

OPERATION MANUAL



HHJM-164Y/204Y

HHJM

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JINMA

HUANGHAIJINMA



Jiangsu Yueda Intelligent Agricultural Equipment Co.,Ltd.

Preface

Thank you for choosing HHJM -164Y/204Y wheel tractors. The model has a more rational structure, hi-quality material and improved performances. They are more powerful, lower in oil consumption, higher efficient, nice in appearance, easy in operation and maintenance, applicable for a wide range of gardening or field work, not for forestry application. This operation manual is prepared to help you know better about the use, adjustment, maintenance and repair of this model to get the best performance of the model. Please refer to diesel manual about the repair of the engine.

With technical development and requirements from our customers, descriptions in the manual may differ from the real tractor structure 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 Symbols

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.

"Warning" and **"Notice"**: These focus on correct operational steps or techniques. Driver or stander-bys will be hurt or even die due to neglect.

"Important": It focuses on correct operational steps or techniques. Your ignoring may result in 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 and the code on the right of the front bracket for the information contents. Complete and right information help user to apply for an immediate repair, or it is the evidence for a lost tractor. This operation manual is a fixed 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	Jiangsu Yueda Intelligent Agricultural Equipment Co.,Ltd.
Manufacturer's address	9# Nenjiang Road,Economic-Technological Developing Zone ,yancheng,Jiangsu,Prc
Manufacturer's phone	86-515-68823978/68829666

HHJM-164Y/204Y Wheel Tractors

Operation Manual

Edited by Jiangsu Yueda Intelligent Agricultural Equipment Co.,Ltd.

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Chapter One Precautions for Safe Operations


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

1.2 Tractor cannot be operated without licenses. When driving along the road, you'd better follow the local traffic rules.


1.3 This machine only can be operated, maintained and repaired by the persons who are familiar to its features and know the related safe operation rules. The driver should wear tight, safe, and do not bare feet and wear slippers.






1.4 In any case kids or no-drivers should be kept far away from the machine ,Keep the people away from the area between the tractor and the trailer,because it can cause serious injuries or death.






1.5 Overload, over-limit driving and use of tractors are strictly prohibited. It is forbidden to drive tractors after being drunk, tired or taking some antipsychotic.





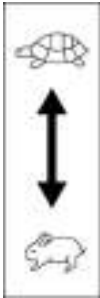
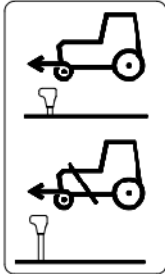
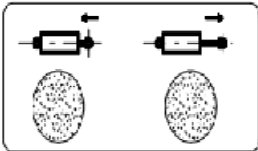
1.6 Driver should pay especial attention to the precaution symbol  on the machine.




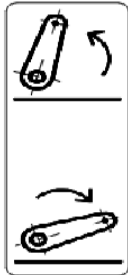

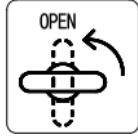

1.7 During operating the tractor, driver should strictly complies with the informed steps accroding to the presaution symbols to avoid accidents. When the symbols are lost, poluted or abraded, they should be replaced in time.(See Fig.1-1~Fig.1-31for precaution and operation symbols)







REF	MEANNING	LOCATION	Q.TY
1-1		Danger: Engine fan	On the two sides of radiator wind scooper clearly. 2

1-2		Danger: Hot parts	Near to muffler.	1
1-3		Danger: Engine belt pulley	Near to belt pulley	1
1-4		Manual before operating the machine	On the right of meter	1
1-5		Danger:PTO shaft	Upper side PTO protective cover	1
1-6		Do not stand between tractor and equipment while operating hydraulic lift	At the central site of the machine end.	1

1-7		<p>Always lock ROPS in upright position unless it has to be allow operation underneath trees or bushes</p>	<p>On the left of ROPS</p>	<p>1</p>
1-8		<p>Danger:Hot parts</p>	<p>On the two sides of radiator wind scooper clearly.</p>	<p>2</p>
1-9		<p>Danger: Maintain</p>	<p>On the right of meter</p>	<p>1</p>
1-10		<p>Danger: It is prohibited to sit in the position of non-occupant.</p>	<p>On the both of the fender.</p>	<p>2</p>
1-11		<p>Danger:Use safety belts</p>	<p>On the right of the inside of ROPS</p>	<p>1</p>

1-12		Diesel	On the front end of oil tank	1
1-13		Starter control	Above starting switch	1
1-14		Engine shut-off control	Above choke line	1
1-15		Parking brake control	Near hand throttle assembly	1
1-16		Engine rotary variations	On cover plate f hand throttle assembly	1
1-17		2WD& 4WD	Near front drive handle	1
1-18		Hydraulic output	Near single-way valve	1

1-19		Differential lock	Near to differentiallock pedal	1
1-20		Refuel	Engine refueling Front drive refueling	2
1-21		Control PTO	Near to PTO control lever	1
1-22		Control lifter	Near to the lifter handle	1
1-23		Transmission refuel	Near to transmission refuel port	1
1-24		Open the hood lock	Near to the hood lock	2
1-25		Dipped-beam headlamps control	On the surface of head lamps	1

1-26		Starter control	Above starting switch	1
1-27		Engine shut-off control	Above choke line	1
1-28		Differential lock control	Above pedal of differential lock	1
1-29		Engine rotary variations	On cover plate of hand throttle assembly	1
1-30		Three-point lifting mechanism control	At the starting and ending positions of lifter control lever	1
1-31		Parking brake control	Near hand throttle assembly	1

1.8 Before operation, a new tractor should have a running-in following the related 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 repairing the tractor, the machine should be stopped and the key should be taken off. 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.

1.13 When leaving the tractor, the implement should be down to the ground, and each shift should be "neutral", engine is flameout, take down the key in case other start it.

1.14 To avoid turn-over, only low gears can be used, especially going on high slopes or muddy path. When going downslope, clutch engaging or neutral gear is not allowed. Let the running tractor not too near to any ditch, to avoid damage due to 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. Do not put feet on the brake pedal or clutch

pedal during running.

1.16 No sharp turn is permitted while driving at a high speed. Sharp turn with the help of one side brake is prohibited either to avoid turn-over or parts damaging.

1.17 When deep treaded tires working or transferring in fields, high speed is not allowed; Deep treaded tires can't be used for transportation.

1.18 Tractor cannot be used with over load to avoid damage to organs. Load limit of the trailer is 3 tons, specific power more than 4.0kW/t.

1.19 Before starting the tractor, you'd better check oil duct, electric circuit and cooling water. In any case, it is not allowed to fill the fuel that has not been precipitated or filtrated into tank. After starting the machine, you'd better pay attention to all indicators and meters.

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

1.21 Dirts should be eliminated from radiating water tank to guarantee its heat radiating performance. 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 in hot state, do not screw the lid of the water tank to prevent it from scald.

1.22 During harvesting or operating in field yard, a spark extinguisher should be installed on air exhaust to prevent fires.

1.23 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, damaging or other accidents.

1.24 You should tell your next shift about any troubles of the tractor. During operation in night, fine lightings are necessary.

1.25 When it works below 0 °C in winter, exhaust all the water in the case of idling operation to avoid organs freezing caused by remained water.

1.26 Only running in field or slipping on muddy road you can use front drive axle. Not use under other condition or cause power train system premature wear.

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

1.28 Before using PTO, a protecting cover need be installed. Can not sharp turn when PTO shaft work on load or damage cardan.

1.29 when the area with hills or steps, or the ramp is too big, the driver shouldn't operation

tractor. Don't stop the tractor on a big slope. When the driver need to use the lifting jack to repair the tractor, the lifting jack can place on the position of the front driving shaft housing or the rear driving shaft housing, its park brakes should be used and a triangle should be stuck under the rear wheels as following picture.



Front lifting jack position



Rear lifting jack position

1.30 Boarding or leaving the tractor, use the left foot pedal (B) and grab the handrail (A) to prevent falling(as following picture).



No boarding and leaving during running; Do not jump directly from the tractor.

During working in field or muddy area, the driver should clean shoe sole before start tractor.

1.31 Faulted tractor 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.

1.32 You'd better check and fasten bolts of wheel radial plates and the bolts or nuts in other key positions to avoid personal injury and machinery damage.

1.33 Manufacturer is not responsible for any reduced reliability of the machine, personnel hurt or damaged machine due to any unauthorized reform on the tractor.

1.34 When the suspended implement of the tractor is transferred, hydraulic lifter should be at the position of "neutral".

1.35 When operating 3-Point Suspension, the people must far away from the area that may cause hurt; When transferring to another field or operating with hung farm implements, high speed is forbidden to avoid the damage to parts of lifting system and suspending system.

1.36 The protecting components for driver is not indispensable. However when installing safety frame on the tractor, a seat belt is necessary; when removing the frame from the tractor, the seat belt should be removed too to avoid use by mistake.

1.37 Before operating the tractor, please read operation manual; Please be sure to sit on the seat, then you can start and operate the tractor.

1.38 It is forbidden to put down the roll bar when you are starting and using the tractor normally!

1.39 You can use the differential lock only when the tractor skids on the muddy road; when the tractor skids, please press the handle of the differential lock, then the differential lock works, and it makes left-right jaw of the drive shaft meshing to be one, and then makes the tractor driving out of the muddy road; At the same time release the handle back to the position!

1.40 Only one driver is allowed on the tractor. No one is allowed to ride.

1.41 Being involved in a rotating drive mechanism may lead to personal injury or death. The transmission shield must always be in place.

1.42 Be careful when cleaning the tractor, especially when using a water cannon. Even if all precautions are taken to protect electronic components and joints, the pressure of some cleaning machines may still be too much to ensure full water resistance. When using water cannon, do not get too close to the tractor. Do not use a cooling water to wash engine or exhaust pipe directly.

1.43 If you need to use and maintain the machine in high altitude, please use the installed pedals and handrails correctly. Do not stand on the surface out of the foot pedal or platform. Do not use the machine as a crane or ladder when working at high altitude.

1.44 Check the hydraulic hose at least half a year for oil leakage, knot, incision, crack, abrasion, rust, wire leakage or any other damage.

1.45 It is forbidden to weld or heat the high pressure liquid pipeline or other combustible materials. If the heat is beyond the heating zone, the high pressure liquid pipeline will burst.

1.46 When pulling a tractor, try to pull a short distance as far as possible, such as pulling

out from buildings. Do not pull tractors or transport tractors on highways. Use the trailer lever when pulling the tractor, and keep the minimum speed.

1.47 There is a danger of explosion from the gas that overflows from the battery, so the battery cannot be close to the open fire (matches, lighters or cigarette fire, etc.); Don't short-circuit the wires. Contact with electrolyte is very dangerous, if eyes, skin or clothes contact with electrolyte, should be washed with water immediately, or ask a doctor to treat.

1.48 When charging the battery, it should ensure that the vent hole of the filling plug is unblocked, keep away from the open fire, and then power off the power to prevent the explosion.

1.49 The ramp is a major cause out of control and rollover accidents, which can cause serious injury or death. Be careful on the ramp. It is not possible to enumerate every possible condition that may cause a tractor to turn over, and it must be noted for each case that may affect stability.

1.50 The engine, radiators, exhaust parts and hydraulic pipes may become hot during the operation. Be careful when maintaining these parts. Please handle or disconnect the high temperature parts after cooling. Wear protective equipment in due course.

1.51 When excavating or using the ground operation equipment, please pay attention to the buried cable or other service facilities. Please contact the utility department to determine the location of the cable equipment. Pay attention to the overhead wires and hanging obstacles, and to be safe, you need to keep a large distance from the high pressure line.

1.52 Do not operate the machine during thunder and lightning. If you are standing on the ground, stay away from the machine and hide in a permanently protected building.

1.53 When the tire is installed and disassembled, it is not easy to operate according to the prescribed procedures. There may be an explosion, which may cause serious casualties. Do not disassemble tyres without proper equipment and safety work experience.

1.54 Must keep the right tire inflation pressure, do not exceed the stipulated by the tire inflation pressure, if exceed the maximum pressure, tire edge crack happens, even an explosion.

1.55 Do not use heavy machinery on high places, or it will reduce the stability of the tractor.

Chapter II General Description

HHJM-164Y/204Y wheel tractor is a new type developed according to the International demands of updated small wheel tractor. It is mainly applicative to various house gardening operations. The type has the characteristics of light weight, flexibility, multi-purpose and nice appearance.

This type utilizes Italian KOHLER (KDW1003) diesel as the power with direct transmission between engine and transmission system, single-acting clutch and 4 wheels driving. It is equipped with 6-gear transmission case for rotary cultivation, ploughing and transportation, hydraulic suspending system complete in performance, low-pressure & wide driving tyres with good adhesive force. Their advantages are not only proper power, large traction force, tight structure, efficient transmission, easy operation, simple maintenance, convenient matching, economical use and excellent joint application.



Warning:

- 1. Manufacturer is not responsible for any declined reliability of the machine, personnel hurt or machine damaging due to any unauthorized reform on the tractor or any operation that doesn't follow related technical requirements.**
- 2. 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.**

Chapter Three Key Technical Specifications of the Tractors

3.1 Parameters of whole unit

Model		164Y	204Y
Mode		4-wheel driving	
Engine	Type	KDW1003	
	Supply Code	ED2E18E0-1	ED2B6890-1
	Mode	Vertical, water cooling, 4-stroke and natural aspirated	
	Fuel injection system	Mechanical fuel pump	
	Net weigh(kg)	87	
	Cylinder weight × Cylinder bore × Stroke	3×75mm×77.6mm	
	Displacement(L)	1.028	
	Nominal power(kW)	11.8	14.2
	Rated speed(r/min)	2400	
	Idling(r/min)	900	
	Max. torque(N.m)	50	61
	Rev at the max speed(r/min)	1800	
	Fuel consumption rate(g/kW.h)	259.3	328.6
	Engine oil consumption rate(g/kW.h)	0.93	
	Intake depression (kPa)	≤3.2	
	Back pressure (kPa)	≤10.9	
	Starting method	Electric starting	
	Lubricating method	Pressure/splash	
	Cooling method	Antifreezing solution	
	Temperature	Cooling liquid	Temperature
Oil		85~95	
PTO Power (kW)		10.03	12.07
Rated Traction (kN)		3.5	3.6
Towable mass without braking (kg)			
Towable mass with independent braking (kg)			

Towable mass with inertia braking (kg)			
Towable mass with hydraulic or pneumatic braking (kg)			
external sound levels dB(A)		75.7	76.5
driver-perceived sound levels dB(A)		83.0	84.0
Vibration of the seat ($awS \leq 1.25m/sec^2$)			
Vibration of the seat ($awS/awB \leq 2$)			
Overall dimension	Length (including front bob-weight, suspension)	2670	
	Width(tread to outer side of back wheel before delivery)	1090	
	Height (to steering wheel top)	2300	
Wheelbase (mm)		1277	
Tread (mm)	Front wheel (size at delivery)	750	
	Rear wheel (size at delivery)	890	
Ground clearance (under front driving axle housing) (mm)		248	
Front balance (kg)		24	
Rear balance (kg)		60	
Min. service mass (with bob-weight stand without bob-weight) (kg)		835	
Mass distribution	Front wheels (kg)	360	
	Rear wheels (kg)	475	
Gear levels		(3+1) x2	
Theoretic speed (km/h)	Low gears	I	1.32
		II	1.95
		III	3.04
	Middle gears	I	6.01
		II	8.90
		III	13.92
	Reverse gears	I	1.63
		II	7.46

3.2 Transmission system

Clutch	single-action clutch
Gear box	Composition type 2× (3+1) , 6 forward gears and 2 reverse gears. Basic transmission is constantly-engaged spurgear; secondary transmission is constantly-engaged spurgear.
Central transmission	Spiral bevel gear pair
Differential	Closed and two straight bevel planet gear
Differential lock	Jaw and toothed type. Stepping down the differential lock pedal automatically means an engagement status.
Final transmission	Mono-stage planet gear type
Front driving axle	Middle-positioned integrated type
Front central transmission	Spiral cone gear pair
Front final transmission	Mono-step planet gear type

3.3 Traveling, steering and braking

Housing	No housing			
Drive shaft of front axle	Middle-positioned driving shaft			
Tyre		Spec.	Load (kg)	Pressure (kPa)
	Front wheels	Agriculture tyre 5.00-12-8PR	345	200-250
		Grassland tyre 5.00-12-6PR	335	200-250
	Back wheels	Agriculture tyre 7.50-16-6PR	650	200-250
Grassland tyre 31x9.5-16-10PR		1150	200-250	
Front wheel alignment	Toe-in of front wheel(mm)	4-8		
	Camber of front wheel	3°		
	Kingpin inclination angle	7°		
Pivot angle of front axle		12° (Each side)		
Turning radius	Unilateral brak (mm)	2440		
	No braking(mm)	2750		
Steering mode		Hydraulic steering		
Steering model		101S-1-50-12-A		
Service brake		Shoe brake		

3.4 Working device

Mode	Semi-separated type
Lifter type	Three-point suspension
Model of pump	C901-1.5CPF8.3
Plough depth control	Force & position control and floating control
Master cylinder diameter × stroke (mm)	60×79
Adjusting pressure of system safety valve (MPa)	16
Opening pressure of cylinder safety valve (MPa)	18
Min. system lifting force (kN) (at the point 610mm behind the suspending point)	2.64
Suspending gear	Rear positioned, Category 0
Set pressure of safety valve (MPa)	18
PTO shaft	Rear positioned and independent type
Speed (r/min)	540/1000
Diameter of axle (mm)	I spline shaft (6-35x28.91x8.69)
Ground clearance (mm) and turning direction of shaft head	487/Right-handed rotation
Mode of traction device	Swing draw bar
Diameter of traction pin (mm)	Φ30

3.5 Perfusion capacity

Fuel(L)	15	
Cooling liquid (L)	2	
Oil for engine (L)	2.8	
Oil for steering gear(L)	0.3	
Engine oil for front axle(L)	Transmission case	1.1
	side reduction	0.3
Engine oil for transmission (L)	10.3	

3.6 Electrics and instruments

Electric system	12V, Minus earth
Battery	Maintenance-free C603-65Ah
Starter	12V, 1.6kW
Headlamps	C201-017
Rear turn signals	400E.48.021
Combined meters	C110-050
Generator	40A,12V
Horn	C502-50F/C502-DL129
Front signal lights	C202-007A
License light	C209-001
Fuse box	C703-006
7-hole socket	C604-014
Rotary combination switch	C403-003
Start relay	C502-018
Speed sensor	C304-013
Oil mass sensor	C302-029
Oil pressure sensor	C303-007
Water temperature sensor	C301-008
hand brake switch	C402-042
Neutral switch	250.48.360A
Battery main switch	C402-031

Chapter IV Operation

4.1 Fuel and lubricating oil

Refer to Fig.4-1 for fuel and lubricating oil used for tractor

Site	Season and Environmental Temperature	Oil Specification
Fuel Tank	Summer (Above 10°C)	0#, -10 # solar oil (GB/T 252)
	Winter (Below 10°C)	-10# solar oil (GB/T 252)
Oil pan of engine, hydraulic-pressure steering gear of lifter, oil pan of air filter, and injection pump	Below 0°C	20# 40# diesel oil (GB/T 5323)
	Between 0°C - 25°C	30# diesel oil (GB/T 5323)
	Above 25°C	40# diesel oil (GB/T 5323)
Gear box, transfer case, front driving axle, mechanical steering device	Summer (Above 10°C)	40# diesel oil (GB/T 5323)
	Winter (Below 10°C)	30# diesel oil (GB/T 5323)
Each grease nipple	For all seasons	ZFG2# complex calcium lubricating grease(SH0370)
engine, starter, bearing6203-E	For all seasons	ZFG2# complex calcium lubricating grease(SH0370)

Fig.4-1 Fuel and lubricating oil



Warning:

(1) Before refueling or repairing fuel system, engine shall be stopped; Smoking is prohibited during the refueling or repairing.

(2) It is strictly prohibited to add gasoline or alcohol into diesel oil, as these mixtures can cause fire or explosion. In fuel tank, the mixtures are more explosive than pure gasoline. Oil of different grades cannot be mixed to use.

• Important:

(1) Use of unclear fuel shall be in strict control. Before adding into fuel tank, fuel shall be deposited for over 48hours and only middle and top layers of fuel can be used. Use filter net during refueling. Don't fill up the tank for volatilizing space. Screw up the

tank cover after refueling.

(2) Refuel before the fuel tank becomes empty. If refueling after supply system is used up, air in oil supply system shall be exhausted completely.

(3) Refueling tools shall be kept clean and cannot be washed with diesel oil. Wipe out overflowing diesel oil.

(4) Do periodic cleaning for fuel tank and let out oil sediment. Wash diesel filter.

(5) Don't transport refuel with open oil drum.

(6) Put all cloth stuck with oil into covered container to avoid dropping butt.

(7) Do regular checks on the engine oil at every lubricating site. Add it in time if not sufficient. Fill in grease to grease nipples termly.

4.2 Cooling liquid

4.2.1 Fill in antifreeze solution into cooling water tank to avoid cooling effect declined by scale deposit of engine cooling system.



Attention:

When engine works or just stops, water tank has a high temperature, so scalding may happen when opening water tank cover. Open it after water tank is cooling down. Before opening the water tank cover completely, screw it off slowly to release the pressure in the tank.

● Important:

(1) Dirt should be eliminated from radiating water tank to guarantee its heat radiating performance. When the water tank is too hot, you can't water the engine or the tank 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. Check cooling water in the tank that should be kept full. Cooling water can't be less than 2/3 of the tank volume.

(2) When the water in tank is over 100°C, stop the engine immediately. Have a necessary check and repair on the water tank after it is cooled.

4.3 Running-in

To put into use, new tractors or heavily repaired tractors must run in first, because newly manufactured parts have more or less tool marks on the surfaces. If you use the tractor with a heavy load without running-in, abrasion on the parts will be more severe and the parts can even be stuck and damaged to shorten the tractor life.

4.3.1 Preparation before Running-in

(1) Wash the housing of the engine.

(2) Check and tighten the external bolts and nuts.

(3) Check the oil level in each lubricating box, refill oil if not enough.

(4) Fill grease to every oil site.

(5) Fill fuel and cooling water.

(6) Check the toe-in of front wheel (4-8mm); Check air pressure of the front and the rear tires and adjust the pressure to the rated value.

(7) Check batteries and connections of the electric circuit in electric system.

(8) Put shifter at neutral gear, hand throttle in idle-speed position and hydraulic hand in dropping position.

4.3.2 Running-in of the engine without load

After starting the engine according to stipulated steps, you should listen to the engine carefully. Make sure there is no water leak, oil leak or gas leak. Read all indicators to see if all are OK. Do next running-in step after making sure that the engine works normally. Run the engine from low speed to middle speed and then high speed for 7 minutes, 5minutes and 3 minutes respectively, totally running-in of the engine without load costs 15 minutes.

4.3.3 Free and loaded running-in of tractor

Tractor running-in should be done at rated engine rev. Running-in steps and time should be consistent with the following rule:

Running-in Mode	Load	Running-in time of each gear (H)								Total	General Total
		I	II	III	IV	V	VI	Reverse-I	Reverse-II		
Free-load running-in	No load	1	1	1	2	0.5	0.5	0.5	0.5	6	21
Load	Transporting on road with 0.5t-loaded trailer	1	2	4	4	2	2			15	

Table 4-2 Tractor Running-in Rules

When abnormal things or troubles happen, you'd better find out their causations. Only after all troubles are disposed, can the running-in go on.

After the running-in is finished, do the following maintenance and then the tractor can be put into use.

(1) After the machine is stopped, discharge the lubricating oil from the oil pan of diesel engine. Wash oil pan, engine oil filter cloth and engine oil cleaner, and fill new lubricating oil to rated level.

(2) Discharge the lubricating oil from gear box, hydraulic system and front driving axle when it is hot. Fill in some diesel oil, travel for 2-5minutes at II-gear and reverse I-gear, wash it, let out the washing oil and fill in new lubricating oil.

(3) Wash diesel oil cleaner (including the filter cloth in fuel box) and air filter.

(4) Check and adjust the free travels of the clutch pedal and brake pedal, and the operating of the brake.

(5) Check and tighten the bolts and nuts at every key connecting sites.

(6) Check oil nozzle and valve clearance. Adjust them if necessary.

-
- (7) Check the work of electric system.
 - (8) Check and adjust toe-in of the front wheels.
 - (9) Fill lubricating grease to every grease nipple sites.

● **Important:**

- (1) **See if the operation of engine is in normal condition.**
- (2) **See if clutch adjustment is normal and if it can be disengaged completely.**
- (3) **See if gear shifting of gear box including front driving handle is flexible and easy. Pay attention to possible spontaneous out-of-gear or failure interlock.**
- (4) **See if brake adjustment is proper and the performance is reliable.**
- (5) **See if steering control is flexible.**
- (6) **See if electric units and meters work normally and reliably.**

4.4 Steering mechanism and meter

It is a necessary condition for right operating tractor to get familiar with all the functions and positions of every control unit and indicator (see fig. 4-1).

(1) Meter: The working condition of each system of tractor is reflected, and the function is detailed in the electrical system.

(2) Fuse box: An overcurrent protection switch device.

(3) Legal name plate: Legal nameplates conforming to eu regulations.

(4) Rotary switch: Control switch centralized layout, function details see electrical system.

(5) Clutch pedal: to get power disengaged through stepping down the pedal and turn off the engine power

(6) PTO control lever: To combine and separate the power output shaft power.

(7) Handle for high and low gears: shifting between high gears and low gears.

(8) Hand brake handle: Pull the handle and lock the tractor in place.

(9) Hand throttle control handle: to adjust oil supply. Pushing forward means speed down while pulling back means speed up.

(10) Steering wheel: Used to steer the tractor.

(11) Left and right brake pedal: move the brake lock-link plate right to link the left and the right pedals and carry out braking. Separating link-lock plate can carry out left or right unilateral brake for a unilateral brake steering.

(12) Foot throttle pedal: Step down the pedal for higher gears while lifting foot means lower down.

(13) Differential lock pedal: Used to combine and separate the both rear drive shaft for adjusting their speed.

(14) Gear shift board: Represents the location of each gear.

(15) Main shift lever: Used to manipulate the main gears.

(16) Front driving disengaging lever: to engage or shut the power of the front driving to get 4 wheels driving or 2 wheels driving.

(17) Lift control lever: Used to manipulate the rear three-point hoisting or descending.

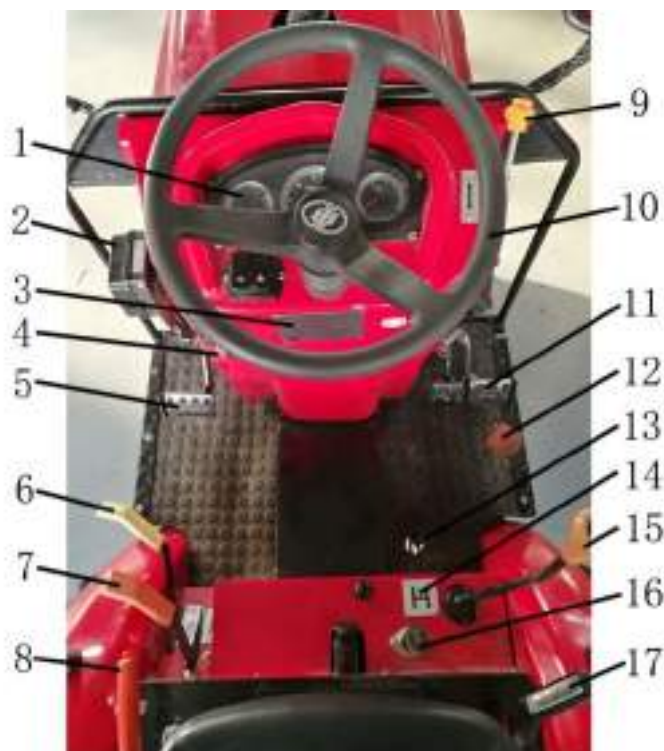


Fig. 4-1 Control unit and indicators

4.5 Control and drive



Warning:

(1) Only after reading the manual carefully, can the driver who has got special training and driving license with a full survey record can operate the tractor. Tractor cannot be operated without licenses. Overload is forbidden.

(2) Drivers should pay especial attention to the safety & warning symbols and understand them correctly.

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

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

(5) Don't getting on or off the tractor when it is running. No repair or check under the tractor is allowed when the engine runs. People are forbidden to sit on the fender apron. Casualty accident can happen when it parks, so parking brake is necessary.

(6) To go on an abrupt slope, you'd better select a proper gear. It is not allowed to shift gears on an abrupt slope. When going down the slope, it is forbidden to stop the engine or out-of-gear or turn sharply. For emergency stop, you should step down the clutch pedal and the brake pedal at the same time. Don't just step down the brake pedal, or some mechanical parts will be damaged.

(7) For transportation operation, the right and the left brake pedals should be locked together. For high-speed driving or full-load operation, it is strictly forbidden to use unilateral brake to get a sharp turn.

(8) High speed is not allowed when operating or transferring to other field with hung farm implements. Lift the working units of farm implements out of the earth to avoid damages to the parts of lifting system and suspending system. When leaving the tractor, driver should drop farm implements to the ground, stop the engine, take off the keys and pull the hand brake to avoid others' starting tractor.

(9) For emergency parking, you should step down the clutch pedal and brake pedal at the same time. Don't only step down the brake pedal, or the brake will be damaged.

(10) Driving on road, you should follow the local traffic rules.



Notice:

(1) Carefully check and listen to the engine and all parts of the tractor when they are working to see if there are abnormal sound and noise, especially check the technical situations of clutch and brake, check and tighten the bolts and nuts at every key site of the tractor. Check air pressure of the tires, aerate the tires if necessary.

(2) When the tractor head rises during operation, shift to a low gear, release the clutch and discharge the load to avoid lengthways turn-over.

(3) When engine is over speed, unloading is not allowed. You'd better immediately pull shut-down lever, and turn the decompression rod to the decompression position or keep air away from entering engine or cut off the oil way.

(4) Watch the color of the exhausted air. Too much black smoke is not allowed to avoid overload of the engine. If the clutch slides or cannot separate thoroughly or brake doesn't work well, the machine should be stopped for check.

(5) Operations during nights need complete lighting equipments.

(6) When 4-wheel driving tractors travel without load or are engaged in transportation, the front driving lever should be placed in the neutral position.

(7) To avoid turn-over, especially travel on steep slope and muddy roads. Only low gears are allowed. When going down the slope, it is forbidden to step down the clutch and slide with neutral gear.

(8) To avoid the pollution caused by the exhaust gas don't start the diesel in a room that is closed without fine ventilated conditions. When a diesel transfers, keep human and animals far away from the exhaust gas.

4.5.1 Starting the engine

Before starting, the fuel, lubricating oil, and cooling liquid should be checked. Make sure all parts and electric circuits work normally, and oil circuits are through without air. Gear lever should be put in the neutral gear and PTO release lever should be released. With hydraulic system installed, lifter must have full hydraulic oil.

When the preparation is done, the driver should sit and step on the clutch pedal, then tractor can be started.



Attention:

To start the tractor should meet four conditions:① the driver must sit on the seat; ② the driver should step on the clutch pedal;③ main gear shift level should be put in the neutral;④PTO level should be put in the neutral;

(1) When using electric starting, turn the starting switch clockwise to I gear and the electric starter drives the engine. Starting time of electric starter does not exceed 5~10 seconds each time and the interval between starting should not be less than 2 seconds.

(2) Turn the switch to III gear, Once the engine begins working, the key to starting switch should be turned withershins immediately to the battery charging position.

(3) When using electric starting in Summer, decompress is not necessary; starting in winter is difficult, so use preheating device (II gear) is necessary.

4.5.2 Start to move

After starting the engine, make it running for 5~10minutes to preheat the engine. When the water temperature rises to 70°C and the above, follow the steps below to start:

(1) Raise the suspending implements.

(2) Step down the clutch pedal, put gear lever on the low gear needed, and release self-lock handle of brake pedal.

(3) Watch around and pay attention to any barrier. Sound the horn to catch people's attention.

(4) Release clutch pedal slowly. Gear up gradually and the tractor starts moving smoothly.

4.5.3 Driving tractor

(1) During tractor's operation, watch the meters to make sure the readings are ok.

(2) During driving tractor, driver is not allowed to put foot on the clutch pedal to avoid clutch burned caused by long-term semi-engagement.

(3) During transporting or traveling on road, use link-lock to lock up the left and the right brake pedals.

(4) Working in fields, single-side braking can be done to minus turning radius. However, it is forbidden to operate single-side braking to get sharp turn in high-speed operation or transporting on road to avoid turn-over and damaging parts..

(5) Select proper gear levels for tractor operation for higher production and economical efficiency. Different gear application as 4-3:

Gear	Low I	Low II	Low III	High I	High II	High III	Reverse I	Reverse II
Application	Rotary tillage	Rotary tillage	Rotary tillage	Ploughing, cultivator, seeding	Ploughing, Cultivator, seeding	Ploughing, cultivator, seeding	hitch implement	hitch implement

4-3 Reference table

4.5.4 Braking, parking and engine flameout

Braking:

In generally, firstly decrease throttle, then step on the clutch pedal. Step on the service brake pedal as require to make tractor stopped smoothly. If need emergency braking, should step on the clutch pedal and service brake pedal at the same time in case the brake lest the brakes be worn or the engine flameout.

Do as follows for long-time parking:

(1) Reduce oil supply to slow down the tractor speed.

(2) Step down the clutch pedal immediately and push the master gear lever to the neutral gear, release the clutch pedal.

(3) Release clutch pedal to make engine run at a low speed without load, not flameout in high temperature.

(4) Position the starting switch at the "STOP" site. Take down the key.

(5) Pull the handbrake self-lock device, or when the driver leave the seat more than 2S, buzzer will ring.

(6) For long-time parking, fuel tank switch should be turned off.

● Important:

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

2. You should tell your next shift about the troubles and malfunctions you found.

3. Try to avoid barriers on roads when driving tractors.

4. Driving on roads, farm implements cannot be put into use.

4.6 Operation and use of the working units of tractor

4.6.1 Operation and use of PTO shaft

Power of PTO shaft is shifted and cut off through controlling the PTO shaft handle at the left side of transmission case.

Speeds of PTO shaft are 540r/min., neutral, 1000r/min.. When the control handle is at the "N" position, PTO Shaft is cut off.

Use PTO shaft as the steps below:

(1) Put PTO level in the neutral position, disassemble the bush of PTO Shaft and mount implement.

- (2) Put main gear lever in the neutral position.
- (3) Step down the clutch pedal to disengage the clutch. Pull PTO shaft to the needed speeds.
- (4) Release clutch pedal slowly. Running at a low-speed can check if the operation is normal and then do the working.

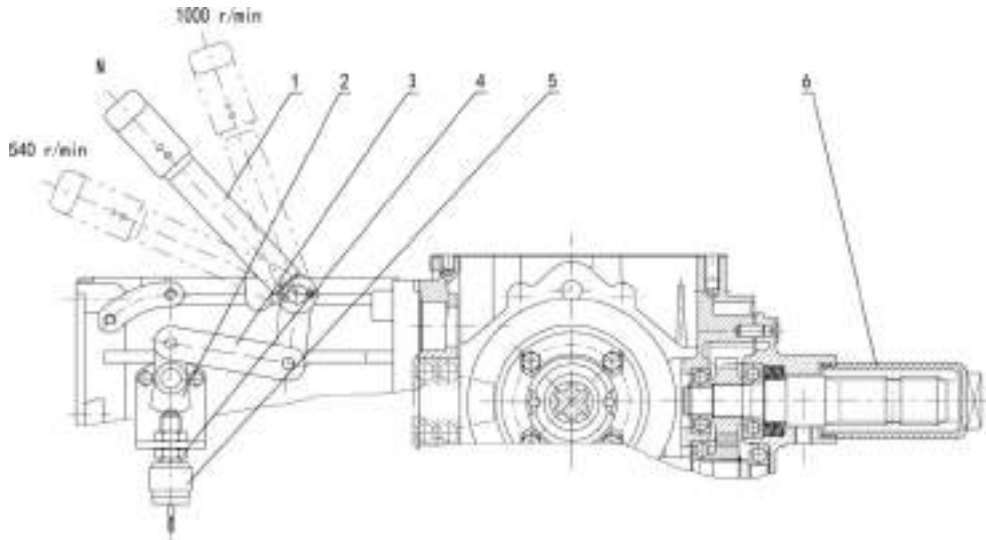


Fig 4-2 Adjustment on PTO

1 PTO control lever 2 PTO rocker 3 draw bar 4 nut 5 start button 6 shaft sleeve

Warning:

(1) When using PTO shaft, a safety protecting cover should be installed. People are not allowed to stand on the protecting cover. When the operation is over, an axial sleeve is needed to cover the PTO shaft.

(2) When selecting implements, you make rotating speed of the farm implement match that of PTO shaft;

(3) Stop the engine to couple farm implements.

(4) Coupling with the PTO shaft, cardan joint can't have a too big deviation angle;

(5) To couple with cardan joint, the clutch should be released thoroughly first.

(6) When the machine travels for a long distance, the PTO control handle should be at the neutral position. Cut off power to avoid breaking farm implements and personnel hurts.

(7) When the PTO shaft is being coupled, only work staff can be near to the farm implements to guarantee personnel safety.

(8) When the engine works, to engage or separate the PTO shaft, you should step down the clutch pedal.

(9) When the tractor stopped and PTO shaft still running, the engine will flameout if the driver left for more than 3 seconds.

4.6.2 Control and utilization of the hydraulic suspension system

Before use hydraulic suspension system, should adjust and maintain the implement as operating manual, then connect with suspension device. Firstly make the handle to low position, then tractor reverse to the implement. Connect the both side rod, then the upper link, finally lock them with lockpin.

When it works in field, should lift the implement before turning at the edge of a field. After turning and running straight, can lower the implement.

Choose different control methods as different soil condition.

(1) Position adjusting:

When using position adjusting, implement positioning lifting is done through pulling control handle of distributor to adjust the stopper's location on the return bar. When needed position is got, lock the stopper on the bar with bolt.

Ploughing depth can be adjusted during ploughing. When using position adjustment, farm implement needs no land wheels.

(2) Height adjusting:

Ploughing in dry fields, height adjustment is available. During using height adjustment, farming implement needs land wheel. For ploughing, distributor handle should be at the dropping position (that is to control distributor handle to drop return stopper. Control handle should not return to the neutral position). Now, oil circuit of hydraulic system should be at the "floating" state.

To use height adjusting, ploughing depth is controlled through adjusting the distance from land wheel to land. Thus uniform ploughing depth can be got in dry fields with soil specific resistance.

(3) Dropping speed adjusting

Dropping speed is controlled for quick or slow dropping of farming implements. Select proper dropping speed of the farming implement to avoid implements damaged caused by severe impact. Select a proper one according to the weight of farming implements and soft degree of the land.

Turn the valve clockwise and implement will drop slower while turn it counter-clockwise, it drops faster.

(4) Use of suspending gear:

Before coupling with tractor suspending device, farming implement should be adjusted according to manual.

During ploughing, to get uniform depth of the front and rear ploughshares, ploughshares should be adjusted fore-and-aft horizontally and laterally horizontally.

① Fore-and-aft horizontal adjustments:

Adjust the length of the top lever of the suspending device to get the plough fore-and-aft horizontal and get uniform depth of all ploughshares. Extend top lever when the front ploughshares plough deeper and rear ploughshare or plow heel leaves furrow sole; shorten the

top lever when the front ploughshare plough shallow and ploughshare's heel presses the land too tightly.

②Horizontal adjustments

Adjust the right length of lifting lever to keep the plough frame horizontal. Extend the right lifting rod, the ploughing depth of the first ploughshare is increased; Shorten the right lifting lever, the ploughing depth of the first ploughshare is decreased. Usually, don't make adjustments on the left lifting lever. Only when the adjustments of the right lifting rod, can the left lifting rod be adjusted to keep uniform depth of all ploughshares.

During real operations, to get better ploughing quality, ploughing width should get adjusted according to the manual to avoid repeated or missed ploughing. As the above adjustments are interconnected, adjustments should be based on the real situation to get nice performance.

Check chain can make the unit be controlled easily during operation in fields and can avoid impaction on the rear wheels caused by too large swing when the implement rises for turning. When implement do ploughing, the chain is loosed to allow some swing between tractor and farm implement. In ploughing, it is forbidden to tighten the chain to adjust implement's traction.

③When driving type implements are used, length of cardan driving shaft should be proper. After coupling, there should be an axle clearance of about 10mm between the front and the rear driving axles.



Notice:

(1) Keep people far away from the lifting area of the lifter when operating hydraulic lifters

(2) 3-point suspending unit is only for the farm implement especially designed for 3-point suspending devices.

(3) High speed is not allowed when operating or transferring to other field with suspending farm implements. Lift the working units of farm implements out of the earth to avoid damages to the parts of lifting system and suspending system.

(4) With heavy farm tools connected, the lifting control handle should move up slowly to avoid turn-over.

(5) Trailer should be connected to the drawing plate.

(6) Before leaving, suspension implement should be down to the ground location.

4.6.3 Differential lock

Differential lock is useful during operation, but it's dangerous to misuse. We can just use differential lock under the following condition.

① When one of the rear tyre sank into the mud and the tractor cannot move.

② The two rear tyres slipping during ploughing.

Then you can control the differential lock as the following steps:

(1) Step down the pedal of the differential lock, shift to a low gear.

(2) Turn the hand throttle to the max. position.

(3) Press the control lever of the differential lock at the low right position of the driver's seat. Release the clutch pedal slowly to engage the clutch. Now the two driving wheels of the tractor drive at the same time to let the tractor out of the sliding area.

(4) After driving from the sliding area, should release the pedal and let it reset. Or the tractor cannot turn, or it is possible to damage the mechanical parts



Notice:

(1) During normal driving and direct changing of the tractor, the differential lock should be forbidden to use, or the differential lock will stop the tractor from turning and this will enhance the abrasions of the tires even danger in personal safety by tractor turn over.

(2) If one of the rear wheels is in wheelspin, speed down the engine before stepping down the differential lock to avoid impact on the transmission box.

(3) After driving from the sliding area, should release the pedal and let it reset.

4.6.4 Operation of front drive axle

When 4WD tractor work with heavy loading or running on moist soft soil, the power can pass through the power input shaft to the front axle by pushing the front drive axle control handle.



Notice:

- ① **Only when the clutch is completely separated can the front drive control handle be push down or pull up.**
- ② **Not use front drive axle when running on rough road, or the tyre will premature wear. When raining/snowing or slipping upslope, can use front drive axle. But should release front drive axle when it pass the hard area.**

Chapter V Technical Maintenance of the Tractor

For continuous normal work and a longer life of the tractor, technical maintenance rules should be strictly followed and technical maintenance should be often done to see the technical situation of the tractor.

The service cycle divide into following class as accumulated working hours:

Table 5-1 Technical Maintenance Schedule:

Maintenance Class	Working hours of tractor (h)
Shift technical maintenance	After every shift or 10-12 working hours
First class technical maintenance	50
Second class technical maintenance	250
Third class technical maintenance	500
Forth class technical maintenance	1000

It can add and improve the contents and method of maintenance depending on the actual situation during utilization.

5.1 Technical service of every shift

Make the following maintenances after each shift's work or every 10~12 hours of work.

(1) Clean the dust and mud form tractor and farming implement. The air filter should be cleaned in case working in the environment with heavy dust and sand.

(2) Check the tightening bolts and nuts of every main part of tractor exterior, especially whether the connecting bolts and nuts of front and rear wheels are loosen or not, tighten it when necessary.

(3) Inspect the liquid level of oil pan of diesel, water box, oil tank and lifter. Refill it when necessary. Inspection of oil pan level should be carried out after 15 minutes when engine stops.

(4) Inspect whether there are air leakage, oil leakage and water leakage etc. Eliminate it in case anyone of them happened.

(5) Inspect whether cooling liquid in radiator is full, wash and clean the sundries between radiating fins in order to avoid decreasing the radiating effect.

(6) Inspect whether there are dirt and water in the fuel oil depositing cup. Eliminate them and get rid of the air in the oil circuit when necessary.

(7) Check the pressure of front and rear tires.

(8) Fill grease according to the stipulations in Fig 4-1 <Fuel oil and lubrication oil of tractor>.

All the muddy water inside lubricating position should be squeezed out until the grease comes out when filling grease.

(9) Check whether the lights、horn、meter is normal.

(10) Check whether the tool box is complete.

5.2 Class-I technical maintenance

Make the following maintenances after every 50 hours of working

(1) Complete the shift maintenance items.

(2) Wash the air filter; replace the machine oil inside the oil pan.

(3) Check the tightness of the fan belt. Push the middle of belt at the longest side with hand.

It is appropriate that the belt will be sagged 15~25mm at the pressure of around 10N. Adjust it when necessary.

(4) Check and adjust free stroke of the clutch pedal and brake pedal.

(5) Check the oil level of transmission box and front driving-axle. Refill it in case insufficient.

(6) Check the electrolyte level inside accumulator. It is required that the electrolyte level should be 10-15mm over the pole plate. Refill with distilled water when insufficient. If the proportion of electrolyte does not meet the normal value, it should be added to the specified height of 1.28.

5.3 Class-II technical maintenance

Make the following maintenances after every 250 working hours:

(1) Complete the first class technical maintenance items.

(2) Replace machine oil inside the diesel oil pan, wash oil pan and absorbing pan and oil filter.

5.4 Class-III technical maintenance

Make the following maintenance after every 500 hours of working.

(1) Complete the secondary technical maintenance items.

(2) Check and adjust the throttle gap, nozzle pressure and atomization condition according to the operation Manual.

(3) Wash the fuel oil tank and filter.

(4) Wash the transmission box and replace lubrication oil.

(5) Wash the filter of hydraulic lifter, check the cleanness of oil. Wash the internal bore of lifter case and replace with new oil when necessary.

(6) Check and adjust the front wheel toe-in (required toe-in 4-10mm). Check the tightness of front wheel bearing and adjust it when necessary. Replace the grease in the front wheel hub.

(7) Check the idle-running angle of steering wheel (required idle angle less than 15°), adjust it when necessary.

(8) Check the oil level inside the steering gear, refill it when insufficient.

(9) Wash and wipe out the accumulator with boiled water. The proportion of electrolyte should more than 1.24, Should service and charge if accumulator abnormal discharge.

5.5 Class-IV technical service

Make the following maintenances after every 1000 working hours.

- (1) Complete the class III technical maintenance items.
- (2) Carry out the relative maintenance items according to the Instruction Manual of diesel.
- (3) Wash the oil tank completely with 25% hydrochloric acid, and then wash with clean water.
- (4) Disassemble the generator and start-motor, wash off the grease inside bearing and replace with new grease. In the mean time check the drive gear of start-motor.
- (5) Clean off the carbon deposit in exhaust pipe and silencer.
- (6) Soak the bearings dissembled from clutch into the molten high-temperature grease, and refill the lubrication grease.
- (7) Check and adjust the engaging clearance and meshing impression of central driving bevel gear, and clearance and pre-tension of the bevel gear
- (8) Wash the filter of hydraulic lifting system, replace oil of the system.
- (9) Wash steering gear, replace the lubrication grease inside the case.
- (10) Carry out test running in short-term, check whether all parts work in good condition.

5.6 Technical maintenance in winter

When operating tractors under a temperature below 5°C, special technical maintenance is necessary. Now besides shift technical maintenance, you should follow the rules below:

- (1). Engine can't be started without cooling liquid in cooling system. Preheating machine helps starting engine.
- (2) After cold start, the engine should be preheated for a while until the water is above 60°C.
- (3) Fuel and lubricating oil selections depend on air temperatures or seasons.
- (4) In severely cold seasons, for easily starting the engine, you'd better store the tractor in a warm garage.

5.7 Technical maintenance for long-time storage

The tractor that is to be stored for a long time should get a thorough check and test for its technical situation before its storage.

- (1) You'd better store the tractor in a dry garage, and support its front and rear wheels with wood blocks to leave ground. If you have to park in an open area, a tarp is necessary to cover the tractor with drainage lead around it. The storing area should be far from fire resources such as oil store and kitchen.
- (2) Wash and clean the tractor body before its storage. Oil the sites that need lubricating following Fig. 4-1 <<Fuel and Lubricating Oil of Tractor>>.
- (3) After parking, the cooling water should be discharged from the diesel; disassemble the batteries for another storage; cover air exhaust mouths.

(4) Start the engine once every three months, and let it running for 20 minutes at various rev. Watch abnormal performances.



Notice:

(1) Only the persons who are familiar to the features of the machine and have related safe-operation skills can maintain and repair the machine.

(2) Read the parts book relative to this manual and the manual for diesel before maintenance.

Chapter VI Main Adjustments on Tractor

6.1 Adjustment on clutch

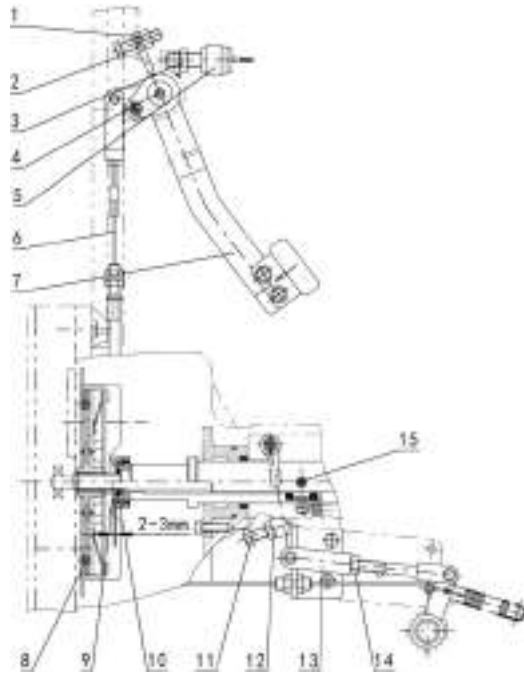


Fig.6-1 Single action clutch

1 screw 2 nut 3 lock nut 4 oil cup 5 start button 6 clutch stay wire 7 clutch pedal
8 finger 9 finger 10 release bearing 11 screw 12 nut 13 adjusting fork 14 nut 15 oil cup

During operation, clutches will have sliding or inexhaustive release caused by continuous part wearing, which can lead to malfunctions. So adjustments should be done in time.

6.1.1 Adjustment on free stroke

Rotate the fork 13, lock the nut 14 when the distance between 10 and 9 is 2-3mm.(see fig.6-1).

6.1.2 Adjustment on operating stroke of clutch

Rotate nut 1 and 12, adjust 2 and 11, then step on the clutch pedal 6. Lock nut 1 and 12 when the clutch is fully separated. Need to readjust the stay wire after working for a period of time(see fig.6-1).

6.1.3 Adjustment on start button

Release lock nut 3, adjust start button 5, when the clutch pedal is pressed, the distance between the clutch control panel and the starting switch contact is reduced by 2~3mm. then lock the nut 3(see fig.6-1).

6.1.4 The lubrication of the clutch system

Front bearing should be added lubrication grease before assembling, release bearing 10 not need to add lubrication grease normally. When the tractor is working for 1000h, or when it is found that the bearing has an abnormal noise, pour grease into the oil cup (15). Step on the clutch pedal repeatedly until the bearing is filled with grease. Check the oil cup 4 on the clutch pedal regularly. When the phenomenon of card lag occurs, it is necessary to add sufficient grease(see fig.6-1).

Attention:

(1)With safety considered, the engine cannot be started without clutch released.

(2)When you released the clutch pedal, your action should be quick and when you engage it, action should be slow. Before speed changing, the clutch pedal should be stepped down completely.

(3) During operation, don't put your feet on the clutch pedal, or the abrasion of the clutch is increased.

6.2 Adjustment on central transmission and pretension of bevel bearing

To reduce the axial movements and increase their supporting stiffness of spiral bevel gear pair during operation, the two bearings 12 on the two ends of differential and the ball bearing 7204B from cone bearings 6 should contain some pretension force when it is assembled. After some working time, the original pretension force will be reduced gradually due to the cone bearing's wearing. Then free play will come between the two cone bearings. In case the play is over 0.1mm, a second pretension should be done for the bevel springs.

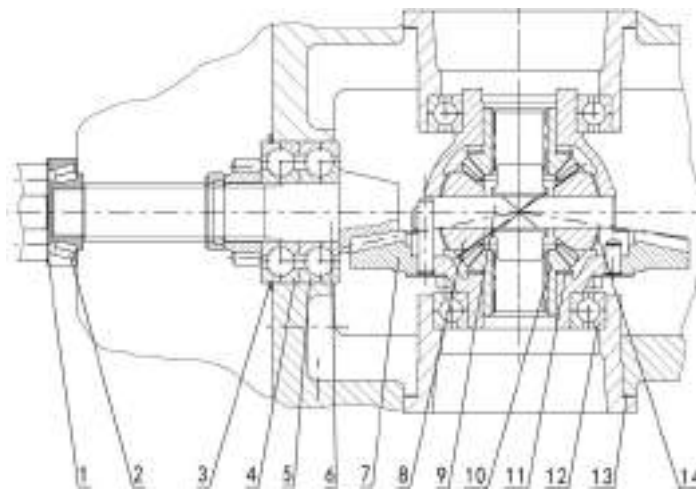


Fig.6-2 Central transmission and differential

1 spacer 2 ball bearing7204B 3 check ring 4 bearing6305N 5 bearing6305 6 bevel gear 7 driven gear 8 planet gear 9 planet gear shift 10 half axle gear 11 gasket 12 bearing6009 13 adjusting shim 14gasket

6.2.1 Adjustment for the pretension of bevel bearing

During regular inspection(each III level), if need to adjust the ball bearing2 of bevel pinion shaft6, torque is (0.7~1.1) N·m, then add spacer1(see fig.6-2).

6.2.2 Adjustment for the pretension of bearing of the differential

During regular inspection,if need to readjust the bearing 10 and add the shim13 between rear axle housing12 and bearing seat. Tighten bolts of bearing seat,turn bevel pinion shaft. If the rotating torque is 0.4~0.76N·m stronger than that before installing differential, it means the pretension is proper. Here push and press the driven gear7 should not cause any free play(see

fig.6-2).

6.2.3 Adjustment on tooth clearance and imprints

(1) Standards of gear tooth clearance and imprints

Tooth clearance of bevel gear is required to be 0.10~0.25mm. Ideal imprints are distributed in the middle section of working gear flank close to the smaller end. Imprints look like spots with a length over 60% of that of gear tooth and a height over 50% of that of tooth.

(2) Check tooth clearance and imprints

① Check tooth clearance

There are two ways to check the clearances: You can check with a dial indicator. Put contactor of a dial indicator onto the gear tooth flank of the big end of big bevel gear, fix small bevel gear and swing the big bevel gear following the rotating direction. If the dial indicator reads 0.14~0.3mm, it means the tooth clearance is right; You can also use a 15~20mm long and 0.5mm thick lead sheet or “∞”-shaped fuse. Put the sheet or fuse between the unengaged tooth flanks (that is between the convex surface of small bevel gear and the concave surface of the large bevel gear). Turn the gear, then the pressed thickness of the big lead sheet end suggests the normal tooth clearance of this site. The clearance value should be 0.1~0.25mm (normal clearance). It is proper to have three or more spots equally distributing around the gear.

② Check flank imprints

Use chromatic way to check imprints of gear flanks. Paint the tooth flank of the big bevel gear with a thin and equal red lead coat. Rotate gear for several rounds, and the imprints left on the small bevel gear surface are touch imprints. As the small bevel gear is right spiral, the concave surface of the gear bears force when tractor goes forward. Here the big bevel gear's convex surface should be painted with red lead; when tractor move backward, the convex surface of the small bevel gear will bear force, and the concave surface of the big bevel gear should be painted with red lead.

③ Adjustments for tooth clearance and tooth flank imprints (fig. 6-1 shows the adjusting methods)

During adjustments, axial play of large and small bevel gears will make tooth clearance and tooth flank imprints have changes. If imprint and tooth clearance are inconsistent, correct imprints have priority, while the adjusting range of tooth clearance can be enlarged properly. Especially when a new adjustment is done after gear and bearing are abraded, the tooth clearance is 0.1~0.15mm.

During normal operation, tooth clearance and tooth flank imprints will both have changes. In this case, if the tooth touch imprints are normal while tooth clearance is increased, no new adjustment is needed. However, when the tractor is heavily repaired or when it is replaced with a new pair of central driving gear or cone bearing, careful adjustments must be carried out to guarantee right tooth clearance and tooth flank imprints at the same time.



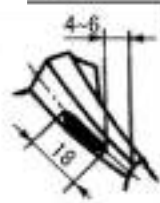









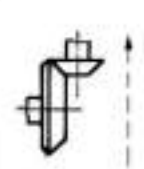


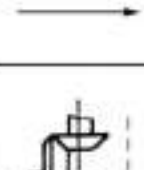
forward	reverse		Adjustment	
				
		Right Imprints	During forwarding gears in operations, concave of small curved-tooth bevel gear should get imprints of concave not less than 60% of the tooth width and 50% of the tooth height. The imprints should be distributed near the smaller end of the tooth height; During reverse gears in operation, the imprints of the convex surfaces of small curved bevel gears are the same as the above.	
		abnormal imprints	Reduce the adjusting washers 1 of the second shaft to move small curved-tooth bevel gears back (fig.6-3)	
			Add the adjusting washers 1 of the 2nd shaft to move small curved -tooth bevel gears forward. (Fig.6-3)	
			Add adjusting washers 5 of large curved-tooth bevel gear on the right , and reduce adjusting washers of the same amount on the left to drive large curved-tooth bevel gear right (fig. 6-3)	
			Add adjusting washers 5 of the large curved-tooth bevel gears on the left and reduce washers of the same amount on the right to drive the bevel gear left (fig. 6-3)	
Note: solid arrow means adjusting imprints while dotted arrow means adjusting engagement clearance				

Fig.6-3 Adjustment on imprints of spiral bevel gear

● **Important:**

The central transmission big and small gears are a pair of matched gears. Make sure that they are fixed correctly. It's better that they are replaced together with the bearing, otherwise the service life will be shortened.

6.3 Adjustment on brakes

After the brake is used for a certain time, the clearance between friction pieces and brake drum or, friction pieces and the brake housing or brake cover will increase due to abrasion of friction pieces. Then it influences brake function. The too long free travel will lead to failure of braking so the brake should be often adjusted for safe running.

No matter what the tractor is (new or old), its brake should be adjusted when the following phenomena happens to the brake.

①The free travel of the brake pedal is too long and causes brake failure.

②The free travel of the brake pedal is too short, making the brake be “half-braking” state, the brake housing becomes hot.

③As braking force of the left pedal doesn't conform to right pedal, the tractor deviates from the right path.

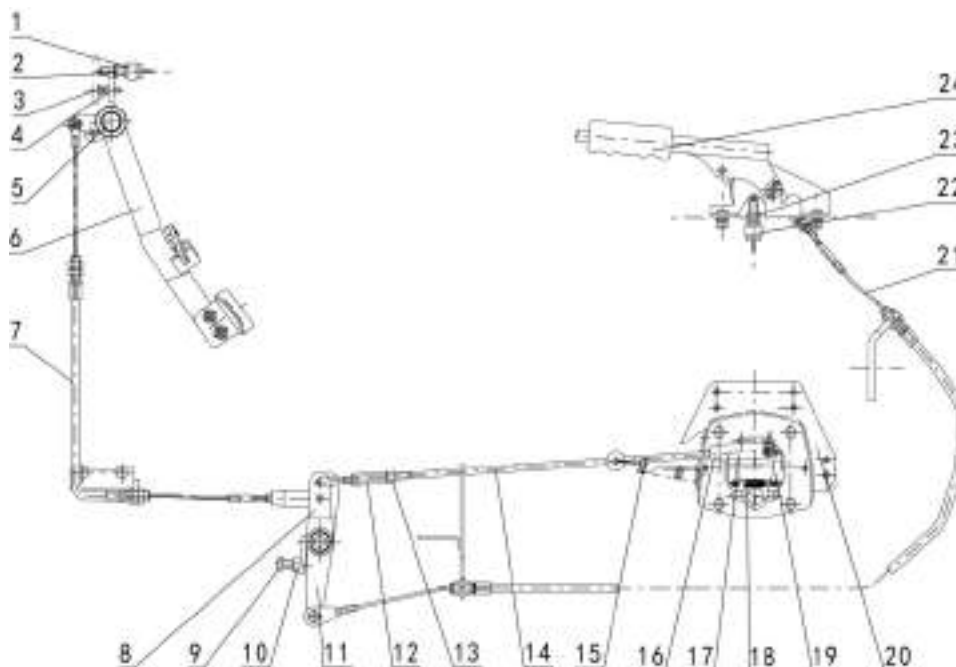


Fig.6-4 shoe brake

1 brake switch 2 nut 3 limit bolt 4 nut 5 brake pedal shaft 6 brake pedal 7 stay wire
8 rocker arm 9 bolt 10 nut 11 brake rocker arm 12 adjusting screw 13 nut 14 brake pull
rod 15 return spring 16 nut 17 adjusting fork 18 return spring 19 brake shoe 20 brake
hub 21 stay wire 22 hand brake switch 23 nut 24 brake handle

6.3.1 Adjustment on free stroke of brake pedal

The free travel of the pedal implies the displacement measured from brake pedal's highest position to a position you feel obvious resistance when pressing the pedal. The free travel should be within 55-65mm (Fig. 6-4).

Loose the nut 13 of the adjusting screw 12, turn the screw 12 to change the length of the brake lever (14). Make the brake pedal 6 down from the highest position

When adjusting, turn the adjusting bolt to change the length to get a displacement within 55-65mm measured after the clearance between the top brake drum (20) and the shoe brake

(19) is eliminated through pressing the brake pedal(6) Make the adjustment of left pull-rod conform to the right pull-rod, then fasten lock nut (13) (Fig .6-4).

6.3.2 Adjustment on operation stroke of brake pedal

Loose nut 4, adjust limit bolt 3, then press brake pedal 6. When the brake can fully brake, lock the nut 4 again. After a period of time, brake cable 7 and hand brake cable 21 should be readjust(see fig.6-4).

6.3.3 Adjusting brake switch and hand braking switch

Firstly, working stroke of brake pedal should be adjusted and lock nut4 before the nut2 loosed. Adjust the brake switch1 to compress 2~3mm from the contact between the pedal control panel and the brake switch, keep the constant joint state, then lock the nut (2) (see fig.6-4).

Loose nut 23, adjust hand brake switch 22, so that the distance between the contact head and the hand brake handle (24) is reduced by 2~3mm when the brake handle (24) is completely lowered, then lock the nut (2) (see fig.6-4).

6.3.4 Adjustment for brake "deviation"

In case the adjustment of left and right brake is inconsistent, the braking imprints on right and left tires are different and tractor's deviation will happen when braking the tractor running in high speed promptly. In this case the length of brake lever(14) on the long imprint side shall be increased appropriately, or decrease the length of brake lever(14) on the short imprint side until the length of left and right tire imprints are basically the same and can guarantee the reliable braking. After that, tighten the lock nut(13), first check with II gear, then check with IV gear after adjustment(see fig. 6-4).

Warning:

Before starting, interlock left and right brake pedal. Single-side braking can cause sharp turn and leads to turn over.

● **Important**

Free travel of the left brake pedal of tractor must be identical with that of the right one; otherwise tractor will deviate from its course and lead to accident in case of emergency brake.

When the operator leaves the driving seat or the tractor is parked, the operator must open the hand brake self-locking device, otherwise the alarm device will be triggered and the buzzer will ring.

6.4 Adjustment on front axle

6.4.1 Adjustment on front wheel toe-in

During the use of tractor, the front wheel toe-in changes due to deformation and wearing of steering gear and front axle. It will speedup the wearing of front wheel tire if it is not adjusted properly

in time. Toe-in adjusting should follow the following steps(fig.6-5):

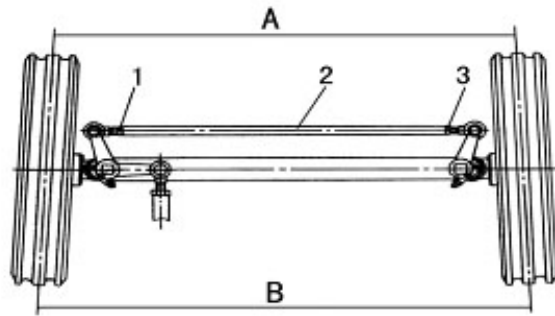


Fig.6-5 Adjustment on front wheel toe-in
 1 right handed nut 2 tie rod 3 left handed nut

- ① Park the tractor on the ground and put the front wheels in beeline running direction.
- ② Measure the distance A and B between front side and back side of two wheels at the height of front wheel center.
- ③ Loose the lock nuts 1 and 3 at the two sides of drawbar 2, rotate the drawbar until $B - A = 4 \sim 10$ mm, and then tighten drawbar 2 with nut 1 and 3 (fig..6-5).

6.5 Adjustment on front driving axle

6.5.1 Adjustment of central transmission

During assembling, put some washers (2) and (5) between the right half axle sleeve (1) and bearing 6008 (3), and between bearing 6008 (4) and fixing ring (6) to keep the backlash of the central transmission gear pair (driving conic gearwheel 10 and driven gearwheel 11) within 0.15~0.20mm, and ensure axial movement of the differential device does not happen to the differential device bearings, and differential device assembly works smoothly. Turn nut (9) to ensure its axial movement does not happen to the driving conic gearwheel and works smoothly, and then fasten the lock plate (8). (fig..6-6)

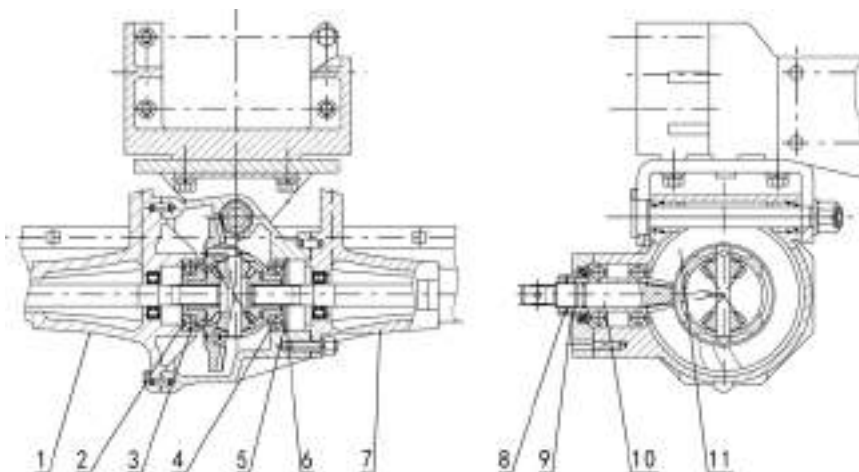


Fig. 6-6 Front-driving system adjusting

- | | | | |
|---------------------------|-----------------------------|--------------------------|------------------|
| 1. Right half axle sleeve | 2. Adjusting washer | 3. Bearing 6008 | 4. Bearing 6008 |
| 5. Adjusting washer | 6. check ring | 7. left half axle sleeve | 8. Locking plate |
| 9. Locking nut | 10. Driving conic gearwheel | 11. Driven gearwheel | |

6.6 Adjustment on PTO

6.6.1 PTO shift adjustment

PTO neutral position is shown in fig.6-6. Adjust as follows: firstly adjust PTO rocker arm 2 so that it is in neutral position, then adjust pull rod 3 to make the control lever 1 as fig.6-6.

According to the instruction, push and pull power output joystick (1) to change gear control, ensure that the shift can be smoothed smoothly(see fig.6-7).

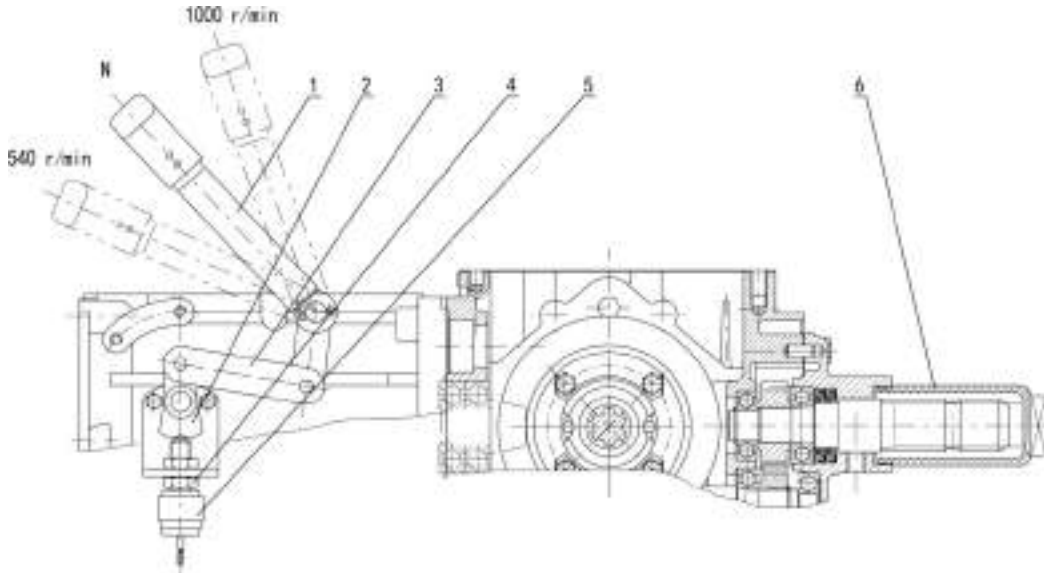


Fig 6-7 Adjustment on PTO

1 PTO control lever 2 PTO rocker 3 draw bar 4 nut 5 start button 6 shaft sleeve

6.6.2 Adjustment on safety start switch

Loose lock nut 4, adjust safety start switch 5; When PTO is in neutral, the switch contact is in the groove of the PTO rocker (2); When push and pull power output joystick (1), the distance between the contact head and the PTO rocker(2) is reduced by 2~3mm, then lock the nut (2) (see fig.6-7).

6.7 Adjustment on the safety start switch of main shift lever

Control the shift lever 1, and make 2 in neutral as fig.6-8, then loose lock nut 3. Adjust start switch 4 and make the switch contact in the groove of 2 (see fig.6-8).

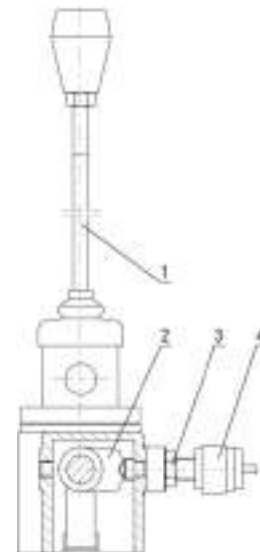


Fig.6-8 Main shift control

1 main shift control lever 2 fork 3 nut 4 start switch

6.8 Adjustment and operation of hydraulic steering device

Model : 101S-1-50-12-A, Incorporates relief valve, shock valve, function valve and check valve inside the steering unit. They can control the steering pressure, and provide the oil cylinder with shockproof and oil suction protection, to avoid the oil flowing backward.

6.8.1 Installation of the steering gear

(1) the mounting data of SCU should conform with the coaxial requirement between the steering control unit and the steering column, meanwhile there should be about 1 mm clearance in the axial direction between the steering column and the steering control unit.

(2) The depth of the bolt that fastens the steering column, screwing inside the steering thread hole, should be $\leq 17\text{mm}$, the fastening torque should be $\geq 30\text{N.m}$.

(3) After mounting, the steering control unit should be checked whether the steering wheel can return to the neutral position smoothly, to ensure the flexibility.

(4) Pipe connecting: Port P should be connected with supply pipe of the pump, Port T should be connected with pipe to oil tank. Port L and R should be connected separately with the left and the right pipe (see fig.6-9).

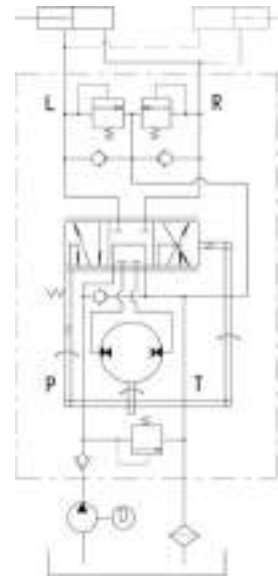


Fig. 6-9 schematic diagram

⚠ Attention:

(1) **It's necessary to keep oil clean, to prevent the internal part of the steering unit from being locked by any dirty fragment, resulting in malfunction of steering. Therefore, the filter and the oil should be frequently inspected (the oil should be changed under the condition that there appears the black center on the blotter, if one drop of oil is put on the paper.**

(2) **If the operator feels the steering unit heavy or malfunction during the operation, the operator should check carefully and check the reason, it's forbidden to turn the steering wheel rudely, or disassembly the steering unit to prevent parts being damaged. It's forbidden that two operators turn steering wheel at the same time.**

(3) **The rotation winding number of the steering wheel is related to the rated capacity of the steering gear. If the radial or axial clearance of the rotor is too large, and there is no manual rotation, it is necessary to replace the rotor and the rotor.**

⚠ Warning:

The steering device is a precise and complicated hydraulic unit produced by a professional manufacturer. If there is no condition, it is not familiar with the structure,

the fault is not clear and can not be easily removed. The adjustment shall be disassembled by a professional or trained personnel if necessary.

6.9 Lifter

6.9.1 Working principle of distributor (simple reversing valve)

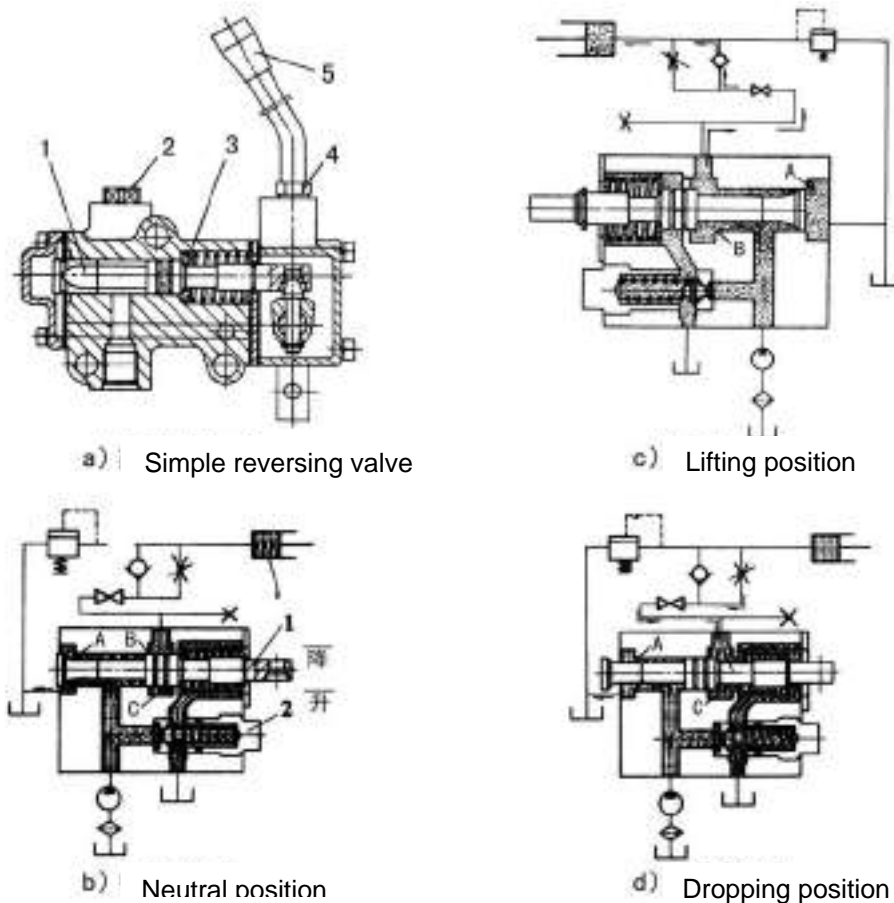


Fig 6-10 Working principle of distributor (simple reversing valve)

The working principle of distributor (simple reversing valve) is indicated on fig.6-10. Pull the control handle 5 can put it in three different working positions named as lifting, neutral and dropping. When main control valve 1 is in neutral position (fig.6-10b), the oil fed to reversing valve by oil pump flows back to oil tank through oil returning port A following arrow indication on the drawing. At this time the oil inlet port B and oil returning port C are closed by main control valve, and oil cylinder is under a closed situation, therefore the farming implement is kept in a fixed position.

When the main control valve 1 is pushed from neutral position to dropping position (fig.6-10d), oil returning port C of cylinder is opened, and the oil inside cylinder is forced back to oil tank through oil returning port C following arrow direction indicated on fig.(6-10d) by self-weight of farming implement, therefore the farming implement begins dropping. At this time,

the oil of the input reversing valve of oil pump still flow back to oil tank through oil returning port A.

When the main control valve is pushed from neutral position to lifting position (fig.6-10c), oil returning port A of cylinder is closed and oil inlet port B of cylinder is opened. At this time oil of pump input reversing valve flows into oil tank through oil port B following arrow direction indicated on the fig. and push the piston, then the farming implement begins lifting. In order to prevent the hydraulic elements from being damaged by over-load arisen from farming implement lifting, a system safety valve is added inside the reversing valve.

6.9.2 Working principle of lifter

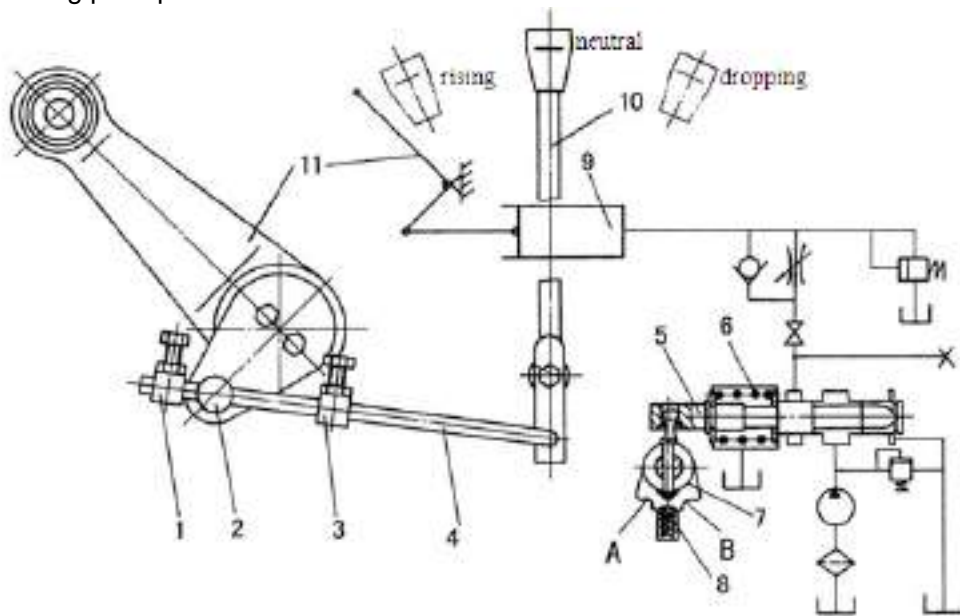


Fig.6-11 lifter working principle

1 return block for lifting 2 return pin 3 return block for dropping 4 handle returning rod
5 master control valve 6 return spring of slide valve 7 handle fixing block 8 fixing steel ball
9 cylinder 10 control handle 11 outer lifting arm

Fig.6-11 is simple position adjustment principle diagram of lifter with height adjusting performance. In the drawing the main control valve 5 is in neutral position.

Pull the control handle 10 to the dropping position, locking ball 8 drops to the drop locking locating slot B on the locating block 7. Master control valve 5 moves right to the dropping position at the same time. Oil in cylinder flows back to oil tank through master control valve and the farming implement begins dropping. Along with the implement dropping step by step, backing pin 2 fixed on lifter shaft baffle does laevorotation around the lifting shaft and slide along return push lever 4. When it slides and touches drop limit stop 3 fixed on return push lever, it will drive return push lever 4 to move right and turn control handle at the same time until locating steel ball 8 is pushed out of locating slot 8. Now under the tensile force of master control valve return spring 6, control handle 10 and master control valve 5 jump back to the neutral position at the same time. Cylinder stops oil returning and so implement stops dropping. Therefore, implement dropping location depends on the fixed location of dropping return block 3 on return push lever 4.

That is, the closer dropping return baffle is from control handle the lower position the implement can go. Loosen the locking bolt of the dropping return baffle, the return push lever cannot return the control handle to the neutral position. The master control valve will stay at the dropping position all the time. Now cylinder will work in "floating" state.

To lift farming implement, push the control handle 10 to the lifting position. Now the locating steel ball will drop into locating slot A (fig. 6-11) and master control valve 5 move left to lifting position. Then farming implement begins rising. Along with farming implement's rising step by step, return baffle pin 2 rotates clockwise. When the baffle pin slides and touches lifting block 1, it drives return push lever to move left. Rotate control handle 10 at the same time until locating steel ball 8 is pulled out of locating slot A. Now under the tensile force of return spring 6, control handle 10 and master control valve 5 jump back to the neutral position at the same time. Oil pump stops supply cylinder with oil and the farming implement stops rising accordingly. The rise height of the farming implement depends on the fixed position of lifting return baffle 1 on return push lever 4. The closer the return block 1 is from return push lever, the farm implement will rise higher(see fig.6-11).

- **Important:**

During operation, improper adjustment can keep control handle from returning in time, which will lead to overload of hydraulic system and damaging the machine.

6.9.3 Adjustments on hydraulic lifter

① Adjustment for Max. lifting position

Put control handle 1 at the neutral position in Fig. 6-12, turn lifting arm assembly 2 to the rising side to get a distance of not less than 5mm between the top of the lifting arm and limit pin 4 (insert a pad at the site of air plug to control this size). Adjust distance L of 9~10mm between baffle plate 3 and baffle pin 4. Fix the plate on the return push lever 5 with bolts and nuts.

② Adjustment for dropping position

Put control handle 1 at the neutral position, turn lifting arm assembly 2 to the dropping side. When it reaches dropping location, adjust the distance L of 9-10 mm between fixing block 3 and pin 4. Location adjustment should be done during traveling. After the farming implement dives into earth, fix block 3 on return lever 5 with bolts and nuts (Fig. 6-12). Then lift farming implement and repeat tests and check the adjustments.

If operate farming implement with land wheels, use height adjustment. Now block for dropping 3 should be adjusted to keep distributor control handle 1 from returning to the central position (see Fig. 6-12).

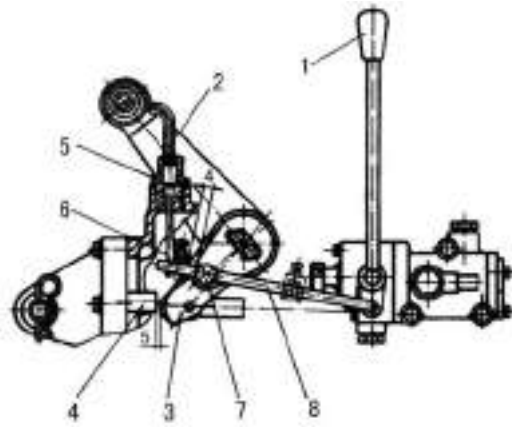


Fig. 6-12 adjustment for lifting position
 1 control handle 2 lifting arm assembly
 3 inner lifting arm 4 spacer pin 5 air plug 6 block 7 pin 8 return rod

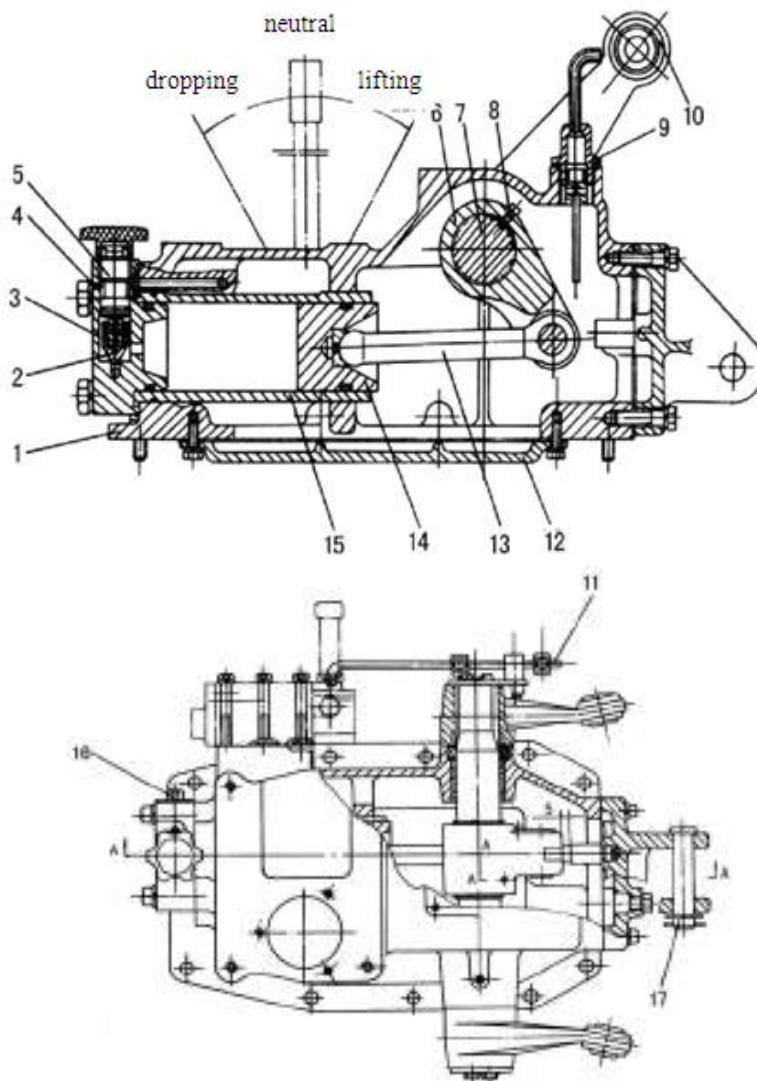


Fig.6-13 Lifter

1 lifter housing 2 adjusting valve 3 cylinder head 4 fixing bolt 5 bolts of adjusting valve 6 inner lifting arm 7 lifting shaft 8 fixing bolt of inner arm 9 air plug and oil dipstick 10 outer lifting arm 11 return push lever of handle 12 oil sump 13 fixing bolts of inner arm 14 piston 15 cylinder 16 hydraulic output plug 17 front connecting pin of top link

③ Adjustments for dropping speed

During adjustments, turn adjusting valve screw bolt 5 to control the dropping speed of farming implement. When dropping speed is adjusted to a proper value, limit the move range of adjusting valve bolt with limiting screw (Fig. 6-13).

④ Adjustments on safety valve

Safety valve has been adjusted when machine is delivered from factory. During operation, it cannot be dismantled in common conditions. When it needs new adjusting, the adjustment should be done on a special pressure adjusting bench. Test oil is HC-8 (SY1152-77) and oil temperature is controlled at $65^{\circ}\text{C} \pm 5^{\circ}\text{C}$. When safety valve presses screw plug and turns clockwise, opening pressure is increased. Otherwise, the opening pressure will be reduced. (Fig. 6-13)

In Hydraulic system, most components have high precision and their assembled parts have not careful debugging on test table. Therefore, during operation, service and trouble shooting, you should care the hydraulic oil, oil for washing and clean environment around. In common conditions, no dismantling at random is allowed.



Attention:

(1) Before checking hydraulic system, turn off engine and push hydraulic handle to decrease pressure inside the system.

(2) High-pressure oil will soak into skin and cause hurts. So pay much attention to the high-pressure oil. Don't let the high-pressure oil spray to eyes and such other site.

(3) Only after filling fully hydraulic oil into the shell of hydraulic lifter according to rules, can the engine be started to burn out the hydraulic gear pump.

(4) When tractor transfers with farming implements suspended, hydraulic lifter handle should be at the position of "neutral". When it transfer to a new field or operates with farming implement suspended, no high speed is allowed to avoid damaging parts of suspending system and lifting system. When driver leaves tractor, the farming implement must be dropped to the ground.

6.10 Operation of electrical equipments

The electric equipments of tractor are used to start tractor and meet the requirements of sending out signal from tractor and lighting at night etc. The electric system of this tractor is negative-grounded 12V single wire schedule.

6.10.1 Accumulator

When the type of accumulator 6-QW-65 has a rated voltage of 12V and a rated capacity of 65 ampere hour, the accumulator is used to store redundant power from generator. When the generator is not working or running at low speed, it can supply its power to start the tractor and other power consumers. When the engine is over-loaded at short time, it also assists to supply

power.

Check and maintain the tractor regularly according to the Technical Maintenance of tractor during daily use.

(1) For a new accumulator, charge it for 1—2 hours before using it, which can prolong the service life of the accumulator.

(2) Clean the dust and dirt on the accumulator case regularly in order to avoid the leakage. Check whether there is crack or electrolyte leakage and maintain the pole and wire contactor in good contacting condition. The blowhole of plastic cover shall be kept unblocked in order to avoid explosion.

(3) Each starting time shall not be over 10 seconds and interval between starting should not be less than 2 minutes in order to avoid over discharging. Accumulator shall be charged timely. The single battery voltage shall be 12.6V after being charged.

(4) Before the tractor is to be stored for a long term, cathode cable should be dismantled to avoid self-discharging of the battery. When the battery is in long-term use, charge it before next use. It is forbidden to start the tractor in the deficient power state of battery.

 **Warning:**

(1) When engine is running, it is absolutely forbidden to disassemble accumulator cover. Don't let eye, hand or clothe being touched by electrolyte. In case being touched, wash with clean water completely.

(2) Maintenance of electric equipments can only be carried out after disconnecting the ground cable and accumulator.

(3) Gas emitted from accumulator is explosive. Keep the accumulator far away from electric spark in order to avoid damaging the accumulator.

(4) Don't discharge in enclosure environment. Appropriate ventilation can protect the build-up gas from explosion.

● **Important:**

(1) Improper use of accumulator can decrease its service life and increase its maintenance cost. It shall be used properly and exert its full performances.

(2) The positive and negative poles of accumulator shall not be connected reversedly. Reversed connection of positive and negative will cause failure of accumulator and electrocircuit.

(3) Disconnecting the wire of accumulator from negative pole and connecting it from positive pole.

6.10.2 Operation of generator

(1) It is forbidden to check whether generator generating power with the method of ground ignition. It is not allowed to check insulation of generator with tramegger or AC power over 100V. It can only be checked with multimeter with high inner-resistance, otherwise the diode will be destroyed.

- (2) When parking, it should remove the key in order to disconnect the motor field winding and accumulator, and ensure the accumulator will not discharging in long term.

6.11.3 Use of start motor

- (1) During using, keep regularly the start-motor clean, all contacting points of wire being tightened tightly and in good contacting condition.
- (2) Each starting time shall not be over 10 seconds, the time between two starting shall be less than 2 minutes. Find the reason and eliminate them in case fail to start several times.
- (3) Pre-heating the engine and then use the start-motor when starting in cold weather.

6.11 Intake and exhaust system

6.11.1 Intake system

① The structure and air flowing chart are shown in Fig. 6-14. Air is absorbed in from the intake port on the upper part of air filter. The torsion angle makes the air whirling. The bigger particle is thrown off to the bottom because of the centrifugal force and files up.

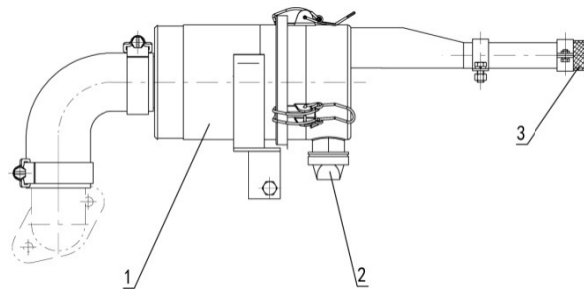


Fig. 6-14 Air filter

1 Air filter 2 Outlet 3 Inlet

The briefly cleaned air will be cleaned again through the paper filtrate core before it is absorbed into the cylinder so that it can prolong the cylinder sleeve and piston unit's service life.

② According to the dust level of the environmental air, the filtrate element need to be maintained after being used for some time according to tractor service requirements

(If in dusty environment, it needs to be maintained nore early).

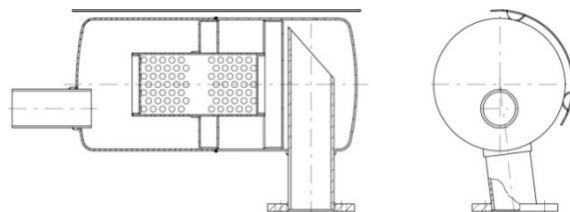
Take out the filtrate element, remove the dust with a soft brush (Fig. 6-15) and knock on the surface gently. If condition permits, airproof the two ends of the filtrate element, blow it from the inside to the outside with compressed air. Never clean it with oil or water.



Fig. 6.15

6.11.2 Exhaust system

The muffler is fixed on the exhaust elbow. The waste gas enters the muffler and moves on through the eyelets on the down-side to the muffler cavum, and then goes out through the eyelets on the up-side of the filtrate element. After several times ' swerve, blocking and inflation, the noise is greatly reduced. After being used for about 1000



hours, the dust need to be removed

Fig. 6-16 Muffler

by knocking at the outside of the muffler in order not to block up or affect the engine's function(Fig. 6-16).

6.12 Operator Seat

The operator's seat can be adjusted for position and weight of operator. These adjustments are to be done prior to starting the engine.

6.12.1 Adjusting Seat Position

The seat can be adjusted fore and aft upto 6 inch. To adjust the position of seat, proceed as follows:

- ① Sit on the operator seat.
- ② Shift the Lever (B) to left side
- ③ Move the seat fore-and-aft to adjust the seat to desired position.
- ④ Ensure that all controls can be accessed easily.
- ⑤ Release the Lever. Ensure that the pin of lever is engaged in groove.
- ⑥ Loosen the knobs of (E) lift the seat up and down to desired height and lock tightly.



6.12.2 Weight Adjustment

Optimum seat suspension can be adjusted as per the weight of operator. Turn the knob (D) in clockwise or counterclockwise direction according to the weight of operator.

6.12.3 Using Seat belt

Use a seat belt when you operate with Roll over protective structure (ROPS) to minimize chance of injury from an accident such as an overturn. Do not jump if machine tips.

Fasten Seat belt

- ① Pull belt end (C) across operator lap.
- ② Install tab into buckle (A)

Release Seat belt

Press red button, the seat belt will automatically retract.



⚠ Caution

Attempting to adjust the seat while driving the tractor may cause the operator to lose control of the tractor

⚠ A warning:

Do not use seat belt if operating without a ROPS or with an optional folding ROPS in the folded position.

6.13 Roll Over Protective Structure

The tractors are fitted with a frame for the protection of tractor operators to minimize serious operator injury resulting from accidental roll over. These frames, known as ROPS, form a safety zone within which the operator is offered some protection in the event that the tractor turns over. It is necessary that the tractor operator fasten the seat belt around him/her to be protected by the ROPS.

The mounting structure and fasteners forming the mounting connection with the tractor are part of the ROPS.



6.13.1 (ROPS) Maintenance and Inspection

The ROPS has been certified to industry and/or government standards. Any damage or alteration to the ROPS, mounting hardware or seat belt voids the certification and will reduce or eliminate protection for the operator, in the event of a roll-over.

The ROPS, mounting hardware and seat belt should be checked after the first 100 hrs. of machine operation and every 500 hours thereafter for any evidence of damage, wear or cracks. In the event of damage or alteration the ROPS must be replaced prior to further operation of the machine. The seat belt must be worn during machine operation when it is equipped with a certified ROPS. Failure to do so will reduce or eliminate protection of the operator in the event of a roll-over.

Substitution of mounting hardware, seat belt etc. with components not equal to or superior to the original certified components will void the certification and will reduce or eliminate protection for the operator in the event of a rollover.

6.13.2 Damage of the ROPS

If the Tractor has rolled over or the ROPS has been damaged (such as striking an overhead object during transport), it must be replaced to provide the original protection. After an accident, check for damages to the 1. ROPS 2. Seat 3. Seat belt & seat mountings.

Before you operate a Tractor, replace all damaged parts.

⚠ Warning:

(1) Never attach chains or ropes to the ROPS for pulling purposes; this will cause the tractor to tip backwards. Always pull from the tractor drawbar. Be careful when driving through door openings or under low overhead objects. Make sure there is sufficient overhead clearance for the ROPS. If the ROPS is removed or replaced, make certain that the proper hardware is used to replace the ROPS and the recommended torque values are applied to the attaching bolts. Always wear your seat belt if the tractor is equipped with a ROPS.

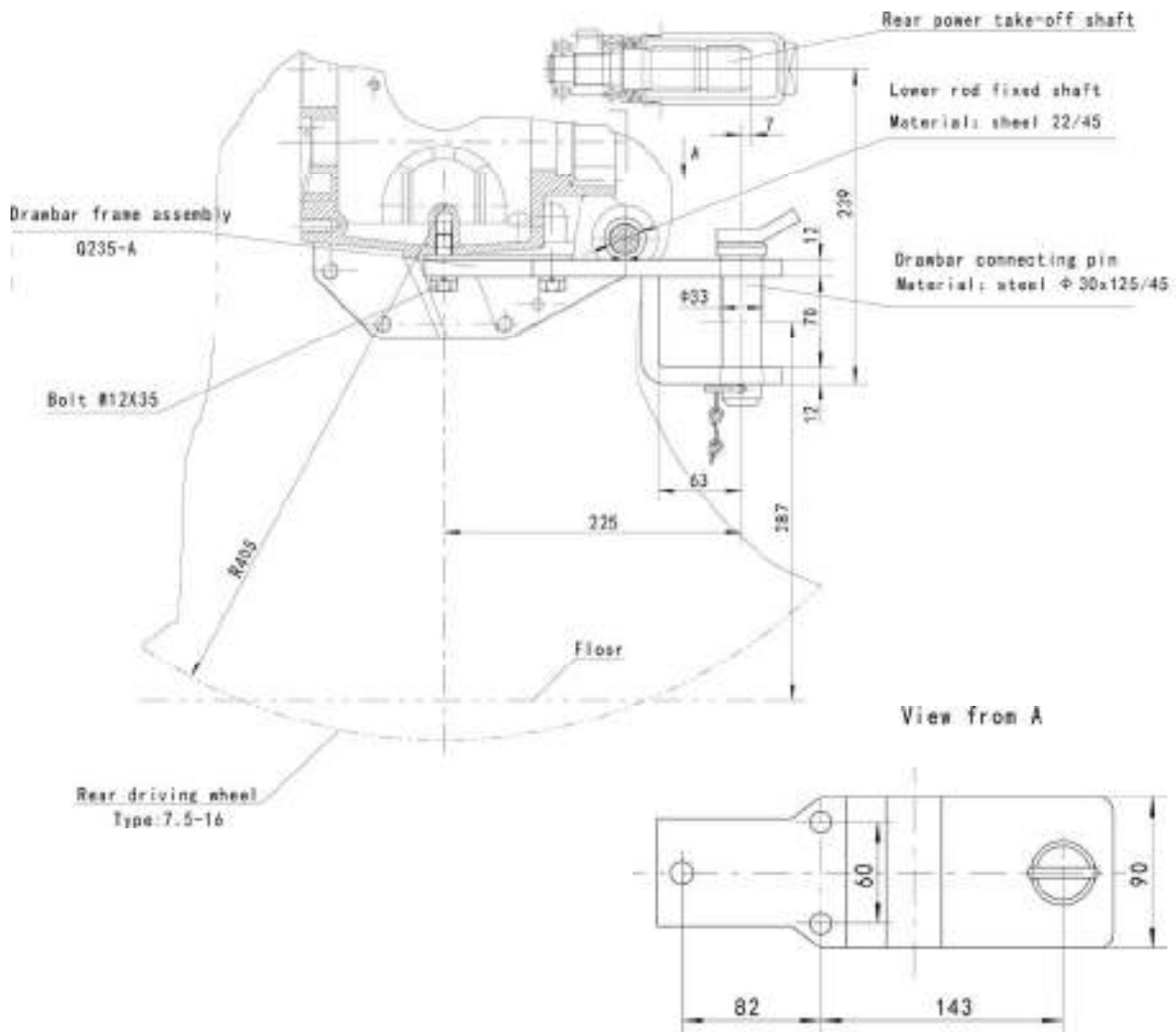
(2) When improperly operated, a tractor can roll over. For low clearance storage only, the roll bar may be folded. No protection is provided when the tractor is operated with the roll bar in the folded position. Always raise the roll bar immediately after low clearance storage. Always use the seat belt when the roll bar is raised. Seat belts save lives when they are used. Do not use the seat belt when the roll bar is lowered.

6.14 Swinging Drawbar

Tractor can be equipped with a drawbar for connecting to pull behind implements. A tractor can be equipped with a traction device that connects to an implement by connecting pins. In each position the dimensions achieved are as per chart.

Certain heavy equipment such as a loaded single axle trailer can place excessive strain on the drawbar. Strain is greatly increased by rough road and high speed. Static vertical load on drawbar should not exceed as stated in chart.





Towing implements/Trailers on road or field
 Use bolts M12 8.8 Tightening torque:100Nm.

Adjusting drawbar length

- 1.Remove the drawbar.
 - 2.Position the drawbar as per sketch to achieve desired length.
- Lock the drawbar in desired position before using it.

Maker: Jiangsu Yueda Intelligent Agricultural Equipment Co.,Ltd.

Add: NO. 9 NenJiang Road, Economic-Technological Developing Zone, Yancheng
 JiangSu, PRC

Type: 164Y.35.001

Type-approval number: e50*2009/144*0006*00 Directive 2009/144-EC-annexe IV
 Appendix 1- fig 3 (ISO 6489 Part 3)

Towable mass: 3.0t Vertical load: 0.0t

⚠️ WARNING:

Rear roll-over can result if pulling from wrong location on tractor. Hitch only to drawbar. Use 3 point hitch only with implements designed for its use, not as a drawbar.

⚠️ WARNING:

Try to balance the load primarily on the implement wheels. Avoid overloading the drawbar. Add Jerrycan weights for improved stability. Engage the clutch smoothly, avoid jerking and use brakes cautiously to avoid jackknifing.

6.15 The plate of the tractor(Fig. 6-17)

6.16 When the PTO connected with farm implements, angle of the cardan should not beyond fifty degree. (Fig. 6-18)



Fig. 6-17



Fig. 6-18

Chapter VII Main Troubles and Solutions

Must stop and check if the faults appeared. Find the reason as the following table.



Attention:

(1) **Disassemble and replace the new parts with high technical level, user should contact with service network or expert.**

(2) **Please read the engine maintenance manual when check the mating engine.**

7.1 Diesel

7.1.1 Difficult diesel starting

Causes	Solutions
1. Too low temperature 2. Diesel oil cannot flow smoothly. 3. Air enters fuel pipes 4. Such couple units as fuel injection nozzle and injection pump are blocked or abraded. 5. Intake and exhaust ports have leakage, washer of air cylinder cover is damaged, piston rubber ring is abraded, or the air port has no clearance. These cause inefficient pressure. 6. Insufficient battery voltage	1. Fill hot water into radiator, or preheat engine oil and then fill into crankcase 2. Check and wash fuel pipes and filter core 3. Exhaust air from fuel pipes and tighten every joint. 4. Wash, repair or replace couple units. 5. Grind intake and exhaust port, adjust air port clearance, replace air cylinder cover washer and piston ring. 6. Charge battery or replace with a new one.

7.1.2 Insufficient power

Causes	Solutions
1. Air filter or diesel oil filter is jammed. 2. Wrong advance angle of fuel supply 3. Diesel contains moisture. 4. Oil injector needle valve is seized or jet orifice is jammed. 5. Intake & exhaust air port has leakage or air port has wrong clearance. 6. Main bearing or connecting rod bearing shell is over abraded or burnt out. 7. Two diesel cylinders cannot equally work	1. Wash filter core with diesel oil or coal oil. 2. Regulate it to the stated value. 3. Eliminate moisture or replace diesel oil. 4. Check, repair or replace couple pieces of oil injecting port 5. Grinding air port; adjust air port clearance. 6. Check, repair or replace it. 7. Check and adjust two cylinders of oil injecting pump for oil supply and injecting pressure to improve the equality.

7.1.3 Sudden self-park of Engine

(1) Crank is seized with bearing

Repair or replace crank and bearing

Causes	Solutions
1. Insufficient or halt engine oil 2. Machine oil is too watery or goes bad after long-term use. 3. Oil pump loses effects suddenly or oil filter is jammed; safety and by-pass valve don't work well.	1. Check the oil level in oil pan. If the level is too low, supplement machine oil in time. 2. Replace with new machine oil. Check oil injecting pump post pair to see if too much diesel oil leakage dilutes machine oil. If so, do repair. 3. Check, repair or replace machine oil pump and filter.

(2) Piston is seized with air cylinder

Repair or replace such parts as air cylinders and pistons

Causes	Solutions
1. Diesel lacks water and is so hot that seizes cylinder 2. Too much water scale in cylinder water jacket makes cylinder over hot. 3. Engine works with over loads 4. Fan belt is too loose.	1. Supplement cooling water 2. Clear water scale away. 3. Strictly comply with operation rules 4. Adjust belt tautness or replace belt.

(3) If flywheel can still run, the following are the possible reasons

Causes	Solutions
1. Diesel oil in fuel tank is used out or fuel pipe breaks. 2. Air is induced in fuel pipes 3. Diesel oil filter or pipes are jammed. 4. Injection pump plunger spring is broken.	1. Fill in diesel oil or replace fuel pipes 2. Eliminate air from fuel pipes. 3. Wash diesel filter core or fuel pipes. 4. Replace with new plunger spring.

7.1.4 Abnormal smoke exhaust

Causes	Solutions
1. Diesel works with over loads. 2. Much smoke comes with exhaust, which is caused by the secondary air ring is wrongly mounted or oil ring is severely abraded. 3. White smoke in exhaust is caused by water in fuel, or bad atomization of oil injector, or too low oil injecting pressure.	1. Minus loads. Adjust until requirements are met 2. Re-mount air ring. Make the surface with symbol "上" face piston top or replace oil ring. 3. Wash oil tank, diesel filter, replace diesel, repair oil injecting pairs and adjust oil injecting pressure.

7.1.5 Over-hot diesel

Causes	Solutions
<ol style="list-style-type: none">1. Fan belt is too loose2. Diesel works with overload for a long term.3. Oil supply is too late or oil injector drops oil to make exhaust test too high.	<ol style="list-style-type: none">1. Adjust belt tautness or replace with belt.2. Reduce diesel loads3. Check and repair.

7.2 Transmission system

7.2.1 Clutch slides

Causes	Solutions
<ol style="list-style-type: none">1. Friction plate surface is oil stained2. Pressure spring has no full force or is broken.3. Free travel is small or zero. Releasing levers are not in a plane.4. Friction plates are severely abraded.	<ol style="list-style-type: none">1. Wash with diesel oil. Eliminate oil leakage.2. Replace spring3. Re-adjust according to rules.4. Replace friction plates.

7.2.2 Clutch cannot be released completely. Gear lever has difficult for gear shifting

Causes	Solutions
<ol style="list-style-type: none">1. Too large free travel or too small working travel2. Clearance between three releasing levers and releasing bearing.	<ol style="list-style-type: none">1. Re-adjust according to requirements.2. Re-adjust according to requirements.

7.2.3 Transmission case sounds abnormally.

Causes	Solutions
<ol style="list-style-type: none">1. Tooth flank of gear is severely abraded or peeled off.2. Gear tooth is broken.3. Bearing is severely abraded or damaged.4. Engage clearance of central drive gear is broken.	<ol style="list-style-type: none">1. Replace gear.2. Replace gear3. Replace bearing4. Re-adjust to stated value.

7.2.4 Transmission case is too hot

Causes	Solutions
<ol style="list-style-type: none">1. Bearing clearance or bevel gear's engaging clearance is too small.2. Insufficient oil volume3. Bad oil quality	<ol style="list-style-type: none">1. Re-adjust to stated value.2. Add lubrication oil to stated oil level.3. Wash with diesel and then fill in proper lubricating oil.

7.3 Brakes

7.3.1 Brakes don't work well

Causes	Solutions
<ol style="list-style-type: none"> 1. Brake shoe bears too much abrasion on friction belt. 2. Friction belt on brake shoe contains oil. 3. Improper adjustment. 	<ol style="list-style-type: none"> 1. Replace with new brake shoe. 2. Wash it with gasoline and shoot the trouble of leakage. 3. Re-adjust according to requirements.

7.3.2 Crooked running during braking

Causes	Solutions
<ol style="list-style-type: none"> 1. The left and the right brake pedals have inconsistent travel. 2. Friction belt on single -side brake shoe is stained with oil. 3. Abrasion of friction belt on the left and the right braking shoes are not consistent. 	<ol style="list-style-type: none"> 1. Re-adjust until consistency. 2. Wash with gasoline and shoot the trouble of leakage. 3. Re-adjust or replace with new braking shoe.

7.3.3 Uncomplete release; high temperature

Causes	Solutions
<ol style="list-style-type: none"> 1. Brake shoe return spring has no full force. 2. Clearance between the friction belt and drum on brake shoe is too small. 	<ol style="list-style-type: none"> 1. Replace spring 2. Adjust free travel of pedals.

7.4 Steering unit and traveling system

7.4.1 Hard steering

Causes	Solutions
<ol style="list-style-type: none"> 1. Clearances or abrasion between pin and worm, or between bolt & nut assembly and rocker tooth, or between hindley screw and rolling wheel are severe. 2. Too low air pressure of front tires; 3. Insufficient oil supply of oil pump; 4. Steering system contains air. 5. Oil tank is not full. 	<ol style="list-style-type: none"> 1. Adjust clearance or replace worn parts. 2. Inflate as instructions. 3. Select proper oil pump or check oil pump for its normal performance. 4. Eliminate air from exhaust system and check oil inlet pipes. 5. Fill oil to stated level.

7.4.2 Tractor automatically goes to one side.

Causes	Solutions
1. Air pressure of the left and the right tires are not consistent. 2. Wheel treads of the left and the right tires don't match.	1.Adjust for consistence. 2.Replace tires

7.4.3 Front wheels swing

Causes	Solutions
1. Bearing clearance of front wheel shaft is too large or severely abraded. 2. Round-head pin or round-head base is severely abraded. 3. Sleeve of swing shaft is abraded. 4. Steering knuckle sleeve is abraded.	1.Adjust clearance or replace bearing. 2.Replace round-head pin or round-head base. 3.Replace axle sleeve. 4.Replace axle sleeve.

7.4.4 Initial abrasion of tires

Causes	Solutions
1. Improper adjustments on toe-in of front wheels. 2. Low tire pressure 3. Driving wheels are installed wrongly.	1.Re-adjust to stated value. 2.Inflate according to rules. 3.Re-install it.

7.5 Hydraulic suspension system

7.5.1 Farming Implements can't rise or drop

Causes	Solutions
1. Adjusting valve is locked up. 2.Master valve is seized	1.Release adjusting valve. 2.Wash the valve

7.5.2 Implement has too quick static dropping

Causes	Solutions
1.Oil cylinder and piston are severely abraded. 2. Oil seal on piston is damaged. 3. Slide valve of distributor is damaged.	1.Repair or replace oil cylinder piston assembly 2.Replace oil seal. 3.Replace distributor.

7.6 Electrical system

7.6.1 Starter

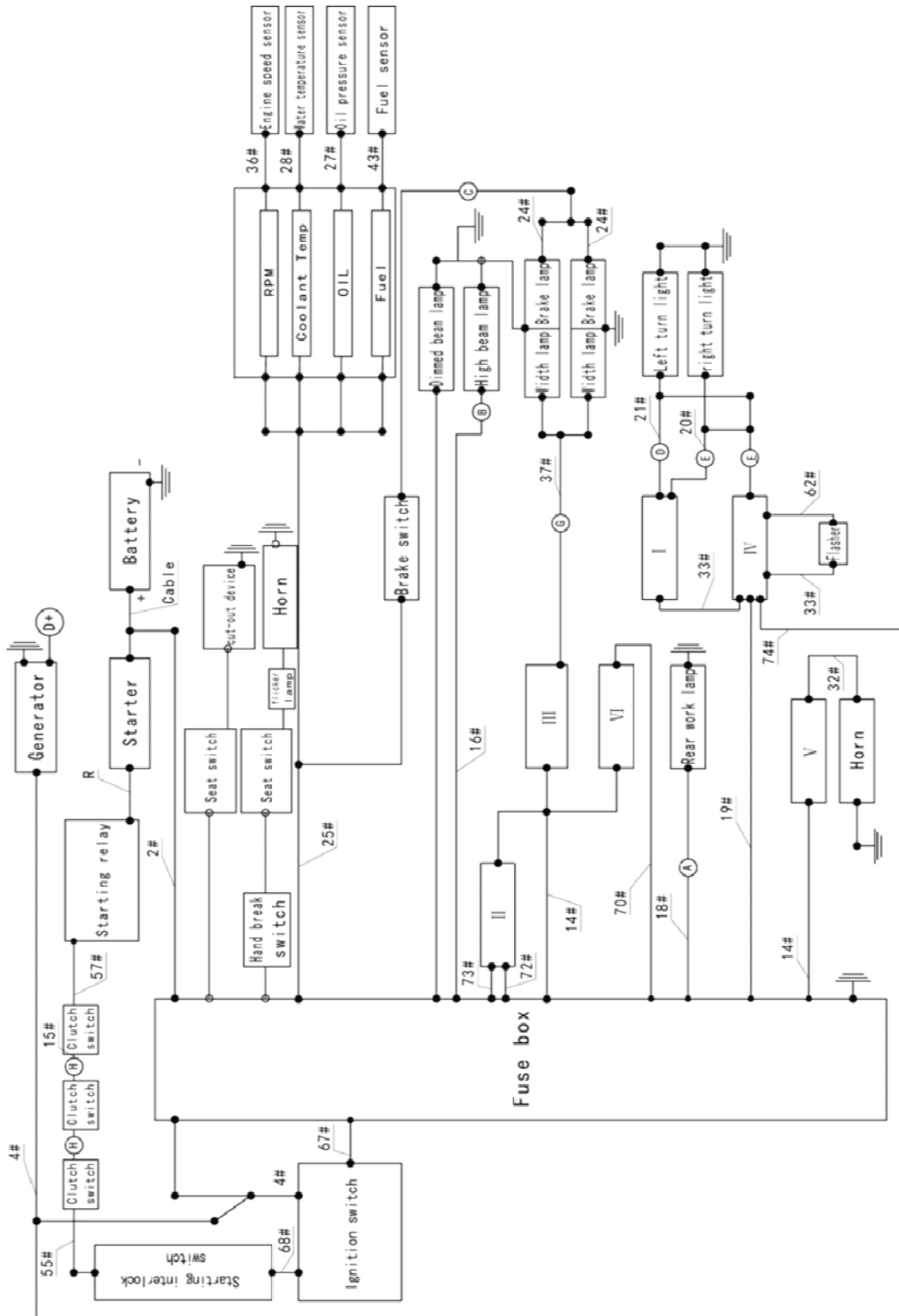
Causes	Solutions
<p>1. Starter cannot turn.</p> <p>①Connecting wire is broken or cannot contact well.</p> <p>②Battery has insufficient charging.</p> <p>③E-brush cannot contact commutators well.</p> <p>④Starter has inside short or open circuit.</p> <p>2. Starter in idling without starting power.</p> <p>①E-Brush cannot contact commutators well.</p> <p>② Communtator surfaces burnt or has oil stain.</p> <p>③Connector cannot work well.</p> <p>④.Electromagnet switch doesn't work well.</p> <p>⑤Insufficient battery charging</p> <p>3. Starting small gears are not engaged and the starter turns, so gears impact against each other.</p> <p>Electromagnet switch armature has too small travel.</p>	<p>1.</p> <p>①Weld or screw connecting points tightly.</p> <p>②Supplement electric charging or replace batteries.</p> <p>③Clean commutators surface or replace brush.</p> <p>④Check and repair.</p> <p>2.</p> <p>①Clean commutators' inter-surfaces.</p> <p>②Restore commutator with sand cloth or clean oil stain.</p> <p>③Clean and screw up contact points.</p> <p>④Check and repair switches.</p> <p>⑤Check and charge</p> <p>3.Turn electromagnet switch armature connecting screws in for 2-3 teeth.</p>

7.6.2 Battery

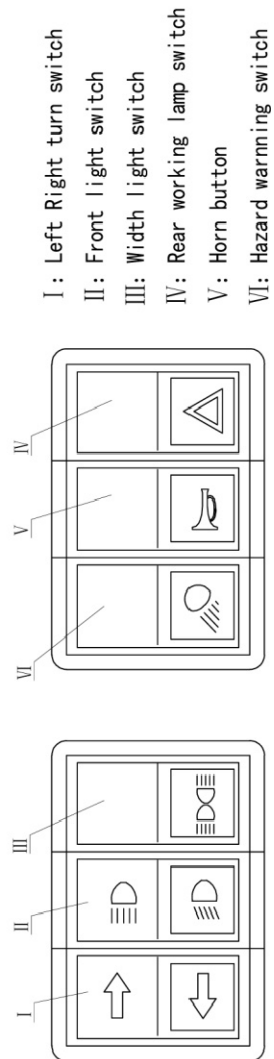
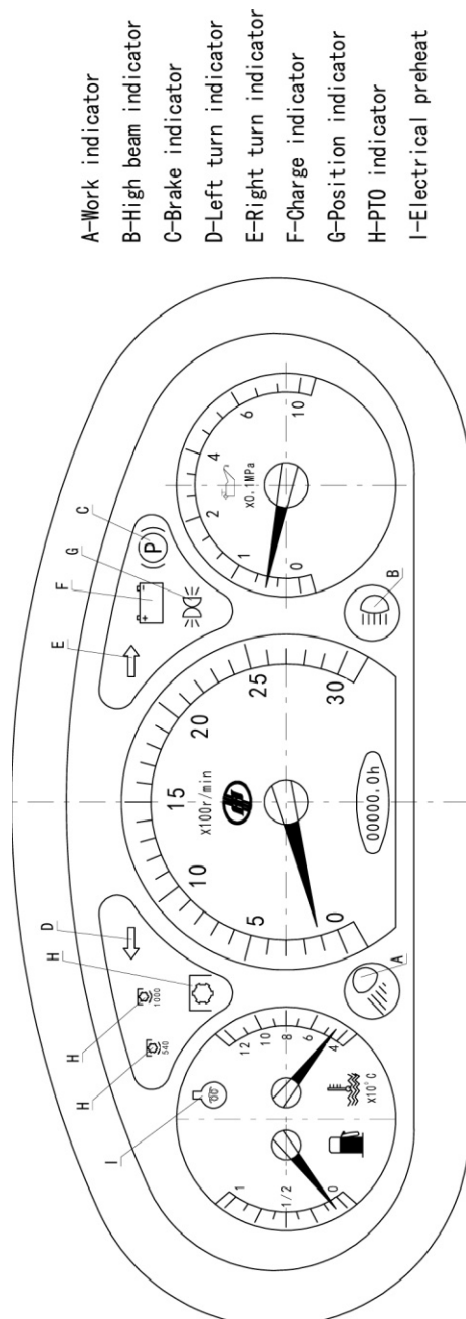
Causes	Solutions
<p>1. Battery often has no sufficient electric storage.</p> <p>① Generator or adjustor has malfunction and produce no charging current.</p> <p>② Connecting wire of charging circuit is loose or rusted, which cause increased resistance.</p> <p>③ Pole plate has short circuits.</p> <p>2. Battery has self-discharging; Material of polar plate has too much impurities or the electrolyte is not pure.</p> <p>3. Battery capacity is obviously reduced (low discharging voltage, high charging voltage, electrolyte density is low) and pole plate is vulcanized.</p> <p>① Charging is always no sufficient.</p> <p>② Discharging with low current for a long term doesn't get charging in time.</p>	<p>1.</p> <p>① Repair generator or adjustor.</p> <p>② Check post clamping chuck and connecting bolts. If they are loose, screw it up or eliminate rusts.</p> <p>③ Repair it.</p> <p>2. Discharge batteries completely or do overdischarging to make pole plate impurity enter electrolyte and then discharge electrolyte, wash it with distilled water. Pour new electrolyte to charge again.</p> <p>3.</p> <p>① Charging with low current for long time, or do fully-charging & fully-discharging</p> <p>② Circulations to react the active elements.</p>

Chapter VIII Appendix

8.1 Wiring diagram of electric system



8.2 Meter and Switch schema

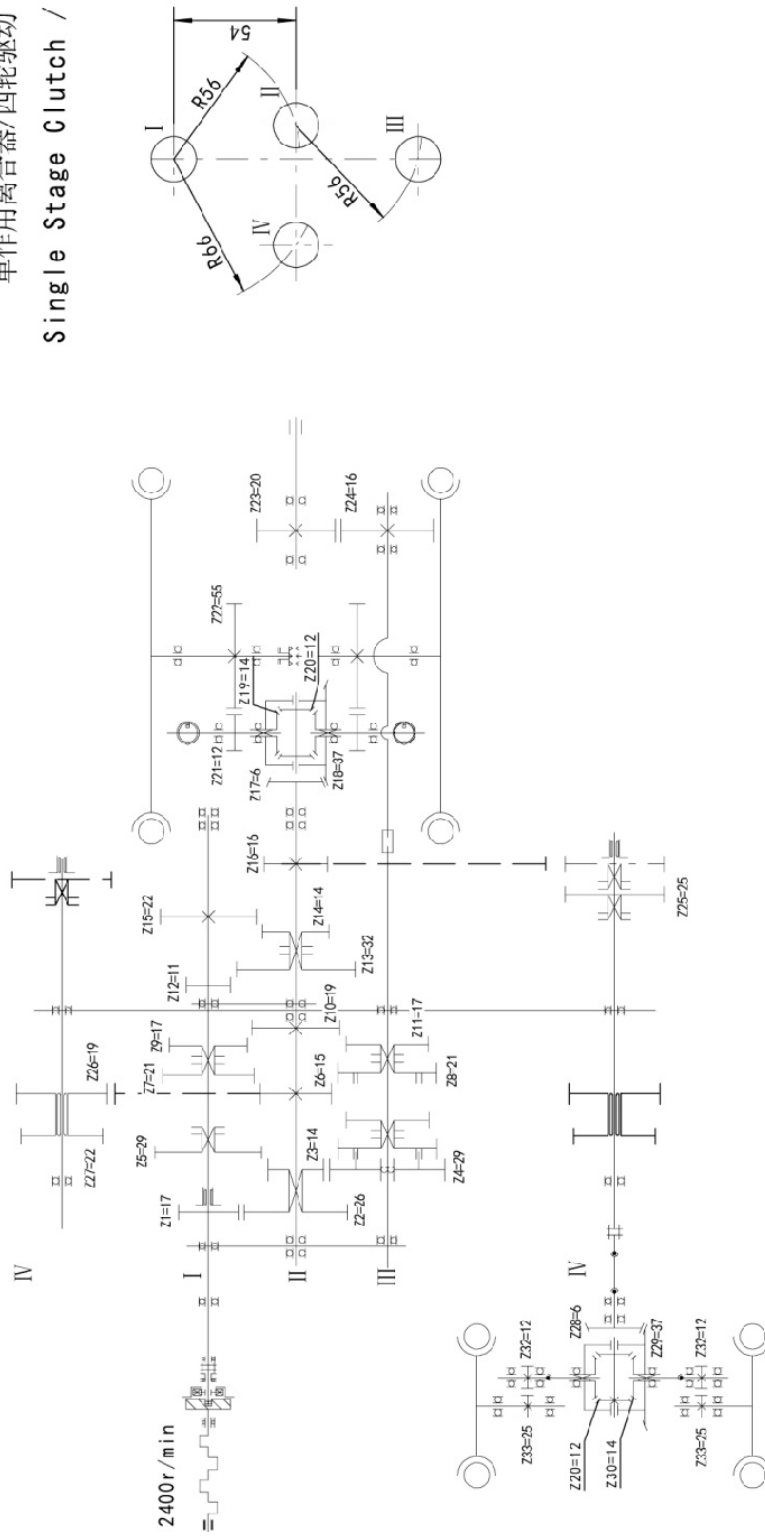


- A-Work indicator
- B-High beam indicator
- C-Brake indicator
- D-Left turn indicator
- E-Right turn indicator
- F-Charge indicator
- G-Position indicator
- H-PTO indicator
- I-Electrical preheat

- I : Left Right turn switch
- II: Front light switch
- III: Width light switch
- IV: Rear working lamp switch
- V: Horn button
- VI: Hazard warning switch

8.3 Distribution of tractor transmission system and rolling bears

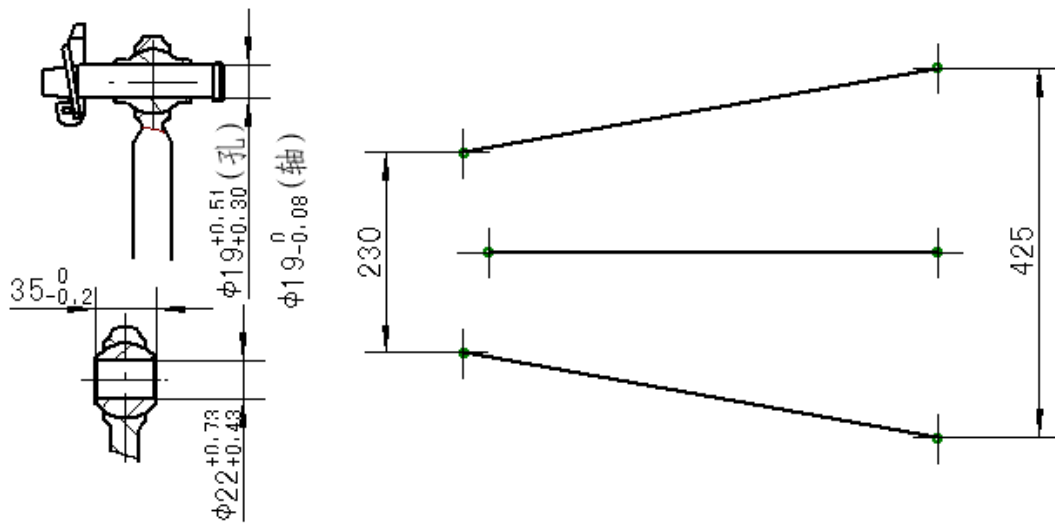
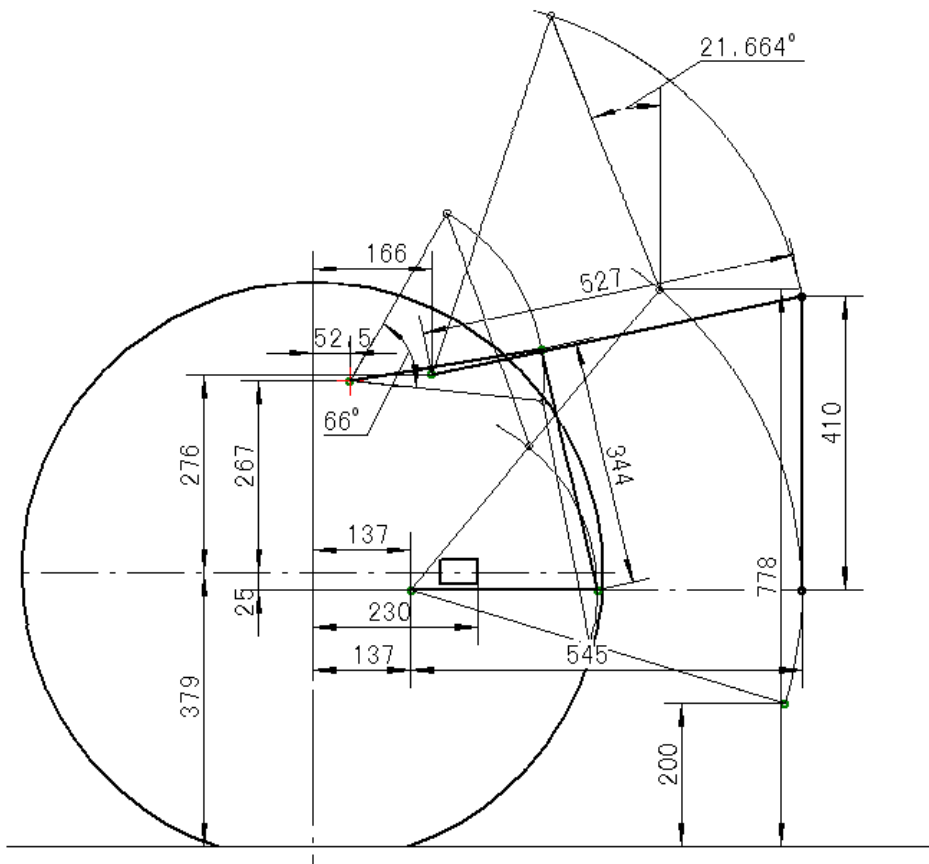
单作用离合器/四轮驱动
Single Stage Clutch / 4WD



8.4 Chassis oil spec. and sites

Component	Spec.		Installing site	Quantity
Gear box	GB/T9877.1 Lip type packing of rotating shaft	FB20×35×7	Spindle nose of reverse gear	1
	JB/T2600 Reinforced seal	SG17×30×8	Front end cap of Axle I	1
	GB/T 3452.1 O-ring	9.5×2.65 9×1.8	PTO declutch shift shaft Declutch shift shaft of II-III gears Screws on cover plate of transmission case	1 1 1
Clutch	GB/T9877.1 Lip type packing of rotating shaft	FB20×35×7	Inside release bearing base	2
Rear Transmi ssion case	GB/T9877.1 lip type packing of rotating shaft	FB35×50×8	PTO shaft	1
Final transmission	GB/T9877.1 lip type packing of rotating shaft	FB58×80×10	The smaller end of final transmission shell	4
	GB 3452.1 O-ring	10.6×1.8	Declutch shift shaft	1
Front driving axle	JB/T2600 reinforced seal	W35×50×7	Side reduction	2
	GB/T9877.1 lip type packing of rotating	FB20×35×7 FB22×47×7 FB25×40×8 FB35×50×8 FB35×55×8	Inside dustproof pipes Inside bush of half axle Side reduction Side reduction bearing cover	1 2 2 2 1
	GB 3452.1 O-ring	20×2.65 25×2.65	Swing shaft	1 1

8.5 Sizes of suspending system



8.6 Accessories

No.	Code	Name	Qty.
1	GB/T3390.3 Sleeve Spanner	sleeve 10*12.5	1
2		sleeve 13*12.5	1
3		sleeve 16*12.5	1
4		sleeve 18*12.5	1
5		sleeve 21*12.5	1
6		sleeve 24*12.5	1
7		sleeve 27*12.5	1
8		sleeve 10*12.5	1
9		splicing pole, boosting lever, sliding coupler	respectiv
10	stud dead spanner GB/T4388	spanner 8*10	1
11		spanner 13*16	1
12		spanner 12*14	1
13		spanner 17*19	1
14		spanner 18*21	1
15		spanner 22*24	1
16	spanner 27*30	1	
17	Allen wrench	allen wrench S6(lengthened)	1
18	GB/T5356	outside calipers	1
19		inside calipers	1
20		cruciform screwdriver 150*5	1
21		dash line screwdriver 250*9	1
22		diesel accessories and the tool box	1set
23		Parts catalogue of HHJM-164Y series tractors	1
24		Manual of HHJM-164Y series tractors	1

8.7 Wearing parts

No.	Code	Name	Qty.	Note
1	JB/T2600	reinforced seal W35*50*7	1	
2		reinforced seal SG17*30*8	1	
3	GB/T9877.1	oil seal FB20*35*7	1	
4		oil seal FB22*47*7	1	
5		oil seal FB25*40*8	1	
6		oil seal FB35*50*8	1	
7		oil seal FB35*55*8	1	
8	GB3452.1	O-ring 9.5*2.65	2	
9		O-ring 10.6*1.8	2	
10		O-ring 14*2.65	2	
11		O-ring 16*2.65	2	
12		O-ring 17*1.8	2	
13		O-ring 20*2.65	2	
14		O-ring 25*2.65	2	
15		O-ring 28*2.65	2	
16		O-ring 42.5*2.65	2	

8.8 Standards, commands and laws

1. GB/T18447.1 Agriculture tractors Safety requirements
2. GB/T3871 Agriculture tractors test method
3. GB/T6376 Tractors limited of sound levels
4. GB/T19040 Steering requirements for Agriculture tractors
5. GB/T9840 The rules of operation manual for Agriculture tractors
6. (EU) NO 167/2013
7. (EU) NO 2015/208
8. (EU) NO 1322/2014
9. (EU) NO 2015/96
10. (EU) NO 2015/68
11. (EU) NO 2015/504



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