

Troubleshooting Valkyrie 1500 Backfiring

A quick Overview

I often get requests for help understanding why a Valkyrie is backfiring. There are a number of reasons why backfiring, sputtering in the exhaust, afterburn can occur. We will address the most common reasons I have seen.

If the backfiring just started, and you have not made any changes, it is most likely a vacuum leak.

For finding a vacuum leak you can use starting fluid spray. With the engine running, spray a little on each of the vacuum hose connections under the carbs. If RPM increases that location is your vacuum leak. Repair or replace the vacuum hose or cap.

Airbox Tube leak

- Tube folded on the Air Horn of the carb.
 - Verify the tubes are connected and not folded.
 - The difficulty of installing the airbox can result in the tube folding over on the Air Horns of the carbs. The clamp can fool you into thinking the tube is on, when in fact it is not.
 - Very unlikely with our Airbox Mod Kit. This is one of the reasons we created the kit.
- Clamps are loose.
 - Are ALL the clamps on ALL the tubes tight?
- Tubing connections on the bottom of the airbox open.
 - Verify Drain line, Breather box connection, Pair Vac line (removed if desmogged).

An exhaust gasket leak can cause afterburn in the exhaust.

- Exhaust gasket nut torque is only 7 ft lbs., so be careful or you can break an exhaust stud.

If you changed your exhaust to an open exhaust like Cobra 6 into 6, it lowered the back pressure, and the engine is running lean. You might be able to tune it out. I just rejet the carbs.

- Stock jets are 35 slow jets, and 100 main jets.
- For Cobra 6 into 6 with baffles INSTALLED rejet to 38/105.
- For Cobra 6 into 6 with baffles REMOVED, rejet to 38/108.

I buy jets from Jets R US www.jetsrus.com.

If it sat with ethanol fuel in it, the slow circuits are likely blocked and causing a lean condition. You may be able to clean it with a fuel additive. The downside is fuel additives can be harsh on the rubber components. It can be an alternative to an immediate carb rebuild if the blockage is not too severe. Put

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the additive in the tank and run the engine long enough to get the additive circulated through the carbs. Let it sit overnight then ride it to see if the additive will clear the blockage.

- Most of the carbs I rebuild have been sitting and have a “fungus” looking deposit or lacquer in the carb bowls. Cleaning with an ultrasonic cleaner is needed. Of course, that requires complete carb rebuilding.
 - Ethanol fuel attracts water. It does it quickly and causes the fuel to break down and causes the deposits.
 - If you run ethanol fuel, I recommend running Marine Stabil in the fuel tank.

It could be a failed Air Cut Valve (ACV).

ACV is not repairable without breaking the carbs apart except for #2 and #5. If one is bad it must be replaced.

I do not find many ACVs bad. When bad, it is likely because someone sprayed carb cleaner into the carbs and caused the ACV diaphragm to fail.

A Deeper Dive

When is it backfiring? During acceleration, or deceleration?

Backfiring during deceleration.

Afterburn when engine braking is used.

(A high vacuum spike occurs when you let off the throttle. It sucks in air and causes afterburn in the exhaust by combining with the unburnt fuel in the exhaust.)

- Lean mixture in slow circuit. Unless the pilot or balance screws have been adjusted, the adjustment is still correct, and something else is causing the problem.
 - **If the bike has been sitting** with ethanol fuel in the carbs, the slow circuits are likely blocked or partially blocked.
 - **Faulty Air Cut-off Valve** or cracked ACV tubing.
 - **Faulty Pulse Secondary Air Injection (PAIR) system.**
 - If your bike has been desmogged the PAIR System has been removed..
 - Faulty PAIR control valve.
 - Faulty PAIR check valve.
 - Clogged hose of the PAIR system.

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- **If you narrow it down to the PAIR system**, the best fix is to desmog the bike to eliminate vacuum leaks.
- **Faulty ignition system** (section 17 of Honda Maintenance Manual) Not the most likely problem, though possible. Verify no vacuum leaks first.

Backfiring or misfiring during acceleration

- **Lean mixture.** In this case, it is running lean because there is not enough fuel for proper fuel/air ratio. Maybe a pilot circuit got blocked during the winter.
 - See above section “If it sat with ethanol fuel in it.”
 - See above section for “If you changed your exhaust.”
- **Faulty ignition system** (section 17) Not the most likely problem, though possible. Verify no vacuum leaks first.

In a nutshell, these are the most likely reasons the bike is backfiring.

- **A vacuum leak.**
- **Leaking airbox connections.**
- **Blocked pilot or slow circuit.**
 - Bike was stored with ethanol fuel in the carb bowls and no Stabil; it may be getting blocked.
 - If it will only run with the enrichment (choke) on the pilots are clogged.
 - It may run OK if only one or 2 pilots are blocked, especially if they are not fully blocked.
 - Additives are not the best for the rubber O-rings and gaskets but may be a better alternative to tearing down the carbs to clean them right now. Try running some **Berryman® B-12 Chemtool® Carburetor, Fuel System and Injector Cleaner**. If the passage is not fully blocked, it will get through and clear out the gunk.
 - Put the Berryman® B-12 in the tank and run the engine enough to get it into the carbs.
 - Let it sit overnight and take it out for a run. See if the backfire clears.
- **An exhaust gasket leak.**

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- Sometimes the exhaust gaskets loosen up and allow air to get sucked into the exhaust. This will cause backfiring (afterburn) because the unburnt fuel in the exhaust will mix with the air and detonate.
 - The Torq spec on the exhaust header nuts is only 7 foot pounds. Tighten carefully so as not to break off the stud.
 - The exhaust gaskets are hollow rings that crush as you tighten the header nuts. After installation, they will settle and need to be retightened.

- **Fuel Starvation.**

- Run it with a ty wrap in the gas cap to allow air to enter the tank.
 - If this removes the backfiring, you have a pinched tank vent line. The one on the tail of the tank.
 - The tube going up into the tank can get rusted shut also, requiring routing it out. This is a less likely scenario.
- Unless you added a fuel filter or lengthened the petcock fuel line, fuel delivery is set up correctly.
 - If you added a fuel filter or lengthened the petcock fuel line, put it back to stock. It is causing fuel starvation. Our fuel system is gravity feed. There is very little pressure pushing the fuel. A filter will most times cause starvation, especially at highway speeds.
 - The length of the fuel line to the petcock from the TEE is 8 3/8 inches. If it is longer, the line will heat and sag, causing a loop seal and fuel starvation.
 - If you have a fuel solenoid the same applies to the fuel line.
 - If you bought the fuel solenoid harness from Valkyrie Carbs and Custom, your fuel solenoid lines were sized properly to prevent the loop seal.
 - If someone else supplied it, make sure the line to the petcock is straight. Rule of thumb is 5 inches from the rear carb stay to the petcock.

- **Ignition problem.**

- Easiest to check is the spark plugs.
 - Are they correct?
 - Are they old?
 - Is there water in the spark plug wells?

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- There is a drain hole in the well at about 7 o'clock. Rout it out with a piece of mechanic's wire. Then clean the well.
- If all else has failed then you can troubleshoot the ignition coils, ICM, timing pickups, etc.
 - Check the other more likely items first.
 - If you have not found the problem with the above, contact me and we will pursue other issues.

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