The 'Dirty 30' highly polluting diesel cars in Europe and the national regulators failing to act

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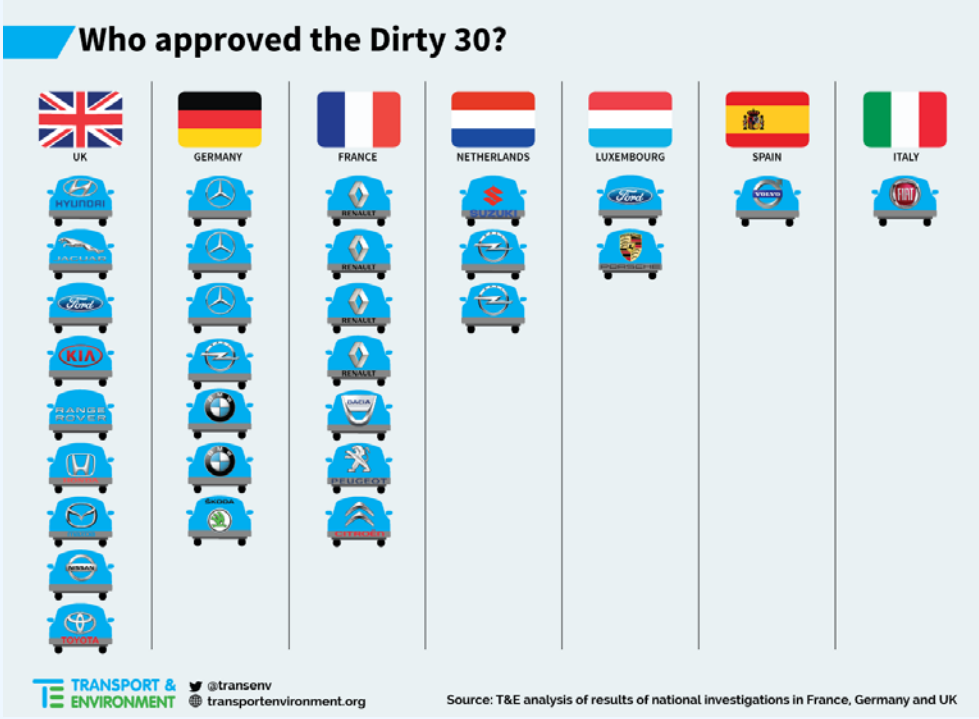
A briefing by TRANSPORT & ENVIRONMENT

Summary

Transport & Environment has re-analysed the data from the national emissions testing programmes and identified **30 of among the highest polluting new diesel cars on Europe's roads**. The "**Dirty Thirty**" span across **most carmakers** with Renault (four), Mercedes (three) and Opel/Vauxhall (three) standing out. Each car was approved by one of **seven national type approval authorities**. Nine cars were approved in the **UK**; **Germany** and **France** each approved seven; the **Netherlands** approved three; **Luxembourg** two; and **Spain** and **Italy** one each. These regulators have to date taken no legal action against any of the carmakers or taken forward more in-depth investigations to scrutinise whether the models used illegal defeat devices despite strong evidence that they did, including: inappropriate use of a 'thermal window' (29 models); high 'hot restart' emissions (23 models) and plain shut-offs after a certain time (at least one model). Urgent action is needed by national agencies (TAAs) to investigate these suspect emissions control strategies.

EU transport ministers are meeting in Luxembourg on 7 June to discuss the results. They must not brush the Dieselgate scandal under the carpet in an attempt to cover up the inadequacies of their own compromised regulatory agencies and, in doing so, let carmakers off the hook.

Early signs are worrying though. Germany is planning an in-camera AOB item to blame inadequate EU regulations for the Dieselgate debacle. Rules can surely be improved, but the primary problem has been inadequate enforcement by compromised national regulators. European institutions need to work together to get vehicles with high emissions fixed; sanction carmakers that break the rules; and strengthen testing regimes to prevent a reoccurrence. Ministers should take responsibility for fixing the problems and avoid a blame game with the European Commission.



1. 30 of the most polluting diesel cars in Europe

This paper identifies 30 of among the most polluting, modern ('Euro 6') diesel cars in Europe and the national regulators that have approved the cars for use and are now failing to take follow-up action to tackle their excessive emissions. It assesses the suspect test results for each model and explains what these show about the use of potential illegal defeat devices on these vehicles which cause much higher emissions when the car is on the road than when it is being tested.

The list is based on the results of national investigations into vehicle emissions that have been performed and published in Germany[1], France,[2] and the UK.[3] These investigations were screening exercises designed to identify models with anomalous emissions. The tests were not capable of determining definitively the presence of defeat devices. For suspect vehicles, more detailed follow up is required – but none is underway.

T&E's list of the "Dirty 30" polluting cars in Europe includes: four Renault cars; three Mercedes; three Vauxhall/Opels; two Fords; and two BMWs plus one from another 16 carmakers (see **full list in annex I**). The list includes a Porsche and Skoda car from the Volkswagen group. However, none of the tested VW vehicles produced exceptional emissions. **Real-world driving emissions (RDE) tests** conducted on some of these models show the nitrogen oxide emissions are many times the 80mg/km limit laid down in Euro 6 legislation. Among the cars were models with the following emissions on the road (RDE test, table below). Not all cars were tested on the road – a full list of emissions is therefore not available.

MAKER	MODEL	ENGINE	Approved in	RDE[4]
BMW	2 Series GT	216d	DE	**x5.1**
Dacia	Sandero II	1.5 dCi 66 kW	FR	**x12.8**
Ford	C-Max II	1.5 TDCi 88 kW	LU	**x5.5**
		2.0 TDCi 110 kW		**x6**
Hyundai	i20 II	1.1 CRDi	UK	**x7.9**
Jaguar	XE	2.0d 120 kW	UK	**x7.4**
Opel	Insignia	2.0 CRDi	DE	**x8**
	Zafira III	1.6 CRDi	NL	**x9**
Porsche	Macan	S Diesel	LU	**x9.9**
Renault	Kadjar	1.5 dCi	FR	**x14.6**
		1.6 dCi		**x13.3**
Suzuki	Vitara IV	1.6 DDiS	NL	**x14**

The 8.5 million Volkswagen vehicles affected by the Dieselgate scandal represent the tip of a huge iceberg. This is not a question of technology availability or unrealistic standards – there are models on the road today that achieve the air pollution standards in normal use conditions including the **VW Golf** (2.0 TDI, approved in Germany), **Peugeot 208** (1.6 BlueHDi, approved in France) and **BMW 320xd** (approved in Ireland).

[1] http://www.autoevolution.com/pdf/news_attachements/630000-diesel-cars-of-german-origin-to-be-recalled-in-europe-more-to-follow-106820.pdf
[2] http://www.developpement-durable.gouv.fr/IMG/pdf/DP_Resultats_Commission_UTAC_le_27-04-2016.pdf
[3] https://www.gov.uk/government/news/government-publishes-findings-of-diesel-emissions-testing-programme
[4] How many times (x) above the Euro 6 NOx limit of 80mg/km

The "Dirty 30" vehicles were approved by seven national type approval authorities: Germany (seven Vehicles), France (seven), UK (nine), Italy (one), Spain (one), the Netherlands (three) and Luxembourg (two).[5] None of these regulators (or their governments) plan to undertake further investigations to: explain *why* these vehicles have such high emissions; identify if they use illegal defeat devices; or bring them into compliance and/or withdraw their type approvals. Instead, voluntary recalls for some of the models are foreseen[6], letting carmakers off the hook and instead blaming EU law for vagueness and openness to interpretation.

2. Clear signs of more defeat devices

The tests performed by national agencies point to a number of different cheating techniques used by carmakers that significantly raise emissions on the road. While the screening tests that have been performed cannot definitely determine the presence of illegal defeat devices, they clearly illustrate where further investigations and/or enforcement activity are needed. Techniques[7] which significantly raise emissions on the road include the use of:

1. Thermal window defeat device
2. Hot restart defeat device
3. Cycle detection defeat device.

Almost all of the "Dirty 30" cars (29) show the presence of a **"thermal window" defeat device**. These switch off or lower the effectiveness of the exhaust treatment systems at temperatures below those typically used during laboratory tests (23°C and 29°C). Because the national testing investigations were mostly undertaken in winter and early spring, tests conducted on track or road produced high emissions highlighting that manufacturers were turning down or switching off the emission control systems during these tests. Manufacturers claim such behavior is needed to protect the engine but the temperatures at which the exhaust treatment effectiveness is lowered is much greater than necessary in many models. This is demonstrated by Renault which has voluntarily agreed to extend the operating range for full functioning of its exhaust treatment system to between 5°C and 40°C from below 17°C and above 35°C. Such wide thermal windows should *not* have been allowed and probably constitute illegal defeat devices. At a minimum, further investigations are needed to determine whether the original approval was granted incorrectly; and whether the manufacturer provided incorrect or misleading information. If so, penalties should be applied and the recalls made mandatory.

The second type of defeat device relates to **"hot restarts".** 23 of the "Dirty 30" show much higher emissions after a hot engine restart than when the engine is cold. Manufacturers' explanation – that high emissions are generated by hotter engine temperatures and pressures experienced at warm restarts – is "bogus"[8] as the emissions generated are both a function of the combustion and effectiveness of the after-treatment that should be much better when hot, as found in data obtained by the ICCT from the EPA.[9] High warm start emissions are highly suspicious and possibly suggest that during a cold start a different and more effective engine and exhaust calibration is being used (as the EU test mandates cold starts). If so this would constitute an illegal defeat device.

[5] Only information on Whole Vehicle Type Approval is available; emissions systems are often certified in a different type approval agency from that issuing the final approval; insiders point out that it's often done in Luxembourg though there is no data available to third parties to check that.
[6] These include Renault Captur, Mercedes A and V class, Opel Insignia and Zafira and Porsche Macan.
[7] More in-depth analysis of this in earlier T&E briefing:
https://www.transportenvironment.org/sites/te/files/publications/2016_05_Dieselgate_continues_briefing.pdf
[8] http://www.theicct.org/blogs/staff/emissions-test-defeat-device-problem-europe-not-about-vw
[9] Ibid.

In May 2016 allegations of a **third defeat device** came to light. It was reported that several tests by the German type approval authority (KBA) had found evidence that the exhaust treatment system in some Fiat models would switch itself off after 22 minutes[10]. Emissions tests normally run for around 20 minutes. Despite Fiat's refusal to cooperate, KBA are currently trying to investigate Fiat 500X models for the presence of this defeat device.

3. What ministers should do

The recent national testing programmes have exposed high and suspicious emissions from at least 30, new (Euro 6) diesel models; the "Dirty Thirty". Some of these vehicles produce emissions on the road more than 10 times the Euro 6 limit for nitrogen oxides (80mg/km).

The tests performed in the UK, France and Germany were screening tests to detect suspect vehicles. They have done their job but now further investigations are needed. While no other defeat devices like that used by VW were found, the results have exposed other types of devices that require further investigation.

EU transport ministers will meet on 7 June in Luxembourg to discuss the follow-up to the VW emissions scandal and their national investigations. National governments are embarrassed by the findings of the inadequate enforcement of regulations by their own agencies. However, rather than taking action to clean up the mess and enforce the rules they appear to accept manufacturers' bogus justifications for the high emissions and blame the ambiguity of the EU law for their own mismanagement. Germany is seeking to add an in-camera AOB item to the transport ministers' agenda (in addition to the formal debate) with the aim of blaming the rules originally agreed by the member states back in 2007.

The attempt to divert attention from national agencies that have inadequately approved dodgy diesels and their carmaker clients flies in the face of the facts. EU law clearly outlaws defeat devices apart from some clearly defined exemptions. It is the responsibility of national testing regulators to enforce this ban but they are failing to do so because they lack independence. Some clearly operate a minimal regulatory approach to support national companies (like the KBA in Germany; CNRV in France and VCA in the UK). Others compete for the business of approving cars, earning high fees from carmakers for the services they deliver (like the SNCH in Luxembourg).

TRANSPORT MINISTERS MUST HOLD CARMAKERS TO ACCOUNT AND ACT TO ENSURE THEIR COMPROMISED TYPE APPROVAL AUTHORITIES TAKE ACTION TO CLEAN UP THE "DIRTY THIRTY".

Three things must follow:

1. Ministers responsible for Type Approval Authorities must announce **further detailed investigations** to examine if regulations have been breached. The current testing results should be scrutinised further and followed by a much **wider testing exercise** to dig deeper and **unveil all types of defeat strategies** applied by carmakers to cheat the emissions tests. All manufacturers must be forced to come clean, type approvals withdrawn where necessary and mandatory recalls to redesign emissions systems initiated. Penalties must be issued for those found in breach of the rules.

2. In the absence of a truly independent EU regulator, the current **rules around defeat device exemptions should be strengthened** to ensure national type approval authorities cannot circumvent them. This can be achieved by explicitly requiring manufactures to disclose such

[10] http://www.bild.de/bild-plus/geld/wirtschaft/abgas-skandal/auch-fiat-betruegt-mit-illegaler-software-45905214,var=x,view=conversionToLogin.bild.html

strategies during type approval (at present this is at the discretion of the Authority). Also Agencies should be mandated to examine claims and the authorities should be provided with clear engineering guidelines on which to base their approvals (as is the case in the US).

3. The current **type approval procedure in Europe must be reformed**[11] and made more rigorous and transparent. EU oversight to ensure that national authorities do their work properly is urgently needed, as is a comprehensive testing programme of vehicles in use. The current race to the bottom among national testing agencies must finally come to an end.

Further information

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LIST OF VEHICLES IN ANNEX I ON NEXT PAGE

[11] https://www.transportenvironment.org/publications/type-approval-reform-once-decade-opportunity-improve-europe%E2%80%99s-failing-testing-system

Annex I: Full 'Dirty Thirty' list and methodology

T&E created a full database with results from the three national investigations in Germany, France and the UK. We added the Fiat 500X from the DUH test because it offers interesting additional insights.

The table below shows the number of 'Euro 6' vehicle variants tested in the three programmes. NEDC is the so-called 'New European Driving Cycle' that is currently in use to check cars and vans on their compliance with EU emissions (CO2 and air quality) legislation in Europe.

Type of test	DE	UK	FR	Total
1 NEDC hot, road	30			30
2 NEDC hot, in lab	30			30
3 NEDC hot, in lab, 10° C	24			24
4 NEDC cold, track			22	22
5 NEDC hot, track		19		19
6 DUH tests	1			1
7 Real Drive Emissions (RDE)	30			30
Total vehicles tested	30	19	22	46*

*Total is lower than the sum of the countries because some vehicles were tested by more than one authority

We stress that the list is *not* a ranking, or merely a list of the most polluting vehicles; the list intends to illustrate the fullest possible spectrum (in terms of vehicles and national approval authorities) of suspicious emissions behavior identified in the national investigations.

The criteria were the following:

1. Only 'Euro 6' (latest EU emission class) model; we disregarded 'Euro 5' models;
2. RDE NOx emissions over 400 mg/km (5 times the Euro 6 limit);
3. NEDC NOx emissions over 160 mg/km (2 times the Euro 6 limit);
4. Widest possible selection of vehicle brands and market segments to illustrate the fullest possible spectrum of emissions problems.

Brand	**Model**	**Engine**	**Country of approval**	**Most suspicious test(s)[12]**	**Possible defeat strategy to examine**
BMW	2 Series GT	216d	**DE**	2	**Thermal window (TW) + Hot restart (HR)[13]**
	5 Series VI	530d			
Citroën	C4 Picasso II	1.6 BlueHDi	**FR**	4	**TW**
Dacia	Sandero II	1.5 dCi 66 kW	**FR**	1 + 2 + 3	**TW + HR**
Fiat	500X	2.0 MJT	**IT**	6	**Switch-off after 22 min**
Ford	C-Max II	1.5 TDCi 88 kW 2.0 TDCi 110 kW	**LU**	1 + 3	**TW + HR**
	Focus III	1.5 TDCi	**UK**	5	**TW + HR**
Honda	CR-V IV	1.6 i-DTEC 4WD	**UK**	5	**TW + HR**

[12] See previous table for which number represents which test
[13] More information on this in Section 2 and here.

Hyundai	i20 II	1.1 CRDi	**UK**	1 + 3	**TW + HR**
Jaguar	XE	2.0d 120 kW	**UK**	1 + 5	**TW + HR**
Kia	Sportage III	1.7 CRDi	**UK**	5	**TW + HR**
Land Rover	Range Rover Evoque	2.0 TD4 132 kW	**UK**	1	**TW + HR**
Mazda	6 III	2.2d	**UK**	5	**TW + HR**
Mercedes-Benz	A-Class III	A180d	**DE**	5	**TW + HR**
		A200d		4	**TW**
	S-Class VI	S350 Bluetec		1 + 2 + 3	**TW + HR**
	V-Class III	V250d		1 + 2	**TW + HR**
Nissan	Qashqai II	1.6 dCi	**UK**	4	**TW**
Opel	Mokka	1.6 CDTi	**NL**	4 + 5	**TW + HR**
	Zafira III	1.6 CDTi		1 + 3 + 4	**TW + HR**
	Insignia	2.0 CDTi	**DE**	1 + 3 + 5	**TW + HR**
Peugeot	5008	1.6 BlueHDi	**FR**	4	**TW**
Porsche	Macan	S Diesel	**LU**	1 + 3	**Test recognition (TR) + TW + HR**
Renault	Captur	1.5 dCi 66 & 81 kW	**FR**	4	**TW**
	Mégane III	1.5 dCi		5	**TW + HR**
	Kadjar	1.5 & 1.6 dCi		1 + 3 + 4	**TW + HR**
	Espace V	1.6 dCi		4	**TW**
Škoda	Octavia III	1.6 TDI	**DE**	5	**TR + TW + HR**
Suzuki	Vitara IV	1.6 DDiS	**NL**	1 + 3	**TW + HR**
Toyota	Avensis III	2.0 D-4D	**UK**	5	**TW + HR**
Volvo	V60	D3	**ES**	1	**TW + HR**

Other investigated vehicles that emit at least more than two times the Euro 6 limit on NEDC are: Ford Kuga II and Mondeo IV 2.0 TDCi, Honda HR-V II 1.6 i-DTEC (88 kW), Hyundai i30 II 1.6 CRDi, Mercedes-Benz C220d Bluetec, Peugeot 3008 1.6 HDi and Peugeot 508 2.0 HDi.