

Technical Data

1100 Series

Diesel engine - Electropak

1103C-33 G1

30,0 kWm @ 1800 rev/min

Basic technical data

Number of cylinders	3
Cylinder arrangement	Vertical in-line
Cycle	Four stroke
Induction system	Naturally Aspirated
Compression ratio	19-25:1
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	329 kg
-wet	TBA kg

Overall dimensions (Electropak)

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

Moments of inertia (mk²)

Engine:	
-longitudinal	23,3 kgm ²
-horizontal	38,1 kgm ²
-axial	24,4 kgm ²
Flywheel (polar)	1,14 kgm ²

Centre of gravity of engine (fan to flywheel)

-forward from rear of block	192,9 mm
-above centre line of block	139,0 mm
-offset to RHS of centre line	-4,7 mm

Performance

Note: All data based on operation to ISO/TR14396, ISO3046/1 standard reference conditions.

Speed variation at constant load ... $\pm 0.5\%$

Test conditions

-air temperature	25 °C
-barometric pressure	100 kPa
-relative humidity	30%

Sound level

Engine sound power levels, ref. 1pW without inlet and exhaust at 1 metre:

@ 1800 rev/min... 101 dB(A)

All ratings certified to within $\pm 5\%$

If the engine is to operate in ambient conditions other than those of the test conditions, suitable adjustments must be made for any change in inlet air temperature, barometric pressure or humidity. For full details, contact Perkins Technical Service Department.

For details of load acceptance values, contact the applications department at Perkins Engines Company Limited, Stafford.

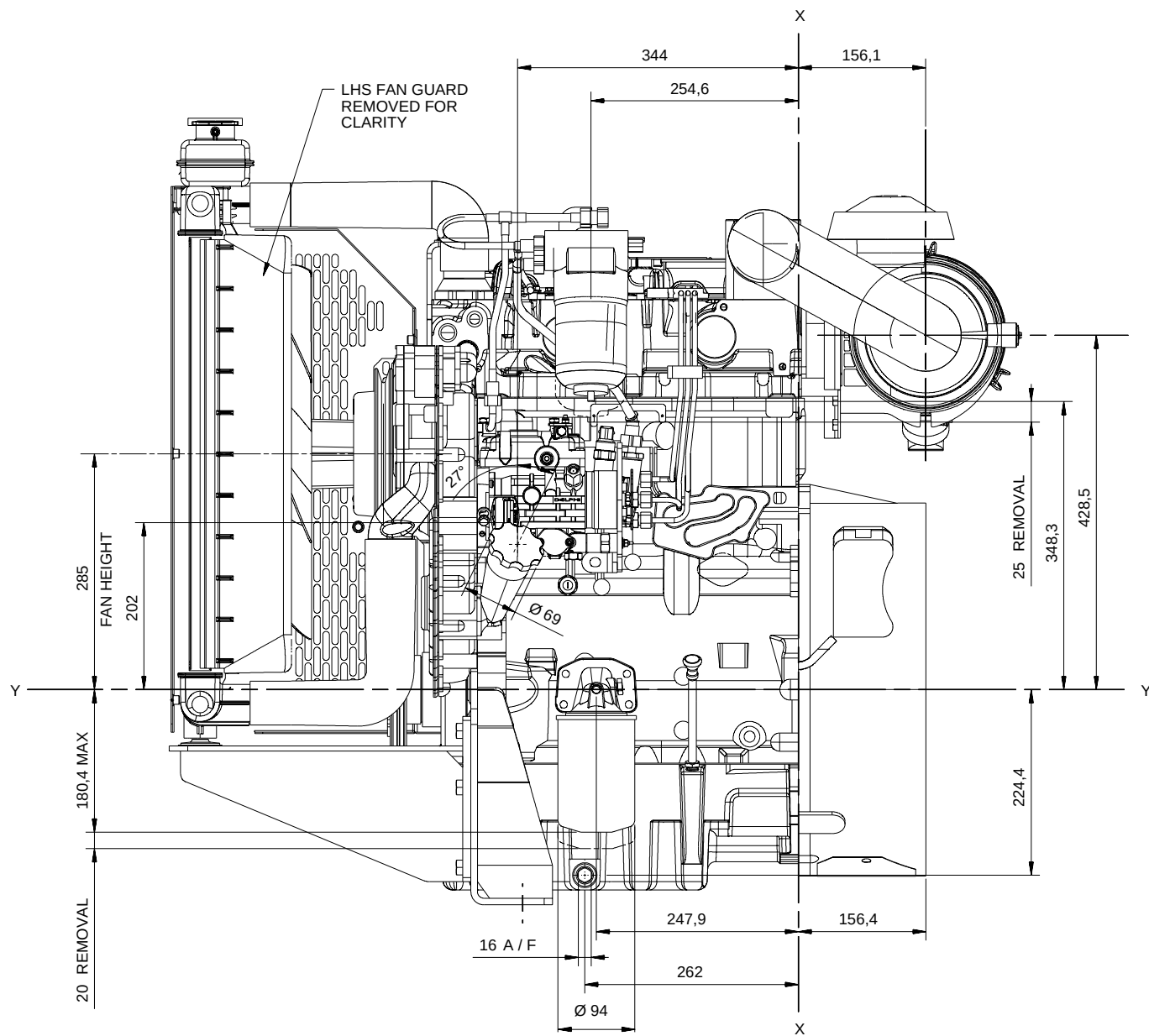
Emissions Capability: Certified against the requirements of Tier 2 legislation for non-road mobile machinery, powered by constant speed engines (EPA 40 CFR Part 89 Tier 2)

General Installation (60 Hz)

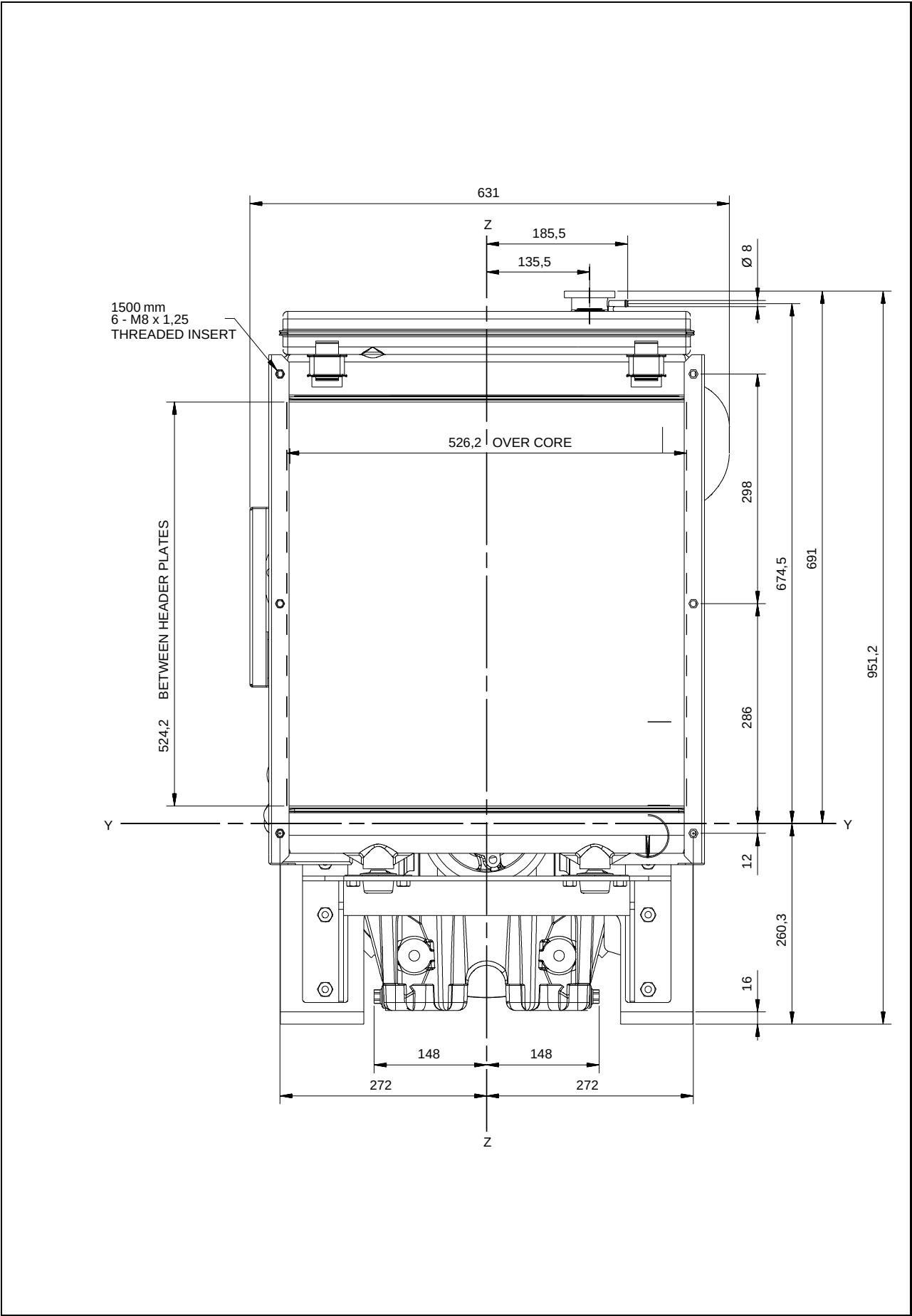
Designation	Units	Type of operation and application	
		Prime	Stand-by
		60Hz	60Hz
Gross engine power	kWb	31,5	35
Brake mean effective pressure	kPa	660	735
ElectropaK net engine power	kWm	27	30
Engine coolant flow 35 kPa system restriction	l/min	151	151
Combustion air flow	m ³ /min	2,6	2,6
Exhaust gas flow (max)	m ³ /min	6,1	6,52
Exhaust gas temperature (max)	°C	530	580
Cooling fan air flow (200 kPa External Restriction)	m ³ /min	69,6	69,6
Energy balance			
Energy in fuel (Fuel heat of combustion)	kWt	90	100
Gross heat to power	kWb	31,5	35
Energy to coolant and lubricating oil	kWt	20	22
Energy to exhaust	kWt	34	38
Heat to radiation	kWt	5	6

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.

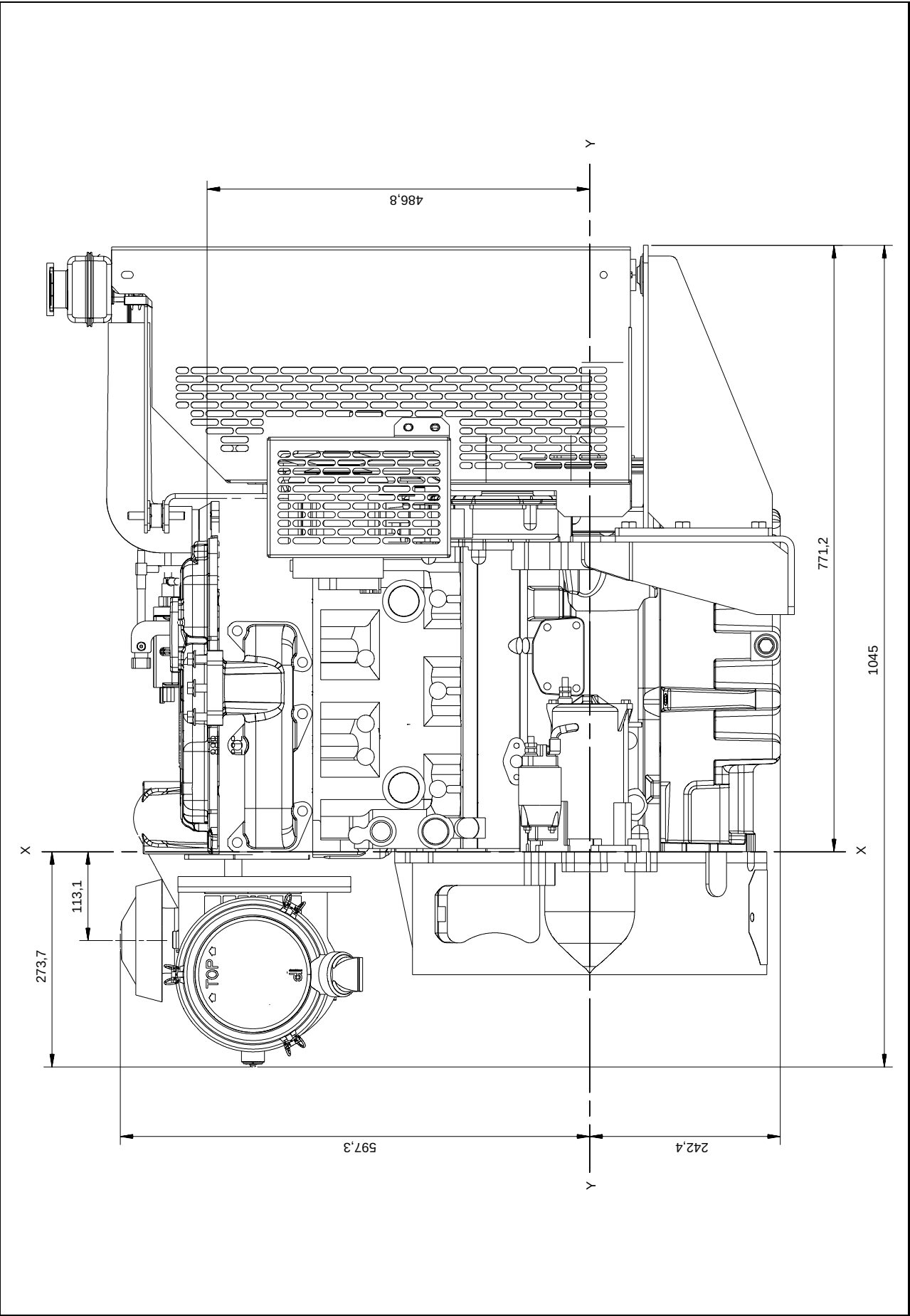
1103C-33 G1 Electropak - Left side view



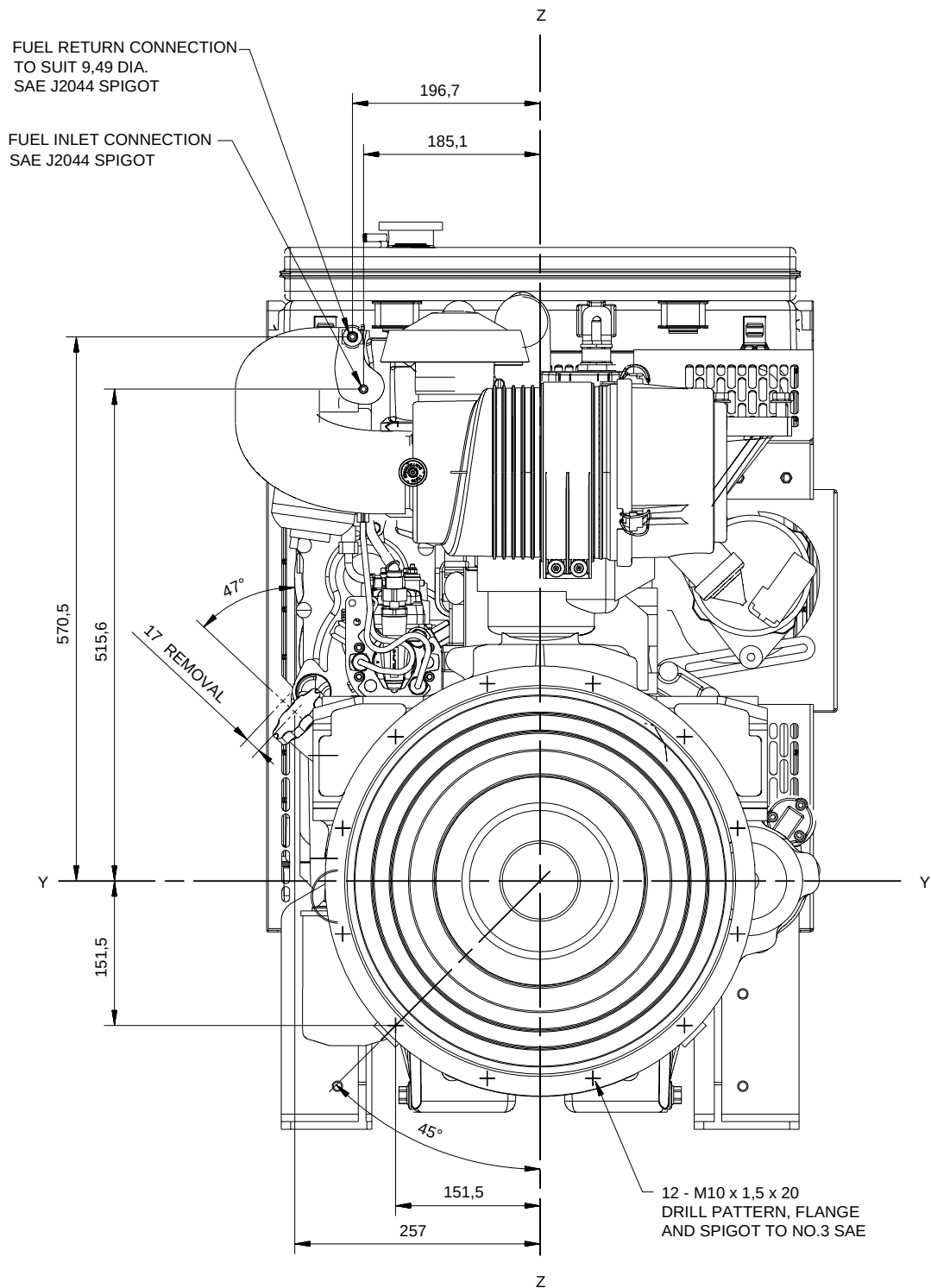
1103C-33 G1 ElectropaK - Front view



1103C-33 G1 ElectropaK - Right side view



1103C-33 G1 ElectropaK - Rear view



Cooling system

Radiator

-face area 0,276 m²
-rows and materials Single, Aluminium
-matrix density and material 12,7 Aluminium 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 l
-without radiator 4,4 l
Maximum top tank temperature 110 °C
Thermostat operation 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
-output 65 amps
Starter motor
-voltage 12 V
-power 3 kW
Number of teeth on flywheel 126
Stop solenoid (maximum)
-pull in current @ -25 °C ⁽¹⁾ 10 amps
-hold in current @ -25 °C ⁽¹⁾ 10 amps
Engine stop solenoid 12 V
1. All leads to rated at 10 amps minimum

Cold start recommendations

Minimum cranking speed 80 rpm

Starter specification

Starter motor type	Minimum starting temperature		Minimum battery type for SAE lubricating oil viscosity			
	°C	°F	15W	10W	5W	0W
12 volt 3.0 kW	-5	23	1 x A			
	-15	5		1 x A		
	-20	-4			1 x B	
	-25	-13				1 x B

Battery specifications

Commercial ref number	Perkins Code	Battery Minimum performance		
		BS 3911	SAEJ537	DIN 43539.2
643	A	440	660	400
647	B	510	770	465
069	D	340	540	300
655	E	570	810	490

Exhaust system

Maximum back pressure 15 kPa
Exhaust outlet size 56 mm

Fuel system

Type of injection Direct
Fuel injection pump DP210
Fuel atomiser Multi-hole
Nozzle opening pressure 29,0 MPa

Fuel lift pump

-flow/hour 120 - 150 l/h
-pressure 30 - 75 kPa
Maximum suction head (with clean filter)
. 17 kPa at 1.7 m using 8 mm dia bore pipe
Maximum static pressure head
. 30 kPa at 2.0 m using 8 mm dia bore pipe

Governor type

Electronic governor L Series Electronic Governor
Electronic governor speed control to ISO 8528, G3
Mechanical governor speed control to ISO 8528, G2

Fuel specification

Fuel specification	USA Fed Off Highway EPA2D 89.330-96
Density (kg/l @ 15°C)	0,835/0855
Viscosity (mm ² /s @ 40 °C)	2,0/4.5
Sulphur Content	0,2% max
Cetane Number	40 - 48

Fuel consumption - litres/hour

Power rating			
110%	100%	75%	50%
10,1	9,1	7,1	4,9

Induction system

Maximum air intake restriction

- clean filter 3,0 kPa
- dirty filter 6,6 kPa
- air filter type 2 stage cyclonic/paper element

Lubrication system

Lubricating oil capacity

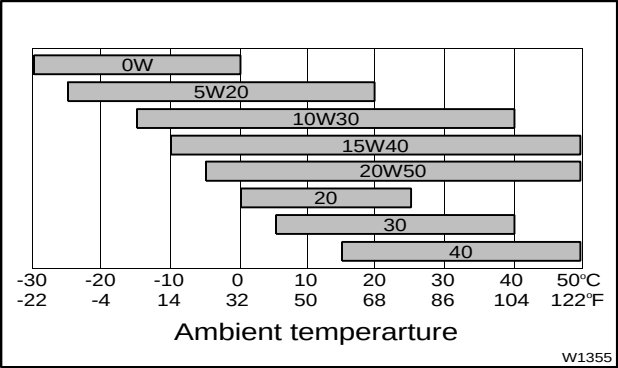
- Total system 8,3 litres
- Sump minimum 6,2 litres
- Sump maximum 7,8 litres
- Maximum engine operating angles
- front up, front down, right side or left side. 25°

Lubricating oil pressure

- at rated speed minimum 250 kPa
- Normal oil temperature 110 °C
- 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 or ACEA-E3/E5, see illustration below:



Mountings

- Maximum static bending moment
- at rear face of block 791 Nm



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