

List of Parameters of YC12VTD2070-D32 G-Drive Diesel Engine

Version: 2021V01 Implementation Jul. 1, 2021

YC12VTD2070-D32

Prime power: 1,380 kW @ 1,800 r/min

Standby power: 1,520 kW @ 1,800 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	12
Configuration	V, 90°
Aspiration	Turbocharged, water-air intercooled
Combustion system	Direct injection
Compression ratio	14:1
Bore	152 mm
Stroke	180 mm
Displacement	39.2 L
Rotation	Counterclockwise (viewed from the flywheel end)
Firing order: A(1)-B(2)-A(5)-B(4)-A(3)-B(1)-A(6)-B(5)-A(2)-B(3)-A(4)-B(6)	Viewed from the back end: numbered starting from 1, with A for left side, and B for right side.
Dry weight (excluding radiator)	4,200 kg
Wet weight (excluding radiator)	4,450 kg

Overall dimensions

Length (from the fan to the flywheel housing)	2,200 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. ....	.867.1mm
Height relative to the center of the crankshaft .....	.224.5 mm
Centerline deviation relative to the crankshaft center gravity ..	-0.9mm

Shafting rotation inertia

Engine	13.02 kg·m ²
Flywheel .....	.9.188 kg·m ²

Performance rating

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

Test conditions

Ambient temperature .....	.25°C
Atmospheric pressure .....	.100 kPa
Relative humidity .....	.30%
Max. operating intake resistance .....	.≤5 kPa
Exhaust backpressure limit .....	.≤10 kPa
Fuel temperature (fuel inlet pump) .....	.38±2°C

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
		60 Hz @ 1800 r/min	
Gross engine power	kW	1520	1380
Net engine power	kW	1445	1305
Fan power consumption (belt pulley driven)	kW	73	73
Other power loss	kW	2	2
Mean effective pressure	MPa	2.59	2.35
Intake air flow	m ³ /min	95.4	86.6
Exhaust temperature limit (after turbocharger)	°C	550	550
Exhaust flow	m ³ /min	234.5	209.1
Boost pressure ratio		4.26	3.79
Thermal efficiency	%	39.5	40.1
Mean piston speed	m/s	10.8	10.8
Coolant flow (high temperature)	L/min	1500	1500
Coolant flow (low temperature)	L/min	1020	1020
Cooling fan air flow	m ³ /min	2430	2430
Typical gen-set electrical output (power factor:0.8)	kW	1320	1200
	kVA	1650	1500
Assumed generator efficiency	%	91.3	92.0

Energy balance parameters

Note: The calorific value of diesel is 42,700 kJ/kg

Designation	Unit	Energy balance parameters	
		Standby	Prime
		60 Hz @ 1800 r/min	
Total fuel chemical energy	kW	3845	3439
Output power (gross)	kW	1520	1380
Output power (net)	kW	1445	1305
Fan power consumption	kW	73	73
Other power loss	kW	2	2
Heat dissipation capacity(coolant circulation)	kW	920	835
Heat dissipation capacity(intake intercooled system)	kW	360	322
Heat dissipation of exhaust	kW	938	830
Heat dissipation of thermal radiation	kW	107	72

When a TDV300-1301100-A81 radiator is used as a matching unit, the heat dissipations of Yuchai engine at an ambient temperature of 40°C are shown below: (-50°C Cooling fluid test data)

Designation	Unit	Energy balance parameters	
		Standby	Prime
		60 Hz @ 1800 r/min	
Total fuel chemical energy	kW	3914	3483
Output power (gross)	kW	1520	1380
Output power (net)	kW	1445	1305
Fan power consumption	kW	73	73
Other power loss	kW	2	2
Heat dissipation capacity(coolant circulation)	kW	935	845
Heat dissipation capacity(intake intercooled system)	kW	372	332
Heat dissipation of exhaust	kW	965	845
Heat dissipation of thermal radiation	kW	122	81

Cooling system

Total coolant capacity	467 L
Engine coolant capacity	121 L
Radiator coolant capacity	: 306 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).....	≤70°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	9.5°C
- Prime power	8.5°C

High temperature radiator

Cooling area	485 m ²
Dry weight	860 kg
Material.....	Aluminum
Number of lines	/line
Density of core	cooling fins/inch
Width of core	2000 mm
Height of core	1800 mm
Min. pressure of pressure cover	(70±5) kPa
Resistance limit	25 kPa

Low temperature radiator

Cooling area	530 m ²
Material.....	Aluminum
Number of lines	Line
Density of core	cooling fins/inch
Width of core	2000mm
Height of core	1800 mm
Resistance limit	15 kPa

Water pump

Rotation speed.	3,374 r/in
Drive mode	Gear drive

Fan

Diameter	1,700 mm
Gear ratio	1:0.61
Material.....	Nylon

Number of blades	10
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: 160 L)	5°/5°
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Fuel system

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

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

Fuel pump

Drive mode	Gear drive
Fuel delivery pump flow @ 1,800 rpm.	2×4.8 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

Max. fuel return pressure of fuel pump.....	30 kPa
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Fuel filter

Primary filter

Rated flow	2×15 L/min
Max. original resistance.....	15 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	2×15 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	1800 r/min	
	g/ (kW·h)	L/h
Standby power	213.7	389.0
Prime power	210.1	347.2
75% of prime power	212.3	263.2
50% of prime power	225.6	186.4

Lubricating system

Total oil capacity (dry engine) 215 L
 Total oil capacity (oil change) 210 L
 Oil sump capacity - low level/high level 160/210 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 44 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 55 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 6 kW/220 V
 Engine preheater water outlet interface 2×NPT 1
 Engine preheater water inlet interface 2×Φ28

Oil heater

Recommended specification 300 W/220 V
 Interface (oil sump, 2) M22×1.5

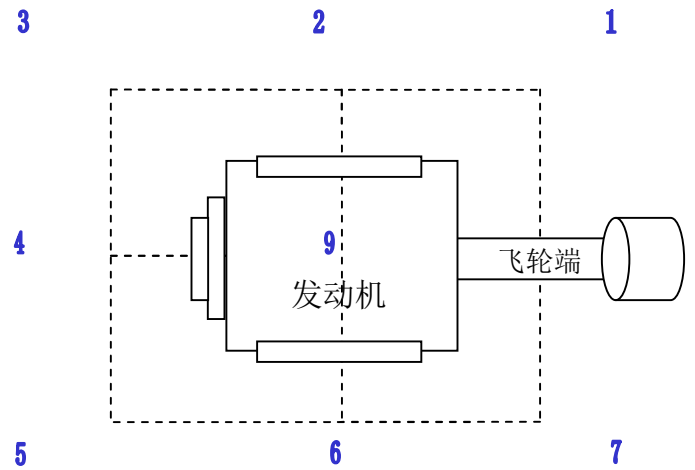
Exhaust system

Max. exhaust backpressure 10 kPa
 Inner diameter of exhaust port 250 mm

Noise

Noise data (1,380 kW @ 1,800 r/min)

Position	Sound pressure level Lp, dB(A)
1	/
2	/
3	/
4	/
5	/
6	/
7	/
8	/
9	/



Noise spectrum (1,380 kW @ 1,800 r/min)

Frequency, Hz	Noise, dB(A)
63	/
125	/
250	/
500	/
1K	/
2K	/
4K	/
8K	/