Technical Data

2800 Series 2806A-E18TAG3

Diesel Engine - ElectropaK

Basic technical data

Number of cylinders ... 6
Cylinder arrangement ... Vertical, in line
Cycle ... 4 stroke, compression ignition
Induction system ... Turbocharged, air to air charge cooling
Compression ratio ... 14·5:1 nominal
Bore ... 145 mm
Stroke ... 183 mm
Cubic capacity ... 18,13 litres
Direction of rotation ... Anti-clockwise viewed on flywheel
Firing order ... 1, 5, 3, 6, 2, 4
Cylinder 1 ... furthest from flywheel

Total weight ElectropaK

-dry ... 2050 kg
-wet ... 2158 kg

Overall dimensions

-height ... 1807,5 mm
-length ... 2545,0 mm
-width ... 1536,0 mm

Moment of inertia (mk²)

-flywheel @ 1500 rev/min ... 4,74 kgm²
-engine @ 1500 rev/min ... 2,31 kgm²
-flywheel @ 1800 rev/min ... 4,74 kgm²
-engine @ 1800 rev/min ... 2,70 kgm²

Performance

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

Cyclic irregularity

for engine/flywheel maximum:
1500 rev/min ... 0,01920
1800 rev/min ... 0,01163

Ratings

Steady state speed stability at constant load ... ± 0·25%
Electrical ratings are based on average alternator efficiency and are for guidance only (0.8 power factor being used).

Operating point

Engine speed ... 1500 rev/min
Cooling water exit temp ... 88 - 103 °C

Fuel data

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

Noise

Estimated sound pressure levels:
1500 rev/min ... 105,3 dB(A)
1800 rev/min ... 108,0 dB(A)
Note: Noise level represents highest recorded at 1500 and 1800 rev/min respectively

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

General installation

Designation	Units	Type of operation and application			
		Prime	Standby	Prime	Standby
		50 Hz 1500 rev/min		60 Hz 1800 rev/min	
Gross engine power	kWb	539,7	583,8	617,5	678,2
Fan power	kWm	9		15	
Restriction losses	kWm	9,1	9,8	10,3	11,2
Nett engine power	kWm	522	565	592	652
BMEP gross	kPa	2381	2576	2270	2493
Combustion air flow	m³/min	42,3	38,5	47,2	50,5
Exhaust gas temperature (after turbo)	°C	487,8	541,2	517,6	542,8
Exhaust gas flow	m³/min	100	98,7	125	135,7
Boost pressure ratio	-	2,9	3,1	3,1	3,4
Overall thermal efficiency (net)	%	43,4	43,6	40,5	41,65
Friction power and pumping losses	kWm	20		34	
Mean piston speed	m/s	9		11	
Engine coolant flow	l/s	6,1		7,2	
Cooling fan airflow	m³/min	702		852	
Typical gen set electrical output 0.8 pf	kWe	480	520	545	600
	kVa	600	650	681	750
Assumed alternator efficiency	%	92		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 statement

All 2806A ratings are optimised to ‘best fuel consumption’ and do not comply to Harmonised International Regulation Emission Limits. More information on these statements can be obtained by contacting the applications department at Perkins Engines Company Limited.

Energy balance

Designation	Units	Type of operation and application			
		Prime	Standby	Prime	Standby
		1500 rev/min		1800 rev/min	
Energy in fuel	kWt	1258	1355	1497	1637
Energy in power (gross)	kWb	540	584	618	678
Energy to fan and restriction losses	kWm	18,1	18,8	25,3	26,2
Energy to coolant and lubricating oil	kWt	141	173	177	170
Energy to exhaust	kWt	434	445	515	583
Energy to charge cooler	kWt	106	114	143	156
Energy to radiation	kWt	38	41	45	49

Cooling system

Recommended coolant: 50% clean water with 50% Perkins ELC. Where there is no likelihood of ambient temperature 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 Perkins.

Nominal jacket water pressure in crankcase. ... ... 280 kPa
Maximum top tank temperature (standby) ... ... 103 °C
Thermostat operating range.. ... ... .88 - 98 °C
Ambient cooling clearance maximum duct allowance and resultant minimum airflow (standby power). Based on air temperature at fan 10 °C above ambient

Duct allowance kPa	Ambient clearance °C	Min airflow m³/min	Ambient clearance °C	Min airflow m³/min
	1500 rev/min		1800 rev/min	
0	49	702	54	852
13	46	660	52	804
19	42	630	52	792
25	37	606	51	762

Radiator

-face area.. ... ... 1,75 m²
-rows and material. ... ... 2 Aluminium
-fins per inch.. 15

Width and height of matrix

-height ... ... 1260 mm
-width. ... ... 1390 mm
Total coolant capacity (radiator and engine). ... ... .61 litres
Pressure cap setting . ... 70 kPa

Charge cooler, integral with radiator

Face area.. ... ...1,623 m²
Rows and material ... ... 1 Aluminium
Fins per inch.. 14

Width and height of matrix

-height ... ... 1390 mm
-width. ... ... 1180 mm

Coolant pump

Speed ... ... 1,08 x e rev/min
Method of drive . ... Gear

Fan

Type .. ..Pusher
Drive ratio.. ... ... 0,8:1
Diameter ... ... 965 mm
Number of blades.. 9
Material . ...Plastic

Lubrication system

Recommended SAE viscosity

A single or multigrade oil must be used which conforms to API CG4 or APEA E5.

Lubricating oil capacity

Total system ... ... 62,0 litres
Sump maximum . ... 53,0 litres
Sump minimum . ... 45,0 litres

Lubricating oil temperature (sump)

Normal ... ...95 °C
Maximum ... ... .113 °C

Lubricating oil pressure

At rated speed ... ...420 kPa
Minimum. ... ...200 kPa
Oil relief valve opens.. ... ...610 kPa
Oil filter spacing.. ... ...30 µm
Sump drain plug tapping size. ... ... 1 in NTPF
Oil pump speed and method of drive . .. 1,16 x engine speed, gear
Oil pump flow 1500/1800 ... ... 2,90 / 3,48 litres/sec
Oil consumption as a percentage of full load fuel
-less than 0,1%

Normal operating angles

Front and rear. ... ... 7° maximum
side tilt ... ... 7° maximum

Electrical system

Type ... ...Insulated return
Alternator output. ... ...24 volts / 70 amps
Starter motor power ... ... 9 kW
Number of teeth on flywheel... 136
Number of teeth on starter motor 11
Minimum cranking speed ... ... 115 rev/min
Pull-in current of starter motor solenoid . ...49 amps
Hold-in current of starter motor solenoid ... ... 6 amps

Engine management system

Full electronic engine management system controlling:

- Speed governing
- Air / Fuel ratio
- Start sequence
- Engine Protection and diagnostics.

Starting requirements

Temperature range		
Down to -10 °C (14 °F)	Oil:	15W / 40 API CG4
	Starter:	24 Volt
	Battery:	2 x 12V 128 Ah
	Max breakaway current:	1400 amps
	Cranking Current:	700 amps
	Aids:	Not required
Down to -25 °C (-13 °F)	Oil:	0W / 30 API CG4
	Starter:	24 volt
	Battery:	2 x 12V 128 Ah
	Max breakaway current:	1400 amps
	Cranking Current:	600 amps
	Aids:	Block heater to 45 °C

Notes:

- The battery capacity is defined by the 20 hour rate at 0 °C
- The oil specification should be for the minimum ambient temperature as the oil will not be warmed by the immersion heater
- The breakaway current is dependant on the battery capacity available. Cables should be capable of handling the transient current which may be up to double the steady cranking current.

Induction system

Air intake restriction:.. ... ... 3,7 kPa
Maximum restriction (dirty filter) ... ... 6,35 kPa
Air filter type .. .. Paper element 457 mm Diameter

Exhaust system

Exhaust outlet size (internal). ... ... 202 mm
Maximum exhaust back pressure for total system ... ... 6,9 kPa
For recommended pipe sizes, see installation manual.

Fuel system

Type of injection system. ... ...MEUI
Fuel injector pressure. ... ... 200 MPa

Fuel lift pump

-output per hour at 1500/1800 rev/min ... ... 413 / 457 litres/hour
-delivery pressure ... ... 600 kPA
-maximum suction head . ... 3 m
-maximum pressure head ... ...4 m

Fuel filtration level

Primary .. ..10 µm
Secondary . ... 2 µm

Typical fuel consumption

Fuel consumption calculated on engine nett rated powers				
Rating	**g/kWh**	**litres/hr**	**g/kWh**	**litres/hr**
	1500 rev/min		**1800 rev/min**	
Standby	197	129	208	157
Prime + 10%	198	129	208	157
Prime	198	120	209	144
At 75% of Prime	204	93	202	104
At 50% of Prime	204	62	210	72

Note: Assumed fuel density 0,862 kg/l.

Engine mounting

Maximum bending moment
-at rear face of the engine crankcase. ... ... 1356 Nm

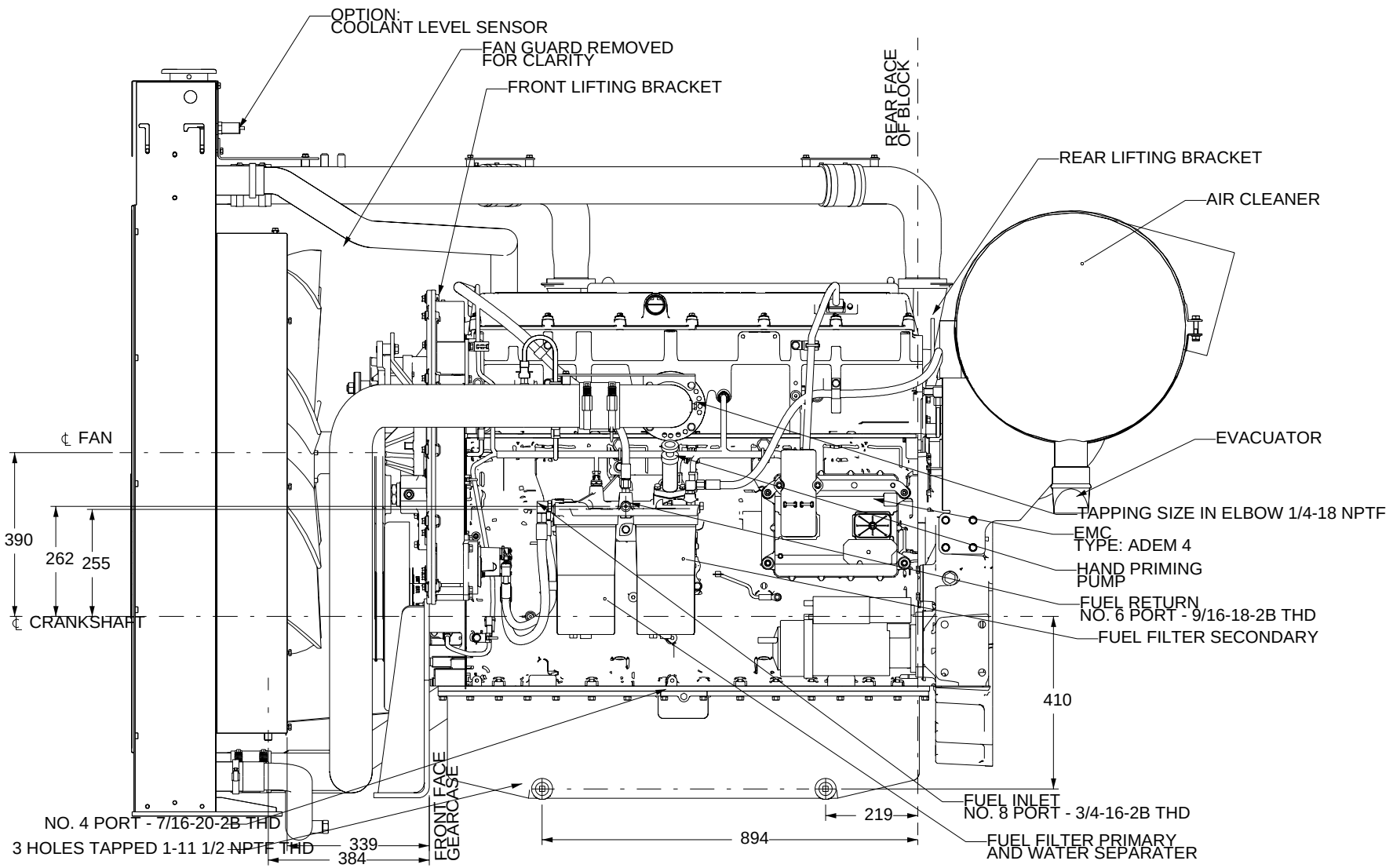
Position of centre of gravity (bare dry engine)

Forward of the rear face of the engine crankcase 550 mm
Above crankshaft centre line 250 mm

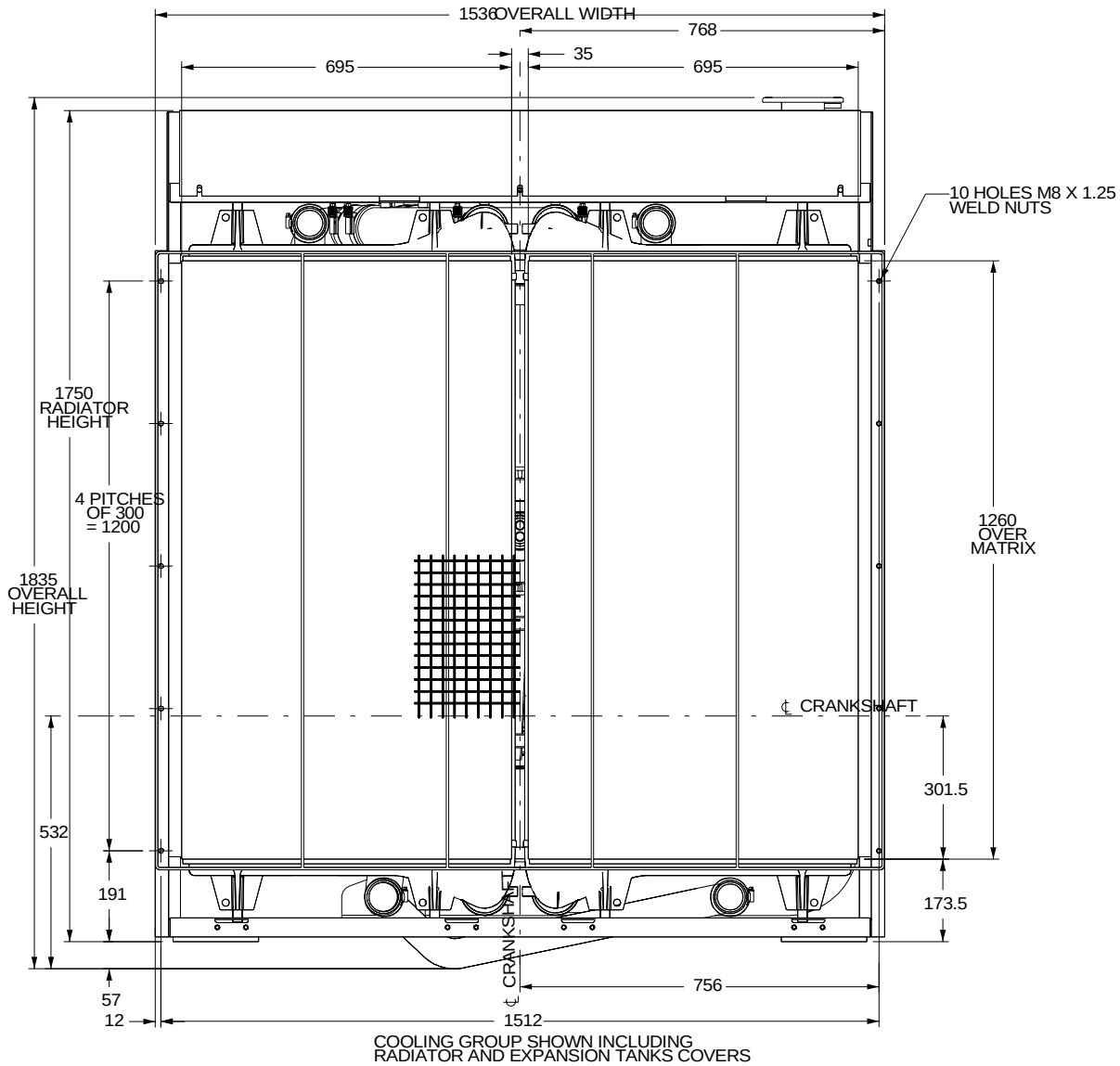
Weight of engine and cooling system

Engine (bare dry) ... ...1832 kg
Radiator (dry) . ... 200 kg

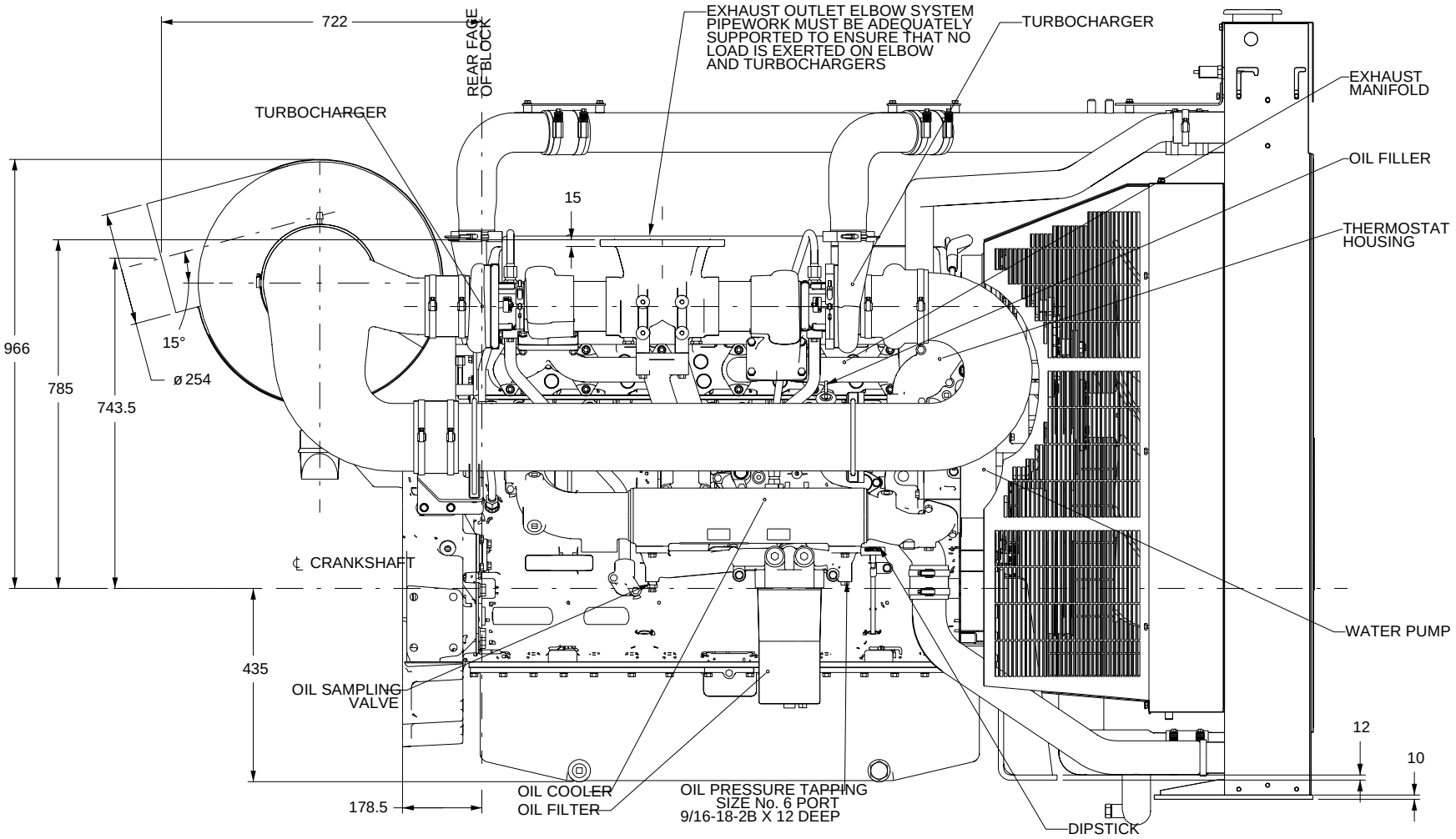
2806A-E18TAG3 - left hand side



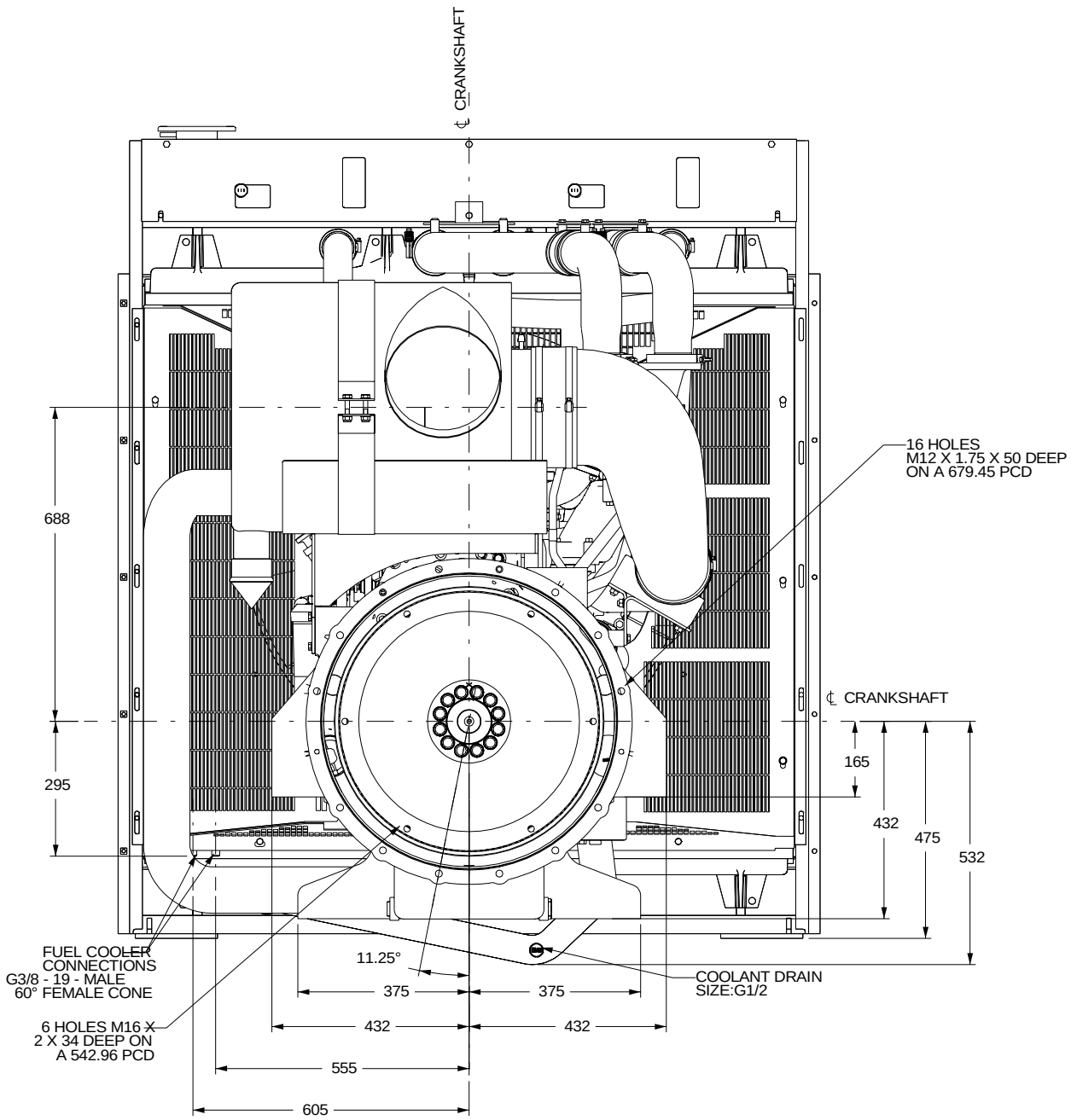
2806A-E18TAG3 - front view



2806A-E18TAG3 - right hand side



2806A-E18TAG3 - rear view



Typical load acceptance

Prime %	1800 rev/min			
	Load on		Load off	
	Transient % speed change	Speed recovery time (sec)	Transient % speed change	Speed recovery time (sec)
20	1,6	0,9	1,2	1,2
40	2,8	1,6	2,4	1,4
60	7,0	2,3	3,7	1,7
70	9,5	2,7	4,3	1,8
80	15,1	3,1	5,0	1,9
100	25,4	3,8	6,2	2,1

The above figures were obtained under test conditions as follows:
Engine block temperature: . ... 45 °C
Minimum ambient temperature .. .. 15 °C
Governing mode ... ... Isochronous
Alternator inertia. ... ... 10,4 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

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

Applied load is a percentage of generator electrical output using alternator efficiencies as published in the general installation section of this data sheet.

The information given on Technical Data Sheets is for standard ratings only. For ratings other than shown contact Perkins Engines Company Limited, Stafford.

The information given in this document is for guidance only.

Notes

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