

Low Emission Bus Scheme Certificate

Customer:	Volvo Bus Corporation				
Customer Address:	Wedgnoek Lane, Warwick, CV345YA				
Test Purpose:	LEB certificate for Volvo 7900EH Plug-in Electric Hybrid			DYNAMOMETER SETTINGS	
Vehicle Manufacturer:	Volvo	Unladen weight (kg)	12550.0	Test Weight	13706 [†] kg
Vehicle Type & Number:	7900EH Plug-In Electric Hybrid	Gross Weight (kg)	18000.0	F ⁰	104.00 N
Engine:	Euro VI	Seated Capacity	32	F ¹	1.4810 N/kmh
Transmission:	Hybrid	Passenger Capacity	80	F ²	0.1476 N/kmh ²
Euro VI certificate Y/N	Manufacturer Certified	GVW CHECK	OK	F ³	0.000000 N/kmh ³

Declared fuel, properties and source plus carbon conversion factors

Net Heating Value: Diesel	36.00	MJ / Litre	Fuel Provider	UK market standard
Well-to-Tank Factor: Diesel	15.40	g CO2e / MJ	WTT evidence	UK GHG reporting factors 2016
Well-to-Tank Factor: Electricity	143.50	g CO2e / MJ	Fuel Type*	UK Pump Diesel, UK Grid Electricity inc. WTT + T&D

Emissions and Energy consumption results from approved test facility - Average 3 tests

Test Phase	HC (g/km)	CO (g/km)	NOx (g/km)	PM (g/km)	CO ₂ (g/km)	CH ₄ (g/km)*	N ₂ O (g/km)*	Diesel Fuel Consumption (l/100 km)	Grid Energy Consumption (kWh/ 100 km)
Rural	9.03	0.05	0.46	0.004	530.03	0.000	0.064	20.06	3.2
Outer London	0.00	0.02	0.03	0.002	82.02	0.000	0.016	3.13	87.3
Inner London	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.00	109.7
MLTB Average	0.00	0.02	0.02	0.0016	59.04	0.000	0.012	2.25	93.6
LUB Average	0.00	0.03	0.22	0.0027	270.39	0.000	0.035	10.24	53.0

Zero Emissions (Z.E.) Range: Energy consumption and charging efficiency

Total measured energy consumed on vehicle (kWh)	8.52	Distance in Z.E. mode (km)	8.06	Usable Battery Capacity (kWh)	8.5
Measured grid energy during charging (kWh)	9.03	Charging efficiency (%)	94%	Max Theoretical Z.E. Range (km)	7.8 [†]

Total Tank-to-Wheel GHG CO₂ equivalent

Test Phase	CO ₂ (g/km)	CH ₄ (g/km x 25)*	N ₂ O (g/km x 298)*	Fuel TTW** GHG (CO ₂ Equivalent g/km)
Rural	530.03	0.000	19.09	549.12
Outer London	82.02	0.000	4.87	86.89
Inner London	0.00	0.000	0.00	0.00
MLTB	59.04	0.000	3.51	62.54
LUB Total Average	270.39	0.000	10.50	280.89

Calculated total Well-to-Wheel GHG CO₂ equivalent emissions over test

Test Phase	Fuel Energy (MJ / km)	Fuel WTT*GHG Emissions (g CO ₂ e / km)	Electrical Energy (MJ / km)	Electricity WTT* GHG Emissions (g CO ₂ e / km)	Measured Fuel TTW** GHG Emissions (g CO ₂ e / km)	Total WTW*** GHG Emissions (g CO ₂ e / km)
Rural	7.22	111.20	0.12	16.52	549.12	676.84
Outer London	1.13	17.36	3.14	450.92	86.89	555.17
Inner London	0.00	0.00	3.95	566.77	0.00	566.77
MLTB	0.81	12.50	3.37	483.37	62.54	558.41
LUB Total Average	3.69	56.79	1.91	273.87	280.89	611.55

Data Generated by (On behalf of Test facility):	Insert Date	Data Approved by:	Insert Date
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Low Emission Bus Certificate Summary

GHG Well-to-Wheel	628.7 [†]	g CO ₂ e / km
Euro V Average Diesel Equivalent	1233.6	g CO ₂ e / km
WTW GHG saving (compared with Euro V diesel equivalent)	604.9	g CO ₂ e / km
% WTW GHG saving (compared with Euro V diesel equivalent)	49%	g CO ₂ e / km
Max Theoretical Zero Emission Operating Range (km)	7.8 [†]	km
WTW CO ₂ per passenger km (@ Max Pass Capacity)	7.9	g CO ₂ e/pass km
Approved as Low Emission Bus? (15% saving or more)	YES	

* WTT : Well-to-Tank ** TTW : Tank-to-Wheel *** WTW : Well-to Wheel

COMMENTS: Measured grid energy consumption has been calculated based on the consumed battery energy and charging efficiency of plug-in hybrid bus. Updated 6 June 2016 with latest DECC carbon emission factors. [†] Updated 19 Oct 16 with adjustment to GHG Well-to Wheel and Z.E. range to reflect test weight increase for 25% pax load - original test weight too low

Test Numbers:	15R424-426 (27.11), 15R427-429 (27.11), 15R430-432 (27.11).	WTT Factors Published:	6th June 2016
Certificate approved by: On behalf of Bus manufacturer	Certificate Approved by: On behalf of LowCVP/DJT		