**444fab Fuel System Instructions**

 **Superduty 99-03**

**Important Info**

**You must carefully read and understand these instructions beginning to end, there are many important details you may miss.** Before starting the install take the time to layout the whole system. Make sure you completely understand its install, operation and are fully equipped to finish the job. This install is recommended for advanced mechanics with knowledge in 7.3s and aftermarket fuel systems. Do not bring to local mechanics who have never installed a system like this before as you will likely get unsatisfactory results.

**Disclaimer:** For off-road use only unless permitted by law**. End user assumes all liability for this system.**

**Needed:** socket and wrech set, crow’s feet wrenches, needle nose vice grips, zip ties, wire strippers and crimpers, electrical tape, drill bit set, Dremel (97 trucks only), crash safety switch (inertia switch), fuel pressure gauge (budget kit), rtv sealant, brake clean, liquid Teflon based thread sealant rated for fuels and oil.

Use caution when working with all fuel system components. Never install components in such a way they will vibrate, rub or chafe on other parts. Double check all connections for leaks and re-tighten all flare connection after 1 week. Periodically check all lines for wear or leaks, service filters minimum every 10-20k miles depending on conditions and listen for abnormal pump and regulator operation.

**Replacement Parts**

Filters wix 3367 pre pump and 3528 post

Filter base wix 4770

Fuelab regulator 51502, rebuild kit 14602

Common pumps, walbro gsl392, bosch 69136

Lingo used in instructions you may not know:

Street fitting: Fitting with male on one side and female on the other (drivers rear brass fuel fitting)

JIC: 37\* flare connection (regulated return and premium pump unit hardline connections)

NPT: National pipe thread, tapered connection (Fittings into cylinder heads and filter bases)

For all npt (Pipe Thread) connections, thoroughly apply **liquid thread sealant** to the male threads filling the threads completely. All 1/8” npt connections are hand tightened plus 1-2 full turns. ½” npt is hand tight plus 2-3 full turns. **Don’t overtighten you could crack the head causing serious damage. Teflon tape is NOT recommended.**

Any connection using blue pushlok hose on a fitting with a **yellow ring** does not require a clamp. Simply lubricate the hose and push on the fitting until the yellow ring cannot be spun. For all other hose connections secure with provided clamps of appropriate size.

***Feel free to contact us at any point during the install with questions***

**Email:** **fueledby444fab@gmail.com** **subject: tech support “order number”**

**Please reference which step you are stuck on, include pictures if able**

**Regulated Return Install**

* Start by removing the fuel bowl and stock 1/4” lines at the two corners of the cylinder heads. Make sure to clean thoroughly around the fittings in the cyl head before removing to ensure no contaminants enter the fuel rails.
* Remove the factory 1/8 npt plugs at the drivers rear and passenger front of the cyl heads, 7mm square drive (needle nose vice grips work well). Soaking with some penetrating oil or heat may be necessary.
* **For early 1999 trucks** the up-pipes are extremely close to the cyl head making special attention needed for the next step. You must either grind material off the up-pipe collector and new brass 45, loosen the up-pipe v band, or pull the turbo to gain enough clearance to install the brass street 45\*. Late 99-03 will have enough clearance to just spin the new brass 45 in.
* **If you are using aftermarket intake plenums** that are much thicker than stock you may have a clearance issue with the brass 45, simply grind the brass fitting or plenum to fit.
* Install the brass 1/8 npt street 45\* in the drivers rear cyl head facing straight forward, followed by the jic 45\* facing to meet the new stainless line.
* **This fitting arrangement can be a difficult part of the kit. The angle of the 2 fittings greatly affects how the stainless lines will align. The brass 45 faces straight forward and the steel 45 is angled to meet the stainless line you will be installing next. Closeup is shown in included pictures. Be patient and contact us if you need help.**
* Install the straight jic fitting in the rear passenger cyl head.
* **Installing rear feed lines**. Remove the tee and barb fitting until both lines are in place. Lines are shipped with fittings on the correct ends, don’t install drivers line backwards, if you lose direction of drivers line the end that’s 4in from the bend goes rearward. Both passenger and drivers lines go between turbo pedestal and block underneath plenums as shown in pictures. It takes a little wiggling to get the drivers line up between pedestal and head, push up from underneath the pedestal with your left hand while moving the line rearward with your right hand. **Install passenger line into gap** between pedestal before connecting rear flare. **Do not** **install passenger line resting on corner of plenum**. If hardlines are not lining up they are either in thewrong position or the fittings are angled incorrectly, **never bend them to fit. See Pictures.** Make sure flares are lined up correctly with fittings.Connect front of feed lines to tee and then tighten all flare connections with a very firm snug using backup wrenches.
* Install both front jic 45\* into cylinder heads. These will face up and rear ward however the final angle will need to be adjusted to meet the stainless lines. Drivers front accessory bracket must be loosened or removed to gain access to drivers front fitting.
* Assemble jic straight fittings into fuel lab regulator with supplied O-rings and 90\* to barb adapter on the bottom port with barb facing back (See fuelab instructions for regulator setup) **Do not hook up boost reference port, simply leave the barb fitting open and installed in the side of regulator**
* Install bracket onto regulator and bolt regulator down to existing bolt on hpop reservoir bracket. Use extra washers to take up the space between bracket and hpop reservoir so bracket sits flat.
* Install front stainless lines between cyl heads and regulator, adjust fitting angle in cylinder heads accordingly, straighten regulator and tighten flares firmly with backup wrenches. Taller line is drivers side, see pictures
* Connect outlet on bottom of regulator to factory steel 5/16 return line with provided short black piece of 5/16 hose. Factory steel return line can be gently bent or cut back to fit better. Some special order systems or integrated return sumps will not reuse factory return line and will come with enough blue pushlok to replace return line. If applicable connect hose from regulator to new return inlet such as “R” port on integrated return sump.
* Route blue pushlok hose from filter/pump unit outlet to rear feed line tee. A gently tightened fuel injection clamp on the tee barb connection is a good idea here due to heat and vibration but not 100% necessary. Follow the factory steel fuel lines, secure properly, keep away from exhaust manifold. This is the longest section of blue hose used so make sure to run this first and use leftover sections for the smaller runs.
* **Rear lines are supply, regulator is return, do not hook supply line to regulator.**
* If you have a problematic flare fitting that won’t seal a small amount of thread sealant can be used on the flare mating surface. Be careful not to get any inside the lines. Under normal circumstances do not use thread sealant on flare fittings.

**Filter and Pump Install**

**Budget Kit**

* Plan layout of filter/pump setup, system flows from feed line, sump or drawstraw into 3367 water separator, out water separator to inlet of pump, out pump and into 3528 post filter and out post filter to feed tee on engine. Pictures have been included showing an easy to assemble design you can use as a template. Picture shows unit flowing right to left for outside frame mount, reverse for inside.
* Reuse Stock pump kits will usually move the pump from its factory location onto the filter bracket. You could consider leaving the pump in place and routing the pushlok to and from pump. However this will probably use too much hose and not be as nice looking, but would avoid wiring.
* Install fittings and plugs into filter housings with thread sealant, paying attention to in/out flow markings on top. Make sure to tighten for full thread engagement but not overtighten or the housing can crack. 30 ft lbs roughly. The post pump filter will hold 65 psi of fuel so a proper seal is important. **Pro Tip** we gently heat the housing and tighten a second time to ensure no leaks in the premium kits. Due to the nature of this diy product warranty **does not** cover leaks or cracks from field assembled housings.
* Install barb adapters into fuel pump with copper washers if applicable. Reuse stock pumps kits will receive a compression fitting for the inlet side.
* Drill two holes in bracket to mount pump and attach with ¼" hardware.
* Attach filter housings to bracket with ¼" hardware.
* Connect pump to filter housing with short sections of blue hose roughly 18”, clamps ends if needed. Use leftover sections after running new supply line to engine.
* Follow instructions for the premium kit regarding bolting bracket to frame.
* If using the factory tank pickup, cut the 5/16 factory steel fuel supply line and use the provided compression to barb adapter and make connection to 3367 filter inlet. **Of the two factory lines heading forward to the engine, the line going to factory pump is supply.** If you have enough hose you may consider attaching directly to the sending unit by removing the quick disconnect. Slide hose over the larger of the two ports and clamp.

**Premium Kit**

* Install stainless lines between pump and filters, they are numbered**.** **Pumps may shift during shipping causing misalignment, simply straighten pump and/or p clamps if this happens.**
* Find a suitable location to mount bracket to frame, usually under the cab. The bracket is very “universal” and can be mounted in almost any safe location on the frame. You may choose to bolt the bracket tucked up high for clearance or lower for show.
* Premium kits are built for inside or outside frame mount depending on your order. The outlet of the pumping station will point forward respectively for a clean install.
* Line up a few factory holes with the back of the bracket and drill out bracket to match. (Make Level) Bigger bolts are included, you can use these for the larger factory holes or enlarge smaller holes for even more strength. A minimum of two properly torqued 3/8 grade 8 bolts must be used.
* Bracket can also be welded on if no other suitable location, but bolting is usually preferred and easier.
* If using the factory tank pickup, cut the 5/16 factory steel fuel supply line and use the provided compression to barb adapter and make connection to 3367 filter inlet. **Of the two factory lines heading forward to the engine, the line going to factory pump is supply.** If you have enough hose you may consider attaching directly to the sending unit by removing the quick disconnect. Slide hose over the larger of the two ports and clamp.

**Wiring**

* **Premium kits** come with a mostly plug and play harness, smaller pumps will be prewired to hook to factory wiring. Larger pumps will come with an external relay harness, the yellow and gray trigger wires connect to factory pump wiring. Positive may be hooked to battery or fuse box junction lug.
* **Budget kits** will usually come with wire to connect to factory pump wiring.
* **Diagram is included in pictures**
* **RACE PUMPS:** Fuelab pumps must be wired with a jumper for constant low speed operation (this will be completed on a premium kit). Twin walbro and some twin bosch kits must be wired to run with only one pump for continuous operation. Automatic solutions like hobbs boost switches or internally triggered gauges have been used. Contact with any questions about proper setup of these high performance systems.

**Sump, Hutch or Drawstraw**

* When using a sump or drawstraw be sure to crimp or block off the factory line from the tank, otherwise fuel leakage will occur.
* Disregard connection to factory supply line instead connect pushlok hose from your sump, straw or tank pickup to inlet of pump station.
* Follow instructions included with sump, hutch or drawstraw
* **If using 5/8 pushlok** you must use a heat source such as hot water or heatgun to soften the hose enough to allow it to push all the way on a pushlok fitting.

**Start Up**

* **Check** everything is hooked up correctly before energizing the fuel pump.
* **Check** supply line from pump station is hooked to rear of cyl heads and the bottom of regulator is hooked to return line
* **Ensure** source that the pump unit is drawing from to be free from restriction and the tank clean
* **Fill pre-pump water separator 6637** with clean diesel and system will self-prime.
* **Set regulator to 65psi (60 for walbro pumps)** according to fuelab instructions using a gauge in the regulators 1/8 npt gauge port. If 0 pressure builds by the time the regulator screw is halfway down, something is wrong, shutdown and correct issues to ensure pump damage does not occur.
* Run pump for a few minutes before starting engine to bleed out all air and possible contaminants.
* It is **not** recommended to leave a mechanical gauge permanently installed in the regulator however an electric in cab fuel pressure gauge is highly recommended.
* Double and triple check for fuel leaks!!!!

**\*Stock sending unit concerns.** The factory super duty tank sending unit is equipped with an internal filter basket that can become clogged. We highly recommend everyone installing a fuel system to at a minimum clean and inspect this assembly. Deleting “Hutch Mod”, sump or drawstraw is even more recommended. Never hook up any aftermarket fuel pump to draw from a sending unit in unserviced condition. An original or new oem bosch is much more tolerant of restrictions from this filter basket however it is still advised to clean, inspect or delete.