313/O.E.C.D.

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

EICHER TIGER I, TYPE 3008 S

Manufactured by:

Gebr. Eicher Traktoren- und Landmaschinenwerke. Forstern/Obb.



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

Date of Approval: 24-2-1970 *Serial No.: 313*

INSTITUUT VOOR LANDBOUWTECHNIEK EN RATIONALISATIE
DR. S. L. MANSHOLTLAAN 12 - WAGENINGEN

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APPENDIX

Power take off test

curves of power-off-horse power, torque, fuel consumption, specific fuel consumption/engine speed.

Drawbar test with ballast

curves of drawbar horse power and wheelslip/ drawbar pull curves.

Drawbar test without ballast

curves of drawbar horse power and wheelslip/ drawbar pull.

Spec. Fuel consumption and travelling speed

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

PART I SPECIMEN TEST REPORT

Tractors manufacturer's name and address: Gebr. Eicher, Traktoren- und Landmaschinenwerke, 8011 Forstern.
Submitted for test by: Manufacturer
Selected by: Manufacturer,in accordance with testing station
Place of running-in: by manufacturer
Duration of running-in: 20 h

SPECIFICATION OF TRACTOR

Tractor

make: Eicher
model: Tiger I
type: 3008 S
Serial no.: 117722

Motor

make: Eicher
model: four-stroke diesel
type: EDK 2
Serial no.: 107700

Cylinders

number: 2
disposition: in line
bore/stroke: 100/125 mm
capacity: 1963 cm^3
compression ratio: 20,4 : 1
arrangement of valves: overhead valves

cylinder liners: replaceable Alfin cylinders with cooling ribs

Fuel and ignition system

type of fuel feed: commercial diesel fuel
make, type and model of fuel filters: Knecht/FB 716/1 MM with replaceable fine paper filter elements
capacity of fuel tank: 50 l
make, type and model of injection pump: Kugelfischer: PSSE 02-22.09 B plunger in line pump
Serial no.: not available
manufacturer's production setting: 21° before top dead centre
make, type and model of injectors: Kugelfischer DFO 40 A
manufacturer's production setting: 140 + 5 atm

Governor

make: Kugelfischer
type: centrifugal governor
range of speed: 600 - 2140 engine rev/min
rated speeds: 2000 rev/min

Air cleaner

main: oil bath filter
make: Mann und Hummel
type: 310 3475 384
oil capacity: 0,75 l

Pre-cleaner

main: centrifugal pre-cleaner
make: Mann und Hummel
type: 480 2467 180

Lubrication system

type: forced feed from gear pump
type and number of filters: replaceable full flow paper filter
oil capacity: 6,0 l
changing period: 100 h

Cooling system

type: air cooled engine
details of pump and fan: two separated blowers on one shaft, driven by V-belt
coolant capacity: -
means of temperature control: distance thermometer
pressure details: -

Electrical system

Voltage: 12 V
Generator: DC generator
make: Bosch
type: 0101 209 032

Battery

main: lead accumulator
make: Mittermaier
type: 12 D 90
capacity: 90 Ah

Starting system

main: electrical
make: Bosch
type: 0001 354 093
aids for cold starting: by means of a hand fuel pump

Transmission

clutch: dry clutch with two functions: 1. transmission 2. p.t.o.

make: Fichtel und Sachs

type and size: DUT 250/250 K

method of operation: foot pedal

Gearbox

make: Zahnradfabrik Friedrichshafen

type: A-208

No. of speeds: 8 forward speeds and 4 reverse speeds

ar axle and final drive

make: Zahnradfabrik Friedrichshafen

type: bevel gear and planetary drive

differential lock: Zahnradfabrik Friedrichshafen

type: sliding key

methode of operating lock: by foot pedal

Oil capacity

gearbox + differential gear

rear axle: per planetary gear: 18,1 l gear oil SAE 80

drive

final drive(s): 1,3 l gear oil SAE 80 per planetary

change period: 1000 h or at least once a year

Gear no.	Number of engine revolutions for one revolution wheel or sprocket	Nominal travelling speed for rated speed of engine km/h	Nominal travelling speed for rated speed of engine. Results of test carried out by the testing station km/h
1 L	256,68	1,68	1,72
2 L	155,36	2,87	2,96
3 L	94,65	4,71	4,79
4 L	58,54	7,64	7,77
1 H	73,88	6,04	6,21
2 H	43,20	10,33	10,65
3 H	26,32	16,95	17,41
4 H	16,25	27,45	27,72
reverse			
1	147,77	3,02	
2	86,40	5,16	
3	52,64	8,48	
4	32,50	13,73	

Power take-off

location: at rear of tractor
dimensions: 29 x 34,9 x 8,7 mm or 1 3/8"
no. of splines: 6
standard B.S. 1495; ASAE 203.2; DIN 9611/Form A
height above ground: 495 mm
proportional engine speed: 558/1116 rev/min at 2000 rev/min engine speed

engine speed: 1935/1795 rev/min at standard p.t.o. speed 540/1000 rev/min

direction of rotation: clockwise viewed from the rear

Ground speed (optional extra, not fitted on tested tractor)

proportional ground speed: distance travelled for I revolution 229,5 mm of p.t.o. (value given by manufacturer)

no. of p.t.o. revolutions for I revolution of driving wheel: 16,2

direction of rotation: clockwise viewed from the rear with tractor in forward gear.

details of other power take-off, if any: none

Belt pulley (optional extra, not fitted on tested tractor)

location: at rear of p.t.o.

type: ZF/WTS 35

dimensions: 220 mm

diameter and width of face: 150 mm

speed-linear: 17,7 m/sec and: 1545 rev/min

at rated engine speed 2000 rev/min

engine speed 1893 rev/min at standard linear speed 16,75 m/sec

direction of rotation: clockwise or anti-clockwise, depending on way of fitting

Power lift

make: ZF-Bosch-Eicher

type: hydraulic

oil capacity: 7,5 l

category: category I implement linkage, acc. DIN 9674

description of controls: single lever control

Drawbars

Implement linkage: three point implement linkage, cat. I, acc. DIN 9674
height above ground max. 905 mm, min 35 mm
method of changing position by power lift and adjustable stay links

Fixed drawbar: optional extra, on lower links,
construction 1: 90x30x680 mm
construction 2: 90x30x1320 mm
holes construction 1: central hole and three holes apart either side of centre line at a distance 90/90/90 mm
holes construction 2: central hole and six holes apart either side of centre line at a distance 90/90/90/180/90/90
distance from hole behind rear wheel centre: 891 mm
distance from central hole behind p.t.o.: 631 mm

Swinging drawbar: optional extra
height above ground: 300 or 385 mm
distance from pivot behind rear wheel centre 615, 665 or 715 mm
distance from pivot behind p.t.o. 355, 405 or 455 mm
lateral adjustment: 290 mm to the left and to the right

Hitch

height above ground: 605, 655, 705 or 755 mm
distance from rear axle: 482 mm
position relative to p.t.o.: 224 mm

Steering

make: ZF-Gemmer
type: 7340 900 140
method of operation: mechanical

Brakes

make: Knott

type: internal shoe brakes

method of operation: by brake pedals. It is possible to couple the right and the left brake by turning the right brake pedal (180°)

type of parking brake: mechanical by lever

Wheeled tractors

Steering wheels

number: 2

arrangement: at front

type of tyre(s): pneumatic tyres acc. DIN 7808

make: Veith-Pirelli

size: 6.00-16

ply rating: 6 PR

maximum permissible weight on each tyre: 620 kg at 3,5 atm. pressure

track widths: normal 1280mm, adjustable at 1360 or 1500 mm

method of changing: by extending front axle

Driving wheels

number: 2

position: at rear

type of tyre(s): pneumatic tyres, acc. DIN 7807

make: Firestone

size: 12,4/11-28

ply rating: 6

rim size: W 10x28

maximum permissible weight on each tyre: 1200 kg at 1,5 atm. pressure

track width: 1250 or 1500 mm

method of changing: reversible discs

wheelbase: 1890 mm

Weights

Tractor (without driver but with tanks full)

	Front	Rear	Total
Without ballast	732 kg	1132 kg	1864 kg
With ballast	990 kg	1770 kg	2760 kg

Ballast	No. of weights	Total weight	Water
Front	3	165 kg	-- kg
Rear	1 inner and 2 outer weights per wheel	500 kg	231 kg
Additional		--	

Seat

make: Fritzmeier SF 4005

type of suspension: torsion spring

type of damping: hydraulic shockabsorber

range of adjustments: at drivers weight, distance between steering wheel and seat and height of seat

Number of grease points (whole tractor): 21

Overall dimensions (mm)

	Length	Width x)	Height
With ballast	3550 mm	1550 mm	Steering wheel: 1450 Passenger seat: 1560
Without ballast	3190 mm	1550 mm	with vertical exhaus pipe: 2080 mm

special remarks: x) at normal track width

Lighting

height above ground of centre	diameter	distance from outside edge of tractor to centre
Head lights 980 mm	130 mm	470 mm
Side lights 1210 mm	85 x 55 mm	195 mm
Rear lights 1210 mm	85 x 55 mm	195 mm
Reflectors 1028 mm	124 x 36 mm	160 mm

Mirror and passenger seat: fitted on left rear mudguard

Remarks: none

Part II FUELS AND LUBRICANTS USED IN TESTS

TRACK TESTS/LABORATORY TESTS

Fuel: Shell automotive gas oil

type: diesoline — Specific gravity at 15°C: 0,8315

cetane number: 53

conforms to -- — Standard --

Engine-oil

type: motor oil HD — Viscosity: SAE 20

Transmission-oil

type: gear oil — Viscosity: SAE 80

Part III COMPULSORY TESTS

Date and location of tests: May 1969, Wageningen

Type of dynamometer: 2 RT water brake

Horsepower (h.p.)	Speed		Fuel consumption		
	Engine rev/min	p.t.o. rev/min	Total l/h	specific ghp/h	hp.h/l
Maximum power - 2 hours test					
29,0	2046	1140	6,89	193,9	4,22
Standard p.t.o. speed (540/1000 rev/min)					
26,6	1799	1002	6,19	190,0	4,30
The speed recommended by the manufacturer for drawbar work					
28,4	2000	1116	6,6	191,8	4,3
Part loads					
25,6	2122	1182	6,01	192,3	4,25
----	2247	1252	2,16	-----	----
13,2	2201	1226	3,9	242,4	3,37
29,0	2046	1140	6,89	193,9	4,22
6,7	2226	1240	2,98	363,5	5,16
19,6	2161	1204	4,94	206,3	9,09

No loads maximum engine speed: 2247 rev/min

Equivalent crankshaft torque at maximum power: 10,17 kgm

Maximum equivalent crankshaft torque 10,47 kgm at 1799 rev/min of the engine

Mean atmospheric conditions: temperature 18,3 °C

pressure 762 (mm) Hg

relative humidity 70 %

Maximum temperature: coolant -- °C
engine oil 73 °C
fuel 18 °C

(2) DRAWBAR PERFORMANCE

Date of tests: Aug.-Sept. 1969

Type of track: concrete

Height of drawbar above ground: 590 mm

Gear number	Horse-power (h.p.)	Draw-bar pull (kg)	Engine speed rev/min	Slip of wheels %	Fuel consumption: Drawbar horse-power h.p.h./l	Fuel consumption: Specific (h.p.h.)
(i) MAXIMUM POWER (ballasted)						
1 L	10,6	1775	2204	15,5	--	--
2 L	17,3	1750	2147	16,1	2,97	275,5
3 L	22,7	1350	2046	7,8	3,25	252,3
4 L	23,0	890	1881	4,6	3,36	244,1
1 H	24,4	1100	2070	6,7	3,4	241,9
FIVE HOUR TEST at 75% of pull at maximum power						
1 H	18,3	789	2149	4,9	3,3	254
FIVE HOUR TEST at pull corresponding to 15% wheelslip in test (i)						
2 L	16,8	1684	2136	14,9	3,4	247,1
MAXIMUM POWER (unballasted)						
1 L	7,8	1260	2223	13,7	--	--
2 L	12,9	1280	2173	15,5	--	--
3 L	20,8	1280	2098	14,2	--	--
4 L	22,7	800	2068	5,7	--	--
1 H	23,3	1060	2072	7,8	--	--
2 H	24,3	650	1994	4,8	--	--
3 H	20,6	385	1703	2,0	--	--

Temperature (°C)				Atmospheric conditions	
Fuel	Coolant	Engine oil	Temperature (°C)	Relative humidity %	Pressure in mm Hg
(i) MAXIMUM POWER (ballasted)					
17,6	--	74	18,5	79,3	768
18,7	--	75	20,0	68,0	760
18,9	--	77	20,0	68,0	760
19,3	--	78	20,0	68,0	760
19,4	--	79	20,0	68,0	760
FIVE HOUR TEST at 75% of pull at maximum power					
14,6	--	79	14,5	75	767
FIVE HOUR TEST at pull corresponding to 15% wheelslip in test (i)					
15,7	--	78	15,9	72	767
MAXIMUM POWER (unballasted)					
13	--	77	13,2	55,7	764
13	--	78	13,2	55,7	764
13	--	80	13,2	55,7	764
12,8	--	81	12,4	77,3	773
12,6	--	79	12,4	77,3	773
12,5	--	79	12,4	77,3	773

(3) TURNING SPACE AND TURNING CIRCLE

Detail of wheel equipment: front: 6.00-16; rear 12,4/11-28; 6 PR both unballasted

Track of wheels - front 1310 mm rear 1240 mm

Results	With brakes		Without brakes	
	right-hand	left-hand	right-hand	left-hand
Radius of turning space	3180 mm	3120 mm	3550 mm	3450 mm
Radius of turning circle	3070 mm	3010 mm	3440 mm	3340 mm

(4) LOCATION OF CENTRE OF GRAVITY

Height above ground 740 mm

Distance forward from the vertical plane containing the axis of the rear wheels 740 mm

Distance from the medium plane --

(5) BRAKING

Date of test: October 1969

Type of track: concrete

Weight of ballasted tractor: 2760 kg

Cold brakes

	ballasted	without ballast
travelling speed of the tractor	25 km/h	25 km/h
(I) deceleration m/sec^2	3,4	3,8
(II) stopping distance m	7,0	6,3
(III) force exerted on the brake pedal	80 kg	76 kg

Brake fade characteristics (hot tests)

deceleration hot/deceleration cold. 100 94%

stopping distance cold/stopping distance hot 93%

force on pedal, cold/force on pedal, hot. 100 101%

efficiency of handbrake or parkinglatch: no rotation of the wheels

pull on handbrake (cold) 24 kg (hot) 24 kg

(6) MEASUREMENT OF AMBIENT NOISE EMITTED BY THE TRACTOR

Date of tests: October 1969

Type of sound level meter: Rohde und Schwarz, type EZGN

Type of track: Asphalt

Results of tests:

Gear: 4 H

Travelling speed: 20,59 km/h before acceleration

Sound level: right side: 79 dBA; left side: 79 dBA

(7) NOISE MEASUREMENT AT THE DRIVER'S EAR LEVEL

Date of tests: October 1969

Type of sound level meter and octave filter: Rohde und Schwarz, type EZGN

Type of track: Asphalt

Type of frequency analyser: Rohde und Schwarz, type PBO

Results of tests:

Gear	Travelling speed (km/h)	Loudness sones
4 L	7,64	69

(8) POWER LIFT AND HYDRAULIC PUMP PERFORMANCE

Date and location of tests: October 1969, Wageningen

Hydraulic fluid:

make and type: motor oil HD

viscosity: SAE 20

	Vertical movement in (mm)	Maximum force exerted through full range (kg)	Pressure (kg/cm^2)
Linkage giving maximum mechanical advantage			
At lower hitch points (height above ground in down position 330 mm	575	1400	172
On the frame	730	775	172
Linkage giving minimum mechanical advantage			
At lower hitch points (height above ground in down position 35 mm	675	1325	172
On the frame		820	172

Type of linkage lock for transport: hydraulic

Opening pressure of the cylinder over pressure relief valve 172 atm.

Pump characteristics:

i - opening pressure of the relief valve 172 atm
  - sustained pressure by the open relief valve 172 atm

ii - pump delivery rate at minimum pressure and rated engine speed 22,9 1/min

iii - pump delivery rate 21,7 1/min
  delivery pressure 135 atm
  power (calculated) 6,51 pk

Part IV

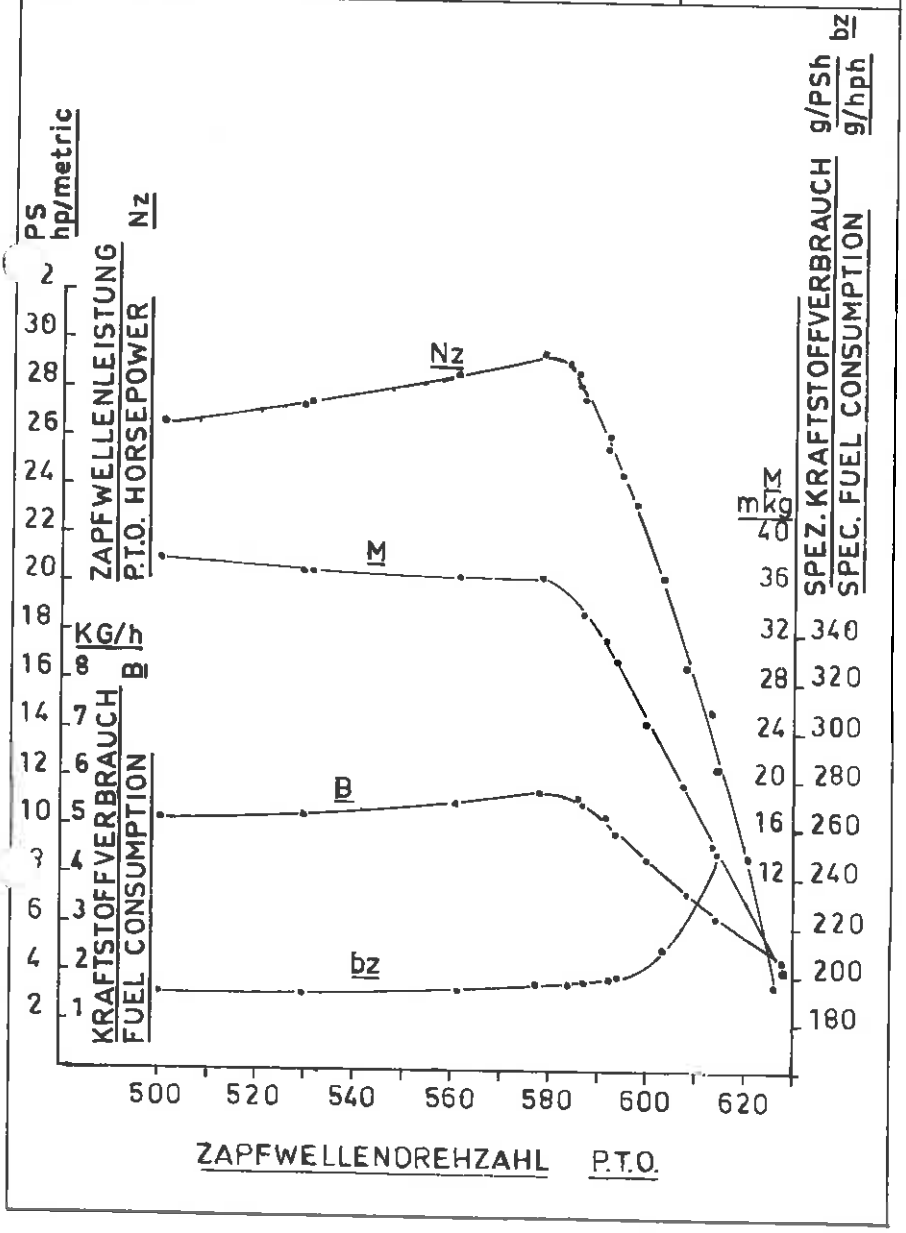
1 Repairs and adjustments during tests: none

2 Remarks : none

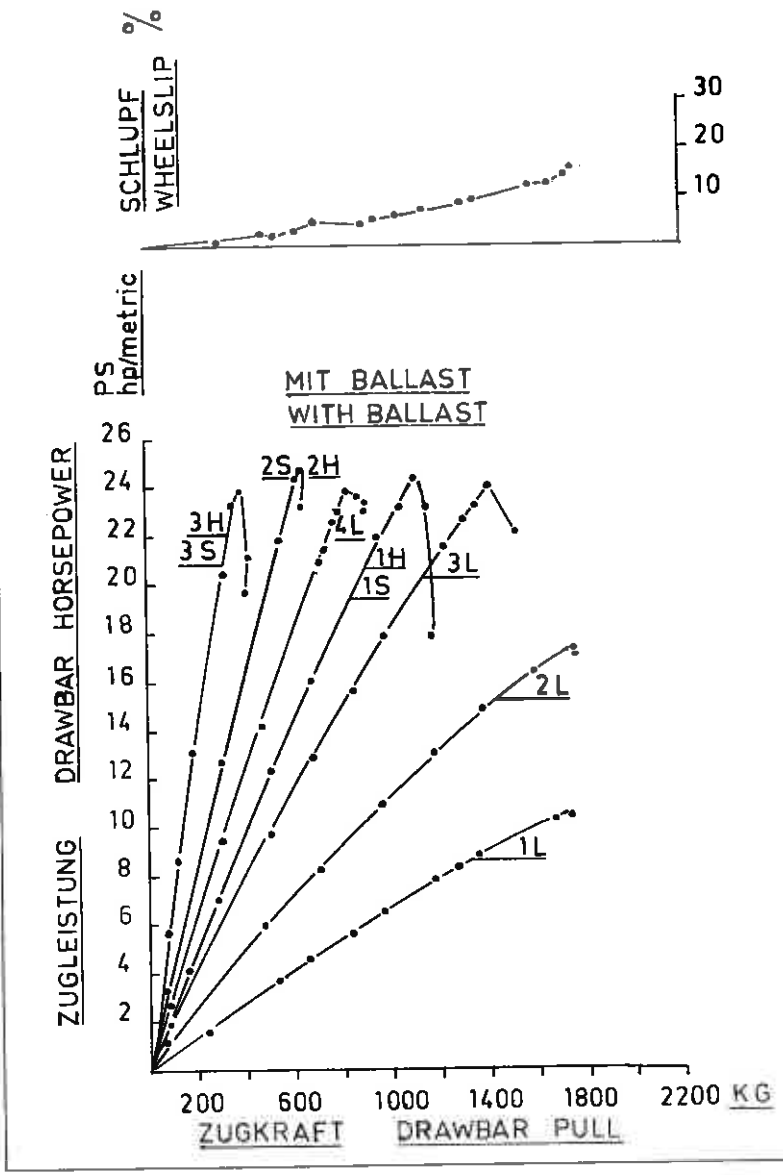
Wageningen, 27 december 1969

Head of Department of Agricultural Engineering Agricultural University	Head of Testing Department Institute of Agricultural Engineering and Rationalization
Prof. Ir. G.J. Quast	Ir. A.R. Kraai

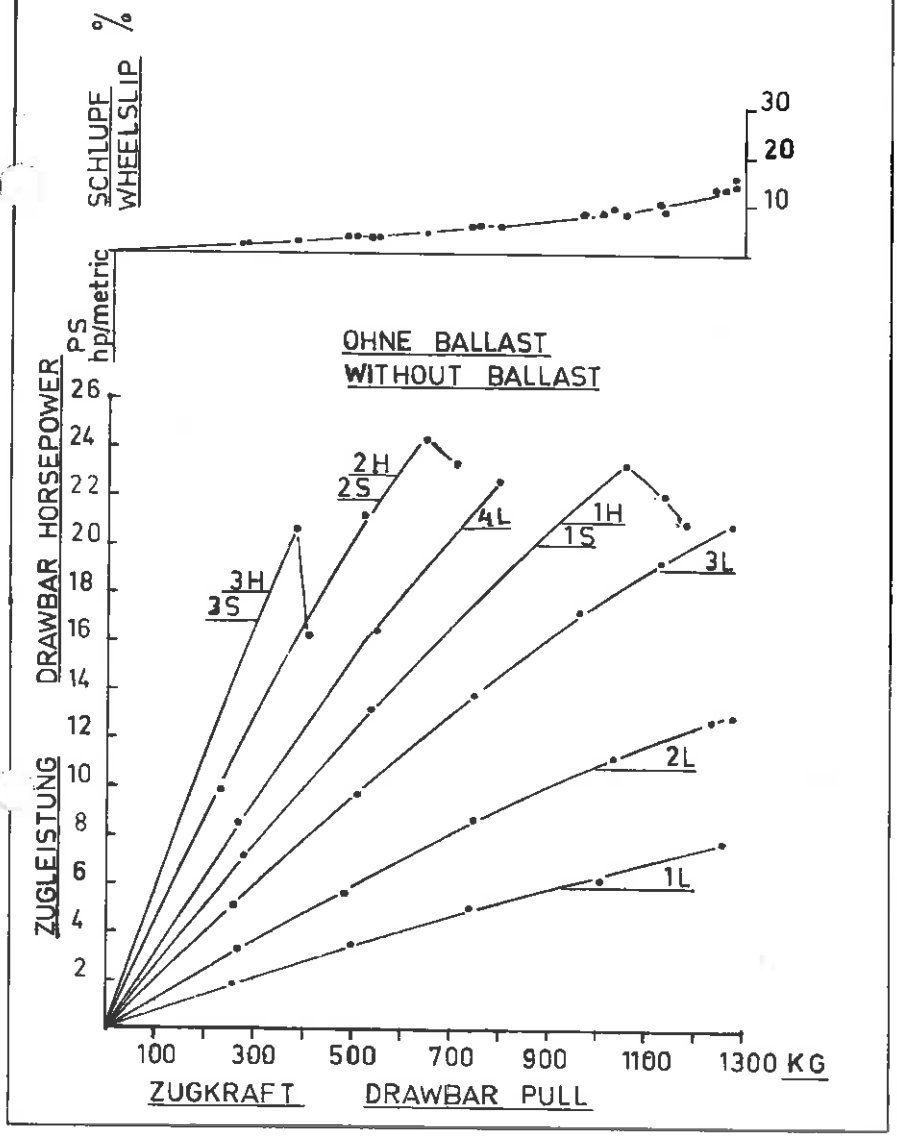
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