

The Art of 'Wheeling

by Richard Miller

In my continuing effort to provide useful information and resources on our web site, I'm beginning a series of articles dealing with different aspects of four-wheeling. From off-highway driving techniques to approaches to building your 4x4 to benefits of particular upgrades, I'll cover a wide range of topics that I hope you'll find useful.

For the first installment, I'll cover tips and techniques for negotiating a challenge that each of us has encountered at one time or another – mud. Why did I select this as my first topic? Well, the topic is fresh in my mind due to a recent trail ride that happened to fall on a rainy Saturday following a week of heavy rains. Long story short, it was long day of winching, snatch-strapping, pushing, and sliding. The resulting body damage to our '96 Cherokee XJ (from a run-in with a tree or two) was not unexpected, but that trail ride reminded me why mud falls near the bottom of my wheeling preferences. Not that I mind the inevitable mud hole on the trail, but after several bad experiences with the stuff, let's just say I don't intentionally seek it out... ;-)

MUD TECHNIQUES

The first thing to understand about mud is that there's no single, all-inclusive approach to successfully navigating it. With the possible exception of snow, mud is arguably the most diverse and deceptive obstacle you'll face on the trail. The consistency can vary wildly from "chocolate milk" to thick clay and everything in between, and each type may require a different approach to overcome. So rather than try to give you a generic answer on conquering the brown stuff, I'll provide basic guidelines on what it takes to do so.



EQUIPMENT

The single most important key to overcoming mud is traction, and the best place to start this discussion is tires. Most manufacturers outfit new vehicles with all-season street tread tires or very mild all-terrain tires designed for long life and a quiet ride. Subject these tires to even a small amount of mud and the tread becomes completely caked, causing the tires to spin and yielding little if any traction. So if you intend to use your vehicle at all off the pavement, an upgrade is required. There are dedicated "extreme" mud tires designed specifically for the wettest, nastiest environments such as the Interco Super Swamper TSL and Bogger, and if your four-wheeling is done primarily in mud these are by far the best choices. For the dual-purpose 4x4 that is driven daily but also sees moderate trail use, a better choice is a bread and butter mud-terrain tire such as the BFGoodrich Mud-Terrain T/A KM, the ProComp Xtreme M/T, or the Mickey Thompson Baja MTZ. These tires provide vastly improved noise, ride, and wear characteristics while retaining enough of an aggressive design to power through most any mud. A good mud tire will incorporate aggressive tread blocks, sidewall lugs, high-void tread pattern (lots of space between lugs), and self-cleaning features that keep the tire from retaining mud, especially while spinning. An aggressive all-terrain tire such as the BFGoodrich All-Terrain T/A KO or the Cooper Discoverer S/T will also perform well in light to moderate mud, but will tend to be overwhelmed in deep thick mud.

The second piece of hardware that will help get you through the brown stuff is a traction aiding differential. This can be a limited-slip differential (also called “posi-traction” or a “posi”), an automatic locking differential, or a selectable locking differential. As you probably know, an open differential sends the engine’s power to the tire with the least resistance/traction. This means that once you start spinning a tire in the mud, all of the power sent to that axle will be routed to the tire that’s spinning, while the tire with traction will sit idle. A limited-slip differential will progressively engage when a tire starts spinning, directing power to the opposite tire, maintaining forward



progress. Many vehicles offer OEM limited-slip differentials from the factory, and aftermarket units are also available such as the Detroit Tru-Trac and Auburn limited-slips. There are automatic locking differentials (such as the Detroit Locker and LockRight) that engage automatically, and selectable locking differentials (such as the ARB Air Locker, Auburn ECTED, and Ox Locker) that are engaged by the driver, but all locking diffs provide 100% lockup so that both tires spin at the same speed. A traction aiding differential paired with a good set of aggressive tires can be the key to getting home without getting stuck.

LIFT HEIGHT

What does lift height have to do with mud, you ask? Indirectly, a lot. Lift by itself won’t gain you much advantage in mud, but it makes room for larger tires that lift your chassis above the mud. If you’ve ever tried to drive through a deep, thick mud hole, you’ve probably sunk to the point that your axle assemblies begin pushing a wall of mud in front of them. At that point, your 4x4 is performs like an anchor, and you’d need to overcome the considerable resistance of your mired vehicle to maintain forward progress. Larger tires via installation of a suspension and/or body lift can increase your clearance and help you avoid this situation.

POWER

That’s right; performance is one of the key ingredients if you routinely encounter deep mud. The additional resistance of the brown stuff sucking at your vehicle requires more power and torque to overcome, and this is multiplied in an uphill situation. As discussed earlier, mud tires are designed to clean themselves when spun which provides more traction – this means your rig has to have enough power to spin those tires. Which is why a key ingredient to building a competition mud-bog vehicle is a built V8 engine. This doesn’t mean you have to run out and order a new crate engine, but consider adding some well chosen performance upgrades to your vehicle. It’s not too hard to coax some additional power and torque out of your engine with a high-flow exhaust, performance headers, and a performance air filter/intake. There are a couple of caveats here: 1) Big-block power won’t do you any good unless you address traction first – all you’ll succeed in doing is providing some entertaining mud-sliding antics. 2) Lower axle or transfer-case gears can also multiply your engine’s available power, but avoid ultra-low gears if you spend a lot of time in the mud. Too low a crawl ratio can cause you to spin your tires in just about any gear without intending to.

RECOVERY

This may seem like a no-brainer, but it's important to mention. If you 'wheel in mud, you will eventually get stuck. When you do, you have to have solid recovery points on the front and rear of your vehicle. These can be tow hooks or D-rings attached to the frame or a heavy-duty bumper, but they must be securely tied to the frame and rated for any pull you might attempt. Keep in mind that you may be offering someone else a strap, and their vehicle may be significantly heavier than yours; consider this when selecting your equipment. A quality vehicle recovery winch is an ideal companion and a necessity if you ever 'wheel alone. A recovery kit that includes items such as a Hi-Lift Jack, a snatch-strap, a heavy-duty tow chain, extra D-rings, and leather gloves can mean the difference between driving home or walking home.



Okay, so I've covered the equipment that will help you to successfully negotiate mud. Chances are you're building your 4x4 on a budget, and you don't have all of the above items installed yet. This doesn't mean you have to stay on the asphalt. By employing the following techniques, you can still attack the trails with a good chance of success.

KNOW YOUR LIMITATIONS

Not just a great Clint Eastwood quote, this is a great approach to adopt for four-wheeling in general, but especially in mud. Knowing that the above equipment contributes to success in mud, use the knowledge of what you don't have as you size up an obstacle. If a Jeep with 35" Boggers and plenty of clearance sinks to the headlights in a mud-hole and struggles to get out the other side, the message to you with your 29" street tires and stock lift height is to take the bypass or suffer some ugly consequences. If you're running 33" A/T tires with a 4" suspension lift, but you have a front-mounted winch and solid tow points, pull your winch cable for easy access and proceed with caution. Don't let the well-intentioned ribbing from observers goad you into something you'll regret later. It's also a good idea to consider beforehand the potential body damage and the amount of mud/water exposure you're comfortable with. Are you okay with small dings and paint scratches from hidden stumps and logs? Can you handle saturating the interior of your new \$30k 4x4 with smelly mud and water if you get stuck in a bottomless hole? Deciding your comfort level before you're in the heat of the moment can save you a lot of trouble.

DON'T 'WHEEL ALONE

This is another one that seems obvious, but you'd be amazed how many people do it. The deceptive nature of mud can allow you to get in over your head when you think an obstacle is safe. Many times, a judicious application of throttle and some friends to rock and push is all that's required to get you moving again. Other times, a snatch strap and gentle tug will pull you right out. If you find yourself alone in one of these situations, you're out of luck.

CHECK IT OUT BEFORE DIVING IN

If you approach a mud hole, scout it out before proceeding. Looks can be very deceiving! Find a sturdy stick (or carry a length of 2x4 with you) and probe the bottom of the hole. If you can't touch bottom, find a bypass. If you can touch bottom, check the depth and also check the consistency of the bottom. It may be solid and rocky, or you may be able to push your "probe"

down another two feet! Also check the angle of escape at the exit – is it a vertical wall, or is it a nice gradual slope? This will give you a good idea of what to do.

COMPENSATE AND ADJUST

When driving in slick mud (it doesn't have to be deep), you lose some control in every aspect of driving. It takes longer to get up to speed, it takes longer to stop, and your steering inputs may or may not produce the desired result. So it's important to look further ahead down the trail and compensate with your driving style. Give yourself more time to stop. Calculate your speed and clearance around turns. Be careful stopping on an uphill obstacle – you may need continuous momentum to make it. Also be very aware of side hills – any off-camber sections will cause you to slide toward the low side of the trail, so position yourself up high to begin with.



SLOW AS YOU'RE ABLE, FAST AS YOU NEED

Considering the last point, it makes sense to slow down on wet, slippery trails. However, you'll find that when dealing with mud, it's much more likely that you'll need to utilize momentum to overcome an obstacle. Some of the trickiest obstacles will involve mud and an uphill climb. A hill that can be crawled in compound low gear when dry will generally require momentum when wet and muddy. In instances where you encounter tire spin and loss of forward motion, back up and shift to a higher gear, then make another attempt with slightly more

momentum. Avoid the urge to just drop the hammer and blast through – although there are rare times when this is the correct approach, it more often results in broken parts and/or loss of vehicle control. If you're spinning your tires but maintaining constant forward progress, stay on the throttle – this means your tires are cleaning themselves of mud and getting traction. In this scenario, avoid using the clutch to shift to the next gear with a manual transmission, as it will decrease your momentum and cause your RPMs to drop.

AFTERMATH

After a day in the mud, you need to be prepared for some extra clean-up time, and not just on the pretty parts you can see. You'll need to break out the power-washer or other high-pressure hose to clean the dried mud off your undercarriage and from underhood. Ideally, if there's a water crossing with a swift running stream nearby, drive through it a couple of times to remove the worst of the mud. Try to remove the mud as soon as possible after the trail ride – it's much easier to remove before it's completely dry. I've had 50 lbs. of Ohio clay dry to a state resembling concrete in my transfer-case skidplate. I literally had to use a hammer and a prybar to break it up into small pieces so I could remove it (your skidplate can act like a scoop at times)! You'll also want to check your frame – mud can become packed inside and will contribute to an early death for your frame. If you're wondering why cleaning the undercarriage and underhood is important, the grit and contaminants can work their way into brakes, past seals, into u-joints, and can build up on the inside of your wheels causing major steering vibrations. I've had overheating problems on a brand new Jeep Wrangler Rubicon after playing in deep mud with a sandy base – and this



Capability Built In.

was after I thought I had sprayed the radiator out reasonably well! It can also cause excessive heat build-up if it's caked around drivetrain components such as differentials, the transfer-case, and the transmission. You'll also want to pull the plug on your transmission, t-case, and differentials to check for water contamination (it will look like chocolate milk) – water left in these components will guarantee an expensive repair. Also check the air filter, as it's common to get mud and dirt splashed up onto the filter element (if you have a cotton gauze filter like a K&N, you can simply clean, re-oil and reinstall it). Finally, it's good practice to lube the chassis to remove contaminants from steering joints, u-joints, etc. after exposure to excessive mud.

I've learned these techniques the hard way in most cases, and I've been very fortunate on a couple of occasions to find help nearby in the middle of nowhere. Hopefully this article will help you learn from my mistakes! By employing these techniques, you'll increase your driving skill and decrease your risk of pain and suffering. You'll still get stuck at some point (I guarantee it!), but at least you'll be forewarned and forearmed.

