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Bob.Wohlens@discoveroffroading.com. You can access, download, and read previous newsletters on my website by clicking [HERE](#). Look through the Newsletter Reference for a topic that may interest you, or download them all!



Off-Roading Snowy Trails



Survival Preparation

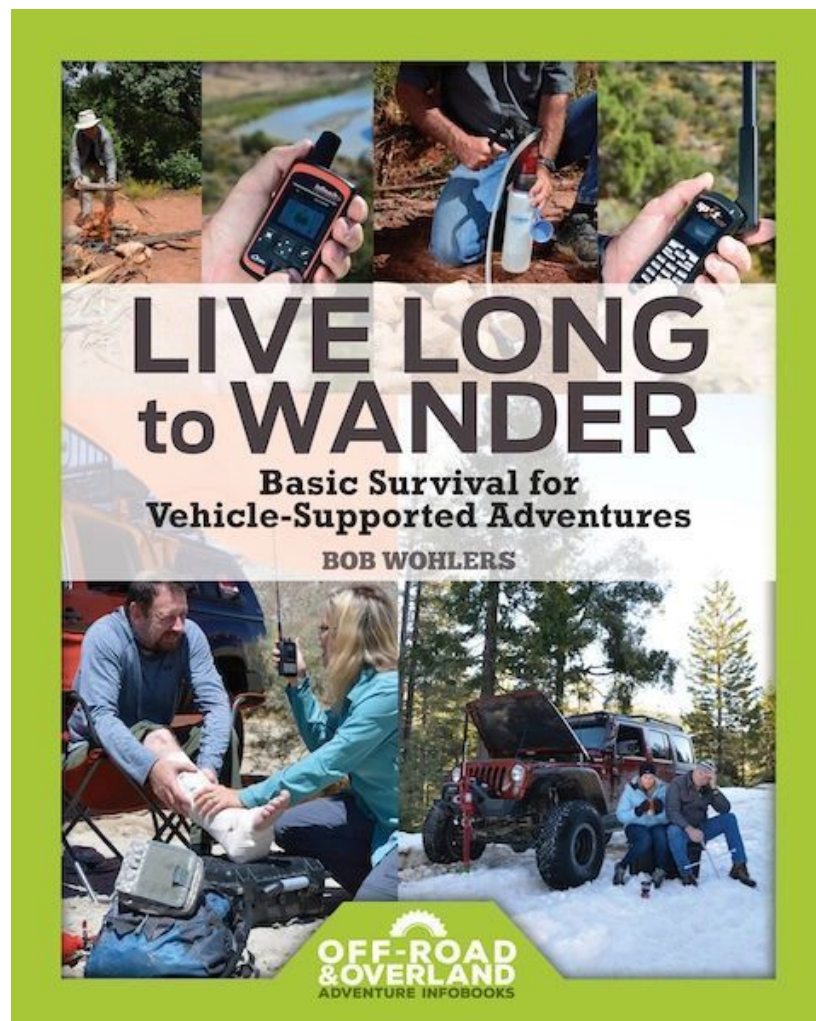
If you've taken one of my 4WD courses, you know what I mean by the acronym RSI. Remote, Solo (no other vehicles with you on the trail), and International. I generated this acronym some years ago to clearly identify the conditions under which off-road problems (getting stuck, mechanical problems) would be magnified.

Stop for a moment and think about this acronym. The "context" for off-roading does not get worse should your vehicle get stuck or malfunction. Add extremely low (or high) temperatures to being RSI and it's easy to envision that the non-prepared can easily perish in the remote backcountry.

I wrote my book "Live Long to Wander - Basic Survival for Vehicle-Supported Adventures" to help off-roaders should the unexpected occur in the remote backcountry. Unlike most off-roading books, this book can save your life by helping you proactively prepare for the unexpected.

When exploring on snowy trails in the remote backcountry, your risk of real harm is high if you are unprepared. You shouldn't flippantly turn off the pavement and head into the remote backcountry on a snowy trail without some important survival items in your vehicle and the knowledge of how to use the equipment. All you need to know on the topic of survival for winter wheeling is beyond the scope of a short newsletter. I strongly suggest you purchase "Live Long to Wander – Basic Survival for Vehicle-Supported Adventures" before your next winter excursion. You can purchase this book [HERE](#).

As a final note on backcountry winter survival, take along more warm coats, gloves, hats, and blankets than you might need. I wear waterproof boots, wool socks, thermal underwear, and ski pants. Often, I have more food and drinks in the vehicle than needed. Be totally prepared to spend the night in the freezing backcountry should your vehicle breakdown.





What is Compression Terrain?

Compression Terrain is sand, snow, and mud. Why lump these different types of terrain together? It's because you can drive all three in a similar fashion even though the three types of compression terrain differ.

It is important to note that the traction a vehicle can secure from the same type of compression terrain - sand, snow, or mud – can differ at different times of the day and geographical location. For example, the amount of traction a vehicle can secure in the mud in Eastern Texas is different than the mud on the Baja Peninsula. Beach sand can be different than sand found in most dunes. Sand and snow can also differ based on the time of day. In the morning there's often more moisture in the sand giving it more traction and less compression than sand heated by the sun in the afternoon. Similar with snow. In the morning the crunchy frozen snow on a trail may provide more traction than in the afternoon when the trail is more slushy and slippery. The time of day and amount of sun hitting a snowy trail changes its characteristics.

The good news is that you can mostly forget the minor differences between the diverse types of compression terrain. Begin with basic safe driving techniques in compression terrain, then modify your techniques when they fail. Further, there are few "never do this" or "always do this" guidelines in off-roading. Learn how your vehicle works completely, then modify your driving techniques when navigating a specific type of terrain.



Different 4WD Vehicles Are Driven Differently in Varying Types of Terrain

Every make, model, and year vehicle is driven somewhat differently over different terrain. Am I saying that there are only two essentials that can change when driving off-road? Yes. Here they are:

1. The make, model, and year vehicle you are driving off-road.
2. The type of terrain you are driving that vehicle on.

Let me explain this concept using a personal example. When I am driving my PowerWagon with a heavy camper on a particular trail, I will drive it much differently than I would drive my two-door Jeep TJ on that same trail. Even after 45 years of off-road experience, when I switch vehicles that I own, it takes me at least a day to get my head re-wrapped around the vehicle I've not driven off-road for a while. When I jump in a vehicle completely unknown to me, it may take me even longer.

Let's relate this truth to driving on snowy and icy trails. First, you may have lots of experience in your 4WD vehicle on rocks, in mud, and on graded gravel trails. But do you have any experience with your vehicle on snowy trails? If not, the point I'm trying to make here is to start your learning process in a mature manner. Don't tackle really challenging snowy trails the first time out. Practice on easy snowy trails with different gearing combinations, airing down tires or putting on snow chains, and different recovery techniques in the cold. Venture out with other vehicles at first, rather than exploring solo.



Vehicle Set Up and Equipment Needed to Drive Snowy Trails

You need to focus on your vehicle's fluids. Since you will probably be dealing with freezing temperatures on a snowy trail, make sure your engine's fluids can handle the cold. First, reference your owner's manual for winter tips specific to your vehicle. Pay attention to your engine's coolant. Frozen coolant can cause engine overheating and inefficiencies, even engine damage. Make sure you have the correct anti-freeze coolant in your vehicle and the right "mix" – water to anti-freeze ratio. Personally, I like pre-mixed coolant rather than the concentrates. Next check your oil. Some vehicles require a thinner oil to operate effectively at freezing temperatures. Don't forget your windshield wiper fluid. Pure water is a no-no in the winter. Use an anti-freeze type windshield wiper fluid all winter. For overlanders with larger freshwater receptacles in campers and the like, make sure you don't freeze the water in these containers or your plumbing if you have any.

Turn your focus on snowy trail traction and how you should set up your vehicle for winter adventures. Here's some basics. You **MUST** have excellent tires. Newer tires with great tread are best. Different types of snow on a trail allow different types of tires to excel. Generally, I like narrow tires rather than wide fat tread. Skinny tires cut through most types of snow better than wide tires.

On fresh powdery snow I like mud-terrain (MTs) type tires as they are designed with more aggressive tread with large spaces between lugs. The larger spaces allow the compacted snow between the lugs to be "thrown" out of the spaces when you move. I also like tires rated for the snow. Tires for snowy trails can be a long dissertation and provide plenty of reader feedback (even arguments). For the purposes of this abbreviated newsletter, I'll stick with these few important tire tips.

To help your tires secure traction on snowy trails you will typically air down for a larger tire footprint. I often let out fifty percent of my tire's pressure. For example, if your driver's side door sticker says that the on-highway tire pressure should be 60 PSI, I will remove enough air from my tire to read 30 PSI. The exact air pressure you off-road with on a snowy trail will partially depend on the type of snow on the trail. In fresh powder, I may remove more than fifty percent of my tire's pressure, however without beadlock rims I almost never go lower than 15 psi in a tire. You will have to experiment with tire pressures in your specific vehicle and when driving on different types of snow. Don't be afraid to modify your tire pressures to find the right traction. Obviously when you air down tires for off-roading, you'll need a method of airing them back to pavement PSI – compressors or CO2. As most of my 4WD students know, I'm partial to compressors sold by **Extreme Outback Products**. I also use **PowerTank's** CO2 systems for airing up tires.

When I off-road on a snowy trail I almost always carry tire chains sized to my vehicle's tires. Chains are traction-aiding devices and especially important on icy trails. When I do carry chains, I always take a set of four. Yes, I said always. Okay, two sets are better than none, but I carry four sets – one for each tire. For over 15 years I've purchased my chains from tirechain.com. The only type of chains I've recently purchased are their 3.8mm Diamond style, although I do own other styles. Their Diamond style chains are tough, lighter than most styles of chains, and go on/come off quickly without moving the vehicle. This last point is huge. TireChain.com's Diamond style can be fitted to each tire on your vehicle without having to roll forward/backward over a laid-out chain on the ground. This feature is especially helpful if you wish to put chains on your tires once you are already on the trail.

Before you purchase any style chains for your vehicle, make sure that you CAN put chains on your tires. Some makes and models of vehicles have restricted chain use. One other note for off-roaders. Do not put chains on aired down tires. If you are going to use chains off-road you need to install them on fully inflated tires. You need to decide on your "method" of securing traction when driving on a snowy trail: 1) Air Down Tires, or 2) Use Chains. You really can't do both as the chains will be too "sloppy" on aired down tires. Sloppy chains can cause wheel well damage or damage to shocks, air bags, springs, etc.

I can't remember ever off-roading on a snowy trail without having with me a set of traction boards. Four boards are better than two and I personally like **ActionTrax** boards, based on personal use and testing of various types off-road. I like the DuPont material ActionTrax are made from.

Make sure your windshield wipers are new – I like the silicone type as they

seem to brush away heavy snow better. In my mind you absolutely need recovery points front and rear should you need to pull on your vehicle or realign it on a trail as it begins to slip sideways on a narrow off-camber trail. I also like having a winch and a healthy amount of recovery gear (I'm partial to **Factor 55** gear) when I off-road on snowy trails. My winch has saved me (and others) a couple of times in the winter. In my opinion, you must always carry a shovel off-road, so that's a given piece of equipment in the winter.

Driving on Snowy Trails

It's impossible to discuss off-roading on snowy trails without an overview of vehicle gearing. I like 4WD-High range when driving on most types of compression terrain. That said, I can be found driving on different types of snow and in different situations in 4WD-Low for extra torque – especially when I drive up and down steep hills. The general problem with extra torque on compression terrain like snow is that wheels can easily break traction and begin to spin resulting in little or no vehicle movement. (Lots-O-Torque and Little Traction = Spinning Tires = Little/No Vehicle Movement)

Also, I like using the manual-mode of my automatic transmission. I rarely drive on snowy trails in “D.” I intelligently choose the correct transmission gear while driving. If I head up hill in a certain transmission gear, I stay in that gear all the way to the top without shifting regardless of what the engine's RPM is reading. You can “redline” an engine's RPM for a short period of time without engine damage. Of course, there are multiple considerations on this topic. These tips are generalities. Particularly on snowy trails, I do everything I can to avoid a “failed hill climb.”

Regardless of a vehicle's gearing, momentum is your friend while driving on compression terrain. Speed is not often your friend on snowy trails. Knowing the difference between momentum and speed is what I loosely call the “Zen” of off-roading. It is relaxed and calm off-roading. “As slow as possible, as fast as necessary” is the guideline for this approach. The faster you drive on snowy trails the longer it takes you to stop. Drive with this much reduced stopping power in mind when on snowy trails.

When driving snowy trails (or any terrain) avoid spinning tires that are not gaining traction. Get off the gas once spinning tires begin. Often, spinning tires on a snowy trail are a precursor to bad events to follow – roll over, tip over, slipping off the trail, etc.

I have front and rear lockers in all my vehicles. I've found engaging my rear

lockers on snowy trails helpful. My rear lockers can help me maintain momentum when driving a straight line. If I need to tackle a steep snowy hill, I often engage both front and rear lockers proactively before starting straight up the hill.



When you are the first vehicle to drive on a deep snowy trail after a storm, be careful of hidden objects – rocks, downed trees, etc. In this situation, I drive very carefully and slowly. I've witnessed fools “plowing” at speed through deep fresh powder only to hit something hidden beneath the snow. This is a sure way to break something on your vehicle. Trail repairs in the snow can be a danger (e.g., vehicle slippage and hypothermia).



When driving on a snowy trail that's been previously traveled by vehicles, there

can be ruts. When the snow is deep on the trail so can the ruts be deep. Like the ruts in mud, snowy trail ruts can be difficult to avoid especially on narrow singletrack trails. On some trails you will be forced to drive in these deep ruts. Deep snowy ruts restrict steering making them difficult to exit. Ruts are also difficult to cross perpendicularly. Your vehicle will often have a propensity to “fall” into these ruts whether you like it or not. Relax. In my experience the ruts are often the best place to position your tires. Snowy ruts allow you to envision the best “line” on the trail and secure the best traction. If you need to exit your line while in the ruts, be cautious. It’s easy to high-center your vehicle on the elevated snowy berms once you exit a rut and if the snow is hard, breaking steering or suspension components is possible.

Be Safe Out There... I Care About Your Ability to Have Quality Adventures.



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