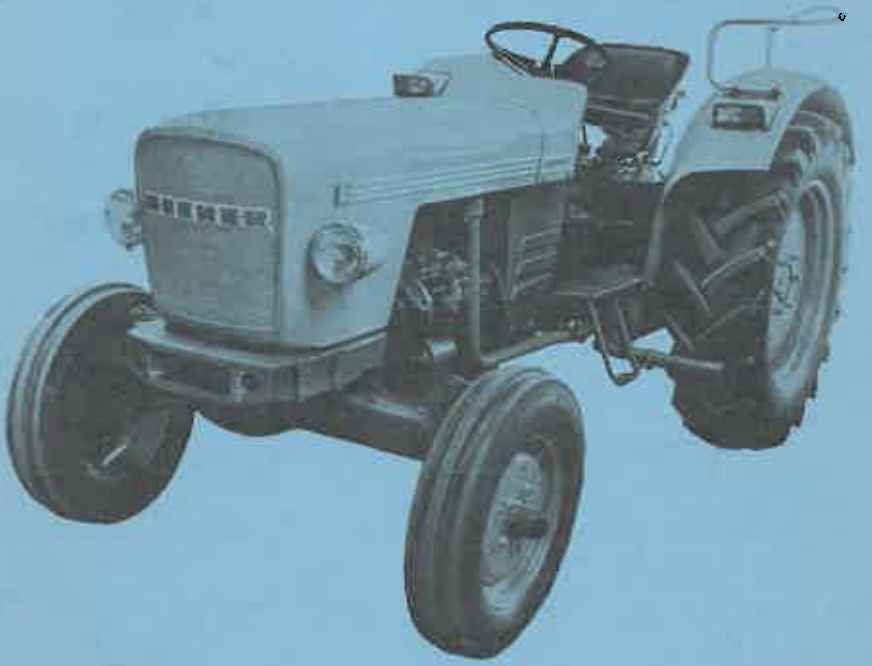
303/O.E.C.D.

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

EICHER TIGER II, TYPE 3009 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: 16-2-1970 *Serial No.: 303*

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 TRACTOR

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: 21 h

SPECIFICATION OF TRACTOR

Tractor

make: Eicher
model: Tiger II
type: 3009 S
Serial no.: 117660

Motor

make: Eicher
model: four-stroke diesel
type: EDK 3-2
Serial no.: 107623

Cylinders

number: 3
disposition: in line
bore/stroke: 100/125 mm
capacity: 2944 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 element
capacity of fuel tank: 50 l
make, type and model of injection pump: Kugelfischer: PSAFE 13-22.29 A, plunger in line pump
Serial no.: 10 P 01133
manufacturer's production setting: 23° (+ 1°) 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 4075 094
oil capacity: 0,9 l

Pre-cleaner

main: centrifugal pre-cleaner
make: Mann und Hummel
type: 480 3667 160

Lubrication system

type: forced feed from gear pump
type and number of filters: replaceable full flow paper filter
oil capacity: 9,0 l
changing period: 200 h

Cooling system

type: air cooled
details of pump and fan: three seperated 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: 1010 209 032

Battery

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

Starting system

main: electrical
make: Bosch
type: 0001 359 006
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

Rear axle and final drive

make: Zahnradfabrik Friedrichshafen

type: bevel gear and planetary drive

differential lock: Zahnradfabrik Friedrichshafen

type: sliding key

method of operating lock: by foot pedal

Oil capacity

gearbox + differential gear
rear axle per planetary gear } 18,1 l gear oil SAE 80

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

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	265,68	1,68	1,68
2 L	155,36	2,87	2,86
3 L	94,65	4,71	4,68
4 L	58,42	7,64	7,59
1 H	73,88	6,04	5,99
2 H	43,20	10,33	10,24
3 H	26,32	16,95	16,83
4 H	16,25	27,45	27,23
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 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 1393 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: Cat.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. 880 mm, min. 30 mm
- method of changing position: by power lift and adjustable stay links

Fixed drawbar: optional extra, fitted 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 mm
- distance from central 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
maximum permissible weight on each tyre: 620 kg at 3,5 atm, pressure
track widths: 1300, 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: Fulda Pionier
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: reverseable discs

wheelbase: 2050 mm

Weights

Tractor (without driver but with tanks full)

	Front	Rear	Total
Without ballast	783 kg	1240 kg	2023 kg
With ballast	1030 kg	1785 kg	2815 kg

Ballast	No. of weights	Total weight	Water
Front	3	165 kg	-- kg
Rear	1 inner and 1 outer weights per wheel	375 kg	252 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 seat and steering wheel and height of seat

Number of grease points (whole tractor): 21

Overall dimensions (mm)

	Lenght	Width	Height
With ballast	3770	1550	steering wheel:1450 passenger seat:1560
Without ballast	3420	1550	with vertical exhaust pipe: 2080

special remarks: lengths are measured incl. three point linkage.

Lighting

	height above ground of centre	diameter	distance from out - side 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: Shell 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	Speed		Fuel consumption		
(h.p.)	Engine rev/min	p.t.o. rev/min	Total l/h	specific ghp/h	hp.h/l
Maximum power - 2 hours test					
35,9	2006	560	8,34	189,8	4,32
Standard p.t.o. speed (540/1000 rev/min)					
34,4	1935	540	8,12	193,4	4,23
The speed recommended by the manufacturer for drawbar work					
35,9	2006	560	8,34	189,8	4,32
Part loads					
31,4	2053	575	7,42	193,7	4,23
----	2111	589	2,69	-----	----
16,1	2078	580	4,88	248,8	3,29
36,0	1996	557	8,14	185,2	4,42
12,3	2096	585	4,70	247,6	3,31
23,7	**2068**	**577**	**6,13**	**211,8**	**3,87**

No, loads maximum engine speed: 2111 rev/min

Equivalent crankshaft torque at maximum power: 12,8 kgm

Max. equivalent crankshaft torque 13,9 kgm at 1035 rev/min of the engine

Mean atmospheric conditions: temperature 21,2 °C

pressure 764 (mm) Hg

relative humidity 63,8 %

Maximum temperature: coolant --

engine oil 87 °C

fuel 21 °C

(2) DRAWBAR PERFORMANCE

Date of tests: April-Sept. 1969

Type of track: concrete

Height of drawbar above ground: ballasted: 720 mm, unballasted: 510 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	11,2	2050	2092	15,4	----	----
2 L	18,4	1960	2074	14,3	2,75	300,1
3 L	28,4	1875	1981	11,6	3,20	258,8
4 L	29,1	1075	2028	5,4	3,22	256,2
1 H	30,5	1490	2011	8,2	3,52	234,1
FIVE HOUR TEST at 75% of pull at maximum power						
1 H	22,9	1075,3	2072	7,2	3,1	266,7
FIVE HOUR TEST at pull corresponding to 15% wheelslip in test (i)						
2 L	19	2068	2069,8	16,5	2,8	298,2
MAXIMUM POWER (unballasted)						
1 L	9,32	1720	2091	16,7	--	--
2 L	15,1	1610	2068	14,8	--	--
3 L	24,7	1410	2057	15,1	--	--
4 L	28,6	1080	2013	7,2	--	--
1 H	29,0	1460	2003	11,5	--	--
2 H	29,6	820	1987	5,3	--	--
3 H	27,9	520	1754	2,94	--	--

Temperature (°C)				Atmospheric conditions	
Fuel	Coolant	Engine oil	Temperature (°C)	Relative humidity %	Pressure in mm Hg
(i) MAXIMUM POWER (ballasted)					
9,7	--	83	10,5	68	762
9,7	--	83	10,5	68	762
8,5	--	82	8,5	55	762
8,4	--	83	8,5	55	762
8,6	--	83	8,5	55	762
FIVE HOUR TEST at 75% of pull at maximum power					
14,8	--	85	15,6	73,5	769
FIVE HOUR TEST at pull corresponding to 15% wheelslip in test (i)					
15,2	--	87	16,2	71,3	769
MAXIMUM POWER (unballasted)					
17,8	--	88	18,5	85,2	755
17,8	--	88	18,5	85,2	755
17,8	--	88	18,5	85,2	755
17,8	--	89	18,5	85,2	755
17,8	--	89	18,5	85,2	755
17,8	--	89	18,5	85,2	755
17,8	--	89	18,5	85,2	755

(3) TURNING SPACE AND TURNING CIRCLE

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

Track of wheels - front 1300 mm rear 1250 mm

Results	With brakes		Without brakes	
	right-hand	left-hand	right-hand	left-hand
Radius of turning space	3320 mm	3220 mm	3770 mm	3670 mm
Radius of turning circle	3200 mm	3100 mm	3650 mm	3550 mm

(4) LOCATION OF CENTRE GRAVITY

Height above ground 620 mm

Distance forward from the vertical plane containing the axis of the rear wheels 790 mm

Distance from the medium plane --

(5) BRAKING

date of test: October 1969

type of track: concrete

weight of ballasted tractor: 2815 kg

Cold brakes

	ballasted	without ballast
travelling speed of the tractor	25 km/h	25 km/h
(I) deceleration m/sec^2	3,8	3,1
(II) stopping distance m	6,2	7,0
(III) force exerted on the brake pedal	84 kg	68 kg

Brake fade characteristics (hot tests)

deceleration hot/deceleration cold 100 91%

stopping distance cold/stopping distance hot 90 90%

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

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 EZGA

Type of track: Asphalt

Results of tests:

Gear: 4 H

Travelling speed: 20,59 km/h before acceleration

Sound level: left side 83 dBA; right side 85 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 EZGA

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	91

(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 machanical advantage			
At lower hitch points (height above ground in down position 320 mm	560	1540	167
On the frame	710	860	167
Linkage giving minimum mechanical advantage			
At lower hitch points (height above ground in down position 30 mm	655	1415	167
On the frame		862	167

Type of linkage lock for transport: hydraulic
Opening pressure of the cylinder over pressure relief valve 167 atm

Pump characteristics:

i - opening pressure of the relief valve 167 atm
  - sustained pressure by the open relief valve 167 atm

ii - pump delivery rate at minimum pressure and rated engine speed 21,4 l/min

iii - pump delivery rate 20,2 l/min
  delivery pressure 130 atm
  power (calculated) 6,23 pk

Part IV

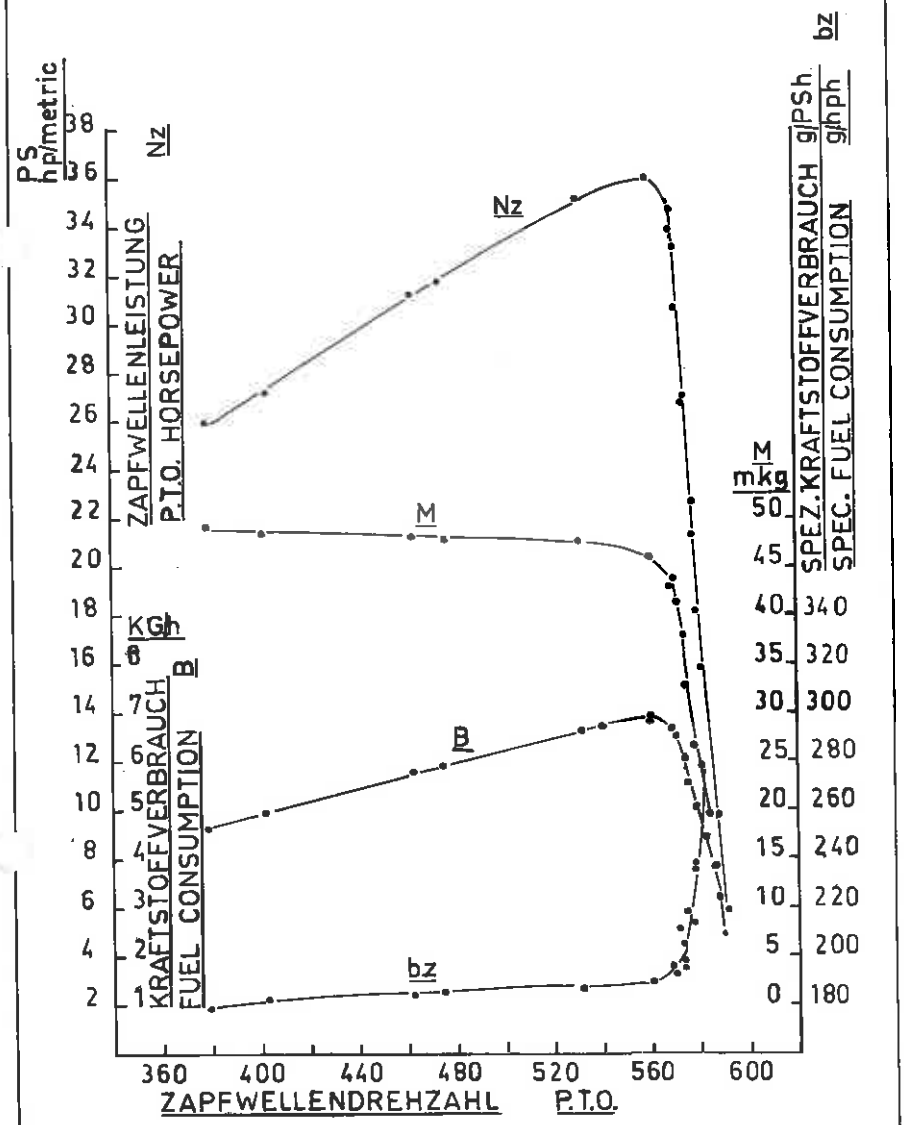
1 Repairs and adjustments during the tests: None

2 Remarks : None

Wageningen, 17th January 1970

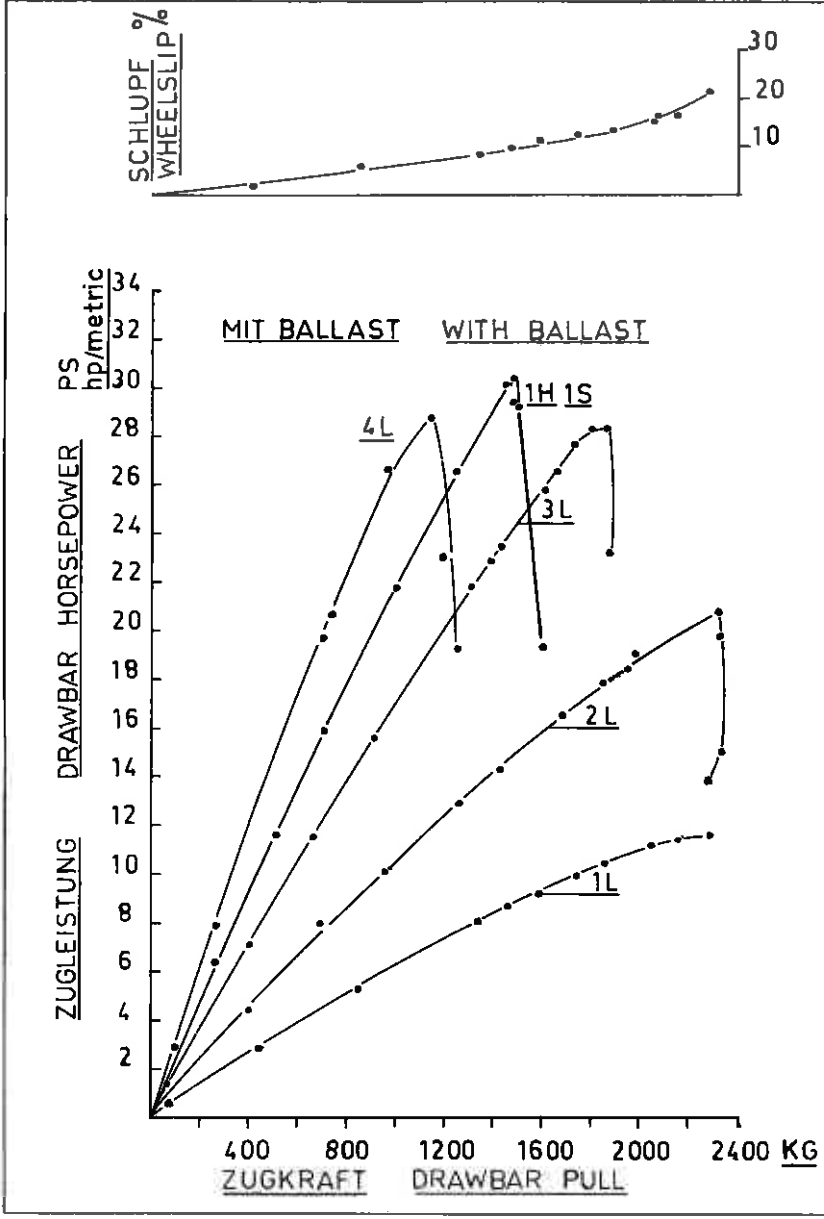
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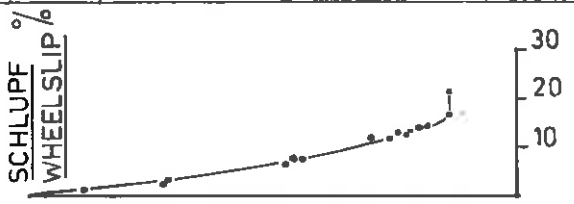
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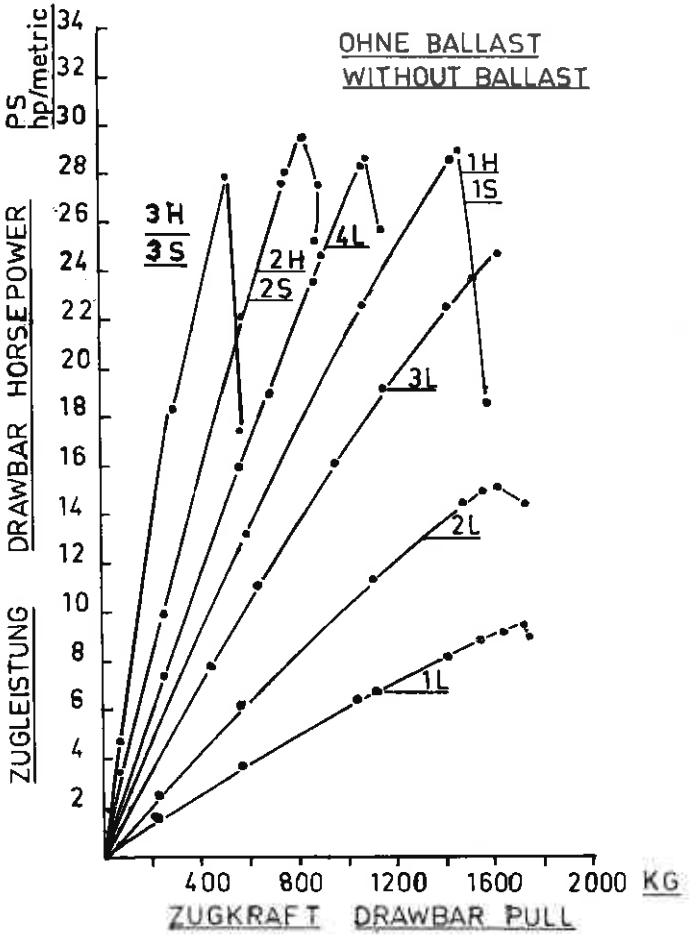
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