

Dead Head EFI Fuel Systems

By Larry Klusza, April 2022

NOTE: First, I want to acknowledge **63 bomb ohc** and **Danny Cabral**, the forum moderator, over on the Holley Sniper forum for their help. I'm just sharing what I learned from them during my EFI install that may be of help to anyone else considering a dead head fuel setup for their EFI installation. I'll include links to those conversations at the end of this post.

Most of the standard throttle body EFI setups out there operate at about 58psi. Mine happens to be a Holley Sniper Quadrajet unit. Fuel can be supplied to it in one of two ways. One is by using an electric pump with a regulator and a return line back to the tank just like the directions show. The second is called a "dead head" configuration. Given that my GTO came equipped with a brand new 3/8" factory replacement fuel line, I wanted to repurpose that in a dead-head configuration. It takes a bit more work, but will allow you to retain a more stock or stealthy look under the hood which is what I wanted.

To help make this happen, Holley produces an in-tank pump/regulator module. My GTO uses model 12-303. It replaces your stock fuel pickup and sending unit. The Hydramat pickup sock, fuel pump, regulator, and fuel return, are all on the pickup tube along with a new float and sending unit, inside the tank. So, no drilling holes in your stock fuel tank for return lines. This setup allows you to run a single rubber fuel line all the way up to the throttle body or, if yours is really clean like mine, re-use the stock steel line. However, using hard lines like I did is where you can potentially run into mischief, and it all has to do with maintaining consistent fuel pressure to the throttle body.

It seems that at 58 psi (or any pressure really) the injectors opening and closing at however many hundreds of times per second, produce pulses in the fuel flow. As these pulses race back and forth through your fuel lines they will collide and can inhibit the flow of fuel. It will show on a fuel pressure gauge as fluctuations by as much as +/- 20 psi. Imagine your EFI's CPU trying to deal with the changing pressure, and you have an engine being nervous, jerky, and not happy at all. Running full length rubber fuel line will likely avoid this issue as the rubber hose can expand and contract like an artery, absorbing and attenuating the pulses, resulting in more consistent pressure and flow of fuel acceptable to your EFI.

On the other hand, steel lines behave like a megaphone. They transmit the pulses strongly without absorbing anything. It's very much like the "water hammer" effect in your household plumbing. Run your faucet wide open and then slam it shut and you'll hear the plumbing reverberate with the shockwaves from the water trying to stop its forward motion. Now imagine that at up to hundreds of times per second (Yikes!). To combat this phenomenon, you need to include a fuel pulse dampener in your fuel system.

Generally speaking, the pulse dampener should be mounted as close as possible to the injectors in your throttle body. It can be prior to the TBI so that fuel passes through it before going in. Alternatively, you could mount it to the TBI's return port and put a cap on the unused end of the dampener. Either method will expose it to the pulses no matter what, and still be as close as possible to the injectors. The dampener I chose was from Radium Engineering. My dead head plumbing install using the factory steel fuel line works perfectly with rock steady fuel pressure. With the air cleaner assembly on, no one is the wiser (except for the fuel pressure gauge peeking out from under the side of the air cleaner).

Links:

- 1) <https://forums.holley.com/showthread.php?51527-Fuel-Pump-for-Sniper-QuadraJet-Question>
Post #7 shows pictures of my completed installation.
- 2) <https://forums.holley.com/showthread.php?50375-Sniper-With-Returnless-Please-Read&highlight=quadrajet>
- 3) Radium Engineering: [Universal Fuel Pulse Dampers \(radiumauto.com\)](http://www.radiumauto.com)