2506D-E15TAG2

497 kWm (gross) @ 1500 rpm

2500 Series

India CPCBII ElectropaK

Basic technical data

Number of cylinders	6
Cylinder arrangement	Vertical inline
Cycle	4 stroke
Induction system	Turbocharged, air-to-air chargecooling
Combustion system	Direct injection
Compression ratio	17:1
Bore	137 mm
Stroke	171 mm
Cubic capacity	15.2 litres
Direction of rotation	Anti clockwise when viewed from flywheel
Firing order (number 1 cylinder furthest from flywheel)	1, 5, 3, 6, 2, 4
Estimated total weight (dry)	1799 kg
Estimated total weight (wet)	1880 kg

Overall dimensions, ElectropaK

Height	1718 mm
Length (air cleaner fitted)	2657 mm
Width	1120 mm

Moments of inertia (mk²)

Engine	2.3291 kgm²
Flywheel	1.96355 kgm²

Centre of gravity (bare dry engine)

Forward from rear of block	570 mm
Above crankshaft centre line	240 mm

Cyclic irregularity

Engine/flywheel maximum .. 1:60

Performance

Note: All data based on operation to ISO 3046/1, BS5514 and DIN 6271 standard reference conditions.

Ratings

Electrical ratings are based on average alternator efficiency and are for guidance only (0.8 power factor being used).

Steady state stability at constant speed ... ± 0.25%

Sound level

Estimated sound pressure at 1 metre ... 107.5 dB(A)

Operating point

Engine speed	1500 rpm
Cooling water maximum exit temperature	< 107°C

Test conditions

Air temperature	25°C
Barometric pressure	100 kPa
Relative humidity	30%
Air inlet restriction at maximum power (nominal)	2.5 kPa
Exhaust back pressure at maximum power (nominal)	6.0 kPa
Fuel temperature (inlet pump)	40°C

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.

For test conditions relevant to data on load acceptance, refer to page 4.

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General installation

Designation	Units	Type of operation and application	
		50 Hz @ 1500 rpm	
		Prime power	Standby
Gross engine power	kWb	453	497
Fan power	kWm	10	
Restriction losses	kWm	8.2	8.6
ElectropaK nett engine power	kWm	435	478
Gross brake mean effective pressure	kPa	2396	2628
Combustion air flow	kg/s	0.68	0.71
Exhaust gas temperature after turbo (maximum)	°C	n/a	420
Exhaust gas flow	kg/s	0.72	0.75
Boost pressure ratio		3.73	3.92
Overall thermal efficiency (nett)	%	39	
Mean piston speed	m/s	8.6	
Engine coolant flow	l/sec	350	
Cooling fan air flow (zero duct allowance)	m³/min	624	
Typical generator set electrical output (0.8pf)	kWe	400	440
	kVA	500	550
Assumed alternator efficiency	%	92	

Rating definitions

Prime power

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

Standby power

Variable load. Limited to 500 hours annual usage up to 300 hours of which may be continuous running. No overload is permitted.

Emissions capability

- India CPCB II certified
- Certified against the requirements of EU2011 Stage 3A legislation for non-road mobile machinery, powered by constant speed engines.

Energy balance

Designation	Units	Type of operation and application	
		50 Hz @ 1500 rpm	
		Prime power	Standby
Energy in fuel	kWt	1106	1201
Energy in power output (gross)	kWb	453	497
Energy to cooling fan and restrictions	kWm	18.2	18.2
Energy in power output (nett)	kWm	435	478
Energy to exhaust	kWt	323	344
Energy to coolant and oil	kWt	170	185
Energy to chargecooler	kWt	135	140
Energy to radiation	kWt	25	35

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Cooling system

Recommended coolant

50% inhibited ethylene glycol or 50% inhibited propylene glycol and 50% clean fresh water. Where there is no likelihood of ambient temperatures below 10°C, clean soft water may be used, treated with 1% by volume of Perkins inhibitor in the cooling system.
The inhibitor is available from all Perkins Distributors

Total system coolant capacity ... 48.0 litres
Maximum pressure in crankcase water jacket ... 276 kPa
Maximum top tank temperature ... 107°C
Maximum static pressure on pump ... 170 kPa
Maximum permissible restriction to coolant pump flow ... 30 kPa

Temperature rise across engine with inhibited coolant
Standby power ... 10°C
Prime power ... 9°C
Thermostat operation range ... 88 to 98°C

Radiator

Face area ... 0.819 m²
Weight (dry) ... 158 kg
Number of rows and materials ... 2 rows, Aluminium
Matrix density and material ... 15 fins per inch, Aluminium
Width of matrix ... 694.6 mm
Height of matrix ... 1180 mm
Pressure cap setting (minimum) ... 70 kPa

Chargecooler with integral radiator

Face area ... 0.630 m²
Number of rows and materials ... 2 row, Aluminium
Matrix density and material ... 10 fins per inch, Aluminium
Width of matrix ... 580.6 mm
Height of matrix ... 1085 mm

Coolant pump

Speed @ 1500 rpm ... 1622 rpm
Drive method ... Gear

Fan

Diameter ... 927 mm
Drive ratio ... 0.92:1
Number of blades ... 9
Material ... B3WG6 or PA6GF30 nylon 6 glass filled 30%
Type ... ACS 367500

Exhaust system

Maximum back pressure - 1500rpm ... 10 kPa
Exhaust outlet, internal diameter ... 118 mm

Recommended exhaust pipe diameter

Length	mm
up to 10 m	150
10 m to 20 m	150
20 m to 30 m	200

Cooling clearance

Ambient cooling clearance (standby power) based on air temperature at fan of 7°C above the ambient

2506D-E15TAG2 maximum additional restriction (duct allowance) to cooling airflow and resultant minimum airflow			
Duct allowance with 50% glycol at 50°C			
Description	**rpm**	**Units**	**Standby**
Duct allowance	1500	KPa	0.125
Minimum airflow	1500	m³/min	555
Duct allowance with 50% glycol at 42°C			
Duct allowance	1500	KPa	0.2
Minimum airflow	1500	m³/min	151

Electrical system

Type ... 12 volts negative earth
Alternator type ... 22 SI
Alternator voltage ... 24 volts
Alternator output ... 70 amps
Starter motor type ... 42 MT
Starter motor voltage ... 24 volts
Starter motor power ... 7.5 kW
Number of teeth on the flywheel ... 113
Number of teeth on starter pinion ... 11
Minimum cranking speed ... 100 rpm
Starter solenoid maximum (1)
Pull-in current @ -25°C ... 57 amps
Hold-in current @ -25°C ... 16 amps

1. All leads to rated at 10 amps minimum.

Cold start recommendations

Temperature range	5 to -10°C	-11 to -25°C
SAE grade Oil	15W40	0W40
Starter	42MT	
Battery	2x 12V 128 Ah	
Maximum breakaway current	1250 amps	
Cranking current	676 amps	880 amps
Starting Aids (ECM controlled)	None	Block heater 1.5 kW
Minimum mean cranking speed	120 rpm	

Notes:

- battery capacity is defined by the 20 hour rate
- the oil specification should be for the minimum ambient temperature as the oil will not be warmed by the immersion heater
- 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.

Mountings

Maximum static bending moment at rear face of block ... 1356 Nm

Engine management system

Full electronic engine management system controlling:

- speed governing
- air/fuel ratio
- start/stop sequence
- engine protection and diagnostics

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Fuel system

Injection system ... MEUI
Injector type ... MEUI
Injector pressure ... 200 MPa

Fuel data

To conform to ... BS2869 class A2 or BS EN590

Fuel lift pump

Type ... gear driven
Delivery flow ... 413 litres/hour
Pressure ... 550 kPa
Maximum suction head at pump inlet ... 3 m
Maximum static pressure head ... 4 m
Fuel inlet temperature to be less than ... 55°C
Governor type ... electronic
Governing to ... ISO 8528-5 class G3 steady state

Fuel filtration level

Primary ... 10 µm
Secondary ... 2 µm

Fuel consumption

Designation	Fuel consumption calculated on nett rated powers	
	1500 rpm	
	g/kWh	litres/hour
Standby	211	117
Prime	209	106
75% Prime power	216	82
50% Prime power	230	58

Induction system

Maximum air intake restriction

Clean filter ... 3.7 kPa
Dirty filter ... 6.2 kPa
Air filter type ... Paper element - 457 mm diameter

Lubrication system

The recommended SAE viscosity is a multigrade oil (15W40) which adequately meets the specifications of API CI4

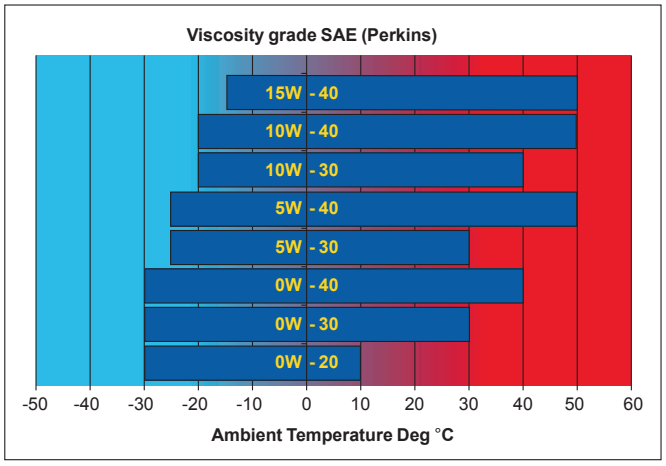
Total system capacity ... 62.0 litres
Maximum sump capacity ... 53.0 litres
Minimum sump capacity ... 45.0 litres
Lubricating oil pressure, at rated speed ... 420 kPa
Nominal (minimum) ... 200 kPa
Oil relief valve opens ... 620 kPa
Oil filter screen spacing ... 30 µm
Sump drain plug tapping size ... M24
Oil pump speed and drive method ... 1.16 x engine speed, gear
Oil flow ... 2.9 litres/second
Oil consumption at full load rated speed (as a percentage of fuel consumption) ... 0.1%
Oil temperature (in rail) maximum continuous operation ... 114°C

Normal operating angles

Front and rear ... 7°
Side tilt ... 7°

Recommended SAE viscosity

A single or multigrade oil must be used which conforms to API CI4 or ACEA E5.



Typical load acceptance

The below figures were obtained under test conditions as follows:

Engine block temperature ... 45°C
Ambient temperature ... 15°C
Governing mode ... Isochronous
Alternator inertia ... 8.14 kgm²
Under frequency roll off (UFRO) point set to ... 1 Hz below rated frequency
UFRO rate set to ... 2% voltage/1% frequency
LAM on/off ... off
Assumed alternator efficiency ... 95%

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

Initial Load Acceptance when engine reaches rated speed (15 seconds maximum after engine starts to crank)		
Description	Units	1500 rpm
% of Prime power	%	55
Load (nett)	kWm	220
Transient frequency deviation	%	≤10
Frequency recovery time	Seconds	5

2nd Load Application immediately after engine has recovered to rated speed (5 seconds after initial load application)		
Description	Units	1500 rpm
% of Prime power	%	45
Load (nett)	kWm	180
Transient frequency deviation	%	≤10
Frequency recovery time	Seconds	5

Note:

- the applied load is a percentage of generator electrical output, using alternator efficiencies as published in the general installation section of this Technical Data Sheet.
- the information given on this Technical Data Sheet is for standard ratings only. For ratings other than those shown, please contact Perkins Engines Company Limited, Stafford.
- the information given in this document is for guidance only.

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Noise data

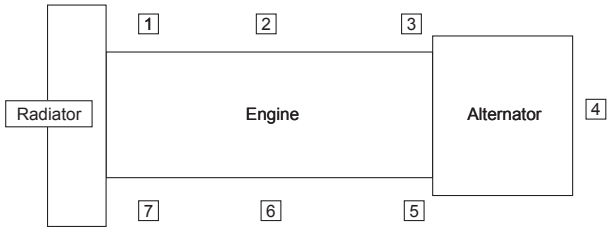
Noise levels

The figures for total noise are typical for an engine running at prime power rating in a semi-reverberant environment and measured at a distance of one meter from the periphery of the engine.

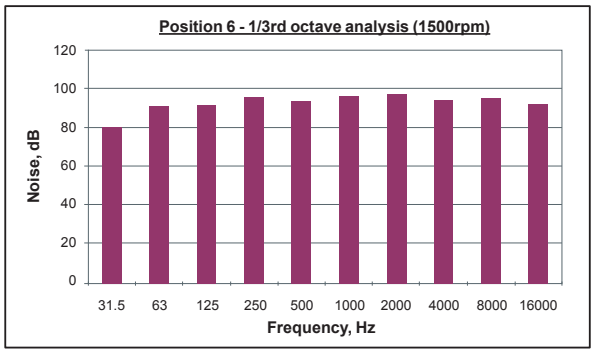
Octave analysis

The following histograms show an octave band analysis at the position of the maximum noise level.

Position	Noise, dBA
1	107.3
2	107.3
3	106.6
4	n/a
5	106.6
6	107.4
7	107.5



Frequency, HZ	Noise, dB
31.5	79.5
63	89.8
125	90.7
250	94.5
500	92.6
1000	95.2
2000	96.2
4000	92.9
8000	94.1
16000	91.4



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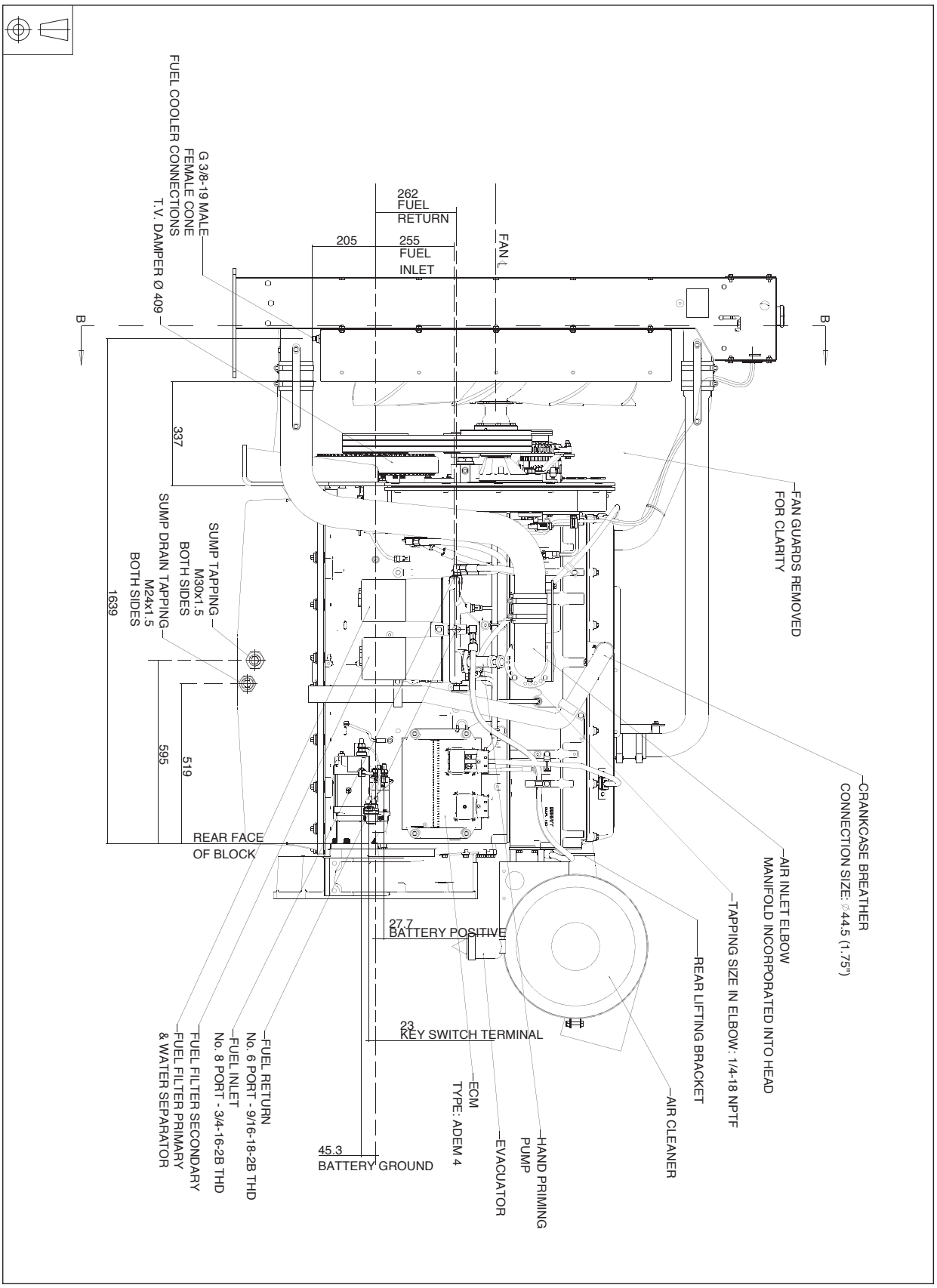
2506D-E15TAG2 - left side view



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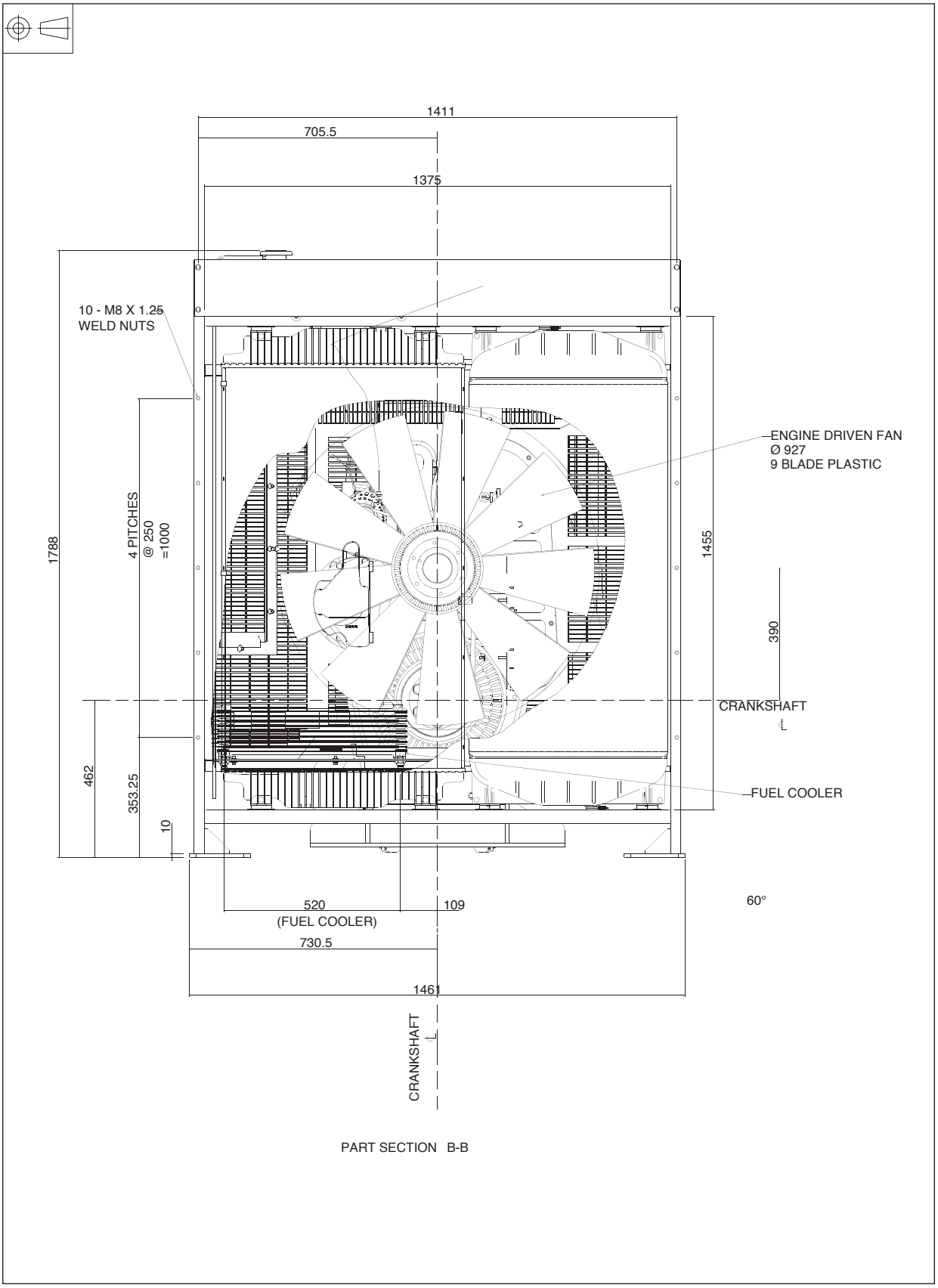
2506D-E15TAG2 - front view



PART SECTION B-B

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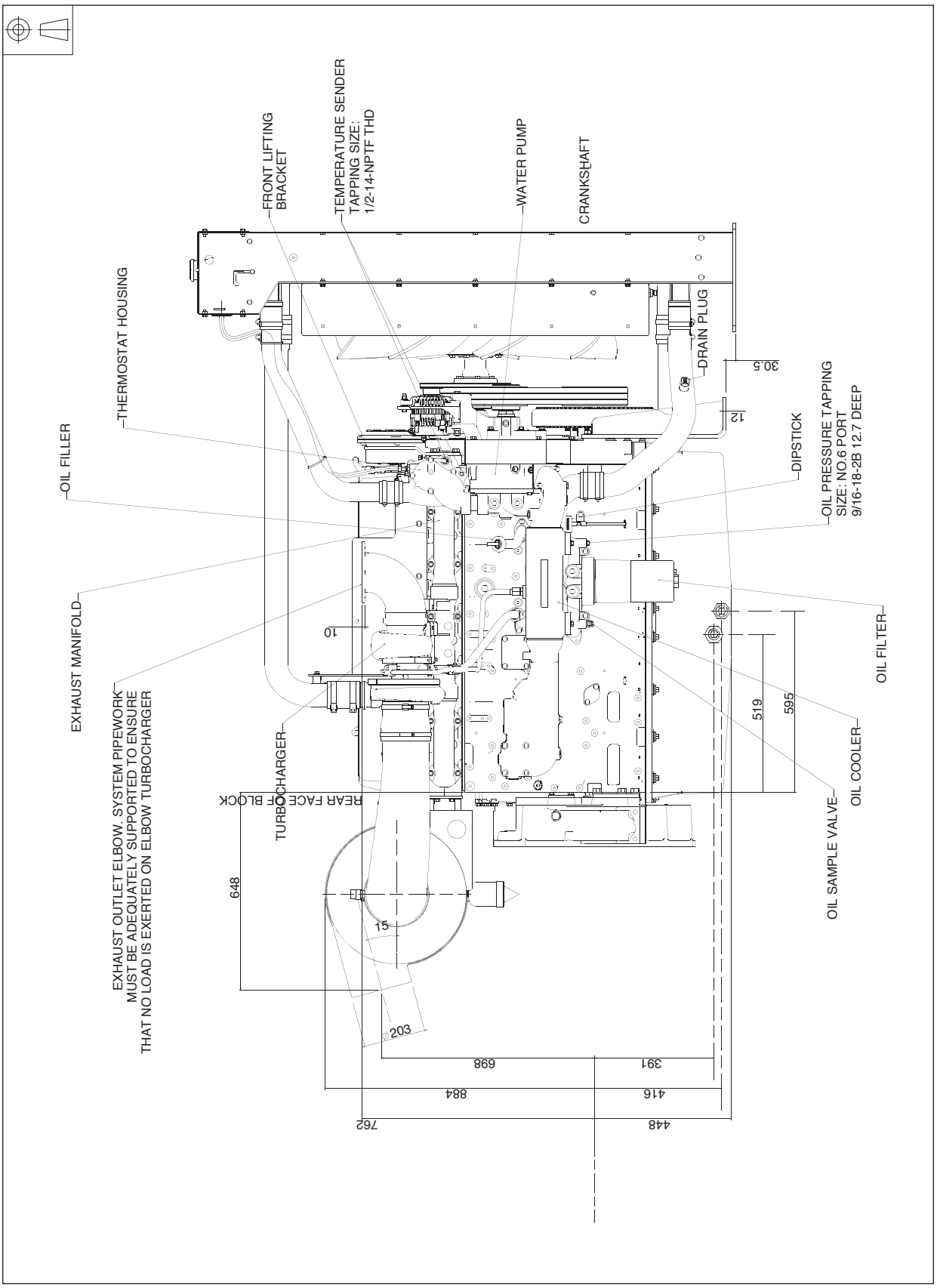
2506D-E15TAG2 - right side view



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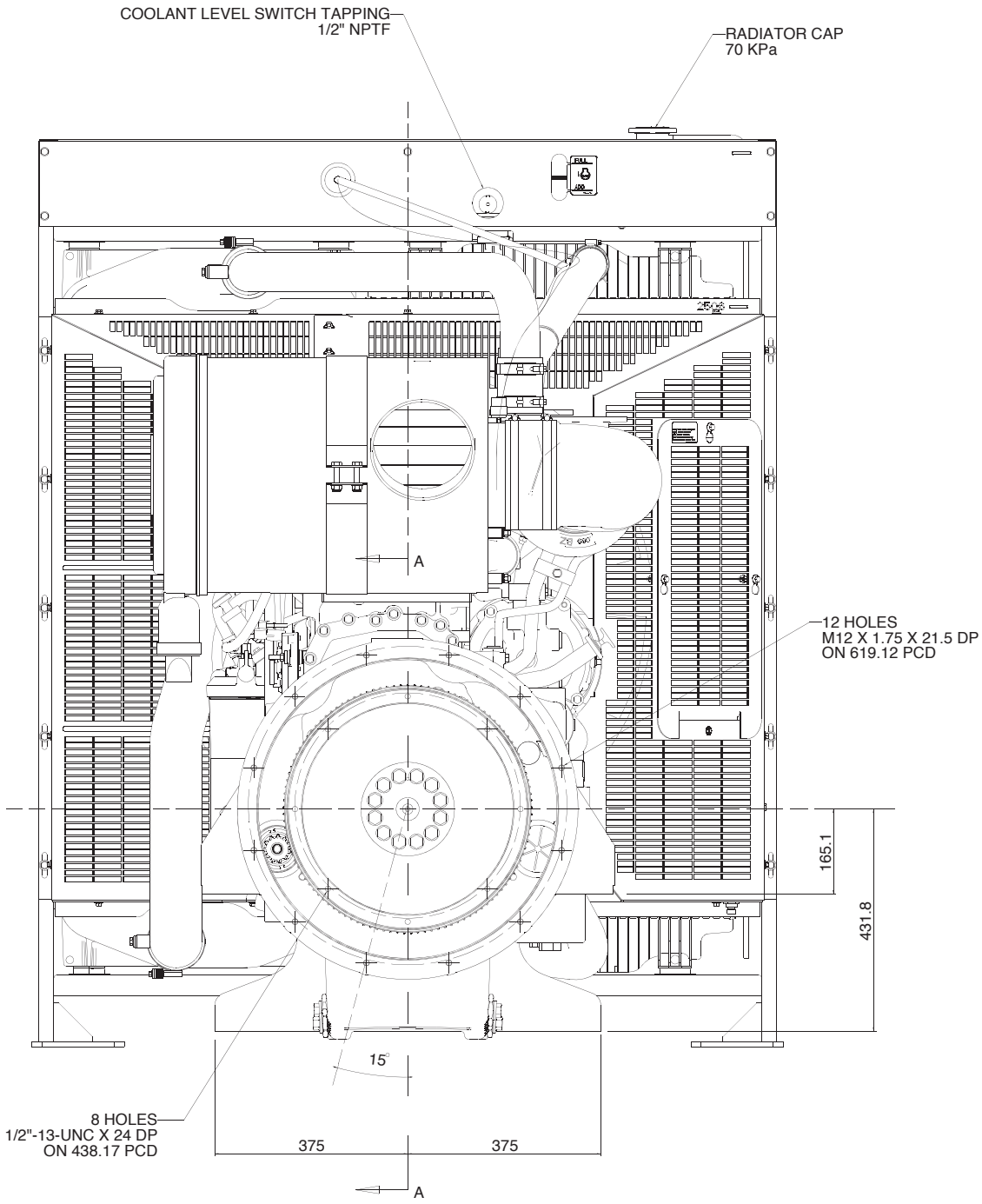
2506D-E15TAG2 - rear view



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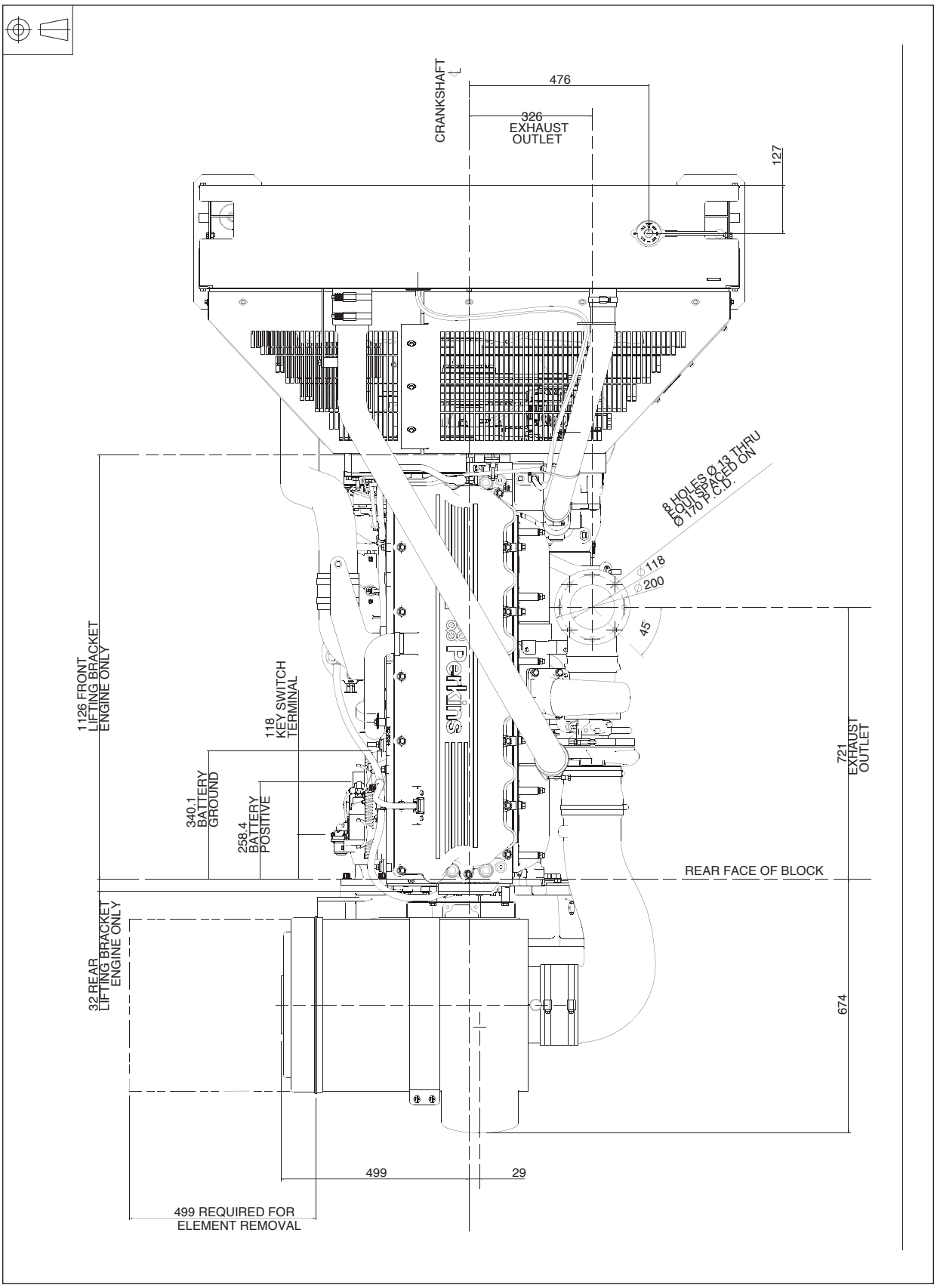
2506D-E15TAG2 - plan view



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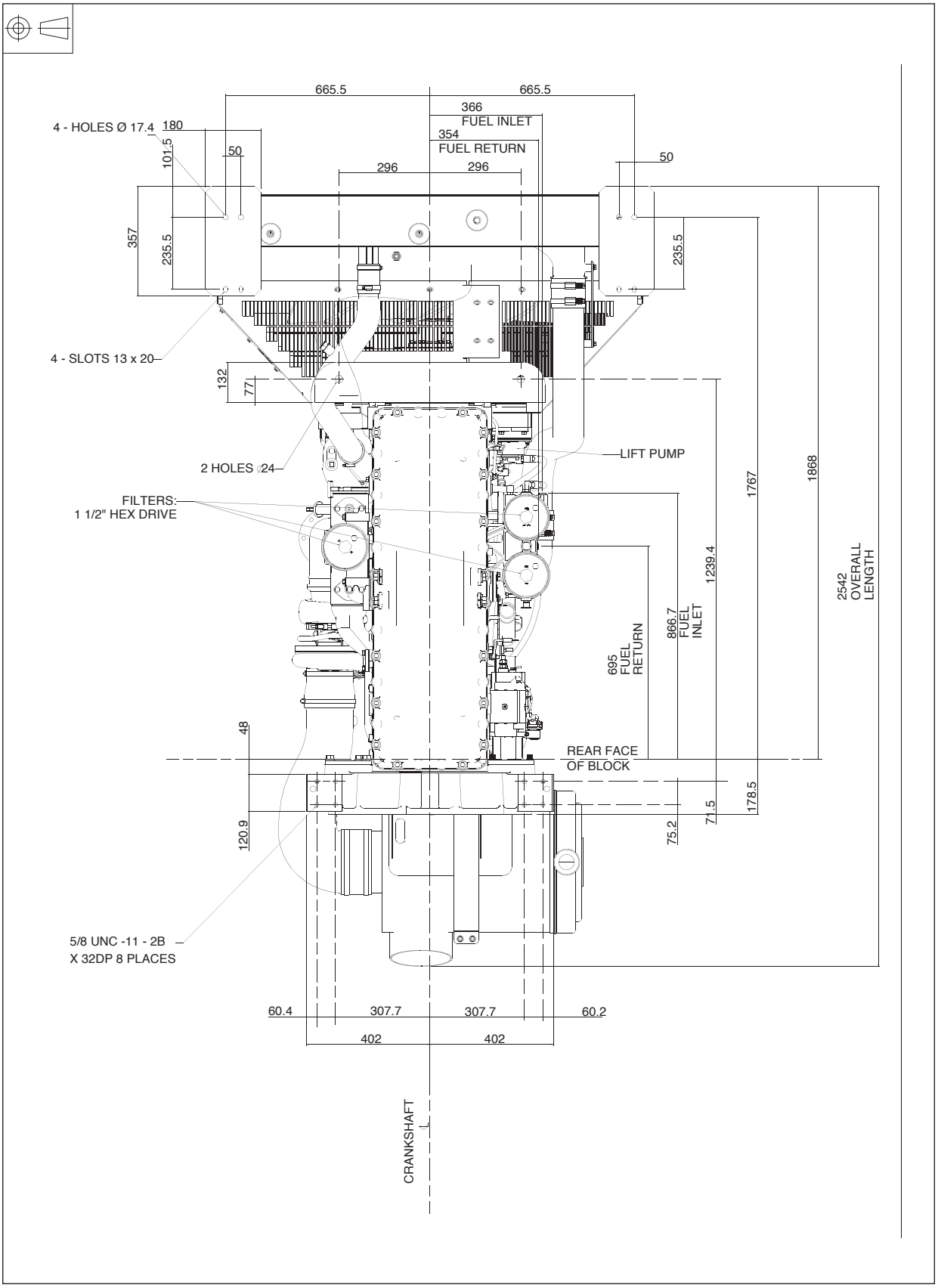
2506D-E15TAG2 - underside views



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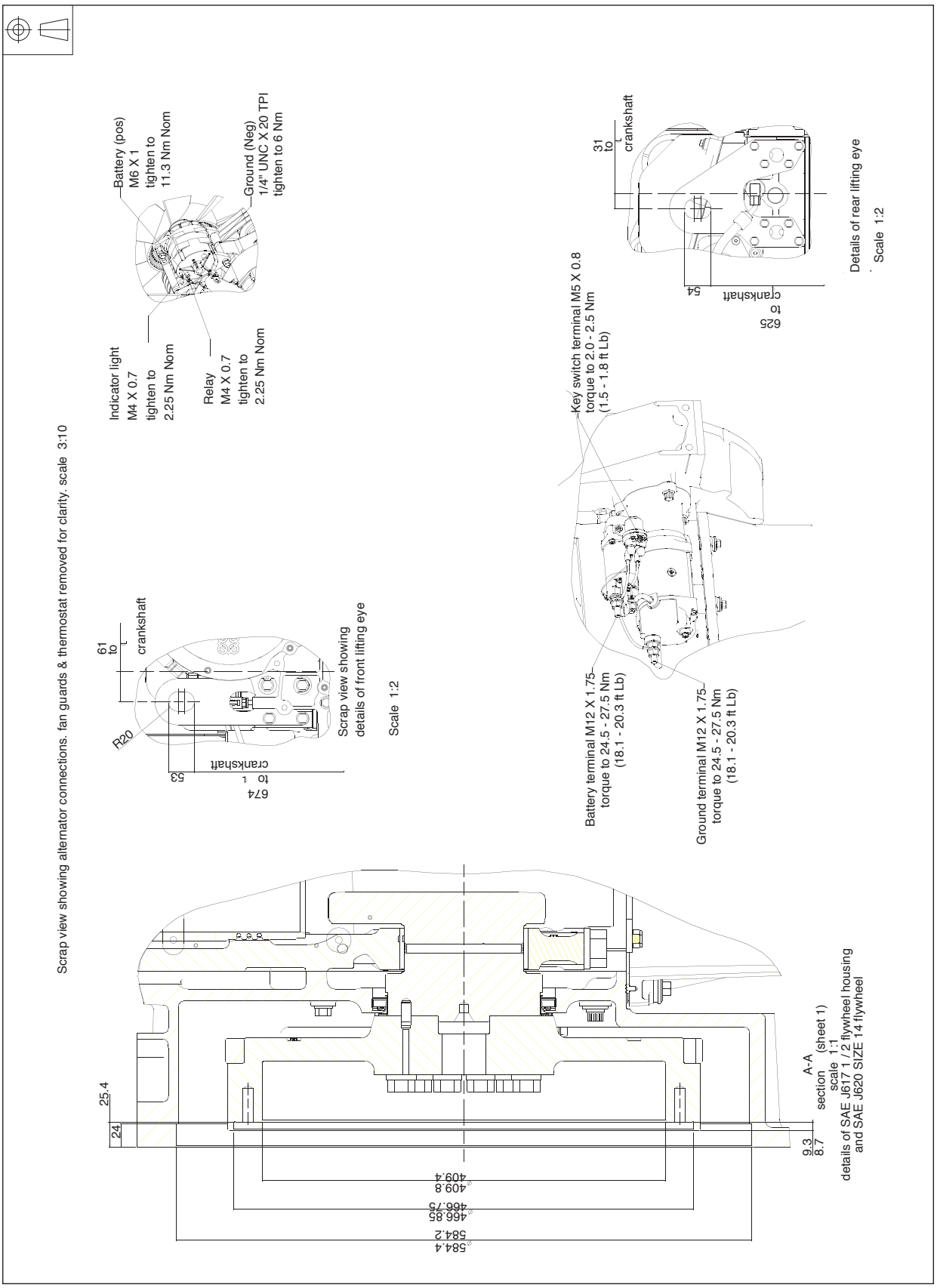
2506D-E15TAG2 - miscellaneous views



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