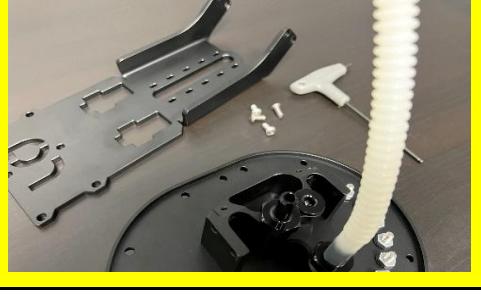
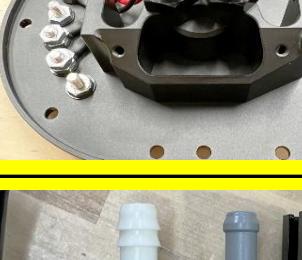
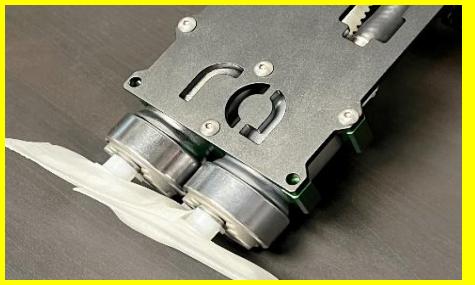


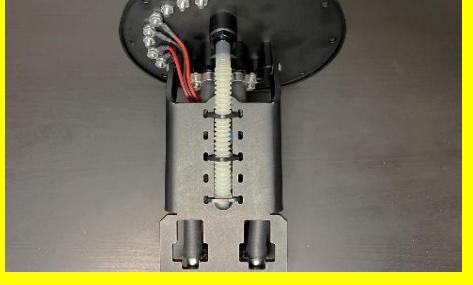
5	Pry Tool	The fuel pump assembly is located underneath the rear parcel shelf.	
		As shown, carefully remove the 5 plastic carpet retainers using a pry tool.	
		From the front, lift up and tightly roll the carpet towards the rear to expose the fuel pump access cover.	
6	Screwdriver	Remove the fuel pump access cover.	
7	10mm Socket	To unplug the fuel pump connector (shown), depress the thumb lock and pull. Start the vehicle and allow the engine to stall. This will depressurize the fuel lines.	
		Remove the fuel cap and reinstall. This will depressurize the air volume inside the fuel tank.	
		Disconnect the negative battery terminal.	
8	Pliers	For 1989-1997 MX-5	
	Rag	Loosen the spring clamps on the feed and return hoses. Carefully pull the hoses off the barbs. Have a rag handy.	
9	Rag	For 1999-2005 MX-5	
		Push the SAE quick connect fuel line fittings further on, then simultaneously squeeze the 2 outer locks and pull away. Have a rag handy.	
10	7mm Socket	For 1999-2005 MX-5	
		There will be a metal strap that needs to be removed. First, unscrew the nut, as shown. Next, look under the sheet metal and find the line that it is fastened to. Squeeze the plastic clip to remove the strap.	
		NOTE: This metal strap will not be reused.	

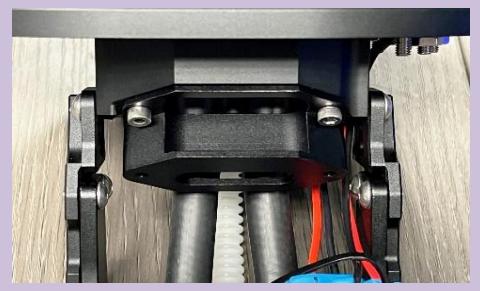
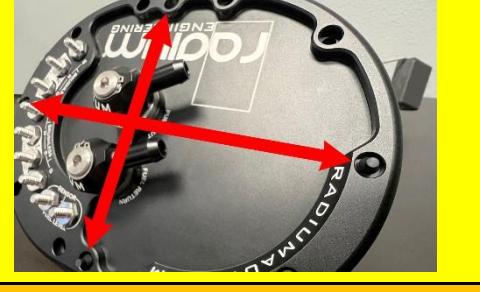
11	Bucket Screwdriver	<p>Remove the 8 perimeter screws. These will NOT be reused.</p> <p>Pull up, tilt, and twist the assembly to clear the fuel float arm. Place the pump assembly into a bucket.</p> <p>Cover the gas tank opening to prevent dirt and/or debris from accidentally falling in.</p>	
12		<p>Set the OEM fuel pump unit onto a workbench. Inspect the large fuel tank gasket. Replace if necessary.</p> <p>Mazda 89-97, P/N: NA01-60-962 Mazda 99-05, P/N: BP4W-60-962</p>	
13	7mm Socket Wrench	<p>To unplug the fuel level sensor connector, depress the thumb lock and pull away. Unscrew and remove the fuel level sensor from the 2-bolt flange.</p> <p>NOTES:</p> <ol style="list-style-type: none"> 1. There are a couple variations of fuel level sensors (shown). 2. The OEM parts that will be reused: fuel level sensor, fuel tank gasket, and (optionally) the external fuel lines. 	
14	3mm Allen Wrench	<p>To disassemble the Radium Engineering fuel pump hanger, first remove the 4 screws shown.</p>	
15	3mm Allen Wrench	<p>Next, remove the 6 screws shown.</p>	
16	3mm Allen Wrench	<p>Lastly, remove the 4 screws shown.</p>	

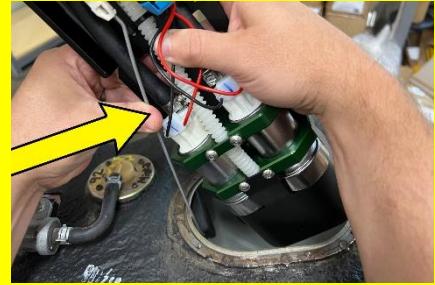
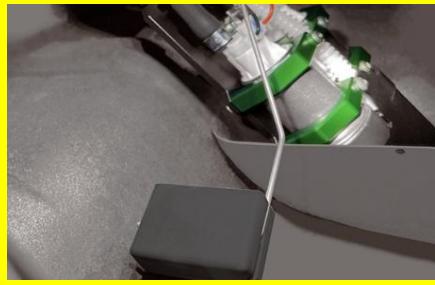
17	3/8" Socket Wrench	There are 2 sets of fuel pump connectors provided in the kit. Only 1 connector is required for single pump applications. Match the exact type to the fuel pump(s) being installed.	
		Using the provided hex nuts, install the ring terminals to the studs while referencing the labeling on the top side.	
		NOTE: To avoid gasket interference, point the wires from the studs towards the center of the fuel hat, as shown.	
	1/4" Allen Wrench	For dual pump applications, remove the 1 plug (shown).	
		No actions are required in this step for single pump applications.	
18			
19	Oil Lubrication	For dual pump applications, install the provided 6AN ORB to barb fitting, as shown.	
	19mm Wrench	No actions are required in this step for single pump applications.	
20		There are 2 different diameter submersible hoses included. Use the hose that matches the fuel pump outlet barb.	
	Walbro GSS342	Use the small ID rubber hose	
	AEM 50-1200	Use the small ID rubber hose	
	Walbro F90000267	Use the large ID rubber hose	
	Walbro F90000274	Use the large ID rubber hose	
21	Walbro F90000285	Use the large ID rubber hose	
	Ti Automotive E5LM	Use the large ID rubber hose	
22	Ruler	For 1989-1993 Fuel Tank, cut hose(s) to 7" (178mm).	
	Hose Cutter	For 1994-1998 Fuel Tank, cut hose(s) to 8.2" (208mm).	
		For 1999-2005 Fuel Tank, cut hose(s) to 9" (228mm).	
		NOTE: For Ti Automotive E5LM pump(s), the hose will need to be cut shorter and will depend if check valve(s) are used.	

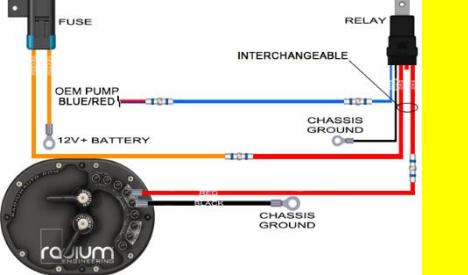
23	Oil Lubrication Screwdriver	<p>Lubricate the inside of the submersible hose and insert onto the fuel pump barb(s). As shown, rotate the fuel pump(s) so the outlet barb(s) will be nearest the large fuel pump bracket when installed.</p> <p>For now, loosely secure the included EFI hose clamp(s). They will be slightly tweaked in a later step.</p>	
24		<p>For 1989-1993 Fuel Tank The depth does NOT require the extension brackets.</p> <p>For 1994-1998 Fuel Tank The depth requires the extension brackets (shown).</p> <p>For 1999-2005 Fuel Tank The depth requires the extension brackets (shown).</p>	
25	3mm Allen Wrench	<p>For 1994-1997 Fuel Tank</p> <p>Install the extension brackets to the large fuel pump bracket, as shown. Take note of the exact location of the 4 screws through the extension brackets (shown red). This is important for proper fitment inside the fuel tank.</p>	
26	3mm Allen Wrench	<p>For 1999-2005 Fuel Tank</p> <p>Install the extension brackets to the large fuel pump bracket, as shown. Take note of the exact location of the 4 screws through the extension brackets (shown red). This is important for proper fitment inside the fuel tank.</p>	
27		<p>For 1989-1993 Fuel Tank</p> <p>Insert the convoluted "return" tubing through the long slot on the backside of the large fuel pump bracket, as shown.</p> <p>NOTE: Do not perform this step for any other fuel tank.</p>	
28	3mm Allen Wrench	<p>Using 4 of the button head screws, install the lower assembly to threads on the fuel hat.</p> <p>NOTE: Shown is the setup for 1989-1993 fuel tank. For this fuel tank, the large fuel pump bracket installs directly to the fuel hat, as shown. The extension brackets are NOT required. For the other fuel tanks, the extension brackets will be installed to the fuel hat.</p>	

29		<p>Press the provided filter sock(s) onto the fuel pump inlet(s). Secure with the included star washer.</p>	
30	Screwdriver 3mm Allen Wrench	<p>Place the pump(s) down onto the large fuel pump bracket. If necessary, rotate the EFI clamp(s) so they do not interfere with the bracket and tighten.</p> <p>For now, loosely install the billet pump mounts using just the 4 button head screws shown.</p> <p>NOTE: It is correct for the pump(s) to hang past the bottom of the large fuel pump bracket, as shown.</p>	
31		<p>Adjust the fuel pump(s) to the proper height. This distance will be verified in a later step when the collector box is installed.</p>	
32	3mm Allen Wrench	<p>If installing 39/50 DCSS pumps (Walbro F900002XX), simply push the pump up just enough for the large pump base to not interfere with the large fuel pump bracket, exactly as shown.</p> <p>After adjusted, tighten the 4 button head screws shown.</p>	
33	3mm Allen Wrench	<p>Fold in the fuel pump filter sock(s) and insert the collector box. Attach the button head screws shown.</p> <p>NOTE: Be sure the rubber fill valves at the bottom of the collector box are free to move in and out.</p>	
34	3mm Allen Wrench	<p>Insert the convoluted "return" tube into the collector box.</p> <p>As shown, put the small 2 bolt bracket in place.</p> <p>Secure all button head screws.</p>	

35		<p>For 1994-2005 Fuel Tanks</p> <p>Secure a cable zip tie around the convoluted "return" tube up against the billet pump mount in the exact area shown. This will lock the tubing in place.</p>	
36	Cutter	<p>Using the cable zip ties, secure the convoluted "return" tube to the large fuel pump bracket.</p> <p>NOTE: The placement of the cable zip ties will be dependent on the fuel tank and the fuel pumps used. Shown is a 1990-1993 fuel tank pump assembly where the convoluted tubing is placed on the opposite side of the large fuel pump bracket.</p>	
37	Cutter	<p>Connect the fuel pump electrical lead(s).</p> <p>The fuel pump wires (or connector plugs, if applicable) must be secured to the side of the large fuel pump bracket shown. This will permit the necessary room for the fuel level float arm on the opposing side of the large fuel pump bracket in later steps.</p>	
38	Cutter	<p>As shown, cut off the OEM fuel level sensor connector leaving as much wire as possible.</p> <p>Carefully remove the stiff insulating wire loom shown.</p>	
39	Wire Strippers Wire Crimpers Heat Gun	<p>Strip 1/4" of insulation off the 2 wires and slide a short piece of small heat shrink over each wire.</p> <p>Crimp 2 small ring terminals to the wires and then slide the heat shrink over the crimped area.</p> <p>Heat the tubing until they fully shrink, as shown.</p>	
40		<p>1989-1993 Fuel Tank The depth does NOT require the fuel level extension.</p> <p>1994-1998 Fuel Tank The depth requires the fuel level extension (shown).</p> <p>1999-2005 Fuel Tank The depth requires the fuel level extension (shown).</p>	

41	3mm Allen Wrench	<p>For 1994-2005 Fuel Tanks</p> <p>The fuel level extension is required. As shown, install the fuel level extension directly to the fuel hat using 2 of the socket head screws.</p>	
42	3mm Allen Wrench	<p>Using 2 of the socket head screws, install the fuel level sensor.</p> <p>NOTES:</p> <ol style="list-style-type: none"> 1. Shown is the setup for 1989-1993 Fuel Tank. For this fuel tank, the OEM fuel level sensor installs directly to the fuel hat, as shown. The fuel level sensor extension is NOT required. 2. This picture illustrates the reason why the fuel pump electrical connector was secured to the opposing side of the fuel level float arm. 	
43	3/8" Socket Wrench	<p>Route the 2 fuel level sensor wires and install to the "fuel level sensor" studs. Secure using the provided hex nuts (shown).</p> <p>NOTE: Because this simply outputs a resistance, polarity does NOT matter. The sensor cannot be wired backwards.</p>	
44	Oil Lubrication	<p>The fuel pump hanger is preassembled with SAE quick connect male fittings for 99-05 MX-5 fuel hoses.</p> <p>If installing into a 89-97 MX-5, find the provided SAE quick connect female hose ends. Lubricate the internal O-rings and push them onto the preinstalled fittings until a "click" is felt. As shown, this has now adapted the fuel pump hanger for 89-97 MX-5 fuel hoses.</p>	
45		<p>Line up the fuel tank gasket to the fuel hat. NOTE: It might need to be rotated 180 degrees.</p> <p>Be sure to press the 4 indicator nubs through the fuel hat as shown, to fully seat the gasket.</p>	
46		<p>1989-1993 Fuel Tank Only</p> <p>For the OEM fuel level float to have full range (empty to full), the internal baffle inside the fuel tank needs to be tweaked in the area shown.</p>	

47		<p>1989-1993 Fuel Tank Only</p> <p>Reach into the fuel tank opening and find the area shown. Push and bend the thin steel baffle about 1/2" (13mm).</p>	
48		<p>Place the fuel level float into the tank first. When inserting the fuel pump hanger assembly, carefully bend the fuel level float arm (shown yellow arrow) just enough to get the assembly into the fuel tank.</p>	
49		<p>When lowered down, the Radium Engineering collector box will fit perfectly into the integrated baffle at the bottom of the fuel tank, as shown.</p>	
50	3mm Allen Wrench	<p>Secure the fuel hat to the tank in a crisscross pattern using the 8 provided socket head screws.</p>	
51	Pliers	<p>Reconnect the fuel lines.</p> <p>NOTE: For the 1999-2005 Mazda MX-5, simply reconnecting the fuel lines (as shown) will not be enough. A fuel pressure regulator must be installed into the system since it was removed with the OEM fuel hanger. See below for more details.</p>	
52	Cutter Wire Stripper 8mm Socket Wrench	<p>Remove some of the sleaving from the OEM connector. Cut the 2 fuel level sensor wires from the connector.</p> <p>89-97 Mazda MX-5: Yellow and black 99-05 Mazda MX-5: Black and Brown/Black</p> <p>Strip 3/8" (10mm) of insulation off the ends, as shown. Install the provided small ring terminals and heat shrink to each wire. Install the terminals to the "fuel level sensor" studs.</p>	

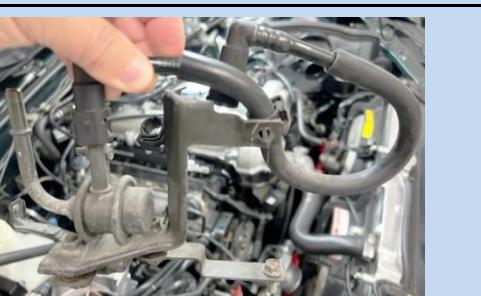
53	<p>Each fuel pump must use an independent fuse and relay to handle the extra current draw. Consider purchasing Radium 17-0031 (shown) for each pump.</p> <p>NOTE: Refer to the installation instructions for 17-0031 for additional details on wiring.</p>	
54	<p>If Radium 17-0031 DIY Fuel Pump Wiring Kit was purchased, the OEM fuel pump wiring can be used to trigger this higher current capable system, as shown. Use the blue wire provided in the fuel hanger kit to extend the trigger wire.</p>	
55	<p>Shown is an example of the 17-0031 wire routing into a Mazda MX-5.</p>	
56	<p>Depending on the pump installed and the fuel pressure demand, the OEM pump wiring can potentially be sufficient.</p> <p>OEM Fuel Pump + (Blue/Red Wire) ----> Pump1 + terminal OEM Fuel Pump - (Black Wire) -----> Pump1 - terminal</p> <p>Use the included ring terminals and heat shrink to connect the OEM wires to the fuel hat studs listed above.</p>	
57	<p>10mm Socket</p> <p>For 1989-1997 MX-5</p> <p>Reconnect the battery and put fuel in the tank. Pressurize the fuel system and check for leaks. Start the engine and check for leaks.</p> <p>FUEL PUMP HANGER INSTALLATION COMPLETE</p>	
58	<p>For 1999-2005 MX-5</p> <p>At minimum, a fuel pressure regulator must be installed. Consider purchasing P/N: 20-1022 FPR KIT, 99-05 MAZDA MX-5, RA-SERIES (shown). There are specific instructions for this kit at www.radiumauto.com.</p> <p>FUEL PUMP HANGER INSTALLATION COMPLETE</p>	

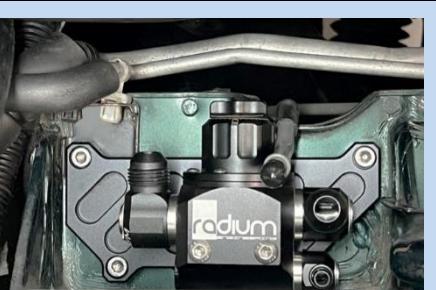
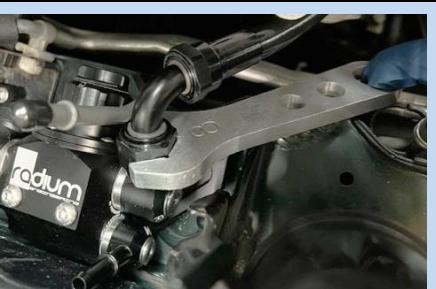
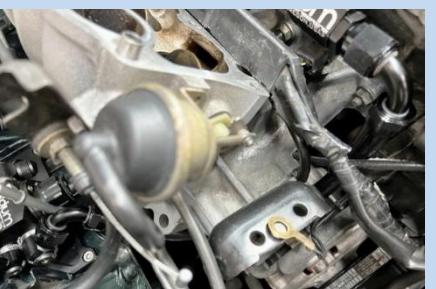
59		<p>FUEL HANGER PLUMBING KIT INSTRUCTIONS</p> <p>The OEM fuel filter is located in front of the EVAP charcoal canister in between the drive shaft and the RH rear wheel behind a plastic cover (shown).</p>	
60	Screwdriver	<p>Remove the 5 plastic clip retainers and pull off the fuel filter cover.</p>	
61	10mm Socket Wrench	<p>To provide extra space to work, remove the nuts that secure the EVAP charcoal canister and allow it to hang.</p>	
62	Pliers Rag	<p>For 89-97 Mazda MX-5 Only</p> <p>Loosen and move the spring clamps off the hose on each side of the fuel filter. Carefully pull each hose off the fuel filter barbs. Have a rag handy.</p>	
63	Rag	<p>For 99-05 Mazda MX-5 Only</p> <p>Push the SAE quick connect fuel line fittings further on, then simultaneously squeeze the 2 outer locks and pull away. Have a rag handy.</p>	
64	10mm Socket Wrench	<p>Remove the fuel filter clamp screw (shown).</p>	

65	Pick	<p>Pull the fuel filter from the OEM clamp and empty the contents into a fuel safe container.</p> <p>NOTE: The 99-05 Mazda MX-5 fuel filter is shown. If the SAE quick connect locks (shown white) are still on the fuel filter, transfer them back to the OEM fuel hoses.</p>	
66		<p>NOTES:</p> <ol style="list-style-type: none"> 1. As a reference, the OEM 89-97 MX-5 fuel filter is shown. 2. The fuel hoses (non hard line) can be permanently removed, if necessary. If they will remain in the vehicle, be sure to blow them out. 	
67	10mm Socket Wrench	<p>Unscrew the 2 bolts that secure the OEM fuel filter clamp.</p>	
68		<p>The OEM fuel filter clamp and mounting bolts will NOT be reused.</p>	
69	5mm Allen Wrench	<p>Use two of the five M6x1mm socket head screws for mounting the fuel filter bracket to the chassis.</p>	
70	Oil Lubrication 5mm Allen Wrench	<p>Secure the 10AN ORB to 8AN male fittings to the fuel filter ports, as shown.</p>	

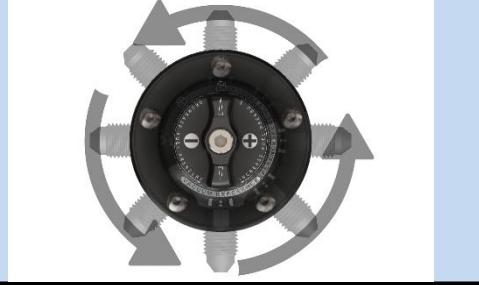
71	4mm Allen Wrench	<p>Place the fuel filter into the mount with the inlet side towards the center and the outlet side towards the outside of the vehicle.</p> <p>Loosely install the fuel filter clamp using the 2 provided M5x0.8mm socket head screws. NOTE: Do NOT tighten the clamp yet as the fuel filter will slide over in a later step.</p>	
72	4mm Allen Wrench	<p>As shown, remove the "pump out" and "fuel return" port fittings on the fuel hat.</p>	
73	Oil Lubrication 4mm Allen Wrench 5mm Allen Wrench	<p>Install the provided 8AN ORB to 6AN male fitting to the "fuel return" port.</p> <p>Install the provided 10AN ORB to 8AN male fitting to the "pump out" port.</p>	
74		<p>NOTE: This is a difficult step that requires 2 people.</p> <p>Find the rubber hoses included in the kit. From inside the vehicle, push the 8AN hose down the backside of the fuel tank while the other person pulls the hose from underneath. Now insert the 6AN hose next to the 8AN hose on the inner side and repeat the process. Run the hoses adjacent to each other.</p> <p>Leave just enough hose slack to reach the fuel hanger ports.</p>	
75	Oil Lubrication	<p>Find the 6AN and one of the 8AN hose ends in the kit. Liberally lubricate the PushLok barbs. With a large amount of force, insert each hose end into their respective hose, as shown.</p> <p>NOTE: PushLok hose ends do NOT require hose clamps.</p>	
76		<p>Route the hoses to their respective fuel pump hanger ports.</p> <p>NOTE: this hose routing may look different depending on the fuel tank (1999 MX-5 NB1 fuel tank shown).</p>	

77	11/16" Wrench 7/8" Wrench	As shown, secure the hose ends to the banjo fittings.	
78		From underneath the vehicle, keep the feed and return hoses up and away from moving components and the exhaust system.	
79	Hose Cutter	The OEM hard (feed) line will be repurposed as a return line. 89-97 MX-5: the hose will attach directly to the hard line. 99-05 MX-5: the hose will first attach to the included 90 degree SAE quick connect then to the hard line. Route the 6AN rubber hose towards the OEM hard line and cut to length. NOTE: The cut hose will be used in a later step.	
80	Oil Lubrication Screwdriver	For 1999-2005 MX-5 Find the included 90 degree SAE quick connect and the EFI hose clamp. Place the EFI clamp on the rubber hose. Lubricate the fitting and fully seat the fitting into the hose. As shown, secure the EFI clamp.	
81	Screwdriver	Install the new return line to the original fuel feed line. For 89-97 MX-5, push the hose over the barb on the hard line and secure using the included EFI hose clamp. For 99-05 MX-5 (shown), push the SAE quick connect on until a "click" is felt.	
82	Hose Cutter	Route the 8AN rubber hose towards the fuel filter inlet fitting and cut to length.	

83	Oil Lubrication	<p>Find the other 8AN hose end in the kit. Liberally lubricate the PushLok barbs. With a large amount of force, insert the hose end into the 8AN rubber hose. NOTE: PushLok hose ends do NOT require hose clamps.</p> <p>As shown, screw the hose end to the fuel filter inlet fitting, but do not tighten.</p>	
84	4mm Allen Wrench	<p>With respect to the fuel filter clamp, slide the fuel filter for best fitment with the hose and the surrounding area. When properly located, tighten the clamp to secure the fuel filter in place.</p>	
85	7/8" Wrench	<p>As shown, secure the 8AN hose end to the fuel filter fitting.</p> <p>NOTE: Make sure these 2 aforementioned hoses are away from moving components and the exhaust system.</p>	
86		<p>The included fuel pressure regulator (FPR) will mount in the engine bay just below the inner side of the RH strut tower.</p> <p>For 99-05 MX-5, remove the fuel damper assembly shown. This will NOT be reused.</p>	
87	Thread Locker	<p>Find the FPR provided in the kit. Install 1 of the 4 fittings to the vacuum port. All fittings (excluding the push-to-connect) require a wicking thread locker, such as green Loc-Tite 290.</p> <p>NOTE: the threaded plug keeps a constant pressure that mimics 99-05 MX-5 fuel pressure. All other fittings permit a 1:1 pressure ratio when connected to an intake manifold vacuum port that mimics 89-97 MX-5 fuel pressure.</p>	
88	Oil Lubrication 5mm Allen Wrench 4mm Allen Wrench	<p>Install the provided 8AN ORB to 8AN male fitting to the high pressure port on the side of the regulator shown.</p> <p>Install the provided 6AN ORB to SAE quick connect fitting to the low pressure port on the side of the regulator shown.</p>	

89	Oil Lubrication 5mm Allen Wrench 1/4" Allen Wrench	Install the provided 6AN ORB to 8AN male fitting to the exact high pressure port on the side of the regulator shown. Install the provided 6AN ORB plugs to the remaining ports.	
90	4mm Allen Wrench	Find the FPR mount and the 2 long button head M6x1mm screws in the kit. Rotate the 3 adapter fittings as shown. Install the FPR to the mount in the exact orientation shown.	
91	5mm Allen Wrench	Place the FPR mounting assembly down. Check to see if the 3 holes lineup with the holes in the unibody. If so, secure using the last 3 socket head M6x1mm screws, as shown. If the holes do not lineup with the chassis, holes will need to be drilled. NOTE: hardware, such as sheet metal screws or rivet nuts, will need to be sourced separately.	
92	7/8" (22mm) Wrench	NOTE: An aftermarket 8AN ORB threaded fuel rail must be preinstalled for this plumbing kit. Consider the following: Radium Engineering 20-0369 Fuel Rail, Mazda 1.8L BP Radium Engineering 20-0769-02 Fuel Rail, Mazda 1.6L B6	
93	7/8" (22mm) Wrench	Install the provided 8AN ORB to 8AN male fitting to the front of the fuel rail. Next, find the short 8AN PTFE hose with 90 degree hose ends. Secure one side to the front of the fuel rail.	
94		Depending on the exact intake manifold installed, this aforementioned 8AN PTFE hose may route slightly different than pictured.	

101	7/8" (22mm) Wrench	<p>Find the long 8AN PTFE hose provided in the kit.</p> <p>Install the 90 degree hose end side to the aforementioned 8AN fitting on the fuel pressure gauge assembly. Do not fully tighten yet.</p>	
102	7/8" (22mm) Wrench	<p>From underneath, route the 8AN PTFE hose to the rear of the vehicle. Thread the straight hose end to the 8AN fuel filter outlet fitting. Do not fully tighten yet.</p>	
103		<p>Be sure the 8AN PTFE hose is routed away from moving components such as the front RH suspension.</p> <p>Secure the hose in place using the provided cable zip ties.</p>	
104	Cutters 7/8" (22mm) Wrench	<p>Once the 8AN PTFE hose is fixed to the chassis, cut the tails off the cable zip ties.</p> <p>Now both 8AN hose ends can be tightened.</p>	
105	10mm Socket	<p>Reconnect the battery.</p>	
106		<p>Briefly start the engine. Once fuel pressure stabilizes, shut the engine off.</p> <p>Check for leaks at every junction point. Do not move forward until they are all fixed (if necessary).</p>	

107	<p>Fuel Pressure Adjustment Notes:</p> <ol style="list-style-type: none"> The regulator is NOT pre-set to a particular pressure. OEM FPR Pressure: <ul style="list-style-type: none"> 89-97 Mazda MX-5 = 44psi (1:1 ratio) 99-05 Mazda MX-5 = 60psi (constant) If using a 1:1 vacuum reference (89-97 MX-5), the vacuum hose needs to be removed from the FPR during the adjustment process. Also, temporarily plug the vacuum hose to prevent a vacuum leak in the system. 	
108	<ol style="list-style-type: none"> Tighten the knob (clockwise) to increase pressure. Loosen the knob (counter-clockwise) to decrease pressure. No locking necessary. Don't attempt to tighten the screw. It is not uncommon for pressure to drop after the pump is off. This behavior does not necessarily imply there is a regulator issue. <p>FUEL HANGER PLUMBING KIT INSTALLATION COMPLETE</p>	