

# 1106A-70TAG3

# 1100

180.2 kWm (Gross) @ 1500 rpm  
197.7 kWm (Gross) @ 1800 rpm

## Series

## Electropak

### Basic technical data

Number of cylinders	6
Cylinder arrangement	Inline
Cycle	4 stroke
Induction system	Turbocharged and air charge cooled
Combustion system	Direct injection diesel
Compression ratio	16.5:1
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	1092 mm
Length (air cleaner fitted)	1706 mm
Width	756 mm

### Moments of inertia

Engine rotational components	0.27 kgm <sup>2</sup>
Flywheel	1.26 kgm <sup>2</sup> (SAE2)

### 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	± 0.75%
Cyclic irregularity at standby power	0.028
All ratings within	± 5%

**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 (nominal)
Exhaust back pressure at maximum power	6 kPa (nominal)
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.

## General installation

General Installation	Units	Prime	Standby	Prime	Standby
		50 Hz		60 Hz	
		Gross engine power	kW	162.7	180.2
Gross BMEP	kPa	1856.0	2056.5	1709.0	1880.2
Mean piston speed	metres/s	6.8		8.1	
ElectropaK nett engine power	kW	157.7	175.2	171.7	189.7
Engine coolant flow (against 35 kPa restriction)	litres/min	142		170	
Combustion air flow (at STP)	m <sup>3</sup> /min	12.74	13.45	16.55	17.37
Exhaust gas flow (maximum)	m <sup>3</sup> /min	30.37	32.28	37.45	40.66
Exhaust gas temperature (maximum) in manifold (after turbocharger)	°C	487		486	
Nett engine thermal efficiency	%	40.0	40.4	37.3	36.8
Typical genset electrical output (0.8pf 25°C)	kWe	144	160	156.8	173.0
	kVA	180	200	196.9	216.5
Regenerative power (estimated)	kW	8.1		9	
Assumed alternator efficiency	%	91.3		91.3	

## 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	Prime	Standby
		50 Hz		60 Hz	
		Heat in fuel	kW	394.2	433.6
Power to cooling fan	kW	5.0		8.0	
Power to coolant and lubricating oil	kW	71.9	77.9	80.8	92.5
Power to exhaust	kW	119.1	129.6	144.7	162.4
Energy to charge coolers	kW	28.7	32.9	41.9	46.8
Power to radiation	kW	11.8	13.0	13.8	15.4

## Cooling system

### Cooling pack

Overall weight (wet) .....	45 kg
Overall face area .....	469,200 mm <sup>2</sup>
Width .....	684 mm
Height .....	690 mm

### Radiator

Face area .....	303,600 mm <sup>2</sup>
Number of rows and materials .....	4 rows, Aluminium
Matrix density and material .....	11.3 fins per inch, Aluminium
Width of matrix .....	440 mm
Height of matrix .....	690 mm
Pressure cap setting (minimum) .....	110 kPa

### Charge cooler

Face area .....	151,800 mm <sup>2</sup>
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 .....	690 mm

### Fan

Diameter .....	635 mm
Drive ratio .....	1.25:1
Number of blades .....	7
Material .....	Nylon
Type .....	Pusher
Air flow @ 1500 rpm .....	222 m <sup>3</sup> /min
Power @ 1500 rpm .....	4.5 kW
Air flow @ 1800 rpm .....	282 m <sup>3</sup> /min
Power @ 1800 rpm .....	8 kW

### Coolant

Total system capacity .....	20.5 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	m <sup>3</sup> /min
Duct allowance with inhibited coolant at 53°C			
Minimum air flow	1500	0.125	204
	1800	0.12	258
Duct allowance with inhibited coolant at 46°C			
Minimum air flow	1500	0.2	184
	1800	0.2	228

## Electrical system

Alternator .....	8SI
Alternator voltage .....	12 volts
Alternator output .....	65 amps
Starter .....	38 MT
Starter motor voltage .....	12 volts
Starter motor power .....	5.0 kW
Number of teeth on the flywheel .....	134
Pull-in and hold-in current of starter motor solenoid @ 25°C maximum <sup>(1)</sup> .....	12 volts 320 amps
Hold-in current of starter motor solenoid @ 25°C maximum <sup>(1)</sup> .....	12 volts 25 amps
Engine stop method .....	Solenoid

<sup>1</sup> All leads to rated at 10 amps minimum

### Cold start recommendations

Minimum required cranking speed over TDC .....

	5 to -10°C	-10 to -20°C	-20 to -25°C
Oil	15W40	10W40	5W40
Starter	38 MT		
Battery	2 x 950 CCA		
Cranking current	850 A		
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.

## Exhaust system

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

## 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/minute  
 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/hour	
	50 Hz	60 Hz	50 Hz	60 Hz
110% Prime power	203.1	216.7	43.7	51.7
Prime power	203.5	214.7	39.6	46.4
75% Prime power	209.3	221.5	30.7	35.7
50% Prime power	193.9	206.2	18.8	22.2
25% Prime power	217.5	224.7	10.5	12.1

## Induction system

### Maximum air intake restriction

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

## Lubrication system

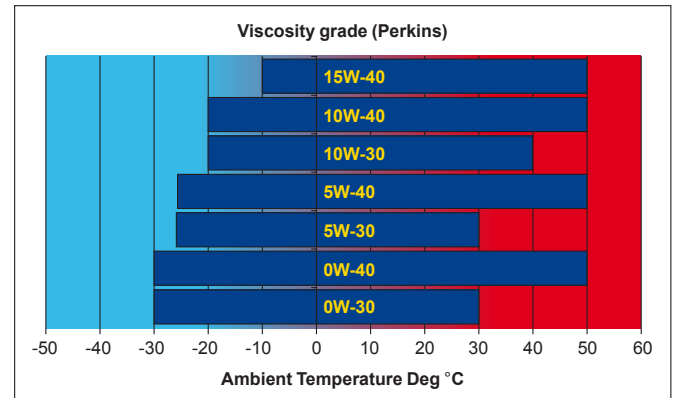
Maximum total system oil capacity ..... 18.0 litres  
 Minimum oil capacity in sump ..... 12.5 litres  
 Maximum oil capacity in sump ..... 16.1 litres  
 Maximum engine operating angles -  
 Front up, front down, right side, left side..... 25°  
 Sump drain plug tapping size ..... 3/4 - 16 UNF  
 Shutdown 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 C14  
 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	50 Hz	60 Hz
% of prime power	%	75	85
Load	kWe	109	150
Transient frequency deviation	%	<10	<10
Frequency recovery time	Seconds	1.6	2.3

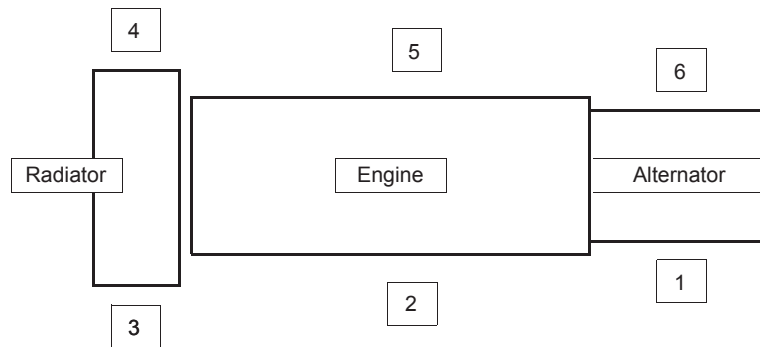
## Noise data

### Noise levels

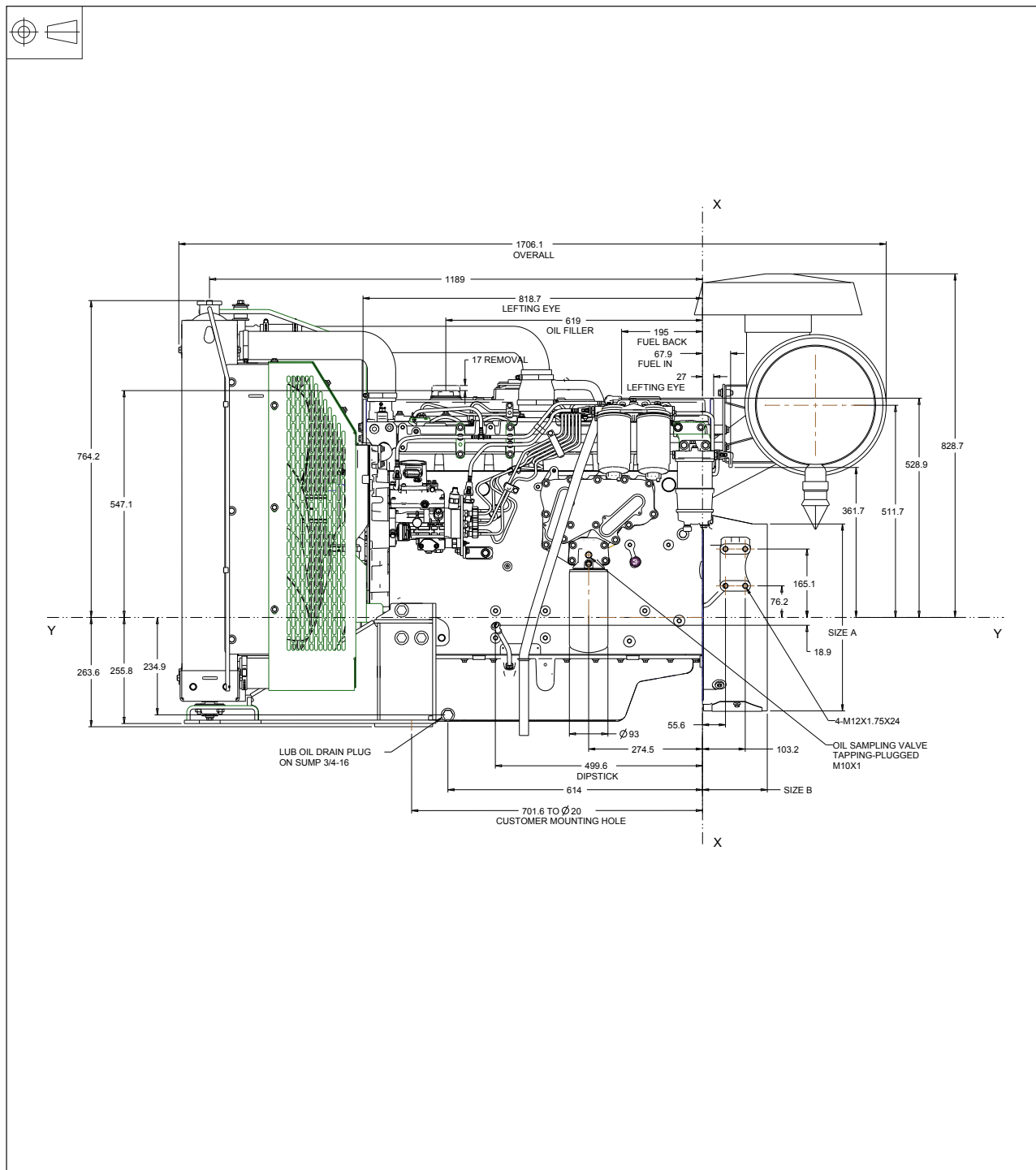
Position	Noise level [dB(A)]			
	Prime power		Standby	
	50 Hz	60 Hz	50 Hz	60 Hz
1	97.49	100.2	96.67	99.7
2	95.15	97.3	93.77	97.1
3	94.68	97.4	94.21	97
4	93.6	97.2	93.42	96.8
5	98.57	102.5	98.68	101.9
6	95.15	99.1	95.14	98.8

Noise reference level 65 dB(A)

1/3 octave analysis: TBC



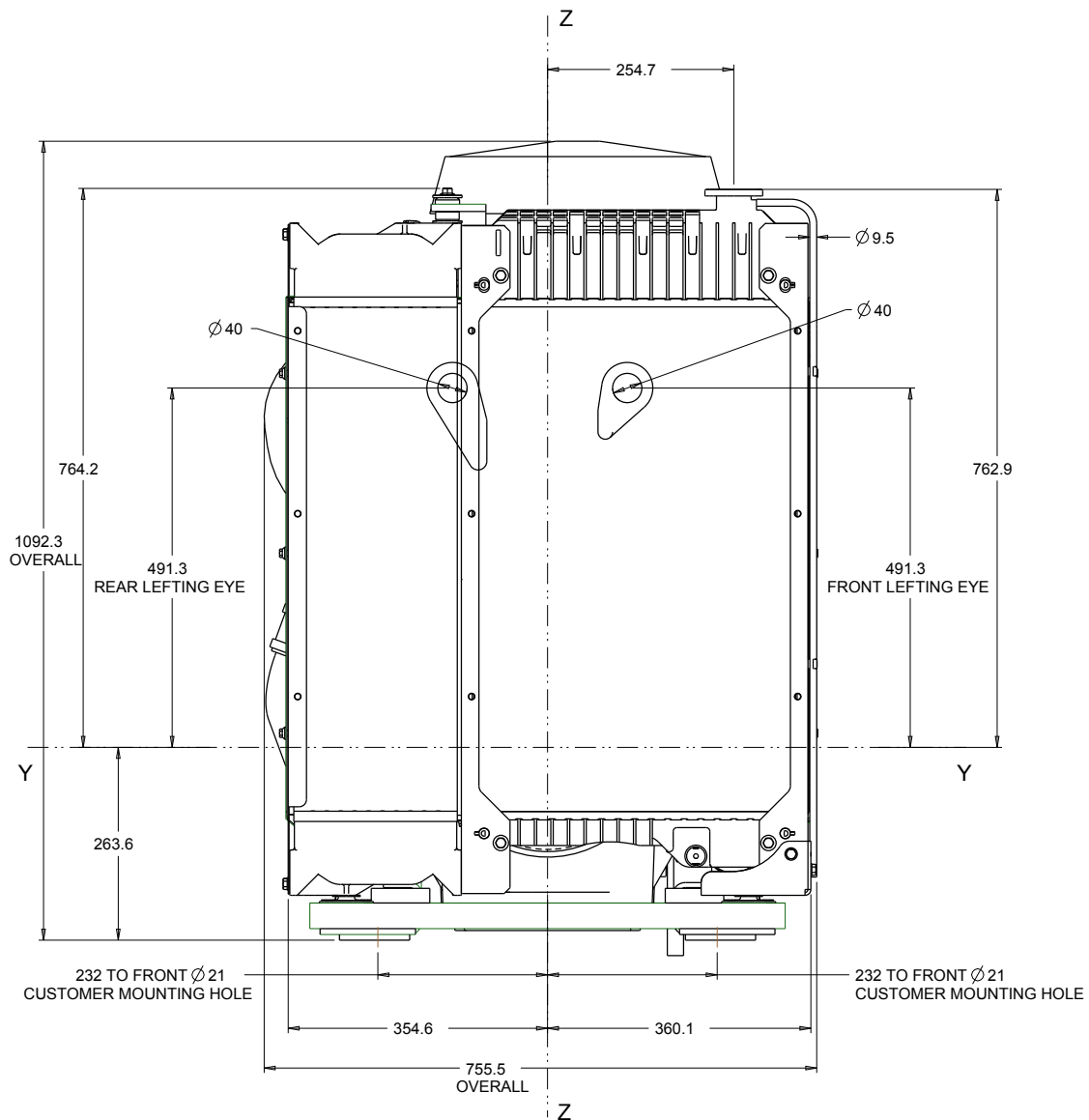
## 1106A-70TAG3 - Left side view



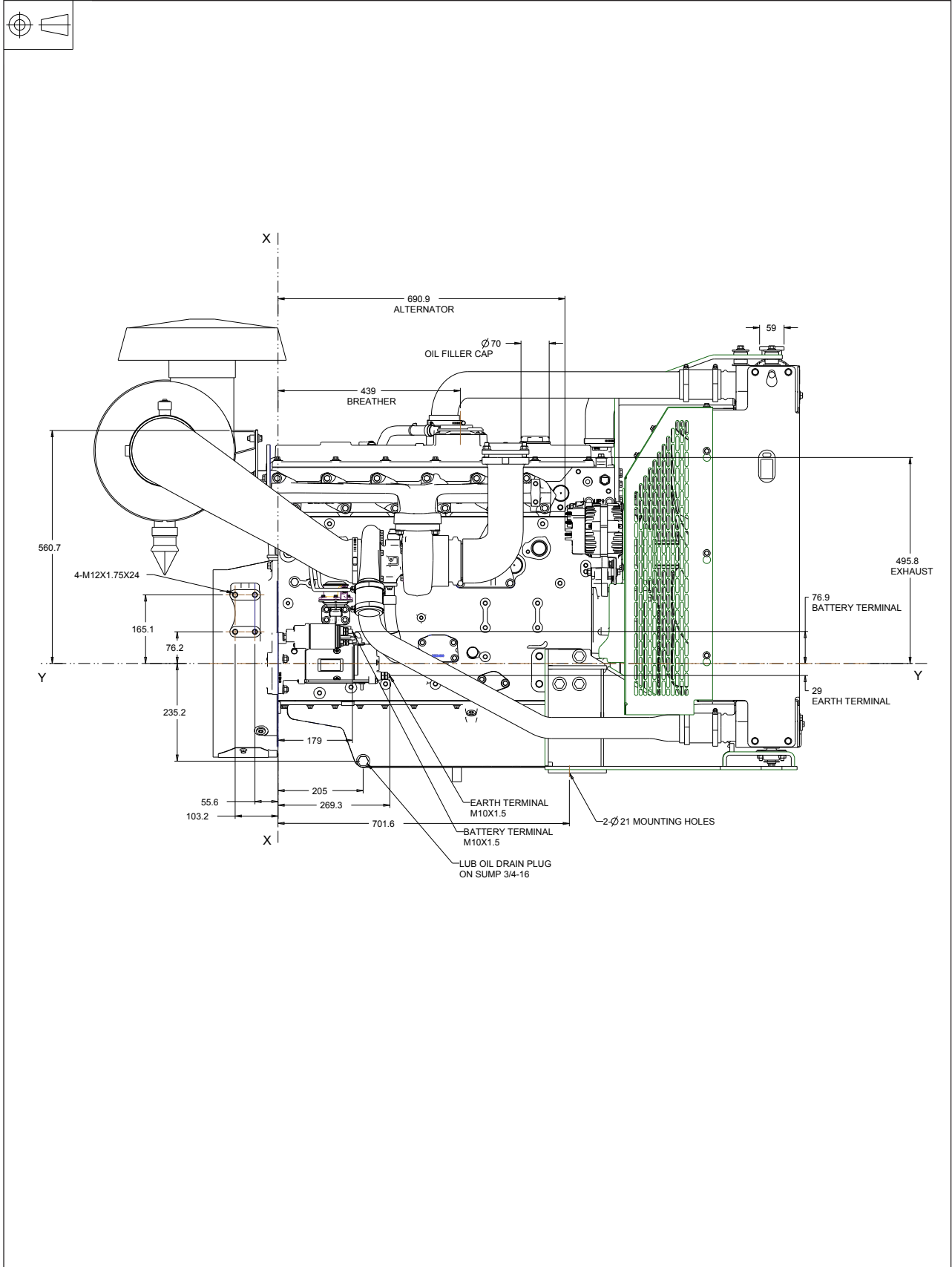
## Flywheel and housing options

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

# 1106A-70TAG3 - Front view

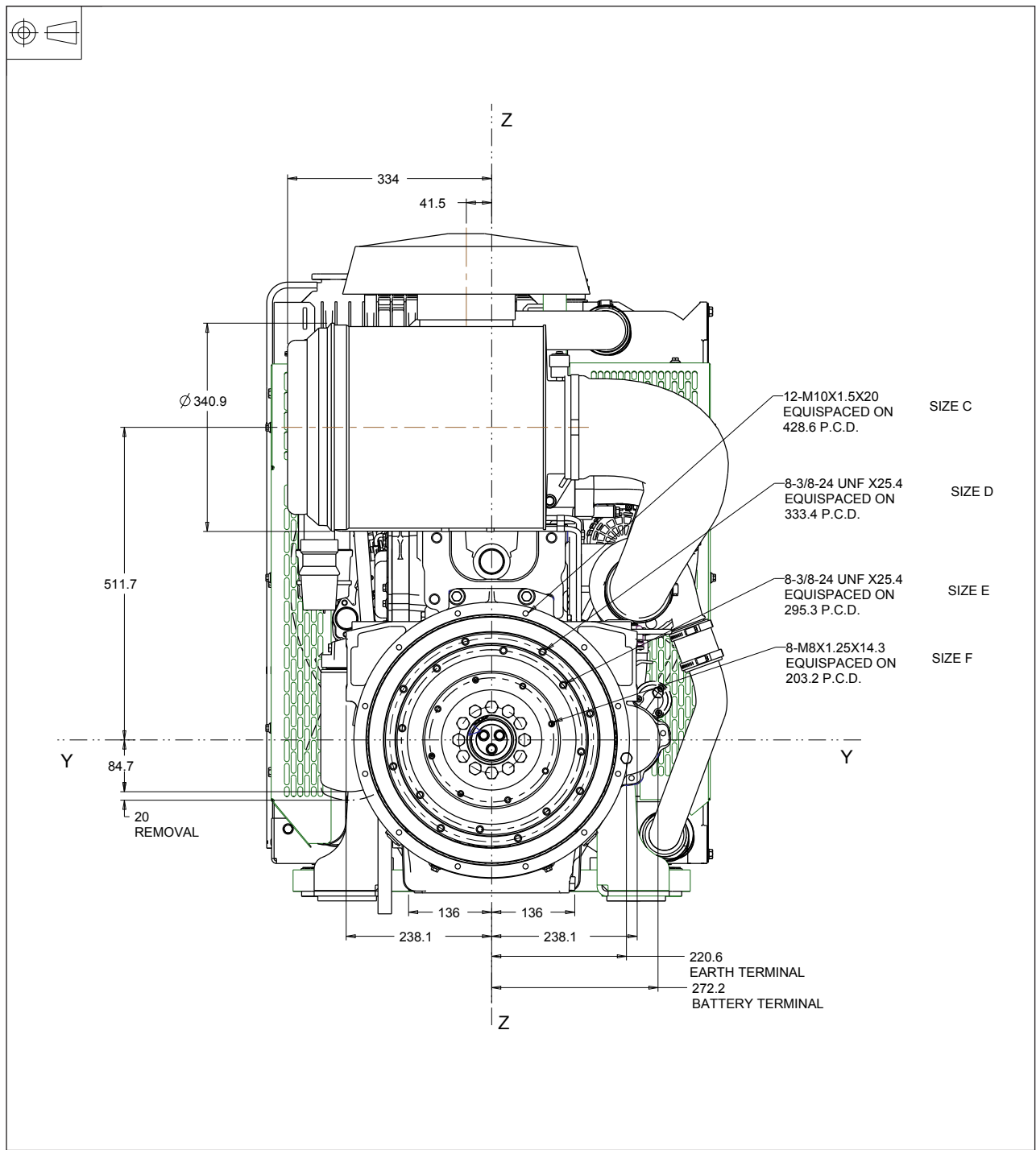


# 1106A-70TAG3 - Right side view





# 1106A-70TAG3 - 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		

