

2206A-E13TAG2

2206A-E13TAG3

2200

Series

ElectropaK

Basic technical data

Number of cylinders	6
Cylinder arrangement	Vertical inline
Cycle	4 stroke
Induction system	Turbocharged, air-to-air charge cooling
Combustion system	Direct injection diesel
Compression ratio	16,3:1
Bore	130 mm
Stroke	157 mm
Cubic capacity	12,5 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 of ElectropaK (dry)	1478 kg
Estimated total weight of ElectropaK (wet)	1582 kg

Overall dimensions, ElectropaK

Height	1725 mm
Length (air cleaner fitted)	2410 mm
Width	1120 mm

Moments of inertia (mk²)

Engine	1,36 kgm ²
Flywheel	1.41 kgm ²

Centre of gravity

Forward from rear of cylinder block	650 mm
Above crankshaft centre line	250 mm

Cyclic irregularity

1500 rev/min	1,54
1800 rev/min	1,82

Performance

Steady state speed capability at constant load - G3	± 0,25%
All ratings certified to within	±3%

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

Note: All data based on 42584 MJ/kg calorific value for diesel conforming to specification BS2869 Class A2.

Test conditions

Air temperature	25°C
Barometric pressure	100 kPa
Air inlet restriction at maximum power (nominal)	2,5 kPa
Exhaust back pressure at maximum power (nominal)	6,8 kPa
Relative humidity	30%
Fuel temperature (inlet pump)	40°C

Sound level

Sound pressure level (exhaust piped away, cooling pack and air cleaner fitted)	
1500 rev/min	102 dB(A)
1800 rev/min	104,6 dB(A)

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.

Note: Emissions capability: All 2206A ratings are to 'best fuel consumption' and do not comply to Harmonised International regulation Emission Limits

General installation - 2206A-E13TAG2

Designation	Units	Prime	Standby	Prime	Standby
		50 Hz @ 1500 rev/min		60 Hz @ 1800 rev/min	
Gross engine power	kWb	324,2	368,4	373,4	406,5
Brake mean effective pressure (BMEP)	kPa	2061	2355	1984	2171
Combustion air flow (at rated speed)	m ³ /min	21,3	23,6	27,4	29,0
Exhaust gas flow (maximum)	m ³ /min	56,6	64,8	67,5	73,5
Exhaust gas mass flow	kg/min	25,1	27,8	32,6	34,5
Exhaust gas temperature (turbocharger outlet)	°C	630	630	630	660
Boost pressure ratio		2,8	3,2	3,1	3,4
Overall thermal efficiency (nett)	%	41,3	40,8	40,7	40,3
Typical generator set electrical output (0.8 pf 25°C)	kWe	280	320	320	350
	kVA	350	400	400	438
Assumed alternator efficiency	%	92,0			

Energy balance

Designation	Units	50 Hz @ 1500 rev/min		60 Hz @ 1800 rev/min	
		Prime power	Standby	Prime power	Standby
Energy in fuel	kWt	739,9	854,1	857,0	945,7
Energy in power output (gross)	kWb	324,2	368,4	373,4	406,5
Energy to additional losses	kWb	4,9	5,5	5,6	6,1
Energy to cooling fan	kWm	14,0		19,0	
Energy in power output (nett)	kWt	305,3	348,9	343,8	381,4
Energy to exhaust	kWt	213,2	245,3	244,7	273,7
Energy to coolant and lubricating oil	kWt	113,5	128,5	130,2	139,5
Energy to charge cooler	kWt	64,8	79,7	68,4	76,5
Energy to radiation	kWt	24,1	32,2	40,3	49,5

Rating definitions

Prime power

Variable load. Unlimited hours usage with an average load factor of 70% of the published prime power rating over each 24 hour period. A 10% overload is available for 1 hour in every 12 hours of 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.

General installation - 2206A-E13TAG3

Designation	Units	Prime	Standby	Prime	Standby
		50 Hz @ 1500 rev/min		60 Hz @ 1800 rev/min	
Gross engine power	kWb	368,4	412,5	373,4	406,5
Brake mean effective pressure (BMEP)	kPa	2344	2637	1984	2171
Combustion air flow (at rated speed)	m³/min	24,3	26,4	27,4	29,0
Exhaust gas flow (maximum)	m³/min	64,6	72,5	67,5	73,5
Exhaust gas mass flow	kg/min	28,1	30,9	32,6	34,5
Exhaust gas temperature (turbocharger outlet)	°C	630	630	630	660
Boost pressure ratio		3,2	3,5	3,1	3,4
Overall thermal efficiency (nett)	%	41,4	40,9	40,7	40,3
Typical generator set electrical output (0,8 pf 25°C)	kWe	320	360	320	350
	kVA	400	450	400	438
Assumed alternator efficiency	%	92,0			

Energy balance

Designation	Units	50 Hz @ 1500 rev/min		60 Hz @ 1800 rev/min	
		Prime power	Standby	Prime power	Standby
Energy in fuel	kWt	842,6	958,2	857,0	945,7
Energy in power output (gross)	kWb	368,4	412,5	373,4	406,5
Energy to additional losses	kWb	5,5	6,2	5,6	6,1
Energy to cooling fan	kWm	14		19	
Energy in power output (nett)	kWt	348,9	392,3	348,8	381,4
Energy to exhaust	kWt	252,6	290,4	244,7	273,7
Energy to coolant and lubricating oil	kWt	127,3	139,9	130,2	139,5
Energy to charge cooler	kWt	60,3	75,5	68,4	76,5
Energy to radiation	kWt	34,0	39,8	40,3	49,6

Rating definitions

Prime power

Variable load, Unlimited hours usage with an average load factor of 70% of the published prime power rating over each 24 hour period, A 10% overload is available for 1 hour in every 12 hours of 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.

Cooling system

Radiator

Face area	1.238 mm ²
Number of rows and materials	1 row, Aluminium
Matrix density and material	12 fins per inch, Aluminium
Width of matrix	1048 mm
Height of matrix	1100 mm
Weight of radiator (dry)	132 kg
Pressure cap setting (minimum)	70 kPa

Charge cooler

Face area	1.006 mm ²
Number of rows and materials	1 row, Aluminium
Matrix density and material	12 fins per inch, Aluminium
Width of matrix	915 mm
Height of matrix	1100 mm

Coolant pump

Speed @ 1500 rev/min	2056 rev/min
Speed @ 1800 rev/min	2468 rev/min
Drive method	Gear

Fan

Diameter	927 mm
Drive ratio	0,92:1
Number of blades	9
Material	Composite
Type	Pusher
Cooling fan air flow @ 1500 rev/min	654 m ³ /min
Cooling fan air flow @ 1800 rev/min	788 m ³ /min

Coolant

Total system capacity	51,4 litres
Maximum top tank temperature	104 °C
Temperature rise across engine	10 °C
Maximum pressure in engine cooling circuit	70 kPa
Maximum permissible external system resistance	30 kPa
Maximum static pressure head on pump	30 kPa
Coolant flow against 30 kPa restriction	
1500 rev/min	5,3 litres/sec
1800 rev/min	6,7 litres/sec
Thermostat operation range	87 to 98 °C

Note: For details of recommended coolant specifications, refer to the Operation and Maintenance Manual for this engine model

Duct allowance 2206A-E13TAG2 - standby

Maximum additional restriction (duct allowance) to cooling airflow and resultant minimum airflow			
Engine speed rev/min	Ambient clearance inhibited coolant °C	Duct allowance Pa	m3/min
1500	59	200	563
1800	59	200	716

2206A-E13TAG3 - standby

Maximum additional restriction (duct allowance) to cooling airflow and resultant minimum airflow			
Engine speed rev/min	Ambient clearance inhibited coolant °C	Duct allowance Pa	m3/min
1500	55	200	563
1800	59	200	716

Electrical system

Type	24 volts negative earth
Alternator type	22 SI
Alternator voltage	24 volts
Alternator output	70 amps
Starter motor type	39 MT
Starter motor voltage	24 volts
Starter motor power	7,8 kW
Number of teeth on the flywheel	113
Number of teeth on starter pinion	11
Minimum cranking speed	106 rev/min
Starter solenoid maximum Pull-in current @ 0°C	200 amps
Hold-in current @ 0°C	25 amps

Cold start recommendations

	5 to -10°C	-11 to -25°C
SAE grade Oil	15W40	5W40
Starter	42MT	
Battery	24 volts	
Maximum breakaway current	1311 amps	1585 amps
Cranking current	588 amps	828 amps
Starting Aids (ECM controlled)	None	Block heater 1,5 (110V/240V)
Minimum mean cranking speed	106 rev/min	

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 the battery capacity available. Cables should be capable of handling transient current twice that of cranking current.

Exhaust system

Maximum back pressure - 1800 rev/min	10 kPa
Exhaust outlet, internal diameter	123 mm

Fuel system

Injection system	MEUI
Injector type	MEUI
Governor type	electronic
Governing conforms to	ISO 8528-5 Class G2
Injector pressure	207 MPa

Fuel lift pump

Lift pump type	gear driven
Lift pump delivery - 1500 rev/min	480 litres/min
Lift pump delivery - 100 rev/min	600 litres/min
Lift pump delivery pressure	621 kPa
Maximum suction head at pump inlet	3 m
Maximum static pressure head	4 m
Maximum fuel inlet temperature	55°C
Fuel filter spacing primary	10 microns
Fuel filter spacing secondary	2 microns

Fuel specification

BS2869 Class A2 or BSEN590
ASTM D975 Class 1D and Class 2D

Note: For further information on fuel specifications and restrictions, refer to the OMM, "Fluid Recommendations" for this engine model.

Induction system

Maximum air intake restriction

Clean filter	2,5 kPa
Dirty filter	6,4 kPa
Air filter type	Paper element - 15 inch diameter

Fuel consumption

2206A-E13TAG2 - 1500 rev/min

Load	2206A-E13TAG2 - 1500 rev/min	
	g/kWh	litres/hr
Standby	195	80
110% Prime power	195	77
100% Prime power	196	71
75% Prime power	198	54
50% Prime power	203	37

2206A-E13TAG3 - 1500 rev/min

Load	2206A-E13TAG3 - 1500 rev/min	
	g/kWh	litres/hr
Standby	194	90
110% Prime power	196	89
100% Prime power	197	81
75% Prime power	199	62
50% Prime power	202	42

2206A-E13TAG2 - 1800 rev/min

Load	2206A-E13TAG2 - 1800 rev/min	
	g/kWh	litres/hr
Standby	193	87
110% Prime power	195	88
100% Prime power	196	81
75% Prime power	199	62
50% Prime power	205	43

2206A-E13TAG3 - 1800 rev/min

Load	2206A-E13TAG3 - 1800 rev/min	
	g/kWh	litres/hr
Standby	193	87
110% Prime power	195	88
100% Prime power	196	81
75% Prime power	199	62
50% Prime power	205	43

Note: All fuel consumption figures are based on nett power

Lubrication system

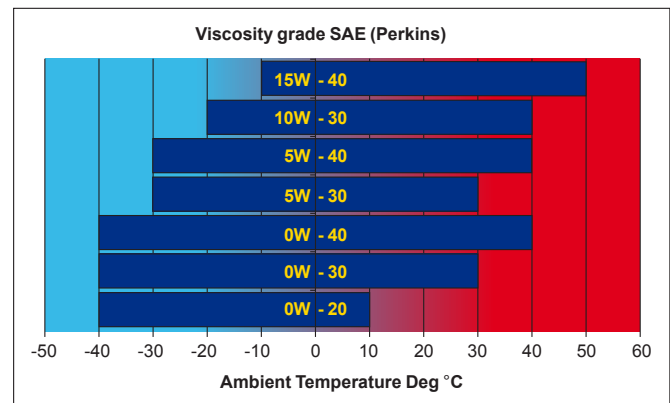
Maximum total system oil capacity 40,0 litres
 Minimum oil capacity in sump 32,5 litres
 Maximum oil capacity in sump 38,0 litres
 Maximum engine operating angles -
 Front up, front down, right side, left side 7°

Lubricating oil

Oil flow @ 1500 rev/min 140 litres/min
 Oil flow @ 1800 rev/min 172 litres/min
 Oil pressure at bearings (1500 rev/min) 310 kPa
 Oil pressure at bearings (1800 rev/min) 358 kPa
 Oil pressure at bearings (minimum) 270 kPa
 Oil temperature (continuous operation) 113 °C
 Oil consumption at full load as a % of fuel consumption 0.15%
 Oil filter screen spacing 30 microns
 Oil consumption as % of fuel consumption 0.1
 Sump drain plug tapping 1 1/8 UNF
 Lubricating oil specification API-CH4 - SAE15W-40

Recommended SAE viscosity

A multigrade oil must be used which conforms to EMALRG-1 or API CH-4 viscosity grade must be used, see illustration below:



Mountings

Maximum static bending moment at rear face of block 1356 Nm

Load acceptance

The information shown below complies with the requirements of classification 3 and 4 of ISO 8528-12 and G2 operating limits stated in ISO 8528-5

The below figures were obtained under the following test conditions:

Minimum engine block temperature..... 45°C
 Ambient temperature..... 15°C
 Governing mode..... isochronous
 Alternator efficiency..... 92%
 Alternator inertia..... 6.9 kgm²
 Under frequency roll off (UFRO) point set to..... 1 Hz below rated
 UFRO rate set to..... 2% voltage / 1% frequency
 LAM on/off..... Off

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

TAG2 (cold)

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	%	66	80
Load (nett)	kWm	184,8	256
Transient frequency deviation	%	< 10	< 10
Frequency recovery time	Seconds	5	5

Second load application: When engine reaches rated speed (5 seconds after initial load application)			
Description	Units	50 Hz	60 Hz
% of Prime power	%	73	85
Load (nett)	kWm	204,4	272
Transient frequency deviation	%	< 10	< 10
Frequency recovery time	Seconds	5	5

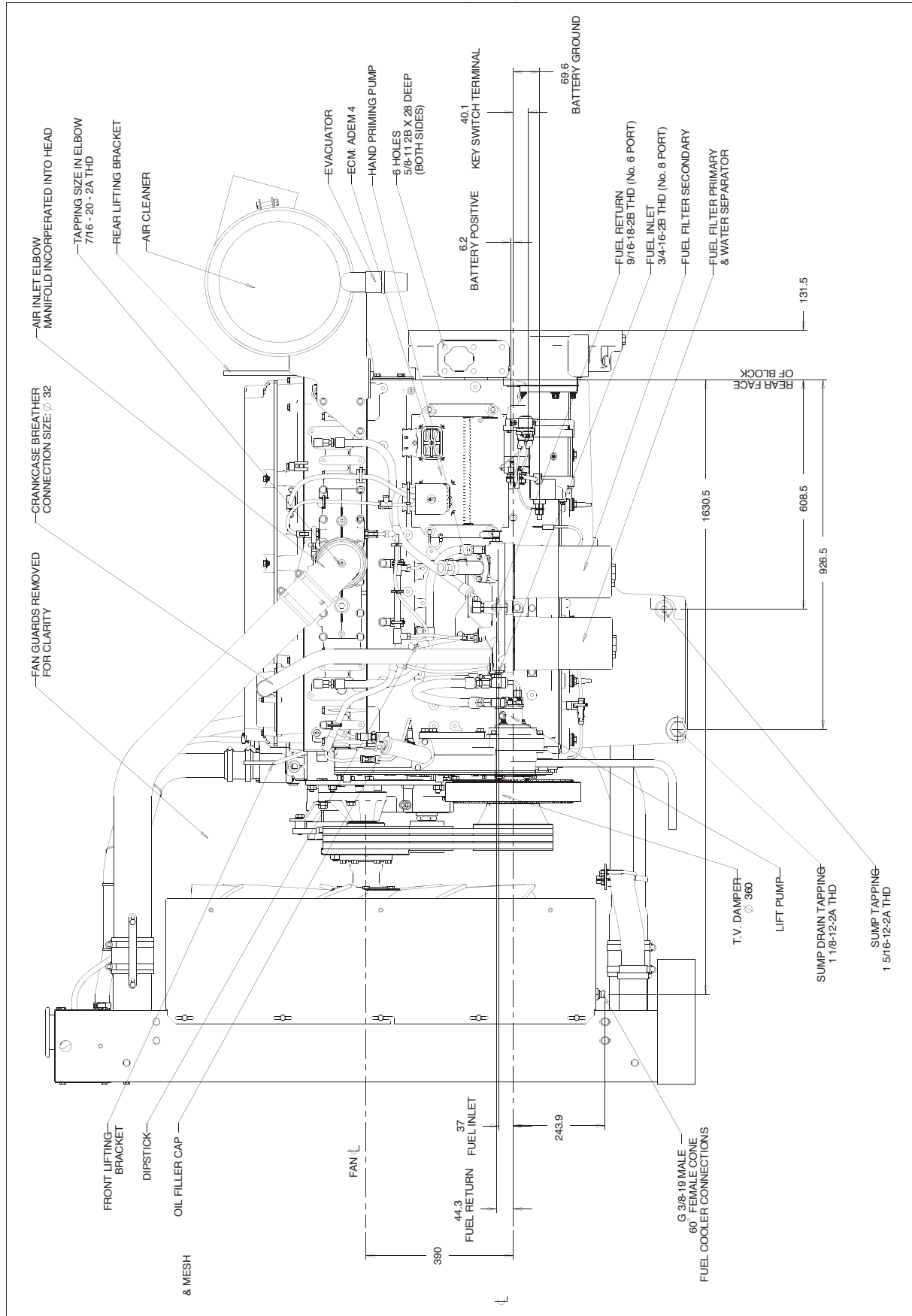
TAG3 (cold)

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	%	58	80
Load (nett)	kWm	185,6	256
Transient frequency deviation	%	< 10	< 10
Frequency recovery time	Seconds	5	5

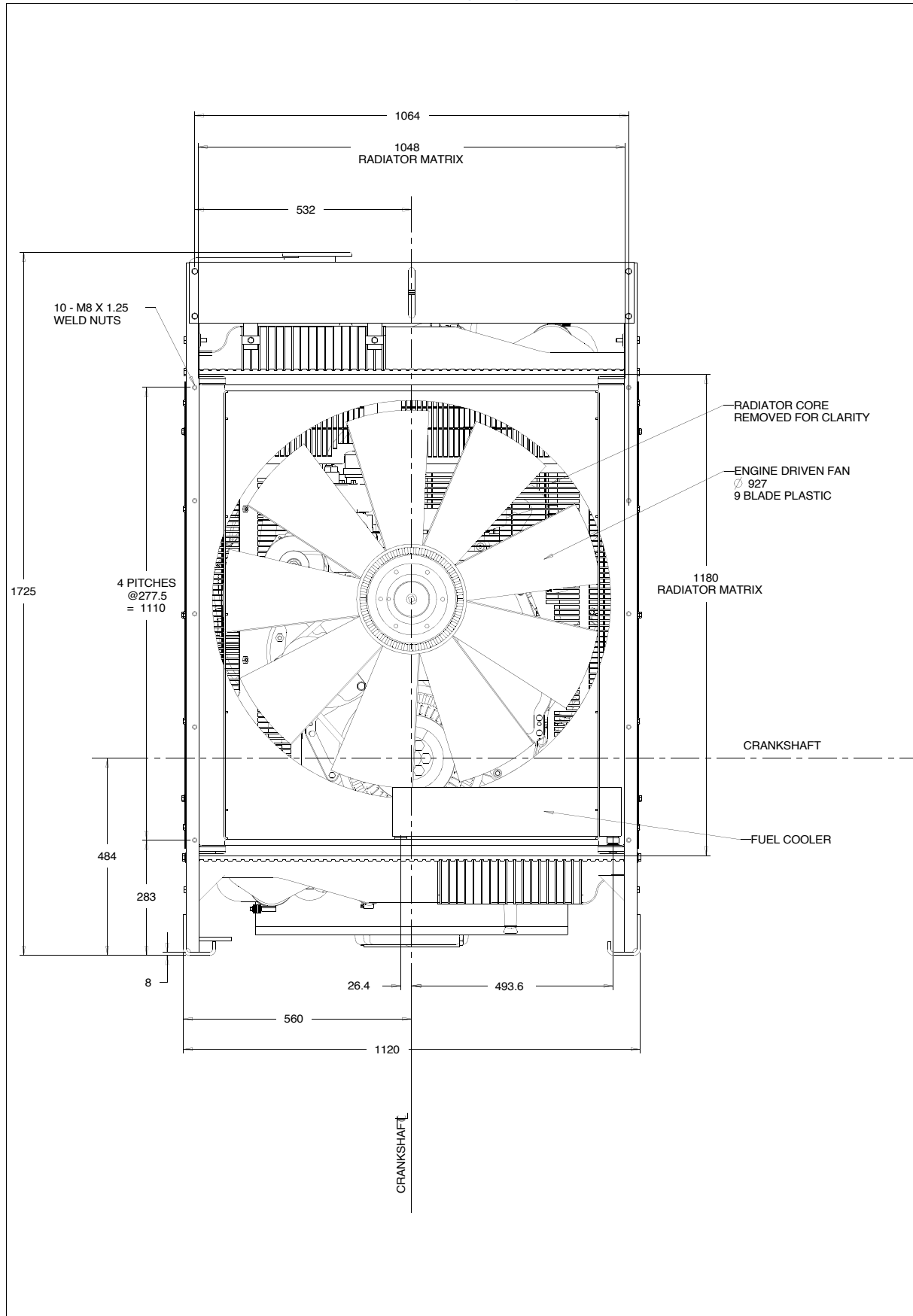
Second load application: When engine reaches rated speed (5 seconds after initial load application)			
Description	Units	50 Hz	60 Hz
% of Prime power	%	65	85
Load (nett)	kWm	208	272
Transient frequency deviation	%	< 10	< 10
Frequency recovery time	Seconds	5	5

Note: The general arrangement drawings shown in this data sheet are for guidance only. For installation purposes, latest versions should be requested from the Applications Dept., Perkins Engines Stafford, ST16 3UB United Kingdom.

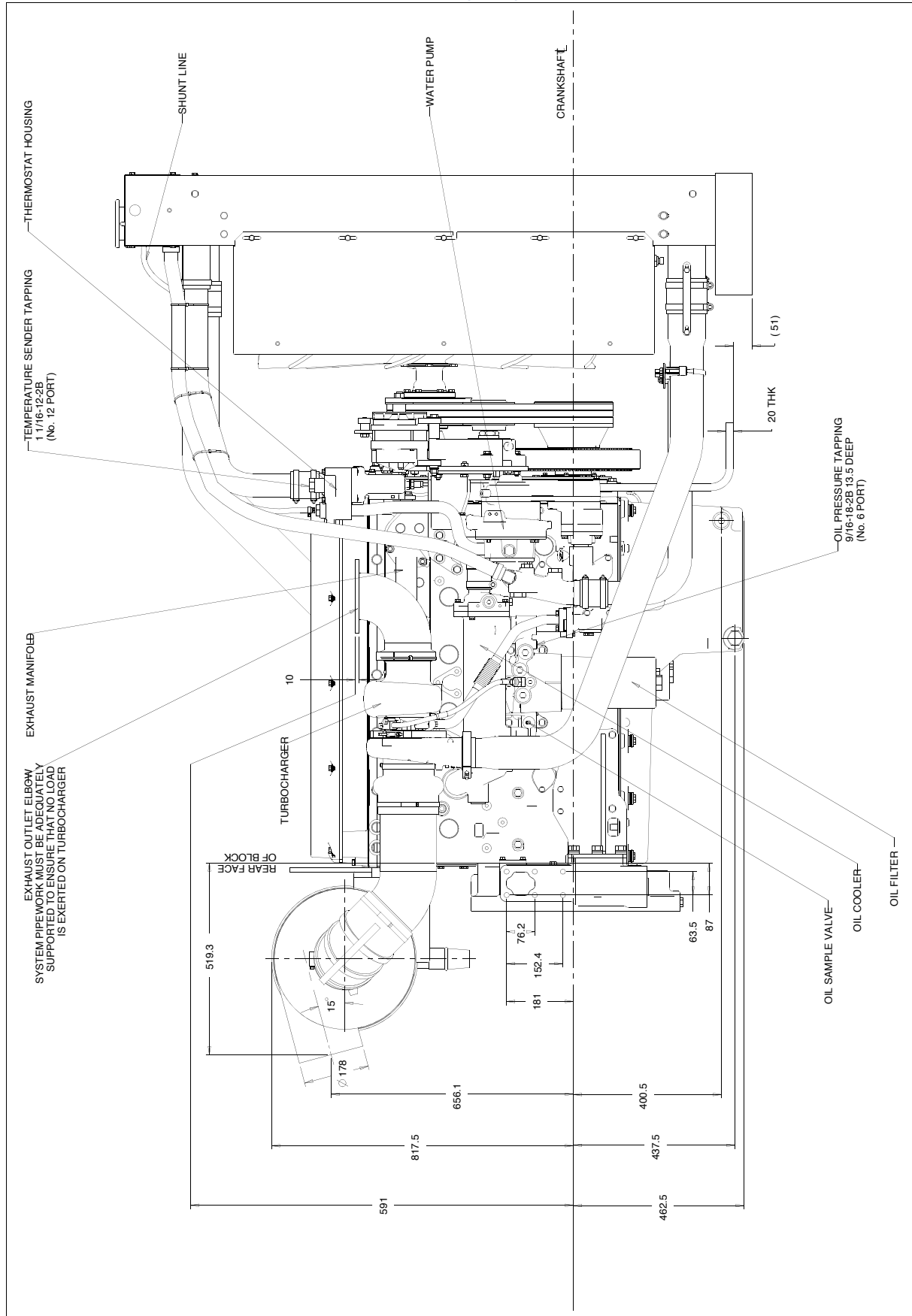
2206A-E13TAG2 and 2206A-E13TAG3 - GA Z13622 (50Hz)



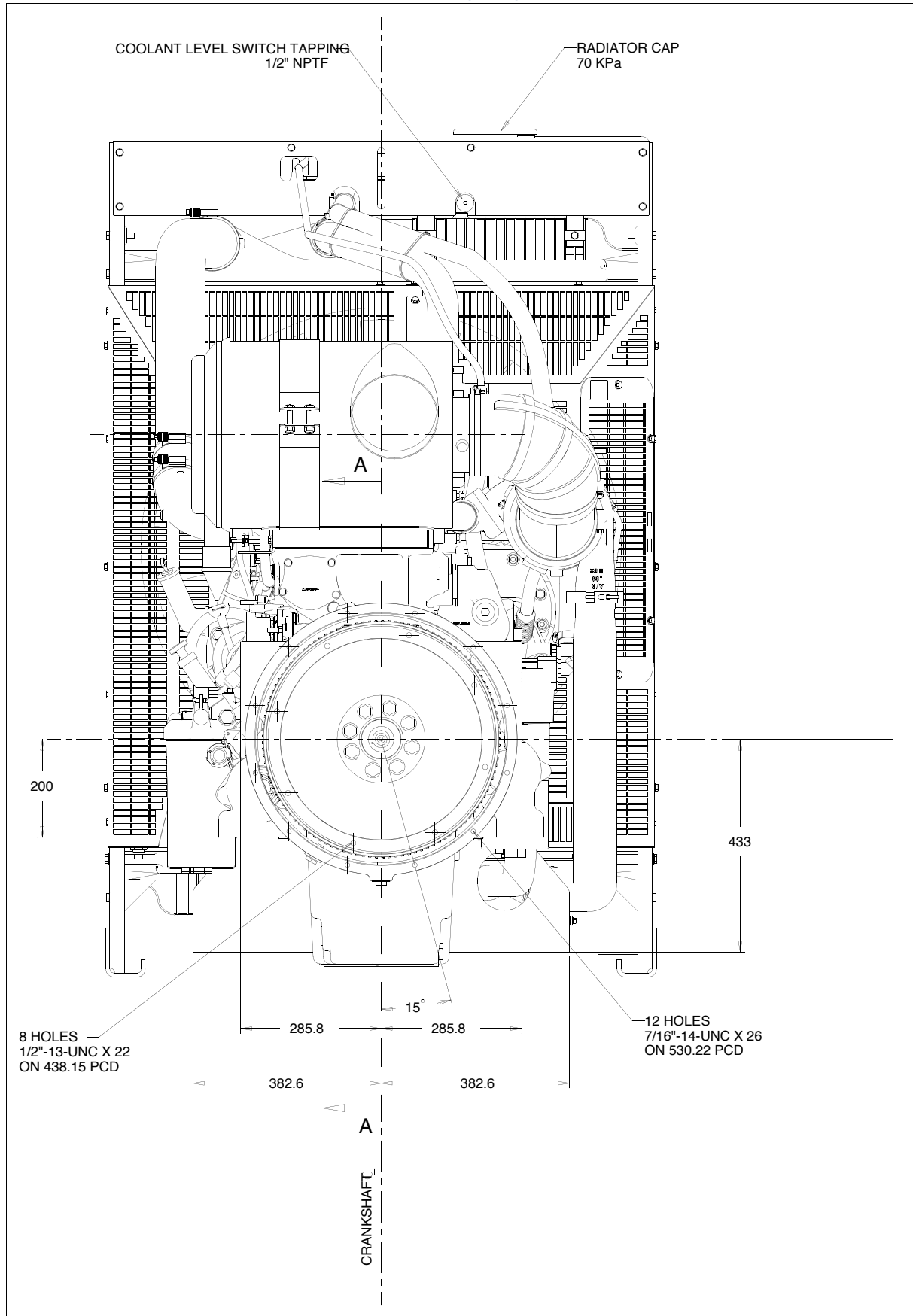
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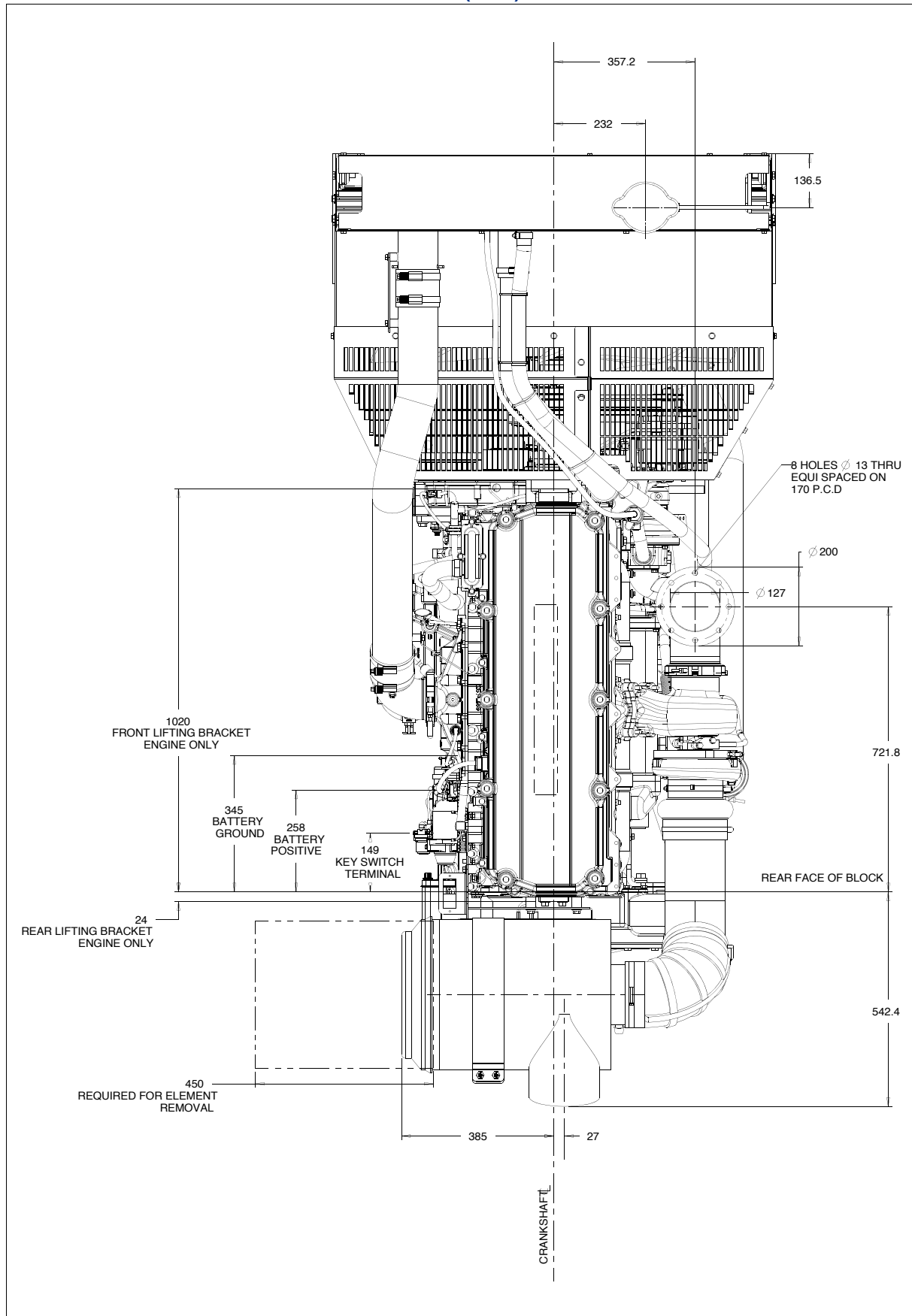
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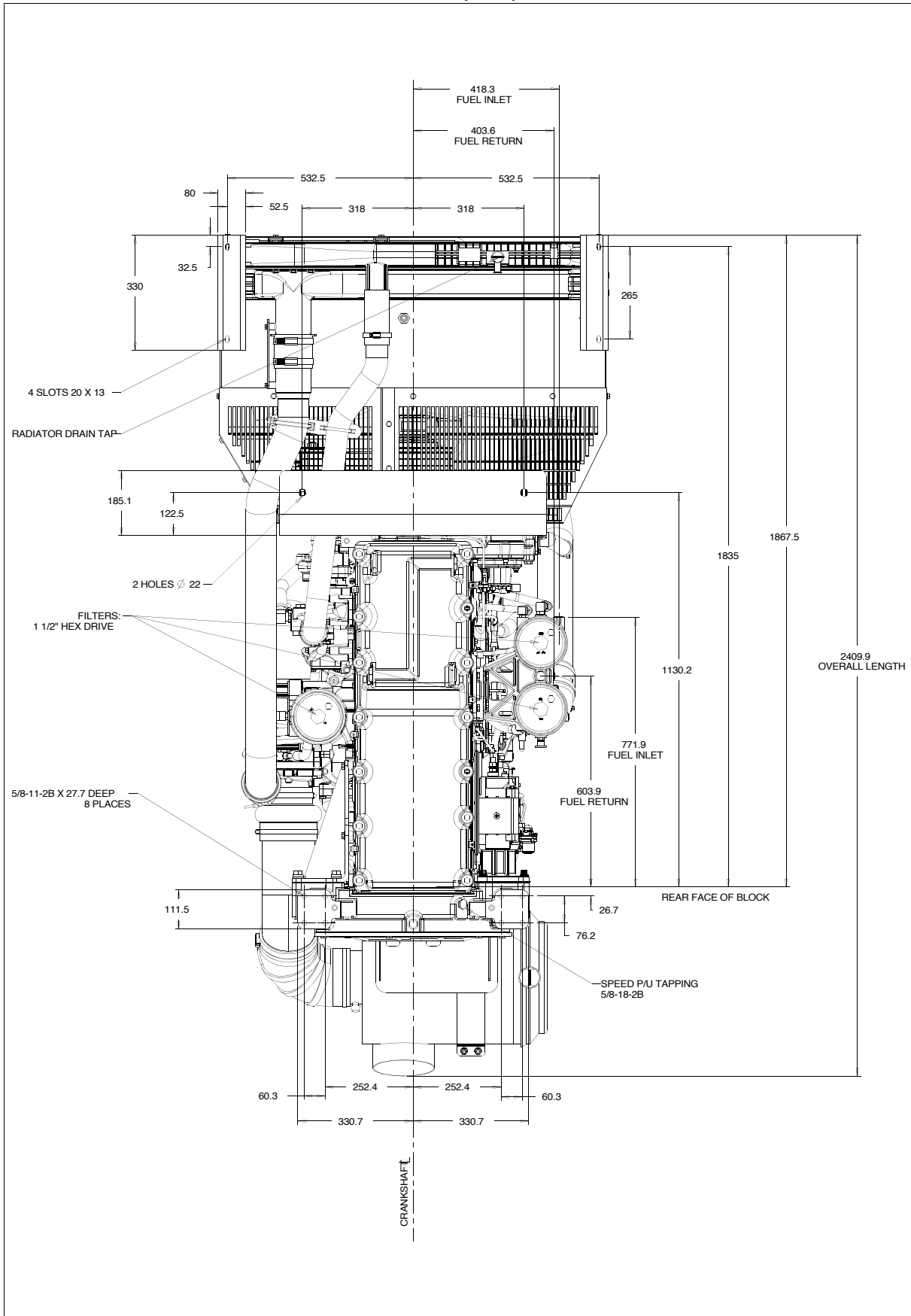
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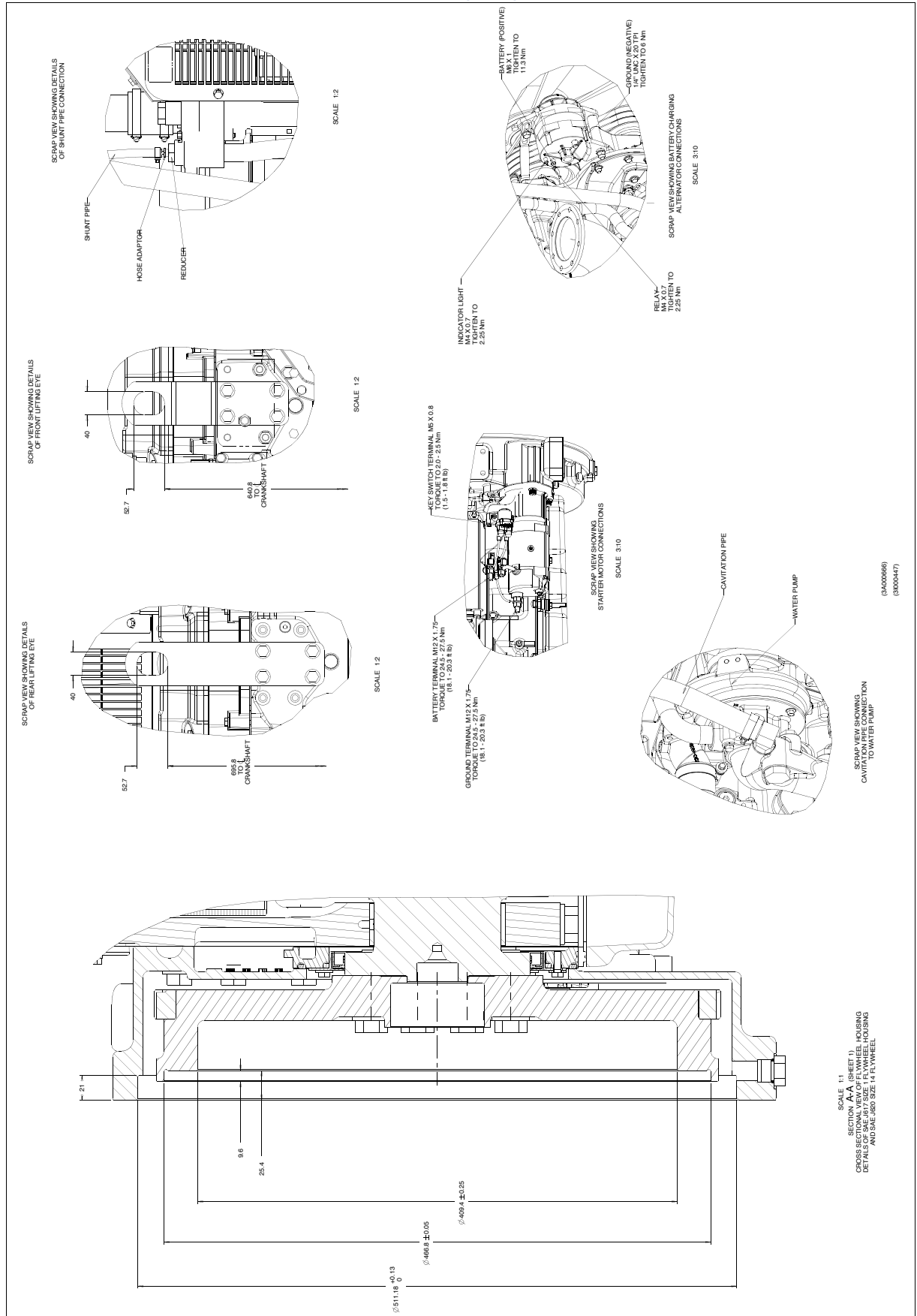
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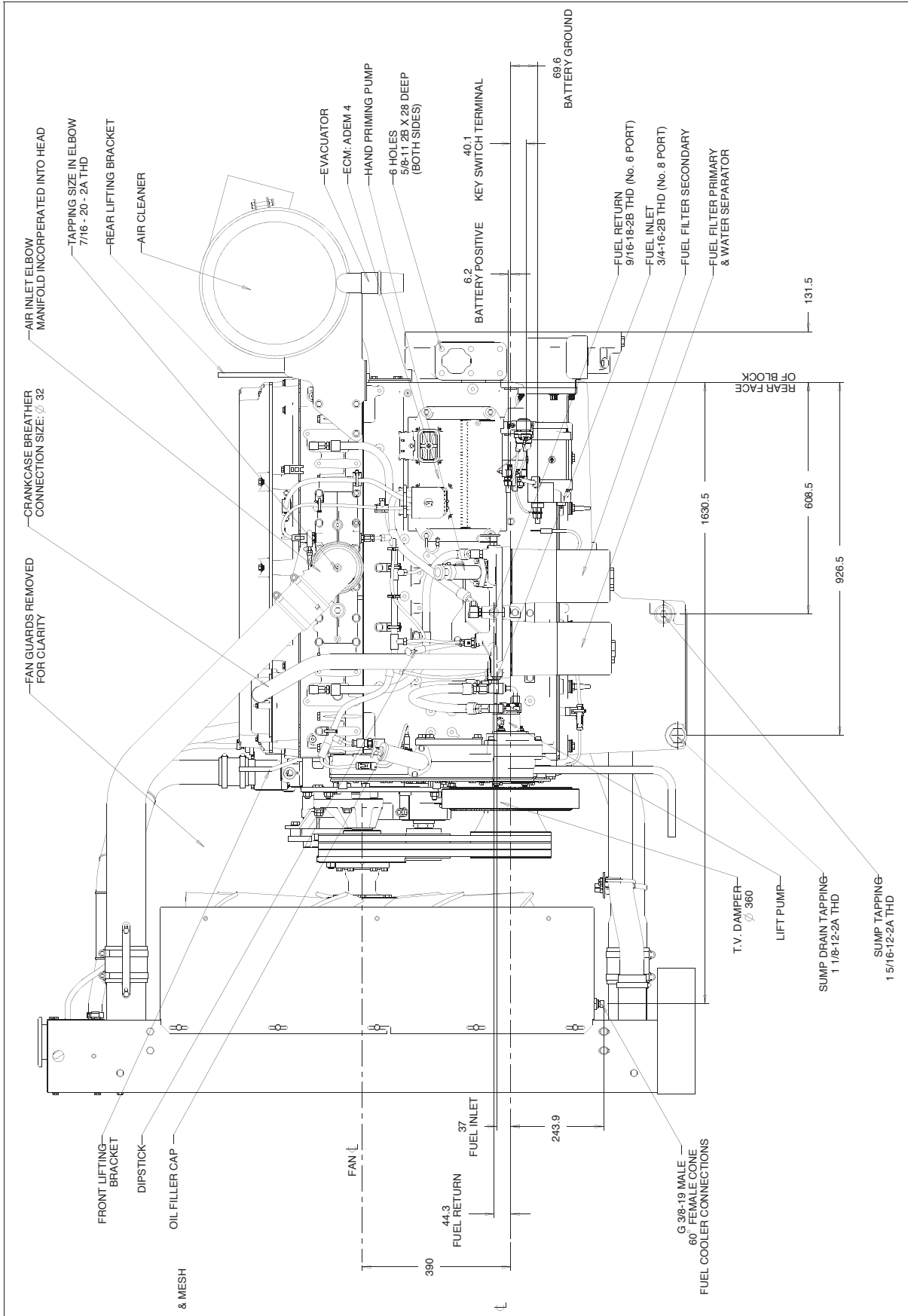
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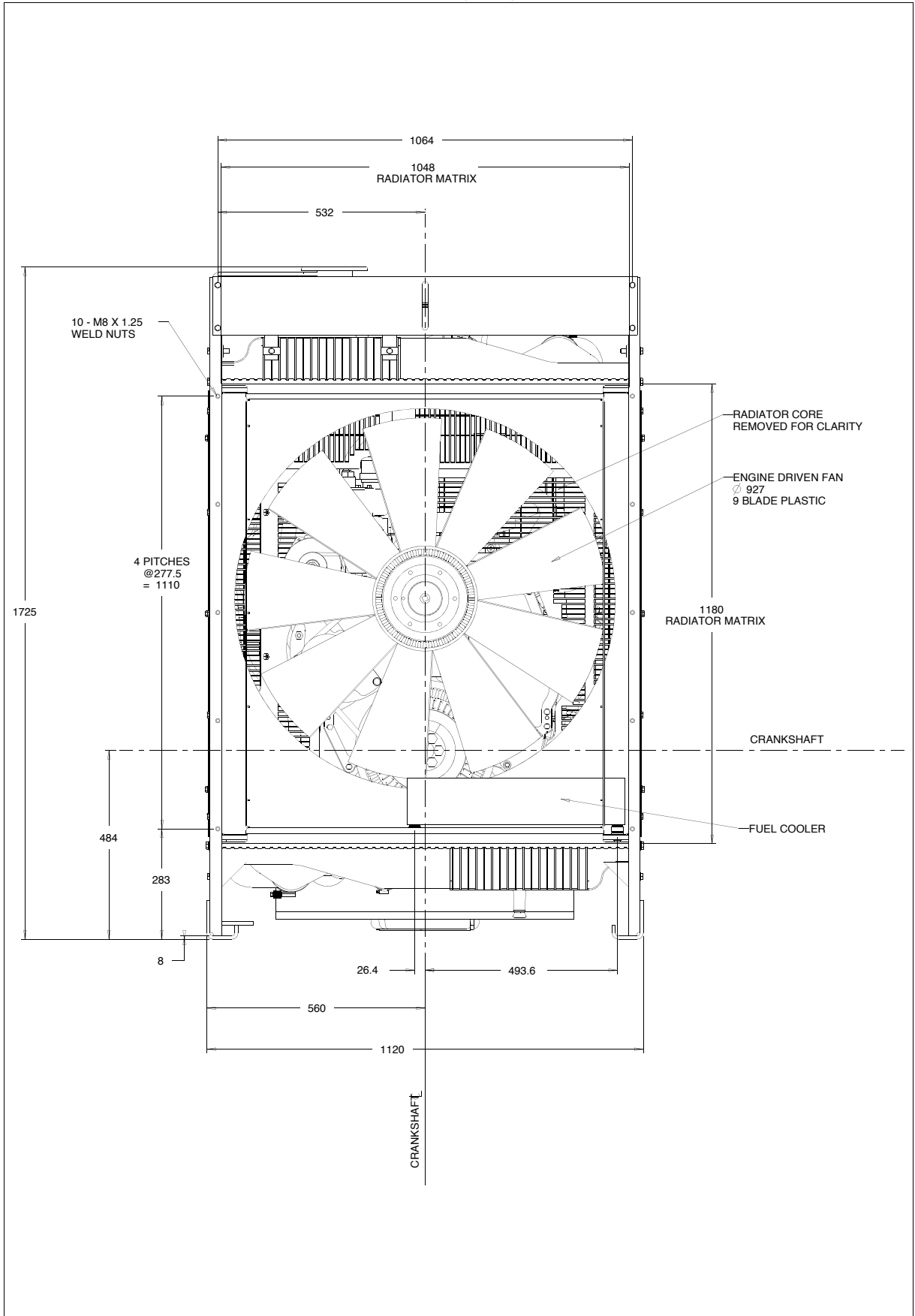
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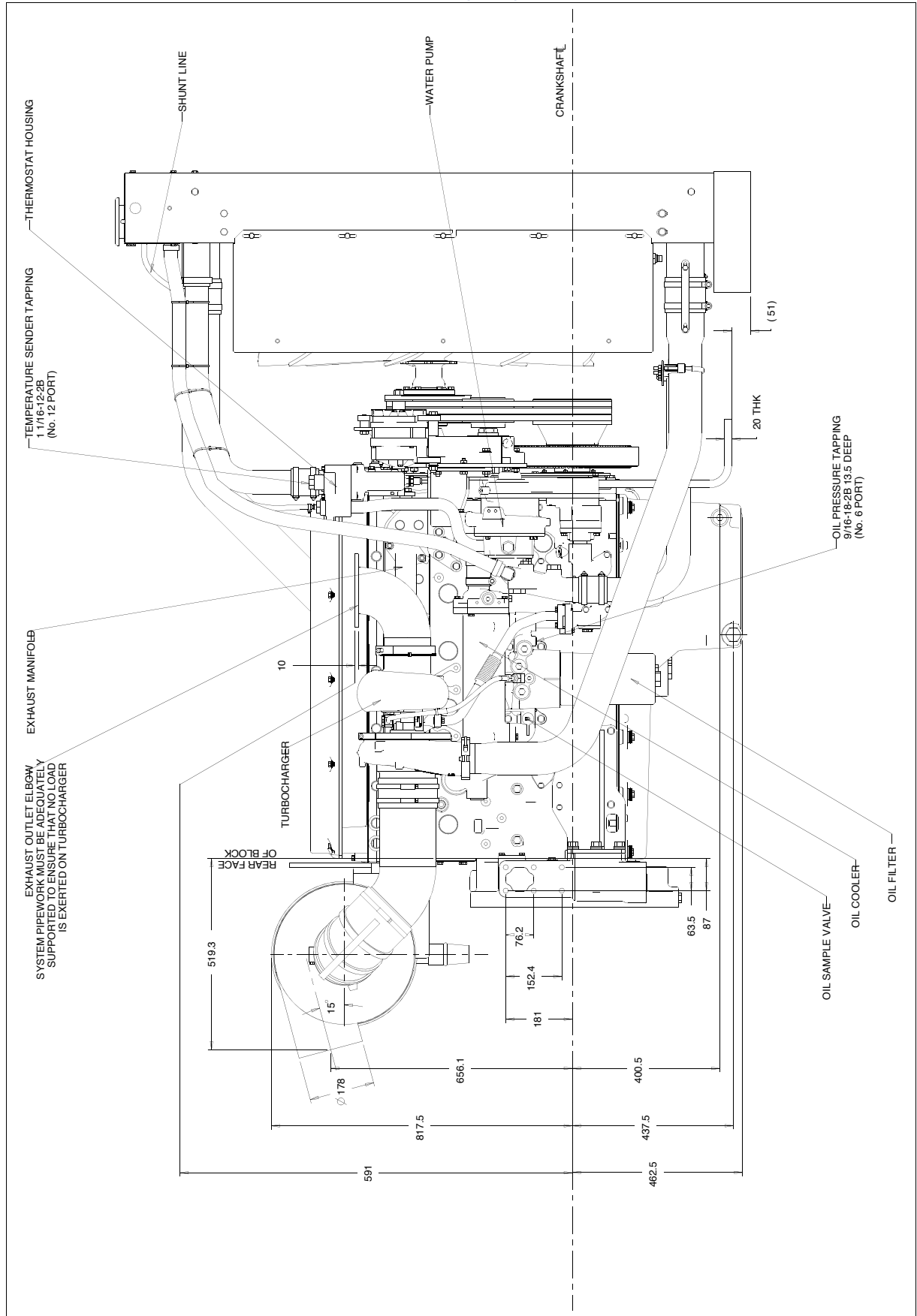
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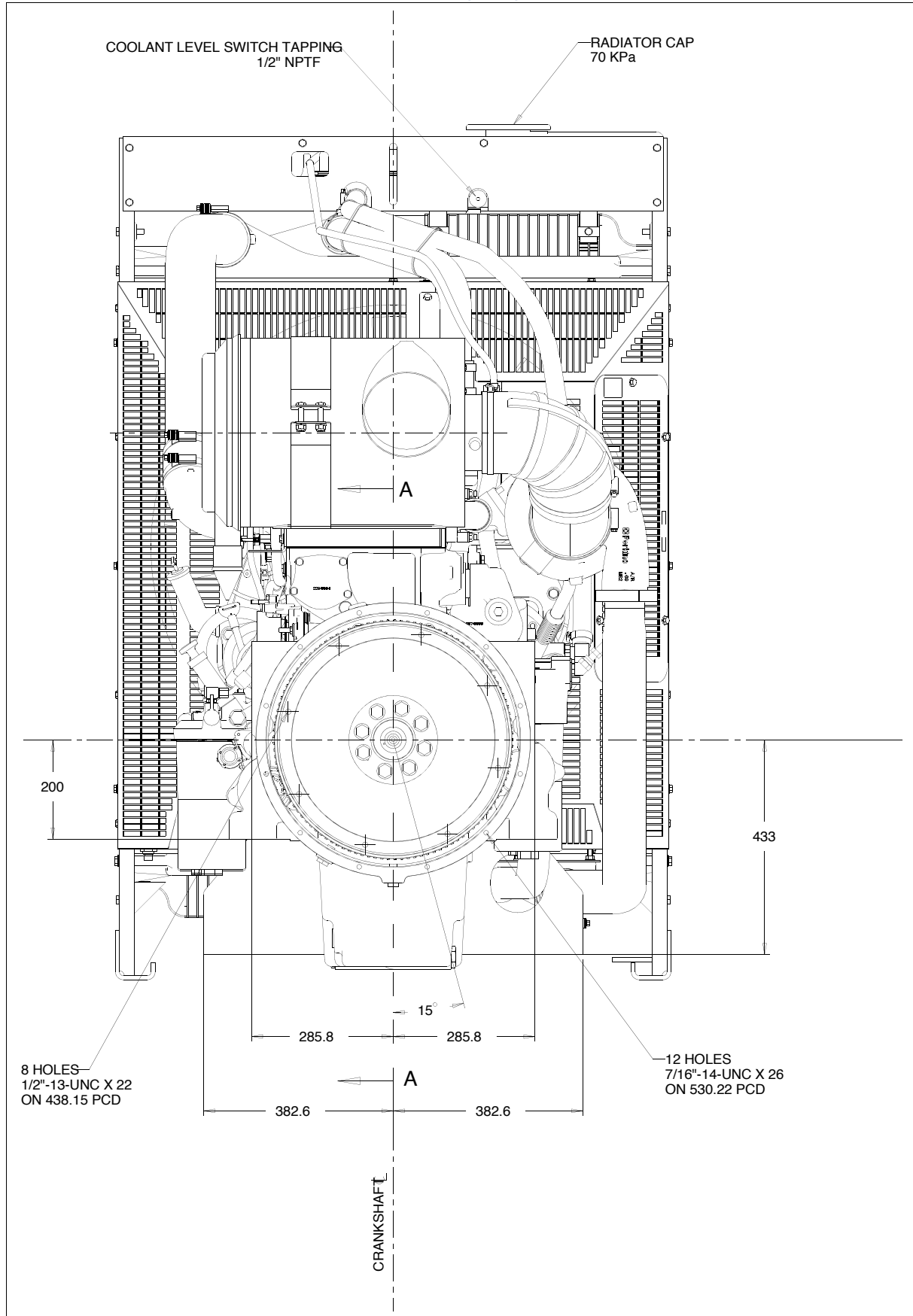
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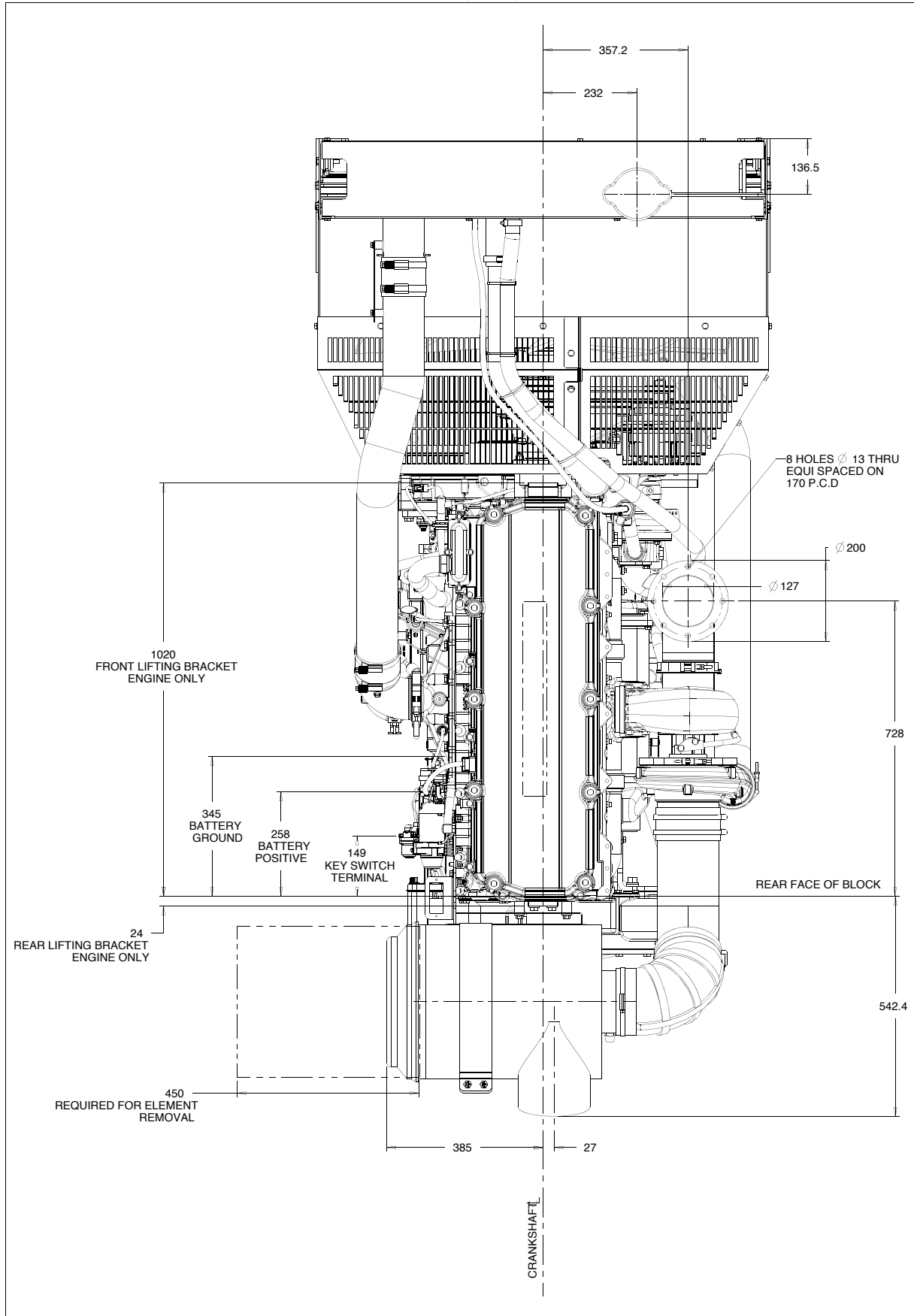
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2206A-E13TAG2 and 2206A-E13TAG3 - GA Z13620 (50Hz)



2206A-E13TAG2 and 2206A-E13TAG3 - GA Z13620 (50Hz)



2206A-E13TAG2 and 2206A-E13TAG3 - GA Z13620 (50Hz)

