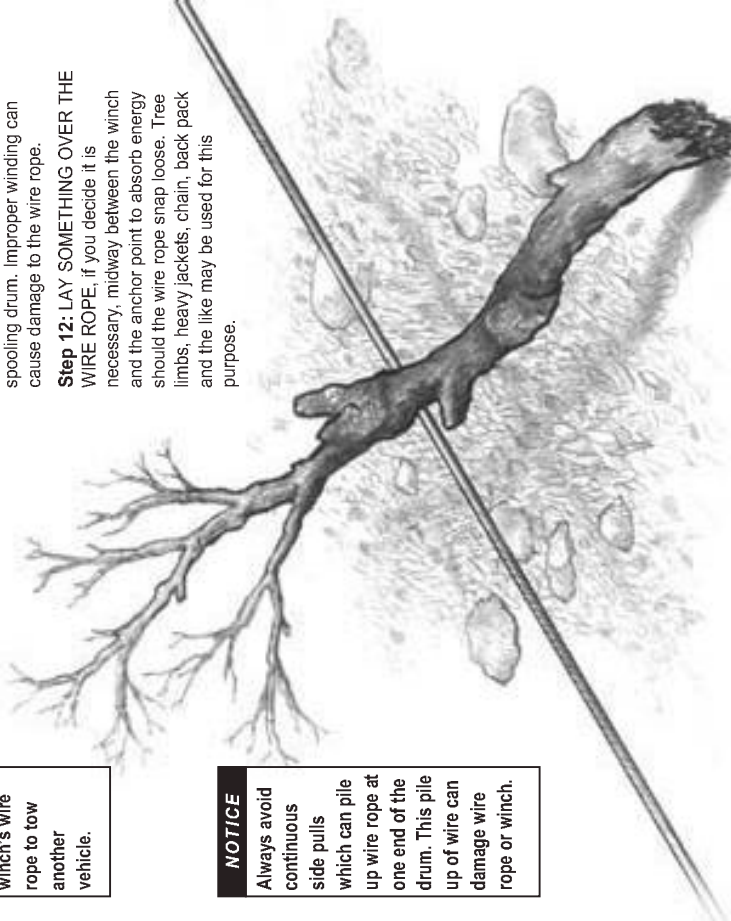
Operating your winch properly is so important, in fact, you should practice these techniques before having to face the distractions and stresses of a real winching situation.

CAUTION
 Never use the winch as a hoist. Never use the winch's wire rope to tow another vehicle.



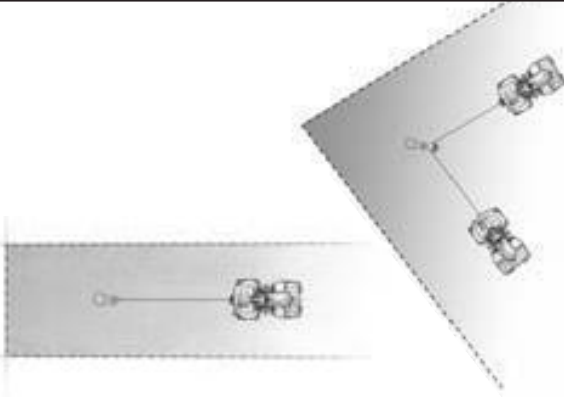
Step 11: CHECK WIRE ROPE. The wire rope should be neatly wound around the spooling drum. Improper winding can cause damage to the wire rope.

Step 12: LAY SOMETHING OVER THE WIRE ROPE, if you decide it is necessary, midway between the winch and the anchor point to absorb energy and should the wire rope snap loose. Tree limbs, heavy jackets, chain, back pack and the like may be used for this purpose.



NOTICE
 Always avoid continuous side pulls which can pile up wire rope at one end of the drum. This pile up of wire can damage wire rope or winch.

Establish "no people" zones:



Step 13: MAKE YOUR INTENTIONS CLEAR. Be sure that everyone in the immediate vicinity surrounding the winching operation is completely aware of your intentions before you pull.

Declare where the spectators should not stand — never behind or in front of the vehicle and never near the wire rope or snatch block. Your situation may have other "no people" zones.

Step 14: BEGIN WINCHING. With the winching vehicle's engine on and light tension already on the wire rope, begin winching slowly and steadily. Be sure that the wire rope is winding evenly and tightly around the spooling drum. For additional assistance, the winched vehicle can be slowly driven while being pulled by the winch.

What to look for under load

The wire rope must always spool onto the drum as indicated by the drum rotation decal on the winch.

As you power in, make sure the wire rope winds 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 by using the control switch intermittently to take up wire rope slack. Shock loads can momentarily far exceed the winch and wire rope ratings.

During side pulls the wire rope tends to stack up at one end of the drum. This stack can become large enough to cause serious damage to the winch. So, line up pulls as straight ahead as possible and stop winching if the wire rope comes close to the tie rods or mounting plate. To fix an uneven stack, spool out that section of the rope and reposition it to the opposite end of the drum which will free up space for continued winching.

NOTICE
 Avoid overheating the winch motor. For extended winching, stop at reasonable intervals to allow the winch motor to cool down.

Step 15: FOR VEHICLE RECOVERY, continue pulling until the vehicle is on stable ground. If you are able to drive the vehicle, the winching operation is complete.

Step 16: SECURE VEHICLE. Once recovery of the vehicle is complete, be sure to secure the vehicle's brakes and put the Transmission in "park". Release tension in the wire rope.

RIGGING TECHNIQUES

Various winching situations will require application of other winching techniques. These could range from too little distance to achieve maximum pull using straight line rigging, simply increasing pulling power, or maintaining a straight-line pulling situation. You will have to assess what technique is correct for your situation. Think "safety" at all times.

How to spool under no load

Arrange the wire rope so it will not kink or tangle when spooled. Be sure any wire rope already on the spooling drum is wound tightly and evenly layered. Tighten and straighten the layer if necessary. Keep the wire rope under

light tension and spool the wire rope back onto the winch drum in even layers one layer at a time. At the end of each layer stop spooling and arrange the wire rope in tight even layers.

Repeat this process until the winch hook is a minimum of 4 ft. (1.2m) from the winch. Pinch the hook between your thumb and forefinger and attach the hook strap. Hold the hook strap between the thumb and forefinger to keep tension on the wire rope. Walk the wire rope towards the fairlead, carefully spooling in the remaining wire rope by pulsing the control switch. Store the hook at the fairlead or tensioned to a suitable location to the side.

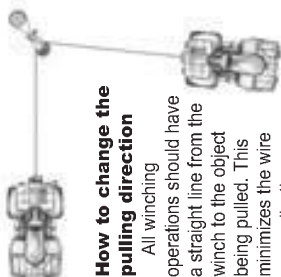
If you do not have the hook strap, use a length of cord or something similar. To prevent serious injury, NEVER put your fingers inside the hook area as you are powering in.



Double line

Because pulling power decreases with the number of layers of wire rope on the winch drum, you can use a snatch block to double line out more wire rope. This decreases the number of layers of wire rope on the drum, and increases pulling power.

Start by feeding out enough wire rope to free the winch hook. Attach the hook to your vehicle's frame and run the wire rope through a snatch block. Do not attach hook to mounting kit.



How to change the pulling direction

All winching operations should have a straight line from the winch to the object being pulled. This minimizes the wire rope collecting on one side of the drum affecting pulling efficiency and damaging wire rope. A snatch block, secured to a point directly in front of the vehicle, will enable you to change your pulling direction while still allowing the wire rope to be at 90° to wind properly onto the spooling drum.

Increasing pulling power

In some cases, you may find yourself needing more pulling power. The use of snatch blocks increases mechanical advantage and that increases your pulling power:



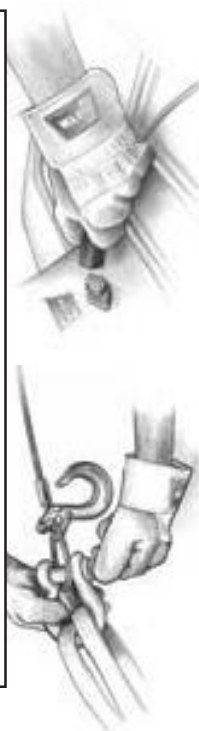
Single line



Double line

Disengage the clutch and, using the snatch block, pull out enough wire to reach your anchor point.

Secure to the anchor point with a free trunk protector or choker chain. Attach the clevis/shackle. Attach the shackle to the two ends of the strap/chain, being careful not to over tighten (tighten and back-off 1/2 turn).



Step 17: DISCONNECT WIRE ROPE. Disconnect from the anchor.

Step 18: REWIND WIRE ROPE. The person handling the wire rope should walk the rope in and not let it slide through the hand and control the winch at all times.

Step 19: DISCONNECT REMOTE CONTROL. Disconnect the remote control cord and store in a clean and dry place. Winching operations are now complete. Put the cap on the solenoid plug in.



WARNING
Always keep hands and clothing clear of the wire rope, hook and fairlead opening during operation and when spooling.

MAINTENANCE

- Inspect the wire rope before and after each winching operation. If the wire rope has become kinked or frayed, the wire rope needs to be replaced. Be sure to also inspect the winch hook and hook pin for signs of wear or damage. Replace if necessary.
- Keep winch, wire rope, and switch control free from contaminants. Use a clean rag or towel to remove any dirt and debris. If necessary, unwind winch completely (leaving a minimum of 5 wraps on spooling drum), wipe clean, and rewind properly before storage. Using a light oil on the wire rope and winch hook can keep rust and corrosion from forming.
- Operating your winch for a long period of time places an extra burden on your vehicle's battery. Be sure to check and maintain your battery and battery cables according to manufacturer guidelines. Also inspect switch control and all electrical connections to be certain they are clean and tight fitting.
- Inspect the remote control for damage, if so equipped. Be sure to cap the remote socket to prevent dirt and debris from entering the connections. Store remote control in a protected, clean, dry area.
- No lubrication is required for the life of the winch.

THE FINAL ANALYSIS

The basic guide to proper winching techniques cannot cover all the possible situations in which you may need to use a winch. In the final analysis, the decisions you make will determine the final outcome. So think through each situation and each step of use. Always be mindful of your own safety and the safety of others. Pay attention and you'll have fun.