

Duramax LBZ and LMM P0087 Low Fuel Pressure code

Summer comes, temps rise, and the working trucks with relatively high miles start to set a P0087 code and go into limp mode while towing. I am on the receiving end of continuous calls over the past few years inquiring what to do. This has prompted me to write this Tech Tip to help explain better what we are finding. My hopes are that you can read and understand this so that I can focus on fixing rather than troubleshooting and explaining this repeatedly.

What is happening to cause this?

The direct answer in most cases: Injectors. Simply put, the backflow or return rate is excessive so the pump does not keep up and rail pressure drops. Our testing of suspect injectors has shown backflow rates of 2x the factory spec or more. GM has issued a document PI0474 identifying excessive clearance wear caused by dirt and debris as the cause. In some cases it could be exaggerated by excessive demand from an overly aggressive performance programmer etc. so it may be wise to return to stock programming before troubleshooting.

Note: just because the truck starts runs and drives great does not mean the injectors are fine. I get this one a lot.

How do I troubleshoot this situation?

The first test that everyone tries is to check the balance rates. Problem is this never shows anything. This is because balance rates are checked at idle and low fuel temps and pressures. You are essentially testing the injectors at the exact opposite end of the scale from where they are acting up. People put far too much faith and effort into balance rates.

Step one is simple: Verify system restriction. Just changing the fuel filter does not mean that the supply side restriction is OK. Lines can pinch, get blocked etc. To test, use our [Fuel Filter Restriction Gauge](#) which is a tool that every Dmax owner should carry along on the road. Supply side restriction runs normally in the 2-4" hg range on this gauge. If it is any higher than 4"hg start with a fresh filter. If the restriction does not improve then you will need to trace lines back to tank from the filter housing and possibly open the tank to inspect the pickup assembly. Added note: Plastic housing fuel filters are cut rate leaky pieces of garbage and should never be used.

Step two: This is actually a dealer test. The dealer can use his Tech 2 scan tool to control the injection pump and increase desired rail pressure to max of 160mpa at idle. The observed actual pressure should follow desired or at least be quite close. If not then step 3 is necessary to eliminate the rail pressure relief valve as a possible leak.

Step three: Bottle test. See this document:

<http://www.kennedydiesel.com/docs/Shim%20mod%20Bottle%20Test%20etc.pdf>

Fixing the issue: Two paths forward

Both paths start by adding a lift pump setup like my [Twin Pump Deluxe Kit](#) has helped in many cases. What this does is push fuel to the injection pump rather than making it draw the fuel from the tank. Placing the fuel under positive pressure is a good thing. Secondary filtration like the [KD Mega filter](#) helps to further clean the fuel, and [FPPF Total Power](#) fuel treatment to keep the fuel system clean and well lubricated/water free. These are items that every Dmax should have so it is not like you are just changing parts or adding something on a whim.

Path 1 ECM Programming

I have developed a tuning fix with my Kennedy Custom ECM Programming that alters the control parameters and has been shown to keep the actual fuel pressures in line with desired under load. I also alter the limp mode parameters to make the truck more useable, but have not deleted the diagnostics or widened the parameters. I used to call this somewhat of a band aid rather than a fix as your injectors are still worn, but I have been receiving more and more contact from people who have replaced pump, injectors etc (outside sourced) and still not fixed the issue. What the tuning does is alter the control of the pump in an effort to maintain pressure. The parameters are not widened nor is the DTC disabled. It will also allow you to operate the vehicle as normal without the nasty limp mode until you can afford the time and/or money to do the injectors. I have been doing this work for many years now and can proudly say that as of my June 2015 revisions I have had no reports of limp modes or power reduction with this tuning. Customers report improved performance and smoother operation as an added bonus. This programming can move forward with you if and when you decide to replace your injectors.

Path 2 Replace injectors

The true cure is to replace the injectors. Unfortunately, they are very expensive. Further complicating, this is the potential of receiving substandard parts at discount prices. We carry both remanufactured and brand new [Genuine Bosch Factory Injectors](#) for the LB7, LLY, LBZ, and LMM engines at reasonable prices. We may not always be the absolute cheapest, but we are a reputable company that can be trusted to provide the best source of technical expertise in the industry. In rare instances where I don't have the answer I know someone who does. We appreciate your patronage.

Note: I have received many contacts from Dmax owners looking for solutions AFTER they have replaced the CP3 pump, many other fuel system components, and added supposed NEW injectors purchased from outside sources. I cannot put my finger the why other than the same supplier names keep coming up. I can also say that of the injectors that we have sold to the best of my knowledge it has always taken care of the issue and in some cases, those who had my programming prior to injector replacement needed to have the pump adjustment part of the programming returned to stock which I do at no charge.

How do I prevent this from happening to me?

I have no guaranteed answer for you, but what I can say is that the injectors are taking a beating from running dirty, air laden fuel with poor lubricity. I recommend 3 key things: Added Filtration, Lift Pump, and Quality Fuel Additive as noted in my Tech Tip [Duramax Injector Failures](#) I can make no promises that your injectors will last forever, but something needs to be done and if dirt and debris is the cause, these items are a huge step in the right direction.