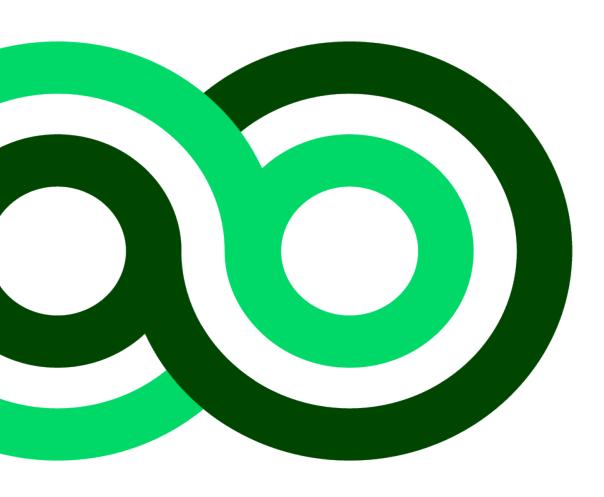


TEST PROCEDURE

Overall Test Procedure





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Green NCAP test procedure: stage 1



vehicle selection: current model year, Euro 6d , according to GNT_Green_NCAP_VSSTR

for definitions, acronyms and symbols please see GNT_Definitions_Accronyms_Symbols

wheel alignment with wheel alignment protocol;

This can be either performed by the laboratory or a specialized workshop. It has to be ensured, that the correct values and tolerances are applicable. A protocol (usually handed out by the workshop or given by the measurement device) has to prove the correctness of the wheel alignment adjustments.

vehicle data collection according to GNT_Parameter_Input_List_Template

driving resistance from vehicle's CoC documents according to GNT Driving Resistance

weighing on laboratory scale according to GNT Overall Test Procedure

Calculation of test masses: The calculation of test masses will automatically be conducted in GNT Parameter Input List Template by following these formulas:

Laboratory tests:

If deviation between (mass on laboratory scale) and mass – 75 Kg) is less than ± 3% (actual

TM = TM from CoC (point 47.1.1)

Where:

mass on laboratory scale = mass on laboratory scale, 100 % fuel, without

actual mass = point 13.2 of vehicle's CoC

If deviation between (mass on laboratory scale) and mass – 75 Kg) is more than ± 3% (actual

TM = UM + OM + 100kg + 0,15 (LM - (UM + OM))

Wher

mass on laboratory scale = mass on laboratory scale, 100 % fuel, without

actual mass = point 13.2 of vehicle's CoC

UM + OM = actual mass - 75 kg

LM = gross vehicle weight: point 16.1 of vehicle's CoC

PEMS+ regular cold:

If deviation between (mass on laboratory scale) and mass – 75 Kg) is less than ± 3% (actual

 $TM_{regular\ cold} = UM + OM + 0.7 (LM - (UM + OM + 75 kg))$

Mhoro.

mass on laboratory scale = mass on laboratory scale, 100 % fuel, without driver

actual mass = point 13.2 of vehicle's CoC

UM + OM = actual mass - 75 kg

LM = gross vehicle weight: point 16.1 of vehicle's CoC

If deviation between (mass on laboratory scale) and (actual mass – 75 Kg) is more than ± 3%

TM_{requiar cold} = mass on laboratory scale

0,7 (LM - (mass on laboratory scale + 75 kg))

Where:

mass on laboratory scale = mass on laboratory scale, 100 % fuel, without driver

actual mass = point 13.2 of vehicle's CoC

UM + OM = actual mass - 75 kg

LM = gross vehicle weight: point 16.1 of vehicle's CoC

PEMS+ heavy warm:

If deviation between (mass on laboratory scale) and actual mass – 75 Kg) is less than ± 3%

 $TM_{heavy\ warm} = UM + OM + 0.9 (LM - (UM + OM + 75 kg))$

Where:

mass on laboratory scale = mass on laboratory scale, 100 % fuel, without driver

actual mass = point 13.2 of vehicle's CoC

UM + OM = actual mass - 75 kg

LM = gross vehicle weight: point 16.1 of vehicle's CoC

If deviation between (mass on laboratory scale) and (actual mass – 75 Kg) is more than \pm 3%

TM_{heavy_warm} = mass on laboratory scale

0,9 (LM - (mass on laboratory scale + 75 kg))

Where:

mass on laboratory scale = mass on laboratory scale, 100 % fuel, without driver

actual mass = point 13.2 of vehicle's CoC

 $UM + OM = actual \ mass - 75 \ kg$

LM = gross vehicle weight: point 16.1 of vehicle's CoC

PEMS+ Eco light warm:

TM_{light_warm} = minimum test mass possible

Minimum mass for execution of the test with driver and test equipment. No additional payload allowed.

tyres summer or if otherwise defined in the CoC according to CoC, min. 50% pattern depth, pressure according to GNT_WLTC+_Test_Procedure

AdBlue quality check according to GNT_AdBlue_Quality_Check; mileage from 1.000km up to 30.000km; PEVs shall be tested with at least 300km

maintenance check according to GNT WLTC+ Test Procedure, GNT Parameter Input List Template, check service history, vehicle memory readout

vehicle OBD memory readout and check; readout OBFCM values and fill in GNT Parameter Input List Template, installation of accelerator pedal position acquisition device

documentation test vehicle according to GNT Parameter Input List Template, GNT Footage Procedure

vehicle preparation for emissions testing according to GNT_WLTC+_Test_Procedure, GNT_PEMS+_Test_Procedure

Test sequence flexibility:

The test sequence can generally be switched. The influence of such switches regarding the following tests has to be taken into account. It has to be ensured, that a WLTC+ warm cycle is put in front of a WLTC cold test. Same applies for cold start PEMS+ tests, where a Precon of 20 min before the soak is mandatory. This precon can either be the last cycle on the chassis dynamometer or a free trip of at least 20 min.

Warmup for warm start tests:

For a warm up of the engine, the vehicle shall be driven at a speed of 100 km/h until the engine oil temperature has reached 90 °C or for a maximum of 5 minutes, whatever comes first. Therefore, a thermocouple has to be installed to the oil sump. The engine oil temperature at the start of the cycle must be at 90 °C +/- 5 °C. If the installation of a thermocouple isn't possible, it shall be ensured (e.g. by the vehicle's gauges), that the vehicle has reached it's standard operation temperature.

Instructions for tests with Diesel Particulate Filter regeneration occurrence:

If a regeneration is detected during testing, the test should be continued and conducted as normal, not be interrupted, and shall be completed! This rule is valid for any test, both on chassis dyno and on-road. Generally, the results of the test, in which regeneration was detected, will not be included in the rating. The objective of completing tests that retroactively were declared invalid owing to regeneration is to be able to quantify the impact of regeneration on the individual test results as well as on the clean air index scores. Tests in which regeneration occured have to be repeated, in advance it has to be ensured, that the filter is conditioned again.

Vehicle cabin temperature during chassis dynamometer tests: For cabin temperature measurement, a temperature measuring tip has to be installed at the front-seat passenger's headrest. All measurements shall be recorded.

The automatic air condition is operated with A/C switch on, temperature set at 23 °C and fan speed on automatic regulation with airflow on automatic regulation. No readjustments shall be done. Settings shall be proved by photographs.

The manual air condition is operated with A/C switch on, temperature ½ (middle position) and fan speed on 1/3 to ½ with airflow on floor and windscreen. If necessary, the settings for temperature have to be readjusted until 23 °C ± 3 °C are met. This shall only be done during stop phases. All readjustments have to be recorded and proved, e.g. by photographs.

Soak provisions for 23°C soak (roller bench tests and PEMS + tests):

The Soaktime for 23°C cold start tests on the chassis dynamometer and cold start PEMS tests is 6-72 h. The target oil temperature of 23°C ±5°C before test start has to be ensured either by measurement or OBD readout.

				Conventional, GFV, HEV, P	HEV			PEV
			ref	ference fuel according to GNT_WLTC+_Test_Proceed	dure			At no test shall the battery SoC be depleted to a level below 10 % or where power restriction
setup			G	FV		HEV	PHEV CD capitals: charge depleting	strategies are activated! The battery capacity test shall be conducted
Propulsion unit	Diesel and Petrol	monovalent		bivalent (fuel tank > 20l)		in addition to the provisions made in GNT_WLTC+_Test_Procedure, the requirements in GNT_Special_Requirements_for_Hybrid_Elec tric_Vehicles have to be fulfilled	CS capitals: charge sustaining in addition to the provisions made in GNT_WLTC+_Test_Procedure,	according to GNT_Driving_Range_Test_Procedure; PEMS+ tests can be used for determination of the available battery capacity, the final battery discharge has to be conducted on the chassis dynamometer
_		note down BC (board computer) values for fuel consu	mption of	note down BC (board computer) values for fuel consu	mption o	note down BC (board computer) values for fuel consumption of every cycle	note down BC (board computer) values for energy consumption of every cycle	note down BC (board computer) values for energy consumption of every cycle
	note down BC (board computer) values for fuel consumption of every cycle	every cycle		every cycle		read out OBD battery SOC value before and after each test	read out OBD battery SOC value before and after each test	read out OBD battery SOC value before and after each test
	test cell at 23 °C ± 3 °C	test cell at 23 °C ± 3 °C		test cell at 23 °C ± 3 °C		test cell at 23 °C ± 3 °C	optional 3PHEV Free urban trip (if battery is not depleted) until ICE starts, plus free urban trip for additional 20 km	test cell at 23 °C ± 3 °C
	4WLTC_warm_cd according to GNT_WLTC+ Test_Procedure	4WLTC_warm_cd according to GNT_WLTC+_Test_Procedure		4WLTC_warm_cd according to GNT_WLTC+_Test_Procedure	gfv	4WLTC_warm_cd according to GNT_WLTC+_Test_Procedure	test cell at 23 °C ± 3 °C	4WLTC_warm_cd according to GNT_WLTC+ Test_Procedure
	maximum 120 s inbetween	maximum 120 s inbetween		maximum 120 s inbetween		maximum 120 s inbetween	4WLTC_warm_cd according to GNT_WLTC+_Test_Procedure	maximum 120 s inbetween
ory)	4cd for 23°C tests according to GNT_WLTC+_Test_Procedure	4cd for 23°C tests according to GNT_WLTC+_Test_Procedure		4cd for 23 °C tests according to GNT_WLTC+_Test_Procedure		4cd for 23 °C tests according to GNT_WLTC+_Test_Procedure	maximum 120 s inbetween	4cd for 23°C tests, 4WD mode acc. to GNT_WLTC+_Test_Procedure
(laboratory)	warm up	warm up		warm up		warm up, SoC adjustment (60% +/- 10% or to a SoC corresponding to CS mode)	4cd for 23°C tests according to GNT_WLTC+_Test_Procedure	5WLTC_warm_def according to GNT_WLTC+_Test_Procedure
(lab	5WLTC_warm_def according to GNT_WLTC+_Test_Procedure	5WLTC_warm_def according to GNT_WLTC+_Test_Procedure		5WLTC_warm_def according to GNT_WLTC+_Test_Procedure	gfv	5WLTC_warm_def according to GNT_WLTC+_Test_Procedure	warmup	18Battery capacity test according to GNT Driving Range Test Procedure (can also be
testing	41Soaktime 6-72 h, 23 °C ± 3 °C, see provisions	41Soaktime 6-72 h, 23 °C ± 3 °C, see provisions		41Soaktime 6-72 h, 23 °C ± 3 °C, see provisions		41Soaktime 6-72 h, 23 °C ± 3 °C, see provisions	n-times 5WLTC_warm_def_CS until CS acc. to GNT_WLTC+_Test_Procedure	performed inbetween the tests)
	6WLTC_cold_def according to GNT_WLTC+_Test_Procedure	6WLTC_cold_def according to GNT_WLTC+_Test_Procedure		6WLTC_cold_def according to GNT_WLTC+_Test_Procedure	gfv	6WLTC_cold_def according to GNT_WLTC+_Test_Procedure	warmup	41Soaktime 6-72 h, 23 °C ± 3 °C
ficiency	road load verification	road load verification		road load verification		road load verification	11BAB_warm_def_CS according to GNT_BAB_Motorway_Test_Procedure	6WLTC_cold_def according to GNT_WLTC+_Test_Procedure

d eff	warm up	warm up		warm up		warm up, SoC adjustment (60% +/- 10% or to a SoC corresponding to CS mode)	WLTC_warm_CS (only precon)	road load verification	
ıs and	11BAB_warm_def according to GNT_BAB_Motorway_Test_Procedure	11BAB_warm_def according to GNT_BAB_Motorway_Test_Procedure	gfv	11BAB_warm_def according to GNT_BAB_Motorway_Test_Procedure	gfv	11BAB_warm_def according to GNT_BAB_Motorway_Test_Procedure	41Soaktime 6-72 h, 23 °C ± 3 °C	warm up	
Emissions				warm up			6WLTC_cold_def_CS according to GNT_WLTC+_Test_Procedure	11BAB_warm_def according to GNT_BAB_Motorway_Test_Procedure	
Em				WLTC_warm_precon according to GNT_WLTC+_Test_Procedure	petrol		charge to SOC 100% according to GNT_Driving_Range_Test_Procedur		
				41Soaktime 6-72 h, 23 °C ± 3 °C			41Soaktime 6-72 h, 23 °C ± 3 °C		
				14WLTC_cold_def according to GNT_WLTC+_Test_Procedure	petrol		7WLTC_cold_def_CD according to GNT_WLTC+_Test_Procedure		
				warm up			incl. n-times WLTC+ according to GNT_WLTC+ _Test_Procedure until CS		
				15BAB_warm_def according to GNT_BAB_Motorway_Test_Procedure	petrol		road load verification		
							charge to SOC 100% according to GNT_Driving_Range_Test_Procedure		
				for MAW method use CO ₂ v	alues in v	ehicle's CoC document			
	PEMS preparation and pictures	PEMS preparation and pictures		PEMS preparation and pictures		PEMS preparation and pictures	PEMS preparation and pictures	PEMS preparation and pictures	
B _C	20Preconditioning 20 min (can also be preceded cycle)	20Preconditioning 20 min (can also be preceded cycle)	gfv	20Preconditioning 20 min (can also be preceded cycle)	gfv	20Preconditioning 20 min (can also be preceded cycle)	20Preconditioning 20 min (can also be preceded cycle); charge to SOC 100%	battery charging to SOC 100%	
testi						SoC adjustment (60% +/- 10% or to a SoC corresponding to CS mode)	41Soaktime 6-72h at 23 °C ± 3 °C		
PEMS testing	41Soaktime 6-72 h at 23 °C ± 3 °C	41Soaktime 6-72 h at 23 °C ± 3 °C		41Soaktime 6-72 h at 23 °C ± 3 °C		41Soaktime 6-72 h at 23 °C ± 3 °C	32PEMS+ cold CD according to GNT_PEMS+_Test_Procedure	41Soaktime 6-72 h at 23 °C ± 3 °C	
PE	21PEMS+ cold according to GNT_PEMS+_Test_Procedure	21PEMS+ cold according to GNT_PEMS+_Test_Procedure	gfv	21PEMS+ cold according to GNT_PEMS+_Test_Procedure	gfv	21PEMS+ cold according to GNT_PEMS+_Test_Procedure	20Preconditioning 20 min (can also be preceded cycle); ensure CS mode via OBD readout	21PEMS+ cold according to GNT_PEMS+_Test_Procedure	
							41Soaktime 6-72h at 23 °C ± 3 °C		
							21PEMS+ cold CS according to GNT_PEMS+_Test_Procedure		
	PEMS disassembly	PEMS disassembly		PEMS disassembly		PEMS disassembly	PEMS disassembly	PEMS disassembly	
		Fill in rating sheet (GNT_Rating_Sheet	Maste	r, GNT_Rating_Sheet_PHEV) with prel	iminary	test results to see if stage 2 evaluation	is necessary		
bΩ				vehicle OBD men	nory reado	ut and check			
Rating	Test analysis according to GNT_Test_performance_limits								
sis, F	Results template GNT_Template_Test_Results								
Analy	Report table GNT_Template_Test_Results								
Test Analysis,				Rating GNT_Rating_Sheet_M	aster and (SNT_Rating_Sheet_PHEV			
_				Upload Output te	st data on	Sharepoint			

Green NCAP test procedure: stage 2



vehicle selection: current model year, homologation Euro 6c, Euro 6d-Temp, Euro 6d-Temp-EVAP or Euro 6d (Euro 6 with characters AP), according to GNT_Green_NCAP_VSSTR

for definitions, acronyms and symbols please see GNT_Definitions_Accronyms_Symbols

vehicle data collection according to GNT_Parameter_Input_List_Template

wheel alignment with wheel alignment protocol;

This can be either performed by the laboratory or a specialized workshop. It has to be ensured, that the correct values and tolerances are applicable. A protocol (usually handed out by the workshop or given by the measurement device) has to prove the correctness of the wheel alignment adjustments.

driving resistance from vehicle's CoC documents according to GNT_Driving_Resistance

weighing on laboratory scale according to GNT_Overall_Test_Procedure

Calculation of test masses: The calculation of test masses will automatically be conducted in GNT_Parameter_Input_List_Template by following these formulas:

Laboratory tests:

If deviation between (mass on laboratory scale) and (actual mass - 75 Kg) is less than ± 3%

TM = TM from CoC (point 47.1.1)

Where:

mass on laboratory scale = mass on laboratory scale, 100 % fuel, without driver

actual mass = point 13.2 of vehicle's CoC

If deviation between (mass on laboratory scale) and (actual mass – 75 Kg) is more than ± 3%

TM = UM + OM + 100kg + 0.15 (LM - (UM + OM))

Where:

mass on laboratory scale = mass on laboratory scale, 100 % fuel, without

actual mass = point 13.2 of vehicle's CoC

UM + OM = actual mass - 75 kg

LM = gross vehicle weight: point 16.1 of vehicle's CoC

PEMS+ regular cold:

If deviation between (mass on laboratory scale) and (actual mass - 75 Kg) is less than ± 3%

 $TM_{regular\ cold} = UM + OM + 0.7 (LM - (UM + OM + 75 kg))$

mass on laboratory scale = mass on laboratory scale, 100 % fuel, without driver

actual mass = point 13.2 of vehicle's CoC

UM + OM = actual mass - 75 kg

LM = gross vehicle weight: point 16.1 of vehicle's CoC

If deviation between (mass on laboratory scale) and (actual

mass – 75 Kg) is more than ± 3%

TM_{regular_cold} = mass on laboratory scale

0,7 (LM - (mass on laboratory scale + 75 kg))

mass on laboratory scale = mass on laboratory scale, 100 % fuel, without driver

actual mass = point 13.2 of vehicle's CoC

UM + OM = actual mass – 75 kg

LM = gross vehicle weight: point 16.1 of vehicle's CoC

PEMS+ heavy warm:

If deviation between (mass on laboratory scale) and (actual mass - 75 Kg) is less than ± 3%

 $TM_{heavy\ warm} = UM + OM + 0.9 (LM - (UM + OM + 75 kg))$

mass on laboratory scale = mass on laboratory scale, 100 % fuel, without driver

actual mass = point 13.2 of vehicle's CoC

UM + OM = actual mass - 75 kg

LM = gross vehicle weight: point 16.1 of vehicle's CoC

If deviation between (mass on laboratory scale) and (actual

mass – 75 Kg) is more than $\pm 3\%$

TM_{heavy_warm} = mass on laboratory scale 0,9 (LM - (mass on laboratory scale + 75 kg))

mass on laboratory scale = mass on laboratory scale, 100 % fuel, without driver

actual mass = point 13.2 of vehicle's CoC

UM + OM = actual mass - 75 kg

LM = gross vehicle weight: point 16.1 of vehicle's CoC

PEMS+ Eco light warm:

TM_{light_warm} = minimum test mass possible

Minimum mass for execution of the test with driver and test equipment. No additional payload allowed.

tyres summer or if otherwise defined in the CoC according to CoC, min. 50% pattern depth, pressure according to GNT_WLTC+_Test_Procedure

AdBlue quality check according to GNT_AdBlue_Quality_Check

maintenance check according to GNT_WLTC+_Test_Procedure, GNT_Parameter_Input_List_Template, check service history, vehicle memory readout

mileage from 1.000km up to 30.000km; PEVs shall be tested with at least 300km

installation of accelerator pedal position acquisition device

vehicle OBD memory readout and check

readout OBFCM values and fill in GNT_Parameter_Input_List_Template

documentation test vehicle according to GNT_Parameter_Input_List_Template, GNT_Footage_procedure

Test sequence flexibility:

The test sequence can generally be switched. The influence of such switches regarding the following tests has to be taken into account. It has to be ensured, that a WLTC+ warm cycle is put in front of a WLTC+ cold test. Same applies for cold start PEMS tests, where a Precon of 20 min before the soak is mandatory. This precon can either be the last cycle on the chassis dynamometer or a free trip of at least 20 min.

Warmup for warm start tests:

For a warm up of the engine, the vehicle shall be driven at a speed of 100 km/h until the engine oil temperature has reached 90 °C or for a maximum of 5 minutes, whatever comes first. Therefore, a thermocouple has to be installed to the oil sump. The engine oil temperature at the start of the cycle must be at 90 °C +/- 5 °C. If the installation of a thermocouple isn't possible, it shall be ensured (e.g. by the vehicle sauges), that the vehicle has reached it's standard operation temperature.

Instructions for tests with Diesel Particulate Filter regeneration occurrence:

If a regeneration is detected during testing, the test should be continued and conducted as normal, not be interrupted, and shall be completed! This rule is valid for any test, both on chassis dyno and on-road. Generally, the results of the test, in which regeneration was detected, will not be included in the rating. The objective of completing tests that retroactively were declared invalid owing to regeneration on the individual test results as well as on the clean air index scores.

According to "GNT_Overall_Test_Procedure", two valid PEMS+ cold tests are to be conducted: "PEMS+ cold rep". A test with regeneration occurring is generally not considered valid. If one of the PEMS+ cold tests is a test with regeneration occurring and therefore invalid, a third PEMS+ cold test shall be conducted. If at the third PEMS+ cold test regeneration is also occurring, the results of the first PEMS+ with regeneration shall be included in the rating — this means that the rating will include the results of one test without regeneration and one test with regeneration, which in this case is declared valid. If at all three tests regeneration occurrs, the rating shall consist of the first two tests with regeneration occurrence, which in this case are both declared valid.

Vehicle cabin temperature during chassis dynamometer tests:

For cabin temperature measurement, a temperature measuring tip has to be installed at the front-seat passenger's headrest. All measurements shall be recorded.

The automatic air condition is operated with A/C switch on, temperature set at 23 °C and fan speed on automatic regulation with airflow on automatic regulation. No readjustments shall be done. Settings shall be proved by photographs.

The **manual air condition** is operated with A/C switch on, temperature ½ (middle position) and fan speed on 1/3 to ¼ with airflow on floor and windscreen. If necessary, the settings for temperature have to be recorded and proved, e.g. by photographs.

Conventional, GFV, HEV, PHEV

PEV

Soak provisions for 23°C soak (roller bench tests and PEMS+ tests):

The Soaktime for 23°C cold start tests on the chassis dynamometer and cold start PEMS+ tests is 6-72 h. The target oil temperature of 23°C ±5°C before test start has to be ensured either by measurement or OBD readout.

				Conventional, Gr V, HEV, THE	. •			
			refere	ence fuel according to GNT_WLTC+_Test_Proced	ure			At no test shall the battery SoC be depleted to a level below 10 % or where power restriction
setup			GFV	1		HEV	PHEV CD capitals: charge depleting	strategies are activated! The battery capacity test shall be conducted
Propulsion unit	Diesel and Petrol	monovalent		bivalent (fuel tank > 20l)		in addition to the provisions made in GNT_WLTC+_Test_Procedure the requirements in GNT_Special_Requirements_for_Hybrid_El ectric have to be fulfilled	CS capitals: charge sustaining in addition to the provisions made in GNT_WLTC+_Test_Procedure, the requirements in GNT_Special_Requirements_for_Hybrid_Elec tric_Vehicles have to be fulfilled	according to GNT_Driving_Range_Test_Procedure; PEMS+ tests can be used for determination of the available battery capacity, the final battery discharge has to be conducted on the chassis dynamometer
_	note down BC the and assumption below for first	note down BC (board computer) values for fuel consumpti		to down BC (board converte) value for first converted		note down BC (board computer) values for fuel	note down BC (board computer) values for energy consumption of every cycle	note down BC (board computer) values for energy consumption of every cycle
	note down BC (board computer) values for fuel consumption of every cycle	every cycle	tion of no	every cycle	триоп о	read out OBD battery SOC value before and after each test		read out OBD battery SOC value before and after each test
rat V ing	٥							
Laborat ory testing								
			-	for MAW method use CO2 va	lues in v	vehicle's CoC document		
	PEMS preparation and pictures	PEMS preparation and pictures		PEMS preparation and pictures		PEMS preparation and pictures	PEMS preparation and pictures	
	23Warm up (5 min free urban trip and 80 °C coolant temperature)	23Warm up (5 min free urban trip and 80 °C coolant temperature) gfv	fv	23Warm up (5 min free urban trip and 80 °C coolant temperature)	gfv	23Warm up (5 min free trip and 80 °C coolant temperature), SoC adjustment	41Soak at 23 °C ± 3 °C, until HVB SOC 100%	
	27Idling 15 min	27Idling 15 min	fv	27Idling 15 min	gfv	27Idling 15 min	33PEMS_eco_cold CD according to GNT_Emission_Robustness_Test_Procedure	
sting	24PEMS_heavy_warm according to GNT_Emission_Robustness_Test_Procedure	24PEMS_heavy_warm according to GNT_Emission_Robustness_Test_Procedure gfv		IPEMS_heavy_warm according to NT_Emission_Robustness_Test_Procedure	gfv	24PEMS_heavy_warm according to GNT_Emission_Robustness_Test_Procedure	41Soak at 23 °C ± 3 °C, until HVB SOC 100%	
ss tes							35PEMS_heavy_cold CD according to GNT_Emission_Robustness_Test_Procedure	

To GNT_WLTC+_CAT_Test_Procedure to GNT_WLTC+_CAT_Test_Procedure give to GNT_WLTC+_CAT_Test_Procedure to GNT_WLTC+_CAT_Test_Procedure to GNT_WLTC+_Test_Procedure to GNT_WLTC+_CAT_Test_Procedure t									
Month of the control in the contro	ne:	36Warm up (5 min free urban trip and 80 °C	36Warm up (5 min free urban trip and 80 °C		36Warm up (5 min free urban trip and 80 °C		36Warm up (5 min free trip and 80 °C coolant	Ensure CS mode (break-off criterion shall be	
Month of the control in the contro	<u>st</u>	coolant temperature)	coolant temperature)	gfv	coolant temperature)	gfv	temperature), SoC adjustment		
Month of the control in the contro	opr								
See an included to a control of the		200							
38/00m up Drain for inter the order of 20 CT		_		gfv		gfv			
Coolant temporaturally PPPUIS CO. yourset according to performance of the control following it is a control following it	8 LID	GNT_EMISSION_ROBUSTNESS_Test_Procedure	GNT_Emission_Robustness_Test_Procedure		GNT_Emission_Robustness_Test_Procedure		GNT_Emission_Robustness_Test_Procedure	<u> </u>	
PATES See, worm according to OHT Jamsson Jabaharea, Test Procedure OHT Jamsson Jabaharea, Test	tes	36Warm up (5 min free urban trip and 80 °C							
## 150 person ##	<u>S</u>		· · · · · · · · · · · · · · · · · · ·	gfv	1 /	gfv	· · · · · · · · · · · · · · · · · · ·		
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Procedure for AdBlue Quality Check

In order to avoid implausible measurement results due to poor quality or manipulated AdBlue, a quality check of the AdBlue (AUS 32, according to ISO 22241) in the vehicle should be carried out as part of the GNCAP procedure. This document proposes a corresponding procedure and defines the corrective measures to be taken if the quality criteria are not met. This procedure could be integrated in the vehicle maintenance check or during the documentation of the test vehicle.

- 1. General AdBlue check procedure
- 1.1 Prepare a sample of the vehicles AdBlue according to point 2 of this document
- 1.2 Quick check the AdBlue according to point 3.1 of this document
 - If the urea content is within the specified limits, proceed with the WLTC+ precon and WLTC+ cold test
 - If the urea content is out of limits, rinse and refill the AdBlue tank according to point 4 of this document and send the AdBlue sample for analysis according to point 3.2 of this document.
- 1.3 Check the emission levels after the the WLTC+ precon and WLTC+ cold test
 - If the values for NOx, NH3 and N2O are within reasonable limits, proceed with the tests according to the standard test procedure
 - If the values for NOx, NH3 and N2O are above reasonable limits (high and inconsistent peaks showing evidence of abnormal reactant):
 - Option 1: proceed with the tests according to the standard test procedure, analyse the sample according to point 2.2 of this document, and add the results to the vehicle data sheet.
 - Option 2: rinse and refill the AdBlue tank according to point 4 of this
 document and send the AdBlue sample for analysis according to point 3.2 of
 this document. Repeat the WLTC+ precon and WLTC+ cold test and proceed
 with the standard measurement protocol

2. AdBlue sampling

2.1 Sampling bottles

The used sampling bottles must fulfil the specifications of ISO 22241-2

- Wide neck bottles shall be used. Suited materials for these bottles are high-density polyethylene (HPDE), high-density polypropylene (HDPP) polyvinylidene fluoride (PVDF) and perfluoroalkoxy alkane (PFA).
- Prior to the first use with AdBlue, the bottles shall be cleaned and finally rinsed with deionized water

2.2 AdBlue sample

- Fill the sampling bottle to 1/3 with AdBlue from the vehicles AdBlue tank to rinse the container. To avoid contamination, do not fill the AdBlue back to the tank. The liquid used for rinsing must then be disposed in accordance with the disposal regulations.
- Fill the sampling bottle completely (500ml) with AdBlue from the vehicles AdBlue tank.
- During the filling of the sample, maximum care shall be taken that neither dust nor liquid pollutants get into the bottle.
- Label the bottle accordingly (vehicle ID, VIN, time and date)

2.3 AdBlue sample storage

- The sample shall be stored until two months after the publication of the measurement data/rating of the vehicle.
- According to 22241-2, it is recommended to conduct the analysis within three weeks in order to take into account possible changes in the ammonia content.

3. AdBlue quality check

3.1 Quick check with refractometer

- AdBlue has to be at lab ambient temperature (15-25°C)
- Urea content must be between 30 and 35%
- The value read with the refractometer must be recorded

3.2 AdBlue lab analysis

- AdBlue lab analysis shall be performed according to 22241-2
- According to 22241-2, it is recommended to conduct the analysis within three weeks in order to take into account possible changes in the ammonia content.

4. Rinsing/refilling of the vehicle AdBlue tank

4.1 Rinsing

- If not already done, prepare a sample of the vehicles AdBlue according to 1.2 of this document
- Empty the vehicles AdBlue tank as much as possible (by removing and emptying or pumping it empty)
- Fill up one litre of new AdBlue from the lab storage to dilute residuals and empty the tank again
- Quick check new AdBlue from the lab storage according to point 3.1 of this document
- Fill the vehicles AdBlue tank completely with new AdBlue from the lab storage

4.2 AdBlue from lab

- If possible, the AdBlue should already be analysed
- If the AdBlue is not analysed, take a sample according to point 1.2 of this document
- The date of the first opening of the AdBlue container must be protocolled
- AdBlue should be stored at temperatures between -5 °C and + 25 °C
- AdBlue should not be older than 36 months