

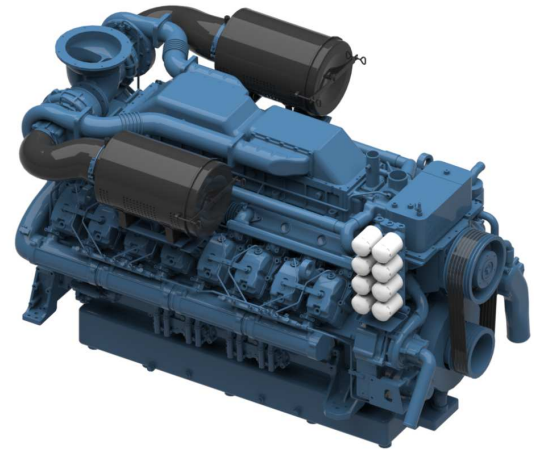
List of Parameters of YC16VTD2510-D30 G-Drive Diesel Engine

Version: 2021V01 Implementation May. 20, 2021

YC16VTD2510-D30

Prime power: 1680 kW @ 1500 r/min

Standby power: 1850 kW @ 1500 r/min



Definitions

Prime Power

It corresponds to the prime rated power (PRP) of GB/T 2820 and ISO 8528, and refers to the maximum power accessible at the variable load for unlimited running hours per year, with the maintenance intervals and procedures being carried out as prescribed by Yuchai. The allowed average output power within 24 h shall not be higher than 70% of the prime power.

Standby Power

It corresponds to the emergency standby power (ESP) of GB/T 2820 and ISO 8528, and refers to the maximum power accessible at a certain variable load series in the event of a utility power outage or under test conditions for limited running hours up to 200h, with the maintenance intervals and procedures being carried out as prescribed by Yuchai. The allowed average output power within 24 h shall not be higher than 70% of the prime power.

Main technical parameters

Number of cylinders	16
Configuration	V, 90°
Aspiration	Turbocharged, water-air intercooled
Combustion system	Direct injection
Compression ratio	14:1
Bore	152 mm
Stroke	180 mm
Displacement	52.26 L
Rotation	Counterclockwise (viewed from the flywheel end)
Firing order:	
A1-B6-B4-A6-A4-B7-A3-B8-B2-A8-A2-B5-B3-A5-B1-A7 Viewed from the back end: numbered starting from 1, with A for left side, and B for right side.	
Dry weight (excluding radiator)	5600 kg
Wet weight (excluding radiator)	6050 kg

Overall dimensions

Length (from the fan to the flywheel housing)	2,800 mm
Width	1,700 mm
Height	1,950mm

Gravity center coordinate (dry engine, with the center of the end face of the flywheel shell as the origin)

From the rear end face of the flywheel.1043mm
Height relative to the center of the crankshaft172 mm
Centerline deviation relative to the crankshaft center gravity ..	-11mm

Shafting rotation inertia

Engine	18.63 kg·m ²
Flywheel11.34 kg·m ²

Performance rating

Speed drop	0.3%
Speed fluctuation rate	0.5%
Speed governing type	Electronic control

Test conditions

Ambient temperature25℃
Atmospheric pressure100 kPa
Relative humidity	30%
Max. operating intake resistance	≤5 kPa
Exhaust backpressure limit	≤10 kPa
Fuel temperature (fuel inlet pump)	38±2℃

Note: Unless otherwise specified, the data of this list of parameters are measured under these test conditions. If the engine is used under other test conditions other than those described above, proper adjustment shall be made according to the actual environment. For specific details, please contact Yuchai technical service department.

Matching parameters

Designation	Unit	Matching parameters	
		Standby	Prime
		50 Hz @ 1500 r/min	
Gross engine power	kW	1850	1680
Net engine power	kW	1759	1589
Fan power consumption (belt pulley driven)	kW	89	89
Other power loss	kW	2	2
Mean effective pressure	MPa	2.83	2.57
Intake air flow	m ³ /min	123	114
Exhaust temperature limit (after turbocharger)	°C	550	550
Exhaust flow	m ³ /min	295.8	267.2
Boost pressure ratio		3.76	3.45
Thermal efficiency	%	40.9	41.5
Mean piston speed	m/s	9	9
Coolant flow (high temperature)	L/min	1230	1230
Coolant flow (low temperature)	L/min	720	720
Cooling fan air flow	m ³ /min	2888	2888
Typical gen-set electrical output (power factor:0.8)	kW	1650	1500
	kVA	2063	1875
Assumed generator efficiency	%	95.0	95.0

Energy balance parameters

Note: The calorific value of diesel is 42,770 kJ/kg

Designation	Unit	Energy balance parameters	
		Standby	Prime
		50 Hz @ 1500 r/min	
Total fuel chemical energy	kW	4418	4052
Output power (gross)	kW	1850	1680
Output power (net)	kW	1759	1589
Fan power consumption	kW	89	89
Other power loss	kW	2	2
Heat dissipation capacity(coolant circulation)	kW	828	785
Heat dissipation capacity(intake intercooled system)	kW	410	365
Heat dissipation of exhaust	kW	1188	1094
Heat dissipation of thermal radiation	kW	142	128

The heat dissipations of Yuchai engine at an ambient temperature of 40°C are shown below: (softened water bench test data)

Designation	Unit	Energy balance parameters	
		Standby	Prime
		50 Hz @ 1500 r/min	
Total fuel chemical energy	kW	4505	4112
Output power (gross)	kW	1850	1680
Output power (net)	kW	1759	1589
Fan power consumption	kW	89	89
Other power loss	kW	2	2
Heat dissipation capacity(coolant circulation)	kW	860	794
Heat dissipation capacity(intake intercooled system)	kW	420	373
Heat dissipation of exhaust	kW	1227	1130
Heat dissipation of thermal radiation	kW	148	135

Cooling system

Total coolant capacity	554 L
Engine coolant capacity.High temperature: 140 L, low temperature: 30 L	
Radiator coolant capacityHigh temperature: 182 L, low temperature: 162 L	
Pipeline coolant capacity	40 L
Max. water outlet temperature of engine (high temperature water passage).....	≤97°C
Max. outlet temperature of engine (low temperature water passage).....	≤65°C
Pressure difference between inlet and outlet of water pump (max. hydrostatic head).....	150 kPa
Thermostat operation temperature	
Initial opening temperature (75±2)°C, full opening temperature (85±2)°C	
Max. water temperature rise:	
- Standby power	13°C
- Prime power	12°C

High temperature radiator

Cooling area	665 m ²
Dry weight	920 kg
Material.....	Aluminum
Number of lines	/line
Density of core	cooling fins/inch
Width of core	2220 mm
Height of core	2200 mm
Min. pressure of pressure cover	(90±5) kPa
Resistance limit	25 kPa

Low temperature radiator

Cooling area	616m ²
Material.....	Aluminum
Number of linesLine
Density of core	cooling fins/inch
Width of core	2220mm
Height of core	2200 mm
Resistance limit	15 kPa

Water pump

Rotation speed.	2,813 r/in
Drive mode.....	Gear drive

Fan

Diameter.....	1,700 mm
Gear ratio	1:0.73

Material	Nylon
Number of blades	8
Blowing/suction	Blowing type

Intake system

Air cleaner

Max. intake resistance:	
- Clean air cleaner	3.5 kPa
- Dirty air cleaner	5 kPa
- Air cleaner type	Dry paper element

Inclination

Transverse inclination/longitudinal inclination (oil sump capacity: 280 L).....	5°/5°
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Fuel system

Injection system.....	High pressure common rail
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Fuel injector

Type	Electronically-controlled injector, multi-hole injection
Fuel injector opening pressure	Electronically-controlled

Fuel pump

Drive mode.....	Gear drive
Fuel delivery pump flow @ 1,500 rpm	8.5 L/min
Max. fuel inlet temperature limit.....	70°C

Allowed fuel inlet pressure (absolute pressure) at the front end of fuel delivery pump	(50~100) kPa
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Max. fuel return pressure of fuel pump.....	30 kPa
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Fuel filter

Primary filter

Rated flow	30 L/min
Max. original resistance.....	7 kPa
Water separation efficiency under rated flow	≥95%

Filtration efficiency:

For particles of 25 µm.....	99%
For particles of 10 µm.....	85 %

Secondary filter

Rated flow	60 L/min
Max. original resistance.....	10 kPa
Filtration efficiency:	

For particles of 10 µm.....	99.6%
For particles of 3 µm.....	98.5%

Fuel consumption

Note: The diesel density is 0.835 kg/L.

Conditions	1500 r/min	
	g/ (kW·h)	L/h
Standby power	210	465.3
Prime power	205	412.5
75% of prime power	205	309.3
50% of prime power	215	216.3

Lubricating system

Total oil capacity (dry engine) 310 L
 Total oil capacity (oil change) 280 L
 Oil sump capacity - low level/high level 176/280 L
 Max. oil temperature (oil sump)..... 120°C
 Operating oil temperature (oil sump)..... (90~115)°C
 Oil pressure at idle speed..... ≥120 kPa
 Oil pressure at rated speed (250~500) kPa
 Engine oil-fuel consumption ratio ≤0.3 %

Oil filter

The filtering efficiency at the rated flow of 60 L/min and the assembly initial resistance ≤25 kPa:

15 μm ≤ Particle size < 20 μm >75%;
 20 μm ≤ Particle size < 30 μm >95 %;
 30 μm ≤ Particle size < 40 μm >99 %;
 Particle size ≥ 40 μm >99.9999%;

Electric system

Type Negative grounding

Charging alternator 24 V

Voltage 28 V
 Output current 35 A

Starter (24 V/12 V)

Type Electric start, 2

Voltage 24 V
 Power 8.5 kW
 Number of flywheel teeth..... 141
 Number of starter teeth..... 10

Cold start (test data, for reference only)

24V					
Battery specification × quantity 12 V/195 Ah×4					
Starting temperature	°C	-15	-20	-25	-30
Starting speed	r/min	/	/	/	/
Starting current	A	/	/	/	/
Starting voltage	V	/	/	/	/
Starting time	s	/	/	/	/
Preheating time	s	/	/	/	/

Auxiliary intake heater

Type N/A
 Specification N/A

Water preheater

Recommended specification 2×5 kW/220 V
 Engine preheater water outlet interface..... 2×Φ20
 Engine preheater water inlet interface..... 2×NPT 1

Oil heater

Recommended specification 500W/220V
 Interface (oil sump, 2)..... M22×1.5

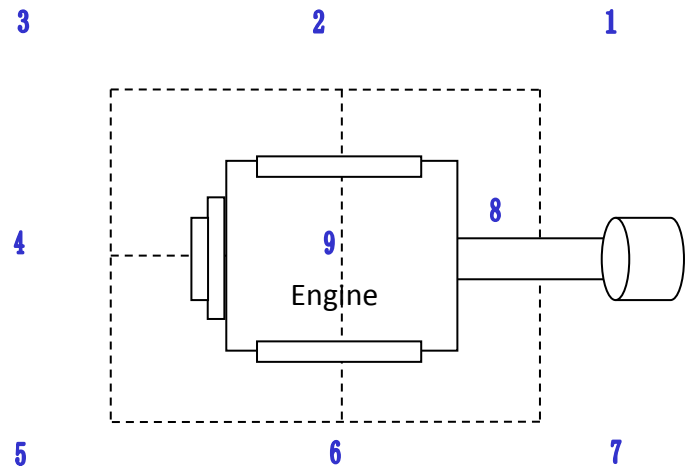
Exhaust system

Max. exhaust backpressure..... 10 kPa
 Inner diameter of exhaust port..... Φ300 mm

Noise

Noise data (1680 kW @ 1,500 r/min)

Position	Sound pressure level Lp, dB(A)
1	101.7
2	103.4
3	102.5
4	104.5
5	102.3
6	104.7
7	101.2
8	103.0
9	104.7



Noise spectrum (1680 kW @ 1,500 r/min)

Frequency, Hz	Noise, dB(A)
63	70.3
125	72.0
250	82.2
500	88.6
1K	91.7
2K	92.2
4K	92.5
8K	97.3