

# **HHJM — Series Tractors**

## **Operation Manual**



**Mahindra Yueda(Yancheng) Tractors Co., Ltd.**  
**(Former Jiangsu Yueda Yancheng Tractor Manufacturing Co., Ltd.)**

## **Brief introduction**

Thank you for your trust on our HHJM -100 ~ 125 series wheel tractors (hereinafter HHJM -850B, HHJM -1104, HHJM -1204, , and HHJM -1254).

HHJM-100 ~ 125 series wheel tractors are newly developed with kinds of new technologies, new techniques, and new structures and on the years' production experiences of HHJM-18-30 , 30 ~ 40, 40 ~ 65, 65 ~ 70 and 75 ~ 85 series. The new series has more reasonable structures and better improved performances. They are more powerful, have lower oil consumption, higher efficient, nice in appearance, easy in operation and maintenance, convenient for being supported, economical in use and perfect in integrated performance.

Designed usage of HHJM -100 ~ 125 series wheel tractors is operation for common farming and similar conditions. If equipped with proper implements, it can do plough, rotary tillage, harrowing, sowing, harvesting, returning crop stocks to the field and so on. If equipped with paddy wheels, it can work in paddy field. It can also be used as the power supplier for water pump and thresher. Farming loading and digging can be carried out when it is equipped with front loader and rear digging unit. Farm-purpose transportation is available when it matches with trailer.

In order to help customers operate, adjust, repair and maintain the machine in a better way, and for better performance of this series, we compile this operation manual. As for the operation & maintenance manual of engines, please refer to diesel engine manual.

With technical development and requirements from our customers, descriptions in the manual may differ from the real structure of your tractors and the differences will be involved in the next version. If what you want to know is beyond this book, you can contact the agent or the manufacturer.



### **Precaution Symbol**

In this manual, this precaution symbol means some important safety information. Seeing this symbol, you should read the contents below it carefully and inform other operators to

protect from possible hurts.

**"Warning"** and **"Attention"**: These focus on correct steps or techniques in operations.

Driver or stander-bys will be hurt or even die due to ignore.

**"Important"** :These focus on correct steps or techniques in operations. Your ignoring may result in the damages to tractors or equipments.

## Symbols and Marks of the Product

When you purchase this machine, please fill in the table below carefully. The information including code and each letter should be complete, right and clear. Refer to the name plate at the inside of tractor's fender and the code at the rear part of the chassis for the information contents. Complete and right information help user to inform for an immediate repair, or it is the evidence for a lost tractor. This operation manual is a certain part of the machine, so it is recommended for the suppliers of new or second-hand machine to keep the related documents to approve that this book is offered together with the machine. User should keep the book well for a long term at a place separated from the tractor.

Product name	HHJM
Product model	
Machine number	
Chassis number	
Engine model	
Engine number	
User' s name	
Purchase date	
Purchase place	
Dealer	
Dealer' s phone	
Manufacturer	Mahindra Yueda (Yancheng) Tractors Co., Ltd.
Manufacturer' s address	9# Nengjiang Road, Yancheng Economic Development Zone, Jiangsu Province
Manufacturer' s phone	86-515-88260118(Exchange)

**HHJM-100 ~ 125 Series tractors**

**Operation Manual**

**Edited by Mahindra Yueda (Yancheng) Tractors Co., Ltd.**

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## Chapter I Precautions for Safe Operation

1.1 Only after reading the manual carefully, can the driver who has got special training and driving license with a full survey record operate the tractor.

1.2 Tractor cannot be operated without licenses. Refer to Fig.1-1 for installing front plate. When driving along the road, you'd better follow local traffic rules.

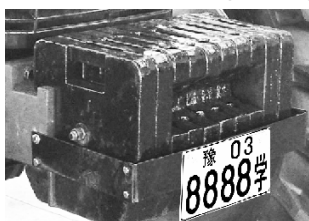



Fig.1-1 Installing front tag

1.3 This machine only can be operated, maintained and repaired by the persons who are familiar to its features and know related safe operation rules.

1.4 In any case kids or non-drivers should be kept far away from the machine to avoid hurts.

1.5 It is forbidden to drive tractors after being drunk, tired or taking some antipsychotic.

1.6  Driver should pay especial attention to the precaution symbols on the machine.

1.7 During operating the tractor, driver should strictly comply with the informed steps according to the precaution symbols to avoid accidents. When the tags are lost, polluted or abrade, they should be replaced in time.( See Fig.1--2~Fig. 1- 7 for safety tags)


 <b>Warning</b>
For physical safety: ----When using a PTO shaft, a safety cover should be installed, on which people are strictly prohibited to sit. Bush of PTO shaft should be installed when PTO shaft is out of operation. -----Rotation speeds of farm implements should match with that of the tractor PTO. ----- Engine should stop working when a farm implement is connected. -----The deviation angle of universal joint should not be too big when it is connected with PTO, or the gimbaled joint can be damaged. -----Only after the clutch is released thoroughly, can the gimbaled joint be connected.

Fig.1-2 Stuck to the back of the tractor


 <b>Warning</b>
For physical safety: ----Read and comprehend the operation manual before operating tractor; ----When starting the tractor, put into neutral gear and release the clutch. -----Skidding down aslope with neutral gear is strictly prohibited. -----Only when sitting on the driver's seat, can an operator start engine; -----Drunk driving or fatigue driving is strictly prohibited; -----Before maintaining and repairing tractor, operator should stop engine and take down the key. When engine works, don't open or disassemble the safety cover.

Fig. 1-3 Stuck to the front of the dashboard

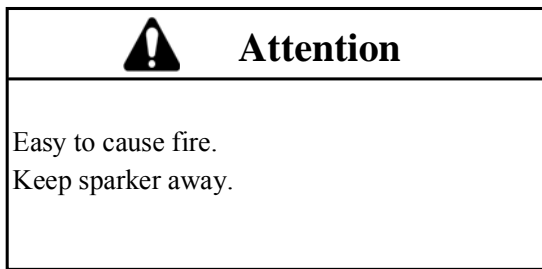


Fig. 1-4 Stuck beside the oil filler of the fuel tank

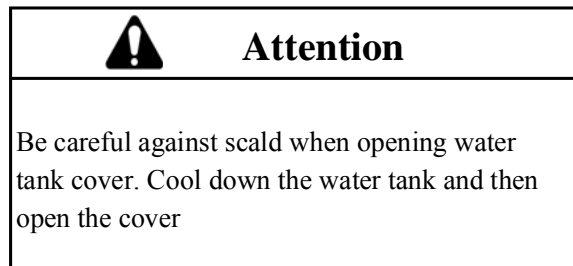


Fig. 1-5 Stuck near water tank

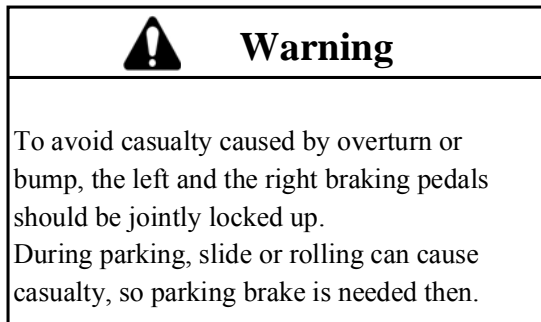


Fig.1-6 Stuck on the right-back Wheel-guard plate

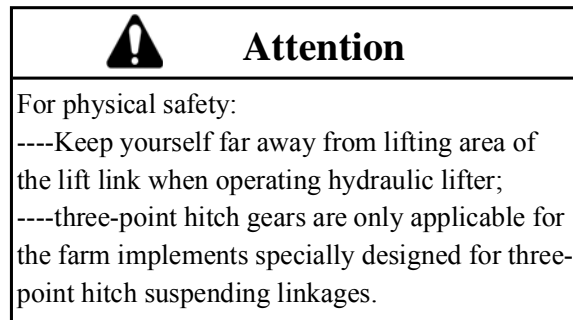


Fig. 1-7 Stuck to the back of the tractor

1.8 Before operation, a new tractor or an old tractor after heavy repair should follow the related running-in regulations. And then normal loaded work can be done.

1.9 Before the tractor moves, on its path should be no any barrier, and no people between the tractor and the rear implement or trailer.

1.10 Don't leave driver's seat to start or control the tractor. Each gear shifter should be placed at the "neutral gear" before starting or getting off the tractor.

1.11 Don't get on or off the tractor during its running. Before checking, washing, adjusting, repairing, and maintaining the tractor, the machine should be stopped and the key should be taken off. Put gear shifter and PTO shaft control lever at neutral gear and lock up park brake to make all moving parts stay in idle status. Repair or check under the tractor is forbidden when the engine runs.

1.12 Only after taking earth wire off from the battery, can electric parts be repaired to avoid electric parts burnt.

1.13 When driver leaves tractor, drop the implement to the ground and shift all gearlevers to "neutral gear" position. Stop engine, and take down key to avoid others' starting the tractor.

1.14 To avoid turn-over, only low gears can be used, especially going on high slopes or muddy paths. When going down slope, clutch engaging or neutral gear is not allowed. Let the running tractor not too near to any ditch to avoid any damage caused by broken trenches.

1.15 In transportation, the left and the right brake pedals should be joined and locked together. Move PTO handle to the "Apart" position. During tractor running, driver' feet cannot step on the brake pedal or clutch pedal.

1.16 No sharp turn is permitted while driving at a high speed. Sharp turn with single-side brake is prohibited to avoid turn-over and parts damaging.

1.17 When tractor runs with suspending farm implements, position control handle should be fixed at the rising position. Screw out dropping speed control knob (under driver' s seat) and lock up farm implement to avoid lifter control handle touched to cause accidents by sudden dropping of farm implement.

1.18 Tractor cannot be used with overload to avoid damages to parts. The ratio between trailer' s max. total weight and tractor' s use weight should be not bigger than 3. Specific power of tractor transportation unit should be less than 4.0kW/t. During towing trailer, you must use towing hook instead of three-point suspending lever. Trailer must have its own separated brake system to ensure safe transportation operation for quick parking.

1.19 Before starting the tractor, you'd better check oil duct, electric circuit and cooling water. After starting the machine, you'd better pay attention to digits on all indicators and meters.

1.20 Fluids on each position of the tractor should be just the recommended brands. Fuel and lubricating oil must be deposited for 48 hours at least. Lubricating oil on transmission system (except front driving axle) must be filtered by a filter that has the same filtering precision as that of lifter before it is filled.

1.21 Before filling fuel into tank, you'd better stop the engine; smoking and open flame is prohibited during fuel filling and check & repair for fuel system.

1.22 When the water tank is too hot, you can't water the engine or water tank with cold water to avoid breaking the tank. You should reduce its load and only after the water is not so hot can cooling water be filled with the engine running. When the engine is hot, don' t screw the water tank cover to avoid scald caused by sprayed cooling fluid. Dirt

should be eliminated from radiating water tank to guarantee its heat radiating performance.

1.23 During harvesting or operating in field yard, a spark extinguisher should be installed on air exhaust.

1.24 Exhaust elbow and muffler are high temperature components. Within a half hour after starting or stopping the engine, anyone is not allowed to get near to avoid burn.

1.25 You should tell your next shift about any trouble of the tractor. During operation in night, fine lighting is necessary.

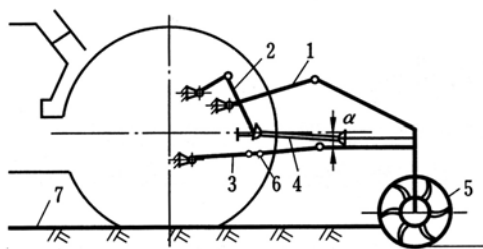
1.26 When it works below 0 °C in winter, exhaust all the water in the case of idling operation to avoid parts' freezing caused by remained water (except antifreeze added).

1.27 Tractor' s front driving axle is used only when tires slide during working in farm fields and on muddy road. It is forbidden to use it in other situations, or it can lead to early abrasion of tires and transmission system.

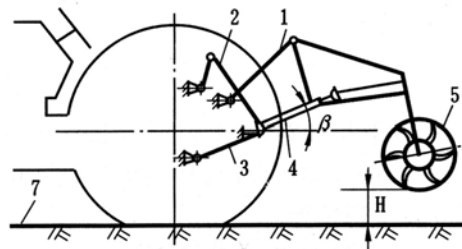
1.28 During running or working, if one of the tractor's driving wheels is found severe wheel spin, you can use the differential lock following its instruction. The differential lock is forbidden to use in any other case to avoid machine damaging or other accidents.

1.29 Before using PTO, a protecting cover need be installed. When tractor PTO shaft works with loads, tractor can not do a sharp turn to avoid damaging joint shaft. When PTO shaft is out of use, PTO guard must be installed to cover the PTO shaft completely.

1.30 Before using PTO shaft to drive farm implement, check the matching quality of tractor and the farm implement. For usual farming actions, angle between PTO shaft together with implement input shaft and universal drive shaft should be not bigger than 10 ° ; after lifting farm implements at the field end, the angle should be bigger than 30 ° (Fig. 1-8).



(a) Plough of tractor equipped with rotocultivator



(b) Lifting at land corner of tractor equipped with rotocultivator

Fig. 1-8 Working with rotary tiller

1. Upper lever    2. Lift lever (2 Levers at the left and the right)
3. Lower lever (2 levers at the left and the right)    4. Universal driving shaft
5. Blade wheel    6. External coupling point
7. Land to be harrowed  $\alpha < 10^\circ$      $\beta < 30^\circ$      $H > 250\text{mm}$

1.31 Don't stop the tractor on a big slop. If so, its park brakes should be used and a triangle should be stuck under rear wheels.

1.32 When working in fields or muddy area, you'd better remove the dirt from your shoes and keep the pedals clean. Catch the armrest carefully when getting on or off the tractor.

1.33 Tractor of malfunction cannot be put into use, especially when oil pressure is zero or too low, water is too hot, or abnormal sound or smell come. The machine should be stopped for check and the trouble should be shot in time.

1.34 You'd better check and fasten bolts of wheel radial plates and the bolts or nuts in other key positions.

1.35 Manufacturer is not responsible for any weakened reliability of the machine, personnel hurt or machine damage due to any unauthorized reform on the tractor.

1.36 You can only use the implements specially designed for this series. Customers should try to avoid possible damages to the machines caused by the farm implements that don't follow the configuring regulations.

1.37 During maintenance and when new parts are needed, the new parts should be stuck with the warning symbols in Item 1.7. Contact our aft-service department for getting the tags.

1.38 For safety, stop engine when taking away the barriers on road and things on implement and blades.

1.39 When tractor head rises during operation, throttle down immediately, separate clutch to reduce loads to avoid longitudinal turn over.

1.40 Solutions against “Flying running” . “Flying running” means rotation speed of diesel out of control, and sharp speed increase makes it beyond normal rotation speed. In such case, you can take the following steps: (1) Take off wind cover and use hands or clothes (Take off your own clothes quickly if nothing else can be found.) to plug up inlet

hole of air filter to block up air absorbing; (2) Put speed control handle and pedal at no-oil-supply position and rapidly release oil pipe joint at once. Without spanner, the oil pipe can be broken for emergency case; (3) Pour water into diesel air filter to let air cylinder contain much moisture. The above steps usually need combined two steps to stop the engine. In case of “Flying running” during driving or operation, don’t step on clutch but step on brake directly, and control speed through applying or increase loads together with the above measurements.

## Chapter II Key Technical Specifications of the Tractor

### 2.1 Parameters of the whole unit

Model			HHJM-1004B/1104	HHJM-1204/1254
Mode			4-wheel driving	
PTO Power（kW）			66.2 / 72.8	79.4 / 82.7
Rated Traction（kN）			24 / 25	26 / 27
External size（mm）	Length (including front bob-weight, suspending)		4800	4800
	Width(tread before delivery, to outer side of back wheel)		2251	2251
	Height (to top of exhaust pipe)		2980	2980
Wheelbase（mm）			2689	2689
Tread（mm）	Front wheel（size before delivery）		1826-2148（1912）	1826-2148（1912）
	Rear wheel（size before delivery）		1680-2268（1784）	1680-2268（1784）
Ground clearance（under front driving axle housing）（mm）			470	475
Front bob-weight（kg）			398	398
Rear bob-weight（kg）			320	320
Min. service quality (with driver's cab and bob-weight frame without bob-weight)（kg）			4500	4600
Quality distribution	Front wheels（kg）		1900	1960
	Rear wheels（kg）		2600	2640
Gear levels			12F ± 4R	12F ± 4R
Theoretic speed（km/h）	Low gears	I	2.15	2.24
		II	3.21	3.34
		III	3.90	4.06
		IV	6.09	6.34
	Middle gears	I	4.57	4.76
		II	6.80	7.08
		III	8.27	8.61
		IV	12.92	13.46

Theoretic speed (km/h)	High gears	I	9.95	10.37
		II	14.81	15.43
		III	18.01	18.77
		IV	28.15	29.32
	Reverse gears	I	4.65	4.84
		II	6.92	7.21
		III	8.41	8.76
		IV	13.14	13.69

## 2.2 Parameters of Engine

Model	HHJM-1004B/1104	HHJM-1204/1254
Model	LR6105T79D/ LR6105T79E	LRC6108T79D/ LRC6108T79E
Cylinders	6	
Cylinder diameter × stroke (mm)	105 × 125	108 × 135
Rated speed (r/min)	2400	2400
12-h power (kW)	73.5 / 80.9	88.2 / 92
Speed at max.torque (r/min)	1650 ~ 1750	1650 ~ 1750
Fuel consumption rate under rated operation mode (g/kW·h)	≤ 242	≤ 235
Engine oil consumption under rated operation mode (g/kW·h)	≤ 2.62	≤ 2.62
Mode of combustion chamber	Direct injection	Direct injection

## 2.3 Transmission system

Clutch	Dry, single, dependently-operated, and disk spring pressed double-action clutch. Master clutch is operated by pedal. Secondary clutch is operated by handle.
Gear box	Composition type 4 × (3+1), 12 forward gears and 4 reverse gears. Basic transmission's gear shifting is constantly-engaged helical gear, sliding sleeve or synchronizer; secondary's gear shifting is through constantly-engaged straight toothed spur gear and sliding sleeve.
Central transmission	Spiral bevel gear pair
Differential	Closed and two straight bevel planet gear
Differential	Peg type, step down pedal of differential lock and it keeps engaged by itself; for separation, step down brake pedal and hydraulic operation will be separated.



Final transmission	Mono-stage planet gear type
Front driving axle	Middle-positioned integrated type
front central transmission	Spiral cone gear pair
Front differential	Closed and two straight bevel planet gear
Front final transmission	Mono-step planet gear type
Transfer case	Straight toothed spur gear with engage-separating part

## 2.4 Traveling, direction changing and braking

Model			HHJM-1004B/1104	HHJM-1204/1254
Rack			No rack	No rack
Power drive shaft of front axle			Middle-positioned drive shaft	Middle-positioned drive shaft
Tyre Spec.（in）	Front wheels		14.9-24	14.9-24 or 14.9-26
	Back wheels		16.9-38	18.4-38
Tyre air pressure（kPa）	In transportation:	Front wheels	147-196	147-196
		Back wheels	147-196	147-196
	In plough:	Front wheels	98-118	98-118
		Back wheels	98-118	98-118
Wheel alignment	Toe-in of front wheel(mm)		0-5	
	Camber of front wheel		1 °	
	Kingpin inclination angle		7 ° 30 '	
	Kingpin caster angle		10 °	
Pivot angle of front axle			11 ° （each side）	
Steering mode			Independent oil circuit, full-hydraulic steering of front wheels	
Steering pump			HLCB-D16/12 (right hand turn)constant-flow pump	
Output volume （ml/r）			12	
Constant flow （L/min）			13-16	
Set pressure for safety valve （MPa）			12.5	12.5
Hydraulic steering gear			BZZ1-1600 full-hydraulic steering gear	
Steering cylinder diameter （mm）			48 （double-cylinder）	
Stroke of steering cylinder （mm）			200	
Max. turning angle of front wheels			50 °	

Service brake	Operation through oil-bath, disk type (single-disk ),manual hydraulic pedal
Parking brake	Hand-operating, multi-friction face, mechanical pressed oil-bath type

## 2.5 Working device

Hydraulic suspending system	HHJM-1004B/1104	HHJM-1204/1254
Mode	Split semi-separated type	
Plough depth control	Force-control, position-control, force & position control and floating control	
Oil pump	CBN-G320/G310	
Master cylinder diameter × stroke (mm)	110 × 128 (with a secondary cylinder)	110 × 128 (With two secondary cylinders)
Set pressure of system safety valve (MPa)	16	18
Opening pressure of cylinder safety valve (MPa)	19.5	
Max. system lifting power (kN) (at the point 610mm behind the suspending point)	≥ 22	≥ 26
Suspending gear	Rear positioned, Type-II. Quick connecting device is an option	
Hydraulic output device	Slide-valve type multi-way valve can use one, two or three pieces. It is adjustable between single action and double action.	
Mode and quantity of quick-change coupler	Both-side self-closed type (1 ~ 3) pairs ZG1/2 "	
Set pressure of safety valve (MPa)	18	
Output flow(L/min)	50	50
PTO shaft	Rear positioned and independent type	
Speed (r/min)	1000/540 (the two speeds can be shifted through PTO shaft end)	
Diameter of axle (mm)	35,6 rectangular spline shaft( at a speed of 540r/min ) 35,21 involute-gear-tooth spline (at a speed of 1000r/min )	
Ground clearance (mm) and turning direction of shaft head	712, Clockwise(at the back)	747, Clockwise (at the back)
Synchronous speed	Output axle runs 17.28 cycles for each turn of rear wheels (at a speed of 540r/min) Every turn the rear wheels run, output shaft turns 28.22 cycles (at a speed of 1000r/min)	

Mode of traction device	Swing draw bar, adjustable draw fork position and swinging lever position	
Diameter of traction pin (mm)	Φ28	
Position of traction pin (mm)	440, 550	475, 585
Adjustable coupling hook position (mm)	Adjustable height	

## 2.6 Perfusion capacity

Model	HHJM-1004B/1104	HHJM-1204/1254
Fuel	230	230
Water tank, heat radiator	26	28
Oil for engine	22	22
Hydraulic oil tank	32	32
Oil type air filter	1	1
Oil for steering gear	1.5	1.5
	Each side 1.5	Each side 1.5
	Center 5.4	Center 5.4
Engine oil for transmission case	60	60
Oil for brake	0.44	0.44
Cleaner for windshield glass scrubbers	2	2

## 2.7 Electric meters and equipments

Electric system	12V, Minus earth
Battery	6-Q (A) -200, 12V, 200Ah
Starter	12V, 3.7kW
A.C. generator	JFZ1625 900W
Adjustor	Integral type voltage adjustor
Headlamps	Combined head lamps
Front turn signals	
Rear turn signals	Z-HX
Combined meters	Water temperature meter, fuel gauge, speed meter, oil pressure gauge and various warn lamps and indicators
Cold start device	Preheater (Optional)
Trailer socket	7-hole trailer socket

## 2.8 Accessories

Driver's seat	Flexible suspension with adjustable height, front-rear position and stiffness
Cab	Fully-closed integral comfortable cab with good ventilation. Base-plate, mudguard and rear casing are integrated as a whole. Flexible supporting base plate. Air-conditioner is optional equipment.

## **Chapter III Running-in of the Tractor**

**Only after running-in, can a new or heavily-repaired tractor be used. Otherwise, service life of the tractor will be shortened.**

### **3.1 Preparation before running-in**

3.1.1 Check the external bolts and nuts of tractor, if loosen, tighten them.

3.1.2 Grease up the oil cups of front hubs, front driving axle pin and water pump axle; check the oil level of engine oil pan, transmission system and lifter, front driving axle central transmission and final transmission. Refill if not full (oil filled into to gearbox cannot be over enough to avoid too-hot parts.)

3.1.3 Fill fuel and cooling water.

3.1.4 Verify normal pressure of tyres.

3.1.5 Verify stable and reliable connection in electric system.

3.1.6 Put all control handles at neutral-gear position.

### **3.2 Running-in of the engine without load**

Do 15-minute free-load running-in for engine. Start engine as per steps in “Manual for Driver” and make the engine run following the steps of low-speed---medium-speed---hi-speed for 5 minutes respectively.

During free-loaded running-in of engine, check engine, air compressor and hydraulic pump to see if abnormal operation or sound, oil or water leakages happen, and if the meters work well. If abnormal cases found, stop the tractor at once. Do troubleshooting and then carry out running-in again.

### **3.3 Free-load running-in for PTO shaft**

Put engine throttle control handle at medium-gear position; make PTO shaft run at independent and synchronous positions for five minutes respectively (synchronous running-in can be carried out together with tractor’s free-load running-in, or done with rear tyres jacked up.). Check against abnormal things. After running-in, PTO shaft should be put at neutral-gear position.

### **3.4 Running-in for hydraulic system**

Start engine and put gear at the middle position, use position-control handle to lift and drop suspending gear several times to watch against abnormal situations. Mount farm

implements onto the suspending gear (with a mass of 750kg), and then operate rapid lifting-dropping button to lift or drop the suspending unit for more than 20 times. Watch hydraulic suspending unit to see if it is fixed at the top or needed position, and notice its lifting time and leakage.

When tractor is stopped, start engine to run at a low speed, medium and high speed respectively. Control steering wheel to stably turn left and right ten times respectively. Watch tractor's front wheels for their left and right direction turning to verify normal, sound, easy, and stable work of steering wheel.

If troubles found during running-in, shoot them immediately.

### **3.5 Free-load and loaded running-in for tractor**

After free-load running-in of engine, free-load running-in of PTO shaft and hydraulic system, if the tractor's technical status is completely normal, do free-load running-in for the whole tractor. Follow the running-in standards below for running-in steps and time (Table 3-1) for 60 hours.

During free-load running-in, it needs to carry out left and right steering controls and proper braking.

After free-load running-in, only when technical status of the tractor is normal can loaded running-in be carried out.



**Attention:** When doing loaded running-in at medium gear II and medium gear III, you should connect front driving axle, while for other gears, separate front driving axle.



**Attention:**

- (1) Verify normal digits on electric equipments and various meters.**
- (2) Verify normal running of engine**
- (3) Check for smooth clutch engagement and incomplete disengagement.**
- (4) Verify flexible and easy gear-shifting of gearbox without disorderly gear levels and automatic gear-off.**
- (5) Verify reliable brake performance.**
- (6) Verify reliable differential lock's engagement and disengagement.**
- (7) Inspect reliable connection and separation of front driving axle.**

**(8) During running-in, do shift technical maintenance and 50h technical maintenance according to rules.**

Once malfunction is found, eliminate it and then go on running-in.

**Table 3-1 Running-in standard of the tractor**

Towing load kN	Actions related	Throttle opening	Running-in time of all gears (h)				(h) Total hours (h)
			Low gear	Middle gear	High gear	Reverse gear	
			I II IIIIV	I II IIIIV	I II IIIIV	I II IIIIV	
0	Driving without loads	3/4	0.5	0.5	0.5	0.5	8
3-4	Transporting 5-ton cargos with trailer	3/4	2	2	2		12
9-11	Equipped with five-furrow plough IL-530, plough on sandy soil (specific resistance 30-35kPa) with a plough depth of 20cm	Fully open	4	2440	4		18
12-15	Equipped with five-furrow plough IL-530, plough on sandy soil (specific resistance 45-50kPa) with a plough depth of 20cm	Fully open	2	2660	6		22

### 3.6 Work after running-in

3.6.1 Discharge engine oil from engine oil pan and oil tank of steering system when tractor is just stopped. Wash oil pan, engine oil filter net, diesel filter, engine oil filter, air cleaner and the filter net in steering oil tank. Change diesel filter core and engine oil filter core, and then fill in new lubricating oil.

3.6.2 Discharge lubricating oil from transmission system, lifter and front driving axle when machine is just stopped. Meanwhile, fill in some light diesel or kerosene; without starting engine, pull tractor forward or backward for three minutes, or lift the front and the back wheels to leave ground, turn the front and back tyres left and right for about three minutes, and discharge the washing liquid immediately; meanwhile, dismount oil

absorber filter of the lifter for washing; after remounting, fill in new lubricating oil to transmission system according to rules.

3.6.3 Maintain engine according to rules in “Operation and Maintenance Manual of Diesel Engine Dongfanghong-LR100/105” .

3.6.4 Discharge cooling water, wash engine cooling system with clear water and fill in new cooling solution.

3.6.5 Check free strokes of fore wheel toe-in, clutch and brake. Do adjustments if necessary.

3.6.6 Check and fasten all external bolts, nuts and screws.

3.6.7 Fill in grease as per tractor maintenance table 5-1.



## Chapter IV Operation of Tractor

### 4.1 Operation control devices and meters

#### 4.1.1 Operation handles, pedals and control buttons

Refer to Fig.4-1 for operation handles, pedals and control buttons

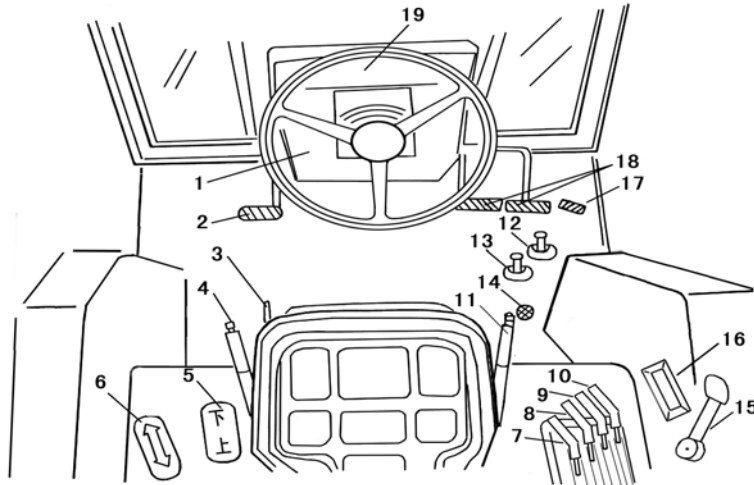




Fig.4-1 Control handles, pedals and control buttons


1. Control switch panel    2. Master clutch pedal    3. Fore-rear handle of driver' s seat
4. Operation lever of parking brake ( pull-up is braking while pushing-down means release)
5. Control handle of PTO shaft    6. Driving connection handle of front axle
7. 8 Hydraulic output handle      9.10 Lifter control handle
11. PTO shaft clutch operation handle    12. Assistant gear shift lever
13. Main gear shift lever    14. Pedal of differential lock
15. Operation handle of hand throttle    16. Quick lifting button
17. Foot accelerator pedal    18. Service-brake pedal    19. Meter panel

#### 4.1.2 Meters

Refer to Fig. 4-2 for tractor' s meters

 Left turn indicator: Turn on power switch. When tractor turns left, push steering switch upward and the light is on.

 Right turn indicator: Turn on power switch. When tractor turns right, push the steering switch downward and the indicator is on.

 Battery charging alarm indicator: after turn on general power switch, turn the

ignition starting switch to the “On” position and the indicator is on. Now excitation is applied to the generator. After generator’s operation is normal, the light is off, which means normal battery charging. If the light is not off when generator runs at middle or high speed, it means the charging circuit has some trouble, stop tractor for repair.

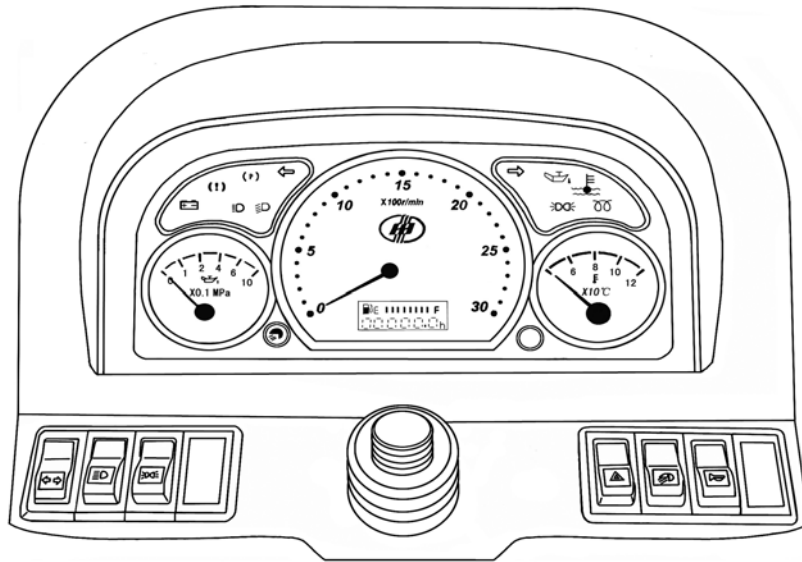


Fig. 4-2 Meters and switches

**(P)** Service brake indicator: when something abnormal happens during driving, step down the service brake pedal. If the indicator is not on (the light off means the brake light at the back is off too.). Stop tractor for check to see if the hydraulic braking switch is available.

**(!)** Service brake oil indicator: Turn on general power switch. If oil level is normal, the light is off. If the light is on during normal running, it means braking oil circuit has leakages. Stop for repair.

Do regular checks for alarms following the steps below: turn on the power switch. Press the floater of the brake oil tank, and the light should be on; after releasing, the light should be off. This means right function.

**(D)** Head lamp hi-beam indicator: Turn on the general power switch. When pushing the switch upward, the indicator is on, now it’s the hi-beam head lamp.

**(D)** Head lamp low-beam indicator: turn on the general power switch; when pushing the switch upward, the indicator is on. Now it’s low-beam head lamp.



Engine oil pressure warning light: After engine works normally, the light is off, which suggests normal engine lubricating pressure. When engine runs at idle speed, the light may be on due to low pressure of lubricating system, which is a normal case. When engine runs at normal speeds and the light is still on, stop the tractor and check oil pressure alarm sensor against any damage or to see if the lubricating system works well.



Water temperature warning light: When engine works normally, the light is off, which means normal performance of engine cooling system. If water temperature is over 95 ° C and the light is on, it means a too hot engine. Stop and do an all-around check on cooling system.



Parking & position lights indicator: When running or working in nights, turn on this indicator to guarantee safe traffic and operation by reminding the vehicles or machines nearby. Make the indicator at the dropping position, parking lights and this indicator will shine.



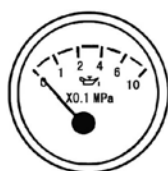
Preheating indicator: In case the engine is started hard in winter, turn the ignition starting switch to “preheating” position and the light is on, which means the engine in preheating starting.



Rear working lights indicator: Turn on the general power switch, the rear working light is at the pushing-downward position and indicator and the rear working lights are on.



Low diesel warning indicator: If the indicator is shining, diesel in secondary tank is under 14L.

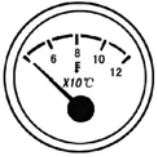


Engine oil pressure gauge: The digits on this meter have a range of 0-1-2-4-6-8 ( × 0.1Mpa ), among which 0-1 and 6-8 are red that means the high-pressure and low-pressure statuses of starting lubricating system respectively. If the needle points to the two sections when engine normally works, it means engine lubricating system is at abnormal working status, and oil pressure warning indicator shines. Stop the tractor to check engine lubricating system.



Engine speed meter: Here are two modes of digital displays: dial display and LED digital display. The needle points at engine speed, and red section shows abnormal rev of engine. If the needle stays at the latter section, stop for check. Rev signals on the rev meter are supplied by the pulse formed by the geared ring on the flying wheel’ s cutting rev sensor’ s magnetic field. Rev sensor should be

adjusted when tractor is stopped, following the steps below: screw rev sensor into flying housing first until top end of sensor touches geared ring' s top end. Then turn the sensor 1.5-2 circles outward. LED screen shows the oil level of the oil tank and accelerated engine working time.



Engine water temperature indicator: This gauge panel scale range of 4-6-8-10-12 (  $\times 10^\circ\text{C}$  ), , among which 10-12 is in red. If the needle points to this section, stop the tractor to check cooling system, to see if water in radiator is insufficient, if radiator plates are jammed, if fan belt is loosen, if cooling system has water leakage, etc.



Switch of turning lamps: When this switch is at position “ I ” , left-turn indicator is on, position “ 0 ” means power off; and position “ II ” means right-turn indicator is on.



Switch of head lamps: When the switch is at the position “ I ” , headlamps are turned off; position “ 0 ” means hi-beam lamps are on while position “ II ” means low-beam lights are off.



Switch of position lamps: When the switch is at position “ I ” , power off; position “ II ” means position lamps are on.



Switch of warning indicators: When the switch is at position “ I ” , it means warning indicators are power off; when switch turns to position “ II ” , direction lights, turn indicators on the meter panel and indicator of warn indicator switch are all shining.

This function is applied when it needs to warn vehicles in front and at back or attract passengers' attention in case of malfunction or other reasons.



Switch of rear working lamps: when the switch is at position “ I ” , cut off the power of rear working lamps; at position “ II ” , rear working lamps are on.



Horn switch: When the switch is at position “ I ” , cut off horn power; when the rocker switch is pressed to position “ II ” , put the horn circuit through; when rocker switch is released, switch returns to position “ I ”

#### 4.1.3 Back fence of instrumentation console

Refer to Fig. 4-3 for the back fence of instrumentation console

- (1) Choke wire “A” : Pull out the choke wire and the engine will be shut off.
- (2) Ignition switch “C” : It is used to control instrument circuit and starting circuit. Refer to Fig. 4-4 for its operation.
- (3) Fuse box “B” : Fuse box has 8 grades. Fig. 4-3 shows their all functions.

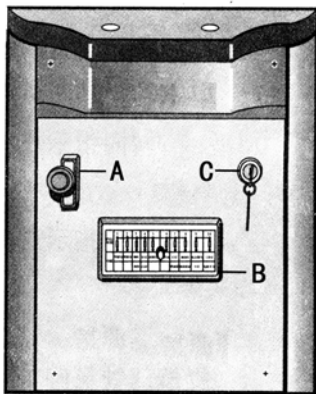


Fig. 4-3 Back fence of instrumentation console

### 4.2 Operation of tractor

#### 4.2.1 Starting of engine

##### 4.2.1.1 Preparation before starting

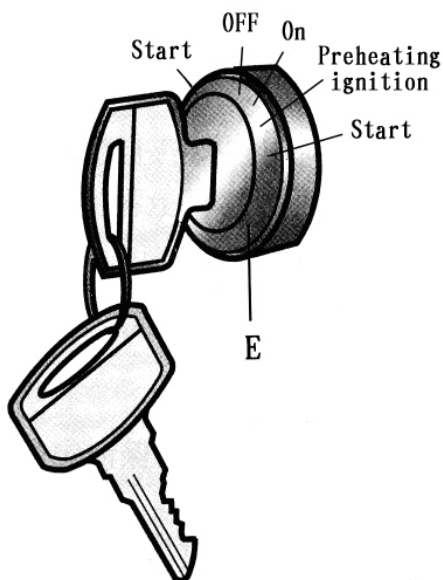


Fig.4-4 Ignition start switch

(1) Do careful checks before starting. Right connection of engine and flexible throttle operation should get guaranteed. Fill up cooling fluid to make sure the engine oil level within a normal range, all pipe joints tightened and no leakage.

(2) Make master gear box operation 13, control handle of PTO shaft 5, and front driving control handle 6 at neutral gear while lifter operation handle 10 at the dropping position. (Fig.4-1)

(3) Pull block pin of choke wire “A” to release the ignition wire. Now fuel injection pump is supplying oil.

(4) Put the hand throttle operation handle 15 at the middle position (Fig.4-1).

(5) Insert key to the position “Off” on ignition switch “E” .

#### 4.2.1.2 Start

##### (1) Battery starting

Start under normal temperature (above  $-5^{\circ}\text{C}$ ): Insert starting key into “Off”, step down clutch pedal, and turn starting key to “Start” clockwise or counter-clockwise. Once the engine is started, release the key immediately. If counter-clockwise turning, after releasing it, turn the key to the position of “On”; clockwise turning will lead to automatic returning to position “On” .

Start under lower temperature (under  $-5^{\circ}\text{C}$ ): For preheating start, turn the key to the position “Preheat” and the meter preheating indicator is on. About 30 seconds later (or as needed time), turn the key to the position of “Start” to start engine.



**Attention: Once engine is started, please release the key immediately to let the key return to “On” by itself, or the started engine will drive the starting motor and damage it.**



**Attention: Continuous starting time should be within 15 seconds and internal time between starts should be not less than 2 minutes to avoid starting motor is over heated or too low battery capacity. If the engine cannot be started several times, do checks on the engine, starter, battery and the connection.**

Before starting engine in severe winter, cover the front part of the water tank for rapid temperature rise of the cooling fluid and then take the cover away. For easy starting

engine, pour 80-90 °C water into the water tank of radiator.

(2) Start with secondary battery

In case of insufficient battery capacity and secondary battery needed, the two batteries should be in parallel connection. When charging the battery, the battery main switch should be at “0” .



**Attention: Electrical system is applied with minus earth. Make sure the polarity is correct, or electrical equipment will be damaged. Usually, connect positive cable first and then minus cable.**

(3) Start by towing tractor

Start by towing or pushing the tractor, and high shift-III and shift-IV. For safe operation, the speed to tow tractor should not be more than 15km per hour.



**Attention: When towing tractor, once it is started, step down the master clutch pedal immediately and throttle down.**

#### 4.2.2 Starting of tractor

After engine is started, make it running for 5-10minutes until engine water temperature is above 60 °C , do as the following steps (Fig.4-1):

(1) Pull up lifter control handle 10 (Fig.4-1)to raise suspending implement.

(2) Step down the master clutch pedal 2 and put master and secondary gear levers 13 and 12 to needed gear levels.

(3)Push down parking brake control lever 4 and release the parking brake.

(4) Hoot the horn and watch around against any barrier.

(5)Control hand throttle 15 or accelerator pedal 17.Raise engine’ s rotation speed and release clutch pedal 2 gradually to get a smooth step starting.



**Attention: Make engine preheating running at a zero speed for less than 10 minutes.**

#### 4.2.3 Tractor’ s steering

When turning direction, throttle down and control steering change for direction changing. When turning direction on road, slow down first, early and slowly turning steering wheel for a small turn, and turn fore and back a little. Do late and quick turn for

sharp steering, and turn fore and back much.

In case of sharp turn on soft soil or paddy fields, inflexible steering often happens due to side sliding of front wheels. To decrease turning radius, single-side brake can be applied for steering (the inter-lock of left and right brake pedals should be separated in advance). That is, steering with steering wheel, step down brake pedal on this side to decrease turning radius at the same time.



**Attention: When tractor runs at a high speed, single-side brake is forbidden to use. When front wheels turn a big angle and safety valve creaks during working, turn steering wheel back a little to avoid long-time over load of hydraulic steering system.**

#### 4.2.4 Gear shifting and working speeds selection of tractor

Master and secondary gearboxes are controlled with two control levers (master gear shift lever and secondary gear shift lever B)(Refer to Fig.4-6) to realize 12 forward gears and 4 reverse gears. Master gear shift lever “A” can get 4 gears(1,2,3,and 4) while secondary gear lever “B” can get 3 forward speed range (low, middle and high)and a reverse gear range R.

When operating secondary gear shift lever “B” , the tractor should be parked. Push lever to right from the neutral position and then push ahead to get low gear levels while pushing back for high gear level. Push left from the neutral position, and then push ahead to get reverse gears while pushing backward for middle gears.

When operating master gearshift lever, step down the master clutch without stopping the tractor for synchronizer gearshift type while for sliding sleeve gearshift type, stop tractor first and then shift gear. Move master gear shift lever to the right from the neutral gear and then push ahead for gear-III or push backward for gear-IV. Move left from the neutral gear and then push ahead for gear I or push backward for gear-II.

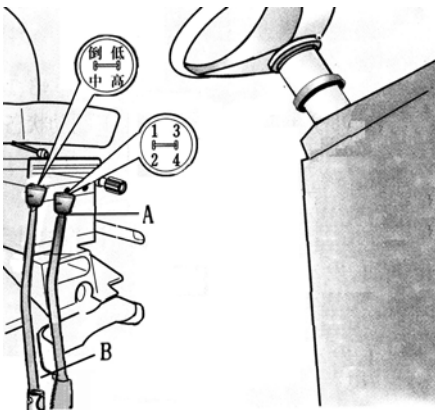


Fig. 4-6 Gear shift lever

A. Main gear shift lever    B. Assistant gear shift lever





**Attention: It is forbidden to shift gear through gear shift lever during running to avoid beating gear teeth of driving gears.**

Proper working speed can not only lead to the best productivity and economicality but also longer service life. When tractor works, too many over-load operations should be avoided. Engine should have some power reserve. Select proper field working speed to make engine work with about 80% load. In case of light-load operation at a not so high working speed, select next higher gear and throttle down a little to save fuel.

Basic working gear levels for field operation: Apply low gear IV, middle gear I and middle gear III for plough; use low gear-I, low gear-II and low gear-III for rotary tillage; low gear – IV, middle gear-II, middle gear-3, middle gear-Iv and high gear-I for harrowing; middle gear-I, middle gear-II and middle gear-III for seeding; low gear-II, low gear-III, low gear-IV and middle gear-I; middle gear-IV, high gear-II, high gear-III and high gear-IV for transportation on field path.

#### 4.2.5 Operation of differential locks

When tractor works, differential locks should be kept separated or disengaged in normal cases. In case of severe single-side wheels pin of tractor back wheels, tractor's driving speed is lowered down or even cannot move on. Now connect differential locks as per steps below for a rigid connection of left and right driving axles to drive over the sliding lands at the same speed.

In case two back wheels have a big slipping rate or one of the wheels is fixed, don't engage the differential lock immediately. Step down the clutch and engage differential lock and then engage clutch.



**Attention: When differential lock is engaged, tractor cannot apply turn driving.**

#### 4.2.6 Braking of tractor

Usually, retard engine throttle 15 or 17 first, step down main clutch pedal 2, and then step down service brake pedal 18 gradually to make tractor stop there smoothly. (Fig. 4-1)

During emergency braking, step down clutch pedal and service brake pedal at the same time. Don't only step down service brake pedal to avoid severe abrasion of brake and flame-out of engine.



**Attention:** When tractor runs on road, the left and the right brake pedals must be locked up together.

#### 4.2.7 Stop of tractor and flame-out of engine

(1) Throttle down first to reduce tractor speed.

(2) Step down main clutch pedal 2 and service brake pedal 18. After tractor parks, you should put main and assistant gear shift levers 13 and 12 to the neutral position. Pull parking brake control lever 4 upward (Fig. 4-1) to make parking brake in braking.

(3) Step down main clutch pedal and service brake pedal, throttle down to make engine run without load at idle speed for five minutes. Don't stop the tractor suddenly in case of over-high water temperature.

(4) Pull flame-out wire A (Fig. 4-3), oil injection pump stops oil supply and engine stops at once. Make the wire drawing at locked status, and take down starting key. Cut off general power switch.

(5) After flame-out of the engine, turn key to "ON" to keep parking lights on.



**Attention:**

(1) If parking the tractor on a slope, after flame-out of the engine, put into a gear before releasing service brake pedal. Putting into forward gears for upslope while reverse gears for down-slope.

(2) When parking in a temperature under 0 ° C, discharge all cooling water for the tractors without anti-freeze.

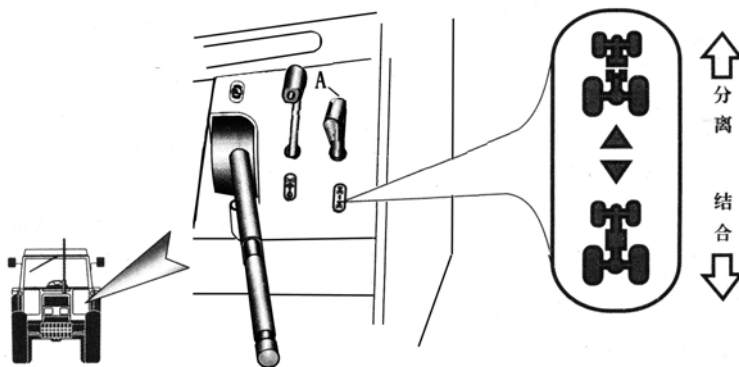


Fig.4-7 Front axle driving connecting handle

Fig. 4-8 Engagement and separation of front axle driving  
Connecting handle "A" down---engagement (front wheels drive)  
Connecting handle "A" up---separation (front wheels don't drive)

#### 4.2.8 Operation of front-wheel drive

When tractor operates with heavy loads in fields or on wet and soft soil or works in paddy fields, connect to front driving axle usually to enhance appendiculate performance of the tractor. Now pull front driving connecting handle A upward to engage front driving axle (Fig. 4-7, Fig. 4-8). In case of difficult connecting, hold the handle, pull downward slowly, and operate tractor to make the two gears do relative rotary. Push the connecting handle upward, the front driving axle can be separated. Because pre-driver meshing gear is designed with an anti- dislocating structure, In case of difficult pre-driver, step down clutch pedal, shift to gear of Reverse 1, pull up Handle A upward during clutch pedal' s returning (Tractor is to go back.), and then the pre-driver should be separated.

When connecting to the front driving axle, tractor should be set in non-towing, straight-line low-speed running conditions.

When tractor does normal transportation on hard road, front driving axle cannot be engaged, otherwise, early abrasion of front wheels will happen. Front driving wheel can only be connected only in case of rain and snow, slipping roads and macroslope. After passing the hard road section, front driving axle is separated.

Transporting work always leads to rapid abrasion of front wheels. If the abrasion on the left and the right sides of tyre is uneven, exchange left and right tyres accordingly.



**Attention: To prevent too early abrasion of the tires, inflation pressure of tires must meet rated requirements. Front driver wheels should be separated when tractor runs on hard road.**

#### 4.2.9 Adjustment on tread

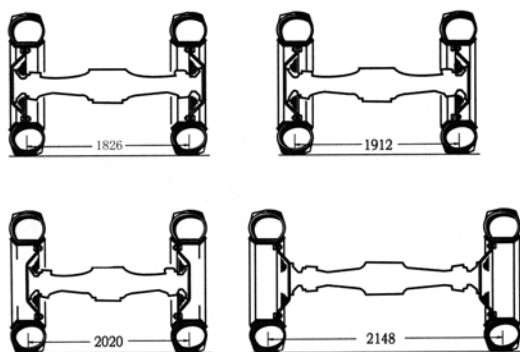
##### 4.2.9 .1Adjustment on front tread

Changing the connecting position of hub and rim can get four kinds of thread (Fig.4-9)

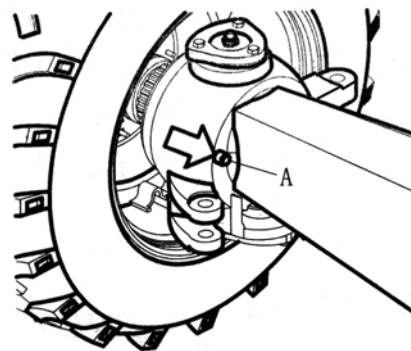
Front wheels are equipped with 14.9-24 and 14.9-26 tires.If a tread equal to or bigger than 1826 is applied, dismount steering limit screw “A” for a bigger angle (Fig. 4-10).



**Attention: When tractor applies narrow tread, limit screw “A” should be used (screw limit screw “A” to the bottom.) to avoid tyres touching hood when tractor realizes sharp turn or ploughs.**



**Fig. 4-9 Adjustment on front tread**

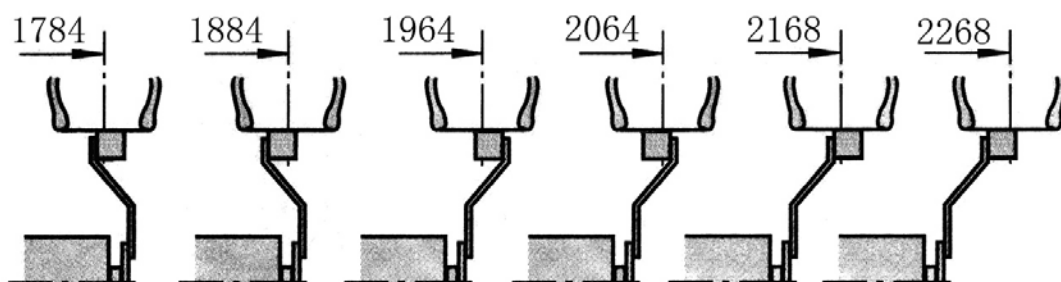


**Fig. 4-10 Limit screw**

#### 4.2.9.2 Rear tread

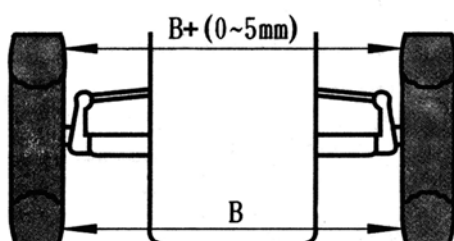
Six treads can be realized through different connecting positions of rims and hubs (Fig. 4-11).

During adjusting rear tread, arrows marked on sides of tyres must face the advancing direction of tractor, and keep the two wheels and rear wheels symmetry for center line of tractor; during adjustment, select the proper rear tread and then front tread.



**Fig. 4-12 Adjustment on rear tread**

#### 4.2.9.3 Checks on toe-in of front wheels



**Fig. 4-12 Checks on toe-in of front wheels**

#### 4.2.10 Use of bobweight

##### 4.2.10.1 Bobweight of rear wheels

To enhance towing force of tractor, mount semi-round cast iron bobweight to radiator plates on rear wheels. 8 pieces can be used (320kg).

##### 4.2.10.2 Bobweight of front axle

Front bobweight is 130kg. With 10 pieces, total front bobweight is 528kg.



**Attention: Max. service weight of HHJM-1004B tractor (including bobweight but no farm implement) should not be bigger than 6000kg. HHJM-1254 tractor should not be bigger than 6800kg.**

#### 4.2.11 Use adjustment on driver' s seat

Working stroke and position can be adjusted for the driver' s seat with damping device. Driver can drive and do adjustments at the same time.

To move the handle on the right of seat can realize fore or rear moving. After moving, lock it up.

#### 4.2.12 Cab

This tractor is equipped with ventilating and comfortable driver' s cabinet, and air conditioner is optional device.

##### 4.2.13.1 Door

Open the tractor door from outside with key and turn the handle “A” (Fig. 4-13). Push the handle “B” upward, and then door can be opened from inside.(Fig. 4-14)

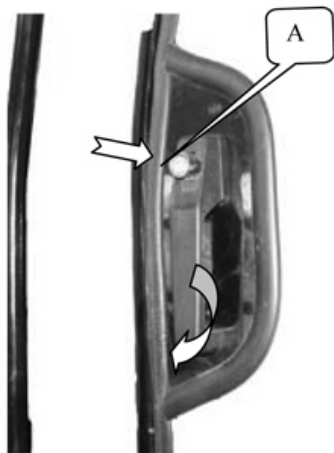


Fig. 4-13 Door handle (Lock outside )

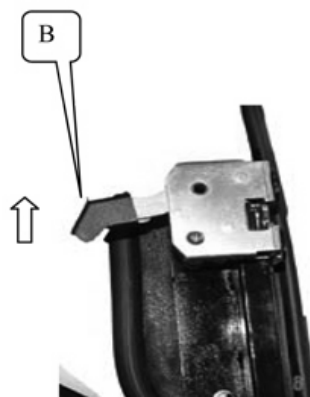


Fig. 4-14 Door handle (Lock inside)

Lock the door with key from outside. Close the right door first, pull handle “B”

backward, and then door is locked from inside.

#### 4.2.12.2 Rear window

Turn handle “C” to support glass with air-spring strut bar “D”, rear window can be opened.(Fig.4-15)



**Attention:** When tractor works on uneven roads or in farming fields, you cannot open the rear window to protect against glasses broken.

#### 4.2.12.3 Side windows

To open side windows, lift handle “E”, push it outward, put handle to a locking position, and side window can be partly opened.

#### 4.2.12.4 Electric wiper (Fig.4-17)

Wiper is controlled by switch “A” .

#### 4.2.12.5 Cab radio (Fig.4-17)

Turn Switch B clockwise and radio power is on; turn Switch D to needed channel. C is the inlet and outlet mouth for tape.

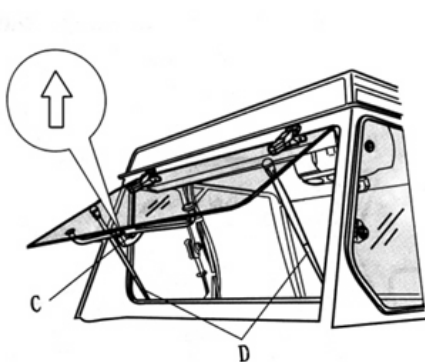


Fig.4-15 Rear window

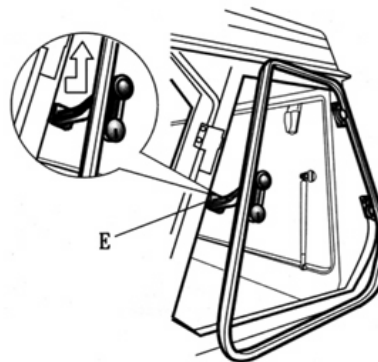


Fig.4-16 Side window

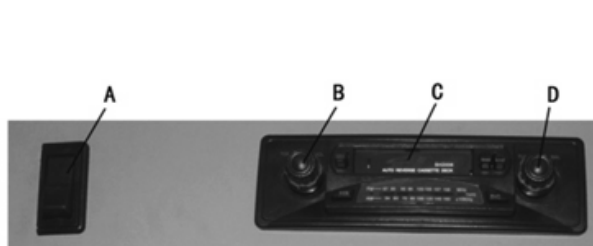


Fig.4-17 Wiper switch and radio

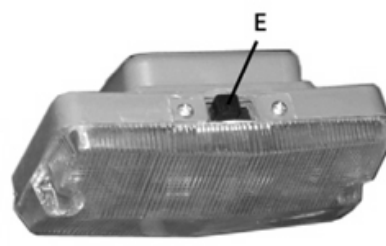


Fig.4-18 Ceiling lamp of cab

#### 4.2.12.8 Fan heater

When general power switch H is at “HI” , turn on or off air conditioner with fan heater switch; when it is at position “2” , fan heater runs at a high speed.



**Attention: Cab air filter has no function of poison (pesticide or pesticide) defense. Only do according to features of kinds of pesticides, and safe anti-poison can be available.**

#### 4.2.12.9 Fan heater equipment

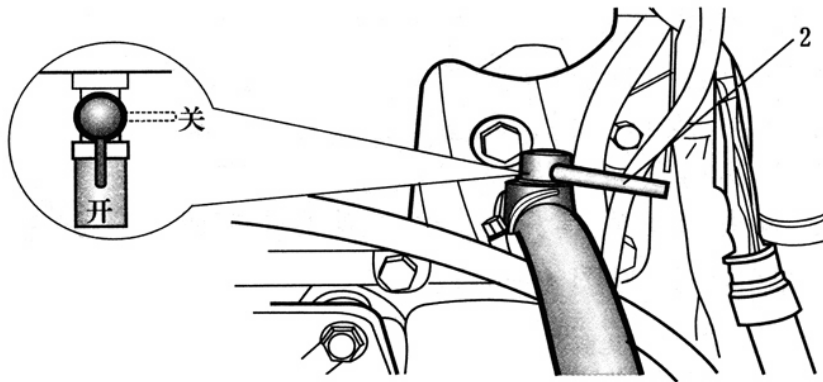


Fig.4-20 Hot water valve

Hot water valve is mounted behind engine and the water valve of heater inlet water pipe is mounted on the plate (Fig.4-20). Turn handle “2” to control the flow of cooling water from engine to adjust temperature inside the cab. Warm wind can enter cab through the heater inlet “M” . Close water valve when heating is not necessary (In Fig.4-20, Handle “2” is clockwise turned to extreme site.), to make cooling water not flow inside heater radiator.

During water discharging, hot water valve must be put at opening position; after all water is out, open the water drain plug under heater to discharge cooling water completely.

#### 4.2.12.10 Water flow system

Cooling fluid from engine is connected to heat air radiator before flowing through engine radiator.

Liquid adding for engine cooling system and cab radiator: Take down water tank cover, pour water or anti-freeze liquid into water tank and then screw the tank cover up; close hot water valve (In Fig 4-20, handle “2” is clockwise turned to the extreme site.),

and then start engine at idle speed for 5-10 minutes at least to warm up cooling liquid; take water tank cover then, open hot water valve, and make engine run at max.throttle for about 5 minutes. At the same time when engine runs, add up cooling liquid in water tank, and then cover the water tank.

#### 4.2.12.11 Circuitry of cab

Refer to Fig.4-21 for circuitry of cab.

### 4.3 Use of working units of tractor

#### 4.3.1 Operation of hydraulic lifter

Position control handle “D” and force control handle “E” of hydraulic lifter (Fig.4-22) can realize position control, force control, force-position control and floating control.

##### 4.3.1.1 Control mode

##### (1) Position control:

During plough, relative position of tractor and farm implement should be constant without change.

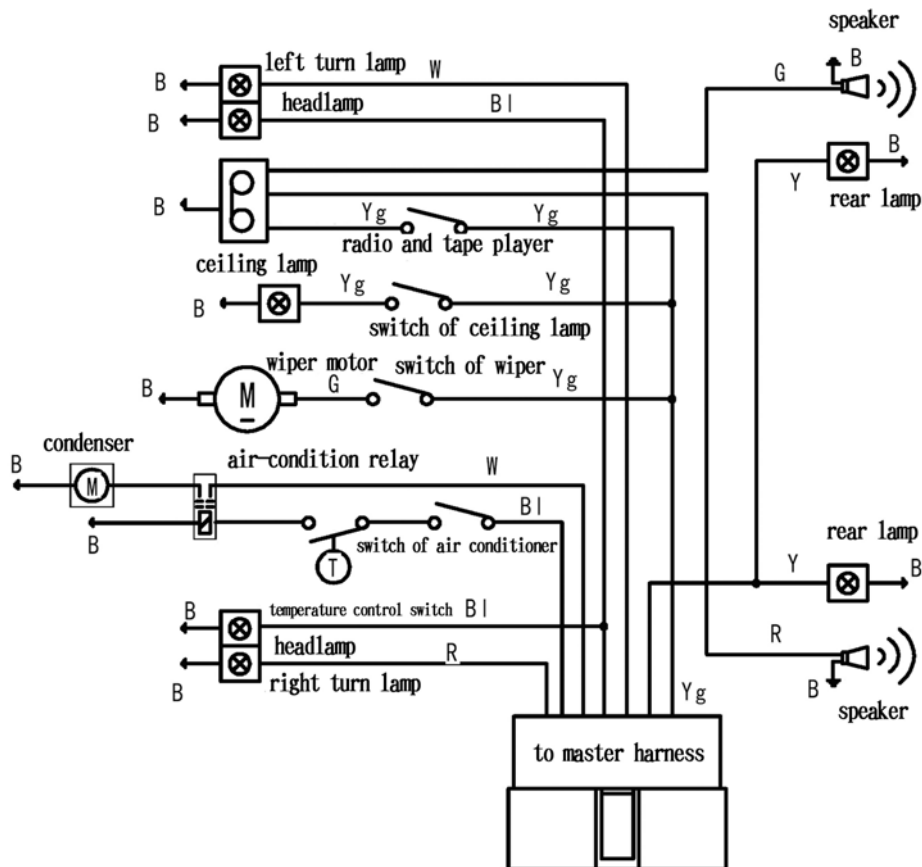


Fig. 4-21 Cab circuit system



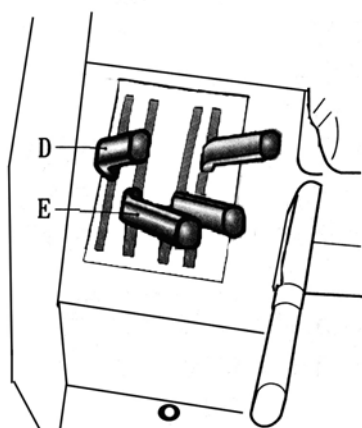


Fig.4-22 Position & force control handle  
D. Position control handle E. Force control handle

During operation, push the force control handle “E” (at the inside) to the most front, operate position control handle “D” (at the outside) to lift and drop implement. When handle “D” is moved forward, implement drops, conversely implement rises. Implement lift momentum is proportional to the move distance of Handle “D”. Operate quick lift button “C” to lift and drop implement at field end.

#### (2) Force control

During plough, farm implement can have changes in a certain plough depth range to automatically keep a constant tractive resistance of the implement.

First, push control handle “D” to the most front, and then move the force control handle “E” ahead slowly. When farm implement drops to soil to a needed plough depth, handle “E” can stop at once.

**! Attention: Apply position control handle “D” to lift and drop implement at field end. Now operate quick lifting button “C” for easier operation.**

#### (3) Floating control:

During plough operation, the hydraulic system is at floating status and lifting arm can swing freely. Plough depth is controlled by depth-limit wheel and the whole unit does ploughing, following soil profile up and down.

**! Attention: Generally, to raise and drop the implement only needs operating handle “D”. Operating quick lifting “C” can get an easier performance.**

#### (4) Force-position integrated control

During plough, force-control and position-control control plough depth of farm

implement at the same time. When tractor works on soil of very changeable soil resistances, please try to avoid plough deep soil onto land surface due to too sharp dropping of farm implement caused by sudden soil resistance decrease.

Operate in the way to control resistance. Put position control handle “D” to the bottom, push force control handle “E” slowly ahead until implement drops to the needed plough depth. Then move control handle “D” backward slowly until lift arm is to rise.



**Attention: Now to lift and drop farm implement at field end, only quick lifting button “C” can be applied. Don’ t apply handle “D” and “E” .**

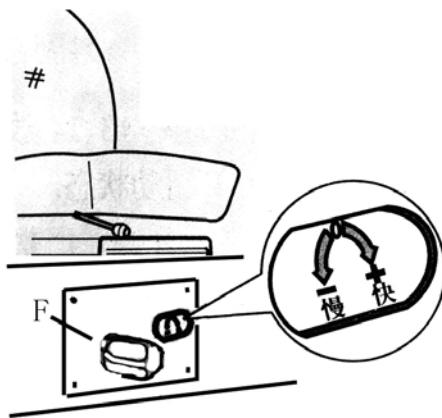


Fig. 4-23 Drop speed control knob

-- (clockwise) speed-up dropping

-- (counter-clockwise) speed-down dropping

#### 4.3.1.2 Control over dropping speed of farm implement

To adjust dropping speed of farm implement and lock up the implement onto the needed position, a dropping-speed control knob “F” (Fig.4-23) is equipped. When turning the knob F clockwise, dropping speed will be increased while counter-clockwise turning will cause speed decreased. When the knob is fully returned, it plays a role as a hydraulic lock. When the implement rises to needed site, counter-clockwise turning knob to extreme site, the implement will be locked at the needed height by the hydraulic lock. Now, even moving force and position control handles will not cause implements’ dropping.

During working, a right dropping speed can avoid damaging farm implement caused by too rapid dropping.



**Attention:** When tractor runs on road with farm implement suspended, turn out the button “F” counter-clockwise and lock the implement up at transportation position.

#### 4.3.1.3 Control operation device outside tractor (optional part)

To make driver stand on ground to control lifting and dropping implement, an outside-tractor-control operation lever “B” (Fig.4-24) is designed. When lever “B” turns counter-clockwise, suspending rod drops, conversely, it will rise. The lifting or dropping distance is proportional to the turning distance of lever “B” .



**Attention:** When operating lever “B” , operator and others should keep away from suspending rod and suspending farm implement.

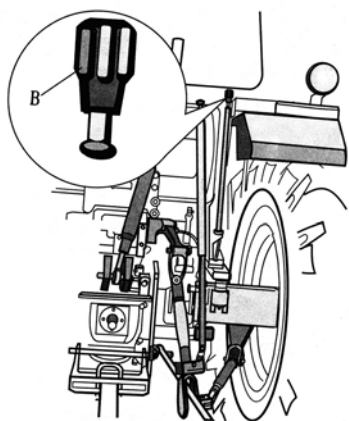


Fig.4-24 Outside-tractor-control operation lever      Fig.4-25 Quick lifting button

#### 4.3.1.5 Quick lifting implement

To lift and drop farm implement quickly at field end during plough to release driver’ s labor intensity, quick lift button “C” is designed to control quick lifting of farm implement (Fig.4-25).

Insert “C” to position “1” (Fig.4-25), suspending implement drops. Pull button “C” out of position “2” backward, suspending implement rises to transportation position.



**Attention:** When PTO shaft is equipped with farm implement, only when

**implement matches with tractor well, can quick lifting button be used. Generally, lift to the longest size to avoid damaging such parts as driving axles.**

#### 4.3.2 Use of suspending unit

The machine applies 2 kinds of 3-point suspending device to connect with farm implement (Fig.4-26).

Lower link lever (lower lever) has a max. lifting stroke of 720mm (lifting lever is adjusted to the longest site and connect at “B” ) and 660mm (lifting lever is adjusted to the longest site and connect at “C” )

Max. lifting force of tractor system (at the site 610mm under lower suspending point):  
HHJM-1004B/1104  $\geq$  22KN; HHJM-1204/1254  $\geq$  26KN.

Do necessary adjustments on tractor suspending gear according to “Manual of Farm Implement” before it is coupled with farm implement.

When tractor connects to farm implement, couple left lower lever (5) first, use adjusting handle (8) to adjust length of right lift lever (6) then to link right lower lever, and finally connect upper lever (1).

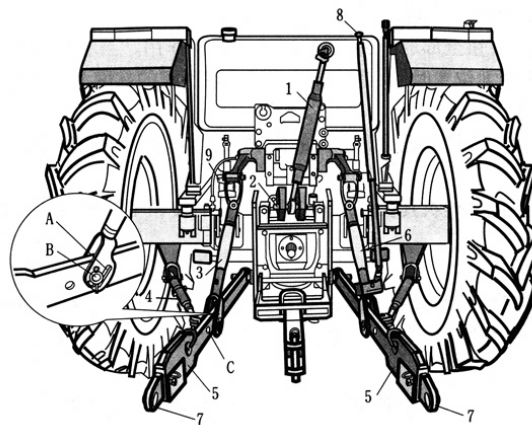


Fig.4-26 Implement suspending device

- A. Slot of oblique guide post    B. Front coupling hole of lower lever  
C. Rear coupling hole of lower lever
1. Upper lever with adjustable length    2. Pin roll of upper lever  
3. Left oblique lifting lever    4. Limit lever    5. Lower lever  
6. Right lift lever    7. Flexible spherical hinge  
8. Horizontal adjusting handle with elastic stop    9. Secondary cylinder

#### 4.3.2.1 Lower lever's connecting

There are two connecting holes of lower lever and lifting levers: front hole “B” and rear hole “C”. During normal operation (like plough), the front hole “B” is always connected, while the rear hole “C” should be used in case of the implement driven by PTO shaft and large compound operation implement. (Fig.4-26)

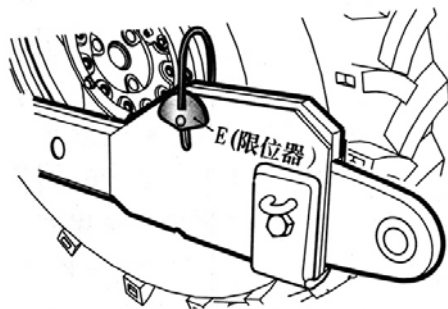


Fig.4-29 Limiting stopper

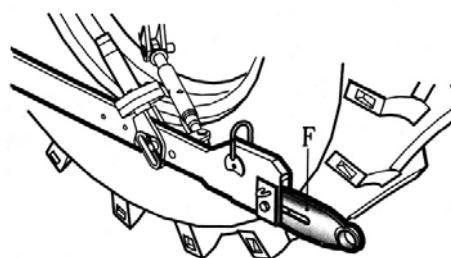


Fig.4-30 Sliding end

When coupling to farm implement, release limiting stopper “E”, end “F” can slide freely (Fig. 4-29 and Fig.4-30). Pull out sliding end “F” to connect with farm implement, and make tractor go in reverse slowly finally until sliding end “F” retracts, and limiting stopper “E” returns to locking position.

#### 4.3.2.2 Coupling of lifting lever

Generally, medium length of lift lever is proper. Length of left lift lever (3) (Fig.4-26) can only be adjusted through dismounting lower end of lift lever and turning screw lever. To adjust length of right lift lever (6), driver can operate handle “8”. Adjustments on lift lever are mainly applied to adjust implement horizontally.

When tractor is connected to the farm implement driven by PTO shaft, put the matching quality of tractor suspending rod and implement into your attention. To reduce the angle between PTO shaft and universal drive shaft, lifting lever should be adjusted to the biggest length generally.

Slot hole “A” of lower end of lift lever (Fig.4-26) connecting to pin of lower lever can make some horizontal adjustment range of lower lever (5). This is very useful to very wide implement (such as harrow and cultivator).

#### 4.3.2.3 Connection of upper lever

Length adjustment of upper lever is mainly used to adjust vertical horizontal position

of farm implement. Two holes are for your options to couple with base. Select a right connection position as per implement' s upright post length.

#### 4.3.2.4 Adjustment on limit lever

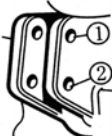


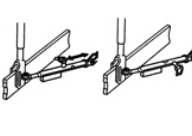
Limit lever is used to limit horizontal swing amount of farm implement (lower lever). Insert locking pin position, which can make limit lever fixed (lock pin is inserted to side hole of casing) or have some moving amount (lock pin is inserted to middle hole of casing); Turning threaded limit bushing can adjust the length of limit lever to make max. lateral swing quantity of lower lever (5) end not bigger than 120mm.

Select movement amount according to operation mode of implement. Generally, limit levers of such operations such as plough and harrow operations have some movement amount to bring tractor with good operation performance. For such operations as rotovators and mowers, fix limit lever.

Limit lever' s movement amount is decided as per the operation mode of the farm implement. When operating with plow or harrow, there should be some movement amount for a sound performance of the tractor; while limit lever should be fixed during working with rotavator and mower.

Refer to Table 4-1 “Operation Guide of Lifter” to select right position of upper lever and length of limit lever.

**Table 4-1 “Operation Guide of Lifter ”**

Implement Name	Fixing hole of upper lever	Operation method	Limit wheel	Position of limit lever	Remark
					
Furrow plow	1-2	Force or integrated adjustment	<input type="checkbox"/>		The farm implement with gauge wheel should be put in floating control position. Multiway valve is needed
Single, double and three furrow (single direction or double directions)	1-2	Force or integrated adjustment	<input type="checkbox"/>		
Four furrow, five furrow	1-2	Force or integrated adjustment	<input type="checkbox"/>		
Disk plough	1-2	Force or integrated adjustment	<input type="checkbox"/>		
2-piece	1-2	Force or integrated adjustment	<input type="checkbox"/>		
3-piece					
4-piece					
Disk harrow(cutting edge type, teeth type and disk)	1-2		<input type="checkbox"/>		
	1-2	Force or integrated adjustment	<input type="checkbox"/>		
Deep plough machine	1-2		<input type="checkbox"/>		
Ditcher	1-2			<input type="checkbox"/>	
Cultivator					
Weeding machine, ridger	1-2	Force or integrated adjustment		<input type="checkbox"/>	
	1-2			<input type="checkbox"/>	
Seed drill, fertilizer distributor	1-2			<input type="checkbox"/>	
Bulldozer, trench excavator, land leveler, manure fork, and rear coupled freight carriage		Force adjustment			
		Force adjustment		<input type="checkbox"/>	
Mower (equipped at side or back) hayrake, and tedding machine		Force adjustment	<input type="checkbox"/>		
Fore-equipped loader, self-discharging trailer, hydraulic-control towing implement		Floating			
Tractor with farm implement ( during transportation)		Force adjustment			
Quick connecting to farm implement		Position adjustment			
		Position adjustment			
		Position adjustment			

#### 4.3.3 Operation of hydraulic output valve

One or two slide valve type hydraulic output valves control the single-action cylinder through the two operation handles of “A” and “B”. Hydraulic output at floating position and trailer brake control can be realized. (Fig. 4-31)

Each control valve has two ZG1/2 inch female quick-change couplers to connect with male quick-change coupler (Fig.4-32).

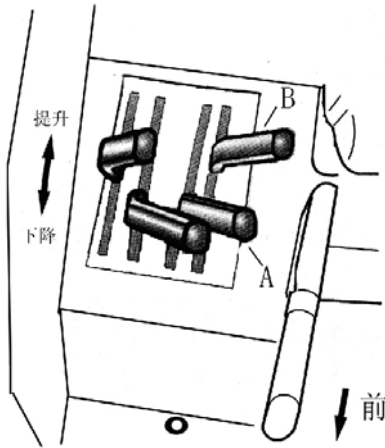


Fig. 4-31 Multi-way valve operation handle

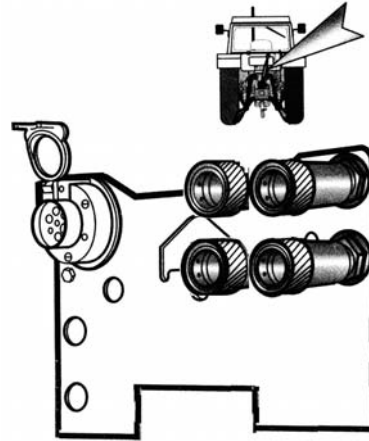


Fig.4-32 Quick-change connector

“A”, “B” and “C” are single-action or bi-action multi-way valve operation handle.

Handle's action: forward-dropping backward-lifting

Hydraulic output is carried out through operating screw “A” of output valve to realize single-action hydraulic output or bi-action hydraulic output (Fig. 4-33). Release screw “A” for single-action hydraulic output; screw out “A” for bi-action hydraulic output.



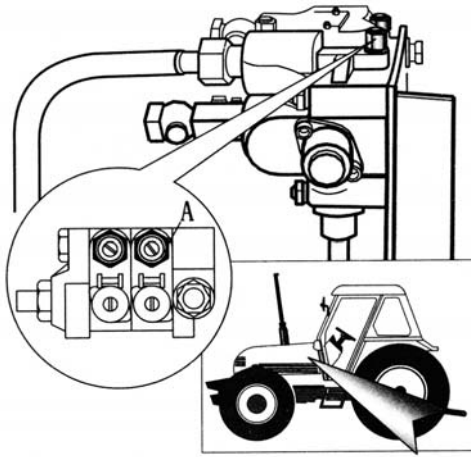


Fig. 4-33 Multiway valve

When single-action valve is used, to distinguish oil outlet joint and oil inlet joint for correct coupling with farm implement cylinder, you can move handle of single-action valve, the joint with overflowed fluid is outlet joint.

To guarantee safety, the pipe connecting to single-action implement must go to the furthest joint of the screw “A” on the valve.

When the output valve with floating position is selected on tractor, push the relative valve handle ahead. Push it over the first position and to the second position to get floating position.

When using hydraulic quick-change joint, you should follow the steps below to put the male joint into female joint.

- (1) Stop engine;
- (2) Drop suspending farm implement;
- (3) Move hydraulic output valve operation handle fore and back to release pressure of hydraulic quick-change joint;
- (4) Take down female joint plastic cover and wash quick-change joint.



**Attention:**

- (1) When quick-change joint is not in use, female joint must be covered with a plastic cover.
- (2) Lifter and hydraulic output valve cannot be used at the same time.
- (3) After operation of hydraulic output valve is finished, operation handle must be returned to the neutral position, or hydraulic system will be overheated.

#### 4.3.4 Operation of PTO unit

##### 4.3.4.1 Operation of PTO shaft

Synchronous independent PTO shaft is operated by PTO shaft operation handle “A” (Fig. 4-34).



When synchronous PTO shaft operation handle is lifted, speed of PTO shaft is proportional to the speed of tractor driving wheels.



Neutral position of PTO shaft (Operation handle “A” is set at the middle position).



Press independent PTO operation handle “A” , moving action or fixing operation can be done. Work of PTO shaft is fully independent. So when stepping down clutch to make tractor stop going ahead, PTO shaft can go on working. Separate PTO shaft clutch “B” (Fig.4-35), and tractor can still go forward although PTO shaft stops working.

##### 4.3.4.2 Operation of PTO shaft clutch

Pull operation handle “B” upward, and PTO shaft clutch is separated. Wait a minute and push the operation handle “A” downward (Fig.4-34).

Press operation handle “B” slowly to engage PTO shaft well.

As for the rotating direction of PTO shaft, it is clockwise turning if watching from the back of tractor. The direction is consistent to the turning direction of spline end of PTO shaft.



**Attention: To separate PTO shaft, press locking device at the end of handle “B” inside and then pull handle “B” upward.**



Fig. 4-34 Operation of PTO shaft

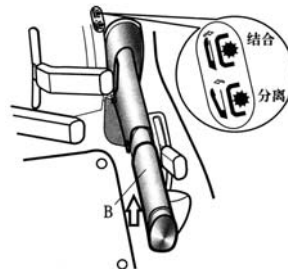


Fig. 4-35 Operation of PTO shaft clutch

A. PTO shaft operation handle

B. Operation handle of PTO shaft clutch

**! Attention: Make PTO clutch at engaged position no matter the PTO shaft is working or not, that is handle “B” is at lower site. Only before coupling with PTO shaft can it be separated.**

#### 4.3.4.3 Independent PTO shaft

(1) Before adjusting the farm implement driven by PTO shaft, separate PTO shaft clutch first, that is secondary clutch, and return handle “A” to neutral gear or stop engine.

(2) Before using the farm implement driven by PTO shaft, check the performance of the safety clutch on universal driving axle that drives the farm implement. In case of overload, safety clutch should skid.

(3) According to national standard, when PTO shaft runs at a speed of 540r/m, max. power transferred is 48kW, which is under the power of the machine’ s PTO shaft, so the shaft cannot transfer all power of the engine. Therefore, please throttle down during operation with a relative engine speed of 2198 r/m or lower.

PTO shaft: Double-speed PTO shaft---540r/m and 1000r/m.

PTO shaft end can be mounted with two kinds of splines through nut “D” , whose tightening torque is 160N • m (Fig.4-36).

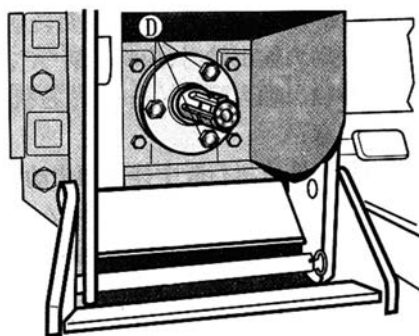


Fig.4-36 PTO shaft

Two speeds of 540r/m and 1000r/m can be shifted to each other through changing different PTO shaft ends.

For the PTO shaft of 540 r/min, use 35mm-diameter 6-tooth parallel spline (Fig 4-37), and the corresponding engine speed is 2124 r/min.

For the PTO shaft of 1000 r/min, use 35mm-diameter 21-tooth involute spline shaft end (Fig.4-38), and the corresponding engine speed is 2400 r/min.

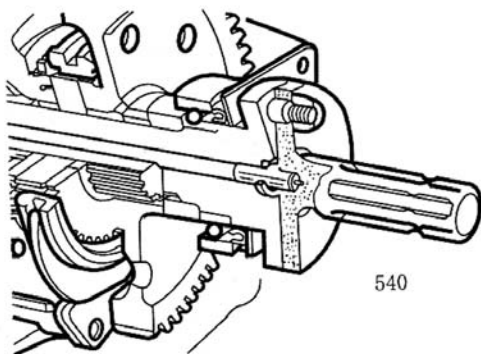


Fig.4-37 540r/min PTO shaft

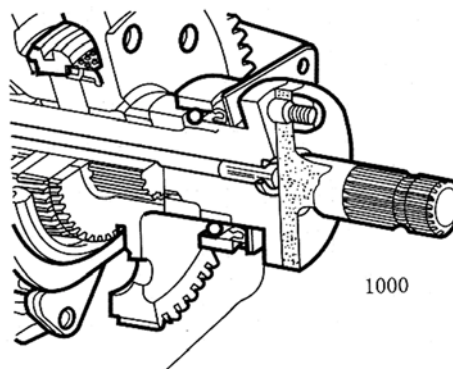


Fig.4-38 1000r/min PTO shaft

#### 4.3.4.4 Synchronous PTO shaft

Synchronous PTO shaft is mainly used for driving trailer. Reduction ratio of tyre type and driving trailer should be selected according to the rotation speed of Synchronous PTO shaft.

Synchronous PTO shaft is driven by transmission device instead of directly driven by engine. When tractor stops, Synchronous PTO shaft stops rotating; When a forward gear is changed into reverse gear, Synchronous PTO shaft will change rotation direction immediately.

For 540r/min synchronous PTO shaft, every round the rear wheels turn, output shaft turns 17.28 rounds. For 1000r/min synchronous PTO shaft, every round the rear wheels turn, output shaft turns 28.22 rounds.

When connecting PTO shaft, pull handle “A” upward. (Fig.4-34)

When PTO shaft is at standard speed, refer Table 4-2 for tractor forward speed.



#### **Attention:**

- (1) **Don't connect synchronous PTO shaft during tractor traveling.**
- (2) **When using driving trailer, you must use 1000r/min synchronous PTO shaft.**
- (3) **To connect PTO shaft with farm implement, separate PTO clutch first and operate handle “A” to return to neutral gear position.**
- (4) **Before using PTO shaft driving farm implement, shift to gear through handle “A”, push operation lever “B” downward, and engage PTO shaft clutch.**

**(5) When farm implement is not engaged, put handle “A” at the neutral gear, and cover the shaft end of PTO shaft with protecting guard.**

**Table 4-2**

Speed Gear level Model	540r/min PTO shaft (Engine speed 2124r/min)km/h		1000r/min PTO shaft (Engine speed 2400r/min)km/h	
	HHJM-1004B/1104	HHJM-1204/1254	HHJM-1004B/1104	HHJM-1204/1254
Low gear I	2.16	2.26	2.24	2.34
Low gear II	3.23	3.36	3.34	3.48
Low gear III	3.92	4.09	4.06	4.23
Low gear IV	6.13	6.39	6.34	6.61
Middle gear I	4.58	4.77	4.73	4.94
Middle gear II	6.81	7.10	7.05	7.35
Middle gear III	8.28	8.64	8.57	8.94
Middle gear IV	12.95	13.52	13.40	14.00
High gear I	10.00	10.43	10.35	10.80
High gear II	14.89	15.50	15.41	16.08
High gear III	18.07	18.89	18.70	19.55
High gear IV	28.3	29.50	29.3	30.55
Reverse gear I	4.66	4.87	4.83	5.04
Reverse gear II	6.96	7.26	7.20	7.51
Reverse gear III	8.45	8.82	8.75	9.13
Reverse gear IV	13.2	13.79	13.07	14.27

#### 4.3.5 Operation of towing trailer unit

Select proper towing trailer unit according to types of towing farm implements and trailers.

Proper selection of towing trailer unit has great effects on the operation and stability of tractor.

##### 4.3.5.1 Swing draft lever

Swing lever can only be used to trail implement and two-axle trailer, but not single-axle trailer. Otherwise, load on draft lever will make tractor head lifted (Fig. 4-39).

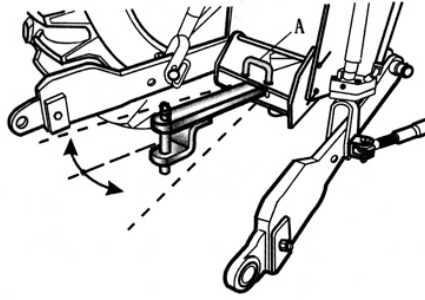


Fig.4-39 Swing draft lever

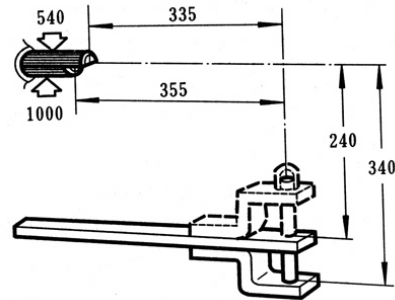


Fig. 4-40 Swing draft lever

#### Draft lever adjusting

- (1) Turning the draft lever can change height of the towing point to make towing height satisfy farm implement. (Fig.4-40)
- (2) Changing the mounting site of U-pin “A” can adjust the horizontal position of towing point (Fig.4-39).
- (3) The towing fork position relative to PTO shaft (Fig.4-41).

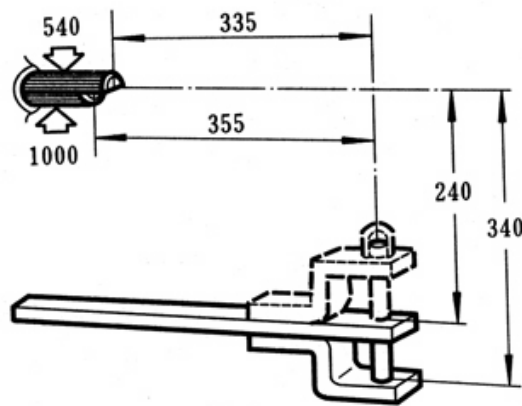


Fig.4-41 Towing fork position relative to PTO shaft

Make the towing fork face downward for correct connection of farm implement and PTO shaft. (Fig.4-43)

#### 4.3.5.2 Adjustable towing hook (for your options)

Adjustable towing hook is applicable to various kinds of trailers, including single-axle trailer. It's height (can be adjusted to above or under PTO shaft) has 6 adjusting positions. Swing draft lever can be assembled at the same time (Fig.4-42, 4-43).

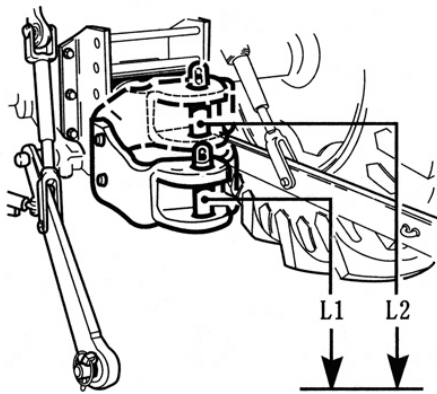


Fig.4-42 Adjustable towing hook

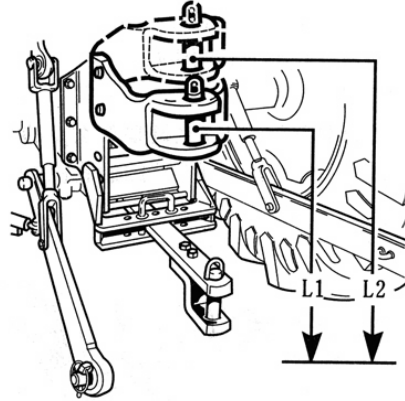


Fig.4-43 Adjustable towing hook



#### Attention:

- (1) Raising towing site can increase towing force but also can lead to tractor head up. Therefore, the site should be as low as possible.
- (2) When driven by front wheels, put trailer hook at low site to make the towing site be close to horizontal level.
- (3) No overload during towing operation and working with trailer.
- (4) To do braking action, brake of trailer should be ahead of brake of tractor.

#### 4.3.6 Operation of trailer braking system (Optional)

4.3.6.1 Trailer braking applies inflating brake and air-break brake systems to meet the requirement of matching trailer. For normal service brake, inflating brake works to get a smooth braking action, while air-break is used for parking or emergency cases. To guarantee a harmonious braking action between tractor and trailer, operation of air braking system is carried out through hydraulic oil of tractor traveling system.

In Fig.4-44, after tractor is started, compressed air from air compressor (2) goes through retaining valve and then into air storage cylinder to build up a working air pressure (not smaller than 0.39MPa). When air pressure reaches 0.78MPa, pressure adjusting valve (6) is opened. The compressed air in the cylinder passes valve (6), pushes unloading valve (1), and the air compressor runs without loads.

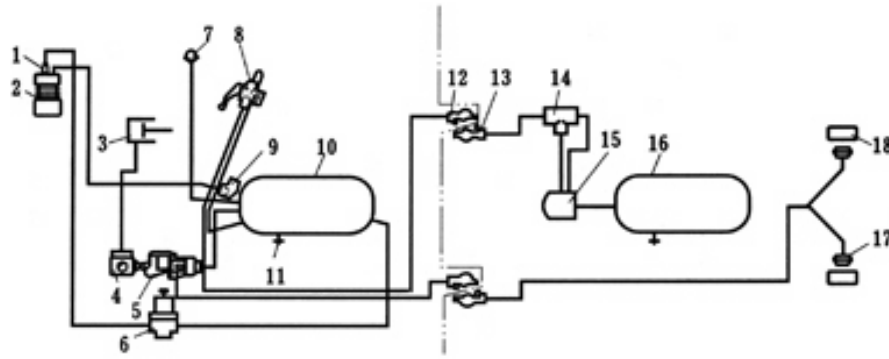


Fig.4-44 Trailer braking system

1. Unloading valve 2. Air compressor 3. Master cylinder of brake
4. Oil pressure operation device of brake valve 5. Brake valve
6. Air pressure adjusting valve 7. Air pressure alarm 8. Separating switch
9. Retaining valve 10. Air storage cylinder 11. Water drain valve
12. Joint with reverse valve 13. Joint with tappet inside 14. Tee valve
15. Emergency brake valve 16. Trailer air storage cylinder 17. Brake chamber
18. Trailer wheel

When driver needs to apply parking brake, step down brake pedal. Hi-pressure oil inside brake master oil cylinder (3) will apply brake valve (5) by the screw of brake valve oil pressure operating device (4). Compressed air in air storage cylinder goes through brake valve (5) and joints (12) and (13), and then directly enters brake chamber (17), brake trailer wheels and realizes inflating brake.

When driver needs to leave the tractor, turn the handle to the right to make handle end face down, and then separating switch (8) is at closed status. Now compressed air in trailer air storage cylinder (16) enters brake chamber (17) through emergency brake valve (15) to realize trailer wheel braking (Now hand throttle is applied on tractor).

#### 4.3.6.2 Adjustment on trailer brake system

Adjust the bolt of brake valve oil pressure operation device (4) to make it press tappet of brake valve (5). Now the brake valve balance spring has certain pretightening force and at working status (The way to judge if the bolt is in place is to step down brake and brake action begins at once, and release brake can stop the braking action immediately.)



If there is air in brake oil, follow the instruction stated in Chapter V to release bleed screw of oil pressure operation device 4 until exhaust all air and then tighten it up.

#### 4.3.6.3 Notice for operating trailer brake system

- (1) Don't connect inflating brake and air-break brake in wrong ways.
- (2) After engine is started, open separating switch (8). When handle is at horizontal position, inflate to trailer air storage cylinder.
- (3) Air-break brake cannot be used as long-time parking to avoid accidents caused by too low air pressure.
- (4) During operation, when air pressure alarm indicator shines, it means the air pressure is under 0.392 Mpa. Do checks on air circuit in time.
- (5) After operating for some time, open water drain valve (11) and discharge cooling water inside air storage cylinder.

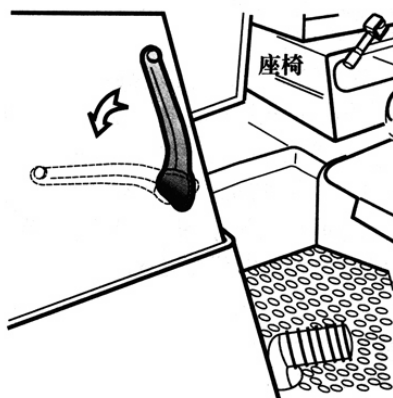


Fig. 4-45 Air brake control handle of trailer

#### 4.3.7 Electric system of tractor

The system voltage is 12v with minus earth. Power of the whole unit comes from silicon rectification generator and battery. This battery is a maintenance-free type that should get checked regularly. If they are not in use for a long time, please dismount cathode wire. Do charging when it is put into use again. Rated voltage of silicon rectification generator is 14V. It is used for battery charging and power supply of other electric equipments.

Fig. 7.5 shows wiring of electric system; Fig. 7.2, line route of electric system; table 4-, fuse box grades.

Table 4-3 Fuse box grades

Grade	1	2	3	4	5	6	7	8
Currency	30A	30A	20A	10A	5A	20A	10A	10A
Function		Preheating	Air conditioner	Steering light	Horn	Head lamps	Rear working lights and width lamp	Meters and brake indicator

● **Important**

**Before changing new fuse, please check and do trouble shooting, and then replace with fuse of the same specification.**

**Light distribution adjusting for head lamps:**

**Light distribution curve in Fig. 4-46 is applicable to right traffic. If light distribution features of head lamps need checking and adjusting. Do as the steps below:**

**(1) Check tyre pressure first to make it satisfy rules. Park tractor (without loads) on an even ground, facing a smooth and clean wall.**

**(2) Draw two marks “+” on the wall corresponding to the center line of the head lamps.**

**(3) Make tractor 5m away from the wall. Switch on dipping switch.**

**(4) Reference points P-P are 5cm down the “+” marks.**

**(5) Rotate cross-head screw in hole A to adjust the light distribution curve of head lamps**

Fig. 4-46 Light distribution curve of head lamps



## **Chapter V Technical Maintenance of Tractor**

### **5.1 Procedure of technical maintenance**

For a sound performance and a longer service life of the tractor, procedure of technical maintenance should get strictly executed. According to accumulated loaded working hours, the procedure is divided into:

- (1) Shift technical maintenance: executed after each shift or 10 hours' operation.
- (2) 50-hour tech. maintenance: executed after 50 hours' operation;
- (3) 200-hour tech. maintenance: executed after 200 hours' operation;
- (4) 400-hour tech. maintenance: executed after 400 hours' operation;
- (5) 800-hour tech. maintenance: executed after 800 hours' operation;
- (6) 1600-hour tech. maintenance: executed after 1600 hours' operation.

#### **5.1.1 Shift technical maintenance:**

- (1) Clean dusts and mud away from the tractor.
- (2) Check tractor's external fitting nuts and bolts, especially to see if the nuts on front and rear wheels are loose.
- (3) Check the fluid levels of water tank, fuel tank, steering oil tank and brake oil tank. Add the fluids in case of insufficiency.
- (4) Grease up as per maintenance table 5-1 according to Maintenance Fig.5-1.
- (5) Check and adjust the height of main clutch pedal and stroke of PTO shaft.
- (6) Check air pressure of front and rear tyres, inflate according to rules in case of insufficiency.
- (7) Check against air leakage, oil leakage or water leakage. Shoot the trouble if found.
- (8) Verify normal work of lamps, horns and meters.
- (9) Maintain diesel engine according to "Shift Technical Maintenance" stated in "Operation & Maintenance Manual of Diesel Engine" .

#### **5.1.2 50-hour technical maintenance**

- (1) Fulfill all steps of shift technical maintenance.
- (2) Grease up according to maintenance table 5-1.
- (3) Check oil level of oil bath air cleaner and clean dusts away.
- (4) Maintain air filter of comfortable-type cab.

(5) Maintain diesel engine according to “ Class-1 Technical Maintenance ” in “Operation & Maintenance Manual of Diesel Engine “.

#### 5.1.3 200-hour technical maintenance

(1) Fulfill all steps of 50-hour technical maintenance

(2) Change lubrication oil of engine oil pan.

(3) Wash and maintain the oil tray of oil bath air cleaner.

(4) Wash engine oil filter of prompter. Change filter core if necessary.

(5) Do maintenance on diesel engine according to the requirements of “ Class-2 Technical Maintenance ” described in “ Operation & Maintenance Manual of Diesel Engine ” .

#### 5.1.4 400-hour technical maintenance

(1) Fulfill all steps of 200-hour technical maintenance.

(2) Grease up according to maintenance table 5-1.



**Attention: Lubrication oil used in engine must be diesel engine oil of grade L-ECC. It is forbidden to use ordinary lubricating oil for engine. Don’ t mix new oil, old oil or lubricating oil of different brands to use. It is also forbidden to mix oil made by manufacturers and of different brands to avoid weakening the quality of the oil.**

(3) Check the oil levels of central transmission and final transmission of front driving axle. Refill if necessary.

(4) Check lubricating oil levels in transmission system and lifter. Refill if necessary.

(5) Check the free stroke of parking brake handle. Add if necessary.

(6) Wash and maintain filter of hydraulic steering oil tank.

(7) Do maintenance on diesel engine according to the requirements of “ Class-2 Technical Maintenance ” described in “ Operation & Maintenance Manual of Diesel Engine ” .

#### 5.1.5 800-hour technical maintenance

(1) Fulfill all steps of 400-hour technical maintenance

(2) Change air filter core in the more comfortable driver’ s cabinet.

(3) Change hydraulic steering lubricating oil.

(4) Change lubricating oil in transmission system and lifter.

- (5) Check and adjust clearance between engine valves.
- (6) Check and adjust injection pressure of the nozzle.
- (7) Wash and maintain fuel tank.
- (8) Check, maintain and service generator and start-up motor.
- (9) Do maintenance on diesel engine according to the requirements of “ Class-3 Technical Maintenance ” described in “ Operation & Maintenance Manual of Diesel Engine ” .

#### 5.1.6 1600-hour technical maintenance

- (1) Fulfill all steps of 800-hour technical maintenance.
- (2) Wash and maintain the cooling system of engine.
- (3) Change the lubricating oil on the central transmission and final transmission of the front driving axle.
- (4) Check, adjust and maintain the starter.

(5) Do maintenance on diesel engine according to the requirements of “ Class-3 Technical Maintenance ” described in “ Operation & Maintenance Manual of Diesel Engine ” .

#### 5.1.7 Technical maintenance for long-term storage

(1) If the storage of engine is under one month and engine oil gets changed within 100 working hours, no necessary to take any protective measurement. If the storage is over one month, discharge all engine oil, change new engine oil and make engine run at lower speed for minutes before machine is ready for long-term storage.

(2) Refuel the fuel tank. Wash and maintain air filter. Discharge cooling water in the cooling system (If antifreeze is used as cooling agent, don't discharge it.).

(3) All control handles should be put at the neutral-gear position, including switch of electric system and parking brake, put front tyres right, all suspending levers should be put at the lowest positions.

(4) Take battery down, charge it, wash the surface, and grease up the terminal posts to reduce self-discharge and prevent capacity decreased by sulfuration of polar plate. Store the machine in a dark and ventilating room under 10 ° C. As for ordinary batteries, check the electrolyte level every month, and use hydrometer to check charging-discharging status and the capacity status.

(5) Jack up the front and back axles of the machine to make tyres leave ground a little.

Besides, the tyres should be deflated, or the tractor should be jacked up regularly to check the air pressure of the tyres.

(6) Clean and wash the whole machine. Wax painted pieces, paint the no-paint workpieces' surfaces with repellent. Cover the whole machine with protective shield.

(7) Maintain the cab according to rules.

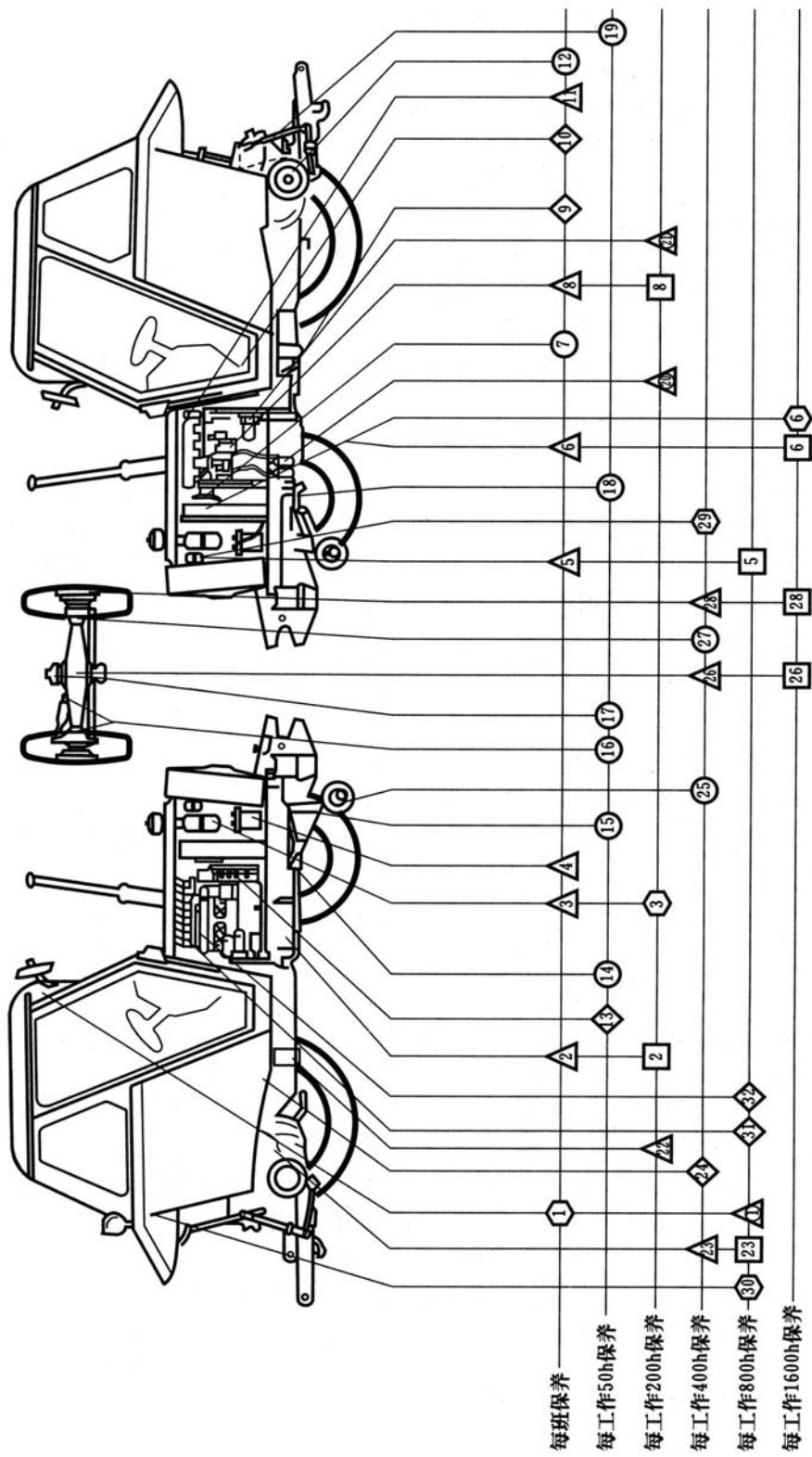


Fig. 5-1 Maintenance for whole machine

每班保养 Shift maintenance    每工作 50h 保养 50 working hours maintenance  
 每工作 200h 保养 200 working hours maintenance  
 每工作 400h 保养 400 working hours maintenance  
 每工作 800h 保养 800 working hours maintenance  
 每工作 1600h 保养 1600 working hours maintenance

## 5.2 Steps of maintenance

### 5.2.1 Maintenance for the tractor

Refer to Fig. 5-1 and Table 5-1 for maintenance sites, steps and maintenance cycle

### 5.2.2 Steps of technical maintenance

#### 5.2.2.1 Maintenance of batteries

Maintenance-free battery is used in the tractor, so the requirements on maintaining battery are not so strict. In case of long-term storage, the cathode of the battery should be released to guarantee a fully charged status for next use.

Table 5-1 Maintenance for the Tractor

No.	Maintenance sites	Steps	Site number	When to maintain (h)	Remarks
1	Air filter in cab	Maintain and wash	1	Every shift	If necessary
2	Engine oil pan	Check fluid level	1	Every shift	
3	Oil-bath type air cleaner	Check fluid level	1	Every shift	If necessary
4	Hydraulic steering oil tank	Check fluid level	1	Every shift	If necessary
5	Heat radiator (water tank)	Check fluid level	1	Every shift	
6	Engine pump shaft	Grease up	1	Every shift	
7	Fuel injection pump	Check fluid level	1	Every shift	
8	PTO shaft clutch handle	Check stroke of stop pin	1	Every shift	
9	Main clutch pedal	Check pedal height.	1	Every shift	
10	Brake oil tank	Check fluid level	1	Every shift	If necessary
11	Rear hub	Grease up	2	Every shift	
12	Fan belt	Check belt tightening	1	Every 50 working hours	
13	Steering cylinder driven by rear wheels	Grease up	1	Every 50 working hours	



14	Main pin bush of front axle	Grease up	2	Every 50 working hours	
15	4-wheel driving steering oil cylinder	Grease up	2	Every 50 working hours	
16	4-wheel driving front axle swing axle	Grease up	2	Every 50 working hours	
17	Front axle central balance pin bush	Grease up	1	Every 50 working hours	
18	Suspending levers	Grease up	3	Every 50 working hours	
19	Diesel oil filter	Change filter core	1	Every 200 working hours	
20	Rotary type engine oil filter	Change filter	1	Every 200 working hours	
21	Lifter hydraulic oil-absorbing filter	Wash or change filter core		Every 200 working hours	
22	Oil injection pump	Change lubricating oil	1	Every 200 working hours	
23	Engine oil pan	Maintain and wash	1	Every 200 working hours	
24	Oil-bath type air cleaner oil tray	Check oil level	1	Every 200 working hours	
25	Transmission system and lifter	Adjust free stroke	1	Every 400 working hours	Refill if necessary
26	Park brake	Grease up	1	Every 400 working hours	

Continued 5-1

No.	Maintenance sites	Steps	Site number	When to maintain (h)	Remarks
27	Front wheels	Adjust free stroke	2	400h Every 400 working hours	
28	Central transmission of front driving axle	Check oil level	1	Every 400 working hours	Refill if necessary
29	Oil cup of 4-wheel driving main pin	Grease up	2	Every 400 working hours	
30	Final transmission of front driving axle	Check oil level	2	Every 400 working hours	Refill if necessary
32	Air filter in cab	Change filter core	1	Every 800 working hours	
33	Hydraulic steering oil tank	Change lubricating oil	1	Every 800 working hours	
34	Fuel tank	Maintain and wash	1	Every 800 working hours	
35	Inlet-outlet valve of engine	Adjust valve clearance	8	Every 800 working hours	

36	Oil vapor pump	Adjust injection oil pressure	4	Every 800 working hours	
37	Transmission and lifter	Change lubricating oil	1	Every 800 working hours	
38	Cooling system of engine (with cab heating )	Maintain and wash	1	Every 1600 working hours	
39	Engine cooling system with antifreeze	Change lubricating oil	Change lubricating oil	Every 1600 working hours	
40	Central transmission of front driving axle	Change lubricating oil	1	Every 1600 working hours	
41	Final transmission of front driving axle	Change lubricating oil	1	Every 1600 working hours	

Table 5-2 Voltage and Capacity of Battery

Voltage (V)	12.6	12.4	12.20	12.00
Battery status	Full	3/4 Capacity	1/2 Capacity	Little

#### 5.2.2.2 Check oil tank and pedal of service brake

Fig.5-2 shows oil tank of service brake.

If the red alarm indicator of combined meters shines, it shows the oil level of service brake is under the limit. Please find out the cause of oil leakage and then refill oil. After refilling, the oil level should reach the top mark line.

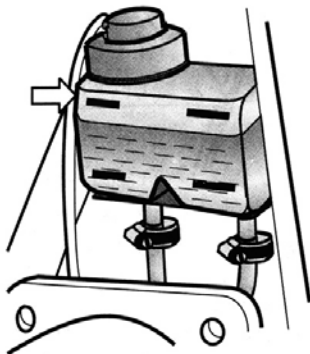


Fig. 5-2 Check oil level of service brake's oil tank



Fig. 5-3 Mounting of brake pedal

Clean dusts away from dust-collecting bowl of filter. Do regular checks at each connecting site against any air leakage. Do cleaning immediately when dusts in dust-collecting tray of strainer filter. When tractor works in dusty area, oil tray needs more checks. If it contains too many deposits, the cycle for washing deposits and maintaining filter core should be shortened.

When mounting service brake pedal, spline of pedal shaft should match with corresponding spline on control rods to guarantee a size  $H=150\text{mm}$  (See fig. 5-3)

#### 5.2.2.3 Check oil level of steering oil tank and oil pipe

Check oil level, and refill oil as per demands; Check oil pipes of hydraulic steering oil tank against any tangling, upheaval or crackle. No oil leakage is permitted between pipes and joints. (Fig.5-4)

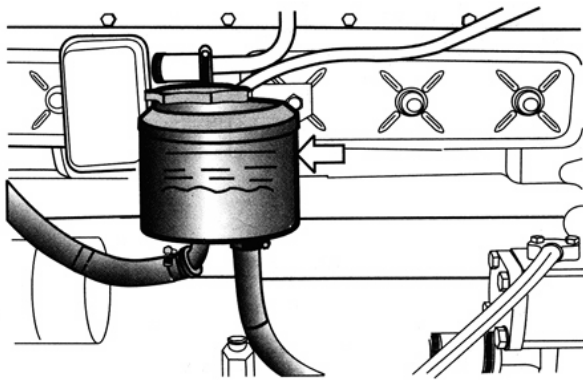


Fig.5-4 Check oil level of steering oil cylinder

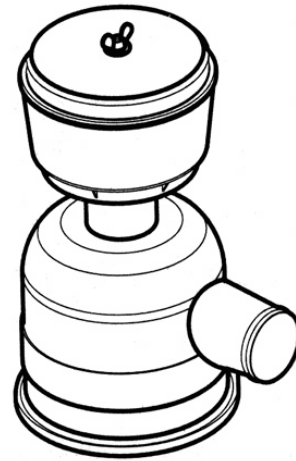


Fig.5-5 Oil-bath type air filter

#### 5.2.2.4 Maintenance for coarse strainer of oil-bath type air filter

Refer to Fig.5-5 for oil-bath type air filter

#### 5.2.2.5 Maintenance on air filter in cab

Refer to Fig.5-6 for cab filter. Dismount bolts, remove outer housing and take out the filter core. Use compressed air of under  $0.7\text{ MPa}$  (7 kilogram force per square centimeter) to blow the filter core inside out or steep the filter core into water or non-foam detergent solution. 15 minutes later, use water of under  $0.27\text{ Mpa}$  to wash and flash off. As for paper filter core, replace it after 5 times' wash. Dismount fixing screws, take down filter cover and replace with a new filter core.

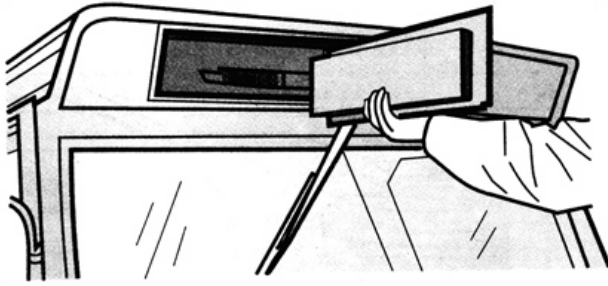
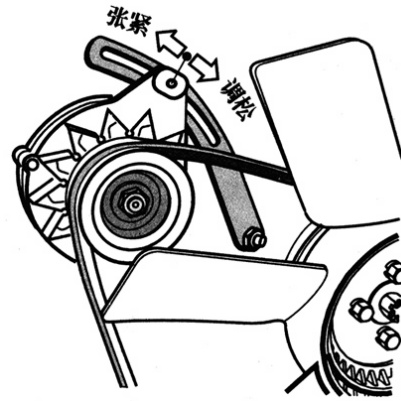


Fig.5-6 Cab air filter



张紧 tensioning 调松 release  
Fig.5-7 Check the fan belt tightening

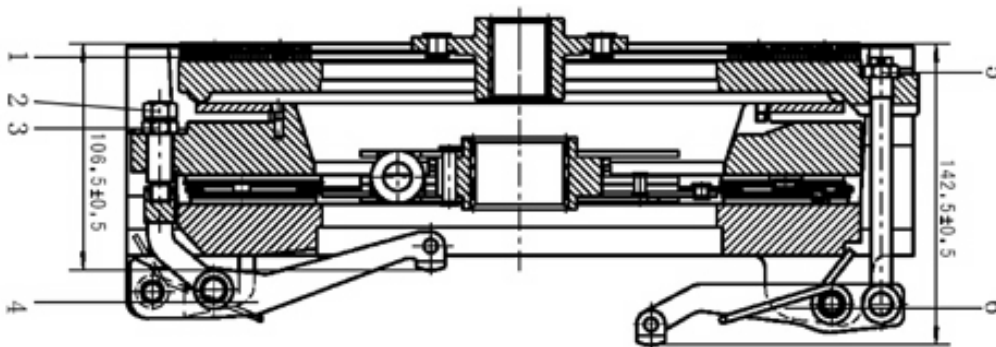


Fig. 5-8 Adjustment on clutch

1. Secondary clutch driven disk    2. Lock nut    3. Adjusting nut  
4. Master clutch disengaging lever    5. Self-lock nut    6. Secondary clutch disengaging lever

#### 5.2.2.6 Adjustments on fan belt tightening

Fig. 5-7 shows the check of fan belt tightening level.

Thumb presses the middle position of fan belt down and the pushing distance should be  $15 \pm 3$  mm. If it cannot be done well, do adjustments as the steps below:

Release the fitting nut on the generator adjusting frame, pull the motor outside to tighten the belt, and then screw up that fitting nut.

#### 5.2.2.7 Adjustment on clutch

Refer to Fig.5-8 for adjustment on clutch.

Dual clutch should get adjusting on clamps with the steps below:

Adjust the site of nut 3 to get a distance of  $106 \pm 0.5$  mm between three master clutch

disengaging levers 4 and the left side face of secondary clutch driven disk 1. End run-out of the three disengaging levers is 0.4mm. Lock it up with nut 2 after adjustment is finished; Adjust position of self-lock nut 5 to get a distance of  $142.5 \pm 0.5\text{mm}$  between end face of the three secondary clutch disengaging levers 6 and the left side face of secondary clutch driven disk 1. End run-out of the three disengaging levers is 0.4mm. Tighten self-lock nut.

#### 5.2.2.8 Adjustment on master clutch pedal

Refer to Fig.5-9 for adjustment on master clutch pedal

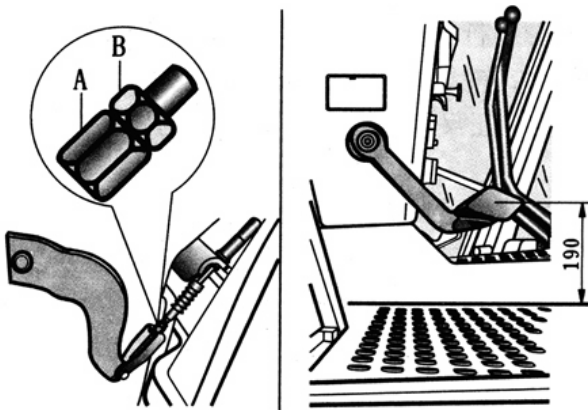


Fig.5-9 Adjustment on master clutch

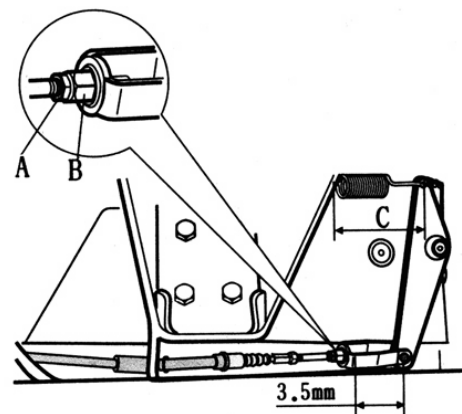


Fig.5-10 Adjustment on PTO shaft clutch

If master clutch cannot be disengaged completely because clutch pedal is too high or clutch pedal has an insufficient stroke, do adjustments as the following steps:

Release lock nut “B” and brake nut “A” (Every round nut “A” turns equals to that pedal stroke is adjusted 9mm). When the distance from static position of clutch pedal to floor is 190-200mm, tighten nut “B” .

Check master clutch operating flexible axle: There should be no crack or damage on external cover of flexible axle. Flexible axle can’ t be bent.

#### 5.2.2.9 Adjustment on operating gear of PTO shaft clutch

The free stroke in Fig. 5-10 is 3.5-3.7mm (equal to 53-56mm site of operating handle). If its free stroke is under 1.5mm, do adjusting as steps below:

Release nut “A” , turn nut “B” counter-clockwise (every round nut “B” turns, free stroke position moves 1mm). When free stroke is adjusted to 3.5mm, lock up nut “A” . After free stroke is adjusted, the mounting length of return spring “C” is about 140mm.

#### 5.2.2.10 Check oil level of engine oil pan

Refer to Fig.5-11 for checks on oil level of engine oil pan.

Draw out the dipstick “A” . Verify the oil level is between the upper and the lower mark lines. If the oil level cannot reach the lower line, take down cover “B” (Fig.5-12) of housing for timing gear to refill.

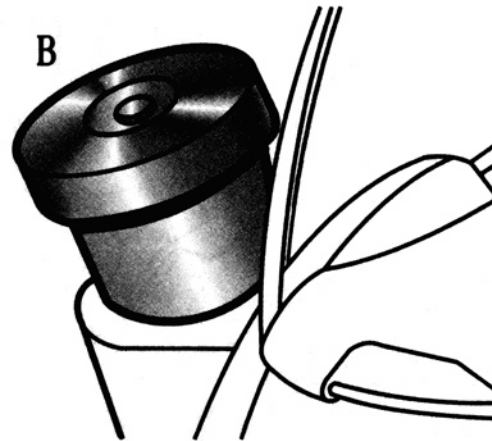
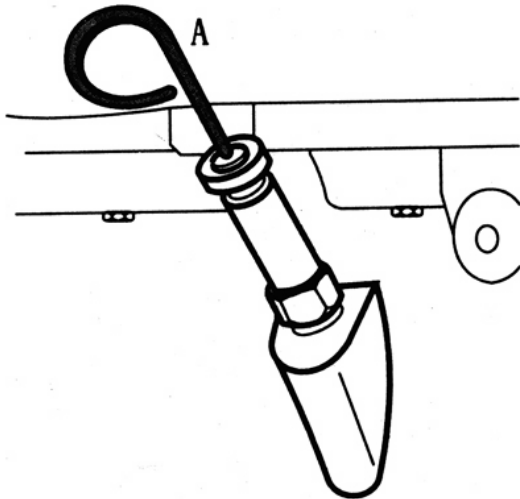


Fig.5-11 checks on oil level of engine oil pan Fig.5-12 Refilling cover of engine timing gear chamber

#### 5.2.2.11 Maintenance of rear hubs

Refer to Fig.5-13 for tractor rear hubs

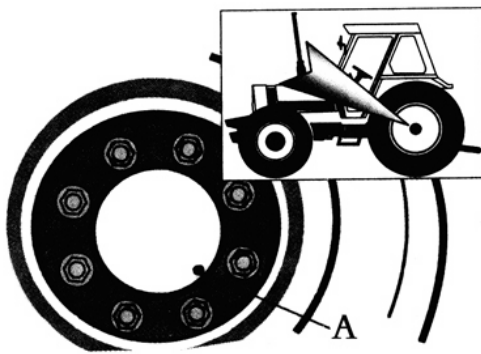


Fig.5-13 Rear hubs

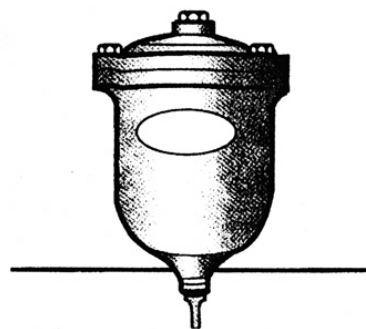


Fig.5-14 Fuel sediment bowl

Fill in lubricating grease from site “A” (one site each side) of oil cup until grease can be extruded from the slot of inside dust guard.

When tractor works on dusty fields, paddy or marsh areas, you should pay more

attention to regular lubricating grease-filling to avoid dusts and slurry entering hubs. When adding lubricating grease, all mud and water should be extruded until clear lubricating grease overflows.

#### 5.2.2.12 Maintenance on fuel sediment cup

Refer to Fig.5-14 for fuel sediment cup.

If the cup contains water, open the discharge plug at the bottom.

#### 5.2.2.13 Maintenance on suspending levers

Fill lubricating grease to the sites of the arrows in Fig.5-15

#### 5.2.2.14 Maintenance of hydraulic steering oil cylinder

Refer to Fig.5-16 for hydraulic steering oil cylinder of 4-wheel driving tractor. Fill lubricating grease to where the arrow points as per maintenance requirements.

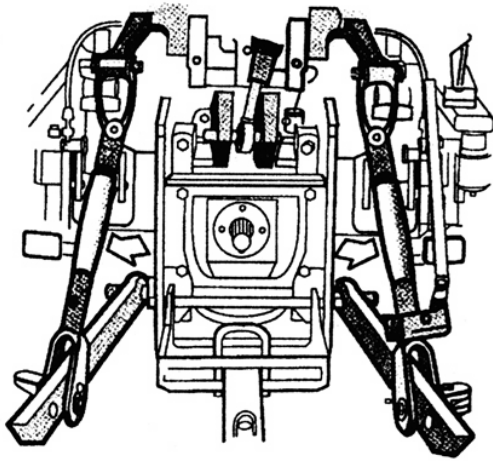


Fig.5-15 Suspending lever

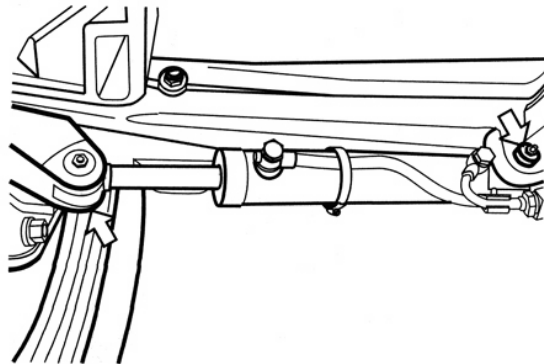


Fig.5-16 Hydraulic steering oil cylinder

#### 5.2.2.15 Maintenance over the central swing pin of the front driving axle

Fill in lubricating grease to where the arrow points as per maintenance instruction (Fig.5-17).

#### 5.2.2.16 Change engine oil for engine oil pan

Screw down the drain plug in Fig.5-18 to discharge oil and wash oil pan, screw up the plug and refill with new lubricating oil as per rules.

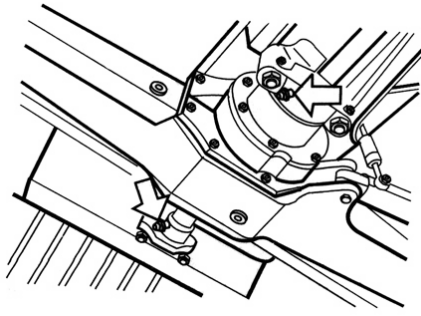


Fig. 5-17 Central swing pin of front driving axle

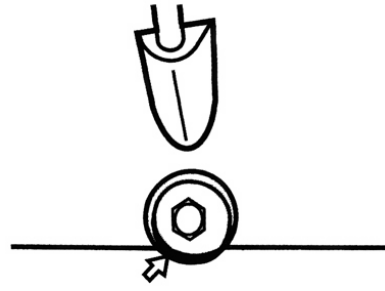


Fig.5-18 Drain plug of engine oil pan

5.2.2.17 Dismount bottom oil tray, clean dirty oil away and wash it with kerosene. Meanwhile, wash lower filter core and blow it with compressed air. Finally, mount it again after new engine oil is filled to oil basin.



**Attention: Upper filter core cannot be dismounted. After engine works for 600-1000hours, take it down together with upper housing. Wash the upper filter core with diesel oil and blow to the inside from air filter outlet with compressed air.**

5.2.2.18 Maintenance on fuel filter

Refer to fig. 5-20 for fuel filter.

Two filters are connected in series. The left one is the first section while the right one, the second section. Paper filter core cannot be washed. Change the first section filter each 200 working hours of the engine. You can replace it with the second section filter and use a new one as the second section.

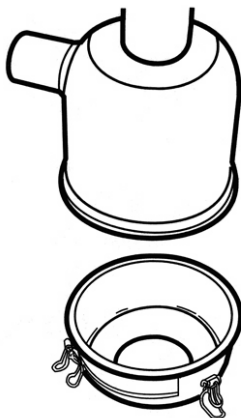


Fig.5-19 Oil-bath type air cleaner

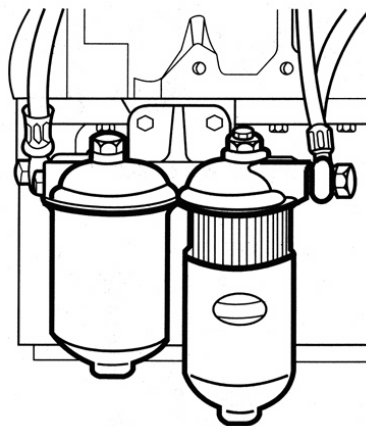


Fig. 5-20 Fuel filter



#### 5.2.2.19 Maintenance on rotary-type oil filter

See fig. 5-21 For rotary-type engine oil filter

Change filter core according to technical requirements every 200 working hours of engine.

#### 5.2.2.20 Maintenance on lifter engine oil filter

Refer to Fig.5-22 for lifter oil filter

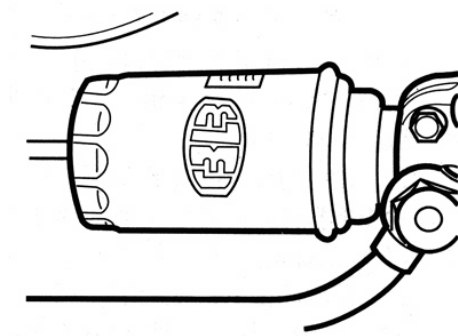


Fig.5-21 Rotary-type engine oil filter

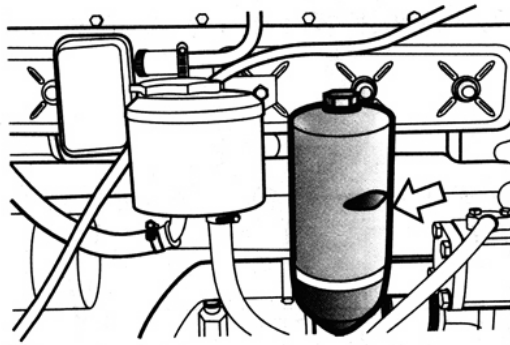


Fig.5-22 Lifter engine oil filter

Wash the net filter and blow it cleaned with compressed air. When filter core is hard to wash clean or is damaged, replace with a new filter core. Wash the inside of filter cover and fill in new lubricating oil.

#### 5.2.2.12 Check oil level of final transmission of the front driving axle

When checking oil level of final transmission of the front driving axle (Fig.5-23), turn the front wheels to make the screw-plug “A” at the horizontal position. Screw out the plug and the oil level should reach the screw-plug hole, or refill engine oil.

When changing engine oil, turn the hub to make the drain plug “A” at the lowest position. Dismount the drain plug to discharge all dirty oil. Turn the hub again to make the plug at a horizontal position and then refill new engine oil until it reaches the plug hole.

#### 5.2.2.22 Adjustment on parking brake

Refer to Fig.5-24 for parking brake

If the toothed sector plate has a free stroke over 3 ratchets, do adjustment as the steps below:

Release nut “A” , remove pin “C” , and turn link fork “B” until the toothed sector plate has a free stroke of 3 ratchets. Do assembling well then.

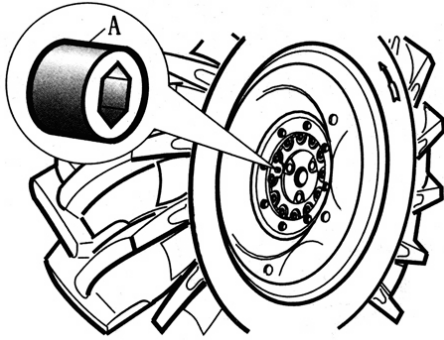


Fig. 5-23 Oil level check for front axle  
final transmission housing

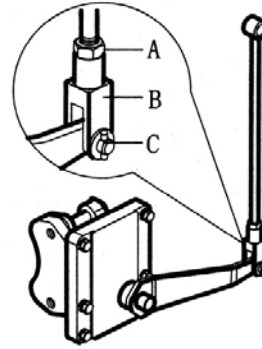


Fig.5-24 Adjustment on parking brake

#### 5.2.2.13 Oil level for front driving axle casing (Fig. 5-25)

To check the oil level of the front axle casing, tighten screw plug “A” and oil level should reach the plug hole. Refill oil in case of insufficiency. To change engine oil, discharge all dirty oil from position “B” of the screw plug, tighten the plug “B”, and then refill new oil from the position “A” of screw plug.

#### 5.2.2.24 Main pin of front driving axle

There are two oil cups on every side of the front driving axle for filling grease (Fig.5-26). Grease up every 400 working hours.

Do grease refilling two times a year at least.

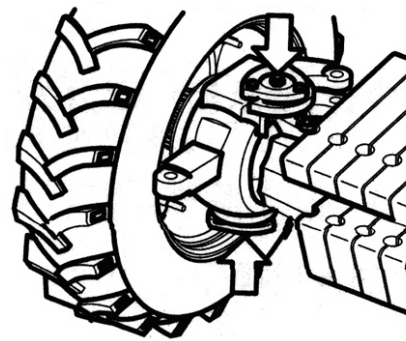
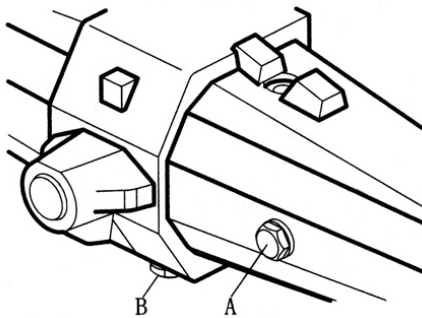


Fig.5-25 Adjustment on oil level of front axle casing    Fig.5-26 Lubrication of front axle master pin

#### 5.2.2.25 Maintenance on hydraulic steering oil tank

Take out the filter (Fig.5-27) (Press filter down to make its upper end incline to oil tank filler, and then it can be taken out). Use kerosene to wash it together with filter cover.

When changing oil, disassemble pipe “B” and discharge oil from oil tank. Take out filter and wash it, and then mount oil pipe “B” and refill with new engine oil.

#### 5.2.2.26 Maintenance of transmission system and lifter

To check the oil level (Fig.5-28), the tractor should park on a level ground. Stop the engine, put lift arm to the lowest position, and then check oil level. If oil level is under the upper limit line “A” of dipstick, refill from site “B” .

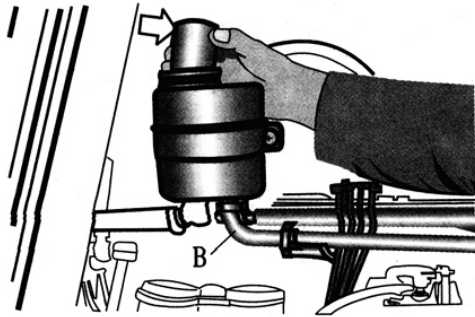


Fig. 5-27 Maintenance for hydraulic steering oil tank

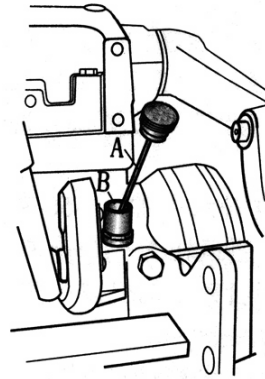


Fig. 5-28 Checks on oil levels of transmission case and lifter

To change lubricating oil (Fig.5-29 and Fig.5-30), dismantle the screw plugs “A,B,C, D,E” to discharge dirty oil completely. Fill diesel or kerosene and wash the inside of gearbox, and then tighten all screw plugs and refill new engine oil.

#### 5.2.2.27 Maintenance of fuel tank

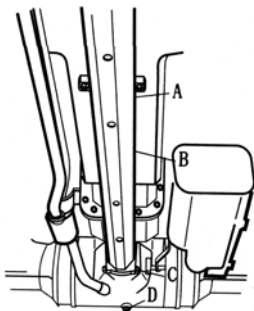


Fig.5-29 Casing of gearbox

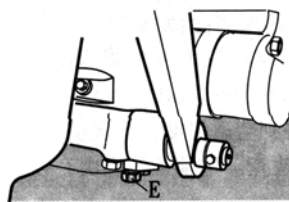


Fig.5-30 Lifter

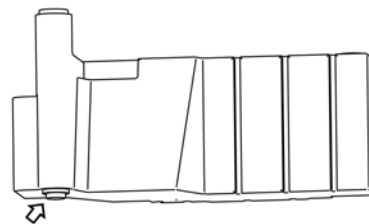


Fig.5-31 Discharge sediments from fuel tank bottom

Refer to Fig.5-31 for fuel tank. Park tractor on level ground, stop engine, and dismantle the screw plug under the oil tank to clean the dirt in the oil tank.

#### 5.2.2.28 Adjustment on clearance of engine valve

Inlet valves have a clearance of 0.3-0.4mm while outlet valves' clearance is 0.4-0.5mm (without engine temperature in consideration). Checks on valve clearances should be done carefully by experienced technicians.

#### 5.2.2.29 Checks and adjustment on injection pressure of oil injector

To dismount oil injector, you should test oil injection pressure on oil injector pressure calibrator apparatus. An oil injecting pressure of 19.6~20.6 Mpa is required.

#### 5.2.2.30 Checks on starting motor

To check the slip ring and carbon brush must be done by experienced person.

#### 5.2.2.31 Checks on tyre inflation pressure

See table 5-3 for tyre inflation pressure

**Table 5-3 Tractor tyre inflation pressure**

Pressure (kPa)	During transportation	During ploughing
Front wheels	147-196	89-119
Rear wheels	147-196	98-118

#### 5.2.2.32 Maintenance on the engine cooling system

Cooling fluid used in the tractor should be clear soft water, such as river water, snow water, rain water, or boiled tap water. In severe freezing season, Antifreeze should be applied when temperature is below 0 ° C, like the mixture of glycerol and water that has anti-freeze, anti-oxidation, anticorrosion and anti-foam functions. Anti-freeze has a valid term of two years or 1600 hours. Change and wash the cooling system if beyond the limit, and then fill in new anti-freeze fluid.

Wash incrustant in the cooling system away. Operators of the shift before maintenance should fill up the cooling system with the mixture at a proportion of 10 L water: 750g caustic soda : 200g kerosene. Make the engine run at a medium speed for 5-10 minutes and keep the mixed solution in the system for 10-12hours (Note: keep it warm to avoid freezing in winter). And then start the engine again to make it run at a medium speed for 20 minutes. Stop the machine and discharge the wash fluid.

After the engine is cooled down, open the plug at the water tank bottom, stick water pipe into the water tank to wash, and then mount the plug. Fill water, make the engine run

for minutes and then discharge all the water. After engine is cooled down, fill new antifreeze or cooling water according to rules.

Wash and fluid adding for the engine cooling system of the tractor equipped with heating-installation driver' s cabinet: Cooling water of the engine directly flows to the radiator of heater (including the cooling system of heater' s water conduit of driver' s cabinet with a capacity of 16L) before going to engine radiator. To discharge all cooling water, move handle “2” to horizontal position (Fig.4-26).

In the cooling system is equipped with temperature saver to let cooling fluid get a proper temperature in the shortest time. When the temperature reaches above 85 ° C, make cooling fluid flow through water box. If the temperature saver doesn' t work well, take it down for check. This should be done by an experienced operator.



**Attention: In winter, the concentration of the anti-freeze should get often checked according to temperature changes. As for the tractors without anti-freeze, discharge all water (including water in the water conduit of heater' s radiator)when stopping the machine to avoid water frozen.**

#### 5.2.2.33 Exhaust of fuel system

If the tractor is in idle status for a long time, or the diesel oil filter core is changed, or oil tank is empty, air can enter the fuel conduit. Air in fuel system can make engine start hard. Exhaust the air according to the following steps when oil tank is full and fuel conduit switch “R” is at “engaged” position (Fig.4-6): first, release the exhaust screw “A” on fuel filter (Fig. 5-32), press the button “B” on the fuel pump (Fig.5-33) upon and down until diesel oil flows from the exhaust screw without bubbles, tighten exhaust screw “A” . And then release the exhaust screw of fuel pump “C” (Fig.5-33. ) press the button “B” on the fuel pump (Fig.5-10) upon and down until diesel oil flows from the exhaust screw without bubbles, tighten exhaust screw “A” .

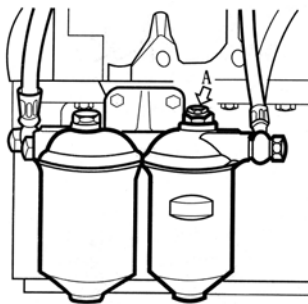


Fig. 5-32 Fuel filter

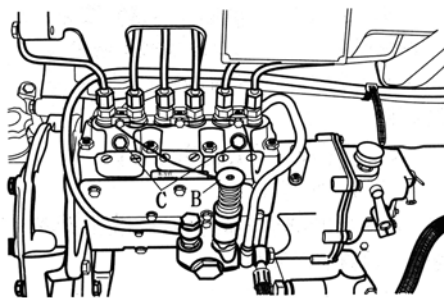


Fig. 5-33 Injection pump



**Attention:**

(1) Engine must apply hi-quality diesel oil that meets rules. Generally, 0# light diesel oil is used in summer and -10# in winter. The diesel oil must be pure and should get a depositing and purifying for at least 48 hours before use.

(2) For ZHB-type oil injector pump, lubricating oil level should get regular checked. In case of insufficient lubricating oil, refill oil to the mark line. Change lubricating oil once every 150 working hours.

5.2.2.34 Exhaust of braking system

After oil pipes in braking system is dismounted, or when doing checks and adjustments on the braking ride level (synchronicity), braking system should get exhausted.

Exhaust for braking system should be done by well-trained and experienced operators, following the steps below:

Wash the places around bleeder and brake oil tank cover well. During air exhausting, oil levels of left oil tank “B” and right “A” must be kept at the top oil level position (Fig.5-34).

Air exhaust of brake system is always done by two persons. One operator step the left brake pedal down to the bottom slowly to get a braking pressure while the other operator loose the bleeder “C” for half round to make oil overflow (Fig.5-35)

Tighten the bleeder (C). Repeat the actions above until the oil overflows without bulbs. Step brake pedal down again to get an oil pressure. When pedal reaches normal stroke the oil pressure can be completely set up (reaches rated pressure).

Follow the steps above to exhaust the right brake on the other side. Fill oil to full brake oil tank.



**Attention: Oil not filtered cannot be reused.**

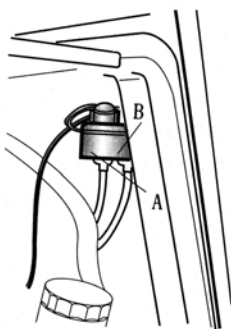


Fig. 5-34 brake oil tank

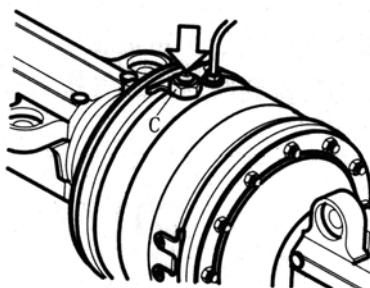


Fig.5-35 drain plug

#### 5.2.2.35 Maintenance over cab and hood panel

##### (1) Protection against natural corrosion

Natural causes of damages and corrosion of tractor:

- Wet air containing salts
- Air pollution (in industrial zone)
- Scraping caused by sands
- Corrosive organic matters and chemicals
- Mechanical damage (impress, scratching, nick)

Measurements against the troubles above:

- Use anti-corrosion metal plate
- Use painting methods that is anti-scratching and anti-corrosion
- Cover the corrosives sites (corners, welding lines and folding sites) with hard

plastic.

- Waxing for open storage

As the affects of atmosphere is unforeseen, and it is also related to the environments and tractor operation, driver should do protection as well as he can.

##### (2) Maintenance on driver' s cabinet and hood

When metal of cab and the hood can be seen due to scratching or nick, recover it immediately following the techniques and steps below:

- Sand blasting at the damaged site
- Primer
- Dry and slight burnishing
- Paint
- Burnishing

According to working conditions and environment of the tractor, wash hood and cab with water pipe regularly. Washing should often be done when the tractor work in coastal area or in heavily polluted area. After the tractor works in an environment full of organic matter and chemicals, do washing immediately. Wash with a solution of 2%~4% cleaner and low-pressure water pipe. After complete washing, blow with compressed air.

When the tractor is explored in sharp sun shining for a long time or the engine is stopped, don' t wash with water immediately. Wash after it is cooled down, or the gloss of the paint will die away. To guarantee a good gloss, waxing is a sound way.

(3) Maintenance for the inside of cab.

----- Check termly and clean water under the floor pad.

----Print hinges, locks and windows with anti-water lubricating agents.

-----Use proper cleaner to wash windows. Use special cleaner for some special sites if necessary.

-----Take down the beams of the wipers and paint them with talc powder

----- Open the door and side windows half way.



## Chapter VI Troubleshooting for Tractor Chassis

### 6.1 Clutch

Trouble	Causes	Solution
1. Clutch skids	1) Friction plate is stained with oil. 2) Friction plate wears badly, and rivet heads stick out. 3) Pressure of film spring reduces. 4) Pedal height is too small to release travel. 5) Driven disc of main clutch is deformed severely.	Clean with gasoline. Replace  Replace Adjust Replace
2. Not sound release of main clutch	1) Insufficient pedal height 2) Driven disc of main clutch is upwarped too much 3) Height of main clutch release lever is adjusted wrong	Adjust Replace Adjust
3. Shaking when tractor is started	1) Friction plate and driven disc are stained with oil. 2) Main clutch driven disc is warped severely. 3) Height of main clutch release lever is adjusted wrong	Adjust Replace Adjust
4. Main and secondary clutches cannot be released	1) Soft control shaft of clutch is broken. 2) Disengaging pawls of clutches are abased severe or broken. 3) Disk spring doesn' t work or is broken.	Replace Replace Replace
5. Not sound disengagement of assistant clutch	1) Not proper soft shaft 2) External control lever is deformed and warped.	Adjust Repair

### 6.2 Gear box

Trouble	Causes	Solution
1. Difficult or failed putting into gear	1) Not complete disengagement of clutch 2) Sleeve edge and gear section are worn or broken.	As per troubleshooting for clutch Change or repair
2. Clutch inside front transmission case is found with oil	1) Engine bent axle rear oil seal is invalid. 2) The oil sealing of first axle of gearbox is out of effects. 3) Oil seal of master clutch is found with oil leakage	Replace Replace Replace
3. Abnormal sound of gearbox	1) Gear is severely worn. Case crush or teeth broken. 2) Bearing is heavily worn or broken. 3) Insufficient lubricating oil or unqualified oil	Replace Replace Refill or change lubricating oil

### 6.3 Rear axle and brake

Trouble	Causes	Solution
1. Too noise of central transmission	1) Too much play of driving screw bevel gear bearing 2) Abnormal gear engagement 3) Differential shaft is worn and seized 4) Planet gear or gasket is worn. 5) Differential bearing is worn or broken	Adjust  Adjust meshing prints Replace Replace Replace
2. Driving helical bevel gear bearing and differential bearing are too hot.	1) Bearing is pre-tightened too much. 2) Not sound lubricating;  3) Too small bearing or tooth surface clearance	Adjust Check oil level; refill if insufficient Adjust
3. Abnormal sound of final transmission	1) Fitting screw of driving shaft is loose; locking plate is broken 2) Bearing is worn or damaged.	Change  Change
4. Brake doesn' t work well	1) Friction plate is severely worn or found with eccentric wear 2) Brake pump is blocked 3) Lake of braking liquid; air in pipes  4) Oil leakage is found in braking piping system.	Change  Wash Add braking liquid, exhaust Delete leakage sites
5. Tractor running deviation when braking	1) Braking pump balance valve doesn' t work or throttle valve is jammed 2) Different tyre pressure of the two rear tyre. 3) Air into left or right braking pipe	Change parts Inflate Exhaust Exhaust

### 6.4 Running system

Trouble	Causes	Solution
1. Front wheels are worn severely.	1) Tire rims or radial plates of front wheels are deformed severely. 2) Improper toe-in adjustments 3) Steering knuckle and two end shafts are worn severely. 4) Insufficient tyre pressure during doing transportation 5) During transportation, the front driving axle is not uncoupled.	Regulate it  Adjust Change  Inflate  Uncouple

Trouble	Causes	Solution
2. Front-wheel swings	1) Severe bearing abrasion 2) Severe abrasion of steering main pin 3) too large clearance between rocker shaft and bracket 4) Rims of front wheels are deformed severely. 5) Improper adjustment on toe-in 6) Steering globe joint is worn severely. 7) Steering cylinder piston' s sealing is damaged. 8) Pin shafts on both ends of steering cylinder are heavily abraded.	Replace Replace Adjust  Regulate it Adjust Change Change  Change
3. Too much noise	1) Meshing prints of front central transmission gear are not so good. 2) Central transmission bearing clearance is too big or broken. 3) Differential shaft is damaged or seized. 4) Planet gear or gasket is worn. 5) Final transmission gear pair' s meshing is not good.	Adjust  Adjust or change  Change Change Change
4. Too hot transmission shaft	1) Transmission shaft is bent and deformed severely. 2) Central supporting bearing base is loose.	Regulate or change  Tighten

## 6.5 Hydraulic steering system

Trouble	Causes	Solution
1. Oil leakage	1) Rubber gaskets on hydraulic steer valves, diaphragm plates, stator and rear cover are damaged. 2) Rubber gasket at shaft neck is damaged. 3) Rubber rings of joints are damaged.	Wash and change rubber gasket.  Change rubber gasket Change rubber gasket
2. Heavy steering action	1) Constant-flow gear pump doesn' t work. 2) Too low oil level in oil tank 3) Air into pipes 4) Too heavy viscosity of oil; 5) Steel ball retaining valve inside valve doesn' t work well with weak steering force. 6) Oil leakage of steering system, oil leakage of steering cylinder and pipes 7) Safety valve has a too low adjusting pressure or is choked by dirt.	Change Refill Exhaust Change oil Wash and maintain  Maintain or replace  Replace and wash

Trouble	Causes	Solution
3. Failed steering	1) Pin is broken or deformed. 2) Couple axle is broken or deformed. 3) Wrong positions of rotor and couple axle 4) Steering cylinder piston or piston sealing is broken	Change Change Assemble again Change
4. Steering wheel cannot turn back by itself.	1) Return spring plate is broken 2) Rotor shaft and valve core is eccentric. 3) Steering shaft and steering post bush are eccentric with a big turning resistance. 4) Steering shaft seizes valve core in axial direction. 5) Too much reduced pressure at neutral position, or no unloading of redirector when steering wheel stops turning.	Change Repair or change Repair or change  Repair  Repair or change
5. no manual steering	1) Too big clearance between stator and rotor 2) Too bad sealing of cylinder piston 3) Insufficient oil; air into pipes 4) Broken retaining valve 5) Broken or seized cylinder safety valve	Change Change Refill oil, exhaust Repair, change Repair or change
6. Insensitive steering	1) Too big clearance between valve core and valve housing 2) Too big clearance between couple axle and pin 3) Too big clearance between couple shaft and pin 4) Broken or too soft return spring plate	Change  Change  Change  Change

## 6.6 Hydraulic suspending system

Trouble	Causes	Troubleshooting
1. Farm implement cannot be lifted.	1) Oil return valve of distributor is blocked. 2) Inlet line is jammed. 3) Air enters the inlet line.  4) Insufficient oil pump  5) Too low oil level 6) Quick lifting operating flexible axle is not adjusted well, and fixed at dropping position.	Wash return valve and sensitivity valve Wash or replace filter Check against any air leakage of coupling sites. Change with new pump Fill lubricating oil Do adjustment again.

Trouble	Causes	Troubleshooting
2. Implement shakes during lifting. Lifting is slow.	1) Oil filter is jammed. 2) Air entering oil absorbing pipe line; 3) Defective gear oil pump; 4) Too low hydraulic oil level.	Wash Check the sealing performances of joints. Change Fill in lubricating oil.
3. After lifting, farm implement frequently “nodding”; after engine stops, quick static dropping.	1) O-ring of distributor has an unsound sealing. 2) Master valve is worn and has oil leakage. 3) Check valve is found with oil leakage. 4) Cylinder safety valve has oil leakage 5) Cylinder piston O-ring is damaged and has oil leakage.	Change O-ring Change Repair or replace Repair or replace Change O-ring
4. Lifting with light loads is ok while heavy-load lifting is not available.	1) Improper adjustment on system safety valve. 2) Air absorbed or entering oil-absorbing circuit. 3) Improper adjustment on cylinder safety valve	Adjust again or change. Check oil inlet circuit. Do adjustment or change again.
5. Safety valve is opened when lifting at top position.	Improper lifting stroke adjusting.	Do adjustment again.
6. Farm implement can't drop	1) Master control valve is choked. 2) Improper adjustment on quick lifting flexible axle, fixed at lifting position (guy wire is not long) 3) Improper adjustment on force-adjusting sensing	Wash Readjustment  Readjustment
7. Multi-way valve can only have single action, no double action.	1) Improper adjustment on operating lever 2) Shifting valve (between single and double actions) is put at single-action position. 3) Valve rod oil groove is jammed 4) Fixing spring of valve rod is loose.	Do adjustment Do adjustment  Check and wash Check

### 6.7 Electric system: (starting motor, generator, battery, meters, lamps and cab electrical equipment)

Trouble	Cause	Solution
1. Starting motor doesn't run.	1) Insufficient battery capacity; 2) Battery pole bar is too dirty; joints of cables are loosen; bond strap is rusted. 3) Such control circuits as start safety switch are broken. 4) Carbon shoe and ring header have malfunction connection. 5) Open-circuit, short-circuit or bond strap of starter.	Charge according to rules. Eliminate dirt, derust and fasten joints. Check reliability of connection. Maintain, adjust and wash. Repair.

Trouble	Cause	Solution
2. Insufficient starting of starting dynamo; Engine cannot be started.	1) Insufficient battery capacity. 2) Malfunctioned cable connection 3) Commutator surface is burnt or stained with oil. 4) Carbon brush is worn too much or carbon brush spring 's pressure is insufficient, which causes bad connection between it and commutator. 5) Main contactor of solenoid switch is ablated. 6) Severe abrasion on bearing	Charge Repair Burnish and clean oil stain. Change or adjust.  Maintain and burnish Change bearing.
3. Generator doesn' t work.	1) Wrong or broken connection with poor contact. 2) Rotor coil is broken or short. 3) Rectifier diode is damaged. 4) Carbon brush has insufficient contacts. 5) Adjustor is damaged.	Check and repair  Check, repair or change the assembly Change Eliminate dirt and carbon brush. Change adjustor.
4. Insufficient generator' s charging	1) V-shape triangle belt is loose.  2) Carbon brush has bad contacts; slip ring is stained with oil. 3) Adjustor is damaged. 4) Too old battery.	Adjust tensity according to requirements. Adjust and wash.  Change adjustor. Adjust electrolyte level to rated height as per requirements. For too severe vulcanization to recovery capacity, the battery should be changed.
5. Too big currency of generator	Adjustor is out of control.	Change adjustor.
6. Insufficient battery capacity make starting engine hard.	1. Longtime idle status.  2. Battery has bad joint connection, oxide on polar post is too much, insufficient power charging.	Release battery cathode for long-time idle status. Charge fully for next use. Fasten connection; eliminate dirt, paont with a layer of Vaseline.

Trouble	Cause	Solution
7. Water temperature meter always stays at low-temperature section.	1) Circuit is broken, or connector clip has bad connection. 2) Water-temperature sensor is damaged.	Check and finish all the circuit; clean the dirt from the connector. Change water-temperature sensor.
8. Water-temperature meter needle always points to hi-temperature section.	1) Water-temperature sensor has short circuit or is damaged. 2) Short circuit	Change water-temperature sensor. Check and do troubleshooting against short circuit.
9. Oil meter needle works abnormally.	1) Circuit is broken or has short circuit. 2) Oil sensor has broken part, short circuit or bad connection	Check, repair and trouble shooting. Repair and change sensor
10. Speed gauge needle doesn' t move	1)Generator doesn' t generate electricity. Phase Output point "W" has no signal pressure output. 2) Circuit is broken with bad connection.	Repair generator Repair circuits.
11. Head lamps have no hi-beam or dipped lights.	1) Circuit is broken. 2) Light switches and dip switch have bad connection or are damaged. 3) Bad-quality or damaged bulbs.	Repair and power-on Check, repair and change. Replace with better bulbs
12. Rear lights don' t work	1) Circuits are broken. 2) Rear lights switch has bad connection or are damaged.	Check, Repair and power-on Check, repair or change.
13 Electrics in driver' s cabinet don' t work.	1) Circuits are broken. 2) Switches have malfunctions or are damaged.	Check, repair and power-on Check, repair or change.

## Chapter VII Appendix

### 7.1 Oil and solution used for tractor

#### 7.1.1 Fuel

International standard: ASTM fuel D-975; in ordinary temperature, grade 2-D; below +5 ° C, grade 1-D.

Domestic standard: light diesel oil as per national standard GB/T252-87. (Fig. 7-1)

**Fig. 7-1 Diesel Oil**

Air temperature	20 °C 以上 Above 20 °C	4~20 °C	4 ~ -5 °C	-5 ~ -14 °C	-14 ~ -29 °C
Diesel oil grade	Light diesel oil grade 10	Light diesel oil grade 0	Light diesel oil grade -10	Light diesel oil grade-20	Light diesel oil grade-35



**Attention: Only after 48h deposition, can the fuel be filled into cylinder.**

**During engine running, don' t fill fuel into fuel tank. If the tractor works under sharp sun shining, don' t fill the tank fully, or the fuel can overflow. Once it overflows, clean it away immediately.**

#### 7.1.2 Oil used for diesel

Overseas standard: diesel oil pan, oil injector pump, speed governor and oil-bath filter all apply the viscosity grading of SAE: SAE10W under -5 °C , and SAE15W/40 for general use above -5 °C . Quality grade should meet the standards of APICD.

Domestic standard: diesel oil pan, oil injector pump, speed governor and oil-bath filter all apply L-ECC grade diesel oil or its parallels (GB11122-89). Don' t use ordinary diesel oil.

When environment temperature is  $\geq +5$  °C , apply 20# CC grade diesel oil; when temperatures between -10 °C and +20 °C , use 20/20WCC grade diesel oil; when it is between -20 °C and 0 °C , select 10CC grade diesel oil.



**Attention: Don' t mix different grades of lubricating oil for diesel.**

#### 7.1.3 Transmission-hydraulic engine oil



International standard: for lifter and hydraulic steering system, MF1135 made by Massey Ferguson, M2C 86A of Ford, or J20A of John Deer.

Domestic standard: for lifter and hydraulic steering system, N100D is a kind of Transmission-hydraulic engine oil with a company standard of Q/SH018.44.07-90.



**Attention: Only after 48h deposition, can the dual-purpose engine oil be used.**

#### 7.1.4 Oil for brake

International standard: SAE10W oil; the quality meets standards of grade CD by API.

Domestic standard: Use “hydraulic-transmission-brake” general-purpose oil with the standard of ZB32.02-96.

#### 7.1.5 Grease

International standard: grade D-217 of grease stated by NLGI with a grade-2 viscosity.

Domestic standard: General alban grease GB491-87) used for all oil cups.

#### 7.1.6 Distilled water

In case of insufficient battery fluid level, add distilled water. Don't fill in replenisher and other clear water. Or it will cause insufficient charging. In case of too quick fluid level dropping, get professional factory to repair it immediately.

#### 7.1.7 Cooling fluid

It is recommended to use anti-freeze solution in cooling system that is a kind of mixture of water and glyceric featured with such functions as anti-freeze, anti-oxidation, anticorrosion and anti-foaming. As the solution's performance is controlled by its mixture proportion, concentrations of 32%, 43% and 58% are applied to -8 ° C, -15 ° C and -25 ° C respectively.

If you don't use anti-freeze, use clear soft water. Tap water that has been chemical treated and boiled is also applicable.

#### 7.1.8 Water and cleaner (only applicable to the fully sealed cab)

Water and cleaner are used for windshield washer. In -10 ° C temperature, use anti-freeze solution with a concentration of 50%.

## 7.2 Wiring distribution of tractor electrical system

NO.	Wire No.	Sectional area, Color	Starting point---finish point
1	2	2.5 White	Starting motor-- fuse box
2	3	2.5 Green	Fuse box-- ignition switch
3	6	2.5 Red	Ignition switch-- fuse box
4	7	2.5 Orange	Fuse box-- silicon rectification generator
5	8	1.0 Green	Adjustor --silicon rectification generator
6	9	1.0 Black	Adjustor --silicon rectification generator
7	10	2.5 White on pink	Starting switch-- cranking motor
8	12	2.5 Green	Starting switch-- fuse box
9	14	1.5 Green	Fuse box-switch of headlamps
10	15	1.5 White	Switch of headlamps---headlamp (low-beam)
11	16	1.5 Yellow	Switch of headlamps---headlamp (high-beam)
12	17	1.0 White	Fuse box-rear working lamps switch
13	18	1.0 Gray	Rear working lamps switch---rear working lamps
14	19	1.0 Blue	Fuse box-- flasher relay
15	20	1.0 Red	Right turn indicator switch---right turn lamp
16	21	1.0 White	Left turn indicator switch---left turn lamp
17	22	1.0 White	Fuse box-hydraulic brake switch
18	23	1.0 Coffee	Hydraulic brake switch---brake lamp
19	28	1.0 Orange	Water temperature sensor --- combined meters
20	29	1.0 Yellow and blue	Oil pressure sensor --- combined meters
21	30	1.0 Blue	Fuse box-- horn relay
22	31	1.0 White on red	Horn relay--horn switch
23	32	1.0 Yellow	Horn relay-- horn
24	33	1.0 Blue	Flasher --- steering switch
25	35	1.0 White	Oil level sensor--combined meters
26	36	1.0 Blue	Speed sensor--- combined meters
27	37	1.0 Yellow	Width indicator switch---width indicator
28	42	2.5 Yellow on red	Fuse box-cab air-conditioner control switch
29	46	1.0 Blue	cab air-conditioner control switch ---AIR COND RLY
30	47	2.5 Red on blue	Fuse box-- relay
31	49	1.5 Red on black	AIR COND RLY --fuse box
32	50	1.0 Pink	Fuse box-- drying bottle
33	51	1.0 Red on blue	Drying bottle-- compressor
34	60	1.0 Yellow on blue	Master oil cylinder sensor---secondary oil cylinder oil level sensor

### 7.3 Tightening force moments of main bolts and nuts

Name and site	Thread spec.	Tightening moment	
		N. m	Kgf.m
Connecting bolt of front gearbox casing and rear gearbox casing	M14 × 1.5	147	15
Engine and front gearbox casing	M12 × 1.5	98	10
PTO shaft housing bolt	M16 × 1.5	220	22.5
Final transmission casing connecting nut	M14 × 1.5	176	18
Fitting nut for radiator plate and hub	M16 × 1.5	245	25
Fitting nut for radiator plate and hub	M18 × 1.5	255	26
Nut connecting front bracket and engine	M18 × 1.5	314	32
Parking-brake base bolt	M12 × 1.25	98	10
Steering cylinder pin nut	M18 × 1.5	294	30
Nut connecting steering cylinder rod and steering arm	M14 × 1.5	147	15
Nut connecting steering gear and tractor	M10 × 1.5	44	4.5
Nuts connecting steering wheel and steering post	M18 × 1.5	69	7
Bolts connecting fore-rear swing pin base and front basket	M18 × 1.5	392	40
Nut connecting transfer case housing and transfer case housing	M12 × 1.25	98	10
Bolt connecting lifter housing and transfer case housing	M12 × 1.25	98	10
Lift cylinder connecting bolt	M16 × 1.5	260	26.5
Bent lever base bolt	M16 × 1.5	294	30
Limit lever base bolt	M18 × 1.5	294	30
Secondary cylinder base fitting bolt	M14 × 1.5	147	15
Bolt connecting clutch and engine flywheels	M10 × 1.25	69	7
Bevel pinion bearing self-lock nut	M50 × 1.5	294	30
Nut connecting bevel gear wheel and differential casing	M12 × 1.25	12.3	12.5
Self-lock bolt of differential left and right bearing base	M10 × 1.25	61	6.2

## 7.4 Farming implements matching with the tractor

Type	Model	Name	Main parameters	Maker
Tillage equipment	1L-535	Suspending plow	Max. tilling depth 270mm Tilling width 1.75m	Dezhou Farm Machinery Factory
	1LT-535	Suspending working width-adjustable plough	Max. tilling depth 270 mm Tilling width 1.75	Heilongjiang Datian Farm Machinery Factory
	1LT-435	Hydraulic swivel plough	Max. tilling depth 280 mm Tilling width 1.4	Baoding Farm Machinery Factory
	ISQ-340	Ripper	Max. tilling depth 450 mm Tilling width 1.2m	Beijing Shuangken Farm Machinery Factory
	1GQN-250S	Rotovator	Max. tilling depth 160 mm Tilling width 2.5 m	Lianyungang Rotovator Factory
Soil preparation machines	1BQT-5.0	60-piece hydraulic foldable light harrow	Max. tilling depth 100 mm Tilling width 5.0 m	Zhu Ma Dian Farm Machinery Factory
	1BZ (FD) - 3.0	30-piece opposed heavy harrow	Max. tilling depth 200 mm Tilling width 3 m	Xuzhou Farm Machinery Factory
	1BQD-6.6	79-piece opposed light harrow	Max. tilling depth 100 mm Tilling width 6.6 m	Yu Cheng Farm Machinery Factory
Compound tillage tools	1GSZ-280	Combined rototiller multi-purpose machine	Tilling depth 120~160 mm Tilling width 2.8 m	Lianyungang Rotovator Factory
Seeding & fertilization machine	2BFX-24	Combined seed and fertilizer drill	Seeding depth 30~80 mm Width 3.6 m	Shijiazhuang Farm Machinery Factory
	3ZF-12	Cultivator-fertilizer	Intertill depth 80~120 mm Width 9.6 m	
Other machines	4Q-2.5	Straw shredding returning machine	Stubble height 20~80 mm Width 2.5 m	



### Attention:

(1) When suspending furrow-type plough does plowing, you should select force-control or force-position integrated control according to soil conditions. If furrow-type plough plows with ground wheels, operation without ground wheels can raise productivity.

**(2) When tractor is equipped with rotavator, or other farm implements driven by PTO shaft, angles between universal drive shaft and PTO shaft and farming input shaft should get your attention; during farming, the angles should be less than 10 ° ; during lifting, the angles should be not bigger than 30 ° 。 Blades roller should be more than 250mm above ground. During plough tractor should apply floating control or position control. Don' t use force control or integrated control. When plough don' t start with hobbing cutter entering soil. Only when hobbing cutter leaves ground, and PTO shaft driving is normal, can operation begin.**

**It needs your attention that no matter the implement is at plowing position or lifting position, square shafts of universal drive shaft all can freely extend in square bushes to protect normal transmission against squeezing or pulling away.**

**(3) When tractor is equipped with trailer, connect it as per rules and check connection of gas flow system for a reliable performance without air leakage; inspect normal braking (trailer' s braking should be ahead of tractor). If any trouble found, shoot it and then do transportation.**

## 7.5 Attachment tools of tractor

No.	Code	Name	Quantity	Note
1	GB1432	Mimus screw driver 250*9	1	
2	GB1433	Cross-head screw driver 2-150 × 6	1	
3	GB4388	Open spanner 8*10	1	
4	GB4388	Open spanner 13*16	1	
5	GB4388	Open spanner 12*14	1	
6	GB4388	Open spanner 17*19	1	
7	GB4388	Open spanner 22*24	1	
8	GB4388	Open spanner 27*30	1	
9	GB4388	Open spanner 32*36	1	
10		Monkey wrench 300*36	1	
11	GB5356	Internal hexagonal wrench S5	1	
12	1204.49.101	Internal hexagonal wrench S6(55*220)	1	
13	GB5356	Internal hexagonal wrench S8	1	
14	GB5356	Internal hexagonal wrench S10	1	
15	GB5356	Internal hexagonal wrench S12	1	
16	GB/T3390.1	Sleeve 8*12.5	1	
17	GB/T3390.1	Sleeve 10*12.5	1	
18	GB/T3390.1	Sleeve 13*12.5	1	
19	GB/T3390.1	Sleeve 16*12.5	1	
20	GB/T3390.1	Sleeve 18*12.5	1	
21	GB/T3390.1	Sleeve 21*12.5	1	
22	GB/T3390.1	Sleeve 24*12.5	1	
23	GB/T3390.1	Sleeve 27*12.5	1	
24	GB/T3390.1	Sleeve 30*12.5	1	
25	GB/T3390.4	Pipe jaw 125	1	
26	GB/T3390.4	Pipe jaw 250	1	
27	JB2104	Lifting jack YQI5(5 吨 )	1	
28	JB/T7942.1	Lever type grease gun A200	1	
29	GB4953	Combination pilers 200	1	
30	JB/T3411.48	Clamp A2.5	1	Internal Circlip Pliers
31	JB/T3411.47	Clamp A2.5	1	External Circlip Pliers
32		Diesel engine tool box	1	Offered by diesel engine factory

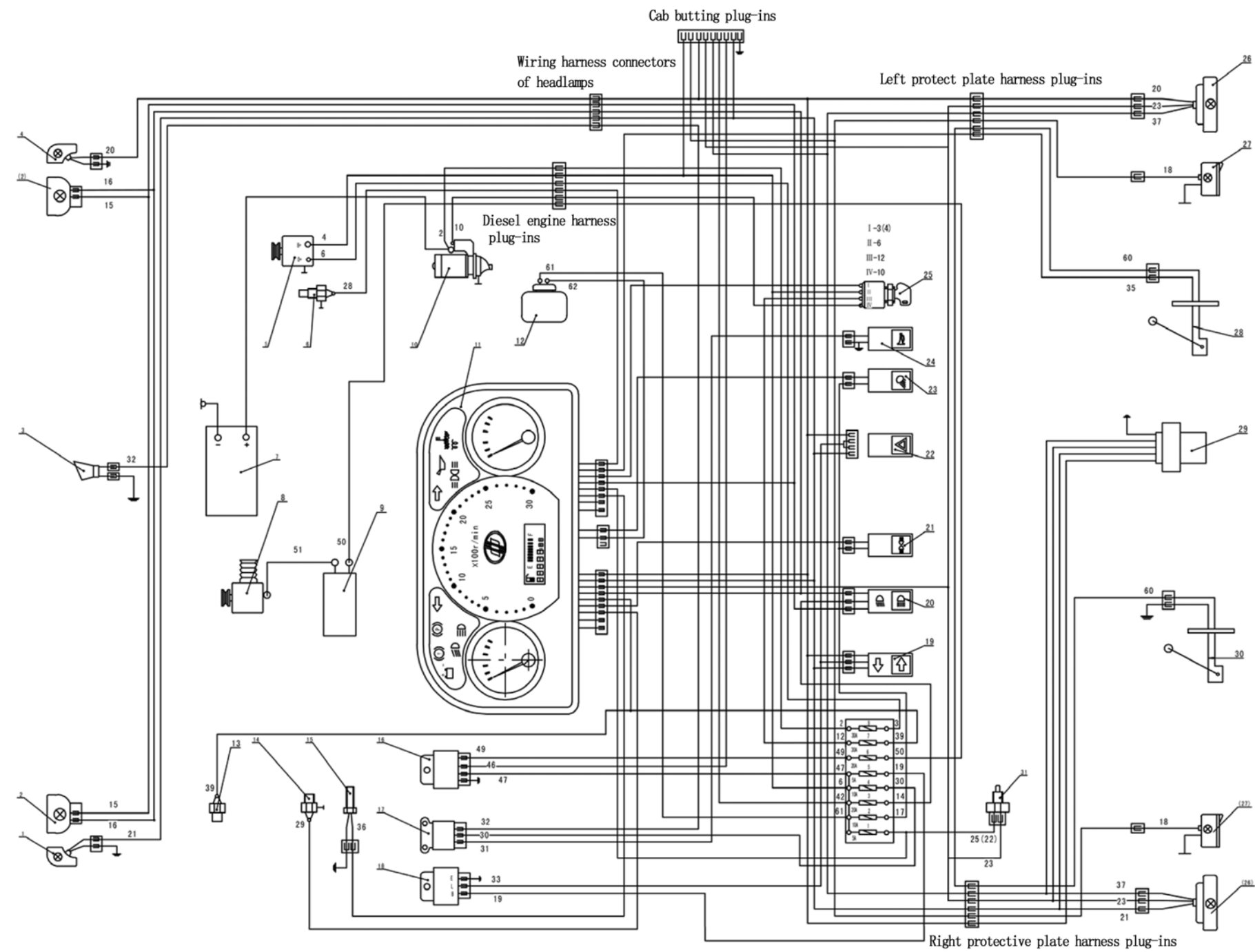
## 7.6 Attachment spares for tractor

No.	Code	Name	Quantity	Note
1	GB3452.1	O-ring seal 11.2*2.65	5	
2	GB3452.1	O-ring 12.5*2.65	2	
3	GB3452.1	O-ring 17*2.65	2	
4	GB3452.1	O-ring 19*2.65	2	
5	GB3452.1	O-ring 21.2*2.65	2	
6	GB3452.1	O-ring seal 31.5*3.55	2	
7	GB3452.1	O-ring seal 15*2.65	4	
8	GB3452.1	O-ring seal 16*2.65	2	
9	GB3452.1	O-ring seal 20*2.65	5	
10	GB3452.1	O-ring seal 51.5*2.65	1	
11	GB3452.1	O-ring seal 50*3.55	1	
12	GB3452.1	O-ring seal 53*3.55	1	
13	GB3452.1	O-ring seal 58*3.55	4	
14	JB/T982	Compound gasket 14	10	
15	JB/T982	Compound gasket 18	10	
16	JB/T982	Compound gasket 20	10	
17	JB/T982	Compound gasket 22	10	
18	JB/T982	Compound gasket 24	2	
19	JB/T982	Compound gasket 27	2	
20	GB/T9877.1	Rotary shaft Lip 10*18*6	1	
21	GB/T9877.1	Rotary shaft Lip seal SB40*62*8	1	
22	GB/T9877.1	Rotary shaft Lip seal FB68*90*10	1	
23	GB/T9877.1	Rotary shaft Lip seal FB110*150*12	4	
24	GB/T9877.1	Hi-speed Rotary shaft Lip seal SB55*75*8	1	
25	1204.31.172	Oil seal 115*99*7.5	2	
26	1204.37.412	Driving axle rear oil seal 28*38*7	1	
27	1204.43.166	Size of square groove	2	
28	1204.43.167	Size of square groove	2	
29		Miniature bulb	1	
30		Fuse 5A、10A、20A、30A	1 for each type	
31		Supplied accessories of engine	1 set	

32		Operation Manual for HHJM1004B ~ 1204	1	
33		Parts Drawing Brochure for HHJM1004B ~ 1204	1	
34	1204.41.102	PTO shaft (1000rounds)	1	or1204.41.101
35		Multi-way valve accessories bag	1	
36		Lifter accessories bag	1	



7.7 Electric wiring drawing for tractor



31		Brake hydraulic switch	1
30	C302-005	Oil level sensor of secondary oil tank	1
29	C604-001	7-core socket	1
28	C302-005	Oil level sensor of master oil tank	
27	C203-004	Rear working lamps	2
26	SSWD-3	Combined rear lamps	2
25	JK290A	Starting switch	1
24	C4002-016	Horn switch	1
23	C4002-016	Rear working lamp switch	1
22	C4002-011	Emergency alarm switch	1
21	C402-017	Width indicator switch	1
20	C402-013	Front working lamp switch	1
19	C402-015	Steering switch	1
18	SG123	Electronic flasher	1
17	C502-J2	Horn relay	1
16	C502-002	Relay (for air conditioner)	1
15	C303-003	Speed sensor (M16 × 1.5)	1
14	C303-002	Oil pressure alarm(NPT1/8)	1
13		Preheating plug	
12		Brake fluid storage bottle	1
11	ZB103	Combined meters	1
10	QD154E 12V	Starter	1
9	515-3R	Air-conditioner kettle	1
8	SE508	Air-conditioner compressor	1
7	N200	Maintenance-free battery	1
6	C301-003	Water temperature sensor(NPT3/8)	1
5	JFZ1625	A/C generator	1
4	EB70-Q	Right steering lamp (combined lamp)	1
3	C502-028	Electric horn	1
2	EB70-Q	Headlamps(combined lamps)	2
1	EB70-Q	Left turn indicator (Combined lamps)	1
No.	Code	Name	Quantity