COMITATO DI COORDINAMENTO PER L'OMOLOGAZIONE
DELLE MACCHINE AGRICOLE IN ITALIA

**REPORT No. 271/O.E.C.D.**

REPORT ON TEST IN ACCORDANCE WITH O.E.C.D. TEST CODE
FOR AGRICULTURAL TRACTORS

# FIAT 550/8 DIESEL TRACTOR

*Manufactured by*: FIAT S. p. A.
Torino, Italy




*Date of Tests:* January 1968 - June 1969
*Test No.:* 266/O.E.C.D.

*This report has been approved by the O. E. C. D. Coordinating Center (C.N.E.E.M.A., France) as beeing in accordance with the O. E. C. D. Tractor Test Code*
*Date of approval: 4 November, 1969* *Serial No.: 285*

CONSIGLIO NAZIONALE DELLE RICERCHE
LABORATORIO PER LA MECCANIZZAZIONE AGRICOLA
TORINO - ITALY

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

## TABLE OF CONTENTS


| | PAGE |
|---|---|
| Specification of tractor | 2 |
| Fuels and lubricants used in tests | 5 |
| **Compulsory tests** | |
| Power take-off performance | 6 |
| Drawbar performance | 7 |
| Turning space and turning circle | 8 |
| Location of centre of gravity | 8 |
| Braking | 8 |
| Measurement of ambient noise emitted by the tractor | 9 |
| Noise measurement at the driver's ear level | 9 |
| Power lift and hydraulic pump performance | 9 |
| **Optional tests** | |
| None | |


## PERFORMANCE CURVES


| | FIG. NO. |
|---|---|
| Power take-off test | |
| Curves of power take-off horsepower, equivalent crankshaft torque and specific fuel consumption/engine speed | 1 |
| Curves of specific fuel consumption/power take-off horsepower | 2 |
| Drawbar test with ballast | |
| Curves of drawbar horsepower and wheelslip/drawbar pull | 3 |
| Curves of travel speed and specific fuel consumption/drawbar pull | 4 |
| Drawbar test without ballast | |
| Curves of drawbar horsepower and wheelslip/drawbar pull | 5 |

| | |
|---|---|
| Manufacturer: | FIAT Spa - TORINO - Italy |
| Submitted for test by: | The manufacturer |
| Selected by: | The manufacturer with the agreement of the testing station |
| Place of running-in: | FIAT - Centro Tecnico Trattori - TORINO - Italy |
| Duration of running-in: | engine 50 hours, p.t.o. 20 hours, transmission 30 hours |

## SPECIFICATION OF TRACTOR

| | |
|---|---|
| Make: | FIAT |
| Model: | 550/8 |
| Type: | Four wheel, rear wheel driven, unit construction |
| Serial No.: | 500001 |

### Engine:

| | |
|---|---|
| Make: | FIAT |
| Model: | 854 A |
| Type: | 4-stroke, direct injection diesel |
| Serial No.: | 000012 |
| Cylinders: | 4 cylinders, vertical, in-line, 95 mm bore x 110 mm stroke, capacity 3120 $cm^3$, compression ratio 17 : 1, overhead valves, replaceable dry cylinder liners |
| Fuel system: | Forced feed; FISPA diaphragm-type fuel pump; two CAV paper filters one of which is of a replaceable cartridge type; capacity of fuel tank 54 l. CAV distributor-type injection pump model DPA 3248810 C - A 44/1100/3/2550 serial No. R 14358; manufacturer's production setting 42 to 44 $mm^3$ per cycle at 1200 pump rev/min and 15° C. Own make injector, model EPPZ 10 F1. serial No. 2/9584; injector setting 230 $\pm$ 5 $kg/cm^2$. |
| Governor: | CAV mechanical, incorporated in fuel injection pump. Governed range of engine speed 600 to 2550 rev/min. Rated engine speed 2400 rev/min. |
| Air cleaner: | FIAT oil bath with centrifugal pre-cleaner with automatic dust unloader; oil capacity 0.650 l |
| Lubrication system: | Force feed from gear-type pump. One screen filter installed on pump suction side and one replaceable cartridge-type filter installed on pressure side to the engine. Oil capacity (engine sump) 11.6 l. Recommended oil change period: 200 h. Cartridge change period: 400 h |
| Cooling system: | Water cooled from centrifugal pump (0.5 $kg/cm^2$); thermostat for temperature control; 4-blade belt-driven fan with a diameter of 390 mm. Cooling water capacity 14 l. Visual control with thermometer |
| Starting system: | Electrical, 12 V and 4 HP Marelli type starter motor |

**Electrical system:**

| | |
|---|---|
| Voltage: | 12, negative earth |
| Alternator: | FIAT A 12 M - 124/12/42 X |
| Battery: | Marelli 6 AT 25, lead acid, capacity 136 Ah |

**Transmission:**

Clutch: Ferodo dual dry clutch, two plates both of 280 mm dia., one pedal operated for gearbox drive and one hand lever operated for p.t.o. drive.

Gearbox: Own make, mechanical type with sliding and constant-mesh gears, giving 8 forward speeds and 2 reverse; it consists of 4 forward and 1 reverse speed gearbox with dual range planetary reduction unit

Rear axle and final drive: Own make; crown wheel and pinion with bevel gear type differential, pedal operated differential lock; bull gear final drives

Oil capacities: Gearbox, differential and hydraulic lift 17.5 l; final drives 4.4 l each. Recommended oil change period 1600 h

| *Gear No.* | *Number of engine revolutions for one revolution of driving wheel* | *Nominal travelling speed for 2400 rev/min rated speed of engine, km/h* |
|---|---|---|
| 1 | 256.122 | 2.25 |
| 2 | 170.159 | 3.39 |
| 3 | 116.208 | 4.96 |
| 4 | 89.959 | 6.41 |
| 5 | 71.144 | 8.11 |
| 6 | 47.268 | 12.20 |
| 7 | 32.279 | 17.87 |
| 8 | 24.990 | 23.08 |
| R. Low | 178.198 | 3.24 |
| R. High | 49.520 | 11.65 |

**Power take-off:** In centre-line at rear of tractor; it can work two ways: fully independent or proportional to ground-speed; manually engaged. 34.9 mm (1 3/8") dia 6-spline according to ISO standard. Height above ground 580 mm. Proportional engine speed: 659 rev/min at 2400 rev/min rated engine speed; 540 rev/min at 1970 rev/min engine speed. Direction of rotation: clockwise viewed from tractor rear. Proportional ground speed: 1 revolution of p.t.o. shaft for approximately 0.24 m of travel. Number of p.t.o. revolutions for one revolution of driving wheel 16.65

**Belt pulley:**

Location: At rear of tractor, driven from p.t.o. clutch trough bevel gears; two alternative positions: on right side or on left side of p.t.o.

Diameter/width: 250 mm/150 mm

Speed: 1248 rev/min at 2400 rev/min rated engine speed giving 973 m/min linear speed. Engine speed at 945 m/min standard belt speed: 2330 rev/min

Direction of rotation: Clockwise viewed from tractor right side with pulley on right side of p.t.o.: opposite direction of rotation by reversing pulley unit

**Power lift:** Own make, fully independent hydraulic, gear-type pump; max. working pressure 170 kg/cm². Category 1 and 2 implement linkage, controls for draught and position. Oil capacity (uses transmission oil) 17.5 litres. Max vertical lift: 700 mm (from 90 mm above ground). Minimum vertical lift: 530 mm (from 360 mm above ground).

**Drawbar:** Swinging with clevis end, sliding on drilled guide. Radius of swing: 4 positions, from 495 to 685 mm. Vertical height to centre of clevis: 4 positions from 300 to 460 mm; adjustments are obtained with vertical movements of the drilled guide and inversion of the drawbar. Drawbar hole: 29 mm dia.; distance behind rear axle: 580 to 770 mm; position relative to p.t.o.: from 120 to 280 mm below, 356 to 546 mm to rear (horizontal line). Lateral adjustment: 4 positions from 250 to 345 mm.

**Hitch:** Clevis type; adjustable height through drilled guides. Height above ground to centre of clevis: 4 positions, 390 to 810 mm. Hitch hole: 29 mm dia.; distance from rear axle 300 mm; position relative to p.t.o.: 230 mm above, 190 below, 60 mm to rear (horizontal line)

**Steering:** Own make, worm gear mechanical type, steering wheel control

**Brakes:** Own make, band type with drums fixed to differential half-shafts; dual control through independent or combined foot pedal. Parking brake hand-lever operated with ratchet and pawl

**Wheels:**

Steering wheels: Two at front; Pirelli « Tractor » tyres 6.00-16, 4 ply rating. Maximum permissible weight on each tyre 560 kg at 2.50 kg/cm². Track width 1320 mm, by 8 steps to 2020 mm obtained by extending front axle and reversing wheel discs.

Driving wheels: Two at rear; Pirelli « Tractor cinturato » tyres 14.9/13-28, 6 ply rating. Maximum permissible weight on each tyre 1690 kg at 130 kg/cm², W13-28" rims. Track width 1400 mm by 7 steps to 2000 mm obtained by reversing wheel centres and offset lug type rims.

Wheelbase: 2070 mm

**Tractor and ballast weights**
(without driver but with tanks full)

Weight without ballast

| | |
|---|---|
| Front: | 770 kg |
| Rear: | 1210 kg |
| Total: | 1980 kg |

Ballast

| | |
|---|---|
| Front: | Weights—1 per wheel, total 70 kg. Liquid—nil |
| Rear: | Weights—6 per wheel, total 670 kg. Liquid—320 kg |
| Additional: | 7 front frame weights, total 230 kg |

Weight with ballast

| | |
|---|---|
| Front: | 1100 kg |
| Rear: | 2170 kg |
| Total: | 3270 kg |

**Seat:** Own make; parallelogram suspension with rubber lined coil spring; range of adjustment 25 mm fore and aft in median plane of tractor

**Number of grease points**

Whole tractor: 16

**Overall dimensions**

Overall length:
— without front weights: with hydraulic lift installed 3.40 m
— without front weights: without hydraulic lift installed 3.17 m
— with front weights: with hydraulic lift installed 3.72 m
— with front weights: without hydraulic lift installed 3.49 m

Overall width:
— without ballast weights 1.69 m to 2.39 m
— with ballast weights 2.10 m to 3.00 m

Overall height: — to top of steering wheel 1.52 m

Minimum ground clearance:
— to underside of front axle 0.42 m
— to underside of drawbar 0.20 m

**Lighting**

| | *Height above ground of centre* cm | *Size* cm | *Distance from outside edge of tractor to centre* cm |
|---|---|---|---|
| Headlights | 95.5 | 13 dia. | 49.5 |
| Side lights | 95.5 | 13 dia. | 49.5 |
| Rear lights | 125.0 | 7×5 | 41.0 |
| Reflectors | 114.0 | 5.5 dia. | 39.5 |

## FUELS AND LUBRICANTS USED IN TESTS

**Laboratory tests:**

| | |
|---|---|
| Fuel: | Diesel oil, density 0.831 kg/l at 15° C, Cetane No. not recorded |
| Engine oil: | FIAT AMBRA, viscosity SAE 20 W-40 |
| Transmission oil: | FIAT AMBRA, viscosity SAE 20 W-40 |

**Track tests:**

| | |
|---|---|
| Fuel: | Diesel oil, density 0.831 kg/l at 15° C, Cetane No. not recorded |
| Engine oil: | FIAT AMBRA, viscosity SAE 20 W-40 |
| Transmission oil: | FIAT AMBRA, viscosity SAE 20 W-40 |

## COMPULSORY TESTS

### 1. Power take-off performance:

Date and location of tests: 23th January, 1968 - L.M.A. - Torino, Italy

Type of dynamometer: Electrical, swinging frame

| *Horse power* | *Speeds* | | *Fuel consumption* | | |
|---|---|---|---|---|---|
| | *Engine* | *P.T.O.* | *Per hour* | *Specific* | *HP hours/unit of volume* |
| *metric hp* | *rev/min* | *rev/min* | *l/h* | *g/metric hp h* | *metric hp h/l* |
| A. Maximum power: 2 hour test | | | | | |
| 51.44 | 2400 | 659 | 12.27 | 198 | 4.19 |
| B. Standard p.t.o. speed (540 rev/min) | | | | | |
| 47.73 | 1967 | 540 | 10.59 | 184 | 4.51 |
| C. Manufacturer recommended speed for drawbar work | | | | | |
| 51.44 | 2400 | 659 | 12.27 | 198 | 4.19 |
| D. Part loads | | | | | |
| 45.38 | 2492 | 684 | 10.97 | 201 | 4.14 |
| — | 2547 | — | 4.04 | — | — |
| 22.99 | 2523 | 693 | 6.93 | 251 | 3.32 |
| 51.44 | 2400 | 659 | 12.27 | 198 | 4.19 |
| 11.54 | 2535 | 696 | 5.20 | 374 | 2.22 |
| 34.34 | 2513 | 690 | 8.90 | 215 | 3.86 |

No load, maximum engine speed: 2547 rev/min

Equivalent crankshaft torque at maximum power: 15.35 mkg

Maximum equivalent crankshaft torque: 19.00 mkg at 1200 rev/min engine speed

Mean atmospheric conditions: temperature 17.0° C
pressure 747.8 mm Hg
relative humidity 75%

Maximum temperature: coolant 90° C
engine oil 119° C
fuel 18° C

## 2. Drawbar performance:

Date of tests: 23rd July, 5th and 9th September, 1968
Type of track: Concrete
Height of drawbar above ground: 680 mm

| Gear No. | Horse-power, metric hp | Drawbar pull, kg | Travelling speed, km/h | Engine speed, rev/min | Wheelslip, % | Fuel consumption | | Temperature °C | | | Atmospheric conditions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | specific g/hph | metric drawbar hp h/l hph/l | Fuel | Coolant | Engine oil | Temperature, °C | Relative humidity, % | Pressure, mmHg |
| 1 - Maximum power (ballasted) | | | | | | | | | | | | | |
| 1 | 19.00 | 2565 | 2.00 | 2493 | 14.9 | 329 | 2.53 | 85 | 35 | 110 | 19.8 | 75 | 746.2 |
| 2 | 28.27 | 2544 | 3.00 | 2475 | 14.2 | 294 | 2.82 | 85 | 35 | 112 | 19.8 | 75 | 746.2 |
| 3 | 41.39 | 2563 | 4.36 | 2435 | 13.6 | 243 | 4.11 | 88 | 35 | 112 | 21.5 | 70 | 746.0 |
| 4 | 44.59 | 2000 | 6.02 | 2396 | 6.1 | 227 | 4.41 | 88 | 37 | 114 | 24.2 | 55 | 744.0 |
| 5 | 46.17 | 1594 | 7.82 | 2427 | 4.7 | 222 | 4.51 | 88 | 37 | 114 | 23.0 | 59 | 743.8 |
| 6 | 45.99 | 1046 | 11.87 | 2407 | 3.1 | 221 | 4.52 | 88 | 37 | 114 | 22.6 | 63 | 743.5 |
| 2 - Five-hour test at 75% of pull at maximum power | | | | | | | | | | | | | |
| 5 | 35.87 | 1200 | 8.07 | 2467 | 3.1 | 238 | 3.50 | 88 | 40 | 115 | 15.0 | 70 | 745.5 |
| 3 - Five-hour test at pull corresponding to 15% wheelslip in Test (1) | | | | | | | | | | | | | |
| 2 | 31.37 | 2390 | 3.27 | 2478 | 7.1 | 248 | 3.35 | 88 | 34 | 108 | 21.5 | 65 | 746.2 |
| 4 - Maximum power (unballasted) | | | | | | | | | | | | | |
| 3 | 30.85 | 1807 | 4.61 | 2473 | 9.6 | — | — | 86 | — | 108 | 17.0 | 85 | 748.6 |
| 4 | 39.71 | 1805 | 5.94 | 2455 | 8.7 | — | — | 86 | — | 110 | 18.5 | 75 | 748.6 |
| 5 | 46.23 | 1660 | 7.52 | 2417 | 7.0 | — | — | 88 | — | 112 | 22.0 | 66 | 748.5 |
| 6 | 46.92 | 1080 | 11.73 | 2405 | 3.7 | — | — | 88 | — | 112 | 29.2 | 54 | 748.0 |
| 7 | 46.22 | 718 | 17.38 | 2393 | 2.1 | — | — | 88 | — | 112 | 29.8 | 51 | 747.5 |

Oil consumption during ten hours duration of tests (2) and (3): 15 g/h

3 and 4. **Turning space and turning circle:**

Details of wheel equipment: As in specification, without ballast

Track of wheels: Front—1320 mm
Rear—1500 mm

| | *With brakes* | | *Without brakes* | |
|---|---|---|---|---|
| | *Right-hand* | *Left-hand* | *Right-hand* | *Left-hand* |
| Radius of turning space, m | 3.13 | 3.16 | 3.50 | 3.54 |
| Radius of turning circle, m | 3.03 | 3.06 | 3.40 | 3.44 |

5. **Location of centre of gravity:**

| | *mm* |
|---|---|
| Height above ground | 711 |
| Distance forward from the vertical plane containing the axis of the rear wheels | 776 |
| Distance from the median plane of the tractor | 0 |

6. **Braking:**

Date of test: 4th July, 1969

Type of track: Concrete

*Cold brakes*

| | | *Tractor without ballast* | *Tractor ballasted* |
|---|---|---|---|
| Travelling speed of tractor, | km/h | 24 | 24 |
| Maximum deceleration, | $m/s^2$ | 4.6 | 4.2 |
| Stopping distance, | m | 6.7 | 9.4 |
| Force on brake pedal, | kg | 45 | 52 |

*Brake fade characteristics* (hot tests)

Maximum deceleration hot/maximum deceleration cold × 100 = 97%

Stopping distance cold/stopping distance hot × 100 = 96%

Force on pedal cold/force on pedal hot × 100 = 100%

Efficiency of hand brake: no wheel rotation, both when pulling braked tractor forwards and backwards

Pull on hand brake: — cold 42 kg
— hot 42 kg

## 7. Measurement of ambient noise emitted by the tractor:

| | |
|---|---|
| Date of tests: | 3th July, 1969 |
| Type of sound level meter: | ELIT type 905 |
| Type of track: | Concrete |
| Results of tests: | gear 8th<br>travelling speed 23.5 km/h<br>sound level 84 dBA |

## 8. Noise measurements at the driver's ear level:

| | |
|---|---|
| Date of tests: | 3th July, 1969 |
| Type of sound level meter and octave filter: | ELIT types 905 and 955 |
| Type of track: | Concrete |
| Type of frequency analyzer: | octave type, with 10 bands from 31.5 to 16,000 Hz |

**Results of tests**

| *Gear* | *Travelling speed, km/h* | *Loudness, sones* |
|---|---|---|
| 4 | 6.16 | 121 |
| 5 | 7.82 | 139 |

## 9. Power lift and hydraulic pump performance:

| | |
|---|---|
| Date and location of tests: | 11th June, 1969; L.M.A. - TORINO (Italy) |
| Hydraulic fluid: | FIAT AMBRA, viscosity: SAE 20 W/40 |

| | *Vertical movement* | *Maximum force exerted through full range* | *Pressure* | *Linkage load at which unballasted front end of tractor lifts off the ground* |
|---|---|---|---|---|
| | *mm* | *kg* | *kg/cm²* | *kg* |
| *Linkage giving maximum mechanical advantage* | | | | |
| At lower hitch points (height above ground in down position 360 mm) | 530 | 1450 | 170 | 1750 |
| On the standard frame | 620 | 1100 | 170 | 900 |
| *Linkage giving minimum mechanical advantage* | | | | |
| At lower hitch points (height above ground in down position 90 mm) | 700 | 1250 | 170 | — |
| On the standard frame | 790 | 950 | 170 | 1050 |

| | |
|---|---|
| Type of linkage lock for transport: | Hydraulic |
| Opening pressure of the relief valve: | 150 kg/cm² |
| Pump characteristics: | |
| (1) Opening pressure of relief valve: | 150 kg/cm² |
| Sustained pressure of the open relief valve: | 170 kg/cm² |
| Pump delivery rate: | |
| (2) at minimum pressure (rated engine speed): | 21.8 l/min |
| (3) at maximum hydraulic power (rated engine speed): | 20.6 l/min |
| delivery pressure: | 150 kg/cm² |
| power: | 6.9 metric hp |

10. **Remarks:**

Optional: the tractor may be equipped with
1) BOSCH injection pump, type EP/VA 4/110H 1200 AL 136,
2) LUK dual dry plate clutch.

Officer in charge: Ing. R. Gioia

Head of L.M.A.: Doct. L. Lisa

Date: 7th July, 1969

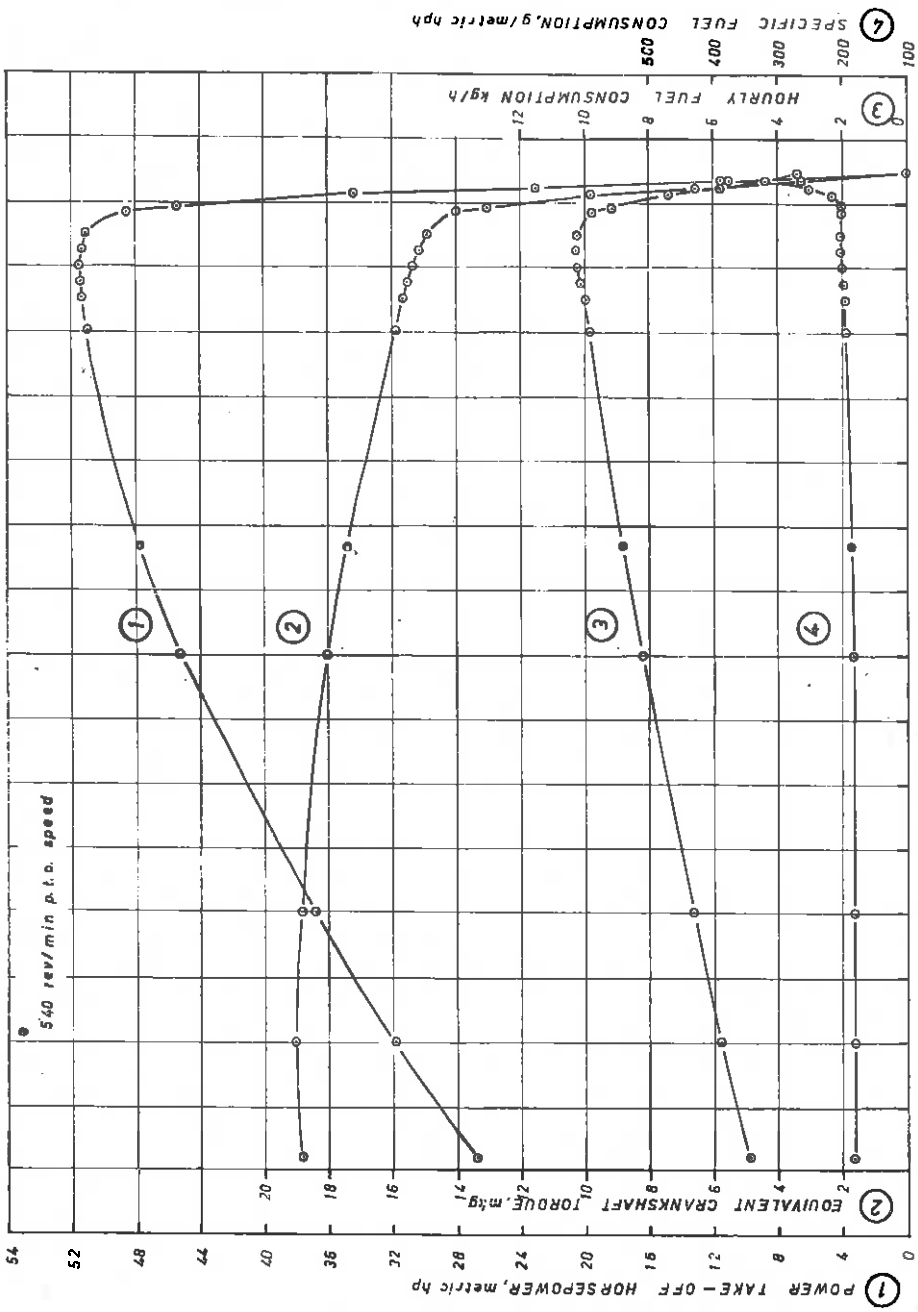



FIG. 1. Power take-off test

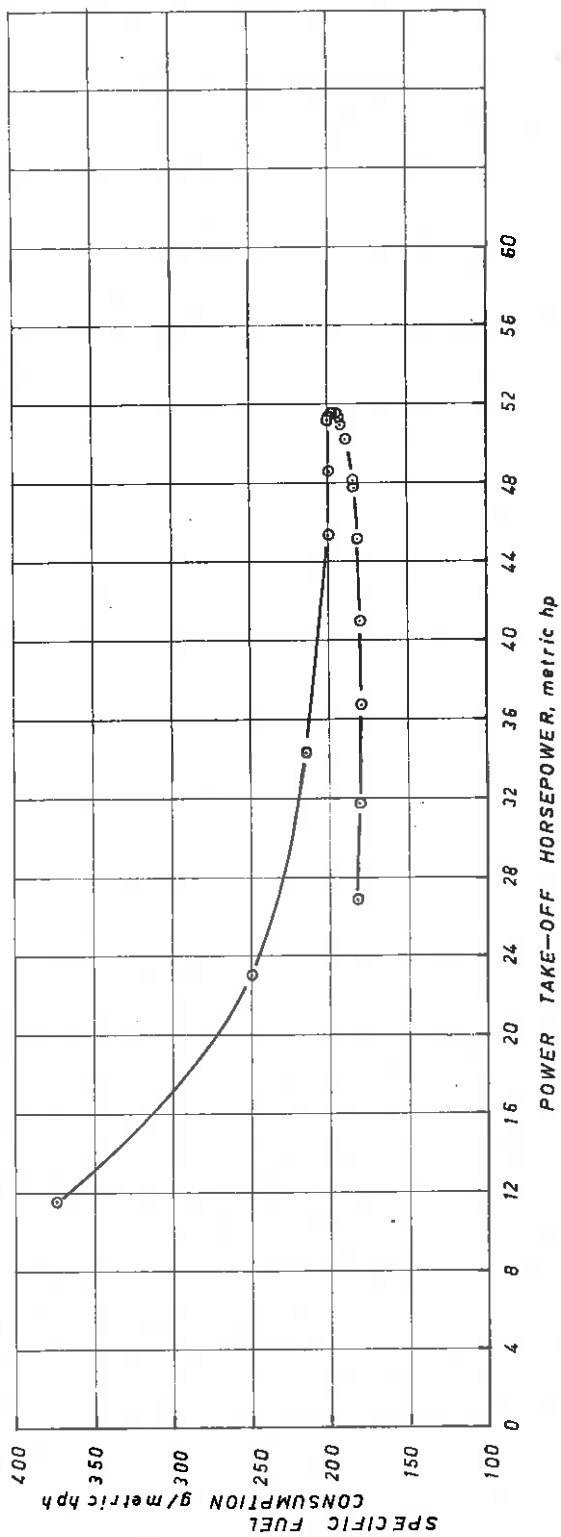



Fig. 2. Power take-off test

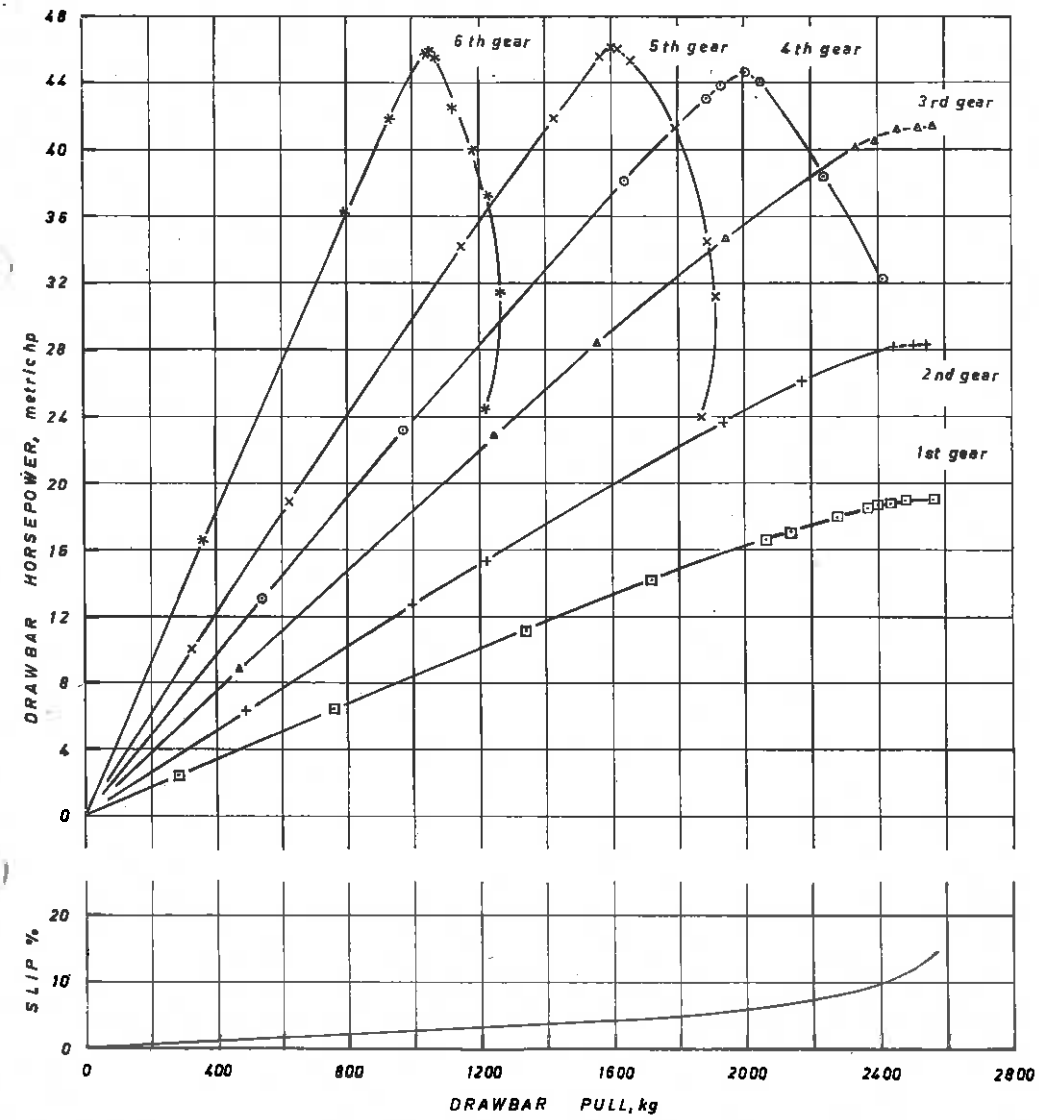



FIG. 3. Drawbar test on concrete, with ballast

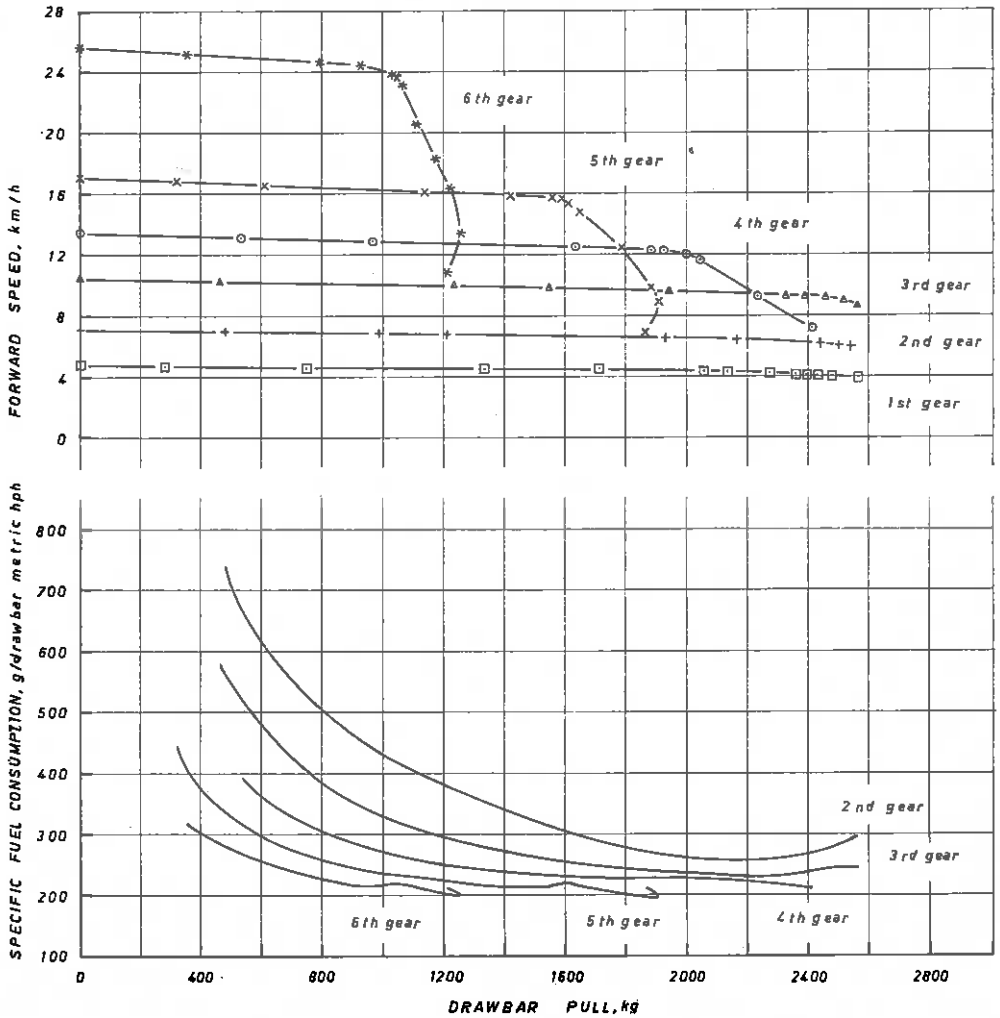



FIG. 4. Drawbar test on concrete, with ballast

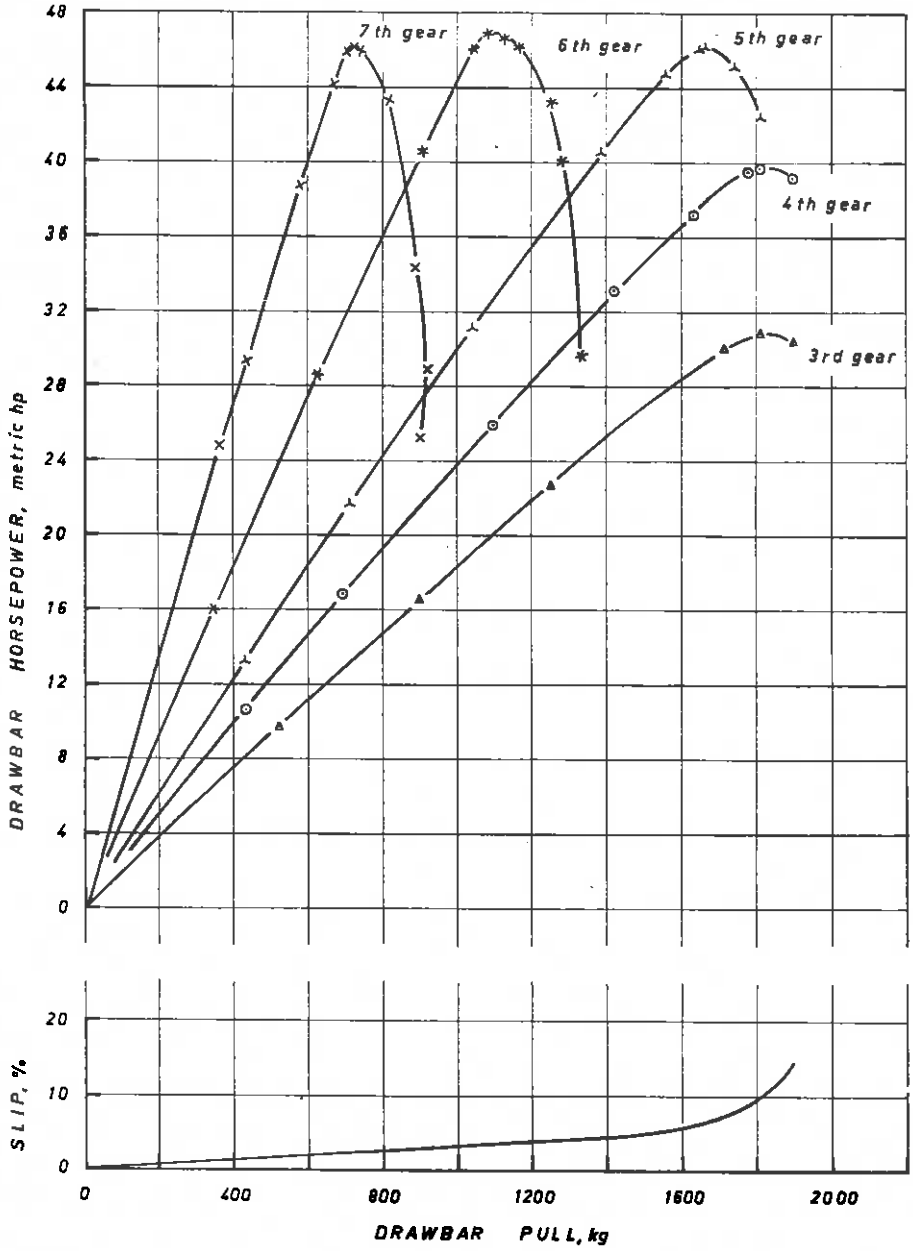



FIG. 5. Drawbar test on concrete, without ballast

CONSIGLIO NAZIONALE DELLE RICERCHE - ROMA
LABORATORIO PER LA MECCANIZZAZIONE AGRICOLA

Copyright 603.74.100 - 2000 - S.A.N. - TORINO - Printed in Italy