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Report No: OECD/7137/0196
OECD Approval No: 1727 Restricted Code
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Report on test in accordance with the OECD STANDARD CODE II (RESTRICTED CODE) for the Official Testing of Agricultural and Forestry Tractors

New Holland 8560/M160 Four-Wheel Drive Tractor with 18-speed Semi Power Shift Transmission (40 Km/h)



Manufactured by:	New Holland UK Ltd Basildon Essex United Kingdom
Submitted for test by:	The manufacturer
Report No:	785
Date:	October 1997

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Tractor manufacturer's name and address:	New Holland UK Ltd Basildon, Essex, United Kingdom
Location of tractor assembly:	Basildon, Essex
Submitted for test by:	The manufacturer
Selected for test by:	The manufacturer
Place of running in:	Basildon, Essex
Duration of running in:	140 hours
Location of test:	Silsoe Research Institute Wrest Park, Silsoe, United Kingdom

I. SPECIFICATION OF TRACTOR

TRACTOR

Make:	New Holland
Model:	8560/M160
Type:	Four wheel drive, unit construction
Serial No:	BX00015
1st Serial No:	003361B

ENGINE

Make:	New Holland
Model:	675T/WM
Type:	4 stroke direct injection turbo charged diesel
Serial No:	WM472992

Cylinders

Number/disposition:	6 vertical In-line
Bore/stroke:	111.8 mm/127.0 mm
Capacity:	7480 cm^3
Compression ratio:	17.5 :1
Arrangement of valves:	Overhead
Cylinder liners:	None, monobloc construction

Supercharging

Make:	Garrett
Model:	GT35
Type:	Exhaust driven
Pressure:	31-35"Hg at rated speed/load

Fuel system

Fuel feed system:	Wabco series 6000 or Purolator 'Facet' electric lift pump
Make, type and model of fuel filter:	Plastic strainer in tank and one disposable canister filter with sediment bowl and water seperator plus secondary disposable canister filter between tank and injection pump
Capacity of fuel tank:	325 litres
Make, type and model of injection pump:	Bosch, 'VE' Rotary, 0 460 426 235
Serial No:	666 967077
Manufacturer's production setting of injection pump:	
Flow rate:	81.5-86.5 mm^3 per stroke at 1150 rev/min pump speed and full load
Timing:	Delivery starts 6° before T.D.C
Make, type and model of injectors:	Bosch, multihole, 0 432 191 650 nozzle
Injection pressure:	270-278 bar

Governor

Make:	Bosch
Model:	None
Type:	Mechanical incorporated in fuel injection pump
Governed range of engine speed:	700 rev/min to 2530 rev/min
Rated engine speed:	2300 rev/min

Air cleaner

Pre-cleaner:	None
Make:	Locker Air Maze or Donaldson
Type:	3 stage dry paper element with replaceable cartridge (Exhaust Aspirated - optional)
Model:	None
Location of air intake:	Under engine hood in front and above radiator
Maintenance indicator:	Warning light on instrument panel

Lubrication system

Type of feed pump:	Forced feed from eccentric rotor pump
Type of filter:	Metal mesh strainer in sump on suction line and full flow disposable canister on pressure line to engine
Number:	1

Cooling system

Type of coolant:	Water and antifreeze (50% solution)
Type of pump:	Belt driven centrifugal impeller
Specification of fan:	Thermal controlled with viscous clutch
Number of fan blades:	5
Fan diameter:	510 mm
Coolant capacity:	26.0 litres
Type of temperature control:	Thermostat with full flow bypass
System pressure:	100 kPa

Starting system

Make:	Bosch JF
Model:	JF
Type:	Electrical, positive engagement, solenoid operated
Starter motor power rating:	3.1/3.6 kW
Cold starting aid:	CAV Thermostart - Type 357-33
Safety device:	Starting operable when all gear levers are in neutral

Electrical system

Voltage:	12 V
Generator:	Alternator
Make:	Magneti Marrelli
Model:	MME A 127
Type:	Belt driven
Power:	70/100 amps at 6000 rev/min
Batteries:	2 CEAC lead acid, mounted on front support
Rating:	70/95 AH at 20 hours rating

Exhaust system

Make:	Alcom
Model:	None
Type:	Underhood horizontal silencer with vertical stack pipe
Location:	Left-hand side of engine, under bonnet
Height of outlet above ground:	2989 mm

TRANSMISSION TO WHEELS

Main clutch

Make:	New Holland
Model:	None
Type:	Wet multiplate located in gearbox, for travel only
Number of plates:	7
Diameter of plates:	160 mm
Method of operation:	Mechanical/electro-hydraulic with pedal overide

Gear box

Make:	New Holland
Model:	Range command (semi power shift)
Type:	Electro/Hydraulic, syncromesh (range) operation. 6 powershift speeds with 3 ranges selected by 3 buttons on an adjustable lever mounted on the right hand console. Forward/reverse is actuated by a steering column mounted shuttle lever.
Number of gears:	18 forward, 6 reverse (40 Km/h)
Available options:	31 x 12 with creep (40 Km/h) 17 x 6 (30 Km/h) 30 x 12 with creep (30 Km/h)

Rear axle final drives

Make:	New Holland
Model:	None
Type:	Crown wheel and pinion with differential and inboard epicyclic reduction gear final drive
Differential lock:	
Type:	Mechanical
Method of engagement:	Electro-hydraulic actuation in response to signal from switch on right-hand control panel
Method of disengagement:	Via panel switch or in response to electrical signal from brakes on application

Front axle and final drives

Make:	New Holland
Model:	None
Type:	Crown wheel and pinion with differential and outboard epicyclic reduction gear final drives
Drive engagement:	
Type:	Multiplate clutch - located within the gearbox
Method of operation:	Electro-hydraulic actuation in response to signal from switch on the RH control panel
Differential lock:	
Type:	Mechanical
Method of engagement:	Electro-hydraulic actuation in response to signal from switch on right-hand control panel
Method of disengagement:	Via panel switch or in response to electrical signal from brakes on application

Total ratios and travelling speeds

Gear	Group No	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed at rated engine speed:* 2300 rev/min km/h
Forward			
1	A	335.42	2.12
2	A	278.93	2.55
3	A	232.21	3.06
4	A	193.11	3.68
5	A	160.54	4.43
6	A	133.51	5.33
1	B	144.41	4.92
2	B	120.09	5.92
3	B	99.98	7.11
4	B	83.14	8.55
5	B	69.12	10.29
6	B	57.48	12.37
1	C	50.91	13.97
2	C	42.34	16.79
3	C	35.25	20.17
4	C	28.95	24.26
5	C	24.37	29.18
6	C	20.26	34.47
Reverse			
1	R	171.92	4.14
2	R	142.97	4.97
3	R	119.02	5.97
4	R	98.98	7.18
5	R	82.29	8.64
6	R	68.43	10.39

A = Low range B = Medium range C = High range

(*) Calculated with a tyre dynamic radius index of 820 mm (ISO 4251/1-1992)

Number of revolutions of front wheels for one revolution of rear wheels: 1.324

POWER TAKE-OFF

Main power take-off

Type:	Independent
Method of engagement:	Electro - hydraulically operated multi-plate clutch in response to a signal from switch on the right-hand control panel
Number of shafts:	1 interchangeable shaft, 6 or 21 spline to ISO.500/1991
Method of changing power take-off speeds:	
Two speed	Shiftable, 540 or 1000 rev/min by lever on right-hand console

Clutch

Make:	New Holland
Model:	None
Type:	Multiplate, wet
Number of plates:	6
Diameter of plates:	140.0 mm

Two/three speed shiftable power take-off proportional to engine speed and with changeable shafts

540/750/1000 rev/min	540 rev/min	750 rev/min	1000 rev/min
Location:	Rear of tractor	Rear of tractor	Rear of tractor
Diameter of power take-off shaft:	34.9 mm	34.9	34.9
Number of splines:	6 or 21	6 or 21	6 or 21
Height above ground:	803 mm	803 mm	803 mm
Distance from the median plane of the tractor:	Central	Central	Central
Distance behind rear wheel axis:	602 mm	602 mm	602 mm
Pto speed at rated engine speed:	630	804	1085
Engine speed at standard power take-off speed:	1971	2145	2121
Ratio of rotation speeds:	3.65	2.86	2.12
Power restriction and maximum torque:	None	None	None
Direction of rotation (viewed from behind tractor):	Clockwise	Clockwise	Clockwise

Power take-off proportional to ground speed

Travelling distance for one revolution of power take-off shaft	.355 m	.263 m	.194 m
Number of power take-off shaft revolutions for one revolution of rear driving wheels	15.4	19.6	26.5

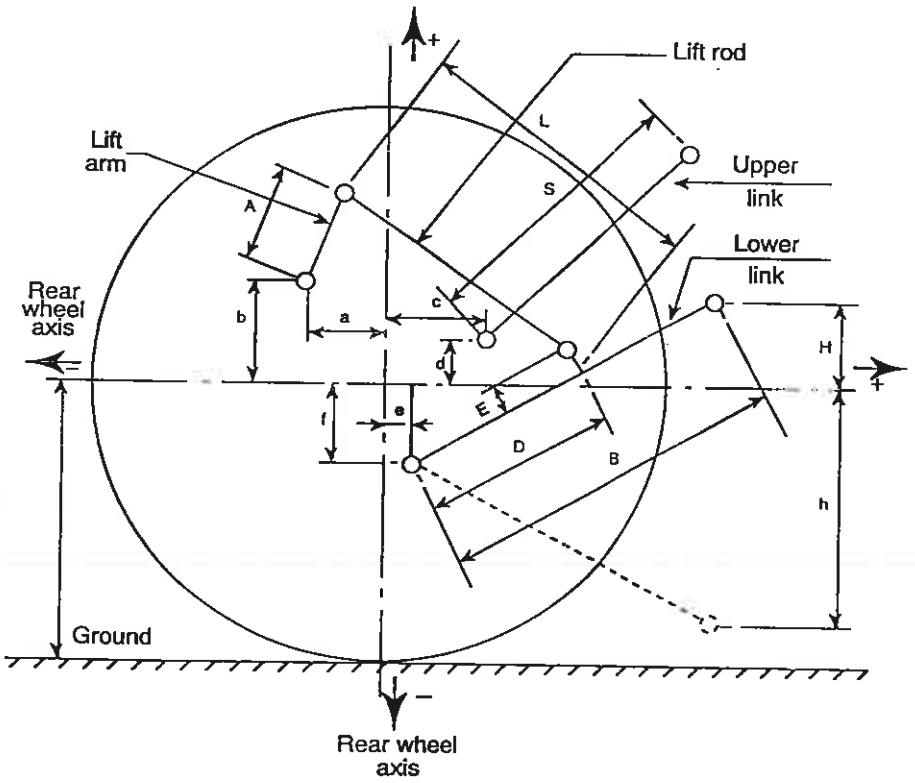
POWER LIFT - standard

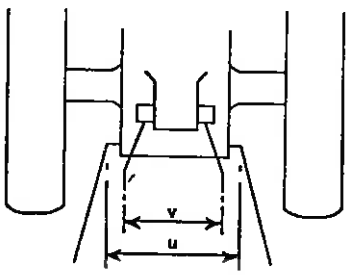
Pump - standard

Make:	New Holland
Model:	None
Type:	Electro-hydraulic with solenoid valves, open centre for lift and drop
Type and number of cylinders:	1 single acting inside transmission housing plus the option of 1 or 2 single acting, externally mounted assistor rams. 1 fitted for test I, 2 fitted for test II
Type of linkage lock for transport:	Hydraulic
Relief valve pressure setting:	18.7 - 19.3 MPa
Opening pressure of cylinder safety valve:	19.3 MPa
Lift pump type:	Gear
Transmission between pump and engine:	Gear driven from pto shaft, independent of main and pto clutches
Type and number of filters:	2 disposable canister filters
Site of oil reservoir:	Rear axle housing
Type, number and position of tapping points:	1, 2, 3 or 4 remote couplers at rear of tractor
Maximum volume of oil available to external cylinders:	18 - 20 litres

THREE-POINT LINKAGE

Category:	**2 to ISO standard 730-1:1994**
Category adaptor:	**None**
Controls:	**Electronic draught/position control link.** **(Optional - draught or position control)** **Lower link sensing**





LIFT TEST
Linkage geometry

Fig 2.1

Table 2.1
Dimensions of linkage when attached to the standard frame (ISO 730-1: 1994 CAT 2)

			Dimensions or range	Settings used in main test	Settings used in optional test
Length of lift arms		(A)	230	230	230
Length of lower links		(B)	974	974	974
Distance of lift arm pivot point from rear wheel centre line:	horizontally:	(a)	156	156	156
	vertically:	(b)	362.5	362.5	362.5
Horizontal distance between the two lower link points:		(u)	544	544	544
Horizontal distance between the two lift arm end points:		(v)	560	560	560
Length of upper link:		(S)	652-942	754	968
Distance of upper link pivot point from rear wheel centre line:	horizontally:	(c)	430-455	455	430
	vertically:	(d)	208-275	208	275
Distance of lower link pivot point from rear wheel centre line:	horizontally:	(e)	220	220	220
	vertically:	(f)	250	250	250
Distance of lower link points to lift rod pivot points on lower link centre line:	horizontally:	(D)	435-504	435	504
	vertically:	(E)	on centre line	on centre line	on centre line
Length of lift rods:		(L)	635-780	720	768
ISO mast height			610	610	610
Height of lower hitch points (*) relative to the rear wheel centre line, situated 820 mm above the ground level:					
- in low position		(h)	250-744	626	622
- in high position		(H)	41-328	100	45
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 ISO 4251/1-1992

SWINGING DRAWBAR	**Drawbar**	**Pick up hitch**
(Incorporated in automatic pick-up hitch with hook on opposite end and selectable by reversing drawbar)		
Type:	Clevis	Hook
Height above ground, unballasted maximum:	487 mm	475 mm
minimum:	435 mm	-
Type of adjustment:	Inverting drawbar	None
Distance of hitch point from rear-wheel axis, horizontally:	850 mm, 950 mm, 1000 mm	620 mm
Distance of hitch point from power take-off shaft ends:		
Vertically:	316 mm, 368 mm,	330 mm
Horizontally:	248 mm, 348 mm, 398 mm	0 mm
Lateral adjustment (centre of clevis):		
Right-hand	235 mm, 260 mm	None
Left-hand	235 mm, 260 mm	None
Distance of pivot point from rear axles horizontally:	345 mm, 400 mm	-
Width of clevis:	64 mm	-
Diameter of drawbar pin hole:	33 mm	
Maximum vertical permissible load - Clevis uppermost:	2400 kg	3000 kg
Clevis underneath:	2180 kg	-

<u>Trailer Hitch</u>

Type: None fitted

<u>Linkage Drawbar</u>

Type: None fitted

<u>Front Towing Hitch</u>

Type None fitted

STEERING

Make:	New Holland
Model:	None
Type:	Hydrostatic
Method of operation:	
Pump:	New Holland
Motor:	Danfoss OSPC-160-OR
Ram:	2, a balanced single acting cylinder operating each steering arm
Filter:	Integral with hydraulic power lift system
Working pressure:	166 - 178 bar

BRAKES

Service brake

Make:	New Holland
Model:	None
Type:	Oil-immersed single plate disc
Method of operation:	Hydraulic, independent on rear wheels (On 40 kph (4WD) models. When the service brakes are actuated the front wheel drive is automatically engaged)
Trailer braking take-off:	Hydraulic connector fitted to ISO 5676-1983

Parking brake

Make:	New Holland
Type:	Fully independent three plate disc operating on bevel pinion shaft
Method of operation:	Hand lever with ratchet

WHEELS

Number:	4
Front:	2 steering and driving
Rear:	2 driving
Wheelbase:	2723 mm

Track settings

	Minimum mm	Maximum mm	Adjustment method
Front	1551	2359	Reversing wheels and offset lug rims
Rear	1630	2232	Reversing wheels and offset lug rims

PROTECTIVE STRUCTURE

Make:	New Holland
Model:	New Holland SLTV2
Type:	Cab safety frame
Manufacturer's name and address:	New Holland UK Ltd, Basildon
Protective device:	
Rollguard:	Safety cab
Tiltable/Not tiltable:	Non tiltable
OECD approval number:	CSD-1399/1-4, 28 September 1994
New Holland M160:	CSD 1399/3
New Holland 8560:	CSD 1399/1

Original test and minor modification certificates under the responsibility of S.H. Statens Husdyrbrugsforsog Bygholm, Denmark.

DRIVERS SEAT

Make/Model/Type:	Grammer DS85HI/90A
Type of suspension:	Parallelogram suspension spring
Type of damping:	Double acting, hydraulic
Range of adjustment:	
Longitudinal:	± 75 mm
Vertical:	± 30 mm

Passenger seat

Make:	New Holland
Type:	Soft plastic moulding, half folding, on LH side of inner fender. EEC approved to Directive 76/763/EEC-e110725

LIGHTING

In accordance with EEC Directive 78/933/EEC

Unrestricted beam angle of headlight in plan view: 140°

	Height above ground to centre mm	Size mm	Distance from outside edge to median plane of tractor mm
Headlight	1390	150 x 90	200
Sidelights	1620	105 x 30	870
Rear lights	1825	50 x 50	843
Axle reflectors	792	100 x 35	570
Cab reflectors	1825	50 x 50	843

II TEST CONDITIONS

Overall dimensions

Length mm	Width		Height at top of	
	Minimum mm	Maximum mm	Protective structure mm	Exhaust pipe mm
4655	2135	2771	2835	2989

Ground clearance (unballasted tractor) 369 mm

Clearance-limiting part: Drawbar clevis in lowest position

Tractor mass (safety cab)

	Unballasted		Ballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	2281	2298	–	–
Rear	3393	3451	–	–
Total	5674	5749	–	–

Tyres and track width specification

	Front	Rear
Tyres dimensions ply rating type	 14.9 R 28 128A8 Radial	 18.4 R 38 146A8 Radial
Maximum load (tyre manufacturer's), kg 30 km/h (40 km/h)	1925 (1800)	3210 (3000)
Maximum load (tractor manufacturer's), kg	1925 (1800)	3210 (3000)
Inflation pressure (tyre manufacturer's), Bar	1.6	1.6
Dynamic radius index	640	820
Chosen track width (manufacturer's nominal)	1730	1830

Oils and lubrication

Capacity and change interval

	Capacity litre	Oil change hours	Filter change hours
Engine	19.0	300	300
Front axle differential	9.0	1200	None
Final drive (front) - per side	1.7	1200	None
Rear axle Range command + CCLS	90	1200	300
Gearbox } Hydraulic system } Final drives (rear) } Steering }	Integral with rear axle		
Brakes	0.5	Top-up	None

Fuels and lubricants used in tests

Fuel

Type: Diesel oil to Class D, 1.5 to 5.5 cSt. Specific gravity: 0.8390 g/cm^2 at 15°C

Oils	NH spec	Recommended	Used during test
Engine oil			
Type:	NH 324B	SAE 10W/30	As recommended
Viscosity:		11.5 cSt at 100°C	
Classification:		API CF-4	
Transmission oils			
Type:	NH 410B	SAE 10W/30	As recommended
Viscosity:		9 cSt at 100°C	
Classification:		API GL-4	
Rear final drives			
Type:	NH 410B	SAE 10W/30	As recommended
Viscosity:		9 cSt at 100°C	
Classification:		API GL-4	
Front differential and final drives			
Type:	NH 410B	SAE 10W/30	As recommended
Viscosity:		9 cSt at 100°C	
Classification:		API GL-4	
Hydraulic brakes			
Type:	NH 610A	No equivalent	As recommended
Viscosity:		6 cSt at 100°C	
Classification:		No equivalent	
Hydraulic fluid			
Type:	NH 410B	SAE 10W/30	As recommended
Viscosity:		9 cSt at 100°C	
Classification:		API GL-4	
Steering oil			
Type:	NH 410B	SAE 10W/30	As recommended
Viscosity:		9 cSt at 100°C	
Classification:		API GL-4	
Grease points			
Recommended grease:	NH 720A	Lithium based	As recommended
Number of lubrication points:	14		

III. **TEST RESULTS**

A. **COMPULSORY TESTS**

1. MAIN POWER TAKE-OFF (1000)

Date and location of tests: 22 November 1996
Silsoe Research Institute,
Wrest Park, Silsoe, Bedford

Type of dynamometer: Eddy Current, Borghi and Saveri

Power kW	Speed		Fuel consumption			Specific energy kWh/l
	Engine rev/min	P.T.O. rev/min	Hourly kg/h	l/h	Specific g/kWh	
1.1 MAXIMUM POWER - TWO HOUR TEST						
111.4	1970	929	26.84	31.99	241	3.48
1.2 POWER AT RATED ENGINE SPEED						
107.1	2300	1085	28.83	34.36	269	3.12
1.3 STANDARD POWER TAKE-OFF SPEED (1000 ± 25 rev/min)						
109.4	2121	1000	27.60	32.89	252	3.33
1.4 PART LOADS 1.4.1 The torque corresponding to maximum power at rated engine speed						
107.1	2300	1085	28.83	34.36	269	3.12
1.4.2 85% of the torque defined in 1.4.1						
95.5	2414	1138	27.24	32.47	285	2.94
1.4.3 75% of the torque defined in 1.4.2						
71.9	2425	1144	21.75	25.92	303	2.77
1.4.4 50% of the torque defined in 1.4.2						
48.1	2441	1152	16.93	20.17	352	2.39
1.4.5 25% of the torque defined in 1.4.2						
24.3	2460	1160	12.33	14.69	507	1.65
1.4.6 Unloaded						
0	2491	1175	8.15	9.71	--	--

Power kW	Speed		Fuel consumption			Specific energy kWh/l
	Engine rev/min	P.T.O.	Hourly kg/h	l/h	Specific g/kWh	
1.5	PART LOADS AT STANDARD POWER TAKE-OFF SPEEDS (1000 ± 25 rev/min)					
1.5.1	The torque corresponding to maximum power					
109.4	2121	1000	27.60	32.89	252	3.33
1.5.2	85% of the torque obtained in 1.5.1					
97.3	2217	1046	25.43	30.31	261	3.21
1.5.3	75% of the torque obtained in 1.5.2					
74.0	2246	1059	20.71	24.68	280	3.00
1.5.4	50% of the torque obtained in 1.5.2					
49.8	2267	1069	15.62	18.62	314	2.67
1.5.5	25% of the torque obtained in 1.5.2					
25.2	2298	1084	11.32	13.49	448	1.87
1.5.6	Unloaded					
0	2331	1099	6.85	8.16	--	--

No load, maximum engine speed: 2491 rev/min

Torque (equivalent crankshaft) at maximum power: 539.9 Nm

Torque (equivalent crankshaft) at rated speed: 444.7 Nm

Maximum torque (equivalent crankshaft): 652.1 Nm
(engine speed 1401 rev/min)

Mean atmospheric conditions:

- Temperature 24°C
- Pressure 1005 m bar
- Relative humidity 28%

Maximum temperatures:

- Coolant 88°C
- Engine oil 113C
- Fuel 55°C
- Engine air intake 33°C

2. HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 20 March 1997

2.1 Hydraulic power test

Sustained pressure with relief valve open: 20.6 MPa

Pump delivery rate at minimum pressure: 98.4 l/min

	Flow rate l/min	Pressure MPa	Power kW
Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power	76.5	18.5	23.59
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	94.6	17.6	27.74

Tapping point used for test: Auxiliary service connection

Temperature of hydraulic fluid if different from 65 ± 5°C: -- °C

Opening pressure of the unloading valve: -- MPa

Closing pressure of the unloading valve: -- MPa

2.2 I. Power lift test - (To ISO 730-1:1990)

1. Assistor ram fitted

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	194 mm	194 mm
Vertical movement	714 mm	846 mm
Maximum corrected force exerted through full range	35.9kN	32.5 kN
Corresponding pressure of hydraulic fluid	18.5 MPa	18.5 MPa
Moment about rear-wheel axis	42.9 kNm	58.6 kNm
Maximum tilt angle of mast from vertical	--	11 degrees

Linkage settings for test - see Table 2.1 and Figure 2.1

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-428	-376	-300	-200	-100	0	100	200	300	338	418
Lifting forces (the values measured are corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure delivered by the hydraulic system)											
at the hitch points kN	--	35.9	41.8	46.9	49.9	51.8	53.5	54.3	55.3	56.5	--
Corresponding pressure: 18.5 MPa											
at the frame kN	32.5	36.2	39.5	41.7	42.7	42.9	42.6	41.9	41.0	40.5	40.1
Corresponding pressure: 18.5 MPa											

2.2 II. Power lift test - (To ISO 730-1:1990)

2. Assistor rams fitted

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	194 mm	194 mm
Vertical movement	671 mm	808 mm
Maximum corrected force exerted through full range	39.2 kN	36.1 kN
Corresponding pressure of hydraulic fluid	18.5 MPa	18.5 MPa
Moment about rear-wheel axis	46.8 kNm	65.1 kNm
Maximum tilt angle of mast from vertical	--	10 degrees

Linkage settings for test - see Table 2.1 and Figure 2.1

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-428	-376	-300	-200	-100	0	100	200	255	295	380
Lifting forces (the values measured are corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure delivered by the hydraulic system)											
at the hitch points kN	--	39.2	49.8	55.9	61.3	65.5	68.5	72.0	73.5	73.7	--
Corresponding pressure: 18.5 MPa											
at the frame kN	36.1	40.5	46.2	50.9	53.0	54.2	54.8	54.2	53.9	53.4	51.2
Corresponding pressure: 18.5 MPa											

3. DRAWBAR POWER AND FUEL CONSUMPTION TEST (UNBALLASTED TRACTOR), 4 WHEEL DRIVE

Date and location of tests: 12 December 1996
Silsoe Research Institute
Wrest Park
Silsoe

Height of drawbar above ground	Tyre inflation pressure (kPa)	
	Front	Rear
395 mm	117	103

Type of track: Concrete

Gear and Range	Power	Drawbar Pull	Speed	Engine Speed	Slip of wheels or track	Spec fuel cons	Spec energy	Temperature			Atmospheric conditions		
								Fuel	Coolant	Eng oil	Temp	Rel Humidity	Pressure
	kW	kN	km/h	rev/min	%	g/kwh	kWh/l	Deg.C	Deg.C	Deg.C	Deg.C	%	kPa
3.1 MAXIMUM POWER IN TESTED GEARS													
4A*	54.3	58.3	3.35	2418	14.6	350	2.40	50	87	107	4	69	100.2
5A*	63.6	58.0	3.94	2409	15.1	370	2.27	49	87	108	4	69	100.2
1B	69.7	56.1	4.47	2413	13.5	380	2.21	52	87	108	5	61	100.4
6A	76.9	56.6	4.89	2378	12.0	354	2.37	50	88	106	7	51	101.4
2B	82.6	52.8	5.63	2397	10.0	345	2.43	50	87	111	5	63	100.4
3B	89.7	51.2	6.31	2206	8.8	317	2.65	49	87	111	4	65	100.4
4B	91.9	48.3	6.85	1961	7.3	292	2.87	48	86	110	4	64	100.4
5B	93.7	39.9	8.46	1973	5.5	285	2.94	49	86	108	6	60	100.4
6B	91.8	32.1	10.29	1977	4.8	291	2.88	48	87	109	5	62	100.4
1C	96.0	29.7	11.64	1970	4.0	279	3.01	47	87	111	5	63	100.2
2C	93.7	23.9	14.11	1972	3.3	283	2.97	46	86	111	5	63	100.2
3C	91.6	19.3	17.04	1973	2.9	286	2.93	45	86	111	5	65	100.2
3.2 FUEL CONSUMPTION 3.2.1 In selected gear, at maximum power at rated speed													
1C	89.7	23.5	13.73	2307	3.4	331	2.53	46	87	111	5	60	100.2
3.2.1.1 75% of pull at maximum power at rated speed													
2C	70.9	17.6	14.48	2415	2.6	336	2.50	46	87	110	4	67	100.2
3.2.1.2 50% of pull at maximum power at rated speed													
1C	47.4	11.6	14.71	2436	1.9	470	1.78	46	87	111	4	68	100.2
3.2.1.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.1													
2C	71.8	17.8	14.50	2011	2.6	292	2.87	47	86	109	4	69	100.2
3.2.1.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.2													
2C	46.7	11.4	14.72	2025	1.7	259	3.24	47	85	106	4	69	100.2
3.2.2 In selected gear nearest to 7.5 km/h, at maximum power at rated engine speed													
3B	89.5	48.3	6.67	2300	7.6	318	2.64	49	87	111	4	66	100.4
3.2.2.1 75% of pull at maximum power at rated speed													
3B	71.9	36.0	7.20	2416	5.0	310	2.70	49	87	112	4	64	100.4
3.2.2.2 50% of pull at maximum power at rated speed													
3B	48.8	23.8	7.39	2436	3.3	419	2.00	49	87	111	4	64	100.4
3.2.2.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.1													
4B	71.1	35.6	7.20	2005	4.8	294	2.86	48	86	108	4	69	100.2
3.2.2.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.2													
4B	48.9	23.9	7.38	2025	3.3	264	3.18	46	85	107	4	69	100.2

*Maximum power limited by wheelslip

TEST RESULTS

B. SUPPLEMENTARY TESTS

2. POWER LIFT TESTS

2.2 I. Power lift test - (To manufacturers lift rod setting)

1. Assistor ram fitted

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	198 mm	198 mm
Vertical movement	647 mm	702 mm
Maximum corrected force exerted through full range	42.5 kN	42.3 kN
Corresponding pressure of hydraulic fluid	18.5 MPa	18.5 MPa
Moment about rear-wheel axis	50.7 kNm	76.3 kNm
Maximum tilt angle of mast from vertical	--	5 degrees

Linkage settings for test - see Table 2.1 and Figure 2.1

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-392	-372	-300	-200	-100	0	100	200	260	275	310
Lifting forces (the values measured are corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure delivered by the hydraulic system)											
at the hitch points kN	--	42.5	48.9	53.9	56.4	57.8	58.4	59.4	60.1	58.9	--
Corresponding pressure:				18.5 MPa							
at the frame kN	42.3	44.0	48.5	51.0	51.7	51.5	50.5	48.9	48.0	47.9	45.8
Corresponding pressure:				18.5 MPa							

2.2 II. Power lift test - (To manufacturers lift rod setting)

2. Assistor rams fitted

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	198 mm	198 mm
Vertical movement	607 mm	665 mm
Maximum corrected force exerted through full range	47.9 kN	49.5 kN
Corresponding pressure of hydraulic fluid	18.5 MPa	18.5 MPa
Moment about rear-wheel axis	57.2 kNm	89.3 kNm
Maximum tilt angle of mast from vertical	--	5 degrees

Linkage settings for test - see Table 2.1 and Figure 2.1

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-392	-372	-300	-200	-100	0	30	170	200	235	270
Lifting forces (the values measured are corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure delivered by the hydraulic system)											
at the hitch points kN	--	47.9	58.2	65.7	70.3	74.0	74.6	78.4	78.8	79.2	--
Corresponding pressure: 18.5 MPa											
at the frame kN	49.5	51.6	57.8	62.9	65.3	65.9	65.9	65.4	65.3	65.2	63.9
Corresponding pressure: 18.5 MPa											

3. DRAWBAR POWER AND FUEL CONSUMPTION TEST (UNBALLASTED TRACTOR, 2 WHEEL DRIVE)

Date and location of tests: 22 January 1997
Silsoe Research Institute
Wrest Park
Silsoe

Type of track: Concrete

Height of drawbar above ground	Tyre inflation pressure (kPa)	
	Front	Rear
450 mm	117	103

Gear and Range	Power	Drawbar Pull	Speed	Engine Speed	Slip of wheels or track	Spec fuel cons	Spec energy	Temperature			Temp	Rel Humidity	Pressure
								Fuel	Coolant	Eng oil			
	kW	kN	km/h	rev/min	%	g/kwh	kWh/l	Deg.C	Deg.C	Deg.C	Deg.C	%	KpA
3.1 MAXIMUM POWER IN TESTED GEARS													
1A	25.4	46.7	1.96	2449	13.6	551	1.52	53	87	106	5	59	101.8
2A	30.4	46.3	2.36	2444	13.0	483	1.74	49	86	106	6	57	101.8
3A	36.8	45.4	2.92	2441	10.4	426	1.97	52	87	107	6	56	101.8
4A	43.9	45.0	3.51	2437	10.1	388	2.16	49	86	108	7	56	101.8
5A	52.6	44.9	4.22	2429	10.0	378	2.22	49	87	108	7	58	101.8
1B	58.0	45.8	4.56	2422	12.2	373	2.25	48	87	108	5	60	101.8
6A	63.0	45.6	4.98	2415	11.2	380	2.21	48	87	109	6	58	101.9
2B	69.3	44.1	5.66	2415	9.2	336	2.50	46	87	109	5	58	101.9
3B	81.9	44.5	6.62	2397	10.9	342	2.46	49	88	110	6	59	101.9
4B	88.8	42.9	7.45	2174	8.0	311	2.69	47	87	109	7	57	101.9
5B	91.2	40.1	8.19	1972	7.4	294	2.85	47	87	109	2	83	102.3
6B	92.1	32.8	10.10	1976	5.1	291	2.88	45	87	110	2	83	102.3
1C	96.5	30.2	11.49	1976	4.5	289	2.91	46	87	110	3	83	102.2
2C	96.7	25.0	13.91	1972	3.6	280	2.99	39	87	106	4	79	102.2
3C	94.5	20.1	16.89	1982	3.1	286	2.93	45	87	109	4	76	102.2
3.2 FUEL CONSUMPTION 3.2.1 In selected gear, at maximum power at rated speed													
2C	90.7	20.0	16.37	2304	3.0	315	2.67	44	87	109	4	75	102.2
3.2.1.1 75% of pull at maximum power at rated speed													
2C	71.2	14.8	17.28	2418	2.4	385	2.18	45	87	111	4	75	102.2
3.2.1.2 50% of pull at maximum power at rated speed													
2C	48.9	10.0	17.53	2436	1.7	424	1.98	44	87	110	4	76	102.2
3.2.1.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.1													
3C	70.7	14.8	17.21	2005	2.4	301	2.79	45	86	107	4	76	102.2
3.2.1.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.2													
3C	48.2	9.9	17.51	2025	1.6	349	2.40	46	86	106	4	75	102.

* Maximum power limited by wheelslip

Gear nearest 7.5 km/h is also slip gear.

REPAIRS AND ADJUSTMENTS DURING TESTS: None

REMARKS: None

Test carried out by: S J Devonshire

Signed: Officer in charge of tests

P C Seward

Signed: for the Director

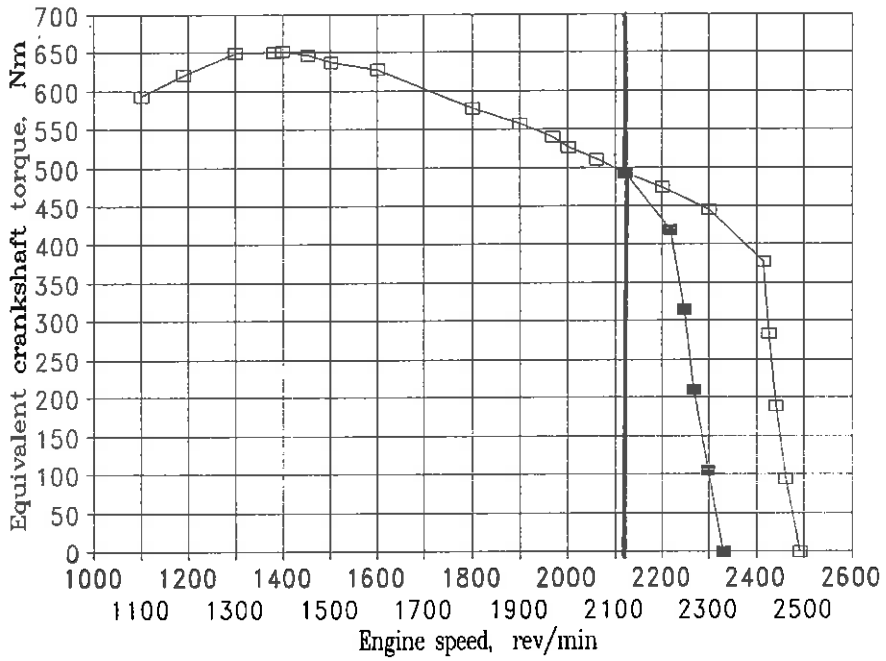
P C Seward
Head of Test Engineering Group

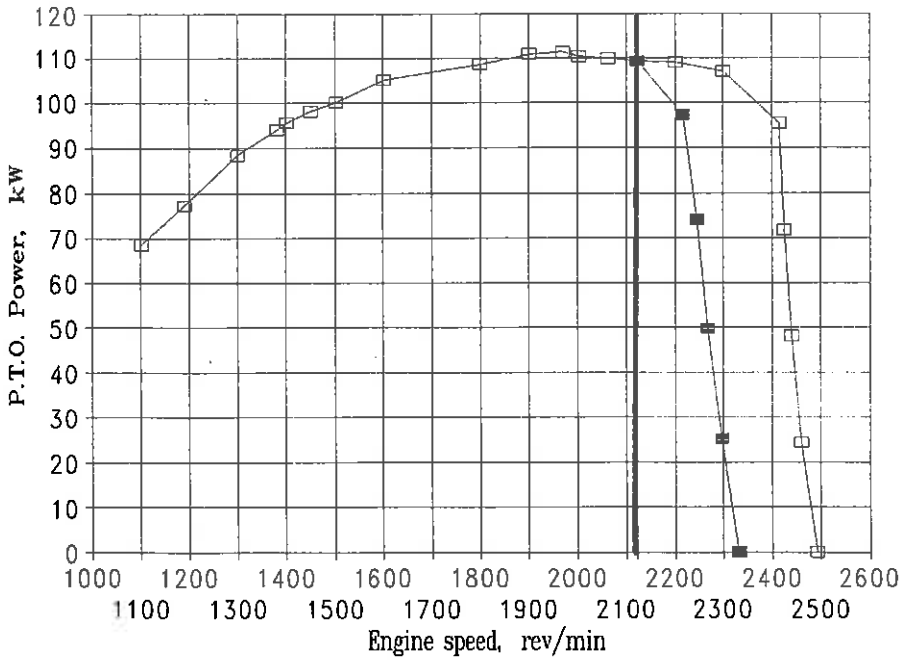
Date: 14/1/98

ANNEX 1 MAIN POWER TAKE-OFF CURVES

P.T.O. POWER TEST - NEW HOLLAND M160 FOUR-WHEEL DRIVE (1000 rev/min)

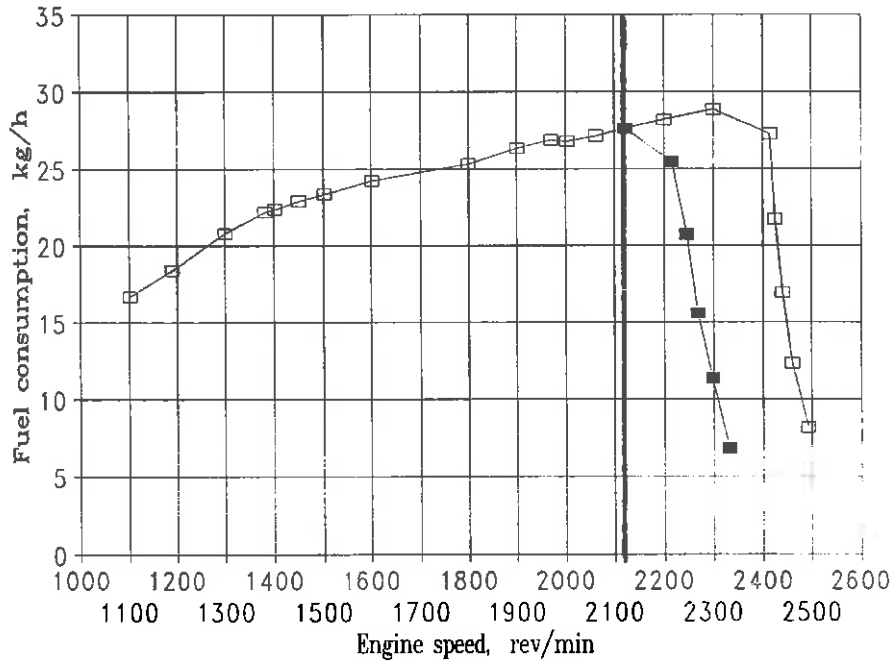
Governor set for maximum power at rated speed □
Governor set for maximum power at pto speed ■
Power take-off speed (1000 rev/min) ▮

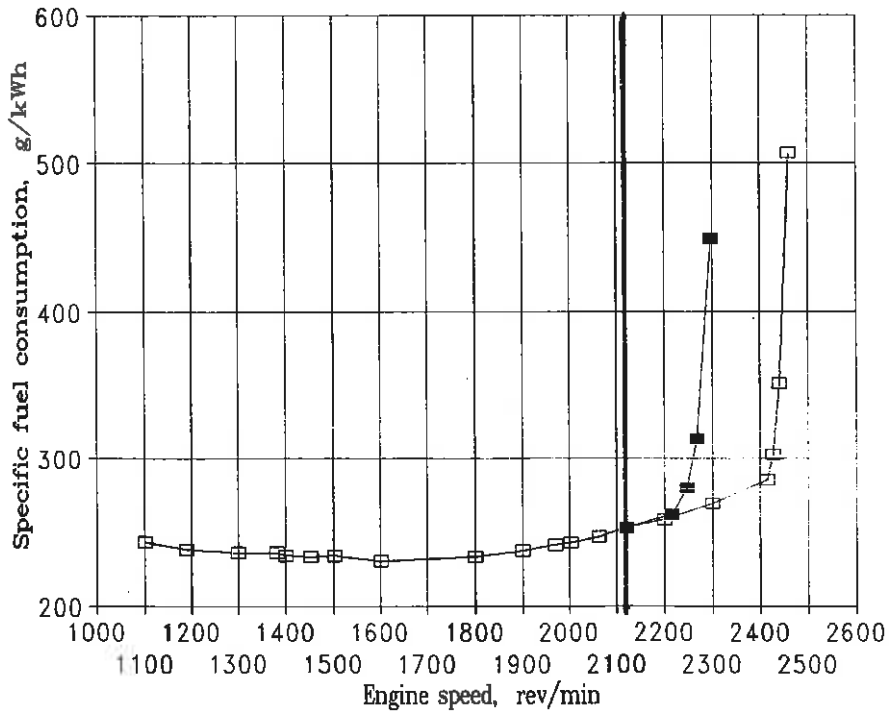




P.T.O. POWER TEST - NEW HOLLAND M160 FOUR-WHEEL DRIVE (1000 rev/min)

Governor set for maximum power at rated speed □
Governor set for maximum power at pto speed ■





P.T.O. POWER TEST - NEW HOLLAND M160 FOUR-WHEEL DRIVE (1000 rev/min)

Governor set for maximum power at rated speed ☐
Governor set for maximum power at pto speed ■

