

2806A-E18TAG1A 2806A-E18TAG2

2800

Series

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 when viewed from 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, ElectropaK

Height	1807.5 mm
Length	2545.0 mm
Width	1536.0 mm

Moments of inertia

Flywheel @ 1500 rpm	4.74 kgm ²
Engine @ 1500 rpm	2.31 kgm ²
Flywheel @ 1800 rpm	4.74 kgm ²
Engine @ 1800 rpm	2.70 kgm ²

Cyclic irregularity

For engine/flywheel maximum:	
1500 rpm	0.01920
1800 rpm	0.01163

Performance

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

Ratings

Steady state speed capability at constant load ... + 0.25%
Electrical ratings are based on average alternator efficiency and are for guidance only (0.8 power factor being used).

Operation point

Engine speed ... 1500/1800 rpm
Cooling water exit temperature ... 88 - 103°C

Fuel data

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

Noise

Sound pressure level
(exhaust piped away, cooling pack and air cleaner fitted)
1500 rpm ... 105.3 dB(A)
1800 rpm ... 108.0 dB(A)

Note: Noise level represents highest recorded at 1500 and 1800 rpm respectively.

Test conditions

Air temperature ... 25°C
Barometric pressure ... 100 kPa
Relative humidity ... 30%
Air inlet restriction at maximum power (normal) ... 6 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

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Designation	Units	Type of operation and application			
		Prime	Standby	Prime	Standby
		50 Hz @ 1500 rpm		60 Hz 1800 rpm	
Gross engine power	kWb	539.7	592.7	567.7	623
Fan, battery and alternator power	kWm	9		15	
Restriction losses	kWm	9.1	9.9	9.5	10.3
Nett engine power	kWm	522	574	543	598
BMEP gross	kPa	2381	2615	2087	2290
Combustion air flow	m ³ /min	34	36	43	45
Exhaust gas temperature (after turbo)	°C	568	571	481	489
Exhaust gas flow	m ³ /min	96	104	109	118
Boost pressure ratio	-	2.81	3.07	2.97	3.18
Overall thermal efficiency (nett)	%	42.8	42.4	43.1	42.7
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	m ³ /min	702		852	
Typical gen set electrical output 0.8 pf	kWe	480	528	500	550
	kVa	600	660	625	687
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 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	Unit	Prime	Standby	Prime	Standby
		50 Hz @ 1500 rpm		60 Hz 1800 rpm	
Energy in fuel	kWt	1276.8	592.7	1328	1465
Energy in power (gross)	kWm	540	593	568	623
Energy to fan and restriction losses	kWm	18.1	18.9	24.5	25.3
Energy to coolant and lubricant oil	kWt	208	222	166	190
Energy to exhaust	kWt	410.7	442.1	441	482
Energy to change cooler	kWt	80	94	113	125
Energy to radiant	kWt	38	42	40	44

General installation

2806A-E18TAG2

Designation	Units	Type of operation and application			
		Prime	Standby	Prime	Standby
		50 Hz @ 1500 rpm		60 Hz 1800 rpm	
Gross engine power	kWb	584	628	567.7	623
Fan, battery and alternator power	kWm	9		15	
Restriction losses	kWm	9.8	10.4	9.5	10.3
Nett engine power	kWm	565	609	543	598
BMEP gross	kPa	2576	2770	2087	2290
Combustion air flow	m ³ /min	37	40	43	45
Exhaust gas temperature (after turbo)	°C	555	553	481	489
Exhaust gas flow	m ³ /min	106	114	109	118
Boost pressure ratio	-	3.04	3.22	2.97	3.18
Overall thermal efficiency (nett)	%	42.6	42	43.1	42.7
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	m ³ /min	702		852	
Typical gen set electrical output 0.8 pf	kWe	520	560	500	550
	kVa	650	700	625	687
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.

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Energy balance

Designation	Unit	Prime	Standby	Prime	Standby
		50 Hz @ 1500 rpm		60 Hz 1800 rpm	
Energy in fuel	kWt	1374.3	1485.7	1328	1465
Energy in power (gross)	kWm	584	628	568	623
Energy to fan and restriction losses	kWm	18.8	19.4	24.5	25.3
Energy to coolant and lubricant oil	kWt	202	219	166	190
Energy to exhaust	kWt	447	484	441	482
Energy to charge cooler	kWt	100	110	113	125
Energy to radiant	kWt	41	45	40	44

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 crankcase280 kPa
 Maximum top tank temperature (standby)103°C
 Thermostat operating range88 - 98°

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	Minimum airflow m³/min	Ambient clearance °C	Minimum airflow m³/min
	1500 rpm		1800 rpm	
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
 Number of rows and materials2 row, 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

Change cooler, integral with radiator

Face area 1.623 m²
 Rows and material 1 Aluminium
 Fins per inch 14

Coolant pump

Speed 1,08 x e rpm
 Method of drive Gear

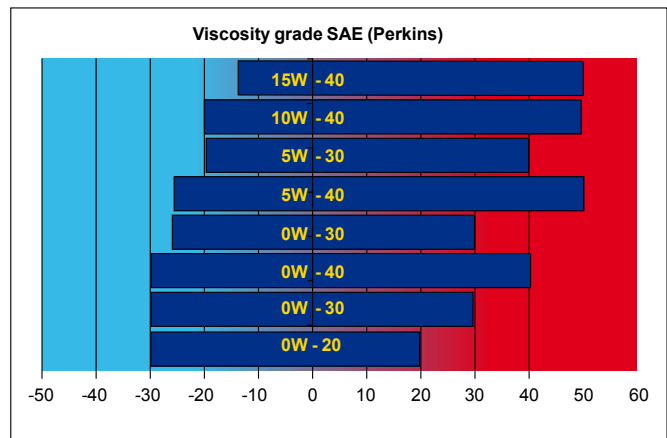
Fan

Type Pusher
 Drive ratio 0.8:1
 Diameter 965 mm
 Number of blades 9
 Materials 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 litres
 Sump maximum 53 litres
 Sump minimum 45 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 rpm
 Pull-in current of starter motor solenoid 49 amps
 Hold-in current of starter motor solenoid 6 amps

Engine management system

Full electronic management system controlling:

- Speed governing
- Air/fuel ratio
- Start sequence
- Engine protection and diagnostics

Starting requirements

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

Note:

- 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 depends on the battery capacity available. Cables should be capable of handling the transient current which may be up to double steady cranking current

Induction system

Air intake restriction 3.7 kPa
 maximum restriction (dirty filter) 6.4 kPa
 Air filter type:
 1500 rpm Paper element 457 mm diameter
 1800 rpm Paper element 533 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.

Governor

Governor type electronic
 To confirm to IOS 8528-5 Class G3 steady state

Fuel filtration level

Primary 10 µm
 Secondary 2 µm

Fuel system

Type of injection system MEUI
 Fuel injector pressure 6.9 kPa
 For recommended pipe sizes, see installation manual.

Typical fuel consumption

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Rating	Temperature range			
	g/kWh		Litres/hr	
	1500	1800	1500	1800
Standby	201	203	134	141
Prime+ 10%	201	203	134	141
Prime	203	202	123	127
At 75% of prime	199	201	90	95
At 50% of prime	203	210	61	66

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Note: Assumed fuel density 0.862 kg/l

Rating	Temperature range			
	g/kWh		Litres/hr	
	1500	1800	1500	1800
Standby	203	203	143	141
Prime+ 10%	203	203	143	141
Prime	202	202	132	127
At 75% of prime	198	201	97	95
At 50% of prime	201	210	66	66

Fuel lift pump

Delivery per hour at 1500/1800 rpm 413/457 litres/hour
 Fuel delivery pump
 Delivery pressure 600 kPa
 Maximum suction head 4 m
 Maximum pressure head 4 m

Engine mounting

Maximum bending moment

At rear face of the engine crankcase 4000 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 the engine and cooling system

Engine (bare dry) 1832 kg

Radiator (dry) 200 kg

All tests were conducted using an engine installed serviced to Perkins Engines 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

Typical load acceptance

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Prime %	1500 rpm			
	Load on		Load off	
	Transition % speed change	Speed recovery time (sec)	Transition % speed change	Speed recovery time (sec)
20	1.8	1.2	1.5	1.0
40	3.6	1.4	3.1	1.2
60	6.4	2.2	4.8	1.6
70	9.8	2.8	5.9	1.8
80	13.5	2.9	6.5	1.9
100	22.1	3.7	8.3	2.2

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Prime %	1800 rpm			
	Load on		Load off	
	Transition % speed change	Speed recovery time (sec)	Transition % speed change	Speed recovery time (sec)
20	1.3	1.0	1.1	1.0
40	2.6	1.5	2.2	1.5
60	4.4	2.1	3.3	1.8
70	6.1	2.7	4.2	1.8
80	8.1	3	4.8	1.8
100	12.7	3.5	4.9	2.0

The above figures were obtained under test conditions as follows:

Engine block temperature 45°C

Minimum block temperature 10°C

Governing mode Isochronous

Alternator inertia 10.4 kgm²

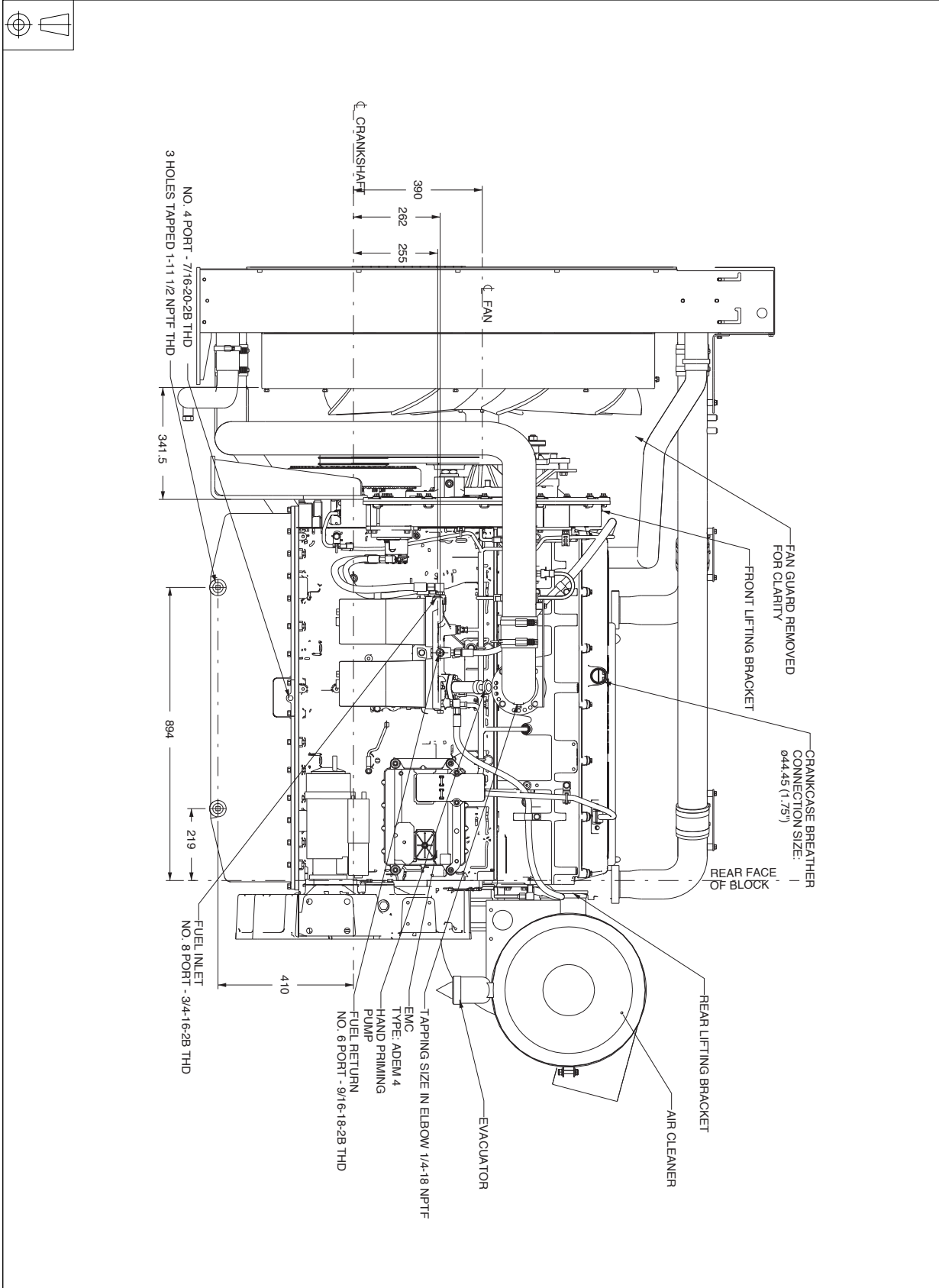
Under frequency roll off

UFRO point set to 1 Hz below rated frequency

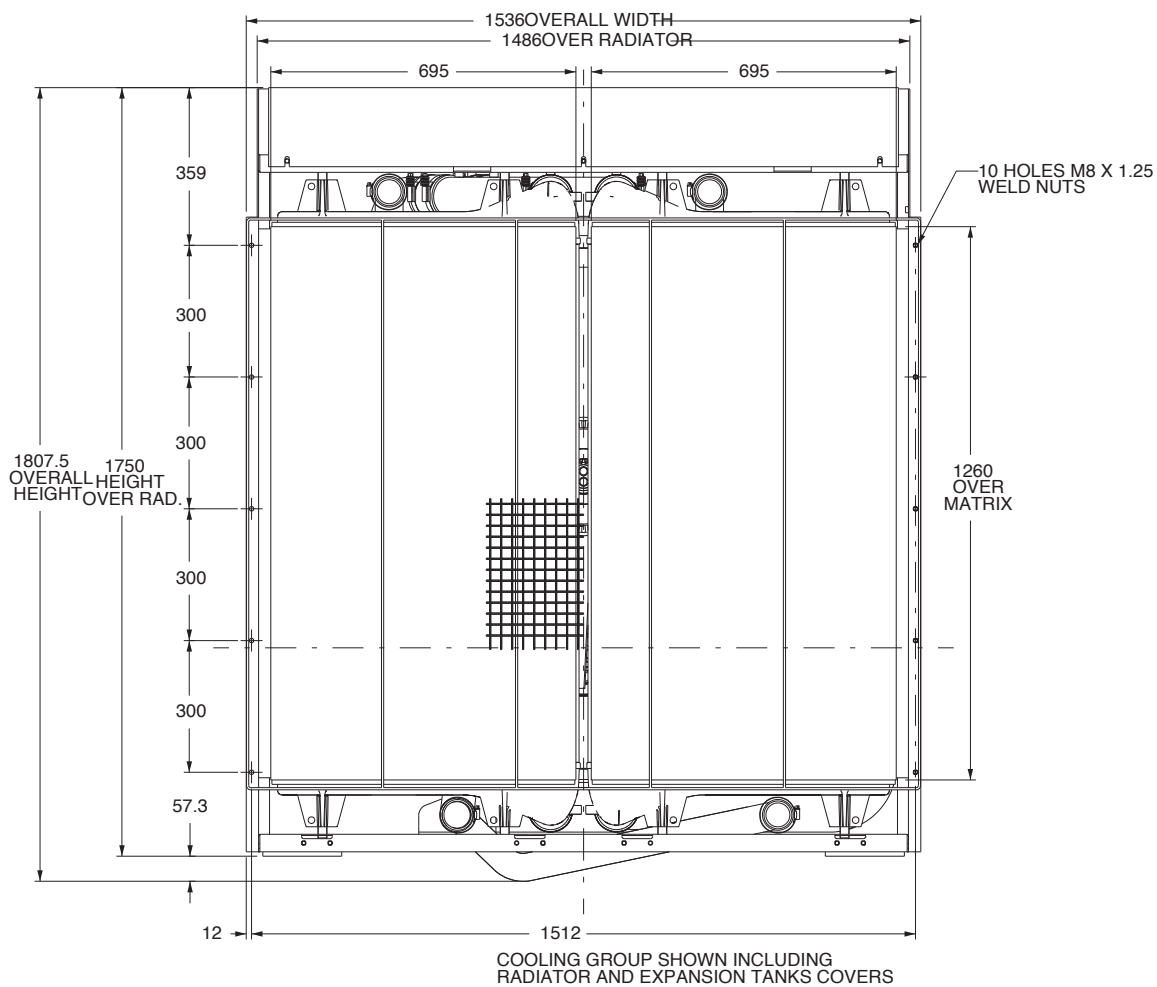
UFRO rate set to 2% voltage / frequency

LAM on /off. off

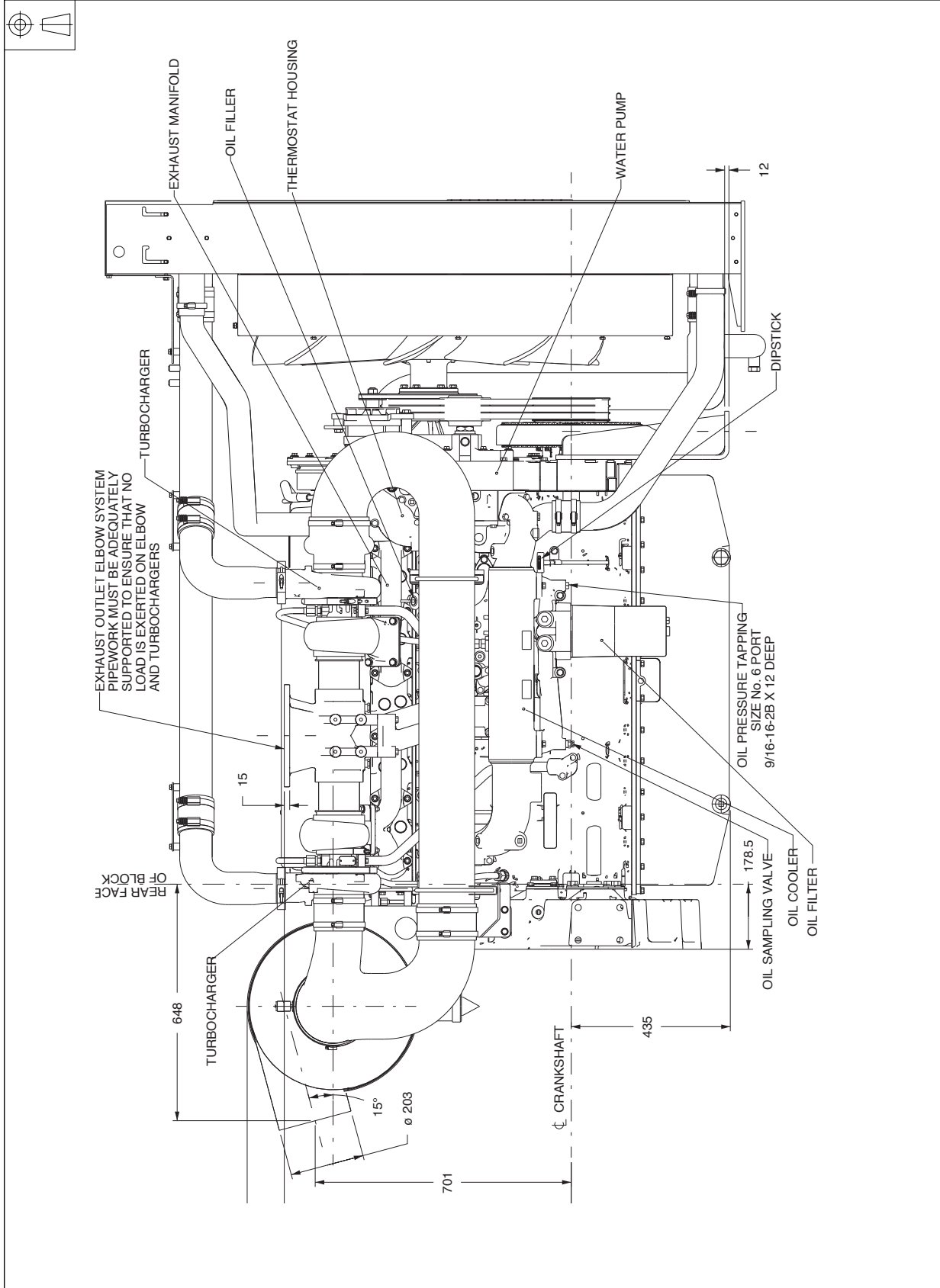
2806A-E18TAG1A and 2806A-E18TAG2 - Left hand side



2806A-E18TAG1A and 2806A-E18TAG2 - Front view



2806A-E18TAG1A and 2806A-E18TAG2 - Right hand view



2806A-E18TAG1A and 2806A-E18TAG2 - Rear view

