

MODEL JIANGSU — *old*  
MEDIUM SIZE TRACTOR

OPERATION AND  
MAINTENANCE MANUAL



China First Tractors Qingjing Tractor Co., Ltd

**MODEL JIANGSU MEDIUM – SIZE TRACTOR**

**OPERATION AND MAINTENANCE MANUAL**

**China First Tractor Qingjiang Tractor Co. ,Ltd**

**Model Jiangsu Medium - size Tractor  
Operation and Maintenance Manual**

**Compiled by China First Tractor Qingjiang Tractor Co. ,Ltd**

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## PREFACE

Jiangsu-500 tractor, as a multi-purpose medium-size tractor for dry and paddy field operations and mainly for field works and providing power for transportation, with its characteristics of compact in construction, convenience control, nimble steering and facilitated maintenance, can be attached with appropriate implements for plowing, harrowing sowing, harvesting and transporting. It can also provide power for stationary operations.

Jiangsu-50H high ground clearance tractor, a new version of model Jiangsu-500, is a kind of specialized type which is suitable for field management and plant protection operations of cotton, maize and sugarcane, etc.

Jiangsu-504 4WD tractor, another version of Model Jiangsu-500, equipped with advanced static hydraulic steering system and fully sealed front drive axle, has its characteristics of easy control, well adhesive performance, relatively high traction ability and a large numbers of suitable working conditions despite the advantages of Model Jiangsu-500 and is especially suitable for paddy field operations and for cultivating in sandy loam and heavy clay soil land. It's reputable as "the king of paddy field" by our users. This model has won the championship of international the "day of the field" held in Australia 1984 and of the traction Championship held in the United States, the UK, Japan, Italy etc. for the same versions of tractors, and has made itself to be the first tractor which has won the international championship in our country.

Developing on the basis of Jiangsu-500 and Jiangsu-504 tractors, Jiangsu series tractor has expanded its family to a great deal of new versions, such as Jiangsu-550, 650, 554, 654, 704 etc. Despite the advantages of their basic models, these new versions have significantly improved their traction and lifting ability due to the improvement in construction design and the increasing in the power of the engine equipped to have better field performance in paddy field and heavy clay soil operations than their basic models. They can do paddy field works without high lug tire to generating improved productivity and benefits for our users.

This manual takes Jiangsu medium-size tractor equipped with Model 495T diesel engine as an example to show the structure, working principle and operating & maintenance of them, and it provides the drivers with systematic analysis of common troubles and remedies.

This manual is the essential reading for tractor users and maintenance personnel and the teaching material for training drivers. It also can be used by repair workers, technical and administrative personnel for reference. Since the structure of the tractor is being improved rapidly, the contents in this manual may be inconsistent with the products. Please refer to the production manual of this product while reading this manual.

Written by Engineer Liao Hanping and proofread by Senior Engineers Wu Rongsheng and Li Chunlin.

The whole book is examined and approved by Deputy General Manager Chang Xiaoling. Senior Engineers Wei Wenlin and Sun Huakun also participated in the examination.

We sincerely hope that our users give us the experience and suggestions about operating and functional requirements on the tractor, so as to fully meet the demand of our users.

China First Tractor Qingjiang Tractor Co., Ltd  
May, 1999

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# Chapter I Main Technical Specifications

## of Jiangsu Medium - size Tractors

### 1. Tractor Parameters

Model		JS-500/550/550E	JS-50H	JS-504/554	JS-650	JS-654	JS-704
Type		General - purpose wheeled tractor for both dry and paddy field jobs	High - crop tractor	4WD tractor for both dry and paddy field jobs	General - purpose wheeled tractor for both dry and paddy field jobs	4WD tractor for both dry and paddy field jobs	
Power output at PTO (kW)		33/38.5			45.4	48.9	
Traction (kN) with adhesive coefficient at 0.84 and slip at 15%		18/18.6/18.6	8 (rated value)	22.5/23.5	19.5	25.5	27
Draft power (kW) (Stipulated by factory)		27/30.5	27	27/30.5	36	36	40
Overall dimensions (mm)	Length	3350(to rear end of lower link)		3590	3415	3655	3800
	Width (normal)	1660/1830 (without ballast)			1830 (without ballast)		
	Height (to top of steering wheel)	1650	1880	1780	1650	1780	
	Height (to top of exhaust pipe)	2170	2400	2290	2615	2735	
Wheel base (mm)		1950	1900	2050	2015	2115	
Wheel tread (mm)	Front	1300 (normal), 1400, 1500, 1600	1470 (normal), 1570	1420 (normal), 1520	1300 (normal), 1400, 1500, 1600	1420 (normal), 1520	
	Rear	1250, 1350(normal), 1450(55 normal), 1550, 1650			1350, 1450(normal), 1550, 1650		
Ground clearance (mm)	Farming operation	510 (to main sleeve of front axle)	740 (as left)	415 (to both sides of front axle casing)	510	415	
	Road	370 (to front spherical joint of lower link)	600 (as left)	360 (to middle of front axle casing)	385	360	400
Structure mass (kg)		1920/1960/1980	1930	2280/2310	2050	2414	2500
Min. operating mass (kg)		2100/2160/2180	2110	2470/2510	2230	2614	2700
Min. operating mass distribution	Front axle (kg)	850/860/880	850	1150	910	1248	1269
	Rear axle (kg)	1250/1300/1300	1260	1298/1360	1320	1366	1431
Front axle ballast (kg)		54	54	150	90	150	



(Continued)

Model		JS-500/550/550E	JS-50H	JS-504/554	JS-650	JS-654	JS-704
Rear axle ballast (kg)		450/530/530	450	450/530	550		
Turning radius (m)	Without one - side braking	3.5	3.7	4.3	3.7	4.3	
	With one - side braking	3.0	3.2	4.0	3.2	4.0	
Travel speed (km/h)	I	2.12			2.33	2.30	
	II	3.19			3.51	3.46	
	III	5.21			5.73	5.65	
	IV	7.03			7.73	7.63	
	V	8.48			9.31	9.20	
	VI	12.76			14.04	14.04	
	VII	20.84			22.92	22.59	
	VIII	28.12			30.93	30.49	
	Rev. I	2.79			3.07	3.03	
	Rev. II	11.16			12.28	12.12	

## 2. Diesel Engine\*

Tractor model	JS-50 series		JS-55 series	JS-65 series	JS-704
Engine model	495T (Yangzhou)	495A (Shanghai)	YZ4100T (Yangzhou)	LR4105T <sub>7</sub> (Luoyang)	LR4105T <sub>14</sub> (Luoyang)
Type	Vertical, in - line, water - cooled, four - stroke, swirl chamber	Vertical, in - line, water - cooled, four - stroke, spherical chamber	Vertical, in - line, water - cooled, four - stroke, direct injection chamber		
Compression ratio	20:1	16.5:1	17.2:1	17:1	
Cylinder number	4				
Cylinder bore (mm)	95		100	105	
Piston stroke (mm)	115		122	125	
Piston displacement (L)	3.26		3.83	4.33	
Firing order	1-3-4-2				
Rated speed (r/min)	2000			2200	2300
Idling speed (r/min)	≤550			≤600	
Rated horsepower (for 12h)(kW)	35.3		40.5	47.8	52
Specific fuel consumption (at rated conditions)(g/kW·h)	≤251.7	≤246.2	≤242.0		

\* Observe the specifications and maintenance instruction of the relative model of diesel engine.

(Continued)

Tractor model	JS-50 series		JS-55 series	JS-65 series	JS-704
Specific oil consumption (at rated conditions) (g/kW·h)	≤1.84	≤1.47	≤1.80		
Max. torque (N·m)	≥196.1	≥193.8	≥227	≥243.0	
Engine speed at Max. torque (r/min)	1400		1500	1550~1650	
Steady speed governing ratio at rated conditions (%)	≤8				
Crankshaft turning direction (to facing wards flying wheel end)	Counter clockwise				
Lubricating method	Forced circulation and splash lubrication combined				
Cooling method	Closed and forced circulation water - cooled			Closed and forced circulation water - cooled with oil radiator	
Starting method	Electric motor				
Engine net mass (kg)	330	340		410	
Overall dimensions (L × W × H) (mm)	837 × 630 × 810	977 × 595 × 785	830 × 660 × 810	844 × 619 × 828	
Valve timing					
Intake valve opens (before T. D. C)	17°	8° ± 2°	20°	12°	
Intake valve closes (after B. D. C)	43°	48° ± 2°	46°	38°	
Exhaust valve opens (before B. D. C)	43°	48° ± 2°	48°	55°	
Exhaust valve closes (after T. D. C)	17°	8° ± 2°	18°	12°	
Valve clearance (cold) (mm)					
Intake valve	0.30	0.25~0.30	0.35	0.3~0.4	
Exhaust valve	0.35	0.30~0.35	0.35	0.4~0.5	
Injection advance (before T. D. C)	16° ± 2°	23° ± 3°	20° ± 2°	18° ~ 21°	
Injection pressure (MPa)	12~12.5	17.5 ± 0.5	19.6~20.6		
Oil pressure (kPa)	300~500 (≥50 at idling speed)			300~500 (≥100 at idling speed)	
Oil temperature in sump	≤95℃	≤100℃	≤95℃	100℃	
Outleted cooling water temperature	75~90℃	≤98℃	75~90℃	≤98℃	
Exhaust temperature at rated conditions	≤470℃	≤600℃	≤550℃	≤620	

### 3. Transmission

Clutch	Dry, single-plate, constant engaged, double acting
Gearbox	Straight gear, two shafts, compound
Main drive	Spiral bevel gear
Differential	Simple, with two straight planetary bevel gears
Differential lock	Involute splined coupling

(Continued)

Final drive	Spur gear
Front main drive	Spiral bevel gear (for 4WD tractor)
Front differential	Simple, with two straight planetary bevel gears (for 4WD tractor)
Front final drive	Spiral bevel gears and straight bevel gears combined (for 4WD tractor)
Transfer case	Midship spar gear reduction box with engage/disengage device (for 4WD tractor)

## 4. Running gears, steering gears and braking system

Tractor model		JS-500/550	JS-50H	JS-504/554	JS-650/550E	JS-654	JS-704
Frame type		Frameless					
Front axle type		Steps, telescopic sleeve adjusting		Full closed, gear drive front drive axle	as JS-500	as JS-504	
Front tire size		6.00-16		9.5-24 (paddy field) 9.5-24 (high lugs)	6.50-16/ 6.00-16	9.5-24	11.2-24
Rear tire size		11-32/14.9-28 dryland, 11-32 paddy field (high lugs)			14.9-30/ 14.9-28	14.9-30	
Inflation pressure (kPa)	Front	200~300		80~120	200~300	80~120	
	Rear	80~120 (180 for High lugs tire)			80~120	80~120	
Front wheel adjustment	Toe-in	3~15 mm					
	Camber	3°		1°40'	3°	1°40'	
	Knuckle pin inclination	8°		7°30'	8°	7°30'	
	Caster	0°					
Front axle pivot angle		±10°					
Steering method		Mechanical steering linkage front wheel		Remotely full hydraulic steering front wheel	Hydraulic steering linkage front wheel	as JS-504	
Steering gear type		Recirculating ball-and-nut		BZZ1-100 full hydraulic steering unit	as JS-504	as JS-504	
Power steering cylinder				SGD50 × 160L double-acting	double-acting	as JS-504	
Power steering pump				CBN - E310 gear pump, right-hand	as JS-504	as JS-504	
Safety valve response pressure				7 ± 0.5MPa	7 ± 0.5MPa	7 ± 0.5MPa	
Brake type		Dry, double disks, mechanical					
Parking brake		Locked pedal					
Trailer braking		Optional pneumatic braking system					

### 5. Working equipment

Tractor model		JS-500/550/550E	JS-50H	JS-504	JS-650	JS-654/704
Hydraulic lift and hitch	Type	Semi - remotely mounted				
	Plowing depth control	Draft, position and height controls				
	Pump type	CBN - E312, gear pump, right - hand			CBN - E314, gear pump, right - hand	
	Cylinder (bore × stroke)	Single - acting, 95 × 100 mm			Single - acting, 110 × 120 mm	
	Hydraulic outlet	One threaded hole M20 × 1.5 (under seat); optional: quick joint or multi - outlet valve				
	Response pressure of safety valve (MPa)	17 <sup>+0.5</sup> <sub>0</sub>				
	Rated lifting force (N)	9000			12000	
	Rated lifting time	≤ 3 sec.				
	Linkage type	Rear - mounted, category II, three - point hitch (spherical joint)				
	Hitching triangle (mm)	754 × 510 (diameter × width)				
	Size of connecting hole of upper link (mm)	25.7 × 51 (diameter × width)				
	Size of connecting hole of lower link (mm)	28.7 × 45 (diameter × width)				
PTO shaft	Type	rear, semi - independent				
	Speed (r/min)	540 or 1000				
	Rotation direction	Clockwise (seen towards the head of tractor)				
	Spline dimension	6 - 35 × 30 × 8.69 (outer diameter × bottom diameter × teeth width), 8 - 38 × 32 × 6 (option)				
	Height to ground (mm)	560	790	690	560	690
Belt pulley	Size (mm)	235 × 180 (diameter × width)				
	Speed increase ratio	0.75				
Towing hook	Type	Stationary type or swing type as an option				
	Pin diameter of towing hook (mm)	φ34				
	Height (center to ground) (mm)	560	790	690	560	690

### 6. Electrical systems

Tractor model	JS-50 series, JS-55 series	JS-650, JS-654, JS-704
Electrical system	12V, negative grounded, single - wire system	
Generator	2JF200, 14V, 200W	JFZ1514Y, 14V, 500W

(Continued)

Tractor model	JS-50 series, JS-55 series	JS-650, JS-654, JS-704
Regulator	FT111, 14V, $\geq 500W$	JFT1401, 14V
Battery	3-NQ-150, 6V, 150Ah, (two in series)	
Starting motor	2Q2C, 12V, 1.84kW	QD154C, 12V, 3.7kW
Front headlight	ND140×90T-1, 12V, 50/35W (two in series)	
Rear headlight	WD134-1, 12V, 45/20W (one)	
Front turning signal light	J-120, 12V, 20/8W, (two)	110, 12V, 20/8W, (two)
Tail light	XH8-5, 12V, 20/8W, 20W, (one) or XH8-4, 12V, 20/8W, (two)	
Panel light	NZ2-2A(2B), 12V, 2W (two)	
Horn	DL 41DS/12, 12V	
Ammeter	307-A, 12V, $\pm 30A$	
Oil pressure gauge	308-A, 12V, 0~0.5MPa	
Water temperature gauge	302-A, 12V, 40~100°C	
Fuel gauge	304-A, 12V, 0~1/2~1	
Air pressure gauge	YTQ-60, 0~1.2MPa	
Speedometer and sensor	GS145, 12V, sensor M16×1.5 (495T, YZ4100T diesel engine), M18×1.5 (495A, LR4105T diesel engine)	

## 7. Filling capacity (L)

Tractor model		JS-500/550	JS-50H	JS-504/554	JS-650	JS-654, JS-704
Fuel tank		53				
Engine sump	495T, YZ4100T	17			/	
	495A	9			/	
	LR4105T	/			18	
Gearbox - rear axle		17		20	17	20
Final drive (each side)		6.5	7	6.5	6.5	
Steering gear housing		0.9		/	/	/
Lift housing and power steering canister		10				
Front main drive housing		/	/	8	/	8
Front final drive housing (each side)		/	/	6.5	/	6.5

## Chapter II Operating Instruction of the Tractor

### Section 1 Controls and Instruments

Controls and instruments of the tractor (see Fig. 2-1).

#### 1. Oil pressure gauge(No. 30)

It is used to indicate the oil pressure in the main passages of the engine. The normal pressure is

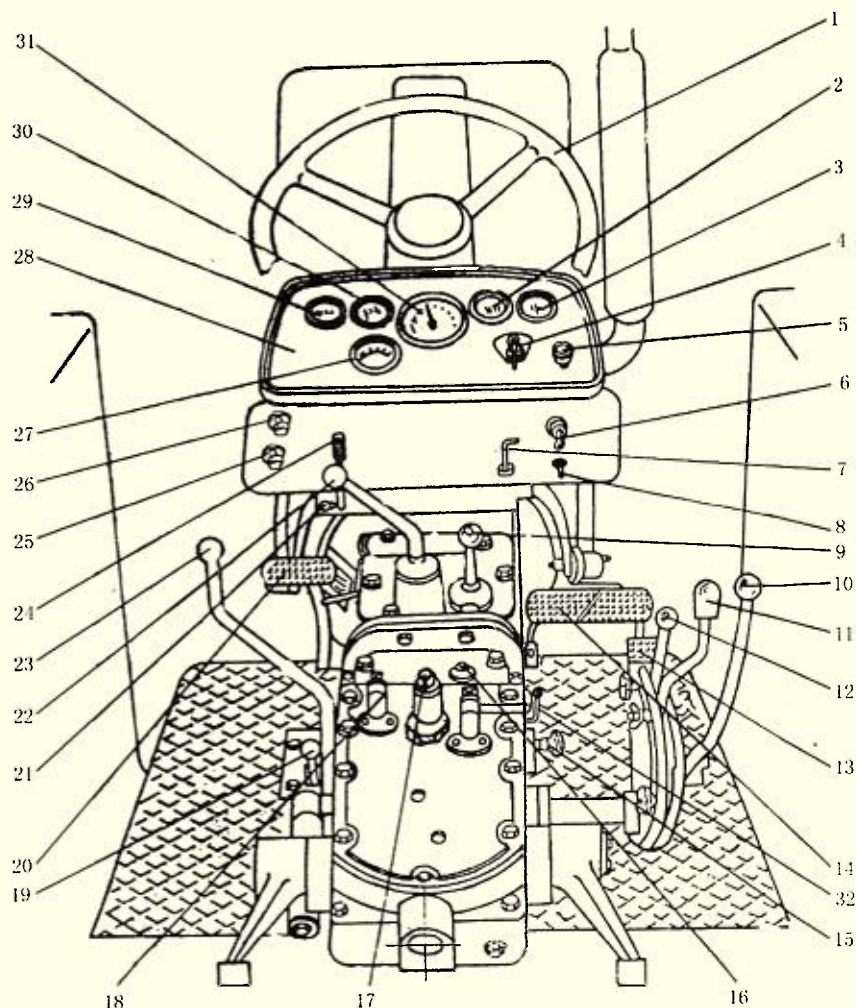


Fig. 2-1 Controls and instruments

1. Steering wheel 2. Water temperature gauge 3. Ammeter 4. Light switch 5. Horn button 6. Preheating and starting switch 7. Hand throttle lever 8. Turning signal switch 9. Auxiliary shift lever 10. Differential lock control lever 11. Draft control lever 12. Position control lever 13. Foot throttle pedal 14. Brake pedal 15. Handwheel for implement drop speed adjustment 16. Transmission - rear axle oil dipstick 17. Lifter oil filler 18. Hydraulic outlet point 19. Control lever for hydraulic oil pump 20. Clutch pedal 21. Fuel cutoff lever 22. Main shift lever 23. PTO control lever 24. Decompressing lever 25. 2nd shift switch 26. 1st shift switch 27. Air pressure gauge 28. Instrument panel 29. Fuel gauge 30. Oil pressure gauge 31. Speedometer 32. Transfer case control lever

between 200 ~ 400kPa.

## 2. Instrument light

It is used to light up the instrument at night .

## 3. Preheating and starting switch (No. 6)

Insert the key at "0" position and it could be turned left or right; counter clockwise: "Q" starting; clockwise: "D" connecting power, "Y" preheating, "Q" starting.

## 4. 1st shift switch(No. 26)

Pull the switch out, front and rear width indicators and instrument light are turned on.

## 5. Hand throttle lever(No. 7)

It is used to control the speed of the engine by hand, the hand throttle lever could be positioned in any place. It is used to adjust the quantity of the fuel supply.

## 6. Ammeter(No. 3)

It is used to indicate the operation and charging state of the storage battery. It is meant by the pointer being partial to "+" that the battery is in charging state, and it is meant by the pointer being partial to "-" that the battery is discharging. When the engine is working normally, the pointer should be partial to "+" slightly; if it is partial to "-", it means there is something wrong in the electrical system.

## 7. Water temperature gauge(No.2)

It is used to indicate the temperature of the diesel engine cooling water, the normal temperature is between 70 ~ 90°C .

## 8. Light switch(No. 4)(turning clockwise)

The first position: high beams of headlight on.

The second position: lower beams of headlight on.

The third position: lower beams of headlight, dim beam of rear light on.

## 9. 2nd shift switch(No. 25)

Roof light of cab on or wiper.

## 10. Turning signal switch(No. 8)

The turning signal switch is a double - direction switch, it could be passed to the right or to the left, which direction it is passed, the high beams of that signal on that side is on.

## 11. Decompressing lever(No.24)

Actuate the decompressing lever to make the intake valves in open condition, then the spinning resistance of the engine is decreased. It is used in driving the diesel engine, starting it and making adjustment and maintenance, it also could be used to stop the engine from working. Jiangsu - 50 tractors are equipped with decompressing unit.

## 12. Foot throttle pedal(No.13)

It is used to control the fuel supply by foot via the engine speed control rod, the fuel supply is increased when depressing it, otherwise the fuel supply is decreased and the engine operates at its idle speed automatically with the foot throttle pedal free.

## 13. Main shift lever(No.22)

It is used to choose the desired gear, and the main shift lever has six gear positions: neutral gear,