SILSOE RESEARCH INSTITUTE

OECD Report

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CODE 2

OECD RESTRICTED STANDARD CODE FOR THE OFFICIAL TESTING OF AGRICULTURAL AND FORESTRY TRACTOR PERFORMANCE

Case IH PDR7BC2 (MXU 125) Four-Wheel Drive Tractor with 16-speed Semi Powered Shift Transmission (40 km/h)



Manufactured by: CNH UK Limited
Basildon
Essex SS14 3AD
United Kingdom

Reference No: 853

Date: October 2004

File: 6673/2003

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ENGINEERING for Life

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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.

[C]	Tractor manufacturer's name and address:	CNH UK Limited Basildon, Essex, SS14 3AD United Kingdom
[C]	Location of tractor assembly:	Basildon, Essex / St Valentin, Austria
[D]	Submitted for test by:	The manufacturer
[C]	Selected for test by:	The manufacturer with the agreement of the testing station
[D]	Place of running in:	Basildon. Essex
[D]	Duration of running in:	76 hours
[C]	Location of test:	Silsoe Research Institute Wrest Park, Silsoe, MK45 4HS United Kingdom

1. SPECIFICATIONS OF TRACTOR

1.1 Identification

1.1.1

[C]	Make of tractor:	Case IH
[C]	Model (trade name):	MXU125
[C]	Type:	Four- wheel drive, unit construction

1.1.2 *Numbers*

[D]	1st Serial No or prototype:	ACP207661/EKP001001
[C]	Serial No:	216664

1.1.3 *Other specifications (if applicable)*

[D]	Model(s) for other countries:	None
[C]	Transmission type or gears x ranges:	16-Speed Semi-Power Shift
[C]	Speed version:	40 km/h
[C]	Manufacturer identification or Technical type number:	PDR7BC2

1.2 Engine

[C]	Make:	CNH
[C]	Model:	F4DE0684B*D
[C]	Type:	4 stroke turbocharged direct injection and after cooled diesel
[C]	Serial No:	00076512

1.2.1 *Cylinders*

[C]	Number/disposition:	6 vertical in-line
[D]	Bore/stroke:	104.0mm/132.0mm
[D]	Capacity:	6728 cm^3
[D]	Compression ratio:	17.0 : 1
[D]	Arrangement of valves:	Overhead
[D]	Cylinder liners:	None, monobloc construction

1.2.2 *Supercharging*

[D]	Make/Model:	Holset/HX35W, HX35
[C]	Type:	Exhaust driven
[D]	Pressure:	0.089 MPa at rated speed/load

1.2.3 *Fuel system*

[D]	Fuel feed system:	Gear pump
[C]	Make, type and model of fuel filter:	None, two disposable canister filters incorporating sediment and water separation plus plastic strainer in tank
[D]	Capacity of fuel tank:	254 dm^3
[D]	Make, type and model of injection pump:	Bosch, high pressure pump – common rail/CR/CP3 S3
[D]	Serial No:	489 8921
	Manufacturer's production setting of injection pump	
[C]	Flow rate (rated engine speed and full load):	74 mm^3 ±5% per stroke at 2200 min^{-1} (rev/min) 27.84 - 30.77dm^3/h
[D]	Timing:	Variable
[D]	Make, type and model of injectors:	Bosch, managed by electronic control unit DSLA143 P970
[D]	Injection pressure:	90 MPa

1.2.4 *Governor*

[C]	Make:	Bosch
[D]	Model:	None
[C]	Type:	Managed by electronic control unit
[C]	Governed range of engine speed:	700 to 2375 min^{-1} (rev/min)
[C]	Rated engine speed:	2200 min^{-1} (rev/min)

1.2.5 *Air cleaner*

[C]	Pre-cleaner	Not fitted
[C]	Type:	----
[C]	Location:	----
	Main cleaner Make:	Donaldson
[C]	Type:	3 stage dry paper element with replaceable cartridge
[D]	Model:	None
[C]	Location of air intake:	Under engine bonnet at front and above radiator.
[C]	Maintenance indicator:	Warning light on instrument panel

1.2.6 *Lubrication system*

[D]	Type of feed pump:	Forced feed from concentric rotor pump
[D]	Type of filter:	Mesh strainer in sump on suction line and full flow disposable canister on pressure line to engine
[C]	Number:	1

1.2.7 *Cooling system*

[C]	Type of coolant:	Water and antifreeze (50% solution)
[D]	Type of pump:	Belt driven centrifugal impeller
	Specification of fan	
[C]	Number of fan blades:	5
[C]	Fan diameter:	510 mm
[D]	Coolant capacity:	23 dm^3
[D]	Type of temperature control:	Thermostat with full flow bypass
[D]	System pressure:	100 kPa

1.2.8 *Starting system*

[D]	Make:	Bosch
[D]	Model:	EV3
[C]	Type:	Electrical, positive engagement, solenoid operated
[D]	Starter motor power rating:	3.1/3.6 kW 3.0 kW (Reduction geared)
[D]	Cold starting aid:	Phillips and Temro, injection management thermostarter
[C]	Safety device:	Starting inoperable unless shuttle lever in neutral, clutch pedal depressed and operator seat presence switch is activated

1.2.9 *Electrical system*

[C]	Voltage:	12 V
	Generator:	Alternator
[C]	Make:	Denso
[C]	Model:	A 127
[C]	Type:	Belt driven
[C]	Power:	70 amps at 6000 min^{-1} (rev/min)
	Batteries	
[C]	Number:	1 Exide lead acid, mounted behind right hand steps
[D]	Rating:	176 Ah at 20 hours

1.2.10 *Exhaust system*

[C]	Make:	COR.TUBI
[D]	Model:	None
[C]	Type:	Vertical stack pipe with intergral silencer
[C]	Location:	Engine rear on right hand side
[C]	Height of outlet above ground:	2940 mm

1.3 Transmission

1.3.1 *Clutch (Travel alone)*

[D]	Make:	CNH
[D]	Model:	None
[D]	Type:	Wet multiplate in gearbox, for travel only
[D]	Number of plates:	9
[D]	Diameter of plates:	160 mm
[C]	Method of operation:	Electro-hydraulic with pedal override

1.3.2 *Gear box*

[D]	Make:	CNH
[C]	Model:	Semi power shift
[C]	Description:	Electro/Hydraulic, synchromesh operation. 4 powershift gears with 4 ranges (total 16 speeds) selected by a combination of mechanical lever and electrical buttons located within the right-hand console Forward/reverse is actuated by a steering column mounted shuttle lever.

		Forward	Reverse
[C]	Number of gears	4	4
[C]	Number of ranges/groups	4	4
[C]	Total of arrangements	16	16

Available options:

12 x12 with or without creep (30/40 km/h)
16 x 16 with or without creep (30/40 km/h)
24 x 24 with or without creep (30/40 km/h)
17 x 16 less creep only (50km/h)

1.3.3 *Rear axle and final drives*

[D]	Make:	CNH
[D]	Model:	None
[D]	Type:	Crown wheel pinion with differential and inboard epicyclic reduction gear final drive
	Differential lock:	
[D]	Type:	Mechanical or multiplate
[C]	Method of engagement:	Electro-hydraulic actuation in response to signal from switch on right-hand control panel or auto diff actuation
[C]	Method of disengagement:	Via panel switch or in response to signal from brakes on application, or auto diff lock disengagement

1.3.4 *Front axle and final drives*

[D]	Make:	CNH
[D]	Model:	None
[D]	Type:	Crown wheel and pinion with differential and outboard epicyclic reduction gear final drives
	Drive engagement:	
[D]	Type:	Mechanical or multiplate clutch – located within the gearbox
[C]	Method of operation:	Electro-hydraulic actuation in response to signal from switch on right-hand control panel or auto 4wd engagement
	Differential lock:	
[D]	Type:	Mechanical or multiplate clutch
[C]	Method of engagement:	Electro-hydraulic actuation in response to signal from switch on right-hand control panel or auto diff lock actuation
[C]	Method of disengagement:	Via panel switch or in response to signal from brakes on application, or auto diff lock disengagement

1.3.5 *Total ratios and travelling speeds*

	Gear	Group or range	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed at rated engine speed:* 2200 rev/min km/h
	Forward			
[C]	1	A	300.12	2.27
[C]	2	A	244.86	2.78
[C]	3	A	200.93	3.39
[C]	4	A	163.80	4.15
[C]	5	B	127.76	5.32
[C]	6	B	104.15	6.53
[C]	7	B	85.53	7.95
[C]	8	B	69.73	9.75
[C]	9	C	76.75	8.86
[C]	10	C	62.57	10.87
[C]	11	C	51.38	13.24
[C]	12	C	41.89	16.24
[C]	13	D	32.57	20.82
[C]	14	D	26.63	25.54
[C]	15	D	21.87	31.09
[C]	16	D	17.83	38.14
	Reverse			
[C]	1	A	303.57	2.24
[C]	2	A	247.56	2.75
[C]	3	A	203.30	3.35
[C]	4	A	165.73	4.10
[C]	5	B	129.29	5.26
[C]	6	B	105.38	6.45
[C]	7	B	86.54	7.86
[C]	8	B	70.55	9.64
[C]	9	C	77.66	8.76
[C]	10	C	63.31	10.74
[C]	11	C	51.99	13.08
[C]	12	C	42.38	16.05
[C]	13	D	33.06	20.57
[C]	14	D	26.95	25.24
[C]	15	D	22.13	30.73
[C]	16	D	18.04	37.70

(*) Calculated with a tyre dynamic radius index of 820 mm

[C] Number of revolutions of front wheels for one revolution of rear wheels: 1.353

1.4 Power take-off

1.4.1 *Main power take-off*

[C]	Type:	Independent
[C]	Method of engagement:	Electro – hydraulic operated multi-plate clutch in response to a signal from switch on the right-hand control panel
[C]	Number of shafts:	1 interchangeable shaft, 6 or 21 splines to ISO 500/1991
[C]	Method of changing power take-off speeds:	Two speed shiftable, 540 or 1000 min^{-1} (rev/min) by lever on right-hand console or by changing shafts
	Clutch	
[D]	Make:	CNH
[D]	Model:	None
[D]	Type:	Multiplate, wet
[D]	Number of plates:	6
[D]	Diameter of plates:	140.0 mm

1.4.1.1 Power take-off proportional to engine speed

Power take-off at 540 min^{-1} (rev/min)

[C]	Location:	Rear of tractor
[C]	Diameter of power take-off shaft:	34.9 mm
[C]	Number of splines:	6 in conformity with ISO 500/1991 (available option 21)
[C]	Height above ground:	772 mm
[C]	Distance from the median plane of the tractor:	Central
[C]	Distance behind rear wheel axis:	555 mm
[C]	PTO speed at rated engine speed:	603 min^{-1} (rev/min)
[C]	Engine speed at standard power take-off speed:	1969 min^{-1} (rev/min)
[C]	Ratio of rotation speeds:	3.65
[D]	Power restriction:	None
[D]	Maximum torque transmissible:	None
[C]	Direction of rotation (viewed from behind tractor):	Clockwise

Power take-off at 1000 min^{-1} (rev/min)

[C]	Location:	Rear of tractor
[C]	Diameter of power take-off shaft:	34.9 mm
[C]	Number of splines:	21 in conformity with ISO 500/1991 (available option 6)
[C]	Height above ground:	772 mm
[C]	Distance from the median plane of the tractor:	Central
[C]	Distance behind rear wheel axis:	555 mm
[C]	PTO speed at rated engine speed:	1038 min^{-1} (rev/min)
[C]	Engine speed at standard power take-off speed:	2120 min^{-1} (rev/min)
[C]	Ratio of rotation speeds:	2.12
[D]	Power restriction	None
[D]	Maximum torque transmissible:	None
[C]	Direction of rotation (viewed from behind tractor):	Clockwise

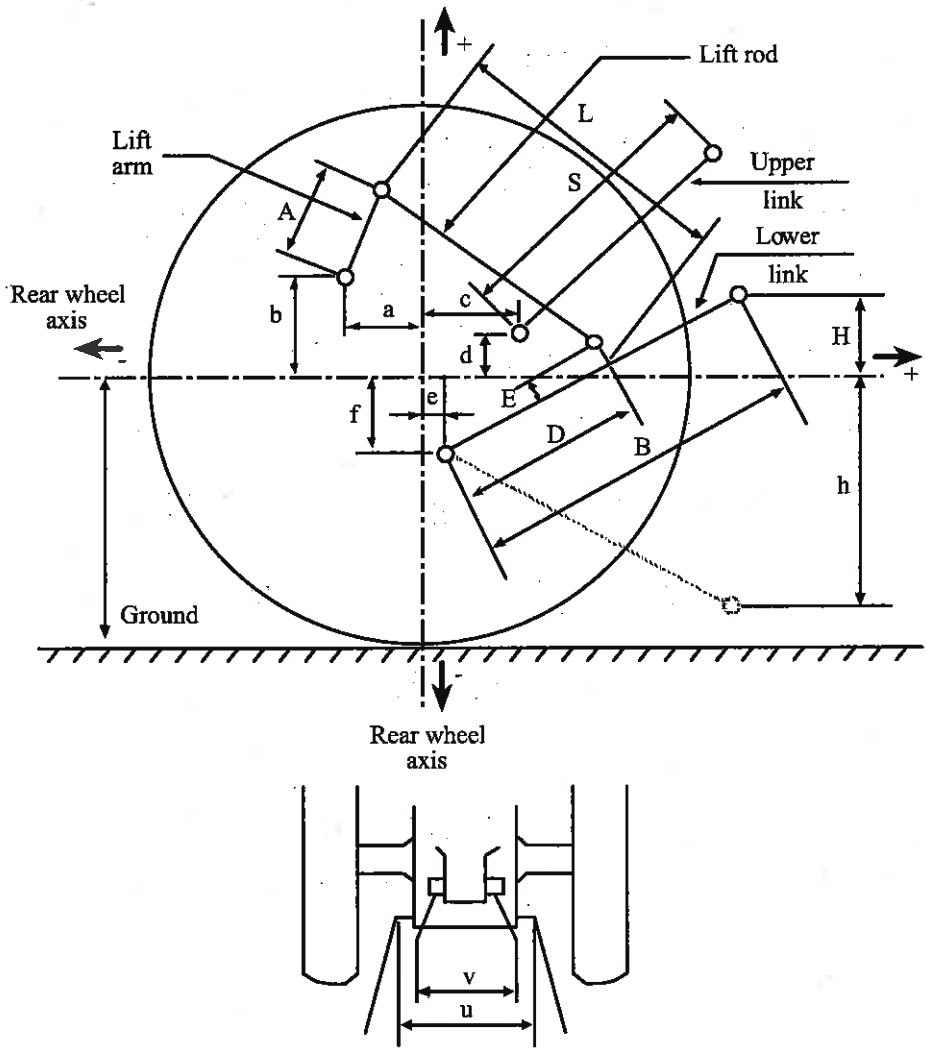
1.4.1.2 Power take-off proportional to ground speed — Not applicable

1.5 Hydraulic power lift

[C]	Make:	CNH
[D]	Model:	None
[D]	Type:	Mechanical closed centre
[C]	Type and number of cylinders:	1 internal plus 2 single acting externally mounted assist rams.
[C]	Type of linkage lock for transport:	Hydraulic
[D]	Pump maximum pressure / Relief valve pressure setting:	20.5 – 21.5 MPa
[D]	Opening pressure of cylinder safety valve:	22.0 – 23.0 MPa
[D]	Lift pump type:	Variable displacement piston pump
[D]	Transmission between pump and engine:	Gear driven from PTO shaft, independent of main and PTO clutches
[C]	Type and number filters:	1 disposable canister filter and 1 cartridge filter
[C]	Site of oil reservoir:	Rear axle housing
[C]	Type, number and location of tapping points:	2 remote couplers at rear of tractor
[D]	Maximum volume of oil available to external cylinders:	19 litres under normal conditions (flat fields) 27 litres when operating stationary on level ground

1.6 Three-point linkage

[C]	Category:	2 in conformity with ISO 730-1:1994 + Cor.1:1995
[C]	Category adapter:	None
[C]	Controls:	Mechanical draught / position control with lower link sensing



LIFT TEST
Linkage geometry

Fig 1.1 and Fig 1.2

Table 1.1
Dimensions of linkage when attached to the standard frame (ISO 730-1-1994 CAT 2)

				Dimensions or ranges	Settings used in tests		
					3.2.2	7.1	7.2
				mm	mm	mm	mm
[C]	Length of lift arms:		(A)	310	310	310	310
[C]	Length of lower links:		(B)	950	950	950	950
[C]	Distance of lift arm pivot point from rear wheel centre line:	horizontally: vertically:	(a) (b)	138 370	138 370	138 370	138 370
[C]	Horizontal distance between the two lower link points:		(u)	460	460	460	460
[C]	Horizontal distance between the two lift arm end points:		(v)	550	550	550	550
[C]	Length of upper link:		(S)	585 – 780	700	723	710
[C]	Distance of upper link pivot point from rear wheel centre line:	horizontally: vertically:	(c) (d)	430 – 455 208 – 275	455 208	430 275	430 275
[C]	Distance of lower link pivot point from rear wheel centre line:	horizontally: vertically:	(e) (f)	168 235	168 235	168 235	168 235
[C]	Distance of lower link points to lift rod pivot points on lower link centre line:		(D)	505,585,665	505	665	585
[C]	Length of lift rods:		(L)	680 – 815	762	815	815/735
	Height of lower hitch points (*) Relative to the rear wheel centre line, situated 820 mm above the ground level:						
[C]	- in low position		(h)	80 – 740	603	492	545/460
[C]	- in high position		(H)	0–225	0	0	0/50
[C]	Height of lower hitch points when locked in transport position (*)			Any height within lift range (hydraulic transport lock)			

*Assuming r = tyre dynamic radius index of 820 mm

1.7 Swinging drawbar

[C]	Type:		Clevis		
[C]	Height above ground:	Unballasted Maximum:	558 mm		
		Minimum:	448 mm		
[C]	Type of adjustment:		Inverting drawbar		
[C]	Distance of hitch point from rear-wheel axis, horizontally:		805 mm	905 mm	955 mm
[C]	Distance of hitch point from power take-off shaft end:				
		Vertically:	214 mm	324 mm	
		Horizontally:	250 mm	350 mm	400 mm
[C]	Lateral adjustment (centre of clevis):				
		Right-hand:	173 mm	210 mm	220 mm
		Left-hand:	173 mm	210 mm	220 mm
[C]	Distance of pivot point from rear axles	horizontally:	243 mm	behind rear axle	
[C]	Width of clevis:		70 mm		
[C]	Diameter of drawbar pin hole:		33 mm		
[D]	Maximum vertical permissible load:	Clevis uppermost:	2040 kg	1330 kg	1140 kg
		Clevis underneath:	1305 kg	1225 kg	1045 kg

1.8 Trailer hitch

None fitted

1.9 Holed drawbar

Type: None fitted

1.10 Steering

[D]	Make:	CNH
[D]	Model:	None
[D]	Type:	Hydrostatic
	Method of operation	
[C]	Pump:	Bosch
[C]	Motor:	Sauer Danfoss OSPC-160-OR
[C]	Ram:	2, balanced system with double acting cylinders one operating each steering arm
[D]	Filter:	Integral with hydraulic power lift system
[D]	Working pressure:	17 MPa

1.11 Brakes

1.11.1 *Service brake*

[D]	Make:	CNH
[D]	Model:	None
[D]	Type:	Oil-immersed single plate disc
[C]	Method of operation:	Hydraulic, independent on rear wheels (On 4WD models. When the service brakes are activated the front wheel drive is automatically engaged providing 4-wheel braking)
[C]	Trailer braking take-off:	Hydraulic connector fitted to ISO 5676-1983

1.11.2 *Parking brake*

[D]	Type:	Fully independent four plate disc operating on bevel pinion shaft
[C]	Method of operation:	Hand lever with ratchet

1.12 Wheels

Number

[C] Front: 2 driving/steering

[C] Rear: 2 driving

[C] Wheelbase: 2652 mm

Track width adjustment:

		Minimum mm	Maximum mm	Adjustment method
[C]	Front*	1630	2080	Reversing wheels and offset lug rims
[C]	Rear	1730	2130	Reversing wheels and offset lug rims

*55° steering angle available only on 1860 mm and larger track settings

1.13 Protective structure

[C] Make: CNH

[C] Model: APH02

[C] Type: Rear mounted 2 post folding ROPS

[C] Manufacturer's name and address: CNH UK Ltd
Cranes Farm Road
Basildon
Essex
SS14 3AD

Protective device

[C] Cab/frame/rollguard/ other: ROPS

[C] Tiltable/Not tiltable: Tiltable

OECD approval

[C] Approval number: 4/0739

[C] Date of approval: 19 September 2002

Nos. minor modification certificates, if any: 2

The certificates for minor modifications established by Danish testing station

1.14 Seat

1.14.1 *Driver's seat*

[C]	Make/model/Type:	Grammer MSG 44/520, 85/731 EEC approved to 78/764/EEC – e1*0008*01, e1*10009*04
[C]	Seat and steering wheel reversible:	No
[C]	Type of suspension:	Parallelogram – mechanical spring
[C]	Type of damping:	None
	Range of adjustment -	
[C]	Longitudinal:	+ 90 mm / -120 mm
[C]	Vertical:	± 75 mm
[C]	Safety belt:	Yes

1.14.2 *Optional driver's seat(s)*

1.14.3 *Passenger seat* — Not fitted

1.15 Lighting

		Height above ground to centre	Size	Distance from outside edge of lights to medium plane of tractor
		mm	mm	mm
[C]	Headlights	1310	170 x 170	190
	Sidelights	---	—	—
[C]	Rear lights	1835	125 x 80	863
[C]	Rear fender reflectors	1835	125 x 80	820
[C]	Rear fender strip reflectors	1820	230 x 50	720

2 TEST CONDITIONS

2.1 Overall dimensions

	length	Width		Height at top of	
		minimum	maximum	Protective structure	Exhaust pipe
	mm	mm	mm	mm	mm
Unballasted	4505	2340	2340	2940	2940

2.2 Ground clearance (unballasted tractor) 362 mm

Clearance-limiting part: Drawbar clevis in lowest position

2.3 Tractor mass

Mass (with or without frame/roll guard/cab/other): With ROPS

	Unballasted	
	Without driver	With driver
	kg	kg
Front	1981	1997
Rear	3033	3092
Total	5014	5089

2.4 Ballast Not applicable

2.5 Track specifications Not applicable

2.6 Tyres and track width specification

	Front	Rear
Tyres Dimensions ply rating type	 480/65R28 136 A8 Radial	 600/65R 38 153 A8 Radial
Maximum load (tyre manufacturer's) 30/40/50 km/h	15.4/14.4/13.1 kN	25.3/23.6/21.4 kN
Maximum load (tractor manufacturer's) 30/40/50	15.4/14.4/13.1 kN	25.3/23.6/21.4 kN
Inflation pressure (tyre manufacturer's)	62 kPa	62 kPa
Dynamic radius index	640 mm	820 mm
Chosen track width (manufacturer's nominal)	1760 mm	1740 mm

2.7 Fuel

Type: Diesel oil to Class D, 1.5 to 5.5 cSt.

Density at 15° C: 0.8453 g/cm^3

2.8 Oils and lubrication

2.8.1 *Capacity and change interval*

	Capacity	Oil change	Filter change
	dm^3	h	h
Engine	15.0	600	600
Front axle differential	9.0	1200	None
Front axle hub (each)	1.7	1200	None
Gearbox	62.0	1200	600/1200
Rear axle Hydraulic system Final drives (rear) Steering	Integral with gearbox		
Brakes	0.5	Top-up	None

2.8.2 *Specifications (SAE, APL, CCMC, ACEA, MILL, ISO)*

	spec	Recommended	Used during test
Engine oil Type: Viscosity Classification:	MS 1121	SAE 10W/30 11.5 cSt at 100° C API CH – 4	As recommended
Transmission oils Type: Viscosity Classification:	MAT 3525	SAE 10W/30 9 cSt at 100° C API GL – 4	As recommended
Rear final drives Type: Viscosity: Classification:	MAT 3525	SAE 10W/30 9 cSt at 100° C API GL – 4	As recommended
Front differential and final drives Type: Viscosity: Classification:	MAT 3525	SAE 10W/30 9 cSt at 100° C API GL – 4	As recommended
Hydraulic brakes Type: Viscosity: Classification:	LHM fluid	No equivalent 6 cSt at 100° C ISO 7308	As recommended
Hydraulic fluid Type: Viscosity: Classification:	MAT 3525	SAE 10W/30 9 cSt at 100° C API GL – 4	As recommended
Steering oil Type: Viscosity: Classification:	MAT 3525	SAE 10W/30 9 cSt at 100° C API GL – 4	As recommended

2.8.3 *Grease*

Type:	251 HEP	Lithium Based	As recommended

Number of lubrication points: 14

3. COMPULSORY TESTS RESULTS

3.1 Main power take-off

Date and location of tests: 28 July and 4 August 2004
Silsoe Research Institute
Wrest Park, Silsoe, Bedford

Type of dynamometer bench: Eddy Current, Borghi and Saveri

Power	Speed			Fuel consumption			Specific Energy
	Engine	P.T.O.	Fan	Hourly		Specific	
kW	min^{-1} (rev/min)			kg/h	l/h	g/kWh	kWh/l
3.1.1 MAXIMUM POWER – TWO - HOUR TEST							
86.6	1896	894	2140	20.78	24.58	240	3.52
3.1.2 POWER AT RATED ENGINE SPEED							
79.4	2197	1036	2310	21.01	24.85	265	3.19
3.1.3 STANDARD POWER TAKE-OFF SPEED [1000 ± 25 min^{-1} (rev/min)]							
81.2	2120	1000	2284	20.81	24.62	256	3.30
3.1.4 PART LOADS 3.1.4.1 the torque corresponding to maximum power at rated engine speed							
79.4	2197	1036	2310	21.01	24.85	265	3.19
3.1.4.2 85% of torque obtained in 3.1.4.1							
69.2	2254	1063	2136	19.06	22.54	275	3.07
3.1.4.3 75% of torque defined in 3.1.4.2							
52.7	2290	1080	2321	16.72	19.78	317	2.67
3.1.4.4 50% of torque defined in 3.1.4.2							
35.6	2320	1094	2210	13.55	16.03	381	2.22
3.1.4.5 25% of torque defined in 3.1.4.2							
18.0	2346	1107	2000	10.33	12.21	574	1.47
3.1.4.6 unloaded							
0	2370	1118	1800	7.27	8.60	-	-
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED [1000± 25 min^{-1} (rev/min)] 3.1.5.1 the torque corresponding to maximum power							
81.2	2120	1000	2284	20.81	24.62	256	3.30
3.1.5.2 85% of torque obtained in 3.1.5.1							
70.7	2176	1026	2232	18.78	22.22	266	3.18
3.1.5.3 75% of torque defined in 3.1.5.2							
53.3	2187	1031	2196	15.75	18.63	295	2.86
3.1.5.4 50% of torque defined in 3.1.5.2							
35.7	2194	1035	2121	12.62	14.92	353	2.39
3.1.5.5 25% of torque defined in 3.1.5.2							
17.9	2203	1039	1774	9.24	10.93	517	1.63
3.1.5.6 unloaded							
0	2210	1043	1281	6.06	7.16	-	-

3.1.6 PART LOADS AT DIFFERENT ENGINE SPEEDS 3.1.6.1 maximum power at rated engine speed							
79.4	2197	1036	2310	21.01	24.85	265	3.19
3.1.6.2 80% of power obtained in 3.1.6.1 at max speed setting							
63.4	2270	1071	2297	18.40	21.76	290	2.91
3.1.6.3 80% of power obtained in 3.1.6.1 with governor set to 90% of rated engine speed							
63.6	1983	935	2016	16.46	19.47	259	3.27
3.1.6.4 40% of power obtained in 3.1.6.1 with governor set to 90% of rated engine speed							
31.7	1984	936	1631	10.45	12.36	329	2.56
3.1.6.5 60% of power obtained in 3.1.6.1 with governor set to 60% of rated engine speed							
47.6	1316	621	1418	11.36	13.44	238	3.54
3.1.6.6 40% of power obtained in 3.1.6.1 with governor set to 60% of rated engine speed							
31.8	1318	622	1732	8.25	9.76	260	3.26

No load maximum engine speed: 2370 min^{-1} (rev/min)

Torque (equivalent crankshaft) at maximum power

At rated engine speed: 345.0 Nm

At 2-hour test: 436.7 Nm

Maximum torque (equivalent crankshaft): 506.1 Nm
(engine speed:1406 min^{-1} (rev/min)

Mean atmospheric conditions:	
Temperature	23 °C
Pressure	101.6 kPa
Relative humidity	53 %
Maximum temperatures:	
Coolant	88 °C
Engine oil	106 °C
Fuel	51 °C
Engine air intake	27 °C

Optional power take-off test

Boosted power

Power	Speed			Fuel consumption			Specific Energy
	Engine	P.T.O.	Fan	Hourly		Specific	
kW	min^{-1} (rev/min)			kg/h	l/h	g/kWh	kWh/l
3.1.1 MAXIMUM POWER							
101.0	1900	896	2279	24.26	28.70	240	3.52
3.1.2 POWER AT RATED ENGINE SPEED							
93.8	2199	1037	2581	24.69	29.21	263	3.21
3.1.3 STANDARD POWER TAKE-OFF SPEED [1000 ± 25 min^{-1} (rev/min)]							
96.3	2121	1001	2498	24.50	28.99	254	3.32
3.1.4 PART LOADS 3.1.4.1 the torque corresponding to maximum power at rated engine speed							
93.8	2199	1037	2581	24.69	29.21	263	3.21
3.1.4.2 85% of torque obtained in 3.1.4.1							
81.0	2234	1054	2385	22.09	26.14	273	3.10
3.1.4.3 75% of torque defined in 3.1.4.2							
61.7	2268	1070	2387	18.71	22.13	303	2.79
3.1.4.4 50% of torque defined in 3.1.4.2							
41.9	2304	1087	2220	15.04	17.79	359	2.35
3.1.4.5 25% of torque defined in 3.1.4.2							
21.2	2338	1103	2000	11.16	13.20	527	1.60
3.1.4.6 unloaded							
0	2368	1117	1900	7.71	9.12	-	-
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED [1000± 25 min^{-1} (rev/min)] 3.1.5.1 the torque corresponding to maximum power							
96.3	2121	1001	2498	24.50	28.99	254	3.32
3.1.5.2 85% of torque obtained in 3.1.5.1							
82.6	2139	1009	2408	21.98	26.00	266	3.17
3.1.5.3 75% of torque defined in 3.1.5.2							
62.4	2149	1014	2363	17.80	21.06	285	2.96
3.1.5.4 50% of torque defined in 3.1.5.2							
41.6	2162	1020	2136	13.80	16.32	331	2.55
3.1.5.5 25% of torque defined in 3.1.5.2							
21.1	2171	1024	1936	10.04	11.88	477	1.77
3.1.5.6 unloaded							
0	2182	1029	1230	6.15	7.28	-	-

3.1.6 PART LOADS AT DIFFERENT ENGINE SPEEDS 3.1.6.1 maximum power at rated engine speed							
93.8	2199	1037	2581	24.69	29.21	263	3.21
3.1.6.2 80% of power obtained in 3.1.6.1 at max speed setting							
74.9	2245	1059	2531	21.23	25.11	283	2.98
3.1.6.3 80% of power obtained in 3.1.6.1 with governor set to 90% of rated engine speed							
75.0	1980	934	1961	18.57	21.96	248	3.41
3.1.6.4 40% of power obtained in 3.1.6.1 with governor set to 90% of rated engine speed							
37.5	1984	936	2290	11.69	13.83	312	2.71
3.1.6.5 60% of power obtained in 3.1.6.1 with governor set to 60% of rated engine speed							
56.3	1320	623	1549	13.06	15.45	232	3.64
3.1.6.6 40% of power obtained in 3.1.6.1 with governor set to 60% of rated engine speed							
37.5	1323	624	1478	9.33	11.04	249	3.40

No load maximum engine speed: 2368 min^{-1} (rev/min)

Torque (equivalent crankshaft) at maximum power

At rated engine speed: 407.2 Nm

At maximum power: 507.9 Nm

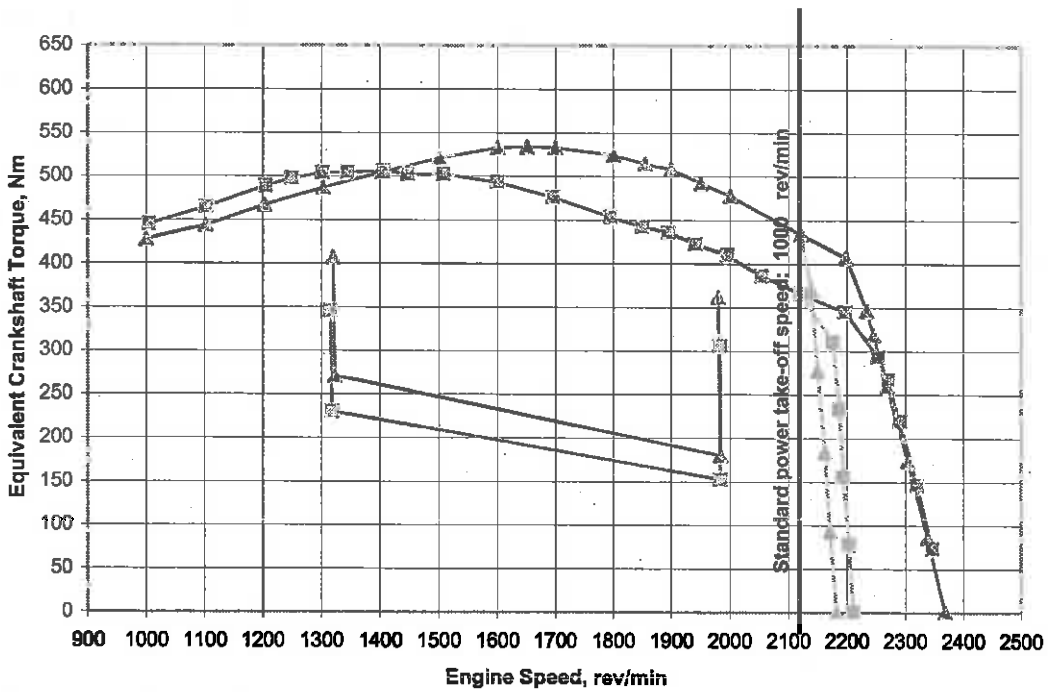
Maximum torque (equivalent crankshaft): 533.7 Nm
(engine speed:1652 min^{-1} (rev/min)

Mean atmospheric conditions:	
Temperature	24 °C
Pressure	100.8 kPa
Relative humidity	66 %
Maximum temperatures:	
Coolant	87 °C
Engine oil	106 °C
Fuel	52 °C
Engine air intake	26 °C

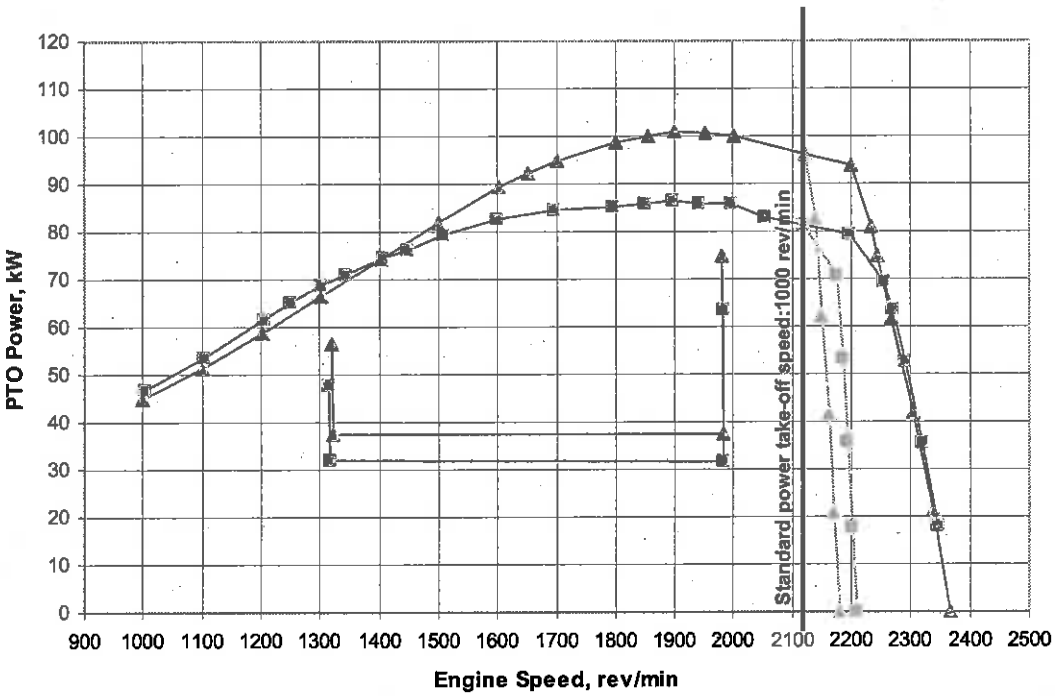
■ Main power take-off curve

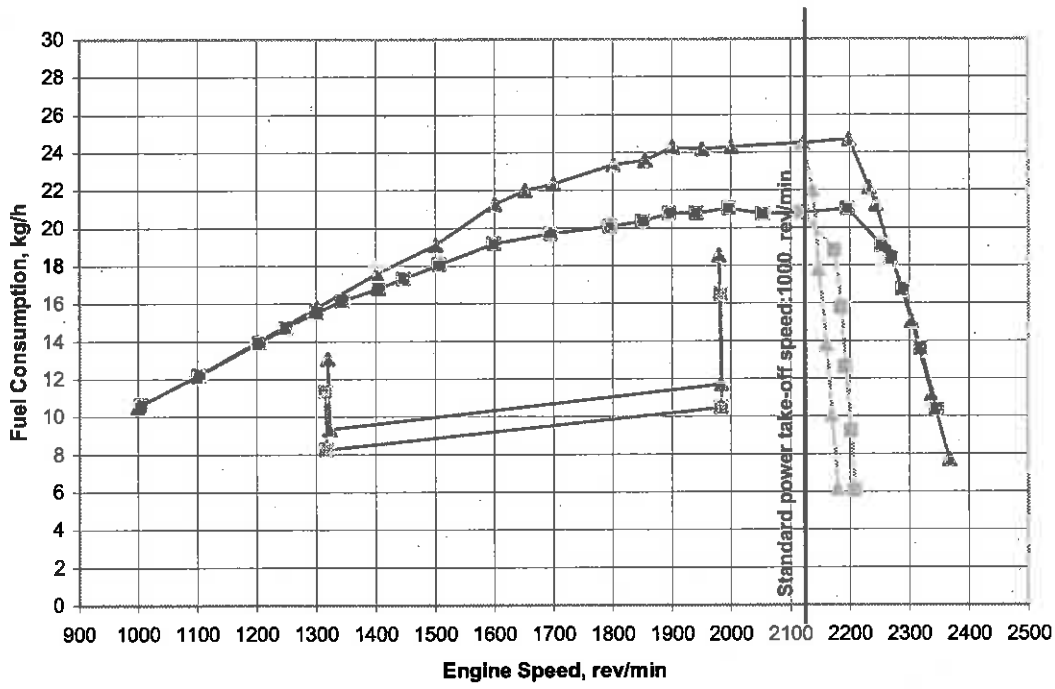
▲ Boosted power take-off curve

Power take-off curves

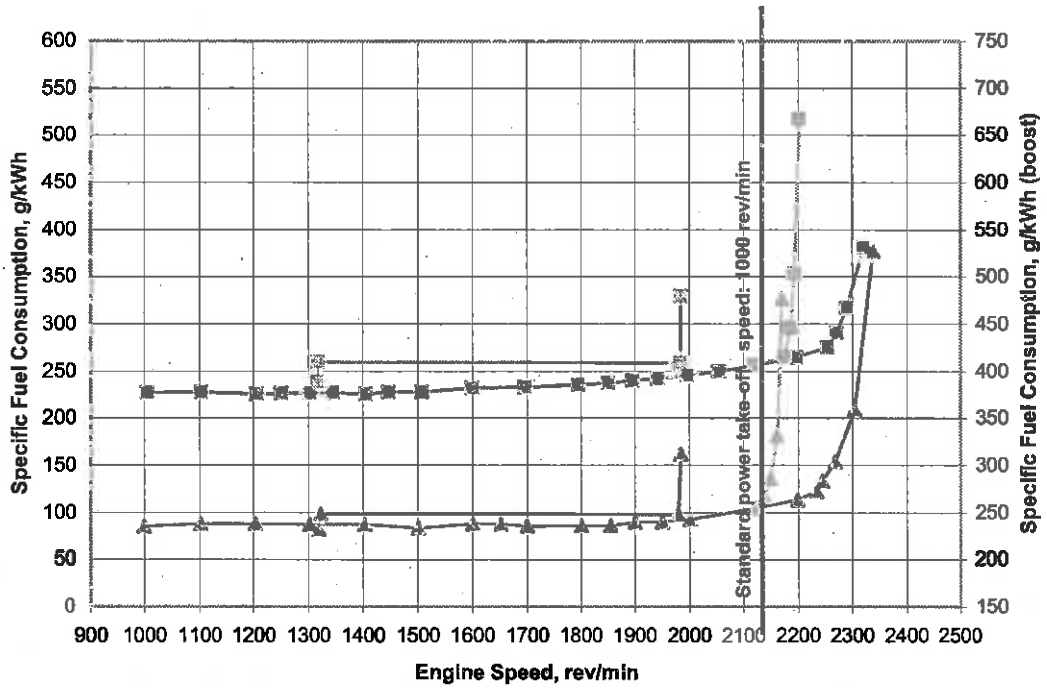


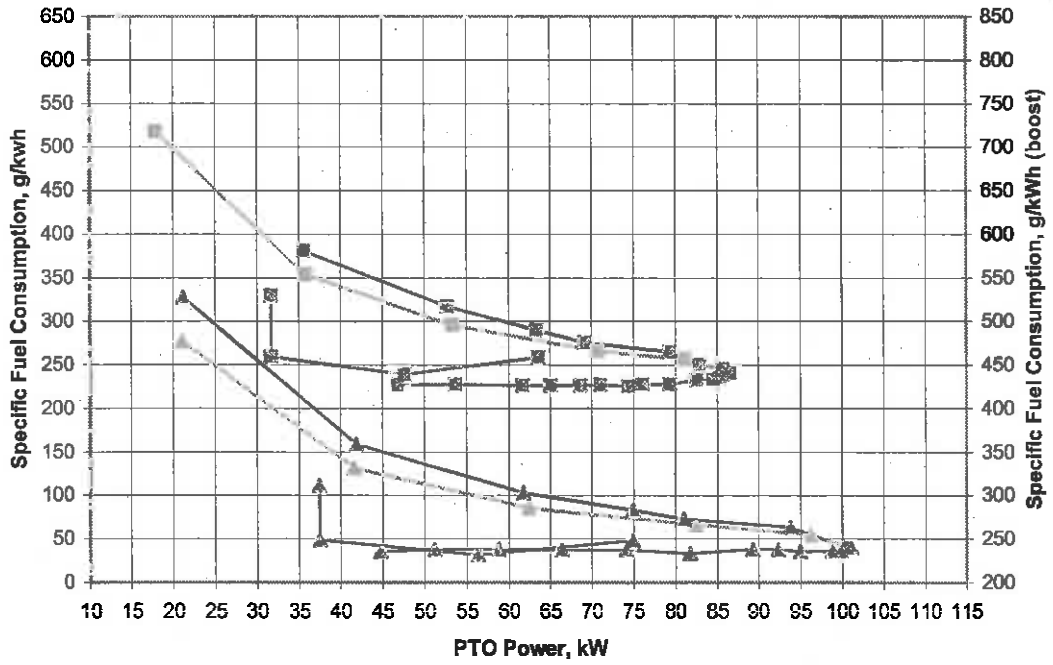
Power take-off curves





Power take-off curves





3.2 Hydraulic power and lifting force

Date of tests: 25 and 26 October 2004

3.2.1 *Hydraulic power test*

3.2.1.1 Hydraulic fluid data

Hydraulic fluid type: MAT 3525

Viscosity index (ISO 3448+Corr 1:1993): 130

Viscosity at 65° C: 36.5 mm^2/s

3.2.1.2 Compulsory Reporting (Test Results):

	Pressure	Reservoir oil Temperature °C (65 °C target)		Engine Speed	Flow rate	Power
	MPa	Min.	Max.	Rev/min	l/min	kW
Rated Engine Speed				2200		
3.2.1.2.1 Maximum (sustained) pressure with relief valve open as measured at the coupler Pump stalled: Yes	21.2	65	68	2368		
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 (one coupler pair)	19.1 19.1*	65 65*		2340 2337*	56.5 73.7*	17.99 23.46*
3.2.1.2.3 Maximum available flow and maximum power from one coupler pair:	16.0	65		2324	91.3	24.35
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):	17.0	65		2324	98.2	27.83

* From 2 couplers

Maximum flow from 1 pair of couplers: 95.7 l/m

Maximum flow from 2 pairs of couplers: 111.1 l/m

3.2.2 Compulsory Power lift test

Power lift test – (To ISO 730-1:1994)

Linkage settings for test – see Table 1.1 and Figures 1.1 and 1.2.

	At the hitch point	on the frame
Height of lower hitch points above ground in down position	197 mm	197 mm
Vertical movement	603 mm	738 mm
Maximum corrected force exerted through full range	45.6 kN	33.0 kN
Corresponding pressure of hydraulic fluid	19.1 MPa	19.1 MPa
Moment about rear-wheel axis	51.0 kNm	57.0 kNm
Maximum tilt angle of mast from vertical	—	11 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	- 473	- 388	- 285	- 190	- 85	0	+50	+110	+180	+215	+265
Lifting forces (the values of force measured shall be corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting of the hydraulic lift system):											
at the hitch points kN	--	46.2	47.0	47.7	47.9	47.6	47.1	46.6	46.0	45.6	–
Corresponding pressure: 19.1 MPa											
at the frame kN	40.9	–	40.7	40.5	39.2	37.9	36.6	35.3	33.5	–	33.0
Corresponding pressure: 19.1 MPa											

3.3 Drawbar power test (unballasted tractor)

Date and Location of tests: 16 and 21 September 2004
Silsoe Research Institute
Wrest Park
Silsoe
Bedford MK45 4HS

Type of track: Concrete

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
	mm	kPa	kPa
Unballasted 4WD	425	70	70
Unballasted 4WD disengaged	530	70	70

Gear number and range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels or track	Fan speed	Specific fuel cons	Specific Energy	Temperature			Atmospheric condition		
									Fuel	Coolant	Engine oil	Temp	Relative humidity	Pressure
	kW	kN	Km/h	min^{-1}	%	min^{-1}	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.3.1	MAXIMUM POWER IN TESTED GEARS (unballasted tractor)													
1A	29.0	49.8	2.10	2316	13.8	1856	452	1.87	56	88	104	20	39	101.6
2A	35.4	49.9	2.56	2299	13.6	2026	414	2.04	56	88	106	19	43	101.6
3A	43.1	49.6	3.13	2279	12.6	2178	394	2.15	57	88	106	20	37	101.6
4A	52.5	49.1	3.85	2254	11.3	2045	355	2.38	56	88	106	20	38	101.6
5B	64.4	47.6	4.87	2165	8.9	2036	316	2.68	57	88	107	20	38	101.6
6B	70.8	45.5	5.61	1999	7.5	1910	298	2.84	56	86	106	19	42	101.7
7B	70.5	38.1	6.66	1903	5.1	1870	290	2.91	54	85	105	18	44	101.8
9C	71.8	34.7	7.46	1903	4.7	1950	285	2.97	55	85	105	18	44	101.7
8B	70.9	30.7	8.31	1914	4.0	1945	295	2.86	55	85	106	18	45	101.7
10C	71.3	27.6	9.29	1912	3.6	1936	293	2.88	53	85	105	14	62	101.8
11C	69.3	22.2	11.26	1891	2.9	1826	300	2.82	53	85	105	15	61	101.8
12C	67.1	17.4	13.92	1896	2.4	1857	308	2.75	52	84	105	15	58	101.8

3.3.2 FUEL CONSUMPTION														
3.3.2.1 In selected gear, at maximum power at rated speed														
9C	64.8	26.7	8.72	2201	3.5	1822	324	2.61	52	87	105	14	62	101.8
3.3.2.1.1 75% of pull corresponding to maximum power at rated engine speed														
9C	50.7	20.1	9.06	2272	2.8	2050	354	2.39	53	87	103	20	44	101.7
3.3.2.1.2 50% of pull corresponding to maximum power at rated engine speed														
9C	34.4	13.4	9.27	2302	1.9	1865	417	2.03	54	87	104	20	42	101.6
3.3.2.1.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1														
8B	50.7	20.1	9.06	2063	2.8	1945	324	2.61	56	86	105	20	40	101.6
3.3.2.1.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2														
8B	34.5	13.4	9.26	2091	2.0	1765	384	2.20	55	86	105	19	41	101.6
3.3.2.2 In selected gear nearest to 7.5 km/h at rated engine speed														
7B	63.4	29.3	7.79	2199	3.8	2042	331	2.55	50	86	100	17	46	101.8
3.3.2.2.1 75% of pull corresponding to maximum power at rated engine speed														
7B	49.6	22.0	8.12	2270	3.0	1938	371	2.28	52	87	103	18	44	101.8
3.3.2.2.2 50% of pull corresponding to maximum power at rated engine speed														
7B	33.7	14.6	8.31	2302	2.0	1848	447	1.89	53	87	104	18	45	101.8
3.3.2.2.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1														
9C	49.5	22.0	8.11	2036	3.1	1800	318	2.66	56	86	105	20	40	101.6
3.3.2.2.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2														
9C	33.7	14.6	8.29	2062	2.1	1886	371	2.28	56	86	104	20	38	101.6

Drawbar power test (unballasted tractor)

Optional Test

(Four-Wheel Drive disengaged)

Gear number and range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels or track	Fan speed	Specific fuel cons	Specific Energy	Temperature			Atmospheric condition		
									Fuel	Coolant	Engine oil	Temp	Relative humidity	Pressure
	kW	kN	Km/h	min^{-1}	%	min^{-1}	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.3.1	MAXIMUM POWER IN TESTED GEARS (unballasted tractor)													
1A	22.8	38.8	2.11	2327	12.7	1916	580	1.46	53	88	104	16	55	101.1
2A	28.4	39.0	2.62	2320	11.5	2010	467	1.81	53	88	104	16	53	101.1
3A	33.9	38.7	3.16	2301	11.7	2150	450	1.88	53	88	105	17	49	101.1
4A	41.0	38.0	3.88	2288	10.8	2175	404	2.09	56	88	108	17	47	101.1
5B	52.4	38.0	4.97	2264	10.0	2132	309	2.73	53	88	105	17	46	101.1
6B	62.3	37.1	6.05	2211	8.6	2019	319	2.65	54	87	106	17	45	101.1
7B	67.3	36.6	6.62	1963	7.5	1916	310	2.73	49	84	102	14	61	100.9
9C	70.9	34.5	7.40	1939	6.1	2170	292	2.89	51	84	102	16	56	101.1
8B	70.5	31.1	8.18	1922	5.0	1966	287	2.95	49	84	101	16	56	101.1
10C	71.6	28.5	9.04	1902	4.6	1946	287	2.95	52	85	106	16	46	101.1
11C	69.4	22.4	11.17	1907	3.4	2100	303	2.79	52	85	105	15	60	101.0
12C	68.3	17.9	13.70	1897	2.9	1997	306	2.76.	52	85	104	15	59	101.0

3.3.2 FUEL CONSUMPTION														
3.3.2.1 In selected gear, at maximum power at rated speed														
10C	64.1	21.8	10.57	2197	3.4	2054	330	2.56	52	87	106	15	60	101.0
3.3.2.1.1 75% of pull corresponding to maximum power at rated engine speed														
10C	50.2	16.4	11.00	2271	2.7	2166	359	2.36	53	87	106	17	47	101.1
3.3.2.1.2 50% of pull corresponding to maximum power at rated engine speed														
10C	34.1	10.9	11.22	2301	2.1	1878	427	1.98	54	87	106	17	44	101.1
3.3.2.1.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1														
11C	50.2	16.4	11.03	1870	2.7	1726	315	2.69	50	84	101	17	44	101.2
3.3.2.1.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2														
11C	34.1	10.9	11.21	1889	2.1	1541	362	2.34	53	85	101	17	42	101.1
3.3.2.2 In selected gear nearest to 7.5 km/h at rated engine speed														
7B	61.1	28.7	7.65	2198	4.5	2202	342	2.47	49	86	102	14	64	100.9
3.3.2.2.1 75% of pull corresponding to maximum power at rated engine speed														
7B	48.0	21.6	8.00	2272	3.4	1875	362	2.34	51	87	104	15	60	100.9
3.3.2.2.2 50% of pull corresponding to maximum power at rated engine speed														
7B	32.7	14.4	8.17	2301	2.5	2057	453	1.87	49	87	105	14	63	100.9
3.3.2.2.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1														
9C	48.0	21.6	8.00	2041	3.4	1935	330	2.56	50	85	102	16	44	101.2
3.3.2.2.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2														
9C	32.8	14.4	8.18	2068	2.5	1589	374	2.26	52	86	102	16	44	101.2

5. REPAIRS None

6. REMARKS Boosted Engine Power Operation

This vehicle is equipped with an electronically – controlled engine Power Management™ system that monitors and boosts engine power output in certain circumstances, as engine load increases. This is achieved by electronically changing the characteristics of the engine power-speed curve.

The engine Power Management function ("boosted" power level) becomes active in higher transmission gears (16th gear and above with 24 x 24 transmissions and 13th gear and above with 16 x 16 transmissions), for road transport applications. With the 24 x 24 transmission, the system is also activated once power transfer through the rear P.T.O. exceeds a pre-set level (and forward speed exceeds 0.5 km/h), for mobile P.T.O. – driven implement applications.

An over-ride system is provided to enable P.T.O. operation at the "boosted" power level whilst the vehicle is stationary, for test purposes. The results of such a P.T.O. power output test are presented in this report.

The test results for this report were obtained from a test carried out on a New Holland TS125A which is identical to the Case IH MXU125 in all practical aspects relating to the tests.

Test carried out by: S J Devonshire

Signed: Officer in charge



J P Evans
Senior Test Engineer
Field Machinery Centre

Date: 6 April 2005

APPENDIX 1 ADDITIONAL TESTS

7.1 *Power lift tests – (To Manufacturers lift rod setting)*

"Not covered by the approval"

Linkage settings for test – see Table 1.1 and Figures 1.1 and 1.2.

	At the hitch point	on the frame
Height of lower hitch points above ground in down position	318 mm	318 mm
Vertical movement	492 mm	560 mm
Maximum corrected force exerted through full range	52.8 kN	40.4 kN
Corresponding pressure of hydraulic fluid	19.1 MPa	19.1 MPa
Moment about rear-wheel axis	59.0 kNm	69.8 kNm
Maximum tilt angle of mast from vertical	—	7 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-305	- 267	-180	-90	0	+50	+100	+173	+200	+225	+255
Lifting forces (the values of force measured shall be corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting of the hydraulic lift system):											
at the hitch points kN	--	61.8	61.5	60.5	58.8	57.2	55.6	53.3	52.9	52.8	--
Corresponding pressure: 19.1 MPa											
at the frame kN	55.6	--	55.0	52.8	49.4	47.3	45.2	42.0	40.7	--	40.4
Corresponding pressure: 19.1 MPa											

7.2 *Power lift tests – (To SAE J283)*

Linkage settings for test – see Table 1.1

* Lift rods readjusted to 735 mm to allow for lift force to be measured throughout the total lift range

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	- 385	- 323	- 225	-150	- 100	0	+87	+ 135	+ 160	---	---
*mm	---	---	- 225	- 150	- 100	0	+ 87	+ 135	+ 160	+ 220	+ 285
SAE J283											
kN	62.3	62.3	56.3	54.5	52.6	49.2	45.4	44.0	43.1	---	---
*kN	---	---	59.0	57.6	56.0	52.6	49.6	47.0	46.0	43.7	42.3
Corresponding pressure: 18.5 MPa											

HYDRAULIC LIFT COMBINATION / REPORT REFERENCE TABLE

CASE IH MXU100 / MXU110 / MXU115/ MXU125 / MXU135

OECD Report Numbers	Hydraulic Lift Force (OECD, SAE and Manufacturers Settings)							
	Mechanical Draft Control with internal lift ram				Electronic Draft Control with external rams			
	Plus 1 x 50mm assist ram		Plus 2 x 50mm assist rams		2 x 80mm rams		2 x 90mm rams	
	Pump Displacement		Pump Displacement		Pump Displacement		Pump Displacement	
	Fixed	Variable	Fixed	Variable	Fixed	Variable	Fixed	Variable
6676/2003	x							
6678/2003			x					
6679/2003						x		
6667/2003		x						
6668/2003					x			
6670/2003				x				
6671/2003							x	
6673/2003				x				
6674/2003								x

X Denotes hydraulic lift combination test report number

TEST RESULTS (OECD Code 5)

"Not covered by the approval"

Make and type of sound level meter: Bruel and Kjaer 2260

Type of test track: Concrete

Date of tests: 11 November 2004

Four wheel drive engaged

Gear	Test Condition	Measured travelling speed km/h	Sound level dB(A)
7B	Light Load	8.3	84

Four wheel drive dis-engaged

Gear	Test Condition	Measured travelling speed km/h	Sound level dB(A)
7B	Light Load	8.2	84