

I get questions often about hydrolock, petcocks, and using a fuel solenoid.

I will address the following issues.

- What is hydrolock?
- Petcocks.
- There is a failure mode of the vacuum operated petcock that can flood the #6 cylinder.
- Why Manual Petcock?
- Some Manual Petcock Options.
- Fuel Shutoff Solenoid with Relay Harness.
- Modifying the OEM Petcock to remove the Vacuum Function.

Hydrolock is a combination of failures unless it is the #6 vac line, which I will discuss later.

- a. Fuel must be available on the carbs. It can come from:
 1. Petcock left in RUN and vacuum function fails.
 2. Manual petcock left in RUN or ON.
- b. One or more Float Needle valves must leak.
 - a. Even with fuel on the carbs, it does not have a path to the cylinder unless an intake valve is open. However, if the float needle valve leaks, fuel will fill the bowl and overflow out the vent hose onto the block. In this situation, it can also overflow into an intake and toward the cylinder. It still needs an open intake valve to get to the combustion chamber.

If you ever try to start your bike, and it goes “UMPH” like it has a dead battery. **STOP. DON'T push the button again!** Take it outside. Remove the spark plugs and then spin the starter. If it has tried to hydrolock, it will shoot gas 6 feet out of the offending cylinder(s). The starter is strong. If you try to start the bike with fuel pooled in the cylinder, the piston will be pushed against the noncompressible fuel. The result will be broken starter gears and possibly much greater damage. Some have even broken the engine housing.

Another way to hydrolock.

A friend purchased a new to him Valkyrie. He had it shipped to me to work on then he came and rode it home. When I took delivery, I attempted to start the bike, and CLUNK. I stopped and pulled the spark plugs, then hit the start button. Fuel shot 6 feet out of multiple cylinders. The petcock was in the ON position. Without the bike running the petcock should have closed. The petcock had failed keeping fuel on the carbs. Apparently, bouncing around on the trailer had caused the floats to bounce, allowing the float needle valves to open. When the engine is running, the fuel is being burned and level is regulated. With the engine off, every time the floats bounced a little fuel was let into the carb bowl. Eventually it overflowed and filled some of the cylinders.

Petcocks

The stock petcock has a vacuum line connected to the #6 intake. When the engine is starting, vacuum opens the petcock and allows fuel to flow to the carbs. When the engine shuts off, the vacuum goes away and the petcock closes. With this configuration you can leave the petcock selected to “RUN” and the vacuum operated petcock will shut off the fuel when you turn off the engine. Though it is a better idea to turn the fuel selector switch to OFF in case the vacuum function fails.

There is a failure mode of the vacuum operated petcock that can allow fuel to flow down the vacuum line into the #6 intake and cause hydrolock.

Why Manual petcock?

The reason some go to a manual petcock is to eliminate the vacuum line.

Some Manual Petcock Options

- a. Pingel Power-Flo High-Volume Petcock 1311-CH.
 - a. Advantages
 1. Manual
 2. High flow
 - b. Disadvantages
 1. Expensive, (about \$150)
 2. Does not connect to the fuel select knob, so you must reach under the seat to switch to reserve.
 3. Less reserve capacity because tube is shorter, but you can swap it with the OEM tube.
- b. OEM petcock from the Honda CBR 600 F3 bike, part number 16950-MAL-601.
 - a. Advantages
 1. Manual only with no vacuum line.
 2. Honda petcock connects to the fuel selector knob just like the stock petcock.
 3. Less expensive than the Pingel.
 - b. Disadvantages
 1. Must be purchased (about \$74)
- c. Modify the OEM petcock to eliminate the vacuum function.
 - a. Advantages
 1. manual only with no vacuum line.
 2. Will connect to the fuel selector knob because it is the stock petcock.
 3. Less expensive, however you may want to purchase a rebuild kit- HONDA 16953-MN5-023 COVER SET, PETCOCK, so you have new diaphragm parts. (About \$50)

Hydrolock, Petcocks, and Fuel Solenoid with Relay Harness

The Valkyrie Riders Cruiser Club (VRCC) web site has info on modifying the petcock to manual. It is just a matter of flipping the spring and diaphragm on the vacuum side to make it stay open without vacuum. The fuel selector switch will still work. Then you plug the vac port on the intake, and petcock.

See article from <https://www.valkyrieriders.com> this link:

[Modifying the OEM fuel petcock to remove vacuum function](#)

Fuel Shutoff Solenoid with Relay Harness

Using a manual only petcock will require you to turn off the fuel each time you park the bike unless you install a fuel solenoid. With the Fuel Solenoid you can leave the petcock in RUN.

This fuel shutoff is Mounted on the carbs as close to the fuel rails as possible. The idea is to shut off the fuel when the engine is not running and limit the amount of fuel available to cause hydrolock.



It is debated whether there is enough fuel in the fuel rails and tubing to still run into a cylinder and cause hydrolock. I have not tried to measure it. I just run a fuel solenoid as part of my defense strategy. I also have installed new high quality Float Needle Valves.

A positive fuel shutoff is a vital component of preventing hydrolock on a Valkyrie. At Valkyrie Carbs and Custom, we custom build an electric solenoid fuel shutoff harness with a relay.

We are using the “safety circuit” 12V connection to trigger the relay. When the key is turned on, if the safety circuit is satisfied, 12V energizes the relay. The relay then routes power from the battery and energizes the fuel solenoid. The fuel solenoid will remain energized until any shutoff signal is received. The safety shutoff signals such as the ignition key, kill switch, bank angle sensor, kickstand sensor, deenergize the fuel solenoid and stop fuel flow.

To use the fuel shut off, simply start the bike as you usually do. The solenoid will energize when you turn on the key. It will turn off with any signal that shuts down the bike.

I hope you find this information useful.

Hydrolock, Petcocks, and Fuel Solenoid with Relay Harness

If you wish to purchase a Fuel Shutoff Solenoid with Relay Harness, you can purchase it on our website.

<https://valkyriecarbsandcustom.com/ols/products/fuel-shutoff-solenoid-with-relay>

Here is a link to the whole website and all our products, and downloads:

www.valkyriecarbsandcustom.com

Link to Valkyrie Riders Cruiser Club (VRCC) <https://www.valkyrieriders.com>

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