

21.9L



ENERGY

[Stoichiometric]
56100041 Rev: 2

General Engine Data ³											
Type	V-type 4 cycle				Flywheel housing			SAE No.1			
Number of cylinders	12				Flywheel			No. 14			
Aspiration	Turbo Charge Air Cooled				Dry Weight (Fan to Flywheel)		lb	kg	3630	1650	
Firing Order	1-12-5-8-3-10-6-7-2-11-4-9				Wet Weight (Fan to Flywheel)		lb	kg	3810	1732	
Rotation Viewed from Flywheel	Counter Clockwise				CG From Flywheel Housing Rear Face		in	mm	23.7	602	
Bore	in	mm	5.0	128	CG Above Crank Centerline		in	mm	7.2	182	
Stroke	in	mm	5.6	142	Max Bending Moment @ Rear of Block		lb/ft	N m	8130	6000	
Displacement	in ³	L	1336	21.9	Oil Specification		SAE 15W-40 Low Ash Gas engine oil (.25-.5% by wt), API CD/CF or higher				
Compression Ratio	10.5				Engine Oil Capacity ⁸		Min	qts	L	35.0	33.0
Exhaust Manifold Type	Water Cooled Manifold				Max		qts	L	42.4	40.0	
Turbo Exhaust Outlet Pipe Size	in	mm	2.5	65	ECU Oil Pressure Warning ⁵		psi	bar	30	2.1	
Catalyst Inlet Size	in	mm	3.5	89	ECU Oil Pressure Shut Down ⁶		psi	bar	25	1.7	
Catalyst Dp	in-H ₂ O	kPa	20.5	5.1	Oil Pressure at 1000 rpm (Idle)		Min	psi	bar	13	0.9
Maximum Allowable Exhaust Back Pressure	in-Hg	kPa	3.0	10.2	Max		psi	bar	44	3.0	
Maximum Fuel System Pressure	psi	kPag	1.0	6.9	Max Allowable Oil Temperature		°F	°C	250	121	
Maximum Operating pressure to EPR	in-H ₂ O	kPa	11.0	2.7	Coolant Capacity (Engine only)		gal	L	12	44	
Minimum Operating pressure to EPR	in-H ₂ O	kPa	7.0	1.7	Coolant Capacity (Radiator only)		gal	L	39	146	
Minimum Gas Supply Pipe Size ⁵	2 x 2" NPT				Radiator Weight (Dry)		lb	kg	1597	726	
Maximum Pressure Drop Across CAC	psi	kPa	1.5	10.5	Thermostat Operating Temperature Range ⁹		Cracking	°F	°C	160	71
Maximum Allowable Intake Restriction	Clean Air Filter	in-H ₂ O	kPa	5.0	1.2	Full Open		°F	°C	185	85
	Dirty Air Filter	in-H ₂ O	kPa	15.0	3.7	ECU Coolant Temp Warning		°F	°C	219	104
Spark Plug Part Number	IFR7F-4D				ECU Coolant Temp Shutdown		°F	°C	230	110	
Standard Spark Plug Gap ¹⁰	in	mm	0.015	0.38	Maximum Radiator Cooling Air Temp		°F	°C	140	60	
Spark Plug Coil - Primary Resistance	Ohms		0.59Ω ± 10%		Max External Coolant Friction Head		psi	kPa	6	40	
Battery Voltage	Volts				24	CAC Rise Above Ambient Specified		°F	°C	16	9
Starter Motor Power	HP	kW	9.4	7.0							
Performance Data 60Hz ^{3,5}					Performance Data 50Hz ^{3,5}						
Nominal Engine Speed	RPM		1800		Nominal Engine Speed	RPM		1500			
Mean Piston Speed	ft/min	m/s	1677	8.5	Mean Piston Speed	ft/min	m/s	1397	7		
RPM Range (Min-Max) ISO 8528-5 G1	RPM		1778-1823		RPM Range (Min-Max) ISO 8528-5 G1	RPM		1481-1519			
Charging Alternator Voltage	Volts		24		Charging Alternator Voltage	Volts		24			
Charging Alternator Current	Amps		45		Charging Alternator Current	Amps		45			
Total Engine Coolant Flow	gal/min	L/min	151	570	Total Engine Coolant Flow	gal/min	L/min	125	474		
Cooling Fan Power ¹¹	HP	kW	42	31	Cooling Fan Power ¹¹	HP	kW	24	18		
Cooling Fan Speed	RPM		1440		Cooling Fan Speed	RPM		1200			
Cooling Fan Air Flow ¹¹	SCFM	m ³ /min	39995	1133	Cooling Fan Air Flow ¹¹	SCFM	m ³ /min	34276	971		
Standby		NG 60Hz			NG 50Hz		LP 60Hz		LP 50Hz		
Power Rating ^{1,2,3,4} Per ISO 3046	HP	kWm	684	510	532	397	472	352	370	276	
MEP (@ rated Load on NG)	psi	bar	229	15.8	210	14.5	155	10.7	146	10.0	
Fuel Consumption ^{3,4,7}	lb/hr	kg/hr	239	109	181	82	187	85	141	64	
BSFC	lb/(hp-hr)	g/(kW-hr)	0.349	213	0.340	207	0.395	241	0.381	232	
Turbine Outlet Temperature	°F	°C	1136	614	981	527	1071	577	1018	548	
Exhaust Flow at Turbine Outlet Conditions (entire engine)	lb/hr	kg/hr	4249	1932	3182	1447	2951	1341	2240	1018	
	ACFM	m ³ /min	2821	80	1938	55	1892	54	1394	39	
Air Induction System ⁵											
Combustion Air required (entire engine)	lb/hr	kg/hr	4006	1821	2892	1314	2750	1250	2049	932	
	ACFM	m ³ /min	829	23.49	599	17	569	16	424	12	
Compressor Outlet Temperature ²	°F	°C	289	143	292	145	279	137	231	110	
Thermal Balance ⁵											
Total Fuel	BTU/min	kW	83883	1475	62260	1095	60970	1072	46082	810	
Mechanical Power	BTU/min	kW	29003	510	22577	397	20018	352	15696	276	
Heat Rejected to Cooling Water at Rated Load	BTU/min	kW	29240	514	22002	387	22839	402	17461	307	
Heat Rejection CAC at Rated Power	BTU/min	kW	4055	71	2397	42	2202	39	1064	19	
Heat Rejection to Exhaust (LHV to 150C)	BTU/min	kW	20069	353	13993	246	14051	247	9749	171	
Engine Radiated Heat	BTU/min	kW	1517	27	1290	23	1860	33	2112	37	

¹ Standby and overload ratings based on ISO 3046 gross flywheel power.

² Technical data based on ISO 3046-1 standards of 77°F(25°C), absolute pressure 14.5Psi(100kPa) and 30% relative humidity.

³ Production tolerances in engines and installed components can account for power variations of ± 5%. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

⁴ All fuel and thermal calculations unless otherwise noted are done at ISO 3046 rated load using LHV for NG of 48.17 MJ/kg.

⁵ All values in the following section are provided for informational purpose only and are non-binding.

⁶ >1400RPM.

⁷ See PSI Energy Technical Spec. 56300019 - Fuel Standard.

⁸ Standard Sump Capacity.

⁹ ± 2 degrees Celsius.

¹⁰ ± 0.002" or 0.05mm.

¹¹ At 0.5" H2O Package Restriction and 125F @ radiator