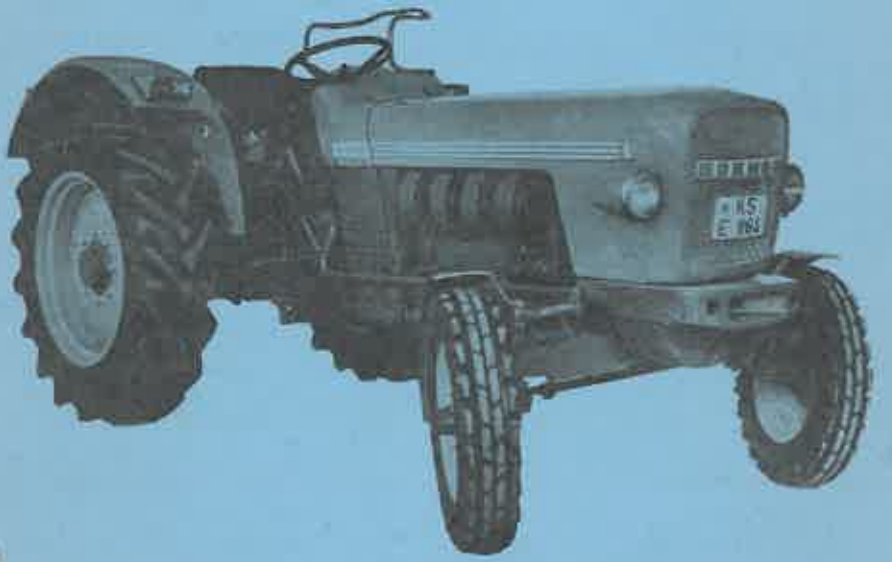
304/O.E.C.D.

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

EICHER KÖNIGSTIGER II, TYPE: 3015 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.: 304*

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: 17,5 h

SPECIFICATION OF TRACTOR

Tractor

make: Eicher
model: Königstiger II
type: 3015 S
Serial no.: 117745

Motor

make: Eicher
model: four-stroke diesel
type: EDK 4-7
Serial No.: 108041

Cylinders

number: 4
disposition: in line
bore/stroke: 100/125 mm
capacity: 3927 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 filter: 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 14-22.30 A plunger in line pump
Serial no.: 2 P 00752
manufacturer's production setting: 27° (+ 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 cleaner
make: Mann and Hummel
type: 310 4575 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: 10,0 l
changing period: 200 h

Cooling system

type: air cooled
details of pump and fan: 4 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 302 039

Battery

main: lead accumulator
make: Mittermaier
type: 12 ED 114
capacity: 114 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 212

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 } 20 l gear oil SAE 80

rear axle per planetary gear }

final drive(s): 2,5 l gear oil SAE 80 p.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	269,91	1,77	1,82
2 L	158,85	3,04	3,09
3 L	111,92	4,31	4,38
4 L	68,86	7,00	7,30
1 H	74,98	6,43	6,52
2 H	44,10	10,94	11,13
3 H	31,08	15,52	15,77
4 H	19,12	25,23	26,29
reverse			
1	149,62	3,22	
2	88,04	5,48	
3	62,02	7,78	
4	38,16	12,64	

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 178 mm of p.t.o. (value given by manufaturer)

no. of p.t.o. revolutions for I revolution of driving wheel: 22,58

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 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 1544/1893 rev/min at standard linear speed 16,75 m/sec

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

ower lift

make: ZF-Bosch-Eicher

type: hydraulic

oil capacity: 7,5 1

category: cat. II implement linkage acc. DIN 9674 (cat. I is available too)

description of controls: single lever control

Drawbars

Implement linkage: three point implement linkage, cat. II (or I), acc. DIN 9674
height above ground max. 995 mm, min.125 mm
method of changing position: by power lift and adjustable stay links

Fixed drawbar: optional extra, fitted on lower links
construction 1: 90 x 40 x 825 mm
construction 2: 90 x 40 x 1500 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: 880 mm
distance from central hole behind p.t.o. 620 mm

Swinging drawbar: optional extra
height above ground: 345 mm or 430 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: 655, 705, 755 or 805 mm
distance from rear exle: 482 mm
position relative to p.t.o.: 244 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 mm, adjustable at 1280 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: Continental

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, 1670 or 1710 mm

method of changing : reversible discs and rims

wheelbase: 2210 mm

Weights

Tractor (without driver but with tanks full)

	Front	Rear	Total
Without ballast	816 kg	1403 kg	2219 kg
With ballast	950 kg	2520 kg	3470 kg

Ballast	No. of weights	Total weight	Water
Front	2	116 kg	-- kg
Rear	1 inner and 4 outer weights per wheel	770 kg	365 kg
Additional	--	--	

Seat

make: Fritzmeier SF 4005 hydraulic

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)

	Lenght	Width	Height
With ballast	3810 mm	2085 mm	steering wheel:1500 mm passenger seat:1700 mm
Without ballast	3570 mm	1725 mm	with vertical exhaust pipe: 2120 mm

special remarks: lenghts measured incl. implement linkage

Lighting

	height above ground of centre	diameter	distance from outside edge of tractor to centre
Head lights	986 mm	130 mm	532 mm
Side lights	1325 mm	85 x 55 mm	265 mm
Rear lights	1325 mm	85 x 55 mm	265 mm
Reflectors	1155 mm	124 x 36 mm	230 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: Water brake 2 RT

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					
49,9	2021	563,9	11,5	191,7	4,3
Standard p.t.o. speed (540/1000 rev/min)					
48,9	1946	543	11,1	188,3	4,4
The speed recommended by the manufacturer for drawbar work					
49,6	2000	558	11,3	189,7	4,4
Part loads					
43,5	2068	577	10,2	195,2	4,3
--	2146	599	3,8	--	--
22,2	2114	590	6,7	251,0	3,3
49,8	2021	564	11,5	191,7	4,3
11,3	2128	594	5,3	390,9	2,1
32,8	2085	582	8,4	211,9	3,9

No loads maximum engine speed: 2146 rev/min

Equivalent crankshaft torque at maximum power: 17,9 kgm

Maximum equivalent crankshaft torque 19,1 kgm at 1376 rev/min of the engine

Mean atmospheric conditions: temperature 21 °C
pressure 768 (mm) Hg
relative humidity 48%

Maximum temperature : coolant --
engine oil 87°C
fuel 20 °C

(2) DRAWBAR PERFORMANCE

Date of tests: May-Sept. 1969

Type of track: concrete

Height drawbar above ground: 580 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	15,9	2600	2108	13,8	--	--
2 L	26,2	2590	2072	14,5	2,9	287,8
3 L	38,5	2720	2047	14,9	3,2	260,1
4 L	40,7	1590	2018	6,1	3,4	240
1 H	42,7	1890	2022	7,6	3,5	233,1
FIVE HOUR TEST at 75% of pull at maximum power						
1 H	32	1342	2082	5,1	3,2	259,5
FIVE HOUR TEST at pull corresponding to 15% wheelslip in test (i)						
3 L	38,5	2720	2047	14,9	3,2	260,1
MAXIMUM POWER (unballasted)						
1 L	12	1950	2105	13,9	--	--
2 L	20,4	1975	2090	14,6	--	--
3 L	28,4	2020	2055	16,3	--	--
4 L	38,6	1680	1870	9,8	--	--
1 H	39,2	1825	1991	11,4	--	--
2 H	40,9	1100	1899	5,0	--	--
3 H	36,9	700	1862	3,6	--	--

Temperature (°C)			Atmospheric conditions		
Fuel	Coolant	Engine oil	Temperature (°C)	Relative humidity %	Pressure in mm Hg
(i) MAXIMUM POWER (ballasted)					
15,7	--	85	16,1	66	758
15,9	--	85	16,1	66	758
15,6	--	86	15,1	73	756
15,5	--	86	15,1	73	756
5,4	--	86	15,1	73	756
FIVE HOUR TEST at 75% of pull at maximum power					
16	--	86	16,2	74	778
FIVE HOUR TEST at pull corresponding to 15% wheelslip in test (i)					
16	--	86	15,8	73	770
MAXIMUM POWER (unballasted)					
16,7	--	79	17,5	89	759
17,1	--	81	17,5	89	759
17,2	--	82	17,5	89	759
16,9	--	83	15,9	66,7	761
16,7	--	85	15,9	66,7	761
16,6	--	85	15,9	66,7	761
16,6	--	85	15,9	66,7	761

3) TURNING SPACE AND TURNING CIRCLE

Detail of wheel equipment: front: 6.00-16; rear: 14,9/13-28; both 6 PR, 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	3270 mm	3320 mm	3820 mm	3970 mm
Radius of turning circle	3150 mm	3200 mm	3700 mm	3850 mm

(4) LOCATION OF CENTRE GRAVITY

Height above ground 710 mm
Distance forward from the vertical plane containing the axis of the rear wheels 810 mm
Distance from the medium plane --

(5) BRAKING

Date of test: October 1969
Type of track: Concrete
Weight of ballasted tractor: 3470 kg

Cold brakes

	ballasted	without ballast
travelling speed of the tractor	25 km/h	25 km/h
(I) deceleration m/sec^2	3,6	4,6
(II) stopping distance m	6,6	5,2
(III) force exerted on the brake pedal	75 kg	76 kg

Brake fade characteristics (hot tests)

deceleration hot/deceleration cold. 100 92%
stopping distance cold/stopping distance hot.100 90%
force on pedal, cold/force on pedal, hot.100 104%
efficiency of handbrake or parkinglatch: no rotation of the wheels
pull on handbrake (cold) 23 kg (hot) 23 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 19,0 km/h before acceleration

Sound level: left side 87 dBA; right side 87 dBA

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

ıte 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	7,00	104,7

(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 420 mm	575	1500	160
On the frame	715	975	160
Linkage giving minimum mechanical advantage			
At lower hitch points (height above ground in down position 125 mm	675	1350	160
On the frame		940	160

Type of linkage lock for transport: hydraulic

Opening pressure of the cylinder over pressure relief valve 160 atm.

Pump characteristics:

i - opening pressure of the relief valve 160 atm
sustained pressure by the open relief valve 160 atm

ii - pump delivery rate at minimum pressure and rated engine speed 21,8 l/min

iii - pump delivery rate 16,8 l/min
delivery pressure 143 atm
power (calculated) 5,3 pk

Part IV

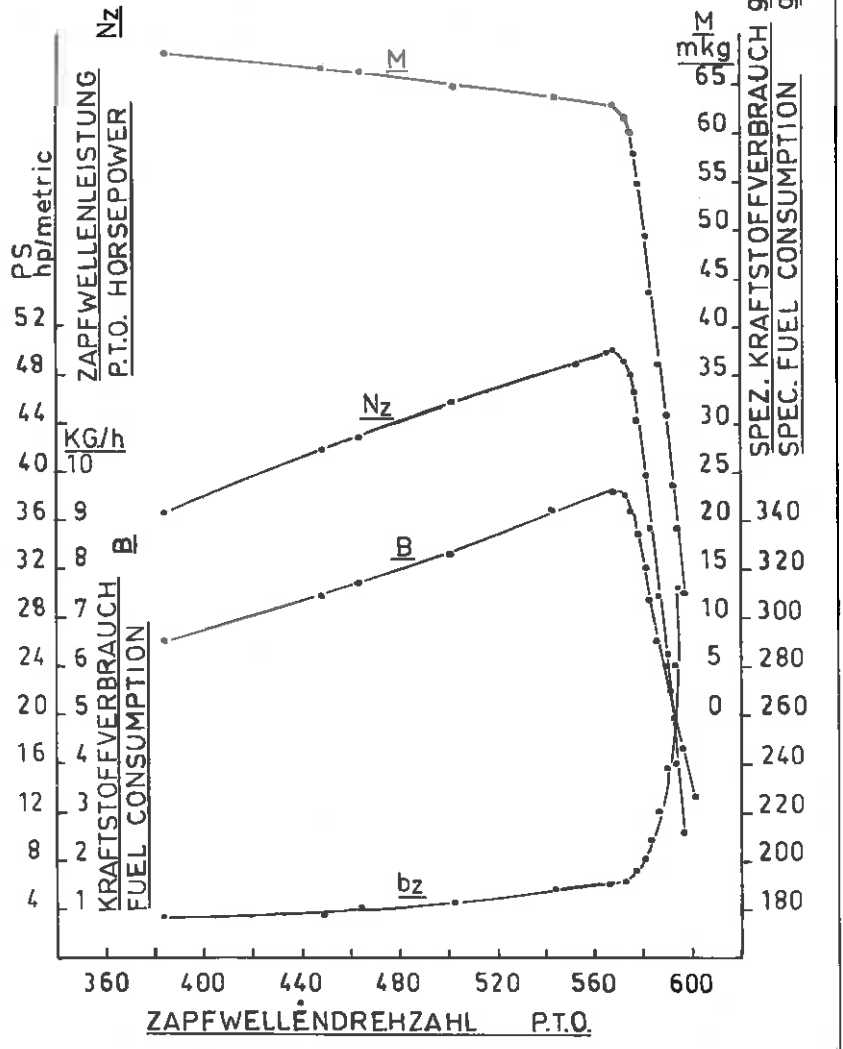
1 Repairs and adjustments during the tests: none

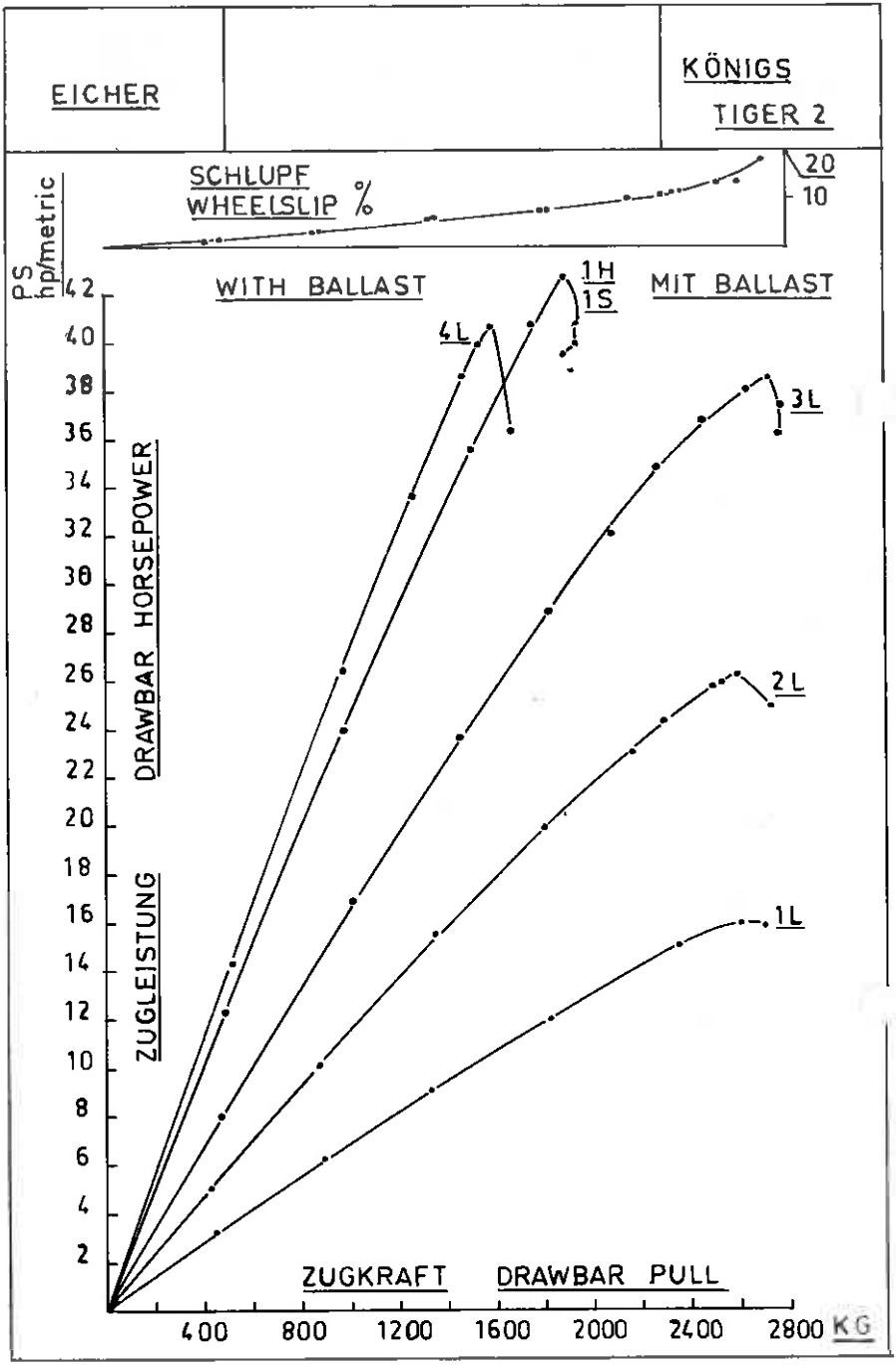
2 Remarks : none

Wageningen, 17th January 1970

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

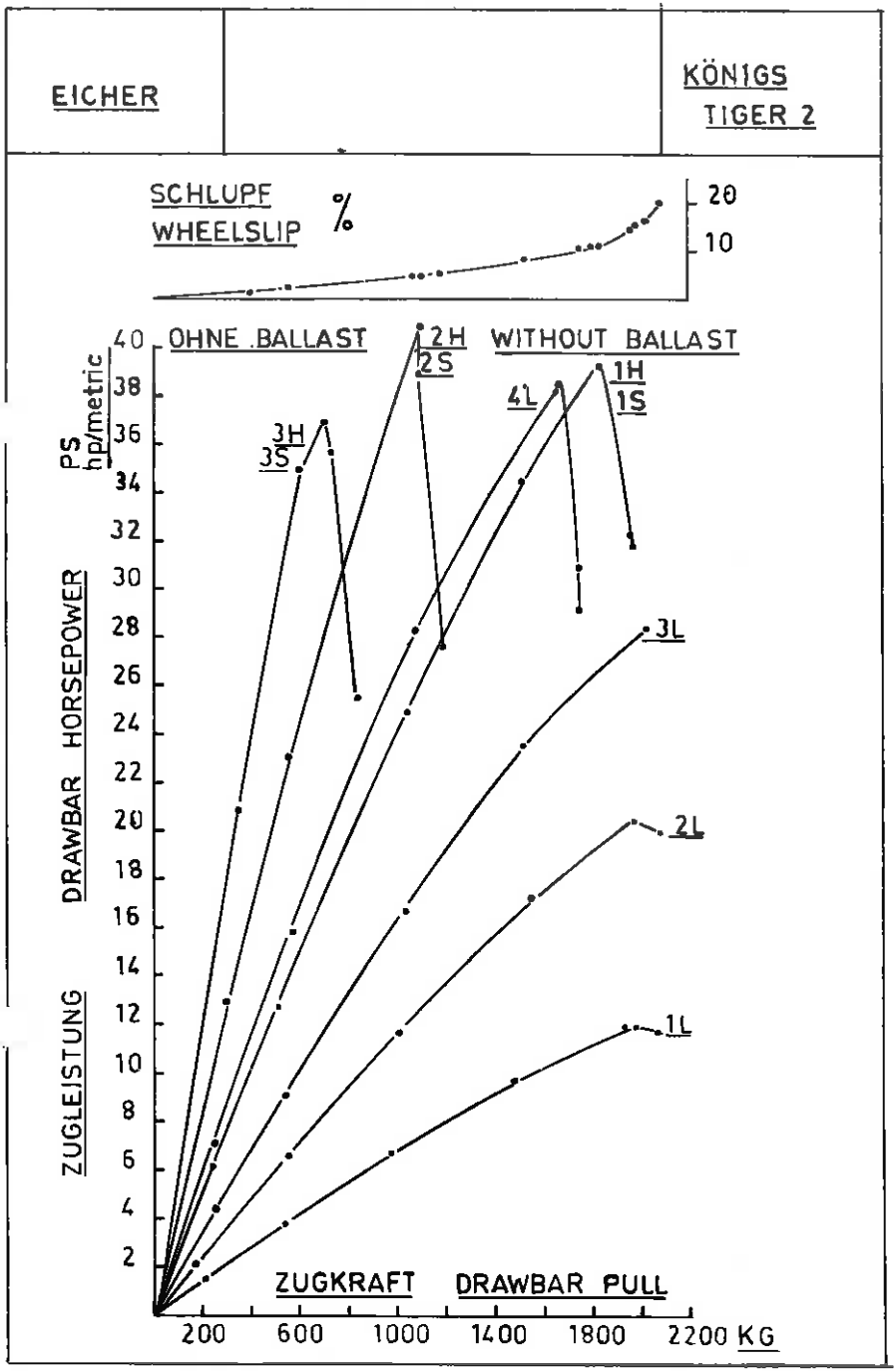
EICHER	ZAPFWELLENLEISTUNG P.T.O. TEST	KÖNIGS TIGER 2




EICHER
KÖNIGS
TIGER 2
SCHLUPF
WHEELSLIP %
20
10
PS
hp/metric
WITH BALLAST
MIT BALLAST
1H
1S
4L
3L
2L
1L
DRAWBAR HORSEPOWER
ZUGLEISTUNG
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
ZUGKRAFT
DRAWBAR PULL
400
800
1200
1600
2000
2400
2800
KG

EICHER

KÖNIGS TIGER 2



EICHER		KÖNIGS TIGER 2

