

# INSTALLATION INSTRUCTIONS

DIRECT MOUNT REGULATOR (DMR)

Document# 19-0248

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 sealed metal 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.**

The DMR is a compact high-flowing fuel pressure regulator for EFI fuel systems. It can be used with a wide variety of OEM and high flow fuel pumps. The regulator is E85 compatible. It is typically secured directly to the fuel rail but can be remotely mounted using the 20-0624 DMR, REMOTE MOUNT ADAPTER KIT.

## PLUMBING

### Inlet Port

The 6AN ORB inlet port on the DMR is used for incoming high-pressure fuel.

### Direct Mount

If mounting the DMR directly to the fuel rail, the provided swiveling adapter fitting will be used. This fitting must be compatible with the fuel rail outlet port.

### Remote Mount

If remotely mounting the DMR (using optional P/N: 20-0624), a hose from the fuel rail to the DMR inlet must be constructed.

### Return Port

The bottom DMR port is used for fuel return. This port should be plumbed back to the fuel tank. Different adapters can be used in this port if the provided fitting is not ideal for the installation.

### 1/8" NPT Port

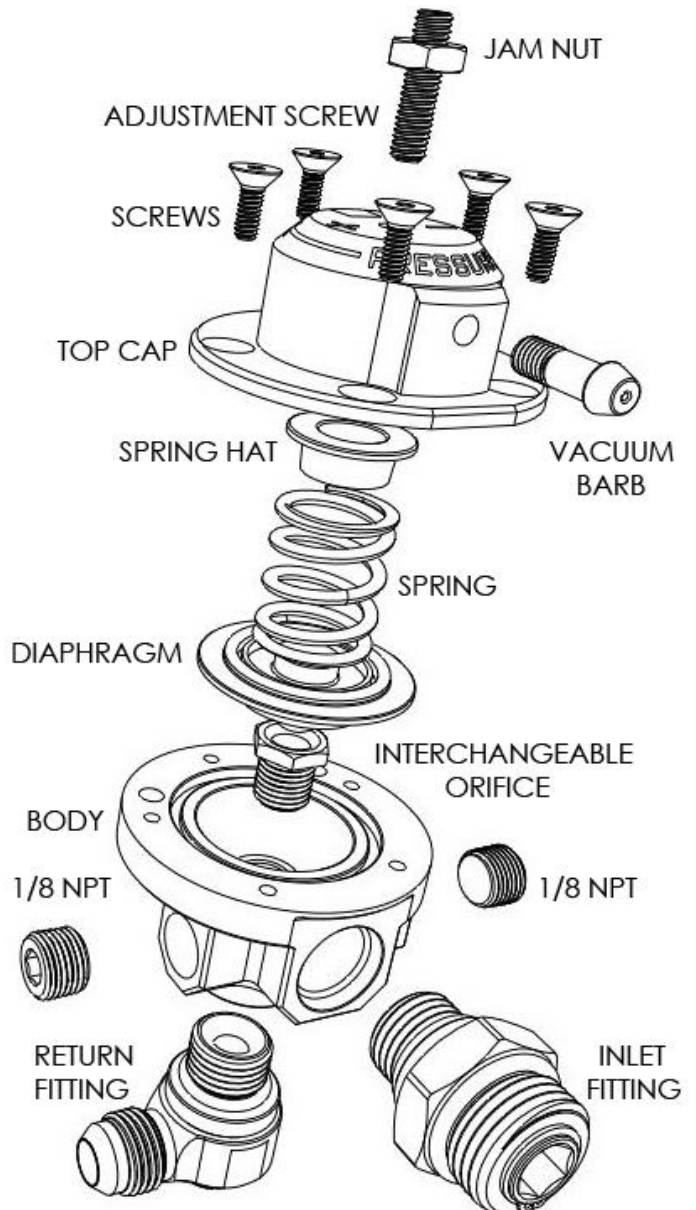
The 1/8" NPT side ports see the same high-pressure fuel as the inlet port and fuel rail. Plugs are included but ancillary components can be used such as a pressure gauge, transducer, sensor probe, etc. Plug whichever port is not used.

## VACUUM REFERENCE

The 3/16" (5mm) vacuum barb on the regulator 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 DMR. For constant fuel pressure, leave the vacuum barb open to atmosphere.

### NOTES:

1. The billet cap can be clocked to point the barb fitting in 5 different directions. See the servicing information below for more details.
2. The barb adapter may be unscrewed and replaced with P/N: 14-0369 3AN male adapter fitting (sold separately).



## INTERCHANGEABLE ORIFICE

The DMR is equipped with an interchangeable orifice inside the regulator. These interchangeable orifices have different inside flow diameters. This is required in order to match the fuel pump(s) flow rate, fuel hose restrictions, and targeted base static fuel pressure. The DMR comes preassembled with the silver orifice, which is a good match for the vast majority of single and dual pump systems. However, if multiple high flow pumps are used and target pressure cannot be achieved, the “gold” orifice can be easily swapped in using common tools. See the servicing information below for more details.



ORIFICE COLOR	MANUFACTURER RATED PUMP FLOW @ 43.5 PSI
Silver (Factory Installed)	Up to 900 LPH total fuel pump flow
Gold	Up to 1500 LPH total fuel pump flow

*\*These recommendations are only general suggestions to get started. Backpressure created by return line system, operating voltage and line pressure drop will have an influence on the final static pressure and orifice selection.*

## DMR INSTALLATION

1. Lubricate the 6AN ORB O-ring on the 90 degree swiveling return fitting. Using a 4mm Allen wrench, secure the return fitting to the DMR’s bottom port. If a different adapter will be used for the return port, install it at this time.
2. Install the NPT fittings or plugs into the high pressure 1/8 NPT ports. Make sure there is PTFE paste on the threads. For NPT threads, finger tight, then rotate another 1.5 to 3 turns with a wrench.
3. Mount the DMR

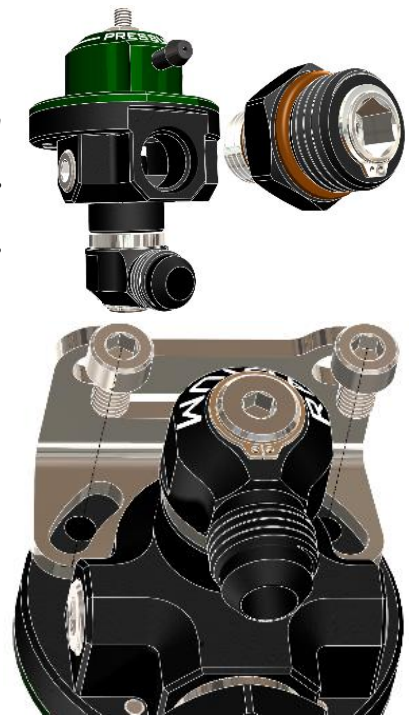
*For Direct Mount Applications*

- a) Lubricate the 6AN ORB O-ring on the swiveling inlet fitting. Using an 8mm Allen wrench, secure the inlet fitting to the DMR, as shown.
- b) Lubricate the O-ring on the opposite side of the swivel fitting and secure the regulator/adaptor assembly to the fuel rail using a wrench.
- c) Rotate the DMR to an ideal direction. If required, the DMR can be mounted upside down.

*For Remote Mount Applications (P/N: 20-0624)*

- a) Lubricate the 6AN ORB inlet fitting O-ring that is specific to the application (not included).
- b) Install the bracket to the DMR using the M5x0.8 screws and tighten with a 4mm Allen wrench, as shown.
- c) Find a location in the vehicle to mount the DMR. The provided bracket requires two 0.275” diameter holes spaced 1.25” apart.
- d) Secure the included M6x1.0 mounting hardware using a 4mm Allen wrench and 10mm wrench.
- e) Route a hose from the fuel rail to the DMR inlet port.

4. Install the fuel return hose to the DMR return fitting.



## 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

The DMR is not set to any particular pressure out of the box and **MUST** be adjusted for the specific application. Pressure can be fine-tuned using a fuel pressure sensor or gauge. Determine what the target static fuel pressure setting should be before beginning this procedure. This target setting can be different for many vehicles. Consult with the EFI tuner, or match the factory pressure specified by the vehicle manufacturer.

- To set static fuel pressure, disconnect and temporarily plug the DMR vacuum line to prevent an intake manifold leak. During this test, leave the DMR vacuum barb open to atmosphere to allow venting.
- Activate the fuel pump by starting the engine or manually powering the pump (Note: engine may run rough).
- Loosen the jam nut on top of the DMR using a 3/8" wrench.
- Using a 3/32" Allen wrench:
  - a) Tighten the set screw (clockwise rotation) to increase fuel pressure.
  - b) Loosen the set screw (counter-clockwise rotation) to decrease fuel pressure.
- Once fuel pressure is targeted, tighten the jam nut on the adjustment screw.
- Recheck pressure with the engine running. If correct, connect vacuum line back to the DMR vacuum barb.

## SERVICING

- Relieve fuel pressure. Unscrew pressure adjustment screw to relieve preload on the internal spring.
- Use a 5/64" Allen wrench to gradually remove the 5 screws using an alternating cross-pattern sequence.
- Inspect the diaphragm for excessive wear and find any potential leak points.
- For replacement parts, please contact Radium Engineering.
- To change the orifice, use a 7/16" socket wrench. Do not overtight. Orifices can distort with excessive torque.
- Reference diagram for reassembly. The diaphragm and seating surfaces **MUST** be clean for proper sealing.
- **BE CAREFUL NOT TO INSTALL THE SPRING HAT UPSIDE DOWN**
- Orient the top cap to point the vacuum barb as needed.
- Tighten the 5 screws gradually in an alternating cross-pattern sequence then readjust pressure.

## Troubleshooting Guide

Symptom	Possible Causes	Solution
Pressure too high, despite adjustment screw fully backed out.	Orifice too small. Restriction in return line.	1. Install larger orifice. 2. Run a temporary hose from the regulator return port (bypassing return line system on vehicle) to a bucket and re-check pressure.
Fuel leaking from vacuum nipple or adjustment screw.	Torn or unseated diaphragm allowing fuel into vacuum chamber of regulator.	Remove regulator top cap and inspect diaphragm. If diaphragm is damaged or torn, contact Radium for a replacement. If diaphragm is unseated, contact Radium tech support for resolution.
Adjustment screw has no change on fuel pressure	Fuel pressure gauge not installed in correct part of fuel system (such as on the return line)  Regulator missing an internal component.	Make sure pressure gauge is installed on the high pressure side of the system and not on a return port or the return line.  Remove adjustment screw and look into threaded hole on top of regulator. Make sure the spring hat is immediately visible.
Unstable pressure adjustment over 60psi.	Internal spring fully compressing (for regulators purchased before 2017). Pump not able to produce higher pressure. Leak in feed line somewhere between pump outlet and regulator.	Contact Radium for an updated replacement spring. Check all connections in feed line from pump to regulator.
Fluttering noise from the regulator or fuel lines.	Orifice is too big for pump flow.	Install a smaller orifice.
Fuel leaking from between the top cap and regulator body.	Diaphragm has become unseated.	Contact Radium tech support for resolution.
Pressure spikes during on/off throttle driving.	Orifice may be too small.	Install larger orifice.
Small vacuum leak on top side of diaphragm.	Minute air leak around the threads of the adjustment screw.	Apply a conservative amount of thread sealant around the threads of the pressure adjustment screw where it threads into the top cap of the regulator.
Pressure drops quickly after fuel pump is turned off.	Leak in fuel feed system, leaking injector, pump does not have one-way check valve.  Regulator not sealing correctly internally.	Check system for leaks.  Contact Radium for a replacement orifice.