AFRC Institute of ENGINEERING RESEARCH

OECD Approval No. 1178

Test in accordance with the OECD standard code for the official testing of agricultural tractors

Report on Test of Zetor 10245 Tractor with 4 Wheel-Drive



Manufacturered by	Zavody Tazkeho Strojarstva, Narodny Podnik, Box 03657 Martin, Czechoslovakia.
Test No.	R88/70638/OECD
Report No.	730
Date	September 1988

THE BRITISH SOCIETY FOR RESEARCH IN AGRICULTURAL ENGINEERING

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Tractor manufacturer's name and address:	Zavody Tazkeho Strojarstva, Narodny Podnik, Box 03657 Martin, Czechoslovakia.
Submitted for test by:	The manufacturer
Selected for test by:	The manufacturer with the agreement of the testing station
Place of running in:	Z.T.S. Martin, Czechoslovakia
Duration of running in:	63 hours
Location of tests:	AFRC Institute of Engineering Research

SPECIFICATION OF TRACTOR

TRACTOR

Make:	Z.T.S. N.P. Martin
Trade name:	Zetor
Model:	Z 10245
Type:	4 wheel-drive, unit construction
Serial No:	10245 0002
1st Serial No:	10245 0001

ENGINE

Make:	Z.T.S. N.P. Martin
Model:	Z 8002.1234
Type:	4 stroke, direct injection, turbocharged diesel
Serial No:	000 002

Cylinders

Number/disposition:	4, vertical in-line
Bore/stroke:	110 mm x 120 mm
Capacity:	4562 cm^3
Compression ratio:	17:1 nominal
Arrangement of valves:	Overhead
Cylinder liners:	Replaceable, wet

Supercharging

Make:	CZM
Model:	K27.2960 u/6.11
Type:	Exhaust driven
Pressure:	0.90 MPa

Fuel System	
Fuel feed system:	Lift pump integral with fuel injection pump
Make, type and model of fuel filter(s):	Autobrzdy, dual, FD10 RP1.3
Capacity of fuel tank:	90 l
Make, type and model of injection pump:	Motorpal, in line, PP4 M9Kle-3119
Serial No:	Us0028 Ns034
Manufacturer's production setting of injection pump:	
Flow rate:	18.3-20.9 l/h at 2200 rev/min engine speed at full load and 20°C pump inlet temperature
Timing:	22° + 2° before T.D.C.
Make, type and model of injectors:	Motorpal, DOP 150S 5351417, 5 hole
Injection pressure:	16.8-17.6 MPa
Governor	
Make:	Motorpal
Type:	Mechanical incorporated in the injection pump
Model:	RV 3M 300/1100 - 2538
Governed range of engine speed:	600-2450 rev/min
Rated engine speed:	2200 rev/min
Air cleaner	
Pre-cleaner	
Make:	Sandrik
Type:	Stack cap with centrifugal dust trap
Model:	PC 500
Location:	Above bonnet forward of radiator
Main	
Make:	Sandrik
Type:	Oilbath
Model:	9450.11
Oil capacity:	2.2 l
Location:	Under bonnet forward of radiator
Maintenance indicator	Warning light on instrument panel
Lubrication system	
Type of feed pump:	Gear
Type of filter(s):	Centrifugal, replaceable element RDP 3/A
Number:	1

Cooling system	
Type of coolant:	Water and anti-freeze 1.5:1 solution
Type of pump:	Centrifugal, belt driven
Description of fan:	Belt driven
Number of fan blades:	4
Fan diameter:	460 mm
Coolant capacity:	23.0 l
Type of temperature control:	Thermostat
Superpressure system:	41 kPa
Starting system	
Starter motor	
Make:	Pal-Magneton
Type:	Electrical, solenoid engaged
Model:	12V
Power rating:	2.9 kW
Cold starting aid:	None
Safety device:	Gear selector lever to be in neutral position
Electrical system	
Voltage:	12 (negative earth)
Generator	
Make:	Pal-Magneton
Model:	443 113 516 184 (14V)
Type:	Belt driven, alternator
Power:	55 A at 9000 rev/min
Batteries	2, Prazska, Akumulatorka
Rating:	2 x 100 Ah at 20-hour rating
Exhaust system	
Make:	Z.T.S.
Type:	Oval, baffle
Model:	890 175 00
Location:	Left-hand side of engine, vertical

TRANSMISSION TO WHEELS

Clutch	
Make:	Z.T.S.
Model:	83021 500
Type:	Dry, for transmission only
Number of plates:	1
Diameter of plate:	350 mm
Method of operation:	Mechanically by pedal
Gear box	
Make:	Z.V.L. Povazske Strojarne
Model:	84 000 761
Type:	Mechanical
Arrangement:	4 gears with manually operated high, low or reverse selector and manually operated, hydraulically actuated torque multiplier on all gears
Number of speeds:	16 forward and 8 reverse
Available options:	1 creep gear, less torque multiplyer
Rear axle and final drives	
Make:	ZPC Ursus
Model:	83 000 286
Type:	Crown wheel and pinion, bevel gear and differential, planetary reduction gear final drives
Differential lock	
Type:	Mechanical
Method of engagement:	Manual by pedal
Method of disengagement:	Self disengaging
Front axle and final drives	
Make:	UTB
Model:	89 000 650
Type:	Crown wheel and pinion, bevel gear and limited slip, differential planetary reduction gear final drives
Driven from:	Front of gearbox, through hydraulic clutch arrangement controlled by hand lever
Differential lock	
Type:	Mechanical
Method of engagement:	Automatic
Method of disengagement:	Automatic

Gear	Group No.	Number of engine revolutions for one revolution of the driving wheels	*Nominal travelling speed at rated engine speed: 2200 rev/min, km/h
Forward			
1	LM	320.612	2.06
1	L	239.620	2.75
2	LM	203.401	3.24
2	L	152.019	4.34
3	LM	111.583	5.91
1	HM	96.238	6.85
4	LM	89.943	7.33
3	L	83.395	7.91
1	H	71.928	9.17
4	L	67.222	9.81
2	HM	61.063	10.80
2	H	45.641	14.45
3	HM	33.498	19.68
4	HM	26.989	24.43
3	H	25.036	26.34
4	H	20.179	32.68
Reverse			
1	M	205.277	3.21
1		153.421	4.30
2	M	130.274	5.06
2		97.365	6.77
3	M	71.452	9.23
4	M	57.584	11.45
3		53.402	12.35
4		43.037	15.32

L = Low range H = High range M = Torque multiplier engaged

Rear tyre size: 16.9-38

*Calculated with a tyre dynamic radius index of: 795 mm (ISO 4251/1-1984)

Number of revolutions of front wheels for one revolution of rear wheels: 1.41

POWER TAKE-OFF

Main power take-off

Type: Hydraulically operated, independent of main clutch

Method of engagement: By hand lever

Number of shafts: 1

Method of changing power take-off speeds: Manually, by exchanging shafts

Clutch

Make: Ursus

Type: Independent, multi-plate, wet

Number of plates: 5

Model: 89 153 209

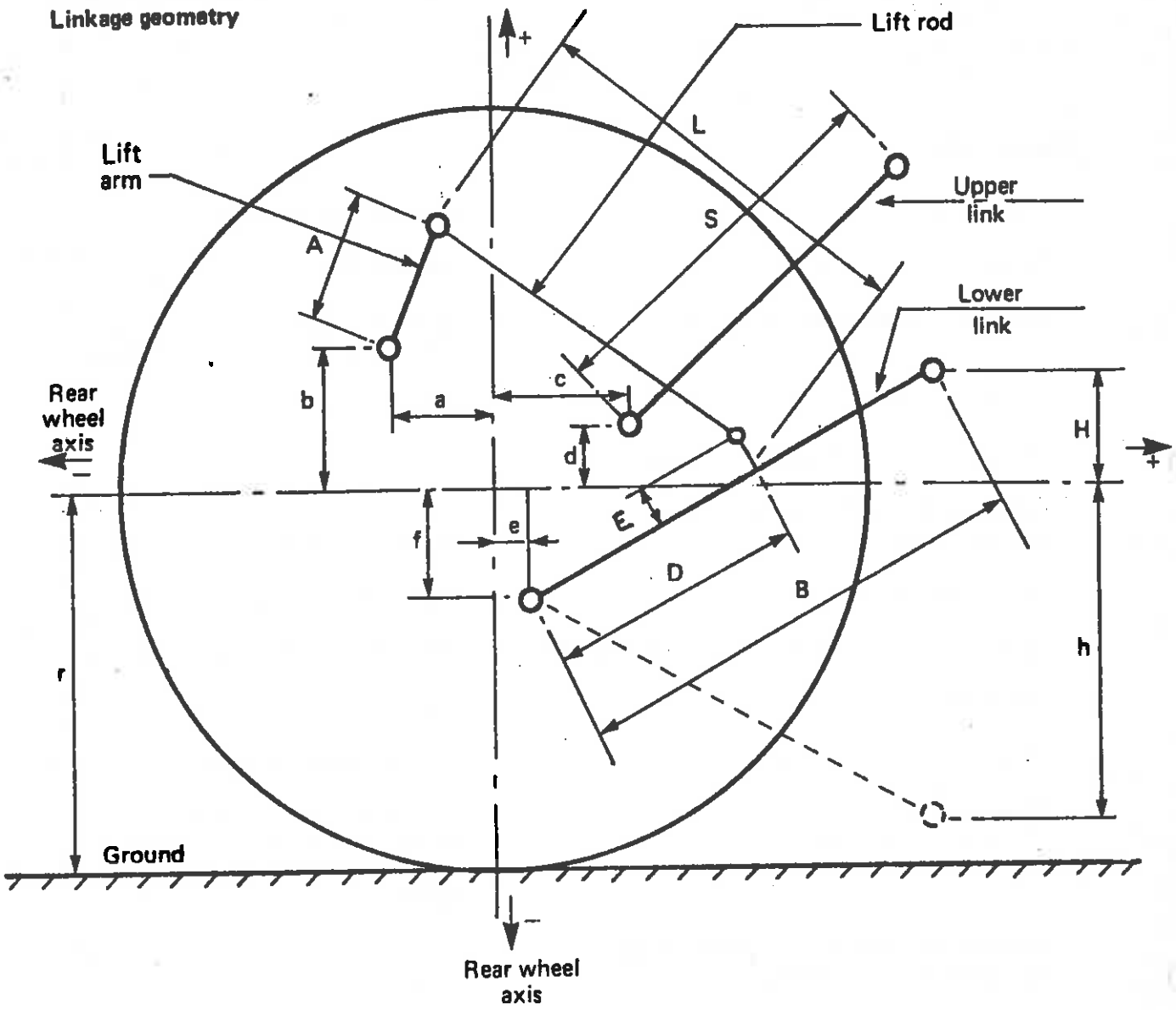
Power take-off proportional to engine speed	
540 rev/min	
Location:	At rear of tractor
Diameter of power take-off shaft:	34.9 mm
Number of splines:	6 to ISO standard 500 - 1979
Height above ground:	640 mm
Distance from the median plane of the tractor:	Central
Distance behind rear axle:	510 mm
Pto speed at rated engine speed:	628 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:	45.0 kW (Manufacturers recommendation)
Direction of rotation (viewed facing driving end):	Clockwise
1000 rev/min	
Location:	At rear of tractor
Diameter of power take-off shaft:	34.9 mm
Number of splines:	21 to ISO standard 500 - 1979
Height above ground:	640 mm
Distance from the median plane of the tractor:	Central
Distance behind rear axle:	510 mm
Pto speed at rated engine speed:	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	
Speed of shaft:	1000 rev/min
Travelling distance for one revolution of power take-off shaft:	188 mm
Number of pto shaft revolutions for one revolution rear wheels:	27.4
Direction of rotation with forward gear engaged:	Clockwise

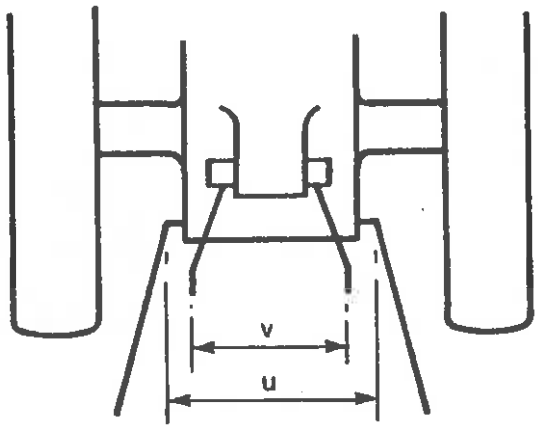
POWER LIFT

Make:	PZL Hydral Wroclaw
Type:	88 400 000
Type and number of cylinders:	One internal single acting, two external single acting
Type of linkage lock for transport:	Hydraulic
Relief valve pressure setting:	18.0 - 20.5 MPa
Opening pressure of cylinder safety valve:	20.5 - 21.5 MPa
Lift pump type:	Gear, PZ 2-18KS
Transmission between pump and engine:	Gear driven from gearbox
Make and number of filters:	ZPC, 2
Site of oil reservoir	Transmission housing
Type and number of tapping points:	4 pressure or return spool valve controlled, 1 pressure only and 1 return only, quick release at rear of tractor
Maximum volume of oil available to external cylinders:	15.0 l

Three-point linkage

Category:	2 to ISO standard 730/1 - 1977
Category adapter:	Not applicable
Controls	Draught or position control, or combined plus pressure control for semi-mounted implements, lower link sensing, adjustable speed on drop.


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


v
u

Dimensions of linkage when attached to the standard frame (ISO 730/3-1982 CAT 2)

			Dimensions or range	Setting used in test
Length of lift arms:		(A)	330 mm	330 mm
Length of lower links:		(B)	909 mm	909 mm
Distance of lift arm pivot point from rear wheel centre line	horizontally:	(a)	170 mm	170 mm
	vertically:	(b)	286 mm	286 mm
Horizontal distance between the two lower link points:		(u)	520 mm	520 mm
Horizontal distance between the two lift arm end points:		(v)	640 mm	640 mm
Length of upper link:		(S)	620-810 mm	656 mm
Distance of upper link pivot point from rear wheel centre line	horizontally:	(c)	385 mm	385 mm
	vertically:	(d)	100,160,210 mm	210 mm
Distance of lower link pivot point from rear wheel centre	horizontally:	(e)	130 mm to rear	130 mm to rear
	vertically:	(f)	255 mm	255 mm
Distance of lower link points to lift rod pivot points on lower link centre line:	horizontal:	(D)	439, 499 mm	499 mm
	vertical:	(E)	0	0
Length of lift rods:		(L)	515-610 mm	570 mm
Height of lower hitch points relative to the rear wheel centreline				
- in low position:		(h)	393-711 mm	595 mm
- in high position:		(H)	57-297 mm	105 mm
Height of lower hitch points when locked in transport position:			Any height within lift range	

SWINGING DRAWBAR

Height above ground, maximum:	393 mm
minimum:	308 mm
Type of adjustment:	Inverting drawbar
Distance of hitch point from rear axle centre:	910 and 865 mm to rear
Distance of hitch point from power take-off shaft ends:	
vertically:	330 and 247 mm
horizontally:	400 and 355 mm
Distance of pivot point from rear axle horizontally:	365 mm to rear
Lateral adjustment:	330 and 310 mm
Diameter of drawbar pin holes:	32 mm
Maximum vertical permissible load:	7 kN (Drawbar out)
	9 kN (Drawbar in)

TRAILER HITCH

Height above ground, maximum:	811 mm
minimum:	661 mm
Distance of hitch point from rear axle centre:	870 mm
Distance of hitch point from power take-off shaft end:	
vertically above maximum:	202 mm
minimum:	52 mm
horizontally:	360 mm
Pin diameter:	35 mm
Maximum vertical permissible load:	10 kN

LINKAGE DRAWBAR

Height above ground, maximum:	892 mm
minimum:	200 mm
Horizontal distance to power take-off shaft end:	529 mm
Number of holes:	9
Distance between holes:	82 mm
Hole diameter:	32 mm
Thickness and width of drawbar:	70 mm x 90 mm with 32 mm lateral slot

FRONT TOWING HITCH

Vertical height to centre of clevis:	924 mm
Width of clevis	70 mm
Diameter of pin hole:	32 mm

STEERING

Method of operation:	Hydrostatic system with hand operated steering motor powered from gear box mounted gear pump
Pump:	Pilmet, gear type Z CT-16L
Motor:	Danfoss OSPB 160 - ON
Oil cooler:	Mounted to front of radiator
Ram	Pilmet, double acting
Working pressure:	14 MPa
Filter	
Make:	Ursus
Model:	PP 8-4
Type:	Replaceable canister and metal strainer

BRAKES

Service brake

Make:	Zetor
Model:	89 227 000
Type:	Dry disc, multiplate
Number of plates:	4
Method of operation:	Hydraulically by pedals, coupled or independent
Trailer brakes:	Air brake operated by tractor pedals

Parking brakes

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

WHEELS

Number:	4
Front	2, driving/steering
Rear:	2, driving
Wheelbase:	2390 mm

Track width adjustment

	Minimum, mm	Maximum, mm	Adjustment method
Front	1620	1820	By changing wheel discs to either side of wheel centre
Rear	1500	1875	Reversing wheels and off-set lug rims

PROTECTIVE STRUCTURE

OECD approval number:	CSS 0116/7, CSD 1211/7
Make:	Vlad, Presov
Model:	UR II M87
Type:	Six post ROPS
Protective device:	Safety cab

DRIVER'S SEAT

Make:	Mars Svratka
Model:	Mars Zetor 59115400
Type:	Suspension seat
Type of suspension:	Parallelogram linkage
Type of damping:	Hydraulic
Range of adjustment, longitudinal:	150 mm
vertical:	90 mm

LIGHTING

	Height above ground of centre, mm	Size, mm	Distance from outside edge of tractor to centre, at 1725 mm track width, *mm
Headlights	1172	120 dia	902
Sidelights	1695	65 x 60	341
Rear lights	1718	105 x 75	364
Reflectors	1185	80 dia	230

*Mudguards being outside edge

TEST CONDITIONS

Overall dimensions (unballasted tractor)

Length: 4.25 m

Width

Minimum: 2.17 m to mudguards
Maximum: 2.32 m to outside wheels at 1875 mm track

Height

Top of protective structure: 2.71 m
Top of exhaust: 2.93 m

Ground clearance (unballasted tractor): 245 mm

Clearance - limiting part: Drawbar clevis in lowest position

Tractor mass (with cab)

		Without driver kg	With driver kg
Unballasted	Front	1962	1973
	Rear	2864	2928
	Total	4826	4901
Ballasted	Front	2381	2392
	Rear	3693	3757
	Total	6074	6149

Ballast

	Number of weights	Mass (total) kg	Water kg
Front	Nil	-	-
Rear	4 + 2 adaptors	202	596
Additional front frame and weights	16	450	-

Tyres and track width specification

	Front wheels	Rear wheels
Tyres		
Dimensions	12.4-28	16.9-38
Ply rating	6	8
Type	Cross ply	Radial ply
Maximum load below 30 km/h (tyre manufacturer's), kg	1275	2520
Maximum load above 30 km/h (tractor manufacturer's), kg	1148	2268
Inflation pressure (tyre manufacturer's), kPa	170	170
Dynamic radius index, mm	590	795
Chosen track width, mm	1620	1725

Oils and lubrication

Capacity and change interval

	Capacity l	Oil change h	Filter change h
Engine	10.0	200	200
Air cleaner	2.0	100	NA
Gearbox	52.0	1200	600
Rear axle	Common with gearbox		
Final drive (rear)	2 x 4.0	1200	600
Front axle	3.5	1200	NA
Final drive (front)	2 x 1.3	1200	NA
Hydraulic system	Common with gearbox		
Steering	8.0	1200	1200
Brakes	0.8	2 years	NA

Specifications

Oils	Recommended	Used during test
Engine + Air Cleaner		
Type:	S.A.E. 10W/30	
Viscosity:	71.5 cSt at 50°C	As recommended
Classification:	M.I.L. L-451993	
Transmission		
Gearbox, rear axle and powerlift		
Type:	S.A.E. 80	
Viscosity:	44.2 cSt at 50°C	As recommended
Classification:	API GL-4	
Rear final drives		
Type:	S.A.E. 80	
Viscosity:	44.2 cSt at 50°C	As recommended
Classification:	API GL-4	
Front differential and final drives		
Type:	S.A.E. 80	
Viscosity:	44.2 cSt at 50°C	As recommended
Classification:	API GL-4	
Hydraulic brakes		
Type:	HD-205P (S.A.E. J1703F)	
Viscosity:	4.2 cSt at 50°C	As recommended
Classification	ISO 4925	
Steering		
Type:	OL-N2	
Viscosity:	15-2 cSt at 50°C	As recommended
Classification:	I.S.O. WG-22	
Recommended grease:	Mobilgrease MP	As recommended
Number of grease points:	18	
Fuel		
Type:	Diesel oil	
Viscosity:	3.30 cSt at 40°C (to British Standard 2869:1983, Class A)	
Density at 15°C:	0.8345 For PTO tests 0.8327 For Drawbar	

TEST RESULTS

COMPULSORY TESTS

1. MAIN POWER TAKE-OFF PERFORMANCE

Date of tests: 18th February 1988

Type of dynamometer: Water brake, Heenan & Froude

Power, kW	Speed, rev/min		Fuel consumption, Hourly,		Specific, kg/kWh	Specific energy, kWh/l
	Engine	P.t.o.	l/h	kg/h		
MAXIMUM POWER - 2 HOUR TEST						
65.2	2200	1146	18.29	15.23	0.234	3.56
POWER AT RATED ENGINE SPEED						
65.2	2200	1146	18.29	15.23	0.234	3.56
POWER AT STANDARD POWER TAKE-OFF SPEED						
60.6	1920	1000	16.64	13.86	0.229	3.64
PART LOADS						
(i) The torque corresponding to maximum power at rated engine speed						
65.2	2200	1146	18.29	15.23	0.234	3.56
(ii) 85% of the torque obtained in (i)						
56.7	2259	1177	16.70	13.90	0.245	3.40
(iii) 75% of the torque defined in (ii)						
43.3	2300	1198	14.02	11.67	0.270	3.08
(iv) 50% of the torque defined in (ii)						
29.4	2340	1219	11.21	9.34	0.317	2.63
(v) 25% of the torque defined in (ii)						
14.8	2372	1235	8.34	6.95	0.470	1.77
(vi) Unloaded						
0	2400	1250	5.73	4.77	-	-

Part loads, the governor hand lever in the position corresponding to the standard p.t.o. speed at full load (1000 rev/min).

Power, kW	Speed, rev/min		Fuel consumption, Hourly,		Specific,	Specific energy,
	Engine	P.t.o.	l/h	kg/h	kg/kWh	kWh/l
(i) The torque corresponding to maximum power at standard p.t.o. speed						
60.6	1920	1000	16.64	13.86	0.229	3.64
(ii) 85% of the torque obtained in (i)						
52.7	1965	1023	14.77	12.30	0.234	3.56
(iii) 75% of the torque defined in (ii)						
40.7	2019	1051	12.40	10.33	0.254	3.28
(iv) 50% of the torque defined in (ii)						
27.7	2067	1077	9.87	8.22	0.297	2.80
(v) 25% of the torque defined in (ii)						
14.2	2115	1102	7.22	6.01	0.425	1.96
(vi) Unloaded						
0	2160	1125	4.65	3.87	-	-

Standard specific fuel consumption, kg/kWh

a) 0.245 c) 0.234
b) 0.317 d) 0.297

No load, maximum engine speed		2400 rev/min
Equivalent crankshaft torque at maximum power		281.9 Nm
Maximum equivalent crankshaft torque		324.8 Nm 1600 rev/min engine speed
Mean atmospheric conditions	temperature	20°C
	pressure	1025 m bar
	relative humidity	27%
Maximum temperature	coolant	84°C
	engine oil	102°C
	fuel	35°C
	air intake	22°C

2. HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 11th November 1987

2.1 Hydraulic power test

Sustained pressure with relief valve open 19.8 MPa

Pump delivery rate at minimum pressure 46.8 l/min

Flow rate corresponding to a hydraulic pressure equivalent to 90 per cent of the actual relief valve pressure setting and corresponding hydraulic power

Flow rate	27.1 l/min
Pressure	17.8 MPa
Power	8.0 kW

Flow rate and hydraulic pressure corresponding to maximum hydraulic power

Flow rate	39.8 l/min
Pressure	16.5 MPa
Power	10.95 kW

Tapping point used for test: External spool valve connection

Temperature of hydraulic fluid, if different from 60° ±5°C: Not applicable

Opening pressure of the unloading valve: Not applicable

Closing pressure of the unloading valve: Not applicable

2.2 Power lift test

	Height of lower hitch point above ground in down position, mm	Vertical movement, mm	Maximum force exerted through full range, kN	Corresponding pressure of hydraulic fluid, MPa	Moment about rear axle, kNm	Maximum tilt angle of mast over range of lift, degrees
At the hitch point	200	700	47.6	16.5	49.5	-
On the frame	200	760	34.6	16.5	57.1	9

Main linkage dimensions - see drawings and table on pages 8 and 9

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

mm	-340	-200	-100	0	100	200	360	420

Lifting forces at hitch points
(corresponding pressure 16.5 MPa)

kN	48.5	49.6	50.0	50.2	50.1	50.1	50.0	-

Lifting forces at test frame
(corresponding pressure 16.5 MPa)

kN	52.2	48.1	46.2	44.1	42.0	39.7	35.8	34.6

5. DRAWBAR PERFORMANCE

Date of tests: 10th June and 18th July 1988

Type of track: Concrete

	Height of drawbar above ground, mm	Inflation pressure, kPa Front	Rear
Unballasted	235	100	100
Ballasted	235	100	100

Gear	Group No.	Speed, km/h	Power, kW	Drawbar pull, kN	Engine speed, rev/min	Wheel-slip, %	Specific fuel consumption, kg/kWh	kWh/l	Temperature, °C Fuel	Coolant	Engine oil	Atmospheric conditions Temperature, °C	Relative humidity,%	Pressure, m bar
(i) MAXIMUM POWER (unballasted)														
*1	L	2.45	35.1	51.5	2272	15.0	0.355	2.34	42	80	88	16	58	1006
*2	LM	2.81	40.2	51.5	2249	15.0	0.339	2.46	46	82	92	18	55	1007
2	L	3.94	52.2	47.6	2201	8.8	0.297	2.80	44	82	94	17	44	1000
3	LM	5.60	53.2	34.2	2200	5.0	0.285	2.93	43	81	89	18	48	1003
1	HM	6.54	53.5	29.5	2200	3.7	0.286	2.91	40	81	90	16	53	1002
4	LM	7.05	53.3	27.2	2207	3.5	0.292	2.85	40	79	90	16	52	1002
3	L	7.59	55.0	26.1	2201	2.9	0.284	2.94	41	81	90	16	55	1004
1	H	8.85	54.5	22.2	2203	1.6	0.280	2.97	42	80	92	16	53	1003
(ii) MAXIMUM POWER (ballasted)														
*1	LM	1.80	29.6	59.1	2267	15.0	0.394	2.11	39	77	86	15	65	1018
*1	L	2.37	38.9	59.1	2230	15.0	0.350	2.38	41	80	91	17	49	1018
*2	LM	2.81	46.1	59.1	2226	15.0	0.333	2.50	37	77	89	13	66	1018
2	L	4.06	53.6	47.5	2198	6.4	0.297	2.80	36	78	89	13	63	1019
3	LM	5.67	53.2	33.8	2196	4.0	0.292	2.85	35	80	85	14	63	1020
1	HM	6.62	52.6	28.6	2199	2.8	0.290	2.87	37	79	88	14	59	1020
4	LM	7.11	51.5	26.1	2201	2.5	0.297	2.80	37	80	89	14	63	1020
3	L	7.67	53.5	25.1	2198	2.4	0.288	2.89	38	80	90	14	66	1020
1	H	8.93	54.3	21.9	2201	2.0	0.284	2.93	38	78	88	14	64	1020
4	L	9.60	51.2	19.2	2204	1.8	0.296	2.81	38	78	88	14	68	1020
(iii) FIVE HOUR TEST AT 75% of PULL AT MAXIMUM POWER														
3	L	7.95	41.5	18.8	2262	1.7	0.293	2.84	47	81	91	20	71	1020
(iv) FIVE HOUR TEST AT PULL CORRESPONDING TO 15% WHEELSLIP IN TEST (ii)														
2	LM	3.02	-	59.1	2217	-	-	-	45	82	90	14	62	1005

Total oil consumption during ten hours duration of tests (iii) and (iv) 100 g/h
*Maximum power available at 15% wheelslip
Test (iv) was carried out with additional ballast and the results for power, slip and fuel consumption have no practical significance

4. TURNING SPACE AND TURNING CIRCLE

Details of wheel equipment:		Tyre size	Track width
	front	12.4-28	1620 mm
	rear	16.9-38	1725 mm

		With brakes		Without brakes	
		Left-hand	Right-hand	Left-hand	Right-hand
Radius of turning space, m	2 WD	4.80	4.70	5.63	5.48
Radius of turning space, m	4 WD	4.36	4.24	5.64	5.46
Radius of turning circle, m	2 WD	4.52	4.42	5.35	5.20
Radius of turning circle, m	4 WD	4.08	3.96	5.36	5.18

5. LOCATION OF CENTRE OF GRAVITY

Height above ground, mm	916
Distance forward from the vertical plane containing the axis of the rear wheels, mm	962
Distance from the median plane of the tractor, mm	0

6. BRAKING

Date of tests: 8th and 19th July 1988

Type of track: Concrete

Masses during brake tests

	Front, kg	Rear, kg	Total, kg
Ballasted	2160	4536	6696
Unballasted	1962	2864	4826

6.1 Cold service braking device test

Speed before application of brakes, 34.3 km/h (unballasted)

Ballasted tractor	Braking device control force, N	100	200	300	400	500	550
	Mean deceleration, m/s^2	1.0	1.8	2.4	3.0	3.6	3.9
Unballasted tractor	Braking device control force, N	100	200	300	400	500	600
	Mean deceleration, m/s^2	1.2	2.0	2.9	3.5	3.5	3.5

6.2 Fade test

Speed before application of brakes, 34.3 km/h (ballasted)

Ballasted tractor	Braking device control force, N	100	200	300	400	500	600
	Mean deceleration, m/s^2	1.0	1.8	2.4	3.0	3.6	4.1

Brakes were heated by: Driving

Comments on deviation and vibration: None

6.3 Parking braking device test

	Force applied on slope of 18%	
	Up	Down
Braking device control force, N	235	216

7. MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of tests:	22nd July 1988
Type of sound level meter:	Bruel and Kjaer 2209
Type of track:	Concrete
Results of test	2-wheel drive only in top gear
Gear:	4 Group No: H
Travelling speed before acceleration:	25.7 km/h
Sound level:	86 dBA

REPAIRS AND ADJUSTMENTS DURING TESTS: None

REMARKS: None

Test carried out by: A.D. Stockton; F. Thistlethwaite

Officer in charge: P.C. Seward

Signed: Head of Testing Group

for the Director

Date: 19.12.88

B. SUPPLEMENTARY TEST

AUXILIARY HYDRAULIC SYSTEM FOR FRONT MOUNTED IMPLEMENTS

1. SPECIFICATION

AUXILIARY HYDRAULIC SYSTEM

Make, model:	Z.T.S., U32-L
Relief valve pressure setting:	16±2 MPa
Pump type:	Gear
Transmission between pump and engine:	Connected to crankshaft pulley of engine via dog clutch
Make, number and type of filters:	Own make, 1, FN32BH 30P
Time between oil changes:	1200 hrs
Time between filter changes:	600 hrs
Oil capacity:	52.0 l
Site of oil reservoir:	On RHS under cab and behind step
Type and number of tapping points:	2 pairs of quick release at front, 1 pair and one separate return quick release at rear
Maximum volume of oil available to external cylinders:	Maximum 52.0 l
Recommended oil:	As gearbox on page 16

2. HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 16th November 1988

2.1 Hydraulic power test

Sustained pressure with relief valve open	14.2 MPa
Pump delivery rate at minimum pressure	71.9 l/min

Flow rate corresponding to a hydraulic pressure equivalent to 90 per cent of the actual relief valve pressure setting and corresponding hydraulic power

Flow rate	68.3 l/min
Pressure	12.8 MPa
Power	14.6 kW

Flow rate and hydraulic pressure corresponding to maximum hydraulic power

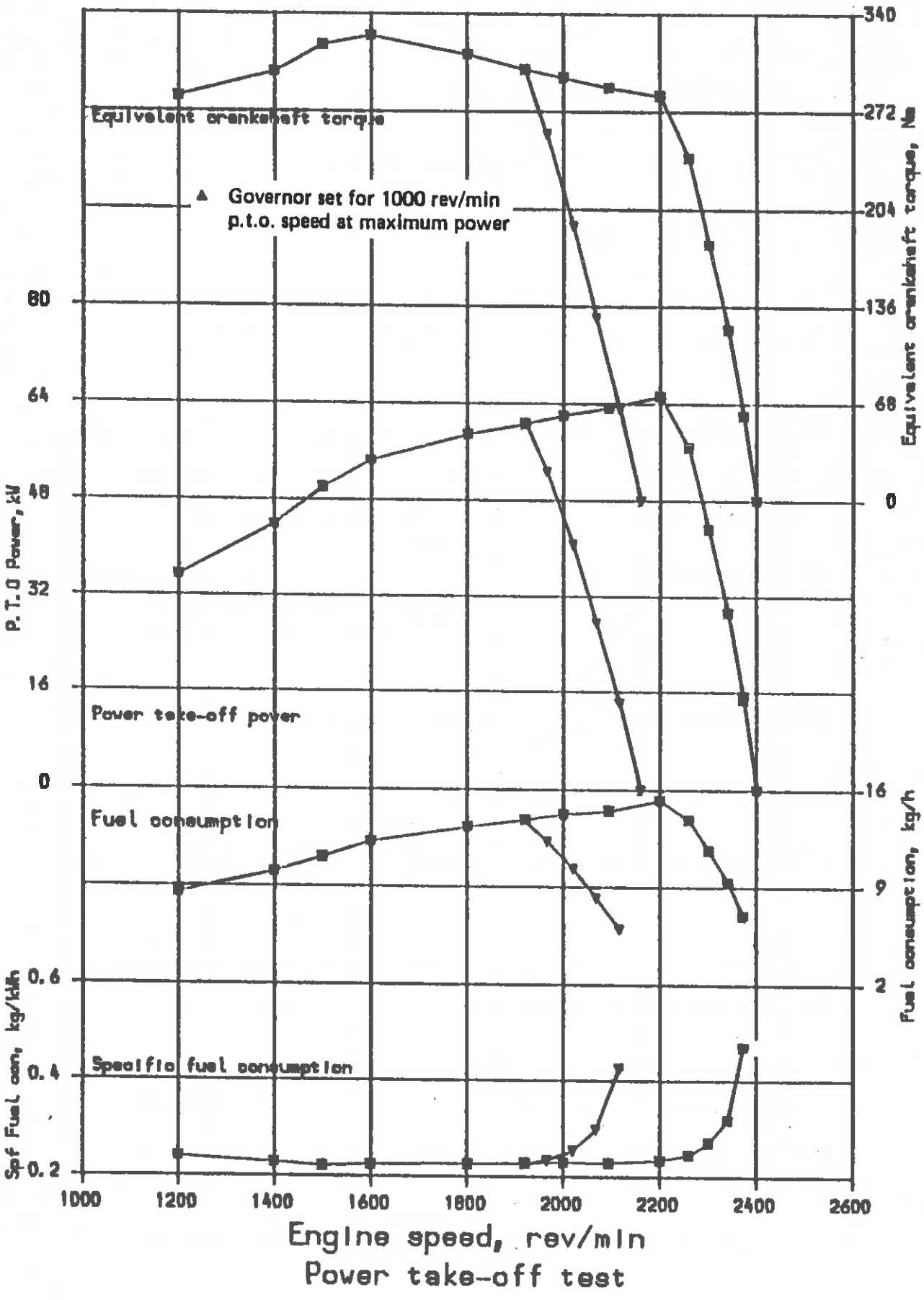
Flow rate	66.7 l/min
Pressure	14.0 MPa
Power	15.6 kW

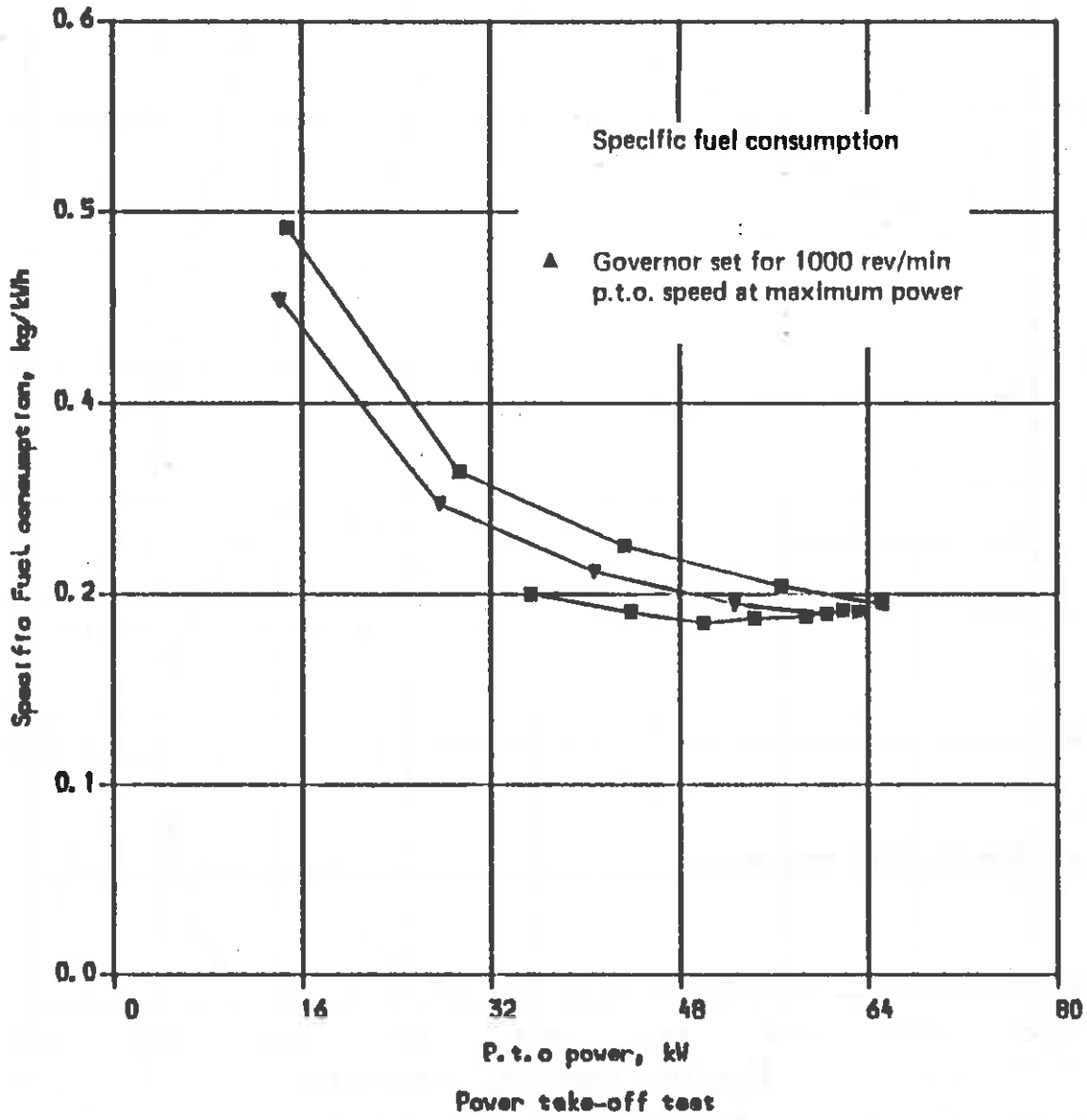
Tapping point used for test: Auxiliary service connection

Temperature of hydraulic fluid, if different from 60° ±5°C: Not applicable

Opening pressure of the unloading valve: Not applicable

Closing pressure of the unloading valve: Not applicable


Equivalent crankshaft torque
Governor set for 1000 rev/min
p.t.o. speed at maximum power
Power take-off power
Fuel consumption
Specific fuel consumption
P.T.O Power, kW
Spf Fuel con, kg/kWh
Equivalent crankshaft torque, Nm
Fuel consumption, kg/h
80
64
48
32
16
0
0.6
0.4
0.2
340
272
204
136
68
0
16
9
2
1000
1200
1400
1600
1800
2000
2200
2400
2600
Engine speed, rev/min
Power take-off test



Power take-off test