Installation Instructions

Blue Chip Diesel VP44

PLEASE READ THESE INSTRUCTIONS COMPLETELY BEFORE STARTING INSTALLATION. DO NOT NICK/PIERCE THE FUEL SOLENOID WIRE OR YOU WILL VOID THE PUMP WARRANTY.

Use our "pump cover" to save your warranty. See www.bluechipdiesel.com

Installation Instructions:

Remove the Intake Tube by loosening the clamp on the hose coming from the intercooler. To make it come off easier use a flat bladed screwdriver and put it in between the hose and the tube and twist in a few places to release the hose from the tube. Undo the bolt holding the dipstick tube to the intake tube and then the four bolts that go through the intake tube and heating ribbon housing to the intake plate. Pull straight up on the tube as you wiggle the hose off and then when it lets go you shouldn't have ruined the gasket under the intake tube. Just don't turn the intake tube before the gasket lets go, when you are removing it and you should be fine. If you hurt the gasket just put a little RTV (Silicone) on it when reinstalling the intake tube.

Remove the APPS or TPS Housing above the injection pump (three 13mm headed bolts). Leave all the cables attached and unplug the wire harness from underneath it by pushing on the locking tab of the plug while pushing on the plug until the lock releases. Then, still holding the lock tab in, pull on the plug to remove it from the housing. Move housing out of the way.

Remove the 9-Way Connector or Big Plastic Electrical Plug at the rear of the pump by pulling the locking slide in the plug toward the fender. There are two half round indents on the slide lock and you will need to pull pretty hard toward the fender while wiggling the main plug with the other hand. The slide will come out about an inch and stop and then you will be able to wiggle and pull the main plug toward the firewall to remove it from the pump. When you reinstall plug and push in the slide lock, try to remove the plug by pulling on it. If it comes off you didn't get plug on far enough before you slid the locking slide in. See figure 22.

Remove the Two Banjo Bolts holding the fuel supply and return lines to the pump. When reinstalling, don't tighten too tightly as banjo bolts break pretty easily. Be sure they each have a rubber sealing washer on both sides of the line when reinstalling. See figure 23.

Remove ONLY 3 Injector Lines To remove the necessary lines stand at the driver's side fender and remove the three lines at the rear of the vp44 that are CLOSEST to you. DO NOT undo the clamps that hold the lines together. Take the line BRACKETS off the intake plate instead and leave the clamps and the clamp part of the brackets still tight on the lines. Then undo the corresponding injector line nuts at the valve cover and the three lines will come off together in one unit and go back on in exactly the right position so as to eliminate potential leaks. This gives you easy access to the remaining three lines at the rear of the pump. Do not loosen any part of the remaining lines anywhere except at the back of the back of the pump. Take off

the remaining lines at the pump and push them toward the engine block. This allows you to sneak the injection pump past them during removal and replacement. This saves you almost an hour and a half of fighting with the rear lines at the valve cover.

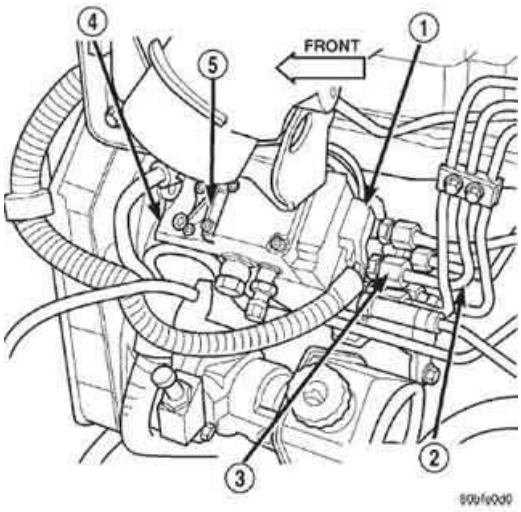

Fig. 22 FPCM 9–Way Connector

1 - FPCM ELECTRICAL CONNECTOR
2 - HIGH-PRESSURE FUEL LINES
3 - FITTINGS
4 - FUEL INJECTION PUMP
5 - FPCM

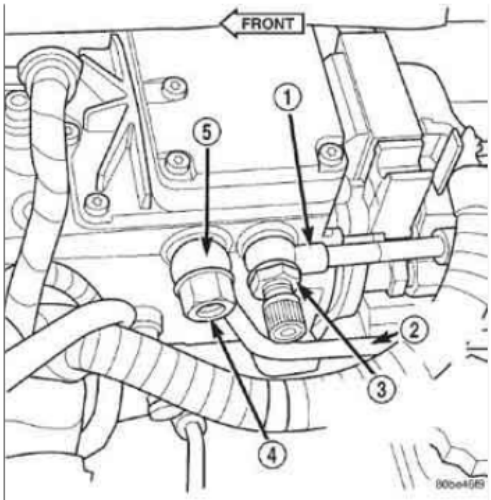

Fig. 23 Fuel Supply and Return Lines at Pump

1 - FUEL SUPPLY LINE
2 - FUEL RETURN LINE
3 - BANJO BOLT (TEST PORT FITTING)
4 - OVERFLOW VALVE
5 - BANJO FITTING

Unscrew the Crankcase Vent System from the Front Cover with a big pair of water pump pliers, OR a fuel filter wrench works well too. Yours may not look exactly like this picture, as they changed over several years of production. See figure 24.

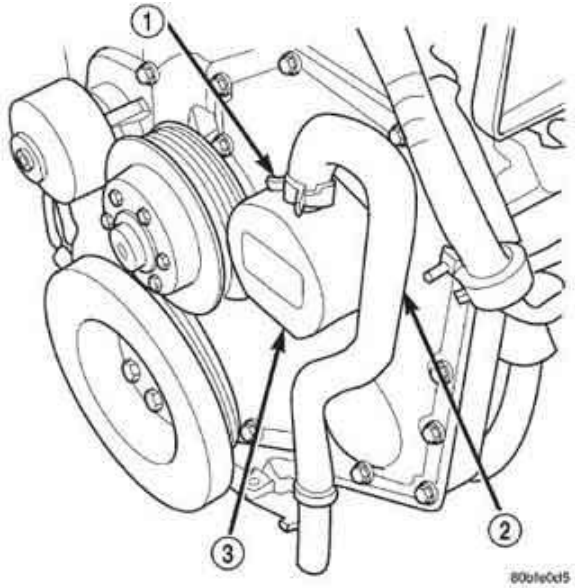

Fig. 24 Crankcase Vent Hose

1 - HOSE CLAMP
2 - CRANKCASE VENT HOSE
3 - CRANKCASE BREATHER

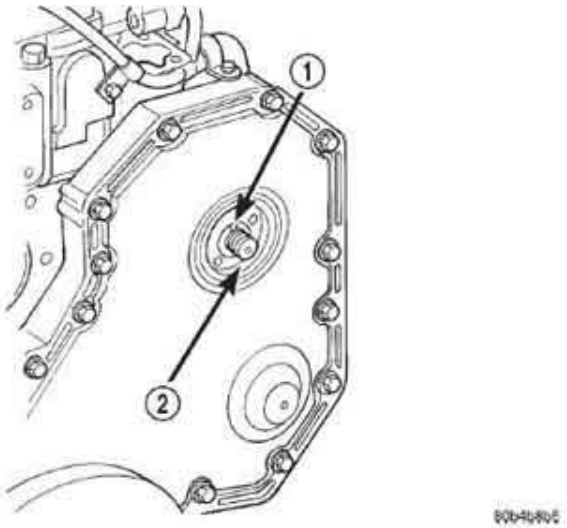

Fig. 27 Placing Keyway at 12 O'clock Position

1 - KEYWAY AT 12 O'CLOCK POSITION
2 - PUMP GEAR

Remove the Drive Gear from the Injection Pump Loosen the 27 mm nut (This larger metric size socket can be replaced with an equivalent US size if necessary.) on the shaft on the front of the pump. I recommend loosening and unscrewing the nut until it protrudes just past the end of the shaft to prevent damage to the threads due to the use of the puller. Install puller and tighten bolts equally and evenly until you hear or feel a pop, indicating the gear is loose on the shaft. If the bolts get really tight it probably means the gear came off the shaft and the puller bottomed out on the nut and you didn't realize it. I like to put a pencil magnet on the end of the pump shaft when I remove the nut and washer, so there is no way I can lose either into the gear case. I install the washer and nut the same way. Should you lose anything down behind the front cover or in the gear case DO NOT TURN OVER THE ENGINE until you remove the front tin cover and find what you dropped. Call for hints and suggestions if you have to remove and reinstall the front cover. If you DON'T do this and turn over the engine there is a good chance you will do about $1500 damage to the gears and gear case. If you can't find what you dropped and you really think it went into the oil pan, it's OK; it probably will never bother! Just replace what you lost! Turn the engine over by using a 15/16" socket on the big nut on the alternator or small bolt on crankshaft damper. Get the keyway and key close to 12 o'clock so key doesn't fall out of the shaft when removing pump from gear case. See figure 27.

Page 3 Remove the 2 - 13 mm. bolts from the Bracket at the Rear of the Pump that holds the bracket to the block.. See figure 29.

Take off the Four Nuts Holding the Pump to the Gear Case If a stud comes out with the nut don't panic, just reinstall the stud without the nut before reassembly. You should not have to pry hard on the pump to separate it from the housing as there is only an o-ring holding it in. Pry marks on case will be cause for damage assessment for core refund. See figure 34.

Remove Old Injection Pump You CAN turn the engine over with or without the pump installed, with the drive gear loose. It CANNOT get out of time with the cam gear as long as the front tin cover is on. Push the rear three fuel lines toward the engine block and remove the pump. Do NOT turn pump shaft during or after removal; see why in paragraph below. See figure 34.

Install New Injection Pump Swap the bracket from the old pump with a 50 Torx bit. Put a little oil on the new o-ring AND gear case opening to make the replacement pump slide in easily. When you install the new pump it is most important that the key ends up in the keyway completely. NOT having the key centered in the keyway and tightening the front nut squashes the key, and then the truck runs badly because it is out of time. This MAY cause a code 216 to be set SOME times. This is the most common installation mistake. A clever tip a customer gave me is to paint the end of the key with a bright color and then you can see it better in the slot. I prefer to position the keyway in the gear and the key in the injection pump shaft at about 12 o'clock. If you remove the key from the new pump shaft for any reason be sure to reinstall it with arrow on the key pointing toward the pump housing. Feel free to either super glue the key in the keyway of the pump shaft or bugger the key a little on the part that goes in the keyway of the pump shaft so that you have to tap it in with a hammer and feels tight. To align the shaft on the new pump exactly like the

old one, so it slides in easily with the key completely in the slot hopefully, and my preferred way, is to stand up the old pump on the bench on the delivery valve end and stand up the new pump the same way right next to it. Turn new pump shaft to exactly the same place as the removed pump and install it that way. We do NOT recommend grease to hold the key in the slot.

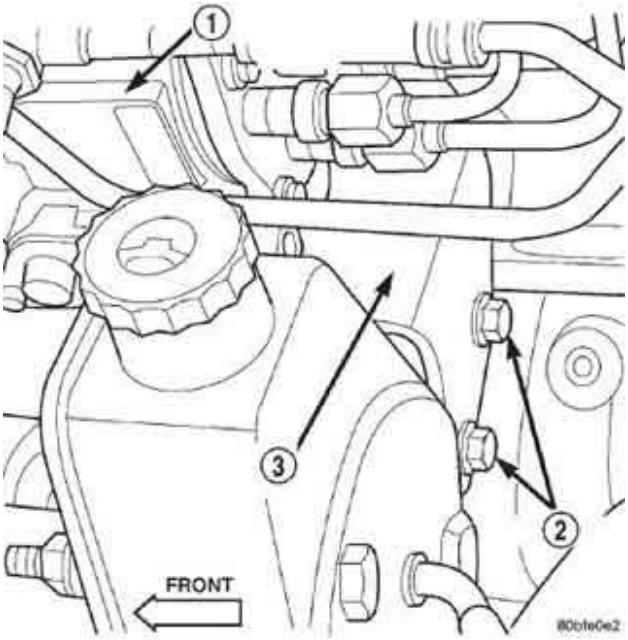

Fig. 29 Rear/Lower Pump Bracket and Mounting Bolts

1 - FUEL INJECTION PUMP
2 - BOLTS (2)
3 - REAR/LOWER BRACKET

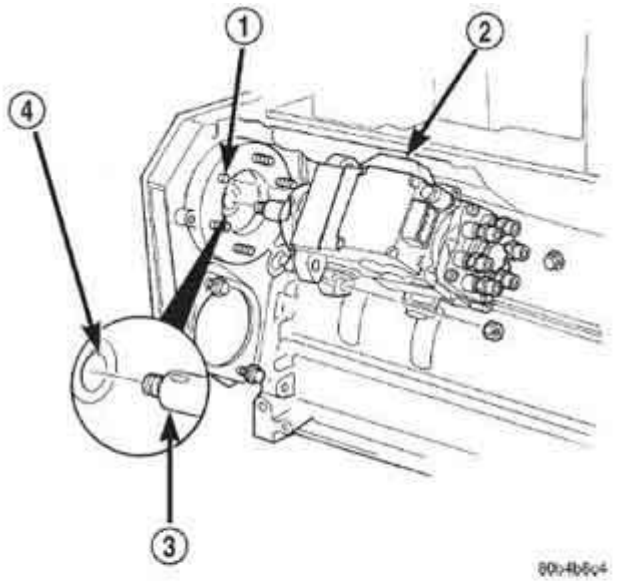

Fig. 34 Injection Pump Installation

1 - DOWEL
2 - PUMP
3 - PUMP SHAFT TAPER
4 - INJECTION PUMP GEAR TAPER

Our most emphatic suggestion is to look at the key with a mirror before you put on the big nut, to be sure the key is COMPLETELY in the keyway. When you have carefully installed the replacement pump into the drive gear and gear case, torque the big nut to 125 FT LBS.

Reinstall all other components

IMPORTANT TIP: Tighten the number #2 injection line at the valve cover that is behind the intake tube, BEFORE you install the tube!

Double check your work and make sure you don't have any extra parts left over!

So now it is time to bleed the system. Before attempting to bleed and or start the truck, verify that injector lines #1, #3 and #5 are slightly loose at the valve cover. Turn the key to "start" just for a second and let go, so the key remains in the "run" position. You should hear the lift pump run for 25 seconds. Wait for the lift pump to stop running and repeat this key trick three times. Crank the engine in 10 second intervals of cranking and then 10 seconds of waiting/cooling, until you get fuel out of the three lines. Close each line when it gets fuel and then crank the engine until it

starts. When the engine starts it will sound AWFUL, and run rough until the remaining air is purged from the lines. Holding the throttle at about 2000 RPM after it has been running for about 10 seconds will make it smooth out sooner. Don't Panic! If you can, use a scan tool clear all the old codes so the next time you check them you don't see the old ones and think they are new. To be sure you cleared the codes, REREAD the ECM to see that all the codes are gone, BEFORE you start then engine. Disconnecting the batteries clears some of the codes but does NOT always clear the 216 code!

Problems and Solutions:

If the engine will only idle, you have forgotten to plug in the wiring harness plug into the APPS or Throttle Position Sensor! Yes it will set a code and turn on the engine (MIL) light, but it will go out after a few starts with the plug plugged in correctly.

Should the truck idle rough or show white smoke and run poorly during your road test after your install and or 5 minutes running has elapsed, you probably have squashed the key in the gear, and the timing is way off. This is possible because the shaft and the gear are tapered. If this should occur, you must remove the pump and try harder. If you have damaged the new key* and can't fix the damage, re-use the key from the old pump, even though many people say not to. The timing won't be perfect, but you'll never feel the difference.

If you get frustrated or unsure of yourself feel free to call our tech line at 603-966-6459.

Speed Safely, and thanks for doing business with us!

Blue Chip Diesel
Technical Line: 603-966-6459
info@bluechipdiesel.com

*You can always get a fresh key from us, $8.00 + shipping