COTTEC

CHINA
OFFICIAL TRACTOR
TEST AND
EVALUATION CENTRE

Address:
Luoyang Tractor
Research Institute
Luoyang, Henan,China
Tel: 86 379 4270001
Fax: 86 379 4270817

OECD TEST REPORT OF HUANGHAI JM454(4WD)

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. 1/1 999 Full Code
Date: Sep. 06. 2002

Tested Tractor
Make: Huanghai Model: JM454 Type: 4WD

Submitted for test by
Name: Yancheng Tractor Works Address: Yancheng, Jiangsu, China Tel: 86 515 8231150 Fax:86 515 8231121

This report includes 30 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 Sep. 06,2002 Approved No. 1/1 999 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:	49.5 hours
Location of test:	COTTEC, Luoyang, Henan, China

1. SPECIFICATIONS OF TRACTOR

1.1 Identification

1.1.1 Make:	Huanghai
-Model:	JM454
-Type:	4WD
1.1.2 Numbers	
-1st Serial No.:	203801
- Serial No.:	203801
1.1.3 Other Specifications	
- Models for other countries:	None

1.2 Engine

-Make:	Lijia
-Model:	SL3105BT
-Type:	4-stroke,water cooling ,direct injection
-Serial No.:	031255

1.2.1 Cylinders

-Number:	3
-Disposition:	Vertical,in line
-Bore/Stroke:	105/117 mm/mm
-Capacity:	3039 cm^3

-Compression ratio: 17

-Arrangement of valves: Overhead,in line

-Cylinder liners: Wet

1.2.2 Supercharging **None**

1.2.3 Fuel system

-Fuel feed system: Forced feed type

-Make of fuel filter: Changlong

-Model of fuel filter: C0708

-Type of fuel filter: Paper cartridge,replaceable

-Capacity of fuel tank: 35 dm^3

-Injection pump:

. Make: Weifu

. Model/type: 3I14-left1400 cylinder plunger

. Serial No. : 10283493

-Manufacturer's production setting of injection pump:

. Flow rate(at rated engine speed and full load): 9.5 ± 0.5 dm^3 /h

.Timing: $16^0 \sim 20^0$ before T.D.C.

-Injectors:

.Make: Weifu

. Model/type: PF68S19,Long neck,Multi-hole

.Injection pressure: 18.5～19.5 MPa

1.2.4 Governor

- Make: Weifu

- Model/type: T7B,Mechanical,centrifugal

- Governed range of engine speed: 700～2375 rev/min

-Rated engine speed: 2200 rev/min

1.2.5 Air cleaner

-Pre-cleaner	None
-Main-cleaner	
.Make:	Sanhe
.Model/type:	K1317A-1 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):	J0810 Full flow, Centrifugal,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:	Φ330 mm
-Coolant capacity:	12.5 dm^3
-Type of temperature control:	Thermostat
-Superpressure system:	None

1.2.8 Starting system

-Make:	Quandian
-Model/Type:	QD143,D.C. solenoid engaged
-Starter motor power rating:	2.5 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:	Huatai
.Model/Type:	JF131A,Altermator,belt driven
.Power	0.35 kW
-Battery(number of accumulators):	
.Model/Type:	3-QA-150,Lead accumulator
.Number:	2
.Rating:	150 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):	250 mm
-Method of operation:	Mechanically actuated by pedal

1.3.2 Gear box

-Make:	Own make
-Model/Type:	HH 4×(2+1) , 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
Number of gears	4	4
Number of groups /ranges	2	1
Total of arrangements	8	4

-Available options Creeper device

1.3.3 Rear axle and final drives

-Make: Own make

-Model/Type: Helical gear type differential and single stage epicyclic 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 single stage epicyclic 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 2200 rev/min km/h
1	L-1	228.1679	2.145
2	L-2	155.3230	3.150
3	L-3	95.5385	5.122
4	L-4	72.7643	6.725
5	H-1	50.8044	9.632
6	H-2	34.5839	14.150
7	H-3	21.2730	23.003
8	H-4	16.2021	30.203
R1	R1	153.7643	3.182
R2	R2	104.6728	4.675
R3	R3	64.3846	7.600
R4	R4	49.0360	9.9791
(*)Calculted with the dynamic radius index of 590 mm(ISO 4251/1-1998).			

Number of revolutions of front wheels for one revolution of rear-wheels: 1.40

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:	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:	577 mm
-Distance from the median plane of the tractor:	0 mm
-Distance behind rear wheel axis:	393 mm
-PTO speed at rated engine speed:	595 rev/min
-Engine speed at standard power take-off speeds:	1994 rev/min
- Ratio of rotation speeds (engine speed/p.t.o. speed):	3.692
-Power restriction and maximum torque (Manufacturer' s recommendation):	32.71 kW 644.8 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:	577 mm

-Distance from the median plane of the tractor:	0 mm
-Distance behind rear wheel axis:	393 mm
-PTO speed at rated engine speed:	1073 rev/min
-Engine speed at standard power take-off speeds:	2050 rev/min
- Ratio of rotation speeds (engine speed/p.t.o. speed):	2.050
-Power restriction and maximum torque (Manufacturer' s recommendation):	32.71 kW 358.0 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:	Hydraulic,three hitch point
-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:	18±0.5 MPa
-Lift pump type:	CBN-E310L-X1 Gear pump
-Transmission between pump and engine:	Driven by engine cam shaft
-Type and number of filters:	Cartridge type,1
-Site of oil reservoir:	Transmission housing
-Tapping points:	

.Type:	Thread
.Number:	1
.Location:	Rear of tractor
-Maximum volume of oil available to external cylinders:	4 dm^3

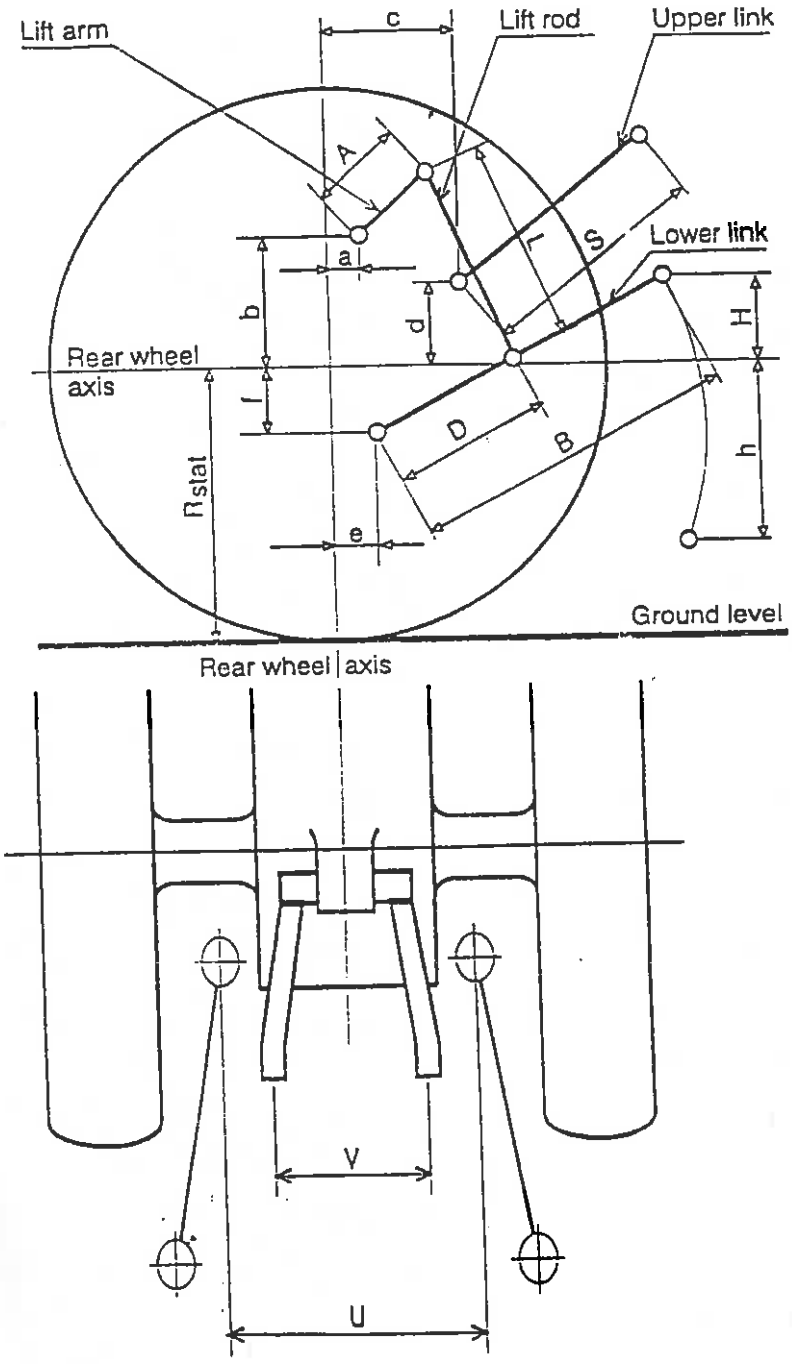
1.6 Three point linkage

-Category:	2,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)	235	235
Length of lower links	(B)	720	720
Distance of lift arm pivot point from rear wheel axis: Horizontally	(a)	-157	-157
Vertically	(b)	358	358
Horizontal distance between the 2 lower link point:	(u)	440	440
Horizontal distance between the 2 lift arms end points:	(v)	500	500
Length of uppe link:	(S)	from 535 to 700	565
Distance of upper link pivot point from rear wheel axis: Horizontally	(c)	375	375
Vertically	(d)	from 180 to 247	230
Distance of lower link pivot point from rear wheel axis: Horizontally	(e)	227	227
Vertically	(f)	160	160
Distance of lower link pivot point to lift rod pivot points on lwer links:	(D)	340	340
Length of lift rods:	(L)	from 500 to 620	540
Height of lower hitch points relative to the rear wheel axis: in low position	(h)	from 212 to 622	405
in high position	(H)	from 75 to 330	215
Height above ground of lower hitch points when locked in transport position:		from 190 to 810	-----
(*)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

Lift test-linkage geometry:



Figures 1.1

1.7 Swinging drawbar:	**None**
1.8 Trailer hitch	
-Type:	Fixed
-Hole diameter:	Φ30 mm
-Height above ground:	620 mm
-Distance of hitch point from rear wheel axis,horizontally:	677 mm
-Distance of hitch point from power take-off shaft end:	
.Vertically:	43 mm
.Horizontally:	284 mm
-Maximum vertical load:	8.0 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: 1943 mm

-Track width adjustment:

	Minimum mm	Maximum mm	Adjustment method
Front	1300	1300	None
Rear	1300	1600	Reversing wheels and off-set lug rims

1.13 Protective structure **not fitted on the tested tractor**

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	1170	130×70	198
Side lights	----	----	----
Rear lights	1410	100×70	630
Reflectors	1290	32×31	640

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	3830	1625	1925	----	2060
Unballasted	3520	1625	1925	----	2065

2.2 Ground Clearance(unballasted tractor)

-Clearance limiting part: Under the front axle 328 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	956	960	1108	1112
Rear	1090	1156	1232	1298
Total	2046	2116	2340	2410

2.4 Ballast

	Weights		Water kg
	Number	Total mass kg	
Front	4	110	—
Rear	4	184	—
Optional	—	—	—

2.5 Track specifications: **None**

2.6 Tyres and track width specifications

	Front	Rear
Tyres		
.dimensions	8.3-20	12.4-28
.ply rating	6	8
.type	Cross ply	Cross ply
.maximum load (tyre manufacturer's)	6.81 kN	14.8 kN
.maximum load (tractor manufacturer' s)	5.39 kN	12.8 kN
.inflation pressure(tyre manufacturer' s)	160kPa	170 kPa
.dynamic radius index	420 mm	590 mm
Chosen track width	1300 mm	1300 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	250	500
Gear box, rear axle and final drives	31	500	—
Front axle and final drives	7	500	—
Steering	1.3	1000	—
hydraulic system	12	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: 16

3 COMPULSORY TESTS RESULTS

3.1 Main power take-off

-Date and location of tests: Apr. 18,2002,COTTEC

-Type of dynamometer: 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						
31.77	2212	599	8.01	9.40	252.1	3.38
3.1.2 POWER AT RATED ENGINE SPEED						
31.70	2201	596	7.87	9.23	248.3	3.43
3.1.3 STANDARD POWER TAKE-OFF SPEED (540±10 rev/min)						
29.97	1994	540	7.29	8.55	243.2	3.50
3.1.4 PART LOADS 3.1.4.1 the torque corresponding to maximum power at rated engine speed						
31.70	2201	596	7.87	9.23	248.3	3.43
3.1.4.2 85 % of torque obtained in 3.1.4.1						
28.14	2297	622	7.18	8.42	255.2	3.34
3.1.4.3 75 % of torque defined in 3.1.4.2						
21.44	2334	632	5.91	6.93	275.6	3.09
3.1.4.4 50 % of torque defined in 3.1.4.2						
14.38	2348	636	4.67	5.48	324.8	2.62
3.1.4.5 25 % of torque defined in 3.1.4.2						
7.21	2356	638	3.48	4.08	482.0	1.77
3.1.4.6 Unloaded						
1.27	2363	640	2.52	2.96	—	—

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						
29.97	1994	540	7.29	8.55	243.2	3.50
3.1.5.2 85 % of torque obtained in 3.1.5.1						
26.59	2079	563	6.53	7.66	245.6	3.47
3.1.5.3 75 % of torque defined in 3.1.5.2						
20.21	2108	571	5.31	6.23	262.7	3.24
3.1.5.4 50 % of torque defined in 3.1.5.2						
13.65	2130	577	4.12	4.83	301.8	2.82
3.1.5.5 25 % of torque defined in 3.1.5.2						
6.72	2153	583	3.03	3.55	450.9	1.89
3.1.5.6 Unloaded						
1.17	2164	586	2.15	2.52	—	—

-No load maximum engine speed: 2363 rev/min

-Torque(equivalent crankshaft) at maximum power

. At rated engine speed: 137.6 Nm

.At 2-hour test: 137.6 Nm

-Maximum torque(equivalent crankshaft) : 162.2 Nm

(engine speed:1355rev.min)

Mean atmospheric conditions	
Temperature	20 ℃
Pressure	100.4 kPa
Relative humidity	49 %
Maximum Temperature:	
Coolant	78 ℃
Engine oil	107 ℃
Fuel	25 ℃
Engine air intake	20 ℃

3.2 Hydraulic power and lifting force

-Date and location of test: Apr. 20,2002 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: 22.9 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	19.7	14.4	4.73
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	20.7	14.1	4.86

-Tapping point used for test: At rear part of the tractor

-Temperature of hydraulic fluid: 65 ℃

-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	190 mm	140 mm
Vertical movement: without lifting force: with lifting force:	 620 mm 600 mm	 778 mm 755 mm
Maximum corrected force exerted throught full rang	12.50 kN	8.51 kN
Corresponding pressure of hydraulic fluid	14.4 MPa	14.4 MPa
Moment about rear wheel axle	11.84 kN.m	13.25 kN.m
Maximum tilt angle of mast from vertical	—	10.2

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-285	-235	-200	-100	0	100	200	300	365	400	470
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 16.0 MPa											
kN	—	15.51	15.26	14.68	14.04	13.41	12.97	12.76	12.50	—	—
At the frame, Corresponding pressure 16.0 MPa											
kN	14.22	—	13.93	13.30	12.74	11.86	10.91	10.10	—	9.22	8.51

3.3 Drawbar performance

-Date of tests: Apr. 21,2002

-Type of track: Concrete

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
	mm	kPa	kPa
Unballasted	628	160	170
Ballasted	623	160	170

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	9.53	17.59	1.95	2342	15.0	535	1.58	26	80	84	19	49	100.3
2	14.06	17.57	2.88	2333	14.9	391	2.16	26	80	84	19	49	100.3
3	22.76	17.43	4.70	2220	14.9	339	2.49	26	80	83	19	48	100.2
4	25.14	13.51	6.70	2200	9.5	325	2.60	26	80	83	18	49	100.2
5	26.01	9.91	9.45	2200	6.4	314	2.69	26	79	83	18	49	100.2
6	24.96	6.20	14.49	2200	5.9	338	2.50	25	79	83	18	49	100.2
3.3.2 MAXIMUM POWER IN TESTED GEARS(ballasted tractor)													
1	10.21	18.94	1.94	2340	15.1	510	1.66	27	81	85	19	50	100.3
2	15.09	18.93	2.87	2331	14.9	388	2.18	27	81	85	19	50	100.3
3	22.99	16.55	5.00	2200	11.0	351	2.41	26	80	84	19	50	100.3
4	25.19	13.72	6.61	2200	8.5	318	2.66	26	80	84	19	50	100.3
5	26.89	9.92	9.76	2200	4.8	299	2.83	26	80	84	19	50	100.3
6	25.06	6.34	14.23	2200	4.3	317	2.67	26	80	84	19	50	100.3
3.3.3 FIVE-HOUR TESTS													
3.3.3.1 FIVE-HOUR TEST at 75 % of pull at maximum power(at rated engine speed)													
5	21.79	7.45	10.29	2355	4.6	321	2.63	28	85	80	25	60	100.2
3.3.3.2 FIVE-HOUR TEST at pull corresponding to 15 % wheelslip													
2	16.19	18.92	3.08	----	----	----	----	28	85	80	24	56	100.2

Oil consumption during ten hours duration of tests 3.3.3.1 and 3.3.3.2: 48.0 g/h

3.4 Turning area and turning circle

	Without brakes	
	Right-hand	Left-hand
	m	m
Radius of turning area	4.42	4.44
Radius of turning circle	4.29	4.31

3.5 Location of centre of gravity

-Height above ground: 701 mm

-Distance from the vertical plane containing the axis of the rear-wheels: 882 mm

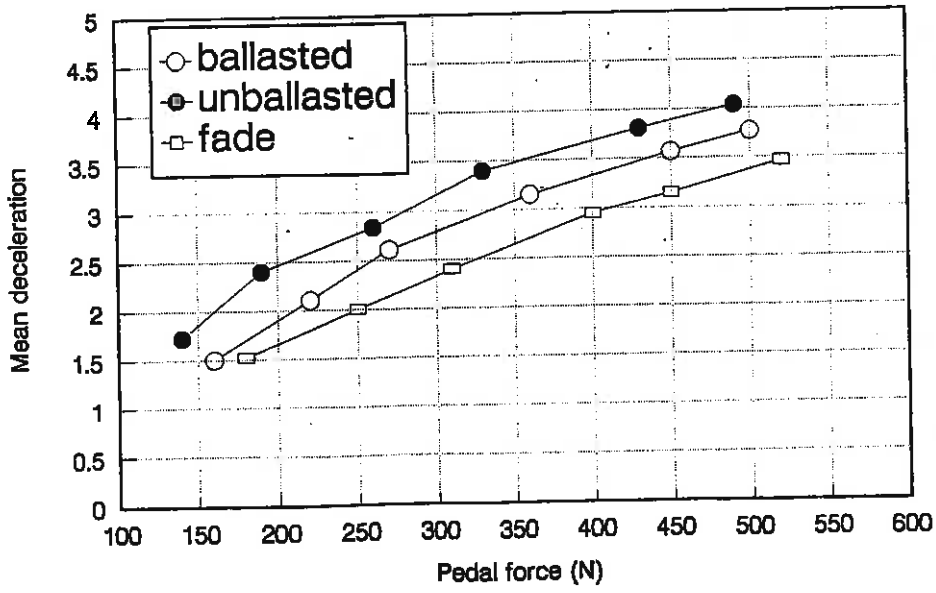
-Distance from the median longitudinal plane of the tractor: -2 mm

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

3.6 Braking

-Date of tests: Apr. 26,2002

3.6.1 Cold service braking device test



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
	km/h	kN	m/s^2
Ballasted tractor	32.6	0.16	1.50
	32.8	0.22	2.10
	32.6	0.27	2.61
	32.8	0.36	3.15
	32.9	0.45	3.57
	32.8	0.50	3.77
Unballasted tractor	32.9	0.14	1.72
	33.0	0.19	2.40
	32.9	0.26	2.84
	32.9	0.33	3.40
	33.0	0.43	3.81
	33.0	0.49	4.04

	Speed before application of brakes	Braking device control force	Minimum stopping distance without locking the wheels
	km/h	kN	m
Ballasted tractor	32.8	0.50	11.0
Unballasted tractor	33.0	0.49	10.4

3.6.2 Fade test

Speed before application of brakes km/h	Braking control force kN	Mean deceleration m/s^2
32.7	0.18	1.52
32.7	0.25	2.00
32.8	0.31	2.40
32.6	0.40	2.95
32.7	0.45	3.15
32.6	0.52	3.47

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

-Abnormal vibration: None

-Brake heating method: Driving

	Speed before application of brakes	Braking device control force	Minimum stopping distance without locking the wheels
	km/h	kN	m
Ballasted tractor	32.6	0.52	11.8

3.6.3 Parking braking device test

	Uphill	Downhill
Braking device control force	0.39 kN	0.39 kN

3.7 Measurement of external noise

-Date of tests: Apr. 26,2002

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

-Type of track: Concrete

-Gear number: 8

-Travelling speed before accceleration: 24.6 km/h

-Sound level: 87.5 dB(A)

4 OPTIONAL TEST RESULTS

4.1 Low temperature starting

-Date of tests:	Apr. 28,2002
-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:	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 ℃

5 REPAIRS

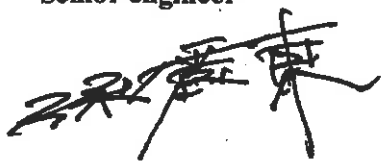
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6 REMARKS

None

Director of the COTTEC

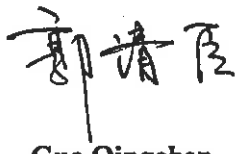
Senior engineer



Sun zhendong

Vice-director of the COTTEC

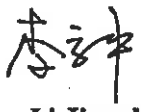
Senior engineer



Guo Qingchen

Vice-director of the COTTEC

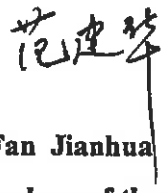
Senior engineer



Li Jingzhong

Responsible engineer for these tests:

Senior engineer



Fan Jianhua

Members of the tractor test board:

Shen Jilan	**Xie Zhiqiao**
Wang Dailin	**Yan Xiaofang**
Sun Zhennan	**Gao Jian**
Zhen zhigang	**Liu Hui**

Editor for the test report publish:

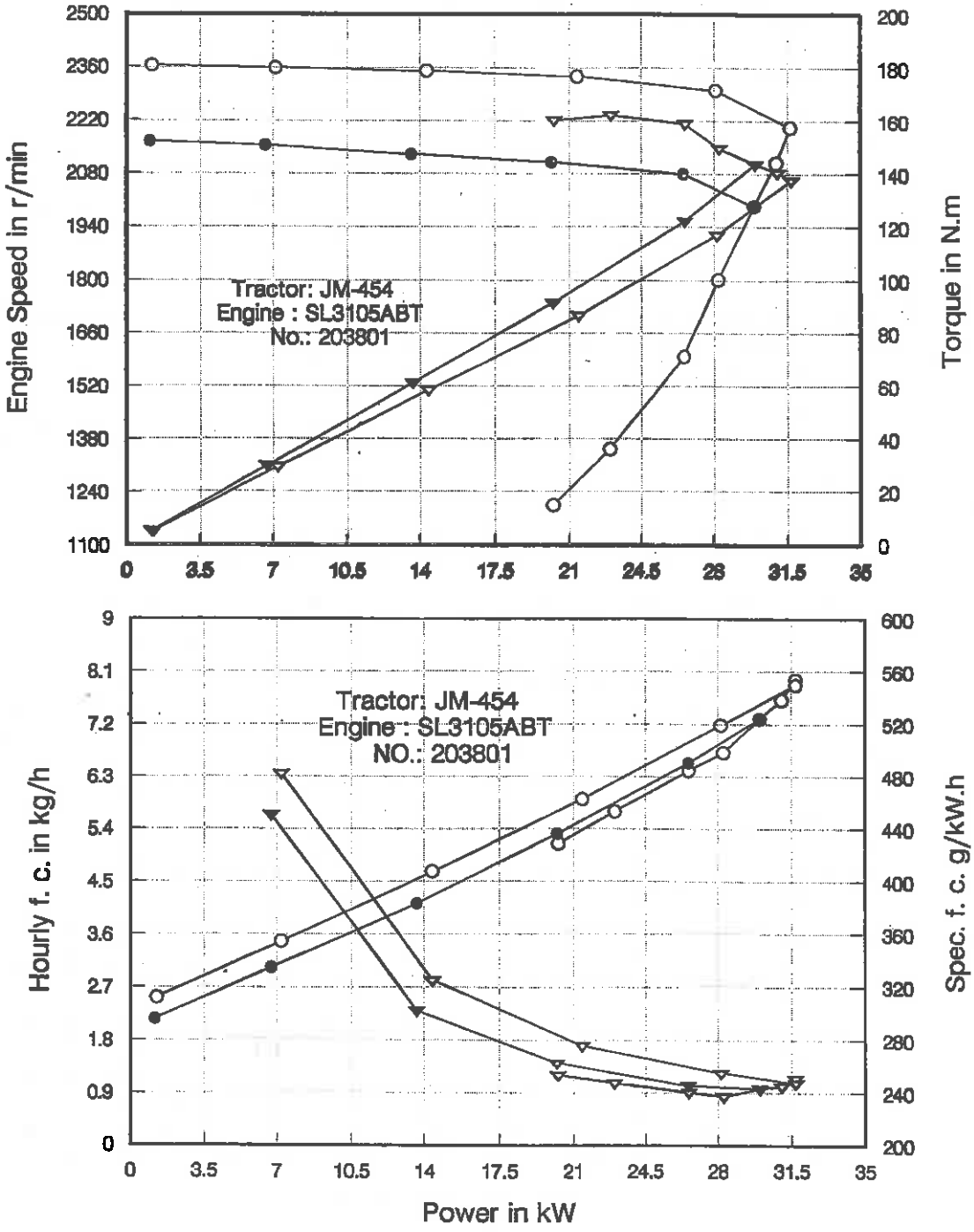
Senior engineer

Fan Jianhua

Date: June 18,2002

ANNEX

MAIN POWER TAKE-OFF TEST CURVES 1



ANNEX

MAIN POWER TAKE-OFF TEST CURVES 2

