306/O.E.C.D.

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

EICHER KÖNIGSTIGER I, TYPE: 3007 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.: 306*

INSTITUUT VOOR LANDBOUWTECHNIEK EN RATIONALISATIE

DR. S. L. MANSHOLTLAAN 12 - WAGENINGEN

TABLE OF CONTENTS

		Page
PART I	Specification of tractor	2
PART II	Fuels and lubricants used in tests	12
PART III	Compulsory tests:	13
	1. Main power - take off performance ..	13
	2. Drawbar - performance	14
	3. Turning space and turning circle ...	15
	4. Location of centre of gravity	16
	5. Braking	16
	6. Measurement of ambient noise emitted by the tractor	17
	7. Noise measurement at the driver's ear level	17
	8. Power lift and hydraulic pump performance	17
PART IV	Repairs and remarks	19
	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 wheel-slip/drawbar pull curves.	
	Drawbar test without ballast curves of drawbar horse power and wheel-slip/drawbar pull.	
	Spec. Fuel consumption and travelling speed	

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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: 17,2 h

SPECIFICATION OF TRACTOR

Tractor

make: Eicher
model: Königstiger I
type: 3007 S
Serial no.: 117575

Motor

make: Eicher
model: four-stroke diesel
type: EDK 3
Serial no.: 107546

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 13-22.28 A, plunger in line pump
Serial no.: 8 P 00224
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 and Hummel
type: 310 4075 094
oil capacity: 0,9 l

Pre-cleaner

main: centrifugal pre-cleaner
make: Mann and 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:9,5 l
changing period: 200 h

Cooling system

type: air cooled engine
details of pump and fan: three 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: Bosch
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 210/111

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; } 20 l gear oil SAE 80

final drive(s): 2,5 l gear oil SAE 80 per planetary gear

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	287,70	1,68	1,69
2 L	168,23	2,87	2,88
3 L	102,50	4,71	4,76
4 L	63,36	7,62	7,66
1 H	80,00	6,03	6,06
2 H	46,78	10,31	10,37
3 H	28,50	16,92	17,09
4 H	17,60	27,41	27,54
reverse			
1	160,01	3,01	
2	93,55	5,15	
3	57,00	8,46	
4	35,19	13,70	

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: 543 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 of p.t.o. 229 mm (value given by manufacturer)

no. of p.t.o. revolutions for I revolution of driving wheel: 17,54

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: two types are possible; ZF/WTS 45 or WTS 35

dimensions: 220 mm (both)

diameter and width of face: 150 mm (both)

speed-linear: 21,7/17,7 m/sec and: 1890/1545 rev/min at rated engine speed 2000 rev/min

engine speed 1540/1893 rev/min of standard linear speed 16,75 m/sec

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

Lower lift

make: ZF-Bosch-Eicher

type: hydraulic

oil capacity: 7,5 l

category: Cat. I (or II) implement linkage, acc. DIN 9674

description of controls: single lever control

Drawbars

Implement linkage: three point implement linkage, cat. I (or II), acc. DIN 9674

height above ground max. 1000 mm, min. 125 mm

method of changing position: 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: 345 or 430 mm

distance from pivot behind rear wheel centre 615, 655 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: 655, 705, 755 or 805 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: Continental

size: 6.50-16

ply rating: 6

maximum permissible weight on each tyre: 740 kg at 3,5 atm. pressure

track widths: normal 1360, adjustable at 1280 and 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: Veith-Pirelli

size: 14.9/13-28

ply rating: 6

rim size: W 12x28

maximum permissible weight on each tyre: 1535 kg at 1,3 atm. pressure

track width: normal 1360, adjustable at 1250, 1410, 1450, 1500, 1610, 1710 mm

method of changing: reverseable discs and rims

wheelbase: 2050 mm

Weights

Tractor (without driver but with tanks full)

	Front	Rear	Total
Without ballast	780 kg	1374 kg	2154 kg
With ballast	1088 kg	2430 kg	3518 kg

Ballast	No. of weights	Total weight	Water
Front	4	232 kg	-- kg
Rear	1 inner and 4 outer weights per wheel	750 kg	382 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	Height
With ballast	3800	1725	steering wheel:1500 passenger seat:1700
Without ballast	3400	1725	with vertical exhaust pipe: 2120

special remarks: lengths are measured incl. three point linkage

Lighting

height above ground of centre	diameter	distance from outside edge of tractor to centre
Head lights 970 mm	130 mm	490 mm
Side lights 1325 mm	85 x 55 mm	200 mm
Rear lights 1325 mm	85 x 55 mm	200 mm
Reflectors 1135 mm	124 x 36 mm	165 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 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					
42,2	1928	538	9,7	191,4	4,3
Standard p.t.o. speed (540/1000 rev/min)					
42,2	1928	538	9,7	191,4	4,3
The speed recommended by the manufacturer for drawbar work					
36,8	2000	558	8,7	195,6	4,3
Part loads					
36,8	2000	558	8,7	195,6	4,3
--	2057	574	3,0	--	--
18,8	2039	569	5,4	239,4	3,5
42,2	1928	538	9,7	191,4	4,3
9,5	2043	570	4,0	350,9	2,4
31,4	2010	561	7,5	197,7	4,2

No loads maximum engine speed: 2057 rev/min

Equivalent crankshaft torque at maximum power: 15,6 kgm
Max. equivalent crankshaft torque 16,4 kgm at 1433 rev/min of the engine.

Mean atmospheric conditions: temperature 22 °C
pressure 761 (mm) Hg
relative humidity 63,7%

Maximum temperature : coolant --°C
engine oil 73 °C
fuel 22 °C

(2) DRAWBAR PERFORMANCE

Date of tests: May - Sept. 1969

Type of track: concrete

Height of drawbar above ground: 570 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	Specific h.p.h.
(i) MAXIMUM POWER (ballasted)						
1 L	14,2	2680	2051	17,0	--	--
2 L	24,1	2620	2055	13,5	3,1	269,2
3 L	34,0	2110	2015	9,3	3,3	251,9
4 L	34,4	1330	1917	5,0	3,4	242,9
1 H	35,6	1780	1921	7,2	3,5	233,9
2 H	34,4	960	1936	3,6	3,4	239,9
3 H	32,0	530	1946	2,0	3,1	266,6
FIVE HOUR TEST at 75% of pull at maximum power						
1 H	25,8	1232	1998	4,5	3,3	252,5
FIVE HOUR TEST at pull corresponding to 15% wheelslip in test (i)						
2 L	23,8	2510	2006	15	3,1	264,1
MAXIMUM POWER (unballasted)						
1 L	10,3	1800	2097	14,6	--	--
2 L	17,1	1720	2068	12,1	--	--
3 L	27,0	1720	2049	14,0	--	--
4 L	34,3	1320	1967	8,1	--	--
1 H	32,5	1595	2026	11,6	--	--
2 H	34,6	935	2007	4,7	--	--
3 H	35,8	625	1856	3,0	--	--

Temperature (°C)				Atmospheric conditions	
Fuel	Coolant	Engine oil	Temperature (°C)	Relative humidity %	Pressure in mm Hg
MAXIMUM POWER (ballasted)					
12,5	--	72	13	67,1	759
12,5	--	73	13	67,1	755
12,5	--	73	13	67,1	755
12,5	--	73	13,5	71	755
12,5	--	73	13,5	71	755
12,5	--	73	13,5	71	755
12,5	--	74	13,5	67	755
FIVE HOUR TEST at 75% of pull at maximum power					
13,4	--	75	15,3	83	765
FIVE HOUR TEST at pull corresponding to 15% wheelslip in test (i)					
14,0	--	74	14,6	82	765
MAXIMUM POWER (unballasted)					
17,3	--	72	18,5	85,2	755
17,3	--	72	18,5	85,2	755
17,3	--	72	18,5	85,2	755
17,3	--	72	18,5	85,2	755
17,3	--	72	18,5	85,2	755
17,3	--	72	18,5	85,2	755
17,3	--	72	18,5	85,2	755

(3) TURNING SPACE AND TURNING CIRCLE

Detail of wheel equipment: front: 6.50-16; rear 14,9/13-28; both 6PR unballasted

Track of wheels - front 1360 mm rear 1360 mm

Results	With brakes		Without brakes	
	right-hand	left-hand	right-hand	left-hand
Radius of turning space	3170 mm	3170 mm	3770 mm	3720 mm
Radius of turning circle	3050 mm	3050 mm	3650 mm	3600 mm

(4) LOCATION OF CENTRE OF GRAVITY

Height above ground 680 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: 3518 kg

Cold brakes

	ballasted	without ballast
travelling speed of the tractor	25 km/h	25 km/h
(I) deceleration m/sec^2	3,7	2,1
(II) stopping distance m	6,3	5,7
(III) force exerted on the brake pedal	88 kg	72 kg

Brake fade characteristics (hot tests)

deceleration hot/deceleration cold. 100 97%
stopping distance cold/stopping distance hot.100 99%
force on pedal, cold/force on pedal, hot. 100 100%
efficiency of handbrake or parkinglatch: no rotation of the wheels
pull on handbrake (cold) 25 kg (hot) 25 kg

(6) MEASUREMENT OF AMBIENT NOISE EMITTED BY THE TRACTOR

Date of tests: 1 October 1969

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

Type of track: Asphalt

Results of tests:

Gear: 4 H

Travelling speed: 20,56 km/h before acceleration

Sound level: left side 82 dBA; right side 84 dBA

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

ate of tests: 1 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	7,62	95

(8) POWER LIFT AND HYDRAULIC PUMP PERFORMANCE

Date and location of tests: October 1969, Wageningen

Hydraulic fluid:

make and type: motor oil

viscosity: SAE 20 HD

	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 415 mm	585	1655	182
On the frame	725	760	182
Linkage giving minimum mechanical advantage			
At lower hitch points (height above ground in down position 125 mm	680	1495	182
On the frame		940	182

Type of linkage lock for transport: hydraulic

Opening pressure of the cylinder over pressure relief valve 182 atm

Pump characteristics:

i - opening pressure of the relief valve 182 atm
  - sustained pressure by the open relief valve 182 atm

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

iii - pump delivery rate 20 l/min
  delivery pressure 150 atm
  power (calculated) 6,7 pk

Part IV

1 Repairs and adjustments during tests: none

2 Remarks : none

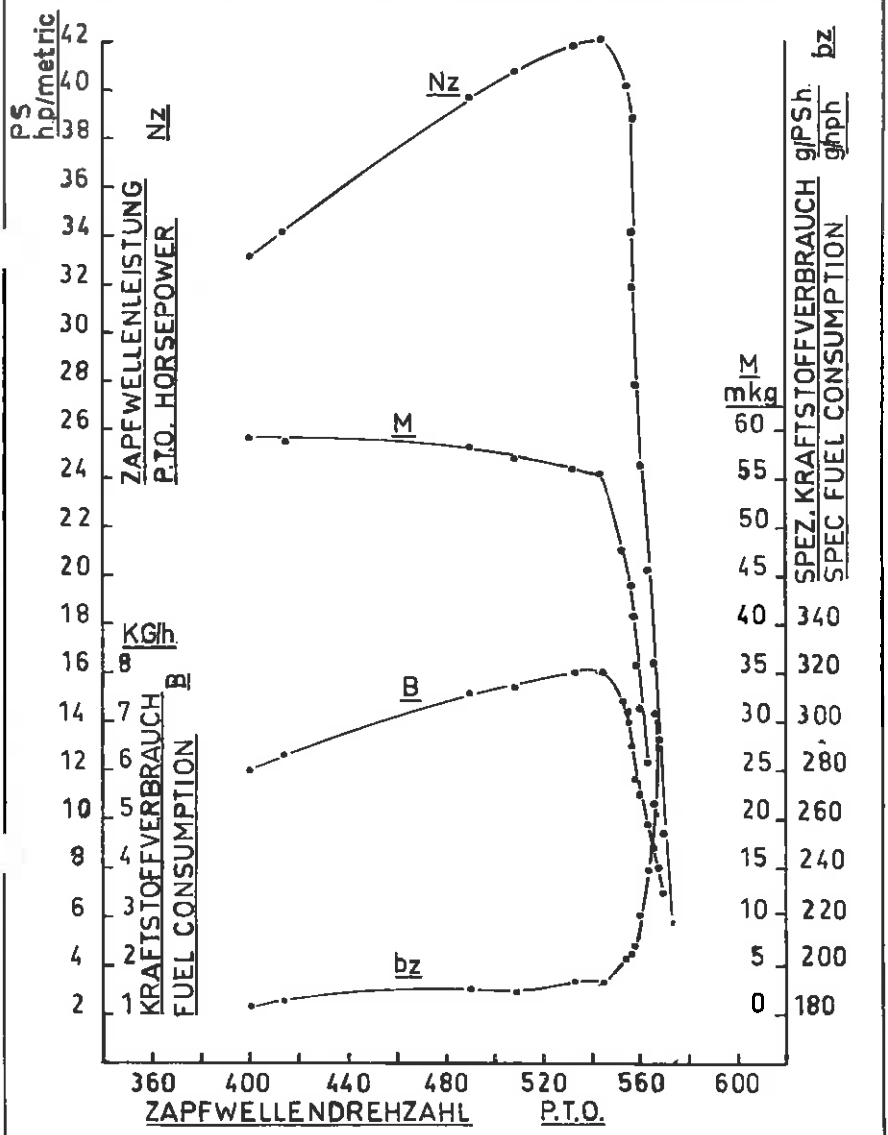
Wageningen, 17th January 1970

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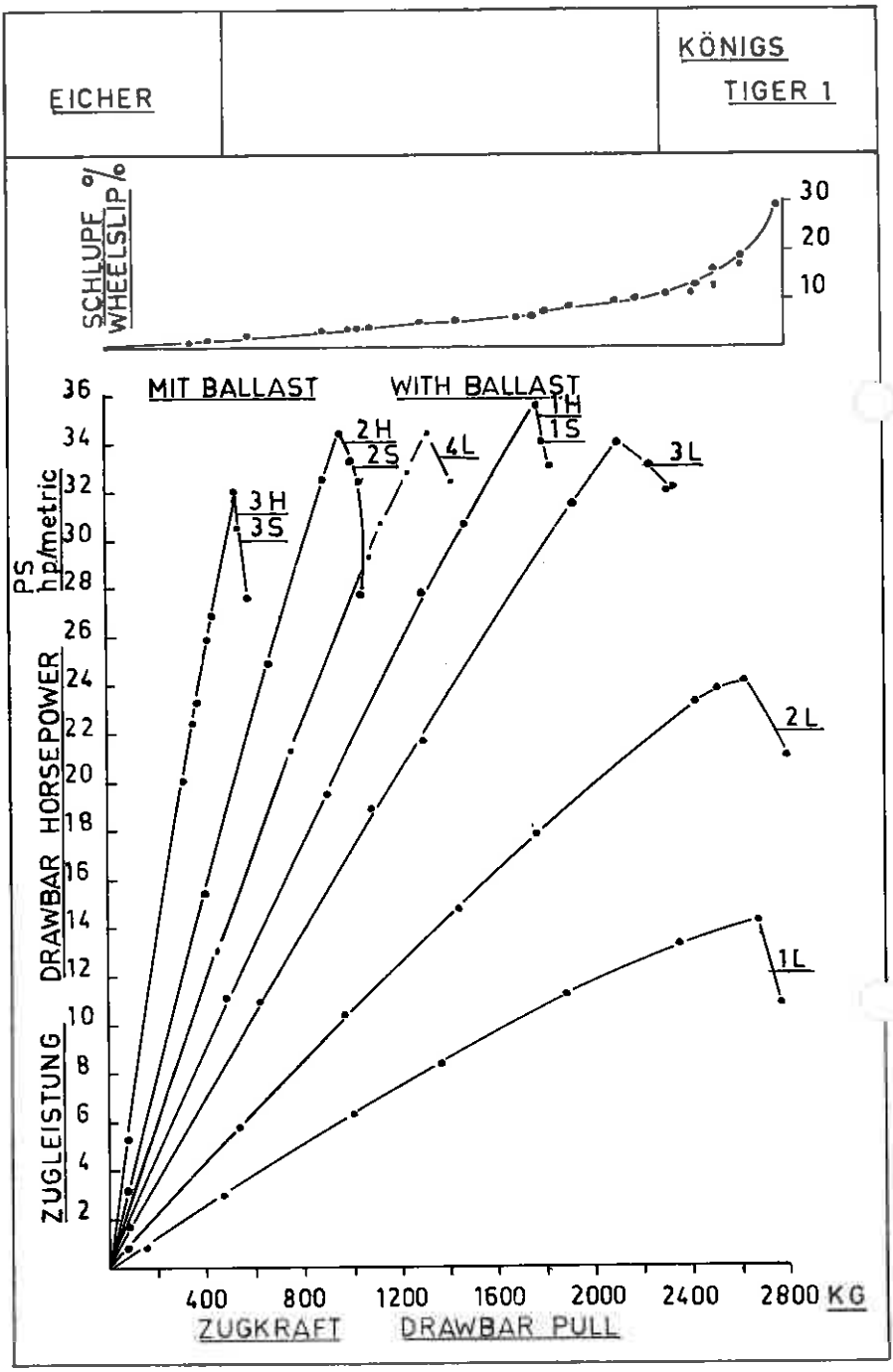
ZAPFWELLENLEISTUNG
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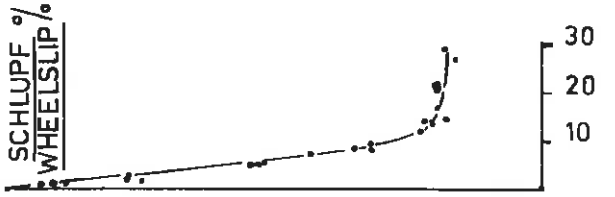
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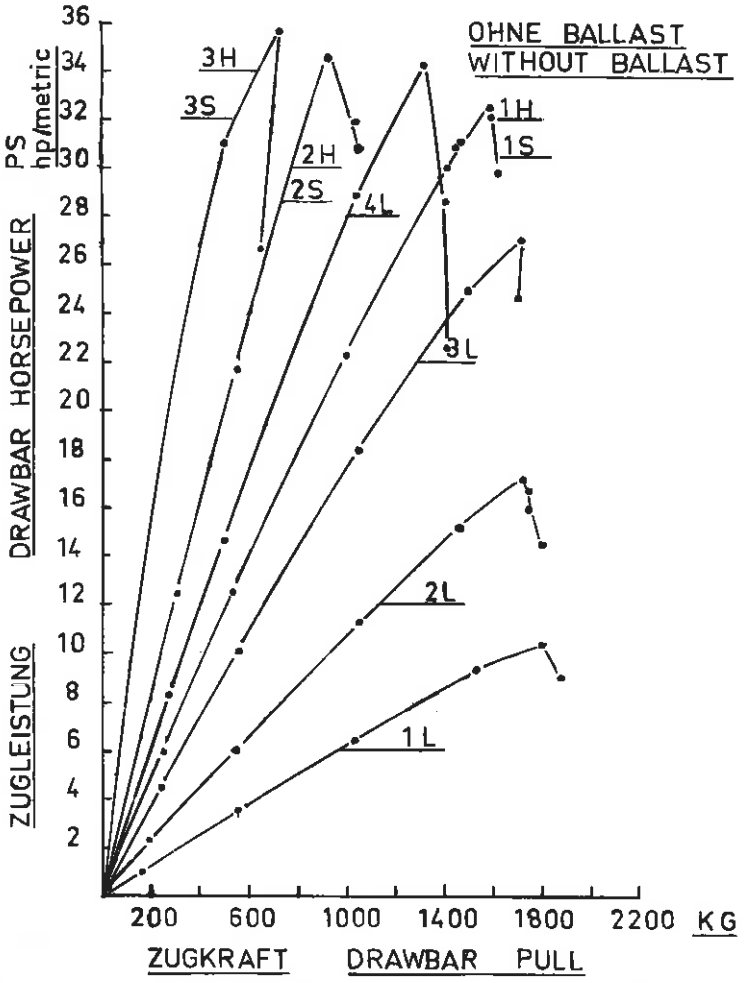
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