

Perf No: DM6097

Change Level: 01

[General](#)
[Heat Rejection](#)
[Sound](#)
[Emissions](#)
[Regulatory](#)
[Altitude Derate](#)
[Cross Reference](#)
[Supplementary Data](#)
[Perf Param Ref](#)

View PDF

SALES MODEL:	3406C	COMBUSTION:	DIRECT INJECTION
BRAND:	CAT	ENGINE SPEED (RPM):	1,800
ENGINE POWER (BKW):	298.0	ASPIRATION:	TA
COMPRESSION RATIO:	14.5	AFTERCOOLER TYPE:	JWAC
RATING LEVEL:	B-RATING (HEAVY DUTY)	AFTERCOOLER CIRCUIT TYPE:	JW+OC+AC
PUMP QUANTITY:	1	AFTERCOOLER TEMP (C):	52
FUEL TYPE:	DIESEL	JACKET WATER TEMP (C):	99
MANIFOLD TYPE:	WATER COOLED	TURBO CONFIGURATION:	SINGLE
GOVERNOR TYPE:	HYDRA	TURBO QUANTITY:	1
CAMSHAFT TYPE:	STANDARD	TURBOCHARGER MODEL:	S4DW034-0.94
IGNITION TYPE:	CI	CERTIFICATION YEAR:	2000
INJECTOR TYPE:	MUI	PISTON SPD @ RATED ENG SPD (M/SEC):	9.9
REF EXH STACK DIAMETER (MM):	127		
MAX OPERATING ALTITUDE (M):	500		

INDUSTRY	SUB INDUSTRY	APPLICATION
MARINE	GENERAL CARGO	MARINE PROPULSION

General Performance Data
 [Top](#)

MAXIMUM LIMIT

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
RPM	BKW	NM	KPA	G/BKW-HR	L/HR	KPA	DEG C	DEG C	KPA	DEG C
1,800	298	1,581	1,357	208.0	73.9	134.9	86.6	553.1	119.0	377.3
1,700	261	1,467	1,260	209.8	65.3	109.7	83.5	556.6	93.0	388.4
1,600	222	1,322	1,135	213.0	56.2	84.0	81.7	558.2	69.7	398.4
1,500	188	1,197	1,028	215.9	48.4	63.5	80.5	556.9	52.5	403.6
1,400	165	1,127	968	217.1	42.8	50.4	79.9	555.4	41.5	407.1
1,300	146	1,074	922	218.0	38.0	40.2	79.2	553.8	32.9	407.3
1,200	130	1,036	890	219.0	34.0	32.4	78.6	551.3	26.4	405.5
1,100	116	1,009	866	220.9	30.6	25.7	78.2	548.5	21.1	401.6
1,000	104	989	849	223.5	27.6	20.1	78.0	545.0	16.9	395.9

MAXIMUM LIMIT

ENGINE SPEED	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	ENGINE OUTLET WET EXH VOL FLOW RATE (0 DEG C AND 101 KPA)	ENGINE OUTLET DRY EXH VOL FLOW RATE (0 DEG C AND 101 KPA)
RPM	BKW	KPA	DEG C	M3/MIN	M3/MIN	KG/HR	KG/HR	M3/MIN	M3/MIN
1,800	298	138	142.3	25.0	56.2	1,734.8	1,796.8	23.6	21.5
1,700	261	113	124.4	21.5	49.2	1,489.5	1,544.2	20.3	18.5
1,600	222	86	105.4	18.0	41.7	1,245.7	1,292.8	17.0	15.4
1,500	188	65	89.7	15.1	35.3	1,044.2	1,084.7	14.2	12.9
1,400	165	51	79.4	13.0	30.6	898.9	934.7	12.3	11.1
1,300	146	41	70.8	11.2	26.6	778.8	810.6	10.7	9.6
1,200	130	33	63.9	9.8	23.1	678.9	707.4	9.3	8.4
1,100	116	26	57.9	8.5	20.1	591.8	617.5	8.1	7.3
1,000	104	21	52.7	7.4	17.3	515.4	538.5	7.1	6.3

PROP DEMAND CURVE P

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ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
RPM	BKW	NM	KPA	G/BKW-HR	L/HR	KPA	DEG C	DEG C	KPA	DEG C
1,800	298	1,581	1,357	208.0	73.9	134.9	86.6	553.1	119.0	377.3
1,700	251	1,410	1,211	210.3	62.9	103.6	83.2	550.1	88.3	385.7
1,600	209	1,249	1,072	213.9	53.4	77.1	81.4	548.5	65.0	393.5
1,500	172	1,098	943	217.4	44.7	55.6	80.3	538.7	47.6	392.4
1,400	140	956	821	219.9	36.8	39.3	79.3	517.0	34.7	380.3
1,300	112	825	708	222.4	29.8	27.2	78.4	485.4	25.3	358.7
1,200	88.3	703	603	225.3	23.7	18.1	78.0	445.5	18.6	330.1
1,100	68.0	590	507	231.0	18.7	11.3	77.9	402.0	13.5	298.9
1,000	51.1	488	419	240.5	14.7	6.5	78.0	355.3	9.6	266.7

PROP DEMAND CURVE P

ENGINE SPEED	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	ENGINE OUTLET WET EXH VOL FLOW RATE (0 DEG C AND 101 KPA)	ENGINE OUTLET DRY EXH VOL FLOW RATE (0 DEG C AND 101 KPA)
RPM	BKW	KPA	DEG C	M3/MIN	M3/MIN	KG/HR	KG/HR	M3/MIN	M3/MIN
1,800	298	138	142.3	25.0	56.2	1,734.8	1,796.8	23.6	21.5
1,700	251	106	120.0	20.9	47.6	1,448.2	1,501.0	19.7	18.0
1,600	209	79	100.2	17.3	39.9	1,199.5	1,244.3	16.3	14.8
1,500	172	57	83.3	14.3	33.0	992.7	1,030.2	13.5	12.3
1,400	140	40	69.4	11.9	27.0	827.9	858.7	11.3	10.2
1,300	112	28	58.3	10.1	22.0	698.9	723.9	9.5	8.7
1,200	88.3	19	50.3	8.6	17.9	598.5	618.4	8.1	7.4
1,100	68.0	12	44.0	7.4	14.7	516.3	532.0	7.0	6.4
1,000	51.1	7	39.1	6.4	12.0	448.2	460.5	6.1	5.6

MAXIMUM POWER CURVE M

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
RPM	BKW	NM	KPA	G/BKW-HR	L/HR	KPA	DEG C	DEG C	KPA	DEG C
1,800	298	1,580	1,356	208.0	73.8	134.8	86.6	553.0	118.9	377.3
1,700	285	1,602	1,375	209.3	71.1	124.8	84.6	571.4	104.3	394.6
1,600	271	1,616	1,388	210.5	68.0	113.6	83.0	592.6	89.9	414.5
1,500	255	1,621	1,392	211.9	64.3	101.2	81.8	616.7	76.0	437.1
1,400	236	1,610	1,382	213.5	60.1	87.3	81.7	643.0	62.9	463.4
1,300	214	1,575	1,352	214.2	54.8	72.2	81.6	666.3	50.7	486.6
1,200	191	1,521	1,306	217.1	49.4	57.0	81.0	683.8	40.0	502.6
1,100	167	1,447	1,242	222.4	44.2	45.0	79.5	691.4	30.9	507.0
1,000	142	1,360	1,167	229.4	38.9	34.5	78.0	687.4	23.5	500.3

MAXIMUM POWER CURVE M

ENGINE SPEED	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	ENGINE OUTLET WET EXH VOL FLOW RATE (0 DEG C AND 101 KPA)	ENGINE OUTLET DRY EXH VOL FLOW RATE (0 DEG C AND 101 KPA)
RPM	BKW	KPA	DEG C	M3/MIN	M3/MIN	KG/HR	KG/HR	M3/MIN	M3/MIN
1,800	298	138	142.2	25.0	56.2	1,734.0	1,795.9	23.6	21.5
1,700	285	128	134.8	22.9	53.1	1,588.5	1,648.1	21.7	19.7
1,600	271	117	127.1	20.8	49.6	1,439.7	1,496.6	19.7	17.8
1,500	255	104	119.1	18.6	45.8	1,288.3	1,342.1	17.6	15.8
1,400	236	90	110.7	16.3	41.4	1,131.0	1,181.2	15.4	13.7
1,300	214	75	101.2	14.0	36.6	973.8	1,019.9	13.2	11.7
1,200	191	59	91.0	11.9	31.8	825.1	866.6	11.2	9.9
1,100	167	47	80.0	10.1	27.2	697.7	734.8	9.5	8.3
1,000	142	36	69.3	8.5	22.7	587.2	619.8	8.0	7.0

Heat Rejection Data [Top](#)

MAXIMUM LIMIT

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ENGINE SPEED	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXH RECOVERY TO 177C	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
RPM	BKW	KW	KW	KW	KW	KW	KW	KW	KW	KW
1,800	298	176	22.1	264	105	39.2	28.0	298	737	785
1,700	261	160	20.6	236	95.6	34.7	17.4	261	651	694
1,600	222	146	19.1	204	84.1	29.9	8.7	222	561	597
1,500	188	132	18.0	174	72.3	25.7	3.0	188	482	514
1,400	165	121	17.2	152	63.4	22.7	0.0	165	427	454
1,300	146	111	16.5	133	55.1	20.2	-1.8	146	379	403
1,200	130	103	15.9	116	47.7	18.0	-2.8	130	339	361
1,100	116	97.2	15.3	101	41.0	16.2	-3.4	116	305	325
1,000	104	92.3	14.8	87.8	34.9	14.7	-3.6	104	275	293

Sound Data [Top](#)

Note(s)
SOUND PRESSURE DATA FOR THIS RATING CAN BE FOUND IN SUPPLEMENTARY DATA, PERFORMANCE NUMBER EM0554

Emissions Data [Top](#)

Units Filter

All Units ▼

RATED SPEED NOMINAL DATA: 1800 RPM

ENGINE POWER		BKW	298	224	149	74.5	29.8
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	3,003	2,342	1,532	702	356
TOTAL CO		G/HR	181	120	115	162	205
TOTAL HC		G/HR	24	20	21	23	30
TOTAL CO2		KG/HR	191	146	103	61	37
PART MATTER		G/HR	43.9	33.5	31.2	41.4	45.8
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	3,390.9	3,465.1	3,221.7	2,500.9	2,130.1
TOTAL CO	(CORR 5% O2)	MG/NM3	218.1	188.5	257.4	631.5	1,624.9
TOTAL HC	(CORR 5% O2)	MG/NM3	25.2	26.7	41.6	78.3	213.8
PART MATTER	(CORR 5% O2)	MG/NM3	44.0	44.3	59.4	141.5	314.6
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,652	1,688	1,569	1,218	1,038
TOTAL CO	(CORR 5% O2)	PPM	174	151	206	505	1,300
TOTAL HC	(CORR 5% O2)	PPM	47	50	78	146	399
TOTAL NOX (AS NO2)		G/HP-HR	7.57	7.87	7.73	7.08	8.97
TOTAL CO		G/HP-HR	0.46	0.40	0.58	1.63	5.17
TOTAL HC		G/HP-HR	0.06	0.07	0.11	0.23	0.76
PART MATTER		G/HP-HR	0.11	0.11	0.16	0.42	1.15
TOTAL NOX (AS NO2)		LB/HR	6.62	5.16	3.38	1.55	0.78
TOTAL CO		LB/HR	0.40	0.26	0.25	0.36	0.45
TOTAL HC		LB/HR	0.05	0.04	0.05	0.05	0.07
TOTAL CO2		LB/HR	420	321	228	135	81
PART MATTER		LB/HR	0.10	0.07	0.07	0.09	0.10
OXYGEN IN EXH		%	10.6	11.4	12.7	15.1	17.1
DRY SMOKE OPACITY		%	1.2	1.0	1.4	2.7	3.5
BOSCH SMOKE NUMBER			0.78	0.65	0.94	1.62	1.93

Regulatory Information [Top](#)

IMO	2000 - 2010
GASEOUS EMISSIONS DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN REGULATION 13 OF ANNEX VI OF MARPOL 73/78 AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THIS ENGINE CONFORMS TO INTERNATIONAL MARINE ORGANIZATION'S (IMO) MARINE COMPRESSION-IGNITION EMISSION REGULATIONS.	

Altitude Derate Data [Top](#)

ALTITUDE CORRECTED POWER CAPABILITY (BKW) ▢

AMBIENT OPERATING TEMP (C)	10	15	20	25	30	35	40	45	50	NORMAL
ALTITUDE (M)										
0	298	298	298	298	298	298	298	297	292	298
250	298	298	298	298	298	297	293	288	284	298
500	298	298	298	298	293	288	284	279	275	298
750	298	298	294	289	284	279	275	271	266	293

AMBIENT OPERATING TEMP (C)	10	15	20	25	30	35	40	45	50	NORMAL
1,000	295	290	285	280	275	271	266	262	258	285
1,250	286	280	276	271	267	262	258	254	250	278
1,500	276	272	267	263	258	254	250	246	242	271
1,750	268	263	259	254	250	246	242	238	235	264
2,000	259	255	250	246	242	238	234	231	227	256
2,250	251	246	242	238	234	230	227	223	220	250
2,500	243	238	234	230	227	223	219	216	213	243
2,750	235	231	227	223	219	216	212	209	206	236
3,000	227	223	219	216	212	209	205	202	199	230
3,250	220	216	212	208	205	202	198	195	192	224
3,500	212	208	205	202	198	195	192	189	186	217
3,750	205	202	198	195	192	188	185	182	180	211
4,000	198	195	191	188	185	182	179	176	174	205
4,250	191	188	185	182	179	176	173	170	168	200
4,500	185	182	178	175	172	170	167	164	162	194

Cross Reference [Top](#)

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
0K1698	NAP	1778869	E323	-	4TB00001	
0K1698	NAP	1778870	E323	-	4TB00001	
4150563	PP4499	4480057	E323	-	4T700001	

Supplementary Data [Top](#)

This performance data is supplementary data for:

[EM0554](#)

Performance Parameter Reference [Top](#)

Parameters Reference: DM9600 - 11

PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600

APPLICATION: Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.

PERFORMANCE PARAMETER TOLERANCE FACTORS: Power +/- 3% Torque +/- 3% Exhaust stack temperature +/- 8% Inlet airflow +/- 5% Intake manifold pressure-gage +/- 10% Exhaust flow +/- 6% Specific fuel consumption +/- 3% Fuel rate +/- 5% Specific DEF consumption +/- 3% DEF rate +/- 5% Heat rejection +/- 5% Heat rejection exhaust only +/- 10% Heat rejection CEM only +/- 10%

Heat Rejection values based on using treated water.

Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.

On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.

These values do not apply to C280/3600. For these models, see the tolerances listed below.

C280/3600 HEAT REJECTION TOLERANCE FACTORS: Heat rejection +/- 10% Heat rejection to Atmosphere +/- 50% Heat rejection to Lube Oil +/- 20% Heat rejection to Aftercooler +/- 5%

TEST CELL TRANSDUCER TOLERANCE FACTORS: Torque +/- 0.5% Speed +/- 0.2% Fuel flow +/- 1.0% Temperature +/- 2.0 C degrees Intake manifold pressure +/- 0.1 kPa
OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.

REFERENCE ATMOSPHERIC INLET AIR FOR 3500 ENGINES AND SMALLER SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.

FOR 3600 ENGINES Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE Location for air temperature measurement air cleaner inlet at stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL DIESEL Reference fuel is #2 distillate diesel with a 35API gravity; A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 29 deg C (84.2 deg F), where the density is 838.9 G/Liter (7.001 Lbs/Gal).
GAS Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set. Standard temperature values versus altitude could be seen on TM2001.

When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet. Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001. Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.

Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

EMISSIONS DEFINITIONS: Emissions : DM1176

EMISSION CYCLE DEFINITIONS

1. For constant-speed marine engines for ship main propulsion, including,diesel-electric drive, test cycle E2 shall be applied, for controllable-pitch propeller sets test cycle E2 shall be applied.
2. For propeller-law-operated main and propeller-law-operated auxiliary engines the test cycle E3 shall be applied.
3. For constant-speed auxiliary engines test cycle D2 shall be applied.
4. For variable-speed, variable-load auxiliary engines, not included above, test cycle C1 shall be applied.

HEAT REJECTION DEFINITIONS: Diesel Circuit Type and HHV Balance : DM9500

HIGH DISPLACEMENT (HD) DEFINITIONS: 3500: EM1500

RATING DEFINITIONS: Agriculture : TM6008

Fire Pump : TM6009
Generator Set : TM6035
Generator (Gas) : TM6041
Industrial Diesel : TM6010
Industrial (Gas) : TM6040
Irrigation : TM5749
Locomotive : TM6037
Marine Auxiliary : TM6036
Marine Prop (Except 3600) : TM5747
Marine Prop (3600 only) : TM5748
MSHA : TM6042
Oil Field (Petroleum) : TM6011
Off-Highway Truck : TM6039
On-Highway Truck : TM6038

SOUND DEFINITIONS: Sound Power : DM8702
Sound Pressure : TM7080

Date Released : 11/29/18