

Written evidence From Martyn Maynard (VTA0016)

This information has been supplied by Martyn Maynard, a resident of Leeds, retired engineer and owner of a 2014 registration Volkswagen Passat TDI.

1. I am a supporter of the VW brand. My 3 previous cars were VW Passat TDI's. I drove my last one from new. We travelled just short of 200,000 miles together in 11 years. When I traded her in for the above 12 month old VW, I was completely happy with the performance, reliability durability and service that she had given me. At present am equally as happy with my latest VW.
2. I was clearly disappointed when I heard that VW had deceived the world in this manner. Never the less, I trusted them when they said they would be open and transparent whilst resolving this issue. I expected them to explain how and why they had deceived us all. I expected them to explain how they intend to fix the problem. I expected them to repair my car and tell me if it would be degraded in any way. I expected them to compensate me appropriately if there was any degradation.
3. I am concerned, because I believe that the fix may impact the reliability and durability of my vehicle. VW have done nothing to alleviate this fear.
4. VW have written to me twice (Signed Alex Smith Director of Volkswagen. See Annex A).
 - 4.1. Once to say that there was a problem and
 - 4.2. Once to say that they were sorry that my vehicle was affected (I think that's an apology), to explain that the fix would be software only, and to confirm that **the objective was not to affect engine output, fuel consumption or performance.**
5. The above correspondence did not satisfy my expectations of "openness and transparency". There was no reference to the potential impact of the fix on other issues such as **reliability durability maintainability and in particular the diesel particulate filter.**
6. I therefore contacted VW at least 4 times to explain my concerns (See Annex B).
 - 6.1. I used the contact form on their website (which doesn't give a confirmation of receipt).
 - 6.2. I emailed Alex Smith directly.
 - 6.3. The only response was by phone and appeared to come from a call centre. The operative could not answer any of my detailed questions. He just seemed to be going through a check list of the obvious ones. Eventually he advised me that the technician would be able to answer my questions when my car software was

updated.

7. Clearly, I am disappointed, that a brand I trusted could have let me down so badly. I have therefore constructed a theory as to how VW may have got into this mess and why they don't appear to be acting transparently. I should emphasise that I am not an engine expert, this theory may be incorrect, and I would not have gone down the route of writing to this committee enquiry if VW had answered my queries and responded more openly when interviewed by the committee. Nevertheless, I believe this theory is credible and worthy of further investigation, if only to help reveal what actually happened and correct things for the future.
8. **The Theory** (one of many possible options) is as follows:-
 - 8.1. Designing a successful engine system requires a careful trade of many factors, including performance, fuel consumption, emissions, reliability, durability and maintainability. Within emissions, there are further tradeoffs between for example NOx and Diesel Particulates.
 - 8.2. When developing the Euro 5 engine, VW were unable to achieve the specified requirements with the available technology. They could achieve the requirements during testing, but during extended road tests there were problems with the diesel particulate filter blocking prematurely, leading to reliability and durability problems with the filter. This would primarily happen when vehicles were driven on short trips.
 - 8.3. They didn't want their reputation for reliability to be tarnished, and they didn't want to say to the customers "don't use this vehicle for short trips", so they developed the "defeat" mechanism.
 - 8.4. This mechanism works by exploiting the well established trade off between NOx and Diesel Particulate emissions. They introduced "dual map" engine control software.
 - 8.5. During tests, the selected map causes the engine to produce low NOx and high diesel particulates. The diesel particulates are absorbed by the DP filter, so emissions out of the tail pipe achieve specification values. The filter does not clog, because the test is only for a relatively short period of time.
 - 8.6. On the road, the selected map causes high NOx emissions, but diesel particulates into the DP filter are reduced so acceptable life and reliability is achieved
 - 8.7. When the diesel scandal broke, the Engineers were instructed to fix the emissions problem as quickly and cheaply as possible, whilst maintaining fuel consumption and performance. In addition the solution had to be easily retrofitable.
 - 8.8. The only solution available to the engineers was to essentially run the engine in "defeat" mode the whole time. Emissions, fuel consumption and performance were achieved. The solution is easy to retrofit as it requires only software. All "contractual" requirements are met. Any reduction in reliability/ durability of the

filter will only affect a relatively small number of customers and is not covered by warranty.

8.9. Everyone goes home happy, with the exception of the small number of customers who intend to use the vehicle for primarily short trips. The damage will be contained.

9. Below, I have included some of the evidence which demonstrates why I believe the above

scenario is feasible and could have happened. I appreciate that in the main the evidence is circumstantial and there are many different scenarios that could have played out. If, however, VW had been clear and transparent and answered my queries there would have been no need for me to develop my own theory. I believe they are going through a process of damage limitation, guided by lawyers and accountants. As a result the brand and their reputation for engineering excellence are being tarnished. The bond of trust between VW and their customers has been broken.

10. General Evidence

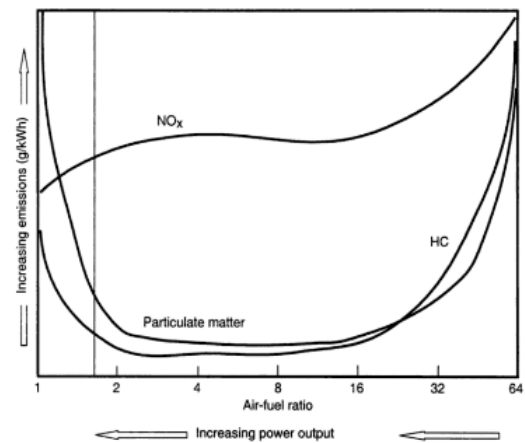
10.1. The article at https://www.dieselnet.com/tech/engine_fi.php describes the earliest “defeat” mechanism.

“Between 1987 and 1998 when electronically controlled injection timing retard was the primary means for reducing NOx emissions, one means that many North American engine manufacturers commonly used to offset fuel consumption penalties associated with retarded fuel injection timing was a [dual-mapping](#) strategy in electronically controlled engines. In this approach, a nominal injection timing setting that assured regulatory compliance with NOx emission standards was used in transient operation such as during emission certification test cycles. However, when it was determined that a vehicle was in cruise mode, injection timing was advanced to improve fuel economy. This provided a significant fuel economy improvement under the highway cruise condition commonly encountered by heavy-duty trucks but also increased NOx emissions significantly.”

10.2. The book Air Pollution and Motor Vehicles Standards and Control Mechanisms for Controlling Emissions ([Asif Faiz](#), [Christopher S. Weaver](#), [Michael P. Walsh](#)), describes the complexities of controlling emissions. Actual trade off is extremely complicated as stated in the extract below.

Emissions Tradeoffs

There is an inherent conflict between some of the most powerful diesel NO_x control techniques and PM emissions. This is the basis for the much-discussed "tradeoff" relationship between diesel NO_x and PM emissions. The tradeoff is not absolute—a combination of technical advances can make it possible to reduce both NO_x and particulate emissions (figure A3.2.4). These tradeoffs do place limits on the extent to which any one pollutant can be reduced, however. To minimize emissions of all pollutants simultaneously requires careful optimization of the fuel injection, fuel-air mixing, and combustion processes over the full range of engine operating conditions.



10.3. In the past, trading NO_x for Diesel Particulates would have been ineffective. During tests, both are measured and must be controlled. A reduction in NO_x would increase diesel particulates. However, modern diesel engines are fitted with a diesel particulate filter. This is very efficient at trapping diesel particulates. Increased particulates from the engine would be absorbed by the DP filter resulting in acceptable levels at the tailpipe.

10.4. VW advise against purchasing a diesel vehicle if it is to be used primarily for short trips
<http://www.volkswagen.co.uk/need-help/technology/dpf-short-journeys?searchTerm=I+make+lots+of+short+journeys%2C+how+will+this+affect+m+y+DPF%3F&category>

"The particles are trapped on the walls of the DPF, stored and continually disposed of. We call this process 'regeneration'. The DPF system needs the car to be driven at a constant road speed so the regeneration process can be completed successfully. Lots of short journeys, and trips that involve stop/start traffic, may cause the regeneration cycle to be unsuccessful. A single, longer journey may be all that is required for regeneration to be successfully completed. If your typical driving profile involves short trips in heavy traffic, you may wish to reconsider your choice of a car, and may prefer to choose one with a small petrol engine instead."

I do not know if this advice was on the site when I bought my vehicle. Interestingly, I can find no similar advice on the Audi website.

10.5. I was concerned when I was buying my latest VW, that DPF filter could be problematic. I was particularly sensitised to the issue because I had a close friend with a diesel vehicle (not VW) predominantly used on short trips. He had endless problems, with DPF lights and the engine being forced into reversionary mode. The dealer eventually agreed that they should not have sold him the car, and gave him a good deal on a petrol replacement.

I discussed the issue with the VW salesperson prior to purchasing my latest VW,

who advised that that many of their company and demonstrator vehicles do exclusively short journeys and they had not had any problems. Suitably reassured I purchased my current VW Passat TDI. I am extremely pleased with the vehicle, and as advised by the salesperson, I have had no problems with the DPF. At the time I assumed that VW must have a better DPF system than my friends car (who had the problems)

I am now concerned . Perhaps the reason that VW's do not have a problem with the DPF is because of the defeat mechanism. What will happen when VW implement the revised software? Will I start having problems?

10.6. Panorama tested a VW Passat similar to mine. They found that when the vehicle was tested in normal mode (rather than "defeat" mode) the NOx emissions increased by a factor of 2.5.

<http://www.bbc.co.uk/iplayer/episode/b06q6nh2/panorama-the-vw-emissions-scandal> . This indicates that the defeat mechanism is having an effect on NOx emissions.

10.7. Appendix A includes a copy of the 2nd letter that VW sent to me. It says that VW objectives is to maintain output fuel consumption and performance, but says nothing about reliability durability or the DPF filter.

10.8. Appendix B includes the emails I sent to Alex Smith. Director VW. I also expressed my concerns via their website.

10.9. Appendix C is a note to me from Mr Bizley from the RAC. He appears to confirm that the above theory is plausible, but advises that if this is what happened, only a minority of vehicles (driving short distances) will be affected.

11. Comments on Verbal Evidence Given To The Enquiry on 25 January 2016

<http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/transport-committee/volkswagen-group-emissions-violations/oral/27791.pdf>

11.1. *"Q154 Chair: Mr Schmidt, what can you tell us about the software update?*

What difference has it made to NOx levels during emissions tests compared with vehicles that have not had it? Oliver Schmidt: The amount of NOx levels stays the same. We were within the legal limits for NOx levels before, and afterwards the NOx levels were within the legal limits as well."

"Q155 Chair: Are you telling me that the software update is not making any difference? Is that what you are saying? Oliver Schmidt: The software update removes the software that recognised the drive trace, but during an emissions test it has no impact."

This confirms that VW software update effectively keeps the vehicle in "defeat" mode permanently. There is mention of NOx, but no mention of other potential effects (e.g. on the diesel particulate filter).

11.2. *"Q160 Chair: Are you seriously saying to us, Mr Schmidt, that the software devices that have now been put in to test the engines are not showing any difference*

in NOx emissions? Oliver Schmidt: No; as I said, they do not show any differences in the new European driving cycle, where we are below 100 mg per kilometre, which was the legal limit for Euro 5 vehicles. We see improvements in the other areas that vary from engine type to engine type, because of the advances we have gained in engineering over the last 10 years."

Mr Schmidt is implying that the updated software has resolved the issue because **of the many advances made over the past 10 years**. He didn't say what these advances are, or explain how they could be retrofitted to vehicles by purely changing software.

11.3. *"Q172 Chair: I am not talking about the assessment of the Volkswagen Group. Are you telling me that you have not removed the device that was described as a "defeat device" and seen as improper, if not illegal, by the German transport authority? Oliver Schmidt: No. Q173 Chair: Are you telling me that you have not removed it? Oliver Schmidt: No. I am telling you that **we have removed it**, but I said that in the understanding of the Volkswagen Group **it is not a defeat device**."*

I think what Mr Schmidt is saying that, because the "defeat mechanism" only changes injection timing, and doesn't make any adjustments to the emissions systems (e.g EGR SCR or LNT) it is not a defeat mechanism. After all, you can't prohibit the ECU from modifying the injection timing. In my opinion this is just a play on words. The **intent to deceive is just the same**.

11.4. *"Q251 Chair: Why were there different types of software? Oliver Schmidt: The base function of the software is the same—it recognises drive traces—but the effect of what the software does afterwards is different. In Europe, in an effective Euro 5 engine there is no NOx after treatment system on the engine. You have only an oxidation catalytic converter and a particulate trap for particulates. **There is nothing that reduces NOx on a Euro 5 engine**. On a US engine in our older generations you have a lean NOx trap. In the newer generations you have an SCR, a selective catalytic reduction system. In the US, the software influenced the function of those two systems, which are not present in the EU. "*

Mr Schmidt conveniently omits to say that **NOx emissions on a Euro 5 engine can be adjusted by changing the injection timing**. On modern diesels the ECU can adjust injection timing (and hence NOx) for a variety of reasons.

11.5. *"Q190 Huw Merriman: The defeat device, as many call it but you do not, enhanced the NOx results. You then take out the defeat device and due to new technology, from the last 10 years, you can then net off any of that NOx impact. Oliver Schmidt: Correct. Q191 Huw Merriman: If that is the case, and it has been there for 10 years, why did you need to put in the defeat device in the first place? The technology was already there. Oliver Schmidt: Again, I have to refer to the Jones Day report. Paul Willis: We do not know"*

I understand that there may be legal reasons why VW can not speculate on how and why the "defeat device" was introduced. However, by now, **VW will know exactly**

how it works, what it does, and exactly what the full impact of removing it will be. In my view, they are not being clear and transparent on this issue.

*M H Maynard
VW TDI Owner
15 Feb 2016*

APPENDIX A



[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Vehicle Registration Number: [REDACTED]

Chassis Number: [REDACTED]

Service Action: EA189 diesel engines

December 2015

Dear [REDACTED]

Vehicle registration number: [REDACTED]

I am sorry that your vehicle is affected by the EA189 diesel engines NOx emissions issue. Volkswagen Group is taking this issue very seriously and has been working closely with the relevant authorities to obtain approval for our technical solutions for models affected in Europe. Thank you for your patience whilst we have been developing these technical solutions. I can now provide you with further information on what this will involve.

- For the 2.0 and 1.2 TDI engines, the solution will involve a software update to the engine management system. We expect that it will take around 30 minutes to complete this software update.
- For the 1.6 TDI engine, the solution will involve the fitting of a 'flow transformer' directly in front of the air mass sensor. This transformer is a mesh that stabilises the air flow in front of the sensor to improve its accuracy. Accurate measurement of air mass is a very important factor in achieving an optimum combustion process. In addition, we will perform a software update to the engine management system. We expect to complete both processes in less than one hour.

Our objective is to achieve the applicable emission targets without affecting engine output, fuel consumption or performance. However, as all model variants have to be measured first, we cannot give a final confirmation of the results just yet.

The solutions will be deployed as quickly as possible once they are signed off. Our aim is to start implementing the technical solutions in early 2016 for 2.0 TDI engines, followed by the different engine types and sizes throughout the full calendar year of 2016. We cannot specify exact dates at this time, but we anticipate the 1.2 and 1.6 TDI engine solutions will arrive in the second and third quarters of 2016. The timings are due to the variations of brands, models, engines, model years and transmissions affected.

Once the solutions are ready to be deployed, we will be in touch directly with further details. We are working closely with our network of Volkswagen Authorised Repairers to ensure they're fully prepared to undertake this work for you. We of course won't charge you for implementing the necessary measures, and we will do our utmost to minimise any inconvenience including, if required, keeping you mobile while the work is carried out. We can do the work alongside any scheduled service event you may have. You will be able to have the work done at any Volkswagen Authorised Repairer.

continued overleaf

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APPENDIX B

From: Martyn Maynard
Sent: 23 January 2016 14:30
To: alex.smith@volkswagen.co.uk
Subject: FW: Emissions Fix Trade-offs:- VW KX14RXB

Ref attached email, I recently had a phone response from a member of your call center.

Although he was polite and helpful, unfortunately he was not adequately briefed to answer my specific questions. Could you please get someone with the relevant technical knowledge to address my queries.

Just to clarify, I would expect diesel particulates at the tail pipe to comply with regulations (as would the authorities). I am more concerned with the potential increase of dp into the filter. If there is any increase, there will be a corresponding reduction in the life of the filter, and the system will be more susceptible to reliability/ maintainability/ durability issues.

Clearly such an effect would be unacceptable. One of the main reasons for buying a VW is reliability and durability.

Thank You
Martyn Maynard

To: alex.smith@volkswagen.co.uk
From: martyn_maynard@hotmail.com
Subject: Emissions Fix Trade-offs:- VW KX14RXB
Date: Wed, 6 Jan 2016 10:36:04 +0000

FAO Alex Smith Director of Volkswagen

Thank you for your letter of Dec 2015 advising that you will shortly be recalling my vehicle to fix the emissions problem. I also note that your objectives are to fix the problem without effecting engine output, fuel consumption or performance.

I am a little concerned that you have not mentioned reliability, durability or maintainability. These are all issue which could also be effected by the proposed change to software.

For example, I am aware that there is a clear trade off between NOx and particulate emissions. Increasing particulate emissions to reduce NOx could well effect the longevity/ reliability of the particulate filter. I was particular concerned about this issue when I bought the car, as I know that this can be a serious issue, particularly for cars that do a lot of short journeys. I also understand that it may not be covered by warranty (presumably because you know that there is potentially an issue and would prefer the costs of repair to be born by the customer).

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Can you please advise what steps are being taken to ensure (and assure the customer) that additional trade-offs (such as reliability, durability and maintainability) are not being compromised by the proposed changes.

Thank You

Martyn Maynard

Sent from [Mail](#) for Windows 10

APPENDIX C

From: David Bizley <dbizley@rac.co.uk>

Sent: 09 February 2016 14:51

To: Martyn Maynard

Subject: RE: VW Emissions Scandal

Dear Mr Maynard,

I have now had an opportunity to consult with colleagues on the matters raised in your email to me.

Can I start by making it clear that the RAC does not know precisely how VWG plans to address the emissions concerns that have been widely reported since last. Ultimately therefore, only VWG can respond authoritatively to the points you have raised.

Most commentators expect VWG to remap the engine management system when they recall vehicles to remove the defeat device. My understanding is that VWG have stated publicly that this will not adversely affect the driveability or fuel economy of the vehicle. Never the less, we have suggested to a few members who have voiced concerns to us about a possible impact of the modifications on fuel economy, that they should seek written assurances on the matter from VWG and that they might wish to consider monitoring fuel consumption both before and after the modifications are carried out to satisfy themselves that fuel economy has not changed.

You are, I believe, correct in pointing out that the formation of Nitrogen Dioxide and of particulates in diesel engines are inter-related and indeed the conditions that prevail within a diesel particulate filter when in operation are not conducive to minimising Nitrogen Dioxide emissions. However, in our experience, the single most important factor determining the effectiveness and life of the DPF is the drive cycle over which the vehicle operates. The vehicle needs to undertake sufficient journeys of a speed and duration to allow for regeneration of the DPF, which of course is why diesels fitted with a DPF are generally not recommended when a vehicle is only going to undertake short journeys. In our experience, DPFs do not normally require maintenance or replacement over the life of a vehicle provided the drive cycle is such as to allow for regular regeneration of the DPF when required. Replacement of a DPF is normally associated with blockage as a result of the regeneration cycle not kicking in and is not a consequence of the filtration duty itself.

It is theoretically possible that any remapping of the engine management system could impact marginally on the volume of particulates entering the DPF, though I should stress that the RAC has no evidence that this will be the case. However, for those owners whose drive cycles are normal, I would expect that the DPF will handle this and I have no reason to anticipate any adverse impact for owners. Owners who only drive short distances and use their vehicles in a manner that does not create opportunities for regeneration of the DPF may possibly find that the DPF warning light comes on a little sooner than it otherwise would have. However, this would only affect owners of diesel whose drive cycles are dominated by short journeys and for whom a modern diesel vehicle would not normally be recommended anyway.

Clearly, any member of the public can make contact with a House of Commons Select Committee or any individual member of that Committee and ask them to consider particular evidence relevant to an enquiry. The oral evidence given by me on behalf of the RAC was part of a session in which the Committee was seeking views on how motorists were feeling about the

emissions scandal and how it had changed their levels of trust in motor manufacturers. I was not there as a technical expert and I based my responses on survey data that RAC had gathered in June when undertaking research for our Annual Report on Motoring and in October, when we sought the views of a panel of motorists on matters arising from the VWG vehicle emissions revelations. However, the committee has taken evidence from a number of technical specialists and I think it likely that if any of them had serious concerns regarding DPF life, then they would have raised these concerns with the Committee.

I hope you find this response of some help.

Kind regards,

David Bizley
Chief Engineer