O.E.C.D. Report No.: 623

GEPRÜFT

PROT. Nr.

**BUNDESVERSUCHS- UND PRÜFUNGSANSTALT**
**für landwirtschaftliche Maschinen und Geräte,**
**Wieselburg**

# Dieseltractor URSUS C-385 A

Trade name:

## URSUS C-385 A


Date of approval: 1979 02 21

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**

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|---|---|
| Tractor manufacturer: | Zaklady Mechaniczne "URSUS"<br>Warszawa, Poland |
| Submitted for test by: | A. MOSER, A-4813 Altmünster, Austria |
| Selected by: | Manufacturer in agreement with BVPA-Wieselburg |
| Place of running in: | Zaklady Mechaniczne "URSUS" |
| Duration of running in: | 50 hours appr. |

## SPECIFICATION OF TRACTOR

Tractor:

| | |
|---|---|
| Make: | ZM URSUS |
| Model: | C-385 A |
| Type: | Wheel tractor, four wheel driven, unit construction |
| Serial No.: | 2640 |

Engine:

| | |
|---|---|
| Make: | T.S. Martin |
| Model: | Z 8001 |
| Type: | 4-stroke diesel engine with direct injection |
| Serial No.: | 76125 |
| Cylinders: | 4, vertical in line<br>Bore/stroke: 110/120 mm<br>Capacity: 4562 $cm^3$<br>Compression ratio: 17<br>Wet liners |
| Valves: | Overhead valves |
| Fuel system: | Capacity of fuel tank: appr. 90 l<br>Fuel feed by piston pump CD1 M-2237<br>Fuel filter:<br>Make: Zaklady Sprzetu Motoryzacyinego, Poland<br>Type: Two step filter, felt and paper element<br>Model: FD 1 ORP 2.4<br><br>Injection pump:<br>Make: MOTORPAL<br>Type: in line fuel injection pump<br>Model: PP 4M 85 P $1_c$ - 2456 |

| | |
|---|---|
| Fuel system: (cont.) | Manufacturers production setting: 70 $mm^3$/stroke at 2200 rev/min and full load<br><br>Injection timing: 24° before TDC<br><br>Oil capacity: 0,32 l<br>Recommended oil viscosities: summer SAE 30 HD<br>winter SAE 20 HD<br><br>Changing interval: 400 hours<br><br>Fuel injectors:<br>Make: MOTORPAL<br>Type: Injector with multi hole injector nozzle insert<br>Model: Injector: VP 81 S 453 a - 2555<br>Insert: DOP 150 S 525 - 1402<br><br>Injection pressure: $157 \pm 3$ bar |
| Governor: | MOTORPAL speed governor RV1M 225/1100 = 2501<br>Mechanically acting, incorporated in injection pump<br>Range of speed: 440 to 2390 rev/min<br>Rated speed: 2200 rev/min |
| Air cleaner: | Own make<br>Main-cleaner: dry type, changeable element<br>Pre-cleaner: cyclonic type, integrated in main-cleaner<br>Model: VTC - P 350<br><br>Optional (not on tested tractor)<br>wet air filter |
| Exhaust silencer: | Own make<br>Reflexion type, left side of the engine, mouth upwards |
| Lubrication system: | Forced lubrication with gear pump, strainer in sump, centrifugal oil filter RDP 3/A in full flow<br>Oil capacity: appr. 10 l<br>Changing interval: 200 hours<br>Cleaning interval of oil filter: 200 hours<br>Recommended oil viscosity: summer SAE 30 HD<br>winter SAE 20 HD |
| Cooling system: | Double circuit water cooling with centrifugal pump, pump and fan belt driven, 4 blade fan, tubular radiator<br>Thermostat control, cooling water thermometer<br>Coolant capacity: appr. 20 l<br>Overpressure: max. 0,52 bar<br>Joining for warm water heating |
| Starting system: | Electrically; solenoid engaged type<br>Starter motor model: R 11 b, 12 V, 2,95 kW |

| | |
|---|---|
| Electrical system: | Voltage: 12 V<br>Generator: PAL, three phase type, 14 V, 35 A, 490 W<br>Batteries: 2 in series connection, 6 V each, with totally 190 Ah at 20 hours rating; model: 3 SE - 190 |

Transmission:

| | |
|---|---|
| Clutches: | Main-clutch: ZBROJOVKA BRNO<br>Single plate dry clutch, 325 mm dia, pedal operated<br>P.t.o. clutch: Own make<br>Wet multiplate clutch, hydraulically engaged, hand lever operated<br>Front wheel drive clutch: Own make, wet multiplate clutch, hydraulically engaged, hand switch operated |
| Gearbox: | Own make, mechanically acting<br>Torque amplifier group - 4 speed change gear - group gear with 2 forward and 1 reverse group<br>Torque amplifier group; speed reduction 1,338 switched by hydraulically engaged brake band on a planetary gear<br>Totally: 16 forward and 8 reverse speeds |
| Axles and final drives: | Own make<br>Rear axle: central driving type; Pinion and bevel gear, lockable bevel gear differential, planetary final gears<br>Front axle: steerable driving axle; central type front wheel drive clutch, universal joint propeller shaft, pinion and bevel gear, bevel gear differential, double joints, planetary final gears in wheel hubs<br>Front wheel drive: hydraulically engaged, hand switch operated<br>Differential lock: mechanically engaged, pedal operated |
| Switching aid circuit: | Own oil circuit with gear pump, directly driven by engine, oil supply from gearbox<br>Aid for p.t.o. clutch, torque amplifier group and front wheel drive clutch |
| Oil capacity: | Common oil case for gearbox, rear axle differential and hydraulic power lift: appr. 50 l<br>Planetary reduction of rear axle final drive: 2 x 4,5 l<br>Front drive axle differential: 3,5 l<br>Planetary reduction of front axle final drive: 2 x 1,25 l<br>Changing interval: 1600 hours<br>Recommended oil: SAE 80 EP |

Total ratios and speeds

| | Gear No. | Number of engine revolutions for one revolution of driving wheel | *) Nominal travelling speed for rated speed of engine km/h |
|---|---|---|---|
| without torque amplifier group | 1 I | 260,40 | 2,372 |
| | 2 I | 165,21 | 3,740 |
| | 3 I | 103,98 | 5,942 |
| | 4 I | 73,03 | 8,460 |
| | 1 II | 89,26 | 6,922 |
| | 2 II | 56,63 | 10,911 |
| | 3 II | 35,65 | 17,332 |
| | 4 II | 25,04 | 24,676 |
| with torque amplifier group | 1 I | 348,35 | 1,773 |
| | 2 I | 221,05 | 2,795 |
| | 3 I | 139,10 | 4,442 |
| | 4 I | 97,18 | 6,358 |
| | 1 II | 119,42 | 5,174 |
| | 2 II | 75,76 | 8,156 |
| | 3 II | 47,57 | 12,989 |
| | 4 II | 33,49 | 18,450 |
| without torque amplifier group reverse | 1 | 190,43 | 3,244 |
| | 2 | 120,82 | 5,114 |
| | 3 | 76,04 | 8,125 |
| | 4 | 53,40 | 11,571 |
| with torque amplifier group reverse | 1 | 254,75 | 2,425 |
| | 2 | 161,63 | 3,822 |
| | 3 | 101,72 | 6,074 |
| | 4 | 71,45 | 8,647 |

*) Calculated with index radius 745 mm

Power take off: At rear of tractor, in median plane, 609 mm above ground
Dimensions:
540 rev/min: ISO R 500, Type 1 (35 mm, 6 splines)
1000 rev/min: ISO R 500, Type 2 (35 mm, 21 splines)

Power take off: (cont.)

Proportional to engine speed p.t.o.:

Live p.t.o. driven by a mechanical control and a hydraulically engaged wet multiplate clutch, hand lever operated

Method of changing p.t.o. speeds: One of the two p.t.o. shaft end-pieces is located in the rear of tractor, the other one is inserted in the clutch housing. If the two end-pieces are changed from rear of tractor to the clutch housing and contrary, the speed of the p.t.o. shaft is selected (automatically selection of spur gears by the p.t.o. shaft end-pieces in the clutch housing)

Speeds: 540/628 rev/min at 1892/2200 rev/min engine speed
1000/1012 rev/min at 2174/2200 rev/min engine speed

Engine speed resp. p.t.o. speed indication by indicator-instrument

Direction of rotation: clockwise viewed from driving end

Proportional to ground speed p.t.o.:

Both end-pieces can be used

Switchable in all ratios and speeds by mechanical control and hydraulically engaged wet multiplate clutch

Travelling distance for one revolution of p.t.o. shaft: 0,171 m (calculated with index radius 745 mm)

Number of p.t.o. shaft revolutions for 1 revolution of rear wheels: 27,38

Direction of rotation: clockwise in forward gears, anti-clockwise in reverse gears (viewed from driving end)

Belt pulley: Optional, not on tested tractor

Power lift: ARCHIMEDES-WROCLAW

Hydraulically acting, with single acting working cylinder and additional working cylinder (bore/stroke: 50/305 mm)

Draft-control, position-control, pressure-control and floating position; lower link sensing

Standard linkage for category II; 2 lift rod/lower link coupling points

Two stage oil pump system consisting of gear pump and piston pump, both pumps working in the same hydraulic circuit, open centre type hydraulic system

max. sustained pressure of gear pump: 157 bar

max. sustained pressure of piston pump: 173 bar

Gear pump directly driven by engine, incorporated in clutch housing, switchable out of gear by a hand lever

Piston pump directly driven by engine

**Power lift: (cont.)**

ARCHIMEDES-WROCLAW control unit
Oil capacity: common oil case with gearbox: appr. 50 l
Oil tapping: 2 with ARCHIMEDES-WROCLAW control unit for 2 single acting cylinders or 1 double acting cylinder

Optional (not on tested tractor): 3 oil tappings
Capacity of tappings: not specified

**Holed drawbar:**

Fitted in the clevis of the lower links of the threepoint linkage, category II
Number of holes: 7, diameter: 32 mm, distance: 80 mm thickness: appr. 72 mm, width: 90 mm

Height above ground:

| lift rod/lower link coupling point giving: | Min. lift rod length 530 mm | Max. lift rod length 680 mm |
|---|---|---|
| Max. mech. advantage | from 255 to 1005 mm | from 15 to 725 mm |
| Min. mech. advantage | from 310 to 970 mm | from 0 to 725 mm |

Method of changing: by power lift, lift rod and lower link
Distance to rear axle: 1040 mm (lower links horizontally)
Distance relative to p.t.o.: 530 mm

**Pull attachement:**

**Trailer hitch:**

Own make
Fork type, only for four wheel trailers
Height above ground: 2 positions; 725/825 mm (tyre index radius 745 mm)
Distance from rear axle: 730/715 mm
Position relative to p.t.o.: 116/216 mm above and 220/205 mm behind
Diameter of coupling pin: 38 mm

**Swinging drawbar:**

Height above ground: (tyre index radius 745 mm) 437 mm
Distance from rear axle: (2 positions) rearw. 920/865 mm
Lateral adjustment (5 positions): sym. 0/80/160 mm
totally: 10 positions
Distance relative to p.t.o.: 410/355 mm
Diameter of coupling pin: 30 mm
Distance of pivot point from rear axle: frontw. 305 mm
Max. vertical load: 5900 N

**Towing hitch:**

Fork type
Height above ground: 850 mm
Distance from front axle: frontwards 655 mm
Diameter of coupling pin: 38 mm

**Steering:**

PILMET-WROCLAW
Circular ball gear steering, hydraulic power assisted
Own oil circuit, gear pump (incorporated in clutch housing) directly driven by engine
Capacity of oil case: appr. 7 l
Pump delivery rate: 20 l/min (at rated engine speed)
Working pressure: 78,5 bar
Operated by steering wheel, acting on front wheels
Changing interval: 800 hours
Recommended oil: SAE 10 W

**Brakes:**

Own make

Service brake: Hydraulically acting dry disc brake, acting on rear wheels, pedal operated

Parking brake: Mechanically acting, same discs as foot brake, operated by hand lever with ratchet

Steering assistance brake: Operated by divided pedal of foot brake

Trailer braking system: Pressure air system, V-belt driven air compressor on left side of the engine, switchable out of gear by a hand lever
Storage pressure: 5,7 - 5,9 bar
Working pressure: 5,7 - 5,9 bar
activated by foot brake or hand brake

**Wheels:**

Front wheels: 2 pneumatics, steering and driving function, radial carcass 12,4/11-24 (R) PR 6; rim: W 9 x 24
Maximum permissible load on each tyre:
11 380 N at 1,57 bar inflation pressure
(17 660 N at 2,06 bar inflation pressure for frontloader working, with speed limit of 8 km/h)
Track width: 1630 mm

Rear wheels: 2 pneumatics, driving function, radial carcass 16,9/14-34 (R) PR 8; rim: W 15 L x 34
Maximum permissible load on each tyre:
21 975 N at 1,47 bar inflation pressure
Track width: 1500 mm (1725 mm by reversing wheels)

Wheel base: 2385 mm

Lighting:

Unrestricted beam angle of head light in plan view: 92 mrad (5,3°)

| | *) Height above ground of centre mm | Dimension mm | Distance from outside edge of tractor to centre mm |
|---|---|---|---|
| Head lights | 1140 | 145 dia | 480 |
| Side Lights | 1720 | 70 x 55 | 190 |
| Rear lights | 1380 | 90 x 80 | 230 |
| Reflectors | 1040 | 75 dia | 140 |
| Backing light | 1500 | 140 dia | 230 |

*) Measured with tyre index radius at rear 745 mm and 540 mm at front

Number of grease points: 25

Driver seat: Own make
Parallelogram construction with pneumatic spring element, adjustable to drivers weight (inflation pressure from 1,47 to 2,45 bar)
Hydraulically damping
Horizontal adjustment range: 100 mm

Cab: FPS KUNOW model 80.000.1017
Rubber block mounted, with seat for driver and passenger, air ventilation and warm water heating

Optional: Acoustic damped cab

## CONDITIONS DURING TEST

Tractormass:

Tractor without driver but with tanks full and cab

| | Front | Rear | Total |
|---|---|---|---|
| Without ballast | 1698 kg | 2680 kg | 4378 kg |
| With ballast | 2381 kg | 3410 kg | 5791 kg |

Ballastmass:

| | Number of weights | Total mass (excluding water) | Water |
|---|---|---|---|
| Front | 7 + 7 + 4 | 432 kg | 140 kg |
| Rear | 10 | 341 kg | 500 kg |
| Additional | - | - | - |

Track setting: 1630 mm at front
1500 mm at rear
Front wheels: 12,4/11-24 (R) PR 6
Rear wheels: 16,9/14-34 (R) PR 8

Overall dimensions:

| | Length | Width | | Height *) |
|---|---|---|---|---|
| | | max. | min. | |
| | mm | mm | mm | mm |
| With ballast | 4180 | 2188 | 2090 | 2530/2350 |
| Without ballast | 4150 | 2188 | 2090 | 2530/2350 |

*) measured to top of: exhaust pipe/protective cab

Minimum ground clearance: 400 mm under front axle
420 mm under rear axle
330 mm under swinging drawbar

Fuel and lubricants used in tests:

| | |
|---|---|
| Fuel: | ELAN Diesel fuel (according to DIN 51601)<br>specific gravity at 15°C: 0,830 kg/l<br>Viscosity at 50°C: 3 $mm^2/s$ (3 cSt)<br>Cetane no.: 46 (ÖNORM C 1104) |
| Engine oil: | MOBIL OIL SPECIAL SAE 10 W-30<br>Viscosity at 100°C: 11 $mm^2/s$ (11 cSt) |
| Transmission oil: | MOBILUBE SAE 80 EP<br>Viscositiy at 50°C: 49 $mm^2/s$ (49 cSt) |
| Hydraulic oil of hydraulic power assisted steering: | MOBIL D. T. E. SAE 10<br>Viscosity at 50°C: 12 $mm^2/s$ (12 cSt) |

## COMPULSORY TESTS

1. Main power take-off performance

Date and location of tests: 1978 06 05, Wieselburg/Austria
Type of dynamometer: SCHENK, eddy current brake, W 780

Main test on: 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 | | | | | |
| 53,38 | 2200 | 628 | 15,37 18,52 | 288 | 2,882 |
| Standard p.t.o. speed | | | | | |
| 49,41 | 1890 | 540 | 13,83 16,66 | 280 | 2,965 |
| | | | | | |
| The speed recommended by the manufacturer for drawbar work | | | | | |
| 53,38 | 2200 | 628 | 15,37 18,52 | 288 | 2,882 |
| PART LOADS<br>Governor hand lever in position giving maximum power | | | | | |
| (i) 85 % of torque at maximum power | | | | | |
| 46,42 | 2253 | 643 | 12,73 15,34 | 274 | 3,026 |
| (ii) unloaded | | | | | |
| 0 | 2400 | 685 | 4,10 4,94 | - | - |
| (iii) 50 % of the load defined in (i) | | | | | |
| 24,00 | 2330 | 665 | 7,99 9,63 | 333 | 2,492 |
| (iv) maximum power | | | | | |
| 53,38 | 2200 | 628 | 15,37 18,52 | 288 | 2,882 |
| (v) 25 % of the load defined in (i) | | | | | |
| 12,15 | 2365 | 675 | 6,03 7,26 | 496 | 1,673 |
| (vi) 75 % of the load defined in (i) | | | | | |
| 35,38 | 2291 | 654 | 10,23 12,32 | 289 | 2,871 |

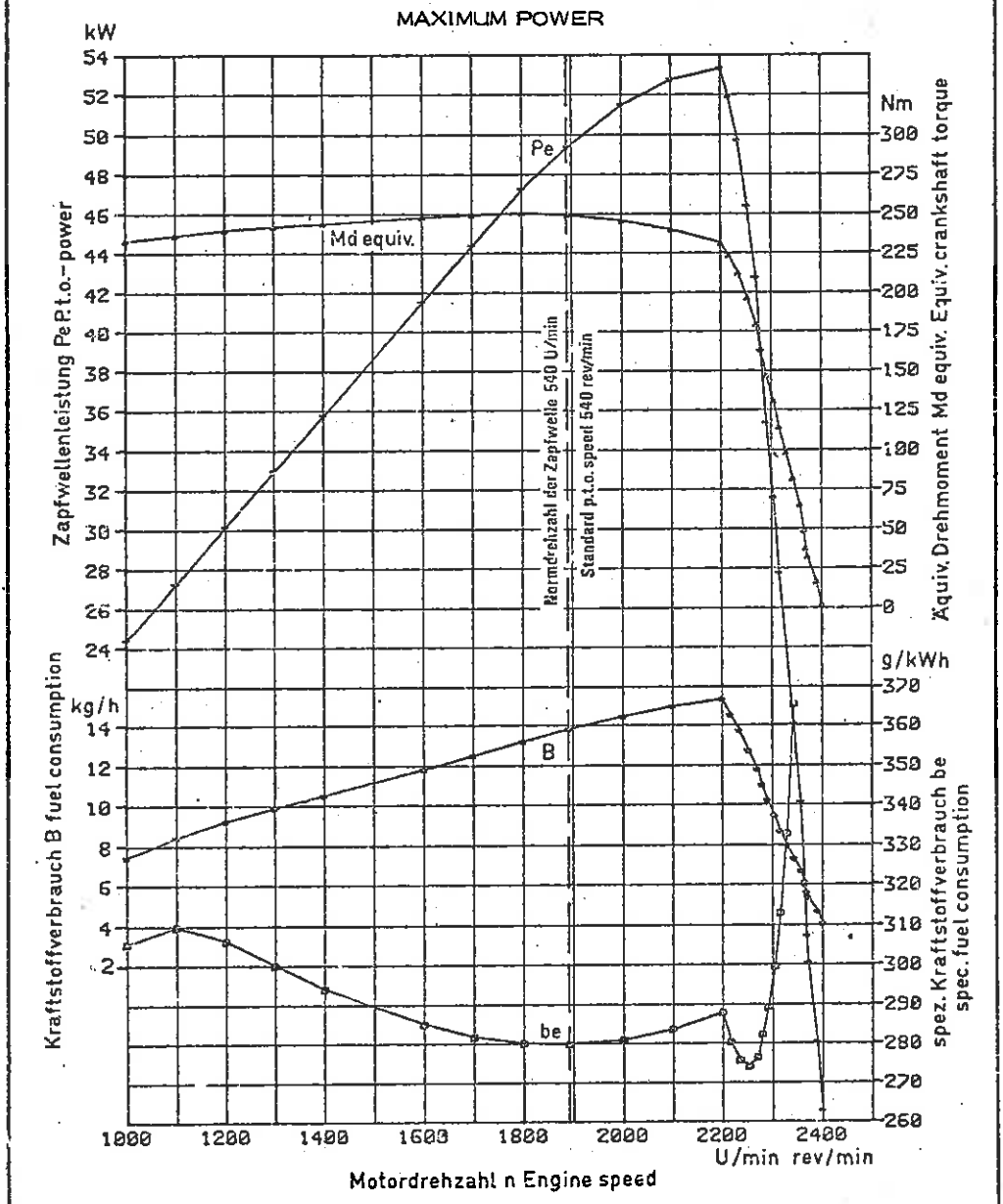
| Power | Speed | | Fuel consumption | | | |
|---|---|---|---|---|---|---|
| | engine | p.t.o. | total | | specific | specific |
| kW | rev/min | rev/min | kg/h | l/h | g/kWh | kWh/l |
| PART LOADS<br>Governor hand lever in position giving standard p.t.o. speed at full load | | | | | | |
| (i) 85 % of torque at standard p.t.o. speed | | | | | | |
| 43,10 | 1941 | 554 | 11,46 | 13,81 | 266 | 3,121 |
| (ii) unloaded | | | | | | |
| 0 | 2105 | 601 | 3,25 | 3,91 | - | - |
| (iii) 50 % of the load defined in (i) | | | | | | |
| 22,52 | 2029 | 579 | 7,11 | 8,57 | 316 | 2,627 |
| (iv) maximum power at standard p.t.o. speed | | | | | | |
| 49,41 | 1890 | 540 | 13,83 | 16,66 | 280 | 2,965 |
| (v) 25 % of the load defined in (i) | | | | | | |
| 11,45 | 2067 | 590 | 5,11 | 6,15 | 446 | 1,861 |
| (vi) 75 % of the load defined in (i) | | | | | | |
| 33,11 | 1987 | 567 | 9,14 | 11,01 | 276 | 3,007 |
| STANDARD SPECIFIC FUEL CONSUMPTION: 274/333/266/316 g/kWh | | | | | | |

No load maximum engine speed: 2400 rev/min
Equivalent crankshaft torque
at maximum power: 231,7 Nm at 2200 rev/min of engine
Maximum equivalent crankshaft torque: 250,9 Nm at 1800 rev/min of engine

Mean atmospheric conditions: temperature: 22°C
pressure: 993 mb
humidity: 72 %

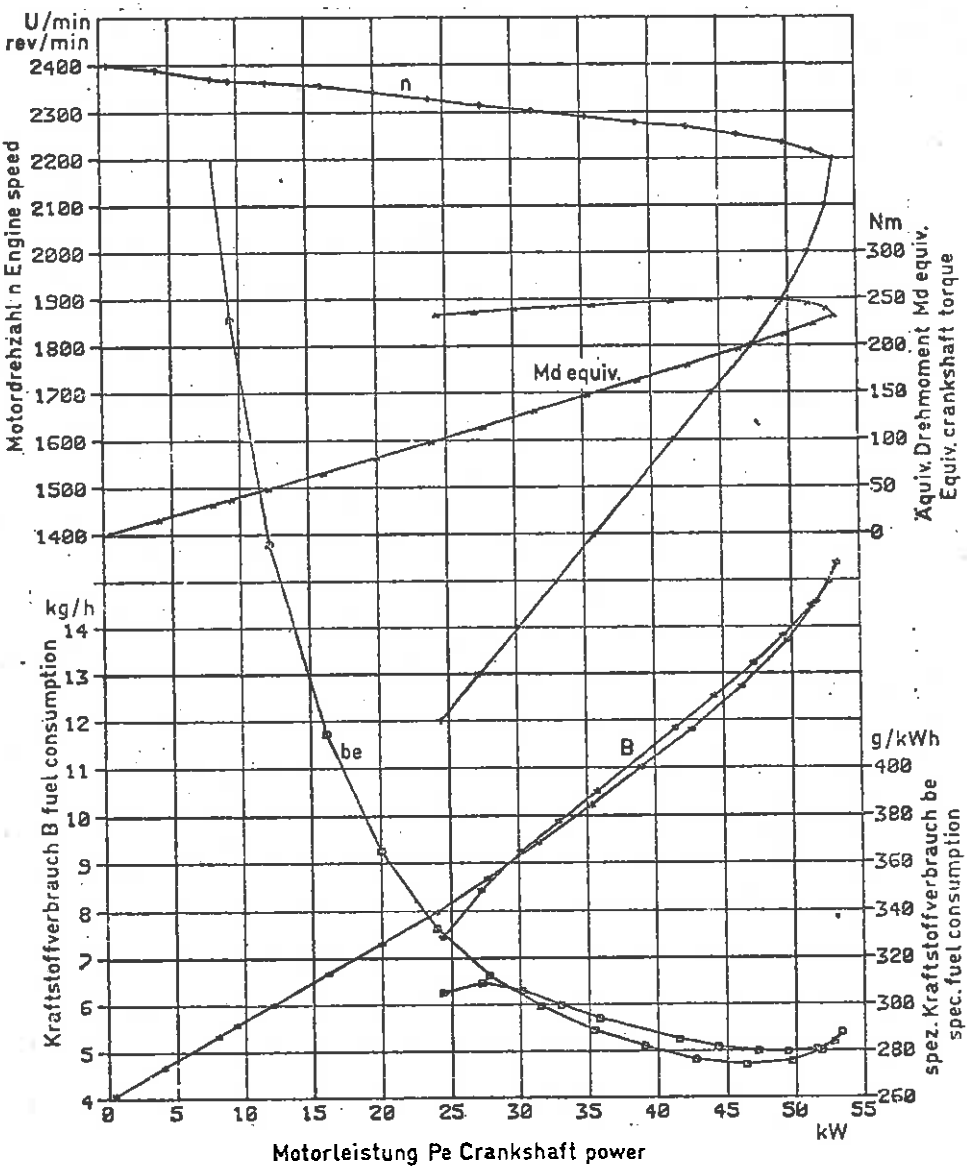
Maximum temperatures: coolant: 78°C
engine oil: 113°C
fuel: 60°C
air intake: 23°C

| Bundesversuchs-u.Prüfungsanst. f. landw. Maschinen u. Geräte Wieselburg / Austria Protokoll Nr. 016/79 | Zapfwellenprüfung P.t.o.-test | Dieseltraktor URSUS Typ C-385A Mot. Typ Z-8001 |
|---|---|---|




| | | | | |
|---|---|---|---|---|
| Engine ser.No. 76125 | Atm.pressure: 993 mb | Coolant temp.: 78°C | D. of tests: 1978 06 05 | Signature |
| Tractor ser.No. 2640 | Air temperature: 22°C | Oil temperature: 113°C | Test No. 113/Za 107 | A. Reitlier |
| Fuel: 0.830/15°C | Engine oil: Mobil special | Fuel temp.: 60°C | Curves No. 1 | |

| Bundesversuchs-u.Prüfungsanst. f. landw. Maschinen u. Geräte Wieselburg / Austria Protokoll Nr. 016/79 | Zapfwellenprüfung P.t.o.-test | Dieseltraktor URSUS Typ C-395A Mot. Typ Z-8001 |
|---|---|---|

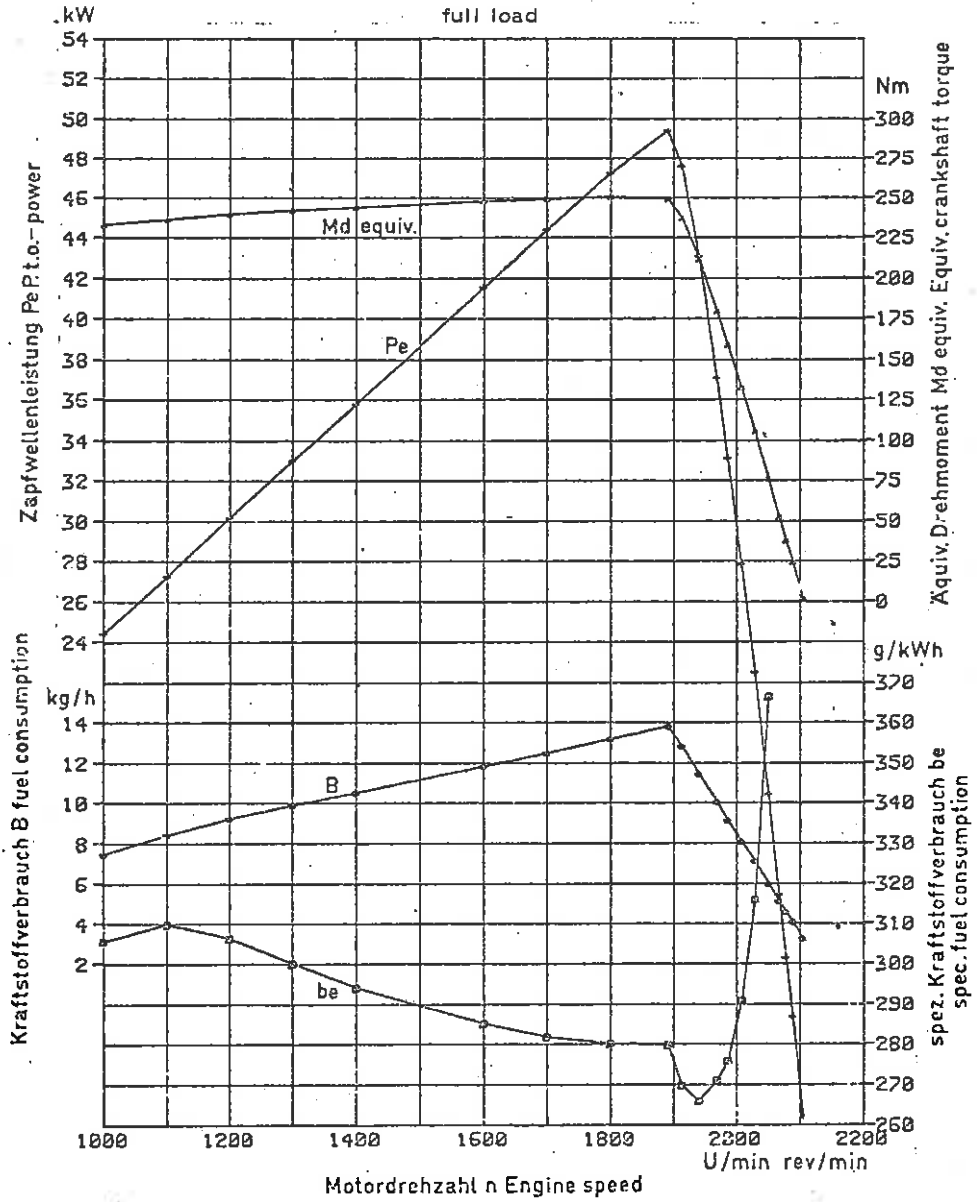



| | | | | |
|---|---|---|---|---|
| Engine ser. No. 76125 | Atm. pressure: 993 mb | Coolant temp.: 78°C | D. of tests: 1978 06 05 | Signature |
| Tractor ser. No. 2640 | Air temperature: 22°C | Oil temperature: 113°C | Test No. 113/Za 107 | A. Reitlner |
| Fuel: 0,830/15°C | Engine oil: Mobil special | Fuel temp.: 60°C | Curves No. 2 | |

| Bundesversuchs-u.Prüfungsanst. f.landw.Maschinen u.Geräte Wieselburg / Austria Protokoll Nr. 016/79 | Zapfwellenprüfung P.t.o.-test | Dieseltraktor URSUS Typ C-385A Mot. Typ Z-8001 |
|---|---|---|

PART LOADS

Governor handlever in position giving standard p.t.o. speed at full load




| | | | | | |
|---|---|---|---|---|---|
| Engine ser. No. 76125 | Atm. pressure: 993 mb | Coolant temp.: 78°C | D. of tests: 1978 06 05 | Signature |
| Tractor ser. No. 2640 | Air temperature: 22°C | Oil temperature: 113°C | Test No. 113/Za 107 | A. Reithes |
| Fuel: 0.830/15°C | Engine oil: Mobil special | Fuel temp.: 60°C | Curves No. 2a | |

## 2. Drawbar performance

Date of tests: 1978 06 29 to 1978 07 12
Type of track: Concrete
Height of drawbar above ground: 390 mm ballasted, 410 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) | | | | | | | | | | | | | |
| 1 I *) | 1,587 | 24,27 | 55040 | 2315 | 15 | – | – | 54 | 79 | 102 | 23 | 74 | 988 |
| 1 I | 2,102 | 32,16 | 55080 | 2289 | 15 | – | – | 55 | 80 | 100 | 23 | 74 | 988 |
| 2 I *) | 2,455 | 37,56 | 55080 | 2272 | 15 | 2,668 | 311 | 56 | 80 | 99 | 24 | 73 | 988 |
| 2 I | 3,250 | 47,40 | 52500 | 2200 | 13,3 | 2,562 | 324 | 56 | 79 | 98 | 22 | 72 | 989 |
| 3 I *) | 4,000 | 48,60 | 43750 | 2202 | 10,2 | 2,622 | 317 | 54 | 78 | 98 | 20 | 72 | 989 |
| 1 II *) | 4,748 | 49,13 | 37250 | 2201 | 8,6 | 2,653 | 313 | 54 | 79 | 98 | 20 | 71 | 989 |
| 3 I | 5,522 | 49,24 | 32100 | 2199 | 7,6 | 2,660 | 312 | 56 | 80 | 100 | 21 | 70 | 989 |
| 4 I *) | 5,936 | 49,06 | 29750 | 2200 | 7,2 | 2,649 | 313 | 55 | 78 | 96 | 21 | 69 | 989 |
| 1 II | 6,509 | 48,82 | 27000 | 2200 | 6,7 | 2,636 | 315 | 56 | 79 | 95 | 22 | 68 | 989 |
| 2 II *) | 7,725 | 48,28 | 22500 | 2199 | 6,0 | 2,609 | 318 | 55 | 78 | 94 | 23 | 68 | 989 |
| | | | | | | | | | | | | | |

*) with torque amplifier group engaged

| 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 | | | | | | | | | | | | | |
| 3 I | 5,753 | 38,46 | 24070 | 2269 | 6,1 | 2,695 | 308 | 56 | 78 | 98 | 22 | 74 | 989 |
| (iii) Five-hour-test at pull corresponding to 15 % wheelslip in test (i) | | | | | | | | | | | | | |
| 2 I *) | 2,455 | 37,51 | 55000 | 2275 | 15 | 2,652 | 313 | 61 | 81 | 112 | 24 | 68 | 989 |
| (iv) Maximum power (unballasted) | | | | | | | | | | | | | |
| 2 I | 3,294 | 38,43 | 42000 | 2270 | 15 | 2,694 | 308 | 51 | 75 | 104 | 19 | 70 | 990 |
| 3 I *) | 3,841 | 44,81 | 42000 | 2228 | 15 | 2,652 | 313 | 50 | 75 | 103 | 19 | 70 | 990 |
| 1 II *) | 4,626 | 46,80 | 36420 | 2200 | 11,2 | 2,530 | 328 | 51 | 78 | 100 | 20 | 69 | 990 |
| 3 I | 5,429 | 47,50 | 31500 | 2199 | 9,4 | 2,561 | 324 | 51 | 80 | 101 | 20 | 70 | 989 |
| 4 I *) | 5,843 | 47,60 | 29330 | 2200 | 9,1 | 2,570 | 323 | 50 | 79 | 100 | 19 | 70 | 989 |
| 1 II | 6,412 | 47,64 | 26750 | 2201 | 8,4 | 2,575 | 322 | 51 | 78 | 98 | 20 | 69 | 989 |
| 2 II *) | 7,632 | 47,49 | 22400 | 2200 | 7,6 | 2,562 | 324 | 51 | 78 | 98 | 19 | 68 | 989 |
| 4 I | 7,931 | 47,40 | 21520 | 2199 | 7,4 | 2,560 | 324 | 50 | 78 | 96 | 19 | 69 | 989 |

Total oil consumption during 10 hours duration of tests (ii) and (iii): 87 g/h

*) with torque amplifier group engaged

## 3. Turning space and turning circle

Wheel equipment front: 12,4/11-24 (R), 6 PR
rear: 16,9/14-34 (R), 8 PR

Track of wheels front: 1630 mm
rear: 1500 mm

| Results | With brakes | | Without brakes | |
|---|---|---|---|---|
| | right-hand | left-hand | right-hand | left-hand |
| | m | m | m | m |
| Radius of turning space | 4,42 *)<br>4,60 | 4,66 *)<br>4,91 | 6,20 *)<br>6,50 | 5,31 *)<br>5,65 |
| Radius of turning circle | 4,22 *)<br>4,40 | 4,46 *)<br>4,71 | 6,00 *)<br>6,30 | 5,11 *)<br>5,45 |

*) four-wheel-drive switched off

## 4. Location of centre of gravity

| | mm |
|---|---|
| Height above ground | 973 |
| Distance forward from the vertical plane containing the axis of the rear wheels | 919 |
| Distance from the median plane, left-hand | 7 |

## 5. Braking

Date of tests: 1978 02 27 - 1978 07 13
Type of track: Concrete
Type of decelerometer: Moto-Meter Nr. 03382 (Kombi-Schreiber)
Mass of ballasted tractor: 5866 kg

Cold brakes (four-wheel-drive engaged)

| | | Ballasted | Without ballast |
|---|---|---|---|
| Travelling speed of the tractor | km/h | 25 | 25 |
| (i) Deceleration | $m/s^2$ | 4,7 | 6,5 |
| (ii) Stopping distance | m | 4,82 | 4,15 |
| (iii) Force exerted on the brake pedal | N | 530 | 480 |
| (iv) Force exerted on the brake pedal to achieve a deceleration of 2,5 $m/s^2$ | N | 294 | 137 |

| Brake fade characteristics (hot tests) | Ballasted | Unballasted |
|---|---|---|
| Deceleration hot / deceleration cold x 100 | 108 | 69 |
| Stopping distance cold / Stopping distance hot x 100 | 84 | 72 |
| Force on pedal, cold / Force on pedal, hot x 100 | 93 | 98 |
| Force on pedal, cold / force on pedal, hot to achieve a deceleration of 2,5 $m/s^2$ x 100 | 88 | 47 |

Efficiency of handbrake:
Satisfactory facing up and down slope of 16 %
Pull on handbrake: 245 N

6. Measurement of ambient noise

Date of tests: 1978 02 06
Type of sound level meter: 2203 BRÜEL & KJAER
Type of track: Concrete

Results of tests:
Gear: 4 II, four-wheel-drive engaged
Travelling speed before acceleration: 20 km/h
Sound level: 87 dB(A)

7. Noise measurement at the driver's ear level

Date of tests: 1978 05 31
Type of sound level meter and octave filter: 2203 and 1613 BRÜEL & KJAER
Type of track: Concrete

Results of tests (tractor with cab)

| Gear | Travelling speed | dBA |
|---|---|---|
| 1 I *) | 1,81 km/h | 90 |
| 1 I | 2,49 km/h | 90 |
| 1 II**) | 7,59 km/h | 89 |
| 4 II | 25,70 km/h | 90 |

*) With torque amplifier group engaged
**) The gear tested corresponds to a travelling speed nearest to 7,5 km/h.

## 8. Power lift an hydraulic pump performance

Date and location of tests: 1978 08 16, Wieselburg, Austria
Hydraulic fluid:
Make and type: MOBILUBE SAE 80 EP
Viscosity at 50°C: 49 $mm^2/s$ (49 cSt)
Typ of linkage lock for transport: hydraulically by throttle valve
Opening pressure of the cylinder overpressure relief valve (manufacturer specification): 196 bar

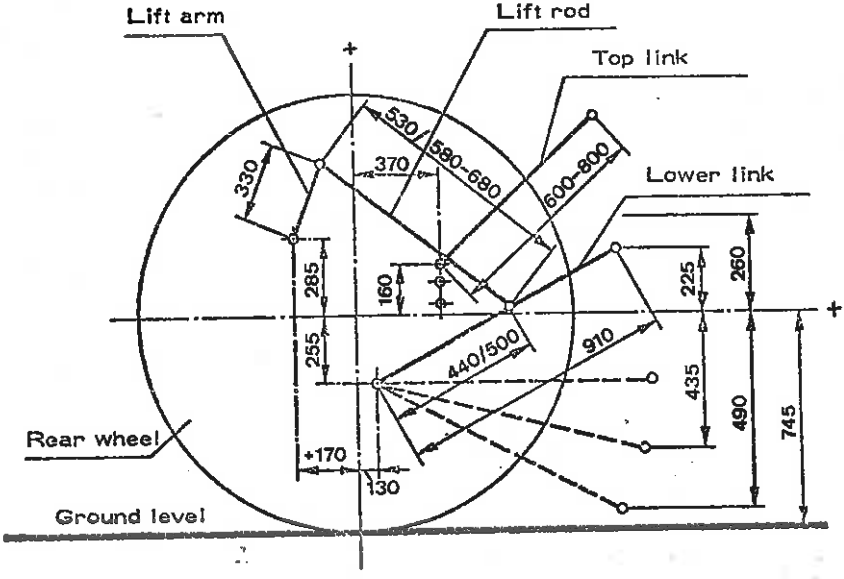
Pump characteristics:

(i) Opening pressure of the relief valve: 196 bar
sustained pressure by the open relief valve: 173 bar

(ii) Pump delivery rate at minimum pressure and rated engine speed: gear pump: 35 l/min
piston pump: 4 l/min

(iii) Gear pump
Pump delivery rate: 32 l/min
delivery pressure: 157 bar
power: 8,37 kW

Piston pump
Pump delivery rate: 4 l/min
delivery pressure: 173 bar
power: 1,15 kW at 173 bar (1,04 kW at 157 bar)



Linkage geometry when connected to the standard frame

| | | Maximum mechanical advantage | | Minimum mechanical advantage | |
|---|---|---|---|---|---|
| Projected length in side view | | | | | |
| Lower links | mm | 910 | | 910 | |
| Lift arms | mm | 330 | | 330 | |
| Lift rods | mm | 530 | | 530 | |
| Top link | mm | 672 | | 672 | |
| Distance of lift rod connection point from pivot point of lower link | mm | 500 | | 440 | |
| The following dimensions are given relative to the rear wheel centre line, situated 745 mm above the ground level | | | | | |
| Lower link pivot point | mm | 130 behind | 255 below | 130 behind | 255 below |
| Top link pivot point | mm | 370 behind | 160 above | 370 behind | 160 above |
| Lift arm pivot point | mm | 170 behind | 285 above | 170 behind | 285 above |
| Maximum und minimum height of lower link hitch points | mm | 225 above | 435 below | 260 above | 490 below |
| Height of lower link hitch points locked in transport position | mm | 225 above (max. height) | | 260 above (max. height) | |

## Performance of power lift

| Lifting heights in relation to a horizontal line through the lower link pivoting point mm | | -240 | -235 | -190 | -180 | -90 | 0 | +100 | +200 | +300 | +400 | +480 | +515 | +615 | +670 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | | | | 41,88 | 45,02 | 45,61 | 45,37 | 45,22 | 45,56 | 45,91 | 44,83 | | | |
| | min. mech. advantage | | 35,31 | 37,08 | 37,42 | 39,14 | 39,63 | 39,73 | 39,97 | 40,51 | 41,30 | 41,54 | 41,20 | | |
| | Maximum force exerted throughout whole range: 41,88/35,31 kN | | | | | | | | | | | | | | |
| | Oil pressure: 173 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 | | | 41,88 | 42,37 | 43,26 | 41,93 | 39,92 | 37,86 | 35,95 | 33,99 | 32,27 | 31,34 | 28,35 | |
| | min. mech. advantage | 36,64 | 36,78 | 37,67 | 37,76 | 37,57 | 36,44 | 34,92 | 33,40 | 31,88 | 30,36 | 28,98 | 28,35 | 26,09 | 24,52 |
| | Maximum force exerted throughout whole range: 28,35/24,52 kN | | | | | | | | | | | | | | |
| | Oil pressure: 173 bar | | | | | | | | | | | | | | |

## ADDITIONAL TESTS

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

1. OCTAVE-ANALYSIS OF NOISE AT THE DRIVERS EAR LEVEL

Made in the gear with the nominal travelling speed nearest to 7,5 km/h

Date of tests: 1978 05 31

Test track: concrete

Type of sound level meter: 2203 BRÜEL & KJAER

Type of frequence analyser: 1613 BRÜEL & KJAER

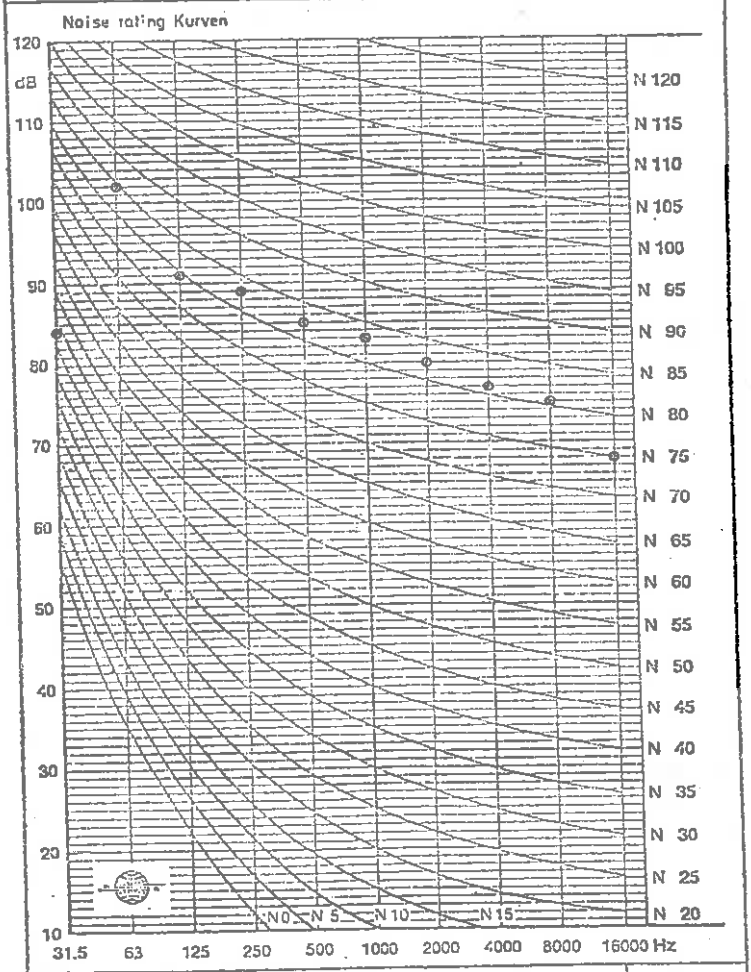
Results of tests:

Tractor with cab,

| Gear | Effective travelling speed | Sound level | |
|---|---|---|---|
| | | dB(A) | Noise rating |
| 1 II *) | 7,59 km/h | 89 | 85 |

*) four wheel drive engaged

| Bundesversuchs-u.Prüfungsanst. f.landw.Maschinen u.Geräte Wieselburg / Austria | Octave analysis of noise at the drivers ear level | Dieseltractor URSUS Typ C-385 A |
|---|---|---|




Gear: 1 II four-wheel-drive engaged
Trav. speed: 7,59 km/h

A. Reither