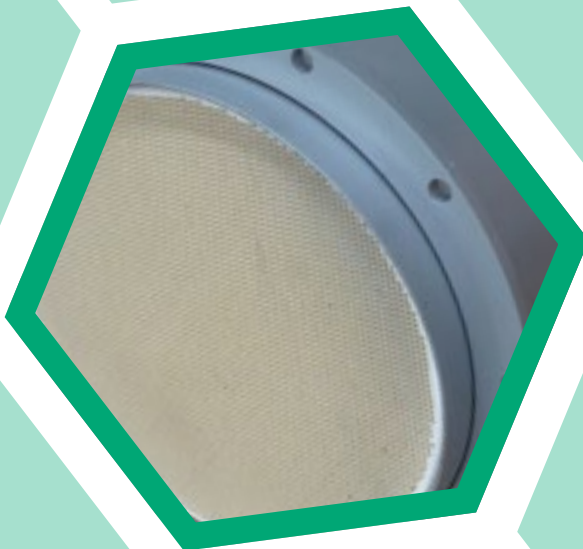




DPF TRAINING: DO THE RIGHT THING

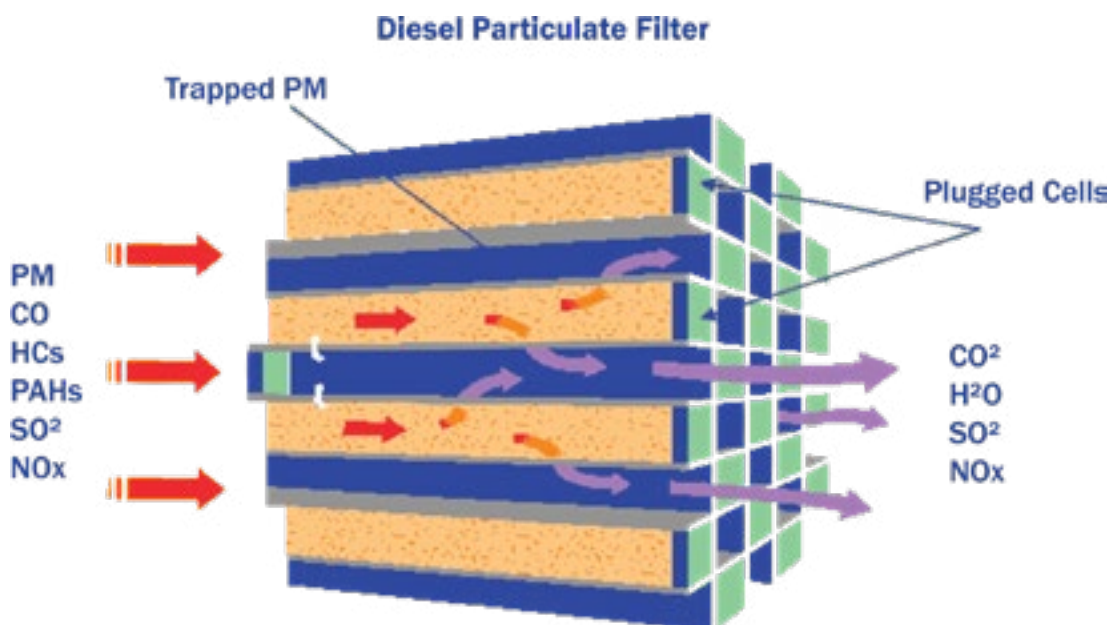


When it comes to DPF's, do the right thing.

The mystery surrounding Diesel Particulate Filters (DPF's) is understandable, whether you're an exhaust specialist, mechanical workshop or a dealer, uttering the words Diesel Particulate Filter can send exhaust technicians into a cold sweat.

So why the fear? After all a DPF is a serviceable item; a filter like any other. Or is it?

The fact is a DPF is a filter, but it's a filter with a few differences. Let's call it a "smart filter". The basic workings of a DPF are straight forward although different to a catalytic converter, the catalytic converter and the DPF work together to reduce emissions. A catalytic converter is a flow through device where exhaust gases pass over a substrate coated with precious metals to cause a chemical reaction which in turn changes the makeup of the exhaust gas released into the atmosphere, whereas a DPF is not a flow through device. Its substrate is blocked at the ends forcing exhaust gases through the substrate walls where soot particles are deposited producing a cleaner exit gas.



This is an internal diagram of a DPF. It clearly shows that its main function is to clean the exhaust gases by forcing them to pass through the walls of the filter. It is not a flow-through device. The soot build up is then burnt off at high temperatures during the 'Regeneration' process.

Once the soot level reaches a certain percentage blocked (measured by pressure sensors before and after the DPF), a value determined by the manufacturer, the DPF needs to be cleaned. This is a process that usually happens automatically and is controlled by the engine management system. The process is known as "regeneration" and will usually happen in one of two ways. "Passive Regeneration", which happens whenever the vehicle is at operating temperature, but with no other special engine conditions. And "Active Regeneration" which occurs when the vehicle is at operating temperature, running at a predetermined RPM and within a certain time frame, normally upwards of 15min. Once these requirements have been met the engine control module changes injection timing and pulse forcing unburnt fuel into the exhaust system which upon contact with the catalytic converter "fires" leading to a rise in temperature in the Diesel Particulate Filter causing the stored particulate matter to be burnt off. This is a very precise and controlled system, however if the vehicle is only used over short distances or there are other mechanical issues with the vehicle, this regeneration process is not possible. If this continues to occur the Diesel Particulate Filter may reach a saturation of above 80%. Anything above this percentage will require the unit to be replaced as neither active nor passive regeneration can be performed.

Australians are a resourceful bunch. We've built our reputation on work-arounds and clever fixes. So why would a DPF be any different? Why not clean a blocked filter with high pressure water or air? Why not superheat it with an oxy acetylene gun or furnace? Why not use a DPF delete pipe or better still why not just "cut the damn thing out" all together?

The fact is that the early DPF aftermarket has already seen many examples of well meaning mechanics and exhaust specialists taking the easy way out or just doing what the customer has asked them to do in order to make an easy sale. Cleaning a DPF with water can result in any residual water turning to steam and cracking the substrate or outer DPF housing. Flushing soot particles further down the DPF with water may block the pores downstream and cause the DPF to fail again shortly afterwards. This method may also cause contaminated water to flow into our waterways leading to environmental damage.



This image shows a DPF with holes punched into the substrate. The owner of the vehicle wanted to make it a flow-through device, as it was blocked. You can see by the colour of the filter, the engine is not running correctly.

Some manufacturers have the DPF substrate not only acting as a Filter but also as a catalyst which is coated with non-corroding precious metals rhodium, platinum and palladium. In these units high pressure air blasting may move or dislodge some of the precious metals resulting in reduced efficiency. This is due to the uncontrolled pressure and flow of the air being passed across the substrate.

Heating a DPF with an oxy acetylene or furnace system is unlikely to heat the unit evenly leading to hot spots or partial meltdown of the substrate, or possible damage or warping to the body of the unit or further blocking of the pores due to no back pressure to remove the burnt off soot particles.

Cutting the DPF out altogether or using a delete pipe carries the greatest risks. Putting to one side the fact that you might be bypassing the legitimate opportunity to supply a replacement DPF or maybe charge appropriately for a correct vehicle issue diagnosis (which may not actually be related to the DPF itself). You might be running the gauntlet with the Department of Transport and inviting your customer to come back to you for answers about EPA fines. You may also void the customer's insurance policy in the event of an accident and a police report which says the vehicle has been tampered with and is therefore deemed un-roadworthy. In vehicles with time or kilometre based

regenerations they will try to regenerate even though there is no DPF present causing large white clouds of unburnt or partially burnt diesel being released from the exhaust system. And in many vehicles the lack of a DPF can cause the vehicle to go into limp mode as well as causing engine light illumination. In fact in some late model cars removal of the DPF may invoke complete shut down of the ECU meaning a trip back to the dealer for reprogramming or in severe cases complete replacement of the ECU. **The message is clear. When it comes to DPF's do the right thing the first time.**



It is against the law to remove or modify the Diesel Particulate Filter on any vehicle in Australia. If you are thinking about doing this on any diesel vehicle fitted with a DPF, think again.

An estimated 15 % of diesel vehicles on Australian roads currently contain DPF's and on current projections that figure could rise to around 40% by 2020. The figures are somewhat subjective and depend greatly on dealer range decisions and other market factors but either way the significance of this to the aftermarket is enormous. Currently most replacement DPF's are done through the dealer network under warranty but some dealers are now looking to write DPF's out of their warranty conditions as a serviceable item. Added to this is that aftermarket DPF's can be as little as a third of the price of OE units which means that the market is now starting to see aftermarket DPF's as a viable option.

Nissan, Mazda, Ford, Volkswagen, Hyundai, BMW, Citroen, Fiat, Audi, Alpha Romeo, Volvo, Saab, Skoda, Peugeot, Kia, Opel, Renault and Jaguar already all have DPF's fitted to some portion of their passenger or light commercial ranges with many more manufacturers being forced to do the same with tightening emissions laws.

Australia's vehicle emission regulations closely follow European standards with Euro 5 already in place for new vehicles and full introduction to be completed by November 2016. From September this year Europe will be operating under Euro 6 regulations with Australia beginning its move to Euro 6 in July 2017. This means that new vehicles entering the Australian market will be subject to progressively tighter emissions controls and the current available technology to help meet these regulations includes the use of catalytic converters and DPF's. Make no mistake, DPF's are not going away in a hurry.

So why do people experience so many problems when fitting new DPF's? As with the introduction of any new technology the secret lies in training and awareness. Before fitting any new DPF a full vehicle history check should be done, checking for evidence of a reason for the DPF to stop functioning. Most DPF's have a combination of at least four temperature and pressure sensors which need to be checked and replaced if a new DPF is fitted. The engine management unit needs to be reset and a forced regeneration completed to let the vehicle know that a new DPF has been fitted and is operating correctly. Correct engine oil and a new fitment kit should always be used when fitting a new DPF and the use of bio diesel is likely to cause a DPF to reach saturation quicker.

Can you trust an aftermarket DPF to do the job? To some degree this may depend on your supplier and which overseas manufacturer they are using. You need to work with a supplier that has done their homework on the vehicle makes and models available in the Australian market. For example the Nissan Navara D40 has a Thai manufactured and a Spanish manufactured model available in the Australian market. Each model has a different configuration for its DPF heat shield and sensor positions. Without this knowledge you may be supplied with an incorrectly fitting unit. DPF's that form part of a DPF/Catalytic Converter combination unit must also come with a type approval certificate which ensures they comply to appropriate emission standards. Many of the more established European DPF manufacturers also produce for the aftermarket divisions of the OE manufacturers which means they are more likely to produce a high quality reliable unit. Another consideration is does your supplier have stock on the shelf? If they do not this may mean they are just flying the unit in as required and may not be certain of the unit's fitment suitability for the vehicle model specified.

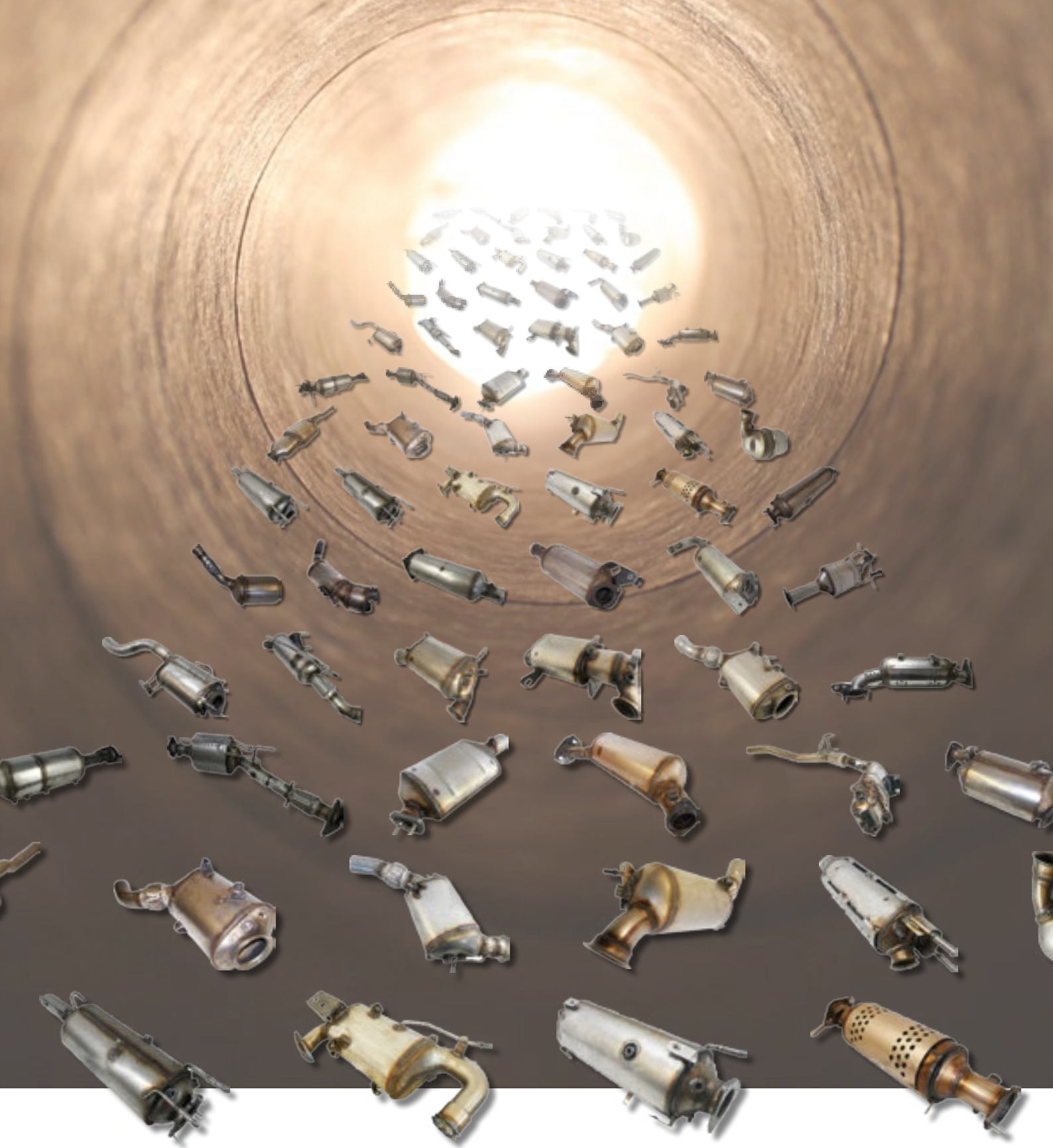
There is some excellent diagnostic equipment becoming available to assist with DPF issue diagnosis. A five gas analyser will help identify engine timing issues, ignition problems or incorrect fuel mixture all of which can be leading causes of a blocked DPF. A relatively inexpensive DPF diagnostic tool will allow you to identify a DPF fault code or reset the vehicles ECU and run a forced regeneration on an existing or replacement DPF.



The Zetti Emissions DPF Diagnostic Tool can help check fault codes, diagnose DPF faults and perform 'Forced Regenerations'. When replacing a DPF, it can also help to reset the DPF by communicating with the Engine Management System.

This article is presented to you by **SWD AUST Pty Ltd**. SWD have the largest range of aftermarket DPF's available in Australia covering all the major manufacturers as well as a complete range of diagnostic equipment. SWD are emissions specialists and are happy to share their knowledge and answer any questions you may have regarding DPF's.

SWD can be contacted on 1300 4 ZETTI (93884) or visit the Zetti Emissions information website at www.zettiemissions.com.



**SWD STOCK THE LARGEST RANGE
OF DIESEL PARTICULATE FILTERS
IN AUSTRALIA.
FULL STOP.**





SPECIALISED **WHOLESALE** DISTRIBUTION

SWD AUST Pty Ltd

Customer Service Team: 1300 493 884

www.zettiemissions.com

