

Technical Data

1200 Series

1204E-E44TTA

Electropak

100 kWe @ 1800 rpm

Basic technical data

Number of cylinders 4
 Cylinder arrangement Vertical in-line
 Cycle 4 stroke
 Induction system Series turbocharged charge cooled
 Combustion system Direct injection
 Compression ratio 16.5:1
 Bore 105 mm (4.13 in)
 Stroke 127 mm (5.00 in)
 Displacement 4.4 litres (268.5 in³)
 Direction of rotation when viewed from flywheel. Anti-clockwise
 Direction of rotation when viewed from front Clockwise
 Firing order 1, 3, 4, 2
 Lifting points location Front left hand side, rear right hand side
 Mobile use g-load limitations 2g vertical
 -est. total weight (dry) Including radiator support brackets.. 700 kg
 -est. total weight (wet) Including radiator support brackets . 720 kg

Overall dimensions

-height, including radiator support brackets. 1212 mm
 -length, front of radiator to rear of air cleaner 1433 mm
 -width 794 mm

Moments of inertia (mk²)

Engine rotational inertia (excluding pulley and flywheel) .0.17 kgm²
 Crank pulley inertia (dependant on option code) Refer to ESM
 Flywheel inertia (dependant on option code) Refer to ESM

Centre of gravity

Forward from rear of block - wet. 265 mm
 Above crankshaft centre line - wet. 250 mm
 Offset to RHS of crankshaft centre line - wet. 15 mm

Performance

Note: All performance data based on operation to ISO Standard reference: TR 14396.

All ratings certified to within ± 3%
 Speed variation at constant load ± 10 rpm

Test conditions

Air temperature 25°C
 Barometric pressure. 101 kPa
 Relative humidity. 10.7 %
 Air inlet restriction at maximum power (nominal) 5.0 kPa
 Exhaust back pressure at maximum power (nominal) 23.0 kPa
 Fuel temperature (inlet pump) 40.0°C

Noise data

Radiated Sound Power Levels (dB(A) ref. 1pW)	@ 1800 rpm
At rated speed with pusher fan	112.5 dB(A)

Note: 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 statement:

No enforced de-rate.

General installation

	Units	Prime	Standby
Gross engine power (sales power)	kWm	117.4	129.1
Fan and battery charging alternator power	kW	8.1	
Cooling fan airflow at zero duct - Dia 660mm pusher (including engine and core resistance)	m ³ /sec	3.9	
Radiator core resistance	Pa	395	
Fan power absorption	kWm	7.6	
Net engine power - full battery	kWm	109.3	121.0
Torque gross	Nm	622.7	685.0
Brake mean effective pressure	kPa	1792	1951
Inlet air flow volume - wet	m ³ /min	7.6	8.0
Exhaust gas flow - wet	m ³ /min	19.2	20.7
Exhaust gas mass flow - wet	kg/sec	9.3	9.8
Exhaust gas temperature (ex. Manifold / turbo outlet)	°C	458.0	470.0
Exhaust gas flow (max)	m ³ /min	20.7	
Boost pressure ratio	:1	3.28	
Overall thermal efficiency (net)	%	39%	39%
Assumed alternator efficiency	%	89.3	
Regenerative power estimated	kW	17.3	
Engine coolant flow - minimum against 35 kPa restriction	l/min	152.0	
Typical GenSet electrical output (0.8pf)	kVA	113.6	125
	kWe	90.9	100

Caution: The airflows shown in this table will provide acceptable cooling for an open power unit operating in ambient temperatures of up to 55°C (131°F) or 48°C (118.4°F) if a canopy is fitted with an air flow restriction of up to 120 Pa. 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.

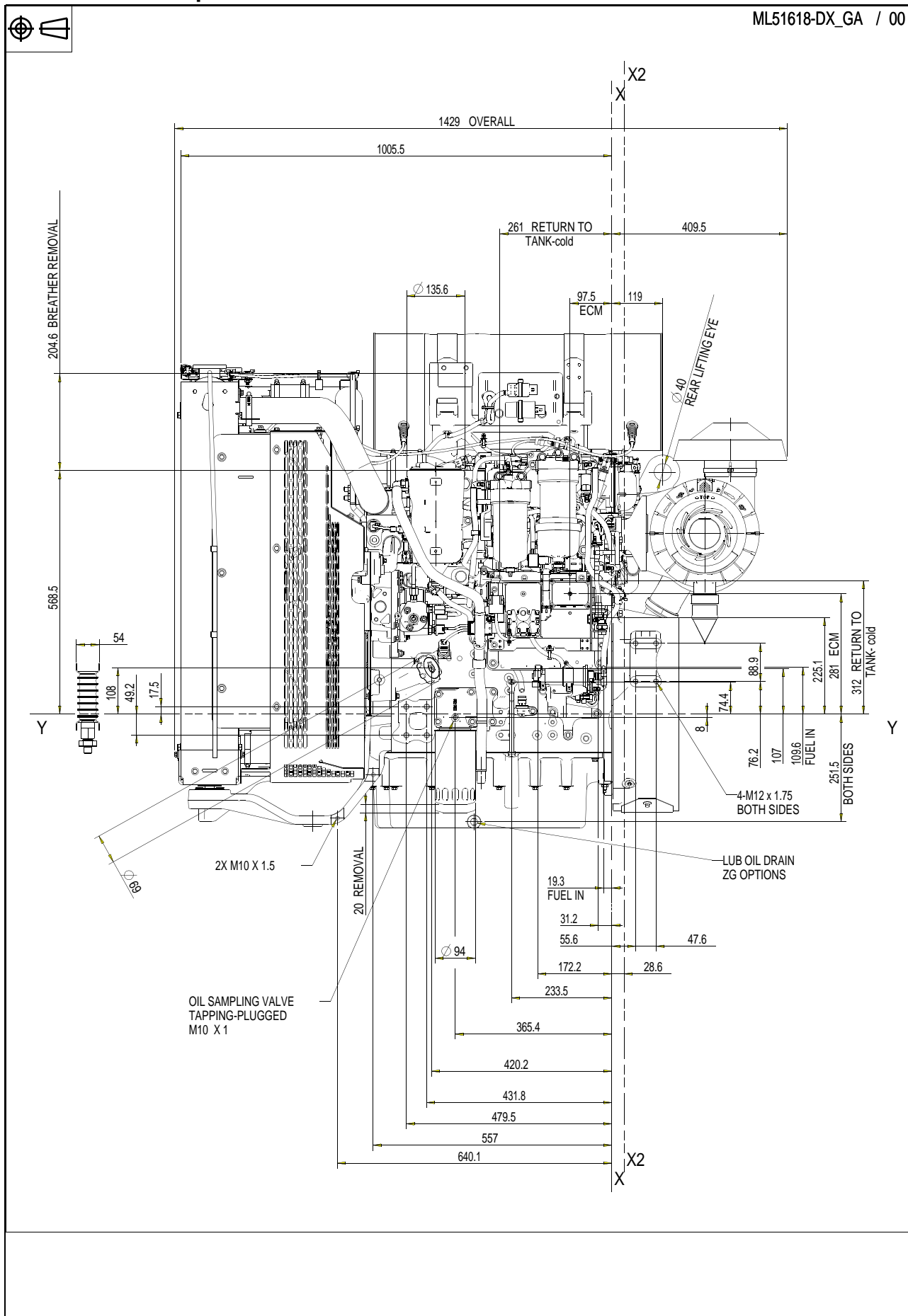
Energy balance

Designation	Units	Prime	Standby
Energy in fuel (fuel heat of combustion)	kWt	304.3	331.6
Energy to power (gross)	kWt	118.3	128.8
Energy to cooling fan - pusher	kWm	7.5	7.5
Energy to power (nett)	kWm	110.2	120.7
Heat rejection to radiator	kWt	65.8	71.2
Energy to exhaust	kWt	124.3	133.7
Energy to charge cooler	kWt	18.6	21.2
Energy to radiation	kWt	21.3	23.2

Energy balance referenced to absolute 0 Kelvin.

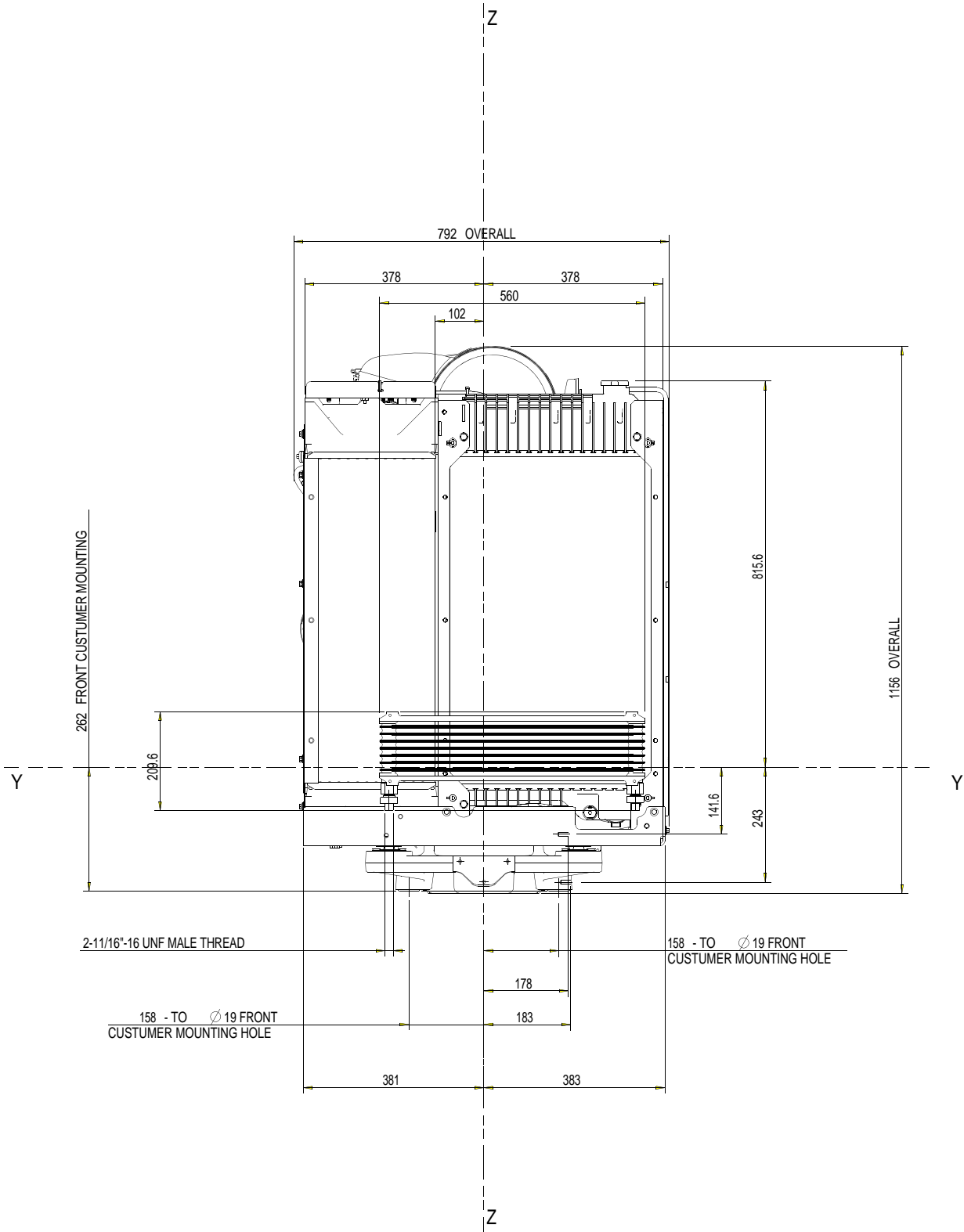
100 kWe @ 1800 rpm - left side view

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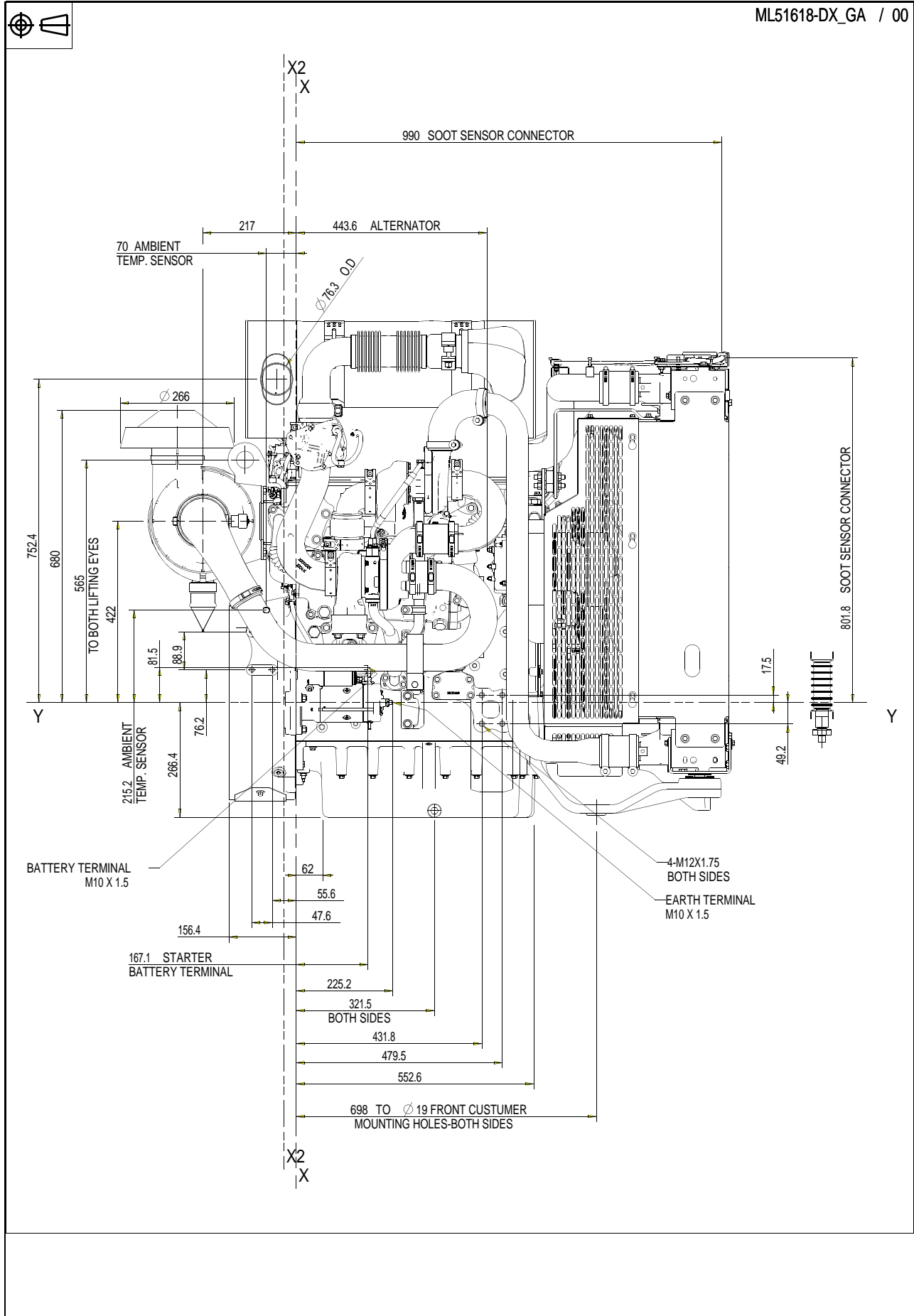
100 kWe @ 1800 rpm - front view

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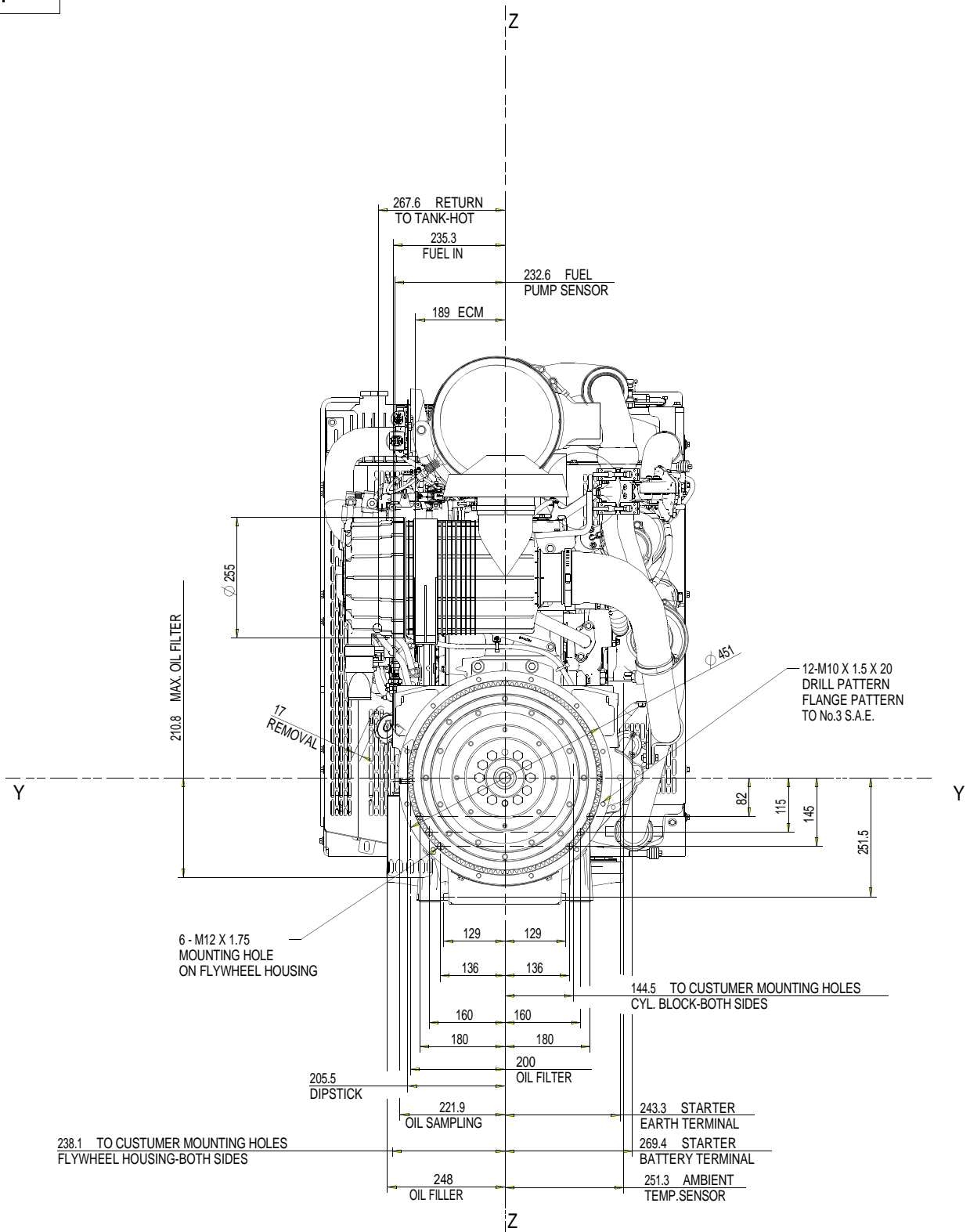
100 kW_e @ 1800 rpm - right side view

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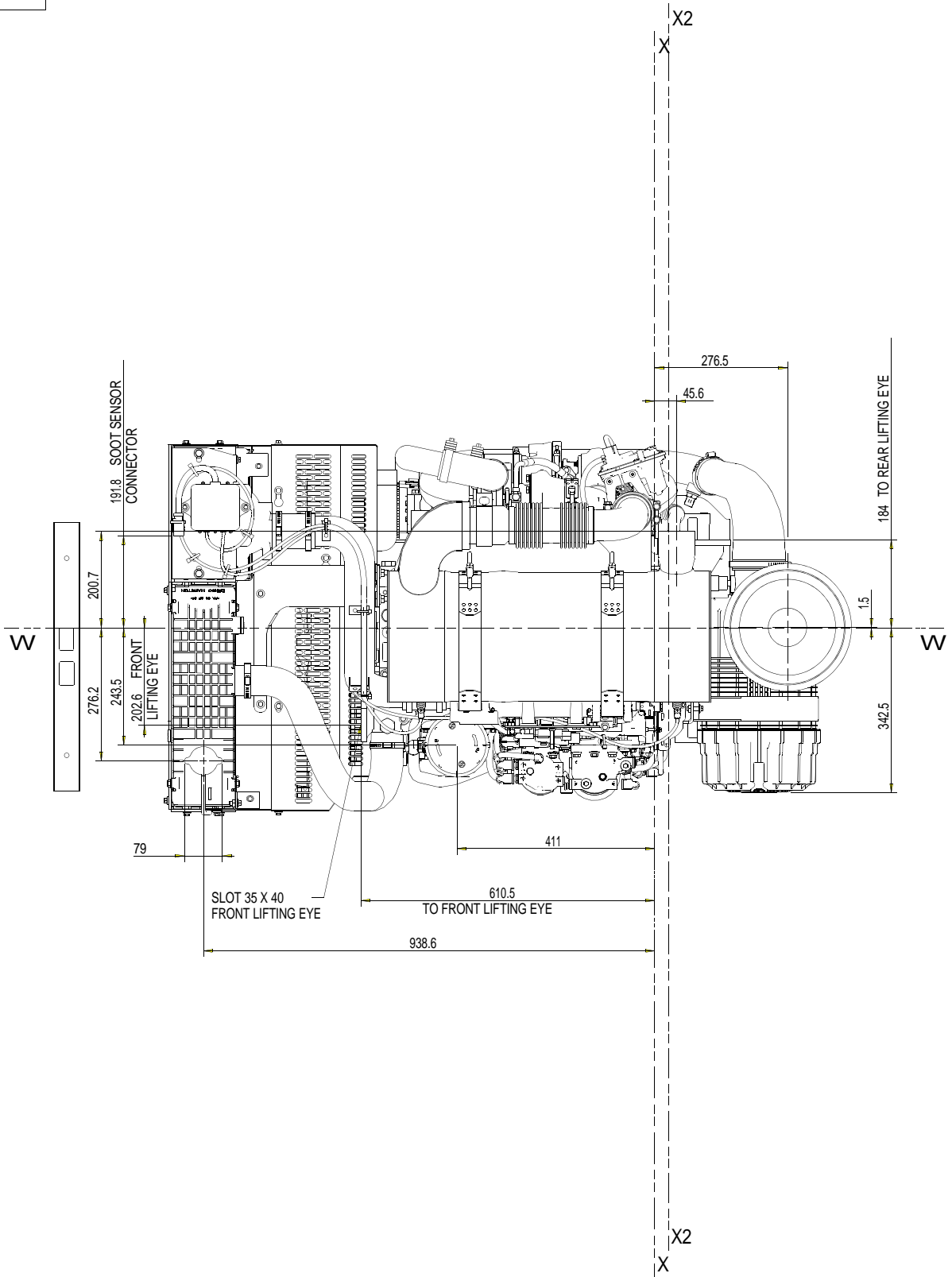
100 kWe @ 1800 rpm - rear view

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100 kWe @ 1800 rpm - plan view

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Cooling system

Cooling pack

Overall weight (wet)	64 kg
Overall face area	0.536475 m ²
Width	777.5 mm
Height	981.1 mm

Radiator

Face area	0.302841 m ²
Number of rows	4
Matrix density and material	10 fins/inch, Aluminium
Width of matrix	438.9 mm
Height of matrix	690.0 mm
Pressure cap setting	100.0 kPa

Charge cooler

Face area	0.17802 m ²
Number of rows and materials	2 high temp, Aluminium
Matrix density and material	10 fins/inch, Aluminium
Width of matrix	258 mm
Height of matrix	690 mm

Fan

Type pusher	M0005
Diameter	660 mm
Drive ratio	1.2:1
Number of blades	7
Blade Material	Composite
Airflow at rated speed (1800 rpm)	3.9 m ³ /sec
Power absorbed @ 1800 rpm	7.5 kW

Coolant

Total system capacity	18.3 litres
Bare engine capacity	9.4 litres
Maximum top tank temperature	108°C
Thermostat operation range	82 - 94°C
Temperature rise across engine (maximum)	9°C
Coolant pump drive	Gear
Recommended coolant immersion heater rating (minimum)	0.6 kW

Recommended coolant

BS6580 - 1992, and ELC coolants to 1E1966
 Maximum additional restriction (Duct allowance) to cooling airflow and resultant Min. airflow

M0005 puller

	Ambient clearance	Duct allowance	Cooling fan airflow	Radiator core resistance
Engine speed rpm	°C	Pa	m ³ /sec	Pa
1800	55	120	3.7	354
1800	48	200	3.4	315

Electrical system

Alternator	Unit	N0101
Alternator voltage	Volts	12
Alternator output	Amps	100

Starter	Unit	E0311
Starter motor voltage	Volts	12
Starter motor power	kW	3.0
Number of teeth on flywheel	(D0004)	126
Number of teeth on starter pinion		10
Minimum cranking speed	rpm	100 with glow plugs, 130 without glow plugs
Starter solenoid - Max. pull-in current @ -20°C	Amps	68
Starter solenoid - Max. hold-in current @ -20°C	Amps	20

Engine stop method

Cold start recommendations

Minimum battery cold cranking amps

Cold start recommendation	Minimum battery Cold Cranking Amps
	With glow plugs 12v
-5	750
-10	750
-15	1650
-20	1650
-25	1500
Max. battery CCA.	2410

Notes:

- Glow plugs needed below -10°C.
- For cable sizes see Applications and Installation manual.

Exhaust system aftertreatment SF451

Aftertreatment system type... DOC and DPF
 Type of regeneration ... low temperature
 Aftertreatment length... 673.1 mm (26.5 Inch)
 Aftertreatment height... Refer to GA as engine mounted
 Aftertreatment weight... 37.0 Kg
 Outlet orientation when viewed from rear of engine ...
 ... 0° (Horizontal RHS)
 Aftertreatment skin temperature... 250.0°C
 Max Temp for electronic components on aftertreatment... 120.0°C
 Max Temp for external electronic components for
 Aftertreatment (soot sensor box)... 85.0°C
 Typical maximum temperature exhaust out...
 ... Same as - exhaust gas temperature (Ex. manifold / turbo outlet)
 Maximum system back pressure limit.. NA for engine mounted AT
 Aftertreatment exhaust outlet connection ... 76.2 mm
 Aftertreatment exhaust outlet connection load limit... 60.0 Nm
 Attenuation of the DPF ... NA dB(A)
 Ash service... 8000.0 hours
 Maximum back pressure for customer installed pipe work.. 10 kPa

Induction system

Maximum air intake restriction
 Clean filter ... 5.0 kPa
 Dirty filter ... 8.0 kPa
 Induction indicator setting ... 5.0 kPa
 Air filter type...
 ... Medium Duty: Specification – minimum dust-holding capacity
 (tested to S.A.E J726b or ISO 5011): 10 gram SAE coarse test
 dust/cu. ft./min of airflow

Fuel injection system

Fuel pump type / model... HP3
 Injection system... Common rail
 Injector type... Solenoid
 Injection pressure ... Electronically governed

Fuel Priming

Priming pump type... Electric
 Maximum priming time ... 90 seconds

Fuel feed

Maximum fuel supply restriction at primary filter ... 50 kPa abs
 Maximum fuel return restriction at low idle ... 20 kPa
 Maximum fuel return flow ... 1.74 l/min
 Maximum fuel flow through inlet connection ... 2.6 l/min
 Maximum lift pump delivery pressure... 450 kPa
 Maximum suction head at fuel pump inlet... 150 kPa abs
 Maximum static pressure head ... 20 kPa
 Maximum fuel temperature at lift pump inlet... 80°C
 Maximum fuel filter service interval ... 500 hrs

Fuel specification

ULSD (Ultra Low Sulphur Diesel) 15ppm Sulphur

Fuel consumption (SFC)

Load	g/kW.hr	litres/hr
25%	265	9.6
50%	227	16.2
75%	216	23.5
100% (Prime)	211.6	30.5
110% (Standby)	211	33.3

Lubrication system (G1100)

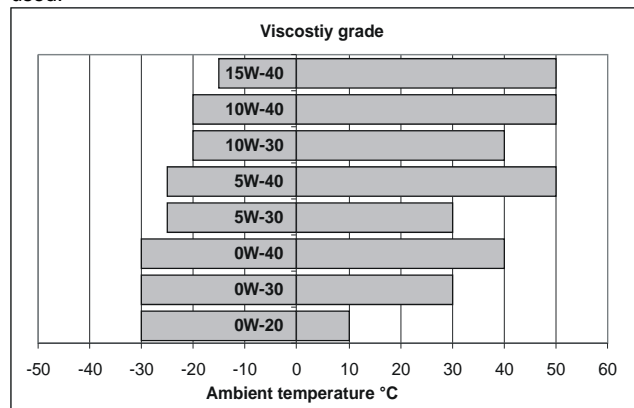
Maximum system capacity ... 9.1 Litres
 Maximum capacity in sump... 8.0 Litres
 Minimum capacity in sump ... 6.8 Litres
 Maximum oil temperature continuous operation ... 125°C
 Maximum oil temperature intermittent operation... 135°C

Lubricating oil pressure

At rated speed... 360 - 440 kPa
 Minimum ... 250.0 kPa @ 1000 rpm
 Oil relief valves opens at... 545 - 595 kPa
 Sump drain plug tapping size
 or hose connection size ... 3/4 UNF STOR port
 Oil pump drive method... Gerotor (gear driven off crankshaft)
 Oil pump speed ... 2 x engine speed
 Lubricating oil flow at rated speed ... 50 litres/min.
 Oil consumption at full load rated speed ... 0.065 % of fuel

Recommended SAE viscosity

A multigrade oil conforming to API-CJ4, ACEA-E9, ECF3 must be used.



Normal operating angles

Front and rear ... 25°
 Side... 25°

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PTO capabilities

Q1030

Flange type	SAE A
Torque capability intermittent	210 Nm
Torque capability continuous	142 Nm
Maximum bending moment at flange	0 Nm

Note: Refer to "Applications and Installation Manual" for "PTO approval requirements".

Mountings

Maximum static bending moment at rear face of block	Nm	Calculate based on dynamic limit and intended installation g load
Maximum permissible load applied to rear of crankshaft (vertically down)	kN	1.6
Maximum permissible bending moment (in vertical direction) at crankshaft rear mounting face	Nm	54
Maximum permissible front and rear crankshaft overhung load capability	N	See OHL polar diagrams in ESM
Maximum bending moment at rear of flywheel housing (Nm) - SAE3	Nm	Dynamic vertical bending moment. Nm ± 3000Nm dynamic lateral bending moment. Nm ± 1700Nm

Note: Refer to "Applications and Installation Manual" for "Bending Moment approval requirements".

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