# A DPF Cleaning Solution

## By Clinton Brett

I'm very careful when it comes to endorsing products, however in this issue I am going to share with you a valuable insight to a common DPF fault and the cost effective on-vehicle DPF cleaning process that I recommend as part of our diagnostics clinics.

A failed DPF differential pressure sensor has been one of my all-time favorite diesel diagnostics. It goes to show how easily DPF fault codes can give mechanics a bum steer. This fault also inspired our own innovative diagnostic tool, the DPF and turbo test kit. This common fault has helped us to create technical bulletins, ensuring that overall, simple DPF diagnostics are achieved.

I have chosen these 2 test cases from our technical bulletin library for this article-

2017 Isuzu D-max/M-UX fitted with the 4JJ1- TC engine and the Mitsubishi Triton and Pajero using the 4N15 engines.

**Dmax**

**Isuzu symptoms/codes:** Engine Light on and poor performance which is more noticeable at lower road speeds. Fault codes present included P2002 DPD Efficiency below threshold and/or P2227 barometric pressure circuit range/performance. Another code found was P2456 differential pressure sensor learnt position. Typical odometer range for initial fault from 55,000 to 90,000kms.

**Mitsubishi**

**Mitsubishi symptoms/codes:** DPF P1498 DPF Overloaded, DPF light illuminating or flashing, vehicle experiencing performance issues. Other codes such as P252F Oil level too high and on some occasions no fault codes.

**Failure/Issue:** Failed differential pressure sensor.


**Isuzu DPF sensor**

**Diagnosis and/or early detection of the fault:** Using the scan tool data, locate the differential pressure readings and record. You are going to compare pressure readings on the scan tool with an analogue pressure gauge. To carry out, you will use a barbed T connector with one rubber hose connected to the gauge, one going to the differential pressure sensor (pictured below) and the other into the pressure side of the DPF. This is the hose closest to the engine side of DPF. Some vehicles are fitted with an exhaust back pressure sensor. These are not the same sensor so make sure you are reading the correct one.

**Isuzu Differential sensor location**

On some vehicles, the manufacturer marks the pressure side with a paint color as shown on the following pic of the Mitsubishi sensor, has a white mark. As a reference, the following specifications are what we have determined as a standard pressure on most DPFs:

- Idle: no greater than 1.0 kPa
- No load cruising: No greater than 6 kPa
- Under load: No greater than 20 kPa

If not met and/or different between the gauge and scan too, check hoses are clear, cracks, split, frail or blocked.

If these items are ok, then it is likely that the differential sensor has failed. With several of the Isuzu cases we found that certain brand scan tools were not able to read the differential pressure. These scan tools can only read the voltage feedback of the sensor. The D-max sensor reads 0.5 volts with no pressure present. Anything outside this range has been an issue.

One case with access to differential pressure, with KOEO the sensor reading on the scan tool was 4.5kpa. When started at idle (KOEO), the pressure remained on 4.5kpa. We strongly advise to gain access to a scan tool capable of reading the actual differential pressure sensor. The objective is to confirm pressure readings are within specification and both the sensor and gauge are the same.


**DPF test kit**

**Mitsubishi sensor**

In the case of diagnosing the Mitsubishi, the task has been much easier as all scan tools have been capable of reading the differential pressure. The worse case I have experienced was an ASX 4N14 engine reading 14 kPa on the scan tool and 96 kPa on the test gauge.

**Mitsubishi comparison**

**Solution:**

Once you have confirmed the cause of the fault is the differential pressure sensor, replace as necessary. Use your scan tool to read all sensors before starting the engine. If the DPF pressure was reading above the minimum specification on the analogue gauge, we recommend performing a clean of the emissions filter. This can be carried out on the vehicle without physically removing the DPF.

This is the cost-effective cleaning solution I was referring at the start.

Just over 6 months ago I was invited to demonstrate the use of our DPF and Turbo test kit at a workshop in Ballarat Victoria. It was here where I met the director of Tunap Australia. The company has only been in our country for a little over a year, yet the German company has been around since 1974. Tunap have developed a range of environmentally safe engine system cleaning products which I have found very satisfactory indeed.

But within an hour, I was satisfied with the outcome of this DPF cleaner. We did not need to run anything through the engine, therefor it's not possible for any damage to occur. The clean involves the use of a Tunap compressed air spray gun filled with Tunap 931 Particulate Filter Cleaner. Using the selected probe, the liquid is applied via the engine side of the differential pressure hose. Tunap advise to read and follow the strict instructions to ensure the task is completed correctly. Inject into the DPF filter at a cold engine temperature condition, followed by the 932 Flushing concentrate, the water-based products do their thing- remove Ash, Soot and reduce the restriction in the exhaust filter.


**DPF probe** **DPF cleaner**

Now I know how difficult it is to budge Ash so I was impressed to see the DPF pressure on the Mitsubishi drop from 8 to 0 kPa in just under 10 minutes. This makes the task easier especially for those with limited access to a stretch of road to perform a passive regen.


**Before / after**

**What is a passive regeneration procedure and how is it performed?**

A passive regen is a simulation of the ECU to determine when the conditions are correct to perform a regeneration. This is possible without activating the computer by a forced regen which is something we prefer to avoid. Drive the vehicle at a constant speed of approx. 80kmh with the rpm between 1800 and 2200 for 20 minutes. Do not fluctuate the revs, do not try to go full revs or change rpm if possible. You may be required to select a lower gear to ensure correct speed and rpm are obtained. Once you are satisfied the DPF is clean, clear, and ready for use (cleaned or replaced), repeat pressure and temperature test. If the temperature sensors are not reading correctly, replace them as necessary.

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