# INSTALLATION INSTRUCTIONS

DIRECT MOUNT REGULATOR

Document# 19-0316

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.**

The direct mount regulator (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 compatible with gasoline and alcohol fuels, such as E85. It is typically secured directly to the fuel rail but can be remotely mounted using P/N: 20-0624 DMR, REMOTE MOUNT ADAPTER KIT (see page 4).
The regulator is designed to operate in normal EFI pressure ranges of approximately 20 to 100 psi static. Exact minimum and maximum fuel pressures will depend on the fuel pump setup.

# PORTS

**INLET PORT "A"**

The 6AN ORB inlet port on the DMR is located on the side of the regulator and is used for incoming high-pressure fuel.

**Direct Mount**

If securing the DMR directly to the fuel rail, the provided 8AN ORB swiveling adapter fitting will be used. This fitting must be compatible with a 3/4"-16 threaded fuel rail outlet port (8AN ORB).

**Remote Mount**

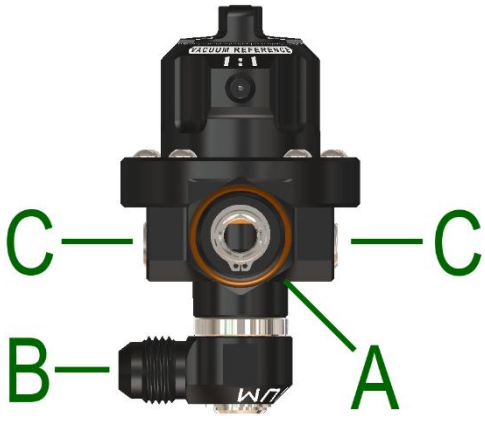
If remotely installing the DMR (using optional P/N: 20-0624), a hose from the fuel rail to the DMR inlet must be constructed.

**RETURN PORT "B"**

The 6AN ORB bottom DMR 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 swiveling 6AN male fitting is not ideal for the installation.

**1/8" NPT PORTS "C"**

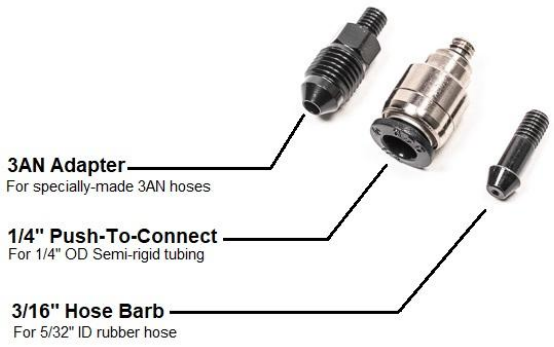
The 1/8" NPT side ports see the same high-pressure fuel as the inlet port and fuel rail. Thus, these ports can be used for fuel pressure monitoring using a fuel pressure gauge or sensor. Using the included plugs, block off whichever port(s) are not used. These plugs have a PTFE coating pre-applied, so 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 or feed line before proceeding to other troubleshooting steps.

# VACUUM REFERENCE

This regulator features a vacuum reference port on the top cap. Multiple unique adapters are provided for vacuum connection to this port. 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 DMR. 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. For constant pressure (used in all returnless fuel systems), plug the reference port using the provided screw.




When installing the vacuum adapter into the regulator, use a wicking thread locking compound, such as LOCTITE 290. If not available, any other medium strength thread locking compound can be used. Take care not to allow the thread locking compound in the air passage of the vacuum adapter.

NOTES:
1. Simply finger tighten the fitting.
2. If installing the 3AN fitting, do NOT over torque. Be sure to hold the fitting with a wrench when securing the hose end. These are manufactured from high strength steel, but are very small.

The vacuum port has the ability to rotate 360 degrees about the regulator body. This permits the installer to point the vacuum fitting in any direction.

# RETURN ORIFICE

The DMR-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.

# DMR INSTALLATION

1. Install the swivel union adapter into the side port (A) of the DMR using an 8mm Allen wrench. Apply a small amount of oil to the O-rings before assembly.

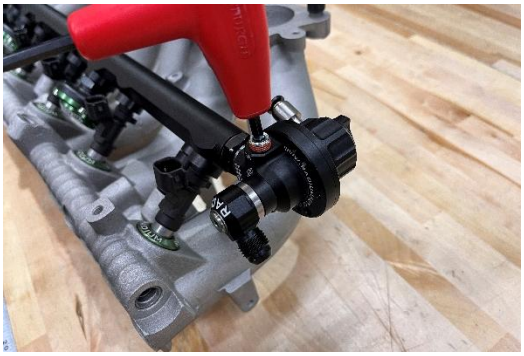
2. Screw the DMR with adapter fitting into the fuel rail port using a 7/8” (22mm) wrench or an adjustable -AN wrench.
The regulator can be oriented any way, including upside down.

NOTE: The feed line from the fuel pump should be plumbed directly to the fuel rail in a different port.

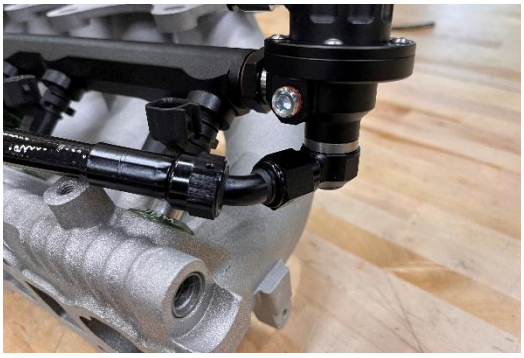

3. Install the return fitting into the bottom port (B) of the regulator using a 4mm Allen wrench. Apply a small amount of oil to the O-rings before assembly.

4. Install the vacuum reference adapter fitting. Refer to the vacuum reference section earlier in this document for more information.

5. Install the 1/8” NPT fittings into ports “C”. The plugs require a 3/16” Allen wrench, as shown.



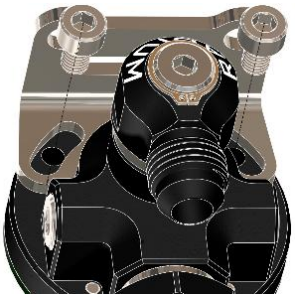
6. Attach the fuel return line to the bottom DMR fitting. This may look different based on the installation.



7. Connect the vacuum line to the DMR (if applicable).

NOTE: If using the push-to-connect fitting, a ¼” OD tube is required, as shown.

***For “remote mount” applications, use this DMR with P/N: 20-0624 and follow the steps below.***



- *a) P/N: 20-0624 comes with adapter fittings for 6AN or 8AN size hose. Lubricate the 6AN ORB inlet fitting O-ring and install into the side inlet port of the DMR.*
- *b) Install the bracket to the DMR using the M5x0.8 screws. 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, shown below as “custom hose”.*
- *f) Connect the fuel return hose from the fuel tank to the bottom fitting on the DMR.*

# START UP/LEAK CHECK

After installation, perform a leak check to be 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 installed in another area 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.

**IMPORTANT!: DO NOT tighten the adjustment knob more than 16 revolutions from full loose. This will result in damage to internal threads and will NOT be covered under warranty. If target fuel pressure is not obtained within those 16 revolutions, inspect the fuel system for issues or contact technical support.**

# SERVICING

- Relieve fuel pressure and turn the pressure adjustment knob counterclockwise as far as possible.
- 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. There are no other parts that should require servicing.
- 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-lb.
- Reset fuel pressure.

Replacement Diaphragm P/N: 18-0017