O.E.C.D. Report No.: 709

GEPRÜFT

PROT. Nr.

BUNDESVERSUCHS - UND PRÜFUNGSANSTALT
für landwirtschaftliche Maschinen und Geräte,
Wieselburg

Dieseltractor

Trade name:

STEYR 8080a

Manufacturers signature:

STEYR 357.15



Date of approval: 1981 05 14

Date of test: 1980 04 30

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

04

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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:	120 hours

SPECIFICATION OF TRACTOR

Tractor:

Make:	STEYR-DAIMLER-PUCH AG.
Model:	Diesel-Tractor 357.15 Trade name: STEYR 8080a
Type:	Wheel tractor, four-wheel driven, unit construction
Serial No.:	357.15 - 01001

Engine:

Make:	Own make
Model:	WD 411.85
Type:	4 stroke diesel engine with direct injection and turbo supercharger
Serial No.:	411.85 - 1006
Cylinders:	4, vertical in line Bore/stroke: 100/110 mm Capacity: 3456 cm^3 Compression ratio: 16,2 Wet liners
Valves:	Overhead valves
Fuel system:	Capacity of fuel tank: appr. 96 l Optional: small tank appr. 64 l Fuel feed by gravity BOSCH fuel filter Dual filter with water trap and changeable elements, model 0450 134 002 Fuel precleaner FJSJ 1/1 Z BOSCH distributor injection pump Prototype model: VA 4/10 H 1200 CRV 3678 Serialmodel: VA 4/10 H 1200 CR 145-5 Manufacturers production setting: 51^{+2}_{-2} mm^3/stroke at 2400 rev/min and full load Injection timing: 18^{+2}_{-2} before TDC at 1 mm pump stroke

Fuel system: (cont.)

Injectors:
BOSCH
Multi hole injection nozzles
Prototypemodel DLLA 150 SV 11966
Serialmodel DLLA 150 S 798
FRIEDMANN & MAIER
Multi hole injection nozzles D 1 LMK 150/54

Injection pressure: $21,6^{+0,5}_{-0}$ MPa (216^{+5}_{-0} bar)

Governor:

BOSCH variable speed governor
Hydraulically acting, incorporated in injection pump
Range of speed: 600 to 2580 rev/min
Rated speed: 2400 rev/min

Supercharger:

KÜHNLE, KOPP & KAUSCH
Exhaust type turbo-supercharger
K 26 - 2460 G - 6.11
Supercharge pressure: appr. 665 mbar
without air intercooler

Air cleaner:

MANN & HUMMEL or PUROLATOR/KNECHT
Main-cleaner: Dry type with changeable element and electrical indicator
Model: MANN & HUMMEL 45.165.65.424
optional: additional safety element CF 700
PUROLATOR LP 060/1
optional: additional safety element AF 099 or
KNECHT SE 060
Pre-cleaner: Cyclonic type, transparent dust container
Model: MANN & HUMMEL 48.056.67.900

Exhaust silencer:

EBERSPÄCHER
Absorption type, at left side of the engine, mouth upwards 2433 mm above ground, 150 mm left of median plane
Model: T 16.47.178.04.0.00 with protective frame 110.01
T 16.47.178.05.0.00 with protective frame 110.02

Lubrication:

Forced lubrication with EATON pump, strainer in sump, paper filter in full flow
Oil capacity: appr. 9 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 C, SAE 20W-40 - API CD)

Cooling system:

Double circuit water cooling with centrifugal pump, pump and 4 blade fan (dia: 420 mm) belt driven
Turbular radiator, longtime filling with frostprotection down to -20°C
Thermostat control, cooling water thermometer and sight glass for level indication
Coolant capacity: appr. 15,5 l (17 l with cab heating)

Cooling system: (cont.)	Overpressure: max. 50 kPa (0,5 bar) Joining for warm water heating
Starting system:	Electrically BOSCH solenoid engaged starter, model: 0 001 367 011 - 12 V, 3,0 kW Cold starting aid: BERU or BOSCH 2 glow plugs in intake pipe, BERU model 184 G or 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, 0 120 339 526 14 V, 28 A, 392 W Batteries: lead acid type, 1 with 12 V and 135 Ah capacity at 20 hours rating

Transmission:

Clutches:	Clutch: LAMELLEN-U. KUPPLUNGSBAU BADEN-BADEN Dual plate dry clutch, model LUK (DT 310/310 G), both plates 310 mm dia, independent activated Main clutch: 310 mm dia, pedal operated P. t. o.-clutch: 310 mm dia, hand lever operated Front wheel-drive clutch: Wet multiplate clutch, 135 mm dia, mechanically acting, hand lever operated
Gearbox:	Own make, mechanically acting, model 357 Basis model: (optional) reversing gear (FORWARD - REVERSE) combined with 4 speed change gear and reduction gear (ROAD - FIELD) Total: 8 forward and 8 reverse speeds Normal model: (as tested) 2 forward and 1 reverse group gear (FORWARD FAST, FORWARD NORMAL, REVERSE) combined with 4 speed change gear and reduction gear (ROAD - FIELD) Total: 16 forward and 8 reverse speeds Crawler gear model: (optional) Basis model with crawler gear reduction Reduction ratio: 4,67 Total: 16 forward and 16 reverse speeds Optional: synchronised helical 4 speed change gear Optional: top speed 25 km/h or 30 km/h (as tested)
Rear axle and final drive:	Own make, model 357 Central axle; pinion and bevel gear, lockable bevel gear differential, acting by planetary gears on rear wheels Differential lock: mechanically acting, foot lever operated, lockable, self disengaging

Front axle and final drive:

ZF-PASSAU
Steering axle, central type
Driving shaft, pinion and bevel gear, bevel gear differential, half shafts, universal joints, planetary gears in wheel hubs
Front wheel drive: mechanically engaged, hand lever operated
Optional: automatically locking differential

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 *)	
		field L	road S	field L	road S
forward normal VN	1	357,67	109,61	1,87	6,11
	2	203,55	62,38	3,29	10,73
	3	135,22	41,44	4,95	16,16
	4	83,88	25,71	7,98	26,05
forward fast VS	1	313,14	95,96	2,14	6,98
	2	178,21	54,61	3,76	12,26
	3	118,38	36,28	5,66	18,46
	4	73,44	22,51	9,12	29,75
reverse R	1	464,97	142,49	1,44	4,70
	2	264,62	81,09	2,53	8,26
	3	175,78	53,87	3,81	12,43
	4	109,05	33,42	6,14	20,04

*) Calculated with index radius of 740 mm and test tyre equipment 13,6-38 AS

Oil capacity:

Gearbox and rear axle: appr. 24,5 l
Rear axle final drives: appr. 2,7 l for each planetary gear
Recommended oil: SAE 90, MIL-L-2105
Front axle differential: appr. 4,75 l SAE 90 - API GLS MIL-L-2105 B
Front axle final drives: appr. 0,75 l each side SAE 90 2105
Changing interval: uniformly 1000 hours or one year

Power take off:

At rear of tractor, in median plane, 445,5 mm behind rear axle, 630 mm above ground (740 mm tyre index radius)
Dimension: ISO R 500, Type I (35 mm, 6 splines)

Power take off: (cont.)

Proportional to engine speed (independent) p.t.o.:

P.t.o. shaft driven by p.t.o. clutch (dry plate type) and speed selector

Speeds:

540/ 634 rev/min at 2044/2400 rev/min engine speed
1000/1127 rev/min at 2130/2400 rev/min engine speed

Engine speed resp. p.t.o. speed indication by "Traktor-meter" (needle instrument)

Direction of rotation: clockwise viewed from driving end

Proportional to ground speed p.t.o.:

Only engageable when reduction gear is on O (NEUTRAL = stationary) or L (FIELD) position. P.t.o. shaft driven by main clutch (dry plate type), group gear, 4 speed change gear and reduction gear (only in position O or L FIELD)

Driving mode (reduction gear in L position):

Travelling distance for 1 revolution of p.t.o.:
0,07806 m with 740 mm tyre index radius

Number of p.t.o. revolution for 1 revolution of driving wheel: 59,58

Stationary mode (reduction gear on O position, tractor not driving):

Speeds at 2400 rev/min rated engine speed (rev/min):

30 km/h model as tested

Group gear:	VN	VS	R
Gear No.: 1	400	457	308
2	702	802	540
3	1057	1208	813
4	1705	1947	1311
Direction of rotation	clockwise	clockwise	anticlockwise
	viewed from driving end		

25 km/h model (not tested)

Group gear:	VN	VS	R
Gear No.: 1	326	374	308
2	572	657	540
3	862	989	813
4	1389	1594	1311
Direction of rotation	clockwise	clockwise	anticlockwise
	viewed from driving end		

Middle p.t.o.:

Optional, not on tested tractor
Forward direction, on the left side of the gearbox, 186,5 mm left hand of median plane of tractor, 645 mm above ground, 806 mm before rear axle
Dimension: ISO R 500, Type I (35 mm, 6 splines)
No power restriction
Driven by p.t.o. clutch
Speed: 1000/1183 rev/min at 2029/2400 rev/min engine speed
Direction of rotation: anticlockwise viewed from the driving end

Front p.t.o.:

Optional, not on tested tractor
Forward direction, on the left side of the tractor, 310 mm left hand of median plane, 746 mm above ground, 468 mm before front axle
Driven by middle p.t.o. and propellershaft with intermediate bearing
No power restriction
Same speeds and direction of rotation of middle p.t.o.

Belt pulley:

Optional, not on tested tractor
At rear of tractor, perpendicular transmission on rear p.t.o., all speeds of rear p.t.o. engageable
Dimensions: 250 mm dia, 160 mm width
Number of pulley revolutions for 1 revolution of p.t.o.: 2,23

Power lift:

In the rear:

Own make, open center type
Draught control with two stage pull adjustment and upper link sensing, position control, floating position
"STEYR SIMPLEMATIK" standard linkage, categorie I/II, double hole lift arms, in accordance to ISO 730
BOSCH gear type pump, directly driven by engine
BOSCH control unit
Own oil supply, capacity: 14 l (15 l with oil tappings)
Recommended oil: SAE 20 W, MIL-L-46152, API CC
Working cylinder: single acting type, bore/stroke: 85/152 mm

Optional (not on tested tractor):
WALTERSCHEID linkage quick coupler, category II
Additional working cylinders for increased power lift performance, 35 mm dia and 226 mm stroke each side

Oil tappings: up to 3 oil circuits with BOSCH control units for single or double acting cylinders
Capacity of tappings: 6 l

Power lift: (cont.)

Optional (not on tested tractor):
Increased capacity of oil tappings up to 17 l with 11 l supplementary tank

In the front:

Optional (not on tested tractor):
Three point linkage, category II, open system, hydraulic power lift, disintegrated construction
Oil supply from own control unit and common oil supply with power lift in the rear
Single acting cylinder, bore/stroke: 60/250 mm

Holed drawbar:

Fitted in the clevis of the lower links of the three point linkage, category I or II

Dimensions of the holed drawbar	category I	category II
Number of holes	5	7
Hole diameter mm	33	33 . .
Distance between holes mm	130	115

Height above ground*)	Min. lift rod length (basis adjustment)	Max. lift rod length
Lift arm 200 mm length: 240 mm	from 420 to 925 mm from 305 to 910 mm	from 175 to 745 mm from 70 to 730 mm

*) Calculated with tyre index radius of 740 mm

Method of changing: by power lift, lift rod and lift arm length
Distance of rear axle: 985 mm (lower links horizontally)
Distance relative to p.t.o.: 540 mm

Pull attachement:

Trailer hitch:

Own make
Fork type, model 273 Q

Height above ground:	458/486/816/844 mm
Distance from rear axle:	497 mm
Position relative to p.t.o.:	rearwards 51 mm
Diameter of coupling pin:	30,5 mm
Max. vertical load:	15 kN

Optional (not on tested tractor):
ROCKINGER automatic coupler model 248
Fork type, height adjustable in 2 positions

Trailer hitch: (cont.)	Height above ground:	824/836 mm
	Distance from rear axle:	544 mm
	Position relative to p.t.o.:	rearwards 99 mm
	Diameter of coupling pin:	30 mm
	Max. vertical load:	15 kN
	or ROCKINGER model 273 J	
	Fork type	
	Height above ground:	682/723 mm
	Distance from rear axle:	584 mm
	Position relative to p.t.o.:	rearwards 139 mm
	Diameter of coupling pin:	31 mm
	Max. vertical load:	15 kN
	or ROCKINGER automatic coupler, model 279	
	Fork type	
	Height above ground:	677/728/760/811 mm
	Distance from rear axle:	607 mm
	Position relative to p.t.o.:	rearwards 162 mm
	Diameter of coupling pin:	30 mm
	Max. vertical load:	15 kN
	or own make	
	Fork type (italian equipment)	
	Height above ground:	462/820/840 mm
	Distance from rear axle:	457 mm
	Position relative to p.t.o.:	rearwards 12 mm
	Diameter of coupling pin:	28 mm
	Max. vertical load:	15 kN
Towing hitch:	Fork type	
	Height above ground:	690 mm
	Distance from front axle:	frontwards 470 mm
	Diameter of coupling pin:	31 mm

Steering:

ZF-SCHWÄBISCH GMÜND
Hydrostatic steering, model ZF 8452
or DANFOSS equivalent model OS PC 125 OR
Own oil circuit with filter in the oil case, gear pump directly driven by engine
Changing interval of oil and filter: 1000 hours
Capacity of oil case: 1,75 l
Recommended oil: Automatic Transmission Fluid (ATF Dexron D or ATF M 2 C 33 E/F)
Delivery rate: 34,6 l/min
Working pressure: 10,0 MPa (100 bar)
Operated by steering wheel, acting on front wheels

Brakes: Own make

Service brake: Hydraulically acting inner brake (Simplex), 229 mm dia, 60 mm width, acting on differential shafts, pedal operated

Parking brake: Mechanically acting on separate inner brake, 229 mm dia, 30 mm width, acting on differential shafts, activated by hand lever with ratchet

Steering assistance brake: Operated by divided pedal of service brake

Optional brake equipment: (on tested tractor)
Front wheel brake: Hydraulic activated dry disc brake on front wheels, max. dia 411 mm, active dia 178 mm
Trailer braking valve: High pressure air system, one or combination one and two line system, air-compressor V-belt driven
Storage pressure: $1,8^{+0,2}_{-0,0}$ MPa (18^{+2}_{-0} bar)
Working pressure: 0,72 MPa
Storage capacity: 10 l

Wheels:

Front wheels: 2 pneumatics, steering and driving function, diagonal or radial carcass
11,2-24 AS, PR 6; rim: W 9 x 24
Optional: (not on tested tractor)
mudguards synthetic material
Maximum permissible load on each tyre:
10250 N at 1,8 bar inflation pressure
14350 N at 2,25 bar inflation pressure and
max. 8 km/h driving speed for front implement working
Track width: 1612 mm

Rear wheels: 2 pneumatics, driving function, diagonal or radial carcass sheet metal mudguards integrated in the safety cab
13,6-38 AS, PR 8; rim: W 12 x 38
Maximum permissible load on each tyre:
16285 N at 1,6 bar inflation pressure
Track width: 1524 mm (1680 mm by reversing wheels)
with adjustable rim: 1550, 1650, 1750, 1850 and 1950 mm

Optional rear wheel equipment:
16,9-34 AS, PR 8; rim: DW 16 x 34
Track width: 1524 mm (1680 mm by reversing wheels)
with adjustable rim: 1550 - 1850 mm

18,4-30 AS, PR 8; rim: DW 14 x 30
Track width: 1524 mm (1680 mm by reversing wheels)
with adjustable rim: 1550 - 1854 mm

Wheel base: 2220 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	1018	135 x 115	806
Side Lights	1630	80 x 65	226
Rear lights	1630	80 x 65	226
Reflectors	1522 780	75 dia	186 511

*) with tyre equipment: 13, 6-38 AS and 11, 2-24 AS
**) with overall width of 1901 mm

Number of grease points: 26

Driver seat:

BOSTROM
Model XH 2 TS 2; tested on tractor according to national regulation (Prot. Nr. 083/79)
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. 082/79)
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

Safety frame:

Own make
Model 110.01
Rubber mounted sheet construction with roof, windscreen, front cladding and rubber floor, without doors, claddings and damping materials, without side and rear glasses and without ventilation and heater.
Strength tested according to OECD-Code (identical to Austrian national legislation)
OECD-Nr.: CSD 0225/1-b(C)

Safety fram: (cont.)	Optional: Own make Model 110.02 Same construction, 120 mm lower Strength tested to national legislation (identical to OECD-Code)
Safety cab:	(as on tested tractor) Own make Model 110.11 Same rubber mounted sheet construction as safety frame with windscreen, front cladding, rubber floor, with damping material, with doors and side and rear glasses and with ventilation and heater. Strength tested according to OECD-Code (identical to Austrian national legislation) OECD-Nr.: CSD 0225/1-a(C)
	Optional: Model 110.12 Same construction, 120 mm lower Strength tested to national legislation (identical to OECD-Code)

CONDITIONS DURING TEST

Tractormass:

Tractor without driver but with tanks full and safety cab

	Front	Rear	Total
Without ballast	1300 kg	2044 kg	3344 kg
With ballast	1682 kg	2667 kg	4349 kg

Ballastmass:

	Number of weights	Total mass (excluding water)	Water
Front	5	183 kg	124 kg
Rear	4 + 2	298 kg	400 kg
Additional	-	-	-

Track setting and tyre equipment:

1612 mm at front
1524 mm at rear
Front wheels: 11,2-24 AS, PR 6; rim: W 9 x 24
Rear wheels: 13,6-38 AS, PR 8; rim: W 12 x 38

Overall dimensions:

	Length	Width		Height **)
		max. *)	min. *)	
	mm	mm	mm	mm
With ballast	3985	2213	1910	2500/2533
Without ballast	3805	2213	1910	2500/2533

*) measured on front wheels
**) measured on top of: safety frame/exhaust pipe with basis tyre equipment

Minimum ground clearance: 375 mm under front axle with basis tyre equipment 11,2-24 AS

Fuel and lubricants used in tests:

Fuel:	ELAN Diesel fuel (according to DIN 51601) specific gravity used for volumetric measurement: 0,855 kg/l at 15°C Viscosity at 20°C: 5 mm^2/s (5 cSt) Cetan 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: 1980 04 30, Wieselburg, Austria
Type of dynamometer: SCHENK-eddy-current brake - W 780

Main test on: ISO R 500, Type 2 (DIN 9611) - 1000 rev/min

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					
48,01	2400	1127	12,34 14,43	257	3,326
Standard p.t.o. speed					
47,40	2130	1000	11,49 13,43	242,5	3,526
The speed recommended by the manufacturer for drawbar work					
48,01	2400	1127	12,34 14,43	257	3,326
PART LOADS Governor hand lever in position giving maximum power					
(i) 85 % of torque at maximum power					
41,74	2456	1153	11,24 13,15	269,5	3,174
(ii) unloaded					
-	2571	1207	3,56 4,16	-	-
(iii) 50 % of the load defined in (i)					
21,43	2522	1184	7,33 8,57	342	2,500
(iv) maximum power					
48,01	2400	1127	12,34 14,43	257	3,326
(v) 25 % of the load defined in (i)					
10,82	2547	1196	5,35 6,25	493,5	1,733
(vi) 75 % of the load defined in (i)					
31,77	2492	1170	9,31 10,88	293	2,919

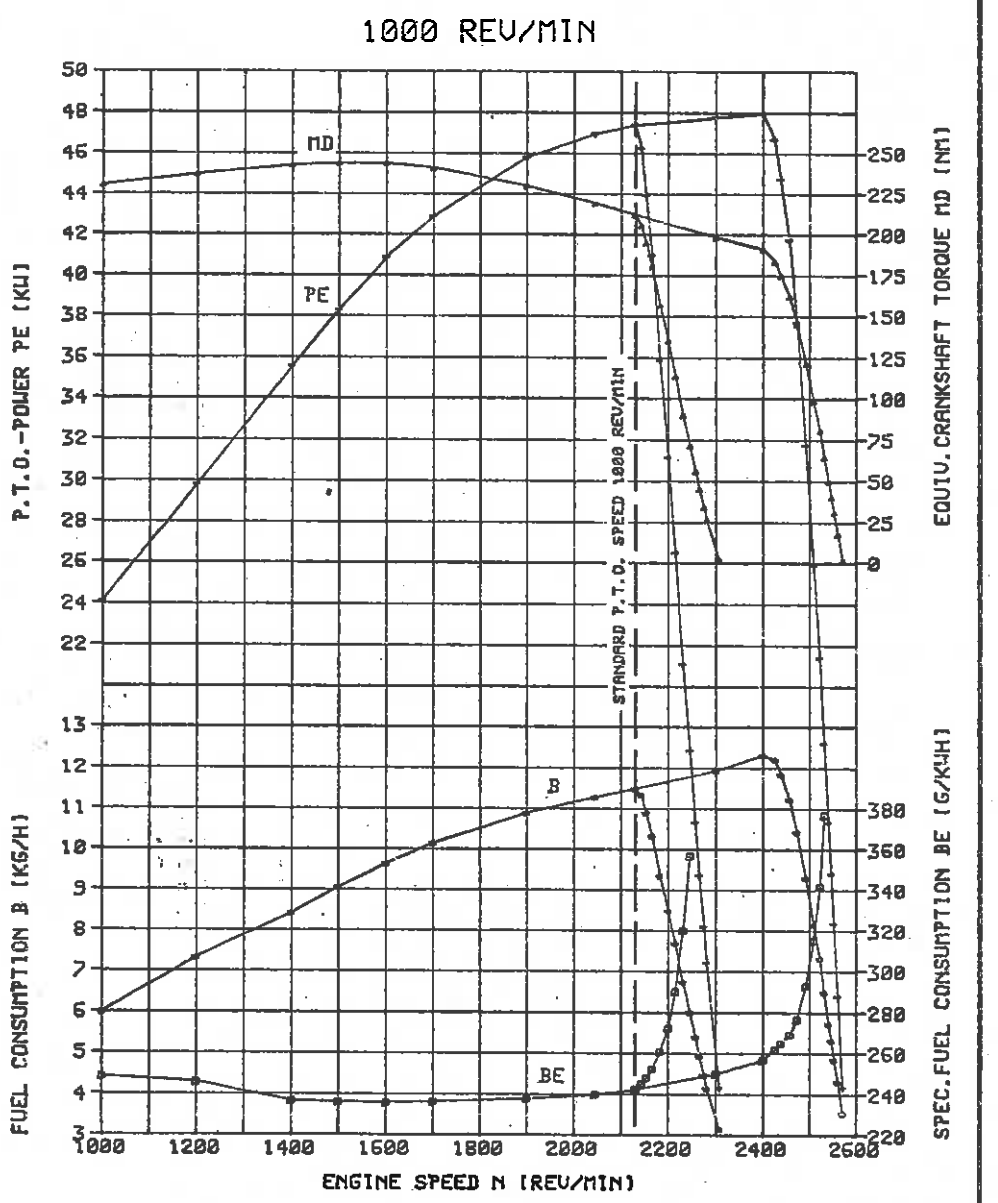
Power	Speed		Fuel consumption		
	engine	p.t.o.	total	specific	specific
kW	rev/min	rev/min	kg/h l/h	g/kWh	kWh/l
PART LOADS Governor hand lever in position giving standard p.t.o. speed at full load					
(i) 85 % of torque at standard p.t.o. speed					
40,99	2166	1017	10,34 12,00	252,5	3,388
(ii) unloaded					
-	2307	1083	3,18 3,72	-	-
(iii) 50 % of the load defined in (i)					
21,12	2232	1048	6,76 7,90	320	2,671
(iv) maximum power at standard p.t.o. speed					
47,40	2130	1000	11,49 13,44	242,5	3,526
(v) 25 % of the load defined in (i)					
10,75	2266	1064	4,95 5,79	460,5	1,856
(vi) 75 % of the load defined in (i)					
31,20	2200	1033	8,50 9,95	272,5	3,138
STANDARD SPECIFIC FUEL CONSUMPTION: 269,5/342 - 252,5/320 g/kWh					

No load maximum engine speed: 2571 rev/min
Equivalent crankshaft torque
at maximum power: 191 Nm
Maximum equivalent crankshaft torque: 243,8 Nm at 1600 rev/min of engine

Mean atmospheric conditions: temperature: 15°C
pressure: 993 mbar
humidity: 74 %

Maximum temperatures: coolant: 88°C
engine oil: 112°C
fuel: 67°C
air intake: 26°C

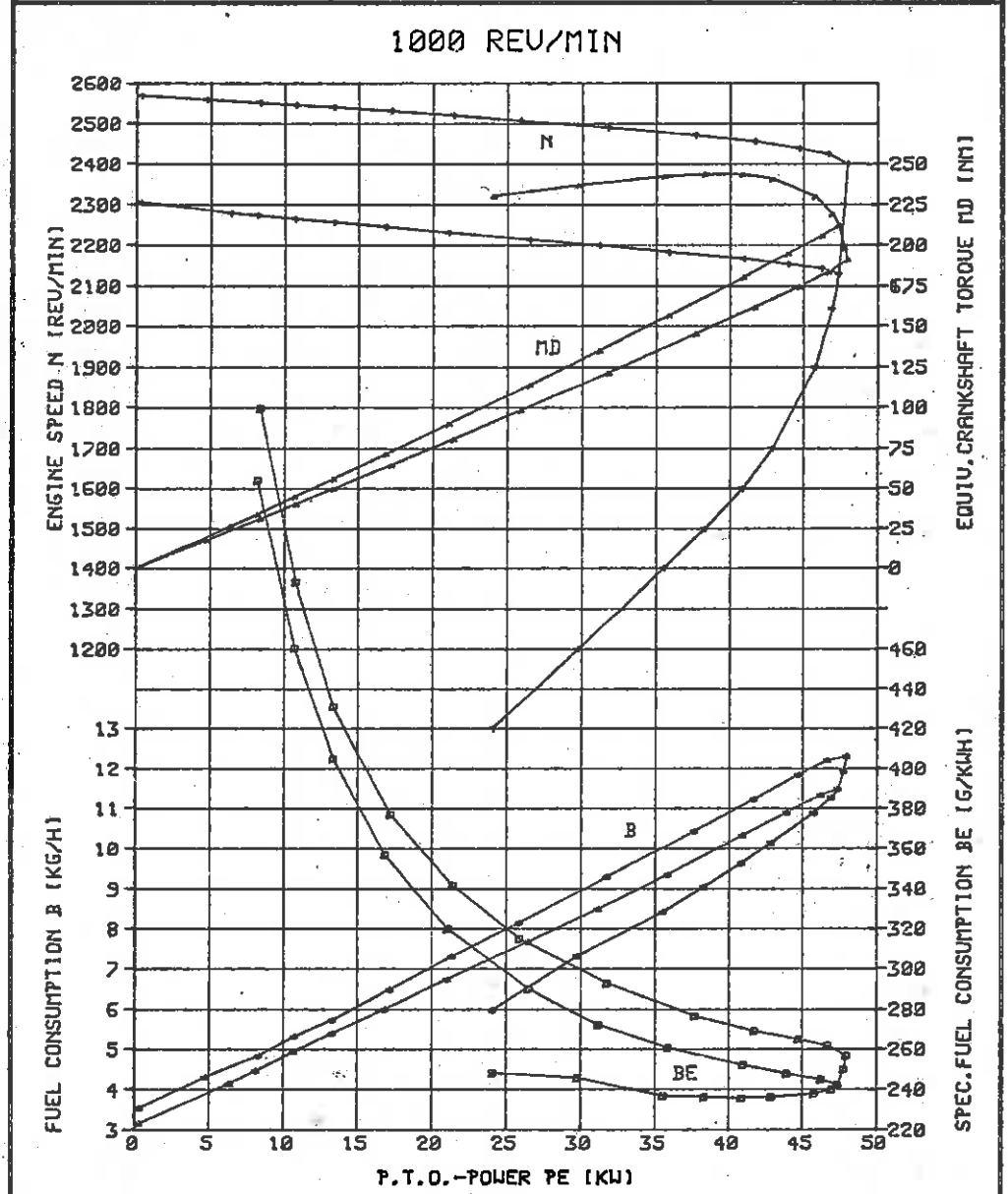
BUNDESVERSUCHS-U. PRUEFUNGSANST. FUER LANDW. MASCHINEN U. GERAETE WIESELBURG/ERLAUF, AUSTRIA PROT. NR.: 1071/80	P.T.O.-TEST	STEYR TYP 357.15 (8080A) MOT. TYP WD 411.85



ENGINE SER.NR.: 411.85-1006	ATM. PRESSURE : 993 MBAR	FUEL TEMP.: 67 C	SIGNATURE
TRAKTOR SER.NR.: 357.15-1001	AIR TEMPER. : 15 C	D.OF TESTS: 1980-04-29	A. Reitlner
FUEL : B.BSS/15 C	COOLANT TEMP.: 88 C	TEST NO. : 127/2A123A	
ENGINE OIL : SAE 10W-30 MD	OIL TEMP. : 112 C	CURVES NO.: 1	REITNER

DUR.:8108846-DL883.MKU037.DAT;MKU28-22

BUNDESVERSUCHS-U. PRUEFUNGSANST. FUER LAND.U.MASCHINEN U.GERAETE WIESELBURG/ERLAUF, AUSTRIA PROT.NR.:071/80	P.T.O.-TEST	STEYR TYP 357.15 (8080A) MOT.TYP WD 411.85



ENGINE SER.NR.: 411.85-1006	ATM.PRESSURE : 993 MBAR	FUEL TEMP.: 67 C	SIGNATURE
TRAKTOR SER.NR.: 357.15-1001	AIR TEMPER. : 15 C	D.OF TESTS: 1980-04-29	A. Reitlier
FUEL : 0.855/15 C	COOLANT TEMP.: 88 C	TEST NO. : 127/2A123A	
ENGINE OIL : SAE 10W-30 MD	OIL TEMP. : 112 C	CURVES NO.: 2	REITHER

DUR.:8100846-DL003;MKU037;DAT:MKU28-22

2. Drawbar performance

Date of tests: 1980 05 05, 06 and 07
Type of track: Concrete
Height of drawbar above ground: 480 mm ballasted, 460 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	N	rev/min	%	kWh/l	g/kWh	°C	°C	°C	°C	%	mbar
(i) Maximum power (ballasted) tyre inflation pressure in the front 1,2 bar, in the rear 1,6 bar													
VN1L	1,631	20,45	45137	2474	15	-	-	49	82	103	19	61	988
VS1L	1,846	23,15	45136	2451	15	-	-	50	82	103	19	61	988
VN2L	2,781	34,86	45130	2400	15	2,411	354,5	50	82	103	20	60	988
VS2L	3,323	37,85	41002	2400	11,4	2,614	327	51	83	104	20	59	988
VN3L	4,536	40,85	32422	2400	7,9	2,826	302,5	52	83	104	21	59	988
VS3L	5,268	41,30	38224	2400	6,7	2,857	299,5	51	83	105	21	59	988
VN1S	5,726	41,35	25999	2400	6,1	2,860	299	52	82	105	21	59	988
VS1S	6,603	41,00	22352	2400	5,2	2,832	302	52	83	104	22	59	988
VN4L	7,618	40,00	18903	2398	4,4	2,767	309	50	82	104	22	58	988
VS4L	8,773	38,23	15688	2400	3,6	2,649	323	51	83	105	22	58	988

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	N	rev/min	%	kWh/l	g/kWh	°C	°C	°C	°C	%	mbar
(ii) Five-hour-test at 75 % of pull at maximum power													
VN1S	5,948	32,22	19503	2474	4,5	2,651	322,5	58	86	110	19	51	993
(iii) Five-hour-test at pull corresponding to 15 % wheelslip in test (i)													
VS2L	2,756	34,56	45146	2404	15	2,390	358	63	87	114	18	49	982
(iv) Maximum power (unballasted) tyre inflation pressure in the front 1 bar, in the rear 1,2 bar													
VN2L	2,837	28,82	36561	2451	15	-	-	48	82	103	18	64	985
VS2L	3,208	32,58	36564	2426	15	2,276	375,5	47	82	104	19	66	985
VN3L	4,408	39,19	32004	2400	10,4	2,706	316	47	82	104	18	66	985
VS3L	5,131	40,70	28554	2400	8,7	2,806	304,5	46	83	105	19	66	985
VN1S	5,590	41,11	26474	2400	7,9	2,835	301,5	47	82	104	20	66	985
VS1S	6,475	41,20	22904	2400	6,6	2,841	301	46	82	105	20	67	985
VN4L	7,495	40,75	19575	2400	5,5	2,815	303,5	46	82	105	19	67	985
VS4L	8,642	39,59	16493	2398	4,6	2,734	312,5	46	83	105	20	67	985

Total oil consumption during 10 hours duration of tests (ii) and (iii): 67,8 g/h

3. Turning space and turning circle

Wheel equipment front: 11,2-24 AS, PR 6
rear: 13,6-38 AS, PR 8

Track of wheels front: 1612 mm
rear: 1524 mm

Results *)	With brakes		Without brakes	
	right-hand	left-hand	right-hand	left-hand
	m	m	m	m
Radius of turning space	3,94/4,11	3,90/3,98	5,31/4,86	5,17/4,76
Radius of turning circle	3,80/3,97	3,76/3,84	5,17/4,72	5,03/4,62

*) four wheel-drive switched: ON/OFF

4. Location of centre of gravity

	mm
Height above ground	944
Distance forward from the vertical plane containing the axis of the rear wheels	853
Distance from the median plane, left-hand	2

5. Braking

Date of tests: 1979 11 17
Type of track: Concrete
Type of decelerometer: Moto-Meter Nr. 03382 (Kombi-Schreiber)
Mass of ballasted tractor: 4430 kg (with driver)

Cold brakes

		Ballasted	Without ballast
Travelling speed of the tractor	km/h	25	25
(i) Deceleration	m/s^2	8,1	8,5
(ii) Stopping distance	m	4,39	3,73
(iii) Force exerted on the brake pedal	N	650	570
(iv) Force exerted on the brake pedal to achieve a deceleration of 2,5 m/s^2	N	185	155

Brake fade characteristics (hot tests)	Ballasted	Unballasted
Deceleration hot / deceleration cold x 100	95	95
Stopping distance cold / Stopping distance hot x 100	103	93
Force on pedal, cold / Force on pedal, hot x 100	103	109
Force on pedal, cold / force on pedal, hot to achieve a deceleration of 2,5 m/s^2 x 100	112	97

Efficiency of handbrake:
Satisfactory facing up and down slope of 16 %
pull on handbrake: upward 196 N
pull on handbrake: downward 147 N

6. Measurement of ambient noise

Date of tests: 1979 11 16
Type of sound level meter: 2203 BRÜEL & KJAER
Type of track: Concrete

Results of tests:
Gear: VS 4 S
Travelling speed before acceleration: 23,9 km/h
Sound level: 87 dB(A)

7. Noise measurement at the driver's ear level

Date of tests: 1980 05 27
Type of sound level meter and octave filter:
2203 and 1613 BRÜEL & KJAER
Type of track: Concrete

Results of tests (tractor with safety cab):

Gear	Effective travelling speed	Sound level	
		dB(A)	Noise rating
VN 1 L	1,83 km/h	83	-
VS 1 L	1,98 km/h	83	-
VN 2 L	3,13 km/h	83	-
VS 2 L	3,68 km/h	85	-
VN 3 L	4,10 km/h	83,5	-
VS 3 L	5,24 km/h	83,5	-
VN 1 S	6,27 km/h	83	-
VS 1 S	6,50 km/h	83	-
VN 4 L	7,99 km/h	83	-
VS 4 L	9,11 km/h	84	-
VN 2 S	10,28 km/h	83	-
VS 2 S	12,46 km/h	83	-
VN 3 S	15,93 km/h	83,5	-
VS 3 S	18,16 km/h	85	-
VN 4 S	26,00 km/h	84	-
VS 4 S	30,00 km/h	84	-

8. Power lift and hydraulic pump performance

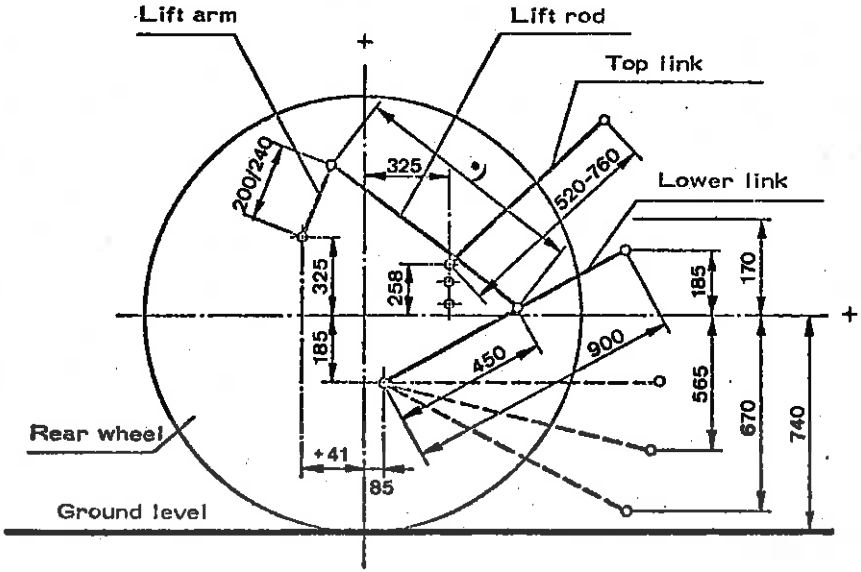
Date and location of tests: 1979 11 07, Wieselburg, Austria
Hydraulic fluid:
Make and type: SHELL Tellus 33, SAE 20 W
Viscosity at 50°C: 40 mm^2/s (40 cSt)
Typ of linkage lock for transport: hydraulically by throttle valve
Opening pressure of the cylinder overpressure relief valve (manufacturer specification): 24,5 MPa (245 bar)

Pump characteristics:

(i) Opening pressure of the relief valve: 17,8 MPa (178 bar)
sustained pressure by the open relief valve: 17,0 MPa (170 bar)

(ii) Pump delivery rate at minimum pressure and rated engine speed: 35,1 l/min

(iii) Pump delivery rate: 34,4 l/min
delivery pressure: 17,0 MPa (170 bar)
power: 9,74 kW



*) basis adjustment: both lift rods 579 mm
left lift rod: from 579 mm to 666 mm adjustable
right lift rod: from 546 mm to 666 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	200	240
Lift rods	mm	579	579
Top link	mm	660	660
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 740 mm*) above the ground level			
Lower link pivot point	mm	85 behind 185 below	85 behind 185 below
Top link pivot point	mm	325 behind 258 above	325 behind 258 above
Lift arm pivot point	mm	41 behind 325 above	41 behind 325 above
Maximum und minimum height of lower link hitch points	mm	185 above 320 below	170 above 435 below
Height of lower link hitch points locked in transport position	mm	from 185 above to 320 below	from 170 above to 435 below

*) Index radius

Performance of power lift

Lifting heights in relation to a horizontal line through the lower link pivoting point mm		-245	-200	-135	-75	0	+100	+150	+200	+250	+300	+325	+350	+365	+380
Lifting force at the hitch-points kN (Values for the pressure at maximum hydraulic power, calculated from measurements made at maximum pressure)	max.mech. advantage		*)	24,92 34,73	24,13 34,19	23,34 33,50	22,42 32,81	21,97 32,47	21,58 32,13	21,20 31,88	20,79 31,68	20,60 31,50	20,40 31,49		
	min. mech. advantage	21,38 30,31	20,21 29,09	19,72 28,40	19,47 27,96	18,08 27,57	18,05 27,17	17,71 27,03	17,41 26,88	17,21 26,78	17,07 26,68	17,07 26,68			
	Maximum force exerted throughout whole range: 20,40 (31,49)/17,07 (26,68) kN														
	Oil pressure: 17,0 MPa (170 bar)														
Lifting force at the frame kN (Values for the pressure at maximum hydraulic power, calculated from measurements made at maximum pressure)	max.mech. advantage			24,72 34,73	23,45 33,35	21,93 31,78	20,40 29,82	19,72 28,84	18,34 27,57	17,17 26,39	16,58 25,46	16,33 25,06	16,04 24,62	15,89 24,33	15,79 24,18
	min. mech. advantage	24,67 31,49	21,88 29,09	20,40 28,35	19,52 27,86	18,49 27,08	17,07 25,31	16,38 24,18	15,79 23,15	15,06 22,32	14,47 21,43	14,13 21,09	13,88 20,70	13,73 20,60	
	Maximum force exerted throughout whole range: 15,79 (24,18)/13,73 (20,60) kN														
	Oil pressure: 17,0 MPa (170 bar)														

*) The recorded values in the second line are made with additional working cylinders.

OPTIONAL TEST

9. Main power take-off performance

Date and location of tests: 1980 04 29, Wieselburg, Austria
Type of dynamometer: SCHENK-eddy-current brake - W 780

Main test on: ISO R 500, Type 1 (DIN 9611) - 540 rev/min

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					
47,17	2400	634	12,40 14,51	263	3,251
Standard p.t.o. speed					
46,22	2044	540	11,30 13,22	244,5	3,497
The speed recommended by the manufacturer for drawbar work					
47,17	2400	634	12,40 14,51	263	3,251
PART LOADS Governor hand lever in position giving maximum power					
(i) 85 % of torque at maximum power					
41,05	2456	649	11,33 13,25	276	3,097
(ii) unloaded					
-	2570	679	3,56 4,16	-	-
(iii) 50 % of the load defined in (i)					
21,05	2521	666	7,30 8,55	347	2,463
(iv) maximum power					
47,17	2400	634	12,40 14,51	263	3,251
(v) 25 % of the load defined in (i)					
10,63	2547	673	5,33 6,23	501	1,706
(vi) 75 % of the load defined in (i)					
31,22	2490	658	9,30 10,88	298	2,868

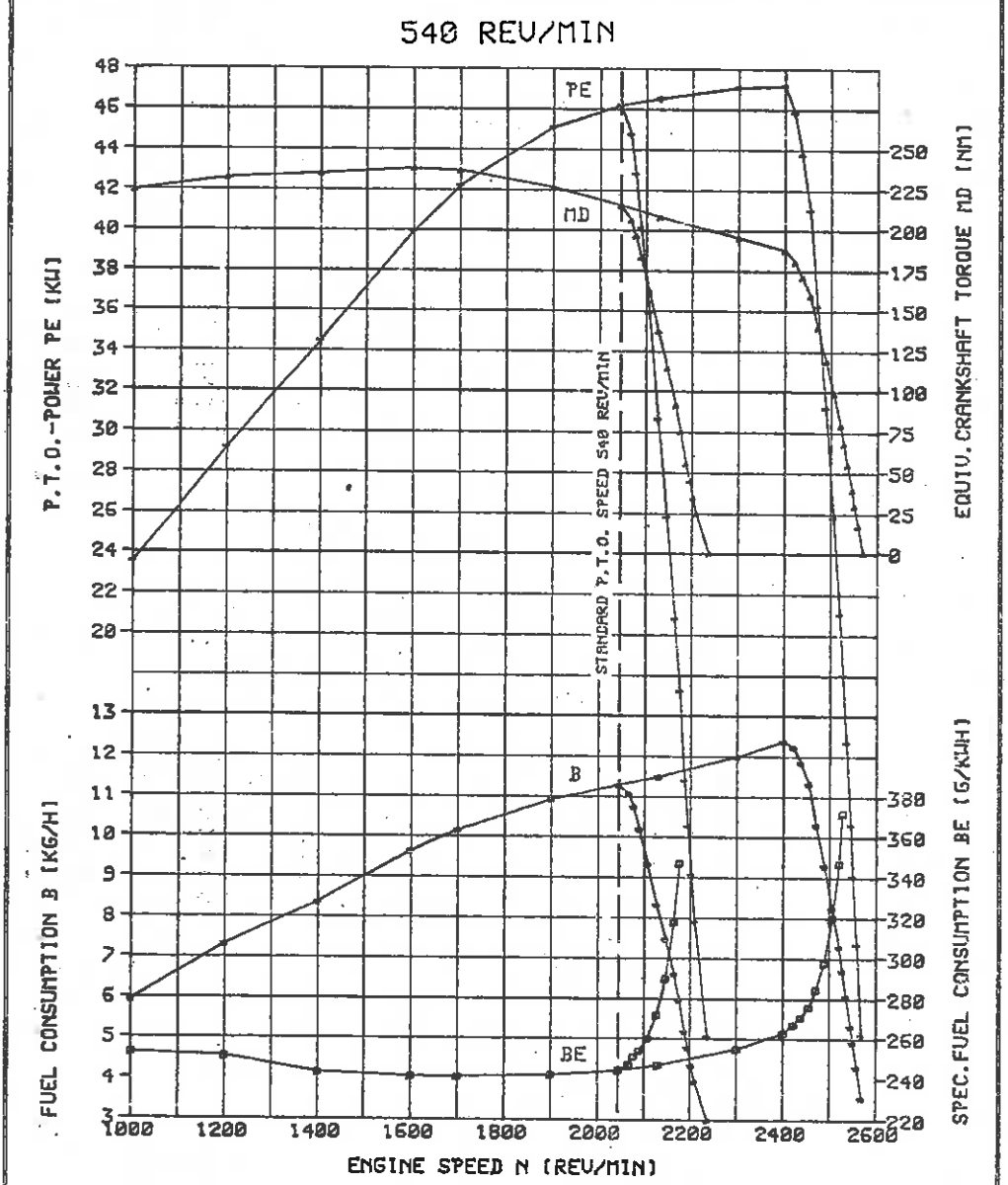
Power	Speed		Fuel consumption		
	engine	p.t.o.	total	specific	specific
kW	rev/min	rev/min	kg/h l/h	g/kWh	kWh/l
PART LOADS Governor hand lever in position giving standard p.t.o. speed at full load					
(i) 85 % of torque at standard p.t.o. speed					
40,18	2089	552	10,20 11,94	254	3,366
(ii) unloaded					
-	2237	591	3,00 3,51	-	-
(iii) 50 % of the load defined in (i)					
20,82	2165	572	6,62 7,74	318	2,689
(iv) maximum power at standard p.t.o. speed					
46,22	2044	540	11,30 13,22	244,5	3,497
(v) 25 % of the load defined in (i)					
10,55	2195	580	4,80 5,61	455	1,880
(vi) 75 % of the load defined in (i)					
30,68	2127	562	8,34 9,76	272	3,144
STANDARD SPECIFIC FUEL CONSUMPTION: 276/347 - 254/318 g/kWh					

No load maximum engine speed: 2570 rev/min
Equivalent crankshaft torque
at maximum power: 187,7 Nm
Maximum equivalent crankshaft torque: 238,6 Nm at 1600 rev/min of engine

Mean atmospheric conditions: temperature: 15°C
pressure: 993 mbar
humidity: 74 %

Maximum temperatures: coolant: 89°C
engine oil: 113°C
fuel: 68°C
air intake: 28°C

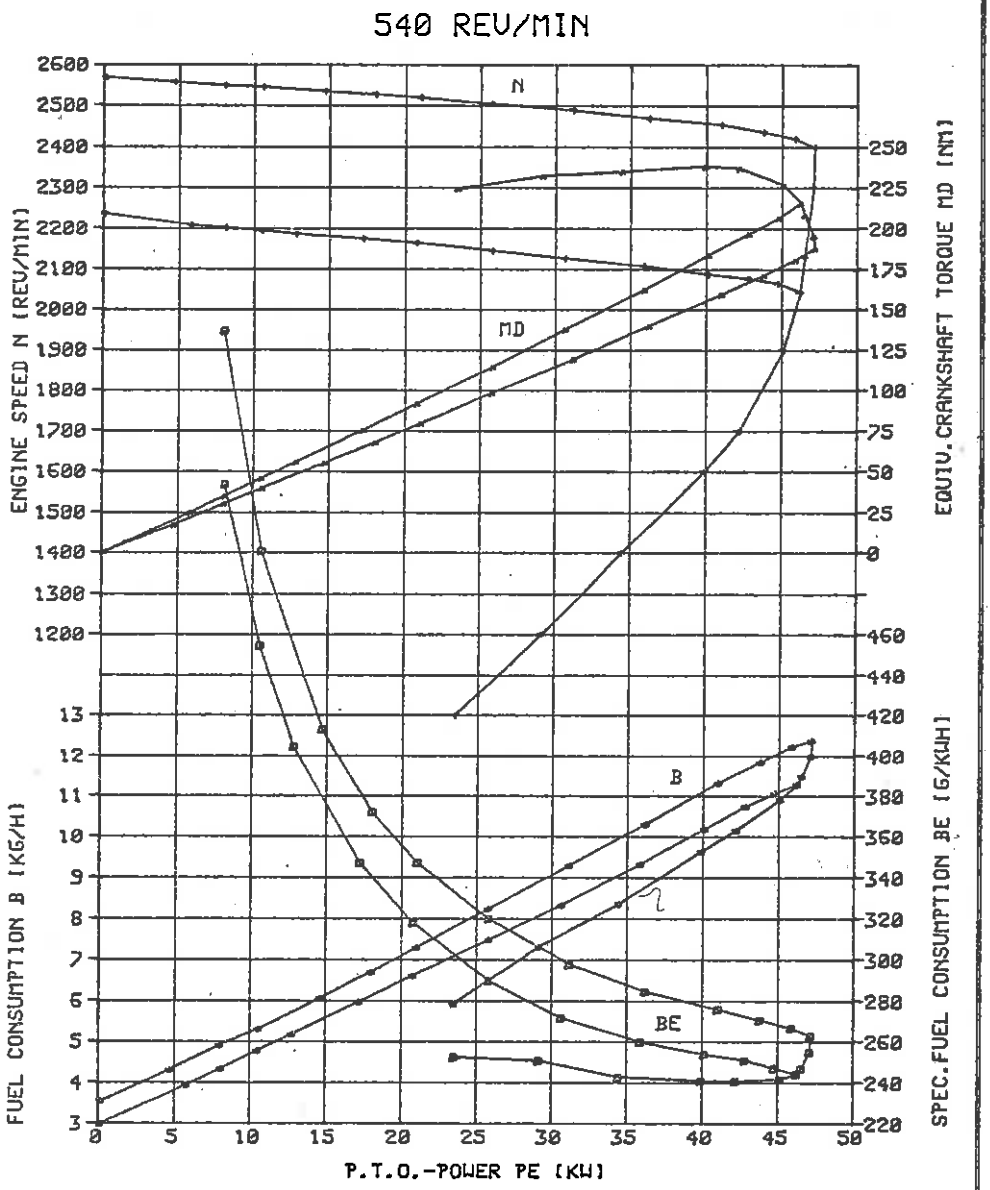
BUNDESVERSUCHS-U. PRUEFUNGSANST. FUER LANDW. MASCHINEN U. GERAETE WIESELBURG/ERLAUF, AUSTRIA PROT.NR.: 071/80	P.T.O.-TEST	STEYR TYP 357.15 (8080A) MOT.TYP WD 411.85



ENGINE SER.NR.: 411.85-1006	ATM.PRESSURE : 993 MBAR	FUEL TEMP.: 58 C	SIGNATURE
TRACTOR SER.NR.: 357.15-1001	AIR TEMPER. : 15 C	D.OF TESTS: 1980-04-29	A. Reither
FUEL : 0.855/15 C	COOLANT TEMP.: 89 C	TEST NO. : 127/ZA\23A	
ENGINE OIL : SAE 10W-30 MD	OIL TEMP. : 113 C	CURVES NO.: 3	REITHER

DOK.:81808446-DL003;MKU037.DAT;MKU26-21

BUNDESVERSUCHS-U. PRUEFUNGSANST. FUER LANDW. MASCHINEN U. GERAETE WIESELBURG/ERLAUF, AUSTRIA PROT. NR.: 071/80	P.T.O.-TEST	STEYR TYP 357.15 (8080A) MOT. TYP WD 411.85



ENGINE SER.NR.: 411.85-1006	ATM.PRESSURE : 993 MBAR	FUEL TEMP.: 68 C	SIGNATURE
TRAKTOR SER.NR.: 357.15-1001	AIR TEMPER. : 15 C	D.OF TESTS: 1980-04-29	A. Reither
FUEL : 0.855/15 C	COOLANT TEMP.: 89 C	TEST NO. : 127/ZA123A	
ENGINE OIL : SAE 10W-30 MD	OIL TEMP. : 113 C	CURVES NO.: 4	REITHER

DOR.:0100846-DL003.MKU037.DAT.MKU28-21

OPTIONAL TEST

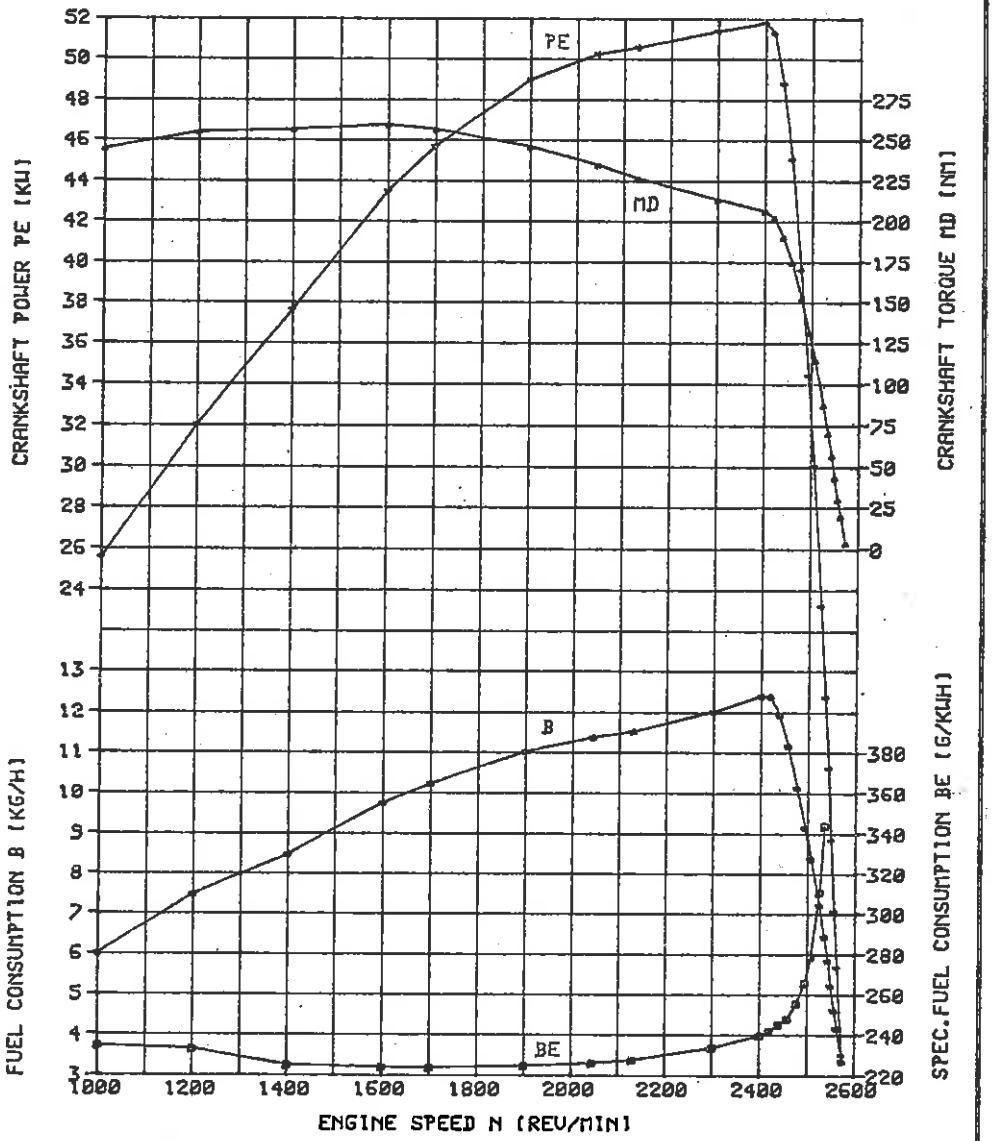
10. Engine performance

Date and location of test: 1979 11 26, 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				
51,48	2400	12,43 14,54	240	3,595
Standard p.t.o. speed (1000 - 540 rev/min)				
50,59	2130	11,53 13,49	228	3,749
50,28	2044	11,39 13,32	226,5	3,775
The speed recommended by the manufacturer for drawbar work				
51,84	2400	12,43 14,54	240	3,565
Part loads				
(i) 85 % of torque at maximum power				
45,10	2458	11,18 13,08	248	3,448
(ii) unloaded				
-	2574	3,38 3,95	-	-
(iii) 50 % of the load defined in (i)				
23,24	2526	7,22 8,45	311	2,751
(iv) maximum power				
51,84	2400	12,43 14,54	240	3,565
(v) 25 % of the load defined in (i)				
11,73	2550	5,24 6,13	447	1,914
(vi) 75 % of the load defined in (i)				
34,43	2495	9,16 10,71	266	3,214

Optimum fuel consumption: 222 g/kWh at 43,8 kW and 1600 rev/min
No load maximum engine speed: 2574 rev/min
Torque at macimum power: 206,3 Nm
Maximum torque: 259,7 Nm at 1600 rev/min of engine
Mean atmospheric conditions: temperature: 15°C
pressure: 993 mbar
relative humidity: 64 %
Maximum temperatures: coolant: 88°C
engine oil: 110°C
fuel: 65°C
engine air intake: 21°C

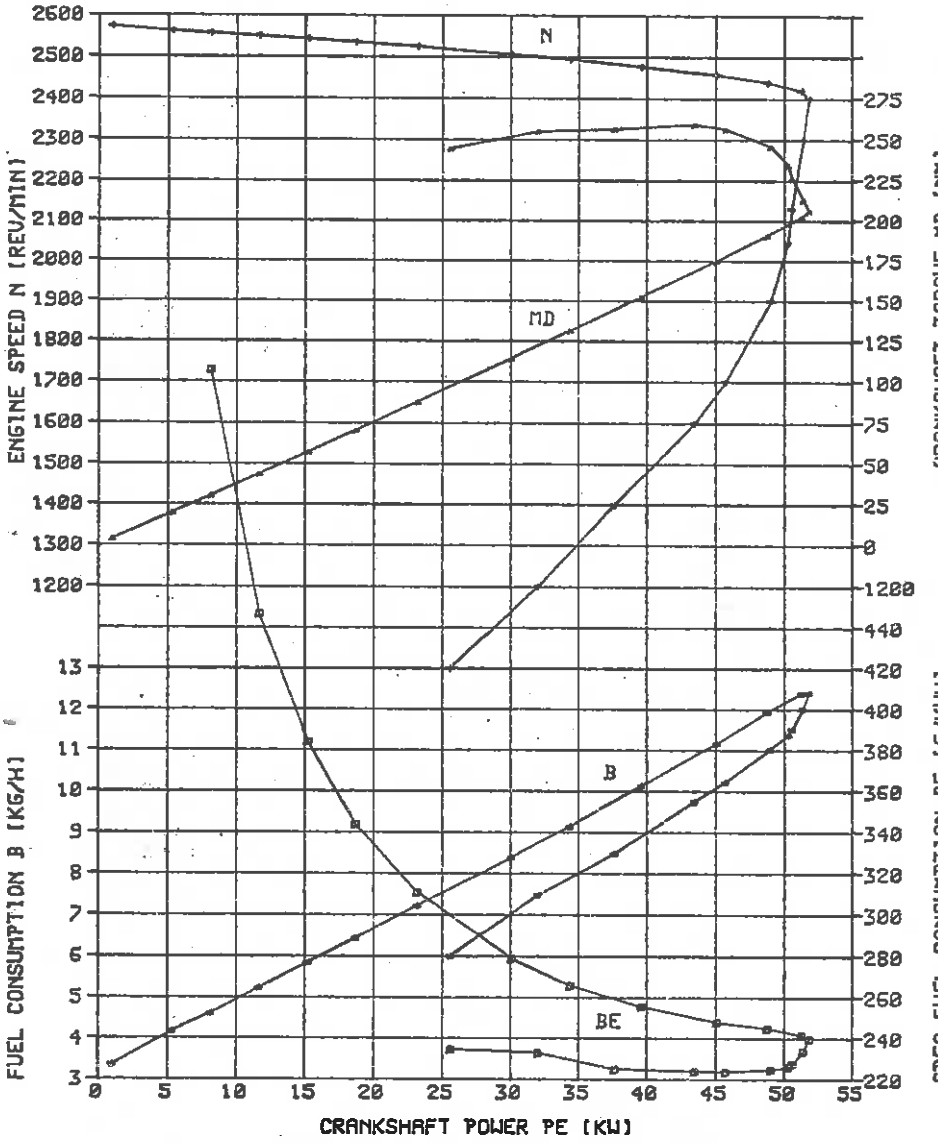
BUNDESVERSUCHS-U. PRUEFUNGSANST. FUER LAND.U. MASCHINEN U. GERAETE WIESELBURG/ERLAUF, AUSTRIA PROT.NR.: 071/80	ENGINE-TEST	STEYR TYP 357.15 (8080A) MOT.TYP WD 411.85



ENGINE SER.NR.: 411.85-1006	ATM.PRESSURE : 993 MBAR	FUEL TEMP.: 65 C	SIGNATURE
TRAKTOR SER.NR.: 357.15-1001	AIR TEMPER. : 15 C	D.OF TESTS: 1979-11-26	A. Reither
FUEL : 0.855/15 C	COOLANT TEMP.: 88 C	TEST NO. : 127/M175	
ENGINE OIL : SAE 10W-30 MD	OIL TEMP.- : 110 C	CURVES NO.: 3	REITHER

DVR.: 0100846-DL003.MKU037.DAT; MKU28-KW

BUNDESVERSUCHS-U. PRUEFUNGSANST. FUER LANDW. MASCHINEN U. GERAETE WIESELBURG/ERLAUF, AUSTRIA PROT.NR.:071/80	ENGINE-TEST	STEYR TYP 357.15 (8080A) MOT.TYP WD 411.85



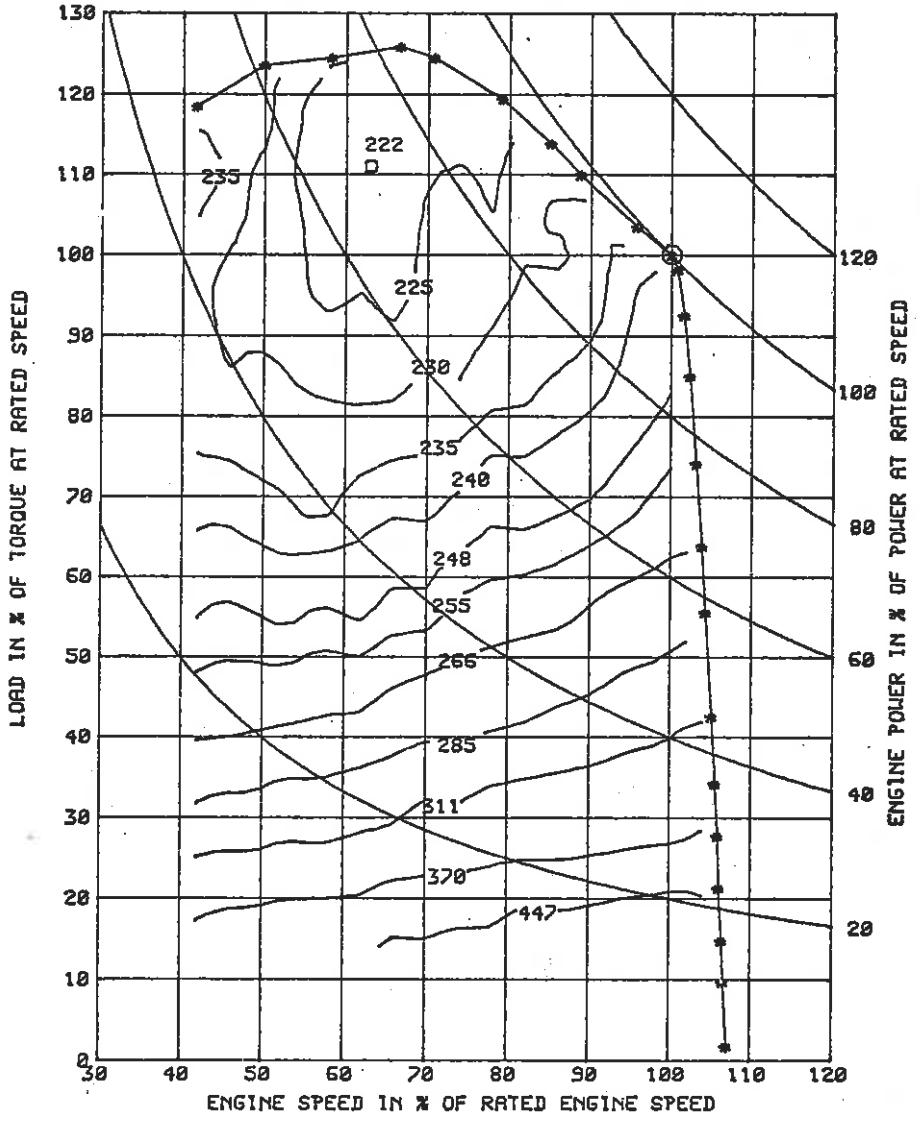
ENGINE SER.NR.: 411.85-1006	ATM.PRESSURE : 993 MBAR	FUEL TEMP.: 65 C	SIGNATURE
TRAKTOR SER.NR.: 357.15-1001	AIR TEMPER. : 15 C	D.OF TESTS: 1979-11-26	A. Reither
FUEL : 0.855/15 C	COOLANT TEMP.: 88 C	TEST NO. : 127/M175	
ENGINE OIL : SAE 10W-30 HD	OIL TEMP. : 110 C	CURVES NO.: 6	REITHER

DUR.:0100846-DL003.MKU017.DAT:MKU28-KW

BUNDESVERSUCHS-U. PRUEFUNGSANST. FUER LANDW. MASCHINEN U. GERAETE WIESELBURG/ERLAUF, AUSTRIA PROT.NR.: 071/80	ENGINE PERFORMANCE CHARACTERISTICS	STEYR TYP 357.15 (8080A) MOT.TYP WD 411.85

□ ....MIN.FUEL CONS. 222.80 G/KWH AT N = 1512. REV/MIN, MD = 228.95 NM, P = 36.3 KW

Ⓐ....N = 2400. REV/MIN, MD = 206. NM, P = 51.8 KW



ENGINE SER.NR.: 411.85-1086	ATM.PRESSURE : 993 MBAR	FUEL TEMP.: 65 C	SIGNATURE
TRAKTOR SER.NR.: 357.15-1801	AIR TEMPER. : 15 C	D.OF TESTS: 1979-11-26	A. Reither
FUEL : 0.855/15 C	COOLANT TEMP.: 88 C	TEST NO. : 127/M175	
ENGINE OIL : SAE 10W-30 MD	OIL TEMP. : 110 C	CURVES NO.: 7	REITHER

EDV-DL803:MKU837.DAT:MKU84MV

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 21, chapter 7)

