STÁTNÍ ZKUŠEBNA ZEMĚDĚLSKÝCH, POTRAVINÁŘSKÝCH A LESNICKÝCH STROJŮ

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Extension of validity of a test made 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 № 2/1 708/1

Date of approval: 21st June 2001



Agricultural Tractor

ZETOR 63 41 Super (4WD) 40 km/h version

with Emissions Compliant Engine

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

Report № 19893

Date of test: May 2001

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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:	10th May 2001

This extension of validity for an 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.

OECD approval number:	2/1 708/1
Date of approval:	21st June 2001

ORIGINAL TEST REPORT

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

OECD approval number:	1708 Restricted Code
Date of approval:	20th November 1997
Make, model and type of tractor:	ZETOR, 6341 Super 40 km/h version, 4WD
Manufactured by:	ZETOR a.s., CZ-632 00 Brno, Czech Republic
Submitted for test by:	The manufacturer

The differences between the tractors ZETOR 6341 Super (4WD) 40 km/h version and ZETOR 6341 Super (4WD) 40 km/h version with Emissions Compliant Engine are written in *italics*, taking into account these differences, SZZPLS Praha has reproduced the main power take-off 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 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:	65 hours
Location of test:	SZZPLS Praha, Czech Republic

1. SPECIFICATIONS OF TRACTOR

1.1 IDENTIFICATION

Make of the tractor:	ZETOR
Model (trade name):	6341 Super 40 km/h version *6341 Super 40 km/h version with Emissions Compliant Engine*
Type:	4WD

1.1.1 Numbers

1st Serial № or prototype:	001 001 *D634101009B*
Serial №:	001 001 *D634101009B*

1.1.2 Other specifications

Model denomination(s) for other countries:	None
Transmission type or gears × ranges:	5 × 2
Speed version:	40 km/h
Manufacturer identification of technical type number:	None

1.2 ENGINE

Make:	ZETOR
Model:	7702 *7703*
Type:	4-stroke diesel engine, direct injection, water cooled, naturally aspirated
Serial №:	*001001* **7703-060521**

1.2.1 Cylinders

Number/disposition:	4, in-line, vertical
Bore/stroke:	102 mm/120 mm
Capacity:	3922 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 *IMTESO, 443 752 020 808, one-stage with paper cartridge*
Capacity of fuel tank:	120 dm³
Make, model and type of injection pump:	MOTORPAL, 4M 3137, in-line *MOTORPAL, 4M 3465, in-line*
Serial №:	BB 0017 *LG 0001*
Manufacturer's production setting of injection pump	
Flow rate (rated engine speed and full load):	14.55+0.38 dm³/h *14.85+0.37 dm³/h*
Timing:	25°+1° before TDC *18°±0.5° before TDC*
Make, model and type of injectors:	MOTORPAL, DOP 160 S 430-1436, 4 hole *MOTORPAL, DOP 160 S 428-4144, 4 hole*
Injection pressure:	18.6-0.8 MPa *22.0-0.8 MPa*
Fuel cooler:	None
1.2.4 Governor	
Make, model and type:	MOTORPAL, RV 3M 350/1100, centrifugal, variable speed *MOTORPAL, RV 3M 350 1100 3365, centrifugal, variable speed*
Governed range of engine speed:	From 700 to 2440 rev/min
Rated engine speed:	2200 rev/min
1.2.5 Air cleaner	
Pre-cleaner	
Make, model and type:	Integral with main cleaner, cyclon type
Location of air intake:	Under bonnet forward of radiator
Main cleaner	
Make, model and type:	WOODGATE, WGCS 1175 or DONALDSON, FGL 08-0560, dry with paper primary and safety elements, integrated cyclon type pre-cleaner *FILTREL, WGCS 1175 or DONALDSON, FGL 08-0560, dry with paper primary and safety elements, integrated cyclon type pre-cleaner*
Maintenance indicator:	Indicator on air cleaner

1.2.6 Lubrication system

Type of feed pump:	Gear
Type of filter(s):	Full flow with replaceable paper element
Number of filters:	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:	6
Fan diameter:	380 mm
Coolant capacity:	11.6 dm³
Type of temperature control:	Thermostat
Superpressure system:	40±10 kPa

1.2.8 Starting system

Make, model and type:	MAGNETON, 443 115 144 722, electrical, solenoid engaged
Starter motor power rating:	2.9 kW
Cold starting aid:	None *Intake air heating-up*
Safety device:	Gear change lever in neutral position *Clutch pedal to be fully depressed*

1.2.9 Electrical system

Voltage:	12 V, negative earth
Generator	
Make, model and type:	MAGNETON, 443 113 516 673, alternator, belt driven
Power:	980 W
Battery of accumulators	
Number:	1
Rating:	135 Ah at 20 hours

1.2.10 Exhaust system

Make, model and type:	ZETOR, 43.014.010, expansion and absorption muffler
Location:	Left-hand side of engine, vertical

1.3 TRANSMISSION

1.3.1 Clutch (travel and power take-off/travel alone)

Make, model and type:	ZETOR, 7901 1120, dual dry for travelling and p.t.o.
Number of plates:	2

Diameter of plates: 310 mm

Method of operation: Hydraulically by pedal

1.3.2 Gear box

Make, model and type: ZETOR, 53.122.000, 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: Synchromesh gear box with 5 forward and 1 reverse speeds, group gear box with two speed ranges (T and R) and pneumatically actuated torque multiplier (M and N)

	Forward	Reverse
Number of gears	5	1
Number of ranges	2	2
Number of groups	2	2
Total of arrangements	20	4

Available options: Synchromesh gear box with 5 speeds, group gear box with two speed ranges (T and R) and reverser (F and R)

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

Available options: Synchromesh gear box with 5 forward and 1 reverse speeds, group gear box with two speed ranges (T and R) and creeper (C and N)

	Forward	Reverse
Number of gears	5	1
Number of ranges	2	2
Number of groups	2	2
Total of arrangements	20	4

Oil cooler: None

1.3.3 Rear axle and final drives

Make, model and type: ZETOR, 53.161.000, crown wheel and bevel pinion differential and spur gear final drives

Differential lock

Type:	Dog clutch, electro-pneumatically activated
Method of engagement:	Rocker switch on the dashboard
Method of disengagement:	Service brake pedal

1.3.4 Front axle

Make, model and type:	CARRARO, 20.14/164, crown wheel and bevel pinion differential and planetary final drives

Differential lock

Type:	Limited slip
Method of engagement:	Self-engaging
Method of disengagement:	Self-disengaging

1.3.5 Total ratios and travelling speeds (version fitted on the tested tractor)

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	312.091	2.05
2		222.628	2.87
3		171.188	3.73
4		106.557	5.99
5		67.163	9.51
1	R	79.837	8.00
2		56.951	11.21
3		43.792	14.58
4		27.259	23.43
5		17.181	37.17
R	T	229.375	2.78
	R	58.677	10.88
(*) Calculated with a tyre dynamic radius index of 770 mm (ISO 4251-1:1998)			

T: Turtle group, R: Rabbit group

Number of revolutions of front wheels for one revolution of rear-wheels:	1.3540

1.3.5 Total ratios and travelling speeds (optional – gear box with torque multiplier)

Gear №	Group	Range	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	M	409.719	1.56
		N	312.091	2.05
2		M	292.271	2.19
		N	222.628	2.87
3		M	224.739	2.84
		N	171.188	3.73
4		M	139.891	4.57
		N	106.557	5.99
5		M	88.173	7.24
		N	67.163	9.51
1	R	M	104.812	6.09
		N	79.837	8.00
2		M	74.767	8.54
		N	56.951	11.21
3		M	57.491	11.11
		N	43.792	14.58
4		M	35.786	17.85
		N	27.259	23.43
5		M	22.556	28.31
		N	17.181	37.17
R	T	M	301.128	2.12
		N	229.375	2.78
	R	M	77.033	8.29
		N	58.677	10.88
(*) Calculated with a tyre dynamic radius index of 770 mm (ISO 4251-1:1998)				

T: Turtle group, R: Rabbit group, M: Torque multiplier engaged, N: Normal (Torque multiplier disengaged)

Number of revolutions of front wheels for one revolution of rear-wheels: 1.3540

1.3.5 Total ratios and travelling speeds (optional – gear box with reverser)

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 (*)
Forward			
1	T	312.091	2.05
2		222.628	2.87
3		171.188	3.73
4		106.557	5.99
5		67.163	9.51
1	R	79.837	8.00
2		56.951	11.21
3		43.792	14.58
4		27.259	23.43
5		17.181	37.17
Reverse			
1	T	284.349	2.25
2		202.839	3.15
3		155.971	4.09
4		97.085	6.58
5		61.193	10.44
1	R	72.740	8.78
2		51.889	12.31
3		39.900	16.01
4		24.836	25.71
5		15.654	40.80
(*) Calculated with a tyre dynamic radius index of 770 mm (ISO 4251-1:1998)			

T: Turtle group, R: Rabbit group

Number of revolutions of front wheels for one revolution of rear-wheels: 1.3540

1.3.5 Total ratios and travelling speeds (optional – gear box with creeper)

Gear №	Group	Range	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	C	2894.535	0.22
2			2064.805	0.31
3			1587.710	0.40
4			988.283	0.65
5			622.918	1.03
1		N	312.091	2.05
2			222.628	2.87
3			171.188	3.73
4			106.557	5.99
5			67.163	9.51
1	R	C	740.463	0.86
2			528.206	1.21
3			406.158	1.57
4			252.816	2.53
5			159.351	4.01
1		N	79.837	8.00
2			56.951	11.21
3			43.792	14.58
4			27.259	23.43
5			17.181	37.17
R	T	C	2127.375	0.30
		N	229.375	2.78
	R	C	544.212	1.17
		N	58.677	10.88
(*) Calculated with a tyre dynamic radius index of 770 mm (ISO 4251-1:1998)				

T: Turtle group, R: Rabbit group, C: Creeper engaged, N: Normal (Creeper disengaged)

Number of revolutions of front wheels for one revolution of rear-wheels: 1.3540

1.4 POWER TAKE-OFF

1.4.1 Main power take-off

Type: Independent

Method of engagement: Mechanically operated by hand lever or hydraulically by clutch pedal, through second plate in main clutch

Number of shafts: 1 interchangeable shaft, 6 or 21 splines

Method of changing power take-off shaft ends and speeds: Manually replace shafts, shiftable by hand lever

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: 777 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 p.t.o. and 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	
T	0.118	41.0443
R	0.461	10.4997
(*) Independent of adjusting p.t.o. speed 540 or 1000 rev/min		

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 (on request available, not fitted to tested tractor)

Type: Independent

Method of engagement: Pneumatically operated by hand lever, through dry multiplate clutch

Number of shafts: 1

Method of changing power take-off speeds: None

1.4.2.1 Power take-off proportional to engine speed

Location: At front of tractor

P.T.O. type	Diameter of power take-off shaft end	Number of splines	In conformity with ISO 8759-1:1998
	mm		
1000	34.9	21	Yes

Height above ground: 717 mm

Distance from the median plane of the tractor: 0 mm

Distance in front front-wheel axis: 590 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
1000	1000	1818	1.8182	30.0/286.5
	1210	2200		

Direction of rotation (viewed from face tractor): Clockwise

1.4.2.2 Power take-off proportional to ground speed None

1.5 HYDRAULIC POWER LIFT

1.5.1 Rear power lift

Make, model and type: ZETOR, 53.940.039, 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 and 2 external 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

Type and number of filters: 1 full flow with replaceable paper element

Site of oil reservoir: Transmission housing

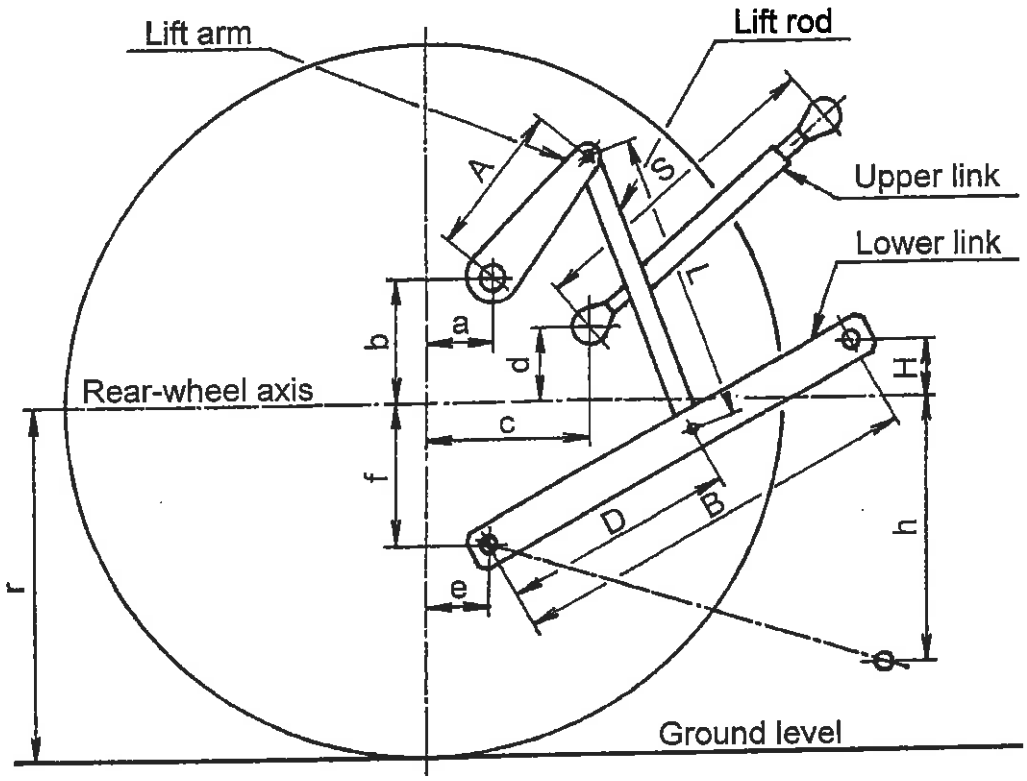
Type, number and location of tapping points: ISO standard couplings 12.5 mm, 1 double acting control valves, 2 pressure and 1 return couplings at rear of tractor

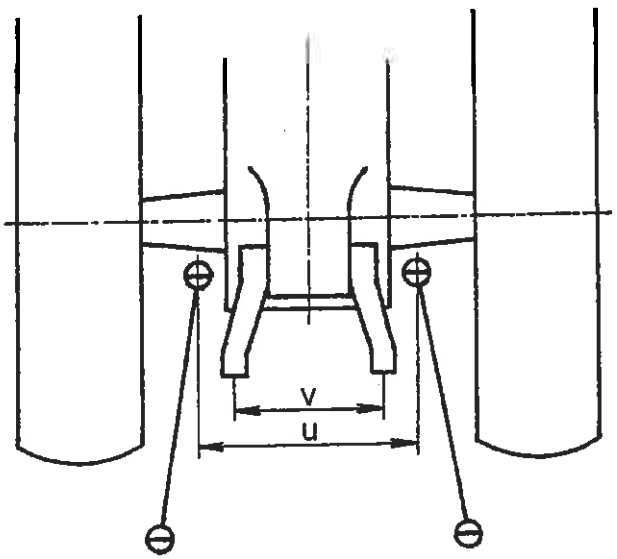
Maximum volume of oil available to external cylinders: 20 dm^3

1.6 THREE-POINT LINKAGE

Category: 2, in conformity with ISO 730-1:1994 + Cor.1:1995

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)	861	861
Distance of lift arm pivot point from rear-wheel axis:	horizontally	(a)	30	30
	vertically	(b)	363	363
Horizontal distance between the 2 lower link points		(u)	450	450
Horizontal distance between the 2 lift arm end points		(v)	639	639
Length of upper link		(S)	550 to 760	678
Distance of upper link pivot point from rear-wheel axis:	horizontally	(c)	288	288
	vertically	(d)	182, 229, 276, 323	229
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)	402	402
Length of lift rods		(L)	442 to 572	555
Height of lower hitch points relative to the rear-wheel axis:				
	in low position	(h)	252 to 575	545
	in high position	(H)	121 to 372	145
Height above ground of lower hitch points when locked in transport position (*)			Any height withing lift range	
(*) Assuming r=745 mm tyre dynamic radius index of ISO 4251-1:1998				

1.7 SWINGING DRAWBAR

Type:	Clevis
Height above ground	
Maximum:	512 mm
Minimum:	472 mm
Type of adjustment:	Inverting drawbar
Distance of hitch point from rear-wheel axis, horizontally:	652 and 658 mm
Distance of hitch point from power take-off shaft end	
Vertically:	265 and 305 mm
Horizontally:	389 and 395 mm
Lateral adjustment (centre of clevis)	
Right-hand:	80 mm
Left-hand:	80 mm
Distance of pivot point from rear-wheel axis, horizontally:	93 mm to rear
Diameter of drawbar pin hole:	31 mm
Maximum vertical permissible load:	12 kN

1.8 TRAILER HITCH

Type:	Automatic clevis
Hole diameter:	35 mm
Height above ground:	777, 827, 877, 927 and 977 mm
Distance of hitch point from rear-wheel axis, horizontally:	628 mm
Distance of hitch point from power take-off shaft end	
Vertically:	0, 50, 100, 150 and 200 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:	915 mm
Minimum:	225 mm
Horizontal distance to power take-off shaft end (rear):	681 mm

1.10 SEMI-TRAILER HITCH

Type:	Towing hook
Hole diameter:	47 mm
Height above ground:	537 mm
Distance of hitch point from rear-wheel axis, horizontally:	368 mm
Distance of hitch point from power take-off shaft end	
Vertically:	240 mm
Horizontally:	105 mm
Maximum vertical permissible load:	17 kN

1.11 FRONT TOWING HITCH

Height above ground:	739 mm
Diameter of pin hole:	31 mm

1.12 STEERING

Make, model and type:	EATON, 261-1312-002 or DANFOSS, OSPC 100 ON or RCD-CALZONI, GIVI ON 100 G 125 or ZF, LAGC 100-1712-2, 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:	12.5 MPa

1.13 BRAKES

1.13.1 Service brake

Rear axle	
Make, model and type:	KNOTT, 33.227.000, wet disc, multiplate, 4 discs on each side
Method of operation:	Hydraulically by pedals, coupled or independent
Front axle	
Make, model and type:	CARRARO, 20.14/164, wet disc, 2 discs on each side
Method of operation:	Hydraulically with air brake booster by coupled pedals
Trailer braking take-off:	Combined one line and two line air braking system, actuated by tractor pedals

1.13.2 Parking brake

Type:	Common with service brake
Method of operation:	Mechanically by hand lever with ratchet

1.14 WHEELS

Number	
Front:	2, steering and driving
Rear:	2, driving
Wheelbase:	2198 mm

Track width adjustment:

	Minimum	Maximum	Adjustment method
	mm	mm	
Front	1580	1810	Reversing wheels and off-set lug rims
Rear	1495	1795	Reversing wheels and off-set lug rims

1.15 PROTECTIVE STRUCTURE

Make, model and type:	ZETOR, UBK 7341, cab with integrated frame
Manufacturer's name and address:	ZETOR a.s., CZ-632 00 Brno, Czech Republic
Protective device	
Cab/frame/rollguard/other:	Cab
Tiltable/not tiltable:	Not tiltable

OECD approval

Approval number:	CSS 0404/9 with seat MARS Zetor 7211-5400 CSS 0404/10 with seat KAB XH2/U4 Fieldmaster CSS 0404/11 with seat KAB XH2/T6 Ploughmaster or seat GRAMMER DS 85H1/90A CSS 0404/12 with seat GRAMMER DS 85H/3A
Date of approval:	6th January 1997
Nos. of minor modification certificates, if any:	None

1.16 SEAT

1.16.1 Driver's seat

Make, model and type:	MARS, Zetor 7211-5400, upholstered seat
Seat and steering wheel reversible:	No
Type of suspension:	Parallelogram linkage adjustable for driver's weight
Type of damping:	Hydraulic
Range of adjustment	
Longitudinally:	150 mm
Vertically:	60 mm
Safety belt:	No

1.16.2 Optional driver's seat(s)

Make	Model	Type of suspension	Type of damping	Range of adjustment	
				Longitudinally	Vertically
				mm	mm
GRAMMER	DS 85H/3A	Mechanic	Hydraulic	150	60
GRAMMER	DS 85H1/90A	Mechanic	Hydraulic	150	60
KAB	XH2/T6 Ploughmaster	Mechanic	Hydraulic	150	70
KAB	XH2/U4 Fieldmaster	Mechanic	Hydraulic	150	70

Type:	Upholstered seat with back rest and arm rests
Safety belt:	No

1.16.3 Passenger seat

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

1.17 LIGHTING

	Height above ground of centre	Size	Distance from outside edge of lights to median plane of tractor
	mm	mm	mm
Headlights	1280	145x80	195
Sidelights	1585	60x65	615
Rearlights	1690	140x40	800
Reflectors		Not fitted	

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
3790	2005	2295	2690	2940

2.2 GROUND CLEARANCE (unballasted tractor): 441 mm

Clearance-limiting part: Differential of the front axle

2.3 TRACTOR MASS (unballasted tractor with cab)

	Without driver	With driver
	kg	kg
Front	1480	1495
Rear	2220	2280
Total	3700	3775

2.4 TYRES AND TRACK WIDTH SPECIFICATIONS

	Front	Rear
Tyres:		
Make	TAURUS	BARUM
Model	Energysaver Radial HT	TZ 19
Dimensions	13.6 R 24	18.4-34
Ply rating	121 A8	8 PR
Type	Radial	Diagonal
Maximum load (tyre manufacturer's)	14.50 kN	20.52 kN
Maximum load (tractor manufacturer's)	10.00 kN	**17.00 kN**
Inflation pressure (tyre manufacturer's)	160 kPa	140 kPa
Dynamic radius index	560 mm	770 mm
Chosen track width:	1580 mm	1495 mm

2.5 FUEL

Type:	Diesel fuel, in conformity with national standard ČSN EN 590
Density at 15 °C:	0.842 g/cm³ for p.t.o. tests *0.837 g/cm³ for p.t.o. supplementary tests on modified tractor* 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	12.0	200	200
Gear box	64.0	1200	600
Front axle	5.5	1200	-
Rear axle		Common with gear box	
Final drive (front)	2×1.7	1200	-
Final drive (rear)	2×1.9	1200	-
Hydraulic system		Common with gear box	
Steering	2.5	1200	1200

2.6.2 Specifications

	Recommended	Used during test
Engine oil: Type Viscosity Classification	 SAE 15W-40 14.6 cSt at 100 °C API CF-4/SG	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	 ARAL Vitam HF 32 7.2 cSt at 100 °C ISO 6743 HF 32	As recommended

Hydraulic fluid: Same as transmission

2.6.3 Grease

Number of lubrication points: 26

3. COMPULSORY TESTS RESULTS

3.1 MAIN POWER TAKE-OFF

Date and location of tests: 13th December 1996, 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						
46.9	2200	1073	12.38	14.70	264	3.19
3.1.2 POWER AT RATED ENGINE SPEED						
46.9	2200	1073	12.38	14.70	264	3.19
3.1.3 STANDARD POWER TAKE-OFF SPEED [1000±25 rev/min]						
45.2	2050	1000	11.58	13.75	256	3.29
3.1.4 PART LOADS 3.1.4.1 the torque corresponding to maximum power at rated engine speed						
46.9	2200	1073	12.38	14.70	264	3.19
3.1.4.2 85 % of torque obtained in 3.1.4.1						
40.3	2224	1085	10.75	12.77	267	3.16
3.1.4.3 75 % of torque defined in 3.1.4.2						
30.9	2271	1108	8.77	10.42	284	2.97
3.1.4.4 50 % of torque defined in 3.1.4.2						
20.9	2302	1123	6.86	8.15	328	2.56
3.1.4.5 25 % of torque defined in 3.1.4.2						
10.6	2335	1139	5.12	6.08	483	1.74
3.1.4.6 unloaded						
-	2366	1154	3.57	4.24	-	-

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						
45.2	2050	1000	11.58	13.75	256	3.29
3.1.5.2 85 % of torque obtained in 3.1.5.1						
41.0	2189	1068	10.59	12.58	258	3.26
3.1.5.3 75 % of torque defined in 3.1.5.2						
31.4	2237	1091	8.70	10.33	277	3.04
3.1.5.4 50 % of torque defined in 3.1.5.2						
21.3	2271	1108	6.84	8.12	321	2.62
3.1.5.5 25 % of torque defined in 3.1.5.2						
10.8	2306	1125	5.05	6.00	468	1.80
3.1.5.6 unloaded						
-	2333	1138	3.47	4.12	-	-

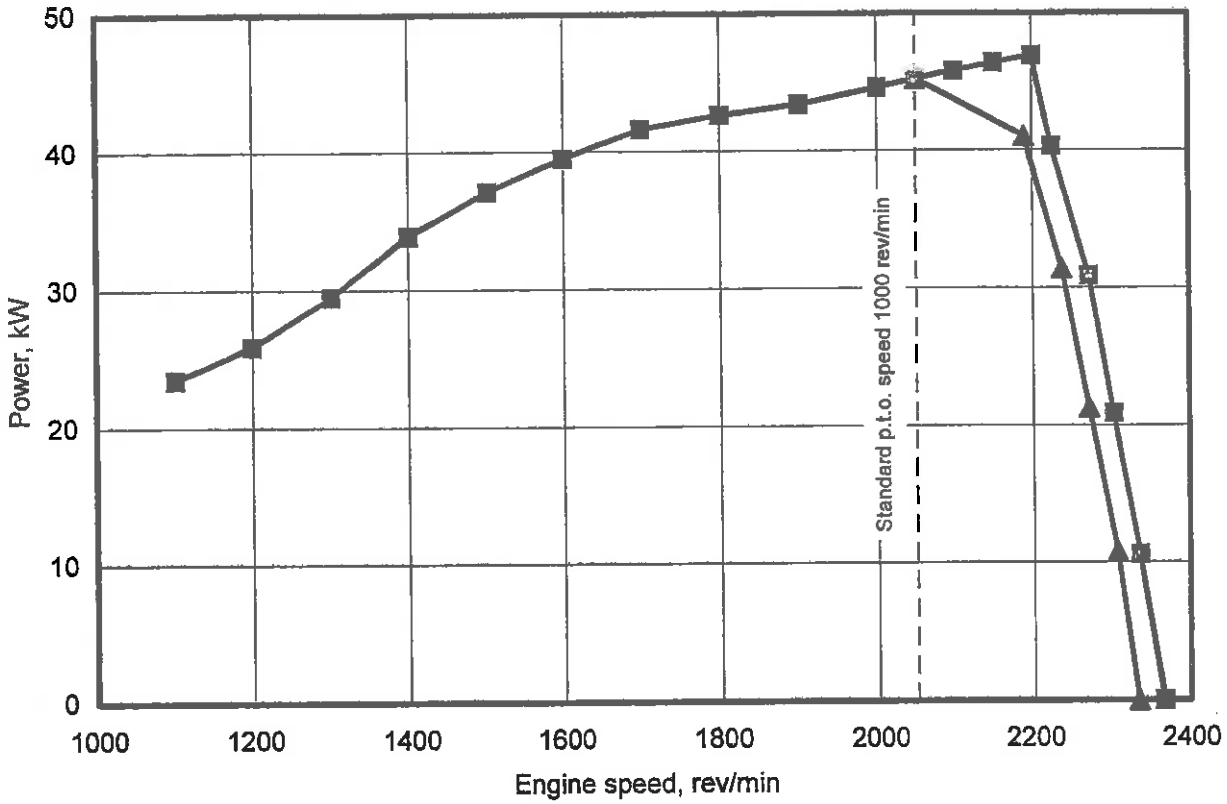
No load maximum engine speed: 2366 rev/min

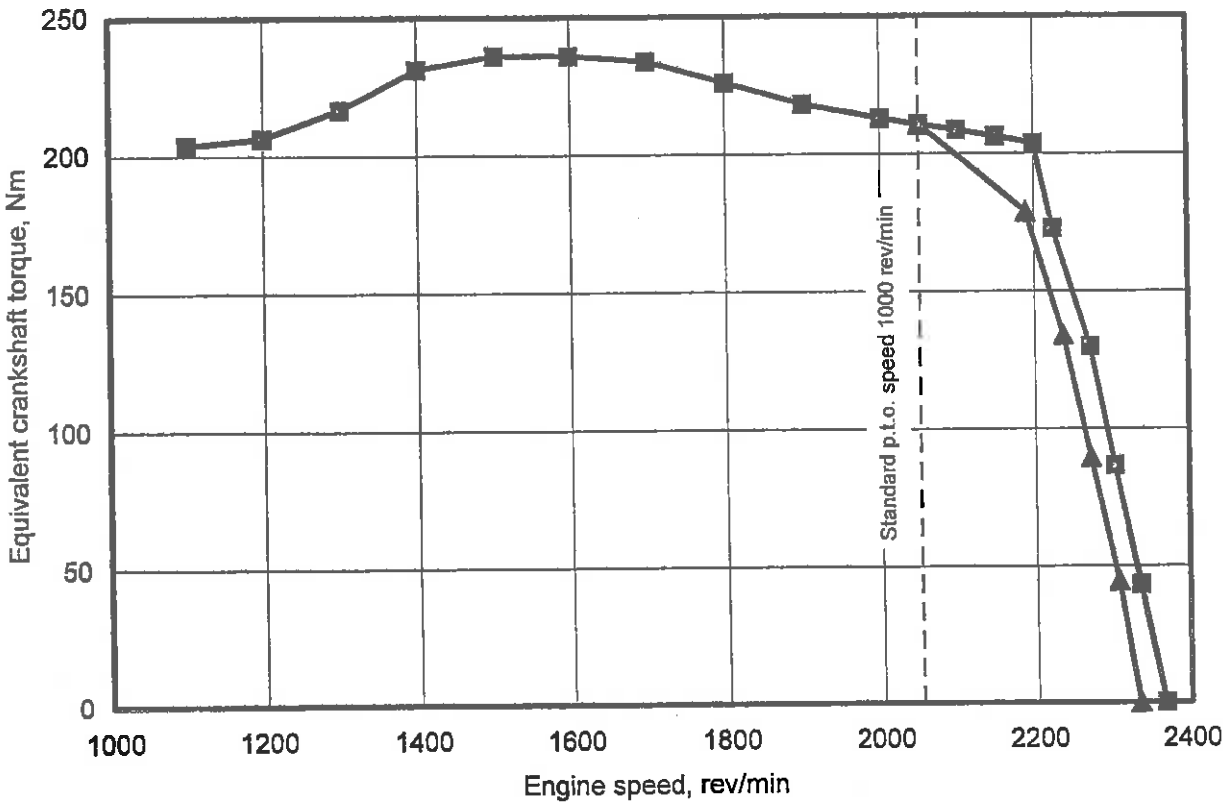
Torque (equivalent crankshaft)
At maximum power: 203.6 Nm
At rated engine speed: 203.6 Nm
At standard power take-off speed: 210.6 Nm

Maximum torque (equivalent crankshaft): 236.0 Nm
(engine speed: 1501 rev/min)

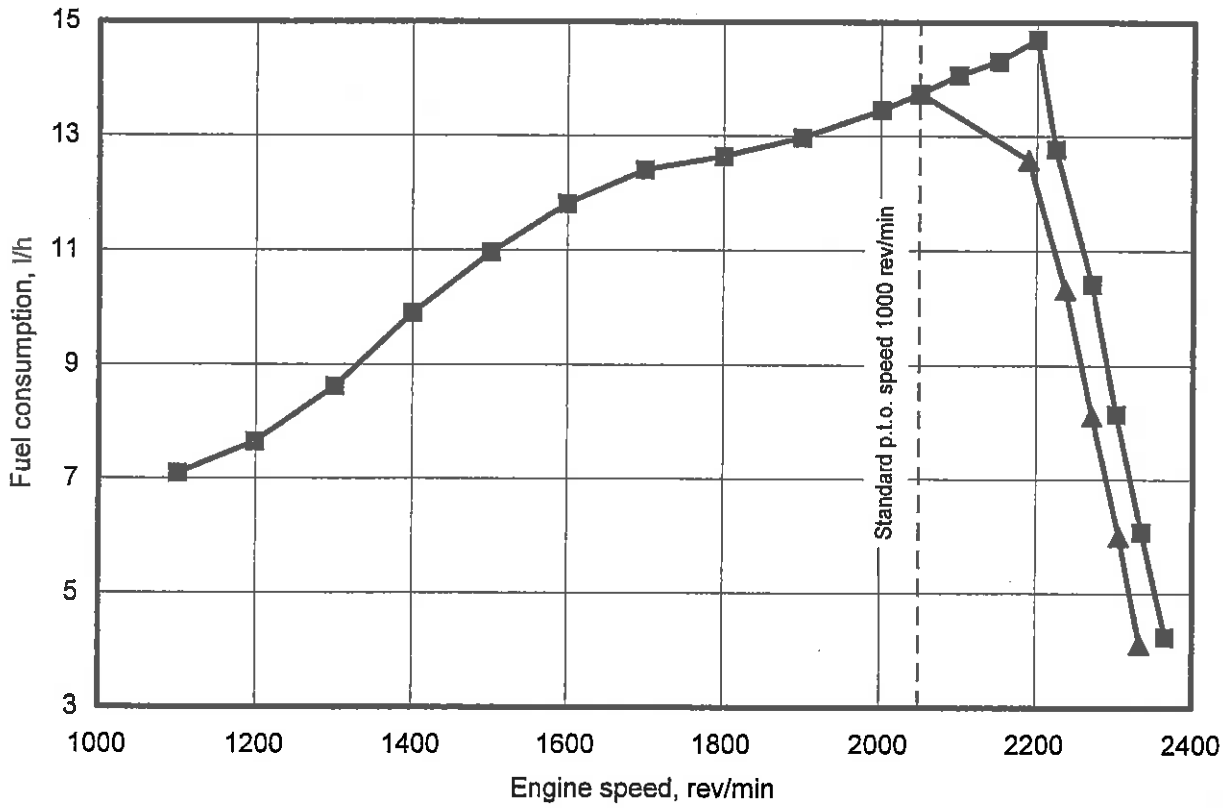
Mean atmospheric conditions:	
Temperature	23 °C
Pressure	96.1 kPa
Relative humidity	34 %
Maximum temperatures:	
Coolant	79 °C
Engine oil	102 °C
Fuel	40 °C
Engine air intake	28 °C

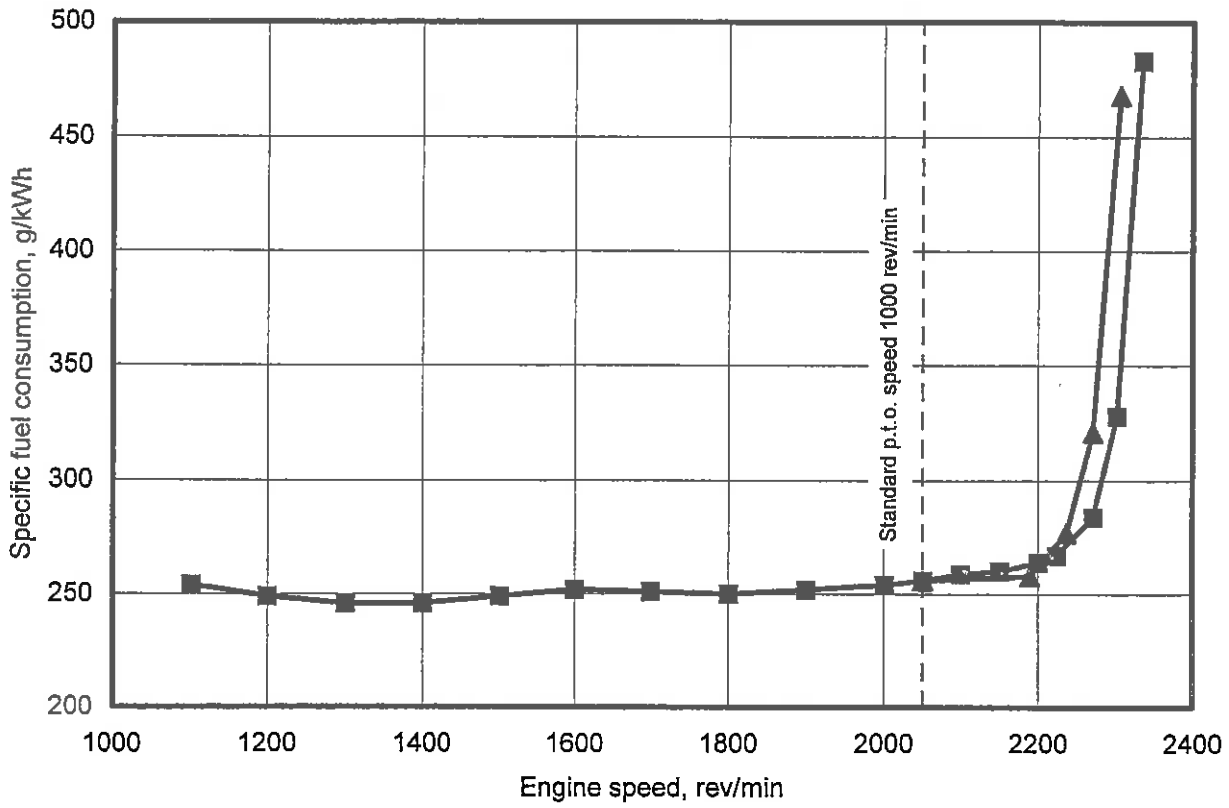
POWER TAKE-OFF TEST



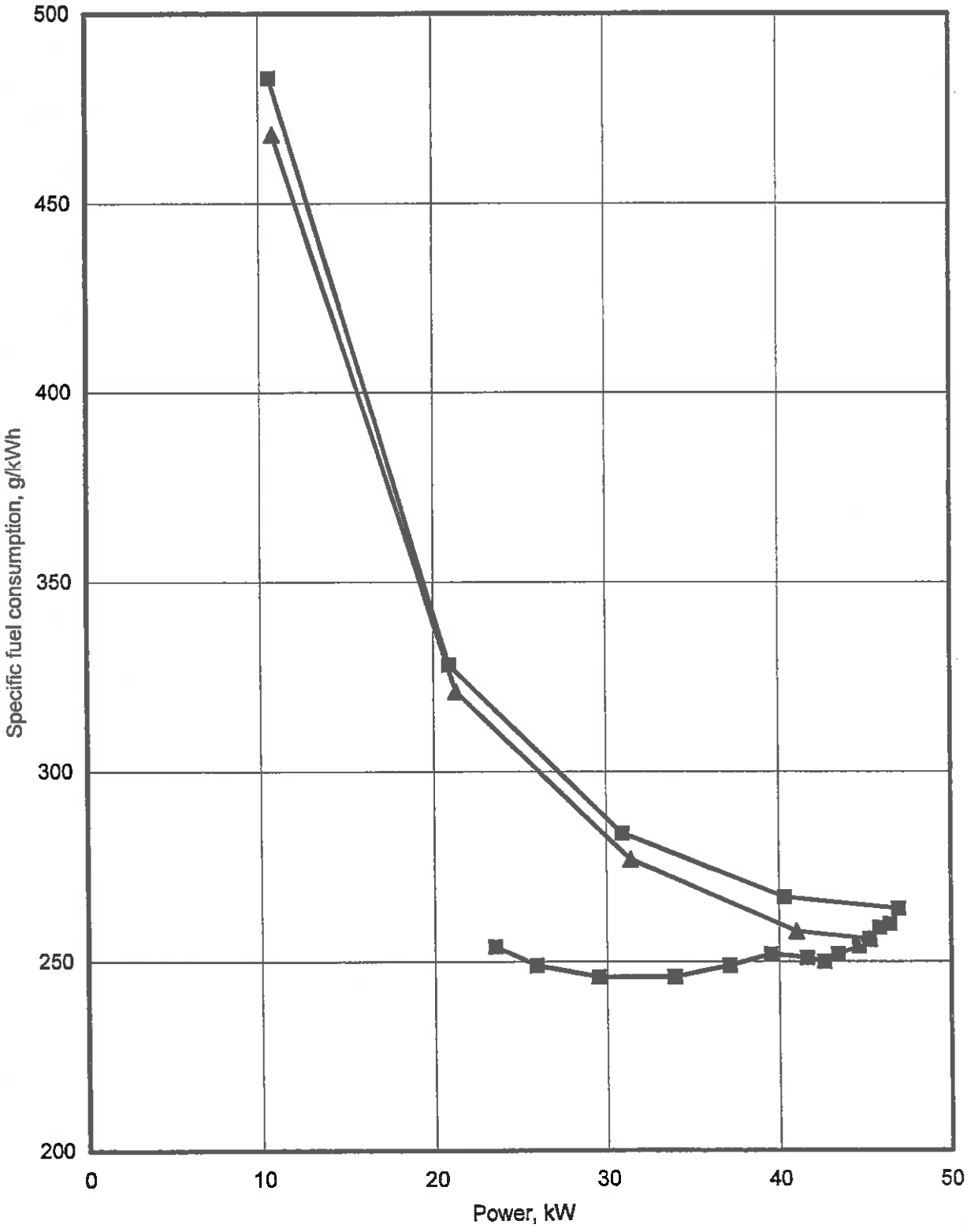


POWER TAKE-OFF TEST





POWER TAKE-OFF TEST



3.2 HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 9th and 14th July 1997

3.2.1 Hydraulic power test

Sustained pressure with relief valve open: 18.0 MPa

Pump stalled: No

Pump delivery rate at minimum pressure: 45.0 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	41.8	16.2	11.3
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	41.8	16.2	11.3

Tapping point used for test: External tapping

Temperature of hydraulic fluid: 66 °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 15

	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	690 mm	917 mm
with lifting force	650 mm	864 mm
Maximum corrected force exerted through full range	35.1 kN	22.8 kN
Corresponding pressure of hydraulic fluid	16.2 MPa	16.2 MPa
Moment about rear-wheel axis	33.1 kNm	35.4 kNm
Maximum tilt angle of mast from vertical	-	11 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points													
mm	-517	-500	-407	-400	-300	-200	-100	0	+100	+200	+243	+300	+347
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	-	-	46.1	45.8	44.3	42.1	39.9	38.0	36.7	35.6	35.1	-	-
Corresponding pressure: 16.2 MPa													
Lifting forces at the test frame													
kN	38.3	38.3	-	35.7	34.0	31.9	30.0	28.3	26.9	24.9	-	23.3	22.8
Corresponding pressure: 16.2 MPa													

3.3 DRAWBAR POWER TEST (unballasted tractor)

Date of tests: 21st August 1997

Type of track: Bituminous-concrete surface

Height of drawbar above ground	Tyre inflation pressure	
	Front	Rear
mm	kPa	kPa
512	110	110

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)						
2 T	21.9	30.1	2.62	2303	15.0	385
3 T	27.9	30.0	3.35	2275	14.9	358
4 T	37.2	23.9	5.61	2199	8.0	322
1 R	38.9	18.1	7.73	2195	4.8	306
5 T	37.8	14.5	9.38	2203	3.8	316
2 R	38.2	12.5	11.01	2204	2.9	312
3 R	37.0	9.2	14.47	2197	2.1	321
3.3.2 FUEL CONSUMPTION 3.3.2.1 in selected gear, at maximum power at rated speed						
1 R	38.9	18.1	7.73	2195	4.8	306
3.3.2.1.1 75 % of pull at maximum power at rated speed						
1 R	30.7	13.6	8.13	2271	3.3	320
3.3.2.1.2 50 % of pull at maximum power at rated speed						
1 R	21.3	9.1	8.44	2308	2.0	363
3.3.2.1.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1						
5 T	30.6	13.6	8.11	1916	3.3	300
3.3.2.1.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2						
5 T	21.3	9.1	8.44	1945	2.0	334
3.3.2.2 in selected gear nearest to 7.5 km/h at rated speed						
1 R	38.9	18.1	7.73	2195	4.8	306
3.3.2.2.1 75 % of pull at maximum power at rated speed						
1 R	30.7	13.6	8.13	2271	3.3	320
3.3.2.2.2 50 % of pull at maximum power at rated speed						
1 R	21.3	9.1	8.44	2308	2.0	363
3.3.2.2.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1						
5 T	30.6	13.6	8.11	1916	3.3	300
3.3.2.2.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2						
5 T	21.3	9.1	8.44	1945	2.0	334

Specific energy	Temperature			Atmospheric conditions		
	Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
kWh/l	°C	°C	°C	°C	%	kPa
2.18	36	77	84	26	55	98.1
2.34	38	79	90	26	55	98.1
2.61	39	80	93	26	55	98.1
2.74	40	78	96	27	54	98.1
2.65	40	79	95	27	53	98.1
2.68	41	79	96	28	50	98.1
2.61	39	79	95	28	49	98.1
2.74	40	78	96	27	54	98.1
2.62	41	80	94	28	49	98.1
2.31	40	78	96	28	49	98.1
2.79	39	79	93	28	48	98.0
2.51	37	78	92	28	48	98.0
2.74	40	78	96	27	54	98.1
2.62	41	80	94	28	49	98.1
2.31	40	78	96	28	49	98.1
2.79	39	79	93	28	48	98.0
2.51	37	78	92	28	48	98.0

4. OPTIONAL TESTS RESULTS

4.1 BRAKING

Date of tests: 26th August and 1st September 1997

Tractor mass (with driver)

	Front	Rear	Total
	kg	kg	kg
Ballasted tractor	2000	3400	5400
Unballasted tractor	1495	2280	3775

4.1.1 Cold service braking device test

	Speed before application of brakes	Braking device control force	Mean deceleration	Minimum stopping distance without locking the wheels
	km/h	kN	m/s²	m
Ballasted tractor	38.9	0.045	0.53	110.15
		0.105	0.97	**60.19**
		0.150	1.50	38.92
		0.190	2.00	29.19
		0.245	2.86	20.41
		0.320	4.41	13.24
		0.350	4.71	12.39
Unballasted tractor	40.0	0.060	0.75	82.30
		0.100	1.03	59.93
		0.150	2.20	28.06
		0.195	3.38	18.26
		0.265	4.53	13.63

Maximum deviation of tractor from its original course: Not significant

Abnormal vibration: None

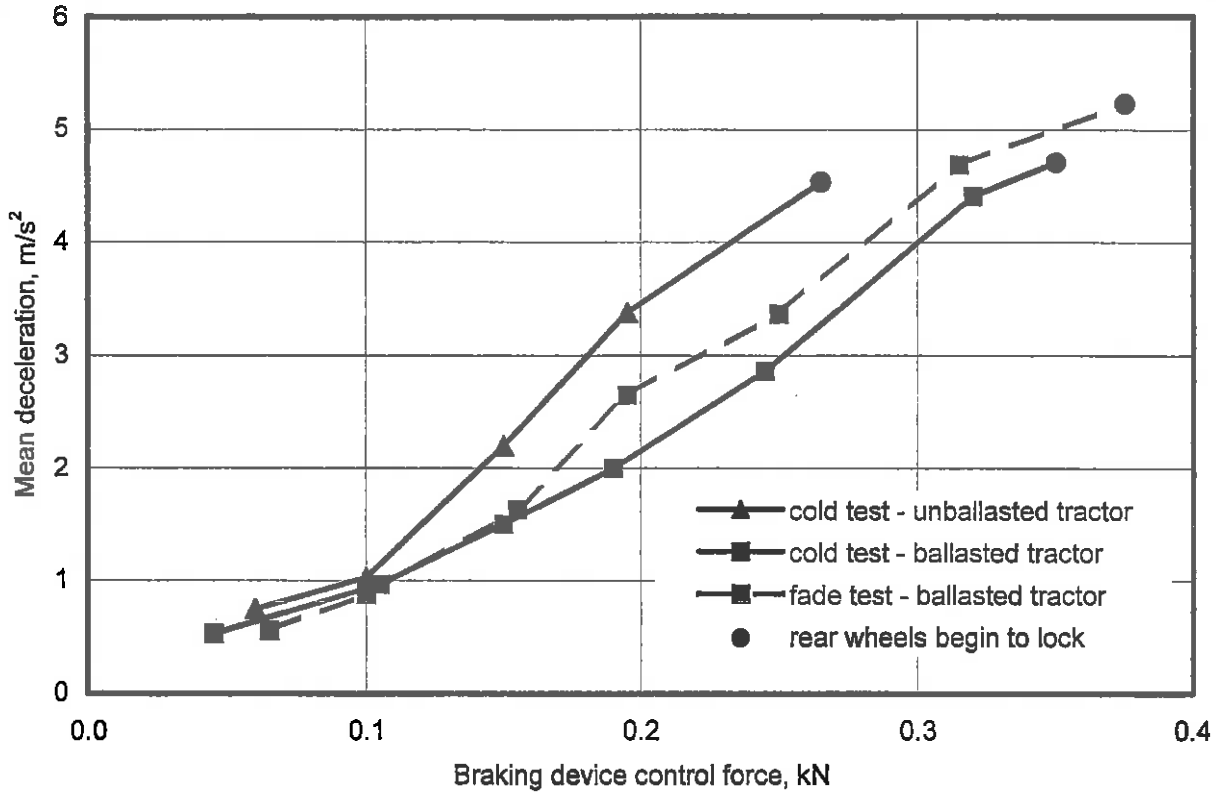
4.1.2 Fade test

	Speed before application of brakes	Braking device control force	Mean deceleration	Minimum stopping distance without locking the wheels
	km/h	kN	m/s²	m
Ballasted tractor	38.9	0.065	0.56	104.25
		0.100	0.88	66.34
		0.155	1.63	35.82
		0.195	2.65	22.03
		0.250	3.37	17.32
		0.315	4.69	12.45
		0.375	5.23	11.16

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
	kN	kN
Braking device control force	0.160	0.145

4.2 MEASUREMENT OF EXTERNAL NOISE

Date of tests: 20th August 1997

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 R

Travelling speed before acceleration: 30.0 km/h

Sound level: 87.0 dB(A)

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

Gear number: 5 R

Travelling speed before acceleration: 30.0 km/h

Sound level: 86.0 dB(A)

5. SUPPLEMENTARY TESTS RESULTS

5.1 MAIN POWER TAKE-OFF (modified tractor)

Date and location of tests: 10th May 2001, 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
5.1.1 MAXIMUM POWER – TWO-HOUR TEST						
46.6	2200	1073	12.43	14.85	267	3.14
5.1.2 POWER AT RATED ENGINE SPEED						
46.6	2200	1073	12.43	14.85	267	3.14
5.1.3 STANDARD POWER TAKE-OFF SPEED [1000±25 rev/min]						
45.2	2050	1000	11.68	13.95	258	3.24
5.1.4 PART LOADS 5.1.4.1 the torque corresponding to maximum power at rated engine speed						
46.6	2200	1073	12.43	14.85	267	3.14
5.1.4.2 85 % of torque obtained in 3.1.4.1						
40.8	2265	1105	11.15	13.32	273	3.06
5.1.4.3 75 % of torque defined in 3.1.4.2						
31.0	2300	1122	9.12	10.90	294	2.84
5.1.4.4 50 % of torque defined in 3.1.4.2						
21.0	2337	1140	7.37	8.81	351	2.38
5.1.4.5 25 % of torque defined in 3.1.4.2						
10.6	2358	1150	5.54	6.62	523	1.60
5.1.4.6 unloaded						
-	2378	1160	3.87	4.62	-	-

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
5.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED [1000±25 rev/min] 5.1.5.1 the torque corresponding to maximum power						
45.2	2050	1000	11.68	13.95	258	3.24
5.1.5.2 85 % of torque obtained in 3.1.5.1						
39.3	2095	1022	10.25	12.25	261	3.21
5.1.5.3 75 % of torque defined in 3.1.5.2						
30.0	2132	1040	8.30	9.92	277	3.02
3.1.5.4 50 % of torque defined in 3.1.5.2						
20.4	2175	1061	6.65	7.95	326	2.57
5.1.5.5 25 % of torque defined in 3.1.5.2						
10.3	2202	1074	4.97	5.94	483	1.73
5.1.5.6 unloaded						
-	2228	1087	3.41	4.07	-	-

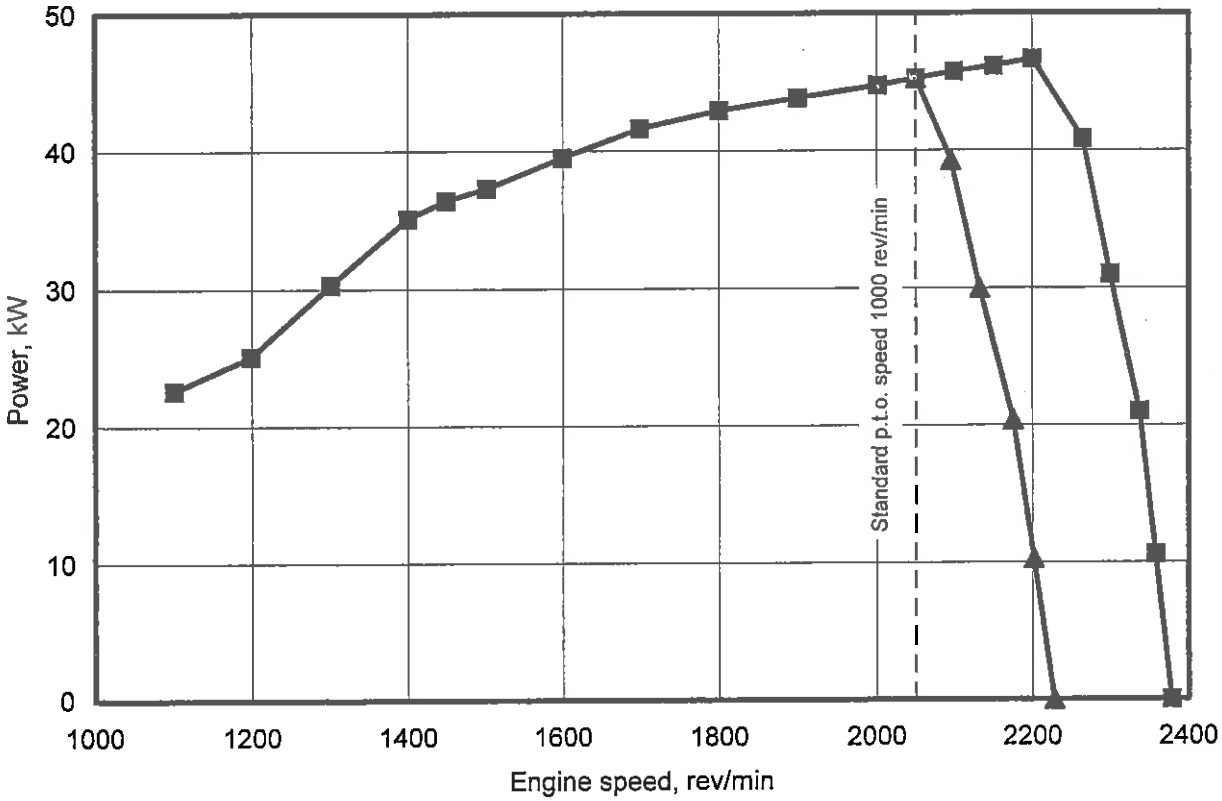
No load maximum engine speed: 2378 rev/min

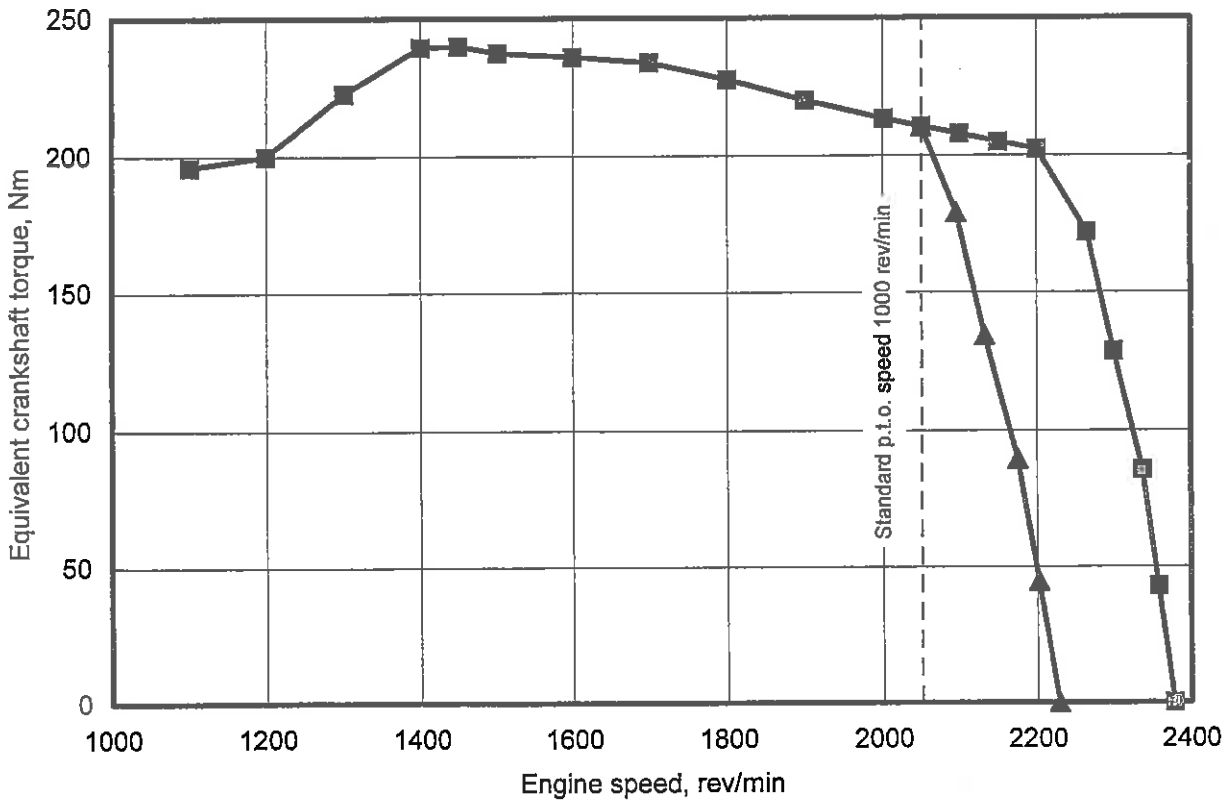
Torque (equivalent crankshaft)
At maximum power: 202.3 Nm
At rated engine speed: 202.3 Nm
At standard power take-off speed: 210.6 Nm

Maximum torque (equivalent crankshaft): 239.9 Nm
(engine speed: 1449 rev/min)

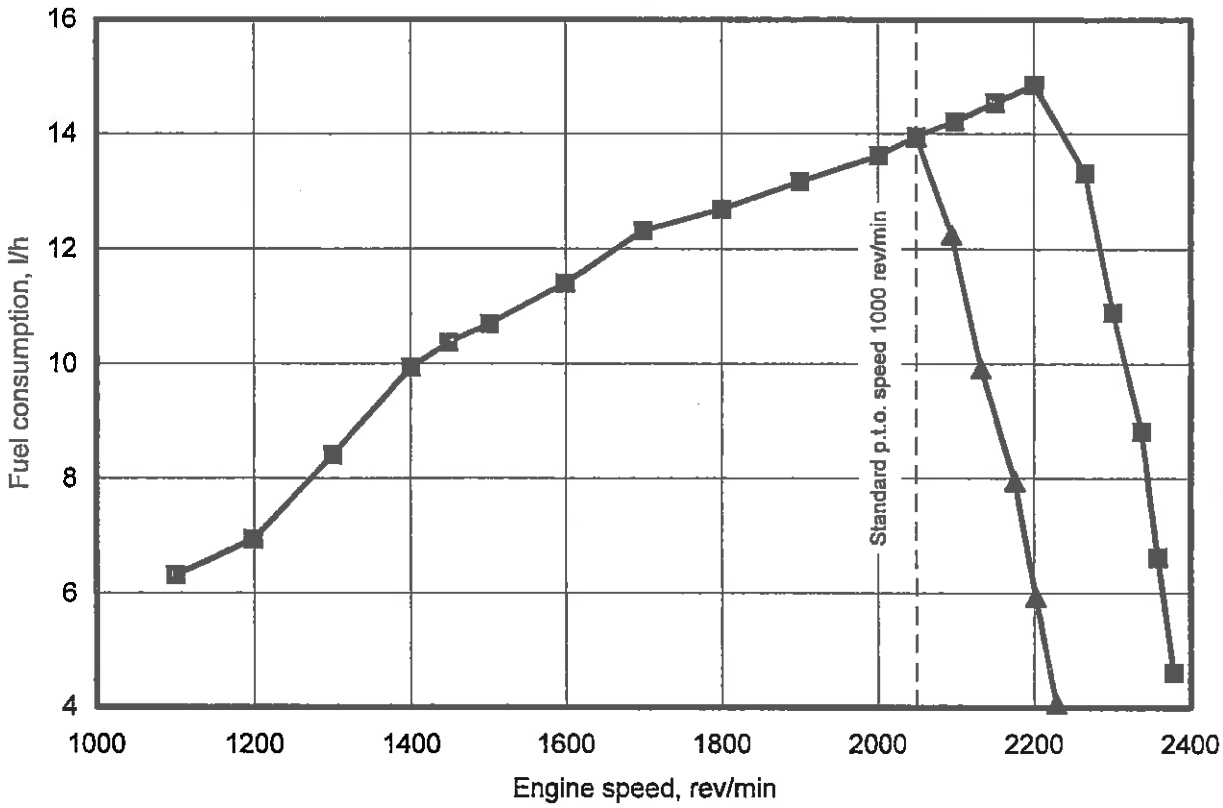
Mean atmospheric conditions:	
Temperature	23 °C
Pressure	97.5 kPa
Relative humidity	26 %
Maximum temperatures:	
Coolant	87 °C
Engine oil	103 °C
Fuel	43 °C
Engine air intake	29 °C

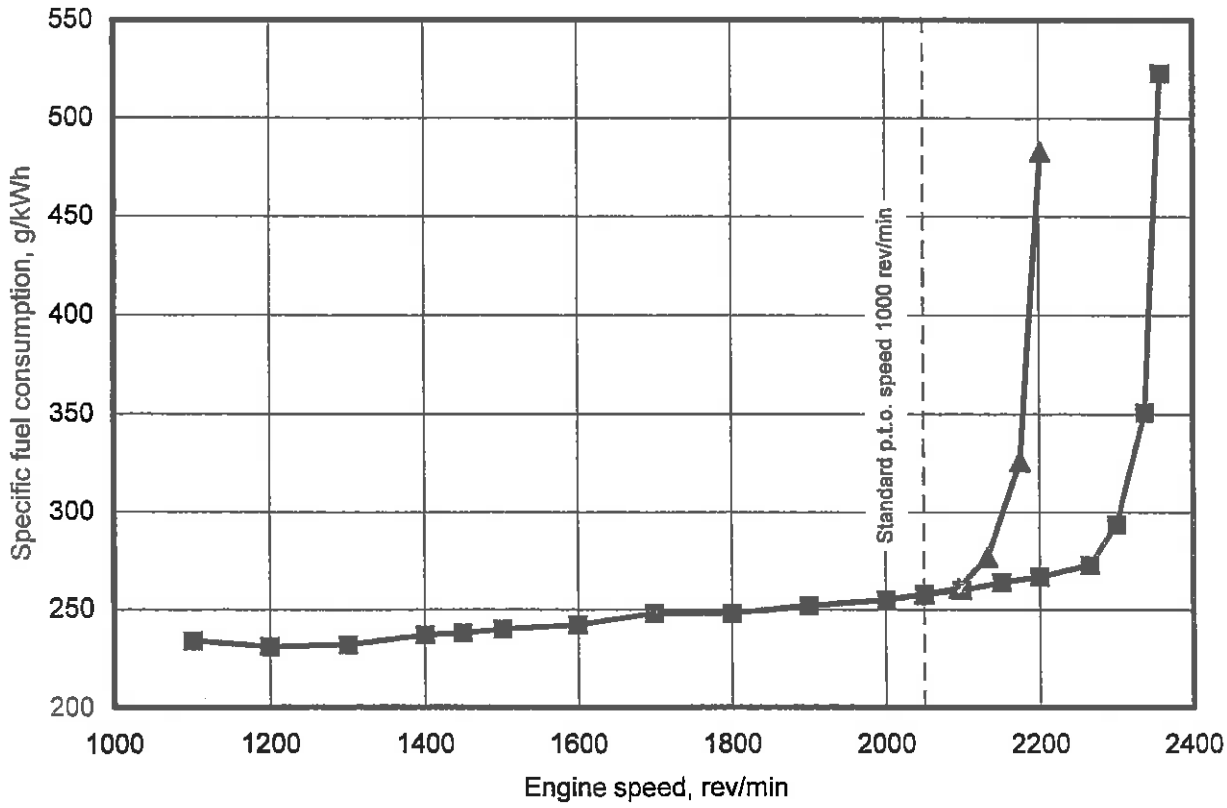
POWER TAKE-OFF TEST



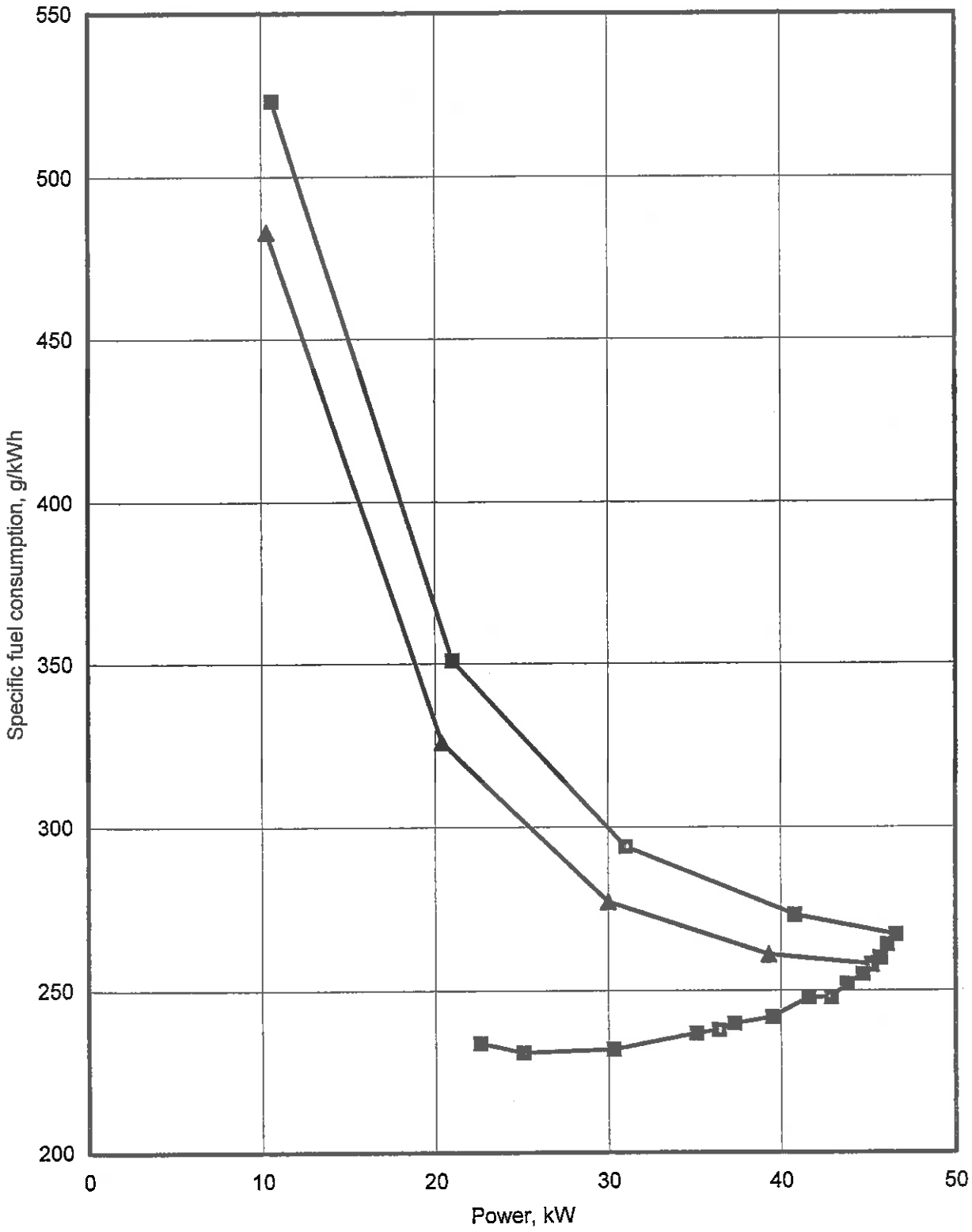


POWER TAKE-OFF TEST





POWER TAKE-OFF TEST



6. REPAIRS

None

7. REMARKS

None

Extensions granted by: Dipl. Ing. Peter Pernis

Signed:

Date: 16th May 2001

Head of the Tractor Laboratory

Peter Pernis

Dipl. Ing. Peter Pernis

STÁTNÍ ZKUŠEBNA ZEMĚDĚLSKÝCH, POTRAVINÁŘSKÝCH A LESNICKÝCH STROJŮ SZZPLS zkušební laboratoř * 1 *

Director

Dipl. Ing. Vladimír Hanzlík