

1103C-33TG2

1100

45,6 kWm @ 1500 rpm
52,4 kWm @ 1800 rpm

Diesel engine - Electropak

Series

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 (4.13 in)
Stroke 127 mm (4.99 in)
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 359 kg

Overall dimensions (Electropak)

Height 951 mm (37.44 inches)
Length 1045 mm (41.14 inches)
Width (including mounting brackets) 631 mm (24.84 inches)

Moment of inertia

Engine:
- longitudinal 25 kgm²
- horizontal 42 kgm²
- axial 25 kgm²
Flywheel (polar) 1.14 kgm²

Centre of gravity (fan to flywheel)

Forward from rear of block 193 mm (7.59 inches)
Above centre line of block 139 mm (5.47 inches)
Offset of RHS of centre line -4,7 mm (-0,18 inches)

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:
@1500 rpm 98 dB(A)
@1800 rpm 100 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.

Note: 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

Cyclic irregularity (for engine & flywheel)

Prime Power:
@1500 rpm ±0.045%
@1800 rpm ±0.031%

General installation

1103C-33TG2

Designation	Units	Type of operation and application			
		Prime power 50 Hz	Standby power 50 Hz	Prime power 60 Hz	Standby power 60 Hz
Gross engine power	kWm	41.9	46.5	48.6	54.0
Fan power	kWm	0.9		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	litres/min	125.5		151.0	
Combustion air flow	m ³ /min	2.9	3.1	3.7	3.9
Exhaust gas flow (max.)	m ³ /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		10.3	
Assumed alternator efficiency	%	90			
Cooling fan air flow	m ³ /min	53		70	
Specific fuel consumption	l/min	0.20	0.21	0.20	0.21

Energy balance

Designation	Units	Prime power 50 Hz	Standby power 50 Hz	Prime power 60 Hz	Standby power 60 Hz
Power in fuel (fuel heat of combustion)	kWt	110.1	121.5	135.1	149
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		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

Note: 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 m ²
Rows and materials	Single row aluminium
Matrix density and material	Aluminium 12,5 fins/inch
Width of matrix	526 mm (20.7 inches)
Height of matrix	524 mm (20.6 inches)
Pressure cap setting	107 kPa

Fan

Diameter	457mm (18 in)
Drive ratio	0.85:1
Number of blades	7
Material	Composite
Type	Pusher

Coolant

Recommended coolant: 50 % ethylene glycol with a corrosion inhibitor (BS 658 : 1992 or MOD AL39) and 50% clean fresh water.

Total system capacity:

With radiator	10.2 l (21.5 pt)
Without radiator	4.4 l (9.2 pt)
Maximum top tank temperature	110 °C (230 °F)
Thermostat operating range	82 - 93 °C (180 - 199 °F)

Lubrication system

Lubricating oil capacity

Total system	8.3 litres (17.5 pt)
Sump minimum	6.2 litres (13.1 pt)
Sump maximum	7.8 litres (16.4 pt)
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 speed	276 - 414 kPa
Max continuous oil temperature	125 °C (257 °F)
Oil consumption at full load as a % of fuel consumption	0.15%

Exhaust system

Maximum back pressure

1500 rpm	12 kPa
1800 rpm	15 kPa
Exhaust outlet size	56 mm (2.2 inches)

Fuel System

Type of injection	Direct
Fuel injection pump	Rotary
Fuel atomiser	Multi-hole
Nozzel opening pressure	29 MPa (290 bar)
Static injection timing	TDC

Fuel lift pump

Type	Mechanical
Flow/hour	120 - 150 litres/h (211 - 264 pt/m)
Pressure	30 - 75 kPa (4.4 - 10.9 psi)
Maximum suction head:	
1500 rpm	20 kPa

Governor type

Electronic governor	Woodward LCG2
Speed control for diesel to conform to:	
Electronic	ISO 8528, Class G3

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%	216	11.7	230	14.3
100%	217	10.7	226	13.1
75%	224	8.6	233	10.6
50%	237	6.1	254	7.7
25%	274	3.5	296	4.4

Induction system

Maximum air intake restriction

Clean filter	4 kPa
Dirty filter	5 kPa
Air filter type	2 stage cyclonic / paper element

Electrical system

Type	Negative ground
Alternator voltage	12 volts
Alternator output	65 amps
Starter motor voltage	12 volts
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 volts
Stop solenoid (minimum):	
Pull in current	10 amps
Hold in current	10 amps

Cold start recommendations

Minimum cranking speed	80 rpm
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Starter specification

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

* Starting aid fitted

Note: CCA - Cold Cracking Amps to SAEJ537.

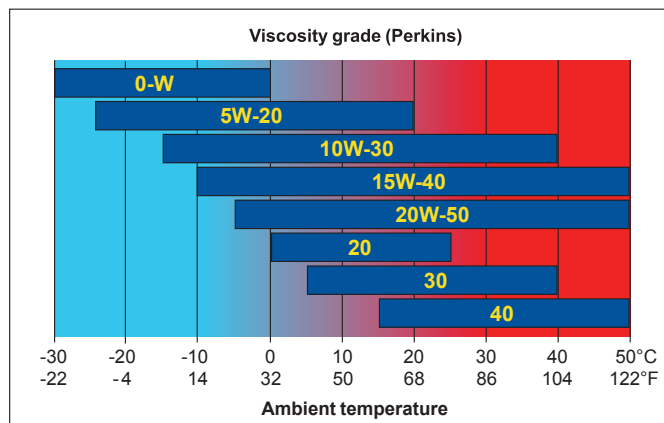
Note: Battery capacity is defined by the 20 hour rate.

Note: 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.

Note: 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.

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 (583 lb/ft)

Load acceptance

Initial load application: When engine reaches rated speed (15 seconds maximum after engine starts to crank)			
	Units	1500 rpm	1800 rpm
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..... .89 %

Minimum ambient temperature 10 °C

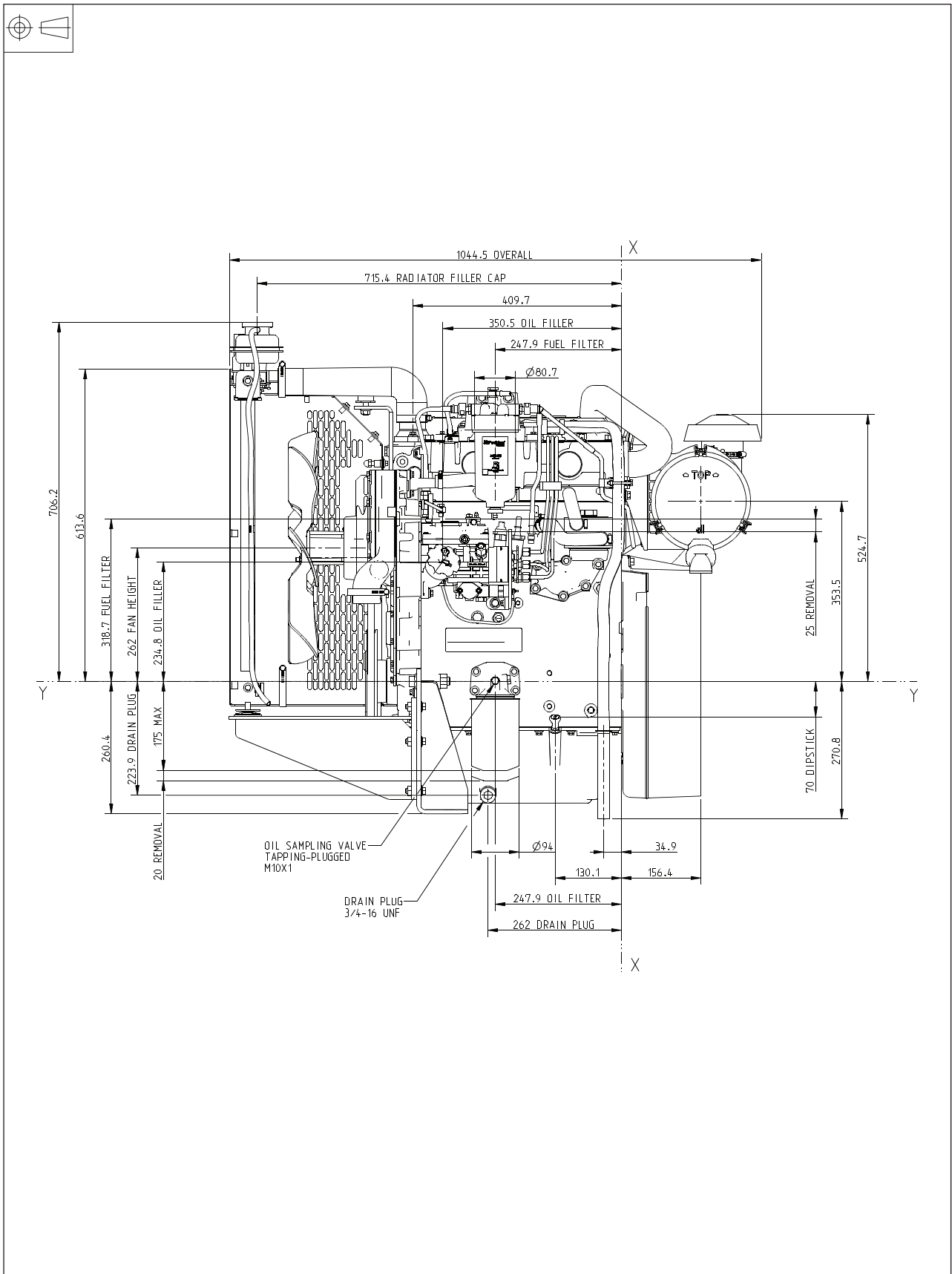
Isochronous governing:

Typical alternator inertia 0.496 kgm²

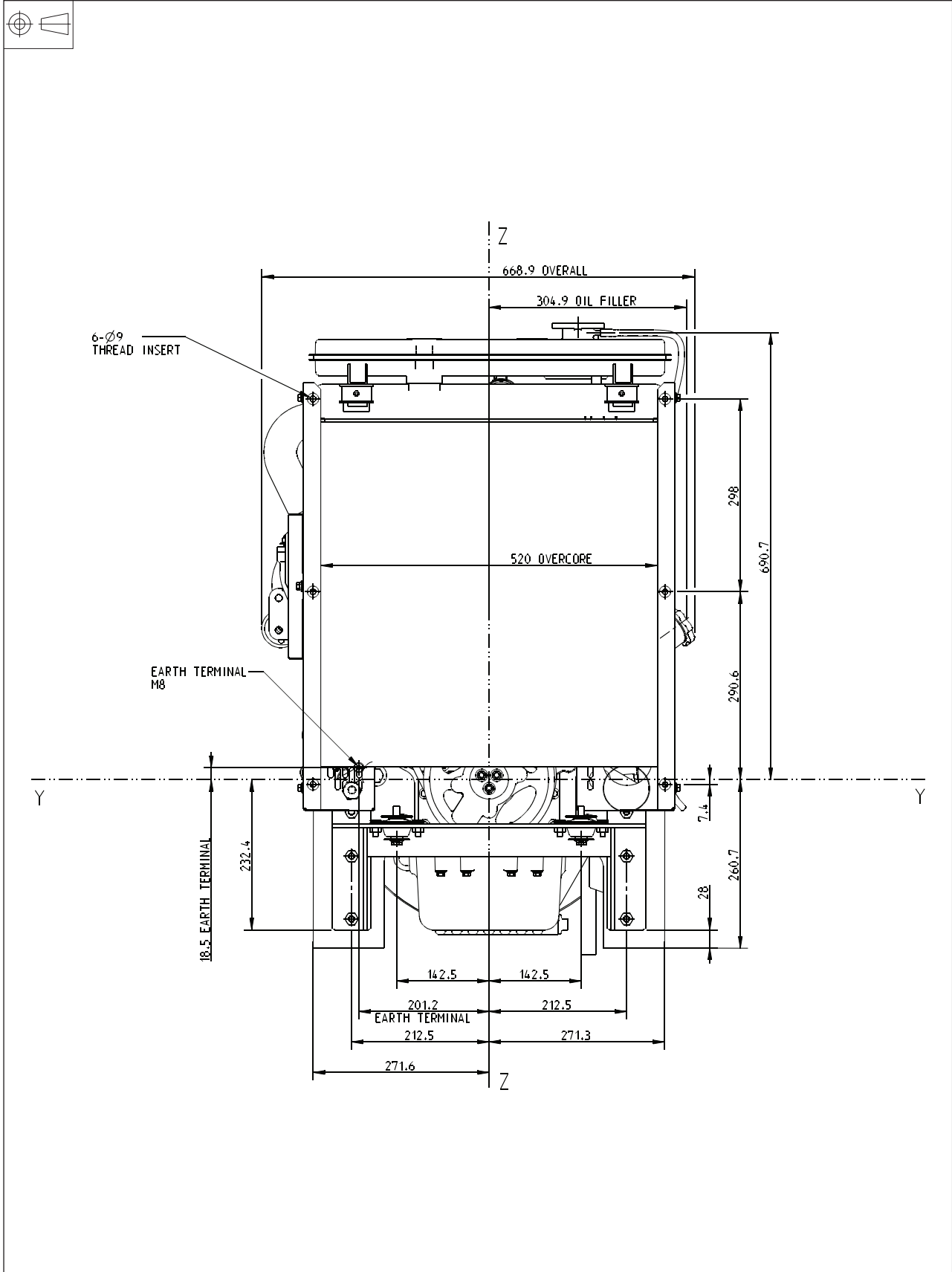
All tests were conducted using an engine installed and serviced to Perkins Engine Company Limited recommendations.

The information given in this document is for guidance only.

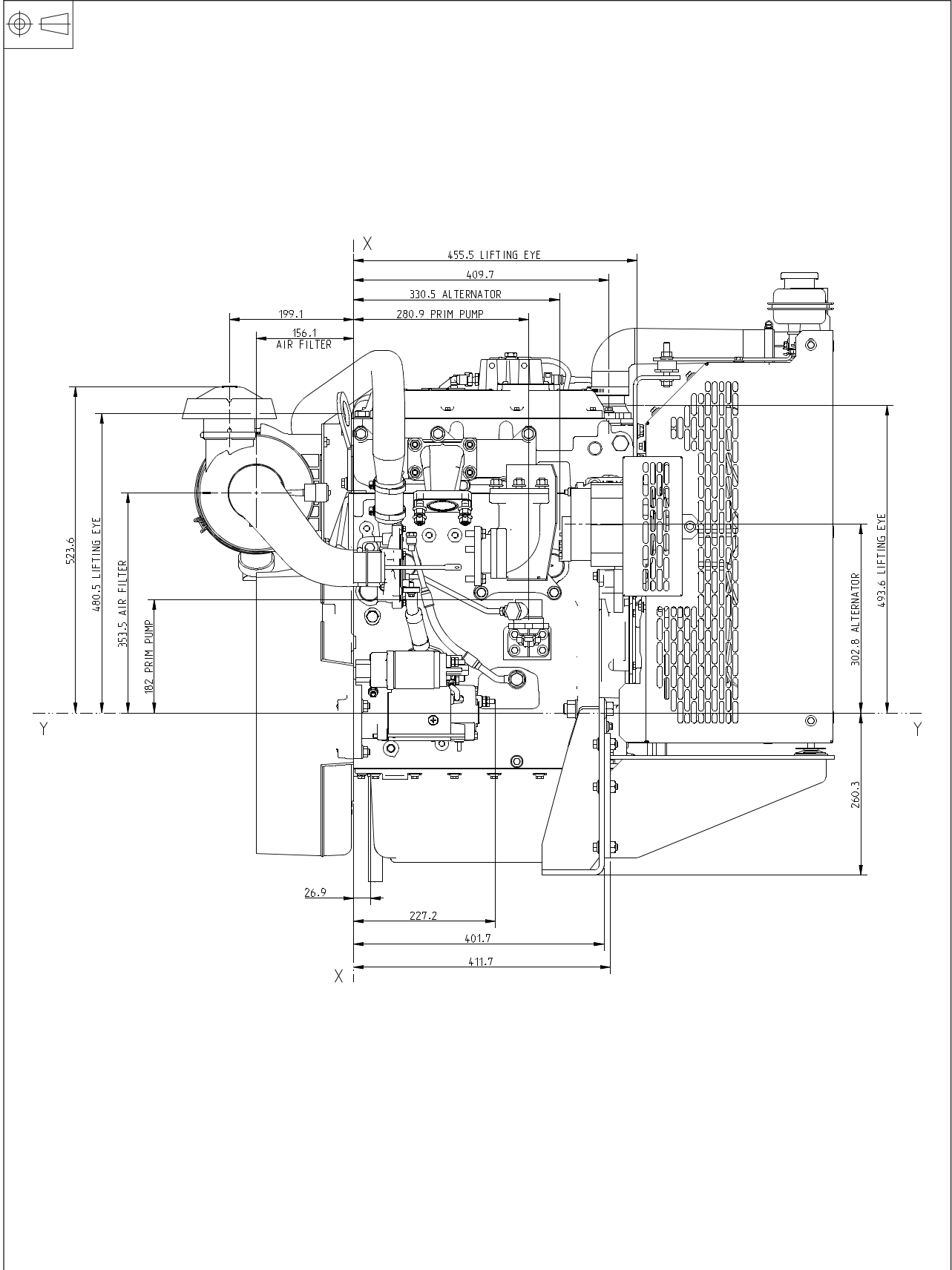
1103C-33TG2 - Left side view



1103C-33TG2 - Front side view



1103C-33TG2 - Right side view



1103C-33TG2 - Rear side view

