STÁTNÍ ZKUŠEBNA ZEMĚDĚLSKÝCH, POTRAVINÁŘSKÝCH A LESNICKÝCH STROJŮ

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Report on test in accordance with the O.E.C.D. STANDARD CODE 2 for the Official Testing of Agricultural and Forestry Tractors

Restricted Code

O.E.C.D. approval № 2/1458/3

Date of approval: 9th March 1999



Agricultural Tractor

ZETOR 33 20 Utility (2WD) 30 km/h version

Manufactured by: ZETOR a.s., CZ-632 00 Brno, Czech Republic

Report № 14090

Date of test: December 1998 – January 1999

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GENERAL NOTE

SZZPLS Praha is still the official Czech Republic Test Station for carrying out Tests in accordance with the OECD Standard Codes for the Official Testing of Agricultural and Forestry Tractors.

Checking for the extension test report

Location:	SZZPLS Praha, Czech Republic
Date of checking:	25th January 1999

This extension of validity for a original test has been approved by the OECD Co-ordinating Centre in Antony (France), as being in accordance with OECD Standard Code for the Official Testing of Agricultural and Forestry Tractors - Code 2.

O.E.C.D. approval number:	2/1458/3
Date of approval:	9th March 1999

ORIGINAL TEST REPORT

The specifications of the tractor and the results of the performance test are taken from the report number:

O.E.C.D. approval number:	1458 Restricted Code
Date of approval:	21st June 1993
Make, model and type of tractor:	ZETOR, 3320, two wheels drive
Manufactured by:	ZETOR s.p., CZ-632 00 Brno, Czech Republic
Submitted for test by:	The manufacturer

The differences between the tractors ZETOR 3320 (2WD) and ZETOR 3320 Utility (2WD) 30 m/h version are written in *italics*, taking into account these differences, SZZPLS Praha has reproduced the hydraulic power and lifting force test and external sound level test and considers that the other results of reference test are valid for the tractor for which the extension is asked.

Tractor manufacturer's name and address:	ZETOR s.p., 632 00 Brno, Czech Republic *ZETOR a.s., CZ-632 00 Brno, Czech Republic*
Location of tractor assembly:	Brno, Czech Republic
Submitted for test by:	The manufacturer
Selected for test by:	The manufacturer
Place of running-in:	Brno, Czech Republic
Duration of running-in:	60 hours
Location of test:	SZZPLS Praha, Czech Republic

1. SPECIFICATIONS OF TRACTOR

1.1 IDENTIFICATION

Make:	ZETOR
Model:	3320 *3320 Utility 30 km/h version*
Type:	Wheeled, unit construction, rear wheels drive
Number of driving wheels:	2
Serial №:	047 333 *007 351*
1st Serial №:	047 333 *007 351*

1.2 ENGINE

Make:	ZBROJOVKA *ZETOR*
Model:	Zetor 5201 *5201*
Type:	4-stroke diesel engine, direct injection, water cooled, naturally aspirated
Serial №:	*075 587* **5201-094474**

1.2.1 Cylinders

Number/disposition:	3, in-line, vertical
Bore/stroke:	102 mm/110 mm
Capacity:	2697 cm³
Compression ratio:	17.0:1
Arrangement of valves:	Overhead
Cylinder liners:	Wet, replaceable
1.2.2 Supercharging	None

1.2.3 Fuel system

Fuel feed system:	Lift pump piston-type, integral with fuel injection pump
Make, model and type of fuel filter(s):	AUTOBRZDY, 443 741 111 001, one-stage with paper cartridge *ATESO, 443 741 111 001, one-stage with paper cartridge*
Capacity of fuel tank:	70 dm³ *43 dm³*
Make, model and type of injection pump:	MOTORPAL, PP 3M 3143, in-line *MOTORPAL, 3M 3143, in-line*
Serial №:	Dw 0552 *KD 0092*
Manufacturer's production setting of injection pump	
Flow rate (rated engine speed and full load):	9.72 to 10.12 dm³/h
Timing:	25°+1° before TDC
Make, model and type of injectors:	MOTORPAL, DOP 160S 430-1436, 4 hole
Injection pressure:	18.6-0.8 MPa

1.2.4 Governor

Make, model and type:	MOTORPAL, RV 3M 350 1100 3341, centrifugal, variable speed *MOTORPAL, RV 3M 350 1100 3303, centrifugal, variable speed*
Governed range of engine speed:	From 700 to 2410 rev/min
Rated engine speed:	2200 rev/min

1.2.5 Air cleaner

Pre-cleaner	
Make, model and type:	SANDRIK, PC 250, cyclon type *Integral with main cleaner, cyclon type*
Location of air intake:	Under bonnet forward of radiator
Main cleaner	
Make, model and type:	SANDRIK, 9420.11, oil bath *DONALDSON, FPG 07-0006, dry with paper primary and safety elements, integrated cyclon type pre-cleaner*
Maintenance indicator:	None *Indicator on air cleaner*

1.2.6 Lubrication system

Type of feed pump:	Gear
Type of filter(s):	Full flow, two-stage screen filter *Full flow with replaceable paper element*
Number of filters:	2 *1*
Oil cooler:	None

1.2.7 Cooling system

Type of coolant:	Water and anti-freeze
Type of pump:	Centrifugal, belt driven
Specification of fan or blower:	Axial, belt driven
Number of fan blades:	4
Fan diameter:	380 mm
Coolant capacity:	10.5 dm³ *9.5 dm³*
Type of temperature control:	Thermostat
Superpressure system:	40±10 kPa

1.2.8 Starting system

Make, model and type:	PAL, 443 115 144 722, electrical, solenoid engaged *MAGNETON, 443 115 144 722, electrical, solenoid engaged*
Starter motor power rating:	2.9 kW
Cold starting aid:	None
Safety device:	Clutch pedal to be fully depressed

1.2.9 Electrical system

Voltage:	12 V, negative earth
Generator	
Make, model and type:	PAL, 443 113 516 651, alternator, belt driven *MAGNETON, 443 113 516 653, alternator, belt driven*
Power:	770 W
Battery of accumulators	
Number:	1
Rating:	150 Ah at 20 hours *88 Ah at 20 hours*

1.2.10 Exhaust system

Make, model and type:	ZETOR, 78.014.010, expansion and absorption muffler *ZETOR, 78.014.020, expansion and absorption muffler with additional muffler*
Location:	Left-hand side of engine, vertical

1.3 TRANSMISSION

1.3.1 Clutch

Make, model and type:	ZBROJOVKA, 5201 1100, dry for travelling and p.t.o. *ZETOR, 5201 1100, dry for travelling and p.t.o.*
Number of plates:	2
Diameter of plates:	280 mm

Method of operation: Hydraulically by pedal for travelling and p.t.o. and pneumatically by hand lever for p.t.o.
Mechanically by pedal for travelling and p.t.o. and mechanically by hand lever for p.t.o.

1.3.2 Gear box

Make, model and type: ZETOR, 60.121.000, mechanical

Description: Synchromesh gear box with 5 forward and 1 reverse speeds, group gear box with two speed ranges (T and R)

	Forward	Reverse
Number of gears	5	1
Number of groups	2	2
Total of arrangements	10	2

Available options: Alternative mounting of torque multiplier, creeper reduction gear or reverser
None

Oil cooler: None

1.3.3 Rear axle and final drives

Make, model and type: ZETOR, 6211 2800, crown wheel and bevel pinion differential and spur gear final drives

Differential lock

Type: Dog clutch

Method of engagement: Mechanically by pedal

Method of disengagement: Self-disengaging

1.3.4 Front axle

Make, model and type: ZETOR, 7211 3300, telescopic with adjustable track

1.3.5 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	T	553.886	1.07 *0.96*
2		451.294	1.31 *1.18*
3		303.818	1.95 *1.75*
4		189.114	3.14 ***2.81***
5		119.199	4.97 *4.45*
1	R	96.301	6.16 *5.51*
2		78.464	7.56 ***6.76***
3		52.823	11.23 *10.05*
4		32.880	18.04 ***16.14***
5		20.724	28.61 ***25.61***
R	T	556.084	1.07 *0.95*
	R	96.683	6.13 *5.49*
(*) Calculated with a tyre dynamic radius index of 715 mm (ISO 4251/1-1988) *Calculated with a tyre dynamic radius index of 640 mm (ISO 4251-1:1992)*			

T: Turtle group, R: Rabbit group

1.4 POWER TAKE-OFF

1.4.1 Main power take-off

Type:	Independent, through second plate in main clutch
Method of engagement:	Pneumatically operated by hand lever or hydraulically by clutch pedal *Mechanically operated by hand lever or by clutch pedal*
Number of shafts:	1
Method of changing power take-off shaft ends and speeds:	Manually by exchanging shafts *None*

1.4.1.1 Power take-off proportional to engine speed

Location: At rear of tractor

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

Height above ground: 722 mm
647 mm

Distance from the median plane of the tractor: 0 mm

Distance behind rear-wheel axis: 263 mm

P.T.O. type	P.T.O. speed	Engine speed	Ratio of rotation speeds (engine speed/p.t.o. speed)	Power restriction/Maximum torque transmissible
	rev/min	rev/min		kW/Nm
540	540	1994	3.6923	None
	596	2200		
1000	1000	2050	2.0500	None
	1073	2200		

Direction of rotation (viewed from behind tractor): Clockwise

1.4.1.2 Power take-off proportional to ground speed

Indicate	Group	Travelling distance for one revolution of power take-off shaft	Number of power take-off shaft revolutions for one revolution of (rear) driving wheels
rev/min		m	
540 or 1000	T	0.084 *0.075*	53.6395
	R	0.482 *0.431*	9.3260

T: Turtle group, R: Rabbit group

Direction of rotation with forward gear engaged (viewed from behind tractor): Clockwise

1.4.2 Optional power take-off

None

1.5 HYDRAULIC POWER LIFT

Make, model and type: ZETOR, 5011 9485, hydraulic with mechanical position, draft or mixed control, top link sensing

Type of hydraulic system: Open centre

Type and number of cylinders: 1 integral single-acting

Type of linkage lock for transport: Hydraulic

Relief valve pressure setting (tolerance): 18.0+0.2 MPa

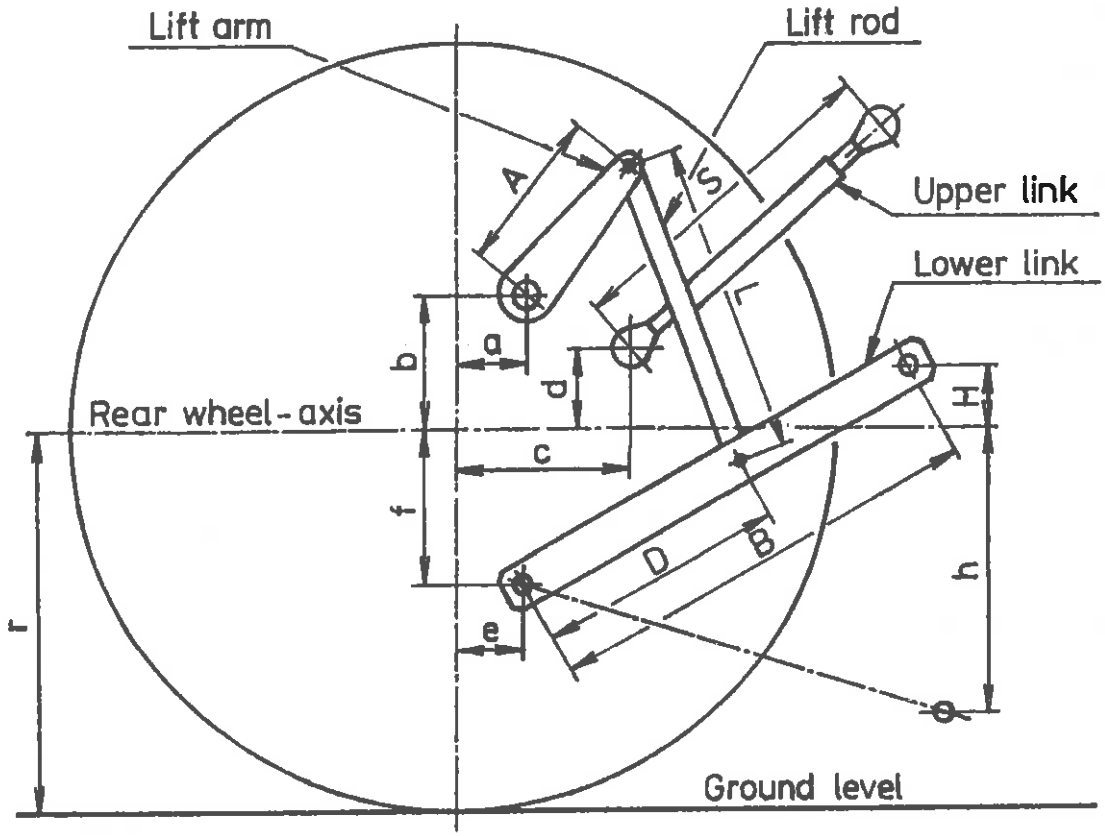
Opening pressure of cylinder safety valve: 21.0+2.0 MPa

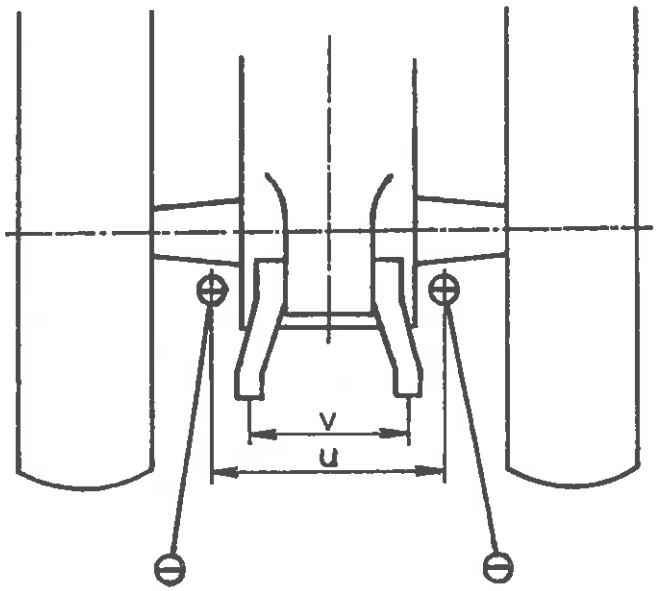
Lift pump type:	Gear pump
Transmission between pump and engine:	Gear driven from engine *Gear driven from p.t.o. shaft*
Type and number of filters:	1 magnetic, 1 screen and 1 filter with paper cartridge in delivery side of distributor *1 magnetic and 1 screen filter*
Site of oil reservoir:	Transmission housing
Type, number and location of tapping points:	ISO standard couplings 12.5 mm, one double acting control valves, 2 pressure and 1 return couplings at rear of tractor
Maximum volume of oil available to external cylinders:	10 dm^3

1.6 THREE-POINT LINKAGE

Category: 2, in conformity with ISO 730-1:1994

Category adapter: None





Linkage geometry dimensions:

			Dimension or range	Settings used in test
			mm	mm
Length of lift arms		(A)	320	320
Length of lower links		(B)	857	857
Distance of lift arm pivot point from rear-wheel axis:	horizontally	(a)	30	30
	vertically	(b)	362	362
Horizontal distance between the 2 lower link points		(u)	636	636
Horizontal distance between the 2 lift arm end points		(v)	450	450
Length of upper link		(S)	590 to 770	648 *656*
Distance of upper link pivot point from rear-wheel axis:	horizontally	(c)	288	288
	vertically	(d)	182, 229, 276, 323	276 *323*
Distance of lower link pivot point from rear-wheel axis:	horizontally	(e)	83	83
	vertically	(f)	138	138
Distance of lower link pivot points to lift rod pivot points on lower links		(D)	401	401
Length of lift rods		(L)	436 to 572	560 *511*
Height of lower hitch points relative to the rear-wheel axis:				
	in low position	(h)	271 to 605	515 *440*
	in high position	(H)	99 to 370	180 *189*
Height above ground of lower hitch points when locked in transport position (*)			Any height withing lift range	

(*) Assuming r=715 mm tyre dynamic radius index of ISO 4251/1-1988
Assuming r=640 mm tyre dynamic radius index of ISO 4251-1:1998

1.7 SWINGING DRAWBAR

Type: Clevis

Height above ground
Maximum: 614 mm
642 mm
Minimum: 444 mm
232 mm

Type of adjustment: Inverting drawbar and clevis
Inverting drawbar and clevis and sliding drawbar in two distance of the hitch point from power take-off shaft end – 335 and 405 mm

Distance of hitch point from rear-wheel axis, horizontally: 653, 664 and 668 mm
604, 614, and 618 mm for 355 mm, 653, 664 and 668 mm for 405 mm

Distance of hitch point from power take-off shaft end	
Vertically:	108, 188, 198 and 278 mm *5, 115, 305 and 415 mm*
Horizontally:	390, 401 and 405 mm *341, 351 and 355 mm for 355 mm, 390, 401 and 405 mm for 405 mm*
Lateral adjustment (centre of clevis)	
Right-hand:	80 and 160 mm *75 and 150 mm for 355 mm, 80 and 160 mm for 405 mm*
Left-hand:	80 and 160 mm *75 and 150 mm for 355 mm, 80 and 160 mm for 405 mm*
Distance of pivot point from rear-wheel axis, horizontally:	185 mm to front
Diameter of drawbar pin hole:	32 mm
Maximum vertical permissible load:	6 kN *12 kN for the height above ground 342 and 642 mm and 6 kN for the height above ground 232 and 532 mm*

1.8 TRAILER HITCH *(on request available, not fitted to tested tractor)*

Type:	Automatic clevis
Hole diameter:	35 mm
Height above ground:	747, 797, 847, 897 and 947 mm *672, 722, 772, 822 and 872 mm*
Distance of hitch point from rear-wheel axis, horizontally:	628 mm
Distance of hitch point from power take-off shaft end	
Vertically:	25, 75, 125, 175 and 225 mm
Horizontally:	365 mm
Maximum vertical permissible load:	10 kN

1.9 HOLED DRAWBAR *(on request available, not fitted to tested tractor)*

Number of holes:	7
Distance between holes:	80 mm
Hole diameter:	32 mm
Thickness/width of the drawbar:	2×20 mm/90 mm
Height above ground	
Maximum:	895 mm *829 mm*
Minimum:	200 mm
Horizontal distance to power take-off shaft end (rear):	677 mm

1.10 FRONT TOWING HITCH

Height above ground: 628 mm
619 mm

Diameter of pin hole: 31 mm

1.11 STEERING

Make, model and type: DANFOSS, OSPC 80 ON, hydrostatic
DANFOSS, OSPC 100 ON, hydrostatic

Method of operation: Independent hydraulic circuit for steering

Pump(s): Gear pump, driven from engine

Ram(s): Double-acting cylinder on the front axle, simmetrical design

Working pressure: 8.0 MPa

1.12 BRAKES

1.12.1 Service brake

Rear axle

Make, model and type: ZETOR, 7245 2600, dry disc, multiplate, 2 discs on each side

Method of operation: Hydraulically by pedals, coupled or independent

Front axle: None

Trailer braking take-off: Air brake operated by tractor pedals
None

1.12.2 Parking brake

Type: Common with service brake

Method of operation: Mechanically by hand lever with ratchet

1.13 WHEELS

Number

Front: 2, steering

Rear: 2, driving

Wheelbase: 2114 mm

Track width adjustment:

	Minimum	Maximum	Adjustment method
	mm	mm	
Front	1350 *1380*	1800 *1830*	By extending of front axle
Rear	1345 *1350*	1795 *1800*	Reversing wheels and off-set lug rims

1.14 PROTECTIVE STRUCTURE *(not fitted to tested tractor)*

Make, model and type:	ROSTROJ, BK 6245, cab with integrated safety frame *VALMETAZ, OR 6320, rear roll bar frame*
Manufacturer's name and address:	ROSTROJ s.p., CZ-683 01 Rousínov, Czech Republic *VALMETAZ s.r.o., Kuoty 037, CZ-757 0 1 Valašské Meziříčí, Czech Republic*
Protective device	
Cab/frame/rollguard/other:	Cab *Rollguard*
Tiltable/not tiltable:	Not tiltable
O.E.C.D. approval	
Approval number:	CSD 1363/12 *None*
Date of approval:	11th September 1992
Nos. of minor modification certificates, if any:	None

1.15 SEAT

1.15.1 Driver's seat

Make, model and type:	MARS, Zetor 5911-5400, upholstered seat *ZETOR, 6311 5400, upholstered seat*
Seat and steering wheel reversible:	No
Type of suspension:	Parallelogram linkage adjustable for driver's weight *Parallelogram linkage*
Type of damping:	Hydraulic *Mechanic*
Range of adjustment	
Longitudinally:	150 mm *90 mm*
Vertically:	60 mm *0 mm*
Safety belt:	No

1.15.2 Optional driver's seat(s)

None

1.15.3 Passenger seat

None

Location:	Left-hand side of driver
Capacity (number):	1

1.16 LIGHTING

	Height above ground of centre	Size	Distance from outside edge of lights to median plane of tractor
	mm	mm	mm
Headlights	1005 *975*	120×120 *Ø137*	188 ***195***
Sidelights	1500 *1455*	60×65	655 *650*
Rearlights	1560 *1465*	105×70	765 ***615***
Reflectors	1440 *675*	Ø78	890 ***475***

2. TEST CONDITIONS

2.1 OVERALL DIMENSIONS (unballasted tractor)

Length	Width		Height at top of	
	minimum	maximum	protective structure	exhaust pipe
mm	mm	mm	mm	mm
3640	1800 *1745*	2180 *2195*	2640 -	2595 *2575*

2.2 GROUND CLEARANCE (unballasted tractor): 375 mm
278 mm

Clearance-limiting part: Swinging drawbar in lowest position

2.3 TRACTOR MASS (unballasted tractor with cab)

	Without driver	With driver
	kg	kg
Front	1005 *785*	1015 ***800***
Rear	1890 *1370*	1955 *1430*
Total	2895 *2155*	2970 *2230*

2.4 TYRES AND TRACK WIDTH SPECIFICATIONS

	Front	Rear
Tyres:		
Make	BARUM	BARUM
Model	TP 8 *TP 8P*	TZ 13 *TZ 19*
Dimensions	7.50-16 *6.00-16*	13.6-36 *14.9-28*
Ply rating	6 PR *6 PR*	6 PR *8 PR*
Type	Diagonal	Diagonal
Maximum load (tyre manufacturer's)	7.45 kN *5.70 kN*	16.15 kN *18.80 kN*
Maximum load (tractor manufacturer's)	6.50 kN *5.60 kN*	16.15 kN *16.80 kN*
Inflation pressure (tyre manufacturer's)	280 kPa *340 kPa*	160 kPa *180 kPa*
Dynamic radius index	364 mm *340 mm*	715 mm *640 mm*
Chosen track width:	1425 mm *1455 mm*	1425 mm *1425 mm*

2.5 FUEL

Type:	Diesel fuel, in conformity with national standard ČSN EN 590
Density at 15 °C:	0.835 g/cm³ for p.t.o. tests 0.835 g/cm³ for drawbar tests

2.6 OILS AND LUBRICATIONS

2.6.1 Capacity and change interval

	Capacity	Oil change	Filter change
	dm³	h	h
Engine	9.0	200	- *200*
Gear box	25.0	1200	600
Rear axle		Common with gear box	
Final drive (rear)	2×1.9	1200	-
Hydraulic system		Common with gear box	
Steering	4.6	1200	1200
Air cleaner	1.3	100	-

2.6.2 Specifications

	Recommended	Used during test
Engine oil: Type Viscosity Classification	 SAE 15W-50 16.5 cSt at 100 °C API SD/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	 OH – HM32 28.8 cSt at 40 °C ISO 6743-L-HM32	As recommended

Hydraulic fluid: Same as transmission

Air cleaner filling: Same as engine
None

2.6.3 Grease

Number of lubrication points: 19
17

3. COMPULSORY TESTS RESULTS

3.1 MAIN POWER TAKE-OFF

Date and location of tests: 12th February 1992, SZZPLS Praha

Type of dynamometer bench: FROUDE AG 400, eddy-current

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	rev/min	rev/min	kg/h	l/h	g/kWh	kWh/l
3.1.1 MAXIMUM POWER - TWO-HOUR TEST						
31.9	2200	1073	8.12	9.72	255	3.28
3.1.2 POWER AT RATED ENGINE SPEED						
31.9	2200	1073	8.12	9.72	255	3.28
3.1.3 STANDARD POWER TAKE-OFF SPEED [1000±25 rev/min]						
31.2	2050	1000	7.78	9.32	249	3.35
3.1.4 PART LOADS 3.1.4.1 the torque corresponding to maximum power at rated engine speed						
31.9	2200	1073	8.12	9.72	255	3.28
3.1.4.2 85 % of torque obtained in 3.1.4.1						
28.5	2314	1129	7.56	9.05	265	3.15
3.1.4.3 75 % of torque defined in 3.1.4.2						
21.7	2351	1147	6.19	7.41	285	2.93
3.1.4.4 50 % of torque defined in 3.1.4.2						
14.8	2392	1167	4.91	5.88	332	2.52
3.1.4.5 25 % of torque defined in 3.1.4.2						
7.4	2409	1175	3.70	4.43	500	1.67
3.1.4.6 unloaded						
-	2450	1195	2.64	3.16	-	-

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	rev/min	rev/min	kg/h	l/h	g/kWh	kWh/l
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED [1000±25 rev/min] 3.1.5.1 the torque corresponding to maximum power						
31.2	2050	1000	7.78	9.32	249	3.35
3.1.5.2 85 % of torque obtained in 3.1.5.1						
28.2	2177	1062	7.15	8.56	254	3.29
3.1.5.3 75 % of torque defined in 3.1.5.2						
21.4	2208	1077	5.83	6.98	272	3.07
3.1.5.4 50 % of torque defined in 3.1.5.2						
14.5	2247	1096	4.53	5.43	312	2.67
3.1.5.5 25 % of torque defined in 3.1.5.2						
7.4	2278	1111	3.33	3.99	450	1.85
3.1.5.6 unloaded						
-	2294	1119	2.30	2.75	-	-

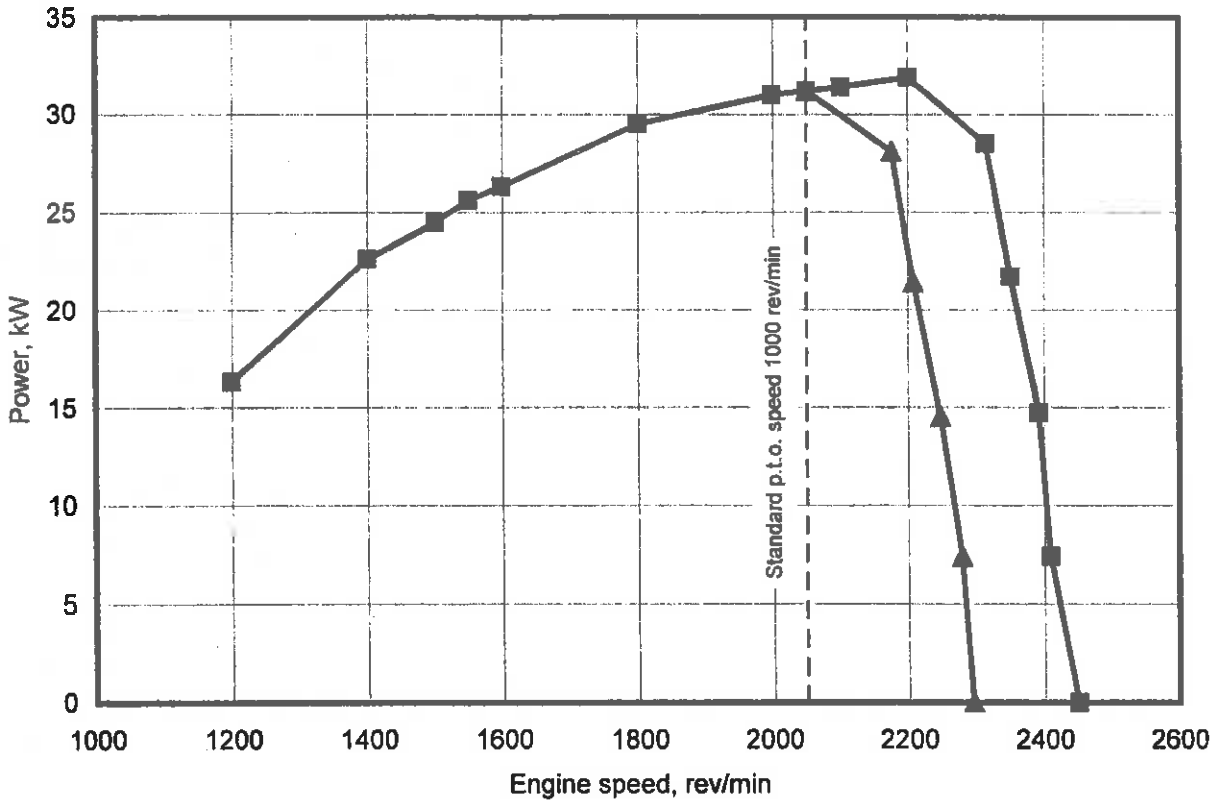
No load maximum engine speed: 2450 rev/min

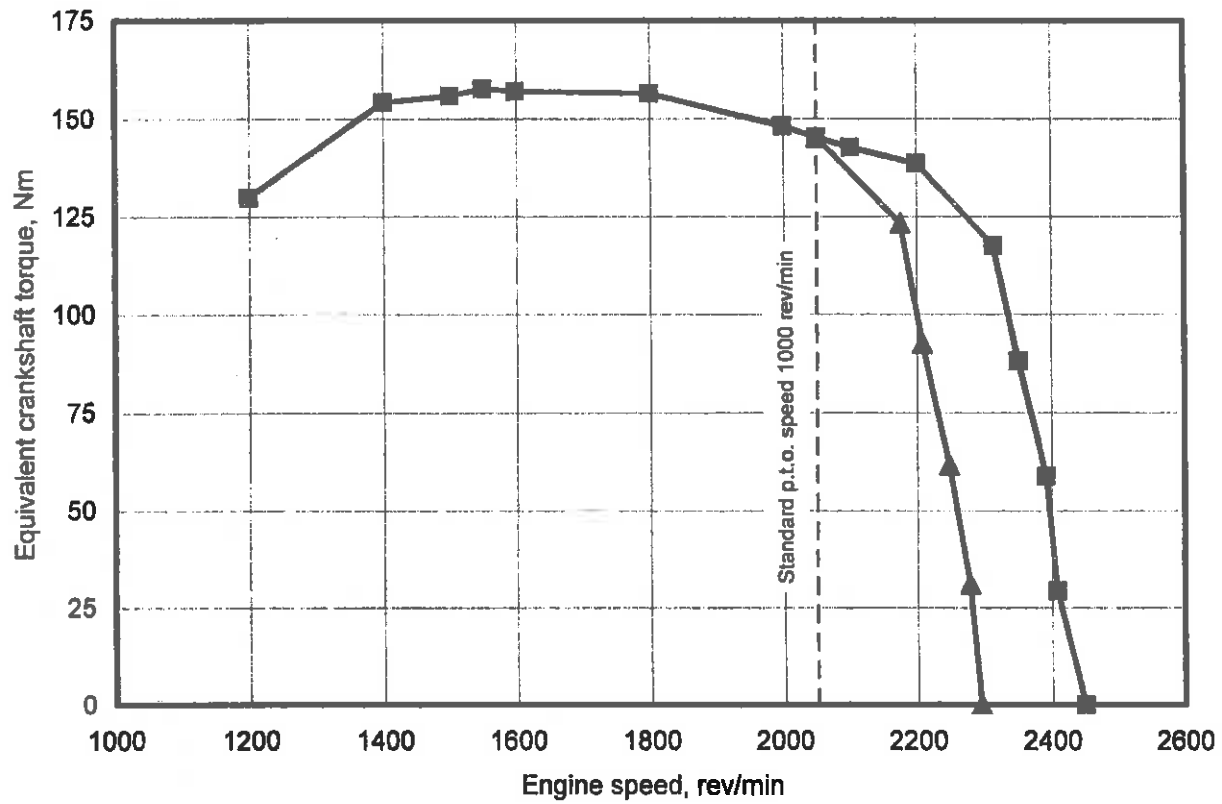
Torque (equivalent crankshaft)
At maximum power: 138.5 Nm
At rated engine speed: 138.5 Nm
At standard power take-off speed: 145.3 Nm

Maximum torque (equivalent crankshaft): 157.7 Nm
(engine speed: 1550 rev/min)

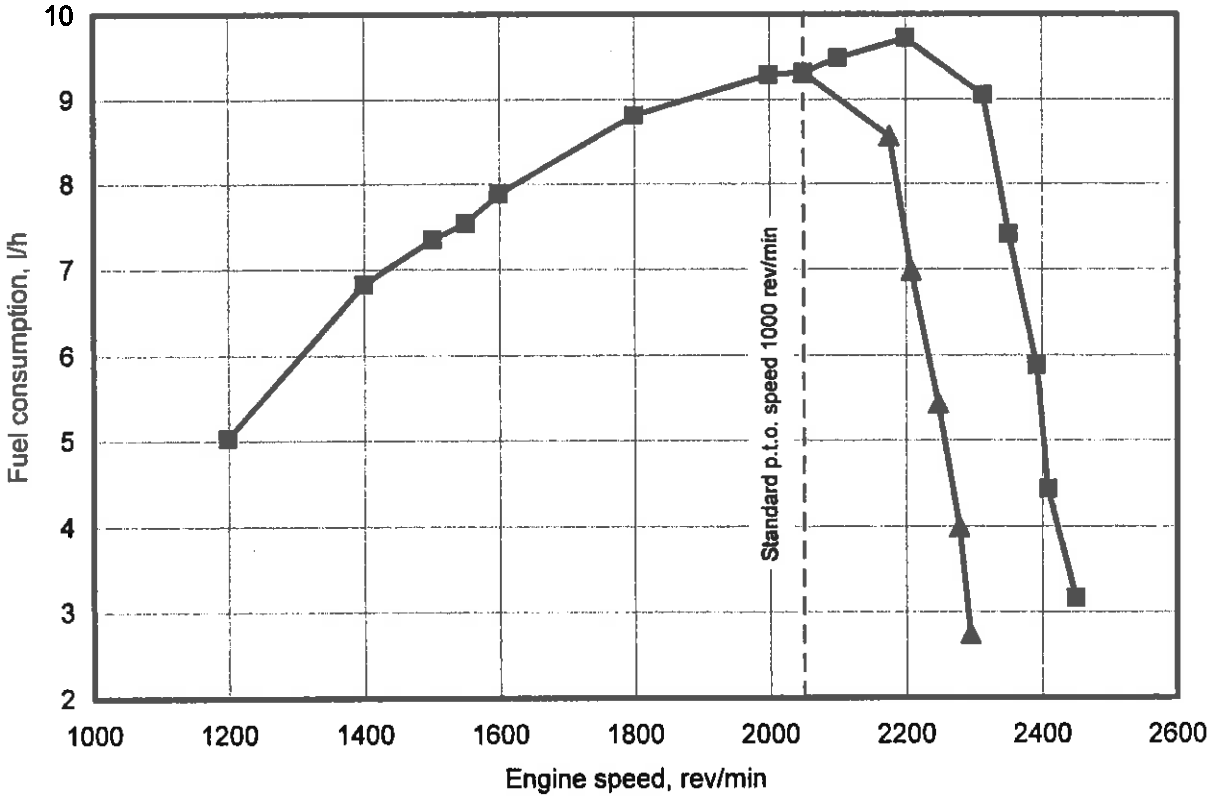
Mean atmospheric conditions:	
Temperature	22 °C
Pressure	99.1 kPa
Relative humidity	55 %
Maximum temperatures:	
Coolant	88 °C
Engine oil	111 °C
Fuel	55 °C
Engine air intake	28 °C

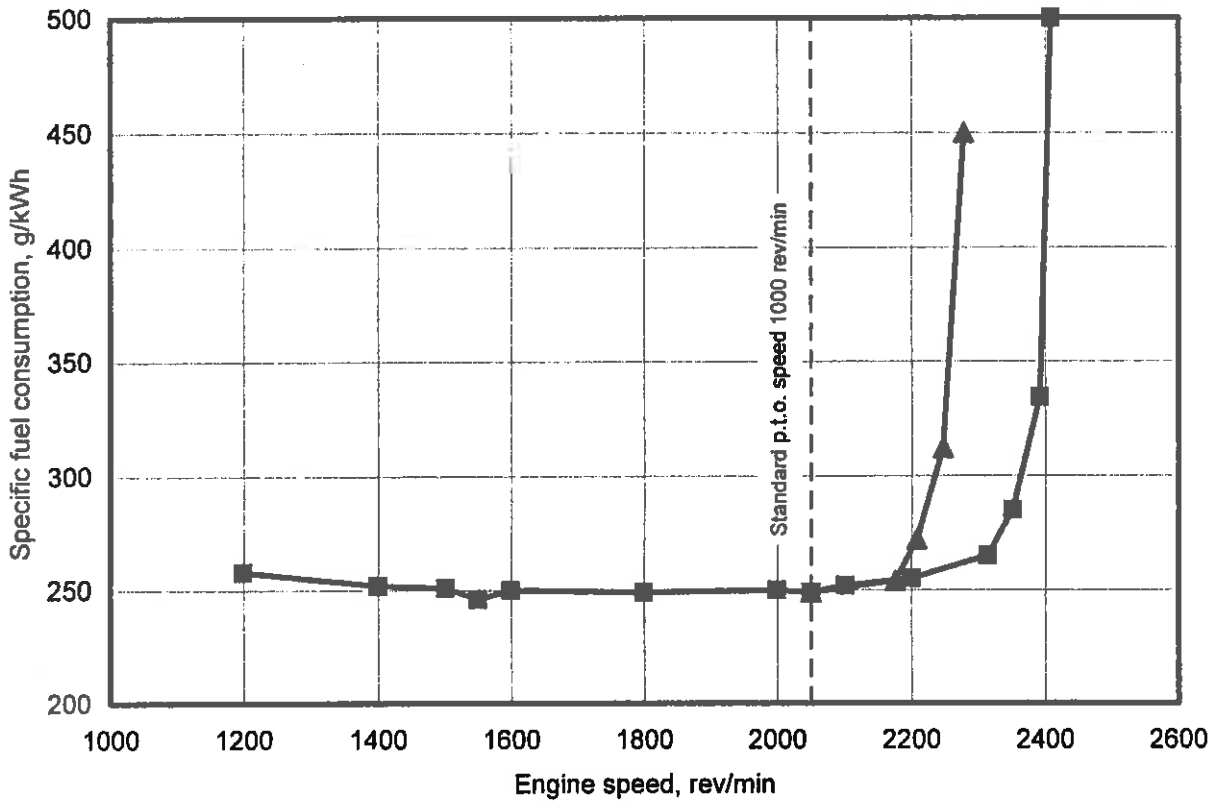
POWER TAKE-OFF TEST



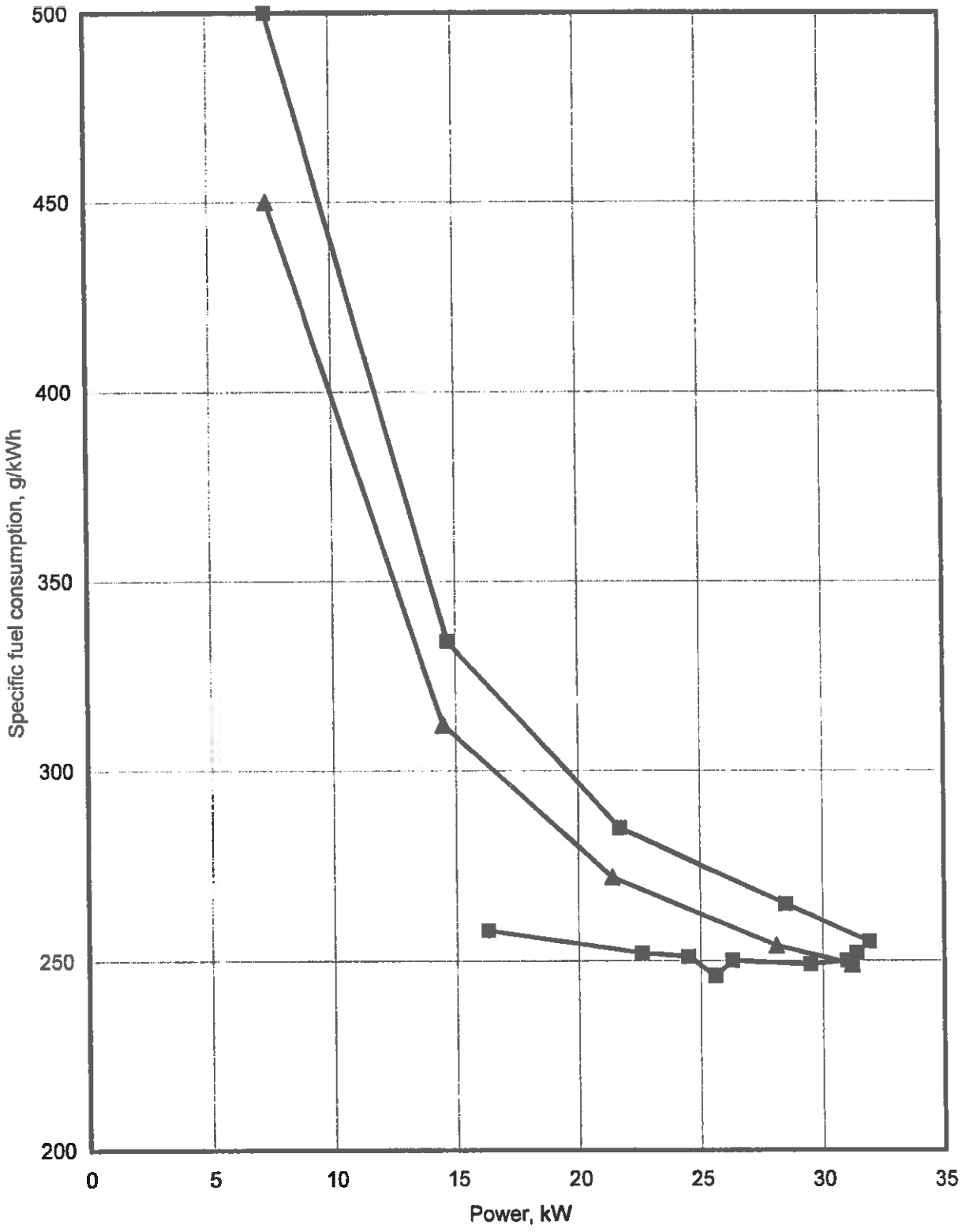


POWER TAKE-OFF TEST





POWER TAKE-OFF TEST



3.2 HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 6th January 1999

3.2.1 Hydraulic power test

Sustained pressure with relief valve open: 17.5 MPa

Pump stalled: Yes

Pump delivery rate at minimum pressure: 38.0 l/min

	Flow rate	Pressure	Power
	l/min	MPa	kW
Flow rate corresponding to a hydraulic pressure equivalent to 90 % of the actual relief valve pressure setting and corresponding hydraulic power	21.0	15.8	5.5
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	28.0	14.2	6.6

Tapping point used for test: External tapping

Temperature of hydraulic fluid: 65 °C

Opening pressure of the unloading valve: Not applicable

Closing pressures of the unloading valve: Not applicable

3.2.2 Power lift test

Linkage setting for test - see page 11

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	200 mm	200 mm
Vertical movement: without lifting force	664 mm	810 mm
with lifting force	629 mm	778 mm
Maximum corrected force exerted through full range	20.2 kN	13.6 kN
Corresponding pressure of hydraulic fluid	15.8 MPa	15.8 MPa
Moment about rear-wheel axis	19.0 kNm	21.1 kNm
Maximum tilt angle of mast from vertical	-	10 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points												
mm	-339	-302	-300	-200	-100	0	+100	+200	+300	+327	+400	+439
Lifting forces at the hitch points (the values of force measured shall be corrected to correspond to a hydraulic pressure equivalent to 90 % of the actual relief valve pressure setting of the hydraulic lift system)												
kN	-	22.5	22.5	22.4	22.0	21.5	21.0	20.6	20.2	20.2	-	-
Corresponding pressure: 15.8 MPa												
Lifting forces at the test frame												
kN	20.6	-	20.3	19.5	18.7	17.8	16.8	15.9	14.9	-	14.1	13.6
Corresponding pressure: 15.8 MPa												

3.3 DRAWBAR POWER TEST (unballasted tractor)

Date of tests: 18th November 1992

Type of track: Bituminous-concrete surface

Height of drawbar above ground	Tyre inflation pressure	
	Front	Rear
mm	kPa	kPa
444	210	160

Gear number and group	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Specific fuel consumption
	kW	kN	km/h	rev/min	%	g/kWh
3.3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)						
1 T	5.6	19.5	1.03	2419	15.0	663
2 T	6.8	19.6	1.25	2409	15.0	566
3 T	10.0	19.3	1.86	2395	14.9	432
4 T	15.9	19.5	2.94	2360	15.0	348
5 T	24.4	19.1	4.60	2319	14.9	312
1 R	28.0	17.6	5.72	2200	9.9	285
2 R	28.4	14.1	7.25	2202	7.0	281
3 R	28.3	9.1	11.20	2204	3.5	281
4 R	27.2	5.4	18.14	2202	2.6	287
3.3.2 FUEL CONSUMPTION 3.3.2.1 in selected gear, at maximum power at rated speed						
2 R	28.4	14.1	7.25	2202	7.0	281
3.3.2.1.1 75 % of pull at maximum power at rated speed						
2 R	23.4	10.7	7.86	2342	4.7	287
3.3.2.1.2 50 % of pull at maximum power at rated speed						
2 R	16.0	7.1	8.13	2376	2.8	327
3.3.2.1.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1						
3 R	23.3	10.7	7.83	1513	4.7	255
3.3.2.1.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2						
3 R	15.9	7.0	8.18	1612	2.8	294
3.3.2.2 in selected gear nearest to 7.5 km/h at rated speed						
2 R	28.4	14.1	7.25	2202	7.0	281
3.3.2.2.1 75 % of pull at maximum power at rated speed						
2 R	23.4	10.7	7.86	2342	4.7	287
3.3.2.2.2 50 % of pull at maximum power at rated speed						
2 R	16.0	7.1	8.13	2376	2.8	327
3.3.2.2.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1						
3 R	23.3	10.7	7.83	1513	4.7	255
3.3.2.2.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2						
3 R	15.9	7.0	8.18	1612	2.8	294

Specific energy	Temperature			Atmospheric conditions		
	Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
kWh/l	°C	°C	°C	°C	%	kPa
1.26	16	76	84	4	88	96.7
1.47	20	77	85	4	88	96.7
1.93	18	78	86	4	88	96.7
2.40	20	78	87	4	88	96.7
2.68	23	77	90	4	89	96.7
2.93	21	77	89	4	89	96.8
2.97	22	77	89	4	89	96.8
2.98	17	77	89	4	89	96.8
2.90	20	77	88	4	89	96.8
2.97	22	77	89	4	89	96.8
2.91	22	77	90	3	87	96.8
2.55	23	77	91	3	87	96.8
3.27	23	77	84	3	87	96.8
2.84	23	76	87	3	87	96.8
2.97	22	77	89	4	89	96.8
2.91	22	77	90	3	87	96.8
2.55	23	77	91	3	87	96.8
3.27	23	77	84	3	87	96.8
2.84	23	76	87	3	87	96.8

4. OPTIONAL TESTS RESULTS

4.1 BRAKING

Date of tests: 18th March 1993

Tractor mass (with driver)

	Front	Rear	Total
	kg	kg	kg
Ballasted tractor	1300	3600	4900
Unballasted tractor	1015	1955	2970

4.1.1 Cold service braking device test

	Speed before application of brakes	Braking device control force	Mean deceleration
	km/h	N	m/s²
Ballasted tractor	31.2	100	0.24
		160	0.53
		200	0.90
		250	2.31
		300	3.04
Unballasted tractor	31.7	65	0.30
		150	1.04
		190	2.18
		250	2.62
		260	3.12

Maximum deviation of tractor from its original course: Not significant

Abnormal vibration: None

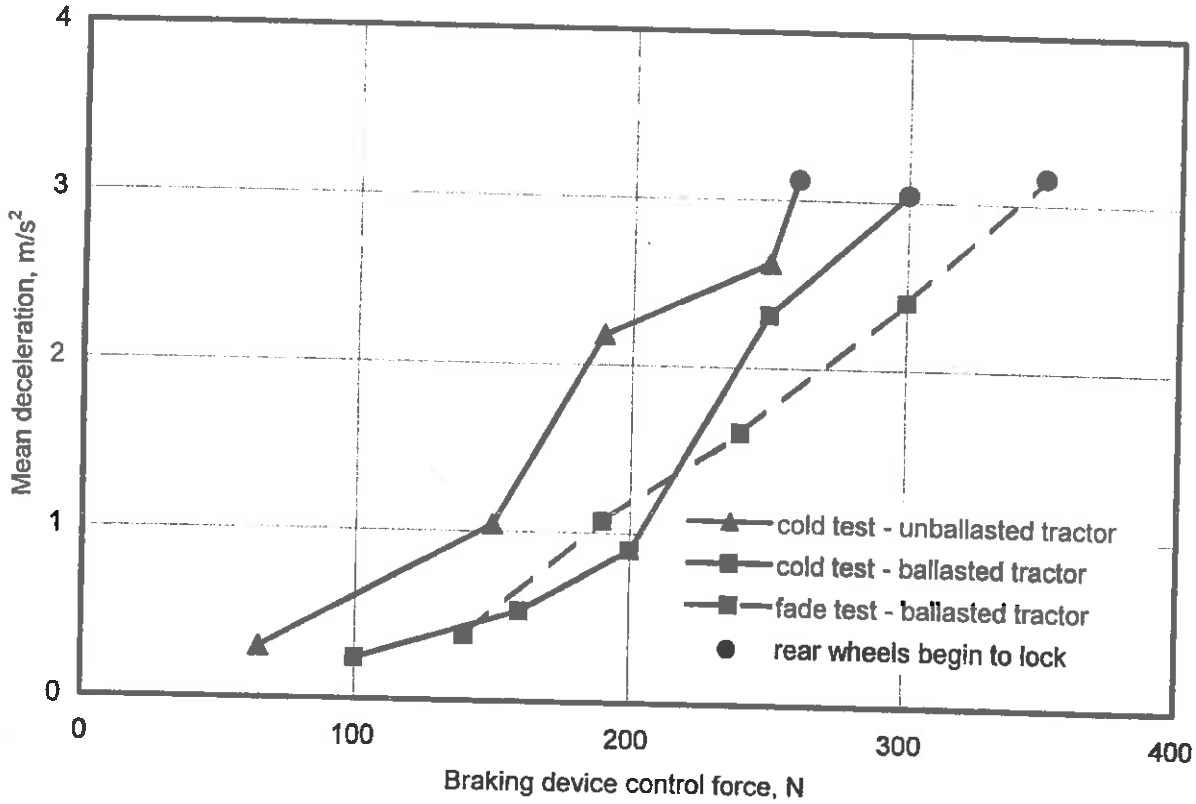
4.1.2 Fade test

	Speed before application of brakes	Braking device control force	Mean deceleration
	km/h	N	m/s²
Ballasted tractor	31.2	140	0.38
		190	1.07
		240	1.61
		300	2.40
		350	3.16

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/s²



4.1.3 Parking braking device test

	Ballasted tractor on 18 % slope	
	Uphill	Downhill
	N	N
Braking device control force	275	270

4.2 MEASUREMENT OF EXTERNAL NOISE

Date of tests: 22nd January 1999

Make and model of sound level meter: BRÜEL & KJÆR, 2231

Type of track: Bituminous-concrete surface

4.2.1 According to OECD standard code 1

Gear number: 5 T

Travelling speed before acceleration: 21.6 km/h

Sound level: 89.5 dB(A)

4.2.2 According to EEC directives 74/151/EEC (Annex VI), 88/410/EEC and 97/54/EC

Gear number: 5 T

Travelling speed before acceleration: 21.6 km/h

Sound level: 88.5 dB(A)

5. REPAIRS

None

6. REMARKS

None

Extensions granted by: Dipl. Ing. Peter Pernis

Signed:

Date: 25th January 1999

Head of the Tractor Laboratory

Dipl. Ing. Peter Pernis

Director

Dipl. Ing. Vladimír Hanzlík