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Printed: January 1971

Report on test in accordance with
O.E.C.D. STANDARD-CODE for the Official Testing
of Agricultural Tractors



Narrow-Gauge Tractor AGRIA 4800

Manufactured by: AGRIA-Werke GmbH
7108 Möckmühl

Date of Tests: July till September 1970

DEUTSCHE LANDWIRTSCHAFTS-GESELLSCHAFT e.V.
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This bulletin is based on engineering tests in accordance with the O.E.C.D. STANDARD-CODE for the Official Testing of Agricultural Tractors.

It does not contain an evaluation of the performance of the tractor on practical work.

This report has been approved by the O.E.C.D. Co-ordinating Centre (C.N.E.E.M.A.France) as being in accordance with the O.E.C.D. STANDARD-CODE.

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PRÜFUNGS-ABTEILUNG
Agria 4800

Test No. 70-11

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PRÜFUNGS-ABTEILUNG Test No. 70-11

Agria 4800

Tractor manufacturer:	AGRIA-Werke GmbH., 7108 Möckmühl
Submitted for test by:	Manufacturer
Selected by:	Manufacturer by agreement with DLG
Place of running-in:	Möckmühl and Groß-Umstadt
Duration of running-in:	Engine appr. 50 hours; Tractor appr. 25 hours

SPECIFICATION OF TRACTOR

Tractor

Make:	AGRIA-Werke GmbH., 7108 Möckmühl
Model:	4800
Type:	Unit construction
Serial No.:	480 3744 G

Engine

Make:	Engine Factory Ruggerini, Rubiera (R.E.) Italy
Model:	CRD 100 P
Type:	Air cooled 4-stroke Diesel engine
Serial No.:	36842
Cylinders:	1 cylinder vertical; bore 100 mm, stroke 95 mm, capacity 741 cm^3; compression ratio 18 : 1
Valves:	Overhead in cylinder head
Fuel system:	Fuel: Commercially available diesel oil; Injection pump: Bosch type PFR 1 K 80 282/11 Injection nozzles: Bosch type DLLA 180 SV 9549/2 Injection pressure: 200 kp/cm^2 Injection timing: 10° before TDC Fuel filter: Knecht felt tube type and Micronic fine filter cartridge Capacity of fuel tank: 11 liter
Governor:	Make: Engine Factory Ruggerine, Rubiere (R.E.) Italy Mechanical variable speed type governor Governed range of engine speed 700 rev/min to 3200 rev/min; rated engine speed for p.t.o.-work 3000 rev/min for field-work 3000 rev/min for transportation-work 3000 rev/min
Air cleaner:	Torna Technik F. Drechsel, 7471 Eich/Stuttgart Oil bath type filter, oil capacity 0,5 liter

Lubrication system: Forced feed from gear type pump; screen in sump; replaceable filter cartridge in main current, oil capacity 2,2 liter; recommended oil change period 50 hours; recommended oil: multipurpose oil HD SAE 10 W/30 for all seasons

Cooling system: Air cooling by axial blower with V-belt drive

Electric equipment

Voltage: 12 Volt, negative earth

Starting device: Bosch type starter motor JD 12V 1,8 PS

Starting aid: Half compression device

Generator: Bosch type EH 14V 11A 19

Battery: Lead acid type battery 12V 44 Ah

Transmission

Clutch: Fichtel & Sachs AG., 872 Schweinfurt; single plate dry clutch type K 180, operated by foot pedal

Gearbox: AGRIA-Werke GmbH., 7108 Möckmühl; 3 speed selective gear, 2 stage group gear and reversing gear for all speeds, giving total 6 forward speeds and 6 reverse

Rear axle and final drive: AGRIA-Werke GmbH., 7108 Möckmühl; bevel gear type differential gear with crown wheel and pinion, differential lock fitted, hand lever operated and self-disengaging; spur gear final drive

Oil capacity: 7 liter; oil change period 100 hours; recommended oil: SAE 80

Total ratios and speeds

Group gear	Select. gear No.	Number of engine revolution for one revolution of driving wheel	Theoretical travelling speed at rated engine speed km/h	m/s
Reversing gear in forward position				
slow	1	333 : 1	1,36	0,38
	2	150 : 1	3,04	0,84
	3	41 : 1	11,10	3,09
fast	1	196 : 1	2,30	0,64
	2	88 : 1	5,15	1,43
	3	24 : 1	18,85	5,25
Reversing gear in reverse position				
slow	1	333 : 1	1,36	0,38
	2	150 : 1	3,04	0,84
	3	41 : 1	11,10	3,09
fast	1	196 : 1	2,30	0,64
	2	88 : 1	5,15	1,43
	3	24 : 1	18,85	5,25

PRÜFUNGS-ABTEILUNG Test No. 70-11

Agria 4800

Power take-off a) Main power take-off, manually engaged

Location:	At rear of tractor, in median plane, 360 mm above ground
Dimensions:	Spline shaft 29 x 34,9 x 8,7 mm = $1\frac{3}{8}$"; 6 splines (acc.to DIN 9611 Form A; B.S. 1495; ASAE S 203.5)
Speed:	825 rev/min at 3000 rev/min rated engine speed; standard p.t.o. speed 540 rev/min at 1963 rev/min engine speed
Direction of rotation:	In forward speeds clockwise; in reverse speeds anticlockwise

b) Ground speed power take-off.
Main p.t.o. commu-table to ground speed p.t.o. by hand lever; location and dimensions like main p.t.o.
One revolution of p.t.o. for 0,33 m travelling distance; 6,94 revolutions of p.t.o. for one revolution of driving wheel

Power lift

AGRIA-Werke GmbH., 7108 Möckmühl
Disintegrated design with floating position;
hydraulic pump manufacturer Hidroirma, Reggio-Emilia, Italy, type AM 1,5/14/S;
control valve manufacturer Bucher, 7891 Griessen/Baden, type ZE 11-A;
single acting ram of own production;
recommended oil: Engine oil HD SAE 10 W/30 or Esso Univis J 43;
oil capacity: 2,3 l

Pull attachment

Implement linkage:	AGRIA-Werke GmbH., 7108 Möckmühl Own design, operated by power lift by links; lifting height above ground from 210 mm to 595 mm change by power lift and changing length of rods; lifting rods adjustable to three length, 270 mm, 320 mm and 370 mm
Drawbar:	Fitted in implement linkage; height above ground adjustable from 170 mm to 635 mm by power lift; fixable in 300 mm above ground by screws; central hole and two holes on either side, one with 70 mm the other with 280 mm distance from central hole; distance of central hole from the middle of the rear axle 540 mm when linkage is horizontal; distance of central hole from end of p.t.o. shaft 130 mm

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Agria 4800

Trailer hitch: At rear of tractor; height above ground 550 mm; distance from centre of rear axle 420 mm

Towing hitch: Not provided

Steering device: Make: AGRIA-Werke GmbH., 7108 Möckmühl
Spur gear steering, operated by hand-wheel

Brakes

Parking brake: Mechanical external bandbrake, acting on transmission, operated with hand lever with one locking rest

Foot brake: Mechanical shoe type brake with balance, acting on the rear axle, operated by foot pedal

Steering brake: Operated by two separate foot pedals independent from the normal foot brake pedal

Wheels

Steering wheels: Two at front; tyres 4,00-12 AM 4 ply pneumatics; maximum permissible weight on each tyre 270 kp at 2,5 kp/cm²; rim 3,00 x 12

Trackwidth: 675 mm and 725 mm adjustable by turning wheels

Driving wheels: Two at rear; tyres 7,50-16 AS 4 ply pneumatics; maximum permissible weight on each tyre 595 kp at 1,5 kp/cm²; rim 5,50 F x 16

Trackwidth: 635 mm and 845 mm adjustable by turning wheels

Wheel base: 1200 mm

PRÜFUNGS-ABTEILUNG
Agria 4800

Test No. 70-11

Weights

With power lift, three-point linkage, full fuel tank and oil, as tested

		without driver	with driver
Weight of tractor without ballast:	Front axle load:	278 kp	284 kp
	Rear axle load:	378 kp	446 kp
	Total:	656 kp	730 kp
Ballast front:	1 weight per wheel each 11 kp	total	22 kp
Ballast rear:	1 weight per wheel each 30 kp	total	60 kp
	water in tyres		57 kp
		without driver	with driver
Weight of tractor with ballast:	Front axle load:	299 kp	302 kp
	Rear axle load:	496 kp	567 kp
	Total	795 kp	869 kp

Seat

Make: Fr. Meese, 522 Waldbröhl
Upholstered mold seat; not sprung; in median plane of tractor; height above ground 750 mm; distance of back rest from drawbar adjustable from 330 mm to 370 mm

Number of grease points (whole tractor) : 12

Overall dimensions

Overall length:	2265 mm with implement linkage and drawbar
Overall width:	1040 mm at 845 mm track, without ballast weights
Overall height:	1115 mm to steering wheel
Maximum ground clearance:	200 mm in median plane of tractor
	215 mm apart median plane

Lighting equipment

Electric 12 Volt, acc.to StVZO (German Govt.Regulation) additionally with main head light beam

	Height above ground of centre mm	Dimensions of area mm	Distance from outside edge of tractor to centre at 845 mm track mm
Head lights	865	85 ø	385
Stop and tail lights	810	70 ø	270
Reflectors	820	50 ø	200

PRÜFUNGS-ABTEILUNG
Agria 4800

Test No. 70-11

FUEL AND LUBRICANTS USED IN TESTS

Laboratory and track tests

Fuel:	Aral Diesel oil, specific gravity at 15°C : 0,827 kg (commercially available quality acc.to DIN 51 601)
Engine oil:	Shell Rotella HD 20
Transmission oil:	SAE 80
Hydraulic oil:	Shell Rotella HD 20

COMPULSORY TESTS

(1) MAIN POWER TAKE-OFF PERFORMANCE

Date and location of tests: 13.7.1970, Groß-Umstadt

Type of dynamometer: Schenck hydraulic dynamometer U1-30

Maximum power

Horsepower metric hp	Speed engine rev/min	Speed p.t.o. rev/min	Fuel consumption total l/h	Fuel consumption specific g/metric hp h	Specific work metric hp h/l
At maximum power - 2 hour test					
15,25	3000	825	4,35	237	3,50
At standard p.t.o. speed (540 rev/min)					
10,75	1963	540	3,17	244	3,40
At the speed recommended by the manufacturer for drawbar work					
15,25	3000	825	4,35	237	3,50
Fuel consumption at part loads					
(i) 85% of torque at maximum power					
13,51	3140	863	3,70	226	3,66
(ii) unloaded					
-	3280	905	1,34	-	-
(iii) 50% of the load defined in (i)					
7,04	3250	894	2,26	267	3,11
(iv) maximum power					
15,25	3000	825	4,35	237	3,50
(v) 25% of the load defined in (i)					
3,45	3275	901	1,74	416	1,98
(vi) 75% of the load defined in (i)					
10,40	3200	880	2,90	231	3,59

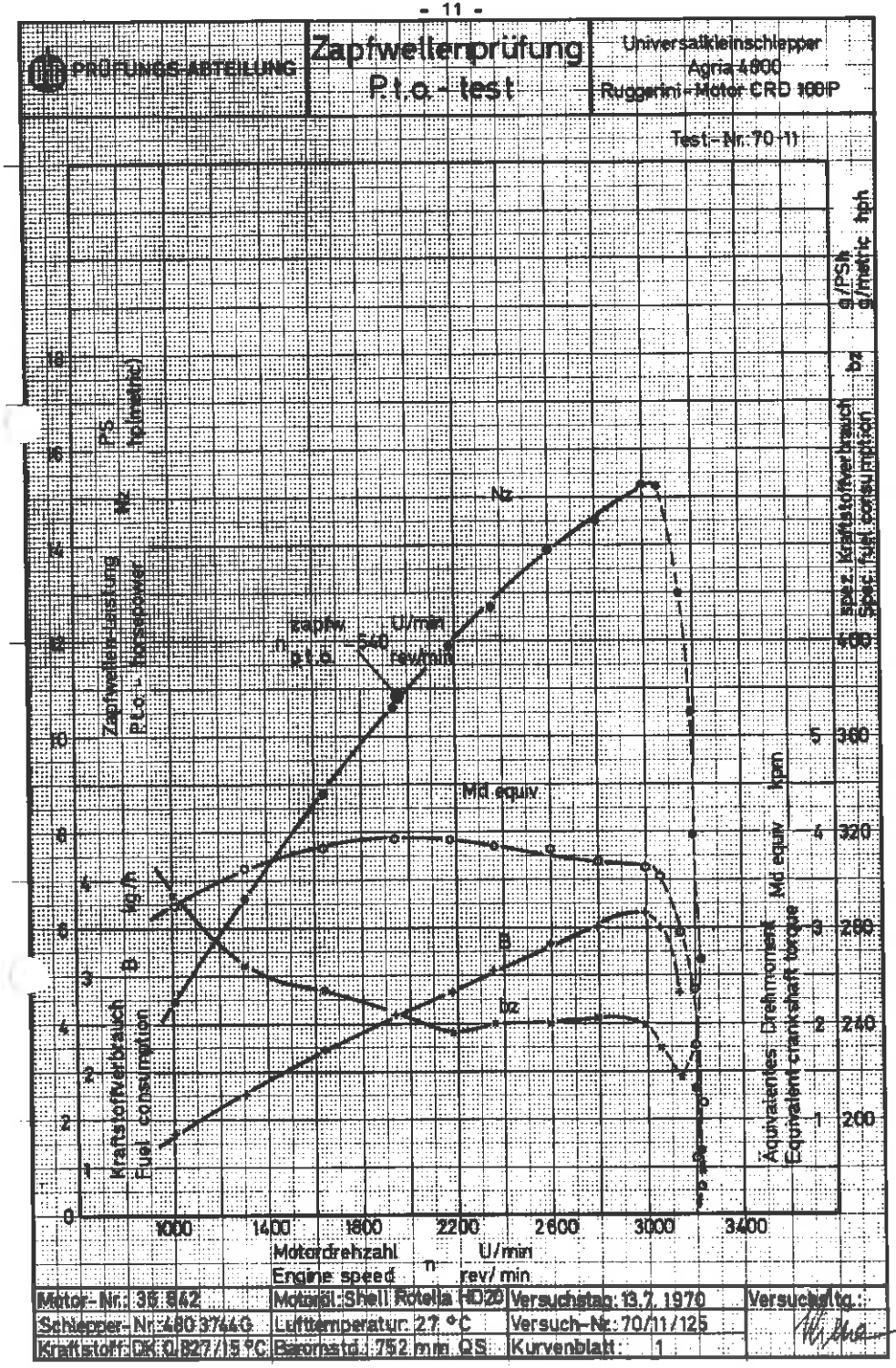
No load maximum engine speed: 3280 rev/min

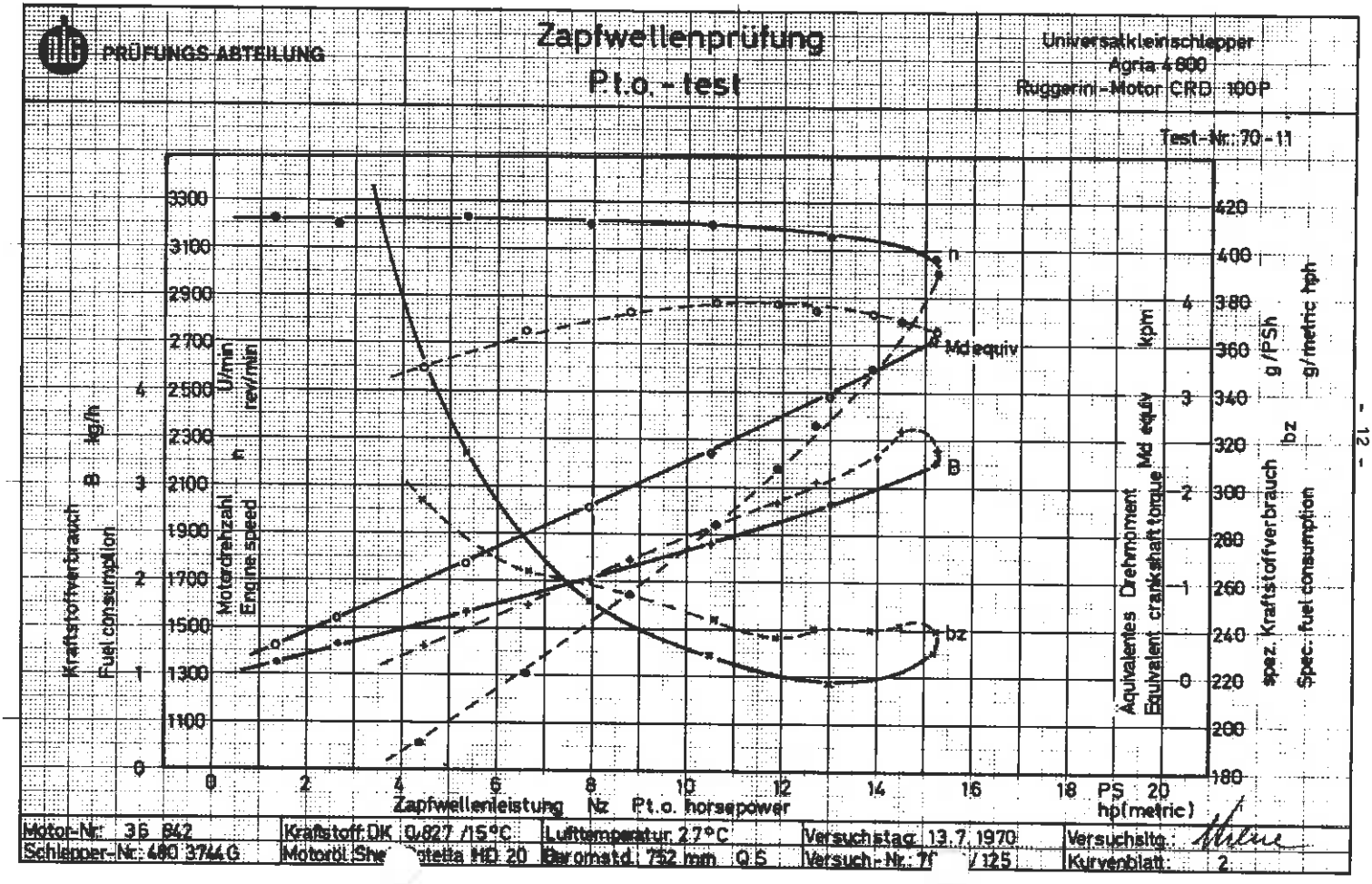
Equivalent crankshaft torque at maximum power: 3,66 kpm

Maximum equivalent torque: 3,93 kpm at 2185 rev/min of the engine

Mean atmospheric conditions:
temperature 27°C
pressure 753 mm Hg
relative humidity: 55%

Maximum temperatures:
coolant: —
engine oil: 115 °C
fuel: 33°C


PRÜFUNGS-ABTEILUNG
Zapfwellenprüfung
P.t.o. - test
Universalkleinschlepper
Agria 4900
Ruggerini-Motor CRD 100P
Test-Nr. 70-11
Zapfwellenleistung
P.t.o. - horsepower
PS
kW
Kraftstoffverbrauch
Fuel consumption
kg/h
lb
spez. Kraftstoffverbrauch
Specific fuel consumption
g/PSh
g/metric hph
lbz
zapfw. n p.t.o. = 540 U/min rev/min
Md equiv
Drehmoment
Equivalent crankshaft torque
kpm
Motordrehzahl
Engine speed
n U/min rev/min
1000
1400
1800
2200
2600
3000
3400
Motor-Nr.: 36 842
Motoröl: Shell Rotella HD20
Versuchstag: 13.7.1970
Versuchsltg.:
Schlepper-Nr.: 480 3744 G
Lufttemperatur: 27 °C
Versuch-Nr.: 70/11/125
Kraftstoff: DK 0,827/15 °C
Barometerst.: 752 mm QS
Kurvenblatt: 1


PRÜFUNGS-ABTEILUNG
Zapfwellenprüfung
P.t.o. - test
Universalkleinschlepper
Agria 4800
Ruggerini-Motor CRD 100P
Test-Nr.: 70-11
Kraftstoffverbrauch B kg/h
Fuel consumption
Motordrehzahl n U/min rev/min
Engine speed
Äquivalentes Drehmoment Md equiv kpm
Equivalent crankshaft torque
spez. Kraftstoffverbrauch bz g/PSh g/metric hph
Spec. fuel consumption
n
Md equiv
B
bz
Zapfwellenleistung Nz Pt.o. horsepower
hp(metric)
Motor-Nr.: 36 842
Schlepper-Nr.: 480 3744 G
Kraftstoff: DK 0,827 /15°C
Motoröl: Shell Rotella HD 20
Lufttemperatur: 27°C
Barometerst.: 752 mm
Versuchstag: 13.7.1970
Versuch-Nr.: 71 /125
Versuchsltg.:
Kurvenblatt: 2

(2) DRAWBAR PERFORMANCE

Date of tests: 28.8.1970 till 2.9.1970

Type of track: concrete

Height of drawbar above ground: 300 mm

Gear No. and Group	Speed km/h	Horse-power metr.hp	Drawbar pull kp	Engine speed rev/min	Slip of wheels %	Specific work metr.hp h/l	Specific fuel consumpt. g/metr.hp h	Temperatures Fuel °C	Coolant °C	Engine oil °C	Atmospheric conditions Tempe-rature °C	Relative humidity %	Pressure mm Hg
(i) MAXIMUM POWER with ballast													
1.slow	1,17	3,4	785	3270	15,3	1,61	510	22	-	95	23	50	751
1.fast	1,99	5,7	767	3260	15,0	2,16	383	19	-	95	19	55	751
2.slow	2,59	7,6	792	3220	15,0	2,53	327	18	-	95	17	70	751
2.fast	4,16	11,3	736	3010	14,2	2,62	315	22	-	95	23	65	748
3.slow	9,82	11,6	320	3005	5,5	2,67	310	22	-	95	23	65	748
3.fast	17,30	11,6	182	3010	2,6	2,67	309	23	-	95	25	50	751
(ii) FIVE-HOUR-TEST AT 75% OF PULL AT MAXIMUM POWER ON 2. GEAR OF FAST GROUP													
2.fast	4,44	9,1	550	3075	10,2	2,69	306	25	-	95	26	45	751
(iii) FIVE-HOUR-TEST AT PULL CORRESPONDING TO 15% SLIP IN TEST (i)													
2.slow	2,60	7,6	790	3220	15,0	2,53	327	24	-	95	25	50	751
(v) MAXIMUM POWER without ballast													
2.slow	2,53	6,4	682	3120	15,1	2,40	344	20	-	95	18	66	753
2.fast	4,30	10,8	678	3130	15,3	2,69	308	20	-	95	18	68	753
3.slow	9,68	11,9	330	3000	7,2	2,68	307	28	-	95	30	40	753
3.fast	17,30	11,5	180	3010	3,5	2,59	318	28	-	95	30	40	753

Engine oil consumption during ten hours duration of test (ii) and (iii): 19 g/h

(3) TURNING SPACE AND TURNING CIRCLE

Wheel equipment front: 4,00-12 AM 4 ply, without ballast
rear: 7,50-16 AS 4 ply, without ballast

Track of wheels front: 725 mm
rear: 845 mm

	With brakes left-hand m	With brakes right-hand m	Without brakes left-hand m	Without brakes right-hand m
Radius of turning space	2,01	2,09	2,55	2,57
Radius of turning circle	1,97	2,05	2,51	2,53

(4) LOCATION OF CENTRE OF GRAVITY

	Without ballast mm
Height above ground	541
Distance forward from the vertical plane containing the axis of the rear wheels	468
Distance of the median plane of the tractor	0

(5) BRAKE TESTS

A) FOOT BRAKE

Date of test: 31.8.1970

Type of track: concrete

Type of decelerometer: Moto Meter Bremsverzögerungs- und Pedealkraft-schreiber, Moto Meter Hermann Schlaich 7 Stuttgart N

Travelling speed of tractor: 19,65 km/h

With cold brakes

		Traktor with ballast	Traktor without ballast
Deceleration	m/s^2	4,5	4,5
Stopping distance	m	3,6	3,6
Force on pedal	kp	32	27
Force on pedal to achieve a deceleration of 2,5 m/s^2	kp	13	13

BRAKE FADE CHARACTERISTICS

		Traktor with ballast	Tractor without ballast
Deceleration	hot/cold %	100	96
Stopping distance	cold/hot %	100	95
Force on pedal	cold/hot %	100	128

B) PARK BRAKE

Tractor facing up slope
Pull on hand brake 16 kp, tractor does not roll.

Tractor facing down slope
Pull on hand brake 16 kp, tractor does not roll.

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Agria 4800

Test No. 70-11

(6) MEASUREMENT OF AMBIENT NOISE EMITTED BY THE TRACTOR

Date of test: 28.8.1970
Type of track: concrete
Type of sound level meter: Brüel & Kjaer type 2203

Result of test

Speed: 3.fast
Travelling speed before acceleration: 15,0 km/h
Sound level: 89 dBA

(7) NOISE MEASUREMENT AT THE DRIVER'S EAR

Date of test: 31.8.1970
Type of track: concrete
Type of sound level meter: EZGN, Rohde & Schwarz, 8 München
Type of octavfilter: PBO, Rohde & Schwarz, 8 München

No cab fitted on tractor

Results of tests

Gear	Drawbar pull at which the tractor develops the maximal sound level kp	Travelling speed nominal km/h	Travelling speed effective km/h	Sound level dBA	Sone
1.slow	430	1,36	1,20	96	
1.fast	300	2,30	2,15	99	106
2.slow	675	3,04	2,47	97	
2.fast	*) 675	5,15	4,05	97	102
3.slow	330	11,10	9,55	99	144

*) The 2. gear of the fast group corresponds to the travelling speed nearest to 7,25 km/h

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Test No. 70-11

(8) TEST OF POWER LIFT AND HYDRAULIC PUMP PERFORMANCE

Date and location of tests: 10.8.1970, Groß-Umstadt

Hydraulic fluid: Aral HD 20 W/20

POWER LIFT

a) Lift rods with the uppermost holes fitted on the lift arms

Hight of hitch point above ground in down position mm	Total vertical movement mm	Maximum force exerted through full lift range kp	Pressure of hydr. oil kp/cm²	Linkage load at which unballasted front end of tractor lifts off the ground kp
Measured on the hitch points of lower links				
210	300	585	122	630

b) Lift rods with the lowermost holes fitted on the lift arms

Measured on the hitch points of lower links				
300	280	510	122	630

Type of linkage for transport: No linkage lock provided
Opening pressure of the cylinder overpressure relief valve: No relief valve provided

Test frame not applicable by reason of the special design of the implement linkage.

PRÜFUNGS-ABTEILUNG
Agria 4800

Test No. 70-11

OPTIONAL TESTS

(9) ENGINE TESTS

Date and location of tests: 3.7.1970

Type of dynamometer: Schenck-eddycurrent-dynamometer W 150

Maximum power

Horsepower metric hp	Engine speed rev/min	Fuel consumption total l/h	Fuel consumption specific g/metric hp h	Specific work metric hp h/l
At maximum power 2-hour test				
16,80	3004	4,25	209	3,96
At standard p.t.o. speed (540 rev/min)				
12,00	1966	3,22	221	3,73
At the speed recommended by the manufacturer for drawbar work				
16,80	3004	4,25	209	3,96
Fuel consumption at part loads				
(i) 85% of torque at maximum power				
14,86	3130	3,62	201	4,10
(ii) unloaded				
-	3200	1,24	-	-
(iii) 50% of the load defined in (i)				
7,53	3166	2,13	234	3,54
(iv) maximum power				
16,80	3004	4,25	209	3,96
(v) 25% of the load defined in (i)				
3,8	3190	1,60	348	2,38
(vi) 75% of the load defined in (i)				
11,4	3185	2,83	205	4,03

Optimum fuel consumption: 184 g/metric hp h at 11,8 metric hp and 2630 rev/min

Standard fuel consumption 1/2 (acc.to DIN 9606): 1,55/3,30 l/h

No load maximum engine speed: 3200 rev/min

Torque at maximum power: 4,0 kpm

Maximum torque: 4,45 kpm at 2200 rev/min of the engine

Mean atmospheric conditions:

temperature	19°C
pressure	745 mm Hg
relative humidity	85%

Maximum temperatures:

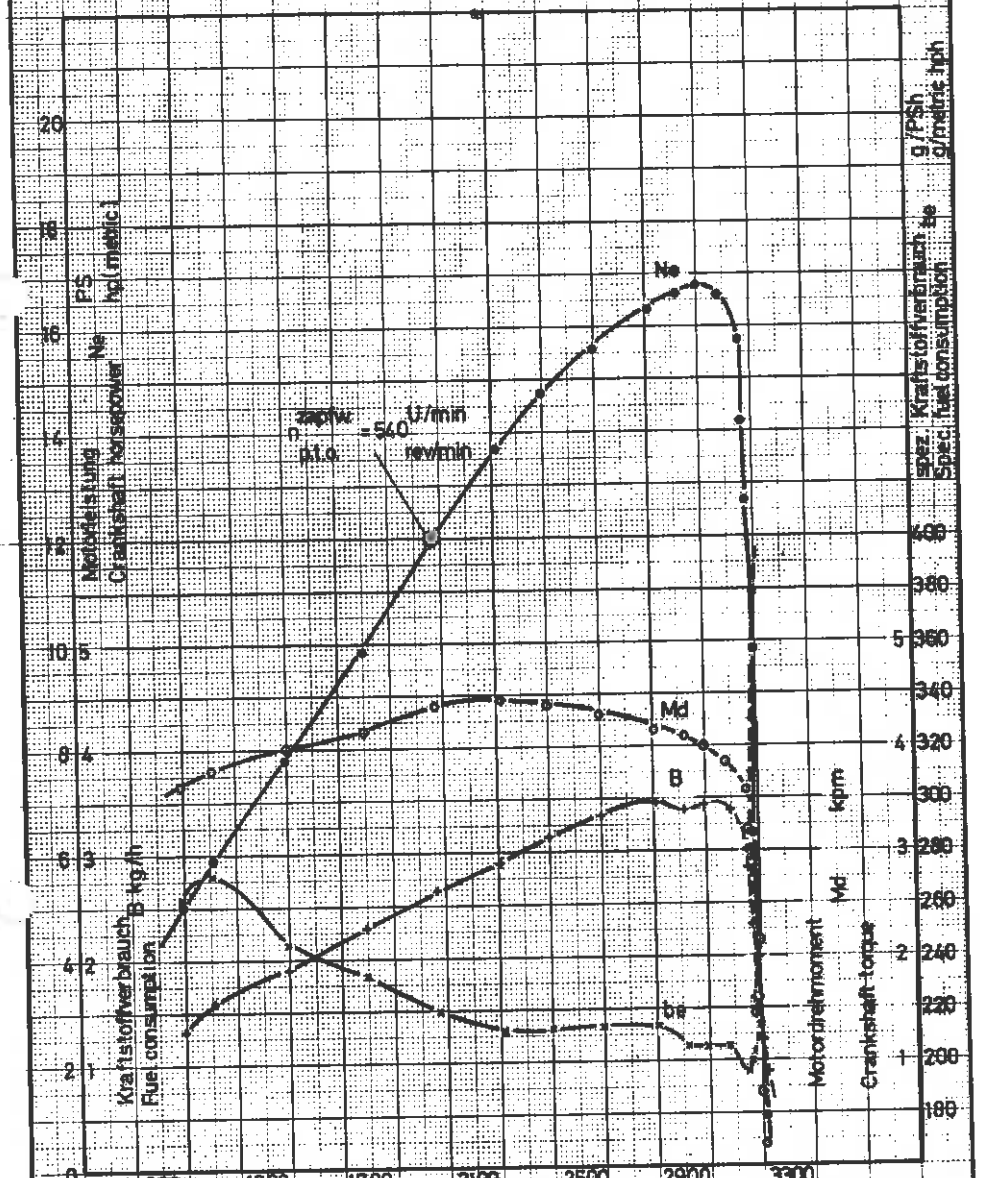
coolant	-
engine oil	110°C
fuel	20°C

PRÜFUNGS-ABTEILUNG

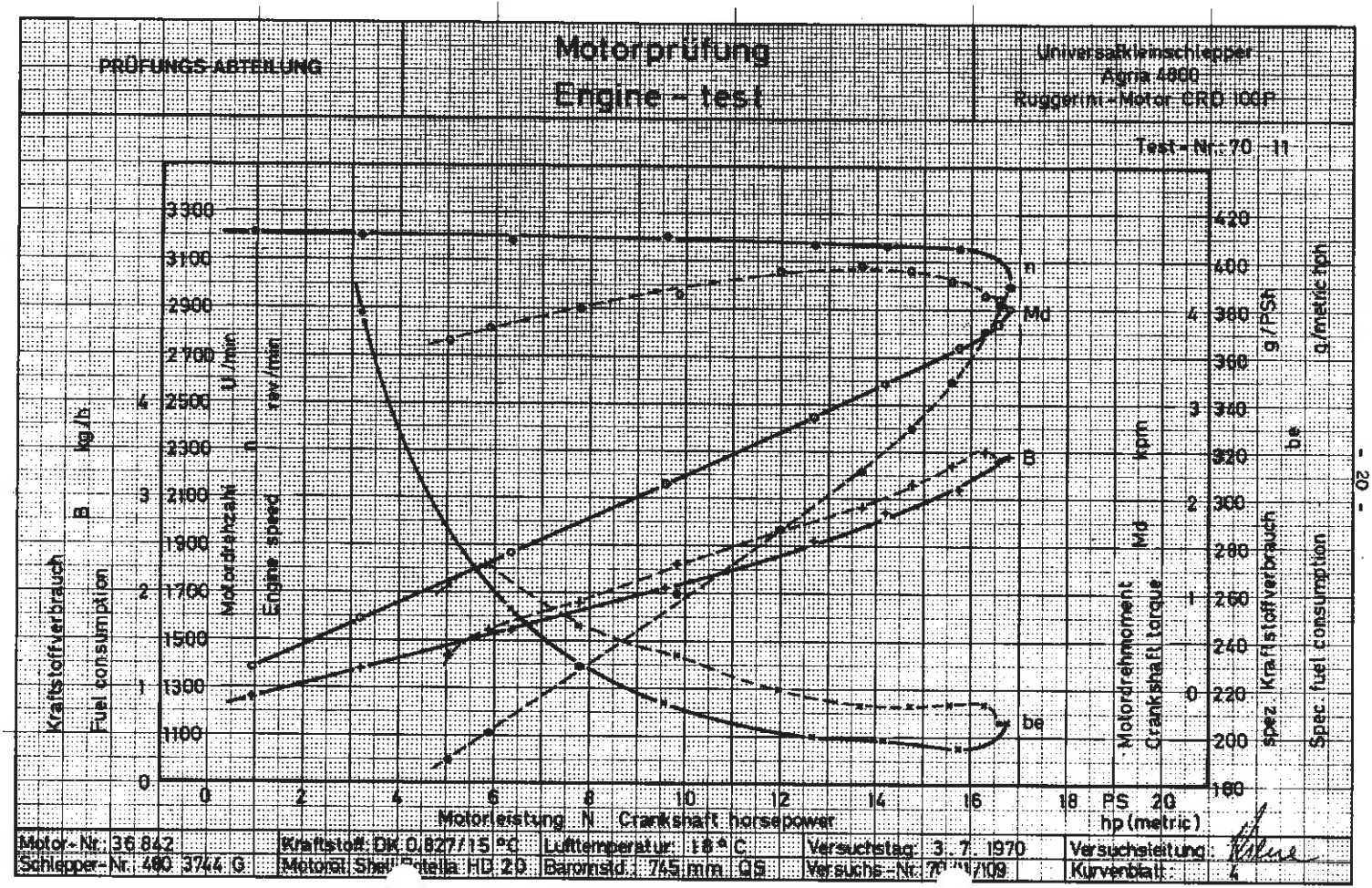
Motorprüfung
Engine - test

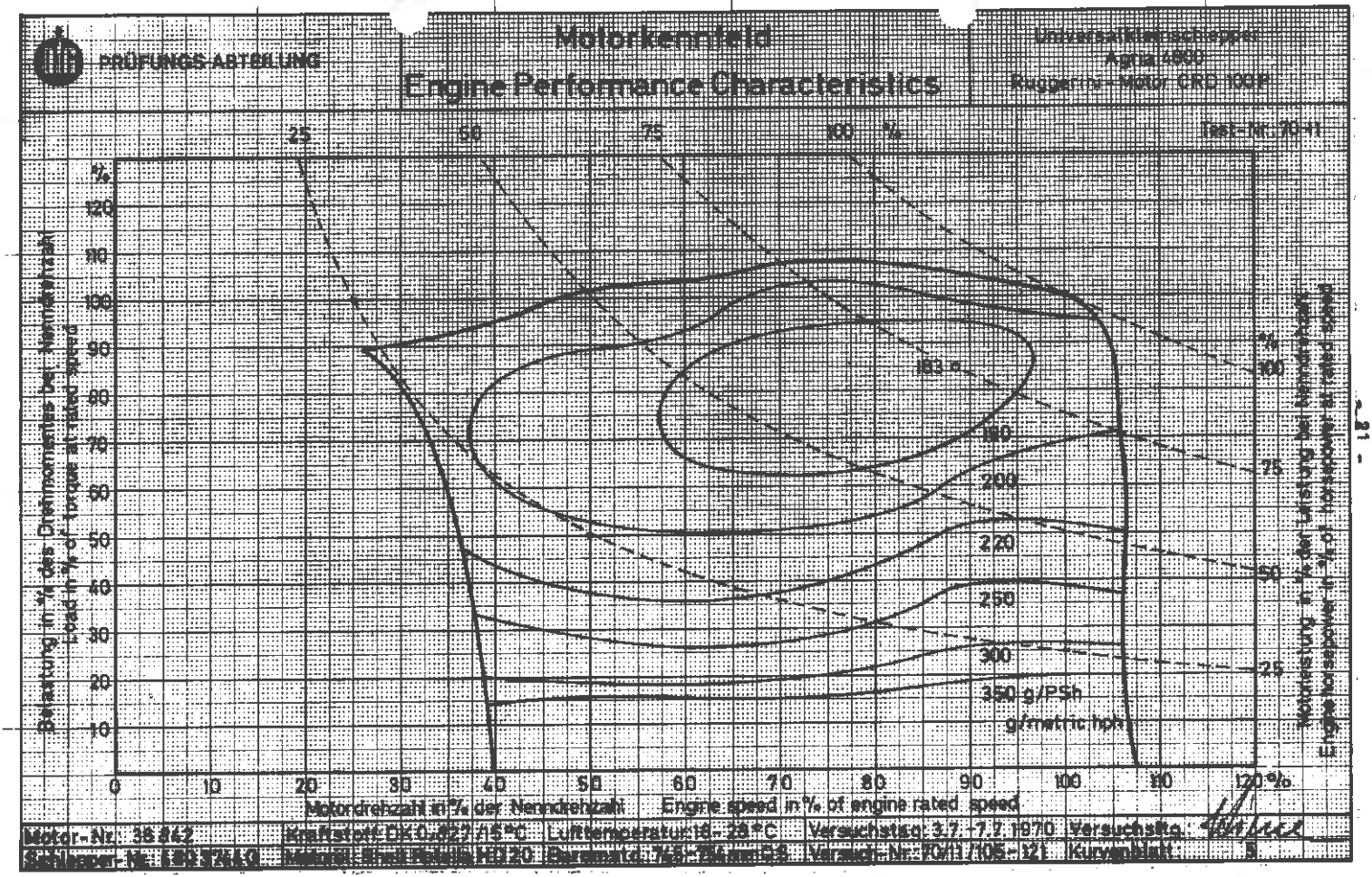
Universalkleinschlepper
Agria 4800
Ruggerini-Motor CRD 100 P

Test-Nr.: 70-11



Motor-Nr.: 36 842	Motoröl: Shell Rotella HD 20	Versuchstag: 3.7.1970	Versuchsltg.:
Schlepper-Nr.: 480 3744 0	Lufttemperatur: 18 °C	Versuch-Nr.: 70/11/109	
Kraftstoff: DIN 0,827 /15°C	Barometerst.: 745 mm QS	Kurvenblatt: 3	


PRÜFUNGS-ABTEILUNG
Motorprüfung
Engine - test
Universalklemschlepper
Agria 4800
Ruggerini-Motor CRD 108F
Test-Nr.: 70 11
Kraftstoffverbrauch B kg/h
Fuel consumption
Motordrehzahl n U/min
Engine speed
rev./min
Motordrehmoment Md kpm
Crankshaft torque
spez. Kraftstoffverbrauch be g/PSh
Spec. fuel consumption g/metric hph
Motorleistung N Crankshaft horsepower
hp (metric)
Motor-Nr.: 36 842
Schlepper-Nr.: 490 3744 G
Kraftstoff: DK 0,827/15 °C
Motoröl: Shell Rotella HD 20
Lufttemperatur: 18 °C
Barometerst.: 745 mm QS
Versuchstag: 3. 7. 1970
Versuchs-Nr.: 70 11/109
Versuchsleitung:
Kurvenblatt: 4


PRÜFUNGS-ABTEILUNG
Motorkennfeld
Engine Performance Characteristics
Universalfräsmaschine
Agrola 4500
Ruggerini - Motor CRD 100P
Test-Nr. 70-11
Drehmoment in % des Drehmomentes bei Nennleistung
Leistung in % der Nennleistung
Power in % of rated power
Torque in % of torque at rated power
183 g
180
200
220
250
300
350 g/PSh
g/metric hph
Motordrehzahl in % der Nenndrehzahl
Engine speed in % of engine rated speed
Motor-Nr. 38 842
Kraftstoff DIN 0,827 / 15 °C
Lufttemperatur 18 - 23 °C
Versuchstag: 3.7. - 7.7.1970
Versuchsta.
Schlepper-Nr. 130 7210
Verdicht.-N.: 70/1705-121
Kurvenblatt
5