403A-15G2

15.1 kWm (Gross) @ 1500 rpm

ElectropaK

400 Series

Basic technical data

Number of cylinders	3
Cylinder arrangement	Vertical inline
Cycle	4 stroke
Induction system	Naturally aspirated
Compression ratio	22.5:1
Bore	84 mm
Stroke	90 mm
Displacement	1.496 litres
Direction of rotation when viewed from flywheel	Anticlockwise
Firing order	1, 2, 3

Weight of of ElectropaK

Dry (estimated)	197 kg

Overall dimensions of ElectropaK

Height	793 mm
Length	820 mm
Width	469 mm

Centre of gravity

Forward from rear of block	139 mm
Above centre line of block	67 mm

Moments of inertia

Engine rotational components	0.45 kgm²
Flywheel	2.01 kgm²

Cyclic irregularity for engine standby power

At 110%	TBA

Ratings

Steady state speed stability at constant load	± 0.75%

Performance

Average sound pressure level for bare engine (without inlet and exhaust) at 1 metre	76.7 dB(A)

Note: All data based on operation to ISO 3046/1:2002 standard reference conditions.

Note: For engines operating in ambient conditions other than the standard reference conditions stated below, a suitable derate must be applied

Note: Derate tables for increased ambient temperature and/or altitude are available, please contact Perkins Applications Department.

Test conditions

Air temperature	25°C
Barometric pressure	100 kPa
Relative humidity	31.5%
Air inlet restriction at maximum power (nominal)	3 kPa
Exhaust back pressure at maximum power (nominal)	10.2 kPa
Fuel temperature (inlet pump)	40°C
All ratings certified to within	± 5%

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.

Publication No. TPD1800E5, September 2016.

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General installation

Designation	Units	Type of operation and application	
		Prime power (50 Hz)	Standby power (50 Hz)
Gross engine power	kWb	13.7	15.1
Gross BMEP	kPa	734	808
Mean piston speed	m/s	4.5	
ElectropaK nett engine power	kW	13.5	14.9
Engine coolant flow against 35 kPa restriction	litres/min	40.3	
Combustion air flow	m³/min	1.0	TBA
Exhaust gas flow (maximum) at atmospheric pressure	m³/min	2.2	TBA
Exhaust gas temperature (maximum)	°C	470	580
Overall thermal efficiency	%	33.35	33.42
Typical Genset electrical output (0.8pf 25°C)	kWe	11.75	12.93
	kVa	14.69	16.16
Assumed alternator efficiency	%	87	

Rating definitions

Prime power

Variable load. Unlimited hours usage with an average load factor of 80% of the published prime power over each 24 hour period. A 10% overload is available for 1 hour in every 12 hour operation.

Standby power

Limited to 500 hours annual usage with an average load factor of 80% of the published standby power rating over each 24 hour period. Up to 300 hours of annual usage may be run continuously. No overload is permitted on standby power.

Energy balance

Designation	Units	Type of operation and application	
		Prime power (50 Hz)	Standby power (50 Hz)
Energy in fuel	kWt	40.8	45.0
Energy in power output (gross)	kWb	13.7	15.1
Energy to cooling fan	kWm	0.2	
Energy in power output (nett)	kWm	13.5	14.9
Energy to exhaust	kWt	10.5	11.5
Energy to coolant and oil	kWt	13.1	14.4
Energy to radiation	kWt	3.6	3.9

Note: Not to be used for combined heat and power (CHP) purposes (indicative figures only). If necessary, consult Perkins Engines Company Limited.

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Cooling system

Recommended coolant: 50% anti freeze/50% water.

For details of recommended coolant specifications, please refer to the Operation and Maintenance Manual (OMM) for this engine model.

Total coolant capacity

ElectropaK (with radiator) ... 6 litres
ElectropaK (without radiator) . 2.6 litres
Maximum top tank temperature . 112°C
Maximum static pressure head on pump.. 30.4 kPa
Temperature rise across engine. 5.1°C
Maximum permissible external system resistance. TBA kPa
Thermostat operation range .. 82 - 95°C

Radiator

Radiator face area .. 0.167 m²
Material and number of rows.. Aluminium, 2 rows
Material and fins per inch ... Aluminium, 4.5 fins/inch
Width of matrix.. 334.2 mm
Height of matrix. 500 mm
Pressure cap setting ... 90 kPa
Estimated cooling air flow reserve. 0.125 kPa

Fan

Type. ... Pusher
Diameter. 320 mm
Number of blades.. 6
Material... Plastic
Drive ratio .. 1.25:1

Duct allowance - Maximum additional restriction to cooling airflow and resultant minimum airflow		
Ambient clearance 50% Glycol	Duct allowance (Pa)	m³/sec
53°C	45	41.4
46°C	83	41.4

Fuel system

Type of injection ... Indirect injection
Fuel injection pump.. Cassette type
Fuel injector ... Pintle nozzle
Nozzle opening pressure ... 14.7 MPa
Maximum particle size . 25 microns

Fuel lift pump

Type. ... Mechanical (camshaft driven)
Flow/hour .. 63 litres/hour
Pressure . 10 kPa
Maximum suction head .. 0.8 metres
Maximum static pressure head .. 3 metres
Maximum fuel temperature at lift pump inlet ... 40°C
Maximum fuel filter service interval ... 1000 hours
Governor type .. Mechanical
Speed control conforms to .. G2

Fuel specification

USA Fed Off Highway .. EPA2D 89.330-96
Europe Off Highway. . CEC RF-06-99

Note: For further information on fuel specifications and restrictions, refer to the OMM fuels section for this engine model.

Fuel consumption

Power rating %	14.6 kW/1500 rpm	
	g/kWh	litres/hour
25	355	1.47
50	271	2.24
75	251	3.11
100	260	4.30
110	277	5.04

Cold start recommendations

Minimum cranking speed @ 1500 rpm

Minimum starting temp	Grade of engine lubricating oil	Battery specifications			
		BS3911 Cold start amps	SAEJ537 Cold cranking amps	Number of batteries required	Commercial ref number
0°C	20W	420	590	1	72
-15°C	10W	420	590	1	72
-20°C	5W	540	740	1	647

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Lubrication system

Total system capacity

Maximum sump capacity ... 6 litres
Minimum sump capacity . ... 4.5 litres
Maximum oil temperature (continous operation) ... .125°C
Maximum oil temperature (intermittent operation).. ... .135°C

Lubricating oil pressure

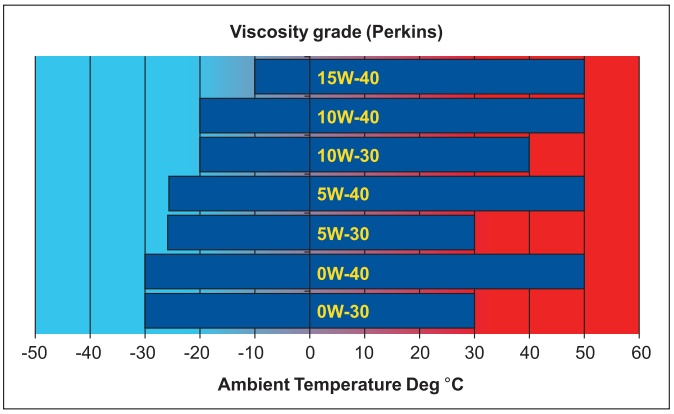
Relief valve opens. ... 262 - 359 kPa
Minimum oil pressure... ..120 kPa
At maximum no-load speed ... . TBA
Oil flow at rated speed.. ... 10.9 litres/min

Maximum engine operating angles

Front up, front down, right side or left side ... . 35° continuous

Recommended SAE viscosity

A single or multigrade oil conforming to API-CH-4 or ACEA E5 must be used.



Induction system

Maximum air intake restriction of engine

Clean filter.. ...3.0 kPa
Dirty filter. ...6.4 kPa
Air filter type ... Dry element type

Exhaust system

Exhaust outlet size ... 42 mm
Maximum back pressure. ... ... 10.2 kPa

Electrical system

Alternator ... . 15 amps, 12 volts
Starter motor.. ... 2 kW, 12 volts

Engine mounting

Maximum static bending moment at rear face of block.. ... 990 Nm

Load acceptance

The figures below comply with the requirements of classification 3 and 4 of ISO 8528-12 and G2 operating limits stated in ISO 8528-5.

Initial load application: When engine reaches rated speed (15 seconds maximum after engine starts to crank)	
Descriptor	**50 Hz**
% of Prime power	60%
Transient frequency deviation	10%
Frequency recovery	5 seconds

The figures shown in the table above were obtained under the following test conditions:

Engine block temperature ... TBA°C
Ambient temperature ... ..25 °C
Governing mode 5%
Alternator inertia ... .. TBA kgm²
Under frequency roll off (UFRO) point set to ... .. . 2% volt/1% frequency
UFRO rate set to ... ..1 Hz below rated speed
LAM on/off . ... Off

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

Derate curves

Derate curves for altitude and humidity can be found in Chapter 6 of the 400 Series Engine Specification Manual.
The general arrangement drawings shown in this data sheet are for guidance only. The latest versions should be requested from the Perkins Applications Department.

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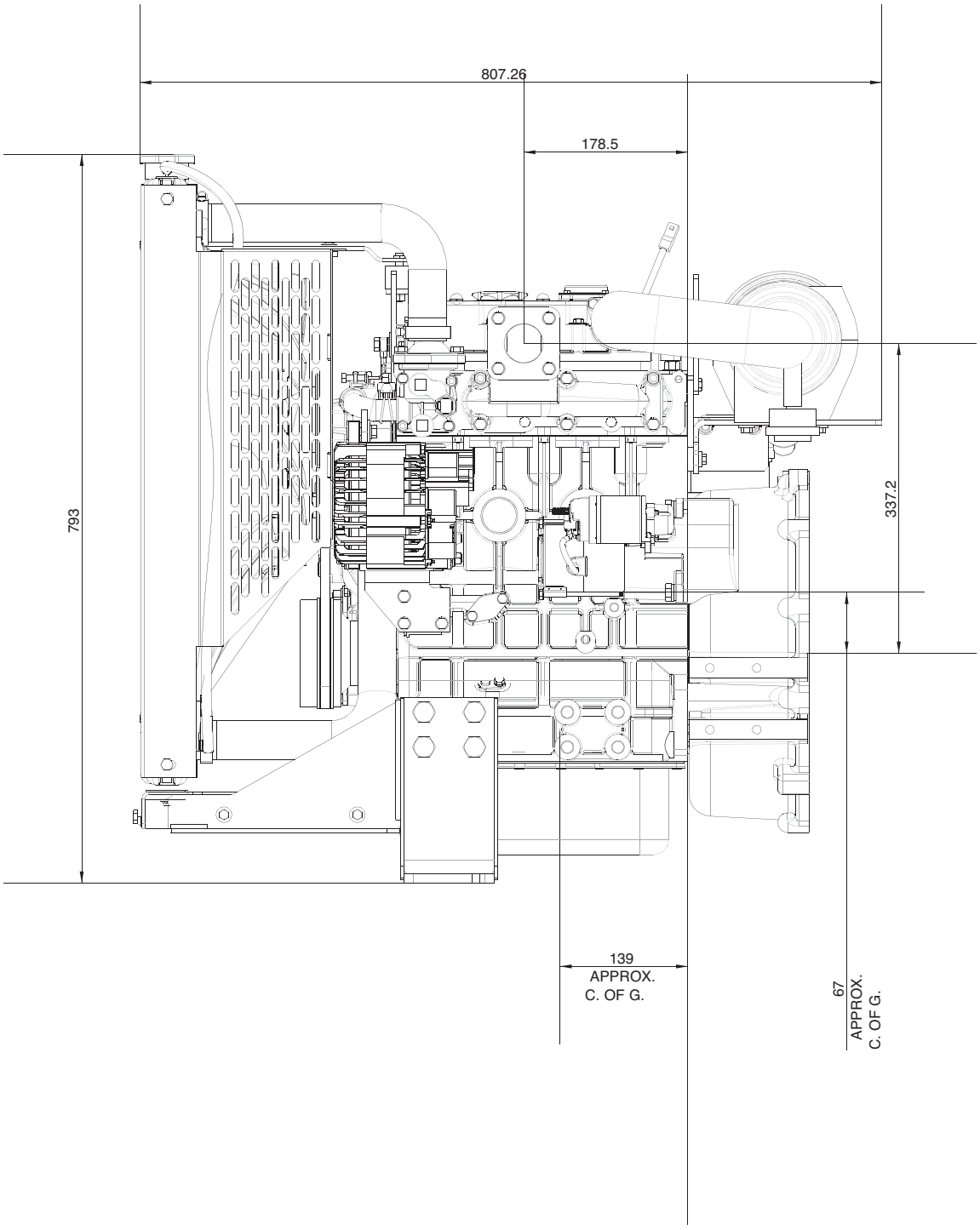
403A-15G2 - Left side view



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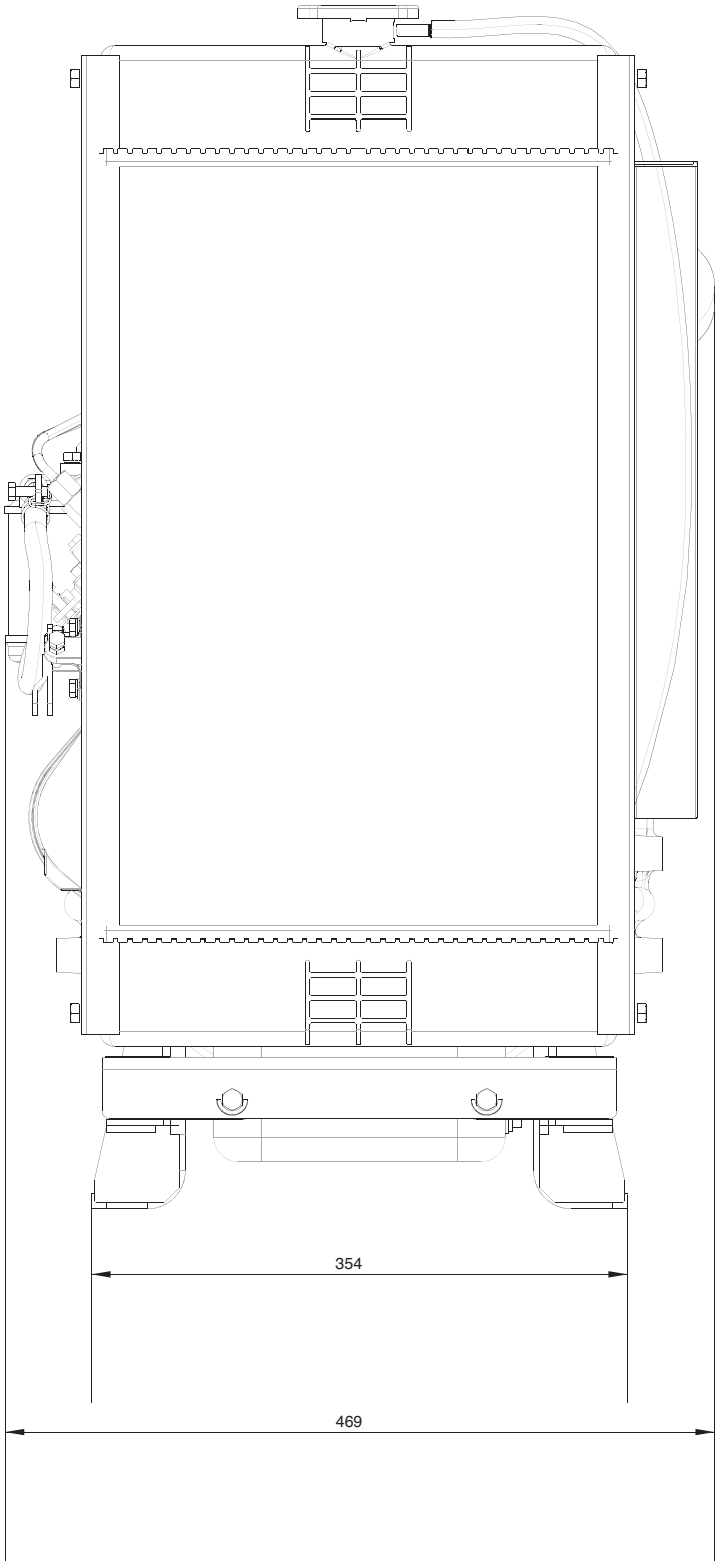
403A-15G2 - Front view



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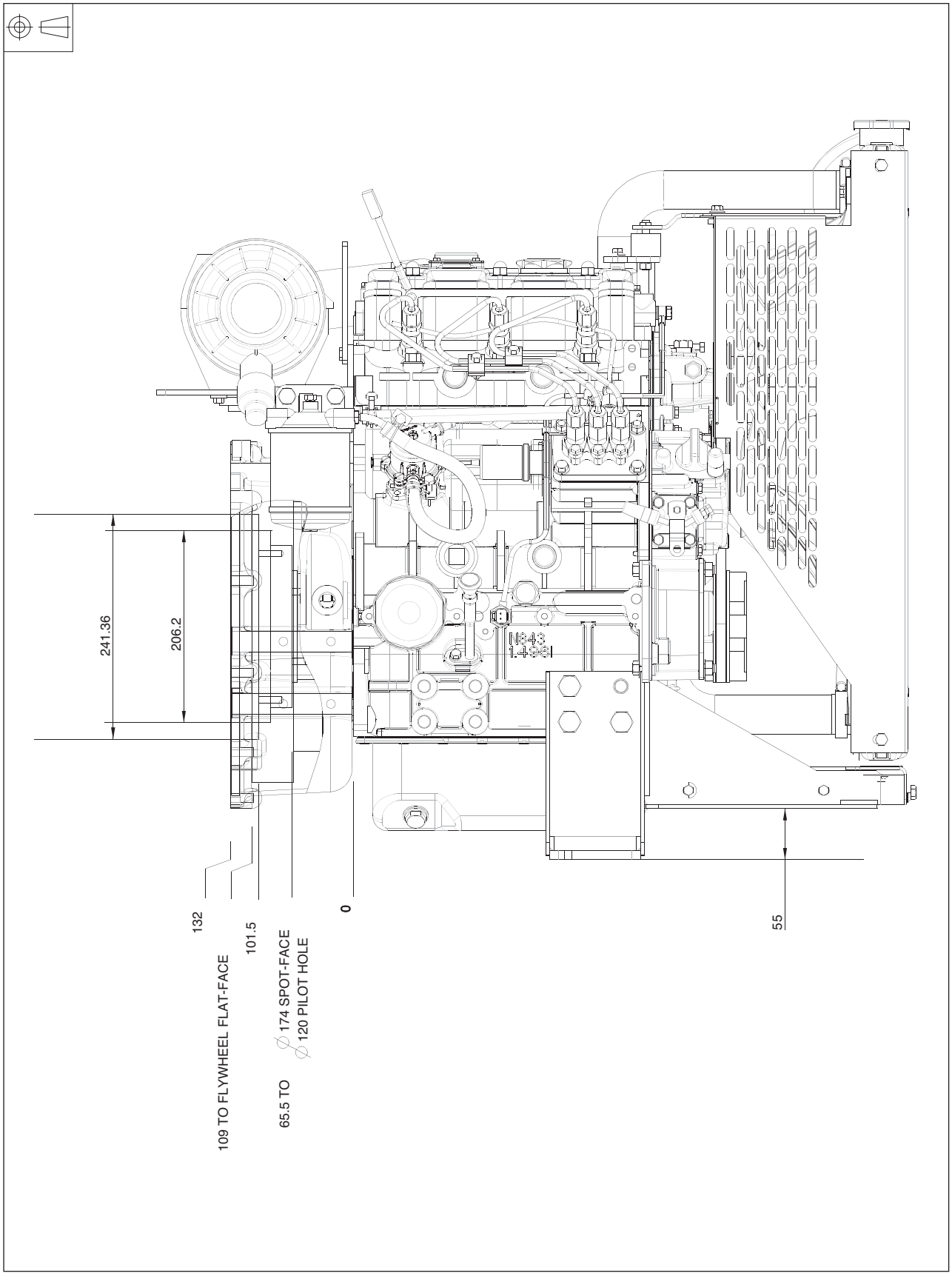
403A-15G2 - Right side view



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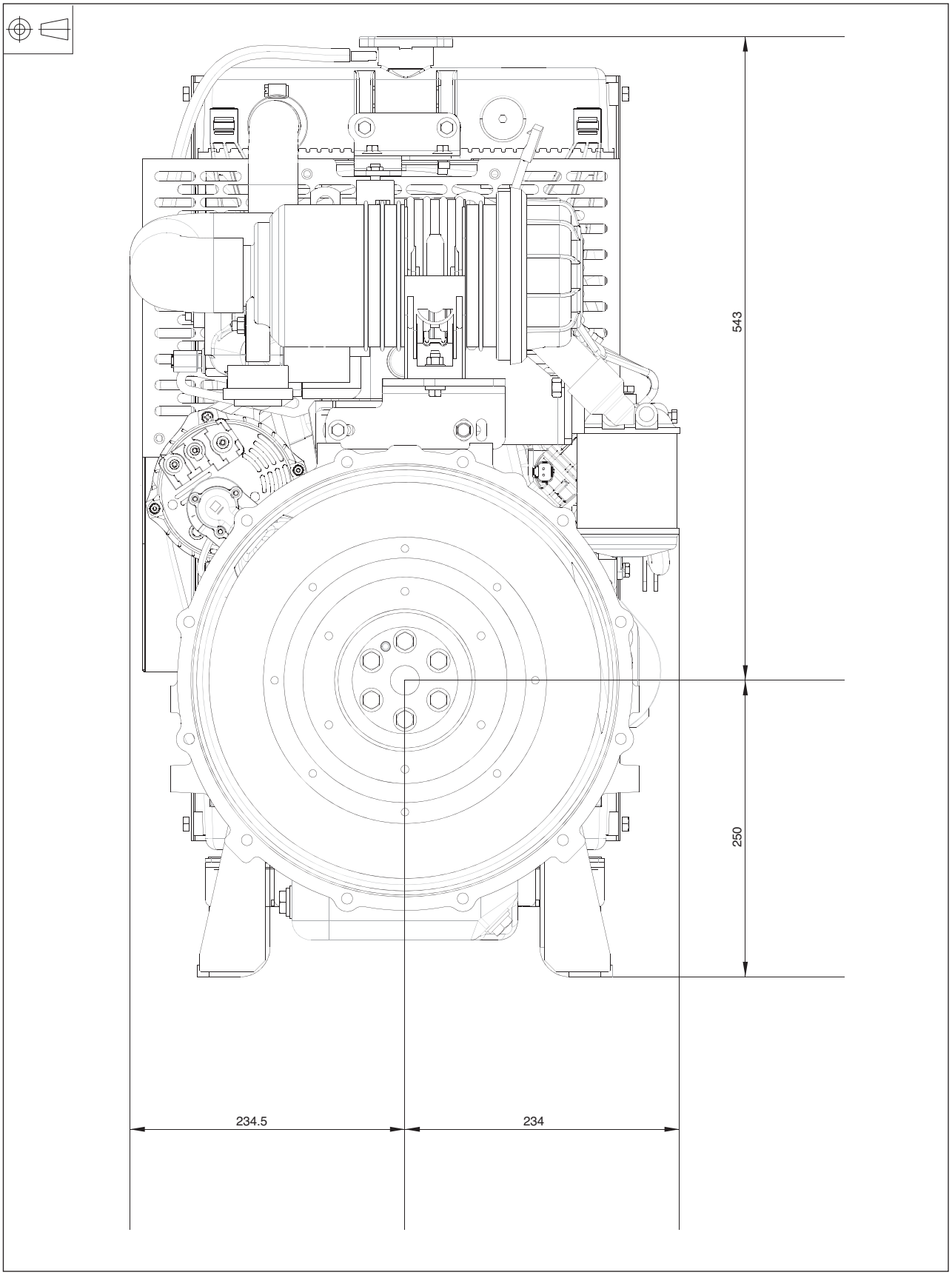
403A-15G2 - Rear view



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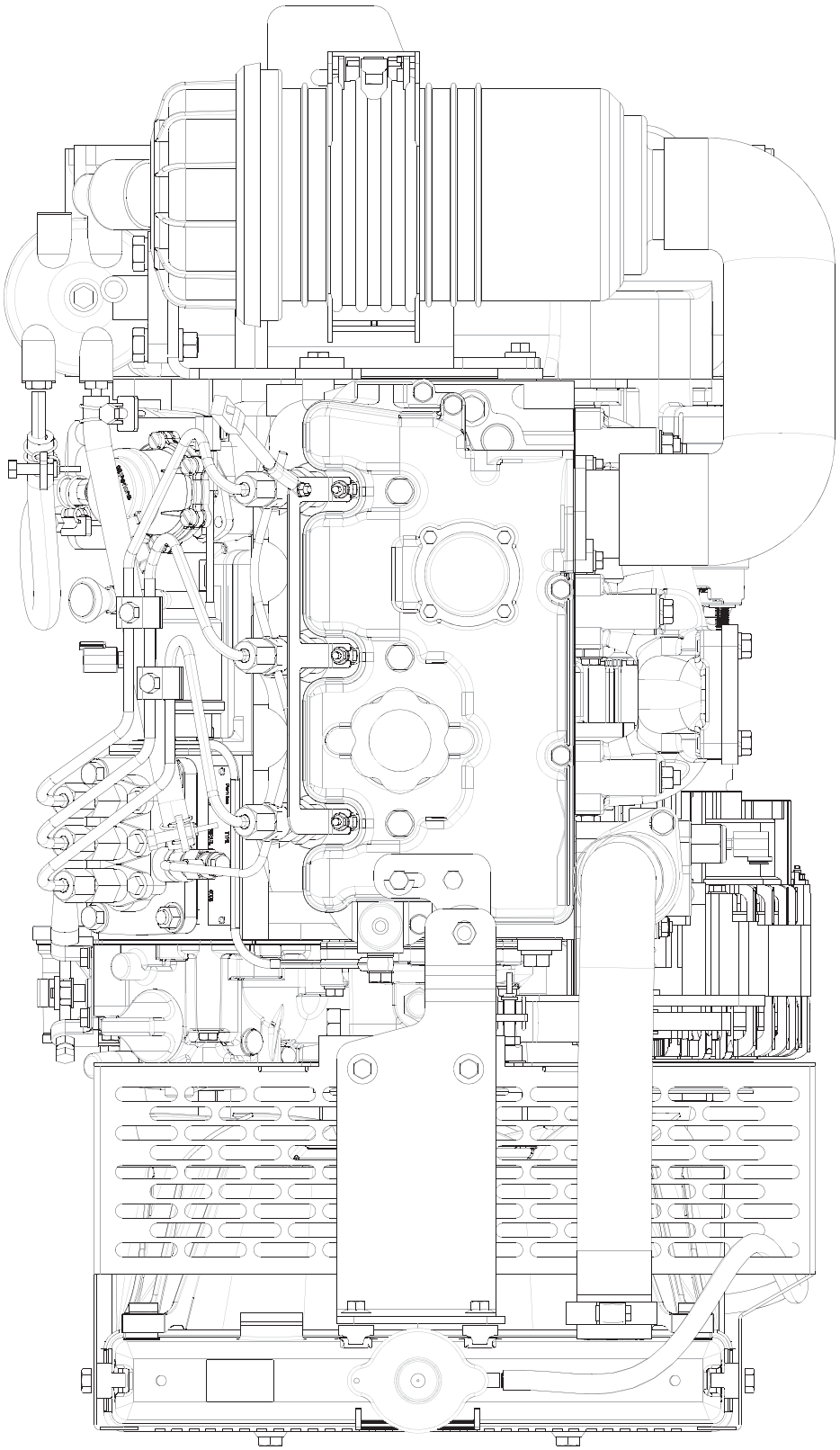
403A-15G2 - Plan view



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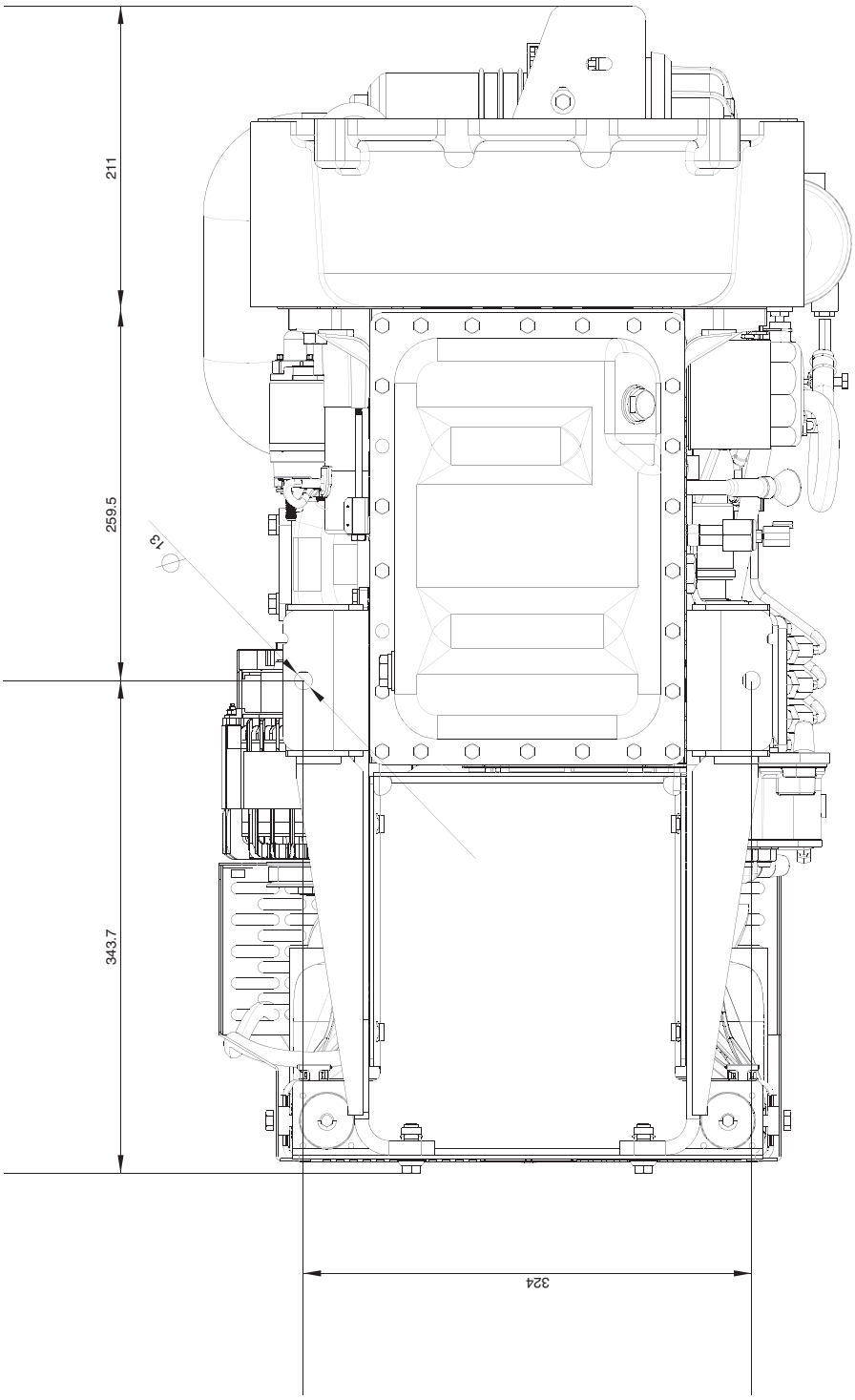
403A-15G2 - Underside view



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