FEDERATION INTERNATIONALE DE L'AUTOMOBILE

FIA consumer testing programme – Volkswagen recall

Summary of findings

In mid-2015, an investigation by the US Environmental Protection Agency (EPA) discovered that VW had fitted the engine control units of its diesel vehicles with illegal defeat devices in order to comply with US emissions standards in type approval tests. The device was programmed to detect when a vehicle was undergoing laboratory emissions testing and modify the vehicle's emission control system to meet mandatory pollutant levels. The defeat device was used in vehicles worldwide, predominantly in the EA189 diesel engine variant. In addition to VW branded vehicles, vehicles of the sister brands Audi, Seat and Skoda are affected. According to VW, refitting affected vehicles in Europe should be relatively simple. In fact, all that is needed is to update the engine control unit's software in the 1.2l and 2.0l engines. The 1.6l engines require the additional installation of hardware i.e. a so-called flow straightener.

The very first models approved by the German Federal Motor Transport Authority (KBA) to receive the software update and to be recalled included the Audi Avant 2.0 TDI and the VW Golf 2.0 TDI BMT. The manufacturers promised that no disadvantages were to arise for consumers in the context of the refit. To verify whether or not this promise holds up, ADAC, ÖAMTC and TCS tested a Golf 2.0 TDI BMT and three Audi A4 2.0 TDI Avant vehicles prior to and after the refit. All vehicles came with a manual gearbox and a start/stop system. While the tests focused on fuel consumption and nitrogen oxide (NO_x) emissions, engine performance was evaluated as well. In addition, driveability of the vehicles was examined to identify any potential changes in vehicle handling relevant for consumers.

In Europe, the defeat devices were to ensure compliance with nitrogen oxide limits in the New European Driving Cycle (NEDC). The KBA also use this test procedure to approve the refit measures. The automobile clubs followed the profile of the regulatory test cycle (NEDC) and additional elements of ADAC's EcoTest procedure before and after the refit.

The NEDC revealed no major differences in NOx emissions and consumption levels before and after the software update. ADAC's EcoTest procedures, however, based on WLTC 2.0 (Worldwide Harmonized Light Vehicles Test Cycle) and BAB130 (motorway at 130kph) paint a completely different picture: in fact, NO_x emissions are significantly lower with slightly higher consumption levels.

To enable correct interpretation of the measurements, a margin for measurement uncertainty needs to be considered. With a +/-2 percent margin for measurement uncertainty, the fuel

consumption in the VW Golf was found marginally higher (between 0.4 and 2.5 percent depending on the test cycle), while a reduction in NO_x of up to 33.9 percent emissions was measured. In the tested Audi vehicles, the consumption variance was even lower, as was the reduction in nitrogen oxide emissions achieved (max. 10.6%).
In addition to exhaust gas measurements, we examined vehicle performance prior to and after the refit. In this category, VW and Audi were true to their promise: no changes in vehicle performance.

No noticeable changes in the vehicle handling performance were found either.

Vehicle	NEDC			WLTC			Motorway:		
	NOx mg/km	CO_2 g/km	FC l/100km	NOx mg/km	CO_2 g/km	FC l/100km	NOx mg/km	CO_2 g/km	FC l/100km
Measurements before refit									
ADAC Golf	119	122	4.67	397	113	4.31	724	144	5.49
ÖAMTC A4-1	135	134	5.10	352	120	4.60	661	155	5.90
ÖAMTC A4-2	137	129	4.90	309	124	4.7	613	156	6.00
TCS A4	159	143	5.42	349	136	5.15	605	166	6.3
Measurements after refit									
ADAC Golf	121	125	4.78	308	119	4.5	464	149	5.66
ÖAMTC A4-1	147	134	5.10	364	118	4.5	635	150	5.70
ÖAMTC A4-2	138	130	4.90	304	122	4.6	536	153	5.80
TCS A4	169	143	5.41	334	135	5.09	545	166	6.28
Difference before/after refit									
ADAC Golf-1	1.7%	2.5%	2.4%	-22.4%	4.5%	4.4%	-35.9%	3.6%	3.1%
ÖAMTC A4-1	8.9%	0.0%	0.0%	3.4%	-1.7%	-2.2%	-3.9%	-3.2%	-3.4%
ÖAMTC A4-2	0.7%	0.8%	0.0%	-1.6%	-1.6%	-2.1%	-12.6%	-1.9%	-3.3%
TCS A4-3	6.3%	0.3%	-0.2%	-4.1%	-0.8%	-1.2%	-10.0%	0.1%	-0.3%

All exhaust data measured before and after the software update.