COTTEC

CHINA
OFFICIAL TRACTOR
TEST AND
EVALUATION CENTRE

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OECD TEST REPORT OF JIANGSU – 650(2WD) AGRICULTURAL TRACTOR(CODE Ⅰ)

Report on test in accordance with the OECD standard code for the official testing of agricultural tractor performance(C(87)53(Final), Code Ⅰ)



OECD Approval
No.1/1 872 Full Code
Date Jan.5, 2000

Tested Tractor
Make: JIANGSU
Model: 650
Type: 2WD

Submitted for test by
Name: Yituo Qingjiang Tractor Co., Ltd
Address: Huaiyin, Jiangsu, China
Tel: 86 517 3932141
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This report includes 25 pages and may only be duplicated as a whole

JS – 650 COTTEC Test No.9901 OECD No.1/1 872

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This report has been approved by the OECD Co-ordinating Centre (CEMAGREF) in Antony (France) on Jan.5,2000 Approved No.1/1 872 Full code

JS – 650 COTTEC Test No.9901 OECD No.1/1 872

Tractor manufacturer's name and address:	Yituo Qingjiang Tractor Co. Ltd Huaiyin, 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:	48 hours
Location of test:	COTTEC, Luoyang, Henan, China

SPECIFICATIONS OF TRACTOR

TRACTOR

—Make:	JIANGSU
—Model:	650
—Type:	2WD
—Number of driving wheels:	2
—Serial No.:	1761
—1st Serial No.:	1761

ENGINE

—Make:	China Yituo Group Co. Ltd Diesel Engine Co. Ltd
—Model:	LR4105T7
—Type:	4-stroke, water cooling, direct injection
—Serial No.:	9908648

Cylinders

—Number:	4	
—Disposition:	Vertical, in line	
—Bore/Stroke:	105/125	mm
—Capacity:	4330	cm^3
—Compression ratio:	17:1	
—Arrangement of valves:	Overhead, in line	
—Cylinder liners:	Wet	

Fuel system

—Fuel feed system:	Forced feed type	
—Fuel filter:		
·Make:	Yangzhou Agricultural Machinery Accessory Works	
·Model/type:	C07085, replacealbe paper catridge	
—Capacity of fuel tank:	53	dm^3
—Injection pump		
·Make:	China Yituo Group Co. Ltd. Pump and Injector works	
·Model/type:	plunger I Serial, 4 – cylinder	
·Serial No.:	002	
—Manufacturer's production setting of injection pump:		
· Flow rate (at rated engine speed and full load):	13.61	dm^3/h
·Timing:	20 ± 1°before T.D.C.	
—Injectors:		
·Make:	China Yituo Group Co., Ltd. Pump and Injector works	
·Model/Type:	Long-neck, single hole	
·Injection pressure:	20.1 ± 0.5	MPa

Governor

—Make:	China Yituo Group Co., Ltd. Pump and Injector works	
—Model/type:	Mechanical, centrifugal	
—Governed range of engine speed:	600 ~ 2380	rev/min
—Rated engine speed:	2200	rev/min

Air cleaner

—Pre-cleaner:	None	
—Main-cleaner:		
·Make:	Bangbu Air-Cleaner Works	
·Model/Type:	Oil bath	
·Location of air intake:	Left-hand side of engine	
·Maintenance indicator:	None	

Lubrication system

—Type of feed pump:	JX0811A Gear pump	
—Type & Number of filter(s):	FL100 Full flow, Centrifugal, 1	

Cooling system

—Type of coolant	Water	
—Type of pump:	Centrifugal, belt driven	
—Description of fan:	Axial flow type, belt driven,	
—Number of fan blades:	6	
—Fan diameter:	450	mm
—Coolant capacity:	17	dm^3
—Type of temperature control:	Thermostat	
—Superpressure system	None	

Starting system

—Make:	Hubei Automobile Electrical Machinery Factory	
—Model/Type:	QD154E D.C. solenoid pre-engaged	
—Starter motor power rating:	3.7	kW
—Cold starting aid:	Electrothermic plug or preheater	
—Safety device:	Main shift lever in neutral position	

Electrical system

—Voltage:	12(Negative earth)	V
—Generator:		
·Make:	Hubei Automobile Electrical Machinery Factory	
·Model/Type:	JFZ15219A, alternator, belt driven	
·Power:	0.70	kW
—Battery(number of accumulators):		
·Model/Type:	3-Q(A)-150, Lead accumulator	
·Number:	2	
·Rating:	150	Ah at 20 hour rating

Exhaust system

—Make:	Own make	
—Model/Type:	JS－650, expension type silencer	
—Location:	Right-hand side of engine, vertical	

TRANSMISSION TO WHEELS

Clutch

—Make:	Own make	
—Model/Type:	Dry, dual-acting, Single plate	

—Number of plate(s): 2
—Diameter of plate(s): 280 mm
—Method of operation: Mechanically by pedal

Gear box

—Make: Own make
—Model/Type: JS – 650, Spur gear mechanical

– Description

	Forward	Reverse
Number of gears	4	1
Number of ranges/groups	Low/High	Low/High
Total of arrangements	8	2

– Available options: None

Rear axle and final drives

—Make: Own make
—Model/Type: Crown wheel and pinion bevel gear differential, spur gear final drives

—Differential lock:
- Type: Mechanical
- Method of engagement: Manual by lever
- Method of disengagement: Self-disengaging

Front axle and final drives

—Make: Own make
—Model/Type: Balanced arm type, telescopic axle

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	227.91	2.42
2	L	151.52	3.64
3	L	92.85	5.94
4	L	68.86	8.01
1	H	56.98	9.68
2	H	37.88	14.56
3	H	23.23	23.74
4	H	17.21	32.05
R_1	L	172.9	3.19
R_2	H	43.19	12.77
(*) Calculated with a tyre dynamic radius index of 665mm(ISO 4251/1－1992)			

POWER TAKE-OFF

Main power take-off

—Type: Semi-independent
—Method of engagement: By hand lever
—Number of shafts: 1
—Method of changing power take-off shaft ends and speeds: Manually by exchanging p.t.o shafts

Power take-off proportional to engine speed
540 rev/min

—Location: At rear of the tractor
—Diameter of power take-off shaft end: Φ34.79 mm
—Number of splines: 6, in conformity with ISO 500/1991
—Height above ground: 580 mm
—Distance from the median plane of the tractor: 0 mm
—Distance behind rear wheel axis: 235 mm
—PTO speed at rated engine speed: 634 rev/min
—Engine speed at standard power take-off speed: 1872 rev/min

—Ratio of rotation speeds (engine speed/p.t.o.speed):	3.47	
—Power restriction and maximum torque: (Manufacturers recommendation)	43kW　900N.m	
—Direction of rotation (viewed from behind tractor):	Clockwise	
1000 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:	580	mm
—Distance from the median plane of the tractor:	0	
—Distance behind rear wheel axis:	235	mm
—PTO speed at rated engine speed:	1150	rev/min
—Engine speed at standard power take-off speed:	1913	rev/min
—Ratio of rolation speeds (engine speed/P.T.O.Speed):	1.91	
—Power restriction and maximun torque:	43kW　500N·m	
—Direction of rotation (Viewed from behind tractor):	Clockwise	
Power take-off proportional to ground speed:	None	

Optional Power Take-off:

– Location:	At rear of the tractor		
– Diameter of power take-off shaft end:	38		mm
– Number of splines:	6, not in conformity with ISO 500/1991		
– Height above ground:	710		mm
– Distance from the median plane of the tractor:	0		mm
– Distance behind rear wheel axis:	224		mm
– PTO speed at rated engine speed:	808(L)	1075(H)	rev/min
– Engine speed at standard power take – off speed:	1470(L)	2045(H)	rev/min
– Ratio of rotation speeds (engine speed/p.t.o.speed):	2.72(L)	2.05(H)	
– Power restriction and maximum torque: (Manufacturers recomendation)	43kW	750N·m	

－Direction of rotation(viewed from behind tractor): Clockwise

Power take-off proportional to ground speed: None

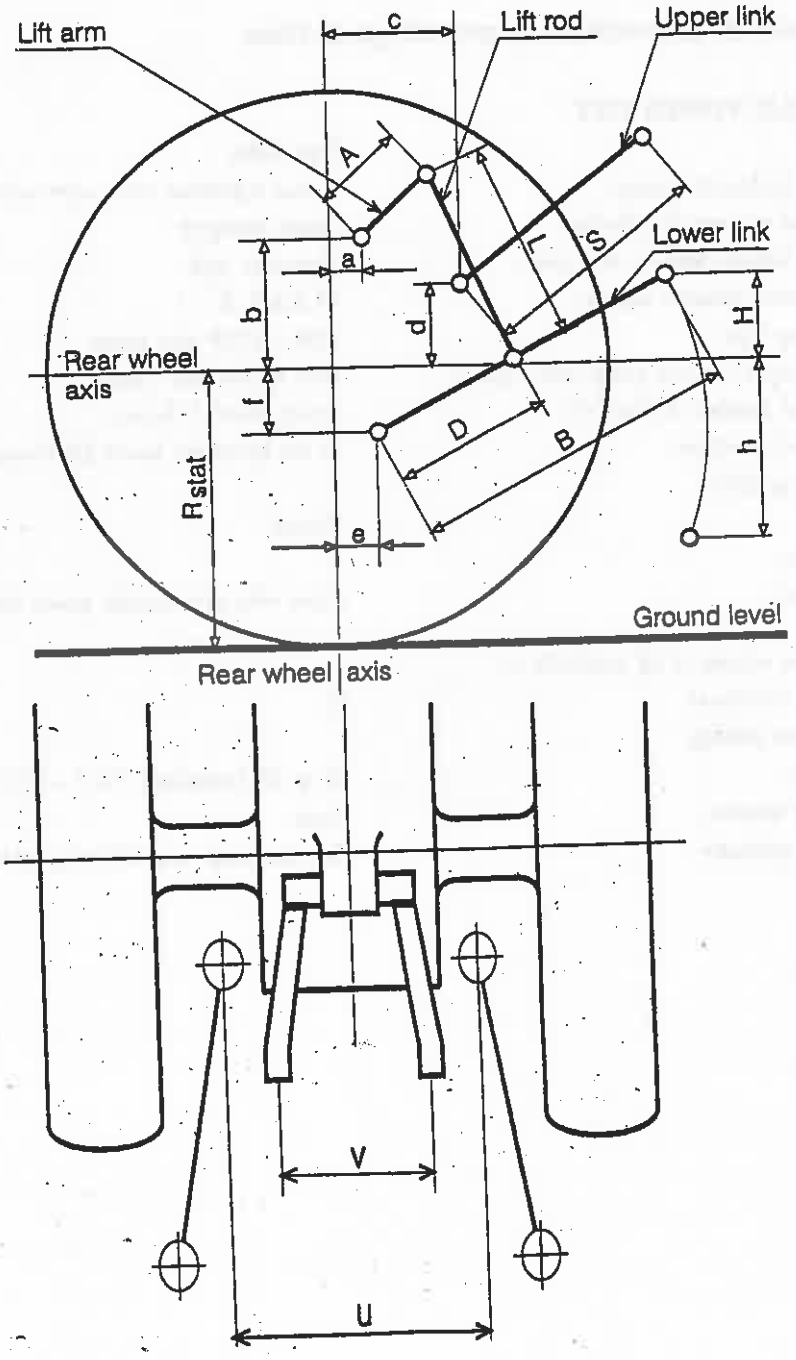
HYDRAULIC POWER LIFT

—Make:	Own make	
—Type of hydraulic system:	Partial separated units, open centre system	
—Type and number of cylinders:	Single acting, 1	
—Type of linkage lock-for transport:	Hydraulic lock	
—Relief valve pressure setting:	17.0±0.5	MPa
—Lift pump type:	CBN－E314 gear pump	
—Transmission between pump and engine:	Gear driven from engine	
—Type and number of filter(s):	Screen filter, 1 Screen	
—Site of oil reservoir:	In the hydraulic power lift housing	
—Tapping point(s)		
·Type:	Thread	
·Number:	1	
·Location:	Front side of hydraulic power Lift housing	
－Maximum volume of oil available to external cylinders:	15	dm^3

Three point linkage

—Category:	Ⅱ to ISO standard 730/1－1990	
—Category adapter:	None	
—Linkage geometry:	See next page and following table	

Lift test – Linkage geometry:



		Dimension or range (*)	Setting used in test
		mm	mm
Length of lift arms	(A)	230	230
Length of lower links	(B)	900	900
Distance of lift arm pivot Horizontally	(a)	55	
pivot from rear wheel axis: Vertically	(b)	304.5	
Horizontal distance between the 2 lower link points:	(u)	490	
Horizontal distance between the 2 lift arm end points	(v)	508	508
Length of upper link	(S)	from 474 to 660	600
Distance of upper link pivot Horizontally	(c)	290	290
point from rear wheel axis: Vertically	(d)	154,228	191
Distance of lower link pivot Horizontally	(e)	– 6	– 6
point from rear wheel axis: Vertically	(f)	230	230
Distance of lower link pivot points to lift rod pivot points on lower links	(D)	450	450
Length of lift rods	(L)	from 590 to 680	620
Height of lower hitch points relative to the rear wheel axis:			
in low position	(h)	from 385 to 620	465
in high position	(H)	from 100 to 265	206
Height above ground of lower hitch points when locked in transport position		Any height within lift range	

(*) Assuming(r) with a type dynamic radius index of 665mm(ISO4251/1 – 1992)

TRAILER HITCH

—Type:	Fixed	
—Hole diameter:	Φ34	mm
—Height above ground:	580	mm
—Distance of hitch point from rear wheel axis, horizontally:	714	mm
—Distance of hitch point from power take-off shaft end:		
·Vertically:	287	mm
·Horizontally:	480	mm
—Maximum vertical permissible load:	15	kN

STEERING

—Make: Own make

—Model/Type: BZZI－100, Hydrostatio, steering system

—Method of operation: Manual operated

BRAKES

—Make: Own make

—Model/Type Dry, double plates

—Method of operation: By pedals,

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

Parking brake

—Type: Mechanical

—Method of operation: By Pedals locked by ratchet

WHEELS

—Number

·Front: 2, steering

·Rear: 2, driving

—Wheelbase: 2015 mm

—Track width adjustment:

	Minimum mm	Maximum mm	Adjustment method
Front	1300	1600	Telescopic axle
Rear	1350	1650	Reversing wheels and Off-set lug rims

PROTECTIVE STRUCTURE

—Make/Model/Type: not applicable

—Manufacturer's name and address: not applicable

—Protective device: not applicable

DRIVER'S SEAT

—Make: Own make

—Model/Type: C1M3 Adjustable suspension

—Seat and steering wheel reversible: No

—Type of suspension: Spring with damper

—Type of damping Hydraulic damper

—Range of adjustment:

·Longitudinal: 70 mm

·Vertical: 0 mm

—Safety belt: No

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MISCELLANEOUS

—Additional seat:　None

LIGHTING

	Height above ground of center mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headlight	1386	140×90	210
Sidelight	1405	135×65	670
Rearlight	1382	Φ150	700
Brakelight	1380	Φ100	700

TEST CONDITIONS

OVERALL DIMENSIONS

	Length mm	Width		Height at top of	
		Minimum mm	Maximum mm	protective structure mm	exhaust silencer mm
Ballasted	3630	585	1920	—	2353
Unballasted	3630	485	1850	—	2350

GROUND CLEARANCE(unballasted tractor):

—Clearance limiting part:　Under the front axle　385　mm

TRACTOR MASS

Without protective structure:

	Unballasted		Ballasted	
	Without driver	With driver	Without driver	With driver
	kg	kg	kg	kg
Front	930	958	1000	1024
Rear	1346	1386	1894	1940
Total	2276	2344	2894	2964

BALLAST

	Weights		Water kg
	Number	Total mass kg	
Front	4	70	—
Rear	12	550	—
Optional	—	—	—

TYRE SPECIFICATIONS

	Front	Rear
Tyres:		
Dimensions	6.50 – 20	14.9 – 30
Ply rating	6	6
Type	Cross ply	Cross ply
Maximum load(tyre manufacturer's)	7.2kN	16.4kN
Inflation pressure(tyre manufacturer's)	120kPa	80kPa
Dynamic radius index	404mm	665mm
Chosen track width:	1330mm	1450mm

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OILS AND LUBRICATION

Capacity and change interval:

	Capacity dm^3	Oil change h	Filter change h
Engine	17	125	125
Gear box	20	1000	—
Rear axle	Common with gear box		—
Final drive(rear)	5.8	1000	—
Hydraulic system	12	1000	—
Steering	2.5	1000	—

Specifications:

	Recommended	Used during test
Engine oil		
Type:	SAE 10W/30	CA – 30
Viscosity:	11.4mm^2/s at 100℃	10.0mm^2/s at 100℃
Classification:	API CC	GB 5353 – 85
Transmission oil		
Type:	SAE 80W/90	80W/90
Viscosity:	9.3mm^2/s at 100 ℃	15 ~ 19mm^2/s at 100℃
Classification:	API GL – 4	SH0350 – 92 (China standard)
Hydraulic fluid		
Type:	Same as trans.oil	Same as trans.oil
Viscosity:		
Classification:		
Steering oil		
Type:	Same as trans.oil	Same as trans.oil
Viscosity:		
Classification:		

Grease

– Type: ZFG-12 complex calcium base grease ZBE 36003-88(China standard)

– Number of lubrication points: 21

Fuel

– Type: Standard diesel fuel in conformity with GB 10327-89(China standard)

– Density at 15℃ 0.852 g/cm^3

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TEST RESULTS

COMPULSORY TESTS RESULTS

1. MAIN POWER TAKE-OFF

－Date and location of tests:　　Jul,16,1999.COTTEC

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

Power kW	Speed		Fuel consumption			Specific energy kW·h/l
	Engine rev/min	P.T.O. rev/min	Hourly		Specific g/kW·h	
			kg/h	l/h		
1.1 MAXIMUM POWER-TWO HOURS TEST						
43.82	2200	634	11.13	13.06	254	3.36
1.2 POWER AT RATED ENGING SPEED						
43.82	2200	634	11.13	13.06	254	3.36
1.3 STANDARD POWER TAKE-OFF SPEED (540 ± 10rev/min)						
42.01	1874	540	10.20	11.97	243	3.51
1.4 PART LOADS						
1.4.1 The torque corresponding to max.power at rated engine speed						
43.82	2200	634	11.13	13.06	254	3.36
1.4.2 85% of the torque obtained in 1.4.1						
37.95	2242	646	9.82	11.53	259	3.29
1.4.3 75% of the torque defined in 1.4.2						
28.89	2280	657	8.20	9.62	284	3.00
1.4.4 50% of the torque defined in 1.4.2						
19.54	2304	664	6.52	7.65	334	2.55
1.4.5 25% of the torque defined in 1.4.2						
9.91	2346	676	4.98	5.85	503	1.69
1.4.6 Unloaded						
1.21	2363	681	3.61	4.24	—	—

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Power kW	Speed		Fuel consumption			Specific energy kW·h/l
	Engine rev/min	P.T.O. rev/min	Hourly		Specific g/kW·h	
			kg/h	l/h		
1.5 PART LOADS AT STANDARD POWER TAKE – OFF SPEED 540 rev/min						
1.5.1 The torque corresponding to maximum power						
42.01	1874	540	10.20	11.97	243	3.51
1.5.2 85% of the torque obtained in 1.5.1						
36.86	1933	557	9.06	10.63	246	3.47
1.5.3 75% of the torque defined in 1.5.2						
28.29	1978	570	7.35	8.63	260	3.28
1.5.4 50% of the torque defined in 1.5.2						
19.19	2013	580	5.77	6.77	301	2.83
1.5.5 25% of the torque defined in 1.5.2						
9.78	2051	591	4.26	5.00	436	1.96
1.5.6 Unloaded						
0.94	2082	600	2.88	3.38	—	—

– No load maximum engine speed:	2363	rev/min
– Equivalent crankshaft torque at maximum power at rated engine speed	190.2	N·m
– Maximum Equivalent crankshaft torque: (Engine speed: 1329 rev/min)	239.8	N·m
– Mean atmospheric conditions		
·Temperature:	30	℃
·Pressure:	98.5	kPa
·Relative humidity:	67	%
– Maximum temperatures		
·Coolant:	78	℃
·Fuel:	31	℃
·Engine air intake:	29	℃
·Engine oil:	82	℃

2. HYDRAULIC POWER AND LIFTING FORCE

－Date and location of tests:　Jul.20,1999,COTTEC

2.1 HYDRAULIC POWER TEST

－Sustained pressure with relief valve open:　17.8　MPa

－Pump delivery rate at minimum pressure:　32.54　1/min

	Flow rate	Pressure	Power
	1/min	MPa	kW
Flow rate corresponding to a hydraulic pressure equivalent to 90 per cent of the actual relief valve pressure setting and corresponding hydraulic power	27.57	16.0	7.35
Flow rate and hydraulic pressure corresponding to max. hydraulic power	28.92	15.6	7.52

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

－Temperature of hydraulic fluid:　60　℃

－Opening pressure of the unloading valve:　None

－Closing pressure of the unlading valve:　None

2.2 POWER LIFT TEST

	At the hitch point	On the frame at the 610 mm point
Height of lower hitch points above ground in down position(with lifting force) mm	200	125
Vertical movement(with Lifting force) mm	671	960
Maximum corrected force exerted throught full range kN	21.15	11.32
Corresponding pressure of hydraulic fluid MPa	15.3	15.3
Moment about rear wheel axle kN·m	18.49	16.80
Maximum tilt angle of mast from vertical degrees	—	24.4

—Linkage setting for test: see above table and figures

Lifting heights relative to the horizontal plane inculding the lower link pivot points												
mm	－310	－300	－235	－200	－100	0	＋100	＋200	＋300	＋400	＋416	＋500
Lifting forces (the values of force measured are corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting of the hydraulic lift system).												
At the hitch point kN	－	－	26.35	27.06	27.78	26.67	25.93	24.80	23.82	21.93	21.15	－
Corresponding pressure: 15.3 MPa												
At the frame kN	21.79	21.74	－	21.00	20.15	19.11	17.90	16.59	15.33	14.04	—	11.32
Corresponding pressure: 15.3 MPa												

3. DRAWBAR PERFORMANCE

—Date of tests: 27th July. 1999

—Type of track: Concrete

Height drawbar above ground: :
Unballasted: 550 mm
Ballasted: 545 mm

Tyre inflation pressure:
Front: 220 kPa
Rear: 90 kPa

Gear and range	Power kW	Drawber pull kN	Speed km/h	Engine speed rev/min	Slip of wheels %	Specific fuel Consumption g/kW·h	Sencific energy kW·h/l	Temperature			Atmospheric conditions		
								Fuel ℃	Coolant ℃	Engine oil ℃	Temperature ℃	Relative humidity %	Pressure kPa
3.1 MAXIMUM POWER IN TESTED GEARS(unballasted tractor)													
3L	24.34	16.85	5.20	2262	15.1	353	2.41	30	77	78	28	69	99.0
4L	32.08	16.76	6.89	2216	14.9	330	2.58	30	77	79	28	69	99.0
1H	37.03	15.59	8.55	2200	12.0	302	2.82	31	78	80	28	69	99.0
3.2 MAXIMUM POWER IN TESTED GEARS(ballasted tractor)													
1L	12.53	20.69	2.18	2310	14.9	481	1.77	31	76	78	29	70	99.2
2L	18.77	20.86	3.24	2290	15.1	393	2.17	32	77	80	29	70	99.2
3L	29.90	20.82	5.17	2234	15.0	331	2.57	32	77	80	29	70	99.2
4L	35.74	17.87	7.20	2200	10.8	315	2.70	32	78	80	30	70	99.2
1H	38.39	15.65	8.83	2198	9.1	296	2.88	32	78	80	30	70	99.2
3.3 TEN – HOUR TEST(ballasted tractor)													
3.3.1 FIVE – HOUR TEST at 75% of pull at maximum power													
4L	28.18	13.40	7.57	2246	8.2	329	2.59	29	76	77	28	68	99.1
3.3.2 FIVE – HOUR TEST at pull corresponding to 15% wheelslip without additional ballast													
3L	30.32	20.79	5.25	2234	15.0	—	—	30	77	80	28	68	99.1

Oil consumption during ten hours duration of tests 3.3.1 and 3.3.2: 40 g/h

4. TURNING AREA AND TURNING CIRCLE

Details of wheel equipment:

	Type size	Track mm
Front	6.50－20	1330
Rear	14.9－30	1450

	With brakes		Without brakes	
	Right hand	Left hand	Right hand	Left hand
	m	m	m	m
Radius of turning area	3.29	3.19	3.57	3.44
Radius of turning circle	3.14	3.04	3.42	3.29

5. LOCATION OF CENTRE OF GRAVITY

- Height above ground: 789 mm
- Distance forward from the vertical plane containing the axle of the rear wheels: 823 mm
- Distance from the median plane of the tractor: From left 2 mm

6. BRAKING

- Date of tests: 28th Jul., 1999
- Type of track: Concrete
- Speed before application of brakes: 34.3 km/h

6.1 COLD SERVICE BRAKING DEVICE TEST

Ballasted	Braking device control force N	120	200	295	350	400	450	500
	Mean deceleration m/s^2	0.29	1.12	2.21	2.89	3.20	3.25	3.29
Unballasted tractor	Braking device control force N	160	250	300	350	400	450	500
	Mean deceleration m/s^2	0.84	1.83	2.44	3.13	3.32	3.36	3.40

6.2 FADE TEST

Ballasted tractor	Braking device control force N	170	260	300	350	410	440	500
	Mean deceleration m/s^2	0.51	1.41	1.95	2.45	2.86	2.95	3.02

- Maximum deviation of tractor from its original course: 0 mm
- Abnormal vibration: None
- The brakes were heated by: Driving

6.3 PARKING BRAKING DEVICE TEST

	Uphill	Downhill
Braking device control force	0.28kN	0.30kN

7. MEASUREMENT OF EXTERNAL NOISE LEVEL

- Date of tests: 28th Jul., 1999
- Sound level meter, Make/Model/Type: B & K 2209
- Type of track: Concrete
- Gear number: 8(H4)
- Traveling speed before acceleration: 23.5 km/h
- Sound level: 85.0 dB(A)

OPTIONAL TEST RESULTS

8. LOW TEMPERATURE STARTING

—Date of tests: Aug.4, 1999

—Detail of the starting aids used for the tests.
battery included: None

—Fuel/petrol
- Type: －20#
- Octance or cetane number: ＞50
- Pour-point and other specification: －30 ℃

—Engine oil
- Type: 5W/30CD
- Viscosity and other specifications: 12.5－16.3 cst. at 100℃

—Test results
- Starting procedure used the tests: CODE Ⅰ
- Lowest temperature at which the engine started: －10.2 ℃

JS－650　　COTTEC　Test No.9901　　OECD No.1/1 872

REPAIRS AND ADJUSTMENTS DURING TESTS:

None

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

Lu Zhenzhou

Vice-director of the COTTEC
Senior engineer

Lang Zhizhong

Vice-director of the COTTEC
Senior engineer

Guo Qingchen

Responsible engineer for these tests:
Senior engineer

Fan Jianhua

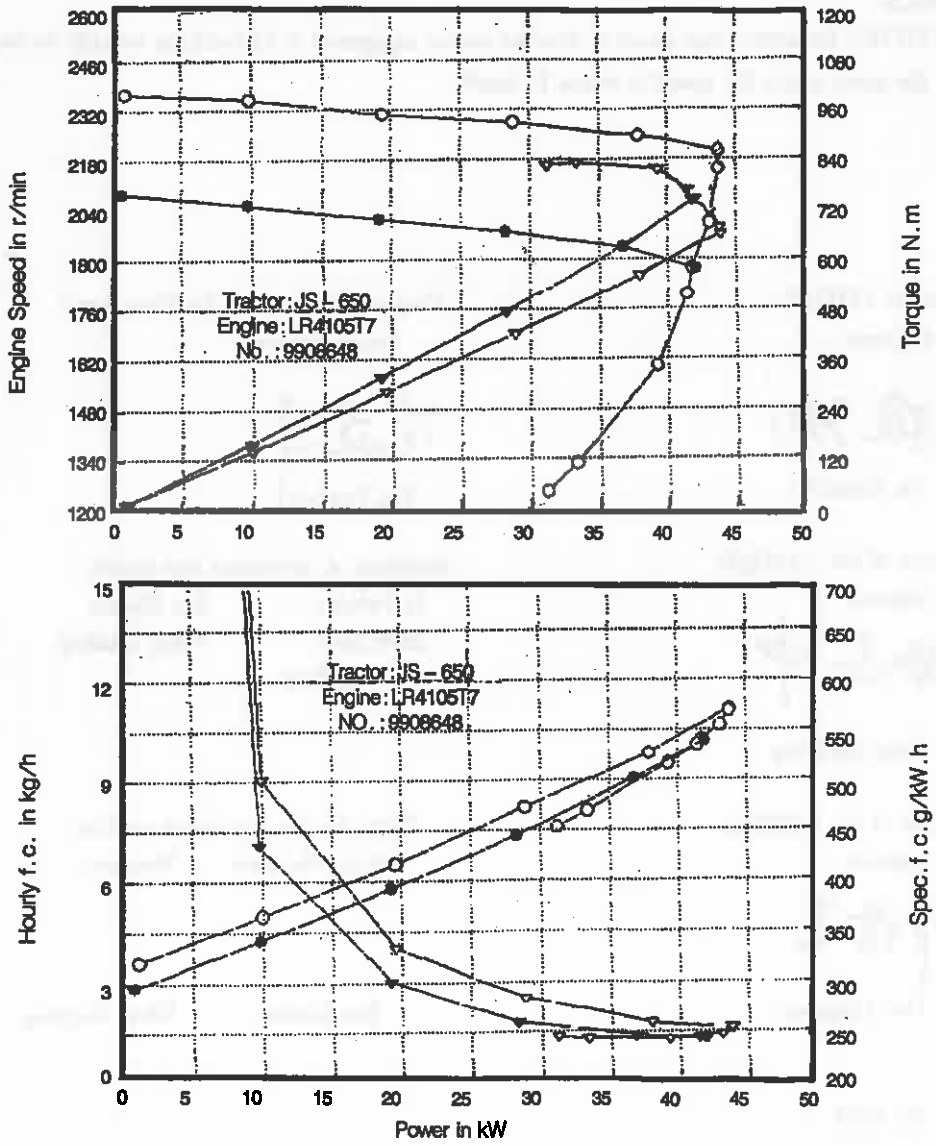
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Yan Xiaofang

Editor for the test roport publish:
Senior Engineer　　Engineer

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Date: Oct.30, 1999

ANNEX I
MAIN POWER TAKE-OFF TEST CURVES



JS – 650 COTTEC Test No. 9901 OECD No. 1/1 872

MAIN POWER TAKE-OFF TEST CURVES

