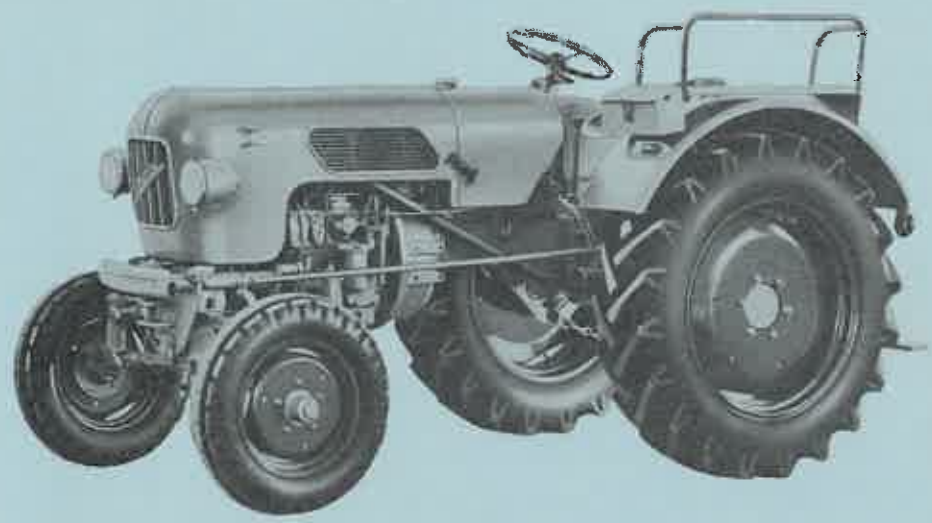
...oratorium für Technik in der Landwirtschaft

No. 108

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

EICHER PANTHER, TYPE EM 295

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



Date of test: September 1962
Test No.: 031/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.:* 031

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 „Panther": EM 295

Engine:

Make:	Eicher, Forstern/Obb EM 295 Direct injection, diesel, No. 68534
Rated output:	22 hp. (engine)
Cylinders:	2 cylinders, vertical in line, 95 mm bore × 120 mm stroke, compression ratio 1 : 20,5 replaceable dry cylinder liners, 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: Shäfer Pumpe PSSE 02 - 22-08 A - 1 Injection nozzles: DFO 33 A 2. Injection timing 19° + 1°/—0,5° before T.D.C. Injection pressure 140 + 5 kg/cm². Capacity of fuel tank 38 l
Governor:	Eicher, centrifugal type. Governed range of engine speed 700-2200 rev/min.
Air cleaner:	Oil bath. Oil capacity 0,7 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 6,5 l
Cooling system:	Air cooled, two separated blowers on one shaft, belt driven

Transmission:

Clutch:	Fichtel & Sachs, dry clutch
Gearbox:	Z.F. (Zahnradfabrik, Friedrichshafen), sliding gear type, 6 forward speeds and 1 reverse speed. Total transmission oil capacity 8,5 l. Oil change period 1000 h. Recommanded oil viscosity SAE 90 (SAE 80 in winter)

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	277,567	1,55
2nd	136,933	3,15
3rd	76,609	5,62
4th	57,799	7,46
5th	37,009	11,66
6th	21,770	19,83
rev	78,241	5,52

Differential:	Crown wheel and pinion. Differential lock fitted
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 5,50-16 Track 1250 mm
Driving wheels:	Two at rear. Tyres 11,2-28/10-28 Vredestein Track 1250 mm

Belt pully:

Location:	At rear of the P.T.O.
Diam. × width:	180 × 140 mm
Speed:	1858 r.p.m.
Linear speed:	17,46 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:	650 mm (test figure)
Speed:	619 r.p.m. at engine speed of 2100 r.p.m.

Power lift:	Hydraulic Eicher Maximum load at end of lower links 940 kg (test figure). Working pressure 130 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 250 to 820 mm (test figure)
	Distance from rear axle 800 mm (test figures)

Hitch:

Height above ground:	830 mm (test figure) (max.) 700 mm (test figure) (min.)
Distance from rear axle:	460 mm (test figure)

Electrical equipment:

Voltage:	12
Generator:	Bosch REEA 5/12/1800 CRI
Battery:	Bayern. Capacity 12 Volt - 84 AH
Starting device:	Bosch EJD 1,8/12 R 60

Overall dimensions: (Test Figures)

Overall length:	3140 mm
Overall width:	1560 mm
Overall height:	1560 mm
Minimum ground clearance:	370 mm
Wheel base:	1850 mm

Weights:

	Without additional weight - kg	*With maximum additional weight - kg*
On front wheels	481	645
On rear wheels	892	1215
Total	1373	1860

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 2RT (TH 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	22,3	2074	26,3	184	—	—	—	23	765
1	18,0	1560	28,2	174	—	—	—	23	765

Special remarks: None

Varying speed tests:

	Horsepower	Engine speed r.p.m.	Fuel consumption			Temperature			Atmos-condit.	
			kg/h	kph/l	g/hph	oil °C	coolant °C	fuel °C	temp. °C	pressure mm Hg
Rated speed for p.t.o. work . .	22,0	2000	3,9	4,7	180	—	—	—	23	765
P.T.O. 540 r.p.m.	20,5	1836	3,6	4,8	172	—	—	—	—	765
Lowest recorded	6,5	2170	—	—	—	—	—	—	23	765

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: 11,2-28/10-28
Front: 5,50-16

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: 481 kg
Rear: 892 kg

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

Rear: 2 × 64 kg = 128 kg

Water: 198 kg

Total weight: 1860 kg

Tyre pressure: 1,4 kg/cm²

Height of drawbar above ground: 450 mm

Special remarks: The 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	14,0	1400	18,4	2,7	—	15	765	1400	slip
3	18,4	930	7,3	5,3	—	15	765	1000	engine stall
4	18,3	700	4,3	7,1	—	15	765	780	engine stall
5	16,7	470	4,7	9,5	—	15	765	470	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	
2	250	3,33	1225	1400-900
3	225	3,70	1000	1000-700
4	210	3,97	780	780-650
5	210	3,97	470	470-430

B. Tests without ballast

Weight of tractor without driver:

Weight without ballast:	Front 481 kg Rear 892 kg Total 1373 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
2	10,2	1010	19,3	2,7	—	16	760	1060	slip
3	17,6	900	7,6	5,3	—	16	760	1000	engine stall
4	17,9	675	6,0	7,2	—	16	760	770	engine stall
5	18,7	450	3,2	11,3	—	16	760	490	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 — 620 mm forward of rear wheel centre

   b. Tractor with tanks filled, with driver (75 kg) fully ballasted — 620 mm forward of rear wheel centre.

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

Type of wheels: Front 5,50-16
Rear 10-28

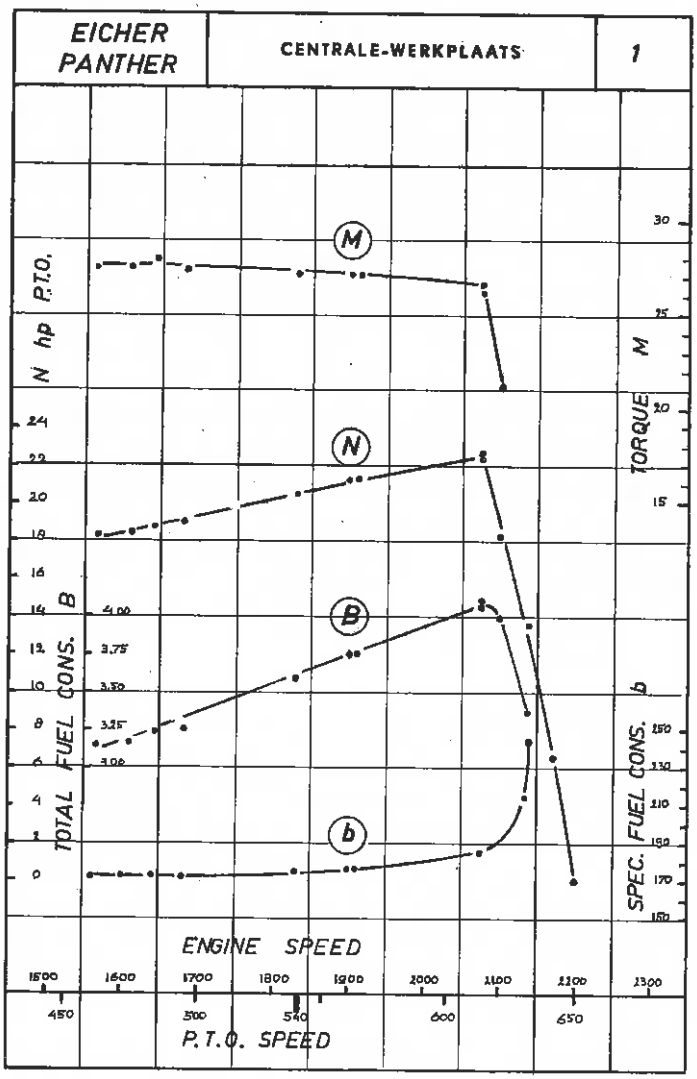
Wheel track: Front 1250 mm
Rear 1250 mm

Results	With brakes		Without brakes	
	right-hand	left-hand	right-hand	left-hand
Radius of turning space	3350	3350	3570	3620
Turning radius (in mm)	3220	3220	3450	3500

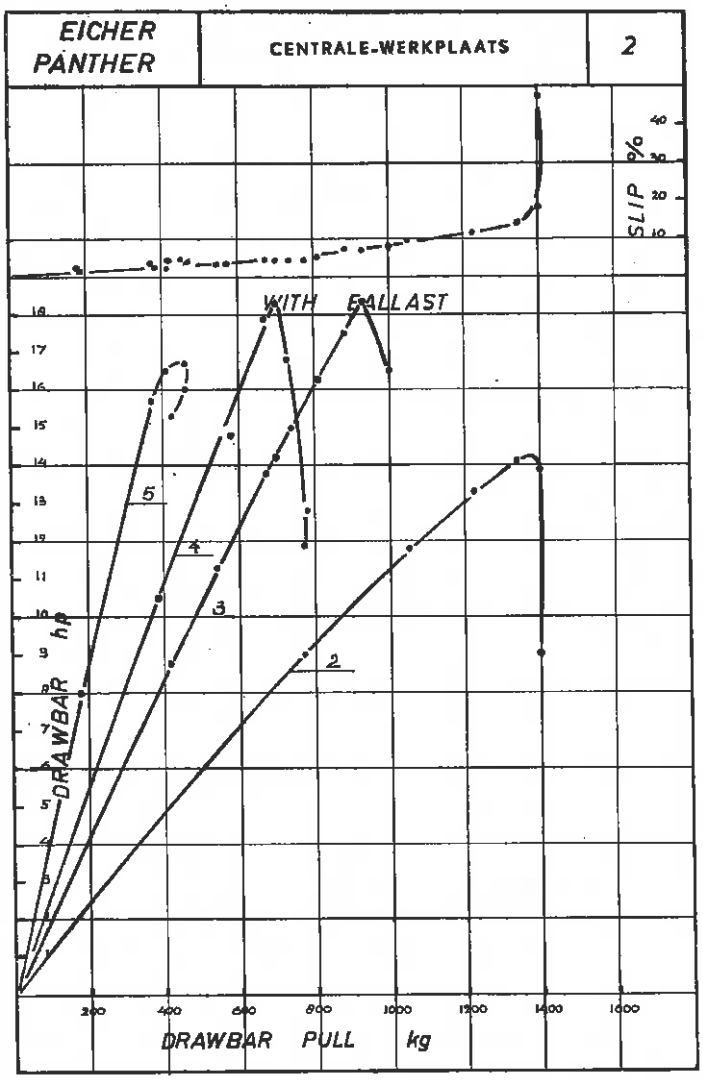
PART V

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

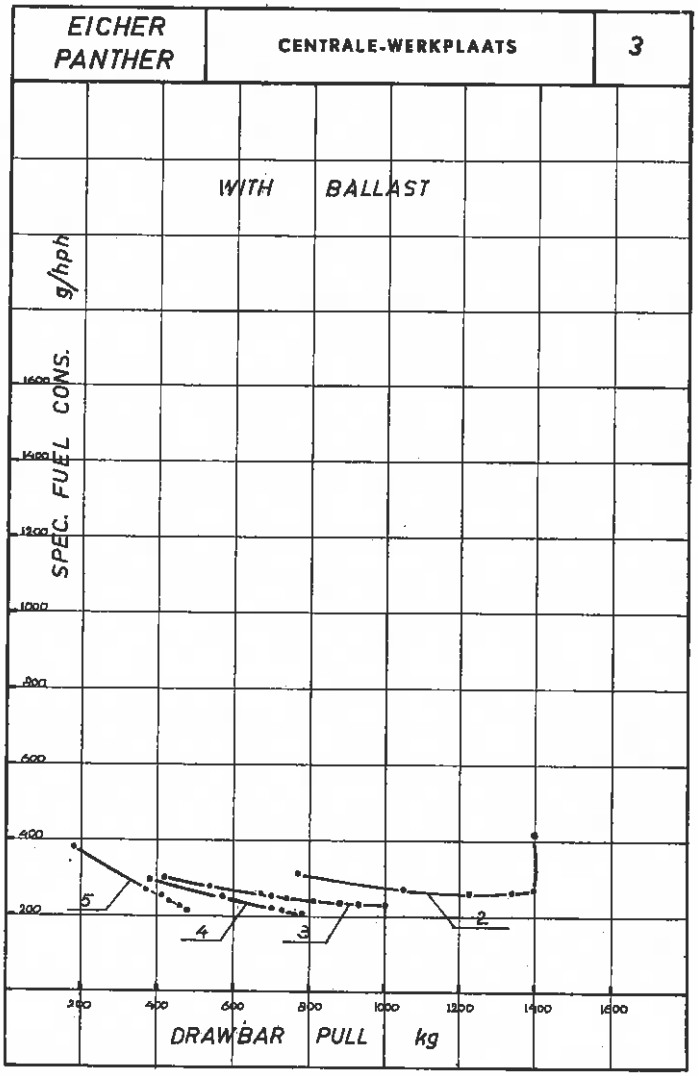
2. **Remarks:** None


EICHER PANTHER
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
450
500
540
600
650
P.T.O. SPEED

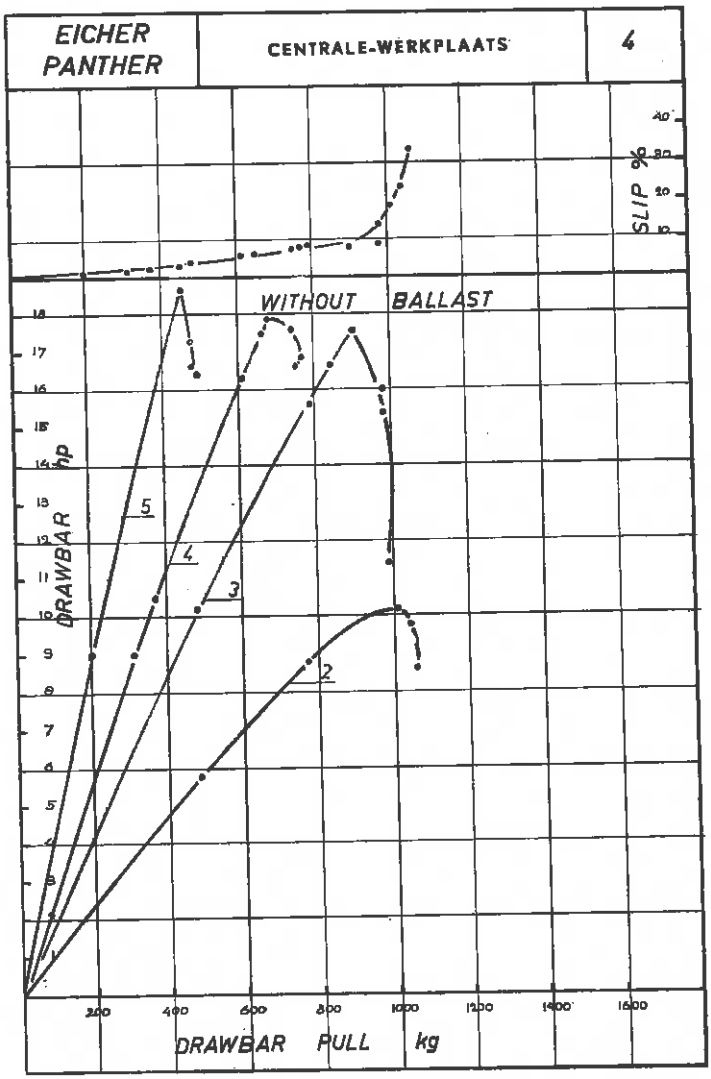
P.T.O. test



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)