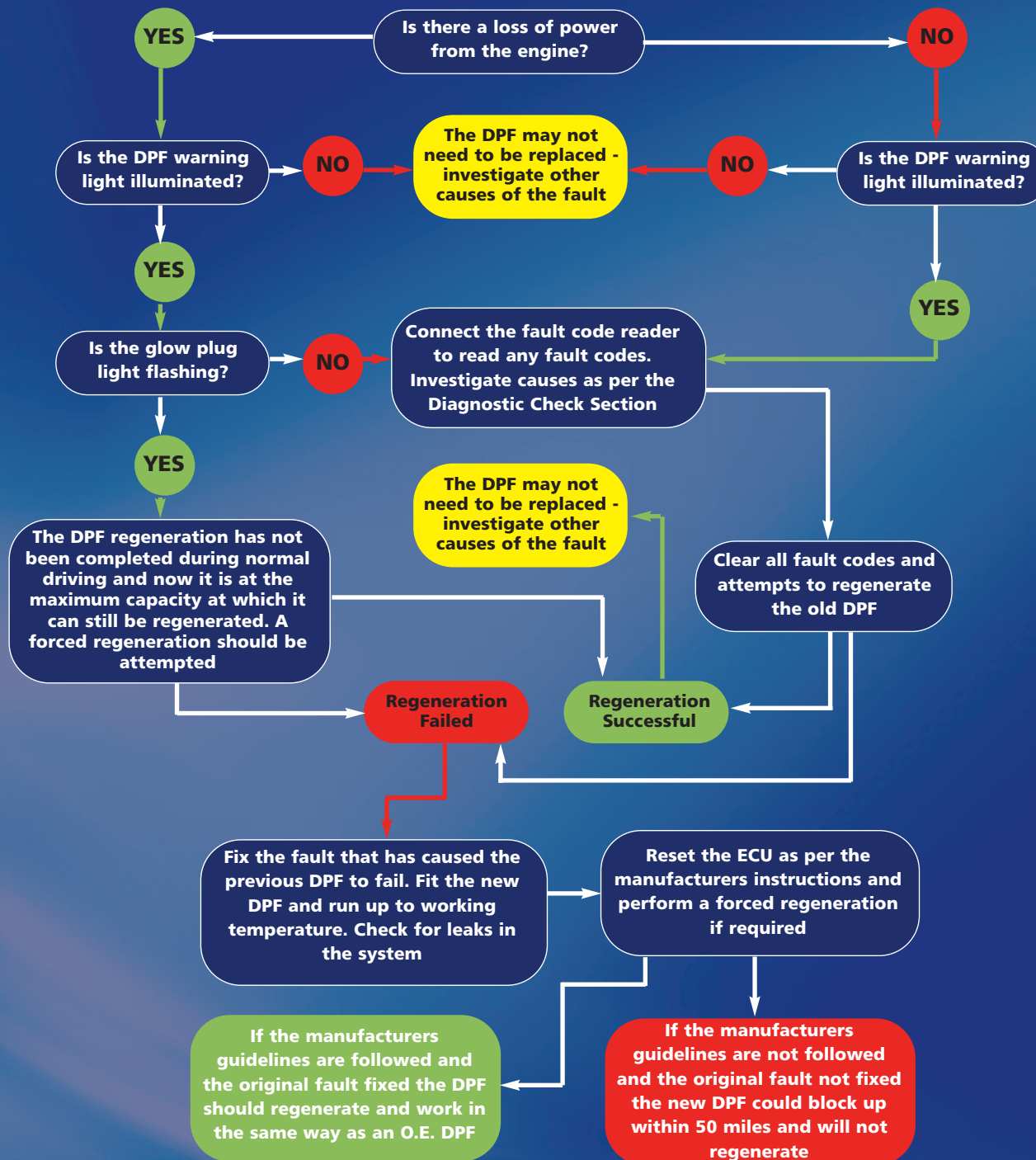


DPF GUIDE



Installation
& Fault Finding

IMPORTANT NOTE! If you are replacing your DPF it is highly likely that either a fault occurring elsewhere on the vehicle or the driving style has caused it to fail. A full fault diagnosis must be carried out by a fully trained technician with appropriate diagnostic equipment to establish if the DPF needs to be replaced. The checks listed in this guide should be carried out prior to replacement to ensure the new DPF operates correctly when fitted. By not carrying out these checks, the DPF could fail shortly after it is replaced.

• How do DPFs work?

Unlike a catalytic converter a DPF is not a flow through device, it is a soot trap that collects particulates from exhaust emissions. The exhaust gasses flow into the DPF, but cannot exit down the same channel as the exit is blocked. The gasses escape through the porous cell walls, but the particulate matter is too large to escape so is trapped within the DPF. The DPF disposes of the soot during a process called "regeneration" when the particulates are burnt off. On a properly functioning vehicle regeneration will occur approximately every 500 miles (it can vary substantially dependant on the vehicle and driving conditions).

• Why do DPFs Fail?

The most common reason for the failure of a DPF is that it has become too "clogged" with soot to be able to regenerate. It is easy in this instance to simply assume the DPF is at fault and replace it, but if no diagnostic work is carried out it is likely the new DPF will fail quickly within a short period of time (less than 200 miles).

• Initial Investigation

The best source of information is the vehicle owner! The information they provide can be invaluable in identifying the fault:

➤ What type of driving does the customer mostly do?

If the customer mostly does town or city driving it is likely the DPF has not reached the optimum temperature to regenerate and become "clogged". If the customer does a lot of motorway driving and the vehicle has 6 gears, the revs are sometimes so low the exhaust temperature does

enough for regeneration to occur. Occasional harder driving in lower gears should be enough to burn off the soot in these cases.

➤ How long has the DPF Warning Light been illuminated?

Many DPF problems are caused by simply ignoring the warning lights that advise the DPF needs to be regenerated. Once the DPF is around 45% full the ECU makes changes to the fuel injection timing to increase the exhaust temperature and burn off the particulates. If the journey at this point is stop/start the conditions for regeneration may not be met and the warning light will be illuminated indicating a partial blockage. It should be possible to clear this warning light by driving at speeds greater than 40mph for around 10 minutes, although this can take up to 25 minutes if there are lots of downhill descents etc. If the warning light continues to be ignored or conditions for regeneration are not met the level of soot in the DPF will continue to increase, and at around 75% full the DPF will have to be regenerated by a dealer or specialist garage. You can expect other dashboard warning lights to be illuminated as well. If the warnings are still ignored and the soot levels increase to around 95% you can expect the vehicle to be put into "limp mode" by the ECU in order to protect the engine from damage due to the increased back pressure. At this point the DPF cannot be regenerated and needs to be replaced.

➤ Has the vehicle been serviced recently or has the oil been changed?

If the vehicle has recently been serviced it is worth checking the correct type of oil has been used. Most DPF vehicles require a special type of low ash oil, and using the incorrect oil can lead to problems during the regeneration process. If the vehicle uses a fuel additive system to aid regeneration it should be checked that the additive tank has been filled. The additive tank is normally located near the fuel tank.

• Diagnostic Checks

Before fitting, the DPF diagnostic checks should be carried out with an appropriate fault code reader to establish any codes held within the ECU. Visual inspections of the components listed below should also be carried out as a fault with any of them either alone or in combination can lead to DPF failure.

➤ DPF Pressure Pipes and Sensors – checks should be made to ensure all pipes are free from blockages and the pressure sensors are operating correctly.

- Oil Level – if the oil level is high this is a sign it has been contaminated with fuel from failed regeneration attempts. The extra fuel intended to increase the exhaust temperature can find its way into the engine sump, contaminating the lube oil and sometimes leading to a breakdown as the engine can start to run uncontrollably on its sump oil. An oil change will be necessary.
- Oil Specification – check the correct low ash oil has been used
- Fuel Additive (where applicable) – check the level of the fuel additive, and fill the additive tank as required. There is normally a manufacturer's procedure that must be followed to reprogram the ECU to the new additive level.
- Sensor Checks – check all sensors (such as the oxygen sensor) to ensure they are operating correctly.
- EGR System – check the EGR valve is working correctly and the EGR pipe is free from blockages.
- The following should also be checked – air flow meter, engine and turbo wear, injectors (in case of leaking), glow plug condition, air filter condition and the ECU should also be checked for any malfunctions.

• DPF Fitting

Once the fault that caused the previous DPF to fail has been rectified the new DPF can be fitted. It should be fitted along similar guidelines to when fitting a cat. New fittings should always be used wherever possible, don't use undue force or exhaust paste as this will damage the DPF. The new DPF should be fitted loosely to line it up correctly with the rest of the exhaust system before tightening it up. An appropriate code reader should be used to set up the ECU in accordance to the manufacturer's guidelines. A forced regeneration may be required at this stage, but if all the guidelines have been followed the DPF will work in the same way as the O.E. specification DPF.

If the procedures set out in this guide have not been followed the new DPF could block up within a very short space of time, and may not be able to be regenerated.

**TECHNICAL HELPLINE
+44 (0)1623 663802**