



Installation Manual

Triple Pump Billet Surge Tank

PFEFCA020



Included Items	QTY
PFEFCA020 Billet Surge Tank 2.5L	1
PFE790-06BK -06AN ORB Male To 3/8" Barb	3
PFE814-06BK -06AN ORB Allen Key Plug	2
PFEFT-0105 PTFE Electrical Bulkhead Connectors	4
PFEFT-0101 In-tank Wiring Kit	1

WARNING: PLEASE READ ALL INSTRUCTIONS BEFORE PROCEEDING. PROFLOW WILL NOT BE RESPONSIBLE FOR ANY DAMAGE AS A RESULT OF THE INCORRECT INSTALLATION OF THIS PRODUCT. IT IS RECOMMENDED THAT A QUALIFIED AUTOMOTIVE TECHNICIAN PERFORMS THIS INSTALLATION.

WARNING: THE INSTALLATION OF THIS PRODUCT REQUIRES THE HANDLING OF FUEL. IT IS RECOMMENDED TO WORK IN A WELL-VENTILATED AREA AND WEAR APPROPRIATE PERSONAL PROTECTION. KEEP ALL IGNITION SOURCES AND FLAMES AWAY FROM THE VEHICLE AT ALL TIMES.

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Description

The Proflow performance billet aluminium triple surge tank is a 2.5L tank that prevents fuel starvation to the engine on vehicles with inadequate fuel tank baffling. Fuel is supplied to this tank by another fuel pump called the lift pump, which is usually the OEM in-tank fuel pump. This tank maintains a small amount of fuel for its internal pump(s), even if the lift pump from the cars main fuel tank starves momentarily. This surge tank provides a quick and easy way to upgrade any OEM fuel system without changing the stock fuel tank, and is a great solution for vehicles when installing high powered upgrades such as forced induction. Its unique design combines all pumps into a single large outlet for better pressure equilisation and simpler, easier plumbing, requiring no external couplers.

Mounting

The surge tank should be firmly mounted to a stable structural component of the vehicle away from excess heat and collision prone areas. This tank can only be mounted in a VERTICAL orientation using all 4 mounting tabs located on the base plate, securing it with M6 mounting bolts and the appropriate lock nuts, washers and spring washers. Rubber mounts (not included) can be used to reduce noise and vibration transmission to the vehicle.

Plumbing

The supply, return and overflow ports are threaded with -08AN ORB threads. The central pump outlet is threaded with -10AN ORB threads. The SUPPLY port receives fuel from the lift pump to feed the surge tank. The RETURN port accepts the excess low pressure fuel from the fuel pressure regulator's return port. The OVERFLOW port routes excess fuel back to the vehicles main fuel tank. This may require installing a fitting or modifying the fuel tank. The central PUMP outlet port will be the high pressure outlet to the vehicles fuel rail. The main fuel tank must be vented in order to prevent pressure build-up in the surge tank.

Note: The three -08AN ports can be interchangeable and are labelled on the surge tank as the best general guide. The middle port will always be the high pressure feed to the engine. All four ports on the surge tank must be plumbed and none can be blocked off.



Figure 1: Triple surge tank port configuration.

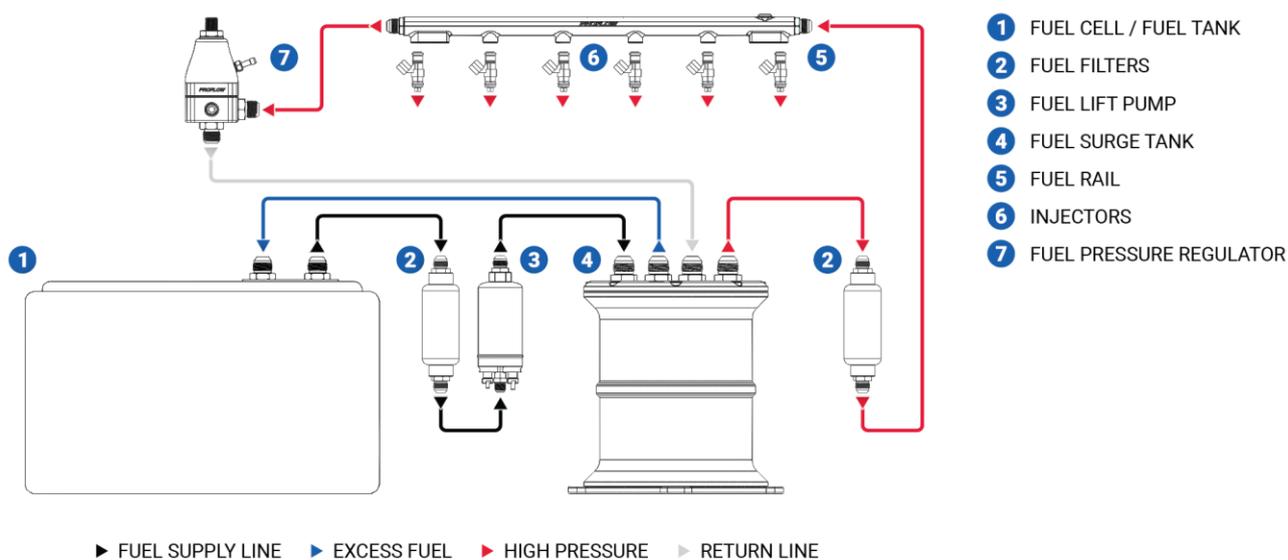


Figure 2: Flow chart of a typical surge tank fuel system setup.

Wiring

This surge tank is designed so you have the ability to activate multiple pumps in stages. Running all three pumps at the same time is not necessary for light driving or while the car is idling. This will add excess heat to the fuel system and potentially damage the fuel pumps. This surge tank is designed with 2 activation stages in mind:

- **Stage 1 (Primary):** This pump should be wired to activate with the lift pump (OEM in-tank pump). It is recommended to use the lift pump to trigger the primary stage 1 pump so they operate simultaneously.
- **Stage 2 (Secondary):** This stage can be triggered in several different ways depending on your vehicles setup. Cars with forced induction can trigger the second stage with a Hobbs switch that activates at low boost pressure, or a WOT switch for naturally aspirated setups. If you are running a standalone ECU, you can setup a second pump output and use that wire to trigger this stage. This gives access to safety features and other options for triggering such as RPM, Load, Injector duty cycle, etc.

Note: ensure the second stage pumps/terminals use the included 14 gauge wiring to handle the excess current draw of two pumps running together.

Selecting a Feeder Pump

As the surge tank is connected to the OEM fuel tank which is not pressurized, the factory in-tank fuel pump will operate at a lower pressure than advertised, so even a small OEM pump will see an increase in fuel flow rate. As a general rule of thumb, the lift pump should have a rated flow rate of at least **50%** of the primary pump(s) flow rate.

Eg. If your primary pump(s) in the surge tank is rated to flow at 400LPH, the minimum flow rate for the lift pump needs at least a flow rate of 200LPH (at 43.5 PSI).

Typical Installation

1. Remove the 8 socket head cap screws holding the top plate to the surge tank and remove the pump hanger assembly.

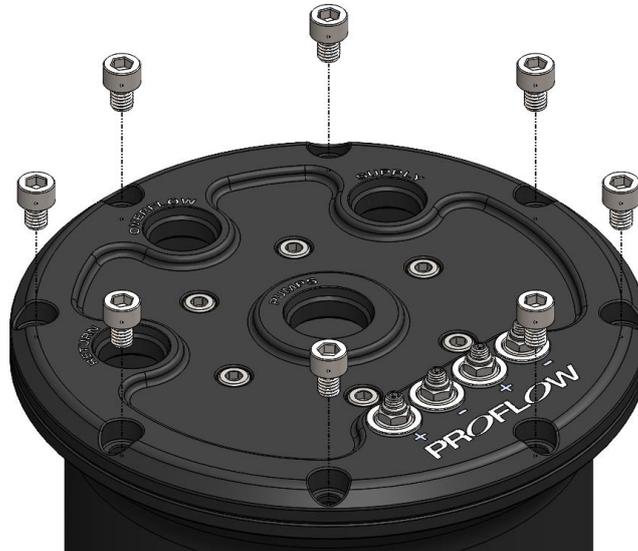


Figure 3

2. Fasten the pump merger to the top plate by fastening the 6x M5 socket head screws through the top plate and into the merger (figure 4). Apply a low strength thread-locker to these screws. Also ensure the gasket is adequately lined up with the bolt holes.
3. Install the supplied 3/8" hose barb fittings with o-rings into the pump merger underneath the top plate. If you are using only one or two pumps, block these ports with the supplied plug and o-rings (figure 5 is an example when using 1 pump).

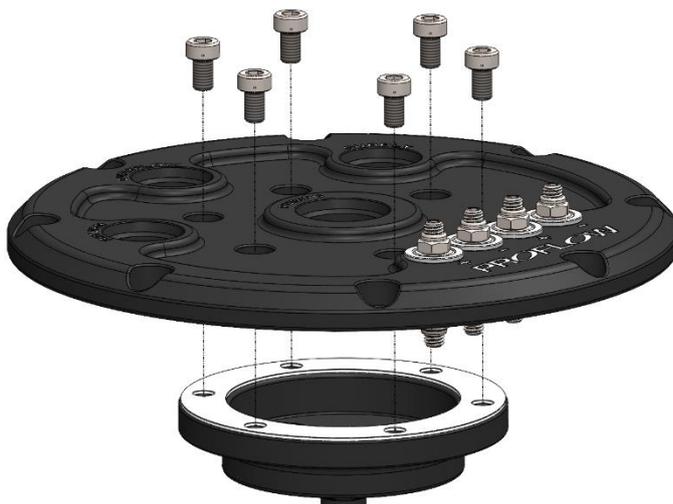


Figure 4



Figure 5

4. Fasten the supplied M6x16mm socket head cap screw with a low strength thread-locker through the bracket and into the central shaft (figure 6). Ensure the markers on the bottom of the pump collector and the top of the pump bracket are **above** each other as shown in figure 7 (pumps will only line up with this orientation).

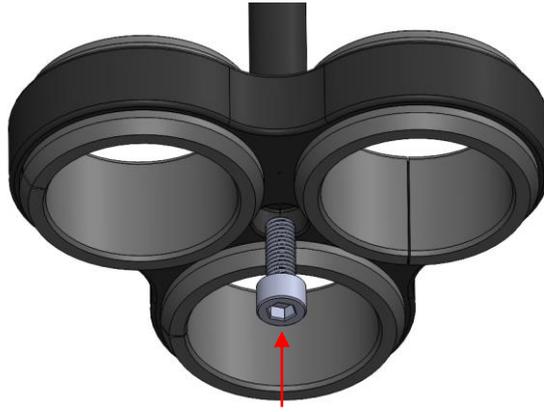


Figure 6

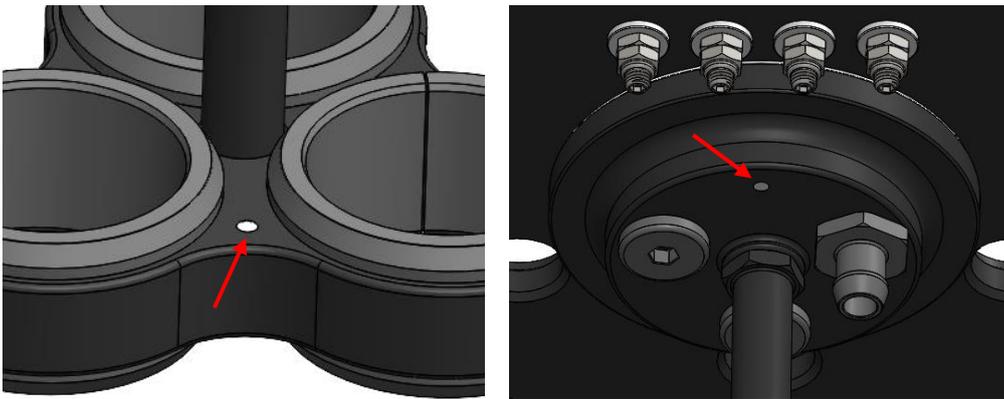


Figure 7

5. Install the pump into the pump bracket with the supplied NBR sleeve. Cut roughly 40mm of submersible hose and fasten with 2 stainless steel clamps (not supplied).



Figure 8

6. Plug the wiring connector into the pump and strip and crimp two of the included ring terminal ends onto the ends of the fuel pump wiring with heat shrink. Fasten the ring terminals to the corresponding positive and negative electrical connectors in between the lock nut and nylon nut as shown in figure 9.
Repeat this process if using more than 1 pump.

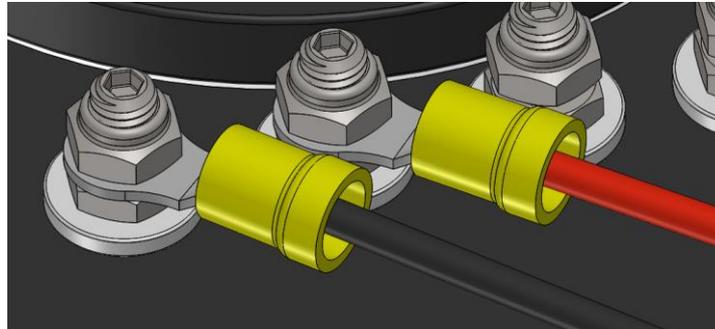


Figure 9

7. Install the pump's filter sock onto the bottom of the pump inlet (this process may be different for varying pumps). If using more than one pump, it may be necessary to rotate the pumps once installed so the filters do not overlap each other.
8. Ensure all threaded fasteners (such as the central shaft screw and M5 screws on the top plate holding the pump collector) are tightened with a low strength thread-locker before proceeding. Also ensure the M10 countersunk bolts underneath the tank are securely fastened.
9. Place the fuel pump hanger assembly into the surge tank as shown in figure 10 and ensure the o-ring is seated correctly in its groove before fastening the top plate onto the tank. Torque each perimeter bolt in a cross pattern to approximately 5 Nm.

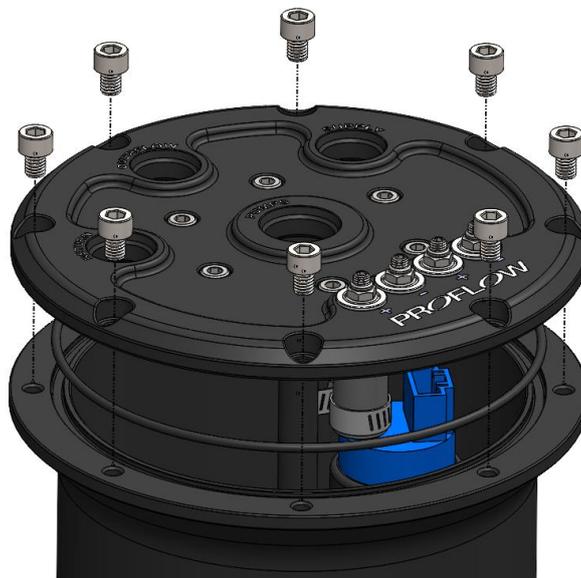


Figure 10

10. Before starting the car, the surge tank will need to be primed with fuel. This can be done by cycling the vehicles ignition power on and off several times. This will activate the primary fuel pump to fill the surge tank before finally starting the car.