COTTEC

CHINA
OFFICIAL TRACTOR
TEST AND
EVALUATION CENTRE

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OECD TEST REPORT OF HHJM-450(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.: 2/2 383
Date: Aug .24 ,2007

Tested Tractor

Make: HHJM
Model: 450
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 Aug .24 ,2007, Approved No.2/2 383

	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):	450
C	-Type:	2WD
	1.1.2 Numbers	
D	-1st Serial No or prototype:	07122100002
C	- Serial No.:	07122100002
	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:	Fujian lijia
C	-Model:	SL3015ABT2S
C	-Type:	4-stroke,water cooling ,Vertical, direct injection
C	-Serial No.:	61029204
	1.2.1 Cylinders	
C	-Number:	3
C	-Disposition:	Vertical, in line
D	-Bore/Stroke:	105/117 mm/mm
D	-Capacity:	3039 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:	Changlong
C	-Model of fuel filter:	C0708
C	-Type of fuel filter:	Paper cartridge,replaceable
D	-Capacity of fuel tank:	47 dm^3
C	-Make of injection pump:	Weifu
C	-Model/type of injection pump:	3I346-85 left 1150,cylinder plunger
C	-Serial No :	60909981
	-Manufacturer's production setting of injection pump:	
C	. Flow rate(at rated engine speed and full load):	9.5 ± 0.5 dm^3 /h
D	.Timing:	$18^0 \pm 2^0$ before T.D.C.
D	-Make of injectors:	Weifu
D	-Model/type of injectors:	PF68S19 Long neck,Multi-hole
D	-Injection pressure:	19 ± 0.5 MPa
C	-Make/Mode/Type of carburettor:	None
	1.2.4 Governor	
C	- Make:	Weifu
C	-Model/type:	T7B,mechanical,centrifugal
C	-Governed range of engine speed:	700～2375 min^{-1}(rev/min)
C	-Rated engine speed:	2200 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:	Linghai jiangnen
C	.Model/type:	K4100,Oil bath
C	.Location of air intake:	Left-hand side of the engine
C	.Maintenance indicator:	None
	1.2.6 Lubrication system	
D	-Type of feed pump:	Rotor
C	-Type of filters:	J0801 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:	Φ420 mm
D	-Coolant capacity:	12.5 dm^3
C	-Type of temperature control:	Thermostat
D	-Superpressure system:	None
	1.2.8 Starting system	
C	-Make:	Quandian
C	-Model/Type:	QD143,D.C. solenoid engaged
D	-Starter motor power rating:	2.5 kW
C	-Cold starting aid:	Electrothermic plug
C	-Safety device:	Automatic return
	1.2.9 Electrical system	
C	-Voltage:	12 (Negative earth) V
	-Generator:	
C	.Make:	Huatai
C	.Model/Type:	JF131A,Altermator,belt driven
D	.Power	0. 35 kW
	-Battery of accumulators:	
C	.Number:	1
D	.Rating:	80 Ah at 20 hours rating
	1.2.10 Exhaust system	
C	-Make:	Daxia
C	-Model/Type:	300,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:	250 mm
C	-Method of operation:	Mechanically actuated by pedal
	1.3.2 Gear box	
D	-Make:	Own make
D	-Model/Type:	(2+1)×4, Mechanical
	-Description:	8 forward speed gear,4 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	1
C		Number of gears	4	4
C		Total of arrangements	8	4

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
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 2200 rev/min km/h
C	1	L1	228.1679	2.145
C	2	L2	155.3230	3.150
C	3	L3	95.5385	5.122
C	4	L4	72.7643	6.725
C	5	H1	50.8044	9.632
C	6	H2	34.5899	14.150
C	7	H3	21.2730	23.003
C	8	H4	16.2021	30.203
C	R1	R1	153.7643	3.182
C	R2	R2	104.6728	4.675
C	R3	R3	64.3846	7.600
C	R4	R4	49.0360	9.979

(*)Calculated with the dynamic radius index of 590 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:	577 mm
C	-Distance from the median plane of the tractor:	0 mm
C	-Distance behind rear wheel axis:	393 mm
C	-PTO speed at rated engine speed:	595 rev/min
C	-Engine speed at standard power take-off speeds	1994 rev/min
C	-Ratio of rotation speeds (engine speed/p.t.o. speed):	3.692
D	-Power restriction:	33 kW
D	-Maximum torque transmissible:	644.8 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:	577 mm
C	-Distance from the median plane of the tractor:	0 mm
C	-Distance behind rear wheel axis:	393 mm
C	-PTO speed at rated engine speed:	1073 rev/min
C	-Engine speed at standard power take-off speeds	2050 rev/min
C	-Ratio of rotation speeds (engine speed/p.t.o. speed):	2.050
D	-Power restriction:	33 kW
D	-Maximum torque transmissible:	358.0 N.m
C	-Direction of rotation(viewed from behind tractor):	Clockwise
	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:	Shandong Hongyi
C	-Model:	E500
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:	16.0±0.5 MPa

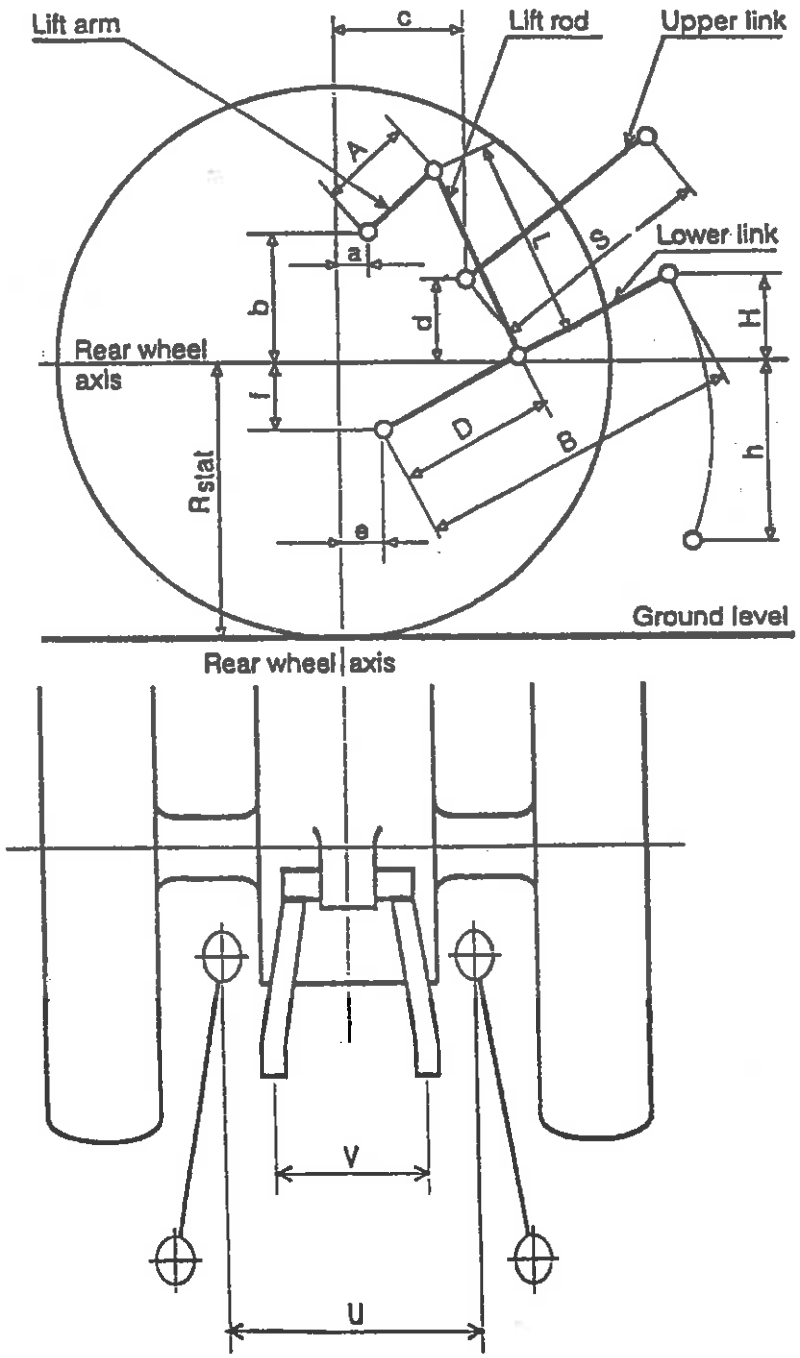
D	-Opening pressure of cylinder safety valve :	18.0±0.5 MPa
D	-Lift pump type:	Gear pump CBN-E314
D	-Transmission between pump and engine:	Driven by engine cam shaft
C	-Type and number of filters:	Cartridge type, 1
C	-Site of oil reservoir:	Transmission housing
C	-Type, number and location of tapping points:	One coupler pair quick shift adaptor, At rear of tractor
D	-Maximum volume of oil available to external cylinders:	4 dm^3

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)	235	235	
C		Length of lower links :	(B)	720	720	
		Distance of lift arm pivot point from rear wheel axis:				
C		-Horizontally	(a)	157	157	
C		-Vertically	(b)	358	358	
C		Horizontal distance between the 2 lower link points:	(u)	500	500	
C		Horizontal distance between the 2 lift arms end points:	(v)	480	480	
C		Length of upper link:	(S)	From 619 to 784	625	
		Distance of upper link pivot point from rear wheel axis:				
C		-Horizontally:	(c)	375	375	
C		-Vertically	(d)	From 200 to 260	260	
		Distance of lower link pivot point from rear wheel axis:				
C		-Horizontally:	(e)	227	227	
C		-Vertically	(f)	160	160	
C		Distance of lower link pivot point to lift rod pivot points on lwer links:	(D)	340	340	
C		Length of lift rods:	(L)	From 500 to 620	560	
		Height of lower hitch points relative to the rear wheel axis:				
C		-in low position	(h)	From 320 to 535	400	
C		-in high position	(H)	From 110 to 370	260	
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=590 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	446 mm
C	.Minimum	355 mm
C	-Type of adjustment:	Reversing
C	-Distance of hitch point from rear wheel axis,horizontally:	754 mm
	-Distance of hitch point from power take-off shaft end:	
C	.Vertically:	126 mm
C	.Horizontally:	361 mm
	-Lateral adjustment(centre of clevis)	
C	.Right hand:	164 mm
C	.Left hand:	164 mm
C	-Distance of pivot point from rear wheel axis,horizontally:	314 mm
C	-Diameter of drawbar pinhole:	Φ30.0 mm
D	-Maximum vertical permissible load:	12.0 kN
	1.8 Trailer hitch	
C	-Type:	None
C	-Hole diameter :	None
C	-Height above ground:	None
C	-Distance of hitch point from rear wheel axis,horizontally:	None
	-Distance of hitch point from power take-off shaft end:	None
C	.Vertically:	None
C	.Horizontally:	None
D	-Maximum vertical permissible load:	None
	1.9 Holed drawbar:	**None**
	1.10 Steering	
D	-Make:	Eaton Fluid Power (jining) Co.,Ltd
D	-Model/Type:	BZZI-80, Hydrostaticsteering system
	-Method of operation	
D	.Pump:	CBT-E306HL062bir Gear Pump
D	.Ram:	1,double acting ram actuating directly on front axle
D	-Working pressure:	16.0±0.5 MPa
	1.11 Brakes	
	1.11.1 Service brake	
D	-Make:	Hangzhou Podwer Metallurgy Research Institute
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:	1877.5 mm

-Track width adjustment:

		Minimum mm	Maximum mm	Adjustment method
D	Front	1240	1550	Telescopic axle
D	Rear	1300	2600	Reversing wheels and off-set lug rims

1.13 Protective structure

C	-Make:	Own make
C	-Model:	400.45.001
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 with tools
	-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:	Yecheng wuxing
C	-Model:	Xinli
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	1160	135×75	192
C		Side lights	1340	50×65	680
C		Rear lights	1500	Φ140	803
C		Reflectors	1340	50×65	680
C		Brake lights	1340	50×65	585
		Front turn lights	1160	100×430	315
		Rear turn lights	1340	95×65	730

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	3880	1625	1925	2515	2135
Unballasted	3690	1625	1925	2521	2139

2.2 Ground Clearance(unballasted tractor)

-Clearance limiting part: Under the front axle 375 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	749	758	924	933
Rear	1111	1177	1236	1302
Total	1860	1935	2160	2235

2.4 Ballast

	Weights		Water
	Number	Total mass kg	kg
Front	6	120	—
Rear	4	180	—
Optional	—	—	—

2.5 Track specifications: None

2.6 Tyres and track width specifications

	Front	Rear
Tyres:		
.dimensions	6.50-16	12.4-28
.ply rating	4	8
.type	Cross ply	Cross ply
.maximum load (tyre manufacturer's)	4.5 kN	14.8 kN
.maximum load (tractor manufacturer's)	4.0 kN	12.8 kN
.inflation pressure(tyre manufacturer's)	195～220kPa	80～120kPa
.dynamic radius index	346 mm	590 mm
Chosen track width	1240 mm	1305 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	250	500
Gear box in common with rear axle and final drives	30.0	500	—
Steering	1.3	1000	—
Hydraulic system	12.0	1000	—

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

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

2.8.3 Grease

-Number of lubrication points: 16

3 COMPULSORY TESTS RESULTS

3.1 Main power take-off

-Date and location of tests: March 14,2007,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							
30.20	2200	596	3300	8.16	9.57	270.2	3.15
3.1.2 POWER AT RATED ENGINE SPEED							
30.20	2200	596	3300	8.16	9.57	270.2	3.15
3.1.3 STANDARD POWER TAKE-OFF SPEED(1000±25 or 540±10min^{-1}(rev/min)							
28.34	1994	540	2991	7.42	8.71	261.9	3.25
3.1.4 PART LOADS 3.1.4.1 the torque corresponding to maximum power at the rated engine speed							
30.20	2200	596	3300	8.16	9.57	270.2	3.15
3.1.4.2 85% of torque obtained in 3.1.4.1							
26.66	2285	619	3428	7.51	8.81	281.7	3.03
3.1.4.3 75% of torque obtained in 3.1.4.2							
20.23	2311	626	3466	6.17	7.24	305.1	2.79
3.1.4.4 50% of torque obtained in 3.1.4.2							
13.59	2330	631	3495	4.99	5.85	367.1	2.32
3.1.4.5 25% of torque obtained in 3.1.4.2							
6.85	2348	636	3522	3.97	4.66	579.6	1.47
3.1.4.6 unloaded							
1.07	2367	641	3550	2.95	3.46	—	—

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±10min^{-1}(rev/min)]							
3.1.5.1 the torque corresponding to maximum power							
28.34	1994	540	2991	7.42	8.71	261.9	3.25
3.1.5.2 85% of torque obtained in 3.1.5.1							
25.15	2082	564	3123	6.80	7.98	270.4	3.15
3.1.5.3 75% of torque obtained in 3.1.5.2							
19.10	2104	570	3156	5.52	6.48	289.1	2.95
3.1.5.4 50% of torque obtained in 3.1.5.2							
12.85	2127	576	3190	4.43	5.20	344.9	2.47
3.1.5.5 25% of torque obtained in 3.1.5.2							
6.49	2149	582	3224	3.37	3.95	519.3	1.64
3.1.5.6 unloaded							
0.80	2160	585	3240	2.52	2.96	—	—
3.1.6 PART LOADS AT DIFFERENT ENGINE SPEEDS							
3.1.6.1 Maximum power at rated engine speed							
30.20	2200	596	3300	8.16	9.57	270.2	3.15
3.1.6.2 80% of power obtained in 3.1.6.1 at max. speed setting							
24.13	2293	621	3440	6.99	8.20	289.7	2.94
3.1.6.3 80% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed							
24.05	1972	534	2958	6.36	7.46	264.4	3.22
3.1.6.4 40% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed							
12.04	1975	535	2962	4.00	4.69	332.1	2.57
3.1.6.5 60% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed							
18.15	1322	358	1983	4.44	5.21	244.6	3.48
3.1.6.6 40% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed							
12.14	1325	359	1988	3.23	3.79	266.1	3.20

-No load maximum engine speed: 2367 rev/min
-Torque(equivalent crankshaft) at maximum power
.At rated engine speed: 131.1 Nm
.At 1-hour test: 131.1 Nm
-Maximum torque(equivalent crankshaft) (engine speed:1451 rev/min): 167.9 Nm

Mean atmospheric conditions	
Temperature	17 ℃
Pressure	100.1 kPa
Relative humidity	55 %
Maximum Temperature:	
Coolant	55 ℃
Engine oil	93 ℃
Fuel	24 ℃
Engine air intake	19 ℃

3.2 Hydraulic power and lifting force
-Date of test: March 16,2007 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)				2200		
3.2.1.2.1 Maximum (sustained) pressure with relief valve open as measured at the coupler Pump stalled: Yes	16.50	62.1	69.1	2334		
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	14.80	67.2		2336	23.7	5.85
3.2.1.2.3 Maximum available flow and maximum power from one coupler pair:	15.00	68.1		2335	23.5	5.88
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 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	190 mm	110 mm
Vertical movement: without lifting force:	660 mm	895 mm
with lifting force:	645 mm	865 mm
Maximum corrected force exerted through full range	12.63 kN	9.88 kN
Corresponding pressure of hydraulic fluid	14.85 MPa	14.85 MPa
Moment about rear wheel axle	11.96 kN.m	15.39 kN.m
Maximum tilt angle of mast from vertical	—	16.7^0

Lifting heights relative to the horizontal plane including the lower link pivot points													
mm	-320	-300	-240	-200	-100	0	100	200	300	400	405	500	545
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 14.85 MPa													
kN	—	—	12.63	13.29	14.06	14.96	15.64	15.88	16.27	16.35	16.46	—	—
At the frame, Corresponding pressure 14.85 MPa													
kN	10.09	10.23	—	11.13	11.50	11.72	11.64	11.40	10.94	10.35	—	10.04	9.88

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

-Date of tests: March 21,2007

-Type of track: Concrete

Height of drawbar above ground	Tyre inflation pressure	
	Front	Rear
mm	kPa	kPa
524	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
3.3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)														
L1	6.92	12.82	1.94	2345	3518	15.05	559	1.53	18	95	84	14	50	100.0
L2	10.08	12.79	2.84	2332	3498	15.00	488	1.75	18	95	84	14	50	100.0
L3	16.20	12.80	4.56	2302	3453	15.00	410	2.08	18	95	84	14	50	100.0
L4	20.36	12.83	5.71	2200	3300	15.05	375	2.27	18	95	84	14	50	100.0
H1	25.29	10.20	8.93	2200	3300	7.33	324	2.63	18	95	84	14	50	100.0
H2	24.26	6.45	13.54	2200	3300	4.30	337	2.53	18	95	84	14	50	100.0
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														
L4	20.36	12.83	5.71	2200	3300	15.05	375	2.27	18	95	84	14	50	100.0
3.3.2.1.1 75 % of pull corresponding to maximum power at rated engine speed														
L4	17.38	9.63	6.50	2295	3443	7.40	383	2.23	18	95	84	14	50	100.0
3.3.2.1.2 50 % of pull corresponding to maximum power at rated engine speed														
L4	12.24	6.52	6.76	2324	3486	4.87	446	1.91	18	95	84	14	50	100.0
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														
H1	17.12	9.65	6.39	1570	2355	7.06	296	2.88	18	95	84	14	50	100.0
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														
H1	12.00	6.46	6.68	1605	2408	4.87	332	2.56	18	95	84	14	50	100.0
3.3.2.2 in selected gear/speed setting nearest between 7 km/h and 10 km/h at rated engine speed														
H1	25.29	10.20	8.93	2200	3300	7.33	324	2.63	18	95	84	14	50	100.0
3.3.2.2.1 75 % of pull corresponding to maximum power at rated engine speed														
H1	19.81	7.58	9.41	2283	3425	5.86	370	2.31	20	95	85	15	40	98.8
3.3.2.2.2 50 % of pull corresponding to maximum power at rated engine speed														
H1	13.84	5.12	9.73	2320	3480	4.20	402	2.12	20	95	85	15	40	98.8
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														
H2	19.65	7.52	9.41	1550	2325	5.64	290	2.94	20	95	85	15	40	98.8
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														
H2	13.71	5.06	9.75	1580	2370	4.02	318	2.68	20	95	85	15	40	98.8

4 OPTIONAL TEST RESULTS

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

-Date of tests: March 22,2007
-Type of track: Concrete

Height of drawbar above ground	Tyre inflation pressure	
	Front	Rear
mm	kPa	kPa
520	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	7.86	14.60	1.94	2340	3510	15.00	537	1.59	19	95	85	15	30	98.8
L2	11.47	14.58	2.83	2328	3492	15.00	446	1.91	19	95	85	15	30	98.8
L3	18.28	14.45	4.55	2300	3450	14.94	379	2.25	19	95	85	15	30	98.8
L4	23.63	14.56	5.84	2248	3372	14.98	344	2.48	19	95	85	15	30	98.8
H1	26.08	10.55	8.90	2200	3300	7.59	316	2.70	19	95	85	15	30	98.8
H2	25.05	6.67	13.52	2200	3300	4.44	329	2.59	19	95	85	15	30	98.8
4.1.2 OPTIONAL FIVE-HOUR TESTS 4.1.2.1 FIVE-HOUR TEST at 75% of the pull corresponding to maximum power at rated speed														
H1	20.97	7.98	9.46	2290	3435	5.64	342	2.49	17	94	84	14	40	100.0
4.1.2.2 FIVE-HOUR TEST at pull corresponding to 15% wheelslip , with additional ballast : 0 kg														
L2	11.37	14.46	2.83	2325	3488	15.00	457	1.86	19	95	85	15	30	98.8

Oil consumption during ten hours duration of tests 3.3.3.1 and 3.3.3.2: 40.0 g/h

4.2 Low temperature starting

-Date of tests: March 23,2007
-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: -5.0 ℃

4.3 Turning area and turning circle

	Without brakes	
	Right-hand	Left-hand
	m	m
Radius of turning area	4.03	4.19
Radius of turning circle	3.92	4.08

4.4 Location of center of gravity

-Height above ground: 752 mm
-Distance from the vertical plane containing the axis of the rear-wheels: 736 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

4.5 Braking

-Date of tests: March 20,2007

4.5.1 Cold service braking device test

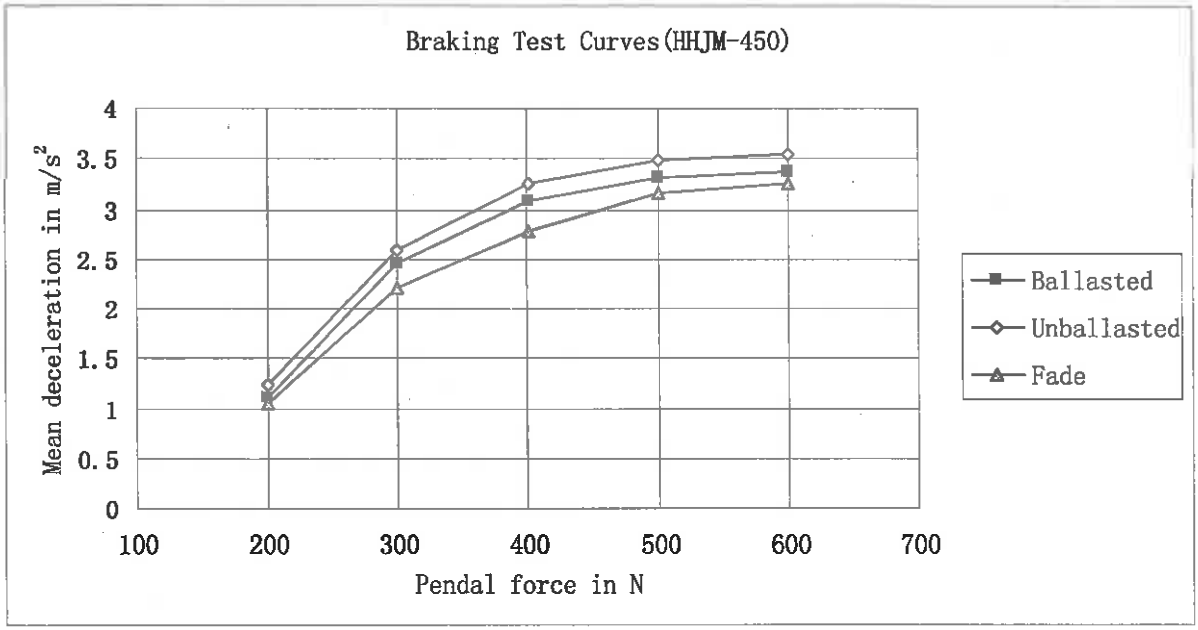
	Speed before application of brakes	Braking device control force	Mean deceleration	Minimum stopping distance without locking the wheels
	km/h	kN	m/s^2	m
Ballasted tractor	32.5	0.20	1.10	37.0
	32.5	0.30	2.45	16.6
	32.5	0.40	3.09	13.2
	32.5	0.50	3.31	12.3
	32.5	0.60	3.37	12.1
Unballasted tractor	32.5	0.20	1.24	32.9
	32.5	0.30	2.60	15.7
	32.5	0.40	3.26	12.5
	32.5	0.50	3.48	11.7
	32.5	0.60	3.54	11.5

-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
32.5	0.20	1.05	38.8
32.5	0.30	2.20	18.5
32.5	0.40	2.79	14.6
32.5	0.50	3.16	12.9
32.5	0.60	3.26	12.5

-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	270	260

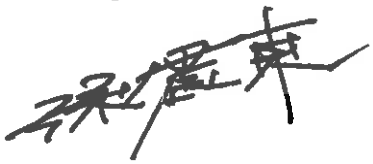
4.6 Measurement of external noise

-Date of tests:	March. 20,2007
-Sound level meter, make/mode/type:	ONO SOKKI LA-5111
-Type of track:	Concrete
-Gear number:	H4
-Travelling speed before acceleration:	24.4 km/h
-Sound level:	86.8 dB(A)

5 REPAIRS **None**

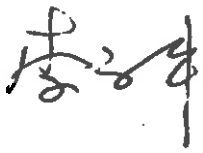
6 REMARKS **None**

Director of the COTTEC
Senior engineer



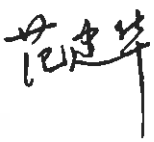
Sun Zhendong

Vice-director of the COTTEC
Senior engineer



Li Jingzhong

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

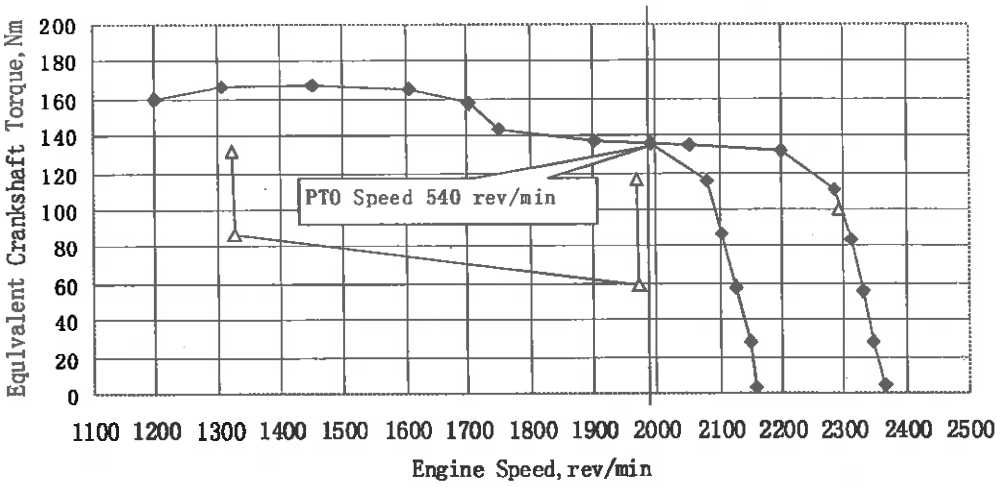


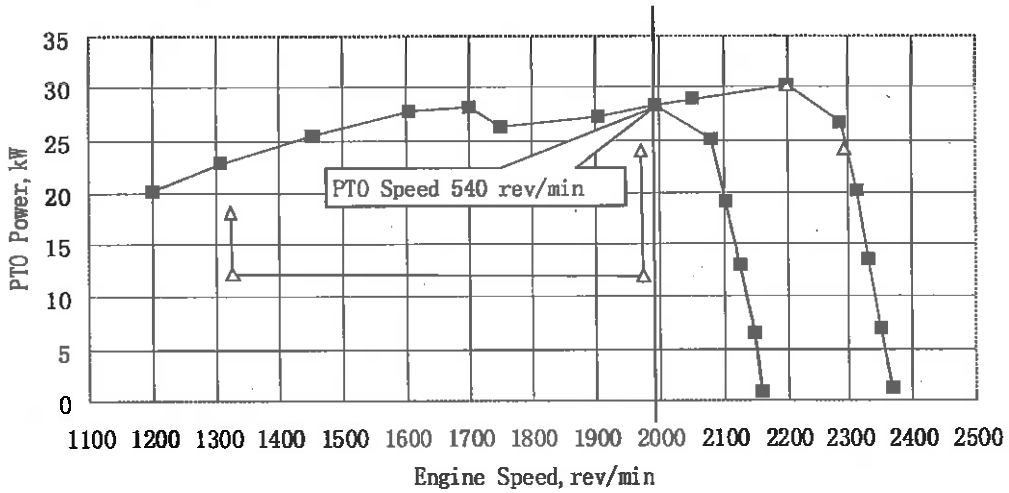
Fan Jianhua

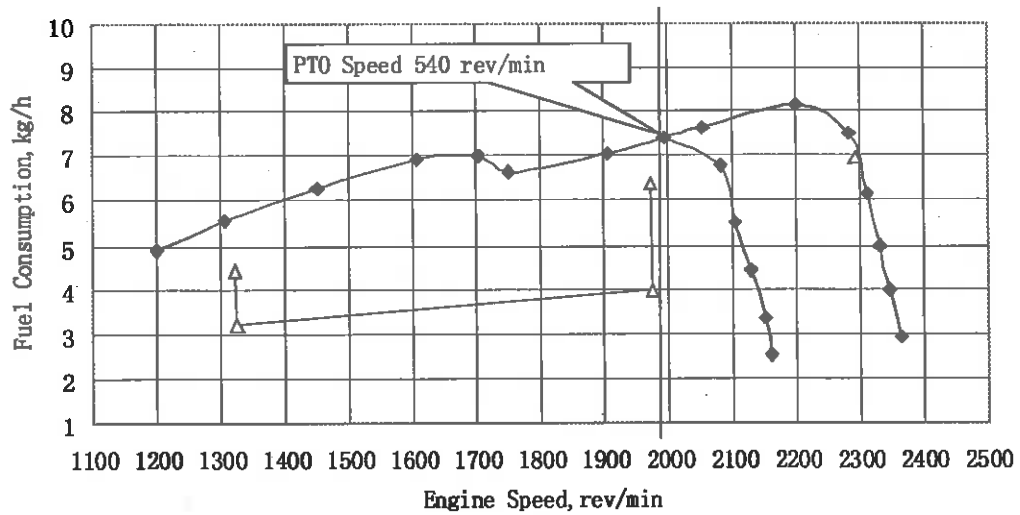
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Date: March 28,2007

ANNEX
MAIN POWER TAKE-OFF TEST CURVES 1







ANNEX
MAIN POWER TAKE-OFF TEST CURVES 2

