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**CODE 2**

**Tests in accordance with the OECD RESTRICTED STANDARD CODE for the  
Official Testing of Agricultural and Forestry Tractors**

**New Holland MFC7CG1 (TM190) Four-Wheel Drive Tractor with  
19-speed Full Power Shift Transmission (50 km/h)**



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

**Reference No:** 829

**Date:** April 2004

**File:** 6425/2002

**Rev:** 19 July 2004



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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<br>Basildon, Essex, SS14 3AD<br>United Kingdom<br>Basildon, Essex |
| [C] | Location of tractor assembly:            |                                                                                  |
| [D] | Submitted for test by:                   | The manufacturer                                                                 |
| [C] | Selected for test by:                    | The manufacturer with the agreement of<br>the testing station                    |
| [D] | Place of running in:                     | Basildon. Essex                                                                  |
| [D] | Duration of running in:                  | 140 hours                                                                        |
| [C] | Location of test:                        | Silsoe Research Institute<br>Wrest Park, Silsoe, MK45 4HS<br>United Kingdom      |

**1. SPECIFICATIONS OF TRACTOR**

**1.1 Identification**

**1.1.1**

|     |                     |                                      |
|-----|---------------------|--------------------------------------|
| [C] | Make of tractor:    | New Holland                          |
| [C] | Model (trade name): | TM 190                               |
| [C] | Type:               | Four- wheel drive, unit construction |

**1.1.2 Numbers**

|     |                                         |           |
|-----|-----------------------------------------|-----------|
| [D] | 1 <sup>st</sup> Serial No or prototype: | ACM186090 |
| [C] | Serial No:                              | 171080B   |

**1.1.3 Other specifications (if applicable)**

|     |                                                       |                           |
|-----|-------------------------------------------------------|---------------------------|
| [D] | Model(s) for other countries:                         | None                      |
| [C] | Transmission type or gears x ranges:                  | 19-Speed Full Power Shift |
| [C] | Speed version:                                        | 30/40/50 km/h             |
| [C] | Manufacturer identification or Technical type number: | MFC7CG1                   |

**1.2 Engine**

|     |            |                                                                                              |
|-----|------------|----------------------------------------------------------------------------------------------|
| [C] | Make:      | CNH                                                                                          |
| [C] | Model:     | 675TA/FA                                                                                     |
| [C] | Type:      | 4 stroke turbocharged direct injection and<br>after cooled diesel, electronically controlled |
| [C] | Serial No: | 963806                                                                                       |

**1.2.1 Cylinders**

|     |                        |                             |
|-----|------------------------|-----------------------------|
| [C] | Number/disposition:    | 6 vertical in-line          |
| [D] | Bore/stroke:           | 111.8mm/127.0mm             |
| [D] | Capacity:              | 7480 cm <sup>3</sup>        |
| [D] | Compression ratio:     | 17.5 : 1                    |
| [D] | Arrangement of valves: | Overhead                    |
| [D] | Cylinder liners:       | None, monobloc construction |

### 1.2.2 Supercharging

|                 |                               |
|-----------------|-------------------------------|
| [D] Make/Model: | Borg Warner/K27               |
| [C] Type:       | Exhaust driven                |
| [D] Pressure:   | 0.144 MPa at rated speed/load |

### 1.2.3 Fuel system

|                                                     |                                                                                                           |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| [D] Fuel feed system:                               | Stanadyne electronic lift pump                                                                            |
| [C] Make, type and model of fuel filter:            | One disposable canister filter with sediment bowl and water separator plus plastic strainer in tank       |
| [D] Capacity of fuel tank:                          | 389 dm <sup>3</sup>                                                                                       |
| [D] Make, type and model of injection pump:         | Bosch, VP Rotary Electronic, 0 470 006 001                                                                |
| [D] Serial No:                                      | 87802531                                                                                                  |
| Manufacturer's production setting of injection pump |                                                                                                           |
| [C] Flow rate (rated engine speed and full load):   | 119 mm <sup>3</sup> ±3% per stroke at 2200 min <sup>-1</sup><br>(rev/min) 45.71 – 48.54dm <sup>3</sup> /h |
| [D] Timing:                                         | T.D.C                                                                                                     |
| [D] Make, type and model of injectors:              | Bosch, differential needle,<br>DSL A 143 PV 338 5300                                                      |
| [D] Injection pressure:                             | 27.0-28.2 MPa                                                                                             |

### 1.2.4 Governor

|                                     |                                         |
|-------------------------------------|-----------------------------------------|
| [C] Make:                           | Bosch                                   |
| [D] Model:                          | None                                    |
| [C] Type:                           | Electronically controlled               |
| [C] Governed range of engine speed: | 895 to 2405 min <sup>-1</sup> (rev/min) |
| [C] Rated engine speed:             | 2200 min <sup>-1</sup> (rev/min)        |

### 1.2.5 Air cleaner

|                             |                                                                        |
|-----------------------------|------------------------------------------------------------------------|
| [C] Pre-cleaner             |                                                                        |
| [C] Type:                   | Spin tube                                                              |
| [C] Location:               | Air cleaner canister inlet                                             |
| Main cleaner                |                                                                        |
| Make:                       | Locker Filtration                                                      |
| [C] Type:                   | 3 stage dry paper element with replaceable cartridge Exhaust Aspirated |
| [D] Model:                  | None                                                                   |
| [C] Location of air intake: | Under engine bonnet on front and above radiator.                       |
| [C] Maintenance indicator:  | Warning light on instrument                                            |

#### 1.2.6 Lubrication system

|     |                    |                                                                                                          |
|-----|--------------------|----------------------------------------------------------------------------------------------------------|
| [D] | Type of feed pump: | Forced feed from eccentric rotor pump                                                                    |
| [D] | Type of filter:    | Metal 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:        | 7                                   |
| [C] | Fan diameter:                | 550 mm                              |
| [D] | Coolant capacity:            | 26 dm <sup>3</sup>                  |
| [D] | Type of temperature control: | Thermostat with full flow bypass    |
| [D] | System pressure:             | 100 kPa                             |

#### 1.2.8 Starting system

|     |                             |                                                                                                                   |
|-----|-----------------------------|-------------------------------------------------------------------------------------------------------------------|
| [D] | Make:                       | Bosch JF / Iskra                                                                                                  |
| [D] | Model:                      | JF                                                                                                                |
| [C] | Type:                       | Electrical, positive engagement, solenoid operated                                                                |
| [D] | Starter motor power rating: | 3.1/3.6 kW<br>3.0 kW (Reduction geared)                                                                           |
| [D] | Cold starting aid:          | Lucas – Type 357-33                                                                                               |
| [C] | Safety device:              | Starting inoperable unless shuttle lever in neutral, clutch pedal depressed and seat presence switch is activated |

#### 1.2.9 Electrical system

|     |            |                                                  |
|-----|------------|--------------------------------------------------|
| [C] | Voltage:   | 12 V                                             |
|     | Generator: | Alternator                                       |
| [C] | Make:      | Magneti Marcelli / Denso                         |
| [C] | Model:     | MME / A 127                                      |
| [C] | Type:      | Belt driven                                      |
| [C] | Power:     | 100/120 amps at 6000 min <sup>-1</sup> (rev/min) |
|     | Batteries  |                                                  |
| [C] | Number:    | 1 Exide lead acid,<br>mounted on RHS fuel tank   |
| [D] | Rating:    | 176 Ah at 20 hours                               |

### 1.2.10 Exhaust system

- [C] Make: COR.TUBI
- [D] Model: None
- [C] Type: Under bonnet horizontal silencer with vertical stack pipe
- [C] Location: Rear left hand side above engine, under bonnet
- [C] Height of outlet above ground: 3175 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: 12
- [D] Diameter of plates: 150 mm
- [C] Method of operation: Electro-hydraulic with pedal override

### 1.3.2 Gear box

- [D] Make: CNH
- [C] Model: Power command (full power shift)
- [C] Description: Electro/Hydraulic, 19 forward and 6 reverse powershift speeds, selected by 2 buttons on an adjustable lever mounted on the RH console  
Forward/reverse is actuated by a steering column mounted shuttle lever.

|     |                         | Forward | Reverse |
|-----|-------------------------|---------|---------|
| [C] | Number of gears         | 19      | 6       |
| [C] | Number of ranges/groups | 1       | 1       |
| [C] | Total of arrangements   | 19      | 6       |

Available options:

17 x 6 with creep (30 km/h)  
18 x 6 with creep (40 km/h)  
19 x 6 with creep (50 km/h)

### 1.3.3 *Rear axle and final drivers*

|     |        |                                                                                       |
|-----|--------|---------------------------------------------------------------------------------------|
| [D] | Make:  | CNH                                                                                   |
| [D] | Model: | None                                                                                  |
| [D] | Type:  | Crown wheel pinion with differential and inboard epicyclic reduction gear final drive |

#### Differential lock:

|     |                          |                                                                                                          |
|-----|--------------------------|----------------------------------------------------------------------------------------------------------|
| [D] | Type:                    | Multi-plate clutch                                                                                       |
| [C] | Method of engagement:    | Electro-hydraulic actuation in response to signal from switch on right-hand control panel                |
| [C] | Method of disengagement: | Via panel switch or in response to signal from brakes on application, or steering movement, or axle lift |

### 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:                | Multi-plate clutch – located within the gearbox                                           |
| [C] | Method of operation: | Electro-hydraulic actuation in response to signal from switch on right-hand control panel |

#### Differential lock:

|     |                          |                                                                                                          |
|-----|--------------------------|----------------------------------------------------------------------------------------------------------|
| [D] | Type:                    | Multi-plate clutch                                                                                       |
| [C] | Method of engagement:    | Electro-hydraulic actuation in response to signal from switch on right-hand control panel                |
| [C] | Method of disengagement: | Via panel switch or in response to signal from brakes on application, or steering movement, or axle lift |

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:*<br>2200 rev/min<br>km/h |
|-----|---------|----------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------|
|     | Forward |                |                                                                       |                                                                          |
| [C] | 1       |                | 396.08                                                                | 1.90                                                                     |
| [C] | 2       |                | 329.38                                                                | 2.28                                                                     |
| [C] | 3       |                | 274.21                                                                | 2.74                                                                     |
| [C] | 4       |                | 228.03                                                                | 3.29                                                                     |
| [C] | 5       |                | 189.58                                                                | 3.96                                                                     |
| [C] | 6       |                | 157.65                                                                | 4.76                                                                     |
| [C] | 7       |                | 136.44                                                                | 5.50                                                                     |
| [C] | 8       |                | 113.47                                                                | 6.62                                                                     |
| [C] | 9       |                | 94.46                                                                 | 7.95                                                                     |
| [C] | 10      |                | 78.55                                                                 | 9.56                                                                     |
| [C] | 11      |                | 65.31                                                                 | 11.49                                                                    |
| [C] | 12      |                | 54.31                                                                 | 13.82                                                                    |
| [C] | 13      |                | 47.25                                                                 | 15.87                                                                    |
| [C] | 14      |                | 39.29                                                                 | 19.10                                                                    |
| [C] | 15      |                | 32.71                                                                 | 22.95                                                                    |
| [C] | 16      |                | 27.20                                                                 | 27.60                                                                    |
| [C] | 17      |                | 22.62                                                                 | 33.19                                                                    |
| [C] | 18      |                | 18.81                                                                 | 39.91                                                                    |
| [C] | 19      |                | 16.39                                                                 | 45.80                                                                    |
|     | Reverse |                |                                                                       |                                                                          |
| [C] | 1       |                | 178.88                                                                | 4.20                                                                     |
| [C] | 2       |                | 148.75                                                                | 5.05                                                                     |
| [C] | 3       |                | 123.84                                                                | 6.06                                                                     |
| [C] | 4       |                | 102.98                                                                | 7.29                                                                     |
| [C] | 5       |                | 85.62                                                                 | 8.77                                                                     |
| [C] | 6       |                | 71.20                                                                 | 10.54                                                                    |

Range selection: None

[C] (\*) Calculated with a tyre dynamic radius index of 905 mm (Not in conformity with ISO 4251/1-1998)  
Number of revolutions of front wheels for one revolution of rear wheels: 1.343

## 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, 540E or 1000 min <sup>-1</sup> (rev/min) by lever on right-hand console                          |
|     | <u>Clutch</u>                             |                                                                                                                       |
| [D] | Make:                                     | CNH                                                                                                                   |
| [D] | Model:                                    | None                                                                                                                  |
| [D] | Type:                                     | Multiplate, wet                                                                                                       |
| [D] | Number of plates:                         | 8                                                                                                                     |
| [D] | Diameter of plates:                       | 140.0 mm                                                                                                              |

#### 1.4.1.1 Power take-off proportional to engine speed

##### Power take-off at 540E min<sup>-1</sup> (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:                                | 875 mm                                                  |
| [C] | Distance from the median plane of the tractor:      | Central                                                 |
| [C] | Distance behind rear wheel axis:                    | 637 mm                                                  |
| [C] | PTO speed at rated engine speed:                    | 757 min <sup>-1</sup> (rev/min)                         |
| [C] | Engine speed at standard power take-off speed:      | 1569 min <sup>-1</sup> (rev/min)                        |
| [C] | Ratio of rotation speeds:                           | 2.90                                                    |
| [D] | Power restriction:                                  | None                                                    |
| [D] | Maximum torque transmissible:                       | None                                                    |
| [C] | Direction of rotation (viewed from behind tractor): | Clockwise                                               |

Power take-off at 1000 min<sup>-1</sup> (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<br>(available option 6) |
| [C] | Height above ground:                                | 875 mm                                                     |
| [C] | Distance from the median plane of the tractor:      | Central                                                    |
| [C] | Distance behind rear wheel axis:                    | 637 mm                                                     |
| [C] | PTO speed at rated engine speed:                    | 1021 min <sup>-1</sup> (rev/min)                           |
| [C] | Engine speed at standard power take-off speed:      | 2154 min <sup>-1</sup> (rev/min)                           |
| [C] | Ratio of rotation speeds:                           | 2.154                                                      |
| [D] | Power restriction                                   | None                                                       |
| [D] | Maximum torque transmissible:                       | None                                                       |
| [C] | Direction of rotation (viewed from behind tractor): | Clockwise                                                  |

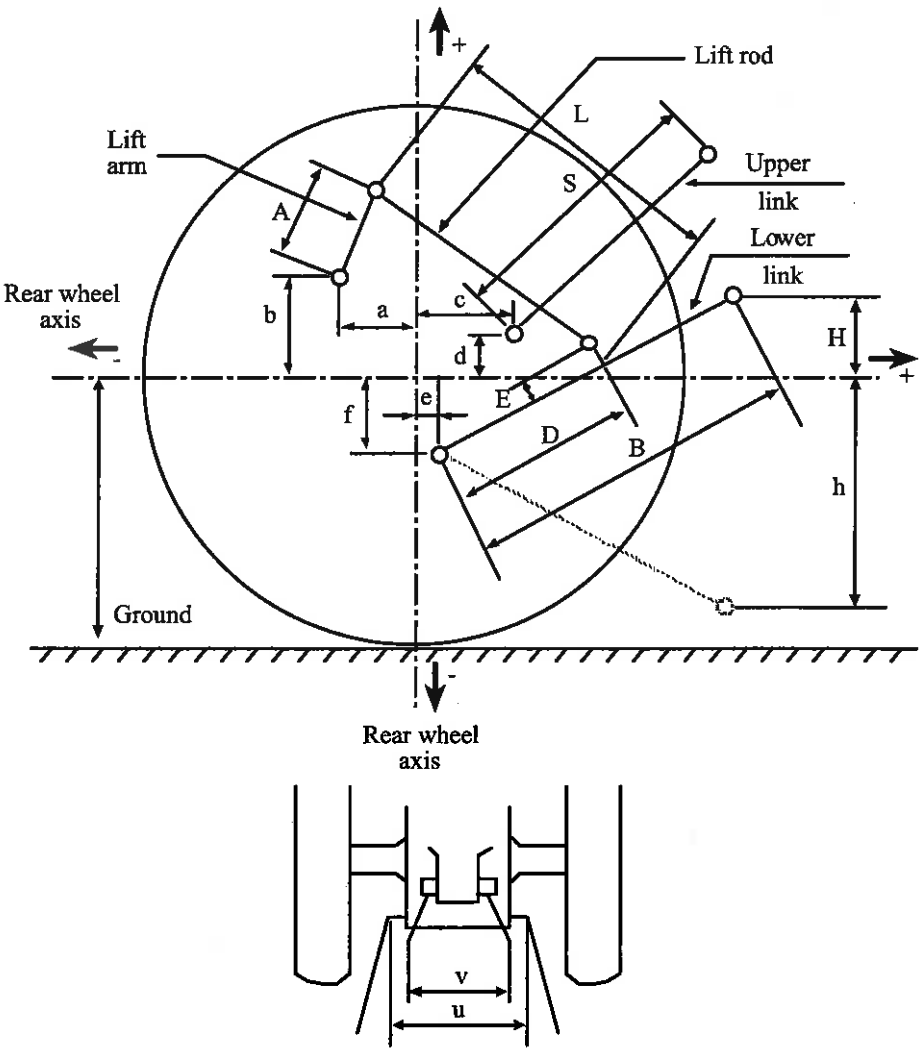
1.4.1.2 Power take-off proportional to ground speed                      Not applicable

## 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                                                                                  |
| [C] | Type of linkage lock for transport:                       | Hydraulic                                                                                                            |
| [D] | Pump maximum pressure /<br>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,<br>independent of main and PTO clutches                                                  |
| [C] | Type and number filters:                                  | 1 disposable canister filter and 1 element filter                                                                    |
| [C] | Site of oil reservoir:                                    | Rear axle housing                                                                                                    |
| [C] | Type, number and location of tapping points:              | 4 or 5 remote couplers at rear of tractor<br>(5 Remote valves fitted on test tractor)                                |
| [D] | Maximum volume of oil available to external cylinders:    | 28 litres max under normal conditions<br>(flat fields)<br>40 litres max when operating stationary<br>on level ground |

1.6     **Three-point linkage**

|     |                   |                                                             |
|-----|-------------------|-------------------------------------------------------------|
| [C] | Category:         | 2 in conformity with<br>ISO 730-1:1994 + Cor.1:1995         |
| [C] | Category adapter: | None                                                        |
| [C] | Controls:         | Electronic draught/ position control,<br>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<br>or ranges | Settings used in tests |            |            |
|-----|---------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------------------------|-------------------------|------------------------|------------|------------|
|     |                                                                                                                     |                              |                                                            |                         | 3.2.2                  | 7.1        | 7.2        |
|     |                                                                                                                     |                              |                                                            | mm                      | mm                     | mm         | mm         |
| [C] | Length of lift arms:                                                                                                | horizontally:<br>vertically: | (A)                                                        | 450                     | 450                    | 450        | 450        |
| [C] | Length of lower links:                                                                                              |                              | (B)                                                        | 974                     | 974                    | 974        | 974        |
| [C] | Distance of lift arm pivot point from rear wheel centre line:                                                       |                              | (a)                                                        | 92                      | 92                     | 92         | 92         |
|     |                                                                                                                     |                              | (b)                                                        | 372                     | 372                    | 372        | 372        |
| [C] | Horizontal distance between the two lower link points:                                                              |                              | (u)                                                        | 644                     | 644                    | 644        | 644        |
| [C] | Horizontal distance between the two lift arm end points:                                                            | (v)                          | 560                                                        | 560                     | 560                    | 560        |            |
| [C] | Length of upper link:                                                                                               | (S)                          | 690 – 915                                                  | 740                     | 790                    | 790        |            |
| [C] | Distance of upper link pivot point from rear wheel centre line:                                                     | horizontally:<br>vertically: | (c)<br>(d)                                                 | 440 – 500<br>217 – 277  | 500<br>217             | 440<br>277 | 440<br>277 |
| [C] | Distance of lower link pivot point from rear wheel centre line:                                                     | horizontally:<br>vertically: | (e)<br>(f)                                                 | 250<br>270              | 250<br>270             | 250<br>270 | 250<br>270 |
| [C] | Distance of lower link points to lift rod pivot points on lower link centre line:                                   |                              | (D)                                                        | 612 – 682               | 612                    | 682        | 682        |
| [C] | Length of lift rods:                                                                                                |                              | (L)                                                        | 870 – 990               | 978                    | 990        | 990/945    |
|     | Height of lower hitch points (*)<br>Relative to the rear wheel centre line, situated 905 mm above the ground level: |                              |                                                            |                         |                        |            |            |
| [C] | - in low position                                                                                                   |                              | (h)                                                        | 422 – 720               | 705                    | 635        | 635/550    |
| [C] | - in high position                                                                                                  |                              | (H)                                                        | 75 – 260                | 80                     | 100        | 83/163     |
| [C] | Height of lower hitch points when locked in transport position (*)                                                  |                              | Any height within lift range<br>(hydraulic transport lock) |                         |                        |            |            |

\*Assuming r = tyre dynamic radius index of 905 mm

### 1.7 Swinging drawbar (Incorporating Slider Germany and Swinging drawbar EEC)

|     |                                                             |                      |         |                       |
|-----|-------------------------------------------------------------|----------------------|---------|-----------------------|
| [C] | Type:                                                       | Clevis               |         |                       |
| [C] | Height above ground:                                        | Unballasted Maximum: | 600 mm  |                       |
|     |                                                             | Minimum:             | 485 mm  |                       |
| [C] | Type of adjustment:                                         | Inverting drawbar    |         |                       |
| [C] | Distance of hitch point from rear-wheel axis, horizontally: | 877 mm               | 993 mm  | 1043 mm               |
| [C] | Distance of hitch point from power take-off shaft end:      |                      |         |                       |
|     |                                                             | Vertically:          | 275 mm  | 390 mm                |
|     |                                                             | horizontally:        | 240 mm  | 356 mm 406 mm         |
| [C] | Lateral adjustment (centre of clevis):                      |                      |         |                       |
|     |                                                             | Right-hand:          | -- --   | 180 mm 192 mm         |
|     |                                                             | Left-hand:           | -- --   | 180 mm 192 mm         |
| [C] | Distance of pivot point from rear axles                     | horizontally:        | 115 mm  | in front of rear axle |
| [C] | Width of clevis:                                            |                      | 70 mm   |                       |
| [C] | Diameter of drawbar pin hole:                               |                      | 33 mm   |                       |
| [D] | Maximum vertical permissible load:                          | Clevis uppermost:    | 2575 kg | 1680 kg 1440 kg       |
|     |                                                             | Clevis underneath:   | 1305 kg | 1225 kg 1045 kg       |

### 1.8 Trailer hitch

|     |                                                             |                                |
|-----|-------------------------------------------------------------|--------------------------------|
| [C] | Type:                                                       | Coupling                       |
| [C] | Hole diameter:                                              | 33 mm                          |
| [C] | Height above ground:                                        | 535 mm to 1055mm               |
| [C] | Distance of hitch point from rear wheel axis, horizontally: | 830 mm                         |
| [C] | Distance of hitch point from power take-off shaft end       |                                |
|     |                                                             | Vertically: -337 mm to +200 mm |
|     |                                                             | Horizontally: 204 mm           |
| [D] | Maximum vertical permissible load:                          | 2000 kg                        |

### 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 Rexroth                                                                         |
| [C] | Motor:              | Sauer Danfoss OSPQ 125-250<br>(Dynamic)                                               |
| [C] | Ram:                | 2, balanced system with double acting<br>cylinders one operating each steering<br>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 two plate disc                                                                                                                                                                   |
| [C] | Method of operation:      | Hydraulic boosted, independent on rear<br>wheels<br>(On 4 WD models. When the service brakes<br>are activated the front wheel drive is<br>automatically engaged providing 4-wheel<br>braking) |
| [C] | Trailer braking take-off: | Hydraulic connector fitted to<br>ISO 5676-1983                                                                                                                                                |

### 1.11.2 Parking brake

|     |                      |                                                                     |
|-----|----------------------|---------------------------------------------------------------------|
| [D] | Type:                | Fully independent six plate disc<br>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: 2818 mm

Track width adjustment:

|     |        | Minimum<br>mm | Maximum<br>mm | Adjustment method                                                 |
|-----|--------|---------------|---------------|-------------------------------------------------------------------|
| [C] | Front* | 1538/1560     | 2238/2260     | Reversing wheels and offset lug rims                              |
| [C] | Rear   | 1530          | 2230          | Reversing wheels and offset lug rims/<br>Optional bar axle fitted |

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

## 1.13 Protective structure

[C] Make: CNH

[C] Model: SLTV 10

[C] Type: Cab safety frame - suspended

[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: 4/0699

[C] Date of approval: 19 October 2001

Nos. minor modification certificates, if any: 2

The certificates for minor modifications established by and under the responsibility of the Danish Institute of Agricultural Sciences, Bygholm, Denmark

## 1.14 Seat

### 1.14.1 Driver's seat

- [C] Make/model/Type: Sears SST 1503  
EEC approved to 78/764/EEC – e11-1294
- [C] Seat and steering wheel reversible: No
- [C] Type of suspension: Low frequency, parallelogram suspension air spring
- [C] Type of damping: Double acting, hydraulic
- Range of adjustment
- [C] Longitudinal:  $\pm 100$  mm
- [C] Vertical:  $\pm 68$  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: Soft plastic moulding, folding, on left hand side of inner fender.
- [C] Type: EEC approved to 76/763/EEC – e11 1383
- [C] Capacity (numbers): 1

## 1.15 Lighting

|     |                        | Height above<br>ground to<br>centre | Size     | Distance from outside<br>edge of lights to medium<br>plane of tractor |
|-----|------------------------|-------------------------------------|----------|-----------------------------------------------------------------------|
|     |                        | mm                                  | mm       | mm                                                                    |
| [C] | Headlights             | 1430                                | 150 x 90 | 200                                                                   |
| [C] | Sidelights             | 2035                                | 105 x 30 | 870                                                                   |
| [D] | Rear lights            | 2025                                | 50 x 50  | 845                                                                   |
| [D] | Rear fender reflectors | 2025                                | 50 x 50  | 845                                                                   |
| [C] | Rear axle reflectors   | 875                                 | 100 x 35 | 640                                                                   |

## 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 | 5190   | 2490    | 2490    | 3050                 | 3175         |

### 2.2 Ground clearance (unballasted tractor)

410 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 | 3289           | 3291        |
| Rear  | 4636           | 4709        |
| Total | 7925           | 8000        |

### 2.4 Track specifications

Not applicable

### 2.5 Tyres and track width specification

|                                                  | Front             | Rear              |
|--------------------------------------------------|-------------------|-------------------|
| Tyres                                            |                   |                   |
| Dimensions                                       | 540/65 R 30       | 650/65 R 42       |
| ply rating                                       | 143 A8            | 158 A8            |
| type                                             | Radial            | Radial            |
| Maximum load (tyre manufacturer's) 30/40/50 km/h | 28.6/26.7/24.3 kN | 44.6/40.5/37.9 kN |
| Maximum load (tractor manufacturer's) 30/40/50   | 28.6/26.7/24.3 kN | 44.6/40.5/37.9 kN |
| Inflation pressure (tyre manufacturer's)         | 160 kPa           | 160 kPa           |
| Dynamic radius index                             | 695 mm            | 905 mm            |
| Chosen track width (manufacturer's nominal)      | 1820 mm           | 1810 mm           |

### 2.6 Fuel

Type:

Diesel oil to Class D, 1.5 to 5.5 cSt.

Density at 15° C:

0.8413 g/cm<sup>3</sup>

## 2.7 Oils and lubrication

### 2.7.1 Capacity and change interval

|                                                                  | Capacity<br>dm <sup>3</sup> | Oil change<br>h | Filter change<br>h |
|------------------------------------------------------------------|-----------------------------|-----------------|--------------------|
| Engine                                                           | 19.0                        | 300             | 300                |
| Front axle differential                                          | 9.0                         | 1200            | None               |
| Front axle hub (each)                                            | 1.7                         | 1200            | None               |
| Gearbox                                                          | 100.0                       | 1200            | 1200               |
| Rear axle<br>Hydraulic system<br>Final drives (rear)<br>Steering | Integral with gearbox       |                 |                    |
| Brakes                                                           | 0.5                         | Top-up          | None               |

### 2.7.2 Specifications (SAE, APL, CCMC, ACEA, MILL, ISO)

|                                                                               | NH spec | Recommended                                       | Used during test |
|-------------------------------------------------------------------------------|---------|---------------------------------------------------|------------------|
| Engine oil<br>Type:<br>Viscosity<br>Classification:                           | NH 324H | SAE 10W/30<br>11.5 cSt at 100° C<br>API CH – 4    | As recommended   |
| Transmission oils<br>Type:<br>Viscosity<br>Classification:                    | NH 410B | SAE 10W/30<br>9 cSt at 100° C<br>API GL – 4       | As recommended   |
| Rear final drives<br>Type:<br>Viscosity:<br>Classification:                   | NH 410B | SAE 10W/30<br>9 cSt at 100° C<br>API GL – 4       | As recommended   |
| Front differential and final drives<br>Type:<br>Viscosity:<br>Classification: | NH 410B | SAE 10W/30<br>9 cSt at 100° C<br>API GL – 4       | As recommended   |
| Hydraulic brakes<br>Type:<br>Viscosity:<br>Classification:                    | NH 610A | No equivalent<br>6 cSt at 100° C<br>No equivalent | As recommended   |
| Hydraulic fluid<br>Type:<br>Viscosity:<br>Classification:                     | NH 410B | SAE 10W/30<br>9 cSt at 100° C<br>API GL – 4       | As recommended   |
| Steering oil<br>Type:<br>Viscosity:<br>Classification:                        | NH 410B | SAE 10W/30<br>9 cSt at 100° C<br>API GL – 4       | As recommended   |

### 2.7.3 Grease

Type: NH 720A      Lithium Based      As recommended

Number of lubrication points: 14

### 3. COMPULSORY TESTS RESULTS

#### 3.1 Main power take-off

Date and location of tests:

14 and 27 November 2003  
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. | Hourly           |       | Specific |                 |
| kW                                                                                              | min <sup>-1</sup> (rev/min) |        | kg/h             | l/h   | g/kWh    | kWh/l           |
| <b>3.1.1 MAXIMUM POWER – TWO-HOUR TEST</b>                                                      |                             |        |                  |       |          |                 |
| 128.3                                                                                           | 1790                        | 831    | 30.77            | 36.57 | 240      | 3.51            |
| <b>3.1.2 POWER AT RATED ENGINE SPEED</b>                                                        |                             |        |                  |       |          |                 |
| 122.0                                                                                           | 2199                        | 1021   | 32.24            | 38.32 | 264      | 3.18            |
| <b>3.1.3 STANDARD POWER TAKE-OFF SPEED [1000 ± 25 min<sup>-1</sup> (rev/min)]</b>               |                             |        |                  |       |          |                 |
| 124.8                                                                                           | 2153                        | 1000   | 32.47            | 38.60 | 260      | 3.23            |
| <b>3.1.4 PART LOADS</b>                                                                         |                             |        |                  |       |          |                 |
| <b>3.1.4.1 the torque corresponding to maximum power at rated engine speed</b>                  |                             |        |                  |       |          |                 |
| 122.0                                                                                           | 2199                        | 1021   | 32.24            | 38.32 | 264      | 3.18            |
| <b>3.1.4.2 85% of torque obtained in 3.1.4.1</b>                                                |                             |        |                  |       |          |                 |
| 107.3                                                                                           | 2277                        | 1057   | 29.25            | 34.77 | 273      | 3.09            |
| <b>3.1.4.3 75% of torque defined in 3.1.4.2</b>                                                 |                             |        |                  |       |          |                 |
| 81.3                                                                                            | 2303                        | 1069   | 23.64            | 28.10 | 291      | 2.89            |
| <b>3.1.4.4 50% of torque defined in 3.1.4.2</b>                                                 |                             |        |                  |       |          |                 |
| 54.8                                                                                            | 2325                        | 1079   | 18.19            | 21.62 | 332      | 2.53            |
| <b>3.1.4.5 25% of torque defined in 3.1.4.2</b>                                                 |                             |        |                  |       |          |                 |
| 27.6                                                                                            | 2345                        | 1089   | 12.83            | 15.25 | 466      | 1.81            |
| <b>3.1.4.6 unloaded</b>                                                                         |                             |        |                  |       |          |                 |
| 0                                                                                               | 2367                        | 1099   | 7.82             | 9.29  | -        | -               |
| <b>3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED [1000 ± 25 min<sup>-1</sup> (rev/min)]</b> |                             |        |                  |       |          |                 |
| <b>3.1.5.1 the torque corresponding to maximum power</b>                                        |                             |        |                  |       |          |                 |
| 124.8                                                                                           | 2153                        | 1000   | 32.47            | 38.60 | 260      | 3.23            |
| <b>3.1.5.2 85% of torque obtained in 3.1.5.1</b>                                                |                             |        |                  |       |          |                 |
| 109.5                                                                                           | 2230                        | 1035   | 29.57            | 35.14 | 270      | 3.12            |
| <b>3.1.5.3 75% of torque obtained in 3.1.5.2</b>                                                |                             |        |                  |       |          |                 |
| 83.2                                                                                            | 2255                        | 1047   | 23.58            | 28.02 | 283      | 2.97            |
| <b>3.1.5.4 50% of torque obtained in 3.1.5.2</b>                                                |                             |        |                  |       |          |                 |
| 55.9                                                                                            | 2276                        | 1057   | 17.86            | 21.23 | 320      | 2.63            |
| <b>3.1.5.5 25% of torque obtained in 3.1.5.2</b>                                                |                             |        |                  |       |          |                 |
| 28.1                                                                                            | 2298                        | 1067   | 12.52            | 14.88 | 445      | 1.89            |
| <b>3.1.5.6 unloaded</b>                                                                         |                             |        |                  |       |          |                 |
| 0                                                                                               | 2320                        | 1077   | 7.59             | 9.02  | -        | -               |

\* In the PTO test fan speed was not measured because we do not have the facility to do so at present

No load maximum engine speed:

2367 min<sup>-1</sup> (rev/min)

Torque (equivalent crankshaft) at maximum power

At rated engine speed:

529.7 Nm

At 2-hour test:

684.8 Nm

Maximum torque (equivalent crankshaft):  
(engine speed: 1505 min<sup>-1</sup> (rev/min))

750.7 Nm

| Mean atmospheric conditions: |           |
|------------------------------|-----------|
| Temperature                  | 23 °C     |
| Pressure                     | 100.2 kPa |
| Relative humidity            | 33 %      |
| Maximum temperatures:        |           |
| Coolant                      | 97 °C     |
| Engine oil                   | 122 °C    |
| Fuel                         | 62 °C     |
| Engine air intake            | 33 °C     |

### Boosted power take-off

| Power<br>kW                                                                                    | Speed                                 |        | Fuel consumption |       |                   | Specific<br>Energy<br>kWh/l |
|------------------------------------------------------------------------------------------------|---------------------------------------|--------|------------------|-------|-------------------|-----------------------------|
|                                                                                                | Engine<br>min <sup>-1</sup> (rev/min) | P.T.O. | Hourly           |       | Specific<br>g/kWh |                             |
|                                                                                                |                                       |        | kg/h             | l/h   |                   |                             |
| <b>3.1.1 MAXIMUM POWER – TWO-HOUR TEST</b>                                                     |                                       |        |                  |       |                   |                             |
| 154.1                                                                                          | 2000                                  | 928    | 40.13            | 47.69 | 260               | 3.23                        |
| <b>3.1.2 POWER AT RATED ENGINE SPEED</b>                                                       |                                       |        |                  |       |                   |                             |
| 143.0                                                                                          | 2200                                  | 1022   | 37.33            | 44.37 | 261               | 3.22                        |
| <b>3.1.3 STANDARD POWER TAKE-OFF SPEED [1000 ± 25 min<sup>-1</sup> (rev/min)]</b>              |                                       |        |                  |       |                   |                             |
| 147.1                                                                                          | 2154                                  | 1000   | 37.76            | 44.88 | 257               | 3.28                        |
| <b>3.1.4 PART LOADS</b>                                                                        |                                       |        |                  |       |                   |                             |
| <b>3.1.4.1 the torque corresponding to maximum power at rated engine speed</b>                 |                                       |        |                  |       |                   |                             |
| 143.0                                                                                          | 2200                                  | 1022   | 37.33            | 44.37 | 261               | 3.22                        |
| <b>3.1.4.2 85% of torque obtained in 3.1.4.1</b>                                               |                                       |        |                  |       |                   |                             |
| 125.0                                                                                          | 2263                                  | 1051   | 33.64            | 39.79 | 268               | 3.14                        |
| <b>3.1.4.3 75% of torque defined in 3.1.4.2</b>                                                |                                       |        |                  |       |                   |                             |
| 94.9                                                                                           | 2293                                  | 1065   | 26.53            | 31.53 | 279               | 3.01                        |
| <b>3.1.4.4 50% of torque defined in 3.1.4.2</b>                                                |                                       |        |                  |       |                   |                             |
| 64.0                                                                                           | 2315                                  | 1075   | 20.41            | 24.26 | 319               | 2.64                        |
| <b>3.1.4.5 25% of torque defined in 3.1.4.2</b>                                                |                                       |        |                  |       |                   |                             |
| 32.4                                                                                           | 2343                                  | 1088   | 13.62            | 16.19 | 420               | 2.00                        |
| <b>3.1.4.6 unloaded</b>                                                                        |                                       |        |                  |       |                   |                             |
| 0                                                                                              | 2368                                  | 1099   | 7.77             | 9.24  | -                 | -                           |
| <b>3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED [1000± 25 min<sup>-1</sup> (rev/min)]</b> |                                       |        |                  |       |                   |                             |
| <b>3.1.5.1 the torque corresponding to maximum power</b>                                       |                                       |        |                  |       |                   |                             |
| 147.1                                                                                          | 2154                                  | 1000   | 37.76            | 44.88 | 257               | 3.28                        |
| <b>3.1.5.2 85% of torque obtained in 3.1.5.1</b>                                               |                                       |        |                  |       |                   |                             |
| 128.5                                                                                          | 2211                                  | 1027   | 34.55            | 41.06 | 269               | 3.13                        |
| <b>3.1.5.3 75% of torque obtained in 3.1.5.2</b>                                               |                                       |        |                  |       |                   |                             |
| 97.8                                                                                           | 2244                                  | 1042   | 27.04            | 32.15 | 277               | 3.04                        |
| <b>3.1.5.4 50% of torque obtained in 3.1.5.2</b>                                               |                                       |        |                  |       |                   |                             |
| 65.9                                                                                           | 2268                                  | 1053   | 19.99            | 23.76 | 303               | 2.77                        |
| <b>3.1.5.5 25% of torque obtained in 3.1.5.2</b>                                               |                                       |        |                  |       |                   |                             |
| 33.3                                                                                           | 2292                                  | 1064   | 14.55            | 17.30 | 437               | 1.93                        |
| <b>3.1.5.6 unloaded</b>                                                                        |                                       |        |                  |       |                   |                             |
| 0                                                                                              | 2320                                  | 1077   | 7.59             | 9.02  | -                 | -                           |

\* In the PTO test fan speed was not measured because we do not have the facility to do so at present

No load maximum engine speed:

2368 min<sup>-1</sup> (rev/min)

Torque (equivalent crankshaft) at maximum power

At rated engine speed:

620.6 Nm

At 2-hour test:

735.8 Nm

Maximum torque (equivalent crankshaft):

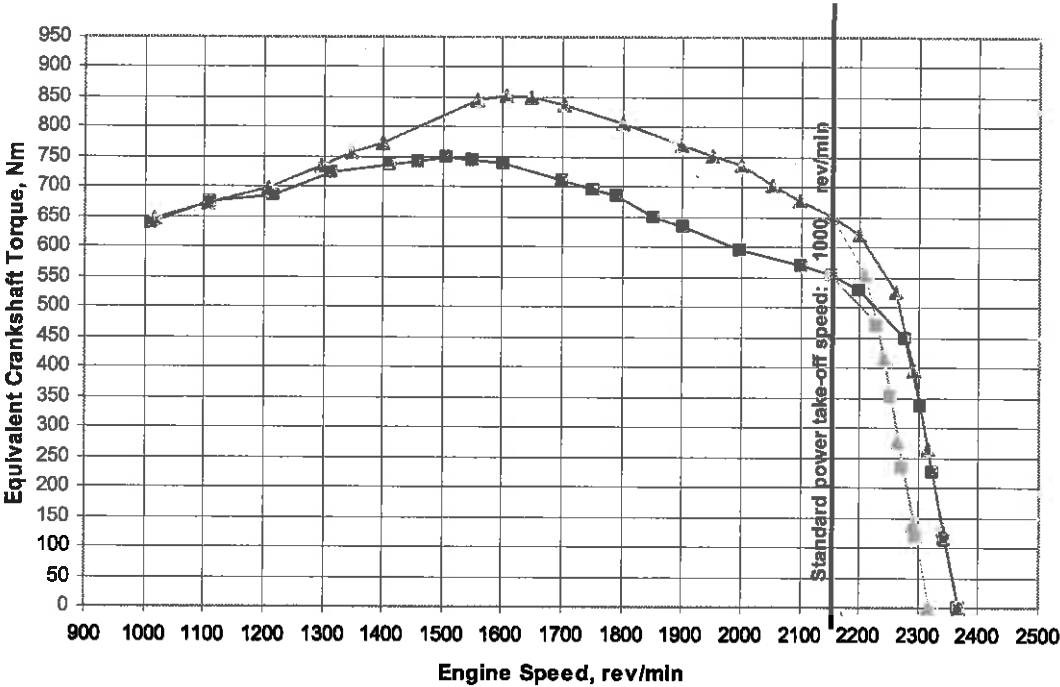
853.3 Nm

(engine speed:1606 min<sup>-1</sup> (rev/min))

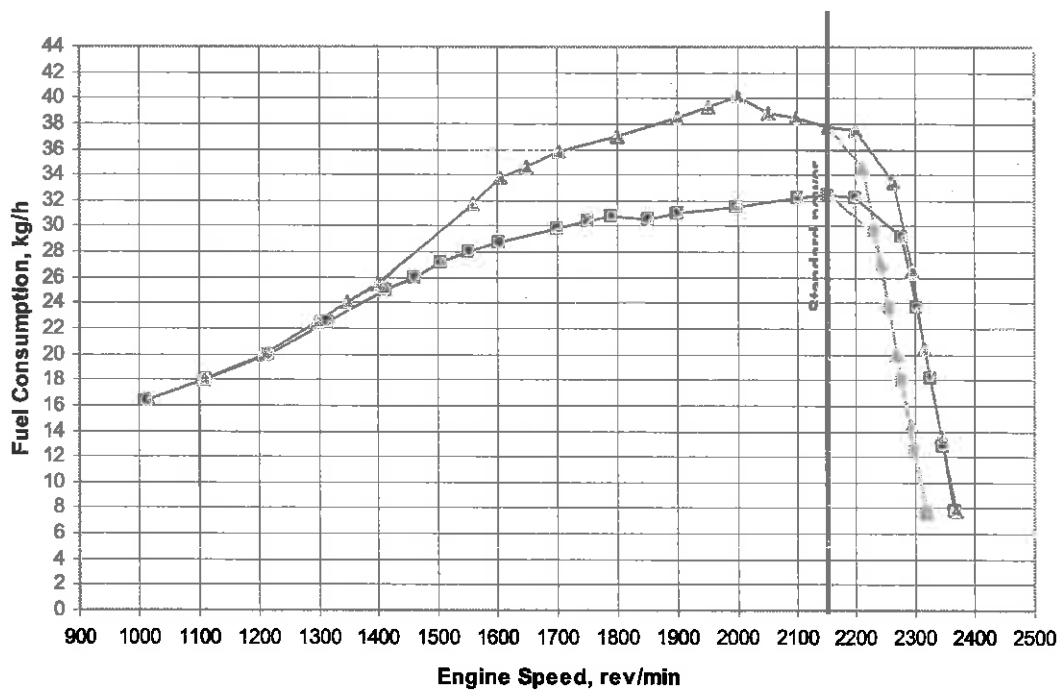
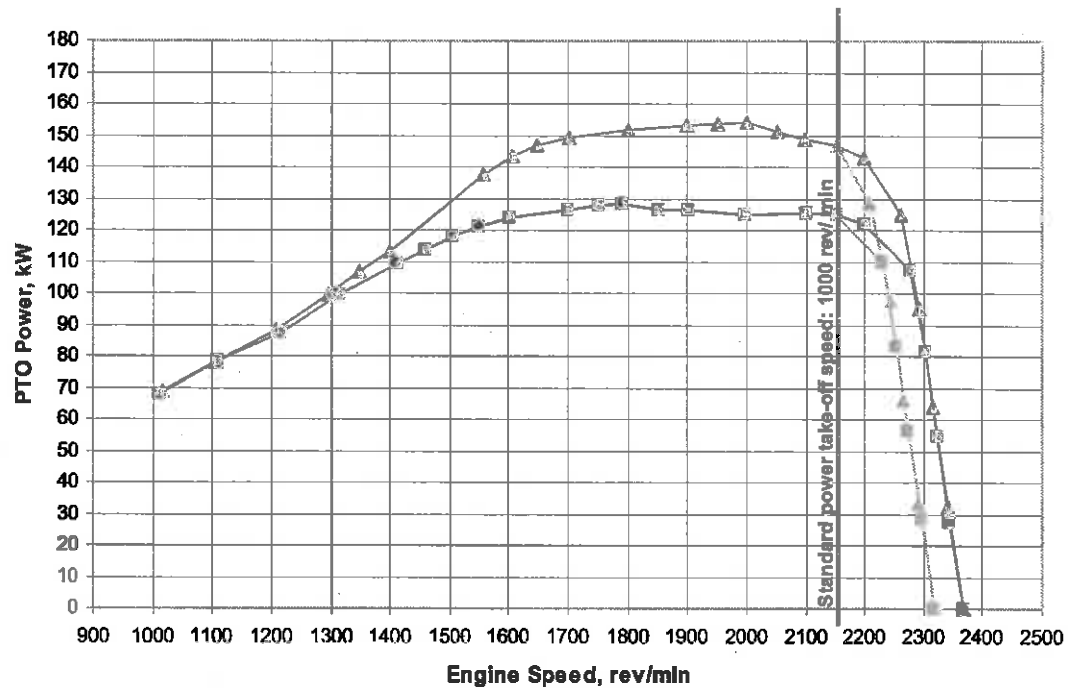
| Mean atmospheric conditions: |           |
|------------------------------|-----------|
| Temperature                  | 23 °C     |
| Pressure                     | 100.6 kPa |
| Relative humidity            | 36 %      |
| Maximum temperatures:        |           |
| Coolant                      | 95 °C     |
| Engine oil                   | 124 °C    |
| Fuel                         | 62 °C     |
| Engine air intake            | 30 °C     |

- Main power take-off curve
- ▲ Boosted power take-off curve

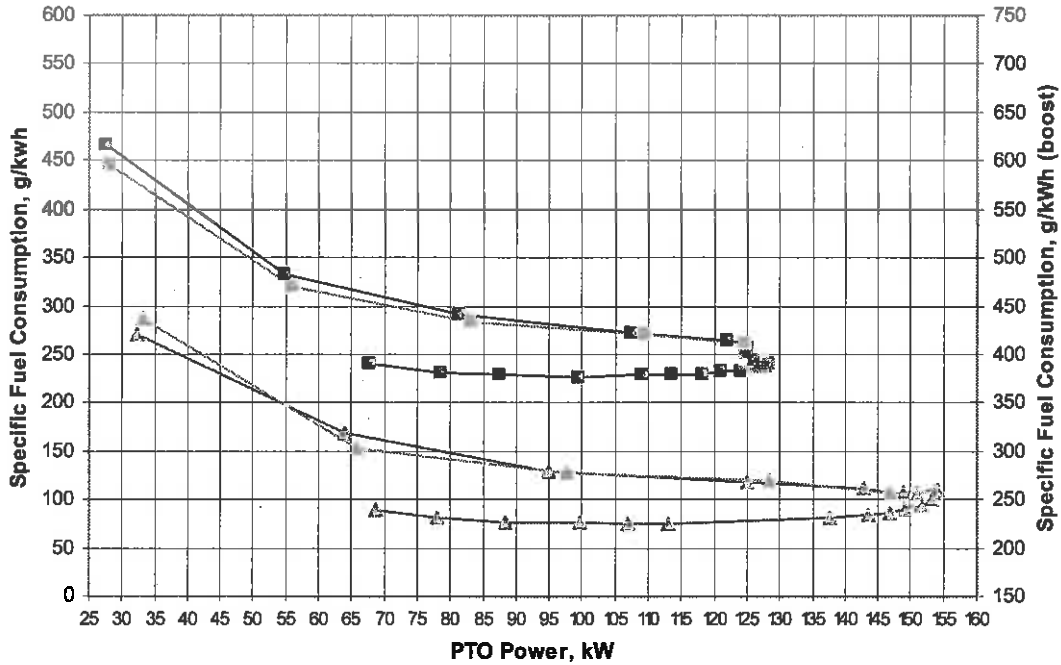
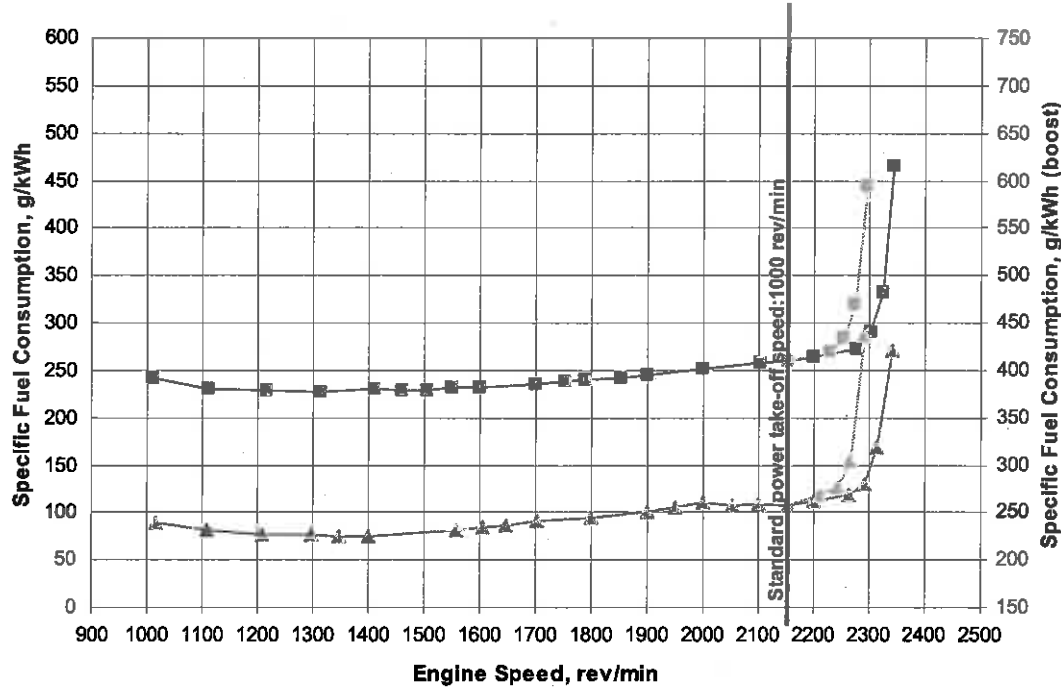
Power take-off curves



### Power take-off curves



Power take-off curves



### 3.2 Hydraulic power and lifting force

Date of tests:

14 and 22 April 2004

#### 3.2.1 Hydraulic power test

##### 3.2.1.1 Hydraulic fluid data

Hydraulic fluid type: See Specification

##### 3.2.1.2 Compulsory Reporting (Test Results):

|                                                                                                                                                              | Pressure | Reservoir oil Temperature °C<br>(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<br>Maximum (sustained) pressure with relief valve open as measured at the coupler<br>Pump stalled: Yes                                             | 21.5     | 65                                             | 69   | 2367         |           |       |
| 3.2.1.2.2<br>Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power | 19.4     | 67                                             |      | 2350         | 71.7      | 23.18 |
| 3.2.1.2.3<br>Maximum available flow and maximum power from one coupler pair:                                                                                 | 17.5     | 66                                             |      | 2332         | 94.5      | 27.56 |
| 3.2.1.2.4<br>Maximum available flow and maximum power from coupler pairs operating simultaneously (flow through two or more coupler pairs if required):      | 19.4     | 67                                             |      | 2367         | 102.0     | 32.98 |

Tapping point used for test:

Remote/Auxiliary service connection

Temperature of hydraulic fluid if different from  $65 \pm 5^{\circ}\text{C}$

—°C

Opening pressure of the unloading valve:

Not applicable

Closing pressure of the unloading valve:

Not applicable

### 3.2.2 Power lift test – (To ISO 730-1:1994)

Linkage settings for test – see Table 2.1 and Figures 2.1 and 2.2.

|                                                            | At the hitch point | on the frame |
|------------------------------------------------------------|--------------------|--------------|
| Height of lower hitch points above ground in down position | 200 mm             | 200 mm       |
| Vertical movement                                          | 785 mm             | 905 mm       |
| Maximum corrected force exerted through full range         | 62.6 kN            | 50.2 kN      |
| Corresponding pressure of hydraulic fluid                  | 19.4 MPa           | 19.4 MPa     |
| Moment about rear-wheel axis                               | 76.6 kNm           | 92.1 kNm     |
| Maximum tilt angle of mast from vertical                   |                    | 10 degrees   |

|                                                                                                                                                                                                    |      |      |      |      |      |      |      |      |      |      |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Lifting heights relative to the horizontal plane including the lower link pivot points                                                                                                             |      |      |      |      |      |      |      |      |      |      |      |
| mm                                                                                                                                                                                                 | -475 | -435 | -310 | -215 | -135 | 0    | +78  | +175 | +300 | +350 | +430 |
| 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<br>kN                                                                                                                                                                          | —    | 62.6 | 62.8 | 64.7 | 66.0 | 68.5 | 70.8 | 71.5 | 72.0 | 71.7 | —    |
| Corresponding pressure: 19.4 MPa                                                                                                                                                                   |      |      |      |      |      |      |      |      |      |      |      |
| at the frame<br>kN                                                                                                                                                                                 | 60.6 | —    | 59.5 | 59.3 | 59.2 | 59.3 | 57.5 | 55.6 | 52.4 | —    | 50.2 |
| Corresponding pressure: 19.4 MPa                                                                                                                                                                   |      |      |      |      |      |      |      |      |      |      |      |

### 3.3 Drawbar power test (unballasted tractor)

(Four-Wheel Drive)

17 and 22 March 2004

Date and Location of tests:

Silsoe Research Institute  
Wrest Park  
Silsoe  
Bedford MK45 4HS

Type of track:

Concrete

|             | Height of drawbar<br>above ground | Tyre inflation pressure |             |
|-------------|-----------------------------------|-------------------------|-------------|
|             | mm                                | Front<br>kPa            | Rear<br>kPa |
| Unballasted | 435                               | 85                      | 85          |

| Gear<br>and<br>range | Power                                                                                    | Drawbar<br>pull | Speed | Engine<br>speed   | Slip of<br>wheels<br>or track | Specific<br>fuel<br>cons | Specific<br>Energy | Temperature |               |                     | Atmospheric conditions |                           |                 |
|----------------------|------------------------------------------------------------------------------------------|-----------------|-------|-------------------|-------------------------------|--------------------------|--------------------|-------------|---------------|---------------------|------------------------|---------------------------|-----------------|
|                      | kW                                                                                       | kN              | km/h  | min <sup>-1</sup> | %                             | g/kWh                    | kWh/l              | Fuel<br>°C  | Coolant<br>°C | Engine<br>oil<br>°C | Temp<br>°C             | Relative<br>humidity<br>% | Pressure<br>kPa |
| 3.3.1                | MAXIMUM POWER IN TESTED GEARS                                                            |                 |       |                   |                               |                          |                    |             |               |                     |                        |                           |                 |
| 1                    | 38.1                                                                                     | 77.4            | 1.77  | 2326              | 12.4                          | 482                      | 1.75               | 62          | 98            | 119                 | 13                     | 78                        | 101.9           |
| 2                    | 46.0                                                                                     | 77.7            | 2.13  | 2318              | 12.0                          | 411                      | 2.05               | 61          | 97            | 119                 | 16                     | 61                        | 101.9           |
| 3                    | 55.8                                                                                     | 77.2            | 2.60  | 2309              | 10.4                          | 400                      | 2.11               | 63          | 98            | 119                 | 14                     | 74                        | 101.9           |
| 4                    | 65.3                                                                                     | 75.0            | 3.13  | 2299              | 10.0                          | 371                      | 2.28               | 64          | 92            | 120                 | 15                     | 70                        | 101.9           |
| 5                    | 78.0                                                                                     | 74.7            | 3.76  | 2284              | 9.6                           | 377                      | 2.24               | 64          | 91            | 120                 | 16                     | 56                        | 101.9           |
| 6                    | 93.7                                                                                     | 74.3            | 4.54  | 2254              | 7.9                           | 325                      | 2.60               | 64          | 91            | 121                 | 16                     | 57                        | 101.9           |
| 7                    | 102.7                                                                                    | 73.2            | 5.05  | 2169              | 7.9                           | 320                      | 2.64               | 62          | 90            | 122                 | 16                     | 57                        | 101.9           |
| 8                    | 112.0                                                                                    | 70.9            | 5.69  | 1999              | 6.5                           | 302                      | 2.80               | 63          | 94            | 122                 | 17                     | 55                        | 101.9           |
| 9                    | 112.8                                                                                    | 61.1            | 6.65  | 1898              | 4.1                           | 276                      | 3.07               | 63          | 96            | 123                 | 16                     | 56                        | 101.9           |
| 10                   | 111.4                                                                                    | 50.0            | 8.02  | 1879              | 2.8                           | 296                      | 2.84               | 61          | 96            | 121                 | 16                     | 56                        | 101.9           |
| 11                   | 111.7                                                                                    | 41.5            | 9.70  | 1873              | 2.0                           | 298                      | 2.84               | 61          | 96            | 123                 | 16                     | 54                        | 102.0           |
| 12                   | 109.5                                                                                    | 33.1            | 11.93 | 1908              | 1.7                           | 304                      | 2.78               | 61          | 95            | 123                 | 17                     | 49                        | 101.9           |
| 13                   | 111.5                                                                                    | 29.4            | 13.66 | 1897              | 1.4                           | 299                      | 2.83               | 61          | 93            | 124                 | 16                     | 48                        | 101.9           |
| 3.3.2                | FUEL CONSUMPTION                                                                         |                 |       |                   |                               |                          |                    |             |               |                     |                        |                           |                 |
| 3.3.2.1              | In selected gear, at maximum power at rated speed                                        |                 |       |                   |                               |                          |                    |             |               |                     |                        |                           |                 |
| 9                    | 102.6                                                                                    | 47.3            | 7.80  | 2205              | 3.2                           | 324                      | 2.61               | 62          | 98            | 124                 | 16                     | 57                        | 102.0           |
| 3.3.2.1.1            | 75% of pull at maximum power at rated speed                                              |                 |       |                   |                               |                          |                    |             |               |                     |                        |                           |                 |
| 9                    | 80.9                                                                                     | 35.5            | 8.19  | 2289              | 2.1                           | 346                      | 2.44               | 60          | 93            | 120                 | 16                     | 56                        | 101.9           |
| 3.3.2.1.2            | 50% of pull at maximum power at rated speed                                              |                 |       |                   |                               |                          |                    |             |               |                     |                        |                           |                 |
| 9                    | 54.8                                                                                     | 23.7            | 8.32  | 2312              | 1.5                           | 407                      | 2.08               | 62          | 90            | 120                 | 16                     | 57                        | 101.9           |
| 3.3.2.1.3            | Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1 |                 |       |                   |                               |                          |                    |             |               |                     |                        |                           |                 |
| 10                   | 81.2                                                                                     | 35.5            | 8.24  | 1908              | 1.7                           | 316                      | 2.67               | 61          | 98            | 123                 | 16                     | 50                        | 102.0           |
| 3.3.2.1.4            | Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2 |                 |       |                   |                               |                          |                    |             |               |                     |                        |                           |                 |
| 10                   | 55.2                                                                                     | 23.7            | 8.37  | 1922              | 0.9                           | 337                      | 2.51               | 61          | 97            | 120                 | 15                     | 51                        | 101.9           |
| 3.3.2.2              | In selected gear nearest to 7.5 km/h, at maximum power at rated engine speed             |                 |       |                   |                               |                          |                    |             |               |                     |                        |                           |                 |
| 9                    | 102.6                                                                                    | 47.3            | 7.80  | 2205              | 3.2                           | 324                      | 2.61               | 62          | 98            | 124                 | 16                     | 57                        | 102.0           |
| 3.3.2.2.1            | 75% of pull at maximum power at rated speed                                              |                 |       |                   |                               |                          |                    |             |               |                     |                        |                           |                 |
| 9                    | 80.9                                                                                     | 35.5            | 8.19  | 2289              | 2.1                           | 346                      | 2.44               | 60          | 93            | 120                 | 16                     | 56                        | 101.9           |
| 3.3.2.2.2            | 50% of pull at maximum power at rated speed                                              |                 |       |                   |                               |                          |                    |             |               |                     |                        |                           |                 |
| 9                    | 54.8                                                                                     | 23.7            | 8.32  | 2312              | 1.5                           | 407                      | 2.08               | 62          | 90            | 120                 | 16                     | 57                        | 101.9           |
| 3.3.2.2.3            | Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1 |                 |       |                   |                               |                          |                    |             |               |                     |                        |                           |                 |
| 10                   | 81.2                                                                                     | 35.5            | 8.24  | 1908              | 1.7                           | 316                      | 2.67               | 61          | 98            | 123                 | 16                     | 50                        | 102.0           |
| 3.3.2.2.4            | Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2 |                 |       |                   |                               |                          |                    |             |               |                     |                        |                           |                 |
| 10                   | 55.2                                                                                     | 23.7            | 8.37  | 1922              | 0.9                           | 337                      | 2.51               | 61          | 97            | 120                 | 15                     | 51                        | 101.9           |

### 3.3.1 Drawbar power test (unballasted tractor)

(Four-Wheel Drive disengaged)

|             | Height of drawbar<br>above ground | Tyre inflation pressure |      |
|-------------|-----------------------------------|-------------------------|------|
|             | mm                                | Front                   | Rear |
|             |                                   | kPa                     | kPa  |
| Unballasted | 560                               | 85                      | 85   |

| Gear<br>and<br>range                                                                                      | Power | Drawbar<br>pull | Speed | Engine<br>speed   | Slip of<br>wheels<br>or track | Specific<br>fuel<br>cons | Specific<br>Energy | Temperature |         |               | Atmospheric conditions |                      |          |
|-----------------------------------------------------------------------------------------------------------|-------|-----------------|-------|-------------------|-------------------------------|--------------------------|--------------------|-------------|---------|---------------|------------------------|----------------------|----------|
|                                                                                                           |       |                 |       |                   |                               |                          |                    | Fuel        | Coolant | Engine<br>oil | Temp                   | Relative<br>humidity | Pressure |
|                                                                                                           | kW    | kN              | km/h  | min <sup>-1</sup> | %                             | g/kWh                    | kWh/l              | °C          | °C      | °C            | °C                     | %                    | kPa      |
| <b>3.3.1 MAXIMUM POWER IN TESTED GEARS</b>                                                                |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| 1                                                                                                         | 27.3  | 55.1            | 1.78  | 2339              | 12.6                          | 558                      | 1.52               | 58          | 96      | 117           | 11                     | 59                   | 100.4    |
| 2                                                                                                         | 32.8  | 54.8            | 2.15  | 2334              | 12.1                          | 508                      | 1.66               | 58          | 95      | 117           | 10                     | 60                   | 100.4    |
| 3                                                                                                         | 39.2  | 54.4            | 2.59  | 2326              | 11.5                          | 467                      | 1.81               | 54          | 96      | 118           | 10                     | 61                   | 100.4    |
| 4                                                                                                         | 46.2  | 53.8            | 3.09  | 2317              | 11.7                          | 452                      | 1.87               | 60          | 90      | 119           | 11                     | 59                   | 100.4    |
| 5                                                                                                         | 55.8  | 53.2            | 3.77  | 2310              | 10.1                          | 380                      | 2.23               | 57          | 92      | 119           | 11                     | 61                   | 100.4    |
| 6                                                                                                         | 65.3  | 51.9            | 4.53  | 2301              | 10.0                          | 393                      | 2.15               | 53          | 90      | 120           | 10                     | 59                   | 100.4    |
| 7                                                                                                         | 76.3  | 52.2            | 5.26  | 2290              | 9.2                           | 356                      | 2.38               | 55          | 96      | 119           | 10                     | 56                   | 100.5    |
| 8                                                                                                         | 91.5  | 52.2            | 6.30  | 2270              | 8.7                           | 335                      | 2.52               | 57          | 98      | 118           | 10                     | 60                   | 100.5    |
| 9                                                                                                         | 102.3 | 51.0            | 7.22  | 2158              | 8.4                           | 314                      | 2.70               | 62          | 90      | 117           | 12                     | 55                   | 100.4    |
| 10                                                                                                        | 109.4 | 48.0            | 8.21  | 2001              | 6.6                           | 312                      | 2.71               | 57          | 96      | 118           | 10                     | 61                   | 100.4    |
| 11                                                                                                        | 109.5 | 40.6            | 9.70  | 1940              | 5.4                           | 309                      | 2.74               | 54          | 99      | 121           | 10                     | 60                   | 100.4    |
| 12                                                                                                        | 106.2 | 32.7            | 11.68 | 1922              | 4.4                           | 314                      | 2.70               | 55          | 95      | 123           | 10                     | 58                   | 100.4    |
| 13                                                                                                        | 110.5 | 29.5            | 13.48 | 1924              | 4.0                           | 301                      | 2.81               | 54          | 97      | 123           | 11                     | 56                   | 100.4    |
| <b>3.3.3 FUEL CONSUMPTION</b>                                                                             |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| <b>3.3.2.1 In selected gear, at maximum power at rated speed</b>                                          |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| 13                                                                                                        | 95.2  | 22.0            | 15.56 | 2203              | 3.1                           | 336                      | 2.52               | 53          | 95      | 123           | 11                     | 54                   | 100.4    |
| <b>3.3.2.1.1 75% of pull at maximum power at rated speed</b>                                              |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| 13                                                                                                        | 74.6  | 16.5            | 16.24 | 2287              | 2.8                           | 375                      | 2.26               | 54          | 97      | 124           | 10                     | 60                   | 100.4    |
| <b>3.3.2.1.2 50% of pull at maximum power at rated speed</b>                                              |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| 13                                                                                                        | 50.8  | 11.1            | 16.49 | 2309              | 2.1                           | 441                      | 1.92               | 59          | 96      | 122           | 11                     | 55                   | 100.4    |
| <b>3.3.2.1.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1</b> |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| 14*                                                                                                       |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| <b>3.3.2.1.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2</b> |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| 14*                                                                                                       |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| <b>3.3.2.2 In selected gear nearest to 7.5 km/h, at maximum power at rated engine speed</b>               |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| 9                                                                                                         | 98.0  | 47.1            | 7.48  | 2198              | 6.7                           | 331                      | 2.55               | 57          | 98      | 118           | 11                     | 57                   | 100.4    |
| <b>3.3.2.2.1 75% of pull at maximum power at rated speed</b>                                              |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| 9                                                                                                         | 78.3  | 35.3            | 7.98  | 2291              | 4.6                           | 322                      | 2.62               | 57          | 97      | 119           | 12                     | 60                   | 100.4    |
| <b>3.3.2.2.2 50% of pull at maximum power at rated speed</b>                                              |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| 9                                                                                                         | 53.6  | 23.6            | 8.16  | 2312              | 3.4                           | 418                      | 2.02               | 59          | 99      | 120           | 12                     | 56                   | 100.4    |
| <b>3.3.2.2.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1</b> |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| 10                                                                                                        | 78.5  | 35.3            | 8.01  | 1911              | 4.6                           | 303                      | 2.79               | 56          | 96      | 116           | 11                     | 54                   | 100.5    |
| <b>3.3.2.2.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2</b> |       |                 |       |                   |                               |                          |                    |             |         |               |                        |                      |          |
| 10                                                                                                        | 53.4  | 23.5            | 8.17  | 1922              | 3.2                           | 335                      | 2.52               | 53          | 96      | 115           | 11                     | 54                   | 100.5    |

\* Shutdowns were not possible in gear 14 as speed was too fast to control test load vehicle

\* In the drawbar test(s) fan speed was not measured because we do not have the facility to do so at present

4. OPTIONAL TESTS RESULTS None

5. REPAIRS AND ADJUSTMENTS DURING TESTS: None

**REMARKS: Boosted Power Take-Off (P.T.O.) 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 (16<sup>th</sup> and above), for road transport applications. The system is also activated once power transfer through the rear P.T.O. exceeds a pre-set level (and forward speed exceed 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  
Senor Test Engineer  
Field Machinery Centre

Date: 23/08/04

## 7. APPENDIX 1 ADDITIONAL TESTS

### 7.1 Power lift test – (To Manufacturers lift rod setting)

**"Not covered by the approval"**

Linkage settings for test – see Table 2.1 and Figures 2.1 and 2.2.

|                                                            | At the hitch point | on the frame |
|------------------------------------------------------------|--------------------|--------------|
| Height of lower hitch points above ground in down position | 270 mm             | 270 mm       |
| Vertical movement                                          | 730 mm             | 783 mm       |
| Maximum corrected force exerted through full range         | 68.9 kN            | 57.1 kN      |
| Corresponding pressure of hydraulic fluid                  | 19.4 MPa           | 19.4 MPa     |
| Moment about rear-wheel axis                               | 84.3 kNm           | 104.7 kNm    |
| Maximum tilt angle of mast from vertical                   | ---                | 5 degrees    |

|                                                                                                                                                                                                    |       |       |       |       |      |      |       |       |       |       |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|
| Lifting heights relative to the horizontal plane including the lower link pivot points                                                                                                             |       |       |       |       |      |      |       |       |       |       |       |
| mm                                                                                                                                                                                                 | - 375 | - 365 | - 235 | - 110 | 0    | + 65 | + 150 | + 228 | + 290 | + 370 | + 408 |
| 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                                                                                                                                                                             | —     | 68.9  | 69.5  | 72.0  | 73.5 | 74.6 | 75.1  | 75.6  | 75.9  | 74.2  | —     |
| Corresponding pressure: 19.4 MPa                                                                                                                                                                   |       |       |       |       |      |      |       |       |       |       |       |
| at the frame kN                                                                                                                                                                                    | 68.8  | —     | 67.7  | 67.7  | 67.7 | 66.5 | 65.4  | 63.4  | 61.5  | —     | 57.1  |
| Corresponding pressure: 19.4 MPa                                                                                                                                                                   |       |       |       |       |      |      |       |       |       |       |       |

## 7.2 Power lift test – (To SAE J283)

**Linkage settings for test – see Table 2.1**

\* Lift rods readjusted to 945 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                                                                                     | - 365 | - 280 | - 175 | - 50 | 0    | + 125 | + 213 | + 285 | + 353 | ---   | ---   |
| *mm                                                                                    | ---   | - 280 | - 175 | - 50 | 0    | + 125 | + 213 | + 285 | + 353 | + 395 | + 433 |
| SAE J283                                                                               |       |       |       |      |      |       |       |       |       |       |       |
| kN                                                                                     | 82.1  | 82.1  | 80.8  | 77.6 | 76.4 | 72.9  | 70.1  | 65.8  | 62.2  | ---   | ---   |
| *kN                                                                                    | ---   | 80.5  | 80.5  | 79.0 | 78.5 | 74.0  | 72.3  | 69.3  | 65.9  | 62.8  | 60.9  |
| Corresponding pressure: 18.5 MPa                                                       |       |       |       |      |      |       |       |       |       |       |       |

# **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:

15 April 2004

Four wheel drive engaged Windows closed

| Gear | Test Condition | Measured travelling speed km/h | Sound level dB(A) |
|------|----------------|--------------------------------|-------------------|
| 9    | Light Load     | 8.6                            | 76                |

Four wheel drive engaged Windows open

| Gear | Test Condition | Measured travelling speed km/h | Sound level dB(A) |
|------|----------------|--------------------------------|-------------------|
| 9    | Light Load     | 8.6                            | 84                |

Four wheel drive dis-engaged Windows closed

| Gear | Test Condition | Measured travelling speed km/h | Sound level dB(A) |
|------|----------------|--------------------------------|-------------------|
| 9    | Light Load     | 8.5                            | 76                |

Four wheel drive dis-engaged Windows open

| Gear | Test Condition | Measured travelling speed km/h | Sound level dB(A) |
|------|----------------|--------------------------------|-------------------|
| 9    | Light Load     | 8.5                            | 84                |

