Report on test in accordance with O.E.C.D. STANDARD CODE

O.E.C.D. No. 611



Agricultural Tractor DEUTZ DX 90-S and DX 90-N

Manufacturer
Klöckner-Humboldt-Deutz AG, D-5000 Köln-Deutz

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

Performance of tests: April till August 1978

DLG-Testing-Station for Agricultural Machinery, Max-Eyth-Weg 1, D-6114 Groß Umstadt

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

Date of Approval: 5th February 1979 O.E.C.D. No. 611

The tractor DX 90 is manufactured in 2 variants:

i) as **DX 90-S** with a speed change gear with 5 speeds and a maximum design related speed of 30 km/h
ii) as **DX 90-N** with the same speed change gear but without the 5th gear and a maximum design related speed of 25 km/h

In the rest both variants are identical.

In this report all performance characteristics are given corresponding to the International System of Units.

The reference to the former used Technical System of Units is given by the following relations:

Forces	1 N = 0,102 kp	or 1 kp = 9,81 N
Powers	1 kW = 1,36 PS	or 1 PS = 0,736 kW
Pressures	1 bar = 1,02 kp/cm²	or 1 kp/cm² = 0,981 bar
	1000 mbar = 750,1 mm Hg	

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PRÜFUNGS-ABTEILUNG
DEUTZ DX 90-S
DX 90-N

Test No. 78-28

Tractor manufacturer:	KLÖCKNER-HUMBOLDT-DEUTZ AG D-5000 Köln-Deutz
Submitted for test by:	Manufacturer
Selected by:	Manufacturer with agreement by DLG
Place of running-in:	Köln-Deutz und Groß-Umstadt
Duration of running-in:	Engine and tractor appr. 100 hours

SPECIFICATION OF TRACTOR

Tractor

Make:	KLÖCKNER-HUMBOLDT-DEUTZ AG
Model:	DX 90-S and DX 90-N
Type:	Wheel tractor, unit construction, rear wheel driven
Serial no:	7618/0001

Engine

Make:	Own make
Model:	F5L 912
Type:	4-stroke DIESEL engine with direct injection, air cooled
Serial no:	5772631
Cylinders:	5 in line, bore 100 mm, stroke 120 mm; displacement 4710 cm^3; compression ratio 17:1, replaceable ribbed cylinder liners
Valves:	Overhead
Fuel system:	PIERBURG fuel feed pump PE 15252; BOSCH in line injection pump: PES 5 A 80 D 410/3 RS 2526; manufacturer's production setting 55 mm^3/stroke at rated engine speed; injection timing 30° before TDC; BOSCH multihole injection nozzles DLLA 149 S 394; injection pressure 175 bar; BOSCH fuel filter with replaceable cartridge; capacity of fuel tank 125 l
Governor:	BOSCH centrifugal variable speed governor: EP/RSV 325-1150 A 8 B 2014 DL; governed range of engine speed 750 to 2400 rev/min; rated engine speed 2300 rev/min

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Air cleaner:	Own make DEUTZ-SICCOPUR dry paper element filter with precleaner, replaceable cartridge with electrically operating maintenance teleindicator; air intake below bonnet; on desire additional DONALDSON cyclonic precleaner with air intake above bonnet; optional: MANN UND HUMMEL oil bath air cleaner with DONALDSON cyclonic precleaner with air intake above bonnet; oil capacity 0,9 l
Exhaust silencer:	LANGE 1-chamber-expansion type silencer; 120 x 230 mm oval, 1090 mm long; on the left hand side of the bonnet; mouth showing upwards; mouth 2639 mm above ground
Lubrication system:	Forced feed from gear pump; strainer in sump; MANN UND HUMMEL oil filter in full flow with by-pass valve and replaceable cartridge; cartridge change at all oil changes; oil capacity 13 l; recommended oils and change intervals: MIL-L-2104 B or MIL-L-2104 C 100 hours 200 hours recommended oil viscosities: below - 5°C SAE 10W from -10°C to +10°C SAE 20W/20 from + 5°C to +30°C SAE 30 above +25°C SAE 40 or SAE 20W/40 above -10°C oil cooler on the right hand side of engine
Cooling system:	Air cooling with axial blower V-belt driven
Starting system:	Electrical BOSCH screw push starter motor JD 12V 3 kW, BOSCH flame plug in intake pipe
Electrical equipment:	12 Volt, negative earth; BOSCH three phase alternator G 1 14 V 33 A; 1 battery 110 Ah at 20 hours rating

Transmission

Clutch:	LAMELLEN UND KUPPLUNGSBAU GMBH independent dry dual disc clutch: DT 295/280G; driving part pedal operated, 295 mm diameter, p.t.o. part hand lever operated, 280 mm diameter
Gear box:	Own make; TW 90.20; synchromesh speed change gear with 5 speeds; at model DX 90-N with 4 speeds; collar shifted group gear with 3 forward groups and 1 reverse group; optional: intermediate group and reverse group synchronized; collar shifted creep group optional, not fitted on tractor tested; totally 15 forward and 5 reverse speeds; at model DX 90-N 12 forward and 4 reverse speeds, see page 7
Rear axle and final drive:	Bevel gear with crown wheel and pinion; bevel gear differential on intermediate shaft; spur gear final drives; differential lock in the rear axle, pedal operated, self disengaging, electrically tele-indicated when locked
Front axle:	Not propelled; standard axle model 01; reinforced front axle model 02 for heavy-duty available; permissible axle loads are the same for both axle models
Oil capacity:	Speed change gear, group gear, rear axle and final drives totally 48 l
Recommended oil:	Engine oil SAE 20W/20 MIL-L-2104 B
Oil changing:	2000 hours but at least after 2 years

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Total ratios and speeds (tyres 18,4 R 34)

Group	Gear	Total ratio engine : driving wheel	Nominal travelling speed *) at rated engine speed km/h	Nominal travelling speed *) at standard p.t.o. speed 540 rev/min km/h
Creep group optional o)	1	1721,21	0,39	0,35
	2	1127,41	0,59	0,53
	3	919,54	0,73	0,65
	4	634,17	1,05	0,94
	5 +)	516,73	1,29	1,15
Slow group	1	322,29	2,07	1,85
	2	211,09	3,16	2,83
	3	172,17	3,88	3,47
	4	118,74	5,62	5,03
	5 +)	96,75	6,90	6,17
Intermediate group	1	159,05	4,20	3,75
	2	104,17	6,41	5,73
	3	84,97	7,86	7,03
	4	58,60	11,39	10,19
	5 +)	47,75	13,98	12,51
Fast group	1	75,83	8,80	7,87
	2	49,67	13,44	12,02
	3	40,51	16,48	14,74
	4	27,94	23,90	21,37
	5 +)	22,76	29,33	26,23
Reverse group	1	129,59	5,15	4,61
	2	84,88	7,87	7,04
	3	69,23	9,64	8,63
	4	47,74	13,98	12,51
	5 +)	38,90	17,16	15,35

*) calculated with the INDEX RADIUS 770 mm as per WdK 154

+) not fitted on model variant DX 90-N

o) not fitted on tractor tested

Power take-off

Independent p.t.o.;
2 stub shafts at rear of tractor,
1 for 540 rev/min, 1 for 1000 rev/min;
both shafts rotate in common and are
driven through the hand lever operated
second disc of the dual disc clutch;
both are engaged or disengaged in common
by hand lever of p.t.o.-
disc of dual disc clutch;
direction of rotation of both p.t.o. shafts
clockwise, viewed from tractor rear

540 rev/min p.t.o.
615 mm above ground,
50 mm right of tractor's median plane;
29 x 34,9 x 8,7 mm = 1 3/8in, 6 splines
DIN 9611 Form 1, BS 1495 ASAE S 203.7;
604 rev/min at rated engine speed;
standard p.t.o. speed 540 rev/min at
2057 rev/min engine speed

1000 rev/min p.t.o.
600 mm above ground,
50 mm left of tractor's median plane;
involute profile 1 3/8in, 21 splines;
DIN 9611 Form 2, ASAE S 204.4;
optional: 29 x 34,9 x 8,7 mm = 1 3/8in,
6 splines;
DIN 9611 Form 1, BS 1495, ASAE S 203.7;
1111 rev/min at rated engine speed;
standard p.t.o. speed 1000 rev/min at
2071 rev/min engine speed

All p.t.o. speeds may be set by aid
of tractormeter

Power lift

Hydraulic system:

Own make;
K 55.2 DEUTZ TRANSFERMATIC system;
hydraulic power lift, unit construction;
BOSCH tandem gear type pump:
HY/ZFFS 11/16 + 14 L;

tandem part for hydraulic steering;
delivery of power lift part 16 cm³/rev or 39,6 l/min at rated engine speed;
optional: BOSCH tandem gear type pump: HY/ZFFS 11/22,5 + 14 L;
delivery of power lift part 22,5 cm³/rev or 55,6 l/min at rated engine speed;
directly driven by engine;
single acting ram 90 mm bore, 146 mm stroke;
overpressure relief valve for ram adjusted to 210 to 260 bar;
1 external additional ram of own make, 55 mm bore, 185 mm stroke;
optional: 2 external additional rams of own make 55 mm bore, 185 mm stroke;
DEUTZ control valve for lifting, lowering, neutral and floating position, draft control and position control;
maximum oil pressure 175 bar;
up to 3 single and/or dual acting DEUTZ-additional control valves with each 1 or 2 oil tappings available;
hydraulic oil tank with 18,5 l capacity;
optional: additional oil tank with 20 l capacity;
4,5 l (with additional tank 24,5 l) oil may be taken off through oil tappings when tractor is working driving, 7,5 l (with additional tank 27,5 l) when tractor is working stationary;
recommended oil engine oil SAE 10W MIL-L-2104 C throughout the year;
oil changing interval 1000 hours or once 1 year

Implement linkage:

Three point linkage category II DIN 9674;
WALTERSCHEIDT quick coupler available;
2 holes in the lower links for fitting the lift rods;
hole 1 in 570 mm
hole 2 in 610 mm distance of the pivot point of lower links;

lift rods length adjustable from 755 to 895 mm;
lifting range above ground when using
hole no. 1:
with short lift rods from 359 to 1004 mm
with long lift rods from 94 to 794 mm
hole no. 2:
with short lift rods from 399 to 1004 mm
with long lift rods from 149 to 814 mm

Holed bar

Short bar;
fitted on clevis of lower links;
length between the joint balls 825 mm;
width of the bar 80 mm, thickness 30 mm;
centre hole and 4 holes on either side with 80 mm distance each;
all holes 33 mm diameter;
height above ground adjustable by power lift from 109 to 1019 mm depending from lift rods length and fixing on the lower links, measured at the surface of the bar;
distance of centre hole with lower links in horizontal position
from rear axle centre 1087 mm
from p.t.o. shaft end 562 mm

Trailer hitch

CRAMER	or	own make
KU 758		AK 8500
automatical		not automatical

height above ground 865 mm, not adjustable;
hitch hole diameter 33 mm;
distance of hitch hole centre to rear axle centre 608 mm;
permissible vertical load 1170 kg

Swinging drawbar

Height above ground 382 mm;
diameter of hitch hole 33 mm;
pivot point 338 mm before rear axle centre;
in 3 positions fixable on pivot point;
distance of hitch hole
from rear axle centre 881, 926 or 1026 mm
from p.t.o. shaft end 355, 400 or 500 mm;
swingable to either side about 530, 545 or 590 mm

Towing hitch

667 mm above ground

Steering

ZAHNRADFABRIK FRIEDRICHSHAFEN AG
hydrostatic steering;
model SERVOSTAT 8452;
pressure oil supply from tandem part of
power lift hydraulic pump;
oil delivery 14 cm³ per revolution;
control valve operated by steering wheel;
double acting ram propped on the front axle;
ram with 45 mm bore and 250 mm stroke
when tractor is equipped with front axle model 01
or 50 mm bore and 250 mm stroke when tractor
is equipped with reinforced front axle model 02

Brakes

Parking brake: SIMPLEX shoe type brake;
mechanically acting on 2 brake drums on
the differential half shafts;
brake drum diameter 180 mm, width 60 mm;
operated by hand lever with ratchet

Service brake: TEVES
hydraulically-mechanically acting dry
fixed saddle disc type brake SS 60;
acting on 2 discs on the differential half shafts;
effectual disc diameter 216 mm;
outside disc diameter 276 mm;
pedal operated

Steering brake: Divided pedal of service brake;
for normal braking locked together

Trailer
braking device: Own make;
dual line type or combined single-dual
line type;
air compressor with 120 l/min delivery at
rated engine speed,
air tank with 20 l capacity;
operating pressure 8 bar;
air pressure to relief valve 14 bar
to control valve 7,3 bar;
connection pressure at single line type 5,3 bar
at dual line type 7,3 bar

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Wheels

Steered wheels: 2 pneumatics in front 7,50-20 AS 6 ply;
maximum permissible load per tyre 875 kg
at 2,25 bar inflation pressure and 30 km/h;
track width adjustable from 1476 to 1976 mm
in 5 steps of 100 mm each by extending
telescopic half axles;
rims 5,5 F x 20

Driving wheels: 2 pneumatics at rear 18,4 R 34 AS 8 ply
radial type tyre casing;
maximum permissible load per tyre 2565 kg
at 1,4 bar inflation pressure and 30 km/h;
track width adjustable from 1600 to 2000 mm
in 4 steps of 100 mm each by turning wheels
and offset lug type rims;
rims W 15 L x 34

Wheel base: 2558 mm

Other wheels: Optional available are:

steered wheels	10,00-16	AS	6 ply
driving wheels	9,5-48	AS	8 ply
	13,6-38	AS	6 ply
	16,9-34	AS	6 ply
	16,9-38	AS	8 ply

radial type tyre casings as well as
diagonal type tyre casings permissible;
permissible loads and total weights page 15

Cab

Own make;
safety cab:
model SK 1905-37 LUXUS (MASTER CAB)
O.E.C.D. tested
approval no. CSD 0018/ 8-a(C) DX 90-S
no. CSD 0018/ 7-a(C) DX 90-N
platform with rubber vibration damper
fixed on rear axle casing and clutch casing;
four post protection frame of square steel
tubes with steel roof built up upon platform;
protection frame completed by front frame
of square steel tubes too;
round about glassed with safety glass;
windscreen and upper part of back window
may be opened upwards and fixed;
rear side windows may be removed;

lower part of back window for free look on implement linkage, swinging drawbar and trailer hitch is built in solid;
inside totally covered with noise damping paddings of PVC-material;
door on the left hand side, optional on the left and right hand side, manufactured of glass fiber reinforced synthetics;
entry with 2 steps, lower step 530 mm above ground, upper step 820 mm above ground;
oil cooler heat exchanger heating system;
optional additional heating and/or air-conditioning system;
electric windscreen wiper and washer;
2 rear view mirrors;
optional inside mirror

The tractor is also available without cab or with safety frame or without safety frame or with JUNIOR CAB (simpler equipment)

Seat

GRAMMER
DS 85 H/90 AR
upholstered seat with back and arm rests;
adjustable spring with shock absorber;
back rest infinitely variable,
side inclination adjustable,
arm rest adjustable;
height of driver's platform 1080 mm above ground,
height of unloaded seat above platform adjustable in 3 steps from 420 to 480 mm;
for and aft adjustable about 155 mm

Dimensions

Total length:	4362 mm	with implement linkage without ballast
Total width:	2304 mm	with smallest track width
	2504 mm	with largest track width
Total height:	2639 mm	to top of exhaust pipe
Ground clearance:	500 mm	below engine crankshaft case

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Weights	Ready for use as tested	without driver	with driver
Without ballast:	front	1495 kg	1515 kg
	rear	2710 kg	2775 kg
	total	4205 kg	4290 kg
Front ballast:	4 front weights, 40 kg each		160 kg
Rear ballast:	1 intermediate ring per wheel 45 kg		90 kg
	8 weights per wheel 50 kg each		800 kg
	water in the tyres		660 kg
With ballast:	front	1665 kg	1695 kg
	rear	4250 kg	4305 kg
	total	5915 kg	6000 kg

Lighting equipment: Electrical, 12 Volt
as per German legislation

	Dimensions mm	Height above ground of centre mm	Distance from outside edge of tractor to centre mm
Head lights with parking lights	130 ø	1005	944
Side lights	50 x 50	1617	354
Rear lights	45 x 66	1582	325
Reflectors	103 x 58	1319	142

*) at smallest track width

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Permissible total weights and axle loads

for all available wheel equipment

Wheel equipment front	Wheel equipment rear	Permissible total weights kg	Permissible axle load front kg	Permissible axle load rear kg
DX 90-S				
7,50-20 6 PR or 10,00-16 6 PR	9,5-48 8 PR	5840	1750	4090
	13,6-38 6 PR	5070		3320
	16,9-34 6 PR	5780		4030
	16,9-38 8 PR	6000		4300
	18,4-34 8 PR	6000		4300
DX 90-N				
7,50-20 6 PR or 10,00-16 6 PR	9,5-48 8 PR	6000	2010	4090
	13,6-38 6 PR	5560		3550
	16,9-34 6 PR	6000		4300
	16,9-38 8 PR	6000		4300
	18,4-34 8 PR	6000		4300

All driving wheel tyres are permissible as diagonal type tyre casings as well as radial type tyre casings

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FUELS AND LUBRICANTS USED IN TESTS

Fuel:	ARAL-DIESEL-fuel DIN 51601
	specific gravity at 15°C
	at engine tests 0,824 kg/l
	at p.t.o. tests 0,833 kg/l
	at drawbar tests 0,833 kg/l
Engine oil and transmission oil:	ESSOLUBE HDX SAE 20W/20 MIL-L-2104 B
Hydraulic oil:	ESSOLUBE HDX SAE 10W MIL-L-2104 B

TEST RESULTS

PRÜFUNGS-ABTEILUNG
DEUTZ DX 90-S
DX 90-N

Test No. 78-28

COMPULSORY TESTS

(1) MAIN POWER TAKE-OFF PERFORMANCE (1000 rev/min)

Date of tests: 20th April 1978
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

Power kW	Speed engine rev/min	Speed p.t.o. rev/min	Fuel consumption total l/h	Fuel consumption total kg/h	Fuel consumption specific g/kWh	Specific energy kWh/l
Maximum power						
At 2-hour test						
61.2	2300	1110	18.91	15.75	257	3.24
At standard p.t.o. speed						
58.7	2071	1000	17.76	14.80	252	3.30
At the speed recommended for drawbar work						
61.2	2300	1110	18.91	15.75	257	3.24
Part loads, the governor hand lever in the position corresponding to the maximum power at full load						
(i) 85% of the torque at maximum power at 2-hour test						
52.7	2327	1123	15.84	13.20	251	3.32
(ii) unloaded						
-	2428	1172	4.44	3.70	-	-
(iii) 50% of the load defined in (i)						
26.8	2370	1144	9.80	8.16	304	2.74
(iv) maximum power						
61.2	2300	1110	18.91	15.75	257	3.24
(v) 25% of the load defined in (i)						
13.6	2404	1160	7.13	5.94	437	1.91
(vi) 75% of the load defined in (i)						
39.9	2348	1134	12.79	10.65	267	3.12

PRÜFUNGS-ABTEILUNG

DEUTZ DX 90-S
DX 90-N

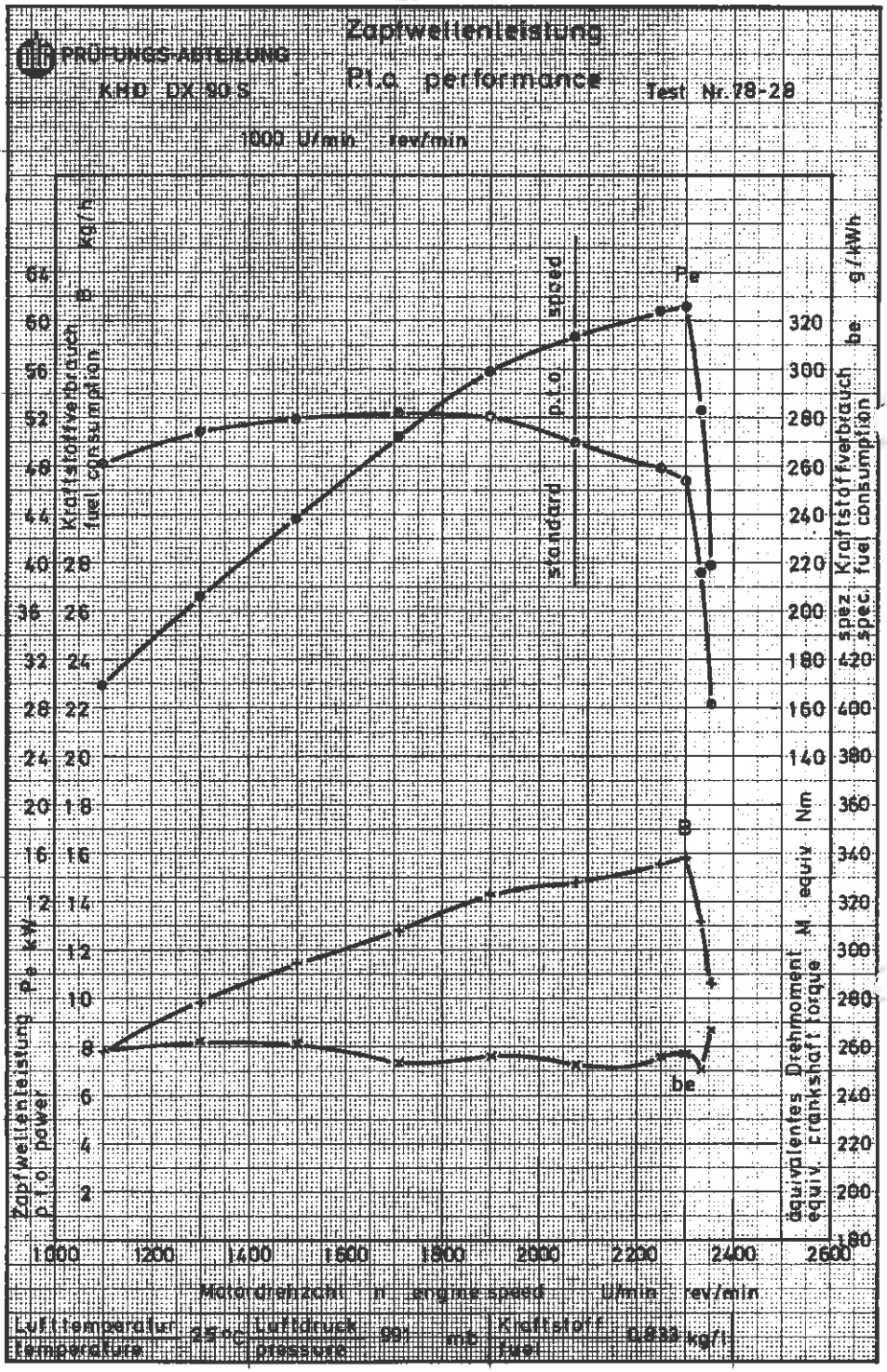
Test No. 78-28

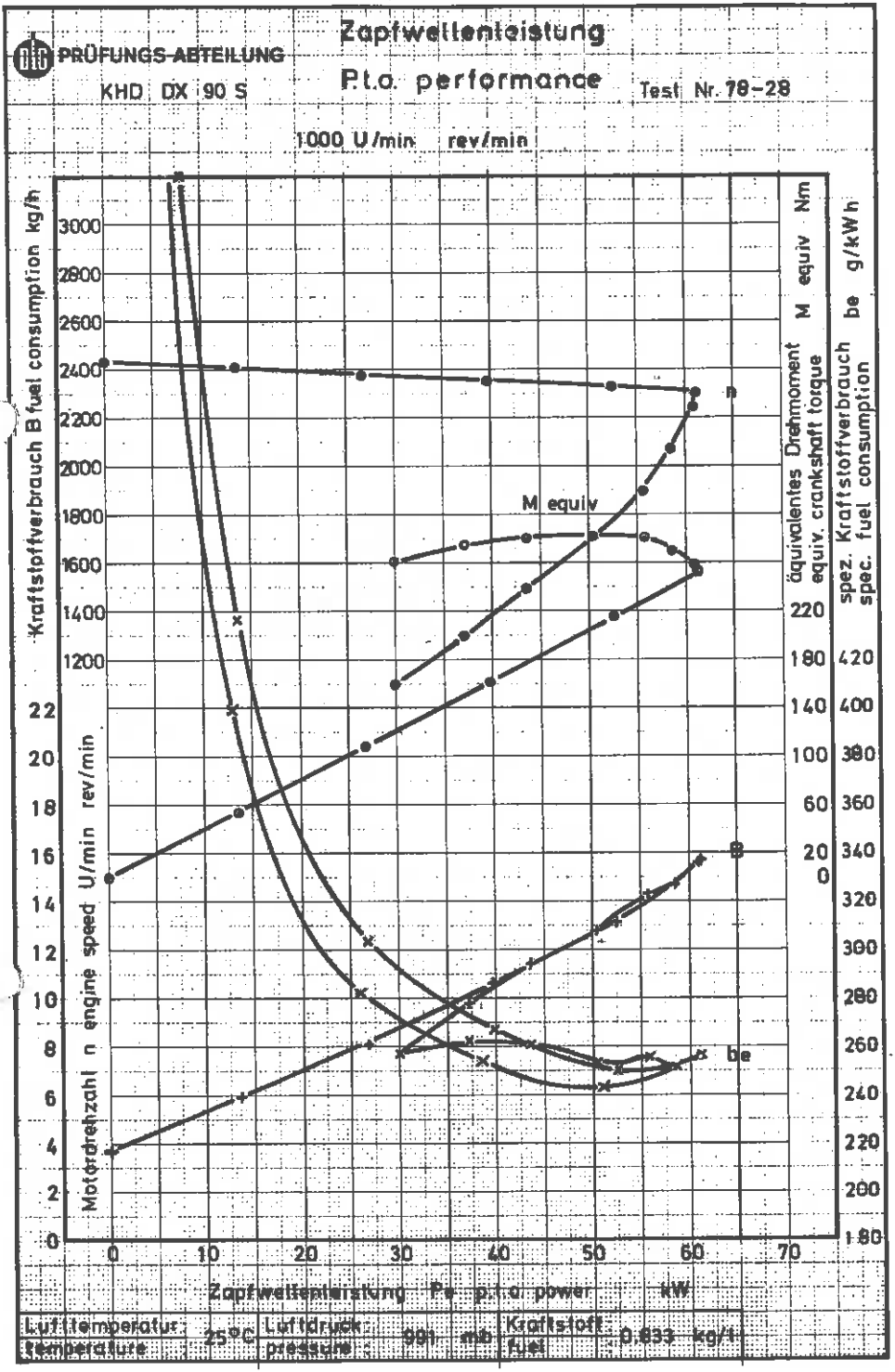
Power kW	Speed engine rev/min	Speed p.t.o. rev/min	Fuel consumption total l/h	Fuel consumption total kg/h	Fuel consumption specific g/kWh	Specific energy kWh/l
Part loads, the governor hand lever in the position corresponding to the standard p.t.o. speed at full load						
(i) 85% of the torque at maximum power at 2-hour test						
50.9	2114	1021	14.83	12.35	243	3.43
(ii) unloaded						
-	2206	1065	3.62	3.01	-	-
(iii) 50% of the load defined in (i)						
25.8	2147	1037	8.77	7.31	283	2.95
(iv) maximum power						
58.7	2071	1000	17.76	14.80	252	3.30
(v) 25% of the load defined in (i)						
13.1	2180	1052	6.27	5.22	398	2.09
(vi) 75% of the load defined in (i)						
38.3	2122	1024	11.69	9.74	254	3.28

Standard specific fuel consumption (g/kWh): 251/304/243/283

No load maximum engine speed: 2428 rev/min
Equivalent crankshaft torque at maximum power (2 hours): 254 Nm
Maximum equivalent crankshaft torque: 283 Nm at 1706 rev/min of the engine

Mean atmospheric conditions:	temperature	25 °C
	pressure	1000 mbar
	relative humidity	46 %
Maximum temperatures:	coolant	-
	engine oil	107 °C
	fuel	25 °C
	engine air intake	29 °C


Zapfwellenleistung
PTO PRÜFUNGS-ABTEILUNG
KHD DX 90 S
P.t.o. performance
Test Nr. 78-28
1000 U/min rev/min
Zapfwellenleistung p.t.o. power
Kraftstoffverbrauch fuel consumption
kg/h
l/h
Drehmoment M equiv
äquivalentes equiv. crankshaft torque
Nm
spez. Kraftstoffverbrauch be spec. fuel consumption
g/kWh
standard
p.t.o. speed
Pe
B
be
Motordrehzahl n engine speed U/min rev/min
Lufttemperatur temperature °C
Luftdruck pressure
Kraftstoff fuel
kg/l


PRÜFUNGS-ABTEILUNG
KHD DX 90 S
Zapfwellenleistung
P.t.o. performance
Test Nr. 78-28
1000 U/min rev/min
Kraftstoffverbrauch B fuel consumption kg/h
Motordrehzahl n engine speed U/min rev/min
äquivalentes Drehmoment M equiv Nm
equiv. crankshaft torque
spez. Kraftstoffverbrauch be g/kWh
spec. fuel consumption
n
M equiv
B
be
Zapfwellenleistung Pe p.t.o. power kW
Lufttemperatur 25°C Luftdruck 991 mb Kraftstoff 0,833 kg/l
temperature pressure fuel

PRÜFUNGS-ABTEILUNG
DEUTZ DX 90-S
DX 90-N

(2) DRAWBAR PERFORMANCE

Date of tests: 25th July till 8th August 1978
Type of track: Concrete

Gear No. and Group	Speed km/h	Power kW	Drawbar pull N	Engine speed rev/min	Slip of wheels %	Specific energy kWh/l
(i) MAXIMUM POWER with ballast height of drawbar above ground 620 mm						
1 slow	1,82	26,0	51390	2372	15,0	2,22
2 slow	2,70	38,5	51320	2340	15,0	2,44
3 slow	3,32	47,4	51420	2329	15,0	2,56
1 inter	3,62	48,7	48450	2300	13,3	2,53
4 slow	5,08	53,9	38200	2300	8,8	2,80
2 inter	5,91	53,4	32520	2303	7,0	2,77
5 slow *)	6,41	52,8	29660	2305	6,3	2,74
3 inter	7,38	53,0	25850	2299	5,4	2,76
1 fast	8,34	54,1	23360	2304	4,6	2,81
4 inter	10,87	54,6	18090	2300	3,5	2,83
2 fast	12,92	53,3	14860	2299	2,7	2,80
(ii) FIVE-HOUR-TEST at 75% of pull at maximum power in 2nd gear of inter group						
2 inter	6,19	41,9	24390	2344	4,3	2,82
(iii) FIVE-HOUR-TEST at pull corresponding to 15% wheel slip in test (i)						
3 slow	-	-	51420	-	-	-
(iv) MAXIMUM POWER without ballast height of drawbar above ground 741 mm						
3 slow	3,36	36,6	39260	2350	15,1	2,44
1 inter	3,62	39,8	39530	2340	15,1	2,50
4 slow	4,82	50,8	37950	2300	13,9	2,64
2 inter	5,61	52,0	33350	2292	11,9	2,71
5 slow *)	6,18	50,7	29530	2300	10,1	2,62
3 inter	7,11	52,2	26420	2300	9,2	2,73
1 fast	8,08	52,5	23410	2300	7,8	2,73
4 inter	10,64	53,7	18160	2298	5,9	2,79
2 fast	12,70	52,6	14900	2300	4,8	2,73
5 inter*)	13,28	51,7	14010	2300	4,6	2,73

Total oil consumption during ten hours duration of tests (ii) and (iii): 78 g/h

*) not at DX 90-N

PRÜFUNGS-ABTEILUNG

Test **No.** 78-28

Tyres make and size — front: FIRESTONE 7,50-20 AS Front 6 ply
rear: CONTINENTAL 18,4 R 34 AS 8 ply

Tread bar height at the beginning of drawbar tests 87% of the value when new

Specific fuel consumpt. g/kWh	Temperatures Fuel °C	Coolant °C	Engine-oil °C	Atmospheric conditions Tempe-rature °C	Relative humidity %	Pressure mbar
tyre inflation pressure 1,4 bar rolling radius of tyres under static load 761 mm						
372	27	-	79	25	85	997
337	29	-	82	26	83	997
322	27	-	84	23	88	998
327	26	-	84	21	98	989
295	27	-	85	22	99	989
298	27	-	85	22	100	989
302	22	-	90	20	93	988
299	25	-	91	23	97	989
293	30	-	90	26	77	997
291	30	-	90	28	81	994
295	24	-	90	22	87	990
292	25	-	91	22	85	995
-	25	-	103	22	88	996
tyre inflation pressure 1,2 bar rolling radius of tyres under static load 764 mm						
337	30	-	81	27	77	1001
329	30	-	82	27	77	1001
313	28	-	79	26	79	996
303	33	-	91	29	74	1001
315	28	-	95	27	78	996
301	34	-	91	32	70	999
301	33	-	88	30	76	1000
294	33	-	92	31	71	1000
301	33	-	89	31	71	999
301	34	-	91	32	70	999

Test (iii) was carried out with additional ballast,
the figures not quoted are therefore irrelevant

PRÜFUNGS-ABTEILUNG
DEUTZ DX 90-S
DX 90-N

Test No. 78-28

(3) TURNING SPACE AND TURNING CIRCLE

Wheel equipment front: 7,50-20 AS FRONT 6 ply
rear: 18,4 R 34 AS 8 ply

Track of wheels front: 1576 mm
rear: 1700 mm

	With brakes		Without brakes	
	left-hand m	right-hand m	left-hand m	right-hand m
Radius of turning space	3,90	4,02	4,33	4,45
Radius of turning circle	3,78	3,90	4,21	4,33

(4) LOCATION OF CENTRE OF GRAVITY

Height above ground	962 mm
Distance forward from rear axle centre	905 mm
Distance from tractor's median plane	0 mm

PRÜFUNGS-ABTEILUNG
DEUTZ DX 90-S
DX 90-N

Test No. 78-28

(5) BRAKING PERFORMANCE

A) SERVICE BRAKE

Date of tests: 17th July 1978
Type of track: Concrete
Type of decelerometer: MOTO-METER-Bremsverzögerungs- und Pedalkraftschreiber

Weight of ballasted tractor with driver 6000 kg

Cold brakes

		With ballast	Without ballast
Travelling speed	km/h	23,9	23,9
Deceleration	m/s^2	4,3	3,8
Stopping distance	m	7,2	7,8
Force on pedal	N	340	250
Force on pedal to achieve a deceleration of 2,5 m/s^2	N	160	100

Brake fade characteristics (hot tests)

Deceleration	hot/cold	%	102	108
Stopping distance	cold/hot	%	106	100
Force on pedal	cold/hot	%	106	93

B) PARKING BRAKE

Tractor facing up 16 % slope
Pull on hand brake 250 N, tractor does not roll

Tractor facing down 16 % slope
Pull on hand brake 230 N, tractor does not roll

PRÜFUNGS-ABTEILUNG

DEUTZ DX 90-S
DX 90-N

Test No. 78-28

(6) AMBIENT NOISE EMITTED BY THE TRACTOR

Date of test: 26th July 1978
Type of track: Concrete
Type of sound level meter: BRÜEL AND KJAER model 2203

Results of test	DX 90-S	DX 90-N
Gear:	5th fast	4th fast
Travelling speed before acceleration:	22,0 km/h	18,0 km/h
Sound level:	87 dB(A)	86,5 dB(A)

(7) NOISE AT THE DRIVER'S EAR LEVEL

Date of tests: 26th July 1978
Type of track: Concrete
Type of sound level meter: BRÜEL AND KJAER model 2607

The tractor was fitted with a safety cab
SK 1905-37-MASTER CAB

Results of tests

Gear	Drawbar pull at which the tractor develops the maximum sound level N	Travelling speed nominal km/h	Travelling speed effective km/h	Sound level dB(A)
1 slow	39020	2,07	1,80	81
2 slow	38110	3,16	2,72	81,5
3 slow	38890	3,88	3,34	82
1 inter	38760	4,20	3,60	82
4 slow	36100	5,62	4,81	82
2 inter	31620	6,41	5,71	83,5
5 slow o)	28540	6,90	6,16	84
3 inter*)	25620	7,86	7,12	83,5
1 fast	22780	8,80	8,11	84
4 inter	17470	11,39	10,70	83
2 fast	14730	13,44	12,76	83,5
5 inter o)	13850	13,98	13,26	84,5
3 fast	11420	16,48	15,81	84
4 fast	light load	23,90	24,90	81,5
5 fast o)	light load	29,33	30,42	82

*) the 3rd inter gear corresponds at the model DX 90-S as well as at the model DX-90-N to the travelling speed nearest to 7,5 km/h

o) not at DX 90-N

PRÜFUNGS-ABTEILUNG
DEUTZ DX 90-S/90-N

Test No. 78-28

(8) POWER LIFT AND HYDRAULIC PUMP PERFORMANCE

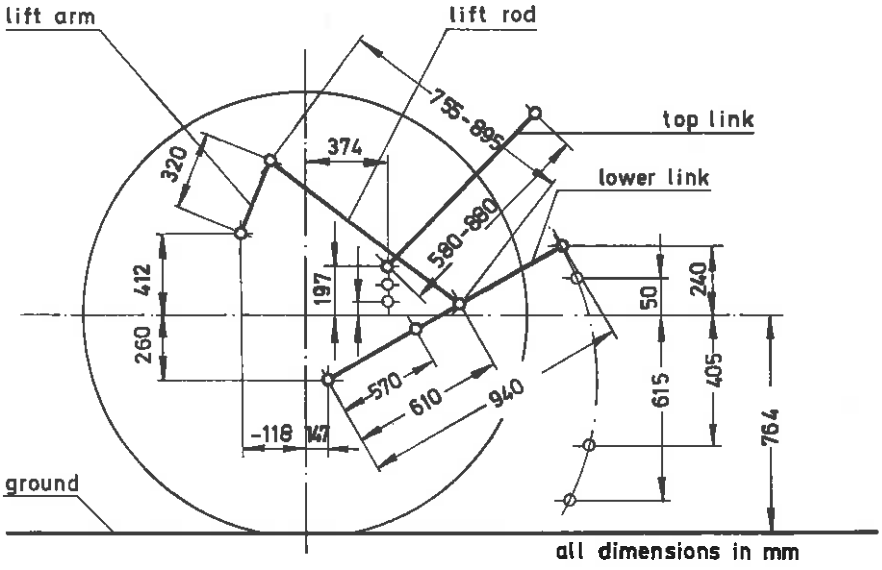
Date of tests: 1st and 2nd August 1978

HYDRAULIC PUMP

(1) Opening pressure of relief valve in remote circuit	167 bar
Sustained pressure by open relief valve	174 bar
(2) Pump delivery rate at minimum pressure and maximum engine speed	42,0 l/min
(3) Pump delivery rate	38,0 l/min
Delivery pressure	169 bar
Hydraulic power	10,7 kW

POWER LIFT

Dimensions of linkage geometry for the table on page 30



PRÜFUNGS-ABTEILUNG
DEUTZ DX 90-S
DX 90-N

LIFTING FORCES tractor fitted with 1 external ram, 55 mm bore

Lifting heights relative to horizontal lower links

mm	-410	-400	-330	-300	-200	-145	-105	-100
at hitch points maximum mechanical advantage								
N							34150	34400
minimum mechanical advantage								
N	29100	29300		30350	31000			31300

Max. force exerted throughout the whole range 34150 N

Front of tractor does not lift with maximum allowable front ballast

at test frame maximum mechanical advantage								
N			36600	36100	34950			34000
minimum mechanical advantage								
N						32800		32600

Max. force exerted throughout the whole range 29550 N

Force at which front of tractor lifts with maximum allowable front ballast 29720 N

PRÜFUNGS-ABTEILUNG

Test No. 78-28

0	+100	+200	+290	+300	+320	+400	+500	+555	

lift rods 755 mm long, hole no. 2

35600	36550	37000		36800		37000	37250		

lift rods 895 mm long, hole no. 1

32250	32250	32900	33400						

lift rods 895 mm long, hole no. 2

32800	31350	30200		29750	29550				

lift rods 755 mm long, hole no. 1

32800	32600	31150		29900		28800	27800	27550	

All values of forces for pressure at max. hydraulic power 169 bar, see page 27; calculated from measurements at max. oil pressure 174 bar

LINKAGE GEOMETRY when connected to the standard frame	Maximum mechanical advantage	Minimum mechanical advantage
Projected length in side view:		
Lower links	940 mm	940 mm
Lift arms	320 mm	320 mm
Lift rods	895 mm	755 mm
Top link	730 mm	730 mm
Distance of lift rod connection point from pivot point of lower link	610 mm	570 mm
The following dimensions are given relative to rear axle centre line 764 mm above ground		
Lower link pivot point	147 mm behind, 260 mm below	147 mm behind, 260 mm below
Top link pivot point	374 mm behind, 197 mm above	374 mm behind, 197 mm above
Lift arm pivot point	118 mm behind, 412 mm above	118 mm behind, 412 mm above
Maximum and minimum height of lower link hitch points	50 mm above, 615 mm below	240 mm above, 405 mm below
Height of lower link hitch points above ground when locked in highest transport position	814 mm	1004 mm

PRÜFUNGS-ABTEILUNG
DEUTZ DX 90-S
DX 90-N

Test No. 78-28

OPTIONAL TESTS

(9) ENGINE PERFORMANCE

Date of tests: 3rd April 1978
Type of dynamometer: SCHENCK eddy-current dynamometer W 400

Power kW	Engine speed rev/min	Fuel consumption total l/h	Fuel consumption total kg/h	Fuel consumption specific g/kWh	Specific energy kWh/l
Maximum power					
At 2-hour test					
65.3	2300	18.90	15.56	238	3.46
At standard p.t.o. speed (1000 rev/min)					
62.5	2071	17.92	14.75	236	3.49
At the speed recommended for drawbar work					
65.3	2300	18.90	15.56	238	3.46
Part loads					
(i) 85% of the torque at maximum power at 2-hour test					
56.1	2330	16.17	13.32	237	3.47
(ii) unloaded					
-	2431	3.90	3.21	-	-
(iii) 50% of the load defined in (i)					
28.7	2372	9.69	7.98	278	2.96
(iv) maximum power					
65.3	2300	18.90	15.56	238	3.46
(v) 25% of the load defined in (i)					
14.5	2404	6.97	5.74	395	2.08
(vi) 75% of the load defined in (i)					
42.5	2348	12.77	10.51	247	3.33

Optimum fuel consumption: 220 g/kWh at 37.4 kW and 1500 rev/min
No load maximum engine speed: 2431 rev/min
Torque at maximum power (2 hours): 271 Nm
Maximum torque: 300 Nm at 1697 rev/min of the engine

Mean atmospheric conditions:	temperature	24 °C
	pressure	989 mbar
	relative humidity	53 %
Maximum temperatures:	coolant	-
	engine oil	98 °C
	fuel	23 °C
	engine air intake	27 °C

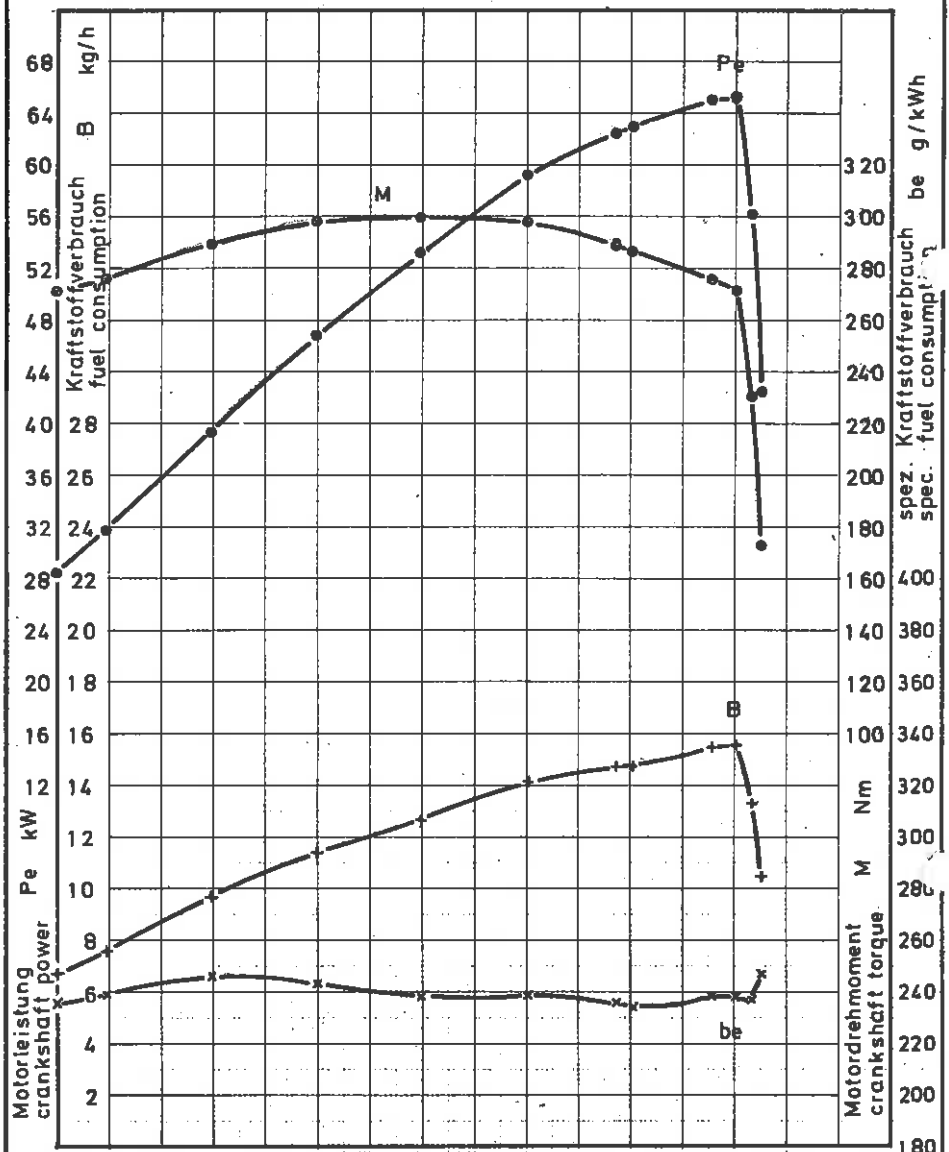
PRÜFUNGS-ABTEILUNG

KHD DX 90 S

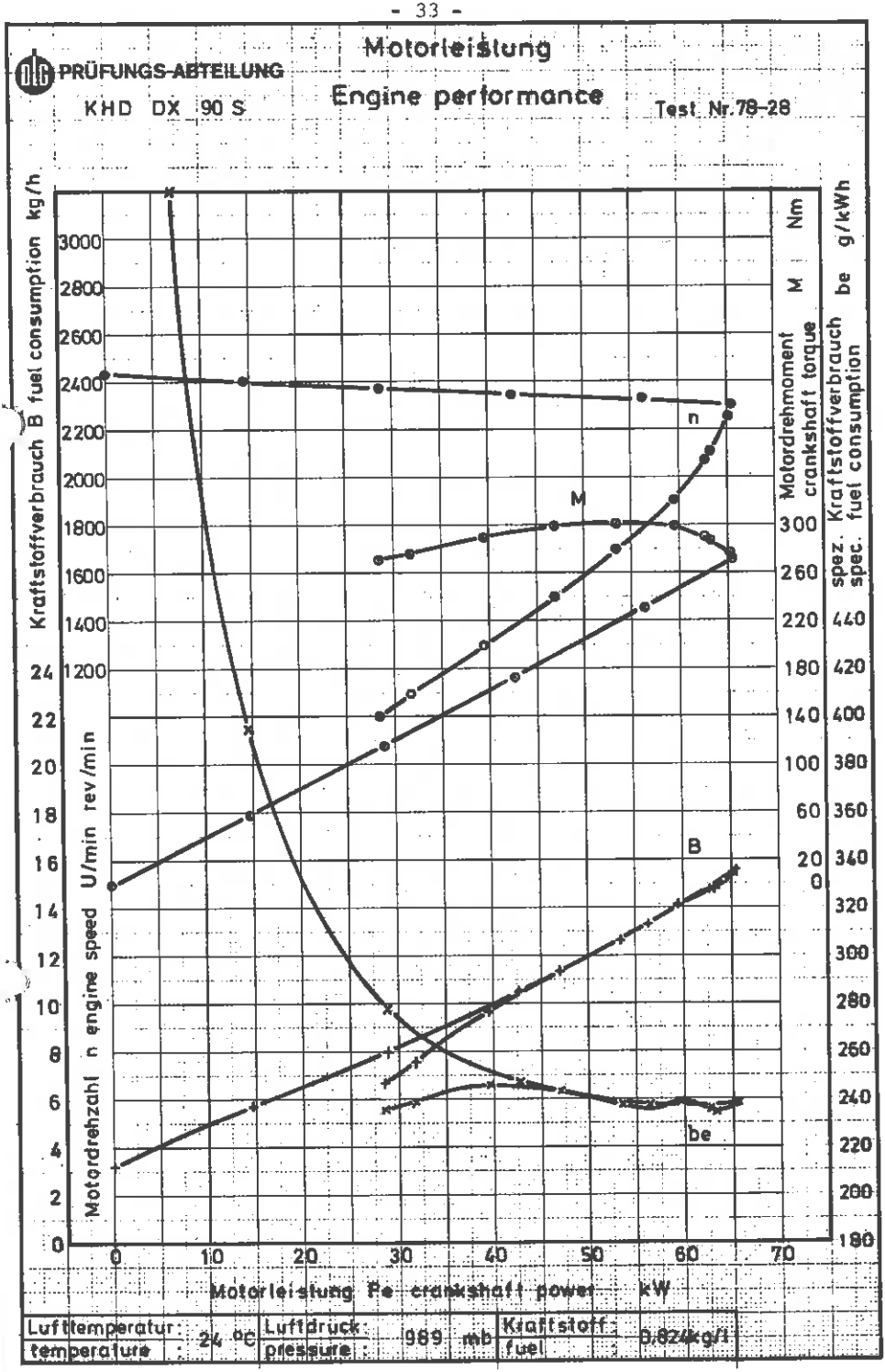
Motorleistung

Engine performance

Test Nr. 78-28



Lufttemperatur temperature	24 °C	Luftdruck pressure	989	mb	Kraftstoff fuel	0,824	kg/l

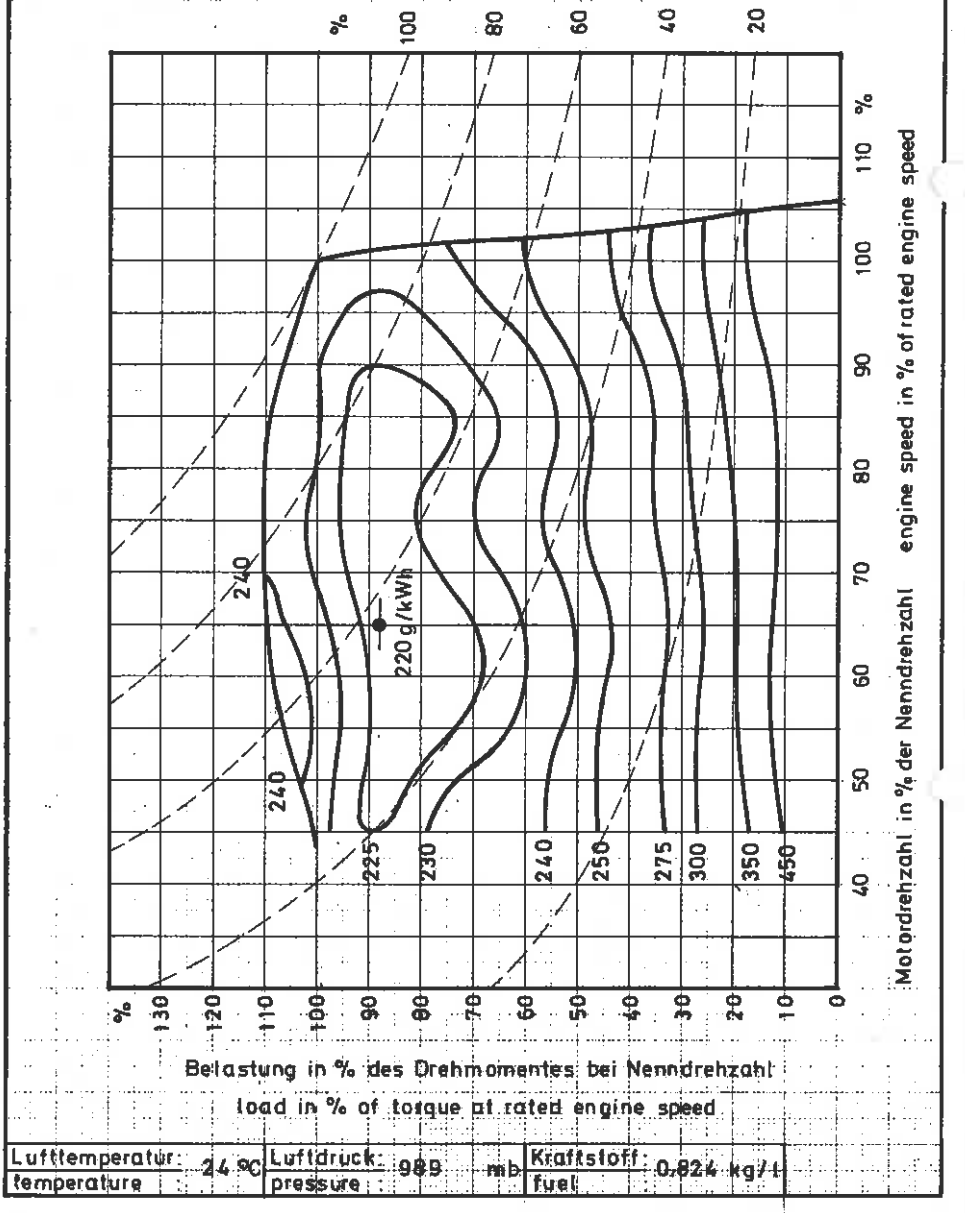

PRÜFUNGS-ABTEILUNG
KHD DX 90 S
Motorleistung
Engine performance
Test Nr. 78-28
Kraftstoffverbrauch B fuel consumption kg/h
Motordrehzahl n engine speed U/min rev/min
Motordrehmoment crankshaft torque M Nm
spez. Kraftstoffverbrauch spec. fuel consumption be g/kWh
n
M
B
be
Motorleistung Pe crankshaft power kW
Lufttemperatur: temperature : 24 °C
Luftdruck: pressure : 989 mb
Kraftstoff: fuel : 0,824 kg/l

PRÜFUNGS-ABTEILUNG

KHD DX 90 S

Motorleistung
Engine performance

Test Nr. 78-28



Lufttemperatur: temperature	24 °C	Luftdruck: pressure	989 mb	Kraftstoff: fuel	0,824 kg/l

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