

Note 43.

Mercedes-Benz racing engines, 1924 - 1937



	A	B	C	D	E	F	G	H	I	J	K	L
1	11 January 2009 MERC. 1924-1937											
2	ENGINE IDENTITY											
3	PEP Serial No.											
4	Data Source Ref.	468	4,468									
5	File DASO				4,468	4,468	4,468	4,468	4,468	4,468	4,468	4,468
6	YEAR	1924	1934		1934	1934.6	1934.7	1935	1936	1937	1937.5	
7	Make	MERC.	MERC.		MERC.	MERC.	MERC.	MERC.	MERC.	MERC.	MERC.	
8	Model	M218	M25A		M25A	M25AB	M25B	M25C	ME25	M125	M125	
9	Swept Volume Litres	2	3.4		3.4	3.7	4	4.3	4.7	5.7	5.7	
10	Induction System	PC/Suctn	PC/Press		PC/Press	PC/Press	PC/Press	PC/Press	PC/Press	PC/Press	PC/Suctn	
11	Class	RR	RR		RR	RR	RR	RR	RR	RR	RR	
12	GEOMETRY											
13	Configuration	IL8	IL8		IL8	IL8	IL8	IL8	IL8	IL8	IL8	
14	No. of Cylinders CN	8	8		8	8	8	8	8	8	8	
15	No.Cyls/Intake CNI	8	8		8	8	8	8	8	8	8	
16	In. & Ex. Configuration	RSC/CF	RSC/CF		RSC/CF	RSC/CF	RSC/CF	RSC/CF	RSC/CF	RSC/CF	RSC/CF	
17	Comb. Ch/b/r/Piston Config'n	PR/F	PR/LH		PR/LH	PR/LH	PR/LH	PR/LH	PR/LH	PR/MH	PR/MH	
18	Compression Ratio R	5	7.5		7.5	7.5	7.33	8.17	8.2	8.9	8.9	
19	BORE B mm	61.7	78		78	82	82	82	86	94	94	
20	STROKE S "	82.8	88		88	88	94.5	102	102	102	102	
21	Valve Opening/Return System	DOHC	DOHC		DOHC	DOHC	DOHC	DOHC	DOHC	DOHC	DOHC	
22	Valve No./Cyl.-In. VNI	2	2		2	2	2	2	2	2	2	
23	" " " -Ex. VNE	2	2		2	2	2	2	2	2	2	
24	Valve Incl. Angle VIA Deg	60	60		60	60	60	60	60	70	70	
25	Inlet Valve Dia. IVD mm		34		34	35.5	35.5	35.5	37	39	39	
26	Inlet Valve Lift IVL "		8.5		8.5	8.5	8.5	8.5	8.5	8.5	8.5	
27	Inlet Tract Length LIN "											
28	Timing-In. Open IVO Deg		25		25			20	20	15	15	
29	" " Close IVC "		45		45			40	35	42	42	
30	" " Ex Open EVO "		50		50			28	27	30	30	
31	" " Close EVC "		20		20			6	10	3	3	
32	In. Open Duration IOD "		250		250	250	250	240	235	237	237	
33	Ex. " " EOD "		250		250			214	217	213	213	
34	In.-Ex. Overlap OL "		45		45			26	30	18	18	
35	Main Journal Dia. MJ mm		63		63			63		67	67	
36	Crank Pin Dia. CP "		53		53			59		66	66	
37	Gudgeon Pin Dia. GP "		22		22			22		25	25	
38	Con. Rod Length CRL "		161		161			168		167	167	
39	Piston Height PH "		94		94			94		96	96	
40	Piston Skirt Length PSL "		74		74			74		81	81	
41	Equiv. PSL - EPSL "		74		74			74		81	81	
42	INFLOW CONDITIONS											
43	Fuel Type	P/B	P/B		A/WW	A/WW	A/WW	A/WW	A/WW	A/WW	A/WW	
44	Fuel Adj. to Petrol AA	1	1		1	1	1	1	1	1	1	
45	Press. @ In. Valve IVP ATA	1.97	1.66		1.66	1.66	1.66	2.1	2	1.9	1.77	
46	Manifold Density Ratio = MDR	1.5	1.39		1.66	1.66	1.66	2.1	2	1.9	1.77	
47	CODE											
48	Induction Code	B	B		B	B	B	B	B	B	B	
49	PERFORMANCE											
50	Peak (Rated) Power PP HP	168	310		349	393	424	456	487	574	580	
51	Crank RPM @ PP NP	7000	5800		5800	5800	5800	5800	5800	5800	5800	
52	Peak Torque TP LbFt											
53	Crank RPM @ TP NT											
54	GEOMETRIC ANALYSIS											
55	B/S	0.745	0.886		0.886	0.932	0.868	0.804	0.843	0.922	0.922	
56	PA SqCm	239.19	382.27		382.27	422.48	422.48	422.48	464.70	555.18	555.18	
57	V/CN cc per cylinder	247.6	420.5		420.5	464.7	499.1	538.7	592.5	707.9	707.9	
58	V cc	1980.5	3364.0		3364.0	3717.8	3992.4	4309.3	4740.0	5662.9	5662.9	
59	IVA SqCm		145.3		145.3	158.4	158.4	158.4	172.0	191.1	191.1	
60	IVA/PA		0.380		0.380	0.375	0.375	0.375	0.370	0.344	0.344	
61	IVL/IVD		0.25		0.25	0.239	0.239	0.239	0.230	0.218	0.218	
62	ISA SqCm		145.3		145.3	151.7	151.7	151.7	158.1	166.6	166.6	
63	ISA/PA		0.380		0.380	0.359	0.359	0.359	0.340	0.300	0.300	
64	MJ/S %		71.6		71.6	0.0	0.0	61.8	0.0	65.7	65.7	
65	CP/S %		60.2		60.2	0.0	0.0	57.8	0.0	64.7	64.7	
66	GP/S %		25.0		25.0	0.0	0.0	21.6	0.0	24.5	24.5	
67	CRL/S		1.83		1.83	0.00	0.00	1.65	0.00	1.64	1.64	
68	B/PH		0.83		0.83			0.87		0.98	0.98	
69	100/Smm	1.208	1.136		1.136	1.136	1.058	0.980	0.980	0.980	0.980	
70	R*VIA	300.0	450.0		450.0	450.0	439.8	490.2	492.0	623.0	623.0	
71	PERFORMANCE ANALYSIS											
72	PP/V=SP HP/Litre	84.8	92.2		103.7	105.7	106.2	105.8	102.7	101.4	102.4	
73	F= (NP-NT)/NP %											
74	MPSP = 2*S*NP m/s	19.32	17.01		17.01	17.01	18.27	19.72	19.72	19.72	19.72	
75	BMPP Bar	10.84	14.22		16.01	16.31	16.39	16.33	15.85	15.64	15.80	
76	MPST m/s											
77	BMTP Bar											
78	RA =0.63/(1-1/R^0.4)	1.327	1.138		1.138	1.138	1.147	1.108	1.107	1.081	1.081	
79	PPA = PP*RA/AA HP	222.9	352.9		397.3	447.4	486.3	505.4	539.1	620.3	626.8	
80	BMPA= BMPP*RA/AA Bar	14.39	16.18		18.22	18.57	18.79	18.09	17.55	16.90	17.08	
81	BMPA/MDR Adj.Bar	9.59	11.64		10.98	11.18	11.32	8.62	8.77	8.89	9.65	
82	TPA = TP*RA/AA Lb.Ft											
83	BMTA =BMTP*RA/AA Bar											
84	PPA/PA HP/SqCm	0.93	0.92		1.04	1.06	1.15	1.20	1.16	1.12	1.13	
85	(PPA/PA)/MDR Adj.HP/SqCm	0.62	0.66		0.63	0.64	0.69	0.57	0.58	0.59	0.64	

E Com % 40.0 48.6 45.9 46.7 47.5 36.0 36.6 37.1 40.3

Continued below.

Note 43 continurd

	A	B	C	D	E	F	G	H	I	J	K	L
5	YEAR	1924	1934		1934	1934.6	1934.7	1935	1936	1937	1937.5	
6	Make	MERC.	MERC.		MERC.	MERC.	MERC.	MERC.	MERC.	MERC.	MERC.	
7	Model	M218	M25A		M25A	M25AB	M25B	M25C	ME25	M125	M125	
85												
86	(PPA/PA)*(B/S)/ MDR	0.463	0.589		0.555	0.594	0.602	0.458	0.489	0.542	0.588	
87	PPA/V HP/Litre	112.6	104.9		118.1	120.3	121.8	117.3	113.7	109.5	110.7	
88	(PPA/V)/ MDR) Adj.HP/Litre	75.0	75.5		71.1	72.5	73.4	55.8	56.9	57.7	62.5	
89	PPA/IVA HP/SqCm		2.43		2.73	2.82	3.07	3.19	3.13	3.25	3.28	
90	PPA/ISA "		2.43		2.73	2.95	3.21	3.33	3.41	3.72	3.76	
91	MGVP = MPSP*PA/IVA m/s		44.77		44.77	45.39	48.74	52.61	53.27	57.28	57.28	
92	MSVP = MPSP*PA/ISA "		44.77		44.77	47.39	50.89	54.93	57.97	65.70	65.70	
93	BNP = B*NP "	7.20	7.54		7.54	7.93	7.93	7.93	8.31	9.09	9.09	
94	MVS = IVL*NP/(83.333*OD) "		2.37		2.37	2.37	2.37	2.47	2.52	2.50	2.50	
95	MPD @ nom'l (CRL/S)=2 g	2834.5	2068.2		2068.2	2068.2	2220.9	2397.2	2397.2	2397.2	2397.2	
96	MPD @ actual CRL g											
97	MOD. MPSP (MMPSP) m/s											
98	NPx(MPSP)^2/10^5	26.13	16.79		16.79	16.79	19.36	22.55	22.55	22.55	22.55	
99	KF1 for FPMEP	0.75	0.75		0.75	0.75	0.75	0.75	0.75	0.75	0.75	
100	KF2 for FPMEP*10^7	9	9		9	9	9	9	9	9	9	
101	EIMPA Bar	18.50	18.76		20.79	21.14	21.65	21.17	20.63	19.90	20.08	
102	Estd. Mech. Effy. EEM %	77.8	86.3		87.6	87.8	86.8	85.4	85.1	84.9	85.0	
103	EIMPA/MDR Bar	12.34	13.50		12.53	12.73	13.04	10.08	10.31	10.48	11.34	
104	EIMPA/(MDR*(MPSP)^0.5)= SPPA	2.81	3.27		3.04	3.09	3.05	2.27	2.32	2.36	2.55	
105												
106	SPPB	2.39	2.78		2.54	2.59	2.56	1.77	1.82	1.89	2.08	
107	SPPB -(CRL/S)=SPPC	2.04	2.82		2.58	2.24	2.21	1.96	1.47	2.09	2.28	
108	Delta from 3*(B/PH)^1/3 %		-0.1		-8.4			-31.6		-30.0	-23.4	
109												
110	EBMTA	15.34	17.06		19.06	19.41	19.64	18.93	18.39	17.75	17.93	
111	Delta EBMTA Act from Est %											
112												
113												
114	SPEED CORRn FACTOR - SCF		159.89		159.89	156.03	149.00	153.42	147.31	144.46	142.77	
115	NP Repeat - RPM		5800		5800	5800	5800	5800	5800	5800	5800	
116	GS = Actual NP/SCF		36.3		36.3	37.2	38.9	37.8	39.4	40.1	40.6	
117	KS = 47.4 or 38.6		38.6		38.6	38.6	38.6	38.6	38.6	38.6	38.6	
118	Delta Actual from KSxSCF %		-6.0%		-6.0%	-3.7%	0.8%	-2.1%	2.0%	4.0%	5.2%	
119												
120												
121	WEIGHT - W - kg		203		203	203	206	215	211	223	223	
122	PP/W - HP/kg		1.53		1.72	1.94	2.06	2.12	2.31	2.57	2.60	
123	RFW - Litres adj.	3.76	5.37		5.37	5.64	6.51	7.58	7.95	8.69	8.69	
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149		M218										
150		Adj.										
151		to Press										
152		Carbs.,										
153		WW Fuel										
154	100/Smm	1.208										
155	(PPA/PA)/MDR Adj HP/SqCm	0.55										
156	(PPA/V)/MDR Adj HP/Litre	65.2										
157												
158												
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