# COTTEC

CHINA
OFFICIAL TRACTOR
TEST AND
EVALUATION CENTRE

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# OECD TEST REPORT OF DONGFENG -250(2WD) AGRICULTURAL TRACTOR (CODE 1)

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



**OECD Approval**
**No.: 1/2 312**
**Date:Jan.24,2006**

| Tested Tractor | Submitted for test by |
|---|---|
| Make: Dongfeng<br>Model: 250<br>Type: 2WD<br>Speed version: 30 km/h | Name:Changzhou Dongfeng Agricultural Machinery Group Co.,Ltd (Changzhou Tractor Plant)<br>Address: Changzhou,Jiangsu, China<br>Tel: 86 519 3256638;3260424<br>Fax:86 519 3260445 |

**This report includes 21 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 Jan. 24,2006, Approved No. 1/2 312 FULL code.

| | | |
|---|---|---|
| | 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: | Changzhou Dongfeng Agricultural Machinery Group Co.,Ltd (Changzhou Tractor Plant) |
| D[1] | -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 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** | |
| C | - Make of the tractor: | Dongfeng |
| C | -Model(trade name): | 250 |
| C | -Type: | 2WD |
| | | |
| | 1.1.1 Numbers | |
| D | -1st Serial No or prototype: | 055526 |
| C | - Serial No.: | 055526 |
| | | |
| | 1.1.2 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: | Yangdong |
| C | -Model: | Y385T |
| C | -Type: | 4-stroke,water cooling ,Vertical, Vortex,indirect injection |
| C | -Serial No.: | Y5073506A |
| | | |
| | 1.2.1 Cylinders | |
| C | -Number: | 3 |
| C | -Disposition: | Vertical, in line |
| D | -Bore/Stroke: | 85/90 mm/mm |
| D | -Capacity: | 1532 $cm^3$ |
| D | -Compression ratio: | 22.5 |

1. An item marked "C"indicates 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: | Dry |
| | | |
| | 1.2.2 Supercharging | None |
| | | |
| | 1.2.3 Fuel system | |
| C | -Fuel feed system: | Forced feed type |
| C | -Make of fuel filter: | Chendu Ningliang |
| C | -Model of fuel filter: | HECX0706 |
| C | -Type of fuel filter: | Paper cartridge,replaceable |
| D | -Capacity of fuel tank: | 28 $dm^3$ |
| C | -Make of injection pump: | Weifu xishu |
| C | -Model/type of injection pump: | I pump,Single-acting pistion type |
| C | -Serial No : | 28332 |
| | -Manufacturer's production setting of injection pump: | |
| C | . Flow rate(at rated engine speed and full load): | 5.8±0.3 $dm^3$ /h |
| D | .Timing: | $11^0 \pm 1^0$ before T.D.C. |
| D | -Make of injectors: | Weifu xishu |
| D | -Model/type of injectors: | 00P21-15A,Single hole,Pintle-type |
| D | -Injection pressure: | 13.0±0.5 MPa |
| C | -Make/Mode/Type of carburettor: | None |
| | | |
| | 1.2.4 Governor | |
| C | - Make: | Weifu xishu |
| C | -Model/type: | T110,Mechanical,centrifugal |
| C | -Governed range of engine speed: | 700～2592 $min^{-1}$( rev/min) |
| C | -Rated engine speed: | 2400 $min^{-1}$( 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: | Zhejiang Laixi |
| C | .Model/type: | KW1025,Dry |
| C | .Location of air intake: | Above front hood |
| C | .Maintenance indicator: | None |
| | | |
| | 1.2.6 Lubrication system | |
| D | -Type of feed pump: | Roter |
| C | -Type of filters: | Full flow,paper cartridge,replaceable |
| 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: | 6 |
| C | .Fan diameter: | Φ300 mm |
| D | -Coolant capacity: | 7.2 $dm^3$ |
| C | -Type of temperature control: | Thermostat |
| D | -Superpressure system: | None |
| | | |
| | 1.2.8 Starting system | |
| C | -Make: | Jiangsu Henli |
| C | -Model/Type: | QD1332CA,D.C. solenoid engaged |
| D | -Starter motor power rating: | 2.0 kW |
| C | -Cold starting aid: | Preheat plug |
| C | -Safety device: | Automatic return |
| | | |
| | 1.2.9 Electrical system | |
| C | -Voltage: | 12 (Negative earth) V |
| | -Generator: | |
| C | .Make: | Wujin Wuqi |
| C | .Model/Type: | JF11C,Altermator,belt driven |
| D | .Power | 0.35 kW |
| | -Battery of accumulators: | |
| C | .Number: | 1 |
| D | .Rating: | 100 Ah at 20 hours rating |
| | | |
| | 1.2.10 Exhaust system | |
| C | -Make: | Own make |
| C | -Model/Type: | DF250,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: | 225 mm |
| C | -Method of operation: | Mechanically actuated by pedal |
| | | |
| | 1.3.2 Gear box | |
| D | -Make: | Own make |
| D | -Model/Type: | DF (4+1)×2, 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 | None |
| | 1.3.3 Rear axle and final drives | |
| D | -Make: | Own make |
| D | -Model/Type: | Crown wheel and pinion bevel gear differential and spur gear type final drives external gearing |
| | -Differential lock | |
| D | .Type: | Tooth inlayed type |
| 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, 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 2400 rev/min km/h |
|---|---|---|---|---|---|
| C | | 1 | L | 398.3532 | 1.12 |
| C | | 2 | L | 247.3393 | 1.81 |
| C | | 3 | L | 152.5172 | 2.94 |
| C | | 4 | L | 87.4432 | 5.12 |
| C | | 5 | H | 76.8750 | 5.83 |
| C | | 6 | H | 47.7321 | 9.38 |
| C | | 7 | H | 29.4331 | 15.22 |
| C | | 8 | H | 16.8750 | 26.54 |
| C | | R1 | L | 307.3003 | 1.46 |
| C | | R2 | H | 59.3036 | 7.55 |
| | | (*)Calculated with the dynamic radius index of 495 mm(ISO 4251/1-1998). | | | |

| | |
|---|---|
| C | -Number of revolutions of front wheels for one revolution of rear-wheels: — |

| | | |
|---|---|---|
| | **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: | 517 mm |
| C | -Distance from the median plane of the tractor: | 0 mm |
| C | -Distance behind rear wheel axis: | 382 mm |
| C | -PTO speed at rated engine speed: | 593 rev/min |
| C | -Engine speed at standard power take-off speeds | 2186 rev/min |
| C | -Ratio of rotation speeds (engine speed/p.t.o. speed): | 4.05 |
| D | -Power restriction and maximum torque (Manufacturer's recommendation): | 30.0 kW 493.4 N.m |
| C | -Direction of rotation(viewed from behind tractor): | Clockwise |
| | | |
| | Power take-off at 1000 rev/min: | |
| C | -Location: | At rear of the tractor |
| C | -Diameter of power take-off shaft end: | 35 mm |
| C | -Number of splines: | 6, not in conformity with ISO 500/1991 |
| C | -Height above ground: | 517 mm |
| C | -Distance from the median plane of the tractor: | 0 mm |
| C | -Distance behind rear wheel axis: | 382 mm |
| C | -PTO speed at rated engine speed: | 1071 rev/min |
| C | -Engine speed at standard power take-off speeds | 2238 rev/min |
| C | -Ratio of rotation speeds (engine speed/p.t.o. speed): | 2.24 |
| D | -Power restriction and maximum torque (Manufacturer's recommendation): | 30.0 kW 272.8 N.m |
| C | -Direction of rotation(viewed from behind tractor): | Clockwise |
| | | |
| | 1.4.1.2 Power take-off proportional to ground speed: | None |
| | | |
| | 1.4.2 Optional power take-off: | None |
| | | |
| | **1.5 Hydraulic power lift** | |
| C | -Make: | Own make |
| C | -Model: | DF250 |
| 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 |
| D | -Relief valve pressure setting: | 14.0±0.5 MPa |

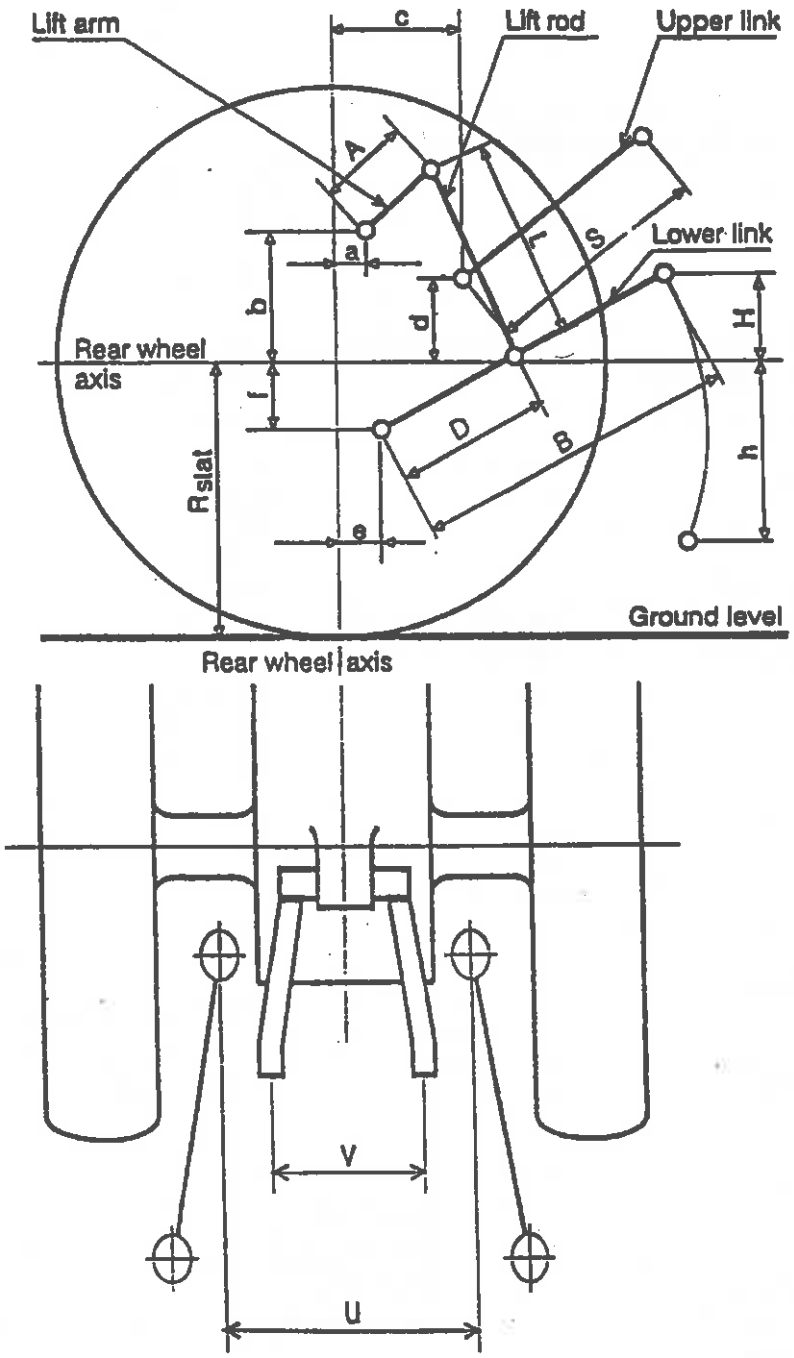
| | | |
|---|---|---|
| D | -Opening pressure of cylinder safety valve : | None |
| D | -Lift pump type: | Gear pump |
| D | -Transmission between pump and engine: | Driven by engine cam shaft |
| C | -Type and number of filters: | Cartridge type, 1 |
| C | -Site of oil reservoir: | Transmission housing |
| C | -Type, number and location of tapping points: | 1 double acting outlets at the rear |
| D | -Maximum volume of oil available to external cylinders: | 10 $dm^3$ |

**1.6 Three point linkage**

| | | |
|---|---|---|
| C | -Category | 1 ,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) | 200 | 200 |
| C | Length of lower links : | (B) | 700 | 700 |
| | Distance of lift arm pivot point from rear wheel axis: | | | |
| C | -Horizontally | (a) | 70 | 70 |
| C | -Vertically | (b) | 350 | 350 |
| C | Horizontal distance between the 2 lower link points: | (u) | 321 | 321 |
| C | Horizontal distance between the 2 lift arms end points: | (v) | 294 | 294 |
| C | Length of upper link: | (S) | From 510 to 760 | 600 |
| | Distance of upper link pivot point from rear wheel axis: | | | |
| C | -Horizontally: | (c) | 237 | 237 |
| C | -Vertically | (d) | 248、278、308 | 308 |
| | Distance of lower link pivot point from rear wheel axis: | | | |
| C | -Horizontally: | (e) | 155 | 155 |
| C | -Vertically | (f) | 78 | 78 |
| C | Distance of lower link pivot point to lift rod pivot points on lwer links: | (D) | 260、310、360 | 310 |
| C | Length of lift rods: | (L) | From 375 to 508 | 485 |
| | Height of lower hitch points relative to the rear wheel axis: | | | |
| C | -in low position | (h) | From 30 to 370 | 307 |
| C | -in high position | (H) | From 277 to 505 | 315 |
| 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=495 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: | Fixed |
| | -Height above ground: | |
| C | .Maximum | 454 mm |
| C | .Minimum | 310 mm |
| C | -Type of adjustment: | Reversing |
| C | -Distance of hitch point from rear wheel axis,horizontally: | 783 mm |
| | -Distance of hitch point from power take-off shaft end: | |
| C | .Vertically: | 64 mm |
| C | .Horizontally: | 401 mm |
| | -Lateral adjustment(centre of clevis) | |
| C | .Right hand: | 36 mm |
| C | .Left hand: | 36 mm |
| C | -Distance of pivot point from rear wheel axis,horizontally: | 174 mm |
| C | -Diameter of drawbar pinhole: | Φ30 mm |
| D | -Maximum vertical permissible load: | 6.5kN |
| | | |
| | **1.8 Trailer hitch** | |
| C | -Type: | Fixed |
| C | -Hole diameter : | Φ30 mm |
| C | -Height above ground: | 469 mm |
| C | -Distance of hitch point from rear wheel axis,horizontally: | 418 mm |
| | -Distance of hitch point from power take-off shaft end: | |
| C | .Vertically: | 48 mm |
| C | .Horizontally: | 36 mm |
| D | -Maximum vertical permissible load: | 12 kN |
| | | |
| | **1.9 Holed drawbar:** | **None** |
| | | |
| | **1.10 Steering** | |
| D | -Make: | Xinxing |
| D | -Model/Type: | BZZI-80, Hydrostatic steering system |
| | -Method of operation | |
| D | .Pump: | CBN-E306(A) Gear pump |
| D | .Ram: | 1,double acting ram actuating directly on front axle |
| D | -Working pressure: | 7±0.5 MPa |
| | | |
| | **1.11 Brakes** | |
| | 1.11.1 Service brake | |
| D | -Make: | Own make |
| D | -Model/Type: | Dry, 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: | 1630 mm |
| | -Track width adjustment: | |

| | | Minimum mm | Maximum mm | Adjustment method |
|---|---|---|---|---|
| D | Front | 975 | 1275 | Extending telescopic |
| D | Rear | 1020 | 1320 | Reversing wheels and off-set lug rims |

| | | |
|---|---|---|
| | **1.13 Protective structure (not fitted on the tested tractor)** | |
| C | -Make: | Own make |
| C | -Model: | DF300 |
| C | -Type: | Rear Roll Bar Frame |
| C | -Manufacture's name and address: | Own make |
| | -Protective device | |
| C | .Cab/frame/rollguard/other: | Frame |
| C | .Tiltable/not tiltable: | Tiltable |
| | -OECD approval | |
| C | .Approval number: | 7/S/0 230 |
| C | .Date of approval: | Oct. 11,2005 |
| C | .Nos. of minor modification certificates,if any: | None |
| | **1.14 Seat** | |
| | 1.14.1Driver's seat | |
| C | -Make: | Dongfeng |
| C | -Model: | 280.44C.101 |
| C | -Type: | Fixed |
| C | -Seat and steering wheel reversible: | No |
| C | -Type of suspension: | None |
| C | -Type of damping: | None |
| | -Range of adjustment: | |
| C | .Longitudinal: | 230 mm |
| C | .Vertical: | 0 mm |
| C | -Safety belt: | Yes |
| C | .Type: | Purposeless |
| | 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 | 845 | 135×40 | 233 |
| C | | Side lights | 840 | 135×45 | 304 |
| C | | Rear lights | 1220 | 115×75 | 570 |
| C | | Reflectors | 1105 | 65×65 | 510 |
| C | | Brake lights | 1105 | 65×65 | 510 |

## 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 | 3130 | 1348 | 1648 | — | 1969 |
| Unballasted | 3060 | 1348 | 1648 | — | 1972 |

### 2.2 Ground Clearance(unballasted tractor)

-Clearance limiting part: Under the Drawbar clamping plate 280 mm

### 2.3 Tractor mass

-Mass(without protective structure and full fuel tank):

| | Unballasted | | Ballasted | |
|---|---|---|---|---|
| | Without driver | With driver | Without driver | With driver |
| | kg | kg | kg | kg |
| Front | 452 | 457 | 553 | 558 |
| Rear | 742 | 812 | 947 | 1017 |
| Total | 1194 | 1269 | 1500 | 1575 |

### 2.4 Ballast

| | Weights | | Water |
|---|---|---|---|
| | Number | Total mass kg | kg |
| Front | 4 | 79.0 | — |
| Rear | 8 | 227 | — |
| Optional | — | — | — |

### 2.5 Track specifications: None

### 2.6 Tyres and track width specifications

| | Front | Rear |
|---|---|---|
| Tyres: | | |
| .dimensions | 4.00-16 | 8.3-24 |
| .ply rating | 6 | 6 |
| .type | Stripe pattern | Herringbone pattern |
| .maximum load (tyre manufacturer's) | 3.50 kN | 8.15 kN |
| .maximum load (tractor manufacturer's) | 3.50 kN | 8.15 kN |
| .inflation pressure(tyre manufacturer's) | 220～250kPa | 100～150 kPa |
| .dynamic radius index | 296 mm | 495 mm |
| Chosen track width | 980 mm | 1220 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 | 6.0 | 100 | 100 |
| Gear box, rear axle and final drives, in common with hydraulic system, Steering | 20.0 | 1000 | — |
| Front axle and final drives | — | — | — |

### 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<br>.Type:<br>.Viscosity:<br>.Classification: | SAE 85W/90<br>9.3cSt at 100 ℃<br>API GL-4 | Same as recommended |

### 2.8.3 Grease

-Number of lubrication points: 18

## 3 COMPULSORY TESTS RESULTS

### 3.1 Main power take-off

-Date and location of tests: Nov. 5,2005,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-TWO-HOUR TEST | | | | | | | |
| 16.21 | 2402 | 593 | 3802 | 5.10 | 5.99 | 314.8 | 2.71 |
| 3.1.2 POWER AT RATED ENGINE SPEED | | | | | | | |
| 16.21 | 2402 | 593 | 3802 | 5.10 | 5.99 | 314.8 | 2.71 |
| 3.1.3 STANDARD POWER TAKE-OFF SPEED(1000±25 or 540±10$min^{-1}$(rev/min) | | | | | | | |
| 14.93 | 2187 | 540 | 3462 | 4.58 | 5.37 | 306.5 | 2.78 |
| 3.1.4 PART LOADS<br>3.1.4.1 the torque corresponding to maximum power at the rated engine speed | | | | | | | |
| 16.21 | 2402 | 593 | 3802 | 5.10 | 5.99 | 314.8 | 2.71 |
| 3.1.4.2 85% of torque obtained in 3.1.4.1 | | | | | | | |
| 14.31 | 2495 | 616 | 3950 | 4.78 | 5.61 | 333.9 | 2.55 |
| 3.1.4.3 75% of torque obtained in 3.1.4.2 | | | | | | | |
| 10.84 | 2519 | 622 | 3988 | 4.03 | 4.72 | 371.4 | 2.29 |
| 3.1.4.4 50% of torque obtained in 3.1.4.2 | | | | | | | |
| 7.31 | 2547 | 629 | 4032 | 3.42 | 4.01 | 468.2 | 1.82 |
| 3.1.4.5 25% of torque obtained in 3.1.4.2 | | | | | | | |
| 3.69 | 2576 | 636 | 4078 | 2.75 | 3.23 | 744.4 | 1.14 |
| 3.1.4.6 unloaded | | | | | | | |
| 1.14 | 2592 | 640 | 4103 | 2.29 | 2.68 | — | — |

| 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 | | | | | | | |
| 14.93 | 2187 | 540 | 3462 | 4.58 | 5.37 | 306.5 | 2.78 |
| 3.1.5.2 85% of torque obtained in 3.1.5.1 | | | | | | | |
| 13.40 | 2309 | 570 | 3655 | 4.31 | 5.06 | 321.7 | 2.65 |
| 3.1.5.3 75% of torque obtained in 3.1.5.2 | | | | | | | |
| 10.10 | 2321 | 573 | 3674 | 3.65 | 4.29 | 361.7 | 2.36 |
| 3.1.5.4 50% of torque obtained in 3.1.5.2 | | | | | | | |
| 6.81 | 2349 | 580 | 3718 | 3.09 | 3.62 | 452.7 | 1.88 |
| 3.1.5.5 25% of torque obtained in 3.1.5.2 | | | | | | | |
| 3.45 | 2377 | 587 | 3763 | 2.48 | 2.90 | 717.8 | 1.19 |
| 3.1.5.6 unloaded | | | | | | | |
| 0.87 | 2394 | 591 | 3790 | 2.02 | 2.37 | — | — |
| 3.1.6 PART LOADS AT DIFFERENT ENGINE SPEEDS | | | | | | | |
| 3.1.6.1 Maximum power at rated engine speed | | | | | | | |
| 16.21 | 2402 | 593 | 3802 | 5.10 | 5.99 | 314.8 | 2.71 |
| 3.1.6.2 80% of power obtained in 3.1.6.1 at max. speed setting | | | | | | | |
| 12.94 | 2503 | 618 | 3962 | 4.53 | 5.32 | 350.1 | 2.43 |
| 3.1.6.3 80% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed | | | | | | | |
| 12.97 | 2163 | 534 | 3424 | 4.04 | 4.74 | 311.6 | 2.74 |
| 3.1.6.4 40% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed | | | | | | | |
| 6.49 | 2163 | 534 | 3424 | 2.79 | 3.27 | 429.6 | 1.98 |
| 3.1.6.5 60% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed | | | | | | | |
| 9.73 | 1442 | 356 | 2283 | 2.86 | 3.36 | 293.9 | 2.90 |
| 3.1.6.6 40% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed | | | | | | | |
| 6.49 | 1442 | 356 | 2283 | 2.11 | 2.48 | 325.5 | 2.62 |

-No load maximum engine speed: 2592 rev/min
-Torque(equivalent crankshaft) at maximum power
.At rated engine speed: 64.4 Nm
.At 2-hour test: 64.4 Nm
-Maximum torque(equivalent crankshaft) (engine speed:1584 rev/min): 79.8 Nm

| Mean atmospheric conditions | |
|---|---|
| Temperature | 18 ℃ |
| Pressure | 99.2 kPa |
| Relative humidity | 52 % |
| Maximum Temperature: | |
| Coolant | 76 ℃ |
| Engine oil | 101 ℃ |
| Fuel | 38 ℃ |
| Engine air intake | 37 ℃ |

**3.2 Hydraulic power and lifting force**
-Date and location of test: Nov. 16,2005 COTTEC
3.2.1 Hydraulic power test
3.2.1.1 Hydraulic fluid data
- Hydraulic fluid type: SAE 85W/90
-Viscosity index(ISO3448+Corr 1:1993): 9.3cSt at 100 ℃

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) | | | | 2400 | | |
| 3.2.1.2.1 Maximum (sustained) pressure with relief valve open as measured at the coupler Pump stalled: Yes | 14.50 | 60 | 70 | 2579 | | |
| 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 | 13.10 | 68 | | 2579 | 10.32 | 2.25 |
| 3.2.1.2.3 Maximum available flow and maximum power from one coupler pair: | 11.30 | 65 | | 2580 | 19.63 | 3.70 |
| 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): | — | — | | — | — | — |

3.2.2 Power lift test
-Linkage settings for test-see Table 1.1 and Figures 1.1

| | At the hitch point | On the frame |
|---|---|---|
| Height of lower hitch points above ground in down position | 188 mm | 123 mm |
| Vertical movement: without lifting force: | 622 mm | 765 mm |
| with lifting force: | 603 mm | 740 mm |
| Maximum corrected force exerted through full range | 7.62 kN | 5.88 kN |
| Corresponding pressure of hydraulic fluid | 13.05 MPa | 13.05 MPa |
| Moment about rear wheel axle | 6.52 kN.m | 8.61 kN.m |
| Maximum tilt angle of mast from vertical | — | $11^0$ |

| Lifting heights relative to the horizontal plane including the lower link pivot points | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | -294 | -229 | -200 | -100 | 0 | 100 | 200 | 300 | 374 | 400 | 446 |
| 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 13.05 MPa | | | | | | | | | | | |
| kN | — | 7.62 | 7.77 | 8.11 | 8.29 | 8.39 | 8.42 | 8.48 | 8.63 | — | — |
| At the frame, Corresponding pressure 13.05 MPa | | | | | | | | | | | |
| kN | 6.58 | — | 6.93 | 7.06 | 7.09 | 6.76 | 6.62 | 6.41 | — | 6.26 | 5.88 |

### 3.3 Drawbar performance

-Date of tests: Nov. 6~7,2005

-Type of track: Concrete

| | Height of drawbar above ground | Tyre inflation pressure | |
|---|---|---|---|
| | | Front | Rear |
| | mm | kPa | kPa |
| Unballasted | 330 | 220 | 100 |
| Ballasted | 326 | 220 | 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 |
| 3.3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor) | | | | | | | | | | | | | | |
| 1 | 2.41 | 8.51 | 1.02 | 2572 | 4071 | 14.98 | 1111 | 0.77 | 17 | 75 | 97 | 16 | 51 | 99.1 |
| 2 | 3.91 | 8.58 | 1.64 | 2560 | 4052 | 15.12 | 778 | 1.10 | 17 | 75 | 97 | 16 | 51 | 99.1 |
| 3 | 6.26 | 8.57 | 2.63 | 2530 | 4005 | 15.12 | 570 | 1.50 | 17 | 75 | 97 | 16 | 51 | 99.1 |
| 4 | 10.69 | 8.50 | 4.53 | 2495 | 3950 | 14.96 | 444 | 1.92 | 17 | 75 | 97 | 16 | 51 | 99.1 |
| 5 | 12.18 | 8.54 | 5.14 | 2490 | 3942 | 15.08 | 419 | 2.03 | 17 | 75 | 97 | 16 | 51 | 99.1 |
| 6 | 13.74 | 5.58 | 8.87 | 2440 | 3863 | 7.03 | 392 | 2.18 | 17 | 75 | 97 | 16 | 51 | 99.1 |
| 3.3.2 MAXIMUM POWER IN TESTED GEARS(ballasted tractor) | | | | | | | | | | | | | | |
| 1 | 2.96 | 10.49 | 1.02 | 2564 | 4059 | 14.98 | 941 | 0.91 | 18 | 75 | 97 | 17 | 50 | 99.3 |
| 2 | 4.76 | 10.52 | 1.63 | 2544 | 4027 | 15.07 | 668 | 1.28 | 18 | 75 | 97 | 17 | 50 | 99.3 |
| 3 | 7.59 | 10.44 | 2.62 | 2510 | 3973 | 14.88 | 499 | 1.71 | 18 | 75 | 97 | 17 | 50 | 99.3 |
| 4 | 12.88 | 10.42 | 4.45 | 2450 | 3878 | 14.88 | 403 | 2.11 | 18 | 75 | 97 | 17 | 50 | 99.3 |
| 5 | 13.42 | 9.13 | 5.29 | 2442 | 3866 | 10.78 | 401 | 2.13 | 18 | 75 | 98 | 17 | 50 | 99.3 |
| 6 | 14.24 | 5.66 | 9.06 | 2442 | 3866 | 5.12 | 379 | 2.25 | 18 | 75 | 98 | 17 | 50 | 99.3 |
| 3.3.3 FIVE-HOUR TESTS<br>3.3.3.1 FIVE-HOUR TEST at 75 % of pull at maximum power(at rated engine speed) | | | | | | | | | | | | | | |
| 6 | 11.30 | 4.22 | 9.64 | 2570 | 4068 | 4.02 | 439 | 1.94 | 18 | 75 | 98 | 17 | 50 | 99.3 |
| 3.3.3.2 FIVE-HOUR TEST at pull corresponding to 15 % wheel slip with additional ballast: 0 kg | | | | | | | | | | | | | | |
| 3 | 7.56 | 10.40 | 2.62 | 2510 | 3973 | 14.90 | 505 | 1.69 | 18 | 75 | 98 | 17 | 50 | 99.3 |

Oil consumption during ten hours duration of tests 3.3.3.1 and 3.3.3.2: 27.9 g/h

### 3.4 Turning area and turning circle

| | Without brakes | |
|---|---|---|
| | Right-hand | Left-hand |
| | m | m |
| Radius of turning area | 2.72 | 2.77 |
| Radius of turning circle | 2.52 | 2.58 |

### 3.5 Location of center of gravity

-Height above ground: 673 mm

-Distance from the vertical plane containing the axis of the rear-wheels: 587 mm

-Distance from the median longitudinal plane of the tractor: 0 mm

-If the angle of suspension of the tractor is less then 20° ,indicate its value: None

**3.6 Braking**

-Date of tests: Nov. 6,2005

3.6.1 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 | 28.0 | 0.10 | 1.10 | 27.5 |
| | 28.0 | 0.20 | 2.15 | 14.1 |
| | 28.0 | 0.30 | 2.97 | 10.2 |
| | 28.0 | 0.35 | 3.22 | 9.4 |
| | 28.0 | 0.40 | 3.44 | 8.8 |
| | 28.0 | 0.45 | 3.60 | 8.4 |
| | 28.0 | 0.50 | 3.69 | 8.2 |
| Unballasted tractor | 28.0 | 0.10 | 1.42 | 21.3 |
| | 28.0 | 0.20 | 2.46 | 12.3 |
| | 28.0 | 0.30 | 3.36 | 9.0 |
| | 28.0 | 0.35 | 3.60 | 8.4 |
| | 28.0 | 0.40 | 3.78 | 8.0 |
| | 28.0 | 0.45 | 3.88 | 7.8 |
| | 28.0 | 0.50 | 3.93 | 7.7 |

-Maximum deviation of tractor from its original course: 0 mm

-Abnormal vibration: None

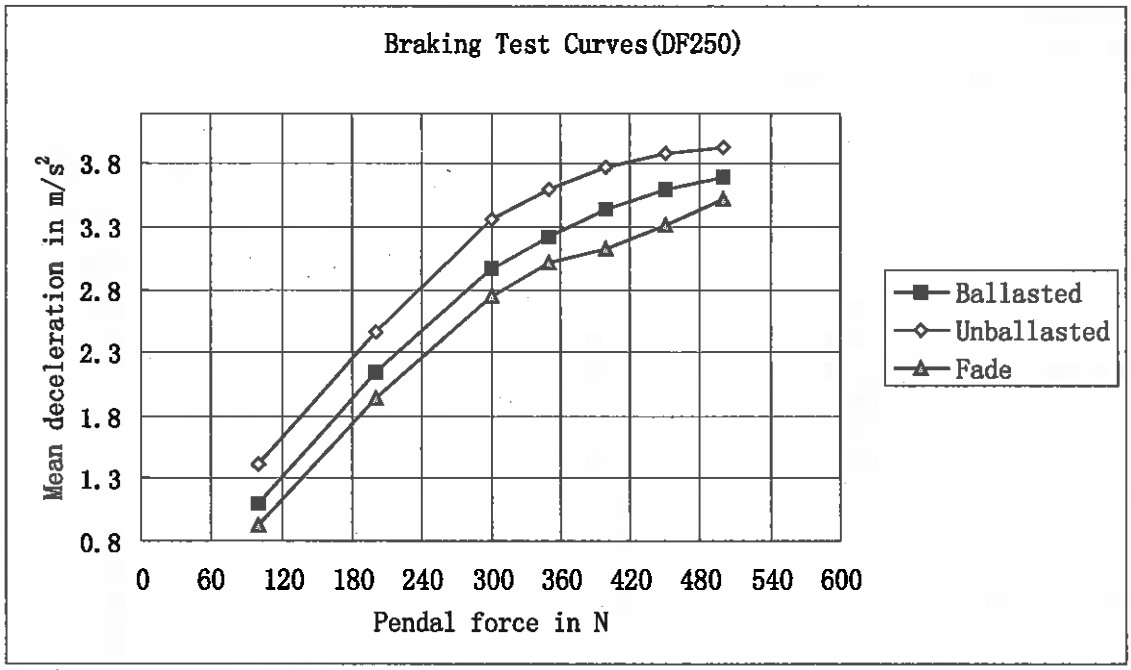
3.6.2 Fade test

| Speed before application of brakes | Braking control force | Mean deceleration | Minimum stopping distance without locking the wheels |
|---|---|---|---|
| km/h | kN | $m/s^2$ | m |
| 28.0 | 0.10 | 0.93 | 32.5 |
| 28.0 | 0.20 | 1.94 | 15.6 |
| 28.0 | 0.30 | 2.75 | 11.0 |
| 28.0 | 0.35 | 3.02 | 10.0 |
| 28.0 | 0.40 | 3.12 | 9.7 |
| 28.0 | 0.45 | 3.32 | 9.1 |
| 28.0 | 0.50 | 3.52 | 8.6 |

-Maximum deviation of tractor from its original course: 0 mm

-Abnormal vibration: None

-Brake heating method: Driving




3.6.3 Parking braking device test

| | Uphill | Downhill |
|---|---|---|
| Braking device control force N | 310 | 300 |

**3.7 Measurement of external noise**

| | |
|---|---|
| -Date of tests: | Nov. 6,2005 |
| -Sound level meter, make/mode/type: | B & K 2209 |
| -Type of track: | Concrete |
| -Gear number: | 8 |
| -Travelling speed before accceleration: | 21.0 km/h |
| -Sound level: | 79.6 dB(A) |

**4 OPTIONAL TEST RESULTS**

**4.1 Low temperature starting**

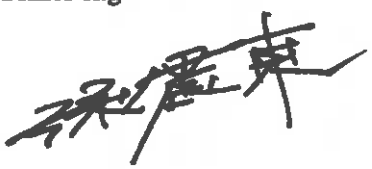
| | |
|---|---|
| -Date of tests: | Nov.23,2005 |
| -Detail of the starting aids used for the tests,battery included: | None |
| -Fuel | |
| .Type | -35# |
| .Octane or cetane number: | >50 |
| .Pour-point and other specifications: | -30 ℃ |
| -Engine oil | |
| .Type: | SAE10W/30 |
| .Viscosity and other specifications: | 11.4cSt at 100 ℃ |
| -Test results | |
| .Starting procedure used for the tests: | The manufacturer's procedure |
| .Lowest temperature at which the engine started: | -7.0 ℃ |

**5 REPAIRS** None

## 6 REMARKS

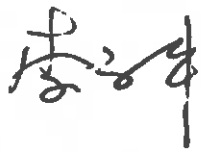
In COTTEC the safety limit speed of drawbar testing equipment is 12 km/h, so we only do drawbar power in the gears which the speed is below 12 km/h.

**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

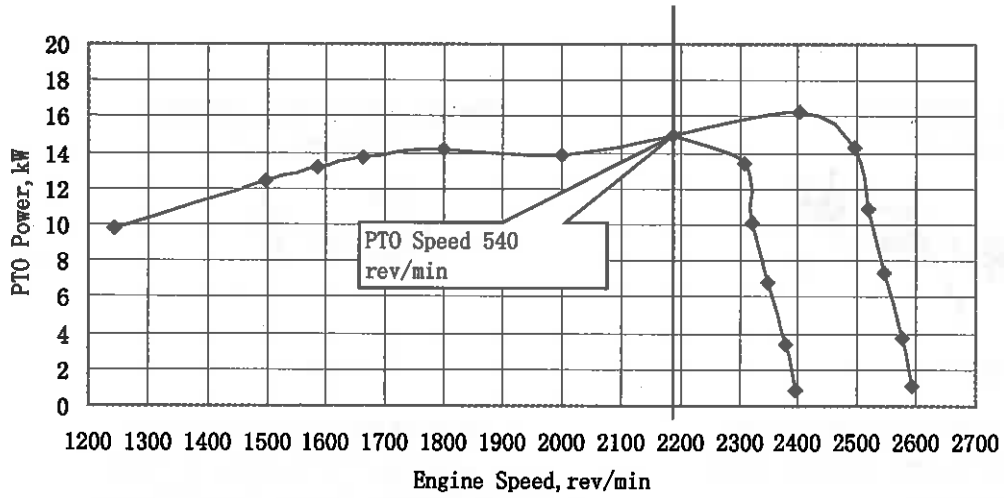


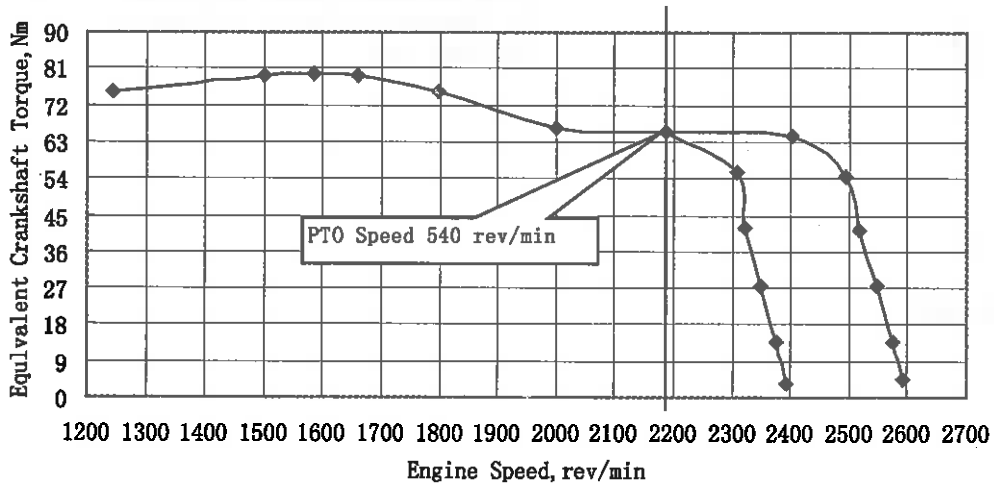
Fan Jianhua

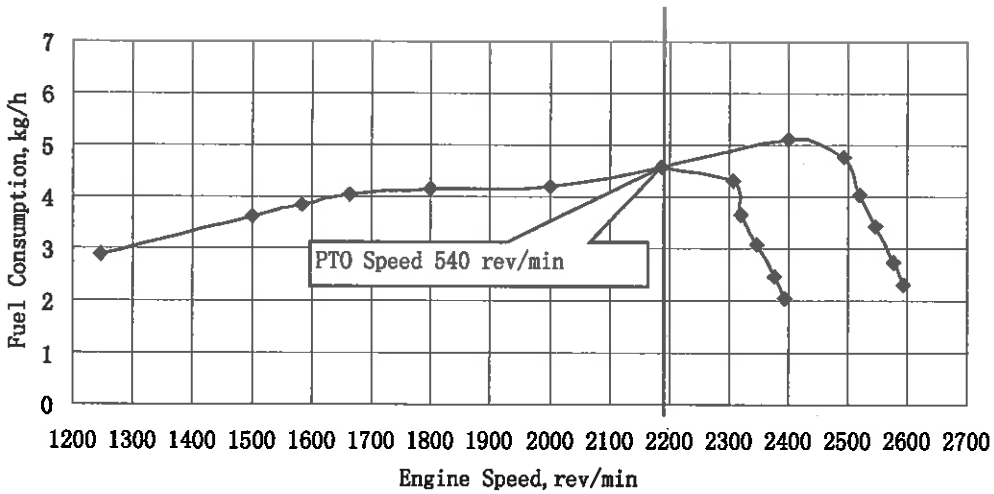
**Date: Nov. 28,2005**

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

ANNEX
MAIN POWER TAKE-OFF TEST CURVES 1



ANNEX
MAIN POWER TAKE-OFF TEST CURVES 2

