



INSTALLATION INSTRUCTIONS

20-199X-0X FUEL CELL SURGE TANK

For older versions of the FCST, see PDF links on product page on radiumauto.com

Document: 19-0390
Support: info@radiumauto.com





The RADIUM Engineering Fuel Cell Surge Tank (FCST-X) flange is only compatible with fuel cells that utilize a 6" x 10" (24-bolt) fill plate.

CAUTION






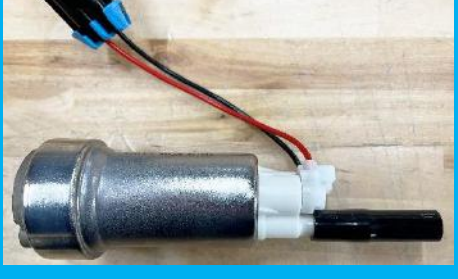
Only a qualified technician following applicable safety procedures should perform the installation of this product. One must have knowledge in repair and modification of fuel systems and general vehicle modifications to install this product. **Gasoline and other fuels are flammable and can be explosive.**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






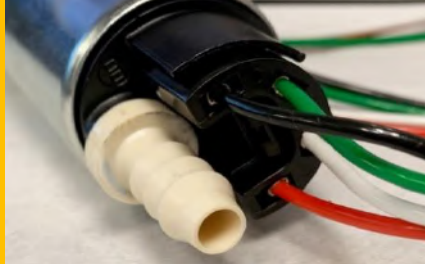
WARNING


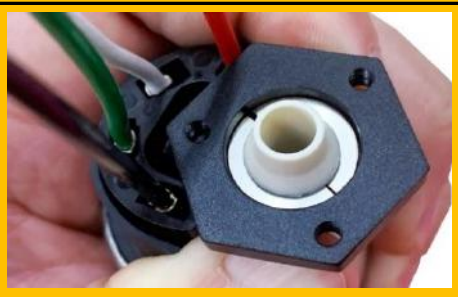
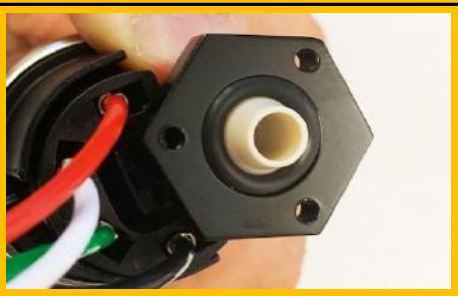


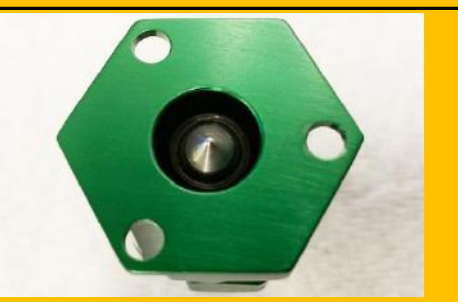
The fuel system is under pressure! Do not loosen any connections until relieving the fuel system pressure. Consult a service manual for instructions on relieving fuel pressure safely. This product is designed for off-highway and racing use only. Fuel system components may not be legal for sale or use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




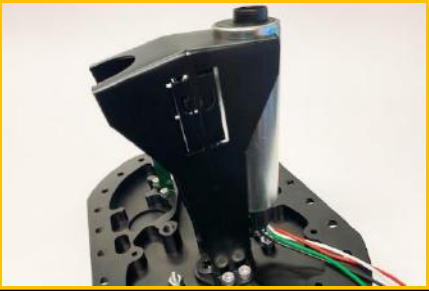


STEP	TOOLS NEEDED	INSTRUCTIONS	PHOTO
1	3mm Allen Wrench	If purchased with fuel "pumps included", the FCST-X will be delivered ready to be installed into the fuel cell. Skip to step 44 For fuel level switch installation, follow steps 54-57. For final assembly into the fuel cell, follow steps 58-68.	
		If purchased with fuel "pumps not included", the FCST-X will be partially assembled. Fuel pump assembly is required. First, remove the nine M4x0.7mm screws (depicted) that hold down the fuel surge tank (FST) hat and the lift pump hat. Grab the handle and carefully pull upwards.	
2		For 20-1990/1/2-00 versions, follow steps 3-19 and 44-68. For 20-1993-00 ESLM Pump version, follow steps 20-36 and 44-68. For 20-1995-00 External Pump version, follow steps 37-68.	
		NOTE: The fuel pumps specified in the part number short description must be used as the provided components and the assembly procedure are specific to those pumps.	
3	4mm Allen Wrench	20-1990/1/2-00 FCST-X FUEL PUMP ASSEMBLY Unscrew the three M5x0.8mm bolts that secure the fuel pump cradle support to the underside of the FCST-X top plate. As shown, remove the fuel pump cradle/filter assembly.	
4	3/8" Socket Wrench	Determine how many surge tank pumps will be installed. Attach the corresponding electrical connectors to the wiring studs (shown). NOTES:	
	Wire Stripper	1. Red wires are positive (+) and black wires are negative (-). Reference the top of the FCST-X plate. 2. If the provided electrical connectors do not plug into the fuel pump being installed, the flying lead harness that comes with the fuel pump will need to be modified. Use the ring terminals and heat shrink included in the FCST-X kit to terminate the ends.	







5	Oil Lubrication	20-1992-00 ONLY	<p>Skip this step if installing 3 Walbro F90000267/274/285 FST pumps.</p> <p>As shown, block-off the unused port(s) on the triple pump block using the included 2AN ORB plug fitting(s). Lubricate the O-ring(s).</p> <p>-If installing 1 FST pump, use 2 plugs (shown).</p> <p>-If installing 2 FST pumps, use 1 plug.</p> <p>-If installing 3 FST pumps, do NOT install any plugs.</p> <p>Any of the 3 ports can be used as they share the same external outlet.</p>	
	1/8" Allen Wrench			
6	Oil Lubrication	20-1991-00 ONLY	<p>Skip this step if installing 3 Bosch BR540 or DW400 FST pumps.</p> <p>As shown, block-off the unused port(s) on the triple pump block using the included 6AN ORB plug fitting(s). Lubricate the O-ring(s).</p> <p>-If installing 1 FST pump, use 2 plugs (shown).</p> <p>-If installing 2 FST pumps, use 1 plug.</p> <p>-If installing 3 FST pumps, do NOT install any plugs.</p> <p>Any of the 3 ports can be used as they share the same external outlet.</p>	
	1/4" Allen Wrench			
7	4mm Allen Wrench	20-1990-00 ONLY	<p>Skip this step if installing 3 Walbro GSS342, AEM 50-1200 or DW440 FST pumps.</p> <p>These pumps require an additional step compared to the others. First, remove the 6 screws that secure the triple pump block collector. Next, install the included 2AN ORB plug(s) to any of the 3 threaded holes.</p> <p>-If installing 1 FST pump, use 2 plugs (shown).</p> <p>-If installing 2 FST pumps, use 1 plug.</p> <p>-If installing 3 FST pumps, do NOT install any plugs.</p> <p>Lastly, seat the gasket and reinstall all pieces. NOTE: The 6-bolt flange cannot be improperly orientated as the bolt spacing is not symmetrical.</p>	
	Oil Lubrication			
	1/8" Allen Wrench			
8		20-1990-00 ONLY	<p>The pre-cut lines are used to match the specific FST pump.</p> <p>-Walbro GS342: Requires the mid length plastic tubing.</p> <p>-AEM 50-1200: Requires the shortest plastic tubing.</p> <p>-Deatschwerks DW440: Requires the rubber hose.</p> <p>NOTES:</p> <ol style="list-style-type: none"> Extra lines are provided in case of damage during assembly. The long rubber hose and long plastic tube will be cut to length in a later step for the lift pump. 	
9		20-1991-00 ONLY	<p>Because the Bosch BR540 (DW400) pumps are so tall, the pump outlet adapters (shown) will be used for the FST pump(s).</p> <p>NOTE: The long plastic tube (not shown) will be cut to length in a later step for the lift pump.</p>	
10		20-1992-00 ONLY	<p>The pre-cut lines are used to match the specific FST pump.</p> <p>-Walbro F90000267</p> <p>-Walbro F90000274</p> <p>-Walbro F90000285</p> <p>NOTES:</p> <ol style="list-style-type: none"> Extra tubes are provided in case of damage during assembly. The long plastic tube will be cut to length later for the lift pump. 	






11	Oil Lubrication	20-1990-00 ONLY NOTE: Fuel pump hose barbs can fracture if not treated with extra care.	
	Heat Gun		
	Screwdriver	For Walbro GSS342 and AEM 50-1200: Lubricate and apply a small amount of heat to one side of the plastic tubing . Push the tubing onto the fuel pump outlet barb. Find the small ID EFI hose clamp in the kit and secure the tubing, as shown.	
		For Deatschwerks DW440 Only: Lubricate one side of the rubber hose . Push the hose onto the fuel pump outlet barb. Find the large ID EFI hose clamp in the kit and secure.	
12		20-1991-00 ONLY First inspect the pump outlet hose barb. If the hose barb is deformed, modified or damaged, the pump outlet adapter will not install correctly and the fuel pump cannot be used.	
		First, slide the black collar over the pump outlet with the flat surface upward, as shown.	
13		20-1991-00 ONLY Slip the stainless steel retainers between the 2 large hose barbs. When assembled, it will lodge itself under the hose barb ridge closest to the end of the pump outlet opening.	
		Pull the collar up to confirm the retainers lock into place, as depicted.	
14	Oil Lubrication	20-1991-00 ONLY As shown, place the included O-ring on the pump outlet while applying a small amount of pressure upwards on the black collar.	
		Press the O-ring down into the groove.	
		Drop a small amount of the lubrication on the O-ring.	
15	2.5mm Allen Wrench	20-1991-00 ONLY Line up the green fitting holes to the black fitting threads. As shown, secure and tighten all screws evenly.	
16	Oil Lubrication	20-1992-00 ONLY	
	Heat Gun	Lubricate and apply a small amount of heat to one side of the plastic tubing. Push the tubing onto the fuel pump outlet barb, as shown. Use one of the supplied EFI hose clamps to secure the tubing. NOTE: Fuel pump outlet barbs can fracture if not treated with extra care.	
	Screwdriver		






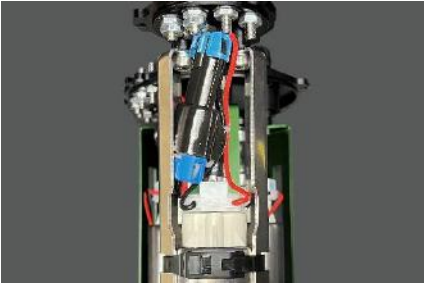
17	Oil Lubrication	<p>20-1990-00 and 20-1992-00 ONLY</p> <p>Slide a second hose clamp onto the line attached to the fuel pump(s). Lubricate the inside of the fuel line(s). Push the fuel line(s) over the triple pump barb(s) until fully seated. Do NOT tighten the clamp(s).</p> <p>NOTES:</p> <ol style="list-style-type: none"> 1. Ensure pump(s) are not accidentally installed into a plugged port. 2. For the Walbro GSS342 and AEM 50-1200 pumps, be sure to use the small ID EFI clamp(s) provided in the kit. 3. For the DW440 pump, be sure to use the large ID EFI clamp(s). 	
	15mm Wrench	<p>20-1991-00 ONLY</p> <p>Lubricate the external O-ring on the male 6AN green fitting.</p> <p>Install the fuel pump(s) into any of the available ports on the triple pump block.</p>	
	Screwdriver	<p>Rotate each fuel pump so the wire connectors are facing outwards. Make sure the EFI clamp(s) do not interfere with the triple pump block. Once positioned correctly, tighten the EFI clamps.</p> <p>Reinstall and tighten the 3 fuel pump cradle bracket screws.</p> <p>Plug in the electrical fuel pump connector(s).</p>	
	4mm Allen Wrench		
20	4mm Allen Wrench	<p>20-1993-00 ONLY</p> <p>To remove the fuel surge tank pump cradle, remove the four M5x0.8mm screws from the top plate and set aside.</p>	
21	1/4" Allen Wrench	<p>If installing 2 fuel surge tank pumps, remove the 6AN ORB plug, as shown.</p> <p>If installing 1 fuel surge tank pump, make sure there is a 6AN ORB plug in either one of the ports.</p> <p>Perform the following procedure for both pumps.</p>	
22		<p>Inspect the Ti Automotive E5LM pump outlet hose barb. If deformed or damaged, the Radium Engineering check valve pump adapter will NOT seal properly.</p> <p>NOTE: The Ti Automotive E5LM 4-pin wiring connector MUST first be installed to the electrical terminals prior to installing the check valve in the next few steps.</p>	

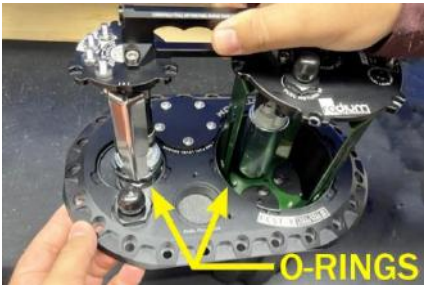



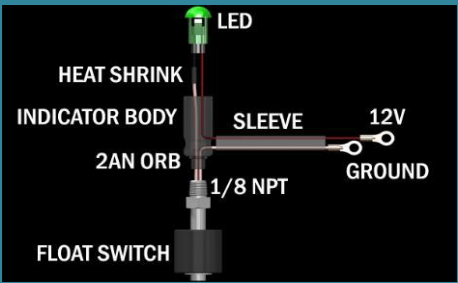
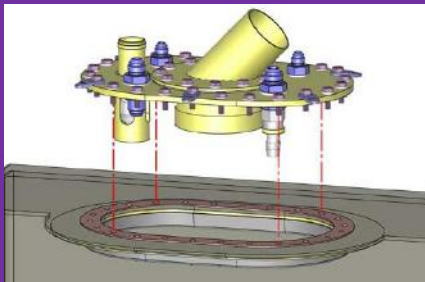
23		<p>To install the check valve, first slide the black collar over the fuel pump outlet barb with the flat surface upward, as shown.</p>	
24		<p>Next, slip the stainless steel retainers under the hose barb ridge closest to the end of the pump outlet. Be patient as this will take a little bit of work.</p> <p>Pull the collar up to confirm the retainers lock into place as depicted.</p>	
25	Oil Lubrication	<p>Lubricate and place the included O-ring on the fuel pump outlet.</p> <p>Slide the black collar upward and tuck the O-ring into the groove, as shown.</p>	
26		<p>Place the O-ring onto the check valve plunger groove, as shown.</p>	
27		<p>Place the provided spring around the plunger rod, as shown.</p>	
28		<p>Insert the plunger rod through the internal center hole of the green adapter fitting, as shown.</p>	


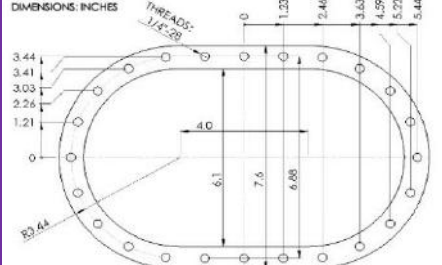




29	2.5mm Allen Wrench	Apply a high-strength thread locking compound to the threads on the 3 included screws. Line up the green fitting holes to the black fitting threads.	
	Thread Locker		
30		After tightening all screws evenly, inspect the internal side of the green fitting. When installed properly, the plunger should be slightly sticking out of the center hole at rest, as shown.	
31	Oil Lubrication	Lubricate the external O-ring on the 6AN side of the check valve.	
	1" Wrench	Tighten the fuel pump check valve(s) to the 6AN ORB port(s).	
		NOTE: these 6AN ORB ports on the FCST-X plate are intentionally at a slight angle.	
32	4mm Allen Wrench	Rotate the fuel pump(s) so that the electrical connector(s) are on the outside, furthest away from the center of the FST. Single pump shown.	
		Secure the fuel surge tank pump cradle.	
33		Press the fuel filter sock(s) down onto the fuel pump inlet(s) until fully seated. Dual fuel pump shown.	
		NOTE: Depending on the brand or style of fuel pump filter sock(s), the orientation may need to be adjusted with respect to the FST canister.	
34	Diagonal Cutters	Cut the wires to lengths around 3.5" (89mm).	
	Wire Strippers	Strip the wires.	
		Slide the provided heat shrink to each wire as shown.	

35	Wire Crimpers	Crimp the provided ring terminals to the end of each wire.	
	Heat Gun	Slide the heat shrink over the crimped area. Apply heat to shrink the insulation.	
36	3/8" Wrench	Connect each ring terminal to the corresponding wire color terminal depicted on the top of the FCST plate. R = Red G = Green W = White Shared Ground= Black Lastly, reinstall and tighten the four FST pump cradle screws.	
	4mm Allen Wrench		
37		<u>20-1995-00 ONLY</u> NOTES: 1. Designed for a Walbro F90000267/274/285/295 lift pump. 2. Can be used with a combination of 1 or 2 pickup tubes. 3. As depicted, a single 10AN pickup (with filter sock) is preinstalled. 4. Another 10AN pickup tube and corresponding fitting is included. 5. A 16AN pickup tube and corresponding fitting is also included. 6. If using the 16AN pickup tube, an external (high micron) filter will need to be purchased separately. See Radium P/N: 20-0220-04. <u>If using the preinstalled fuel pickup, skip all of these steps.</u>	
38	3/8" Allen Wrench	To install a second 10AN pickup, remove the 10AN ORB plug installed in the "10AN ORB FUEL PICKUP" port.	
	Oil Lubrication	Next, install the provided green 10AN ORB bulkhead fitting, as shown.	
	Adjustable Wrench		
39	Oil Lubrication	From underneath, slide the provided black tubing over the green barb.	
	Pinch Clamp Pliers	Cinch the included pinch clamp. NOTE: diagonal cutters (shown) can be used if pinch clamp pliers are not available.	
40		As shown, press the included filter sock onto the end of the new black pickup tube.	

41		To install a 16AN pickup, loosen the black 16AN ORB bushing and remove the pickup assembly from the top hat, as shown.																																																																
	Oil Lubrication	As shown, install the large black bulkhead fitting to the top hat.																																																																
	Adjustable Wrench																																																																	
42																																																																		
43	Oil Lubrication	From underneath, slide the provided large black tubing over the black barb.																																																																
	Pinch Clamp Pliers	Cinch the included pinch clamp. NOTE: diagonal cutters can be used if pinch clamp pliers are not available.																																																																
44		There are 2 sets of lift pump ladders included (shallow and mid depth).																																																																
		Shallow depth lift pump ladder (preinstalled) compatibility: Radium Engineering 6 Gallon, 10 Gallon, and 10.5 Gallon Fuel Cells																																																																
		Mid depth lift pump ladder compatibility: Radium Engineering 14 Gallon and 22 Gallon Fuel Cells																																																																
		NOTE: The lift pump ladders provided in 20-1991 are specific to 46mm Bosch BR540 (DW400) pumps. All others are for 39mm pumps (shown).																																																																
45	Tape Measure	Measure the depth from the FCST-X flange to the fuel cell floor. Calculate the required length of fuel line for the lift pump. Test fit for proper height.	<table border="1"> <thead> <tr> <th></th> <th>AEM</th> <th>Bosch</th> <th>Deatschwerks TI</th> <th>Automotive</th> <th>Walbro</th> <th>Walbro</th> </tr> </thead> <tbody> <tr> <td></td> <td>50-1200</td> <td>BR540</td> <td>DW440</td> <td>E5LM</td> <td>F90000267</td> <td>G5S342</td> </tr> <tr> <td></td> <td></td> <td>Deatschwerks</td> <td></td> <td></td> <td>F90000274</td> <td></td> </tr> <tr> <td></td> <td></td> <td>DW400</td> <td></td> <td></td> <td>F90000285</td> <td></td> </tr> <tr> <td>Radium 20-0606</td> <td>68mm</td> <td>53mm</td> <td>88mm</td> <td>39mm</td> <td>64mm</td> <td>70mm</td> </tr> <tr> <td>Radium 20-0610</td> <td>68mm</td> <td>53mm</td> <td>88mm</td> <td>39mm</td> <td>64mm</td> <td>70mm</td> </tr> <tr> <td>Radium 20-0611</td> <td>68mm</td> <td>53mm</td> <td>88mm</td> <td>39mm</td> <td>64mm</td> <td>70mm</td> </tr> <tr> <td>Radium 20-0614</td> <td>162mm</td> <td>147mm</td> <td>182mm</td> <td>133mm</td> <td>158mm</td> <td>164mm</td> </tr> <tr> <td>Radium 20-0622</td> <td>162mm</td> <td>147mm</td> <td>182mm</td> <td>133mm</td> <td>158mm</td> <td>164mm</td> </tr> </tbody> </table>		AEM	Bosch	Deatschwerks TI	Automotive	Walbro	Walbro		50-1200	BR540	DW440	E5LM	F90000267	G5S342			Deatschwerks			F90000274				DW400			F90000285		Radium 20-0606	68mm	53mm	88mm	39mm	64mm	70mm	Radium 20-0610	68mm	53mm	88mm	39mm	64mm	70mm	Radium 20-0611	68mm	53mm	88mm	39mm	64mm	70mm	Radium 20-0614	162mm	147mm	182mm	133mm	158mm	164mm	Radium 20-0622	162mm	147mm	182mm	133mm	158mm	164mm
		AEM		Bosch	Deatschwerks TI	Automotive	Walbro	Walbro																																																										
		50-1200		BR540	DW440	E5LM	F90000267	G5S342																																																										
				Deatschwerks			F90000274																																																											
				DW400			F90000285																																																											
Radium 20-0606	68mm	53mm	88mm	39mm	64mm	70mm																																																												
Radium 20-0610	68mm	53mm	88mm	39mm	64mm	70mm																																																												
Radium 20-0611	68mm	53mm	88mm	39mm	64mm	70mm																																																												
Radium 20-0614	162mm	147mm	182mm	133mm	158mm	164mm																																																												
Radium 20-0622	162mm	147mm	182mm	133mm	158mm	164mm																																																												
		NOTES: 1. To prevent pump cavitation, space is required between the fuel pump inlet and the fuel cell floor. 2. If installing into a Radium Engineering fuel cell, use the cut lengths listed. 3. Although not likely, the lift pump ladders may need to be cut shorter for extremely shallow fuel cells. 4. For fuel cells deeper than 9", use Radium P/N 20-1214 (sold separately).																																																																
46	Oil Lubrication	NOTE: Fuel pump hose barbs can fracture if not treated with extra care.																																																																
	Heat Gun	Lubricate and apply a small amount of heat to one side of the plastic tubing. Push the tubing onto the fuel pump outlet barb. Secure using an EFI clamp. Loosely insert another EFI clamp onto the line, as shown.																																																																
	Screwdriver																																																																	
		For Deatschwerks DW440 Only: Lubricate one side of the rubber hose. Push the hose onto the fuel pump outlet barb. Find the large ID EFI hose clamp in the kit and secure. Loosely insert another large EFI clamp onto the fuel hose.																																																																

47	Oil Lubrication	Lubricate and apply a small amount of heat to the open end of the plastic tubing. Push the tubing onto the fuel hat barb. Secure the EFI clamp. Walbro GSS342 fuel pump shown.	
	Heat Gun		
	Screwdriver	For Deatschwerks DW440 Only: Lubricate the open end of the rubber hose. Push the hose onto the fuel hat barb. Secure the EFI clamp.	
48		As shown, install the sock filter to the lift pump.	
49	Flathead Screwdriver	Insert the large zip ties into 2 of the lift pump ladder slots.	
	Cutters	NOTE: Using a blunt object to hold the zip tie lock in place will permit the maximum amount of pull force.	
50		NOTE: When installing a Bosch BR540 (DW400) lift pump into a Radium Engineering fuel cell, notice how the supplied ladders cover the length of the fuel pump (shown).	
51		NOTE: If the provided electrical connectors do not plug into the fuel pump being installed, the flying lead wiring harness that comes with the fuel pump will need to be modified. Use the ring terminals and heat shrink included in the FCST-X kit to terminate the ends.	
		Plug in the electrical lift pump connector. The Ti Automotive E5LM pump is very tall and does not leave much room for wiring. But as shown, it is easily manageable.	
52		If using a Walbro F90000267/274/285/295 lift pump, the large Delphi connector will need to be strategically located above the pump. If not, the lift pump assembly will not fit through the small opening in the FCST-X when servicing.	
		In the example shown, the pump connector is gently pressed into the area diagonally.	

53	3mm Allen Wrench	Prior to dropping-in the complete pump module, be sure the two O-rings are placed down in both FCST-X openings.	
		Reinstall the 9 screws and tighten in an alternating cross pattern.	
		The assembly is complete and the unit is now ready for installation into the fuel cell.	
54	1/8" Allen Wrench	20-0461 Fuel Level Switch and Indicator Installation	
	PTFE Sealing Paste	The float can be flipped for Normally Open (NO) or Normally Closed (NO) configuration by removing the E-clip. To be closed during low fuel, the float arrow should be pointing downward.	
	1/4" Wrench	Remove the 2AN ORB plug from the top plate. Apply PTFE paste to the threads of the float switch. Route switch wires through the top plate's threaded hole from underneath. To screw in the switch, first hand tighten. Then add another 1.5 to 3 turns with a wrench until tight and sealed.	
		The 2 wires can be routed for the installer's specific purposes. The switch will trigger when fuel level drops by 20% or more.	
55	Diagonal Cutter	20-0508 Diagnostic Indicator Kit	
	Oil	Route the 2 pink wires (from the 20-0461 fuel level switch) through the included black aluminum tube.	
	1/2" Wrench	Lubricate the O-ring and thread the tube into the top plate and tighten.	
	Wire Stripper	Route 1 of the switch wires back down into the tube and out 1 of the side holes of the aluminum tube. Pull slack out.	
	Solder Station	Cut the other switch wire and red LED wire to length and solder together. Cover this connection with the included shrink tube.	
Heat Gun			
56		20-0508 Diagnostic Indicator Kit	
		Route the LED black wire down into the tube and out the same hole as the other level switch wire.	
		Push the LED down into the tube until it is fully seated, as shown.	
		Cover both loose wires with the protective sleeving and route to the power source. For simplicity, this can be the pump power terminals.	
57	Wire Stripper	20-0508 Diagnostic Indicator Kit	
	Crimper	Crimp the ring terminals to the power and ground wires. Connect the red to the positive terminal and black to the negative terminal. Use heat shrink on the ring terminal crimps.	
	Heat Gun		
		NOTE: The wiring described above puts the switch on the positive side of the LED. However, the switch can also be put on the negative side of the LED, as shown in the wiring diagram.	
58		Fuel Cell Installation	
		If needed, remove the older fill plate from the fuel cell. As shown, discard the 24 bolts, fill plate, and gasket as they will NOT be reused.	
		NOTE: The 24-bolt nut ring on all RA-series fuel cells are secured to the bladder. However, depending on other brand fuel cell bladders, the nut ring may or may not be glued to the underside of the bladder.	

59		<p>No modifications are required on RA-series fuel cells. However, bladder trimming may be required for other fuel cell manufacturers.</p> <p>Now is a perfect time to reconfirm that the lift pump is positioned at an optimal height. Adjust if necessary.</p> <p>Also, pay close attention to the arrangement of the foam inside the fuel cell (if equipped). Trim the foam to fit around the FCST-X components, as necessary.</p>	<p>CUT ALONG RED LINE SHOWN BELOW</p> 
60		<p>Shown are the flange hole pattern dimensions for the FCST-X.</p>	
61		<p>Install all 24 of the provided O-rings onto the 24 screws, as shown.</p>	
62	<p>5/32" Allen Wrench Torque Wrench</p>	<p>There are 2 types of fuel cell outer shell cans (new and old). If there aren't 24 holes in the fuel cell can, you have an "old" version (pictured). Radium Engineering has ALWAYS used the new style outer shell can.</p> <p>Place the provided 24 bolt gasket directly onto the bladder (not shown). Next, insert the FCST-X assembly. Using the included bolts, torque to 65 in-lbs.</p> <p>NOTE: 1/4"-28 all-thread rods can make installation easier. Also, if your nut-ring uses stainless steel nut inserts, apply anti-seize to the threads to prevent galling. Radium uses anodized aluminum nut rings so this is not required.</p>	
63	<p>5/32" Allen Wrench Torque Wrench</p>	<p>If the fuel cell can has 24 holes in the outer shell (pictured), you have a "new" version. All Radium Engineering fuel cells use the "new" version.</p> <p>For the fuel cans that use the "newer" style, place the provided 24-bolt gaskets on both sides of the fuel cell can lid (1 directly on the bladder and 1 on the fuel cell can). Then install the FCST-X assembly. Insert all 24 bolts into their respective holes and torque to 40 in-lbs in an alternating cross pattern.</p> <p>NOTE: if your nut-ring uses stainless steel nut inserts, apply anti-seize to the bolt threads to prevent galling. Radium uses anodized aluminum nut rings so this is not required.</p>	
64	<p>Wire Terminal Crimper Heat Gun</p>	<p>Terminate the fuel pump power wires (not included) with the supplied ring terminals. Apply the shrink tube to the terminals to prevent wire shorting to the plate.</p> <p>Secure the ring terminals to the FCST-X studs using the included acorn nuts.</p>	

65		<p>Fuel pump control is left up to the installer. However, the lift pump and at least 1 of the FST pumps should use the normal (priming/safety) fuel pump output strategy from the ECU.</p> <p>Optionally, an adjustable pressure switch, such as Radium Engineering P/N: 20-0236 (shown), can trigger the secondary pump(s) based on intake manifold pressure.</p>	
66		<p>Vent hose routing</p> <ol style="list-style-type: none"> 1. From the fuel cell, the vent hose should first run upwards allowing any fuel captured in the vent line to drain back down into the cell. 2. After ascending vertically, the vent hose should briefly route towards the front of the vehicle to prevent fuel from sloshing out. 3. Vertical loops can be added to act as a "make-shift" expansion chamber and allow air to escape and any fuel to drop to the bottom of the loops. 4. Depending on the application, the overall vertical height of the vent hose should be at least 12". 	
67		<p>continued...</p> <ol style="list-style-type: none"> 5. For remote fuel fill applications, the vertical loops must be higher than the fill point. 6. The vent hose should terminate below and behind the fuel cell outside of the cabin away from the exhaust system. 7. Utilizing an expansion chamber that is larger than the vent hose diameter will further aid in preventing liquid fuel from escaping. <p><i>NOTE: There are vent kits available. P/N: 20-0484-08 (shown) is used for standard filling. P/N: 20-0484-12 is used for quick filling.</i></p>	
68		<p>When fueling, do not top-off or overfill unless a vented fill cap is installed. All Radium Engineering fill caps are vented.</p> <p>Because the bottom of the FST canister uses 1-way fill valves, fuel will make it's way into the surge tank when the fuel cell is simply filled. Lift pump priming is no longer necessary for this FCST-X specifically.</p> <p>After starting the engine, monitor all fittings and hoses for leaks and fix immediately. Check again for leaks after initial test drive.</p> <p>INSTALLATION COMPLETE</p>	