

WP13D405E200 G-Drive Engine Data Sheet

Speed	Gross Engine Output		
	COP	PRP	ESP
rpm	kWm	kWm	kWm
1500	313	368	405

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	WP13D405E200	Cylinder number	6
bore diameter /stroke mm	127×165	Displacement(L)	12.54
Fuel System	Mechanical Pump	Aspiration	Turbocharged and Aftercooled
Compression Ratio	16:1	Emission Standard	Off-road stageII
Overall Dimension (Length×Width×Height) (mm)	1572×889×1172	Engine net weight (kg)	1000±50
Injection timing (°CA)	14 ±0.5 BTDC		
Flywheel housing	SAE 1	Flywheel	14#
Max. Permissible Fixing Angle (°)	Longitudinal Inclination	Front /Rear	10/10
	Cross Inclination	Left/Right	45/15
Dynamic angle (°)	Longitudinal Inclination	Front/Rear	/
	Cross Inclination	Exhaust pipe side /Intake pipe side	/

Permitted temperature ambient °C	-30~50	Permitted altitude limit m	2300
Valve lashes at cold (mm)	Intake: 0.4 Exhaust 0.6		

Performance Data

Idle Speed (rpm)	600±50	Over Speed limit (rpm)	1545
Mean Piston Speed (m/s)	8.25	BMEP (MPa)	2.45
Friction Power (kW)	/	Fan Power (kW)	18
Load factor	Power kW	Fuel consum. g/kW.h	Fuel consum. L/h
10%			
25%	91.9	213.2	23.33
50%	183.7	197.1	43.10
75%	275.7	193.4	63.48
85%	330.9	193.8	76.34
100%	366.1	195.1	85.03
110%	405.4	196.7	94.93

Air intake system

Intake air temperature rise (°C)	Permitted difference between turbocharger inlet temperature and ambient temperature (this parameter impacts emission, LAT and altitude capability)	≤30
Intake air resistance (kPa)	Clean filter	≤3
	Dirty filter	≤6
Air filter mass flow (kg/h)		/
Air mass flow (kg/h)	Rated Power	1573
	Standby Power	1691
Clear efficiency of air filter (%)		99.9
Recommended Min. diameter of intake pipe (mm)		100

Inter cooling system

Intercooler heat dissipating capacity (KJ/S)	Rated Power	53.5
	Standby Power	61.4
Intercooler efficiency (%)	Rated Power	/
	Standby Power	/
Max. intake temperature (°C)		55

Max. difference between intake temperature and ambient temperature (°C)	30
Permitted max. intake pressure drop of intercooler (kPa)	12
Recommended intercooler radiator cooling area (m ²)	12.5

Exhaust system

Max. exhaust back pressure (kPa)	7.5	
Max. exhaust temperature (°C)	Before turbocharger	≤740
	After turbocharger	≤580
Recommended muffler mass flow/volume (kg/h)	2100	
Exhaust-gas mass flow (kg/h)	Rated Power	1646
	Standby Power	1765
Recommended Min. diameter of exhaust pipe (mm)	100	
Max. bending moment of turbocharged flange (N•m)	19	

Lubrication system

Volume of oil pan (L)	36	
Oil pressure in normal condition (kPa)	Idle speed	130-250
	Rated Power	350-550
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)	105	
Max. oil pressure while engine starting (kPa)	1000	
Opening pressure of main oil passage pressure limiting valve (kPa)	450-550	
Max. Oil flow (L/min)	190 (oil pump speed n=2704r/min)	
Oil consumption	≤0.2%	

Noise and Emission

Emission standard	Off-road stageII	
Exhaust smoke (FSN)	Rated Power	Rb≤1.5
	Standby Power	/
Diesel engine noise dB(A)	117 (sound power level)	

Fuel system

Injection pump type	Mechanical, PZ
Governor	Mechanical/ Electric optional
Steady speed governing factor	6% (Mechanical) 2% (Electrical)

Max supply fuel restriction at rated power conditon (kPa)		≤18
Return restriction in pipe (kPa)		≤22
Max. supply fuel temperature at rated power condition (°C)		≤70
Max. flow of fuel suply (kg/h)	Rated Power	68.94
	Standby Power	76.64
Min. pressure of fuel pump (kPa)		35
Min. Ventilation rate of fuel tank (L/h)		/
Recommended diameter of inlet pipe (mm)		12
Recommended diameter of return pipe (mm)		12

Electrical system

Electrical system voltage (V)		24
Motor power/ working voltage (kW/V)		5.4/24
Battery charging Alternator/ working voltage (kW/V)		2.0/24
Permitted max. electric resistance of motor control lines (Ω)		0.004
Recommended Min. conductor cross-sectional area (mm ²)		50
The lowest cold starting temperature (°C)	No aided starting device	-10
	Aided starting device	-30

Cooling system

Water pump Transmission ratio		2.01
Min. coolant temperature of engine working (°C)		50
Min. water fill rate (L/min)		3--7
Max. initial fill time (min)		17
Recommended Min diameter of outside water pipe(mm)		75
Min. pressure at water pump inlet at No or only a part of degassing Device (kPa)		/
Min. pressure at water pump inlet at Complete degassing device (kPa)		50
Max. deaeration time(min)		25
Min. expansion tank volume (% total cooling system capacity)		0.15
Min expansion space (% total cooling system capacity)		0.06
Coolant capacity of engine (L)		25
Coolant capacity of radiator (L)		/

High temperature of alarm (°C)	98±2
Thermostat opening temp./ full open temp. (°C)	76±2 / 88
Min. permitted pressure in cooling system (kPa)	50
Max. permitted external resistance (at rated speed) (kPa)	50

Heat balance test data

Pressure of water in/ water out (kPa / kPa)	Rated Power	-1.9/26.1
	Standby Power	-1.8/19.5
Coolant mass flow (m ³ /h)	Rated Power	19.8
	Standby Power	20.0
Temperature of water in/ water out (°C/°C)	Rated Power	84.6/90.0
	Standby Power	84.9/91.0
Temperature of intake air : before/after intercooler (°C/ °C)	Rated Power	172.0/50.7
	Standby Power	185.4/56.6
Pressure of intake air :before /after intercooler (kPa /	Rated Power	184.2/182.9
	Standby Power	208.4/207.8
Heat be taken away by Coolant (kJ/s)	Rated Power	127.8
	Standby Power	136.5
Heat be taken away by exhaust gas (kJ/s)	Rated Power	53.5
	Standby Power	61.4
Heat be taken away by intercooler (kJ/s)	Rated Power	234.3
	Standby Power	276.5
Gross Heat of Engine (kJ/s)		785.0/874.3

Mounting system

Inertia of complete engine (kg•m ²)	I _{xx} = 44.9 , I _{xy} =-0.6	
	I _{yy} =149.1 , I _{yz} =3.34	
	I _{zz} =128.1 , I _{xz} =4.79	
Inertia of flywheel (kg•m ²)		1.34
Inertia of crankshaft (including crankshaft gear) (kg•m ²)		0.064
Centroid position mm	X	451
	Y	0
	Z	162
Permitted static bending moment at flywheel housing flange face		11700