

# INSTALLATION INSTRUCTIONS

## FUEL SURGE TANK KIT

### 2013+ FORD FOCUS ECOBOOST

Document: 19-0168

Support: info@radiumauto.com

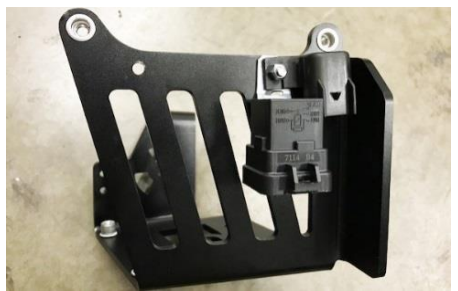

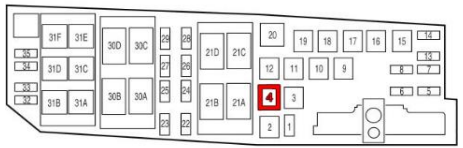

Working under the vehicle is required.  
This installation is best performed with the vehicle raised on a lift.  
If a lift is not available, be prepared to raise and safely support the vehicle.  
When installing any part which has an O-ring, lubricate with light oil.



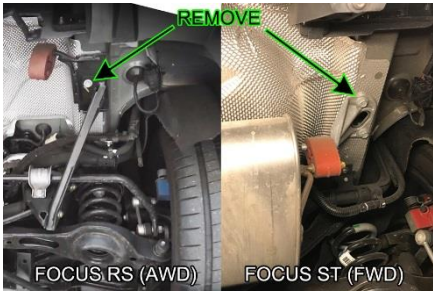


#### CAUTION

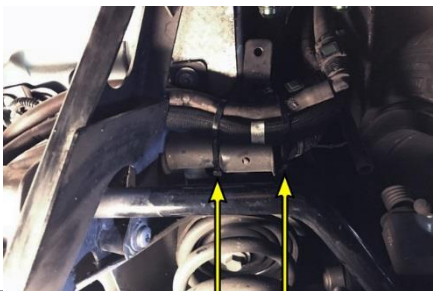





Only a qualified technician following applicable safety procedures should perform the installation of this product.  
One must have knowledge in repair and modification of fuel systems and general vehicle modifications to install this product.  
**Gasoline and other fuels are flammable and can be explosive.**  
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




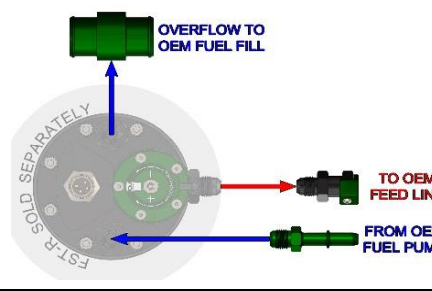


The fuel system is under pressure! Do not loosen any connections until relieving the fuel system pressure.  
Consult a service manual for instructions on relieving fuel pressure safely. This product is designed for off-highway and racing use only.  
Fuel system components may not be legal for sale or use on emissions controlled motor vehicles. Consult local, state, and federal laws.







| STEP | TOOLS NEEDED     | INSTRUCTIONS  | PHOTO   |
|------|------------------|---|---|
| 1    | 8mm Wrench       | Find the relay and fuse provided in the kit.  |   |
|      | 3mm Allen Wrench | Using the thumb tab, unlock the flying lead connector from the relay.   |   |
|      |                  | Using the thumb tab, unlock the fuse flying lead wires from the holder.   |   |
|      |                  | Secure the relay and fuse holder to the Focus mounting bracket. Overlap the mounting tabs, as shown.  |   |
|      |                  |   |   |
| 2    | 4mm Allen Wrench | It is likely the FST-R (sold separately) will need to be reclocked (proper orientation shown). This will ensure that there is a spare port at the highest point of the surge tank canister for overflow purposes. To reclock FST-R; remove 6 perimeter bolts, lift up top plate, rotate accordingly, retighten bolts. Make sure the gasket does not kink. |  |
|      |                  | Replace the FST-R pump outlet -6AN male side fitting with the 90deg low profile -6AN banjo fitting provided in the this kit, as shown.  |   |
|      |                  | Secure the FST-R to the mount using the 4 provided countersink screws.  |   |
|      |                  |   |   |
|      |                  |   |   |
| 3    | 10mm Wrench      | Prop the hood and remove the fuse cover panel. Remove the 20A fuel pump fuse at terminal 4. To relieve fuel pressure, start the engine and allow it to stall. Switch the vehicle OFF and replace the fuse and panel.  |  |
|      |                  | Release the battery cover tabs and pull upwards to remove. Disconnect the battery.  |   |
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|      |                  |   |   |
| 4    |                  | Safely raise the vehicle.   |  |
|      |                  | From the RH rear of the vehicle (near the muffler), pop out the electrical connector from the chassis holes, as shown.  |   |
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| 5  | Sand Paper         | Next, remove the clip from the rearward hole, as shown. These holes will be used to secure the Focus mounting bracket.  |    |
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| 6  | Diagonal Cutters   | From the rubber grommet, route the wire loom in between the 2 tabs.   |    |
|    |                    | Next, find the OEM sheet metal hole towards the RH rear side of this area.  |   |
|    |                    | Using the included zip tie, secure the OEM wire connector to this hole.   |   |
|    |                    | As shown, the connector will nestle nicely in this area and free up the required space for the kit.   |   |
|    |                    |   |   |
| 7  | 13mm Socket Wrench | Remove the M8 bolt shown in the picture.  |   |
|    |                    | The function of this bolt is slightly different between the AWD Focus RS and the FWD Focus ST, but is found in the same chassis location.   |   |
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| 8  | 13mm Socket Wrench | Raise the FST assembly up to this area. Run the 2 provided M6 bolts (shown in gold) through the chassis and into the bracket rivet nuts.  |  |
|    | 10mm Socket Wrench |   |   |
|    |                    | <b><u>Ford Focus ST (FWD) ONLY</u></b><br>The OEM M8 bolt will NOT be reused. Use the longer M8 bolt provided in this kit (shown) to secure the inner mounting tab.                       |   |
|    |                    | <b><u>Ford Focus RS (AWD) ONLY</u></b><br>The OEM M8 bolt WILL be reused for securing the inner mounting tab. The extra M8 bolt provided in this kit can be discarded.                    |   |
|    |                    |   |   |
| 9  |                    | If there is interference between the FST-R and the OEM muffler chassis mount (AWD Focus RS), place the included washer on top of the inner mount to shim the assembly slightly downwards. |  |
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| 10 | Diagonal Cutter    | Find the 3 OEM hoses directly in front of the FST. Pull out the OEM clips and cut the corresponding OEM zip ties to free up the hoses.  |  |
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| 11 | Diagonal Cutter    | Just in front of the FST port fittings is a metal tab where the clip was secured. Bend this tab up and out of the way.  |    |
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| 12 | Pipe Thread Paste  | The FST overflow port will return fuel into the gas tank via the OEM rubber fuel filler tube. The included barbed coupler will replace a small cut away section from the OEM fuel filler tube.  |    |
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| 13 | Marker             | Find the OEM rubber hose that connects the fuel filler tube to the gas tank port. NOTE: Access to the AWD Focus RS and FWD Focus ST models will be slightly different.  |   |
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| 14 | 7mm Socket Wrench  | Loosen the worm drive hose clamp near the gas tank.   |  |
|    | Hose Cutter        | Dislodge the rubber fuel filler hose from the gas tank and pull the hose down just enough to reach the cut lines. Cut at the upstream mark.   |   |
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| 15 | Hose Cutter        | Place the OEM fuel filler hose onto a workbench. As shown, cut out a 1/2" section near the downstream mark.   |  |
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| 16 | 7mm Socket Wrench  | Using a 1/4" socket, secure the short hose to the barbed coupler using one of the included hose clamps. Place the assembly onto the gas tank port. Orientate the coupler so there is room to install a hose end to the -6AN fitting. Secure using the OEM clamp and a 7mm socket. |  |
|    | 1/4" Socket Wrench |   |   |
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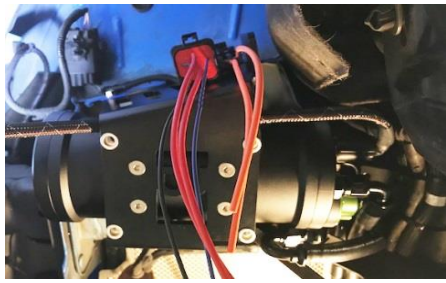
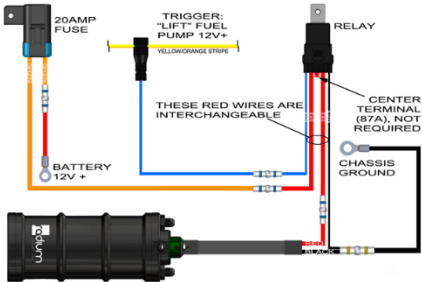
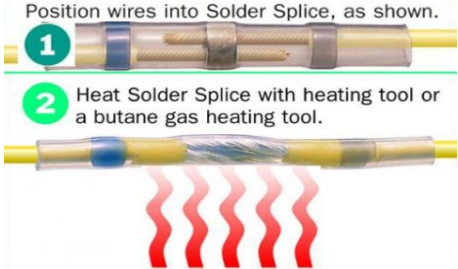






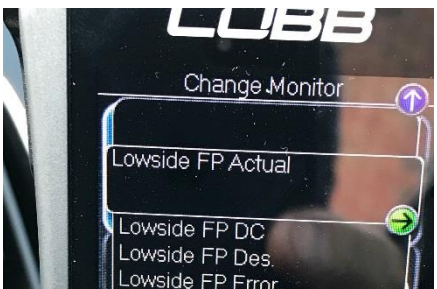

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| 17 |                                 | <b>Ford Focus ST (FWD) ONLY</b><br><b>THE PROVIDED 3/8" SAE CONNECTOR FITTINGSS WILL NOT BE USED.</b> Find the SAE quick connect fuel line junction just in front of the gas tank on the RH side (shown). NOTE: The tubing with the green locking clip (shown) does NOT need to be removed.   |                             |
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|    |                                 | Gently pry and remove the white locking clip from the 5/16" SAE connector. Be careful as these are brittle. Have a rag handy as about a cup of fuel will spill from this connection. Press the white 5/16" SAE quick connect thumb tab inwards and release the fuel tube.   |  |
| 18 |                                 | <b>Ford Focus RS (AWD) ONLY</b><br><b>THE PROVIDED 5/16" SAE CONNECTOR FITTINGS WILL NOT BE USED.</b> Find the OEM fuel filter under the vehicle located just in front of the gas tank on the RH side. There are 3 SAE quick connect fittings in this area. Only the pre filter fitting will be unplugged. It is located furthest to the RH side of the car and has a black thumb tab (shown). The green and white thumb tab SAE connections do NOT need to be unplugged. Gently pry and remove the white locking clip from the SAE connector, as shown. Be careful as these are brittle. Have a rag handy as about a cup of fuel will spill from this connection. Press the black 3/8" SAE quick connect thumb tab inwards and |                             |
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| 19 | 5/64" Allen Wrench<br>Light Oil | Find the SAE female fittings provided in the kit (Focus ST = 5/16", Focus RS = 3/8"). Remove the green lock and lubricate the internal O-rings. Insert the fitting onto the OEM SAE male connection that was just unplugged. After engaged, reinstall the green retaining clip onto the fitting and secure with the small screw.<br><br>Find the SAE male fittings provided in the kit (Focus ST = 5/16", Focus RS = 3/8"). Lubricate the male portion and insert into the OEM SAE female connector until a "click" is felt. Reinstall the OEM SAE white lock.  |                            |
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| 20 |                                 | Use the included EFI fuel line and various Pusk Lok hose ends to route the plumbing, as shown.<br><br>When routing the hoses, be sure to stay away from moving components such as suspension as well as areas that get excessively hot.<br><br>NOTE: The hose lengths listed in the following steps are only recommendations. Depending on the vehicle and how the hoses are exactly plumbed, variations will be present. Measure before cutting and assembling.  |                           |
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| 21 | Light Oil                       | To properly install the 6AN Push Lok hose ends into the provided 3/8" EFI fuel hose, first lubricate the barbs. Fully push the hose onto the barbs until it bottoms out, as shown.<br><br>NOTE: Hose clamps are not necessary for Push Lok connections.   |  |
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| 22 |                                 | The highest point on the FST is used as the overflow port. It is important to route this hose to the Radium barbed coupler fitting that is attached to the OEM fuel filler hose. Route this hose along the same path and next to the OEM fuel filler hose, as shown.<br><br><b>Hose Recommendations:</b><br>Highest FST Port: 90 Degree Hose End<br>Barbed Coupler: Straight Hose End<br>Hose Cut Length: 25 inches   |                           |
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| 23 |                 | The OEM fuel pump inside the gas tank will supply fuel to the FST-R. Assemble a hose from the Radium SAE male fitting (shown) to the lowest FST-R port. Direct the hose along the RH side of the gas tank then route it along a similar path as the previous "overflow" hose keeping it high up and away from hot and/or moving components. |    |
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| 24 |                 | The fuel pump in the FST-R will supply fuel to the OEM fuel system. Assemble a hose from the FST-R pump outlet side port to the Radium SAE female fitting connected to the OEM feed line (shown). Route this hose along a similar path as the previous hose.  |    |
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| 25 | 11/16" Wrench   | Tighten all connections. It is recommended to use an aluminum wrench to prevent marring.  |   |
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| 26 | Diagonal Cutter | Using the provided cable zip ties, secure the 3 hoses in place as shown. Make sure they are kept away from excessively hot areas and moving components.   |  |
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|    |                 |   |   |
|    |                 |   |   |
| 27 | Scissors        | Use the provided heat tape to wrap the bundle of fuel hoses that route in front of the exhaust muffler, as shown.   |  |
|    |                 |   |   |
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|    |                 |   |   |
| 28 | T40 Torx        | Plug in the electrical relay and fuse flying lead connectors and allow them to dangle. Lower the vehicle.   |  |
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| 29 |                 | Gently pull the panel (shown) to the RH side to pop out the plastic retainer from the door sill.   |    |
|    |                 |  |   |
|    |                 | Gently pull up to release the plastic door sill panel.   |   |
|    |                 |  |   |
|    |                 | Pull up the carpet and secure the seat belt out of the way so it does not interfere while working in this area.  |   |
| 30 |                 | To activate the FST-R fuel pump, the relay will be triggered from the OEM fuel pump's power wire.  |    |
|    |                 |  |   |
|    |                 | The FWD Focus ST (shown) uses 1 fuel pump controller. The AWD Focus RS uses 2 fuel pump controllers (shown in following picture).  |   |
|    |                 |  |   |
|    |                 | Unplug the connector by squeezing the lock and simultaneously pulling away. For AWD Focus RS, use the rearward fuel pump controller.   |   |
| 31 | Wire Stripper   | Unscrew both ends off the included black Posi-Tap connector. Insert the OEM power wire (yellow/orange stripe) from the fuel pump module connector into the slotted end of the Posi-Tap connector. Screw the center section back on making sure the wire gets pierced.  |   |
|    |                 |  |   |
|    |                 | Slide the Posi-Tap collar end piece over the blue wire provided in the kit. Strip the blue insulation back to expose 3/8" of copper and insert into the end of the Posi-tap connector. Finally, smash the blue wire by tightening the collar end into the Posi-Tap connector, as shown. See the online Posi-Tap tutorial videos for more information.      |   |
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| 32 |                 | Next to the OEM fuel pump controller is a rubber grommet plug. As shown, pull up to release. Looking in the hole, there is a passage for the blue trigger wire to route back to the new fuel pump relay. Poke a small hole and insert the blue wire through the middle of the rubber grommet. Feed the wire down until it can be found underneath the car. |  |
|    |                 |  |   |
|    |                 | Reattach the rubber grommet. For strain relief, allow slack in the wire so it does not pull away from the OEM fuel pump controller. Use the included split wire loom to protect the wire. Route it safely avoiding any sharp edges that could cause unwanted chaffing.   |   |
|    |                 |  |   |
|    |                 |  |   |
| 33 | Electrical Pick | Find the included relay flying lead connector. The large red wire located in the center (terminal 87A) will not be used.   |  |
|    | RTV Silicone    |  |   |
|    |                 | To remove, first pry off the large red rubber seal and slide it along the 5 wires to dislodge it from the connector. As shown, insert a pick into the socket and pry the terminal loose from its internal lock. Simultaneously push the wire through the front of the connector.   |   |
|    |                 |  |   |
|    |                 | Discard the wire/terminal and reattach the large red rubber seal. Apply a small dab of silicone RTV into the unused hole of the red rubber seal.   |   |
| 34 | Wire Cutters    | <b>FUEL SURGE TANK P/N: 20-0933</b>  |  |
|    | Wire Strippers  | Use the shrink tube and ring terminals provided with the FST-R. Cut each piece of shrink tube to length and insert onto each wire. Crimp a ring terminal to each wire. As shown, heat shrink into place.   |   |
|    | Wire Crimpers   |  |   |
|    | Heat Gun        |  |   |
|    |                 | <b>FUEL SURGE TANK P/Ns: 20-0129-00, 20-0129-01, 20-0130-00, 20-0130-01 20-0133-01, 20-0134-00, 20-0134-01, 20-0135-00, 20-0135-01, 20-0368-00</b><br>The circular flying lead connector has a keyway that must be properly oriented prior to inserting into the mating FST-R connector. Spin fully clockwise to lock into place.                          |   |

|    |                 |   |   |
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| 35 |                 | Plug the fuse and relay into their respective connectors.   |    |
|    |                 | Run the FST-R wiring through the mounting bracket, as shown.  |   |
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|    |                 |   |   |
|    |                 |   |   |
| 36 | Wire Cutters    | Assemble the components as shown in the wiring schematic (not to scale).  |    |
|    | Wire Strippers  | Cut all wires to length.  |   |
|    | Wire Crimpers   |   |   |
|    |                 |   |   |
|    |                 |   |   |
|    |                 |   |   |
| 37 | Heat Gun        | Note the different locations of the included solder butt connectors in the wiring schematic diagram above. There are 4 blue (small) connectors and 1 yellow (large) connector.  |   |
|    |                 | 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. |   |
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|    |                 |   |   |
| 38 | 10mm Socket     | For strain relief, always allow some slack in the wire so it does not pull.   |  |
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|    |                 |   |   |
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| 39 | 10mm Socket     | As shown, ground the components to the chassis using the metal underneath the rear M6 bolt. NOTE: The paint in this area was ground down in an earlier step.  |  |
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| 40 | Diagonal Cutter | Use the included split wire loom for protection. Route it safely avoiding hot areas or any sharp edges that could cause unwanted chaffing.  |  |
|    |                 | Use the small zip ties included to secure the wire loom in place.   |   |
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| 41 |                   | Temporarily remove the new fuel pump fuse. Reconnect the battery. Switch the ignition to the ON position a few times without starting the engine. This will prime the OEM fuel pump and fill the FST. Check for leaks and fix any that may have occurred. Reinstall the fuse. |   |  |  |
|    |                   |   |  |  |  |
|    |                   | It may take longer than usual to start the engine as air pockets are being bled from the system. Start and idle the engine. Recheck for leaks.  |  |  |  |
|    |                   |   |  |  |  |
|    |                   | The FST-R is NOT preassembled to a specific fuel pressure (see below).  |  |  |  |
|    |                   |   |  |  |  |
| 42 |                   | There a couple of ways to calibrate the fuel pressure from the FST-R. If the car already uses special OBDII software which monitors the OEM fuel pressure sensor in low pressure feed line, installing an auxiliary gauge or sensor is not necessary.                         |   |  |  |
|    |                   |   |  |  |  |
|    |                   | The "Lowside FP Actual" parameter is shown using a COBB Access Port.  |  |  |  |
|    |                   |   |  |  |  |
|    |                   | NOTE: Ford does not send this low fuel pressure signal out for standard OBDII scan tools to read.   |  |  |  |
|    |                   |   |  |  |  |
| 43 | Pipe Thread Paste | Alternatively, Radium Engineering P/N: 20-0152 includes a liquid-filled fuel pressure gauge and -6AN inline adapter fitting. This can be installed onto the FST-R fuel pump outlet port, as shown. No other parts are required.   |  |  |  |
|    | 7/16" Wrench      |   |  |  |  |
|    | 11/16" Wrench     |   |  |  |  |
|    |                   | Adjust the FST-R (discussed below) until 65psi is achieved.   |  |  |  |
|    |                   |   |  |  |  |
|    |                   |   |  |  |  |