

Technical Data

1100 Series

Diesel engine - Electropak

1103C-33TG2

45,6 kWm @ 1500 rev/min

52,4 kWm @ 1800 rev/min

Basic technical data

Number of cylinders ... 3
 Cylinder arrangement ... Vertical, in-line
 Cycle ... four stroke
 Induction system ... turbocharged
 Compression ratio ... 18·23:1
 Bore ... 105 mm
 Stroke ... 127 mm
 Cubic capacity ... 3.3 litres
 Direction of rotation... Anti-clockwise when viewed from flywheel
 Firing order ... 1, 2, 3

Estimated total weight (fan to flywheel)

-dry ... 341 kg
 -wet ... TBA kg

Overall dimensions (electropak)

-height ... 951 mm
 -length ... 1045 mm
 -width (including mounting brackets) ... 631 mm

Moment of inertia (mk²)

Engine:
 -longitudinal ... 25 kgm²
 -horizontal ... 42 kgm²
 -axial ... 25 kgm²
 -flywheel (polar) ... 1,14 kgm²

Centre of gravity (fan to flyheel)

-forward from rear of block ... 193 mm
 -above centre line of block ... 139 mm
 -offset of RHS of centre line.. -4,7 mm

Performance

Steady state speed stability at constant load:
 G2 ... ± 0.5%
Note: All data based on operation to ISO 3046/1, BS 5514 and DIN 6271 standard reference conditions.

Test conditions

Air temperature ... 25 °C
 Barometric pressure ... 100 kPa
 Relative humidity ... 30%
 Air inlet restriction at maximum power ... 3,5 kPa
 Exhaust back pressure ... 12 kPa
 Fuel temperature (pump inlet) ... 40 °C

Sound level

Estimated sound power level for bare engine without inlet and exhaust at 1 metre:
 -at 1500 rev/min ... 98 dB(A)
 -at 1800 rev/min ... 100 dB(A)

If the engine is to operate in ambient conditions other than those of the test conditions, suitable adjustments must be made for these changes. For full details, contact Perkins Technical Service Department.

Emissions capability: Certified against the requirements of EU2007 (EU 97/68/EC Stage II) legislation for non-road mobile machinery, powered by constant speed engines

General installation

Designation	Units	Type of Operation and Application			
		Prime	Stand-by	Prime	Stand-by
		50 Hz	50 Hz	60 Hz	60 Hz
Gross engine power	kWm	41,9	46,5	48,6	54,0
Fan power	kWm	0,9	0,9	1,6	1,6
Brake mean effective pressure (gross)	kPa	1023	1128	1020	1124
ElectroPaK nett engine power	kWm	40,9	45,6	47,0	52,4
Engine coolant flow 35 kPa restriction	l/min	125,5	125,5	151,0	151,0
Combustion air flow	m³/min	2,9	3,1	3,7	3,9
Exhaust gas flow (max)	m³/min	7,0	7,7	8,8	9,5
Exhaust gas temperature (max) in manifold	°C	610	660	620	670
Overall thermal efficiency	%	38,0	38,4	36,5	36,9
Boost pressure ratio		1,75	1,85	TBA	TBA
Typical genset electrical unit (0.8 pf 25° C	kWe	37,0	41,0	42,0	47,0
	kVA	46,0	51,0	53,0	59,0
Friction power and pumping losses	kWm	7,7	7,7	10,3	10,3
Assumed alternator efficiency	%	90			
Cooling fan air flow	m³/min	53		70	
Specific fuel consumption	l/min	0,20	0,21	0,20	0,21
Energy balance					
Power in fuel (fuel heat of combustion)	kWt	110,1	121,5	135,1	149,1BS2869 1998 Class A2 or BS EN590
Power output (gross)	kWb	41,9	46,5	48,6	54,0
Power output (nett)	kWm	40,9	45,6	47,0	52,4
Power to cooling fan	kWm	0,9	0,9	1,6	1,6
Power to coolant and lubricating oil	kWt	26,4	29,0	31,9	35,1
Power to exhaust	kWt	34,1	37,5	45,2	49,7
Power to radiation	kWt	7,7	8,5	9,3	10,2

Caution: The airflows shown in this table will provide acceptable cooling for an open power unit operating in ambient temperatures of up to 53 °C, or 46 °C. if a canopy is fitted. If the power unit is to be enclosed totally, a cooling test should be done to check that the engine cooling is acceptable. If there is insufficient cooling, contact Perkins Technical Service Department.

Cooling system

Radiator

-face area... 0.276 m²
-rows and materials... single row aluminium
-matrix density and material... Aluminium 12,5 fins/inch
-width of matrix... 526 mm
-height of matrix... 524 mm
-pressure cap setting... 107 kPa

Fan

-diameter... 457 mm
-drive ratio... 0.85 : 1
-number of blades... 7
-material... Composite
-type... Pusher

Coolant

Total system capacity
-with radiator... 10,2 litres
-without radiator... 4,4 litres
Maximum top tank temperature... 110 °C
Thermostat operating range... 82 - 93 °C
Recommended coolant: 50 % ethylene glycol with a corrosion inhibitor (BS 658 : 1992 or MOD AL39) and 50% clean fresh water.

Electrical system

Type... Negative ground
Alternator voltage... 12 V
Alternator output... 65 amps
Starter motor voltage... 12 V
Starter motor power... 3 kW
Number of teeth on flywheel... 126
Pull in current of starter motor solenoid... 60 amps
Hold in current of starter motor solenoid... 15 amps
Engine stop solenoid... 12 V
Stop solenoid (minimum)
-pull in current... 10 amps
-hold in current... 10 amps

Cold start recommendations

Minimum cranking speed... 80 rev/min

Starter specification

Starter motor type	Minimum starting temperature	Lubricating oil viscosity SAE / battery type - values in CCA			
12 volt 3.0 kW	°C (°F)	15W/40	10W/40	5W/40	5W/30
	-10 (14)	1 x 660			
	-15 (5) *		1 x 660		
	-20 (-4) *			1 x 660	
	-25 (-13) *				2 x 570

* - Glow plug start aid fitted.

Note: CCA - Cold Cracking Amps to SAEJ537.

Notes:

- Battery capacity is defined by the 20 hour rate
- If a change to a low viscosity oil is made, the cranking torque necessary at lower ambient temperatures is much reduced. The starting equipment has been selected to take advantage of this. It is important to change the appropriate multigrade oil in anticipation of operating in low ambient temperatures.
- Breakaway current is dependent on battery capacity available. Cables should be capable of handling the transient current which may be up to double the steady cranking current.

Exhaust system

Maximum back pressure
-1500 rev/min... 12 kPa
-1800 rev/min... 15 kPa
Exhaust outlet size... 56 mm

Fuel system

Type of injection... direct
Fuel injection pump... rotary
Fuel atomiser... multi-hole
Nozzle opening pressure... 29,0 MPa
Static injection timing... TDC

Fuel lift pump

Type... Electrical
-flow/hour... 120 - 150 l/h
-pressure... 30 - 75 kPa
Maximum suction head:
-1500 rev/min... 20 kPa

Governor type

Electronic governor (optional)... Woodward LCG2
Speed control for diesel to conform to
-electronic... ISO 8528, Class G3
-mechanical... ISO 8528, Class G2

Fuel specification

Fuel Specification	BS2869 1998 Class A2 or BS EN590
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Fuel consumption

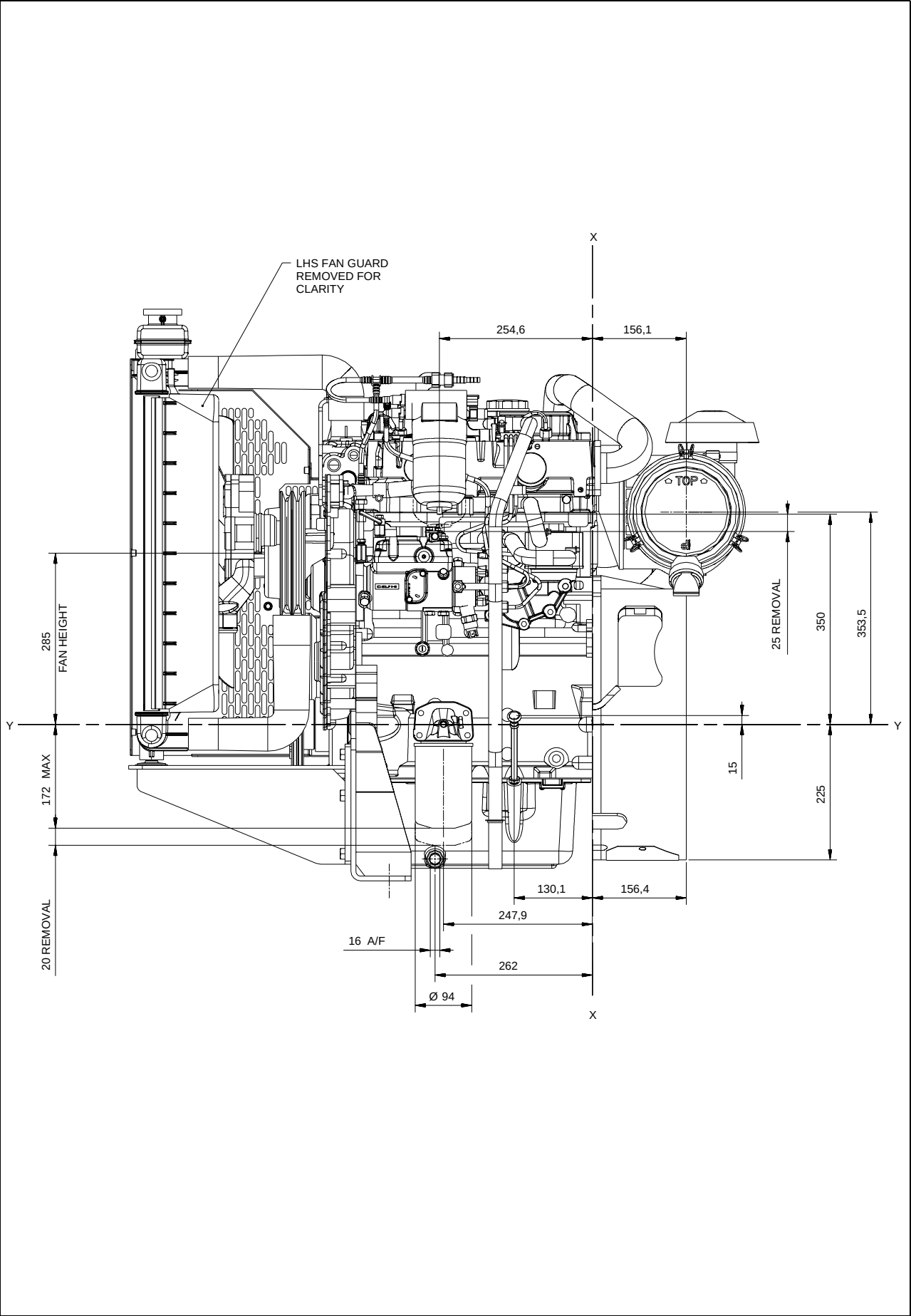
Load	Type of operation and application			
	1500 rev/min		1800 rev/min	
	g/kwhr	litres/hr	g/kwhr	litres/hr
110%	220	11,8	224	13,8
100%	218	10,5	242	13,4
75%	222	8,0	251	10,4
50%	233	5,6	271	7,5
25%	266	3,2	304	4,2

Induction system

Maximum air intake restriction

-clean filter... 4 kPa
-dirty filter... 5 kPa
-air filter type... 2 stage cyclonic / paper element

1103C-33TG2 ElectropaK - left view



6 - M8 X 1,25
THREAD INSERT

BETWEEN HEADER PLATES

524,2

634

Z

185,5

135,5

$\varnothing 8$

298

674,5

691

951,3

Y

OVERCORE

526,2

285

13

260,3

16

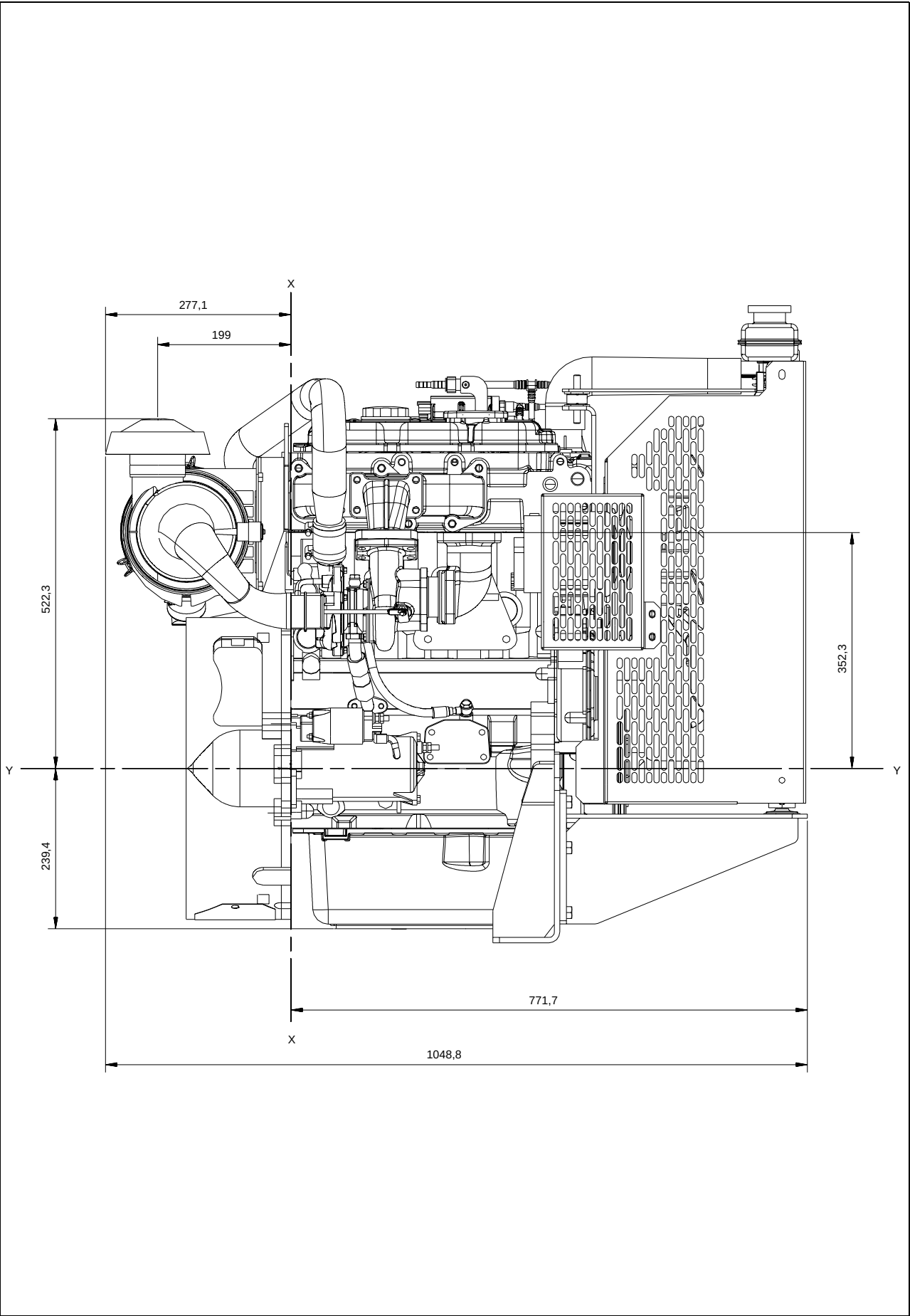
118,6

272

272

Z

1103C-33TG2 ElectropaK - right view



1103C-33TG2 ElectropAK - rear view

FUEL RETURN CONNECTION TO
SUIT DIA. 8 OR DIA. 10 HOSE.

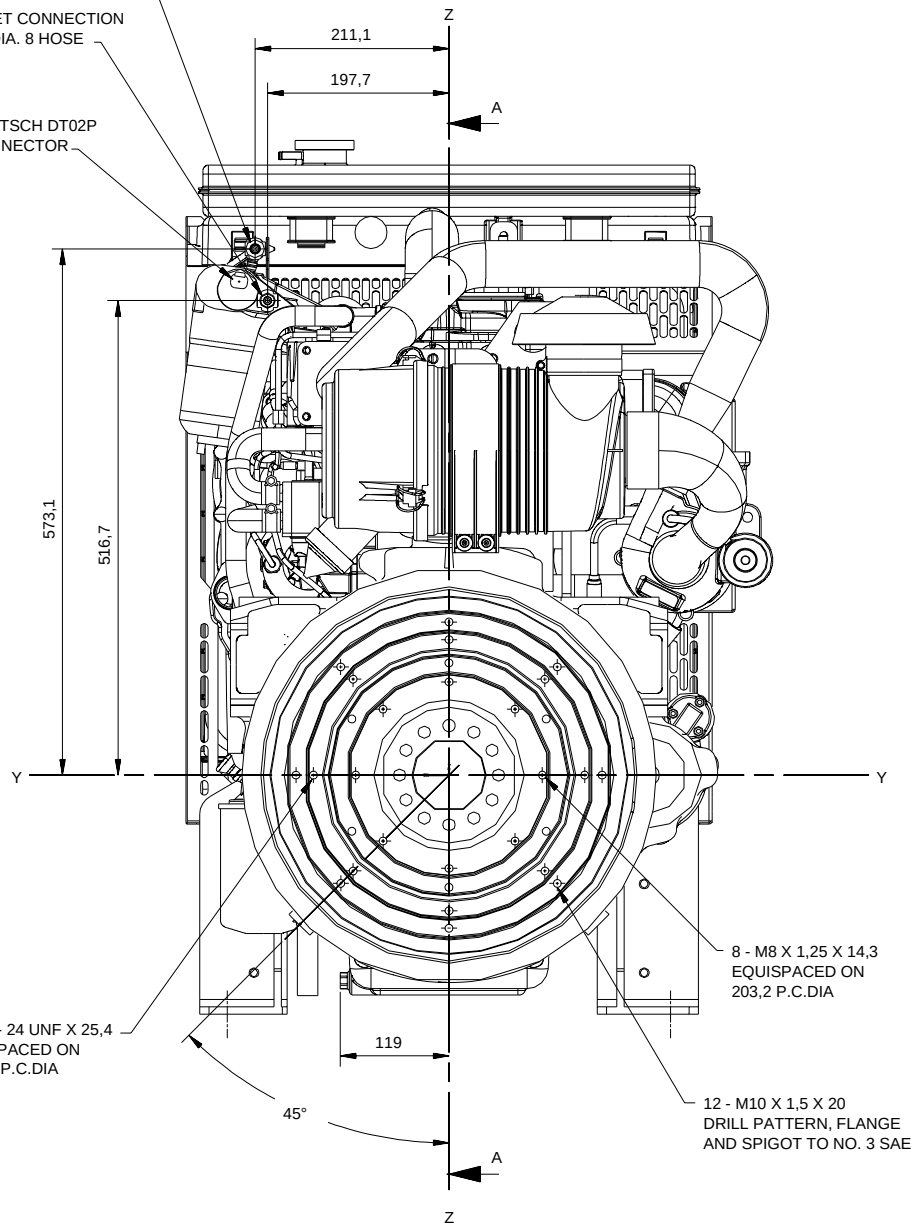
FUEL INLET CONNECTION
TO SUIT DIA. 8 HOSE

DEUTSCH DT02P
CONNECTOR

8 - 3/8 - 24 UNF X 25,4
EQUISPACED ON
295,28 P.C.DIA

8 - M8 X 1,25 X 14,3
EQUISPACED ON
203,2 P.C.DIA

12 - M10 X 1,5 X 20
DRILL PATTERN, FLANGE
AND SPIGOT TO NO. 3 SAE



Lubrication system

Lubricating oil capacity

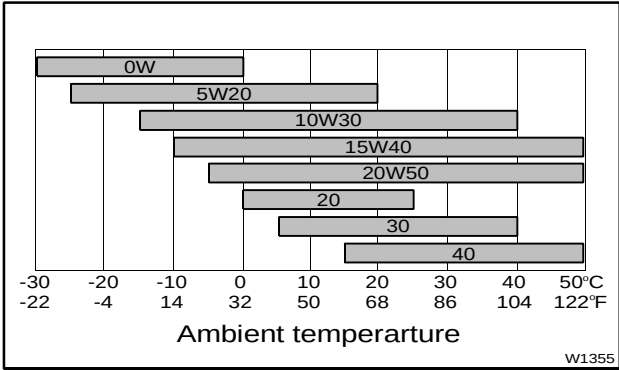
Total system... ..8,3 litres
Sump minimum... ..6,2 litres
Sump maximum... .. 7.8 litres
Maximum engine operating angles:
-front up, front down, right side or left side.25°

Lubricating oil pressure

-relief valve opens..415 - 470 kPa
-at maximum no-load speed276 - 414 kPa
Max continuous oil temperature. 125 °C
Oil consumption at full load as a % of fuel consumption 0,15%

Recommended SAE viscosity

A single or multigrade oil must be used which conforms to API-CG4 / CH4, see illustration below:



Mountings

Maximum static bending moment
at rear face of block 791 Nm

Load acceptance

Intital load appliacion when engine reaches rated speed (15 seconds max after engine starts to crank)			
	Units	1500 rev/min	1800 rev/min
Prime Power	%	90	90
Load	kWm/ kWe	33,0	38,0
Transient frequency deviation	%	< 10	< 10
Frequency recovery	seconds	< 5	< 5

The above complies with requirements of classification 3 & 4 of ISO 8528-12 and G2 operating limits stated in ISO 8528-5. The above figures were obtained under the test conditions as follows:

Engine block temperature 45 °C
Alternator efficiency. TBA %
Minimum ambient temperature 10 °C
Isochronous governing
-typical alternator inertia... .. TBA kgm²

All tests were conducted using an engine installed and services to Perkins Engines Company Limited recommendations

The information given in this document is for guidance only.



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