



Investigations on the CV Chassis Dynamometer as Basis for an Assessment by TÜV-Nord – Part 1

Result Report

EMITEC

Result Report: Measurements on the CV Chassis Dynamometer



MAN TGX Tractor Vehicle in series configuration (Original) versus equipped with dynaCERT HydroGEN System

The investigations, on which this report is based, were carried out during June 5th to 15th and July 12th to 19th and October 9th to 19th 2018 under the Continental Emitec quotations ESA-TV-18-024-V1 (May 7th 2018) and ESA-TV-18-045-V1 (October 8th 2018) and the associated dynaCERT Inc. purchase orders PO000010260 (May 11th 2018) and PO000010401 (October 11th 2018).

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Background



- › The results described here, based on the work performed under the Continental Emitec quotations ESA-TV-18-024-V1 (May 7th 2018) and ESA-TV-18-045-V1 (October 8th 2018) and the associated dynaCERT Inc. purchase orders PO000010260 (May 11th 2018) and PO000010401 (October 11th 2018)..
- › The intention of the company dynaCERT Inc. was to demonstrate that the use of the dynaCERT HydraGEN system has no, respectively a positive impact on emission performance and fuel consumption of a commercial vehicle with the aim of obtaining an official operating permit (ABE). Basis for the ABE is an assessment of the TÜV NORD.
- › For this purpose, a MAN TGX vehicle was investigated in series configuration and equipped with a dynoCert HydroGEN system and measured on the commercial vehicle chassis dynamometer in presence of a TÜV NORD engineer.
- › Each of the variants described above was then operated and measured at
 - Full Load curve (corresponding with UN R.49WHSC)
 - Stationary test corresponding with WHSC (World Harmonized Stationary Cycle) and
 - Transient test corresponding with WHTC (World Harmonized Transient Cycle)
 - Vibration measurement at full load and part load



		Original	with HydraGen	Change / Improvement
System Configuration	-			
Date of Measurement	-	13.06.2018	17.07.2018	
Test no.	-	23	39	
Test Cycle	-	WHSC	WHSC	
THC	g/kWh	0.0046	0.0022	52.0%
CO	g/kWh	0.0010	0.0079	-685.4%
NOx	g/kWh	0.0876	0.0283	67.7%
CO2	g/kWh	559.9	518.3	7.4%
Ammonia	ppm	4.7256	3.8746	18.0%
Particulate Matter	g/kwh	0.0011	0.0005	54.5%
Particle number	p/kWh*10 ¹¹	4.4648	1.1484	74.3%
Fuel Consumption	g/kWh	188.5	173.8	7.8%

System Configuration	-	Original	with HydraGen	Change / Improvement
Date of Measurement	-	13.06.2018		
Test no.	-	24	40	
Test Cycle	-	WNTE	WNTE	
THC	g/kWh	0.0015	0.0010	34.3%
CO	g/kWh	0.0000	0.0022	-
NOx	g/kWh	0.0633	0.0071	88.7%
CO2	g/kWh	532.1	485.2	8.8%
Ammonia	ppm	1.7311	2.8237	-63.1%
Particulate Matter	g/kwh	0.0009	0.0009	0.0%
Particle number	p/kWh*10 ¹¹	3.1395	0.9639	69.3%
Fuel Consumption	g/kWh	178.7	162.8	8.9%

System Configuration	-	Original			with HydraGen			Change / Improvement
Date of Measurement	-	14.06.2018	14.06.2018	14.06.2018	17.07.2018	17.07.2018	17.07.2018	
Test no.	-	26	27		37	38		
Test Cycle	-	cold	hot	Total	cold	hot	Total	
Weighting factor	-	0.14	0.86	-	0.14	0.86	-	
THC	g/kWh	0.007867	0.002471	0.00322644	0.006624	0.004422	0.00473028	-46.6%
CO	g/kWh	0.089161	0.015228	0.02557862	0.04928	0.013632	0.01862272	27.2%
NOx	g/kWh	0.603154	0.056122	0.13270648	0.487336	0.031765	0.09554494	28.0%
CO2	g/kWh	603.3187	585.4682	587.96727	559.6342	542.635	545.014888	7.3%
Ammonia	ppm	0.516389	0.472988	0.4791	0.320242	0.190114	0.20833192	56.5%
Particulate Matter	g/kwh	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0%
Particle number	p/kWh*10 ¹¹	248.6995	8.807838	42.3927	5.950978	1.448322	2.07869384	95.1%
Fuel Consumption	g/kWh	208.7005	203.0532	203.843822	194.7669	189.1959	189.97584	6.8%

System Configuration	-	Original			with HydraGen			Change / Improvement
Date of Measurement	-	14.06.2018	14.06.2018	14.06.2018	18.07.2018	18.07.2018	18.07.2018	
Test no.	-	26	27		42	43		
Test Cycle	-	cold	hot	Total	cold	hot	Total	
Weighting factor	-	0.14	0.86	-	0.14	0.86	Gesamt	
THC	g/kWh	0.007867	0.002471	0.00322644	0.003052	0.001114	0.00138532	57.1%
CO	g/kWh	0.089161	0.015228	0.02557862	0.044265	0.01809	0.0217545	15.0%
NOx	g/kWh	0.603154	0.056122	0.13270648	0.598463	0.044372	0.12194474	8.1%
CO2	g/kWh	603.3187	585.4682	587.96727	546.4386	529.0187	531.457486	9.6%
Ammonia	ppm	0.516389	0.472988	0.4791	0.641249	0.250808	0.30546974	36.2%
Particulate Matter	g/kwh	0.0015	0.0015	0.0015	0.0011	0.0006	0.00067	55.3%
Particle number	p/kWh*10 ¹¹	248.6995	8.807838	42.3927	26.06366	0.258675	3.8713729	90.9%
Fuel Consumption	g/kWh	208.7005	203.0532	203.843822	191.1531	185.4914	186.284038	8.6%