



DIYers simple oil change nightmare



By Clinton Brett

Be warned, Do It Yourself (DIY) self-claimed mechanics better look out when playing with the modern diesels. This issue's Diesel Help article was prompted by one of our members which we think would be of interest to the wider repairer workshop community.

Something as simple as changing your own oil can get you into trouble. Toyota, in this example Landcruiser's have been known to have their share of service failures such as oil filter tubes and incorrect air filter replacement mostly often caused by consumers wishing to do their own servicing.

In this instance, over-filling the engine oil can be nasty but in this particular case, the owner was very fortunate to have a local mechanic with knowledge and who was a member of Diesel Help.



VDJ79 series

The 2018 VDJ Landcruiser with 166k had been recently serviced by the owner himself prior to faults and symptoms appearing. The customer had not mentioned any work prior to it arriving at our member's workshop on the back of a tow truck. Needless to say they were a bit embarrassed and not forthcoming of their home servicing mistake.

Soon after our member logged the job in, and a discussion took place between myself and the technician. We discussed the **symptoms**: Running rough, rough idle, excessive white, blue or black smoke, engine rattles and these fault codes:

- P1603 Engine Stall History
- P1605 Rough Idling
- P0299 Turbocharger/supercharger under boost
- P1608 Engine Lack of Power
- P1609 Air Fuel Ratio Too Rich

As part of our login sheet we also provide an area to enter the injector feedback values as these have often proven to assist diagnosis in multiple cases. Our members have access to a number free online training courses including injector feedback values-

Injector feedback values:

COLD

1# -1.8 2# +0.8 3# -1.4 4# +0.5
5# 0.0 6# +0.6 7# +1.0 8# 0.0

WARM

1# -2.4 2# +0.2 3# -1.7 4# +0.2
5# 0.0 6# +1.1 7# +2.8 8# 0.0

One the scan tool, feedback for a V8 Landcruiser may display similar to the image shown here.

Item(1/116)	Value	Unit
Idle Injection Timing	0.0	°CA
Idle Injection Quantity Correction Learning Value	1.9	mm3/st
Injection Quantity Correction #1	-4.7	mm3/st
Injection Quantity Correction #2	5.0	mm3/st
Injection Quantity Correction #6	0.9	mm3/st
Injection Quantity Correction #7	3.3	mm3/st
Injection Quantity Correction #3	-3.6	mm3/st
Injection Quantity Correction #4	-0.0	mm3/st
Injection Quantity Correction #5	-1.4	mm3/st
Injection Quantity Correction #8	-0.0	mm3/st

VDJ INJ FB VALUES

At the beginning of our diagnosis chat, the technician mentioned he had drained 18 litres of engine oil whereas the specification for this engine is 9.4 litres including the oil filter!

At first, he thought something must have caused an internal diesel leak into the sump causing it to overfill and over rev the engine as expected. The customer claimed he went to start the engine and it was difficult and would stall soon after.

HaynesPro WorkshopData™

Estimate: AUD 5.00

Adjustment Data

Print

Engine (general)

Engine (Europe | Australia and New Zealand | Russia)

Engine code: 1VDFTV

Capacity: 4401 (l)

Distribution type: Timing chain

Capacities

Engine (Europe | Australia and New Zealand | Russia)

Engine sump, including filter: 9.4 (l)

Go to Lubricant page

Haynes engine specs

My first advise was to do a dilution test. There was no diesel fuel dilution and went back to his customer for further interrogation to confirm something in which he was suspicious about already. He knew from their previous records the car was overdue for service as he'd regularly brought the vehicle in for them to service.

The customer came forward and admitted that times were tough financially and that he'd serviced it himself that day. Now that we had discovered what took place prior to all of these fault codes and erratic injector feedback values, we still had to confirm the engine was ok and also determine why these codes had been triggered. Especially the turbo code appearing, we had to ensure it had not failed.

Diesel Help doesn't stop assisting after the problem has been determined. We go beyond to find out why these codes and



injector feedback values have occurred particularly in a case like this that I had not ever witnessed. From this we created a technical bulletin for future reference.

Most of our technical bulletins are created from 3 or more cases but this one deserves a place in the library as it is an educational bulletin! The below information has been taken from our technical bulletin:

Diagnosis and/or early detection of the fault: A scan tool is only your source of communication with the vehicle's Engine Computer Unit (ECU). The fault codes listed in this case, demonstrate how easily the incorrect diagnostic pathway can be chosen.

Other than the fault codes and symptoms, the only other information provided was this fault occurred after the customer, the vehicle's owner serviced himself.

Before connecting the scan tool first check the vitals- fluid levels including engine oil, coolant, and fuel. Look around the engine bay for anything abnormal such as excessive oil leaks from the intake and any modifications.

Explanation of the fault code strategy:

P1603 Engine Stall History- While the is engine running, common rail pressure drops below the low-level threshold (less than 12000 kPa) and the engine stalls (1 trip detection logic).

This code most likely occurred when the engine was initially started. High oil level in the sump would cause the engine to stall soon after cranking. This would be caused by a hydraulic lock in the engine as a result of oil entering the intake via the engine breather.

P1605 Rough Idling- After 5 seconds or more elapse after starting the engine, with the engine running, the engine speed drops to

400 rpm or less (1 trip detection logic).

Due to the design of this intake, the displacement of the oil would be uneven triggering the ECU to constantly adjust the compensation of the injectors thus the reason for the large spread in the injector feedback values.

P0299 Turbocharger/supercharger under boost- Excessive oil within the intake and intercooler would reduce the air flow thus causing a loss of turbo boost.

P1608-Engine Lack of Power- A result like or in relation to the above code P0299.

P1609-Air Fuel Ratio Too Rich- Due to being another fuel source, the oil within the intake would change the readings. The ECM also detects that the air fuel ratio is too rich due to a malfunction in the mass air flow meter or diesel turbo pressure sensor.

Solution: Drain the oil and refill with the specified grade and quantity of oil to the full line, clear the codes, remove and clean the intake pipes and intercooler. Start the engine and allow to idle, idle followed by a 20 minute test drive. Recheck for fault codes and observe the injector values and turbo pressures confirming all are within specification.

Special notes: This engine is fitted with a DPF from the factory but in this particular case, the DPF had been illegally removed. Had the DPF still been fitted, it is likely that other fault codes may appear. It is also advisable to clean the DPF exhaust system before returning to the customer. We recommend Tunap to assist in the cleaning the DPF.

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