

Technical Data

400 Series

404C-22G

ElectropaK

G: 23,9 kWm @ 1800 rev/min

Basic technical data

Number of cylinders	4
Cylinder arrangement	Vertical in-line
Cycle	four stroke
Induction system	Naturally aspirated
Compression ratio	23,3:1
Bore	84 mm (3.3 in)
Stroke	100 mm (3.9 in)
Cubic capacity	2.216 litres (135 in ³)
Direction of rotation	clockwise viewed from front
Firing order	1, 3, 4, 2
Estimated total weight (dry)	242 kg (533 lb)
Estimated total weight (wet)	TBA kg (lb)

Overall dimensions

-height	840 mm (33.1 in)
-length	915 mm (36.1 in)
-width	477 mm (18.8 in)

Moments of inertia (GD²)

-engine	TBA kg m ²
-flywheel	2,55 kg m ²

Centre of gravity

-forward from rear of block	TBA mm (in)
-above centre line of block	TBA mm (in)
-offset to RHS of centre line	TBA mm (in)

Performance

Note: All data based on operation to ISO 14396 standard reference conditions

Speed variation at constant load	± 0,5%
Cyclic irregularity	
-at 110% stand-by power	TBA

Test conditions

-air temperature	25 °C (77 °F)
-barometric pressure	100 kPa (29.61 in hg)

Sound level

Average sound pressure level for bare engine (without inlet and exhaust) at 1 metre	79,6 dB(A)
-all ratings certified to within	± 5%

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.

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

Emissions capability

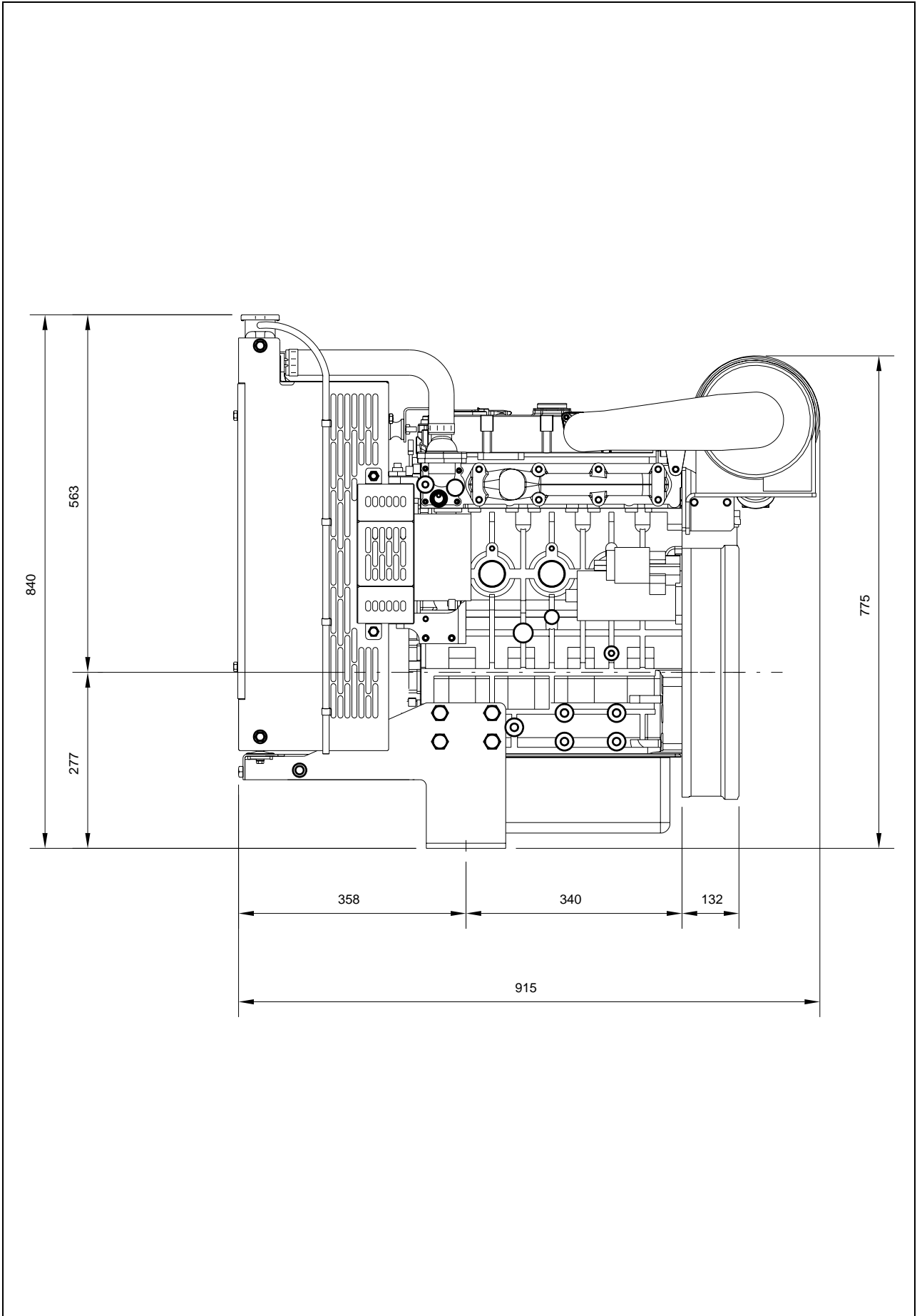
Certified against the requirements of EPA Tier 2 (EPA 40 CFR Part 89 Tier 2) legislation for non-road mobile machinery, powered by constant speed engines.

General installation - 404C-22G @ 1800 rev/min

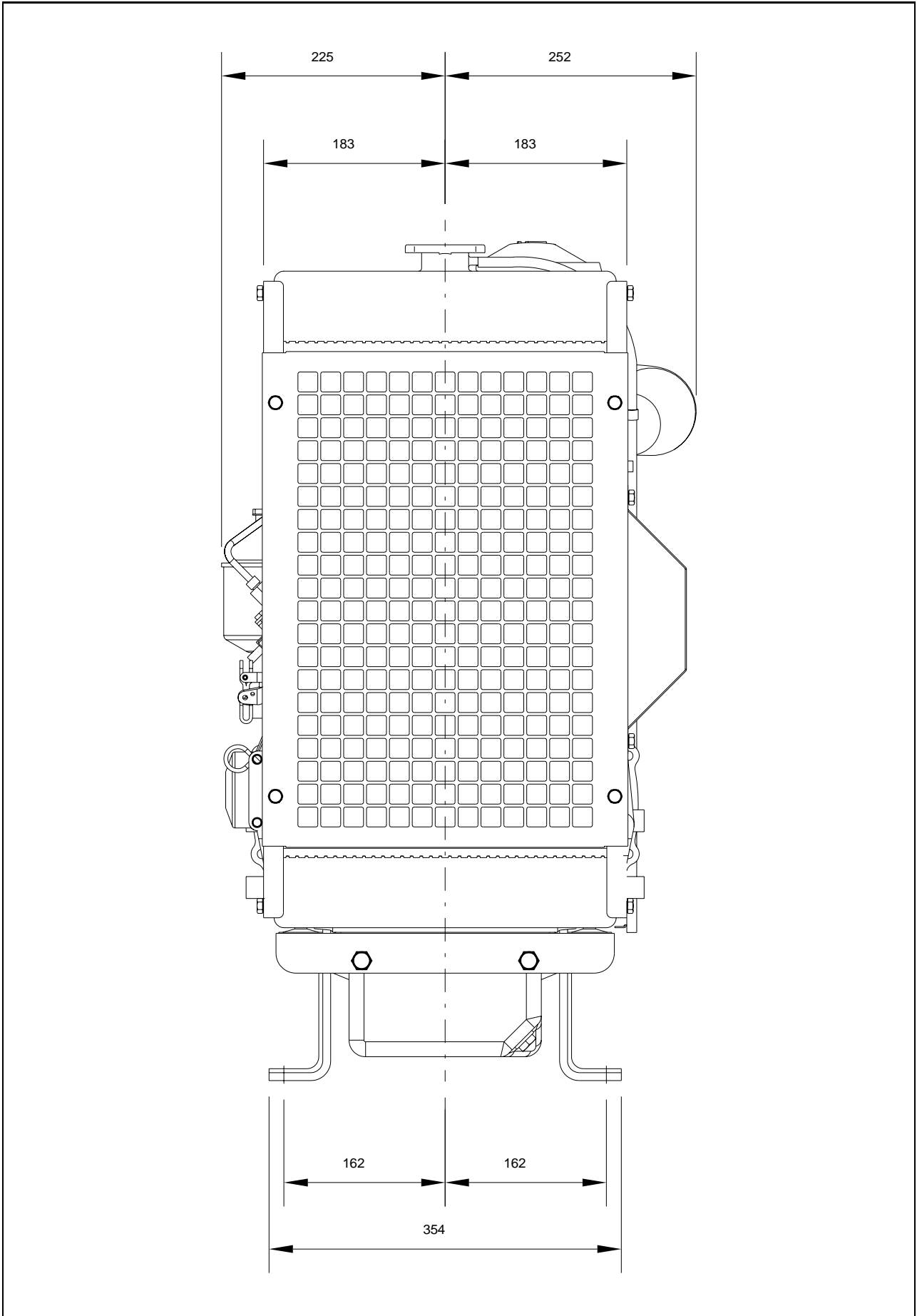
Designation	Units	Type of operation and application	
		Prime	Stand-by
		60Hz	60Hz
Gross engine power	kW (bhp)	22 (29.5)	24,3 (32.6)
Brake mean effective pressure	kPa (lbf/in ²)	657,9 (95.4)	731 (106)
Mean piston speed	m/s (ft/s)	6 (19.7)	
ElectropaK net engine power	kW (bhp)	21,6 (28.9)	23,9 (32.1)
Engine coolant flow (coolant pump ratio 1:25:1)	l/min (UK gal/min)	48,5 (10.7)	
Combustion air flow	m ³ /min (ft ³ /min)	1,74 (61.4)	
Exhaust gas flow (max)	m ³ /min (ft ³ /min)	4,34 (153)	4,76 (168.1)
Exhaust gas temperature (max)	°C (°F)	440 (824)	510 (950)
Cooling fan air flow (zero duct allowance)	m ³ /min (ft ³ /min)	47,4 (1674.0)	
Cooling fan air flow (0.125 kPa duct allowance)	m ³ /min (ft ³ /min)	39,6 (1398.0)	
Energy balance			
Energy in fuel (heat of combustion)	kW (Btu/min)	62,2 (3538)	69,5 (3952)
Gross heat to power	kW (Btu/min)	22 (1252)	24,3 (1382)
Energy to coolant and lubricating oil	kW (Btu/min)	19,9 (1132)	22,2 (1265)
Energy to exhaust	kW (Btu/min)	16,6 (944)	18,3 (1043)
Heat to radiation	kW (Btu/min)	3,8 (216)	4,6 (262)

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 (127 °F) or 46 °C (115 °F) if a canopy is fitted with an air flow restriction of up to 0,125 kPa. 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.

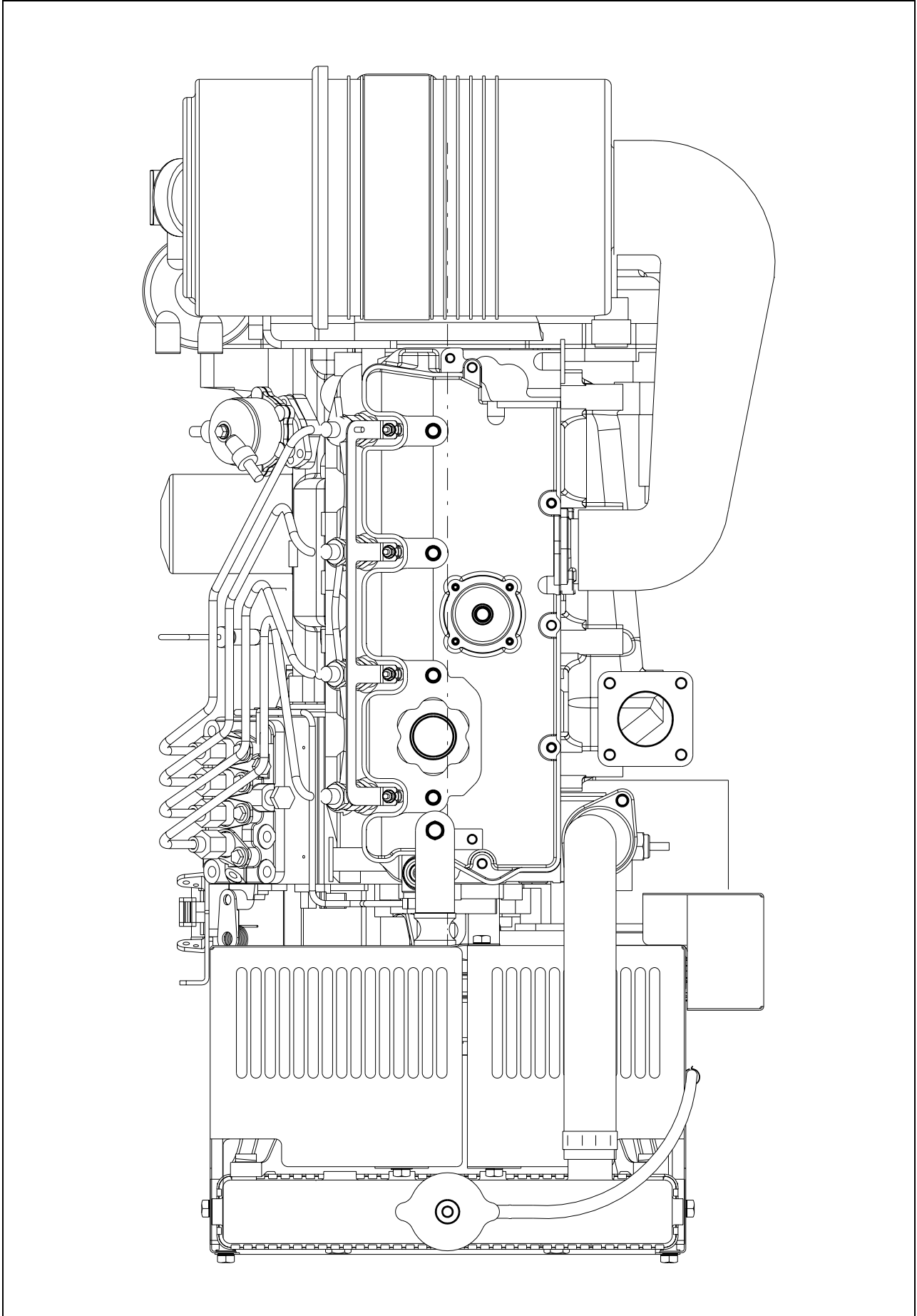
404C-22G ElectropaK, left side view



404C-22G ElectropaK, front view



404C-22G ElectropaK, plan view



Cooling system

Radiator

-face area ... 0,167 m² (1.79 ft²)
 -rows and materials ... 2 rows aluminium
 -matrix density and material ... 14.5 fins per inch, aluminium
 -width of matrix ... 334,2 mm (13.2 in)
 -height of matrix ... 500 mm (19.7 in)
 -pressure cap setting ... 90 kPa (13.05 lb/in²)
 Estimated cooling air flow reserve ... 0,125 kPa

Fan

-diameter ... 320 mm (12.6 in)
 -drive ratio ... 1,25:1
 -number of blades ... 7
 -material ... Plastic
 -type ... Pusher

Coolant

Total system capacity
 -with radiator ... 7,0 litres (12.3 UK pints)
 -without radiator ... 3,6 litres (6.3 UK pints)
 -draindown capacity ... TBA litres (UK pints)
 Maximum top tank temperature ... 110 °C (230 °F)
 Minimum temperature to engine ... TBA °C (°F)
 Temperature rise across engine ... TBA °C (°F)
 Max permissible external system resistance ... TBA kPa (lb/in²)
 Thermostat operation range ... 82 - 95 °C (180 - 203 °F)
 Recommended coolant:
 50% ethylene glycol with a corrosion inhibitor (BS 6580 :1992 or ASTM D3306-89 or AS2108) and 50% clean fresh water.

Electrical system

-alternator ... 65 amps, 12 V
 -starter motor ... 2 kW, 12 V

Cold start recommendations

Minimum cranking speed ... TBA rev/min

Minimum starting temperature		Grade of engine lubricating oil	Battery specifications			
			BS3911 Cold start amps	SAEJ537 Cold cranking amps	Number of batteries needed	Commercial ref number
0	32	20W	540	740	1	647
-15	5	10W	540	740	1	647
-20	-4	5W	600	780	1	655

Exhaust system

Maximum back pressure ... 10,2 kPa (3.012 in Hg)
 Exhaust outlet size ... 42 mm (1.65 in)

Fuel system

Type of injection ... Indirect injection
 Fuel injection pump ... Cassette type
 Fuel injector ... Pintle nozzle
 Nozzle opening pressure ... 14,7 MPa (2133 lbf/in²)

Fuel lift pump

-flow/hour ... 63 litres/hr (16.6 UK gals/hr)
 -pressure ... 10 kPa (1.45 lbf/in²)
 Maximum suction head ... 0,8 m (2.6 ft)
 Maximum static pressure head ... 3 m (9.84 ft)
 Governor type ... Mechanical

Fuel specification

Density (kg/l @ 15 °C)	0,835 - 0,855
Viscosity (mm ² /s @ 40 °C)	2,0 - 4,5
Sulphur Content	0.2% mass, maximum
Cetane Number	45 minimum

Fuel consumption

Power rating %			
g/kWh (litres/hr)			
110	100	75	50
252 (7.3)	245 (6.4)	247 (4.8)	269 (3.5)

Induction system

Maximum air intake restriction

- clean filter3,0 kPa (0.44 lbf/in²)
- dirty filter6,4 kPa (0.93 lbf/in²)
- air filter typeDry element type

Lubrication system

Lubricating oil capacity

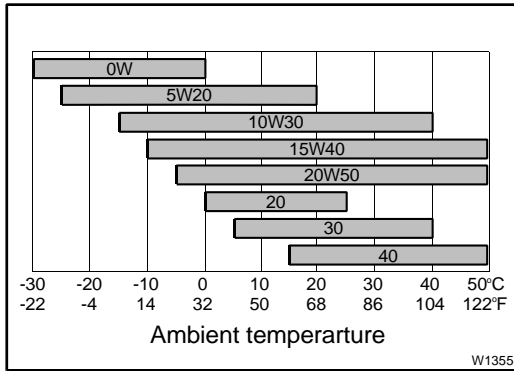
- Total system... ..10,6 litres (18.6 UK pints)
- Minimum... .. 8,9 litres (15.6 UK pints)
- Maximum engine operating angles
- front up, front down, right side or left side... .. 35° continuous

Lubricating oil pressure

- relief valve opens 352 - 448 kPa (51.1 - 64.9 lbf/in²)
- at maximum no-load speed. TBA
- Normal oil temperature. 125 °C (257 °F)

Recommended SAE viscosity

A single or multigrade oil must be used which conforms API-CH-4 or ACEA E5.



Maximum static bending moment

at rear face of block.. ... TBA Nm (lb ft)



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