Report on test in accordance with O.E.C.D. Standard Code 2
for the Official Testing of Agricultural Tractors

O.E.C.D. approval No. : 2/2 372
Date of approval : 29 May 2007



# Agricultural Tractor KIOTI DK45S (4WD)

Manufactured by : DAEDONG INS. CO. Ltd.
1-12, Buk-ri, Nongong-eub, Dalseong-gun, Daegu-si,
Republic of Korea

NATIONAL INSTITUTE OF AGRICULTURAL ENGINEERING
249, Seodun-dong, Gwonseon-gu, Suwon-si, Gyeonggi-do, Republic of Korea

This is a report on a tractor test in accordance with OECD STANDARD CODE for the Official Testing of Agricultural Tractor Performance [C(2000)59/FINAL, and its amendments C(2001)5/FINAL, C(2001)267/FINAL, C(2002)17/FINAL, C(2003)14/FINAL and C(2003)252/FINAL]

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This report has been approved by the OECD Co-ordinating Centre (CEMAGREF, France) as being in accordance with the OECD STANDARD CODE 2.

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" that the manufacturer's declaration has been endorsed.

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## GENERALITIES

| | | |
|---|---|---|
| [C] | Tractor manufacturer's name and address: | DAEDONG INS. CO., Ltd.<br>1-12, Buk-ri, Nongong-eub, Dalseong-gun, Daegu-si, Republic of Korea |
| [C] | Location of tractor assembly: | Daegu, Republic of Korea |
| [C] | Submitted for test by: | The manufacturer |
| [C] | Selected for test by: | The manufacturer |
| [C] | Place of running-in: | Daegu and Suweon, Republic of Korea |
| [C] | Duration of running-in: | 30 h |
| [C] | Location of test: | NIAE, Suwon, Republic of Korea |

## 1. SPECIFICATIONS OF TRACTOR

### 1.1 Identification

1.1.1 Denomination

| | | |
|---|---|---|
| [C] | - Make: | KIOTI |
| [C] | - Model: | DK45S |
| [C] | - Type: | 4WD, wheel tractor, unit construction |

1.1.2 Numbers

| | | |
|---|---|---|
| [D] | - 1st serial No.: | DC44-00001 |
| [C] | - Serial No.: | FC44-00260 |

1.1.3 Other specifications

| | | |
|---|---|---|
| [C] | - Model(s) for other countries: | None |
| [C] | - Transmission type or gears x ranges: | Gear type, 4 gears x 3 ranges |
| [C] | - Speed version: | 30 km/h |

### 1.2 Engine

| | | |
|---|---|---|
| [C] | - Make: | DAEDONG |
| [C] | - Model: | 4A220LXB |
| [C] | - Type: | Water-cooled 4-stroke diesel engine with direct injection |
| [C] | - Serial No.: | FD2600099 |

#### 1.2.1 Cylinders

| | | |
|---|---|---|
| [C] | - Number / disposition: | 4 / Vertical in-line |
| [D] | - Bore / stroke: | 87 mm / 92.4 mm |
| [D] | - Capacity: | 2197 $cm^3$ |
| [D] | - Compression ratio: | 22.0 : 1 |
| [D] | - Arrangement of valves: | Overhead valves |
| [D] | - Cylinder liners(wet or dry): | None |

#### 1.2.2 Supercharging

None

### 1.2.3 Fuel system

| | | |
|---|---|---|
| [C] | - Fuel feed system: | Mechanically driven gear pump |
| | - Fuel filters | |
| [C] | · Make: | DAEHWA |
| [C] | · Model: | T4682-25732 |
| [C] | · Type: | Replaceable paper element cartridge |
| [D] | - Capacity of fuel tank: | 58 $dm^3$ |
| | - Injection pump | |
| [C] | · Make: | DOOWON |
| [C] | · Model: | PFR-4KD |
| [C] | · Type: | Rotary |
| [C] | · Serial No.: | 61121 |
| | - Manufacturer's production setting of injection pump | |
| [C] | · Flow rate: | 10.1 L/h ± 5 % at rated engine speed 2600 $min^{-1}$ and full load |
| [D] | · Timing: | 18° before TDC |
| | - Injectors | |
| [D] | · Make: | DOOWON |
| [D] | · Model: | KCA-P |
| [D] | · Type: | Throttle type |
| [D] | - Injection pressure: | 13.7 - 14.7 MPa |

### 1.2.4 Governor

| | | |
|---|---|---|
| [C] | - Make: | HANIL |
| [C] | - Model: | E5627-56051 |
| [C] | - Type: | Mechanical |
| [C] | - Governed range of engine speed: | From 850 ± 50 to 2800 ± 50 $min^{-1}$ |
| [C] | - Rated engine speed: | 2600 $min^{-1}$ |

### 1.2.5 Air cleaner

| | | |
|---|---|---|
| [C] | - Pre-cleaner: | None |
| | - Main-cleaner | |
| [C] | · Make: | NIPPON DONALDSON |
| [C] | · Model: | FP G068506 |
| [C] | · Type: | Dry paper element in cartridge |
| [C] | · Location of air intake: | Under the engine bonnet |
| [C] | - Maintenance indicator: | None |

### 1.2.6 Lubrication system

| | | |
|---|---|---|
| [D] | - Type of feed pump: | Rotor pump |
| [C | - Type of filter: | Full flow, replaceable paper element cartridge |
| [C] | - Number of filter: | 1 |

### 1.2.7 Coolng system

| | | |
|---|---|---|
| [C] | - Type of coolant: | water-antifreeze solution mixture |
| [D] | - Type of pump: | Centrifugal |
| | - Specification of fan | |
| [C] | · Number of fan blades: | 6 |
| [C] | · Fan diameter: | 400 mm |
| [D] | - Coolant capacity: | 8.6 $dm^3$ |
| [C] | - Type of temperature control: | Thermostat |
| [D] | - Over-pressure system: | 88.2 kPa |

### 1.2.8 Starting system

| | | |
|---|---|---|
| [C] | - Make: | VALEO |
| [C] | - Model: | TM000A07101 |
| [C] | - Type: | Electrical, pre-engaged solenoid-operated motor |
| [D] | - Starter motor power rating: | 1.7 kW |
| [C] | - Cold starting aid: | Electric glow plug |
| [C] | - Safety device: | Starting operable only when main clutch pedal fully depressed |

### 1.2.9 Electrical system

| | | |
|---|---|---|
| [C] | - Voltage: | 12 V |
| | - Generator | |
| [C] | · Make: | VALEO |
| [C] | · Model: | TA000A58101 |
| [C] | · Type: | 3-phase alternator |
| [D] | · Power: | 600 VA |
| | - Battery | |
| [C] | · Number: | 1 |
| [D] | · Rating: | 80 Ah at 20 hours rating |

### 1.2.10 Exhaust system

| | | |
|---|---|---|
| [C] | - Make: | YOUNGIN |
| [C] | - Model: | T4624 |
| [C] | - Type: | Expansion and absorption type |
| [C] | - Location: | Under the bonnet, horizontal above and on the left side of the engine |

## 1.3 Transmission

### 1.3.1 Clutch (Only for travelling)

[D] - Make: SEOJIN

[D] - Model: 0412601500

[D] - Type: Dry plate

[D] - Number of plate: 1

[D] - Diameter of plate: 260 mm

[C] - Method of operation: Mechanically actuated by pedal

### 1.3.2 Gear box

[D] - Make: DAEDONG GEAR

[D] - Model: M20TM

[D] - Type and description: Syncro-mesh 4 main gears, constant-mesh 3 range gears and synchro-mesh forward / reverse gear with hand lever

| | Forward | Reverse |
|---|---|---|
| [C] Number of gears | 4 | 4 |
| [C] Number of ranges | 3 | 3 |
| [C] Total of arrangements | 12 | 12 |

[D] - Available options: None

### 1.3.3 Rear axle and final drives

[D] - Make: DAEDONG GEAR

[D] - Model: M20RA

[D] - Type: Bevel gear type differential and planetary gear type final drives

- Differential lock

[D] · Type: Mechanical

[C] · Method of engagement: Engaged during the pedal is depressed

[C] · Method of disengagement: Self-disengaged by spring when the pedal is released

### 1.3.4 Front axle and final drives

[D] - Make: DAEDONG GEAR

[D] - Model: M20FA

[D] - Type: Differential and bevel gear type final drives

[C] - Differential lock: None

### 1.3.5 Total ratios and travelling speeds

[C]

| Range - Gear | Number of engine revolutions for one revolution of the driving wheels | | Nominal traveling speed(*) at rated engine speed of 2600 $min^{-1}$ (km/h) | |
|---|---|---|---|---|
| | Forward | Reverse | Forward | Reverse |
| L - 1 | 1621.10 | 1958.83 | 0.35 | 0.29 |
| L - 2 | 1140.78 | 1378.44 | 0.50 | 0.42 |
| L - 3 | 775.31 | 936.83 | 0.74 | 0.61 |
| L - 4 | 484.47 | 585.40 | 1.18 | 0.98 |
| M - 1 | 345.10 | 417.00 | 1.66 | 1.38 |
| M - 2 | 242.85 | 293.44 | 2.36 | 1.95 |
| M - 3 | 165.05 | 199.43 | 3.47 | 2.88 |
| M - 4 | 103.13 | 124.62 | 5.56 | 4.60 |
| H - 1 | 81.00 | 97.87 | 7.08 | 5.86 |
| H - 2 | 57.00 | 68.88 | 10.06 | 8.32 |
| H - 3 | 38.74 | 46.81 | 14.80 | 12.25 |
| H - 4 | 24.21 | 29.25 | 23.68 | 19.60 |
| (*)Calculated with the dynamic radius index of 585 mm (KS M 6752)<br>L = Low range, M = Medium range , H = High range | | | | |

[C] Number of revolutions of front wheels for one revolution of rear-wheels (for 4WD tractors only): 1.519

## 1.4 Power take-off

### 1.4.1 Main power take-off

[C] - Type: Independent

[C] - Method of engagement: Multiplate wet type clutch engaged or disengaged by switch on the right-hand console

[C] - Number of shafts: 1

[C] - Method of changing PTO shaft ends: Not changeable

[C] - Method of changing PTO speeds: Not changeable

#### 1.4.1.1 PTO proportional to engine speed

PTO at 540 $min^{-1}$

[C] - Location: Rear of tractor

[C] - Diameter of PTO shaft end: 35 mm

[C] - Number of splines: 6, in conformity with ISO 500:1991 Type 1

| | | |
|---|---|---|
| [C] | - Height above ground: | 575 mm |
| [C] | - Distance from the median plane of the tractor: | 0 mm |
| [C] | - Distance behind rear-wheel axis: | 365 mm |
| [C] | - PTO speed at rated engine speed (2600 $min^{-1}$): | 561 $min^{-1}$ |
| [C] | - Engine speed at standard PTO speed: | 2504 $min^{-1}$ |
| [C] | - Ratio of rotation speeds (engine / PTO): | 4.636 : 1 |
| [D] | - Power restriction: | None |
| [D] | - Maximum torque transmissible: | None |
| [C] | - Direction of rotation (viewed from behind tractor): | Clockwise |

PTO at 1000 $min^{-1}$

| | | |
|---|---|---|
| [C] | - Location: | None |

1.4.1.2 PTO proportional to ground speed: None

**1.4.2 Optional PTO:** None

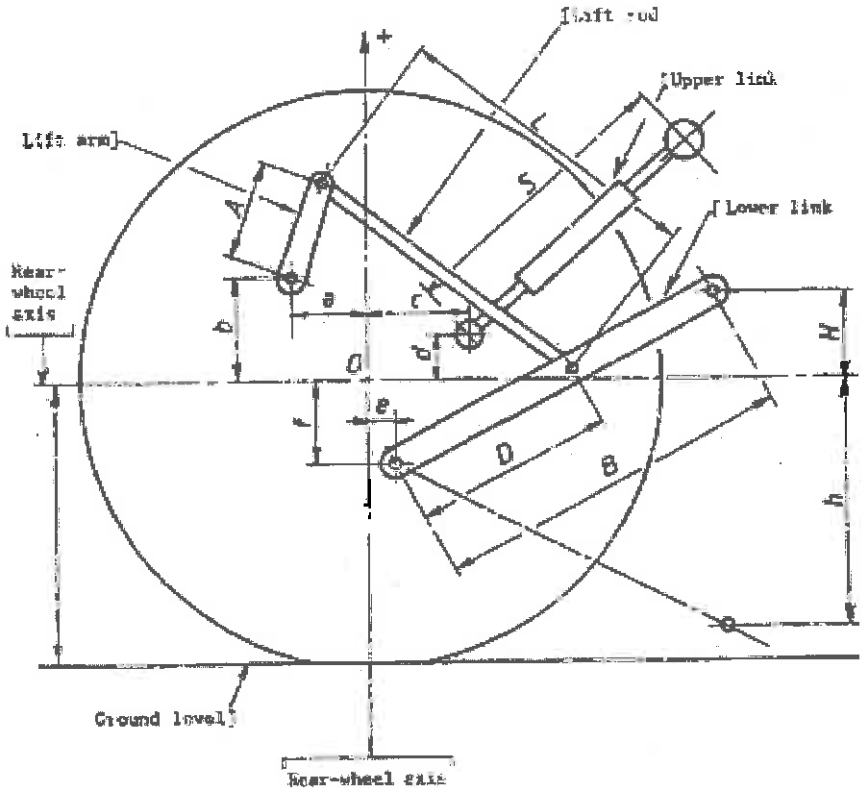
**1.5 Hydraulic power lift**

| | | |
|---|---|---|
| [C] | - Make: | DAEHWANG |
| [C] | - Model: | M35D |
| [C] | - Type: | Position and load control |
| [C] | - Type of hydraulic system: | Open center system |
| [C] | - Number and type of cylinders: | 1, Single acting |
| [C] | - Type of linkage lock for transport: | Hydraulic |
| [D] | - Relief valve pressure setting: | 17.6 ± 0.5 MPa |
| [D] | - Opening pressure of cylinder safety valve: | 22.5 ± 0.5 MPa |
| [D] | - Lift pump type: | Gear type |
| [D] | - Transmission between pump and engine: | Geared cam shaft |
| [C] | - Number and type of filters: | 1, replaceable paper element cartridge |
| [C] | - Site of oil reservoir: | In common with transmission and rear axle housing |
| [C] | - Type, number and location of tapping points: | 2 double acting female couplers at rear of tractor<br>4 double acting female couplers at right-hand side of tractor |
| [D] | - Maximum volume of oil available to external cylinders: | 5 $dm^3$ |

## 1.6 Three point linkage

[C] - Category: 1, in conformity with ISO 730-1:1994 + Cor.1:1995

[C] - Category adapter: None



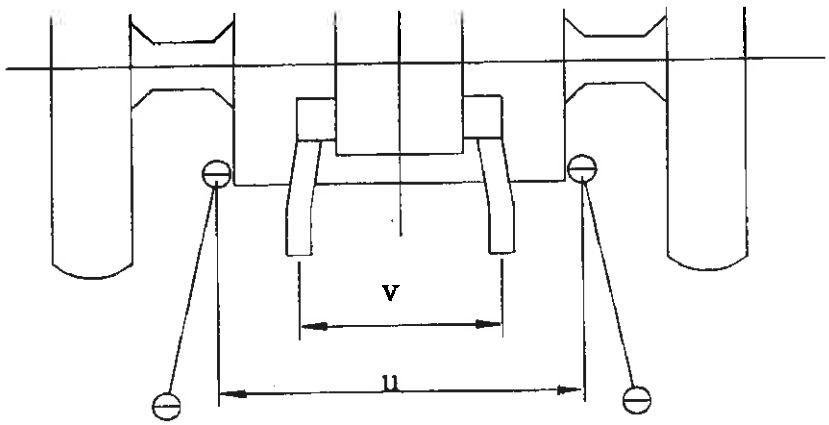



**Table 1 Dimensions of linkage geometry when connected to the standard frame**

| Dimensions of rear implement linkage | | | | Projected lengths in mm | |
|---|---|---|---|---|---|
| | | | | Dimension or range | Settings used in test |
| [C] | Length of lift arms: | | (A) | 230 | 230 |
| [C] | Length of lower links: | | (B) | 780 | 780 |
| [C] | Distance of lift arm pivot point from rear-wheel axis: | Horizontally<br>Vertically | (a)<br>(b) | 35<br>264 | 35<br>264 |
| [C] | Horizontal distance between the 2 lower link points: | | (u) | 331 | 331 |
| [C] | Horizontal distance between the 2 lift arm end points: | | (v) | 496 | 496 |
| [C] | Length of upper link: | | (S) | 534 - 842 | 670 |
| [C] | Distance of upper link pivot point from rear wheel axis: | Horizontally<br>Vertically | (c)<br>(d) | 184, 172, 199<br>252, 279, 339 | 184<br>252 |
| [C] | Distance of lower link pivot point from rear wheel axis: | Horizontally<br>Vertically | (e)<br>(f) | 80<br>173 | 80<br>173 |
| [C] | Distance of lower link pivot points to lift rod pivot points on lower links: | | (D) | 335 | 335 |
| [C] | Length of lift rods: | | (L) | 410 - 490 | 455 |
| [C] | Height of lower hitch points relative to the rear-wheel axis: | in low position<br>in high position | (h)<br>(H) | 258 - 480<br>217 - 371 | 390<br>260 |
| [C] | Height above ground of lower hitch points when locked in transport position (*) | | | Any height within lifting range (Hydraulic transport lock) | |

(*) Assuming r = 585 mm tyre dynamic radius index of 13.6-26 tyres on rear axle (KS M 6752)

## 1.7 Swinging drawbar

[C] - Type: Clevis

- Height above ground:

[C] · Maximum: 400 mm

[C] · Minimum: 325 mm

[C] - Type of adjustment: inverting drawbar, longitudinally in two steps

[C] - Distance of hitch point from rear wheel axis, horizontally: 720 mm

- Distance of hitch point from PTO shaft end

[C] · Vertically: 177 mm

[C] · Horizontally: 355 mm

- Lateral adjustment (center of drawbar hole)

[C] · Right / left hand side: 118 mm

[C] - Distance of pivot point from rear wheel axis, horizontally: 276 mm

[C] - Diameter drawer pin hole: 26 mm

[D] - Maximum vertical permissible load: 6.3 kN

**1.8** **Trailer hitch**: Not fitted

**1.9** **Holed drawbar**: Not fitted

**1.10** **Steering**

[D] - Make: Sumitomo Eaton

[D] - Model: RW074B120R3A

[D] - Type: Hydrostatic power steering

[D] - Method of operation: By steering wheel and each cylinder acting on each steering arm

[D] - Pump(s): 1, gear pump

[D] - Ram(s): 2, single acting ram

[D] - Working pressure: 11.8 MPa

**1.11** **Brakes**

1.11.1 Service brake

[D] - Make: JIN MYOUNG

[D] - Model: T2440-28202

[D] - Type Oil-immersed multiplate discs on rear left and right differential shafts

[C] - Method of operation: Right and left brakes operated by pressing separate two foot pedals which can be locked together by means of a pin

[C] - Trailer braking take-off: None

1.11.2 Parking brake

[C] - Type: Mechanically in common with service brake

[C] - Method of operation: Engaged by depressing brake pedals and latching by hand lever

**1.12** **Wheels**

- Number

[C] · Front: 2, steering and driving

[C] · Rear: 2, driving

[C] - Wheelbase: 1880 mm

- Track width adjustment:

| | Minimum mm | Maximum mm | Adjustment method |
|---|---|---|---|
| [D] Front | 1265 | 1380 | By reversing wheels |
| [D] Rear | 1208 | 1518 | By reversing wheels and offset lug rims |

## 1.13 Protective structure

| | | |
|---|---|---|
| [C] | - Make: | SAMWOO |
| [C] | - Model: | SRB450 |
| [C] | - Type: | Rollguard |
| [C] | - Manufacturer's name and address: | Samwoo Agricultural Machinery Co., LTD<br>92-11, Paho-dong, Dalseo-gu, Daegu-si, Rep. of Korea |
| | - Protective device | |
| [C] | · Rollguard: | Two post roll-over protective structure |
| [C] | · Tiltable / not tiltable: | Tiltable |
| [C] | - OECD approval: | None |

## 1.14 Seat

1.14.1 Driver's seat

| | | |
|---|---|---|
| [C] | - Make: | WOOCHANG |
| [C] | - Model: | T11412 |
| [C] | - Type: | Upholstered seat with back rest |
| [C] | - Seat and steering wheel reversible: | No |
| [C] | - Type of suspension: | Spring |
| [C] | - Type of damping: | None |
| | - Range of adjustment | |
| [C] | · Longitudinal: | 84 mm |
| [C] | · Vertical: | None |
| [C] | - Safety belt: | Yes |

1.14.2 Optional driver's seat(s): None

1.14.3 Passenger seat: None

## 1.15 Lighting

| | Height above ground of center<br>mm | Size<br>mm | Distance from outside edge of lights to median plane of tractor<br>mm | Number |
|---|---|---|---|---|
| [C] Head light | 1170 | W 130 x H 90 | 160 | 2 |
| [C] Front working light | 1170 | Φ 95 | 250 | 2 |
| [C] Side direction light | 1025 | W 55 x H 100 | 610 | 2 |
| [C] Side working light | 1100 | W 55 x H 45 | 610 | 2 |
| [C] Rear direction lamp | 1425 | Φ 84 | 605 | 2 |
| [C] Rear position / stop lamp | 1425 | Φ 84 | 505 | 2 |
| [C] Rear working light / Back-up lamp | 1410 | W 150 x H 90 | 280 | 1 |
| [C] Reflector | None | - | - | - |

## 2. TEST CONDITIONS

### 2.1 Overall dimensions

| | Length | Width | Height at top of | |
|---|---|---|---|---|
| | | | Protective structure | Exhaust pipe |
| | mm | mm | mm | mm |
| Unballasted | 3280 | 1570 | 2570 | 650 |

### 2.2 Ground clearance (unballasted tractor): 325 mm

Clearance limiting part: Drawbar bracket

### 2.3 Tractor mass (Unballasted, with roll guard)

| | Without driver kg | With driver kg |
|---|---|---|
| Front | 790 | 805 |
| Rear | 1075 | 1135 |
| Total | 1865 | 1940 |

### 2.4 Ballast

Not applicable

### 2.5 Tyres and track width specifications

| | Front | Rear |
|---|---|---|
| Tyres: | | |
| - Dimensions | 9.5-16 | 13.6-26 |
| - Ply rating | 6 | 8 |
| - Type | Bias ply | Bias ply |
| - Maximum load (tyre manufacturer's) | 7.1 kN | 15.5 kN |
| - Maximum load (tractor manufacturer's) | 7.1 kN | 15.5 kN |
| - Inflation pressure (tyre manufacturer's) | 215 kPa | 196 kPa |
| - Dynamic radius index (KS M 6752) | N/A | 585 mm |
| Chosen track width | 1265 mm | 1208 mm |

### 2.6 Fuel

- Type: Diesel fuel No. 2 in conformity with Korean Standard (KS M 2610 : 2005)
- Density at 15 ℃: 0.836 g/cm$^3$

## 2.7 Oils and lubricants

### 2.7.1 Capacity and change interval

| | Capacity $dm^3$ | Oil change h | Filter change h |
|---|---|---|---|
| Engine | 8.0 | 100 | 200 |
| Transmission, rear axle/final drives, brake, steering, in common with hydraulic system | 38 | 300 | 300 |
| Front axle/final drives | 8.2 | 300 | None |

### 2.7.2 Specifications

| | Recommended | Used during test |
|---|---|---|
| Engine oil<br>- Type:<br>- Viscosity:<br>- Classification: | SAE 15W-40<br>105-110 cSt at 40℃<br>API CD-4 | As recommended |
| Transmission oils, rear axle/final drives, front axle/final drives, brake oil, steering oil, hydraulic fluid<br>- Type:<br>- Viscosity:<br>- Classification: | Gear oil, DAEDONG TF65<br>60-68 cSt at 40℃<br>API GL-4 | As recommended |

2.7.3 Number of grease lubrication points: 11

## 3. COMPULSORY TESTS RESULTS

### 3.1 Main power take-off

- Date and location of tests: 15 November 2006 / NIAE, Suweon, Republic of Korea
- Type of dynamometer bench: Eddy current FROUD AG400

| Power | Speed | | | Fuel consumption | | | Specific energy |
|---|---|---|---|---|---|---|---|
| | Engine | P.T.O. | Fan | Hourly | | specific | |
| kW | $min^{-1}$ | | | kg/h | L/h | g/kWh | kWh/L |
| 3.1.1 Maximum power - one-hour test | | | | | | | |
| 26.1 | 2302 | 496 | 2694 | 7.86 | 9.40 | 301 | 2.78 |
| 3.1.2 Power at rated engine speed | | | | | | | |
| 25.3 | 2600 | 561 | 3042 | 8.22 | 9.83 | 325 | 2.57 |
| 3.1.3 Power at standard p.t.o. speed [540 ± 10 $min^{-1}$] | | | | | | | |
| 25.6 | 2504 | 540 | 2930 | 8.11 | 9.70 | 317 | 2.64 |
| 3.1.4 Part loads<br>3.1.4.1 the torque corresponding to maximum power at rated engine speed | | | | | | | |
| 25.3 | 2600 | 561 | 3042 | 8.22 | 9.83 | 325 | 2.57 |
| 3.1.4.2 85 % of torque obtained in 3.1.4.1 | | | | | | | |
| 22.3 | 2693 | 580 | 3151 | 7.67 | 9.18 | 344 | 2.43 |
| 3.1.4.3 75 % of torque defined in 3.1.4.2 | | | | | | | |
| 16.9 | 2732 | 588 | 3196 | 6.50 | 7.78 | 385 | 2.17 |
| 3.1.4.4 50 % of torque defined in 3.1.4.2 | | | | | | | |
| 11.4 | 2766 | 596 | 3236 | 5.45 | 6.52 | 480 | 1.74 |
| 3.1.4.5 25 % of torque defined in 3.1.4.2 | | | | | | | |
| 5.8 | 2783 | 599 | 3256 | 4.41 | 5.28 | 764 | 1.09 |
| 3.1.4.6 unloaded | | | | | | | |
| 0.0 | 2795 | 602 | 3270 | 3.42 | 4.09 | - | - |
| 3.1.5 Part loads at standard p.t.o. speed [540 ± 10 $min^{-1}$]<br>3.1.5.1 the torque corresponding to maximum power | | | | | | | |
| 25.6 | 2504 | 540 | 2930 | 8.11 | 9.70 | 317 | 2.64 |
| 3.1.5.2 85 % of torque obtained in 3.1.5.1 | | | | | | | |
| 22.3 | 2574 | 555 | 3012 | 7.58 | 9.07 | 340 | 2.46 |
| 3.1.5.3 75 % of torque obtained in 3.1.5.2 | | | | | | | |
| 17.2 | 2620 | 565 | 3065 | 6.41 | 7.67 | 374 | 2.24 |
| 3.1.5.4 50 % of torque obtained in 3.1.5.2 | | | | | | | |
| 11.6 | 2650 | 572 | 3101 | 5.30 | 6.34 | 457 | 1.83 |
| 3.1.5.5 25 % of torque obtained in 3.1.5.2 | | | | | | | |
| 5.8 | 2670 | 576 | 3124 | 4.27 | 5.11 | 738 | 1.13 |
| 3.1.5.6 unloaded | | | | | | | |
| 0.0 | 2693 | 581 | 3151 | 3.27 | 3.91 | - | - |

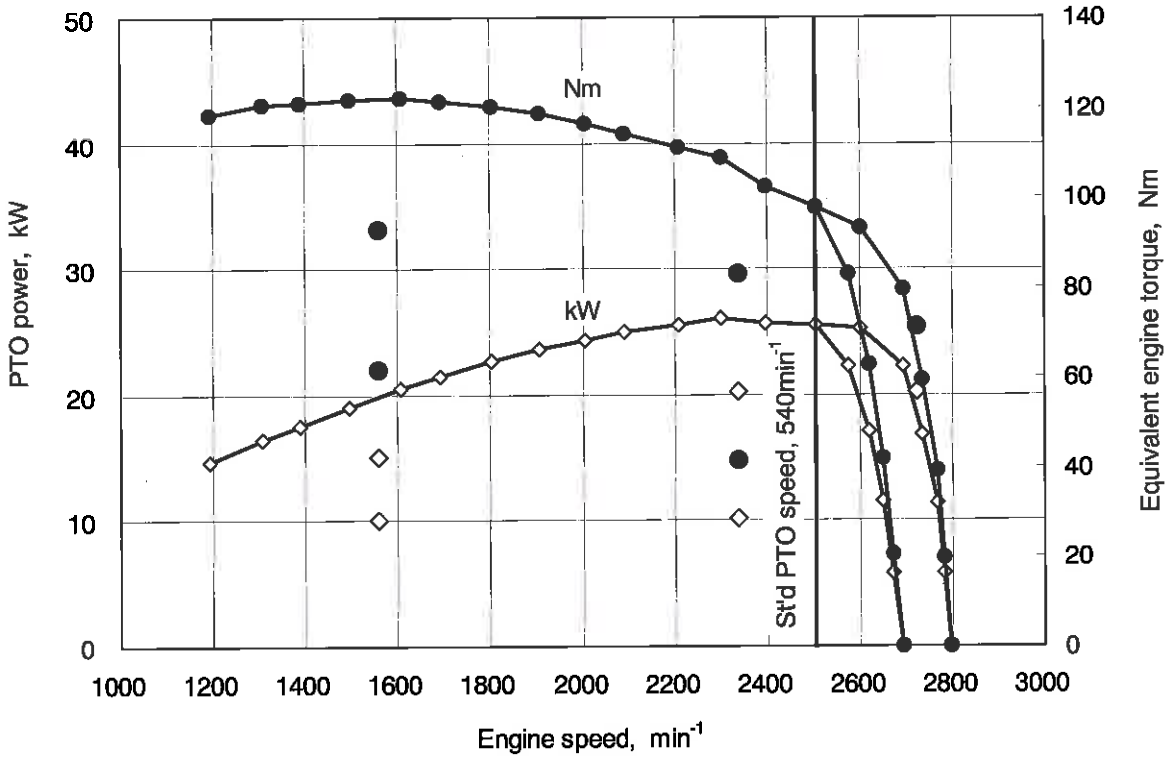
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3.1.6 Part loads at different engine speeds<br>3.1.6.1 maximum power at rated engine speed | | | | | | | |
| 25.3 | 2600 | 561 | 3042 | 8.22 | 9.83 | 325 | 2.57 |
| 3.1.6.2 80 % of power obtained in 3.1.6.1 at max. speed setting | | | | | | | |
| 20.2 | 2721 | 586 | 3184 | 7.16 | 8.57 | 355 | 2.36 |
| 3.1.6.3 80 % of power obtained in 3.1.6.1 with governor set to 90 % of rated engine speed | | | | | | | |
| 20.3 | 2340 | 504 | 2738 | 6.35 | 7.59 | 313 | 2.67 |
| 3.1.6.4 40 % of power obtained in 3.1.6.1 with governor set to 90 % of rated engine speed | | | | | | | |
| 10.1 | 2340 | 504 | 2738 | 4.26 | 5.10 | 421 | 1.99 |
| 3.1.6.5 60 % of power obtained in 3.1.6.1 with governor set to 60 % of rated engine speed | | | | | | | |
| 15.1 | 1560 | 336 | 1825 | 4.23 | 5.06 | 279 | 2.99 |
| 3.1.6.6 40 % of power obtained in 3.1.6.1 with governor set to 60 % of rated engine speed | | | | | | | |
| 10.1 | 1560 | 336 | 1825 | 3.19 | 3.81 | 317 | 2.64 |

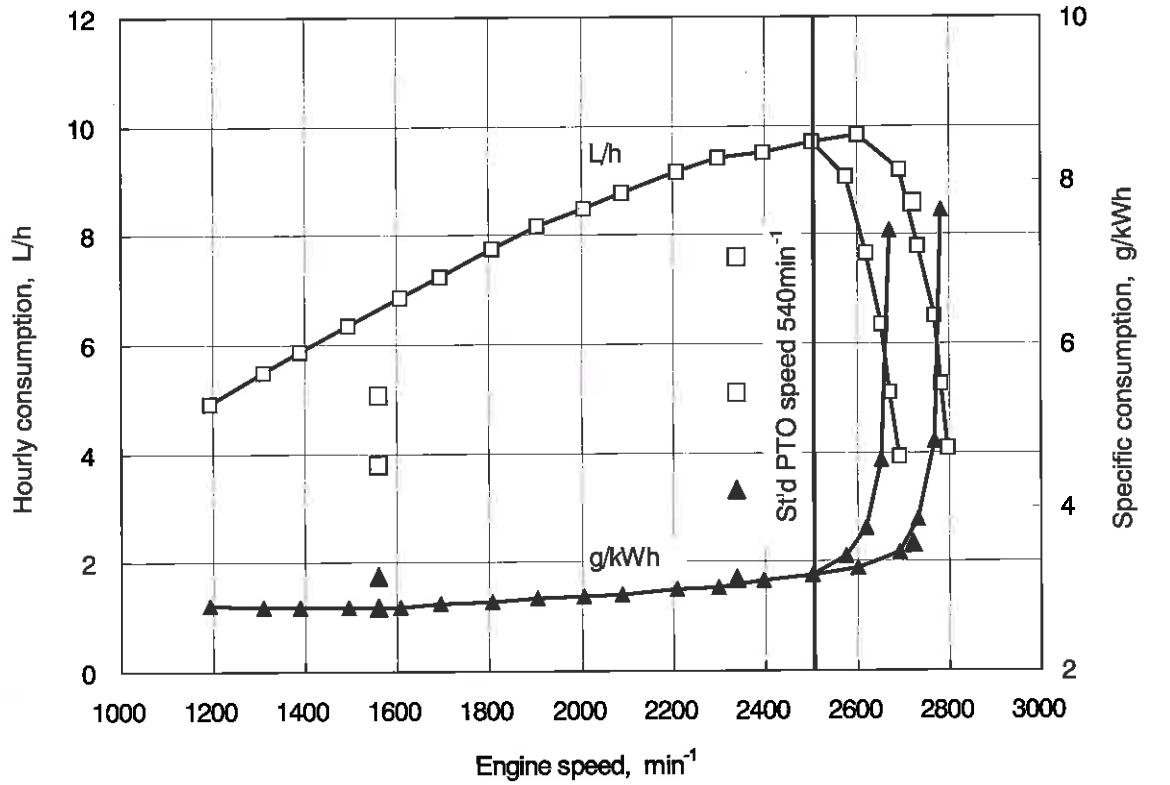
- No load maximum engine speed: 2795 $min^{-1}$
- Torque(equivalent crankshaft) at maximum power
  - At rated engine speed: 93 Nm
  - At 1-hour test: 109 Nm
- Maximum torque(equivalent crankshaft): 122 Nm at engine speed 1606 $min^{-1}$

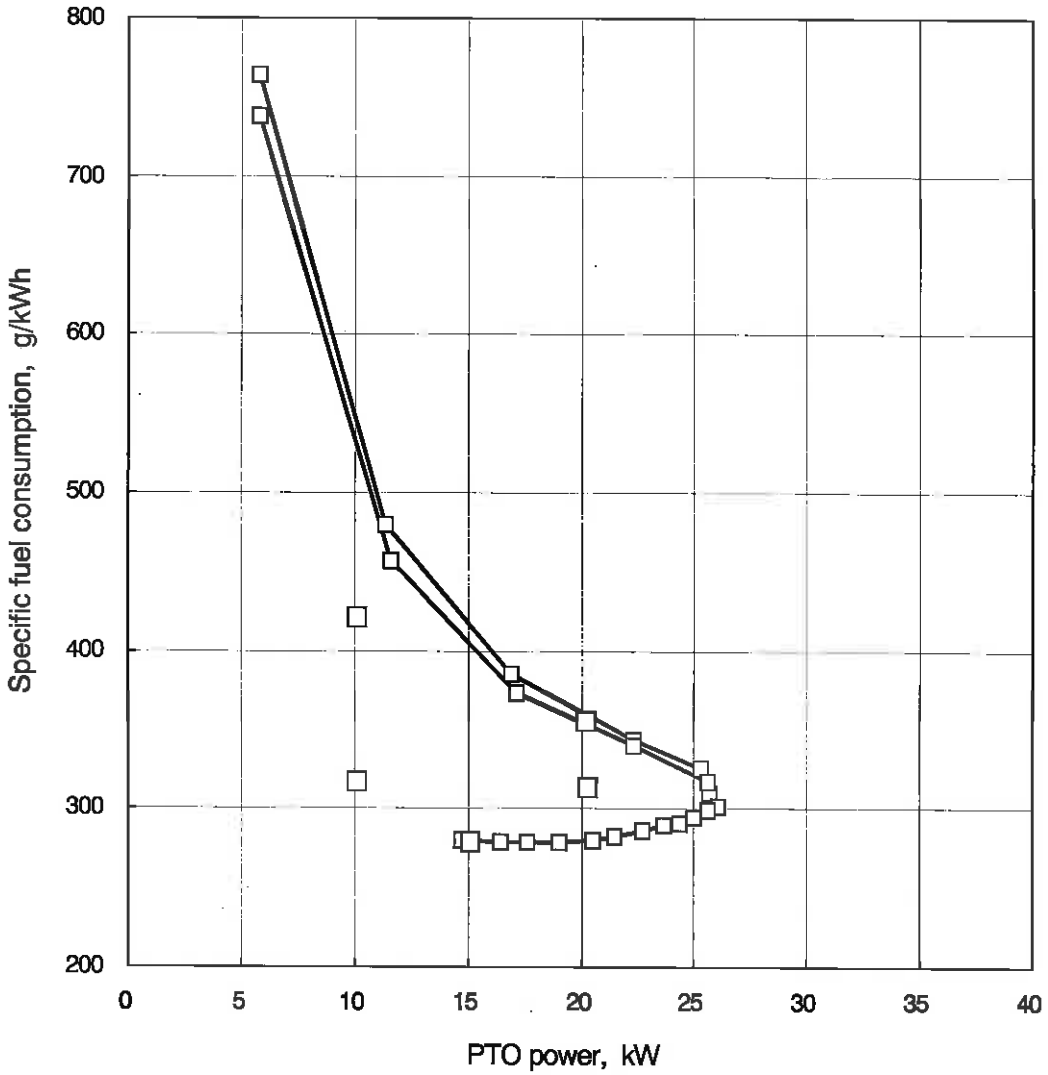
- Mean atmospheric conditions
  - Temperature: 21 ℃
  - Pressure: 101.1 kPa
  - Relative humidity: 30 %

- Maximum temperatures
  - Coolant: 78 ℃
  - Engine oil: 103 ℃
  - Fuel: 37 ℃
  - Engine air intake: 25 ℃

## Power take-off curves






## 3.2 Hydraulic power and lifting force

- Date of tests: 18 December 2006

### 3.2.1 Hydraulic power test

3.2.1.1 Hydraulic fluid data

- Hydraulic fluid type: TF65
- Viscosity index (ISO 3448:1992+Corr 1:1993): 150
- Viscosity at 65℃: 26.3 cSt

3.2.1.2 Test results

| | Pressure ④ | Reservoir oil Temperature℃ (65℃ target) | | Engine Speed | Flow rate | Power |
|---|---|---|---|---|---|---|
| | MPa | Min. | Max. | $min^{-1}$ | l/min | kW |
| Rated Engine Speed | - | - | - | 2600 | - | - |
| 3.2.1.2.1 Maximum (sustained) pressure with relief valve open as measured at the coupler<br><br>Pump stalled: No | ② 17.8 | 69 | 69 | 2750 | - | - |
| 3.2.1.2.2 Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding power measured at one coupler | ② 16.0 | ③ 69 | | 2750 | 25.4 | 6.77 |
| 3.2.1.2.3 Maximum available power with a single coupler pair, and corresponding flow and available coupler outlet pressure ① | ② 15.1 | ③ 69 | | 2750 | 33.5 | 8.43 |
| 3.2.1.2.4 Maximum available power with coupler pairs operating simultaneously and corresponding flow and available coupler outlet pressure ① | Not applicable (only one pair of coupler available) | | | | | |

① Calculated maximum power is based on only the coupler outlet pressure (pressure near coupler where oil is exiting from tractor) and does not take into account the return coupler pressure

② Record pressure as measured at the outlet coupler

③ Average test temperature

④ See ISO 789-10:1996 for the specific location of the pressure measurements and other referenced terms

### 3.2.2 Power lift test

| | at the hitch point | at the frame |
|---|---|---|
| Height of lower hitch points above ground in down position | 195 mm | 195 mm |
| **Vertical movement**<br>- without lifting forces<br>- with lifting forces | <br>650 mm<br>617 mm | <br>700 mm<br>670 mm |
| Maximum corrected force exerted through full range | 12.7 kN | 9.6 kN |
| Corresponding pressure of hydraulic fluid | 16.0 MPa | 16.0 MPa |
| Moment about rear-wheel axis | 10.9 kNm | 14.1 kNm |
| Maximum tilt angle of mast from vertical | - | 5°(※) |

(※) With the linkage geometry of this tractor, the maximum tilt angle of mast was 5°

| Lifting heights relative to the horizontal plane including the lower link pivot points | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| mm | - 217 | - 200 | - 100 | 0 | 100 | 200 | 300 | 400 | 470 |
| Lifting forces corrected to 16.0 MPa, 90 % of the actual relief valve pressure setting | | | | | | | | | |
| at the hitch points kN | 12.7 | 12.8 | 13.2 | 13.5 | 13.6 | 13.6 | 13.5 | 13.4 | - |
| at the frame kN | - | 12.5 | 12.4 | 12.3 | 12.0 | 11.5 | 10.9 | 10.3 | 9.6 |

### 3.3 Dawbar power and fuel consumption test (unballasted tractor)

- Date of tests: 04 January 2007
- Type of track: Asphalt

| | Height of drawbar above ground | Tyre inflation pressure | |
|---|---|---|---|
| | | Front | Rear |
| Unballasted | 365 mm | 215 kPa | 196 kPa |

#### 3.3.1 Maximum power in tested gears

| Range - Gear | Power | Drawbar pull | Speed | Engine speed | Fan speed | Slip of wheels | Specific fuel consumption | Specific energy | Temperature | | | Atmospheric conditions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Fuel | Coolant | Engine oil | Tempe-rature | Relative humidity | Pressure |
| | kW | kN | km/h | $min^{-1}$ | $min^{-1}$ | % | g/kWh | kWh/L | ℃ | ℃ | ℃ | ℃ | % | kPa |
| L - 4 | 3.9 | 12.4 | 1.14 | 2783 | 3256 | 15.2 | 1130 | 0.74 | 20 | 74 | 89 | 16 | 43 | 101.8 |
| M - 1 | 5.6 | 12.7 | 1.60 | 2773 | 3245 | 15.0 | 890 | 0.94 | 20 | 74 | 91 | 16 | 42 | 101.8 |
| M - 2 | 8.0 | 12.6 | 2.28 | 2764 | 3234 | 15.0 | 685 | 1.22 | 19 | 75 | 93 | 18 | 42 | 101.9 |
| M - 3 | 11.6 | 12.5 | 3.32 | 2742 | 3208 | 15.0 | 554 | 1.51 | 20 | 75 | 93 | 18 | 40 | 101.8 |
| M - 4 | 17.8 | 12.3 | 5.21 | 2682 | 3137 | 15.0 | 459 | 1.82 | 19 | 76 | 94 | 18 | 40 | 101.8 |
| H - 1 | 20.4 | 12.8 | 5.72 | 2298 | 2689 | 14.4 | 393 | 2.13 | 20 | 75 | 95 | 18 | 38 | 101.8 |
| H - 2 | 22.1 | 9.0 | 8.80 | 2298 | 2689 | 7.2 | 364 | 2.30 | 20 | 76 | 94 | 17 | 39 | 101.8 |
| H - 3 | 21.4 | 5.7 | 13.47 | 2299 | 2690 | 3.3 | 375 | 2.23 | 20 | 76 | 94 | 15 | 40 | 101.9 |

### 3.3.2 Fuel consumption

| Range – Gear | Power | Drawbar pull | Speed | Engine speed | Fan speed | Slip of wheels | Specific fuel consumption | Specific energy | Temperature | | | Atmospheric conditions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Fuel | Coolant | Engine oil | Tempe-rature | Relative humidity | Pressure |
| | kW | kN | km/h | $min^{-1}$ | $min^{-1}$ | % | g/kWh | kWh/L | ℃ | ℃ | ℃ | ℃ | % | kPa |
| 3.3.2.1 in selected gear nearest 7.5 km/h, at maximum power at rated engine speed | | | | | | | | | | | | | | |
| H - 1 | 20.1 | 10.7 | 6.79 | 2600 | 3042 | 10.1 | 396 | 2.11 | 21 | 75 | 92 | 14 | 40 | 101.9 |
| 3.3.2.1.1 75 % of pull corresponding to maximum power at rated engine speed | | | | | | | | | | | | | | |
| H - 1 | 16.6 | 8.0 | 7.48 | 2726 | 3189 | 5.6 | 438 | 1.91 | 19 | 75 | 85 | 15 | 40 | 101.9 |
| 3.3.2.1.2 50 % of pull corresponding to maximum power at rated engine speed | | | | | | | | | | | | | | |
| H - 1 | 11.5 | 5.3 | 7.80 | 2758 | 3227 | 2.7 | 519 | 1.61 | 19 | 75 | 89 | 14 | 40 | 101.9 |
| 3.3.2.1.3 highest gear setting at reduced engine speed able to achieve both 3.3.2.1.1 and 3.3.2.1.2; same pull and travelling speed as in 3.3.2.1.1 | | | | | | | | | | | | | | |
| H - 2 | 16.6 | 8.0 | 7.47 | 1922 | 2249 | 5.9 | 365 | 2.29 | 19 | 75 | 87 | 14 | 40 | 101.9 |
| 3.3.2.1.4 same gear selection as 3.3.2.1.3 at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2 | | | | | | | | | | | | | | |
| H - 2 | 11.5 | 5.3 | 7.85 | 1970 | 2305 | 3.5 | 420 | 1.99 | 16 | 74 | 87 | 12 | 43 | 101.9 |
| 3.3.2.2 in selected gear nearest between 7 km/h and 10 km/h at rated engine speed | | | | | | | | | | | | | | |
| H - 2 | 21.4 | 7.6 | 10.17 | 2600 | 3042 | 5.3 | 385 | 2.17 | 21 | 76 | 90 | 15 | 40 | 101.9 |
| 3.3.2.2.1 75 % of pull corresponding to maximum power at rated engine speed | | | | | | | | | | | | | | |
| H - 2 | 16.7 | 5.7 | 10.64 | 2710 | 3171 | 4.4 | 436 | 1.92 | 19 | 76 | 87 | 15 | 40 | 101.9 |
| 3.3.2.2.2 50 % of pull corresponding to maximum power at rated engine speed | | | | | | | | | | | | | | |
| H - 2 | 11.7 | 3.7 | 11.26 | 2762 | 3232 | 1.3 | 501 | 1.67 | 21 | 75 | 86 | 17 | 39 | 101.9 |
| 3.3.2.2.3 highest gear setting at reduced engine speed able to achieve both 3.3.2.2.1 and 3.3.2.2.2; same pull and travelling speed as in 3.3.2.2.1 | | | | | | | | | | | | | | |
| H - 3 | 16.8 | 5.7 | 10.65 | 1814 | 2122 | 3.0 | 359 | 2.33 | 18 | 75 | 87 | 14 | 40 | 101.9 |
| 3.3.2.2.4 same gear setting as 3.3.2.2.3 at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2 | | | | | | | | | | | | | | |
| H - 3 | 11.9 | 3.8 | 11.34 | 1902 | 2225 | 1.6 | 418 | 2.00 | 18 | 74 | 88 | 13 | 41 | 101.9 |

## 4. OPTIONAL TESTS RESULTS

### 4.1 Turning area and turning circle

| | Without brakes | |
|---|---|---|
| | Right-hand m | Left-hand m |
| Radius of turning area | 3.68 | 3.68 |
| Radius of turning circle | 3.54 | 3.54 |

### 4.2 Location of centre of gravity

- Height above ground: 864 mm
- Distance from the vertical plane containing the axis of the rear-wheels: 780 mm
- Distance from the median longitudinal plane of the tractor: 11 mm (to the left)

### 4.3 Measurement of external noise

- Date of tests: 03 January 2007
- Sound level meter, make/model/type: Bruel & Kjaer 2236 sound level meter
- Type of track: Asphalt
- Gear number(Range-Gear): H - 4
- Travelling speed before acceleration: 20 km/h
- Sound level: 78.5 dB(A)

### 4.4 Waterproofing test

- Date of tests: 08 ~ 09 January 2007
- Water level from ground to top: 400 mm
- Gear number (Range - Gear): M - 4, at engine speed 2600 $min^{-1}$
- Test results

| Parts | Checking method | Result |
|---|---|---|
| Transmission, rear axle drives, brake, steering | Visual method and crackling method | Passed |
| Front axle/final drives | Visual method and crackling method | Passed |
| Clutch housing | Dry type clutch housing was disassembled and checked visually inside for water ingress | Passed |

- Statement: The tractor is a waterproof tractor in accordance with the Code

## 5. REPAIRS & REMARKS None

## TEST COMMISSION

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