

Operation Manual

110HP-130HP ULTRA TRACTOR



IMPORTANT!

You must ensure all operators of this machine read and understand these instructions and any additional instructions provided prior to operation

Product Identification marks record form

Trade name:
Model Type:
Identification number of Tractor:
Identification number of Chassis:
Engine type:
Identification number of Engine:
Time of acquisition:
Place of purchase and contact:
User name:
Manufacturer's Name:
Manufacturer's Address:
Manufacturer's Phone:

Note: 1. Please users fill out the above form carefully at time of purchasing.

2. The number in the table shall be completely written (including letters).

1104 /1204/1254/1304 Wheeled Tractors

Operation Specification

* * *

Number: BF-SM-E-01.1

Instruction to Users

Valued Customer:

Thank you for your belief in our company, and purchasing wheeled tractors of our company. For the sake of correct, reasonable and effective operation of tractors, please pay attention to the following information.

1、 Before operating the tractor, please read this specification carefully whether you have experience of driving or not before, because it will help you operate tractor more reasonably and effectively.

2、 For the sake of more economic benefit to you and longer service life of tractor, before operation, please read carefully this operation specification and operation instruction of matching engine and agricultural implements, and manipulate and maintain tractor closely as required in operation specification for the purpose of full use of performance of tractor.

3、 Please don't modify tractors randomly for fear of effect on tractor performance and unexpected accident, or even the consequence that it is hard to performance guarantee service.

4、 Due to great difference in agriculture and soil condition, there are diversified purposes, parameters, matching agricultural implements and operation efficiency recommended in this operation specification accordingly. Please users make a choice according to practical conditions.

5、 The tractor can be only manipulated, maintained and repaired by persons familiar with characteristics of tractor, and relevant safe operation knowledge.

6、 Drivers must have the license of agricultural vehicles and tractors issued by local traffic department.

7、 Local safety rules and road traffic regulations shall be observed at any time for fear of unexpected accident.

8、 Tractor shall be used in accordance with requirements of this operation specification; Otherwise, it will probably lead to degradation or failure of tractor.

9、 This operation specification is not a quality warranty. Therefore users must not put forward any requirements on the basis of data, illustration or instruction in the operation specification.

10、 The contents said in this operation specification shall be subject to the published product structure. The contents are subject to change without further notice. Please users pay attention to it.

11、 The products in operation specification accord with the up-to-date standard before the date of manufacturing.

General Description

General Description

The operation specification introduces in detail the safe operation rules, operation precautions, main technical specification, and methods of wearing, operation, technical maintenance, adjustment, and trouble clearing etc. of series 80 of wheeled tractors for reference of tractor drivers and .service man.

In this operation specification, safety sign  indicate important safety information. When seeing this sign, please pay attention to it to avoid possible injury. Read carefully the following information of the sign and inform other operators of it.

 Warning: denote that if not avoided, there will possibly be potential danger, such as casualties or serious personal injury.

 Attention: denote that if not avoided, there will be potential danger such as low and medium degree personal injury.

 Warning: denote that if not avoided, there will possibly be machinery breakdown or damage to environment.

Note: specifying supplementary information.

This operation specification is an important part of products. It will be supplied to users along with tractors. Pleas users keep it properly.

In case of incomprehension of part in the operation specification, you can dial service hotline for consultation.

Intended Use

This series of wheeled tractors are multipurpose agricultural wheeled tractors. This type of tractors is characterized by compact structure, convenience manipulation, flexible steering, great tractive force, wide application, and maintenance and repair convenience etc. if fitted with appropriate agricultural implements, the tractors will be able to conduct plowing, harrowing, sowing and harvesting operations etc. fitted with a trailer, they can be used for agricultural transportation; trailer and tractor mass ratio (specific value between gross mass of trailer and unladen mass of tractor) shall not be more than 3. By power output shaft, they can be coupled with straw returning machine to conduct straw returning operation. They can be also used as motive power of water pump and threshing machine. Please fit agricultural implements correctly as required in this operation specification for the sake of maximum economic benefit. Users shall closely comply with prescribed service, maintenance and repair conditions of manufactory, as well as basic requirements for intended use. The use for other operation will deviate from intended use of tractors.

The tractors can be only operated, maintained and repaired by persons familiar with their characteristics, as well as relevant safe operation knowledge.

Users must comply with the rules against unexpected accident, other safety regulations and road traffic regulations at any time.

Manufactory shall assume no responsibility for degradation of reliability, machinery breakdown or personal injury caused from random modification, or use for the operation going against intended use of tractors.

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1. Safety Notes

1.1 Safety regulations and notes for use

Please carefully read the following information before operation

1. Must be fully read and understand the operator's manuals and safety warning signs;
2. Must be remembered the correct operation and working method.

Qualified operator

1. When operating the machine, the operator must have enough judgment;
2. Those who feel unwell or suffer from sleep insufficiency, those who are intoxicated, pregnant woman, those who are color-blind and those who are below 18 years old shall not operate the machine;
3. The driver shall obtain a driving license after receiving the special training, and shall receive the examination and check on time.
4. Before getting familiar with the operation, the operators who operate the machine for the first time shall make the machine run at a low speed.

Clothing appropriate for driver

When operation, the driver shall wear suitable and close-fitting work clothes, and shall not baggy coat and shirt, or wear a tie.

Oil use

1. The fuel is inflammable, so smoking and fire shall be prohibited when use.
2. Before oil is filled into the fuel tank, the engine shall be stopped;
3. No smoking when oiling and inspection & repair of fuel system;
4. When the fuel or machine oil overflows, please clean it out with a clean rag;
5. The quality of fuel and lubricating oil shall strictly comply with the requirements of the "appendix".

Placement of waste oil

1. The replaced machine oil is waste oil, and it shall not be discarded randomly;
2. The replaced storage battery acid will cause environmental pollution, and it shall not be dumped randomly.

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When the pipeline has leakage phenomenon

Do not directly contact the high pressure oil leaking out from the oil pipe with hands; thick paper or wood board can be used to detect the possible positions suffering from leakage.

Emergency response

1. When there is brake failure, stabilize the steering wheel, and immediately stop the machine after reaching a safe place, and stop the engine;
2. When the steering wheel has a failure, brake immediately and then stop the engine;
3. When the machine catches fire, immediately stop the engine. If there is fire extinguisher, spray downwards by making the fire extinguisher aim at the flame root; if there is no fire extinguisher, can put out the fire with sand.
4. After a safety accident occurs, the emergency call of local emergency center, hospital or fire department shall be made immediately according to the actual conditions.



Warning:

1. **For your life safety and property safety and for your relatives' happiness, please operate safely.**
2. **Before the tractor is started, observe if there is any barrier on the road, and if there is person between the tractor and agricultural implement/ trailer; and whistling sound shall be made for warning, so as to prevent accident and risk caused by sudden start of the tractor;**
3. **Do not start and operate the tractor by leaving the driver's seat. When the tractor is started, it shall be ensured that the gear shift levers are at the neutral position; the power take off operating handle and the front drive operating handle are at the separation status; and the lifter operating handle is at the neutral position, so as to prevent accident and risk caused by sudden start of the tractor;**
4. **The engine shall not be started by bridging of short circuit terminal, otherwise when the gear box is put into gear, the tractor will move automatically, which may cause accident and risk;**
5. **The motion of pedals shall not be hindered, and all the pedals must be able to return to the normal position without being hindered. The things that may hinder the pedal stroke shall not be placed under the floor and pedal, and the articles that may roll or slide when the pedal is treaded shall not be placed. Additional foot carpet or other cushions shall not be placed around the pedals, so as to prevent the risks caused by the pedal action. The lever shall be at the neutral position; the power take off operating handle and the front drive operating handle are at the separation status; lifter;**

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6. Nobody shall get on/off the tractor when the tractor is moving; and nobody shall be under the tractor when the engine is running; Inspection and repair shall be performed to prevent accident and risk;

7. After tractor is stopped, before getting off the tractor, the driver must draw out the key; make the gear shift levers turned to the neutral position; and lock the brake handle for parking, so as to prevent accident and risk caused by sudden start of the tractor that may lead to auto action (out of control);

8. When transport, the left and right brake pedals must be interlocked, and the speed shall be reasonably controlled; when passing through culverts and bridges, notice whether the stipulated height is exceeded; when making a turn, sufficient deceleration shall be made in advance, so as to prevent accident (turnover, crash);

9. When uphill or downhill driving, the minimum gear stage shall be used, and the throttle control shall be reasonably applied. It is forbidden to make the tractor downhill with the gear shift at neutral position or by treading the clutch pedal; and it is forbidden to perform gear shift when uphill or downhill, so as to prevent turnover risk;

10. The tractor shall not make a sharp turn when high-speed driving, and the sharp turn shall not be made by adopting unilateral braking, so as to prevent turnover risk;

11. Pay attention to traffic signs when driving the tractor on road, and the traffic rules shall be well complied with, so as to prevent turnover risk;

12. When transfer, the traffic rules shall be well complied with; and the distance between two vehicles shall be 60m at least, so as to prevent accident and risk (crash);

13. The road bed near trench, hole and dike is vulnerable and the weight of the tractor may damage it, so please detour, or accident and risk may be caused;

14. The tractor shall not be used under overload conditions, so as to prevent overload of machine members (which may cause machine damage and even personal injury);

15. There shall be proper lighting equipment when night work of tractor, so as to prevent the working effect of the tractor from being affected and prevent accident and risk;

16. When the tractor is performing reaping or backyard operation, spark annihilator shall be installed on the exhaust pipe, so as to prevent fire risk;

17. When operation in rainy and snowy days, the running speed must be reduced, so as to prevent the turnover risk caused by sloppy road and ground;

18. When power take off operation, it must be ensured that the connection and protection are reliable, so as to prevent movable parts from loosening (which may cause personal injury);

19. When connection and traction of implements, it must be ensured that all the hinge pins are reliably and firmly connected, so as to prevent the crash risk caused by falling hinge pins. When loosening and articulation of implements, it shall be ensured that the

Safety Notes

hinge pins are at separation status, so as to avoid machine damage and personal injury caused by unclear separation;

20. When lifting, pay attention to the control over the engine throttle, so as to prevent machine damage and personal injury caused to too high lifting speed;

21. When charging of storage battery, it shall be guaranteed that the exhaust hole of the filling piston is unblocked; and it shall be kept away from open fire. The power supply shall be cut off firstly after the charging is completed, so as to prevent explosion;

22. The safety height allowed by high voltage transmission line shall be strictly complied with, so as to prevent accident and risk;

23. When the tractor performs such operations as reaping, threshing and transport of inflammable materials, fire extinguisher shall be provided, so as to prevent fire accident;

24. Failure warning sign shall be prepared by user when the tractor performs transport operation. When the tractor has failure and it is necessary to repair, the failure warning sign shall be placed at the coming direction, so as to warn other vehicles of the repair and prevent risk;



Notes:

1. The bolts, nuts and other parts that are liable to loosen at connection positions (such as the fixing nut of front and rear drive wheel, connecting nut of steering rod, tight nut of steering wheel, etc.) shall be inspected frequently, and they shall be screwed down in time in case of any looseness, so as to prevent accident and risk;

2. Power take off shaft safety cover shall be installed during the running of the power take off shaft of the tractor, and personnel shall not approach the power take off shaft. When the power take off shaft is loaded, the tractor shall not make a sharp turn, so as to prevent the damage of cardan joint or the power take off shaft of the tractor. When the power take off shaft is not used, the handle shall be at the separation position, so as to prevent accident and risk;

3. After the tractor is stopped, before flameout of the engine, the driver shall not leave the tractor, so as to prevent accident and risk caused by sudden start of the tractor that may lead to auto action (out of control);

4. When the tractor has to be stopped at an inclined slope, the manual brake handle shall be at work status; the engine shall be stopped and put into gear (uphill position: forward gear; downhill position: back gear). Parking braking must be used and triangular brake shoe shall be used to stop up the rear wheels, so as to prevent accident caused by auto action (out of control) of tractor;

5. The installation and adjustment of tire only can be carried out by experienced

Safety Notes

professionals with proper special tools, and serious accidents will be caused if the tire is not properly installed;

6. When the water tank is cleaned, the engine shall be stopped firstly, and the cleaning shall be performed after the water tank cools, so as to prevent scald accident and damage of water tank;

7. Before installation and use of parts and connected implements, please pay attention to your safety and carefully read the safety signs and user manual.

Important notes:

1. For the newly delivered tractor and the tractor given heavy repair, wear in must be carried out according to the requirements for tractor;

2. The various solutions used for the tractor shall be used according to requirements. The fuel shall precipitate for at least 48h for purification; the lubricating oil used for drive system only can be filled after being filtered by the oil filter that has the same filter fineness with that of lifter.

3. Before the tractor is started, the oil circuit, circuit and cooling water shall be inspected; pay attention to the indications of instruments after start.

4. Before the power take off shaft is used to drive the agricultural implement, the matching reasonableness between the tractor and the driven agricultural implement shall be inspected. When farming, the included angle between the power take off shaft and the cardan joint drive shaft shall be no larger than 15°; when the hydraulic control is normal, after the agricultural implement is lifted when turning, the included angle between the power take off shaft, the output shaft of agricultural implement and drive shaft shall be no larger than 20°. It is forbidden to make the rotary cultivator inserted into soil before the power take off shaft is connected, or the damage of rotary cultivator and serious damage of tractor clutch will be caused (to improve the working efficiency, it is unnecessary to cut off the power source when making a turn, but the lifting height of the implements must be about 200mm (from ground));

5. When the agricultural implement is hung on the tractor for transfer, the agricultural implement position shall be locked; when the driver leaves the tractor, the agricultural implement must be lowered to ground;

6. If the temperature in winter is below 0°C, anti-freeze fluid must be used;

7. The front drive axle of tractor is only used when field work and tire skid on sloppy road; It shall not be used under other circumstances, or premature wear of tire and drive system is liable to occur;

8. During the running of tractor, the driver's feet shall not place on the brake pedal and clutch pedal, so as to prevent the early damage of brake or clutch;

Safety Notes

9. When the agricultural implement is hung on the tractor for transfer, the upper pull rod of the suspension device shall be adjusted to the shortest status, and the limit rod shall be adjusted to prevent the left-right swing of the agricultural implement. In the meantime, the locking nut of the upper pull rod and limit rod shall be screwed down, so as to ensure safety and prevent the risk in damage of machine and agricultural implement;

10. The parts meeting quality requirements shall be used for tractor repair.

Unscrew the radiator cover

When the engine is still at hot status, you shall be careful to unscrew the radiator cover. After several minutes' idle running, make the radiator cover unscrewed to the first stage position after the engine is stopped and cools; and screw it out after the pressured is released.

When repair of electrical parts

1. Make the switch key of the electric lock drawn out.
2. Electrical repair only can be performed after the earth wire is disconnected with storage battery.

When the tractor has abnormal phenomenon

1. The tractor shall not work under faulty conditions. In particular, if there are such phenomena as zero oil pressure, too low oil pressure, over high water temperature and abnormal sound, the tractor shall be stopped immediately for inspection, eliminating the fault.

2. The engine shall be stopped when lubrication for maintenance and adjustment on farmland.

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1.2 Safety warning signs



Notes:

1. The safety warning signs must be kept clear and legible; if they are dirty, wash them with soap water, or clean them with soft rag;
2. If the safety warning signs are lost or unclear, contact the distribution department or manufacturer in time for replacement;
3. If the parts with safety warning signs are to be replaced, then the safety warning signs also shall be replaced when the parts are replaced;
4. The contents of safety warning signs involve personal safety, so they shall be well implemented.

Meaning:

It is forbidden to sit at the non-passenger position of the tractor, or falling accident may occur!

Application position:

Middle position of left and right fender boards.



Figure1-1 Safety warning signs

Meaning:

Certain distance shall be kept with the hot machine surface during the machine operation, or scald accident may be caused!

Application position:

Outside of silencer.

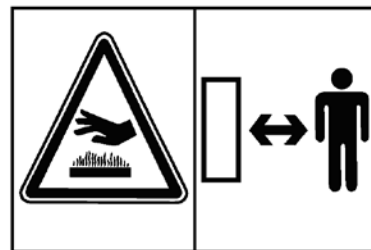


Figure1-2 Safety warning signs

Safety Notes

Meaning:

When the lifting lever control mechanism works, keep away from the lifting area or personal injury may be caused!

Application position: Rear side of left fender board.



Figure1-3 Safety warning signs

Meaning:

Before the tractor is repaired, maintained and adjusted, stop the engine and draw out the key according to the requirements of the user manual!

Application position:

Right side of instrumentation console.



Figure1-4 Safety warning signs

Meaning:

The driver must start the engine while sitting on the driver's seat.

Application position:

Right side of instrumentation console.



Figure1-5 Safety warning signs

Safety Notes

Meaning:

Please read the operator's manuals to understand the meaning of the letterless signs.

Application position:

Left side of instrumentation console



Figure1-6 Safety warning signs

Meaning:

Lock-up sign of differential lock.

Application position: Inside of right fender board.



Figure1-8 Safety warning signs

Meaning :

1. It should be far from power, when PTO works.
2. It should be stop controlling, when PTO shaft connect agricultural implements.

Application position: Near the PTO shaft



图 1-8 Safety warning signs

Safety Notes

Meaning:

1. Make sure the gear lever in the neutral position before starting tractors.
2. Make sure lock the left and right driving pedal

Application position:

Foreside of right fender boards

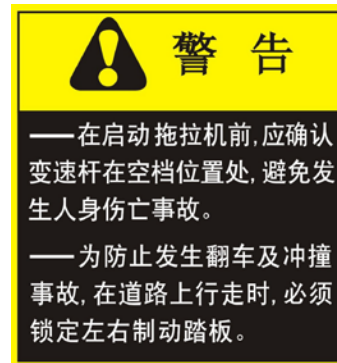


Figure1-11 Safety warning signs

Meaning:

Make sure the power source separate with battery,
When repairing electric parts; Driver mustn't press
braking pedal and clutch pedal when tractors driving.

Application position:

Foreside of right fender board.



Figure1-12 Safety warning signs

Meaning:

Mustn't near fire to protect make a fire disaster.

Application position:

Foreside of right fender board.



Figure1-13 Safety warning signs

Safety Notes

Meaning:

Must make park braking after parking.

Application position:

Near parking braking control handle.



Figure1-14 Safety warning signs

Meaning:

1. It should far from lifter region, when controlling hydraulic lifters.
2. Three point suspension device is only used for its matching agricultural implements.

Application position: Rear side of left fender board.



Figure1-15 Safety warning signs

Meaning:

1. It should far from lifter region, when controlling hydraulic lifters.
2. Three point suspension device is only used for its matching agricultural implements.

Application position:

Foreside of left fender board.



Figure1-16 Safety warning signs

Safety Notes

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10. Appendix

10.1 Oil and solution for tractors

Table 10-1 Oil and solution for tractors

Engine oil: 20/50

Gearbox oil: 85/140

Hydraulic Oil: ISO68

Oil ring	National standard	GB/T 7324 General purpose lithium lubricating grease
	International standard	D-217 grease lubricant ,meet the requirements of National Lubricating Grease Institute (USA), viscosity grade: 2.
Brake system	National standard	The three-purpose oil for tractor transmission, hydraulic and brake system
	International standard	Viscosity grade :SAE 10W; Quality grade :API CD
Windshield	Used for wind shield cleaner. -10℃: --45# Antifreeze (SH/T0521)	

Important matters:

- 1. The three-purpose oil for tractor transmission, hydraulic and brake system, diesel oil, and diesel engine oil must go through at least 48h sedimentation before it is put into service.**
- 2. It is forbidden to mix oil of different grades and from different manufactures.**
- 3. In winter, the tractor with heating system or air-conditioning system must use antifreeze.**

10.2 Tightening torque table of main bolts and nuts

Table 10-2 Tightening torque table of main bolts and nuts

Connection Parts	Thread specification	Tightening Torque(N·m)
Connecting bolts and nuts between engine and gearbox housing	M10	60-70
Connecting bolts and nuts between engine and gearbox housing	M12×1.5	90-110
Connecting bolts and nuts between engine and gearbox housing	M14×1.5	122-149
Connecting bolts and nuts between engine and gearbox housing	M16×1.5	182-222
Connecting bolts between gear box and rear axle housing	M12×1.5	90-110
Connecting bolts between gear box and rear axle housing	M16×1.5	182-222

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Connecting bolts between engine and clutch	M10	65-79
Large bevel gear bolts	M14×1.5	160-200
Connecting bolts between driving shaft housing and rear axle housing	M14×1.5	160-200
Connecting bolts between driving wheel hub and wheel plate	M18×1.5	397-457
Connecting bolts between front wheel hub and wheel plate	M16×1.5	200-260
Connecting bolts between front support and engine	M16	182-245
Left and right steering arm nuts	M14×1.5	140-205
Connecting nuts between steering circle and steering column	M16×1.5	130-150
Connecting bolts between oil cylinder head and lifter housing	M18×1.5	200-260
Steering oil cylinder end fixed pin nuts	M18×1.5	300-330
Connecting bolts between front rear swing pin bracket and front bracket	M18×1.5	182-245(392)
Connecting bolts between power adjusting seat and rear axle housing	M12×1.5	90-110
Connecting bolts and nuts between lift housing and rear axle housing	M12×1.5	90-110

Note: main bolts and nuts of tractor must be tightened with torque wrench.

10.3 Implements and accessories for wheel tractor

Table 10-4 implements and accessories for wheel tractor

Type	Matching Implements	Model	Main Technical Parameter
Plough machinery	Three-share mounted plow	1L-335	Plowing depth 22-28cm
	Three-share turn mounted plow	1LF-335	
	Three-share amplitude mounted plow	1LT-335	Plowing depth 22-28cm
	Five-share mounted plow	1L-525	Plowing depth 1-24cm
	Six-share mounted plow	1L-627	Plowing depth 16-20cm
	Seven-share mounted plow	1L-727	Plowing depth 16-20cm

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	Hydraulic mounted plow	1LF-430/335	Plowing depth 20-26cm
	Deeply shallow plow	1LH-435/430	Plowing depth 30-35cm
	Deeply shallow plow	1FSL-435	Plowing depth 30-35cm
	Various speed rotary plow	1GQNB-200/230	Plowing depth 12-15cm
	Rotary plow	J	Plowing depth 12-15cm
Scarification equipment	20-disc suspension harrow	1BJX-2.2	Harrowing depth 12-14cm
	24-disc half-suspension harrow	1BJBX-2.5	Harrowing depth 12-14cm
	Light mounted 28-disc suspension harrow	1BQX-3.1	Harrowing depth 12-14cm
	Light mounted 24-disc suspension harrow	1BZBX-2.0/2.5	Harrowing depth 14-16cm
Straw returning machine	Straw shredding returning machine	4JH-180	Working width: 1.8m/2.0m Stubble height: 2-8cm
		4JHY-1.8/2.0	
		4JH-1.8/2.0	
Trailer	Agricultural trailer	7C-7	Load capacity: 7t
	Agricultural side-tipping trailer	7C-7	

Warning:

1. Before buying agricultural machinery, select initially the types of matching agricultural implements in reference to the list according to operational conditions (soil resistance and agricultural requirements etc.) of operation area, and consult the dealer.

2. Lease determine model of agricultural implements and other main technical parameters according to power of tractor, operational conditions (soil resistance and agricultural requirements etc.) of operation area as well as advisory opinions so as to achieve reasonable matching. In case of

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unreasonable matching, it will bring adverse effect on the unit.

3. Please users determine operating speed and working width etc. according to local operational conditions for fear of influence on operation efficiency and service performance of machinery.

2. Operation Instruction

The proper operation of the tractor can make the performance of the tractor fully exerted, reduce the tractor abrasion and accident, and guarantee that the operation on farmland and road is completed in high-quality, high-efficiency, and low-consumption and safely by the operator.

2.1 Product description

The use, technical maintenance, adjustment, faults and troubleshooting method of the series tractors are described in the manual.

The series wheeled tractor, which is a kind of multi-purpose medium-sized agricultural wheeled tractor, is featured by compact structure, convenient for manipulation, flexible steering, large traction force, convenient for repair and maintenance.

2.2 Operating mechanism and instrument of tractor

2.2.1 Operating mechanism of tractor

The operating mechanism is arranged at the middle position of the tractor and the front, back, left and right side of the driver.

1. Power take off operating handle (left rear side of driver)
2. Front drive operating handle (left front side of driver)
3. Clutch pedal (front face and left side of driver)
4. Flameout wire handle (front face and left side of driver)
5. Left and right brake pedal (front face and right side of driver)
6. Foot throttle operating handle (right front side of driver)
7. Riser operating handle(right side of the driver, near the seat)
8. Hydraulic out put operating handle (right side of riser operating handle)
9. Main gear shift lever (right side of driver)
10. Sub gear shift lever (right side of driver)
11. Hand throttle operating handle (right side of driver)

2.2.2 Instrument and switches

The instrument cluster includes tachometer (including hour meter), fuel gauge, water temperature gauge, pressure indicator, left and right direction indicator lamp, high beam lamp, charge lamp, too low oil pressure indicator lamp, preheat indicator lamp, position indicator lamp, parking braking indicator lamp, etc.

Operation Instruction

2.3 Start of engine



Notes:

Before use, the tractor shall be subject to careful and full inspection, so as to eliminate hidden trouble and effectively prevent the occurrence of risk and accident.

2.3.1 Preparation before start of engine

- Careful inspection shall be performed before start. The connection of various parts shall be firm and reliable; the operating mechanisms shall be able to work normally; the pipe joints of various parts shall be screwed down without such phenomenon as oil leakage, water leakage or air leakage;
- Inspect the lubricating oil level in the engine oil sump, tractor gear box-rear axle and the hydraulic system. Sufficient cooling water shall be filled into the radiator of water tank; and there shall be enough fuel in the fuel tank;
- Make the oil circuit switch handle of the fuel tank turned to the relevant consequent position, making the fuel oil circuit at the connected position;
- Inspect the gear box operating lever and power take off operating handle; make the main gear shift lever, power take off operating handle and front drive operating handle placed at the neutral position, and make the lifter handle placed at drop position.
- The hand throttle shall be at half-open status (half throttle position);
- Pull the flameout stay wire locking device, let the flameout stay wire relax, at this time, the oil injection pump in a position of oil supply.
- For the new tractor, the tractor given heavy repair or the tractor that has not been used for a long time, before start, the air in the oil circuit shall be removed firstly, so as to guarantee the smooth start of the diesel engine. The method is as follows: first, unscrew the air bleed screw of diesel filter; press the pump with hand; oil pumping will make the air in the oil circuit from the oil tank to diesel filter exhausted until the discharged fuel has no bubble. Then, screw down the air bleed screw of the diesel filter, and bleed air with the same method until the discharged fuel has no bubble.
- Put the key into starting switch.

Important notes:

1. The sundries in the water tank meshes shall be cleaned away periodically, so as to prevent the failure of engine caused by poor heat dissipation;

2. When the tractor carries out field work under poor heat dissipation conditions, to guarantee the long-time continuous work of the engine, it is suggested to make auxiliary

Operation Instruction

heat dissipation device installed at the proper position of the tractor.

2.3.2 Start of engine



Notes:

Before the engine is started, shall be ensured that the main and sub gear shift levers and the front drive operating lever are at the neutral position; and the lifter operating lever is at drop position, so as to prevent accident and risk caused by sudden start of the tractor.

Important notes:

1. After the engine is started, loosen your grip immediately to let the key automatically rebound to “ON” position, otherwise the started engine will drive the start of motor, which will cause motor damage;
2. The continual start time of each time shall not exceed 5s, and the start interval shall be 15s at least. To maintain the charge performance of the storage battery, the continual start times shall not exceed 3. If the start fails after three times' continual start, find out the reasons and then start again.

Start of storage battery:

- Start under normal temperature (above -5℃): Make the key rotated to “ON” position at clockwise direction to connect the circuit; then, make the key rotated to “ST” position to start the engine; after the engine is started, loosen your grip immediately to let the key automatically rebound to “ON” position. If there is safe start switch, then the main clutch pedal shall be treaded firstly, and then rotate the key to start the engine.
- Start under low temperature (below -5℃): In cold winter, before the engine is started, the hot water of above 90℃ shall be added into the water tank; close the water drain valve until hot water flows from the water drain valve of the cylinder, and then make the whole cooling system filled with hot water. Make the machine oil in the oil sump discharged (it is better to make the oil discharged when flameout of last time); make the oil dumped into a container with a cover and heated to (70-90) °C, and then make the oil filled into the oil sump. It is forbidden to bake the oil sump with fire.
- Starting of tractor by traction: When is starting of tractor by traction, it is using high III shift or high IV shift. To assure the safety, the speed is not higher than 15km/h.

Important notes: When the start is performed by making use of pull tractor, once the engine runs, the main clutch pedal shall be treaded immediately and the throttle should

Operation Instruction

reduced, so as to prevent the engine flameout.

2.3.3 Operation of engine

- After the engine is started, the throttle shall be reduced immediately to make the engine at idle running status. Inspect the engine oil pressure at this time; it shall be ensured that the machine oil pressure is no less than 98 kPa. At this time, the oil pressure indicator lamp goes out.
- After the engine is started, full-load running shall not be performed immediately; and the engine shall be subject to intermediate speed no-load running for heating. When the temperature of the cooling liquid is above 60°C, the revolution speed can be increased to the maximum speed for full-load running.
- The revolution speed and load of engine shall be slowly increased or reduced. In particular, for the engine that is just started, sudden high speed running is unallowable.
- When engine running, the pressure of machine oil and temperature of cooling liquid shall be inspected frequently.

2.4 Start of tractor

- When the engine is under low speed status, tread the clutch pedal, and then make the gear shift lever of gear box placed at the needed stage;
- Push the locating detent rocker arm downwards, and loosen the parking brake;
- Whistling sound shall be made and observe whether there is barrier around;
- Gradually increase the revolution speed of engine and slowly loosen the clutch pedal to make the tractor start smoothly. After the tractor starts moving, quickly loosen the clutch pedal, so as to avoid the slipping of clutch.
- Gradually increase the throttle to make the tractor reach the needed working speed;
- During the use process, the driving speed of tractor shall not be reduced by adopting the method of semi-combination of clutch. During the driving process, the feet shall not be always placed on the clutch pedal, so as to avoid the accelerated abrasion of disengaging lever and friction plate. Clutch pedal; avoid the slipping of clutch.

Important notes:

- 1. To prevent collision of teeth of drive gear of gear box and the early damage of clutch, high stage start is forbidden;**
- 2. The parking brake must be loosened before the tractor starts moving, so as to prevent the damage of other working parts;**
- 3. When putting into gear or gear shift, the clutch pedal must be treaded to separate the**

Operation Instruction

main clutch, so as to prevent collision of teeth of drive gear of gear box and the early damage of clutch.

2.5 Steering of tractor

When steering of tractor on road, the horn switch on the instrument panel shall be operated firstly; whistling sound shall be made for warning, and then make a turn. If the speed is high, reduce the speed firstly. In case of shallow turn, steer early and slowly; in case of sharp turn, steer late and quickly.

When the tractor have little steering or steering on the soft field, because of the front wheel side slip cause the steering unavailable , can steering the steering wheel and tread the pedal at the same time to help steering.



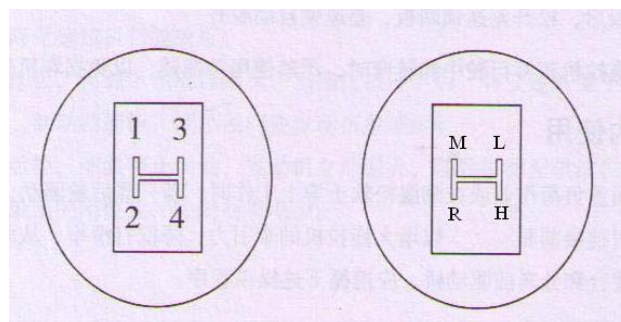
Warning:

1. When the tractor is driving at a high speed, making a sharp turn by adopting unilateral braking is unallowable. When the front wheel make a wide turn, if there is squeak when the safety valve works, the steering wheel shall be withdrawn a little, so as to avoid the damage caused by long-time overload of hydraulic steering system and steering failure accident;

2. When making a turn or head back during field work, the working parts of agricultural implement inserted into soil must be lifted above ground, so as to avoid damage of agricultural implement or personal injury.

2.6 Gear shift of tractor

The main and sub gear shift is respectively operated by 2 operating levers, realizing 12 forward shift stages and 4 reverse gear stages. The main gear shift lever may get 4 gears (1, 2, 3, 4); the sub gear shift lever may get 3 forward speed areas (L: low speed area, M: medium speed area, H: high speed area) and 1Reverse area: R.



Main gear shift lever A Sub gear shift lever B

Operation Instruction

Figure 2-1 Gear shift of tractor

Tread the main clutch pedal; operate the sub gear shift lever B to make it pushed leftwards from the neutral position; and then pushed forwards to get the Medium stage M; if it is pushed backwards, then Reverse stage R will be gotten. If it is pushed rightwards from the neutral position and then pushed forwards, then Low stage L will be gotten; if it is pushed backwards, then high stage H will be gotten

Tread the main clutch pedal; make the main gear shift lever A moved leftwards from the neutral position; and then pushed backwards to get stage 2; and stage 1 will be gotten if it is pushed forwards. If it is moved rightwards from the neutral position and then pushed backwards, stage 4 will be gotten; and stage 3 will be gotten if it is pushed forwards.

The optimal production efficiency and economical efficiency can be obtained if the proper driving speed of tractor is selected, and the service life of the tractor can be prolonged. The tractor shall not often work under overload condition, and the engine shall have certain power reserve. As to selection of driving speed when working in the field, the diesel engine shall work under about 80% load. When the tractor works under light load and the driving speed is not high, High 1 stage small throttle work can be selected to save fuel.

The basic gear stage for field work: Low stage 4, medium stage 1, 2 and 3 for plough; low stage 1, 2 and 3 for rotary tillage. Low stage 4, medium stage 2 and low stage 3 for harrowing. When the diesel engine is deep-voiced and has speed drop and black smoke during operation, it shall be changed over to low stage 1 and small throttle, so as to prevent tractor overload. When the load is light and the working speed shall not be too high, high stage 1 and small throttle can be selected, so as to save fuel.

Important notes:

- 1. When engine running, before gear shift, the main clutch pedal shall be treaded to floor, and the gear shift shall be performed after several seconds, so as to prevent poor engagement of sliding sleeve of gear box (which will lead to “collision of teeth”);**
- 2. The tractor only can be at back gear stage when it is still;**
- 3. Do not make the hands placed on the gear shift lever when the tractor is driving, or the hand pressure will be transmitted to the gear shift fork in the gear box, which will lead to premature wear of the shift fork.**

2.7 Operation of Differential Lock

During the operation or working process of tractor, if the tractor can not move forward due to sticking or the unilateral driving wheel is slipping, the differential lock can be connected according to the following steps to rigidly connect the left driving wheel and the right driving wheel so as to drive the tractor out of the slipping section at the same speed.

Operation Instruction

- Step on the main clutch pedal and operate the gear shift lever to change to low gear;
- Turn the throttle operating handle to the maximum oil-supply position;
- Step on the differential lock operating pedal by the right foot;
- Loosen the clutch pedal smoothly, so as to make the tractor start smoothly;
- Loosen the differential lock pedal after driving out of the slipping section, and the differential lock will be disengaged automatically.

Important matters: it is forbidden to use the differential lock when the tractor is driving normally and turning in case of damaging the machine component and wearing the acceleration tire.

2.8 Using of Front Drive Axle

This series of four-wheel drive tractor works in farm fields under heavy load or works on humid and soft soil; if only driven by the rear wheel, the traction property of the tractor may present insufficiently; at this time, hanging the front drive axle can increase the traction force of the tractor and reduce the slipping rate, thereby improving the working adaptability of the tractor. In order to be convenient for connecting and separating the front drive axle, the following operation procedures shall be followed:

2.8.1 Hanging of the Front Drive Axle

Step on the main clutch pedal, hang the position of the gear-box well, and then loose the clutch pedal slowly, wait for the slighting moving of the tractor and timely pull the front drive axle operation handle upward, so as to change two-wheel drive to four-wheel drive.

2.8.2 Disconnection of the Front Drive Axle

When it is necessary to disconnect the front drive axle, step on the main clutch pedal and push the front axle operation handle downward, so as to separate the front drive axle

Important matters:

1. When the tractor is conveying on a hard roadway for ordinary transportation, it is forbidden to connect the front drive axle, otherwise it will cause early stage abrasion of the front wheel and increase oil consumption. Only when the roadway is slipping and the back wheel can easily slip after climbing large slope during raining or snowing day, the front drive axle be connected. After the tractor drives out of the difficult section, the front drive axle shall be separated.

2. When the tractor is conveying, the front tyre wears faster and the tyre treads at the left and right side of the tyre wear unevenly; the left tyre and right tyre can be exchanged for use according to the condition.

Operation Instruction

2.9 Braking of the Tractor

Generally, firstly decrease the throttle, step on the clutch pedal, and then gradually step on the brake pedal according to the condition to steadily pause the tractor.

For emergency stop, you shall simultaneously step on the clutch and the brake pedal and cannot solely step on the brake pedal, so as to prevent rapid abrasion of the brake friction plate or causing engine stop.

When a trailer is added for braking, you shall adjust the length of the brake valve hang rod to firstly brake the trailer and then brake the main engine.

When the tractor is running on road, you shall lock the left brake pedal and the right brake pedal together by the chain board.



Warning:

1. Before departure of each time, you shall uniformly check the oil level of the brake oil tank as well as whether there is oil leakage generated at the brake piping or not; if the oil level of the oil tank is too low or there is oil leakage generated at the brake piping, you shall timely find out the reason, repair it, otherwise major incident like brake failure will be raised.

2. When the tractor is running on road, you must interlock the left brake pedal and the right brake pedal together, so as to prevent off tracking and even overturning of the tractor when braking.

2.10 Stopping of Tractor Stop and Flameout of Engine

Flameout of the tractor and stopping of the tractor shall follow the following procedures:

- Decrease the throttle, and reduce the running speed of the tractor.
- Step on the clutch pedal, then step on the brake pedal and place the gear shift lever at the position of neutral gear after the tractor stops
- Loosen the clutch and brake pedal, and then decrease the throttle to lead the engine run under idle speed.
- Pull the flameout pull rod back, the oil pump stops supplying oil and the engine shuts down immediately, and then push it to the position of oil supply
- Turn the power switch to the off position, and shut down all the power sources.

Operation Instruction



Notices:

1. After stopping and before flameout of the engine, the driver is forbidden to leave the tractor, so as to prevent the tractor from starting suddenly, which will cause accidental risk.
2. If the tractor must stop at a slope land, you shall engage the gear (engage the forward gear at upslope position, and engage the backward gear at downslope position), and must use parking brake and plug the back wheels by triangle brake shoes, so as to prevent the tractor from suddenly starting and out of control automatically, which will cause accidental risk.

Important matters:

1. When the temperature is lower than zero DEG in winter, turn on the drain valve of the water tank and the drain switch of the engine of the tractor, which does not use antifreeze when the engine is running under idle speed, to discharge cooling water out, and then shut down the engine, so as to prevent freezing of the cooling water which will crack the engine body through frosting;
2. After discharging water in winter, in order to prevent residual water in the outlet pipe of the water tank from cracking the water pipe through frosting, suggest the user to turn on the water discharge switch of the engine after the engine stops, position the flameout handle at the position of flameout and drag the engine to run 2 to 3 times for 15 second with a interval of 2 to 3 minutes, so as to prevent discharging all of the water in the water pipe.

2.11 Adjusting of tread

2.11.1 Front wheel tread adjusting:

2.11.1.1 Front Driving wheel treads adjusting:

According to change the connect position of radials and rims, can get different wheel tread.

2.11.2 Rear Driving wheel treads adjusting:

According to change the connect position of radials, hubs and rims, can get different wheel tread.

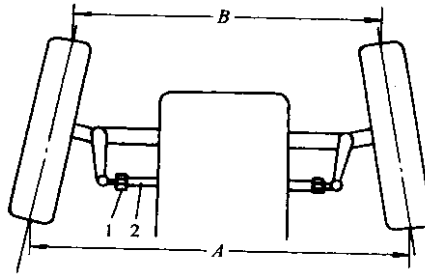
Note:

1. When rear wheel tread was adjusted, maybe it will cause the rear ballast can't be used, the user should have choice very carefully.
2. When adjusting the rear wheels, should make the tyre upper signal or the pattern shape type direct to the tractor forward direction, the 2 front wheels and rear wheels should always symmetry with tractor centre line. When adjusting, should choose proper rear wheel tread, then choose front wheel tread.

2.11.3 Inspection of Front axle toe-in.

Operation Instruction

Front wheel toe-in is 0-10mm, the number can be measured from two inside rims. Rotating tie rod is adjusting front axle toe-in.



Picture 2-2 Adjusting of front wheel toe-in

2.12 Using, Dismounting and Mounting of Tyre

2.12.1 Using of Tyre

Tyre is the main wearing part of the tractor; and attention must be paid to the using and maintenance of the tyre, so as to possibly prolong the service life.

All the tyres have regulated load values; overburden will deform the tyre excessively, bend the tyre side excessively and crack the tyre easily; moreover, glue will be easily separated from the tyre body fabric and the buffer layer; the fabric layer is loosen until the tyre is broken, especially when the tractor is running on uneven roadway or is impacted by barrier, the tyre will be broken more easily.

The inflation pressure of the tyre must meet the regulations; both lower pressure and higher pressure will affect the service life of the tyre. Lower pressure will deform the tyre excessively, which will accelerate the wearing of the tread, and even quickly grind the tyre casing and cut off the inflating valve as well as increase the running resistance at the same time. If the pressure of the front tyre is too low, it needs more force to operate; higher inflating pressure will crack the tyre body because of excessive stretching, accelerate the wearing of the tread, and increase machine body vibration. The pressure of the tyre shall be properly lower when the tractor is working in farm field; and the pressure shall be properly higher if the tractor is running for road transportation for a long term. The tyre pressure shall be checked by barometer under normal temperature, so as to prevent inaccurate measurement because of heat emitting of the tyre after working. Improper driving operation will also lead the wear or damage of the tyre at an early period. Crossing barrier, at high speed, sudden brake or quick turn shall be prevented when running. Tyre slippage shall be avoided when the tractor is running on macadam.

Don't adhere chemical corrosive like oil, acid or alkali on the tyre when using and avoid insolation under burning sun as much as possible, so as to prevent ageing and modification of rubber. Regularly check whether the front wheel orientation and toe-in are right or not, so as to prevent eccentric wear of the tyre. When the wear of the tyre figure is uneven, exchange the left tyre and the right tyre for use.

Operation Instruction

Note: Four wheel tractors' front and rear wheel inflate pressure should be same, as to avoid wearing heavily.

2.12.2 Dismounting and Mounting of the Tyre

Dismounting of the tyre

Special tools shall be used for dismounting the tyre and it is forbidden to use hard tools (like screwdriver) and sledge hammer to beat the tyre, so as to prevent puncturing the tyre or damaging the tyre edge and rim section.

When dismounting the tyre, you shall discharge the air at first, and press the tyre edge at two sides of the tyre casing into the groove of the rim section; then use a crowbar to pry the tyre edge at one side out of the rim section from the position near the inflating valve; and then use two crowbars alternately pry the whole tyre edge out. After taking the inner tyre out, use the same method to pry out the tyre edge at the other side, and take down the tyre casing.

Mounting of the tyre

When mounting the tyre, firstly check whether the rim section and the tyre are matched or not, and there shall be no burrs and serious deformation at the edge of the rim section; then eliminate rust on the rim section, check whether there is breakage on the tyre or not. After wiping up each spare part, coat a thin layer of talcum powder between the inner tyre and the tyre casing during mounting. Lay the rim section flat, mount the tyre casing and step by foot or pry it into the rim section by crowbar.

Put the inner tyre in (slightly underlay the tyre casing) and use galvanized wire to fix the inflating valve in the inflating valve hole of the rim section to prevent slipping. Use a crowbar to pry one side of the tyre casing into the rim section (it will spend most force at the last section and use a hand hammer to slightly knock the crowbar). Finally, check whether the position of the inflating valve is inclined or not and whether the rim edge and the rim section are closely fitted or not. When inflating, recheck whether the inner tyre is broken or not by prying, inflate and at the same time knock the tyre casing by the hand hammer, after inflating to the regulated pressure, then discharge half of the air, so as to make the inner tyre expand normally and eliminate cockle phenomenon.

When mounting the tyre onto the tractor, you shall also pay attention to the direction of the tyre figure; otherwise, the adhering property and abrasion performance will be influenced, and mud will be deposited.



Warning: it is forbidden to dismount the connecting bolts of the tyre, the drive hub and the hub; otherwise they will fly out and hurt people.

Operation Instruction

2.13 Using of Balance Weight

2.13.1 Rear balance weight

When the tractor is working in farm field, the quantity of the balance weight can be selected according to different working patterns in order to improve the working performance of the tractor. Each piece of cast iron balance weight weighs 50kg, and at most 3 pieces can be mounted at one side (150kg).



Notice: Before dismounting the rear wheel which is provided with the rear balance weight from the tractor, you shall firstly dismount the back balance weight from the tyre, so as to prevent the risk of losing balance.

2.13.2 Front balance weight

In order to adjust the relation between the front balance weight and the back balance weight of the tractor, it is necessary to mount the front balance weight block at the front part of the tractor. For plough work under heavy load or hanging machines like large scale seeding machinery, in order to guarantee the head of the tractor does not raise and run safely, the front balance weight with sufficient weight must be mounted.

The front ballast weight 130Kg.

At most 10 pieces of cast iron front balance weights can be selected and mounted on the tractor [each piece weighs 40kg].



Notice: The rear parts of tractor match large agricultural machinery, to assure the safety, we must match enough front balance weight, otherwise the tractor will turn over.

2.14 Adjustment of the Driver's Seat

The driver can adjust the seat according to his/her height.

2.14.1 The front and rear adjustment of the Driver's Seat

Loosen the hexagon head bolts under driver's seat, in according to the drivers' height, then adjusting the driver's seat. After adjusted, fastening the hexagon head bolts.

2.14.2 The front and rear adjustment of the Driver's Seat

In according to the driver's height, weight adjusting cab's flywheel.



Notice:

Seat adjustment must be implemented when the tractor is under static condition, so as to prevent accidental risk.

Under the rough road surface circumstances, please note the stiffness of seat is not too soft.

2.15 Covering Panels of the Tractor

The covering panels mainly comprise an engine cover, a driving cab, a splash guard, an instrument desk, a floor, accessories, etc.

2.15.1 Engine cover

The engine cover of the tractor adopts a streamline move-in structure which has an elegant appearance.

2.15.2 Instrument desk

The electrical appliance switches and instrument clusters of the tractor are uniformly mounted on the instrument desk; and the instrument desk mainly takes the effects of bracket of the control switch as well as decoration and seal.

2.15.3 Cab (Options)

The cab of the tractor is manufactured by a framework which is welded by tubular-shaped profiled materials and inlayed by large area of spatial curved glass.

2.15.4 Fan of the cab (Options)

The cab is provided with interior trim and fan.

2.15.5 Interior trim of the cab (Options)

The interior trim comprises a splash guard interior trim, a floor mat, an instrument desk, an interior cresting, etc.

2.16 Using of the working device of the tractor

This series of tractors mainly have the working devices as follows: (Partially selected and installed)

- Hydraulic raiser:, shall preferentially adopt force position comprehensive adjustment when working with plough so as to guarantee the working effect.
- Hydraulic output device can be used for hydraulic reversible plow, hydraulic harrow, etc.;
- Suspension mechanism is mainly used for the hanging and connecting of hanging agricultural machineries.
- Power output device: is mainly used for agricultural machineries which needs power drive.

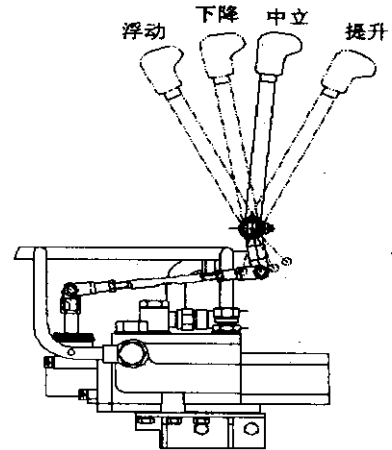
Operation Instruction

- Pendulum traction apparatus is mainly used for demand heavy duty harrow, mower, traction seeder, single axle trailer, etc.
- Traction frame is mainly used for double axle trailer, etc.

2.16.1 Operation of hydraulic raiser

Raiser of this series of tractor is of push-in-soil type, has the advantages of simple structure and strong practicability. The multi-way valve handle at the right side of the driver is the operation handle of the raiser.

- When the operation handle is turned to the forepart from the 'neutral' position (obviously feel that the operation handle is orientated), the suspension mechanism starts to rise; when it rise to the terminal, the operation handle automatically resets (go back to the neutral position);
- When the operation handle is held and turned backward from the 'neutral' position (at this time the operation is not at the final position), the suspension mechanism start to drop, at this time, if the operation handle is loosen, the operation handle will timely rebound to 'neutral' position, and the dropping will stop.
- When the operation handle is turned from the 'neutral' position to the final position (obviously feel the operation handle is orientated), the suspension mechanism is at 'float' condition after dropping to the final position.



Picture2-3

Using

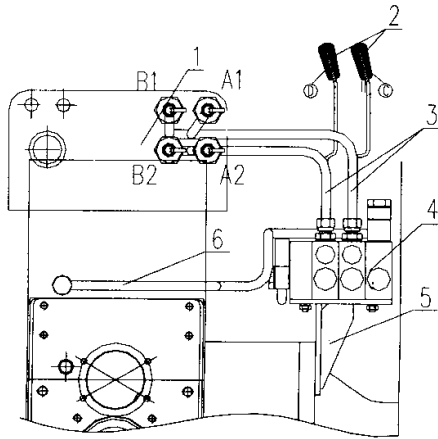
of hydraulic lifters

2.16.2 Operation and use of hydraulic output device

One group of hydraulic output can be selected for this series of tractors according to the necessity. The hydraulic output is provided with two quick-change coupler male connectors; when it is not used, it shall be covered well by sealed cap. When using, connect the backup female connector (put in the spare part case) and the male connector of the quick-change coupler and then communicate it with the oil inlet and oil outlet of the oil cylinder of hydraulic agricultural machinery. The hydraulic operation handle (on the multi-way valve assembly which is at the right side of the driver and is close to the right splash guard) controls the hydraulic output. The hydraulic output valve can achieve single action hydraulic output and double action hydraulic output through squashing in and squashing out the single action and double action transforming bolt which is arranged on the multi-way valve. Withershins twist to looser and exit the bolt can achieve hydraulic output of single action; on the contrary, to totally twist the bolt in can achieve double action

Operation Instruction

hydraulic output.



Picture 2-4 Hydraulic output device

- | | |
|----------|---------|
| 1.快换接头 | 4.多路阀总成 |
| 2.操纵手柄 | 5.多路阀支架 |
| 3.多路阀输油管 | 6.回油管总成 |

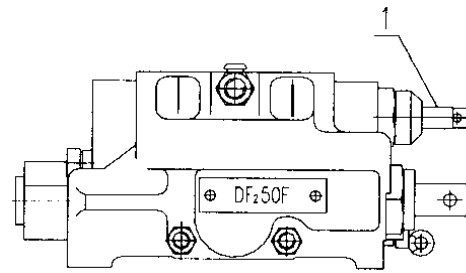


图 2-5 多路阀总成

- 1.单双作用转换螺钉“E”

When using hydraulic quick-change coupler to implement connection, the following work need to be finished at first, and then the female connector on the agricultural machinery can be inserted into connector assembly:

- Stop the engine;
- Drop the suspension agricultural machinery;
- Move the hydraulic output valve operation handle front and end, so as to eliminate pressure in the hydraulic quick-change connector assembly;
- Take down the seal cap of the quick-change connector, and clear the quick-change connector.

Important matters:

1. When the quick-change connector is not used, the assembly hole must be covered well by dust cover to prevent dust from entering;
2. The raiser and the hydraulic output valve can not be used simultaneously;
3. After the operation of the hydraulic output valve is finished, the operation handle must go back to the neutral position; otherwise overheating of the hydraulic system will be caused.

Important matters:

1. When tractor which is hanging suspension agricultural machinery is transferring a long distance, adjust the upper pull rod to the shortest position, and adjust the limit rod to prevent the agricultural machinery from swing left to right, simultaneously tighten the lock nut on the upper pull rod and the limit rod;
2. When the tractor is turning a corner at the edge of the field, the agricultural

Operation Instruction

machinery must be lift at first and then the tractor can turn, after entering straight line driving position, the agricultural machinery can be dropped.

2.16.3 Using of suspension mechanism

This series of tractor is connected with agricultural machinery by adopting a three-point linkage.

2.16.3.1 Connection of the lower pull rod

There are two connection holes on the lower pull rod and the lifting rod: front hole and back hole. Generally, the central hole will be connected during normal operation; however, the front hole shall be connected when the agricultural machinery needs to be hung and moved for a long distance.

The hole connecting the lower pull rod and the limit rod is the central hole.

2.16.3.2 Connecting of the lifting rod

Generally, the length of the lifting rod shall be adjusted at the central position. The adjustment of the left lifting rod and the right lifting rod shall be uniformly implemented through rotating the welding of the central lifting rod conduit. Rotate deasil and the lifting rod will be prolonged; conversely, the lifting rod will be shortened. To adjust the lifting rod is mainly to adjust the lateral level position of the agricultural machinery.

When tractors connect PTO driving agricultural implements, it should be considered that the rationality between tractors' suspension rod and agricultural implements. To reduce the included angle between PTO shaft with universal drive shaft, it is usually adjusting the lift rod to the longest.

Lift rod lower long hole connect with lower pull rod pin, it makes lower pull rod have a lot of lever adjustment. It is an advantage of using the widest type agricultural implements.

2.16.3.3 Connection of the upper pull rod

To adjust the height of the upper pull rod is mainly used to adjust the longitudinal horizontal position of the agricultural machinery and to adjust the consistency of the heights which are ploughed by the front plow and the back plow.

2.16.3.4 Adjustment of the limit rod

The limit rod is mainly used to limit the lateral oscillating quantity of the agricultural machinery (namely the lower pull rod). To insert the lock pin into the round hole at the front of the limit sleeve can fix the limit rod without moving. To rotate limit sleeve with threads can adjust the length of the limit rod. The round hole at the back side is a jack socket for placing the lock pin when adjusting the length of the limit rod.

The amount of movement of the limit rod can be selected according to the working type of the agricultural machinery. A certain amount of movement shall be maintained for the limit rod when the tractor is equipped with plow, harrow, etc, which can maintain the tractor with good operation performance. The limit rod shall be fixed without moving when the tractor is equipped with rotary

Operation Instruction

cultivator, mower, etc.

2.16.4 Operation of the power output device

The power output shaft of this series of tractor is of a postposition detached type, a synchronous type, an independent type.

2.16.4.1 Operation of the power output shaft

A synchronous type and an independent type power output shaft operated by power output shaft control handle.

1. When pulling up control handle, it is synchronous power output. The rotating speed of PTO have certain rate with the rotating speed of tractor

2. Control handle is located in middle position, it is in neutral position.

3. Press the control handle, it is independent power output. And it can move work and fix work. The PTO's working is total independent. So when press main cultch to stop moving, PTO shaft still work. Separate PTO shaft clutch, power output stop working, but still moving.

2.16.4.2 Operation of the power output shaft clutch

Pull up the vice clutch control handle, PTO shaft clutch separation, press the PTO control handle at the moment.

Press the clutch control handle slowly, it make PTO smoothly.

It seems from the rear of tractors, the PTO's rotating direction is clockwise. In accordance with PTO splined's rotating direction



Warning:

1. When separating PTO shaft, press the locked device in vice-clutch control handle, then pull up the handle.

2. Whether PTO shaft working or not, the PTO shaft clutch should be in combinate position. That is the vice-clutch control handle at the bottom, only before connect PTO, it is separating.

2.16.4.3 Independent power output shaft

When tractors' implements need power output, should be operate as follows,

① connect agricultural implements with suspension.

② pull up vice-clutch handle, put the power output control handle on the middle neutral shift.

③ pull out the traction bracket and power output shaft cover, then connect universal joint with power output shaft.

④ package well the power output container housing.

⑤ put the lift control handle on the "Lift" position, lifting agricultural implements.

⑥ pull up the vice-clutch handle again, then press the PTO control handle, at this time, it is independent power output. It is according your demands to

Operation Instruction

choose the power output shaft speed. Pull up the PTO control handle, it reach higher shift 1000r/min; press it, reach lower shift 720r/min or 540r/min.

⑦ when you don't need power output, PTO control handle should be in neutral position, install and fasten traction bracket and PTO cover.

2.16.4.4 Synchronous power output shaft

Synchronous power output shaft main use matching driving trailer. The model of wheel and reduce speed rate of driving trailer must according to the speed of synchronous power output to choose.

Synchronous power output shaft driving by transmission device, not driving by diesel engine directly. When tractor stopping, the PTO is also stopping moving. When the forward shift change reverse shift, the synchronous power output change moving the direction, too.

Synchronous power output of 540r / min, rear wheel moving each 1 circle, power output shaft moving 17.28 circles ; Synchronous power output of 1000r / min, rear wheel moving each 1 circle, power output shaft moving 28.22 circles.

Using synchronous power output shaft, it should pull up the PTO control handle, other operate steps as independent power output shaft.



Warning:

1. Power output connection, it forbid everyone nearly agricultural implements, as to prevent arising dangerous.
2. Mustn't connect with synchronous power output when tractors are driving.

2.16.5 Operation of towing device

2.16.5.1 Pendulum type draw bar

The pendulum type draw bar is only used for the trailed implements. The rear end of the drawbar is connected to the farm tools through the towing pin and the drawbar can swing laterally for the convenience of the connection with the farm tools. During operation, the drawbar can swing left and right. However, when the tractor wants to draw the farm tools back, it is necessary to insert two locating pins into the holes of draw plate to prevent the drawbar from swinging. To change the height of towing point, it is allowed to turn the drawbar to create the towing height applicable to the farm tools.

2.16.5.2 Hook bracket

The hook is applied to various trailers, not used with the pendulum type draw bar.



Warning:

1. The overload is not allowed at the towing operation and the operation with trailer.
2. When braking, the trailer shall be braked slightly prior to the tractor.

Operation Instruction

2.16.6 Operation and adjustment of electric system

For this tractor, the electric system has the voltage of 12V and uses the silicon rectification generator, cathode earthing and double-line system. The system is composed of engine starting device and lighting signaling device, of which the engine starting device consists of starting motor and silicon rectification generator. For the operation and maintenance of above devices, see Engine Operation and Maintenance Manual. The lighting signaling device consists of front combined lamp, rear lamp, roof lamp of driver cap, handrail lamp (turning, position), rear tail lamp (turning, position and braking), instrument cluster, horn, fuse box, etc.

2.17 Running-in of tractor

Before the tractor is put into operation, it shall operate for some time under the specified lubrication, rotation speed and load conditions, and it shall be subject to necessary inspection, adjustment and maintenance to reach its normal technical condition. This work is known as running-in.

2.17.1 Preparation before running-in

- During running-in, the tractor shall be subject to the Australian and every 50h (hour) technical maintenance; and every 50h (hour) technical maintenance;
- Check and fasten the bolts, nuts and screws outside the tractor;
- Fill the grease onto each lubricating point;
- Check the engine, gear case, front driving axle, steering gear and lifter for oil level, and fill it if insufficient;
- Fill up the fuel and cooling fluid in accordance with the label;
- Check the tire pressure for normal condition;
- Check the electrical line for normal and reliable connection;
- Check whether the battery needs being charged;
- Place the control handles at their neutral position.

2.17.2 Running-in of engine at idle speed

The diesel engine shall be subject to 15min running-in at idle speed. Start the engine as per the sequence specified in Diesel Engine Operation and Maintenance Manual, and from low speed (small throttle), medium speed (medium throttle) to high speed (large throttle), operate the engine for 5min in turn.

During the running-in of diesel engine at idle speed, carefully check the engine, air compressor and hydraulic oil pump for normal operation, check whether there is abnormal

Operation Instruction

phenomenon or noise, check whether there is water leakage and oil leakage, and check the instrument for normal operation. If any, shut down the tractor for troubleshooting and then conduct running-in again.

The following running-in can be done only after the engine operates normally.

2.17.3 Running-in of power take-off shaft at no load

Place the engine throttle control handle at its position of medium throttle to make the engine operate at medium speed, respectively the power take-off shaft at low speed and high speed for 5min, and check whether there is abnormal phenomenon. After running-in, be sure to place the power take-off shaft at its neutral position.

2.17.4 Running-in of hydraulic system

Start the engine, place the throttle control handle at its position of medium throttle, control the distributor handle, lift and lower the suspension mechanism for several times, check whether there is abnormal phenomenon, hang the applicable farm tools onto the suspension mechanism, operate the engine at high speed, control the distributor handle, lift and lower the suspension mechanism at its full travel for 20 times at least, check whether the suspension mechanism can stay at its highest position or required position, check the lift/lower time and check whether there is leakage.

When the tractor is at rest, operate the engine at low speed, medium speed and high speed, stably control the steering wheel leftwards and rightwards for 10 times, check the front wheels of tractor for their leftward, rightward and steering operation, check whether the sound is normal, and check whether the steering wheel is controlled conveniently and stably.

If any fault is found during running-in, it is necessary to find out the reason and eliminate the fault.

2.17.5 Running-in of tractor without and with load

After the idle running-in and the running-in of power take-off shaft and hydraulic system, when the technical condition of tractor is correct, it is necessary to conduct the running-in of complete machine as per the following sequence and time.

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Table 2-1 Running-in specifications

Drawbar load (kN)				0	3 ~ 4	7~8	10.5~11.5
Throttle opening				75%	75%	100%	100%
Direction	Creeper gear	Range gear	Main gear				
Forward gears	L	L	1	0.5			
			2				
			3				
			4				
		H	1				
			2	0.5			
			3				
			4				
	H	L	1	0.5			
			2	0.5			
			3	0.5	2	4	8
			4	0.5	2	4	5
		H	1	0.5	4	4	5
			2	0.5	4	4	
			3	0.5	4		
			4	0.5	3		
Reverse gear	L	R	1	0.5			
			2	0.5			
			3	0.5			
			4	0.5			
	H	R	1	0.5			
			2	0.5			
			3	0.5			
			4	0.5			
Total time (h)				7	19	16	18

During the running-in at no load, conduct the turning operation and properly use the brake at single side at low speed, and check the emergency brake at high speed.

After the running-in at no load, conduct the running-in under load when the tractor has completely normal technical condition. During the running-in, the load must be from small to large and the gear must be from low speed to high speed. For the tractor fitted with the creeper gear, it is allowed to conduct the running-in under the creeper gear.

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Running-in precautions:

- Check the electrical equipment and instrument for normal readings;
- Check the engine for normal operation;
- Check the clutch for easy combination and thorough separation;
- Check whether the gear of gear case is shifted conveniently and whether there is disorder engagement and spontaneous out-of-gear;
- Check the brake for reliable operation;
- Check the differential lock for reliable combination and separation;
- Check the driving axle for reliable combination and separation;

If any fault is found during running-in, it is necessary to find out the reason, eliminate the fault and continue the running-in.

2.17.6 Technical maintenance after running-in

After the running-in of tractor, there may be some filings or dirt in the drive system, lubrication system and hydraulic system, so it is necessary to clean and replace all the lubrication oils and the oil used for the hydraulic system and to conduct the necessary technical maintenance before the tractor is put into normal operation.

The technical maintenance after running-in is as follows:

- After shutdown, discharge the engine oil from the engine oil sump and the oil tank of steering system immediately, clean the oil pan, engine oil filter screen, diesel filter, engine oil filter, air cleaner and filter screen in steering tank, replace the filter element of diesel filter and engine oil filter and refill the lubrication oil as required.
- Discharge the oil from the transmission system, lifter and front driving axle immediately, and fill the proper light diesel oil or coal oil, do not start the engine, make the tractor run forwards or backwards at low speed for about 3min, lift the front and rear tires from the ground, rotate the front and rear tires along tow directions for about 3min, immediately discharge the cleaning liquid, and remove the oil suction filter of lifter for cleaning, reassemble it, and refill the oil to drive system, lifter and front driving axle as required.
- Conduct the technical maintenance for the diesel engine according to Diesel Engine Operation and Maintenance Manual.
- Discharge the cooling water, clean the engine with clean water, and refill the cooling liquid.
- Check the toe-in of front wheel, clutch and brake for their free travel, and adjust them when necessary.
- Check and fasten all the external bolts, nuts and screws.
- Fill the grease onto each position of tractor according to Operation and Maintenance Manual.

Operation Instruction

2.18 Troubleshooting faults and solutions of tractor

2.18.1 Faults and solutions of chassis

2.18.1.1 Faults and solutions of clutch

Symptom	Reason	Solutions
1. The clutch slips.	1.The friction plate and pressure plate has oil stains; 2.The friction plate has too many abrasions or is burn down; 3.The pressure of butterfly spring reduces; 4.The free travel of pedal is too small or absent; 5. The driven disk of clutch has severe distortion.	1.Clean it with gasoline, find out the reason and eliminate the fault. 2. Replace the friction plate. 3. Replace the butterfly spring. 4. Readjust the free travel of pedal as required. 5. Replace the driven disk of clutch.
2. The clutch cannot separate thoroughly and the gear engagement has noise.	1.The free travel of pedal is too large, but the operating travel is too small; 2.The driven disk of clutch warps severely; 3. The heads of three releasing levers are not in one plane.	1.Adjust the free travel of pedal to 25~30mm. 2. Replace the driven disk. 3. Adjust it as required.
3. The tractor has vibration at starting.	1. The ends of three releasing levers are not in one plane. 2. The friction plate and driven plate have oil stains. 3. The driven disk warps severely. 4. The clamping screw of flywheel and clutch housing is loose.	1. Adjust it as required. 2.Clean the friction plate and driven plate. 3. Replace the driven plate. 4. Shut down the tractor immediately for troubleshooting.
4. Main clutch and vice clutch is not separate	1.Clutch control flexible shaft is broken 2.Clutch separate finger is broken heavily 3. Butterfly-style spring is broken	1. Replace 2. Replace clutch separate fingers 3. Replace butterfly-style spring
5. Vice clutch is not separate	1.Flexible shaft adjusting is not suitable 2. Outer control bar is transforming and warping.	1. Adjust it as required. 2. Repair it.

2.18.1.2 Faults and solutions of gearbox

Symptom	Reason	Solutions
1. The gear is difficult or fails to be engaged.	1. The clutch fails to separate thoroughly. 2. The end face of shift sleeve and gear is worn or broken.	1. Eliminate it according to the clutch fault solutions. 2. Replace or repair it.
2. There is spontaneous out-of-gear.	1. The locating slot of fork shaft is worn severely. 2. The locking spring of fork shaft has insufficient pressure. 3. The spline of shift sleeve is worn.	1. Replace the fork shaft. 2. Adjust or replace the locking spring. 3. Replace the shift sleeve.
3. The gear case has noise or beat.	1. The gear is worn severely, the tooth face is peeled or the gear teeth is broken. 2. The bearing is worn severely or damaged. 3. The lubrication oil is insufficient or fails to conform to the relevant specification.	1. Replace the gear. 2. Replace the bearing. 3. Fill or replace the lubrication oil.

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2.18.1.3 Faults and solutions of rear axle and brake

Symptom	Reason	Solutions
1. The main drive has large noise.	1. The bearing clearance of bevel pinion is too large. 2. The gear fails to engage normally. 3. The bearing or gear of bevel gear pair is damaged. 4. The differential shaft is worn or locked. 5. The planet gear or washer is worn. 6. The differential bearing is worn or damaged.	1. Adjust it as required. 2. Readjust it as required. 3. Replace the bearing or gear. 4. Replace the differential shaft. 5. Replace the planet gear or washer. 6. Replace the differential bearing.
2. The bearings of bevel pinion and differential are too hot.	1. The pretightening force is too large. 2. The lubrication is poor. 3. The backlash of bevel gear pair is too small.	1. Readjust the pretightening force of bearing. 2. Check the lubrication oil level, and refill it when insufficient. 3. Readjust the backlash.
3. The final drive has abnormal sound.	1. The bolts of planet carrier are loose, and the retaining washer is damaged. 2. The bearing, gear or shaft is damaged.	1. Fasten the fixing bolts of planet carrier as required, and replace the retaining washer. 2. Replace the bearing, gear or shaft.
4. The brake is in failure.	1. The free travel of brake pedal is too large. 2. The friction plate is worn severely or partly.	1. Readjust the free travel of pedal. 2. Replace the friction plate.
5. The tractor wanders when braking.	1. The free travel of left and right brake pedal is different. 2. The braking friction place at one side is damaged. 3. The air pressure of two rear tires is different.	1. Adjust it. 2. Replace the friction plate. 3. Check it and charge the tire as required.

Operation Instruction

2.18.1.4 Faults and solutions of running system

Symptom	Reason	Solutions
1. The front tire is worn severely.	1. The front wheel rim or web has severe distortion. 2. The toe-in fails to be adjusted properly. 3. The steering knuckle and two oil cylinder pins are worn severely. 4. The tire pressure is insufficient during transportation. 5. The front driving axle fails to separate during transportation. 6. The front driving wheel tread is installed as per inverse direction.	1. Correct the front wheel rim or web. 2. Adjust the toe-in. 3. Replace the pin. 4. Check it and charge the tire as required. 5. Disconnect the front driving axle. 6. Reassemble the tire as required.
2. The front wheels sway.	1. The toe-in fails to be adjusted properly. 2. The bearing has too large clearance or is worn severely. 3. The steering king pin is worn severely. 4. The front wheel rim has severe distortion.	1. Adjust the toe-in. 2. Adjust or replace the bearing. 3. Replace the steering king-pin. 4. Correct the front wheel rim.
3. There is large noise.	1. The engagement mark of front main drive gear is bad. 2. The main drive bearing has too large clearance or is damaged. 3. The differential shaft is worn or damaged. 4. The planet gear or washer is damaged. 5. The final drive gear pair fails to engage properly.	1. Readjust the engagement mark. 2. Adjust or replace it. 3. Replace the differential shaft. 4. Replace the planet gear or washer. 5. Adjust the final drive gear.
4. The driving shaft and protective sleeve are hot.	1. The driving shaft has friction due to severe bend and distortion. 2. The middle support bearing seat is loose.	1. Correct or replace the driving shaft. 2. Fasten it as required.
5. The transfer case has large noise.	1. The speed is too high. 2. The bearing or gear is worn severely.	1. Apply the low speed gear. 2. Replace or repair it.

Operation Instruction

2.18.1.5 Faults and solutions of hydraulic steering system

Symptom	Reason	Solutions
1. There is oil leakage.	1. The rubber ring of pipe joint is damaged or the bolt is loose. 2. The rubber ring of junction plane of valve body, partition disk, stator and rear cover is damaged. 3. The rubber ring of journal is damaged. 4. The bolts of coupling position of steering gear are loose.	1. Replace the rubber ring or fasten the bolt. 2. Clean it and replace the rubber ring. 3. Replace the rubber ring. 4. Fasten the bolt.
2. The steering operation is heavy.	1. The gear oil pump fails to provide sufficient oil, the gear oil pump has internal leakage, the filter screen of steering tank is blocked, the slow steering operation is light and the quick steering operation is heavy. 2. The steering system has air, and the oil cylinder moves sometimes when rotating the steering wheel. 3. The steering tank has insufficient oil level. 4. The safety valve spring force becomes poor, or the steel ball fails to be sealed properly, the steering operation is light when light load but becomes heavy when increasing load. 5. The oil viscosity is too large. 6. The steel ball one-way valve of valve body is in failure, the steering wheel is heavy whether quick steering or slow steering, and the steering is powerless. 7. The steering system has oil leakage, including internal leakage (oil cylinder) and external leakage.	1. Check the gear oil pump, clean the filter screen. 2. Discharge the air from the system, check whether the oil suction pipe has air. 3. Fill oil to the specified oil level. 4. Clean the safety valve and adjust its spring pressure. 5. Adopt the specified oil. 6. Clean, repair or replace the component. 7. Check and eliminate the oil leakage point.
3. The steering gear is in failure.	1. The pin is broken or has distortion. 2. The opening of universal driving shaft is broken or has distortion. 3. The position of rotor and universal driving shaft is incorrect. 4. The piston or piston seal ring of steering oil cylinder is damaged.	1. Replace the pin. 2. Replace the universal driving shaft. 3. Reassemble it. 4. Replace the piston or seal ring.
4. There is no manual steering.	1. The clearance between rotor and stator is too large. 2. The sealing property of oil cylinder piston is too poor; for power steering, the driver fails to feel the end point obviously when the oil cylinder piston reaches its extreme position; for manual steering, the oil cylinder fails to move when rotating the steering wheel.	1. Replace the rotor and stator. 2. Replace the piston seal ring.
5. The steering operation is insensitive.	1. The clearance between valve core and valve bush is too large. 2. The clearance between universal driving shaft and pin is too large. 3. The clearance between universal driving shaft and rotor is too large. 4. The return spring is broken or too soft.	1. Replace it. 2. Replace it. 3. Replace it. 4. Replace it.

Operation Instruction

2.18.1.6 Faults and solutions of hydraulic suspension system

Symptom	Reason	Solutions
1. It fails to conduct the lifting operation under light and heavy duty.	- The oil level of lifter housing is too low. - The oil filter screen is blocked severely. - The oil suction pipe has air. - The gear oil pump is in failure. - The spring pin outside and inside the control handle falls off. - The pendulum bar in distributor falls off. - The main control valve is blocked at its neutral or lowering position or the oil return valve is locked at its opening position. - The main control valve is blocked. - The lowering valve is blocked. - The lowering valve fails to open because the pin becomes short or the lowering valve assembly becomes loose and screws out. - The oil way to the oil cylinder in the cylinder head is closed.	- Fill oil to the specified oil level. - Clean or replace the oil filter screen. - Check the pipe joint. - Check, repair or replace the gear oil pump. - Reassemble the spring pin. - Open the distributor, assemble the pendulum bar. - Disassemble the distributor, clean the valves. - Clean the main control valve. - Clean the lowering valve. - Take off the plug of lowering valve, readjust the pin clearance of lowering valve or fasten the lowering valve assembly. - Open the oil way.
2. It can conduct the lifting operation under light duty, but under the heavy duty, it cannot conduct the lifting operation or lifts slowly.	- The oil suction inhales or has air. - The set pressure of the system safety valve is too low. - The set pressure of oil cylinder safety valve is too low. - The pressure is poor due to the severe abrasion of gear oil pump. - The oil cylinder seal has oil leakage.	- Check the oil suction pipe and oil filter. - Adjust or replace the system safety valve. - Adjust or replace the safety valve of oil cylinder. - Repair or replace the gear oil pump. - Replace the oil cylinder seal ring.
3. The farm tools shakes during the lifting and the lifting is slow.	- The oil filter is blocked. - The oil suction pipe has air. - The gear oil pump is in failure. - The hydraulic oil level is too low.	- Clean or replace the filter element. - Eliminate the air leakage of joint and O-ring. - Replace the gear oil pump. - Fill the lubrication oil as required.
4. The farm tools frequently shakes its head after lifted, and the static drop is quick after the engine shuts down.	- The one-way valve of distributor fails to be sealed properly. - The lowering valve fails to be sealed properly. - The oil cylinder safety valve has oil leakage or fails to be adjusted properly. - The piston O-ring of oil cylinder has oil leakage due to damage. - The seal ring between the distributor or cylinder head and the lifter housing oil inlet falls off or is damaged due to improper installation.	- Clean the one-way valve; adopt the fine antiscuffing paste when necessary. - Clean or face up the lowering valve. - Repair or readjust the safety valve of oil cylinder. - Replace the O-ring. - Check and replace the seal ring.
Symptom	Reason	Solutions

Operation Instruction

5. The distributor generates sharp sound when the handle is at its lifting position.	1. The safety valve opens because the internal lifting arm jacks the lifter housing due to the improper adjustment.	1. Measure the height of farm tools at this time, readjust and shorten the adjusting rod to ensure the highest lifting position is lower than the original position.
6. The cylinder head has no hydraulic output or the output is powerless.	1. The oil cylinder oil inlet way fails to be cut. 2. The taper body and taper hole before the lowering speed control valve fails to be sealed properly. 3. The lifter is at its neutral position.	1. Clockwise fasten the control handwheel of lowering speed. 2. Face up the taper body and taper hole before the lowering speed control valve, or replace the lowering speed control valve. 3. Pull the lifter control handle to its lowering position, lower the external lifting arm to its lowest position, cut the oil inlet way of oil cylinder, and pull the control handle to its lifting position.

2.18.2 Faults and solutions of electric system

2.18.2.1 Faults and solutions of start motor

Symptom	Reason	Solutions
1.Start motor is out of operation	1.The battery capacity is not enough; 2.The battery poles are too dirt and the cable is loose; 3.The cable joint is loose and the earth wire is rusty; 4.The start switch or any other control circuit is disconnected; 5.The carbon brush and the commutator are in loose contact; 6. An open circuit or short circuit occurs inside start motor.	1.Charge the battery as required; 2.Remove the dirt and fasten the connecting piece; 3.Fasten the joint and remove the rust; 4.Inspect circuit to make connection reliable; 5.Adjust the spring pressure of carbon brush and clean the commutator; 6. Inspect and repair the start motor.
2.Start motor starts weakly and fails to start engine	1. The battery capacity is not enough; 2. The conductors are in loose contact; 3. The commutator surface is burned or stained with oil; 4. The carbon brush is worn excessively or the spring pressure of carbon brush is not enough to make it in loose contact with commutator; 5.Main contact of electromagnetic switch is burned out and it is in bad contact; 6. The bearing is worn severely and the armature rubs against shell.	1. Charge the battery; 2. Fasten the joint of conductors; 3. Polish the commutator surface or remove the oil stain; 4. Replace the carbon brush or adjust the spring pressure of carbon brush; 5. Polish it with 0# non-metal sand paper; 6. Replace the bearing.

Operation Instruction

2.18.2.2 Faults and solutions of generator

Symptom	Reason	Solutions
1. Generator fails to generate electricity	1. The connection is in error or broken, or it is in bad contact; 2. The rotor coil is broken; 3. The rectifier diode is damaged; 4. The carbon brush is in bad contact; 5. The adjuster is damaged.	1. Inspect and repair circuit; 2. Inspect and repair or replace generator assembly; 3. Replace the diode; 4. Remove dirt or replace the carbon brush; 5. Repair or replace the adjuster.
2. Generator is undercharged	1. V-transmission belt is loose; 2. The carbon brush is in bad contact and the slip ring is stained with oil; 3. The adjuster is damaged; 4. The battery has been aged.	1. Adjust the V-transmission belt make it tight; 2. Adjust the carbon brush and clean the slip ring; 3. Replace the adjuster; 4. Replace the battery.
3. Charging current of generator is too strong and the bulb is prone to be burned out	1. The adjusting voltage of adjuster is too high; 2. The magnetizing coil of adjuster is sealed off and has lost adjusting action.	1. Adjust the voltage to an appropriate value as required; 2. Inspect and repair the magnetizing coil and reweld the points of weld.

2.18.2.3 Faults and solutions of battery

Symptom	Reason	Solutions
1. The battery capacity is not enough and it is hard to start engine	1. The electrolyte level is too low; 2. It is short circuit between pole plates; 3. The pole plates are vulcanized; 4. The circuit joints are in bad contact and there are many oxides on terminals to make battery undercharged.	1. Add distilled water or 1:1 dilute sulfuric acid solution; 2. Remove deposits and replace electrolyte; 3. Charge and discharge again and again to remove vulcanization; 4. Fasten the joints and remove oxides, and apply Vaseline to terminals.

Operation Instruction

2.18.2.4 Faults and solutions of instrument

Symptom	Reason	Solutions
1.The indicator of water temperature gauge always indicates low temperature	1.The circuit is broken and the socket joint is in bad contact; 2. The water temperature sensor is damaged.	1.Inspect and repair the circuit and remove the dirt in the socket joint; 2. Replace the water temperature sensor.
2.The indicator of water temperature gauge always indicates high temperature	1.The water temperature sensor is in short circuit and damaged; 2. A short circuit fault occurs.	1.Replace the water temperature sensor; 2. Inspect and remove the short circuit fault.
3.The indication of oil pressure or air pressure gauge is abnormal	1.A short circuit or open circuit occurs; 2. The sensor is in open circuit, or in short circuit or in bad contact.	1.Inspect and remove the short circuit or open circuit; 2. Inspect and repair or replace the sensor.

2.18.2.5 Lamplight faults and clearance methods

Symptom	Reason	Solutions
1.Head lamp has no high and low beams	1.The circuit is broken or open and the fuse is blown out; 2.The lamp switch is in bad contact or damaged; 3. The lamp filament is burned out.	1.Inspect and repair to make circuit closed; 2.Inspect and repair or replace the lamp switch; 3. Replace with a high-quality bulb.
2.Tail lamp is off	1.The circuit is broken; 2. The tail lamp switch is in bad contact or damaged.	1.Inspect and repair to make circuit closed; 2. Inspect and repair or replace the lamp switch.

3. Accessories, Spare Parts and Quick-Wearing Parts

3.1 Accessories

The accessories of the tractor include fan heater, pendulum type draw bar, etc.

3.1.1 Fan heater (optional)

The fan heater on the tractor is installed in the front upper part in the driver's cab. The fan heater switch is installed on the fan heater. The fan heater will be in operation as long as the fan heater switch is turned on, to make working temperature comfortable in cab.

When it needs to be ventilated in the cab (especially in summer), nothing remains but to shut off the hot circulating water outlet valve of the fan heater on engine and turn on the fan heater switch; here the fan of fan heater will be in operation.

The two small flop gates on both left and right sides of fan heater are used to regulate air stream circulation.

3.1.2 Pendulum type draw bar (optional)

The pendulum type draw bar is only used in trailed implement. Rear end of the draw bar is connected with farm implement by draw pin. The draw bar can swing transversely and it is relatively easy to connect with farm implement. The draw bar in operation can swing left and right, but when the tractor draws farm implement to go backward, the locating pin must be inserted in the hole of draw plate to prevent draw bar swinging.

The height of traction point can be changed by turning draw bar to make traction height suitable to the farm implement.

Warning:

For the tractor with fan heater or air conditioner installed, anti-freezing solution must be applied to the cooling system of engine to protect fan heater or air conditioner from frost crack.

Accessories, Spare Parts and Quick-Wearing Parts

3.2 Spare parts

3.2.1 Spare parts

Table 3-1 Spare parts

No.	Code	Name	Quantity	Remark
1		Spare parts for engine	1	From appliance factory
2	SZ1204.58.033B	Quick action couplings	2	Optional, used in 1 pair hydraulic output model
			4	Optional, used in 2 pairs hydraulic output model

3.2.2 Useful Tools

Table 3-2 Useful tools

No.	Code	Name	Quantity	Remark
1	QB/T 2564.4	Screwdriver for slotted head screws6×150	1	Put in the tool bag
2	QB/T 2564.5	Screwdriver for cross-recessed head screws6×150	1	Put in the tool bag
3	GB/T 3390.1	Socket 18	1	Put in the tool bag
4	GB/T 3390.1	Socket 21	1	Put in the tool bag
5	GB/T 3390.1	Socket 27	1	Put in the tool bag
6	GB/T 3390.3	Sliding handle	1	Put in the tool bag
7	GB/T 3390.4	Connecting rod 250	1	Put in the tool bag
8	JB/T 7942.1	Lever type grease gun A200	1	Put in the tool bag
9	JB/T 3411.47	Pincer B2.5	1	Put in the tool bag
10	JB/T 3411.48	Pincer A2.5	1	Put in the tool bag
11	GB/T 5356	Hexagon socket screw keys 8	1	Put in the tool bag
12	QB/T 3001	Open ended wrenches 8×10	1	Put in the tool bag
13	QB/T 4388	Open ended wrenches 10×12	1	Put in the tool bag
14	QB/T 3001	Open ended wrenches 13×16	1	Put in the tool bag
15	QB/T 3001	Open ended wrenches 18×21	1	Put in the tool bag
16	QB/T 3001	Open ended wrenches 24×27	1	Put in the tool bag
17	QB/T 3001	Open ended wrenches 30×34	1	Put in the tool bag
18		Attached tools for engine	1	From the engine factory

Accessories, Spare Parts and Quick-Wearing Parts

3.2.3 List of attached documents

Table 3-2 List of attached documents

No.	Name of documents	Quantity	Remark
1	Attached technical documents relating to engine	1	From the engine factory, placed in archival bag
2	Product qualification certificate	1	Placed in archival bag
3	Three—guarantee service certificate	1	placed in archival bag
4	Operator's manual for air conditioner	1	Optional, used for the model with air conditioner
5	Operator's manual for fan heater	1	Optional, used for the model with fan heater
No.	Name of documents	Quantity	Remark
6	Parts catalogue for tractor	1	placed in archival bag
7	User's manual for tractor	1	placed in archival bag
8	Engine qualification certificate	1	From the engine factory, placed in archival bag

3.3 Quick-wearing parts

The quick-wearing parts of the tractor are described as table 3-4.

Table 3-4 Lists of Quick-Wearing Parts

No.	Parts code	Parts Name	Quantity / unit	Remark
1		Safety lever 5A	2	
2		Safety lever 10A	8	
3		Safety lever 15A	2	
4		Safety lever 20A	3	
5		Distance light 2-filament bulb	2	
6		Steering Bulb	6	
7		Location Bulb	6	
8		Top working Bulb	4	
9		Braking bulb	2	

Warning:

1. The above listed spare parts, tools and quick-wearing parts are special parts of the tractor, so they should be kept well for use in the operation and maintenance of the tractor. If any part is lost, it may affect the functional service and performance of the tractor.

2. For maintenance, standard fittings as manufacturer requires should be used. If non-standard fittings are used, it may affect the function, service performance and service life of the tractor.

4. Maintenance Instructions

Such technical maintenance measures as regularly cleaning, inspecting, lubricating, adjusting or replacing some parts of the tractor are generally called technical maintenance. Good technical maintenance can decelerate the deterioration of technical conditions of parts, reduce faults, extend service life and make tractor in good condition all the time.

Warning:

- 1. All maintenance work must be carried out by the operators that are trained professionally and familiar with features of the tractor, to protect it from damage;**
- 2. The technical maintenance rules must be strictly complied with to make tractor in normal working and extend its service life.**
- 3. During warranty period, any damage to tractor due to the operators those are unfamiliar with features of the tractor, carrying out operation and maintenance, or failing to carry out related maintenance work as required within maintenance period specified by the manufacturer, will be excluded from related guarantee service of the tractor;**
- 4. It is strictly prohibited to adjust without permission the opening pressure of safety valve of engine and hydraulic system, the opening pressure of safety valve of air brake system and the opening pressure of water tank cover, or else a damage may be caused to the tractor and service performance of the tractor will be affected, and moreover, it will be excluded from related three-guarantee service.**

4.1 Technical maintenance rules

The technical maintenance period of the wheeled tractor is determined according to cumulative operating hours. The technical maintenance includes shift technical maintenance (10h), 50h technical maintenance, 200h technical maintenance, 400h technical maintenance, 800h technical maintenance, 1600h technical maintenance, special technical maintenance in winter and technical maintenance for long-time storage.

4.1.1 Shift technical maintenance

- Remove the dust and oil stain on the tractor;
- Inspect and tighten external fasteners of tractor; if there is any looseness, it should be fastened in time, in particular the fastening bolts of front and rear wheels;
- Inspect the liquid level of engine oil sump, water tank, fuel tank, hydraulic steering tank, travel brake oil tank and hydraulic lifter, and inject fuel or water if not enough; before the liquid level of oil sump is inspected, the tractor must be parked on a horizontal ground

Maintenance Instructions

and the engine stops work 15min;

- Inject grease according to table 4-1;
- Inspect air pressure of front and rear tires and inflate tires as required if not enough;
- Inspect and adjust free travel of main and auxiliary clutches and travel brake pedal;
- Inspect whether there are three leakages: air leakage, oil leakage and water leakage; if there is any leakage, remove it;
- Maintain the diesel engine in accordance with the requirements of Routine Shift Technical Maintenance specified in the Operation and Maintenance Manual for Diesel Engine.

4.1.2 50h technical maintenance

- Finish the shift technical maintenance;
- Inject grease according to table 4-1;
- Inspect oil surface of oil bath type air cleaner and remove dust;
- Maintain the diesel engine in accordance with the requirements of Primary Technical Maintenance specified in the Operation and Maintenance Manual for Diesel Engine.

4.1.3 200h technical maintenance

- Finish the 50h technical maintenance;
- Inject grease according to table 4-1;
- Replace the lubricating oil of diesel engine oil sump;
- Clean and maintain the oil basin of oil bath type air cleaner;
- Clean the hydraulic oil filter of lifter, and replace the filter element when necessary;
- Maintain the diesel engine in accordance with the requirements of Secondary Technical Maintenance specified in the Operation and Maintenance Manual for Diesel Engine.

4.1.4 400h technical maintenance

- Finish the 200h technical maintenance;
- Inject grease according to table 4-1;
- Inspect the main drive and final drive oil level of front driving axle, and inject oil when necessary;
- Inspect the oil level of transmission system and lifter, and inject oil when necessary;
- Inspect the free travel of parking brake handle, and adjust it when necessary;
- Clean and maintain the filter of hydraulic steering tank;
- Maintain the diesel engine in accordance with the requirements of Secondary Technical Maintenance specified in the Operation and Maintenance Manual for Diesel Engine.

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4.1.5 800h technical maintenance

- Finish the 400h technical maintenance;
- Inject grease according to table 4-1;
- Replace the transmission hydraulic oil for hydraulic steering system;
- Replace the transmission hydraulic oil for transmission system and lifter;
- Inspect the valve clearance of diesel engine;
- Inspect and adjust the injection pressure of oil injection pump;
- Clean and maintain the fuel tank;
- Maintain the diesel engine in accordance with the requirements of Tertiary Technical Maintenance specified in the Operation and Maintenance Manual for Diesel Engine.

4.1.6 1600h technical maintenance

- Finish the 800h technical maintenance;
- Inject grease according to table 4-1;
- Clean and maintain the cooling system of diesel engine;
- Replace the main drive and final drive lubricating oil of front driving axle;
- Inspect, adjust and maintain the start motor;
- Maintain the diesel engine in accordance with the requirements of Tertiary Technical Maintenance specified in the Operation and Maintenance Manual for Diesel Engine.

4.1.7 Special technical maintenance in winter

- Replace with winter lubricating oil and fuel;
- The anti-freezing solution must be applied when the air temperature in winter is below zero;
- Prior to shift work, the engine should be started according to winter requirements;
- The discharge rate of battery should not be more than 25% and the battery should keep a relatively high charge rate;
- After end of operation, the tractor should be parked in a warm shed that takes shelter from wind.

4.1.8 Technical maintenance for long-time storage

If the storage period of tractor is less than one month and the replacement period of engine oil is not more than 100 operating hours, special protective measures need not to be taken. If the storage period of tractor is more than one month, special technical maintenance must be carried out in accordance with "5 Storage" in this manual.

Maintenance Instructions

4.2 Technical maintenance operation

4.2.1 Tractor maintenance

Table 4-1 Tractor Maintenance

No.	Maintenance part	Operation content	Number of points	Maintenance period
1	Engine oil sump	Inspect liquid level	1	Per shift
2	Oil bath type air cleaner	Inspect oil level	1	Per shift
3	Battery	Inspect oil level	1	Per shift
4	Hydraulic steering tank	Inspect oil level	1	Per shift
5	Radiator (water tank)	Inspect oil level	1	Per shift
6	Water pump shaft of engine	Inject grease	1	Per shift
7	Oil injection pump	Inspect oil level	1	Per shift
8	Main clutch	Adjust free travel	1	Per shift
9	Auxiliary clutch	Adjust free travel	1	Per shift
10	Fan belt	Inspect tightness	1	Every job 50h
11	Steering cylinder	Inject grease	1	Every job 50h
12	Master pin bushing of front shaft	Inject grease	2	Every job 50h
13	Pendulum shaft of front axle with 4WD	Inject grease	2	Every job 50h
14	Central pendulum pin bushing of front shaft	Inject grease	1	Every job 50h
15	Rotary mounted oil filter	Replace filter	1	Every job 200h
16	Hydraulic oil suction filter of lifter	Clean or replace filter element	1	Every job 200h
17	Oil injection pump	Replace lubricating oil	1	Every job 200h
18	Engine oil sump	Replace lubricating oil	1	Every job 200h
19	Oil basin of oil bath type air cleaner	Maintain and clean oil basin	1	Every job 200h
20	Transmission system and lifter	Inspect oil level	1	Every job 400h
21	Breather filter element	Clean filter element	2	Every job 100h
22	Main drive of front drive axle	Inspect oil level	1	Every job 400h
23	Oil cup of master pin of front drive axle	Inject grease	2	Every job 400h
24	Final drive of front driving axle	Inspect oil level	2	Every job 400h
25	Hydraulic steering tank	Replace lubricating oil	1	Every job 800h
26	Fuel tank	Clean and maintain fuel tank	1	Every job 800h
27	Engine inlet and outlet valves	Adjust valve clearance	8	Every job 800h
28	Oil injection pump	Adjust injection pressure	4	Every job 800h
29	Transmission system and lifter	Replace lubricating oil	1	Every job 800h
30	Engine cooling system	Clean and maintain it	1	Every job 1600h
31	Main drive of front drive axle	Replace lubricating oil	1	Every job 1600h
32	Final drive of front drive axle	Replace lubricating oil	1	Every job 1600h

Maintenance Instructions

4.2.2 Technical maintenance operation

4.2.2.1 Battery maintenance

This series tractors use maintenance free battery, usually does not require special maintenance. Observed hydrometer view hole, sufficient electricity for the green, gray for the electricity shortage, no electricity for the black. The batteries are in need of additional charge when the view hole shows the gray; the batteries need to be replaced when the view hole shows the black.



Warning:

1. When charged, the battery should be away from open flame and indoor air should be kept unobstructed. After end of charge, the power supply should be cut off before disconnected from terminals, to prevent striking a flame and causing a fire or explosion;
2. The battery should be stored in a clean, dry and ventilated warehouse between 0°C and 40°C. The battery should be handled with care and kept upright
3. The battery terminals and power supply wire joints should be connected firmly to prevent fusing terminal when starting. The Vaseline should be applied to connection terminals to protect from oxidation etching;
4. External terminals of battery should be kept clean. The exhaust hole on battery should be inspected regularly to make it unobstructed;
5. The charge mark on battery should be inspected regularly. The battery should be charged when necessary.

4.2.2.2 Inspection and maintenance of brake oil tank

The brake oil tank is on the right side of hood bracket. Brake fluid oil level should be higher (10~15) mm than the middle convex plate, when less than this value should identify the causes of Brake fluid spills and to exclude, and then add Brake fluid.



Note:

1. The correct brake fluid oil level is vital to braking system to normal operation;
2. Hydraulic brake must be synthetic oil.

4.2.2.3 Inspection and maintenance of steering oil tank

The steering oil tank is on the engine. Open the tank cover and observe oil level; if the oil is not enough, inspect and find out the cause of oil leakage, and then inject oil. The steering cylinder,

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oil pipe and joints should be free from oil leakage, or else the steering may fail to function. The filter screen in the steering oil tank should be cleaned or replaced regularly.

When inspecting oil level, the breather valve in central position on tank cover should be inspected to make its rise and fall unobstructed; if affected by oil stain, the breather valve should be cleaned to remove oil stain.

4.2.2.4 Operation and maintenance of oil bath air cleaner

Open hooks of the filter, and then remove the bottom of the oil basin, dump the dirty oil and clean with kerosene or diesel fuel, while cleaning filter, then add new oil to the oil height, and then re-installed.

Important matters:

Correct operation and maintenance of air cleaner have the direct bearing on service life of engine, so air cleaner must always be kept clean. During farmland work, air cleaner should be inspected and cleaned prior to shift work. After maintained, the filter element of air cleaner must tightly join with air cleaner to avoid any crack and prevent dust or soil from entering into engine to cause engine scuffing, abnormal wear and severe downward exhaust, etc.

4.2.2.5 Adjustment of fan belt tightness

Press down middle part of fan belt with thumb; the force applied is 29.4~49.0N and the press-down distance is 15±3 mm. If the requirements are not met, it should be adjusted by the method below:

Firstly, release the fixing nuts on generator adjusting bracket; secondly, pull the generator outward to tighten belt; finally, fasten the fixing nuts on generator bracket.

4.2.2.6 Inspection of oil level of engine oil sump and oil replacement

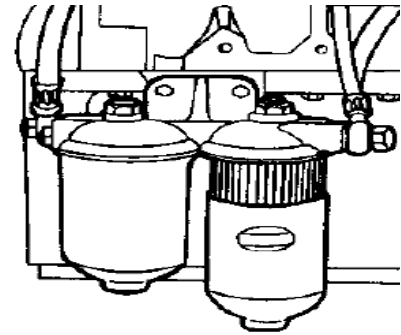
Draw out the oil dipstick in the left front of engine oil sump and inspect whether oil level is between upper and lower scales. If oil level is below lower scale, open the filler cap on engine timing gear case cap of and inject oil.

Prior to replacement of oil, screw off the oil drain plug at the bottom of oil sump and drain off dirty oil, and clean it; then inject new oil.

4.2.2.7 Maintenance of fuel filter

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As picture. Engine adopt 2-class filter concatenation, left is 1-class, right is 2-class. Paper filter is not allow cleaning. Engine works each 200 hours, then change 1-class filter. When is changing, could putting 2-class filter element into 1-class. Then change new one in 2-class.



Picture4-1 Fuel filter

4.2.2.8 Maintenance of rotary-type fuel filter

Rotary-type fuel filter located in left lower side of engine.

Engine works each 200 hours, then change it as technical requirements.

Rotary-type fuel filter adopts whole change. It is fasten when setting up.

4.2.2.9 Maintenance of hydraulic oil filter

Lifter hydraulic absorb oil filter is located in right lower side of engine. It maintains as technical requirements. The means as follows, opening hydraulic filter cover, taking out fuel elements. Make oil cleaning well and flowing by compression air. When fuel elements are broken or dirty, it should change a new one. Return oil filter is located in left side of lifting housing. It should be cleaning each 100 hours, when filter elements are dirty or broken, it should be change a new one.

4.2.2.10 Inspection of final drive oil level of front drive axle

The inspection plug of final drive oil level of front drive axle is at the front hub. Make the plug inlet in horizontal position and inject new engine oil to the plug inlet.

4.2.2.11 Inspection of oil level of front drive axle housing

The oil level should be inspected regularly in operation process of tractor to ensure oil level of housing is in normal position.

4.2.2.12 Front wheel lubricant oil charging

Put the lubricant in the inner front wheel's oil cup.

4.2.2.13 Lubrication of master pin of front drive axle

There is an oil cup respectively at both ends of middle pendulum shaft of front driving axle of the tractor. The oil cups should be lubricated with grease regularly. Generally, the oil cups should be lubricated with grease once 400h.

4.2.2.14 Maintenance of transmission system

When inspecting oil level, park the tractor on level ground and stall engine; screw out and clean the oil dipstick on the right of main gear lever and then insert it; if oil level is below lower scale of dipstick, inject transmission oil between upper and lower scales of dipstick (measure it 5min after injecting engine oil). When replacing lubricating oil, dismount the oil drain plug at the bottom of transmission case and drain off dirty oil; clean with diesel oil; then screw up the oil drain plug and inject new engine oil.

4.2.2.15 Maintenance of lifter

Maintenance Instructions

Park the tractor on level ground; lower lift arm to extreme lower position; stall engine; screw off the oil dipstick with cover on lifter and inspect oil level; if oil level is below lower scale, inject oil between upper and lower scales. When replacing hydraulic oil, dismount the plug and drain off dirty oil; clean and then inject new engine oil as required.

4.2.2.16 Maintenance of fuel tank

Park the tractor on level ground and stall engine; dismount the oil drain plug under fuel tank and drain off the deposits at the bottom of fuel tank. The fuel tank is used to store fuel and deposit water and impurities, so it should be cleaned regularly in use to remove dirt.

4.2.2.17 Inspection of tire inflation pressure

The tire pressure is inspected by barometer and the tire inflation pressure is referred to technical specifications for tractor. Extremely high or low tire pressure will reduce tire life and have an adverse impact on travel control of tractor.

4.2.2.18 Maintenance of engine cooling system

Engine coolant may be boiled tap water or anti-freezing solution. The period of validity of anti-freezing solution is two years or 1600h. When it is beyond the period of validity, anti-freezing solution should be replaced and the cooling system should be cleaned; then new anti-freezing solution is injected.

Precautions for use of radiator:

- Before start, inspect whether cooling water in radiator has been filled up and whether there is water leakage. Inspect whether radiator cover is fastened.
- Irregularly inspect radiator core; if it is blocked by weed, dust or oil stain, the weed, dust or oil stain should be removed.
- Regularly remove incrustation scale in cooling system to guarantee heat dissipation of heat exchange surface.
- Regularly inspect thermostat performance to make it in good condition, or else it will affect circulation of cooling water and reduce cooling effect.

Cleaning of cooling system:

Clean the exterior of radiator. Before cleaning, remove weeds and impurities; then wet the core body with warm water (or steam); finally dry it with compressed air.

When the radiator is dismounted for cleaning, the detergent is applied and the radiator is immersed in 1~2% water solution. The solution temperature is 80~100°C and the radiator is shaken continuously in solution to remove dirt easily; then the radiator is cleaned with clean water.

Removal of incrustation scale in cooling system: The shift prior to maintenance fills up cooling system with solution prepared with 750g caustic soda and 150g kerosene in 10L water. The engine runs 5~10min at medium speed and the solution stays 10~12h (attention should be paid to heat preservation to prevent freezing); then restart engine and make it run 20min at medium speed, and next stop engine and drain cleaning liquid. After the engine is cooled, insert water pipe

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into water tank to flush it, and here the water drain valve at the bottom of water tank should be opened. After end of cleaning, close the water drain valve; inject water and make engine run several minutes, and then drain water. After the engine is cooled, inject new anti-freezing solution or cooling water as required.

Important matters:

- 1. In winter, the concentration of anti-freezing solution shall be checked frequently according to weather conditions. If inappropriate, the solution shall regain normal concentration immediately. As for tractors free of anti-freezing solution, water shall be exhausted under the circumstance of idle running of engine when water temperature drops below 70°C (Celsius), for fear of frost cracking of machine body arising by frozen cooling water.**
- 2. To prevent blocking in the inner of water pipe of radiator core, and formation of incrustant, it is sure that the anti-freezing solution of qualified manufactory must be used.**
- 3. The radiator must not contact any acid, alkaline or other corrosive substances for fear of being corroded.**
- 4. Radiator must be installed and washed carefully without damage or bruising.**

4.2.2.19 Maintenance of breathers

After tractor closes down, breathers will be detached one after another, and washed with clean diesel oil before carried on tractor. The air in the oil circuit must be removed while installation.

4.2.2.20 Exhaust of fuel system

When a tractor has been idle for long, diesel filter core is being replaced or when the air in oil tank is exhausted, air will probably enter oil circuit. The air in fuel system will make engine start-up difficult. Therefore, it must be removed according to the following steps when the oil tank is full and oil circuit breaker is in the on position, i.e. loose the air bleed screw of oil filter, put the draw Knob of oil transfer pump hand pump up and down until there is no bubble in the diesel oil flowing out of air bleed screw; screw down air bleed screw again and loose air bleed screw on injection pump, put draw knob of oil transfer pump hand pump up and down until there is no bubble in the diesel oil flowing out of air bleed pump; then tighten air bleed screw again.

Important matters:

- 1. The engine must be provided with high-quality light diesel oil in accordance with operation specification. Generally, 0# light diesel oil is used in summer, while -10# light diesel oil is used in winter (see diesel engine operation specification for details). Diesel oil must be pure, and be subject to at least 48-hour purification by precipitation before use.**

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2. The lubricated face of ZHB type injection pump shall be frequently checked. The lubricating oil must be added up to the position of scribed line in time in case of shortage. Lubricating oil must be replaced once when engine has worked for 200 hours. The grade of lubricating oil used for injection pump must be same with that used for diesel engine.

4.2.2.21 Exhaust of brake system

Brake system tubing is being demolished, or check the ride (synchronization), the brake system must exhaust.

Exhaust should follow these steps:

First, fill up the brake oil tank, and slowly depresses the left brake pedal to the end so that the establishment of brake pressure.

Loose the bleeder plug on the top of brake housing half a lap to allow air to spill .Repeat the above-mentioned actions until there is no air bubble emitting, fastening the bleeder plug.

Further step on brake pedal to establish oil pressure, when the pedal reaches the normal travel, the oil pressure fully established (up to the required pressure).

Clean the oil on the drive shaft housing to prevent the paint off.

According to the above-mentioned steps, exhaust the air on the other side of the brake. Finally, fill up the brake fluid to specified level.



Warning: If the air is not exhausted, the brake system may act up

4.3 Tractor chassis adjustments

4.3.1 Brake adjustment

Brake adjustment is shown as in the figure 4-2.

Maintenance Instructions

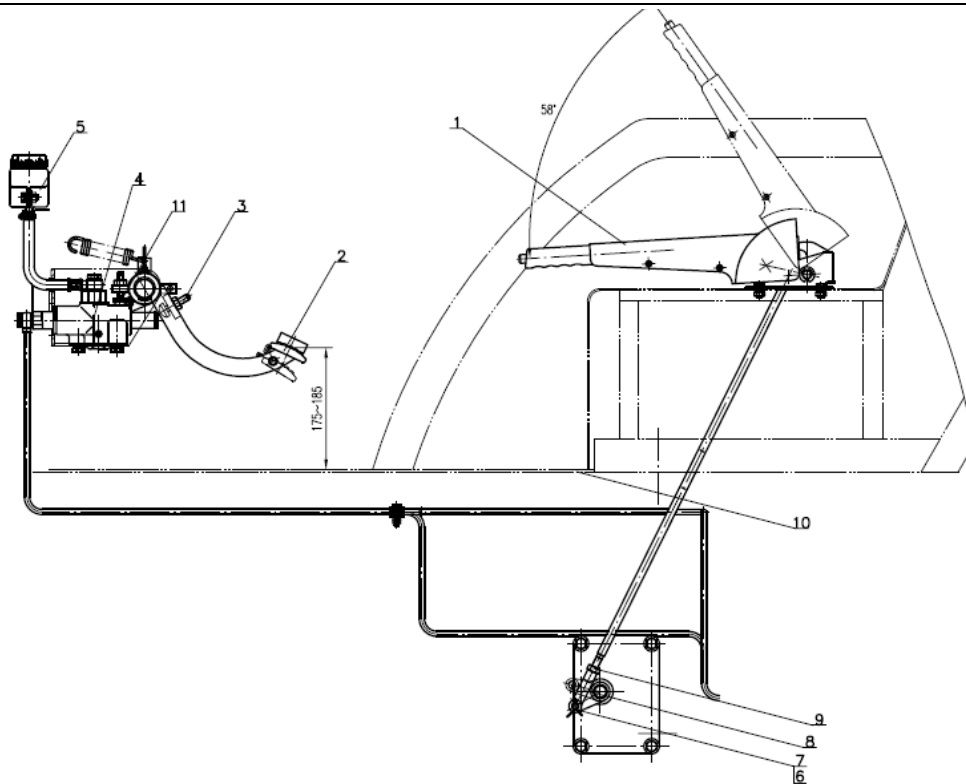


Fig.4-2 Brake adjustment

1-Control lever, 2-Pedal, 3-Limit screws, 4-Brake pump, 5- Brake oil tank,

6-Cotter pin, 7-Clevis pin with head, 8-Hand brake fork rod, 9-Nut, 10-Floor, 11-Limit screws

By adjusting the limit screws 11, to ensure the height (between pedal center and floor) is in 175mm~185mm ;By adjusting the limit screws 3 to ensure the space (between limit screws 3 and between the brake pump 4) is in 3mm ~ 4mm, so that pedal free stroke in 20 mm~ 26 mm and pedal working stroke in 110 mm ~ 120 mm.

The working stroke of Hand brake control handle is in 220mm~ 250mm; by adjusting the length of the hand brake lever to ensure the reliable implementation parking braking within the regulation working stroke.

Specific adjustment method:

Control handle of the hand brake will be placed in initial position (lever horizontal), take down the cotter pin 6 and clevis pin with head 7, release the nut 9 and turn lever to adjust the effective length of the hand brake fork rod 8, until the working stroke to meet the requirement.



Note:

1. The left and right brake pedal free stroke must be consistent, otherwise the tractor will be a sharp tilt to one side when emergency braking, thus causing the accident;
2. in order to be reliable, after the brake control restructuring, but also brake testing, the steps are: chain around the brake pedal, the tractor to open a dry, flat ground, in the case of high-speed straight driving, separation After the primary clutch, with

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brake emergency brake, and then check the driving wheel parking slip prints in the road. If the left and right driven wheel in the same road on the prints (prints both sides into a straight line, parallel to each other, equal in length), indicating that the appropriate adjustment, or need to re-adjust. If repeatedly adjust well, check the brake inside.

4.3.2 Adjustment of front driving axle

4.3.2.1 Adjustment of main drive of front driving axle

The adjustment of main drive of front driving axle is shown in the figure.

The two conical roller bearings on front drive bevel pinion shaft and left and right conical bearings on differential are all retightened. In the course of service, abrasion of bearing will make bevel pinion and differential case have axial internal clearance. Therefore, they shall be examined regularly (with maintenance every 1,600h). The bevel pinion bearing is adjusted by adjusting nut 1. at time of adjustment, nut 1 shall be tightened, and then return by 1/10-1/6 circle; Nut shall be locked tightly at last. The left and right adjusting helicoids 6 shall be adjusted while the adjustment of differential case bearing in order to make backlash of main drive bevel gear pair fall in the range of 0.15~0.3mm. The adjusting helicoids 6 shall be locked tightly by locking plate 7.

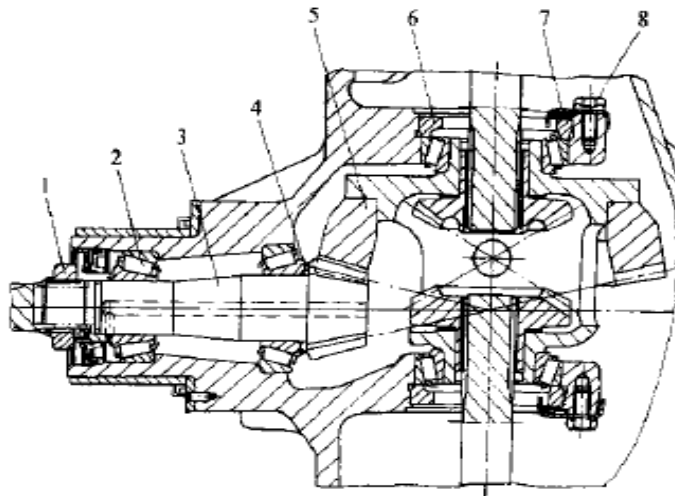


Fig.4-9 Adjustment of main drive of front driving axle

1-Adjusting nut, 2-conical roller bearing, 3-bevel pinion shaft

4-Adjusting washer, 5- large bevel gear, 6-adjusting helicoids, 7-locking plate, 8- bolt

4.3.2.2 Adjustment of final drive of front driving axle

The adjustment of final drive of front driving axle is shown in the figure. Two conical roller bearings 7 of final drive of front driving axle are retightened. Before adjustment, the bolt 1 shall be removed to take off planetary carrier 2; the adjusting nut 3 shall be tightened and then return by 1/10~1/6 circle to make front hub 6 rotate flexibly. Lastly, the detached parts shall be reassembled and tightened.

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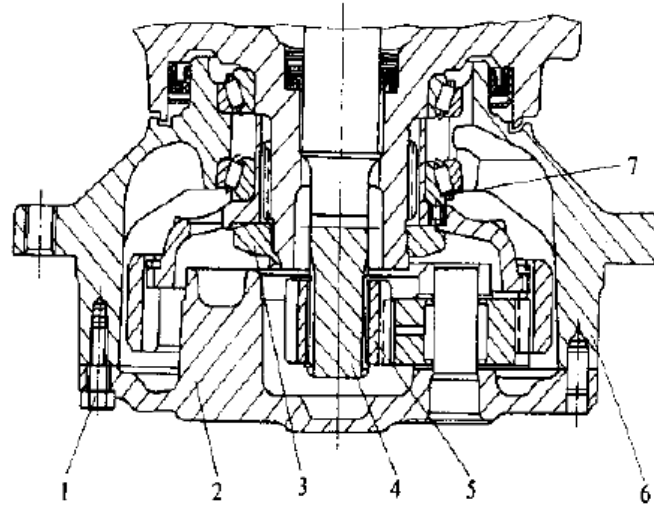


Fig.4-10 Adjustment of final drive of front driving axle

1-Bolt, 2- planetary carrier, 3-adjusting nut, 4-drive shaft

5-Sun gear, 6- front hub, 7- conical roller bearing

4.4 Adjustment of hydraulic suspension system

4.4.1 Adjustment of separate lifting cylinder

To assure agricultural implements are safety and reliably during transport. When the agricultural implement lift maximum position, it should adjusting fixed clamps press the valve. Close the oil-line by fixed valve, making it is not decreasing.

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4.4.2 Adjustment of oil cylinder decreasing height

The decreasing height follows by fixed valves and fixed clips in the oil cylinder to come true. Fixed clips block make up and down adjusting in the piston rod. More downer, less decrease space. On the contrary, more decrease space. During the decreasing, when fixed clips press valve, it stops decreasing. Note : When adjusting the distance between fixed clips and valve, it keeps consistently with two oil cylinders. The error is 0-0.5mm.

4.5 Attention for the operation of full hydraulic steering system

This series of tractors adopt full hydraulic steering system. Before delivery of tractors, the steering system has been adjusted correctly. Users shall pay attention to the following items in use.

- Examine screw joint frequently, in case of loosening, it must be tightened in time. There must not be oil leakage at joints of full hydraulic steering system while it is working.
- Examine level in the steering tank. If insufficient, it must be added as required.
- In case of binding or heaviness, or hidden danger of cornering in the turning of steering wheel in everyday use, steering wheel cannot be turned suddenly. Instead, the cause must be analyzed. It cannot be used until fault is removed. Otherwise, it will damage steering components. It is forbidden to conduct coasting with engine off, because the steering oil pump loses power and cannot feed oil. Turning steering wheel at this time will lead to failure of turning
- With respect to installation of full hydraulic steering system, the steering gear must be coaxial with steering shaft and have clearance while turning. After installation, the steering wheel shall be checked whether it is flexible.

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- The oil must be clean. Filter core and oil must be checked frequently by dripping a drop of oil on blotter paper; if there a black center on the oil stain, it indicates that oil should be replaced.
- After replacement of engine oil, the gas in oil cylinder shall be exhausted by loosening bolted joint of steering cylinder to oil pump going on low-speed running for air bleeding until there is no bubble in the outflow oil.

Important matters:

1. **Pressure relief valve of constant overflow pump will have well-adjusted safety overfall pressure before delivery. Make sure not to detach and adjust it randomly.**
2. **Constant overflow pump is a precision part. It is not allowed to be detached randomly under normal circumstances. It must be detached at the place of cleaning, and washed by clean gasoline or kerosene.**

5. Storage

If the tractor should be disused for a long time after finishing the field work or due to other reasons, it will be necessary to properly seal and store the tractor.

The tractor should be thoroughly cleaned before being sealed and stored. All connectors must be adjusted and fixed, and the technical service should be done in accordance with working hours, so that the tractor will be kept in good state.

Important matters:

Scientific storage and special maintenance and service are very important during disuse. Otherwise, the deterioration speed of tractor's technical state will be higher than that in working period.

5.1 Reasons for damage of tractor during storage period

- Corrosion: during the storage period, the dust and vapor in the air will easily enter into the machine through gap and orifice, and the parts will be polluted and corroded. Other parts such as piston, valve, bearing and gear, if they are kept in a position for a long time, they will lose the protection from lubricant film that flows and has pressure, thus the erosion, rust, cement blocking or clamping stagnation will occur, and the tractor will be scraped.
- Aging: The rubber, plastic and other parts will get aging, degenerated, brittle, corroded, and decayed or lose effect.
- Deformation: plastic deformation occurs in transmission belt, tire and other parts after they sustain force for long time.
- Others: electric parts are affected with damp, the storage battery automatically discharges, and etc.

5.2 Sealing and storing the tractor

- Carefully examine the tractor before sealing and storing it, eliminate the existing failure, keep good technical state, and clean up the appearance of tractor.
- The tractor should be stored in dry warehouse or shed with good ventilation. It can not be stored with corrosive goods and liquid. If the tractor is stored outdoor, select the higher and dry platform, and cover the tractor with tarpaulin.
- Support the tractor off ground with dry wood frame, so that the load can be removed from tire. Regularly examine the air pressure in tire.
- Clean the parts dismounted from tractor and the tools, pack them and store them in dry

Deposit

warehouse.

- Exhaust the antifreeze and antirust in radiator, air cylinder and water pump, the engine oil in lubrication system and the engine oil in hydraulic system.
- Remove the storage battery, and coat the terminal post with lubricant. Store the battery in shady room with fine ventilation and at the temperature of more than 10°C.
- Exhaust the oil in engine and add new engine oil. Operate the engine throttle for several minutes, so that the engine oil will accrete to the surface of moving components.
- Add grease in each lubricating point.
- Coat the electric contacts, connectors and the surface of unpainted metal parts with dehydrate Vaseline (which should be heated at 100°C to 200°C) .
- Let out diesel in the tank and clean up it.
- Use the protective material to chock the unclosed tube in the engine.

5.3 Service during the period of sealing and storing tractor

- All the abovementioned requirements for sealing and storing tractor should be satisfied.
- It is necessary to examine whether the corrosion, aging, deformation and other abnormal phenomenon occur in the tractor and components. The problems should be removed in time.
- The crankshaft of engine should be swerved for 10 to 15 circles every two months, in order to prevent rust. For the lubricating parts where grease needs to be added, clear away the old grease and replace new grease.
- Start up tractor one every three months, and drive it with low speed for 20 to 30 minutes to examine whether abnormal phenomenon occurs in each part.
- Regularly wipe the dust on the surface of storage battery with dry cloth, and maintain it regularly by following the Use Manual of Storage Battery.

Important matters:

If the tractor is unused for several months or longer, the engine oil should be replaced at least. Clean the element of engine oil filter. Start up tractor one every three months, and drive it with low speed for 20 to 30 minutes to examine whether abnormal phenomenon occurs in each part. Keep the exterior clean and dry.

5.4 Unsealing tractor

- Clear away the grease.
- Open the closed nozzle, and clean the tractor.
- Add coolant, engine oil, diesel, and add lubricant in each lubricating point.

Deposit

- Install the storage battery by following the requirements of Storage Battery Use Manual, and coat the terminal post with Vaseline.
- Clear away the antirust in the groove of fan belt, and mount the belt. Adjust the tightness degree of transmission belt in line with technical requirements (see the Use and Service Manual of Engine).
- Examine the security of electric circuits and pipelines.
- Connect battery and spread Vaseline in the connector base.
- Control tractor as specifications.

Notes: Finishing the regular technical maintenance of diesel engine.

6. Delivery, Acceptance and Transportation

6.1 Delivery and acceptance

When the user purchases a tractor, he should mainly examine the following aspects:

- Whether the documents of the tractor are complete or not.

The documents include: Use and Service Manual of Tractor, Warranty Booklet, Catalogue of Tractor's Parts, List of Accessories (Spare Parts).

- Whether the goods of the tractor are complete or not.
- Whether the tractor is in good state.

The technical state of tractor may be changed through consignment or movement, thus the user shall further confirm the tractor's state.

6.2 Transportation

If the tractor is transported by driving, the traffic rules must be strictly complied with, and the distance between two vehicles shall be kept as 60m at least. Collision caused by accidents must be avoided. If the tractor is transported by being loaded on a truck, the following points shall be done:

- The tractor should be loaded and unloaded on level ground.
- The special unloading deck should be used when loading and unloading the tractor.
- The assistant must give guidance at site, and unrelated persons can not be close to the site.
- Put the hitch rod on the lower position after loading the tractor, pull the hand brake, engage the reverse gear, and pull out the startup key.
- Keep the tire stable with blocks.
- Adjust the rear-view mirror downward, and take it off if necessary (dismount the muffler as far as possible).
- When passing culvert and bridge, caution whether the tractor on truck exceeds the height.

Reduce the speed when turning a corner.

- The hand brake should be relieved first when unloading, then engage the forward gear, and drive the tractor with minimum speed from the truck.



Notes:

- 1. The brake of truck should be clamped in loading and unloading the tractor.**
- 2. The tractor should run with minimum speed in loading and unloading.**

7. Technical Specification

7.1 Product execution standard

Product execution standard : Q/LYBM 005-2011 70-100 Wheeled Tractor series

7.2 Products Indication location

1. The chassis No. of this series are indicated at the left upper side of rear axle housing.
2. The tractor nameplate of this series are indicated at the left side of instrument panel.

Technical Specification

7.3 Product Specifications

7.3.1 Parameters of the tractor

Type		Un	Techical specification			
			-1104	-1204	-1254	-1304
Model		—	4×4 Wheeled tractor			
Rated traction power		kN	26	27	29	32
Maximum PTO shaft power		k	69.35	71.25	78.85	81.7
Shape Sides	Length	m	5040			
	Width	m	2285			
	Height (to the top of cab)	m	2960			
	Height (to the top of silencer),	m	3040			
Wheel tread	Front wheel	m	1822、1843、1910、1954、2023、2040、2134、2153			
	Rear wheel	m	1570、1662、1774、1874、1970、2070、2174、2262			
Wheel base		m	2688.5			
Minimum ground clearance		m	485			
Swing circular radius	Use signal side system	m	6.3±0.3			
	Not use signal side system	m	7.0±0.3			

Technical Specification

Struction quality		kg	4560
Minimum using quality		kg	4910
Quality distributes	Front base	kg	1985
	Rear base		2925
Ballast	Front ballast (option)	kg	500
	Rear ballast (option)	kg	300

Technical Specification

7.3.2 Engine

Type		Unit	Technical specification			
			-1104	-1204	-1254	-1304
Engine	Style	—	LR6B3-23	LR6B5-23	LR6M5-23	LR6M5-23
	Model	—	Inline、Injection、Water-cooling、Four-stroke、Naturally aspirate			
	Cylinder NO.	—	6			
	Cylinder bore	mm	108	108	110	110
	Travel	mm	125	135	135	135
	Rated power	kW	81.0	88.2	92.0	95.6
	Rated swing speed	r/min	2300	2300	2300	2300
	Maximum torque	N·m	≥282	≥340	≥350	≥370
	Maximum swing speed	r/min	1500 ~ 1700			
	Torque stock	—	18% ~ 25%			
	Rated fuel consume rate	g/(kW·h)	≤242			
	Rated oil consume rate	g/(kW·h)	≤1.63			
	Lubricate style	—	压力式			
	Starting style	—	Electrical starting			

Technical Specification

7.3.3 Transmission system

Type			Unit	Technical specification
				-1104/1204/1254/1304
Transmission	The style of connect engine with transmission		—	Direct transmission
	Rear axle	Clutch	—	Dry-type、Combination、Double-action、Independent-type
		Gearbox	—	Streaming 4× (3+1) , 12F+4R , main variable speed gear , Vice variable straight gear, Main, vice variable speed meshing sleeve
		Center transmission	—	Spiral cone gear
		Differential	—	closed , 4 planet cone gear
		Differential lock	—	Lock pin type
		Final transmission	—	Single planet gear , with rear axle cover
	Front axle	Transmission shaft	—	Intermediate transmission shaft
		Front central transmission	—	Spiral cone gear

Technical Specification

		Front differential	—	closed , 2 planet cone gear
		Front final transmission	—	Single planet gear

7.3.4 Running system ,steering system, braking system

Type		Unit	Technical specification
			-1104/1204/1254/1304
Walking	bracket	—	None

Technical Specification

system	Front suspension			—	—
	Front base			—	—
	Wheel specification	Standard : front wheel / rear wheel		—	14.9-26/18.4-38
		Pattern (front wheel / rear wheel)		—	R style /R style
		Number (front wheel / rear wheel)		—	2/2
		Pressure	Front wheel	kPa	118 ~ 137
			Rear wheel		118 ~ 137
Braking system	Driving braking			—	Silent hydraulic style, plate style, wet style
	Stopping braking			—	Independent handle braking
	Trailer braking			—	Air brake, break air brake
Swing system	means			—	Front wheel swing
	Swing device			—	Silent hydraulic swing

Technical Specification

7.3.5 Working system

Type			Unit	Technical specification
				-1104/1204/1254/1304
Hydraulic suspension	Style		—	Split
	Hydraulic system		—	open
	Safety valve setting pressure		MPa	20.5-21.5
	Hydraulic pump		—	Gear pump , 2CBN-G320/310A
	Dispatcher		—	Sliding valve
	Oil cylinder	diameter×trip	mm	φ110×200
		Style	—	Double-action
	Suspension structure		mm	Postposition three point suspension, 2-class
	Plough adjusting means		—	Power, position composite control and floating power control
	Maximum lift power [suspension point 610mm]		kN	19.4/21.2/22.1/22.9
	Hydraulic output connector	Style	—	Postposition
		Diameter specification	—	14.5mm
		Pairs number	—	1 pair or 2 pairs

Technical Specification

		pressure	MPa	25
		Streaming	L/min	50
PTO shaft	Style		—	Postposition、 independent and synchronous style
	Specification		—	φ38 , 8 tooch rectangle integral key shaft (Option φ35 , 6 tooth rectangle spline shaft or φ35 , 21 tooth rectangle spline shaft)
	Rotating speed		r/min	Standard : 540/1000 ; Option : 540/720
	Synchronism rotating speed		r/min	Front wheel rotating each 1 circle , output shaft rotating 17.28 circles (540r/min) Rear wheel rotating each 1 circle , output shaft rotating 28.72 circles (1000r/min)
Traction device and trailer device	Traction device		—	Swing
	Trailer device		—	U-type shackle
Driving cab			—	Simply comfortable style, with warm wind, with fan or air-condition.
Driving seat			—	Mechanical suspension, PVC cover, Height , Front and rear adjusting

Technical Specification

7.3.6 Electrical appliances and instruments

Type		Unit	Technical specification
			-1104/1204/1254/1304
Indirectly style		—	12V negative grouding
Engine	Style	—	See engine operation manual
	Voltage	V	14
	Power	kW	1
Adjuster	Style	—	See engine operation manual
	Adjusting voltage	V	14
Starting motor	Style	—	See engine operation manual
	Voltage	V	12
	Power	kW	3.7
Battery	Style	—	6-QW-150
	Voltage	V	12
	Capacity	A·h	150
	Quantity	—	1

Technical Specification

Lighting and signal device	Front combination lamp	—	1
	Rear combination lamp	—	2
	Rear working lamp	—	2
	Handle signal lamp	—	2
	Trailer socket	—	1 set of 7 holes trailer socket
Monitor and	Combination instruments	—	With 1 set of tachometer, fuel indicator, water temperature gauge, oil pressure gauge

Technical Specification

warning device	Warning device	—	Instruments warning indicating lamp: left and right turning indicating lamp, driving lamp, charging indicating lamp, lower oil pressure indicating lamp, preheat indicating lamp, parking braking indicating lamp, signal lamp and devices, braking lamp, left and right turning lamp, front and rear position lamp, reflector, safety warning identify
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Technical Specification

7.3.7 Oil and water injection volume

Type		Unit	Technical specification
			-1104/1204/1254/1304
Filling capacity	Radiator	L	26
	Fuel tank	L	230
	Engine oil bottom cover	L	22
	Oil bath type air filter	L	1.0
	Hydraulic steering oil	L	2.5
	Braking oil	L	0.6
	Transmission system oil	L	60
	Lifter oil	L	25
	Front axle center transmission	L	8.8
	Front axle final transmission	L	1.36 (each side)

Technical Specification

7.3.8 Theoretical speed of tractor

Unit : km/h

Type			-1104/1204/1254/1304
Shift			Rear wheel sides: 18.4-38
Direction	Vice various speed	Main various speed	
Forward shift	Low shift	1	2.34
		2	3.48
		3	4.23
		4	6.61
	Middle shift	1	4.94
		2	7.35
		3	8.94
		4	14.00
	High shift	1	10.80
		2	16.08
		3	19.55
		4	30.55
Reverse shift	Reverse shift	1	5.04
		2	7.51
		3	9.13
		4	14.27

8. Disassembly and Disposal

When the service life of the entire machine is run out, for the sake of personal safety and protection of social environment, please transfer the machine to professional recovery company with permit of disassembly for disposal.

The machine shall be disassembled from up to bottom, from outside to inside. The object of bulk mass or weight must be disassembled by specialized lifting appliance. Battery shall be transferred to professional recovery company of battery. The waste engine oil etc. shall be disposed centrally and properly, instead of being random poured to pollute environment.



Warning:

As battery electrolyte is corrosive, be careful not to make it into eyes, on skin or clothes. If contacting acid liquor, make sure to wash the part infected immediately with clean water, and rush to hospital for treatment for fear of unexpected injury.

Important matters:

- 1. The replaced battery acid must not be poured randomly for fear of pollution of environment.**
- 2. The replaced engine oil, which belongs to waste oil, cannot be discarded randomly for fear of pollution of environment.**

Our company hereby reminds you of possible personal injury arising from improper arrangement of above things during and after disassembly under the circumstance of absence of professional disassembly tools and experience in practical operation.



Warning:

The object of bulk mass or weight must be disassembled by specialized lifting appliance! Pay attention to personal safety!

9. Warranty

9.1 Basis of warranty

The warranty of this series of wheeled tractors is based on the Warranty Booklet supplied by Agrison Pty Ltd.

9.2 Situations beyond warranty

According to relevant laws and regulations, there are some situations beyond warranty. Please read carefully the warranty booklet to understand your obligations as an operator, and also the scope of the warranty.

Note: Some conducts may lead to invalidity of warranty conditions. See Warranty Booklet for further information.

Note: If user modifies tractor randomly or uses it for the purpose other than operation specification, it will not be within the manufacturer's warranty. Please make sure to pay attention.