

## INSTALLATION GUIDE



# Regulated Fuel Return Kit

1999-2003 Ford 7.3L Powerstroke





## WARNING REGARDING EMISSIONS LAWS

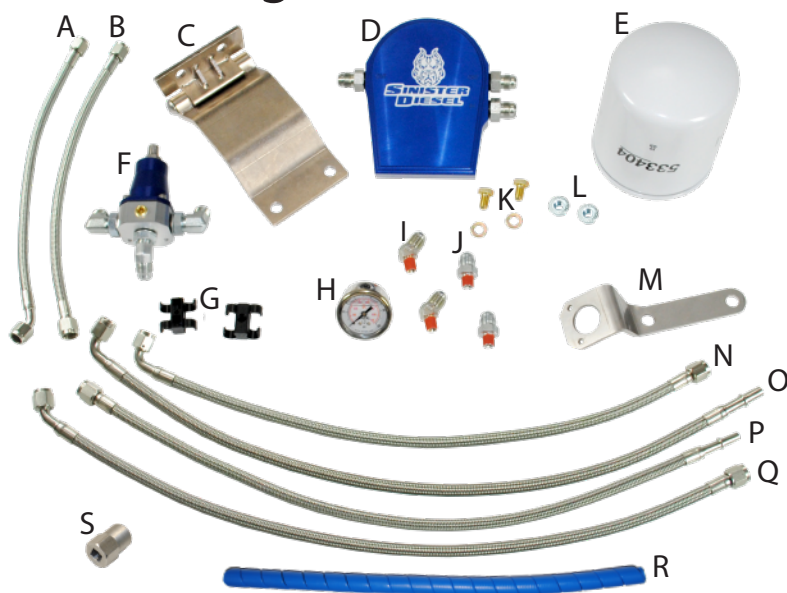
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## 7.3L Regulated Fuel Return



### **PACKING LIST:**

<b>PART#</b>	<b>QTY.</b>	<b>Description</b>
A	1	Driver Front Soft Line (15.5")
B	1	Passenger Front Soft Line (14.5")
C	1	Filter Block Mounting Bracket
D	1	Filter Block w/ Three Fittings
E	1	Filter
F	1	Fuel Regulator w/ Three Fittings
G	2	T-Clips
H	1	100 PSI Fuel Pressure Gauge
I	2	1/8"NPT-6 45° JIC Fitting (Larger Threads)
J	2	1/8"NPT-6 0° JIC Fitting (Larger Threads)
K	2	3/8" Hex Bolts and Lock Washers
L	2	M10 Flare Nuts
M	1	Fuel Regulator Bracket
N	1	Driver Rear Soft Line (19.5")
O	1	Fuel Supply Soft Line
P	1	Fuel Return Soft Line
Q	1	Passenger Rear Soft Line (20.5")
R	1	Protective Soft Line Cover
S	1	1/8" NPT Plug Tool

Note: When tightening all of the soft lines nuts, tighten until a distinct increase in the torque is noticed. Continue tightening an additional 1/6 of a turn. Loosen the nut one turn then re-tighten it until a distinct increase is noticed once again. Continue tightening an additional 1/6-1/3 of a turn.

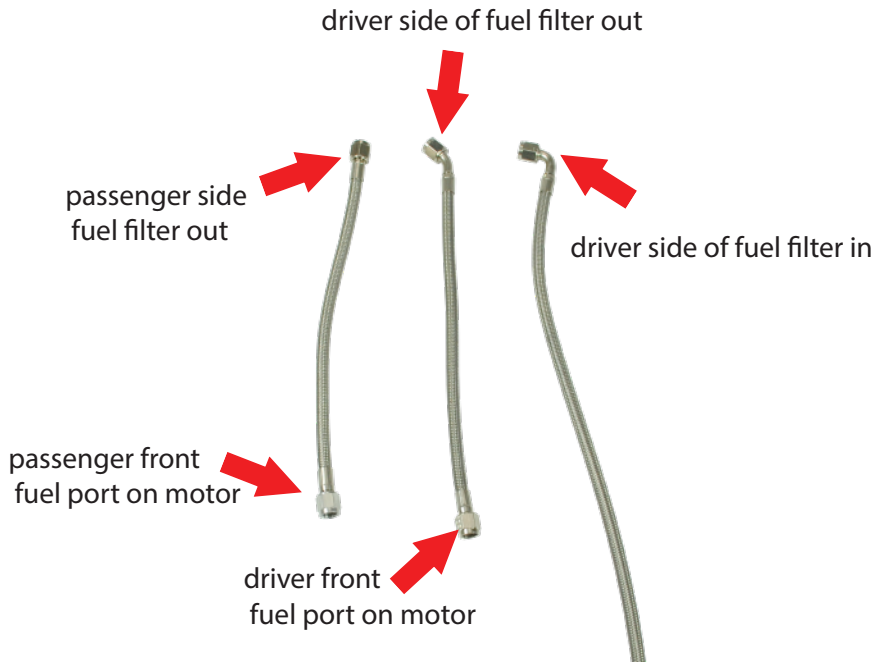
### **Recommended Tools:**

3/8" Quick Disconnect Tool  
 1/2" Breaker Bar  
 Deep Sockets:  
 10, 11, 13, 15mm  
 Combination Wrenches:  
 8, 13, 14, 16, 19mm  
 9/16", 1/2", 11/16"

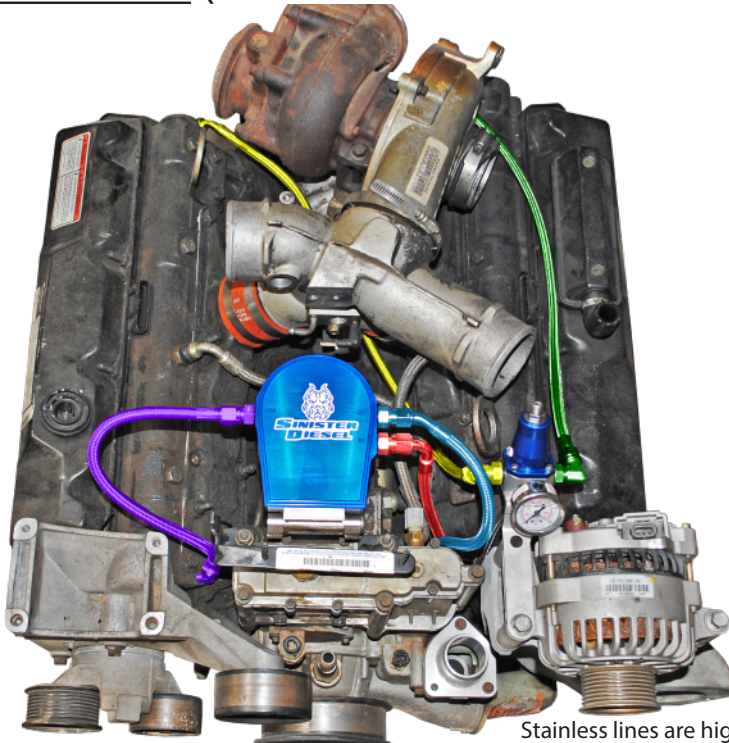
Read all instructions prior to install.

Note: Prior to installation, please compare the parts that you have received with the bill of materials provided on this page to assure that you have all the parts necessary for the installation.

## DIAGRAM A (FRONT SOFT LINES)



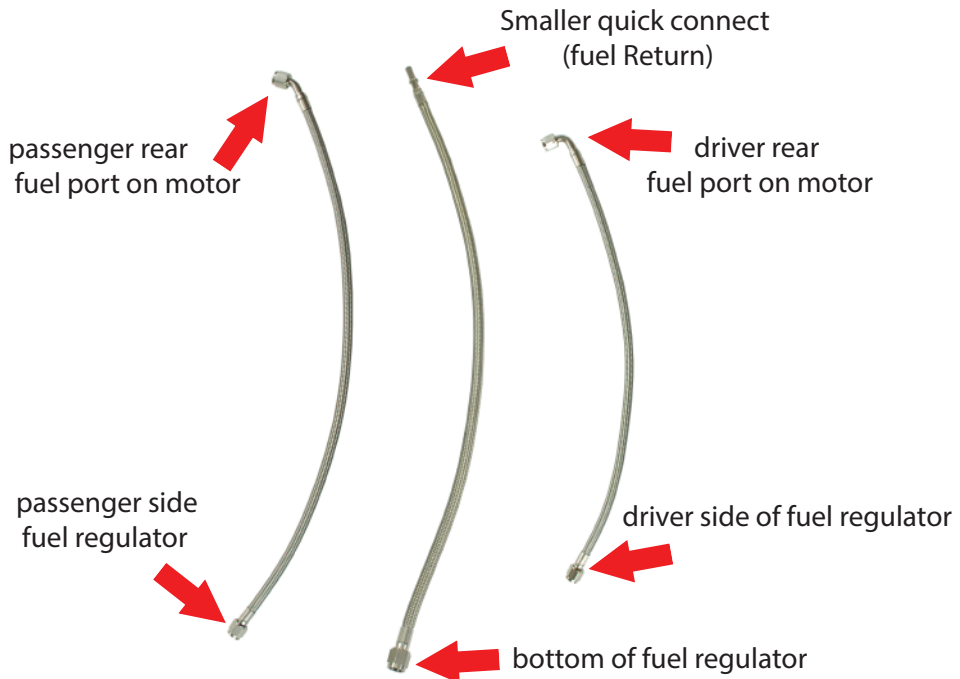
## DIAGRAM B (LINE ROUTING FRONT VIEW)



Stainless lines are highlighted for visual assistance.



## DIAGRAM C (REAR HARD AND SOFT LINES)



## DIAGRAM D (LINE ROUTING REAR VIEW)





**CAUTION!!!** Never work on a hot vehicle. Serious injury in the form of burns can result if the vehicle has been in use. Allow vehicle to cool prior to installation. Always wear eye protection when working on or under any vehicle.

Note: The installation of the regulated fuel return will require a considerable amount of time. We estimate about 5-8 hours installation time. We highly recommend reading through the instructions thoroughly before starting the installation. Take proper precautions for spilt fuel during the installation.

**Step 1:** Disconnect batteries.

**Step 2:** Using a 13mm deep socket, remove the plastic engine cover. (Image 1)



Image 1

**Step 3:** Using a 1/2" breaker bar, remove the accessory/fan belt.

**Step 4:** Drain fuel filter bowl by opening the yellow drain valve located on the passenger rear of the filter bowl. (Image 2)

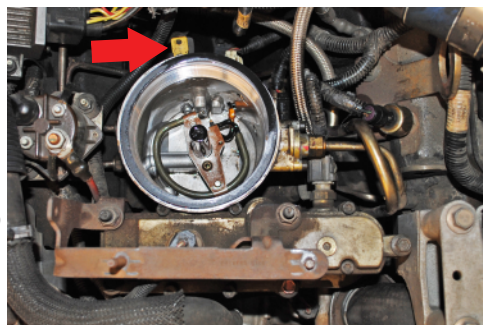


Image 2

Note: The image has the fuel filter cap removed. The fuel will drain out of a hard line under the motor behind the lower alternator. It is recommended to collect all of the fuel to minimize risk of fire.

**Step 5:** Remove the cap and filter from the filter bowl to ensure all of the fuel has been drained out.

**Step 6:** Using a 16mm wrench, disconnect the fuel return line. Then using a 19mm wrench, disconnect the fuel supply line. (Image 3)

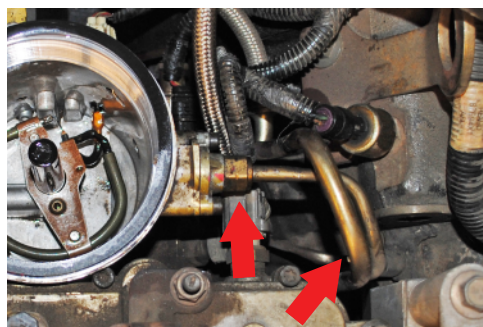


Image 3

**Step 7:** Using a 9/16" wrench, disconnect the fuel lines on the passenger side of the fuel bowl. Then using a 13mm wrench, loosen the two bolts securing the fuel filter bowl to the engine. The bolts are located in the front the engine. Disconnect the electrical connector and remove the fuel bowl. (Image 4)

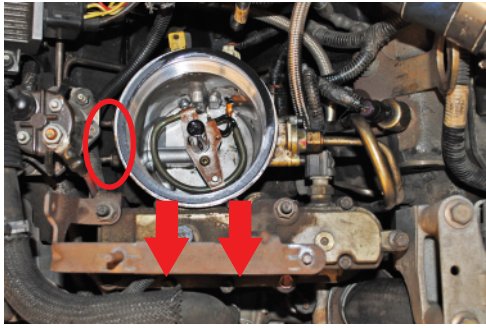


Image 4

**Step 8:** Carefully disconnect the two air vacuum lines; one is circled in image five. The other goes to the intake tube. (Image 5)



Image 5

**Step 9:** Using a 8mm wrench, remove the PCV mount bolts. Then remove the air intake tubes. (Image 6)



Image 6

**Step 10:** Using a 11mm deep socket, loosen and turn the passenger side charge pipe up and out of the way. It is recommended to plug the hole with a clean rag to keep debris out. (Image 7)



Image 7



**Step 11:** Using a 10mm wrench, disconnect the alternator wire. Then use a 13mm socket to remove the alternator secured by three bolts. (Image 8)



Image 8

**Step 12:** Cut the zip tie securing the radiator hose in place on the driver side. Then using a 13mm socket, remove the four bolts securing the alternator bracket to the motor. (Image 9)



Image 9

**Step 13:** Remove the two electrical connectors to the air conditioner pump. Then using a 10mm socket, remove the four bolts securing the pump to the motor. Move the pump up and out of the way. (Image 10)



Image 10

**Step 14:** Using a 13mm wrench and a quick connect tool, remove the bolt securing the fuel supply/return hard lines on the driver front of the motor. Then disconnect the hard lines from the quick connect fittings and remove. (Image 11)



Image 11

**Step 15:** Using 5/8" combination wrench and provided NPT plug tool, remove the two 1/8" NPT plugs. The plugs are located on the top of the motor; one at the driver rear behind the turbo and one at the passenger front to the right of the AC pump bracket. (Image 12)

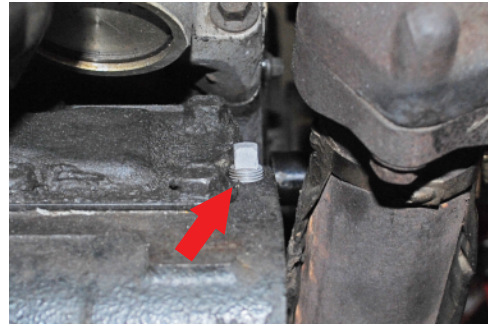


Image 12

**Step 16:** Using 9/16" and 1/2" wrenches, disconnect and remove the hard lines that supply the engine with fuel. Also remove the check valves on the motor that the hard line connected to. The fuel bowl drain line may be left on the motor. (Image 13)

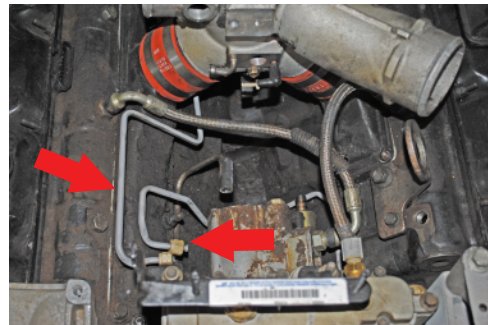


Image 13

Note: Many of the images have parts such as the charge pipes and electronic components removed. This is for visual assistance of the installation instructions.

**Step 17:** Using a 13mm combination wrench and 10mm deep socket, loosen the Up-pipes going to the turbo by loosening the clamps bolted to the exhaust manifolds. Then using a 11mm socket, loosen the V-Band Clamp so that the up-pipes can be tipped back against the fire wall. (Image 14)

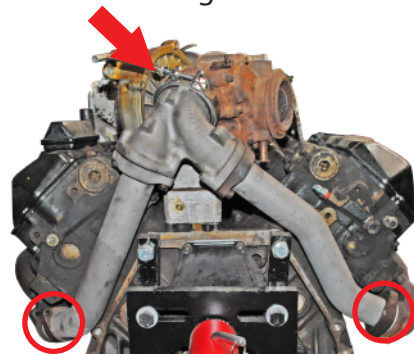


Image 14

**Step 18:** Install the angled 45° 1/8" NPT-6 JIC fitting to the driver rear fuel port. Tighten the fitting so that the male flare connection is pointing up and slightly forward so the braided line can be connected to it. (Image 15)



Image 15

**Step 19:** Install the straight 0° 1/8" NPT-6 JIC fitting to the passenger rear fuel port. (Image 16)



Image 16

**Step 20:** Install straight 0° 1/8" NPT-6 JIC fitting and braided line to the driver front fuel port. (Image 17 and Diagrams A&B)

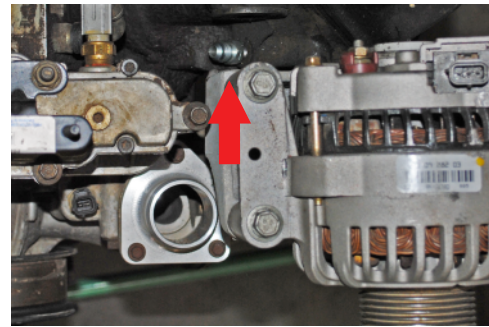


Image 17

**Step 21:** Install the angled 45° 1/8" NPT-6 JIC fitting to the passenger front fuel port of the motor. Tighten the fitting so that the male flare connection is pointing up so the braided line can be connected to it. Also connect the stainless braided line to the fitting. (Image 18 and Diagrams A&B)

**Warning:** The stainless braided line is very abrasive. We recommend covering it all with the provided protective loom.

**Step 22:** Install the driver rear soft line to the JIC fitting previously installed to the driver rear fuel port. (See Diagram C&D)

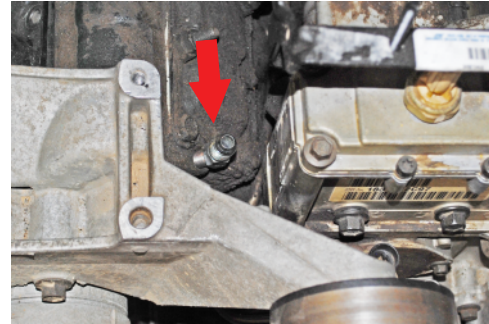


Image 18

**Step 23:** Install the passenger rear soft line to the JIC fitting previously installed to the passenger rear fuel port. (See Diagram C&D)

Note: The braided line will be routed under the charge pipes.

**Step 24:** Using the supplied 3/8" bolts and lock washers, mount the filter block to the filter bracket. (Image 19)

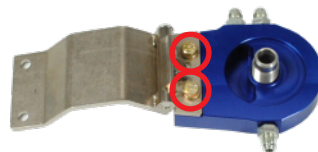


Image 19



**Step 25:** Using the supplied M10 nuts and 15mm socket, mount the filter bracket with the filter block to the factory fuel bowl mounting bolts toward the front of the engine. (Image 18)



Image 18

**Step 26:** Place the stainless braided supply line down through the passageway on the motor. This is where the factory supply and return hard lines ran through. Connect the 90° flare connection to the in port on the Sinister fuel filter block. (Circled In Image 18)

**Step 27:** Connect the driver front braided line to the filter block making sure the 45° fitting is curving toward the front of the motor. Position the line so that it curves around as shown in diagram B. Tighten both fittings on the line while keeping it oriented in the correct position.

**Step 27**

Note: Do not install the fuel pressure gauge until step 31 is complete.

**Step 28:** Re-install the alternator bracket to the motor with the four factory bolts. Also mount the alternator only using one mounting bolt on the driver side to hold it in place.

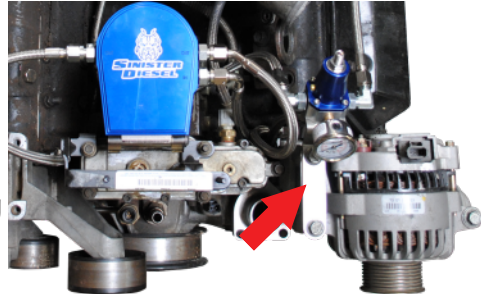


Image 20

**Step 29:** Using the remaining two alternator bolts. Install the fuel regulator and bracket onto the alternator. (Image 20)

**Step 30:** Place the stainless braided fuel return line down along the supply line. Connect the flare fitting to the bottom of the regulator. (Image 21)

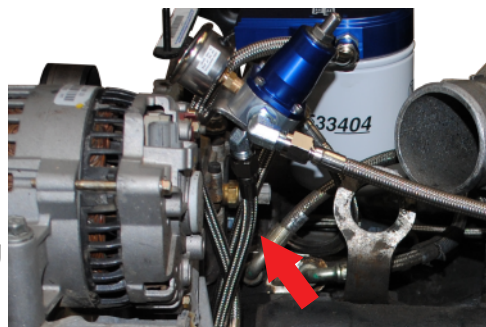


Image 21

**Step 31:** Connect the stainless braided lines coming from the rear fuel ports and connect them to the fittings on the side of the regulator. Also install the fuel pressure gauge onto the regulator. (See Diagram D)

**Step 32:** Connect the stainless braided lines coming off the front fuel ports and connect them to the filter block; the ports are marked OUT. (See Diagram B)

**Step 33:** Lubricate and connect the quick connect fittings that were previously ran to the driver bottom of the motor. The new lines will connect to the fittings that the factory hard lines were removed from. Make sure they are connected properly and the keepers are clipped in place. (Image 22)

Note: We recommend a petroleum based lubricant be used for the quick connect fittings.

**Step 34:** Prefill the supplied fuel filter with diesel fuel, and install the filter onto the filter block. (Image 23)

Note: The bracket for the filter block has a locking hinge for easy filter installation and replacement. Tighten the allen bolt to lock the hinge in place.

**Step 35:** Install the oil filled fuel pressure gauge onto the front of the fuel pressure regulator. (Image 24)

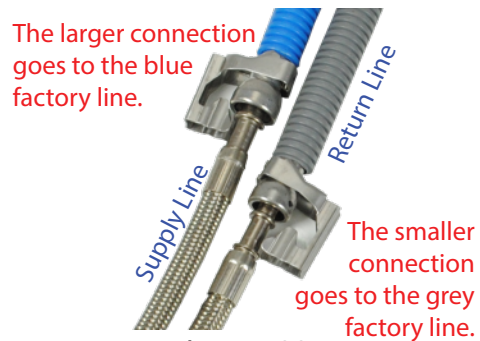


Image 22

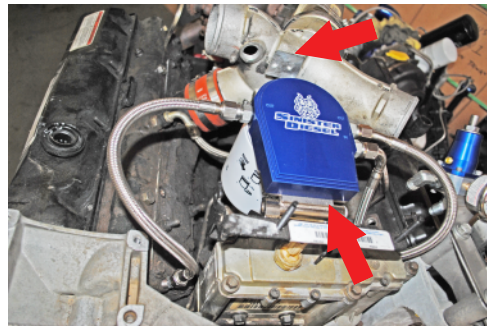


Image 23



Image 24

**Step 36:** Double check all of your fuel lines are properly tightened.

**Step 37:** Re-install the removed parts following steps 1-12 in reverse order. Disregard steps 4-7 as these parts will no longer be necessary.

Warning: Do not crank the motor until step 39 is complete.

**Step 38:** While checking for leaks, purge the fuel line by having someone turn the key to the on position for ten seconds then turn the key off. Repeat this process until you don't hear any air in the system.

Warning: Cycling the fuel with a glow plug out may overload the wiring harness.

**Step 39:** Check to see that the fuel pressure is set to 65-70psi. The adjustment screw on top of the regulator controls fuel pressure. Check pressure while someone turns the key on and off as in the previous step. Be sure to tighten the locking nut after fuel pressure is set. (Image 25)

**Step 40:** Check and adjust fuel pressure with the engine at operating temp. Your Sinister regulated fuel return is now complete.

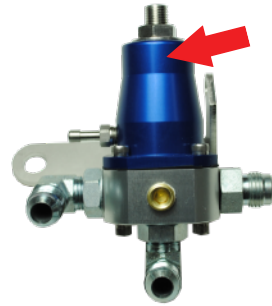


Image 25

Warning: Due to the harsh environment of the engine bay, we ask that the fuel pressure gauge only be used for temporary pressure checks and adjustments. Because of the engine bay conditions, Sinister Diesel cannot warranty pressure gauge malfunctions. We recommend the installation of an in cab fuel pressure gauge also available at Sinister Diesel.

Be sure to check the system after the first couple drives to ensure there are no fuel leaks. Also the braided stainless soft lines are highly abrasive. Please cover any areas with the supplied wire loom that may come in contact with any hoses or wires.

SD-FUELREG-7.3

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