

# INSTALLATION INSTRUCTIONS

Document 19-0009RevD

## FUEL SURGE TANK INSTALLATION KIT 2004+ LOTUS ELISE/EXIGE/CUP (2ZZ-GE) FRAME RAIL MOUNT

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

These instructions are for installing a Radium Fuel Surge Tank (FST-R) in a 04+ Elise/Exige/Cup (2ZZ-GE).

#### **NOTE: SUPERCHARGED LOTUS (EXCLUDING CUP/2-ELEVEN) ONLY**

CHARCOAL CANISTER RELOCATION IS NECESSARY IN ORDER TO MOUNT THE SURGE TANK ON THE FRAME RAIL. RELOCATION IS UP TO THE DISCRETION OF THE INSTALLER. RADIUM DOES NOT PROVIDE INSTRUCTIONS ON THIS PROCESS. IF THE CHARCOAL CANISTER IS REMOVED, A CHECK ENGINE LIGHT WILL BE PRESENT AND THE VEHICLE WILL NOT BE EMISSIONS LEGAL. THE CHARCOAL CANISTER IS LOCATED ON THE RIGHT SIDE FRAME RAIL NEAR THE FUEL FILLER TUBE AND CAN BE ACCESSED THROUGH THE RIGHT HAND REAR WHEEL WELL.



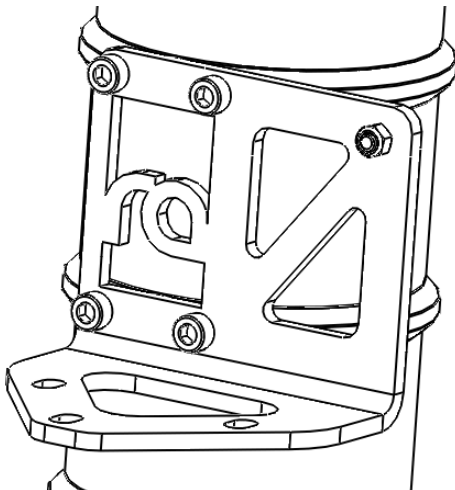
#### **PREPARING THE VEHICLE**

1. To relieve fuel pressure, pull out fuel pump fuse No. R1 20A (06+ model shown). The 4-position fuse holders are located at the front left of the engine compartment.
2. Start the engine and allow it to stall.
3. Reinsert the fuel pump fuse
4. Disconnect the negative terminal of the battery.
5. Jack up and safely support the rear of the vehicle.
6. Remove the RH rear wheel and fender liner.
7. Remove underside panels to access the rear firewall.

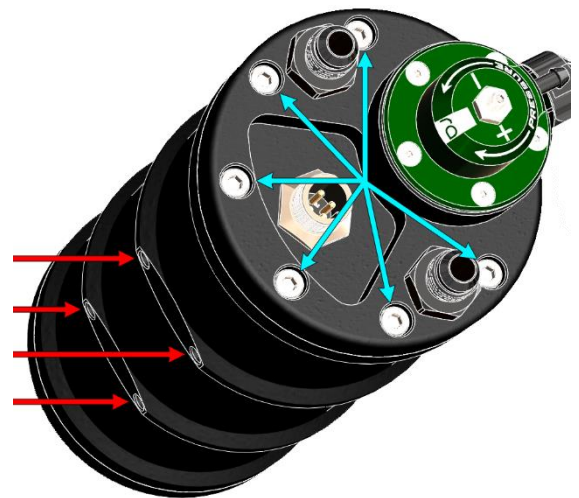


#### **PREPARING THE SURGE TANK**

The top cap of the FST-R (sold separately) needs to be properly orientated. First, remove the 6 perimeter bolts (shown cyan). Next, lift up the top cap assembly and rotate according to the picture. As a reference, note where the M6 mounting threads (shown red) are located. Finally, tighten bolts making sure the gasket does not kink.



Using a medium strength threadlocker, fasten the provided mounting bracket to the FST's vertical mount holes using the 4 provided M6x10mm screws. Attach the relay, fuse holder and small ring terminal wire from the wiring harness to the bracket's spare hole. Use the M5 bolt and nut to secure the fuse and relay.



The next step in preparing the FST is to plug-in the electrical connector into the receptacle on top of the FST. This is a keyed connection, so pay careful attention during installation. Rotate the collar clockwise to seat and lock the connector into place.

**The FST-R is NOT pre-adjusted for a specific pressure setting.** It is advised to have a fuel pressure gauge installed in the new fuel system in order to adjust the FST-R correctly.

**NOTE: When installing -AN hose ends and fittings, use an aluminum wrench to prevent marring and to help reduce the possibility of over-tightening. If a fitting is over-tightened, it could leak.**

## FST INSTALLATION INTO VEHICLE

1. Remove the stock fuel line from the fuel rail fuel pipe. This is accomplished using the included 5/16 inch Fuel Line Disconnect Tool. If ever misplaced, use NAPA part number BK7001932.

Insert tool into end of hose and apply pressure while simultaneously tugging on hose. The tool will release the barbed locking mechanism and the hose should slide off.



2. Find the rubber fuel filler hose on the lower RH side of the firewall from the engine bay. Loosen both OEM clamps and remove the hose from the vehicle, as shown.

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



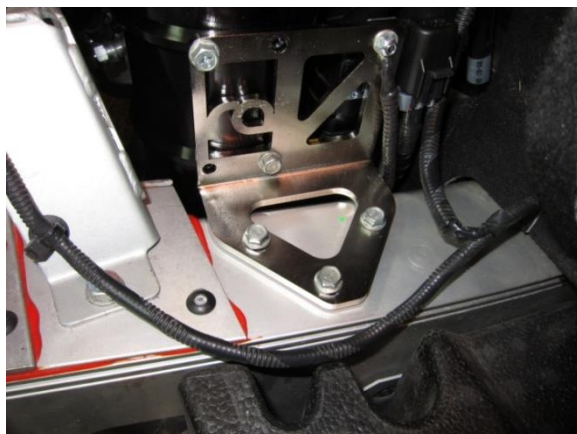
3. Find the included NPT to 6AN elbow and barbed fuel filler adapter. Apply PTFE paste to the fitting's tapered threads and screw it into the barbed adapter. Rotate so the 6AN fitting is in line with the barbed adapter. Secure the cut sections to the filler adapter using the provided clamps.

Reinstall the fuel filler adapter with the 6AN fitting pointing upwards. Position such that there are no kinks or unnecessary bends in the hose.



4. From inside the RH rear wheel well, locate the three fasteners on the frame rail holding the A/C line bracket in place. If the vehicle is not equipped with A/C, there will be 3 threaded holes in this location. NOTE: The Lotus 211 typically does not have these aforementioned threaded holes. Drilling and pulling three M6x1mm rivet nuts is required.

Remove the A/C line bracket fasteners and install the FST over the top of the A/C line bracket. Use the three M6X1.0X25mm screws included in the kit to fasten the bracket to the frame rail.





5. Route the electrical leads from the FST harness across the bulkhead wall, below the intake manifold.

Secure the wiring away from moving or high temperature components.

Locate the ring terminal on the FST wiring harness. This is the main power connection.



6. Locate the power distribution block on the vehicle bulkhead wall, below the ECU. This is best accessed from underneath the vehicle.

Pop open the plastic cover on the distribution block and remove either one of the nuts.

Install the ring terminal wire from the FST harness and replace the nut.

Tighten the nut and snap the cover closed.



7. From the LH rear wheel well, locate the inertia safety switch in the engine compartment.

It is attached to the inside of the frame rail and has an electrical connector plugged into the bottom of it.

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



8. Locate the jumper harness (shown) included in the installation kit.

Next, locate the single-wire connector from the FST harness and plug it into the connector from the previous step.

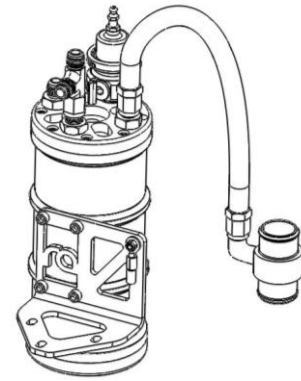
Secure all wires away from moving engine components and pinch points.



9. Install the short hose with straight hose end fittings from the FST to the fuel return adapter fitting, as shown. Use the port on the FST that is nearest the fuel filler adapter.

Adjust the orientation of the fuel filler adapter to suit the hose installation.

Tighten the hose clamps on the return adapter and the hose end fittings.



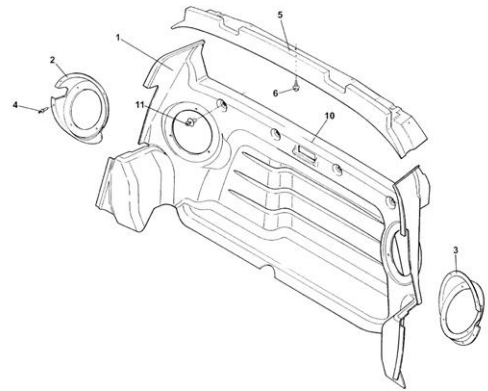
10. **Aftermarket Fuel Rail Applications Only:** The hose with 90deg and 45deg hose ends will be used. The hose with 180deg and 45deg hose ends will not be used. Install the 45deg hose end to the FST-R outlet side port. Run the hose to the left side of the engine and secure to the LH fuel rail port.

**OEM Fuel Rail Applications Only:** The hose with 180deg and 45deg hose ends will be used. The hose with 90deg and 45deg hose ends will not be used. Install the included SAE quick connect adapter (shown) to the 180deg hose end. Remove the green SAE lock and lubricate the internal O-rings. Insert the fitting onto the OEM fuel rail's SAE male connection. After engaged, reinstall the green retaining clip onto the fitting and secure with the small screw.



11. Before installing the last hose, the interior will need to be removed.

First, remove all seat bolts and unplug the LH seat belt terminals. Unscrew the belts from the seats and remove both seats from the vehicle. Pop open the plastic seat belt cover and unscrew the upper seat belt hanger from the roll bar. Remove all associated retaining clips of the rear plastic panel. Unplug the speaker terminals and the interior light. Remove the panel as well as the foam insulation.

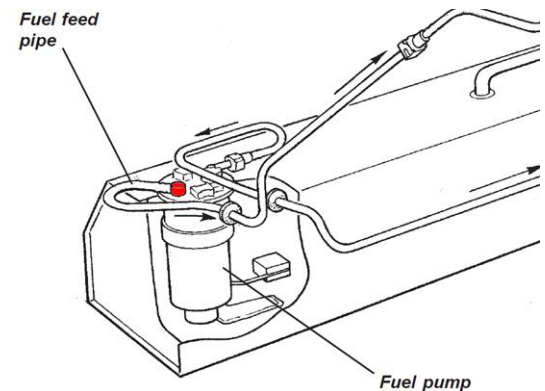


12. There should now be access to the fuel pump plate located behind the LH seat on the shelf.

Remove the 6 Allen head screws on the fuel pump access panel.

Carefully set the fuel pump access cover aside.

Shown in red is the plastic fitting that will be replaced.



13. Be extremely careful when removing the yellow clip. This is very easy to drop and lose underneath the fuel tank. If lost, these yellow clips can be purchased from a local dealership.

Toyota P/N: 77241-32060 or Lotus P/N: A120L6012S

After the clip is removed, pull up on the fuel line fitting until it unseats from the fuel pump housing. Remove the complete fuel line from the vehicle.

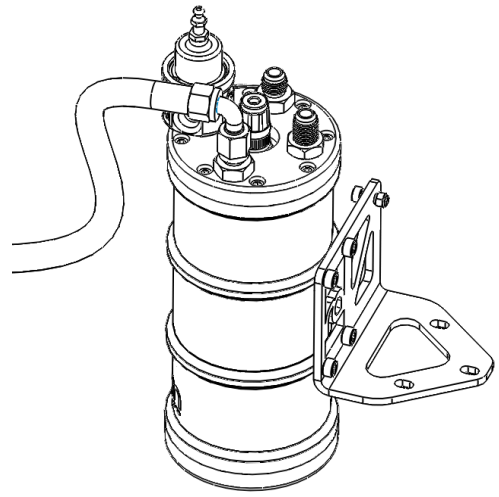


14. The final FST hose is the longest and has 90 degree hose ends.

First, install the fuel pump adapter fitting to one end.

Install the other side to the last port on the surge tank (shown). NOTE: The FST-R will look slightly different than diagram, but the port is in same location.

Route this hose along the bulkhead wall under the intake manifold to the area where the factory fuel line exited the bulkhead into the engine bay.



15. Route the hose through the hole in the firewall where the factory fuel line originally passed through. Cautiously, keep the hose away from moving parts such as the Lotus gear selector lever assembly. Also, keep the hose away from sharp edges and all high temperature engine components.

Lubricate the fuel pump adapter's internal O-ring. Next, push the fitting/hose assembly into the OEM fuel pump port until it is fully seated. Reinsert the yellow clip completely until it locks in place.

Finally, secure the included rubber grommet onto the firewall surface.



#### 16. Adjusting Fuel Pressure:

The FST-R features an integrated and adjustable fuel pressure regulator. The pressure is adjusted by turning the threaded screw on the regulator top. Tightening the screw will increase pressure. Loosening the screw will decrease pressure. Use a pressure gauge on the output line of the FST-R to monitor pressure. Have an assistant prime the fuel pump by cycling ignition power. When the pump is running take note of the fuel pressure. Make adjustments to the FST-R as needed. The OEM Lotus fuel pressure is 3.25bar (47-48 psi). When pressure is adjusted, start the engine. It may take several seconds of cranking for the air to be bleed out of the system. Once it starts and is idling, check the pressure one last time. **CHECK FOR LEAKS**. When pressure is confirmed, lock the adjustment screw in place with the lock nut.

***A vacuum hose connection to the regulator should NOT be used if attempting to mimic OEM Lotus fuel pressure.***