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## Bulletin 010 Crossing A Mud Obstacle

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By The Muniac

### INTRODUCTION:

This is one rider's take on dealing with mud obstacles. It isn't the voice of experience talking so I hope some will find it helpful. Mud has as many versions as the bikes we attempt to ride through it. In the wet climates, it's a reality we dirt riders deal with constantly. This article develops from the experiences of someone (me) that rides conservatively with a more slow and technical style. Other approaches exist and are valid. Like so many things in life, there are many ways to skin the cat. First let's define what mud is to a dirt rider.



Yamaha Tricker run into a sink hole. If the bike is heavy and footing isn't stable, it can take two or more riders to remove it.

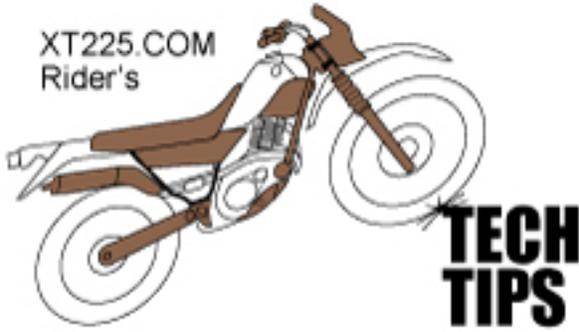
### WHAT IS A MUD OBSTACLE?

*Mud Obstacle* - A viscous watery replacement (of length and girth) to a normally firm and predictable riding surface whose support and traction vary constantly under normal and lateral forces.

### BIKE KINEMATICS:

Our bikes acquire speed via the tangential force of a rotating rear wheel acting through available traction with the riding surface. Once speed is imparted to the bike we have stored energy or momentum. Stored energy, left on its own, decays in time under the effects of friction. What's important with momentum and stored energy is the speed decay time. With bikes the decay time is usually prolonged enough that forward movement will continue through significant distance

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even in the absence of help from the rear wheel. A good way to visualize decaying momentum is to remember the water skier that continues to move for a short time after letting go of the tow line.

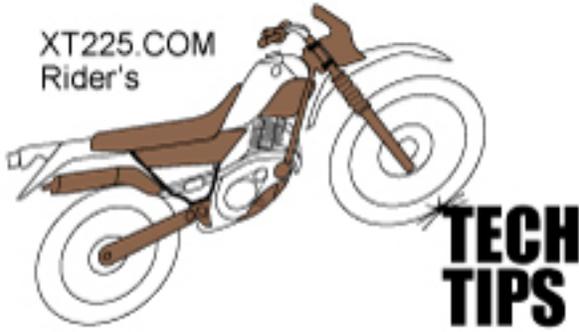
#### HOW MUD VARIES:

It's important to realize that mud can range from a thin slippery skin over a hard surface (known as black ice) all the way to deep quick sand. And this range can occur in the same mud patch. Annual rainfall, streams, absorbed ground water, wind, humidity, sun exposure, frost, snow, soil composition, topology, geology, geographic location, previous traffic, run off, ruts, flash flooding and a host of other factors will influence how, where and when mud forms. Knowing the lay of the land and climate you ride in is a good first step in anticipating the characteristics of a mud obstacle. Once a rider has an idea of a mud obstacle's extent then how best to deal with it is the next challenge. Personally, I don't recommend ever just blasting into the unknown without a look first. Like so many riders I learned this lesson the hard way and almost paid with my life. Caution is king! The small inconvenience of interrupting the ride flow will be more than offset with knowledge and safety. If you are familiar with an obstacle and your information is current then just move through it as comfort dictates. In all other cases, exercise caution.

#### RIDING GOALS & SAFETY:

My riding goals are accuracy, no unforced mistakes and control of the bike at all times. That doesn't mean I clean every obstacle I come to or ride perfectly. It does mean I remain under control even during failed attempts and anticipate where and when things can go wrong. Setting "ride under control" as a goal means my probability for successful execution of trail sections and obstacles remains (on average) in my favor. The overriding goal is to boost safety which keeps injury risks and equipment damage to a minimum. This aids ride flow, efficiency and throughput. If you are the point rider you also help those behind you by calling an obstacle, evaluating it and properly moving through. Any sudden change in your trail conditions means a possible fall, injury or safety issue for you and/or someone in the riding team. At minimum it implies a potential need to slow down and change your riding approach or attack. Mud clearly falls into the category of changing trail conditions and should command immediate attention and respect. With mud you lose both traction and perception. It can happen suddenly and once you're in the thick of it you've bought the entire ranch so to speak.

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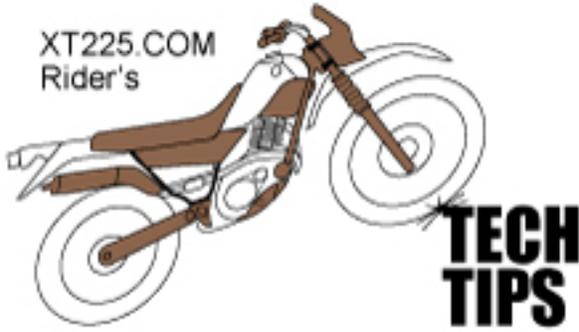
### COMING TO MUD:

First, I will always stop for an unknown mud puddle, mud patch, swamp, bog, etc. for closer inspection. I recommend you do too. Keep in mind that mud and puddles change quickly so yesterday's riding experience might not mean a hill of beans today. Subtle changes can be HUGE and occur quickly. Puddles and mud also offer opportunities for trail saboteurs to do their dirty work. Remember those bent on saving the planet can resort to extreme measures to accomplish their hateful misguided work against dirt bikers. Be careful out there. If you're coming to an unknown mud obstacle it's just plain foolish to power through it not having a clue what's in there. The normal smart rider's response to the unknown is one of caution. So now you're stopped at the brink of a mud obstacle. What do you do?

### CROSSING A MUD OBSTACLE:

First is to make sure you have available help to remove a stuck bike. Getting a bike out of mud can be difficult or impossible. If the bike doesn't have traction the chances are you won't either on foot. If it's dry along side the bike things go better to help a swamped bike out. Know how deep the mud is and what the bottom is like before hand. I use a stick to investigate this. Also consider your bike's air intake system, its height and position. How far do you have to travel before reaching dry ground? Does the bottom remain consistent or are there submerged rocks, roots, logs or heavy vehicle ruts? Make sure that no sink holes exist and/or sabotage. Knowing this helps prepare you for the crossing or avoid it altogether. The more information you can get the better. These preliminary examinations will help you decide where to enter, how much speed is required, which line is best and if it's even smart to attempt a crossing. If you are alone don't even think about it if you have any concerns of dumping the bike or getting stuck. Unless you are very comfortable on the pegs it might be best to enter sitting in the seat. Additional support can come from dabbing or using your legs as out riggers. If you plan on getting your legs involved, make sure there is clearance and nothing to get your feet stuck on. Some mud is very viscous and dries like cement. This can clog your rear wheel, bind it and/or jam your chain. In severe cases it may interfere with your rear suspension and swing arm. Make sure you can unclog and/or clean your drive train once through.

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### COLD WEATHER MUD AND CHECK LIST:

In cold weather climates ice may be present which adds another potential difficulty to deal with. You may find a mud puddle that contains a frozen slab underneath. Mud puddles are dark and absorb heat from the sun so they may melt only on the surface. Loss of traction in all directions should be accounted for when on ice. Here it's best to tripod your way through and keep the bike centered and on a straight line. Use only enough throttle to keep rolling and avoid spinning the rear wheel. Additionally, if the ice can't support you and the bike you'll break through which can trap a wheel. It's very hard to get a bike out of this situation. Again, knowing your terrain and climate alerts you to situations that may lie beneath mud and puddles. Below is the mud crosser's dirty dozen "take away" points you may find helpful:

- 1) A sudden change in terrain conditions (like mud) should signal caution. Stop and explore on foot to gather riding information. Remember the devil is in the details.
- 2) How deep is the mud?
- 3) How far do you need to travel in it before arriving on dry trail?
- 4) What is the bottom like?
- 5) Is quick sand, sabotage or sink holes a possibility?
- 6) Can ice be present under the surface?
- 7) Is the mud viscous enough to clog tires and bind moving parts?
- 8) If your bike becomes swamped can you rescue it?
- 9) If you dump your bike and get trapped under it will your head stay above the surface?
- 10) How far will your bike "sink in" before it bottoms out?
- 11) Should I follow someone else's line or path?
- 12) Is there room to paddle or tripod if required?

The items listed above will help you better understand the riding "situation" or "obstacle" as it were. In addition, you'll need to know your riding ability and how well your bike performs mechanically to include tread pattern, tire pressure, steering, chain, suspension, gearing and ground clearance. The most important element in all this is rider experience, skill and judgement. These three things can only be acquired through saddle time on the trail. If you're uncomfortable crossing then don't attempt it. Experience and the good judgement that results are

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always your best resources. Equipment, speed and horse power are not substitutes for experience. If you are new to dirt riding, teaming up with someone more experienced will reduce your learning curve. Let a more experienced rider tackle a mud section first and observe how it gets done. Ask questions and learn. Pay close attention to their posture (pegs, seat, tripod), speed, throttle usage and line of attack. Use this information to assist your passage and make appropriate allowances for skill level variations.

Crossing a mud obstacle isn't an exact science either. Assuming you've ruled out a really bad situation and/or dangerous condition you just need to get it done. One can analyze to the point of paralysis which doesn't help with building confidence. My personal feelings are you can never have too much knowledge about what you ride. Simply stated it's a good idea to use the eyes, brain and feet before opening up the throttle. Also learn to control your emotions to include anger, ego and competitive posturing. There's nothing wrong with being a showman, just make sure you've got the skills to pull it off safely. If you are the more experienced rider in the group set a good example and make sure others understand what the difficulty and dangers are in what has just been ridden. Don't bait riders into a bad situation for entertainment. I think it best to put something good into the ride instead of using it as a stage.

### **MOMENTUM IS YOUR FRIEND:**

Earlier on we talked about momentum so let's tie that in with mud crossings. We're going to assume you've done due diligences and inspected the mud obstacle thoroughly. You've thus determined that conditions are safe enough to attempt a crossing and you know what's in there and have a bail out plan. If you have a hard consistent bottom, ride into the mud on the pegs (those not comfortable on the pegs should stay in the seat). Select a gear that isn't too punchy to avoid breaking the



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Rider moves through a long puddle. Seated, a rider can dab quickly if required to correct for things not seen in/on the riding path.

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tire loose and avoid excessive spinning. Enter at a comfortable deliberate speed which is a speed you think you can maintain throughout the obstacle. If your balance gets disturbed for whatever reason, come down to the seat and dab if required to regain control. The most important thing is to maintain a constant forward movement. If the bottom becomes turbulent you may need to tripod and paddle yourself through. Try not to lose your forward speed or momentum. Getting started from a standstill in mud can be difficult or impossible. Try to avoid that if possible. If the obstacle doesn't roll "flat out" you may need some additional speed to run up and over a berm before getting back on dry trail. You should have taken notice of this in your post ride inspection. If the attempt feels like it's going bad don't try to become a hero and make it happen. It's better to bog down, take the ribbing and paddle your way out than to drop the bike (and yourself) in the mud. Bail out sideways to dry ground if possible.

### MUD W/O TRACTION:

When traction is available a mud crossing is easier but some crossings don't allow for that. In thick mud that packs into the knobbies traction is poor to nonexistent. Momentum (stored energy created via rolling speed) is the only way through. Enter the mud with enough speed to carry you all the way through. This is a rider judgment call which comes from experience. In the early stages before the tire packs up you may find some traction. Use it to hold your speed. Once the tire packs up all you can do is just keep the rear wheel rolling. Rolling is better than excessive spinning. Tons of throttle here just throws mud all over, digs you in deeper, creates side sliding and removes what little traction you may have. If you can hook into the bottom at points try to take advantage of that but don't use



No reflection on riding ability, as this can happen to anyone. This rider made it to the edge so the bike didn't get completely submerged.

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traction that isn't there.

In this crossing, you'll enter at a higher speed and slowly feel your speed decay as the viscosity of the mud eats up the stored energy in the bike. The goal is to have enough speed to make it across and out. A straight attack line will make best usage of your momentum. Select a seat or peg based posture as comfort dictates. Bouncing around in the seat is less efficient but may be your only option. Unless it's a last resort to keep the bike up, putting your feet in thick mud will only act as a brake. Try to keep this as a last resort. Again, all the cautionary notes mentioned above still apply. If the crossing is going bad make

sure to stay in control. You should always have a "B" plan in place if a crossing doesn't happen. Make sure help is available to rescue a swamped bike and rider. In bad mud crossings I've seen it take four guys to get a bike out.



Severely caked mud like this can jam wheels and interfere with other mechanical systems. Clean up may be required to restore proper operation.

All of this analytical stuff is fine but mud crossings are always somewhat of a poke and hope proposition. No exact science exists as there are so many variables including the random elements which always defies analysis. The goal with analysis should be to completely understand what you're getting into before hand. Analysis helps to ensure nothing dangerous exists in a crossing that would result in serious injury or death. Analysis helps with getting a general feeling for the details which should improve your odds for getting across. It has been said that no amount of planning ever replaced dumb luck and I guess it's

true but don't be stupid about things and don't plan on luck getting the job done. The most important analytical conclusion is one that says "DO NOT CROSS". Sometimes it's best (and safest) to turn back or seek an alternate route. There's no shame in avoiding a bad scene and being able to get up the next morning less injuries. Riding skill is gained slowly over time so don't rush the process. Start with easy crossings and work your way up from there. In time you will be able to read things quickly, decide and execute (or not execute). Whatever you're doing or where ever

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you are, be safe, ride under control and have fun.

### WATER, CARBS & FUEL FEED ISSUES:

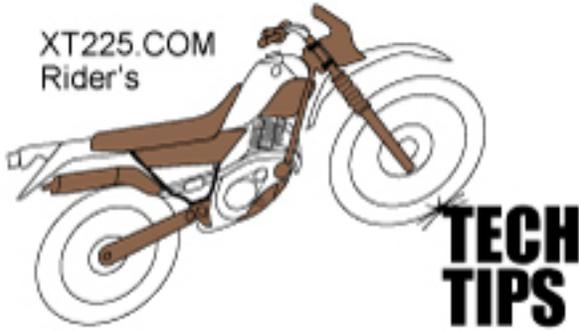
Bikes have vent and drain tubes that usually run between the rear shock and carburetor towards the ground. These tubes drain gasoline from the carburetor's bowl and also vent the bowl to the outside atmosphere. As the engine takes fuel it lowers the fuel level in the bowl. Prior to the float opening the fuel inlet valve, a vacuum forms on the air above the fuel in the bowl. If this vacuum isn't vented the carburetor's venturi system wouldn't be able to draw fuel into the carburetor for atomizing. The result is a stalled engine. The vent tubing prevents this from happening assuming it isn't clogged with water as a result of the tubing ends being submerged. Since we are venting a vacuum, water and mud could be drawn up into the float bowl. If you are riding under conditions where these things will happen your bike should be setup properly.

One might conclude that the easiest way to handle the venting is to redirect the vent tubes up. I would advise against this as doing so means excess fuel won't be drained away safely or at all. If your bike has two vent tubes that connect to the same air space in the float bowl, direct only one of the tubes up. Then vacuum vents through the upper tube if the bottom one is submerged. The heavier than air fuel will drain through the bottom tube. Avoid long U's in the upper tubing run that would fill with fuel and act like a trap.

If only one vent tube exists it's best to install a "T" connection just below the float bowl. Avoid any long U's in the tubing run between the float bowl and "T". Make sure the fuel drain path is a continuous down hill run like a rain gutter. The upper "air" vent can be run as required. Just avoid crimps in the tubing from forming on sharp bents in the presence of heat.

Setting up your bike in this fashioned will allow it to remain in deep water without stalling from fuel bowl vacuum. Make sure to keep the ends of all tubes open and clean. Although this is not normally done, a small filter placed in the upper vacuum vent tube will prevent dust from being ingested. Such a filter needs to have little or no flow resistance. If the filter becomes clogged then it's yet another problem to deal with. Make sure engine air intake is proper as well to avoid ingesting mucky water into the air box, carburetor bore and intake port. If the cylinder fills with water (an incompressible fluid) the piston can't complete its up stroke. You'll need to remove the spark plug to get the water out which

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might be the least of your troubles at that point. If your engine is air cooled make sure to clean mud from the cooling fins to avoid hot spots. Heat from the engine drives off the water and dries the mud. Dry mud doesn't conduct heat very well.

THE END

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