

## WP4D93E201 G-Drive Engine Data Sheet

Speed	Gross Engine Output		
	COP	PRP	ESP
rpm	kWm	kWm	kWm
<b>1800</b>	<b>51</b>	<b>85</b>	<b>93</b>

### Ratings Definitions

	Continuous Power (COP)	Prime Power (PRP)	Standby Power (ESP)
Mean engine load factor	100%	≤70% per 250 h	≤80% per 24 h
Annual working time	Unlimited	Unlimited	≤200 h
Time at full load	Unlimited	≤500 h per year	≤25 h per year
Overload capacity	No	1 h per 12 h (10% overload)	No

- 1) The power ratings are in accordance with ISO 3046.
- 2) Test conditions: 100 kPa, 25 °C air inlet temperature, relative humidity of 30%, with fuel density 0.84 kg/L.
- 3) The engine maybe operated at : up to 1000m and 30 °C without power deration. For sustained operation above these conditions, derate by 3% per 300m, and 2% per 11 °C.
- 4) Power output curves are based on the engine operating with fuel system, water pump and lubricating oil pump; not included are battery charging alternator, fan and optional equipment.

### Engine basic data

Engine model	WP4D93E201	Cylinder number/Valve number	4/8
bore diameter /stroke mm	105 ×130	Displacement(L)	4.5
Fuel System	Mechanical Pump	Aspiration	Turbocharged
Compression Ratio	18:1	Emission Standard	Off-road stageII
Overall Dimension (Length×Width×Height) (mm)	1000×688×980	Engine net weight (kg)	580±50
Injection timing ( °CA)	13		
Flywheel housing	SAE3	Flywheel	11.5#
Max. Permissible Fixing Angle ( °)	Longitudinal Inclination	Front /Rear	10/10
	Cross Inclination	Left/Right	10/10
Dynamic angle ( °)	Longitudinal Inclination	Front/Rear	/
	Cross Inclination	Exhaust pipe side /Intake pipe side	/

Permitted temperature ambient ℃	-30-50	Permitted altitude limit m	2000
Valve lashes at cold (mm)	intake: 0.2~0.25 / exhaust: 0.3~0.35		

## Performance Data

Idle Speed (rpm)	650±25	Over Speed limit (rpm)	1890
Mean Piston Speed (m/s)	7.8	BMEP (MPa)	1.377
Friction Power (kW)	/	Fan Power (kW)	5.8
<b>Load factor</b>	<b>Power kW</b>	<b>Fuel consum. g/kW.h</b>	<b>Fuel consum. L/h</b>
10%	8.5	391.8	3.96
25%	21.25	260.5	6.59
50%	42.5	219.4	11.10
75%	63.75	208	15.79
85%	72.25	206.7	17.78
100%	85	206.8	20.93
110%	93	207.1	22.93

## Air intake system

Intake air temperature rise (℃)	Permitted difference between turbocharger inlet temperature and ambient temperature (this parameter impacts emission, LAT and altitude capability)	≤15
Intake air resistance (kPa)	Clean filter	≤3.5
	Dirty filter	≤6
Air filter mass flow (kg/h)		/
Air mass flow (kg/h)	Rated Power	424
	Standby Power	456
Clear efficiency of air filter (%)		99.5
Recommended Min. diameter of intake pipe (mm)		65

## Inter cooling system

Intercooler heat dissipating capacity (KJ/S)	Rated Power	/
	Standby Power	/
Intercooler efficiency (%)	Rated Power	/
	Standby Power	/
Max. intake temperature (℃)		/

Max. difference between intake temperature and ambient temperature (°C)	/
Permitted max. intake pressure drop of intercooler (kPa)	/
Recommended intercooler radiator cooling area (m <sup>2</sup> )	/

## Exhaust system

Max. exhaust back pressure (kPa)	4±0.5	
Max. exhaust temperature (°C)	Before turbocharger	700
	After turbocharger	550
Recommended muffler mass flow/volume (kg/h)	/	
Exhaust-gas mass flow (kg/h)	Rated Power	442
	Standby Power	475
Recommended Min. diameter of exhaust pipe (mm)	65	
Max. bending moment of turbocharged flange (N·m)	10, using elastic connections	

## Lubrication system

Volume of oil pan (L)	10	
Oil pressure in normal condition (kPa)	Idle speed	≥120
	Rated Power	300~600
Alarm for low & high oil pressure (kPa)	80/1000	
Temperature range in main oil passage at rated working condition (°C)	85~105	
max. oil temperature (°C)	/	
Max. oil pressure while engine starting (kPa)	800	
Opening pressure of main oil passage pressure limiting valve (kPa)	540~750	
Max. Oil flow (L/min)	46	
Oil consumption	≤0.2	

## Noise and Emission

Emission standard	Off-road stageII	
Exhaust smoke (FSN)	Rated Power	≤2.0
	Standby Power	/
Diesel engine noise dB(A)	Acoustic power level : 110.6	

## Fuel system

Injection pump type	Mechanical Pump	
Governor	/	
Steady speed governing factor	/	
Max supply fuel restriction at rated power conditon (kPa)	≤9	

Return restriction in pipe (kPa)		≤12
Max. supply fuel temperature at rated power condition (°C)		≤70
Max. flow of fuel supply (kg/h)	Rated Power	17.6
	Standby Power	19.3
Min. pressure of fuel pump (kPa)		35
Min. Ventilation rate of fuel tank (L/h)		/
Recommended diameter of inlet pipe (mm)		10
Recommended diameter of return pipe (mm)		10

## Electrical system

Electrical system voltage (V)		24
Motor power/ working voltage (kW/V)		6/24
Battery charging Alternator/ working voltage (kW/V)		/
Permitted max. electric resistance of motor control lines (Ω)		0.004
Recommended Min. conductor cross-sectional area (mm <sup>2</sup> )		50
The lowest cold starting temperature (°C)	No aided starting device	-10
	Aided starting device	-30

## Cooling system

Water pump Transmission ratio		1.4
Min. coolant temperature of engine working (°C)		50
Min. water fill rate (L/min)		3~7
Max. initial fill time (min)		5
Recommended Min diameter of outside water pipe(mm)		42
Min. pressure at water pump inlet at No or only a part of degassing Device (kPa)		-2
Min. pressure at water pump inlet at Complete degassing device (kPa)		0
Max. deaeration time(min)		15
Min. expansion tank volume (% total cooling system capacity)		0.15
Min expansion space (% total cooling system capacity)		0.1
Coolant capacity of engine (L)		5.3
Coolant capacity of radiator (L)		/

High temperature of alarm (°C)	100
Thermostat opening temp./ full open temp. (°C)	/
Min. permitted pressure in cooling system (kPa)	15
Max. permitted external resistance (at rated speed) (kPa)	50

## Heat balance test data

Pressure of water in/ water out (kPa / kPa)	Rated Power	2.4/16.4
	Standby Power	3.1/16.5
Coolant mass flow (m <sup>3</sup> /h)	Rated Power	11.7
	Standby Power	11.7
Temperature of water in/ water out (°C/°C)	Rated Power	84.5/87.8
	Standby Power	84.6/88.3
Temperature of intake air : before/after intercooler (°C/°C)	Rated Power	/
	Standby Power	/
Pressure of intake air :before /after intercooler (kPa / kPa)	Rated Power	/
	Standby Power	/
Heat be taken away by Coolant (kJ/s)	Rated Power	41.5
	Standby Power	44.6
Heat be taken away by exhaust gas (kJ/s)	Rated Power	/
	Standby Power	/
Heat be taken away by intercooler (kJ/s)	Rated Power	61.4
	Standby Power	69.9
Gross Heat of Engine (kJ/s)	Rated Power: 195.9 / Standby Power: 215.5	

## Mounting system

Inertia of complete engine (kg•m <sup>2</sup> )	I <sub>xx</sub> =21.0 / I <sub>xy</sub> = - 1.2	
	I <sub>yy</sub> =42.0 / I <sub>yz</sub> = - 4.8	
	I <sub>zz</sub> =33.2 / I <sub>xz</sub> = - 2.2	
Inertia of flywheel (kg•m <sup>2</sup> )	/	
Inertia of crankshaft (including crankshaft gear) (kg•m <sup>2</sup> )	0.27	
Centroid position mm	X	433.2
	Y	15.8
	Z	121.9
Permitted static bending moment at flywheel housing flange face	7000	

**WEICHAI**