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

O.E.C.D. No. **704**



Agricultural Tractor HOLDER A 50

Model name HOLDER 411 (36 kW)

Manufacturer
Gebr. Holder GmbH & Co.
D-7430 Metzingen

Deutsche Landwirtschafts-Gesellschaft e. V.
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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. It does not contain an evaluation of the tractor performance on practical work.

Duration of tests: April 1979 till August 1980

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.N.E.E.M.A., France) as being in accordance with the O.E.C.D STANDARD CODE.

Date of Approval: 27th November 1980 O.E.C.D. No. 704

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

The reference to the former used Technical System of Units is given by the following relations:

Forces	1 daN = 10 N = 1,02 kp	or 1 kp	= 0,981 daN
Powers	1 kW = 1,36 PS	or 1 PS	= 0,736 kW
Pressures	1 bar = 1,02 kp/cm²	or 1 kp/cm²	= 0,981 bar
	1000 mbar = 750,1 mm Hg		

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Tractor manufacturer:	GEBR. HOLDER GmbH und Co. D-7430 Metzingen
Submitted for test by:	Manufacturer
Selected by:	Manufacturer with agreement by DLG
Place of running-in:	Metzingen
Duration of running-in:	Engine 80 hours, tractor appr. 60 hours

SPECIFICATION OF TRACTOR

Tractor

Make:	HOLDER
Model:	Trade name A50, model name 411 (36 kW)
Type:	Wheel tractor, articulated steering, all-wheel driven
Serial-No.:	411 00 299

Engine

Make:	Own make
Model:	6001-3
Type:	4-stroke Diesel-engine, direct injection, water-cooled
Serial-No.	6310154
Cylinders:	3, in line, bore 100 mm, stroke 100 mm, displacement 2356 cm^3, compression ratio 16,6 cylinder liners not replaceable
Valves:	Overhead
Fuel system:	Fuel feed by gravity; BOSCH in line injection pump: PES 3A 80D 410/3 RS1313, manufacturer's production setting 51,5 mm^3/stroke at rated engine speed, with full load; injection timing 32° before TDC; BOSCH multihole injection nozzles DLLA 150 S 764, injection pressure 185 bar; MANN fuel filter with replaceable cartridge; capacity of fuel tank 40 l
Governor:	BOSCH centrifugal variable speed governor: EP/RSV 400-1250 A0B 1123L, governed range of speed 800 to 2680 rev/min, rated engine speed 2500 rev/min

Air cleaner:	MANN dry paper element filter with precleaner, with replaceable cartridge and acoustically operating maintenance-indicator
Exhaust silencer:	Own make reflexion-absorption type silencer, 115 mm dia, 407 mm long, on the left side above engine cowling, mouth showing upward, mouth 1977 mm above ground
Lubrication system:	Forced feed from gear pump; strainer in sump; MANN oil filter in full flow with replaceable cartridge and by-pass valve; cartridge and oil change interval 150 hours; oil capacity 6 l; recommended oil quality MIL-L-2104 B, MIL-L-46152 or for hard working conditions MIL-L-2104C; recommended oil viscosities: below: -10°C SAE 10W from -10°C to +20°C SAE 20W/20 above +20°C SAE 30
Cooling system:	Water cooling with overpressure relief valve, adjusted to 0,4 bar, impeller assisted; by-pass thermostat; fan with 4 blades, 300 mm Ø; water capacity 9 l
Starting system:	Electrical BOSCH screw-push starter motor JF 12V/2,4 kW; BERU spiral-type glow plug in intake manifold
Electrical equipment:	12 Volt, negative earth; BOSCH 3-phase alternator G1 14V/33A; 1 lead acid battery 88 Ah at 20 hours rating

Transmission

Clutch:	FICHTEL UND SACHS AG dry single-plate type clutch MF 240 K, disc diameter 240 mm, hydraulically pedal operated
Gear box:	Own make consisting of 2 gear boxes, connected with each other by universally-jointed propeller shafts; speed change gear with 4 speeds, synchronized; group gear with 2 synchronized forward groups and 1 collar shifted reverse group; totally 8 forward and 4 reverse speeds
Axles and final drives:	Own make all-wheel drive, not disengageable; at front and at rear: bevel gear drive with crown wheel and pinion, bevel gear type differentials with locks, in common hydraulically engageable by hand lever self-disengaging; planetary final drives
Transmission lubrication:	Transmission oil SAE 80 MIL-L-2105/API GL-4 front gear box with front axle 10,2 l rear gear box with rear axle 6,3 l final drives each 0,3 l without oil filter; oil change interval 1500 hours

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Total ratios and speeds

Group	Gear	Total ratio engine : driving wheel	Nominal travelling speed *) at rated engine speed km/h
Forward speeds			
L	1	265,86	1,51
	2	146,51	2,73
	3	88,09	4,55
	4	56,92	7,04
S	1	74,43	5,38
	2	41,02	9,76
	3	24,66	16,24
	4	15,94	25,13
Reverse speeds			
R	1	225,40	1,78
	2	124,22	3,22
	3	74,68	5,36
	4	48,26	8,30

*) calculated with a tyre dynamic radius of 425 mm

Power-take-off

Main p.t.o.:	Independent p.t.o., driven by a wet multi disc clutch, operated by hand lever; at rear of tractor, in tractor's median plane, 472 mm above ground, p.t.o. shaft end 288 mm behind rear axle centre line; 35 mm dia, 6 splines DIN 9611 and ISO 500 type 1; 612 rev/min at rated engine speed, standard p.t.o. speed 540 rev/min at 2205 rev/min engine speed; direction of rotation clockwise viewed from tractor rear
Secondary p.t.o.:	In front of front axle; drive and p.t.o. stub shaft type same as for main p.t.o.; 327 mm above ground, in tractor's median plane, p.t.o. shaft end 190 mm before front axle centre line; 1061 rev/min at rated engine speed, standard p.t.o. speed 1000 rev/min at 2357 rev/min engine speed; direction of rotation counterclockwise viewed from tractor rear; p.t.o. speeds may be set by aid of tractormeter

Power lift

Hydraulic system:	Own make hydraulic power lift in disintegrated construction; BOSCH gear type pump HY/ZFS, delivery 14 cm^3/rev or 35 l/min at rated engine speed, driven by the engine; pressure relief valve set to 190 bar
Power lift at rear:	BUCHER control valve for lifting and lowering; 2 single-acting rams with 60 mm bore and 116 mm stroke without overpressure relief valves in the rams, without lowering throttle

Power lift at front:	Optionally available, fitted on tractor tested; BUCHER control valve for lifting and lowering; 1 single-acting ram with 50 mm bore and 160 mm stroke, without overpressure relief valve in the ram, without lowering throttle Up to 5 singleor double acting additional control valves with oil tappings available
Hydraulic fluid:	Hydraulic oil tank with 14 l capacity, 3,5 l may be taken off through oil tappings when tractor is working driving, 11 l when tractor is working stationary; oil filter with replaceable cartridge; cartridge change all 300 hours; recommended oil: engine oil SAE 20W/20 MIL-L-2104 A; oil change once a year
Implement linkage at rear:	Three point linkage category I DIN 9674, right lift rod adjustable about ± 40 mm, lifting height above ground 77 to 662 mm
Implement linkage at front:	Linkage of own construction, ram acting on 2 laterally stabilized arms
Holed bar:	Short bar, fitted on clevis of lower links; length between the joint balls 680 mm, width 70 mm, thickness 30 mm; centre hole and 3 holes in 80 mm distance each on either side, all holes 33 mm dia; height above ground adjustable by power lift in the range from 92 to 677 mm, measured at the surface of the bar; distance of holes centre line with lower links in horizontal position: from rear axle centre 738 mm from p.t.o. shaft end 450 mm

Pull attachment

Trailer hitch:	ROCKINGER height above ground adjustable by shifting to 582, 622 and 662 mm, hitch hole 33 mm dia; distance of hitch hole centre from rear axle centre 430 mm; permissible vertical load 600 kg
Towing hitch:	None

Steering

Own make in cooperation with DANFOSS,
Type OSPB 100,
hydrostatic articulated steering,
connected with priority flowcontrol valve to the hydraulic system of power lift;
2 double-acting WEBER cylinders with 55 mm bore and 111 mm stroke between front and rear parts of the tractor

Brakes

Parking brake:	Mechanically acting on the drums of the service brake, operated by pedal with ratchet
Service brake:	Own make in cooperation with KNOTT mechanically acting internal-expanding-shoe brake with 150 mm dia, on each differential half shaft of the rear axle, pedal operated

Wheels

Driving wheels:	At front and at rear 4 pneumatics 10,5/80-18 Impl. 6 ply, diagonal type tyre casing; maximum permissible load per tyre 1430 kg at 2,25 bar inflation pressure and 30 km/h; track widths 814,830,924,940,1014 and 1030 mm, adjustable by turning wheels and fitting of intermediate rings to the wheel hubs; rims W 9 x 18

Wheel base	1450 mm
Cab	Own make, type 4134-5 OECD-tested safety cab, approval no. CSD 0278/1-a (C) antivibration mounts, front windshield tiltable, sliding rear windows, inside of cab covered with noise damping materials; doors on both sides of the cab; heat exchanger with blower in the roof of the cab, connected to the engine cooling system
Seat	BOSTROM XH2 and BRENDEL upholstered seat with back rest; adjustable spring with shock absorber; height of driver's platform above ground 500 mm; height of unloaded seat above platform adjustable to 6 positions between 445 and 505 mm; for and aft adjustable about 60 mm
Number of grease points	10
Track setting during test	Front and rear axle 924 mm

Dimensions

Total length:	3390 mm without ballast 4267 mm with ballast
Total width:	1193 mm with and without ballast
Total height:	2036 mm to top of cab
Ground clearance:	250 mm below clutch housing

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Lighting equipment — Electrical 12 Volt
as per German legislation

	Dimensions mm	Height above ground to centre mm	Distance from outside edge of tractor to centre mm
Head lights	140 x 75	1005	455
Side lights	70 x 20	1945	295
Rear lights	90 x 40	970	295
Reflectors	90 x 45	915	295

Permissible total weights and axle loads

for all available wheel equipment (authorized by the national administration)

Tyre dimensions at front and at rear	Permissible total weight kg	Permissible axle load at front and at rear kg
7,50-18 Impl.8 or 10 ply 10,5/80-18 Impl.6 or 8 ply 28 x 9,00-15 6 ply 400 - 15,5 6 ply 400/60-15,5 4 or 6 ply 7,50-20 6 or 8 ply 31 x 15,5-15 4 or 6 ply	2700	1500

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Weights — Ready for use, as tested

		without driver	with driver
Without ballast:	front	1140 kg	1150 kg
	rear	515 kg	600 kg
	total	1655 kg	1750 kg
Front ballast:	1 weight per wheel 50 kg each		100 kg
	1 concrete weight in front implement linkage		370 kg
Rear ballast:	1 concrete weight in rear implement linkage		565 kg
With ballast:	front	1575 kg	1585 kg
	rear	1115 kg	1200 kg
	total	2690 kg	2785 kg

FUELS AND LUBRICANTS USED IN TESTS

Fuel: ARAL Diesel-fuel DIN 51601

specific gravity at 15°C

at engine tests	0,828 kg/l
at p.t.o. tests	0,835 kg/l
at drawbar tests	0,835 kg/l

Engine: MOBIL engine oil DELVAC 1120 SAE 20W/20

Transmission, axles and final drives: MOBIL transmission oil SAE 80

Hydraulic system and steering: MOBIL engine oil DELVAC 1120 SAE 20W/20

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COMPULSORY TESTS

(1) MAIN POWER TAKE-OFF PERFORMANCE (540 rev/min)

Date of tests: 24th June 1980
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

Power kW	Speed engine rev/min	Speed p.t.o. rev/min	Fuel consumption total l/h	Fuel consumption total kg/h	Fuel consumption specific g/kWh	Specific energy kWh/l
Maximum power						
At 2-hour test						
32.6	2500	612	11.50	9.60	294	2.84
At standard p.t.o. speed						
30.2	2205	540	10.29	8.60	285	2.93
At the speed recommended for drawbar work						
32.6	2500	612	11.50	9.60	294	2.84
Part loads, the governor hand lever in the position corresponding to the maximum power at full load						
(i) 85% of the torque at maximum power at 2-hour test						
28.3	2555	626	9.12	7.61	269	3.10
(ii) unloaded						
-	2676	655	2.59	2.16	-	-
(iii) 50% of the load defined in (i)						
14.6	2632	645	5.55	4.64	318	2.63
(iv) maximum power						
32.6	2500	612	11.50	9.60	294	2.84
(v) 25% of the load defined in (i)						
7.4	2653	650	4.03	3.37	457	1.83
(vi) 75% of the load defined in (i)						
21.5	2595	635	7.16	5.98	277	3.01

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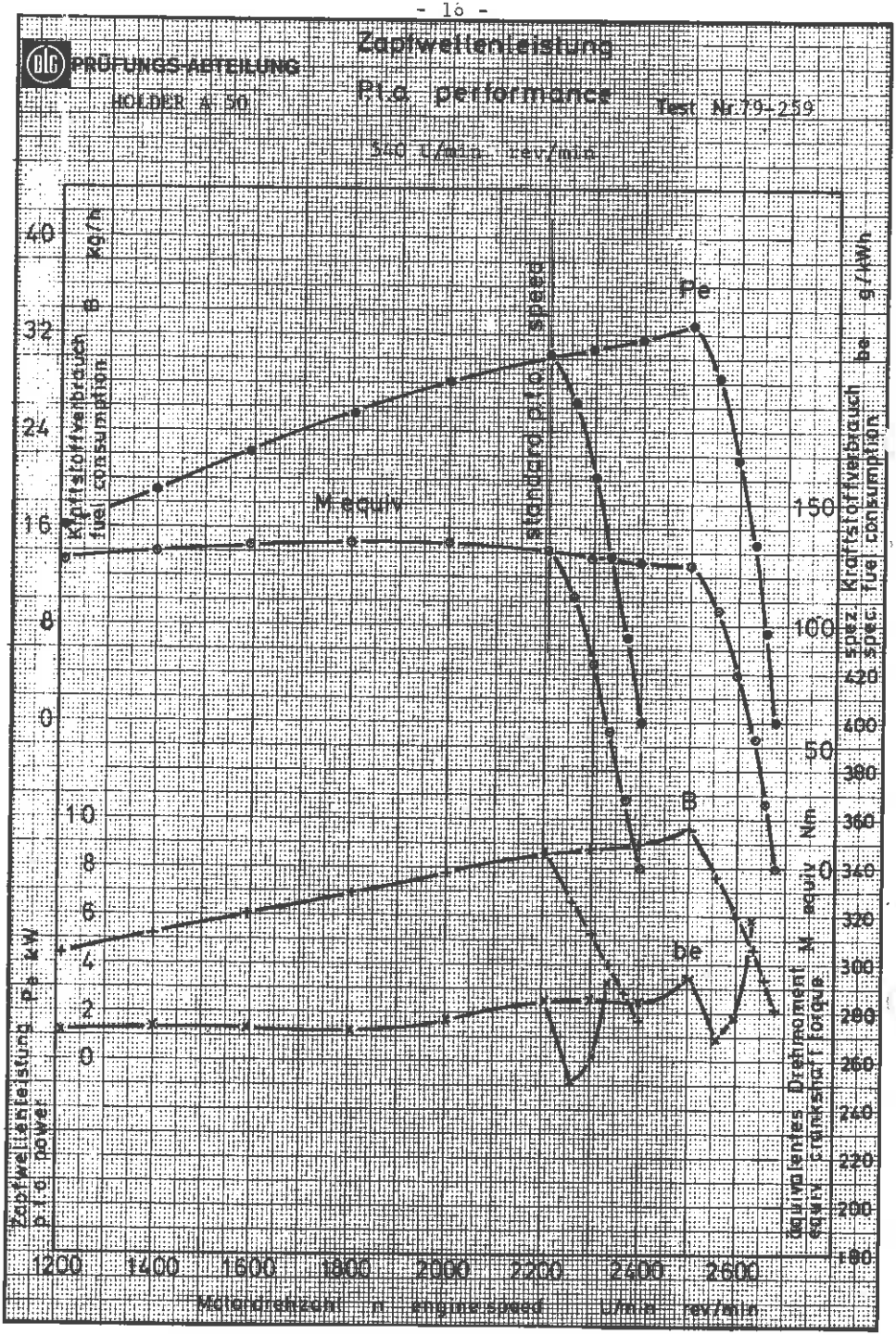
Test No. 79-259

Power kW	Speed engine rev/min	Speed p.t.o. rev/min	Fuel consumption total l/h	Fuel consumption total kg/h	Fuel consumption specific g/kWh	Specific energy kWh/l
Part loads, the governor hand lever in the position corresponding to the standard p.t.o. speed at full load						
(i) 85% of the torque at maximum power at standard p.t.o. speed						
26.3	2258	553	7.93	6.62	252	3.31
(ii) unloaded						
-	2397	587	2.04	1.70	-	-
(iii) 50% of the load defined in (i)						
13.6	2333	571	4.75	3.97	292	2.86
(iv) maximum power						
30.2	2205	540	10.29	8.60	285	2.93
(v) 25% of the load defined in (i)						
6.9	2367	580	3.37	2.81	409	2.04
(vi) 75% of the load defined in (i)						
20.1	2300	563	6.30	5.26	262	3.19

Standard specific fuel consumption (g/kWh): 269/318/252/292

No load maximum engine speed: 2676 rev/min
Equivalent crankshaft torque at maximum power (2 hours): 125 Nm
Maximum equivalent crankshaft torque: 134 Nm at 1804 rev/min of the engine

Mean atmospheric conditions:	temperature	20 °C
	pressure	1000 mbar
	relative humidity	55 %
Maximum temperatures:	coolant	80 °C
	engine oil	107 °C
	fuel	24 °C
	engine air intake	23 °C


Zapfwellenleistung
P.t.o. performance
Test Nr. 79-259
PRÜFUNGS-ABTEILUNG
HOLDER A 50
540 t/min rev/min
Kraftstoffverbrauch B kg/h
fuel consumption
Standard p.t.o. speed
Pe
M equiv
B
be
spez. Kraftstoffverbrauch be g/kWh
spec. fuel consumption
Zapfwellenleistung Pe kW
p.t.o. power
Äquivalentes Drehmoment M equiv Nm
equiv. crankshaft torque
Motordrehzahl n engine speed U/min rev/min

PRÜFUNGS-ABTEILUNG

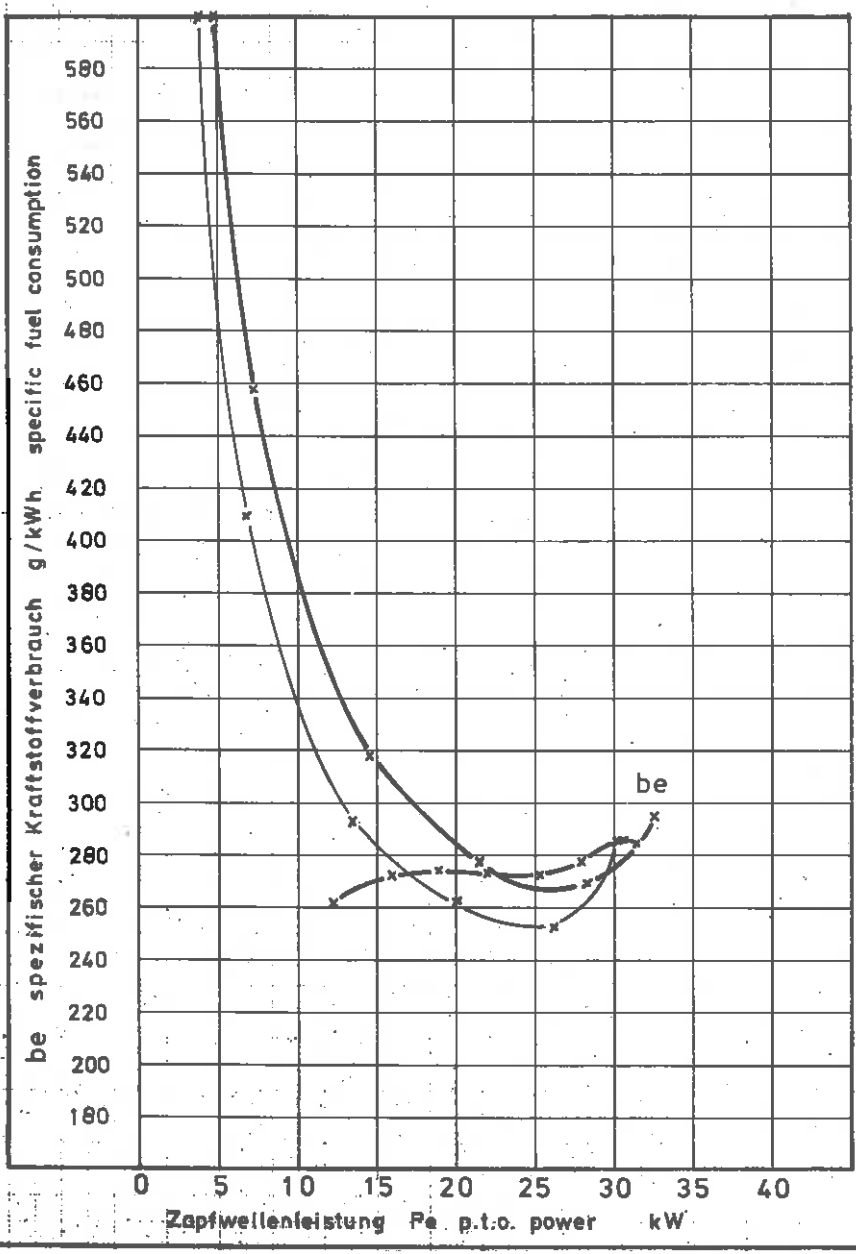
HOLDER A 50

Zapfwellenleistung

P.t.o. performance

Test Nr. 79-259

540 U/min rev/min



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(2) DRAWBAR PERFORMANCE

Date of tests: 1st till 13th August 1980
Type of track: Concrete

Gear No. and Group	Driving speed km/h	Power kW	Drawbar pull daN	Engine speed rev/min	Slip of wheels %
(i) MAXIMUM POWER with ballast height of drawbar above ground 380 mm					
1 L	1,35	10,3	2740	2635	15,1
2 L	2,39	18,3	2758	2585	15,0
3 L	4,05	25,4	2262	2498	10,9
1 S	4,89	26,8	1973	2497	8,9
4 L	6,57	27,6	1513	2497	6,3
2 S	9,33	27,4	1057	2501	4,3
3 S	15,83	25,7	584	2502	2,1
(ii) FIVE-HOUR-TEST at 75 % of pull at maximum power in 1st S gear					
1 S	5,20	21,4	1480	2580	6,2
(iii) FIVE-HOUR-TEST at pull corresponding to 15 % wheel slip in test (i)					
2 L	2,49	19,1	2758	2575	-
(iv) MAXIMUM POWER without ballast height of drawbar above ground 380 mm					
3 L	4,01	21,2	1899	2552	15,0
1 S	4,68	24,3	1870	2523	15,0
4 L	6,51	25,9	1431	2497	8,7
2 S	9,30	27,4	1060	2501	5,8
3 S	15,94	25,9	585	2504	3,2

Total oil consumption during ten hours duration of tests (ii) and (iii) 7 g/h

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Tyres size front and rear: 10,5/80-18 Impl. 6 ply

Tread bar height at the beginning of drawbar tests 88 % of the value when new at front, 86 % at rear

Specific energy kWh/l	Specific fuel consumpt. g/kWh	Temperatures Fuel °C	Coolant °C	Engine-oil °C	Atmospheric conditions Tempe-rature °C	Relative humidity %	Pressure mbar
) tyre inflation pressure 1,0 bar at front and at rear							
1,86	444	23	64	86	19	74	1001
2,29	361	23	65	89	20	76	1001
2,20	376	23	67	91	20	78	1001
2,32	357	23	66	89	23	72	1001
2,38	347	23	66	90	23	72	1001
2,36	350	23	66	88	23	70	1001
2,21	374	24	67	90	24	69	1001
2,54	326	23	72	94	21	74	997
-	-	25	75	98	24	69	990
tyre inflation pressure 1,0 bar at front and at rear							
2,43	341	23	66	90	18	87	1004
2,22	371	24	66	89	18	89	1004
2,22	372	25	63	81	23	78	1001
2,37	348	26	65	87	24	78	1001
2,23	368	27	64	85	26	72	1001

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

(3) TURNING SPACE AND TURNING CIRCLE

Wheel equipment at front and at rear: 10,5/80-18 Impl. 6 ply

Track of wheels at front and at rear: 924 mm

	Left-hand m	Right-hand m
Radius of turning space	2,95	2,95
Radius of turning circle	2,78	2,78

(4) LOCATION OF CENTRE OF GRAVITY

Height above ground	675 mm
Distance forward from rear axle centre	947 mm
Distance from tractor's median plane, to the left	1 mm

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(5) BRAKING PERFORMANCE

A) SERVICE BRAKE

Date of tests: 5th and 6th August 1980
Type of track: Concrete
Type of decelerometer: MOTO-METER-Bremsverzögerungs- und Pedalkraftschreiber

Weight of ballasted tractor with driver 2785 kg

Cold brakes

		With ballast	Without ballast
Travelling speed	km/h	25,0	25,0
Deceleration	m/s^2	4,3	6,7
Stopping distance	m	6,4	4,4
Force on pedal	daN	60	60
Force on pedal to achieve a deceleration of 2,5 m/s^2	daN	33	19

Brake fade characteristics (hot tests)

Deceleration	hot/cold	%	135	100
Stopping distance	cold/hot	%	119	100
Force on pedal	cold/hot	%	100	120

B) PARKING BRAKE

Tractor facing up, 16 % slope
Force on pedal 45 daN, tractor does not roll

Tractor facing down 16 % slope
Force on pedal 43 daN, tractor does not roll

(6) AMBIENT NOISE EMITTED BY THE TRACTOR

Date of test: 5th August 1980
Type of track: Concrete
Type of sound level meter: BRÜEL AND KJAER model 2209

Results of test

Gear: 4th S
Travelling speed before acceleration: 20,3 km/h
Sound level: 86 dB(A)

(7) NOISE AT THE DRIVER'S EAR LEVEL

Date of tests: 1st August 1980
Type of track: Concrete
Type of sound level meter: BRÜEL AND KJAER model 2209

The tractor was fitted with HOLDER safety cab

Results of tests

Gear	Drawbar pull at which the tractor develops the maximum sound level daN	Travelling speed nominal km/h	Travelling speed effective km/h	Sound level dB(A)
1 L	1832	1,51	1,02	90,5
2 L	1806	2,73	2,33	92
3 L	1783	4,55	3,46	93,5
1 S	1768	5,38	4,33	92,5
4 L*)	1465	7,04	6,49	93,5
2 S	1030	9,76	9,30	93
3 S	593	16,24	15,91	92,5
4 S	light load	25,13	27,0	90,5

*) The 4th L gear corresponds to the travelling speed nearest to 7,5 km/h

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(8) POWER LIFT AND HYDRAULIC PUMP PERFORMANCE

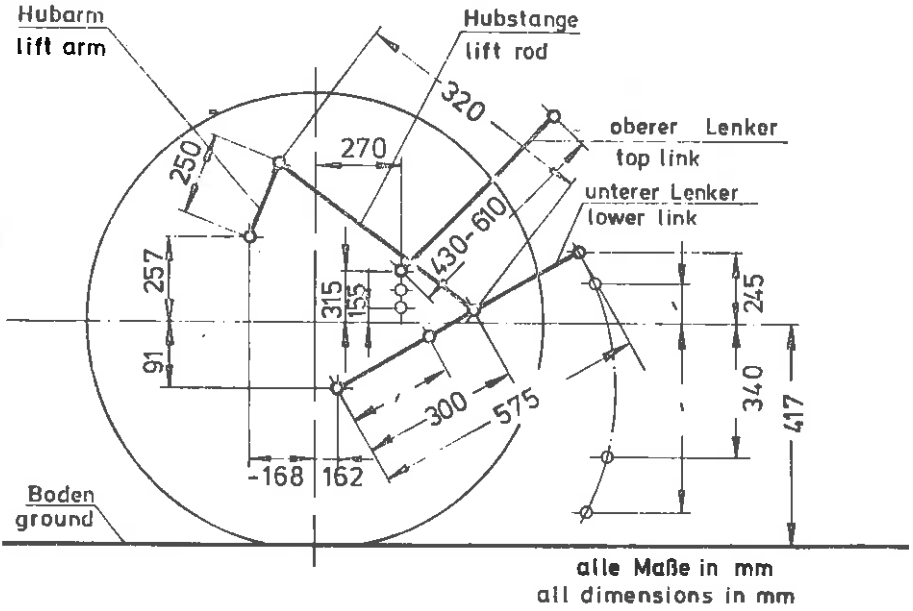
Date of tests: 25th August 1980

HYDRAULIC PUMP

(1)	Opening pressure of relief valve in remote circuit	180	bar
	Sustained pressure by open relief valve	199	bar
(2)	Pump delivery rate at minimum pressure and rated engine speed	23,9	l/min
(3)	Pump delivery rate at max. hydraulic power	24,6	l/min
	corresponding delivery pressure	180	bar
	power	7,4	kW

POWER LIFT

Dimensions of linkage geometry for the table on page 26



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LIFTING FORCES

Lifting heights relative to horizontal lower links

mm	-490	-400	-375	-340	-300	-200	-100	0
At hitch points								
daN				1910	1880	1830	1790	1730

Max. force exerted throughout the whole range 1570 daN

Front axle does not lift

At test frame maximum mechanical advantage

daN			1850		1680	1590	1500	1410
minimum mechanical advantage								
daN	1320	1220			1150	1120	1070	1020

Max. force exerted throughout the whole range 1000 daN

Front axle does not lift

+100	+200	+245	+300	+335	+400	+500	+515
1690	1620	1570					

high top link pivot point

1310	1200		1060	1000			

low top link pivot point

970	920		840		780	720	700

All values of forces for pressure 180 bar at max. hydraulic power, see page 23; calculated from measurements at max. oil pressure 199 bar

LINKAGE GEOMETRY when connected to the standard frame	Maximum mechanical advantage	Minimum mechanical advantage
Projected length in side view:		
Lower links	575 mm	575 mm
Lift arms	250 mm	250 mm
Lift rods	320 mm	320 mm
Top link	498 mm	537 mm
Distance of lift rod connection point from pivot point of lower link	300 mm	300 mm
The following dimensions are given relative to rear axle centre line 417 mm above ground		
Lower link pivot point	162 mm behind,, 91 mm below	162 mm behind, 91 mm below
Top link pivot point	270 mm behind, 315 mm above	270 mm behind, 155 mm above
Lift arm pivot point	168 mm behind, 257 mm above	168 mm behind, 257 mm above
Maximum and minimum height of lower link hitch points	245 mm above, 340 mm below	245 mm above, 340 mm below
Height of lower link hitch points above ground when locked in highest transport position	662 mm	662 mm

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HOLDER A 50 Test No. 79-259

OPTIONAL TESTS

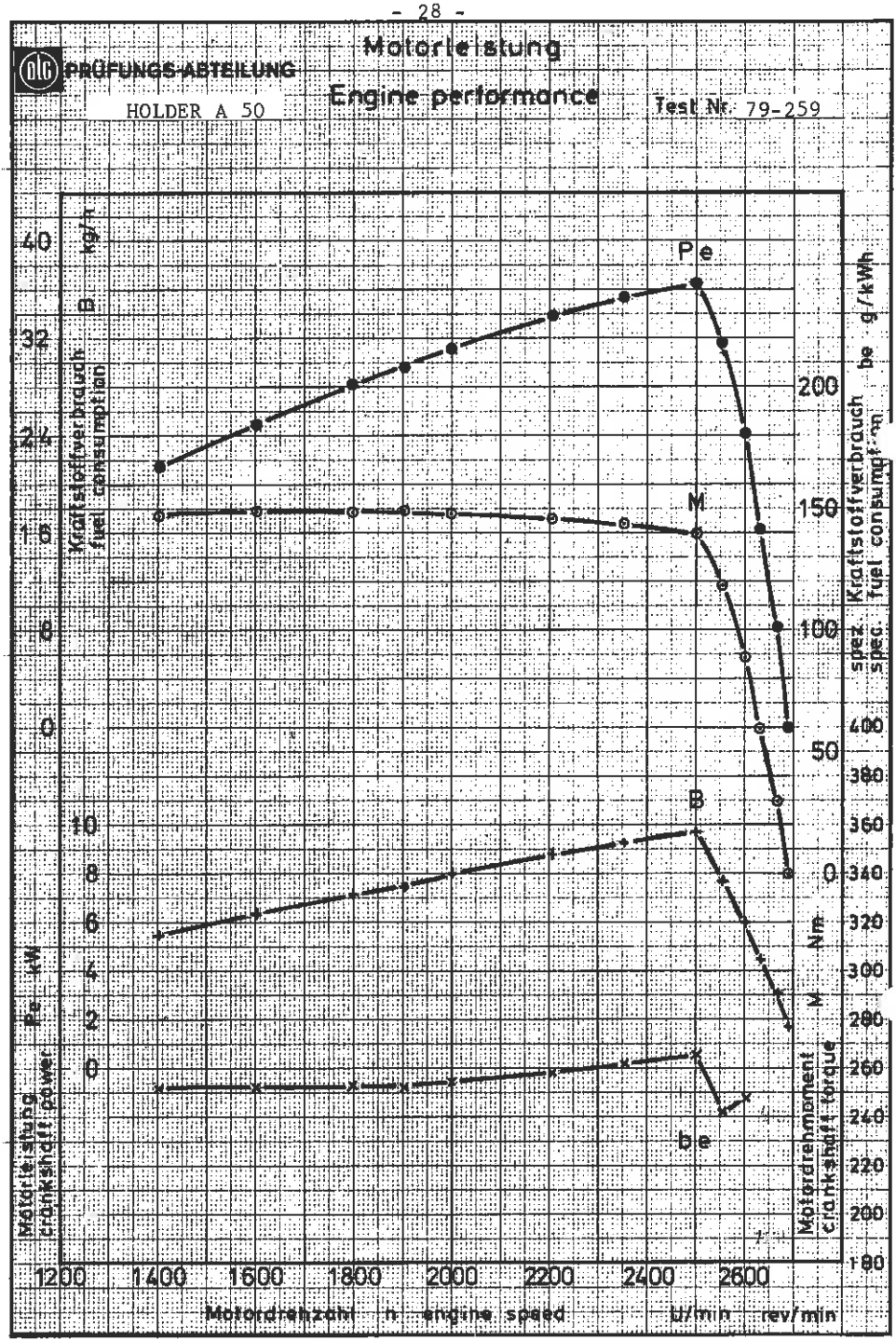
(9) ENGINE PERFORMANCE

Date of tests: 19th April 1979
Type of dynamometer: SCHENCK eddy-current dynamometer W 150

Power kW	Engine speed rev/min	Fuel consumption total l/h	Fuel consumption total kg/h	Fuel consumption specific g/kWh	Specific energy kWh/l
Maximum power					
At 2-hour test					
36.6	2500	11.72	9.70	265	3.12
At standard p.t.o. speed (540 rev/min)					
33.9	2205	10.55	8.73	258	3.21
At the speed recommended for drawbar work					
36.6	2500	11.72	9.70	265	3.12
Part loads					
(i) 85% of the torque at maximum power at 2-hour test					
31.7	2552	9.26	7.66	242	3.43
(ii) unloaded					
-	2687	2.09	1.73	-	-
(iii) 50% of the load defined in (i)					
16.4	2629	5.39	4.46	273	3.05
(iv) maximum power					
36.6	2500	11.72	9.70	265	3.12
(v) 25% of the load defined in (i)					
8.3	2664	3.72	3.08	372	2.23
(vi) 75% of the load defined in (i)					
24.2	2598	7.26	6.01	248	3.34

Optimum fuel consumption: 228 g/kWh at 21,1 kW and 1875 rev/min
No load maximum engine speed: 2687 rev/min
Torque at maximum power (2 hours): 140 Nm
Maximum torque: 150 Nm at 1797 rev/min of the engine

Mean atmospheric conditions:	temperature	22 °C
	pressure	1008 mbar
	relative humidity	40 %
Maximum temperatures:	coolant	71 °C
	engine oil	90 °C
	fuel	19 °C
	engine air intake	23 °C

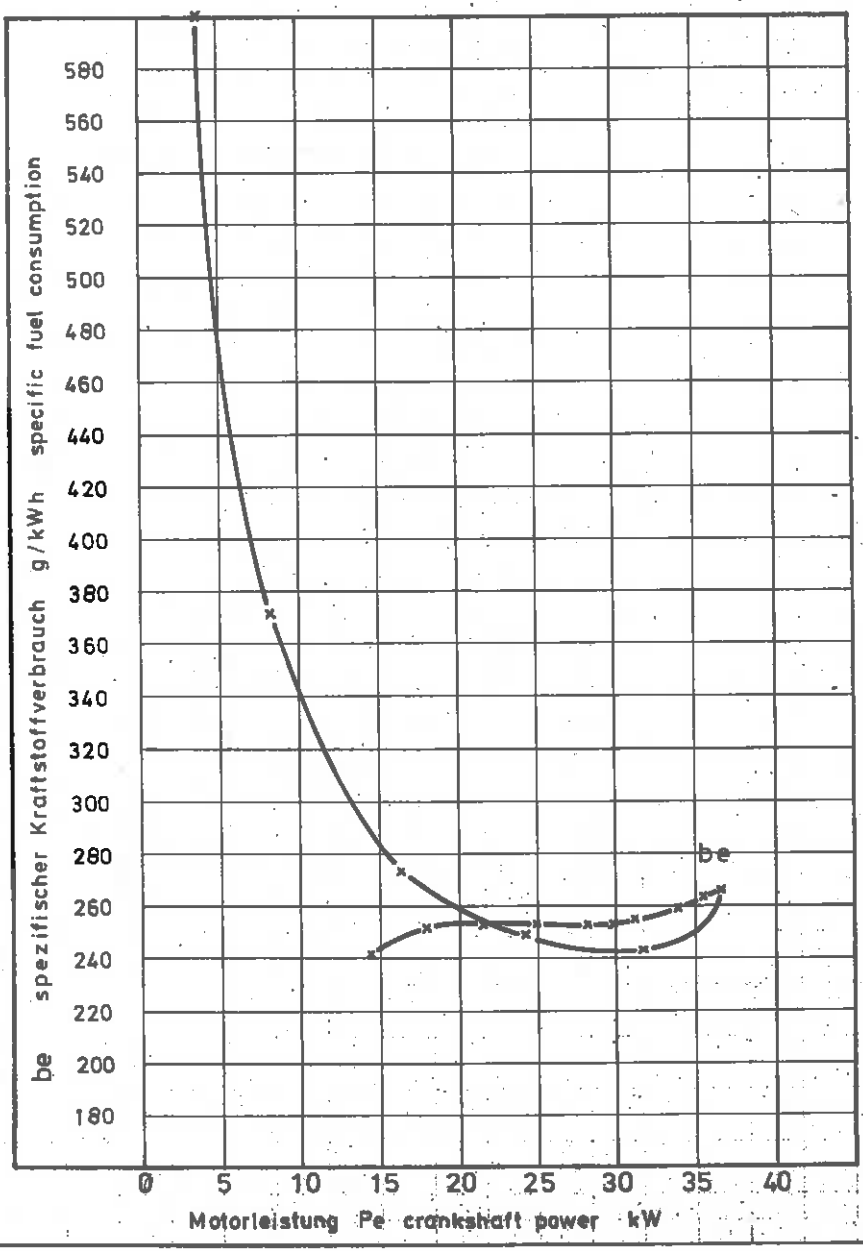

Motorleistung
Engine performance
PRÜFUNGS-ABTEILUNG
HOLDER A 50
Test Nr. 79-259
Pe
M
B
be
Kraftstoffverbrauch B kg/h
fuel consumption
Kraftstoffverbrauch be g/kWh
spez. fuel consumption spec.
Motorleistung Pe kW
crankshaft power
Motordrehmoment M Nm
crankshaft torque
Motordrehzahl n engine speed U/min rev/min
1200
1400
1600
1800
2000
2200
2400
2600

PRÜFUNGS-ABTEILUNG

HOLDER A 50

Motorleistung
Engine performance

Test Nr. 79-259



PRÜFUNGS-ABTEILUNG
HOLDER A 50
Motorleistung
Engine performance
Test Nr. 79-259
Motorleistung τr % der Leistung bei Nenndrehzahl
engine power τr % of power at rated engine speed
Belastung τr % des Drehmomentes bei Nenndrehzahl
load τr % of torque at rated engine speed
Motordrehzahl in % der Nenndrehzahl
engine speed in % of rated engine speed
g/kWh
228
245
250
275
300
350
450
%

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