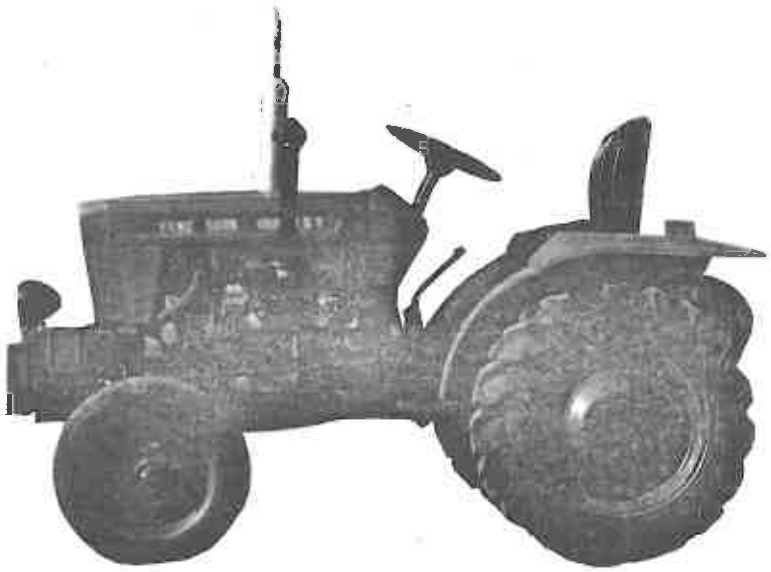
CAMTC

Report on test in accordance with the OECD STANDARD CODE FULL CODE (CODEI) for the official testing of agricultural tractors

OECD Approval No 1333 FULL CODE

Approval Date: 1 Oct. 1991



FENG SHOU 180 standard

Manufacturered by Jiangxi Tractor Plant

Jiangxi Nanchang

Box. 330002, China

Test No: 90TJ113

Date: Sept. 1990

China Agricultural Machinery Testing Centre

40 Shi Li He Donghuan Hanlu

100021, Beijing, China

CAMTC

TABLE OF CONTENTS

–Tractor manufacturer's name and address:	Jiangxi Tractor Plant, China. 330002 Nanchang, China
–Submitted for test by:	The manufacturer
–Selected for test by:	The manufacturer with the agreement of the testing station.
–Place of running–in:	jiangxi T.P.
–Duration of running–in:	50 hours
–Location of test:	China Agricultural Machinery Testing Center(CAMTC)

I. SPECIFICATIONS OF TRACTOR

TRACTOR

–Make / Model / Type:	FENG SHOU,180,2 Wheel–drive
–Number of driving wheels:	2
–Serial No:	4640
–1st Serial No:	1801

ENGINE

–Make / Model / Type:	Jiangxi T.P., J285T, Vertical, water cooling, 4 strokes, diesel
–Serial No:	4916

Cylinders

–Number / disposition:	2, vertical in line
–Bore / stroke:	85 × 101.6mm / mm
–Capacity:	1150 cm^3
–Compression ratio:	19 : 1
–Arrangement of valves:	overhead
–Cylinder liners:	dry

Supercharging	None
Fuel system	
–Fuel feed system:	Mechanical, piston type fuel feed pump
–Make / Model / Type of fuel filter:	Jiangxi T.P. J285 C0506, Replaceable Paper elements
–Capacity of fuel tank:	22 l
–Make / Model / Type of injection pump:	Jiangxi T.P. 2I39–7.5, 2 piston type I
–Serial No:	J285.16.001
–Manufacturer's production setting of injection pump:	13 ml / 400Time
• Flow rate (rated engine speed and full load):	4.595 l / h
• Timing:	16 ± 2 ° before T.D.C
–Make / Model / Type of injectors:	Jiangxi T.P. P662, single hole
–Injection pressure:	12.5+0.5 MPa
Governor	
–Make / Model / Type:	Wuxi, T7B, Mechanical Centrifugal type
–Governed range of engine speed:	from 550 to 2380 rev / min
–Rated engine speed:	2200 rev / min
Air cleaner	
–Pre–cleaner	
• Make / Model / Type:	Jiangxi Wuzhou, K1112 Centrifugal
• Location of air intake:	Under bonnet
–Main cleaner	
• Make / Model / Type:	Jiangxi Wuzhou, K1112, Oilbath
• Location of air intake (in case	

of no pre–cleaner):	Under bonnet
–Maintenance indicator:	Maintenance every 120 h, Change every 480 h

Lubrication system

–Type of feed pump:	gear
–Type of filter:	replaceable paper element
–Number:	1

Cooling system

–Type of coolant:	Water
–Type of pump:	centrifugal pump, belt driven
–Specification of fan or blower:	Belt driven
–Number of fan blades:	4
–Fan diameter:	300 mm
–Coolant capacity:	5.5 l
–Type of temperature control:	Thermostat
–Superpressure system:	None

Staring system

–Make / Model / Type:	Jiansu Wujin, 2Q2A, Electrical solenoid pre–engaged
–Starter motor power rating:	1.47 kW
–Cold starting aid:	Flame glow plug, 10–12–65

Electrical system

–Voltage:	12 V
–Generator	
• Make / Model / Type:	Jiangsu Wujing, 2JF200
• Power:	0.2 KW

–Battery (Number of accumulators):	1
• Rating:	75 Ah at 20 hours rating

Exhaust system

–Make / Model / Type:	Jiangxi T.P. J285 10.202, Expansion Chamber
–Location:	Right–hand side

TRANSMISSION TO WHEELS

Clutch

–Make / model / Type:	Jiangxi T.P., 18–21 1 plate dry clutch
–Number of plates:	1
–Diameter of plates:	204 mm
–Method of operation:	foot pedal

Gear box

–Make / Model / Type:	Jiangxi T.P., 18–37 Mechanical
–Arrangement:	Manually operated gear shift; Mechanical gear box with 4 forward and 1 reverse speed, Group gear with 2 ranges (low and high).
–Number of gears:	8 forward and 2 reverse
–Avaiable options:	Creeper

Rear axle and final drives

–Make / Model / Type:	Jiangxi T.P., 18–38 Externally meshed spur gear
–Differential lock:	
• Type:	Jaw clutch
• Method of engagement:	Manual by pedal

• Method of disengagement: Self disengagement

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	324.71	1.06
2	L	245.85	1.40
3	L	132.38	2.60
4	L	74.82	4.60
1	H	62.58	5.50
2	H	46.51	7.40
3	H	25.50	13.50
4	H	14.52	27.70
R1	L	286.83	1.20
R2	H	52.95	6.50

(*)Calculated with a tyre dynamic radius index of 415 mm (ISO 4251 / 1–1984)

POWER TAKE–OFF

Main power take–off

–Type: Not independent

–Method of engagement: driven by the main clutch

–Number of shafts: 1

–Method of changing power take–off shaft ends and speeds: Manually, by exchanging shafts

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 / 1979
–Height above ground:	350 mm
–Distance from the median plane of the tractor:	Central
–Distance behind rear–wheel axis:	400 mm
–PTO speed at rated engine speed:	605 rev / min
–Engine speed at standard power take–off speed:	1964 rev / min
–Ratio of rotation speeds (engine speed / p.t.o speed):	3.640 : 1
–Power restriction	12 kW
–Direction of rotation (viewed from behind tractor):	clockwise
1000 rev / min	
–Location:	At rear of tractor
–Diameter of power take–off shaft end:	35 mm
–Number of splines	6, in conformity with ISO 500 / 1979
–Height above ground:	350 mm
–Distance from the mediam plane of the tractor:	Central
–Distance behind rear wheel axis:	400 mm
–PTO speed at rated engine speed:	1120 rev / min
–Engine speed at standard power take–off speed:	1964 rev / min
–Ratio of rotation speeds (engine speed / p.t.o speed):	1.964 : 1

–Direction of rotation (viewed from behind tractor):	clockwise
Power take–off proportional to ground speed	None

POWER LIFT

–Make:	Jiangxi T.P.
–Type of hydraulic system:	Piston type pump
–Type and number of cylinders:	One cylinder single acting
–Type of linkage lock for transport:	Hydraulic
–Relief valve pressure setting:	11.5+0.5 MPa
–Lift pump type:	piston
–Transmission between pump and engine:	Mechanical from gearbox
–Site of oil reservoir:	Transmission housing
–Type, number and location of tapping points:	1 pressure only and 1 return only 1, at rear of tractor

Three–point linkage

–Category:	0, not in conformity with ISO standard

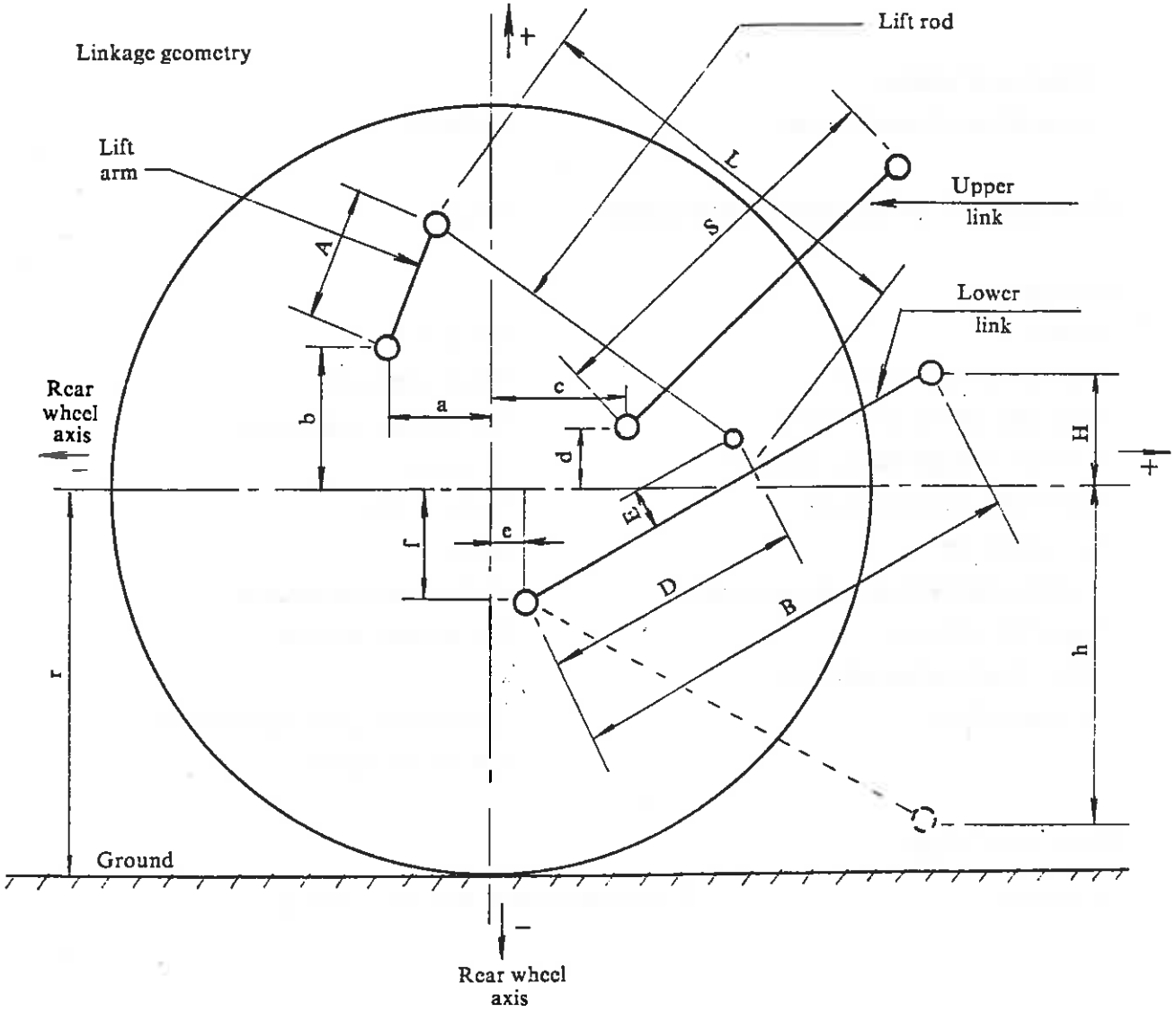


Figure 1.1

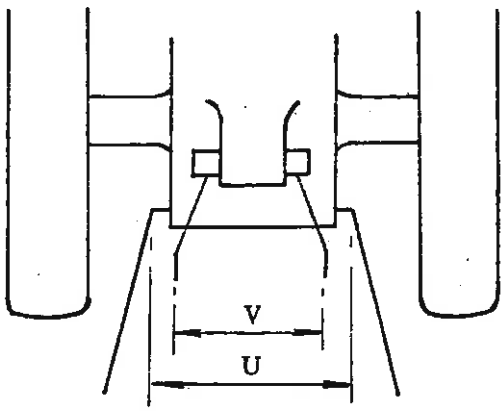


Figure 1.2

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)	205	205
Length of lower links	(B)	645	645
Distance of lift arm pivot: horizontally	(a)	37	37
point from rear–wheel axis: vertically	(b)	352	352
Horizontal distance between the 2 lower link points	(u)	500	500
Horizontal distance between the 2 lift arm end points	(v)	321	321
Length of upper link	(s)	from 440 to 600	555
Distance of upper link pivot point from rear: horizontally	(c)	198	198
wheel axis : vertically	(d)	277	277
Distance of lower link pivot point from rear: horizontally	(e)	127	127
wheel axis : vertically	(f)	75	75
Distance of lower link pivot points to lift rod pivot points on lower links	(D)	from 290 to 470	290
Length of lift rods	(L)	from 330 to 480	410
Height of lower hitch points relative to the rear–wheel axis:			
–in low position	(h)	from 155 to 245	215
–in high position	(H)	from 275 to 410	356
Height above ground of lower hitch points when locked in transport position (*)		from 690 to 825	771

(*)Assuming (r) = tyre dynamic radius index of 415 mm (ISO 4251 / 1–1984.).

TRAILER HITCH

–Hole diameter:	33 mm
–Height above ground:	350 mm
–Distance of hitch point from rear wheel axis, horizontally:	630 mm

–Distance of hitch point from power take–off shaft end	
• Vertically:	300 mm
• Horizontally:	350 mm
• Maximum vertical permissible load:	9 kN

HOLED DRAWBAR

–Number of holes:	3
–Distance between holes:	40 mm
–Hole diameter:	20 mm
–Thickness / width of the drawbar:	8 / 50 mm
–Height above ground	
• Minimum:	760 mm
• Maximum:	840 mm
–Horizontal distance to power take–off shaft end (rear):	100 mm

STEERING

–Make / Model / Type:	Jiangxi T.P., 18–40, Mechanical

BRAKES

Service brake

–Make / Model / Type:	Jiangxi T.P. 18–43, mechanical transmission, shoes with linings
–Method of operation:	Foot–controlled
–Trailer braking take–off:	air brake

Parking brake

–Type:	Mechanical
–Method of operation:	operating mechanical linkage on service brakes

WHEELS

–Number	4
• Front:	2, steering
• Rear:	2, driving
–Wheetbase:	1400 mm
–Track width adjustment	

	Minimum mm	Maximum mm	Adjustment method
Front	935	935	
Rear	950	1250	Reversing wheels and off–set lug rims

DRIVER'S SEAT

–Make:	Jiangxi T.P.
–Type of suspension:	Mechanical
–Type of damping:	Spring
–Range of adjustment:	
• Longitudinal:	40 mm
• Vertical:	/ mm

LIGHTING

	Height above ground of centre mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headlights	1000	140×100	500
Sidelights	1040	90×74	70
Rearlights	1030	Φ140	190
Reflectors	/	/	/

II. TEST CONDITIONS

Overall dimensions

	Length mm	Width		Height at top of	
		minimum mm	maximum mm	protective structure mm	exhaust silencer mm
Ballasted	2550	1000	1450	–	1770
Unballasted	2550	1000	1450	–	1775

Ground clearance(unballasted tractor): 300 mm

–Clearance–limiting part: Final drive case

Tractor mass

	Ballasted		Unballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	482	484	441	443
Rear	831.5	904.5	697	770
Total	1313.5	1388.5	1138	1213

Ballast

	Weights		Water kg
	Number	Total mass kg	
Front	2	41	–
Rear	4	134.5	–
Optinal	–	–	–

Tyres and track width specifications

	Front	Rear
Tyres:		
• dimensions	5.00–12	8.3–20
• ply rating	4	6
• type	cross ply	cross ply
• maximum load (tyre manufacturer's)	2.5 kN	7.5 kN
• maximum load (tractor manufacturer's)	2.5 kN	5.5 kN
• inflation pressure (tyre manufacturer's)	200 kPa	150 kPa
• dynamicradius index	250mm	415 mm

Oils and lubrication

–Capacity and change interval

	Capacity l	Oil change h	Filter change h
Engine	3.5	400	480
Gear box	25	first 100	–
Front axle		then	–
Rear axle	Common with	2 Times / year	–
Final drive (rear)	Gear box		–
Hydraulic system			–

–Specifications (SAE, API, Mil, L, ISO)

	Recommended	Used during test
Engine oil		
• Type:	Chinese standard	
• Viscosity:	HC–11 (SAE 30)	
• Classification:	11 mm^2 / s at 100℃	
Transmission oils		
• Type:		
• Viscosity:		
• Classification:	Chinese standard HQ–15 (SAE–90)	
Hydraulic fluid	15 mm^2 / s at 100℃	
• Type:		
• Viscosity:		
• Classification:		

–Grease:

• Number of lubrication points: 17

Fuel

–Type: Diesel oil No 0 to Chinese standard GB252–77

–Density at 15℃: 0.851 g / cm^3

Ⅲ. TEST RESULTS

COMPULSORY TESTS RESULTS

1. MAIN POWER TAKE–OFF

–Date and location of tests: 9 September 1990 CAMTC

–Type of dynamometer: Eddy Current, SCHENCK 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						
12.6	2200	1120	3.95	4.64	313	2.72
1.2 POWER AT RATED ENGINE SPEED						
12.1	2200	1120	3.95	4.64	313	2.72
1.3 STANDARD POWER TAKE–OFF SPEED 1000 rev / min						
11.9	1964	1000	3.73	4.38	313	2.72
1.4 PART LOADS						
1.4.1 the torque corresponding to maximum power at rated engine speed						
12.6	2200	1120	3.95	4.64	313	2.72
1.4.2 85% of torque obtained in 1.4.1						
11.0	2233	1137	3.42	4.02	311	2.74
1.4.3 75% of torque defined in 1.4.2						
8.4	2257	1149	2.80	3.29	333	2.56
1.4.4 50% of torque defined in 1.4.2						
5.9	2290	1166	2.27	2.67	385	2.21
1.4.5 25% of torque defined in 1.4.2						
3.0	2318	1180	1.74	2.04	580	1.47
1.4.6 unloaded						
0	2333	1188	1.29	1.52	–	–

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 1000 rev / min

1.5.1 the torque corresponding to maximum power

11.9	1964	1000	3.73	4.38	313	2.72

1.5.2 85% of torque obtained in 1.5.1

10.3	2005	1021	3.30	3.88	320	2.66

1.5.3 75% of torque defined in 1.5.2

7.8	2025	1031	2.61	3.07	335	2.54

1.5.4 50% of torque defined in 1.5.2

5.4	2050	1043	2.15	2.53	398	2.14

1.5.5 25% of torque defined in 1.5.2

2.6	2072	1055	1.60	1.88	616	1.38

1.5.6 unloaded

0	2100	1069	1.09	1.28	–	–

-No load maximum engine speed: 2333 rev / min

-Torque (equivalent crankshaft)
at maximum power: 54.5 N.m

-Maximum torque (equivalent crankshaft): 60.3 N.m
(engine speed: 1449 rev / min)

-Mean atmospheric conditions:

- Temperature: 24 ℃
- Pressure: 100.5 kPa
- Relative humidity: 75 %

–Maximum temperatures

- Coolant: 86 ℃
- Engine oil: 98 ℃
- Fuel: 24 ℃
- Engine air intake: 25 ℃

2. HYDRAULIC POWER AND LIFTING FORCE

–Date of tests: 14 Sep. 1990

2.1 HYDRAULIC POWER TEST

–Sustained pressure with relief valve open: 11.5 MPa

–Pump delivery rate at minimum pressure: 11.4 l/min

	Flow rate l/min	Pressure MPa	Power kW
Flow rate corresponding to a hydraulic pressure equivalent to 90 per cent of the actual relief valve pressure setting and corresponding hydraulic power	7.69	10.4	1.33
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	9.94	9.0	1.49

–Tapping point used for test: External spool valve conection

2.2 POWER LIFT TEST

	at the hith point	on the frame
Height of lower hitch points above ground in down position	200 mm	200 mm
Vertical movement	511 mm	511 mm
Maximum corrected force exerted through full range	5.29 kN	3.01 kN
Corresponding pressure of hydraulic fluid	10.3 MPa	10.3 MPa
Moment about rear–wheel axis	4.08 kN.m	4.16 kN.m
Maximum tilt angle of mast from vertical	–	13 degrees

–Linkage settings for test – see Table 1.1 and Figures 1.1 and 1.2

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	...	...	–84	–50	0	+100	+200	+300	+400	+427	
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, whichever is lower)											
at the hitch points kN			6.91	6.80	6.62	6.27	6.08	5.91	5.67	5.29	
Corresponding pressure: 10.3 MPa											
at the frame kN			5.78	5.55	5.33	5.18	4.71	4.21	3.77	3.01	
Corresponding pressure: 10.3 MPa											

3 . DRAWBAR PERFORMANCE

Date of tests: 25 September 1990

Type of track: concrete

		Tyre inflation pressure	
	Height of drawbar above ground	Front	Rear
Umballastad	355 mm	250 kPa	150 kPa
Ballasted	350 mm	250 kPa	150 kPa

Gear and range	Power	Drawbar pull	speed	Engine speed	Slip of wheels	Specific fuel consumption
	kW	kN	km / h	rev / min	%	g / kWh
3.1. MAXIMUM POWER IN TESTED GEARS(Unballasted tractor)						
L2	2.24	6.25	1.29	2309	15	567
L3	4.25	6.56	2.33	2288	15	525
L4	7.00	6.41	3.92	2244	15	410
H1	8.59	6.48	4.77	2228	15	392
H2	10.40	5.98	6.26	2162	13	369
3.2. MAXIMUM POWER IN TESTED GEARS(ballasted)						
L1	2.05	7.83	0.94	2311	15	691
L2	2.65	7.23	1.32	2318	15	549
L3	4.73	7.33	2.32	2269	15	489
L4	8.46	7.87	3.87	2214	15	398
H1	10.04	7.74	4.67	2206	15	372
H2	10.60	5.89	6.48	2196	12	371
3.3.1 FIVE HOUR TEST at 75 per cent of pull at maximum power						
H2	8.30	4.31	6.93	2221	8	368
3.3.2 FIVE HOUR TEST at pull corresponding to 15 per cent Wheelslip						
H1	9.95	7.70	4.65	2203	–	–

Oil consumption during ten hours duration of tests 3.3.1 and 3.3.2 or test 3.4: 18 g / h

specific energy	Temperature			Atmospheric conditions		
	Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
kWh / l	℃	℃	℃	℃	%	kPa
1.50	26	72	85	24	70	100.1
1.62	26	72	85	24	70	100.1
2.08	26	72	86	24	70	100.1
2.17	26	72	86	24	70	100.1
2.31	26	72	87	24	70	100.1
1.23	26	72	85	25	71	100.2
1.55	26	72	86	25	71	100.2
1.74	26	72	86	25	71	100.2
2.14	26	72	86	25	71	100.2
2.29	26	72	87	25	71	100.2
2.29	26	72	87	25	71	100.2
2.31	27	73	89	25	73	100.3
–	27	73	88	24	70	100.1

4. TURNING AREA AND TURNING CIRCLE

Details of wheel equipment:

	Type size	Track width
front	5.00–12	935 mm
rear	8.3–20	957 mm

	With brakes		Without brakes	
	Right–hand m	Left–hand m	Right–hand m	Left–hand m
Radius of turning area	2.21	2.16	2.47	2.60
Radius of turning circle	2.13	2.10	2.43	2.56

5. LOCATION OF CENTRE OF GRAVITY

–Height above ground: 467 mm

–Distance forward from the vertical plane containing the axis of the rear–wheels: 511 mm

–Distance from the median plane of the tractor to the left: 16 mm

6. BRAKING

–Date of tests: 22 September 1990

6.1 COLD SERVICE BRAKING DEVICE TEST

	Speed before application of brakes km / h	Braking device control force N	Mean deceleration m / s^2
Ballasted tractor	24	250, 350, 450, 600	1.9, 2.5, 2.9, 3.1
Unballasted tractor	24	250, 350, 450, 600	2.6, 3.0, 3.4, 3.8

6.2 FADE TEST (Ballasted)

Speed before application of brakes km / h	Braking device control force N	Mean deceleration m / s^2
24	250, 350, 450, 600	2.0, 2.4, 2.7, 2.9

–Maximum deviation of tractor from its original course: None

–Abnormal vibration: None

–The brakes were heated by: Driving

6.3 PARKING BRAKING DEVICE TEST

18 % slope	up	down
Braking device control force	400 N	380 N

7. MEASUREMENT OF EXTERNAL NOISE LEVEL

–Date of tests: 22 September 1990

–Type of sound level meter Bruel δ Kjaer 2232

–Type of track: Concrete

–Gear number: H4

–Travelling speed before acceleratin: 18 km / h

–Sound level: 86 dB (A)

Ⅳ. REPAIRS AND ADJUSTMENTS DURING TESTS: None

Ⅴ. REMARLKS: None

TEST CARRIED OUT BY: Chen Haiyan, Geng Zhanbin

SIGNED: Li Xijiang 李希江 CHIEF OF TRACTOR DIVISION

Wang Liansheng FOR THE DIRECTOR

DATA ACQUISITION OF THE POWER TAKE-OFF CURVES

Test number:

Number and date to OECD approval: 1333 FULL CODE, 1.Oct. 1991

Testing station-City-COUNTRY: CAMTC, Beijing, China

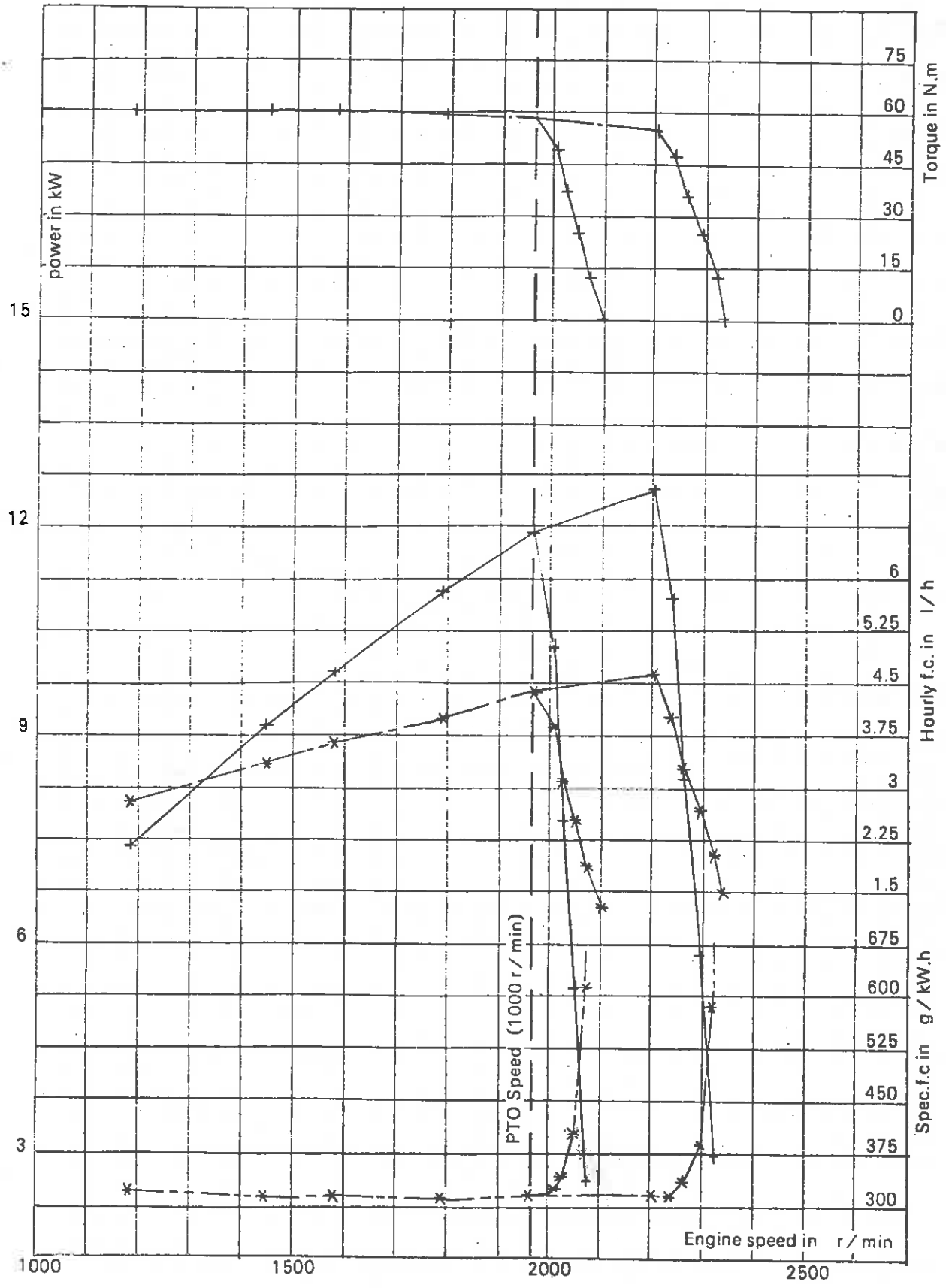
MAKE: Jiangxi T.P.

TRADE NAME: FENG SHOU 180 standard

Power	Speed		Engine torque	Fuel consumption	
	Engine	P.T.O.		Hourly	Specific
kW	rev / min		Nm	l / h	g / kWh
Full load and varying speed: Maximum power, power at rated engine speed, power at standard speed take-off down to the power corresponding to an engine speed at least 15% below the speed at which maximum torque occurs.					
12.6	2200	1120	54.4	4.64	313
11.9	1964	1000	58.0	4.38	313
11.1	1789	911	59.1	3.98	305
9.9	1579	804	60.0	3.64	313
9.1	1449	738	60.3	3.34	321
7.4	1184	603	59.6	2.78	320
Part loads, the governor control set for maximum power, at rated engine speed.					
12.6	2200	1120	54.5	4.64	313
11.0	2233	1137	47.0	4.02	311
8.4	2257	1149	35.6	3.29	333
5.9	2290	1166	24.4	2.67	385
3.0	2318	1180	12.2	2.04	580
0	2333	1188	0	1.52	/
Part loads, the governor control set for maximum power, at standard power take-off speed.					
11.9	1964	1000	58.0	4.38	313
10.3	2005	1021	49.0	3.88	320
7.8	2025	1031	36.7	3.07	335
5.4	2050	1043	25.0	2.53	398
2.6	2072	1055	12.0	1.88	616
0	2100	1069	0	1.28	/

Main power take–off test
Tractor:FENG SHOU 180

Test No.
Date: 10 / 9 / 1990



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Date: 10 / 9 / 1990