



INSTALLATION INSTRUCTIONS

3S-GE / 3S-GTE (GEN1-2) FUEL RAIL

P/Ns: 20-0849

radium
ENGINEERING

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Support: info@radiumauto.com

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.

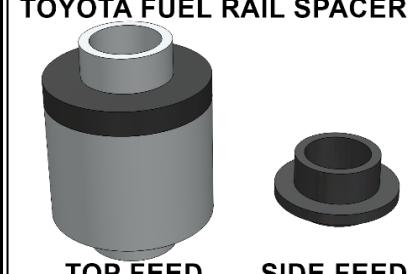
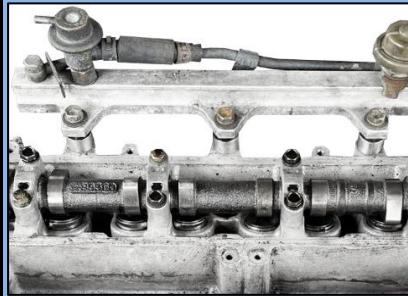
Gasoline and other fuels are flammable and can be explosive.

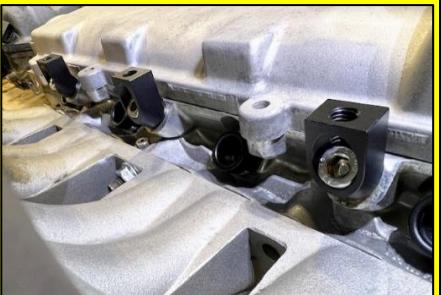
Only install in a well-ventilated location to minimize buildup of fuel vapors.

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	10mm Socket Wrench Rag	Because of the various compatible vehicles, removal of the fuel lines, manifold, fuel rail, and fuel injectors will not be covered. It is recommended to have a factory workshop service manual. NOTES: 1. The OEM mounting screws will NOT be reused. 2. Leave the 3 factory thermal insulating mounting spacers (shown) on the head as they will be reused. 3. When removing these parts, have a rag handy.	TOYOTA FUEL RAIL SPACERS 
2	10mm Socket Wrench	Be sure to turn OFF the ignition and disconnect the battery. CAUTION: Disconnecting the battery may cancel the fault memories of some control units.	
3		3S-GE AND GEN1 3S-GTE: INJECTOR NOTES a. These engines came with top feed fuel injectors from the factory. b. OEM fuel injectors are compatible. c. Aftermarket fuel injectors must be OEM equivalent fitment. d. Radium cannot recommend any specific aftermarket injectors. d. The 4 provided Radium fuel injector seats will NOT be used when installing the fuel rail on one of these cylinder heads (shown).	
4		GEN2 TOYOTA 3S-GTE: INJECTOR NOTES a. These engines came with side feed fuel injectors from the factory. b. The OEM side feed fuel injectors are NOT compatible. c. The 4 provided injector seats must be used. d. Injector Compatibility: Mid Height "48mm" Bosch EV14 injector Lower O-ring: 14mm (standard EV14) Upper O-ring: 11mm (standard EV14 is 14mm) NOTE: The injector top must be machined or adapted (as shown).	

5	9mm Socket	GEN2 TOYOTA 3S-GTE: INJECTOR SEATS	
	Tape	If the lower intake manifold is off, a blunt object simplifies this process. Otherwise, these can be pressed-in with your fingers.	
6	Oil	GEN2 TOYOTA 3S-GTE: INJECTOR SEATS	
	Hammer	Thoroughly clean the 4 injector port areas on the cylinder head. Be sure the O-rings are installed into the Radium Engineering injector seat grooves. Lubricate the O-rings and the cylinder head injector ports. Push or tap to fully seat the 4 injector seats into place.	
		NOTE: Do NOT attempt to install these in a 1st gen 3S-GTE head.	
7		3S-GE AND GEN1 3S-GTE: FUEL RAIL MOUNTING FEET	
		The 3 billet mounting feet and all 6 of the short M8x1.25mm screws (shown) will NOT be used. The design of these cylinder heads permit the fuel rail to mount directly to the cylinder head using the 3 included long mounting screws as well as the OEM spacers.	
8	6mm Allen Wrench	GEN2 TOYOTA 3S-GTE: FUEL RAIL MOUNTING FEET	
		Confirm the OEM spacers are installed onto the fuel rail mounting bosses on the cylinder head.	
		Using 3 of the M8x1.25mm mounting screws, loosely secure the 3 mounting feet to the cylinder head in the orientation shown.	
9	6mm Allen Wrench	GEN2 TOYOTA 3S-GTE: FUEL RAIL MOUNTING FEET	
		Prior to tightening the mounting feet screws, make sure they are properly oriented flat.	
		Shown is a straight edge confirming they are level with one another.	
10	Oil	Because this will be a custom fuel rail installation, adapter fittings are NOT included. Each fuel rail has four 8AN ORB (3/4"-16) ports. Go to www.radiumauto.com to find an array of compatible adapter fittings, fuel pressure regulators, pulse dampers, etc. that can be used.	
		NOTE: Lubricate the O-rings prior to installation.	

11	Oil	For ease of installation, lubricate the injector O-rings and the injector seats. Fully insert the lower portion of the injectors, as shown.	
		NOTE: Depending on the injector, the connectors will need to be oriented properly to clear the surrounded area (manifold, mounting bosses, valve cover, etc. Mid height "machined" Bosch EV14 injectors are shown for the GEN2 3S-GTE.	
12		Shown are Injector Dynamics XXXX.48.11.14 fuel injectors installed on a GEN2 3S-GTE cylinder head.	
13	Oil	Lubricate the 4 fuel rail injector bores and lineup them up with the fuel injectors. Press downward to fully seat.	
	6mm Allen Wrench	Secure the fuel rail using the provided M8x1.25mm socket head screws.	
		3S-GE and GEN1 3S-GTE: use the 3 longer screws	
		GEN2 3S-GTE: use the last 3 short screws	
		Orient the fuel injectors so the connectors can be plugged in.	
14	10mm Wrench	After all the necessary fuel rail plumbing is installed, reconnect the battery. Cycle the keyed ignition switch ON/OFF a few times (without starting the engine). This allows the fuel pump to prime the system. Check for leaks.	
		Start the engine and confirm again while the engine is running.	
		INSTALLATION COMPLETE	