



Normally hard-baked clay trails with traction like slick rock had become slick and greasy. Using the brakes was the wrong action.

# RIGGING A WINCH

## PROPER VEHICLE RECOVERY METHODS

BY TOM SEVERIN | PHOTOGRAPHY: TOM SEVERIN

**I**F YOU SPEND ANY SIGNIFICANT AMOUNT OF TIME IN DIFFICULT TERRAIN, YOU'RE BOUND TO ENCOUNTER A RECOVERY SITUATION AT SOME POINT. IT COULD BE EITHER YOUR VEHICLE OR SOMEONE ELSE'S. AND A WINCH MAY BE THE PROPER TOOL AT THAT TIME. THIS IS A GOOD TIME TO REVIEW RECOVERY TECHNIQUES AND RIGGING CONCEPTS. KEEP IN MIND THAT THESE TIPS AND THE INFORMATION PROVIDED HERE ARE NOT A SUBSTITUTE FOR PROPER TRAINING, SOUND JUDGMENT, AND QUALITY EQUIPMENT.

Every winching operation should start with a plan in your mind as to how you'll rig it up. Winching is a risky procedure; proceed very slowly and methodically. You're dealing with material and parts that are subject to a tremendous amount of force. A mistake can be fatal!



### RIGGING A STRAIGHT PULL

The most common rigging is a straight pull. You hook up to an anchor (a tree or rock) directly in front of you and pull yourself out. Or you connect straight on to a stuck vehicle and pull it out.



When connecting to a tree, use a tree strap. A cable around a tree will crush, break, or cut the bark, leaving the tree susceptible to disease and disrupting the flow of nutrients, hurting or killing a tree like the one pictured above. A tree strap also gives a better point to connect the winch line. If you loop a winch line around a tree and hook it back on itself, the steel cable will be kinked, creating a weak point.



Use a 3/4-inch screw pin bow shackle (commonly called a D-ring) to connect the tree strap to the winch line. Pass the D-ring

through both loops on the tree strap and tighten the screw pin finger tight. Then back it off 1/4 to 1/2 turn. This will prevent it from becoming super tight and difficult to remove later. A 3/4-inch D-ring has a working load limit (WLL) of 4.75 tons. It will be stamped on the bow. That translates to 9,500 pounds. Typically the safety margin is at least 5:1. This means that the D-ring will not break until in the neighborhood of 47,000 to 50,000 pounds. Comforting! Don't use anything smaller than the 3/4-inch D-ring. You need at least two D-rings, and this is one case where more is better (six is not too many).

Do not use a recovery strap as a substitute for a tree strap. Typical recovery straps are designed to stretch 10 to 15 percent. It is not a good idea to introduce additional recoil into the winch rigging. The sweet

spot for tree strap length is about 15 feet. Many straps on the market are too short for a stout tree. And as an added bonus, a longer tree strap might just give you the extra foot needed to reach the tree.

Connect the winch hook to the D-ring on the tree so the open side faces up. This is an extra safety precaution. In the event the hook breaks, it will recoil toward the ground.



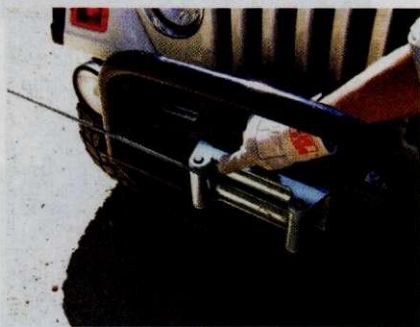
## RATING

Never use any equipment you do not know the load rating of.



This applies to straps, D-rings, pulleys, the winch line, and the winch. Unfortunately, not all of our equipment has the level of safety

margin built into a D-ring. A 5/16-inch steel line is rated at an ultimate breaking strength of 9,800 pounds. On a 9,500-pound rated winch, the safety margin is minimal—almost one to one. Fortunately, we seldom need to pull max loads and there are ways to reduce the load on the line using pulleys. By the way, a 5/16-inch synthetic line is stronger (about 15,500 pounds). And a 3/8-inch synthetic rope can easily be substituted—at 19,600 pounds of ultimate breaking strength. Winch kits often come with a pulley. If the pulley rating is not stamped into the metal, do it yourself. Overtime, stick-on labels are destroyed.



## AN ANGLE PULL

Sometimes, you cannot get in a direct line with the vehicle you plan to recover. Using a pulley, you can bend around a corner for an "angle pull." Even in situations when a direct run could be made, the line may leave the winch at an undesirable angle. Using a pulley allows the line to work straight off the winch. Connect the pulley to a tree strap with a D-ring as before in the straight-line pull.

Under light tension, push down on each side of the strap to test if each one has about the same tension. If not, back off the winch line and rotate the strap a bit. Otherwise, when the load on the rigging finally exceeds the drag from the bark of the tree, the strap will suddenly adjust



and create a spike load. There should be no jerks or surprise spikes of energy introduced that exceed the capability of the equipment. On a big gnarly tree, the strap may get hung up and not rotate smoothly to where it needs to be—exactly half the angle between your vehicle and the one you are pulling out.

No surprise spike of energy applies to the vehicle to be recovered, as well.

If a tire suddenly gets traction and then loses it, letting the vehicle fall back, it will transfer a sudden spike load into the rigging.

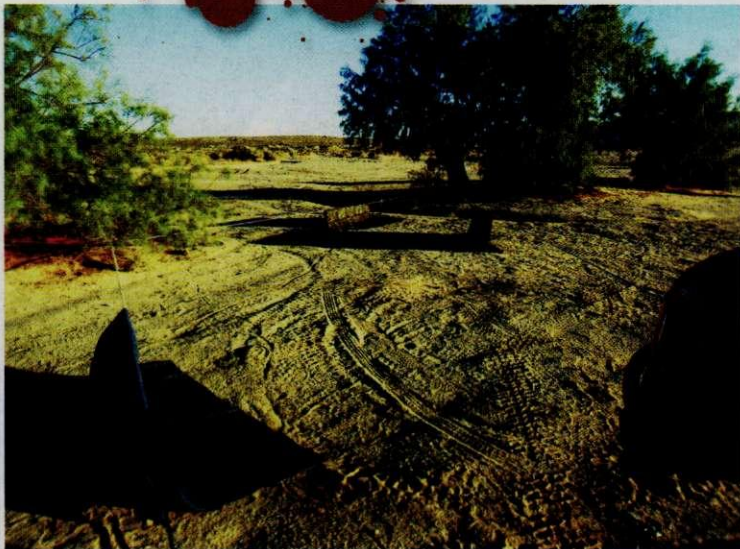
Check that the line does not contact the edges of the pulley. The tree strap is normally flexible enough that it will permit the pulley to rotate a bit so the line runs smoothly through.



## RIGGING A DOUBLE-LINE PULL

Pulleys have some wonderful characteristics we can use to our advantage. Besides changing the direction of the line (angle pull), they can "double the power" of the winch. If you run the winch line straight out to a pulley on a tree (strap) and straight back to your vehicle, the winch will be able to pull twice as much because the full load is split between the two lines and the winch only has to deal with the load on its side. If the load is 10,000 pounds, the winch only sees 5,000 pounds. To move the vehicle one foot now, the winch has to pull twice as much line (one foot from each side). Pulling twice as much line cuts the speed on the ground in half.

# RIGGING A WINCH



## TWO-WAY PULL

The ability to pull a vehicle in two directions at the same time with its own winch is very handy. The vehicle could be in a situation where it is stuck and at risk of rolling over. Or it could be leaning against a rock that will take out the door unless some clearance is achieved. The vehicle needs to be pulled forward and sideways at the same time.

It takes two pulleys and two anchor locations. Naturally there is an ideal location for these anchors, but use what nature has provided where it is. Put a tree strap and pulley on an anchor somewhere in front of the vehicle. Place a second pulley on an anchor somewhere to the side and a bit in front of the vehicle. The winch line runs through the first pulley to the second pulley and then back to a location on the side or rear corner of the vehicle.

Use another tree strap to make the connection to the vehicle. The strap is less likely to damage the vehicle if it comes in contact. A strap can usually be looped through a rock rail or to a recovery point on the bumper. Rock rails make nice anchor points. In a worst-case situation, open the doors and run the strap through and over the roof. Don't just run a strap through the windows; it will crush the thin slot the window rolls up into.



The rigging pulls the vehicle in two directions, forward and sideways. During the recovery, attention needs to be focused on the rear tire bead. Too much sideways angle and the bead may roll off. It is an angle change only. Neither pulley increases the winch power.

The same result can be accomplished with one pulley and one anchor point. There is more risk of the line along side of the vehicle coming in contact with the vehicle. It will move closer and closer to the vehicle as the winch operation proceeds.



## PULL PAL

An anchor can be established anywhere it is needed with a Pull Pal. Sometimes, the only anchor available is the one created with the Pull Pal. Sand dunes come to mind.

Assemble the Pull Pal and place it where an anchor is needed.

Actually place it one or two feet behind where it's needed. It will

be dragged a short distance in the process of burying it. As a precaution to recover the Pull Pal after use, loop a strap around the base where the spade attaches.

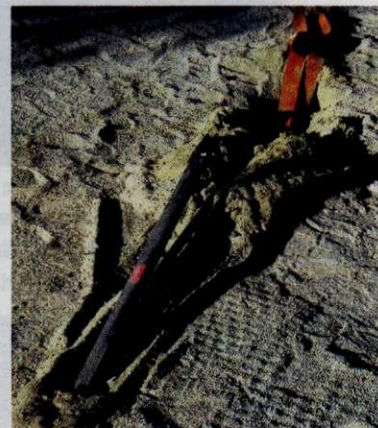


Then rig up your winch and connect it to the Pull Pal with a D-ring. The Pull Pal will bury itself as you start winching. Eventually, it will become like a solid anchor, and the stuck

vehicle will start to move. It will put an initial load on the rigging, so make sure all your connections look good before putting the full load on the winch to bury the Pull Pal.

On hard ground, someone will need to steady the Pull Pal until the spade has dug itself in six to 10 inches.

Recovery operations are a fact of off-road driving. While hazardous by nature, you not only clear your vehicle by using proper equipment and technique, you ensure that you are around to drive another day. **OR**



## WINCH SAFETY

### BASICS

- Wear heavy leather gloves
- Be sure everyone is clear of the line
- Inspect the winch and line prior to use. Do not use a cable with a kink
- Never step over or straddle a winch cable under tension
- Walk the line—do not let it slide through your hands
- Stay an arm's length or more away from the fairlead



▲ A destroyed winch cable

### RIGGING

- Use hand signals with an assistant
- Never use the winch as a tow strap
- Do not use the winch for lowering
- Make sure the anchor is secure
- Never hook the winch back on the winch housing
- Never hook onto a tow ball
- Keep at least five wraps of line on the drum (eight wraps for UHMWPE rope)
- Drape a blanket over the cable (called a

parachute)

- Connect the winch hook with the open side up—hook up
- Make sure the recovered vehicle is secure before releasing rigging

### WINCHING

- Do not run over a winch line with tires
- Keep tension in the line until winching is completed
- Do not slide the winch cable along sharp objects



▲ Here's a good candidate for a two-way pull. It needs to be pulled forward and left at the same time.

## THE SOURCE

**AMERICAN EXPEDITION VEHICLE (AEV)**  
(248) 926-0256  
www.aev-conversions.com

**BADLANDS OFF-ROAD ADVENTURES**  
(310) 374-8047  
www.4x4training.com

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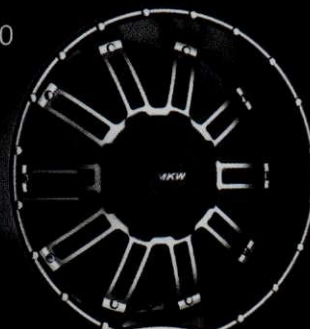
**PULL PAL**  
(970) 963-4507  
www.pullpal.com

**SUPERWINCH**  
(860) 928-7787  
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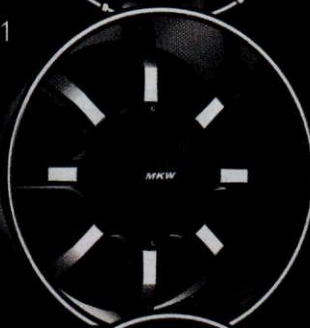
**VIKING OFF ROAD**  
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