



# INSTALLATION INSTRUCTIONS

## FUEL SURGE TANK INSTALLATION KIT

2004-2011 LOTUS ELISE/EXIGE, TRUNK MOUNT

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Document: 19-0011

### READ AND UNDERSTAND THESE INSTUCTIONS COMPLETELY BEFORE BEGINNING INSTALLATION

This instruction manual is for installing a Radium Engineering FST-R (Fuel Surge Tank with Pressure Regulator) in a 2004-2011 Lotus Elise/Exige. NOTE: When installing -AN hose ends and fittings, use an aluminum wrench to prevent marring and to help reduce the possibility of over-tightening. DO NOT use any Teflon or other type of sealant on -AN fittings.

The included PTFE hose resists permeation, so no fuel vapors can be detected. CAUTION: When working with the fuel system, take great care not to expose the area to spark or flame. Work in a well ventilated area and take all relevant safety precautions.

1. To relieve fuel pressure, pull out fuel pump fuse No. R1 20A (06 Elise shown). The 4-position fuse holders are located at the front left of the engine compartment on the cabin bulkhead.

Start the engine and allow it to stall.

Reinsert the fuel pump fuse and disconnect both battery terminals.



2. Jack up and safely support the rear of the vehicle.

Remove the RH rear wheel and fender liner. Remove the underside panels to access the rear firewall where the fuel filler tube resides.

Loosen the hose clamps on the rubber fuel filler hose. Remove the rubber fuel filler tube from the vehicle.



3. Cut a 1" section from the middle of the straight section of the filler hose, roughly 4.5 inches from the end that attaches to the fuel tank. This measurement may vary depending on Lotus model. Please double check before cutting.

Install the fuel return adapter as shown with the included hose clamps. Leave the hose clamps semi-loose. This will help with adjusting fitment later.

Use a small amount of Teflon paste on the 90 degree adapter fitting and screw it into the aluminum fuel return adapter.



4. Rotate the fitting so that it is inline with the aluminum adapter pointing toward the inlet of the filler hose. Reinstall the fuel filler hose assembly into the vehicle.



5. Remove the LH rear wheel and fender liner. From the LH rear wheel well, locate the inertia safety switch in the engine compartment. As shown, it is attached to the inside of the frame rail and has an electrical connector plugged into the bottom.



6. Unplug the connector from the inertia switch by squeezing the latch and pulling downward.



7. Locate the jumper harness included in the installation kit.

Connect this jumper harness in between the inertia switch and the factory inertia switch harness.

This connection allows the new fuel surge tank pump to be deactivated if the vehicle were to be involved in a collision.



8. Disconnect and remove the battery and all carpet from the trunk.

There are existing electrical conduits located in the far left hand front corner of the trunk that lead into the engine bay.

Drill two 1" holes just on the right side of these existing electrical conduits through the trunk wall into the engine bay. NOTE: The picture shown is taken from the engine bay side (not the trunk side).



9. Locate the 2 longest preassembled hoses and two of the rubber grommets included in the kit. Slide the grommets over each hose as shown.

From inside the trunk, push the 2 hoses through the holes and into the engine bay. Seat both grommets into the drilled holes. The proper length will be adjusted later.



10. Using the included 5/16" SAE disconnect tool, remove the OEM fuel line from the fuel rail pipe. Insert the tool into the end of hose and apply pressure while simultaneously tugging on hose. The tool will release the SAE quick connect locking mechanism and the hose should slide off.

On the other end of the factory fuel line, simply squeeze the fuel coupler and pull off. This OEM Lotus hose will not be reused.



11. From the engine bay, install one of the SAE quick disconnect adapter fittings (shown) onto the shorter hose.

Unless an aftermarket fuel rail is used, install the other SAE quick disconnect adapter fitting (shown) onto the longer hose. For users with aftermarket fuel rails, the long hose can install directly to the rail.

NOTE: the green lock and screw will be installed in the following step.

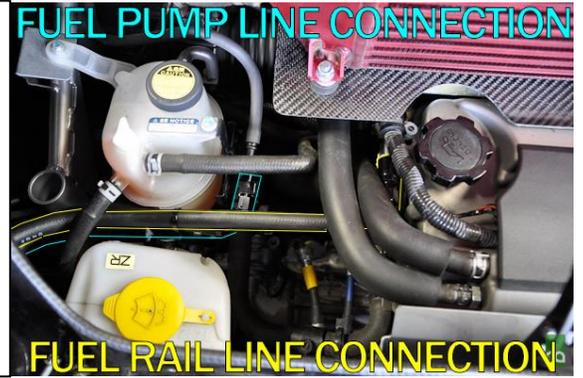


12. Lubricate the internal O-rings inside the SAE quick connect fittings. As shown, route the PTFE hoses between the coolant and washer fluid reservoirs.

Push the SAE adapter fitting from the longest PTFE hose onto the SAE male connection on the fuel rail. For aftermarket rails, install directly to the fuel rail.

Push the SAE adapter fitting from the shorter PTFE hose onto the SAE male connection from the OEM fuel pump line.

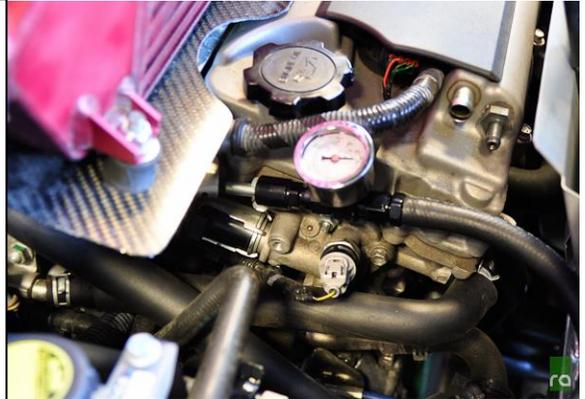
Install a green lock to each SAE adapter fitting using a 5/64" Allen wrench.



#### Optional Pressure Sensor/Gauge

Screw a 1/8" NPT fuel pressure sensor or gauge into the Radium Engineering 14-0148-06 fitting sold separately. Use Teflon paste on the threads being cautious to not get excess into the flow area of the fitting.

Install the gauge and fitting onto the fitting shown in the previous step. Attach the hose from the previous step to the other end of the gauge fitting.



13. Drill a 1" hole through the trunk wall into the engine bay on the right side of the trunk forward wall as shown.

This area can be accessed from inside the RH rear wheel well (as shown) or from inside the trunk on the right side.



14. Locate the shortest hose in the kit and the remaining rubber grommet. Slide the grommet around the 90 degree hose end and push the straight hose end through the drilled hole from the trunk side.

Route the hose through the engine bay and connect the straight hose end to the fuel return adapter fitting and tighten. Secure the hose away from chafe points and moving engine components.

Note: The 90 degree hose end will remain in the trunk.



15. Locate the two M6x1.0mm floor mounted bolts on the right side of the trunk. Using a 10mm socket, remove these bolts and washers.

Locate the fuel surge tank mounting bracket. Line up the floor holes and temporarily secure it to the trunk floor using the previous bolts/washers.

NOTE: This step is easiest to perform if the FST-R is NOT mounted to the bracket.



16. Eye up the bracket and scribe the inner wall through the hole on the upper left portion of the bracket and remove it from the trunk. Drill a 1/4" hole through the wall into the rear right fender well. Note: Pending the accuracy of the hole drilled, it may need to be enlarged to be concentric with the FST bracket's mounting hole.

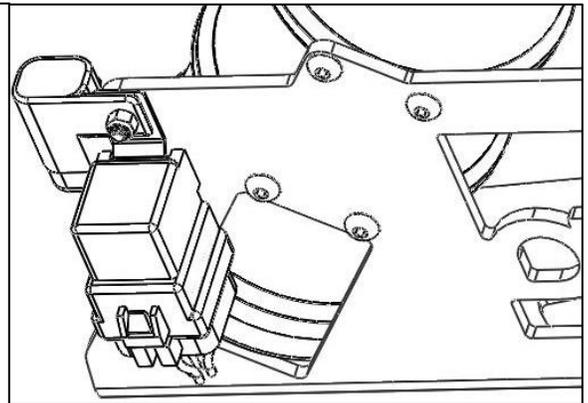
No more drilling is required. Now is a good time to vacuum out the fiberglass chips in the trunk area.



17. Using the four M6x1.0mm button head screws and some medium strength threadlocker, fasten the mounting bracket to the FST-R canister. Tighten using a 4mm Allen wrench.



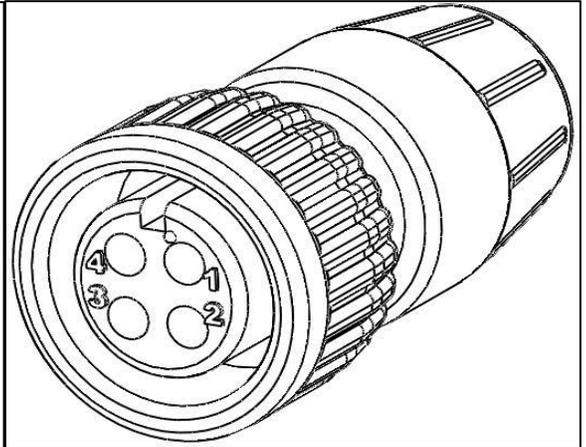
18. Locate the main wiring harness and confirm there is a fuse in the fuse holder. Use the M5x0.8x16mm bolt and nut to secure the fuse and relay in place.



19. Plug in the electrical connector from the wiring harness into the receptacle on top of the FST-R.

This is a keyed connection, so pay careful attention during installation.

Rotate the collar clockwise to seat and lock the connector into place.



20. Test fit the FST-R with the bracket in the trunk to ensure there are no fitment issues. The surge tank is now ready to be permanently installed in the vehicle. Use the factory trunk floor bolts and washers to fasten the surge tank and bracket in place.

Use the included M6x25mm screw, washer, and nut to secure the bracket to the vertical wall using the drilled hole from earlier steps.



21. Route the included main harness around the backside wall of the trunk near the taillights. Leave the 2 power and ground ring terminals on the floor near the battery location until it is ready to be reinstalled.

On the left side of the trunk wall, gently push the 1-pin connector through the factory rubber grommet, as shown. In the engine bay, plug the connector into the inertia switch jumper harness.

Secure all wires away from moving engine components and pinch points.

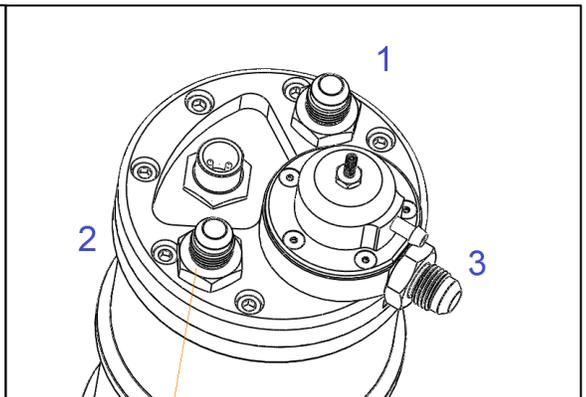


22. Using the diagram at right, connect the fuel hoses to the Radium FST-R.

Port 1: Output fuel overflow returning back to OEM tank via filler neck adapter.

Port 2: Input fuel supply from OEM fuel tank pump.

Port 3: Outlet high pressure fuel feed line to engine fuel rail.



23. Unscrew the bolt located in the front center of the trunk. Locate the included rubber cushioned clamp and zip ties. Route the two hoses through the rubber cushioned clamp. Screw the bolt back in being careful not to pinch the hoses.

Use the included zip ties to keep the hoses together on both sides of the rubber cushioned clamp.

Confirm that all plumbing connections are tight in the entire system.



24. Reinstall the battery and the 2 ring terminals from the main harness.

The FST-R must be filled before starting the engine. Cycle the ignition several times. Listen for the pump inside the FST-R to confirm the electrical. After 3-4 cycles, the fuel system should be fully primed.

Use a gauge to adjust fuel pressure. Tighten the FST-R set screw on the top to increase pressure. Loosen the set screw to reduce pressure. OEM Lotus 2ZZ-GE fuel pressure is 3.25 Bar. Once fuel pressure is adjusted, lock set screw in place with the jam nut. NOTE: The extra gold orifice is ONLY required if fuel pressure cannot be dialed down to the desired target.



25. When the vehicle is running, INSPECT ALL CONNECTIONS FOR LEAKS! Check that all hoses are clear of moving engine parts.

Test-drive the vehicle and inspect again for fluid leaks. Care must be taken to avoid spilling fuel in the trunk area.

Replacement parts are available, contact Radium Engineering for details.

**INSTALLATION COMPLETE**

