Report on test in accordance with
OECD STANDARD CODE II for the Official
Testing of Agricultural Tractor Performance

Restricted Code

OECD No. **1678/1** (EURO-Version)
1678/2 (NAO-Version)



Agricultural Tractor
CASE IH MX120 - MAXXUM (4WD)

30 km/h-version, Power Shift
Model denomination MX120

Manufacturer

CASE United Kingdom Limited
Wheatley Hall Road
Doncaster DN2 4PG, England

Deutsche Landwirtschafts-Gesellschaft e.V. · Eschborner Landstraße 122 (DLG-Haus)
D-60489 Frankfurt a.M. · Telefon (069) 24 78 80
e-mail: FB-VI@DLG-Frankfurt.de · Telefax (069) 24 78 81 10

This is a report on a tractor test in accordance with OECD STANDARD CODE for the Official Testing of Agricultural Tractor Performance (C(87)53(Final), CODE II) and amendments (C(90)79, C(92)52. C(93)52 and C(93)133).

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

Duration of tests: November 1996 till March 1997

DLG-Testing Station for Agricultural Machinery, Max-Eyth-Weg 1,
D-64823 Groß-Umstadt

This report has been approved by the OECD Co-Ordinating Centre (CEMAGREF, France) as being in accordance with the OECD STANDARD CODE.

Date of approval: 2nd October 1997

OECD No. 1678/1 (EURO-Version)
1678/2 (NAO-Version)
Restricted Code

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	kN	=	1000	N	=	102 kp
Powers				1	kW	=	1,36 PS
Pressures	1	MPa	=	10	bar	=	10,2 kp/cm^2
	100	kPa	=	1000	mbar	=	750,10 mm Hg

All rights including the right of translation, reprint and photo-mechanical copying – also of excerpts – reserved by the editor.

Printed in Germany, December 1997
DLG-No. 299

TABLE OF CONTENTS

		Page
SPECIFICATION OF TRACTOR		4 to 17
TEST CONDITIONS		17 to 19
COMPULSORY TESTS		
1	Main power take-off performance	20 to 23
2	Hydraulic power and lifting force	24 and 25
3	Drawbar power and fuel consumption	26 and 27
4	Repairs and remarks	28

PRELIMINARY REMARK

This tractor is available in two versions: for the European market (EURO-version)
for the North American market (NAO-version).

Differences are: - length of the lower links, (longer on the EURO-version because of the quick couplers) and the pivot points of the upper link. Therefore two lifting force measurement tables are contained in this report.

- ratio of 540 rpm p.t.o. Tests were only made on the 1000 rpm p.t.o.

- cab: EURO-version with 2 doors
NAO-version with 1 door

Tractor manufacturer:	CASE United Kingdom Limited Doncaster DN2 4PG, England
Location of tractor assembly:	Doncaster DN2 4PG, England
Submitted for test by:	CASE Germany GmbH, D-41460 Neuss
Selected by:	Manufacturer with agreement by DLG
Place of running-in:	Doncaster and Groß-Umstadt
Duration of running-in:	Engine and tractor 58 hours

SPECIFICATION OF TRACTOR

Tractor

Make:	CASE IH
Trade name:	MX120 - Maxxum (4WD), 30 km/h version
Model denomination:	MX120
Type:	Wheel tractor, semi frame construction, four wheel driven
Serial no.:	JJE 095 0002
1st serial no.:	JJE 095 0001

Engine

Make:	CDC
Model:	6T-590
Type:	Watercooled 4 stroke Diesel-engine direct injection, supercharged,
Serial no.:	452 022 92
Cylinders:	6, in line, bore 102 mm, stroke 120 mm, displacement 5883 cm^3; compression ratio 17.5 ± 1.5 : 1;
Valves:	Overhead

Supercharging

Make:	HOLSET
Model:	HX35
Type:	Exhaust driven supercharger, non wastegate without intercooler
Max. pressure:	104 ± 20 kPa

Fuel system:	FEDERAL MOGUL fuel supply pump, MICO (Lic. BOSCH), Optional: BOSCH inline "A" injection pump serial no.: 566 423 11 manufacturer's production setting 67.0 ± 2 mm³/stroke at maximum power at 2000 rev/min 62.0 ± 2 mm³/stroke at full load and rated speed; static injection timing device, 14° ± 1° crank angle before TDC; BOSCH multihole injection nozzles; injection pressure 24 + 1.0 MPa; replaceable fuel filter; capacity of fuel tank 263 dm³
Governor:	MICO (Lic. BOSCH) mechanical RSV governor, with supercharge pressure compensating device, governed range of engine speed 925 ± 100 to 2420 +0/-50 rev/min, rated engine speed 2200 rev/min
Air cleaner:	DONALDSON, 141568A*, aspirated, Optional: 141567A*, non-aspirated; dry paper element filter with precleaner, safety element, replaceable cartridge; electric warning indicator lamp; air intake below bonnet, behind front grille
Exhaust silencer:	DONALDSON, 220159A*, aspirated, Optional DONALDSON or NELSON, 220158A* non-aspirated; multi-chamber expansion-type muffler 140 mm dia, 1790 mm long, located by RH "A" post; mouth showing forward to the right, top 2970 mm above ground
Lubrication system:	Pressure lubrication, internal gear pump, full flow oil filter with replaceable cartridge, engine oil/cooling-water heat exchanger in crankcase
Cooling system:	Water cooling with impeller pump, overpressure relief valve set to 103 + 7 kPa; thermostat and by-pass circuit; ECS / EATON 188922 A * viscous drive fan, belt driven, variable fan speed controlled by air flow temperature, 7 blades with 580 mm dia; water capacity 20 dm³

Starting system:	Electrical; NIPPONDENSO or BOSCH solenoid pre-engaged drive starter motor 3.1 kW; cold starting aid: Flame plug in air intake channel optionally: Ether injection to air intake manifold Safety device: Forward/neutral/reverse control in neutral position Operator Presence Control
Electrical system:	12 Volt, negative earth; BOSCH 3-phase alternator K1-14 V/95A 1330 W; 2 lead acid batteries, 105 Ah, at 20 hours discharge period, each
Transmission	Universally jointed propeller shaft between engine and gear box
Clutch (travel alone):	CASE France wet multi-plate clutch, 127 mm dia, hydraulically operated by pedal or electro-hydraulically controlled by forward/neutral/reverse lever, integrated in gear box
Gear box:	CASE France, mechanical, POWER SHIFT, 30 km/h version; power shift speed change gear with 4 speeds; range gear with 4 synchronized ranges, (I, II, III, IV); 2 wet multi-plate clutches shift reversing gear (power shifted), range IV locked out in reverse operation; total number of gears: 16 forward, 12 reverse; 2 levers, 1 switch; optionally available, not fitted: 1 collar shifted creeper range (CR), acting on all range gears; provides total 32 forward and 24 reverse speeds
Rear axle and final drives:	CASE France, bevel gear drive; bevel gear differential with multiplate differential lock, electro-hydraulically engaged/disengaged by switch or automatically disengaged by service brake operation or engine cutoff; planetary final drives
Front axle and final drives:	CARRARO 20.19; driven by wet multi-plate clutch, propeller shaft (in tractor's median plane) and bevel gear; clutch operated by electro-hydraulic switch; limited slip differential; planetary final drives

Total ratios and speeds:

Number of revolutions of front wheels for one revolution of rear wheels: 1.3199

Range	Gear	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed *) at rated engine speed 2200 rev/min km/h
Forward speeds			
I	1	322.29	2.20
	2	267.58	2.65
	3	216.50	3.28
	4	174.77	4.06
II	1	141.41	5.01
	2	117.41	6.04
	3	95.00	7.46
	4	76.68	9.25
III	1	86.01	8.24
	2	71.41	9.93
	3	57.78	12.27
	4	46.64	15.20
IV	1	44.22	16.04
	2	36.72	19.31
	3	29.71	23.87
	4	23.98	29.57
Reverse speeds			
I	1	278.52	2.55
	2	231.24	3.07
	3	187.10	3.79
	4	151.04	4.69
II	1	122.20	5.80
	2	101.46	6.99
	3	82.10	8.64
	4	66.27	10.70
III	1	74.33	9.54
	2	61.71	11.49
	3	49.57	14.31
	4	40.31	17.59

*) calculated with the radius index (ISO 4251/1-1992) 855 mm

Main p.t.o.: Independent;
driven by wet multi-plate clutch;
electro-hydraulically operated, electronically controlled by lever;
1 reversible shaft at tractor's rear
2 speeds selectable by hand lever
35 mm dia, 6 splines, ISO 500-1991 type 1
35 mm dia, 21 splines, ISO 500-1991 type 2

754 mm above ground, 500 mm behind rear wheel centre;
direction of rotation clockwise, seen in direction of travel

p.t.o. type	p.t.o. speed rev/min	engine speed rev/min	p.t.o. transmission ratio	power restriction kW
NAO and EURO-version				
1000	1000	2209	2.2095	-
	996	2200		
NAO-version only				
540	540	2163	4.0062	-
	549	2200		
EURO-version only				
540	540	1875	3.4720	-
	634	2200		

Power lift

CASE;
electro-hydraulic power lift, unit construction, draft, position- and intermixable control, floating position, fast raising, lowering throttle, lower links' sensing

Hydraulic system:

Closed, load sensing, pressure and flow compensated system;
VICKERS variable displacement axial-piston pump, driven by gearbox, max. delivery 109 dm³/min at rated engine speed,
oil cooler in front of engine coolant radiator,
oil filter in feed line;

VICKERS control valve,
relief valve pressure setting 20.2 ± 0.4 MPa;
single acting cylinder with 105 mm bore and 227 mm stroke, safety valve set to 23.5 ± 0.7 MPa;

2 double acting additional CASE control valves, 4 oil couplings at rear of tractor;
maximum volume of oil, available to external cylinders :

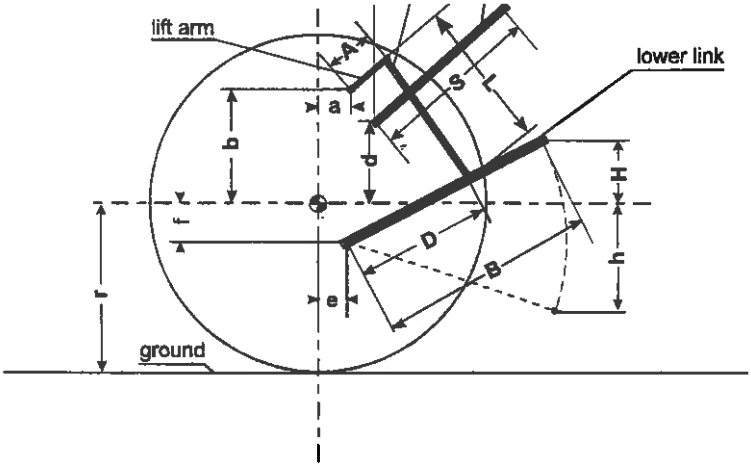
stationary tractor operating on slopes
of no more than 2 degrees 30 dm³,

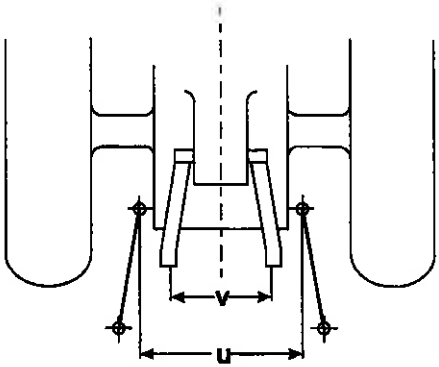
moving tractor operating on slopes
of no more than 15 degrees 20 dm³,
of no more than 30 degrees 12 dm³;

hydraulic oil reservoir in common with gear box with 76 dm³ capacity (88 dm³ capacity with increased oil level)

the hydraulic oil pump further provides hydraulic pressure for actuating of steering, p.t.o clutch, power-shift gear, rear axle differential lock and for shifting the front axle drive clutch

Three-point linkage: Category 2 acc. to ISO 730/1-1994,
lower links with ball joints (NAO - version)
lower links with WALTERSCHEID quick couplers (EURO - version)





Dimensions of rear implement linkage			projected lengths in mm			
			NAO - version	used for test	EURO - version	used for test
Rear tyres 20.8 R 38 radius index *)		(r)*	855		855	
Front tyres 16.9 R 28 radius index **)		(r')*	670		670	
Length of lift arms		(A)	230		230	
Length of lower links		(B)	877		891	
Distance of lift arm pivot points from rear axle centre	horizontal	(a)	249		249	
	vertical	(b)	173		173	
Horizontal distance between lower link pivot point		(u)	543		543	
Horizontal distance between lift arm end points		(v)	692		692	
Length of upper link		(S)	610-880	760	610-880	760
Distance of upper link pivot point from rear wheel axis	horizontal	(c)	366,364	364	342,366	366
	vertical	(d)	219,149	149	284,219	219
Distance of lower link pivot point from rear wheel axis	horizontal	(e)	223		223	
	vertical	(f)	253		253	
Distance of lower link pivot point from lift rod pivot points on lower links		(D)	555		554	
Length of lift rods		(L)	525-642	642	529-642	642

Height of lower link hitch points relative to rear wheels' centre line (situated 855 mm above ground), these data are valid for unloaded power lift:

		NAO - version		EURO - version	
Length of lift rods	(L)	525	642	525	642
Linkage distance of lift rods	(D)	555		554	
Lowest position	(h)	375	655	378	655
Highest position	(H)	175	55	200	100
Transport position	(H')	175	55	200	100

*) Assuming r resp. r'= tyre dynamic radius index of ISO 4251/1-1992

Pull equipment

Swinging drawbar:	Longitudinally adjustable	
	height above ground	433 mm
	distance of hitch point	
	from rear wheel axis, horizontally	895, 945, 1045, 1145 mm
	from p.t.o. shaft end vertically	321 mm
	horizontally	395, 445, 545, 645 mm
	pin hole swingable to both sides of centre line	
	with drawbar fully pushed in	101/184.mm
	with drawbar fully drawn out	127/218.mm
	distance of pivot point from rear wheel axis horizontally (before axis)	73 mm
	diameter of drawbar pin hole	33 mm
	maximum vertical permissible load (drawbar fully pushed in)	18 kN
Trailer hitch:	CRAMER, KU 5410/335, non automatic	
	diameter of hitch pin	30 mm
	height above ground adjustable by one hand quick adjustment to	803, 852, 901, 950, 999 mm
	distance of hitch point from rear wheel axis, horizontally	674 mm
	from p.t.o. shaft end, horizontally	174 mm
	vertically	49, 98, 147, 196, 245 mm
	maximum vertical permissible load	20 kN
Piton fixe	distance of hitch point from rear wheel axis, horizontally	556 mm
	from p.t.o. shaft end vertically	188 mm
	horizontally	56 mm
	maximum vertical permissible load	21 kN
Holed drawbar:	short bar, length between ball guides	820 mm
	9 holes with 33 mm diameter with 80 mm distance each thickness	30 mm
	height above ground: maximum	1055 mm
	minimum	200 mm
	horizontal distance to p.t.o. shaft end (with lower links horizontal, EURO-version)	614 mm
Towing hitch:	At front, height of mouth's centre above ground	1020 mm

Steering	DANFOSS, Dual displacement, OSPD 60/185 LS; or EATON, 263-4325-002 hydrostatic front wheel steering, connected by sequence valve to the hydraulic system of the tractor (see on page 9); 1 integrated WEBER ram (symmetrical design), 240 mm stroke, 72 mm bore and 38 mm dia of piston rod, directly acting on steering levers, working pressure 18.3 ± 0.35 MPa
Brakes	
Service brake:	CASE pedal operated muscle power brake with hydraulic transmission, using oil of gearbox, acting on rear wheels; front axle drive is engaged automatically during braking; oil-immersed disc brake with 1 ring-piston on each differential half shaft; disc diameter 300 mm; hydraulic trailer braking take-off, optional: pneumatic trailer braking take off, power assisted brakes (not fitted to tested tractor)
Parking brake:	Mechanical wet disc brake, operated by lever with ratchet; 2 lining discs with 143 mm dia each, situated on drive shaft of rear axle (in front of bevel-gear pair)
Steering brake:	Divided pedal of service brake, for normal use locked together
Wheels	
Front:	Steering and driving, 2 pneumatics
Rear:	Driving, 2 pneumatics
Wheelbase:	2700 mm
Track width:	At front adjustable from 1530 mm up to 1930 mm in steps of 100 mm each by adjustable gauge bowl wheels and by turning the wheels At rear adjustable from 1530 mm up to 1930 mm in steps of 100 mm each by adjustable gauge bowl wheels and by turning the wheels

Possible combinations of tyre sizes

Tyre sizes	
Front	Rear
13.6 R 28	16.9 R 38 or 480/70 R 38
420/70 R 28	18.4 R 38 or 520/70 R 38
380/70 R 28	16.9 R 38 or 480/70 R 38
14.9 R 28	18.4 R 38 or 480/70 R 38
16.9 R 28	20.8 R 38
480/70 R 28	20.8 R 38 or 580/70 R 38

Protective structure

CASE, cab model CASE IH MX30 - EURO-version 2 doors, resp. US-version NAO 1 door;
OECD-tested driver's platform with integrated safety frame, OECD approval no. CSS 0387 / 321 (EURO - version), resp. CSS 0387 / 69 ´(NAO-version);
not tiltable, antivibration mounted by silent-blocks on tractor; doors with 3 steps each, steps 532, 804 mm and 1076 mm; driver's platform 1315 mm above ground; rear window and rear side windows tiltable, roof hatch; air conditioner (not fitted to tested tractor) and combined heating/ventilation system with 3-step blower and cooling-water heat exchanger incorporated in roof;
air intake around side and front roof perimeter, dry air filter; air outlet jets in the roof at front, recirculating louver at rear, defroster nozzles in the roof at front;

Noise reduction materials:

Roof, Headliner:	Fabric, acoustical-foam	5 - 75 mm
	resin impregnated felt 50/50 cotton felt /fiberglass (moulded part)	10 - 25 mm
	acoustical-foam	70 mm
Roof, front part:	ABS-panel part	3 mm
Floor:	Mat, consisting of:	
	injection moulded rubber	30 mm
Seat support, on the surface and the front side:	Mat, consisting of:	
	compression moulded rubber	30 mm
Console panels:	Compound mat, consisting of:	
	perforated vinyl and foam	12 mm
	ABS backing	3 mm
	foam at the cab floor	25 mm
Rear panel:	None	

Mudguards:	Compound mat, consisting of:	
	perforated vinyl and foam	6 mm
	perforated ABS backing	3 mm
	acoustical-foam	25 mm
B-posts:	ABS-panel part	3 mm
Bulk head:	Compound mat, consisting of:	
	foam	12 mm
	compression moulded rubber	8 mm
	foam	25 mm
Draught proofing:	Rubber seals and Silicon	

Driver's seat

GRAMMER, MSG 95 A/31
upholstered seat with back rest and arm rests, pneumatic suspension with automatic weight adjustment, hydraulic shock absorber; height of unloaded seat above seat platform steplessly adjustable from 410 to 530 mm, longitudinal adjustment 215 mm

Operating hours meter

Electronic, counts real operating hours when engine is running

Lighting Electrical, 12 Volt,

	Height above ground of centre mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headlights	1400	160x80	230
Auxiliary lights	2770	130x75	450
Rearlights	1820	60x50	840
Reflectors	840	100x50	600

TEST CONDITIONS

Overall dimensions

Length mm	Width mm	Height at top of protective structure mm	Height at top of exhaust silencer pipe mm
NAO - version: 4650 EURO - version: 4675	2360	2970	2970

Ground clearance: 390 mm underneath swinging drawbar

Tractor mass (with cab)

	Without driver kg	With driver kg
Front	2400	2415
Rear	3420	3480
Total	5820	5895

Tyres and track widths specifications

	Front	Rear
Tyres:	GOODYEAR	GOODYEAR
Dimensions	16.9 R 28	20.8 R 38
ply rating/load index speed index	- / 141 A8	- / 153 A8
type	radial-ply	radial-ply
maximum load (tyre manufacturer's) 30 km/h	2390 kg	3900 kg
inflation pressure (tyre manufacturer's)	160 kPa	160 kPa
radius index	670 mm	855 mm
Chosen track width	1830 mm	1830 mm
Rims	DW15x28	DW 18Lx38
Technically permissible axle load	4500 kg	7000 kg
Technically permissible total weight	9500 kg	
Technically permissible total weight 30 km/h	9500 kg	

Oils and lubrication

Capacity and change interval:

	Capacity dm³	Oil change h	Filter-change h
Engine	15.0	250, 300 with CASE IH oil and filter	
Gearbox, hydraulic system, rear axle and final drives	76.0	1200	1200
Front axle (differential)	6.0		-
Final drives (front)	2 x 0.6		

Specification:

	Recommended	Used during test
Engine oil used in: Engine Type Viscosity Winter Summer Tropics Classification	 Engine oil SAE 10W/30 SAE 15W/40 or 10W/30 SAE 15W/40 API-CE	 CASE-IH engine oil no.1 SAE 15W/40 API-CE
Transmission oil used in: Gearbox with rear axle incl. final drives, hydraulic system, steering, brake system Type Viscosity Classification Front axle incl. final drives Type Viscosity Classification	 HY-TRAN PLUS ISO-VG-46 MS 1223 *) Gear oil SAE 85W/140 MS 1316 *)	 CASE IH HYTRAN-PLUS ISO-VG-46 MS 1223 *) Gear Oil SAE 85W/140 MS 1316 *)

*) MS = CASE material specification

Grease: Multi purpose grease
number of lubrication points: 10

Fuel:

Used during test:

Type	ARAL Diesel fuel, in conformity with DIN 51601	
Density at 15° C:	at p.t.o. performance tests	0,826 g/cm³
	at drawbar power tests	0,822 g/cm³

According to tractor manufacturer also permitted:

Rape seed oil fuel (methyl ester RME)

COMPULSORY TESTS

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

Date of tests: 5th November 1996
Location of tests: DLG-Testing Station Groß-Umstadt
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

Power kW	Speed Engine rev/min	Speed P.t.o. rev/min	Fuel consumption hourly dm³/h	Fuel consumption hourly kg/h	Fuel consumption specific g/kWh	Specific energy kWh/dm³
Maximum power						
1.1 At 2-hour test						
81.7	2000	905	23.64	19.53	239	3.46
1.2 At rated speed						
79.2	2200	996	24.46	20.20	254	3.24
1.3 At standard p.t.o. speed						
79.2	2200	996	24.46	20.20	254	3.24
1.4 Part loads, the governor hand lever in the position corresponding to maximum power at full load (curve a)						
1.4.1 the torque corresponding to maximum power at rated speed						
79.2	2200	996	24.46	20.20	254	3.24
1.4.2 85% of the torque obtained in 1.4.1						
69.1	2258	1022	22.28	18.40	266	3.10
1.4.3 75% of the torque defined in 1.4.2						
52.7	2295	1039	18.68	15.43	292	2.82
1.4.4 50% of the torque defined in 1.4.2						
35.7	2331	1055	15.08	12.46	349	2.37
1.4.5 25% of the torque defined in 1.4.2						
18.0	2364	1070	11.05	9.13	504	1.63
1.4.6 unloaded						
-	2395	1084	7.34	6.06	-	-

CASE IH MX120 - MAXXUM (30 km/h), Power Shift — Test No. 96-250

Power kW	Speed: Engine rev/min	Speed: P.t.o. rev/min	Fuel consumption: hourly dm³/h	Fuel consumption: hourly kg/h	Fuel consumption: specific g/kWh	Specific energy kWh/dm³
1. 5 Part loads, the governor hand lever in the position corresponding to standard p.t.o. speed at full load (curve b)						
1.5.1 the torque corresponding to maximum power						
79.2	2200	996	24.46	20.20	254	3.24
1..2 85% of the torque obtained in 1.5.1						
69.1	2258	1022	22.28	18.40	266	3.10
1.5.3 75% of the torque defined in 1.5.2						
52.7	2295	1039	18.66	15.43	292	2.82
1.5.4 50% of the torque defined in 1.5.2						
35.7	2331	1055	15.08	12.46	349	2.37
1.5.5 25% of the torque defined in 1.5.2						
18.0	2364	1070	11.05	9.13	504	1.83
1.5.6 unloaded						
-	2395	1084	7.34	6.06	-	-

No load maximum engine speed:	2395 rev/min
Equivalent flywheel torque at rated engine speed	344 Nm
Equivalent flywheel torque at 2-hour test	390 Nm
at engine speed:	2000 rev/min
Maximum equivalent flywheel torque:	485 Nm
at engine speed:	1104 rev/min

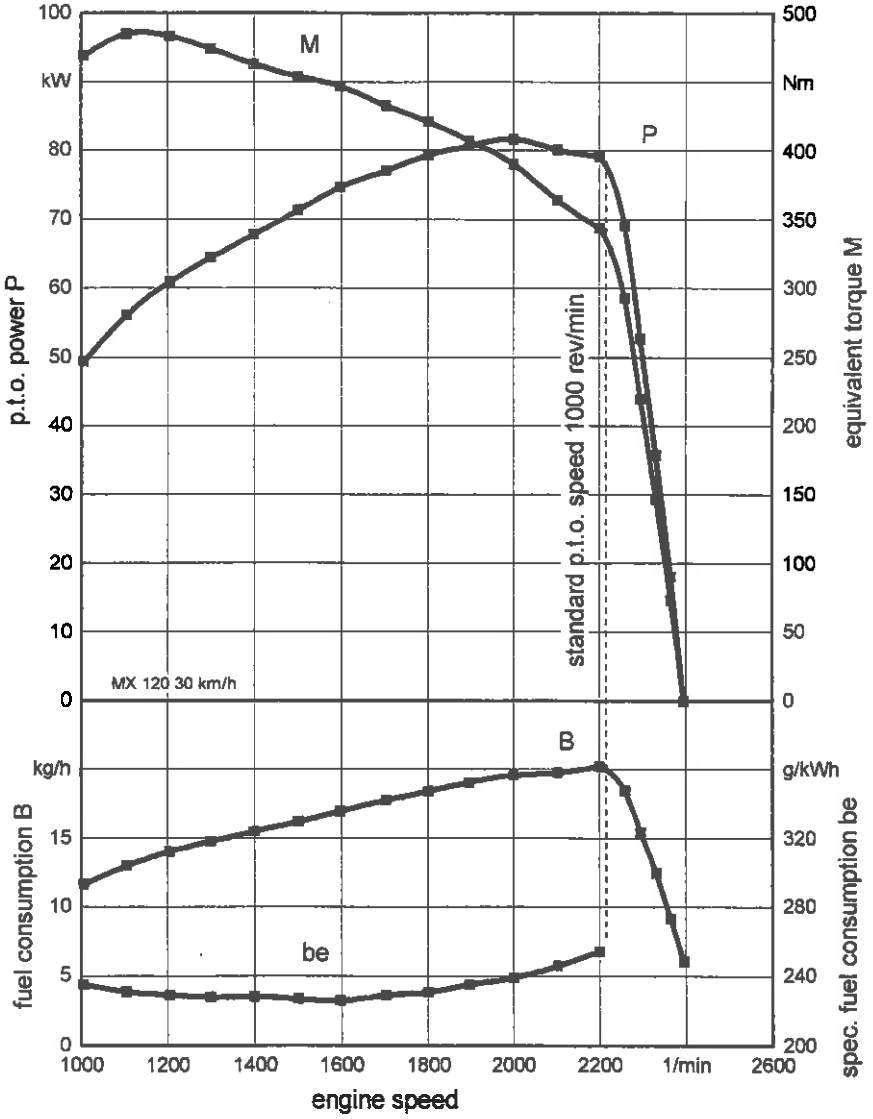
Mean atmospheric conditions

temperature:	19 °C
pressure:	99.7 kPa
relative humidity:	50 %

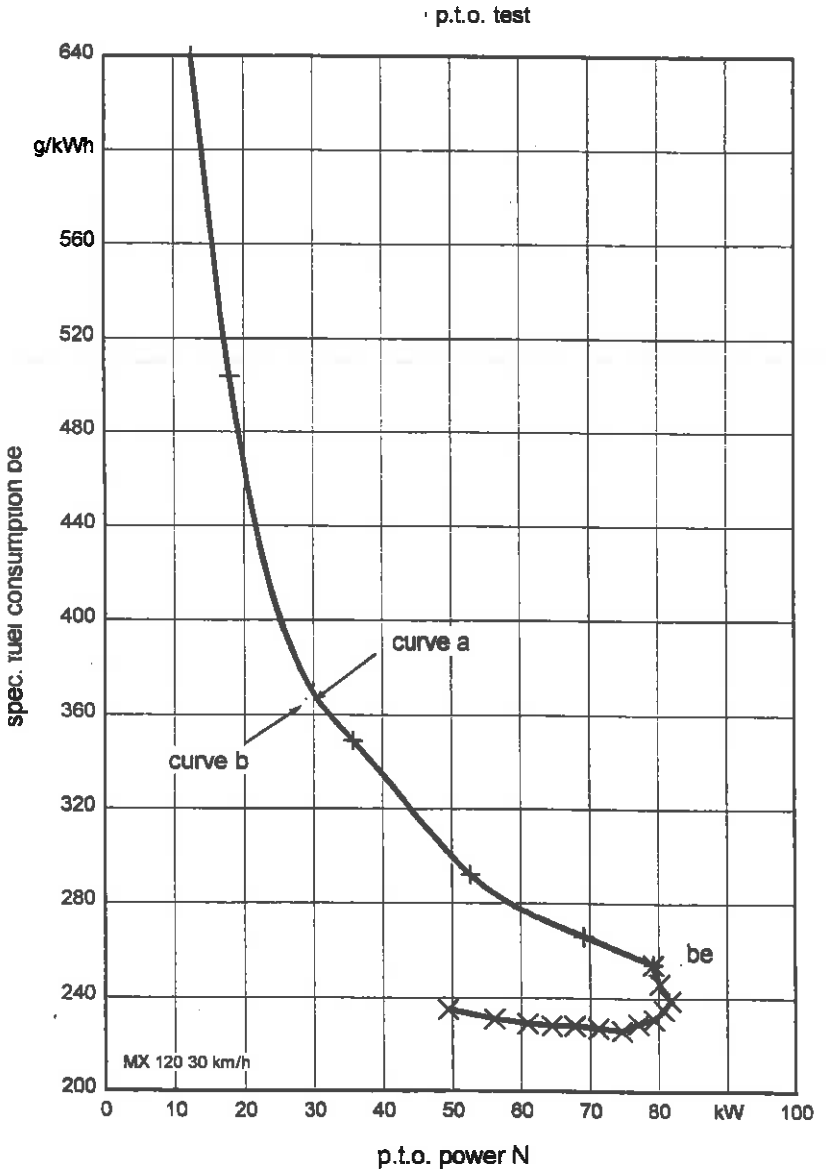
Maximum temperatures

coolant:	87 °C
oil:	110 °C
fuel:	55 °C
air intake:	19 °C

p.t.o. test


M
P
B
be
kW
Nm
kg/h
g/kWh
p.t.o. power P
equivalent torque M
fuel consumption B
spec. fuel consumption be
standard p.t.o. speed 1000 rev/min
MX 120 30 km/h
engine speed
1/min
100
80
70
60
50
40
30
20
10
0
500
400
350
300
250
200
150
100
50
15
5
320
280
240
1000
1200
1400
1600
1800
2000
2200
2600

CASE IH MX120 - MAXXUM (30 km/h), Power Shift **Test No. 96-250**



2 HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 19th till 21st November 1996

2.1 Hydraulic power test

Sustained pressure with relief valve open 19.6 MPa

Pump delivery rate at minimum pressure 97.2 dm³/min

	Hydraulic power kW	Flow rate dm³/min	Pressure MPa	Oil Temperature ° C
At 90% of the actual relief valve setting	14.7	50.0	17.6	65
Maximum	22.5	90.1	15.0	65

Tapping point used for test: at rear of tractor, connected with additional control valve no.1, using control valve no.1 and no.2 as return line.

2.2 Power lift test. Maximum pressure in the lift cylinder 20.5 MPa

EURO - version	At the hitch points	On the frame
Height of lower hitch points above ground in down position	200 mm	
Vertical movement without lifting forces with lifting forces	755 mm 730 mm	865 mm 835 mm
Max. corrected force exerted through full range	44.7 kN	35.25 kN
Corresponding pressure	18.5 MPa	
Moment about rear axle		62.1 kNm
Max. tilt angle of mast from vertical		7°

Lifting heights relative to horizontal lower links												
mm	-465	-400	-300	-200	-100	0	+100	+200	+300	+330	+370	
Lifting forces at hitch points, corrected to 18.5 MPa												
kN		44.7	48.8	51.25	51.00	50.00	48.80	47.15	45.50	45.50		
Lifting forces at standard frame, corrected to 18.5 MPa												
kN	40.6	42.85	44.70	44.70	43.65	41.80	39.80	38.15	36.50		35.25	

2.3 Power lift test. Maximum pressure in the lift cylinder 20.5 MPa

NAO- version							At the hitch points				On the frame	
Height of lower hitch points above ground in down position							200 mm					
Vertical movement without lifting forces with lifting forces							710 mm 690 mm				930 mm 905 mm	
Max. corrected force exerted through full range							45.75 kN				32.40 kN	
Corresponding pressure							18.5 MPa					
Moment about rear axle											56.20 kNm	
Max. tilt angle of mast from vertical											10°	
Lifting heights relative to horizontal lower links												
mm	-505	-500	-400	-300	-200	-100	0	+100	+200	+290	+300	+400
Lifting forces at hitch points, corrected to 18.5 MPa												
kN			45.75	50.00	51.65	51.65	50.85	49.20	47.15	43.35		
Lifting forces at standard frame, corrected to 18.5 MPa												
kN	38.15	38.25	41.00	42.25	42.05	41.00	39.35	37.50	35.90		34.45	32.40

3 DRAWBAR POWER AND FUEL CONSUMPTION

Date of test: 18th March 1997
Type of track: Concrete

Gear and range	Speed km/h	Drawbar pull kN	Power kW	Engine speed rev/min	Slip of wheels %
3.1 MAXIMUM POWER IN TESTED GEARS					
I 3	2.84	62.18	49.1	2228	14.7
I 4	3.35	62.40	58.1	2073	12.8
II 1	4.29	56.30	67.1	2006	6.4
II 2	5.27	47.86	70.0	1997	4.2
II 3	6.60	38.44	70.4	2000	3.1
III 1	7.39	34.45	70.7	2006	2.5
II 4	8.26	30.69	70.4	2006	2.3
III 2	8.90	28.83	71.3	2007	2.2
III 3	10.98	22.99	70.1	1994	1.6
III 4	13.60	18.40	69.5	1990	1.3
3.2 FUEL CONSUMPTION					
3.2.1 gear with max. drawbar power at rated speed					
III 2	9.78	26.00	70.7	2204	1.9
3.2.1.1 75 % of pull at maximum power at rated speed					
III 2	10.16	19.53	55.1	2273	1.4
3.2.1.2 50 % of pull at maximum power at rated speed					
III 2	10.39	13.16	38.0	2316	0.9
3.2.1.3 next higher gear at reduced engine speed; same pull and travelling speed					
III 3	10.14	19.64	55.3	1835	1.3
3.2.1.4 next higher gear at reduced engine speed; same pull and travelling speed					
III 3	10.41	13.13	38.0	1874	0.9
3.2.2 in selected gear nearest to 7.5 km/h at rated speed					
II 3	7.30	33.86	68.7	2201	2.8
3.2.2.1 75 % of pull at maximum power at rated speed					
II 3	7.62	25.31	53.6	2284	1.9
3.2.2.2 50 % of pull at maximum power at rated speed					
II 3	7.81	17.14	37.2	2322	1.3
3.2.2.3 next higher gear at reduced engine speed; same pull and travelling speed					
III 1	7.63	25.34	53.7	2070	1.9
3.2.2.4 next higher gear at reduced engine speed; same pull and travelling speed					
III 1	7.81	16.86	36.6	2100	1.3

Height of drawbar above ground	Tyre inflation pressure Front	Rear
500 mm	80 kPa	80 kPa

Specific fuel consumption g/kWh	Specific energy kWh/dm³	Temperatures Fuel °C	Coolant °C	Engine oil °C	Atmospheric conditions Temperature °C	Relative humidity %	Pressure kPa
369	2.23	54	82	106	16	68	100.5
346	2.38	56	83	108	14	68	100.5
291	2.82	59	84	117	16	68	100.5
280	2.94	54	83	105	16	68	100.5
279	2.95	57	84	119	14	70	100.5
277	2.97	58	84	119	11	70	100.5
278	2.96	57	83	118	18	65	100.5
275	2.99	57	83	118	17	65	100.5
279	2.94	57	83	118	13	68	100.5
283	2.90	57	83	117	15	68	100.5
285	2.88	49	80	105	19	60	100.5
312	2.63	55	82	116	16	60	100.5
364	2.26	55	82	108	17	60	100.5
as in 3.2.1.1							
275	2.99	54	82	107	19	60	100.5
as in 3.2.1.2							
313	2.62	54	82	108	17	60	100.5
294	2.80	57	83	111	15	68	100.5
318	2.58	58	84	113	15	68	100.5
360	2.28	57	83	110	15	68	100.5
as in 3.2.2.1							
295	2.78	57	82	108	18	68	100.5
as in 3.2.2.2							
338	2.43	56	82	108	15	68	100.5

4 REPAIRS AND REMARKS

The drawbar pull and wheel slip in I 3 and I 4 gears were limited to avoid excessive tractor bouncing.

Published
with the support of the Federal Ministry for Food, Agriculture and Forestry

Deutsche Landwirtschafts-Gesellschaft e.V. (DLG)
Fachbereich Landtechnik – Prüfungsabteilung –
Eschborner Landstraße 122 (DLG-Haus)
D-60489 Frankfurt am Main