Basic technical data

- Number of cylinders: 4
- 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, 3, 4, 2
- Total weight (engine only):
  - Dry: 463 kg
  - Wet: 485 kg

Overall dimensions

- Height: 951 mm (37.44 in)
- Length: 1241 mm (48.85 in)
- Width (including mounting brackets): 629 mm (24.76 in)

Moment of inertia (mk²)

- Engine:
  - Longitudinal: 34.5 kgm²
  - Horizontal: 48.8 kgm²
  - Axial: 25.1 kgm²
- Flywheel (polar): 1.14 kgm²

Centre of gravity (wet)

- Forward from rear of block: 270 mm (10.62 in)
- Above centre line of block: 151 mm (5.94 in)
- Offset of RHS of centre line: 13 mm (0.51 in)

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):
- At 1500 rev/min: 91.4 dBA
- At 1800 rev/min: 91.9 dBA

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

<table>
<thead>
<tr>
<th>Designation</th>
<th>Units</th>
<th>Type of Operation and Application</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prime</td>
<td>Stand-by</td>
</tr>
<tr>
<td></td>
<td>50 Hz</td>
<td>50 Hz</td>
</tr>
<tr>
<td>Gross engine power</td>
<td>kWm</td>
<td></td>
</tr>
<tr>
<td>Brake mean effective pressure</td>
<td>kPa (lbf/in²)</td>
<td></td>
</tr>
<tr>
<td>Mean piston speed</td>
<td>m/s (ft/s)</td>
<td></td>
</tr>
<tr>
<td>ElectropaK net engine power</td>
<td>kWm</td>
<td></td>
</tr>
<tr>
<td>Engine coolant flow 35 kPa restriction</td>
<td>l/min (UK gal/min)</td>
<td></td>
</tr>
<tr>
<td>Combustion air flow</td>
<td>m³/min (ft³/min)</td>
<td></td>
</tr>
<tr>
<td>Exhaust gas flow (max)</td>
<td>m³/min (ft³/min)</td>
<td></td>
</tr>
<tr>
<td>Exhaust gas temperature (max) in manifold</td>
<td>°C (°F)</td>
<td></td>
</tr>
<tr>
<td>Cooling fan air flow</td>
<td>m³/min (ft³/min)</td>
<td></td>
</tr>
<tr>
<td>Overall thermal efficiency</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Typical genset electrical unit (0.8 pf 25° C)</td>
<td>kWe</td>
<td></td>
</tr>
<tr>
<td>Assumed alternator efficiency</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td><strong>Energy balance</strong></td>
<td>kWe</td>
<td></td>
</tr>
<tr>
<td>Power in fuel (Fuel heat of combustion)</td>
<td>kW (Btu/min)</td>
<td></td>
</tr>
<tr>
<td>Power output (gross)</td>
<td>kW (Btu/min)</td>
<td></td>
</tr>
<tr>
<td>Power to cooling fan</td>
<td>kW (Btu/min)</td>
<td></td>
</tr>
<tr>
<td>Power output (net)</td>
<td>kW (Btu/min)</td>
<td></td>
</tr>
<tr>
<td>Power to coolant and lubricating oil</td>
<td>kW (Btu/min)</td>
<td></td>
</tr>
<tr>
<td>Power to exhaust</td>
<td>kW (Btu/min)</td>
<td></td>
</tr>
<tr>
<td>Power to radiation</td>
<td>kW (Btu/min)</td>
<td></td>
</tr>
</tbody>
</table>

**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 (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.

[Go to Barrington Diesel Club website](https://barringtondieselclub.co.za/)
Cooling system
Radiator
- face area ........................................ 0.276 m² (2.97 ft²)
- rows and materials ................................ double row aluminium
- matrix density and material ................................ Aluminium 12.5 fins/inch
- width of matrix .................................... 526 mm (20.7 in)
- height of matrix .................................... 524 mm (20.6 in)
- pressure cap setting .................................. 107 kPa
Fan
- diameter ........................................ 457 mm (18.0 in)
- drive ratio ........................................ 1.25 : 1
- number of blades .................................... 7
- material ............................................. Composite
- type .............................................. Pusher
Coolant
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)
Recommneded 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
Alternator output .................................... 65 amps
Startegy motor voltage ................................ 12 V
Startegy 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 V
- pull in current .................................... 10 amps
- hold in current .................................... 10 amps
Cold start recommendations
Minimum cranking speed ......................... 105 rev/min

Starter specification
<table>
<thead>
<tr>
<th>Starter motor type</th>
<th>Minimum starting temperature</th>
<th>Lubricating oil viscosity SAE</th>
<th>battery type</th>
<th>values in CCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 volt 3.0 kW</td>
<td>-10 (14) °C (-14 °F)</td>
<td>15W/40</td>
<td>10W/40</td>
<td>5W/40</td>
</tr>
<tr>
<td></td>
<td>-15 (5) °C (-15 °F)</td>
<td></td>
<td>1 x 900</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-20 (-4) °C (-20 °F)</td>
<td></td>
<td>1 x 900</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-25 (-13) °C (-25 °F)</td>
<td></td>
<td>2 x 570</td>
<td></td>
</tr>
</tbody>
</table>

* - Glow plug start aid fitted.

Note: CCA - Cold Cracking Amps to SAEJ537.

Notes:
- Battery capacity is defined by the 20 hour rate
- 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.
- 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 rev/min .................................. 10 kPa
- 1800 rev/min .................................. 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 ........................... 29.0 MPa (290 bar)

Fuel lift pump
Type .............................................. Electrical
-flow/hour ........................................ 120 - 150 l/h (211 - 264 pt/m)
-pressure ........................................... 30 - 75 kPa (4.4 - 10.9 psi)
Maximum suction head ............................. 20 kPa (2.90 psi)

Governor type
Electronic governor ................................... Woodward LCS2
Electronic governor speed control to ........... ISO 8528, G3 (Hot)
Mechanical governor speed control to ......... ISO 8528, G2 (Cold)

Fuel specification
<table>
<thead>
<tr>
<th>Fuel Specification</th>
<th>European RF75-T-96 / DIN EN990 / BS2869 class A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (kg/l @ 15 °C)</td>
<td>0.835 - 0.845</td>
</tr>
<tr>
<td>Viscosity (mm²/s @ 40 °C)</td>
<td>2.5 - 3.5</td>
</tr>
<tr>
<td>Sulphur content (%)</td>
<td>0.1 - 0.2</td>
</tr>
<tr>
<td>Cetane number</td>
<td>45 - 50</td>
</tr>
</tbody>
</table>

Fuel consumption litres/hour (UK gals/hr)
<table>
<thead>
<tr>
<th>1104A-44TG1 Power rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
</tr>
<tr>
<td>1500</td>
</tr>
<tr>
<td>1800</td>
</tr>
</tbody>
</table>

Induction system
Maximum air intake restriction
- clean filter ...................................... 5.0 kPa
- dirty filter ...................................... 8.0 kPa
- air filter type ................................... Dry

Lubrication system
Lubricating oil capacity
Total system ....................................... 8.0 l (16.9 pt)
Sump minimum ...................................... 5.5 l (11.6 pt)
Sump maximum ...................................... 7.0 l (14.7 pt)
Maximum engine operating angles:
- front up, front down, right side or left side 25°

Lubrication 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%
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

<table>
<thead>
<tr>
<th>Prime Power</th>
<th>1500 rev/min</th>
<th>1800 rev/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>kWm (kWe)</td>
<td>59.6 (51.8)</td>
<td>70.3 (60.5)</td>
</tr>
</tbody>
</table>

Transmit frequency deviation % <-10% <-10%
Frequency recover seconds < 1 < 1

Engine block temperature .. ... ... ... ... ... ... ... ... ... ... ... .. 15 °C
Alternator ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... .. 89%
Maximum ambient temperature .... ... ... ... ... ... ... ... ... ... ... ... .. 15%
Isochronous governing:
- typical alternator inertia ... ... ... ... ... ... ... ... ... ... ... .. 0.498 kgm²

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

The information given in this document is for guidance only.