**COTTEC**

**CHINA**
**OFFICIAL TRACTOR**
**TEST AND**
**EVALUATION CENTRE**

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# OECD TEST REPORT OF HHJM-800(2WD) AGRICULTURAL TRACTOR (CODE 2)

**Report on test in accordance with the OECD standard code for the official testing of agricultural tractor performance**



OECD Approval
No.: 2/2 386
Date:Oct.2 ,2007

**Tested Tractor**

Make: HHJM
Model: 800
Type: 2WD
Speed version: 30 km/h

**Submitted for test by**

Name: Jiangsu Yueda Yancheng Tractor Manufacturering Co., Ltd (Yancheng Tractor Factory )
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**This report includes 22 pages and may only be duplicated as a whole**

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This report has been approved by the O.E.C.D. Co-ordinating Centre(CEMAGREF) in Antony(France) on Oct.2 ,2007 , Approved No. 2/2 386.

| | | |
|---|---|---|
| | Note: Units shown below, which appear in ISO 1000:1992; Amdl:1998,shall be stated and followed by national units in parenthesis | |
| | | |
| C[1] | Tractor manufacturer's name and address: | Jiangsu Yueda Yancheng Tractor Manufacturering Co., Ltd(Yancheng Tractor Factory )Yancheng,Jiangsu,China |
| O. | -Location of tractor assembly: | The manufacturer |
| D | -Submitted for test by: | The manufacturer |
| C | -Selected for test by: | The manufacturer with the agreement of the COTTEC |
| D | -Place of running-in: | COTTEC, Luoyang, Henan, China |
| D | -Duration of running-in: | 50.0 hours |
| C | -Location of test: | COTTEC, Luoyang, Henan, China |
| | | |
| | **1. SPECIFICATIONS OF TRACTOR** | |
| | **1.1 Identification** | |
| | 1.1.1 Denomination | |
| C | - Make of the tractor: | HHJM |
| C | -Model(trade name): | 800 |
| C | -Type: | 2WD |
| | | |
| | 1.1.2 Numbers | |
| D | -1st Serial No or prototype: | 07123800005 |
| C | - Serial No.: | 07123800005 |
| | | |
| | 1.1.3 Other Specifications | |
| D | - Models for other countries: | None |
| C | -Transmission type or gears x ranges: | Mechanical |
| C | -Speed version: | 30 km/h |
| D | - Manufacturer identification or Technical type number: None | |
| | | |
| | **1.2 Engine** | |
| C | -Make: | Weifang Huafong Power |
| C | -Model: | R4105IT19B |
| C | -Type: | 4-stroke,water cooling ,Vertical, direct injection |
| C | -Serial No.: | 6120481 |
| | | |
| | 1.2.1 Cylinders | |
| C | -Number: | 4 |
| C | -Disposition: | Vertical, in line |
| D | -Bore/Stroke: | 105/135 mm/mm |
| D | -Capacity: | 4670 $cm^3$ |
| D | -Compression ratio: | 17.0 |

1. 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.

| | | |
|---|---|---|
| D | -Arrangement of valves: | Overhead,in line |
| D | -Cylinder liners: | Wet |
| | | |
| | 1.2.2 Supercharging | None |
| | | |
| | 1.2.3 Fuel system | |
| C | -Fuel feed system: | Forced feed type |
| C | -Make of fuel filter: | Weifang Baowei |
| C | -Model of fuel filter: | CX0710B4 |
| C | -Type of fuel filter: | Paper cartridge,replaceable |
| D | -Capacity of fuel tank: | 78 $dm^3$ |
| C | -Make of injection pump: | China Yituo Group Co.,Ltd |
| C | -Model/type of injection pump: | 4BA236,4-cylinder plunger |
| C | -Serial No : | 06010149 |
| | -Manufacturer's production setting of injection pump: | |
| C | . Flow rate(at rated engine speed and full load): | $18.0 \pm 0.5$ $dm^3$ /h |
| D | .Timing: | $17^0 \pm 1^0$ before T.D.C. |
| D | -Make of injectors: | China Yituo Group Co.,Ltd |
| D | -Model/type of injectors: | ZCK150J43000,Long neck,Multi-hole |
| D | -Injection pressure: | $20.1 \pm 0.5$ MPa |
| C | -Make/Mode/Type of carburettor: | None |
| | | |
| | 1.2.4 Governor | |
| C | - Make: | Own make |
| C | -Model/type: | Mechanical,centrifugal |
| C | -Governed range of engine speed: | 700～2490 $min^{-1}$( rev/min) |
| C | -Rated engine speed: | 2300 $min^{-1}$( rev/min) |
| | | |
| | 1.2.5 Air cleaner | |
| | -Pre-cleaner | |
| C | .Make: | None |
| C | .Model/type: | None |
| C | .Location of air intake: | None |
| C | .Maintenance indicator: | None |
| | -Main-cleaner | |
| C | .Make: | Bangbu Air-cleaner Works |
| C | .Model/type: | KY250J,Oil bath |
| C | .Location of air intake: | Right hand,Middle of the tractor |
| C | .Maintenance indicator: | None |
| | | |
| | 1.2.6 Lubrication system | |
| D | -Type of feed pump: | Gear Pump |
| C | -Type of filters: | JX0811A Full flow, centrifugal |
| C | -Number of filters: | 1 |
| | | |
| | 1.2.7 Cooling system | |
| C | -Type of coolant: | Water |

| | | |
|---|---|---|
| D | -Type of pump: | Centrifugal,belt driven |
| | -Specification of fan or blower: | |
| C | .Number of fan blades: | 7 |
| C | .Fan diameter: | Φ450 mm |
| D | -Coolant capacity: | 15.0 $dm^3$ |
| C | -Type of temperature control: | Thermostat |
| D | -Superpressure system: | None |
| | | |
| | 1.2.8 Starting system | |
| C | -Make: | Hubei Automobile Electrical Machinery Factory |
| C | -Model/Type: | QD154N,D.C. solenoid engaged |
| D | -Starter motor power rating: | 3.7 kW |
| C | -Cold starting aid: | Eletrothermic plug |
| C | -Safety device: | Automatic return |
| | | |
| | 1.2.9 Electrical system | |
| C | -Voltage: | 12 (Negative earth) V |
| | -Generator: | |
| C | .Make: | Hubei Automobile Electrical Machinery Factory |
| C | .Model/Type: | JFZ1625B,Altermator,belt driven |
| D | .Power | 0.7 kW |
| | -Battery of accumulators: | |
| C | .Number: | 1 |
| D | .Rating: | 165 Ah at 20 hours rating |
| | | |
| | 1.2.10 Exhaust system | |
| C | -Make: | Own make |
| C | -Model/Type: | 4RT68.230001,expansion type,silencer |
| C | -Location: | Right-hand side of the engine,vertical |
| | | |
| | **1.3 Transmission** | |
| | 1.3.1 Clutch(Travel and Power Take-off) | |
| D | -Make: | Own make |
| D | -Model/Type: | Dry,dual clutch for transmission & PTO |
| D | -Number of plates: | 2 |
| D | -Diameter of plates: | 318 mm |
| C | -Method of operation: | Mechanically actuated by pedal |
| | | |
| | 1.3.2 Gear box | |
| D | -Make: | Own make |
| D | -Model/Type: | HH2×(4+1), Mechanical |
| | -Description: | 8 forward speed gear,2 reverse speed gear, main gear is constant-mesh cylindrical gear,auxiliary gear is constant-mesh cylindrical gear,engaging sleeve gear shifting |
| | | |

| | | | Forward | Reverse |
|---|---|---|---|---|
| C | | Number of groups /ranges | 2 | 2 |
| C | | Number of gears | 4 | 1 |
| C | | Total of arrangements | 8 | 2 |

| | | |
|---|---|---|
| D | -Available options | Creeper device |
| | 1.3.3 Rear axle and final drives | |
| D | -Make: | Own make |
| D | -Model/Type: | Helical gear type differential and single stage epicyclic gear type final drives |
| | -Differential lock | |
| D | .Type: | Mechanical,two planet gear |
| C | .Method of engagement: | Mechanically actuated by pedal |
| C | .Method of disengagement: | Self-disengagement by spring |
| | 1.3.4 Front axle and final drives | |
| D | -Make: | Own make |
| D | -Model/Type: | Balanced arm type, telescopic axle |
| | -Differential lock: | None |

1.3.5 Total ratios and travelling speeds

| | Gear No | Group or range | Number of engine revolutions for one revolution of the driving wheels | Nominal travelling speed(*) at rated engine speed of 2300 rev/min km/h |
|---|---|---|---|---|
| C | 1 | L1 | 179.3510 | 3.21 |
| C | 2 | L2 | 133.9223 | 4.31 |
| C | 3 | L3 | 84.4004 | 6.83 |
| C | 4 | L4 | 62.7300 | 9.19 |
| C | 5 | H1 | 49.8196 | 11.57 |
| C | 6 | H2 | 37.2006 | 15.50 |
| C | 7 | H3 | 23.4445 | 24.59 |
| C | 8 | H4 | 17.4250 | 33.09 |
| C | R1 | R1 | 158.2507 | 3.64 |
| C | R2 | R2 | 43.9585 | 13.12 |
| | (*)Calculated with the dynamic radius index of 665 mm(ISO 4251/1-1998). | | | |

C -Number of revolutions of front wheels for one revolution of rear-wheels: None

**1.4 Power take-off**

1.4.1 Main power take-off

| | | |
|---|---|---|
| C | -Type: | Semi-independent |
| C | -Method of engagement: | Mechanically actuated by pedal |
| C | -Number of shafts: | 1 |
| C | -Method of changing power take-off shaft ends speeds: | By hand lever |

1.4.1.1 Power take-off proportional to engine speed

Power take-off at 540 rev/min

| | | |
|---|---|---|
| C | -Location: | At rear of the tractor |
| C | -Diameter of power take-off shaft end: | 35 mm |
| C | -Number of splines: | 6, in conformity with ISO 500/1991 |
| C | -Height above ground: | 635 mm |
| C | -Distance from the median plane of the tractor: | 0 mm |
| C | -Distance behind rear wheel axis: | 307 mm |
| C | -PTO speed at rated engine speed: | 841 rev/min |
| C | -Engine speed at standard power take-off speeds | 1477 rev/min |
| C | -Ratio of rotation speeds (engine speed/p.t.o. speed): | 2.733 |
| D | -Power restriction: | 60 kW |
| D | -Maximum torque transmissible: | 1075.0 N.m |
| C | -Direction of rotation(viewed from behind tractor): | Clockwise |
| | | |
| | Power take-off at 1000 rev/min: | None |
| C | -Location: | None |
| C | -Diameter of power take-off shaft end: | None |
| C | -Number of splines: | None |
| C | -Height above ground: | None |
| C | -Distance from the median plane of the tractor: | None |
| C | -Distance behind rear wheel axis: | None |
| C | -PTO speed at rated engine speed: | None |
| C | -Engine speed at standard power take-off speeds | None |
| C | -Ratio of rotation speeds (engine speed/p.t.o. speed): | None |
| D | -Power restriction: | None |
| D | -Maximum torque transmissible: | None |
| C | -Direction of rotation(viewed from behind tractor): | None |
| | | |
| | 1.4.1.2 Power take-off proportional to ground speed | |
| C | -Indicate 540 or 1000 $min^{-1}$ (rev/min): | None |
| C | -Travelling distance for one revolution of take-off shaft: | None |
| C | -Number of power take-off shaft revolutions for one revolution of (rear) driving wheels: | None |
| C | -Direction of rotation with forward gear engaged (viewed from behind tractor): | None |
| | | |
| | 1.4.2 Optional power take-off: | None |
| | | |
| | **1.5 Hydraulic power lift** | |
| C | -Make: | Own make |
| C | -Model: | JM800 |
| C | -Type: | Hydraulic,three hitch point |
| C | -Type of hydraulic system: | Open centre system |
| C | -Type and number of cylinders: | Single acting,1 |
| C | -Type of linkage lock for transport: | Hydraulic |
| | Relief valve pressure setting | |
| D | - for the lifting power | 18.0±0.5 MPa |
| D | - for the hydraulic power | 16.0±0.5 MPa |
| D | -Opening pressure of cylinder safety valve : | None |
| D | -Lift pump type: | Gear pump |
| D | -Transmission between pump and engine: | Driven by engine cam shaft |
| C | -Type and number of filters: | Cartridge type, 1 |
| C | -Site of oil reservoir: | Transmission housing |

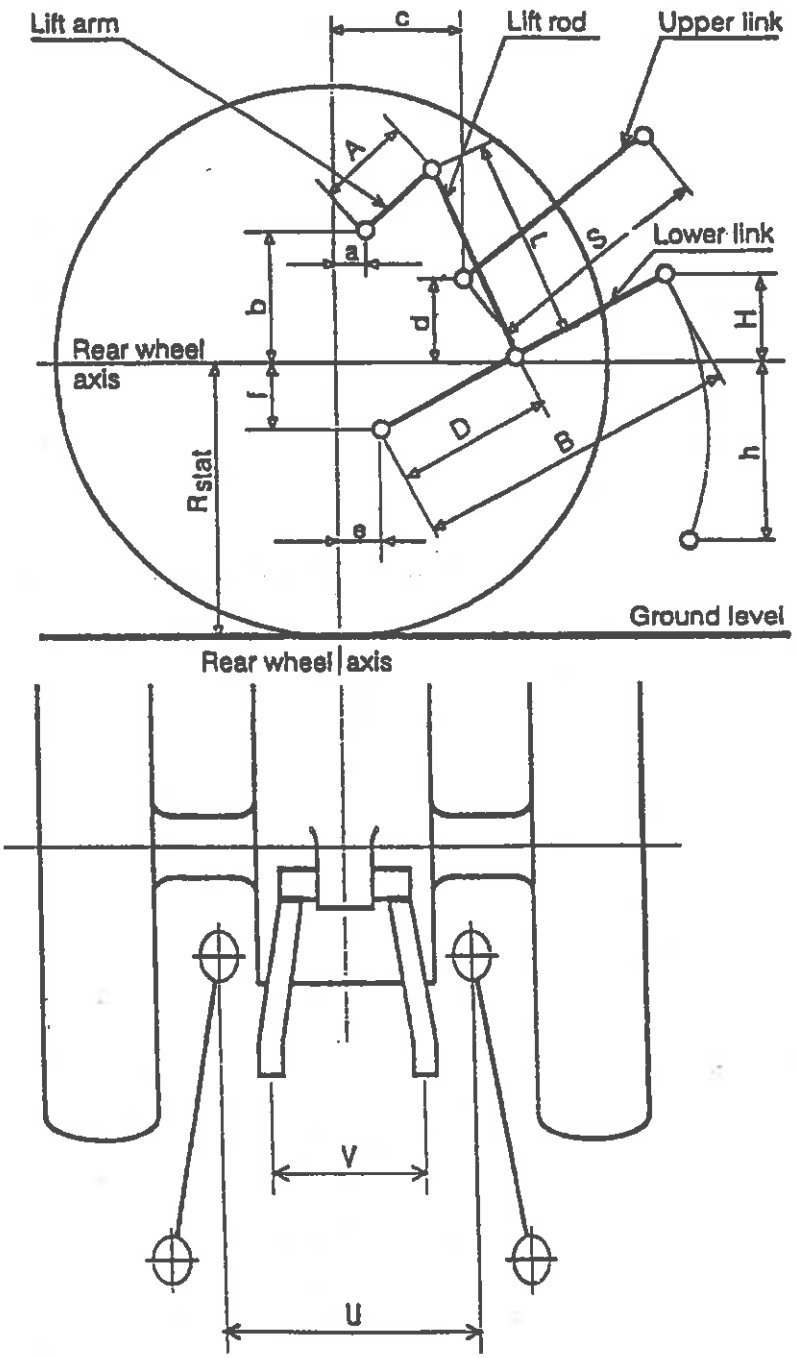
| | | |
|---|---|---|
| C | -Type, number and location of tapping points: | Two coupler pairs quick shift adaptor, At rear of tractor |
| D | -Maximum volume of oil available to external cylinders: | 10 dm3 |

**1.6 Three point linkage**

| | | |
|---|---|---|
| C | -Category | 2 ,in conformity with ISO730-1:1994+Cor.1:1995 |
| C | -Category Adapter: | None |

| | | | | Dimension or range | Setting used in test |
|---|---|---|---|---|---|
| | | | | mm | mm |
| C | | Length of lift arms : | (A) | 230 | 230 |
| C | | Length of lower links : | (B) | 840 | 840 |
| | | Distance of lift arm pivot point from rear wheel axis: | | | |
| C | | -Horizontally | (a) | 60 | 60 |
| C | | -Vertically | (b) | 418 | 418 |
| C | | Horizontal distance between the 2 lower link points: | (u) | 526 | 526 |
| C | | Horizontal distance between the 2 lift arms end points: | (v) | 605 | 605 |
| C | | Length of upper link: | (S) | From 500 to 720 | 585 |
| | | Distance of upper link pivot point from rear wheel axis: | | | |
| C | | -Horizontally: | (c) | 300 | 300 |
| C | | -Vertically | (d) | 245,280,315 | 315 |
| | | Distance of lower link pivot point from rear wheel axis: | | | |
| C | | -Horizontally: | (e) | 50 | 50 |
| C | | -Vertically | (f) | 136 | 136 |
| C | | Distance of lower link pivot point to lift rod pivot points on lwer links: | (D) | 420 | 420 |
| C | | Length of lift rods: | (L) | From 545 to 695 | 650 |
| | | Height of lower hitch points relative to the rear wheel axis: | | | |
| C | | -in low position | (h) | From 298 to 608 | 498 |
| C | | -in high position | (H) | From 22 to 317 | 175 |
| C | | Height above ground of lower hitch points when locked in transport position: | | Any height at lift range | Any height at lift range |
| | | (*)Assuming r=665 mm rear tyre dynamic radius index of ISO 4251/1-1998 | | | |

**Table 1.1**
**Dimensions of linkage geometry**
**when connected to the standard frame**




**Figures 1.1**
**Lift test-linkage geometry**

| | | |
|---|---|---|
| | **1.7 Swinging drawbar:** | |
| C | -Type: | Clevis |
| | -Height above ground | |
| C | .Maximum | 401 mm |
| C | .Minimum | 335 mm |
| C | -Type of adjustment: | Reversing |
| C | -Distance of hitch point from rear wheel axis,horizontally: | 710 mm |
| | -Distance of hitch point from power take-off shaft end: | |
| C | .Vertically: | 259 mm |
| C | .Horizontally: | 403 mm |
| | -Lateral adjustment(centre of clevis) | |
| C | .Right hand: | 165 mm |
| C | .Left hand: | 165 mm |
| C | -Distance of pivot point from rear wheel axis,horizontally: | 270 mm |
| C | -Diameter of drawbar pinhole: | Φ30.0 mm |
| D | -Maximum vertical permissible load: | 10.0 kN |
| | | |
| | **1.8 Trailer hitch** | |
| C | -Type: | Fixed |
| C | -Hole diameter : | Φ30.0 mm |
| C | -Height above ground: | 640 mm |
| C | -Distance of hitch point from rear wheel axis,horizontally: | 590 mm |
| | -Distance of hitch point from power take-off shaft end: | |
| C | .Vertically: | 0 |
| C | .Horizontally: | 283 mm |
| D | -Maximum vertical permissible load: | 18.0 kN |
| | | |
| | **1.9 Holed drawbar:** | **None** |
| | | |
| | **1.10 Steering** | |
| D | -Make: | Xinxing |
| D | -Model/Type: | BZZI-E100B,Hydrostaticsteering system |
| | -Method of operation | |
| D | .Pump: | Gear pump |
| D | .Ram: | 1,double acting ram actuating directly on front axle |
| D | -Working pressure: | 8.0±0.5 MPa |
| | | |
| | **1.11 Brakes** | |
| | 1.11.1 Service brake | |
| D | -Make: | Yancheng Xindao |
| D | -Model/Type: | Oil bath,disc,double plates, mechanical |
| C | -Method of operation: | By pedals |
| C | -Trailer braking take-off: | Pneumatic braking,operated by tractor pedals |
| | 1.11.2 Parking brake | |
| C | -Type: | Mechanical |
| C | -Method of operation: | Depressed by brake pedals and ratched by hand lever |
| | | |
| | **1.12 Wheels** | |
| | -Number | |
| C | .Front: | 2,steering |
| C | .Rear: | 2,driving |
| C | -Wheelbase: | 2195 mm |

| | | | | | |
|---|---|---|---|---|---|
| | -Track width adjustment: | | | | |
| | | | Minimum mm | Maximum mm | Adjustment method |
| D | | Front | 1350 | 1650 | Telescopic axle |
| D | | Rear | 1370 | 1790 | Reversing wheels and off-set lug rims |
| | **1.13 Protective structure** | | | | |
| C | -Make: | | | | Own make |
| C | -Model: | | | | JM700 |
| C | -Type: | | | | Rear roll-bar |
| C | -Manufacture's name and address: | | | | Own make |
| | -Protective device: | | | | |
| C | -Cab/frame/rollguard/other: | | | | Rear roll-bar |
| C | -Tiltable/not tiltable: | | | | Tiltable |
| | -OECD approval | | | | |
| C | .Approval number: | | | | None |
| C | .Date of approval: | | | | None |
| C | .Nos. of minor modification certificates,if any: | | | | None |
| | **1.14 Seat** | | | | |
| | 1.14.1 Driver's seat | | | | |
| C | -Make: | | | | Wuxing |
| C | -Model: | | | | None |
| C | -Type: | | | | Adjustable suspension |
| C | -Seat and steering wheel reversible: | | | | No |
| C | -Type of suspension: | | | | Mechanical |
| C | -Type of damping: | | | | None |
| | -Range of adjustment: | | | | |
| C | .Longitudinal: | | | | 100 mm |
| C | .Vertical: | | | | 0 mm |
| 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 mm | Size mm | Distance from outside edge of lights to median plane of tractor mm |
|---|---|---|---|---|---|
| C | | Head lights | 1075 | 210×120 | 220 |
| C | | Side lights | 1480 | 50×70 | 695 |
| C | | Rear lights | 1675 | Φ140 | 900 |
| C | | Reflectors | 1480 | 50×70 | 695 |
| C | | Brake lights | 1480 | 95×70 | 645 |
| | | Front turn lights | 1070 | 130×120 | 310 |
| | | Rear turn lights | 1480 | 95×70 | 790 |

## 2 TEST CONDITIONS

Separate tables may be added to report other test conditions or equipments.

### 2.1 Overall dimensions

| | Length | Width | | Height at top of | |
|---|---|---|---|---|---|
| | | Minimum | Maximum | Protective Structure | Exhaust Silencer |
| | mm | mm | mm | mm | mm |
| Ballasted | 3950 | 1834 | 2334 | 2722 | 2475 |
| Unballasted | 3760 | 1834 | 2334 | 2728 | 2482 |

### 2.2 Ground Clearance(unballasted tractor)

-Clearance limiting part: Under the front axle 405 mm

### 2.3 Tractor mass

-Mass(with rear roll-bar and full fuel tank):

| | Unballasted | | Ballasted | |
|---|---|---|---|---|
| | Without driver | With driver | Without driver | With driver |
| | kg | kg | kg | kg |
| Front | 1150 | 1160 | 1404 | 1414 |
| Rear | 1713 | 1778 | 1995 | 2060 |
| Total | 2863 | 2938 | 3399 | 3474 |

### 2.4 Ballast

| | Weights | | Water |
|---|---|---|---|
| | Number | Total mass kg | kg |
| Front | 8 | 194 | — |
| Rear | 8 | 342 | — |
| Optional | — | — | — |

### 2.5 Track specifications: None

### 2.6 Tyres and track width specifications

| | Front | Rear |
|---|---|---|
| Tyres: | | |
| .dimensions | 6.50-20 | 14.9-30 |
| .ply rating | 6 | 8 |
| .type | Cross ply | Cross ply |
| .maximum load (tyre manufacturer's) | 7.1 kN | 22.0 kN |
| .maximum load (tractor manufacturer's) | 7.0 kN | 20.0 kN |
| .inflation pressure(tyre manufacturer's) | 195～220kPa | 80～120kPa |
| .dynamic radius index | 405 mm | 665 mm |
| Chosen track width | 1462 mm | 1450 mm |

### 2.7 Fuel

-Type: Standard diesel fuel in conformity with GB 10327(China standard)

-Density at 15 ℃ 0.8523 g/cm$^3$

**2.8 Oils and lubricants**

2.8.1 Capacity and change interval

| | Capacity | Oil change | Filter change |
|---|---|---|---|
| | $dm^3$ | h | h |
| Engine | 15.0 | 250 | 500 |
| Gear box in common with rear axle and final drives | 40.0 | 500 | — |
| Steering | 2.5 | 1000 | — |
| Hydraulic system | 21.0 | 1000 | — |

2.8.2 Specifications(SAE,API,CCMC,ACEA,Mil.L,ISO)

| | Recommended | Used during test |
|---|---|---|
| Engine oil<br>.Type:<br>.Viscosity:<br>.Classification: | SAE10W/30<br>11.4cSt at 100 ℃<br>API-CC | Same as recommended |
| Transmission oil,Hydraulic fluid,Steering oil, rear axle and final drives oil<br>.Type:<br>.Viscosity:<br>.Classification: | SAE 80W/90<br>9.3cSt at 100 ℃<br>API GL-4 | Same as recommended |

2.8.3 Grease

-Number of lubrication points: 10

**3 COMPULSORY TESTS RESULTS**

**3.1 Main power take-off**

-Date and location of tests: March. 16,2007,COTTEC

-Type of dynamometer: LPA-Bedienpult 250 Elec. dynamometer:

| Power | Speed | | | Fuel consumption | | | Specific energy |
|---|---|---|---|---|---|---|---|
| | Engine | P.T.O | Fan | Hourly | | Specific | |
| kW | $min^{-1}$(rev/min) | | | kg/h | l/h | g/kW.h | kW.h/l |
| 3.1.1 MAXIMUM POWER-ONE-HOUR TEST | | | | | | | |
| 54.94 | 2298 | 841 | 2698 | 15.31 | 17.96 | 278.7 | 3.06 |
| 3.1.2 POWER AT RATED ENGINE SPEED | | | | | | | |
| 54.94 | 2298 | 841 | 2698 | 15.31 | 17.96 | 278.7 | 3.06 |
| 3.1.3 STANDARD POWER TAKE-OFF SPEED(1000±25 or 540±10$min^{-1}$(rev/min) | | | | | | | |
| 44.67 | 1476 | 540 | 1733 | 10.87 | 12.75 | 243.3 | 3.50 |
| 3.1.4 PART LOADS<br>3.1.4.1 the torque corresponding to maximum power at the rated engine speed | | | | | | | |
| 54.94 | 2298 | 841 | 2698 | 15.31 | 17.96 | 278.7 | 3.06 |
| 3.1.4.2 85% of torque obtained in 3.1.4.1 | | | | | | | |
| 48.96 | 2411 | 882 | 2830 | 14.31 | 16.79 | 292.3 | 2.92 |
| 3.1.4.3 75% of torque obtained in 3.1.4.2 | | | | | | | |
| 37.13 | 2435 | 891 | 2858 | 11.99 | 14.07 | 322.9 | 2.64 |
| 3.1.4.4 50% of torque obtained in 3.1.4.2 | | | | | | | |
| 24.98 | 2460 | 900 | 2888 | 9.54 | 11.19 | 382.0 | 2.23 |
| 3.1.4.5 25% of torque obtained in 3.1.4.2 | | | | | | | |
| 12.54 | 2479 | 907 | 2910 | 7.22 | 8.47 | 575.9 | 1.48 |
| 3.1.4.6 unloaded | | | | | | | |
| 2.10 | 2490 | 911 | 2923 | 5.42 | 6.36 | — | — |

| Power | Speed | | | Fuel consumption | | | Specific energy |
|---|---|---|---|---|---|---|---|
| | Engine | P.T.O | Fan | Hourly | | Specific | |
| kW | $min^{-1}$(rev/min) | | | kg/h | l/h | g/kW.h | kW.h/l |
| 3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF[1000±25 or 540±10$min^{-1}$(rev/min)] | | | | | | | |
| 3.1.5.1 the torque corresponding to maximum power | | | | | | | |
| 44.67 | 1476 | 540 | 1733 | 10.87 | 12.75 | 243.3 | 3.50 |
| 3.1.5.2 85% of torque obtained in 3.1.5.1 | | | | | | | |
| 39.26 | 1525 | 558 | 1790 | 9.22 | 10.82 | 234.8 | 3.63 |
| 3.1.5.3 75% of torque obtained in 3.1.5.2 | | | | | | | |
| 30.34 | 1571 | 575 | 1844 | 7.37 | 8.65 | 243.0 | 3.51 |
| 3.1.5.4 50% of torque obtained in 3.1.5.2 | | | | | | | |
| 20.65 | 1604 | 587 | 1883 | 5.62 | 6.59 | 272.2 | 3.13 |
| 3.1.5.5 25% of torque obtained in 3.1.5.2 | | | | | | | |
| 10.54 | 1637 | 599 | 1922 | 3.91 | 4.59 | 371.1 | 2.30 |
| 3.1.5.6 unloaded | | | | | | | |
| 1.15 | 1667 | 610 | 1957 | 2.48 | 2.91 | — | — |
| 3.1.6 PART LOADS AT DIFFERENT ENGINE SPEEDS | | | | | | | |
| 3.1.6.1 Maximum power at rated engine speed | | | | | | | |
| 54.94 | 2293 | 841 | 2698 | 15.31 | 17.96 | 278.7 | 3.06 |
| 3.1.6.2 80% of power obtained in 3.1.6.1 at max. speed setting | | | | | | | |
| 43.85 | 2420 | 885 | 2841 | 13.26 | 15.56 | 302.4 | 2.82 |
| 3.1.6.3 80% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed | | | | | | | |
| 44.10 | 2074 | 759 | 2435 | 11.73 | 13.76 | 266.0 | 3.20 |
| 3.1.6.4 40% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed | | | | | | | |
| 21.99 | 2072 | 758 | 2432 | 7.43 | 8.72 | 337.9 | 2.52 |
| 3.1.6.5 60% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed | | | | | | | |
| 33.14 | 1386 | 507 | 1627 | 7.74 | 9.08 | 233.6 | 3.65 |
| 3.1.6.6 40% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed | | | | | | | |
| 22.09 | 1386 | 507 | 1627 | 5.49 | 6.44 | 248.5 | 3.43 |

-No load maximum engine speed: 2490 rev/min
-Torque(equivalent crankshaft) at maximum power
.At rated engine speed: 228.3 Nm
.At 1-hour test: 228.3 Nm
-Maximum torque(equivalent crankshaft) (engine speed:1476 rev/min): 289.0 Nm

| **Mean atmospheric conditions** | |
|---|---|
| Temperature | 18 ℃ |
| Pressure | 101.0 kPa |
| Relative humidity | 30 % |
| **Maximum Temperature:** | |
| Coolant | 79 ℃ |
| Engine oil | 85 ℃ |
| Fuel | 22 ℃ |
| Engine air intake | 23 ℃ |

**3.2 Hydraulic power and lifting force**
-Date of test: March 15,2007 COTTEC
3.2.1 Hydraulic power test
3.2.1.1 Hydraulic fluid data
- Hydraulic fluid type: SAE 80W/90
-Viscosity index(ISO3448+Corr 1:1993): 28.5 $mm^2/s$ at 65 ℃

3.2.1.2 Compulsory Reporting(Test Results):

| | Pressure | Reservoir oil Temperature ℃ | | Engine Speed | Flow rate | Power |
|---|---|---|---|---|---|---|
| | Mpa | Min. | Max. | $min^{-1}$ | L/min | kW |
| Rated Engine Speed (Manufactures Specification) | | | | 2300 | | |
| 3.2.1.2.1 Maximum (sustained) pressure with relief valve open as measured at the coupler Pump stalled: Yes | 16.50(*) | 60.3 | 69.9 | 2461 | | |
| 3.2.1.2.2 Flow rate corresponding to a hydraulic pressure equivalent to 90 percent of the actual relief valve pressure setting and corresponding hydraulic power | 14.8 | 68.6 | | 2463 | 31.0 | 7.65 |
| 3.2.1.2.3 Maximum available flow and maximum power from one coupler pair: | 14.30 | 66.4 | | 2469 | 35.7 | 8.51 |
| 3.2.1.2.4 Maximum available flow and maximum power from coupler pairs operating simultaneously(flow through two or more coupler pairs if required): | 14.30 | 65.7 | | 2470 | 37.2 | 8.87 |

(*) The actual relief valve pressure setting for the hydraulic power.

3.2.2 Compulsory power lift test
-Linkage settings for test-see Table 1.1 and Figure 1.1

| | At the hitch point | On the frame |
|---|---|---|
| Height of lower hitch points above ground in down position | 167 mm | 87 mm |
| Vertical movement: without lifting force: | 673 mm | 870 mm |
| with lifting force: | 648 mm | 827 mm |
| Maximum corrected force exerted through full range | 23.90 kN | 15.23 kN |
| Corresponding pressure of hydraulic fluid | 15.75 MPa | 15.75 MPa |
| Moment about rear wheel axle | 21.27 kN.m | 22.84 kN.m |
| Maximum tilt angle of mast from vertical | — | $12.6^0$ |

| Lifting heights relative to the horizontal plane including the lower link pivot points | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | -442 | -400 | -362 | -300 | -200 | -100 | 0 | 100 | 200 | 286 | 300 | 385 | — |
| Lifting forces (the values of force measured are correspond to a hydraulic pressure equivalent to 90 % of the actual relief value pressure setting (**) of the hydraulic lifting system) At the hitch point,Corresponding pressure 15.75 MPa | | | | | | | | | | | | | |
| kN | — | — | 23.90 | 24.20 | 25.42 | 25.73 | 25.52 | 24.51 | 24.27 | 24.16 | — | — | — |
| At the frame, Corresponding pressure 15.75 MPa | | | | | | | | | | | | | |
| kN | 21.92 | 22.30 | — | 21.87 | 21.64 | 20.82 | 19.55 | 18.17 | 17.17 | — | 16.08 | 15.23 | — |

(**) The actual relief valve pressure setting for the lifting power : 17.5 MPa.

**3.3 Compulsory drawbar power and fuel consumption test (unballasted tractor)**

-Date of tests: March. 19,2007

-Type of track: Concrete

| Height of drawbar above ground | Tyre inflation pressure | |
|---|---|---|
| | Front | Rear |
| mm | kPa | kPa |
| 435 | 200 | 100 |

| Gear umber and range | Power | Drawbar pull | Speed | Engine Speed | Fan Speed | Slip of wheels | Specific fuel consumption | Specific energy | Temperature | | | Atmospheric conditions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Fuel | Coolant | Engine oil | Temperature | Relative hummidity | Pressure |
| | kW | kN | km/h | $Min^{-1}$ | $Min^{-1}$ | % | g/kW.h | kW.h/l | ℃ | ℃ | ℃ | ℃ | % | kPa |
| 3.3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor) | | | | | | | | | | | | | | |
| L1 | 15.55 | 19.14 | 2.92 | 2466 | 2895 | 15.02 | 562 | 1.52 | 21 | 96 | 87 | 16 | 50 | 100.2 |
| L2 | 20.78 | 19.18 | 3.90 | 2450 | 2876 | 15.06 | 476 | 1.79 | 21 | 96 | 87 | 16 | 50 | 100.2 |
| L3 | 30.77 | 19.07 | 5.81 | 2300 | 2700 | 14.96 | 411 | 2.08 | 21 | 96 | 87 | 16 | 50 | 100.2 |
| L4 | 41.79 | 19.10 | 7.88 | 2320 | 2723 | 15.02 | 356 | 2.40 | 21 | 96 | 87 | 16 | 50 | 100.2 |
| H1 | 47.99 | 15.86 | 10.89 | 2300 | 2700 | 5.85 | 313 | 2.72 | 21 | 96 | 87 | 16 | 50 | 100.2 |
| 3.3.2 FUEL CONSUMPTION | | | | | | | | | | | | | | |
| 3.3.2.1 in selected gear/speed setting nearest 7.5 km/h, at maximum power at rated engine speed | | | | | | | | | | | | | | |
| L3 | 30.77 | 19.07 | 5.81 | 2300 | 2700 | 14.96 | 411 | 2.08 | 21 | 96 | 87 | 16 | 50 | 100.2 |
| 3.3.2.1.1 75 % of pull corresponding to maximum power at rated engine speed | | | | | | | | | | | | | | |
| L3 | 26.86 | 14.23 | 6.80 | 2440 | 2864 | 6.22 | 411 | 2.07 | 21 | 96 | 87 | 16 | 50 | 100.2 |
| 3.3.2.1.2 50 % of pull corresponding to maximum power at rated engine speed | | | | | | | | | | | | | | |
| L3 | 18.58 | 9.52 | 7.02 | 2460 | 2888 | 3.84 | 498 | 1.71 | 21 | 96 | 87 | 16 | 50 | 100.2 |
| 3.3.2.1.3. highest gear/speed setting at reduced engine speed able to achieve both 3.3.2.1.1 and 3..3.2.1.2 ; same pull and traveling speed as in 3.3.2.1.1 | | | | | | | | | | | | | | |
| L4 | 27.99 | 14.18 | 7.11 | 1865 | 2189 | 4.65 | 306 | 2.79 | 21 | 96 | 87 | 16 | 50 | 100.2 |
| 3.3.2.1.4 same gear/speed selection as 3.3.2.1.3 at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2 | | | | | | | | | | | | | | |
| L4 | 18.80 | 9.19 | 7.36 | 1888 | 2216 | 2.38 | 358 | 2.38 | 21 | 96 | 87 | 16 | 50 | 100.2 |
| 3.3.2.2 in selected gear/speed setting nearest between 7 km/h and 10 km/h at rated engine speed | | | | | | | | | | | | | | |
| L4 | 41.84 | 17.98 | 8.38 | 2300 | 2700 | 8.85 | 314 | 2.72 | 21 | 96 | 87 | 16 | 50 | 100.2 |
| 3.3.2.2.1 75 % of pull corresponding to maximum power at rated engine speed | | | | | | | | | | | | | | |
| L4 | 33.99 | 13.40 | 9.13 | 2370 | 2782 | 3.58 | 359 | 2.37 | 21 | 96 | 87 | 16 | 50 | 100.0 |
| 3.3.2.2.2 50 % of pull corresponding to maximum power at rated engine speed | | | | | | | | | | | | | | |
| L4 | 23.24 | 8.90 | 9.40 | 2410 | 2829 | 2.36 | 473 | 1.80 | 21 | 96 | 87 | 16 | 50 | 100.0 |
| 3.3.2.2.3 highest gear/speed 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 | | | | | | | | | | | | | | |
| H1 | 33.91 | 13.38 | 9.12 | 1870 | 2195 | 3.02 | 297 | 2.85 | 21 | 96 | 87 | 16 | 50 | 100.0 |
| 3.3.2.2.4 same gear/speed setting as 3.3.2.2.3 at reduced engine speed; same pull and travelling speed as in 3.3.2.2.3 | | | | | | | | | | | | | | |
| H1 | 23.06 | 8.85 | 9.38 | 1900 | 2230 | 1.85 | 331 | 2.58 | 21 | 96 | 87 | 16 | 50 | 100.0 |

## 4 OPTIONAL TEST RESULTS

### 4.1 Optional drawbar power and fuel consumption test (ballasted tractor)

-Date of tests: March 20,2007

-Type of track: Concrete

| Height of drawbar above ground | Tyre inflation pressure | |
|---|---|---|
| | Front | Rear |
| mm | kPa | kPa |
| 431 | 200 | 100 |

| Gear umber and and range | Power | Drawbar pull | Speed | Engine Speed | Fan Speed | Slip of wheels | Specific fuel consumption | Specific energy | Temperature | | | Atmospheric conditions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Fuel | Coolant | Engine oil | Temperature | Relative hummidity | Pressure |
| | kW | kN | km/h | $Min^{-1}$ | $Min^{-1}$ | % | g/kW.h | kW.h/l | ℃ | ℃ | ℃ | ℃ | % | kPa |
| 4.1.1 OPTIONAL MAXIMUM POWER IN TESTED GEARS/SPEED SETTINGS | | | | | | | | | | | | | | |
| L1 | 17.75 | 21.87 | 2.92 | 2464 | 2893 | 15.06 | 515 | 1.65 | 20 | 95 | 86 | 15 | 40 | 100.0 |
| L2 | 23.61 | 21.85 | 3.89 | 2444 | 2869 | 15.06 | 455 | 1.87 | 20 | 95 | 86 | 15 | 40 | 100.0 |
| L3 | 36.78 | 21.79 | 6.08 | 2408 | 2827 | 15.02 | 382 | 2.23 | 20 | 95 | 86 | 15 | 40 | 100.0 |
| L4 | 46.94 | 20.17 | 8.38 | 2300 | 2700 | 8.84 | 322 | 2.65 | 20 | 95 | 86 | 15 | 40 | 100.0 |
| H1 | 48.93 | 16.05 | 10.98 | 2300 | 2700 | 5.14 | 309 | 2.76 | 20 | 95 | 86 | 15 | 40 | 100.0 |
| 4.1.2 OPTIONAL FIVE-HOUR TESTS<br>4.1.2.1 FIVE-HOUR TEST at 75% of the pull corresponding to maximum power at rated speed | | | | | | | | | | | | | | |
| H1 | 39.62 | 12.11 | 11.78 | 2412 | 2831 | 2.94 | 338 | 2.52 | 20 | 95 | 86 | 14 | 50 | 100.4 |
| 4.1.2.2 FIVE-HOUR TEST at pull corresponding to 15% wheelslip , with additional ballast : 0 kg | | | | | | | | | | | | | | |
| L1 | 17.67 | 21.80 | 2.92 | 2460 | 2888 | 15.02 | 520 | 1.64 | 21 | 96 | 86 | 15 | 40 | 100.0 |

Oil consumption during ten hours duration of tests 3.3.3.1 and 3.3.3.2: 55.0 g/h

### 4.2 Low temperature starting

-Date of tests: March 22,2007

-Detail of the starting aids used for the tests,battery included: None

-Fuel

.Type -35#

.Octane or cetane number: >50

.Pour-point and other specifications: -30 ℃

-Engine oil

.Type: SAE20 or10 W-30

.Viscosity and other specifications: 11.4cSt at 100 ℃

-Test results

.Starting procedure used for the tests: The manufacturer's procedure

.Lowest temperature at which the engine started: -10.0 ℃

### 4.3 Turning area and turning circle

| | Without brakes | |
|---|---|---|
| | Right-hand | Left-hand |
| | m | m |
| Radius of turning area | 4.39 | 4.74 |
| Radius of turning circle | 4.22 | 4.59 |

### 4.4 Location of center of gravity

-Height above ground: 862 mm
-Distance from the vertical plane containing the axis of the rear-wheels: 867 mm
-Distance from the median longitudinal plane of the tractor: -10 mm
-If the angle of suspension of the tractor is less then 20° ,indicate its value: None

### 4.5 Braking

-Date of tests: March 22,2007

4.5.1 Cold service braking device test

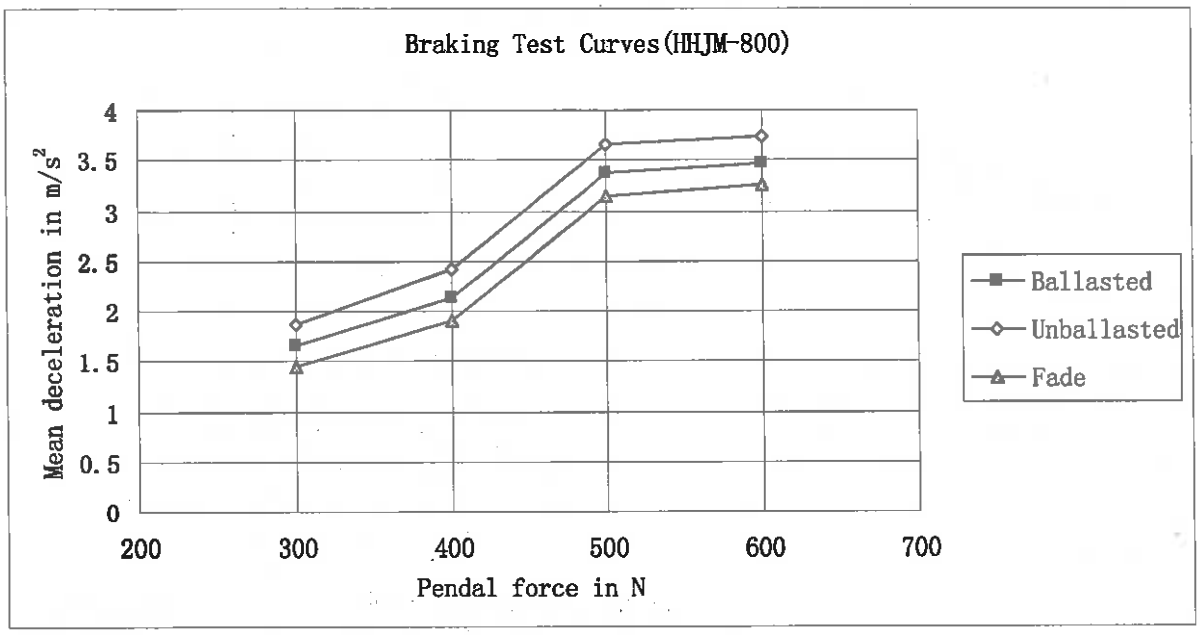
| | Speed before application of brakes | Braking device control force | Mean deceleration | Minimum stopping distance without locking the wheels |
|---|---|---|---|---|
| | km/h | kN | $m/s^2$ | m |
| Ballasted tractor | 36.00 | 0.30 | 1.66 | 30.2 |
| | 36.00 | 0.40 | 2.13 | 23.5 |
| | 36.00 | 0.50 | 3.38 | 14.8 |
| | 36.00 | 0.60 | 3.47 | 14.4 |
| Unballasted tractor | 36.00 | 0.30 | 1.87 | 26.7 |
| | 36.00 | 0.40 | 2.42 | 20.7 |
| | 36.00 | 0.50 | 3.65 | 13.7 |
| | 36.00 | 0.60 | 3.73 | 13.4 |

-Maximum deviation of tractor from its original course: 0 mm
-Abnormal vibration: None

4.5.2 Fade test

| Speed before application of brakes | Braking control force | Mean deceleration | Minimum stopping distance without locking the wheels |
|---|---|---|---|
| km/h | kN | $m/s^2$ | m |
| 36.00 | 0.30 | 1.45 | 34.5 |
| 36.00 | 0.40 | 1.90 | 26.3 |
| 36.00 | 0.50 | 3.14 | 15.9 |
| 36.00 | 0.60 | 3.25 | 15.4 |

-Maximum deviation of tractor from its original course: 0 mm
-Abnormal vibration: None
-Brake heating method: Driving




4.5.3 Parking braking device test

| | Uphill | Downhill |
|---|---|---|
| Braking device control force N | 290 | 280 |

**4.6 Measurement of external noise**

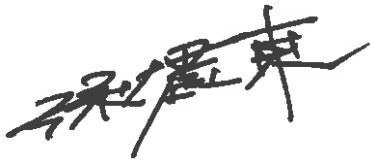
| | |
|---|---|
| -Date of tests: | March 22,2007 |
| -Sound level meter, make/mode/type: | ONO SOKKI LA-5111 |
| -Type of track: | Concrete |
| -Gear number: | H4 |
| -Travelling speed before acceleration: | 27.2 km/h |
| -Sound level: | 87.8 dB(A) |

**5 REPAIRS** **None**

**6 REMARKS**

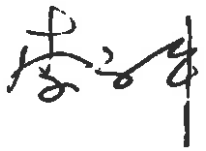
In COTTEC the safety limit speed of drawbar testing equipment is 12 km/h, so we only do drawbar power in the gears which the speed is below 12 km/h.

**Director of the COTTEC**
Senior engineer



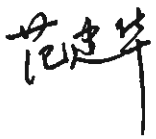
Sun Zhendong

**Vice-director of the COTTEC**
Senior engineer



Li Jingzhong

**Responsible engineer for these tests and editor for the test report publish:**
Senior engineer

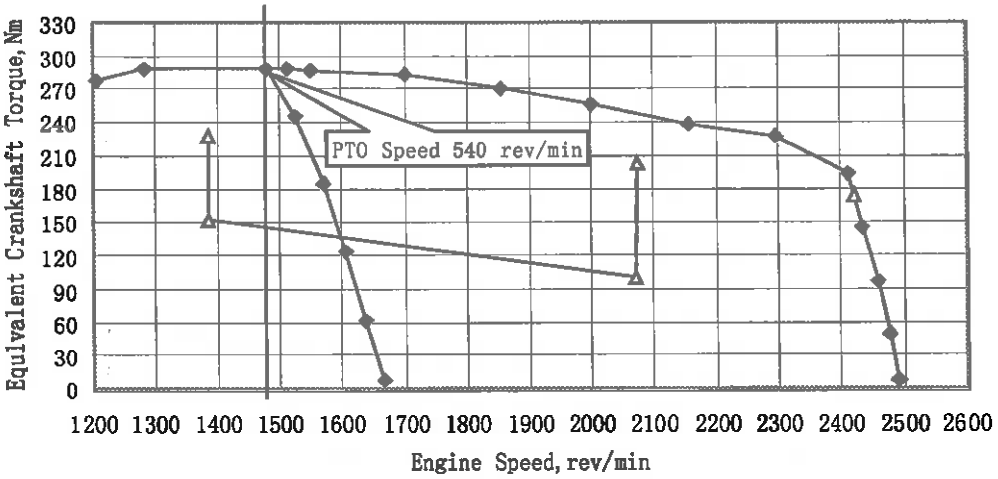


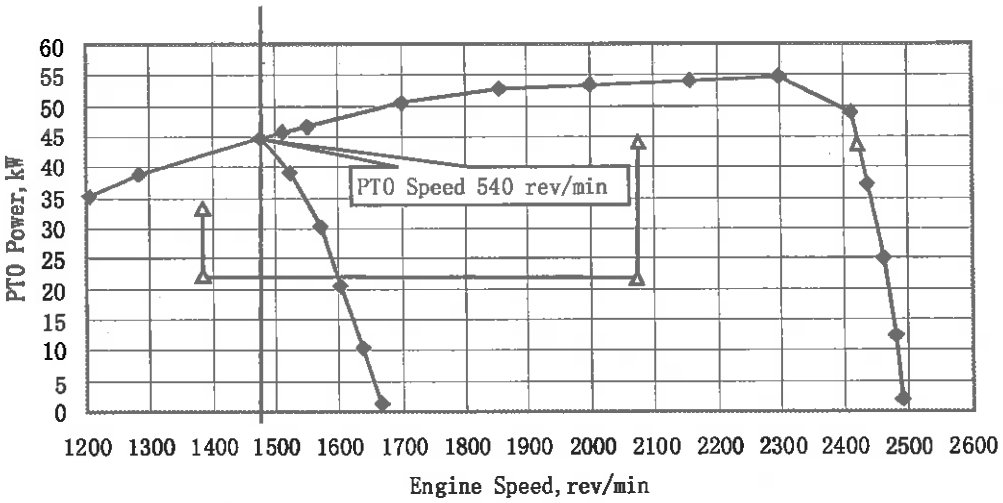
Fan Jianhua

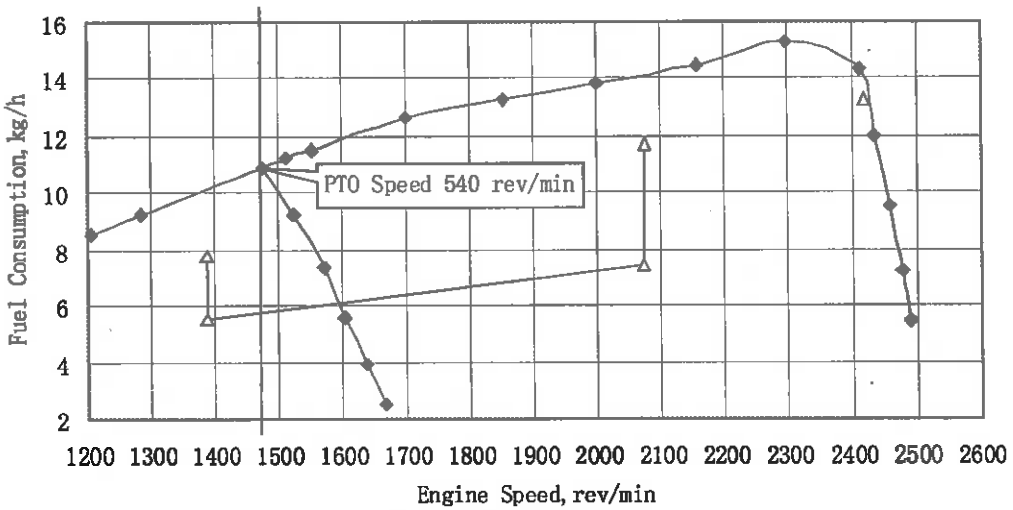
**Members of the tractor test board:**
Chen Zhiqiang Yan Xiaofang, Gao Bo
Zheng Zhigang, Li Yong, Zhao Jun,
Sun Zhennan, Yang Hongmei,Liu Hui
Sun Panpan,Liu Zhiqiang,Bai Demin,
Yi Xiaodong, Liu Hongqiang,

**Date: March 28,2007**

ANNEX
MAIN POWER TAKE-OFF TEST CURVES 1



ANNEX
MAIN POWER TAKE-OFF TEST CURVES 2

