MARINE ENGINE PERFORMANCE DATA [C1J00564]

SEPTEMBER 08, 2023

For Help Desk Phone Numbers Click here

Help

Performance Number: DM7565 **Change Level:** 01

Sales Model: C18 DITA
Engine Power: 447.5 KW
Manifold Type: W/C
Turbo Quantity: 1
Application Type: M PROP ENG
Rating Type: B RATING (HEAVY DUTY)
Combustion: DI
Speed: 1,800 RPM
Governor Type:
Engine App: MP
Engine Rating: MP
Certification: IMO - 2000 - ----
Aspr: TA
After Cooler: SCAC
After Cooler Temp(C): 32
Turbo Arrangement:
Strategy:

General Performance Data : Curve 1: Zone 1

ENGINE SPEED RPM	ENGINE POWER BKW	ENGINE TORQUE N.M	ENGINE BMEP KPA	FUEL BSFC G/BKW-HR	FUEL RATE LPH	INTAKE MFLD TEMP DEG C	INTAKE MFLD P KPA	INTAKE AIR FLOW M3/MIN	EXH MFLD TEMP DEG C	EXH STACK TEMP DEG C	EXH GAS FLOW M3/MIN
1800	413.3	2,193	1,520	200.900	99.0	36.4	114.4	30.1	540.2	416.7	73.3
1700	379.3	2,130	1,477	200.400	90.6	36.1	101.2	26.8	540.0	424.9	66.2
1600	341.8	2,040	1,414	200.600	81.7	35.6	86.3	23.4	540.4	435.8	58.7
1500	305.7	1,946	1,349	201.600	73.5	35.0	71.4	20.2	540.0	447.1	51.5
1400	264.7	1,806	1,252	203.400	64.2	34.9	56.3	17.2	540.1	456.2	44.4
1300	231.2	1,698	1,177	205.100	56.5	34.3	43.3	14.6	540.1	463.1	38.2
1200	213.9	1,702	1,180	206.000	52.5	34.3	37.9	12.9	540.2	472.4	34.4
1100	201.8	1,752	1,214	205.800	49.5	34.2	35.8	11.7	540.0	478.9	31.4
1000	184.0	1,757	1,218	205.400	45.1	34.0	31.9	10.3	532.8	479.4	27.7
900	145.0	1,538	1,066	204.900	35.4	41.1	23.0	8.5	482.3	433.4	21.5
800	123.1	1,469	1,018	204.500	30.0	48.1	18.6	7.2	462.9	416.5	17.6
700	95.1	1,297	899	205.000	23.2	48.2	12.3	5.9	412.5	364.7	13.5
600	68.0	1,082	750	207.000	16.8	43.6	6.5	4.9	349.3	307.4	10.0

General Performance Data :Curve 2: Zone 1-2

ENGINE SPEED RPM	ENGINE POWER BKW	ENGINE TORQUE N.M	ENGINE BMEP KPA	FUEL BSFC G/BKW-HR	FUEL RATE LPH	INTAKE MFLD TEMP DEG C	INTAKE MFLD P KPA	INTAKE AIR FLOW M3/MIN	EXH MFLD TEMP DEG C	EXH STACK TEMP DEG C	EXH GAS FLOW M3/MIN
1800	447.5	2,374	1,645	199.900	106.6	36.9	125.8	31.7	554.6	423.3	78.0
1700	436.5	2,452	1,699	198.400	103.2	36.9	120.0	29.2	565.0	437.3	73.6
1600	391.1	2,334	1,618	198.200	92.4	36.1	102.3	25.4	564.9	449.0	65.0
1500	347.5	2,212	1,533	199.600	82.7	35.1	84.9	21.8	564.9	462.1	56.8
1400	295.3	2,014	1,396	202.000	71.1	34.9	65.1	18.1	565.2	474.2	48.2
1300	252.8	1,857	1,287	204.500	61.6	34.3	49.1	15.2	565.2	482.6	40.8
1200	231.2	1,840	1,275	206.100	56.8	34.3	43.1	13.5	564.7	492.0	36.7
1100	216.9	1,883	1,305	206.200	53.3	34.2	40.2	12.1	565.0	501.3	33.5
1000	184.0	1,757	1,218	205.600	45.1	34.0	31.9	10.3	532.8	479.4	27.7
900	145.0	1,538	1,066	204.900	35.4	41.1	23.0	8.5	482.3	433.4	21.5
800	123.1	1,469	1,018	204.500	30.0	48.1	18.6	7.2	462.9	416.5	17.6
700	94.0	1,283	889	205.000	23.0	48.2	12.1	5.9	408.9	361.7	13.4
600	68.0	1,082	750	207.000	16.8	43.6	6.5	4.9	349.3	307.4	10.0

General Performance Data :Maximum Limit

ENGINE SPEED RPM	ENGINE POWER BKW	ENGINE TORQUE N.M	ENGINE BMEP KPA	FUEL BSFC G/BKW-HR	FUEL RATE LPH	INTAKE MFLD TEMP DEG C	INTAKE MFLD P KPA	INTAKE AIR FLOW M3/MIN	EXH MFLD TEMP DEG C	EXH STACK TEMP DEG C	EXH GAS FLOW M3/MIN
1800	447.5	2,374	1,645	199.900	106.6	36.9	125.8	31.7	554.6	423.3	78.0
1700	436.5	2,452	1,699	198.400	103.2	36.9	120.0	29.2	565.0	437.3	73.6
1600	391.1	2,334	1,618	198.200	92.4	36.1	102.3	25.4	564.9	449.0	65.0
1500	347.5	2,212	1,533	199.600	82.7	35.1	84.9	21.8	564.9	462.1	56.8
1400	295.3	2,014	1,396	202.000	71.1	34.9	65.1	18.1	565.2	474.2	48.2
1300	252.8	1,857	1,287	204.500	61.6	34.3	49.1	15.2	565.2	482.6	40.8
1200	231.2	1,840	1,275	206.100	56.8	34.3	43.1	13.5	564.7	492.0	36.7
1100	216.9	1,883	1,305	206.200	53.3	34.2	40.2	12.1	565.0	501.3	33.5
1000	184.0	1,757	1,218	205.600	45.1	34.0	31.9	10.3	532.8	479.4	27.7
900	145.0	1,538	1,066	204.900	35.4	41.1	23.0	8.5	482.3	433.4	21.5
800	123.1	1,469	1,018	204.500	30.0	48.1	18.6	7.2	462.9	416.5	17.6
700	94.0	1,283	889	205.000	23.0	48.2	12.1	5.9	408.9	361.7	13.4
600	68.0	1,082	750	207.000	16.8	43.6	6.5	4.9	349.3	307.4	10.0

General Performance Data :Prop Demand Curve P

ENGINE SPEED RPM	ENGINE POWER BKW	ENGINE TORQUE N.M	ENGINE BMEP KPA	FUEL BSFC G/BKW-HR	FUEL RATE LPH	INTAKE MFLD TEMP DEG C	INTAKE MFLD P KPA	INTAKE AIR FLOW M3/MIN	EXH MFLD TEMP DEG C	EXH STACK TEMP DEG C	EXH GAS FLOW M3/MIN
1800	447.5	2,374	1,645	199.900	106.6	36.9	125.8	31.7	554.6	423.3	78.0
1700	377.0	2,118	1,468	200.800	90.2	36.1	100.5	26.7	539.0	424.4	65.9
1600	314.3	1,876	1,300	202.200	75.7	35.4	77.6	22.3	525.6	427.3	55.3
1500	259.0	1,649	1,143	203.700	62.9	35.0	57.0	18.4	507.7	425.6	45.6
1400	210.6	1,436	995	205.100	51.5	34.7	40.6	15.4	483.0	412.7	37.3
1300	168.6	1,238	858	206.500	41.5	34.1	27.3	12.9	445.2	386.0	30.1
1200	132.6	1,055	731	208.000	32.9	34.2	17.5	11.0	398.2	353.3	24.2
1100	102.1	887	614	209.800	25.5	34.0	12.1	9.6	341.7	306.4	19.6
1000	76.7	733	508	212.900	19.5	33.9	7.9	8.4	292.2	264.9	15.8
900	55.9	594	411	219.700	14.7	40.2	5.2	7.3	249.9	229.8	12.7
800	39.3	469	325	231.200	10.8	46.1	3.4	6.3	212.5	197.9	10.3
700	26.3	359	249	246.900	7.7	45.9	1.9	5.4	178.2	168.1	8.3
600	16.6	264	183	266.900	5.3	42.0	0.8	4.7	148.7	142.6	6.7

General Performance Data :Max Power Curve M

ENGINE SPEED RPM	ENGINE POWER BKW	ENGINE TORQUE N.M	ENGINE BMEP KPA	FUEL BSFC G/BKW-HR	FUEL RATE LPH	INTAKE MFLD TEMP DEG C	INTAKE MFLD P KPA	INTAKE AIR FLOW M3/MIN	EXH MFLD TEMP DEG C	EXH STACK TEMP DEG C	EXH GAS FLOW M3/MIN
1800	447.5	2,374	1,645	199.900	106.6	36.9	125.8	31.7	554.6	423.3	78.0
1700	447.5	2,513	1,742	198.000	105.6	37.0	123.6	29.7	569.7	439.6	75.0
1600	433.9	2,590	1,795	196.700	101.7	36.7	116.7	27.1	582.9	457.5	70.4
1500	422.9	2,692	1,866	196.200	98.9	35.9	110.5	24.8	602.1	480.5	66.4
1400	390.1	2,661	1,844	197.600	91.9	34.7	92.2	21.1	613.6	502.4	58.5
1300	305.0	2,241	1,553	201.800	73.4	34.2	63.5	16.6	608.4	513.8	46.7
1200	281.9	2,244	1,555	205.900	69.2	34.4	59.8	15.1	627.0	539.1	43.8
1100	219.1	1,902	1,318	206.400	53.9	34.2	40.9	12.2	568.6	504.5	33.8
1000	184.0	1,757	1,218	205.700	45.1	34.0	31.9	10.3	532.8	479.4	27.7
900	145.0	1,538	1,066	204.900	35.4	41.1	23.0	8.5	482.3	433.4	21.5
800	123.1	1,469	1,018	204.500	30.0	48.1	18.6	7.2	462.9	416.5	17.6
700	94.0	1,283	889	205.000	23.0	48.2	12.1	5.9	408.9	361.7	13.4
600	68.0	1,082	750	207.000	16.8	43.6	6.5	4.9	349.3	307.4	10.0

Engine Heat Rejection Data :Maximum Limit

ENGINE SPEED RPM	ENGINE POWER BKW	REJ TO JW KW	REJ TO ATMOS KW	REJ TO EXHAUST KW	EXH RCOV TO 177C KW	FROM OIL CLR KW	FROM AFT CLR KW	WORK ENERGY KW	LHV ENERGY KW	HHV ENERGY KW
1800	447.5	250.0	49.0	334.0	165.0	57.0	62.0	447.0	1,072.0	1,142.0
1700	436.5	237.0	45.0	312.0	157.0	54.0	54.0	436.0	1,018.0	1,084.0
1600	391.1	216.0	41.0	303.0	158.0	50.0	40.0	391.0	931.0	991.0
1500	347.5	190.0	37.0	276.0	146.0	44.0	29.0	348.0	826.0	880.0
1400	295.3	170.0	34.0	250.0	135.0	38.0	19.0	295.0	721.0	768.0
1300	252.8	156.0	30.0	225.0	124.0	34.0	12.0	253.0	633.0	675.0
1200	231.2	144.0	26.0	200.0	111.0	31.0	10.0	231.0	574.0	611.0
1100	216.9	122.0	23.0	179.0	100.0	28.0	8.0	217.0	516.0	550.0
1000	184.0	98.0	21.0	165.0	92.0	24.0	5.0	184.0	444.0	473.0
900	145.0	76.0	18.0	152.0	81.0	20.0	2.0	145.0	369.0	393.0
800	123.1	58.0	17.0	118.0	61.0	16.0	.0	123.0	296.0	316.0
700	94.0	44.0	15.0	94.0	44.0	12.0	-1.0	94.0	230.0	245.0
600	68.0	29.0	13.0	69.0	27.0	9.0	-1.0	68.0	167.0	178.0

EMISSIONS DATA

IMO - 2000 - ---- ********** M2
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) ÝB compression-ignition emission regulations.

REFERENCE EXHAUST STACK DIAMETER	--
WET EXHAUST MASS	2,336.0 KG/HR
WET EXHAUST FLOW (423.00 C STACK TEMP)	78.06 M3/MIN
WET EXHAUST FLOW RATE (0 DEG C AND 101.2 KPA)	30.60 M3/MIN
DRY EXHAUST FLOW RATE (0 DEG C AND 101.2 KPA)	27.51 M3/MIN
FUEL FLOW RATE	106 L/HR

RATED SPEED "Potential site variation"

ENGINE SPEED RPM	PERCENT LOAD	ENGINE POWER BKW	TOTAL NOX (AS NO2) G/HR	TOTAL CO G/HR	TOTAL HC G/HR	PART MATTER G/HR	OXYGEN IN EXHAUST PERCENT
1800	100	447.5	5,099.00	576.00	18.00	41.90	8.8000
1800	75	335.6	3,315.00	409.00	25.00	48.80	9.9000
1800	50	223.8	1,594.00	409.00	26.00	85.40	11.4000
1800	25	111.9	814.00	265.00	31.00	54.50	14.2000
1800	10	44.8	680.00	156.00	41.00	19.50	18.5000

RATED SPEED "Potential site variation"

ENGINE SPEED RPM	PERCENT LOAD	ENGINE POWER BKW	TOTAL NOX (AS NO2) mg/norm cu M @ %5 O2	TOTAL CO mg/norm cu M @ %5 O2	TOTAL HC mg/norm cu M @ %5 O2	PART MATTER mg/norm cu M @ %5 O2	OXYGEN IN EXHAUST PERCENT
1800	100	447.5	4,058.3	456.3	12.8	26.900	8.8000
1800	75	335.6	3,442.8	430.3	24.5	43.400	9.9000
1800	50	223.8	2,350.1	607.8	35.8	107.800	11.4000
1800	25	111.9	2,150.7	715.7	79.4	130.200	14.2000
1800	10	44.8	2,586.5	866.6	130.6	150.300	18.5000

RATED SPEED "Potential site variation"

ENGINE SPEED RPM	PERCENT LOAD	ENGINE POWER BKW	TOTAL NOX (AS NO2) PPM @ %5 O2	TOTAL CO PPM @ %5 O2	TOTAL HC PPM @ %5 O2	OXYGEN IN EXHAUST PERCENT
1800	100	447.5	2,009	372	23	8.8000
1800	75	335.6	1,693	346	43	9.9000
1800	50	223.8	1,138	484	62	11.4000
1800	25	111.9	1,037	566	135	14.2000
1800	10	44.8	2,648	1,344	536	18.5000

RATED SPEED "Potential site variation"

ENGINE SPEED RPM	PERCENT LOAD	ENGINE POWER BKW	TOTAL NOX (AS NO2) G/HP-HR	TOTAL CO G/HP-HR	TOTAL HC G/HP-HR	PART MATTER G/HP-HR	OXYGEN IN EXHAUST PERCENT
1800	100	447.5	8.50	0.96	0.03	0.070	8.8000
1800	75	335.6	7.36	0.91	0.06	0.108	9.9000
1800	50	223.8	5.31	1.36	0.09	0.285	11.4000
1800	25	111.9	5.42	1.76	0.21	0.363	14.2000
1800	10	44.8	11.34	2.60	0.69	0.324	18.5000

RATED SPEED "Nominal Data"

ENGINE SPEED RPM	PERCENT LOAD	ENGINE POWER BKW	TOTAL NOX (AS NO2) G/HR	TOTAL CO G/HR	TOTAL HC G/HR	TOTAL CO2 KG/HR	PART MATTER G/HR	OXYGEN IN EXHAUST PERCENT
1800	100	447.5	4,214.00	308.00	9.00	283.7	21.50	8.8000
1800	75	335.6	2,739.00	219.00	13.00	215.7	25.00	9.9000
1800	50	223.8	1,317.00	219.00	14.00	151.7	43.80	11.4000
1800	25	111.9	673.00	142.00	17.00	84.4	27.90	14.2000
1800	10	44.8	562.00	83.00	22.00	48.3	10.00	18.5000

RATED SPEED "Nominal Data"

ENGINE SPEED RPM	PERCENT LOAD	ENGINE POWER BKW	TOTAL NOX (AS NO2) mg/norm cu M @ %5 O2	TOTAL CO mg/norm cu M @ %5 O2	TOTAL HC mg/norm cu M @ %5 O2	PART MATTER mg/norm cu M @ %5 O2	OXYGEN IN EXHAUST PERCENT
1800	100	447.5	3,353.9	244.0	6.8	13.8	8.8000
1800	75	335.6	2,845.3	230.1	12.9	22.3	9.9000
1800	50	223.8	1,942.2	325.0	18.9	55.3	11.4000
1800	25	111.9	1,777.4	382.7	42.0	66.8	14.2000
1800	10	44.8	2,137.6	463.4	69.1	77.1	18.5000

RATED SPEED "Nominal Data"

ENGINE SPEED RPM	PERCENT LOAD	ENGINE POWER BKW	TOTAL NOX (AS NO2) PPM @ %5 O2	TOTAL CO PPM @ %5 O2	TOTAL HC PPM @ %5 O2	OXYGEN IN EXHAUST PERCENT
1800	100	447.5	1,660	199	12	8.8000
1800	75	335.6	1,399	185	23	9.9000
1800	50	223.8	940	259	33	11.4000
1800	25	111.9	857	303	72	14.2000
1800	10	44.8	2,188	719	284	18.5000

RATED SPEED "Nominal Data"

ENGINE SPEED RPM	PERCENT LOAD	ENGINE POWER BKW	TOTAL NOX (AS NO2) G/HP-HR	TOTAL C0 G/HP-HR	TOTAL HC G/HP-HR	PART MATTER G/HP-HR	OXYGEN IN EXHAUST PERCENT
1800	100	447.5	7.02	0.51	0.02	0.04	8.8000
1800	75	335.6	6.09	0.49	0.03	0.06	9.9000
1800	50	223.8	4.39	0.73	0.05	0.15	11.4000
1800	25	111.9	4.48	0.94	0.11	0.19	14.2000
1800	10	44.8	9.37	1.39	0.36	0.17	18.5000

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:	2419635	**Lube Oil Press @ Rated Spd(KPA):**	--
Effective Serial No:	C1J00923	**Piston Speed @ Rated Eng SPD(M/Sec):**	11.0
Primary Engine Test Spec:	0K5618	**Max Operating Altitude(M):**	--
Performance Parm Ref:	TM0015	**PEEC Elect Control Module Ref**	
Performance Data Ref:	DM7565	**PEEC Personality Cont Mod Ref**	
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:		**Turbocharger Model**	S510W010
Certification Ref:	IMO	**Fuel Injector**	
Certification Year:	2004	**Timing-Static (DEG):**	--
Compression Ratio:	16.5	**Timing-Static Advance (DEG):**	--
Combustion System:	DI	**Timing-Static (MM):**	--
Aftercooler Temperature (C):	32	**Unit Injector Timing (MM):**	--
Crankcase Blowby Rate(M3/H):	--	**Torque Rise (percent)**	--
Fuel Rate (Rated RPM) No Load(L/HR):	--	**Peak Torque Speed RPM**	--
Lube Oil Press @ Low Idle Spd(KPA):	--	**Peak Torque (NM):**	--

Reference Number: DM7565

THIS PERFORMANCE DATA IS ALSO APPLICABLE TO
ENGINE ARRANGEMENT 241-9639 AND TEST SPEC 0K5619 (LH).
IMO - 2000----M2

Parameters Reference: TM0015

MARINE PROP - ALL EXCEPT 3600

LIMIT DEFINITIONS FOR USE WITH A, B AND C RATED ENGINES:
ZONE 1 - FOR CONTINUOUS OPERATION, INLCUDING DREDGE ENGINES, WITHOUT INTERRUPTION OR LOAD CYCLING ON OR UNDER CURVE 1.

ZONE 1-2 - OPERATION LIMITED TO 4 HOUR PERIOD AT FULL POWER FOLLOWED BY A 1 HOUR PERIOD ON OR UNDER CURVE 1.

ZONE 2-3 - OPERATION LMITED TO 1 HOUR PERIOD AT FULL POWER FOLLOWED BY A 1 HOUR PERIOD ON OR UNDER CURVE 1.

MAX LIMIT CURVE - OPERATION LIMITED TO 5 MINUTE PERIOD AT FULL POWER FOLLOWED BY A 2 HOUR PERIOD ON OR UNDER CURVE 1.

CURVE P - POWER CURVE P REPRESENTS THE POWER DEMAND OF A TYPICAL FIXED PITCH PROPELLER, SHAFT POWER MAY BE ASSUMED TO BE 97 PERCENT OF THE BRAKE ENGINE POWER SHOWN.

MAX POWER DATA CURVE M - MAXIMUM POWER ENGINE IS CAPABLE OF PRODUCING.

TOLERANCES:

Power	+/- 3%
Exhaust stack temperature	+/- 8%
Inlet airflow	+/- 5%
Intake manifold pressure-gage	+/- 10%
Exhaust flow	+/- 6%
Specific fuel consumption	+/- 3%
Fuel rate	+/- 5%
Heat rejection	+/- 5%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) DRY BAROMETER AND 25 DEG C (77 DEG F). THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE AS SHOWN IN SAE J1228. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 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/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1228, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN 70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL

AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE O0PERATION.

NORMAL TEMPERATURE - THE NOMRAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS FOUND ON TM2001.

SOUND DEFINITIONS:

Sound Power : DM8702
Sound Pressure : TM7080

Date Released : 03/21/12