

10L TURBO



ENERGY

[Turbocharged Stoich]

56100045

Revision 1

General Engine Data³

Type	Inline 4-cycle			
Number of cylinders	6			
Aspiration	Turbocharged charge-air-cooled			
Firing Order	1 - 5 - 3 - 6 - 2 - 4			
Rotation Viewed from Flywheel	Counter-clockwise			
Bore	in	mm	5.0	126
Stroke	in	mm	5.1	130
Displacement	in ³	L	593.7	9.73
Compression Ratio	10.5:1			
Exhaust Manifold Type	Water-cooled			
Turbo Exhaust Outlet Pipe Size	in	mm	3.25	83
Catalyst Inlet Size	in	mm	3.5	89
Catalyst Dp	in-H ₂ O	kPa	34.6	8.6
Maximum Allowable Exhaust Back Pressure	in-Hg	kPa	4.4	15
Maximum Fuel System Pressure	psi	kPag	1.0	6.9
Maximum Operating pressure to EPR	in-H ₂ O	kPa	10.9	2.7
Minimum Operating pressure to EPR	in-H ₂ O	kPa	6.8	1.7
Minimum Gas Supply Pipe Size ⁵	1-1/4" NPT			
Maximum Pressure Drop Across CAC	psi	kPa	1.7	12.0
Maximum Allowable Intake Restriction	Clean Air Filter	in-H ₂ O	kPa	12.1
	Dirty Air Filter	in-H ₂ O	kPa	24.9
Spark Plug Part Number	Bosch R66857			
Standard Spark Plug Gap ¹⁰	in	mm	0.018	0.45
Spark Plug Coil - Primary Resistance	Ohms 0.59Ω ± 10%			
Battery Voltage	Volts 24			
Starter Motor Power	HP	kW	7.4	5.5

Performance Data 60Hz^{3,5}

Nominal Engine Speed	RPM		1800	
Mean Piston Speed	ft/min	m/s	1535	7.8
RPM Range (Min-Max) ISO 8528-5 G1	RPM		1778 - 1823	
Charging Alternator Voltage	Volts		28	
Charging Alternator Current	Amps		70	
Total Engine Coolant Flow	gal/min	L/min	106	400
Cooling Fan Power ¹¹	HP	kW	12.3	9.2
Cooling Fan Speed	RPM		1782	
Cooling Fan Air Flow ¹¹	SCFM	m ³ /min	14085	399
Maximum Cooling Air Temp at Radiator	°F	°C	113	45

Standby			NG 60Hz		NG 50Hz		LP 60Hz		LP 50Hz	
Power Rating ^{1,2,3,4} Per ISO 3046	HP	kWm	316	236	308	230	225	168	217	162
MEP (@ rated Load on NG)	psi	bar	235	16.2	274	18.9	167	11.5	193	13.3
Fuel Consumption ^{3,4,7}	lb/hr	kg/hr	113	52	109	50	95	43.1	88	40
BSFC	lb/(hp-hr)	g/(kW-hr)	0.358	218	0.353	215	0.421	257	0.405	247
Turbine Outlet Temperature	°F	°C	1107	597	1116	602	1170	632	1141	616
Exhaust Flow at Turbine Outlet Conditions (entire engine)	lb/hr	kg/hr	1916	869	1758	799	1584	720	1441	655
	ACFM	m ³ /min	1249	35.4	1154	32.7	1070	30.3	959	27.2

Air Induction System⁵

Combustion Air required (entire engine)	lb/hr	kg/hr	1912	869	1863	847	1422	647	1320	600
Combustion Air Volume Required (entire engine)	ACFM	m ³ /min	396	11.2	386	10.9	294	8.3	273	7.7
Compressor Outlet Temperature ²	°F	°C	313	156	300	149	239	115	230	110

Thermal Balance⁵

Total Fuel	BTU/min	kW	38842	683	37363	657
Mechanical Power	BTU/min	kW	13421	236	13080	230
Heat Rejected to Cooling Water at Rated Load	BTU/min	kW	12227	215	11317	199
Heat Rejection CAC at Rated Power	BTU/min	kW	1706	30	1649	29
Heat Rejection to Exhaust (LHV to 150C)	BTU/min	kW	10123	178	9554	168
Engine Radiated Heat	BTU/min	kW	1422	25	1706	30

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.

Performance Data 50Hz^{3,5}

Nominal Engine Speed	RPM		1500	
Mean Piston Speed	ft/min	m/s	1279	7
RPM Range (Min-Max) ISO 8528-5 G1	RPM		1477 - 1519	
Charging Alternator Voltage	Volts		28	
Charging Alternator Current	Amps		70	
Total Engine Coolant Flow	gal/min	L/min	90	340
Cooling Fan Power ¹¹	HP	kW	7.1	5.3
Cooling Fan Speed	RPM		1485	
Cooling Fan Air Flow ¹¹	SCFM	m ³ /min	11649	330
Maximum Cooling Air Temp at Radiator	°F	°C	113	45

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 1.0 in-H₂O of Package Restriction at STP.

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Stroke	in	mm	5.1	130
Displacement	in ³	L	593.7	9.73
Compression Ratio	10.5:1			
Exhaust Manifold Type	Water-cooled			
Turbo Exhaust Outlet Pipe Size	in	mm	3.25	83
Catalyst Inlet Size	in	mm	3.5	89
Catalyst Dp	in-H ₂ O	kPa	34.6	8.6
Maximum Allowable Exhaust Back Pressure	in-Hg	kPa	4.4	15
Maximum Fuel System Pressure	psi	kPag	1.0	6.9
Maximum Operating pressure to EPR	in-H ₂ O	kPa	10.9	2.7
Minimum Operating pressure to EPR	in-H ₂ O	kPa	6.8	1.7
Minimum Gas Supply Pipe Size ⁵	1-1/4" NPT			
Maximum Pressure Drop Across CAC	psi	kPa	1.7	12.0
Maximum Allowable Intake Restriction	Clean Air Filter	in-H ₂ O	kPa	12.1
	Dirty Air Filter	in-H ₂ O	kPa	24.9
Spark Plug Part Number	Bosch R66857			
Standard Spark Plug Gap ¹⁰	in	mm	0.018	0.45
Spark Plug Coil - Primary Resistance	Ohms 0.59Ω ± 10%			
Battery Voltage	Volts 24			
Starter Motor Power	HP	kW	7.4	5.5

Flywheel housing	SAE # 3			
Flywheel	SAE # 11.5			
Dry Weight (Fan to Flywheel)	lb	kg	2200	1000
Wet Weight (Fan to Flywheel)	lb	kg	2310	1050
CG From Flywheel Housing Rear Face	in	mm	21.6	549
CG Above Crank Centerline	in	mm	7.0	177
Max Bending Moment @ Rear of Block	lb/ft	N m	7970	10800
Moment of Inertia About Roll Axis	lb-ft ²	kg-m ²	1066	45
Oil Specification		SAE 15W-40 Low Ash Gas engine oil (.25-.5% by wt), API CD/CF or higher		
Engine Oil Capacity ⁸	Min	qts	L	21.2
	Max	qts	L	25.4
ECU Low Oil Pressure Warning ⁶	psi	bar	40	2.8
ECU Low Oil Pressure Shutdown ⁶	psi	bar	30	2
Oil Pressure Operating Range	Idle	psi	bar	19 - 54
	Rated	psi	bar	51 - 84
Max Allowable Oil Temperature	°F	°C	221	105
Coolant Capacity (Engine only)	gal	L	7.1	27
Coolant Capacity (Radiator only)	gal	L	8.5	32
Radiator Weight (Dry)	lb	kg	396	180
Thermostat Operating Temperature Range ⁹	Cracking	°F	°C	169
	Full Open	°F	°C	190
ECU Coolant Temp Warning	°F	°C	205	96
ECU Coolant Temp Shutdown	°F	°C	216	102
Max External Coolant Friction Head	psi	kPa	7.25	50
CAC Rise Above Ambient Specified	°F	°C	37.8	21

Performance Data 60Hz^{3,5}

Nominal Engine Speed	RPM		1800	
Mean Piston Speed	ft/min	m/s	1535	7.8
RPM Range (Min-Max) ISO 8528-5 G1	RPM		1778 - 1823	
Charging Alternator Voltage	Volts		28	
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Cooling Fan Power ¹¹	HP	kW	12.3	9.2
Cooling Fan Speed	RPM		1782	
Cooling Fan Air Flow ¹¹	SCFM	m ³ /min	14085	399
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Cooling Fan Speed	RPM		1485	
Cooling Fan Air Flow ¹¹	SCFM	m ³ /min	11649	330
Maximum Cooling Air Temp at Radiator	°F	°C	113	45

Prime			NG 60Hz		NG 50Hz		LP 60Hz		LP 50Hz	
Power Rating ^{1,2,3,4} Per ISO 3046	HP	kWm	272	203	284	212	225	168	217	162
MEP (@ rated Load on NG)	psi	bar	202	13.9	253	17.4	167	11.5	193	13.3
Fuel Consumption ^{3,4,7}	lb/hr	kg/hr	97	44	98	45	95	43.1	88	40
BSFC	lb/(hp-hr)	g/(kW-hr)	0.358	218	0.345	210	0.421	257	0.405	247
Turbine Outlet Temperature	°F	°C	1094	590	1090	588	1170	632	1141	616
Exhaust Mass Flow (entire engine)	lb/hr	kg/hr	1758	799	1778	808	1584	720	1441	655
Exhaust Flow at Turbine Outlet Conditions	ACFM	m ³ /min	1153	32.6	1163	32.9	959	27.1	976	27.6

Air Induction System⁵

Combustion Air required (entire engine)	lb/hr	kg/hr	1618	735	1629	740	1422	647	1320	600
Combustion Air Volume Required (entire engine)	ACFM	m ³ /min	335	9.5	337	9.6	294	8.3	273	7.7
Compressor Outlet Temperature ²	°F	°C	273	134	282	139	239	115	230	110

Thermal Balance⁵

Total Fuel	BTU/min	kW	33733	593.2	33962	597
Mechanical Power	BTU/min	kW	11544	203.0	12056	212
Heat Rejected to Cooling Water at Rated Load	BTU/min	kW	10293	181.0	10293	181
Heat Rejection CAC at Rated Power	BTU/min	kW	1479	26.0	1365	24
Heat Rejection to Exhaust (LHV to 150C)	BTU/min	kW	8303	146.0	8360	147
Engine Radiated Heat	BTU/min	kW	2116	37.2	1877	33

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 14.5PSia(100kPa) and 30% relative humidity.

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