

# SINISTER DIESEL



Ford 6.0L Powerstroke  
Regulated Fuel Return



## WARNING REGARDING EMISSIONS LAWS

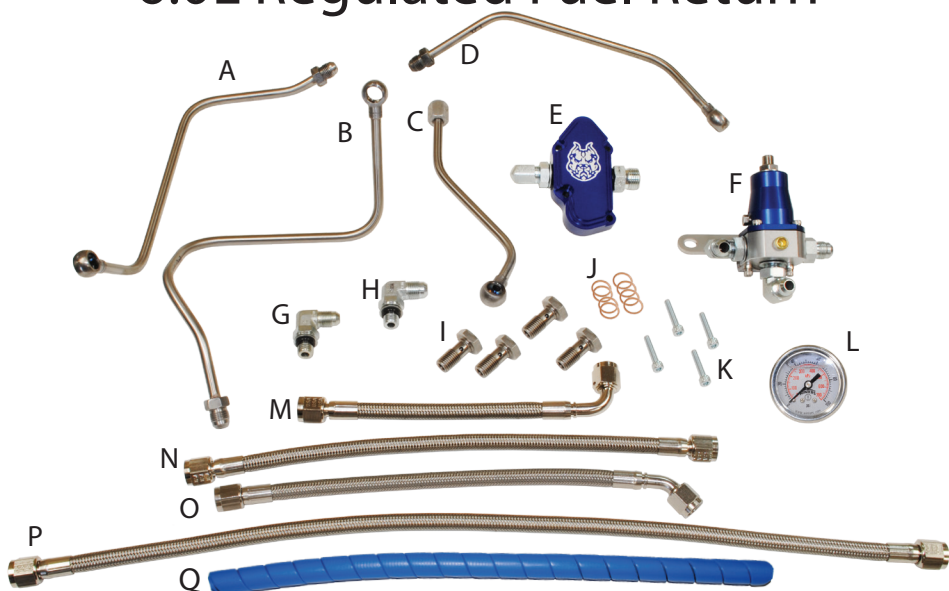
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# 6.0L Regulated Fuel Return



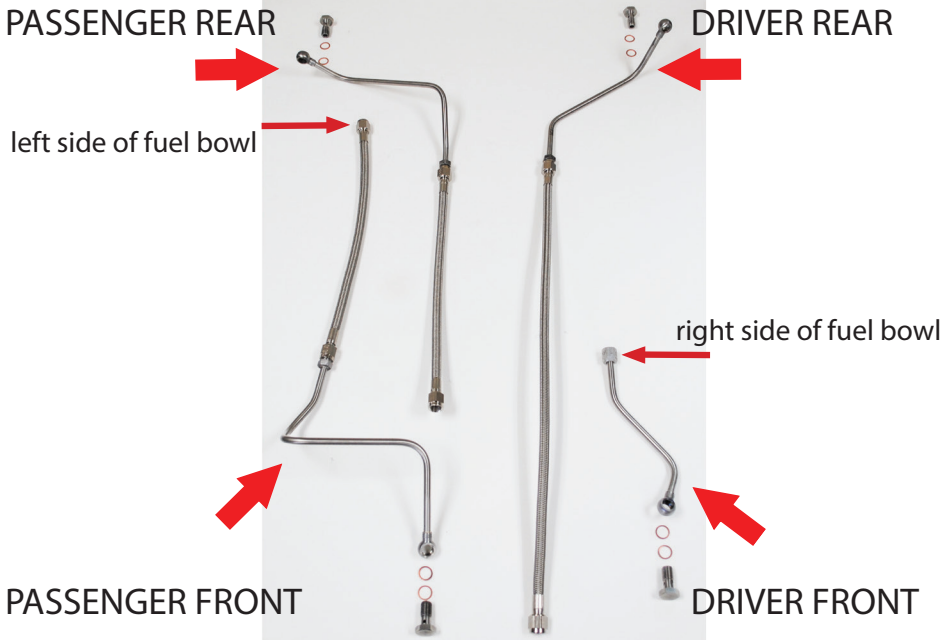
## PACKING LIST:

<u>PART#</u>	<u>QTY.</u>	<u>Description</u>
A	1	Passenger Rear Hard Line
B	1	Passenger Front Hard Line
C	1	Driver Front Hard Line
D	1	Driver Rear Hard Line
E	1	Bypass Block w/ Two fittings and #111 O-ring
F	1	Fuel Regulator w/ Three fittings and Bracket
G	1	12mm-05 90° JIC Fitting (Smaller Threads)
H	1	12mm-06 90° JIC Fitting (Larger Threads)
I	4	Banjo Bolts
J	8	Copper Crush Washers
K	4	M5 Allen Bolts
L	1	100 PSI Fuel Pressure Gauge
M	1	8 3/4 Inch Soft Line w/ One 90° Fitting
N	1	14 Inch Soft Line
O	1	13" Soft Line w/ One 45° Fitting
P	1	25 1/4 Inch Soft Line
Q	1	1Ft. Blue Fuel Line cover

***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



## DIAGRAM B

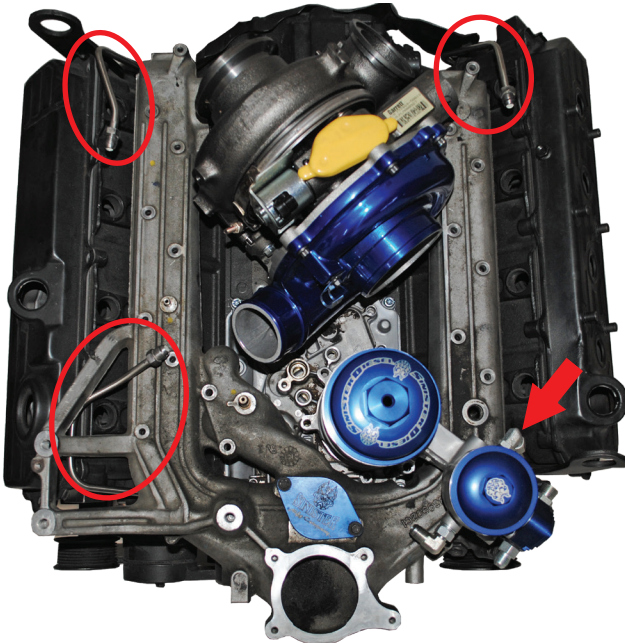
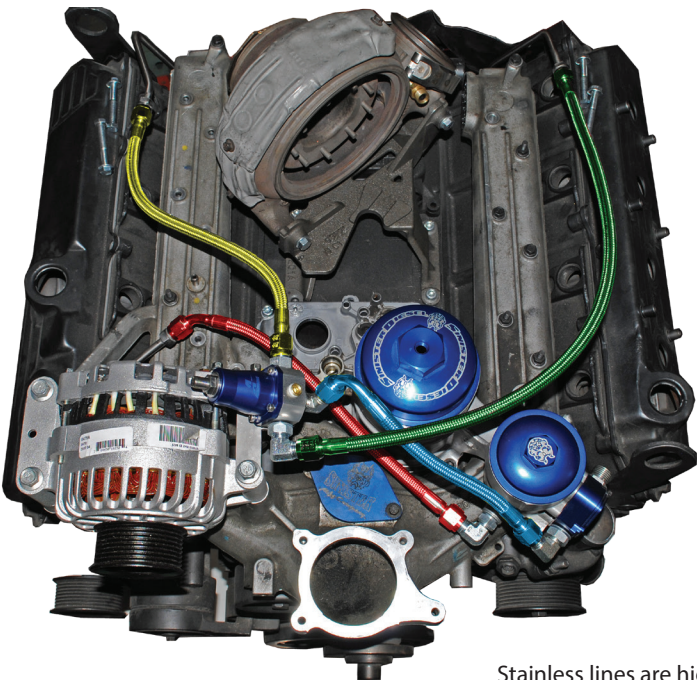




DIAGRAM C (REAR VIEW OF MOTOR)



DIAGRAM D (SOFT LINE ROUTING)



Stainless lines are highlighted  
for visual assistance.



**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 8-12 hours installation time. We highly recommend reading through the instructions thoroughly before starting the installation. During certain steps it will be very helpful to have a helper to install some of the parts. Take proper precautions for spilt fuel during the installation.

Step 1: Disconnect batteries.

Step 2: From under the truck spray Y-pipe to manifold bolts with penetrating fluid on driver and passenger side. (Image 1)



Image 1

Step 3: Drain two to three gallons of coolant. There is a petcock valve on the bottom rear driver side of the radiator to drain the coolant from.

Step 4: Disconnect three coolant lines on the degas bottle(radiator overflow tank). Use 8mm socket to remove the degas bottle. It is secured by two bolts near the firewall. (Image 2)

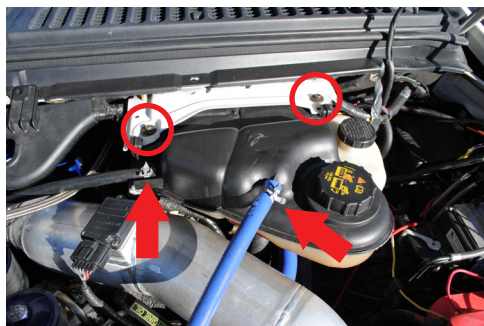


Image 2

Step 5: Disconnect the mass air flow sensor. Your vehicle may also be equipped with an air filter sensor which will also need to be disconnected. (Image 3)

Step 6: Using a 8mm nut driver, loosen hose clamps to remove the air filter box and plumbing to the turbo intake.

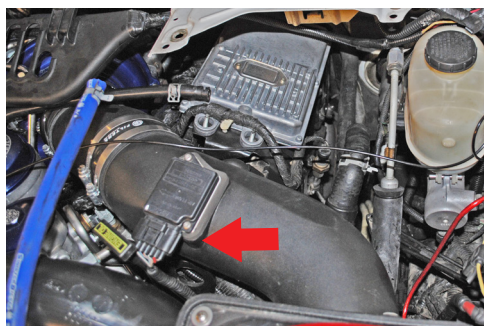


Image 3

Step 7: Using a flat head screw driver, remove the fan shroud. Pulling forward on the rubber trim will reveal where the fan shroud needs to be pried from for removal. (Image 4)

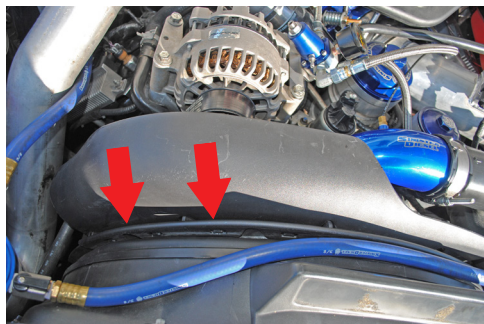


Image 4

Step 8: Using 11mm socket, remove both intercooler charge pipes. (Image 5)

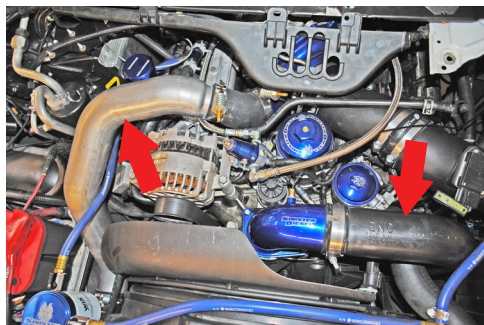


Image 5

Step 9: Remove the intake elbow on the intake manifold. Plug the hole with a clean rag to keep debris out. (Image 6)



Image 6

Step 10: Remove the fuel filter cap, fuel filter and empty all of the fuel in the filter bowl. (Image 7)

Step 11: If your vehicle is equipped with dual alternators you must remove the lower alternator and mounting bracket.

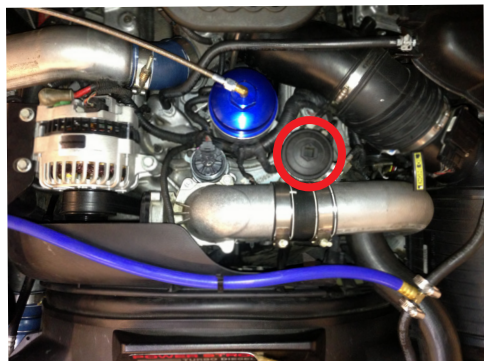


Image 7



Step 12: Disconnect all four of the fuel connections on the filter bowl. (Image 8)

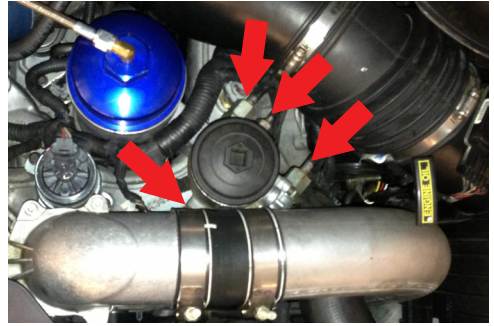


Image 8

Step 13: Remove both front passenger and driver side banjo bolts then remove the fuel lines. The passenger side fuel line is secured with a 10mm wrench size bolt and will have to be cut in the middle to remove it. Be sure the seals are not stuck to the engine block. (Image 9)

**Warning double stacking seals will cause a leak in the fuel system.**

Note: If using a die grinder to cut the passenger fuel line be sure to cover the hole on the engine with tape to keep debris out of the fuel system.



Image 9

Step 14: Install the 90° fittings to the fuel filter bowl hand tight. The 12mm-05 will go on the right side to replace the driver side hard line. The 12mm-06 will go on the left side. (See Diagrams A&B)

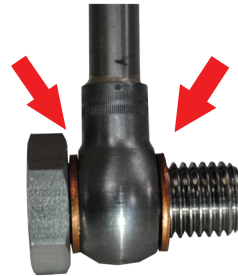


Image 10

Step 15: Install the hard line banjo fitting to the front driver side of the motor loosely with copper crush washers on each side of the banjo fitting. The mating surfaces of the 90° fitting and the hard line may have to be joined at an angle or tilted off center and then twisted and tipped into place. The flare nut should be hand tight for now. Torque the banjo bolt to factory specifications. (Image 10 & 11)



Image 11

Step 16: Install the passenger side hard line to the motor. The line will weave around the bottom and through the alternator mount. Torque the banjo bolt to factory specifications. (Image 11)

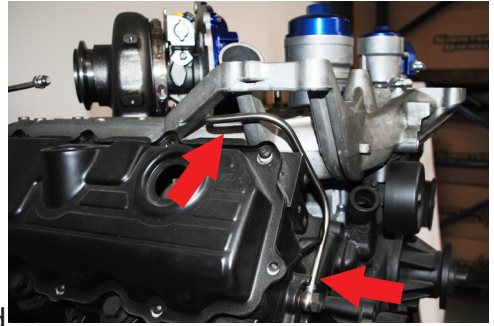


Image 11

Step 17: Install the 13inch Soft line to connect the front passenger hard line to the 90° fitting on the left side of the fuel bowl hand tight. With the 90° fittings on the fuel bowl in the correct orientation, tighten the jam nuts on both fuel lines then tighten the rest of the fittings. (Image 12)

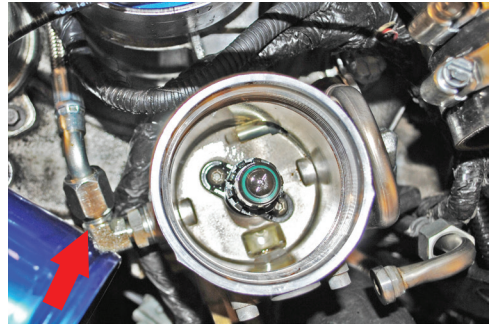


Image 12

Step 18) Using a 10 mm and 8mm wrench remove the Fuel Injection Control Module located on the driver side on top of the motor. There are two bolts in front of the unit and two bolts at the rear of the unit. Disconnect the three wiring harnesses connected underneath the unit. (Image 13)

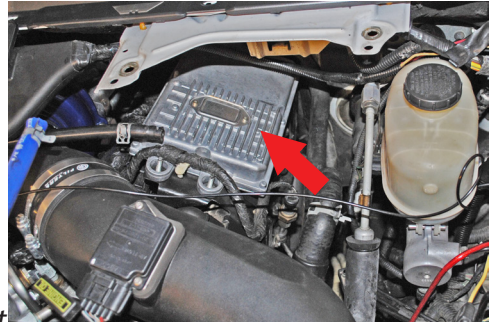


Image 13

*Note: Be sure to keep the plugs in order to reconnect them in the correct places during re-installation.*

Step 19: Using 11mm wrench loosen the V-band clamp to disconnect the Y-pipe from behind the turbo. Also loosen the four bolts securing the Y-pipe to the exhaust manifolds. They do not have to be removed but loosened enough to tilt the Y-pipe back up against the fire wall. (Image 14& 15)



Image 14

*Note: Some of these bolts are easily accessed through the front fender wells. It may help to cut a small hole in the fender liner to fit a socket and extension through.*

Step 20: Using a 6mm allen wrench remove the two fuel plugs behind the engine on the heads. The plugs on the back are located in the same spot as the banjo fittings in the front. Be sure the allen wrench is seated properly in the plug to prevent stripping them out. (See Diagram C)

Tip: You can use a combination wrench to get extra leverage to remove the plugs. (Image 16)

*Note: Fuel will drain out during the removal of the plugs please take the proper precautions accordingly. Be sure the O-ring seals are removed from the engine. Double stacking seals will cause a fuel leak. (Image 17)*

Step 21: Install the hard lines with banjo bolt using a  $\frac{3}{4}$ " wrench. Be sure you place a copper crush washer on each side of the banjo fittings. It makes it much easier if you have one person guide the hard line down from up above while the other person installs the banjo bolt from below. Tighten the banjo bolts to factory torque specification with  $\frac{3}{4}$ " wrench from above the engine. (Image 18)



Image 15



Image 16



Image 17

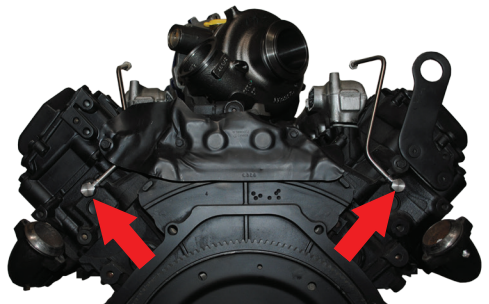


Image 18



Step 22: Install the soft lines to the rear hard lines previously installed. (Diagram D)

Step 23: Re-install the Fuel Injection Control Module. The 8mm wrench size bolts go in the back near the firewall. 10mm wrench size bolts go in the front of the unit.



Image 19

Step 24: Re-install the Y-pipe by securing the turbo side with the V-band clamp. Then secure the flanges to the exhaust manifolds.

### **Now you will install the Sinister Fuel Regulator Bypass Block.**

Step 25: Using a T-27 Torx bit remove the factory fuel regulator cover. After removing the cover make sure you remove the spring and the brass regulator plug with the rubber seal. (Image 19 & 20)



Image 20

Step 26: Reuse the O-ring from the factory regulator cover. Also install the #111 O-ring provided in the kit. Using the provided M5 hardware mount the bypass block on to the fuel bowl. (Image 21 & 22)

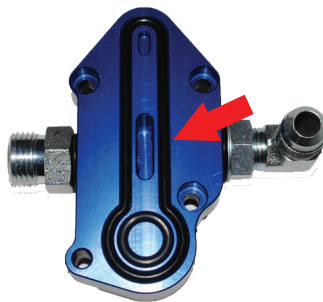


Image 21

Step 27: Reconnect the factory fuel return line to the right side of the fuel bypass block. (Image 22)



Image 22

Step 28: Install two 90° adapter fittings on the left side and bottom of the fuel regulator hand tight. Install and tighten the straight fitting on the right of the regulator. Install the mounting bracket to the Sinister Fuel Regulator. The orientation of the fittings will be set once the soft lines are connected.

(Image 23)



Image 23

Step 29: Mount the fuel regulator next to the alternator. Using a 13mm socket remove the mounting bolt on the driver side of the alternator. Using a 8mm socket remove the casing bolt on the rear driver side of the alternator. Put the Fuel regulator in place and re-install the two bolts. (Image 24)

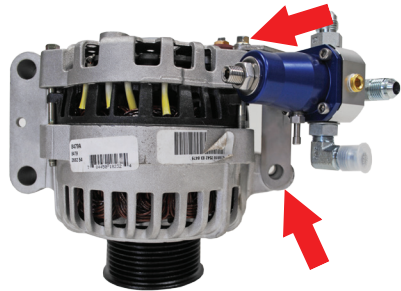


Image 24

Step 30: Install the rear soft lines to the regulator hand tight. The passenger rear soft line will go to the fitting on the right side of the fuel regulator. The driver rear soft line will go to the fitting on the left side of the fuel regulator. The remaining soft line will route from the bottom of the regulator to the fitting on the left side of the bypass block that was installed in step 26. (See Diagram D)

Step 31: Using a 17mm and 14mm wrench tighten all of the 90° fittings on the fuel regulator. Then Tighten the soft lines using 11/16" wrench.



Step 32: Install the oil filled fuel pressure gauge onto the front of the fuel pressure regulator.  
(Image 25)



Image 25

Step 33: Double check all of your fuel line are properly tightened.

Step 34: Re-install the removed parts following steps 1-8 in reverse order.

Step 35: On top of the fuel regulator loosen the adjustment screw till there is no spring tension then tighten it two or three turns.  
(Image 26)

**Warning: Do not crank the motor until step 38.**

**Warning: Due to the harsh enviroment 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.**

Step 36: 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 ten times to flush the air out of the fuel system.

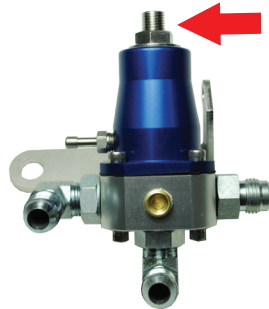


Image 26

Step 37: Set the fuel pressure to 65-70psi by tightening the adjustment screw while some one turns the key on and off as in the previous step. Be sure to tighten the locking nut after fuel pressure is set.

Step 38: Check and adjust fuel pressure with the engine at operating temp. Your Sinister regulated fuel return is now complete.

**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.**



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