



# INSTALLATION INSTRUCTIONS

## FUEL RAIL FOR MX-5, 1.8L BP ENGINE

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**WARNING: DO NOT EXPOSE WORK AREA TO ANY SPARKS OR FIRE. DO NOT SMOKE WHILE OPERATING ON THE FUEL SYSTEM. CLEAN UP ALL FUEL SPILLS IMMEDIATELY. WORK IN A WELL VENTILATED AREA.**

1. To relieve fuel pressure, temporarily disconnect the fuel pump relay. On 1994+ models, this is found under the dash above the accelerator pedal. To make sure the proper relay is disconnected, find the correct fuel pump wire color in the connector:

**1994-1997 MX-5 = Blue/Red Stripe**

**1999-2005 MX-5 = Red/Blue Stripe**

Start the vehicle and allow the engine to stall. Turn the ignition OFF, remove the key, and the fuel fill cap.



2. Before disconnecting the battery, be sure to have the anti-theft code for the OEM radio, if applicable. Write down the frequencies for the radio's preset buttons.

Access the battery. Remove the negative (-) terminal using a 10mm wrench.

Unlatch and prop the hood.

Install fender covers to protect the body and paint.

Allow the engine to cool before proceeding.



3. Refer to the Mazda MX-5 Service Manual for proper fuel rail disassembly.

Notes:

1. The 94-97 models have a 1pc intake manifold that does not need to be removed. If equipped, remove the PRC solenoid bracket (shown) using a 10mm wrench.
2. The upper plenum of the 99-05 model's 2pc intake manifold must be removed.
3. The 99-05 models use a returnless system. A pulse damper is mounted on the fuel rail (not a FPR). Fuel runs at a constant pressure (not dynamic like 94-97 models).
4. For 99-05 models, use a SAE quick disconnect removal tool (auto parts store) into the feed line connection near the rail. Simultaneously pull the OEM fuel hose off.



4. Catch all spilled fuel. Inspect all seals and O-rings. Replace if necessary.

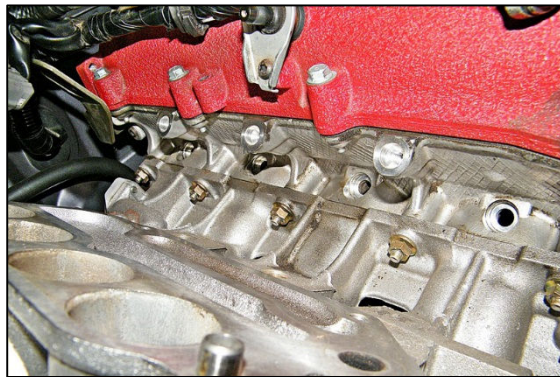
Do not lose the 3 OEM black spacers (shown) found under the fuel rail mounting tabs. They WILL BE reused!

The three OEM M8 bolts (shown) can be discarded. Replacement stainless steel M8x1.25mm fuel rail bolts are included in the kit.



5. Now is a good time to carefully clean all critical areas, especially the lower injector seat bores (1999-2005 model shown.)

Reminder: The basic 20-0269 fuel rail kit does not include hoses, fittings, etc. For custom setups, plumbing items such as fittings, hoses, etc. can be purchased at [www.radiumauto.com](http://www.radiumauto.com). Be sure to **prelubricate all adapter fitting O-rings** when installing.



6. **Skip this step if either plumbing kit was NOT purchased.**

**20-0422 (94-97 MX-5):** Install the 8AN ORB plug to the rear port. Install the included FPR adapter to the upper rear port. Install the FPR to the flange. Install the 8AN ORB to 8.5mm barb fitting to the front port. Pre-lubricate all O-rings.

**20-0423 (99-05 MX-5):** NOTE: EGR must be removed. Install the 8AN ORB plug to the rear port. Install the FPD adapter to the upper rear port. Install the FPD to the flange. It is normal for the damper to freely rotate after installed. Install the following fittings to the front port: 8AN ORB to 6AN male adapter -> 90 degree coupler -> SAE quick disconnect fitting. Pre-lubricate all O-rings.

FRONT PORT



7. **Lubricate each fuel injector's top and bottom O-rings with engine oil.** Fully insert the injectors into the Radium fuel rail bores.

Note that bolt/washer placement through the Radium fuel rail's 3 mounting holes is dependent on the MX-5 model year (see picture).

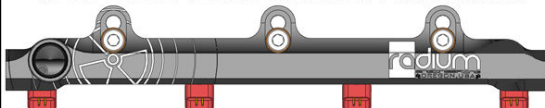
**Reusing the OEM spacers,** position the rail assembly onto the intake manifold.

Check for any clearance issues and grind down if necessary. Torque the 3 included M8 bolts with Phenolic washers to 10 ft-lbs (13.6Nm) using a 6mm Allen wrench.

1994-1997 Bolt / Washer Placement



1999-2005 Bolt / Washer Placement



8. As a test, push the fuel injectors downward until they bottom out. Now inspect the injectors' upper O-rings and confirm they are still inserted into the fuel rail injector bores. Do NOT pressurize the fuel system until the proper height is achieved.

Orientate the fuel injectors such that the electrical connectors do not experience any interference with the surrounding area. Plug in each of the injector connectors.

← UPPER INJECTOR SEAT



PUSH UP/DOWN

← LOWER INJECTOR SEAT

9. **Skip this step if 20-0422 (Plumbing Kit, 94-97 MX-5) was NOT purchased.**

The OEM parts listed below will be reused for this plumbing kit.

4x - Mazda Fuel Hose Spring Clamp

2x - Mazda Convoluted Fuel Hose Sleeve (shown)



**10. Skip this step if 20-0422 plumbing kit was NOT purchased.**

For the fuel feed hose, install the included 5/16" fuel hose to the fuel rail front port and secure using an OEM spring clamp.

Run the hose underneath the intake manifold (as shown) and route towards the lower frame rail mounted hard line.

Measure and cut the hose to length. It will be roughly ~24" in total length.



**11. Skip this step if 20-0422 plumbing kit was NOT purchased.**

For the fuel return hose, install the leftover 5/16" fuel hose to the fuel pressure regulator low pressure return barb and secure using an OEM spring clamp.

Run the hose between cylinder 2 and 3 intake manifold runners and route towards the upper frame rail mounted hard line.

Measure and cut the hose to length. It will be roughly ~18" in total length.



**12. Skip this step if 20-0422 plumbing kit was NOT purchased.**

Slide a convoluted sleeve and OEM spring clamp over the fuel feed hose and secure to the lower hard line.

Slide a convoluted sleeve and OEM spring clamp over the fuel return hose and secure to the upper hard line.



**13. Skip this step if 20-0423 Plumbing Kit, 99-05 MX-5 was NOT purchased.**

Find the OEM feed hose that routes from the right side frame rail.

Clock the front fuel rail port fittings (shown) so they line up with the OEM hose. Loosening and retightening the fittings may be necessary.

Lubricate the male portion of the Radium SAE quick disconnect fitting with light oil and fully insert the OEM feed line until a positive "click" is felt.



14. After everything is reinstalled in a reverse order. For 99-05 engines, temporarily leave the upper plenum off. Cycle the key a few times (without starting engine). This allows the fuel pump to prime the system.

**CHECK FOR LEAKS!**

If no leaks are found, reassemble everything. Start the engine and check for leaks again while the engine is running.

**Installation complete**

