

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

REPORT No. 206/O.E.C.D.

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

TOSELLI 228

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



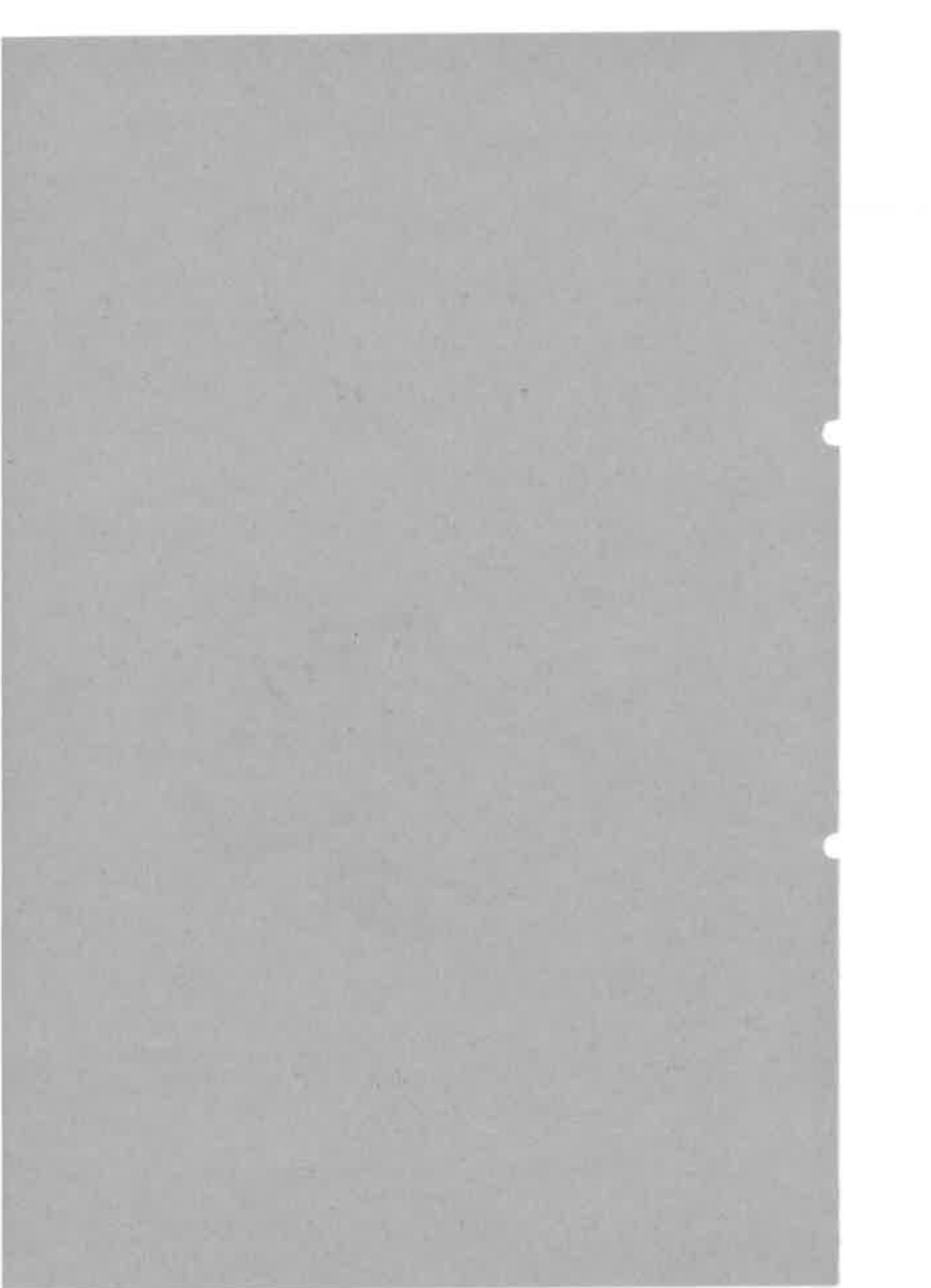
Date of test: SEPTEMBER/OCTOBER 1965
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*This report been approved by the O.E.C.D. Coordinating Center (C.N.E.E.M.A.,
France) as being in accordance with the O.E.C.D. Tractor Test Code*

Date of approval: 16 February 1966

Serial No.: 106

**CENTRO NAZIONALE MECCANICO AGRICOLO
TORINO - ITALY**



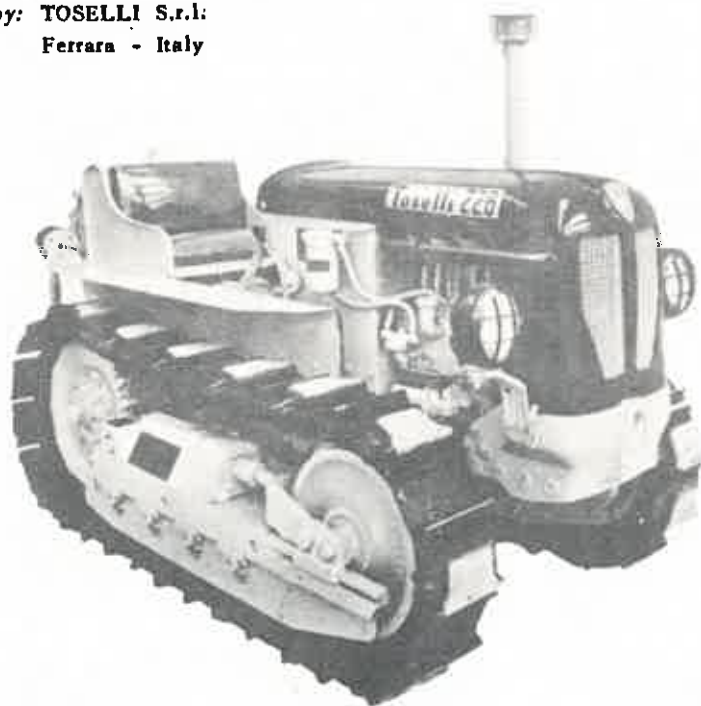
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This Bulletin is based on engineering tests in accordance with the O.E.C.D. Tractor Code. It does not contain an evaluation of the performances of the tractor on practical farm work

PART 1

SPECIFICATION OF TRACTOR

Tractor:

Make: TOSELLI
Model: 228
No.: Serial No. 2134

Engine:

Make: V.M. Cento (Ferrara), Type 22 DA/SL, direct injection diesel, Serial No. 12/8458

Cylinders: 2 cylinders, vertical, in-line, 95 mm bore × 110 mm stroke, compression ratio 17 : 1, overhead valves.

Rated speeds: 2200 rev/min, governor setting - no load engine speed 2325 ± 10 rev/min

Fuel system: Fuel - Diesel oil.
Injection pump: BOSCH Type PFR 1K 80/247; injector nozzles: FL BOSIO. Manufacturer's production setting for injection pump: 5.80 Kg/h to 6.10 Kg/h at 2200 rev/min engine speed at 15 °C fuel temperature (bench test figures); injection pressure 180 ± 5 Kg/cm². SAVA-RA A.C. Type 6007/80 fuel feed pump and one BOSCH Type FY/D 5/303 filters on pressure side. Capacity of fuel tank 27 l

Governor: V.M., mechanical, incorporated in fuel injection pump. 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 and one cartridge element oil filter Type DUCCA FO 2695. Recommended oil change period: 120 ± 150 h. Oil capacity engine sump 6.0 l

Cooling system: Air cooled, impeller assisted with 180 mm dia 10-blades belt driven fan

Transmission

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

Gearbox: Own make, sliding gear type, 8 forward speed and 2 reverse, comprising 4 - speed gearbox and dual rangere-reduction gear at indutend

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

Oil capacities: Transmission 8.0 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: Clutch and brake steering, with hand levers operating dry multi-disc clutches

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 ratched and pawl permits to use both brakes at the same time

Sprockets: Pitch dia 486 mm, 25 teeth, face width 35 mm

Tracks: Non-Girder, track pitch 125 mm, 28 mm dia pins, 220 mm wide track plates, 31 per track, integral grousers 41mm; track gauge 1200 mm; approximate length of track in ground contact 1200 mm; total area of contact with ground 5280 cm²; pressure on ground 0.332 Kg/cm²

Suspension: Front idler wheels 385 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 instead 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 engine speed

Direction of rotation: Clockwise viewed from tractor rear

Proportional ground speed: 1 revolution of p.t.o. for approximately 33.5mm of travel

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: 1.04 m

Overall height: 1.37 m to top of exhaust pipe
1.05 m to top of bennet

Minimum ground clearance: 0.27 m to bottom of swinging drawbar

Weight: With full fuel tank, oil standard track shoes, no driver, 1835 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:

28th and 29th 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 HOUS/UNIT OF VOLUME	COOLANT	OIL	FUEL	AIR TEMP.	ATMOSPHER. PRESSURE
metric hp	rev/min	rev/min	mkg	l/h	g/metric hph	metric hph/l	°C	°C	°C	°C	mmHg
A. Maximum power											
24.82	2200	706	8.08	6.99	234	3.55	70	90	23.0	22.0	734.0
B. Power at standard p.t.o. speed (540 rev/min)											
19.90	1683	540	8.47	5.34	223	3.73	70	89	23.0	21.5	734.0
C. Power at maximum torque											
22.68	1900	610	8.55	6.47	237	3.51	70	89	23.0	21.5	734.0
D. Power at rated speed											
24.82	2200	706	8.08	6.99	234	3.55	70	90	23.0	22.0	734.0
No load, maximum engine speed: 2325 rev/min											

PART III

DRAWBAR TESTS ON ARTIFICIAL TRACK

Date of tests: 6th October 1965
 Type of track: Clay loam soil
 Position of governor control lever: Fully open, giving no load engine speed 2325 \pm 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: 1752 Kg
 Height of drawbar above ground: 240 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	8.25	1688	9.3	2258	1.32	65	15	746.0	1814	Track slip
2	11.46	1739	11.5	2238	1.78	65	15	746.0	1750	Track slip
3	17.38	1751	9.0	2241	2.68	65	15	746.0	1823	Track slip
4	18.66	1504	6.0	2212	3.35	68	18	746.0	1655	Engine stall
5	18.72	1359	3.9	2198	3.72	68	18	746.0	1483	Engine stall
6	18.11	1023	3.2	2191	4.78	70	18	746.0	1075	Engine stall
7	15.40	589	1.6	2188	7.06	70	20	746.0	622	Engine stall
8	13.64	388	0.7	2182	9.49	70	20	746.0	410	Engine stall

2) Fuel consumption

G E A R	OPTIMUM FUEL CONSUMPTION			RANGE OF PULL, OVER WHICH SPECIFIC FUEL CONSUMPTION DOES NOT EXCEED OPTIMUM CONSUMP- TION 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	340	2.44	1690	1320 - 1814 (M.S.P.)
2	295	2.82	1620	1255 - 1750 (M.S.P.)
3	275	3.02	1706	1145 - 1805
4	285	2.92	1360	930 - 1590
5	297	2.80	1297	750 - 1483 (M.S.P.)
6	313	2.65	1075	780 - 1067
7	385	2.16	622	475 - 607 (M.S.P.)
8	447	1.86	388	320 - 410 (M.S.P.)

PART IV

1. Location of centre of gravity.

Height above ground: 404 mm

Distance forward from the vertical
plane containing the axis of
the sprockets: 590 mm

Distance from the median parallel
to the longitudinal axis of
the tractor bisecting the track: 0

2. Radius turning space: 1.33 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

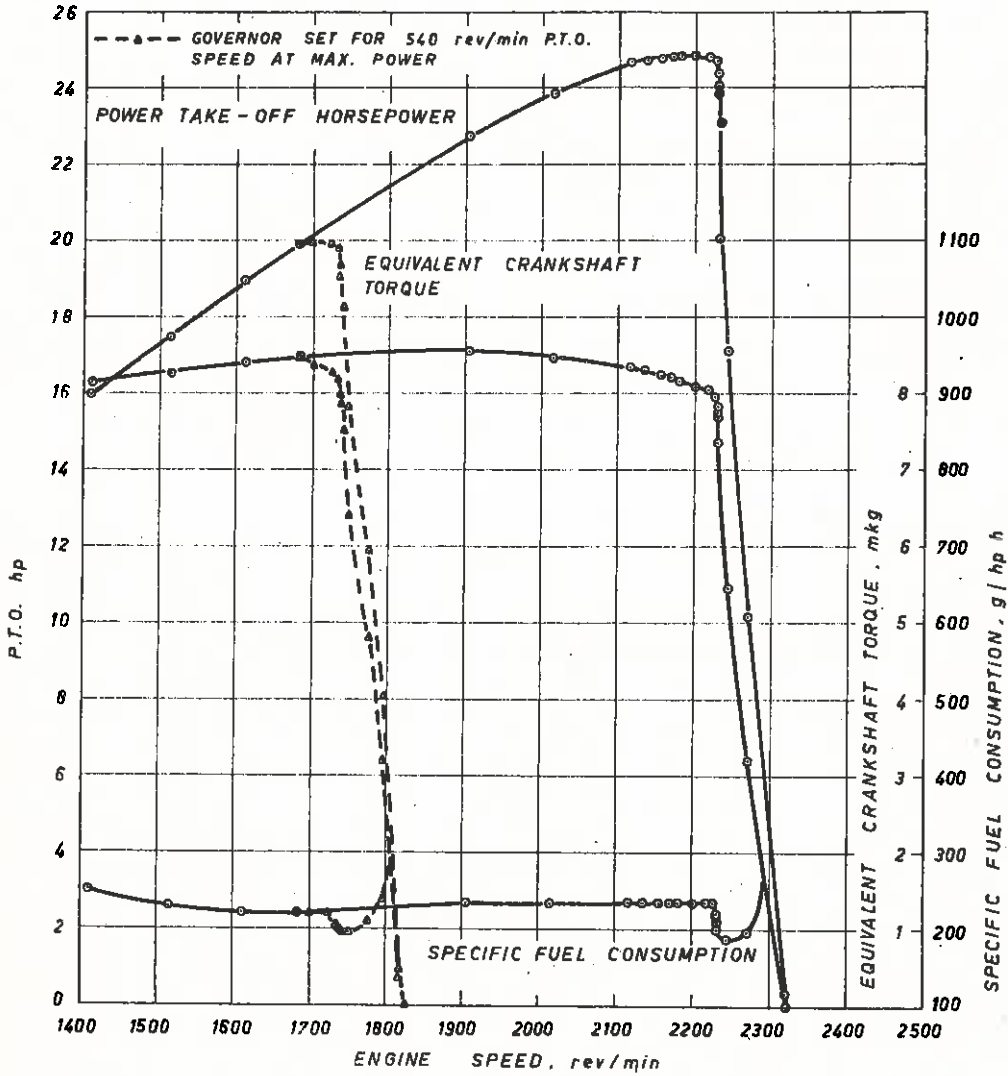


FIG. 1 POWER TAKE-OFF TEST

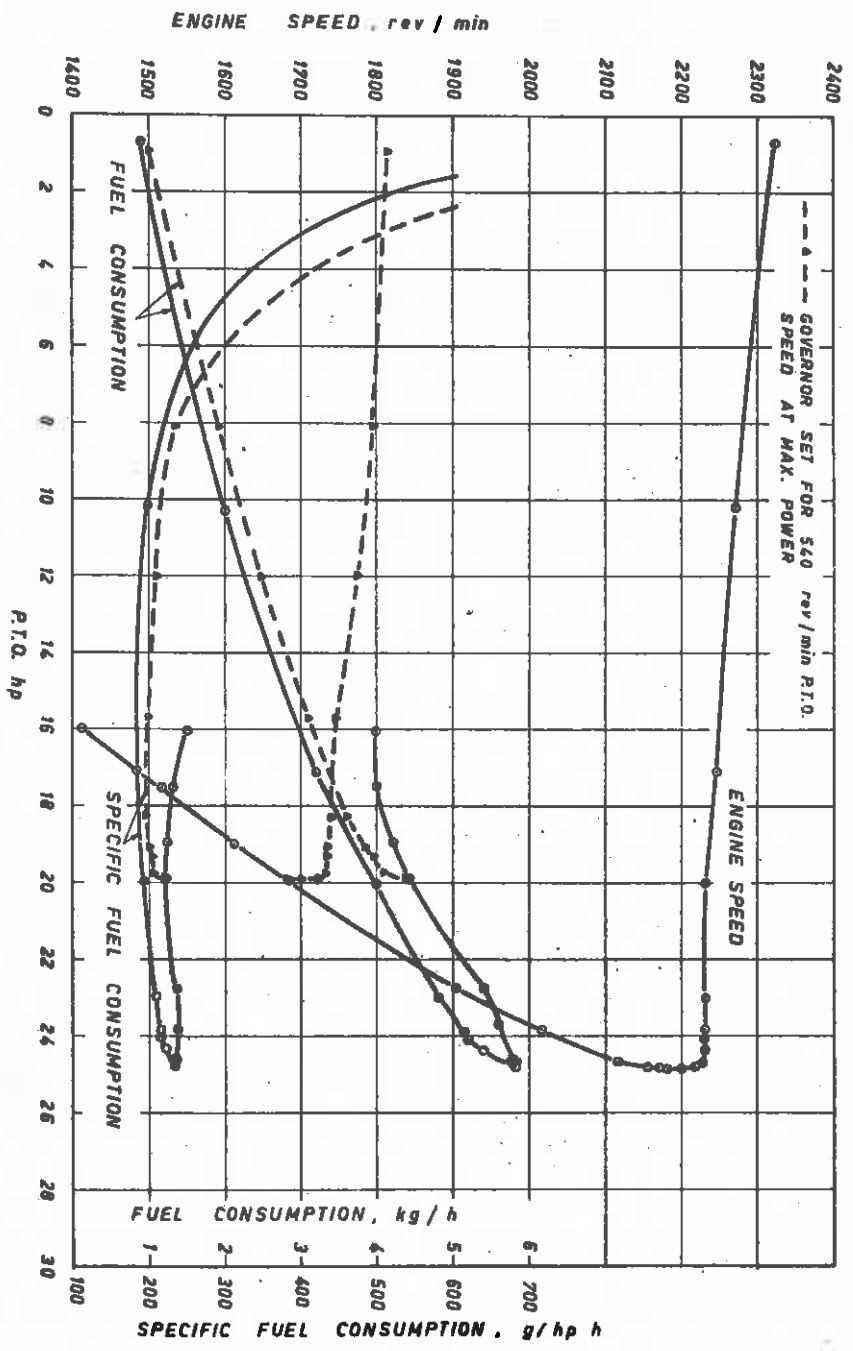


FIG. 2 - POWER TAKE-OFF TEST

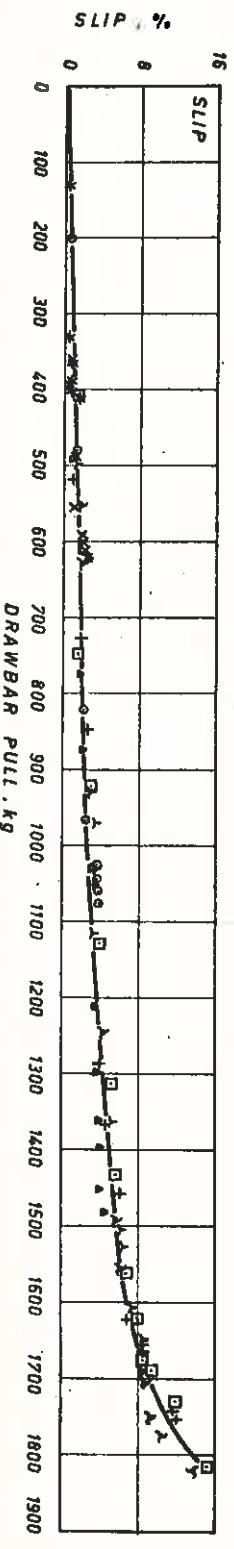
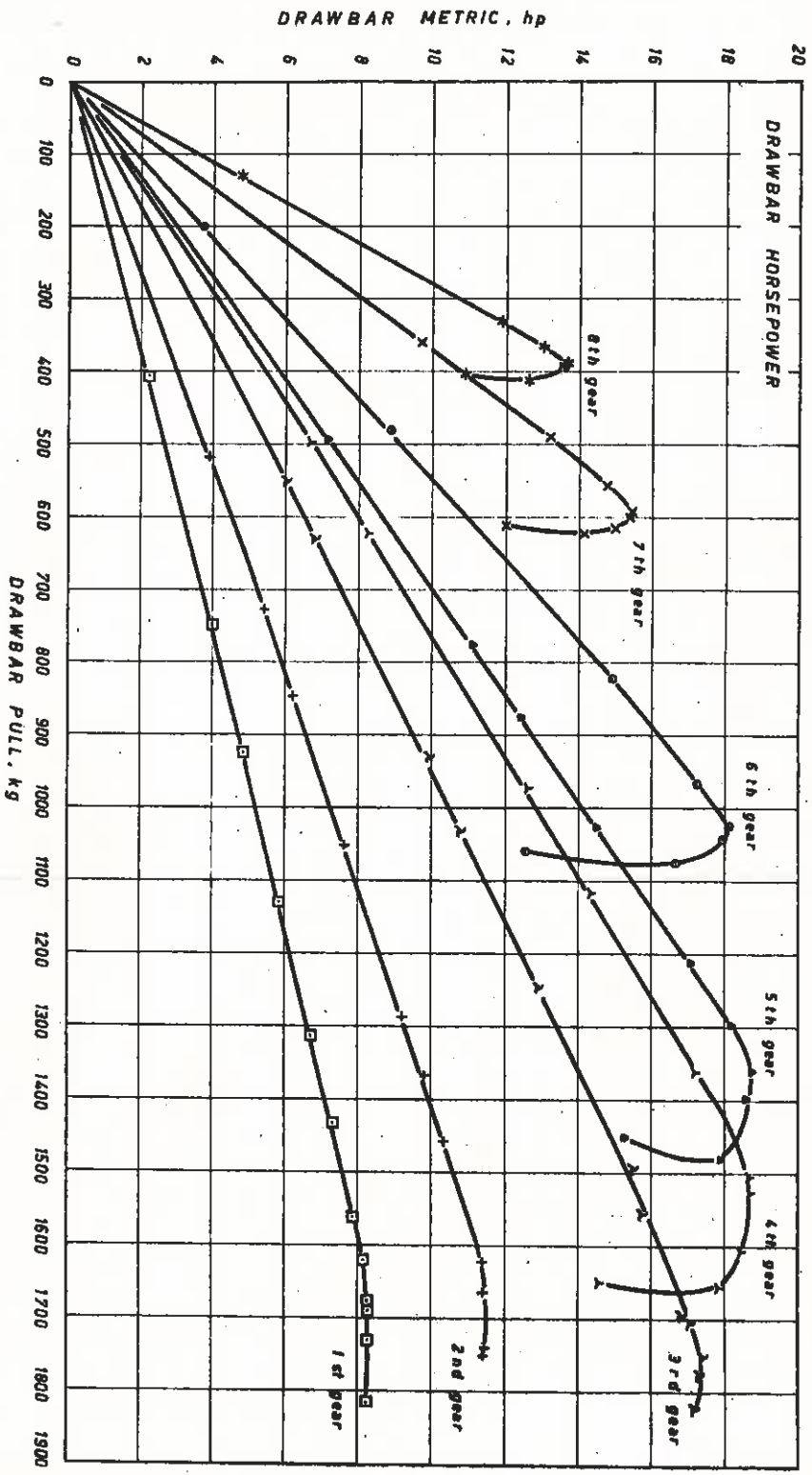


FIG. 3 DRAWBAR TEST ON CLAY LOAM SOIL.

