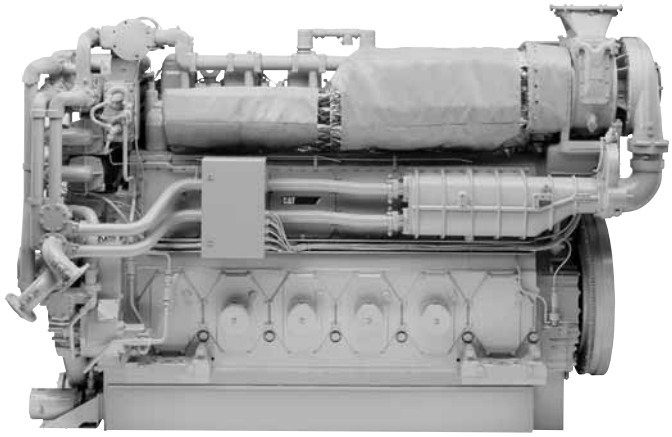
CATERPILLAR®

C280-6 MARINE AUXILIARY & DIESEL ELECTRIC PROPULSION

1650 ekW
1730 bkW (2320 bhp)
60 Hz @ 900 rpm



May not represent actual engine

SPECIFICATIONS

In-Line 6, 4-Stroke-Cycle-Diesel

Emissions	IMO II/EPA Tier 2 Compliant
Bore	280 mm (11.0 in.)
Stroke	300 mm (11.8 in.)
Displacement	111 L (6,773 cu. in.)
Rotation (from flywheel end)	Counterclockwise
Compression Ratio	13:1
Aspiration	Turbocharged-Aftercooled
Governor	Electronic
Low Idle Speed	350 rpm
Rated Speed	900 rpm
Oil Change Interval*	1025 hr
Serial Number Prefix	SCB
Cooling System	Keel or Heat Exchanger
Refill Capacities	
Cooling System	900-1075 L (238-284 gal)
Lube Oil System	697 L (184 gal)

*A new S•O•S℠ analysis must be done to determine actual oil change intervals.

STANDARD ENGINE EQUIPMENT

Air Inlet System
Aftercooler — fresh water, corrosion resistant coated (air side); air inlet shutoff; breather — crankcase, top-mounted; turbocharger — engine oil lubricated

Control System
Single ADEM™ A3 electronic control unit (ECU) with electronic unit injector fuel system, rigid wiring harness (10 amp, 24 volt power required to drive ECUs)

Cooling System
Engine coolant water drains

Exhaust System
Dry, gas tight, exhaust manifold

Fuel System
Distillate fuel (requires viscosity ranging from 1.4 cSt to 20 cSt at 38° C), fuel transfer pump (mounted on left-hand side), duplex fuel filters, electronically controlled unit injectors

Lube Oil System
Centrifugal oil filters with single shutoff, service side engine mounted on cylinder block inspection covers includes installed oil lines and single shutoff valve, filters centrifuge bypass oil from the main lubricating oil pump, can be serviced with the engine running, oil filler and dipstick valve, oil pressure regulating valves, crankcase explosion relief valves

General
Cat® yellow paint; gear-driven pumps: fuel, oil, jacket water, aftercooler/oil cooler water; service literature

Factory-designed systems built at Caterpillar ISO 9001:2000 certified facilities.

MARINE ENGINE PERFORMANCE

C280-6

DIESEL ENGINE TECHNICAL DATA

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Genset	**60 Hz**	RATING:	Marine Aux - Continuous
		CERTIFICATION:	IMO II/EPA MARINE TIER II
ENGINE SPEED (rpm):	900	TURBOCHARGER PART #:	157-5514
COMPRESSION RATIO:	13:1	FUEL TYPE:	Distillate
AFTERCOOLER WATER (°C):	32	RATED ALTITUDE @ 25°C (m):	150
JACKET WATER OUTLET (°C):	90	ASSUMED GENERATOR EFFICIENCY (%):	95
IGNITION SYSTEM:	EUI	ASSUMED GENERATOR POWER FACTOR:	0.8
EXHAUST MANIFOLD:	DRY	MEAN PISTON SPEED (m/s):	9
FIRING PRESSURE, MAXIMUM (kPa)	17300		

RATING		NOTES	LOAD	110%	100%	75%	50%
ENGINE POWER		(2)	bkW	1903	1730	1298	865
GENERATOR POWER		(2)	ekW	1815	1650	1238	825
BMEP			kPa	2290	2082	1561	1041
ENGINE EFFICIENCY	**(ISO 3046/1)**	**(1)**	**%**	**42.6%**	**41.5%**	**39.9%**	**37.9%**
ENGINE EFFICIENCY	(NOMINAL)	(1)	%	41.3%	40.2%	38.7%	36.7%

ENGINE DATA							
FUEL CONSUMPTION	**(ISO 3046/1)**	**(1)**	**g/bkw-hr**	**198.4**	**203.8**	**212.4**	**223.9**
FUEL CONSUMPTION	(NOMINAL)	(1)	g/bkw-hr	202.3	207.8	216.5	228.3
FUEL CONSUMPTION	(90% CONFIDENCE)	(1)	g/bkw-hr	204.5	210.1	219.1	231.1
AIR FLOW (@ 25°C, 101.3 kPaa)			Nm3/min	184.9	179.3	150.9	109.8
AIR MASS FLOW			kg/hr	12378	11998	10098	7351
INLET MANIFOLD PRESSURE			kPa (abs)	363.5	348.3	299.6	218.5
INLET MANIFOLD TEMPERATURE			°C	42.7	41.9	38.6	38.0
EXHAUST STACK TEMPERATURE			°C	383.1	379.2	374.1	362.3
EXHAUST GAS FLOW (@ stack temp, 101.3 kPa)			m3/min	396.2	381.4	316.1	227.2
EXHAUST GAS MASS FLOW			kg/hr	12763	12357	10378	7546

EMISSIONS "NOT TO EXCEED DATA"						
Nox as NO2 + THC (molecular weight of 13.018)		g/bkW-hr	9.72	9.62	8.12	8.29
Nox as NO2		g/bkW-hr	8.94	8.79	7.26	7.16
CO		g/bkW-hr	0.85	0.96	0.82	1.10
THC (molecular weight of 13.018)		g/bkW-hr	0.79	0.84	0.86	1.13
Particulates		g/bkW-hr	0.32	0.27	0.39	0.40

EMISSIONS "NOMINAL DATA"						
NOx (as NO) + THC (molecular weight of 13.018)		g/bkW-hr	8.38	8.28	6.97	7.21
NOx (as NO)		g/bkW-hr	7.77	7.64	6.31	6.23
CO		g/bkW-hr	0.65	0.74	0.63	0.96
THC (molecular weight of 13.018)		g/bkW-hr	0.60	0.64	0.66	0.98
Particulates		g/bkW-hr	0.23	0.19	0.28	0.35

ENERGY BALANCE DATA							
FUEL INPUT ENERGY (LHV)	(NOMINAL)	(1)	KW	4607	4299	3356	2356
HEAT REJ. TO JACKET WATER	(NOMINAL)	(3)	KW	388	365	308	244
HEAT REJ. TO ATMOSPHERE	(NOMINAL)	(4)	KW	92	86	67	47
HEAT REJ. TO OIL COOLER	(NOMINAL)	(5)	KW	192	183	159	135
HEAT REJ. TO EXH. (LHV to 25°C)	(NOMINAL)	(3)	KW	1420	1365	1122	829
HEAT REJ. TO EXH. (LHV to 177°C)	(NOMINAL)	(3)	KW	1047	1026	865	680
HEAT REJ. TO AFTERCOOLER	(NOMINAL)	(6) (7)	KW	599	559	395	233

CONDITIONS AND DEFINITIONS

ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 3046/1 AND SAE J1995 JAN90 STANDARD REFERENCE CONDITIONS OF 25°C, 100 KPA, 30% RELATIVE HUMIDITY AND 150M ALTITUDE AT THE STATED AFTERCOOLER WATER TEMPERATURE
CONSULT ALTITUDE CURVES FOR APPLICATIONS ABOVE MAXIMUM RATED ALTITUDE AND/OR TEMPERATURE
PERFORMANCE AND FUEL CONSUMPTION ARE BASED ON 35 API, 16°C FUEL HAVING A LOWER HEATING VALUE OF 42.780 KJ/KG USED AT 29°C WITH A DENSITY OF 838.9 G/LITER

NOTES

1) FUEL CONSUMPTION TOLERANCE. ISO 3046/1 IS 0, + 5% OF FULL LOAD DATA. NOMINAL IS ± 3 % OF FULL LOAD DATA
2) ENGINE POWER TOLERANCE IS ± 3 % OF FULL LOAD DATA.
3) HEAT REJECTION TO JACKET AND EXHAUST TOLERANCE IS ± 10% OF FULL LOAD DATA. (heat rate based on treated water
4) HEAT REJECTION TO ATMOSPHERE TOLERANCE IS ±50% OF FULL LOAD DATA. (heat rate based on treated water
5) HEAT REJECTION TO LUBE OIL TOLERANCE IS ± 20% OF FULL LOAD DATA. (heat rate based on treated water
6) HEAT REJECTION TO AFTERCOOLER TOLERANCE IS ± 5% OF FULL LOAD DATA. (heat rate based on treated water
7) TOTAL AFTERCOOLER HEAT = AFTERCOOLER HEAT x ACHRF (heat rate based on treated water)
8) FUEL CONSUMPTION DATA IS WITHOUT SEA WATER PUMP.

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MARINE ENGINE PERFORMANCE

C280-6 DIESEL ENGINE TECHNICAL DATA

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ALTITUDE DERATION FACTORS

AIR TO TURBO (°C)	0	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
50	0.94	0.91	0.88	0.86	0.83	0.81	0.78	0.76	0.74	0.71	0.69	0.67	0.65
45	0.95	0.93	0.90	0.87	0.85	0.82	0.80	0.77	0.75	0.73	0.70	0.68	0.66
40	0.97	0.94	0.91	0.89	0.86	0.83	0.81	0.78	0.76	0.74	0.71	0.69	0.67
35	0.98	0.96	0.93	0.90	0.87	0.85	0.82	0.80	0.77	0.75	0.73	0.70	0.68
30	1.00	0.97	0.94	0.92	0.89	0.86	0.84	0.81	0.79	0.76	0.74	0.71	0.69
25	1.00	0.99	0.96	0.93	0.90	0.88	0.85	0.82	0.80	0.77	0.75	0.73	0.70
20	1.00	1.00	0.98	0.95	0.92	0.89	0.86	0.84	0.81	0.79	0.76	0.74	0.72
15	1.00	1.00	0.99	0.96	0.93	0.91	0.88	0.85	0.83	0.80	0.78	0.75	0.73
10	1.00	1.00	1.00	0.98	0.95	0.92	0.89	0.87	0.84	0.82	0.79	0.77	0.74

ALTITUDE (METERS ABOVE SEA LEVEL)

AFTERCOOLER HEAT REJECTION FACTORS

AIR TO TURBO	0	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
50	1.23	1.27	1.30	1.34	1.38	1.42	1.45	1.49	1.53	1.56	1.60	1.64	1.67
45	1.18	1.22	1.25	1.29	1.32	1.36	1.39	1.43	1.46	1.50	1.53	1.57	1.61
40	1.13	1.17	1.20	1.23	1.27	1.30	1.34	1.37	1.40	1.44	1.47	1.50	1.54
35	1.08	1.12	1.15	1.18	1.21	1.24	1.28	1.31	1.34	1.37	1.41	1.44	1.47
30	1.03	1.06	1.10	1.13	1.16	1.19	1.22	1.25	1.28	1.31	1.34	1.37	1.40
25	1.00	1.01	1.04	1.07	1.10	1.13	1.16	1.19	1.22	1.25	1.28	1.31	1.34
20	1.00	1.00	1.00	1.02	1.05	1.07	1.10	1.13	1.16	1.19	1.21	1.24	1.27
15	1.00	1.00	1.00	1.00	1.00	1.02	1.04	1.07	1.10	1.12	1.15	1.18	1.20
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.04	1.06	1.09	1.11	1.14

ALTITUDE (METERS ABOVE SEA LEVEL)

FREE_FIELD MECHANICAL NOISE

SOUND PRESSURE LEVEL dB(A)

DISTANCE FROM THE ENGINE (M)	Overall	63	125	250	500	1000	2000	4000	8000
15M	95	87.7	84.6	83.8	84.1	85.3	81	77	69
7M	102	93.7	90.6	89.8	90.1	91.3	87	83	75
1M	115	104.7	101.6	100.8	101.1	102.3	98	94	86

Octave Band (Hz)

FREE_FIELD EXHAUST NOISE

SOUND PRESSURE dB(A)

DISTANCE FROM THE ENGINE (M)	Overall	63	125	250	500	1000	2000	4000	8000
15M	95	108.0	105.0	96.0	91.0	87.0	87.0	86.0	80.0
7M	102	114.0	112.0	103.0	98.0	93.0	94.0	92.0	87.0
1.5M	115	128.0	125.0	116.0	111.0	107.0	107.0	106.0	100.0

Octave Band (Hz)

TOTAL DERATION FACTORS:

This table shows the deration required for various air inlet temperatures and altitudes. Use this information 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.

AFTERCOOLER HEAT REJECTION FACTORS:

Aftercooler heat rejection is given for standard conditions of 25°C and 150 m 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.

GENERATOR EFFICIENCY:

Generator power determined with an assumed generator effeciency of 95% [generator power = engine power x 0.95]. If the actual generator efficiency is less than 95% [and greater than 94.5%], the generator power [ekW] listed in the technical data can still be achieved. The BSFC values must be increased by a factor.

The factor is a percentage = 95% - actual generator efficiency.

SOUND DATA:

Data determined by methods similar to ISO Standard DIS-8528-10. Accuracy Grade 3.

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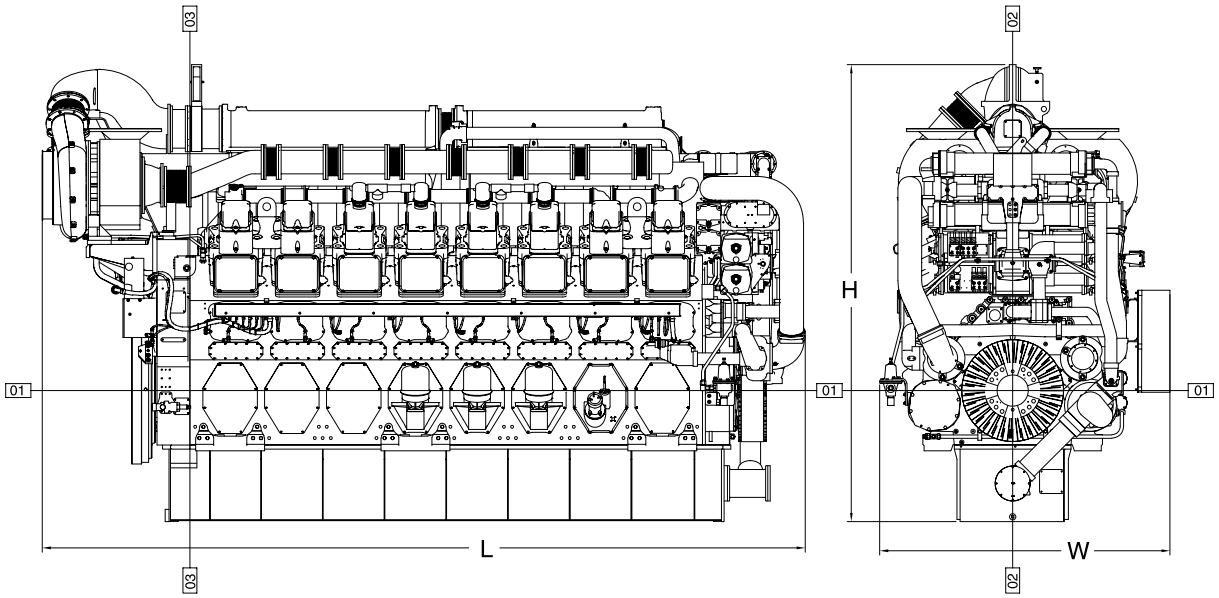
CATERPILLAR®

C280-6 MARINE AUXILIARY & DIESEL ELECTRIC PROPULSION

1650 ekW

DIMENSIONS



Engine Dimensions		
Length of Engine	3691 mm	145.0 in
Length with Generator	7120 mm	280.3 in
Width of Engine	1961 mm	70.7 in
Height	3934 mm	154.9 in
Engine Weight – dry (approx.)	15,680 kg	34,496 lb
Generator Weight – (approx.)	8165 kg	18,000 lb

RATING DEFINITIONS AND CONDITIONS

Continuous Power — 8,000 hrs./yr., for applications with load factors less than or equal to 100%. 10% overload available.

Ratings are based on SAE J1995/ISO3046 standard conditions of 100 kPa (29.61 in. Hg), 25°C (77°F), and 30% relative humidity at the stated charge air cooler water temperature. Ratings also meet classification society maximum temperature requirements of 45°C (113°F) air temperature to the turbocharger and 32°C (90°F) seawater temperature without derate.

Additional ratings may be available for specific customer requirements. Consult your Cat representative for additional information.

Fuel rates are based on 35° API, 16°C (60°F) fuel used at 29°C (85°F) with a density of 838.9 g/liter (7.001 lbs/U.S. gal). Lower Heat Value (LHV) of 42 780 kJ/kg (18,390 Btu/lb). Tolerance is +5%. Includes all engine mounted pumps. BSFC without pumps is 3% less.

Marine Certification — Ratings are marine classification society approved by ABS, BV, CCS, DnV, GL, LRS, and RINA. These societies have also granted C280 factory line production approval which eliminates requirement for society surveyor witness test.

Performance data is calculated in accordance with tolerances and conditions stated in this specification sheet and is only intended for purposes of comparison with other manufacturers' engines. Actual engine performance may vary according to the particular application of the engine and operating conditions beyond Caterpillar's control.

Power produced at the flywheel will be within standard tolerances up to 49°C (120°F) combustion air temperature measured at the air cleaner inlet, and fuel temperature up to 52°C (125°F) measured at the fuel filter base. Power rated in accordance with NMMA procedure as crankshaft power. Reduce crankshaft power by 3% for propeller shaft power.

TMI Reference No.: DM8396-02

LEHM7091-01 (3-10)