O.E.C.D. Report No.: 624

BUNDESVERSUCHS - UND PRÜFUNGSANSTALT
für landwirtschaftliche Maschinen und Geräte,
Wieselburg

Diesel-Tractor STEYR 377.20

Trade name:

Diesel-Tractor STEYR 8120



Date of approval: 1979 02 20

Date of tests: 1978

This report has been approved by the O.E.C.D. Coordinating Centre (C.N.E.E.M.A., France) as being in accordance with the O.E.C.D. Test Code

TABLE OF CONTENTS

Page

SPECIFICATION OF TRACTOR 2
CONDITIONS DURING TEST 10

COMPULSORY TESTS

Main power take-off performance 12
Drawbar performance 16
Turning space and turning circle 18
Location of centre of gravity 18
Braking performance 18
Ambient noise 19
Noise at the driver's ear level 19
Power lift and hydraulic pump performance 20
Linkage geometry 21
Performance of power lift 22

OPTIONAL TEST

Engine performance 23

ANNEX

Octave analysis of noise at the drivers ear level 27

Tractor manufacturer:	STEYR-DAIMLER-PUCH AG., Steyr, Austria STEYR-HELLAS ABE., Sindos, Greece
Submitted for test by:	Manufacturer
Selected by:	Manufacturer by agreement with BVPA-Wieselburg
Place of running in:	Steyr, Austria
Duration of running in:	45 hours

SPECIFICATION OF TRACTOR

Tractor:

Make:	STEYR-DAIMLER-PUCH AG.
Model:	Diesel-Tractor STEYR 377.20 Trade name: STEYR 8120
Type:	Wheel tractor, rear wheel driven, unit construction
Serial No.:	377.20 - 998

Engine:

Make:	Own make
Model:	WD 611.85
Type:	4 stroke diesel engine with direct injection and turbo-super charger
Serial No.:	611.85 - 996
Cylinders:	6, vertical in line Bore/stroke: 100/110 mm Capacity: 5184 cm^3 Compression ratio: 16,2 Wet liners
Valves:	Overhead valves
Fuel system:	Capacity of fuel tank: appr. 122 l Fuel feed by gravity BOSCH fuel filter Dual filter with water trap and changeable elements, model 0450 134 002 Fuel precleaner 1 Z 1457 434 002 BOSCH distributor injection pump Prototype model VA 6/10 H 1150 CRV 3656 (=serial model VA 6/10 H 1150 CR 160-5) Manufacturers production setting: 51 mm^3/stroke at 2300 rev/min and full load Injection timing: 14° before TDC at 1 mm pump stroke

Fuel system: (cont.)	BOSCH injectors Multi hole injection nozzles DLLA 150 SV 11 966 Injection pressure: 21,6 MPa (216 bar)
Governor:	BOSCH variable speed governor Hydraulically acting, incorporated in injection pump Range of speed: 500 to 2580 rev/min Rated speed: 2300 rev/min
Super charger:	KÜHNLE, KOPP UND KAUSCH Exhaust type turbo-super charger, K 26-2470 V 12.22 supercharge pressure appr. 600 mbar without air intercooler
Air cleaner:	MANN & HUMMEL or PUROLATOR Main-cleaner: Dry type with changeable element and electrical indicator Model: MANN & HUMMEL 45.225.65.424; optional: additional safety element CF 800 PUROLATOR LP 080/1; optional: additional safety element SE 080 Pre-cleaner: Cyclonic type, dust container Model: MANN & HUMMEL 48.068.67.900
Exhaust silencer:	EBERSPÄCHER Absorption type, at left side of the engine, mouth upwards Modell: T 16.47.576.02.0.00
Lubrication:	Forced lubrication with EATON pump, strainer in sump, paper filter in full flow Oil capacity: appr. 10 l Changing interval: 200 hours; paper filter: 400 hours Recommended oil viscosity: SAE 20 W/40 HD, SAE 10 W/30 HD in cold environment (MIL-L-2104 B, MIL-L-46 152)
Cooling system:	Double circuit water cooling with centrifugal pump, pump and 6 blade fan (dia: 460 mm) belt driven Tubular radiator, longtime filling with frostprotection down to -20°C Thermostat control, cooling water thermometer and sight glass for level indication Coolant capacity: appr. 18 l (20 l with cab heating) Overpressure: max. 50 kPa (0,5 bar)

Starting system:
Electrically
BOSCH screw push starter, model: 001 367 005 JF
12 V, 3 kW
Cold starting aid: BERU or BOSCH
2 glow plugs in intake pipe, BERU model 184 G
BOSCH model A 250 00. 1088

Electrical system:
Voltage: 12 V, negative earth
Generator: BOSCH, three phase type
model G 1 - 14 V 28 A 22 - 392 W, 0120 339 526
14 V, 28 A, 392 W
Batteries: 1 with 165 Ah capacity at 20 hours rating

Transmission:

Clutches:
Main clutch: FICHTEL & SACHS
Single plate dry clutch, model G 350 KR, 350 mm dia
pedal operated
P.t.o.-clutch: KLÖCKNER HUMBOLDT DEUTZ
Wet multiplate clutch, 132 mm dia, overload function,
hydraulically engaged, hand switch operated

Gearbox:
KLÖCKNER HUMBOLDT DEUTZ
Group gear with 3 forward and 1 reverse group combined
with synchronised 4 speed change gear (25 km/h model)
or optional with synchronised 5 speed change gear
(30 km/h model, as tested)
Model: TW 90.30
Totally: 12 (15) forward and 4 (5) reverse speeds

Optional (not on tested tractor):
Super crawler group: 4th forward group of group gear
Torque amplifier group: only on 4 speed change gear
model with optional speed ratios 1,222 or 0,807 (0,807 at
torque-amplifier-30 km/h-model)
hydraulically engaged by wet multiplate clutch

Totally (with all options): 32 forward and 8 reverse speeds

Rear axle and final drive:
KLÖCKNER HUMBOLDT DEUTZ
Central axle with spur gear transmission from differential;
Pinion and bevel gear, bevel gear differential, spur gears,
lockable wheelshafts acting on rear wheels
Differential lock: foot lever operated, lockable

Total ratios and speeds

Group	Gear No.	Number of engine revolutions for one revolution of driving wheel	Nominal travelling speed for rated speed of engine *) km/h
forward super crawler K	1 **)	1758,73	0,38
	2 **)	1151,92	0,58
	3 **)	939,53	0,71
	4 **)	647,95	1,03
	5 **)	527,96	1,26
forward slow L	1	329,29	2,03
	2	215,68	3,10
	3	175,91	3,80
	4	121,32	5,50
	5 ***)	98,85	6,75
forward medium Z	1	162,51	4,11
	2	106,44	6,27
	3	86,81	7,69
	4	59,87	11,15
	5 ***)	48,78	13,69
forward fast S	1	77,48	8,62
	2	50,75	13,16
	3	41,39	16,13
	4	28,55	23,40
	5 ***)	23,26	28,70
reverse R	1	133,41	5,04
	2	86,72	7,70
	3	70,73	9,44
	4	48,78	13,69
	5 ***)	39,75	16,80

*) calculated with basis tyre equipment, 18,4-34 AS; Index radius: 770 mm

**) optional, not on tested tractor

***) optional, on tested tractor

Switching aid circuit:

Aid for p.t.o. and optional equipment (i.e. torque amplifier) switching

Own oil circuit with BOSCH gear pump, directly driven by engine, incorporated in gearbox, oil supply from gearbox

Delivery rate: 23 l/min

Working pressure: 2 MPa (20 bar)

Oil capacity:

Gearbox and rear axle: appr. 48 l multipurpose oil

Changing interval: 1000 hours or one year

Recommended oil: MIL-L-2104B/MIL-L-46 152 (API-CC) or MIL-L-2104C (API-CD) (SAE 20 W/20, SAE 15 W/30, SAE 20 W/40, STOU)

Power take off:

Rear p.t.o.: 2 shafts at rear of tractor, 50 mm right and left hand of median plane, 621/606 mm above ground
Dimension: ISO R 500, Type 1; (35 mm, 6 splines)
ISO R 500, Type 2; (35 mm, 21 splines)
Live p.t.o., common driven by hydraulically engaged multi plate clutch, hand switch operated
Speeds: 540/ 604 rev/min at 2057/2300 rev/min engine speed
1000/1110 rev/min at 2071/2300 rev/min engine speed
Engine speed resp. p.t.o. speed indication by "Traktormeter"
Direction of rotation: clockwise viewed from driving end

Front p.t.o.: Optional (not on tested tractor)

Power lift:

Own make, open center type
Draught control with two stage pull adjustment and lower link sensing, position control, floating position
"STEYR SIMPLEMATIK" standard linkage, category II, double hole lift arms
BOSCH gear type pump, directly driven by engine
BOSCH control unit
Own oil supply, capacity: 16 l
Recommended oil: SAE 20 W
Working cylinder: single acting type, bore/stroke: 105/160 mm

Optional (not on tested tractor):
WALTERSCHEID linkage quick coupler, category II
Additional working cylinders for increased power lift performance (50 mm dia each)
Oil tappings: up to three oil circuits with BOSCH control units for single or double acting cylinders

Capacity of tappings: 6 l

Holed drawbar:

Fitted in the clevis of the lower links of the threepoint linkage, category II
Number of holes: 7, diameter: 32 mm, distance: 115 mm

Height above ground		Min. lift rod length (basis adjustment)	Max. lift rod length
Lift arm length:	193 mm	from 425 to 980 mm	from 210 to 820 mm
	245 mm	from 295 to 1000 mm	from 80 to 840 mm

Method of changing: by power lift, lift rod and lift arm length
Distance to rear axle: 1045 mm (lower links horizontally)
Distance relative to p.t.o.: 520 mm

Pull attachement:

Trailer hitch:

Own make
Fork type, heights adjustable in 4 positions

Height above ground:	888, 858, 818, 798 mm
Distance from rear axle:	668 mm
Position relative to p. t. o.:	rearwards 142 mm
Diameter of coupling pin:	31 mm
Maximum vertical load:	15 kN

Optional (not on tested tractor)
ROCKINGER automatic coupler
Fork type, heights adjustable in 4 positions

Heights above ground:	888, 858, 818, 798 mm
Distance from rear axle:	689 mm
Position relative to p. t. o.:	rearwards 163 mm
Diameter of coupling pin:	spherical 38 mm
Maximum vertical load:	15 kN

ROCKINGER
Fork type, heights adjustable in 8 positions

Height above ground:	935, 875, 835, 795, 755 695, 655, 615 mm
Distance from rear axle:	669 mm
Position relative to p. t. o.:	rearwards 143 mm
Diameter of coupling pin:	31 mm
Maximum vertical load:	15 kN

ROCKINGER automatic coupler
Fork type, heights adjustable in 8 positions

Heights above ground:	same heights as above
Distance from rear axle:	696 mm
Position relative to p. t. o.:	rearwards 170 mm
Diameter of coupling pin:	spherical 38 mm
Maximum vertical load:	15 kN

Towing hitch:

Fork type

Height above ground:	835 mm
Distance from front axle:	frontwards 496 mm
Diameter of coupling pin:	32 mm

Steering:

ZF-SCHWÄBISCH GMÜND
Hydrostatic steering, model ZF 8452
Own oil circuit, gear pump directly driven by engine
Capacity of oil case: 2,8 l
Delivery rate: 22 l/min
Working pressure: 10 MPa (100 bar)
Operated by steering wheel, acting on front wheels

Brakes:

Service brake:	TEVES, hydraulically acting dry disc brake, acting on differential shafts, pedal operated
Parking brake:	KNOTT, mechanically acting drum brake, acting on differential shafts, hand lever with ratchet
Steering assistance brake:	Operated by divided pedal of service brake
Optional brake equipment:	(not on tested tractor) Trailer braking valve: high pressure air system, one or two line system, air-compressor V-belt driven Storage pressure: 1,8 MPa (18 bar) Working pressure: 0,72 MPa (7,2 bar)

Wheels:

Front wheels:	2 pneumatics, steering function, diagonal carcass 9,00-16 AS front, PR 6; rim: 6,00 F x 16 Maximum permissible load on each tyre: 6830 N at 2,30 bar inflation pressure 17660 N at 3,00 bar inflation pressure and max. 8 km/h driving speed for front implement working Track width: 1478 mm (changeable to 1578, 1678, 1778, 1878, 1978 and 2078 mm by extending the front axle; and 1568, 1668, 1766, 1866, 1966, 2066 and 2166 mm by reversing wheels) Optional front wheel equipment: 11,00-16 AS front, PR 8 (as on tested tractor) Maximum permissible load on each tyre: 12 950 N at 2,45 bar inflation pressure 25 900 N at 3,20 bar inflation pressure 7,50-20 AS front
Rear wheels:	2 pneumatics, driving function, diagonal or radial carcass 18,4-34 AS, PR 8; rim: DW 16 x 34 Maximum permissible load on each tyre: 25 160 N at 1,4 bar inflation pressure Track width: 1654 mm (1910 mm by reversing wheels) Optional rear wheel equipment: 16,9-38 AS, PR 8 (as on photographed tractor)
Wheel base:	2509 mm

Lighting:

Unrestricted beam angle of head light in plan view: 92 mrad (5, 27°)

	*) Height above ground of centre mm	Dimension mm	**) Distance from outside edge of tractor to centre mm
Head lights	1102	140 x 125	925
Side Lights	1719	164 x 70	239
Rear lights	1719	164 x 70	239
Reflectors	1533 666	102 x 54 80 dia	198 555

*) with tyre equipment: 9,00-16 AS front / 18,4-34 AS
**) with overall width of 2140 mm

Number of grease points: 17

Driver seat:

BOSTROM
Model XH 2 TS 2; tested on tractor according to national regulation (Prot. Nr. 131/78)
X-lever suspension with torsion springs, adjustable to drivers weight
Hydraulically damping
Horizontal adjustment range: 140 mm
Vertical adjustment range: 70 mm

GRAMMER
Model DS 85 H/3; tested on tractor according to national regulation (Prot. Nr. 135/78)
X-lever suspension with 2 tension coil springs (force transmission by curve-disc and ball-bearing)
Hydraulically damping
Horizontal adjustment range: 140 mm
Vertical adjustment range: 60 mm

Protective frame:

(as on tested tractor)
Own make
Model 110.01
Sheet construction with roof, windscreen, front cladding and rubber floor, rubber mounted unit with mudguards integrated
Strength tested according to national legislation (identical to OECD-Code)

Protective cab:

Own make
Model 110.11
Completely cladded and closed protective frame with air ventilation and heater
Strength tested according to national legislation (identical to OECD-Code)

CONDITIONS DURING TEST

Tractormass:

Tractor without driver but with tanks full and protective frame

	Front	Rear	Total
Without ballast	1223 kg	2622 kg	3845 kg
With ballast	2030 kg	3524 kg	5554 kg

Ballastmass:

	Number of weights	Total mass (excluding water)	Water
Front	18	637 kg	-
Rear	8 + 2	472 kg	600 kg
Additional	-	-	-

Track setting and tyre equipment:

1778 mm at front
1654 mm at rear
Front wheels: 11,0-16 AS front, PR 8
Rear wheels: 18,4-34 AS, PR 8

Overall dimensions:

	Length	Width		Height **)
		max.	min. *)	
	mm	mm	mm	mm
With ballast	4770	2654	2140	2595/2700
Without ballast	4140	2654	2140	2595/2700

*) measured on mudguards
**) measured to top of: protective frame/exhaust pipe with basis tyre equipment

Minimum ground clearance: 440 mm under front axle with basis tyre equipment

Fuel and lubricants used in tests:

Fuel:	ELAN Diesel fuel (according to DIN 51 601) specific gravity at 15°C: 0,855 kg/l Viscosity at 20°C: 5 mm^2/s (5 cSt) Cetane no.: 50
Engine oil:	MOBIL OIL SPECIAL SAE 10 W-30 HD, MIL-L-2104 A Viscosity at 100°C: 10,6 mm^2/s (10,6 cSt)
Transmission oil:	SHELL SPIRAX 90 HD, MIL-L-2105 B Viscosity at 50°C: 112 mm^2/s (112 cSt)
Hydraulic oil:	SHELL Tellus 33, SAE 20 W Viscosity at 50°C: 40 mm^2/s (40 cSt)

COMPULSORY TESTS

1. Main power take-off performance

Date and location of tests: 1978 06 26, Wieselburg, Austria
Type of dynamometer: SCHENK-eddy current brake - W 780

Main test on: ISO R 500, type 1 - 540 rev/min - p.t.o.

Power	Speed		Fuel consumption		
	engine	p.t.o.	total	specific	specific
kW	rev/min	rev/min	kg/h l/h	g/kWh	kWh/l
MAXIMUM POWER					
Maximum power - 2 hours test					
69,22	2300	604	17,79 20,81	257	3,326
Standard p.t.o. speed					
67,00	2056	540	16,55 19,35	247	3,462
68,40 *)	2072 *)	1000 *)	16,71 19,54*)	244 *)	3,500 *)
The speed recommended by the manufacturer for drawbar work					
69,22	2300	604	17,79 20,81	257	3,326
PART LOADS Governor hand lever in position giving maximum power					
(i) 85 % of torque at maximum power					
60,78	2376	624	16,53 19,33	272	3,144
(ii) unloaded					
0	2570	675	5,59 6,54	-	-
(iii) 50 % of the load defined in (i)					
31,65	2475	650	10,85 12,69	343	2,494
(iv) maximum power					
69,22	2300	604	17,79 20,81	257	3,326
(v) 25 % of the load defined in (i)					
16,18	2525	663	8,31 9,72	514	1,664
(vi) 75 % of the load defined in (i)					
46,28	2414	634	13,65 15,96	295	2,900

*) Complementary test on: ISO R 500, type 2 - 1000 rev/min - p.t.o.

Power	Speed		Fuel consumption		
	engine	p.t.o.	total	specific	specific
kW	rev/min	rev/min	kg/h l/h	g/kWh	kWh/l
PART LOADS Governor hand lever in position giving standard p.t.o. speed at full load					
(i) 85 % of torque at standard p.t.o. speed					
58,92	2129	559	14,97 17,51	254	3,365
(ii) unloaded					
0	2323	610	4,57 5,35	-	-
(iii) 50 % of the load defined in (i)					
30,72	2220	583	9,70 11,34	316	2,709
(iv) maximum power at standard p.t.o. speed					
67,00	2056	540	16,55 19,35	247	3,462
(v) 25 % of the load defined in (i)					
15,73	2270	596	7,18 8,40	456	1,872
(vi) 75 % of the load defined in (i)					
45,03	2171	570	12,34 14,43	274	3,120
STANDARD SPECIFIC FUEL CONSUMPTION: 272/343/254/316 g/kWh					

No load maximum engine speed: 2570 rev/min
Equivalent crankshaft torque at maximum power: 287,4 Nm at 2300 rev/min of engine
Maximum equivalent crankshaft torque: 343,9 Nm at 1400 rev/min of engine

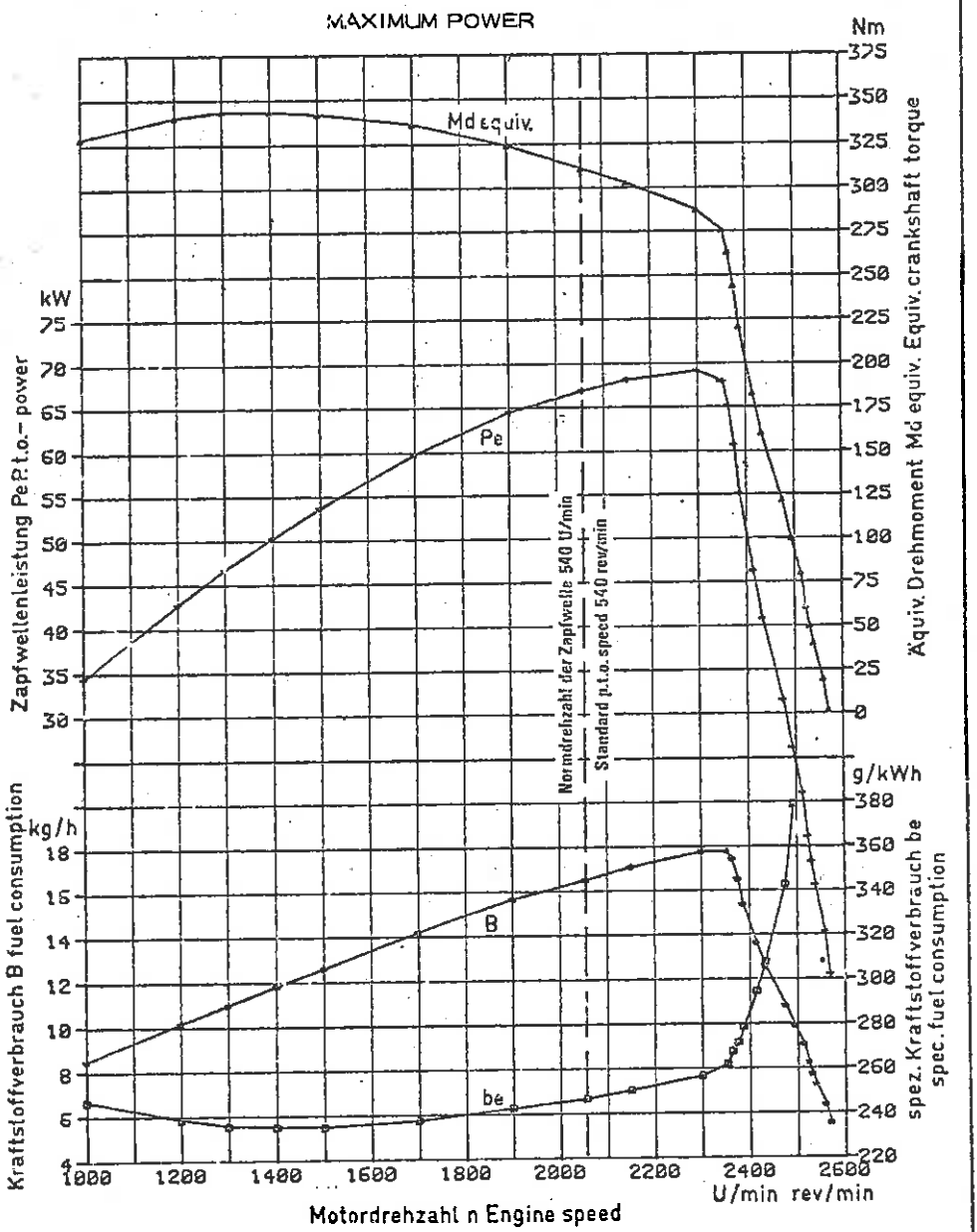
Mean atmospheric conditions: temperature: 17°C
pressure: 986 mbar
humidity: 78 %

Maximum temperatures: coolant: 90°C
engine oil: 118°C
fuel: 68°C
air intake: 27°C

Bundesversuchs-u.Prüfungsanst.
f. landw. Maschinen u. Geräte
Wieselburg / Austria
Protokoll Nr. 019/79

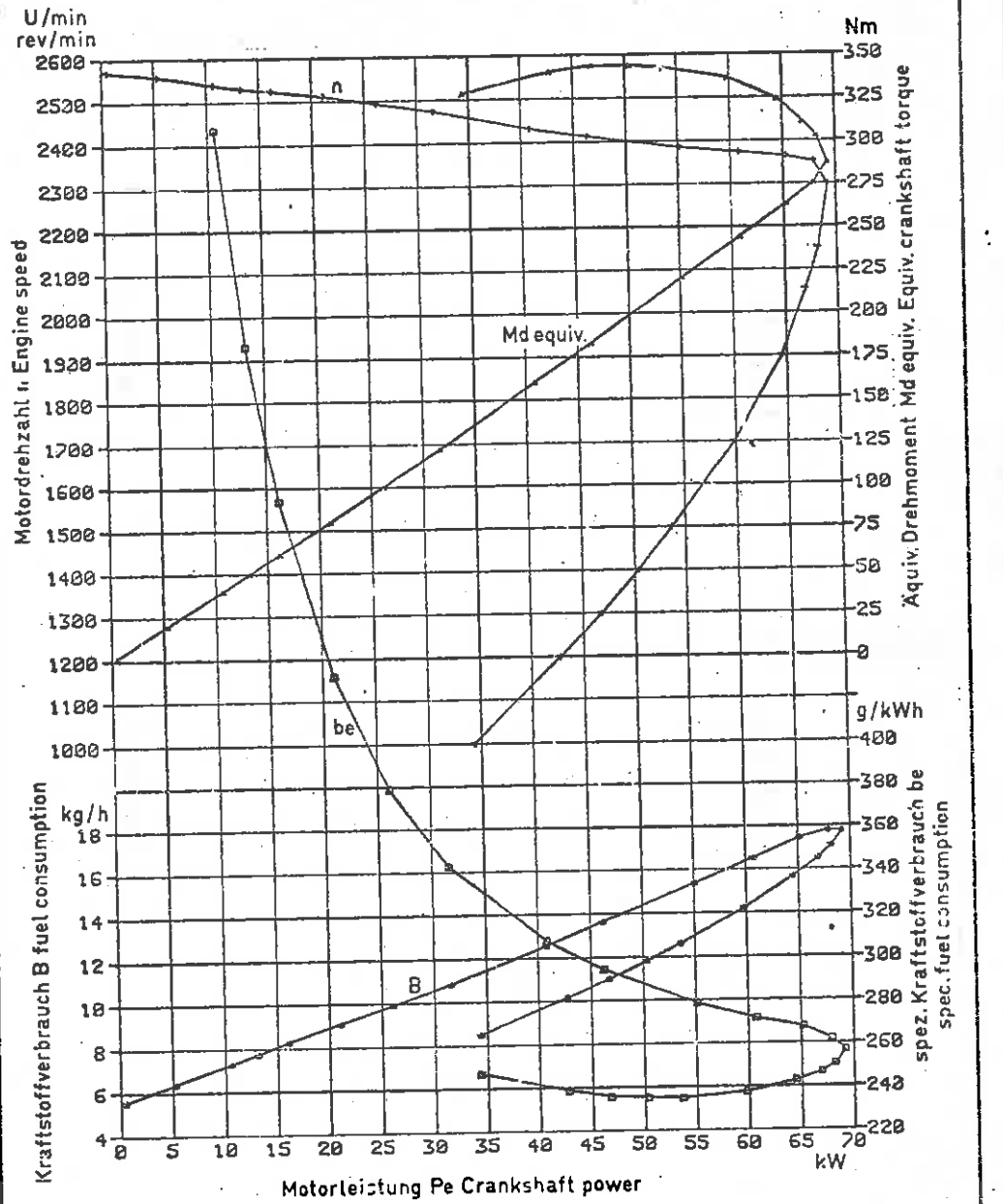
Zapfwellenprüfung
P.t.o. – test

Steyr – Dieseltraktor
Typ 377.20 (8120)
Mot. Typ STEYR WD 611.85



Engine ser. No. 611.85-996	Atm. pressure: 986 mb	Coolant temp.: 90°C	D. of tests: 1978 06 26	Signature
Tractor ser. No. 377.20-998	Air temperature: 27°C	Oil temperature: 118°C	Test No. 118/Za 113	A. Reither
Fuel: 0.855/15°C	Engine oil: Mobil SAE 10W-	Fuel temp.: 68°C	Curves No. 1	

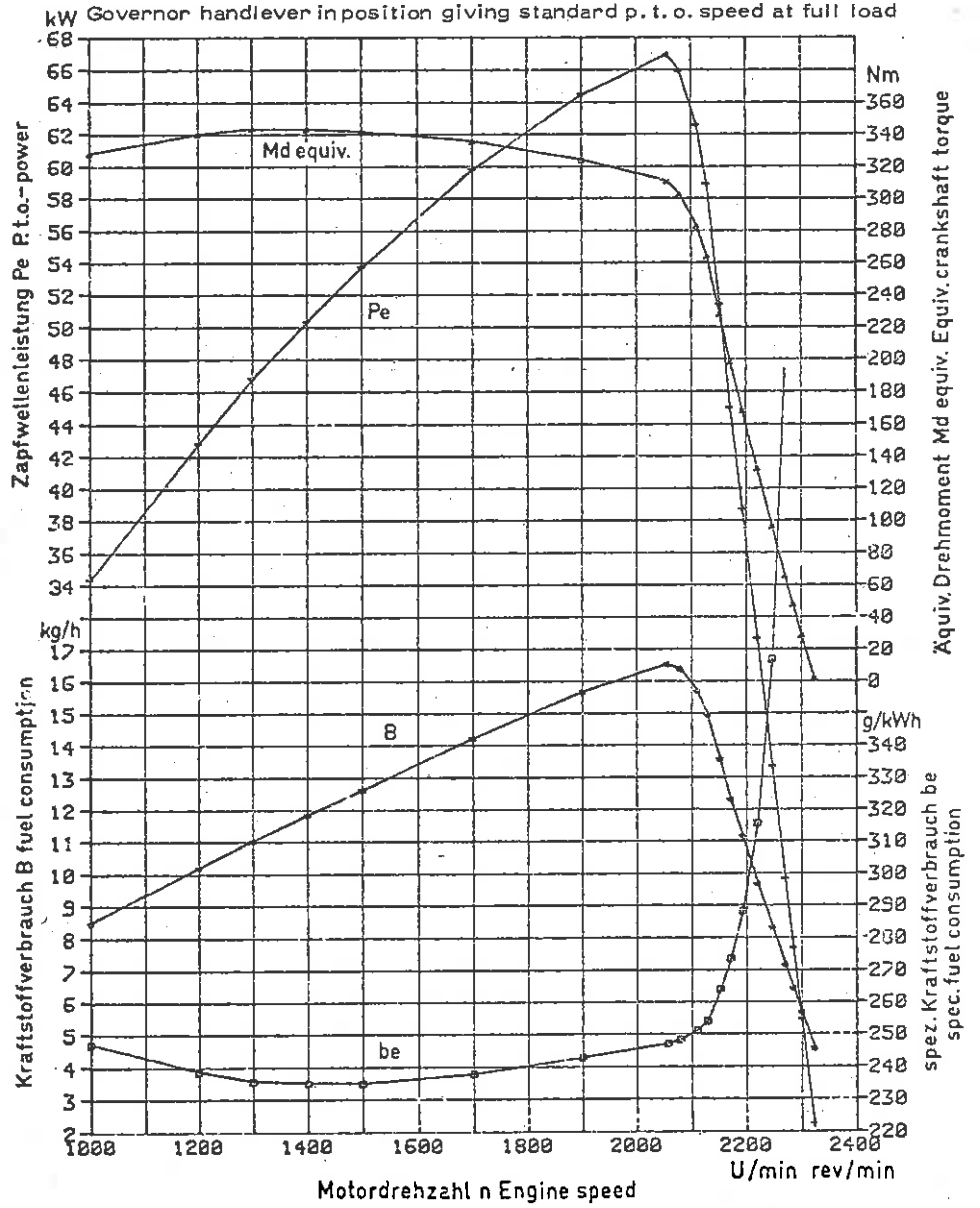
Bundesversuchs-u.Prüfungsanst. f. landw. Maschinen u. Geräte Wieselburg / Austria Protokoll Nr. 019/79	**Zapfwellenprüfung P.t.o.–test**	Steyr–Dieseltraktor Typ 377.20 (8120) Mot. Typ STEYR WD 611.85



Engine ser. No. 611.85–996	Atm. pressure: 986 mb	Coolant temp.: 90°C	D. of tests: 1978 06 26	Signature:
Tractor ser. No. 377.20–998	Air temperature: 27°C	Oil temperature: 118°C	Test No. 119/Za 113	A. Reither
Fuel: D 855/15°C	Engine oil: Mobil SAE 10W-	Fuel temp.: 68°C	Curves No. 2	

Bundesversuchs-u.Prüfungsanst. f.landw.Maschinen u.Geräte Wieselburg / Austria Protokoll Nr. 019/79	**Zapfwellenprüfung P.t.o.-test**	Steyr-Dieseltraktor Typ 377.20 (8120) Mot. Typ STEYR WD 611.85

PART LOADS



Engine ser. No. 611.85-996	Atm. pressure: 986 mb	Coolant temp.: 90°C	D. of tests: 1978 06 26		Signature
Tractor ser. No. 377.20-998	Air temperature: 27°C	Oil temperature: 118°C	Test No. 118/Za 113		A. Reitlhuber
Fuel: D 855/15°C	Engine oil: Mobil SAE 10W-	Fuel temp.: 68°C	Curves No. 2a		

2. Drawbar performance

Date of tests: 1978 07 04 to 1978 07 19
Type of track: Concrete
Height of drawbar above ground: 800 mm ballasted, 660 mm unballasted

Gear No.	Speed	Power	Drawbar pull	Engine speed	Slip of wheels	Fuel consumption		Temperatures			Atmosph. conditions		
						specific	specific	Fuel	Coo-lant	Engine Oil	Tempe-rature	rel.hu-midity	Pres-sure
	km/h	kW	kN	rev/min	%	kWh/l	g/kWh	°C	°C	°C	°C	%	mbar
(I) Maximum power (ballasted)													
1 L	1,879	25,60	49,03	2495	15	-	-	54	83	106	24	62	986
2 L	2,797	38,11	49,03	2429	15	2,552	335	54	82	105	24	62	986
3 L	3,384	46,10	49,03	2398	15	2,679	319	54	83	105	24	63	986
1 Z	3,647	49,67	49,03	2383	15	2,712	315	54	84	105	24	63	986
4 L	4,810	61,21	45,80	2300	13,5	2,928	292	53	84	103	23	64	986
2 Z	5,612	62,51	40,10	2299	11,4	2,989	286	51	83	103	22	64	986
5 L	6,116	63,03	37,10	2300	10,4	3,015	283,5	51	83	103	22	64	986
3 Z	7,099	63,70	32,30	2303	9	3,047	280,5	52	83	102	22	64	986
1 S	8,020	64,00	28,75	2300	8,1	3,061	279	53	84	104	23	64	986
4 Z	10,580	63,50	21,60	2302	6,4	3,036	281,5	53	84	105	24	65	986

Gear No.	Speed	Power	Drawbar pull	Engine speed	Slip of wheels	Fuel consumption		Temperatures			Atmosph. conditions		
						specific	specific	Fuel	Coo-lant	Engine Oil	Tempe-rature	rel.hu-midity	Pres-sure
	km/h	kW	kN	rev/min	%	kWh/l	g/kWh	°C	°C	°C	°C	%	mbar
(ii) Five-hour-test at 75 % of pull at maximum power													
1 S	8,521	51,04	21,56	2390	6,4	2,877	297	60	86	110	21	73	990
(iii) Five-hour-test at pull corresponding to 15 % wheelslip in test (i)													
1 Z	3,629	49,40	49,00	2380	15	2,697	317	64	88	115	24	64	988
(iv) Maximum power (unballasted)													
4 L	4,955	48,89	35,52	2393	15	2,731	313	59	86	105	26	66	981
2 Z	5,590	55,18	35,52	2368	15	2,785	307	58	86	103	26	67	981
5 L	5,994	59,14	35,52	2352	15	2,850	300	57	85	102	25	68	981
3 L	6,900	60,98	31,81	2300	12,3	2,917	293	57	85	102	25	70	981
1 S	7,869	62,41	28,55	2302	10,8	2,987	286	56	84	101	24	70	981
4 Z	10,533	63,64	21,75	2303	8	3,044	281	55	83	100	23	70	981
2 S	12,600	63,00	18,00	2303	6,7	3,013	284	53	83	100	23	69	981

Total oil consumption during 10 hours duration of tests (ii) and (iii): 117 g/h

3. Turning space and turning circle

Wheel equipment front: SEMPERIT 11,00-16 AS front, PR 8
rear: SEMPERIT 18,4-34 AS, PR 8

Track of wheels front: 1778 mm
rear: 1654 mm

Results	With brakes		Without brakes	
	right-hand	left-hand	right-hand	left-hand
	m	m	m	m
Radius of turning space	4,20	4,12	4,71	4,65
Radius of turning circle	3,88	3,80	4,39	4,33

4. Location of centre of gravity

	mm
Height above ground	985
Distance forward from the vertical plane containing the axis of the rear wheels	787
Distance from the median plane	0

5. Braking

Date of tests: 1978 07 12, 1978 07 20
Type of track: Concrete
Type of decelerometer: Moto-Meter Nr. 03382 (Kombi-Schreiber)
Mass of ballasted tractor: 5629 kg (with driver)

Cold brakes

		Ballasted	Without ballast
Travelling speed of the tractor	km/h	25	25
(i) Deceleration	m/s^2	4,0	4,4
(ii) Stopping distance	m	9,9	5,8
(iii) Force exerted on the brake pedal	N	290	245
(iv) Force exerted on the brake pedal to achieve a deceleration of 2,5 m/s^2	N	100	100

Brake fade characteristics (hot tests)	Ballasted	Unballasted
Deceleration hot / deceleration cold x 100	100	102
Stopping distance cold / Stopping distance hot x 100	98	91
Force on pedal, cold / Force on pedal, hot x 100	105	125
Force on pedal, cold / force on pedal, hot to achieve a deceleration of 2,5 m/s^2 x 100	85	88

Efficiency of handbrake:
Satisfactory facing up and down slope of 16 %
pull on handbrake: 150 N

6. Measurement of ambient noise

Date of tests: 1978 06 26
Type of sound level meter: 2203 BRÜEL & KJAER
Type of track: Concrete

Results of tests:
Gear: 5 S
Travelling speed before acceleration: 23 km/h
Sound level: 87 dB(A)

7. Noise measurement at the driver's ear level

Date of tests: 1978 06 27
Type of sound level meter and octave filter: 2203 and 1613 BRÜEL & KJAER
Type of track: Concrete

Results of tests:
(tractor with protective frame)

Gear	Effective travelling speed	Sound level	
		dB(A)	Noise rating
2 L	3,2 km/h	92	-
1 Z	4,4 km/h	92	-
5 L *)	7,2 km/h	91	88,5
1 S	8,7 km/h	92	-
5 Z	13,9 km/h	92	-
3 S	16,7 km/h	92	-
5 S	29,7 km/h	92	-

*) The gear tested corresponds to a travelling speed nearest to 7,5 km/h

8. Power lift and hydraulic pump performance

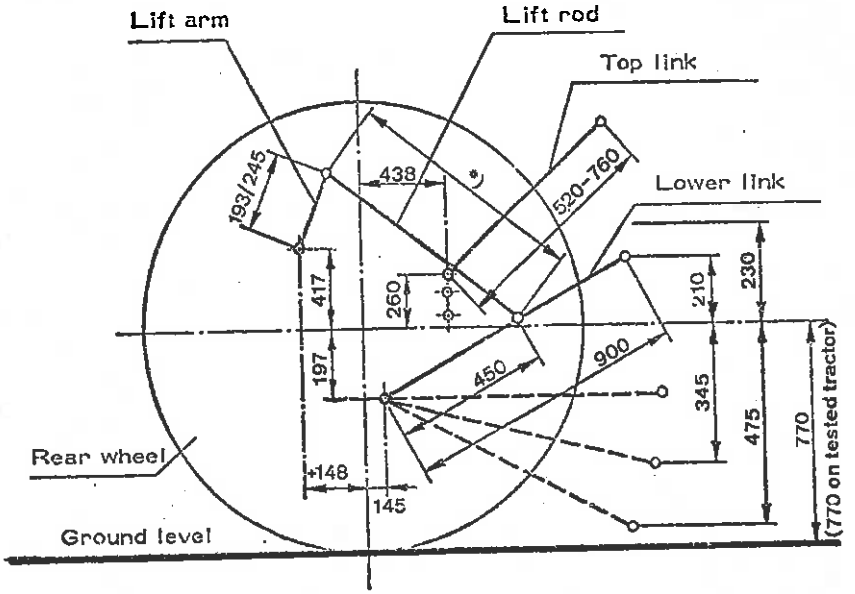
Date and location of tests: 1978 08 16 , Wieselburg, Austria
Hydraulic fluid:
Make and type: SHELL Tellus 33, SAE 20 W
Viscosity at 50°C: 40 mm^2/s (40 cSt)
Typ of linkage lock for transport: hydraulically by throttle valve
Opening pressure of the cylinder over pressure relief valve (manufacturer specification): 24,5 MPa (245 bar)

Pump characteristics:

(i) Opening pressure of the relief valve: 18,2 MPa (182 bar)
sustained pressure by the open relief valve: 17,5 MPa (177 bar)

(ii) Pump delivery rate at minimum pressure and rated engine speed: 35,5 l/min

(iii) Pump delivery rate: 35,5 l/min
delivery pressure: 17,5 MPa (175 bar)
power: 10,35 kW



*) basis adjustment: both lift rods 666 mm
left lift rod: from 666 mm to 756 mm adjustable
right lift rod: from 626 mm to 766 mm adjustable

Linkage geometry when connected to the standard frame

		Maximum mechanical advantage		Minimum mechanical advantage	
Projected length in side view					
Lower links	mm	900		900	
Lift arms	mm	193		245	
Lift rods	mm	666		666	
Top link	mm	610		610	
Distance of lift rod connection point from pivot point of lower link	mm	450		450	
The following dimensions are given relative to the rear wheel centre line, situated 770 mm above the ground level					
Lower link pivot point	mm	145 behind	197 below	145 behind	197 below
Top link pivot point	mm	438 behind	260 above	438 behind	260 above
Lift arm pivot point	mm	148 behind	417 above	148 behind	417 above
Maximum und minimum height of lower link hitch points	mm	210 above	345 below	230 above	475 below
Height of lower link hitch points locked in transport position	mm	up to 210 above		up to 230 above	

Performance of power lift

Lifting heights in relation to a horizontal line through the lower link pivoting point mm		-278	-253	-200	-148	-143	-100	0	+100	+200	+300	+407	+427	+487	+512
Lifting force at the hitch-points kN	max.mech. advantage				31, 60		33, 30	36, 00	36, 90	36, 70	36, 60	37, 40			
(Values for the pressure at maximum hydraulic power, calculated from measurements made at maximum pressure)	min. mech. advantage	26, 50 45, 50*		27, 80 45, 60*	28, 60 46, 10*		29, 20 46, 60*	29, 90 47, 10*	30, 00 46, 60*	29, 20 45, 30*	29, 15 44, 50*	29, 60 44, 00*	29, 90 44, 00*		
	Maximum force exerted throughout whole range: 31, 60/26, 50 kN (44, 00 kN *)														
	Oil pressure: 17, 5 MPa (175 bar)														
Lifting force at the frame kN	max.mech. advantage					32, 20	32, 90	32, 70	31, 20	29, 15	26, 70	24, 80		23, 20	
(Values for the pressure at maximum hydraulic power, calculated from measurements made at maximum pressure)	min. mech. advantage		30, 60 48, 80*	29, 60 47, 80*		28, 60 46, 50*	27, 90 45, 30*	26, 40 42, 00*	24, 50 38, 80*	22, 60 35, 70*	20, 60 32, 90*	19, 20 29, 40*		18, 00 26, 65*	17, 80 26, 10*
	Maximum force exerted throughout whole range: 23, 20/17, 80 kN (26, 10 kN*)														
	Oil pressure: 17, 5 MPa (175 bar)														

*) when fitted with additional working cylinders

OPTIONAL TEST

9. Engine performance

Date and location of test: 1978 05 24, Wieselburg/Austria
Type of dynamometer: SCHENK, eddy current brake, W 780

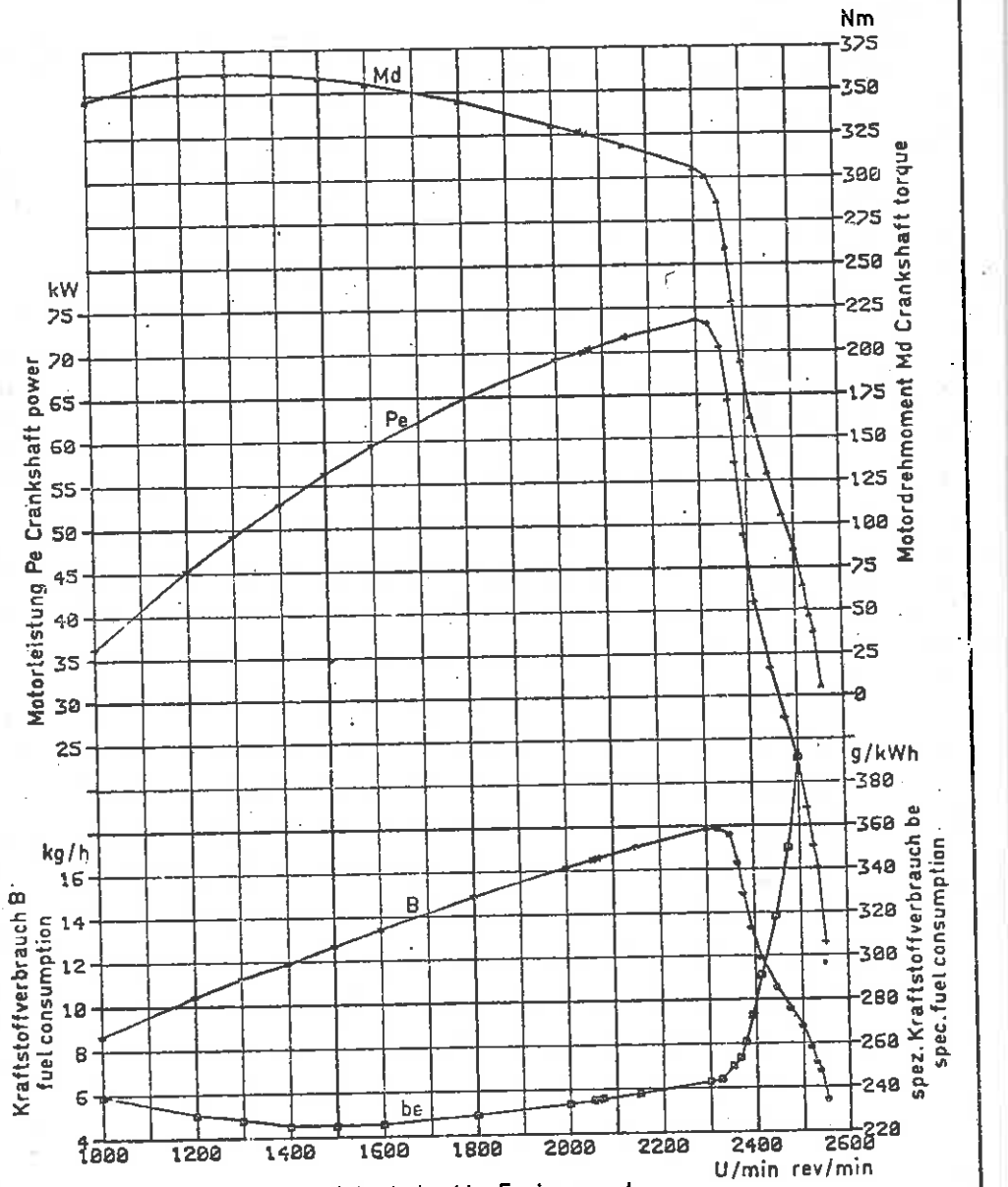
Power	Engine speed	Fuel consumption		
		total	specific	specific
kW	rev/min	kg/h l/h	g/kWh	kWh/l
Maximum power - 2 hours test				
73,60	2300	17,89 20,92	243	3,518
Standard p.t.o. speed (540 rev/min - 1000 rev/min)				
70,31	2056	16,55 19,35	235	3,633
70,45	2072	16,63 19,45	236	3,622
The speed recommended by the manufacturer for drawbar work				
73,60	2300	17,89 20,92	243	3,518
Part loads				
(i) 85 % of torque at maximum power				
64,35	2366	16,34 19,11	254	3,367
(ii) unloaded				
0	2554	5,46 6,39	-	-
(iii) 50 % of the load defined in (i)				
33,26	2446	10,58 12,38	318	2,686
(iv) maximum power				
73,60	2300	17,89 20,92	243	3,518
(v) 25 % of the load defined in (i)				
17,12	2518	7,87 9,21	460	1,859
(vi) 75 % of the load defined in (i)				
48,84	2394	13,33 15,59	273	3,132

Optimum fuel consumption: 223 g/kWh (see page 26)
No load maximum engine speed: 2554 rev/min
Torque at maximum power: 305,6 Nm at 2300 rev/min
Maximum torque: 361,9 Nm at 1300 rev/min
Mean atmospheric conditions: temperature: 15°C
pressure: 978 mbar
relative humidity: 84 %
Maximum temperatures: coolant: 86°C
engine oil: 106°C
fuel: 45°C
engine air intake: 25°C

Bundesversuchs-u.Prüfungsanst. f. landw. Maschinen u. Geräte Wieselburg / Austria Protokoll Nr. 019/79

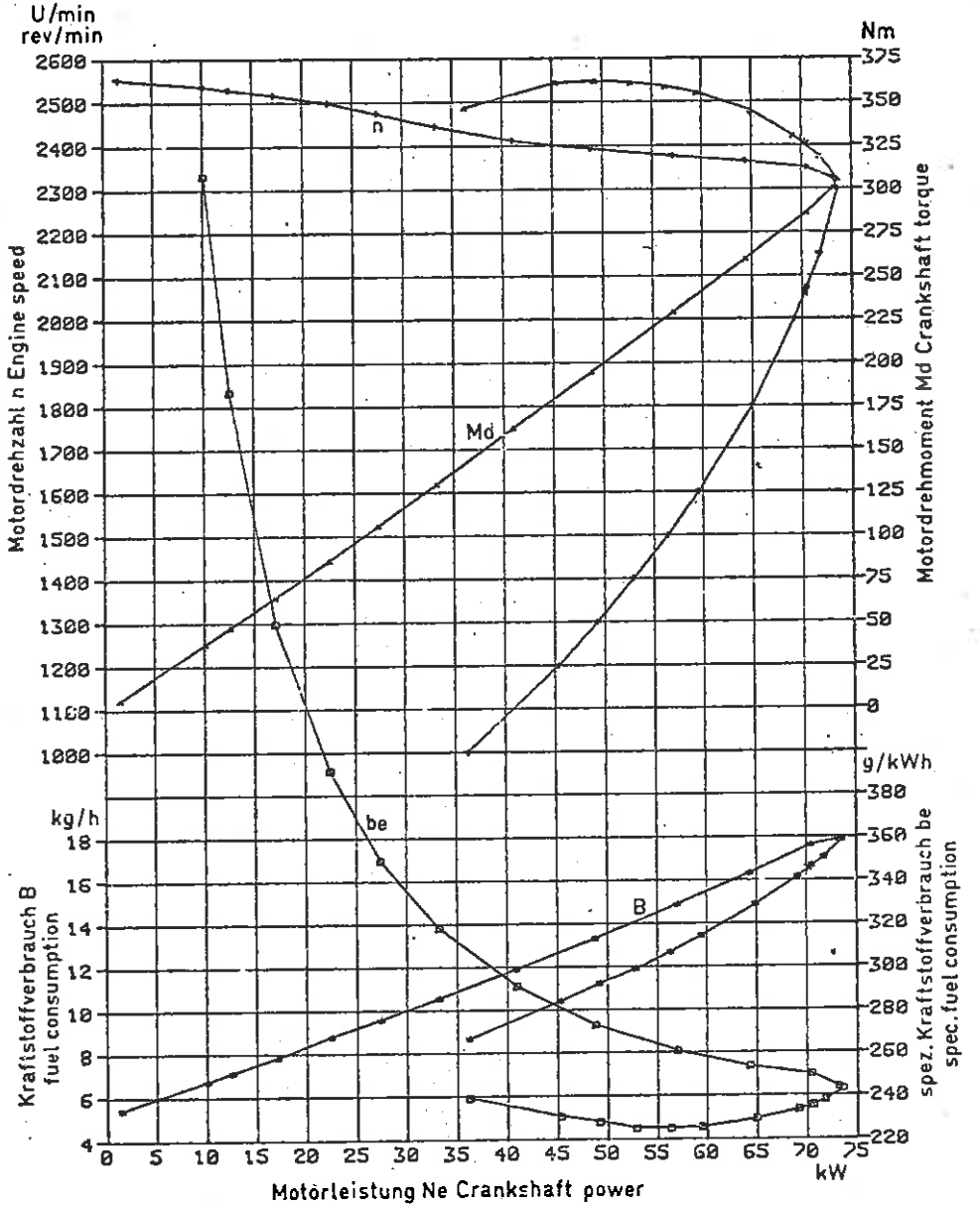
Motorprüfung Engine-test

Steyr-Dieseltraktor
Typ 377.20 (8120)
Mot. Typ STEYR WD 611.85



Engine ser. No. 611.85-996	Atm. pressure: 978 mb	Coolant temp.: 86°C	D. of tests: 1978 05 24	Signature
Tractor ser. No. 377.20-998	Air temperature: 25°C	Oil temperature: 106°C	Test No. 118/M166	A. Reither
Fuel: 0.855/15°C	Engine oil: Mobil SAE 10W-	Fuel temp.: 45°C	Curves No. 3	

Bundesversuchs-u.Prüfungsanst. f.landw.Maschinen u.Geräte Wieselburg / Austria Protokoll Nr. 019/79	**Motorprüfung Engine-test**	Steyr-Dieseltraktor Typ 377.20 (8120) Mot. Typ STEYR WD 611.85



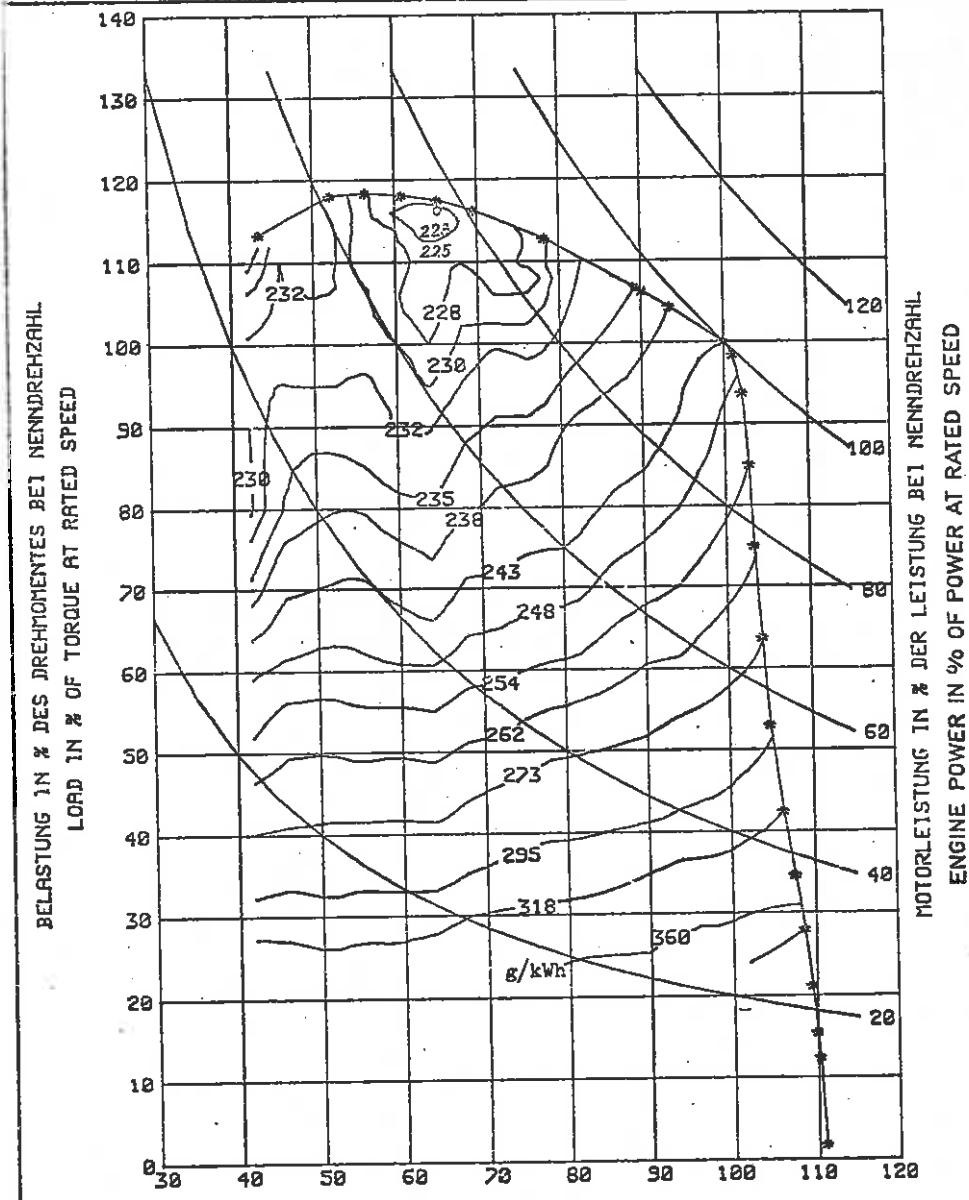
Engine ser. No. 611.85-996	Atm. pressure: 978 mb	Coolant temp.: 86°C	D. of tests: 1970 05 24		Signature
Tractor ser. No. 377.20-990	Air temperature: 25°C	Oil temperature: 106°C	Test No. 118/M 166		A. Reitlinger
Fuel: 0.855/15°C	Engine oil: Mobil SAE 10W-	Fuel temp.: 45°C	Curves No. 4		

Bundesversuchs-u.Prüfungsanst. f. landw. Maschinen u. Geräte Wieselburg / Austria
Protokoll Nr. 019/79

MOTORKENNFELD

ENGINE PERFORMANCE CHARACTERISTICS

Steyr – Dieseltraktor
Typ 377.20 (8120)
Mot. Typ STEYR WD 611.85



Engine ser. No. 611.85-996	Atm. pressure: 978 mb	Coolant temp.: 86°C	D. of tests: 1978 05 24		Signature
Tractor ser. No. 377.20-998	Air temperature: 25°C	Oil temperature: 106°C	Test No. 118/M166		A. Reitler
Fuel: 0,855/15°C	Engine oil: Mobil SAE 10W-	Fuel temp.: 45°C	Curves No. 5		

ANNEX

Out of the OECD-Code under responsibility of the Austrian Testing Station

1. OCTAVE ANALYSIS OF NOISE AT THE DRIVERS EAR LEVEL
(to page 19, chapter 7)

