STÁTNÍ ZKUŠEBNA ZEMĚDĚLSKÝCH,
POTRAVINÁŘSKÝCH
A LESNICKÝCH STROJŮ

163 04 PRAHA 6, ŘEPY

Report on test in accordance with the O. E. C. D. STANDARD CODE
for the Official Testing of Agricultural Tractors

CODE II

Restricted Code

Date of approval: 7th June 1993

O.E.C.D. No. 1454



Agricultural Tractor
ZTS ZETOR 12345 (4WD) 40 km/h version

Manufactured by:
ZTS TEES š.p.
036 57 Martin, Slovakia

Report No. 10706
Date of test: Aug. 1992 - Mar.1993

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Tractor manufacturer's name and address:	ZTS TEES š.p., 036 57 Martin, Slovakia
Location of tractor assembly:	Martin, Slovakia
Submitted for test by:	The manufacturer
Selected for test by:	The manufacturer
Place of running-in:	Martin, Slovakia
Duration of running-in:	60 hours
Location of test:	SZZPLS Praha 6 - Řepy, Czech Republic

I. SPECIFICATIONS OF TRACTOR

TRACTOR

Make:	ZTS ZETOR
Model:	12345 40 km/h version
Type:	Wheeled, unit construction, all wheels drive
Number of driving wheels:	4
Serial No.:	12345 0001
1st Serial No.:	12345 0001

ENGINE

Make:	ZTS
Model:	Z 8703
Type:	4-stroke diesel engine, direct injection, water cooled, naturally aspirated
Serial No.:	000 002

Cylinders

Number/disposition:	6, in-line, vertical
Bore/stroke:	110 mm/128 mm
Capacity:	7299 cm^3
Compression ratio:	16.8:1
Arrangement of valves:	Overhead
Cylinder liners:	Wet, replaceable

Supercharging	None
Fuel system	
Fuel feed system:	Lift pump piston-type, integral with fuel injection pump
Make, model and type of fuel filters:	AUTOBRZDY, 443 741 429 000, two-stage with paper cartridge
Capacity of fuel tank:	245 dm^3
Make, model and type of injection pump:	MOTORPAL, 6M 13160, in-line
Serial No.:	Tv 0004
Manufacturer's production setting of injection pump:	
Flow rate (rated engine speed and full load):	26.00 dm^3/h
Timing:	$22^{o}\pm1^{o}$ before TDC
Make, model and type of injection:	MOTORPAL, DOP 150 S 430-1439, 4 hole
Injection pressure:	20.0+0.8 MPa
Governor	
Make, model and type:	MOTORPAL, RM 3312 - 300/1100, centrifugal, variable speed
Governed range of engine speed:	600-2450 rev/min
Rated engine speed:	2200 rev/min
Air cleaner	
Make, model and type:	SANDRIK, SPP 750, dry with paper element, integrated cyclon type pre-cleaner
Location of air intake:	Under bonnet forward of radiator
Maintenance indicator:	Warning light on instrument panel
Lubrication system	
Type of feed pump:	Gear
Type of filter:	Full flow with replaceable paper element
Number:	2
Cooling system	
Type of coolant:	Water and anti-freeze

Type of pump:	Centrifugal, belt driven
Specification of fan:	Axial, belt driven
Number of blades:	8
Fan diameter:	460 mm
Coolant capacity:	29 dm^3
Type of temperature control:	Thermostat
Superpressure system:	40±10 kPa

Starting system

Make, model and type:	ELMOT, R20e, electrical, solenoid engaged
Starter motor power rating:	5.5 kW
Cold starting aid:	None
Safety device:	Gear selector lever to be in neutral position

Electrical system

Voltage:	12 V, negative earth
Generator:	
Make, model and type:	PAL, 443 113 516 650, alternator, belt driven
Power:	770 W
Battery:	
Number:	2
Rating:	125 Ah at 20 hours

Exhaust system

Make, model and type:	ZTS, 63.614.200, expansion and absorption muffler
Location:	Left-hand side of engine, vertical

TRANSMISSION TO WHEELS

Clutch

Make, model and type:	ZTS, 63.073.002, dry for transmission only
Number of plates:	1
Diameter of plates:	380 mm
Method of operation:	Hydraulically with air booster by pedal

Gear box

Make, model and type:	ZTS, P 135.1, mechanical
Arrangement:	Synchromesh gear box with 8 speeds, group gear box with two speed ranges and reverse (L, H and R) and 2-speed hydraulically actuated torque multiplier (M+ and M-)
Number of gears:	32 forward and 16 reverse
Available options:	None

Rear axle and final drives

Make, model and type:	ZTS, 63.902.531, crown wheel and bevel pinion differential and planetary final drives
Differential lock:	
Type:	Mechanical
Method of engagement:	Hydraulically by pedal
Method of disengagement:	Self-disengaging

Front axle and final drives

Make, model and type:	ZTS, 63.174.400, crown wheel and bevel pinion differential and planetary final drives
Differential lock:	
Type:	Mechanical
Method of engagement:	Hydraulically by pedal
Method of disengagement:	Self-disengaging

Total ratios and travelling speeds

Gear	Group	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed at rated engine speed of 2200 rev/min km/h (*)
1	LM+	334.442	2.12
2		275.035	2.58
3		227.125	3.12
4		187.671	3.78
5		154.899	4.58
6		127.384	5.57
7		105.195	6.74
8		86.921	8.16
1	LM-	278.702	2.54
2		229.196	3.09
3		189.271	3.75
4		156.392	4.53
5		129.083	5.49
6		106.154	6.68
7		87.662	8.09
8		72.434	9.79
1	HM+	87.428	8.11
2		71.898	9.86
3		59.374	11.94
4		49.060	14.45
5		40.493	17.51
6		33.300	21.29
7		27.499	25.79
8		22.722	31.21
1	HM-	72.856	9.73
2		59.915	11.84
3		49.478	14.33
4		40.883	17.35
5		33.744	21.01
6		27.750	25.55
7		22.916	30.94
8		18.935	37.45
1	RM+	221.932	3.20
2		182.510	3.89
3		150.718	4.70
4		124.536	5.69
5		102.789	6.90
6		84.531	8.39
7		69.806	10.16
8		57.680	12.29

Gear	Group	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed at rated engine speed of 2200 rev/min km/h (*)
1	RM-	184.943	3.83
2		152.091	4.66
3		125.598	5.65
4		103.780	6.83
5		85.658	8.28
6		70.442	10.07
7		58.172	12.19
8		48.067	14.75

L: Low range, H: High range, M+: Torque multiplier engaged in position "plus", M-: Torque multiplier engaged in position "minus"

(*) Calculated with a tyre dynamic radius index of 855 mm (ISO 4251/1-1988).

Number of revolutions of front wheels for one revolution of rear-wheels: 1.4038

POWER TAKE-OFF

Main power take-off

Type: Independent

Method of engagement: Hydraulic clutch operated by hand lever, independent of main drive clutch, wet multiplate

Number of shafts: 1

Method of changing power take-off speeds: Manually by shaft turning

Power take-off proportional to engine speed

Location: At rear of tractor

P.T.O.	Diameter of power take-off shaft end mm	Number of splines	In conformity with ISO 500/1991
540	34.9	6	Yes
1000	34.9	21	Yes

Height above ground: 719 mm

Distance from the median plane of tractor: 0 mm

Distance behind rear-wheel axis: 530 mm

P.T.O.	P.T.O. speed rev/min	Engine speed rev/min	Ratio of rotation speeds (engine/P.T.O.)	Power restriction kW
540	540	1908	3.5333	48.0
	623	2200		
1000	1000	1920	1.9200	None
	1146	2200		

Direction of rotation (viewed facing driving end): Clockwise

Power take-off proportional to ground speed: None

Front power take-off

Type: Independent

Method of engagement: Hydraulic clutch operated by hand lever, independent of main drive clutch, wet multiplate

Number of shafts: 1

Method of changing power take-off speeds: None

Power take-off proportional to engine speed

Location: At front of tractor

P.T.O.	Diameter of power take-off shaft end mm	Number of splines	In conformity with ISO 500/1991
1000	34.9	21	Yes

Height above ground: 748 mm

Distance from the median plane of tractor: 0 mm

Distance before front-wheel axis: 621 mm

P.T.O.	P.T.O. speed rev/min	Engine speed rev/min	Ratio of rotation speeds (engine/P.T.O.)	Power restriction kW
1000	1000	1947	1.9474	40.0
	1130	2200		

Direction of rotation (viewed facing driving end): Clockwise

Power take-off proportional to ground speed None

POWER LIFT

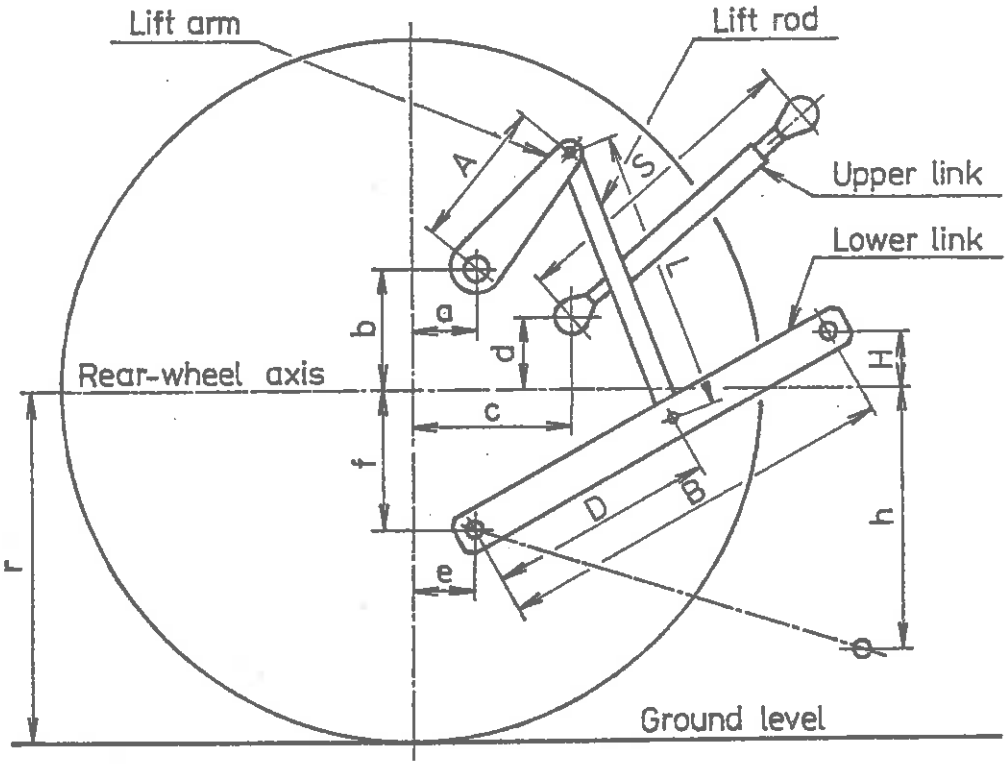
Rear power lift

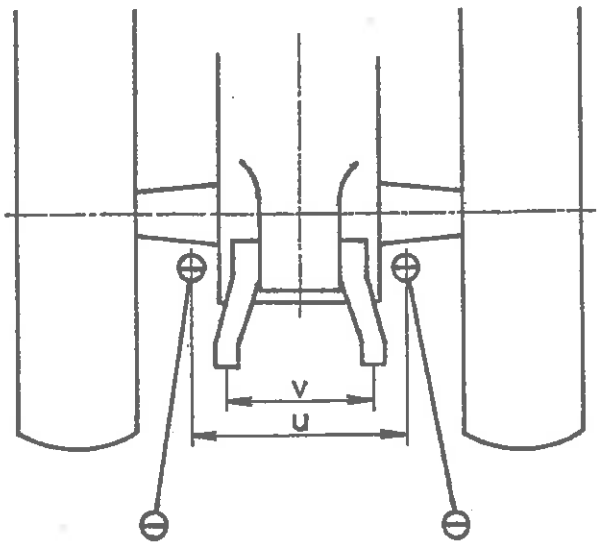
Make, model and type:	ZTS, 63.904.401, hydraulic with mechanical position, draft or mixed control, lower link sensing
Type of hydraulic system:	Open centre
Type and number of cylinders:	1 integral single-acting and 2 external single-acting
Type of linkage lock for transport:	Hydraulic
Relief valve pressure setting:	18.0+2.0 MPa
Opening pressure of cylinder safety valve:	21.0+2.0 MPa
Lift pump type:	Gear, main and additional pumps
Transmission between pump and engine:	Gear driven from engine
Type and number of filters:	1 magnetic and 1 screen filter in suction side and 3 full flow filters with replaceable paper cartridge in delivery side of pumps of hydraulic and gear box
Site of oil reservoir:	Transmission housing
Type, number and location of tapping points:	5 pressure and 1 return, quick release at rear of tractor, quick release 1 and 2 only for main pump and 4 pressure and 1 return, quick release at right front corner of cab, quick release 11 and 12 only for main pump

Maximum volume of oil available to external cylinders:	15 dm^3

Rear three-point linkage

Category:	3, in conformity with ISO 730/1-1990
Category adapter:	None





Linkage geometry dimensions:

		Dimension or range mm	Settings used in test mm
Length of lift arms	(A)	330	330
Length of lower links	(B)	994	994
Distance of lift arm pivot point from :horizontally	(a)	170	170
rear-wheel axis :vertically	(b)	285	285
Horizontal distance between the 2 lower link points	(u)	542	542
Horizontal distance between the 2 lift arm end points	(v)	640	640
Length of upper link	(S)	659 to 880	738
Distance of upper link pivot point from :horizontally	(c)	385	385
rear-wheel axis :vertically	(d)	123, 170, 210	210
Distance of lower link pivot point from :horizontally	(e)	130	130
rear-wheel axis :vertically	(f)	255	255
Distance of lower link pivot points to lift rod pivot points on lower links	(D)	501	501
Length of lift rods	(L)	503 to 588	576
Height of lower hitch points relative to the rear-wheel axis:			
- in low position	(h)	506 to 692	625
- in high position	(H)	61 to 205	127
Height above ground of lower hitch points when locked in transport position (*)		Any height withing lift range	

(*) Assuming the tyre dynamic radius index r=855 mm of ISO 4251/1-1988

Front power lift

Make, model and type: ZTS, 63.440.200, hydraulic

Type of hydraulic system: Common with rear power lift

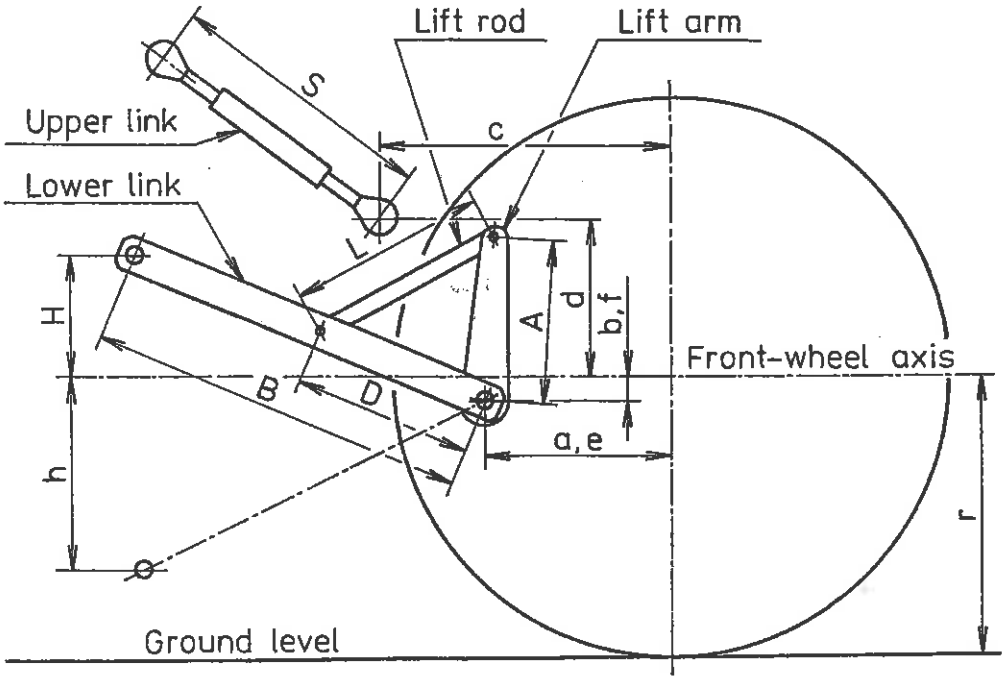
Type and number of cylinders: 2 external single-acting

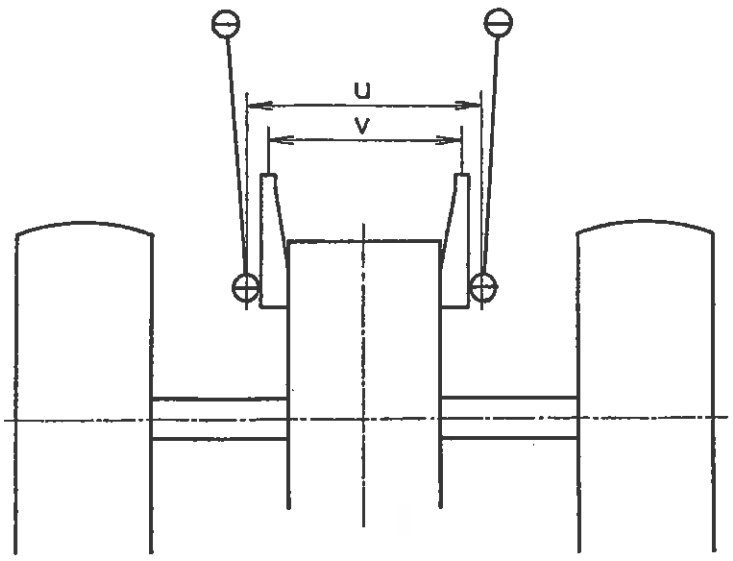
Type of linkage lock for transport: Hydraulic

Relief valve pressure setting:	18.0+2.0 MPa
Opening pressure of cylinder safety valve:	16.5+0.5 MPa

Front three-point linkage

Category:	2, in conformity with ISO 730/1-1990
Category adapter:	None





Linkage geometry dimensions:

		Dimension or range mm	Settings used in test mm
Length of lift arms	(A)	366	366
Length of lower links	(B)	852	852
Distance of lift arm pivot point from :horizontally	(a)	421	421
front-wheel axis :vertically	(b)	53	53
Horizontal distance between the 2 lower link points	(u)	750	750
Horizontal distance between the 2 lift arm end points	(v)	720	720
Length of upper link	(S)	488 to 680	623
Distance of upper link pivot point from :horizontally	(c)	656	656
front-wheel axis :vertically	(d)	353	353
Distance of lower link pivot point from :horizontally	(e)	421	421
front-wheel axis :vertically	(f)	53	53
Distance of lower link pivot points to lift rod pivot points on lower links	(D)	403	403
Length of lift rods	(L)	411 to 487	484
Height of lower hitch points relative to the front-wheel axis:			
- in low position	(h)	265 to 455	420
- in high position	(H)	241 to 437	278
Height above ground of lower hitch points when locked in transport position (*)		Any height withing lift range	

(*) Assuming the tyre dynamic radius index r=620 mm of ISO 4251/1-1988

SWINGING DRAWBAR

Type: Clevis

Height above ground:
Maximum: 439 mm
Minimum: 439 mm

Type of adjustment:	Swinging, sliding drawbar in two distance of hitch point from power take-off shaft end - 400 and 500 mm
Distance of hitch point from rear-wheel axis, horizontally:	907, 924, and 930 mm for 400 mm and 1009, 1025 and 1030 mm for 500 mm
Distance of hitch point from power take-off shaft end:	
Vertically:	280 mm
Horizontally:	377, 394 and 400 mm for 400 mm, 479, 495 and 500 mm for 500 mm
Lateral adjustment:	
Right-hand:	78 and 156 mm for 400 mm, 82 and 164 mm for 500 mm
Left-hand:	78 and 156 mm for 400 mm, 82 and 164 mm for 500 mm
Distance of pivot point from rear-wheel axis, horizontally:	385 mm to rear
Diameter drawbar pin hole:	33 mm
Maximum vertical permissible load:	9 kN for 400 mm, 7 kN for 500 mm

TRAILER HITCH

Type:	Automatic clevis
Hole diameter:	42 mm
Height above ground:	758, 808, 858, 908 and 958 mm
Distance of hitch point from rear-wheel axis, horizontally:	930 mm
Distance of hitch point from power take-off shaft end:	
Vertically:	39, 89, 139, 189 and 239 mm
Horizontally:	400 mm
Maximum vertical permissible load:	10 kN

HOLED DRAWBAR

Number of holes:	9
Distance between holes:	80 mm
Hole diameter:	32 mm

Thickness/width of the drawbar:	2x20 mm/100 mm
Height above ground:	
Maximum:	982 mm
Minimum:	230 mm
Horizontal distance to power take-off shaft end:	594 mm

SEMI-TRAILER HITCH

Type:	Towing hook
Hole diameter:	47 mm
Height above ground:	489 mm
Distance of hitch point from rear-wheel axis, horizontally:	709 mm
Distance of hitch point from power take-off shaft end:	
Vertically:	230 mm
Horizontally:	179 mm
Maximum vertical permissible load:	21 kN

FRONT TOWING HITCH None

STEERING

Make, model and type:	HYDRAULIK NORD, LAGB 100-1, hydrostatic
Method of operation:	Independent hydraulic circuit for steering
Pump:	Gear, driven from engine
Ram:	Double-acting cylinder on the front axle, symmetrical design
Working pressure:	14.0 MPa

BRAKES

Service brake

On the rear axle:

Make, model and type:	ZTS, 63.227.000, wet disc, multiplate, 5 discs on each side

Method of operation:	Hydraulically with air brake booster by pedals, coupled or independent
On the front axle:	
Make, model and type:	ZTS, 63.228.200, dry disc on the driving shaft to the front axle
Method of operation:	Hydraulically with air brake booster by coupled pedals
Trailer braking take-off:	Air brake operated by tractor
Parking brake	
Type:	Common with service brake
Method of operation:	Mechanical by hand lever with ratchet

WHEELS

Number:	
Front:	2, steering and driving
Rear:	2, driving
Wheelbase:	2859 mm

Track width adjustment:

	Minimum mm	Maximum mm	Adjustment method
Front	1910	2010	By changing wheel discs to either side of wheel centre
Rear	1860	1860	None

PROTECTIVE STRUCTURE

Make, model and type:	VĽAD, BK UR IV, cab with integrated safety frame and air conditioner
Manufacturer's name and address:	VĽAD, 081 17 Prešov, Slovakia
Protective device:	Cab, not tiltable
O.E.C.D. approval number:	CSS 0234/4

DRIVER'S SEAT

Make, model and type:	MARS, Zetor 5911 5400, upholstered seat

Type of suspension:	Parallelogram linkage adjustable for driver's weight
Type of damping:	Hydraulic
Range of adjustment:	
Longitudinal:	150 mm
Vertical:	60 mm

MISCELLANEOUS

Additional seat:	None

LIGHTING

	Height above ground of centre mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headlights	1285	120x120	250
Sidelights	2010	60x65	895
Sidelights	2920 (*)	ϕ60	955
Rearlights	1850	105x70	820
Rearlights	2920 (*)	ϕ60	955
Reflectors	990	ϕ80	810

(*) At top of cab

II. TEST CONDITIONS

Overall dimensions

Length mm	Width		Height at top of	
	minimum mm	maximum mm	protective structure mm	exhaust silencer mm
5320	2440	2520	3000	3270

Ground clearence
(unballasted tractor): 345 mm

Clearance-limiting part: Semi-trailer hitch

Tractor mass (with cab)

	Without driver kg	With driver kg
Front	2625	2635
Rear	3870	3935
Total	6495	6570

Tyre and track width specifications

	Front	Rear
Tyres:		
Make	BARUM	TAURUS
Dimensions	16.9-24	20.8R38
Ply rating	8	153 A8
Type	diagonal	radial
Maximum load (tyre manufacturer's)	16.32 kN	36.50 kN
Maximum load (tractor manufacturer's)	16.40 kN	24.73 kN
Inflation pressure (tyre manufac.)	170 kPa	160 kPa
Dynamic radius index	620 mm	855 mm
Chosen track width:	2010 mm	1860 mm

Oils and lubrication

Capacity and change interval:

	Capacity dm^3	Oil change h	Filter change h
Engine	19.0	200	200
Gear box	75.0	1200	(*)
Front axle	2.6	2400	-
Rear axle	Common with gear box		
Final drive (front)	2x1.3	2400	-
Final drive (rear)	2x4.0	1200	-
Hydraulic system	Common with gear box		
Steering	8.0	1200	1200
Front P.T.O.	1.3	1200	-

(*) At switch on warning light on instrument panel

Specifications:

	Recommended	Used during test
Engine oil: Type Viscosity Classification	 SAE 30 12.0 cSt at 100 °C API SC/CB	As recommended
Transmission oils: Type Viscosity Classification	 SAE 80W 7.5 cSt at 100 °C API GL-4	As recommended
Steering oil: Type Viscosity Classification	 OL-N22 19.8 cSt at 40 °C ISO 6743 HH 22	As recommended

Hydraulic fluid: Same as transmission

Grease:

Number of lubrication points: 26

Fuel

Type: Diesel fuel, in conformity with national standard ČSN 65 6506

Density at 15 °C: 0.835 g/cm^3 for P.T.O. tests
0.835 g/cm^3 for drawbar tests

III. TEST RESULTS

COMPULSORY TESTS RESULTS

1. MAIN POWER TAKE-OFF

Date and location of tests: 14th October 1992, SZZPLS Praha
Type of dynamometer: FROUDE AG 400

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	rev/min		kg/h	l/h	g/kWh	kWh/l
1.1 MAXIMUM POWER - TWO-HOUR TEST						
83.4	2200	1146	21.86	26.34	262	3.17
1.2 POWER AT RATED ENGINE SPEED						
83.4	2200	1146	21.86	26.34	262	3.17
1.3 STANDARD POWER TAKE-OFF SPEED 1000 rev/min						
78.3	1920	1000	20.03	24.13	256	3.24
1.4 PART LOADS 1.4.1 the torque corresponding to maximum power at rated engine speed						
83.4	2200	1146	21.86	26.34	262	3.17
1.4.2 85 % of torque obtained in 1.4.1						
72.8	2260	1177	19.63	23.65	270	3.08
1.4.3 75 % of torque defined in 1.4.2						
55.7	2306	1201	16.18	19.49	290	2.86
1.4.4 50 % of torque defined in 1.4.2						
37.7	2342	1220	12.81	15.43	340	2.44
1.4.5 25 % of torque defined in 1.4.2						
19.1	2373	1236	9.85	11.87	516	1.61
1.4.6 unloaded						
-	2398	1249	6.95	8.37	-	-

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	rev/min		kg/h	l/h	g/kWh	kWh/l
1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED 1000 rev/min						
1.5.1 the torque corresponding to maximum power						
78.3	1920	1000	20.03	24.13	256	3.24
1.5.2 85 % of torque obtained in 1.5.1						
70.9	2047	1066	18.06	21.76	255	3.26
1.5.3 75 % of torque defined in 1.5.2						
54.8	2108	1098	14.83	17.87	271	3.07
1.5.4 50 % of torque defined in 1.5.2						
37.1	2141	1115	11.55	13.92	311	2.67
1.5.5 25 % of torque defined in 1.5.2						
18.8	2164	1127	8.39	10.11	446	1.86
1.5.6 unloaded						
-	2200	1146	5.68	6.84	-	-

No load maximum engine speed: 2398 rev/min

Torque (equivalent crankshaft) at maximum power: 362.0 Nm

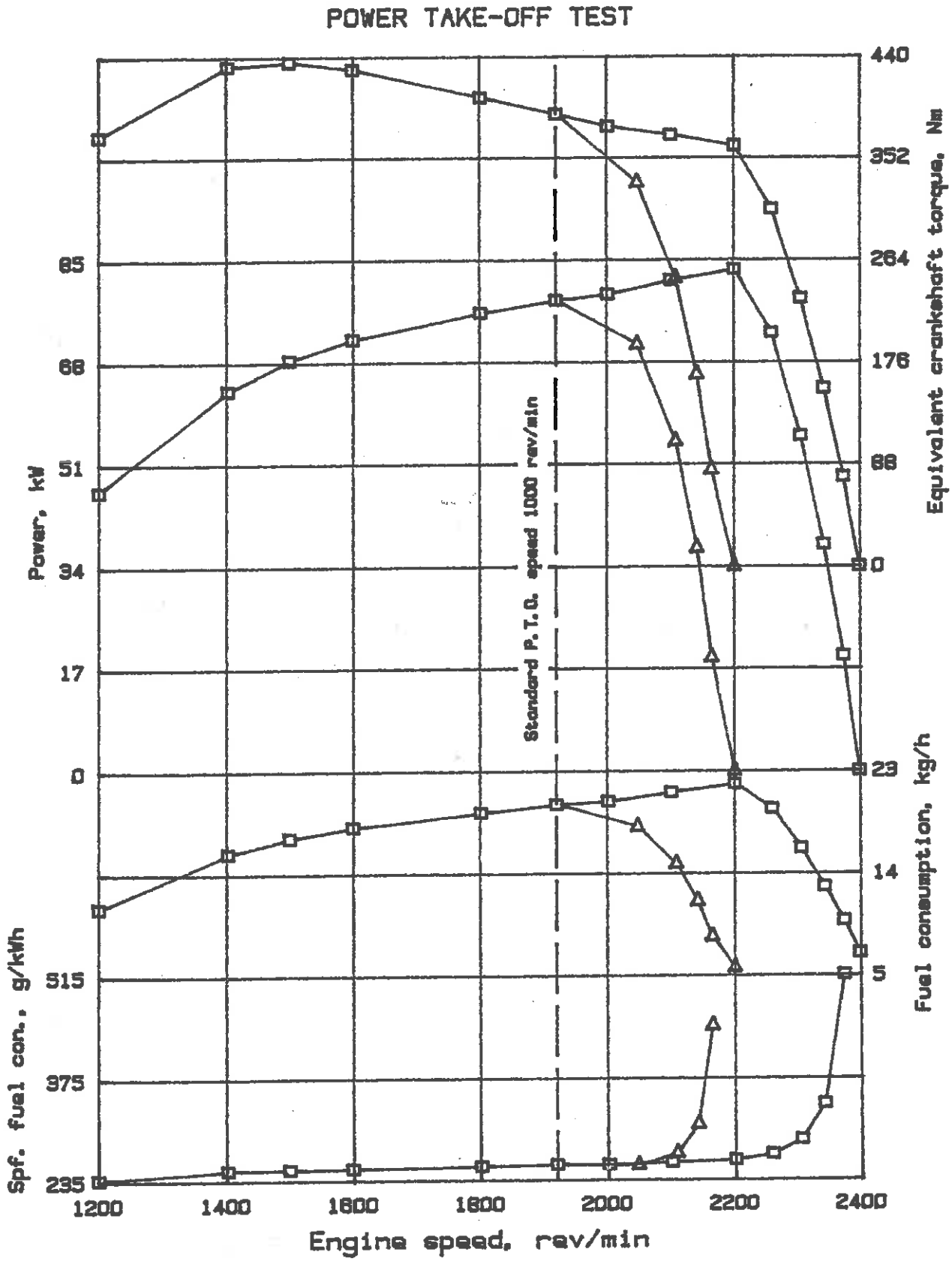
Maximum torque (equivalent crankshaft): 435.4 Nm
(engine speed: 1500 rev/min)

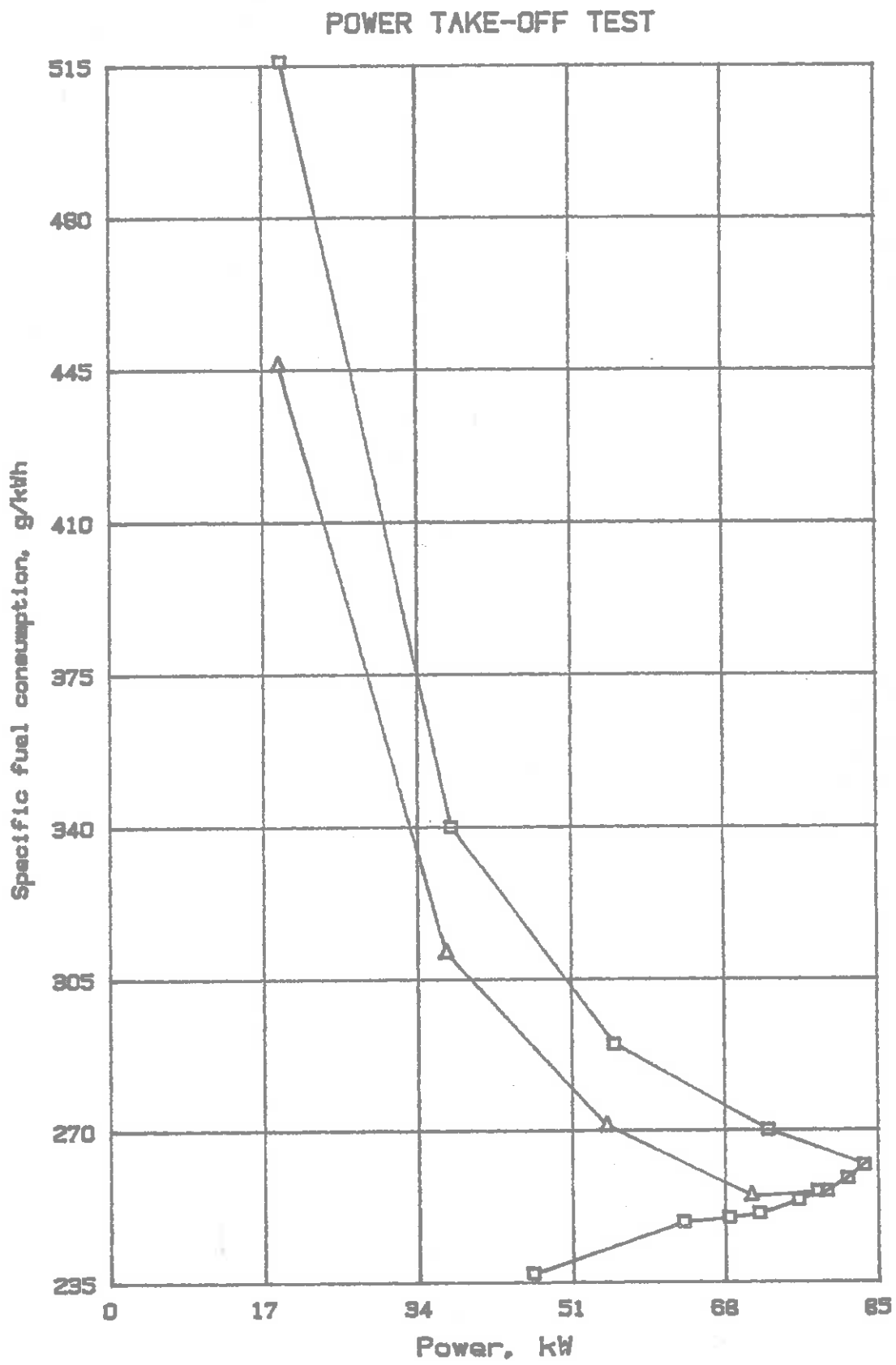
Mean atmospheric conditions:

Temperature: 20 °C
Pressure: 97.6 kPa
Relative humidity: 41 %

Maximum temperatures:

Coolant: 90 °C
Engine oil: 113 °C
Fuel: 40 °C
Engine air intake: 32 °C


POWER TAKE-OFF TEST
Power, kW
85
68
51
34
17
0
Spf. fuel con., g/kWh
515
375
235
Standard P.T.O. speed 1000 rev/min
Equivalent crankshaft torque, Nm
440
352
264
176
88
0
Fuel consumption, kg/h
23
14
5
1200
1400
1600
1800
2000
2200
2400
Engine speed, rev/min


POWER TAKE-OFF TEST
Specific fuel consumption, g/kWh
515
480
445
410
375
340
305
270
235
0
17
34
51
68
85
Power, kW

2. HYDRAULIC POWER AND LIFTING FORCE

Date of test: 9th and 10th February 1993

2.1 HYDRAULIC POWER TEST

Main pump

Sustained pressure with relief valve open: 19.3 MPa

Pump delivery rate at minimum pressure: 22.7 l/min

	Flow rate l/min	Pressure MPa	Power kW
At 90 % of the actual relief valve pressure setting	21.1	17.4	6.1
At maximum hydraulic power	21.0	18.0	6.3

Tapping point used for test: External tapping 1 and 4

Temperature of hydraulic fluid: 66 °C

Opening and closing pressures of the unloading valve: Not applicable

Additional pump

Sustained pressure with relief valve open: 18.0 MPa

Pump delivery rate at minimum pressure: 47.4 l/min

	Flow rate l/min	Pressure MPa	Power kW
At 90 % of the actual relief valve pressure setting	42.5	16.2	11.5
At maximum hydraulic power	41.8	16.8	11.7

Tapping point used for test: External tapping 5 and 4

Temperature of hydraulic fluid: 66 °C

Opening and closing pressures of the unloading valve: Not applicable

Main and additional pumps

Sustained pressure with relief valve open: 18.1 MPa

Pump delivery rate at minimum pressure: 70.0 l/min

	Flow rate l/min	Pressure MPa	Power kW
At 90 % of the actual relief valve pressure setting	62.0	16.3	16.8
At maximum hydraulic power	62.0	16.5	17.1

Tapping point used for test: External tapping 5 and 4

Temperature of hydraulic fluid: 65 °C

Opening and closing pressures of the unloading valve: Not applicable

2.2 POWER LIFT TEST

Rear power lift

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	230 mm	230 mm
Vertical movement	705 mm	888 mm
Maximum corrected force exerted through full range	71.7 kN	48.3 kN
Corresponding pressure of hydraulic fluid	17.4 MPa	17.4 MPa
Moment about rear-wheel axis	80.6 kNm	83.8 kNm
Maximum tilt angle of mast from vertical	-	14 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points												
mm	-436	-370	-300	-200	-100	0	+100	+200	+300	+335	+400	+452
Lifting forces at the hitch points, corrected to 17.4 MPa												
kN	-	79.4	79.6	78.7	77.1	75.3	73.7	72.6	71.8	71.7	-	-
Lifting forces at the test frame, corrected to 17.4 MPa												
kN	68.8	-	67.2	65.0	62.7	59.8	57.3	54.6	52.1	-	49.5	48.3

Front power lift

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	200 mm	200 mm
Vertical movement	674 mm	862 mm
Maximum corrected force exerted through full range	22.6 kN	15.1 kN
Corresponding pressure of hydraulic fluid (*)	14.4 MPa	14.4 MPa
Moment about front-wheel axis	28.8 kNm	29.2 kNm
Maximum tilt angle of mast from vertical	-	11 degrees

(*) Maximum pressure on the hydraulic cylinders: 16.0 MPa

Lifting heights relative to the horizontal plane including the lower link pivot points												
mm	-474	-400	-367	-300	-200	-100	0	+100	+200	+300	+307	+388
Lifting forces at the hitch points, corrected to 14.4 MPa												
kN	-	-	25.5	25.1	24.8	24.7	24.4	24.1	23.8	23.3	22.6	-
Lifting forces at the test frame, corrected to 14.4 MPa												
kN	22.2	20.8	-	20.2	19.7	18.9	18.1	17.5	16.4	15.5	-	15.1

3. DRAWBAR POWER AND FUEL CONSUMPTION (UNBALLASTED TRACTOR)

Date of test: 11th November 1992

Type of track: Bituminous-concrete surface

Height of drawbar above ground	Tyre inflation pressure	
	Front	Rear
439 mm	140 kPa	130 kPa

Gear and group	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Specific fuel consumption
	kW	kN	km/h	rev/min	%	g/kWh
3.1 MAXIMUM POWER IN TESTED GEARS						
4 LM+	53.4	56.7	3.39	2254	15.1	375
4 LM-	64.3	55.1	4.20	2199	14.7	350
5 LM+	64.7	54.7	4.26	2204	11.8	344
5 LM-	71.8	48.3	5.35	2204	5.6	311
6 LM+	72.4	47.8	5.45	2206	5.5	308
6 LM-	71.3	38.7	6.63	2203	3.8	315
7 LM+	71.2	38.2	6.71	2204	3.7	313
7 LM-	68.3	30.5	8.06	2201	3.0	327
1 HM+	73.2	32.6	8.08	2204	3.2	304
8 LM+	69.4	30.7	8.14	2203	3.1	322
1 HM-	73.7	27.2	9.76	2196	2.8	302
8 LM-	66.1	24.2	9.83	2196	2.5	338
2 HM+	73.3	26.6	9.92	2202	2.7	305
3.2 FUEL CONSUMPTION						
3.2.1 in selected gear, at maximum power at rated speed						
1 HM-	73.7	27.2	9.76	2196	2.8	302
3.2.1.1 75 % of pull at maximum power at rated speed						
1 HM-	57.3	20.4	10.11	2261	2.1	324
3.2.1.2 50 % of pull at maximum power at rated speed						
1 HM-	39.1	13.6	10.35	2302	1.5	376
3.2.1.3 next higher gear at reduced engine speed; same pull						
8 LM-	57.2	20.4	10.10	2245	2.1	353
3.2.1.4 next higher gear at reduced engine speed; same pull						
8 LM-	39.0	13.6	10.33	2283	1.5	425
3.2.2 in selected gear nearest to 7.5 km/h at rated speed						
7 LM-	68.3	30.5	8.06	2201	3.0	327
3.2.2.1 75 % of pull at maximum power at rated speed						
7 LM-	53.2	22.9	8.36	2256	2.4	351
3.2.2.2 50 % of pull at maximum power at rated speed						
7 LM-	36.3	15.3	8.55	2289	1.7	416
3.2.2.3 next higher gear at reduced engine speed; same pull						
1 HM+	53.1	22.9	8.35	2246	2.4	319
3.2.2.4 next higher gear at reduced engine speed; same pull						
1 HM+	36.1	15.3	8.49	2269	1.7	453

Specific energy	Temperature			Atmospheric conditions		
	Fuel	Coolant	Engine oil	Tempera-ture	Relative humidity	Pressure
kWh/l	°C	°C	°C	°C	%	kPa
2.23	18	78	97	3	79	96.7
2.38	19	78	98	3	85	96.7
2.43	20	79	98	3	89	96.7
2.68	22	78	98	3	89	96.6
2.71	22	78	98	4	89	96.9
2.65	22	78	98	4	89	96.9
2.67	22	79	97	4	87	96.9
2.55	20	79	98	4	87	96.9
2.75	20	79	97	4	87	96.9
2.60	21	78	97	4	85	96.9
2.76	21	78	98	4	84	96.9
2.47	22	78	98	4	84	96.9
2.73	23	78	98	4	84	96.9
2.76	21	78	98	4	84	96.9
2.58	22	78	97	5	76	96.9
2.22	23	78	98	5	76	96.9
and travelling speed as in 3.2.1.1						
2.36	23	79	97	5	76	96.9
and travelling speed as in 3.2.1.2						
1.96	24	78	98	5	76	96.9
2.55	20	79	98	4	87	96.9
2.38	22	78	98	5	76	96.9
2.01	24	78	98	5	76	96.9
and travelling speed as in 3.2.2.1						
2.62	23	78	98	5	76	96.9
and travelling speed as in 3.2.2.2						
1.84	24	78	97	5	76	96.9

OPTIONAL TEST RESULTS

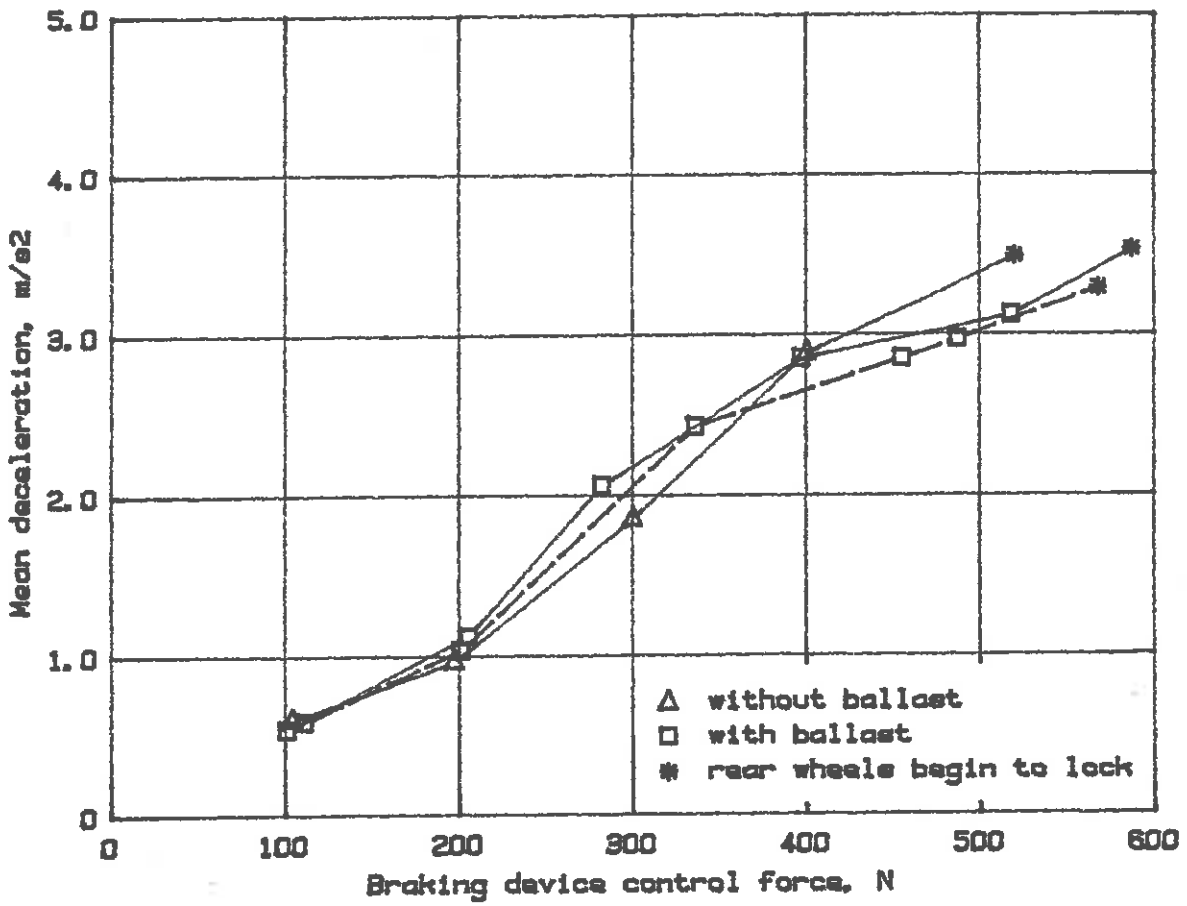
4. BRAKING

Date of test: 10th and 11th September 1992

	Tractor mass (with driver)			Speed before application of brakes
	Front kg	Rear kg	Total kg	km/h
Ballasted	3280	4945	8225	39.1
Unballasted	2635	3935	6570	39.2

4.1 COLD SERVICE BRAKING DEVICE TEST (————————)

4.2 FADE TEST (- - - - - -)



Maximum deviation of tractor from its original course:	Not significant
Abnormal vibration:	None
Brake heating method:	Driven with brakes applied for 1 km at 80 % of maximum speed with a pedal force corresponding to a deceleration of 1 m/s^2

4.3 PARKING BRAKING DEVICE TEST

	Ballasted tractor on 18 % - slope	
	Uphill	Downhill
Braking device control force	301 N	294 N

5. MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of test:	22nd March 1993
Make and model of sound level meter:	BRÜEL & KJAER, 2231
Type of track:	Bituminous-concrete surface
Gear number:	8 HM-
Travelling speed before acceleration:	29.4 km/h
Sound level:	84.5 dB(A)

6. REPAIRS

None

7. REMARKS

None

Test carried out by: Dipl. Ing. Peter Pernis

Head of the Tractor Department	Director
Dipl. Ing. Peter Pernis	Dipl. Ing. Vladimír Hanzlík