COTTEC

CHINA
OFFICIAL TRACTOR
TEST AND
EVALUATION CENTRE

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OECD TEST REPORT OF YTO-454 AGRICULTURAL TRACTOR (CODE 2)

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



OECD Approval
No.: 2/2 399
Date: Feb.19,2008

Tested Tractor
Make: YTO Model: YTO-454 Type: 4WD Speed version: 30 km/h

Submitted for test by
Name: China YTO Group Co., Ltd Address: Luoyang, Henan, China Tel: 86 379 64960764 Fax: 86 379 64969800

This report includes 23 pages and may only be duplicated as a whole

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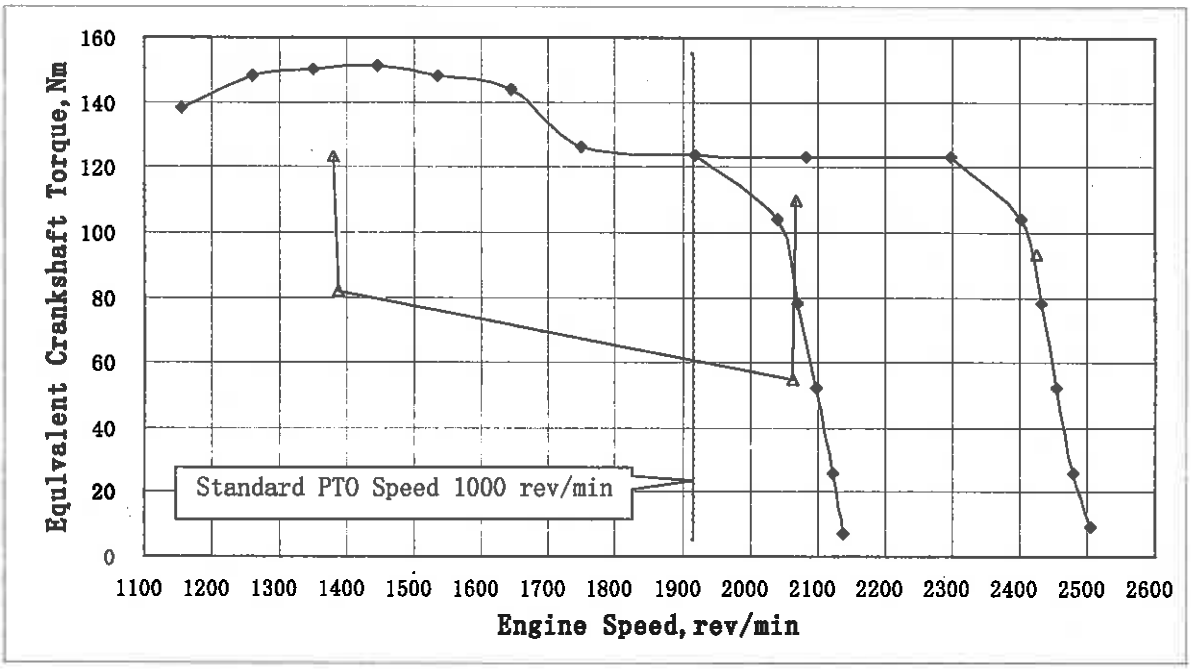
ANNEXⅢ Main power take-off test curves 3....23

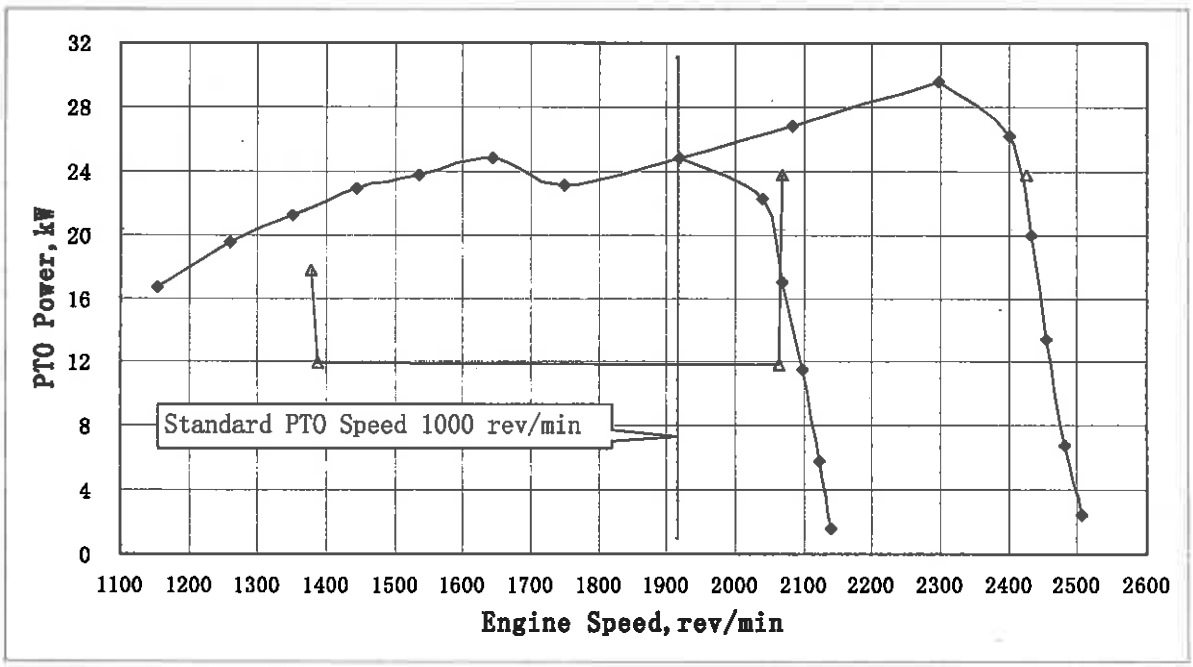
	Note: Units shown below, which appear in ISO 1000:1992; Amdl:1998, shall be stated and followed by national units in parenthesis	
C[1]	Tractor manufacturer's name and address:	China YTO (Yituo) Group Co., Ltd, Luoyang,Henan, China
D[1]	-Location of tractor assembly:	The manufacturer
D	-Submitted for test by:	The manufacturer
C	-Selected for test by:	The manufacturer with the agreement of the COTTEC
D	-Place of running-in:	COTTEC, Luoyang, Henan, China
D	-Duration of running-in:	49.5 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:	YTO
C	-Model (trade name):	YTO-454
C	-Type:	4WD
	1.1.2 Numbers	
D	-1st Serial No or prototype:	0707467
C	- Serial No.:	0707467
	1.1.3 Other Specifications	
D	- Models for other countries:	东方红-454
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:	ZHEJIANG XINCHAI POWER CO.,Ltd
C	-Model:	495BT
C	-Type:	4-stroke,water cooling ,Vertical, direct injection
C	-Serial No.:	0710366
	1.2.1 Cylinders	
C	-Number:	4
C	-Disposition:	Vertical, in line
D	-Bore/Stroke:	95 mm /105 mm
D	-Capacity:	2977 cm^3
D	-Compression ratio:	18.5
D	-Arrangement of valves:	Overhead, in line
D	-Cylinder liners:	Dry
	1.2.2 Supercharging	None

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.

ANNEX I

Main power take-off test curves 1





	1.2.8 Starting system	
C	-Make:	Ningbo Huatai
C	-Model/Type:	QDJ1308L, solenoid engaged
D	-Starter motor power rating:	3.7 kW
C	-Cold starting aid:	None
C	-Safety device:	Forward and reverse lever in neutral position
	1.2.9 Electrical system	
C	-Voltage:	12 V (Negative earth)
	-Generator:	
C	.Make:	Changzhou Shenguang
C	.Model/Type:	JF131AW, altermator, belt driven
D	.Power	0.35 kW
	-Battery of accumulators:	
C	.Number:	1
D	.Rating:	135 Ah at 20 hours rating
	1.2.10 Exhaust system	
C	-Make:	Yi Chuan JuXing
C	-Model/Type:	YT2100,expansion type, silencer
C	-Location:	Right-hand side of the engine, vertical
	1.3 Transmission	
	1.3.1 Clutch (Travel and PTO)	
D	-Make:	Weifang Baocheng
D	-Model/Type:	Dry, dual (for travel and PTO)
D	-Number of plates:	1
D	-Diameter of plates:	254 mm
C	-Method of operation:	Mechanically actuated by pedal
	1.3.2 Gear box	
D	-Make:	Own make
D	-Model/Type:	YT (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	None

	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, two planet gear
C	.Method of engagement:	Mechanically actuated by pedal
C	.Method of disengagement:	Mechanically actuated by pedal
	1.3.4 Front axle and final drives	
D	-Make:	Own make
D	-Model/Type:	Helical gear type differential and full closed bevel 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 2300 rev/min km/h	
C		1	L	206.164	2.48	
C		2		142.138	3.60	
C		3		91.301	5.60	
C		4		67.566	7.57	
C		1	H	47.982	10.66	
C		2		33.081	15.46	
C		3		21.249	24.08	
C		4		15.726	32.53	
C		1	R	138.936	3.68	
C		2		95.788	5.34	
C		3		61.529	8.31	
C		4		45.534	11.24	
		(*) Calculated with the dynamic radius index of 590 mm (ISO 4251-1:2005)				

C	-Number of revolutions of front wheels for one revolution of rear-wheels:	1.405
	1.4 Power take-off	
	1.4.1 Main power take-off	
C	-Type:	Semi-independent
C	-Method of engagement:	By hand lever
C	-Number of shafts:	1
C	-Method of changing power take-off shaft ends and 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 500-1:2005, ISO 500-2:2004, ISO 500-3:2004
C	-Height above ground:	575 mm
C	-Distance from the median plane of the tractor:	0 mm
C	-Distance behind rear wheel axis:	440 mm
C	-PTO speed at rated engine speed:	627 rev/min
C	-Engine speed at standard power take-off speeds	1980 rev/min
C	-Ratio of rotation speeds (engine speed/PTO speed):	3.667
D	-Power restriction:	34.0 kW
D	-Maximum torque transmissible:	750 Nm
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, in conformity with ISO 500-1:2005, ISO 500-2:2004, ISO 500-3:2004
C	-Height above ground:	575 mm
C	-Distance from the median plane of the tractor:	0 mm
C	-Distance behind rear wheel axis:	440 mm
C	-PTO speed at rated engine speed:	1200 rev/min
C	-Engine speed at standard power take-off speeds	1917 rev/min
C	-Ratio of rotation speeds (engine speed / PTO speed):	1.917
D	-Power restriction:	34.0 kW
D	-Maximum torque transmissible:	400 Nm
C	-Direction of rotation (viewed from behind tractor):	Clockwise
	1.4.1.2 Power take-off proportional to ground speed	None
	1.4.2 Optional power take-off:	None
	1.5 Hydraulic power lift	
C	-Make:	Shan Dong Hong Yu
C	-Model:	450
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±0.5 MPa
D	-Opening pressure of cylinder safety valve :	18±0.5 MPa

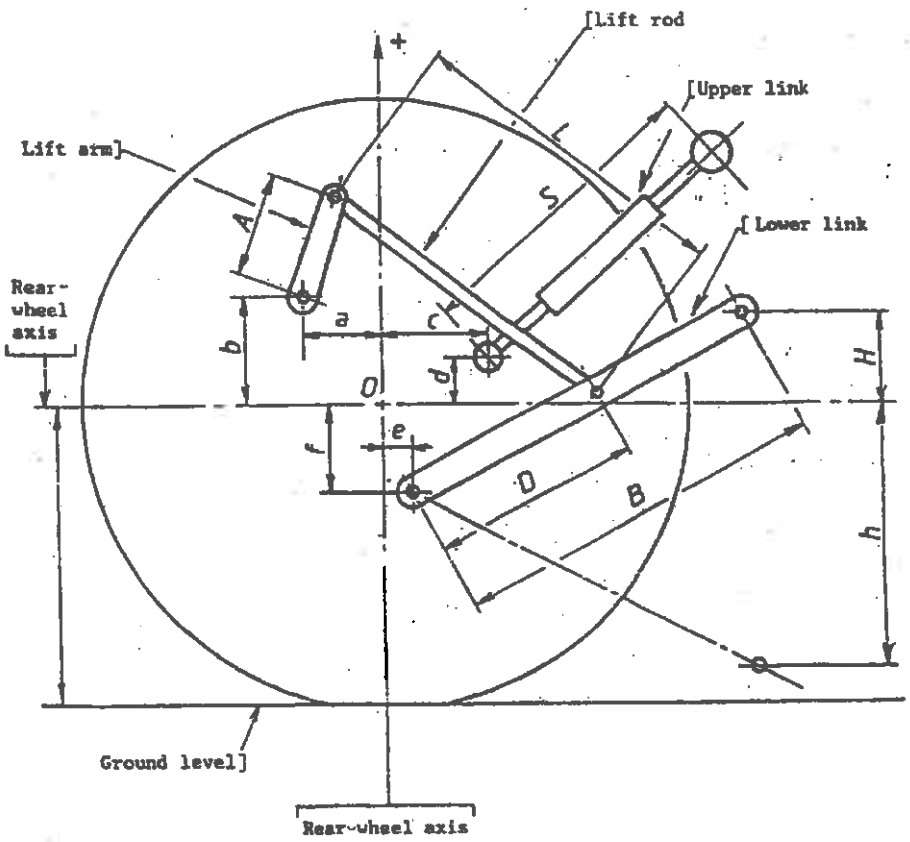
D	-Lift pump type:	Gear pump
D	-Transmission between pump and engine:	Driven by engine cam shaft
C	-Type and number of filters:	Cartridge type, 1
C	-Site of oil reservoir:	Transmission housing
C	-Type, number and location of tapping points:	Coupler pairs quick shift adaptor, At rear of tractor
D	-Maximum volume of oil available to external cylinders:	10 dm^3

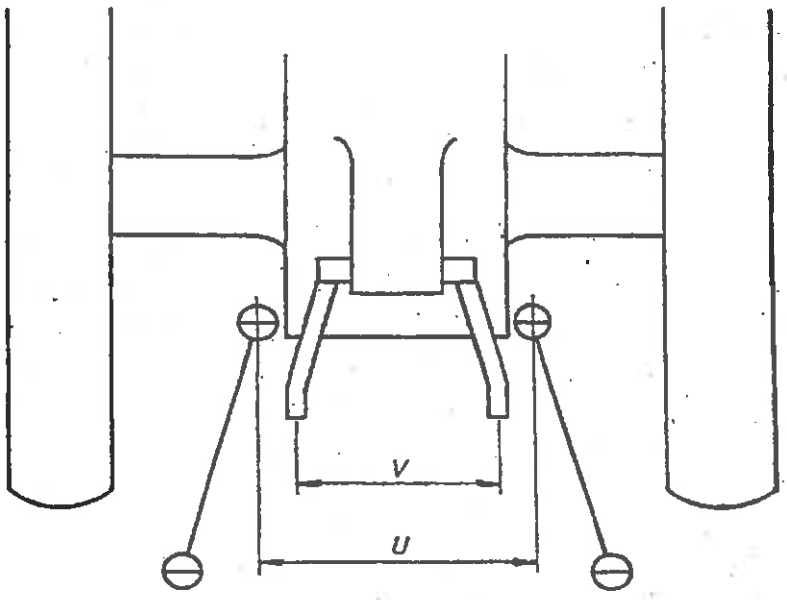
1.6 Three point linkage

C	-Category	1 ,in conformity with ISO730-1:1994+Cor.1:1995
C	-Category Adapter:	None

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

			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)	143	143
C	-Vertically	(b)	339	339
C	Horizontal distance between the 2 lower link points:	(u)	425	425
C	Horizontal distance between the 2 lift arms end points:	(v)	500	500
C	Length of upper link:	(S)	From 500 to 720	550
	Distance of upper link pivot point from rear wheel axis:			
C	-Horizontally:	(c)	361	361
C	-Vertically	(d)	160,190,220,250	250
	Distance of lower link pivot point from rear wheel axis:			
C	-Horizontally:	(e)	203	203
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 475 to 590	530
	Height of lower hitch points relative to the rear wheel axis:			
C	-in low position	(h)	From 275 to 580	393
C	-in high position	(H)	From 82 to 305	217
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 4251-1:2005			





Figures 1.1 Lift test-linkage geometry

	1.7 Swinging drawbar:	None
C	-Type:	None
	-Height above ground	
C	.Maximum	None
C	.Minimum	None
C	-Type of adjustment:	None
C	-Distance of hitch point from rear wheel axis, horizontally:	None
	-Distance of hitch point from power take-off shaft end:	
C	.Vertically:	None
C	.Horizontally:	None
	-Lateral adjustment (centre of clevis)	
C	.Right hand:	None
C	.Left hand:	None
C	-Distance of pivot point from rear wheel axis, horizontally:	None
C	-Diameter of drawbar pinhole:	None
D	-Maximum vertical permissible load:	None
	1.8 Trailer hitch	
C	-Type:	Fixed
C	-Hole diameter :	34 mm
C	-Height above ground:	614 mm
C	-Distance of hitch point from rear wheel axis, horizontally:	700 mm
	-Distance of hitch point from power take-off shaft end:	
C	.Vertically:	49 mm
C	.Horizontally:	260 mm
D	-Maximum vertical permissible load:	12.0 kN
	1.9 Holed drawbar:	None
	1.10 Steering	
D	-Make:	Jining Like
D	-Model/Type:	BZZ1-E80C, Hydrostatic steering system
	-Method of operation	
D	.Pump:	HLCB-D16/12 Gear pump
D	.Ram:	Double acting ram actuating directly on front axle
D	-Working pressure:	16 MPa
	1.11 Brakes	
	1.11.1 Service brake	
D	-Make:	Own make
D	-Model/Type:	454,Oil –immersed multi-plate discs, mechanical
C	-Method of operation:	By pedals
C	-Trailer braking take-off:	None
	1.11.2 Parking brake	
C	-Type:	Mechanical
C	-Method of operation:	Hand lever with ratchet
	1.12 Wheels	
	-Number	
C	.Front:	2, steering & driving
C	.Rear:	2, driving

C	-Wheelbase:	2010 mm
	-Track width adjustment:	

		Minimum mm	Maximum mm	Adjustment method
D	Front	1250	1250	None
D	Rear	1300	1600	Reversing wheels and off-set lug rims

1.13 Protective structure

C	-Make:	Own make
C	-Model:	E500.46.001
C	-Type:	Rear roll bar
C	-Manufacture's name and address:	Own make
	-Protective device:	
C	-Cab/frame / roll guard / other:	Rear roll bar
C	-Tiltable / not tiltable:	Tiltable
	-OECD approval	
C	.Approval number:	4/1 007
C	.Date of approval:	April 20,2007
C	.Nos. of minor modification certificates, if any:	None

1.14 Seat

1.14.1 Driver's seat

C	-Make:	YC (Yacheng)
C	-Model:	SZ550.44.001
C	-Type:	Adjustable suspension
C	-Seat and steering wheel reversible:	No
C	-Type of suspension:	Mechanical
C	-Type of damping:	Spring
	-Range of adjustment:	
C	.Longitudinal:	140 mm
C	.Vertical:	None
C	-Safety belt:	No

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	1120	130×140	280
C	Front direction lights	1210	100×70	280
C	Rear direction lights	1390	115×70	715
C	Rear Position lights	1390	85×70	600
C	Stop lights	1390	100×70	515
C	Work lights	1530	Φ130	645

2 TEST CONDITIONS

2.1 Overall dimensions

	Length	Width		Height at top of	
		Minimum	Maximum	Protective Structure	Exhaust Silencer
	mm	mm	mm	mm	mm
Ballasted	3960	1650	1955	2555	2222
Unballasted	3840	1650	1900	2557	2225

2.2 Ground Clearance (unballasted tractor)

-Clearance limiting part: Under the front axle 285 mm

2.3 Tractor mass

-Mass(with rear roll bar and full fuel tank):

	Unballasted		Ballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	916	926	1020	1032
Rear	1143	1208	1314	1377
Total	2059	2134	2334	2409

2.4 Ballast

	Weights		Water
	Number	Total mass kg	kg
Front	4	77	—
Rear	4	198	—
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)	8.0 kN	12.8 kN
.maximum load (tractor manufacturer's)	8.0 kN	12.8 kN
.inflation pressure (tyre manufacturer's)	80～120 kPa	80～120 kPa
.dynamic radius index	420 mm	590 mm
Chosen track width	1250 mm	1400 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 dm^3	Oil change h	Filter change h
Engine	12	250	250
Gear box, rear axle and final drives	20	500	—
hydraulic system	17	500	500
Front axle and final drives	8.0	500	—
Steering	1.8	500	—

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

	Recommended	Used during test
Engine oil .Type: .Viscosity: .Classification:	SAE 10W/30 11.4 cSt at 100 ℃ API-CD	Same as recommended
Transmission oil, Hydraulic fluid, Steering oil, rear axle and final drives oil, Front axle and final drives oil .Type: .Viscosity: .Classification:	SAE 80W/90 9.3 cSt at 100 ℃ API GL-4	Same as recommended

2.8.3 Grease

-Number of lubrication points: 9

3 COMPULSORY TESTS RESULTS

3.1 Main power take-off

-Date and location of tests: Sep.9, 2007, COTTEC

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

Power	Speed			Fuel consumption			Specific energy
	Engine	P.T.O	Fan	Hourly		Specific	
kW	rev/min			kg/h	l/h	g/kWh	kWh/l
3.1.1 MAXIMUM POWER-ONE-HOUR TEST							
29.62	2298	1199	3251	8.058	9.45	272.0	3.13
3.1.2 POWER AT RATED ENGINE SPEED							
29.62	2298	1199	3251	8.058	9.45	272.0	3.13
3.1.3 STANDARD POWER TAKE-OFF SPEED (1000±25 or 540±10 rev/min)							
24.83	1918	1001	2714	6.418	7.53	258.5	3.30
3.1.4 PART LOADS 3.1.4.1 The torque corresponding to maximum power at the rated engine speed							
29.62	2298	1199	3251	8.058	9.45	272.0	3.13
3.1.4.2 85% of torque obtained in 3.1.4.1							
26.24	2402	1253	3398	7.455	8.75	284.1	3.00
3.1.4.3 75% of torque obtained in 3.1.4.2							
19.94	2434	1270	3444	6.265	7.35	314.1	2.71
3.1.4.4 50% of torque obtained in 3.1.4.2							
13.41	2455	1281	3473	5.045	5.92	376.2	2.27
3.1.4.5 25% of torque obtained in 3.1.4.2							
6.78	2481	1294	3510	3.950	4.63	582.9	1.46
3.1.4.6 Unloaded							
2.46	2506	1307	3545	3.178	3.73	—	—

Power	Speed			Fuel consumption			Specific energy
	Engine	P.T.O	Fan	Hourly		Specific	
kW	rev/min			kg/h	l/h	g/kWh	kWh/l
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF (1000±25 or 540±10 rev/min)							
3.1.5.1 The torque corresponding to maximum power							
24.83	1918	1001	2714	6.418	7.53	258.5	3.30
3.1.5.2 85% of torque obtained in 3.1.5.1							
22.29	2040	1064	2886	6.023	7.07	270.3	3.15
3.1.5.3 75% of torque obtained in 3.1.5.2							
16.96	2070	1080	2929	5.000	5.87	294.8	2.89
3.1.5.4 50% of torque obtained in 3.1.5.2							
11.47	2099	1095	2970	4.015	4.71	350.2	2.43
3.1.5.5 25% of torque obtained in 3.1.5.2							
5.80	2123	1107	3004	3.070	3.60	529.5	1.61
3.1.5.6 Unloaded							
1.64	2139	1116	3026	2.420	2.84	—	—
3.1.6 PART LOADS AT DIFFERENT ENGINE SPEEDS							
3.1.6.1 Maximum power at rated engine speed							
29.62	2298	1199	3251	8.058	9.45	272.0	3.13
3.1.6.2 80% of power obtained in 3.1.6.1 at max. speed setting							
23.72	2426	1266	3432	6.928	8.13	292.1	2.92
3.1.6.3 80% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed							
23.73	2069	1079	2927	6.398	7.51	269.6	3.16
3.1.6.4 40% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed							
11.84	2064	1077	2920	4.048	4.75	342.0	2.49
3.1.6.5 60% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed							
17.78	1379	719	1951	4.625	5.43	260.2	3.28
3.1.6.6 40% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed							
11.90	1388	724	1964	3.433	4.03	288.4	2.96

-No load maximum engine speed: 2506 rev/min
-Torque(equivalent crankshaft) at maximum power
.At rated engine speed: 123.1 Nm
.At 1-hour test: 123.1 Nm
-Maximum torque (equivalent crankshaft) (engine speed: 1445 rev/min): 151.3 Nm

Mean atmospheric conditions	
Temperature	22 ℃
Pressure	100.1 kPa
Relative humidity	40 %
Maximum Temperature	
Coolant	81 ℃
Engine oil	95 ℃
Fuel	37 ℃
Engine air intake	31 ℃

3.2 Hydraulic power and lifting force

- Date and location of tests:t: Sep.19,2007, 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	rev/min	L/min	kW
Rated Engine Speed (Manufactures Specification)				2300		
3.2.1.2.1 Maximum (sustained) pressure with relief valve open as measured at the coupler Pump stalled: Yes	16.0	60.5	69.8	2462		
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	14.4	66.2		2466	24.4	5.86
3.2.1.2.3 Maximum available flow and maximum power from one coupler pair:	14.8	67.8		2464	24.1	5.94
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):	14.8	68.3		2468	24.2	5.97

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	197 mm	177 mm
Vertical movement: without lifting force:	610 mm	757 mm
with lifting force:	588 mm	730 mm
Maximum corrected force exerted through full range	15.08 kN	12.28 kN
Corresponding pressure of hydraulic fluid	14.4 MPa	14.4 MPa
Moment about rear wheel axle	13.92 kNm	18.83 kNm
Maximum tilt angle of mast from vertical	—	11.7^0

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-253	-233	-200	-100	0	100	200	300	355	400	477
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	—	15.08	15.67	16.93	17.63	17.87	18.01	18.13	18.40	—	—
At the frame, corresponding pressure 14.4 MPa											
kN	15.65	—	16.46	16.20	15.75	15.12	14.36	13.39	—	12.43	12.28

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

-Date and location of tests: Sep.14,2007, COTTEC

-Type of track: Concrete

Height of drawbar above ground mm	Tyre inflation pressure	
	Front kPa	Rear kPa
614	120	120

Gear number 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 humidity	Pressure
	kW	kN	km/h	Min^{-1}	Min^{-1}	%	g/kWh	kWh/l	℃	℃	℃	℃	%	kPa
3.3.1 MAXIMUM POWER IN TESTED GEARS														
L1	10.82	17.08	2.28	2478	3506	15.07	474	1.80	30	75	84	20	40	100.2
L2	15.81	17.19	3.31	2465	3487	15.02	404	2.11	30	75	84	20	40	100.2
L3	23.60	16.99	5.00	2395	3388	15.00	341	2.50	30	75	84	20	40	100.2
L4	24.50	12.30	7.17	2300	3254	5.76	333	2.56	31	76	86	20	40	100.2
H1	25.52	8.91	10.31	2302	3257	3.80	319	2.67	31	77	86	20	40	100.2
H2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	24.50	12.30	7.17	2300	3254	5.76	333	2.56	31	76	86	20	40	100.2
3.3.2.1.1 75 % of pull corresponding to maximum power at rated engine speed														
L4	19.63	9.20	7.68	2435	3445	4.28	367	2.32	31	76	86	20	40	100.2
3.3.2.1.2 50 % of pull corresponding to maximum power at rated engine speed														
L4	13.62	6.20	7.91	2446	3461	2.04	442	1.93	31	77	87	20	40	100.2
3.3.2.1.3 Next higher gear/ speed setting at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1														
H1	19.54	9.17	7.67	1715	2426	3.33	305	2.79	31	77	87	20	40	100.2
3.3.2.1.4 Same gear as 3.3.2.1.3 at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2														
H1	13.55	6.15	7.93	1756	2484	2.48	348	2.45	32	77	87	20	40	100.2
3.3.2.2 In selected gear/speed setting nearest between 7 km/h and 10 km/h at rated engine speed														
L4	24.50	12.30	7.17	2300	3254	5.76	333	2.56	31	76	86	20	40	100.2
3.3.2.2.1 75 % of pull corresponding to maximum power at rated engine speed														
L4	19.63	9.20	7.68	2435	3445	4.28	367	2.32	31	76	86	20	40	100.2
3.3.2.2.2 50 % of pull corresponding to maximum power at rated engine speed														
L4	13.62	6.20	7.91	2446	3461	2.04	442	1.93	31	77	87	20	40	100.2
3.3.2.2.3 Next higher gear/speed setting at reduced engine speed: same pull and travelling speed as in 3.3.2.2.1														
H1	19.54	9.17	7.67	1715	2426	3.33	305	2.79	31	77	87	20	40	100.2
3.3.2.2.4 Same gear as 3.3.2.2.3 at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2														
H1	13.55	6.15	7.93	1756	2484	2.48	348	2.45	32	77	87	20	40	100.2

*Remark: Maximum power in the gear H2 was not measured , because the forward speed in this gear exceeded the safety limit of testing equipment.

4 OPTIONAL TEST RESULTS

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

-Date and location of tests: Sep.15, 2007, COTTEC
-Type of track: Concrete

Height of drawbar above ground mm	Tyre inflation pressure	
	Front kPa	Rear kPa
611	120	120

Gear number 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/kWh	kW/l	℃	℃	℃	℃	%	kPa
4.1.1 OPTIONAL MAXIMUM POWER IN TESTED GEARS/SPEED SETTINGS														
L1	12.02	18.98	2.28	2470	3495	15.04	463	1.84	32	78	88	22	35	100.3
L2	17.32	18.89	3.30	2455	3473	15.01	387	2.20	32	80	88	22	35	100.3
L3	24.42	17.98	4.89	2302	3257	13.22	334	2.55	33	82	89	22	35	100.3
L4	26.05	13.10	7.16	2300	3254	5.41	312	2.73	33	82	89	22	35	100.3
H1	26.87	9.40	10.29	2300	3254	3.36	304	2.80	33	82	89	22	35	100.3
H2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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														
L4	20.85	9.75	7.70	2438	3449	4.02	348	2.45	34	82	89	23	40	100.2
4.1.2.2 FIVE-HOUR TEST at pull corresponding to 15% wheelslip , with additional ballast : 0 kg														
L1	11.99	18.93	2.28	2469	3493	15.00	466	1.83	34	81	88	23	40	100.2

*Remark: Maximum power in the gear H2 was not measured , because the forward speed in this gear exceeded the safety limit of testing equipment.

Oil consumption during ten hours duration of tests 4.1.2.1 and 4.1.1.2: 22 g/h

4.2 Low temperature starting

-Date and location of tests: Oct.26, 2007, COTTEC
-Detail of the starting aids used for the tests, battery included:
-Fuel
.Type -35#
.Octane or cetane number: >50
.Pour-point and other specifications: -30 ℃
-Engine oil
.Type: SAE 10W/30 , API-CD
.Viscosity and other specifications: 11.4 cSt at 100 ℃
-Test results
.Starting procedure used for the tests: The manufacturer's procedure
.Lowest temperature at which the engine started: -5℃

4.3 Turning area and turning circle

	Without brakes	
	Right-hand m	Left-hand m
Radius of turning area	4.44	4.49
Radius of turning circle	4.33	4.38

4.4 Location of center of gravity

-Height above ground: 771 mm
-Distance from the vertical plane containing the axis of the rear-wheels: 857 mm
-Distance from the median longitudinal plane of the tractor: -5 mm
-If the angle of suspension of the tractor is less then 20° ,indicate its value: None

4.5 Braking

-Date and location of tests: Sep.27, 2007, COTTEC

4.5.1 Cold service braking device test

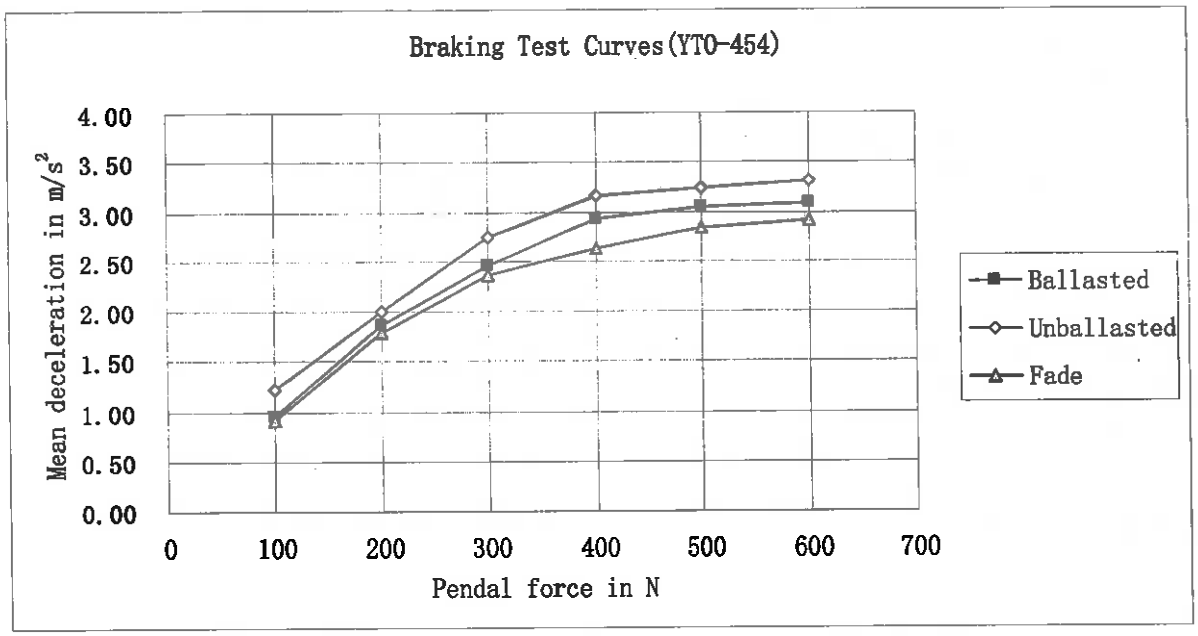
	Speed before application of brakes km/h	Braking device control force kN	Mean deceleration m/s^2	Minimum stopping distance without locking the wheels m
Ballasted tractor	33.5	0.1	0.96	45.1
	33.5	0.2	1.86	23.3
	33.5	0.3	2.46	17.6
	33.5	0.4	2.93	14.8
	33.5	0.5	3.05	14.2
	33.5	0.6	3.09	14.0
Unballasted tractor	33.5	0.1	1.22	35.5
	33.5	0.2	2.00	21.6
	33.5	0.3	2.74	15.8
	33.5	0.4	3.16	13.7
	33.5	0.5	3.23	13.4
	33.5	0.6	3.31	13.1

-Maximum deviation of tractor from its original course: 0 mm
-Abnormal vibration: None

4.5.2 Fade test

	Speed before application of brakes km/h	Braking device control force kN	Mean deceleration m/s^2	Minimum stopping distance without locking the wheels m
Ballasted tractor	33.5	0.1	0.91	47.6
	33.5	0.2	1.79	24.2
	33.5	0.3	2.37	18.3
	33.5	0.4	2.62	16.5
	33.5	0.5	2.83	15.3
	33.5	0.6	2.91	14.9

-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	290	270

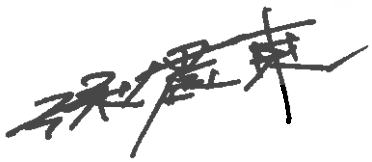
4.6 Measurement of external noise

-Date and location of tests:	Oct.19, 2007, COTTEC
-Sound level meter, make/mode/type:	ONO SOKKI LA-5111
-Type of track:	Concrete
-Gear number:	H4
-Travelling speed before acceleration:	25.0 km/h
-Sound level:	85.6 dB(A)

5. REPAIRS: None

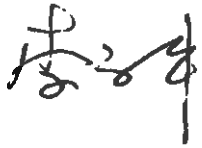
6. REMARKS: None

Director of the COTTEC
Senior engineer



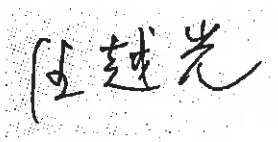
Sun Zhendong

Vice-director of the COTTEC
Senior engineer



Li Jingzhong

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



Ren Yueguang

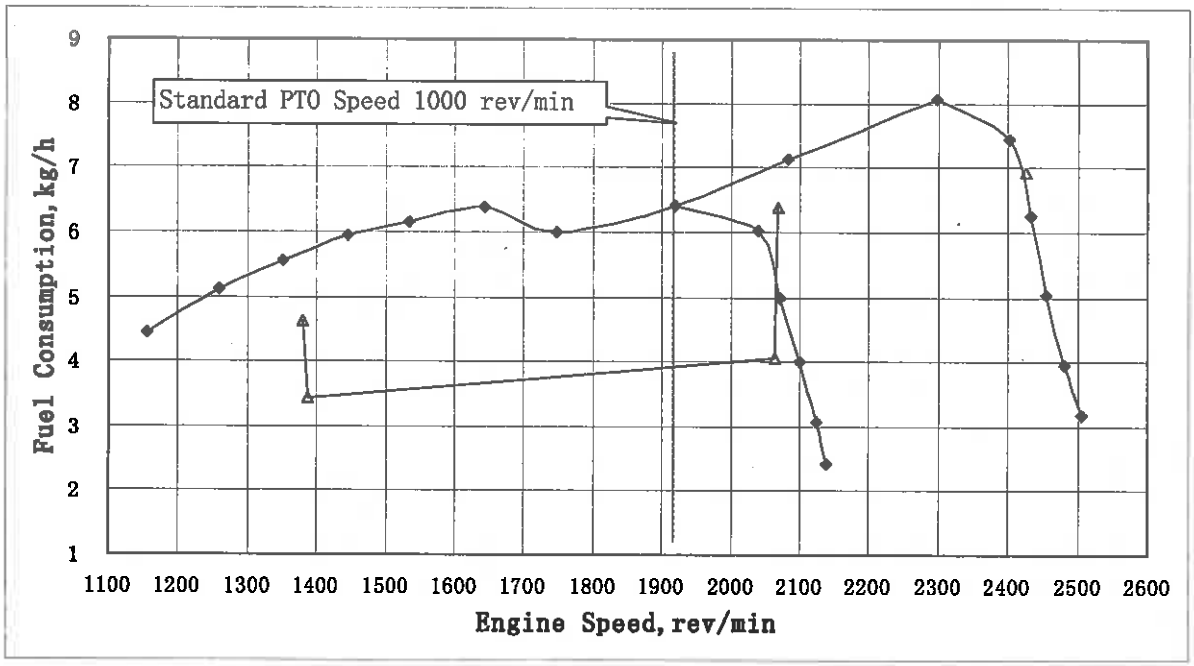
Members of the tractor test board:
Chen Zhiqiang Yan Xiaofang, Gao Bo
Zheng Zhigang, Li Yong, Zhao Jun,
Sun Zhennan, Yang Hongmei,Liu Hui
Sun Panpan,Liu Zhiqiang,Bai Demin,
Yi Xiaodong, Liu Hongqiang,

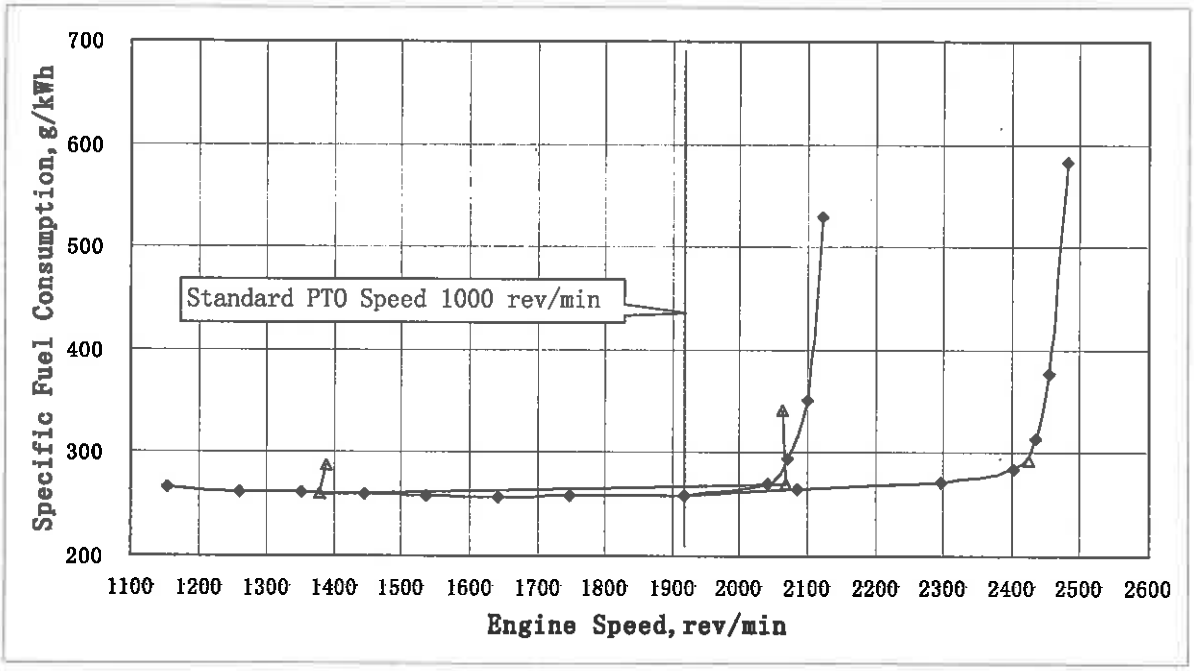
Date: Jan. 04,2008

	1.2.3 Fuel system	
C	-Fuel feed system:	Forced feed type
C	-Make of fuel filter:	Bangbu Jinwei
C	-Model of fuel filter:	CX7085
C	-Type of fuel filter:	Paper cartridge, replaceable
D	-Capacity of fuel tank:	63 dm^3
C	-Make of injection pump:	Wuxi Weifu high-tech Co.,Ltd
C	-Model/type of injection pump:	4IW247A, cylinder plunger
C	-Serial No :	70477510
	-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:	$20^0 \pm 1^0$ before T.D.C.
D	-Make of injectors:	Shandong xinya
D	-Model/type of injectors:	PF685125C,Multi-hole
D	-Injection pressure:	20 MPa
C	-Make/Mode/Type of carburettor:	None
	1.2.4 Governor	
C	- Make:	Wuxi Weifu high-tech Co.,Ltd
C	-Model/type:	T110, Mechanical, centrifugal
C	-Governed range of engine speed:	700～2550 rev/min
C	-Rated engine speed:	2300 rev/min
	1.2.5 Air cleaner	
	-Pre-cleaner	
C	.Make:	Linhai Jiannan
C	.Model/type:	KL1526，cyclone type, integrated with main cleaner
C	.Location of air intake:	At the left side of engine, vertical
C	.Maintenance indicator:	None
	-Main cleaner	
C	.Make:	Linhai Jiannan
C	.Model/type:	KL1526, oil bath
C	.Location of air intake:	At the left side of engine, vertical
C	.Maintenance indicator:	None
	1.2.6 Lubrication system	
D	-Type of feed pump:	Gear
C	-Type of filters:	J0810B, paper cartridge, replaceable
C	-Number of filters:	1
	1.2.7 Cooling system	
C	-Type of coolant:	Water
D	-Type of pump:	Centrifugal, belt driven
	-Specification of fan or blower:	
C	.Number of fan blades:	7
C	.Fan diameter:	420 mm
D	-Coolant capacity:	18 dm^3
C	-Type of temperature control:	Thermostat
D	-Super pressure system:	None

ANNEX II

Main power take-off test curves 2





ANNEX III

Main power take-off test curves 3

