Report on test in accordance with O.E.C.D. STANDARD CODE

O.E.C.D. No. **1142**



Agricultural Tractor MERCEDES-BENZ MB-TRAC 1400 TURBO (4WD)

Type denomination MB-TRAC 443, variant 164

Manufacturer
Daimler-Benz AG
D-7560 Gaggenau

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This bulletin is based on engineering tests in accordance with the O.E.C.D. STANDARD CODE for the Official Testing of Agricultural Tractor Performance, C (87) 53 (Final), Annex I.

Duration of Tests: July till November 1987

DLG-Testing-Station for Agricultural Machinery, Max-Eyth-Weg 1
D-6114 Groß-Umstadt

This report has been approved by the O.E.C.D. Coordinating Centre (C.E.M.A.G.R.E.F., France) as being in accordance with the O.E.C.D. STANDARD CODE.

Date of Approval: 18th April 1988 O.E.C.D. No. 1142

In this report all performance characteristics are given corresponding to the International System of Units.

The reference to the former used systems of units is given by the following relations:

Forces	1 kN	=	1000 N	=	102,00 kp
Powers			1 kW	=	1,36 PS
Pressures	1 MPa	=	10 bar	=	10,20 kp/cm²
	100 kPa	=	1000 mbar	=	750,10 mm Hg

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PRÜFUNGS-ABTEILUNG
MB-TRAC 1400

Test No. 87-170

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*) All stated dimensions refer to tyre size 18.4 R 34 and track width 1871 mm each at front and rear

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Tractor manufacturer:	DAIMLER-BENZ AG D-7560 Gaggenau
Location of tractor assembly:	D-7560 Gaggenau
Submitted for test by:	Manufacturer
Selected for test by:	Manufacturer with agreement by DLG
Place of running-in:	Gaggenau and Groß-Umstadt
Duration of running-in:	Engine 70 hours, tractor 50 hours

SPECIFICATION OF TRACTOR

Tractor

Make:	MERCEDES-BENZ
Trade Name:	MB-TRAC 1400 TURBO
Type denomination:	MB-TRAC 443 variant 164
Type:	Four wheel drive tractor, chassis construction with implement mounting area above rear axle, spring suspended front axle, rotatable driver's seat for driving in two directions
Serial No.:	WDB 443 164 OW 139640
1st serial No.:	WDB 443 164 OW 000001

Engine

Make:	MERCEDES-BENZ
Model:	OM 366A.V/1
Type:	Watercooled 4-stroke DIESEL-engine, direct injection, supercharged
Serial No.:	366958-10-063554
Cylinders:	6, in-line, bore 97,5 mm, stroke 133 mm, displacement 5958 cm^3, no separate cylinder liners; compression ratio 16,5±0,5
Valves:	Overhead
Supercharging:	GARRETT, TO4 B81 exhaust driven turbo supercharger, maximum charge-air pressure 80 kPa
Fuel system:	BOSCH fuel supply pump, BOSCH 2-stage fuel filter with replaceable filter elements, capacity of fuel tank 240 dm^3; BOSCH in-line injection pump EP 3904 PES 6 MW 100/720 RS 1139 with timing device, serial no. 743 312 52; manufacturer's production setting 64+2 mm^3/stroke at rated engine speed and full load, injection timing 16^o+8^o before TDC; BOSCH multihole injection nozzles DLLA 142 S791, injection pressure 20+0,8 MPa

Governor:	BOSCH, RSV 350-1200 MW 1A 316-4 RS 3905, centrifugal variable speed governor, governed range of engine speed from 700 to 2570 rev/min, rated engine speed 2400 rev/min
Air cleaner:	Separate cyclone pre-cleaner MANN optional KNECHT, FZ 9001, air intake above bonnet; main cleaner MANN optional KNECHT, FP 9009; dry paper element filter with safety cartridge, filter elements replaceable, maintenance pilot lamp
Lubrication system:	Forced feed with gear pump, MANN optional KNECHT, oil filter in full flow (with by-pass valve), replaceable
Cooling system:	Water cooling with centrifugal pump; V-belt driven fan with 9 blades, 515 mm dia; water capacity 22 l; temperature control by thermostat; closed-circuit cooling, overpressure relief valve set to 70 kPa
Starting system:	Electrical, BOSCH solenoid pre-engaged-drive starting motor JD 12V 3 kW; cold starting aid STARTPILOT, safety device: disengaged travel and p.t.o. clutches
Electrical system:	12 V, BOSCH 3-phase alternator K1-14 V 23/55 A 770 W; 1 lead acid battery, 120 Ah (optional 154 Ah) at 20 hours rating
Exhaust system:	ROTH, SH 9020; multi-chamber expansion type silencer, 230 x 120 mm oval, 700 mm long; on the left of tractor's median plane, above bonnet, mouth 3020 mm above ground showing upwards-rearwards

Transmission to wheels

Clutch:	LUK, dry dual disc clutch DT 350/330 G; travel clutch hydraulically operated by pedal, disc 350 mm dia; p.t.o. clutch pneumatically operated by control lever, disc 330 mm dia
Gear box:	MERCEDES BENZ, model UG 3/40-7/9, 35 GPA; synchromesh gear box with 4 speeds, combined with pneumatically shifted planetary gear for duplication : 2x4 = 8 speeds, the 8th speed is locked; additional planetary gear with field (A) and road (S) ranges, sliding gear shifted; synchromesh reversing gear for all speeds, forward (V), reverse (R); total 14 forward and 14 reverse speeds, 3 levers; optionally available: modified axle-drive ratio and crawler gear
Rear axle and final drives:	MERCEDES BENZ; rigidly fitted to tractor's chassis, driven by universally jointed propeller shaft; bevel gear drive, bevel gear differential lockable, planetary final drives
Front axle and final drives:	MERCEDES BENZ; linked to chassis by coil springs, shock absorbers and Panhard rod; driven by universally-jointed propeller shaft, pneumatically engageable and disengageable under load by rotary knob; bevel gear drive, bevel gear differential with lock, planetary final drives
Both axles:	Axle drives optionally available with transmission ratios 25:8 or 27:7, tested variant 25:8; differential locks in front and rear axle in common pneumatically engageable and disengageable under load by rotary knob

Number of revolutions of front wheels for one revolution of rear wheels: 1,0000

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Total ratios and travelling speeds

Group		Gear	Number of engine revolutions for one revolution of the driving wheels		Nominal travelling speed*) at rated engine speed of 2400 rev/min km/h	
			1)	2)	1)	2)
V	A	1	367,70	453,84	1,89	1,54
		2	264,77	326,80	2,63	2,13
		3	194,00	239,45	3,59	2,91
		4	142,36	175,72	4,89	3,96
		5	101,55	125,35	6,86	5,56
		6	73,13	90,26	9,53	7,72
		7	53,58	66,13	13,00	10,53
		8	-	48,53	-	14,36
	S	1	115,36	142,36	6,04	4,89
		2	83,06	102,52	8,39	6,80
		3	60,86	75,12	11,45	9,27
		4	44,66	55,13	15,60	12,64
		5	31,86	39,32	21,87	17,72
		6	22,94	28,32	30,37 a)	24,60
		7	16,81	20,75	41,44 b)	33,58 c)
		8	-	15,23	-	40,00
R	A	1	356,17	439,61	1,96	1,58
		2	256,47	316,55	2,72	2,20
		3	187,92	231,95	3,71	3,00
		4	137,90	170,21	5,05	4,09
		5	98,37	121,42	7,08	5,74
		6	70,83	87,43	9,84	7,97
		7	51,90	64,06	13,42	10,88
		8	-	47,01	-	14,82
	S	1	111,74	137,92	6,28	5,05
		2	80,46	99,31	8,66	7,02
		3	58,96	72,77	11,82	9,57
		4	43,26	53,40	16,10	13,05
		5	30,86	38,09	22,57	18,29
		6	22,22	27,43	31,35	25,40
		7	16,28	20,10	42,79	34,66
		8	-	14,75	-	40,00

*) Calculated with the radius index 770 mm

1) tested variant with axle transmission 25:8 and 7-speed gear box (40 km/h)
   a) available variant with 6-speed gear box (30 resp. 32 km/h)
   b) available variant with 7-speed gear box and engine-speed limitation (30 resp. 32 km/h)

2) available variant with axle transmission 27:7 and 8-speed gear box with engine-speed limitation to 40 km/h
   c) available variant with 7-speed gear box

Gear lubrication: Forced lubrication, strainer in suction line before oil pump, oil cooler (in front of engine water cooler)

Power take-off

Main p.t.o.: Independent, driven by second disc of dual disc clutch;
1 p.t.o. shaft at rear of tractor;
45 mm dia, 20 splines, in conformity with ISO 500, type 3 (standard)
optionally available:
35 mm dia, 6 splines, ISO 500 type 1
35 mm dia, 21 splines, ISO 500 type 2
45 mm dia, 6 splines
height above ground 670 mm
distance from tractor's median plane, to the right 20 mm
distance behind rear wheel centre 508 mm

direction of rotation clockwise (viewed facing tractor's rear)
2 speeds are preselectable by hand lever

p.t.o.	p.t.o. speed rev/min	engine speed rev/min	ratio of rotation speeds (engine speed/p.t.o. speed)	power restriction kW
540	540	2080	3,8526	type 1 48 type 2 50 type 3 71
	623	2400		
1000	1000	2190	2,1897	type 1 60
	1096	2400		

Secondary p.t.o.: Front p.t.o., 1 shaft at front of tractor; drive, available profiles, speeds and sense of rotation like main p.t.o.
height above ground 990 mm
distance from tractor's median plane, to the left 213 mm
distance to front wheel centre 1100 mm

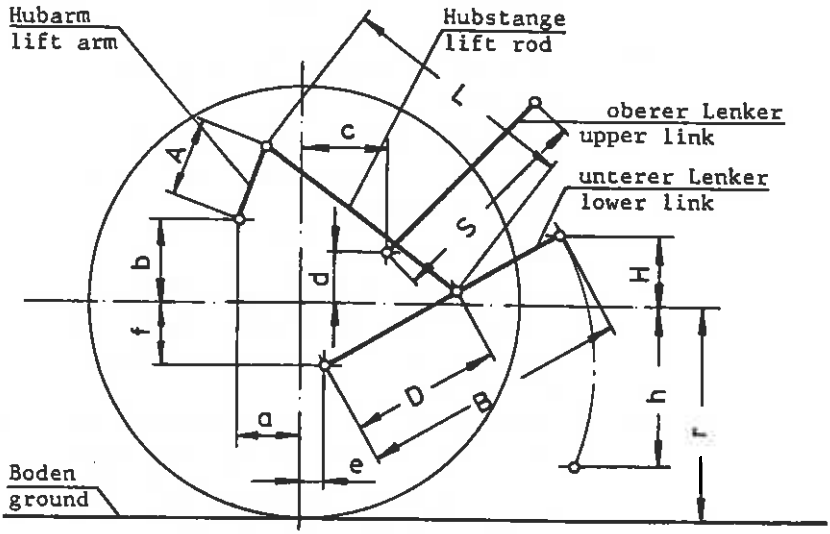
Both p.t.o. shafts may be shifted to simultaneous or separate operation by selection lever

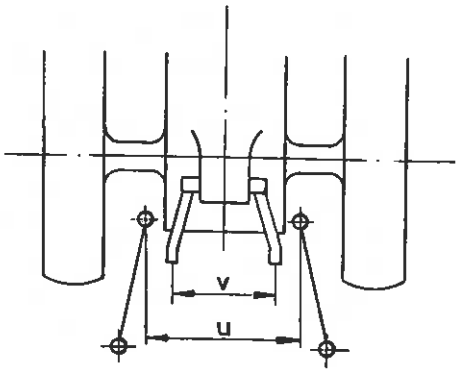
Power lift	MERCEDES BENZ/BOSCH hydraulic power lift, disintegrated construction
Hydraulic system:	Open centre system, relief valve pressure setting 20+1,5 MPa; ECKERLE internal gear pump IPSF-3-16644, directly V-belt driven by engine, delivery 57 dm^3/min at rated engine speed; oil filter in return line; separate oil tank under front end of chassis, 53 dm^3 capacity
Power lift at rear:	Electronic-hydraulic power lift (optionally available with mechanical control), BOSCH control unit EHR, draft and position control, both infinitely mixable, floating position, lower link sensing, lowering throttle; remote control of power lift at tractor's rear; 2 single acting WEBER cylinders, 200 mm stroke and 100 mm dia, piston rod 40 mm dia; no cylinder safety valves transport lock: lowering throttle, control lever fixable
Power lift at front:	Optional, installed to tested tractor only for power lift measurements and ballasting; connected to double acting additional control valve by hydraulic couplings; 2 double acting WEBER cylinders, 250 mm stroke and 63 mm dia, piston rod 30 mm dia, directly acting on laterally stabilized lower links; transport lock: stop cock in pressure line; no cylinder safety valves
Remote circuit:	3 (optional up to 4) double acting additional BOSCH control valves, SRZ 60 with 3 pairs of tapping points each at front and at rear; 1 additional return line coupling each at front and at rear; up to 47 dm^3 oil may be taken off if tractor is working stationary as well as travelling

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Implement linkage at rear: Three-point linkage with WALTERSCHEID quick-couplers; coupler points category 3 acc. to ISO 730/I resp. DIN 9674





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Dimensions of rear linkage geometry when connected to the standard frame (projected lengths in mm, underlined values are valid for power lift measurements p. 25)

Rear and front tyres	radius index	(r)	770
Length of lift arms		(A)	450
Length of lower links		(B)	984
Distance of lift arm pivot points from rear wheel centre	horizontal	(a)	210
	vertical	(b)	510
Horizontal distance between the 2 lower link pivot points		(u)	520
Horizontal distance between the 2 lift arm end points		(v)	770
Length of upper link		(S)	655 to 875, <u>766</u>
Distance of upper link pivot point from rear wheel centre	horizontal	(c)	396
	vertical	(d)	205
Distance of lower link pivot point from rear wheel centre	horizontal	(e)	154
	vertical	(f)	165
Distance of lower link pivot points to lift rod pivot points on lower links		(D)	680
Length of lift rods		(L)	605 to 755, <u>695</u>

Height of lower link hitch points relative to rear wheel centre line (situated 770 mm above ground), these data are valid for unloaded power lift:

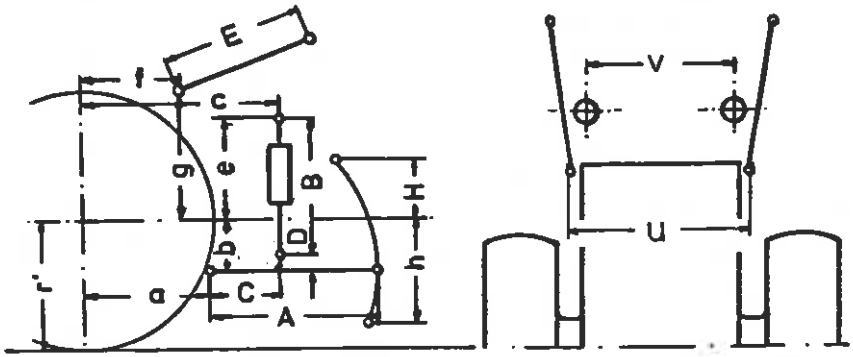
Length of lift rods	(L)	<u>695</u>	605	755
Linkage distance of lift rod	(D)	680		
Lowest position	(h)	540	385	625
Highest position	(H)	195	312	110
Transport position	(H')	195	312	110

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Implement linkage at front: Three-point linkage, coupler points category 2 acc. to ISO 730/I resp.DIN 9674

Dimensions of front linkage geometry (projected lengths in mm, underlined values are valid for power lift measurements p. 24)



Rear and front tyres	radius index (r)	770
Length of lower links	(A)	940
Length of cylinders	(B)	493 to 743
Distance of lower link pivot point to fixing point of cylinder	(C)	304
Distance of cylinder's fixing point to lower link	(D)	72
Length of upper link	(E)	600 to 800, <u>642</u>

Distances of front wheel centre to:	horizontal		vertical	
pivot point of lower link	(a)	960	(b)	202
pivot point of cylinders	(c)	1300	(e)	340
pivot point of upper link	(f)	1260	(g)	300

Horizontal distance between the 2 lower link pivot points	(u)	870
Horizontal distance between the 2 cylinder pivot points	(v)	690

Height of lower link hitch points relative to front wheel centre line (situated 770 mm above ground), these data are valid for unloaded power lift)

lowest position	(h)	510
highest position	(H)	230
transport position	(H')	230

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Pull attachment

Swinging drawbar:	Optional, not fitted on tractor tested; in accordance with manufacturer:		
	height adjustable by turning;		
	hitch point		
	above ground	400 or 500	mm
	behind rear wheel centre	917	mm
	distance to p.t.o. shaft end		
	vertical	170 or 270	mm
	horizontal	409	mm
	lateral adjustment		
	to both sides	240	mm
	pivot point before rear wheel centre	240	mm
	diameter of drawbar pin hole	33	mm
	maximum vertical permissible load	2000	kg
Trailer hitch:	ROCKINGER, model 248 D; with remote control (on request), automatical, height adjustable;		
	hitch point		
	above ground	850, 900, 950 or 1000	mm
	behind rear wheel centre	580	mm
	distance to p.t.o. shaft end		
	vertical	180, 230, 280 or 330	mm
	horizontal	72	mm
	diameter of hitch pin	30	mm
	maximum vertical permissible load	1500	kg
	optionally available		
	ROCKINGER 279 D, automatical or		
	ROCKINGER 277 C, non-automatical		
Holed drawbar:	Short bar, length between joint balls	965	mm
	number of holes	6	mm
	distance between holes	80	mm
	hole diameter	33	mm
	thickness/width of the drawbar	30/120	mm
	height above ground (determined		
	without load) minimum	145	mm
	maximum	1082	mm
	horizontal distance to p.t.o. shaft end		
	(with horizontal lower links)	630	mm
Towing hitch:	At front of tractor,		
	height above ground	840	mm

Steering	ZF, hydrostatic, model SERVOSTAT 8494; ZF-vane pump, delivery 19 dm^3/min, V-belt driven by engine, separate oil circuit with 3,3 dm^3 capacity, replaceable filter 2 double acting WEBER differential rams, 255 mm stroke, 53 mm dia, piston rod 25 mm dia, directly operating on steering levers, working pressure 12 MPa
Brakes	
Service brake:	MERCEDES-BENZ; pedal operated, single circuit, power assisted brake (assisted by compressed air), hydraulic transmission; dual circuit brake optional; per wheel 1 brake drum each with 410 mm dia
Trailer brake:	Optional, fitted on tested tractor: Combined single/dual line typ, compressed air controlled; MERCEDES-BENZ, single-cylinder air compressor, directly driven by engine; additional WABCO air compressor, V-belt driven by engine; 2 air reservoirs with 32 dm^3 and 20 dm^3 volume, working pressure 810±20 kPa; for certain countries hydraulic brake, oil pressure supplied by hydraulic system
Parking brake:	Spring-loaded brake, pneumatically operated by hand valve, acting on rear brake drums of service brake
Steering brake:	None
Wheels	
Steering wheels:	At front, 2 pneumatics
Driving wheels:	At front and at rear
Wheelbase:	2650 mm
Track width adjustment:	None, track width at front and at rear 1871 mm (not adjustable) optional: adjustable-gauge bowl wheels for track widths 1903, 2043 and 2247 mm

Rims: At front and at rear W 15Lx34 (fitted on tested tractor) or W 16Lx34

Available tyres:

Tyre sizes at front	and at rear
18.4 - 30	10, 12, or 16 ply
18.4 R 30	142 A8 or 155 A8
18.4 - 34	10 ply *)
18.4 R 34	144 A8 or 157 A8
12.4 - 38	12 ply *)
520/70 R 34	148 A8
9.5 - 44	12 ply
12.4 R 46	10 ply
11.2 - 48	12 ply

*) as radial ply tyres available, too

Protective structure: MERCEDES-BENZ, model 442.82;
safety cab, OECD-tested
approval-no. CSD 0277/5
optionally available: model 1500/1 C
approval-no. CSS 014/5

welded steel sheet structure, antivibration mounted by 4 silent blocks on chassis, laterally tiltable;

1 door and 3 steps on each side, roof hatch; steps 550, 850 and 1150 mm, driver's platform 1450 mm above ground; windscreen and roof hatch tiltable, rear window divided, both parts shiftable, drop windows in the doors, optional tiltable rear window;
combined heating/ventilation system with 4 step-blower and cooling water heat exchanger incorporated in roof, air intake by paper element filter along the right side of the roof
4 adjustable air outlet jets above wind screen, 1 adjustable air outlet jet each on the left and right at the floor, in front of the doors;
on the left and right each: 3 defroster nozzles above and 4 defroster nozzles beside windscreen;
air channel above rear window, optional air conditioner (incorporated in cab roof)

noise reduction materials:

floor (inside)	laminated floor mat (plastic foil, rubber, foam and film foil)	16 mm
(bottom side)	PVC-damping material (density 9,8 kg/dm³)	4 mm
doors and rear side walls	nappa coated cardboard	2,5 mm
side walls at front and side posts	plastic	5 mm
rear and front wall	plastic coated foam	15 mm
roof front part and on the left, lateral	adhesive damping foil with fabric coating	3,5 mm
ventilation system (lower cover)	foam with fabric coating	15 mm
(other part) and roof hatch	foam on cardboard with fabric coating (density 30 kg/m³)	30 mm
bulk head (side facing to engine)	PVC-damping material (density 9,8 kg/dm³)	4 mm

Driver's seat

ISRINGHAUSEN, model ISRI 6500/516 (on request)
upholstered seat with back rest and arm rests,
pneumatic suspension with hydraulic shock absorber, additional horizontal suspension, lockable;
automatically acting weight adjustment;
range of adjustment:
longitudinal 180 mm
vertical front and rear end in 6 steps each from 420 to 480 mm
standard type: ISRI 6000/516 with mechanical suspension;
optional, on tested tractor fitted: Rotating control desk, including seat laterally turnable about 10° to the right and 30° resp. 180° to the left (reverse driving possibility)

Passenger's seat

On the left of driver's seat;
upholstered with back rest, folding seat, not suspended, not adjustable

Implement mounting area: Behind cab, above rear axle;
width between mudguards 1160 mm
length of bottom plate 800 mm

Lighting: Electrical, 12 Volt, as per German legislation

	Height above ground of centre mm	Size mm	Distance from outside edge of tractor to median plane mm
Headlights	1085	130x120	720
Auxiliary lights	2840	130x120	670
Side lights	1950	60x30	100
Rear lights	1520	60x70	330
Reflectors			
1st pair	1300	75 dia	110
2nd pair	870	75 dia	670

Speed-hour meter: Digital speed and distance display, analog engine and p.t.o. speed display; electronic running-time meter, reference engine speed for 1 really counted hour 1600 rev/min

TEST CONDITIONS

Overall dimensions

Length: 5040 mm
Width: 2490 mm
without ballast
5820 mm
2490 mm
with ballast

Height: 3000 mm to top of cab roof, 3020 mm to upper edge of exhaust silencer mouth

Ground clearance: 530 mm below lowermost step

Tyres and track widths specifications

Tyres:	Front and rear wheels
dimensions	18.4 R 34
type	MICHELIN BIB'X radial ply tyre
load index	157
speed index	A 8
maximum load	41,3 kN
inflation pressure	320 kPa
radius index	770 mm

Chosen track width: 1871 mm, not adjustable

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Tractor mass

		without driver kg	with driver kg
Without ballast: Mass	front	3590	3625
	rear	2880	2915
	total	6470	6540

Front ballast:
- 1 weight 1000 kg
- 1 front power lift 100 kg
- water in front tyres 270 kg

Rear ballast:
- weights on implement mounting area 1500 kg
- water in rear tyres 590 kg

With ballast: Mass	front	5985	6020
	rear	3945	3980
	total	9930	10000

Technically permissible axle loads: at front 6020 kg
at rear 6500 kg

Technically permissible total weight: 10000 kg

Oils and lubrication

Capacity and change interval:

	Capacity dm^3	Oil change h *)	Filter change h *)
Engine	15	300	300
Gear box	12	1200	not provided
Front axle	3	600	-
Rear axle	4,5	600	-
Final drives front	1,5 +)	1200	-
Final drives rear	1,5 +)	1200	-
Hydraulic system	60	1800	1800
Steering	3,3	2400	2400

*) operating hours

+) on the left and right each

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Specifications:

	Recommended	Used during test
Engine oil:		
Type	engine oil	BP VANELLUS
viscosity	SAE	
winter	10W, 20W/20, 20W/30 or 15W/40	SAE 15W/40
summer	30 or 15W/40	
tropics	40	
classification	API-CD or MIL-L-2104 C	API-CD
Transmission oils:		
Gear box		
type	gear oil	SHELL SPIRAX MA80W
vicosity	SAE 80 or 80W/85	SAE 80
classification	API-GL-4 or MIL-L-2105	API-GL-4
Group gear (A/S)		
type	gear oil	ESSO GP-D80
viscosity	SAE 80 or 80W/85	SAE 80
classification	API-GL-4 or MIL-L-2105	API-GL-4
Differentials (at front and at rear)		
type	gear oil	SHELL MBK
viscosity	SAE 90	SAE 90
classification	API-GL-5 or MIL-L-2105 B	API-GL-5
Final drives at rear		
type	gear oil	SHELL MBK
viscosity	SAE 90	SAE 90
classification	API-GL-5 or MIL-L-2105 B	API-GL-5
Final drives at front		
type	gear oil	SAE MBK
viscosity	SAE 90	SAE 90
classification	API-GL-5 or MIL-L-2105 B	API-GL-5
Power lift and steering		
type	engine oil	TEXACO URSATEX
viscosity	SAE 10W	SAE 10W
classification	API-CC	API-CC

Grease: multi purpose grease

number of lubrication points: 20 (with front power lift)
18 (without front power lift)

Fuel

type: ARAL Diesel-fuel in conformity with DIN 51601

density: At 15°C
- at engine performance test: 0,836 g/cm^3
- at p.t.o. performance test: 0,844 g/cm^3
- at drawbar power test: 0,830 g/cm^3

Repairs: None

Remarks: None

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COMPULSORY TESTS

1. MAIN POWER TAKE OFF PERFORMANCE (1000 rev/min)

Date of tests: 25th August 1987
Location of tests: DLG-Testing Station Groß-Umstadt
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

Power kW	speed engine rev/min	speed p.t.o. rev/min	fuel consumption hourly l/h	fuel consumption hourly kg/h	fuel consumption specific g/kWh	specific energy kWh/l
Maximum power						
1.1 At 2-hour test						
91,9	2400	1096	28,12	23,75	259	3,27
1.2 At rated speed						
91,9	2400	1096	28,12	23,75	259	3,27
1.3 At standard p.t.o. speed						
91,2	2190	1000	26,43	22,32	245	3,45
1.4 Part loads, the governor hand lever in the position corresponding to maximum power at full load (curve a)						
1.4.1 the torque corresponding to maximum power at rated speed						
91,9	2400	1096	28,12	23,75	259	3,27
1.4.2 85% of the torque obtained in 1.4.1						
79,5	2442	1115	25,30	21,37	269	3,14
1.4.3 75% of the torque defined in 1.4.2						
60,2	2467	1126	20,90	17,65	293	2,88
1.4.4 50% of the torque defined in 1.4.2						
40,5	2490	1137	16,63	14,04	347	2,44
1.4.5 25% of the torque defined in 1.4.2						
20,5	2522	1152	12,25	10,34	504	1,67
1.4.6 unloaded						
-	2543	1161	8,43	7,12	-	-

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Power kW	speed engine rev/min	speed p.t.o. rev/min	fuel consumption hourly l/h	fuel consumption hourly kg/h	fuel consumption specific g/kWh	specific energy kWh/l
1.5 Part loads, the governor hand lever in the position corresponding to the standard p.t.o. speed at full load (curve b)						
1.5.1 the torque corresponding to maximum power						
91,2	2190	1000	26,43	22,32	245	3,45
1.5.2 85% of the torque obtained in 1.5.1						
80,1	2261	1032	24,29	20,51	256	3,30
1.5.3 75% of the torque defined in 1.5.2						
60,7	2288	1045	19,85	16,76	276	3,06
1.5.4 50% of the torque defined in 1.5.2						
40,8	2307	1053	15,38	12,99	318	2,66
1.5.5 25% of the torque defined in 1.5.2						
20,5	2319	1059	11,03	9,32	454	1,86
1.5.6 unloaded						
-	2339	1068	7,34	6,20	-	-

No load maximum engine speed: 2543 rev/m
Equivalent flywheel torque at rated engine speed: 362 Nm
Maximum equivalent flywheel torque: 460 Nm at 1401 rev/min of the engine

Mean atmospheric conditions

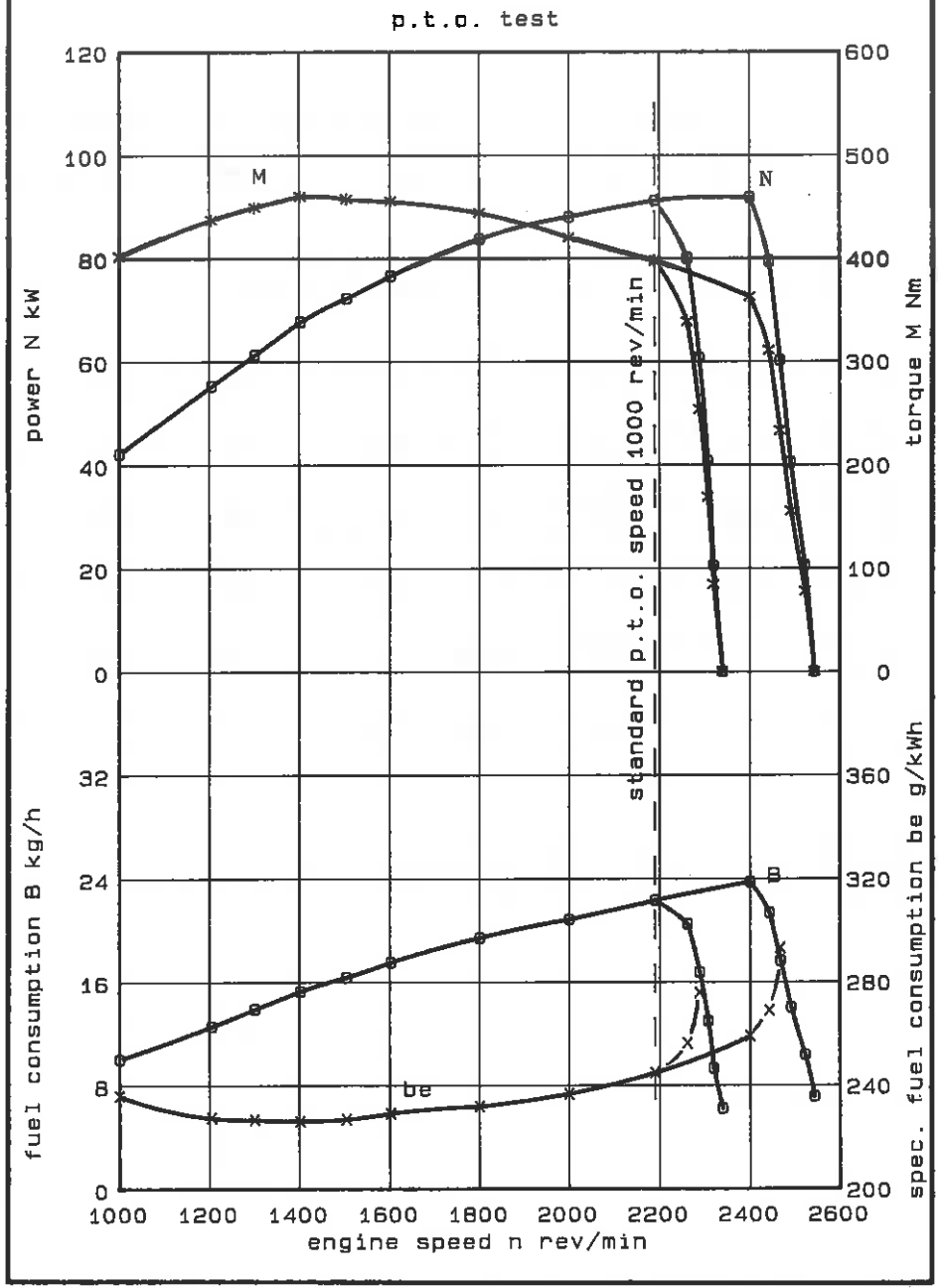
temperature	23 °C
pressure	99 kPa
rel. humidity	55 %

Maximum temperatures

coolant	83 °C
oil	111 °C
fuel	27 °C
air intake	33 °C

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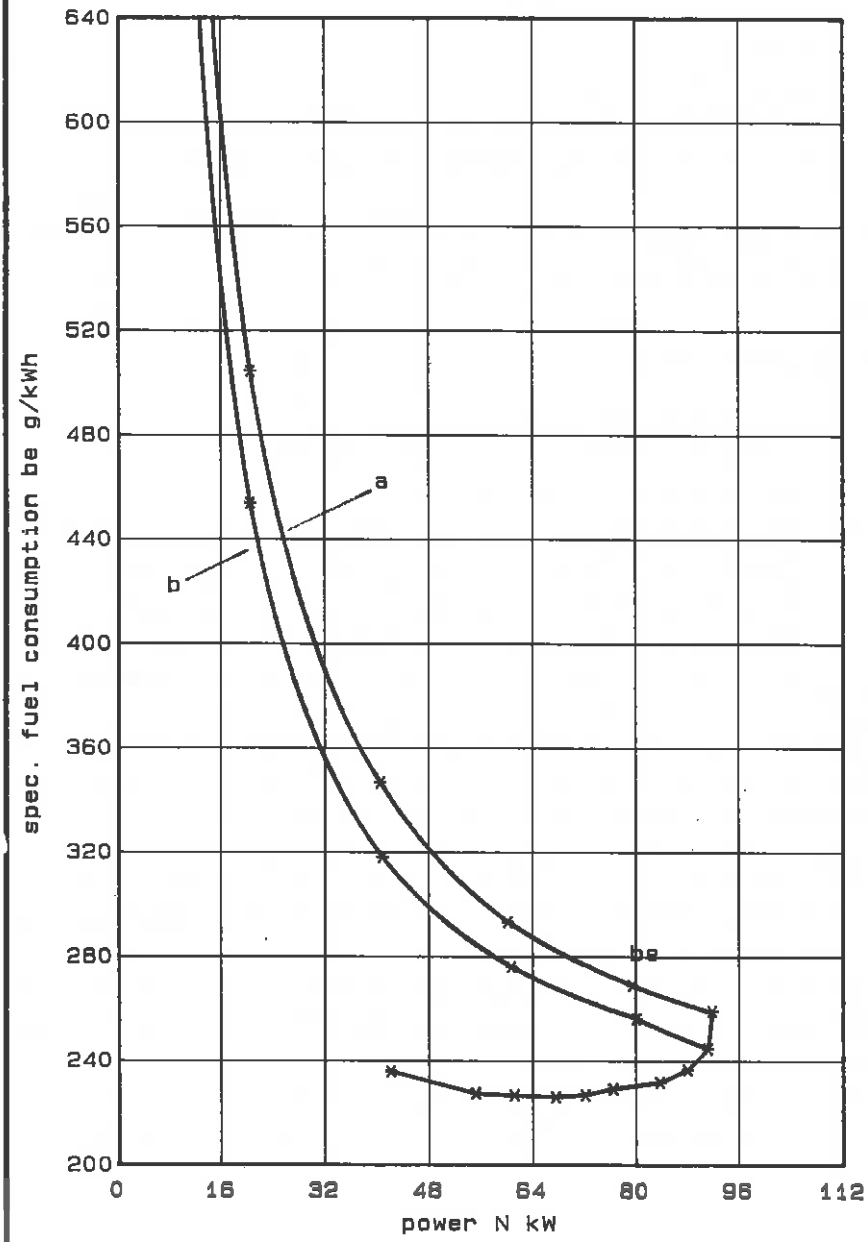
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p.t.o. test



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(2) HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 17th November 1987

(2.1) Hydraulic power test

Sustained pressure with relief valve open 20,4 MPa
Pump delivery rate at minimum pressure 60,0 l/min

	Hydraulic power kW	Flow rate l/min	Pressure MPa	Oil temperature °C
at 90% of the actual relief valve setting	17,0	55,4	18,4	65
maximum	17,1	54,8	18,7	65

Tapping point used for test: At rear of tractor

(2.2) Lifting force at front power lift (spring suspension at front axle locked)

linkage dimensions see page 12

	Height of lower hitch points above ground in down pos. mm	Vertical movement mm	Max. force exerted through full range kN	Corresp. pressure of hydraul. fluid MPa	Moment about front axle kNm	Max. tilt angle of mast from vertical degrees
At hitch points	260	715	27,5	18,4	-	-
On the frame	260	725	23,3	18,4	58,5	6

Temperature of hydraulic fluid at start of test 65°C

Lifting heights relative to horizontal lower links

mm	-308	-300	-283	-200	-100	0	+100	+200	+300	+400	+407	+442
Lifting forces at hitch points												
kN	27,5	27,5		27,7	28,0	28,6	29,7	30,4	31,3	31,9	31,9	
Lifting forces at test frame												
kN			32,8	30,6	29,0	28,1	27,5	26,6	25,3	23,9		23,3

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(2.3) Lifting force at rear power lift

linkage dimensions see pages 10 and 11

	Height of lower hitch points above ground in down pos. mm	Vertical movement mm	Max. force exerted through full range kN	Corresp. pressure of hydraul. fluid MPa	Moment about rear axle kNm	Max. tilt angle of mast from vertical degrees
At hitch points	230	715	65,0	18,4	-	-
On the frame	230	925	43,4	18,4	75,9	11,5

Temperature of hydraulic fluid at start of test 65°C

Lifting heights relative to horizontal lower links

mm	-460	-400	-375	-300	-200	-100	0	+100	+200	+300	+340	+400	+465
Lifting forces at hitch points													
kN			79,6	77,4	75,6	73,4	71,6	70,3	68,5	66,7	65,0		
Lifting forces at test frame													
kN	68,6	68,6		64,0	61,3	58,6	56,0	53,8	51,0	48,6		45,8	43,4

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(3) DRAWBAR PERFORMANCE

Date of tests: 9th till 14th September 1987
Type of track: Concrete

Gear	Driving speed km/h	Power kW	Drawbar pull kN	Engine speed rev/min	Slip of wheels %
(3.1) Maximum power in tested gears (unballasted tractor) height of drawbar above ground 585 mm					
2 A	2,26	42,4	67,49	2458	14,9
3 A	3,05	57,0	67,22	2433	15,0
4 A	4,34	74,7	61,96	2399	10,0
1 S	5,57	77,8	50,29	2397	6,4
5 A	6,41	78,6	44,17	2401	5,2
2 S	7,83	78,3	36,01	2399	3,9
6 A	9,08	78,6	31,17	2399	3,2
3 S	10,99	78,8	25,80	2400	2,4
7 A	12,51	78,1	22,48	2399	2,1
(3.2) Maximum power in tested gears (ballasted tractor) Height of drawbar above ground 575 mm					
1 A	1,65	43,4	95,07	2471	15,0
2 A	2,26	59,6	94,94	2446	15,0
3 A	3,20	74,9	84,29	2396	10,1
4 A	4,58	78,2	61,50	2399	5,6
1 S	5,73	79,6	50,01	2401	4,3
5 A	6,53	79,5	43,83	2400	3,7
2 S	8,06	79,5	35,51	2400	2,8
6 A	9,18	77,8	30,52	2398	2,4
(3.3.1) Five-hour-test at 75% of pull at maximum power in 1 S gear					
1 S	5,94	61,9	37,50	2456	3,0
(3.3.2) Five-hour-test at pull corresponding to 15% wheel slip in test (3.2)					
2 A	2,26	60,0	95,65	2444	-

Total oil consumption during ten hours duration of tests (3.3.1) and (3.3.2) 52 g/h

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Tyre size front and rear: 18.4 R 34 157 A8

Specific fuel consumpt. g/kWh	Specific energy kWh/l	Temperatures Fuel °C	Coolant °C	Engine-oil °C	Atmospheric conditions Tempe-rature °C	Relative humidity %	Pressure kPa
tyre inflation pressure: 160 kPa at front and at rear							
387	2,14	34	81	94	23	76	100,2
351	2,36	31	81	94	22	80	100,2
315	2,64	34	82	92	23	74	100,2
302	2,74	34	81	92	23	78	100,2
299	2,77	33	82	94	24	66	100,1
301	2,76	35	82	94	24	64	100,1
300	2,77	25	80	89	18	87	99,9
299	2,77	31	81	89	20	95	99,9
302	2,75	32	82	89	20	93	99,9
tyre inflation pressure: 180 kPa at front and 130 kPa at rear							
384	2,16	35	82	92	22	84	99,8
348	2,39	35	82	94	24	84	99,8
315	2,64	35	81	91	22	85	99,8
301	2,76	34	81	92	23	84	99,8
296	2,81	34	82	91	23	85	99,8
296	2,80	34	82	90	23	81	99,8
296	2,80	35	82	92	23	81	99,8
303	2,74	35	82	91	24	86	99,8
314	2,64	41	82	102	27	66	100,6
-	-	38	82	102	24	72	100,6

Test (3.3.2) was carried out with additional ballast,
the figures not quoted are therefore irrelevant

(4) TURNING AREA AND TURNING CIRCLE

Wheel equipment front and rear: 18.4 R 34

Track of wheels front and rear: 1871 mm

	all wheels driven		rear wheels driven	
	left-hand m	right-hand m	left-hand m	right-hand m
Radius of turning area	7,45	7,45	7,02	6,98
Radius of turning circle	7,19	7,20	6,76	6,73

(5) POSITION OF CENTRE OF GRAVITY

Height above ground	1127 mm
Distance forward from rear axle centre	1469 mm
Distance from tractor's median plane, to the right	6 mm

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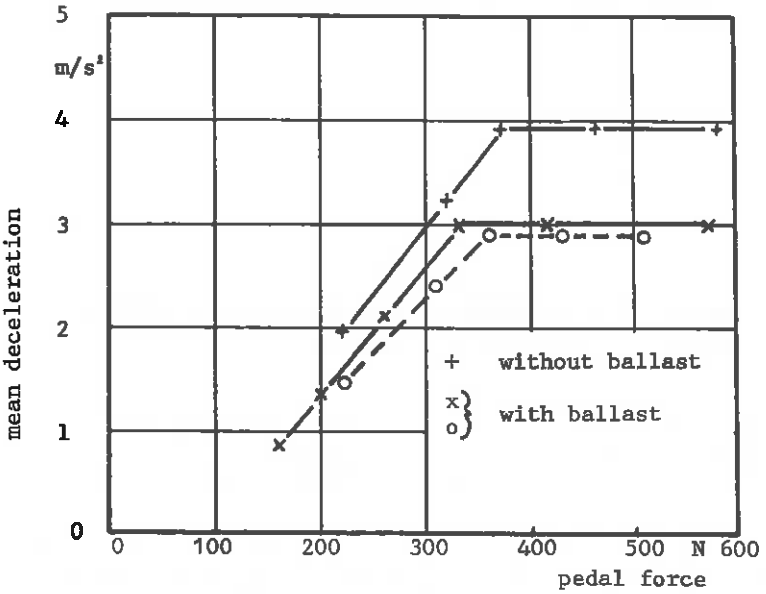
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(6) BRAKING (Front wheel drive disengaged)

Date of tests: 10th and 11th September 1987

	Tractor mass (with driver) front kg	rear kg	total kg	Speed before application of brakes km/h
Without ballast	3625	2915	6540	42,9
With ballast	6020	3980	10000	41,6

(6.1) Cold service braking device test ———
(6.2) Fade test – – –



No significant deviation of tractor from original course and no abnormal vibrations, maximum deceleration limited by adjusted maximum braking pressure.
Brakes-heating: Actuating of brake for 1 km with pedal force corresponding to 1 m/s²

(6.3) Parking braking device test

	Ballasted tractor on 18% - slope
Braking device control force kN	Parking brake pneumatically controlled by hand valve, tractor doesn't roll

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(7) MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of test: 10th September 1987
Type of track: Concrete
Type of sound level meter: BRÜEL & KJAER model 2209

Results of test

Gear: 7 S +)
Travelling speed before acceleration: 32,2 km/h
Sound level: 83,0 dB(A)

APPENDIX

MEASUREMENTS OF NOISE IN THE PROTECTIVE STRUCTURE

Results of OECD-Test No. CSD 0277/5-a(C)

Date of tests: 25th February 1987
Type of track: Concrete
Type of sound level meter: BRÜEL & KJAER model 2209

Gear	Drawbar pull kN	Travelling speed km/h	Sound level dB(A)	Noise rating N
5 A *)	43,28	6,71	79,5	74
2 S	34,65	8,31	81	77
6 A	30,67	9,59	80,5	78
5 A *)	light load	7,35	78	
7 S +)	light load	43,72	78,5	

*) The 5 A gear corresponds to the nominal travelling speed nearest to 7,5 km/h.

+) Front wheel drive disengaged

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OPTIONAL TEST

8. ENGINE PERFORMANCE

Date of tests: 10th August 1987
Location of tests: DLG-Testing-Station Groß-Umstadt
Type of dynamometer: SCHENCK eddy-current-dynamometer WM 400

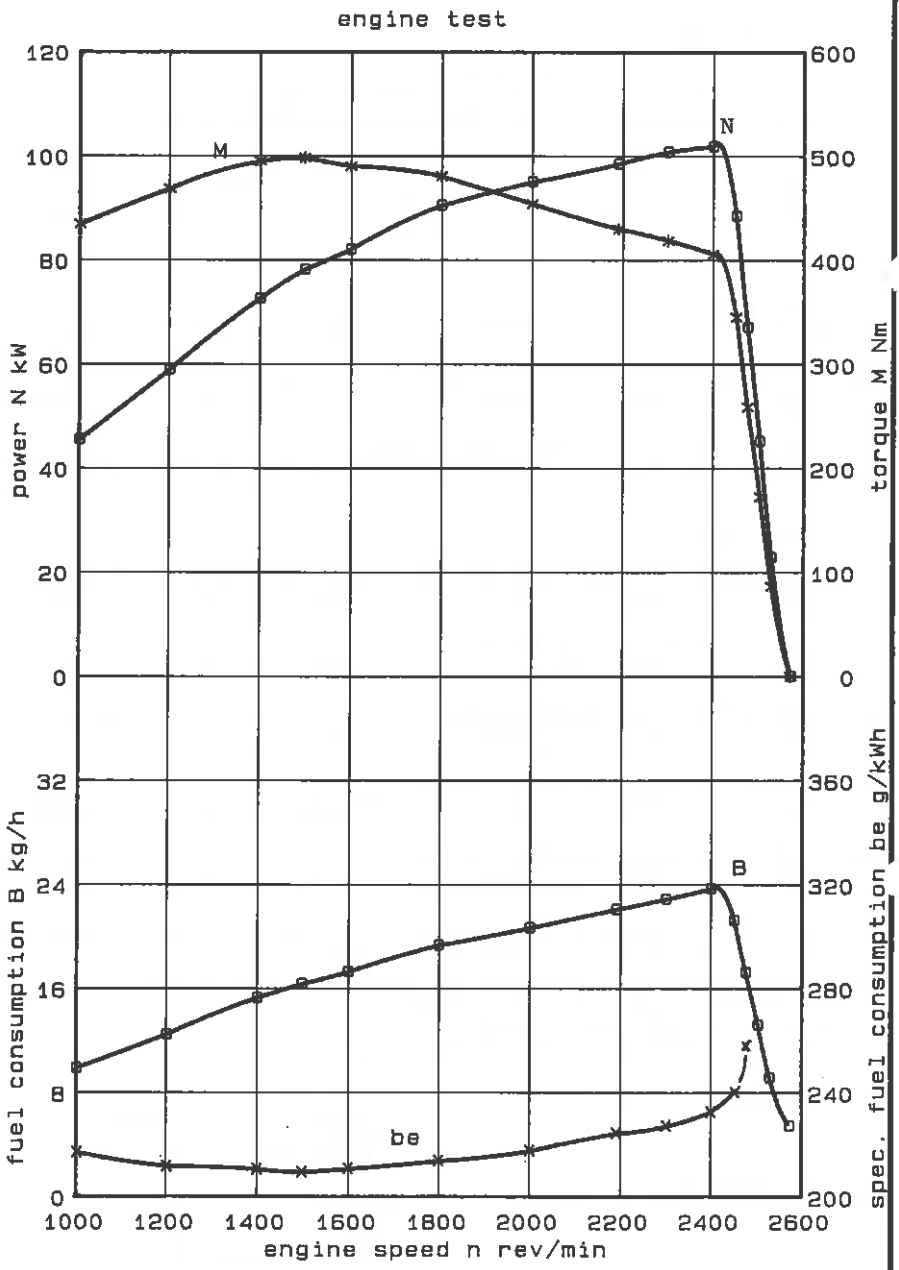
Power kW	Engine speed rev/min	Fuel consumption hourly l/h	Fuel consumption hourly kg/h	Fuel consumption specific g/kWh	Specific energy kWh/l
Maximum power					
8.1 At 2-hour test					
101,9	2400	28,33	23,68	232	3,60
8.2 At rated engine speed					
101,9	2400	28,33	23,68	232	3,60
8.3 At standard p.t.o. speed (1000 rev/min)					
98,5	2190	26,45	22,11	224	3,73
8.4 Part loads					
8.4.1 the torque corresponding to maximum power at rated speed					
101,9	2400	28,33	23,68	232	3,60
8.4.2 85% of the torque obtained in 8.4.1					
88,5	2452	25,41	21,25	240	3,48
8.4.3 75% of the torque obtained in 8.4.2					
67,0	2477	20,62	17,24	257	3,25
8.4.4 50% of the torque obtained in 8.4.2					
45,2	2504	15,77	13,19	292	2,86
8.4.5 25% of the torque obtained in 8.4.2					
22,8	2530	10,91	9,12	400	2,09
8.4.6 unloaded					
-	2573	6,50	5,43	-	-

Optimum fuel consumption: 208 g/kWh at 59.6 kW and 1320 rev/min
No load maximum engine speed: 2573 rev/min
Torque at rated engine speed: 405 Nm
Maximum torque: 498 Nm at 1497 rev/min of the engine

Mean atmospheric conditions	temperature	23 °C
	pressure	100 kPa
	relative humidity	35 %
Maximum temperatures	coolant	86 °C
	oil	110 °C
	fuel	26 °C
	engine air intake	36 °C

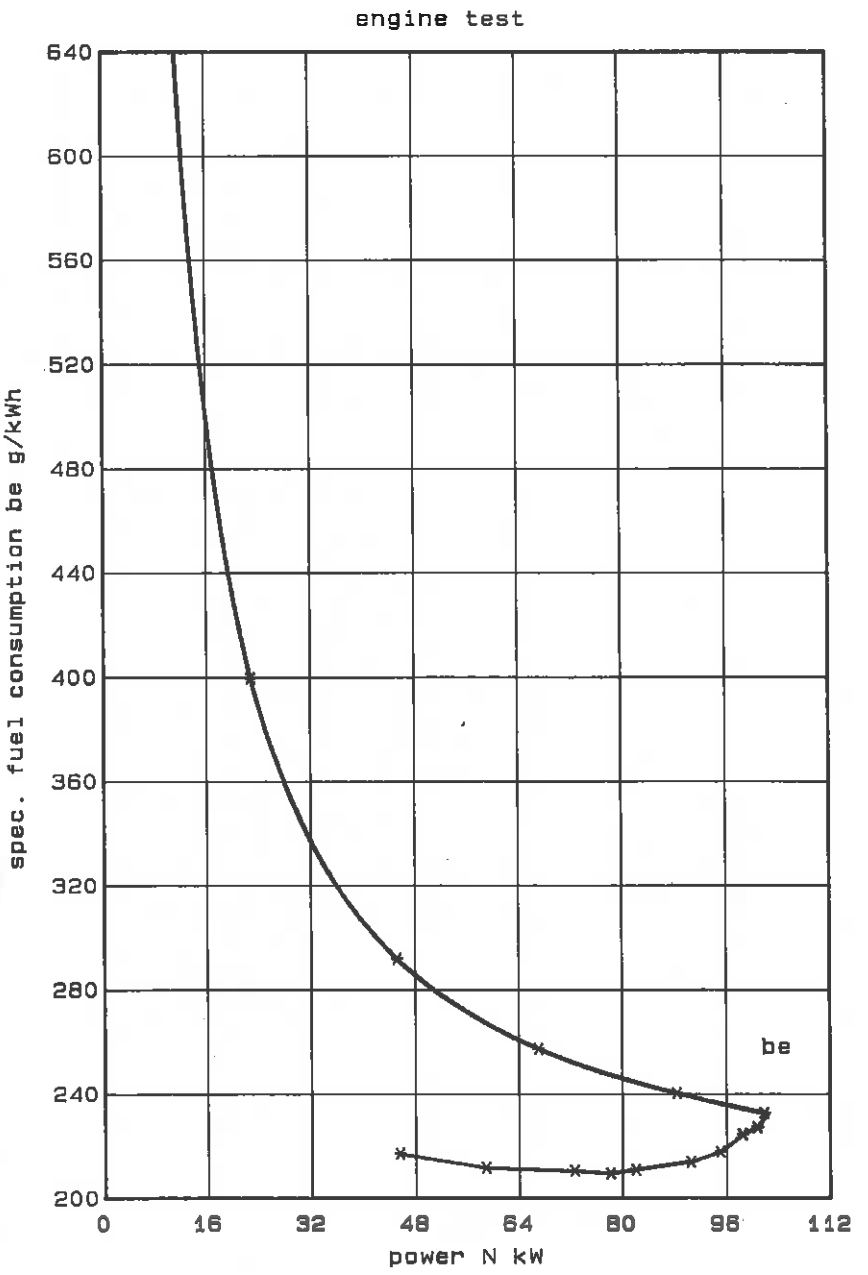
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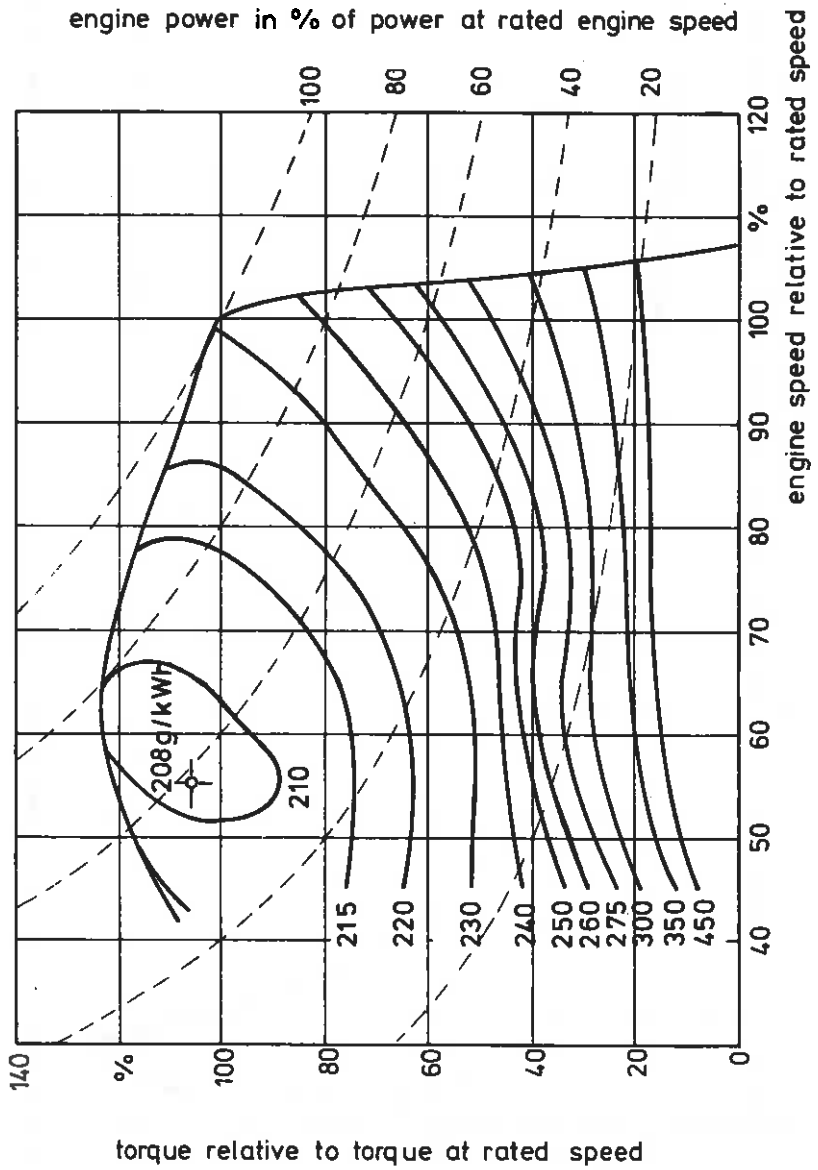
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