

## Low Emission Bus Scheme Certificate

Customer:	Volvo Bus, Volvo Group UK Limited				
Customer Address:	Wedgnoek Lane, Warwick, CV345YA				
Test Purpose:	LEB Testing			DYNAMOMETER SETTINGS	
Vehicle Manufacturer:	Volvo 7900	Unladen weight (kg)	12060.0	Test Weight	13258 <sup>f</sup> kg
Vehicle Type & Number:	YV3T1U225E1168218	Gross Weight (kg)	18000.0	F <sup>o</sup>	127.13 N
Engine:	Euro 6 Volvo D5K Hybrid	Seated Capacity	35	F <sup>1</sup>	0.7464 N/kmh
Transmission:	Auto	Passenger Capacity	82	F <sup>2</sup>	0.16022 N/kmh <sup>2</sup>
Euro VI certificate Y/N	Manufacturer Certified	GVW CHECK	OK	F <sup>3</sup>	0.000057 N/kmh <sup>3</sup>

### Declared fuel, properties and source plus carbon conversion factors

Net Heating Value: Diesel	36.00	MJ / Litre	Fuel Provider	N/A
Well-to-Tank Factor: Diesel	15.40	g CO <sub>2</sub> e / MJ	WTT evidence	UK GHG reporting factors 2016
Well-to-Tank Factor:		g CO <sub>2</sub> e / MJ	Fuel Type*	UK Pump Diesel

### 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 <sub>2</sub> (g/km)	CH <sub>4</sub> (g/km)*	N <sub>2</sub> O (g/km)*	Fuel Consumed (litres)	Fuel Consumption (l/100 km)
Rural	0.000	0.0424	0.1626	N/A	580.46	0.000	0.152	1.64	21.9
Outer London	0.000	0.0490	0.2075	N/A	619.90	0.000	0.107	1.52	23.4
Inner London	0.000	0.1156	0.2194	N/A	860.64	0.000	0.089	0.81	32.5
MLTB Average	0.000	0.0676	0.2108	N/A	687.06	0.000	0.102	3.17	25.9
LUB Average	0.000	0.0562	0.1890	0.00346	638.94	0.000	0.125	3.98	24.1

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

Total measured energy consumed on vehicle (kWh)	N/A	Distance in Z.E. mode (km)	N/A	Usable Battery Capacity (kWh)	N/A
Measured grid energy during charging (kWh)	N/A	Charging efficiency (%)	N/A	Max Theoretical Z.E. Range (km)	N/A

### Total Tank-to-Wheel GHG CO<sub>2</sub> equivalent

Test Phase	CO <sub>2</sub> (g/km)	CH <sub>4</sub> (g/km x 25)*	N <sub>2</sub> O (g/km x 298)*	Fuel TTW** GHG (CO <sub>2</sub> Equivalent g/km)
Rural	580.46	0.000	45.31	625.77
Outer London	619.90	0.000	31.98	651.88
Inner London	860.64	0.000	26.55	887.19
MLTB	687.06	0.000	30.46	717.52
LUB Total Average	638.94	0.000	37.15	676.09

### Calculated total Well-to-Wheel GHG CO<sub>2</sub> equivalent emissions over test

Test Phase	Fuel Energy (MJ / km)	Fuel WTT*GHG Emissions (g CO <sub>2</sub> e / km)	Electrical Energy (MJ / km)	Electricity WTT* GHG Emissions (g CO <sub>2</sub> e / km)	Measured Fuel TTW** GHG Emissions (g CO <sub>2</sub> e / km)	Total WTW*** GHG Emissions (g CO <sub>2</sub> e / km)
Rural	7.89	121.51	N/A	N/A	625.77	747.28
Outer London	8.43	129.77	N/A	N/A	651.88	781.64
Inner London	11.70	180.18	N/A	N/A	887.19	1067.37
MLTB	9.34	143.86	N/A	N/A	717.52	861.38
LUB Total Average	8.69	133.75	N/A	N/A	676.09	809.84

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	824.1 <sup>†</sup>	g CO <sub>2</sub> e / km
Euro V Average Diesel Equivalent	1254.2	g CO <sub>2</sub> e / km
WTW GHG saving (compared with Euro V diesel equivalent)	430.1	g CO <sub>2</sub> e / km
% WTW GHG saving (compared with Euro V diesel equivalent)	34%	g CO <sub>2</sub> e / km
Max Theoretical Zero Emission Operating Range (km)	N/A	km
WTW CO <sub>2</sub> per passenger km (@ Max Pass Capacity)	10.1	g CO <sub>2</sub> e/pass km
Approved as Low Emission Bus? (15% saving or more)	<b>YES</b>	

\* 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. <sup>†</sup> 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 load for 83 passenger capacity

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