

PERFORMANCE DATA

Performance Number: DM7687

Change Level: 08

SALES MODEL:	C13	COMBUSTION:	D
ENGINE POWER (BHP):	440	ENGINE SPEED (RPM):	2,100
PEAK TORQUE (FT-LB):	1,482.5	PEAK TORQUE SPEED (RPM):	1,400
COMPRESSION RATIO:	173	TORQUE RISE (%):	35
APPLICATION:	INDUSTRIAL	ASPIRATION:	TA
RATING LEVEL:	INDUSTRIAL C - INTERMITTENT	AFTERCOOLER TYPE:	ATAAC
PUMP QUANTITY:	1	AFTERCOOLER CIRCUIT TYPE:	JW+OC, ATAAC
FUEL TYPE:	DIESEL	INLET MANIFOLD AIR TEMP (F):	120
MANIFOLD TYPE:	DRY	JACKET WATER TEMP (F):	1922
GOVERNOR TYPE:	ELEC	TURBO CONFIGURATION:	SINGLE
INJECTOR TYPE:	EUI	TURBO QUANTITY:	1
REF EXH STACK DIAMETER (IN):	5	TURBOCHARGER MODEL:	GTA4502BS-48T-1.33
MAX OPERATING ALTITUDE (FT):	2,349	CERTIFICATION YEAR:	2005
		PISTON SPD @ RATED ENG SPD (FT/MIN):	2,163.4

General Performance Data

ENGINE SPEED ENGINE		INLET MFLD		EXH MFLD		IN-HG		DEGF		
RPM	BHP	LBFT	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEGF	DEGF	IN-HG	DEGF
2100	440	1,101	218	0.358	22.7	7	1208	1,170.3	43.4	925.2
2000	440	1,156	228	0.355	22.4	47.8	1120	1,137.2	41.3	833.9
1900	440	1,217	240	0.350	22.1	8	1142	1,159.8	39.5	896.8
1800	440	1,284	254	0.346	21.9	50.1	114.7	1,180.9	38.2	944.2
1700	435	1,345	266	0.347	21.7	51.0	114.8	1,197.5	36.4	972.4
1600	426	1,399	276	0.342	20.9	50.7	112.8	1,201.2	34.2	977.9
1500	413	1,446	286	0.338	20.1	51.1	109.2	1,192.1	32.6	961.2
1400	395	1,484	293	0.336	19.2	50.7	107.1	1,196.9	30.3	974.3
1300	362	1,464	289	0.335	17.5	49.3	103.6	1,174.3	27.8	959.7
1200	327	1,431	283	0.330	15.6	42.4	100.3	1,188.8	22.5	973.8
1100	277	1,321	261	0.333	13.4	33.4	93.2	1,227.3	16.6	1,026.9
1000	231	1,211	239	0.322	10.7	21.0	86.2	1,174.5	10.1	1,015.9
900	183	1,068	211	0.339	8.8	13.9	85.2	1,160.0	6.8	1,009.4
700	117	880	174	0.365	6.2	6.2	83.7	1,164.1	3.7	1,011.1

ENGINE SPEED ENGINE	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	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
RPM	BHP	IN-HG	DEGF	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
2100	440	52	3235	1,028.9	2,723.2	4,434.4	4,593.3	935.8	885.2
2000	440	51	3092	1,004.0	2,481.1	4,323.1	4,480.2	943.0	863.1
1900	440	52	3161	970.4	2,514.2	4,175.0	4,329.4	911.3	833.0
1800	440	53	3220	942.7	2,528.9	4,054.8	4,207.8	885.7	808.8
1700	435	54	3235	911.3	2,490.8	3,910.7	4,062.6	855.1	779.1
1600	426	55	3225	885	2,353.2	3,676.9	3,823.8	804.8	751.9
1500	413	55	3233	814.1	2,205.4	3,484.6	3,625.7	763.2	693.1
1400	395	55	3251	763.5	2,084.5	3,261.4	3,395.5	714.7	648.3
1300	362	51	3220	705.2	1,900.6	3,005.6	3,128.0	688.4	597.7
1200	327	44	3053	600.3	1,632.3	2,550.9	2,659.9	559.9	505.2
1100	277	34	2711	484.5	1,366.8	2,054.0	2,147.5	452.0	406.4
1000	231	22	2728	349.4	981.5	1,478.5	1,553.8	327.0	291.0
900	183	14	1861	272.6	763.1	1,152.1	1,213.4	255.4	226.2
700	117	7	1512	167.9	473.9	709.1	752.6	158.4	138.1

PERFORMANCE DATA

Heat Rejection Data

ENGINE SPEED	ENGINE POWER	REJECTION T O JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION T O EXH	EXHAUST RECOVERY T O 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
RPM	BF	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
2,100	440	7,091	2,411	19,708	11,214	2,574	3,599	18,664	48,321	51,474
2,000	440	6,933	4,553	17,449	9,150	2,551	3,414	18,664	47,888	51,012
1,900	440	6,806	3,342	18,141	10,041	2,516	3,375	18,664	47,245	50,328
1,800	440	6,713	2,396	18,580	10,647	2,486	3,366	18,664	46,674	49,720
1,700	435	6,884	2,121	18,561	10,801	2,465	3,268	18,465	46,279	49,299
1,600	426	6,566	2,149	17,648	10,270	2,376	3,089	18,067	44,608	47,519
1,500	413	6,312	2,264	16,492	9,474	2,279	2,988	17,516	42,781	45,572
1,400	395	5,989	2,052	15,699	9,077	2,188	2,846	16,771	40,700	43,356
1,300	362	5,517	1,869	14,229	8,154	1,981	2,629	15,372	37,189	39,615
1,200	327	5,120	1,749	12,383	7,116	1,760	2,094	13,865	33,053	35,210
1,100	277	4,781	1,451	10,639	6,274	1,503	1,463	11,732	28,225	30,066

PERFORMANCE DATA

Emissions Data

RATED SPEED POTENTIAL SITE VARIATION: 2100 RPM

ENGINE POWER		BHP	440	300	220	110	440
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		GHR	1,346	816	436	209	145
TOTAL CO		GHR	1,103	913	284	208	424
TOTAL HC		GHR	37	44	92	96	77
PART MATTER		GHR	655	637	484	613	827
TOTAL NOX (AS NO2)	(CORR 5% O2)	MGNM3	1,365.7	1,028.3	750.5	699.4	776.8
TOTAL CO	(CORR 5% O2)	MGNM3	1,135.0	1,149.6	496.0	1,195.3	2,255.9
TOTAL HC	(CORR 5% O2)	MGNM3	323	483	136.8	264.8	360.5
PART MATTER	(CORR 5% O2)	MGNM3	737	693	743	234.5	404.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	665	501	366	341	378
TOTAL CO	(CORR 5% O2)	PPM	908	920	397	955	1,805
TOTAL HC	(CORR 5% O2)	PPM	60	90	255	494	673
TOTAL NOX (AS NO2)		GHPHR	305	249	200	19	332
TOTAL CO		GHPHR	253	279	130	190	967
TOTAL HC		GHPHR	005	013	042	087	175
PART MATTER		GHPHR	020	019	022	056	165
TOTAL NOX (AS NO2)		LBHR	297	180	095	046	032
TOTAL CO		LBHR	243	201	063	046	095
TOTAL HC		LBHR	005	010	020	021	017
PART MATTER		LBHR	015	014	011	014	018

RATED SPEED NOMINAL DATA: 2100 RPM

ENGINE POWER		BHP	440	300	220	110	440
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		GHR	1,246	755	404	195	135
TOTAL CO		GHR	590	488	152	111	227
TOTAL HC		GHR	20	20	45	51	41
TOTAL CO2		KGHR	235	186	136	80	42
PART MATTER		GHR	440	327	248	315	424
TOTAL NOX (AS NO2)	(CORR 5% O2)	MGNM3	1,264.5	952.2	694.9	647.6	719.2
TOTAL CO	(CORR 5% O2)	MGNM3	606.9	614.8	265.2	639.2	1,206.3
TOTAL HC	(CORR 5% O2)	MGNM3	17.1	255	724	140.1	190.7
PART MATTER	(CORR 5% O2)	MGNM3	378	355	381	120.3	207.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	615	464	388	315	350
TOTAL CO	(CORR 5% O2)	PPM	455	492	212	511	955
TOTAL HC	(CORR 5% O2)	PPM	32	45	135	262	355
TOTAL NOX (AS NO2)		GHPHR	286	231	185	177	307
TOTAL CO		GHPHR	135	149	070	102	517
TOTAL HC		GHPHR	004	007	022	045	095
PART MATTER		GHPHR	010	010	011	025	097
TOTAL NOX (AS NO2)		LBHR	275	167	089	045	030
TOTAL CO		LBHR	130	108	033	025	050
TOTAL HC		LBHR	004	005	011	011	005
TOTAL CO2		LBHR	513	411	300	175	95
PART MATTER		LBHR	010	007	005	007	005
OXYGEN IN EXH		%	105	122	142	160	170
DRY SMOKE OPACITY		%	09	05	06	05	05
BOSCH SMOKE NUMBER			062	050	029	087	155

Regulatory Information

EPA TIER 3		2005 - 2010		
GASEOUS EMISSIONS DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 89 SUBPART D AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSIONS VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.				
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 3	CO: 3.5 NOx + HC: 4.0 PM: 0.-0
EU STAGE IIIA		2006 - —		
GASEOUS EMISSION DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EU 97/68/EC, ECE REGULATION NO. 96 AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSION VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.				
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
EUROPE	EU	NON-ROAD	STAGE IIIA	CO: 3.5 NOx + HC: 4.0 PM: 0.-0
MOI		2011 - —		
GASEOUS EMISSIONS DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN REGULATION 13 OF REVISED 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

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	60	70	80	90	NORMAL					
ALTITUDE (FT)										
0	40	40	40	40	40	40	40	40	40	40
1,000	40	40	40	40	40	40	40	40	40	40
2,000	40	40	40	40	40	40	40	40	40	40
3,000	40	40	40	40	40	40	40	40	40	40
4,000	40	40	40	40	40	40	40	40	40	40
5,000	40	40	40	40	40	40	40	40	40	40
6,000	40	40	40	40	40	40	40	40	40	40
7,000	40	40	40	40	40	40	40	40	40	40
8,000	40	40	40	40	40	40	40	40	40	40
9,000	40	40	40	40	40	40	40	40	40	40
10,000	40	40	40	40	40	40	40	40	40	40
11,000	40	40	40	40	40	40	40	40	40	40
12,000	40	40	40	40	40	40	40	40	40	40
13,000	40	40	40	40	40	40	40	40	40	40
14,000	40	40	40	40	40	40	40	40	40	40
15,000	40	40	40	40	40	40	40	40	40	40