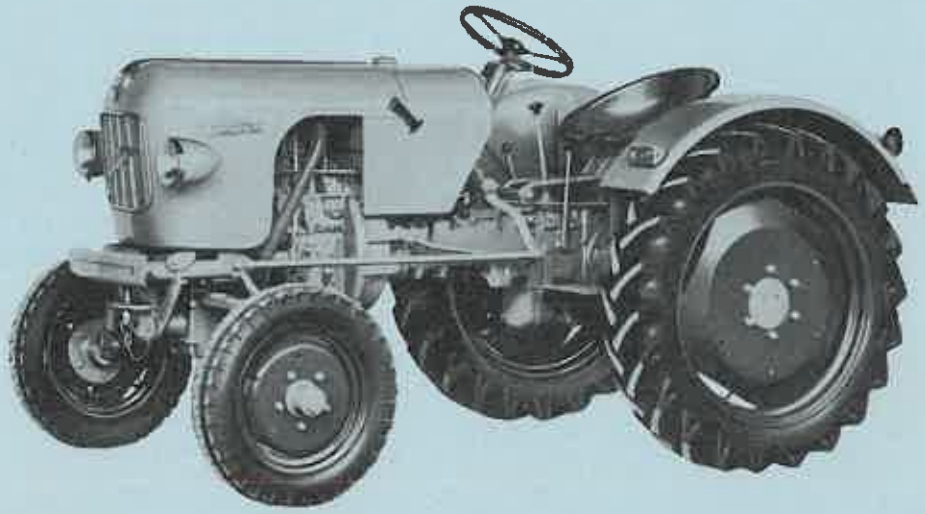
torium für Technik in der Landwirtschaft
Schlepper-Prüffeld Darmstadt-Kranichstein

No. 110

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

EICHER LEOPARD, TYPE EM 100

Manufactured by:
Gebr. Eicher Traktoren und Landmaschinenwerke, Forstern/Obb



Date of test: Augustus 1962
Test No.: 029/O.E.C.D.

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: 31 January 1963 *Serial No.:* 029

STICHTING CENTRALE WERKPLAATS
DR. S. L. MANSHOLTLAAN 12 – WAGENINGEN

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

PART I

SPECIFICATION OF TRACTOR

Tractor:

Make:	Gebr. Eicher Traktoren- und Landmaschinenwerke, Forstern/Obb
Model:	Eicher „Leopard" EM 100

Engine:

Make:	Eicher, Forstern/Obb, type EM 100 Direct injection diesel, No. 68410
Rated output:	15 hp (engine)
Cylinders:	1 cylinder, vertical in line, 100 mm bore × 125 mm stroke, compression ratio 20,5 : 1 overhead valves
Rated speeds:	For belt work, P.T.O.-work and drawbar-work: 2000 rev/min.
Minimum speed:	(For full load work) Not specified
Fuel system:	Fuel: diesel oil, injection pump: Kugelfischer Shäfer Pumpe PSSE 01-22.07 A-1 Injection nozzles: DFO 33-A2. Injection timing 21° before T.D.C. Injection pressure 140 + 5 kg/cm². Capacity of fuel tank 31 l
Governor:	Eicher, centrifugal type. Governed range of engine speed 700-2175 rev/min.
Air cleaner:	Oil bath. Oil capacity 0,8 l
Oiling system:	Forced feed from gear type pump Recommanded oil in summer SAE 20, in winter SAE 10. Oil change period 100 h., oil capacity 3,0 l
Cooling system:	Air cooled

Transmission:

Clutch:	Fichtel & Sachs, dry clutch
Gearbox:	Z.F. (Zahnradfabrik, Friedrichshafen), sliding gear type, 6 forward speeds and 2 reverse speeds. Total transmission oil capacity 7,5 l. Oil change period 1000 h. Recommanded oil viscosity SAE 90
Differential:	Crown wheel and pinion. Differential lock fitted

Gear No.	*Number of Engine revolutions for one revolution of driving wheel*	*Theoretical travelling speed for rated speed of engine - km/h - n = 2000 rev/min*
1st	224,231	1,71
2nd	134,530	2,79
3rd	80,331	4,68
4th	55,731	6,91
5th	33,635	11,15
6th	20,246	18,61
1	320,019 } reverse	1,20
2	79,678 }	4,85

Steering device:	Worm and roller type Gemmer Z.F.
Brakes:	Hand brake fitted Foot brakes, on differential half shafts; independant or combined foot-pedal operated

Wheels:

Steering wheels:	Two at front. Tyres Vredestein 4,5 × 16, 4 ply Track 1250-1410 mm
Driving wheels:	Two at rear. Tyres 9,5-24/9-24, 4 ply Vredestein Track 1250-1500 mm

Belt pully:

Location:	At rear of the P.T.O.
Diam. × width:	180 × 100 mm
Speed:	1650 r.p.m.
Linear speed:	15,4 m/sec.
Direction of rotation:	Both

Power take off:

Main:	6 spline, 34,9 mm ($1^3/_8''$) diam, at rear of tractor
Height above ground:	490 mm (test figure)
Speed:	540 r.p.m. at rated engine speed of 2000 r.p.m.

Power lift:	Hydraulic, Eicher AG 78a Maximum load at end of lower links 970 kg (test figure). Working pressure 150 kg/cm² Oil capacity 1,75 l. Recommanded oil in summer and winter SAE 20 Oil change period 500 h.
Drawbar:	Fixed on hydraulically controlled implement linkage. Vertical adjustement from 150 mm to 750 mm (test figure) Distance from rear axle 700 mm (test figures)

Hitch:

Height above ground:	680 mm (test figure) (max.) 540 mm (test figure) (min.)
Distance from rear axle:	290 mm (test figure)

Electrical equipment:

Voltage:	12
Generator:	Bosch
Battery:	Bayern. Capacity 12 Volt - 84 AH
Starting device:	Bosch

Overall dimensions:

Overall length:	2850 mm
Overall width:	1780 mm
Overall height:	1400 mm
Minimum ground clearance:	310 mm
Wheel base:	1650 mm

Weights:

	Without additional weight - kg	*With maximum additional weight - kg*
On front wheels	470	645
On rear wheels	655	880
Total	1125	1525

Special remarks: The weights are without driver

PART II

LABORATORY TESTS

Compulsory tests:	Power take off test
Date and location of tests:	Aug-Sept. 1962, Wageningen
Type of dynamometer:	Water brake 2 R.T. (T.H. Delft)
Fuel:	Diesel oil, Density 0,831/22° C
Oil:	Shell SAE 20

Duration of test - Hours	*Horse power metrie*	*Engine speed r.p.m.*	*Torque - mkg*	*Specific fuel consumption g/epkh*	*Fuel temp. °C*	*Oil temp. °C*	*Coolant temp. °C*	*Air temp. °C*	*Atmospheric pressure mm Hg*
2	14,2	2040	18,3	192	—	—	—	20	768
1	11,2	1550	19,2	191	—	—	—	20	768

Special remarks: None

Varying speed tests:

	Horsepower	Engine speed r.p.m.	Fuel consumption			Temperature			Atmos-condit.	
			kg/h	hph/l	g/hph	oil °C	coolant °C	fuel °C	temp. °C	pressure mm Hg
Rated speed for p.t.o. work . .	14	2000	2,75	4,30	194	—	—	—	20	760
P.T.O. 540 r.p.m.	14	2000	2,75	4,30	194	—	—	—	—	760
Lowest recorded	4	2155	—	—	—	—	—	—	20	760

Remarks: Engine speed without load is 2200 R.P.M

PART III

DRAWBAR TESTS ON CONCRETE TRACK

Date of test: Aug.-Sept. 1962

Type of track: Concrete

Position of governor control lever: Fully open

Type of tyre: Rear: 9,5-24/9-24, 4 ply
Front: 4,50-16, 4 ply

Fuel: Diesel oil, Density 0,831/22° C

Oil: Shell SAE 20

A. Tests with maximum additional weight

Weight of tractor:

Weight without ballast: Front: 470 kg
Rear: 655 kg

Ballast: Front: 1 × 67 kg = 67 kg
2 × 47 kg = 94 kg

Rear: 2 × 64 kg = 128 kg

Water: 111 kg

Total weight: 1525 kg

Tyre pressure: 1,4 kg/cm²

Height of drawbar above ground: 450 mm

Special remarks: Weights are without driver

Maximum powers and pulls:

Gear no.	Maximum powers							Maximum pulls	
	horse power	corresponding pull - kg	wheelslip - %	speed - km/h	engine temp. °C	air temp. °C	atmos. pressure mm - Hg	pull - kg	remarks
2 L	9,3	1180	24,6	2,1	—	20	760	1180	slip
3 L	11,0	740	9,1	4,1	—	20	760	800	engine stall
1 H	10,7	480	6,4	6,0	—	20	760	530	engine stall
2 H	10,5	300	5,4	9,5	—	20	760	300	engine stall

Fuel consumption:

Gear No.	Optimum fuel consumption			Range of pulls over which specific fuel consumption does not exceed optimum consumption by more than 10 % - kg
	specific fuel consumption g/epkh	in hp hour per unit of volume hph/l	corresponding pull kg	
2L	270	3,07	900	1125-700
3L	250	3,33	800	800-500
1H	230	3,62	530	530-400
2H	230	3,62	300	

B. Tests without ballast

Weight of tractor without driver:

Weight without ballast:	Front 470 kg
	Rear 655 kg
	Total 1125 kg
Tyre pressure:	1,4 kg/cm²
Height of drawbar above ground:	450 mm

Maximum powers and pulls:

Gear No.	Maximum powers							Maximum pulls	
	horse power	corresponding pull - kg	wheelslip - %	speed - km/h	engine temp. °C	air temp. °C	atmos. pressure mm Hg	pull - kg	remarks
2L	7,0	750	12,0	2,5	—	20	760	880	slip
3L	10,7	750	13,4	3,8	—	20	760	780	engine stall
1H	11,7	490	4,9	6,5	—	20	760	500	engine stall
2H	11,9	350	2,6	9,4	—	20	760	350	engine stall

PART IV

1. **Location of centre of gravity:**

   a. Tractor with tanks filled, with driver (75 kg) without water in tyres and ballast weights — 650 mm forward of rear wheel centre

   b. Tractor with tanks filled, with driver (75 kg) fully ballasted — 665 mm forward of rear wheel centre

2. **Turning space and turning radius:**

Type of wheels: Front 4,50-16
Rear 9-24

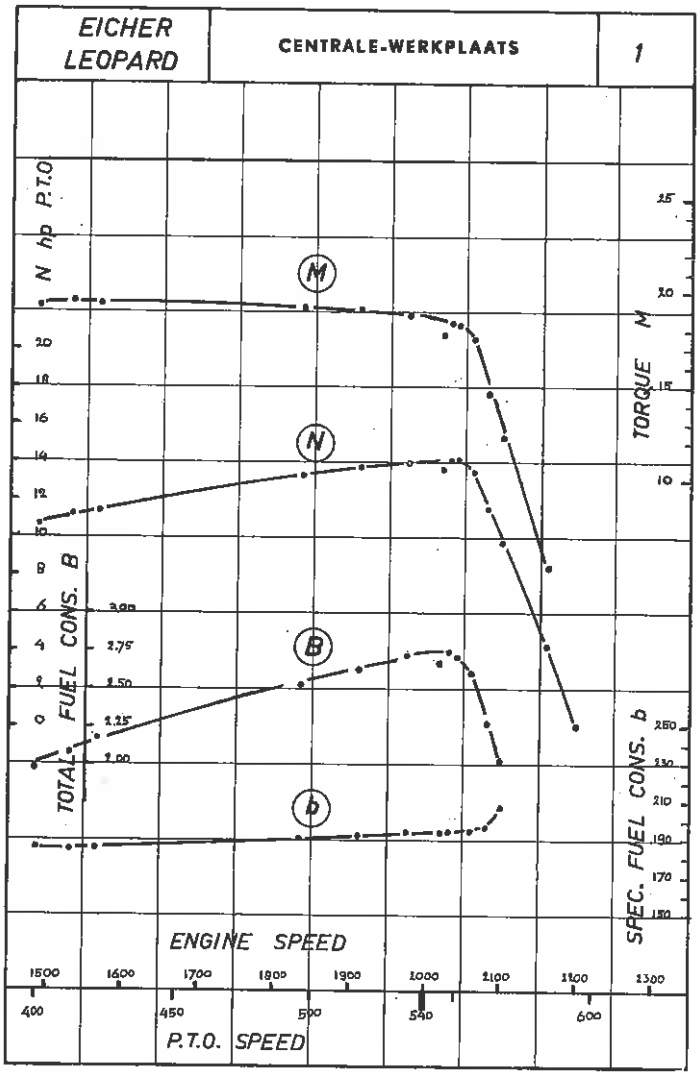
Wheel track: Front 1250 mm
Rear 1250 mm

Results	With brakes		Without brakes	
	right-hand	left-hand	right-hand	left-hand
Radius of turning space	2920	2920	3120	3170
Turning radius (in mm)	2800	2800	3000	3050

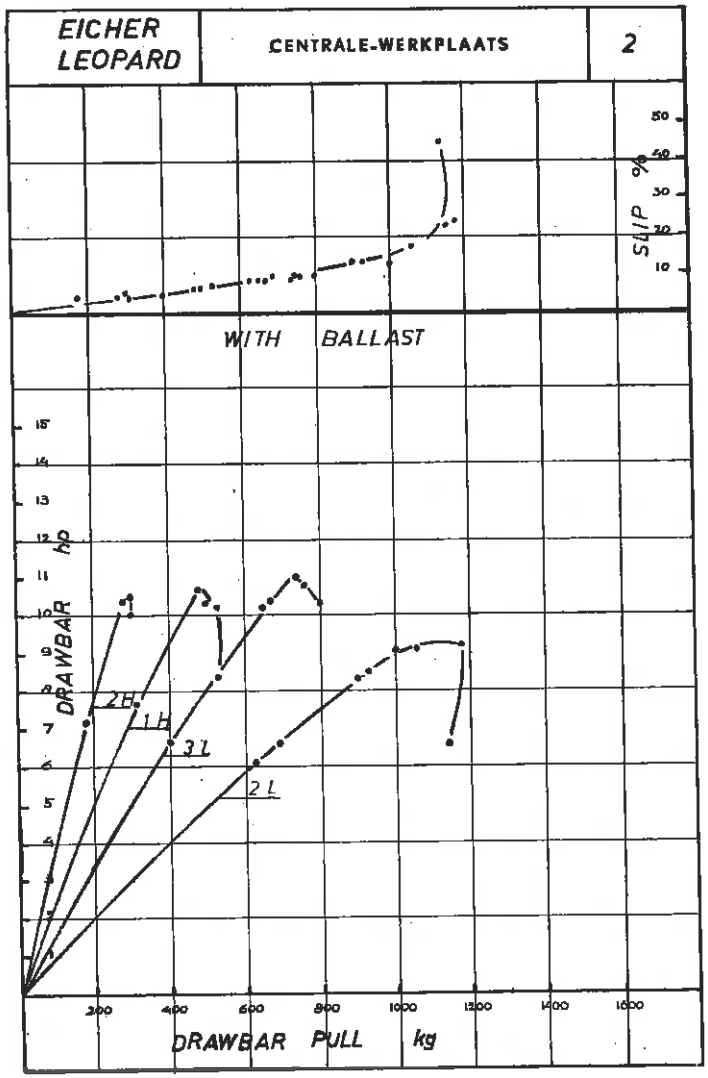
PART V

1. **Repairs and adjustments during test:** None

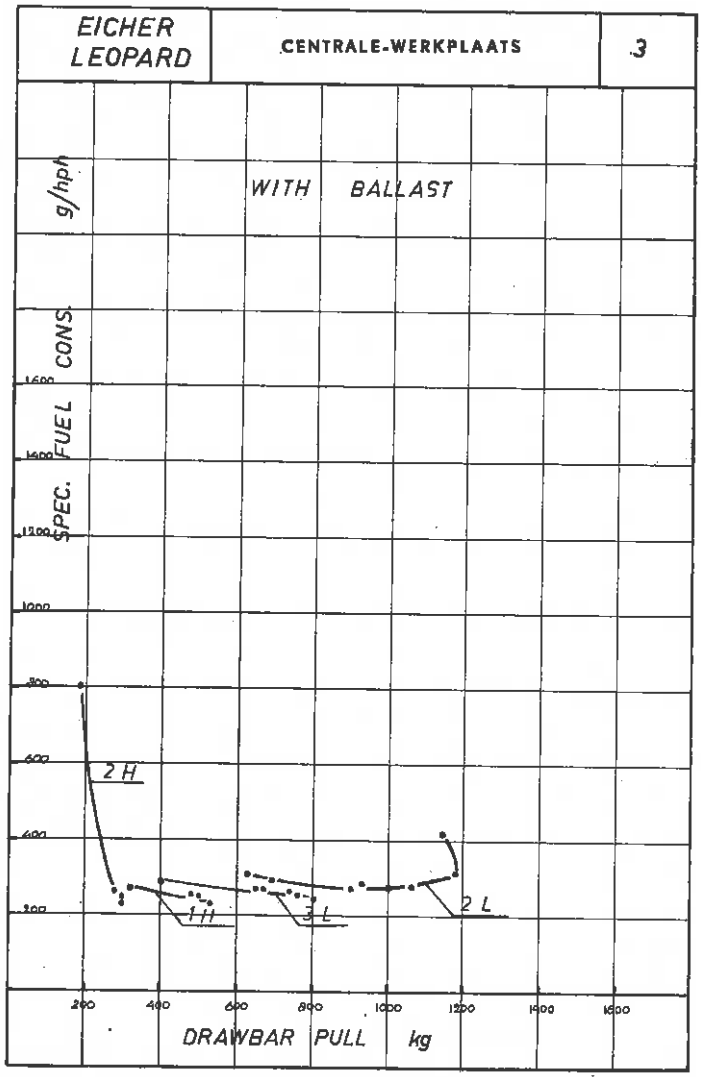
2. **Remarks:** None


EICHER
LEOPARD
CENTRALE-WERKPLAATS
1
N hp P.T.O
TOTAL FUEL CONS. B
TORQUE M
SPEC. FUEL CONS. b
M
N
B
b
ENGINE SPEED
1500
1600
1700
1800
1900
2000
2100
2200
2300
400
450
500
540
600
P.T.O. SPEED

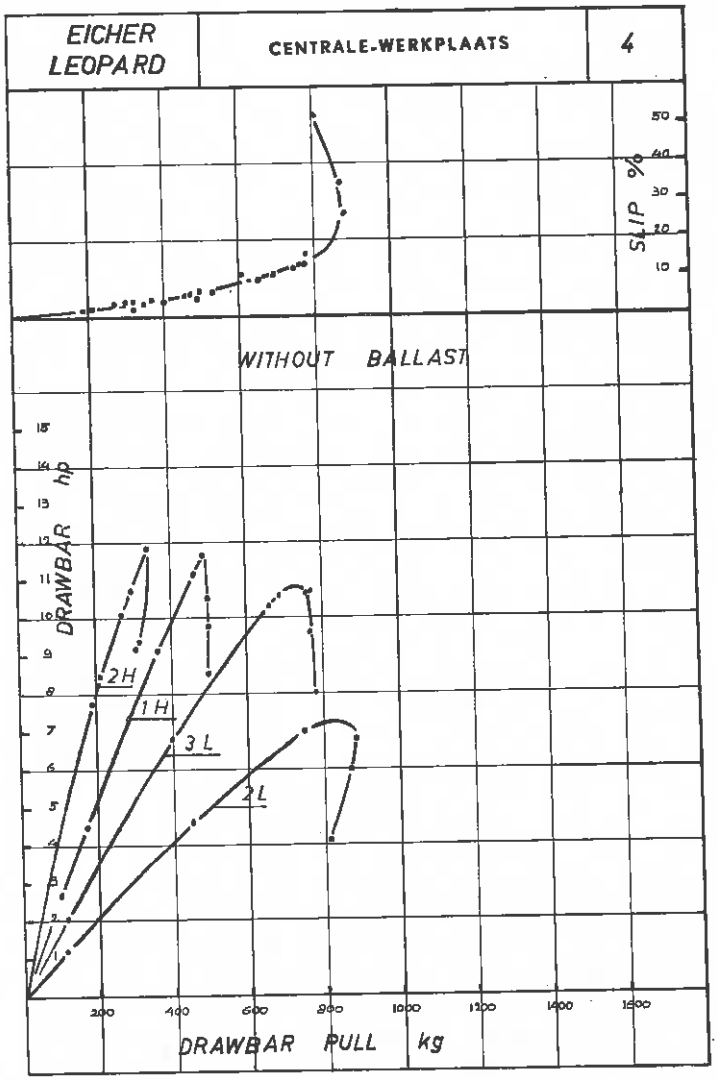
P.T.O. test



Test on concrete track, tractor with ballast (drawbar pull)



Test on concrete track, tractor with ballast (fuel consumption)



Test on concrete track, tractor without ballast (drawbar pull)