

Genset	60 Hz		07/07
ENGINE SPEED (rpm):	900	FUEL TYPE:	Nat Gas
COMPRESSION RATIO:	10.5:1	MIN. FUEL PRESSURE (PSIG):	43
AFTERCOOLER - STAGE 1 (°F)	199	MIN. RATED METHANE NUMBER:	80
AFTERCOOLER - STAGE 2 (°F)	129	RATED ALTITUDE @ 77°F (ft):	1640
JACKET WATER OUTLET (°F)	210	FUEL LHV (BTU/SCF):	905
IGNITION SYSTEM:	CIS/A3	ASSUMED GENERATOR EFFICIENCY (%):	97.0
EXHAUST MANIFOLD:	DRY	GENERATOR POWER FACTOR	0.8

RATING	NOTES	LOAD	100%	75%	50%
ENGINE POWER	(2)	bhp	3228	2421	1614
GENERATOR POWER	(2)	ekW	2335	1751	1167
ENGINE EFFICIENCY (ISO 3046/1)	(1)	%	41.2	40.1	38.6
ENGINE EFFICIENCY (NOMINAL)	(1)	%	40.2	39.2	37.7

ENGINE DATA						
FUEL CONSUMPTION (ISO 3046/1)	(1)	BTU/bhp-hr	6181	6342	6591	
FUEL CONSUMPTION (NOMINAL)	(1)	BTU/bhp-hr	6331	6496	6751	
AIR FLOW (@ 77°F, 14.7 psia)		scfm	8,119	6,057	4,087	
AIR MASS FLOW		lb/hr	36,000	26,858	18,123	
COMPRESSOR OUTLET PRESSURE		psi (abs)	35.7	27.8	20	
COMPRESSOR OUTLET TEMPERATURE		°F	289	225	156	
INLET MANIFOLD PRESSURE		psi (abs)	34.8	26.8	19	
INLET MANIFOLD TEMPERATURE		°F	144	142	140	
LAMBDA			2.17	2.10	2.05	
TIMING		°BTDC	19.9	18.3	17.6	
EXHAUST STACK TEMPERATURE		°F	758	806	833	
EXHAUST GAS FLOW (@ stack temp, 14.5 psia)		ft ³ /min	19,990	15,497	10,681	
EXHAUST GAS MASS FLOW		lb/hr	37,047	27,639	18,650	

EMISSIONS						
NOx (as NO2)	(3)	g/bhp-hr	0.7	0.7	0.7	
CO	(3)	g/bhp-hr	2.5	2.5	2.5	
THC (molecular weight of 15.84)	(3)	g/bhp-hr	8.84	9.24	9.61	
NMHC (molecular weight of 15.84)	(3)	g/bhp-hr	1.33	1.39	1.45	
EXHAUST OXYGEN		%	12.3	12.2	11.9	

ENERGY BALANCE DATA						
FUEL INPUT ENERGY (LHV) (NOMINAL)	(1)	BTU/min	340,562	262,066	181,569	
WORK ENERGY (NOMINAL)	(2)	BTU/min	136,882	102,661	68,441	
HEAT REJ. TO JACKET WATER (NOMINAL)	(4)	BTU/min	28,276	24,581	19,868	
HEAT REJ. TO ATMOSPHERE (NOMINAL)	(5)	BTU/min	11,165	9,639	8,128	
HEAT REJ. TO LUBE OIL (NOMINAL)	(6)	BTU/min	17,250	15,793	13,402	
HEAT REJ. TO EXH. (LHV to 77°F) (NOMINAL)	(4)	BTU/min	125,126	100,072	70,158	
HEAT REJ. TO EXH. (LHV to 350°F) (NOMINAL)	(4)	BTU/min	66,271	55,451	39,745	
HEAT REJ. TO AFTERCOOLER STAGE 1 (NOMINAL)	(7) (8)	BTU/min	11,126	2,324	(2,689)	
HEAT REJ. TO AFTERCOOLER STAGE 2 (NOMINAL)	(6) (7)	BTU/min	10,736	6,996	4,261	

CONDITIONS AND DEFINITIONS

ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 3046/1 (STD. REF. CONDITIONS OF 25°C, 100 KPA, 152 m). NO OVERLOAD PERMITTED AT RATING SHOWN. CONSULT ALTITUDE CURVES FOR APPLICATIONS ABOVE MAXIMUM RATED ALTITUDE AND/OR TEMPERATURE.

NOTES

- FUEL CONSUMPTION TOLERANCE. ISO 3046/1 IS 0, + 5% OF FULL LOAD DATA. NOMINAL IS ± 2.5 % OF FULL LOAD DATA.
- ENGINE POWER AND WORK ENERGY INCLUDE 1 ENGINE DRIVEN WATER PUMP.
- EMISSION DATA SHOWN ARE DRY AND NOT TO EXCEED VALUES.
- HEAT REJECTION TO JACKET AND EXHAUST TOLERANCE IS ± 10% OF FULL LOAD DATA. (heat rate based on treated water)
- HEAT REJECTION TO ATMOSPHERE TOLERANCE IS ± 50% OF FULL LOAD DATA. (heat rate based on treated water)
- HEAT REJECTION TO LUBE OIL TOLERANCE IS ± 20% OF FULL LOAD DATA. (heat rate based on treated water)
- HEAT REJECTION TO AFTERCOOLER TOLERANCE IS ± 5% OF FULL LOAD DATA. (heat rate based on treated water)
- AFTERCOOLER HEAT STAGE 1 = (A/C HEAT STAGE 1 + 0.855 x (STAGE 1 + STAGE 2) x (ACHRF - 1)) : (heat rate based on treated water)
- AFTERCOOLER HEAT STAGE 2 = (A/C HEAT STAGE 2 + 0.145 x (STAGE 1 + STAGE 2) x (ACHRF - 1)) : (heat rate based on treated water)

FUEL USAGE GUIDE									
DERATE FACTOR vs CATERPILLAR METHANE NUMBER									
Methane Number	60	65	70	75	80	85	90	95	100
Rating Factor	0.00	0.87	0.91	0.95	1.00	1.00	1.00	1.00	1.00
Minimum Methane Number for Full Rating =							80.4		
Fuel System Limit (minimum Wobbe Index) =							1039 BTU/SCF		

TOTAL DERATION FACTORS - ALTITUDE & COOLING															
AIR TO TURBO (°F)	130	0.97	0.93	0.90	0.86	0.83	0.80	0.77	0.74	0.71	0.68	0.64	0.61	0.58	
	120	0.98	0.95	0.91	0.88	0.85	0.81	0.78	0.75	0.72	0.69	0.67	0.64	0.61	
	110	1.00	0.97	0.93	0.89	0.86	0.83	0.80	0.76	0.74	0.71	0.68	0.65	0.62	
	100	1.00	0.98	0.95	0.91	0.88	0.84	0.81	0.78	0.75	0.72	0.69	0.66	0.64	
	90	1.00	1.00	0.96	0.93	0.89	0.86	0.82	0.79	0.76	0.73	0.70	0.67	0.65	
	80	1.00	1.00	0.98	0.94	0.91	0.87	0.84	0.81	0.78	0.75	0.72	0.69	0.66	
	70	1.00	1.00	1.00	0.96	0.93	0.89	0.86	0.82	0.79	0.76	0.73	0.70	0.67	
	60	1.00	1.00	1.00	0.98	0.94	0.91	0.87	0.84	0.81	0.77	0.74	0.71	0.68	
	50	1.00	1.00	1.00	1.00	0.96	0.93	0.89	0.86	0.82	0.79	0.76	0.73	0.70	
			0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
	ALTITUDE (FEET ABOVE SEA LEVEL)														

AFTERCOOLER HEAT REJECTION FACTORS															
AIR TO TURBO (°F)	130	1.45	1.52	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	
	120	1.36	1.43	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	
	110	1.27	1.34	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	
	100	1.18	1.25	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	
	90	1.09	1.15	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	
	80	1.00	1.06	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	
	70	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	
	60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
			0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
	ALTITUDE (FEET ABOVE SEA LEVEL)														

ALLOWABLE INERTS IN THE FUEL:

The maximum amount of free inerts in the fuel is limited to 5%.

FUEL SYSTEM LIMIT:

Fuels with a Wobbe index lower than the limit, require a custom fuel system and engine control system mapping from the factory. The Wobbe index is determined using the Caterpillar Methane Number Calculation program.

FUEL USAGE GUIDE:

This table shows the derate factor required for a given fuel. Note that deration occurs as the methane number decreases. Methane number is a scale to measure detonation characteristics of various fuels. The methane number of a fuel is determined by using the Caterpillar Methane Number Calculation program.

TOTAL DERATION FACTORS:

This table shows the deration required for various air inlet temperatures and altitudes. Use this information along with the fuel usage guide chart to help determine actual engine power for your site. The total deration factor includes deration due to altitude and ambient temperature, and air inlet manifold temperature deration.

ACTUAL ENGINE RATING:

It is important to note that the Altitude/Temperature deration and the Fuel Usage Guide deration are not cumulative. They are not to be added together. To determine the actual power available, take the lowest rating between the Altitude/Temperature Deration and the Fuel Usage Guide Deration.

GENERATOR EFFICIENCY:

Generator power determined with an assumed generator efficiency of 97% [generator power=engine power x 0.97]. If the actual generator efficiency is less than 97% [and greater than 95%], the generator power [kW] listed in the technical data can still be achieved. The BSFC values must be increased by a factor. The factor is a percentage = 97% - actual generator efficiency [%].

EXHAUST STACK TEMPERATURE:

The exhaust stack temperature listed in the technical data is a nominal value with a tolerance = +35°C, -30°C (+63°F, -54°F)

AFTERCOOLER HEAT REJECTION FACTORS:

Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft altitude. To maintain a constant air inlet manifold temperature, as the air to turbo temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for ambient and altitude conditions. Multiply this factor by the standard aftercooler heat rejection. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail. For 2 Stage Aftercoolers with separate circuits, the 1st stage will collect 85.5% of the additional heat.