ENGINE SPEED: 1800 FUEL: NAT GAS COMPRESSION RATIO: 11:1 FUEL: Cat Low Pressue APTERSOLOR, NUET (F) 03 FUEL: STEM: Cat Low Pressue APTERSOLOR, SYSTEM: COMBINED NUM. FUEL: STEM: Cat Low Pressue COMPLICES, SYSTEM: COMBINED NUM. MAT AMEENDUCK STEM:	G3516B LE	GAS ENGINE TECHNICAL DATA							
COOLING SYSTEM: COMBINED MIN. METHANE NUMBER: BO EXHAUST MANFOLD: Dy AT AMBIENT TEMP (F): 1812 EXHAUST MANFOLD: Dy NOK EMBISION LEVEL: 0.5 g/bhp-hr COMBUSTON: LEAN BURN NOK EMBISION LEVEL: 0.5 g/bhp-hr LINK OF THE COMPANY AND POLICIES NOK EMBISION LEVEL: 0.5 g/bhp-hr FUNDER FULL NOK EMBISION LEVEL: 0.5 g/bhp-hr ENGINE EFFICIENCY (K) 0.0 g/bhp-hr 0.0 f/bhp-hr 0.0 f/bhp-hr FUEL CONSUMPTION (K) 0.0 g/bhp-hr 0.0 f/bhp-hr 0.0 f/bhp-hr 0.0 f/bhp-hr FUEL CONSUMPTION (K) 0.0 g/bhp-hr 0.0 f/bhp-hr 0.0 f/bhp-hr 0.0 f/bhp-hr FUEL CONSUMPTION (K) 0.0 g/bhp-hr 0.0 f/bhp-hr 0.0 f/bhp-hr 0.0 f/bhp-hr COMPRESSOR OUT TRENS. (K) F1 10 g/bhp-hr 0.0 f/bhp-hr 0.0 f/bhp-hr NOISE - MECH @ 1m (K) F1 10 g/bhp-hr 0.0 f/bhp-hr 0.0 f/bhp-hr NOISE - MECH @ 1m (K) f/bhp-hr 0.0 f/bhp-hr 0.0 f/bhp-hr 0.0 f/bhp-hr NOISE - MECH @	ENGINE SPEED: COMPRESSION RATIO: AFTERCOOLER INLET (°F) JACKET WATER OUTLET (°F)	1800 11:1 90 198			FUEL: FUEL SYSTEN FUEL PRESS.	1: Ca WITH AIR FUEL RANGE (PSIG)	NAT GAS Cat Low Pressure TH AIR FUEL RATIO CONTROL NGE (PSIG) 1.5 - 5		
RATING AND EFFICIENCY NOTES LOAD 100% 75% 50% LIN OF FUEL ENGINE EPROENCY (B) 304617 (C) 345 324.0 324.1	COOLING SYSTEM: IGNITION SYSTEM: EXHAUST MANIFOLD: COMBUSTION:	COMBINED ADEM3 Dry LEAN BURN			MIN. METHAN RATED ALTITU AT AMBIENT T NOx EMISSIO	e numbèr: Jde (FT): Temp (°F): N level:	80 1812 77 0.5 g/bhp-hr		
LHU OF FUEL DBUP 924 924 924 ENGINE POWER (1) 10 171 1478 986 ENGINE EPFICIENCY (10) % 36.5 34.9 924 ENGINE EFFICIENCY (17) % 36.5 34.0 31.7 THERMAL EFFICIENCY (17) % 43.8 44.2 45.8 TOTAL EFFICIENCY (18) 800.36441 (19) % 79.2 78.2 77.4 FUEL CONSUMPTION (19) 0.00 56.4641 (19) 100.00 57.7 78.3 78.37 FUEL CONSUMPTION (10) 0.00 56.4661 100.063 86.8 63.3 COMPRESSOR OUT TEME. (12) "F 10.9 10.9 10.9 INLET MAN. TEMP. (12) "F 10.6 10.0 99 98 NOISE - EXH @ 1.5m (13) "BTU/min 125.5 97.52 69.0 10.2 COMPRESSOR OUT TEMP. (12) "F 10.0 12.4 2.6	RATING AND EFFICIENC	:Y	NOTES	LOAD	100%	75%	50%		
TOTAL EFFICIENCY (8) % 79.2 78.2 77.4 ENDIRE DATA ENDIRE DATA ENDIRE DATA ENDIRE DATA 71.4 74.9 74.9 74.4 FUEL CONSUMPTION (80 03046) (1) BTU/bhp-hr 697.4 739.0 80.37 FUEL CONSUMPTION (90 08 0022) SCPM 4290 330.5 133.63 AIR FLOW (VTF 1, 14.7 psi) (WFT 1) SCPM 4290 330.5 133.63 COMPRESSOR OUT TEMP. in. HG (abs) 83.9 66.3 45.4 in. HG (abs) 83.9 66.3 45.4 INLET MAN. TREP. (12) "F 109 109 109 109 TIMING (13) "BTDC 22 22 22 22 22 22 24 26 3 66.3 107.46 EXHAUST TAKCK TEMP. (12) "F 195.6 15190 1020 109 109 109 109 109 109 109 109 101 100	LHV OF FUEL ENGINE POWER ENGINE EFFICIENCY ENGINE EFFICIENCY THERMAL EFFICIENCY	(ISO 3046/1)	(1) (2) (7)	BTU/SCF BHP % %	924 1971 36.5 35.4 43.8	924 1478 34.9 34.0 44.2	924 986 32.5 31.7 45.8		
ENGINE DATA FUEL CONSUMPTION (iso 39467) BTU/bhp-hr 6974 7283 7837 FUEL CONSUMPTION (iso 39467) (i) BTU/bhp-hr 7178 7490 8032 AIR FLOW (77 *F, 14.7 ps) (iver) SCFM 4230 3305 2337 AIR FLOW (77 *F, 14.7 ps) (iver) BV/br 110225 14657 10363 COMPRESSOR OUT TEMP. in. HG (abs) 33.9 65.3 45.4 INLET MAN. PRESS. (iver) 12 'F 109 109 109 NOISE - EXH @ 1.5m (iver) 48(A) 111 110 109 98 NOISE - EXH @ 1.5m (iver) (iver) 'F 985 1000 1020 EXHAUST TACK TEMP. (iver) (iver) 'F 985 1000 1020 EXHAUST TASS (iver) (iver) 'F 985 1000 1020 EXHAUST MASS (iver) (iver) 'F 25 0.5 <td< td=""><td>TOTAL EFFICIENCY</td><td></td><td>(8)</td><td>%</td><td>79.2</td><td>78.2</td><td>77.4</td></td<>	TOTAL EFFICIENCY		(8)	%	79.2	78.2	77.4		
FUEL CONSUMPTION (iso 3946/i) (i) BTU/bhp-hr 6974 7233 7837 CHEL CONSUMPTION (ii) BTU/bhp-hr 7178 7490 6032 AIR FLOW (iii) BTU/bhp-hr 19025 14657 10363 COMPRESSOR OUT TEMP. (iv) iii) HG (abs) 90.8 86.8 63.3 COMPRESSOR OUT TEMP. (iv) 'F 356 328 244 INLET MAN. PRESS. (iv) 'F 1009 109 109 NOISE - MECH @ 1m (iii) 'BTDC 22 22 22 NOISE - EXH @ 1.5m (iiii) 'BTDC 22 22 22 NOISE - EXH @ 1.5m (iiii) 'BTDC 22 22 29 NOISE - EXH @ 1.5m (iiii) (iiii) 'BDhp-hr 0.4 30 5 5 VMET (iv) (iii) (ibhp-hr 0.4 2.4 2.6 5 VMET (iv) (ibhp-hr 0.5 <td< td=""><td>ENGINE DATA</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	ENGINE DATA								
NOISE - MECH @ 1:m dB(A) 100 99 98 NOISE - MECH @ 1:m gB(A) 111 110 109 EXHAUST GAS FLOW (@ stack temp.) (WET) F 985 1000 1020 EXHAUST GAS FLOW (@ stack temp.) (WET) (Jhr 19706 15190 10746 Image: Stack temp. (WET) (Jhr 19706 15190 10746 Image: Stack temp. (WET) (Jhr 19706 15190 10746 Image: Stack temp. (Jhr g/bp-hr 0.5 0.5 0.5 CO (I) g/bp-hr 0.4 2.4 2.6 3 Image: Stack temp. (I) g/bp-hr 0.7 2.4 2.6 3 Image: Stack temp. (I) g/bp-hr 0.7 2.4 2.6 3 Image: Stack temp. (I) g/bp-hr 0.72 0.78 0.98 91 Image: Stack temp. (I) g/bp-hr 0.72 0.78 1.6 1.6	FUEL CONSUMPTION FUEL CONSUMPTION AIR FLOW (77 °F, 14.7 psi) AIR FLOW COMPRESSOR OUT PRESS. COMPRESSOR OUT TEMP. INLET MAN. PRESS. INLET MAN. TEMP. TIMING	(ISO 3046/1)	(1) (2) (WET) (WET) (12) (13)	BTU/bhp-hr BTU/bhp-hr SCFM Ib/hr in. HG (abs) °F in. HG (abs) °F °BTDC	6974 7178 4290 19025 90.8 356 83.9 109 22	7293 7490 3305 14657 86.8 328 65.3 109 22	7837 8032 2337 10363 63.3 244 45.4 109 22		
EMISSIONS DATA NOx (as NO2) (11) g/bhp-hr 0.5 0.5 0.5 CO (14) g/bhp-hr 2.4 2.6 3 THC (14) g/bhp-hr 4.8 5.2 6.5 NMHC (14) g/bhp-hr 4.8 5.2 6.5 NMHC (14) g/bhp-hr 4.8 5.2 6.5 NMHC (15) % 9.1 9.0 9.1 LAMBDA 1.69 1.67 1.64 HEAT REJ. TO JACKET (2) BTU/min 27834 23169 19963 HEAT REJ. TO JACKET (3) BTU/min 7838 6701 5531 HEAT REJ. TO LUBE OIL (6) BTU/min 98431 69908 51797 HEAT REJ. TO A/C - STAGE1 (4) (10) BTU/min 9824 6227 1645 HEAT REJ. TO A/C - STAGE1 (4) (10) BTU/min 10956 8074 4906 3.05 <td>NOISE - MECH @ 1m NOISE - EXH @ 1.5m EXHAUST STACK TEMP. EXHAUST GAS FLOW (@ stack temp EXHAUST MASS</td> <td>.)</td> <td>(WET) (WET)</td> <td>dB(A) dB(A) °F CFM, 14.5 psi lb/hr</td> <td>100 111 985 12525 19706</td> <td>99 110 1000 9752 15190</td> <td>98 109 1020 6994 10746</td>	NOISE - MECH @ 1m NOISE - EXH @ 1.5m EXHAUST STACK TEMP. EXHAUST GAS FLOW (@ stack temp EXHAUST MASS	.)	(WET) (WET)	dB(A) dB(A) °F CFM, 14.5 psi lb/hr	100 111 985 12525 19706	99 110 1000 9752 15190	98 109 1020 6994 10746		
(1) (1) <td></td> <td></td> <td>(1.1)</td> <td>a/bbp.br</td> <td>0.5</td> <td>0.5</td> <td>0.5</td>			(1.1)	a/bbp.br	0.5	0.5	0.5		
HEAT BALANCE DATA LHV INPUT (2) BTU/min 235819 184551 131939 HEAT REJ. TO JACKET (3) (9) BTU/min 27834 23169 19663 HEAT REJ. TO LUBE OIL (6) BTU/min 9338 7773 6597 HEAT REJ. TO EXH. (LHV to 77°F) (3) BTU/min 86431 69908 51797 HEAT REJ. TO A/C - STAGE1 (4) (10) BTU/min 9824 6227 1645 HEAT REJ. TO A/C - STAGE2 (4) (10) BTU/min 9824 6227 1645 YB '''' GAMMETRIC PRESSURE: 30% RELATIVE HUMIDITY, (1*D2 OAR FILTER RESTRICTION. AND 20' H2D EXHAUST STACK PRESSURE: NO OVERLOAD PERMITTED AT RATING SHOWN. DATA NEPRESENTS CONDTIONS OF 77°F. 98'' HG BAROMETRIC PRESSURE: 30% RELATIVE HUMIDITY, (1*D 42) OAR FILTER RESTRICTION. AND 20' H2D EXHAUST STACK PRESSURE: NO OVERLOAD PERMITTED AT RATING SHOWN. DATA NOTE DAS ISO 3046/1 REPRESENTS CONDTIONS OF 77°F. 98'' HG BAROMETRIC PRESSURE: 30% RELATIVE HUMIDITY, (1*D2 OAR FILTER RESTRICTION. AND 20' H2D EXHAUST STACK PRESSURE: NO OVERLOAD PERMITTED AT RATING SHOWN. DATA NOTED AS ISO 3046/1 REPRESENTS CONDTIONS OF 77°F. 98'' HG BAROMETRIC PRESSURE: 30% OF FULL LOAD DATA. 10 TOLA SHOWER ANT	NOX (as NO2) CO THC NMHC EXHAUST O2 LAMBDA		(11) (14) (14) (14) (15)	g/bhp-hr g/bhp-hr g/bhp-hr %	0.5 2.4 4.8 0.72 9.1 1.69	0.5 2.6 5.2 0.78 9.0 1.67	0.5 3 6.5 0.98 9.1 1.64		
LHV INPUT (2) BTU/min 235819 184551 131939 HEAT REJ. TO JACKET (3) (9) BTU/min 27834 23169 19663 HEAT REJ. TO LUBE OIL (6) BTU/min 7838 6701 5531 HEAT REJ. TO EXH. (LHV to 77°F) (3) BTU/min 86431 69908 51797 HEAT REJ. TO EXH. (LHV to 350°F) (3) BTU/min 96622 44439 32472 HEAT REJ. TO A/C - STAGE1 (4) (10) BTU/min 9624 6227 1645 HEAT REJ. TO A/C - STAGE1 (4) (10) BTU/min 10956 8074 4906 CONDITIONS AND DEFINITIONS ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 30461. DATA REPRESENTS CONDTIONS OF 77°F, 29.6° HG BAROMETRIC PRESSURE, 30% RELATIVE HUMDITY, 10° H20 AIR FILTER RESTRICTION, AND 20° H20 EXHAUST STACK PRESSURE. NO OVERLOAD PERMITTED AT RATING SHOWN. DATA NOTED AS ISO 30461. THERRESENTS THE SAME AMBIENT CONDITIONS ABOVE MAXIMUM RATED ALTITUDE AND/CR TEMPERATURE. NOTAL STACKER PRESSURE. NO OVERLOAD PERMITTED AT RATING SHOWN. DATA NOTED AS ISO 30461. THERESENTS CONDUCTION, AND 20° H20 EXHAUST STACK PRESSURE. NO OVERLOAD ATA. PIELCATIONS ADOVE MAXIMUM RATED ALTITUDE AND/CR T	HEAT BALANCE DATA	1	1						
CONDITIONS AND DEFINITIONS ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 3046/1. DATA REPRESENTS CONDITIONS OF 77°F. 29.6° HG BAROMETRIC PRESSURE, 30% RELATIVE HUMIDITY, 10° H20 AIR FILTER RESTRICTION, AND 20° H20 EXHAUST STACK PRESSURE. NO OVERLOAD PERMITTED AT RATING SHOWN. DATA NOTED AS ISO 3046/1 REPRESENTS THE SAME AMBIENT CONDITIONS WITH 5° H20 AIR FILTER RESTRICTION AND 0° H20 EXHAUST STACK PRESSURE. CONSULT ALTITUDE CURVES FOR APPLICATIONS ABOVE MAXIMUM RATED ALTITUDE AND/OR TEMPERATURE. ENGINE RATING IS WITH 2 ENGINE DRIVEN WATER PUMPS. MOTES 1) ISO 3046/1 FUEL CONSUMPTION TOLERANCE IS 0, + 5% OF FULL LOAD DATA. 2) FUEL CONSUMPTION TOLERANCE IS 10, + 5% OF FULL LOAD DATA. 2) FUEL CONSUMPTION TO LERANCE IS ± 3% OF FULL LOAD DATA. 3) HEAT REJECTION TO ATROSPHERE TOLERANCE IS ± 50% 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 6) HEAT REJECTION TO ALBE OIL TOLERANCE IS ± 20% OF FULL LOAD DATA. (heat rate based on treated water 7) THERMAL EFFICIENCY: ENGINE EFFICIENCY: 8) TOTAL LEFFICIENCY: ENGINE EFF. THERMAL EFF. TOLERANCE IS ± 10% OF FULL LOAD DATA. 9) TOTAL AVC HEAT: COMBINED = A/C STG 2 HEAT + (STG 1 + STG 2) x (ACHRF - 1): (heat rate based on treated water 10) TOTAL AVC HEAT: COMBINED = A/C STG 2 HEAT + (STG 1 + STG 2)	LHV INPUT HEAT REJ. TO JACKET HEAT REJ. TO ATMOSPHERE HEAT REJ. TO LUBE OIL HEAT REJ. TO EXH. (LHV to 77°F) HEAT REJ. TO EXH. (LHV to 350°F) HEAT REJ. TO A/C - STAGE1 HEAT REJ. TO A/C - STAGE2		(2) (3) (9) (5) (6) (3) (3) (4) (10) (4) (10)	BTU/min BTU/min BTU/min BTU/min BTU/min BTU/min BTU/min	235819 27834 7838 9338 86431 56262 9824 10956	184551 23169 6701 7773 69908 44439 6227 8074	131939 19663 5531 6597 51797 32472 1645 4906		
NOTES 1) ISO 3046/1 FUEL CONSUMPTION TOLERANCE IS 0, + 5% OF FULL LOAD DATA. 2) FUEL CONSUMPTION 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 AFTERCOOLER TOLERANCE IS ± 5% OF FULL LOAD DATA. (heat rate based on treated water 5) HEAT REJECTION TO AFTERCOOLER TOLERANCE IS ± 5% OF FULL LOAD DATA. (heat rate based on treated water 6) HEAT REJECTION TO ALMOSPHERE TOLERANCE IS ± 0% OF FULL LOAD DATA. (heat rate based on treated water 7) THERMAL EFFICIENCY: JACKET HEAT + LUBE OIL HEAT + STAGE I A/C HEAT + EXH. HEAT TO 350°F 8) TOTAL EFFICIENCY: JACKET HEAT + LUBE OIL HEAT + STAGE I A/C HEAT + EXH. HEAT TO 350°F 9) TOTAL JW HEAT: COMBINED = JACKET HEAT + OIL COOLER HEAT + (A/C STG 1 HEAT+.764 x (STG 1 + STG 2) x (ACHRF -1)): (heat rate based on treated water 10) TOTAL A/C HEAT: COMBINED = A/C STG 2 HEAT + (STG 1 + STG 2) x (ACHRF -1): (heat rate based on treated water 11) NOX VALUE SHOWN IS DRY. FULL LOAD NOX VALUE IS SET AT SITE. CONTROL TOLERANCE IS ± 30% OF FULL LOAD DATA. 12) MEASURED IN THE INTAKE MANIFOLD PLENUM. 13) TIMING INDICATED IS FOR USE WITH THE MINIMUM FUEL METHANE NUMBER SPECIFIED. CONSULT THE APPROPRIATE FUEL USAGE GUIDE FOR TIMING AT OTHER METHANE NUMBERS. 14) EMISSION DATA SHOWN ARE DRY AND NOT TO EXCEED. 15) EXHAUST O2 IS NOMINAL ± 0.5 % 02.	CONDITIONS AND DEFINITIONS ENGINE RATING OBTAINED AND PRESENT 29.6" HG BAROMETRIC PRESSURE, 30% R PRESSURE. NO OVERLOAD PERMITTED A CONDTIONS WITH 5" H2O AIR FILTER RES APPLICATIONS ABOVE MAXIMUM RATED A ENGINE RATING IS WITH 2 ENGINE DRIVE	TED IN ACCORD ELATIVE HUMIE AT RATING SHO TRICTION AND ALTITUDE AND/O N WATER PUMF	DANCE WI DITY, 10" I WN. DAT 0" H20 EX DR TEMP 2S.	TH ISO 3046/1. D H2O AIR FILTER F A NOTED AS ISO (HAUST STACK P ERATURE.	ATA REPRESENT XESTRICTION, AN 3046/1 REPRESE RESSURE. CONS	S CONDTIONS OI D 20" H20 EXHAU NTS THE SAME A SULT ALTITUDE C	F 77°F, ST STACK MBIENT URVES FOR		
10) NOLKE AVENTERAT: 11) NOLKE AVENTERAT: <td< td=""><td>NOTES 1) ISO 3046/1 FUEL CONSUMPTION TOLER 2) FUEL CONSUMPTION TOLERANCE IS ± 3 3) HEAT REJECTION TO JACKET AND EXH. 4) HEAT REJECTION TO AFTERCOOLER TO 5) HEAT REJECTION TO ATMOSPHERE TO 6) HEAT REJECTION TO LUBE OIL TOLERA 7) THERMAL EFFICIENCY: JACKET HEAT + 8) TOTAL EFFICIENCY: E 9) TOTAL JW HEAT: C</td><td>ANCE IS 0, + 5% 3 % OF FULL LC AUST TOLERAN DLERANCE IS ± LERANCE IS ± 20% C LUBE OIL HEAT NGEINE EFF. + T OMBINED = JAC</td><td>6 OF FUL DAD DATA ICE IS ± 1 5% OF FI 0% OF FI F FULL L F + STAGI HERMAL CKET HEA C STG 1 H</td><td>L LOAD DATA. 000 OF FULL LOA ULL LOAD DATA. ULL LOAD DATA. 0AD DATA. (heat E 1 A/C HEAT + E EFF. TOLERANCI TF - OIL COOLER HEAT + .764 × (STG HEAT + .764 × (STG)</td><td>D DATA. (heat rat (heat rate based o rate based on trea KH. HEAT TO 350° E IS \pm 10% OF FUI HEAT + 1 + STG 2) x (ACI</td><td>e based on treated n treated water in treated water ifed water IL LOAD DATA. HRF-11) : (heat rate</td><td>water</td></td<>	NOTES 1) ISO 3046/1 FUEL CONSUMPTION TOLER 2) FUEL CONSUMPTION TOLERANCE IS ± 3 3) HEAT REJECTION TO JACKET AND EXH. 4) HEAT REJECTION TO AFTERCOOLER TO 5) HEAT REJECTION TO ATMOSPHERE TO 6) HEAT REJECTION TO LUBE OIL TOLERA 7) THERMAL EFFICIENCY: JACKET HEAT + 8) TOTAL EFFICIENCY: E 9) TOTAL JW HEAT: C	ANCE IS 0, + 5% 3 % OF FULL LC AUST TOLERAN DLERANCE IS ± LERANCE IS ± 20% C LUBE OIL HEAT NGEINE EFF. + T OMBINED = JAC	6 OF FUL DAD DATA ICE IS ± 1 5% OF FI 0% OF FI F FULL L F + STAGI HERMAL CKET HEA C STG 1 H	L LOAD DATA. 000 OF FULL LOA ULL LOAD DATA. ULL LOAD DATA. 0AD DATA. (heat E 1 A/C HEAT + E EFF. TOLERANCI TF - OIL COOLER HEAT + .764 × (STG HEAT + .764 × (STG)	D DATA. (heat rat (heat rate based o rate based on trea KH. HEAT TO 350° E IS \pm 10% OF FUI HEAT + 1 + STG 2) x (ACI	e based on treated n treated water in treated water ifed water IL LOAD DATA. HRF-11) : (heat rate	water		
DM5650-00 25-Jul-04	 NOx VALUE SHOWN IS DRY. FULL LOAD NOX VALUE IS SET AT SITE. CONTROL TO LERANCE IS ± 30% OF FULL LOAD DATA. MEASURED IN THE INTAKE MANIFOLD PLENUM. TIMING INDICATED IS FOR USE WITH THE MINIMUM FUEL METHANE NUMBER SPECIFIED. CONSULT THE APPROPRIATE FUEL USAGE GUIDE FOR TIMING AT OTHER METHANE NUMBERS. EMISSION DATA SHOWN ARE DRY AND NOT TO EXCEED. SEMINIST OF SUMMINIST OF COLOR OF COLOR								
	DM5650-00						25-Jul-04		

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GAS ENGINE TECHNICAL DATA

CATERPILLAR®

FUEL USAGE GUIDE							Ī						_	
DERATE FACTOR/ENGINE TIMING								i vs METH	ANE NUN	1BER				
<	30	30	35	40	45	50	55	60	65	70	75	80 to	o 100	
0	/	0/ 0/ 0/ 0/ 0/		0/	.87/22	.93/21	1.0/21	1.0/21	1.0	/22				
* Denotes Air Fuel Ratio Control Required for Maximum Rating Shown.														
ALTITUDE DERATION FACTORS														
А	130	0.97	0.94	0.90	0.87	0.84	0.80	0.77	0.74	0.71	0.69	0.66	0.63	0.61
М	120	0.99	0.95	0.92	0.88	0.85	0.82	0.79	0.76	0.73	0.70	0.67	0.64	0.62
в	110	1.00	0.97	0.94	0.90	0.87	0.83	0.80	0.77	0.74	0.71	0.68	0.65	0.63
1	100	1.00	0.99	0.95	0.92	0.88	0.85	0.82	0.78	0.75	0.72	0.69	0.67	0.64
Е	90	1.00	1.00	0.97	0.93	0.90	0.86	0.83	0.80	0.77	0.74	0.71	0.68	0.65
Ν	80	1.00	1.00	0.99	0.95	0.91	0.88	0.85	0.81	0.78	0.75	0.72	0.69	0.66
т	70	1.00	1.00	1.00	0.97	0.93	0.90	0.86	0.83	0.80	0.76	0.73	0.70	0.68
	60	1.00	1.00	1.00	0.99	0.95	0.91	0.88	0.84	0.81	0.78	0.75	0.72	0.69
(°F)	50	1.00	1.00	1.00	1.00	0.97	0.93	0.90	0.86	0.83	0.79	0.76	0.73	0.70
	-	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
						A	TITUDE	(FEET AB	OVE SEA	LEVEL)				
								r						
	AFTI	ERCOO	LER HE	AT REJI	ECTION	FACTO	RS							
А	130	1.28	1.33	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
м	120	1.23	1.27	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
в	110	1.17	1.21	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
1	100	1.11	1.15	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
Е	90	1.05	1.10	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
N	80	1.00	1.04	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
т	70	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
	60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
(°F)	50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
, í	L	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
						AI	TITUDE	(FEET AB	OVE SEA	LEVEL)				

FUEL USAGE GUIDE:

This table shows the derate factor required for a given fuel and what engine timing to use. Note that deration occurs as the methane number decreases. Methane number is a scale to measure ignition and burning characteristics of various fuels. Representative values are shown below.

Methane	100
Ethane	44
Propane	34
n-Butane	10
Hydrogen	(
	(2)

Most dry pipeline natural gas has a methane number of 67 or above. The gas quality should be analyzed to determine the percentage of each constituent and then determine the methane number. Consult the dealer or factory for assistance.

ALTITUDE DERATION FACTORS:

This table shows the deration required for various ambient temperatures and altitudes at reference inlet restriction and exhaust stack backpressure (If site inlet restriction and/or exhaust stack backpressure differ from reference conditions, refer to inlet and exhaust restriction corrections section for appropriate adjustment). Use this information to help determine actual engine power for your site.

INLET AND EXHAUST RESTRICTION CORRECTIONS FOR ALTITUDE CAPABILITY:

To determine the appropriate altitude derate factor to be applied to this engine for inlet or exhaust restrictions differering from the standard conditions on page 1, a correction to the site altitude can be made to adjust for this difference. Add 88 meters to the site altitude for each additional KPA of stack pressure greater than spec sheet conditions. Add 136 meters to the site altitude for each additional KPA of inlet restriction greater than spec sheet conditions. If site inlet restriction or exhaust stack backpressure are less than spec sheet conditions, the same trends apply to lower the site altitude.

ACTUAL ENGINE RATING:

It is important to note that the Altitude/Temperature deration and the Fuel Usage Guide deration are not cumulative, i.e., they are not to be added together. The same is true for the Low Energy Fuel deration (reference the Caterpillar Methane Number Program) and the Fuel Usage Guide deration. However, the Altitude/Temperature deration and Low Energy Fuel deration are cumulative; and they must be added together in the method shown below. To determine the actual power available, take the lowest rating between 1) and 2).

- 1) (Altitude/Temperature Deration) + (Low Energy Fuel Deration)
- 2) Fuel Usage Guide Deration

Note: For NA's always add the Low Energy Fuel deration to the Altitude/Temperature deration. For TA engines only add the Low Energy Fuel deration to the Altitude/Temperature deration is less than 1.0 (100%). This will give the actual rating for the engine at the conditions specified.

AFTERCOOLER HEAT REJECTION FACTORS:

Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft altitude. To maintain a constant inlet air manifold temperature, as the ambient air 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. Failure to properly account for these factors could result in detonation and cause the engine to shut down or fail.

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