

INSTALLATION INSTRUCTIONS

FUEL PRESSURE REGULATOR DAMPER (FPRD-RA)

Document# 19-0339

Support: info@radiumauto.com

WARNING! Exercise extreme **CAUTION** when working with fuel systems. Do not smoke or expose the working area to any spark or flame. Work in a well-ventilated area. Clean up all spilled fuel immediately and dispose cleaning materials in a fuel safe trash container. Relieve fuel pressure prior to working on the fuel system. **To prevent failure, all O-ring fittings MUST be lubricated prior to assembly.**

PORTS

INLET PORT "A"

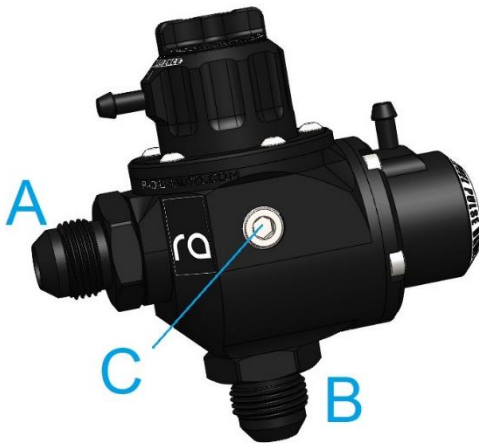
The 10AN ORB inlet port on the FPRD-RA is located on the side of the regulator and is used for incoming high-pressure fuel.

RETURN PORT "B"

The 10AN ORB bottom port is used for fuel return. This port should be plumbed back to the fuel tank. Different adapters (sold separately) can be used in this port if the provided 6AN and 8AN male adapter fittings are not ideal for the installation.

1/8" NPT PORT "C"

The 1/8" NPT side ports see the same high-pressure fuel as the inlet port and fuel rail. Thus, it can be used for fuel pressure monitoring using a fuel pressure gauge or sensor. Using the included plug, block off this port if it will not be used. The plug has a PTFE coating pre-applied, so no further coating is necessary.



IMPORTANT:

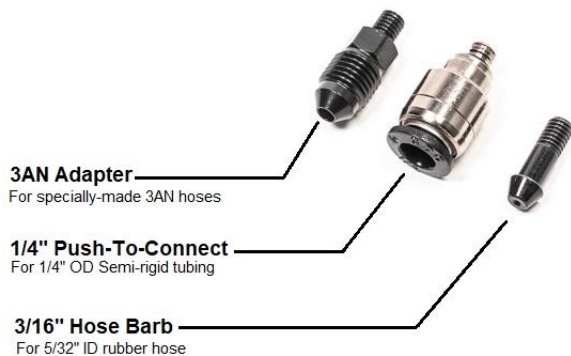
Accidentally switching the function of Ports A and B will result in a non-functioning regulator. Check to make sure the return line going back to the fuel tank is connected to bottom port "B", and port "A" is connected directly to the fuel rail(s) or feed line before proceeding to other troubleshooting steps.

VACUUM REFERENCE

The regulator and pulse damper feature vacuum reference ports. Multiple unique adapters are provided for vacuum connection.

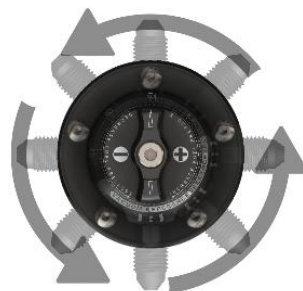
For the regulator, a vacuum reference should be utilized if a 1:1 reference is required. This maintains a constant ratio between fuel pressure and intake manifold pressure for consistent fuel delivery. If the OEM pressure regulator used a vacuum hose, route the hose to the vacuum barb on the regulator. When choosing the intake manifold vacuum signal location, it is not advised to use a single intake manifold runner. The best signal will come from the intake manifold plenum which has the most stable pressure. NOTE: For constant pressure (used in all returnless fuel systems), plug the reference port using the provided screw.

For the pulse damper, a vacuum reference is only required if fuel pressure operates outside of the range of 40-105psi (2.8-7.2bar). Otherwise, install the provided small screw to plug the vacuum reference port.



When installing the vacuum port adapters, use a wicking thread locking compound, such as LOCTITE 290. If not available, any other medium strength thread locking compound will suffice. Take care not to allow the thread locking compound into the air passage of the vacuum adapter. Simply finger tighten the fitting.

As shown, the regulator vacuum port has the ability to rotate 360 degrees about the body. This allows the installer to point the vacuum fitting in any direction.



RETURN ORIFICE

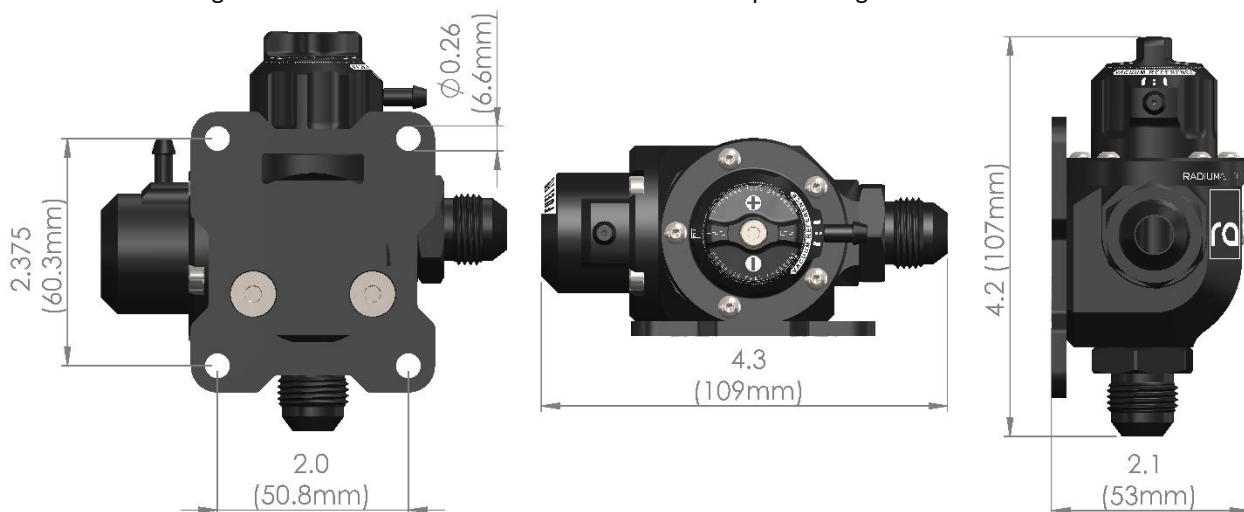
The regulator portion of the FPRD-RA is equipped with a removable flow orifice. Radium Engineering has optimized the size, shape, and material of this orifice for all single and multi-pump applications. The orifice will NOT need to be changed for different fuel pump setups. This orifice should not need to be removed under any circumstances unless instructed by Radium Engineering technical support.



INSTALLATION

MOUNTING

Choose a mounting location away from hot engine parts. Use the supplied mounting bracket and M6 screws to secure the FPR-D to rigid structure. DO NOT hang the FPR-D on the end of the fuel rail with an adapter fitting.



PLUMBING

The FPRD-RA must be plumbed after the fuel rail(s). Select the appropriate adapter fittings to match the chosen hose sizes. Lubricate all O-rings with oil before installing adapter fittings.

START UP/LEAK CHECK

After installation, perform a leak check to make sure all components are installed correctly.

- Connect the battery.
- Turn the ignition to the ON position to allow the fuel pump to prime the system (do not start the engine).
- Cycle the ignition power a few times and check for fuel leaks.
- If there are leaks, they must be corrected before proceeding.
- If no leaks, proceed to pressure adjustment.

FUEL PRESSURE ADJUSTMENT

To set fuel pressure, a gauge or sensor must be used. Sometimes these are already used in other parts of the system such as on the fuel rail(s) or feed line for instance. It is best to monitor pressure as close to the fuel rail(s) as possible.

The regulator is NOT pre-set to any particular pressure out of the box. Determine the target static fuel pressure before beginning this procedure. Consult with the EFI tuner, or match the pressure setting specified by the manufacturer. To set static fuel pressure:

- Disconnect the vacuum line from the vacuum port, if applicable.
- Temporarily plug the line to the intake manifold to prevent a vacuum leak.
- Leave the regulator port open to atmosphere to allow venting.
- Activate the fuel pump manually or by starting the engine.
- Tighten the knob (clockwise) to increase fuel pressure.
- Loosen the knob (counter-clockwise) to decrease fuel pressure.
- Turn OFF the engine and reattach the line back to the vacuum port, if applicable.

NOTES:

1. Fuel pressure will stay at the set pressure. No locking is necessary. Do not attempt to the tighten the Allen screw.
2. Some installations may experience a rapid fall of fuel pressure when the engine and/or fuel pump shuts off. This is considered normal operation for aftermarket fuel pressure regulators, regardless of brand. This can occur due to the diaphragm seat and the return orifice not fully sealing when fuel flow is stopped. For regulators to have the ability to regulate high fuel flow rates, the size of these components must be increased. This creates larger sealing surfaces between the components, preventing them from forming a perfect seal, even with high spring rates. This is not an indication of an issue or defect and it is not a cause for concern on its own. Do NOT contact technical support about this issue. Fuel pressure will reset immediately when the fuel pump is activated again. If the engine is experiencing other symptoms such as long cranking to start, or delays in pressure building when cranking, these symptoms are unrelated to the regulator. There is likely an issue with the fuel feed hose draining back to the tank. This is most likely due to an internal leak somewhere in the pump module, ie: a venturi jet pump, or the lack of a fuel pump check valve.

SERVICING

- Relieve fuel pressure.
- Using a 5/64" Allen wrench, gradually remove the five #5-40 screws in an alternating cross-pattern sequence.
- Inspect the regulator diaphragm for excessive wear or damage.
- For replacement parts, contact Radium Engineering (info@radiumauto.com).
- The diaphragm and seating surfaces MUST be clean for proper sealing.
- Tighten the 5 screws gradually in an alternating cross-pattern sequence to 6 in-lbs.
- Replacement FPR diaphragm, P/N: 18-0017 (shown)
- Replacement FPD diaphragm, P/N: 18-0018

