

403A-15G2

18kW (Gross) @ 1800 rpm

Electropak

400

Series

Basic technical data

Number of cylinders	3
Cylinder arrangement	Vertical in-line
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 Electropak

Dry (estimated)	197 kg
Wet (estimated)	215 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 kgm ²
Flywheel	2.01 kgm ²

Cyclic irregularity for engine standby power

At 110%	TBA
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Ratings

Steady state speed stability at constant load	± 0.75%
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Performance

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

General installation, 403A-15G2 ElectropaK @ 1800 rpm

Designation	Units	Type of operation and application	
		Prime power (60Hz)	Standby power (60Hz)
Gross engine power	kWb	16.33	17.96
Gross BMEP	kPa	728	800
Mean piston speed	m/s	5.4	
ElectropaK nett engine power	kW	16.1	17.77
Engine coolant flow against 35 kPa restriction	litres/min	55.2	
Combustion air flow	m³/min	1.2	TBA
Exhaust gas flow (max.) at atmospheric pressure	m³/min	2.6	TBA
Exhaust gas temperature (max.)	°C	480	590
Overall thermal efficiency	%	33.04	33.10
Typical Generator sets electrical output (0.8pf 25°C)	kWe	14.01	15.62
	kVA	17.51	19.52
Assumed alternator efficiency	%	87	

Energy balance

Designation	Units	Type of operation and application	
		Prime power (60Hz)	Standby power (60Hz)
Energy in fuel	kWt	48.73	53.56
Energy in power output (gross)	kWb	16.33	17.96
Energy to cooling fan	kWm	0.23	
Energy in power output (nett)	kWm	16.1	17.73
Energy to exhaust	kWt	15.6	17.2
Energy to coolant and oil	kWt	12.5	13.7
Energy to radiation	kWt	4.1	4.7

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)	6.0 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 m ²
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
Airflow at rated speed	49 m ³ /min

Duct allowance - Maximum additional restriction to cooling airflow and resultant minimum airflow		
Ambient clearance 50% Glycol	Duct allowance (Pa)	m ³ /sec
53°C	65	48.6
46°C	125	48.6

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/hr
Pressure	10 kPa
Maximum suction head	0.8 m
Maximum static pressure head	3.0 m
Maximum fuel temperature at lift pump inlet	40°C
Maximum fuel filter service interval	1000 hrs
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 %	18 kW/1800 rpm	
	g/kWh	litres/hr
25	375	1.55
50	272	2.25
75	250	3.10
100	261	4.32
110	282	5.12

Cold start recommendations

Minimum cranking speed @ 1800 rpm

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

Lubrication system

Total system capacity

Maximum sump capacity 6.0 litres
Minimum sump capacity 4.5 litres
Maximum oil temperature (continuous operation)..... 125°C
Maximum oil temperature (intermittent operation)..... 135°C

Lubricating oil pressure

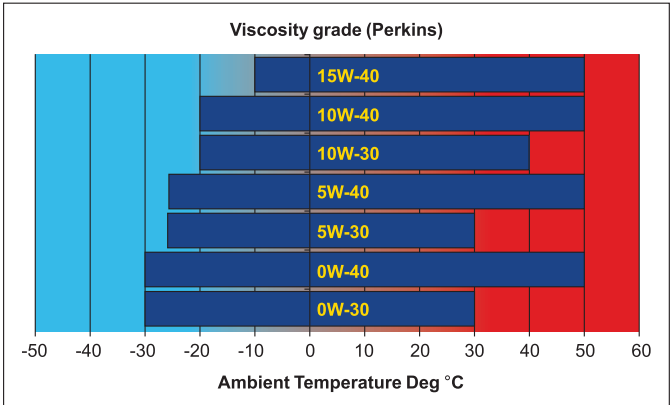
Relief valve opens..... 262 - 359 kPa
Minimum oil pressure..... 120 kPa
At maximum no-load speed TBA
Oil flow at rated speed..... 10.9 litres/min

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
Number of teeth on flywheel 109
Number of teeth on starter pinion..... 9
Engine stop method Solenoid

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	60 Hz
% of Prime power	60%
Transient frequency deviation	10%
Frequency recovery	5 seconds

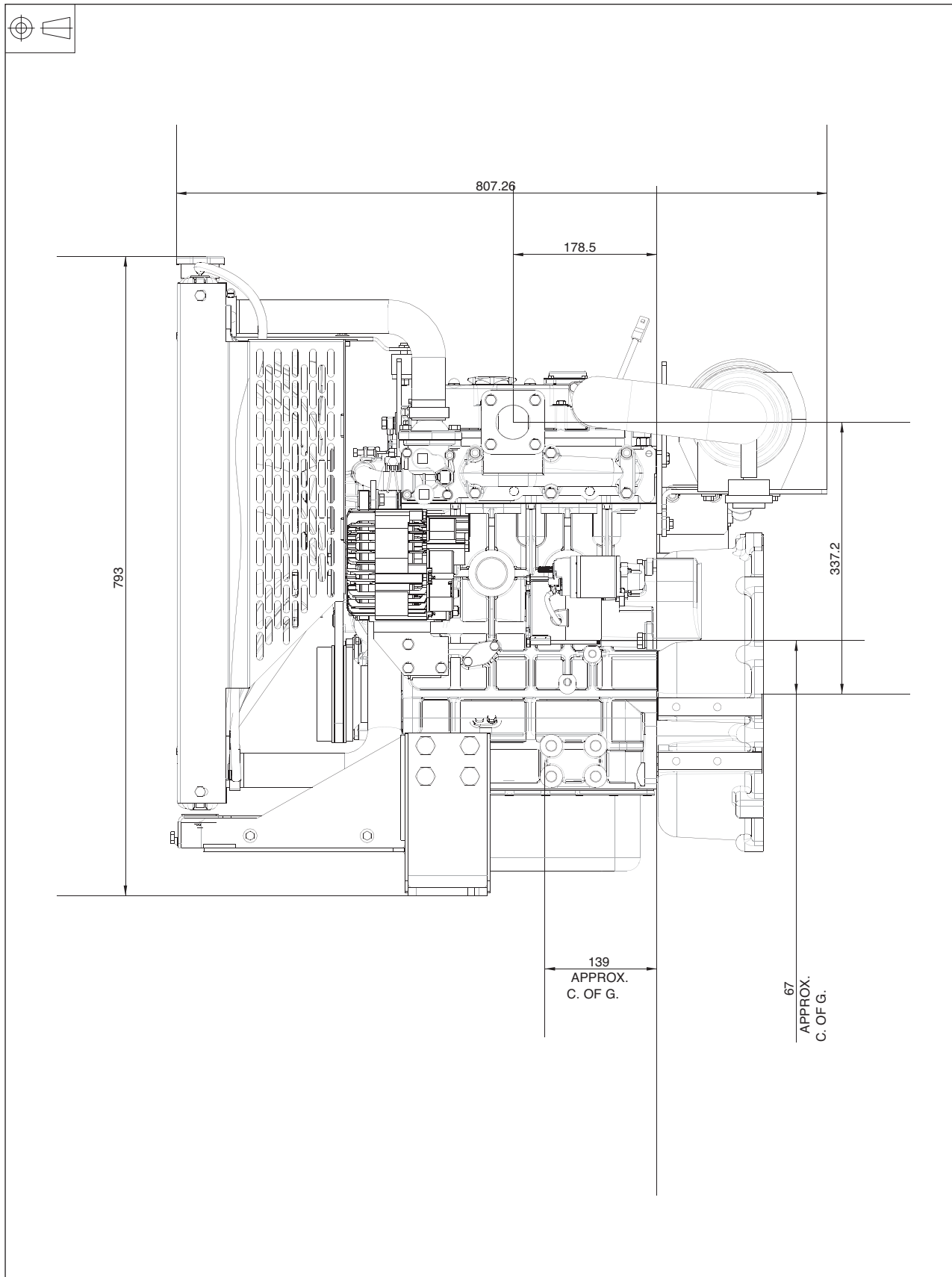
The figures shown in the table above were obtained under the following test conditions:

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.

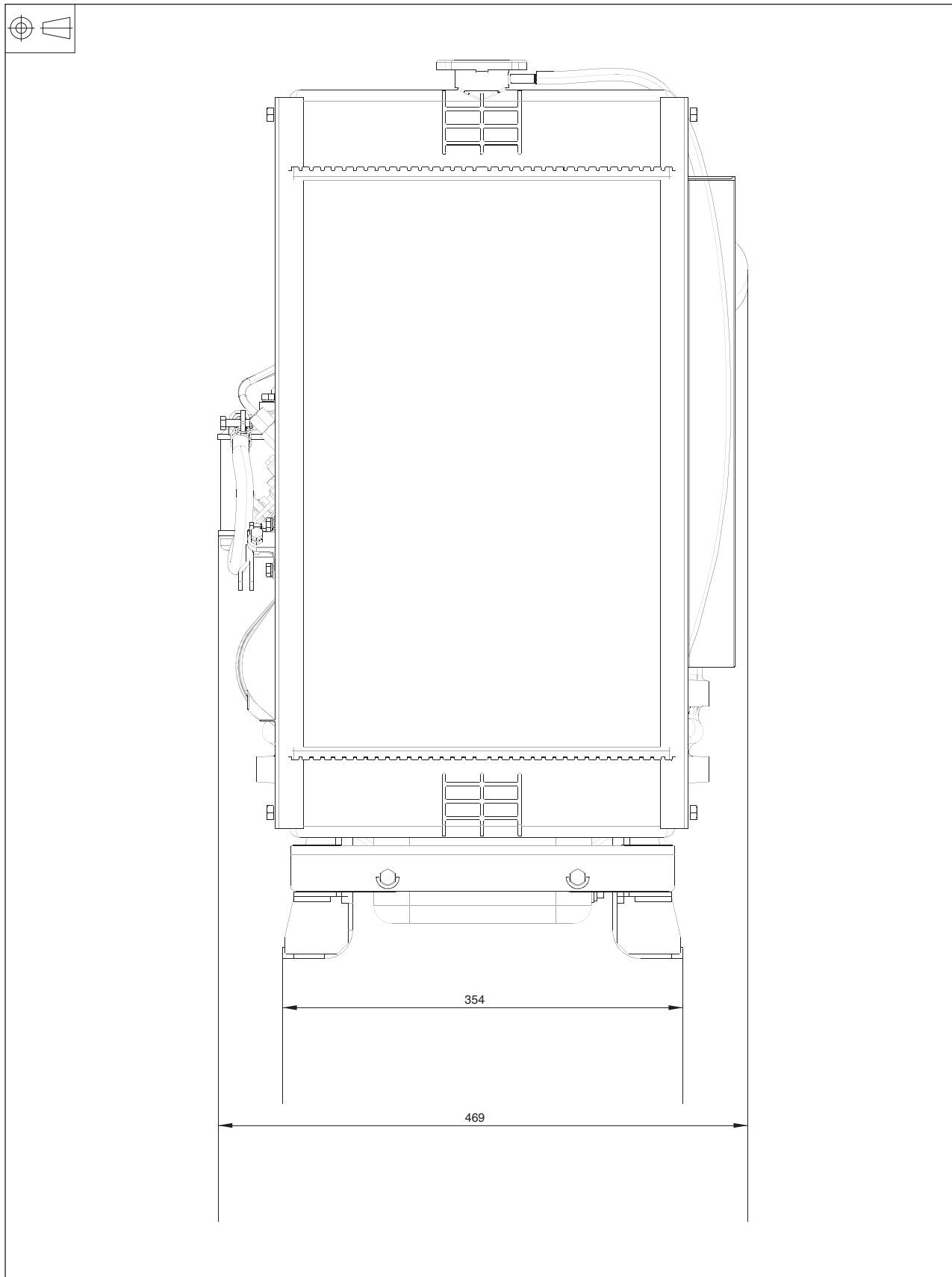
Derate curves

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.

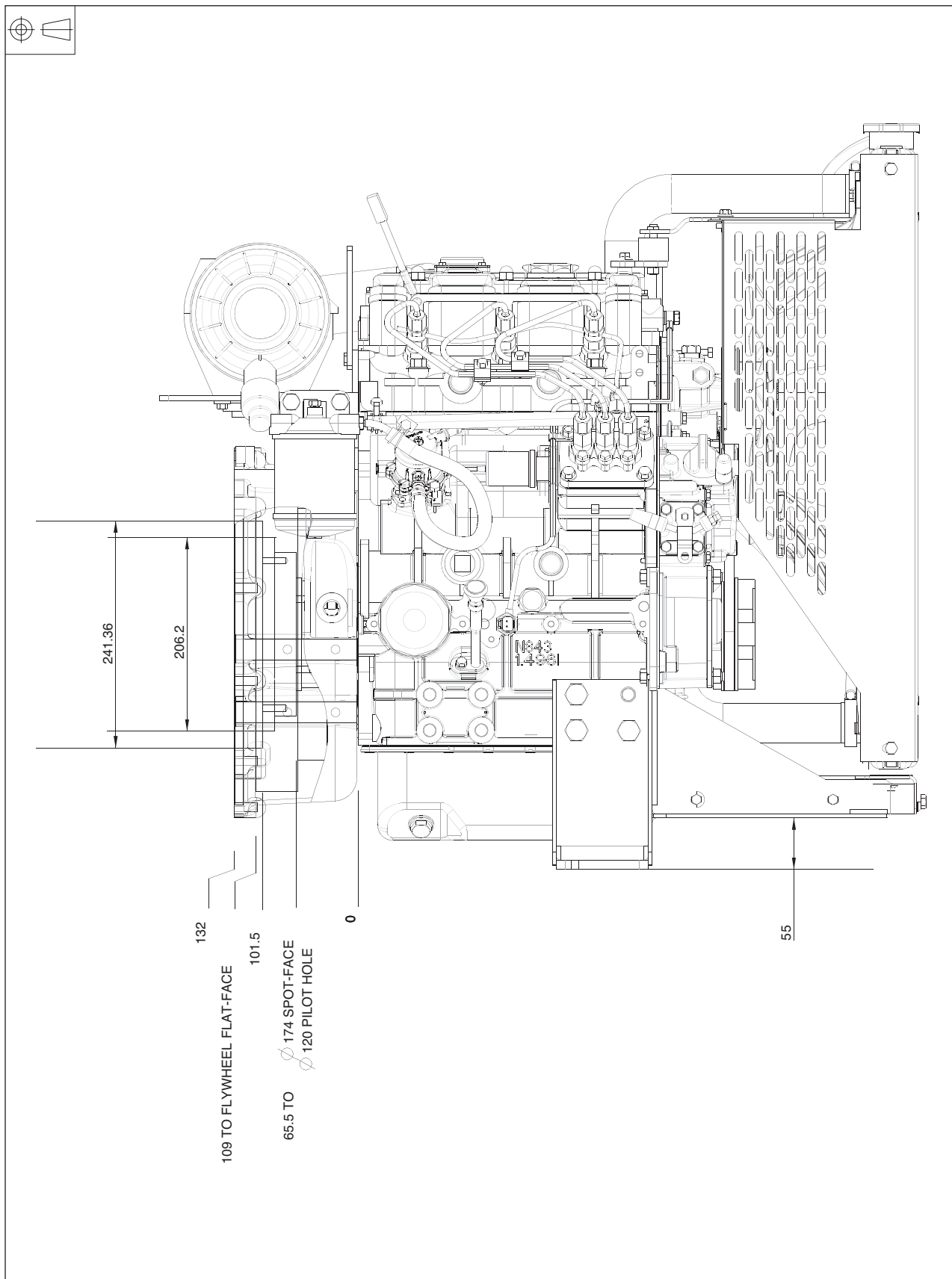
403A-15G2 - Left side view



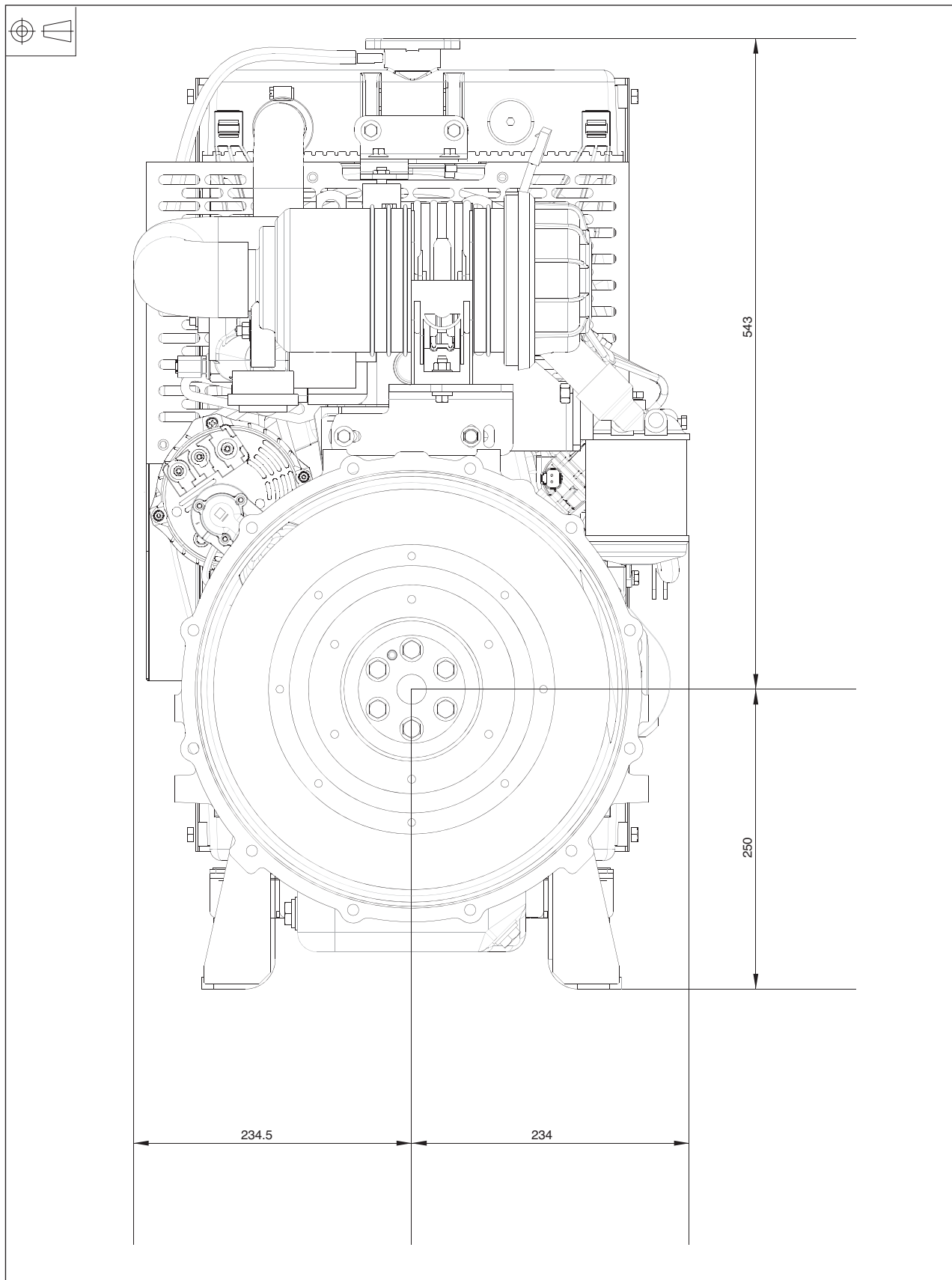
403A-15G2 - Front view



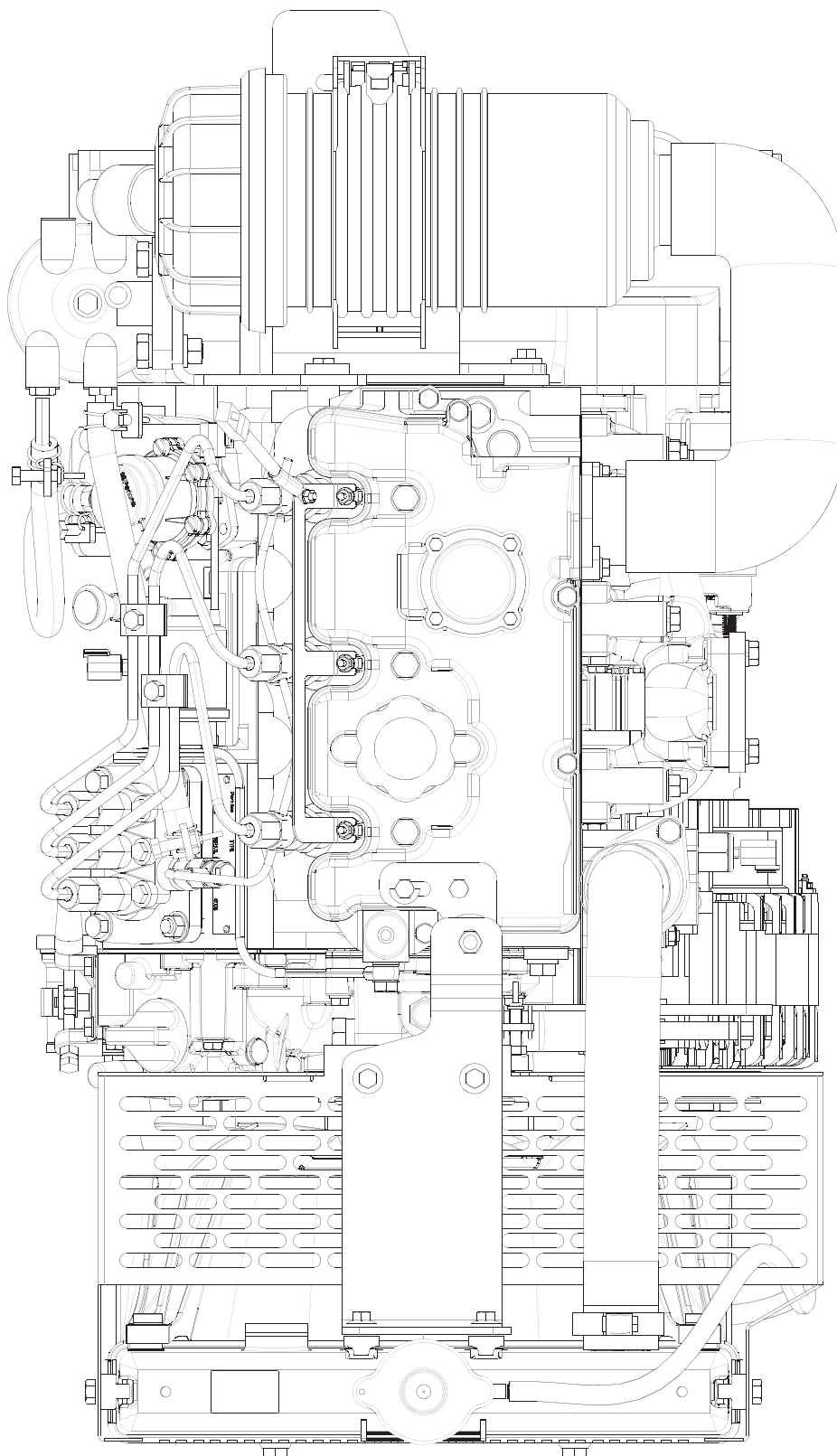
403A-15G2 - Right side view



403A-15G2 - Rear view



403A-15G2 - Plan view



403A-15G2 - Underside view

