STATENS MASKIN-PRÖVNINGAR

NATIONAL SWEDISH TESTING INSTITUTE FOR AGRICULTURAL MACHINERY

Head office: Ultuna, UPPSALA 7, Sweden

Testing Stations for Agricultural, Forestry and Garden Machines:

(South Sweden)	(Middle Sweden)	(North Sweden)
ALNARP	Ultuna, UPPSALA 7	Röbäcksdalen, UMEÅ 5

Testing Station for Dairy Machines: ALNARP

TEST BULLETIN : OECD No. 086 ✓

Date of Approval: 6th August, 1965

TEST IN ACCORDANCE WITH OECD TEST CODE FOR AGRICULTURAL TRACTORS

Valmet 565 diesel tractor

Manufactured by:

Valmet Oy, Jyväskylä, Finland

Test requested by:

Maskinköp AB, Uppsala, Sweden

Date of test: June 1965

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

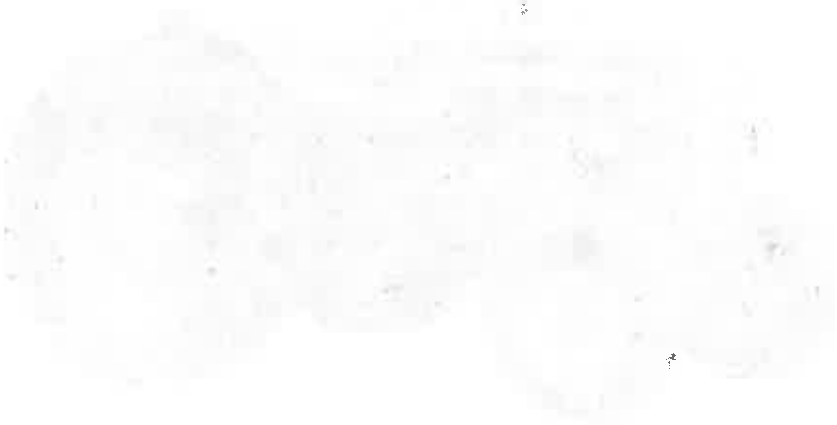


Table of contents

Appendix

Part 1

Specification of tractor

Tractor:

Make:	Valmet Oy
Model:	565
Type:	Wheeled (two-wheel drive)
No.:	Serial No. 26681

Engine:

Make:	Own make, Model 310A, direct injection 4-stroke diesel, Serial No. 16779
Cylinders:	3 cylinders, vertical, in-line, 100 mm bore × 114 mm stroke, compression ratio 17:1, replaceable wet cylinder liners, overhead valves

tated speeds: For p.t.o. work 1500 r/m
For drawbar work 2250 r/m

Fuel system: Fuel — diesel oil
Simms type P 4624/2 (SPGE3M75S250) injection pump,
Simms type NL 283 injection nozzles,
Simms type HB 97 S 591 nozzle holders,
injection timing 20° before T.D.C.,
injector opening pressure 175 kp/cm^2,
A.C. diaphragm type VP fuel feed pump,
Simms prefilter type FP 15 with Valmet felt element type AL 10943 and Simms filter type FP 11 with Valmet paper element type AL 10994 on delivery side of feed pump;
capacity of fuel tank 38 litres

Governor: Simms mechanical governor type 1000 S 740, governed range of speed 600 r/m to 2250 r/m

Air cleaner: Mann & Hummel oil bath type, oil capacity 0.65 litres

Oiling system: Forced feed from gear type pump, recommended oil "For service DM-DS" SAE20-20W, between 0° C and – 15° C SAE10-10W, below – 15° C SAE5W, Valmet type AL 7806 full flow oil filter, recommended oil change period 150 hours; oil capacity 6.4 litres

Cooling system: Pressurised, water cooled, impeller assisted with 2-blade belt driven fan, thermostat and radiator curtain for temperature control, cooling water capacity 10 litres

Transmission:

Clutch: Borg and Beck dry single plate clutch, 11 in. (280 mm) diameter, foot-pedal operated

Gearbox: Own make with 6 forward speeds and 2 reverse; a 3-speed gearbox with one sliding and two synchromesh gears and reverse gear and a dual range synchromesh reduction gear

Differential: Own make, crown wheel and pinion and differential with spur gear final drives, foot-pedal and hand-lever operated differential lock, total transmission oil capacity 14.7 litres

Gear No.	Number of engine revolutions for one revolution of driving wheel	Theoretical travelling speed for 2250 r/m rated engine speed, km/h
1 (low 1)	137.5	3.9
2 (low 2)	84.5	6.4
3 (high 1)	55.1	9.8
4 (low 3)	40.6	13.3
5 (high 2)	33.8	15.9
6 (high 3)	16.2	33.2
Low reverse	96.3	5.6
High reverse	38.5	14.0

Steering device:	Own make, worm and nut type with double drag links
Brakes:	Hand brake—none fitted Foot brakes—internal expanding type on differential half-shafts, mechanical, independent or combined foot-pedal operated, ratchet and pawl for parking
Wheels:	
Steering wheels:	Two at front, tyres 7.50—16, 6-ply pneumatic, track 1370 mm by 50 mm steps to 1670 mm, changed by extending front axle and reversing wheels, maximum permissible weight on each tyre 710 kg at 2.5 kp/cm²
Driving wheels:	Two at rear, tyres 14.9/13—28, 6-ply pneumatic, track 1420, 1530, 1630, 1740, 1840 and 1940 mm, changed by reversing wheel centres and offset lugs on rims, maximum permissible weight on each tyre 1540 kg at 1.3 kp/cm²
Wheelbase:	1900 mm
Belt pulley:	Not fitted for test
Location:	At rear, p.t.o. driven
Diameter × width:	225 × 165 mm
Speeds:	1653 r/m and 19.5 m/s at 2250 r/m rated engine speed 1358 r/m and 16 m/s at 1848 r/m engine speed
Direction of rotation:	Optional depending on position of unit
Power take-off:	
Main:	6-spline, 34.9 mm (1 $^{3}/_{8}$ in.) diameter, in centre-line at rear of tractor
Height above ground:	646 mm
Speeds:	827 r/m at 2250 r/m rated engine speed 540 r/m at 1470 r/m engine speed
Direction of rotation:	Clockwise viewed from tractor rear
Power lift:	Own make, hydraulic with gear type pump direct driven from the crankshaft via splined stub shaft and sliding collar, two-way valve giving pressure for single acting ram cylinder and external tapping, category 2 implement linkage with draught and position controls, adjustable draught response, adjustable speed of lift and drop of implement, oil capacity 10 litres, maximum working pressure 130 kp/cm², oil delivery 24.1 l/min at 110 kp/cm² pressure (maximum power) and 2250 r/m rated engine speed, maximum load liftable through complete range of movement at end of lower links

1150 kg with lift rods in foremost position
1170 kg with lift rods in rearmost position

Drawbar: Swinging drawbar, lateral adjustment 670 mm, height above ground of lower member of yoke 430 mm, that of upper member of yoke 520 mm, distance from rear axle 670 mm to rear

Hitch: Pick-up hitch fitted to power lift arms, vertical range from 130 mm to 450 mm (locked position) above ground, distance from rear axle 233 mm to rear

Towing hitch: At front of tractor, height above ground 705 mm

Electrical equipment:

Voltage: 12
Generator: Lucas type C 40 A
Batteries: Two 6 V Clorex type 3-XCN8-19L lead-acid in series, capacity 140 Ah
Starting device: CAV type CA45 D starter motor

Overall dimensions:

Overall length: 3.11 m
Overall width: 1.78 m at 1420 mm track, no ballast weights
2.30 m at 1940 mm track, no ballast weights
2.76 m at 1530 mm track, to outside of wheel weights, 8 per wheel
Overall height: 2.22 m to top of exhaust pipe
Minimum ground clearance: 0.48 m (without drawbar)

Weights:

	Without additional weight, kg	With maximum additional weight, kg
On front wheels	730	1251
On rear wheels	1202	2927
Total	1932	4178

Part 2

Laboratory tests

I. Main power take-off test: Compulsory tests
Date and location of tests: 15th June, 1965, Ultuna, Uppsala 7
Type of dynamometer: Schenck hydraulic brake

Position of governor control: Fully open and relating to standard p.t.o. speed

Fuel: Shell Diesoline, density 0.828 at 20° C, Cetane No. 48

Engine oil: SAE 20

Transmission oil: SAE 90

Horse-power	Speed		Torque	Fuel consumption			Temperature			Atmos. conditions	
	engine	p.t.o.					cool-ant	oil	fuel	air temp.	atmos. press. mm
hp/ metric	r/m	r/m	kpm	kg/h	g/hph	hph/l	°C	°C	°C	°C	Hg
A. Maximum power, 2 h											
45.7	2248	826	14.6	9.71	212	3.91	82.5	102	21.5	18	760.5
B. Power at standard p.t.o. speed											
31.8	1470	540	15.5	6.30	198	4.18	83.5	99	20	21	760.4
C. Power at maximum torque											
32.5	1490	547	15.6	6.50	200	4.14	83.5	99	20	21	760.4
D. Power at rated engine speed											
45.7	2248	826	14.6	9.71	212	3.91	82.5	102	21.5	18	760.5
No load, maximum engine speed: 2416 r/m											

Part 3

Drawbar tests on drum dynamometer

Date of tests: 17th—29th June, 1965

Type of surface: Concrete

Position of governor control lever: Fully open

Type of tyre: Rear, 14.9/13—28, 6-ply pneumatic
Front, 7.50—16, 6-ply pneumatic

Fuel: Shell Diesoline, density 0.828 at 20° C, Cetane No. 48

Engine oil: SAE 20

Transmission oil: SAE 90

A. Tests with maximum additional weight

Weight of tractor, without driver:

Weight without ballast: Front 730 kg, rear 1202 kg

Ballast front: Weights, 7 per wheel, 364 kg

	Water	107 kg
	Safety cab	50 kg
Ballast rear:	Weights, 8 per wheel,	1120 kg
	Water	477 kg
	Safety cab	128 kg
Weight with full ballast:	Front 1251 kg, rear 2927 kg Total 4178 kg	
Tyre pressure:	Front 2.5 kp/cm² Rear 1.3 kp/cm²	
Height of drawbar above ground:	520 mm	

1. Maximum powers and pulls

Gear No.	Maximum powers								Maximum pulls	
	Horse-power hp/ metric	Corre-sp. pull kp	Wheel-slip %	Engine speed r/m	Speed of travel km/h	Water temp. °C	Air temp. °C	Atmos. press. mm Hg	Pull kp	Reason for stall
1	38.4	2915	11.5	2303	3.56	68.5	19	757.8	3128	Wheelspin
2	41.4	1848	5.3	2266	6.05	70	20	757.8	2052	Engine stall
3	39.7	1144	3.4	2262	9.37	81.5	20	757.8	1295	Engine stall
4	39.4	834	2.9	2250	12.74	78	17.5	757.0	947	Engine stall

2. Fuel consumption

Gear No.	Optimum fuel consumption			Range of pull over which specific fuel consumption does not exceed the optimum consumption by more than 10 % kp
	g/hph	hph/l	Corresponding pull kp	
1	232	3.57	2190	1520—2955
2	214	3.87	1945	1280—2050*
3	212	3.91	1250	1240—1295
4	214	3.87	910	900— 950

* Within the range of 1750 kp to 1860 kp the fuel consumption exceeds the optimum consumption by more than 10 %.

B. Tests without ballast

Weight of tractor, without driver:

Weight without ballast:	Front 730 kg
	Rear 1202 kg
	Total 1932 kg

Tyre pressure: Front 2.5 kp/cm²
Rear 1.3 kp/cm²

Height of drawbar above ground: 520 mm

1. Maximum powers and pulls

Gear No.	Maximum powers								Maximum pulls	
	Horse-power hp/ metric	Corre-sp. pull kp	Wheel-slip %	Engine speed r/m	Speed of travel km/h	Water temp. °C	Air temp. °C	Atmos. press. mm Hg	Pull kp	Reason for stall
1	18.2	1523	13.4	2338	3.22	66.5	19.5	758.5	1523	Wheelspin
2	31.4	1513	14.4	2315	5.61	68.5	22	751.4	1533	Wheelspin
3	39.6	1208	9.5	2241	8.84	72.5	22	751.6	1311	Engine stall
4	40.5	875	6.5	2254	12.48	86	23	751.6	975	Engine stall
5	40.7	716	5.0	2280	15.35	73.5	20	751.4	820	Engine stall
6	38.7	320	1.9	2247	32.62	84	21.5	751.4	356	Engine stall

2. Fuel consumption

Gear No.	Optimum fuel consumption			Range of pull over which specific fuel consumption does not exceed the optimum consumption by more than 10 % kp
	g/hph	hph/l	Corre-sponding pull kp	
1	280	2.96	1270	1000—1525
2	235	3.52	1335	880—1535
3	226	3.66	1260	670—1310
4	219	3.78	915	490— 975
5	216	3.83	760	470— 820
6	219	3.78	350	340— 355

Part 4

I. Location of centre of gravity:

Tractor equipped as in	Test 3 A ballasted	Test 3 B unballasted
Distance forward from vertical plane containing the axis of the rear wheels.....	559 mm	691 mm
Distance from the median plane parallel to the longitudinal axis of the tractor bisecting the track.....	0	0

II. Turning space and turning radius:

Wheel equipment: Front 7.50—16
Rear 14.9/13—28

Wheel track: Front 1370 mm
Rear 1530 mm

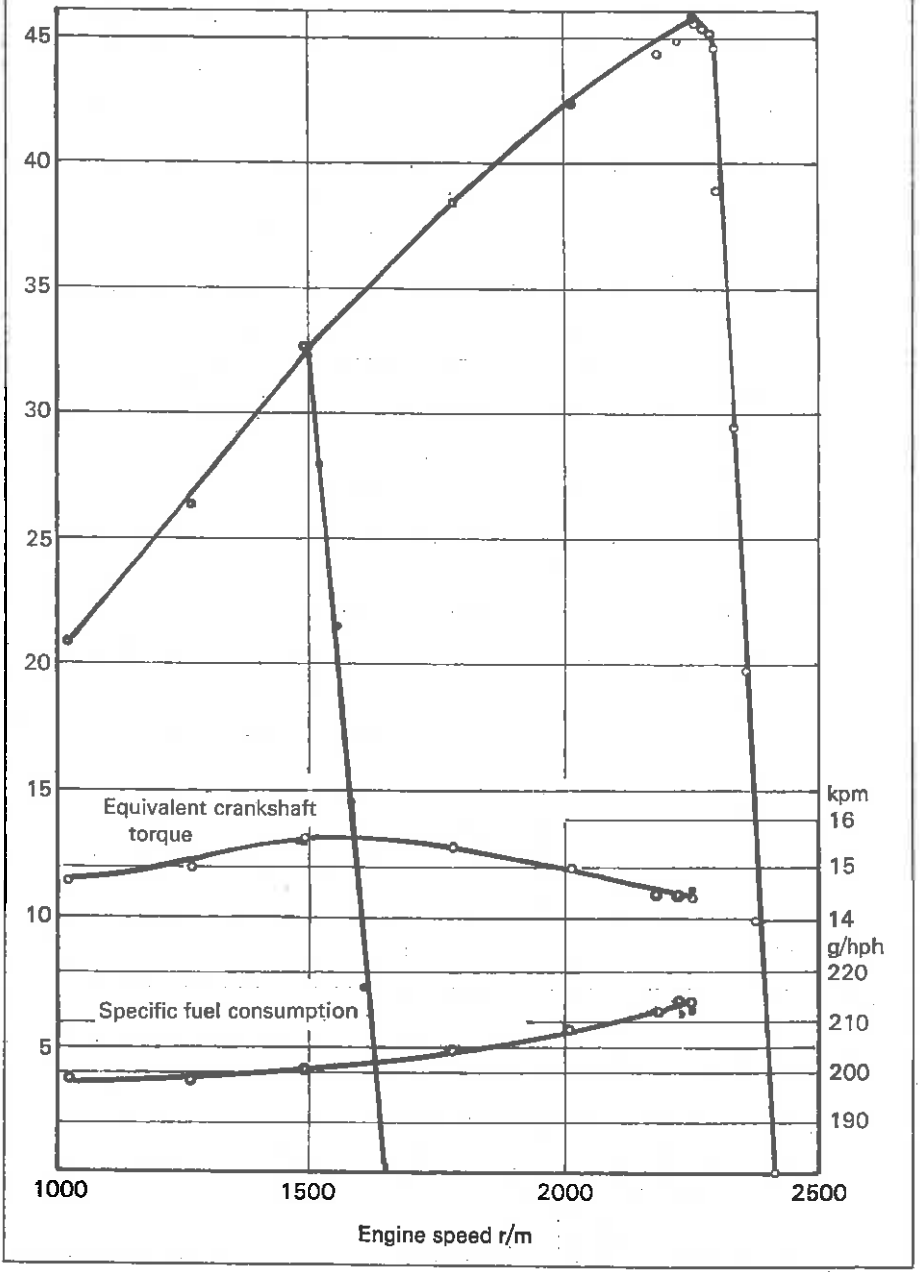
	With brakes		Without brakes	
	Right-hand	Left-hand	Right-hand	Left-hand
Radius of turning space.....	3.06 m	3.11 m	3.41 m	3.55 m
Turning radius	2.93 m	2.98 m	3.28 m	3.42 m

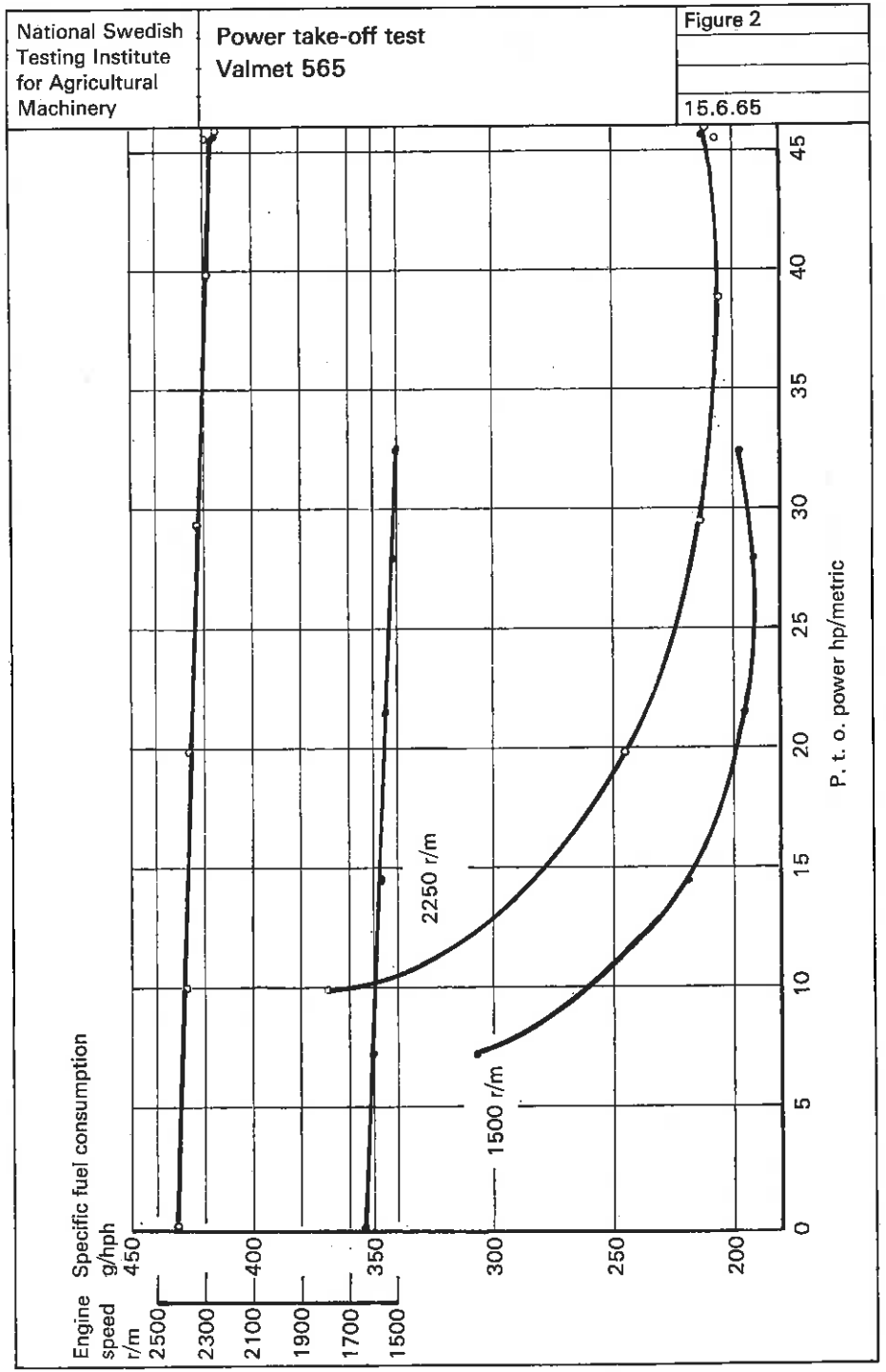
Part 5

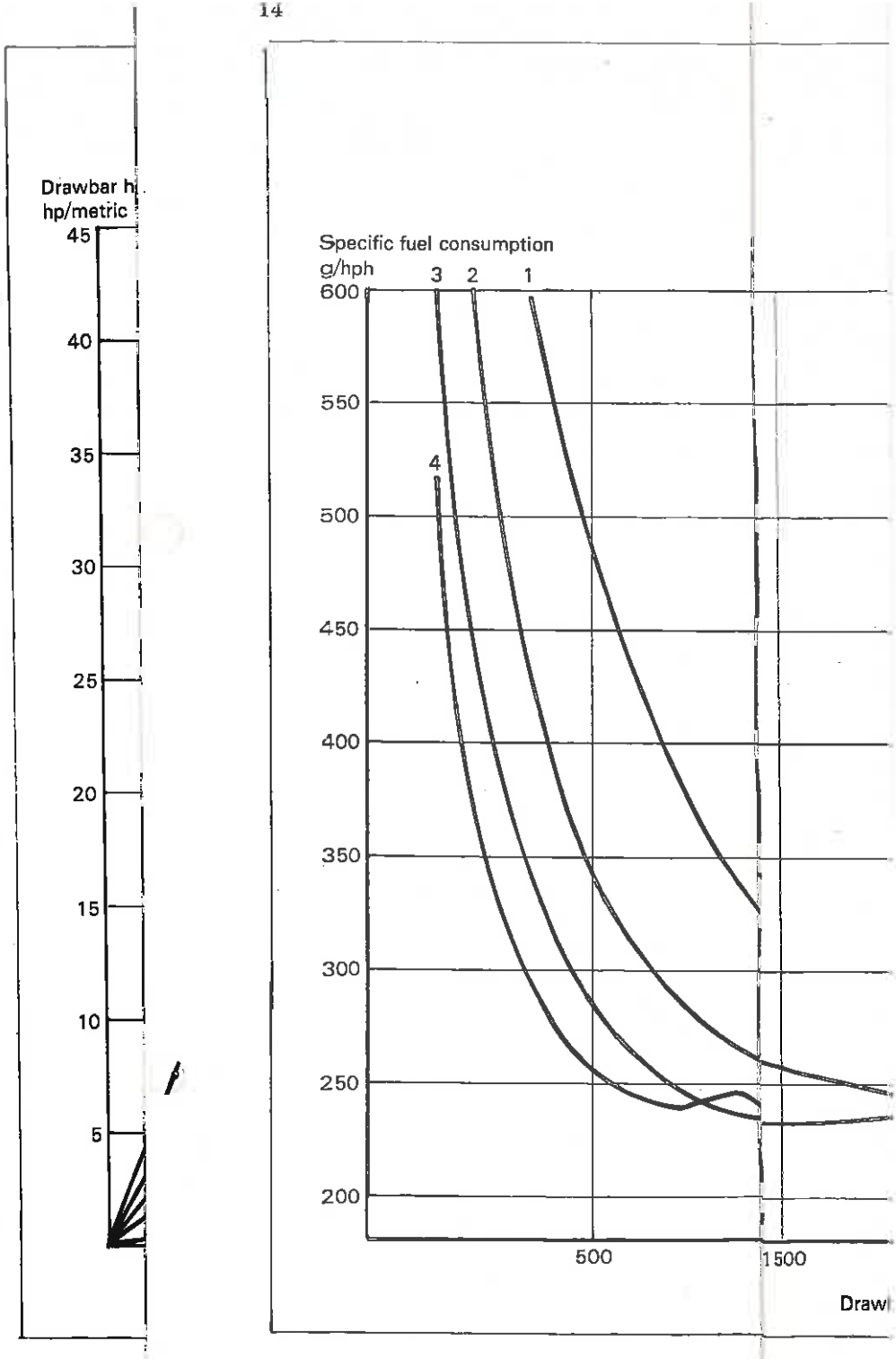
Repairs and adjustments during tests: None
Remarks: None

Ultuna, Uppsala 7, 27th July, 1965
National Swedish Testing Institute for Agricultural Machinery

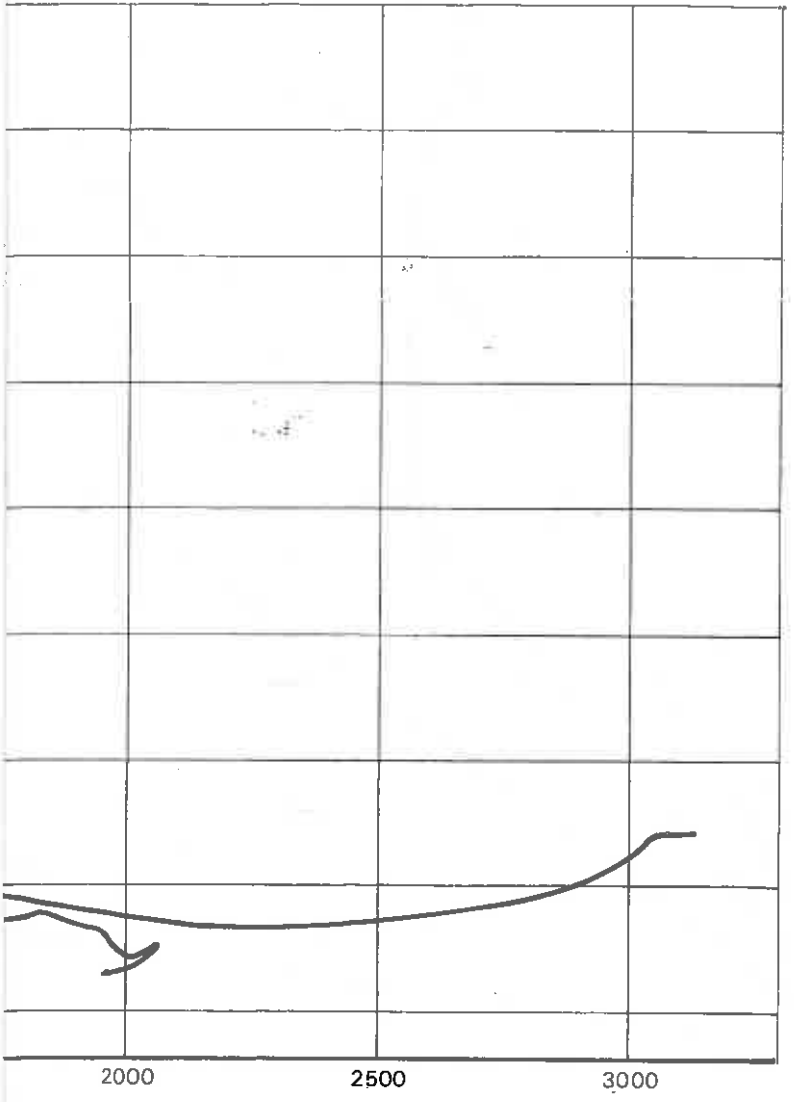
National Swedish Testing Institute for Agricultural Machinery	Power take-off test Valmet 565	Figure 1 15.6.65




National Swedish Testing Institute for Agricultural Machinery
Power take-off test
Valmet 565
Figure 2
15.6.65
Engine speed r/m
Specific fuel consumption g/hph
2500
2300
2100
1900
1700
1500
450
400
350
300
250
200
2250 r/m
1500 r/m
0
5
10
15
20
25
30
35
40
45
P. t. o. power hp/metric

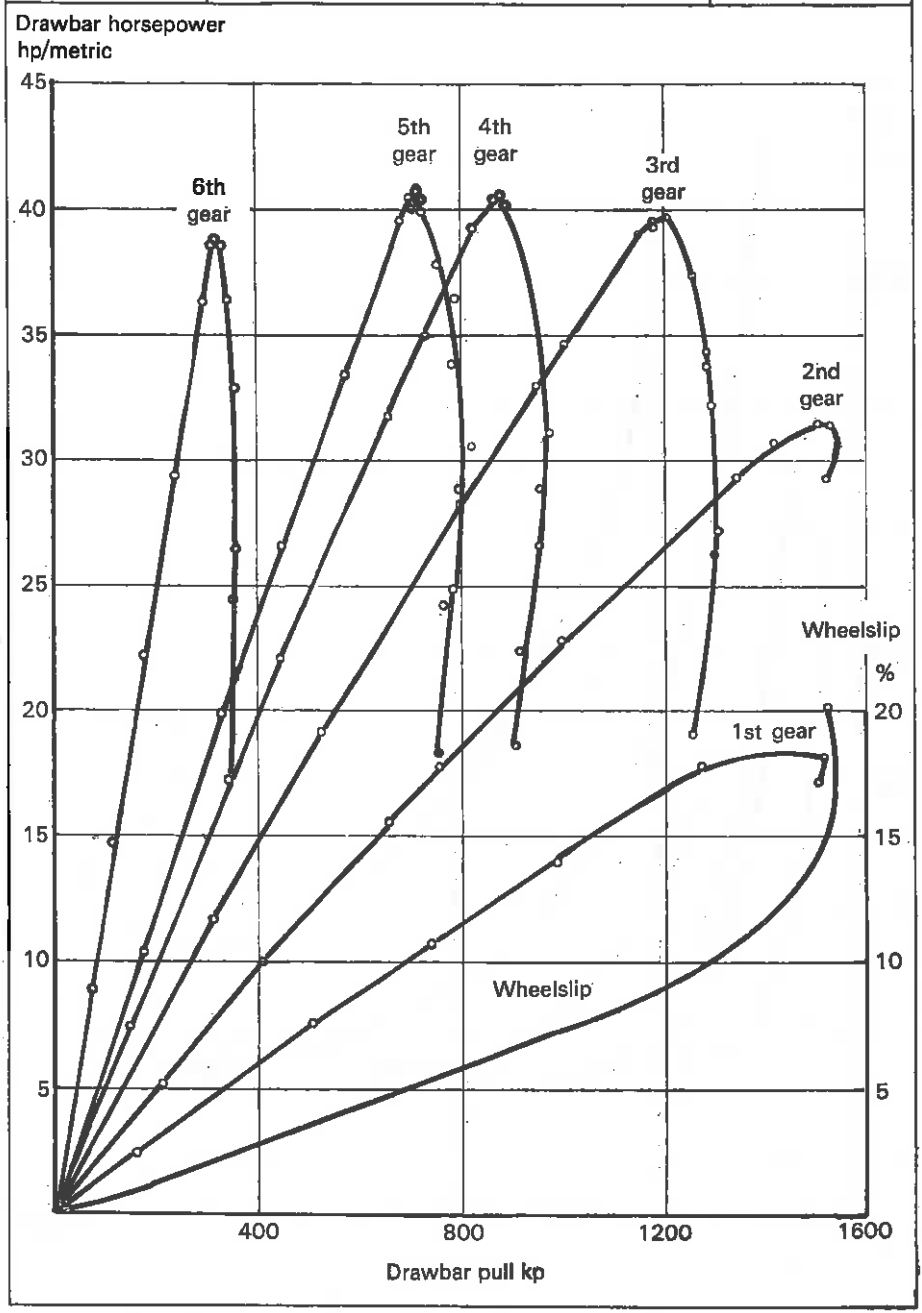

Drawbar h
hp/metric
45
40
35
30
25
20
15
10
5
Specific fuel consumption
g/hph
3
2
1
4
600
550
500
450
400
350
300
250
200
500
1500
Drawl

National Swedish Testing Institute for Agricultural Machinery	Drawbar test on drum dynamometer Valmet 565 with ballast	Figure 4 28/29.6.65

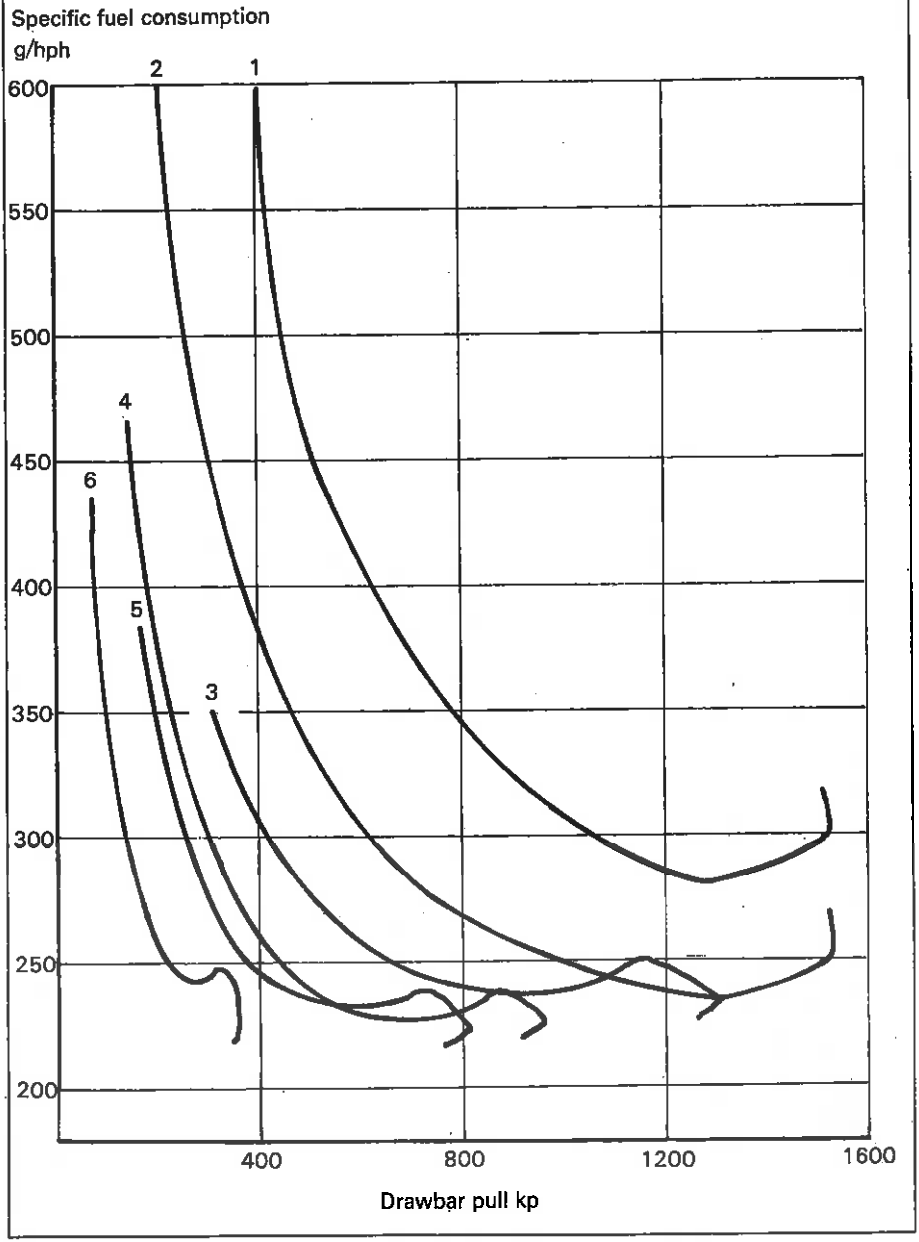


ar pull kp

National Swedish Testing Institute for Agricultural Machinery	Drawbar test on drum dynamometer Valmet 565 without ballast	Figure 5 17,18 and 21.6.65



National Swedish Testing Institute for Agricultural Machinery	Drawbar test on drum dynamometer Valmet 565 without ballast	Figure 6 17, 18 and 21.6.65



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