COTTEC

CHINA
OFFICIAL TRACTOR
TEST AND
EVALUATION CENTRE

Address:
Luoyang Tractor
Research Institute
Luoyang,Henan,China
Tel: 86 379 2690001
Fax:86 379 2690002

OECD TEST REPORT OF HUANGHAI JM204(4WD) AGRICULTURAL TRACTOR (CODE1)

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



OECD Approval
No.1/2 072 Full Code
Date: 08/27/2003

Tested Tractor
Make: Huanghai Model: JM204 Type: 4WD

Submitted for test by
Name:Yancheng Tractor Works Address:Yancheng,Jiansu,China Tel: 86 515 8231150 Fax:86 515 8230611

This report includes 25 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. 27,2003 Approved No. 1/2 072 FULL code.

Tractor manufacturer's name and address:	Yancheng Tractor Works Yancheng, Jiangsu, China
Location of tractor assembly:	The manufacturer
Submitted for test by:	The manufacturer
Selected for test by:	The manufacturer with the agreement of the COTTEC
Place of running-in:	COTTEC, Luoyang, Henan, China
Duration of running-in:	31.0 hours
Location of test:	COTTEC, Luoyang, Henan, China

1. SPECIFICATIONS OF TRACTOR

1.1 Identification

1.1.1 Make:	Huanghai
-Model:	JM204
-Type:	4WD
1.1.2 Numbers	
-1st Serial No.:	20892621
- Serial No.:	20892621
1.1.3 Other Specifications	
- Models for other countries:	None

1.2 Engine

-Make:	Yangdong
-Model:	Y380
-Type:	4-stroke,water cooling ,direct injection
-Serial No.:	20500381

1.2.1 Cylinders

-Numbers :	3
-Disposition:	Vertical,in line
-Bore/Stroke:	80/90 mm/mm
-Capacity:	1357 cm^3
-Compression ratio:	22.5
-Arrangement of valves:	Overhead,in line
-Cylinder liners:	Dry

1.2.2 Supercharging None

1.2.3 Fuel system

-Fuel feed system:	Forced feed type
-Make of fuel filter:	Benfu

-Model of fuel filter:	CX0706
-Type of fuel filter:	Paper cartridge,replaceable
-Capacity of fuel tank:	18 dm^3
-Injection pump:	
. Make:	Weifu
. Model/type:	3I-306,I Serial, 3-cylinder plunger
. Serial No. :	860281
-Manufacturer's production setting of injection pump:	
. Flow rate(at rated engine speed and full load):	4.9 ± 0.2 dm^3 /h
.Timing:	$16^0 \sim 20^0$ before T.D.C.
-Injectors:	
.Make:	Weifu
. Model/type:	P21,Long neck,Multi-hole
.Injection pressure:	13.2 ± 0.5 MPa
1.2.4 Governor	
- Make:	Weifu
- Model/type:	T7B,Mechanical,centrifugal
- Governed range of engine speed:	800～2700 rev/min
-Rated engine speed:	2400 rev/min
1.2.5 Air cleaner	
-Pre-cleaner	None
-Main-cleaner	
.Make:	Wuxi
.Model/type:	475-375 Dry, paper
.Location of air intake:	Above front hood
.Maintenance indicator:	None
1.2.6 Lubrication system	
-Type of feed pump:	Roter
-Type & Number of filter(s):	Jx0706p Full flow, repaceablel,1
1.2.7 Cooling system	
-Type of coolant:	Water
-Type of pump:	Centrifugal,belt driven
-Description of fan:	Axial flow type,belt driven
-Number of fan blades:	7

-Fan diameter:	Φ300 mm
-Coolant capacity:	10 dm^3
-Type of temperature control:	Thermostat
-Superpressure system:	None
1.2.8 Starting system	
-Make:	Wuyue
-Model/Type:	QD100C3 solenoid engaged
-Starter motor power rating:	2.2 kW
-Cold starting aid:	Eletrothermic plug
-Safety device:	Main shift lever in neutral position
1.2.9 Electrical system	
-Voltage:	12 (Negative earth) V
-Generator:	
.Make:	Wuyuei
.Model/Type:	2JF200,Altermator,belt driven
.Power	0.2 kW
-Battery(number of accumulators):	
.Model/Type:	6-QA-100S,Lead accumulator
.Number:	1
.Rating:	100 Ah at 20 hours rating
1.2.10 Exhaust system	
-Make:	Daxia
-Model/Type:	X300,expansion type,silencer
-Location:	Right-hand side of the engine,vertical
1.3 Transmission to wheels	
1.3.1 Clutch(Travel and Power Take-off)	
-Make:	Own make
-Model/Type:	Dry,dual clutch for transmission & PTO
-Number of plate(s):	2
-Diameter of plate(s):	200 mm
-Method of operation:	Mechanically actuated by pedal
1.3.2 Gear box	
-Make:	Own make
-Model/Type:	HH 2×(3+1) , Mechanical
-Description:	6 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
Number of gears	3	1
Number of groups/ranges	2	2
Total of arrangements	6	2

-Available options Creeper device

1.3.3 Rear axle and final drives

-Make: Own make

-Model/Type: Crown wheel and pinion bevell gear differential , spur gear type final drives

-Differential lock

.Type: Mechanical

.Method of engagement: Mechanically actuated by pedal

.Method of disengagement: Self-disengagement by spring

1.3.4 Front axle and final drives

-Make: Own make

-Model/Type: Helical gear type differential and Helical gear type final drives

-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
1	L-1	250.944	1.694
2	L-2	127.045	3.347
3	L-3	76.150	5.584
4	H-1	54.287	7.833
5	H-2	27.484	15.472
6	H-3	16.470	25.819
R1	R1	316.407	1.344
R2	R2	68.449	6.213
(*)Calculted with the dynamic radius index of 470 mm(ISO 4251/1-1998).			

Number of revolutions of front wheels for one revolution of rear-wheels: 1.53

1.4 Power take-off

1.4.1 Main power take-off

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

1.4.1.1 Power take-off proportional to engine speed

Power take-off at 540 rev/min

-Location :	At rear of the tractor
-Diameter of power take-off shaft end:	35 mm
-Number of splines:	6, in conformity with ISO 500/1991
-Height above ground:	470 mm
-Distance from the median plane of the tractor:	0 mm
-Distance behind rear wheel axis:	281 mm
-PTO speed at rated engine speed:	624 rev/min
-Engine speed at standard power take-off speeds:	2077 rev/min
- Ratio of rotation speeds (engine speed/p.t.o. speed):	3.846
-Power restriction and maximum torque (Manufacturer's recommendation):	14.30 kW 300 N.m
-Direction of rotation(viewed from behind tractor):	Clockwise

1.4.1.2 Power take-off at 1000 rev/min

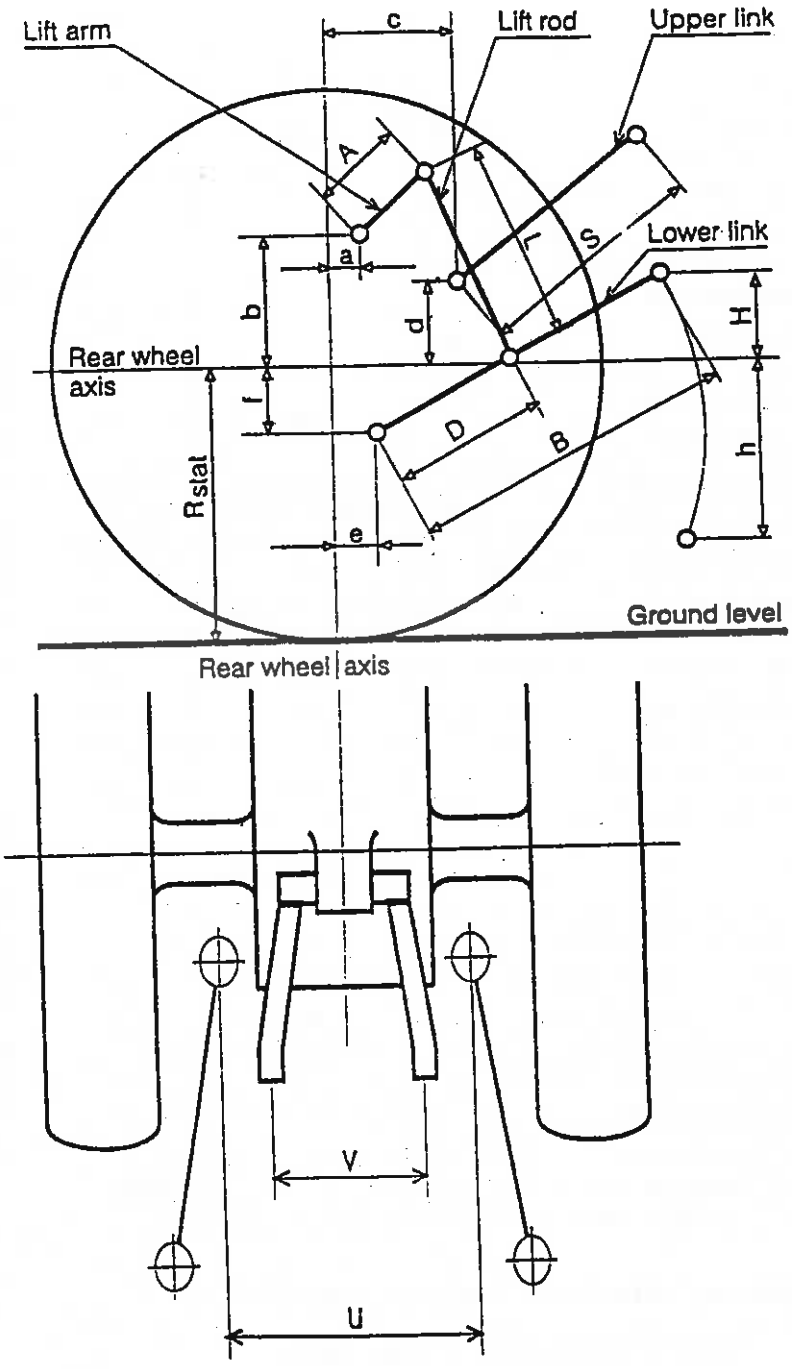
-Location :	At rear of the tractor
-Diameter of power take-off shaft end:	35 mm
-Number of splines:	6, not in conformity with ISO 500/1991
-Height above ground:	470 mm
-Distance from the median plane of the tractor:	0 mm
-Distance behind rear wheel axis:	281 mm
-PTO speed at rated engine speed:	1380 rev/min
-Engine speed at standard power take-off speeds:	1739 rev/min
- Ratio of rotation speeds (engine speed/p.t.o. speed):	1.739

-Power restriction and maximum torque (Manufacturer's recommendation):	14.3 kW 135.6 N.m
-Direction of rotation(viewed from behind tractor):	Clockwise
1.4.1.3 Power take-off proportional to ground speed:	**None**
1.4.2 Optional power take-off:	**None**
1.5 Hydraulic power lift	
-Make:	Dacheng
-Model:	E300
-Type:	Partial separated units
-Type of hydraulic system:	Open centre system
-Type and number of cylinders:	Single acting,1
-Type of linkage lock for transport:	Hydraulic
-Relief valve pressure setting:	16 MPa
-Opening pressure of cylinfer safety valve:	None
-Lift pump type:	CBN-E314L-X1 Gear pump
-Transmission between pump and engine:	Driven by engine cam shaft
-Type and number of filters:	Cartridge type
-Site of oil reservoir:	In the hydraulic power lift housing
-Tapping points:	
.Type:	Thread
.Number:	1
.Location:	Rear of tractor
-Maximum volume of oil available to external cylinders:	5 dm^3
1.6 Three point linkage	
-Category:	1N,in conformity with ISO730-1:1994+Cor.1:1995
-Category Adapter:	None
-Linkage geometry:	See next page and following table

		Dimension or range(*) mm	Setting used in test mm
Length of lift arms	(A)	190	190
Length of lower links	(B)	600	600
Distance of lift arm pivot point from rear wheel axis: Horizontally	(a)	-30	-30
Vertically	(b)	299	299
Horizontal distance between the 2 lower link point:	(u)	304	304
Horizontal distance between the 2 lift arms end points:	(v)	340	340
Length of uppe link:	(S)	from 480 to 650	505
Distance of upper link pivot point from rear wheel axis: Horizontally	(c)	230	230
Vertically	(d)	from 215 to 255	255
Distance of lower link pivot point from rear wheel axis: Horizontally	(e)	155	155
Vertically	(f)	109	109
Distance of lower link pivot point to lift rod pivot points on lwer links:	(D)	298	298
Length of lift rods:	(L)	from 365 to 485	460
Height of lower hitch points relative to the rear wheel axis: in low position	(h)	from 257 to 522	270
in high position	(H)	from 0 to 265	244
Height above ground of lower hitch points when locked in transport position:		from 200 to 714	-----
(*)Assuming r=470 mm rear tyre dynamic radius index of ISO 4251-1:1998			

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

Lift test-linkage geometry:



Figures 1.1

1.7 Swinging drawbar:	
-Type:	Fixed
-Hole diameter:	Φ21 mm
-Height above ground:	
.Maximum	377 mm
.Minimum	307 mm
-Distance of hitch point from rear wheel axis,horizontally:	545 mm
-Distance of hitch point from power take-off shaft end:	
.Vertically:	118 mm
.Horizontally:	261 mm
-Lateral adjustment(centre of clevis)	
.Right hand:	103.5 mm
.Left hand:	103.5 mm
-Distance of pivot point from rear wheel axis,horizontally:	145 mm
-Maximum vertical load:	5.0 kN
1.8 Trailer hitch	
-Type:	Fixed
-Hole diameter:	Φ30 mm
-Height above ground:	
.Maximum	377 mm
.Minimum	307 mm
-Distance of hitch point from rear wheel axis,horizontally:	328 mm
-Distance of hitch point from power take-off shaft end:	
.Vertically:	123 mm
.Horizontally:	44 mm
-Maximum vertical load:	5.0 kN
1.9 Holed drawbar:	**None**
1.10 Steering	
-Make:	Xinxing
-Model/Type:	BZZI-80, Hydrostatic steering system

-Method of operation

.Pump: CBT-E306HL 062BIR Gear pump

.Ram: 1,double acting ram actuating directly on front axle

-Working pressure: 8.0 MPa

1.11 Brakes

1.11.1 Service brake

-Make: Hangzhou Podwer Metallurgy Research Institute

-Model/Type: Oil bath double plates mechanical

-Method of operation: By pedals

-Trailer braking take-off: Pneumatic braking,operated by tractor pedals

1.11.2 Parking brake

-Type: Mechanical

-Method of operation: Depressed by brake pedals and ratched by hand lever

1.12 Wheels

-Number

.Front: 2,steering and driving

.Rear: 2,driving

-Wheelbase: 1655 mm

-Track width adjustment:

	Minimum mm	Maximum mm	Adjustment method
Front	1050	1050	None
Rear	920	1380	Reversing wheels and off-set lug rims

1.13 Protective structure

-Make: Own make

-Model: JM-204SF

-Type: 2-post safety frame

-Manufacture's name and address: Yancheng Tractor Works

Yancheng, Jiangsu, China

-Protective device : Roll guard,tiltable

-OECD approval None

.Nos. of minor modification certificates,if any: None

1.14 Seat

1.14.1Driver's seat

-Make: Tiancheng

-Model: None

-Type: Adjustable suspension

-Seat and steering wheel reversible: No

-Type of suspension: None

-Type of damping: None

-Range of adjustment:

.Longitudinal: 100 mm

.Vertical: 0 mm

-Safety belt: None

1.14.2 Optional driver's seat(s): None

1.14.3 Passenger seat: None

1.15 Lighting

	Height above ground of centre mm	Size mm	Distance from outside edge of lights to media n plane of tractor mm
Head lights	1000	135×40	200
Side lights	----	----	----
Rear lights	1145	110×70	465
Reflectors	1040	35×35	460

2 TEST CONDITIONS

2.1 Overall dimensions

	Lenght mm	Width		Height at top of	
		Minimum mm	Maximum mm	Protective structure mm	Exhaust silencer mm
Ballasted	3000	1210	1440	2126	1855
Unballasted	2855	1210	1440	2132	1856

2.2 Ground Clearance(unballasted tractor)

-Clearance limiting part: Under the front axle 220 mm

2.3 Tractor mass

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

	Unballasted		Ballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	532	537	600	607
Rear	688	758	816	884
Total	1220	1295	1416	1491

2.4 Ballast

	Weights		Water kg
	Number	Total mass kg	
Front	4	52	—
Rear	4	144	—
Optional	—	—	—

2.5 Track specifications: **None**

2.6 Tyres and track width specifications

	Front	Rear
Tyres		
.dimensions	6.00-12	8.3-24
.ply rating	4	4
.type	Cross ply	Cross ply
.maximum load (tyre manufacturer's)	3.10 kN	6.02 kN
.maximum load (tractor manufacturer's)	3.10 kN	5.50 kN
.inflation pressure(tyre manufacturer's)	180-200kPa	100-150 kPa
.dynamic radius index	307 mm	470 mm
Chosen track width	1050 mm	1200 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	4.5	250	500
Gear box, rear axle and final drives	14	500	—
Front axle and final drives	6.0	500	—
Steering	1.3	1000	—
hydraulic system	9	1000	—

2.8.2 Specifications

	Recommended	Used during test
Engine oil .Type: .Viscosity: .Classification:	 SAE10 W/30 11.4cSt at 100 ℃ API-CC	Same
Transmission oil,Hydraulic fluid,Steering oil .Type: .Viscosity: .Classification:	 SAE 80W/90 9.3cSt at 100 ℃ API GL-4	Same

2.8.3 Grease

-Number of lubrication points: 15

3 COMPULSORY TESTS RESULTS

3.1 Main power take-off

-Date and location of tests: Sep. 12,2002,COTTEC

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

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	rev/min	rev/min	kg/h	l/h	g/kW.h	kW.h/l
3.1.1 MAXIMUM POWER -TWO-HOUR TEST						
13.64	2277	592	4.11	4.82	301	2.83
3.1.2 POWER AT RATED ENGINE SPEED						
13.26	2400	624	4.13	4.85	311	2.74
3.1.3 STANDARD POWER TAKE-OFF SPEED (540±10 rev/min)						
13.29	2077	540	3.86	4.53	290	2.94
3.1.4 PART LOADS 3.1.4.1 the torque corresponding to maximum power at rated engine speed						
13.26	2400	624	4.13	4.85	311	2.74
3.1.4.2 85 % of torque obtained in 3.1.4.1						
11.72	2488	647	3.81	4.47	325	2.62
3.1.4.3 75 % of torque defined in 3.1.4.2						
8.96	2531	658	3.19	3.74	356	2.39
3.1.4.4 50 % of torque defined in 3.1.4.2						
6.07	2561	666	2.74	3.21	451	1.89
3.1.4.5 25 % of torque defined in 3.1.4.2						
3.03	2588	673	2.22	2.60	733	1.16
3.1.4.6 Unloaded						
0.0	2615	680	1.72	2.02	—	—

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	rev/min	rev/min	kg/h	l/h	g/kW.h	kW.h/l
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED 540±10 rev/min 3.1.5.1 the torque corresponding to maximum power						
13.29	2077	540	3.86	4.53	290	2.94
3.1.5.2 85 % of torque obtained in 3.1.5.1						
12.29	2258	587	3.68	4.32	299	2.85
3.1.5.3 75 % of torque defined in 3.1.5.2						
9.39	2300	598	3.13	3.67	333	2.56
3.1.5.4 50 % of torque defined in 3.1.5.2						
6.36	2335	607	2.59	3.04	407	2.09
3.1.5.5 25 % of torque defined in 3.1.5.2						
3.21	2361	614	2.02	2.37	629	1.36
3.1.5.6 Unloaded						
0.0	2396	623	1.53	1.80	—	—

-No load maximum engine speed: 2615 rev/min

-Torque(equivalent crankshaft) at maximum power

. At rated engine speed: 52.76 Nm

.At 2-hour test: 57.20 Nm

-Maximum torque(equivalent crankshaft) : 61.9 Nm

(engine speed:1792 rev/min)

Mean atmospheric conditions	
Temperature	24 ℃
Pressure	99.6 kPa
Relative humidity	52 %
Maximum Temperature:	
Coolant	83 ℃
Engine oil	103 ℃
Fuel	35.0 ℃
Engine air intake	27 ℃

3.2 Hydraulic power and lifting force

-Date and location of test: Sep. 12,2002 COTTEC

3.2.1 Hydraulic power test

-Sustained pressure with relief valve open: 16.0 MPa

-Pump stalled: Not applicable,open center system

-Pump delivery rate at minimum pressure: 23.32 l/min

	Flow rate l/min	Pressure MPa	Power kW
Flow rate corresponding to a hydraulic pressure equivalent to 90 percent of the actual relief valve pressure setting and corresponding hydraulic power	7.70	14.4	1.85
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	19.57	12.5	4.08

-Tapping point used for test: At left of the seat

-Temperature of hydraulic fluid: 64 ℃

-Opening pressure of the unloading valve: Not available

-Closing pressure of the unloading valve: Not available

3.2.2 Power lift test

-Linkage settings for test -Table 1.1 and Figures 1.1

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	200 mm	170 mm
Vertical movement: without lifting force: with lifting force:	 486 mm 468 mm	 614 mm 592 mm
Maximum corrected force exerted throught full rang	7.68 kN	5.00 kN
Corresponding pressure of hydraulic fluid	14.4 MPa	14.4 MPa
Moment about rear wheel axle	5.80 kN.m	6.82 kN.m
Maximum tilt angle of mast from vertical	—	10.1^{0}

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	—	-191	-161	-100	0	100	200	300	307	400	—
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 14.4 MPa											
kN	—	—	9.34	8.83	8.61	8.23	7.85	7.69	7.68	—	—
At the frame, Corresponding pressure 14.4 MPa											
kN	—	8.22	—	7.76	7.11	6.78	6.12	5.66	—	5.00	—

3.3 Drawbar performance

-Date of tests: Sep.18~19,2002

-Type of track: Concrete

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
	mm	kPa	kPa
Unballasted	332	190	130
Ballasted	330	190	130

Gear number and range	Power	Drawbar pull	Speed	Engine speed	Slip wheels	Specific fuel consum -ption	Specific energ	Temperatures			Atmospheric conditions		
								Fuel	Coolant	Engine oil	Tempe-rature	Relative humidity	Press-ure
	kW	kN	km/h	rev/min	%	g/kWh	kWh/l	℃	℃	℃	℃	%	kPa
3.3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)													
1	4.49	10.29	1.57	2524	14.89	630	1.34	31	86	89	29	65	98.5
2	8.84	10.71	2.97	2470	15.08	456	1.85	31	86	89	29	65	98.5
3	10.87	8.17	4.79	2195	7.73	384	2.20	31	86	89	28	65	98.5
4	11.39	5.97	6.87	2190	5.77	371	2.27	31	85	88	28	65	98.5
5	10.90	2.80	14.02	2205	2.01	389	2.17	31	86	89	28	65	98.5
3.3.2 MAXIMUM POWER IN TESTED GEARS(ballasted tractor)													
1	5.08	11.87	1.54	2511	14.80	591	1.43	31	86	89	28	65	98.5
2	9.68	12.06	2.89	2407	14.98	441	1.91	31	86	89	28	65	98.5
3	10.73	7.90	4.89	2203	6.32	390	2.16	31	86	89	28	65	98.5
4	11.32	5.84	6.98	2205	4.53	370	2.29	31	85	88	28	65	98.5
5	10.46	2.65	14.21	2207	6.67	398	2.12	31	86	89	28	65	98.5
3.3.3 FIVE-HOUR TESTS													
3.3.3.1 FIVE-HOUR TEST at 75 % of pull at maximum power(at rated engine speed)													
4	9.32	4.24	7.91	2480	3.61	422	2.00	31	86	89	29	64	98.5
3.3.3.2 FIVE-HOUR TEST at pull corresponding to 15 % wheelslip													
2	9.94	12.25	2.92	2420	13.50	430	1.96	31	86	89	29	64	98.5

Oil consumption during ten hours duration of tests 3.3.3.1 and 3.3.3.2: 38.0 g/h

3.4 Turning area and turning circle

	Without brakes	
	Right-hand	Left-hand
	m	m
Radius of turning area	2.56	2.53
Radius of turning circle	2.46	2.44

3.5 Location of centre of gravity

-Height above ground: 640 mm

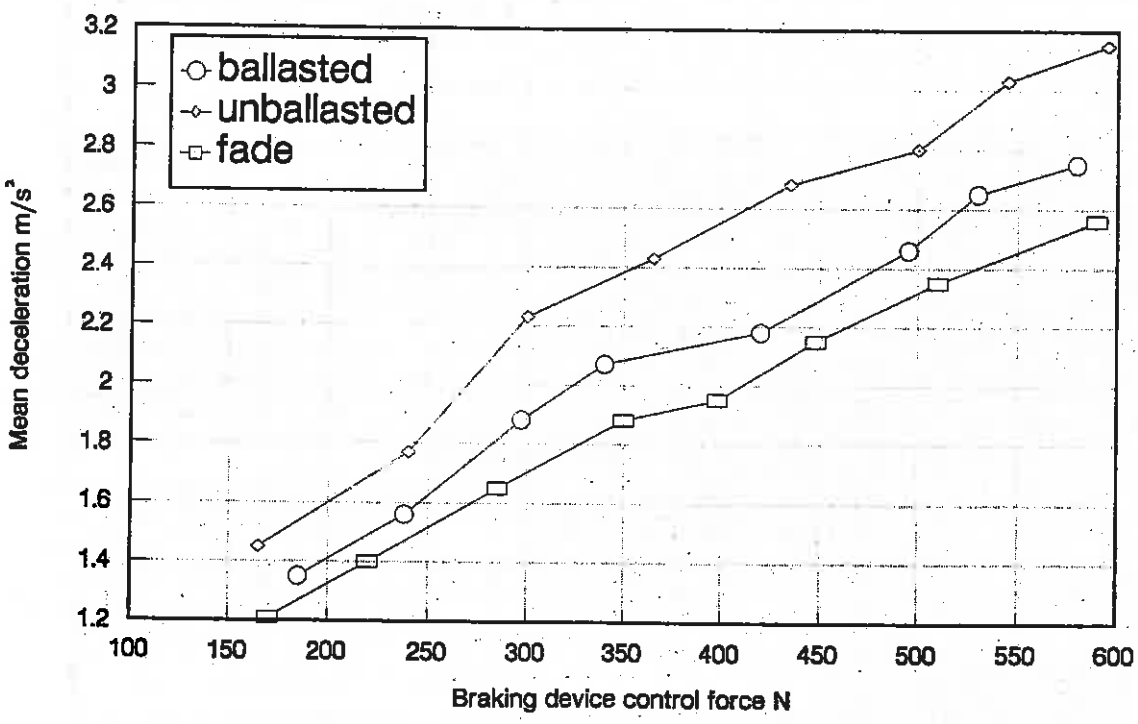
-Distance from the vertical plane containing the axis of the rear-wheels: 686 mm

-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: Sep. 19,2002



3.6.1 Cold service braking device test

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

-Abnormal vibration: None

	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	27.6	0.185	1.35	21.77
	27.6	0.238	1.56	18.84
	27.6	0.297	1.88	15.63
	27.6	0.340	2.07	14.20
	27.6	0.420	2.18	13.48
	27.6	0.495	2.46	11.95
	27.6	0.530	2.65	11.09
	27.6	0.580	2.75	10.69
Unballasted tractor	27.6	0.165	1.45	20.27
	27.6	0.240	1.77	16.60
	27.6	0.300	2.23	13.18
	27.6	0.365	2.43	12.09
	27.6	0.435	2.68	10.97
	27.6	0.500	2.80	10.50
	27.6	0.545	3.03	9.70
	27.6	0.595	3.15	9.33

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
27.6	0.170	1.21	24.29
27.6	0.220	1.40	20.99
27.6	0.285	1.65	17.81
27.6	0.350	1.88	15.63
27.6	0.398	1.95	15.07
27.6	0.448	2.15	13.67
27.6	0.510	2.35	12.51
27.6	0.590	2.56	11.48

- 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	0.38 kN	0.36 kN

3.7 Measurement of external noise

-Date of tests: Sep. 21,2002

-Sound level meter, make/mode/type: B & K 2209

-Type of track: Concrete

-Gear number: 6(H-3)

-Travelling speed before accceleration: 20.5 km/h

-Sound level: 83.0 dB(A)

4 OPTIONAL TEST RESULTS

4.1 Low temperature starting

-Date of tests: Sep. 20,2002

-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: SAE10 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 ℃

5 REPAIRS None

6 REMARKS None

Director of the COTTEC

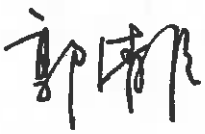
Senior engineer



Sun Zhendong

Vice-director of the COTTEC

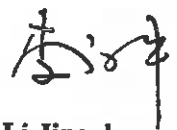
Senior engineer



Guo Qingchen

Vice-director of the COTTEC

Senior engineer



Li Jingzhong

Responsible engineer for these tests:

Senior engineer



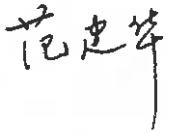
Fan Jianhua

Members of the tractor test board:

Xie Zhiqiao	**Yan Xiaofang**
Wang Dailin	**Zhen zhigang**
Sun Zhennan	**Gao Jian**
Liu Hua	

Editor for the test report publish:

Senior engineer

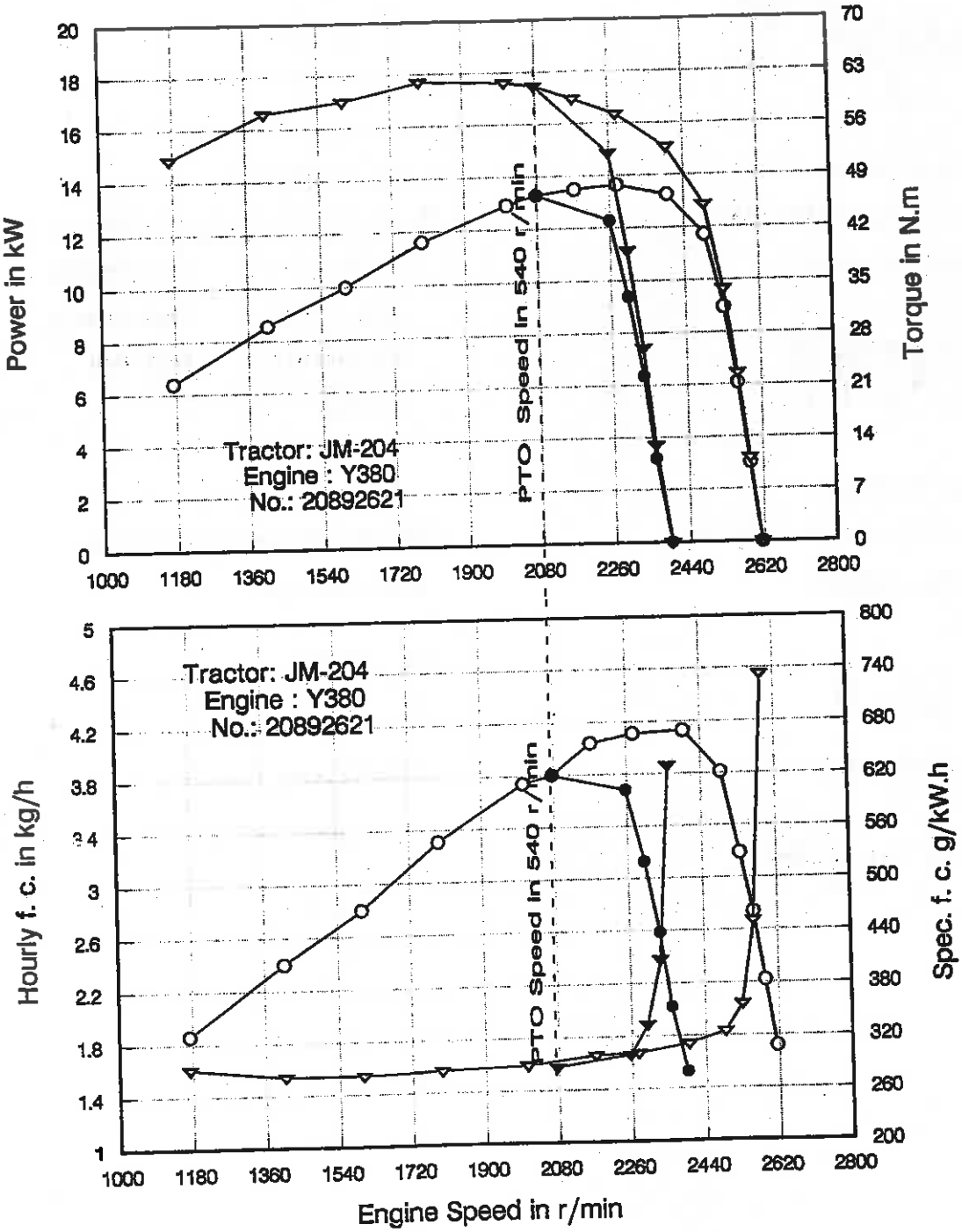


Fan Jianhua

Date: Oct. 28 ,2002

ANNEX

MAIN POWER TAKE-OFF TEST CURVES 1



ANNEX

MAIN POWER TAKE-OFF TEST CURVES 2

