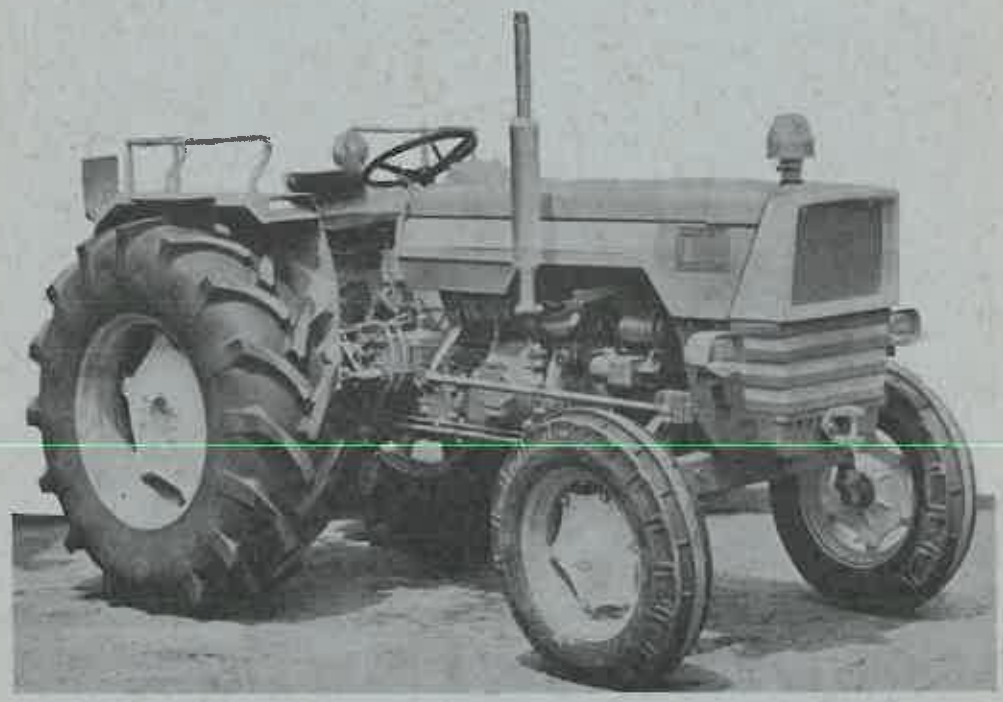
COMITATO DI COORDINAMENTO PER L'OMOLOGAZIONE
DELLE MACCHINE AGRICOLE IN ITALIA

REPORT No. 330 / O.C.S.E.

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

LANDINI R 8000 Super Special S. A.
DIESEL TRACTOR

Manufactured by: MASSEY FERGUSON LANDINI S.p.A.
works of FABBRICO (Reggio Emilia) - Italy



Date of Tests: May 1969 - January 1970

This report has been approved by the O.E.C.D. Coordinating Centre (C.N.E.E.M.A., France) as being in accordance with the O.E.C.D. Tractor Test Code

Date of approval: 10th July *Serial No.: 332*

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

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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 7

Compulsory tests

Power take-off performance 8

Drawbar performance 9

Turning space and turning circle 11

Location of centre of gravity 11

Braking 11

Measurement of ambient noise emitted by the tractor 12

Noise measurement at the driver's ear level 12

Power lift and hydraulic pump performance 13

Optional tests

Engine Test 14

PERFORMANCE CURVES

FIG. NO.

a) *Power take-off test:*

— Curves of power take-off horsepower, equivalent crankshaft torque, hourly and specific fuel consumption/engine speed 1

— Curves of specific fuel consumption/power take-off horsepower . . 2

b) *Drawbar test:*

— Curves of drawbar horsepower and wheelslip/drawbar pull (with ballast) 3

— Curves of travel speed and specific fuel consumption/drawbar pull (with ballast) 4

— Curves of drawbar horsepower and wheelslip/drawbar pull (without ballast) 5

c) *Engine test (optional):*

— Engine crankshaft horsepower and torque, hourly and specific consumption/crankshaft rev/min 6

— Specific consumption/crankshaft horsepower 7

— Constant specific consumption curves 8

SPECIFICATION OF TRACTOR

Manufacturer:	MASSEY FERGUSON LANDINI S.p.A. - Works of FABBRICO (Reggio Emilia) - Italy
Submitted for test by:	The Manufacturer
Selected by:	The Manufacturer with the agreemen of the testing station
Place of running-in:	MASSEY FERGUSON LANDINI S.p.A. - Camerlata workshop (Como), Italy
Duration of running-in:	engine 100 hours, p.t.o. 50 hours, transmission 50 hours.

Tractor:

Make:	LANDINI
Model:	R 8000 Super Special S.A.
Type:	TL 9 N/B - four wheel, rear wheel driven, unit construction
Serial No.:	1095161

Engine:

Make:	Perkins
Model:	A 4. 248
Type	4-stoke, direct injection diesel
Serial No.:	248 UA 5834
Cylinders:	4 cylinders, vertical, in-line, 101 mm bore x 127 mm stroke, capacity 4065 cm^3, compression ratio 16:1, overhead valves, replaceable dry cylinder liners.
Fuel system:	Forced feed; A.C. diaphragm-type fuel pump with sediment bowl, two replaceable cartridge type CAV paper filters. Capacity of fuel tank 86 liters. CAV injection pump, model DPA 3241100, serial No. 10930 ZJ, manufacturer's production setting 12.65 to 12.85 kg/h at 2100 rev/min engine speed and 15°C temperature. CAV injector, model BDLL, serial No. 150 S 6372; injection pressure 175 ± 5 kg/cm^2.
Governor:	CAV mechanical type governor, incorporated in fuel injection pump. Governed range of engine speed 500 to 2310 rev/min. Rated engine speed 2100 rev/min.

Air cleaner:	FISPA oil bath type with AC DELCO centrifugal precleaner; oil capacity 0.850 l
Lubrication system:	Forced feed from gear-type pump. One screen type filter installed on pump suction and one (make AC model C 341) replaceable cartridge type filter installed on the pressure line to the engine. Oil capacity (engine pump) 10.5 liters. Recommended oil change period: 100 hours. Cartridge change period: 200 hours.
Cooling system:	Water cooled from centrifugal pump (0.9 kg/cm²) with thermostatic control; 431 mm diameter, 6-blade, belt-driven fan. Cooling water capacity 19 liters. Temperature visual control with thermometer.
Starting system:	LUCAS model M 45 G electric motor, 12 V; low temperature starting device (<15°C); CAV model 375-5 thermostart.

Electrical system

Voltage:	12 V, negative to earth
Generator:	LUCAS C 40 A model
Battery:	EXIDE model TF 17/3R, lead acid, capacity 118 Ah.

Transmission

Clutch:	Own make, dual dry clutch with two 305 mm dia. plates for gearbox and p.t.o. drive, operated by a single foot pedal with progressive action.
Gearbox:	Own make, mechanical type with sliding and constant-mesh gears; 12 forward speeds and 4 reverse.
Rear axle and final drive:	Own make differential, mechanical type with Gleason crown wheel and pinion; pedal operated differential lock; bull gear final drive.
Oil capacities:	Gearbox and differential 29 liters; final drives 2 liters each. Recommended oil change period 1000 hours.

Gear No.	*Number of engine revolutions for one revolution of driving wheel*	*Nominal travelling speed at 2100 rev/min rated speed of engine km/h*
1	289.754	2.02
2	206.171	2.84
3	190.184	3.08
4	135.323	4.32
5	106.721	5.48
6	77.492	7.55
7	75.936	7.71
8	55.139	10.61
9	50.863	11.51
10	36.191	16.17
11	28.541	20.51
12	20.308	28.82
1 R.M.	190.919	3.07
2 R.M.	135.885	4.31
3 R.M.	51.059	11.46
4 R.M.	36.341	16.10

Power take-off

Main p.t.o.: In centre-line at rear of tractor; indipendent or synchronised with the gearbox; hand lever operated; 34.9 mm (1 3/8") dia., 6 spline according to ISO Standard. Height above ground 715 mm. Speeds proportional to engine speed: 600 rev/min at rated engine speed (2100 rev/min), 540 rev/min at 1890 rev/min engine speed.

Direction of rotation: clockwise viewed from tractor rear.

Proportional ground speed: approximately 0.34 m of travel per 1 revolution of p.t.o. shaft. Number of p.t.o. shaft revolutions for one revolution of driving wheels: 13.61.

Auxiliary p.t.o.: In centre-line at rear of tractor above the main p.t.o.; indipendent or synchronised with the gearbox, hand lever operated; 34.9 mm (1 3/8") dia., 6-spline according to ISO Standard. Height above ground 845 mm.

Speed proportional to engine speed: 2100 rev/min at rated engine speed (2100 rev/min). Direction of rotation anticlockwise viewed from tractor rear.

Proportional ground speed: approximately 0.096 m of travel per 1 revolution of p.t.o. shaft. Number of p.t.o. shaft revolutions for one revolution of driving wheels: 47.63.

Belt pulley

Location: At rear of tractor, driven from auxiliary p.t.o. clutch throught bevel gear; two positions: on right or on left side of auxiliary p.t.o.

Diameter/Width: 240 mm / 155 mm.

Speed: 1315 rev/min at 2100 rev/min rated engine speed giving 985 m/min linear speed.
Engine speed at 945 m/min standard belt linear speed: 2015 rev/min.

Direction of rotation: Clockwise viewed from tractor right side with pulley connected to the right side of p.t.o.; opposite direction of rotation with pulley connected to the left side p.t.o.

Power lift

Own make, hydraulic, gear-type oil pump, max working pressure: 160 kg/cm². Second category implement linkage; controls for draught and position.
Oil capacity 8.0 liters.
Max vertical lift: 710 mm (from 90 mm above ground).

Drawbar

Clevis type sliding on a drilled guide.
Vertical height to centre of clevis: 2 positions 440 and 520 mm above ground; adjustements obtained by inverting the drawbar. Drawbar hole 28.5 mm dia., distance behind rear axle: 700 mm, positions relative to p.t.o.: 205 mm and 275 mm below and 360 mm to rear (horizontal line).
Lateral adjustement: 3 position from 0 at 260 mm per each side.

Hitch

Bridge type, assembled with sector drawbar. Heghit above ground of hitch centre: 540 mm. Hicht hole: 28.5 mm dia., distance from rear axle 410 mm. Position relative to p.t.o.: 175 mm above and 70 mm to rear.

Steering

Own make, worm gear mechanical type; steering wheel control.

Brakes

GIRLING make, dual disc type fixed on the differential shafts; operated by two independent or combined foot pedals. Parking brake with hand operated lever with ratchet and pawl.

Wheels

Steering wheels: Two at front; PIRELLI « Tractor » type 7.50-20; 6 ply rating. Maximum permissible weight on each tyre: 630 kg at 1.50 kg/cm² and 850 kg at 2.50 kg/cm² pressure. Track width 1430 mm by 5 steps to 1830 mm obtained by extending front axle.

Driving wheels:	Two at rear; PIRELLI « Tractor cinturato » tyres 18.4/15-30 6 ply rating. Maximum permissible weight on each tyre: 2300 kg at 1.10 kg/cm² pressure; W 14" - 30" rim. Track width 1450 mm by 6 steps to 1950 mm obtained by changing the locking position of rims.
Wheelbase:	2170 mm

Tractor and ballast weights

(without driver but with tanks full)

Weight without ballast:

Front:	1045 kg
Rear:	1675 kg
Total:	2720 kg

Ballast:

Front:	Weight: one for each wheel, total 120 kg, no liquid in the tyres	
Rear:	Weights: 4 per each wheel, total	480 kg
	Liquid in tyres:	620 kg
Additional:	8 front frame weights, total	250 kg

Weight with ballast:

Front:	1470 kg
Rear:	2720 kg
Total:	4190 kg

Seat:

Own make; adjusting type with rubber foam cushion; longitudinal adjustment: 100 mm

Number of grease points:

10 points

Overall dimensions

Overall length:	— without front weights and with hydraulic lift installed: 3.68 m — without front weights and without hydraulic lift installed: 3.48 m — with front weights and with hydraulic lift installed: 3.94 m — with front weights and without hydraulic lift installed: 3.74 m
Overall width:	— without ballast weights: 1.90 m to 2.40 m — with ballast weights: 2.20 m to 2.70 m
Overall height:	— to top of steering wheel: 1.76 m; to top of exhaust pipe: 2.16 m

Minimum ground clearance: — to underside of drawbar 0.44 m

Lighting

	Height above ground of centre *cm*	*Size* *cm*	*Distance from outside edge of tractor to centre* *cm*
Headlights	104	9.5 × 15.0	46.0
Side lights	104	9.5 × 15.0	46.0
Rear lights	156	8.5 × 7.0	42.0
Reflectors	118	4.5 × 5.0	42.0

FUELS AND LUBRICANTS USED IN TESTS

Laboratory test:

Fuel: Diesel oil, density 0.831 kg/l at 15°C, cetane number not recorded

Engine oil: HDL MASSEY FERGUSON LANDINI, viscosity SAE 20

Transmission oil: L.O.T./C MASSEY FERGUSON LANDINI, viscosity SAE 90

Track test:

Fuel: Diesel oil, density 0.831 kg/l at 15°C, cetane number not recorded

Engine oil: HDL MASSEY FERGUSON LANDINI, viscosity SAE 20

Transmission oil: L.O.T./C MASSEY FERGUSON LANDINI, viscosity SAE 90

COMPULSORY TESTS

1. Power take-off performance

Date and location of test: May 28th, 1969 - 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 hph/l*
A. Maximum power: 2 hour test					
69.96	2170	620	15.52	184	4.51
B. Standard p.t.o. speed (540 rev/min)					
64.47	1890	540	14.01	181	4.60
C. Standard pulley speed (945 m/min)					
67.22	2016	576	14.73	182	4.56
D. Manufacturer recommended speed for drawbar work					
69.18	2100	600	15.23	183	4.54
E. Part loads					
60.70	2215	633	13.72	188	4.42
—	2312	—	4.33	—	—
31.12	2270	649	8.66	231	3.59
69.95	2170	620	15.52	184	4.51
15.68	2290	654	6.20	329	2.53
46.25	2250	643	11.12	200	4.16

No load maximum engine speed: 2312 rev/min

Equivalent crankshaft torque at max. power: 23.09 mkg

Maximum equivalent crankshaft torque: 26.45 mkg at 1200 rev/min engine speed

Mean atmospheric conditions:
- temperature 27.0°C
- pressure 744.0 mmHg
- relative humidity 35%

Maximum temperature:
- coolant 77 °C
- engine oil 110°C
- fuel 28.5°C

2. Drawbar performance

Date of test: October 17th - 20th, 1969

Type of track: Concrete

Height of drawbar above ground: 520 mm

Gear No.	Horse power metric hp	Drawbar pull kg	Travelling speed km/h	Engine speed rev/min	Wheelslip %	Fuel consumption: Specific g/hph	Fuel consumption: Metric drawbar hph/l	Temperature: Coolant °C	Temperature: Fuel °C	Temperature: Engine oil °C	Atmospheric conditions: Temper. °C	Atmospheric conditions: Relative humidity %	Atmospheric conditions: Pressure mmHg
1. Maximum power (ballasted)													
(*) 1	22.09	3139	1.90	2260	11.8	—	—	—	71.0	92.0	10.8	95.0	750.0
(*) 2	31.17	3188	2.64	2229	11.4	253	3.28	29.0	71.0	92.0	10.8	95.0	750.0
(*) 3	33.65	3199	2.84	2215	11.8	246	3.38	29.0	74.0	96.0	10.0	90.0	750.0
(*) 4	47.45	3187	4.02	2203	10.4	226	3.68	29.0	74.0	96.0	10.0	90.0	750.0
(*) 5	59.35	3142	5.10	2187	9.6	212	3.91	29.0	77.0	100.0	10.0	85.0	750.0
6	65.16	2400	7.33	2174	4.7	198	4.18	31.0	77.0	100.0	12.2	55.0	749.5
7	63.98	2297	7.52	2165	4.2	202	4.11	31.0	79.0	102.0	12.2	55.0	749.5
8	66.42	1716	10.45	2160	3.2	197	4.22	32.0	79.0	102.0	12.5	58.0	749.0
9	65.33	1550	11.38	2161	2.7	198	4.20	32.0	79.0	102.0	12.5	60.0	749.0
2. Five-hour test at 75% of pull at maximum power													
6	36.98	1295	7.71	2235	3.0	242	3.43	32.0	76.0	100.0	13.0	85.0	746.5
(°) 3. Five-hour test at pull corresponding to 15% wheelslip in test (1)													
2	49.47	3250	4.11	2192	7.9	—	—	—	76.0	100.0	14.5	72.0	746.5

(*) Maximum drawbar pull at 15% wheelslip 3250 kg

(°) Tractor with additional ballast

2. Drawbar performance

Date of tests: October 24th, 1969

Type of track: Concrete

Height of drawbar above ground: 520 mm

Gear	Horse power	Drawbar pull	Travelling speed	Engine speed	Wheelslip	Fuel consumption		Temperature			Atmospheric conditions		
						Specific	Metric drawbar	Coolant	Fuel	Engine oil	Temper.	Relative humidity	Pressure
No.	metric hp	kg	km/h	rev/min	%	g/hph	hph/l	°C	°C	°C	°C	%	mmHg
4. Maximum power (unballasted)													
(*) 7	57.46	2213	7.01	2185	11.6	—	—	—	74.0	100.0	10.5	90.0	757.2
8	65.02	1693	10.37	2173	4.4	—	—	—	76.0	102.0	11.0	90.0	757.2
9	64.82	1567	11.17	2160	4.0	—	—	—	76.0	102.0	12.0	80.0	757.0
10	64.26	1079	16.08	2164	2.4	—	—	—	76.0	104.0	13.5	75.0	757.0

Oil consumption during ten hours duration of tests (2) and (3): 32 g/h

(*) Maximum drawbar pull at 15% wheelslip: 2250 kg

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

Details of wheel equipment: As in specification, without ballast

Track of wheels: Front-1430 mm
Rear-1450 mm

	With brakes		*Without brakes*	
	Right-hand	*Left-hand*	*Right-hand*	*Left-hand*
Radius of turning space m	3.63	3.66	3.91	3.98
Radius of turning circle m	3.48	3.51	3.76	3.83

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

	????
Height above ground	833
Distance forward from the vertical plane containing the axis of the rear wheels	806
Distance from the median plane of the tractor	0

6. **Braking**

Date of tests: October 27th, 1969

Type of track: Concrete

Cold brakes:

	Tractor without ballast	*Tractor with ballast*
Travelling speed of tractor, Km/h	25	25
Maximum deceleration, m/s²	4.6	4.8
Stopping distance, m	8.00	7.80
Force on brake pedal, kg	15	15

Brake fade characteristics (hot tests)

Maximum deceleration hot/maximum deceleration cold	× 100 = 98%
Stopping distance cold/stopping distance hot	× 100 = 91%
Force on pedal cold/force on pedal hot	× 100 = 83%

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

Pull on handbrake:
— cold 40 kg
— hot 40 kg

7. Measurement of ambient noise emitted by the tractor

Date of tests: October 27th, 1969

Type of sound level meter: ELIT type 905

Type of track: Concrete

Results of tests:
— gear 12
— travelling speed 25.0 Km/h
— sound level: 97 dBA

8. Noise measurements at the driver's ear level

Date of tests: October 27th, 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*
6	7.45	203

9. Power lift and hydraulic pump performance

Date and location of tests: November 6th, 1969 - L.M.A. - Torino (Italy)

Hydraulic fluid: ESSTIC 65

	Vertical movement mm	*Maximum force exerted through full range* kg	*Pressure* kg/cm²	*Linkage load at which unballasted front of tractor lifts off ground* kg
Linkage giving maximum mechanical advantage				
At lower hitch points (height above ground in down position 90 mm)	710	1450	170	—
On the standard frame,	650	1250	170	1250
Linkage giving minimum mechanical advantage (Only one position is possible at the hitch points)				

Type of linkage lock for transport: hydraulic

Opening pressure of relief valve: 160 kg/cm²

Pump characteristics:

1) — opening pressure of relief valve: 160 kg/cm²

— sustained pressure of the open relief valve: 170 kg/cm²

Pump delivery rate:

2) — at minimum pressure at rated engine speed (2100 rev/min): 26.7 l/min

3) — at maximum hydraulic power (at 2100 rev/min rated engine speed): 12.7 hp

delivery pressure: 170 kg/cm²

delivery rate: 25.5 l/min

OPTIONAL TESTS

10. Engine tests

Date and location of tests: May 18th, 1969 - L.M.A. - Torino (Italy)

Type of dynamometer: Electrical, swinging frame

Horsepower	*Engine speeds*	*Fuel consumption*		
		Per hour	*Specific*	*HP hours/unit of volume*
metric hp	*rev/min*	*l/h*	*g/metric hph*	*metric hph/l*
A. - Maximum power: 2 hour test				
74.54	2170	15.63	174	4.77
B - Standard p.t.o. speed (540 rev/min)				
68.35	1890	14.27	172	4.80
C - Standard pulley speed (945 m/min)				
71.50	2016	14.92	173	4.79
D - Manufacturer recommended speed for drawbar work				
73.60	2100	15.32	173	4.80
E - Part loads				
64.52	2210	14.80	175	4.36
2.58	2310	4.48	1442	0.58
33.15	2270	8.80	217	3.88
74.54	2170	15.63	174	4.77
16.72	2290	6.33	309	2.64
49.15	2245	11.10	186	4.43

No load, maximum engine speed: 2314 rev/min

Crankshaft torque at max. power: 24.60 mkg

Maximum equivalent crankshaft torque: 28.10 mkg at 1200 rev/min engine speed

Mean atmospheric conditions: temperature 15.5 °C
pressure 742.5 mmHg
relative humidity 71%

Maximum temperature: coolant 77 °C
fuel 17 °C
engine oil 110 °C

Officer in charge: R. Gioia

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

Turin, 24th March 1970

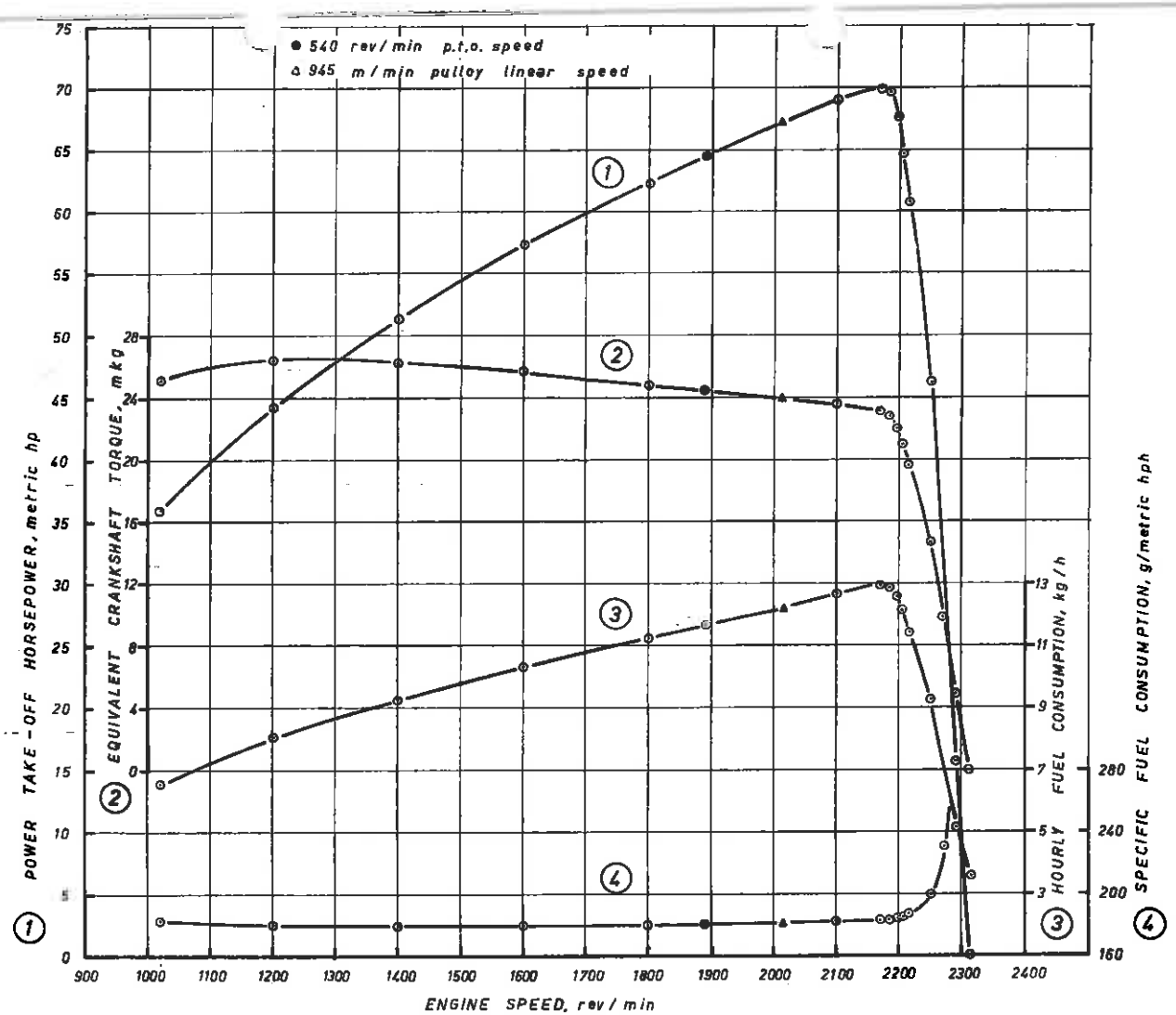


FIG. 1. Power Take-off Test

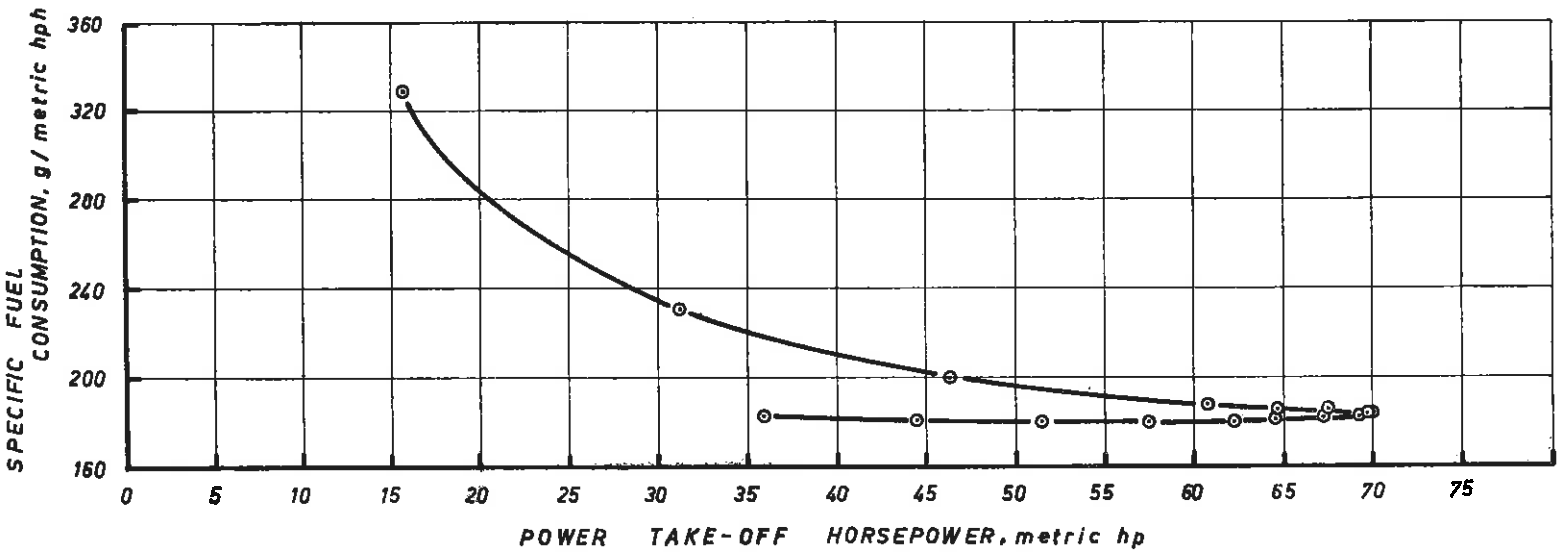


FIG. 2. Power Take-off Test

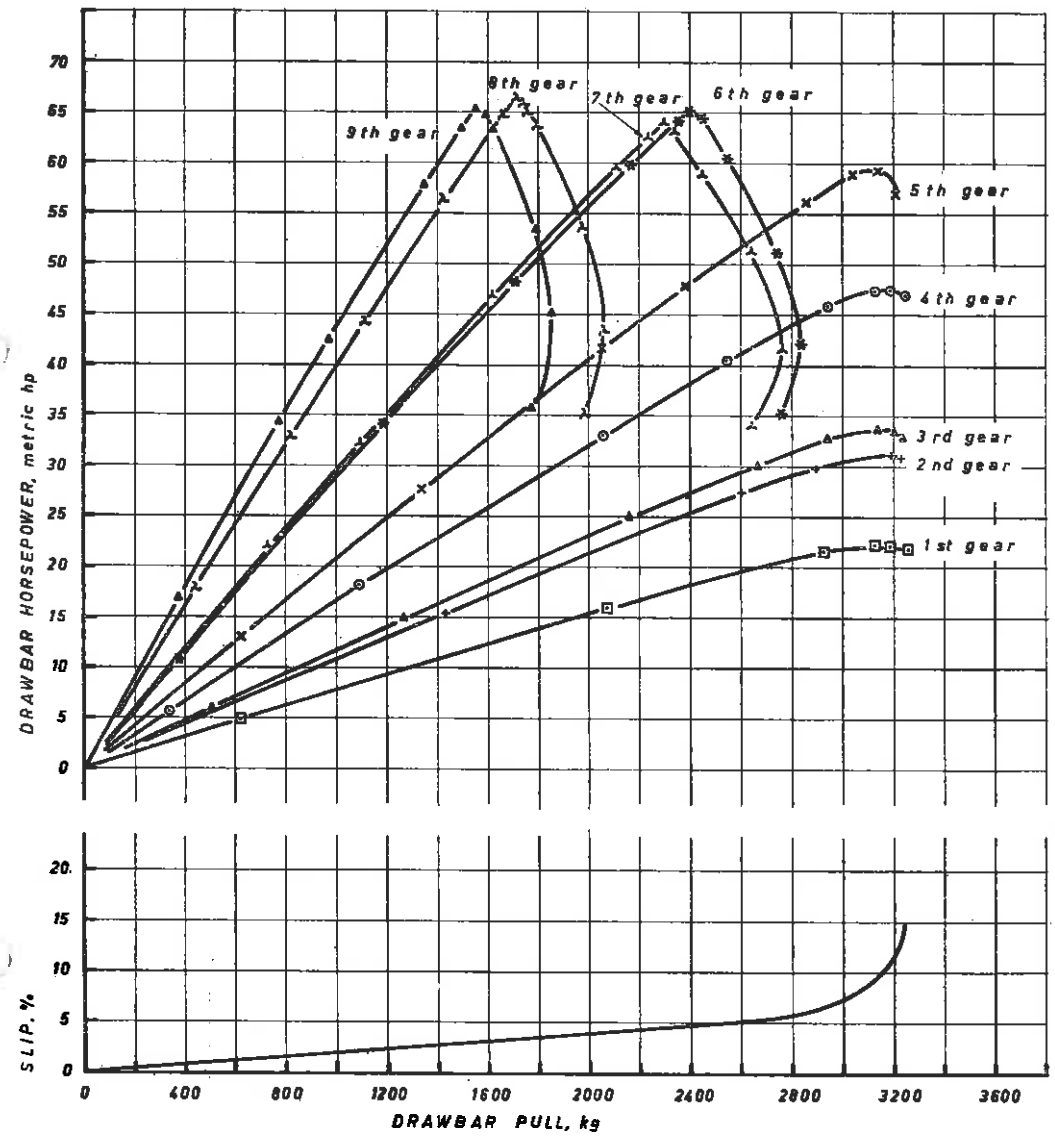


FIG. 3. **Drawbar Test on concrete, with ballast**

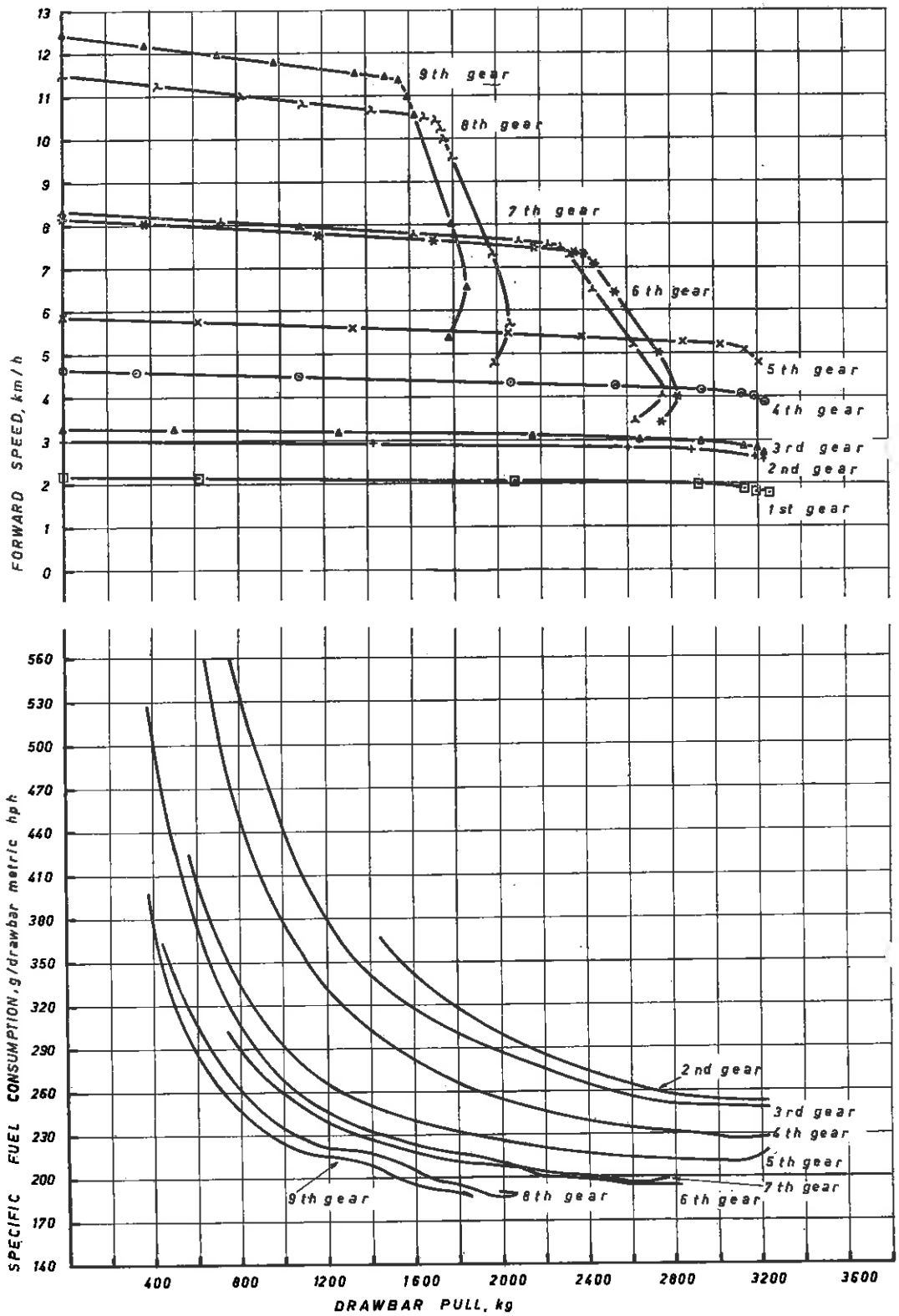


FIG. 4. Drawbar Test on concrete, with ballast

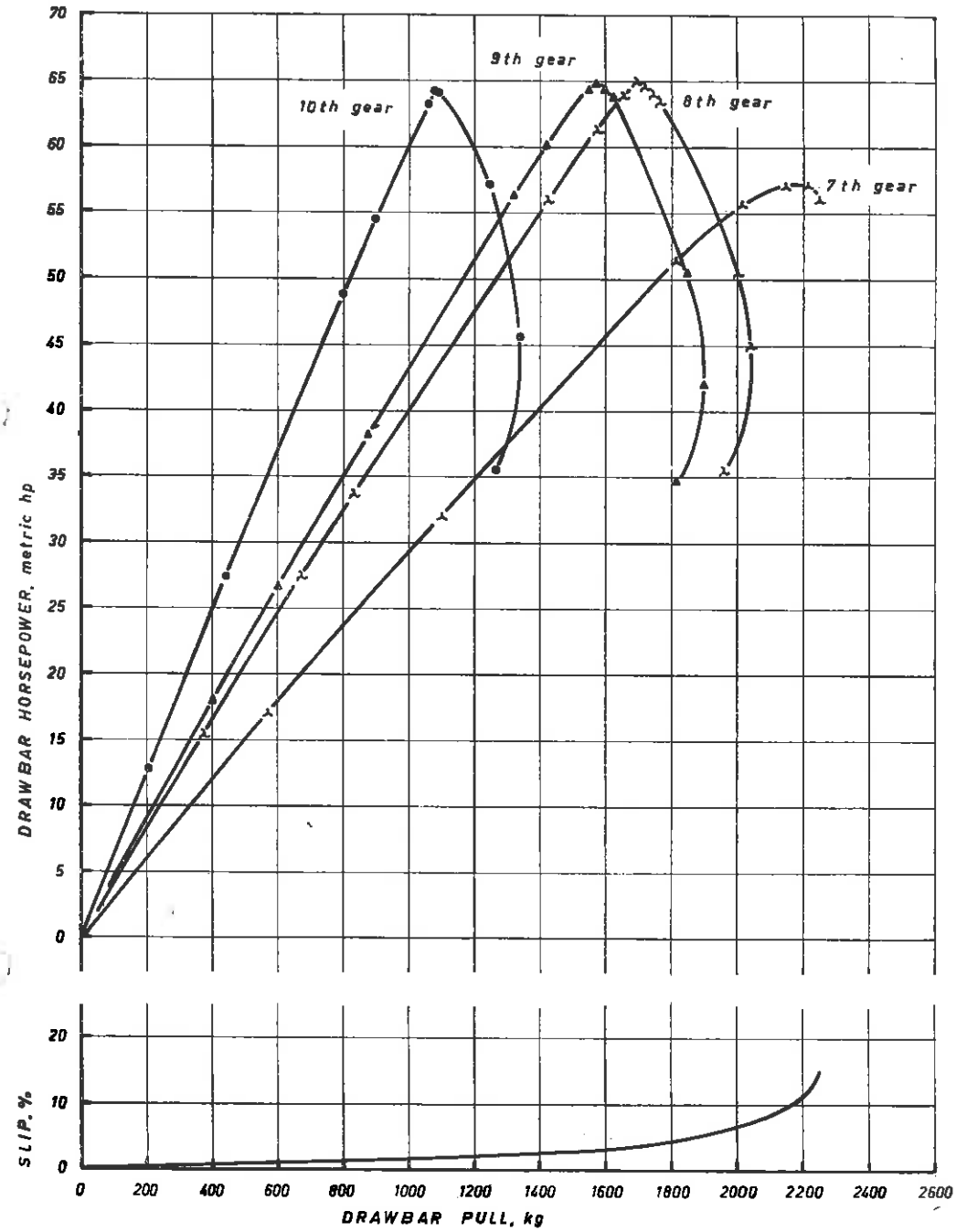


FIG. 5. Drawbar Test on concrete, without ballast

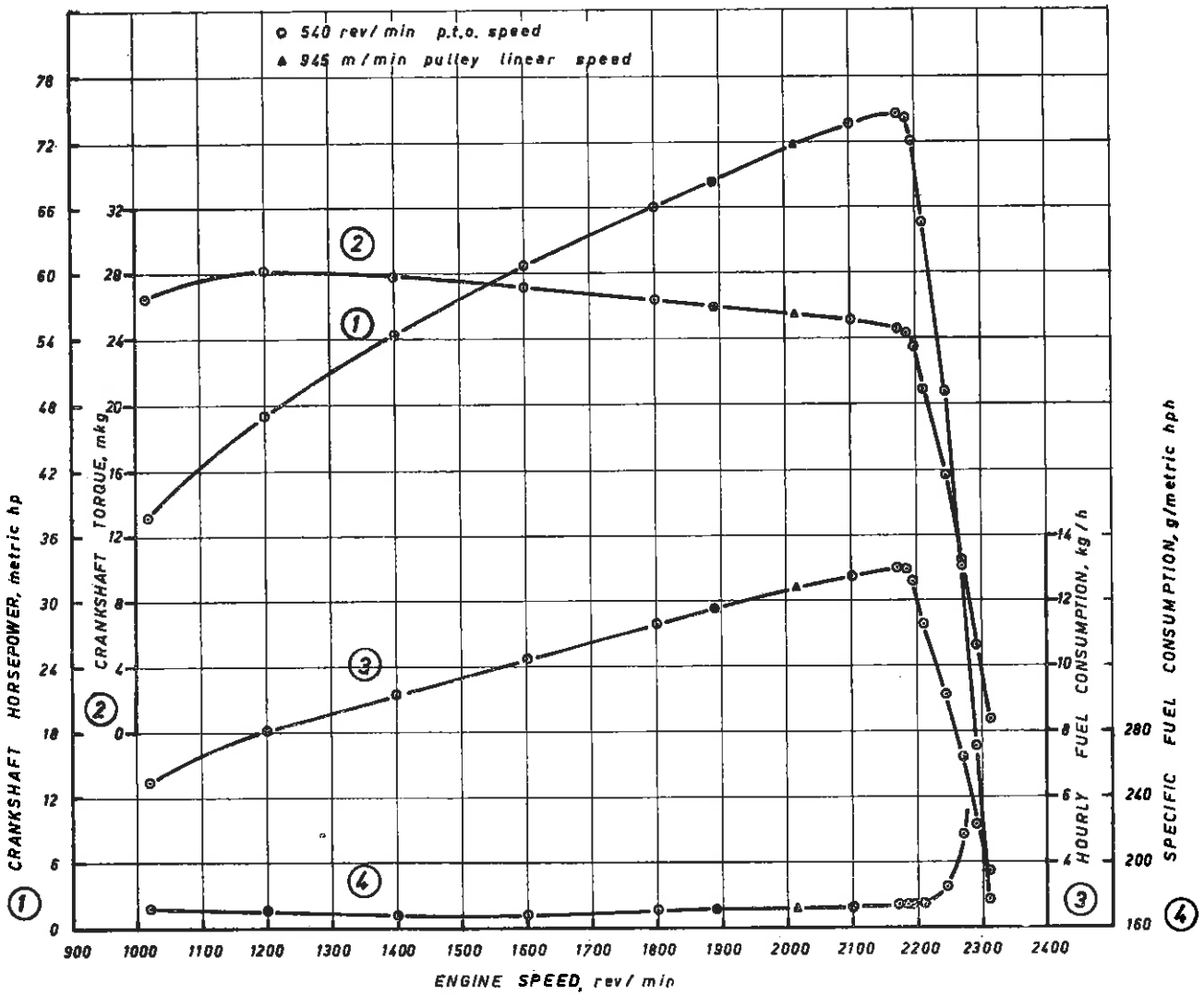


FIG. 6. Engine Test

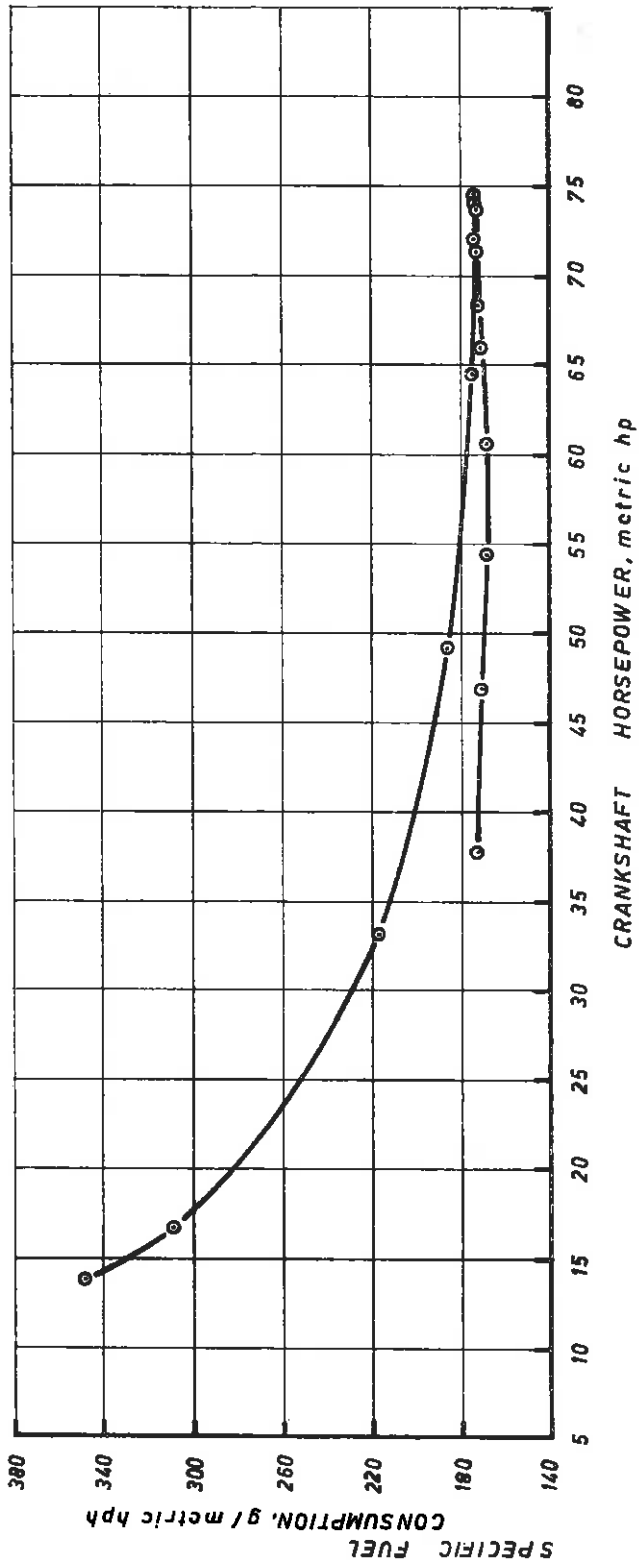


FIG. 7. Engine Test

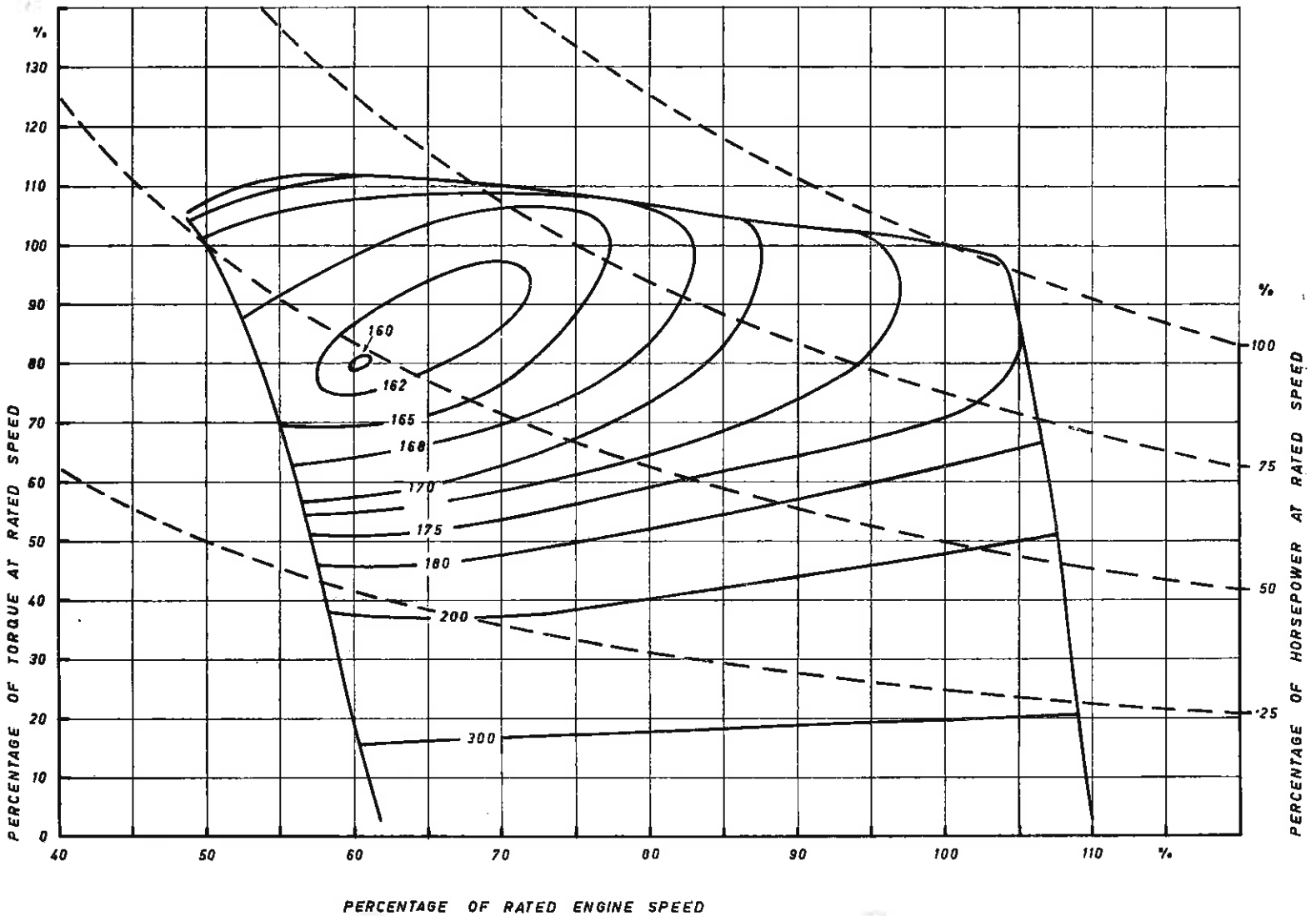


FIG. 8 Engine Test