



AREA 51 - Project "Deep Water Foreman!"

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This year marks a very important mile stone for me, that my 1998 Honda Foreman 450s turns 10 years old. Its important because it was the very first vehicle that I purchased brand new and I have enjoyed every minute and every trip since that day. Over the years this bike has never let me down or left me stranded requiring only the basic maintenance and repairs despite the destinations its reached, trails its traversed, and tasks its performed. This year I decided to do a complete tear down of the bike (minus the engine and transmission) to replace some damaged parts, and worn seals and bearings. This season will also see the fabrication of more custom pieces to compliment modifications performed in the past.

This issue I will be covering the preparation of my Foreman ATV for deep water crossing. This project started about 2 years ago with the fabrication and installation of an engine air intake snorkel, and concludes this year with the addition of an exhaust snorkel.

The Honda Foreman 450 has a factory intake snorkel that takes in air next to the gas tank at about the height of the word "Foreman 450s" on the gas tank cover. It works well for most people in stock form, but I wanted the assurance of a dry crossing for deeper water. After completing some research online, I came up with a rough plan and was off to the plumbing store to pick up some 1.5" ABS pipe, fittings and glue.

I started by removing the gas tank cover so that I could remove the factory snorkel. The first task was to mill down a short piece of ABS pipe to exactly match the diameter of the stock pipe that enters the air box. Once the new pipe fit snugly I coated the end with Silicone Gasket maker just to be doubly sure of no leaks in conjunction with the factory rubber seal and clamp. Next a series of 22.5 degree couplers were used to route the pipe past the engine to the Left Front

fender area. Another series of 45 & 90 degree couplers routed the pipe was forward and up where it would come through the fender and through the Front Rack.

Once the pipe came through the fender and the rack, I fabricated a mount from galvanized sheet metal to brace the new snorkel at the front rack. I cut a hole the same diameter of the pipe in the middle of the tin, and sandwiched the mount between a straight coupler on the bottom and a female threaded coupler on the top to keep the piping sturdy and in place. The plate was then attached to the rack with U-bolts and painted black. The reason I used a threaded coupler on top of the mounting plate was so that I can screw in a short snorkel for everyday riding and a longer one for planned deep water crossings. Using a long snorkel all the time makes the system less sturdy on rough trails, and is directly in the view of the rider. Both of my snorkels have a 90 degree bend at the top to suppress rain, snow or splashing water from entering the intake.

There is no exact science to this process as every bike is different, it took some trial and error and a lot of dry fitting to get every thing routed right. Parts were only glued once everything was fitted in place. Be sure to not run piping too close to the engine as heat may damage the pipe, be aware of tire clearance when routing pipe in the wheel well and be aware of chafing and movement of parts that may cause the pipe to crack over time.

For deep water crossings, there are some other things need to be addressed to keep the bike running when submerged. All vent lines, which on my bike include both differentials, the front and rear drum brakes, gas tank and the engine all need to be extended to a higher location. On some models the engine is already vented to the air box so it may be OK, but the rest need to be re-routed to a higher point. Some people extend them to the height of the handlebars, or plumb them directly into the intake snorkel. The vent for the carburetor on my ATV has to be routed to free air at a higher location and not to the intake.

Next you will need to water proof all electrical connections, especially the ignition system or it may stall when submerged. An application of dielectric grease in the spark plug boot, and all electrical plugs should keep things dry and running.

Also, when fording deep water, you will need to plug off (temporarily) the carburetor over flow tube, I have found that even with a check valve water will enter the bowl of the carb and stall the motor. Be sure to always remove the over flow plug as leaving it plugged may cause problems during off camber situations or while trailering thus damaging your engine. Also, the atmospheric vent on top of the carburetor will need to be extended. I routed mine to the upper head light housing by simply installing a longer line and routing it through the frame of the bike.

For the first couple years of fording deep water I did not use an exhaust snorkel, as long as the engine stays running water shouldn't enter through the exhaust. The trick is to keep blipping the throttle at all times as the engine will stall at idle when the exhaust is underwater, which can fill your engine with water...more on that later. To alleviate this annoyance, I am just finishing the fabrication of an exhaust snorkel which will let me operate the throttle normally, even under water.

Since I've installed my Snorkel I've gotten the engine wet mostly from pushing the limits of my design and the machine. As soon as you pull the bike from the water drain the muffler, air box, and carburetor. Remove the Spark plug and turn the engine over slowly to remove any water that may be on top of the cylinder. Next check the oil level most likely it will milky/grey, but if its over full (from water) you could damage the motor even just trying to start it. You should always have spare oil to do one change in the woods, it will not fix the problem but may get you home if you don't have far to go. (I always recommend towing the machine out to prevent damage from poor oiling). The air filter will most likely be wet as well, and will have to be dried before starting the engine. If these steps are taken, the bike should run again, I have sunk mine and rode it home taking the risk that engine damage may occur.

Once you get home, remove the seat and put it somewhere warm to drain and dry. You will have to change the oil at least 5-6 times to remove all water from the engine. Drain the dirty grey stuff and refill with a cheap ATV approved 10w30. Run the motor at idle for 5-10 mins, then shut off and drain the new (now milky oil) out. Keep repeating until the oil stays clean after running the motor. Now perform one last oil change using whatever oil you normally use and change the oil filter as well. You'll should also check the differential oil changing the fluid if necessary, as well

as any other gear box or transfer case (depending on the particular model).

Things to remember:

1. When the bike is submerged, large ATV tires will help the bike float which will limit your traction and can make the bike very tippy so be careful keeping your balance.
2. Never cross an area that you are not sure about, and be aware of underwater currents that may drift a partially floating ATV into danger.
3. If your riding an ATV in deep water, your going to get very wet yourself. Beware that the water may be cold so dress accordingly and beware of hypothermia and its symptoms.
4. Before you leave home, become familiar with the location of the carburetor drain screw and operate it to ensure its not seized. If water enters the carburetor, it will have to be drained for the engine to run properly (symptoms are the ATV will be hard to start or not start at all; the ATV will start and run only if the choke is on; the ATV will stumble when throttle is applied). To do so, turn off the gas, unplug the overflow line and open the drain screw until all fuel/water has drained. This should be drained into a container and never drained to the environment.
5. Have enough oil to perform at least one oil change in the woods if you sink and/or the engine. Also carry the necessary tools needed to change the oil, drain the carb, remove the spark plug and so on. All of the old oil needs to be collected in a container and put in a sealed container such as an empty oil container for proper disposal at home.
6. Sometimes during deep water riding the vent hose for the fuel tank may plug causing the bike to stall (similar to running out of fuel). If this is the case, remove the hose and blow through it to remove any debris and do not put the hose back in the hole near the handlebars until the bike has completely dried out.

7. Deep water riding should be considered an extreme sport as it certainly is not the norm. Like all extreme riding, there are always more risks so ride safe, have the right equipment, and never ride alone.