6-000-30ST
3.0 Liter Staged Surge Tank Pump Installation Guide

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Parts List:

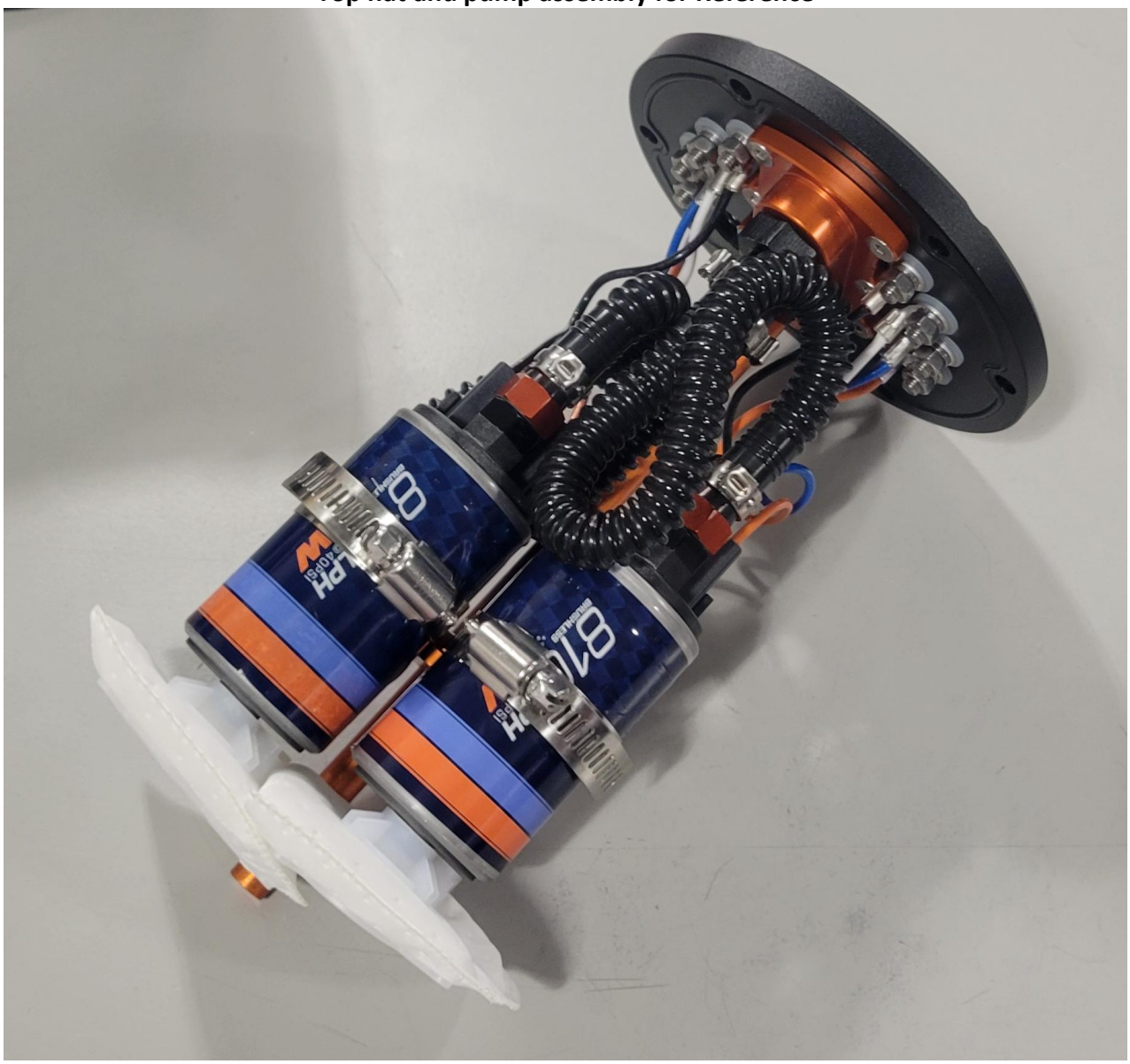
Installation kit shown above

- 3.0 Surge Tank
- 3.0 Top Hat
- Top Hat O-ring Seal
- Flat Bracket
- 90° Bracket
- 6x M6x1.0 x 10mm Cap Bolt
- Pump Holder
- Pump Holder Rod
- 4x M8x1.25 x 14mm Counter Sunk Bolt
- 8x M5 Bulkhead Terminals
- 2x 3/8” Barb to 6 AN ORB
- 2x 8 AN ORB Flat Plug
- 2x 39mm Pump Pre-filter
- 2x 46mm Pump Pre-filter
- 2x 3/8” x 8” Convoluted Tube
- 2x 3/8” to 5/16” x 8” Convoluted Tube
- 5x Permanent Hose Clamps
- 2 ¼” Pump Holding Clamp
- 9x Ring Terminal
- 9x 90° Ring Terminal
- 2x 39mm Pump Pigtail

Suggested Tools

- Wire Stripper and Crimper Tool
- Tubing Cutter
- 5mm Allen Wrench
- 4mm Allen Wrench
- 8mm Socket or Wrench

Top hat and pump assembly for Reference



Note: The 3.0 Liter Staged Surge Tank is designed to use 39mm, 42mm, or 46mm Deatschwerks Universal fuel pumps; it may be incompatible with other brand fuel pumps.

Compatible DW Fuel Pumps Included:

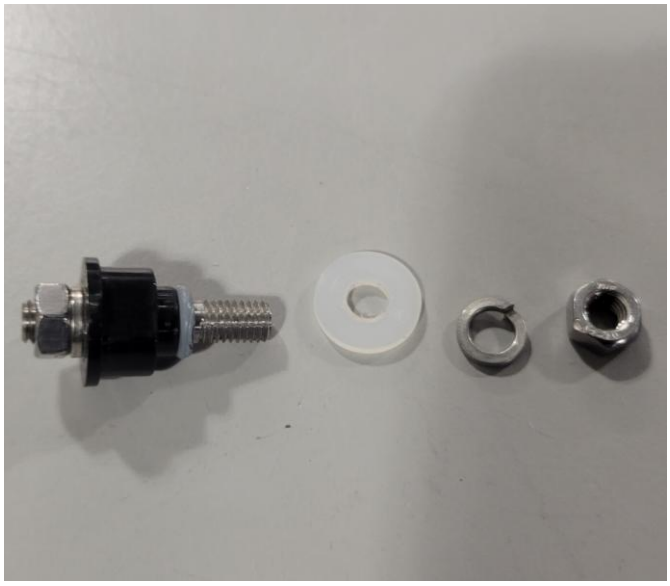
- DW300 (PN# 9-301)
- DW550 (PN# 9-551)
- DW420 (PN# 9-421)
- DW810 (PN# 9-811-C105-1002)

Top hat removal and Bulkhead/Barb Install

1. Take the surge tank out of the box and remove the top hat and brackets from the surge tank. Remove them using a 5mm Allen head wrench.

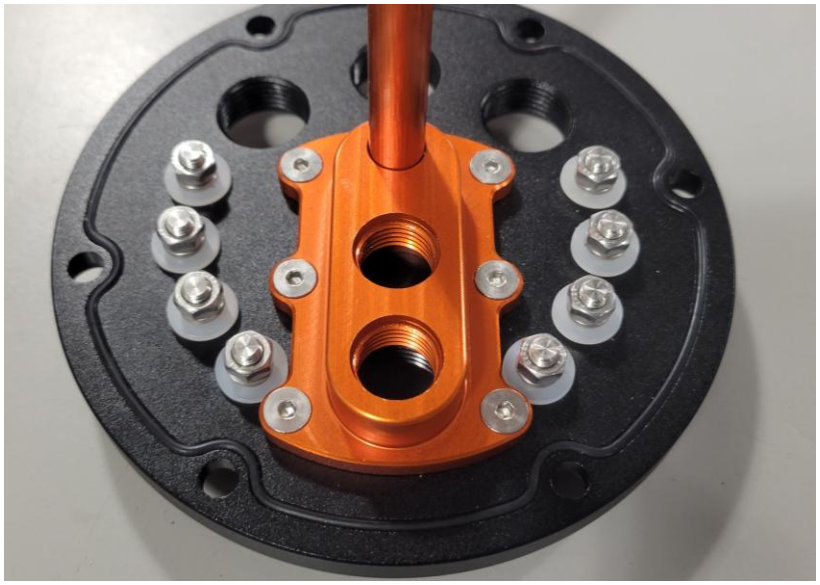

2. Remove the top hat. It will also remove the pump holder. Locate the M5 terminals. These will need to be installed for the wiring.


3. Take the washer and nuts off the bulkheads. This is necessary to install the bulkhead into the top hat.

4. Install the black nylon and threaded stud into the top hat. Then reinstall the washer, lock washer, and nut back onto the terminal.

5. Install the remaining bulkheads into the top hat. Force may be required to install the terminals, such as light tapping from a small hammer or something similar. Make sure not to bind the O-ring, or the tank will leak.



6. Grab the barb fittings (6-02-0504-B) for the manifold and remove them from their packaging. Install the O-rings onto the perch above the threads.

7. Install the barb into the top hat. Tighten until the O-ring is no longer visible.

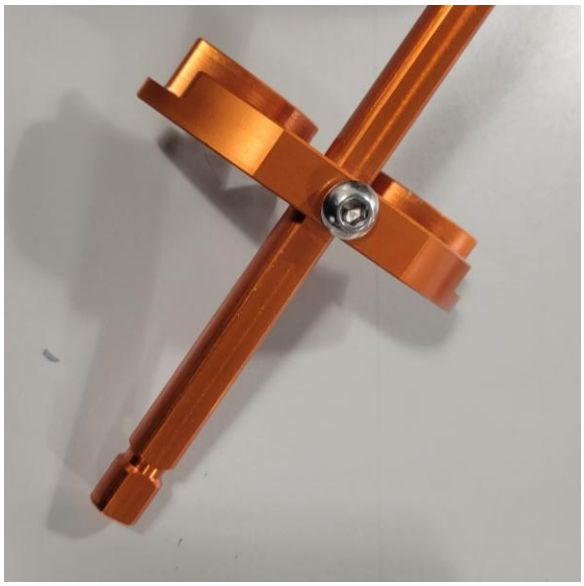

Brushed Pump Installation (DW550, DW300, or DW420)

If using brushless pumps skip to page 15

8. Installing the DW pumps, you will only need what is shown in the pic below. The DW550 will use the pre-filter shown below. The DW300 and DW420 will use the other taller pre-filter that comes with the install kit.

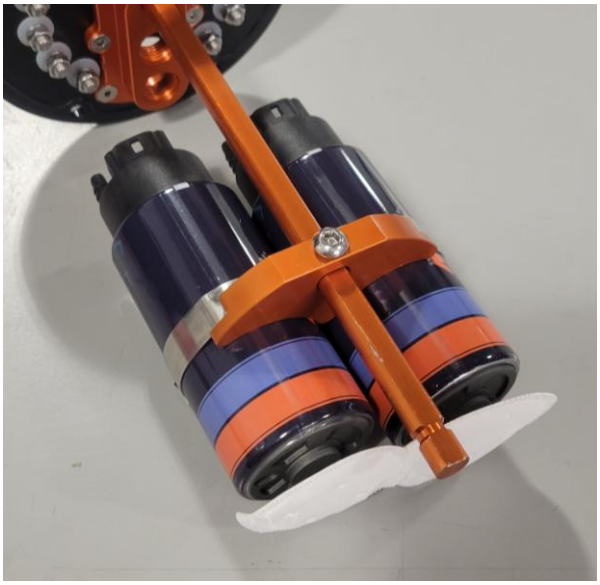
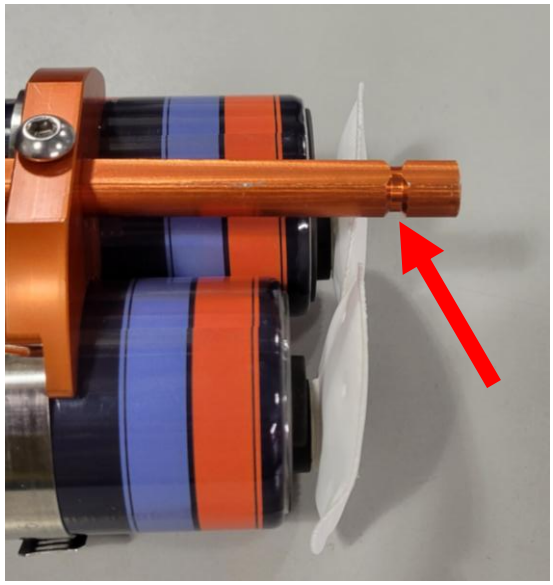
9. Remove the DW pump from the packaging and the round pre-filter for the pump. Set the pre-filter on the workbench or sturdy surface. Line up the inlet of the pump with the pre-filter and press down. Working the pump back and forth yields the best results. The DW550 pre-filter does require force to install, as there is no locking mechanism other than being pressed in. Do this for both pumps.


10. Now we are going to install the pumps onto the pump holder. Remove the pump holder from the pump holder rod. This requires a 4mm Allen head wrench.




11. Take the pump holder, the DW pump, and the larger hose clamps. Set the pump into the pump holder and slide the clamp over the pump and into the groove of the pump holder. The clamps don't need to be arranged like below; however, it does work best with this method. This will aid in installing everything into the surge tank.


12. Put the pump holder with the pumps back on the top hat/pump holder rod. There is a groove on the pump holder rod. This is the lowest point the pumps can be installed. We would recommend installing the pre-filters as close to this line as possible. This will result in the maximum amount of slosh protection.

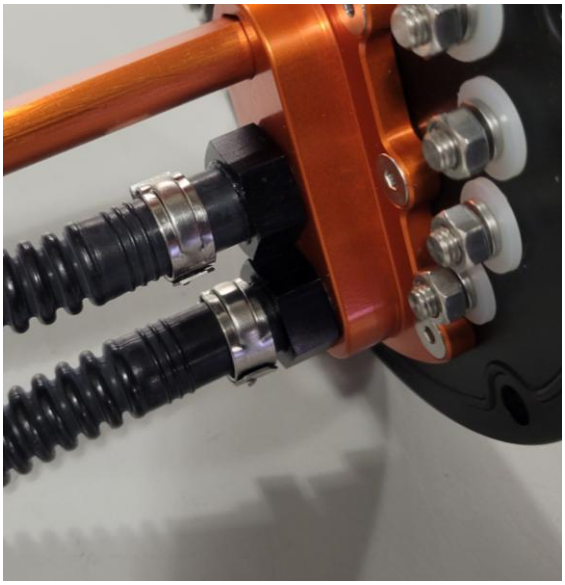



13. With the pump height properly set. Grab the 3/8” x 8”(for DW550s) or 3/8” to 5/16” x 8”(for DW300s or DW420s) convoluted tubes. Install the tubes onto the pumps.

14. Locate the 13.3mm clamps. Slide them onto the tube and clamp around the base using flat-end cutters or side cutters. Crimp the pinch clamps fairly tight so they do not come off under fuel pressure.

15. Slide a clamp onto each tube. Then install the tubes onto the barbs of the manifold. Slide the clamps down and then crimp them down with the flat or side cutters.

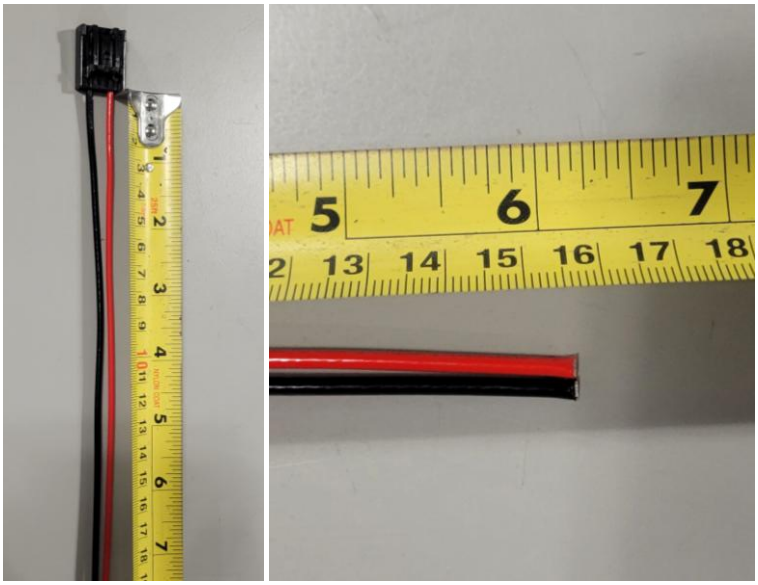




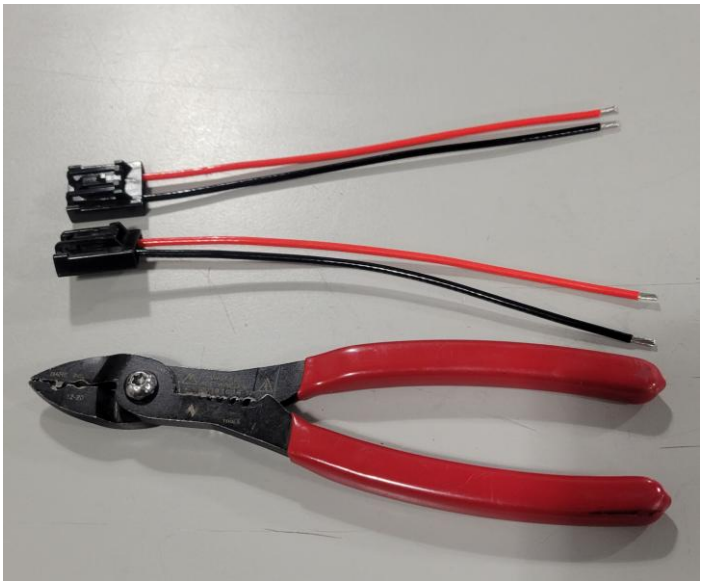
16. With the pumps installed into the pump holder and the tubes attached, slide the pump holder onto the pump holder rod. This will require the tubes to be bent and arranged to sit out of the way of the connector and manifold. Be sure to line up the pump holder bolt with the pocket on the pump holder rod. This will keep the pumps at the correct height.


Brushed Pump Wiring (DW300, DW420, and DW550)

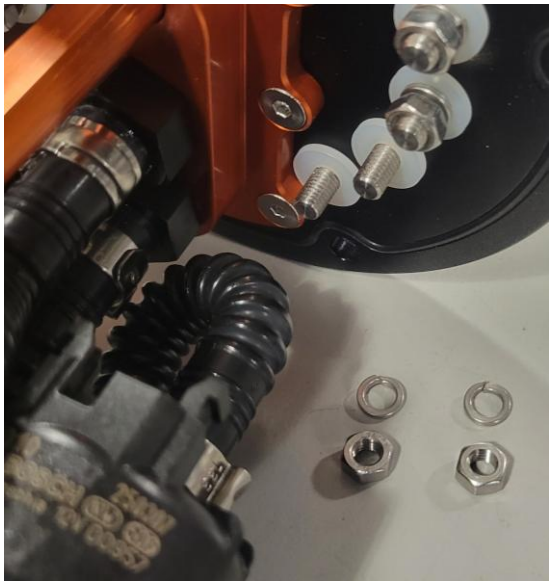
17. Gather the pump harness for the DW pump. We would recommend cutting the harness down to 6 inches in length.



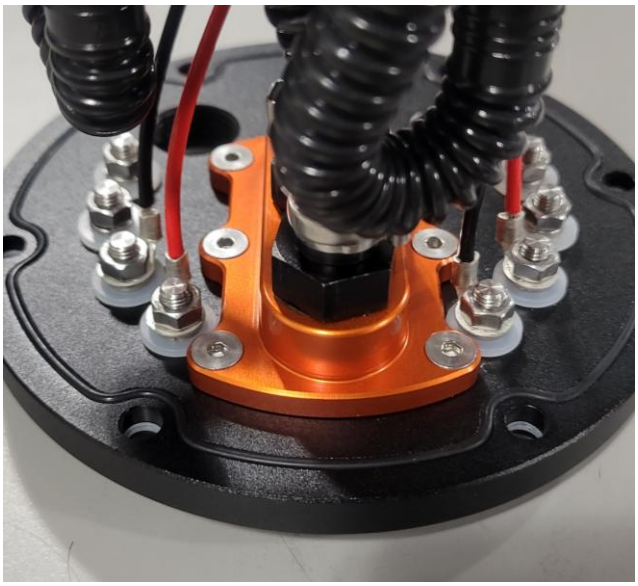
18. Now that the harness is a proper length, remove the shielding using a wire stripper. Then install the 90° ring terminals. Do this for both harnesses.



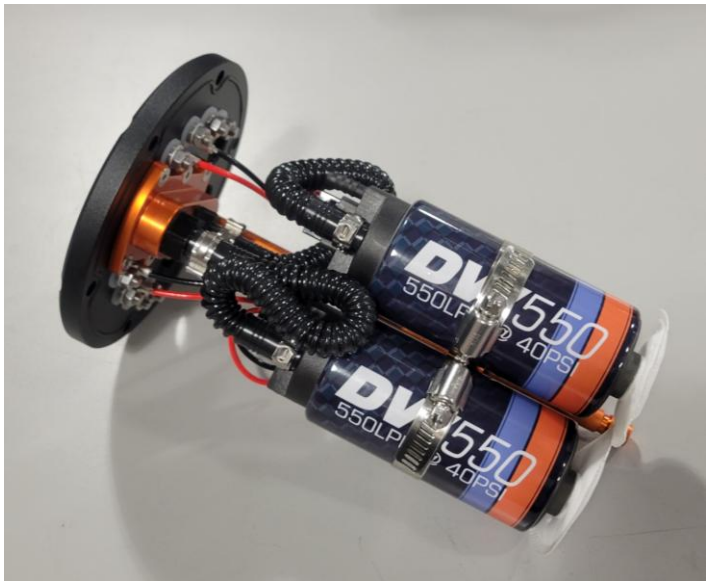
19. Remove the lower nuts on both sides along with the lock washers. The two upper nuts and lock washers need to be tightened to 15-inch lbs. This will be enough to crush the lock washer and seal the O-rings. These top two terminals will not be used with a brushless pump setup. These could be used instead of the lower two if desired. Just note which is used for what. They are labeled on the top of the top hat.




20. Install the wires on their respective terminals. The terminals are labeled on the top of the top hat for positive and negative. Tighten the terminal nuts to 15-inch lbs. The DW300, DW420, and DW550 the red wire is positive and the black wire is negative.

21. With this, the brushed pump top hat assembly is done. Skip to page 20 for the surge tank plumbing/mounting and page X for wiring.



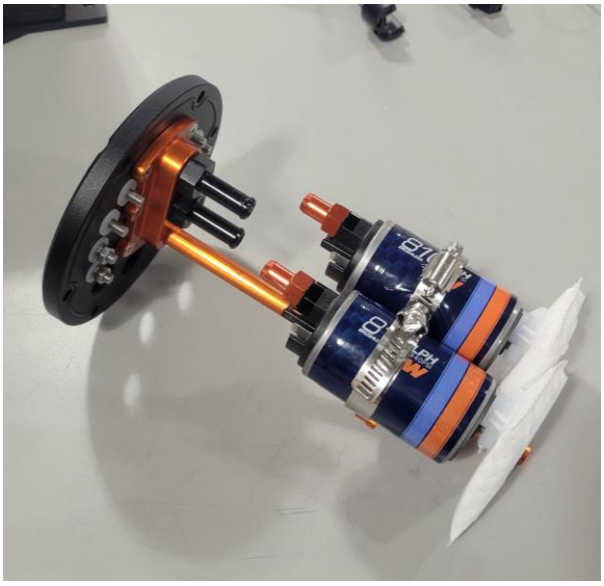
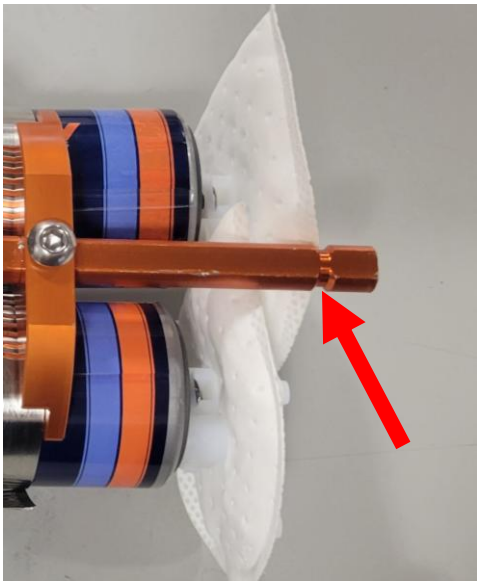
Brushless Pump Installation (DW810)

22. Remove the pump, harness, pre-filter, and 3/8” barb fitting from the packaging. This will be what is needed to install the pump into the surge tank. The controller will be needed, so set that to the side for now.

23. Install the check valve and fitting using lube in order to not destroy the O-ring. Additionally, press the pre-filter on until the locking tab is engaged. Do this for both pumps. Check valves have recently been added and will not reflect in the rest of the install guide. Nothing has changed other than this step.

24. Remove the pump holder from the pump holder rod using a 4mm Allen head wrench. Locate the large clamps to secure the pumps to the pump holder. Place the pumps in the semi-circle section of the pump holder and slide the clamp over the pumps. The clamps will go in the grooves of the pump holder shown in the left picture below. Tighten the clamps loosely enough to hold the pumps. The pumps may need to be adjusted to get the height set properly.


25. With the pumps installed onto the pump holder, slide the pump holder onto the pump holder rod. Make sure the pump pre-filter doesn't sit below the groove on the pump holder rod. If they sit well above the pump holder rod, move them down until they sit closer to it (not below). This will guarantee the best amount of slosh protection.

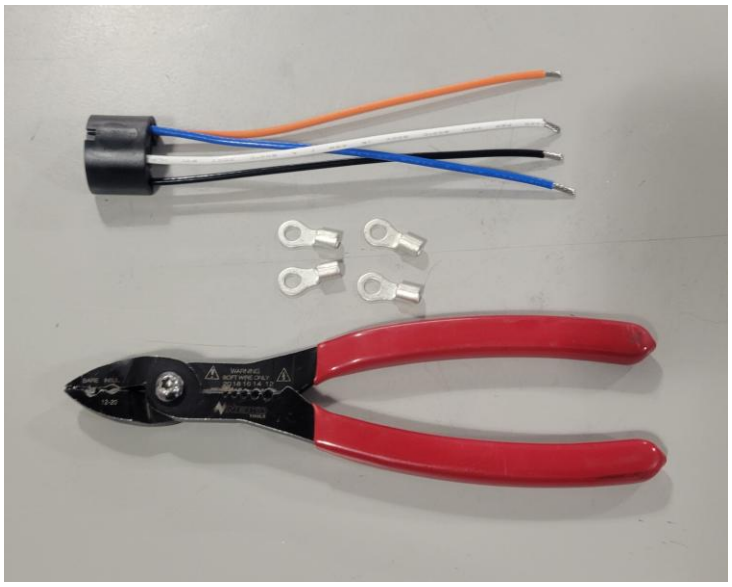



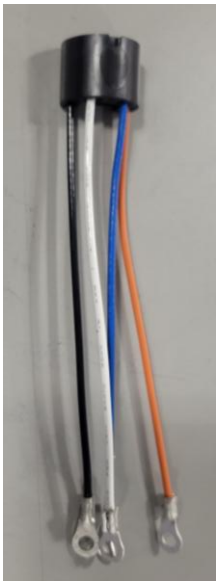
26. With the height set, we can now install the convoluted tubes. This will require the 3/8" x 8" tube and 13.3mm clamps. Clamp down on the pump outlet and then slide on another clamp for each pump for the manifold barbs. Tighten clamps using a side cutter or flat-end cutter.


27. Slide the pump holder back onto the pump holder rod. Tighten the 4mm Allen head bolt into the receiver in the pump holder rod. The hoses will require some bending to get the pumps into the proper position. There should be ample room for the tubing to bend and remain out of the way of wiring and the installation into the tank. Example of what it should look like below.

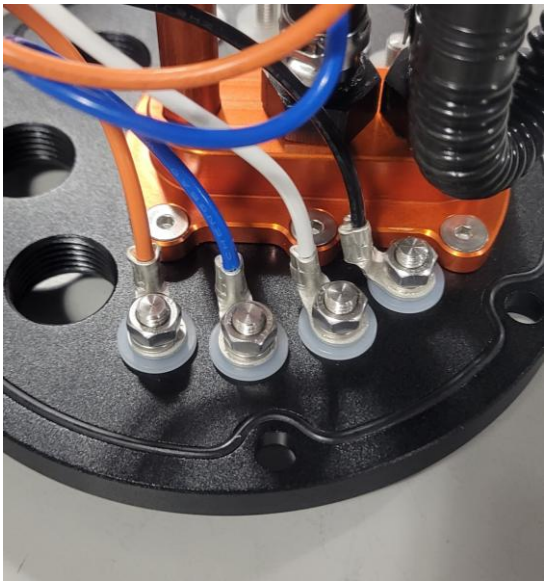
Brushless Pump Wiring (DW810 RACE ONLY)

28. Take the harness for the DW810 and cut the length of the wire to 6 inches. Strip and crimp the 90° ring terminal to the ends of each wire. Do this for both harnesses of the fuel pumps.

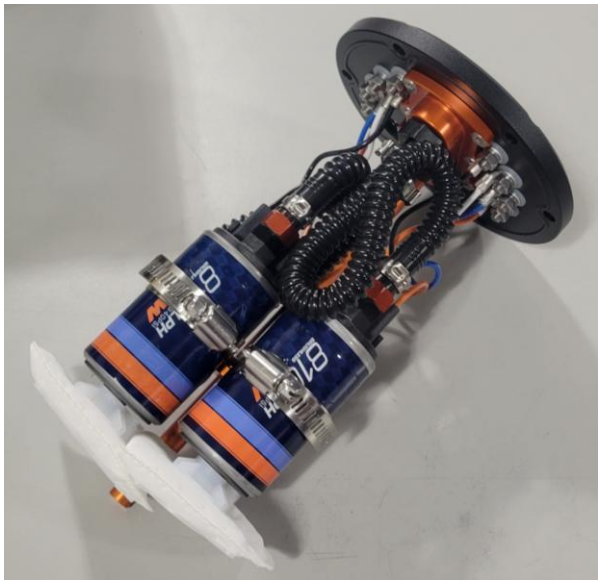




29. There is called out wiring for brushless wiring. Match the color of the letter on top of the top hat. O = Orange, B = Blue, W = White, Bk = Black. This goes for both sides of the top hat.

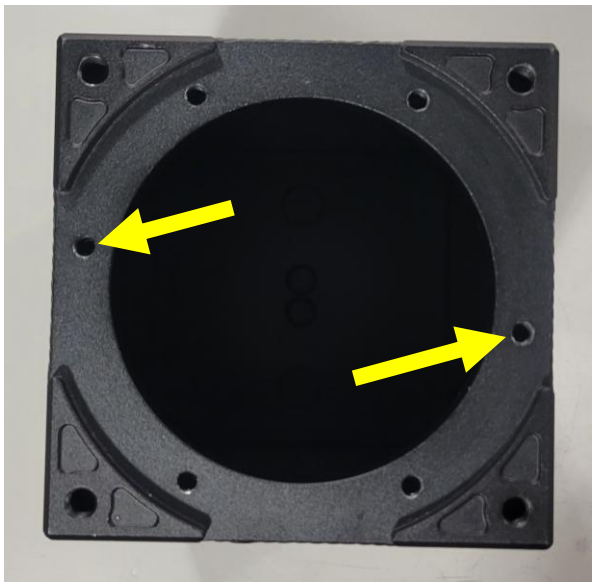



30. With the wiring finished, the pump/top hat assembly is complete.

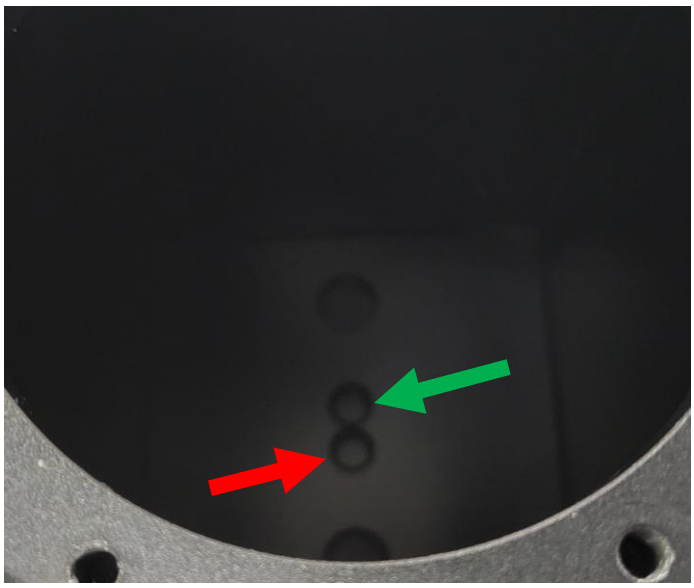


Surge Tank Orientation and Mounting

31. This specific surge tank can be mounted and plumbed in a couple of ways. This requires the surge tank to be mounted directionally. The bolt pattern guarantees that the plumbing stays upright for maximum slosh protection when mounted on its side.



32. If you are installing the top hat and it will not sit flush. The pump holder rod is not lined up with the dimple on the inside of the surge tank. If you line up the bolt holes properly, it will slot into the dimple properly. This makes sure the rod is supported when the tank is on its side. The pump holder rod will always go into the dimple on top.



33. The following step only applies if you are going to be laying the surge tank on its side. The surge tank will have an appropriate orientation for the pumps and top hat when on its side. The top hat will dictate which way is up (Shown via the red arrow). When on its side, the surge tank will work even better if the top hat faces towards the front of the vehicle. This will aid in slosh protection once the main tank level is low.

34. Below are additional options for mounting. The 90° brackets can be used to mount the tank sideways on a frame rail, the base plate can be used to recess the tank into a pocket, or placed on bottom to mount like a normal tank.



Surge Tank Plumbing

35. A surge tank will have to be plumbed with a minimum of four lines. One is to feed it, called the **Fill**, and one is to allow overflow back to the main tank, called **overflow**. One feeds the engine, called **pressure out**, and one receives the returned fuel from the engine. This setup allows for the best slosh protection. If mounting upright, all plumbing will be handled through the top hat, like below. The ports are also labeled for ease of identification.

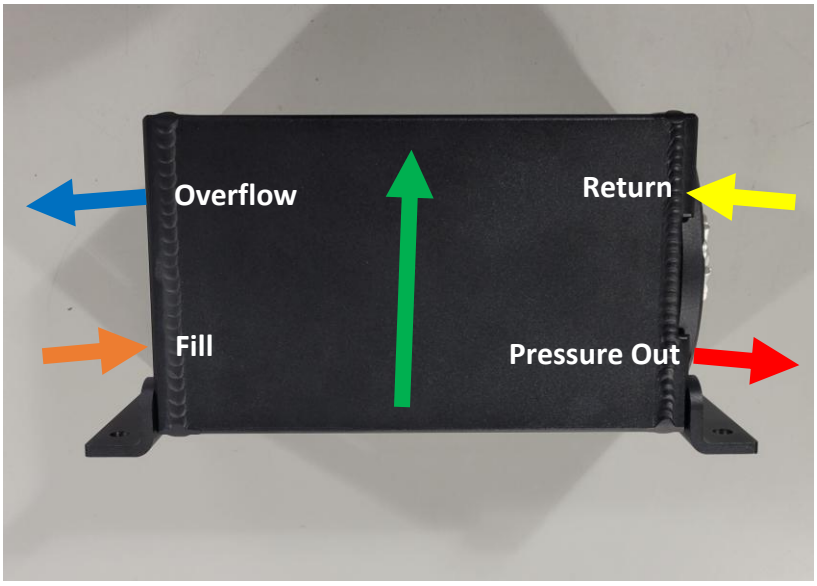
Fill: This is the feed from the in-tank pump to fill the surge tank.

Overflow: This is the overflow, this returns excess fuel back to the main tank.

Return: The return flow from unused fuel from the fuel system's regulator.

Pressure Out: The pressurized fuel from the surge tank pumps. Plumb this to the filter and then rails.

36. If you are mounting the tank on its side, you have some plumbing options. You can do everything through the top hat as normal or you can use the ports on the bottom of the tank for your fill and overflow. This means the surge tank can be plumbed in an "in-line" arrangement. You will need to plug the unused ports on the top hat if you are choosing this setup (shown above). If you do not use the bottom fill/overflow ports, they will need to be plugged (shown below). They can also be used to drain the surge tank if needed.



Wiring the Surge Tank

The 3.0L Staged Surge tank is designed so you have the ability to turn one or two pumps on in stages. Running both pumps at the same time is not necessary for light throttle driving or cruising, or idling a car; doing so will add excess heat to the fuel system. By running a single pump for 90% of the driving, until you need more fuel flow, you can lessen the heat and load on the fuel system. Our 3.0SST is designed with two stages in mind. Stage 1 for your primary pump to carry the load of idle, cruising, and daily driving, and Stage 2 for up to two additional pumps to carry the load of extreme boost or race applications.

NOTE: It is possible to run a smaller lower lower-flowing pump as your Stage 1 Primary pump, and a larger higher higher-flowing pump/s as your Stage 2.

Brushed Wiring:

- Stage 1 (Primary): This pump should be wired to activate along with the OEM in-tank feeder pump. It is recommended you use a hardwire kit for this, using the OEM in-tank pump to trigger the Primary Stage 1 pump.
- Stage 2 (Secondary): This stage can be triggered several different ways depending on your vehicle's setup. Boosted applications can trigger the second stage with a Hobbs-type switch that activates at a low boost pressure, typically 0-5psi. This stage can also be triggered with a WOT switch for a Naturally Aspirated setup, or a window switch like a nitrous setup. The best solution if you are running a standalone style ECU would be to set up a second pump output and use that wire to trigger the stage. Using the standalone setup should give access to safety features and other options to trigger, like RPM, Load, Injector Duty, etc. It is imperative that Stage 2 be wired with a hardwire kit (PN# FPHWK) due to the current draw of two pumps.

Brushless Wiring (DW810)

- Stage 1: If the DW810's have been installed with the provided check valves(6-02-0450-B). Then you can run these pumps independently. Stage 1 will be on the left side of the 3.0 logo. Simply run the primary controller to the color matched call outs (O-orange, B-blue, W-white, and Bk-black).
- Stage 2: The white wire on the controllers can be triggered several different ways depending on your vehicle's setup. Boosted applications can trigger the second stage with a Hobbs-type switch that activates at a low boost pressure, typically 0-5psi. This stage can also be triggered with a WOT switch for a Naturally Aspirated setup, or a window switch like a nitrous setup. The best solution if you are running a standalone-style ECU would be to set up a second pump output and use that wire to trigger the stage. Using the standalone setup should give access to safety features and other options to trigger, like RPM, Load, Injector Duty, etc. It is imperative that Stage 2 be wired with a hardwire kit (PN# FPHWK) due to the current draw of two pumps. You can also use this as a 3 stage setup since the pumps have a built in dual speed control. Use stage 1 as a single pump on low speed and no ground input to the controller. Then trigger the 2nd pump on low speed via the listed options above. Then 3rd trigger the both white wires on both controllers.

Feeder Pumps

Due to the nature of the surge tank, the in-tank feeder pump sees little to no pressure, so even a small OEM fuel pump sees an increase in flow. Calculating the flow rate of a feed pump for your surge tank can be difficult, due to the increased flow of the feed pump and the returning flow of unused fuel from the rail. We have the following suggestions for feeder pumps with our DW 3.0SST.

- DW300 x 2 inside the 3.0SST, Suggested feeder pump is a DW300
- DW420 x 2 inside the 3.0SST, Suggested feeder pump is a DW420
- DW550 x 2 inside the 3.0SST, Suggested Feeder pump is a DW550
- DW810 x 2 inside the 3.0SST, Suggested Feeder pump is a DW810

For additional technical support, please contact us at: TechSupport@Deatschwerks.com or 405.233.3991