

Installation Manual
FUEL BOSS Mechanical LP
P/N FB-03045



2003 – 2004.5 DODGE CUMMINS

“FUEL BOSS”

Mechanical Lift Pump System

Installation Instructions
Fuel Boss LP System p/n FB-03045

PLEASE READ ALL INSTRUCTIONS BEFORE BEGINNING INSTALLATION

WARNING!!!

Improper installation of the bypass valve can cause extreme fuel pressure and fuel system damage!!!

Installation of the Fuel Boss is quite simple if the guidelines are followed. However, due to the extreme pressure and flow capabilities of the Fuel Boss Pump the installation of the bypass valve in the correct direction is critical. If installed in the reverse direction the bypass valve will not be able to open causing the fuel pump to build maximum pressure. This will cause damage to the fuel filter lid and fuel lines.

We do not recommend running this system without a fuel pressure gauge to monitor fuel pressures.

Kit p/n number FB-03045 is for installation on 2003 thru 2004.5 Cummins powered Dodge Rams. If the part number on the installation manual and the package you received do not agree or apply to your vehicle please contact us immediately.

Safety Guidelines!

WARNING! Always secure the vehicle from rolling.

WARNING! Always disconnect vehicle batteries before working on electrical components.

WARNING! Always wear safety glasses when operating power tools such as drills and grinders or using punches and chisels.

WARNING! Always properly secure fuel lines and wiring to prevent chaffing.

WARNING! Always have a fire extinguisher available when working with fuel systems.

WORK SAFELY!

FUEL BOSS Kit Contents



1/4" MPT Plug



1/4" MPT x 3/8"



-an 6 x 3/8" 90°



9ea. JIC x 3/8"
PushLok



2ea. JIC Tee's



GDP Bypass Valve



JIC to 1/4" MPT



JIC to 1/4" MPT 90°



GDP Check Valve



2ea. FPT to 3/8"
PushLok



Pump Mount and
Slider Assembly



M8 x 45MM Allen
Head Pan Bolts



FB-1000 Pump and
Dust Shield



Crankshaft Adapter



24T -12T Pulley &
Belt Set



25' Parker PushLok



Return Manifold



2ea. 1-1/2" Clamps



3ea. 3/8" Clamps



Lift Pump Adapter and Bolts



Adjustable Hobbs Pressure Switch



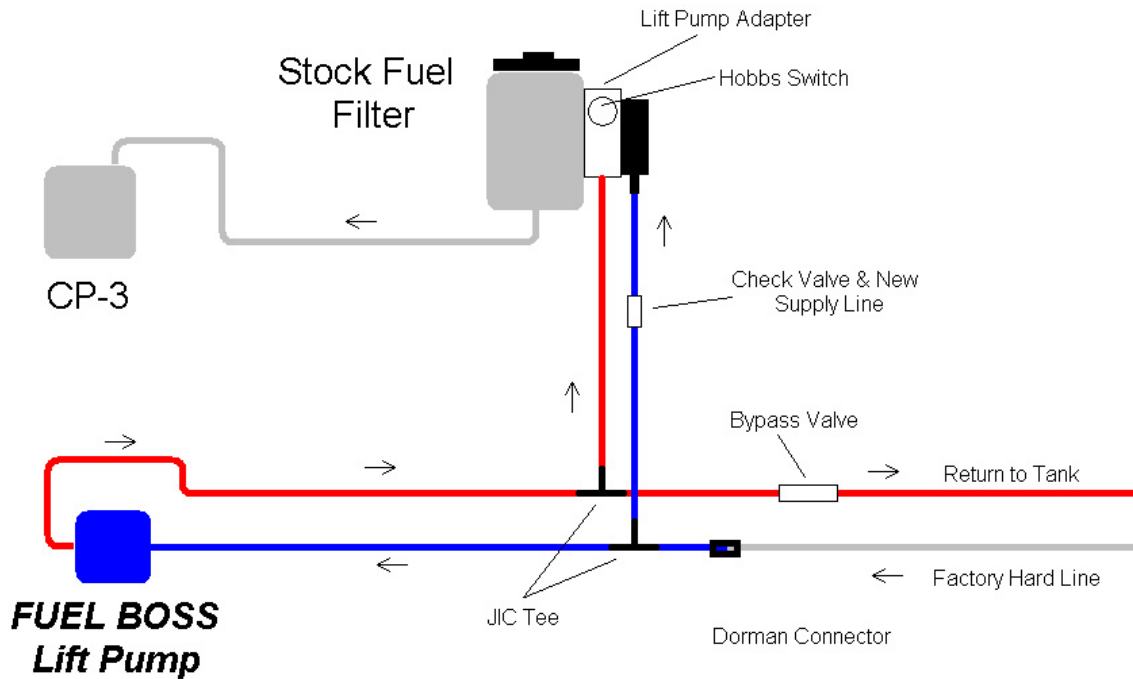
Hobbs Trigger Harness



2ea LP Adapter O-rings

Please check your parts inventory against the above parts list before beginning your installation.

FUEL BOSS HOSE ROUTING & VALVE PLACEMENT



Preparation

- 1) Secure vehicle from rolling.
- 2) Disconnect both batteries.
- 3) Raise vehicle and support safely.
- 4) Drain fuel filter housing into an approved container via the water/fuel separator.
- 5) Remove the fuel feed line from the top of the sending unit at the fuel tank to eliminate siphoning when the hard line is disconnected for installation of the new pump.

Return Manifold Installation

- 6) Remove the fuel filler hose from the vehicle and mark a reference line for re-alignment on the hose. Remove 1" of the fill hose from the area shown in the picture and replace it with the return manifold.
- 7) Position the cut ends of the fuel fill hose 1" apart with your marks aligned. Orient the manifold with the 3/8" connection towards the front of the vehicle and secure with the supplied clamps.
- 8) Reinstall the fuel fill hose and return manifold assembly.



FUEL BOSS Pump & Drive Installation

- 9) Using a 15mm socket, break loose the 4 harmonic balancer bolts but leave the bolts installed.

Note: If you are unable to loosen the bolts you may need to hold the front of alternator with a 22mm or 7/8" inch socket to help prevent the crank from rotating. Another way to break bolts free is to use a breaker bar and a dead blow hammer.

- 10) Remove the 2 bolts in the center front position of the oil pan and thoroughly clean the bottom front lip of oil pan to ensure it is oil and dirt free.

- 11) Install the Fuel Boss pump mounting bracket with the 2 supplied black Allen cap screws. Be sure to get both cap screws equally and fully threaded and snug lightly. Now, remove one cap screw at a time, thoroughly clean any oil off of the threads and apply RTV sealant to the threads. Reinstall cap screw and torque. Repeat this procedure for other cap screw as well. Recommended torque is 15-18 foot-pounds.
- 12) Remove the 4 harmonic balancer bolts.

Caution: When bolts are removed the harmonic balancer could slide off of crank.

- 13) Install the crankshaft adapter with harmonic balancer bolts and be sure to get all 4 bolts fully threaded before any torque is applied. Torque on harmonic balancer bolts is 92 foot pounds. As mentioned above it maybe necessary to hold alternator pulley nut with 22mm or 7/8" socket to prevent the crank from rotating while each bolt is brought up to torque.
- 14) Install the smaller 12 tooth pulley with the Allen set screws. The end of the hub shaft and the pulley need to be flush before tightening the set screws.

We strongly recommend the use of Loctite on the Allen set screws of BOTH pulleys.

- 15) Install large 24 tooth pulley on Fuel Boss pump. Ensure that **neither** Allen is aligned with flat of pump drive shaft but on the rounded portion. The end of the pump shaft and the pulley need to be flush before tightening the set screws.
- 16) **Setting Belt Tension:** Slide pump to center under the harmonic balancer. Install the timing belt around small pulley then around large pulley. Adjust the pump so that there is JUST ENOUGH tension to keep the belt teeth engaged. Proper tension for the belt is **LOOSE**. While this may seem odd, this is a cogged timing belt and requires **zero** tension to stay engaged. Grab the pulley on the pump and rotate it to place tension on one side of the belt. There should be a loose bow to the non-tension side of the belt. If in doubt, looser is better!

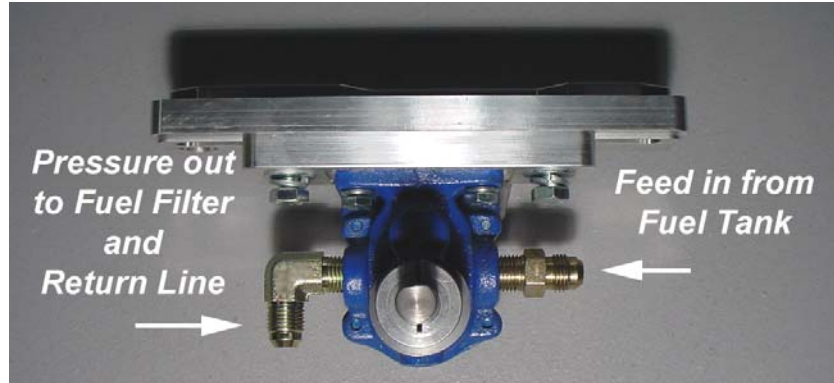
Any tension on the belt will cause early pump wear and seal failure. Pumps that show shaft wear from over tension will not be covered under warranty.

- 17) Tighten the two bolts that are outside of the pump on the pump slide bracket.

DO NOT START ENGINE WITH PLUGS IN THE FUEL BOSS PUMP AND BELT HOOKED UP! PUMP DAMAGE WILL OCUUR!

LINE KIT MUST BE INSTALLED PRIOR TO STARTING ENGINE WHEN FUEL BOSS PUMP BELT IS HOOKED UP!

- 18) Prepare the pump for line connection. Install the 90 degree 1/4" pipe to JIC adapter in the passenger side of the pump using thread tape or pipe sealant. Tighten the fitting so that the JIC end points down or to the rear of the truck. Install the straight 1/4" pipe to JIC adapter in the driver side of the pump using thread tape or sealant and tighten. The straight adapter will be your fuel inlet.



Filter Adapter

- 19) Prepare the aluminum lift pump adapter by installing the 1/4" brass plug in the top of the adapter and tighten. Thread tape or sealant should be used on this fitting. Install the 1/4 MPT x 3/8" PushLok fitting in the bottom of the adapter and tighten. Again, use thread tape or sealant on this fitting and do not over tighten.

- 20) Install the Hobbs switch in the side of the lift pump adapter using thread sealant and tighten.
- 21) Install the new O-ring supplied on the filter side of the adapter and lubricate lightly. Your completed adapter should appear as shown.



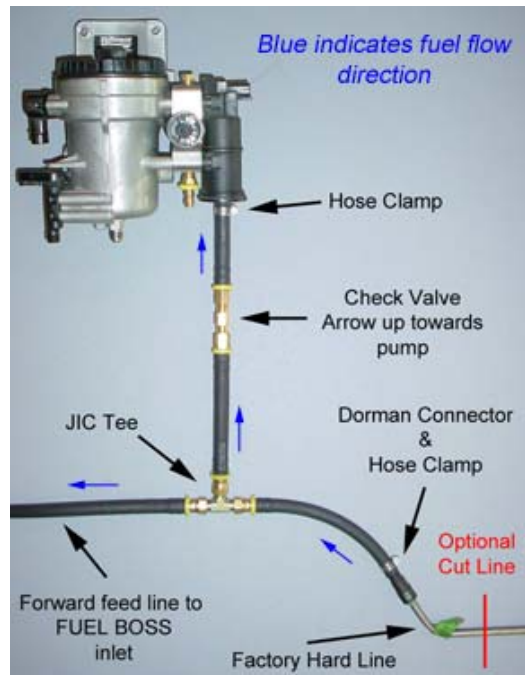
- 22) Have a drain pan ready. From under the vehicle disconnect the lift pump feed line from the end of the stock hard line by squeezing in on the connector release tabs and pulling away from the hard line towards the front of the truck.
- 23) Locate the factory lift pump on the back of the filter housing. Unplug the factory electrical harness connection from the rear of the stock lift pump and remove the four 5mm socket head mounting screws.
- 24) Carefully remove the stock lift pump. Make sure that the stock O-ring hasn't been left in the filter port. Remove the factory nylon supply line from the pump inlet by splitting the line with a utility knife. Save the line and connector for later use.
- 25) Position the new adapter onto the filter housing with the barbed fitting facing down. Press the adapter into the housing using a gentle rocking motion to fully seat the adapter. Position the factory lift pump onto the adapter using a gentle rocking

motion to fully seat the pump. You should be able to fully seat the adapter and pump using mild hand force.

- 26) Ensure that the adapter and pump are flat on the filter housing. Install using the four supplied M6 x 45MM Allen head bolts supplied and tighten to 60 inch lbs.

Pump Supply Lines Installation

Supply line overview: *The new line will go from the factory hard line to a JIC Tee. From here one short supply line will go from the top of the Tee up to the stock lift pump and have the one way check valve in it. The other line will go forward and connect to the driver's side inlet of the new FUEL BOSS lift pump.*



- 27) Locate the flexible line removed from the factory pump in step 24. Carefully remove the Dorman connector from this line by splitting the line with a utility knife. The Dorman connector will be reused to connect the new supply line to the stock hard line.
- 28) Measure out a short piece of new fuel hose to go from the factory hard line on the frame rail to a point just underneath the stock lift pump inlet. Cut the hose and install a female JIC PushLok in the end of this line. Attach this fitting to one leg of the JIC Tee.
Option 1) Install the factory Dorman connector in the other end of the hose and secure with one of the supplied hose clamps. The line may be bent down slightly to achieve a better angle. Be careful not to kink the hard line.
Option 2) The hard line can be cut back to a level area and the hose clamped directly onto the end for the best overall hose alignment (optional cut location shown in the above picture).
- 29) (If option 2 is used skip this step.) Attach the Dorman connector to the factory hard supply line making sure to push the Dorman all the way on. The Dorman connector must engage both plastic locking tabs on the retainer clip.
- 30) Assemble the check valve using the supplied female pipe thread to PushLok fittings.
- 31) Build a new supply line to go from the top of the JIC Tee to the bottom of the stock lift pump using one of the female JIC to PushLok fittings in one end and the check valve in the center with the arrow pointing to the stock lift pump inlet. (Refer to

photo on page 8). Make the connection at the top leg of the tee and the bottom of the factory lift pump using one of the supplied hose clamps as shown in the sample routing photo.

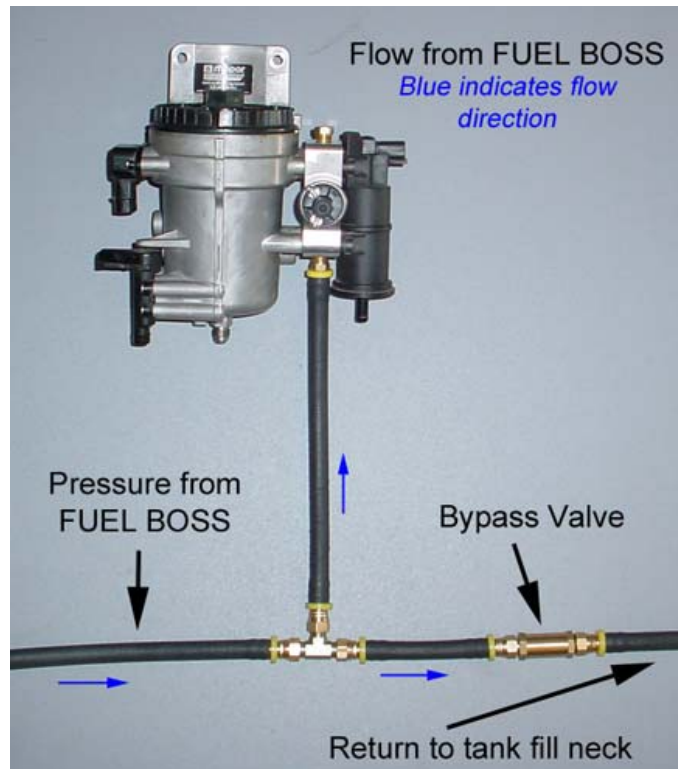
Make sure that the arrow on the check valve faces in the direction of flow and up towards the stock lift pump. Failure to do this will result in low fuel pressure.

- 32) Build the last supply line for the FUEL BOSS using two of the supplied female JIC swivel fittings and a length of the supplied PushLok hose. This line will go from the remaining leg of the JIC Tee forward to the driver's side of the FUEL BOSS (inlet).
- 33) Connect this supply line to the JIC Tee and tighten. Make the connection at the driver side of the FUEL BOSS pump (inlet) and tighten.

Pressure & Return Line Installation

Pressure Line Overview: *In this section you will install the pressure and return line with bypass valve. A hose routing sample is shown at the right.*

- 34) Install a 90° PushLok connector into one end of the remaining hose. Connect this fitting to the passenger side (outlet) 90° JIC fitting of the FUEL BOSS pump. Route this hose all the way back to the nipple on the return manifold placed in the fuel filler neck and cut to length. Do not make the connection at the fill neck yet.



- 35) Make a single cut in this new pressure line straight below the lift pump adapter inlet as shown in the sample routing photo. Assemble and install the second JIC Tee combination with the top leg of the Tee pointing up towards the lift pump adapter inlet.
- 36) Create a new pressure line to go from the top leg of the pressure line Tee to the filter inlet using a female swivel PushLok fitting in one end. Make the connection from the top leg of the tee to PushLok fitting in the bottom of the aluminum lift pump adapter.

- 37) Now choose a location for installation of the bypass valve between the 3rd leg of the JIC Tee and the fuel tank fill neck.
- 38) Cut the return line, connect the bypass valve using one of the supplied female JIC to PushLok fittings and secure. There is a "T" stamped on the bypass valve body. The "T" marking must be towards the fill neck end of the return line.

WARNING!!! Bypass valve must be installed in the correct direction or fuel system damage will occur!

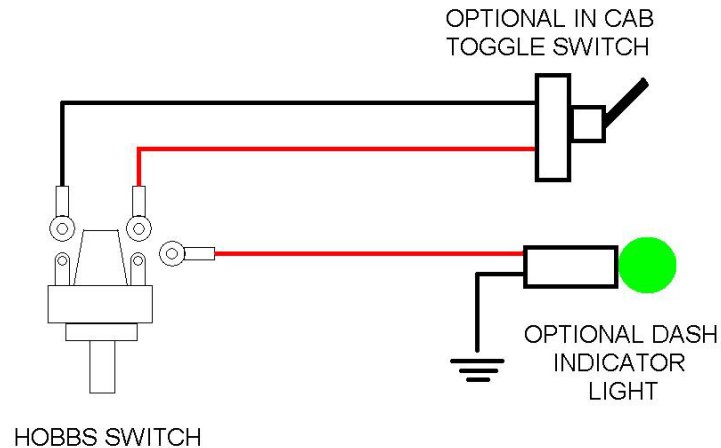
There are two ways to verify correct bypass valve orientation.

- A) The body is stamped with a "T" on the return to tank end.
 - B) Visually inspect the valve. You will be able to see the spring in the return to tank end of the valve and the face of the piston in the end that connects to the fuel filter side of the pressure return line.
- 39) Connect the remaining hose to the bypass valve using the supplied PushLok connector.
 - 40) Route the line up to the return manifold in the fill neck. Cut to length and secure using one of the supplied hose clamps. Your supply, pressure and return plumbing is now complete.

Hobbs Harness Installation

- 41) Locate the factory lift pump harness unplugged from the stock lift pump.
- 42) Plug the factory lift pump harness into the matching connector on the supplied Hobbs trigger harness.
- 43) Plug the other end of the new Hobbs trigger harness back in to the factory lift pump.
- 44) Attach the two wires with eyelets on the new trigger harness to the screw connection on the Hobbs switch. One wire is connected to each post on the Hobbs switch. It does not matter which wire goes to which post.
- 45) The Hobbs switch will turn your stock lift pump off as soon as the pressure from the FUEL BOSS is greater than the set point. This is usually achieved just a second or two after the vehicle is started.

Note: An in cab override switch can easily be added by the owner to allow the stock lift pump to run for longer periods for priming after filter changes as shown in the diagram below. You can also add a small dash light to show when the stock electric lift pump is running. Both are shown in the diagram below.



Finishing Up

- 46) Reconnect both batteries.
- 47) Secure all hoses and wiring using the supplied wire ties.
- 48) Prime the system three to four times to purge all air from the fuel system by turning the key to the run position and bumping the starter without allowing the engine to actually fire. The FUEL BOSS pump is shipped with a heavy oil in the gears to help pull initial prime.
- 49) Start the engine and verify fuel pressure. Fuel pressure may be erratic for a minute as the Fuel Boss pulls prime and purges air from the system.
- 50) Check all connections for leaks and make sure all wires and hoses are clear of moving parts.
- 51) Test drive the vehicle and enjoy.

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The Warranty is Limited to one (1) year from the date of sale and limited solely to the parts contained within the product's kit. The FB-1000 pump (Fuel Boss pump only) is covered for two (2) years from the date of sale. All products that are in question of Warranty must be returned shipping prepaid to the SELLER and must be accompanied by a dated proof of purchase receipt or invoice. All Warranty claims are subject to approval by Glacier Diesel Power.

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