

INSTALLATION INSTRUCTIONS

PORT INJECTION KIT (PIK)





TOYOTA GR SUPRA (MK5)







Document: 19-0276







Support: info@radiumauto.com



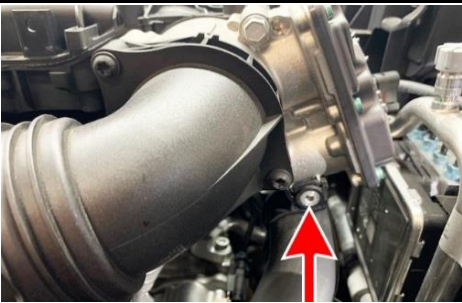

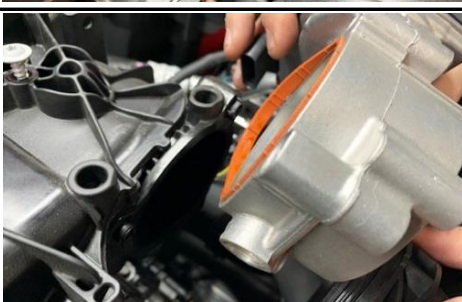

IMPORTANT NOTES:


- o Installation must be performed by an experienced technician.
- o This document outlines the installation of the port injection to the cylinder head only.
- o A custom fuel system will need to be created to feed the port fuel injectors.
- o Bosch EV14 fuel injectors must have 14mm upper and lower O-rings and be 34mm height.
- o Wiring and control of the port injectors must be configured by the installer.
- o An aftermarket charge pipe must be used, as the factory charge pipe can no longer be used.
- o The steps below cover installation into a LHD vehicle. RHD will be similar, but is not covered in this document.


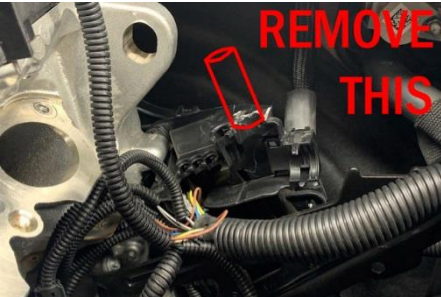




STEP	TOOLS NEEDED	INSTRUCTIONS	PHOTO
1	10mm socket	Disconnect the negative battery terminal in the trunk, as shown.	
		Under the hood, carefully pull up to remove the engine vanity cover.	
2		Pull up to release the ECU cover.	
3		To release the wire harness stay (shown) from the intake manifold, pull the 2 locks outwardly and simultaneously lift upwards.	
4		To remove the insulation from the rear of the engine, pull up to release the 2 rubber grommets from the valve cover.	

5		To release the wire harness stay (shown), pull upwards.	
6		<p>The ECU connectors must be removed in a sequence from front to back.</p> <p>To release each connector, push the locking tab button inwards and simultaneously swing the latch over.</p>	
7		Squeeze the SAE quick connector locks and simultaneously pull to release the tubing shown.	
8		Pull upwards to release the tubing shown.	
9		Pry the tab, than simultaneously pull upwards to release the assembly shown.	
10		Squeeze the locks and simultaneously pull upwards to release the connector at the front of the engine.	



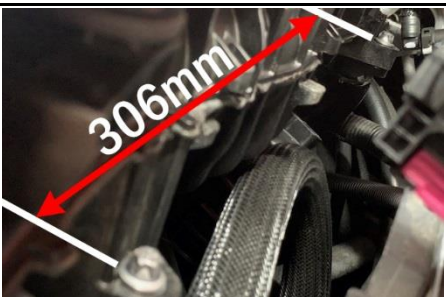


11	T20 Socket Wrench	Unscrew the fastener and pull upwards to release the O-ring flange shown.	
12	Flathead Screwdriver	To release the sensor at the front of the engine, first gently pry the grey tab away from the connection. Next, press the grey tab inwards and simultaneously pull away to unplug the connector.	
13	Flathead Screwdriver	To release the sensor at the rear of the assembly shown, first gently pry the tab away from the connection. Next, press the tab inwards and simultaneously pull away to unplug the connector. Remove the assembly shown from the vehicle.	
14		To release the wire harness stay (shown), pull the 3 locking tabs and simultaneously lift upwards.	
15		Unplug the 2 connectors near the ECU that are attached to the aforementioned wire harness assembly. As shown, move the ECU wire harness out of the way.	
16		Squeeze the locking tabs and simultaneously pull upwards to release the tube connector at the front of the intake manifold.	




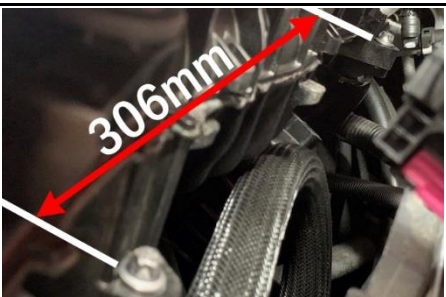


17	Flathead Screwdriver	To release the sensor in the middle of the intake manifold near the cylinder head, first gently pry the grey tab away from the connection.	
		Next, press the grey tab inwards and simultaneously pull away to unplug the connector.	
18	Flathead Screwdriver	To release the throttle body sensor, first gently pry the tab away from the connection.	
		Next, press the tab inwards and simultaneously pull away to unplug the connector.	
19	E10 Torx Socket	Remove the screw (shown) underneath the throttle body.	
		To release from the throttle body mount, pull the large coolant hose forward than downwards.	
20	T30 Torx Socket	Remove the screws that secure the charge pipe to the throttle body.	
		Release the charge pipe from the throttle body.	
21		Remove the screws that secure the throttle body to the intake manifold.	
		Remove the throttle body from the vehicle. Do not lose the gasket.	
22	E10 Torx Socket	Remove the 2 intake manifold mounting screws shown.	







23	10mm Socket	Loosen the intake manifold bolts that secure to the cylinder head.	
		NOTE: these M6x1mm bolts are captured in the intake manifold and thus, are impossible to lose.	
		Pry the wire stay from the side of the intake manifold plenum.	
24	Pick	Carefully lift the intake manifold to gain access to the 2 water to air coolant connections integrated to the intercooler. Pry the locks outwards and pull to release. Be prepared to catch the small amount of coolant loss. Be careful not to lose the metal connector locks.	
	Flat Head Screwdriver		
	Container	Remove the intake manifold from the vehicle. Pour the remaining coolant into a container.	
		Apply tape (not included) to the intake ports for loose debris protection.	
25	Oil Lubrication	Open the Radium Engineering package and remove the contents. Fittings (not included) should now be installed into the fuel rail end ports. Be sure to lubricate the O-rings first.	
	7/8" Wrench		
	5/16" Allen Wrench		
		<u>20-0753-PK FUEL RAIL PLUMBING KIT, MK5 SUPRA</u> Install the 8AN ORB plug to the front port and the 8AN ORB to 6AN male fitting to the rear port, as shown.	
26	Oil Lubrication	NOTE: If a large 8AN fuel feed line will be ran to the front port, it is recommended to use Radium Engineering P/N: 20-1000-0808 (shown). This will allow an 8AN hose end to clear the alternator.	
	5mm Allen Wrench		
27	Oil Lubrication	Lubricate the upper fuel injector O-rings and press into the fuel rail injector bores.	
		NOTES:	
		1. This kit is designed around Bosch EV14 fuel injectors. They must have 14mm upper and 14mm lower O-rings. They must also be the short Bosch EV14 variation (34mm height).	
		2. Shown is a Radium Engineering Direct Mount Regulator (20-0623-0X) which is compatible on the rear fuel rail port.	
28	Oil Lubrication	Alternatively, the cylinder head adapter can be used as a simple intake manifold spacer. In this case, plug the 6 cylinder head adapter ports using Radium Engineering 14-0427 2AN ORB plugs (not included).	
	1/8" Allen Wrench		

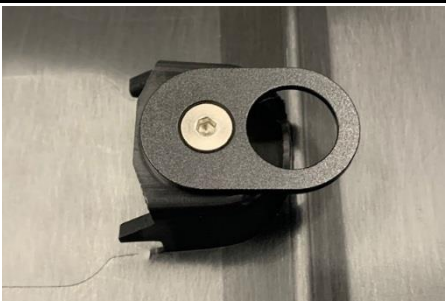
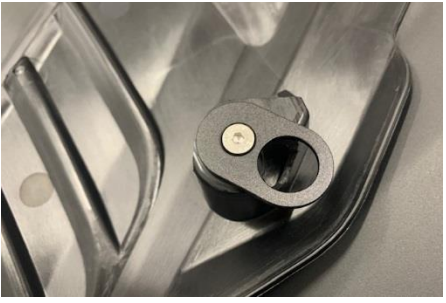


29	Oil Lubrication	Lubricate the lower fuel injector O-rings. Press the fuel rail assembly into the cylinder head adapter. Lineup every injector one by one.	
	3mm Allen Wrench		
		NOTES:	
		1. To prevent interference, rotate the fuel injector electrical plugs.	
		2. When installed, these connectors would be rotated towards the engine (away from the intake manifold).	
		Secure the fuel rail to the cylinder head adapter, using the 10 provided M4x0.7mm bolts.	
30		Without securing, test fit the assembly to the engine. Check to see if there is interference with the forthcoming fuel line plumbing.	
		NOTE: If using a 20-0623-0X Direct Mount Regulator on the rear port, modifications are needed to gain the required space. Unlatch the electrical clam shells. As shown, cut and remove the upper TEE portion and carefully reroute the corresponding wires.	
31		Clean and prep the OEM cylinder head flange surface.	
		As shown, place the 6 included intake manifold gaskets into the cylinder head adapter. Be sure not to lose these in the engine bay.	
32	5mm Allen Wrench	Place the port injection assembly onto the cylinder head. Be sure the gaskets do not move or become unseated.	
		Secure the assembly using the 7 included M6x1.0mm socket head bolts.	
33		<u>20-0753-PK FUEL RAIL PLUMBING KIT, MKS SUPRA</u>	
		The OEM low pressure fuel hose at the rear of the engine will need to be removed.	
		First, pry and pull off the grey safety lock (not shown).	
34	Rag	<u>20-0753-PK FUEL RAIL PLUMBING KIT, MKS SUPRA</u>	
		Next, push the SAE quick connect fitting further on the pipe. Simultaneously push in the black locking tab and pull the hose off, as shown. Be prepared with a rag as fuel will spill out.	
		Repeat this process for opposing side of the hose. Remove the OEM fuel hose from the vehicle. It will NOT be reused.	

35		<u>20-0753-PK FUEL RAIL PLUMBING KIT, MK5 SUPRA</u>	
		<i>Find the hose assembly shown provided with the kit.</i>	
36	11/16" Wrench	<u>20-0753-PK FUEL RAIL PLUMBING KIT, MK5 SUPRA</u>	
		<i>Loosely screw the 6AN 90 degree hose end into the rear fuel rail 6AN port fitting.</i>	
		<i>Next, bend the PTFE hose towards the OEM hard pipe and push the SAE quick connect fitting until a "click" is felt. Tighten the 6AN hose end.</i>	
		<i>Lastly, push the OEM SAE quick connect hose end into the TEE fitting until a "click" is felt. Reinstall the OEM grey lock.</i>	
37	5/64" Allen Wrench	<u>20-0753-PK FUEL RAIL PLUMBING KIT, MK5 SUPRA</u>	
		<i>Remove the green locks from both of the SAE fittings.</i>	
38	11/16" Wrench	<u>20-0753-PK FUEL RAIL PLUMBING KIT, MK5 SUPRA</u>	
	19mm Wrench	<i>Install the SAE connectors to the end of the straight PTFE hose.</i>	
39	Oil Lubrication	<u>20-0753-PK FUEL RAIL PLUMBING KIT, MK5 SUPRA</u>	
		<i>Lubricate the internal O-rings in the SAE connectors.</i>	
		<i>Push both hose ends over the OEM male SAE quick connect pipes.</i>	
40	5/64" Allen Wrench	<u>20-0753-PK FUEL RAIL PLUMBING KIT, MK5 SUPRA</u>	
		<i>Carefully install the green SAE locks. This is easiest if the PTFE hose is first rotated so the threads on the SA connectors are easy to access.</i>	
		<i>Tighten the 5-40 x 1/4" screws.</i>	

41		Make all of the appropriate connections at the rear of the fuel rail.	
		NOTE: Shown in the rear fuel rail port is 20-0623-0X Direct Mount Regulator with 20-0029 fuel pressure gauge. These 2 parts will be required if running an independent fuel system specifically for port injection.	
42		If necessary, make all of the appropriate connections at the front of the fuel rail.	
		NOTE: 90 degree 8AN PushLock hose end shown.	
43	5mm Allen Wrench	Using the 2 short M6x1mm Allen head bolts provided in the kit, install the billet aluminum intake manifold spacers to the OEM intake manifold brackets.	
44	Tape Measure	Insert the intake manifold into position. Do not secure yet.	
		Check to see if the intake manifold spacer bolt holes are concentric. If they do not lineup, adjust the spacers accordingly.	
		NOTE: The distance between these 2 mounting holes should match the intake manifold mounting hole spacing (306mm).	
45		Secure all intake manifold hardware. Install all OEM components in reverse order.	
		NOTES:	
		1. Because of the slight intake manifold shift, some things may not lineup perfectly.	
		2. The factory charge pipe will no longer lineup. An aftermarket charge pipe (not included) must be used.	
		3. A fuel controller or ECU (not included) is required to drive the fuel injectors.	
46		To resecure the engine vanity cover, a simple modification is required. Flip the engine vanity cover upside down. Pry off the 4 rubber grommets.	
		NOTE: When installed, 2 grommets secure to the valve cover and 2 grommets secure to the intake manifold. The 2 grommets that secure to the intake manifold will be repositioned up and outwards. The grommets that secure to the valve cover, will just be repositioned higher. Find the 2 pairs of aluminum engine vanity cover spacers and associated hardware included in the kit.	

47		Make all of the appropriate connections at the rear of the fuel rail.	
		NOTE: Shown in the rear fuel rail port is 20-0623-0X Direct Mount Regulator with 20-0029 fuel pressure gauge. These 2 parts will be required if running an independent fuel system specifically for port injection.	
48		If necessary, make all of the appropriate connections at the front of the fuel rail.	
		NOTE: 90 degree 8AN PushLock hose end shown.	
49	5mm Allen Wrench	Using the 2 short M6x1mm Allen head bolts provided in the kit, install the billet aluminum intake manifold spacers to the OEM intake manifold brackets.	
50	Tape Measure	Insert the intake manifold into position. Do not secure yet.	
		Check to see if the intake manifold spacer bolt holes are concentric. If they do not lineup, adjust the spacers accordingly.	
		NOTE: The distance between these 2 mounting holes should match the intake manifold mounting hole spacing (306mm).	
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52		To resecure the engine vanity cover, a simple modification is required. Flip the engine vanity cover upside down. Pry off the 4 rubber grommets.	
		NOTE: When installed, 2 grommets secure to the valve cover and 2 grommets secure to the intake manifold. The 2 grommets that secure to the intake manifold will be repositioned up and outwards. The grommets that secure to the valve cover, will just be repositioned higher. Find the 2 pairs of aluminum engine vanity cover spacers and associated hardware included in the kit.	

53		Carefully remove the insulation foam (shown) from the engine vanity cover.	
54	3mm Allen Wrench 8mm Wrench	Find the 2 grommet locations on the engine vanity cover that connected to the valve cover. Install the flat head M5x0.8mm screw through the spacer shown and place into position. Install the round washer and the flange nut underneath and tighten. Repeat this process for the other valve cover location.	
55		Find the 2 grommet locations on the engine vanity cover that connected to the intake manifold. Temporarily install the spacer using the provided hardware. Properly rotate the spacer to where the OEM grommet will end up. As shown, mark or scribe the area through the circle.	
56		The tall grommet receptacle will need to be cut as shown. Keep cutting until the OEM rubber grommet fits into the spacer without interference.	
57		The short grommet receptacle will need to be cut as shown. Keep cutting until the OEM rubber grommet fits into the spacer without interference.	
58		Hold the D-shaped washer and the flange nut underneath. NOTE: the flat side of the washer is oriented as shown to prevent OEM grommet interference.	

59	3mm Allen Wrench	Secure the spacer using the provided flat head M5x0.8mm screw.	
	8mm Wrench		
60	3mm Allen Wrench	As shown, repeat the process above for the other grommet receptacle.	
	8mm Wrench		
61		Carefully, reinstall the insulation foam.	
		Attach the OEM rubber grommets to the aluminum spacers, as shown.	
66		To pop back into place, push downwards on the engine vanity cover.	
		NOTE: it is normal for the oil cap to be slightly recessed, as shown.	
		INSTALLATION COMPLETE	