COTTEC

CHINA OFFICIAL TRACTOR TEST AND EVALUATION CENTRE

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OECD TEST REPORT OF YTO-504 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.: 2/2 400
Date: Feb.19,2008

Tested Tractor
Make: YTO Model: YTO-504 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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	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-504
C	-Type:	4WD
	1.1.2 Numbers	
D	-1st Serial No or prototype:	0707468
C	Serial No.:	0707468
	1.1.3 Other Specifications	
D	- Models for other countries:	东方红-504
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:	Dongfanghong
C	-Model:	YTR4105T54SA
C	-Type:	4-stroke,water cooling ,Vertical, direct injection
C	-Serial No.:	X709572
	1.2.1 Cylinders	
C	-Number:	4
C	-Disposition:	Vertical, in line
D	-Bore/Stroke:	105 mm /120 mm
D	-Capacity:	4156 cm^3
D	-Compression ratio:	17.0
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.

	1.2.3 Fuel system	
C	-Fuel feed system:	Forced feed type
C	-Make of fuel filter:	Luoyang tractor research Co.,Ltd
C	-Model of fuel filter:	C0708
C	-Type of fuel filter:	Paper cartridge, replaceable
D	-Capacity of fuel tank:	68 dm^3
C	-Make of injection pump:	WUXI WEIFU HIGH-TECH CO.,Ltd
C	-Model/type of injection pump:	ZHBF49540Z-44A, cylinder plunger
C	-Serial No :	70585203
	-Manufacturer's production setting of injection pump:	
C	. Flow rate (at rated engine speed and full load):	11.8 ± 0.5 dm^3 /h
D	.Timing:	$20^0 \pm 1^0$ before T.D.C.
D	-Make of injectors:	Own make
D	-Model/type of injectors:	PB86J,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, full range
C	-Governed range of engine speed:	700～2400 rev/min
C	-Rated engine speed:	2200 rev/min
	1.2.5 Air cleaner	
	-Pre-cleaner	
C	.Make:	Linhai Jiannan
C	.Model/type:	KY250A，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:	KY250A, 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:	JX0811A, rotating ,paper cartridge
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:	450 mm
D	-Coolant capacity:	18 dm^3
C	-Type of temperature control:	Thermostat
D	-Super pressure system:	None

	1.2.8 Starting system	
C	-Make:	Ningbo Huatai
C	-Model/Type:	QD154E, 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:	Ningbo Huatai
C	.Model/Type:	JF1521A, altermator, belt driven
D	.Power	0. 5 kW
	-Battery of accumulators:	
C	.Number:	1
D	.Rating:	150 Ah at 20 hours rating
	1.2.10 Exhaust system	
C	-Make:	Yi Chuan JuXing
C	-Model/Type:	YT4105T.08.001, 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:	280 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 2200 rev/min km/h	
C		1	L	206.164	2.45	
C		2		142.138	3.56	
C		3		91.301	5.54	
C		4		67.566	7.49	
C		1	H	47.982	10.54	
C		2		33.081	15.29	
C		3		21.249	23.81	
C		4		15.726	32.17	
C		1	R	138.936	3.64	
C		2		95.788	5.28	
C		3		61.529	8.22	
C		4		45.534	11.11	
		(*) Calculated with the dynamic radius index of 610 mm (ISO 4251-1:2005)				

C	-Number of revolutions of front wheels for one revolution of rear-wheels:	1.452
	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:	595 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:	600 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:	38.0 kW
D	-Maximum torque transmissible:	800 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:	595 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:	1148 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:	38 kW
D	-Maximum torque transmissible:	450 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:	550
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

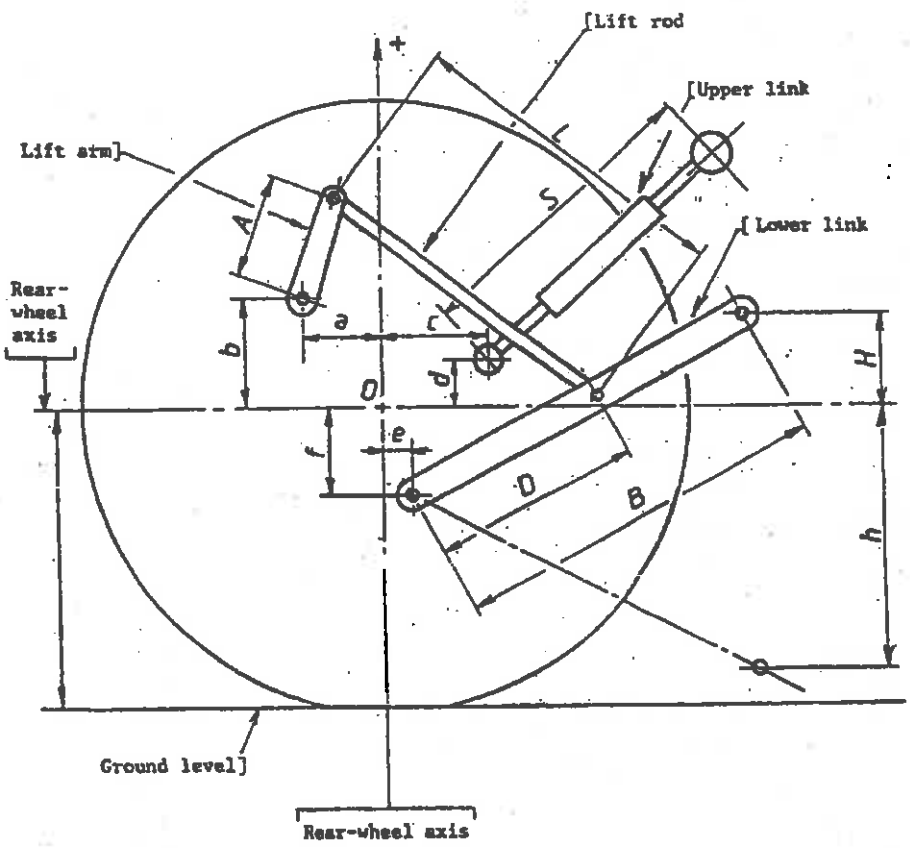
D	-Lift pump type:	Gear pump
D	-Transmission between pump and engine:	Driven by engine cam shaft
C	-Type and number of filters:	Cartridge type, 1
C	-Site of oil reservoir:	Transmission housing
C	-Type, number and location of tapping points:	Coupler pairs quick shift adaptor, At rear of tractor
D	-Maximum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

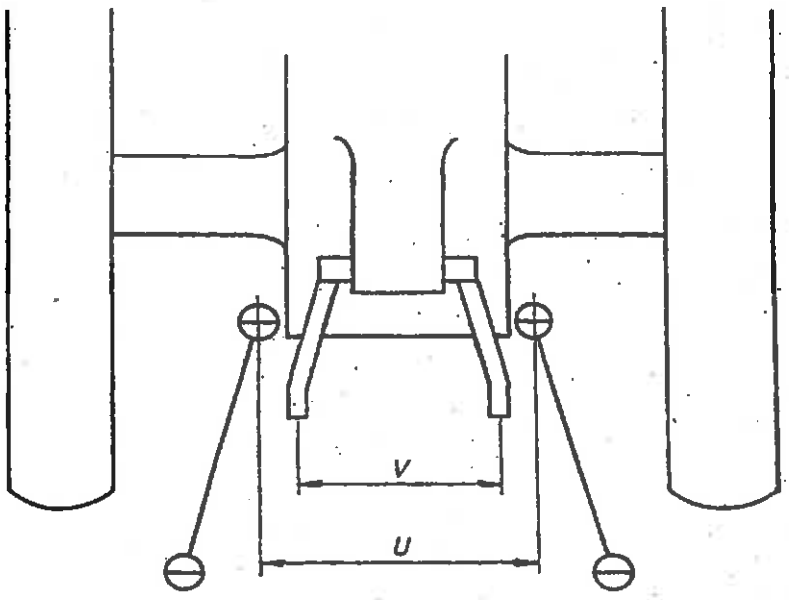
1.6 Three point linkage

C	-Category	2 ,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)	760	760	
		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 600 to 825	610	
		Distance of upper link pivot point from rear wheel axis:				
C		-Horizontally:	(c)	370	370	
C		-Vertically	(d)	280	280	
		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 470 to 590	525	
		Height of lower hitch points relative to the rear wheel axis:				
C		-in low position	(h)	From 245 to 590	410	
C		-in high position	(H)	From 145 to 390	270	
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 = 610 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:	634 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:	554,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:	2127 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:	None

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	1080	130×140	280
C	Front direction lights	1170	100×70	280
C	Rear direction lights	1420	115×70	710
C	Rear position lights	1420	85×70	595
C	Stop lights	1420	100×70	510
C	Work lights	1570	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	3985	1650	1965	2590	2250
Unballasted	3860	1650	1920	2593	2252

2.2 Ground Clearance (unballasted tractor)

-Clearance limiting part: Under the front axle 340 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	1019	1028.0	1115	1124
Rear	1228.5	1294.5	1410.5	1476.5
Total	2247.5	2322.5	2525.5	2600.5

2.4 Ballast

	Weights		Water kg
	Number	Total mass kg	
Front	4	76	—
Rear	4	202	—
Optional	—	—	—

2.5 Track specifications: None

2.6 Tyres and track width specifications

	Front	Rear
Tyres:		
.dimensions	8.3-20	13.6-28
.ply rating	6	8
.type	Cross ply	Cross ply
.maximum load (tyre manufacturer's)	8.0 kN	14.0 kN
.maximum load (tractor manufacturer's)	8.0 kN	14.0 kN
.inflation pressure (tyre manufacturer's)	80～120 kPa	80～120 kPa
.dynamic radius index	420 mm	610 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.11, 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							
35.43	1725	900	2440	9.180	10.77	259.1	3.29
3.1.2 POWER AT RATED ENGINE SPEED							
33.65	2200	1148	3113	9.952	11.68	295.8	2.88
3.1.3 STANDARD POWER TAKE-OFF SPEED (1000±25 or 540±10 rev/min)							
34.45	1917	1000	2712	9.363	10.99	271.8	3.14
3.1.4 PART LOADS 3.1.4.1 The torque corresponding to maximum power at the rated engine speed							
33.65	2200	1148	3113	9.952	11.68	295.8	2.88
3.1.4.2 85% of torque obtained in 3.1.4.1							
30.34	2334	1218	3302	9.665	11.34	318.5	2.68
3.1.4.3 75% of torque obtained in 3.1.4.2							
22.96	2348	1225	3322	8.098	9.50	352.7	2.42
3.1.4.4 50% of torque obtained in 3.1.4.2							
15.31	2356	1229	3333	6.690	7.85	436.8	1.95
3.1.4.5 25% of torque obtained in 3.1.4.2							
7.75	2364	1233	3345	5.390	6.32	695.7	1.23
3.1.4.6 Unloaded							
1.94	2369	1236	3352	4.393	5.15	—	—

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							
34.45	1917	1000	2712	9.363	10.99	271.8	3.14
3.1.5.2 85% of torque obtained in 3.1.5.1							
31.75	2076	1083	2937	9.028	10.59	284.3	3.00
3.1.5.3 75% of torque obtained in 3.1.5.2							
24.36	2124	1108	3005	7.610	8.93	312.3	2.73
3.1.5.4 50% of torque obtained in 3.1.5.2							
16.34	2137	1115	3023	6.135	7.20	375.4	2.27
3.1.5.5 25% of torque obtained in 3.1.5.2							
8.24	2156	1125	3050	4.705	5.52	570.7	1.49
3.1.5.6 Unloaded							
1.78	2168	1131	3067	3.728	4.37	—	—
3.1.6 PART LOADS AT DIFFERENT ENGINE SPEEDS							
3.1.6.1 Maximum power at rated engine speed							
33.65	2200	1148	3113	9.952	11.68	295.8	2.88
3.1.6.2 80% of power obtained in 3.1.6.1 at max. speed setting							
26.91	2335	1218	3304	8.893	10.43	330.4	2.58
3.1.6.3 80% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed							
26.90	1978	1032	2798	7.683	9.01	285.6	2.98
3.1.6.4 40% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed							
13.40	1978	1032	2798	5.178	6.08	386.5	2.21
3.1.6.5 60% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed							
20.14	1317	687	1863	5.238	6.15	260.0	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							
13.43	1315	686	1860	3.948	4.63	293.9	2.90

-No load maximum engine speed: 2369 rev/min
-Torque(equivalent crankshaft) at maximum power
.At rated engine speed: 146.1 Nm
.At 1-hour test: 196.1 Nm
-Maximum torque (equivalent crankshaft) (engine speed: 1600 rev/min): 202.4 Nm

Mean atmospheric conditions	
Temperature	24 ℃
Pressure	100.1 kPa
Relative humidity	45 %
Maximum Temperature:	
Coolant	80 ℃
Engine oil	99 ℃
Fuel	41 ℃
Engine air intake	39 ℃

3.2 Hydraulic power and lifting force

- Date and location of tests:t: Sep.20,2007,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)				2200		
3.2.1.2.1 Maximum (sustained) pressure with relief valve open as measured at the coupler Pump stalled: Yes	16.5	61.0	69.8	2322		
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	14.9	66.8		2333	28.0	6.95
3.2.1.2.3 Maximum available flow and maximum power from one coupler pair:	15.2	67.3		2330	27.6	6.99
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):	15.2	68.1		2329	27.7	7.02

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	200 mm	130 mm
Vertical movement: without lifting force:	680 mm	955 mm
with lifting force:	665 mm	930 mm
Maximum corrected force exerted through full range	14.98 kN	10.09 kN
Corresponding pressure of hydraulic fluid	14.9 MPa	14.9 MPa
Moment about rear wheel axle	14.43 kNm	15.87 kNm
Maximum tilt angle of mast from vertical	—	19.3^0

Lifting heights relative to the horizontal plane including the lower link pivot points														
mm	-320	-300	-250	-200	-100	0	100	200	300	400	415	500	600	610
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 14.9 MPa														
kN	—	—	14.98	15.75	16.41	16.86	17.19	17.42	17.61	18.02	18.12	—	—	—
At the frame, corresponding pressure 14.9 MPa														
kN	12.92	12.99	—	13.38	13.89	13.58	13.42	12.82	11.95	10.82	—	10.47	10.18	10.09

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

-Date and location of tests: Sep.16, 2007, COTTEC

-Type of track: Concrete

Height of drawbar above ground mm	Tyre inflation pressure	
	Front kPa	Rear kPa
634	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 (unballasted tractor)														
L1	12.12	19.31	2.26	2362	3342	14.95	564	1.51	38	75	91	22	40	100.0
L2	17.32	19.13	3.26	2346	3319	15.01	468	1.82	38	75	91	22	40	100.0
L3	25.92	19.04	4.90	2280	3226	15.05	387	2.20	39	75	92	22	40	100.0
L4	28.14	18.59	5.45	1730	2448	8.05	327	2.61	39	76	92	22	40	100.0
H1	29.88	13.65	7.88	1730	2448	5.65	307	2.78	39	76	92	22	40	100.0
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	27.87	14.21	7.06	2200	3113	6.08	363	2.35	38	75	93	22	40	100.0
3.3.2.1.1 75 % of pull corresponding to maximum power at rated engine speed														
L4	22.74	10.70	7.65	2348	3322	4.29	406	2.10	38	75	93	22	40	100.0
3.3.2.1.2 50 % of pull corresponding to maximum power at rated engine speed														
L4	15.80	7.18	7.92	2360	3339	1.57	426	2.00	38	74	92	22	40	100.0
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	22.63	10.72	7.60	1636	2315	3.72	309	2.76	39	74	93	22	45	100.1
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	15.87	7.16	7.98	1689	2390	1.52	349	2.44	38	74	92	22	45	100.1
3.3.2.2 In selected gear/speed setting nearest between 7 km/h and 10 km/h at rated engine speed														
L4	27.87	14.21	7.06	2200	3113	6.08	363	2.35	38	75	93	22	40	100.0
3.3.2.2.1 75 % of pull corresponding to maximum power at rated engine speed														
L4	22.74	10.70	7.65	2348	3322	4.29	406	2.10	38	75	93	22	40	100.0
3.3.2.2.2 50 % of pull corresponding to maximum power at rated engine speed														
L4	15.80	7.18	7.92	2360	3339	1.57	426	2.00	38	74	92	22	40	100.0
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	22.63	10.72	7.60	1636	2315	3.72	309	2.76	39	74	93	22	45	100.1
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	15.87	7.16	7.98	1689	2390	1.52	349	2.44	38	74	92	22	45	100.1

*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.17, 2007, COTTEC

-Type of track: Concrete

Height of drawbar above ground mm	Tyre inflation pressure	
	Front kPa	Rear kPa
631	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	13.54	21.57	2.26	2366	3347	15.03	510	1.67	39	77	94	20	40	100.0
L2	19.70	21.75	3.26	2345	3318	15.05	437	1.95	39	77	94	20	40	100.0
L3	28.26	21.11	4.82	2235	3162	14.98	357	2.39	40	77	94	20	40	100.0
L4	29.39	19.45	5.44	1730	2448	7.76	315	2.71	40	79	96	20	40	100.0
H1	31.06	14.21	7.87	1730	2448	5.19	297	2.87	40	79	96	20	40	100.0
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														
H1	23.34	7.64	11.00	2336	3305	2.15	393	2.17	41	80	96	22	35	100.0
4.1.2.2 FIVE-HOUR TEST at pull corresponding to 15% wheelslip , with additional ballast : 0 kg														
L1	13.51	21.52	2.26	2364	3345	15.01	513	1.66	38	78	94	22	35	100.0

*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 4.1.2.2: 26 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	4.41	4.28
Radius of turning circle	4.30	4.17

4.4 Location of center of gravity

-Height above ground: 784 mm
-Distance from the vertical plane containing the axis of the rear-wheels: 942 mm
-Distance from the median longitudinal plane of the tractor: -3 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: Oct.8, 2007, COTTEC

4.5.1 Cold service braking device test

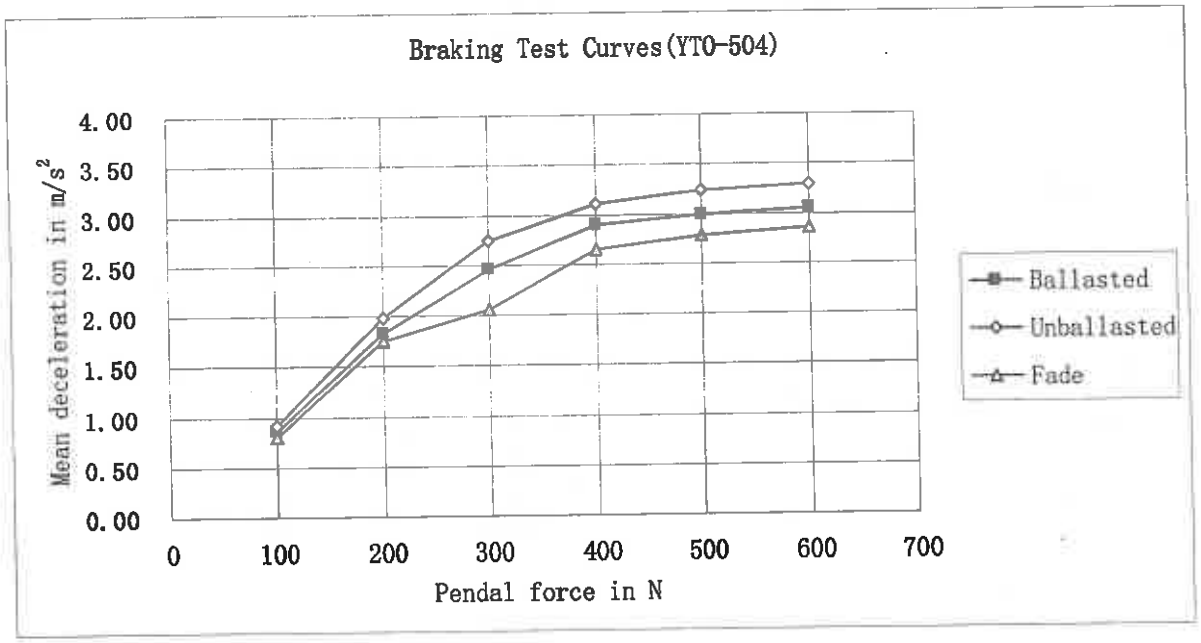
	Speed before application of brakes km/h	Braking device control force kN	Mean deceleration m/s^2	Minimum stopping distance without locking the wheels m
Ballasted tractor	33.8	0.1	0.85	51.8
	33.8	0.2	1.83	24.1
	33.8	0.3	2.45	18.0
	33.8	0.4	2.90	15.2
	33.8	0.5	3.00	14.7
	33.8	0.6	3.04	14.5
Unballasted tractor	33.8	0.1	0.92	47.9
	33.8	0.2	1.98	22.3
	33.8	0.3	2.74	16.1
	33.8	0.4	3.10	14.2
	33.8	0.5	3.24	13.6
	33.8	0.6	3.29	13.4

-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	33.8	0.1	0.80	55.0
	33.8	0.2	1.75	25.2
	33.8	0.3	2.05	21.5
	33.8	0.4	2.66	16.6
	33.8	0.5	2.79	15.8
	33.8	0.6	2.86	15.4

-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

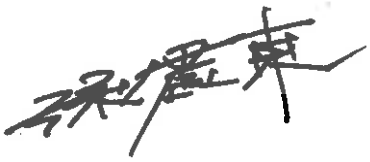
4.6 Measurement of external noise

-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:	25.4 km/h
-Sound level:	86.6 dB(A)

5. REPAIRS: None

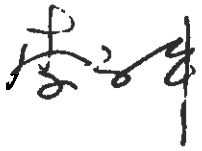
6. REMARKS: None

Director of the COTTEC
Senior engineer



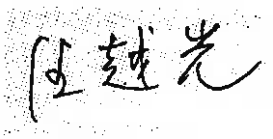
Sun Zhendong

Vice-director of the COTTEC
Senior engineer



Li Jingzhong

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



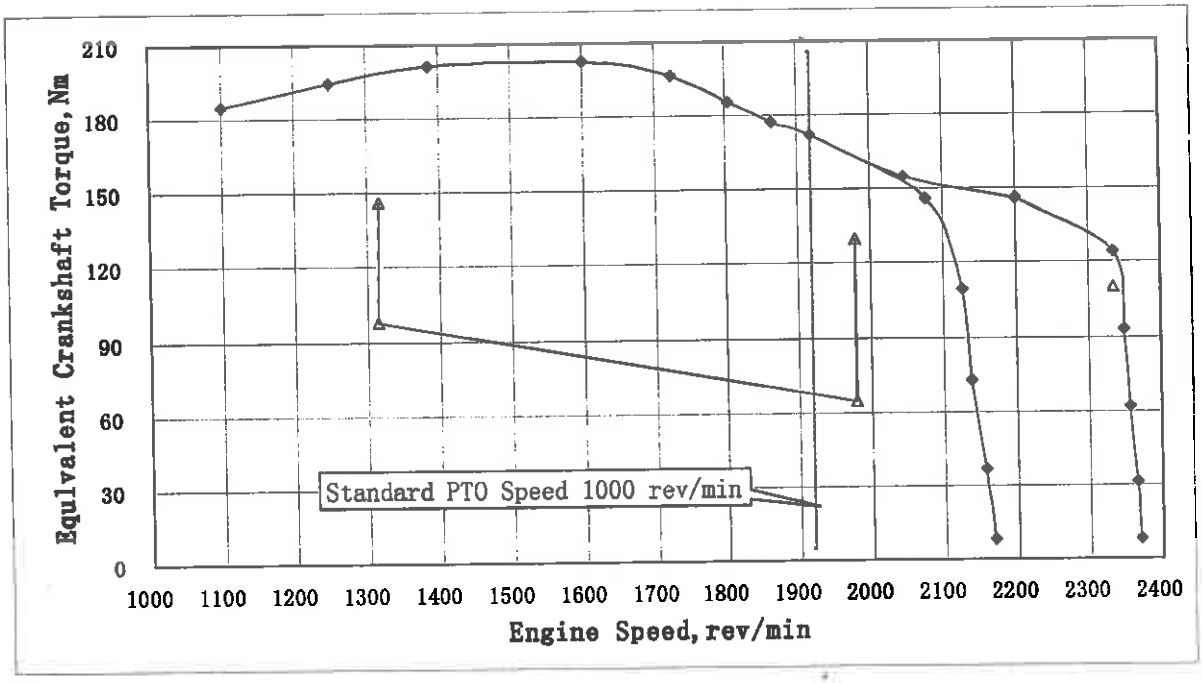
Ren Yueguang

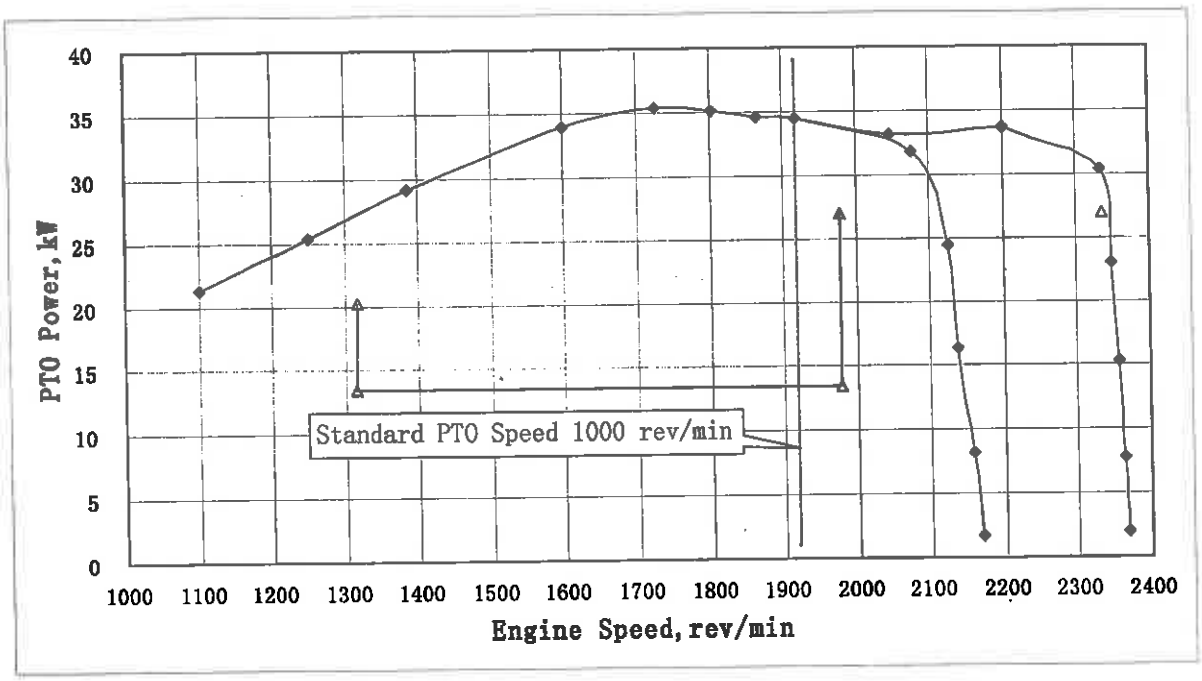
Members of the tractor test board:
Chen Zhiqiang Yan Xiaofang, Gao Bo
Zheng Zhigang, Li Yong, Zhao Jun,
Sun Zhennan, Yang Hongmei,Liu Hui
Sun Panpan,Liu Zhiqiang,Bai Demin,
Yi Xiaodong, Liu Hongqiang,

Date: Jan. 04,2008

ANNEX I

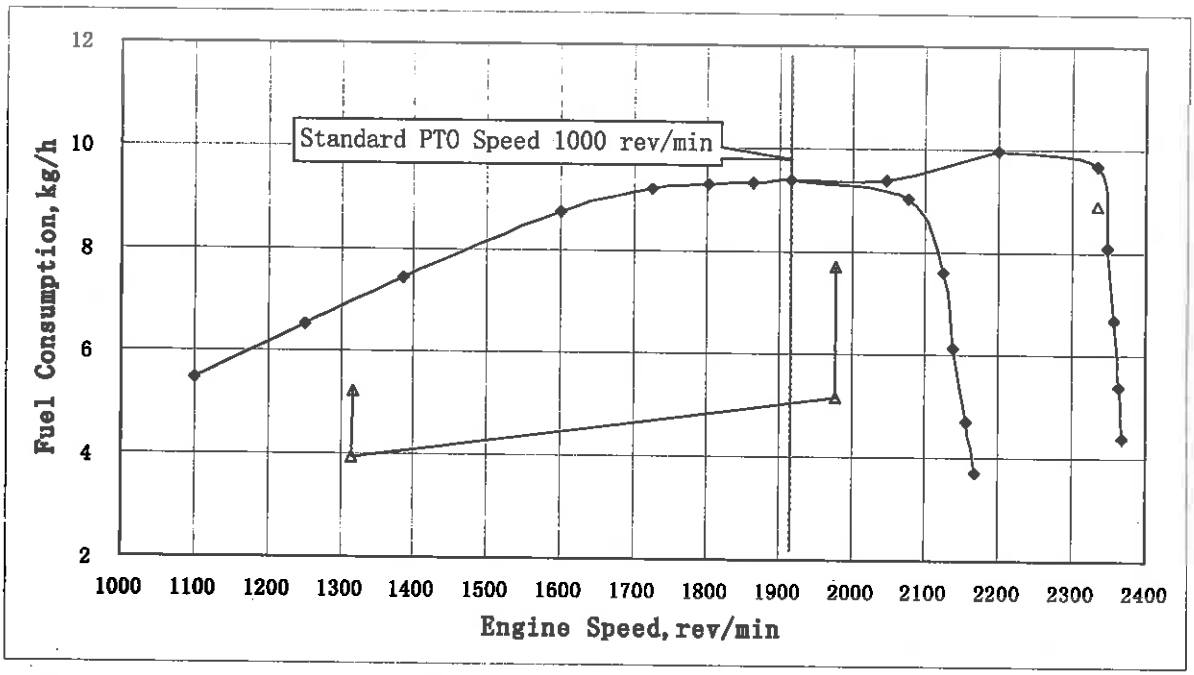
Main power take-off test curves 1

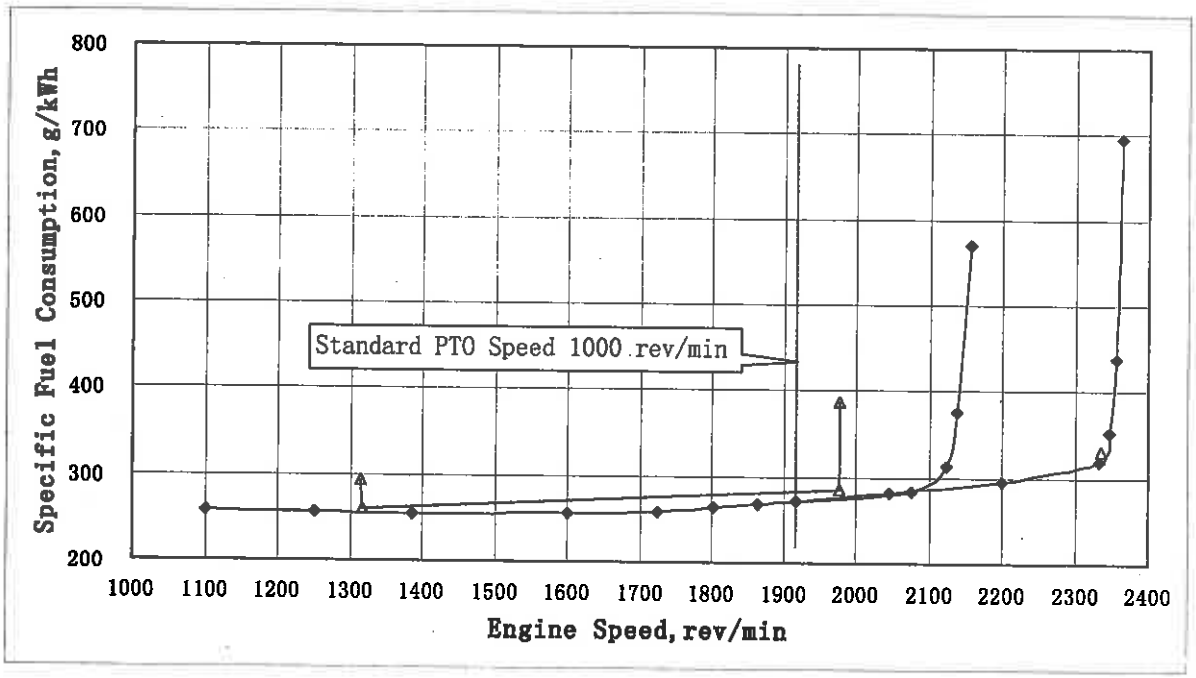




ANNEX Ⅱ

Main power take-off test curves 2





ANNEX III

Main power take-off test curves 3

