INSTALLATION INSTRUCTIONS

LATE MODEL NISSAN (S14/S15/R33/R34)
FUEL PUMP HANGER
AND FHST KITS

Document: 19-0241
Support: info@radiumauto.com

COLOR LEGEND FOR EACH STEP
20-063X-0X FUEL HANGER, LATE NISSAN Follow ORANGE areas
20-0700/20-0701 FHST ADD-ON, LATE NISSAN Follow YELLOW areas
20-0702-03/20-0702-05 PLUMBING KIT Follow GREEN areas

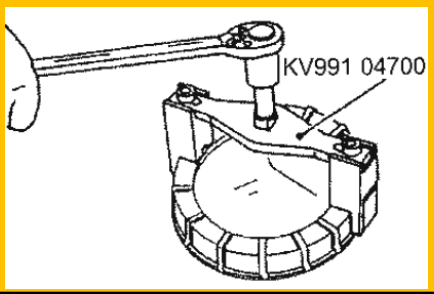
CAUTION

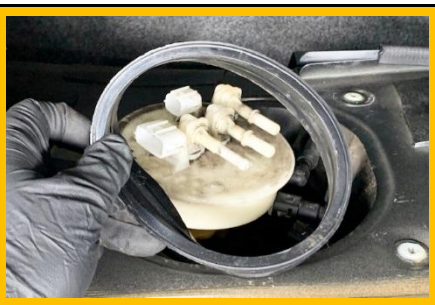
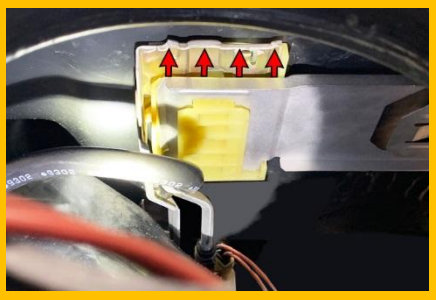
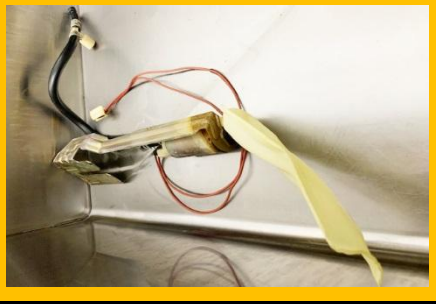
Only a qualified technician following applicable safety procedures should perform the installation of this product.
One must have knowledge in repair and modification of fuel systems and general vehicle modifications to install this product.
Gasoline and other fuels are flammable and can be explosive.
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.

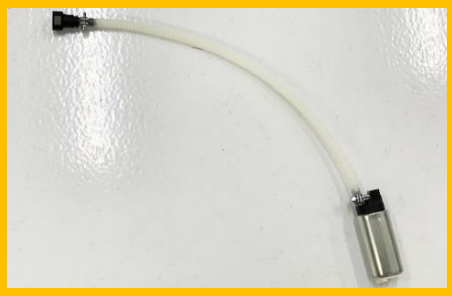
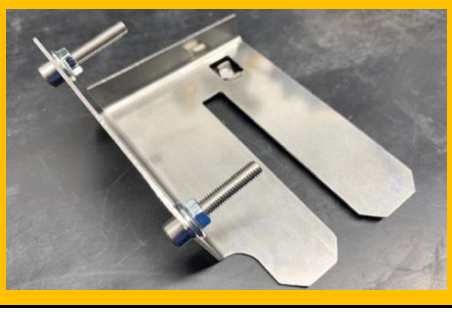
WARNING

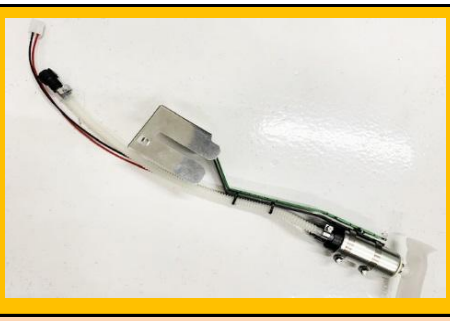
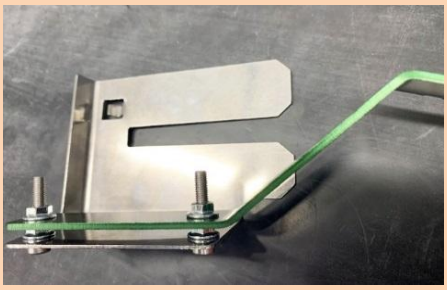
The fuel system is under pressure! Do not loosen any connections until relieving the fuel system pressure.
Consult a service manual for instructions on relieving fuel pressure safely. This product is designed for off-highway and racing use only.
Fuel system components may not be legal for sale or use on emissions controlled motor vehicles. Consult local, state, and federal laws.

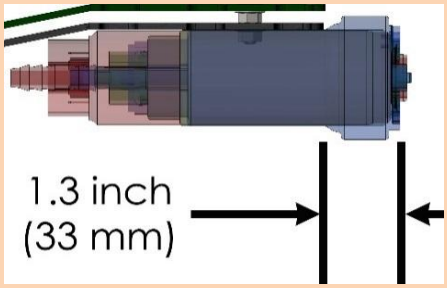
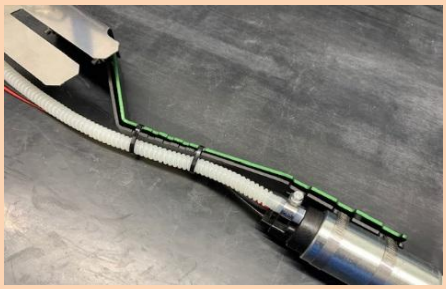
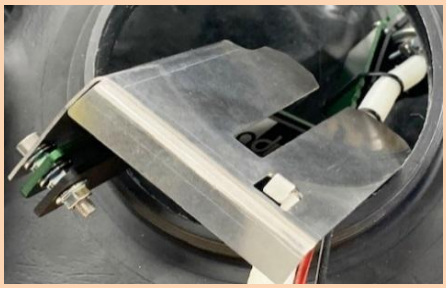
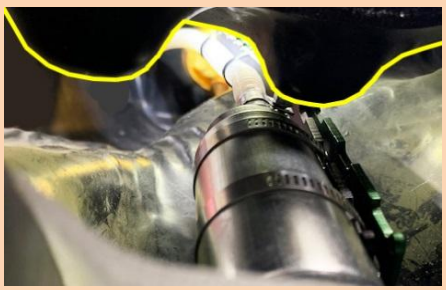
STEP	TOOLS NEEDED	INSTRUCTIONS	PHOTO
1		**20-063X-0X INSTALLATION** ***NOTES:*** ***1. It is recommended to run the fuel tank dry or drain the tank to reduce fuel spills for an easier and safer installation.*** ***2. These instructions will work solely from the rear of the vehicle. Optionally, work can be performed from the rear seat on the S14/S15.*** Open the trunk. On the front RH upper shelf, flip the carpet over to expose the fuel pump access cover (shown).	
2	10mm Socket Wrench	To release the fuel pump access panel, remove the 4 screws. There are 2 electrical connectors. To unplug, press the thumb tabs and gently pull to release.	
3		To depressurize the fuel system, start the engine and allow it to stall. Remove the key from the ignition. Unscrew the gas tank filler cap temporarily to relieve any residual pressure.	
4	10mm Socket Wrench	Open the hood (or trunk) and disconnect the battery's negative terminal. CAUTION: Disconnecting the battery may cancel fault memories of some control units. Consequently, before disconnecting the battery, always cross examine any fault memories.	

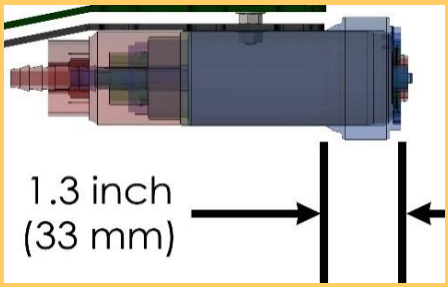
5		Not absolutely necessary, but the plastic stays that secure the wiring harness to the trunk floor could be released to permit additional working space. See pictured red arrows. Move the fuel tank access cover out of the way. It is recommended to clean the plastic module and surrounding area. This will prevent loose dirt from accidentally falling into the tank.	
6	Phillips Screwdriver Pliers Rag	Inspect the 3 connections on the top of the OEM fuel pump module. Depending on the vehicle these connections will vary. Some use barbs and some use SAE quick connectors. Have a rag handy as fuel will spill out of these hose connections. For barbed connections, loosen the clamp to pull off the rubber hose. For SAE quick connections, push the hose ends further onto the fittings and simultaneously squeeze the locking tabs together. Pull the hose end away to release.	
7	Pick	For vehicles with SAE quick connectors, gently pry the SAE locks from the OEM module (shown upper hose). Reinsert the SAE locks into the hose end (shown lower hose). Orange SAE Lock = Pump Out White SAE Lock = Fuel Return	
8		The black fuel tank hold-down ring will need to be spun counterclockwise. Many technicians will use a hammer and flat chisel. However, it is recommended to purchase a spanner tool to avoid breaking this plastic threaded ring. These are relatively inexpensive and can be found online from companies such as Lisle, OEMTools, Ryco, etc. Shown is the genuine Nissan Lock Ring Tool (P/N: KV991 04700).	
9		For this application, Radium Engineering successfully uses Lisle P/N: 63000 (shown).	
10		Remove the threaded hold-down ring (shown). This will be reused.	

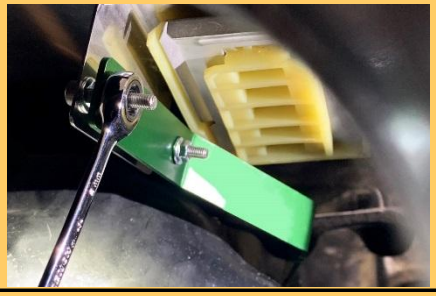
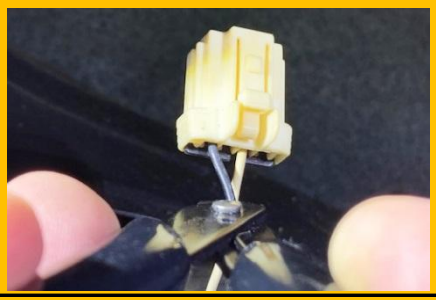
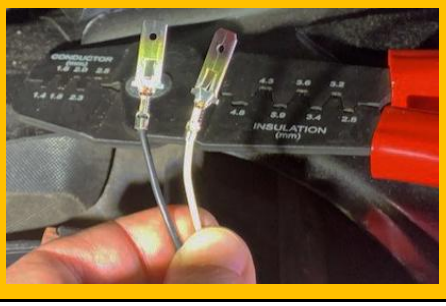
11		Pull the OEM fuel pump module upwards just enough to expose the large gasket. Remove the gasket now to avoid loosing it in the tank. If the gasket is in good condition, it can be reused. Replacement Gasket: Nissan P/N: 173425M303	
12	Pliers	NOTES: 1. The entire OEM pump module is 2-pieces; fuel hat and fuel pump bracket. These 2 components are connected by wires and hose. 2. The fuel level sender and sensors wire connect to the fuel hat but do not physically attach to the fuel hat or pump bracket. Pull the top portion of the OEM fuel hat upwards and carefully flip it over. Disconnect both electrical plugs that attach to the underside of the fuel hat. Loosen the hose clamp and dislodge the rubber fuel pump hose from the barb. It is OK for the wires and hose to fall back into the tank.	
13		The lower portion of the OEM assembly contains the fuel pump that is attached to a steel bracket. The steel bracket is fixed to the front wall of the fuel tank. While standing behind the vehicle, look through the fuel tank opening with a flashlight. There are two steel brackets. The upper bracket (RED) will be removed. The RH bracket (BLUE) is for the fuel level sender sensors and can remain in the tank.	
14		Reach into the fuel tank opening. Use your fingers to pull the upper lip towards you. This will release the upper fuel pump bracket from the fuel tank.	
15		Have a bucket and rags nearby to catch fuel spills. Carefully pull the pump bracket assembly out of the fuel tank.	
16	Container	To reduce potential spills, immediately place the fuel pump assembly into a fuel safe container such as a bucket. Nothing from this lower assembly will be reused.	

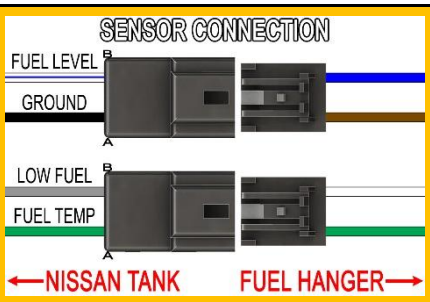
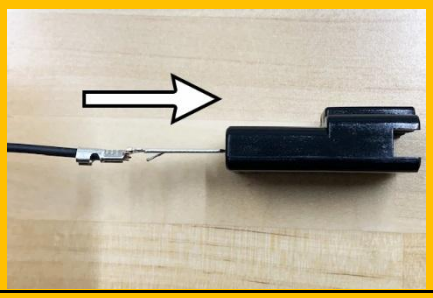
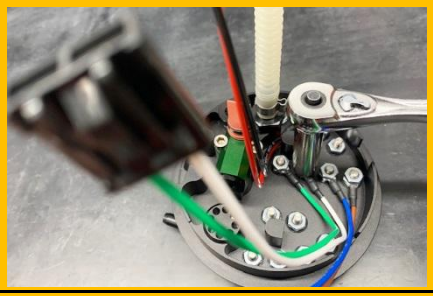
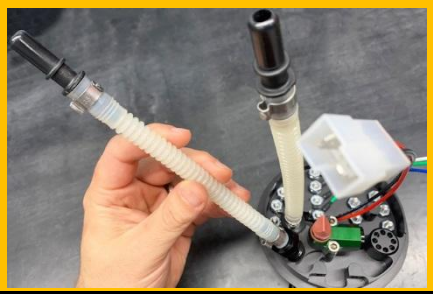
17	Fuel Jug	If there is still residual fuel in the tank, it is a good idea to remove it completely. However, this is not an absolutely necessary step. Pictured is an inexpensive battery-operated liquid transfer pump. While this Nissan fuel tank is very deep, this transfer pump still works very well. ***WARNING: Fuel is highly flammable and should be stored in an approved fuel can. Keep away from direct sunlight, high moisture areas, and extreme temperatures.***	
18		Next, temporarily place the bare OEM fuel hat back onto the opening to prevent foreign debris from entering the fuel system.	
19	9/32" Nut Driver	Open the Radium fuel hanger kit. Find the long convoluted tubing and the plastic barbed push button SAE quick connector(s). The fuel pump(s) and filter sock(s) are needed as well (if not already purchased). To install the convoluted tubing to the SAE quick connector(s) and fuel pump(s), the ends will need to be heated. Boil water or carefully use a heat gun to soften the tubing just enough to slide over the barbs. Secure the tubing using the provided EFI hose clamps. Position the clamp bolt on either side of the pump, as shown. Repeat this entire process is using a second (dual) pump.	
20		As shown, plug in the included fuel pump wire connector(s).	
21		Install the fuel pump filter sock(s).	
22	4mm Allen Wrench 8mm Socket Wrench	Find the stainless steel bracket in the kit. Secure the long Allen "socket" head M5x0.8mm bolts and flange nuts through the 2 holes exactly as shown. NOTE: there are 2 long formed brackets in the kit. Even though they are different colors, they are physically identical.	

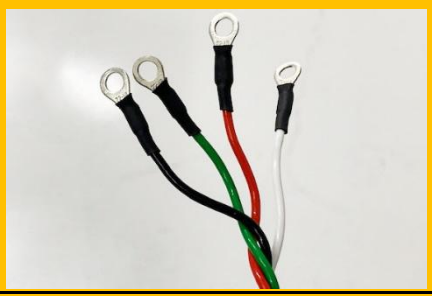
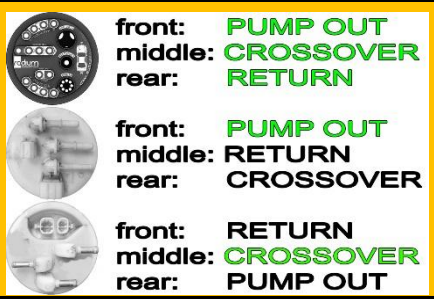
23		Because of the complexity of this Nissan fuel tank, the sequence of installing fuel pump(s) will depend on how many pumps will be used. **Single fuel pump installation:** The single fuel pump assembly (shown) can be dropped into the lower portion of the fuel tank as one unit. Follow steps 24-34. **Dual fuel pump installation:** For dual fuel pump assembly, each individual pump must be installed into the lower portion of the tank one at a time. Follow steps 35-43.	
24	4mm Allen Wrench 8mm Socket Wrench	**SINGLE FUEL PUMP INSTALLATION** For single (and dual) pumps, use both long brackets for rigidity. First, find the long green aluminum bracket in the kit. Lineup and place the green bracket over the two M5x0.8mm socket head "studs". Note the orientation and bend direction of the aluminum bracket with respect to the stainless steel mount. As shown, secure the bracket using 2 more of the provided flange nuts.	
25	3mm Allen Wrench 8mm Socket Wrench	**SINGLE FUEL PUMP INSTALLATION** Insert the shorter M5x0.8mm "button" head bolt to the lower bracket hole in the direction shown. Secure using one of the provided flange nuts. NOTE: this lower bolt/nut combination would NOT be used for dual fuel pump installations.	
26	3mm Allen Wrench 8mm Socket Wrench	**SINGLE FUEL PUMP INSTALLATION** Find the long black aluminum bracket in the kit. Lineup and place the black bracket on top of the green bracket and over the two M5x0.8mm "studs". As shown, secure the bracket using one of the provided flange nuts.	
27	Flat Head Screwdriver	**SINGLE FUEL PUMP INSTALLATION** Unlatch 2 of the worm drive hose clamps. Insert the clamps through the black bracket slots as shown.	
28		**SINGLE FUEL PUMP INSTALLATION** Notes regarding correct mounting slots for specific fuel pumps: 1. For all compatible "brushed" fuel pumps, use the 2 lower slots (depicted with red and blue) arrows. 2. For the tall Ti Automotive brushless E5LM fuel pump (shown), use the outer slots (depicted with green and blue arrows). 3. For single pump applications, the pump should always be installed to the RH bracket (black bracket in this case).	

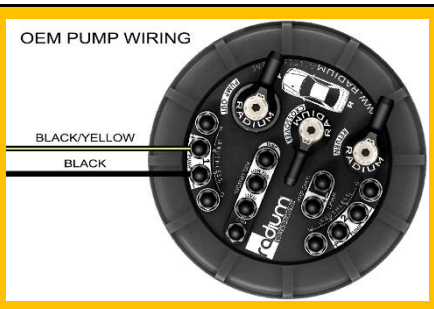
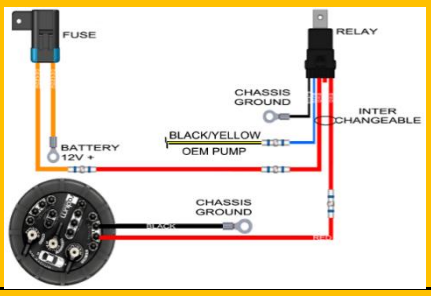
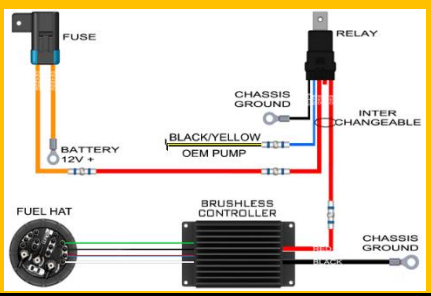
29		**SINGLE FUEL PUMP INSTALLATION** Prior to securing the fuel pump, make sure it is positioned and orientated properly. As shown, the bottom of the fuel pump should be offset from the lower portion of the mounting brackets. This will permit the fuel pump to scavenge from the very bottom of the fuel tank. Spin the pump so the outlet would be at the highest point when installed.	
30	Flat Head Screwdriver Diagonal Cutter	**SINGLE FUEL PUMP INSTALLATION** After fuel pump positioning, tighten the large worm-drive clamps. Next, secure the convoluted tubing and wires to the notched area of the long brackets using the provided cable zip ties.	
31		**SINGLE FUEL PUMP INSTALLATION** The lower fuel pump assembly is now ready to be installed into the fuel tank.	
32		**SINGLE FUEL PUMP INSTALLATION** NOTE: all of this work is being performed on the RH saddle of the fuel tank. However, the pump(s) must be inserted into the LH pocket of the RH saddle (just like stock). Shown in yellow are 2 protrusions molded in the fuel tank that create a slight interference when trying to get the pump into the appropriate location.	
33		**SINGLE FUEL PUMP INSTALLATION** Slide the stainless steel bracket over the top of the OEM fuel level bracket and into the fuel tank slots. NOTE: Both the Radium bracket and the OEM bracket have locking tabs (shown). A common mistake is not pushing the bracket down far enough to reach the engagement point. Push the stainless steel bracket until it snaps into place.	
34		**SINGLE FUEL PUMP INSTALLATION** Shown is a representation of how the fuel pump is positioned if it were possible to see inside the fuel tank. **Skip to Step 44**	

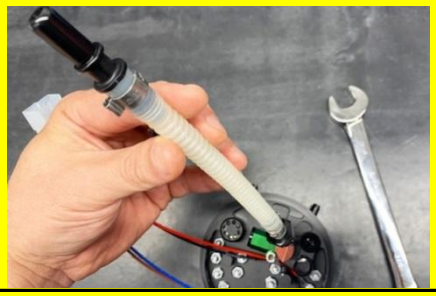
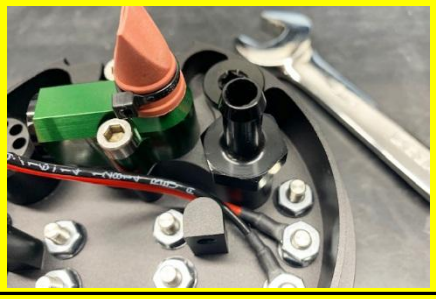
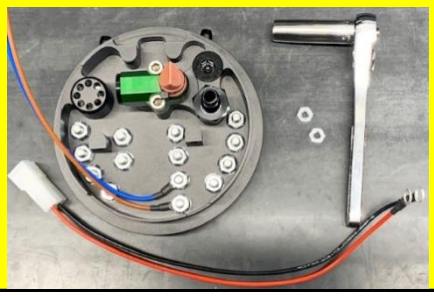
35		**DUAL FUEL PUMP INSTALLATION** Without either long bracket installed, slide the stainless steel bracket into the fuel tank slots, as shown.	
36		**DUAL FUEL PUMP INSTALLATION** NOTE: Both the Radium bracket and the OEM bracket have locking tabs (shown). A common mistake is not pushing the bracket down far enough to reach the engagement point. Push the stainless steel bracket until it snaps into place.	
37	Flat Head Screwdriver	**DUAL FUEL PUMP INSTALLATION** Unlatch the worm drive hose clamps. Insert 2 clamps through the oval slots in the green bracket and 2 clamps through the slots in the black bracket. NOTES: 1. For all compatible "brushed" fuel pumps, use the 2 lower slots (depicted with red and blue) arrows. 2. For the tall Ti Automotive brushless E5LM fuel pump (shown), use the outer slots (depicted with green and blue arrows). 3. The picture shows only 1 pump installed to the black bracket. The second pump would be installed to the green bracket.	
38		**DUAL FUEL PUMP INSTALLATION** Prior to securing the fuel pumps, make sure they are positioned and orientated properly. As shown, the bottom of the fuel pumps should be offset from the lower portion of the mounting brackets. This will permit the fuel pumps to scavenge from the very bottom of the fuel tank. Spin the fuel pumps so the outlets are at the highest point when installed.	
39	Flat Head Screwdriver Diagonal Cutter	**DUAL FUEL PUMP INSTALLATION** After fuel pump positioning on the green bracket, tighten the worm-drive clamps. NOTE: each worm-drive clamp should be routing through the full slot and half slot in the brackets. Next, secure the convoluted tubing and wires to the notched area of the green bracket using the provided cable zip ties.	
40	Flat Head Screwdriver Diagonal Cutter	**DUAL FUEL PUMP INSTALLATION** After fuel pump positioning on the black bracket, tighten the worm-drive clamps. NOTE: each worm-drive clamp should be routing through the full slot and half slot in the brackets. Next, secure the convoluted tubing and wires to the notched area of the black bracket using the provided cable zip ties.	

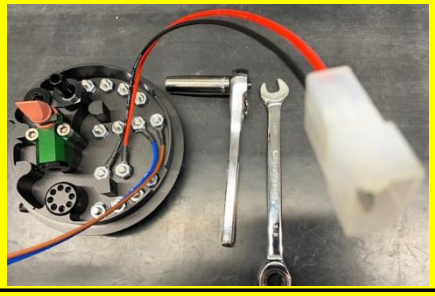
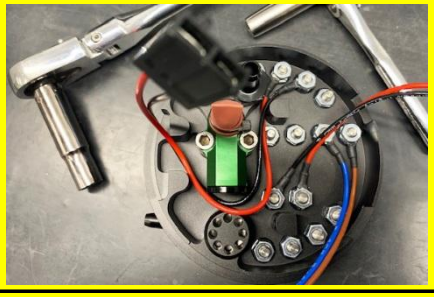
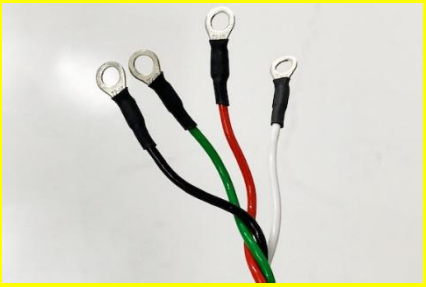
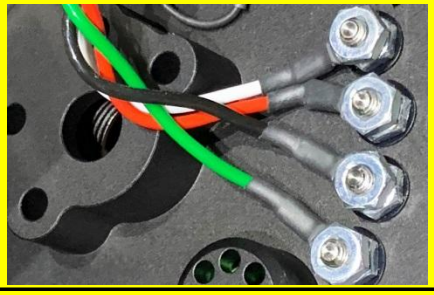
41	8mm Wrench	**DUAL FUEL PUMP INSTALLATION** Insert the green bracket into the fuel tank first. This holds the LH fuel pump. This may take a little work to get it into place as it is very tight in this area of the tank. Place the green bracket onto the two M5x0.8mm studs. As shown, secure the bracket using 2 of the provided flange nuts.	
42		**DUAL FUEL PUMP INSTALLATION** Lastly, insert the black bracket into the fuel tank. This holds the RH fuel pump.	
43	8mm Wrench	**DUAL FUEL PUMP INSTALLATION** Place the bracket onto the two M5x0.8mm studs. As shown, secure the black bracket using 2 of the provided flange nuts.	
44	Diagonal Cutter	Reach in the fuel tank and find the fuel sensor connector that was previously disconnected. As shown, cut the OEM connector off leaving as much wire slack as possible. NOTE: This connector will vary depending on the application and country of origin. Nissan S14 and R33 models will have a 3 wire (shown) or a 4 wire sensor connector.	
45	Diagonal Cutter	NOTE: Nissan S15 and R34 models will have a 2 wire sensor connector (shown).	
46	Wire Stripper Wire Crimper	Strip the insulation off all the sensor wires. Next, crimp the included terminals to each wire using a tool such as Molex 63811-1000 hand crimper. NOTE: This picture is for the S14/R34 which only has 2 wires.	

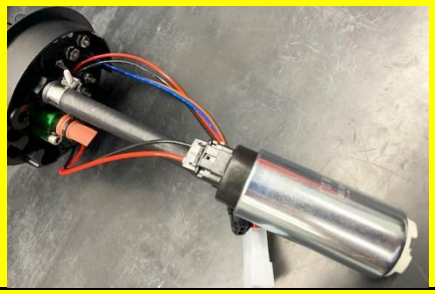
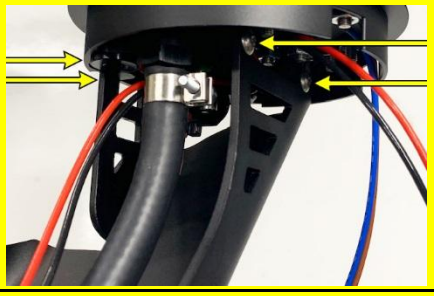
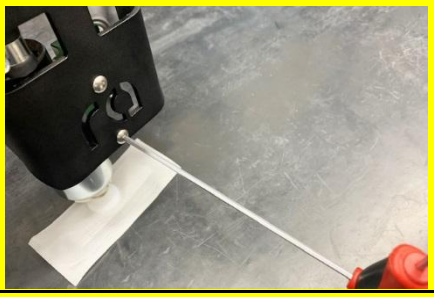
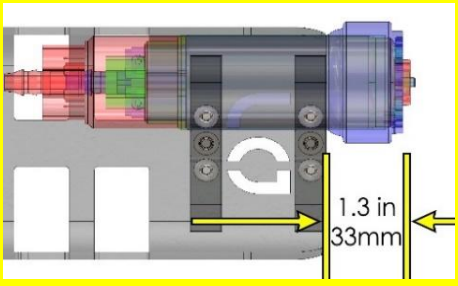
47		Use the depiction when inserting the wire terminals into the connector(s). NOTES: 1. Some vehicle's FUEL LEVEL wire has no stripe. 2. Some vehicle's LOW FUEL wire is tan color. **Nissan S14 (OBD-II Only)** Uses 2 wires in both connectors (4 wires / 2 connectors). **Nissan S14 and R33** Uses 2 wires in 1 connector and 1 wire in the other connector (3 wires / 2 connectors). **Nissan S15 and R34** Uses 2 wires in 1 connector (2 wires / 1 connector).	
48		When inserting the terminals, be sure the terminal lock will engage with the connector lock. NOTE: The terminals will not snap into place if they are inserted upside down.	
49		Slide the terminals into the plastic plugs until a “click” is felt.	
50	3/8" Socket Wrench	For all Nissan S14 and R33 applications, install the provided green and white wire connector ring terminals to the corresponding studs on the bottom side of the Radium Engineering fuel hat. NOTE: It is possible that a second wrench will need to be used on the opposing side to prevent the stud from rotating.	
51	4mm Allen Wrench Oil Lubrication	Depending on the Nissan, the fittings may need to be swapped and/or rotated to suit the hose and tubing orientation. All adapter fittings included: **Pump Out (10AN ORB):** quick connect (red) and 8.5mm barb (yellow) **Crossover (6AN ORB):** 6.5mm barb (blue) **Return (8AN ORB):** quick connect (green) and 8.5mm barb (pink) NOTE: The fitting location of "Pump Out/Crossover/Return" on the Radium Engineering fuel hat are NOT in the same location as the OEM fuel hat. The OEM fuel lines will need to be slightly redirected. **If installing the 20-070X Fuel Hanger Surge Tank Add-On, skip to Step 68**	
52	1/4" Allen Wrench Oil Lubrication 3/4" Wrench	If 2 (dual) pumps were assembled into the fuel tank, the extra convoluted tubing adapter must be installed. First, remove the preassembled 6AN ORB plug on the underside of the fuel hat. Next, lubricate the 6AN ORB O-ring on the tubing adapter fitting. Lastly, tighten the fitting (preferably) with a non marring aluminum wrench.	

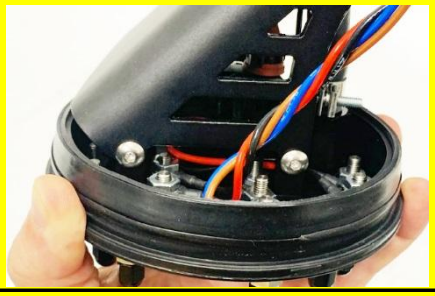
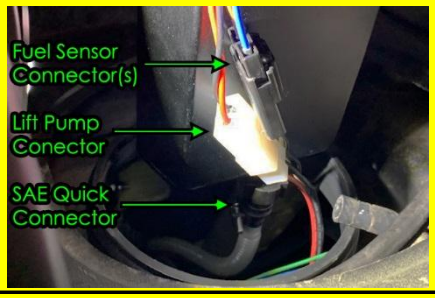
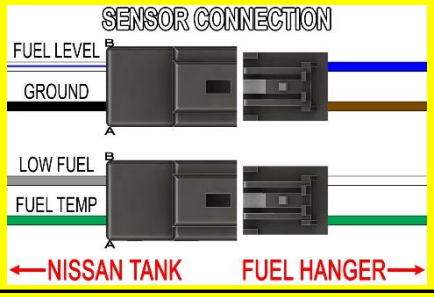
53	Wire Stripper	If brushless fuel pump(s) were installed, the 2 wire fuel pump connectors with white plugs cannot be used as these pumps use 4 wires each. The Ti Automotive BKS1000 kit provides a long flying lead harness for the brushless E5LM pump. These wires will need to reach the underside of the fuel hat. NOTE: If other brushless E5LM controller kits do not provide long enough wires, they will need to be extended. Cut the wires to length allowing enough slack for attaching directly to the fuel hat. Strip the wires and insert the provided heat shrink, as shown.	
54	Wire Crimper Heat Gun	Crimp the small ring terminals onto the end of each wire. Slide the heat shrink up and cover the crimped areas. Apply heat to shrink, as shown.	
55	3/8" Socket Wrench	**For dual fuel pump applications** Install the extra fuel pump wiring ring terminals to the studs underneath. Reference the labeling on the fuel hat top for the appropriate studs. **For brushless Ti Automotive E5LM pumps** Secure the 4 fuel pump ring terminals to the corresponding studs. _____ NOTE: It is possible that a second wrench will need to be used on the opposing side to prevent the stud from rotating.	
56	Oil Lubrication	Find the OEM gasket that was previously removed from the tank. Replace if needed (Nissan P/N: 173425M303). Seat the gasket onto the fuel tank. Lubricate the inner wall of the gasket and the outer diameter of the fuel hat where they will slide together. Lubricate the internal O-rings in the female SAE quick connector and install to the male SAE quick connect from the fuel hat tubing. For dual pump applications, plug in both sets of SAE quick connectors. For standard (brushed) pumps, plug in the white pump connector(s). Plug in the fuel sensors. NOTE: If using both black electrical connectors, be cognizant as these are identical and could accidentally be swapped around.	
57		Drop the fuel hat into the tank opening. Reference the vehicle engraving on the fuel hat for proper orientation. (F)=Front (R)=Rear Secure the fuel hat with the OEM hold down ring. Nissan Torque Spec: 31-35 Nm (22.9-25.8 lbf-ft).	
58		When connecting the OEM hose and tubes, it is important to know that the fitting locations are NOT in the same place as the OEM fuel hat. The OEM fuel lines will need to be slightly redirected. NOTES: 1. For hose connections, be sure to reuse the OEM spring clamps. 2. For quick connect tube connections, be sure they lock into place.	

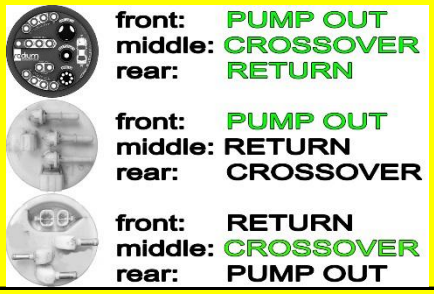
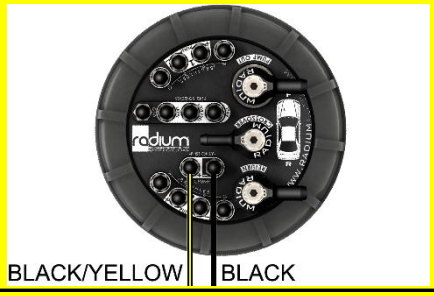
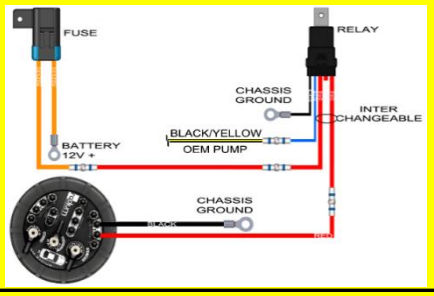
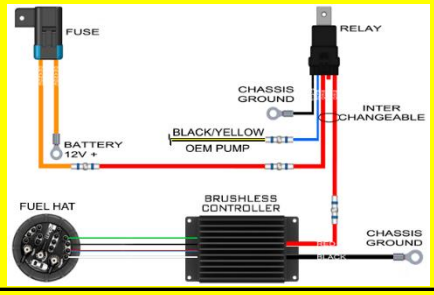
59		**<u>For standard brushed pumps ONLY</u>** To reuse the OEM Nissan pump wiring, reference the following. ***OEM BLACK/YELLOW Wire: Connect to "2-WIRE +" terminal on fuel hat.*** ***OEM BLACK Wire: Connect to "2-WIRE -" terminal on fuel hat.*** *NOTES:* *1. The Skyline GT-R (RB26DETT), Skyline GTS25-T (RB25DET), and Skyline 25GT-T (RB25DET) use a FPCM. This can be reused.* *2. The Nissan electrical system is designed for 15 amps (15A fuse).* *3. In our test, the Walbro GSS342 (255LPH) pump never exceeds 14A.*	
60		*...continued* *4. AEM suggests a 15A fuse. However, these pumps can exceed 15 amps when pushed hard. Consider installing a 17-0031 DIY wiring kit.* *5. 17-0031 DIY wiring kit is required for Walbro F900002XX pumps.* *6. 17-0031 DIY wiring kit MUST be used if installing a second pump.* *7. The picture is a wiring schematic for installing Radium Engineering P/N: 17-0031 DIY Fuel Pump Wiring Kit.* *8. If using dual pumps, this same schematic may apply for the second pump unless it will be staged by an adjustable pressure switch (20-0236) or an ECU. Neither scenarios are detailed in this instruction manual.*	
61		**<u>Brushless Ti Automotive E5LM pumps</u>** This product was not designed for a specific E5LM brushless controller. This exact mounting location of the controller is up to the installer. The picture is a wiring schematic if using a Ti Automotive BKS1000 brushless fuel controller. Other brushless controllers may differ. NOTE: If using dual pumps, this schematic may apply unless the second pump will be staged by an adjustable pressure switch (20-0236) or an ECU. Neither scenarios are detailed in this instruction manual.	
62	Diagonal Cutter	Find the connectors that were unplugged in the beginning. As shown, cut the OEM plugs off leaving wire slack. NOTES: 1. The sensor wires are thinner (AWG) gauge than the pump wires. 2. The pump connector does not need to be cut off if assembling a relay. The relay can simply tap off the OEM fuel pump power wire. 3. The sensor connector will physically vary depending on the country of origin. Nissan S14 and R33 models will use 3 or 4 wires. Nissan S15 and R34 models will have a 2 wire sensor connector (shown).	
63	Wire Stripper Wire Crimper Heat Gun	Cut the heat shrink to length and place over each wire. For the sensor wires, crimp the small ring terminals onto the end of each wire. If reusing the OEM pump wiring, crimp the large ring terminals onto the pump wires. Slide the heat shrink up and cover the crimped areas. Apply heat to shrink. For those wiring in relay(s), extra wire will be required to pass through the harness bundle. To make room, first push the rubber grommet through the metal fuel pump access panel. Next, unravel and cut the electrical tape and sleeving around the rubber grommet, as shown. Pull the wires out of the rubber grommet setting them up to be routed to the relay as depicted in the wiring schematic above.	
64		If installing a relay, find a good ground point. Be sure there is no rust, oxidation, or paint present.	

65	Diagonal Cutters Wire Strippers Heat Gun	If 17-0031 DIY wiring kit was purchased, here is how to properly use the Raychem solder butt connectors: 1. Strip each wire insulation back. 2. Insert both wires into the butt connector ends and overlap them. 3. Use a heat gun. Be careful with the surrounding area as the internal solder will take a few minutes to melt. 4. Verify the connection is solid by giving it a tug. 5. For strain relief, always allow some slack in the wire so it does not pull.	
66	8mm Socket Wrench	Before making the following electrical connections to the fuel hat, be sure to first reinstall the OEM rubber grommet to the OEM cover plate. Secure each assembled ring terminal wire to the appropriate electrical stud on the fuel hat using the provided insulating acorn nuts. **EXTERNAL SENSOR WIRING** SENSOR GROUND: Black FUEL LEVEL: Grey/Red or White/Black or Green LOW FUEL: Mint or Black/Red TEMPERATURE: Yellow (S14 OBD-II Only)	
67	10mm Wrench	Reconnect battery. Turn the ignition switch ON. Start the engine and check for leaks. Reinstall the access panel. For protection, wrap any exposed wire. Reinstall all OEM components in reverse order. **20-063X-0X INSTALLATION COMPLETE** _____ **NOTES REGARDING THE VENTURI JET PUMP** **1. A venturi jet pump is integrated to the high pressure line. This transfers fuel into the canister without restricting the return line. However, pressure is bled-off when the pump(s) are inactive. If pressure needs to be maintained with the engine OFF, a check valve will need to be installed on the fuel feed line. See Radium P/N: 20-0534-XX.** **2. For the venturi jet pump to properly operate, 35 LPH of fuel will be diverted from the fuel pump outlet. Make sure adequate fuel pump flow capacity is available.**	
68	3/4" Wrench 1/4" Allen Wrench	**20-0700/20-0701 FHST ADD-ON INSTALLATION** If not already performed, follow Steps 1-51 above (excluding 35-43). Remove the internal convoluted tube fitting from the underside of the "Pump Out" ports. If installing one FHST pump, one 6AN ORB plug must be installed.	
69	3/4" Wrench	Install a 6AN ORB to barb fitting for each fuel pump used. NOTE: For single FHST pump applications (shown), use the port location shown. The other port second pump port location is slightly more difficult to use as the fuel hose requires a jog.	
70	3/8" Socket Wrench	If installed, remove the red and black fuel pump power harness(es) that have a white connector from the underside of the PUMP 1 and PUMP 2 stud terminals. NOTE: It is possible that a second wrench will need to be used on the opposing side to prevent the stud from rotating.	

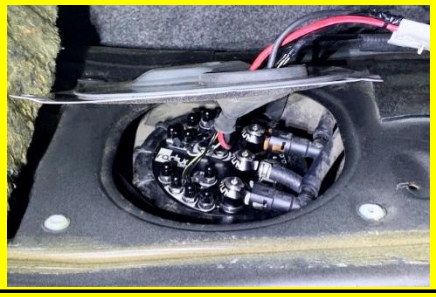
71	3/8" Socket Wrench	The fuel pump wire harness with the white connector will now be repurposed as the lift pump (L.PUMP) power harness. Reference the etching on the top side of the fuel hat and connect to the FHST L.Pump terminals. Red wire is for "+" and the black wire is for "-". NOTE: It is possible that a second wrench will need to be used on the opposing side to prevent the stud from rotating.	
72	3/8" Socket Wrench	**For standard brushed pumps ONLY** Find the red and black fuel pump power harness in the kit that has a black connector. Reference the etching on the top side of the fuel hat and connect to the PUMP 1 terminals. Red wire is for "+" and the black wire is for "-". Repeat for the PUMP 2 terminals if using 2 FHST pumps. NOTE: It is possible that a second wrench will need to be used on the opposing side to prevent the stud from rotating.	
73	Diagonal Cutter Wire Stripper	**Brushless Ti Automotive E5LM pumps** If installing brushless FHST pump(s), the wires provided for the brushless E5LM pump(s) will be installed directly to the PUMP1 and PUMP2 stud terminals. Cut the wires to length. Strip the wires and insert the provided heat shrink, as shown.	
74	Wire Crimper Heat Gun	**Brushless Ti Automotive E5LM pumps** Crimp the small ring terminals onto the end of each wire. Slide the heat shrink up and cover the crimped areas. Apply heat to shrink, as shown.	
75		**Brushless Ti Automotive E5LM pumps** Reference the etching on the top side of the fuel hat and connect to the PUMP 1 terminals. W = White, R = Red, B = Black, G = Green. Do the same for the PUMP 2 terminals if using 2 FHST pumps. NOTE: It is possible that a second wrench will need to be used on the opposing side to prevent the stud from rotating.	
76	Hose Cutter Phillips Head Screwdriver Oil Lubrication	**PUMP #1:** The submersible fuel hose should be the following length. Walbro GSS342 255LPH 4.67" (118.5mm) long sections Walbro F90000274 E85 4.63" (117.6mm) long sections AEM 50-1200 E85 4.55" (115.6mm) long sections Ti Automotive E5LM 3.75" (95.1mm) long sections Apply lubrication to the fuel pump outlet barb. Install the hose and secure an EFI clamp. NOTE: For Walbro F90000267/274/285/295 and Ti Automotive E5LM pump, use the large EFI clamps provided.	

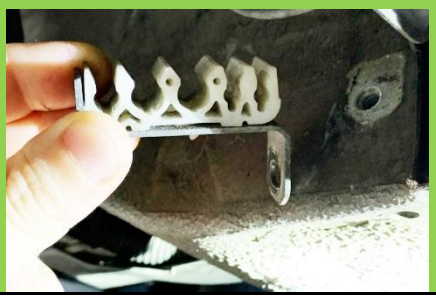
77	Hose Cutter Phillips Head Screwdriver Oil Lubrication	**PUMP #2:** This hose is longer and should be cut to the following length. Walbro GSS342 255LPH 5.01" (127.2mm) long sections Walbro F90000274 E85 4.97" (126.3mm) long sections AEM 50-1200 E85 4.89" (124.2mm) long sections Ti Automotive E5LM 4.15" (105.4mm) long sections Apply lubrication. Install the included EFI clamp to the pump barb. NOTE: For Walbro F90000267/274/285/295 and Ti Automotive E5LM pump, use the large EFI clamps provided.	
78	Phillips Head Screwdriver	Insert the other med-sized EFI clamp over the hose. Slide the hose onto the barb fitting on the underside of the fuel hat. Rotate the fuel pump around to the position shown. This permits the largest hose radius possible in a later step. Tighten the EFI clamps.	
79		Install the filter sock to the pump(s). For standard brushed pumps, Radium P/N: 14-0143 is a perfect fit. For E5LM brushless pump, Radium P/N: 14-0543 is a perfect fit.	
80	4mm Allen Wrench	As shown, install the large FHST mounting bracket using 4 of the included button head screws.	
81	4mm Allen Wrench	Install the 2 billet aluminum fuel pump mounts using 2 of the provided button head screws. Prior to tightening, stand the pump(s) upright on a table. Carefully push the bracket downwards to force the fuel pump(s) upwards. This will permit a tight fuel pump hose radius for fitment purposes.	
82	4mm Allen Wrench	Prior to securing the pumps, make sure they are positioned properly. As shown, the bottom of the fuel pumps should be offset from the lower portion of the mounting bracket. This will permit the fuel pumps to scavenge from the very bottom of the fuel surge tank canister. Tighten the screws.	

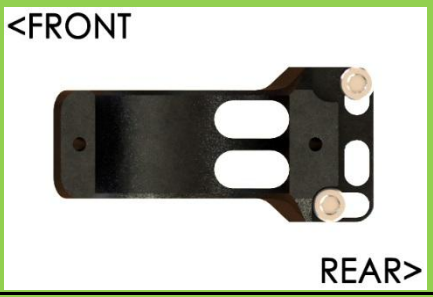
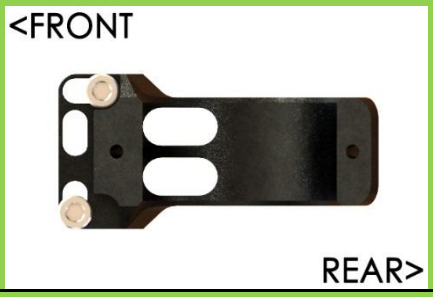
83	4mm Allen Wrench	Carefully insert and slide the fuel pump assembly into the fuel surge tank canister. As shown, secure using 4 of the provided button head bolts.	
84	4mm Allen Wrench	Place the canister lid on top of the canister. Secure using 2 of the provided button head bolts.	
85		As shown, install the Nissan Gasket. Replacement: Nissan P/N: 173425M303	
86	Oil Lubrication	Install the female SAE quick connector from the lift pump tubing to the male SAE quick connect on the canister. Lubricate the internal O-rings. Plug in the white lift pump electrical connector.	
87		Internally, plug in the fuel sensors according to the depiction. If using both black electrical connectors, be cognizant as these are identical and could accidentally be swapped around. NOTES: 1. Some vehicle's FUEL LEVEL wire has no stripe. 2. Some vehicle's LOW FUEL wire is tan color.	
88		Drop the fuel hat into the tank opening. Once the surge tank canister is far enough into the fuel tank, it will automatically orientate the fuel hat. Rotate the fuel hat around to find an ideal resting position that is not creating internal interference. To secure the fuel hat, rotate the OEM hold down ring clockwise. Nissan Torque Spec: 31-35 Nm (22.9-25.8 lbf-ft).	

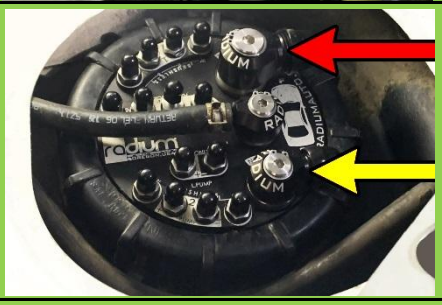
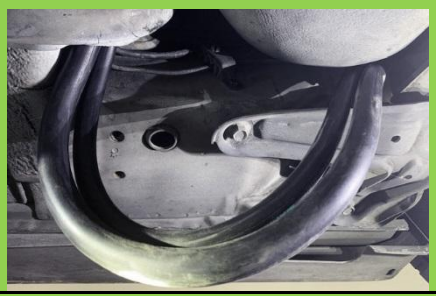
89		When connecting the OEM hose and tube fittings, it is important to know that the fitting locations are NOT in the same place as the OEM fuel hat.	
90		As shown, the OEM fuel lines will need to be slightly redirected. NOTES: 1. For hose connections, reuse the OEM clamps. 2. For quick connect tube connections, be sure to push the fittings in far enough where they lock into place. Gently pull backwards to confirm.	
91		The OEM Nissan pump wiring, fuse, relay will suffice for the lift pump. ***OEM BLACK/YELLOW Wire: Connect to "2-WIRE +" terminal on fuel hat.*** ***OEM BLACK Wire: Connect to "2-WIRE -" terminal on fuel hat.*** NOTE: For optimal surge tank efficiency, the lift pump should be running with a solid 12V+. Turbo Nissan Skylines use a FPCM for pump speed control. In this case, do not use the OEM black ground wire. Instead, simply run a short section of the provided 10AWG black wire from the LIFT PUMP (-) stud terminal to chassis ground. This can be the same ground that is used for the surge tank pump relay(s) described in the next few steps.	
92	Wire Cutter Wire Stripper Wire Crimper Heat Gun	**<u>For standard brushed pumps ONLY</u>** For brushed surge tank pump wire assembly, use the following schematic. NOTE: If using dual pumps, this diagram may apply unless the second pump will be staged by an adjustable pressure switch (20-0236) or an ECU. Neither scenarios are detailed in this instruction manual.	
93	Wire Cutter Wire Stripper Wire Crimper Heat Gun	**<u>Brushless Ti Automotive E5LM pumps</u>** This product was not designed for a specific E5LM brushless controller. This exact mounting location of the controller is up to the installer. The picture is a wiring schematic if using a Ti Automotive BKS1000 brushless fuel controller. Other brushless controllers may differ. NOTE: If using dual pumps, this schematic may apply unless the second pump will be staged by an adjustable pressure switch (20-0236) or an ECU. Neither scenarios are detailed in this instruction manual.	
94	Diagonal Cutter	Find the connectors that were unplugged in the beginning. As shown, cut the OEM connectors off leaving as much wire slack as possible. NOTES: 1. The sensor wires are thinner (AWG) gauge than the pump wires. 2. The sensor connector will physically vary depending on the country of origin. Nissan S14 and R33 models will use 3 or 4 wires. Nissan S15 and R34 models will have a 2 wire sensor connector (shown).	

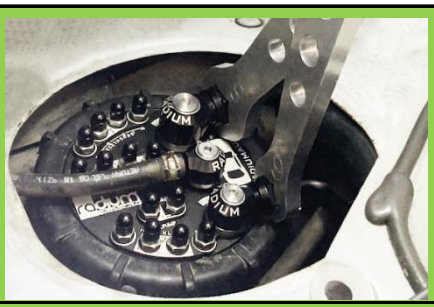
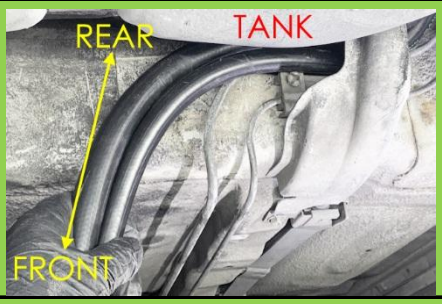
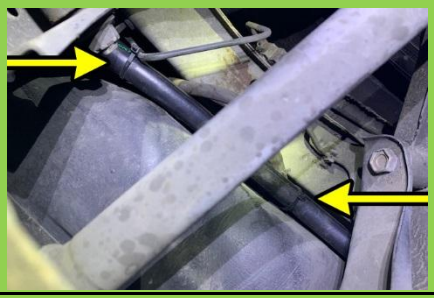
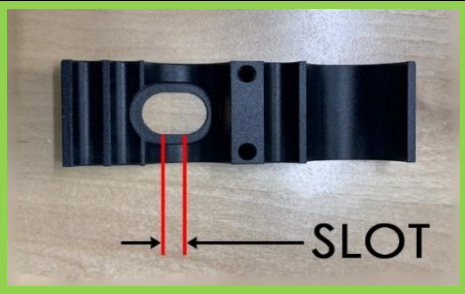
95	Wire Stripper Wire Crimper Heat Gun	Cut the included heat shrink to length and place over each wire. For the sensor wires, crimp-on the small ring terminals. For the OEM pump wiring, crimp-on the large ring terminals. Install the heat shrink, as shown. NOTE: For Nissan Skylines that use a factory fuel pump control module (FPCM), the OEM black pump wire will not be used. For the surge tank pumps, extra wire will be required to pass through the harness bundle. To make room, first push the OEM rubber grommet through the OEM metal fuel pump access panel. Next, unravel and cut the electrical tape and sleeving around the rubber grommet, as shown.	
96	Sander 5mm Allen Wrench 10mm Wrench	Before grounding the ring terminals, be sure there is no rust, oxidation, paint, etc. present. If necessary, use a sander to get to bare metal, as shown. Depending on the vehicle and where the battery is mounted, the relay and fuse may be mounted in different areas. NOTE: To install these components, the included bolts and nuts can be used to make a M6 stud through an existing hole in the sheet metal, as shown.	
97	17/64" Bit Drill	If securing the provided fuse holder to the aforementioned M6 bolt, the hole in the mounting tab will need to be slightly enlarged. Use a 17/64" (or 6.7mm) drill bit to bore-out the mounting hole.	
98	Electrical Pick	Find the included relay flying lead connector in the kit. The large red wire located in the center (terminal 87A) will not be used. To remove, first pry off the large red rubber seal and slide it along the 5 wires to dislodge it from the connector. Insert a pick into the center socket and pry the terminal loose from its internal lock. Simultaneously push the wire through the front of the connector, as shown. Discard the wire/terminal and reattach the large red rubber seal. Reinstall the flying lead connector to the relay.	
99	Diagonal Cutters Wire Strippers Heat Gun	To properly use the Raychem solder butt connectors: 1. Strip each wire insulation back. 2. Insert both wires into the butt connector ends and overlap them. 3. Use a heat gun. Be careful with the surrounding area as the internal solder will take a few minutes to melt. 4. Verify the connection is solid by giving it a tug. 5. For strain relief, always allow some slack in the wire so it does not pull.	
100		For safety purposes, the FHST pump relay(s) must be triggered from a source that turns OFF when the engine stalls. The source should also have a priming feature used for quicker engine starts. Aftermarket ECUs utilize these outputs. Fortunately, the FHST pump relay(s) can be triggered from the OEM fuel pump's BLACK/YELLOW stripe power wire which already has this feature. Carefully unravel the electrical tape from a small area of the OEM pump harness and find the BLACK/YELLOW stripe power wire in a favorable location. Unscrew the grey end from the Posi-Tap connector. Insert the OEM BLACK/YELLOW stripe power wire into the slotted end, as shown.	

101		Screw the center section of the Posi-Tap connector back on making sure the wire gets pierced, as shown.	
102	Wire Stripper	Grab the blue wire flying lead from the relay. Strip the insulation back to expose 3/8" of copper wire. As shown, slide the Posi-Tap collar end piece over the blue wire.	
103		Insert the blue wire into the end of the Posi-Tap connector. Smash the blue wire by tightening the collar end into the Posi-Tap connector, as shown. NOTE: If this is still unclear, see the online Posi-Tap tutorial videos for more information.	
104	8mm Socket Wrench	Before making the following electrical connections to the fuel hat, be sure to first reinstall the OEM rubber grommet to the OEM cover plate. Secure each assembled ring terminal wire to the appropriate electrical stud on the fuel hat using the provided insulating acorn nuts. **EXTERNAL SENSOR WIRING** SENSOR GROUND: Black FUEL LEVEL: Grey/Red or White/Black or Green LOW FUEL: Light Green or Black/Red (S14 and R33 Only) TEMPERATURE: Yellow (S14 OBD-II Only)	
105	10mm Socket	Reconnect the battery. Switch the ignition ON to pressurize the fuel system. Confirm the new fuel pump(s) are properly operating. Check for leaks. If no leaks are found, start the vehicle. NOTE: The engine may run rough for a few seconds until all air is bled from the fuel system. Recheck for leaks. Reference your specific brand fuel pressure regulator instructions for proper calibrating.	
106	10mm Socket Wrench	Carefully reinstall the fuel pump access panel. Optionally wrap any exposed wire with loom and electrical tape (not included). Reinstall all OEM components in reverse order. **20-0700/20-0701 INSTALLATION COMPLETE** _____ ***NOTES REGARDING THE VENTURI JET PUMP*** ***1. The Radium Engineering fuel hanger surge tank kit features a venturi jet pump integrated to the high pressure line. This transfers fuel into the collector box without restricting the return line. However, fuel pressure is bled-off when the pump(s) are inactive. If pressure needs to be maintained at the fuel rail with the engine OFF, a check valve will need to be installed on the fuel feed line. See Radium P/N: 20-0534-XX.*** ***2. For the venturi jet pump to properly operate, 35 LPH of fuel will be diverted from the fuel pump outlet. Make sure adequate fuel pump flow capacity is available.***	

107	10mm Socket Wrench Screwdriver	**20-0702-03/05 FUEL HANGER PLUMBING KIT INSTALLATION** As described in the instructions above, disconnect the battery and depressurize the fuel system. The filter is located near the front RH strut tower. Disconnect the inlet and outlet fuel lines. Have a rag nearby to catch fuel spills. Slide the fuel filter out from the OEM mounting bracket and remove from the vehicle.	
108	10mm Socket Wrench	Unbolt the OEM fuel filter mounting bracket (shown) from the unibody and remove from the vehicle. Nothing will be reused.	
109	Phillips Screwdriver 10mm Socket Wrench	Disconnect the fuel return soft line that runs between the OEM hard lines (under the vehicle) and the fuel pressure regulator. Have a rag nearby to catch fuel spills. As shown, some vehicles have an inline fuel pulse damper in the return line. Unscrew the two M6 bolts from the unibody to remove. NOTE: Because this fuel hanger plumbing kit uses soft lines, this OEM fuel pulse damper will not be required.	
110	10mm Socket Wrench	Safely raise the vehicle. Starting underneath from the front, locate the 2-way retainer underneath the fuel filter. This holds the fuel feed and fuel return hard lines. Unscrew the M6x1mm hex bolt and pry the hard lines from the retainer. NOTE: If the vehicle still uses the long OEM clutch damper hard line, lowering it out of the way can help the following process. Remove the 2 mounting bracket bolts then pull the lines from the unibody.	
111	Flat Blade	Following the hard lines towards the rear of the vehicle, unsnap the next 7-8 retainers. The simple retainer type pictured secures the lines together. Many times it does not interface with the unibody. Note where these are specifically located for when the new replacements will be installed. However, there is another OEM retainer that looks identical to this. The difference is it's flipped upside down and is pressed into the unibody. Simply pry to unclip it from the floor board.	
112	10mm Socket Wrench	The retainer type shown is secured with a M6x1.0mm bolt.	

113	10mm Socket Wrench	The retainer type shown is not common with all compatible vehicles. NOTE: If the vehicle does not have the OEM retainer shown, only 7 of the 8 Radium Engineering retainers will be used. One of the included retainers will NOT be used.	
114		Depending on the chassis, a couple of OEM retainers near the fuel tank will be reused. These are either too difficult to reach with the fuel tank installed or they are in a location not suitable for the large replacement fuel hoses to reside. Pictured are all 8 potential OEM retainers that will be replaced.	
115	Crow Bar	Remove the OEM feed and return hard lines from the vehicle. NOTES: 1. There are retainers on the RH side of the fuel tank. They are not easy to see visually. One retainer is attached to the side of the fuel tank and secures the soft fuel lines. The other retainers secure to the unibody. 2. From the rear of the vehicle, slide a long bar between the unibody and RH side of the fuel tank. Gently pry the fuel lines to release. 3. After removing the feed and return hard lines, reinstall the brake and EVAP hard lines into the OEM retainers that will be reused.	
116	5mm Allen Wrench	The vehicles listed below require the unique fuel filter position shown. Nissan (S14) 200SX, 240SX, Silvia Nissan (S15) 200SX, Silvia NOTES: 1. The provided M6x1x14mm Allen bolts will use the lower mount's slotted hole positions shown. 2. When securing to the unibody, note the proper lower mount orientation with respect to the front and rear of the vehicle.	
117	5mm Allen Wrench	The vehicles listed require the unique filter position shown. Nissan (R33/R34) Skyline NOTES: 1. The provided M6x1x14mm Allen bolts will use the lower mount's slotted hole positions shown. 2. When securing to the unibody, note the proper lower mount orientation with respect to the front and rear of the vehicle.	
118	Oil Lubrication 1" Wrench Adjustable Wrench 5mm Allen Wrench	Lubricate the O-rings on the provided 10AN ORB to 8AN male fittings. Secure this straight adapter fitting (shown on bottom) to the fuel filter inlet port. Secure the swivel banjo fitting (shown on top) to the fuel filter green outlet port.	

119	Oil Lubrication 5mm Allen Wrench 1" Wrench 4mm Allen Wrench	Insert the fuel filter into the lower mount so the green outlet is positioned at the top. As shown, slide the filter within the mount for optimal fitment. This specific position will vary depending on the application. Loosely tighten the filter using the upper clamp and the two M5x0.8mm Allen bolts.	
120	6mm Allen Wrench 5mm Allen Wrench	Install the provided 8AN (red) and 6AN (yellow) adapter fittings to the fuel hat "pump out" (red) and "return" (yellow) ports, respectively.	
121		The provided 1/2" (8AN) and 3/8" (6AN) hoses will be inserted from the trunk. Each hose will start from their respective fuel hat port fittings and run towards the front of the vehicle. First, route the hoses down the backside of the fuel tank.	
122		Be sure the vehicle is safely on a proper lift as the following steps would be difficult laying on the ground.	
123		From underneath, pull the hoses downwards. Slowly make your way from the rear of the vehicle to the front. It is recommended to pull the hose down in "loops" (as shown) and strategically reinsert them into areas along the unibody away from the exhaust and suspension. NOTE: There will be sections that get very tight.	
124	Oil Lubrication	Once the end of the hoses at the rear get close to the fuel hat ports, install the provided 6AN and 8AN 90 degree hose ends. First, apply oil lubrication to the barbs. Then, fully insert each hose onto the respective hose ends. NOTE: PushLok hose ends do NOT require clamps.	

125	11/16" Wrench 7/8" Wrench	Install the hose ends to their respective banjo fittings. Do NOT over tighten -AN fittings. NOTE: Aluminum wrenches will prevent surface marring.	
126		Run the hose past the RH side of the gas tank and pull them down relieving any excessive slack. NOTE: the retainer shown is the last OEM retainer that will be reused moving forward.	
127	Cutters	Secure the hoses along the RH side of the gas tank and away from the suspension using the provided cable zip-ties.	
128	2.5mm Allen Wrench 5mm Allen Wrench	Starting from the rear moving forward, install the retainer mounts that secure to the unibody first. NOTE: Some retainers just secure the lines together. Those can be installed last.	
129		Find the one black retainer in the kit that has a machined slot as depicted.	
130		Find the rubber push-in plug in the kit shown.	

131	Drill	Find the hole in the unibody where the one OEM retainer pressed into the floor board. Without fully inserting, test to see if the rubber plug will fit snug in the hole. If too tight, this hole might need to be slightly enlarged. WARNING: Do not use a drill larger than 21/64" (or 8.25mm).	
132		Lineup the slotted retainer to the hole as shown.	
133		Press the rubber plug into the hole, as shown.	
134	4mm Allen Wrench	There is one 2-way retainer that uses a M6x1mm countersink bolt. This will be installed closest to the front of the vehicle (under the fuel filter).	
135	2.5mm Allen Wrench	Find the locations where the OEM retainers did not secure to the unibody. Secure the lines with a retainer in these areas.	
136	10mm Socket Wrench	If the OEM clutch damper hard line (shown) was dropped down, the mount can now be reinstalled and secured.	

137	Hose Cutter	Temporarily install the provided straight PushLok hose end to the fuel filter's inlet fitting. Mock up the 1/2" feed hose to the hose end barbs and cut to length.	
138	Oil Lubrication	For added space and ease of installation, it might be easier to temporarily remove the fuel filter from the mount. Install and fully seat the straight PushLok hose end into the end of the 1/2" feed hose. Use a liberal amount of lubrication. NOTE: PushLok hose ends do NOT require clamps.	
139	7/8" Wrench	As shown, install the hose end to the fuel filter inlet port.	
140	4mm Allen Wrench	Reinsert the filter into the mount. Slide the filter into position for best fitment. Secure using the clamp.	
141	Oil Lubrication 7/8" Wrench	Lubricate, then fully insert the included 8AN 45 degree hose end into the remaining section of 1/2" hose. Secure to the fuel filter outlet fitting as shown. However, if it is important to maintain fuel pressure when the engine is turned OFF, a check valve must be installed into this system. See the following step.	
142		A simple way to adapt a check valve is pictured using the following Radium Engineering parts (sold separately): P/N: 20-0534 Universal Check Valve (x1) P/N: 14-0534 10AN ORB to 8AN Male (x1)	

143	Hose Cutter 7/8" Wrench	Terminating the feed hose to the aftermarket fuel rail will be dependent on the vehicle application. An extra 8AN 90 degree PushLok hose end is included specifically for connecting to a 8AN male fuel rail fitting.	
144	Hose Cutter 11/16" Wrench 9/32" Nut Driver	Terminating the return hose to the FPR (fuel pressure regulator) will be dependent on the vehicle application. NOTES: 1. For aftermarket FPRs, an extra 6AN 90 degree PushLok hose end is included. 2. For OEM Nissan FPRs, an extra EFI clamp (shown) is provided. Be sure to cinch the clamp until it bottoms out.	
145	10mm Socket Wrench	Reconnect the battery. Switch the ignition to the ON position to pressurize the fuel system. Check for leaks. If no leaks are found, start the vehicle. NOTE: The engine may run rough for a few seconds until all air is bled from the fuel system. Recheck for leaks. Carefully reinstall the fuel pump access panel. Reinstall all OEM components in reverse order. **INSTALLATION COMPLETE**