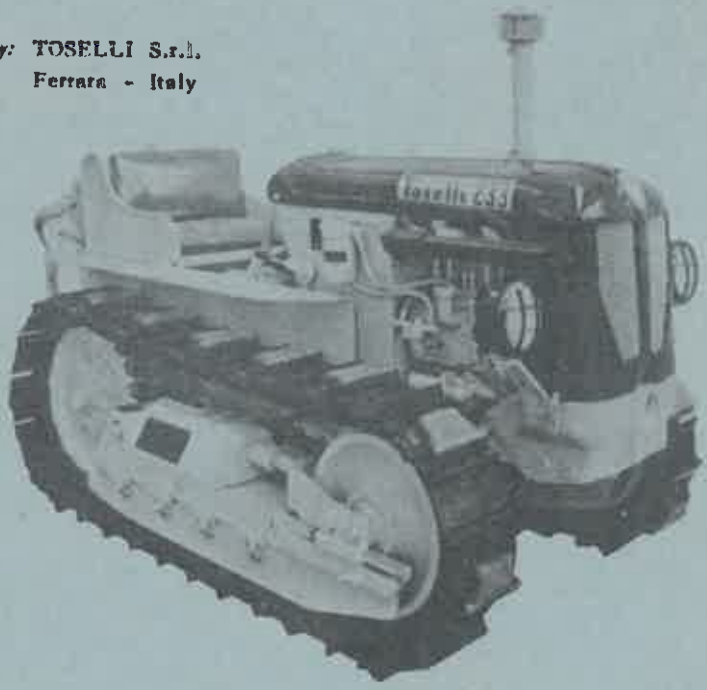
COMITATO DI COORDINAMENTO PER L'OMOLOGAZIONE
DELLE MACCHINE AGRICOLE IN ITALIA

REPORT No. 204/O.E.C.D.

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

TOSELLI 233

Manufactured by: TOSELLI S.r.l.
Ferrara - Italy



Date of Test: September/October 1965
Test No.: 204/ 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: 16th February 1966

Serial No. 108

CENTRO NAZIONALE MECCANICO AGRICOLO
TORINO - ITALY

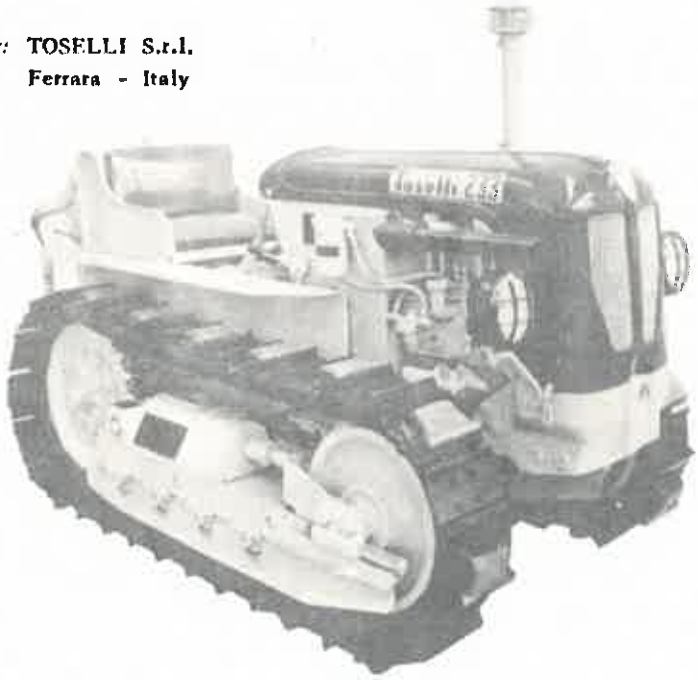
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TABLE OF CONTENTS

		Pa
PART I	- Specification of tractor	1, 2, 3 and
PART II	- Compulsory test: at the power take-off	
PART III	- Drawbar test on artificial track	
PART IV	- Location of centre of gravity	8
	Radius of turning space	8
PART V	- Repairs and adjustments, remarks	8

APPENDIX

	Fig.
POWER TAKE-OFF TEST	
Curves of power take-off horsepower, equivalent crankshaft torque and specific fuel consumption engine speed	1
Curves of engine speed, fuel consumption and specific fuel consumption, power take-off horsepower	2
DRAWBAR TEST	
Curves of drawbar horsepower and trackslip, drawbar pull . . .	3
Curves of fuel consumption and specific fuel consumption, drawbar pull	4

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

PART I

SPECIFICATION OF TRACTOR

Tractor

Make:	TOSELLI
Model:	233
No.:	Serial No. 2088

Engine

Make:	V.M. Cento (Ferrara), Type 210, direct injection diesel, Serial No. 2433
Cilinders:	2 cylinders, vertical, in-line, 100 mm bore × 110 mm stroke, compression ratio 17 : 1, overhead valves
Rated speeds:	2200 rev/min, governor setting - no load engine speed 2350 ± 10 rev/min
Fuel system:	Fuel - Diesel oil Injection pump: BOSCH Type PFR 1 K 80/247; injector nozzles: FL BOSIO Type BLL 160 SV 428. Manufacturer's production setting for injection pump: 6.10 Kg/h to 6.20 Kg/h at 2200 rev/min engine speed at 15 °C fuel temperature (bench test figures); injection pressure 180 ± 5 Kg/cm^2. A.C. Type SAVARA TO.6007/80 fuel feed pump and BOSCH element filter on pressure side. Capacity of fuel tank: 27.0 l
Governor:	V.M. mechanical. Governed range of engine speed 350 rev/min to 2200 rev/min
Air cleaner:	One FISPA Type 2222-03 with replaceable cartridge element dry pre-cleaner and one FISPA Type 2132.26 oil bath cleaner. Oil capacity 0.65 l

Oiling system: Forced feed from gear Type pump with metal strainer in sump. DUCCA Type FO 2695 full flow sheet Type oil filter. Recommended oil change period: from 120 to 150 h. Oil capacity engine sump 6 l

Cooling system: Air cooled, impeller assisted with 170 mm dia 8-blades belt driven fan

Transmission

Clutch: PITTERI & VIOLINI 250 mm dia, single plate dry clutch, pedal operated

Gearbox: Sliding gear Type, 8 forward speeds and 2 reverse, comprising 4 - speed gearbox and dual range reduction gear at indutend

Differential: Crown wheel and pinion and differential with bull gear fianl drives

Oil capacities: Transmission 8 l, final drive 1.2 l each

GEAR No.	NUMBER OF ENGINE REVOLUTIONS FOR ONE REVOLUTION OF DRIVING WHEEL	THEORETICAL TRAVELLING SPEED FOR 2200 REV/MIN RATED SPEED OF ENGINE, Km/h
1	146.01	1.41
2	104.85	1.97
3	71.90	2.87
4	58.57	3.52
5	53.70	3.84
6	42.06	4.90
7	28.84	7.15
8	21.54	9.56
1 R.	146.81	1.40
2 R.	58.89	3.50

Steering device:	Dry disc brakes on differential half shafts, hand lever operated
Brakes:	Separately hand levers operated contracting band brakes, acting upon the steering clutch outer drums, foot-pedal is provided for combined operation. A parking hand lever with ratchet and pawl permits to use both brakes at the the same time
Sprockets:	Pitch dia 486 mm, 25 teeth, face width 35 mm
Tracks:	Non-gierder, track pitch 125 mm, 28 dia pins, 250 mm wide track plates, 31 per track, integral grousers 41 mm; track gauge 1200 mm, approximate length of track in ground contact 1200 mm, total area of contact with ground 6000 cm^2; pressure on ground 0.297 Kg/cm^2
Suspension:	Front idler wheels 386 mm rolling dia, 4 bottom track rollers per track at 180 mm centres, rolling dia 140 mm. Rear suspension by cross beam supported on track frames through lubricated bushes allowing independent track frame swing. Front suspension by transverse leaf spring. Manual lubrication by grease.

Belt Pulley

Location:	At rear of the tractor driven from engine clutch through bevel gear. The belt pulley assembly is fitted istead of the p.t.o. shaft
Diameter/width:	250 mm × 150 mm
Speeds:	1232 rev/min giving 16.13 m/s linear speed at 2200 rev/min rated engine speed
Direction of rotation:	Anti-clockwise viewed from tractor right side

Power take-off

Main:	6-spline, 34.9 mm (1 $\frac{3}{8}$ in.) dia, in centre-line at rear of tractor

Height above ground:	430 mm
Proportional engine speed:	706 rev/min at 2200 rev/min rated engine speed 540 rev/min at 1683 rev/min engine speed
Proportional ground speed:	1 revolution of p.t.o. for approximately 33.5 mm of travel
Direction of rotation:	Clockwise viewed from tractor rear
Drawbar:	Tested with swinging drawbar. Vertical height to centre of clevis from 270 mm to 320 mm

Electrical equipment

Voltage:	12 V
Generator:	BOSCH Type EH-14 V. 11 A.25
Batteries:	One 12 V, capacity 70 amp h.

Overall dimensions

Overall length:	2.02 m
Overall width:	1.12 m
Overall height:	1.40 m to top of exhaust pipe 1.06 m to top of bonnet
Minimum ground clearance:	0.27 m to bottom of swinging drawbar
Weight:	With full fuel tank, oil standard track shoes, no driver 1876 Kg
Special remarks:	Power lift and directional reverse unit (optional)

PART II

LABORATORY TESTS

1. Compulsory tests: Power take-off test

Date and location of tests: 9th September 1965, C.N.M.A. Torino, Italy

Type of dynamometer: Electrical, swinging frame

Fuel: Diesel oil, density 0.831 Kg/l at 15 °C
Cetane No. not recorded

Engine oil: S.A.E. 20

Transmission oil: S.A.E. 90

HORSEPOWER	SPEEDS		EQUIVALENT CRANKSHAFT TORQUE	FUEL CONSUMPTION			TEMPERATURE			ATMOSPHER. CONDITIONS	
	ENGINE	P. T. O.		PER HOUR	SPECIFIC	HP HOURS/UNIT OF VOLUME	COOLANT	OIL	FUEL	AIR TEMP.	ATMOS. PRESSURE
metric hp	rev/min	rev/min	mkg	l/h	g/metric hph	metric hph/l	°C	°C	°C	°C	mmHg
A. Maximum power											
28.11	2210	709	9.11	7.37	218	3.81	77	97	26.0	24.5	741.0
B. Power at standard p.t.o. speed (540 rev/min)											
21.01	1683	540	8.94	5.76	228	3.65	66	78	25.0	23.5	740.0
C. Power at maximum torque											
27.09	2100	674	9.24	6.91	212	3.92	77	95	26.0	24.5	741.0
D. Power at rated speed											
28.08	2200	706	9.14	7.33	217	3.83	77	97	28.0	26.5	741.4
No load, maximum engine speed: 2352 rev/min											

PART III

DRAWBAR TESTS ON ARTIFICIAL TRACK

Date of tests: 22nd and 23rd September 1965

Type of track: Clay loam soil

Position of governor control lever: Fully open, giving no load engine speed 2350 ± 10 rev/min

Fuel: Diesel oil, density 0.831 Kg/l at 15° C
Cetane No. not recorded

Engine oil: S.A.E. 20

Transmission oil: S.A.E. 90

Weight without driver: 1786 Kg

Height of drawbar above ground: 320 mm

1) Maximum powers and pulls

GEAR	MAXIMUM POWERS						AIR TEMP.	ATMOS. PRESSURE	MAXIMUM PULLS	
	HORSEPOWER	CORRESPONDING PULL	TRACK SLIP	ENGINE SPEED	SPEED	ENGINE COOLANT TEMP.			PULL	REASON FOR STALL
No.	metric hp	Kg.	%	rev/min	km/h	°C	°C	mmHg	Kg	
1	8.63	1725	8.7	2281	1.35	68	22	748.5	1813	Track slip
2	11.99	1779	10.3	2255	1.82	68	22	748.5	1779	Track slip
3	17.31	1770	9.0	2214	2.64	70	22	748.5	1770	Track slip
4	20.33	1694	8.3	2195	3.24	75	21.5	744.5	1745	Engine stall
5	21.08	1551	5.7	2211	3.67	75	21.5	744.5	1620	Engine stall
6	19.18	1070	2.0	2202	4.84	78	21.5	744.5	1105	Engine stall
7	16.99	648	1.6	2201	7.08	78	20	743.9	676	Engine stall
8	13.24	374	1.1	2207	9.56	78	20	743.9	392	Engine stall

2) Fuel consumption

GEAR	OPTIMUM FUEL CONSUMPTION (*)			RANGE OF PULL, OVER WHICH SPECIFIC FUEL CONSUMPTION DOES NOT EXEED OPTIMUM CONSUMPTION BY MORE THAN 10%
	SPECIFIC FUEL CONSUMPTION	HP HOURS/ UNIT OF VOLUME	CORRESPONDING PULL	
No.	g/metric D.B. h.p.h.	D.B. metric h.p.h./l	Kg.	Kg
1	333	2.50	1813	1415 - 1813 (M.S.P.)
2	301	2.76	1726	1255 - 1779 (M.S.P.)
3	269	3.09	1572	1128 - 1763
4	272	3.06	1385	968 - 1740
5	280	2.97	1250	890 - 1620 (M.S.P.)
6	300	2.77	880	675 - 1105 (M.S.P.)
7	351	2.37	676	470 - 645
8	458	1.81	390	265 - 367

(*) The drawbar specific fuel consumption curves in 1st gear has no clearly marked minima and the value shown for optimum fuel consumption in this gear is that corresponding to maximum drawbar horsepower.

PART IV

1. Location of centre of gravity

Height above ground:	414 mm
Distance forward from the vertical plane containing the axis of the sprockets:	588 mm
Distance from the median plane parallel to the longituninal axis of the tractor bisecting the track.	0

2. Radius of turning space: 1.30 m

PART V

1. Repairs and adjustments during tests: None

2. Remarks: None

TEST ENGINEER
(S. Sarcinelli)

DIRECTOR OF MECHANICAL DEPARTMENT
(G. Priorelli)

DATE: 30th October 1965

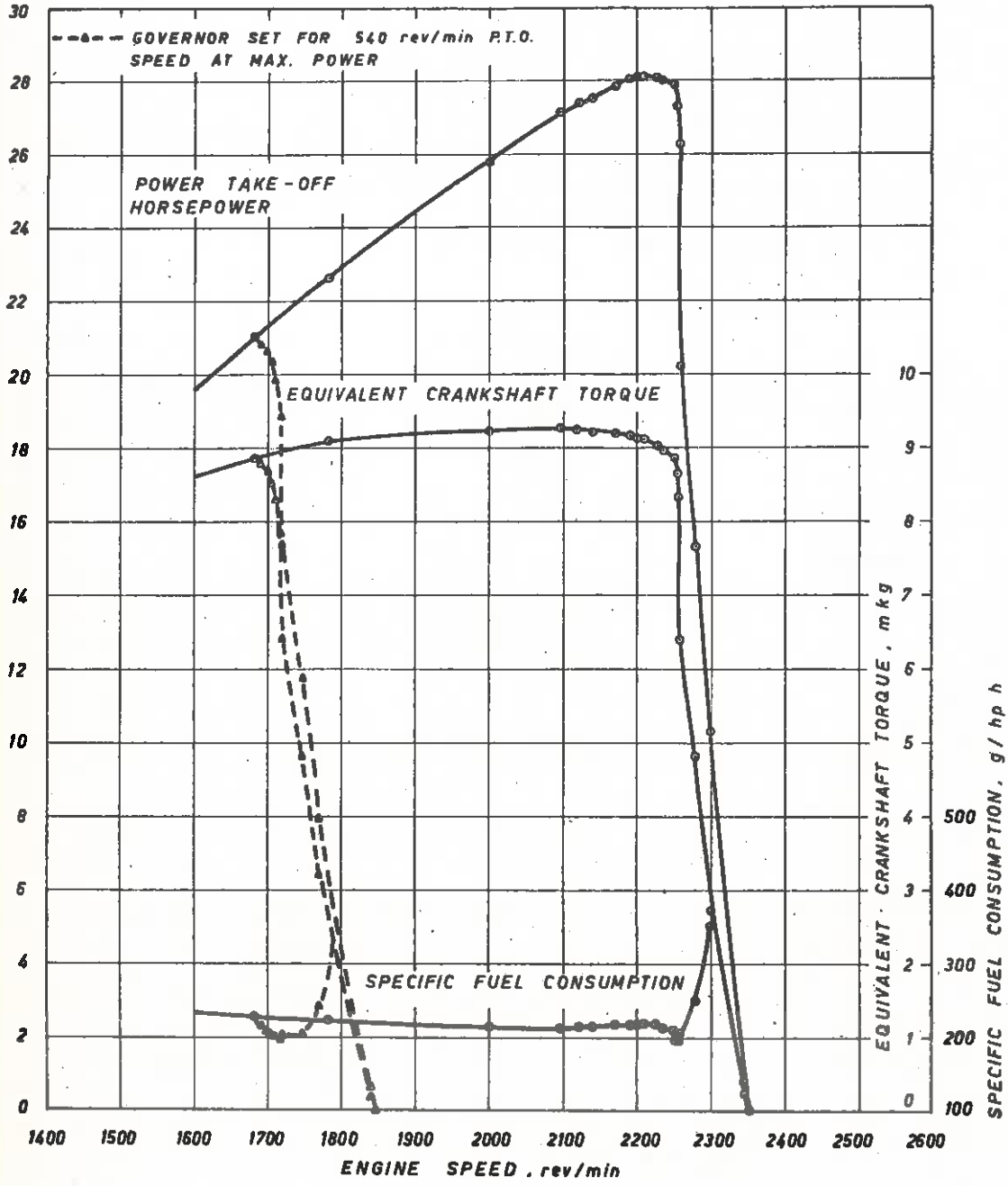


FIG. 1 - POWER TAKE-OFF TEST

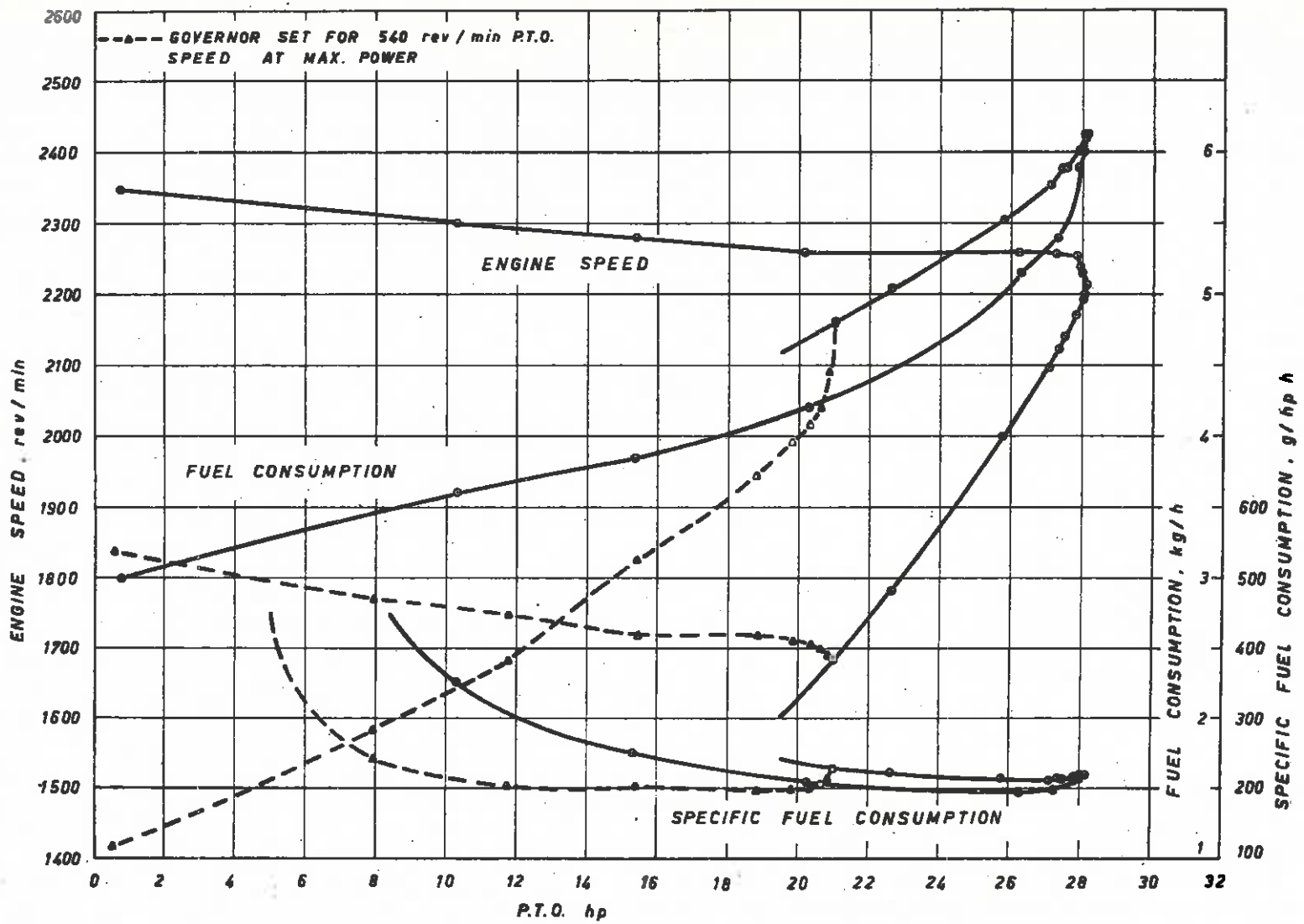


FIG. 2 - POWER TAKE-OFF TEST

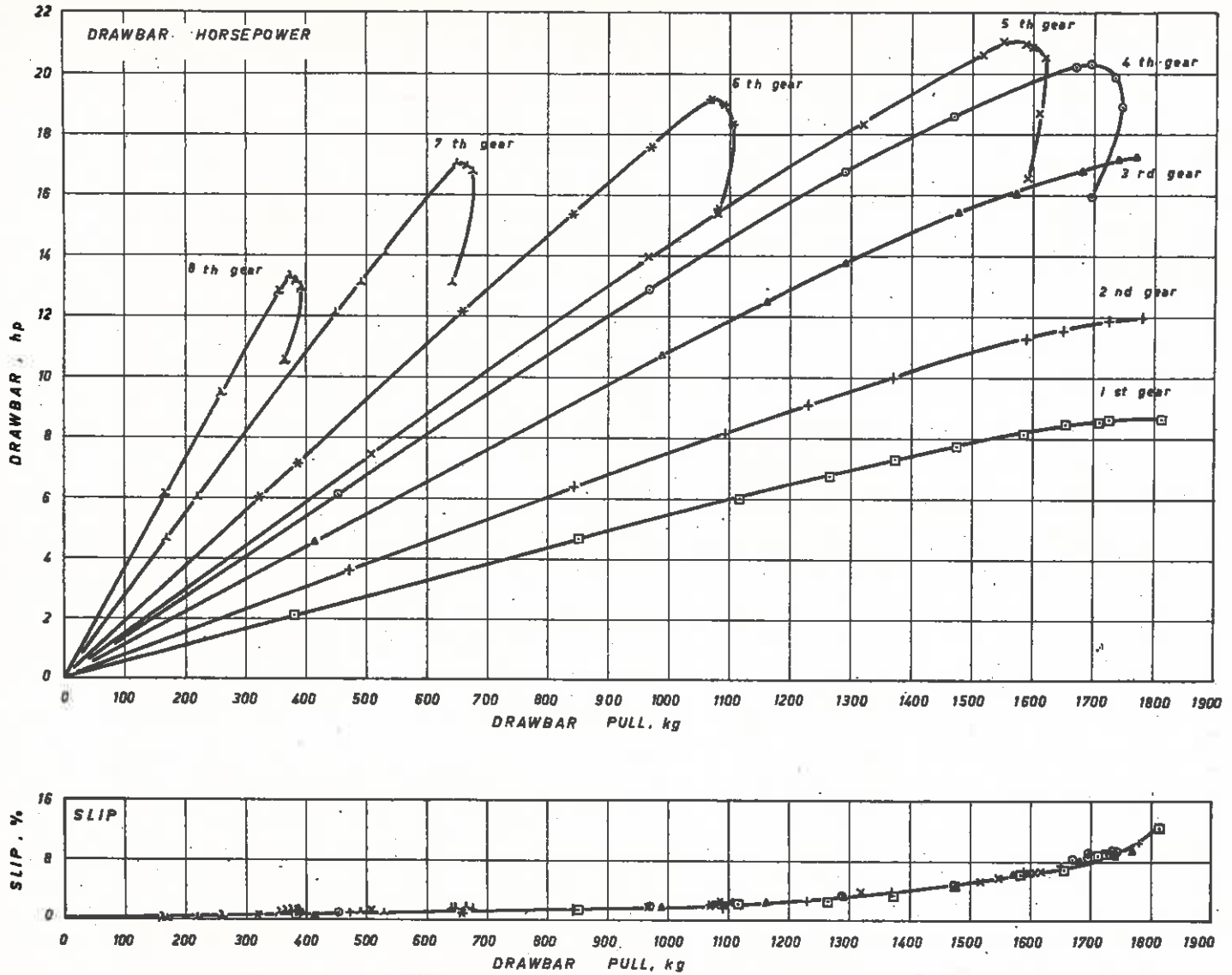
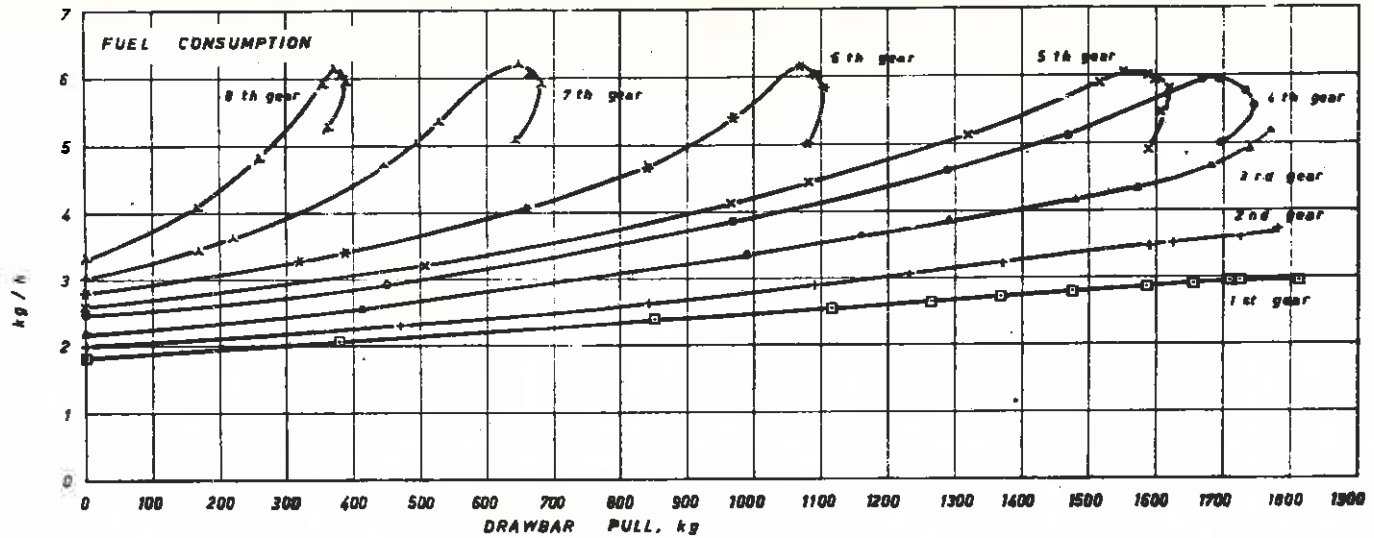


FIG. 3 - DRAWBAR TEST ON CLAY LOAM SOIL



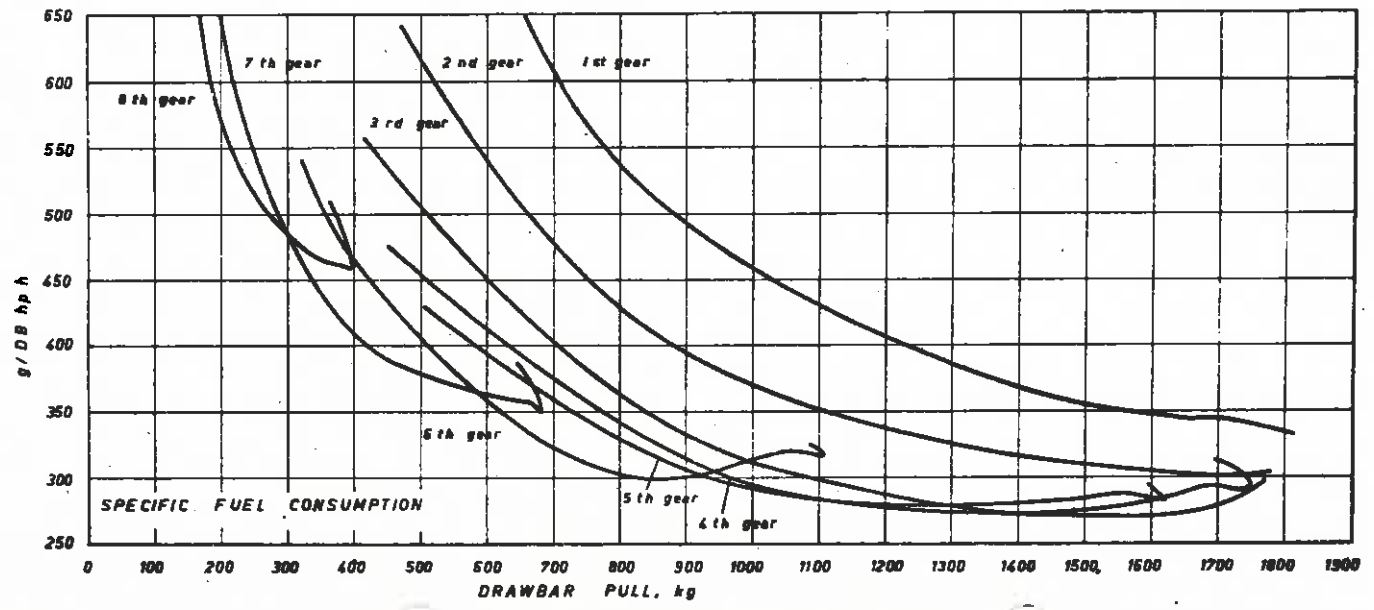


FIG. 4 - DRAWBAR TEST ON CLAY LOAM SOIL