GEPRÜFT

PROT. Nr.

O.E.C.D. Report No.: 847

BUNDESVERSUCHS - UND PRÜFUNGSANSTALT
für landwirtschaftliche Maschinen und Geräte,
Wieselburg

Dieseltractor URSUS Typ 1004



Date of approval 1982 11 04

Date of tests: 1980 10 09

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. Test Code

TABLE OF CONTENTS

	Page
SPECIFICATION OF TRACTOR	2
CONDITIONS DURING TEST	11
COMPULSORY TESTS	
Main power take-off performance - 1000 rev/min	13
Drawbar performance	17
Turing space and turning circle	19
Location of centre of gravity	19
Braking performance	19
Ambient noise	21
Noise at the driver's ear lever	21
Power lift and hydraulic pump performance	23
Linkage geometry	25
Performance of power lift	26

Tractor manufacturer:	Zrzeszenie Przemyslu Ciagnikowego URSUS ul. Traktorzystow 10, 02-495 Warszawa, Poland
Submitted for test by:	Przedsiebiorstwo Handlu Zagranicznego AGROMET-MOTOIMPORT, ul. Przemyslowa 26, 00-950 Warszawa, Poland
Selected by:	Manufacturer by agreement with BVPA-Wieselburg
Place of running in:	Z.P.C. URSUS, Warszawa, Poland
Duration of running in:	50 hours

SPECIFICATION OF TRACTOR

Tractor:

Make:	Zrzeszenie Przemyslu Ciagnikowego URSUS
Model:	1004
Type:	Wheel tractor, four wheel driven, unit construction
Serial No.:	00021

Engine:

Make:	TS Martin
Model:	Z 8002
Type:	4 stroke diesel engine with direct injection, exhaust supercharged
Serial No.:	00564
Cylinders:	4, vertical in line Bore/stroke: 110/120 mm Capacity: 4562 cm^3 Compression ratio: 17 Wet liners
Valves:	Overhead valves
Fuel system:	Capacity of fuel tank appr. 125 l Fuel feed by piston pump CD1M-2237 Fuel filter: Make: Zaklady Sprzetu Motoryzacyjnego, Poland Type: two step filter, felt and paper element Model: FD 1 ORP 2.4 Injection pump: Make: MOTORPAL Type: in line fuel injection pump Model: PP4M85K1d 2480 Manufacturers production setting: 85$^{+3}_{-3}$ mm^3/stroke at 2200 rev/min and full load

Fuel system: (cont.)	Injection timing: $24^{+2^{\circ}}_{-0}$ before TDC Injectors: Make: MOTORPAL Type: Injector with multi hole injector nozzle insert Model: Injector: VP81S453a-2567 Insert: DOP150S428-4357 Injection pressure: $15,7^{\pm 0,3}$ MPa ($157^{\pm 3}$ bar)
Governor:	MOTORPAL speed governor RV1M-225/1100-2518 Mechanically acting, incorporated in injection pump Range of speed: 450 to 2450 rev/min engine speed Rated speed: 2200 rev/min
Turbocharger:	Make: Holset Type: Holset 3 LD - 12/1,41 Pressure: up to 190 kPa (1,9 bar)
Air cleaner:	Two stage oil bath type filter Main cleaner: Oil bath type with cyclonic pre-cleaner and dust container, type: 9450 - 11 Oil quantity: appr. 1,5 l Oil changing interval: 100 hours
Exhaust silencer:	Own make Reflexion type, at left side of the engine, mouth upwards 2500 mm above ground, 380 mm left of median plane
Lubrication:	Forced lubrication with gear pump, strainer in sump, centrifugal oil filter RDP 3/A in full flow. Oil capacity: appr. 10 l Changing interval: 200 hours Cleaning interval of oil filter: 200 hours Recommended oil viscosity: Summer: SAE 20 W/40 CC, MIL-L-2104 B Winter: SAE 10 W/30 CC, MIL-L-2104 B
Cooling system:	Double circuit water cooling with centrifugal pump, pump and fan belt driven, 8 blade fan (dia: 460 mm) Tubular radiator Thermostat control and radiator shutter (driver operated by tow-line), cooling water thermometer Coolant capacity: appr. 21 l (23 l with cab heating) Overpressure: max. 52 kPa (0,52 bar) Joining for warm water heating
Starting system:	Electrically, solenoid engaged starter, model R 11 b, 12 V, 2,9 kW

Electrical system:	Voltage: 12 V, negative earth Generator: ZELMOT, three phase type 12 V, 35 A, 490 W Batteries: 2; lead acid type, 2 in series connection, 6 V each, with totally 190 Ah at 20 hours rating Model: 3 SE - 190

Transmission:

Clutches:	Main clutch: ZBROJOVKA BRNO Single plate dry clutch, 325 mm dia, pedal operated P.t.o. clutch: Own make Wet multiplate clutch, 185 mm dia, hydraulically engaged, hand lever operated Front wheel drive clutch: Own make Wet multiplate clutch, 114 mm dia, hydraulically engaged, hand switch operated
Gearbox:	Own make, mechanically acting Torque amplifier group, 4 speed change gear, group gear with 2 forward and 1 reverse group. Torque amplifier group, speed reduction 1,338, switched by hydraulically engaged brake band on a planetary gear. Totally: 16 forward and 8 reverse speeds
Rear axle and final drive:	Own make Central axle; pinion and bevel gear, lockable bevel gear differential, acting by planetary gears on rear wheels Differential lock: mechanically engaged, pedal operated, self disengaging
Front axle and final drive:	Own make Steering axle, unsymmetrically central axle Front wheel driving clutch, universal joint, propeller shaft, pinion and bevel gear, bevel gear differential, double joints, planetary final gears in wheel hubs. Front wheel drive: hydraulically engaged, hand switch operated.
Switching aid circuit:	Own oil circuit with gear pump, directly driven by engine, oil supply from gearbox. Aid for p.t.o. clutch, torque amplifier group and front wheel drive clutch. Working pressure: 1,2 MPa (12 bar) Filter: working oil filtered by metal-net-felt of power lift circuit.

Oil capacity: Common oil case for gearbox, rear axle differential, hydraulic power lift and switching aid circuit: appr. 45 l
Planetary reduction of rear axle final drive: 2 x 4,5 l
Front drive axle differential: 3,5 l
Planetary reduction of front axle final drive: 2 x 1,25 l
Changing interval for all oils: 1600 hours or two years
Recommended oil: SAE 80 EP, MIL-L-2105, API GL-4

Total ratios and speeds:

Group	Gear No.	Number of engine revolutions for one revolution of driving wheel	Nominal travelling speed for rated speed of engine km/h *)
without torque amplifier group	1 I H	260,40	2,45
	2 I H	165,21	3,87
	3 I H	103,98	6,14
	4 I H	73,03	8,74
	1 II H	89,26	7,15
	2 II H	56,63	11,28
	3 II H	35,65	17,91
	4 II H	25,04	25,50
with torque amplifier group	1 I M	348,35	1,83
	2 I M	221,05	2,89
	3 I M	139,10	4,59
	4 I M	97,18	6,57
	1 II M	119,42	5,35
	2 II M	75,76	8,43
	3 II M	47,57	13,42
	4 II M	33,49	19,07
without torque amplifier group reverse	1 H	190,43	3,35
	2 H	120,82	5,29
	3 H	76,04	8,40
	4 H	53,40	11,96
with torque amplifier group reverse	1 M	254,75	2,51
	2 M	161,63	3,95
	3 M	101,72	6,28
	4 M	71,45	8,94

*) Calculated with tyre index radius 770 mm

Power take off:

At rear of tractor, in median plane, 510 mm behind rear axle, 634 mm above ground (770 mm tyre index radius)
Dimensions:
540 rev/min: ISO R 500 Type I (35 mm, 6 splines)
1000 rev/min: ISO R 500 Type II (35 mm, 21 splines)

Proportional to engine speed (independent) p.t.o.:
Live p.t.o. driven by a mechanical control and a hydraulically engaged wet multiplate clutch, hand lever operated.
Diameter of the wet multiplate clutch: 185 mm
Method of changing p.t.o. speeds: One of the two p.t.o. shaft end-pieces is located in the rear of tractor, the other one is inserted in the clutch housing. If the two end-pieces are changed from rear of tractor to the clutch housing and contrary, the speed of the p.t.o. shaft is selected (automatically selection of spur gears by the p.t.o. shaft end-pieces in the clutch housing).
Speeds:
540/ 628 rev/min at 1890/2200 rev/min engine speed
1000/1012 rev/min at 2174/2200 rev/min engine speed
Engine speed resp. p.t.o. speed indication by needle instrument
Direction of rotation: clockwise (viewed from driving end)
Power restriction of p.t.o. 540 rev/min: 48 kW

Proportional to ground speed (dependent) p.t.o.:
Both end-pieces can be used, no effect to speed of rotation.
Switchable in all ratios and speeds by mechanical control and the hydraulically engaged wet multiplate clutch.
Travelling distance for one revolution of p.t.o. shaft: 0,177 m (calculated with index radius 770 mm)
Number of p.t.o. shaft revolutions for 1 revolution of rear wheels: 27,38
Direction of rotation: clockwise in forward gears, anti-clockwise in reverse gears (viewed from driving end)

Belt pulley:

Optional, not on tested tractor
Mountable on the 1000 rev/min p.t.o.
2200 rev/min engine speed .. 1550 rev/min of belt pulley
Diameter of the belt pulley: 200 mm or 250 mm
Speed of belt pulley directly depending from engine speed.

Power lift:

ARCHIMEDES WROCLAW, open center type
Hydraulically acting, with single acting working cylinder (bore/stroke: 95/165 mm) and one additional working cylinder (bore/stroke: 50/305 mm)
Draft-control, position-control, pressure-control and floating position; lower link sensing
Standard linkage for categorie II; clearance zone and hydraulic linkage in accordance with ISO 730 I
Two lift rod/lower link coupling points, two stage oil pump system consisting of gear pump and piston pump, both pumps working in the same hydraulic circuit.
Max. working pressure of gear pump:
$15,7^{+0,1}_{-0}$ MPa (157^{+1}_{-0} bar)
Max. working pressure of piston pump:
$18,6^{+0,1}_{-0}$ MPa (186^{+1}_{-0} bar)
Gear pump directly driven by engine, incorporated in clutch housing, switchable out of gear by a hand lever
Piston pump directly driven by engine
ARCHIMEDES WROCLAW control unit
Filter: One metal-net-filter in the suction pipe of the gear pump
Cleaning interval: 100 hours
Oil capacity: common oil case with gearbox; appr. 45 l
Recommended oil: SAE 80 EP, MIL-L-2105, API GL-4
Oil tappings: 2 with ARCHIMEDES WROCLAW control unit for two single acting cylinders or one double acting cylinder.

Optional (on tested tractor):
Up to 2 double acting oil circuits or 4 single acting tappings. Two tappings directly from hydraulic lift (connected with the hydraulic lift cylinder).
Max. oil requirement: 12 - 15 l

Holed drawbar:

Fitted in the clevis of the lower links of the three point linkage, category II, length 920 mm

Dimensions of the holed drawbar		Category II
Number of holes		7
Hole diameter	mm	32
Distance between holes	mm	80 symmetrically
Thickness	mm	appr. 107
Width	mm	90

Height above ground*)

Lift rod/lower link coupling point giving	Min. lift rod length	Max. lift rod length
Max. mech. advantage	from 265 mm to 925 mm	from 50 mm to 760 mm
Min. mech. advantage	from 195 mm to 950 mm	from -30 mm to 765 mm

*) Calculated with index radius of rear wheels 770 mm

Method of changing the high about ground: by power lift, lift rod and lower links
Distance of rear axle: 1040 mm(lower links horizontally)
Distance relative to p. t. o. : 330 mm behind

Pull attachement:

Trailer hitch:
Own make
Fork type, only for four wheel trailers without a vertical load on the pull attachement
Height above ground: 685/735/785/835 mm (tyre index radius 770 mm)
Distance from rear axle: 810 mm
Position relative to p. t. o. : above 51 - 201 mm behind 300 mm
Diameter of coupling pin: 30 mm

Swinging drawbar:
Height above ground: 462 mm (tyre index radius 770 mm)
Distance from rear axle: (2 positions) rearwards 920/865 mm
Lateral adjustment: (5 positions) sym. 0/80/160 mm
By changing the pivot point in the drawbar: totally 10 positions
Position relative to p. t. o. : 410/355 mm
Diameter of coupling pin: 30 mm
Distance of pivot point from rear axle: forward 305 mm
Max. vertical load: 5900 N

Towing hitch:
Fork type
Height above ground: 785 mm
Distance from front axle: forwards 655 mm
Diameter of coupling pin: 30 mm

Single axle trailer hitch:
Diameter of hooks: 34 mm
Position relative to rear axle: behind 670 mm
Height above ground: 415 mm
Position relative to p. t. o. : rearwards
Max. vertical load: 20 600 N

Steering:

PILMET WROCLAW
Circular ball gear steering, hydraulic power assisted
Own oil circuit with paper filter in the oil case, gear pump (incorporated in clutch housing), directly driven by engine.
Changing interval of oil and filter: 800 hours
Capacity of oil case: appr. 7 l

Recommended oil: hydraulic oil, viscosity SAE 10 W
Poland, PN-71/C-96057
or corresponding to VDMA 24318 type: HL 36 or HLP 36

Pump delivery rate: 20 l/min (at rated engine speed)
Working pressure: 7,85 MPa (78,5 bar)
Operated by steering wheel, acting on front wheels

Brakes:

Own make

Service brake: Hydraulically activated dry disc brake with 4 friction-faces (dia 227 mm), acting on rear wheels, pedal operated

Parking brake: Mechanically acting, same discs as service brake, operated by hand lever with ratchet

Steering assistance brake: Operated by divided pedal of service brake

Trailer braking system: Pressure air system, V-belt driven air compressor on left side of the engine, switchable out of gear by hand lever.
Storage pressure: $0,58^{+0,02}_{-0}$ MPa ($5,8^{+0,2}_{-0}$ bar)
Working pressure: $0,58^{+0,02}_{-0}$ MPa ($5,8^{+0,2}_{-0}$ bar)
Storage capacity: 20 l
Activated by service brake or praking brake

Wheels:

Front wheels: 2 pneumatics, steering and driving function, radial carcass
12,4/11 - 24 (R), 6 PR, rim: W 9 x 24
Maximum permissible load on each tyre:
11 380 N at 1,57 bar inflation pressure
(17 660 N at 2,06 bar inflation pressure
for front-implement working, with speed limit of 8 km/h)
Track width: 1630 mm

Rear wheels: 2 pneumatics, driving function, radial carcass
18,4/15 - 34 (R), 8 PR; rim: W 15 L x 34
Maximum permissible load on each tyre:
25 165 N at 1,4 bar inflation pressure
21 760 N at 1,1 bar inflation pressure
Track width: 1500 mm (1725 mm by reversing wheels)

Wheel base: 2385 mm

Lighting: Unrestricted beam angle of head light in plan view: 92 mrad (5,27°)

	*) Height above ground of centre mm	Dimension mm	Distance from outside edge of tractor to centre mm
Head lights	1160	dia 125	860
Side lights	1735	60 x 60	245
Rear lights	1400	100 x 100	275
Reflectors	970	dia 75	190
Back light right side	1550	dia 140	-
Brake lights	1390	100 x 100	372
Direction indicator: in the front in the rear	1750 1390	60 x 75 90 x 95	225 180

*) Measured with tyre index radius at rear 770 mm and 540 mm at front
Overall width of tractor 2080 mm (measured on front wheels).

Number of grease points: 27

Driver seat:
Own make
Model 83.342.000
Seat pan guided backside with 2 rolls in a vertical column and mounted on a swinging bar on the bottom side forward.
Suspension with a helical compression spring in the column.
Drivers weight adjustable with a hand-wheel
Hydraulically damping
Horizontal adjustment range: 150 mm
Vertical adjustment range: 3 steps, total 60 mm

Safety cab:
AGROMET, FMR-Kunow
Model 88.361.000
Rubber block mounted, with seat for driver and passenger, with roof, windscreen, front glasses, rubber floor, doors, side and rear glasses, air ventilation and warm water heating. Roof and rear glass can be turned up.
Strength tested according to OECD-Code (identical to Austrian national legislation)
OECD-Nr.: CSD 0534/2 - a (C)

CONDITIONS DURING TEST

Tractormass:

Tractor without driver but with tanks full and safety cab

	Front	Rear	Total
Without ballast	1776 kg	2720 kg	4496 kg
With ballast	2441 kg	3630 kg	6071 kg

Ballastmass:

	Number and position of weights	Total mass (excluding water)	Water
Front	5 inside of the front-facing	134 kg	210 kg
	7 below the front-facing	160 kg	
	4 in front	88 kg	
Rear	2 x 5 full pieces in the wheel hubs	343 kg	640 kg
Additional	-	-	-

Track setting and tyre equipment:

1630 mm at front
1500 mm at rear
Front wheels: 12,4/11 - 24 6 PR (R)
Rear wheels: 18,4/15 - 34, 8 PR (R)

Overall dimensions:

	Length	Width *)	Height
	mm	mm	mm
With ballast	4155	2080	2500
Without ballast	4140	2080	2500

*) Measured on the front axle (on the outside of the tyres)

Minimum ground clearance: 390 mm under front axle
390 mm under hitch mounting plate
350 mm under hitch hook
310 mm under front wheel drive clutch housing

with index radius 770 mm at the rear and 540 mm at the front tyres.

Fuel and lubricants used in test:

Fuel: ELAN Diesel fuel
(according to DIN 51601 and ÖNORM C 1104)
Specific gravity at 15°C: 0,828 kg/l
Viscosity at 20°C: 3 mm^2/s (3 cSt)
Cetan no.: 48 (ÖNORM C 1104)

Engine oil: Superol CC SAE 20 W/40
Viscosity at 100°C: 14,5 mm^2/s (14,5 cSt)

Transmission and hydraulic oil: Hipol 6 SAE 80 EP
Viscosity at 50°C: 48 mm^2/s (48 cSt)

Steering oil: Hydraulic oil
Viscosity SAE 10 W
Poland, PN-71/C - 96057
or
corresponding to VDMA 24318 type HL 36 or HLP 36

COMPULSORY TESTS

1. Main power take-off performance

Date and location of tests: 1980 10 09, Wieselburg, Austria
Type of dynamometer: SCHENK-eddy-current brake W 780

Main test on: ISO R 500, Type 2 (DIN 9611) - 1000 rev/min

Power	Speed		Fuel consumption		
	engine	p.t.o.	hourly	specific	specific
kW	rev/min	rev/min	kg/h l/h	g/kWh	kWh/l
MAXIMUM POWER					
Maximum power - 2 hours test					
67,00	2200	1012	18,21 22,02	272	3,043
Standard p.t.o. speed					
66,70	2174	1000	18,08 21,86	271	3,051
The speed recommended by the manufacturer for drawbar work					
67,00	2200	1012	18,21 22,02	272	3,043
PART LOADS Governor hand lever in position giving maximum power					
(i) 85 % of torque at maximum power.					
58,33	2252	1036	16,65 20,13	285,5	2,898
(ii) unloaded					
0	2413	1110	5,75 6,95	-	-
(iii) 50 % of the load defined in (i)					
30,23	2331	1072	11,16 13,49	369	2,240
(iv) maximum power					
67,00	2200	1012	18,21 22,02	272	3,043
(v) 25 % of the load defined in (i)					
15,38	2372	1091	8,35 10,10	543,5	1,522
(vi) 75 % of the load defined in (i)					
44,48	2291	1054	13,82 16,71	310,5	2,662

PART LOADS

Governor hand lever in position giving standard p. t. o. speed at full load

Because the little difference (26 r. p. m.) between the engine speed at standard p. t. o. speed and the engine speed at maximum power there was not to find a certain governor characteristic at part load.

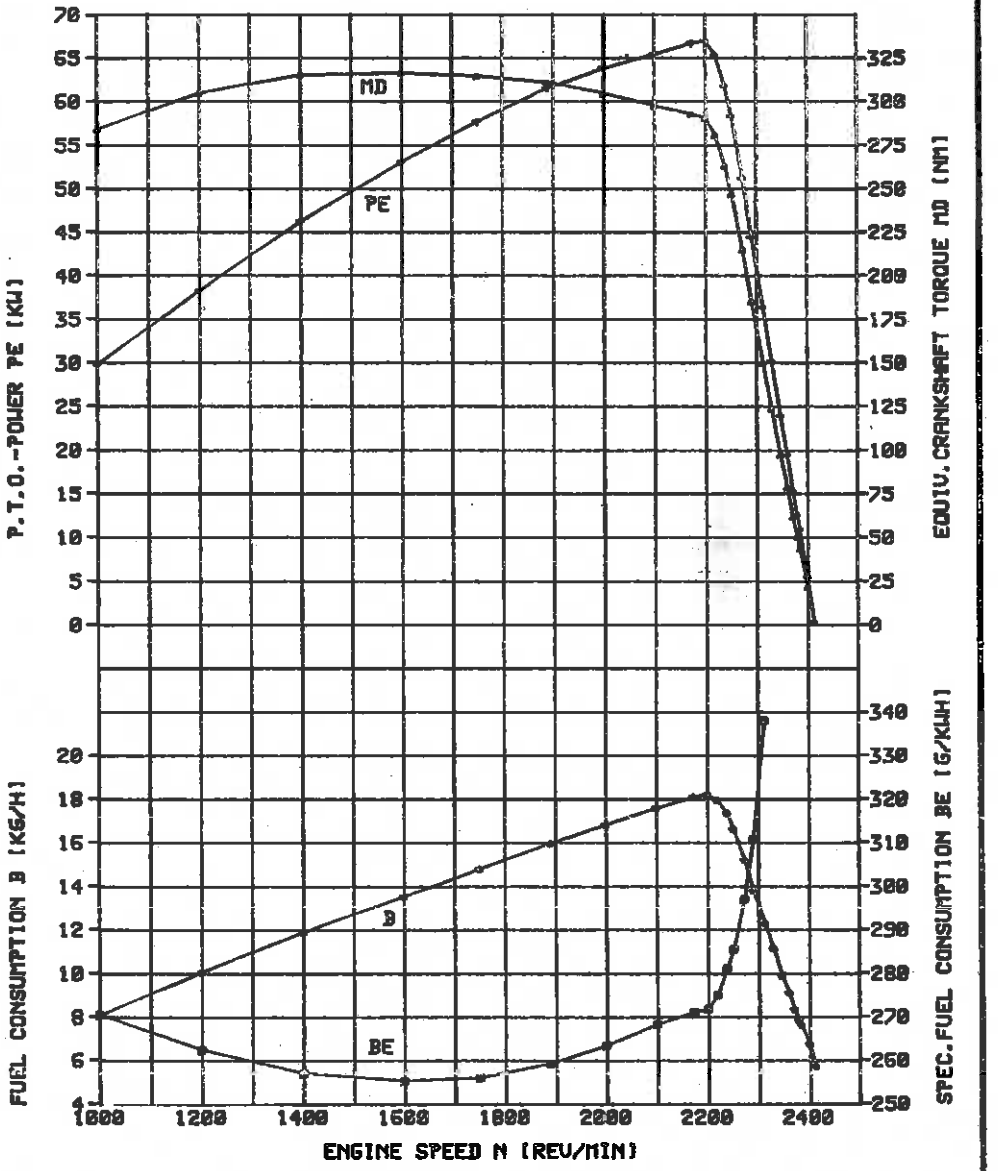
The governor oscillates from part load to full load. The values of the table "PART LOADS - governor hand lever in position giving maximum power" are nearly identically.

STANDARD SPECIFIC FUEL CONSUMPTION: 285, 5/369 g/kWh

No load maximum engine speed: 2413 rev/min
Equivalent crankshaft torque
at maximum power: 290, 8 Nm
Maximum equivalent crankshaft torque: 316, 7 Nm at 1600 rev/min engine speed

Mean atmospheric conditions:	temperature:	15°C
	pressure:	974 mbar
	humidity:	69 %
Maximum temperatures:	coolant:	84°C
	engine oil:	99°C
	fuel:	56°C
	air intake:	17°C

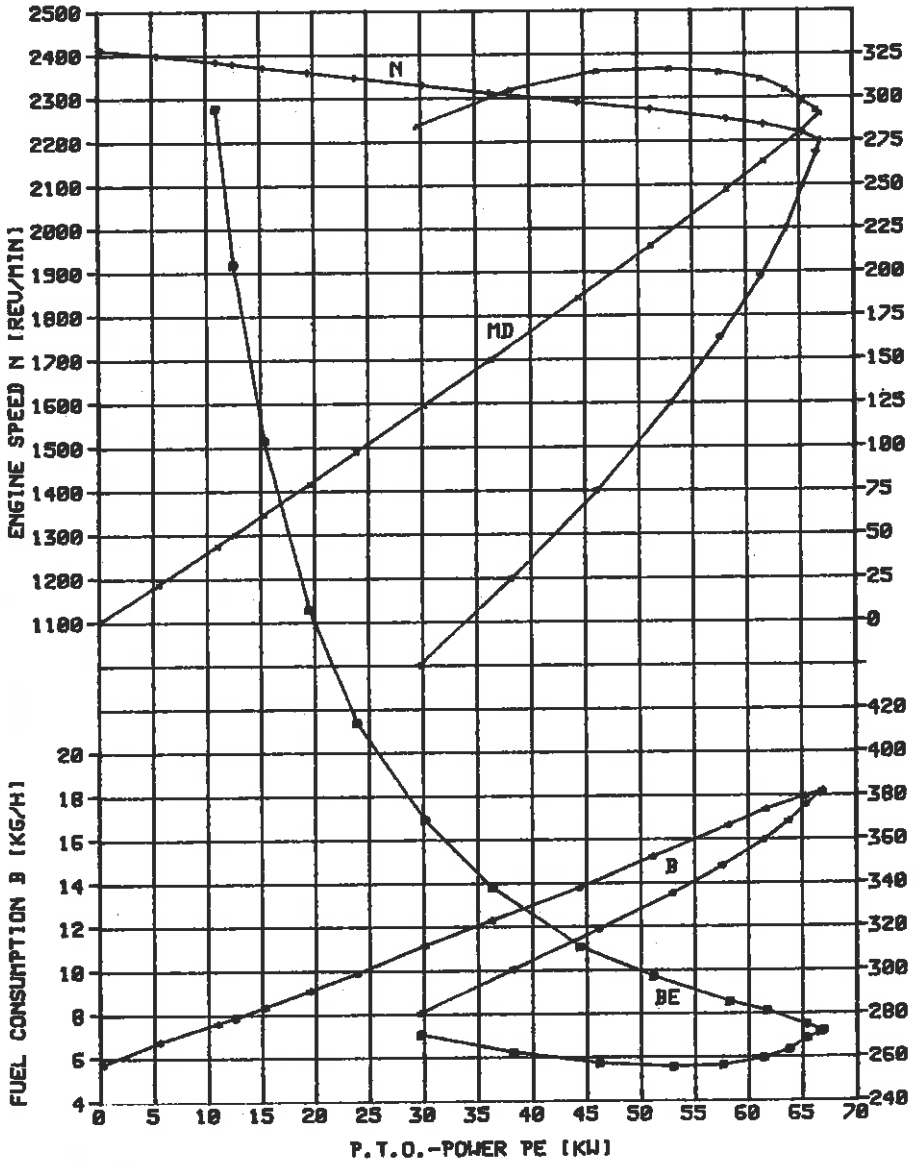
BUNDESVERSUCHS-U.PRUEFUNGSANST. FUER LANDW.MASCHINEN U.GERAETE WIESELBURG/ERLAUF, AUSTRIA PROT.NR.: 065/82	P.T.O.-TEST	URSUS TYP 1004 MOT.TYP Z 8002



ENGINE SER.NR.: 8002-00364	ATM. PRESSURE : 974 MBAR	FUEL TEMP.: 36 C	SIGNATURE
TRAKTOR SER.NR.: 00021	AIR TEMPER. : 17 C	D.OF TESTS: 1980-10-09	
FUEL : D.928/28 C	COOLANT TEMP.: 84 C	TEST NO. : 139/ZA 126	
ENGINE OIL : SUPEROL CC SAE30	OIL TEMP. : 96 C	CURVES NO.: 1	REITHER

DOK.:BIBB845-DL003:PRUB82:PRU82-22

BUNDESVERSUCHS-U. PRUEFUNGSANST. FUER LANDW. MASCHINEN U. GERAETE WIESELBURG/ERLAUF, AUSTRIA PROT.NR.: 085/82	P.T.O.-TEST	URSUS TYP 1004 MOT.TYP Z 8002



ENGINE SER.NR.: 8002-80564	ATM. PRESSURE : 974 MBAR	FUEL TEMP.: 36 C	SIGNATURE
TRAKTOR SER.NR.: 80021	AIR TEMPER. : 17 C	D.OF TESTS: 1988-10-09	
FUEL : 0.828/20 C	COOLANT TEMP.: 84 C	TEST NO. : 130/2A 126	
ENGINE OIL : SUPEROL CC SAE30	OIL TEMP. : 96 C	CURVES NO.: 2	REITHER

DOK.:8108845-DL883;MKU852;MKU20-22

2. Drawbar performance

Date of tests: 1980 10 22 – 1981 04 01
Type of track: Concrete
Height of drawbar above ground: 400 mm ballasted and unballasted

Gear No.	Speed	Power	Drawbar pull	Engine speed	Slip of wheels	Fuel consumption		Temperatures			Atmosph. conditions		
						specific	specific	Fuel	Coo-lant	Engine Oil	Tempe-rature	rel.hu-midity	Pres-sure
	km/h	kW	N	rev/min	%	kWh/l	g/kWh	°C	°C	°C	°C	%	mbar
(1) Maximum power (ballasted) tyre inflation pressure in the front and in the rear 1,4 bar													
1 I M	1,597	25,74	58003	2286	15	–	–	59	74	94	22	62	978
1 I H	2,108	33,96	58004	2255	15	–	–	59	74	94	22	62	978
2 I M	2,447	39,43	58008	2222	15	1,815	455,5	60	76	95	23	62	978
2 I H	3,365	49,35	52802	2200	11,9	2,240	369	59	76	95	22	62	978
3 I M	4,143	52,60	45710	2200	8,7	2,388	346	58	76	94	22	62	978
1 II M	4,914	54,80	40151	2200	7	2,488	332,5	56	76	93	22	62	978
3 I H	5,723	56,25	35389	2200	5,7	2,554	324	55	75	92	22	62	978
4 I M	6,152	56,81	33241	2200	5,2	2,579	320,5	54	76	92	22	62	978
1 II H	6,737	57,35	30647	2200	4,7	2,604	317,5	54	76	92	22	62	978
2 II M	8,012	57,71	25930	2200	3,8	2,620	315,5	54	76	92	22	62	978
4 I H	8,329	57,70	24937	2200	3,6	2,619	315,5	55	75	92	22	62	978
2 II H	10,864	57,25	18970	2200	2,5	2,599	318	55	74	92	22	62	978
3 II M	12,986	56,41	15640	2200	2,1	2,561	323	56	75	91	22	62	978
3 II H	17,435	54,72	11300	2200	1,5	2,484	333	56	74	90	22	62	978

Gear No.	Speed	Power	Drawbar pull	Engine speed	Slip of wheels	Fuel consumption		Temperatures			Atmosph. conditions		
						specific	specific	Fuel	Coo-lant	Engine Oil	Tempe-rature	rel.hu-midity	Pres-sure
	km/h	kW	N	rev/min	%	kWh/l	g/kWh	°C	°C	°C	°C	%	mbar
(ii) Five-hour-test at 75 % of pull at maximum power													
2 II M	8, 430	45, 54	19448	2274	2, 7	2, 453	337	49	72	89	19	67	986
(iii) Five-hour-test at pull corresponding to 15 % wheelslip in test (i)													
2 I M	2, 463	39, 68	58000	2225	15	1, 826	453	52	84	110	15	74	986
(iv) Maximum power (unballasted) tyre inflation pressure in the front and in the rear 1, 1 bar													
2 I M	2, 502	31, 27	45003	2261	15	1, 623	509, 5	51	82	108	16	82	988
2 I H	3, 310	41, 38	45000	2237	15	1, 978	418	52	83	108	15	83	988
3 I M	4, 041	45, 45	40490	2200	11, 2	2, 063	401	49	82	106	15	84	988
1 II M	4, 797	48, 60	36470	2200	9, 5	2, 206	375	51	83	108	15	84	988
3 I H	5, 594	51, 00	32820	2200	8, 1	2, 315	357	50	83	107	16	85	988
4 I M	6, 025	52, 00	31074	2200	7, 5	2, 361	350	50	82	106	15	86	988
1 II H	6, 609	53, 09	28920	2200	6, 8	2, 410	343	49	83	107	15	88	988
2 II M	7, 879	54, 70	24994	2200	5, 7	2, 483	333	48	82	106	15	86	988
4 I H	8, 199	55, 00	24152	2200	5, 4	2, 497	331	48	82	104	15	86	988
2 II H	10, 728	56, 10	18825	2200	4	2, 547	324, 5	48	82	100	15	87	988
3 II M	12, 880	56, 25	15722	2200	3, 2	2, 554	324	46	80	96	15	86	988
3 II H	17, 365	55, 69	11545	2200	2, 2	2, 528	327	45	78	94	15	85	988

Total oil consumption during 10 hours duration of tests (ii) and (iii): 86, 3 g/h

3. Turning space and turning circle

Wheel equipment front: BARUM 12,4/11 - 24 (R), 6 PR, rim: W 9 x 24
rear: BARUM 18,4/15 - 34 (R), 8 PR, rim: W 15 L x 34

Track of wheels front: 1630 mm
rear: 1500 mm

Results *)	With brakes		Without brakes	
	right-hand	left-hand	right-hand	left-hand
	m	m	m	m
Radius of turning space	4,45 *) 4,60	4,68 *) 4,93	6,20 *) 6,50	5,30 *) 5,70
Radius of turning circle	4,25 *) 4,40	4,48 *) 4,74	6,00 *) 6,30	5,10 *) 5,50

*) four wheel-drive switched off

4. Location of centre of gravity

	mm
Height above ground	1006
Distance forward from the vertical plane containing the axis of the rear wheels	937
Distance from the median plane, left-hand	1

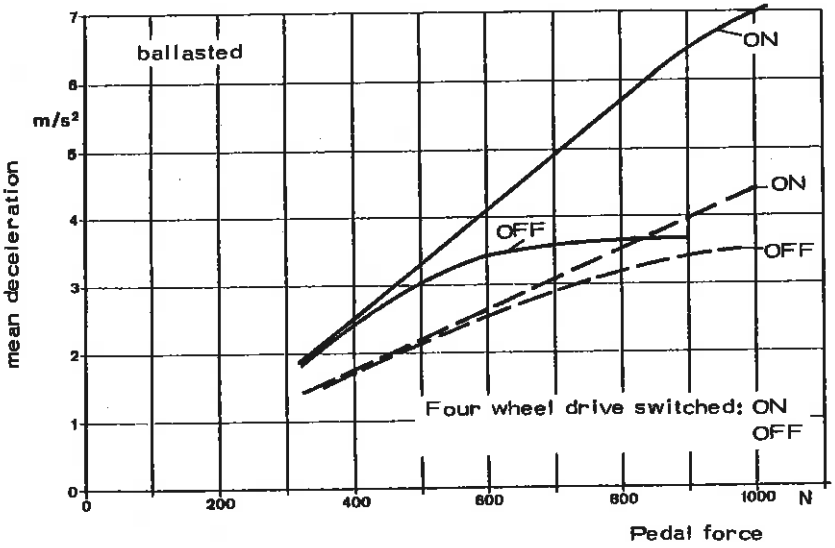
5. Braking

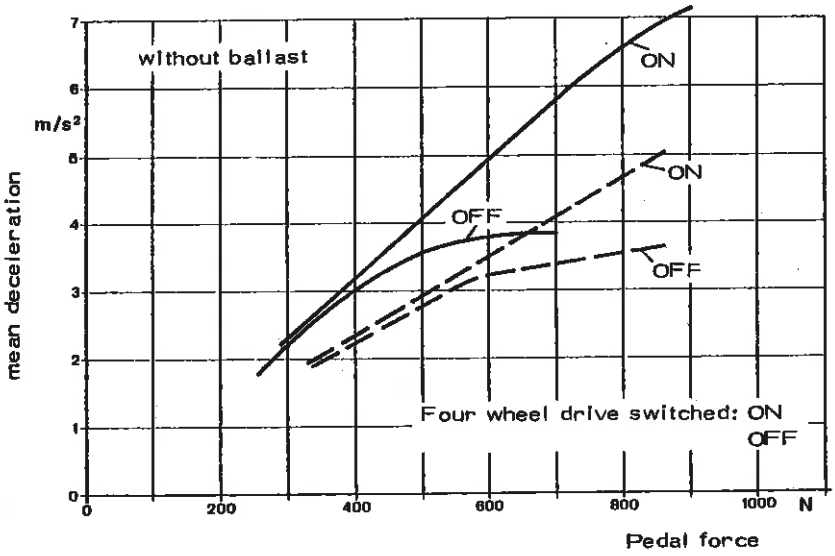
Date of tests: 10.10.1980
Type of track: Concrete
Type of decelerometer: Moto-Meter Nr. 03382 (Kombi-Schreiber)
Tractor masses during brake tests (with driver):

	Front kg	Rear kg	Total kg
Ballasted	2465	3680	6146
Unballasted	1796	2775	4571

Service brake

Four wheel drive switched on and off
Type-0-test (cold brakes) ———— , Type-I (fade) test — — —





Speed before application of brakes: 25 km/h
The tractor brakes were heated by towing of the tractor for 1 km

Parking braking device test

	18 % slope		12 % slope with trailer of 3000 kg	
	up	down	up	down
Braking device control force	210 N	200 N	160 N	150 N

6. Measurement of ambient noise level

Date of tests: 1980 11 24
Type of sound level meter: 2203 BRÜEL & KJAER
Type of track: Concrete

Results of tests:
Gear: Without torque amplifier group 4 II (high 4 II)
Travelling speed before acceleration: 19,8 km/h
Sound level: 92,5 dB(A)

7. Noise measurement at the driver's ear

Date of tests: 1980 11 24
Type of sound level meter: 2203 BRÜEL & KJAER
Type of track: Concrete
Cab fitted and completly closed

Results of tests:

Gear	Drawbar pull at which the tractor develops the max. sound level	Measured travelling speed	Sound level
	kN	km/h	dB(A)
1 I L	42,57	1,53	91
1 I S	43,01	2,05	91
2 I L	43,60	2,03	91
2 I S	35,06	3,57	91
3 I L	20,92	4,04	91
1 II L	12,46	4,71	91
3 I S	30,99	5,77	91
4 I L	29,53	6,18	91
1 II S	19,49	6,98	91
1 II S*)	light load 2,82	7,70	91
2 II L	17,05	9,34	91,5
4 I S	22,11	8,42	91,5
2 II S	17,47	11,00	92
3 II L	12,71	13,19	92
3 II S	7,65	18,17	93,5
4 II L	6,57	19,03	94,5
4 II S	3,00	26,50	95,5

*) The 1 II S gear corresponds to the nominal travelling speed nearest to 7,5 km/h.

8. Power lift and hydraulic pump performance

Date and location of tests: 1980 11 05, Wieselburg, Austria
Hydraulic fluid:
Make and type: Poland, HIPOL 6, SAE 80 EP
Viscosity at 50°C: 48 mm^2/s (48 cSt)
Type of linkage lock for transport: hydraulically, with system-selection lever on position control and lever for inner circuit in vertical position.

Hydraulic pump performance:

(i) Sustained pressure of the relief valve: 185 bar
Opening pressure of the relief valve: from 180 bar to 185 bar

(ii) Pump delivery rate at minimum pressure and rated engine speed:
Gear pump: 35 l/min
Piston pump: 4 l/min

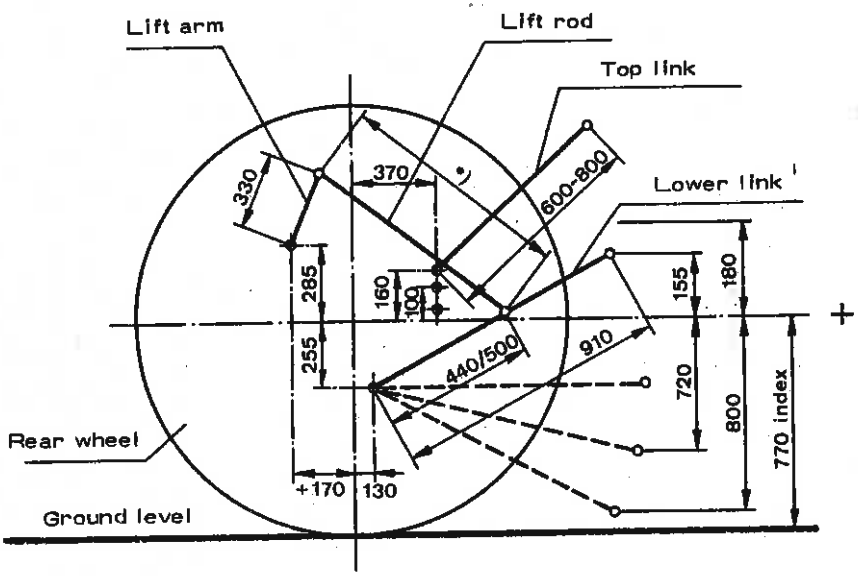
(iii) Gear pump
Pump delivery rate: 32 l/min
Delivery pressure: 157 bar
Hydraulic power: 8,37 kW

Piston pump
Pump delivery rate: 4 l/min
Delivery pressure: 185 bar

Calculated pressure for hydraulic power lift: 16,65 MPa (166,5 bar) (90 % of sustained pressure).

Max. hydraulic power:
Pressure: 90 % of 157 bar = 141,3 bar
Power of gear pump: 7,54 kW
Power of piston pump: 0,94 kW
} 8,48 kW

Max. hydraulic power about a oil pressure of 141,3 bar:
Piston pump
Pump delivery rate: 4 l/min
Delivery pressure: 90 % of 185 bar = 166,5 bar
Power: 1,11 kW



*) Lenght adjustable: left lift rod: from 550 to 700 mm with thread
right lift rod: from 550 to 650 mm with gear and thread
Adjustment during test: 590 mm

	**) Height of lower hitch point above ground in down position mm	**) Vertical movement mm	**) Max. force exerted through full range kN	Corresponding pressure of hydraulic fluid MPa	Moment about rear axle kNm	Max. tilt angle of mast over range of lift degrees
At hitch points	180/105	690/770	38,4/33,8	16,65	39,9/35,1	
On the frame	180/105	690/770	33,1/30,4	16,65	54,6/50,2	8° from -2° to 0° and from 0° to -8°

**) Max. mech. advantage/min. mech. advantage

Linkage geometry when connected to the standard frame

		Maximum mechanical advantage	Minimum mechanical advantage
Projected length in side view			
Lower links	mm	910	910
Lift arms	mm	330	330
Lift rods	mm	590	590
Top link	mm	655	655
Distance of lift rod connection point from pivot point of lower link	mm	500	440
The following dimensions are given relative to the rear wheel centre line, situated 770 mm*) above the ground level			
Lower link pivot point	mm	130 behind 255 below	130 behind 255 below
Top link pivot point	mm	370 behind 160 above	370 behind 160 above
Lift arm pivot point	mm	170 behind 285 above	170 behind 285 above
Maximum und minimum height of lower link hitch points	mm	100 above 590 below	105 above 665 below
Height of lower link hitch points locked in transport position	mm	from 100 above to 590 below	from 105 above to 665 below

*) index radius

Performance of power lift

Lifting heights in relation to a horizontal line through the lower link pivoting point mm		-385	-325	-300	-260	-200	-150	-75	0	+75	+150	+225	+275	+320	+340
Lifting force at the hitch-points kN (Values for the pressure, calculated with 90 % of sustained oil pressure)	max. mech. advantage			38,4	39,6	40,4	40,8	41,1	41,2	41,3	41,3	41,4	41,5	41,6	
	min. mech. advantage	33,8	34,6	34,9	35,3	35,8	36,1	36,6	36,8	37	37	37,3	37,7	38,4	
	Maximum force exerted through whole range: 38,4/33,8 kN (3915/3445 kp)														
	Calculated oil pressure: 16,65 MPa (166,5 bar)														
Lifting force at the standard frame 460 mm mast height, 610 mm behind lower links hitch-point kN (Values for the pressure, calculated with 90 % of sustained oil pressure)	max. mech. advantage				46,8	44,4	42,8	40,8	39,6	38,4	36,9	35,3	34	33,2	33,1
	min. mech. advantage		47,6	45,1	42	39,4	38	36,5	35,2	34	32,9	31,8	31	30,5	30,4
	Maximum force exerted through whole range: 33,1/30,4 kN (3375/3100 kp)														
	Calculated oil pressure: 16,65 MPa (166,5 bar)														