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

New Holland PDC7BB1 (TS 125A) Four-Wheel Drive Tractor with 24-speed Hi-Lo Transmission (40 km/h)



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

Reference No: 843

Date: May 2005

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Rev: 24 June 2005

ENGINEERING for Life

TABLE OF CONTENTS

1.	SPECIFICATIONS OF TRACTOR		1
2.	TEST CONDITIONS		16
3.	TEST RESULTS		18
	Compulsory tests		
	1	Main power take-off (1000 rev/min)	18
		Optional power take-off boosted power (1000 rev/min)	20
		Power take-off curves (1000 rev/min)	21
	2	Hydraulic power and lifting force	24
	3	Drawbar power and fuel consumption test (unballasted tractor, four-wheel drive)	25
		Optional Drawbar power and fuel consumption test (unballasted tractor, four-wheel drive with front axle disengaged)	28
5.	Repairs and adjustments during tests		30
6.	Remarks		30
7.	Appendix 1 Additional tests (not covered by approval)		31

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:	57 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:	New Holland
[C]	Model (trade name):	TS125A
[C]	Type:	Four- wheel drive, unit construction

1.1.2 *Numbers*

[D]	1st Serial No or prototype:	ACP207661/EKP001001
[C]	Serial No:	225458

1.1.3 *Other specifications (if applicable)*

[D]	Model(s) for other countries:	None
[C]	Transmission type or gears x ranges:	24-Speed Hi-Lo
[C]	Speed version:	40 km/h
[C]	Manufacturer identification or Technical type number:	PDC7BB1

1.2 Engine

[C]	Make:	CNH
[C]	Model:	F4DE0684B*D
[C]	Type:	4 stroke turbocharged direct injection and after cooled diesel
[C]	Serial No:	00103907

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 - 30.77 dm^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	Optional
[C]	Type:	Spin tube
[C]	Location:	Air cleaner canister inlet
	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:	25 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:	120 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:	Hi-Lo
[C]	Description:	Mechanical, synchromesh operation, (except for low range selection). 2 powershift speeds, button selected for each of the 4 gear positions on the main lever and the 3 positions on the range lever. Levers mounted on 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	3/2	3/2
[C]	Total of arrangements	24	24

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 lock actuation
[C]	Method of disengagement:	Via panel switch or in response to signal from brakes on application, or auto diff lock disengagement

1.3.4 *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	I lo	414.48	1.64
[C]	1	I hi	338.89	2.01
[C]	2	I lo	282.92	2.40
[C]	2	I hi	231.31	2.94
[C]	3	I lo	198.12	3.43
[C]	3	I hi	161.98	4.20
[C]	4	I lo	136.15	5.00
[C]	4	I hi	111.32	6.11
[C]	1	II lo	165.00	4.12
[C]	1	II hi	134.90	5.04
[C]	2	II lo	112.63	6.04
[C]	2	II hi	92.08	7.39
[C]	3	II lo	78.87	8.62
[C]	3	II hi	64.48	10.55
[C]	4	II lo	54.20	12.55
[C]	4	II hi	44.31	15.35
[C]	1	III lo	68.15	9.98
[C]	1	III hi	55.72	12.21
[C]	2	III lo	46.52	14.62
[C]	2	III hi	38.03	17.88
[C]	3	III lo	32.58	20.88
[C]	3	III hi	26.63	25.54
[C]	4	III lo	22.39	30.38
[C]	4	III hi	18.30	37.16
	Reverse			
[C]	1	I lo	400.81	1.70
[C]	1	I hi	327.70	2.08
[C]	2	I lo	273.59	2.49
[C]	2	I hi	223.69	3.04
[C]	3	I lo	191.59	3.55
[C]	3	I hi	156.64	4.34
[C]	4	I lo	131.68	5.17
[C]	4	I hi	107.64	6.32
[C]	1	II lo	159.59	4.26
[C]	1	II hi	130.45	5.21
[C]	2	II lo	108.92	6.24
[C]	2	II hi	89.05	7.64
[C]	3	II lo	76.27	8.92
[C]	3	II hi	62.36	10.91
[C]	4	II lo	52.42	12.98
[C]	4	II hi	42.85	15.87
[C]	1	III lo	65.90	10.32
[C]	1	III hi	53.88	12.62
[C]	2	III lo	44.99	15.12
[C]	2	III hi	36.78	18.49
[C]	3	III lo	31.50	21.59
[C]	3	III hi	25.76	26.41
[C]	4	III lo	21.65	31.41
[C]	4	III hi	17.70	38.42

I = Low range II = Medium range III = High range
lo = Under drive hi = Direct drive

(*) 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:	792 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:	792 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

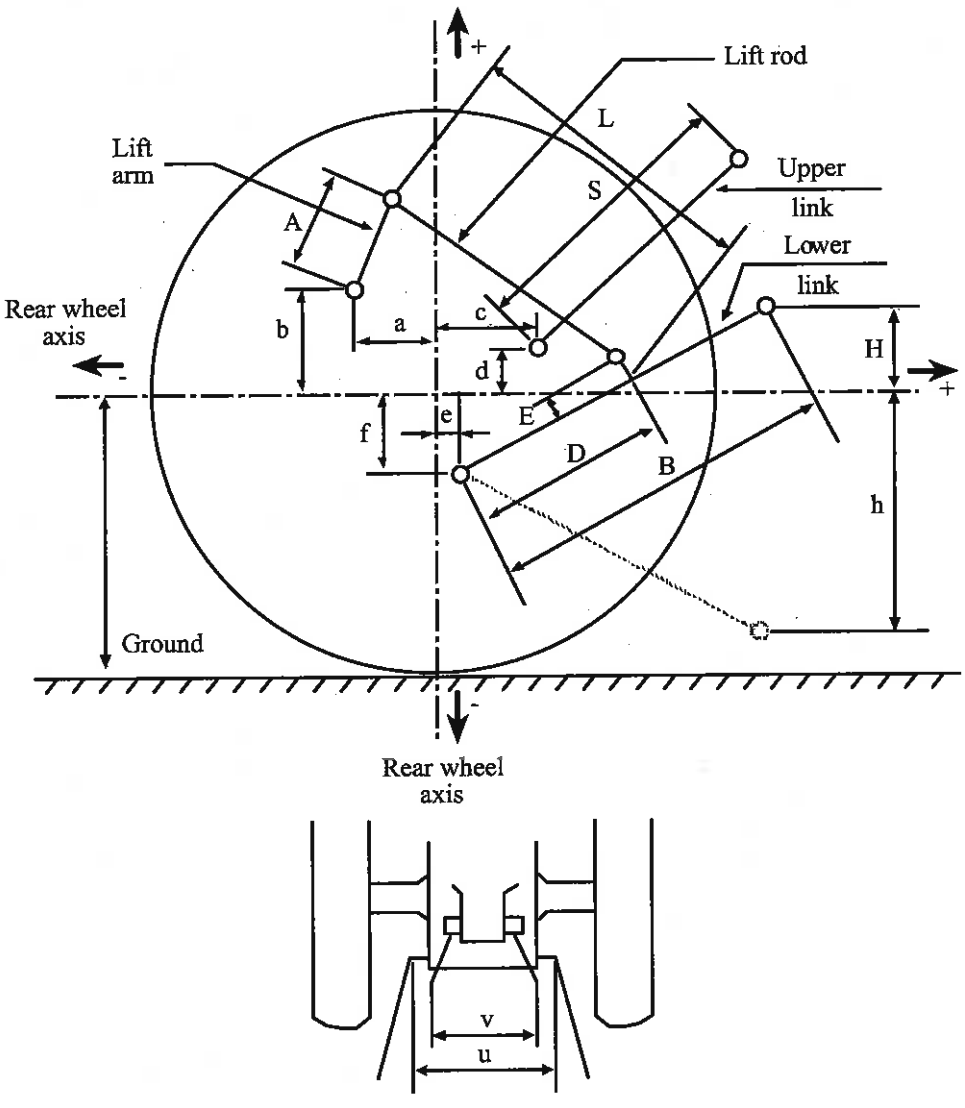
1.4.1.2 Power take-off proportional to ground speed — Not applicable

1.5 Hydraulic power lift

[C]	Make:	CNH
[D]	Model:	None
[D]	Type:	Electro-hydraulic closed centre load sensing
[C]	Type and number of cylinders:	2 single acting externally mounted rams
[C]	Type of linkage lock for transport:	Hydraulic
[D]	Pump maximum pressure / Relief valve pressure setting:	19.5 – 22.0 MPa
[D]	Opening pressure of cylinder safety valve:	22.0 – 23.0 MPa
[D]	Lift pump type:	Fixed displacement gear pump
[D]	Transmission between pump and engine:	Gear driven from PTO shaft, independent of main and PTO clutches
[C]	Type and number filters:	2 disposable canister filters
[C]	Site of oil reservoir:	Rear axle housing
[C]	Type, number and location of tapping points:	4 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:	Electronic 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	697	718	705
[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	505	585	585
[C]	Length of lift rods:		(L)	700 – 888	830	878	878/810
	Height of lower hitch points (*) Relative to the rear wheel centre line, situated 820 mm above the ground level:						
[C]	- in low position		(h)	290 – 750	622	616	615/475
[C]	- in high position		(H)	0 – 260	38	0	0/105
[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
(Incorporated in automatic pick-up with hook and clevis on drawbar and selected by reversing)

[C]	Type:		Clevis		Hook
[C]	Height above ground:	Unballasted Maximum:	505 mm		490 mm
		Minimum:	462 mm		
[C]	Type of adjustment:		Inverting drawbar		
[C]	Distance of hitch point from rear-wheel axis, horizontally:		805 mm	905 mm 955 mm	585 mm
[C]	Distance of hitch point from power take-off shaft end:				
		Vertically:	287 mm	330 mm	302 mm
		Horizontally:	250 mm	350 mm 400 mm	30 mm
[C]	Lateral adjustment (centre of clevis):				
		Right-hand:	145 mm	220 mm 250 mm	None
		Left-hand:	145 mm	220 mm 250 mm	None
[C]	Distance of pivot point from rear axles	horizontally:	Not applicable		
[C]	Width of clevis:		70 mm		
[C]	Diameter of drawbar pin hole:		33 mm		
[D]	Maximum vertical permissible load:	Clevis uppermost:	2400 kg		3000 kg
		Clevis underneath:	2180 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: SLTV 11

[C] Type: Cab safety frame

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

Protective device

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

[C] Tiltable/Not tiltable: Not tiltable

OECD approval

[C] Approval number: 4/0740

[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 93/731, 95A/741
		EEC approved to 78/764/EEC – e1*0006*03, e1*100514*07
[C]	Seat and steering wheel reversible:	No
[C]	Type of suspension:	Parallelogram, suspension air spring
[C]	Type of damping:	Double acting, hydraulic
	Range of adjustment	
[C]	Longitudinal:	+ 90 mm / -120 mm
[C]	Vertical:	± 40 mm
[C]	Safety belt:	Yes

1.14.2 *Optional driver's seat(s)*

1.14.3 *Passenger seat*

[C]	Make:	CNH (instructional seat)
[C]	Location:	Padded with folding back, on left hand side of operator seat
[C]	Type:	76/763/EEC compliant
[C]	Capacity:	1

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	1360	145 x 145	280
[C]	Sidelights	1805	75 x 70	1008
[C]	Rear lights	1800	265 x 53	893
[C]	Rear fender reflectors	1800	265 x 53	893
[C]	Rear axle reflectors	795	100 x 35	581

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	2860	2940

2.2 Ground clearance (unballasted tractor) 355 mm

Clearance-limiting part: Drawbar clevis in lowest position

2.3 Tractor mass

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

	Unballasted	
	Without driver	With driver
	kg	kg
Front	2131	2146
Rear	2342	3402
Total	5473	5548

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:	NH 324H	Ambra Super Gold HSP 11.5 cSt at 100° C API CH – 4	As recommended
Transmission oils Type: Viscosity Classification:	NH 410B	Ambra Multi G 9 cSt at 100° C API GL – 4	As recommended
Rear final drives Type: Viscosity: Classification:	NH 410B	Ambra Multi G 9 cSt at 100° C API GL – 4	As recommended
Front differential and final drives Type: Viscosity: Classification:	NH 410B	Ambra Multi G 9 cSt at 100° C API GL – 4	As recommended
Hydraulic brakes Type: Viscosity: Classification:	NH 610A	Ambra LHM Brake 6 cSt at 100° C ISO 7308	As recommended
Hydraulic fluid Type: Viscosity: Classification:	NH 410B	Ambra Multi G 9 cSt at 100° C API GL – 4	As recommended
Steering oil Type: Viscosity: Classification:	NH 410B	Ambra Multi G 9 cSt at 100° C API GL – 4	As recommended

2.8.3 *Grease*

Type:	NH 710A	Ambra GR 9 NLGI 2 Lithium Based	As recommended

Number of lubrication points: 14

3. COMPULSORY TESTS RESULTS

3.1 Main power take-off

Date and location of tests: 8 and 9 March 2005
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							
90.4	1895	895	2177	21.16	25.03	234	3.61
3.1.2 POWER AT RATED ENGINE SPEED							
81.6	2200	1038	2376	21.28	25.17	261	3.24
3.1.3 STANDARD POWER TAKE-OFF SPEED [1000 ± 25 min^{-1} (rev/min)]							
84.7	2123	1001	2334	21.25	25.14	251	3.37
3.1.4 PART LOADS 3.1.4.1 the torque corresponding to maximum power at rated engine speed							
81.6	2200	1038	2376	21.28	25.17	261	3.24
3.1.4.2 85% of torque obtained in 3.1.4.1							
70.9	2249	1061	2432	19.57	23.15	276	3.06
3.1.4.3 75% of torque defined in 3.1.4.2							
54.2	2294	1082	2262	16.58	19.61	306	2.76
3.1.4.4 50% of torque defined in 3.1.4.2							
36.7	2324	1096	2038	13.63	16.13	371	2.28
3.1.4.5 25% of torque defined in 3.1.4.2							
18.5	2348	1108	2044	10.45	12.36	564	1.50
3.1.4.6 unloaded							
0	2372	1119	1878	7.55	8.93	-	-
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							
84.7	2123	1001	2334	21.25	25.14	251	3.37
3.1.5.2 85% of torque obtained in 3.1.5.1							
73.9	2176	1026	2279	19.47	23.03	263	3.21
3.1.5.3 75% of torque defined in 3.1.5.2							
55.8	2186	1031	2110	16.12	19.07	289	2.92
3.1.5.4 50% of torque defined in 3.1.5.2							
37.4	2196	1036	2178	12.86	15.21	344	2.46
3.1.5.5 25% of torque defined in 3.1.5.2							
18.7	2204	1040	1831	9.45	11.17	505	1.67
3.1.5.6 unloaded							
0	2212	1043	1802	6.38	7.55	-	-

3.1.6 PART LOADS AT DIFFERENT ENGINE SPEEDS							
3.1.6.1 maximum power at rated engine speed							
81.6	2200	1038	2376	21.28	25.17	261	3.24
3.1.6.2 80% of power obtained in 3.1.6.1 at max speed setting							
65.3	2272	1071	2331	18.58	21.98	284	2.97
3.1.6.3 80% of power obtained in 3.1.6.1 with governor set to 90% of rated engine speed							
65.3	1981	934	2029	16.60	19.64	254	3.32
3.1.6.4 40% of power obtained in 3.1.6.1 with governor set to 90% of rated engine speed							
32.6	1980	934	1700	10.60	12.54	325	2.60
3.1.6.5 60% of power obtained in 3.1.6.1 with governor set to 60% of rated engine speed							
49.0	1322	624	1350	11.27	13.34	230	3.68
3.1.6.6 40% of power obtained in 3.1.6.1 with governor set to 60% of rated engine speed							
32.6	1320	623	1317	8.28	9.79	254	3.33

No load maximum engine speed: 2372 min^{-1} (rev/min)

Torque (equivalent crankshaft) at maximum power

At rated engine speed: 354.3 Nm

At 2-hour test: 454.7 Nm

Maximum torque (equivalent crankshaft): 528.0 Nm
(engine speed:1406 min^{-1} (rev/min)

Mean atmospheric conditions:	
Temperature	22 °C
Pressure	102.6 kPa
Relative humidity	29 %
Maximum temperatures:	
Coolant	85 °C
Engine oil	105 °C
Fuel	53 °C
Engine air intake	30 °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							
107.3	1901	897	2294	24.71	29.23	230	3.67
3.1.2 POWER AT RATED ENGINE SPEED							
99.0	2201	1038	2468	25.14	29.74	254	3.33
3.1.3 STANDARD POWER TAKE-OFF SPEED [1000 ± 25 min^{-1} (rev/min)]							
101.8	2120	1000	2434	24.91	29.47	245	3.45
3.1.4 PART LOADS 3.1.4.1 the torque corresponding to maximum power at rated engine speed							
99.0	2201	1038	2468	25.14	29.74	254	3.33
3.1.4.2 85% of torque obtained in 3.1.4.1							
85.5	2235	1054	2425	22.40	26.49	262	3.23
3.1.4.3 75% of torque defined in 3.1.4.2							
65.2	2272	1072	2356	18.57	21.97	285	2.97
3.1.4.4 50% of torque defined in 3.1.4.2							
44.2	2308	1089	2014	14.65	17.33	331	2.55
3.1.4.5 25% of torque defined in 3.1.4.2							
22.4	2344	1106	1972	11.01	13.02	492	1.72
3.1.4.6 unloaded							
0	2372	1119	1902	7.30	8.63	-	-
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							
101.8	2120	1000	2434	24.91	29.47	245	3.45
3.1.5.2 85% of torque obtained in 3.1.5.1							
87.4	2136	1008	2352	21.85	25.85	250	3.38
3.1.5.3 75% of torque defined in 3.1.5.2							
66.0	2148	1013	2171	17.64	20.86	267	3.16
3.1.5.4 50% of torque defined in 3.1.5.2							
44.3	2159	1018	1939	13.54	16.02	305	2.77
3.1.5.5 25% of torque defined in 3.1.5.2							
22.3	2170	1024	1775	9.72	11.50	436	1.94
3.1.5.6 unloaded							
0	2180	1028	1635	6.00	7.10	-	-

3.1.6 PART LOADS AT DIFFERENT ENGINE SPEEDS 3.1.6.1 maximum power at rated engine speed							
99.0	2201	1038	2468	25.14	29.74	254	3.33
3.1.6.2 80% of power obtained in 3.1.6.1 at max speed setting							
79.2	2248	1061	2347	21.10	24.96	266	3.17
3.1.6.3 80% of power obtained in 3.1.6.1 with governor set to 90% of rated engine speed							
79.2	1980	934	2094	19.12	22.62	241	3.50
3.1.6.4 40% of power obtained in 3.1.6.1 with governor set to 90% of rated engine speed							
39.6	1982	935	1750	11.74	13.89	297	2.85
3.1.6.5 60% of power obtained in 3.1.6.1 with governor set to 60% of rated engine speed							
59.4	1320	623	1625	13.24	15.66	223	3.79
3.1.6.6 40% of power obtained in 3.1.6.1 with governor set to 60% of rated engine speed							
39.6	1322	624	1775	9.47	11.20	239	3.53

No load maximum engine speed: 2372 min^{-1} (rev/min)

Torque (equivalent crankshaft) at maximum power

At rated engine speed: 429.6 Nm

At maximum power: 539.0 Nm

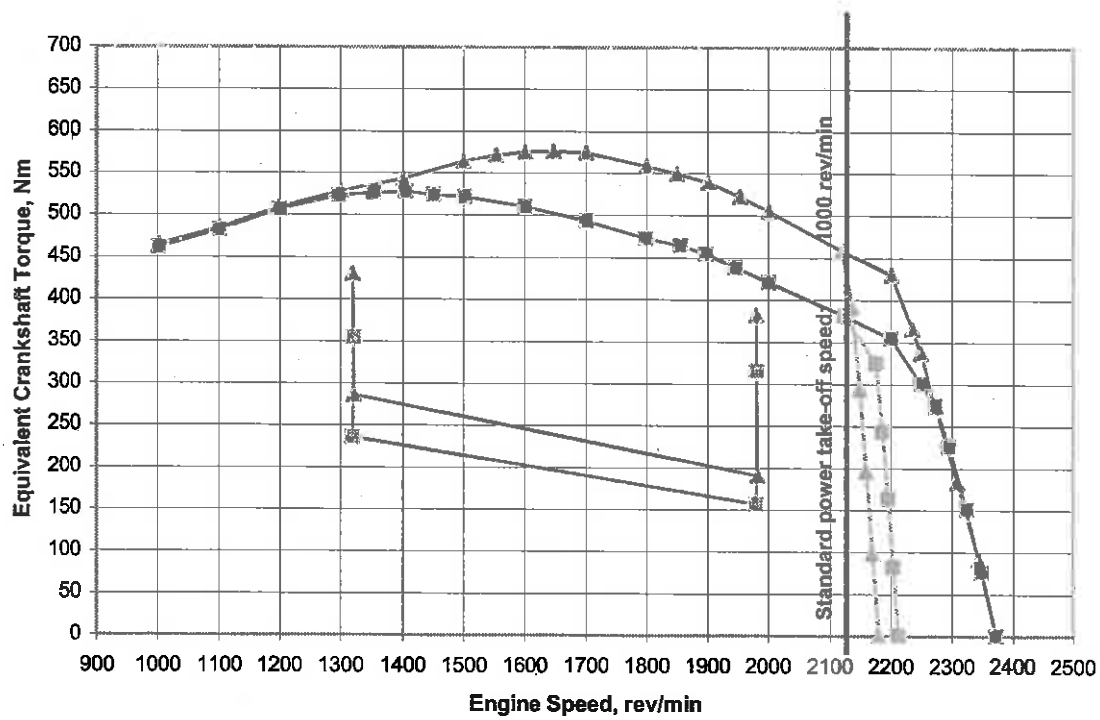
Maximum torque (equivalent crankshaft): 576.0 Nm
(engine speed:1647 min^{-1} (rev/min)

Mean atmospheric conditions:	
Temperature	21 °C
Pressure	102.9 kPa
Relative humidity	36 %
Maximum temperatures:	
Coolant	84 °C
Engine oil	105 °C
Fuel	52 °C
Engine air intake	31 °C

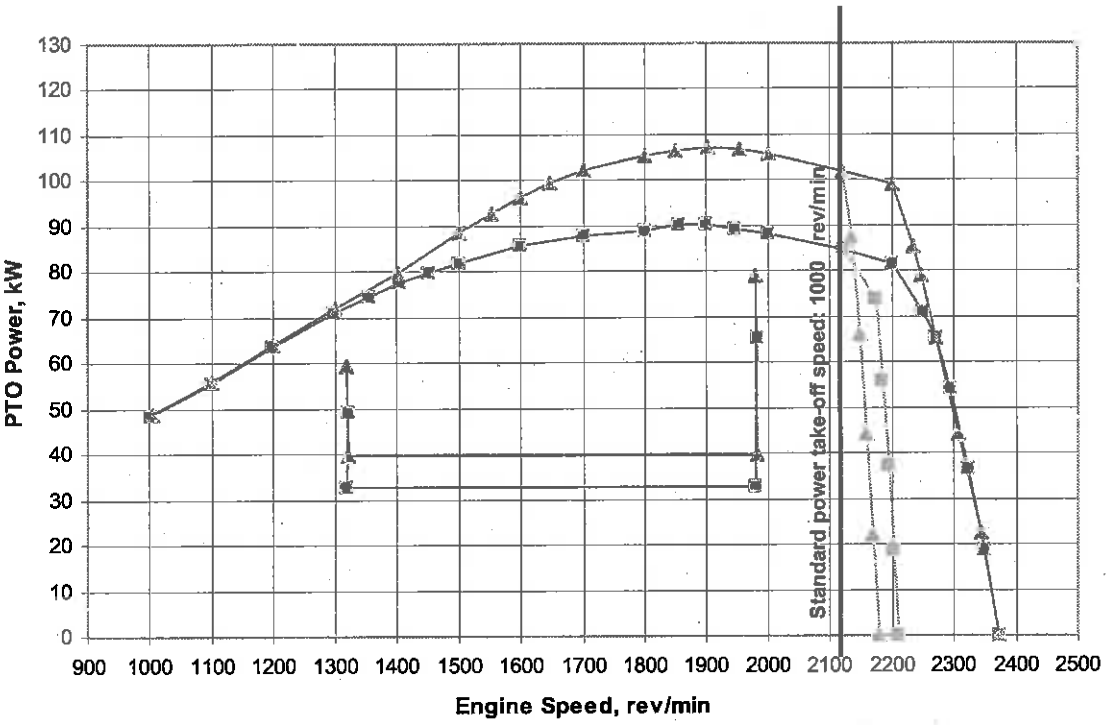
■ Main power take-off curve

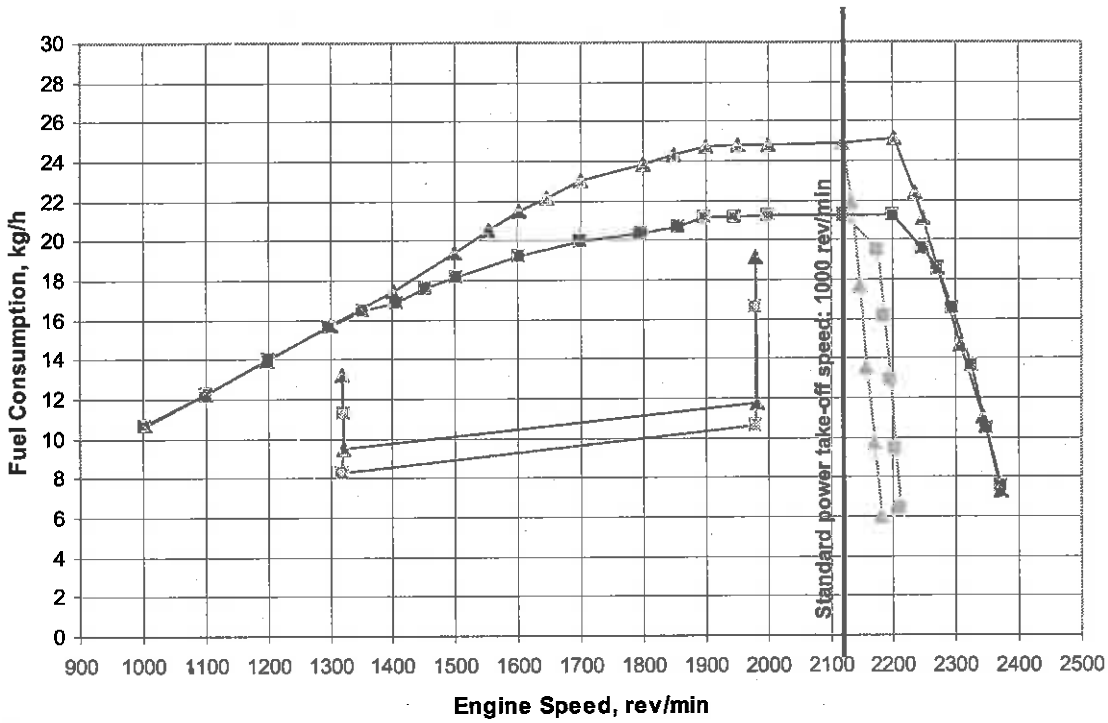
▲ Boosted power take-off curve

Power take-off curves

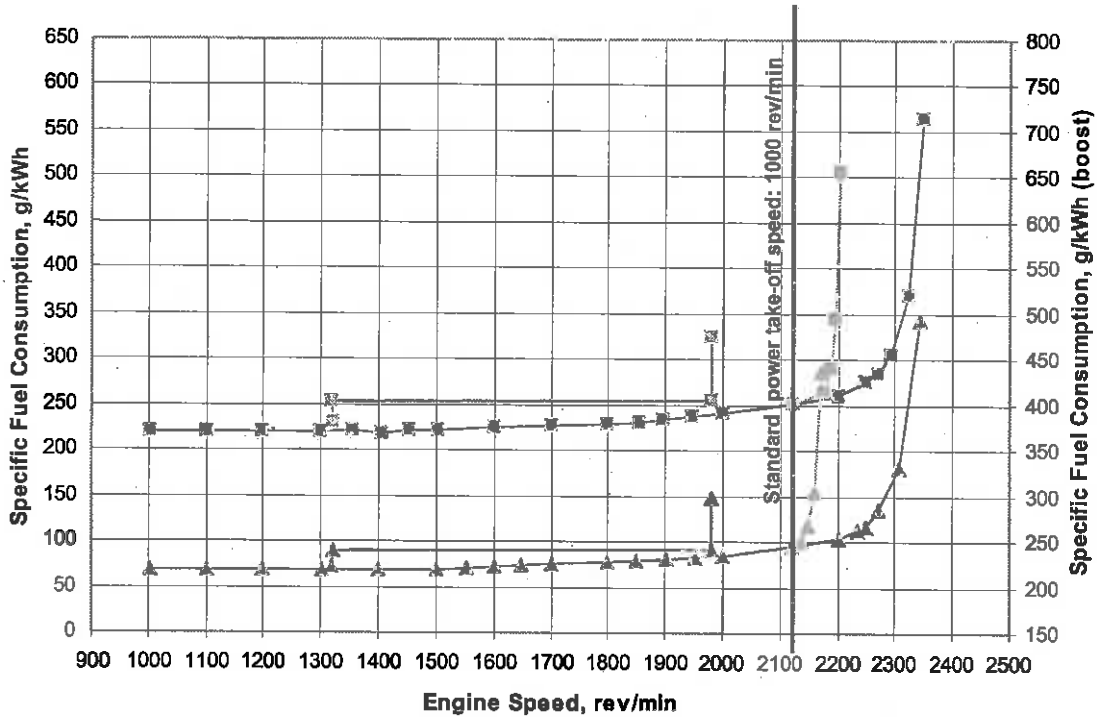


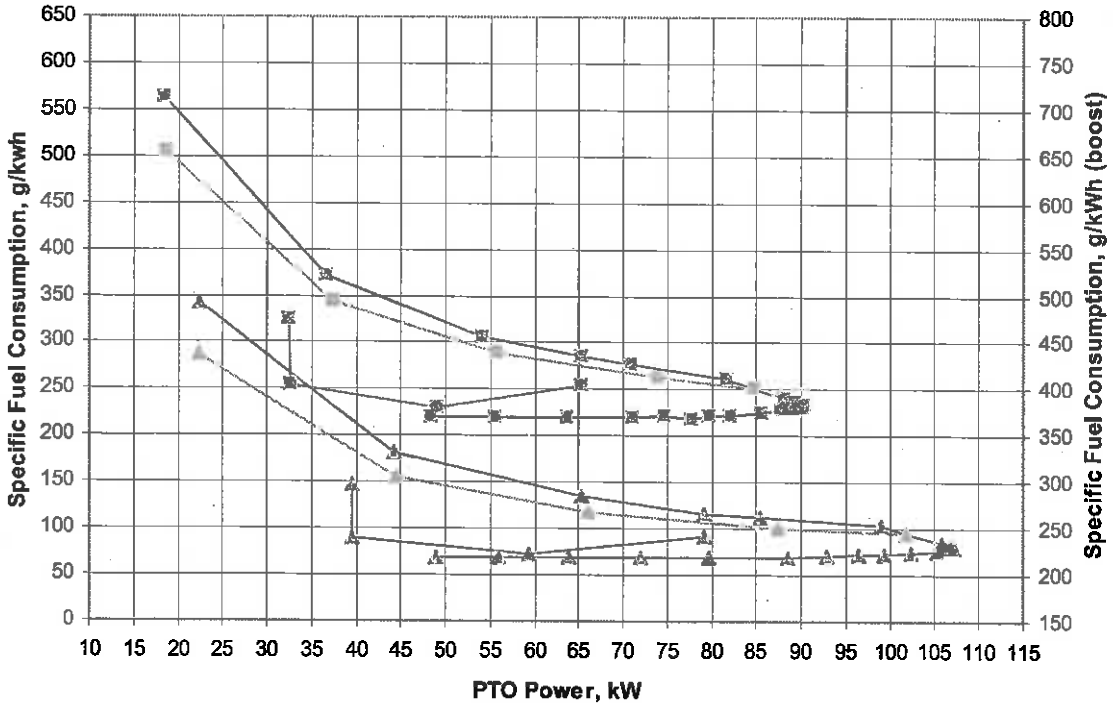
Power take-off curves





Power take-off curves





3.2 Hydraulic power and lifting force

Date of tests: 14 and 19 April 2005
16 and 17 May 2005

3.2.1 *Hydraulic power test*

3.2.1.1 Hydraulic fluid data

Hydraulic fluid type: NH 410B

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	21.5	67	67	2340		
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)	19.4 19.4*	66 67*		2334 2337*	46.3 55.8*	14.97 18.04*
3.2.1.2.3 Maximum available flow and maximum power from one coupler pair:	17.5	65		2337	69.6	20.30
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):	18.5	64		2336	69.2	21.34

* From 2 couplers

Maximum flow from 1 pair of couplers: 81.3 l/m

Maximum flow from 2 pairs of couplers: 82.5 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	198 mm	198 mm
Vertical movement	660 mm	820 mm
Maximum corrected force exerted through full range	52.0 kN	41.9 kN
Corresponding pressure of hydraulic fluid	19.4 MPa	19.4 MPa
Moment about rear-wheel axis	58.1 kNm	72.4 kNm
Maximum tilt angle of mast from vertical	---	10 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	- 460	- 387	- 255	- 175	- 70	0	+75	+175	+240	+273	+360
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	--	52.0	53.3	55.4	57.7	58.9	60.3	61.6	62.2	62.0	--
Corresponding pressure: 19.4 MPa											
at the frame kN	46.2	--	46.6	47.0	47.0	46.6	46.1	44.9	43.4	--	41.9
Corresponding pressure: 19.4 MPa											

3.3 Drawbar power test (unballasted tractor)

Date and Location of tests: 5 and 10 May 2005
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	430	70	70
Unballasted 4WD disengaged	465	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)													
1 I lo	24.4	56.8	1.54	2330	12.3	1750	517	1.63	53	85	104	11	80	101.3
1 I hi	29.8	56.8	1.89	2321	11.9	1697	454	1.86	52	85	104	11	80	101.3
2 I lo	35.6	56.4	2.27	2303	11.0	1822	418	2.02	52	84	104	11	81	101.3
2 I hi	43.1	56.0	2.77	2292	10.6	1875	377	2.24	53	84	104	11	81	101.3
3 I lo	49.4	54.9	3.24	2274	9.9	1917	368	2.29	52	84	104	11	81	101.3
1 II lo	59.0	55.2	3.85	2229	8.9	1971	342	2.47	52	83	103	14	68	101.4
3 I hi	59.6	54.6	3.93	2233	9.0	1992	337	2.51	54	84	104	15	66	101.4
4 I lo	67.2	53.9	4.49	2131	8.5	2090	313	2.70	51	82	103	14	68	101.3
1 II hi	68.1	53.9	4.55	2139	8.5	2216	314	2.69	54	82	105	14	67	101.4
2 II lo	71.6	51.8	4.98	1931	7.3	2083	291	2.91	55	81	104	15	66	101.4
4 I hi	73.5	52.2	5.07	1946	7.4	2119	288	2.94	51	81	103	11	81	101.3
2 II hi	74.4	43.8	6.11	1891	5.0	1890	284	2.98	49	81	101	12	72	101.3
3 II lo	73.0	36.6	7.18	1882	4.0	1929	296	2.85	49	81	102	11	82	101.3
1 III lo	74.3	32.2	8.30	1874	3.6	1981	278	3.04	51	80	103	13	66	101.4
3 II hi	74.0	29.9	8.90	1897	3.4	1996	282	3.00	50	81	102	11	81	101.3
1 III hi	75.1	26.4	10.23	1878	3.1	2031	273	3.10	51	80	102	13	67	101.4
4 II lo	72.9	24.8	10.57	1884	2.8	2025	288	2.93	50	80	102	11	82	101.3
2 III lo	72.0	20.9	12.42	1894	2.5	1987	301	2.81	52	81	103	13	65	101.4
4 II hi	73.0	20.3	12.96	1881	2.5	2002	290	2.91	50	81	102	13	71	101.4

3.3.2 FUEL CONSUMPTION														
3.3.2.1 In selected gear, at maximum power at rated speed														
1 III hi	65.0	19.4	12.05	2198	2.4	2099	330	2.56	53	82	103	14	64	101.4
3.3.2.1.1 75% of pull corresponding to maximum power at rated engine speed														
1 III hi	50.7	14.6	12.51	2270	1.9	2191	360	2.35	51	83	105	13	68	101.4
3.3.2.1.2 50% of pull corresponding to maximum power at rated engine speed														
1 III hi	34.3	9.7	12.74	2301	1.3	1956	430	1.97	51	84	105	14	68	101.4
3.3.2.1.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1														
2 III lo	50.7	14.6	12.52	1898	1.9	1869	308	2.75	53	81	101	16	62	101.5
3.3.2.1.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2														
2 III lo	34.4	9.7	12.72	1918	1.4	1817	371	2.28	53	81	101	16	63	101.5
3.3.2.2 In selected gear nearest to 7.5 km/h at rated engine speed														
2 II hi	66.0	32.9	7.21	2201	3.6	2106	325	2.60	50	82	103	11	81	101.3
3.3.2.2.1 75% of pull corresponding to maximum power at rated engine speed														
2 II hi	51.4	24.7	7.49	2272	3.0	2067	346	2.44	50	83	103	11	81	101.3
3.3.2.2.2 50% of pull corresponding to maximum power at rated engine speed														
2 II hi	35.1	16.5	7.66	2302	2.1	1989	455	1.86	50	83	103	11	81	101.3
3.3.2.2.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1														
3 II lo	51.5	24.7	7.51	1948	2.8	1880	307	2.76	55	81	103	16	62	101.5
3.3.2.2.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2														
3 II lo	35.1	16.4	7.69	1980	2.0	1833	358	2.36	54	82	102	16	64	101.5

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)														
1 I lo	18.2	43.6	1.51	2342	13.8	1915	598	1.41	54	85	103	11	68	101.6
1 I hi	22.6	43.8	1.86	2334	12.7	1611	503	1.68	52	85	103	11	67	101.6
2 I lo	27.3	43.4	2.26	2325	10.9	1621	475	1.78	54	84	104	11	68	101.6
2 I hi	33.3	43.0	2.79	2312	9.7	1776	405	2.09	52	84	104	11	68	101.6
3 I lo	38.2	42.4	3.24	2299	9.7	1840	395	2.14	53	84	105	11	65	101.6
1 II lo	45.3	42.1	3.88	2284	9.4	2051	373	2.27	53	84	105	12	61	101.6
3 I hi	46.3	42.0	3.97	2286	9.1	1996	359	2.35	53	83	105	11	65	101.6
4 I lo	54.6	41.8	4.70	2266	8.8	1998	344	2.46	54	83	105	11	65	101.6
1 II hi	54.7	41.7	4.72	2261	8.9	2038	337	2.51	52	83	105	12	61	101.7
2 II lo	63.2	41.4	5.49	2196	9.0	2095	323	2.61	53	83	105	12	62	101.6
4 I hi	65.0	41.3	5.67	2217	8.0	1855	296	2.85	52	83	104	11	65	101.6
2 II hi	70.9	39.9	6.40	2047	6.9	1971	291	2.90	52	82	104	13	56	101.6
3 II lo	73.0	37.0	7.09	1915	5.5	2009	282	3.00	52	81	103	13	56	101.6
1 III lo	74.8	32.5	8.29	1907	4.2	1980	283	2.99	50	80	103	10	71	101.6
3 II hi	75.2	31.0	8.73	1895	4.0	1935	281	3.00	52	80	103	12	57	101.6
1 III hi	76.6	27.2	10.16	1894	3.4	1905	277	3.05	50	80	103	10	72	101.6
4 II lo	74.4	25.8	10.37	1878	3.2	1925	275	3.07	49	80	102	10	75	101.6
2 III lo	74.3	21.8	12.25	1895	2.8	1918	280	3.02	50	80	103	11	71	101.6
4 II hi	74.3	20.9	12.82	1888	2.7	1913	283	2.99	50	80	102	10	74	101.6

3.3.2 FUEL CONSUMPTION														
3.3.2.1 In selected gear, at maximum power at rated speed														
1 III hi	67.4	20.4	11.88	2199	2.6	2038	305	2.77	50	82	104	10	71	101.6
3.3.2.1.1 75% of pull corresponding to maximum power at rated engine speed														
1 III hi	52.4	15.3	12.35	2272	2.1	1991	333	2.54	49	82	105	10	71	101.6
3.3.2.1.2 50% of pull corresponding to maximum power at rated engine speed														
1 III hi	35.5	10.2	12.57	2302	1.5	1915	415	2.04	50	83	104	10	71	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														
2 III lo	52.5	15.3	12.36	1901	2.2	1776	293	2.89	52	81	102	12	57	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														
2 III lo	35.6	10.2	12.54	1919	1.6	1746	352	2.40	51	81	101	12	58	101.6
3.3.2.2 In selected gear nearest to 7.5 km/h at rated engine speed														
2 II hi	66.3	33.9	7.04	2202	4.9	1924	325	2.60	47	82	100	10	71	101.5
3.3.2.2.1 75% of pull corresponding to maximum power at rated engine speed														
2 II hi	52.2	25.4	7.40	2273	3.1	1913	333	2.54	48	82	102	10	71	101.5
3.3.2.2.2 50% of pull corresponding to maximum power at rated engine speed														
2 II hi	35.4	17.0	7.50	2304	3.0	1821	412	2.05	49	83	102	10	73	101.5
3.3.2.2.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1														
3 II lo	52.0	25.4	7.38	1946	3.2	1895	312	2.71	53	81	103	12	58	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														
3 II lo	35.7	17.0	7.56	1974	2.2	1572	350	2.42	52	82	102	12	58	101.6

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.

Test carried out by: S J Devonshire

Signed: Officer in charge



J P Evans
Senior Test Engineer
Field Machinery Centre

Date: 14 July 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	199 mm	199 mm
Vertical movement	616 mm	703 mm
Maximum corrected force exerted through full range	58.8 kN	45.9 kN
Corresponding pressure of hydraulic fluid	19.4 MPa	19.4 MPa
Moment about rear-wheel axis	65.7 kNm	79.3 kNm
Maximum tilt angle of mast from vertical	----	5 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-428	-386	-295	-185	-85	0	+75	+135	+200	+230	+275
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	--	58.8	58.7	61.4	63.7	64.3	64.6	64.7	64.6	64.2	--
Corresponding pressure: 19.4 MPa											
at the frame kN	54.5	--	54.6	54.9	55.1	54.3	53.3	52.4	50.5	--	45.9
Corresponding pressure: 19.4 MPa											

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

Linkage settings for test – see Table 1.1

* Lift rods readjusted to 810 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	- 320	- 240	-100	0	+100	+168	+208	+230	---	---
*mm	---	---	- 240	- 100	0	+100	+168	+208	+230	+295	+340
SAE J283											
kN	63.5	63.5	61.8	58.6	57.4	55.3	53.6	52.0	49.5	---	---
*kN	---	---	58.8	58.3	57.6	56.4	55.2	54.3	53.8	51.8	48.8
Corresponding pressure: 17.6 MPa											

HYDRAULIC LIFT COMBINATION / REPORT REFERENCE TABLE

NEW HOLLAND TS100A / TS110A / TS115A / TS125A / TS135A

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
6642/2003	x							
6643/2003			x					
6644/2003						x		
6645/2003		x						
6646/2003					x			
6647/2003				x				
6648/2003							x	
6649/2003				x				
6650/2003								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: 25 May 2005

Four wheel drive engaged Windows closed

Gear	Test Condition	Measured travelling speed km/h	Sound level dB(A)
II hi	Light Load	8.0	69

Four wheel drive engaged Windows open

Gear	Test Condition	Measured travelling speed km/h	Sound level dB(A)
II hi	Light Load	8.0	76

Four wheel drive dis-engaged Windows closed

Gear	Test Condition	Measured travelling speed km/h	Sound level dB(A)
II hi	Light Load	7.9	68

Four wheel drive dis-engaged Windows open

Gear	Test Condition	Measured travelling speed km/h	Sound level dB(A)
II hi	Light Load	7.9	76