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TEST REPORT: O.E.C.D. No. 1108

REPORT ON TEST IN ACCORDANCE WITH THE O.E.C.D. STANDARD CODE FOR THE OFFICIAL TESTING OF AGRICULTURAL TRACTORS



URSUS 1012 Tractor with Rear-wheel Drive
Manufacturer: Zrzeszenie Przemyslu Ciagnikowego "URSUS"
Warszaw, Poland

Date of Approval: 8th December 1987

This Bulletin is based on engineering tests in accordance with O.E.C.D. Standard Code for Official Testing of Agricultural Tractors.
It does not contain an evaluation of the performance of the tractor on practical farm work.

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.

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Tractor manufacturer's name and address:	Zrzeszenie Przemysłu Ciągnikowego "URSUS", Warszawa, Poland.
Submitted for test by:	Biuro Handlu Zagranicznego "URSUS", Warszawa, Poland.
Selected for test by:	Manufacturer in agreement with Testing Station.
Place of running-in:	Zakłady Mechaniczne "URSUS", Warszawa.
Duration of running-in:	Approx. 50 hours.

I. SPECIFICATIONS OF TRACTOR

TRACTOR

Make	URSUS
Model:	1012
Type:	Rear-wheel-driven unit construction
Serial No.:	00004
First serial No.:	00001

ENGINE

Make:	ZTS. Martin
Model:	Z-8002.1.
Type:	Turbocharged, water cooled, 4-stroke, direct injection diesel engine
Serial No.:	00037
Cylinders	
Number/disposition:	4/vertical in line
Bore/stroke:	110/120 mm
Capacity:	4562 cm^3
Compression ratio:	17:1
Arrangement of valves:	Overhead
Cylinder liners:	Replaceable, wet

Supercharging

Make:	ZCM
Model:	K 27-2960 U/6.11
Type	Exhaust type
Supercharging pressure:	0.90 MPa

Fuel System

Fuel feed system	Piston pump.
Make, type and model of fuel filter(s):	Two step filter, felt and paper element, FD 10 RP 1-3.
Capacity of fuel tank:	130 dm^3
Make, type and model of injection pump:	Motorpal in-line, PAL PP 4 M 9 K 1e - 3119.
Serial No	014
Manufacturer's production setting of injection pump:	80 mm^3/stroke at 1100 rev/min and full load.
Injection pump timing:	22 + 2^o before T.D.C.
Make, model of injectors	PAL, multihole VP 81 S 453 e 2575
Injection pressure:	16.8 + 0.8 MPa.

Governor

Make:	Motorpal
Model:	RV3M 300/1100
Type:	Mechanical
Governed range of engine speed:	600-2450 rev/min

Rated Engine Speed 2200 rev/min

Air Cleaner

Pre-cleaner	
Make:	Hodrusba-Hamre
Model:	PC 500
Type:	Cyclonic with dust container.
Location of air intake:	Under bonnet, forward of radiator

Main	
Make:	Hodrusba-Hamre
Model:	9450.11
Type:	Two stage oil bath
Oil capacity:	2.25 l
Maintenance indicator:	None

Lubrication System

Type of feed pump:	Gear pump
Type of filter(s):	Centrifugal
Number:	1
Filter change period:	200 hours

Cooling System

Type of coolant:	Water or antifreeze
Type of pump:	Centrifugal belt driven
Specification of fan:	
Number of fan blades:	4
Fan diameter:	460 mm
Coolant capacity:	21 dm^3
Type of temperature control:	Thermostat and thermometer
Superpressure system:	0,52 kPa

Starting System:

Make:	ZELMOT
Model:	R 11 b/12V
Type:	Electrically solenoid engaged.
Starter motor power rating:	2.9 kW
Cold starting aid:	None
Safety device:	Gear selector to be in neutral

Electrical System

Voltage:	12 V
Generator:	Alternator
Make:	ZELMOT
Model:	A 12 M/12V
Power:	42 A
Battery (Number of accumulators):	2
Rating:	190 ah at 20 hours

Exhaust System

Make:	Ursus
Model:	Oval
Type:	Baffle
Location:	Left hand side, vertical
Height of outlet above ground:	2640 mm

TRANSMISSION TO WHEELS

Clutch

Make:	ZTS MARTIN
Type:	Dry, travel alone
Number of plates:	1
Diameter of plates:	350 mm
Method of operation	Mechanical by pedal

Gear Box

Make:	Povazske Strojarne
Type:	Mechanical
Arrangement:	4 forward x 2 ranges x torque multiplyer 4 reverse x torque muliplyer
Number of gears:	16 forward, 8 reverse
Available options:	Creep gear

Rear Axle and Final Drives:

Make:	ZPC "URSUS"
Type:	OERLIKON With planetary wheel reduction gears.

Differential lock:

Type:	Clow clutch, mechanical
Method of engagement:	Manual by pedal
Method of disengagement	Self disengaging

Front Axle:

Make:	Own make
Type:	Telescopic

Total Ratios and Travelling Speeds

Gear	Number of engine rev. for one rev. of the driving wheel.	x) Nominal travelling speed for 2200 rpm. rated engine speed. km/h
Reduction Gear Engaged		
Forward		
L 1	348.35	1.89
O 2	221.05	2.98
L 3	139.10	4.74
L 4	97.92	6.73
H 1	119.42	5.52
H 2	75.76	8.70
H 3	47.68	13.83
H 4	33.50	19.69
Reverse 1	254.75	2.59
- 2	161.64	4.08
- 3	101.72	6.48
- 4	71.45	9.23
Reduction Gear Disengaged		
Forward		
L 1	260.40	2.53
L 2	165.22	3.99
L 3	103.98	6.34
L 4	73.03	9.03
H 1	89.26	7.39
H 2	56.63	11.64
H 3	35.65	18.49
H 4	25.04	26.34
Reverse 1	190.43	3.46
- 2	120.83	5.46
- 3	76.04	8.67
- 4	53.40	12.35

x) Calculated with a tyre dynamic radius index of 795 mm.

POWER TAKE OFF

Main Power Take Off:

Type:	Independent hydraulically operated. Wet multi-disc clutch
Method on engagement:	By hand lever
Number of shafts:	1
Method of changing power take-off shaft ends and speeds	Manually by exchanging shafts

Power Take-off Proportional to Engine Speed.

540 Rev/min

Location:	At rear of tractor
Diameter of power take-off shaft end:	34.9 mm
Number of splines In conformity with ISO 500, 1979:	6
Height above ground:	644 mm
Distance from the median plane of the tractor:	0 mm
Distance behind rear wheel axle:	510 mm
PTO speed at rated engine speed (2200 rev/min):	629 rev/min
Engine speed at standard power take-off speed:	1890 rev/min
Engine to pto ratio:	3.50:1
Power restriction and maximum torque:	48 kW, 850 N.m.
Direction of rotation (Viewed facing driving end):	Clockwise

1000 Rev/min

Location:	At rear of tractor
Diameter of power take-off shaft end:	34.9 mm
Number of splines in conformity with ISO 500, 1979:	21

Height above ground:	644 mm
Distance from the median plane of the tractor:	0 mm
Distance behind rear wheel axle:	510 mm
PTO speed at rated engine speed (2200 rev/min):	1146 rev/min
Engine speed at standard power take-off speed:	1920 rev/min
Engine to pto ratio:	1.92:1
Direction of rotation (Viewed facing driving end):	Clockwise

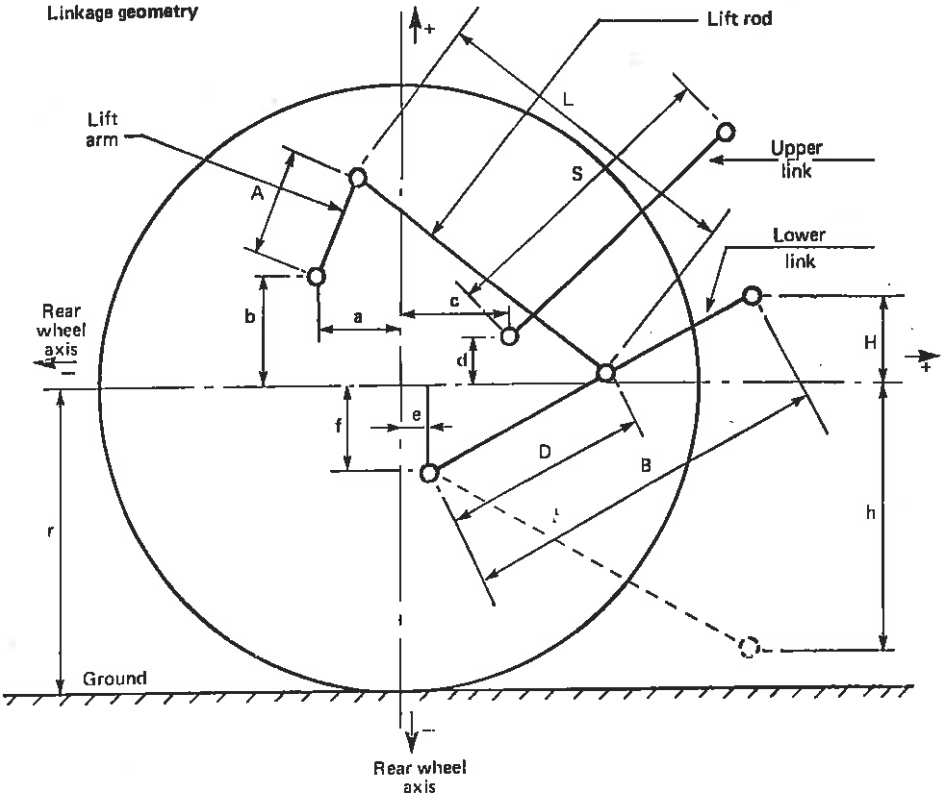
Power Take-off Proportional to Ground Speed Optional

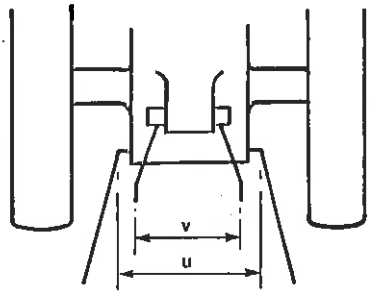
POWER LIFT:

Make:	Archimedes, Wroclaw
Type of hydraulic system:	Open centre
Type and number of cylinders:	One internal and one external single acting.
Type of linkage lock for transport:	Hydraulic
Relief valve pressure setting:	16.0 MPa
Opening pressure of cylinder safety valve:	18.63 + 0.98 MPa
Lift pump type:	Gear pump and additional piston pump.
Transmission between pump and engine:	Gear driven.
Type and number of filters:	ZPZ 2
Site of oil reservoir:	Main transmission housing
Type and number of tapping points:	1 double and 1 single acting
Maximum volume of oil available to external cylinders	15 dm^3

THREE-POINT LINKAGE

Category:	II in conformity with ISO 730/1
Controls:	Draft, position and pressure control and floating position. Lower links sensing


Linkage geometry
Lift rod
Lift arm
Upper link
Lower link
Rear wheel axis
Ground
Rear wheel axis
L
S
A
b
a
c
d
e
f
D
B
H
h
r


v
u

Dimensions of Linkage Geometry (When Connected to the Standard Frame) mm

			Dimension or range	Settings used in test
Rear tyres (size 16.9-38) dynamic index radius		(r)	795	
Front tyres (size 7.5-20) dynamic index radius		(r′)	425	
Lenght of lift arms		(A)	330	
Length of lower links		(B)	925	
Distance of lift arm pivot point from rear wheel centre line	Horizontally	(a)	175 behind	
	Vertically	(b)	290 above	
Horizontal distance between the 2 lower link points		(u)	530	
Horizontal distance between the 2 lift arm end points		(v)	550	
Length of upper link		(S)	from 610 to 865	637
Distance of upper link point from rear wheel centre line	Horizontally	(c)	382	
	Vertically	(d)	205, 155, 95	205
Distance of lower link from rear wheel centre line	Horizontally	(e)	120	
	Vertically	(f)	255	
Distance of lower link pivot points to lift rod pivot points on lower links		(D)	435 500	
Length of lift rods		(L)	from 520 to 715	615

Length of lift rods,	L	520	715	520	715	TEST 615
Linkage distance of lift rods	D	435		500		
Lowest position	h	490	860	420	845	595
Highest position	H	250	-135	225	-105	85

Height above ground of lower hitch points when locked in transport position	Any height within lift range

FIXED DRAWBAR

Type:	Clevis type
Height above ground:	375 mm
Type of adjustment:	Length
Distance of hitch point from rear wheel axis horizontally:	860 - 910 mm
Distance of hitch point from power take-off shaft end	
vertically:	270 mm
horizontally:	350 - 400 mm
Diameter drawbar pin hole:	33 mm

TRAILER HITCH

Type:	Hook
Hook diameter:	47 mm
Height above ground:	445 mm
Distance of hitch point from rear wheel axis Horizontally:	690 mm
Distance of hitch point from power take-off shaft end	
Vertically:	225 mm
Horizontally:	180 mm
Maximum vertical permissible load:	21 kN

HOLED DRAWBAR

Number of holes:	9
Distance between holes:	80 mm
Hole diameter:	33 mm
Thickness/width of the drawbar:	20 + 55/100
Height above ground	
minimum:	0 mm
maximum:	1010 mm
Horizontal distance to power take-off shaft end (rear)	540 mm

STEERING

Make:	Agromet-Pilmet.
Method of operation:	Circular ball gear steering, hydraulically assisted.
Working pressure:	8 + 0,8 MPa

BRAKES

Service Brake

Make:	CSRS
Type:	Dry disc, multiplate, 2 per side
Method of operation:	Hydraulic by pedals coupled or independent
Trailer braking take-off:	Air brake

Parking Brake

Type:	Mechanical
Method of operation:	Hand lever with rachet operating mechanical linkage on service brakes

WHEELS

Number:	Front:	2 steering
	Rear:	2 driving
Wheelbase:		2385 mm

Track width adjustment method

	Min	Max	Adjustment method
Front	1350	1800	Telescopic front axle
Rear	1500	1875	By changing wheels and rim lugs

PROTECTIVE STRUCTURE

Make:	FMR KUNOW
Model:	80.361.000 OR 88.361.000
Manufacturer's name and address:	AGROMET - FMR KUNOW, POLAND
Protective device:	Safety cab
Tilting/not tilting:	Not tilting

DRIVER'S SEAT

Make:	CSRS
Model:	59115400
Type of suspension:	Helical compression spring in the column
Type of damping:	Hydrauically
Range of adjustment:	
longitudinal:	150 mm
vertical:	60 mm

MISCELLANEOUS

Additional seat:	1
Location:	Behind the driver
Number of places:	1

LIGHTING

The lighting is in accordance with the national Danish regulations for road traffic.

	Height above ground of centre mm	Size mm	Distance from outside edge of tractor to median plan mm
Headlights	1110	125 dia	800
Sidelights	1830	65 x 65	180
Rearlights	1620	90 x 90	280
Reflectors	1285	75 dia	135

CONDITIONS DURING TEST

Overall Dimensions

Tyre size front: 7.50-20
rear: 16.9-38

	Length	Width		Height at top of, exhaust silencer	Height at top of, protective structure
	mm	min. mm	max. mm	mm	mm
Without ballast	4160	1970	2400	2640	2695
With ballast	4165	1970	2400	2638	2693

Ground Clearance (unballasted)

Clearance: 345 mm limited by fixed drawbar

Track Setting

Front: 1580 mm
Rear: 1510 mm

Tractor Mass and Ballasting

Tractor mass
(Without driver, but with tanks full - with cab)

Without ballast:

front	1455 kg
rear	2570 kg
total	4025 kg

Front ballast:

7 weights	158 kg
4 add. weights	90 kg

Rear ballast:

5 weights per wheel incl. mountings, total	330 kg
Water in tyres	756 kg

With ballast

front	1732 kg
rear	3627 kg
total	5359 kg

Tyres, Axle Loads and Track Specifications

	Front wheels	Rear wheels
Tyres:		
Dimensions	7.5-20	16.9-38
Ply rating	6	8
Type	radial	radial
Maximum load (tyre manufacturer's) (kN)	8.58	24.72
Maximum load (tractor manufacturer's) (kN)	8.58	24.72
Inflation pressure tyre manufacturer's (kPa)	280	170
Dynamic radius index (mm)	425	795
Chosen track width (mm):	1580	1510

Oils and Lubrication

Capacity and Change Interval

	Capacity (dm^3)	Oil change (h)	Filter change (h)
Engine	10	200	not exchangeable[x])
Gear box and rear axle	47	1600	800
Final drive (rear)	9.0	1600	-
Hydraulic system	in common with gearbox		
Other steering	5.5	800	800

[x]) Cleaning period 400 h

Specifications

	Recommended	Used during test
Engine oil		
Type:	SAE 20W/40	SAE 20W/40
Viscosity:	14.5 c st	14.5 c st
Classification (API, MIL-L, ISO):	API CC-SF	API CC-SF
Transmission oils		
Type:	SAE 80 EP	Hipol 6 SAE 80 EP
Viscosity:	48 c st	48 c st
Classification:	API GL5	API GL5
Hydraulic fluid		
Type:	Same as transmission oils	
Viscosity:	- - -	-
Classification:	- - -	-
Steering oil		
Type:	Same as transmission oils	
Viscosity:	- - -	-
Classification:	- - -	-
Grease	LT 43	Esso MP Grease
Number of lubrication points:	11	

Fuel

Type	
In conformity with national standard:	Esso Diesel Fuel
Density at 15°C:	0.846 g/cm^3

TEST RESULTS

COMPULSORY TEST RESULTS

1. MAIN POWER TAKE-OFF

Date and location of tests: 1985.08.12, Bygholm, Horsens

Type of dynamometer: Schenck

Power	Speed		Fuel consumption		Specific Energy
	Engine	P.T.O	Hourly	Specific	
kW	rev/min		l/h	g/kWh	kWh/l
1.2 MAXIMUM POWER - 2 - hour test					
68.1	2177	1134	21.1	262	3.23
1.4 POWER AT RATED ENGINE SPEED					
65.0	2200	1146	20.2	263	3.22
1.4 STANDARD POWER TAKE-OFF SPEED (1000 ± 25)					
61.8	1920	1000	18.8	257	3.29
PART LOADS					
1.4.1 the torque corresponding to maximum power					
68.1	2177	1134	21.1	262	3.23
1.4.2 85% of torque obtained in 1.4.1					
59.3	2230	1161	18.9	270	3.14
1.4.3 75% of torque defined in 1.4.2					
45.5	2285	1190	15.6	290	2.92
1.4.4 50% of torque defined in 1.4.2					
31.0	2330	1214	12.3	335	2.53
1.4.5 25% of torque defined in 1.4.1					
15.7	2375	1237	8.5	455	1.86
1.4.6 unloaded					
-	2400	1250	6.9	-	-

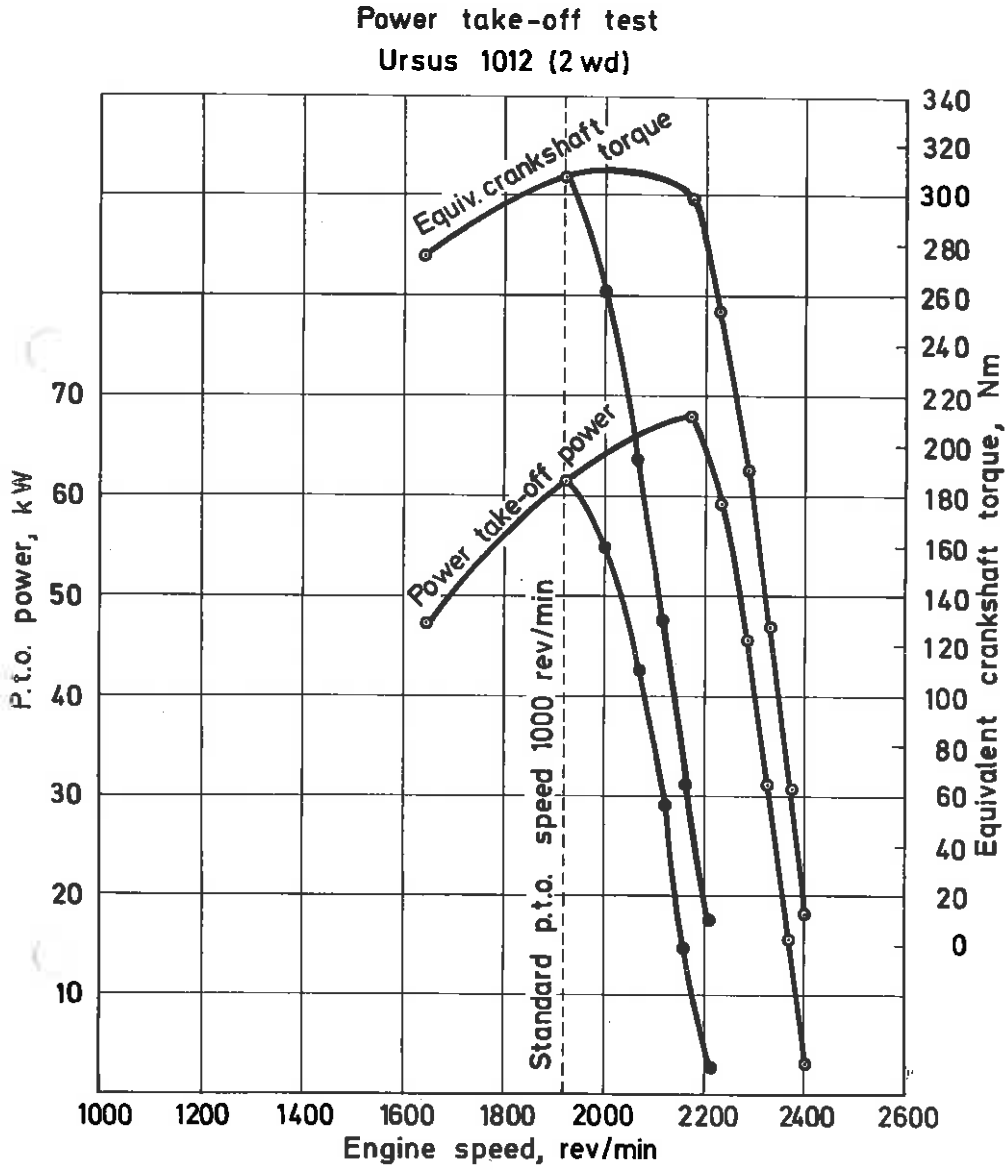
PART LOADS AT STANDARD POWER TAKE-OFF SPEED (1000 rev/min)

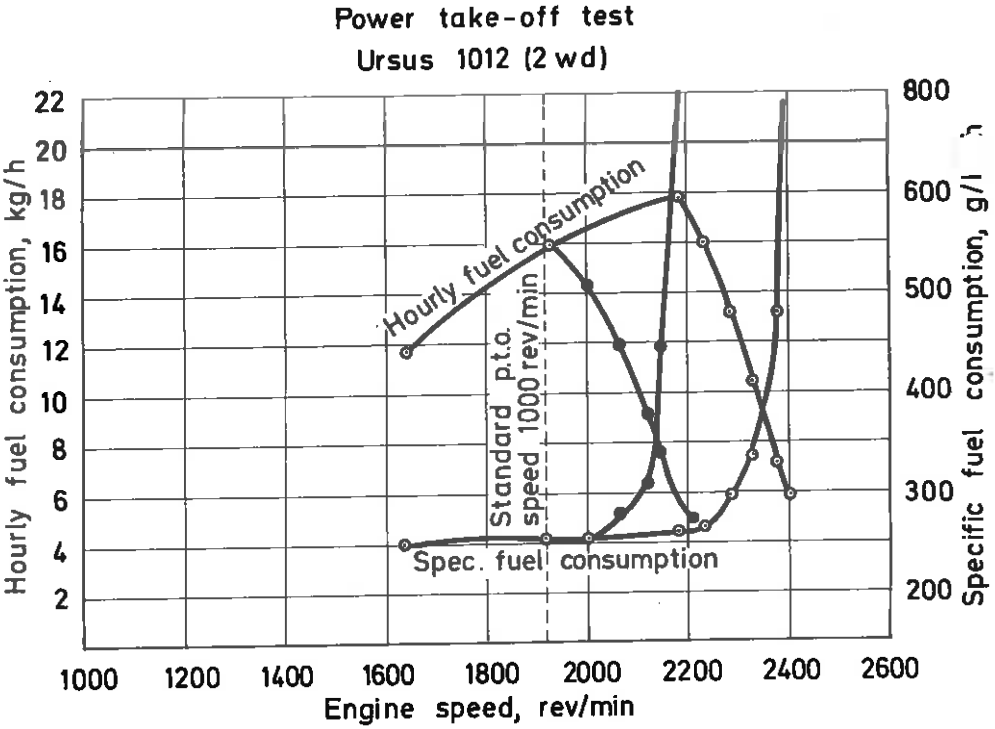
Power	Speed		Fuel consumption		Specific Energy
	Engine	P.T.O	Hourly	Specific	
kW	rev/min		l/h	g/kWh	kWh/l
1.4.1 The torque corresponding to maximum power					
61.8	1920	1000	18.8	257	3.29
1.4.2 85% of torque obtained in 1.4.1					
55.5	2000	1041	16.9	257	3.30
1.4.1 75% of torque defined in 1.4.2					
42.3	2065	1075	14.2	280	3.03
1.4.4 50% of torque defined in 1.4.2					
29.0	2120	1104	10.9	317	2.67
1.4.5 25% of torque defined in 1.4.2					
14.8	2160	1125	7.8	446	1.90
1.4.6 unloaded					
-	2210	1151	5.0	-	-

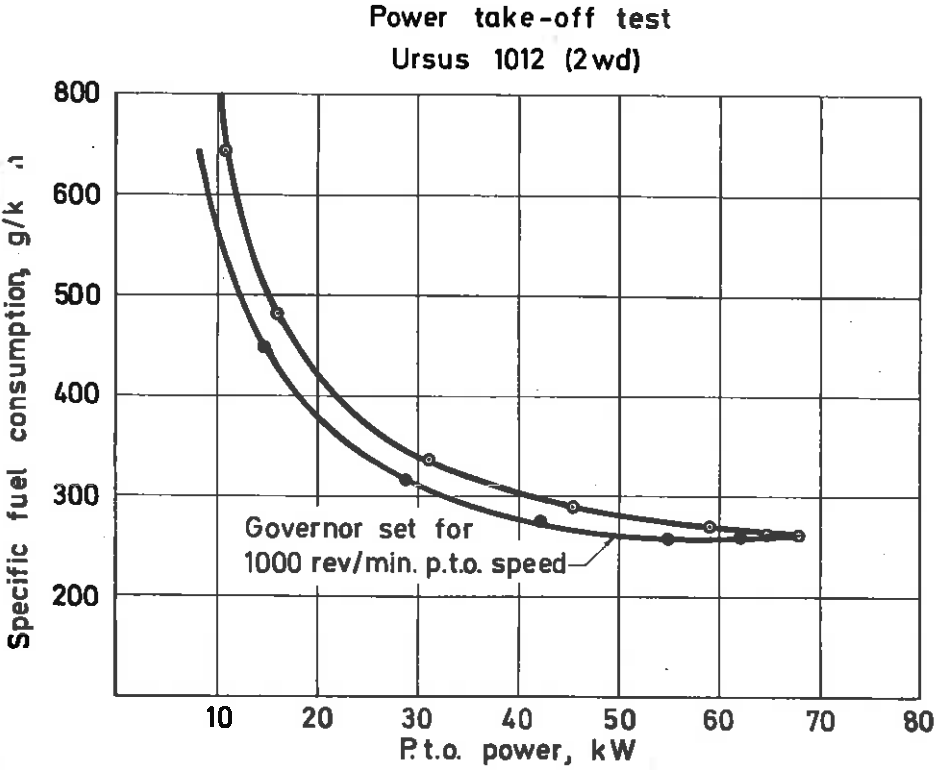
Standard specific fuel consumption, g/kWh 270/335/257/317

No load maximum engine speed: 2400 rev/min

Torque (equivalent crankshaft) at maximum power: 298 N.m


Power take-off test
Ursus 1012 (2 wd)
Equiv. crankshaft torque
Power take-off power
Standard p.t.o. speed 1000 rev/min
P.t.o. power, kW
Equivalent crankshaft torque, Nm
Engine speed, rev/min
10
20
30
40
50
60
70
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
1000
1200
1400
1600
1800
2000
2200
2400
2600


Power take-off test
Ursus 1012 (2 wd)
Hourly fuel consumption, kg/h
Specific fuel consumption, g/l
Hourly fuel consumption
Standard p.t.o. speed 1000 rev/min
Spec. fuel consumption
Engine speed, rev/min
22
20
18
16
14
12
10
8
6
4
2
800
600
500
400
300
200
1000
1200
1400
1600
1800
2000
2200
2400
2600


Power take-off test
Ursus 1012 (2wd)
Specific fuel consumption, g/k
800
600
500
400
300
200
Governor set for
1000 rev/min. p.t.o. speed
10
20
30
40
50
60
70
80
P.t.o. power, kW

Maximum torque (equivalent crankshaft) (engine speed: rev/min.2000):	308 N.m
Mean atmospheric conditions:	
Temperature:	25 °C
Pressure:	102 kPa
Relative humidity:	50 %
Maximum temperatures:	
Coolant:	92 °C
Engine oil:	114 °C
Fuel:	28 °C
Engine air intake:	30 °C

2. HYDRAULIC POWER AND LIFTING FORCE

Date and location of tests:	1986.01.08, Byr ·1n
Hydraulic power test	
Type of hydraulic system:	Open centre
Hydraulic fluid temperature at beginning of test:	62°C

HYDRAULIC POWER TEST

Sustained pressure with relief valve open: (Pump stalled - no)	18.0 MPa
Pump delivery rate at minimum pressure	44.0 l/min
Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power	
Flow rate:	30.0 l/min
Pressure	16.2 MPa
Power:	8.1 kW
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	
Flow rate:	41.0 l/min
Pressure:	14.7 MPa
Power:	10.0 kW

Tapping point used for test:	Auxiliary service connection
Temperature of hydraulic fluid, if different from 65°±5°C	- °C
Opening pressure of the unloading valve	14.7 MPa
Closing pressure of the unloading valve	16.0 MPa

Power Lift Test

	Height of lower hitch point above ground in down position mm	Vertical movement mm	Maximum corrected force exerted through full range kN	Corresponding pressure of hydraulic fluid MPa	Moment about rear axle kN.m	Max. tilt angle of mast from vertical Degrees
at hitch points	200	680	32.6	14.7	34.2	-
on the frame	200	715	22.0	14.7	36.5	14.5

Linkage settings for test - see table and figure in specifications

Lifting heights relative to the horizontal plane including the lower link pivot points

mm	-340	-300	-200	-100	0	+100	+200	+340	+400

Lifting forces at hitch points
(Corresponding pressure 14.7 MPa)

kN	32.6	32.9	33.9	34.5	34.8	35.1	35.3	35.4	-

Lifting forces at test frame
(Corresponding pressure 14.7 MPa)

kN	30.8	30.5	29.8	28.8	27.8	26.6	27.4	24.0	22.3

DRAWBAR PERFORMANCE

Date of tests: 1985-10-17 to 1985-10-21
Type of track: Tarmacadam
Height of drawbar above ground: 770 mm ballasted and unballasted
Tyre size: 7.50-20 at front, 16-9-38 at rear
Tyre inflation pressure: Unballasted 280 kPa at front, 140 kPa at rear
- - - : ballasted 280 kPa at front, 170 kPa at rear

Gear	Speed	Power	Drawbar pull	Engine speed	Slip of wheels	Specific fuel consumption	Temperatures			Atmospheric conditions		
							Fuel	Coolant	engine oil	Temperature	Relative humidity	Pressure
	km/h	kW	kN	rev/min	%	kWh/l	g/kWh	°C	°C	°C	°C	%	kPa
Maximum power (unballasted)													
1 L x)	1.73	15.4	32.11	2387	15.0	1.41	592	30	88	108	12	90	102
1 L	2.30	20.6	32.11	2341	15.0	1.79	467	30	88	108	12	90	103
2 L x)	2.74	24.4	32.11	2326	15.0	1.86	394	30	88	108	12	90	103
2 L	3.71	33.1	32.11	2326	15.0	2.12	394	30	88	108	12	90	103
3 L x)	4.25	37.9	32.11	2273	15.0	2.17	385	30	88	108	12	90	103
3 L	5.76	51.4	32.11	2231	15.0	2.47	338	30	88	108	12	90	103
4 L x)	5.80	48.6	30.17	2200	15.0	2.36	359	30	88	108	12	90	103
4 L	8.57	59.6	25.02	2200	4.6	2.82	300	30	88	108	12	90	103
1 H x)	5.18	46.2	32.11	2234	15.0	2.44	343	30	88	108	12	90	103
1 H	6.70	58.4	31.39	2200	9.2	2.77	306	30	88	108	12	90	103
2 H x)	8.32	58.9	25.50	2211	5.0	2.64	317	30	88	108	12	90	103
Maximum power (ballasted)													
1 L x)	1.73	17.8	37.02	2355	15.0	1.53	546	30	89	108	11	80	102
1 L	2.34	24.1	37.02	2330	15.0	1.79	467	30	89	108	11	80	103
2 L x)	2.74	28.1	37.02	2320	15.0	1.91	438	30	89	108	11	80	103
2 L	3.64	37.4	37.02	2300	15.0	2.24	373	30	89	108	11	80	103
3 L x)	4.14	42.6	37.02	2259	15.0	2.21	383	30	89	108	11	80	103
3 L	5.62	55.1	35.32	2198	11.0	2.50	338	30	89	108	11	80	103
4 L x)	6.19	55.5	32.37	2206	8.4	2.63	332	30	89	108	11	80	103
4 L	8.67	55.6	23.10	2212	3.7	2.73	310	30	89	108	11	80	103
1 H x)	4.97	50.8	36.78	2200	15.0	2.44	347	30	89	108	11	80	103
1 H	6.80	58.4	30.90	2187	6.9	2.77	306	30	89	108	11	80	103
2 Hx)	8.31	58.9	25.50	2207	3.5	2.79	303	30	89	108	11	80	103
2 H	11.30	60.0	19.13	2206	2.4	2.84	298	30	89	108	11	80	103
3 Hx)	13.36	58.3	15.70	2178	1.4	2.76	306	30	89	108	11	80	103
Five hour test at 75% of pull at maximum power													
2H	11.54	45.8	14.3	2316	1.8	2.20	384	34	89	108	10	80	103
Five hour test corresponding to 15% wheel slip													
3L x)	4.10	42.2	37.02	-	-	-	-	34	89	108	10	80	103

x) With torque amplifier group engaged.

Total oil consumption during 10 hours of tests and 53 g/h.

4. TURNING AREA AND TURNING CIRCLE (m)

Wheel equipment	Front 7.5-20 6 PR Rear 16.9-38 8 PR		Track 1580 Track 1510	
	With brakes		Without brakes	
	Right hand	Left hand	Right hand	Left hand
Radius of turning area	3.52	3.85	4.49	4.30
Radius of turning circle	3.38	3.69	4.16	4.14

5. LOCATION OF CENTRE OF GRAVITY (mm)

Height above ground		835
Distance forward from the vertical plane containing the axis of the rear wheels		862
Distance from the median plane of the tractor	left hand	0

6. BRAKING

Date of tests: 1986.07.18

Cold Service Braking Device Test

Ballasted tractor:	Front: 1750 kg Rear: 5040 kg				
Speed before application of brakes	km/h			28.0	
Braking device control force	N	300	400	500	600
Mean deceleration	m/s^2	1.5	2.0	2.7	3.2
Unballasted tractor:	Front: 1455 kg Rear: 2570 kg				
Speed before application of brakes	km/h			28.0	
Braking device control force	N	300	400	500	600
Mean deceleration	m/s^2	1.4	2.4	3.2	3.4

Fade Test

Speed before application of brakes	km/h			28.0	
Braking device control force	N	300	400	500	600
Mean deceleration	m/s^2	1.1	1.7	2.3	2.7

Maximum deviation of tractor from its original course:	None
Abnormal vibration:	None
The brakes were heated by:	Towing

Parking Braking Device Test

	18% slope		12% slope with 3 tons trailer	
	Up	Down	Up	Down
Braking device control force: kN	265	248	240	235

7. MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of tests:	1986.10.14
Sound level meter:	
Make:	Brüel & Kjær
Type:	2209
Type of track:	Tarmacadam
Gear number:	4 H
Travelling speed before acceleration:	21 km/h
Sound level:	88 dB(A)

Noise Measurements at the Driver's Ear

Date of test:	1987.02.09
Type of sound level meter and octave filter:	Brüel & Kjær type 2209 and 1613
Type of track:	Tarmacadam

Gear	Drawbar pull, at which the tractor develops the max. sound level kN	Measured travelling speed km/h	Sound level dB(A)
1.H.	8.8	7.9	88.5
1.H.*)	Light load	8.3	87.5
3.H	5.9	19.6	89.5
4.H.	Light Load	28.0	87.5

*) The 1.H-gear corresponds to the nominal travelling speed nearest to 7.5 km/h.

Repairs and Remarks: None

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 N	= 0.10197 kp	or 1 kp	= 9.80665 N
Powers:	1 kW	= 1.35962 metric hp	or 1 metric hp	= 0.73550 kW
Pressures:	1 bar	= 1.01972 kp/cm^2	or 1 kp/cm^2	= 0.980665 bar
Torques:	1 Nm	= 0.10196 kpm	or 1 kpm	= 9.80665 Nm