

# 1104A-44TG2

# 1100

80.5 kWm @ 1500 rpm  
94.5 kWm @ 1800 rpm (Gross power)

## Genset

## Series

### Basic technical data

Number of cylinders	3
Cylinder arrangement	Vertical in-line
Cycle	Four stroke
Induction system	Turbocharged
Compression ratio	17.25 : 1
Bore	105 mm (4.13 in)
Stroke	127 mm (4.99 in)
Cubic capacity	4.4 litres
Direction of rotation	Clockwise view from front
Firing order	1.2.3
Total weight (engine only)	
-dry	463kg
-wet	485kg

### Overall dimensions

Height	951 mm (37.44 inches)
Length	1241 mm (48.85 inches)
Width (including mounting brackets)	629 mm (24.76 inches)

### Moment of inertia (mk<sup>2</sup>)

Engine:	
- longitudinal	34.5 kgm <sup>2</sup>
- horizontal	48.8 kgm <sup>2</sup>
- axial	25.1 kgm <sup>2</sup>
Flywheel (polar)	1.14 kgm <sup>2</sup>

### Centre of gravity (wet)

- forward from rear of block	270 mm (10.62 inches)
- above centre line of block	151 mm (5.94 inches)
- offset of RHS of centre line	13 mm (0.51 inches)

### Performance

Steady state speed stability at constant load:	
G2	± 0.75%
G3	± 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%

### Sound Level

Overall sound pressure level (cooling pack and air cleaner fitted):	
@1500 rpm	89.7 dB(A)
@1800 rpm	92.0 dB(A)

**Note:** Sound pressure level from the mean of 4 microphones at the front, left, right and above the engine. Exhaust was piped away out of the test cell.

**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.

## General installation

### 1104A-44TG2

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	73.4	80.5	84.5	94.5
Brake mean effective pressure	kPa (lbf/in <sup>2</sup> )	1335 (193.6)	1467 (212.7)	1280 (185.6)	1409 (204.3)
Mean piston speed	m/s (ft/s)	6.35 (20.8)	6.35 (20.8)	7.62 (25.0)	7.62 (25.0)
ElectropaK nett engine power	kWm	71.9	79.1	82.0	90.2
Engine coolant flow 35 kPa restriction	litres/min (UK gal/min)	142 (31.2)	142 (31.2)	170 (37.3)	170 (37.3)
Combustion air flow	m <sup>3</sup> /min (ft <sup>3</sup> /min)	4.8 (169.5)	5.14 (181.5)	6.2 (218.9)	6.5 (229.5)
Exhaust gas flow (maximum)	m <sup>3</sup> /min (ft <sup>3</sup> /min)	12.5 (441.4)	13.3 (469.6)	15.0 (529.7)	15.85 (559.7)
Exhaust gas temperature (maximum) in manifold	°C (°F)	555 (1031)	580 (1076)	535 (995)	560 (1040)
Cooling fan air flow	m <sup>3</sup> /min (ft <sup>3</sup> /min)	89.0 (3143.0)		111.0 (3919.9)	
Overall thermal efficiency (nett)	%	39.5	39.5	38.5	39.5
Typical Genset electrical output (0.8pf 25°C)	kWe	64.0	70.4	73.0	80.3
	kVA	80.0	88.0	91.3	100.3
Assumed alternator efficiency	%	89			

## 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)	kW (Btu/min)	186.0 (10587.0)	204.0 (11611.6)	220.0 (12522.3)	236.0 (13433.0)
Power output (gross)	kW (Btu/min)	73.4 (4177.9)	80.7 (4593.4)	84.5 (4809.7)	93.0 (5293.5)
Power to cooling fan	kW (Btu/min)	1.5 (85.3)	1.6 (91.0)	2.5 (142.2)	2.8 (159.3)
Power output (nett)	kW (Btu/min)	71.9 (4092.5)	79.1 (4502.3)	82.0 (4667.4)	90.2 (5134.1)
Power to coolant and lubricating oil	kW (Btu/min)	46.0 (2618.3)	51.0 (2902.9)	53.0 (3016.7)	57.0 (3244.4)
Power to exhaust	kW (Btu/min)	53.0 (3016.7)	59.0 (3358.2)	68.0 (3870.5)	71.0 (4041.2)
Power to radiation	kW (Btu/min)	13.0 (739.9)	14.0 (796.8)	14.0 (796.8)	15.0 (853.7)

**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 (127 °F) or 46 °C (114.8 °F) 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 <sup>2</sup> (2.97 ft <sup>2</sup> )
Rows and materials	Double 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	1.25:1
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	13.0 l (27.4 pt)
Without radiator	7.0 l (14.7 pt)
Maximum top tank temperature	110 °C (230 °F)
Thermostat operating range	82 - 93 °C (180 - 199 °F)

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 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 105 rpm

### 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 810			
	-15 (5)*		1 x 810		
	-20 (-4)*			1 x 810	
	-25 (-13)*				1 x 900

\* Glow plug start aid fitted.

**Note:** CCA - Cold Cranking 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.

## Exhaust system

Maximum back pressure	
1500 rpm	10 kPa
1800 rpm	15 kPa
Exhaust outlet size	64 mm (2.5 in)

## Fuel System

Type of injection	Direct
Fuel injection pump	Rotary
Fuel atomiser	Multi-hole
Nozzle opening pressure	29 MPa (290 bar)

### Fuel lift pump

Type	Electrical
Flow/hour	120 - 150 litres/h (211 - 264 pt/m)
Pressure	30 - 75 kPa (4.4 - 10.9 psi)
Maximum suction head (1500 rpm)	17 kPa (2.90 psi)

### Governor type

Electronic governor (optional)	Woodward LCG2
Electronic speed control to	ISO 8528. G3 (Hot)
Mechanical governor speed control to	ISO 8528. G2 (Cold)

### Fuel specification

Fuel Specification	European RF75-T-96/DIN EN590/BS2869 class A2
Density (kg/l @ 15 °C)	0.835 - 0.845
Viscosity (mm <sup>2</sup> /s @ 40 °C)	2.5 - 3.5
Sulphur content (%)	0.1 - 0.2
Cetane number	45 - 50

### Fuel consumption litres/hour (UK gals/hr)

Speed	1104A-44TG2 Power rating				
	110%	100%	75%	50%	25%
1500	20.5 (4.5)	18.7 (4.1)	14.0 (3.0)	9.7 (2.1)	5.2 (1.1)
1800	24.4 (5.3)	22.3 (4.9)	16.9 (3.7)	11.9 (2.6)	6.5 (1.4)

### Induction system

Maximum air intake restriction	
Clean filter	5 kPa
Dirty filter	8 kPa
Air filter type	Dry

## Lubrication system

### Lubricating oil capacity

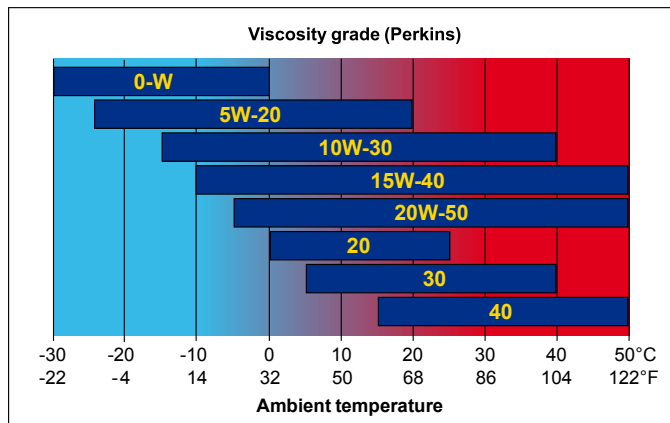
Total system	8.0 litres (16.9 pt)
Sump minimum	5.5 litres (11.6 pt)
Sump maximum	7.0 litres (14.7 pt)
Maximum engine operating angles:	
Front up, front down, right side or left side	25°

### Lubricating oil pressure

Relief valve opens	415 - 470 kPa
- at maximum no-load speed	276 - 414 kPa
Maximum continuous oil temperature (in rail)	125 °C (257 °F)
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 (583 lb/ft)

## Load acceptance

Initial load application: When engine reaches rated speed (15 seconds maximum after engine starts to crank)			
Descriptor	Units	1500 rpm	1800 rpm
Prime power	%	90	100
Load	kWm (kWe)	66,1 (57.5)	84,2 (72.4)
Transient frequency deviation	%	< -10	< -10
Frequency recovery	Seconds	< 1	< 1

Engine block temperature ..... 45 °C

Alternator efficiency.....96%

Minimum ambient temperature ..... 10 °C

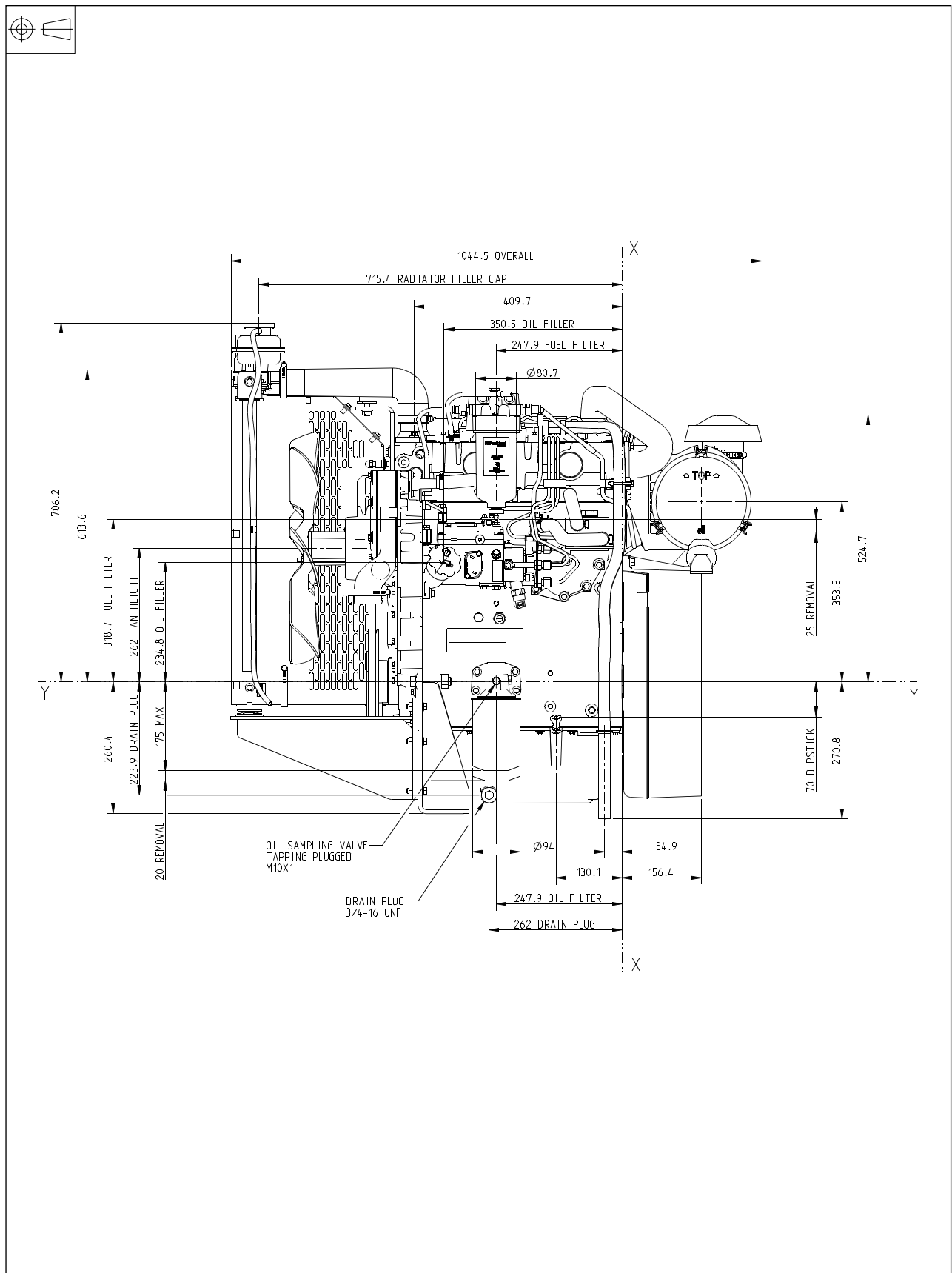
### Isochronous governing

Typical alternator inertia ..... 50 kgm<sup>2</sup>

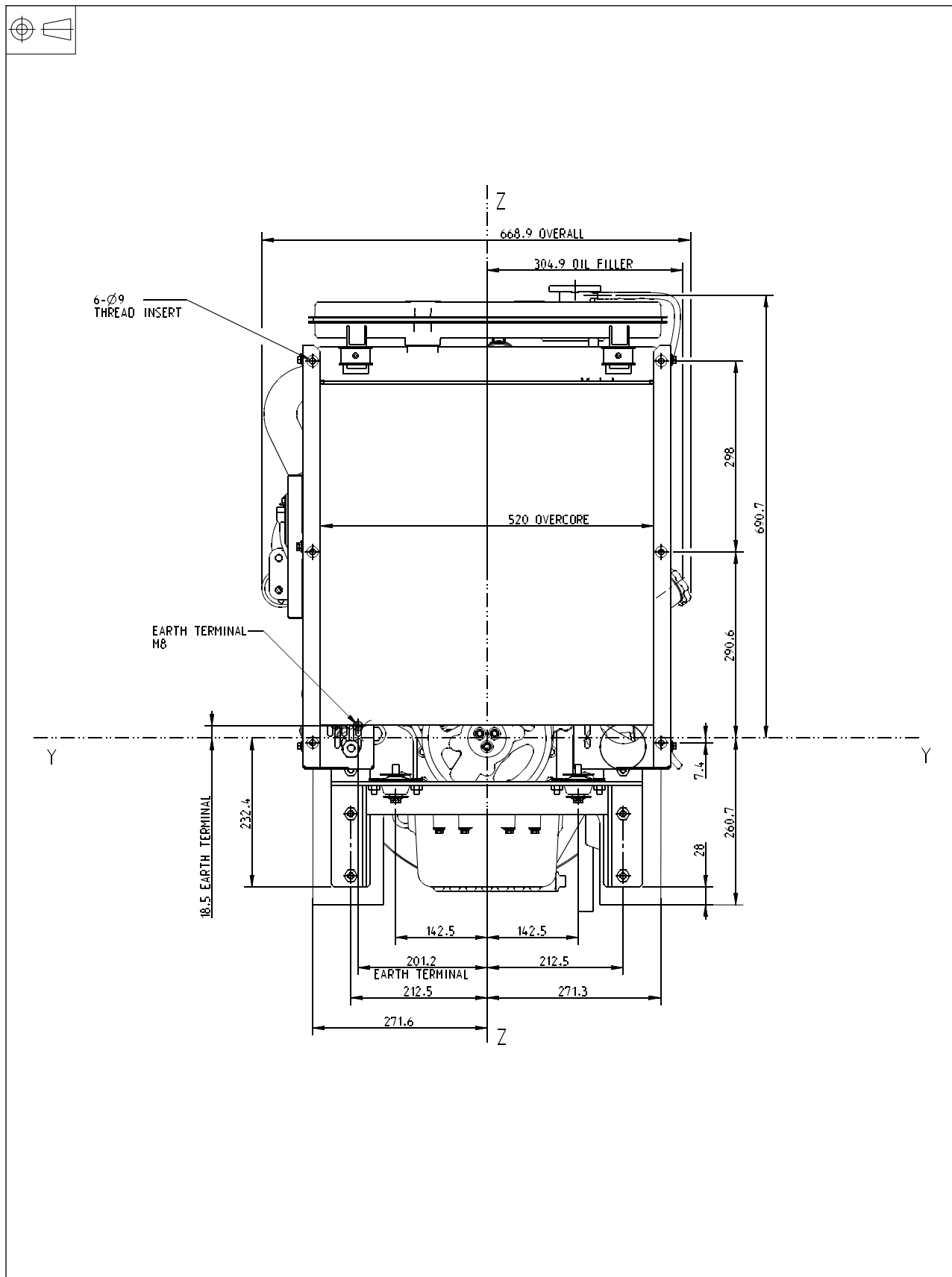
All tests were conducted using an engine installed and serviced to Perkins Engine Company Limited recommendations.

**The information given in this document is for guidance only.**

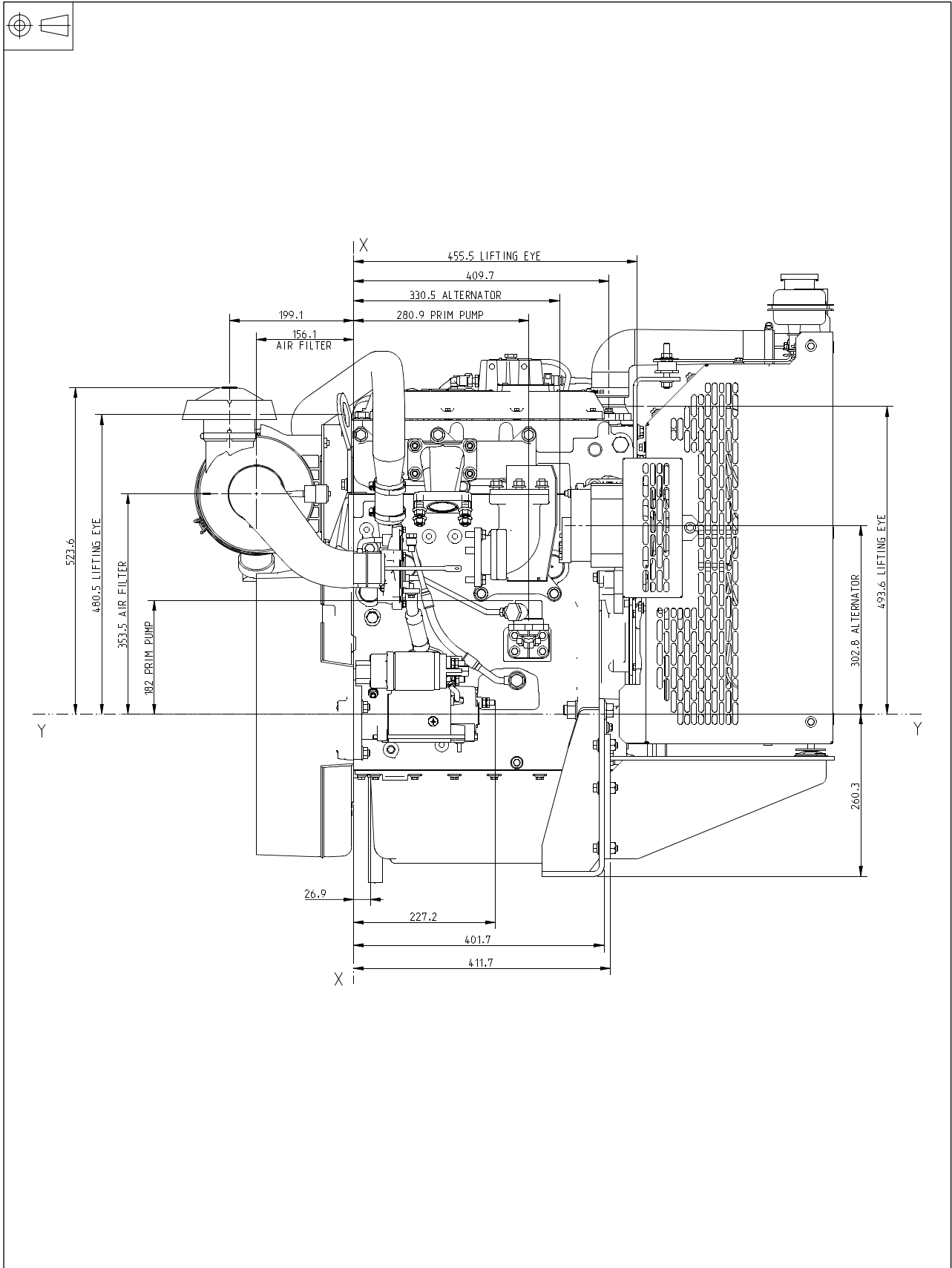
# 1104A-44TG2 - Left side view



# 1104A-44TG2 - Front side view



# 1104A-44TG2 - Right side view



# 1104A-44TG2 - Rear side view

