Report on test in accordance with OECD STANDARD CODE

OECD No. **1214/1**

## Agricultural Tractor
## LANDINI
## DT 6060 (4WD)

Type denomination

**TL 39 DT/K**



OECD No. **1214/2**

## Agricultural Tractor
## MASSEY-FERGUSON
## 363-4 (4WD)

Type denomination

**TL 39 DT/V**



**Manufacturer**

Massey-Ferguson S.p.A., Landini Division
I-42042 Fabbrico (R.E.) Italy

Deutsche Landwirtschafts-Gesellschaft e.V.
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This is a report on a tractor test in accordance with OECD STANDARD CODE for the Official Testing of Agricultural Tractor Performance (C(87)53(Final), Code I).

It does not contain an evaluation of the tractor on practical work.

Duration of tests: October 1988 till February 1989
DLG-Testing Station for Agricultural Machinery, Max-Eyth-Weg 1,
D-6114 Groß-Umstadt

This report has been approved by the OECD Co-Ordinating Centre (CEMAGREF, France) as being in accordance with the OECD STANDARD CODE.

Date of approval: 23 rd August 1989
OECD No. 1214/1 for LANDINI DT 6060 (4WD)
OECD No. 1214/2 for MASSEY-FERGUSON 363-4 (4WD)

The tractors LANDINI DT 6060 and
MASSEY-FERGUSON 363-4
are technically identical in all main respects except colour and denominations.

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In this report all performance characteristics are given corresponding to the International System of Units.

The reference to the former used Technical System of Units is given by the following relations:

| | | | | | |
|---|---|---|---|---|---|
| Forces | 1 kN | = | 1000 N | = | 102 kp |
| Powers | | | 1 kW | = | 1,36 PS |
| Pressures | 1 MPa | = | 10 bar | = | 10,2 kp/cm² |
| | 100 kPa | = | 1000 mbar | = | 750,10 mm Hg |

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PRÜFUNGS-ABTEILUNG
LANDINI DT 6060

Test No. 88-81

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| | |
|---|---|
| Tractor manufacturer: | MASSEY-FERGUSON S.p.A.<br>I-42042 Fabbrico (R.E.), Italy |
| Location of tractor assembly: | I-42042 Fabbrico |
| Submitted for test by: | Manufacturer |
| Selected by: | Manufacturer with agreement by DLG |
| Place of running-in: | Fabbrico and Groß-Umstadt |
| Duration of running-in: | Engine and tractor appr.<br>18 hours |

## SPECIFICATION OF TRACTOR

### Tractor

| | |
|---|---|
| Make: | LANDINI respectively MASSEY-FERGUSON |
| Trade name: | DT 6060 respectively 363-4 |
| Type denomination: | TL39DT/K respectively TL39DT/V |
| Type: | Wheel tractor, unit construction, four wheel driven |
| Serial No.: | 5371V52132 |
| Start of series: | 5371V51001 |

### Engine

| | |
|---|---|
| Make: | PERKINS |
| Model: | T 3.152.4 |
| Type: | Watercooled 4-stroke Diesel-engine, direct injection, turbo charged |
| Serial No.: | CN 31198U815253P |
| Cylinders: | 3, in line, bore 91,5 mm, stroke 127 mm, displacement 2505 cm³, compression ratio 15,5:1;; replaceable wet cylinder liners |
| Valves: | Overhead |

### Supercharging

| | |
|---|---|
| Make: | SCHWITZER |
| Model/Type: | S2A 2674A152, exhaust driven |
| Max.pressure: | 55 kPa |

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| | |
|---|---|
| Fuel system: | PERKINS fuel supply pump;<br>CAV distributor injection pump<br>DPA 3238F471/DSA 649, serial no. 31626 LEG;<br>manufacturer's production setting<br>61+2 mm³/stroke at rated engine speed<br>and full load;<br>with automatic injection timing device;<br>injection timing 17+3° before TDC static,<br>additional 8° automatic;<br>CAV multihole-injection nozzles PN 2645k603,<br>injection pressure 21,0 MPa,<br>CAV fuel filter with replaceable paper<br>element; capacity of fuel tank 86 dm³ |
| Governor: | CAV centrifugal variable speed governor,<br>governed range of engine speed 750 to<br>2530 rev/min, rated engine speed 2250 rev/min; |
| Air cleaner: | FISPA<br>oil bath air filter, cyclone pre-cleaner;<br>no maintenance indicator;<br>air intake in front of engine, below bonnet |
| Lubrication system: | Forced feed with gear pump;<br>strainer in sump,<br>PERKINS oil filter in full flow,<br>replaceable filter |
| Cooling system: | Water cooling with impeller pump,<br>overpressure relief valve set to 70 kPa,<br>thermostat with by-pass;<br>fan with 4 blades with 394 mm dia,<br>water capacity 10,5 dm³ |
| Starting system: | Electrical;<br>LUCAS solenoid pre engaged-drive<br>starter motor 2,5 kW;<br>depressed pedal of clutch as safety<br>device;<br>ISKRA flame plug in intake manifold |
| Electrical equipment: | 12 Volt, negative earth;<br>LUCAS 3-phase alternator 12 V 500 W;<br>1 lead acid battery, 72 Ah at 20 hours<br>rating,<br>test current for low temperature 420 A |

| | |
|---|---|
| Exhaust silencer: | ANSA, DGM SA 1269,<br>expansion type silencer, vertical,<br>130 x 100 mm oval, 660 mm long;<br>on the left, beside the engine bonnet,<br>mouth showing upwards, 2320 mm above ground |

Transmission

| | |
|---|---|
| Clutch: | LUK<br>dry dual-disc clutch;<br>pedal operated travel drive, disc 280 mm dia,<br>organic lining; hand lever operated p.t.o.<br>drive, disc 280 mm dia, organic lining |
| Gear box: | MASSEY-FERGUSON<br>synchronized speed change gear with<br>4 gears, collar shifted range gear<br>with 3 forward ranges (L, M and H) and<br>1 reverse range (R); total 12 forward and<br>4 reverse speeds, 2 gear shift levers;<br>two further gear box models on request<br>available:<br>1. gear arrangement as described above,<br>additional range gear with 3 ranges,<br>in 3 variants:<br>Standard range combined with<br>a) creeper and underdrive range, or<br>b) creeper and overdrive range, or<br>c) underdrive and overdrive range;<br>in each case total: 36 forward and 12<br>reverse speeds<br>2. change gear with 4 gears,<br>range gear with 3 forward ranges,<br>reversing gear (acting on 4x3 forward speeds),<br>combined in 3 variants with<br>a) creeper range, or<br>b) underdrive range, or<br>c) overdrive range;<br>in each case total: 24 forward and 12<br>reverse speeds |
| Rear axle and final drives: | MASSEY-FERGUSON<br>bevel gear drive, bevel gear differential with<br>pedal operated lock, self disengaging;<br>spur gear final drives |
| Front axle and final drives: | MASSEY-FERGUSON,<br>driven by jointless central propeller shaft,<br>hand lever operated, collar shifted;<br>bevel gear drive, planetary final drives,<br>No-spin differential optionally available |
| Lubrication: | Gear box, rear axle and hydraulic system<br>have oil in common, see pages 15 and 16 |

Total ratios and speeds

| Range | Gear | Total ratio engine : driving wheel | Nominal travelling speed *) at rated engine speed 2250 rev/min km/h |
|---|---|---|---|
| L | 1 | 331,81 | 1,78 |
| | 2 | 211,09 | 2,79 |
| | 3 | 167,15 | 3,53 |
| | 4 | 113,28 | 5,20 |
| M | 1 | 138,90 | 4,24 |
| | 2 | 88,36 | 6,67 |
| | 3 | 69,97 | 8,43 |
| | 4 | 47,42 | 12,43 |
| H | 1 | 56,31 | 10,47 |
| | 2 | 35,82 | 16,46 |
| | 3 | 28,37 | 20,78 |
| | 4 | 19,22 | 30,66 |
| R | 1 | 124,32 | 4,74 |
| | 2 | 79,09 | 7,45 |
| | 3 | 62,63 | 9,41 |
| | 4 | 42,44 | 13,89 |

*) calculated with the radius index 695 mm (ISO 4251/1-1984)

Number of revolutions of front wheels for one revolution of rear wheels: 1,3632

Power take-off

Main p.t.o.: Shiftable by hand lever (collar shifting) to independent or ground speed p.t.o. and by second hand lever to 540 or 1000 rev/min;
p.t.o. speed indicator lamps

1 p.t.o. shaft at rear of tractor, in tractor's median plane; height above ground 685 mm, horizontal distance to rear wheels centre line 265 mm;
35 mm dia, 6 splines, in conformity with ISO 500/1979, type 1, when using 540 rev/min speed

Power take-off proportional to engine speed
(independent p.t.o.): Driven by second plate of dry dual-disc clutch; sense of rotation clockwise (viewed to tractor's rear)

| P.t.o. type | P.t.o. speed rev/min | Engine speed rev/min | Ratio engine : p.t.o. | Power restriction kW |
|---|---|---|---|---|
| 540 | 540 | 1944 | 3,6000 | - |
| | 625 | 2250 | | |
| 1000 | 1000 | 1917 | 1,9167 | - |
| | 1174 | 2250 | | |

Power take-off proportional to ground speed:
Driven by rear axle drive, sense of rotation clockwise (at forward movement, viewed to tractor's rear)

| P.t.o. type | Travel distance per p.t.o. revolution m | Number of p.t.o. revolutions per rear wheel revolution |
|---|---|---|
| 540 | 0,4754 | 9,1852 |
| 1000 | 0,2531 | 17,2522 |

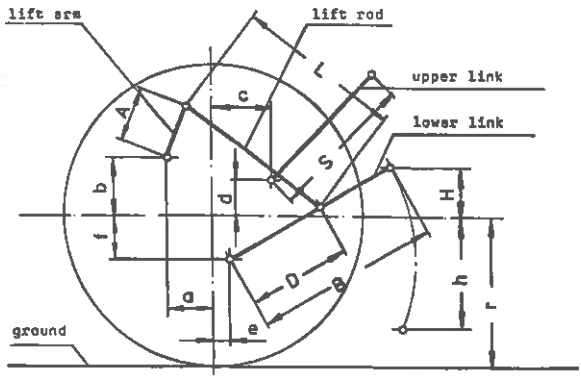
Power lift

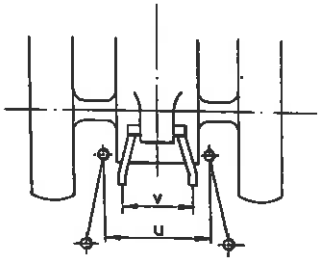
MASSEY-FERGUSON
hydraulic power lift, unit construction;
draft and position control, both infinitely mixable, floating position, lowering throttle (non-adjustable);
adjustable raise control, top link sensing;
open centre system;
1 single acting lifting cylinder,
100 mm bore, 127 mm stroke;
cylinder safety valve set to 19,0 MPa

no linkage lock for transport;
SUNDSTRAND/TUROLLA gear type pump TFA/211 S,
gear driven by engine;
delivery 36 l/min at rated engine speed, relief valve pressure setting 17,0+0,5 MPa;
1 hydraulic oil filter within suction line;
hydraulic oil circuit in common with gear box lubrication, reservoir within gear box;

MASSEY-FERGUSON control valve,
1 double acting OMC additional control valve, 2 oil couplings ar rear of tractor;
maximum volume of oil available to external cylinders 5 dm³

Three-point linkage — category 2 acc. to ISO 730/I-1977



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Dimensions of rear implement linkage (projected lengths in mm, underlined dimensions are valid for power lift measurements p.21)

| | | | |
|---|---|---|---|
| Rear tyres 16.9 R 30 | radius index | (r) | 695 |
| Front tyres 12.4 R 24 | radius index | (r') | 540 |
| Length of lift arms | | (A) | 272 |
| Length of lower links | | (B) | 855 |
| Distance of lift arm pivot points from rear wheel centre | horizontal | (a) | 12 |
| | vertical | (b) | 310 |
| Horizontal distance between lower link pivot points | | (u) | 390 |
| Horizontal distance between lift arm end points | | (v) | 525 |
| Length of upper link | | (S) | 590 to 790, 680 |
| Distance of upper link pivot point from rear wheel centre | horizontal | (c) | 254 |
| | vertical | (d) | 256 or 301 |
| Distance of lower link pivot point from rear wheel centre | horizontal | (e) | 80 |
| | vertical | (f) | 138 |
| Distance of lower link pivot points from lift rod pivot points on lower links | | (D) | 455 |
| Length of lift rods | | (L) | 545 to 665, 610 |

Height of lower link hitch points relative to rear wheels' centre line (situated 695 mm above ground), these data are valid for unloaded power lift:

| | | | | |
|---|---|---|---|---|
| Length of lift rods | (L) | 610 | 545 | 665 |
| Linkage distance of lift rods | (D) | 455 | | |
| Lowest position | (h) | 495 | 337 | 630 |
| Highest position | (H) | 178 | 295 | 80 |
| Transport position | (H') | 178 | 295 | 80 |

## Pull attachment

**Swinging drawbar:** Optionally available (not fitted on tested tractor)

**Trailer hitch:** LANDINI, DGM GA 725 C-87 6t V1.5; non-automatical, height adjustable;

| | |
|---|---|
| hole diameter | 28 mm |
| hitch point | |
| above ground | 480, 575, 705 or 800 mm |
| behind rear wheel axis | |
| horizontal | 395 mm |
| distance from p.t.o. shaft end | |
| vertical, above | 20 or 115 mm |
| below | 110 or 205 mm |
| horizontal | 130 mm |
| maximum permissible vertical load | 15 kN |

**Holed drawbar:** Long bar; length 1500 mm, thickness 30 mm, width 80 mm, length between joint balls 770 mm; 7 holes between joint balls with 80 mm distance each, 2 holes outside the joint balls on either side with 120 mm distance each, holes' diameter 22 mm and 24 mm alternately; at each end of the bar 1 hole with 32 mm dia;

| | | |
|---|---|---|
| height above ground | minimum | 125 mm |
| | maximum | 1050 mm |
| holes' centre line behind p.t.o. shaft end | | 710 mm |

(lower links in horizontal position)

**Towing hitch:** At front of tractor,

| | |
|---|---|
| height above ground | 710 mm |

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| | |
|---|---|
| **Steering** | MASSEY-FERGUSON and DANFOSS, model ORBITROL OSPC 100 , hydrostatic steering; separate oil circuit fed by SUNDSTRAND/ TUROLLA gear type pump TFA/211 S directly driven by front end of crankshaft; delivery 24,8 l/min at rated engine speed, working pressure 15,0 MPa; 1 double acting ram (symmetrical design), bore 57 mm, stroke 234 mm, piston rod 32 mm dia, acting on steering levers of front axle; oil filter incorporated in steering oil tank |
| **Brakes** | |
| Service brake: | SIRMAC, 7 x 5,5 inches pedal operated muscle power brake with mechanical transmission, acting on rear axle of tractor; wet disc brakes on the differential half shafts with 4 lining discs each with 178 mm dia |
| Parking brake: | Mechanically actuated by hand levex with ratchet, acting on the discs of service brake |
| Steering brake: | Divided pedals of service brake, for normal use locked together |
| Trailer braking take-off: | None |
| **Wheels** | |
| Steering wheels: | At front, 2 pneumatics 12.4 R 24, rims W10x24 |
| Driving wheels: | At front and at rear, rear wheels: 2 pneumatics 16.9 R 30, rims W14Lx30 |
| Wheelbase: | 2109 mm |
| Track widths: | At front 1413, 1501, 1601, 1689 1517, 1605, 1705, 1793 mm, variable by adjustable gauge bowl wheels, at rear 1300 to 2000 mm in steps of 100 mm each variable by adjustable gauge bowl wheels |

Permissible tyre combinations:

Tyre sizes

| at front | at rear |
|---|---|
| 9.5/9 - 24 6 ply | 9.5 R 36 6 ply |
| 9.5/9 - 28 6 ply | 8.3/8 - 44 6 ply |
| 11.2 R 24 114 A8 | 12.4 R 36 6 ply<br>14.9 R 30 129 A8<br>16.9 R 28 6 ply |
| 12.4 R 20 116 A8 | 14.9 R 28 128 A8<br>420/70 R 28 133 A8 |
| 12.4 R 24 119 A8 | 16.9 R 30 6 ply |

Protective structure: LANDINI TS 19/2 - MASSEY-FERGUSON TS 20/2, 4 post frame, OECD-tested, approval-no. CSS 081/13 for LANDINI DT 6060 (TL39DT//K), CSS 081/33 for MASSEY-FERGUSON 363-4 (TL39DT/V)

Driver's seat: GRAMMER, DS 44/1H; upholstered seat with back rest, adjustable suspension and hydraulic shock absorber; driver's platform 830 mm above ground, 1 step, 555 mm above ground; range of adjustment of unloaded seat: longitudinal 200 mm vertical 510 to 570 mm (stepless) above platform

Running-time meter: Electronic, counts real operating hours, when engine speed rises above 800 rev/min, otherwise is off

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Lighting — Electrical 12 Volt, in accordance with Italian legislation

| | Size mm | Height above ground of centre mm | Distance from outside edge of lights to median plane of tractor mm |
|---|---|---|---|
| Head lights | 130 dia | 1105 | 245 |
| Side lights | 110x30 | 1445 | 790 |
| Rear lights | 70x50 | 1504 | 600 |
| Reflectors | | | |
| 1st pair | 45x50 | 1504 | 645 |
| 2nd pair | 80 dia | 590 | 400 |

## TEST CONDITIONS

### Overall dimensions

| | |
|---|---|
| Length: | 3624 mm without ballast, 3810 mm with ballast |
| Width: | 1925 mm without ballast, 1925 mm with ballast |
| Height: | 2370 mm to top of protective structure<br>2320 mm to exhaust pipe's mouth |
| Ground clearance: | 420 mm below front axle |

### Tractor mass

| | | | without driver kg | with driver kg |
|---|---|---|---|---|
| Without ballast: | Mass | front | 1125 | 1135 |
| | | rear | 1520 | 1595 |
| | | total | 2645 | 2730 |
| With ballast: | Mass | front | 1625 | 1635 |
| | | rear | 2235 | 2310 |
| | | total | 3860 | 3945 |

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## Ballast

| | | |
|---|---|---|
| Front: | 8 weights, total | 288 kg |
| | water in the tyres | 177 kg |
| Rear: | 2 weights per wheel, total | 240 kg |
| | water in the tyres | 510 kg |

## Tyres and track widths specifications

| | Front | Rear |
|---|---|---|
| Tyres: | MICHELIN BIB'X | MICHELIN BIB'X |
| dimensions | 12.4 R 24 | 16.9 R 30 |
| type | radial | radial |
| ply rating/load index | -/119 A8 | -/137 A8 |
| maximum load | 1360 kg | 2300 kg |
| inflation pressure | 160 kPa | 160 kPa |
| radius index | 540 mm | 695 mm |
| Chosen track width: | 1501 mm | 1500 mm |
| Technically permissible axle load: | 1635 kg | 3400 kg |
| Technically permissible total weight: | 3950 kg | |

## Oils and lubrication

Capacity and change interval:

| | Capacity dm³ | Oil change h | Filter change h |
|---|---|---|---|
| engine | 6,7 | 250 | 250 |
| gear box including rear axle and hydraulic system | 33,0 | | 250 *) |
| front axle | 5,8 | | - |
| final drives at front | 2x1,4 | 1000 | - |
| final drives at rear | 2x2,2 | | - |
| steering system | 2,3 | | 500 *) |

*) only filter cleaning

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Specifications

| | Recommended | Used during test |
|---|---|---|
| Engine oil: | | |
| type | engine oil | MF SUPER UNIVERSALOIL |
| viscosity | | |
| winter | SAE 10W, 20W or 10W/30 | SAE 15W/40 |
| summer | SAE 20W or 20W/30 | |
| tropics | SAE 30, 20W/40 or 20W/50 | |
| for all conditions | SAE 15W/40 | |
| classification | API - CC | API - CC |
| Transmission oils: | | |
| Gearbox, rear axle hydraulic system | | |
| type | super tractor oil universal | MF SUPER UNIVERSALOIL |
| viscosity | SAE 15W/40 | SAE 15W/40 |
| classification | API - CD/API -GL4 | API - CD/API - GL4 |
| Final drives at front and at rear, front axle | | |
| type | gear oil | MOBILUBE GX85W/90-A |
| viscosity | SAE 85W/90 | SAE 85W/90 |
| classification | API - GL4 | API - GL4 |
| Steering oil: | | |
| Steering system | | |
| type | automatic transmission fluid | MOBIL ATF 200 |
| viscosity | - | - |
| classification | Type A, SUFFIX A | |

Grease: Multi purpose grease
number of lubrication points 13

Fuel

type: ARAL Diesel-fuel in conformity with DIN 51601
density: at 15°C at engine test 0,838 g/cm³
at p.t.o. test 0,822 g/cm³
at drawbar power test 0,837 g/cm³

REPAIRS None

REMARKS None

**PRÜFUNGS-ABTEILUNG**
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## COMPULSORY TESTS

### 1. MAIN POWER TAKE OFF PERFORMANCE ( 540 rev/min)

Date of tests: 21st October 1988
Location of tests: DLG-Testing Station Groß-Umstadt
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

| Power kW | Speed Engine rev/min | Speed P.t.o. rev/min | Fuel consumption hourly l/h | Fuel consumption hourly kg/h | Fuel consumption specific g/kWh | Specific energy kWh/l |
|---|---|---|---|---|---|---|
| **Maximum power** | | | | | | |
| 1.1 At 2-hour test | | | | | | |
| 40,5 | 2250 | 625 | 12,30 | 10,11 | 250 | 3,29 |
| 1.2 At rated speed | | | | | | |
| 40,5 | 2250 | 625 | 12,30 | 10,11 | 250 | 3,29 |
| 1.3 At standard p.t.o. speed | | | | | | |
| 37,5 | 1944 | 540 | 10,83 | 8,90 | 238 | 3,46 |
| 1.4 Part loads, the governor hand lever in the position corresponding to maximum power at full load (curve a) | | | | | | |
| 1.4.1 the torque corresponding to maximum power at rated speed | | | | | | |
| 40,5 | 2250 | 625 | 12,30 | 10,11 | 250 | 3,29 |
| 1.4.2 85% of the torque obtained in 1.4.1 | | | | | | |
| 35,2 | 2297 | 638 | 10,96 | 9,01 | 256 | 3,21 |
| 1.4.3 75% of the torque defined in 1.4.2 | | | | | | |
| 26,9 | 2340 | 650 | 9,16 | 7,53 | 280 | 2,93 |
| 1.4.4 50% of the torque defined in 1.4.2 | | | | | | |
| 18,6 | 2432 | 676 | 7,49 | 6,16 | 331 | 2,48 |
| 1.4.5 25% of the torque defined in 1.4.2 | | | | | | |
| 9,5 | 2480 | 689 | 5,51 | 4,53 | 478 | 1,72 |
| 1.4.6 unloaded | | | | | | |
| - | 2527 | 702 | 3,55 | 2,92 | - | - |

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| Power kW | Speed Engine rev/min | Speed P.t.o. rev/min | Fuel consumption hourly l/h | Fuel consumption hourly kg/h | Fuel consumption specific g/kWh | Specific energy kWh/l |
|---|---|---|---|---|---|---|
| **1.5 Part loads, the governor hand lever in the position corresponding to the standard p.t.o. speed at full load (curve b)** | | | | | | |
| 1.5.1 the torque corresponding to maximum power | | | | | | |
| 37,5 | 1944 | 540 | 10,83 | 8,90 | 238 | 3,46 |
| 1.5.2 85% of the torque obtained in 1.5.1 | | | | | | |
| 32,6 | 1993 | 554 | 9,67 | 7,95 | 243 | 3,38 |
| 1.5.3 75% of the torque defined in 1.5.2 | | | | | | |
| 25,2 | 2050 | 570 | 7,99 | 6,57 | 261 | 3,15 |
| 1.5.4 50% of the torque defined in 1.5.2 | | | | | | |
| 17,6 | 2143 | 595 | 6,51 | 5,35 | 305 | 2,70 |
| 1.5.5 25% of the torque defined in 1.5.2 | | | | | | |
| 8,9 | 2175 | 604 | 4,45 | 3,65 | 410 | 2,00 |
| 1.5.6 unloaded | | | | | | |
| - | 2210 | 614 | 2,88 | 2,37 | - | - |

No load maximum engine speed: 2527 rev/min
Equivalent flywheel torque at rated engine speed: 172 Nm
Maximum equivalent flywheel torque: 199 Nm at 1453 rev/min of the engine

Mean atmospheric conditions

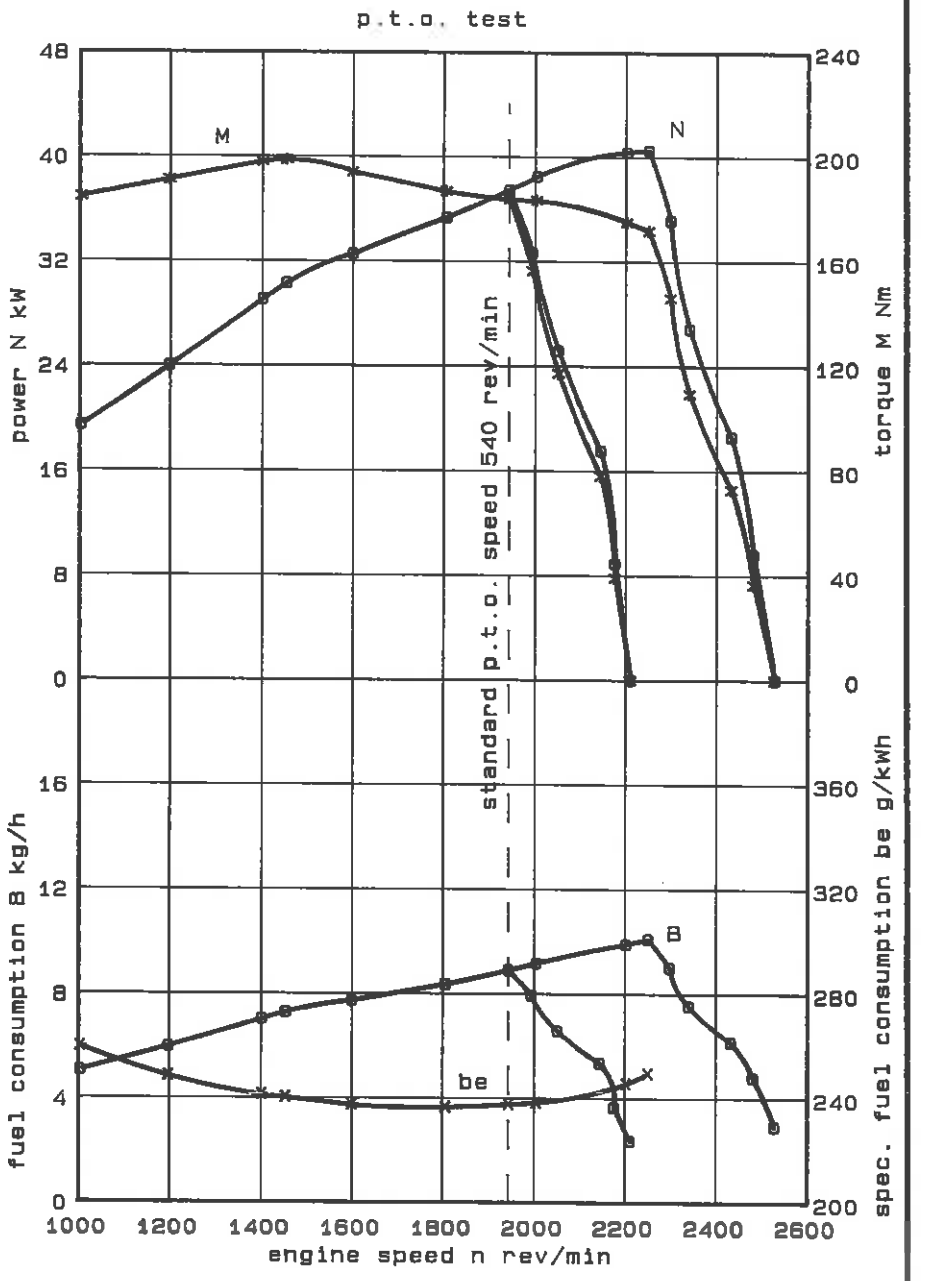
| | |
|---|---|
| temperature | 19 °C |
| pressure | 101 kPa |
| rel. humidity | 56 % |

Maximum temperatures

| | |
|---|---|
| coolant | 84 °C |
| oil | 106 °C |
| fuel | 18 °C |
| air intake | 20 °C |

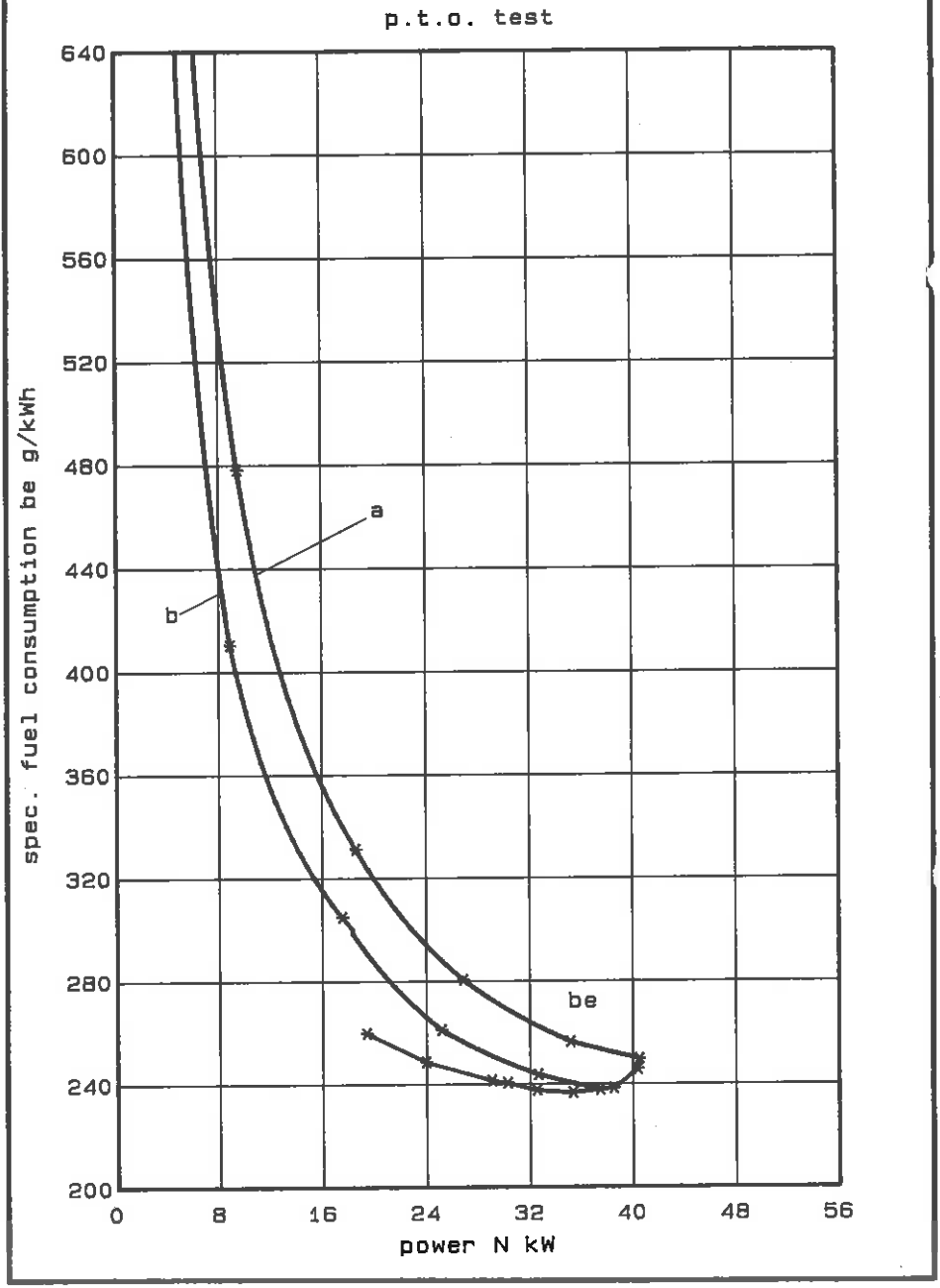
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**PRÜFUNGS-ABTEILUNG**
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## 2 HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 31st January 1989

### 2.1 Hydraulic power test

Sustained pressure with relief valve open 17,4 MPa
Pump delivery rate at minimum pressure 37,6 l/min

| | Hydraulic power kW | Flow rate l/min | Pressure MPa | Oil temperature °C |
|---|---|---|---|---|
| At 90% of the actual relief valve setting | 7,9 | 30,2 | 15,7 | 39 +) |
| At max. power | 9,0 | 35,9 | 15,1 | 39 +) |

Tapping point used for test: At rear of tractor

+) Oil temperature in suction line of hydraulic pump more than 65°C

### 2.2 Power lift test

| | At the hitch point | On the frame |
|---|---|---|
| Height of lower hitch points above ground in down position | 200 mm | 200 mm |
| Vertical movement without lifting force | 673 mm | 800 mm |
| Vertical movement with lifting force | 645 mm | 740 mm |
| Max. corrected force exerted through full range | 14,6 kN | 13,5 kN |
| Corresponding pressure | 15,1 MPa | 15,1 MPa |
| Moment about rear axle | - | 20,9 kNm |
| Max. tilt angle of mast from vertical | - | 9,5° |

Lifting heights relative to horizontal lower links

| mm | -407 | -400 | -357 | -300 | -200 | -100 | 0 | +100 | +200 | +288 | +300 | +333 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

Lifting forces at hitch points, corrected to 15,1 MPa

| kN | | | 14,6 | 16,0 | 17,5 | 18,8 | 19,7 | 20,3 | 20,5 | 21,2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

Lifting forces at standard frame, corrected to 15,1 MPa

| kN | 13,5 | 13,7 | | 15,2 | 15,6 | 16,0 | 16,2 | 16,0 | 15,6 | | 14,7 | 14,5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

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## 3 DRAWBAR PERFORMANCE

Date of tests: 7th till 14th November 1988
Type of track: Concrete

| Gear | Driving speed km/h | Power kW | Drawbar pull kN | Engine speed rev/min | Slip of wheels % |
|---|---|---|---|---|---|
| **3.1 Maximum power in tested gears (unballasted tractor) height of drawbar above ground 490 mm** | | | | | |
| 3 L | 3,15 | 24,6 | 28,14 | 2300 | 14,9 |
| 1 M | 3,74 | 29,4 | 28,34 | 2275 | 15,0 |
| 4 L | 4,74 | 32,3 | 24,56 | 2250 | 11,0 |
| 2 M | 6,28 | 33,5 | 19,19 | 2246 | 7,9 |
| 3 M | 8,10 | 33,0 | 14,66 | 2254 | 5,8 |
| 1 H | 10,21 | 33,3 | 11,73 | 2254 | 4,6 |
| 4 M | 12,28 | 30,4 | 8,92 | 2254 | 3,3 |
| **3.2 Maximum power in tested gears (ballasted tractor) height of drawbar above ground 470 mm** | | | | | |
| 1 L | 1,63 | 17,6 | 38,80 | 2387 | 15,0 |
| 2 L | 2,46 | 26,6 | 38,90 | 2293 | 15,1 |
| 3 L | 3,17 | 32,4 | 36,85 | 2254 | 11,7 |
| 1 M | 3,95 | 33,6 | 30,58 | 2254 | 8,3 |
| 4 L | 4,94 | 33,8 | 24,66 | 2246 | 6,0 |
| 2 M | 6,47 | 33,3 | 18,54 | 2254 | 4,3 |
| 3 M | 8,22 | 32,8 | 14,35 | 2246 | 3,2 |
| 1 H | 10,36 | 31,7 | 11,01 | 2250 | 2,3 |
| **3.3.1 Five-hour-test at 75% of pull at maximum power in 2 M gear** | | | | | |
| 2 M | 6,73 | 25,9 | 13,88 | 2304 | 3,0 |
| **3.3.2 Five-hour-test at pull corresponding to 15% wheel slip in test 3.2** | | | | | |
| 2 L | 2,32 | 25,1 | 38,96 | 2279 | - |

Total oil consumption during ten hours duration of tests 3.3.1 and 3.3.2 : 14 g/h

PRÜFUNGS-ABTEILUNG

Test No. 88-81

Tyre size front: 12.4 R 24
rear: 16.9 R 30

| Specific fuel consumption g/kWh | Specific energy kWh/l | Temperatures Fuel °C | Coolant °C | Engine-oil °C | Atmospheric conditions Tempe-rature °C | Relative humidity % | Pressure kPa |
|---|---|---|---|---|---|---|---|
| tyre inflation pressure: 80 kPa at front and at rear | | | | | | | |
| 345 | 2,43 | 29 | 82 | 94 | 10 | 68 | 100,4 |
| 325 | 2,57 | 28 | 84 | 96 | 11 | 68 | 100,5 |
| 315 | 2,66 | 28 | 86 | 89 | 3 | 89 | 100,5 |
| 305 | 2,74 | 29 | 86 | 99 | 3 | 88 | 100,5 |
| 308 | 2,72 | 26 | 87 | 101 | 3 | 85 | 100,5 |
| 306 | 2,73 | 27 | 87 | 102 | 3 | 84 | 100,5 |
| 333 | 2,52 | 27 | 86 | 100 | 5 | 80 | 100,5 |
| tyre inflation pressure: 80 kPa at front and at rear | | | | | | | |
| 400 | 2,09 | 25 | 83 | 86 | 8 | 66 | 100,3 |
| 337 | 2,48 | 25 | 83 | 89 | 8 | 68 | 100,3 |
| 313 | 2,67 | 27 | 86 | 99 | 9 | 77 | 100,3 |
| 303 | 2,76 | 33 | 85 | 102 | 8 | 78 | 100,3 |
| 301 | 2,78 | 34 | 85 | 104 | 9 | 77 | 100,3 |
| 305 | 2,74 | 33 | 85 | 98 | 9 | 78 | 100,4 |
| 311 | 2,69 | 32 | 85 | 99 | 9 | 77 | 100,4 |
| 320 | 2,61 | 34 | 85 | 100 | 9 | 73 | 100,4 |
| 326 | 2,57 | 26 | 80 | 94 | 7 | 94 | 100,0 |
| - | - | 31 | 80 | 95 | 12 | 80 | 100,6 |

Test 3.3.2 was carried out with additional ballast of 552 kg
the figures not quoted are therefore irrelevant

## 4 TURNING AREA AND TURNING CIRCLE (front wheel drive disengaged)

Wheel equipment front: 12.4 R 24
rear: 16.9 R 30

Track of wheels front: 1501 mm
rear: 1500 mm

| | With brakes | | Without brakes | |
|---|---|---|---|---|
| | left-hand m | right-hand m | left-hand m | right-hand m |
| Radius of turning area | 3,95 | 3,93 | 4,55 | 4,53 |
| Radius of turning circle | 3,69 | 3,68 | 4,29 | 4,29 |

## 5 LOCATION OF CENTRE OF GRAVITY

| | |
|---|---|
| Height above ground | 828 mm |
| Distance forward from rear axle centre | 876 mm |
| Distance from tractor's median plane | 0 mm |

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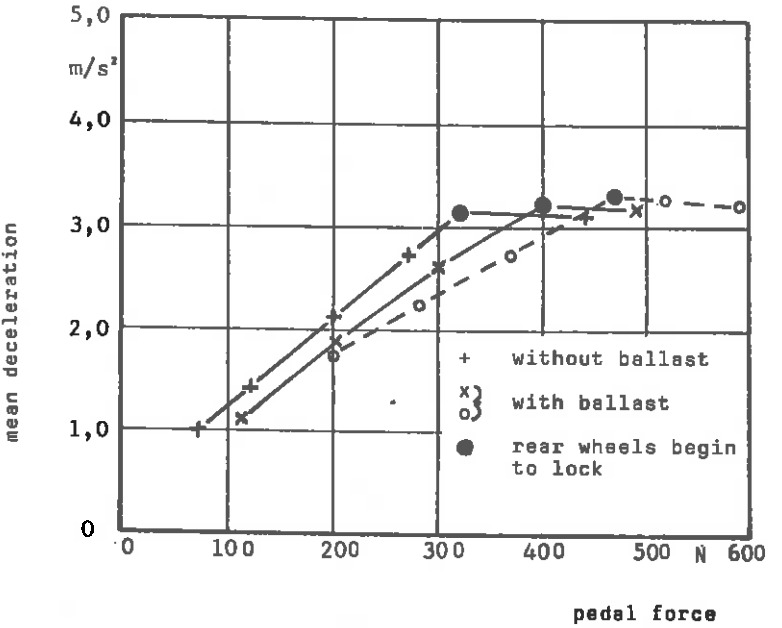
Test No. 88-81

## 6 BRAKING (Front wheel drive disengaged)

Date of tests: 8th and 9th November 1988

| | Tractor mass (with driver) front kg | rear kg | total kg | Speed before application of brakes km/h |
|---|---|---|---|---|
| Without ballast | 1135 | 1595 | 2730 | 31,7 |
| With ballast | 1635 | 2310 | 3945 | 31,1 |

### 6.1 Cold service braking device test
### 6.2 Fade test




No significant deviation of tractor from original course and no abnormal vibrations

Brakes-heating: Actuating of brake for 1 km with pedal force corresponding to 1 m/s²

### 6.3 Parking braking device test

| | Ballasted tractor on 18% - slope up | down |
|---|---|---|
| Braking device control force N | 160 | 160 |

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## 7 MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of test: 25th October 1988
Type of track: Concrete
Type of sound level meter: BRÜEL & KJAER model 2233

### Results of test

Gear: 4 H (Front wheel drive disengaged)
Travelling speed before acceleration: 23,8 km/h
Sound level: 86,5 dB(A)

## APPENDIX

### MEASUREMENT OF NOISE IN THE PROTECTIVE STRUCTURE

with 4-post frame LANDINI TS 19/2

Date of test: 27th October 1988
Type of track: Concrete
Type of sound level meter: BRÜEL & KJAER model 2233

| Gear | Drawbar pull kN | Travelling speed km/h | Sound level dB(A) |
|---|---|---|---|
| 1 L | 26,08 | 1,55 | 93,0 |
| 2 L | 26,90 | 2,45 | 93,5 |
| 3 L | 27,20 | 3,08 | 95,0 |
| 1 M | 27,23 | 3,79 | 96,0 |
| 4 L | 24,19 | 4,70 | 96,5 |
| 2 M +) | 19,22 | 6,27 | 96,0 |
| 2 M +) | light load | 6,89 | 92,0 |
| 3 M | 14,60 | 8,12 | 95,5 |
| 1 H | 11,75 | 10,19 | 95,0 |
| 4 M | 8,96 | 12,20 | 95,0 |
| 2 H | 6,36 | 16,36 | 94,5 |
| 4 H *) | light load | 31,70 | 94,0 |

+) The 2 M gear corresponds to the nominal travelling speed nearest to 7,5 km/h

*) Front wheel drive disengaged

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OPTIONAL TEST

## 8. ENGINE PERFORMANCE

Date of tests: 17th October 1988
Location of tests: DLG-Testing-Station Groß-Umstadt
Type of dynamometer: SCHENCK eddy-current-dynamometer W 150

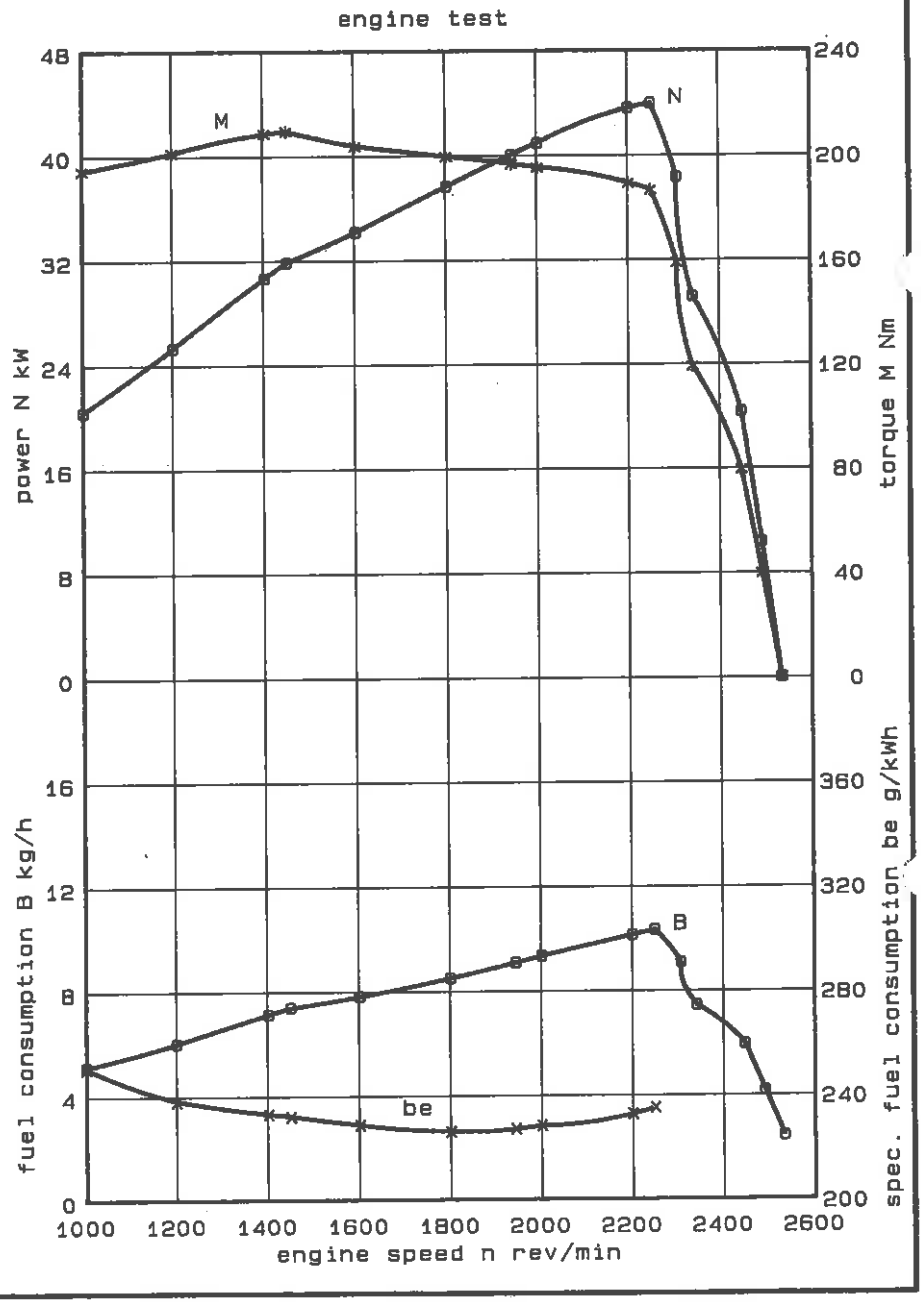
| | Power kW | Engine speed rev/min | Fuel consumption hourly l/h | Fuel consumption hourly kg/h | Fuel consumption specific g/kWh | Specific energy kWh/l |
|---|---|---|---|---|---|---|
| **Maximum power** | | | | | | |
| 8.1 At 2-hour test | 44,0 | 2250 | 12,57 | 10,34 | 235 | 3,50 |
| 8.2 At rated engine speed | 44,0 | 2250 | 12,57 | 10,34 | 235 | 3,50 |
| 8.3 At standard p.t.o. speed ( 540 rev/min) | 40,0 | 1944 | 11,06 | 9,09 | 227 | 3,62 |
| 8.4 Part loads | | | | | | |
| 8.4.1 the torque corresponding to maximum power at rated speed | 44,0 | 2250 | 12,57 | 10,34 | 235 | 3,50 |
| 8.4.2 85% of the torque obtained in 8.4.1 | 38,3 | 2307 | 11,05 | 9,08 | 237 | 3,47 |
| 8.4.3 75% of the torque obtained in 8.4.2 | 29,2 | 2341 | 9,06 | 7,44 | 255 | 3,22 |
| 8.4.4 50% of the torque obtained in 8.4.2 | 20,3 | 2447 | 7,25 | 5,96 | 293 | 2,81 |
| 8.4.5 25% of the torque obtained in 8.4.2 | 10,3 | 2491 | 5,06 | 4,16 | 403 | 2,04 |
| 8.4.6 unloaded | - | 2533 | 2,98 | 2,45 | - | - |

**Optimum fuel consumption: 217 g/kWh at 19,4 kW and 1238 rev/min**
**No load maximum engine speed: 2533 rev/min**
**Torque at rated engine speed: 187 Nm**
**Maximum torque: 210 Nm at 1451 rev/min of the engine**

| | | |
|---|---|---|
| Mean atmospheric conditions | temperature | 20 °C |
| | pressure | 100 kPa |
| | relative humidity | 60 % |
| Maximum temperatures | coolant | 85 °C |
| | oil | 106 °C |
| | fuel | 20 °C |
| | engine air intake | 21 °C |

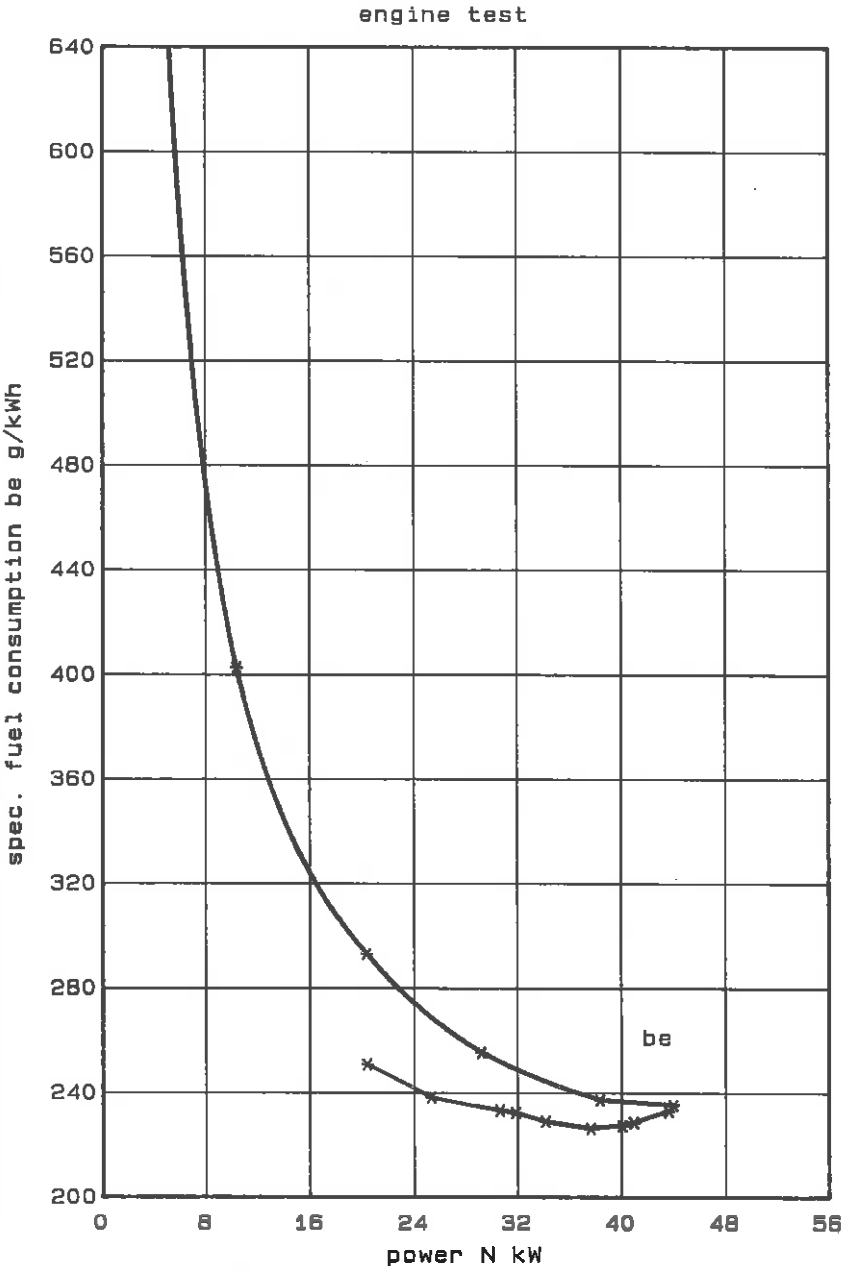
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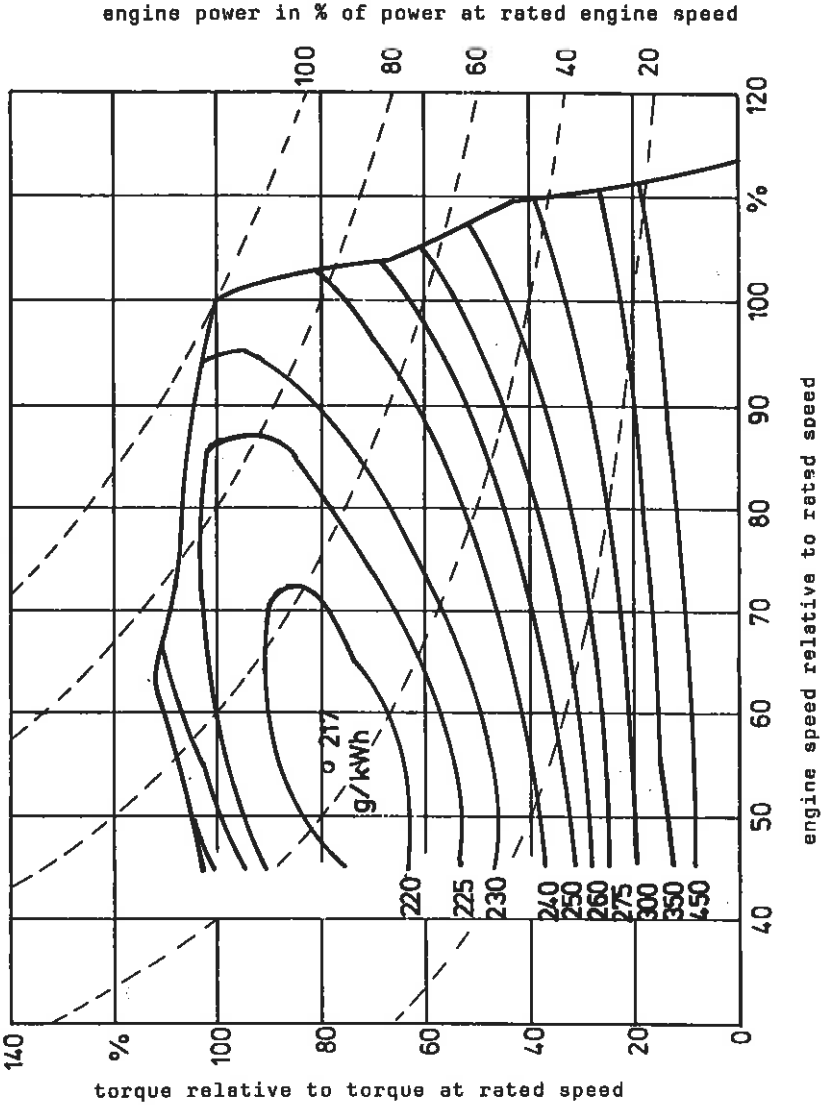
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