DLG-Testzentrum Technik und Betriebsmittel



OECD No. 2/2324/1

Date of Approval: 9th March 2006
Date of Approval -Extension-: 05th May 2006

REPORT on test in accordance with
OECD STANDARD CODE 2 for the
Official Testing of Agricultural Tractor Performance

Agricultural Tractor

Massey Ferguson 8480

Manufacturer

AGCO S.A., B.P. 60307, 60026 Beauvais, FRANCE

This is a report on a tractor test in accordance with OECD STANDARD CODE for the Official Testing of Agricultural Tractor Performance (C(2002)17(FINAL) "Red Code", Code 2).

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

Duration of tests: May till June 2005

DLG-Test Centre Technology and Farm Inputs, 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: 9th March 2006 OECD No.: 2/2324

For the extension report:

Date of Approval: 05th May 2006

No. of Approval: 2/2324/1

The manufacturer requested an extension report because:

The manufacturer offers the MF 8480 as a stepless version and for special markets also as a stepshift version. In case of a stepshift version the continuously variable transmission of the tractor MF 8480 has been modified into a gear box with stepshifts by a special electronic control unit. The driver can change the transmission ratio from step to step by the hand lever in the armrest or by power shuttle (located to the left of steering wheel).

The specification of the tractors is the same. Only the software of the gear box is different. All the test results of OECD test report 2/2324 are valid for the extended model.

Statement

The information opposite each item has been validated by the Testing Station. An item marked [C] indicates to the test report user that the information declared by the manufacturer has been checked; an item marked [D] indicates that the manufacturer's declaration has been endorsed.

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[C]	Tractor manufacturer's name and address:	AGCO S.A. ZA n°2 BP 60307, Avenue Blaise Pascal 60026 Beauvais Cedex, FRANCE
[C]	Location of tractor assembly:	60026 Beauvais Cedex, FRANCE
[D]	Submitted for test by:	Manufacturer
[C]	Selected for test by:	Manufacturer with agreement by DLG
[D]	Place of running-in:	Beauvais and Gross-Umstadt
[D]	Duration of running-in:	75 h
[C]	Location of test:	DLG-Testing Station, D-64823 Gross-Umstadt

1 SPECIFICATIONS OF TRACTOR

1.1 Identification

1.1.1

[C]	- Make:	Massey Ferguson
[C]	- Model:	8480
[C]	- Type:	4WD, wheel tractor, unit construction

1.1.2 Numbers

[D]	- 1st serial No.:	N.A.
[C]	- Serial No.:	N167999

1.1.3 Other specifications:

[C]	- Transmission version:	DynaVT, 40 km/h
[D]	- Engine version:	exhaust emission according to TIER2, EPA and guideline 2000/25/EG
[D]	- Technical type number:	Y27

1.2 Engine

[C]	- Make/Model/Type:	SISU DIESEL / 84.329 ETA / water-cooled 4-stroke Diesel-engine, direct injection, supercharged and intercooler (air to air),
[C]	- Serial No.:	P08256

1.2.1	Cylinders	
[C]	- Number/disposition:	6 / vertical in line
[D]	- Bore/stroke:	111 mm / 145 mm
[D]	- Capacity:	8419 cm^3
[D]	- Compression ratio:	17.5 ± 0.5 : 1
[D]	- Arrangement of valves:	Overhead valves, 2 per cylinder
[D]	- Cylinder liners:	Wet
1.2.2	Supercharging	
[D]	- Make / Model / Type:	BORG WARNER / S2B / exhaust driven supercharger with air to air intercooler
[D]	- Pressure	Max. 150 kPa
1.2.3	Fuel system	
[D]	- Fuel feed system:	1 electrical fuel supply pump
	- Fuel filter	
[D]	Make/Model:	STANADYNE / fuel manager
[C]	Type :	2 replaceable paper element filter
[D]	- Capacity of fuel tank:	600 dm^3
	- Injection pump	
[D]	Make/Model:	BOSCH / VP 44 – 0470506042
[D]	Type:	Rotary
[D]	Serial no.:	N.A.
[C]	Manufacturer's production setting:	147 ± 2 mm^3/stroke at full load and rated speed;
[C]	Flow rate:	58 ± 0.8 dm^3/h at 2200 min^{-1} and full load
[D]	Timing:	electronically controlled
	- Injectors	
[D]	Make/Model:	STANADYNE / M33876
[D]	Type :	Multi hole
[D]	Injection pressure:	27 ± 0.8 MPa
1.2.4	Governor	
[D]	- Make/Model/Type:	SISU DIESEL / EEM2 / electronically driven all speed governor
[C]	- Governed range of engine speed:	800 to 2349 min^{-1}
[C]	- Rated engine speed:	2200 min^{-1}

1.2.5	Air cleaner	
	- Pre-cleaner	
[C]	Make/Model:	DONALDSON / -
[C]	Type:	Cyclone, aspirated, pre-cleaner integrated in housing of main cleaner
[C]	Location of air intake:	on the superior hood
	- Main cleaner	
[C]	Make/Model:	DONALDSON / SRB 13
[C]	Type:	Dry paper element filter with additional safety cartridge
[C]	- Maintenance indicator:	Warning light on dashboard
1.2.6		
	Lubrication system	
[D]	- Type of feed pump:	Electrical pump
[D]	- Type of filter:	Full flow, replaceable paper cartridge
[D]	- Number of filters:	1
1.2.7		
	Cooling system	
[C]	- Type of coolant:	Water-anti-freeze mixture
[C]	- Type of pump:	Centrifugal pump
[C]	- Specification of fan	BWCS viscous drive fan, belt driven, variable fan speed controlled by air flow temperature
[C]	Number of fan blades:	11
[C]	Fan diameter:	715 mm
[D]	- Coolant capacity:	34 dm^3
[D]	- Type of temperature control:	Calorstat
	- Superpressure system:	50 kPa

1.2.8	Starting system	
[D]	- Make/Model/Type:	AET Phillips & Temro / EEM2 / electrical, solenoid pre-engaged drive starter motor
[D]	- Starter motor power rating:	3 kW
[C]	- Cold starting aid:	Grid heater
[C]	- Safety device:	Starter only operating when clutch pedal depressed
1.2.9	Electrical system	
[C]	- Voltage:	12 V, negative earth
	- Generator:	
[C]	Make/Model/Type:	ISKRA / AAN 5125 3-phase alternator
[D]	Power:	n.a.
[C]	- Battery:	2 lead acid battery, 12 V / 480 Ah rating at 20 hours
1.2.10	Exhaust system	
[C]	- Make/Model/Type:	AGCO S.A. / 0037 / absorption-reflection type silencer, round 200 mm dia, 1340 mm long
[C]	- Location:	Vertical stack at right A-post of cab, mouth showing upward / forward to the right
1.2.11		
[D]	Operating hours meter:	Electronic, counts real hours when engine is running

1.3 Transmission

1.3.1		
[D]	Clutch	No clutch in usual sense, pedal fitted, controls the oil flow in hydrostatic drive by valve

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1.3.2 Gear box

[D] - Make: FENDT

[D] - Model: ML 200

[D] - Type: Continue variation transmission with stepshifts and variable power branching in a hydrostatic and a mechanic branch; special electronic control unit modifies the cvt into a gear box with stepshifts; ratios electronically selected by lever

[D] - Power flow: From crankshaft via torsional-vibration damper and primary shaft to the planetary-gear carrier of via the internal gear to the hydrostatic part, and via the sun gear to the mechanical part; both power branches are rejoint on a summation shaft and transmitted by a 2 step range gear to the rear axle

[D] - Hydrostatic branch: Acts as travel clutch, as infinitely variable gearbox and as reversing gear; is composed of a variable displacement axial-piston pump and an adjustable axial-piston motor; the axial-piston pump, driven by internal gear of planetary gear train, is hydrostatically coupled to the axial-piston motor; both are adjusted in common according to the following scheme

Travel speed	Displacement angle [°]	
	pump	motor
Min	0	45
Max	45	0

[D] - Mechanical branch: Consists of planetary gear train and of 2-step range gear (primary shaft of range gear simultaneously serves as summation shaft); the sun gear of planetary gear train propels the summation shaft; electromechanical change of travelling ranges at travelling speed below 2 km/h by push button

range		travel speed [km/h]	
		forward	reverse
I "turtle"	heavy use	0-28	0-18
II "rabbit"	fast transport	0-40	0-19

[D]	- Operation:	Power shuttle (located to the left of steering wheel) which controls following functions: - declutching gearbox in position "neutral" - quick reversing (change of driving direction) - the operating speed of gear ratio change may be varied in 4 steps - change of transmission ratio step by step - forward and reverse Hand lever in the right armrest which controls following functions: - change of transmission ratio step by step - forward and reverse Buttons and switches in the right armrest and the right panel which control following functions - automatic control of travelling speed (cruise control) - change of range turtle-rabbit - engine under-speed supervisor - Various control modes
[D]	- Available options (not fitted):	Transmission version DynaVT, 50 km/h
[C]	- Lubrication:	Oil circuit in common with rear axle drive, air-oil cooler in front of engine water cooler; 1 oil filter in suction line 1 oil filter in pressure line

1.3.3 Rear axle and final drives

[D]	- Make/Model/Type:	FENDT / HA260 / bevel gear drive with bevel gear differential and planetary final drives
	- Differential lock:	
[D]	Type:	Multi-plate lock
[C]	Method of engagement/ disengagement:	Electro-hydraulically operated by switch, disengaged when brakes are actuated; indicator light

1.3.4 Front axle and final drives

[C] - Make/Model/Type: DANA / AG 280 / 4WD axle, transmission via wet multi-plate clutch, shaft in median plane of tractor, bevel gear drive, differential with lock, planetary final drives ;
clutch electro-hydraulically operated by non locking push button;

- Differential lock:

[D] Type: Wet multi plate lock and additional limited slip multi plate lock

[D] Method of engagement/ disengagement: respectively automatic In common with rear axle differential lock,

1.3.5 Total ratios and travelling speeds: Ranges specified in 1.3.2

	Range	Gear	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed*) at rated engine speed of 2200 min^{-1} km/h
	Forward Speed			
[D]	Turtle	1	440.03	1.8
[D]	Turtle	2	360.03	2.2
[D]	Turtle	3	304.64	2.6
[D]	Turtle	4	264.02	3.0
[D]	Turtle	5	232.96	3.4
[D]	Turtle	6	208.44	3.8
[D]	Turtle	7	188.59	4.2
[D]	Turtle	8	165.01	4.8
[D]	Turtle	9	146.68	5.4
[D]	Turtle	10	132.01	6.0
[D]	Turtle	11	116.48	6.8
[D]	Turtle	12	101.55	7.8
[D]	Turtle	13	88.01	9.0
[D]	Turtle	14	76.16	10.4
[D]	Turtle	15	67.12	11.8
[D]	Turtle	16	59.11	13.4
[D]	Turtle	17	51.43	15.4
[D]	Turtle	18	44.50	17.8
[D]	Turtle	19	38.45	20.6
[D]	Turtle	20	33.28	23.8
[D]	Turtle	21	28.91	27.4

[D]	Rabbit	1	208.44	3.8
[D]	Rabbit	2	188.59	4.2
[D]	Rabbit	3	165.01	4.8
[D]	Rabbit	4	146.68	5.4
[D]	Rabbit	5	132.01	6.0
[D]	Rabbit	6	116.48	6.8
[D]	Rabbit	7	104.22	7.6
[D]	Rabbit	8	92.10	8.6
[D]	Rabbit	9	82.51	9.6
[D]	Rabbit	10	74.72	10.6
[D]	Rabbit	11	67.12	11.8
[D]	Rabbit	12	60.00	13.2
[D]	Rabbit	13	53.52	14.8
[D]	Rabbit	14	47.71	16.6
[D]	Rabbit	15	42.13	18.8
[D]	Rabbit	16	37.01	21.4
[D]	Rabbit	17	32.73	24.2
[D]	Rabbit	18	28.91	27.4
[D]	Rabbit	19	25.39	31.2
[D]	Rabbit	20	22.37	35.4
[D]	Rabbit	21	19.70	40.2
	Reverse Speed			
[D]	Turtle	1	440.03	1.8
[D]	Turtle	2	360.03	2.2
[D]	Turtle	3	304.64	2.6
[D]	Turtle	4	264.02	3.0
[D]	Turtle	5	232.96	3.4
[D]	Turtle	6	208.44	3.8
[D]	Turtle	7	188.59	4.2
[D]	Turtle	8	165.01	4.8
[D]	Turtle	9	146.68	5.4
[D]	Turtle	10	132.01	6.0
[D]	Turtle	11	116.48	6.8
[D]	Turtle	12	101.55	7.8
[D]	Turtle	13	88.01	9.0
[D]	Turtle	14	76.16	10.4
[D]	Turtle	15	67.12	11.8
[D]	Turtle	16	59.11	13.4
[D]	Turtle	17	51.43	15.4
[D]	Turtle	18	44.50	17.8

[D]	Rabbit	1	208.44	3.8
[D]	Rabbit	2	188.59	4.2
[D]	Rabbit	3	165.01	4.8
[D]	Rabbit	4	146.68	5.4
[D]	Rabbit	5	132.01	6.0
[D]	Rabbit	6	116.48	6.8
[D]	Rabbit	7	104.22	7.6
[D]	Rabbit	8	92.10	8.6
[D]	Rabbit	9	82.51	9.6
[D]	Rabbit	10	74.72	10.6
[D]	Rabbit	11	67.12	11.8
[D]	Rabbit	12	60.00	13.2
[D]	Rabbit	13	53.52	14.8
[D]	Rabbit	14	47.71	16.6
[D]	Rabbit	15	42.13	18.8

*) Calculated with a dynamic radius index of 955 mm

[D] Number of revolutions of front wheels for one revolution of rear wheels: 1.345

1.4 Power take-off

1.4.1 Main power take-off

[C] - Type: Independent

[C] - Method of engagement: Driven by wet multi-plate clutch with 178 mm dia, electro-hydraulically operated by push buttons; engagement speed controlled by actuation time of push button; additional remote control of p.t.o. clutch on rear mudguards

[C] - Number of shafts: 1

[C] - Method of changing power take-off shaft ends and speeds: Flanged stub shaft, changeable; 2 speeds may be selected by push-button electro-hydraulically

1.4.1.1 Power take-off proportional to engine speed 540E*) or 1000 min^{-1} p.t.o.
*) 540E: Economic type p.t.o. for reduced engine speed

[C]	- Location:	At rear of tractor
[C]	- Diameter of p.t.o. shaft end:	35 mm
[C]	- Number of splines:	6 (540E min^{-1}) in conformity with ISO 500:1991, type 1 21(1000 min^{-1}) in conformity with ISO 500:1991, type 2
[C]	- Height above ground:	890 mm
[C]	- Distance from the median plane of the tractor:	0 mm
[C]	- Distance behind rear wheel axis:	510 mm

	P.t.o. type	P.t.o. transmission ratio	P.t.o. speed min^{-1}	Engine speed min^{-1}	Power restriction kW	Max. torque transmissible Nm
[D]	540E	2.94	540 748	1588 2200	75 kW	not specified
[D]	1000	2.03	1000 1083	2030 2200	not specified	

[C] - Direction of rotation (viewed from behind tractor): Clockwise

1.4.1.2

[D] Power take-off proportional to ground speed: None

1.4.2

[D] Optional power take-off: Front p.t.o., independent, not fitted to tractor

1.5 Hydraulic power lift

[C]	- Make/Model:	AGCO / -
[C]	- Type:	electronic-hydraulic power lift at rear, desintegrated construction

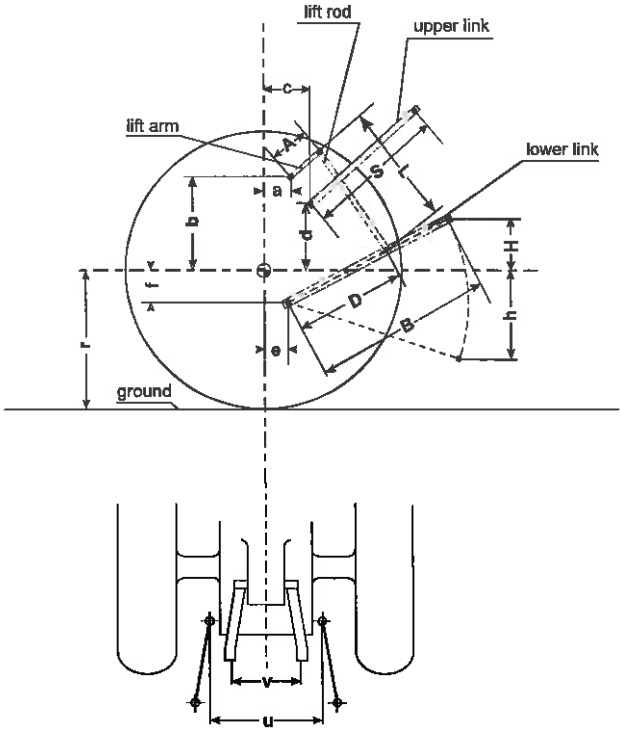
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[C]	- Hydraulic system:	Closed, load sensing, pressure and flow compensated system; supplies rear and front power lift including additional control valves and steering system
[C]	- Rear power lift:	External push buttons left and right on rear mudguards; draft, position and intermixable control; floating position, fast raising (switch with transport lock and button for "vibration damping"), raise limit, lowering throttle, lower link sensing
[C]	- Front power lift:	Optional, not fitted to tractor tested
[D/C]	- Type and number of cylinders:	2 external cylinders, double acting, piston 100 mm bore, tige 40 mm bore, 247 mm stroke
[C]	- Type of linkage lock for transport:	Hydraulic, lowering throttle
[D]	- Relief valve pressure setting:	20.0 ± 1.0 MPa
[D]	- Opening pressure of cylinder safety valve:	23.0 + 1.9 MPa
	- Lift pump:	
[D]	- Make:	REXROTH
[D]	- Model:	A10VO45 DFR1/52 R
[D]	- Type:	Variable displacement axial-piston pump
[D]	- Transmission between pump and engine:	Independently driven by gear box
[C]	- Type and number of filters:	1, exchangeable filter in return line
[D]	- Site of oil reservoir:	Separate oil reservoir with 100 dm³ volume on right hand side below cab floor
[C]	- Type, number and location of tapping points:	Double acting, quick-action; 5 coupler-pairs with adjustable flow control and 1 coupler for low pressure return line at rear of tractor Optional: 1 pair of couplers at front of tractor (not fitted)
[D]	- Maximum volume of oil available to external cylinders:	60 dm³

1.6 Three-point linkage:

1.6.1 Three-point linkage at rear:

[C]	- Category:	3, in conformity with ISO 730-1/1994 + Cor. 1:1995, with CBM quick couplers
[C]	- Category adapter:	None



	Dimensions of rear implement linkage			Projected lengths in mm		
				Dimensions	Settings used in test on page 30	38
[C]	Rear tyres 650/85 R 38 Front tyres 600/70 R 28		(r) *) (r') *)	955 725		
[C]	Length of lift arms		(A)	355		
[C]	Length of lower links		(B)	1030		
[C]	Distance of lift arm pivot points from rear wheel axis	horizontal vertical	(a) (b)	250 405		
[C]	Horizontal distance between the 2 lower link pivot points		(u)	520		
[C]	Horizontal distance between the 2 lift arm end points		(v)	560		
[C]	Length of upper link		(S)	from 770 to 1070	790	835
[C]	Distance of upper link pivot point from rear wheel axis	horizontal vertical	(c) (d)	450 / 360 / 340 275 / 305 / 395	450 275	340 395
[C]	Distance of lower link pivot points from rear wheel axis	horizontal vertical	(e) (f)	200 325		
[C]	Distance of lower link pivot points from lift rod pivot points on lower links		(D)	550 / 700	550	700
[C]	Length of lift rods		(L)	from 820 to 920	840	820

Heights (h, H, H') of lower link hitch points relative to rear wheel axis (situated 955 mm above ground), at different adjustments of L

These data are valid for unloaded power lift

[C]	Length of lift rods	(L)	820	920	840	820
[C]	Linkage distance of lift rods	(D)	700		550	700
[C]	Lowest position	(h)	615	805	725	583
[C]	Highest position	(H)	119	5	132	147
[C]	Transport position	(H')	119	5	132	147

*) Assuming r resp. r' = tyre dynamic radius index

1.6.2 [C]	Three-point linkage at front:	Not fitted	
1.7	**Swinging drawbar**		
[C]	- Type:	Longitudinally adjustable in four steps	
[C]	- Height above ground		525 mm
[C]	- Type of adjustment:		
[C]	- Distance of hitch point from rear wheel axis	Horizontal:	890 / 1040 / 1090 / 1190 mm
[C]	- Distance of hitch point from p.t.o. shaft end	Vertical: Horizontal:	365 mm 380 / 530 / 580 / 680 mm
[C]	- Lateral adjustment (centre of clevis)	Right/left hand side:	160 / 210 / 260 / 310mm
[C]	- Distance of pivot point from rear-wheel axis, horizontally:		0 mm
[C]	- Diameter of drawbar pin hole:		30 mm
[D]	- Maximum permissible vertical load:		18 kN
1.8	**Trailer hitch**		
[C]	- Make/Model/Type:	ROCKINGER / 8660001 / automatically	
[C]	- Pin diameter:		38 mm
[C]	- Height above ground:	Centre of clevis adjustable in 6 steps to	780, 850, 920, 980, 1040, 1150 mm
[C]	- Distance of hitch point from rear wheel axis, horizontally:		770 mm
[C]	- Distance of hitch point from power take-off shaft end		
	vertically:	above	-110, -40, 30, 90, 150, 260 mm
	horizontally:		260 mm
[D]	- Maximum permissible vertical load:		20kN
1.9	**Holed drawbar**	Optionally available, not fitted	

1.10	**Steering**	
[D]	- Make/Model/Type:	DANFOSS/ OSPD 80/205 ON + OVR / hydrostatic steering, acting on front wheels
[C]	- Method of operation:	By steering wheel and cylinder directly acting on steering levers
[D]	Pump:	Gear pump with 45.0 dm³/min delivery at rated engine speed (only if delivery of axial-piston pump of hydraulic circuit is ordered by control valves)
[D]	Ram:	1 integrated ram (symmetrical design) acting on steering levers; 270 mm stroke,75 mm bore and 38 mm dia of piston rod
[D]	- Working pressure:	15.0 MPa
1.11	**Brakes**	
1.11.1	Service brake	
[D]	- Make/Model/ Type:	FENDT & KNOTT / - / Pedal operated combined muscle / power braking system acting on both axles
	Rear axle brake:	Muscle power brake, 1 wet multi disc brake with 4 discs with 223,5 mm diameter each on left and right differential half shafts
	Front axle brake:	Power braking system, controlled by relay valve in brake circuit, hydraulically operated; 1 wet multi disc brake on drive shaft to front axle; 5 discs with 170 mm dia
[C]	- Method of operation:	Pedal operated, hydraulic transmission
[C]	-Trailer braking take-off:	None
1.11.2	Parking brake	
[D]	- Type:	Mechanical brake, acting on rear axle
[C]	- Method of operation:	Operated by lever

1.12 Wheels

[C] - Number

Front:	2, driving and steering
Rear:	2, driving

[C] - Wheelbase: 3075 mm

[D] - Track width adjustment:

	Minimum mm	Maximum mm	Adjustment method
Front	1692	2116	offset lug rims and reversing central wheel discs
Rear	1699	2326	central wheel discs shiftable on the axle by clamping pieces

1.13 Protective structure

[C] - Make/Model/Type: MASSEY FERGUSON / 8033 Q1 / Cab

[C] - Manufacturer's name and address: AGCO S.A., ZA N°2 BP 60307
Avenue Blaise Pascal, 60026 Beauvais Cedex
FRANCE

- Protective device

[C] Cab: Safety cab with integrated safety frame; welded and screwed profile steel tube construction, mounted on antivibration silent blocks in front, suspended in the rear; 1 door and 4 steps each at the left and right side; rear window, roof hatch and side window to open; water-heating, ventilation system, air conditioner

[C] Tiltable / not tiltable: Not tiltable

- OECD approval

[D] Approval number: 4/0 857

[D] Date of approval: 06th August 2004

[D] Nos. minor modification certificates, if any: none

1.14 Seat

1.14.1	Driver's seat	Fitted to tractor
[C]	- Make/Model:	Grammer / MSG 95 AL / 741
[C]	- Type:	Air suspended upholstered seat with backrest and armrests
[C]	- Seat and steering wheel reversible:	No
[C]	- Type of suspension:	Pneumatic
[C]	- Type of damping:	Hydraulic
	- Range of adjustment	
[C]	Longitudinal:	200 mm
[C]	Vertical:	485 to 590 mm
[C]	- Safety belt:	No
1.14.2	Optional driver's seats	
[D]	- Make/Model/Type:	Grammer / MSG 85/731; MSG 95A/731; MSG 95G/731 / mechanical suspension or pneumatic suspension
1.14.3	Passenger seat:	
[C]		Optional, fitted to tractor tested

1.15 Lighting

Electrical, 12 Volt, according to EEC legislation

		Height above ground of centre mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
[C]	Headlights	1400	Ø 120	230
[C]	Additional lights	3030	oval 70 x 120	520
[C]	Side Lights	2210	110 x 30	970
[C]	Rearlights	2124	Ø 120	1010
[C]	Reflectors	2115	Ø 55	890

2. TEST CONDITIONS

2.1 Overall dimensions

	Length mm	Width (track width as in 2.5) mm	Height at top of protective structure mm	 exhaust silencer pipe mm
Unballasted	5320	2550	3180	3140

2.2 Ground clearance 500 mm

- Clearance-limiting part: Steps left side

2.3 Tractor mass

- Unballasted (with cab)

	Without driver kg	With driver kg
Front	3560	3585
Rear	5680	5730
Total	9240	**9315**

2.4 Track specifications Not applicable

2.5 Tyres and track widths specifications

	Front	Rear
Tyres:	KLEBER Topker	KLEBER Topker
- Dimensions	600/70 R 28	650/85 R 38
- Load index speed index	157 A8	173 A8
- Type	radial	radial
- Maximum load (tyre manufacturer's)	41.25 kN*)	65.00 kN*)
- Maximum load (tractor manufacturer's)	41.25 kN	65.00 kN
at travelling speed	50 km/h	50 km/h
at tyre inflation pressure	240 kPa	240 kPa
dynamic radius index	725 mm	955 mm
Chosen track width:	1890 mm	1820 mm

*) With other tyres higher load capacity possible

2.6 Fuel

- Type:- ARAL-Diesel-fuel, in conformity with DIN 51601
- Density at 15°C: At p.t.o. tests 0.8328 g/cm³
  at drawbar power tests 0.8328 g/cm³

2.7 Oils and lubrication

2.7.1 Capacity and change interval

	Capacity dm³	Oil change h	Filter-change h
Engine	20	400	400
Gear box and rear axle	58	1200	400
Front axle	6	800	-
Rear axle	in common with gearbox		
Final drives (front each)	1.5	800	-
Final drives rear (each)	13	1200	-
Hydraulic system	100	1200	1200

2.7.2 Specifications:

	Specified	Used during test
Engine Type Viscosity Classification	BP Full-Year Engine oil SAE 10W/30, 10W/40 SAE 15W/30 or 15W/40 API-CH4	BP 10W/40 API-CH4
Gearbox Rear axle drive Type Viscosity Classification	BP Super-Tractor-Oil-Universal STOU SAE 10W/40, 15W/40 API-GL4	BP 10W/40 API-GL4
Rear axle final drives Type Viscosity Classification	BP Hypoid-Gear-Oil SAE 85W/90 API-GL5	BP 85W/90 API-GL5
Front axle drive Front axle final drives Type Viscosity Classification	BP Hypoid-Gear-Oil SAE , 85W/140 API-GL5	BP 85W/140 API-GL5
Hydraulic system Type Viscosity Classification	BP STOU SAE 10W/40 API-CH4	BP 10W/40 API-CH4

2.7.3 Grease Multi purpose grease TERRAC CHARGE

- Number of lubrication points: 19

3 COMPULSORY TESTS

3.1 Main power take off performance

Date of tests: 2005-05-09
Location of tests: DLG-Testing Station Groß-Umstadt
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

Power	Speed			Fuel consumption			Specific
	Engine	P.t.o.	Fan	hourly		specific	energy
kW	min^{-1}	min^{-1}	min^{-1}	kg/h	dm^3/h	g/kWh	kWh/dm^3
Maximum power							
3.1.1 At 2-hour test							
199.6	2001	984	1655	48.66	58.43	244	3.42
3.1.2 At rated speed							
183.7	2199	1081	1827	48.36	58.07	263	3.16
3.1.3 At standard p.t.o. speed							
198.0	2034	1000	1676	48.83	58.63	247	3.38
3.1.4 Part loads, the governor hand lever in the position corresponding to maximum power at full load (curve a)							
3.1.4.1 the torque corresponding to maximum power at rated speed							
183.7	2199	1081	1827	48.36	58.07	263	3.16
3.1.4.2 85% of the torque obtained in 3.1.4.1							
163.4	2303	1132	2178	47.46	56.99	290	2.87
3.1.4.3 75% of the torque defined in 3.1.4.2							
123.4	2315	1138	1207	36.78	44.16	298	2.79
3.1.4.4 50% of the torque defined in 3.1.4.2							
82.4	2327	1144	1205	26.32	31.60	319	2.61
3.1.4.5 25% of the torque defined in 3.1.4.2							
41.4	2341	1151	948	16.67	20.02	403	2.07
3.1.4.6 unloaded							
-	2350	1155	958	9.93	11.92	-	-

Power	Speed		Fan	Fuel consumption			Specific
	Engine	P.t.o.		hourly		specific	energy
kW	min^{-1}	min^{-1}	min^{-1}	kg/h	dm^3/h	g/kWh	kWh/dm^3

3.1.5 Part loads, the governor hand lever in the position corresponding to standard p.t.o. speed at full load (curve b)

3.1.5.1 the torque corresponding to maximum power

198.0	2034	1000	1676	48.83	58.63	247	3.38

3.1.5.2 85% of the torque obtained in 3.1.5.1

176.1	2128	1046	1748	45.62	54.78	259	3.21

3.1.5.3 75% of the torque defined in 3.1.5.2

132.7	2138	1051	1512	36.06	43.30	272	3.06

3.1.5.4 50% of the torque defined in 3.1.5.2

89.0	2148	1056	1015	26.71	32.07	300	2.77

3.1.5.5 25% of the torque defined in 3.1.5.2

44.7	2160	1062	949	16.44	19.74	368	2.26

3.1.5.6 unloaded

-	2168	1066	948	8.14	9.77	-	-

OPTIONAL RESULTS

Power kW	Speed Engine min^{-1}	Speed P.t.o. min^{-1}	Fan min^{-1}	Fuel consumption hourly kg/h	Fuel consumption hourly dm³/h	Fuel consumption specific g/kWh	Specific energy kWh/dm³
3.1.6 Part loads at different engine speeds							
3.1.6.1 maximum power at rated engine speed							
183.7	2199	1081	1827	48.36	58.07	263	3.16
3.1.6.2 80% of power obtained in 3.1.6.1 at max. speed setting							
147.0	2307	1134	2172	44.60	53.55	303	2.74
3.1.6.3 80% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed							
146.9	1981	974	1226	34.59	41.53	235	3.54
3.1.6.4 40% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed							
73.7	1975	971	953	19.34	23.22	262	3.17
3.1.6.5 60% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed							
110.7	1320	649	929	23.97	28.78	217	3.85
3.1.6.6 40% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed							
73.7	1316	647	916	16.63	19.97	226	3.69

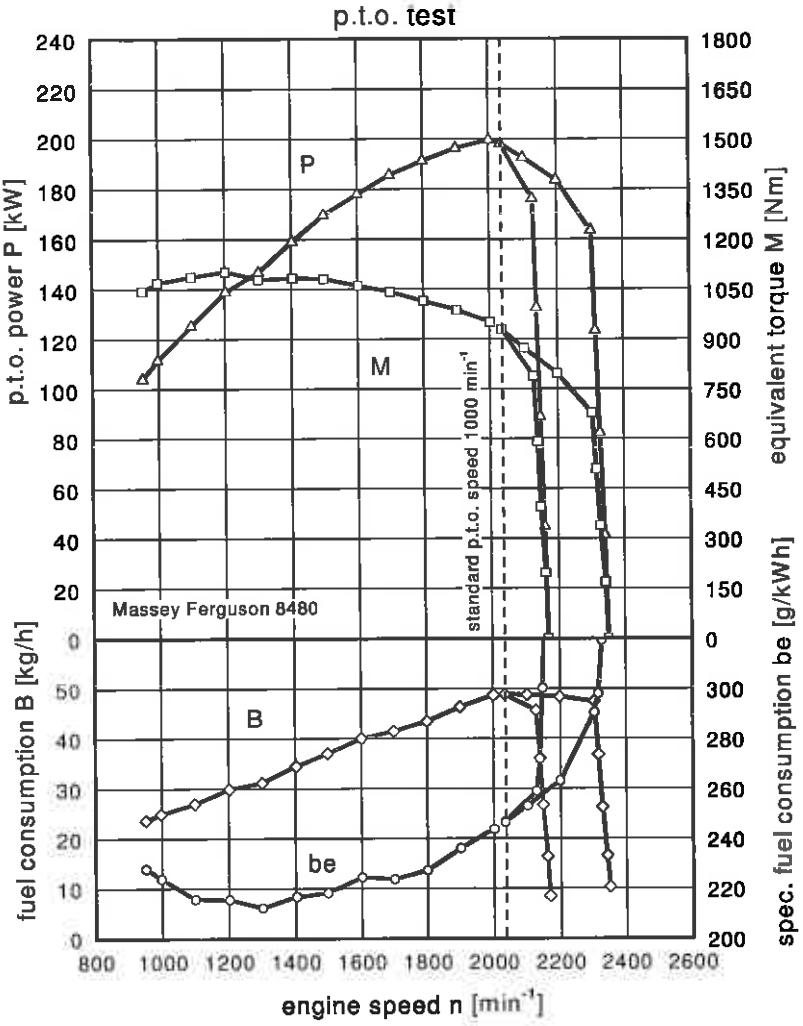
No load maximum engine speed:	2350	min^{-1}
Equivalent flywheel torque at rated engine speed:	797	Nm
Equivalent flywheel torque at 2-hour test:	952	Nm
at engine speed:	2001	min^{-1}
Maximum equivalent flywheel torque:	1082	Nm
at engine speed:	1403	min^{-1}

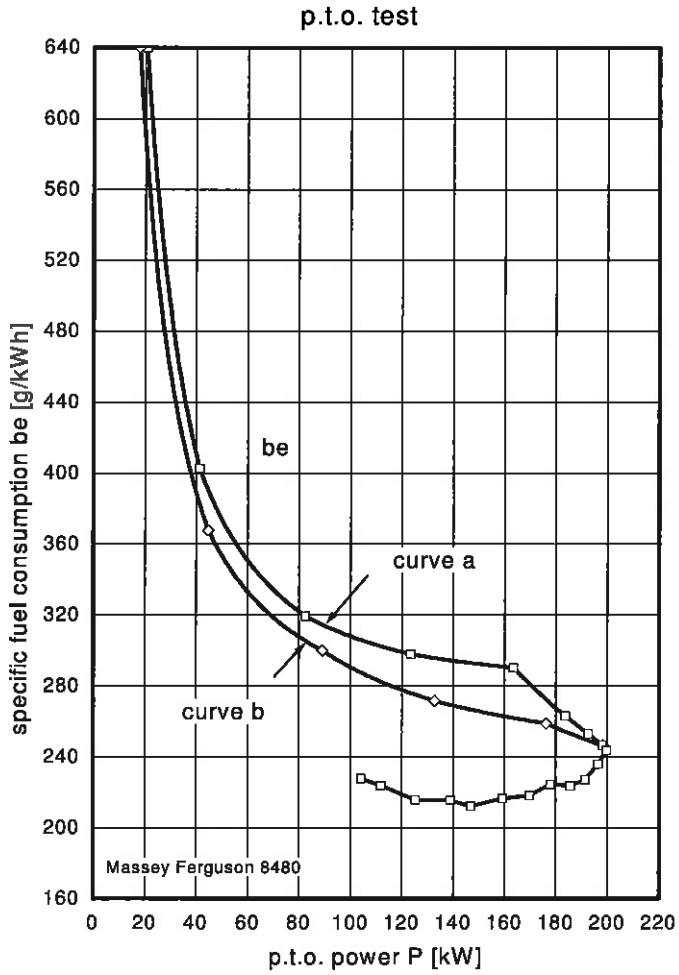
Mean atmospheric conditions

temperature:	20	°C
pressure:	99.4	kPa
relative humidity:	33	%

Maximum temperatures

coolant:	85	°C
oil:	115	°C
fuel:	55	°C
air intake:	20	°C


p.t.o. test
p.t.o. power P [kW]
equivalent torque M [Nm]
fuel consumption B [kg/h]
spec. fuel consumption be [g/kWh]
engine speed n [min-1]
P
M
B
be
Massey Ferguson 8480
standard p.t.o. speed 1000 min-1
240
220
200
180
160
140
120
100
80
60
40
20
0
1800
1650
1500
1350
1200
1050
900
750
600
450
300
150
0
50
40
30
20
10
0
300
280
260
240
220
200
800
1000
1200
1400
1600
1800
2000
2200
2400
2600


p.t.o. test
specific fuel consumption be [g/kWh]
640
600
560
520
480
440
400
360
320
280
240
200
160
be
curve a
curve b
Massey Ferguson 8480
0
20
40
60
80
100
120
140
160
180
200
220
p.t.o. power P [kW]

3.2 HYDRAULIC POWER AND LIFTING FORCE

- Date of tests: 16th June 2005

3.2.1 Hydraulic power test

3.2.1.1 Hydraulic fluid data

- Hydraulic fluid type: STOU
- Viscosity index (ISO 3448+Corr 1:1993): SAE 10W/40
- Viscosity at 65°C: 34 cst

3.2.1.2 Compulsory Reporting (Test Results):

	Pressure	Reservoir oil Temperature °C (65°C traget)		Engine speed	Flow rate	Power
		Min.	Max.			
	MPa	°C	°C	min^{-1}	l/min	kW
Rated Engine Speed *(Manufacturers Specification)*	-	-	-	2200	-	-
3.2.1.2.1 Maximum (sustained) pressure with relief valve open as measured at the coupler Pump stalled: No	19.3 [1] 19.5 [2]	60 [1] 63 [2]	65 [1] 72 [2]	2259 [1] 2261 [2]	-	-
3.2.1.2.2 Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power	17.4 [1] 17.5 [2]	65 [1] 71 [2]		2261 [1] 2253 [2]	61.9 [1] 109.7 [2]	18.1 [1] 31.7 [2]
3.2.1.2.3 Maximum available flow and maximum power from one coupler pair	3.5 15.0	60 64		2259 2253	93.0 89.7	- 22.5
3.2.1.2.4 Maximum available flow and maximum power from coupler pairs operating simultaneously (flow through two or more coupler pairs if required)	3.1 16.1	63 69		2255 2253	139.8 132.5	- 35.6

- Tapping point used for test: At rear of tractor, [1] 1 double acting control valve
  [2] 2 double acting control valves parallel connection

3.2.2 Power lift test at rear power lift – Category 3

- Linkage settings for test - see on page 14

	At the hitch points	On the frame
Height of lower hitch points above ground in down position	230 mm	
Vertical movement without lifting forces	857 mm	1003 mm
with lifting forces	807 mm	915 mm
Max. corrected force exerted through full range	58.65 kN	57.85 kN
Corresponding pressure	17.5 MPa	
Moment about rear axle	72.14 kNm	106.41 kNm
Max. tilt angle of mast from vertical	-	12°

Lifting heights relative to horizontal lower links												
mm	-446	-400	-300	-200	-100	0	+100	+200	+300	+400	+407	+469
Lifting forces at hitch points, corrected to 17.5 MPa												
kN		58.65	67.60	71.75	75.25	78.05	79.45	82.90	85.00	82.20	81.95	
Lifting forces at standard frame, corrected to 17.5 MPa												
kN	57.85	59.90	61.75	61.75	62.00	63.40	66.90	67.15	66.75	63.40		59.25

3.3 DRAWBAR POWER TEST (unballasted tractor)

Remarks:

The MF tractor MF 8480 is fitted with a stepless gear box. But for special markets in the world the gear box is modified to a stepshift version by a special electronic control unit and will be sold as a stepshift tractor. The tractor we tested wasn't fitted with the electronic control unit yet. Because we tested a stepless version of the tractor we weren't able to change the transmission ratio by the hand lever step by step as in usual use.We got a speedchart from the manufacturer wich accords with the speeds and ratios of the stepshift version. We had to adjust the speed by the hand lever. It was not possible to adjust the speed of the speedchart very exactly and that is the reason why we have differences between the calculated speed and the announced speed for each gear.

Massey Ferguson 8480 **DLG-Test No. 2005-060**

Date of tests: 20th / 21st June 2005
Type of track: Concrete

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
Unballasted	520 mm	80 kPa	80 kPa

3.3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)

Gear number and range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Fan speed	Specific fuel consumption	Specific energy	Temperature			Atmospheric conditions		
									Fuel	Coolant	Engine oil	Tempe-rature	Relative humidity	Pressure
	kW	kN	km/h	min^{-1}	%	min^{-1}	g/kWh	kWh/dm^3	°C	°C	°C	°C	%	kPa
Turtle 10	146.7	90.70	5.82	2122	14.9	1758	335	2.49	61	88	121	24	57	99.8
Turtle 11	152.2	91.94	5.96	2051	14.5	1660	323	2.58	59	88	119	23	58	99.8
Turtle 12	166.0	83.72	7.14	2005	7.9	1631	295	2.82	57	86	117	23	57	99.8
Turtle 13	167.0	75.26	7.99	2000	6.4	1673	292	2.85	62	90	121	27	49	99.8
Turtle 14	167.7	64.58	9.35	2000	4.9	1700	292	2.85	64	91	121	27	45	99.8
Turtle 15	167.9	56.82	10.64	2001	4.0	1702	291	2.86	65	92	122	27	47	99.8
Turtle 16	167.0	50.43	11.92	2002	3.4	1702	292	2.85	65	92	122	26	50	99.8
Turtle 17	165.4	43.04	13.83	1998	2.7	1692	296	2.81	65	91	122	26	50	99.8
Turtle 18	164.3	36.97	16.00	2003	2.3	1707	298	2.80	66	93	122	26	48	99.8

Gear number and range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Fan speed	Specific fuel consumption	Specific energy	Temperature			Atmospheric conditions		
									Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
	kW	kN	km/h	min^{-1}	%	min^{-1}	g/kWh	kWh/dm³	°C	°C	°C	°C	%	kPa

3.3.1 MAXIMUM POWER IN TESTED GEARS (continued)

Rabbit 8	162.5	78.03	7.50	2001	6.5	1567	300	2.77	52	85	112	22	59	99.9
Rabbit 9	160.7	69.55	8.32	2001	5.5	1721	302	2.75	58	87	113	29	36	99.9
Rabbit 10	162.4	62.38	9.37	2001	4.7	1726	299	2.78	63	90	118	29	33	99.8
Rabbit 11	164.6	56.48	10.49	2003	4.2	1717	295	2.82	64	89	119	30	31	99.8
Rabbit 12	165.0	50.25	11.82	2001	3.4	1744	294	2.83	63	90	116	32	28	99.9
Rabbit 13	165.7	44.78	13.32	2003	2.8	1737	294	2.83	66	91	119	31	29	99.8
Rabbit 14	166.0	39.26	15.23	2003	2.2	1736	294	2.84	67	92	120	31	29	99.8
Rabbit 15	165.7	35.85	16.64	2005	2.0	1727	295	2.82	68	91	121	31	27	99.8

Massey Ferguson 8480 **DLG-Test No. 2005-060**

Gear number and range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Fan speed	Specific fuel consumption	Specific energy	Temperature			Atmospheric conditions		
									Fuel	Coolant	Engine oil	Tempe-rature	Relative humidity	Pressure
	kW	kN	km/h	min^{-1}	%	min^{-1}	g/kWh	kWh/dm^3	°C	°C	°C	°C	%	kPa
	FUEL CONSUMPTION													
3.3.2.1	In selected gear, at maximum power at rated speed													
Turtle 15	153.7	46.24	11.96	2196	3.2	1879	320	2.60	61	90	116	27	32	100.3
3.3.2.1.1	75 % of pull at maximum power at rated speed													
Turtle 15	123.3	34.67	12.81	2300	2.2	2193	361	2.30	62	90	120	28	28	100.3
3.3.2.1.2	50 % of pull at maximum power at rated speed													
Turtle 15	83.5	23.00	13.07	2313	1.4	2131	414	2.01	62	88	119	28	31	100.3
3.3.2.1.3	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1													
Turtle 16	122.9	34.62	12.78	2099	2.0	1697	315	2.65	63	88	119	27	31	100.2
3.3.2.1.4	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2													
Turtle 16	83.5	22.98	13.08	2121	1.3	1450	354	2.35	63	88	118	28	30	100.2
3.3.2.2	In selected gear nearest to 7.50 km/h at rated speed													
Turtle 12	157.3	72.13	7.85	2200	6.0	1831	310	2.68	57	85	115	26	41	100.3
3.3.2.2.1	75 % of pull at maximum power at rated speed													
Turtle 12	126.5	54.12	8.42	2300	3.9	2192	353	2.36	58	87	119	27	37	100.3
3.3.2.2.2	50 % of pull at maximum power at rated speed													
Turtle 12	86.8	36.03	8.67	2316	2.4	1204	363	2.30	62	88	118	26	42	100.3
3.3.2.2.3	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1													
Turtle 13	126.1	54.06	8.39	2044	3.9	1386	291	2.86	61	87	116	26	40	100.2
3.3.2.2.4	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2													
Turtle 13	86.3	36.06	8.61	2054	2.7	1200	318	2.62	62	88	117	26	41	100.3

4 ADDITIONAL TESTS under the responsibility of the DLG Testing Station

Not covered by the approval.

4.1 DRAWBAR POWER TEST (ballasted tractor with dual wheels)

4.1.1 Tractor mass

ballasted (with cab); dual wheels (4 front wheels, 4 rear wheels)

	Without driver kg	With driver kg
Front	5620	5645
Rear	8770	8820
Total	14390	14465

4.1.2 Tyres and track width specification

Dual wheels (4 front wheels, 4 rear wheels)

	Front	Rear
Tyres:	Michelin Agribib	Michelin Agribib
- Dimensions	480/70 R 34	520/85 R46
- Load index speed index	146 A8	158 A8
- Type	radial	radial
- Maximum load (tyre manufacturer's)	22.40 kN*)	42.50 kN*)
- Maximum load (tractor manufacturer's)	22.40 kN	37.00 kN
at travelling speed	40 km/h	40 km/h
at tyre inflation pressure	160 kPa	160 kPa
dynamic radius index	725 mm	955 mm
Chosen track width:	2850 mm	2730 mm

*) With other tyres higher load capacity possible

Massey Ferguson 8480

DLG-Test No. 2005-060

4.1.3 Test Results Drawbar Power Test with dual wheels

Date of tests: 12th and 13th July 2005
Type of track: Concrete

	Height of drawbar above ground	Tyre inflation pressure Front	Rear
Unballasted	520 mm	60 kPa	60 kPa

Gear number and range	Power	Drawbar pull	Speed	Engine speed	Slip of Wheels	Fan speed	Specific Fuel consumption	Specific energy	Temperature Fuel	Coolant	Engine Oil	Atmospheric conditions Tempe-rature	Relative humidity	Pressure
	kW	kN	km/h	min^{-1}	%	min^{-1}	g/kWh	kWh/dm^3	°C	°C	°C	°C	%	kPa

4.1.3.1 MAXIMUM POWER IN TESTED GEARS

Turtle 7	134.2	127.33	3.79	2223	14.8	1828	379	2.31	64	88	117	27	46	100.3
Turtle 8	143.2	127.90	4.03	2076	15.2	1742	342	2.44	62	87	116	27	44	100.3
Turtle 9	157.2	119.07	4.75	2001	10.1	1681	312	2.67	60	88	119	26	47	100.4
Turtle 10	162.2	109.37	5.34	2001	8.0	1668	302	2.76	57	86	118	25	51	100.4
Turtle 11	164.7	96.26	6.16	2001	6.3	1669	296	2.81	54	85	116	22	61	100.4
Turtle 12	163.5	86.38	6.82	2001	5.6	1701	299	2.79	65	91	120	27	45	100.6
Turtle 13	164.1	73.31	8.06	2001	4.6	1696	298	2.80	65	90	120	28	43	100.6
Turtle 14	163.4	63.54	9.26	2001	3.9	1712	298	2.79	66	92	120	28	43	100.6
Turtle 15	161.4	54.00	10.76	1999	2.8	1714	303	2.75	67	92	121	29	41	100.6
Turtle 16	159.7	47.41	12.13	2002	2.8	1729	307	2.71	68	94	123	28	43	100.6
Turtle 17	157.1	41.24	13.72	2001	2.0	1729	310	2.68	63	88	115	30	37	100.4
Turtle 18	154.0	34.51	16.07	2005	1.7	1734	317	2.63	64	87	117	30	33	100.4

Gear Number and range	Power	Drawbar Pull	Speed	Engine Speed	Slip of Wheels	Fan speed	Specific Fuel consumption	Specific energy	Temperature			Atmospheric conditions		
									Fuel	Coolant	Engine Oil	Temperature	Relative humidity	Pressure
	kW	kN	km/h	min^{-1}	%	min^{-1}	g/kWh	kWh/dm^3	°C	°C	°C	°C	%	kPa

4.1.3.1 MAXIMUM POWER IN TESTED GEARS (continued)

Rabbit 7	155.8	84.77	6.62	2007	5.1	1659	314	2.65	61	88	115	26	46	100.6
Rabbit 8	157.1	76.78	7.37	2001	4.8	1664	310	2.69	53	85	116	24	50	100.7
Rabbit 9	160.7	68.91	8.39	2000	3.9	1662	304	2.74	57	87	118	22	52	100.6
Rabbit 10	161.9	61.54	9.47	2000	3.9	1668	301	2.77	59	89	120	24	50	100.7
Rabbit 11	162.3	56.14	10.41	1995	3.1	1659	301	2.77	59	89	119	22	56	100.7
Rabbit 12	161.6	48.50	12.00	2001	2.6	1682	302	2.76	60	89	118	24	52	100.6
Rabbit 13	161.3	43.76	13.27	2004	2.4	1693	304	2.74	61	90	120	23	54	100.6
Rabbit 14	160.0	38.74	14.87	2002	2.1	1692	307	2.72	62	90	120	24	52	100.6
Rabbit 15	158.2	33.73	16.89	2003	1.8	1694	309	2.69	62	90	120	24	52	100.6

Gear number and range	Power	Drawbar pull	Speed	Engine Speed	Slip of Wheels	Fan speed	Specific fuel consumption	Specific energy	Temperature			Atmospheric conditions		
									Fuel	Coolant	Engine oil	Tempe-rature	Relative humidity	Pressure
	kW	kN	km/h	min^{-1}	%	min^{-1}	g/kWh	kWh/dm^3	°C	°C	°C	°C	%	kPa
	FUEL CONSUMPTION													
4.1.3.2	In selected gear, at maximum power at rated speed													
Turtle 11	150.5	80.22	6.75	2201	5.1	1898	327	2.55	66	90	121	29	41	100.3
4.1.3.2.1	75 % of pull at maximum power at rated speed													
Turtle 11	120.6	60.15	7.22	2299	3.9	2254	373	2.23	65	88	121	30	38	100.3
4.1.3.2.2	50 % of pull at maximum power at rated speed													
Turtle 11	82.1	40.07	7.38	2313	2.4	2201	427	1.95	65	88	119	29	40	100.3
4.1.3.2.3	Next higher gear at reduced engine speed; same pull and travelling speed as in 4.1.3.2.1													
Turtle 12	120.9	60.15	7.23	2032	3.8	1606	300	2.78	65	88	115	30	35	100.3
4.1.3.2.4	Next higher gear at reduced engine speed; same pull and travelling speed as in 4.1.3.2.2													
Turtle 12	81.5	39.98	7.34	2043	3.2	1397	328	2.54	66	88	115	30	35	100.3
4.1.3.3	In selected gear nearest to 7.50 km/h at rated speed													
Turtle 12	147.8	68.55	7.76	2200	4.4	1939	330	2.52	65	89	118	34	25	100.3
4.1.3.3.1	75 % of pull at maximum power at rated speed													
Turtle 12	117.8	51.40	8.25	2300	3.1	2260	382	2.18	63	87	118	33	26	100.3
4.1.3.3.2	50 % of pull at maximum power at rated speed													
Turtle 12	80.1	34.25	8.42	2312	2.0	2279	441	1.89	62	85	117	34	25	100.3
4.1.3.3.3	Next higher gear at reduced engine speed; same pull and travelling speed as in 4.1.3.3.1													
Turtle 13	118.3	51.39	8.29	1955	3.4	1602	301	2.77	65	89	118	30	30	100.2
4.1.3.3.4	Next higher gear at reduced engine speed; same pull and travelling speed as in 4.1.3.3.2													
Turtle 13	80.6	34.27	8.47	1955	1.9	1348	324	2.57	65	88	116	30	32	100.2

4.2 Additional power lift test at rear power lift with different linkage adjustments to obtain maximum lifting force:

- Linkage settings for test - see on page 14

	At the hitch points	On the frame
Height of lower hitch points above ground in down position	372 mm	
Vertical movement without lifting forces	730 mm	685 mm
with lifting forces	659 mm	649 mm
Max. corrected force exerted through full range	71.75 kN	80.15 kN
Corresponding pressure	17.5 MPa	
Moment about rear axle	88.25 kNm	147.44 kNm
Max. tilt angle of mast from vertical	-	2°

Lifting heights relative to horizontal lower links												
mm	-258	-256	-200	-100	0	+100	+200	+300	+393	+400		
Lifting forces at hitch points, corrected to 17.5 MPa												
kN	71.75		77.35	82.20	87.10	88,50	91.30	92.65		89.20		
Lifting forces at standard frame, corrected to 17.5 MPa												
kN		80.15	83.60	86.40	88.05	87.80	86.40	85.00	82.90			

5	**REPAIRS**	**None**
6	**REMARKS**	**None**

Head of Vehicle Technology

Dipl.-Ing. (FH) Ottmar Degrell

Date: 30th March 2006

Test carried out by

Dipl.-Ing. (FH) Thomas Feuerstein

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