4 X 4 Driving Techniques
What you really need to know

Whether a veteran driver or a beginner with a stock vehicle there are some basics of four-wheeling that everyone should know and/or review. These are the basic premises.

Along with driving off road comes responsibility. Responsibility includes more than telling someone where we're going and when we'll be expected back. It also means responsibility for the land on which we drive.

Whether you are new to the sport or an old trail hand, remember that driver experience wins out over vehicular modifications in most situations. An experienced driver will recognize what terrain is beyond the limits of his/her vehicle and know when to call it quits. Likewise, a good driver can be capable of taking a stock vehicle through obstacles that the wallet-job rig and the new-to-the-sport driver combo can't do. With a stock or lightly modified rig, driving techniques definitely come into play. Knowing how to use throttle, gravity, and inertia is also important and often makes the difference between getting through a bad section or getting stuck and needing a tow. The **KEY** is not to overdo it, but to use these variables to your advantage.

Different types of terrain often require somewhat different techniques, so following are some excellent tips for special situations.

The Ten Basics

1 – Put on your seatbelt, and instruct passengers to put them on as well. A good belt will help restrain you when driving difficult terrain, and can save your life in case of a rollover or other accident.

2 – The first thing you do when you get to the trail is to put the transfer case in four-wheel drive and lock the hubs if your vehicle is so equipped. Your control is then increased, braking is improved, and you won't get stuck as fast when you make a mistake. This also spreads the traction over four tires instead of two, minimizing breakage of drivetrain parts, and also putting less stress on the terrain.

3 – Using low range in the transfer case is another asset that many beginners forget. In low range the available power is greater and the speed with which you can drive is diminished. By driving slowly over obstacles you're more likely to make it to the other side instead of breaking your rig or yourself. Most experienced drivers stay in 4-low range throughout the trail ride.

Going downhill is also easier in low range, as compression braking from the engine is increased. This allows you to stay off the brake more often for optimum control.

4 – Watch the driver in front of you and see how they make it through. You can learn a lot on what to do and what not to do. Get out and walk the trail and examine the obstacle before you drive through if necessary. Walk ahead and look back, as the view is different from the other direction, and other features of the terrain become apparent.

5 – While gripping the steering wheel, make sure that your thumbs aren't wrapped around it. If the wheel should suddenly whip around from a tire hitting a rock, your thumbs won't get broken or sprained.

6 – Turn your stereo off, so you can hear what your vehicle is telling you. The sounds of slipping tires, scraping metal, and engine rpm can all help you be a better driver, but not if you can't hear them.

7 – Know your rig inside and out. This means being familiar with all the controls in the cab, as well as how to use them for what purpose. This includes transfer case and locker controls. On the outside, make a mental note of what hangs down underneath, and what side the front differential is on so you won't bang the underside on obstacles.

8 – Staying off the clutch unless you absolutely need it is important in many situations. Usually automatic equipped
4 x 4s can have an easier time crawling over rocks. Once you push in the clutch you've unhooked the drivetrain, and only your brakes will be holding you on a hill.

9 – Consider lowering your tire pressure according to the terrain and speed. Tire pressure lower than the manufacturer's recommendations can provide greater tire traction, flexibility, flotation, and a smoother ride on rough roads. Because the tire will tend to spread out at lower pressure, a bigger footprint is formed, but the tire is more susceptible to sidewall damage. Common air down pressures average 12 to 20 pounds depending on sidewall stiffness and terrain. Remember to air back up to specs when you hit the pavement.

10 – If you are unsure of what you are doing while driving an obstacle, ask someone to spot you over the tough areas. An experienced spotter can be your best ally and get you through the obstacle safely. Remember, though, that you as the driver are the one in command, and it's your decision to trust the spotter or not.

Tips for Special Challenges

1 – **Dirt Roads**: Known as fire roads, two tracks, or graded highways, these can be as difficult to drive as a good boulder patch. What looks like a smooth road where you can get some speed up can get you into trouble at a moment's notice. It only takes one washout, bad pothole, or rock in the road to cause you to lose control or damage your rig. Washboard roads can leave you without directional control as you hop over the bumpy surface. Slow down to the most comfortable speed you and your rig can handle, which also allows the dust to subside a little. Remember, you can't avoid what you can't see, and dust can be a serious hazard.

2 – **Sand**: Higher gears are great for sand, as speed and momentum keeps you flying on top rather than sinking in. Depending on the type of sand, from fine to coarse and from wet to dry, different speeds and gears may need to be used. Lowering air pressure and running wide tires help in the flotation department as well.

3 – **Mud**: Mud is a way of life in many portions of the country, and your local mud matrix may be different than that of other areas. Different consistencies of mud call for different styles of driving. Some mud responds to fast driving with a lot of wheel spin, while others may do better with a slower gate with just enough spin to clean out the tires. Like in snow, skinny tires can dig down to the hard stuff, while wide flotation tires can keep you on top of the goo. Regardless of what the mud is like, a steady forward progress is always needed. Remember, if the rig is not moving forward and your tires are spinning, you are probably going down!

4 – **Snow**: Driving in snow and ice can be extremely dangerous. The number one rule for snow is – Pay Attention! Out on the trail the snow-covered ruts can be treacherous to traverse since the trail may look smooth with a fresh white blanket on it. Underneath the snow can be deep ruts, holes, logs, and rocks which may snag your underside, so going slow is a benefit here. Things can get very slippery. Fresh powder can give you very good traction. Watch out for off-camber side hills as well as going downhill, for spinning your tires in these situations can cause a slide which gravity will want to reinforce. Go easy on the brakes to minimize sliding, as a rolling tire can give more steering and braking control than those that are locked up by a heavy foot on the brake.

5 – **Rocks**: Lowering the air pressure and going slowly is the best recommendation for rocky trails or hard-core rock crawling. Tires should be placed on **TOP** of the rocks, which allows the axle and undercarriage to avoid hitting the boulders. Your lowest speed that keeps your momentum going is usually the best. If you go too fast you end up bashing and crashing while hurting your rig and generally getting stuck. Rock crawling is truly the home of elegant driving! One way to stay in control with an automatic transmission is to use one foot on the brake and one on the gas.

6 – **Water Crossing**: Driving through water can be as hazardous as any other terrain. The swift current, unknown bottom conditions and possibility of engine damage can ruin a nice 4 x 4 outing. Check the depth and bottom conditions before you attempt to drive across a stream. Look to see where others have made it, and imagine what happens if your rig floats or gets washed downstream. Cross streams and rivers at an angle upstream to prevent the force of the water from pushing your vehicle downstream. Know where your engine air intake is, and be sure that it is not lower than the deepest part of the stream you are crossing. If water gets into the cylinders of a running engine it will hydrolock the engine, stopping it cold, and probably bending a connecting rod. You are then in serious trouble. Avoid spinning your tires on rocks when your tires are wet, as your tires can be cut by the rocks much more easily.

7 – **Hills and Dirt:** Usually a steady speed with momentum is adequate, depending on the surface. An occasional blip of the throttle can bump you over some ledges, but rarely will full-throttle attack do much more than break stuff. When climbing or descending a hill, keep straight up or down, and don't turn around on the side of a hill. Know when to quit, and how to back down in a straight line. The steering seems much more sensitive (and backwards) when you are backing down a hill, and miscues and rolls are common. Descending a hill is best done in the lowest gear, for maximum compression braking. Even automatic transmissions will have some compression braking, and a light foot on the brakes is better than locking them up and sliding.

The tires must be rolling to have control so if you start to slide you need to give it a little gas and be easy on the brake pedal, which may be the opposite of your instinctive nature.

Safe Winching
Some Tips on Proper Winch Usage

A winch is a valuable tool to have when you're out on the trail. But like any tool, there is a right way and a wrong way to use it. Use a winch properly and it will serve you faithfully. Use it improperly and a winch will put the big "hurt" on you, your vehicle, or some innocent bystander.

Since no one wants that to happen, here are some winch usage and safety tips. Keep in mind that these are general guidelines, and you should always refer to the owner's manual for complete instructions on setting up and using your particular winch.

Choosing a Winch – One of the keys to safe winching is to choose the right winch to fit your needs. This should include:

- Gross Vehicle Weight (GVW). To calculate your vehicle's GVW, determine its curb weight (check your owner's manual or manufacturer literature), then add in the approximate weight of equipment you'll have in and on the vehicle.

- Line Pull. The rated line pull of the winch must be high enough to pull your vehicle's GVW while overcoming any resistance, like being stuck in a mud bog or on an incline, for example. It is recommended that you select a winch with a line pull rating at least half again greater than your vehicle's GVW.

Winch Usage Tips – Here are just a few general usage and safety tips.

- Inspect the wire rope before and after each winching operation. If the rope is kinked or frayed, replace it. Inspect the winch hook and hook pin for signs of wear or damage and replace if necessary. Using a light oil on the wire rope and winch hook can keep rust and corrosion from forming.

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

- Never winch when there are less than five wraps of wire rope around the drum.

- 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 "bungie" straps, as they can snap and cause serious damage.

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

- Be sure that everyone in the immediate vicinity is aware of your intentions before you pull. People should not stand behind or in front of the vehicle and never near the wire rope or snatch block. Your situation may have other "no people" zones as well. Be alert.

  Throw a heavy blanket over the wire rope midway between the winch and the anchor point to absorb energy should the wire rope snap loose.

- Winch out a vehicle slowly and steadily. If necessary, you can winch at an angle. Be cautious of cable buildup on one side of the winch drum. Do not try to guide the cable while winching as this could result in serious injury. After you are clear of the obstacle, pull the cable out and rewind.

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

How to Choose an Anchor Point –

A secure anchor is critical. It must be strong enough to hold while winching. Natural anchors include tree stumps, and rocks. Hook the cable as low as possible.

The anchor point should allow 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. Choose an anchor point as far away as possible to give the winch its greatest pulling power. Never attach the winch cable to itself around an anchor point. Use a nylon sling and shackle to prevent damage to the wire rope and the anchor point.

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 the wheels to prevent your vehicle from moving.

It is highly recommended that you use a pulley block. The block can double the pulling power of your winch, and is very useful for pulling yourself out and for both direct and indirect pulling.

Trail Spotting Guidelines

Ask if the driver wants help. Not everyone needs or wants a spotter.

The driver should be the one to pick the spotter.

There should only be one spotter at a time.

The spotter should be visible to the driver at all times.

The spotter should use hand signals at all times. Verbal instructions are good but may not be heard.

The driver must trust the spotter. No signal, no movement.

If your spotter turns to walk ahead stop your vehicle.

Be safe, take it slow!

Spotter Hand Signals

Stop: Both hands in fists.

Move Forward: Palms toward the spotter, move fingers toward spotter.

Turn: Both arms pointing in the desired direction of travel.

Back Up: Fists with index fingers pointing backwards.

Tire Lifting: Palms up, lift hand on side of lifting tire.

Distance to Obstacle or Drop: Palms facing together indicate distance.