DPF Common Problems and Solutions

Dealing with a blocked DPF.

Diesel Particular Filters (DPFs) can and will block prematurely through no fault of their own. If a DPF has blocked prematurely due to a fault further upstream then simply replacing or cleaning the DPF will not resolve the problem and the DPF will block again in just a few miles. Many diesel cars will go over 80,000 miles before the DPF needs professionally cleaning or replacing, so to have a DPF block in just a few miles or months after cleaning or replacing is not acceptable. This clearly indicates that there is a fault upstream or the vehicle has reverted to a stop start repetitive drive cycle for long periods, where no regeneration has been taking place.

It is always worth checking to see what regeneration, history is on the ECU, has the car carried out frequent regens and were they successful?

It is very important that the initial cause be repaired. The below information looks at the issues which may affect DPF failure. The vehicle may have a combustion/compression issue, which could be an Exhaust Gas Recirculation (EGR) system problem, injector over fuelling, glow plugs, air intake issues, or even a turbocharger problem. A regeneration shall not take place if there are any faults associated with the DPF pressure sensor, exhaust temperature sensor, and the fuel filler cap. Below is some of the faults associated with DPF fault codes:

Typical DPF fault codes
P1471 Diesel particulate filter (bank 1) regeneration not completed
P2002 Diesel particulate filter (bank 1) efficiency below threshold
P2003 Diesel particulate filter (bank 1) particulate mass too high
P242F Diesel particulate filter (bank 1) regeneration not active
P244A Particulate filter differential pressure too low
P224B Particulate filter differential pressure too high
P2452 Particulate filter differential pressure sensor malfunction
P2453 Diesel particulate filter differential pressure - sensor malfunction
P2454 Diesel particulate filter differential pressure - sensor voltage too low
P2455 Diesel particulate filter differential pressure - sensor malfunction
P2458 Particulate filter regeneration maximum regeneration time exceeded
P2459 Particulate filter regeneration, regeneration frequency implausible

Below are some of the issues that must be adhered, in order for the regeneration of the DPF to work correctly.

For a regeneration to take place there must be sufficient amount of fuel in the tank, roughly at least ¼ of a tank, or around twenty litres of fuel.

For a passive regeneration to take place, the soot content must be under 45% on average. The engine oil can get diluted and or degraded with diesel and if fitted with oil quality monitors, then passive regeneration more than likely shall not occur, until the engine oil low
SAPS (Sulphated Ash, Phosphorous, Sulphur) and oil filter has been replaced and the quality monitor is reset by the diagnostic machine. It is advisable that the oil and filter is renewed with any cleaned or new filter fitted.

If the DPF is excessively blocked, with soot and ash then a professional clean or a replacement unit will be required. Remember any fault in the engine management system will stop a regeneration to occur. This could be some of the issues as discussed above in relation to temperature and pressure sensors, heater / glow plug circuit, and EGR system, these items are all used to monitor and control the regeneration process. All the faults need to be corrected before a regeneration can take place.

Some manufacturers use the DPF as a fixed life item and once the mileage has been achieved, the vehicle ECU will not let the DPF go through the regeneration process. **All the DPF values in the ECU will need resetting when replacing with a new or cleaned DPF using a diagnostic machine**

**Forced Regenerations**

A forced regeneration is required when a fault code occurs showing something like the following; P1471 – DPF Regeneration not completed.

When this fault occurs, the first action would be to try to run a forced regeneration of the DPF. The reason for a forced regeneration is that an active regeneration has not been successful under normal driving conditions by the vehicle owner. The two types of forced regenerations either a static or in motion regeneration.

A static regeneration takes place outdoors on a level and safe surface and in a safe environment in which the chosen diagnostic machine controls the operation of the regeneration from start to finish. The technician must be present during the whole operation and observe the data shown for the cycle. The cycle can last up to an hour depending on a number of factors, usually the soot content, vehicle type, ash content, etc.

An in motion regeneration takes place while the technician is driving the vehicle with the diagnostic machine connected via the vehicles OBD port. The technician shall drive the vehicle at a moderate speed, usually under 60 KM per hour. The in motion regeneration takes approximately twenty to thirty minutes to complete. For safety reasons a second technician is advised to sit in the vehicle and observe the data shown for the cycle.

For a vehicle that has an additive (EOLYS) tank, the correct amount of additive must be in the tank, there should be no faults in the additive ECU. Check the additive level sensor and the fuel filler cap sensor for any faults. When replacing a DPF on a vehicle with an additive tank it is always best practice to refill the additive tank with the correct solution.

*Note*

The above is a guide to help you diagnose the original fault. Please refer to the OEM guidelines for removal and fitment of the DPF along with diagnosing the original fault. All the information on this document has been published in good faith and for general informational purposes only. We do not make any warranties about the completeness, reliability, or accuracy of this information.