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

REPORT No. 369/O.E.C.D.
APPROVED: 29-9-1971

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

FIAT MODEL 500/8B DIESEL TRACTOR

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



Date of Tests: October 1970 - March 1971

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

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	
1 - Power take-off performance	6
2 - Drawbar performance	7
3 - Turning space and turning circle	8
4 - Location of centre of gravity	8
5 - Braking	8
6 - Measurement of ambient noise emitted by the tractor	9
7 - Noise measurement at the driver's ear level	9
8 - 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
Curves of travel speed and specific fuel consumption/drawbar pull	6

Manufacturer:	FIAT S.p.A. - TORINO (Italy).
Submitted for test by:	the manufacturer
Selected by:	the manufacturer with the agreement of the testing station
Place of running-in:	FIAT - Servizio Esperienze Trattori - TORINO (Italy)
Duration of running-in:	engine 50 hours; p.t.o. 20 hours; transmission 30 hours.

SPECIFICATION OF TRACTOR

Make:	FIAT
Model:	500/8B
Type:	Four wheel, rear wheel driven, unit construction
Serial No.:	345773

Engine:

Make:	FIAT
Model:	8035
Type:	4-stroke, direct injection diesel
Serial No.:	141587
Cylinders:	3, vertical, in-line, 100 mm bore x 110 mm stroke, capacity 2592 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 litres. BOSCH injection pump model EP/VA 3/110 H 1300 CLV 3116, serial No. 90600430; manufacturer's production setting $\leq$ 56.5 mm^3 stroke at 1300 rev/min pump speed and 15 °C fuel temperature. Own make injectors, model DLL 145 S 60 F; injector setting 230 $\pm$ 5 kg/cm^2.
Governor:	BOSCH Mechanical, incorporated in fuel injection pump. Governed range of engine speed: 650 to 2845 rev/min. Rated engine speed 2600 rev/min.
Air cleaner:	Own make, oil bath with centrifugal type precleaner with automatic dust unloader; oil capacity 0.940 litres.
Lubrication system:	Forced feed from gear-type pump. One screen type filter installed on pump suction and one replaceable cartridge type filter installed on the pressure line to the engine. Engine sump oil capacity: 7.5 litres. Recommended oil change period: 200 hours; cartridge change period: 400 hours.
Cooling system:	Water cooled from centrifugal pump (0.5 kg/cm^2); thermostat for temperature control; 4-blade belt driven 390 mm dia fan; cooling water capacity: 13 litres; visual temperature control with thermometer.
Starting system:	Electrical, BOSCH starter motor, 12 V and 4 metric hp.

Electrical system:

Voltage:	12 V, negative earth.
Alternator:	Own make, model A 12 M 124/12/42 X
Battery:	MARELLI, model 6 AT 21, lead acid; capacity 110 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 and 2 reverse speeds. It consists of 4 forward and 1 reverse speed gearbox with dual range epicyclic 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 capacity:	Gearbox, differential and hydraulic lift: 17.6 litres; final drives: 2.2 litres each. Recommended oil change period: 1600 hours.

Gear	*Number of engine revolutions for one revolution of driving wheel*	*Travelling speed for 2600 rev/min rated engine speed km/h*
Forward		
1	256.300	2.43
2	170.347	3.66
3	116.335	5.36
4	90.065	6.92
5	71.194	8.76
6	47.319	13.18
7	32.315	19.30
8	25.018	24.92
Reverse		
1	178.380	3.50
2	49.550	12.58

Power take-off: In centre-line at rear of tractor; proportional engine speed or proportional ground speed, manually engaged and clutch driven.
34.9 mm ($1\,^3/_8$ in) dia, according to ISO Standard, 6-spline; height above ground 600 mm.
Proportional engine speeds: 650 rev/min at 2600 rev/min rated engine speed; 540 rev/min at 2160 rev/min engine speed. Direction of rotation: clockwise viewed from tractor rear in forward gear. Proportional ground speed: 1 revolution of p.t.o. for approximately 240 mm of travel. Number of p.t.o. revolutions for one revolution of driving wheel: 16.60.
Direction of rotation: Clockwise viewed from tractor rear in forward gear.

Belt pulley:

Location:	Attachable to rear of tractor, in two alternative positions: on right or on left side of p.t.o. Driven from p.t.o. clutch through bevel gears.
Diameter/width of face:	250 mm/150 mm.
Speed:	1352 rev/min giving 1062 m/min linear speed at 2600 rev/min rated engine speed.
Direction of rotation:	Clockwise with pulley on right side of p.t.o., anticlockwise with pulley on left side of p.t.o., viewed from tractor right side.

Power lift: Own make, fully independent hydraulic, gear-type oil pump.
Category 1 and 2 implement linkage, draught and position controls.
Oil capacity (uses transmission oil) 17.6 litres.

Drawbar: Swinging drawbar, with clevis end sliding on drilled guide. Radius of swing: 3 positions, from 495 mm to 585 mm.
Vertical height to centre of clevis: 4 positions from 350 to 515 mm, adjustments obtained by vertical movement of the drilled guide and invertion of the drawbar.
Drawbar hole 29 mm dia; distance behind rear axle: 635 to 725 mm; position relative to p.t.o.: from 20 to 175 mm below, 365 to 455 mm to rear (horizontal line).
Lateral adjustment: 4 positions from 0 to 250 mm each side.

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

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

Wheels:

Steering wheels: Two at front, PIRELLI « Tractor » 6.00-16 tyres, 4 ply rating. Maximum permissible weight on each tyre 560 kg at 2.50 kg/cm² pressure. Track width 1280 mm by 8 steps to 1980 mm obtained by extending front axle and reversing wheel discs.

Driving wheels: Two at rear, PIRELLI « Tractor cinturato » 14.9/13-28 tyres, 6 ply rating, mounted on W 13-28" rims. Maximum permissible weight on each tyre 1960 kg at 1.30 kg/cm² pressure. Track width 1200 mm by 8 steps to 1900 mm changed by reversing wheel centres and offset lugs on rims.

Wheel base: 1920 mm.

Tractor weights: (without driver but with tank full).

	Front kg	*Rear kg*	*Total kg*
Without ballast	675	1145	1820
With ballast	850	2000	2850

Ballast

	Number of weights	*Total weight kg*	*Water kg*
Front	5 (*)	175	—
Rear	10 (5 per wheel)	600	255
Additional	—	—	—

(*) Placed on a suitable support ahead of front axle.

Seat: Own make, parallelogram suspension with rubber lined coil spring; range of adjustment 10 cm fore and aft in median plane of tractor.

Number of grease points:

Whole tractor: 16.

Overall Dimensions:

	Length *m*	*Width* *m*	*Height* *m*
With ballast:			
— with power lift linkage	3.31	1.83 to 2.28	1.50
— without power lift linkage	3.16		
Without ballast:			
— with power lift linkage	3.14	1.58 to 2.28	1.50
— without power lift linkage	2.99		

Lighting: (Tractor without ballast, 1.40 m rear track).

	Height above ground of centre *cm*	*Size* *cm*	*Distance from outside edge of tractor to centre* *cm*
Head lights	91.5	13 dia	42.5
Side lights	91.5	13 dia	42.5
Rear lights	120	7 × 5	38.5
Reflectors	108	5.5 dia	37.5

FUELS AND LUBRICANTS USED IN TESTS

Laboratory and track tests:

Fuel:	Diesel oil, density 0.831 kg/l at 15 °C, Cetane number 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: 30th October 1970 - L.M.A. - TORINO (Italy)

Type of dynamometer: electrical, swinging frame

Horsepower	*Speeds*		*Fuel consumption*		
	Engine	*P.t.o.*	*Per hour*	*Specific*	*HP hour/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					
46.06	2600	650	11.75	212	3.92
B. Standard p.t.o. speed (540 rev/min)					
41.02	2160	540	9.62	195	4.26
C. Speed recommended by manufacturer for drawbar work					
46.06	2600	650	11.75	212	3.92
D. Part loads					
40.41	2685	671	10.23	210	3.95
—	2845	—	3.49	—	—
20.92	2778	695	6.62	263	3.16
46.06	2600	650	11.75	212	3.92
10.60	2815	704	4.93	387	2.15
30.92	2740	685	8.18	220	3.78

No load, maximum engine speed: 2845 rev/min

Equivalent crankshaft torque at max. power: 12.69 mkg

Maximum equivalent crankshaft torque: 16.55 mkg at 1200 rev/min engine speed

Mean atmospheric conditions:
- temperature 16 °C
- pressure 751.8 mm/Hg
- relative humidity 72%

Maximum temperature:
- coolant 80 °C
- engine oil 118 °C
- fuel 30 °C

2. Drawbar performance:

Date of tests: 16th, 17th, 18th and 24th November 1970
Type of track: concrete
Height of drawbar above ground: 460 mm

Gear No.	Horse-power, metric hp	Drawbar pull, kg	Travelling speed, km/h	Engine speed, rev/min	Wheelslip, %	Fuel consumption		Temperature			Atmospheric conditions		
						metric hp h/l	Specific g/metric hph	Coolant °C	Fuel °C	Engine oil °C	Temperature, °C	Relative humidity, %	Pressure, mmHg
1 - Maximum power (ballasted)													
(*) 1	20.36	2380	2.31	2774	11.0	3.25	255	78	29	110	11.0	42	737.0
(*) 2	30.22	2365	3.45	2719	10.1	3.32	250	78	29	110	10.0	44	737.5
3	41.82	2295	4.92	2615	8.7	3.62	230	80	30	112	8.7	47	737.5
4	43.02	1760	6.60	2599	4.6	3.64	228	80	31	114	9.5	56	735.5
5	43.30	1390	8.41	2597	3.6	3.65	227	80	31	115	10.0	44	737.5
6	41.69	874	12.88	2599	2.3	3.55	234	80	31	115	9.5	56	735.5
2 - Five-hour test at 75% of pull at maximum power													
5	34.09	1040	8.85	2705	2.9	3.43	242	78	30	112	4.5	67	741.3
(°) 3 - Five-hour test at pull corresponding to 15% wheelslip in test (1)													
2	32.12	2450	3.54	2699	7.1	3.36	247	78	30	112	4.0	76	742.5
4 - Maximum power (unballasted)													
(●) 4	37.07	1569	6.38	2688	9.3	3.42	243	80	31	114	10.8	45	748.0
5	43.59	1444	8.15	2596	5.8	3.68	226	80	31	114	11.0	48	748.0
6	43.91	938	12.64	2591	2.9	3.69	225	80	31	114	10.5	51	748.0
7	42.68	614	18.77	2598	1.9	3.61	230	80	31	114	9.0	58	748.0

Oil consumption during ten hours duration of tests (2) and (3): 17 g/h.
(*) Maximum pull available at 15% wheelslip: 2430 kg
(°) Tractor with additional ballast
(●) Maximum pull available at 15% wheelslip: 1630 kg

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

Details of wheel equipment: As in specification, without ballast

Track of wheels: Front 1380 mm
Rear 1400 mm

		With brakes		*Without brakes*	
		Right-hand	*Left-hand*	*Right-hand*	*Left-hand*
Radius of turning space	m	3.20	3.13	3.55	3.45
Radius of turning circle	m	3.05	2.98	3.40	3.30

4. **Location of centre of gravity:**

	mm
Height above ground	719
Distance forward from the vertical plane containing the axis of the rear wheels	709
Distance from the median plane of the tractor	0

5. **Braking:**

Date of tests	25th November 1970
Type of track	concrete
Type of decelerometer	SIEMENS BRAMSMESSER B1S
Weight of ballasted tractor	2850 kg

Cold brakes

		Tractor ballasted	*Tractor without ballast*
Travelling speed of tractor	km/h	25.0	25.0
i - Maximum deceleration	m/s^2	4.8	4.3
ii - Stopping distance	m	7.4	9.0
iii - Force on brake pedal	kg	48	54
iv - Force on brake pedal to a deceleration of 2.5 m/s^2	kg	25	25

Brake fade characteristics (hot tests)

Maximum deceleration hot/maximum deceleration cold × 100 = 96%.
Stopping distance cold/stopping distance hot × 100 = 106%.
Force on pedal cold/force on pedal hot × 100 = 96%.

Parking brake:

Efficiency of handbrake on a slope of 16 per cent: with a 35 kg pull on handbrake no wheel rotation occurs with tractor facing first up and then down the slope.

6. Measurement of ambient noise emitted by the tractor:

Date of test: 24th March 1971
Type of sound level meter: ELIT type 905
Type of track: concrete
Results of test: — gear 8th
— travelling speed 25.0 km/h
— sound level 88 dBA

7. Noise measurement at the driver's ear level:

Date of test: 24th March 1971
Type of sound level meter and octave filter: ELIT type 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 test

Gear	*Travelling speed km/h*	*Loudness sones*
4	6.65	98
5	8.54	102
6	12.00	116

8. Power lift and hydraulic pump performance:

Date and location of tests: 31st March 1971 - L.M.A. - TORINO (Italy)
Hydraulic fluid: Transmission oil
Type of linkage lock for transport: hydraulic
Opening pressure of the relief valve: 150 kg/cm²

Pump characteristics:

i) Opening pressure of the relief valve: 150 kg/cm²
Sustained pressure by the open relief valve: 170 kg/cm²
ii) Pump delivery rate at minimum pressure and rated engine speed: 21.8 l/min
iii) Pump delivery rate: 20.6 l/min
Delivery pressure: 170 kg/cm²
Power: 7.8 metric hp

	Height above ground in down position		*Vertical movement mm*	*Maximum force exerted through full range kg*	*Pressure kg/cm²*	*Lifting force when front of tractor lifts kg*
	Hitch point mm	*Frame mm*				
Linkage giving maximum mechanical advantage						
At hitch points	335	—	545	1450	170	1460
On the frame	—	280	635	1085	170	840
Linkage giving minimum mechanical advantage						
At hitch points	205	—	665	1180	170	—
On the frame	—	155	795	950	170	950

NOTE - On request this tractor is available with the following additional speeds and is designated FIAT 500/12B.

Gear	*Number of engine revolutions for one revolution of driving wheel*	*Travelling speed for 2600 rev/min rated engine speed, km/h*
Forward		
1	791.513	0.79
2	526.072	1.19
3	359.268	1.74
4	278.143	2.25
Reverse		
1	550.878	1.13

Officer in charge: Ing. R. Gioia

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

Date: 10th April 1971

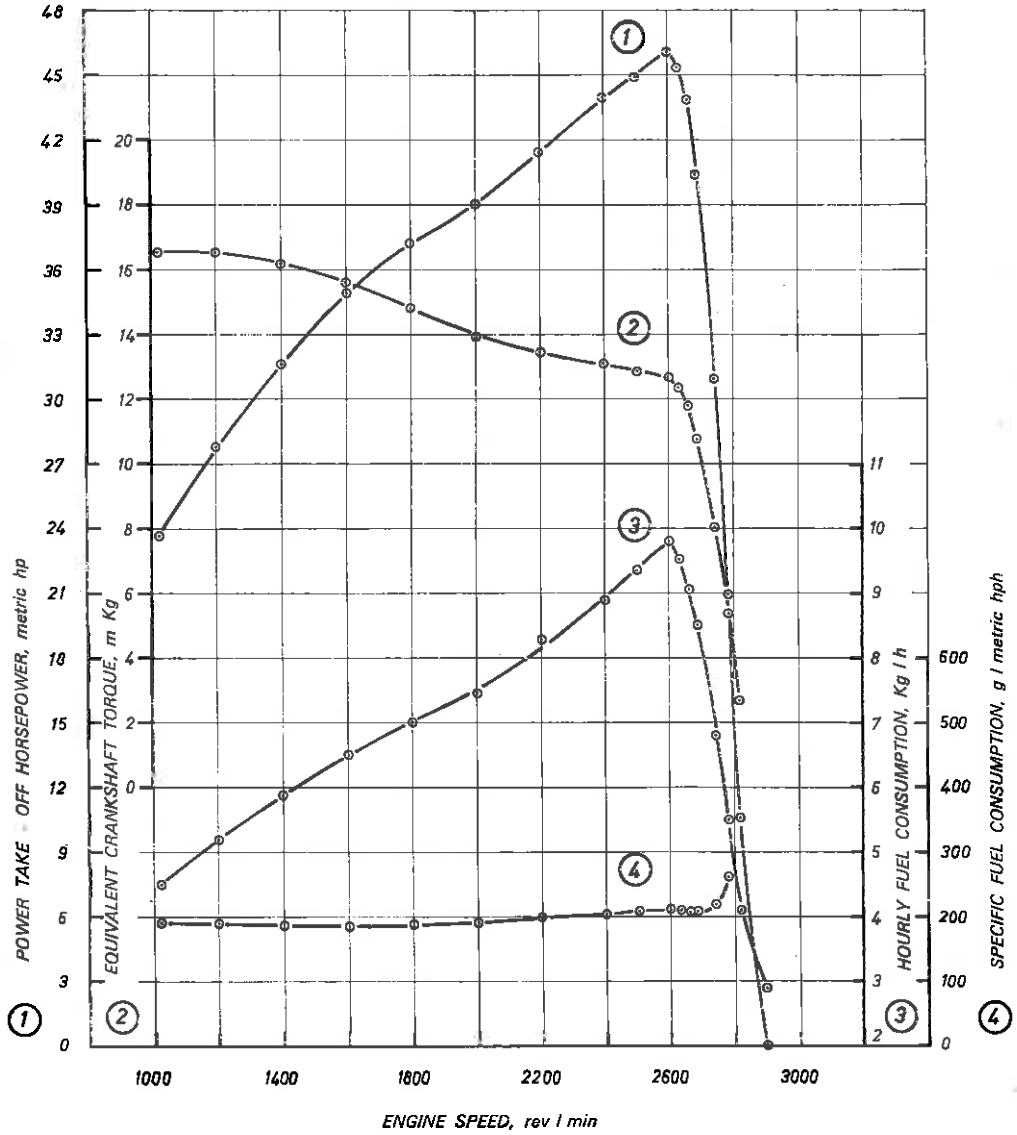


Fig. 1. Power take-off test

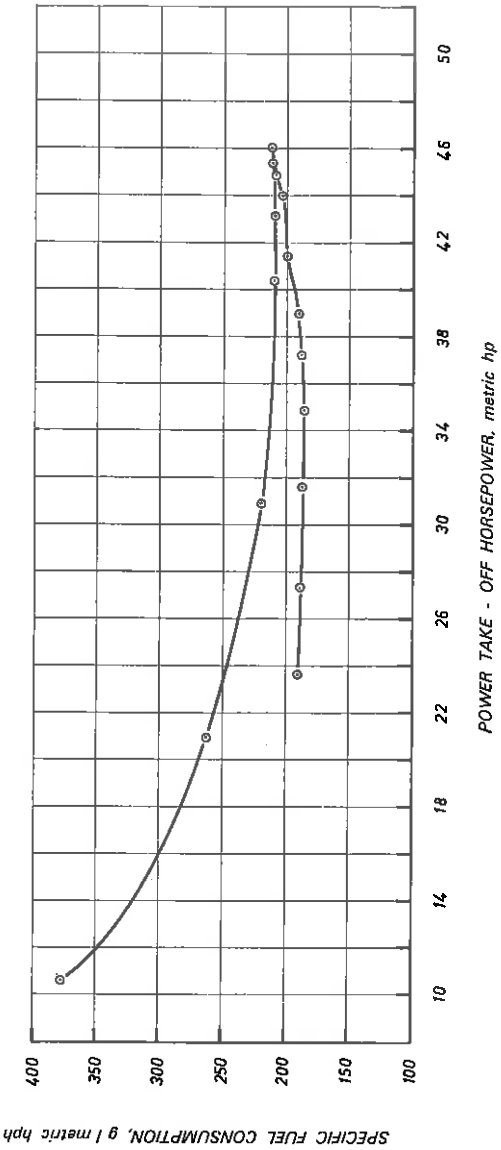


FIG. 2. Power take-off test

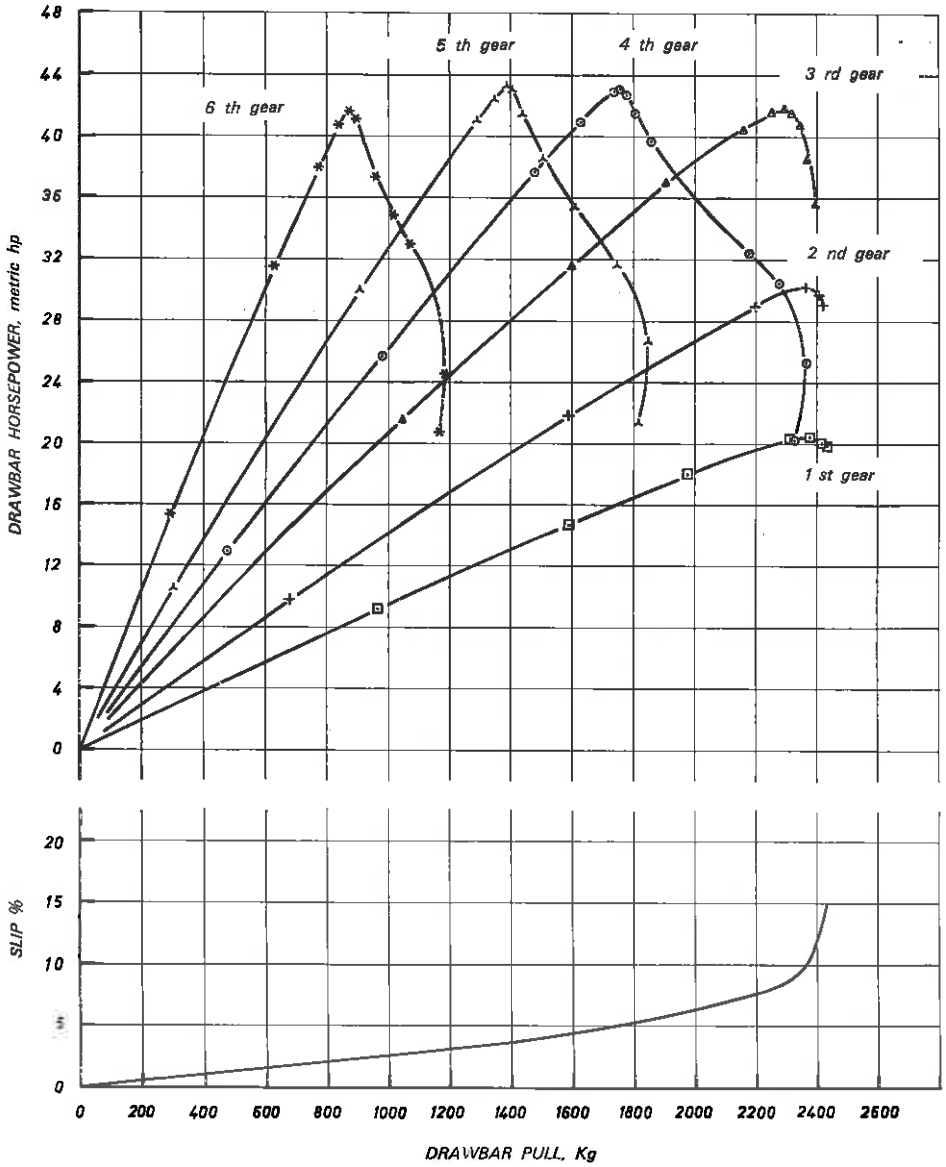


FIG. 3. Drawbar test on concrete, with ballast

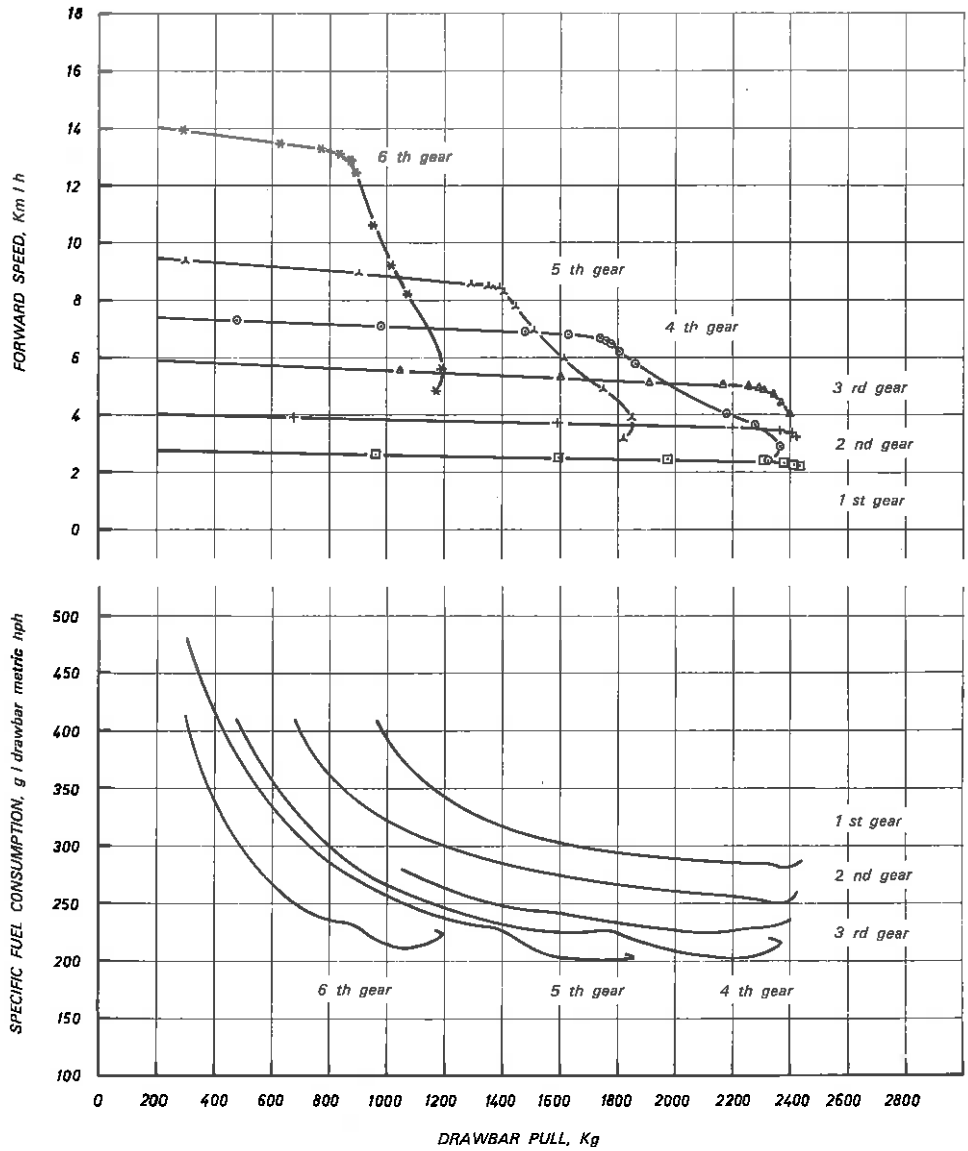


FIG. 4. Drawbar test on concrete, with ballast

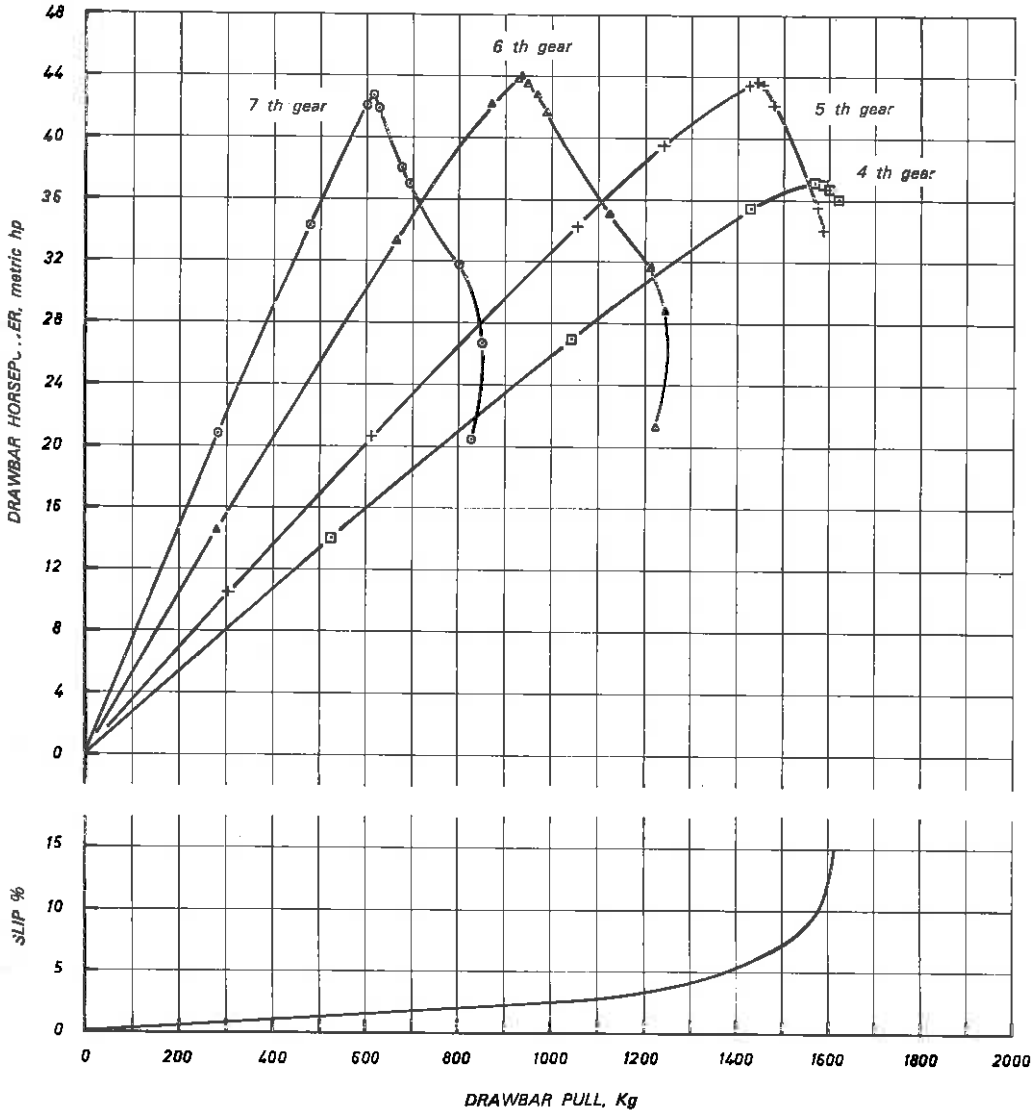


FIG. 5. Drawbar test on concrete, without ballast

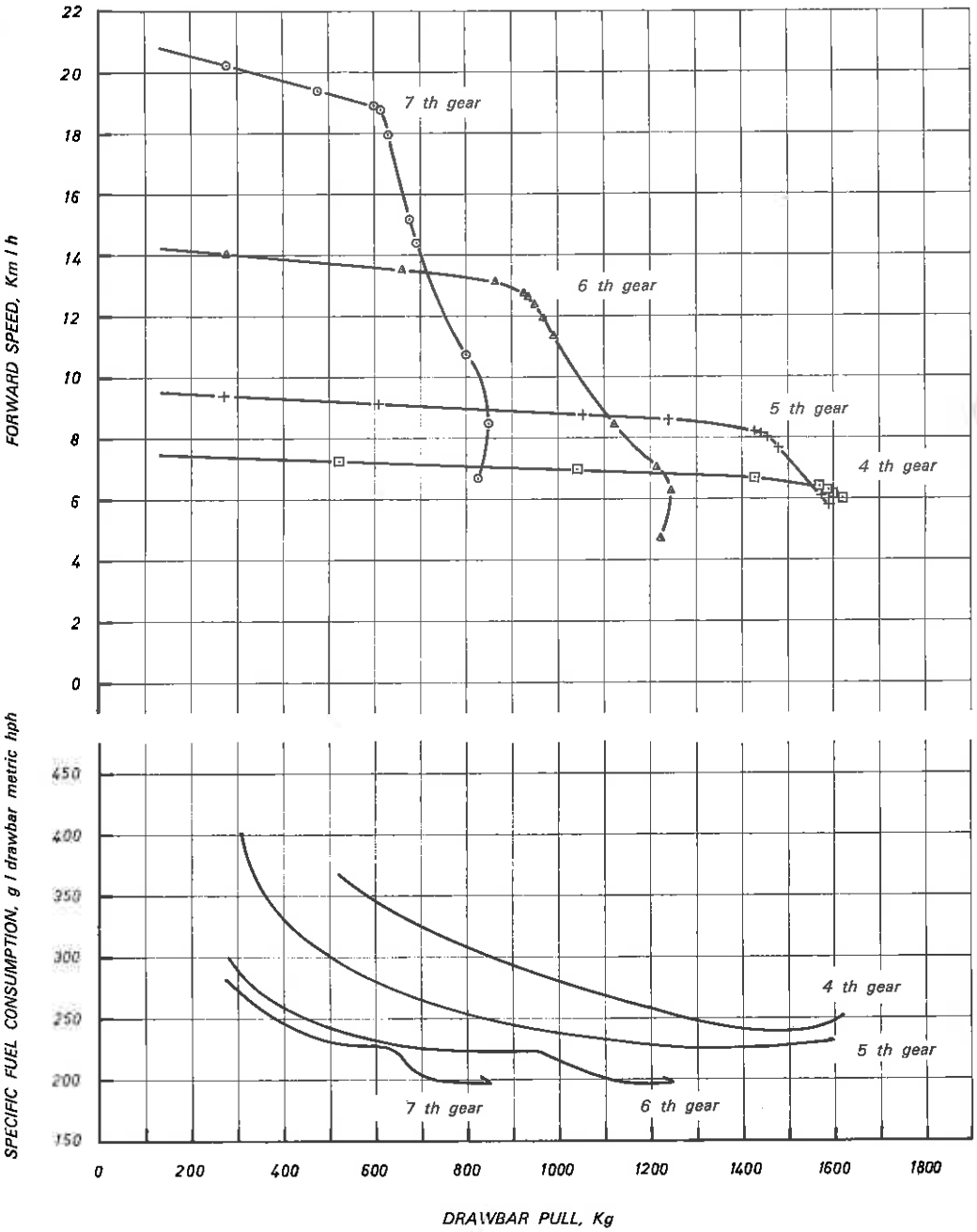


FIG. 6. Drawbar test on concrete, without ballast

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