CAMTC

Report on test in accordance with the OECD STANDARD CODE I for the Official Testing of Agricultural Tractors Performance

OECD Approval No.: 1650 FULL CODE

Approval Date: 18 Mar.1997



JINMA-254 (4WD) 30 km / h VERSION TRACTOR

Manufactured by: Yancheng Tractor Works
Yancheng, Jiangsu, China

Test No.: 96OS202

Date of test: Nov. 1996

China Agricultural Machinery Testing Centre
40 Shi Li He Donghuan Nanlu
100021, Beijing, China

JM-254 CAMTC OECD No. 1650 Full Code

CONTENTS

	Page No.
I SPECIFICATIONS OF TRACTOR	1
II TEST CONDITIONS	9
III TEST RESULTS	12
1. Main power take-off performance	12
2. Hydraulic power and lifting force	13
3. Drawbar performance	15
4. Turning area and turning circle	17
5. Location of centre of gravity	17
6. Braking	17
7. Measurement of external noise level	18
IV REPAIRS AND ADJUSTMENTS DURING TESTS	18
V REMARKS	18
ANNEX Main power take-off curves	19

JM−254 CAMTC OECD No. 1650 Full Code

− Tractor manufacturer's name and address:	Yancheng Tractor Works,No71 Renmin Zhonglu,Yancheng city,Jiangsu
− Location of tractor assembly:	The manufacturer
− Submitted for test by:	The manufacturer
− Selected for test by:	The manufacturer by the agreement of the CAMTC
− Place of running—in:	CAMTC,Beijing,China
− Duration of running—in:	31 h
− Location of test:	CAMTC,Beijing,China

I. SPECIFICATIONS OF TRACTOR

TRACTOR

− Make:	JIN MA
− Model:	254−30 km / h version
− Type:	4WD,unit construction
− Number of driving wheels:	4
− Serial No :	03
− 1st serial No :	580

ENGINE

− Make / Model / Type:	Engine branch of Jiangxi Tractor Works,NJ385T, 4 stroke,water cooling,swirl combustion chamber, indirect injection,naturally aspirated
− Serial No:	1180

Cylinders

− Number / disposition:	3,Vertical in line
− Bore / stroke:	85 / 95 mm / mm
− Capacity:	1617 cm^3
− Compression ratio:	22 / 1
− Arrangement of valves:	Overhead Valves
− Cylinder liners:	Dry liners

Fuel system

− Fuel feed system:	Forced feed by pump
− Make / Model / Type of fuel filter(s):	Jiangxi Shangyou Filter Works,dual acting Paper cartridge,replaceable
− Capacity of fuel tank:	22.5 dm^3
− Make / Model / Type of injection pump:	Tanjin Hongma Injection Pump Works, I / X 2204,3−cylinder plunger
− Serial number:	2858
− Manufacturer's production setting of injection pump:	
• Flow rate (rated engine speed and full load) :	5.90 dm^3 / h
• Timing:	16 ° ～19 ° before T.D.C.
− Make / Model / Type of injectors:	Wuxi Pump Injector Works,P662, flow controled nozzle
− Injection pressure:	12.25 MPa

Governor

− Make / Model / Type:	Engine branch of Jiangxi Tractor Works, variable speed governor,mechanically acting, incorporated in injection pump
− Governed range of engine speed:	From 600 to 2600 rev / min
− Rated engine speed:	2350 rev / min

Air cleaner

− Pre−cleaner	None
− Main cleaner	
• Make / Model / Type:	Engine branch of Jiangxi Tractor Works, paper cartridge with eddy−flow blades
• Location of air intake:	Inside the bonnet,in front of the radiator

Lubrication system

− Type of feed pump:	Inside engaged rotor
− Type of filter(s):	Paper element,unchangable
− Number:	1

Cooling system

− Type of coolant:	Water

– Type of pump:	Centrifugal,belt driven
– Specification of fan or blower:	Axial flow type,belt driven
– Number of fan blades:	6
– Fan diameter:	340 mm
– Coolant capacity:	6 dm^3
– Type of temperature control:	Thermostat
– Superpressure system:	None

Starting system

– Make / Model / Type:	Yangzhou Global Automobile Electrical Machinery Works,QD1268,Electrical solenoid engaged
– Starter motor power rating:	2 kW
– Cold starting aid:	Electrothermal plug
– Safety device:	Main shift lever in neutral position

Electrical system

– Voltage:	14 V (Negative earth)
– Generator	
• Make / Model / Type:	Fujian shirong Electrical Machinery Factory,JF22F,Alternator,belt driven
• Power:	0.25 kW
– Battery (number of accumulators):	1
• Rating:	100 Ah at 20 hours

Exhaust system

– Make / Model / Type:	Engine branch of Jiangxi Tractor Works, expension type silencer,vertical
– Location:	Right-hand side of engine

TRANSMISSION TO WHEELS

Clutch

– Make / Model / Type:	Own make,dry double function,constant engaging
– Number of plates:	2
– Diameter of plates:	200 mm
– Method of operation:	Operated by pedal

JM−254 CAMTC OECD No. 1650 Full Code

Gear box

− Make / Model / Type:	Own make,JM−254,mechanical nuit construction
− Arrangement:	1 level for the 3 forward 1 reverse gear 2 levels for 2 group gear (Low and High)
− Number of gears:	12 forward and 4 reverse gears
− Available options:	Super lower speed device

Rear axle and final drives

− Make / Model / Type:	Own make,crown wheel and pinion bevel gear differential,spur gear final drives installed inside
− Differential lock:	
• Type:	Mechanical,dog−clutch
• Method of engagement:	By hand level
• Method of disengagement:	Constant disengaging

Front axle and final drives

− Make / Model / Type:	Own make,spur gear differential and spur gear final drives
− Differential lock:	None

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 2350 rev / min km / h
1	L	250.944	1.73
2	L	127.045	3.42
3	L	76.150	5.70
4	H	54.287	7.99
5	H	27.484	15.79
6	H	16.470	26.35
R1	L	316.407	1.37
R2	H	68.449	6.34

(*) Calculated with a tyre dynamic radius index of 490 mm (ISO 4251 / 1−1992).

Number of revolutions of front wheels for one revolution of rear wheels: 1.69

JM-254 CAMTC OECD No. 1650 Full Code

POWER TAKE—OFF

Main power take—off

- Type:	Not independent
- Method of engagement:	By hand level,driven by sleeve with splines
- Number of shafts:	1
- Method of changing power take-off shaft ends and speeds:	None

Power take—off proportional to engine speed

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:	490 mm
- Distance from the median plane of the tractor:	0 mm
- Distance behind rear wheel axis:	280 mm
- PTO speed at rated engine speed (2350 rev / min):	611 rev / min
- Engine speed at standard power take—off speed:	2077 rev / min
- Ratio of rotation speeds (engine speed / p.t.o speed):	3.846
- Power restriction and maximum torque:	17.5 kW 275 N.m
- Direction of rotation (viewed from behind tractor):	Clockwise

POWER LIFT

- Make / Model / Type:	Own make
- Type of hydraulic system:	Partial separated units,open centre system
- Type and mumber of cylinders:	Single acting,1
- Type of linkage lock for transport:	Hydraulic lock
- Relief valve pressure setting (tolerance):	15.5+0.5 MPa

− Opening pressure of cylinder safety valve (if fitted):	None
− Lift pump type:	CB−314 gear pump
− Transmission between pump and engine:	Pump driven by splines
− Type and number of filters:	Metal screen, 1
− Site of oil reservoir:	Under the driver's seat
− Type, number and location of tapping points:	Thread,M18 × 1.5,1,front side of hydraulic power lift housing
− Maximum volume of oil available to external cylinders:	9.0 dm^3

Three—point linkage

− Category:	1 in conformity with categories 1 of ISO 730 / 1—1990
− Category adapter:	None

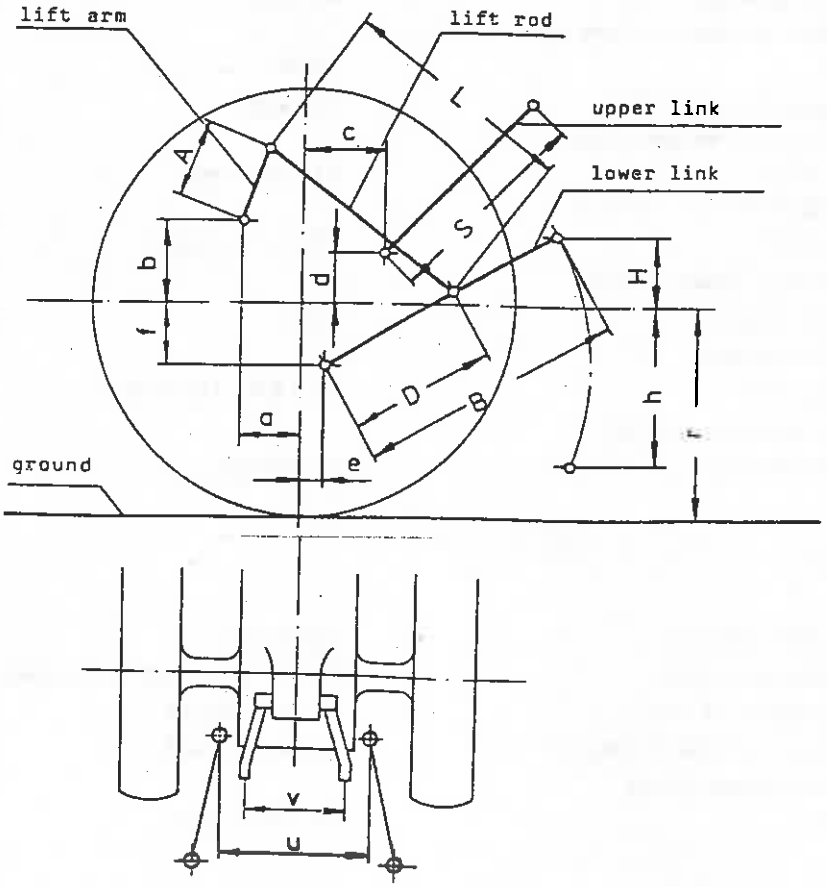


Table 1.1—Dimensions of linkage geometry (when connected to the standard frame)

		Dimension or range mm	Settings used in test mm
Length of lift arms	(A)	190	190
Length of lower links	(B)	625	625
Distance of lift arm pivot : horizontally	(a)	−30	−30
point from rear wheel axis : vertically	(b)	299	299
Horizontal distance between the 2 lower link points	(u)	304	304
Horizontal distance between the 2 lift arm end points	(v)	332	332
Length of upper link	(S)	from 510 to 660	558
Distance of upper link pivot point from rear : horizontally	(c)	230	230
wheel axis: vertically	(d)	255	255
Distance of lower link pivot point from rear : horizontally	(e)	155	155
wheel axis: vertically	(f)	109	109
Distance of lower link pivot points to lift rod pivot points on lower links	(D)	from 248 to 356	280
Length of lift rods	(L)	from 380 to 560	475
Height of lower hitch points relative to the rear wheel axis:			
− in low position	(h)	from 40 to 460	352
− in high position	(H)	from 376 to 68	266
Height above ground of lower hitch points when locked in transport position(*)		Any height within lift range	

(*)Assuming (r) = tyre dynamic radius index of 490mm (ISO 4251 / 1−1992).

TRAILER HITCH

− Type:	Fixed
− Hole diameter:	22 mm
− Height above ground:	331 mm

− Distance of hitch point from rear wheel axis,horizontally:	386 mm
− Distance of hitch point from power take−off shaft end	
• Vertically:	94 mm
• Horizontally:	106 mm
− Maximum vertical permissible load:	10.0 kN

STEERING

− Make / Model / Type:	Owm make, Hydrostatic steering
− Method of operation:	
• Pump(S):	CB−314 gear pump
• Ram(S):	SG−D40 × 185L, double acting
− Working pressure:	10 MPa

BRAKES

Service brake

− Make / Model / Type:	Own make,disc type
− Method of operation:	Operated by pedals,coupled or independent
− Trailer braking take−off:	Air brake,operated by tractor pedals

Parking brake

− Type:	Mechanical,locked by ratchet
− Method of operation:	Pedal locked by ratchet

WHEELS

− Number	
• Front:	2 driving and steering
• Rear:	2 driving
− Wheelbase:	1584 mm
− Track width adjustment:	

	Minimum mm	Maximum mm	Adjustment method
Front	1050	1050	None
Rear	1090	1374	Reversing wheels and off−set lug rims

FRAME

- Make / Model / Type: Own make
- Manufacturer's name and address: Xinxing welding branch of Yancheng Tractor Works, Xinxing country, Yancheng city
- Protective device
  - Cab / frame / rollguard / other: Frame
  - Tiltable / not tiltable: Not tiltable

DRIVER'S SEAT

- Make / Model / Type: Anhu Seat Works
- Type of suspension: None
- Type of damping: None
- Range of adjustment
  - Longitudinal: 60 mm
  - Vertical: 0 mm

LIGHTING

	Height above ground of centre mm	Size mm	Distance from outside side edge to median plane of tractor mm
Headlights	1060	115×80	172.5
Rearlights	1155	135×95	415
Brakelights	1100	68×64	430

II. TEST CONDITIONS

Overall dimensions

	Length	Width		height at top of	
		minimum	maximum	Protective structure	exhaust silencer
	mm	mm	mm	mm	mm
Ballasted	3041	1330	1614	2085	1882
Unballasted	2923	1330	1614	2088	1885

Ground clearance(unballasted tractor): 275 mm

− Clearance−limiting part: Under the front axle housing

Tractor mass

without frame:

	Ballasted		Unballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	606	606	530	530
Rear	748	823	688	763
Total	1354	1429	1218	1293

Ballast

	Weights		Water kg
	Number	Total mass kg	
Front	8	76	/
Rear	2	60	/

Tyres specifications

	Front	Rear
Tyres:		
• dimensions	6.00−12	9.50−24
• ply rating	4	4
• type	Cross ply	Cross ply
• maximum load (tyre manufacturer's)	3.1 kN	7.5 kN
• maximum load (tractor manufacturer's)	3.1kN	7.5kN
• inflation pressure (tyre manufacturer's)	180～200 kPa	100～150 kPa
• dynamic radius index	307 mm	490 mm
Chosen track width:	1050 mm	1132 mm

JM−254 CAMTC OECD No. 1650 Full Code

Oils and lubrication

−Capacity and change interval

	Capacity dm^3	Oil change h	Filter change h
Engine	4.0	100	100
Gear box	14.0	500	—
Front axle	5.0	500	—
Rear axle	Common with gear box		—
Final drive (front)	Common with front axle		—
Final drive (rear)	Common with gear box		—
Hydraulic system	10.0	1000	—
Steering	Common with gear box		500

−Specifications(SAE, API, Mil.L, ISO)

	Recommended	Used during test
Engine oil • Type: • Viscosity: • Classification:	SAE 10 W / 30 11.4 cst at 100℃ API CC	CA−30 11 cst at 100℃ GB 5323−85
Transmission oils • Type: • Viscosity: • Classification:	SAE 80 9.3 cst at 100℃ API GL−4	HQB−10 11 cst at 100℃ GB 485−84
Hydraulic fluid • Type: • Viscosity: • Classification:	Same as trans.oil	Same as trans.oil
Steering oil • Type: • Viscosity: • Classification:	Same as trans.oil	Same as trans.oil

Grease: Calcium basis (GB491−65)
• Number of lubrication points: 15

Fuel

− Type: Standard diesel fuel in conformity with national standard GB10327−89

− Density at 15℃ 0.838 g / cm^3

Ⅲ. TEST RESULTS

COMPULSORY TESTS RESULTS

1. MAIN POWER TAKE-OFF

- Date and location of tests: 5.Nov. 1996, CAMTC
- Type of dynamometer: SCHENCK eddy-current brake W400

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	rev / min		kg / h	l / h	g / kWh	kWh / l
1.1 MAXIMUM POWER-TWO HOUR TEST						
16.70	2350	611	4.95	5.90	296	2.83
1.2 POWER AT RATED ENGINE SPEED						
16.70	2350	611	4.95	5.90	296	2.83
1.3 STANDARD POWER TAKE-OFF SPEED (540 ± 10 rev / min)						
16.17	2077	540	4.71	5.61	291	2.88
1.4 PART LOADS 1.4.1 the torque corresponding to maximum power at rated engine speed						
16.70	2350	611	4.95	5.90	296	2.83
1.4.2 85% of torque obtained in 1.4.1						
14.44	2388	621	4.47	5.33	310	2.71
1.4.3 75% of torque defined in 1.4.2						
10.95	2423	630	3.77	4.49	344	2.44
1.4.4 50% of torque defined in 1.4.2						
7.37	2438	634	3.12	3.72	423	1.98
1.4.5 25% of torque defined in 1.4.2						
3.75	2462	640	2.53	3.02	675	1.24
1.4.6 unloaded						
0	2492	648	1.85	2.21	/	/

JM-254 CAMTC OECD No. 1650 Full Code

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	rev / min		kg / h	l / h	g / kWh	kWh / l
1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED (540 rev / min) 1.5.1 the torque corresponding to maximum power						
16.17	2077	540	4.71	5.61	291	2.88
1.5.2 85% of torque obtained in 1.5.1						
13.89	2100	546	4.13	4.92	297	2.82
1.5.3 75% of torque defined in 1.5.2						
10.67	2154	560	3.43	4.09	321	2.61
1.5.4 50% of torque defined in 1.5.2						
7.24	2181	567	2.81	3.35	388	2.16
1.5.5 25% of torque defined in 1.5.2						
3.65	2200	572	2.21	2.63	605	1.39
1.5.6 unloaded						
0	2231	580	1.53	1.82	/	/

- No load maximum engine speed: 2492 rev / min
- Torque (equivalent crankshaft) at maximum power: 68 N • m
- Maximum torque (equivalent crankshaft): (engine speed: 1758 rev / min) 82 N • m
- Mean atmospheric conditions
  - Temperature: 15℃
  - Pressure: 101.9 kPa
  - Relative humidity: 84%
- Maximum temperatures
  - Coolant: 74℃
  - Engine oil: 105℃
  - Fuel: 15℃
  - Engine air intake: 20℃

2. HYDRAULIC POWER AND LIFTING FORCE

- Date of tests: 12.Nov. 1996

2.1 HYDRAULIC POWER TEST

- Sustained pressure with relief valve open: 16.5 MPa
- Pump delivery rate at minimum pressure: 23.72 l / min

	Flow rate	Pressure	Power
	l / min	MPa	kW
Flow rate corresponding to a hydraulic pressure equivalent to 90 percent of the actual relief valve pressure setting and corresponding hydraulic power	20.16	15.0	5.04
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	20.16	15.0	5.04

- Tapping point used for test: Right side of hydraulic power lift housing
- Temperature of hydraulic fluid: 60～70℃
- Opening pressure of the unloading valve: None
- Closing pressure of the unloading valve: None

2.2 POWER LIFT TEST

	at the hitch point	on the frame
Height of lower hitch points above ground in down position	138 mm	128 mm
Vertical movement	618 mm	753 mm
Maximum corrected force exerted through full range	6.24 kN	4.31 kN
Corresponding pressure of hydraulic fluid	14.85 MPa	14.85 MPa
Moment about rear wheel axis	5.65kN • m	7.81 kN • m
Maximum tilt angle of mast from vertical	/	11 degrees

−Linkage settings for test−see Table 1.1 and Figures 1.1

Lifting heights relative to the horizontal plane including the lower link pivot point											
mm	−253	−243	−200	−100	0	+100	+200	+300	+375	+400	+500
Lifting forces (the values measured are corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting or to maximum power delivered by the hydraulic system,which is lower)											
at the hitch point kN		8.145	7.947	7.605	7.245	6.939	6.606	6.313	6.237		
Corresponding pressure: 14.85 MPa											
at the frame kN	6.498		6.327	5.931	5.616	5.346	5.094	4.968		4.563	4.311
Corresponding pressure: 14.85 MPa											

3. DRAWBAR PERFORMANCE

− Date of tests: 6～8. Nov. 1996
− Type of track: Concrete

		Tyre inflation pressure	
	Height of drawbar above ground	Front	Rear
Unballasted	357 mm	200 kPa	110 kPa
Ballasted	355 mm	200 kPa	110 kPa

Gear and range	Power	Drawbar Pull	Speed	Engine speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperature			Atmospheric conditions		
								Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
	kW	kN	km / h	rev / min	%	g / kWh	kWh / l	℃	℃	℃	℃	%	kPa
3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)													
2(L2)	8.48	10.11	3.02	2405	15	454.0	1.88	13	65	93	12	40	102.2
3(L3)	12.64	8.62	5.28	2380	9	390.0	2.19	13	68	93	12	40	102.2
4(H1)	13.38	6.32	7.62	2348	6	368.5	2.32	13	69	94	12	40	102.2
5(H2)	11.74	2.80	15.10	2355	3	416.7	2.05	13	67	94	12	40	102.2
3.2 MAXIMUM POWER IN TESTED GEARS (ballasted tractor)													
1(L1)	4.77	11.15	1.54	2448	15	612.2	1.40	13	66	92	12	40	102.2
2(L2)	9.40	11.24	3.01	2402	15	436.6	1.96	13	66	93	12	40	102.2
3(L3)	12.91	8.77	5.30	2340	10	382.9	2.23	13	67	95	12	40	102.2
4(H1)	13.48	6.35	7.64	2358	6	363.5	2.35	13	69	95	12	40	102.2
5(H2)	11.78	2.80	15.14	2351	2	405.8	2.11	13	67	93	12	40	102.2
3.3.1 FIVE HOUR TEST at 75 percent of pull at maximum power													
4(H1)	10.31	4.82	7.70	2389	5	411.3	2.08	13	66	92	12	40	102.2
3.3.2 FIVE HOUR TEST at pull corresponding to 15 percent wheelslip													
2(L2)	9.58	11.20	3.08	2400	*	*	*	13	65	90	12	70	102.2

Oil consumption during ten hours duration of tests 3.3.1 and 3.3.2: 20 g / h

(*)Those figures not quoted are irrelevant due to the additional ballast

4. TURNING AREA AND TURNING CIRCLE

Details of wheel equipment:

	Tyre size	Track width
front:	6.00-12	1050
rear:	9.50-24	1132

	With brakes		Without brakes	
	Right hand	Left hand	Right hand	Left hand
	m	m	m	m
Radius of turning area	2.89	2.93	3.17	3.28
Radius of turning circle	2.72	2.55	3.00	3.11

5. LOCATION OF CENTRE OF GRAVITY

Height above ground:	599 mm
Distance forward from the vertical plane containing the axis of the rear wheels:	649 mm
Distance from the median plane of the tractor:	To the right 3. 8mm

6. BRAKING

- Date of tests: 11. Nov. 1996

6.1 COLD SERVICE BRAKING DEVICE TEST

Speed before application of brakes: 28.0 km / h

Ballasted tractor	Braking device control force N	150	250	350	450	500
	Mean deceleration m / s^2	1.65	2.10	2.55	2.85	3.20
Unballasted tractor	Braking device control force N	150	250	350	450	500
	Mean deceleration m / s^2	1.63	1.99	2.53	2.82	3.18

6.2 FADE TEST

Speed before application of brakes: 28.12 km / h

Ballasted tractor	Braking device control force N	150	250	350	450	500
	Mean deceleration m / s^2	1.60	1.96	2.50	2.80	3.15

Maximum deviation of tractor from its original course: 0

Abnormal vibration: None

Brakes were heated by: Driving

6.3 PARKING BRAKING DEVICE TEST

	Up	Down
Braking device control force N	450	480

7. MEASUREMENT OF EXTERNAL NOISE LEVEL

- Date of test: 11. Nov. 1996
- Type of sound level meter: B & K 2235
- Type of track: Concrete
- Cear number: 6(H3)
- Travelling speed before acceleration: 20.94 km / h
- Sound level: 82.8 dB(A)

IV. REPAIRS AND ADJUSTMENTS DURING TESTS: None

V. REMARKS: None

Test carried out by: Baiyuchun, Gengzhanbin, Zhangmenghua
Tianli, Liuqin, Chenxinghe, changxiongbo

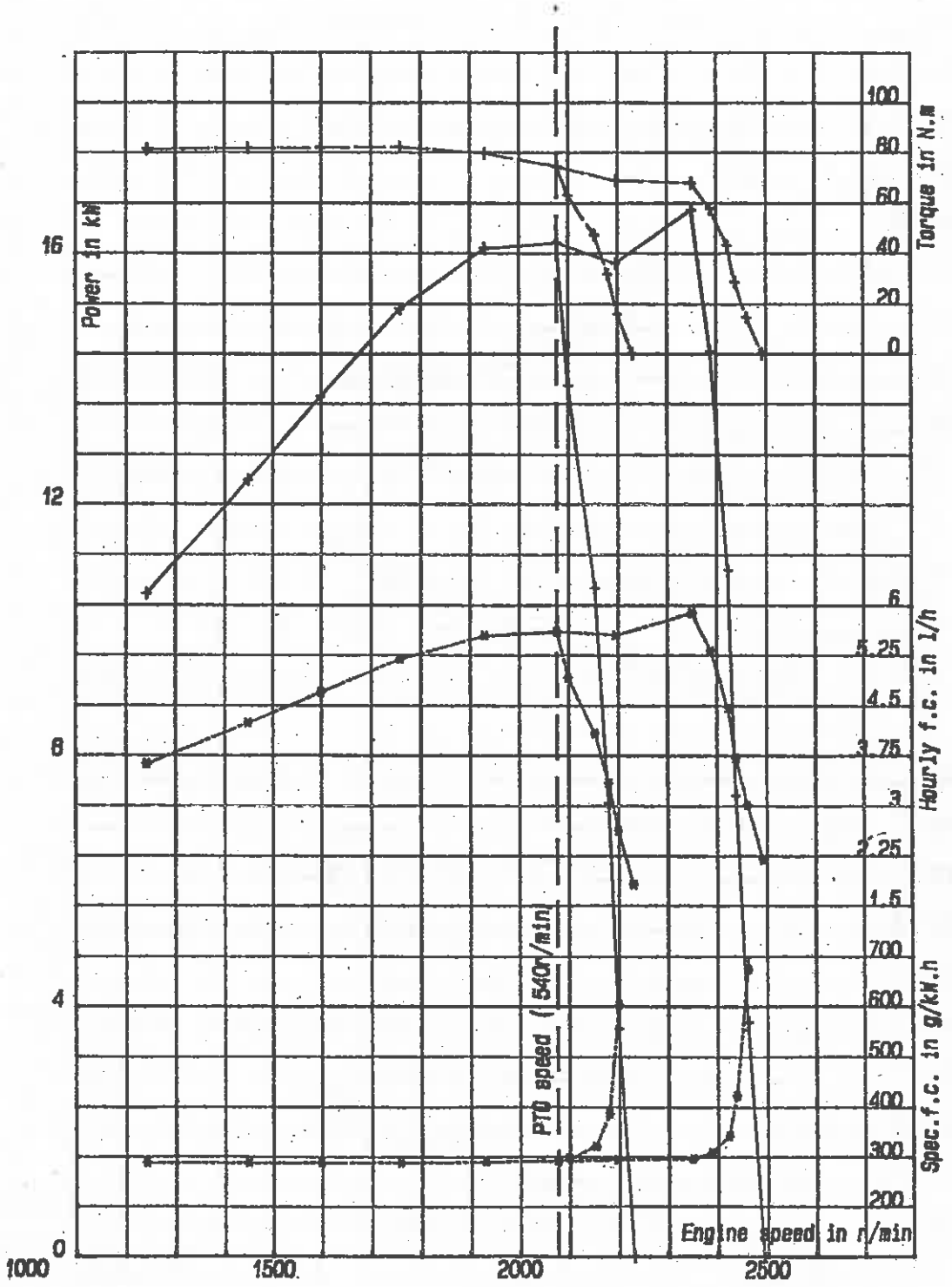
Officer in Charge: Zhangmenghua

Chief of Tractor Testing Division: Lixijiang

For the director: Wangliansheng

ANNEX

MAIN POWER TAKE-OFF TEST CURVES



ANNEX

MAIN POWER TAKE−OFF TEST CURVES

