

INSTALLATION INSTRUCTIONS MULTI-PUMP FUEL SURGE TANK

UNIVERSAL APPLICATION

P/N: 20-0437-XX & 20-0438-XX

MPFSTs manufactured after April 2019

Document: 19-0202

Support: info@radiumauto.com

CAUTION

Only a qualified technician following applicable safety procedures should perform the installation of this product. One must have knowledge in repair and modification of fuel systems and general vehicle modifications to install this product.

Gasoline and other fuels are flammable and can be explosive.

Only install in a well-ventilated location to minimize buildup of fuel vapors.

No sparks, open flames, smoking or other ignition sources are to be present. Draining and removal of all fuel from the fuel system is recommended.

Proper eye and personal protection is required at all times during installation.

WARNING

The fuel system is under pressure! Do not loosen any connections until relieving the fuel system pressure.

Consult a service manual for instructions on relieving fuel pressure safely. This product is designed for off-highway and racing use only.

Fuel system components may not be legal for sale or use on emissions controlled motor vehicles. Consult local, state, and federal laws.

READ AND UNDERSTAND THESE INSTRUCTIONS COMPLETELY BEFORE BEGINNING INSTALLATION

The Radium Engineering Multi-Pump Fuel Surge Tank (MPFST) is designed to enhance the fuel system by providing resistance to starvation (from fuel slosh) and by increasing the fueling capability of the system. It is designed for fuel injected engines only and should not be used in carbureted applications.

The primary fuel pump in the vehicle's main gas tank will no longer directly feed the engine. This fuel pump will now be used to fill and maintain the level of fuel in the surge tank. When selecting this fuel pump, keep in mind that it will operate at a very low pressure since it simply cycles fuel right back into the gas tank. A standard EFI fuel pump will typically suffice.

The fuel pump(s) inside the MPFST will now be the high-pressure source for the engine's fuel demand. A fuel pressure regulator must be used. Fuel pressure should be checked before and after installation to ensure there is no difference with the MPFST operating. Any change in fuel pressure will affect engine performance.

If purchased with fuel pumps included, everything is internally configured and is ready to be installed. Note: fuel pumps are typically factory tested with a harmless fluid. Some small trace amounts may be found in the MPFST.

MOUNTING

The MPFST should be firmly mounted to a stable, structural component of the vehicle away from moving parts, excessive heat, and collision prone areas. The MPFST should not shake or vibrate excessively during operation. This MPFST is designed to be mounted in a standing vertical orientation only. Surge protection effectiveness will suffer if the tank is excessively tilted from the vertical position. A threaded plate or M6x1.0mm nuts are required to secure the MPFST using the provided M6 x 1.0mm mounting bolts. Rubber isolating mounting feet can be used to reduce noise/vibration transmission to the chassis.

PLUMBING

Overflow/Supply/Return

The SUPPLY port receives fuel from the lift pump to fill the MPFST. The OVERFLOW port allows excess fuel to drain back to the gas tank. The RETURN port accepts the low pressure FPR fuel to fill the MPFST. NOTE: For proper surge tank function, DO NOT swap these ports around.

All 3 of these ports are female threaded for 8AN ORB (3/4"-16). As shown, 6AN male adapter fittings are included with all MPFST surge tank variations. If different adapter fittings are needed, they must be purchased separately. Visit radiumauto.com and click the product page labeled "8AN ORB Fittings" found in the universal fittings section of the website.

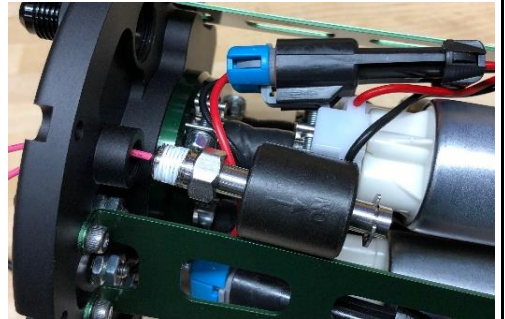


Fuel Level Switch (20-0461)

To install the optional fuel level switch, the top plate must be removed from the surge tank canister. The float on the switch can be flipped for Normally Open (NO) or Normally Closed (NC) configuration by removing the E-clip. For the switch to be closed during low fuel, the arrow on the float should be pointing downward.

Remove the small 2AN ORB plug from the top plate using a 1/8" Allen wrench. Apply a small amount of PTFE paste or tape to the level switch threads, as shown. Route switch wires through the top plate's threaded hole and thread the switch into the underside of the top plate. Hand tighten the switch, then add another 1.5 to 3 turns with a wrench until tight and sealed.

The MPFST top can now be installed back on the canister. The 2 switch wires can be routed for the installer's specific purposes. The switch will activate when fuel level drops by 20% or more.



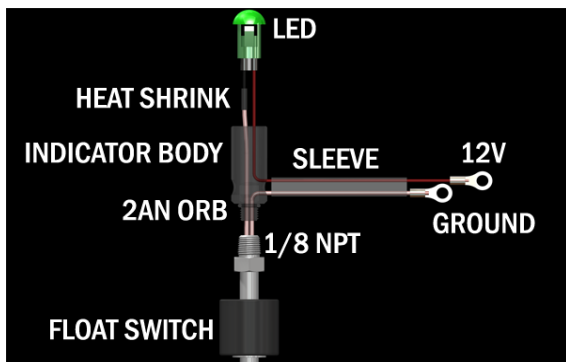
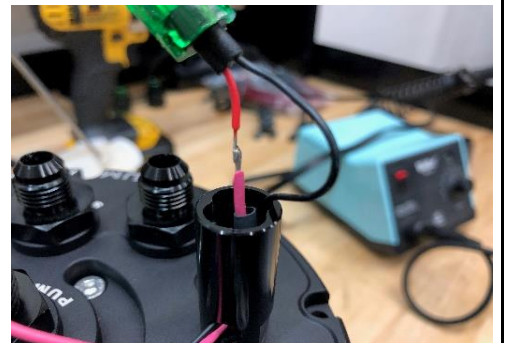
Diagnostic Indicator Kit (20-0508)

Route the 2 pink wires (from the 20-0461 fuel level switch) through the included black aluminum tube. Next, thread the tube into the MPFST top plate and tighten. Route one of the switch wires back down into the tube and out one of the side holes of the aluminum tube. Pull slack out. Cut the other switch wire short and solder it to the red LED wire, which should also be cut short. Make sure to cover this connection with the included shrink tube. Route the LED black wire down into the tube and out the same hole as the other level switch wire.

Push the LED down into the tube until it is fully seated. Cover both loose wires with the protective sleeving and route to the power source. For simplicity, this can be the pump #1 power terminals.

Crimp the ring terminals to the power and ground wires. Connect the red to the positive terminal and black to the negative terminal. Use heat shrink on the ring terminal crimps.

NOTE: The wiring described above puts the switch on the positive side of the LED. The switch can also be put on the negative side of the LED, as shown below:







Start Up

The MPFST must be primed with fuel before the engine can start. Remove the MPFST pump fuses and cycle the vehicle's ignition power several times. This will activate the lift pump for a few seconds each time. After 3-4 cycles the engine should be ready. Reinstall the fuel pump fuses and start the engine. Fix any potential leaks and adjust fuel pressure.


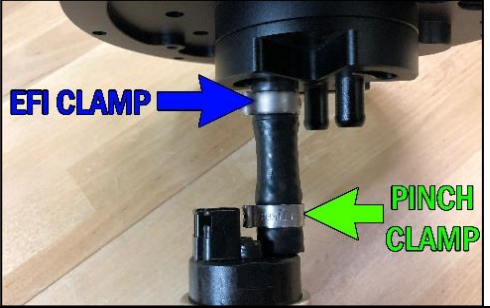
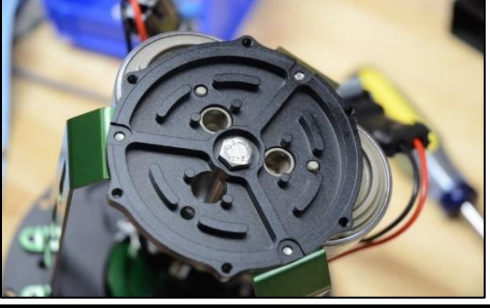
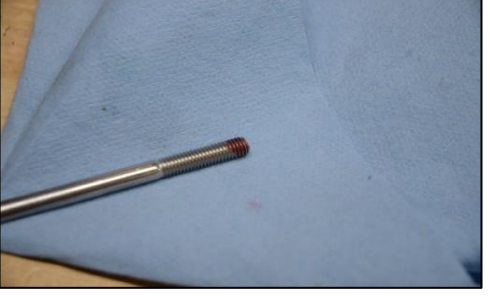
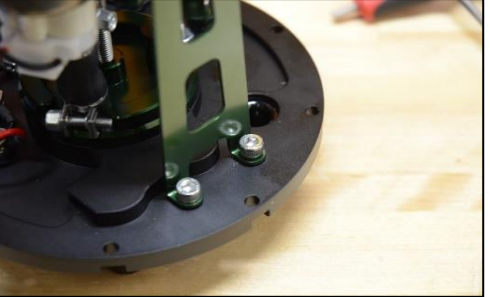

ASSEMBLY

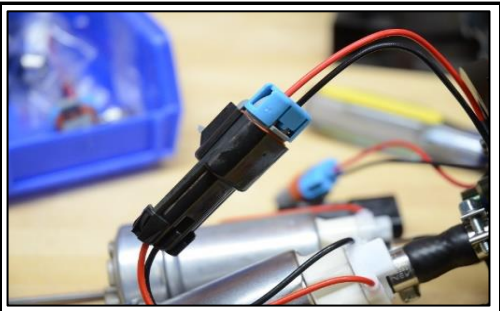



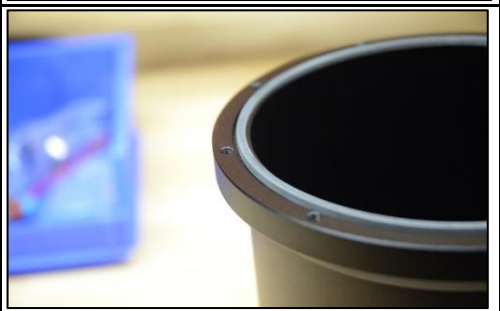
If the MPFST was delivered without pumps installed, follow the steps below to complete the assembly.

STEP	TOOLS NEEDED	INSTRUCTIONS	PHOTO
1	3mm Hex Wrench	Using a 3mm hex wrench, remove the 9 perimeter bolts holding the top plate on the surge tank.	
2		Lift off the top cap and set the assembly on the work bench.	
3	Allen Hex Wrench	Remove the 6 screws holding the green brackets to the underside of the MPFST top cap.	
4	10mm Socket	Remove the center bolt shown in the picture. Lift the pump cradle assembly off and set aside.	

If installing Walbro F90000267/274/285 pumps, follow steps 5-8. If installing Walbro GSS342 or AEM 50-1200 pumps, follow steps 9-12.

5	1/8" Hex Wrench	<p>Walbro F90000267/274/285 pumps ONLY</p> <p>For 1 or 2 pump configurations, install the 2AN ORB plugs into collector block port(s) that will not be used. It does not matter which ports. For 3 pump configurations, do not install any port plugs.</p>	
	Phillips Screwdriver	Verify the submersible hose(s) are 47mm long. If necessary, cut to length.	
	Hose Cutter	Install the hose(s) on the collector barbs. Oil lubrication is recommended as fitment will be tight. Secure the hoses with the included clamps, oriented as shown.	
	Oil Lubrication		
6		Loosely place the remaining clamps on the hose(s). Make sure the clamp(s) are all the way open.	
7	Oil Lubrication	<p>Loosely place the remaining clamps on the hose(s). Make sure the clamp(s) are all the way open.</p>	
8	Oil Lubrication	<p>Install the pump outlet barbs into the hoses. Slide up the hose clamp into place and tighten.</p> <p>Skip to Step 13</p>	
	Phillips Screwdriver		
9	4mm Hex Wrench	<p>Walbro GSS342 or AEM 50-1200 pumps ONLY</p> <p>For 1 or 2 pump configurations, remove the 6 screws around the outlet port, as shown. This will release the pump collector from the bottom of the plate.</p> <p>If installing 3 pumps, skip this step.</p>	
10	1/8" Hex Wrench	<p>As shown, install plugs into any ports that will not be used. It does not matter which ports are plugged.</p> <p>Next, mate the collector back to the bottom side of the top plate. Align the gasket with the features of the underside of the plate.</p> <p>Torque the 6 screws removed in the previous step to 32 in-lbs.</p> <p>If installing 3 pumps, skip this step.</p>	
	4mm Hex Wrench		
	in-lb Torque Wrench		

11	Pinch Clamp Pliers	For Walbro GSS342 255LPH pump applications, verify the submersible hose is 46.5mm long. For AEM 50-1200 pump applications, cut the submersible hose to 44.9mm long.	
		Install the hose onto each pump outlet. Use pinch clamp pliers (shown in blue) to crimp the pinch clamp(s) closed. However, a standard pair of diagonal cutters (shown in red) can also be used. For serviceability, it is recommended to make the crimp on the connector side of the pump, as shown. It will also permit the necessary clearance for the long M6 bolt when reinstalling the fuel pump cradle.	
12	Phillips Screwdriver	Slide the fuel pump hoses along with a loose EFI clamp onto the pump collector hose barbs. Rotate each fuel pump so the electrical connectors are facing outward. Secure the EFI clamp.	
13		Check the orientation of the pumps by installing the pump retaining plate. Rotate the pumps until the inlets and pegs align with the holes in the plate. When the pumps are oriented correctly, proceed to the next step.	
14	10mm socket	Apply high strength threadlocker to the long screw threads. Install the bolt through the pump retaining plate and thread it into the pump collector block. Loosely install this screw.	
	Threadlocker		
15	Allen Hex Wrench	Reinstall the 6 screws removed from the earlier step.	
16	10mm Socket	After all of the six screws are installed and tight, snug down the long bolt using a 10mm socket. Do not overtighten as it could over-compress the short hoses and damage the pump(s).	

17		Plug in the wiring connectors to the pumps. This may look different depending on the fuel pump model.	
18		Place the inlet screen onto the pump retaining plate as shown. Line up the small tabs in screen holder to the recesses in the plate.	
19	5/64" Hex Wrench	Install the 6 small screws to hold the inlet screen in place. Tighten the screws.	
20		The assembly of the pump module is now complete. Tuck any wires in close to the pumps.	
21		Make sure the o-ring is properly seated in the MPFST canister groove, as shown.	
22	3mm Hex Wrench in-lb Torque Wrench	Install the pump module into the surge tank. The orientation should be considered for optimal hose plumbing and electrical routing. Install the 9 perimeter bolts and tighten in an alternating cross pattern to 30 in-lb. Assembly is complete.	