

ASK ALBERT!

Albert Roberts, Pine Stump Farm, Omak, WA

Dear Albert,

I just changed my fuel filter in my diesel motor and am having trouble priming the system and eliminating air bubbles. When I change fuel filters, the bubbles are difficult to get out of the system. What can you suggest?

Signed,

In a conundrum

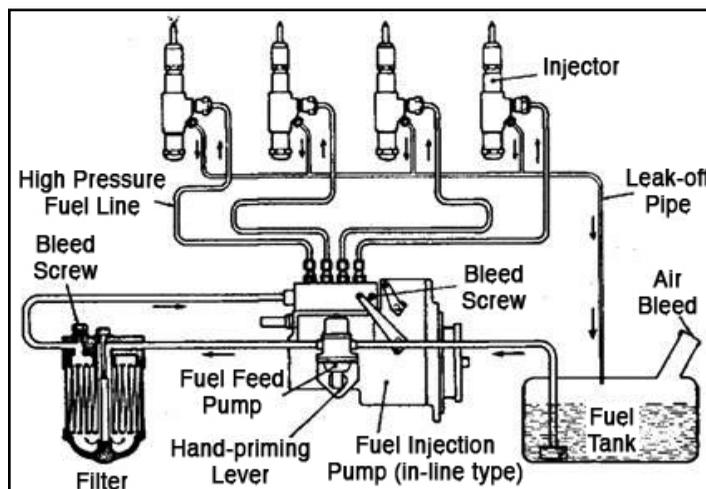
Dear Conundrum,

Do you have primer pumps or can you gravity-flow the fuel? In most tractors the tanks are usually above the fuel pump and injectors. You just have to open your bleeders on your filter and injector pump. On a diesel fuel system, the checklist or flow chart is as follows:

- Fuel tank
- Transfer lines
- Water separator - sometimes this is combined in the primary fuel filter and sometimes it is separate
- Primary fuel filter
- Fuel transfer pump
- Secondary fuel filter
- Injection pump
- Return line

CHANGING THE FILTERS

If the fuel tank is above the filters and injection pumps, turn off the shut-off valve under the tank for normal maintenance like changing filters. Clean debris away from the filters and then remove them. On canister spin-ons, fill the filters with diesel before installing. Fuel filters with cartridges usually have a bleeder valve on the top of the housing. Install new filters and open the fuel shut-off valve. Open bleeders until clear diesel (that is, no bubbles) comes out and then close the bleeders.



Bleeding a diesel fuel system chart. Image credit ehow.com

BLEEDING AND PRIMING

Start at the filter closest to the fuel tank to bleed and work towards the injection pump. If the injection pump is equipped with a bleeder, close it when you get clean fuel coming out. On some tractors (John Deeres, Massey's, Perkins, and some Cats), there is a hand-priming pump located either on the fuel transfer pump or on the injection pump itself. On Cats the hand-priming pump is part of the injector pump.

Activate the hand pump until the fuel flows back through the return or re-circulating tube. If the injection pump has a vent, open it and operate the hand pump until clean fuel comes out, then close the vent. As the air is eliminated, it's going to get harder to pump because liquids don't compress as easily as air does. At this point, the diesel engine should be able to start up.

If the fuel tank is below the injection pump, a fuel transfer pump is needed. Use a hand-operated pump or a really good battery and starter in this situation. Usually it's more or less the same procedure of filling filters manually by filling them prior to installation. Without a hand pump or an electric fuel pump in the tank to pressurize the system, a couple of alternate methods will work.

1. The safest method is to remove the return line from the injection pump to the tank. Install a hand vacuum pump and manually pull the fuel from the tank through the filters and injection pump. Once the fuel is pulled into the vacuum pump line, reattach the return line and rely on the battery to crank the fuel the rest of the way and the rig should start.
2. Another method is to remove the fuel return line to the tank and pressurize the tank with air. NEVER run over two to three pounds of pressure. Wait for fuel to come out of the return line and then reconnect (Detroit's).

If filters need to be changed, always try to manually fill them prior to installation. Purge the system with vents and hand pump. If air bubbles continue to appear in the system and the engine tries to fire up but doesn't, pull the filter off and evaluate if it's a mixture of air and fuel. If it is, then there is probably an air leak somewhere. Check all of the fittings and lines for a crack or leak.

Good luck with getting out the air bubbles,

Albert

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