



INSTALLATION INSTRUCTIONS

Porsche 911 Twin Turbo (996) Fuel Surge Tank Kit

Document# 19-0142

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CAUTION: Exercise extreme caution when working with the fuel system of any vehicle. Keep flame and sparks away. Clean up all spilled fuel immediately and safely dispose of cleaning supplies. Work in a well-ventilated area.

WARNING: Because the hood latch is electronically actuated, do NOT close with the battery disconnected.

NOTES: 1. It is a good idea to verify current fuel pressure before proceeding. This procedure is not discussed in these instructions.

2. For optimal fuel starvation protection, it is recommended to upgrade the OEM fuel pump to a high flow unit. See Radium: 20-0276-0X.

1. Open the front trunk. Using a 10mm wrench, remove the fuel pump access cover. The 4 washers and OEM cover will not be reused. Clean the top area of the OEM fuel pump module. Release the fuel pump connector by squeezing the locks and simultaneously pulling upwards, as shown. To relieve fuel pressure, start the engine and allow it to stall. Remove the key from the ignition switch.

Dislodge the two $\frac{1}{4}$ fasteners and remove the plastic battery panel on the cowl. Using a 10mm wrench, remove the negative battery terminal. **CAUTION:** Disconnecting the battery (G1) may cancel the fault memories of some control units. Consequently, before disconnecting the car's battery, always interrogate the fault memories.



2. Temporarily install the large Radium mounting bracket attaching it to the 4 fuel pump access studs.

Carefully drill $\frac{5}{64}$ " holes through the two bottom hole locations shown. Do NOT excessively pierce the OEM sheet metal as the gas tank is only 1.1" away on the opposing side.



3. Find the gray fitting included in the Porsche installation kit. This FST fitting has a specific (calculated) orifice. In order for the venturi jet pumps inside the gas tank to properly siphon fuel into the OEM fuel pump basket, this gray orifice FST port fitting MUST be used.

Find the Radium fuel surge tank (purchased separately). Using a $\frac{3}{4}$ " non-marring wrench, remove the black port fitting that is 90 degrees from the green fuel pump outlet fitting to the left, as shown. NOTE: for Bosch 044 FSTs only (not shown), replace the black fitting that is to the right (90 degrees) of the electrical bulkhead connector. Lubricate the gray orifice port fitting's O-ring before installing and tighten with a non-marring $\frac{3}{4}$ " socket or wrench.



4. Remove the eight M5 bolts on the top plate of the fuel surge tank (FST) using a 4mm Allen hex wrench.

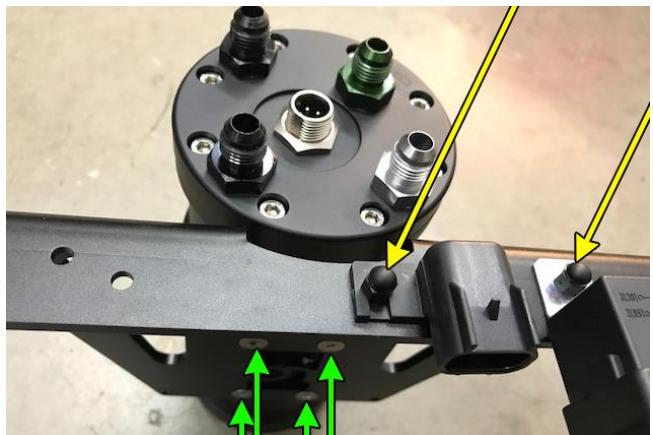
Rotate the top plate assembly until matches the picture at right, referencing the Radium logo on the FST canister. The logo will be facing the front of the vehicle when installed. NOTE: For Bosch 044 FSTs only (not shown), clock the top so the gray fitting is furthest to the rear right hand (caddy-corner) side of the FST. Once proper orientation is achieved re-install the M5 bolts and torque to 50-60 ft-lbs. in an alternating cross pattern. NOTE: This FST fitting orientation will allow all hoses to properly reach the corresponding fittings in later steps.



5. Temporarily unplug the flying lead connectors from the included relay and fuse holder.

Insert the included M5 countersink screws from underneath the mount. Using the included acorn nuts (shown yellow), secure each component with a 3mm Allen hex wrench and 8mm socket wrench. NOTE: the 2 extra holes shown is for another fuse/relay if a second fuel pump is ever used.

Apply a medium strength thread locker to the four FST M6 threaded holes. Insert the included four M6 countersink screws (shown in green) from backside of the mount. Secure the FST with a 4mm Allen hex wrench.



6. Place the large Radium mount assembly on the four OEM studs.

Install the 2 black sheet metal screws included in the kit, as shown. To maintain a clamp preload, do not over torque.



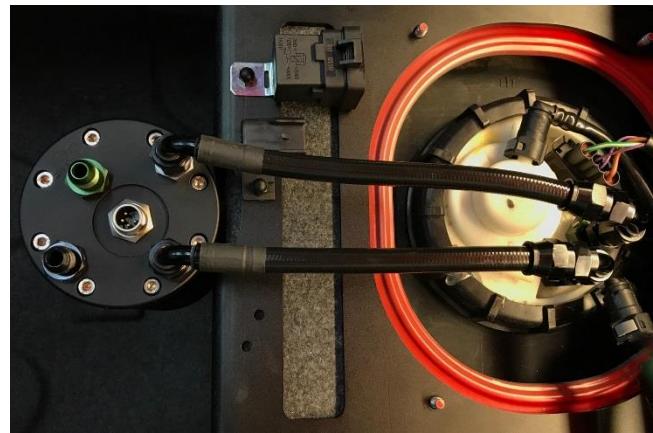
7. Note the position of the two important OEM hose connections. The OEM Porsche fuel pump outlet tube (V) is denoted by a green SAE lock. It routes fuel to the engine. The low pressure tube (R) is denoted by a gray SAE lock. It returns fuel from the pressure regulator. To disconnect these lines, squeeze the colored locks and simultaneously pull upwards. Lubricate the Radium SAE black fittings' internal O-rings. Fully seat one fitting to the OEM (R) male connection until it bottoms out. Install the green lock and screw. For easier access, remove the other SAE tube on the OEM pump module. Use a 5/64" Allen wrench (with ball end) to secure. Fully seat the other SAE fitting to the OEM (V) male connection until it bottoms out. Install the green lock and use the 5/64" ball end Allen wrench.



8. Find the 2 PTFE hoses in the kit that have 90-deg fittings on both ends.

Install the longer of the 2 hoses from the 6AN male fitting on the OEM fuel pump module "V" location to the gray FST orifice fitting, as shown. Use 3/4" and 11/16" non-marring wrenches to tighten.

Install the shorter of the 2 hoses from the 6AN male fitting on the OEM fuel pump module "R" location to the black fitting that is located on the rear LH side of the FST, as shown. Use 3/4" and 11/16" non-marring wrenches to tighten.



9. Find the 2 identical PTFE hoses that have straight and 90 degree fittings on the ends. Install the green Radium SAE male adapter fittings into the straight ends using 5/8" and 11/16" non-marring wrenches, as shown.

Lubricate both male portions of the green Radium SAE male adapter fittings and insert each into the OEM fuel lines with the colored locking tabs.

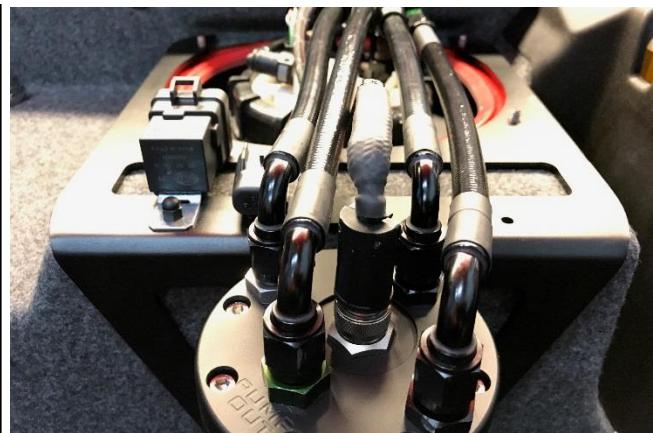
Route the PTFE hose attached to the green lock OEM line to the green "pump out" FST fitting. Secure with a nonmarring 11/16" wrench.

Run the PTFE hose attached to the gray lock OEM line to the black FST fitting on the front LH side. Secure with a nonmarring 11/16" wrench.



10. Install the flying lead harness to the FST top and confirm there is clearance with the hose that secures to the green "Pump Out" FST fitting.

If necessary, loosen the hose end at the FST, rotate the hose appropriately, and retighten while holding the PTFE hose in place.



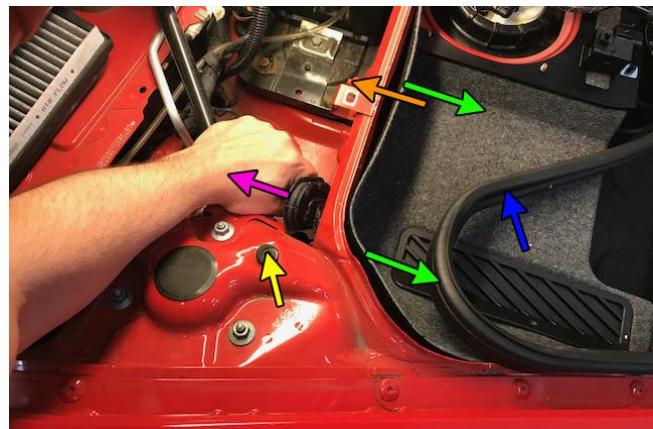
11. Above the fuel pump module, pull the rubber trim (shown in blue) upwards to detach it from the center to RH side of the trunk.

Shown at the yellow arrow, use a T25 Torx driver to unscrew the long RH cowl panel bolt. Detach and remove the panel from the vehicle.

Remove the 2 large plastic anchor clips (shown in green) that secure the trunk carpet. Be careful as these non-serviceable clips can break.

Using a 13mm socket wrench, remove the ground nut (shown in orange).

Pull the large rubber electrical grommet out (shown in purple) of the sheet metal from the cowl side, as shown.



12. Drill two 1/8" holes through the rubber grommet. Be sure to stay clear of the existing wires that pass-through! These drilled holes will permit a weather tight seal for the fuel pump power wires. Insert the included red and black wires through the grommet, as shown.

Crimp the ring terminal (with large mounting hole) to the black wire and give the wire a tug for verification. Install onto the chassis ground stud.

Crimp the ring terminal (with small mounting hole) to the red wire and give the wire a tug for verification. Install onto the battery's 12V+ bolt.

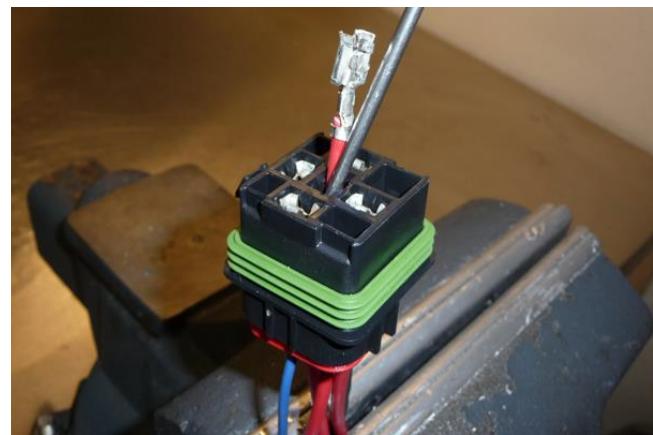
Run the wires behind and underneath the carpet to the fuel pump area.



13. Find the relay flying lead included in the kit. The large red wire located in the center (terminal 87A) will not be used.

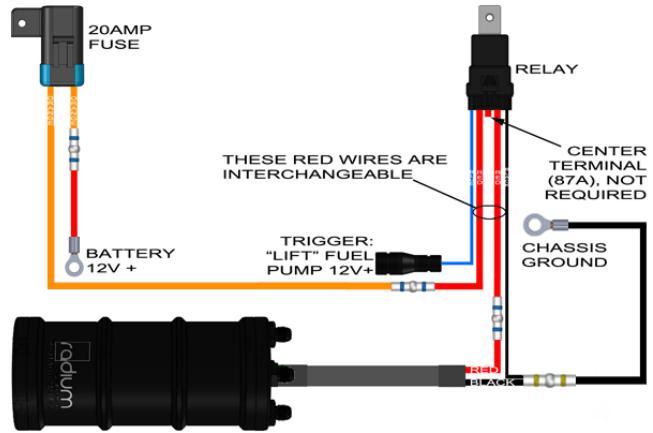
To remove this pin, first pry the large red rubber seal up and fully dislodge it from the connector. Insert a pick into the socket from the front side. Pry the terminal loose from its internal lock and simultaneously push the wire through the front of the connector, as shown.

Discard the wire/terminal and reattach the large red rubber seal.



14. Assemble the components as shown in the wiring schematic.

Cut all wires to length.



15. Note the different locations of the included solder butt connectors in the wiring schematic diagram above. There are 4 in total. The yellow solder butt connector is larger than the blue solder butt connectors.

To properly use the solder butt connectors, strip each wire insulation back and insert both wires into the butt connector ends. Use a heat gun. Be careful with the surrounding area as the internal solder will take a few minutes to melt. Verify the connection is solid by giving it a tug.

Position wires into Solder Splice, as shown.



2 Heat Solder Splice with heating tool or a butane gas heating tool.



16. To activate the surge tank fuel pump, the relay will be triggered from the OEM fuel pump's power wire.

Unscrew both ends off the black Posi-Tap connector. Insert the OEM power wire (green/white stripe) from the fuel pump module connector into the slotted end of the Posi-Tap connector. Next, screw the center section back on making sure the wire gets pierced. Next, strip the blue insulation of the relay wire back to expose 3/8" of copper. Slide the opposite end of the Posi-Tap connector over the blue wire, as shown.

See the online Posi-Tap tutorial videos for more information.



17. For Radium Engineering FSTs with Bosch 044 fuel pump ONLY:

Because the FST connector on these Bosch 044 FSTs are placed slightly closer to the front of the vehicle, hood clearance becomes tighter. To avoid interference, remove the 2 Phillips head screws and plastic retainer from the external FST connector. Bend the wiring harness as shown. Check clearance before fully latching the trunk.



18. Use the included zip ties to organize the wires, as shown.



19. Reconnect the battery and turn the key to the ON position. Confirm that both pumps prime for a few seconds. Cycle the ignition several times to fill the surge tank. Check for leaks at all connections and correct any that may have occurred.

NOTES:

1. When first starting the engine, it may take longer than usual due to air pockets being bled out of the system.
2. Because the OEM Porsche venturi system is retained, there will be a high pressure sound coming from the gray orifice FST fitting. THIS IS NORMAL! This is not a sign of a bad fuel pump.



20. Lastly, place the Radium fuel pump module access cover onto the 4 studs. Using a 10mm socket wrench, install the 4 OEM acorn nuts (no OEM washers required).

Reinstall the trunk carpet, rubber seal, battery panel, spare tire, and hard board.

CAUTION: BEFORE CLOSING THE TRUNK, CONFIRM THERE IS ADEQUATE CLEARANCE WITH THE NEW COMPONENTS. ALL VERIFICATION TESTING WAS PERFORMED ON A PORSCHE 911 TT (996) WITH OEM TRUNK.

