1106A-70TAG4

196.3 kWm (Gross) @ 1500rpm

ElectropaK

Series

Basic technical data

Number of cylinders	6
Cylinder arrangement	In-line
Cycle	4 stroke
Induction system	Turbocharged and air charge cooled
Combustion system	Direct injection diesel
Compression ratio	16:1
Bore	105 mm
Stroke	135 mm
Cubic capacity	7.01 litres
Direction of rotation	Anticlockwise when viewed from flywheel
Firing order	1, 5, 3, 6, 2, 4
Estimated total weight (dry)	743 kg
Estimated total weight (wet)	777 kg

Overall dimensions, ElectropaK

Height	1142 mm
Length (air cleaner fitted)	1764 mm
Width	755 mm

Moments of inertia

Engine rotational components	0.27 kgm²
Flywheel	1.26 kgm² (SAE2) /1.2 kgm² (SAE3)

Centre of gravity, ElectropaK

Forward from rear of block (wet)	476 mm
Above crankshaft centre line (wet)	176 mm
Offset to RHS of crankshaft centre line (wet)	16 mm

Performance

Speed variation at constant load	± 0.25%
Cyclic irregularity at standby power	0.028
All ratings within	± 3%

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

Sound level

Average sound pressure level for prime power @ 1 m . . . TBA dB(A)

Test conditions

Air temperature	25°C
Barometric pressure	100 kPa
Relative humidity	31.5%
Air inlet restriction at maximum power.	3 kPa (maximum)
Exhaust back pressure at maximum power.	6 kPa (maximum)
Fuel temperature	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.

Publication No. TPD1747E3, May 2015.

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General installation

General Installation	Units	Prime	Standby
Gross engine power	kW	178.9	196.3
Gross BMEP	kPa	2041.8	2240.3
Mean piston speed	metres/s	6.8	
ElectropaK nett engine power	kW	173.9	191.3
Engine coolant flow (against 35 kPa restriction)	litres/min	142	
Combustion air flow (at STP)	m³/min	12.6	13.2
Exhaust gas flow (maximum)	m³/min	34.9	36.8
Exhaust gas temperature (maximum) in manifold (after turbocharger)	°C	550	
Nett engine thermal efficiency	%	38.6	39.4
Typical genset electrical output (0.8pf 25°C)	kWe	160	176
	kVA	200	220
Regenerative power (estimated)	kW	9.3	
Assumed alternator efficiency	%	92	

Rating definitions

Prime power

Unlimited hours usage, with an average load factor of 80% over each 24 hour period. A 10% overload is available for 1 hour in every 12 hours 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	Prime	Standby
Heat in fuel	kW	450.8	485.3
Power to cooling fan	kW	5.0	
Power to coolant and lubricating oil	kW	78.2	81
Power to exhaust	kW	148.1	158
Energy to charge coolers	kW	32.8	36.8
Power to radiation	kW	12.8	13.2

Publication No. TPD1747E3, May 2015.

Cooling system

Cooling pack

Overall weight (wet) . . . . . 70 kg
Overall face area . . . . . 524800 mm²
Width . . . . . 724 mm
Height . . . . . 1090 mm

Radiator

Face area . . . . . 351200 mm²
Number of rows and materials . . . . . 4 rows, Aluminium
Matrix density and material . . . . . 10 fins per inch, Aluminium
Width of matrix . . . . . 439 mm
Height of matrix . . . . . 800 mm
Pressure cap setting (minimum) . . . . . 100 kPa

Charge cooler

Face area . . . . . 173,600 mm²
Number of rows and materials . . . . . 2 rows, Aluminium
Matrix density and material . . . . . 10 fins per inch, Aluminium
Width of matrix . . . . . 220 mm
Height of matrix . . . . . 789 mm

Fan

Diameter . . . . . 610 mm
Drive ratio 1.2:1
Number of blades 7
Material . . . . . Nylon
Type . . . . . Pusher
Air flow @ 1500 rpm 282m³/min
Power @ 1500 rpm . . . . . 5 kW

Coolant

Total system capacity . . . . . 21 litres
System drawdown capacity 10%
Engine capacity . . . . . 9.5 litres
Maximum top tank temperature . . . . . 110°C
Temperature rise across engine (Maximum rating dependent) . . . . . 6°C - 12°C
Maximum permissible external system resistance . . . . . 35 kPa
Thermostat operation range . . . . . 82°C to 93°C
Shutdown switch setting . . . . . 118°C
Coolant pump method of drive . . . . . Gear
Recommended coolant immersion heater rating (minimum) . . . . 0.75 kW
Recommended coolant . . . . . BS6580 - 1992, ASTM D3306 and ELC coolants to 1E1966

Duct allowance

Maximum additional restriction (duct allowance to cooling airflow and resultant minimum air flow) - Standby power

Description	rpm	kPa	m³/min
Duct allowance with inhibited coolant at 53°C			
Minimum air flow	1500	0.125	252
Duct allowance with inhibited coolant at 46°C			
Minimum air flow	1500	0.200	234

Electrical system

Alternator 8SI
Alternator voltage . . . . . 12 volts
Alternator output . . . . . 65 amps
Starter . . . . . AZF(E0421)/38MT(E0471)
Starter motor voltage . . . . . 12 volts
Starter motor power . . . . . 4.2kW(E0421)/5.0kW(E0471)
Number of teeth on the flywheel . . . . . 126(D0004)/ 134(D0090)
Pull-in and hold-in current of starter motor solenoid @ 25°C Maximum [1] . . . . . 12 volts 68 amps (E0421)/12 volts 320 amps (E0471)
Hold-in current of starter motor solenoid @ 25°C Maximum [1] . . . . . 12 volts 20 amps (E0421)/12 volts 25 amps (E0471)
Engine stop method . . . . . Solenoid

1 All leads to rated at 10 amps minimum

Cold start recommendations

Minimum required cranking speed over TDC . . . . . 60 rpm

	5 to -10°C	-10 to -20°C	-20 to -25°C
Oil	15W40	10W40	5W40
Starter	38MT/AZF		
Battery	2 x 950 CCA / 2 x 1200 CCA		
Maximum breakaway current	850A / 960A		
Cranking current	960		
Aids	None	Glowplugs	
Minimum mean cranking speed	130 rpm	100 rpm	100 rpm

Note: Battery capacity is defined by the 20 hour rate.

Note: If a change to a low viscosity oil is made, the cranking torque necessary at low ambient temperatures is much reduced. The starting equipment has been selected to take advantage of this. It is important to change to the appropriate multigrade oil in anticipation of operating in low ambient temperatures.

Note: 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.

Exhaust system

Maximum back pressure - 1500 rpm . . . . . 6.0 kPa
Exhaust outlet, internal diameter . . . . . 72 mm

Publication No. TPD1747E3, May 2015.

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Fuel system

Injection components

Injector ... Mechanical
Fuel pump ... DP210G

Fuel priming

Priming pump type ... Manual
Maximum priming time ... 90 seconds

Fuel feed

Maximum fuel flow ... 3 litres/min
Maximum suction head at engine fuel pump inlet ... 50 kPa
Maximum static pressure head ... 50 kPa
Fuel temperature at engine fuel pump inlet ... 85°C
Tolerance on fuel consumption ... ± 5%

Fuel specification

Fuel standard ... Various (contact Perkins Technical Department)

Fuel consumption

Load	Type of operation and application	
	g/kWh	litres/hr
110% Prime power	209	49.4
Prime power	213	45.8
75% Prime power	215	34.7
50% Prime power	215	23.1
25% Prime power	235	12.6

Induction system

Maximum air intake restriction

Clean filter ... 3 kPa
Dirty filter ... 5 kPa
Air filter type ... paper element

Lubrication system

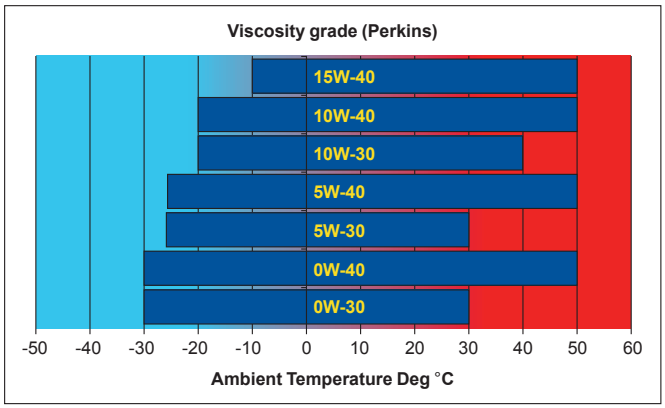
Maximum total system oil capacity ... 18.0 litres
Minimum oil capacity in sump ... 12.5 litres
Maximum oil capacity in sump ... 16.1 litres
Maximum engine operating angles -
Front up, front down, right side, left side ... 25°
Sump drain plug tapping size ... 3/4 - 16 UNF
Shutdown switch setting (where fitted)

Lubricating oil

Relief valve opening pressure ... 460 kPa
Pressure at maximum speed ... 520 kPa
Maximum continuous oil temperature (in rail) ... 125°C
Oil consumption at full load (% of fuel) ... < 0.1

Recommended SAE viscosity

A multigrade oil must be used which conforms to API CH4 or CI4 ACEA E5 must be used, see illustration below:



Mountings

Maximum static bending moment at rear face of block ... 1130 Nm
Maximum permissible overhung load
on the flywheel ... Calculated on request
Maximum bending moment at rear of flywheel housing ... ± 3000 in Shock Nm

Load acceptance

The data below complies 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).

Description	Units	
% of prime power	%	62.5
Load	kWe	100
Transient frequency deviation	%	<10
Frequency recovery time	Seconds	3.5

Publication No. TPD1747E3, May 2015.

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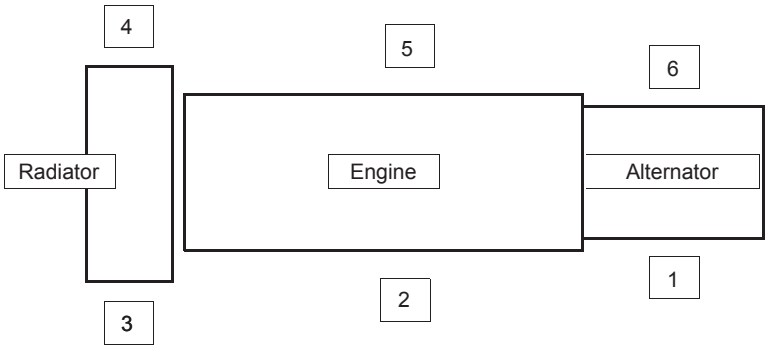
Noise data

Noise levels

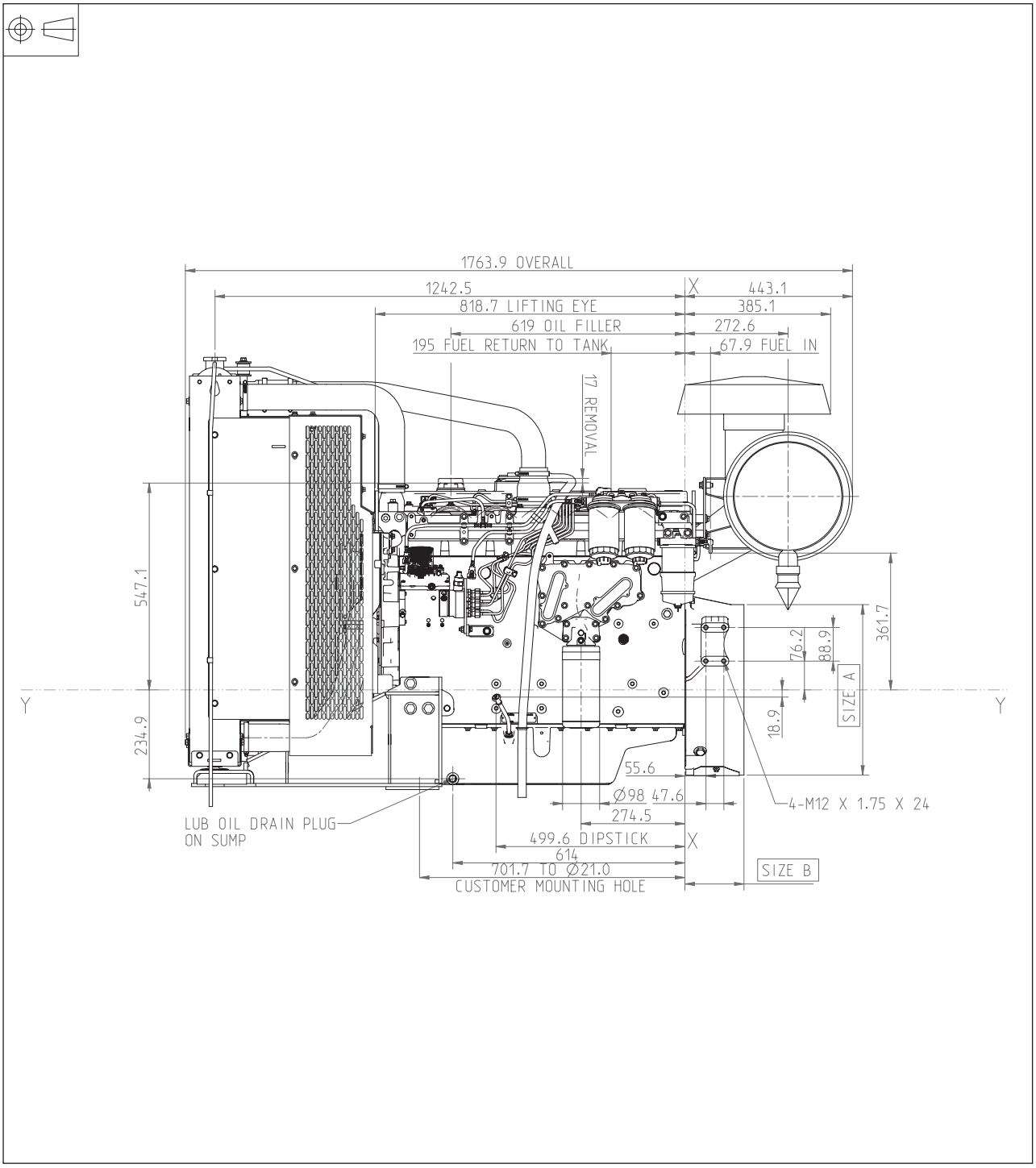
Noise level dB(A)		
Position	Prime power	Standby
1	99.9	99.9
2	100	101
3	100.9	101.2
4	99.8	101
5	101	101
6	100	99.9

1/3 octave analysis: TBC



Publication No. TPD1747E3, May 2015.

1106A-70TAG4 - Left side view

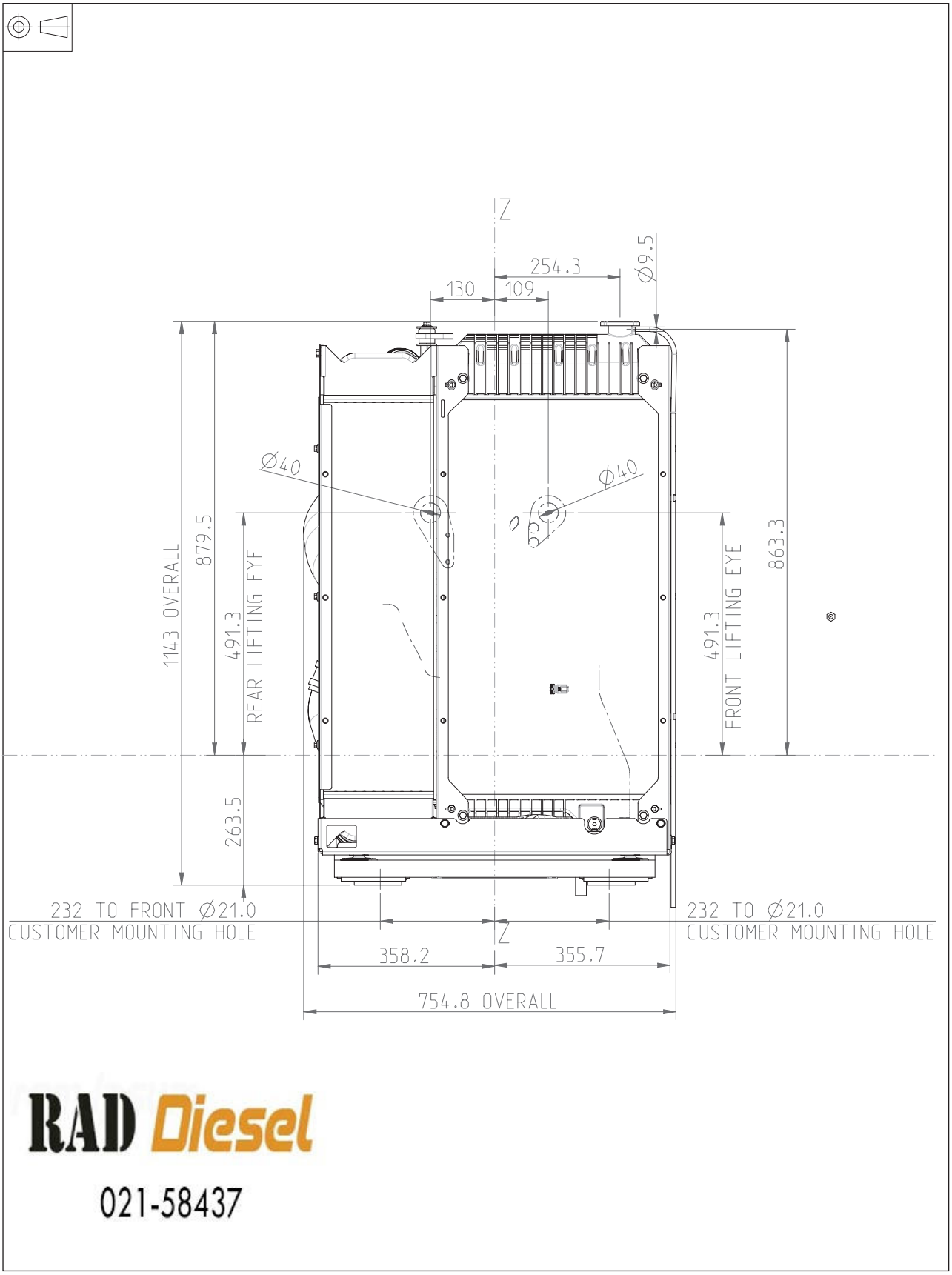


Flywheel and housing options

Option	Part	Size A	Size B	Description
1	C0001 & D0004	ø 450.9	153.37	The type is SAE 3 Use on TAG 2 & 4
2	C0074 & D0090	ø 489	134.6	The type is SAE 2 Use on TAG 3 & 4

Publication No. TPD1747E3, May 2015.

1106A-70TAG4 - Front view



RAD Diesel

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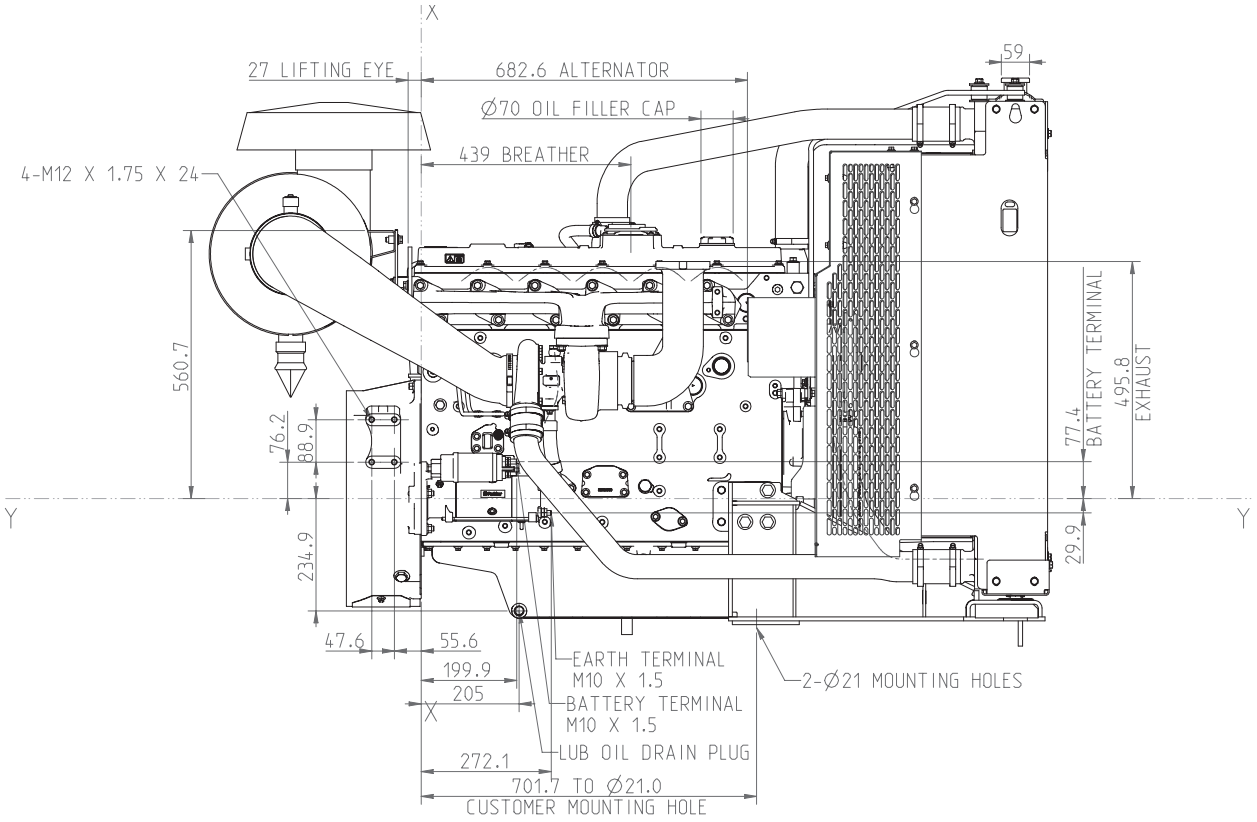
1106A-70TAG4 - Right side view



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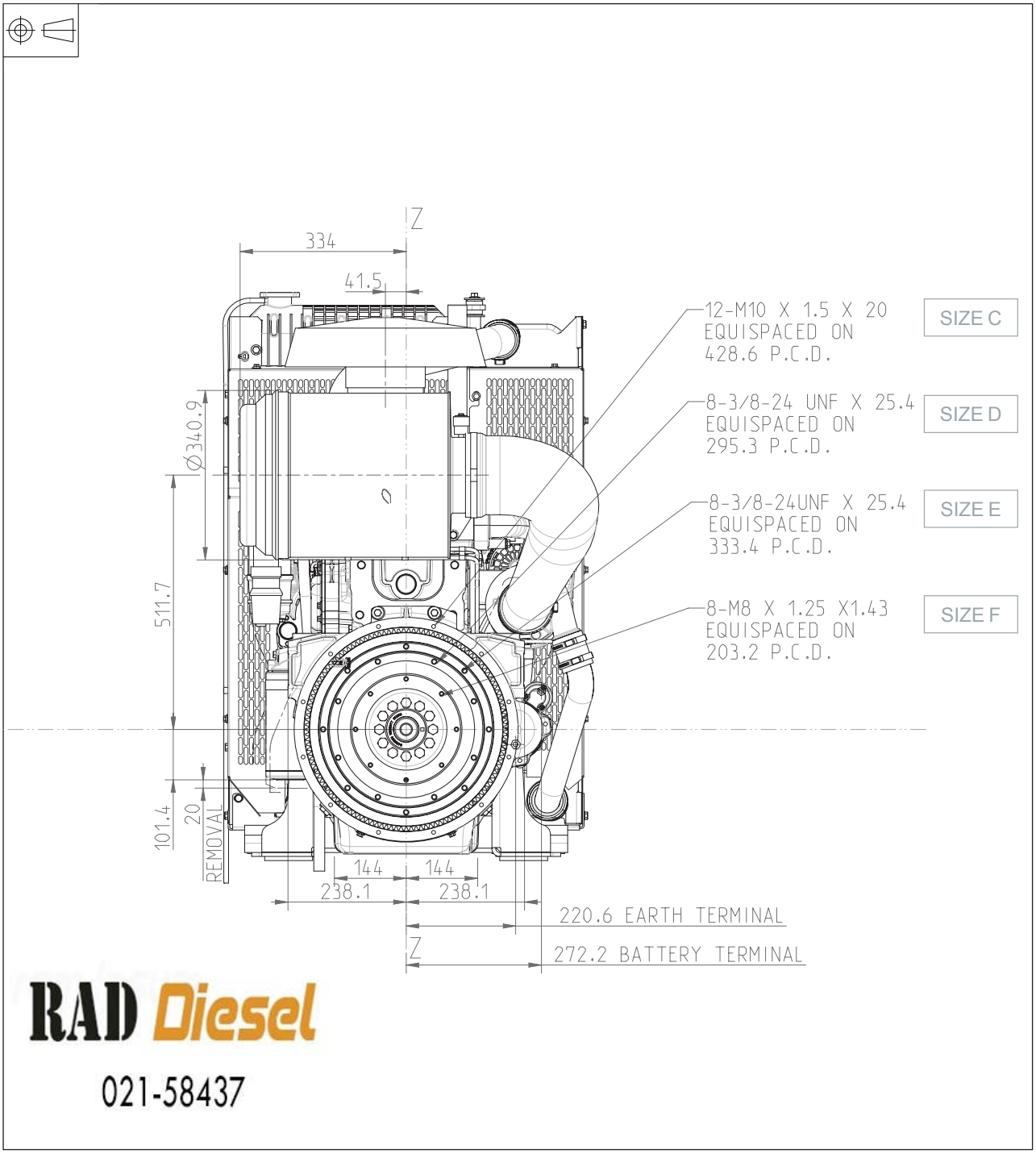
1106A-70TAG4 - Rear view



Option	Part	Size C	Size D	Size E	Size F
1	C0001 & D0004	12- M10 x 1.5 x 20 EQUISPACED ON 428.63 P.C.DIA	8- 3/8 - 24 UNF x 25.4 EQUISPACED ON 333.38 P.C.DIA	8- 3/8 - 24 UNF x 25.4 EQUISPACED ON 295.28 P.C.DIA	8- M8 x 1.25 x 14.3 EQUISPACED ON 203.2 P.C.DIA
2	C0074 & D0090	12- M10 x 1.5 x 20 EQUISPACED ON 466.725 P.C.DIA	8- M10 x 1.5 x 25.4 EQUISPACED ON 333.38 P.C.DIA		

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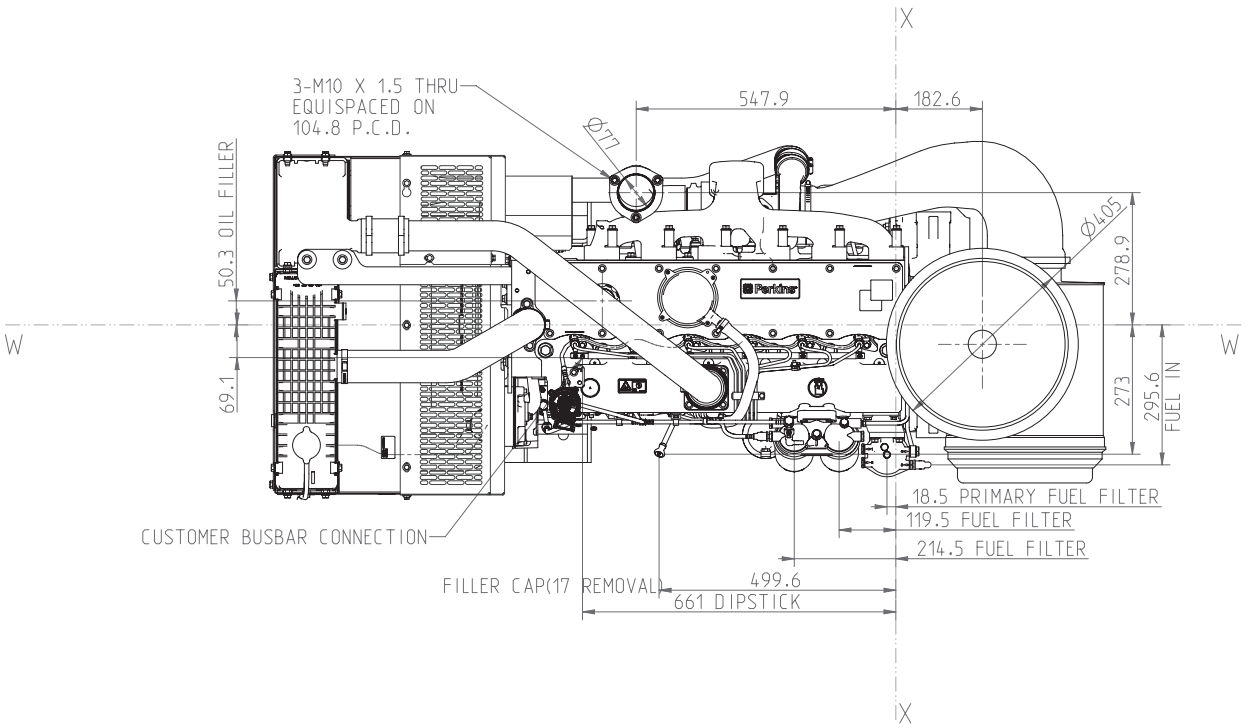
1106A-70TAG4 - Plan view



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