

Disclaimer:

This part is for race use only and does not have DOT (Department of Transportation) approval. Any misuse of this product is done so at the buyers own risk.

All items are guaranteed against defects in manufacture, and will be repaired/replaced if needed. However, any damage inflicted by the end user of this product is not the responsibility of WolfKatz Engineering LLC. If a part is not what you expected, you are welcome to return it for a refund if it is in resalable condition.

Unless otherwise stated, these parts have been tested on a 1993 Toyota MR2 Turbo. Any known compatibility problems will be noted. However, due to running model changes made by Toyota, there may be unforeseen changes. While WolfKatz can make recommendations, it is ultimately the responsibility of the purchaser to decide if a part is suitable to his/her application.

## WolfKatz MR2 Top Feed Fuel Rail Installation Instructions:

Warning, these instructions were writing using a GenII MR2 as a mule. Some Gen III specifics are included, but it is likely that not everything is perfect. Also, other 3S-GTE applications (All Trac / GT4) will vary slightly.

Step 1: Disconnect battery and raise the rear of the vehicle. Be sure to support the rear of the vehicle with appropriate jack stands or ramps.

Step 2: Remove the intake pipe that enters the throttle body. Remove the throttle cable from the throttle body and set aside by opening the throttle body all the way and sliding the cable out. Set the cable aside.

Step 3: Remove the throttle body intake flange/tube (four bolts). Remove the intermediary piece bolted to the throttle body and the valve cover (six bolts). Unplug the black connector to the throttle position sensor. Unplug the grey connector to the Idle Air Controller on the throttle body. Unplug all four of the fuel injectors. Unbolt the throttle body, pull off the rubber EGR hose, and set the throttle body on top of the valve cover (four bolts). Save the gasket that is between the throttle body and the intake manifold. If you feel inclined to replace the gasket, I have reused mine several times, the Toyota Part Number for the gasket is 22271-88381 . Don't remove the water hoses from the throttle body, unless you want to make more work for yourself.

Step 4: Now, for the fun part. The throttle body water hoses are connected to a bracket that is bolted to the back of the intake manifold via two 10 mm bolts. These bolts are a real pain to get to, but the bracket needs to be loose in order to remove the fuel rail. From under the car using a 1/4" drive socket and 10mm socket, remove the two bolts and let the bracket with hoses connected hang out.

Step 5: Remove the bolt on top of the fuel filter and save the two aluminum sealing washers. Watch for gas, don't smoke! There might be a bolt holding the hose to the side of the engine, if so, remove it as well. Now, remove the clamps on the drain fuel hose that runs from the fuel pressure regulator to the pipe near the distributor. I have found that needle nose pliers work well with these spring clamps. Save the hose, you may need it later if you are choosing to reuse your fuel pressure regulator.

Step 6: In order to easily remove the fuel rail, the wiring harness on top of the intake manifold will need to be loose. Take the two 10 mm bolts out that hold the plastic harness cover to the intake manifold. Remove the two banjo bolts that hold in the cold start injector line and set the bolts, 4 aluminum washers, and line aside. Next, remove the three bolts that hold the current complete fuel rail in (12 mm). Remove the oil cap and stick a paper towel or rag into the now open hole. Slowly work the fuel rail out of the car with the 3 foot supply hose that you previously unbolted from the fuel filter. Set the assembled unit aside. Be sure to not loose the three plastic spacers that are between the rail and the cylinder head in case you want to re-install your old rail at some later date.

Step 7:

Clip out your old Injector Clips (wires) leaving just enough wire that you can install them later if need be. Install your new flying leads and injector clips (WolfKatz includes these

when a complete kit including injectors is purchased). I soldered mine and use heat shrink, but there are other ways to do this as well.

(Gen III ONLY): Unplug the intercooler fan, oxygen sensor and whatever else may be plugged into the far end of the injector harness. Unclip the harness from the two bolts on the backside of the top of the timing belt cover. Be sure everything is unplugged along the injector harness and swing it out such that it is removed from the area where the fuel rail belongs! This may help you remove the original rail as well.

Step 8: Time to assemble the Wolf Katz Fuel Rail. Find some engine oil to help with assembly. Be sure the area where the injector adapters will go is clean and free of dirt and other junk. Use a mirror to look if you are having trouble seeing what you are working on. If need be, put small pieces of paper towel in the injector holes in the cylinder head and use some throttle body cleaner and Q-tips to get things cleaned up.

Now, setup the rail. Using the four 10-32 screws, lock washer and washers, bolt on the feet as shown in the next picture. If you are using stock supply line, put one of the included 3/8" NPT plugs in the passenger side end of the rail. If you are using the stock FPR, put the included brass adapter in the drivers side of the rail. Insert the stock FPR such that the fuel return (larger outlet) will face the ground. The adapters should come with sealant on them (If not, use Teflon tape or other thread sealant). They need to be snug, but not extremely tight if you want them to come out again at a later date! If using the stock supply line, insert it using the stock banjo bolts and aluminum sealing washers into the bottom of the rail with the banjo flange upside-down from the factory mounting. This will put the hose such that it goes along the base of the new rail at the trunk side of the engine compartment (Gen III will stick out in a similar location to stock). If you are using a custom FPR, put one of the NPT to AN-8 fittings included in the drivers side of the rail in lieu of the brass FPR adapter. If you are using a custom supply line, install the other included NPT to AN-8 fitting into the passenger (inlet) side of the rail and using one of the factory aluminum sealing disks, put the included bolt (used as a plug in this case) into the hole that would allow the use of the stock supply line.





## Gen II:



Find the injector adapters. Be sure the O-rings are installed on the end of the adapter rings. Find your fuel injectors and put a bit of motor oil on the lower O-Rings. Insert the injectors into the adapters as shown below. Each injector case should bottom out against the adapter. Lightly oil each injector adapter O-ring and insert all four of the top feed injectors with their adapters into the cylinder head. Put a coating of oil on the injector upper O-rings. Now, carefully weave the top feed rail with its feet, supply line (if stock), and FPR (if stock) into place. With all four injectors lined up, use the two included blue bolts and lock washer to start the feet in the cylinder head. Now, carefully tighten the blue bolts and pull the rail into place over the upper injector O-rings. Go SLOWLY and twist each injector occasionally to be sure it is not hung up and is seating properly. If you go too fast, you will tear an O-ring like the one shown to the left! Once everything is snug, play with the injectors, you should be able to twist them a bit, but you should not be able to get them to come out!

Gen III Differences: Instead of installing the injectors into the head first, go ahead and insert the injectors into the rail. Use a bit of oil and get the entire assembly setup. Now, be sure the harness is out of the way, and get everything lowered into place. Be sure each of the four injector adapters have a bit of oil on them as well and get them started into the head. Now, using the supplied blue bolts and lock-washers, SLOWLY tighten everything up. Twist each injector a bit while tightening things up. When everything is tight, the injectors may be able to twist just a bit, but **MUST NOT BE ABLE TO COME OUT**. If it feels like the injectors are held too tightly, then use the two supplied thin 5/16" flatwashers to space the rail a bit higher up. Once again, it is okay for the injectors to twist a bit, but a lot of up and down motion is a bad thing. This is extremely important with the Gen III rail as there is not a lot of margin for error. If something looks funny, contact WolfKatz before attempting to start the engine.

Reference Pics:



Step 9 Bypassing the Resistor Pack. First, determine what your ECU requires. The stock ECU will work with low impedance injectors without bypassing the resistor pack. You can also use it with high impedance injectors with bypassing. Most aftermarket ECU's can now run low impedance (sometimes called peak and hold) injectors without a resistor pack. To test an injector use an Ohm meter and measure across an injector. ~3 ohms is low impedance. High impedance injectors tend to be around 15 ohms. To bypass the resistor pack, unbolt it from the firewall. It is the resistor pack nearest the firewall near your dizzy. Unplug it and set the pack aside. There is a connector pictured below. Clip the connector off the resistor pack and strip all five wires back a bit. Solder or otherwise

connect them all together and insulate the ends. Now plug the modified connector back into the harness and your done.



**Step 10 Hook Up the Plumbing:** If you are using the stock supply line, use the two aluminum disks and bolt it back up to the top of the fuel filter. If you are using the stock regulator, hook the return line up to the outlet on the FPR and the other end to the pipe near the dizzy. If you are using the WolfKatz Fitting Kit and Aeromotive Regulator for your return setup, see the instructions that came with kit. If you are using a custom supply and return, attach that now.

**Step 11 Pressure Test:** To be sure there are not any leaks, we need to pressure test the system. Open the diagnostic port near the latch mechanism for the engine lid on the rear firewall. Use a paper clip to short the B+ pin to the FP pin. Reconnect the battery and turn on the ignition. The fuel pump will be running full blast. Sniff for leaks, beware, as you will likely smell an air fuel mixture coming from the open intake manifold.

**Step 12:** If no leaks are found, time to hook everything back up! Start by hooking up the four injector leads. Take the throttle body and gasket and swing it into position and bolt it home. Reconnect the black connector to the TPS and the grey connector to the idle controller. Reconnect all the vacuum lines to the top of the throttle body and to the fuel rail. If you are using an aftermarket pressure regulator, be sure to hook up its vacuum source via a long piece of vacuum line. Bolt the remaining pieces of the throttle body assembly to the intake manifold and valve cover. Hold the throttle body open all the way and re-connect the throttle cable. Replace the tube from the intercooler to the throttle body inlet and tighten the clamps. You should be all set!

**Step 13:** Reconnect the ignition source spark plug wire and fire up the engine! Check again for leaks and be sure a steady vacuum is present at idle. Your all set, go forth and make power!