No. 032

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

COMBITRAC ACKERSCHLEPPER BRILLANT

Manufactured by:
Rheinstahl Hanomag



Date of test: June 1962
Test No.: 027/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: November 21, 1962 *Serial No.:* 027

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

TABLE OF CONTENTS

		Page
PART I	Specification of tractor	4
PART II	Compulsory test: At the power take-off shaft	6
PART III	Drawbar tests on concrete track	7
PART IV	Location of centre of gravity	9
	Turning space and turning radius	9
PART V	Repairs and adjustments, remarks	9

APPENDIX

	Fig. no.
P.T.O. test	1
Test on concrete track, tractor with ballast (drawbar pull)	2
Test on concrete track, tractor with ballast (fuel consumption)	3
Test on concrete track, tractor without ballast (drawbar pull)	4

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:	Rheinstahl Hanomag
Type:	Combitrac Ackerschlepper Brillant
No:	2420767

Engine:

Make:	Rheinstahl Hanomag
Type:	4 cylindres, watercooled with pre-combustion chamber
No.:	1450752
Rated output:	42 hp at 2200 r.p.m. (power take off)
Cylinders:	Number 4, watercooled — 90 mm bore, 110 mm stroke. Compression ratio 22 : 1. Arrangement of valves: overhead valves
Rated speeds:	For belt work: 2200 r.p.m. For main p.t.o. work: 2200 r.p.m.
Minimum speed at full load:	Not specified
Fuel system:	Fuel: Diesel oil Injection pump: Bosch PE 4A 65 B 310 LS 470/11 Injection nozzle: Bosch DN 5 SD 24 Setting of these parts: injection timing 5,9 mm below top Injection pressure: 125 + 10 kg/cm² Capacity of tank: 67 litre
Governor:	Model: centrifugal type, Bosch EP/RSV 250/1100 AI/A97d Range of speed: 500-2200 r.p.m.
Air cleaner:	Make: Hanomag Type: Oil bath with centrifugal precleaner Oil capacity: 0,75 litre

Gear No.	*Number of engine revolutions for one revolution of driving wheel*		*Theoretical travelling speed for rated speed of engine – km/h =*
1st	143,67		4,20
2nd	106,20		5,70
3rd	71,10	high gearing	8,50
4th	46,20		13,15
5th	29,25		20,60
1st	564,00		1,07
2nd	417,00		1,45
3rd	279,40	low gearing	2,16
4th	181,50		3,35
5th	115,00		5,25
1st	80,40	reverse	7,50
2nd	316,00		1,91

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 litres
Cooling system:	Water cooled, adjustable belt driven van, beltdriven water pump

Transmission:

Clutch:	Make Fichtel & Sachs Type G 22 Z Single plate, dry, foot pedal operated
Gearbox:	Make: Hanomag 10 forward speeds and 2 reverse speeds Total transmission oil capacity: 20 litres Oil change period: 1000 h
Differential:	Crown wheel and pinion. Final drive. Differential lock fitted
Steering device:	Z.F. type GD 28a
Brakes:	Hand brakes fitted Foot brakes: independent or combined operated

Wheels:

Steering wheels:	Two at front. Tyres 600-20 Track 1312 mm 1520 - 1620 - 1720 - 1820
Driving wheels:	Two at rear. Tyres 11-38 Track 1500 mm 1525 - 1625 - 1725

Belt pully:

Location:	At rear of tractor
Dia × width:	265 × 140
Speed:	1573 r.p.m.
Linear speed:	21,78 m/sec.
Direction of rotation:	Clock wise

Power take off:

Main:	6 spline, 34,9 mm ($1^3/_8$") at rear of tractor
Height above ground:	600 mm (test figure)
Speed:	540 r.p.m. at 1950 r.p.m. of the engine

Power lift:	Make: Hanomag Gear type pump. Maximum load at end of lower links 1200 kg (test figure) Oil capacity: 10,5 litres
Drawbar:	Fixed on hydraulically controlled implement linkage. Vertical adjustment from 340 mm to 980 mm (test figure) Distance from rear axle 1000 mm (test figure)

Hitch:

Height above ground:	780 mm (test figure)
Distance from rear axle:	550 mm (test figure) Adjustable from 780 mm to 825 mm

Electrical equipment:

Voltage:	12
Generator:	Bosch LJ/GEH 90/12/2400 R7
Battery:	135 Ah
Starting device:	Bosch BNG/4/12 CR 225. 4 hp.

Overall dimensions: (test figures)

Overall length:	3500 mm
Overall width:	1860 mm
Overall height:	1740 mm
Minimum ground clearance:	400 mm
Wheel base:	1940 mm

Weights:

	Without additional weight – kg	*With maximum additional weight – kg*
On front wheels . . .	853	953
On rear wheels . . .	1780	2456
Total	2633	3409

Special remarks: The weights are without driver

PART II

LABORATORY TESTS

Compulsory tests:

Date and location of tests:	Wageningen, 18 June 1962
Type of dynamometer:	Water brake, 2 RT (T.H. Delft)
Fuel:	Diesel oil, density 0,826/12° C
Oil:	Rotella, SAE 20

Sustained power test	*Power H.P. metric*	*Egine speed r.p.m.*	*Torque – mkg*	*Specific fuel consumption g/hph*	*Fuel temp. °C*	*Oil temp. °C*	*Coolant temp. °C*	*Air temp. °C*	*Atmos. pressure mm Hg*
Max. power 2 hours .	43,7	2270	13,8	217	20	—	85	30	764
Speed less than at max. torque 1 hour	34,5	1625	15,2	200	20	—	85	30	764

Special remarks:

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 Hg*
Rated speed for p.t.o. work .	44,2	2200	9,33	3,81	211	—	85	20	30	764
No load	—	2400	—	—	—	—	75	20	30	764
P.T.O. 540 r.p.m.	41,0	1950	8,41	4,02	205	—	—	20	30	764

Remarks:

PART III

DRAWBAR TESTS ON CONCRETE TRACK

Date of test:	May-June 1962
Type of track:	Concrete
Position of governor control lever:	Fully open
Type of tyre:	Rear: Continental 11-38, 6 ply
	Front: Continental 600-20, 6 ply
Fuel:	Diesel oil, density 0,826/12° C
Oil:	Rotella SAE 20

A. Tests with maximum additional weight

Weight of tractor:

Weight without ballast:	Front: 853 kg
	Rear: 1780 kg

Ballast:	Front:	1 weight of 100 kg
	Rear:	8 weights of 42 kg = 336 kg
	Water:	340 kg
Total weight:		3409 kg
Tyre pressure:		Front 2,5 kg/cm². Rear 1,2 kg/cm²
Height of drawbar above ground:.		500 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 Hg	pull – kg	remarks
1	35,4	2550	12,5	3,60	—	20	760	2780	engine stall
2	36,2	1880	8,5	5,20	—	20	760	2050	engine stall
3	35,5	1280	5,0	8,00	—	20	760	1300	engine stall
4	34,0	720	3,0	12,60	—	20	760	800	engine stall

Fuel consumption:

Gear No.	Optimum fuel consumption			Range of pull over which specific fuel consumption does not exceed optimum consumption by more than 10 % – kg
	specific fuel consumption g/epkh	in H.P. hour per unit of volume	corresponding pull kg	
1	270	3,06	2200	1500-2780
2	255	3,25	2000	1300-2050
3	260	3,18	1250	750-1250
4	260	3,18	800	600-800

B. Tests without ballast

Weight of tractor without driver:

Weight without ballast:	Front 853 kg Rear 1780 kg Total 2633 kg
Tyre pressure:	Front 2,5 kg/cm². Rear 1,2 kg/cm²
Height of drawbar above ground:	500 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 Hg	pull – kg	remarks
1	29,0	2100	14,1	3,60	—	20	760	2220	slip
2	35,0	1900	11,2	5,05	—	20	760	2050	engine stall
3	35,0	1250	6,0	7,50	—	20	760	1320	engine stall
4	34,5	750	4,1	12,50	—	20	760	850	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 weight — 610 mm forward of rear wheel centre.
   b. Tractor with tanks filled, with driver (75 kg) fully ballasted — 540 mm forward of rear wheel centre.
2. **Turning space and turning radius:**

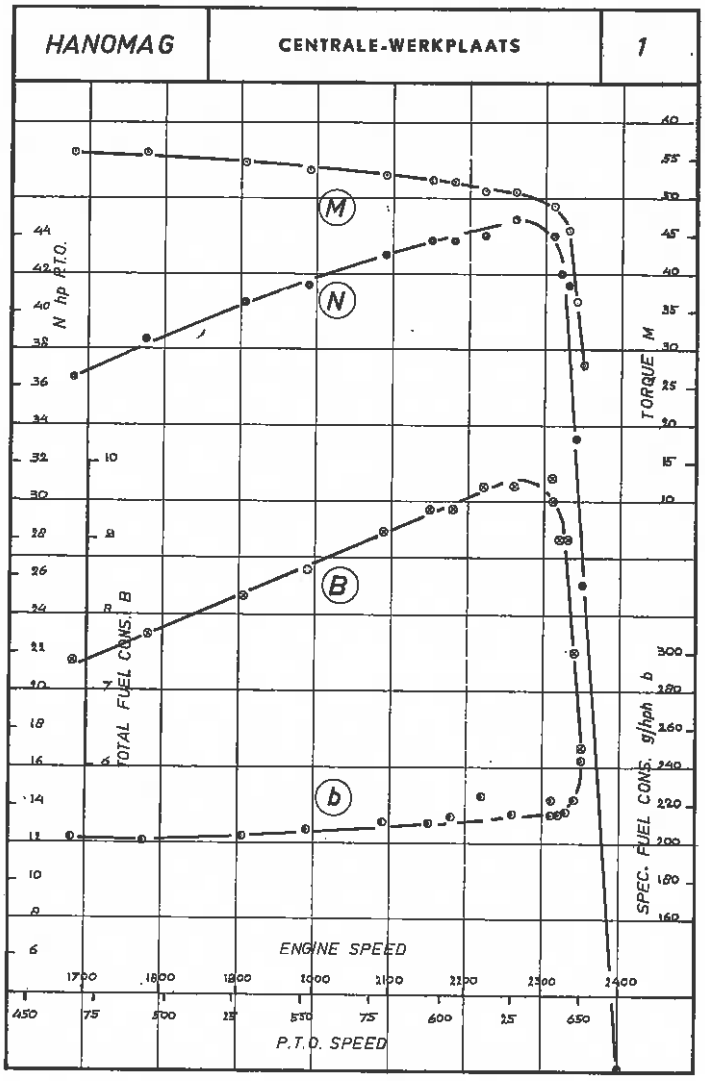
Type of wheels: Front 600-20, 6 ply
Rear 11-38, 6 ply

Wheel track: Front 1500 mm
Rear 1500 mm

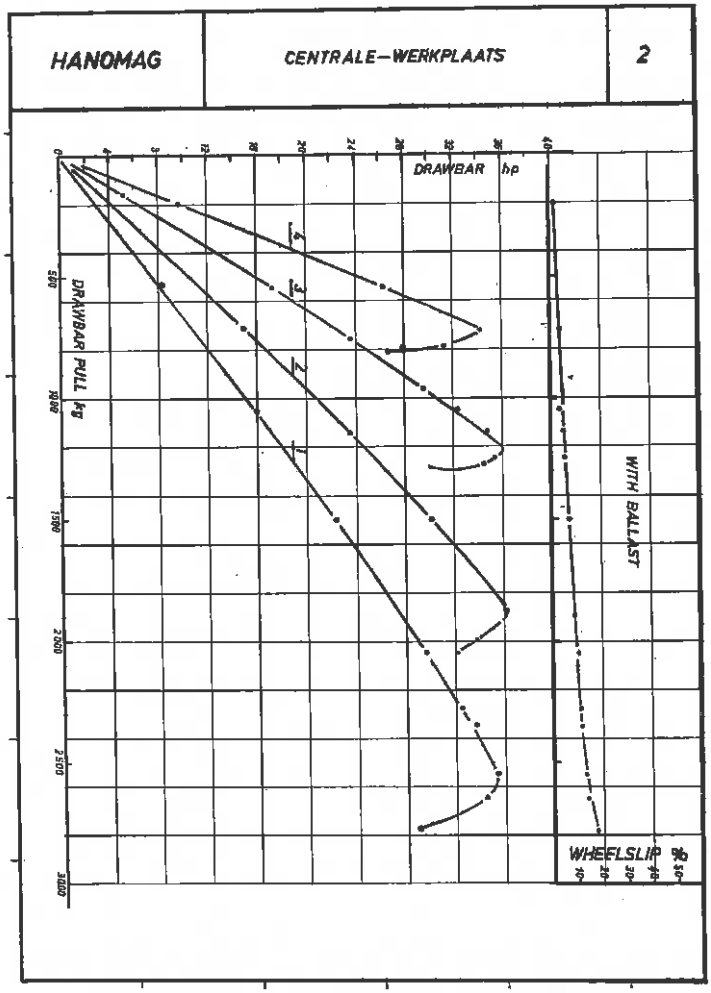
Results	With brakes		Without brakes	
	right-hand	left-hand	right-hand	left-hand
Turning radius (in mm)	3670	3670	4310	4270
Radius of turning space	3690	3690	4330	4300

PART V

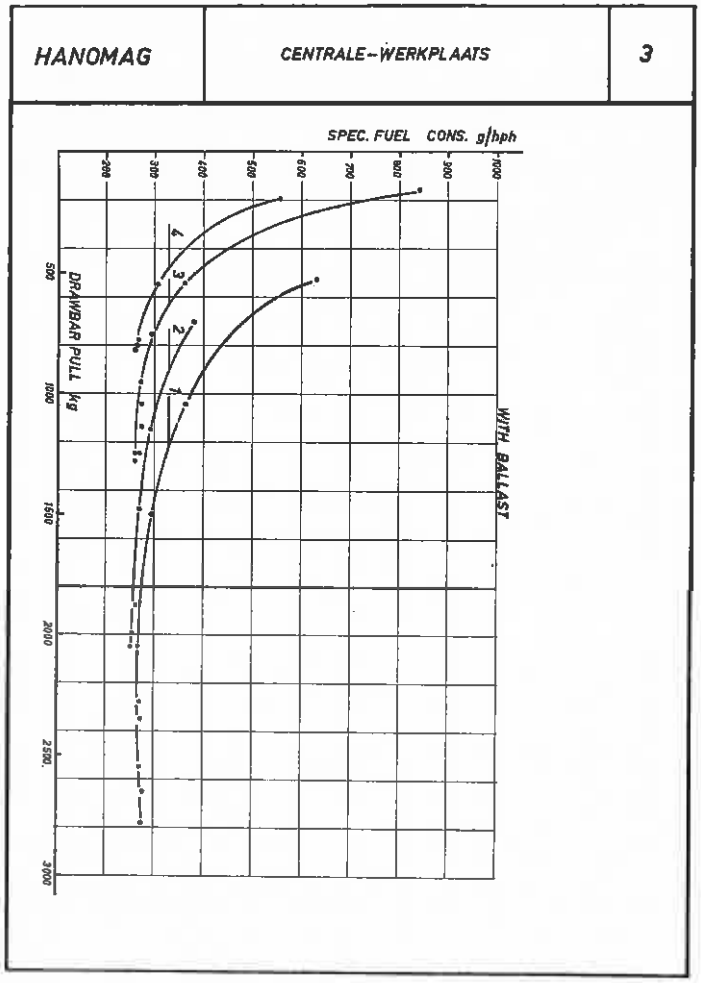
1. **Repairs and adjustments during test:** None
2. **Remarks** None


HANOMAG
CENTRALE-WERKPLAATS
1
M
N
B
b
N hp P.T.O.
TOTAL FUEL CONS. B
TORQUE M
SPEC. FUEL CONS. g/hph b
ENGINE SPEED
1700
1800
1900
2000
2100
2200
2300
2400
P.T.O. SPEED
450
500
550
600
650

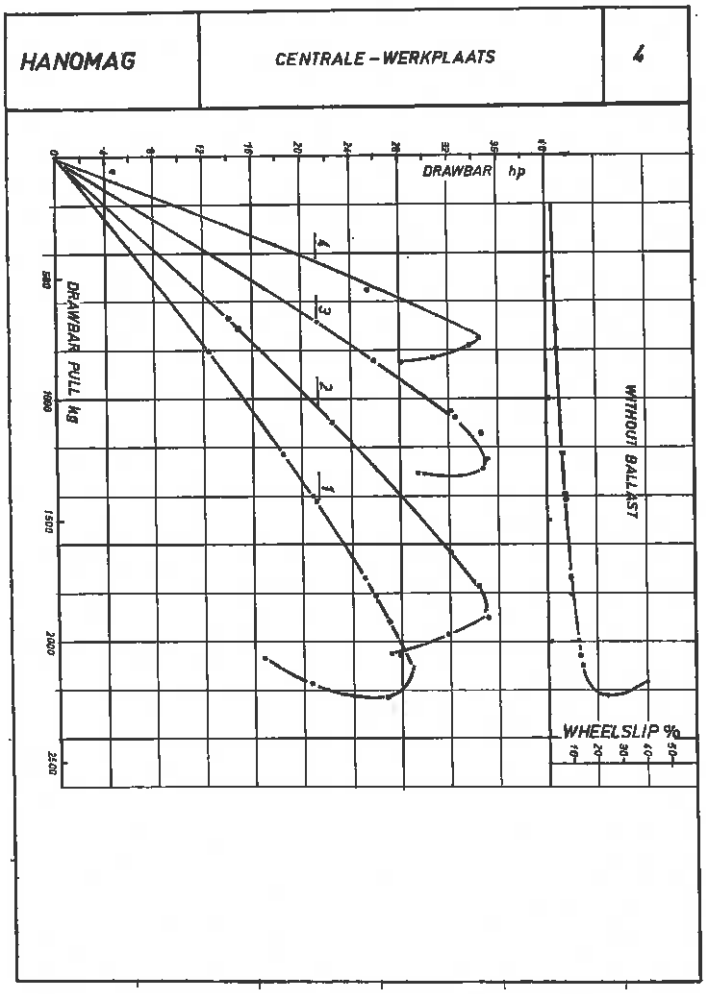
P.T.O. test



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)