ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

# Report on test in accordance with the OECD Standard Code for the Official Testing of Agricultural Tractor Performance



**LAMBORGHINI 564-60 VDT "4WD"** OECD No. **1501/2** Full Code
**SAME ARGON 60 VDT "4WD"** OECD No. **1501/3** Full Code
**HÜRLIMANN 306 VDT "4WD"** OECD No. **1501/1** Full Code

Four-wheel drive agricultural tractors

Manufactured by: S+L+H S.p.A
V.le F. Cassani 15
24047 Treviglio BG
Italy

Date of OECD approval: 14 December 1993
Period of test: July 1993

ISMA Via Milano 43 24047 Treviglio BG Italy
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The Lamborghini 564-60 VDT (4WD), Same Argon 60 VDT (4WD), and Hürlimann 306 VDT (4WD) tractors are technically identical in all main respects except with regard to model designation, colour and side bonnets design. All tests were carried out on the Lamborghini 564-60 VDT.

All stated dimensions and tests refer to tyre size 11.2 R 24 114 (A8) at front and 16.9 R 30 137 (A8) at rear, as well as to track widths 1340 mm at front and 1300 mm at rear.

**Tractor manufacturer**

| | |
|---|---|
| - Name: | S+L+H S.p.A.; |
| - Address: | V.le F. Cassani 15, 24047 Treviglio BG, Italy; |
| - Location of tractor assembly: | Treviglio BG, Italy; |
| - Submitted for test by: | the manufacturer; |
| - Selected by: | the manufacturer with the agreement of ISMA; |
| - Place of running in: | Treviglio BG, Italy; |
| - Duration of running in: | 50 hours, |
| - Location of test: | ISMA, Via Milano 43, Treviglio BG, Italy. |

## SPECIFICATION OF TRACTOR

### TRACTOR

| | |
|---|---|
| - Make: | Lamborghini; |
| - Model: | 564-60 VDT; |
| - Type: | wheeled tractor, unit construction, all wheels drive tractor; |
| - Number of driving wheels: | 4; |
| - Serial number: | 1015; |
| - First serial number: | 1001. |

### ENGINE

| | |
|---|---|
| - Make: | S+L+H; |
| - Model: | 1000.3 A4; |
| - Type: | air cooled 4-stroke diesel engine, direct injection, naturally aspirated; |
| - Serial number: | 1038. |

Cylinders

| | |
|---|---|
| - Number and disposition: | 3, vertical, in-line; |
| - Bore x stroke: | 105 x 115.5 mm; |
| - Capacity: | 3000 cm3; |
| - Compression ratio: | 17:1; |
| - Arrangement of valves: | overhead; |
| - Cylinder liners: | withouth liners. |

Supercharging: none.

Fuel system

- Fuel feed system: AC corone fuel feed pump;
- Make, model and type of fuel filter: FIAMM FNA 166/20;
- Capacity of fuel tank: 57 $dm^3$;
- Make, model and type of injection pump: BOSCH PFR 1K 90A 517, immersed pump, one per cylinder, without serial number, in line injection pump;
- Manufacturer's production setting of injection pump:
  . flow rate: 58 ± 2 $mm^3$/stroke at rated speed and full load corresponding 12.48 $dm^3$/h;
  . timing: 16 ± 0.5° before TDC;
- Make, model and type of injectors: BOSCH DLLA 150 S 925 multihole injection nozzles;
- Injection pressure: 18 ± 1 MPa.

Governor

- Make: S+L+H;
- Model: 085.1650.4;
- Type: mechanical;
- Governor range of engine speed: from 650 to 2565 rev/min;
- Rated engine speed: 2350 rev/min.

Air cleaner

- Main filter
  . make: DONALDSON;
  . model: FKG 06-5402;
  . type: dry paper element filter;
  . location: front of engine;
  . air intake location: below bonnet;
- Maintenance indicator: with the warning lamp on the dashboard.

Lubrication system

- Type of feed pump: forced feed from gear pump;
- Type of filter: FIAMM FT 4803 IN;
- Oil specifications: see page 20.

Cooling system

| | |
|---|---|
| - Type and detail: | air cooling with axial blower; |
| - Specification of fan: | propeller fan driven by engine shaft; |
| - Number of fan blades: | 13; |
| - Fan diameter: | 220 mm; |
| - Type of temperature control: | none. |

Starting system

| | |
|---|---|
| - Make: | BOSCH; |
| - Model: | JF 12 V; |
| - Type: | electromagnetic engagement; |
| - Starter motor power rating: | 2.4 kW; |
| - Safety device: | electrical lockout on clutch and PTO controls; |
| - Starting system for low temperatures: | none. |

Electrical equipment

| | |
|---|---|
| - Voltage: | 12 V; |
| - Generator | |
| . make: | BOSCH; |
| . model: | K1 14V 55A 23; |
| . type: | alternator: |
| . power: | 14 V, 55 A 770 W; |
| - Battery: | 1 lead acid; |
| . capacity: | 100 Ah at 20 hours rating. |

Exhaust system

| | |
|---|---|
| - Make: | S+L+H; |
| - Model: | DGM SA 1130; |
| - Type: | one reflection absorption chamber; |
| - Location: | external, on the left hand side of engine, vertical position; |
| - Height of outlet above ground: | 2420 mm. |

## TRANSMISSION

Clutch (utilized only for travelling of tractor)

| | |
|---|---|
| - Make: | S+L+H; |
| - Model: | 592.23; |
| - Type: | single disk dry clutch; |
| - Number of plates: | 1; |
| - Plates diameter: | 280 mm; |
| - Control system: | mechanical operated by pedal. |

Gear box

| | |
|---|---|
| - Make: | own make; |
| - Model: | 592.31; |
| - Type: | mechanical syncromesh speed change gear; |
| - Arrangement: | four speeds forward, with three ranges of speeds, and one reverse group; |
| - Number of speeds: | 12 forward and 12 reverse; |
| - Available options: | four speeds forward, with three ranges of speeds, minireductor and one reverse group |
| - number of speeds: | 24 forward and 12 reverse; or: four speeds forward, with two ranges of speeds, minireductor and one reverse group |
| - number of speeds: | 16 forward and 8 reverse; |

Rear axle and final drives

| | |
|---|---|
| - Make: | own make; |
| - Model: | 592.44; |
| - Type: | bevel gear differential and epicyclic final drive. |

Rear differential lock

| | |
|---|---|
| - Make: | own make; |
| - Model: | 592.47; |
| - Type: | mechanical; |
| - Control system: | engaged or disengaged by pedal. |

Front axle and final drives

| | |
|---|---|
| - Make: | own make; |
| - Model: | 592.43; |
| - Type: | original S+L+H system with central shaft, bevel gear drive, differential and epicyclic final drives. |

Front differential lock

- Make: own make;
- Model: 592.46;
- Type: mechanical;
- Control system: engaged or disengaged by pedal.

Total ratios and speeds

| Gear | Group | Number of engine revolutions for one revolution of the driving wheels | | Nominal travelling speed at rated engine speed of 2350 rev/min (*), km/h | |
|---|---|---|---|---|---|
| | | Forward | Reverse | Forward | Reverse |
| 1 | S | 2093.37 | 2206.23 | 0.29 | 0.28 |
| 2 | S | 1320.18 | 1391.46 | 0.47 | 0.44 |
| 3 | S | 832.84 | 877.89 | 0.74 | 0.70 |
| 4 | S | 525.94 | 554.40 | 1.17 | 1.11 |
| 1 | N | 331.41 | 349.23 | 1.86 | 1.76 |
| 2 | N | 208.89 | 220.28 | 2.95 | 2.80 |
| 3 | N | 131.92 | 139.10 | 4.67 | 4.43 |
| 4 | N | 83.16 | 87.62 | 7.340 | 7.03 |
| 1 | F | 60.14 | 63.36 | 10.24 | 9.72 |
| 2 | F | 37.87 | 40.10 | 16.26 | 15.36 |
| 3 | F | 23.76 | 25.25 | 25.91 | 24.39 |
| 4 | F | 15.10 | 15.84 | 40.78 | 38.87 |

*S =Slow; N =Normal; F =Fast.*

*(*) Calculated with a tyre dynamic radius index of 695 mm (ISO 4251/1-1984).*
*Number of revolutions of front wheels for one revolution of rear wheels: 1.3830*

POWER TAKE-OFF

Power take-off proportional to engine speed

- Type: independent, at rear of tractor, in tractor's median plane, engaged or disengaged by hand lever, driven by single disk dry clutch independent of travel clutch; ISO 500-1979;
- Number of shafts: 1;
- Method of changing power take-off shaft ends: none;
- Method of changing speed: by hand lever.

1) 540 rev/min

| | |
|---|---|
| - Category (ISO 500-1979): | 1 (35 mm, 6 splines); |
| - PTO speed at rated engine speed: | 621 rev/min; |
| - Engine speed at standard PTO speed: | 2044 rev/min; |
| - Ratio of rotation speeds (engine speed/PTO speed): | 3.7857; |
| - Power restriction and maximum torque: | power and torque of the engine. |

2) 750 rev/min (optional, fitted on tested tractor)

| | |
|---|---|
| - Category (ISO 500-1979): | 2 (35 mm, 6 splines); |
| - PTO speed at rated engine speed: | 752 rev/min; |
| - Engine speed at standard PTO speed: | 2344 rev/min; |
| - Ratio of rotation speeds (engine speed/PTO speed): | 3.125. |
| - Power restriction and maximum torque: | power and torque of the engine. |

3) 1000 rev/min

| | |
|---|---|
| - Category (ISO 500-1979): | 2 (35 mm, 6 splines); |
| - PTO speed at rated engine speed: | 1022 rev/min; |
| - Engine speed at standard PTO speed: | 2300 rev/min; |
| - Ratio of rotation speeds (engine speed/PTO speed): | 2.300. |
| - Power restriction and maximum torque: | power and torque of the engine. |

| | | |
|---|---|---|
| Height above ground: | 690 | mm |
| Distance from the median plane of the tractor: | 0 | mm |
| Distance behind rear axle or forward from front axle: | 440 | mm |
| Direction of rotation (viewed facing driving end): | clockwise | |

Power take-off proportional to ground speed

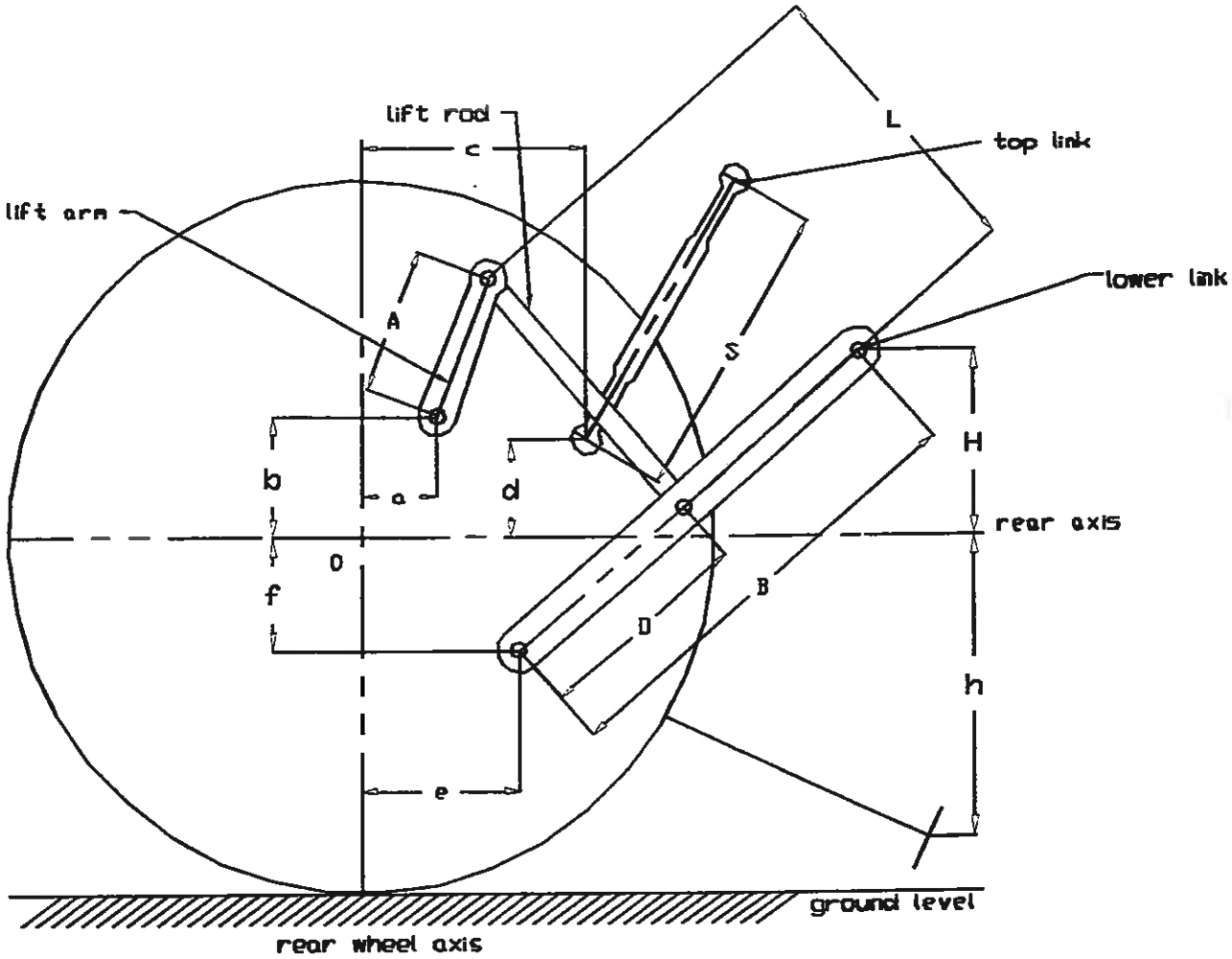
| | |
|---|---|
| - Speed of shaft: | 540 rev/min; |
| - Travelling distance for one revolution of power take-off shaft: | 0.29 m; |
| - Number of power take-off shaft revolutions for one revolution of rear driving wheels: | 14.74. |

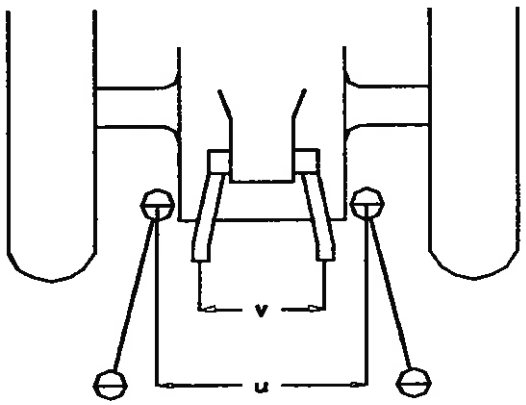
POWER LIFT

| | |
|---|---|
| - Make: | S+L+H; |
| - Model: | 592.39; |
| - Type: | load sensing; |
| - Type of hydraulic system: | open centre system; |
| - Type and number of cylinders: | 1 internal single acting; |
| - Type of lock for transport: | mechanical, with screwed tie rods that lock the lower links; |
| - Relief valve pressure setting: | 18.0 ± 0.5 MPa; |
| - Opening pressure of anti-shock valve: | 21.0 ± 0.5 MPa; |
| - Lift pump | |
| . make: | BOSCH A 510 241 101; |
| . type: | hydraulic rotary pump, driven by engine shaft; |
| - Transmission between pump and engine: | mechanical; |
| - Type and number of filters: | 1, replaceable paper cartridge; |
| - Oil capacity: | 41 $dm^3$; |
| - Site of oil reservoir: | gear box; |
| - Position, type and no. of additional oil plugs: | 4 ways distributor at rear of tractor; |
| - Maximum volume of oil available to external cylinders: | 10 $dm^3$. |
| - Recommended oil: | see page 20. |

Three-point linkage

| | |
|---|---|
| - Category (ISO 730/1-1990): | 2; |
| - Category adapter (ISO 730/1-1990): | to category 1. |


lift rod
c
L
top link
lift arm
lower link
A
S
H
b
a
d
rear axis
0
f
B
D
h
e
ground level
rear wheel axis


v
u

POWER LIFT (continued)

Dimensions of linkage geometry (when connected to the standard frame)

| | | Dimension or range mm | Settings used in test mm |
|---|---|---|---|
| Length of lift arms | (A) | 250 | 250 |
| Length of lower links | (B) | 774 | 774 |
| Distance of lift arm pivot point from rear wheel axis (behind) | | | |
| - horizontally | (a) | 177 | 177 |
| - vertically | (b) | 315 | 315 |
| Horizontal distance between the 2 lower link points | (u) | 340 | 340 |
| Horizontal distance between the 2 lift arm end points | (v) | 450 | 450 |
| Length of upper link | (S) | from 471 to 740 | 556 |
| Distance of upper link pivot point from rear wheel axis | | | |
| - horizontally | (c) | 407-397-407 | 407 |
| - vertically | (d) | 260-295-335 | 260 |
| Distance of lower link pivot point from rear wheel axis | | | |
| - horizontally | (e) | 183 | 183 |
| - vertically | (f) | 154 | 154 |
| Distance of lower link pivot point to lift rod pivot points on lower links | (D) | 400 | 400 |
| Length of lift rods | (L) | from 505 to 655 | 610 |
| Height of lower hitch points relative to the rear wheel axis | | | |
| - in Low position | (h) | from 267 to 593 | 495 |
| - in High position | (H) | from 95 to 347 | 179 |
| Height above ground of lower hitch points when locked in transport position (*) | | | 874 |

(*) *Assuming the dynamic radius index = 695 mm (ISO 4251/1-1984)*

## SWINGING DRAWBAR

Optional, not fitted on tested tractor

| | |
|---|---|
| - Type: | 9.58931.35.0; |
| - Height above ground (tyre size: 16.9R30): | 435 mm; |
| - Type of adjustment: | reversible; |
| - Distance of hitch point from rear wheel axis | |
| . horizontally: | 846 mm; |
| - Distance of hitch point from power take-off shaft end | |
| . vertically: | 240 mm below; |
| . horizontally: | 410 mm behind; |
| - Lateral adjustment (centre of clevis) | |
| . right hand: | 250 mm; |
| . left hand: | 250 mm; |
| - Distance of pivot point from rear wheel axis | |
| . horizontally: | 60 mm forward; |
| - Diameter of drawbar pin hole: | 33 mm; |
| - Maximum vertical permissible load: | not specified. |

## HOLED DRAWBAR

| | |
|---|---|
| - Number of holes: | 9; |
| - Distance between holes: | 55 mm; |
| - Hole diameter: | 22 mm; |
| - Thickness x width of the drawbar: | 30 x 80 mm; |
| - Height above ground, (tyre size: 16.9R30) | |
| . min: | 175 mm; |
| . max: | 915 mm; |
| - Horizontal distance behind power take-off shaft end: | 570 mm; |
| - Diameter of the pinhole: | 28 mm. |

## TRAILER HITCH

| | |
|---|---|
| - Type: | SAME DGM-GA 1189/C; |
| - Hole diameter: | 28 mm; |
| - Height above ground | |
| . min: | 325 mm; |
| . max: | 905 mm; |
| - Distance of hitch point from rear wheel axis | |
| . horizontally: | 500 mm; |
| - Distance of hitch point from power take-off shaft end | |
| . vertically: | 220 mm below, 205 mm above; |
| . horizontally: | 115 mm; |
| - Maximum vertical permissible load: | 14.7 kN. |

## STEERING

| | |
|---|---|
| - Specification: | hydrostatic steering with BOSCH hydraulic gear pump, one double acting ram acting directly on front axle. |
| - Make: | DANFOSS; |
| - Model: | ORBITROL OSPC 80 OR; |
| - Type: | hydrostatic; |
| - Working pressure: | 15 MPa; |
| - Recommended oil: | see page 20. |

## BRAKES

Service brake

| | |
|---|---|
| - Make: | S+L+H; |
| - Model: | 592.54; |
| - Type: | oil bath disc, total 4 discs, 2 at front (1 per wheel) and 2 at rear (1 per wheel), all mounted before the final drive; |
| . front disc diameter: | 178 mm; |
| . rear disc diameter: | 224 mm, |
| . material: | FRENDO HDT 303 lining material; |
| - Method of operation: | hydraulically actuated with 2 pedals; |
| - Trailer braking take-off: | none. |

Parking brake

| | |
|---|---|
| - Type: | fully independent of service brake, 2 oil bath disc mounted on the pinion shaft in the gear box, FRENDO HDT 303 lining material; |
| - Method of operation: | mechanical by hand lever. |

Steering brake

| | |
|---|---|
| - Metod of operation: | divided pedal of service brake, for normal use locked together. |

STEERING WHEELS

| | |
|---|---|
| - Number: | 2; |
| - Location: | at front; |
| - Track widths | |
| . min: | 1340 mm; |
| . max: | 1540 mm; |
| - Adjustment: | changing the position of the rims with respect to the disc. |

DRIVING WHEELS

| | |
|---|---|
| - Number: | 4; |
| - Location: | two at front and two at rear; |
| - Rear track widths | |
| . min: | 1300 mm; |
| . max: | 1400 mm; |
| - Adjustment: | changing the position of the rims with respect to the disc. |

WHEELBASE: 2056 mm.

## PROTECTIVE STRUCTURE

Specifications

| | |
|---|---|
| - OECD approval Nos.: | CSD 1378/18 for the LAMBORGHINI 564-60 VDT (4WD) tractor,<br>CSD 1378/27 for the SAME ARGON 60 VDT (4WD) tractor,<br>CSD 1378/9 for the HÜRLIMANN 306 VDT (4WD) tractor; |
| - Date of approval: | 26 May 1993; |
| - Location and country of test of protective structure: | Istituto di Ingegneria Agraria, Università degli Studi di Milano, Italy; |
| - Reference mass and wheelbase used for calculating impact energies and crushing forces: | 2400 kg and 2056 mm; |
| - Make: | S+L+H; |
| - Model: | T 63; |
| - Type: | frame; |
| - Manufacturer's name: | S+L+H S.p.A. |
| . address: | V.le F. Cassani 15, 24047 Treviglio BG, Italy; |
| - Protective device: | frame. |

## DRIVER'S SEAT

| | |
|---|---|
| - Make: | KAB; |
| - Model: | XH2; |
| - Type: | upholstered seat with back rest; |
| - Type of suspension: | adjustable spring; |
| - Type of damping: | shock absorber; |
| - Range of adjustment | |
| . longitudinal: | 150 mm; |
| . vertical: | 60 mm. |

PASSENGER'S SEAT : none.

## LIGHTING

Lighting system in accordance with EEC 78/933
( all data referred to all models unless otherwise indicated)

| | Height of centre above ground | Size | Distance from outside edge of tractor to centre at 1400 mm track width |
|---|---|---|---|
| | mm | mm | mm |
| Headligths | 1125<br>1075 (1) | 140 x 85 | 800 |
| Front parking lights | 1435 | 110 x 35 | 400 |
| Front direction indicators | 1435 | 110 x 35 | 365 |
| Rear parking lights | 1465 | 50 x 60 | 270 |
| Rear direction indicators | 1465 | 50 x 60 | 220 |
| Brake lights | 1465 | 50 x 60 | 320 |
| Reflectors | 1035 | dia 80 | 260 |

(1) *Same Argon 60 VDT and Hürlimann 306 VDT.*

# TEST CONDITIONS

## OVERALL DIMENSIONS

| | Length | Width | | Height at top of | |
|---|---|---|---|---|---|
| | | min | max | exaust sil. | protect. struct. |
| | mm | mm | mm | mm | mm |
| Unballasted | 3506 | 1605 | 1820 | 2370 | 2270 |
| Ballasted | 3696 | 1605 | 2370 | 2370 | 2270 |

- Ground clearance: 385 mm;
- Clearance-limiting part: front axle.

TRACTOR MASS (with full fuel tanks, frame and no water in tyres)

| | Front kg | Rear kg | Total kg |
|---|---|---|---|
| Without driver | | | |
| Unballasted | 1015 | 1335 | 2350 |
| Ballasted | 1165 | 1525 | 2690 |
| With driver | | | |
| Unballasted | 1040 | 1385 | 2425 |
| Ballasted | 1190 | 1575 | 2765 |

BALLAST

| | Weights no. | Total weight kg | Water kg |
|---|---|---|---|
| Front | 4 | 140 | - |
| Rear | 2 +2 | 200 | - |
| Additional | - | - | - |

TYRES AND TRACK WIDTH SPECIFICATIONS

| | | Front | Rear |
|---|---|---|---|
| - Tyres | | | |
| . dimensions | | 11.2R20 | 14.9R28 |
| . ply rating | | 111 A8 | 128 A8 |
| . type | | radial | radial |
| . maximum load (tyre manufacturer's) | daN | 1069 | 1765 |
| . maximum load (tractor manufact.'s) | daN | 588 | 1324 |
| . inflation pressure (tyre manufact.'s) | kPa | 160 | 160 |
| . dynamic radius index | mm | 465 | 640 |
| - Chosen track width | mm | 1340 | 1300 |
| - Other tyres available | | 9.5R20<br>8.3R24 | 13.6R28<br>12.4R32 |

## OILS AND LUBRICATION

Capacity and change interval

| | Capacity $dm^3$ | Oil change h | Filter change h |
|---|---|---|---|
| Engine | 7.7 | 150 | 300 |
| Gear box | 41.0 | 1200 | 2400 (*) |
| Front axle | 6.0 | 1200 | - |
| Final drives (front) | 3.0 | 1200 | - |
| Rear axle and final drives | in common with gear box | | |
| Hydraulic system | in common with gear box | | |
| Other (steering, etc.) | in common with gear box | | |

(*) *Or when the warning lamp is lighted*

## FUEL AND LUBRICANTS RECCOMENDED AND USED IN TESTS

Fuel
- Type: AGIP DIESEL, DIN 51601; (in accordance with the national standard)
- Specific gravity at 15 °C: 0.838 g/$cm^3$.

Engine oil
- Type: AKROS MOTOR OIL 30 W;
- Viscosity: 12.50 cSt;
- Classification: API CE, MIL-L-2104 E.

Transmission (front and rear axle, final drives and gear box), hydraulic system and steering oil
- Type: AKROS MULTI;
- Viscosity: 11.50 cSt;
- Viscosity index: 95;
- Classification: API GL 4.

Grease
- Type: GREASE 30;
- Number of lubrication points: 9.

# TEST RESULTS

## COMPULSORY TESTS RESULTS

### 1. MAIN POWER TAKE-OFF PERFORMANCE

- Date and location of test: 12 July 1993, ISMA, Treviglio BG, Italy

- Type of dynamometer: ZÖLLNER 350 AC

| Power | Speed | | Fuel consumption | | | Specific energy |
|---|---|---|---|---|---|---|
| | Engine | PTO | Hourly | | Specific | |
| kW | rev/min | rev/min | l/h | kg/h | g/kWh | kWh/l |
| 1.1 MAXIMUM POWER - 2 HOUR TEST | | | | | | |
| 42.5 | 2355 | 1024 | 12.48 | 10.46 | 246 | 3.40 |
| 1.2 POWER AT RATED ENGINE SPEED | | | | | | |
| 42.5 | 2355 | 1024 | 12.48 | 10.46 | 246 | 3.40 |
| 1.3 STANDARD POWER TAKE-OFF SPEED (1000 ± 25 rev/min) | | | | | | |
| 42.0 | 2300 | 1000 | 12.23 | 10.25 | 244 | 3.43 |
| 1.4 PART LOADS | | | | | | |
| 1.4.1 The torque corresponding to maximum power at rated engine speed | | | | | | |
| 42.5 | 2355 | 1024 | 12.48 | 10.46 | 246 | 3.40 |
| 1.4.2 85% of torque obtained in 1.4.1 | | | | | | |
| 37.3 | 2446 | 1063 | 10.75 | 9.01 | 242 | 3.47 |
| 1.4.3 75% of torque defined in 1.4.2 | | | | | | |
| 28.5 | 2492 | 1083 | 8.75 | 7.33 | 257 | 3.26 |
| 1.4.4 50% of torque defined in 1.4.2 | | | | | | |
| 19.3 | 2521 | 1096 | 6.85 | 5.74 | 297 | 2.82 |
| 1.4.5 25% of torque defined in 1.4.2 | | | | | | |
| 9.7 | 2548 | 1108 | 4.88 | 4.09 | 422 | 1.99 |
| 1.4.6 unloaded | | | | | | |
| 0 | 2565 | 1115 | 3.08 | 2.58 | - | - |

| Power | Speed | | Fuel consumption | | | Specific energy |
|---|---|---|---|---|---|---|
| | Engine | PTO | Hourly | | Specific | |
| kW | rev/min | rev/min | l/h | kg/h | g/kWh | kWh/l |
| 1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED (1000 rev/min) | | | | | | |
| 1.5.1 The torque corresponding to maximum power available | | | | | | |
| 42.0 | 2300 | 1000 | 12.23 | 10.25 | 244 | 3.43 |
| 1.5.2 85% of torque obtained in 1.5.1 | | | | | | |
| 37.1 | 2404 | 1045 | 10.75 | 9.01 | 243 | 3.45 |
| 1.5.3 75% of torque defined in 1.5.2 | | | | | | |
| 28.4 | 2447 | 1064 | 8.69 | 7.28 | 256 | 3.27 |
| 1.5.4 50% of torque defined in 1.5.2 | | | | | | |
| 19.1 | 2477 | 1077 | 6.71 | 5.62 | 294 | 2.85 |
| 1.5.5 25% of torque defined in 1.5.2 | | | | | | |
| 9.6 | 2502 | 1088 | 4.77 | 4.00 | 417 | 2.01 |
| 1.5.6 unloaded | | | | | | |
| 0 | 2513 | 1093 | 3.07 | 2.57 | - | - |

- No load maximum engine speed: 2565 rev/min;
- Torque (1) at maximum power at rated engine speed: 17.26 daNm;
- Maximum torque (1) (engine speed: 1544 rev/min): 18.52 daNm.

- Mean atmospheric conditions

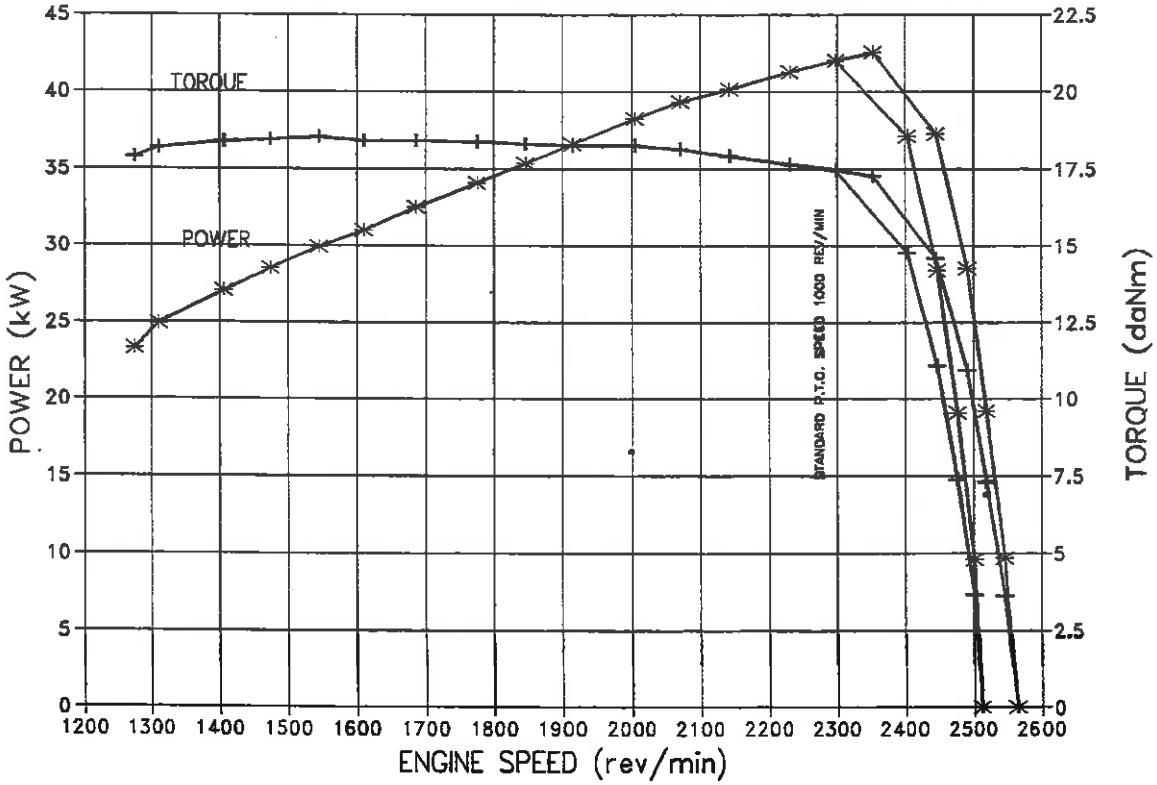
. temperature: 24 °C
. pressure: 98.6 kPa
. relative humidity: 72 %

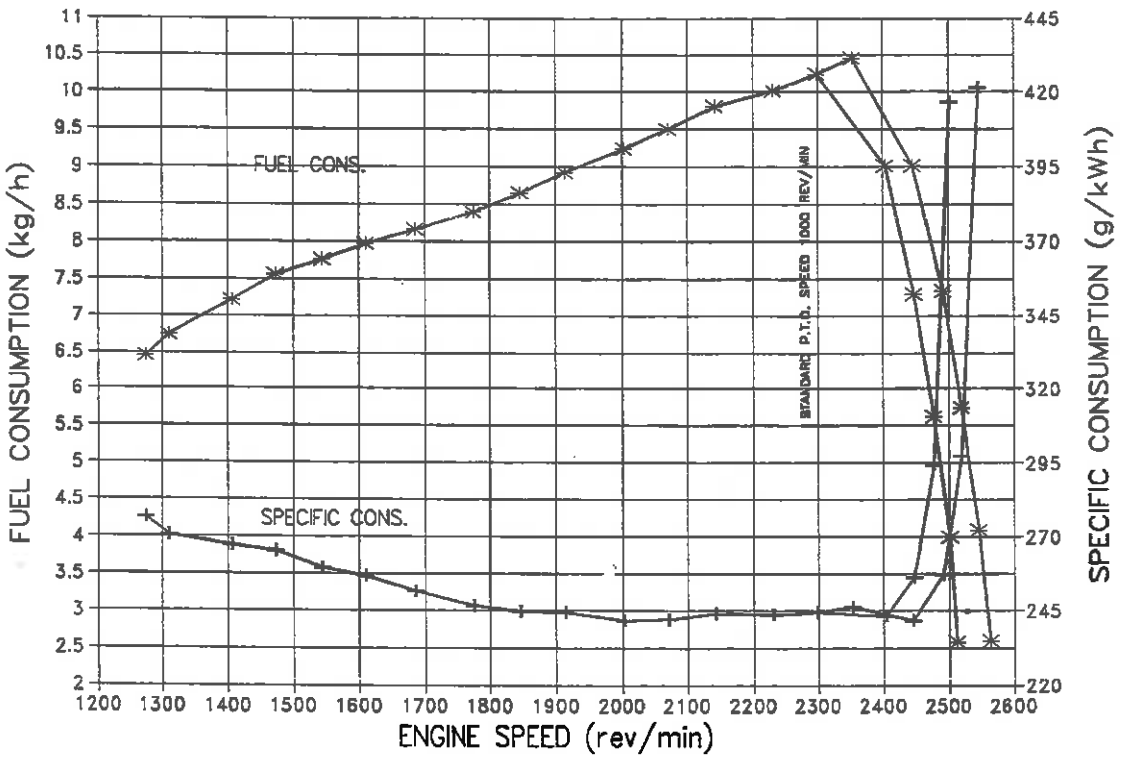
- Maximum temperatures

. coolant: - °C
. engine oil: 142°C
. fuel: 41 °C
. engine air intake: 29 °C

(1) *The torque is the equivalent crankshaft torque.*

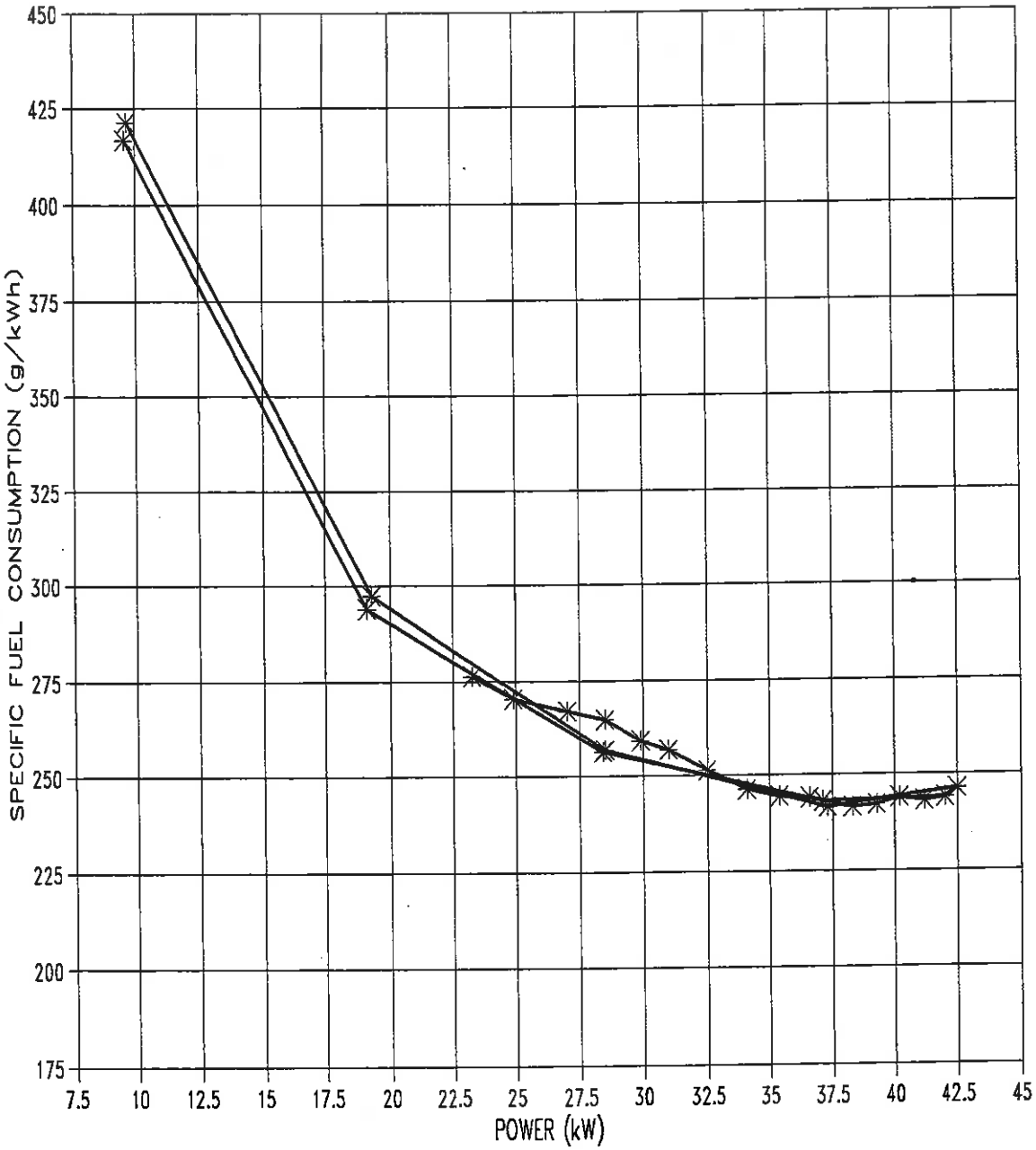
## PTO test


TORQUE
POWER
STANDARD P.T.O. SPEED 1000 REV/MIN
POWER (kW)
TORQUE (daNm)
ENGINE SPEED (rev/min)
0
5
10
15
20
25
30
35
40
45
0
2.5
5
7.5
10
12.5
15
17.5
20
22.5
1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600


FUEL CONS.
SPECIFIC CONS.
STANDARD P.T.O. SPEED 1000 REV/MIN
FUEL CONSUMPTION (kg/h)
SPECIFIC CONSUMPTION (g/kWh)
ENGINE SPEED (rev/min)
2
2.5
3
3.5
4
4.5
5
5.5
6
6.5
7
7.5
8
8.5
9
9.5
10
10.5
11
220
245
270
295
320
345
370
395
420
445
1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

PTO test



## 2. HYDRAULIC POWER AND LIFTING FORCE

- Date and location of tests: 12 July 1993, ISMA, Treviglio BG, Italy

### 2.1 HYDRAULIC POWER TEST

- Sustained pressure with relief valve open: 18.0 MPa;
- Pump delivery rate at minimum pressure: 36.0 l/min;

| | Hydraulic power kW | Flow rate l/min | Pressure MPa | Oil temp. °C |
|---|---|---|---|---|
| At 90% of the actual relief valve setting | 8.48 | 31.4 | 16.2 | 65 |
| Maximum | 8.75 | 32.8 | 16.0 | 65 |

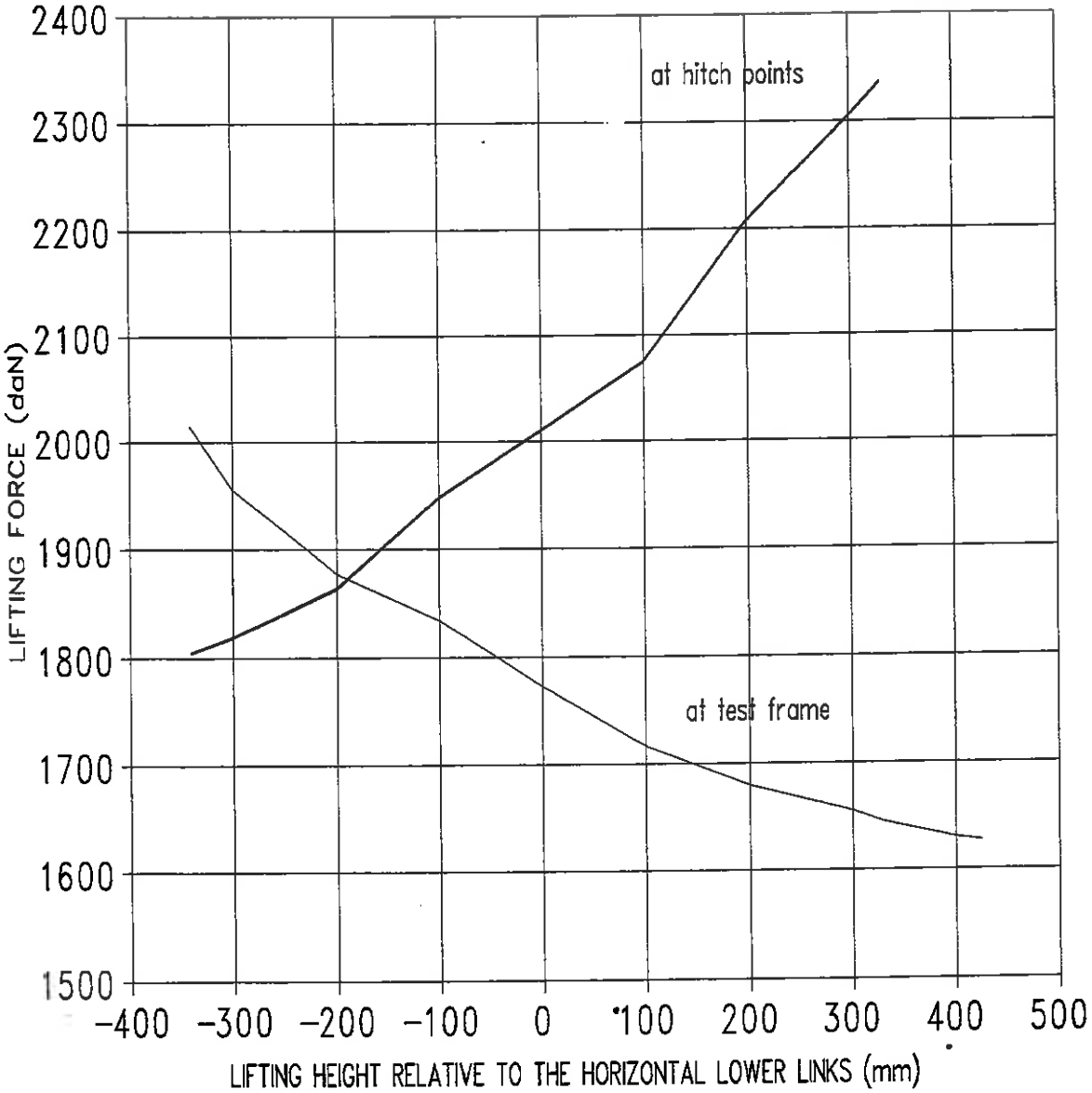
- Tapping point used for test: at rear of tractor;
- Hydraulic fluid: see page 20.

### 2.2 POWER LIFT

| | | At hitch point | On the frame |
|---|---|---|---|
| Height of lower hitch point above ground in down position | mm | 200 | 200 |
| vertical movement | mm | 674 | 766 |
| Maximum corrected force exerted through full range | daN | 1805 | 2015 |
| Corresponding pressure of hydraulic fluid | MPa | 18.0 | 18.0 |
| Moment about rear axle | daNm | 1727 | 2551 |
| Maximum tilt angle of mast over range of lift | degrees | - | 9 |

| Lifting heights relative to the horizontal lower links (mm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| -341 | -300 | -200 | -100 | 0 | +100 | +200 | +300 | +330 | +400 | +412 |
| Lifting forces at hitch points (daN) | | | | | | | | | | |
| 1805 | 1820 | 1865 | 1948 | 2011 | 2075 | 2207 | 2304 | 2335 | - | - |
| Lifting forces at test frame (daN) | | | | | | | | | | |
| 2015 | 1955 | 1877 | 1835 | 1773 | 1717 | 1680 | 1655 | - | 1630 | 1628 |

Performance of power lift



## 3. DRAWBAR PERFORMANCE

- Date of test: 13 to 15 July 1993
- Type of track: concrete

### 3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)

- Height of drawbar above ground: 560 mm;
- Tyre inflation pressure: 160 kPa front, 160 kPa rear.

| Gear and range | Power kW | Draw. pull daN | Speed km/h | Eng. speed rev/min | Slip of wheels % | Specific ener. kWh/l | Specific cons. g/kWh | Temperatures Fuel °C | Cool. °C | Eng. °C | Atm. conditions Temp. °C | Hum. % | Press. kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 S | 0.8 | 1128 | 0.27 | 2563 | 15 | 0.24 | 3529 | 37 | - | 94 | 21 | 62 | 99.8 |
| 2 S | 2.0 | 1645 | 0.43 | 2554 | 15 | 0.48 | 1735 | 37 | - | 94 | 21 | 60 | 99.9 |
| 3 S | 3.5 | 1864 | 0.68 | 2556 | 15 | 0.79 | 1065 | 37 | - | 97 | 21 | 60 | 99.9 |
| 4 S | 5.5 | 1819 | 1.08 | 2544 | 15 | 1.06 | 791 | 37 | - | 105 | 21 | 60 | 99.8 |
| 1 N | 9.1 | 1921 | 1.71 | 2539 | 15 | 1.63 | 515 | 37 | - | 115 | 21 | 59 | 99.9 |
| 2 N | 14.1 | 1885 | 2.69 | 2515 | 15 | 1.97 | 426 | 37 | - | 115 | 22 | 59 | 99.8 |
| 3 N | 22.1 | 1907 | 4.18 | 2487 | 15 | 2.38 | 352 | 38 | - | 115 | 22 | 59 | 99.9 |
| 4 N | 33.7 | 1863 | 6.51 | 2434 | 15 | 3.03 | 276 | 37 | - | 115 | 22 | 59 | 99.8 |
| 1 F | 34.5 | 1304 | 9.52 | 2350 | 7 | 2.78 | 302 | 38 | - | 116 | 22 | 58 | 99.9 |
| 2 F | 29.9 | 686 | 15.68 | 2351 | 3 | 2.37 | 353 | 38 | - | 116 | 22 | 59 | 99.9 |

### 3.2 MAXIMUM POWER IN TESTED GEARS (ballasted tractor)

- Height of drawbar above ground: 560 mm;
- Tyre inflation pressure: 160 kPa front, 160 kPa rear.

| Gear and range | Power kW | Draw. pull daN | Speed km/h | Eng. speed rev/min | Slip of wheels % | Specific ener. kWh/l | Specific cons. g/kWh | Temperatures Fuel °C | Cool. °C | Eng. °C | Atm. conditions Temp. °C | Hum. % | Press. kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 S | 1.5 | 1942 | 0.27 | 2559 | 15 | 0.41 | 2055 | 35 | - | 95 | 22 | 52 | 99.8 |
| 2 S | 2.4 | 1991 | 0.43 | 2549 | 15 | 0.52 | 1618 | 35 | - | 95 | 22 | 52 | 99.9 |
| 3 S | 3.9 | 2059 | 0.68 | 2543 | 15 | 0.74 | 1131 | 36 | - | 98 | 23 | 51 | 99.9 |
| 4 S | 6.4 | 2143 | 1.07 | 2536 | 15 | 1.11 | 754 | 36 | - | 100 | 24 | 49 | 99.9 |
| 1 N | 10.1 | 2138 | 1.70 | 2532 | 15 | 1.64 | 510 | 36 | - | 100 | 24 | 49 | 99.7 |
| 2 N | 16.0 | 2138 | 2.69 | 2520 | 15 | 2.31 | 363 | 36 | - | 108 | 24 | 49 | 99.7 |
| 3 N | 24.8 | 2133 | 4.19 | 2495 | 15 | 2.85 | 294 | 37 | - | 111 | 23 | 50 | 99.8 |
| 4 N | 36.1 | 2027 | 6.41 | 2400 | 15 | 3.15 | 266 | 37 | - | 113 | 23 | 49 | 99.7 |
| 1 F | 36.4 | 1348 | 9.71 | 2350 | 5 | 2.90 | 289 | 37 | - | 116 | 23 | 52 | 99.7 |
| 2 F | 30.4 | 691 | 15.81 | 2350 | 2 | 2.42 | 346 | 37 | - | 116 | 23 | 52 | 99.7 |

*S= Slow; N= Normal; F= Fast.*

## DRAWBAR PERFORMANCE (continued)

### 3.3 FIVE HOUR TESTS

| Gear and range | Power kW | Draw. pull daN | Speed km/h | Eng. speed rev/min | Slip of wheels % | Specific ener. kWh/l | Specific cons. g/kWh | Temperatures Fuel °C | Cool. °C | Eng. °C | Atm. conditions Temp. °C | Hum. % | Press. kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.3.1) FIVE HOUR TEST at 75% of pull at maximum power | | | | | | | | | | | | | |
| 3 N | 20.5 | 1601 | 4.61 | 2508 | 7 | 2.66 | 315 | 36 | - | 105 | 23 | 55 | 99.8 |
| 3.3.2) FIVE HOUR TEST at pull corresponding to 15% wheelslip with additional ballast: 135 kg | | | | | | | | | | | | | |
| 4 N | 37.9 | 2010 | 6.79 | 2382 | (*) | (*) | (*) | 38 | - | 115 | 25 | 55 | 99.7 |

*S= Slow; N= Normal; F= Fast.*
*(*) Having the test been carried out with additional ballast, these figures are irrelevant.*

Oil consumption during ten hours duration of tests 3.3.1 and 3.3.2: 30 g/h.

## 4. TURNING AREA AND TURNING CIRCLE.

| | With brakes on four wheels Right hand m | Left hand m | Without brakes Right hand m | Left hand m |
|---|---|---|---|---|
| Radius of turning area | 6.1 | 6.8 | 8.3 | 8.3 |
| Radius of turning circle | 5.9 | 6.6 | 8.1 | 8.1 |

## 5. LOCATION OF CENTRE OF GRAVITY

| | | |
|---|---|---|
| Height above ground | mm | 765 |
| Distance forward fom rear axle centre | mm | 882 |
| Distance from tractor's median plane | mm | 0 |

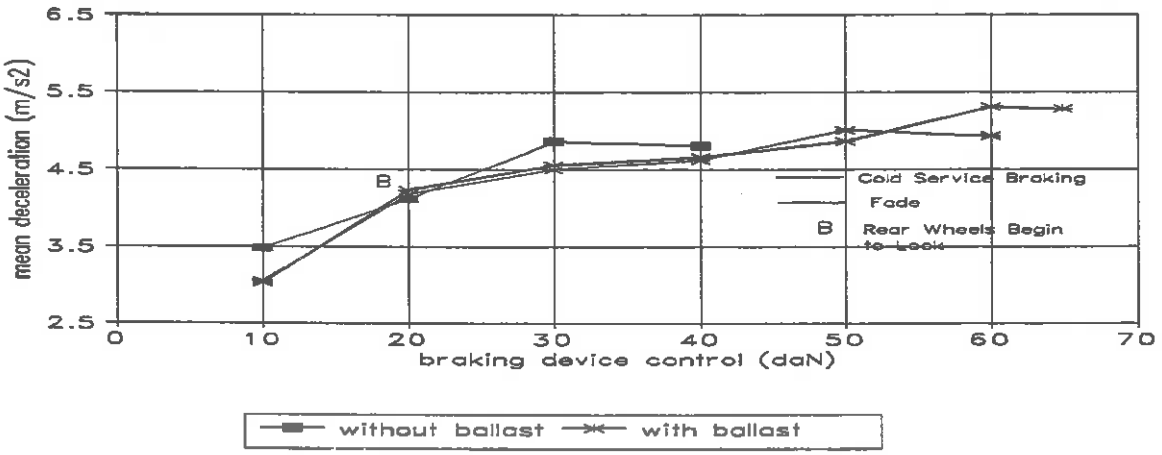
## 6. BRAKING PERFORMANCE

- Date of test: 19 July 1993;
- Type of track: asphalt;
- Type of decelerometer.: PEISELER

Tractor mass (with driver)

| | Front axle kg | Rear axle kg | Total kg |
|---|---|---|---|
| Unballasted | 1040 | 1385 | 2425 |
| Ballasted | 1190 | 1575 | 2765 |

### 6.1 SERVICE BRAKES (all wheels braked)




- Speed before application of brakes (unballasted tractor): 44.4 km/h.
- Speed before application of brakes (ballasted tractor): 44.2 km/h.

The tractor brakes were heated by towing of the tractor for 1 km.
No significant deviation of tractor from original course and no abnormal vibrations were observed.

### 6.2) PARKING BRAKE

Ballasted tractor on 18% slope

| | | Up | Down |
|---|---|---|---|
| Braking device control force | daN | 7.8 | 8.8 |

## 7. MEASUREMENT OF EXTERNAL NOISE LEVEL

- Date of test: 20 July 1993;
- Type of track: concrete;
- Type of sound level meter: BRÜEL & KJÆR, model 2231.

| Tractor | Gear and group | Travelling speed before acceleration km/h | Sound level dB(A) |
|---|---|---|---|
| Lamborghini 564-60 VDT | 4 F | 33.2 | 82.8 |
| Same Argon 60 VDT | 4 F | 33.3 | 83.0 |
| Hürlimann 306 VDT | 4 F | 33.1 | 82.2 |

## 8. REPAIRS AND REMARKS: none.

TEST CARRIED OUT BY
(Per. agr. Giovanni LAMORATTA)

THE DIRECTOR OF TESTING STATION
(Prof. Giuseppe COLZANI)

HEAD OF
ISMA
(Ing. Giovanni SANTORO)

Text and graphics processed by: Per. agr. Gianluigi ROZZONI