CONSIGLIO NAZIONALE DELLE RICERCHE
ISTITUTO PER LA MECCANIZZAZIONE AGRICOLA
Strada delle Cacce, 73 - 10135 TORINO (Italia)

Report No. 1925/T/1994

TEST IN ACCORDANCE WITH THE OECD FULL
CODE FOR THE OFFICIAL TESTING OF AGRICULTURAL TRACTORS

TRACTORS: Make: **S+L+H**

Models: **LAMBORGHINI 880 F PLUS VDT** - Approval number: 1548/2
with 16 forward and 16 reverse speeds

**HÜRLIMANN 481 XF VDT** - Approval number: 1548/1
with 16 forward and 16 reverse speeds

Type: 4 WD



Manufactured by: S+L+H S.p.A. - TREVIGLIO (Italy)

Date and location of the tests: November-December 1994 - TORINO (Italy)

This report has been approved by the O.E.C.D. Co-ordinating Center (CEMAGREF, France) as being in accordance with the O.E.C.D. Tractor Test Code.

Date of approval: 17th February 1995

## PRELIMINARY REMARK

The LAMBORGHINI 880 F PLUS VDT (4WD) and the HÜRLIMANN 481 XF VDT (4WD) tractors are technically identical in all main respects, except with regard to the following items:

- model designation
- colour
- side bonnets design
- height above ground of headlights.

Therefore, tests have not been repeated, and approval number is valid for the both tractor models.
All tests were carried out on the LAMBORGHINI 880 F PLUS VDT (4WD).

This bulletin is based on engineering tests in accordance with O.E.C.D. Full Code (Code I).
It does not contain an evaluation of performance of the tractor on practical farm work.

The S+L+H LAMBORGHINI 880 F PLUS VDT tractor is manufactured in following variants:

1. with 16 forward and 16 reverse speeds (4x4 gear units plus inverter);

2. with 12 forward and 12 reverse speeds (3x4 gear units plus inverter);

3. with 24 forward and 24 reverse speeds (3x2x4 gear units plus inverter);

Tests have been carried out on tractor with the first variant.

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

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| | |
|---|---|
| Tractor manufacturer's name and address: | S+L+H S.p.A.<br>Viale Cassani, 15<br>24047 TREVIGLIO (BG) - Italy |
| Submitted for checks by: | Manufacturer |
| Selected for checks by: | Manufacturer with the agreement of IMA |
| Place of running-in: | TORINO - Italy |
| Duration of running-in: | Engine and tractor appr. 50 hours |
| Location of checks : | IMA - Torino - Italy |

## I. SPECIFICATION OF TRACTOR

### TRACTOR

| | |
|---|---|
| Make: | S+L+H S.p.A. |
| Model: | LAMBORGHINI 880 F PLUS VDT |
| Type: | wheeled tractor, unit construction |
| Number of driving wheels: | 4WD |
| Serial number: | 1056 |
| First serial number: | 1001 |

### ENGINE

| | |
|---|---|
| Make: | S+L+H S.p.A. |
| Model: | 1000.4 W3 |
| Type: | 4-stroke Diesel engine, direct injection, water cooled |
| Serial number: | 1061 |

**Cylinders**

| | |
|---|---|
| Number/disposition: | 4, vertical, in-line |
| Bore/stroke: | 105 x 115.5 mm |
| Capacity: | 4000 $cm^3$ |
| Compression ratio: | 17 : 1 |
| Arrangement of valves: | overhead |
| Cylinder liners: | without liners |
| **Supercharging** | none |

**Fuel system**

| | |
|---|---|
| Fuel feed system: | AC CORONA type fuel feed pump |
| Make, model and type of fuel filter: | FIAMM FNA 166/20 |
| Capacity of fuel tank: | 70 $dm^3$ |
| Make, model and type of injection pump: | BOSCH PFR 1K 90A 517, immersed pump, one for cylinder, without serial number, in line injection pump |
| Serial number: | none |
| Manufacturer's production setting of injection pump: | |
| - flow rate: | 59 ± 2 $mm^3$/stroke at rated speed and full load corresponding 16.65 $dm^3/h$ |
| - timing: | 16.0° ± 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 |
| Governed range of engine speed: | from 650 to 2525 rev/min |
| Rated engine speed: | 2350 rev/min |

**Air cleaner**

Pre-cleaner:

| | |
|---|---|
| Make: | DONALDSON |
| Model: | P01-6330 |
| Type: | cyclone |
| Location of air intake: | in front of the engine over the bonnet |

Main cleaner:

| | |
|---|---|
| Make: | DONALDSON |
| Model: | FLG 08-0524 |
| Type: | dry paper element filter with two replaceable cartridge elements; S+L+H make, 2.4249.130.7 type for the internal one and 2.4249.131.0 type for the external one |
| Location of air intake: | in front of the engine |
| 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 |
| Number: | 1 |

**Cooling System**

| | |
|---|---|
| Type of coolant: | water |
| Type of pump: | impeller |
| Specification of fan: | propeller fan driven by engine shaft |

| | |
|---|---|
| Number of fan blades: | 6 |
| Fan diameter: | 400 mm |
| Coolant capacity: | 13 $dm^3$ |
| Type of temperature control: | electrical control |
| Superpressure system: | 0.6 bar |

**Starting system**

| | |
|---|---|
| Make: | ISKRA |
| Model: | AZ J3557 |
| Type: | electromagnetic engagement |
| Starter motor power rating: | 3.0 kW |
| Cold starting aid: | none |
| Safety device: | preventing engine start in gear |

**Electrical system**

| | |
|---|---|
| Voltage: | 12 V, negative earth |
| Generator: | |
| - Make: | MARELLI |
| - Model: | AA 125 R 14 V 55A |
| - Type: | Alternator |
| - Power: | 55 A |
| Battery: | 1 lead acid, FIAMM make, 2.9559.036.0 model |
| Rating: | 100 Ah at 20 hours |

**Exhaust system**

| | |
|---|---|
| Make: | S+L+H |
| Model: | DGM SA 2301 |
| Type: | two reflections absorption chambers |
| Location: | on the left side of engine, under the bonnet cowling, with the horizontal exaust pipe under the left mounting step |

**TRANSMISSION TO WHEELS**

**Clutch** utilized only for travelling

| | |
|---|---|
| Make: | S+L+H |
| Model: | 676.23 |
| Type: | independent, single disk dry clutch |
| Number of plates: | 1 |
| Diameter of plates | 280 mm |
| Method of operation: | mechanical operated by pedal |

**Gearbox**

| | |
|---|---|
| Make: | S+L+H |
| Model: | 676.31 |
| Type: | mechanical syncromesh speed change gear |
| Arrangement: | sixtheen speeds forward and sixtheen reverse speeds, with four ranges (creeper, slow, medium and high), four speeds and the inverter; |
| Number of gears: | 16 forward and 16 reverse |

| | |
|---|---|
| Available options: | |
| Arrangement: | twelve speeds forward and twelve reverse speeds, with three ranges (slow, medium and high), four speeds and the inverter; |
| - Number of gears: | 12 forward and 12 reverse |
| Arrangement: | twentyfour speeds forward and twentyfour reverse speeds, with three ranges (slow, medium and high), four speeds, one electro-hydraulic shifted reduction gear (hi/lo) and the inverter; |
| - Number of gears: | 24 forward and 24 reverse |

**Rear axle and final drives**

| | |
|---|---|
| Make: | S+L+H |
| Model: | 676.44 |
| Type: | bevel gear differential and epyciclic final drive |
| Differential lock | |
| - Make: | S+L+H |
| - Model: | 676.44 |
| - Type: | mechanical |
| - Method of engagement: | with pedal |
| - Method of disengagement: | self disengaging lock |

**Front axle and final drives**

| | |
|---|---|
| Make: | S+L+H |
| Model: | 676.43 |
| Type: | S+L+H original system with central shaft, bevel gear drive, differential and epyciclic final drives |
| Differential lock | |
| - Make: | S+L+H |
| - Model: | 676.46 |
| - Type: | mechanical |
| - Method of engagement: | with pedal |
| - Method of disengagement: | self disengaging lock |

**LAMBORGHINI 880 F PLUS VDT with 16 forward and 16 reverse speeds**

Total ratios and travelling speeds (tyres 14.9 R 28 and pressure 160 kPa)

| Gear no. | Group or range | 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 | | | |
| 1 | Creeper | 1395.71 | 0.41 |
| 2 | Creeper | 901.39 | 0.63 |
| 3 | Creeper | 598.56 | 0.95 |
| 1 | Slow | 465.02 | 1.22 |
| 4 | Creeper | 396.96 | 1.43 |
| 2 | Slow | 301.54 | 1.88 |
| 3 | Slow | 199.45 | 2.84 |
| 1 | Medium | 155.08 | 3.66 |
| 4 | Slow | 132.25 | 4.29 |
| 2 | Medium | 100.37 | 5.65 |
| 3 | Medium | 66.34 | 8.55 |
| 1 | High | 51.69 | 10.97 |
| 4 | Medium | 43.94 | 12.90 |
| 2 | High | 33.38 | 16.98 |
| 3 | High | 22.18 | 25.55 |
| 4 | High | 14.70 | 38.57 |
| REVERSE | | | |
| 1 | Creeper | 1426.94 | 0.40 |
| 2 | Creeper | 924.87 | 0.61 |
| 3 | Creeper | 611.91 | 0.93 |
| 1 | Slow | 475.57 | 1.19 |
| 4 | Creeper | 406.00 | 1.40 |
| 2 | Slow | 308.22 | 1.84 |
| 3 | Slow | 203.97 | 2.78 |
| 1 | Medium | 158.52 | 3.58 |
| 4 | Slow | 135.27 | 4.19 |
| 2 | Medium | 102.74 | 5.52 |
| 3 | Medium | 67.85 | 8.36 |
| 1 | High | 52.77 | 10.74 |
| 4 | Medium | 45.02 | 12.59 |
| 2 | High | 34.25 | 16.55 |
| 3 | High | 22.62 | 25.07 |
| 4 | High | 14.86 | 38.15 |

(*) Calculated with a tyre dynamic radius index of 640 mm (ISO 4251/1 - 1992).
Number of revolutions of front wheels for one revolution of rear wheels: 1.4794

**LAMBORGHINI 880 F PLUS VDT with 12 forward and 12 reverse speeds**

Total ratios and travelling speeds (tyres 14.9 R 28 and pressure 160 kPa)

| Gear no. | Group or range | 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 | |
| 1 | Slow | 465.02 | 1.22 |
| 2 | Slow | 301.54 | 1.88 |
| 3 | Slow | 199.45 | 2.84 |
| 1 | Medium | 155.08 | 3.66 |
| 4 | Slow | 132.25 | 4.29 |
| 2 | Medium | 100.37 | 5.65 |
| 3 | Medium | 66.34 | 8.55 |
| 1 | High | 51.69 | 10.97 |
| 4 | Medium | 43.94 | 12.90 |
| 2 | High | 33.38 | 16.98 |
| 3 | High | 22.18 | 25.55 |
| 4 | High | 14.70 | 38.57 |
| | | REVERSE | |
| 1 | Slow | 475.57 | 1.19 |
| 2 | Slow | 308.22 | 1.84 |
| 3 | Slow | 203.97 | 2.78 |
| 1 | Medium | 158.52 | 3.58 |
| 4 | Slow | 135.27 | 4.19 |
| 2 | Medium | 102.74 | 5.52 |
| 3 | Medium | 67.85 | 8.36 |
| 1 | High | 52.77 | 10.74 |
| 4 | Medium | 45.02 | 12.59 |
| 2 | High | 34.25 | 16.55 |
| 3 | High | 22.62 | 25.07 |
| 4 | High | 14.86 | 38.15 |

(*) Calculated with a tyre dynamic radius index of 640 mm (ISO 4251/1 - 1992).

Number of revolutions of front wheels for one revolution of rear wheels: 1.4794

**LAMBORGHINI 880 F PLUS VDT with 24 forward and 24 reverse speeds**

Total ratios and travelling speeds (tyres 14.9 R 28 and pressure 160 kPa)

| Gear no. | Group or range | 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 | |
| 1 LO | Slow | 558.28 | 1.02 |
| 1 HI | Slow | 465.02 | 1.22 |
| 2 LO | Slow | 361.85 | 1.57 |
| 2 HI | Slow | 301.54 | 1.88 |
| 3 LO | Slow | 239.29 | 2.37 |
| 3 HI | Slow | 199.45 | 2.84 |
| 1 LO | Medium | 186.09 | 3.05 |
| 4 LO | Slow | 158.74 | 3.57 |
| 1 HI | Medium | 155.08 | 3.66 |
| 4 HI | Slow | 132.25 | 4.29 |
| 2 LO | Medium | 120.40 | 4.71 |
| 2 HI | Medium | 100.37 | 5.65 |
| 3 LO | Medium | 79.69 | 7.11 |
| 3 HI | Medium | 66.34 | 8.55 |
| 1 LO | High | 61.82 | 9.17 |
| 4 LO | Medium | 52.99 | 10.70 |
| 1 HI | High | 51.69 | 10.97 |
| 4 HI | Medium | 43.94 | 12.90 |
| 2 LO | High | 40.06 | 14.15 |
| 2 HI | High | 33.38 | 16.98 |
| 3 LO | High | 26.49 | 21.40 |
| 3 HI | High | 22.18 | 25.55 |
| 4 LO | High | 17.66 | 32.10 |
| 4 HI | High | 14.70 | 38.57 |
| | | REVERSE | |
| 1 LO | Slow | 570.78 | 0.99 |
| 1 HI | Slow | 475.57 | 1.19 |
| 2 LO | Slow | 369.82 | 1.53 |
| 2 HI | Slow | 308.22 | 1.84 |
| 3 LO | Slow | 244.68 | 2.32 |
| 3 HI | Slow | 203.97 | 2.78 |
| 1 LO | Medium | 190.19 | 2.98 |
| 4 LO | Slow | 162.19 | 3.50 |
| 1 HI | Medium | 158.52 | 3.58 |
| 4 HI | Slow | 135.26 | 4.19 |
| 2 LO | Medium | 123.20 | 4.60 |
| 2 HI | Medium | 102.74 | 5.52 |
| 3 LO | Medium | 81.42 | 6.96 |
| 3 HI | Medium | 67.85 | 8.36 |
| 1 LO | High | 63.32 | 8.95 |
| 4 LO | Medium | 54.06 | 10.49 |
| 1 HI | High | 52.77 | 10.74 |
| 4 HI | Medium | 45.02 | 12.59 |
| 2 LO | High | 43.48 | 13.03 |
| 2 HI | High | 34.25 | 16.55 |
| 3 LO | High | 27.14 | 20.89 |
| 3 HI | High | 22.62 | 25.07 |
| 4 LO | High | 17.88 | 31.71 |
| 4 HI | High | 14.86 | 38.15 |

(*) Calculated with a tyre dynamic radius index of 640 mm (ISO 4251/1 - 1992).
Number of revolutions of front wheels for one revolution of rear wheels: 1.4794

## POWER TAKE OFF

### Main power take-off

| | |
|---|---|
| Type and method of engagement: | independent, engaged or disengaged by push button. Driven by single disk dry clutch independent of travel clutch; ISO Standard 500-1991 |
| Number of shafts: | 1 |
| Method of changing power take-off shaft ends and speeds: | none. Speed selection by external hand lever combined with a lever at the left hand side of the seat |

### Power take-off proportional to engine speed

#### 540 rev/min

| | |
|---|---|
| Location: | at rear of tractor, in tractor's median plane |
| Diameter of power take-off shaft end: | 35 mm |
| Number of splines: | 6, in conformity with ISO 500/1991 type 1 |
| Height above ground: | 605 mm |
| Distance from the median plane of the tractor: | 0 mm |
| Distance behind rear-wheel axis: | 395 mm |
| PTO speed at rated engine speed: | 616 rev/min |
| Engine speed at standard power take-off speed: | 2059 rev/min |
| Ratio of rotation speeds (engine speed/p.t.o. speed): | 3.8125 |
| Power restriction and maximum torque: | power and torque of engine |
| Direction of rotation (viewed from behind tractor): | clockwise |

#### 1000 rev/min

| | |
|---|---|
| Location: | at rear of tractor, in tractor's median plane |
| Diameter of power take-off shaft end: | 35 mm |
| Number of splines: | 6, not in conformity with ISO 500/1991 |
| Height above ground: | 605 mm |
| Distance from the median plane of the tractor: | 0 mm |
| Distance behind rear-wheel axis: | 395 mm |
| PTO speed at rated engine speed: | 1034 rev/min |
| Engine speed at standard power take-off speed: | 2272 rev/min |
| Ratio of rotation speeds (engine speed/p.t.o. speed): | 2.2727 |
| Power restriction and maximum torque: | power and torque engine |
| Direction of rotation (viewed from behind tractor): | clockwise |

**Power take off proportional to ground speed**
(separated syncromesh shaft, not adjustable to 540 - 1000 rev/min)

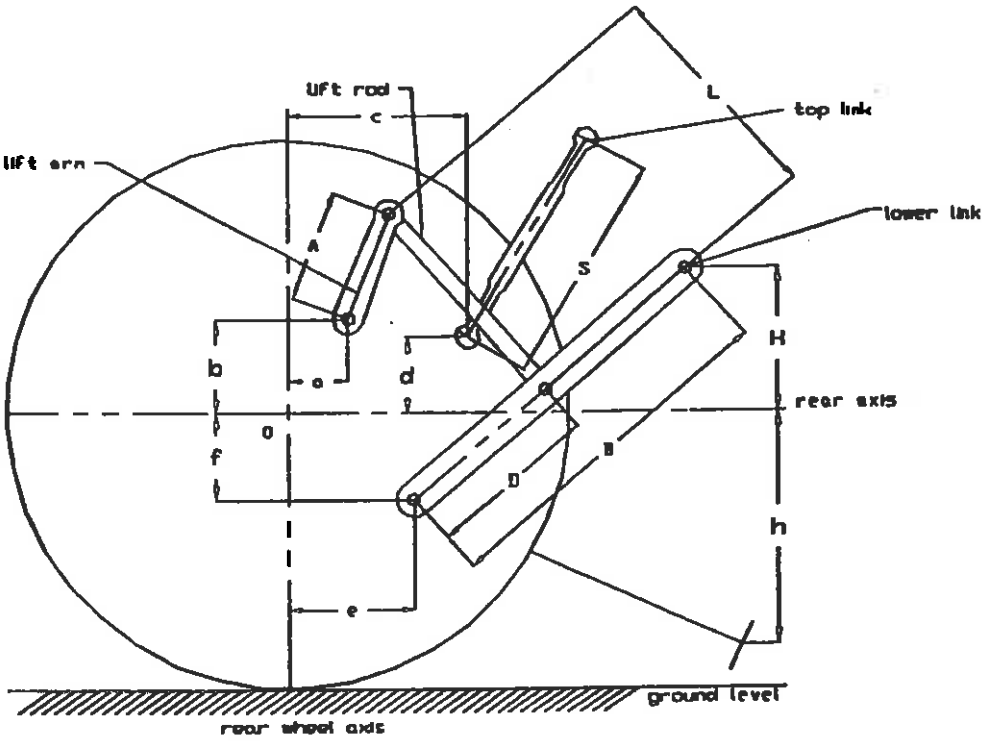
| | |
|---|---|
| Location and method of engagement: | at rear of tractor, in tractor's median plane, engaged or disengaged by hand level at the left hand side of the seat |
| Number of shafts: | 1 |
| Travelling distance for one revolution of power take-off shaft: | 427 mm |
| Number of power take-off shaft revolutions for one revolution of rear driving wheels: | 9.41 |
| Direction of rotation with forward gear engaged (viewed facing driving end): | clockwise |

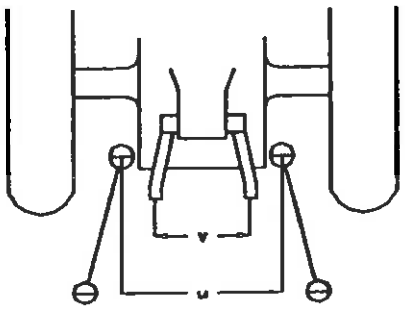
**REAR POWER LIFT**

| | |
|---|---|
| Make: | MITA |
| Model: | 676.39 |
| Type: | load sensing |
| Type of hydraulic system: | open centre system |
| Type and number of cylinders: | 1 internal |
| Type of linkage lock for transport: | mechanical, with screwed tie rods that lock the lower links |
| Relief valve pressure setting: | 18 ± 1 MPa |
| Opening pressure of anti-shock valve: | 21 ± 0.5 MPa |
| Opening pressure of cylinder safety valve: | none |
| Lift pump type: | hydraulic rotary pump, driven by engine shaft, pump BOSCH make, A 510 241 101; |
| Transmission between pump and engine: | mechanical |
| Type and number of filters: | 1, replaceable paper cartridge |
| Site of oil reservoir: | gear-box |
| Type, number and location of tapping points: | 4 ways distributor at rear of tractor |
| Maximum volume of oil available to external cylinders: | 10 $dm^3$ |

**Three point linkage**

| | |
|---|---|
| Category: | 2nd, implement attachment with three point linkage, in conformity with I.S.O. STANDARD 730/I-1990 |
| Category adapter: | none |


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

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

| | | Dimension or range mm | Settings used in test mm |
|---|---|---|---|
| Length of lift arms | (A) | 280 | 280 |
| Length of lower links | (B) | 800 | 800 |
| Distance of lift arm pivot point from rear wheel axis: - horizontally | (a) | 215 | 215 |
| - vertically | (b) | 330 | 330 |
| Horizontal distance between the 2 lower link points | (u) | 400 | 400 |
| Horizontal distance between the 2 lift arm end points | (v) | 500 | 500 |
| Length of upper link | (S) | from 420 to 640 | 480 |
| Distance of upper link pivot point from rear wheel axis: - horizontally | (c) | 430 - 450 | 450 |
| - vertically | (d) | 285-317-355 | 285 |
| Distance of lower link pivot point from rear wheel axis: - horizontally | (e) | 180 | 180 |
| - vertically | (f) | 150 | 150 |
| Distance of lower link pivot points to lift rod pivot points on lower links | (D) | 360 - 410 | 410 |
| Length of lift rods | (L) | from 470 to 570 | 525 |
| Heigth of lower hitch points relative to the rear wheel axis: | | | |
| - in low position | (h) | 390 | 390 |
| - in high position | (H) | 155 | 155 |
| Height above ground of lower hitch points when locked in transport position (*) | | 795 | - |

(*) Assuming the dynamic radius index: 640 mm (ISO 4251/1-1991)

**SWINGING DRAWBAR** (optional not fitted on tested tractor)

**TRAILER HITCH**

Type: DGM-GA 1560
Hole diameter: 29 mm

| | |
|---|---|
| Height above ground: | |
| - min: | 400 mm |
| - max: | 870 mm |
| Distance of hitch point from rear wheel axis, horizontally: | 570 mm |
| Distance of hitch point from power take-off shaft end: | |
| - vertically: | 200 mm below, 190 mm above |
| - horizontally: | 180 mm |
| Maximum vertical permissible load: | 14.7 kN |

**HOLED DRAWBAR**

| | |
|---|---|
| Number of holes: | 9 |
| Distance between holes: | 55 mm |
| Hole diameter: | 22 mm |
| Thickness/width of the drawbar: | 30/80 mm |
| Height above ground with tyre 14.9R28: | |
| - minimum: | 200 mm |
| - maximum: | 800 mm |
| Horizontal distance behind power take-off shaft end: | 585 mm |

**STEERING**

| | |
|---|---|
| Make: | DANFOSS |
| Model: | ORBITROL OSPC 80 LS DYN |
| Type: | hydrostatic |
| Method of operation: | |
| - pump: | hydrostatic steering with BOSCH hydraulic gear pump |
| - rams: | one double acting ram acting directly on front axle |
| Working pressure: | 9 MPa |

**BRAKES**

**Service brake:**

| | |
|---|---|
| Make: | S+L+H |
| Model: | 676.54 |
| Type: | oil bath disc, total 4 discs, 2 at front (1 for wheel) and 2 at rear (1 for wheel), all mounted before the final drive. Front disc 178 mm dia, rear disc 224 mm dia, 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, 1 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:** divided pedal of service brake, for normal use locked together

**WHEELS**

**Steering wheels**

Number: 2
Location: at front

**Driving wheels**

Number: 4
Location: 2 at front and 2 at rear

| Tyre matching | | | |
|---|---|---|---|
| At front | | At rear | |
| 9.5 R 20 | 8 ply | 14.9 R 28 | 128 A8 |
| 300/70R20 | 110 A8 | 420/70R28 | 133 A8 |
| 250/80R16 | 8 ply | 380/70R24 | 125 A8 |
| 260/80R20 | 106 A8 | 420/70R28 | 133 A8 |

**Wheelbase:** 2082 mm

**Track width adjustment**

| | Minimum mm | Maximum mm | Adjustement method |
|---|---|---|---|
| Front | 1210 | 1430 | Changing the position of the rims with respect to the disc |
| Rear | 1180 | 1400 | Changing the position of the rims in respect to the disc |

**PROTECTIVE STRUCTURE**

Make: S+L+H
Model: C 34
**Type:** cab, not tiltable
Manufacture's name and address: S+L+H S.p.A.,
Viale F. Cassani 15
24047 TREVIGLIO (BG) - Italy
OECD approval number: NT/ROPS/R/D 014/55

**DRIVER'S SEAT**

Make: KAB
Model: P1 XL2
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**

| | Height above ground of centre* mm | Size mm | Distance from outside edge of lights to median plane of tractor mm |
|---|---|---|---|
| Headlights: | | | |
| LAMBORGHINI | 1045 | 180 x 85 | 188 |
| HÜRLIMANN | 1000 | 180 x 85 | 188 |
| Sidelights | 1170 | 110 x 35 | 510 |
| Rearlights | 1360 | 50 x 60 | 525 |
| Reflectors | 900 | Ø 80 | 580 |

(*) with tyres: 9.50 R 20 front - 14.9 R 28 rear

## II. TEST CONDITIONS

**Overall dimensions** (with tyres 9.50 R 20 front and 14.9 R 28 rear)

| | Length | Width | | Height at top of | |
|---|---|---|---|---|---|
| | | minimum | maximum | protective structure | exhaust silencer |
| | mm | mm | mm | mm | mm |
| Ballasted | 3642 | 1560 | 1780 | 2430 | 450 |
| Unballasted | 3797 | 1560 | 1780 | 2430 | 450 |

**Ground clearance** (unballasted tractor): 350 mm

Clearance-limiting part: front axle

**Tractor mass** (with protective structure and full fuel tank):

| | Ballasted | | Unballasted | |
|---|---|---|---|---|
| | Without driver kg | With driver kg | Without driver kg | With driver kg |
| Front | 1155 | 1165 | 1040 | 1050 |
| Rear | 1545 | 1610 | 1555 | 1620 |
| Total | 2700 | 2775 | 2595 | 2670 |

**Ballast**

| | Weights | | Water (kg) |
|---|---|---|---|
| | Number | Total mass (kg) | |
| Front wheels | - | - | - |
| Front weight | 3 | 105 | - |
| Rear wheels | - | - | - |

**Tyres and track width specifications**

| | Front | Rear |
|---|---|---|
| Tyres: | | |
| - dimensions | 9.5R20 | 14.9 R 28 |
| - ply rating | 8 | 128 A8 |
| - type | radial | radial |
| - maximum load (tyre manufacturer') | 9.56 kN | 17.95 kN |
| - maximum load (tractor manufacturer's) | 7.35 kN | 13.24 kN |
| - inflaction pressure (tyre manufacturer's) | 280 kPa | 160 kPa |
| - dynamic radius index | 445 mm | 640 mm |
| Chosen track width: | 1210 mm | 1180 mm |

**Oils and lubrication**

Capacity and change interval

| | Capacity $dm^3$ | Oil change h | Filter change h |
|---|---|---|---|
| Engine with filter | 9.2 | 150 | 300 |
| Gear box with power lifts, rear axle, final drive and hydraulic system | 33 | 1200 | 2400 (*) |
| Front axle and final drive | 9 | 1200 | - |

(*) or when the warning lamp is lighted.

Specifications (SAE, API, MIL-L, ISO)

| | Recommended | Used during test |
|---|---|---|
| Engine oil<br>- Type:<br>- Viscosity:<br>- Classification: | AKROS TURBO 15 W/40<br>12.50 cSt<br>API CE MIL-L-2104 E | As recommended |
| Hydraulic fluid<br>- Type:<br>- Viscosity:<br>- Classification | AKROS MULTI<br>11.50 cSt<br>API GL 4 | As recommended |
| Front and rear axle, final drives and gear box<br>- Type:<br>- Viscosity:<br>- Classification: | AKROS MULTI<br>11.50 cSt<br>API GL 4 | As recommended |
| Steering oil<br>- Type:<br>- Viscosity:<br>- Classification: | AKROS MULTI<br>11.50 cSt<br>API GL 4 | As recommended |

Grease: GREASE 30
- Number of lubrication points: 9

**Fuel**

Type: ESSO DIESEL oil, in conformity with national standard.

Density at 15 °C: 0.835 $g/cm^3$

## COMPULSORY TEST RESULTS

**1. MAIN POWER- TAKE-OFF PERFORMANCE**

- Date and location of tests: 30th November 1994, I.M.A., TORINO, ITALY
- Type of dynamometer: PARASITIC CURRENTS, BORGHI & SAVERI FA 300-30 SP

| Power | Speed | | Fuel consumption | | | Specific energy |
|---|---|---|---|---|---|---|
| | Engine | P.t.o. | Hourly | | Specific | |
| KW | rev/min | | kg/h | l/h | g/kWh | kWh/l |
| **1.1 MAXIMUM POWER - TWO HOUR TEST** | | | | | | |
| 54,98 | 2349 | 1034 | 13,90 | 16,65 | 253 | 3,30 |
| 1.2 POWER AT RATED ENGINE SPEED | | | | | | |
| 54,98 | 2349 | 1034 | 13,90 | 16,65 | 253 | 3,30 |
| 1.3 STANDARD POWER TAKE OFF SPEED (1000 ± 25 rev/min) | | | | | | |
| 54,87 | 2322 | 1022 | 13,80 | 16,53 | 251 | 3,32 |
| **1.4 PART LOADS** | | | | | | |
| 1.4.1 the torque corresponding to maximum power at rated engine speed | | | | | | |
| 54,98 | 2349 | 1034 | 13,90 | 16,65 | 253 | 3,30 |
| 1.4.2 85% of torque obtained in 1.4.1 | | | | | | |
| 47,91 | 2408 | 1060 | 12,00 | 14,37 | 250 | 3,33 |
| 1.4.3 75% of torque defined in 1.4.2 | | | | | | |
| 36,35 | 2436 | 1072 | 8,75 | 10,48 | 241 | 3,47 |
| 1.4.4 50% of torque defined in 1.4.2 | | | | | | |
| 24,41 | 2453 | 1079 | 5,65 | 6,77 | 231 | 3,61 |
| 1.4.5 25% of torque defined in 1.4.2 | | | | | | |
| 12,38 | 2489 | 1095 | 4,85 | 5,81 | 392 | 2,13 |
| 1.4.6 unloaded | | | | | | |
| - | 2523 | 1110 | 3,60 | 4,31 | - | - |
| **1.5 PART LOADS AT STANDARD POWER TAKE OFF SPEED** (1000 ± 25 rev/min) | | | | | | |
| 1.5.1 the torque correspondinding to maximum power | | | | | | |
| 54,87 | 2322 | 1022 | 13,80 | 16,53 | 251 | 3,32 |
| 1.5.2 85% of torque obtained in 1.5.1 | | | | | | |
| 46,91 | 2335 | 1027 | 11,38 | 13,63 | 243 | 3,44 |
| 1.5.3 75% of torque defined in 1.5.2 | | | | | | |
| 35,78 | 2374 | 1045 | 8,45 | 10,12 | 236 | 3,54 |
| 1.5.4 50% of torque defined in 1.5.2 | | | | | | |
| 23,96 | 2385 | 1049 | 5,45 | 6,53 | 227 | 3,67 |
| 1.5.5 25% of torque defined in 1.5.2 | | | | | | |
| 12,17 | 2423 | 1066 | 4,02 | 4,81 | 330 | 2,53 |
| 1.5.6 unloaded | | | | | | |
| --- | 2452 | 1079 | 3,40 | 4,07 | --- | --- |

No load maximum engine spead : 2523 rev/min
Torque at maximum power-2 hours : 223.52 Nm
Maximum torque : 258.47 Nm at 1300 rev/min of the engine
Mean atmospherc condition : Temperature 20.0 °C
Pressure 99.70 kPa
Relative Humidity 75 %
Maximum Temperature : Coolant 81.0 °C
Engine oil 110.0 °C
Fuel 37.0 °C
Engine air intake 25.0 °C

## 2. HYDRAULIC POWER AND LIFTING FORCE

- Date of tests: 15th December 1994

### 2.1 HYDRAULIC POWER TEST

- Sustained pressure with relief valve open: 18.0 MPa
- Pump delivery rate at minimum pressure: 29.0 l/min

| | Flow rate l/min | Power kW | Pressure MPa | Oil temp. °C |
|---|---|---|---|---|
| Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power | 26.2 | 7.08 | 16.2 | 65 |
| Flow rate and hydraulic pressure corresponding to maximum hydraulic power | 27.0 | 8.10 | 18.0 | 66 |

- Tapping point used for test: at rear of tractor

### 2.2 POWER LIFT TEST

| | at the hitch point | | on the frame | |
|---|---|---|---|---|
| Height of lower hitch points above ground in down position | 250 | mm | 250 | mm |
| Vertical movement | 490 (*)<br>545 (+) | mm<br>mm | 540 (*)<br>610 (+) | mm<br>mm |
| Maximum corrected force exerted through full range | 20.01 | kN | 17.46 | kN |
| Corresponding pressure of hydraulic fluid | 16.2 | MPa | 16.2 | MPa |
| Moment about rear-wheel axis | 19.61 | kNm | 27.76 | kNm |
| Maximum tilt angle of mast from the vertical | - degress | | 6 degress | |

| Lifting heights relative to the horizontal plane including the lower pivot points | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | - 240 | - 200 | - 100 | - 50 | 0 | 50 | 100 | 200 | 250 | 300 |
| Lifting forces | | | | | | | | | | |
| at the hitch points kN | 20.01 | 20.20 | 21.28 | 21.87 | 22.36 | 22.75 | 23.24 | 23.63 | 23.34 | - |
| Corresponding pressure: 16.2 MPa | | | | | | | | | | |
| at the frame kN | 22.75 | 22.46 | 21.97 | 21.28 | 20.99 | 20.59 | 20.01 | 18.93 | 18.44 | 17.46 |
| Corresponding pressure: 16.2 MPa | | | | | | | | | | |

(*) with lifting forces
(+) without lifting forces

## 3. DRAWBAR PERFORMANCE

Date of tests: 5th-7th December 1994
Type of track: concrete
Tyre size: front: 9.5 R 20
rear: 14.9 R 28

| | Height of hitch above ground | Tyre inflaction pressure Front | Rear |
|---|---|---|---|
| Unballasted | 455 mm | 280 kPa | 160 kPa |
| Ballasted | 455 mm | 280 kPa | 160 kPa |

| Gear no. and group | Driving spead km/h | Power kW | Drawbar pull daN | Engine speed rev/min | Slip of wheels % | Specific fuel consumption g/kWh | Specific energy kWh/l | Temperature Fuel °C | Coolant °C | Engine oil °C | Atmospheric conditions Temperature °C | Relative humidity % | Pressure mbar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.1 - MAXIMUM POWER IN TESTED GEARS ( unballasted tractor) | | | | | | | | | | | | | |
| 2 Slow | 1,73 | 12,19 | 2530 | 2492 | 14,7 | 473 | 1,76 | 31 | 81 | 106 | 17,0 | 70 | 996,0 |
| 3 Slow | 2,59 | 18,11 | 2520 | 2471 | 15,1 | 399 | 2,09 | 31 | 81 | 106 | 17,0 | 70 | 996,0 |
| 1 Medium | 3,34 | 22,80 | 2461 | 2464 | 14,7 | 353 | 2,36 | 32 | 81 | 113 | 17,0 | 70 | 996,0 |
| 4 Slow | 3,89 | 25,12 | 2324 | 2457 | 14,8 | 348 | 2,40 | 32 | 82 | 113 | 17,0 | 70 | 996,0 |
| 2 Medium | 5,11 | 32,54 | 2295 | 2442 | 14,7 | 320 | 2,61 | 33 | 82 | 112 | 17,0 | 70 | 996,0 |
| 3 Medium | 7,90 | 48,01 | 2187 | 2370 | 10,1 | 300 | 2,79 | 34 | 83 | 109 | 17,0 | 70 | 996,0 |
| 1 High | 10,67 | 48,83 | 1648 | 2367 | 5,5 | 294 | 2,84 | 34 | 83 | 108 | 17,0 | 70 | 996,0 |
| 4 Medium | 12,63 | 48,16 | 1373 | 2352 | 4,3 | 305 | 2,74 | 35 | 83 | 106 | 17,0 | 70 | 996,0 |
| 3.2 - MAXIMUM POWER IN TESTED GEARS (ballasted tractor) | | | | | | | | | | | | | |
| 1 Creeper | 0,38 | 2,65 | 2530 | 2521 | 15,0 | - | - | 30 | 80 | 110 | 14,0 | 65 | 995,0 |
| 2 Creeper | 0,58 | 4,10 | 2530 | 2515 | 15,0 | - | - | 30 | 80 | 109 | 14,0 | 65 | 995,0 |
| 3 Creeper | 0,88 | 6,17 | 2530 | 2508 | 14,8 | - | - | 31 | 80 | 110 | 14,0 | 65 | 995,0 |
| 1 Slow | 1,12 | 7,85 | 2520 | 2493 | 14,9 | - | - | 31 | 81 | 108 | 14,0 | 65 | 995,0 |
| 4 Creeper | 1,31 | 9,23 | 2530 | 2487 | 14,8 | - | - | 32 | 81 | 106 | 14,0 | 65 | 995,0 |
| 2 Slow | 1,72 | 12,12 | 2530 | 2480 | 14,7 | - | - | 32 | 81 | 107 | 14,0 | 65 | 995,0 |
| 3 Slow | 2,59 | 18,11 | 2520 | 2471 | 15,1 | 399 | 2,09 | 33 | 81 | 110 | 14,0 | 65 | 995,0 |
| 1 Medium | 3,38 | 23,19 | 2471 | 2464 | 13,5 | 347 | 2,40 | 33 | 82 | 112 | 14,0 | 65 | 995,0 |
| 4 Slow | 4,05 | 26,81 | 2383 | 2461 | 11,5 | 335 | 2,49 | 34 | 82 | 113 | 14,0 | 65 | 995,0 |
| 2 Medium | 5,42 | 35,43 | 2354 | 2447 | 9,6 | 293 | 2,65 | 34 | 82 | 113 | 14,0 | 65 | 995,0 |
| 3 Medium | 8,15 | 48,15 | 2128 | 2366 | 7,1 | 290 | 2,88 | 35 | 82 | 114 | 14,0 | 65 | 995,0 |
| 1 High | 10,75 | 48,32 | 1618 | 2367 | 4,8 | 287 | 2,91 | 35 | 82 | 113 | 14,0 | 65 | 995,0 |
| 4 Medium | 12,63 | 47,82 | 1363 | 2352 | 4,3 | 288 | 2,90 | 36 | 82 | 113 | 14,0 | 65 | 995,0 |
| 3.3.1 - FIVE HOUR TEST at 75% of pull at maximum power | | | | | | | | | | | | | |
| 3 Medium | 8,65 | 37,70 | 1569 | 2451 | 4,8 | 299 | 2,80 | 35 | 84 | 110 | 15,0 | 80 | 995,0 |
| 3.3.2 - FIVE HOUR TEST at pull corresponding to 15% wheelslip - with 150 kg as addictional ballast | | | | | | | | | | | | | |
| 2 Medium | 4,89 | 34,34 | 2530 | 2430 | - | - | - | 36 | 84 | 113 | 15,0 | 75 | 994,0 |

Oil consumption during ten hours tests 3.3.1 and 3.3.2: 55 g/h
Tests 3.3.2 was carried out with additional ballast; so. the not quoted figures are irrelevant.

## 4. TURNING AREA AND TURNIG CIRCLE (front wheel disengaged)

Wheel equipment: front: 9.5 R 20 8 ply rear: 14.9 R 28 128 A8
Track width: front: 1210 rear: 1180

| | With brakes | | Without brakes | |
|---|---|---|---|---|
| | Right-hand m | Left-hand m | Right-hand m | Left-hand m |
| Radius of turning area | 3.86 | 3.91 | 3.95 | 4.05 |
| Radius of turning circle | 3.73 | 3.78 | 4.08 | 4.18 |

## 5. LOCATION OF CENTRE OF GRAVITY

| | |
|---|---|
| Height above ground | 670 mm |
| Distance forward from the vertical plane containing the axis of the rear wheels | 819 mm |
| Distance from the median plane of the tractor | 0 mm |

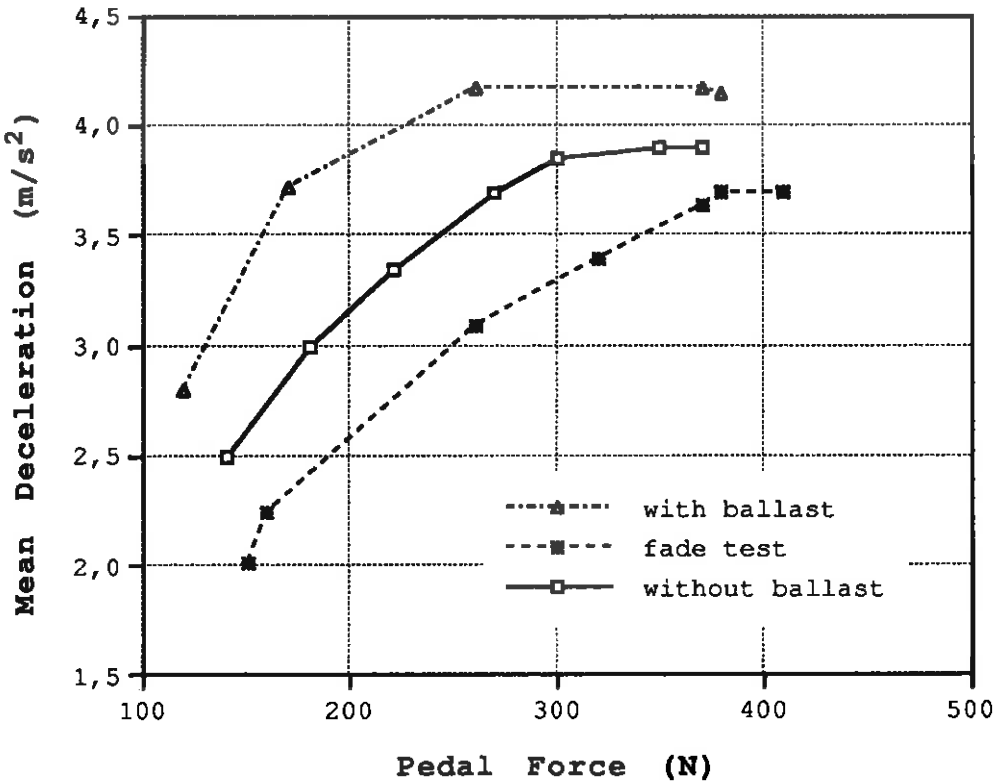
## 6. BRAKING

- Date of tests: 13th December 1994
- Type of track: asphalt
- Type of decelerometer: PEISELER
- Tractor masses during test (*)

| | front axle kg | rear axle kg | total kg |
|---|---|---|---|
| Ballasted | 1165 | 1620 | 2785 |
| Unballasted | 1050 | 1630 | 2680 |

(*) tractor carring a driver and the decelerometer (85 kg)

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



Cold service braking device test

| | Ballasted tractor | Unballasted tractor |
|---|---|---|
| Speed before application of brakes (km/h) | 42.0 | 42.0 |

Fade test

- Maximum deviation of the tractor from its original course: none
- Abnormal vibration: none
- Brake heating method: by means of towing the tractor for 1 km at 33.6km/h with a towing force of 2.72 kN

6.3 **Parking braking device test**

| | Uphill | Downhill |
|---|---|---|
| Braking device control force | 14.70 daN | 14.60 daN |

7. **MEASUREMENT OF EXTERNAL NOISE LEVEL**

- Date of tests: 5th December 1994 - I.M.A. - TORINO
- Sound level meter:
  - . make: BRUEL & KJAER
  - . model: 2209
  - . type: impulse precision
- Type of track: concrete
- Gear number: 4 High
- Travelling speed before acceleration: 31.5 km/h

LAMBORGHINI 880 F PLUS VDT

- Sound level: 87.0 dB(A)

HÜRLIMANN 481 XF VDT

- Sound level: 86.5 dB(A)

8. **REPAIRS** = none

9. **REMARKS** = none

The Responsible of Homologation

R. MARENGO

The Director

S. POTECCHI

Torino, 23rd December 1994

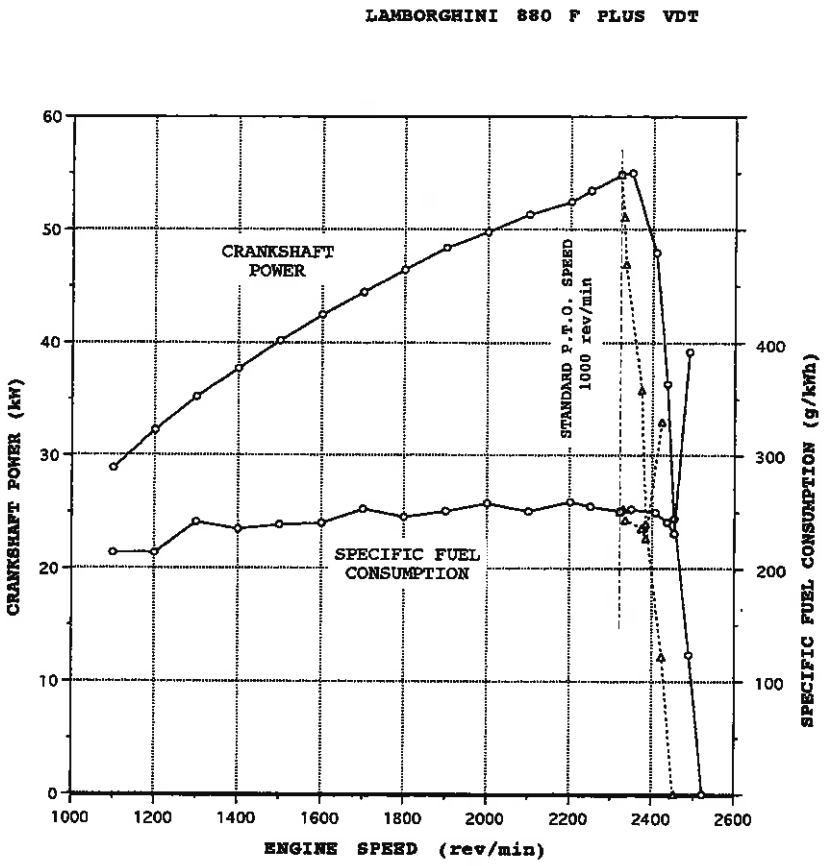



Fig. 1 - POWER-TAKE-OFF TEST

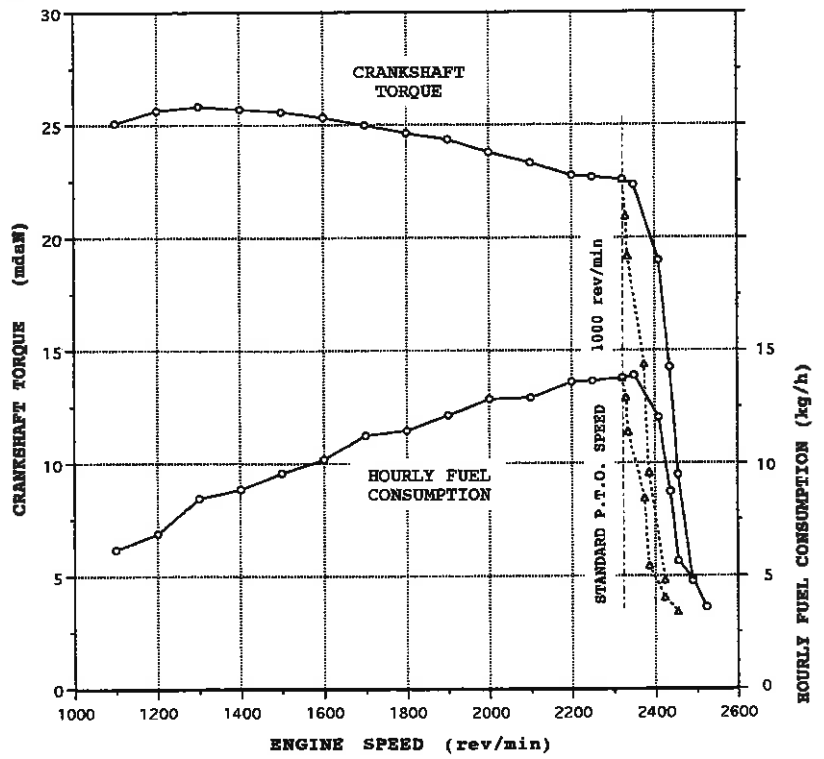



Fig. 2 - POWER-TAKE-OFF TEST

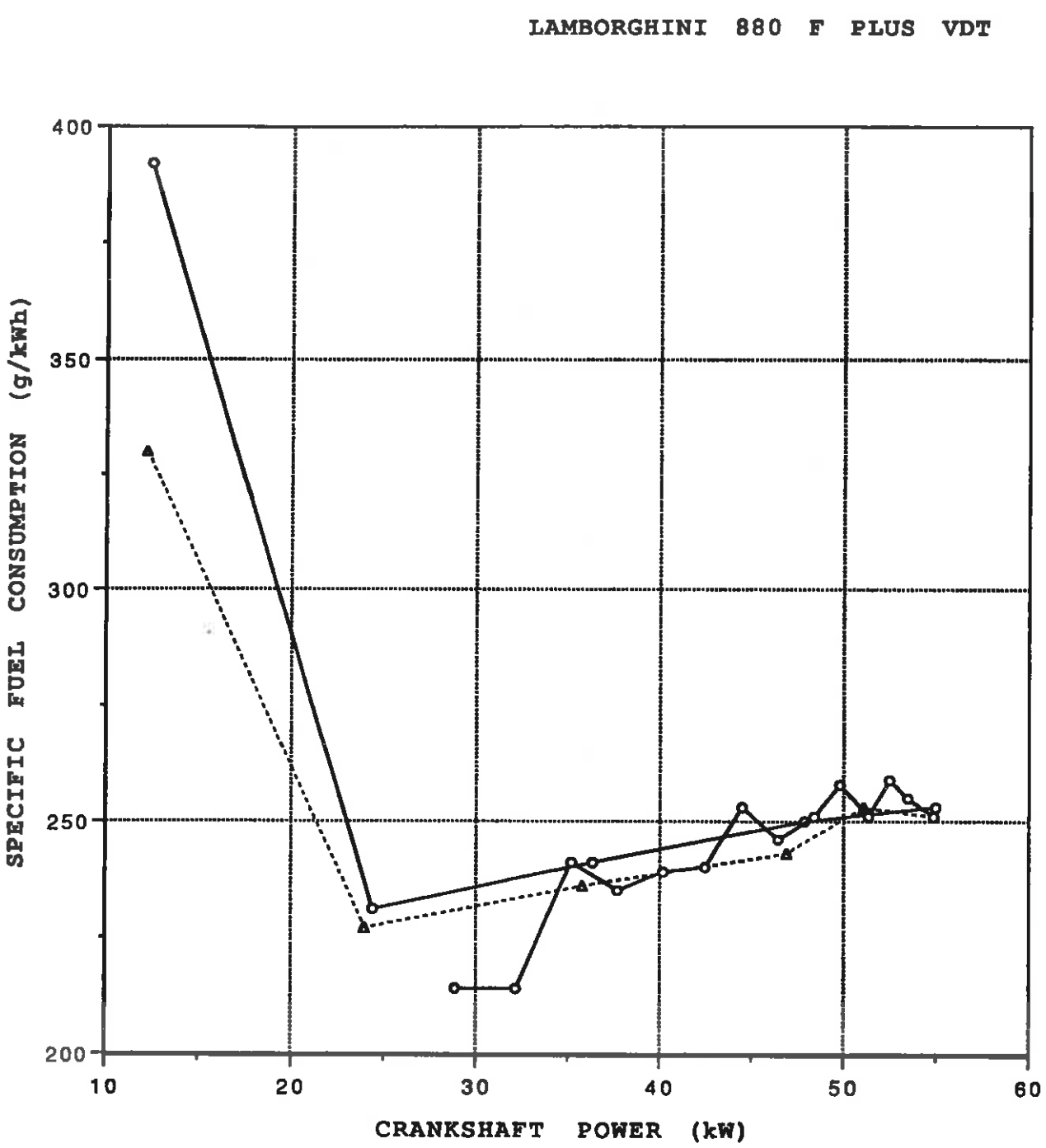



Fig. 3 - POWER-TAKE-OFF TEST