LOVOL-TA Series Wheeled Tractor

TA550/TA554/TA600/TA604/TA650/TA654/TA700/TA704/ TA750/TA754/TA800/TA804/TA820/TA824/TA850/TA854

Operation Manual

The People's Republic of China
LOVOL Heavy Industry Co., Ltd.

Product Identification Mark Record Form

Product Identification Mark Record Form

Product Brand	
Product Model	
Manufacturing Number of Complete Machine	
Engine Model	
Manufacturing Number of Engine	
Purchase Date	
Purchase Place and Contact Information	
User	
Manufacturer	LOVOL Heavy Industry Co., Ltd. (P.R.C)
Factory Site	No.192 Beihai Road (south), Weifang, Shandong, China
Contact Number of Factory	4006589888

Note:

1. Users should fill in the form carefully in the case of purchase.
2. Numbers in the form should be recorded completely (including letters).

LOVOL-TA Series Wheeled Tractor

TA550/TA554/TA600/TA604/TA650/TA654/TA700/TA704/

TA750/TA754/TA800/TA804/TA820/TA824/TA850/TA854

Operation Manual

The People's Republic of China LOVOL Heavy Industry Co., Ltd.

* * *

Format: 880×1230 1/16 Number: TA-SM-02.5

December, 2014 The 5th Edition • 2010 The 1st Printing

Notice

Dear customers,

Thank you for your trust in our company and select our LOVOL-TA series wheeled tractors. With the purpose of proper, reasonable and efficient operation of your tractor, please pay attention to important information below:

1. It is necessary to real this manual carefully before operating the tractor regardless of your driving experiences for this may be helpful for your reasonable and effective tractor operations.
2. For more economic benefits of you and longer service life of the tractor, please read this manual and attached engine and agricultural implement operation instructions carefully prior to use this tractor. Besides, operate and maintain this tractor well in strict accordance with provisions in this manual in order to allow the tractor to play a full role in its performance.
3. Do not modify this tractor at will to avoid tractor performance influences and even accidents.
4. Since agricultural technologies and soil conditions are different from place to place, there may be some differences in recommended product purposes, parameters, matching agricultural implements and operating efficiencies provided by this operation manual. Therefore, users should select according to specific conditions.
5. Operation, maintenance and repair for this tractor should be implemented by people who know well about tractor features and possess relevant safe operation knowledge.
6. Drivers should possess agricultural vehicle or tractor driving licenses issued by local transportation department.
7. Please comply with local safety requirements and road traffic regulations at any time to avoid accidents.
8. It is not allowed to exceed specified range of this operation manual or there will be tractor performance deterioration or faults.
9. This operation manual is not a product quality guarantee. Therefore, no requests which are made on the basis of data, figures and descriptions included in this manual would be accepted.
10. For continuous machine quality improvement, operating performance and safety performance improvements, our company will change some component designs timely and there will be some differences between contents, figures, etc. in the manual and actual products accordingly. Contents of this manual will be changed without any further notice and we apology for the inconvenience this may cause.
11. Product executive standard for this manual is in compliance with the latest one released before the product manufacturing date.

Warranty Statement:

Lovol Responsibilities under the limited quality guarantees

Producing the quality products is Lovol's responsibilities and obligations, but it does mean there is no problem in terms of material and processing. The products from the distributors authorized by Lovol could be

maintained for free by the Lovol or our authorized distributors if the quality or processing failures occur within the warranty. The warranty is dependent on the period the distributor makes the commitment of as the products have different usages within the different areas.

This chapter mainly covers the user's duties and the manufacturer's exceptions about the use of Lovol Equipments. Therefore, please read it carefully and ask for the local distributors authorized by Lovol if there is any question.

User's Duties:

1. User shall timely notify the failures within the warranty and bear the cost to keep the product unattended.

2. Use of the product shall be limited to the stipulated capacity and application.

3. Correctly maintain the product.

4. Provide the complete purchasing vouchers and the handover training copy for application for warranty.

Exceptions:

1) Early wear and failures due to the improper use and maintenance or due to out of the application range

2) Failures or damages due to the self-modification or the improper disassembly

3) Unable to provide the purchasing vouchers and the handover training copy

4) Traffic accidents or operational accidents due to the improper driving, operations or use, the caused property loss and casualties

7) Any damage due to force majeure

8) Unauthorized repair

9) Failures due to use of other parts than original Lovol parts

10) Wear parts or maintenance parts in principle (defects before ex-factory), including but not limited to: Clutch, brake friction lining, filter (air, oil or fuel), bulb, glasswork, lubricant and coolant (use for the allowed repair), belt, cutter blade, bucket tooth, nozzle, outer tube and inner tube.

11) The products certified as the completely damaged and repaired ones.

Overview

This operation manual provides detailed introduction about safety precautions, running-in, usages, technical maintenance, adjustments, faults and corresponding troubleshooting of various parts for LOVOL-TA series wheeled tractors and can be used as reference for tractor drivers and maintenance personnel.

In this manual, safety warning signs ⚠ point out important safety information. When this symbol appears, please be caution of potential injuries. Carefully read information under this symbol and inform other operators of this.

⚠**Warning:** If it is inevitable, the potential hazard may lead to serious injuries or even death;

⚠**Attention:** If it is inevitable, the potential hazard may lead to slight or intermediate injuries.

Important matter: It is used to describe some matters involved with machine damages.

Note: It is used to describe some supplementary information.

This operation manual is an essential part for the product and is provided to a user with the tractor. Please keep this manual properly.

In the case of any confusion during reading this operation manual, welcome to dial out service hotline: 4006589888 for consultation.

Intended Purpose

LOVOL-TA series wheeled tractor is a multi-purpose medium-seized agricultural one. This machine possesses advantages like compact structure, easy control, flexible steering, large traction, wide range of usage and easy maintenance. When being equipped with applicable agricultural implements, this tractor can be applied to tilling, harrowing, sowing and harvesting operations; When being equipped with a trailer, this tractor can be applied to agricultural transport operations with a mass ratio for the tractor and trailer (trailer gross mass: tractor gross mass) not more than 3; besides, it can be connected with a field straw chopper for field straw chopping operations via a PTO shaft which can be taken as the prime power for water pump and thresher. For the optimal economic benefit, please apply applicable matching agricultural implements according to relevant requirements in this manual (See 11.5 List of Matching Agricultural Implements for the Tractor). Users should use, maintain and repair this tractor in strict accordance with conditions provided by the manufacturer as well as basic requirements for the intended purpose. Any other operations except those for the intended purpose of the tractor would be taken as violations.

Operation, maintenance and repair for this tractor should be implemented by people who know well about tractor features and possess relevant safe operation knowledge.

Please comply with precautionary rules, safety requirements and road traffic regulations at any time to avoid accidents.

This tractor is not allowed to be modified to be other equipments, such as: excavator, loader, etc. The manufacturer assumes no responsibility for any machine reliability deterioration, machine damage or personal injury which is caused by unauthorized tractor modification or operation violation for its intended purpose.

Chinese and English Comparison Table for Common Units

S/N	Unit Category	Internal Unit	Chinese Version
1	Time	s	秒
2		min	分钟
3		h	小时
4	Length	mm	毫米
5		cm	厘米
6		m	米
7		km	千米
8	Force	N	牛顿
9		kN	千牛
10	Torque	N·m	牛顿·米
11	Mass	kg	千克
12		g	克
13	Pressure	Pa	帕
14		kPa	千帕
15		MPa	兆帕
16		kgf/cm^2	千克力/平方厘米
17	Temperature	℃	摄氏度
18	Speed	km/h	千米/小时
19	Revolving speed	r/min	转/分钟
20	Current	A	安培
21	Voltage	V	伏
22	Capacity	L	升
23		ml	毫升
24	Flow	L/min	升/分钟
25	Power	kW	千瓦
26		PS	马力
27	Fuel consumption	g/kW·h	克/千瓦·小时
28	Battery capacity	A·h	安培·小时

Content

1 Safety Precautions 1
1.1 Safety rules and precautions 1
1.2 Safety warning signs 9
2 Product Identification 15
3 Operation Instruction 16
3.1 Common marks and symbols 16
3.2 Product description 16
3.3 Tractor maneuvering mechanism and instrument 17
3.4 Engine start 23
3.5 Start the tractor 27
3.6 Tractor steering 28
3.7 Tractor gear shift (for the model with 8+2 speed gearbox) 28
3.8 Gear shift description for optional 16+4 speed gearbox (for the model with 16+4 speed gearbox only) 29
3.9 Gear shift description for optional 10+10 speed shuttle gearbox (for the model with 10+10 shuttle type gearbox only) 30
3.10 Tractor braking 31
3.11 Tractor stopping and engine flameout 31
3.12 Tractor running-in 32
3.13 Differential lock operation 36
3.14 Front drive axle usage 37
3.15 Hydraulic output device operation and usage 38
3.16 Counterweight usage 39
3.17 Driver's seat adjustment 39
3.18 Tractor covering parts 40
3.19 Operation of tractor operation device 45
3.20 Common failures and troubleshooting 52
4 Accessories, Spare and Wearing Parts 61
4.1 Accessories 61
4.2 Spare parts 62
4.3 Wearing parts 65
5 Maintenance Instruction 66
5.1 Technical maintenance procedures: 66
5.2 Clutch adjustment and maintenance 70
5.3 Gearbox adjustment and maintenance 72
5.4 Rear axle adjustment and maintenance 73

Content

5.5 Brake adjustment and maintenance 75
5.6 Steering system adjustment and maintenance 77
5.7 Front axle adjustment and maintenance 78
5.8 Transfer case adjustment and maintenance 80
5.9 Wheel adjustment and maintenance 80
5.10 Electrical system adjustment and maintenance 85
5.11 Adjustment and maintenance of air cut-off brake for trailer (only for machine with air brake) 90
5.12 Maintenance of hydraulic suspension system 91
5.13 Application and maintenance of dry air filter 94
5.14 Maintenance of oil-bath air filter 95
6 Storage 96
6.1 The reasons of tractor damage in shutdown period 96
6.2 Storage of tractor 96
6.3 Maintenance during period of sealing-up for safekeeping tractor 97
6.4 Unseal tractor 97
7 Delivery, Acceptance and Transportation 98
7.1 Delivery and Acceptance 98
7.2 Transportation 98
8 Technical Specifications 99
8.1 Product model 99
8.2 Product technical specifications 100
8.3 Comparison table for previous and current models of LOVOL-TA series wheeled tractors 111
9 Disassembly and Disposal 112
10 Guarantee Items 113
10.1 Basis for product guarantee 113
10.2 Conditions for guarantee nonperformance 113
11 Appendixes 114
11.1 Oil, fuel and solution used for tractor 114
11.2 Main bolt/ nut tightening torque table 115
11.3 Roller bearing, needle bearing and steel ball specification used for tractor 116
11.4 Oil sealing and seal ring specification for tractor 117
11.5 Tractor agriculture implement list 118
Customer Feedback Information sheet 122
Handover training 123
Compulsory insurance 124

1 Safety Precautions

1.1 Safety rules and precautions

Prior to implementation, you must read through and have a good understanding of user manual for safety operation. Do not operate the machine at any time until you have mastered the operational steps indicated in this manual. During operation, you should comply with the following precautions and important safety instructions such as Warning, Attention, Important, Note.

Notices

1 The driver should read through this manual and fully understand the meaning as well as safety warning signs.

2. The driver should know how to operate and work with this machine.

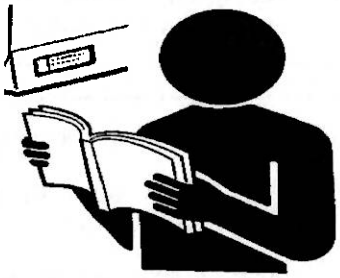


Fig. 1-1 Read Notice

Qualified operator

1. When operating this machine, the driver should have ability to judge in any cases.
2. Those, who are in poor health, or have drunk, or lack enough sleep, or are pregnant, color blindness or under 18 years, will be banned to operate this machine.
3. The driver should have accepted special training and obtained license for driver subject to check-up process. He or she shall comply with the traffic rules strictly.
4. For new operator, always drive the machine at lower speed until he or she has been proficient in operation.

Fig. 1-2 Qualified Operator

Uniform for drivers

1. During operation, the drivers should wear tight fitting clothes; No loose working suits and shirts allowed, never put on neckties and necklaces, etc; For female driver, long hair (if any) should be coiled up.
2. If you work on the site close to tractor or operating parts, coil up your hair (if any), never put on neckties, scarves or necklaces, etc. If these items are wringed into machine, this can cause serious injury.
3. During operations, it is necessary to wear protective tools such as safety shoes, safety helmet, goggles and gloves.

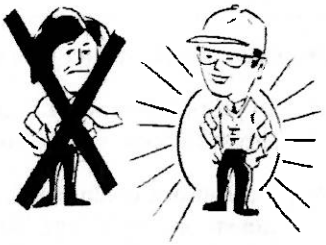


Fig. 1-3 Uniform for drivers

Application of fuel

1. The fuel is flammable, and shall be refilled in the places far away from Fire source.
2. Prior to refilling fuel tank, turn off the engine.
3. Don't smoke and be close to fire when refilling and repairing fuel system.
4. Keep machine clean without dirt, grease, or debris; When fuel and oil overflow, wipe them out with a clean cloth.
5. The quality of fuel and grease should meet the requirements as specified in "Appendix" section.

Fig. 1-4 Application of fuel

Safety replacement of operating oil

1. The working fluid is dangerous and can cause serious injuries, such as high pressure hydraulic oil, brake fluid, engine oil, etc.
2. Shut off the engine before replacing working fluid. No fire and no smoking; Use a cloth to wipe up the oil when it overflows.
3. Replace operating oil with those at specified grade.
4. The used operating oil is waste oil and can not be thrown away.

Tire maintenance precautions

1. In case of installation and removal of tire, it is easy to cause explosion if you fail to operate as specified in the manual. This can cause serious injury or even death; never install or disassemble the tires till you have obtained proper and safety operation experience.
2. Make sure inflation pressure for tire is correct; the maximum inflation pressure cannot exceed specified value. If this is the case, there will appear some crack threads on the edge of the tire, even such can cause explosion accident. When the inflation pressure has reached recommended value, deflation is required if both sides of tire have not positioned yet. Inflate again after the tire is re-fixed and the edge is lubricated.
3. Regular check and tighten torques of locknuts and bolts on the front and rear wheel rims, in order to avoid machine from rollover caused by disengagement of wheel during operation, and protect operator from serious injury and eliminate excessive damage to the machine.

Disposed oil and waster placement

1. Improper disposal of used oil and wasters can cause great threat to ecological environment.
2. Leak-proof container shall be used for disposed oil emission; never use food and beverage containers to prevent others mistake swallow, resulting in accidental injury.
3. Don't dump used oil on the ground, into subway or discharge them into other water sources.
4. Don't dispose arbitrarily used oil, fuel, refrigerant, brake fluid, filter elements or batteries, which can be hazardous; more information for reusing or disposing wasters in a right way, contact local environmental protection department or recycle center.

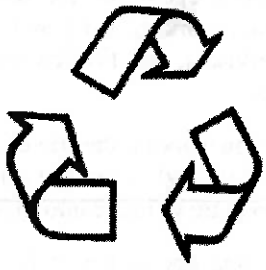


Fig. 1-5 Waster placement

Underway of living and industrial electricity cables

1. Make sure to secure all machine parts to prevent them loosening and electric shock.
2. When driving through under living and industrial electricity cables at low speed, make sure the maximum height falls into the range of cable safety values as required to avoid electric shock caused by hooking or touching with cables.
3. Prevent risk of electric shock from touch with high voltage wires during transportation, operation and in shutoff state.

Correct support for tractor

1. To descent the parts or tools onto the ground, the tractor and its parts needed to be lifted shall be supported safely.
2. Don't use cinders, bricks (hollow) or other fragile substance under continued pressure to support machine.
3. Don't operate tractor in the case only having a jack is used for support tractor.
4. Before operating jack, you should read through the user manual carefully. Never overloading, this is the case only if rigid support deck is stalled to avoid injury and property losses.
5. When using jack, only use it for support right under left and right axle shaft housing of rear axle and front bracket, no need to support other parts.

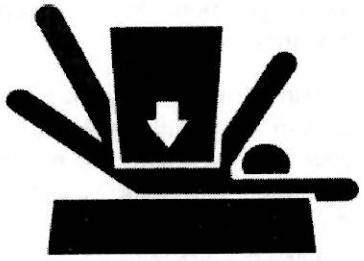


Fig. 1-6 Support risk

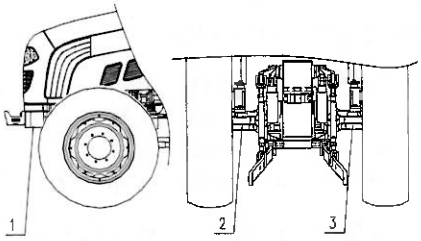


Fig. 1-7 Jack support parts

1.Front bracket; 2.Left axle shaft shell;

3.Right axle shaft shell

Cab emergency exit

There are three emergence exits in the cab, left door, right door and rear window. In the case of emergence, lift unlock handle to open the doors or rotate opening handle clockwise to open rear window and leave the cab safely.

Avoid touch with moving parts

1. When the machine is running, never carry out lubrication, maintenance, service or adjustment operations until its shutdown.
2. Make hands, feet and clothes away from moving drive components.

Fig. 1-8 Avoid touch with moving parts

Hydraulic pineline Caution

1. High-pressure hydraulic oil has sufficient strength to penetrate and injure body on the hand, ear or skin. To check, repair hydraulic line, the pressure on hydraulic system shall be released. Afterwards check possible leakages by using paperboard or wood board, thus avoid hands and body from injury resulting from high-pressure liquid.
2. In case of injury resulting from leaked hydraulic oil, immediately seek medical advice. If failed to take necessary treatment promptly, this can cause serious infection and unwell reaction. diation except flame can cause damage to pipelines by accident.
3. If heating up near pressure liquid pipelines, it can produce a kind of spray mist, which can in turn cause severe burns on your body or others. Do not heat up by pipelines. Never use welding, gas welding or welding torch near hydraulic lines。 Other inflammable fuels as thermal radiation will accidentally damage the pipeline.

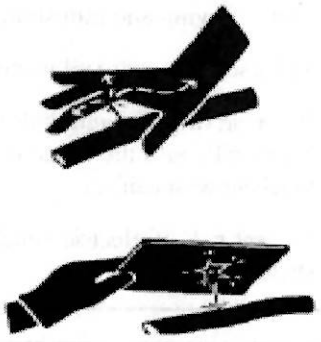


Fig. 1-9 Hydraulic line Leakage

Taking a ride for others

1. Only driver can be allowed to operate machine in driver's seat; the machine without vice seat (for trainer) doesn't allow other personnel to ride, while vice seat (for trainer) on a machine can only be used to train driver or diagnose failures quickly, and in the process of taking vice seat, anybody is prohibited to cause interference, influence and obstacle to driver.
2. When the machine starts or is working, anyone cannot be allowed to climb over the machine, and far away from area where this machine is placed, in order to avoid injury.

Emergency treatment

1. When the brake is failed, stabilize the steering wheel, and drive to a safe place, then immediately turn off the engine.
2. When the steering wheel is failed, immediately depress brake pedal and then turn off the engine.
3. A first aid kit shall be prepared at hand. There are telephone numbers of emergence center, hospital and fire department written down everywhere near all telephone sets. In the case of incidents, call local emergency center, hospital or fire department immediately for help.
4. In order to guarantee the safety and security of your own and others, do not risk driving or operating the machine. Only when making ensure that the machine is repaired by qualified technician and there is no one around service site, the operator can restart the machine to drive at low speed.
5. In the case of fire, immediately shut off engine. If there is fire extinguisher available, it is necessary to use it spray on flame base; If no fire extinguisher is available, use sand or others materials to put out the fire.

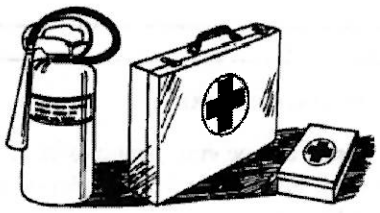


Fig. 1-10 Emergence treatment

When tractor connects to other operating devices or parts are replaced

1. When optional or replaced part is installed, the engine must be closed, stop the tractor on the safe place for replacement. Prior to replacement, read through safety marks and user manual carfully, or carry out replacemenet by professionals if necessary.
2. When the tractor is connected to other devices, if lack working experience, it is possible to cause injury, or ask the professional for help when necessary.

Proper application of battery

1. As the gas overflowed from battery may run the risk of explosion, the battery shall be far away from open flame (such as matchsticks, lighters or cigarettes etc.); avoid short circuit, sparks.
2. The battery is only used for starting engine, not for any other purpose.
3. When the battery is charged or replaced, you should read the caution labels on the battery carefully.
4. Remove bond strap on negative pole (-), then remove the battery. To install battery, the first step is to install the positive pole (+) cable.
5. Before the battery is charged, remove it from machine.
6. Prior to charging, check if battery end cap vent is smooth and the ambient is ventilated.
7. Proper charging current depends on rated capacity of battery. After the charging is over, disconnect power supply, and detach cable from battery post to prevent battery explosion caused by possible electric ignition.
8. Do not use the batteries out of those specified for the machine.
9. It is more dangerous to touch with electrolyte (dilute Sulfuric acid). If it touches with eyes, skin and Clothes, immediately wash them away with clean water; If it is splashed into eyes, flush it fully with clean water, then seek medical treatment. To avoid injuries, the following actions shall be taken: + pole –pole Start

- Wear goggles and rubber gloves;
- Avoid breathing smoke generated by respiratory electrolyte;
- Prevent electrolyte splash or drip;
- Use correct and parallel startup process.

Fig. 1-11 Application of battery

Fig. 1-12 Electrolyte danger

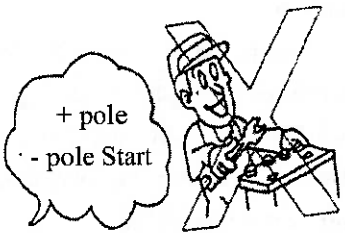


Fig. 1-13 Check of battery

Safety Precautions

Warning!

1. For safety and security of your life and property, operate the machine in a secure way to bring happiness to your relative.
2. When the tractor startup, you should note whether there is obstacle on the road or not and if someone stands between tractor and agriculture implement or trailer, press whistle for warning others to prevent accident injury due to suddenly startup of the tractor.
3. Do not start and operate tractor at the places away from driver's seat. When starting tractor, make sure gear lever is changed to neutral position, power output control stick and front drive joystick disengaged, control stick for lifter in neutral position, in order to prevent accident caused by suddenly startup of tractor.
4. Do not use jumper short circuit terminal start engine. Otherwise, when the gearbox shifts to the gear, the tractor will automatically drive out of control. This can cause the accident hazards.
5. The movement of all the pedals shall not be hindered. All the pedals can restore to the original places smoothly. Never place some obstacles between floor and pedal. Do not place items which can be rolling or sliding down when stepping down the pedal. No carpets or other matting materials around pedal to avoid accident due to pedal movement.
6. Prohibit anyone to get on or off tractor while the tractor is driving, or crawl under the tractor body for overhaul when engine is in operation, as this can cause personal injury.
7. After stopping, the driver shall pull out the key, move the gear lever to neutral position and lock up the parking brake handle before he or she gets off the tractor, in order to prevent accident due to auto-movement out of control.
8. During transportation, left and right brake pedals shall be interlocked together, control appropriate speed. Pay full attention to whether it is beyond the height limit or not when driving through culverts and bridges. Slow down the speed in advance when turning around to avoid unexpected accident, such as rollover, collision.
9. During uphill or downhill, change to the lowest gear, and use throttle control reasonably. The tractor is inhibited to engage neutral gear or depress clutch pedal to slide down hill. No change of gear allowed when uphill or downhill to avoid rollover risk.
10. Do not take sharp turn when driving at higher speed or use unilateral brake to take sharp turn, in order to prevent rollover risk.
11. When driving on the road, you should pay attention to traffic marks, and strictly follow the traffic rules, in order to mitigate the risk of accidents.
12. When driving, you should strictly follow the traffic rules. The space between two vehicles shall be maintained no less than 60m to mitigate the risk of accident collision.
13. As the embankment near ditch, cave and dam is more unsecured, the weight of tractor may make it collapse. Make a detour, or this can run the risk of accidents.
14. The tractor shall never be overloaded, and is prohibited to work at the extreme limit in order to avoid personal injury or damage due to overload.
15. When the tractor is working at night, it is essential to set up a good lighting equipment in order to alleviate influence on performance of tractor and avoid the occurrence of dangerous accident.
16. When the tractor is working on harvest or yard field, it is required to install spark quench on exhaust pipe to mitigate the risk of unexpected accident.
17. In the case of rain or snow weather, slow down operating speed in order to alleviate the risk of rollover event due to slippery ground.
18. In the case of power output operation, it is a must to make sure reliable connection and protection to

prevent injury caused by separation of moving parts.

19. When linkage or traction of implement, all axle pins shall be connected in a secure way to alleviate collision risk due to their separation from tractor. While disconnecting or towing implement, make sure all axle pines separate from tractor to avoid personal injury or machine damage due to unclear separation.
20. When lifting up, pay attention to engine throttle control in order to avoid injury or machine damage due to overtop.
21. On charging battery, it is necessary to make sure smooth filler plug vent, far away from open flames. Turn off the power before the battery is fully charged to prevent explosion.
22. Keep safety height consistent with the value allowed for high voltage output lines to avoid unexpected accident!
23. When tractor is working at field harvest, threshing or transportation for flammable goods, the fire extinguisher shall be equipped on the tractor to prevent the occurrence of accident.
24. On transportation of tractor, the user should install fault warning sign plate. If tractor fails to operation and needs repairing service, the fault warning sign plate shall be put in the position of more than 30m from aft tractor, which is used for remain other drivers that there is a vehicle to be repaired on the road ahead so as to avoid accidents.

Notice:

1. Regular check all bolts, nuts and loose parts on front and rear drive wheels and steering tie rod, if loosening, tighten them in time to prevent unexpected accidents.
2. When tractor PTO shaft is working, the housing must be installed for PTO shaft. It is prohibited for personnel to close to PTO shaft. When it bears load, the tractor shall not take a sharp turn to prevent universal joint or PTO shaft from damage; when PTO shaft is unused, the handle shall be separated from it to avoid unexpected accident.
3. After stopping, the driver shall not leave the tractor prior to shutoff of the engine in order to prevent unexpected accident caused by suddenly startup of tractor out of control.
4. When the tractor has to be stopped on the slope, the hand brake stick shall be in the position for operation, shut off engine, and engage the gear (forward gear in uphill position and reverse gear in downhill position). Be sure of using parking brake and chocking up rear wheel with triangular plug block to prevent unexpected accident due to self movement out of control.
5. Tire installation and adjustment shall be performed by qualified and experienced professionals with appropriate special tools. Improper installation of tire can cause severe accidents.
6. On cleaning up water tank, turn off the engine, and then start to work until the water tank cools down. This can prevent scalding injury and damage to the tank.
7. Before installation of optional parts, new parts or articulated implements, you shall read through instruction for safety mark and the user manual carefully.

Important:

1. New ex-factory or overhauled tractor shall be grinded as required of tractor specification so that the normal lifecycle of tractor can be guaranteed.
2. The tractor shall be required to use various solutions. Only if the fuel has finished sedimentation for impurity for least 48h and lubricating oil for power train has filtered by oil filter whose precision is consistent with lifter suction filter, can filling work be carried out. This can guarantee the life of related parts and working effectiveness of tractor.
3. Prior to startup of tractor, be sure of check oil line, circuit and the cooling water; after startup, observe the reads of all meters and normal operation of tractor.
4. Before the agriculture implement will be driven by using PTO shaft, check if fitness between tractor and driven implement is reasonable. In the case of plough, the angle between PTO shaft and universal joint is less than 15°; with normal hydraulic control, the angle between PTO shaft or implement input shaft and drive shaft is not greater than 20°after implement is lifted for steering on the edges of field; Never take rotary tiller into soil till the power output is connected as this can cause severe damage to rotary tiller and clutch of tractor [in order to improve operation efficiency, power source shall not be cut off when steering. However, the lifting height of implement from ground shall be 200mm or so].
5. When the temperature drops to the degree below 0℃ in winter, you must use antifreeze liquid in order to prevent damage of major parts such as water tank and engine.
6. The front drive axle of tractor is only used in agriculture field work and when the road is muddy to prevent the tire skid; In other cases, it is disabled, or it is easy to cause early wearing for tires and drive train.
7. In the process of driving tractor, the driver is not allowed to step on brake pedal or clutch pedal, in order to mitigate early wearing of brake or clutch.
8. The tractor equipped with agriculture implement moves forward on the road, adjust top link of suspension device to shortest status, and regular limited rod to prevent implement swing from side to side. While tightening locknuts on the top link and limited rod to ensure driving safety and alleviate the risk of machines and implement damage.
9. If the implement articulated to the tract displaces, lock it up tightly; Descend the implement onto the ground before the driver leave tractor in order to mitigate the risk of machine and implement damage.
10. During maintenance, it is essential to select eligible parts and components in order to ensure the normal service life of tractor.

Unscrew radiator cap

When the engine is still hot, be careful of unscrew the radiator cap. After Operating fro several minutes, deactivate the engine, and then loose radiator cap to the first gear. Afterwards unscrew the cap until the pressure is released.

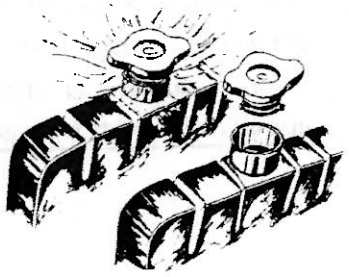


Fig. 1-14 Unscrew radiator cap

When repairing electric parts

1. Pull out ignition key from engine on dashboard
2. Disconnect ground wire of battery, and then start to repair electric parts.
3. When repairing tractor by electric welding, it is necessary to disconnect ground wire from battery and unplug large connector from engine, hydraulic part computer controller (if equipped), or it is easy to cause damage of battery, controller and instrument cluster.

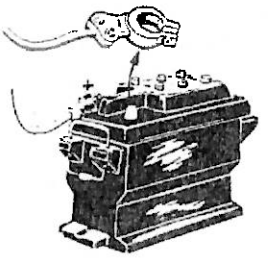


Fig. 1-15 Repair of electric parts

In the case of tractor abnormities

1. Do not allow tractor to work with "sick", particularly in the cases of free or super-low oil pressure, overtop water temperature or unusual noise and odor, immediately stop for check and troubleshoot problems.
2. During lubricating maintenance and field adjustment, deactivate the engine.

Fig. 1-16 In the case of tractor abnormities

Safety rules when the tractor is unattended

1. Shift to neutral gear and place hydraulic control stick to neutral position.
2. Descend lifter or tow articulated device onto the lowest position.
3. Engage parking brake.
4. Remove engine ignition key from dashboard.
5. Choke up rear wheel with triangular plug block if stopping on the slope.

1.2 Safety warning signs

Notice:

1. Keep the safety warning sign clear and visible. If there is dirt, flush them out with soap water, and wipe up with soft cloth.
2. If the safety mark is missing or unclear, timely contact the dealer or manufacturer to reapply for register or replace.
3. To replace the part labeled with safety warning sign, the used part needs to be replaced with safety warning sign.
4. The terms prompted in safety warning sign refers to personal safety, and must be strictly enforced.

Meaning: when operating, you need to keep a certain space with hot surface of machine to prevent injury.

Paste location: outside of muffler and tank side.

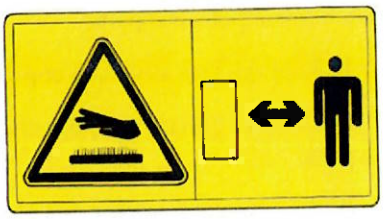


Fig. 1-17 Safety warning ID IV

Meaning: when operating, you need to keep a certain space with tractor to prevent injury.

Paste location: on the lower left side of mudguard.

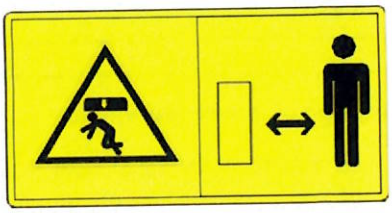


Fig. 1-18 Safety warning sign II

Meaning: It is not allowed to be seated at the places other than seats to prevent shading driver's sight and causing injury.

Paste location: On the front side of left and right mudguard.

Fig. 1-19 Safety warning sign VI

Meaning: When lifter lever control mechanism is operating, move into areas far away top link lifting area.

Paste location: on the right side of mudguard rear.

Fig. 1-20 Safety warning sign III

Meaning: Prior to repair, maintenance, adjustment, shut off the engine, and pull out startup key. Operate as specified in the manual to prevent injury.

Paste location: front side of instrument desk.

Fig. 1-21 Safety warning sign I

Meaning: When the engine is operating, never open or dismount safety protective cover, and Keep hands outside working site in order to prevent injury.

Paste location: on the protective cover of engine.

Fig. 1-22 Safety warning sign IX

Meaning: The driver shall start engine on the driver's seat. Disable startup of engine By short-circuit on the starter side in order to prevent injury.

Paste location: on the front side of instrument desk.

Fig. 1-23 Safety startup mark

Meaning: To prevent injury, read through the user manual to understand the meaning of safety marks without Text description.

Paste location: on the front side of instrument desk.

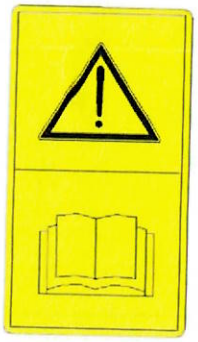


Fig. 1-24 Read manual mark

Meaning: To prevent injury, touch with it only if all the parts of machine completely stopped.

Paste location: On PTO (power take-off shaft) g protective cover.

Fig. 1-25 PTO safety mark

Meaning: During maintenance of battery, look up the user manual to understand appropriate Specification for maintenance so as to prevent injury.

Paste location: on the upper surface of battery.

Fig. 1-26 Battery mark

Meaning: refer to Fig. 1-27.

Paste location: near electric box.

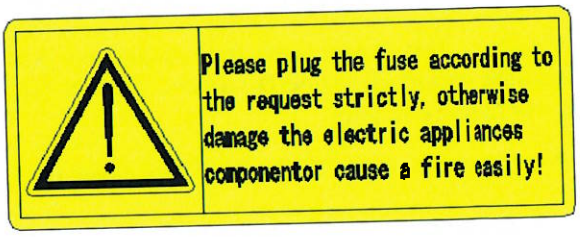


Fig. 1-27 Fuse safety warning sign

Meaning: refer to Fig. 1-28.

Paste location: near oil port on the fuel tank.

Fig. 1-28 Refueling fire proof mark

Meaning: refer to Fig. 1-29.

Paste location: near PTO shaft.

Fig. 1-29 PTO safety mark

Meaning: refer to Fig. 1-30.

Paste location: on the surface of gas tank.

Fig. 1-30 Air braking warning sign

Meaning: refer to Fig. 1-31.

Paste location: on the front side of instrument desk.

Fig. 1-31 Safety startup warning sign

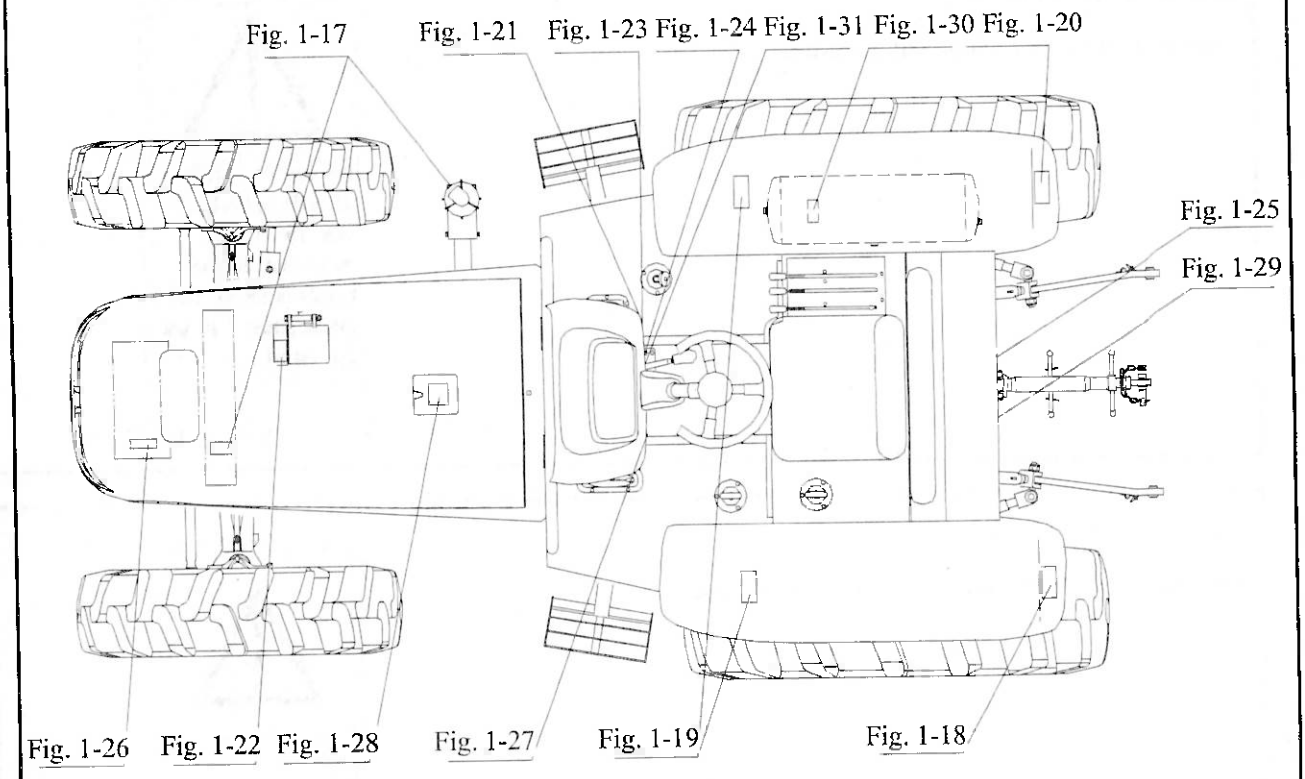


Fig. 1-31 Warning Sign Schematic for Non-flat Floor Model

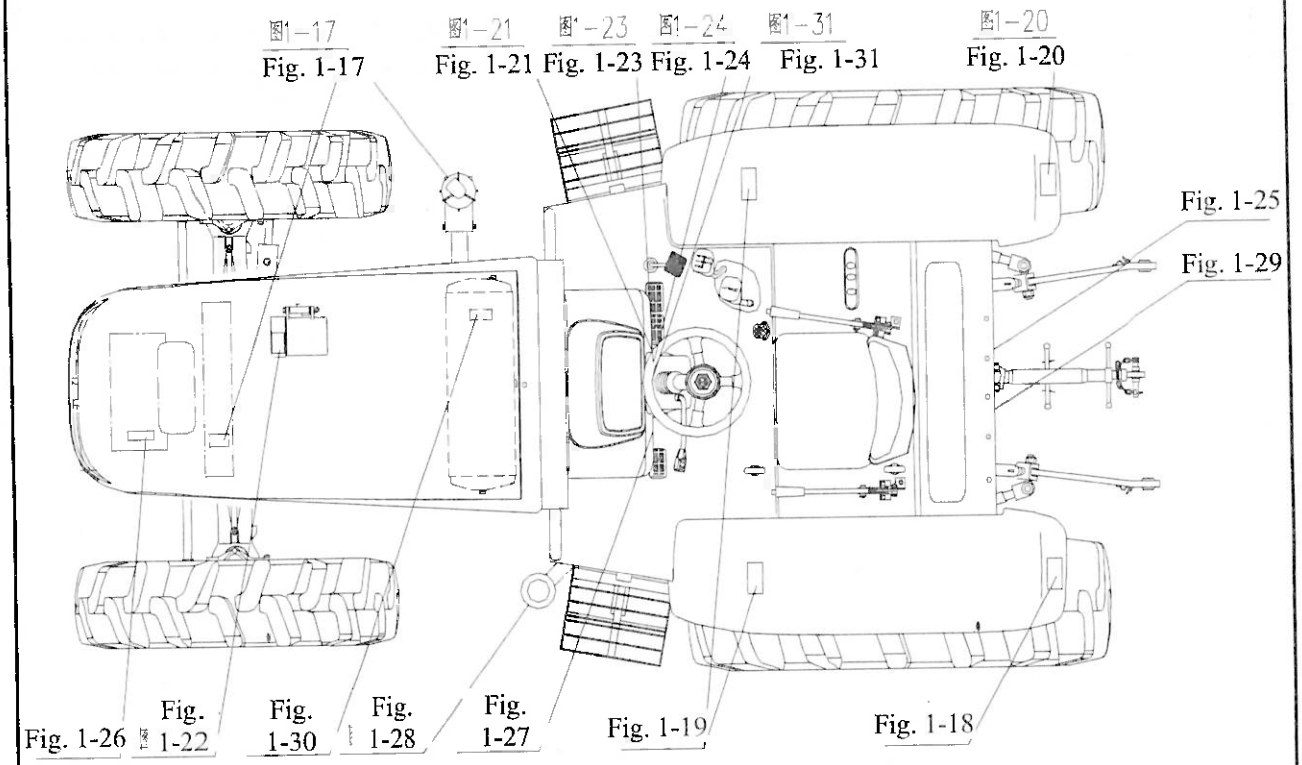


Fig. 1-32 Warning Sign Paste Schematic for Non-flat Floor Model

2 Product Identification

Product nameplate

The product nameplate is an important mark used for effective identification. It is located on the left side of tractor instrument desk When the tractor runs in service, the responsible person will check this nameplate. Do not lose product nameplate, and keep it clear.

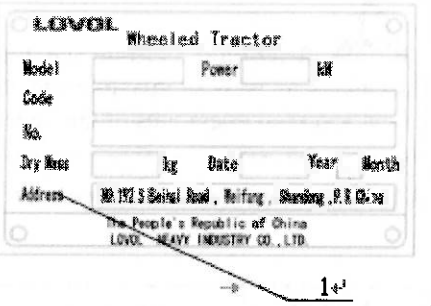


Fig. 2-1 Product nameplate

1. Product nameplate

Engine information

The product nameplate of engine is an important mark used for effective identification of tractor power supporting device. It is located under tractor guard hook. The engine nameplate is equipped on the engine. When the tractor runs in service, the responsible person will check this nameplate. Do not lose product nameplate, and keep it clear.

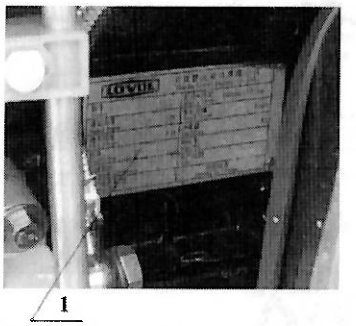


Fig. 2-2 Engine nameplate

1. Engine nameplate

Machine model and manufacturing number

When the tractor is shipped out of factory, machine model and ex-factory manufacturing number is marked on the right side of transmission gear housing, as shown in right Fig. 2-3.

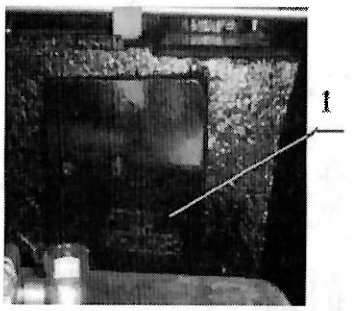


Fig. 2-3 Manufacturing number

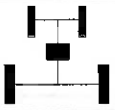
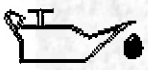
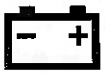
1. Completely machine number

3 Operation Instruction

Attention: Operate the tractor properly to fully play its performance, reducing tractor wears and accidents as well as guaranteeing the completion of high-quality, high-efficiency, low-consumption and safe field and road operations of the operator.

3.1 Common marks and symbols

Table 3-1 Common marks and symbols

Symbol	Meaning	Symbol	Meaning	Symbol	Meaning
	Safety warning sign		Four-wheel drive		Horn
	High beam		Low beam		Fast
	Oil pressure		Battery charging condition		Slow
	Turn signal lamp		Washer		Position lamp
	Engine preheating		Rear wiper		Wiper
	Air filter blockage warning		Oil filter blockage warning		Air brake failure/fault
	Engine coolant temperature		Fuel volume		Parking brake
	Differential lock		Hazard warning lamp		Marker lamp
	Warning due to the brake fluid reservoir lack of fluid				

3.2 Product description

This manual describes usage, technical maintenance, adjustment, fault and troubleshooting and so on for LOVOL-TA series wheeled tractors which include 16 models as TA550/ TA554/ TA600/ TA604/ TA650/ TA654/ TA700/ TA704/ TA750/ TA754/ TA800/ TA804/ TA820/ TA824/ TA850/ TA854.

LOVOL-TA series wheeled tractor is a dual-purpose medium-sized agricultural one for paddy field and dry farmland. This machine possesses advantages like compact structure, easy control, flexible steering, large lifting force, easy maintenance and so on.

3.3 Tractor maneuvering mechanism and instrument

3.3.1 Tractor maneuvering mechanism

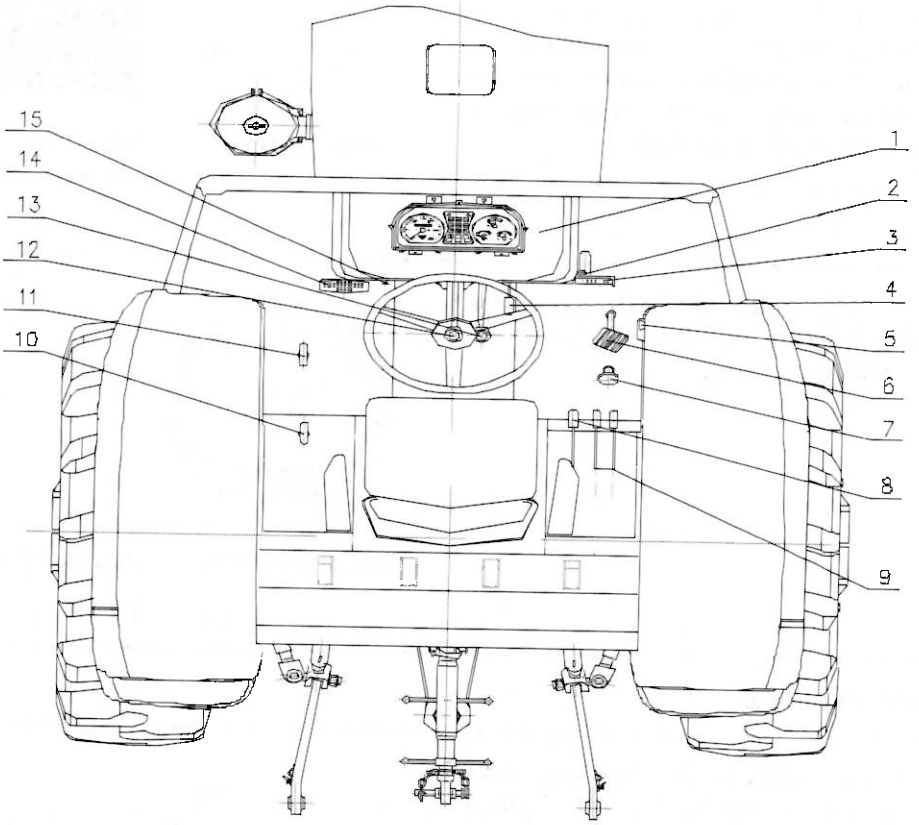


Fig. 3-1 Maneuvering mechanism

1.Dashboard 2.Brake pedal interlocking plate 3.Left and right brake pedals
4.Parking brake handle 5.Hand throttle control handle 6.Foot throttle pedal
7.Differential lock pedal 8.Distributor control handle 9.Hydraulic output control handle (optional)
10.Front drive control handle (for four-wheel drive model) 11.PTO control handle
12.Main gear lever 13.Auxiliary gear lever 14.Clutch pedal 15.Flameout cable

3.3.2 Instruments and switches

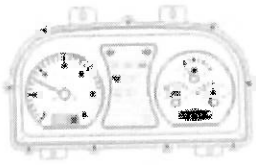
Tractor instruments and switches consist of components in Fig. 3-2 as shown rightward.

Fig. 3-2 Instruments and switches

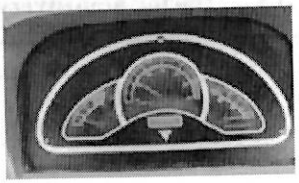
1.Instrument assembly 2.Right side rocker switch combination 3.Ignition lock 4.Left side rocker switch combination

3.3.2.1 Instrument assembly

Combination instrument consists of water temperature gauge, fuel gauge, tachometer, oil pressure gauge as well as indicating devices like turn signal indicator lamp, high/low beam indicator lamp, position indicator lamp, charging indicator lamp and air pressure warning lamp for easy monitoring of vehicle operating condition at any time.



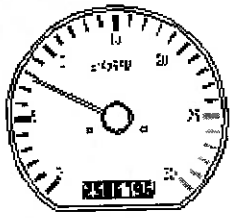
General instrument



Practical power instrument

- Tachometer

After starting the engine, the indicated value shows operating speed of the engine while that in the box shows operating hours of the engine.



General instrument

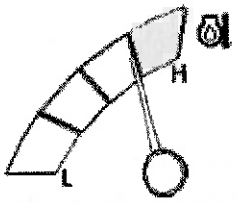
Practical power instrument

Fig. 3-3 Tachometer

- Water temperature gauge

It indicates engine coolant temperature with scales with the pointer moving from left to right. C yellow means the coolant temperature is low; H red means the coolant temperature is high; green zone means the coolant temperature is normal.

General instrument

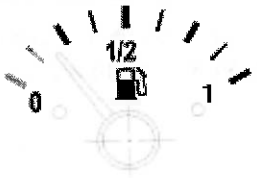


Practical power instrument

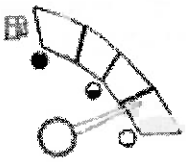
Fig. 3-4 Water temperature gauge

- Fuel gauge

Fuel gauge indicates fuel volume in the fuel tank with scales. If the pointer is at 0 ~ 1/8 red scale, it means the fuel tank merely has less than 1/8 of oil level and thus shall be filled up. If the pointer is at 1, the fuel tank is full of fuel..



General instrument



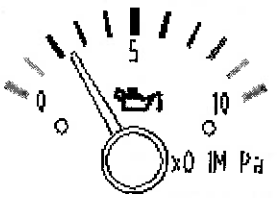
Practical power instrument

Fig. 3-5 Fuel gauge

- Oil pressure gauge

The oil pressure gauge makes use of the color to indicate the engine oil pressure. Pointer in 0 ~1 of red zone means the oil pressure is low; it in 6 ~ 10 of red zone means the oil pressure is high; it in 1~6 of red zone means the oil pressure is normal.

The practical power instrument is a low oil-pressure alarm indicator. It could give out the red light when the engine oil pressure is less than 0.1MPa.



General instrument Practical power instrument

Fig. 3-6 Oil pressure gauge

- Charging indicator lamp (red)

After starting the engine, this lamp should go out to indicate the battery charge is normal. If the indicator lamp does not go out, carry out overhaul accordingly.

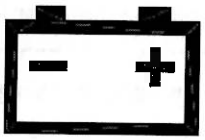


Fig. 3-7 Charging indicator lamp

- Air pressure warning lamp (red)

In the case of a model with an air brake, when the air brake system pressure is lower than 0.4MPa(Megapascal), this lamp lights up to indicate brake air circuit faults or air pressure warner breakdown which should be overhauled at once. Switch on the key with the engine shutdown, is the pressure is insufficient, the lamp will light up normally.

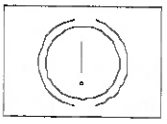


Fig. 3-8 Air pressure warning lamp

Important:

Prior to engine running, turn the key to ignition position to check whether both of the above lamps light up. If not, it may be result of bulb damages or circuit faults which should be overhauled at once.

- Position indicator lamp (green)

In the case of tractor stopping during running on a highroad at night, it is necessary to turn on clearance lamps and place the lighting switch at position "1"to guarantee driving safety and remind drivers in vehicles in front and behind of the parking tractor. At the moment, clearance lamps of position indicator lamps light up.

Fig. 3-9 Position indicator lamp

- Headlamp high beam indicator lamp (blue)

When the lighting switch and dimmer switch are locating at position "2", this lamp lights up to indicate that operating headlamps are high beams at the moment.

Fig. 3-10 Headlamp high beam indicator lamp

- Left turn signal lamp (green)

In the case of left turn of the tractor, switch on the left turn signal switch, this lamp lights up.

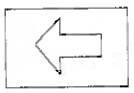


Fig. 3-11 Left turn signal lamp

- Right turn signal lamp (green)

In the case of right turn of the tractor, switch on the right turn signal switch, this lamp lights up.

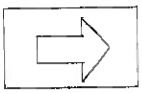


Fig. 3-12 Right turn signal lamp

- Preheating indicator lamp (yellow)

This lamp light up during tractor preheating.

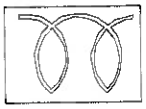


Fig. 3-13 Preheating indicator lamp

- Parking brake indicator lamp (red, optional)

Pull up the hand brake handle of the parking brake and this lamp lights up; Put down the hand brake handle of the parking brake and this lamp goes out.

Fig. 3-14 Parking brake indicator lamp

3.3.2.2 Left side rocker switch combination

Left side rocker switch combination consists of 4 parts as shown in Fig. 3-15.

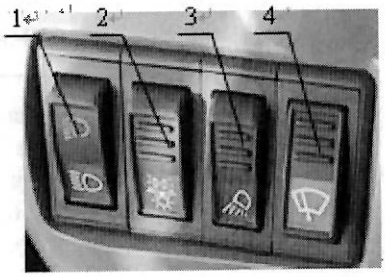


Fig. 3-15 Left side rocker switch combination

1.Dimmer switch

2.Lighting switch

3.Ceiling and rear lamp switch

4.Wiper switch (for the model with cab)

- Dimmer switch

Position "2": high beams light up. Position "0": low beams light up. Position "1": standby.

Change-over between high beams and low beams are controlled by the lighting switch.

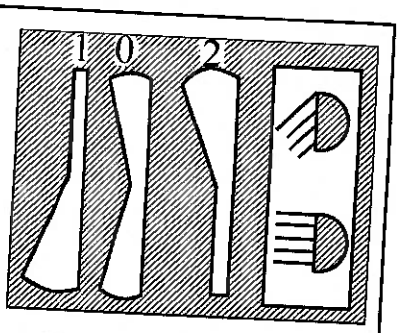


Fig. 3-16 Dimmer switch

- Lighting switch

When it is locating at Position "0", power supply is cut off. Position "1": position lamp lights up. Position "2": headlamps are power-on, when the switch is located at this position, headlamps can be controlled by the dimmer switch for high beam and low beam change-over.

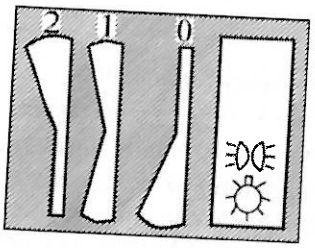


Fig. 3-17 Lighting switch

- Ceiling and rear lamp switch

Position "0": power off. Position "1": ceiling lamp lights up (Applicable for the model with cab).

Position "2": rear lamps light up.

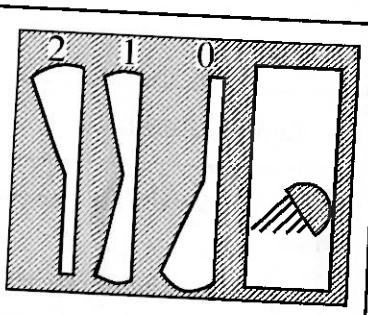


Fig. 3-18 Ceiling and rear lamp switch

- Wiper switch (Optional for the model with wiper)

Position "2", wiper operates quickly; Position "1", wiper operates slowly;

Position "0", wiper is reset and stops operating.

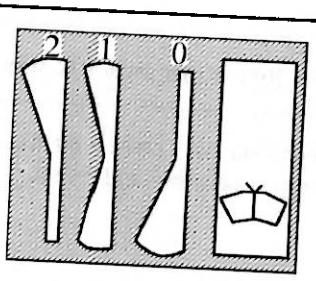


Fig. 3-19 Wiper switch

3.3.2.3 Right side rocker switch combination

Right side rocker switch combination consists of 3 parts as shown in Fig. 3-20.

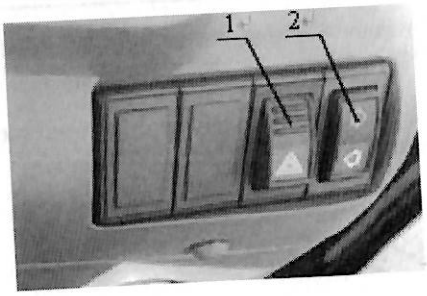


Fig. 3-20 right side rocker switch combination

1. Hazard warning switch
2. Turn signal switch

- Hazard warning switch

Position "1": turn signal lamps in front and rear and at left and right, left and right turn signal indicator lamps on the instrument and indicator lamp on the hazard warning switch all light up. When the tractor is parking on a highroad due to faults or other causes and it is necessary to warn vehicles and passers-by in front and behind via activating this function in order to avoid accidents.

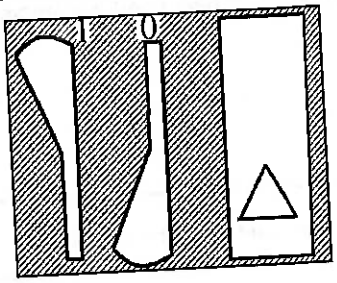


Fig. 3-21 Hazard warning switch

- Turn signal switch

Position "2": switch on the right turn signal lamp. Position "0": power off.

Position "1": switch on the left turn signal lamp.

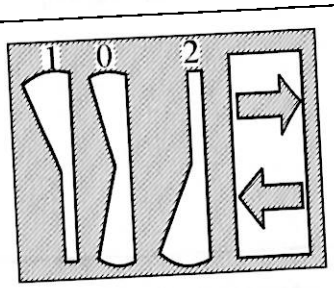


Fig. 3-22 Turn signal switch

- Rear wiper switch (optional when being equipped with a rear wiper)

Position "1": switch on the rear wiper. Position "0": rear wiper stops operating and resets.

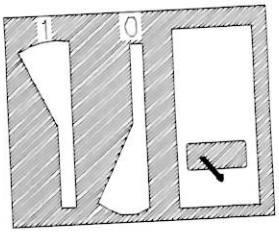


Fig. 3-23 Rear wiper switch

3.3.2.4 Ignition lock

Insert the key into ignition lock and turn the key clockwise to positions as follows:

- Turn it to OFF position (power-off) to switch off the vehicle circuit power supply and the key can be inserted or pulled out;
- Turn it to ACC position (auxiliary component control) to power on auxiliary electrical components (such as: air heater, wiper, fan, horn switch and etc.) and the auxiliary electrical component circuit is power-on;
- Turn it to ON position (ignition position) to switch on the vehicle power supply and the vehicle circuit is power-on;
- Turn it to H position (preheating position) and the engine glow plug (or preheating system) starts to operate;
- Turn it to ST position (start position) to start the engine; after starting the engine, release it immediately and the key returns to ON position automatically. At the moment, ON position and ACC position are connected simultaneously and vehicle circuit is power-on;

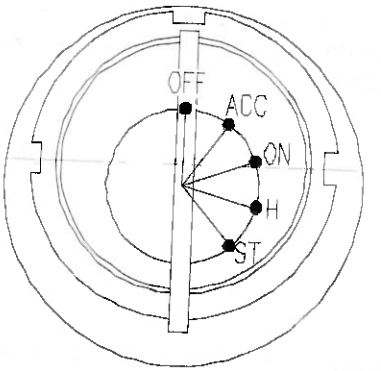


Fig. 3-24 Ignition lock

3.3.2.5 Horn switch

The horn switch is located on the steering wheel. When using the horn, press down the center cover plate of the steering wheel to switch on the horn switch.

Important: During tractor operating, the diver should pay attention to various instruments and indicator lamps. Once there are abnormities, the driver should stop the tractor at once for troubleshooting to prevent relevant parts from damages.

3.4 Engine start

Attention: Prior to operations, please check the tractor carefully and comprehensively to eliminate hidden dangers for effective prevention of accidents.

3.4.1 Preparations for engine start

3.4.1.1 Oil and water level inspections for relevant parts

Check oil levels for engine oil sump, tractor gearbox-rear axle and hydraulic system. There should be sufficient fuel in the fuel tank while the radiator should be filled with water coolant.

Important: During fluid level inspection, the tractor should be parked on horizontal ground with lubricant maintained in stable condition to avoid part damages caused by measurement errors.

- Check oil level of the engine

Check oil level in the engine oil sump. Insert a dipstick into the oil sump and the oil level should be maintained between two scale marks.

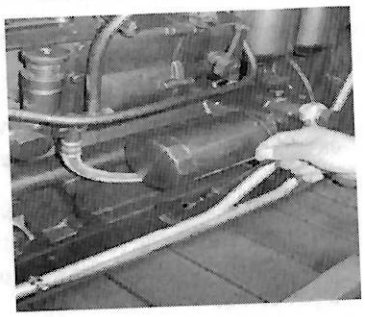


Fig. 3-25 Check oil level of the engine

- Check oil level of the gearbox-rear axle

Oil filler position for the tractor gearbox-rear axle is as shown in the figure rightward. When the dipstick is inserted completely, the oil level should be maintained between two scale marks.

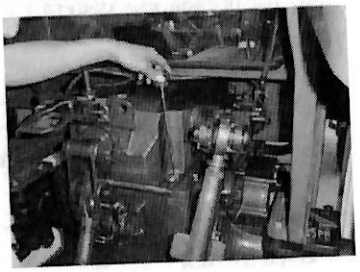


Fig. 3-26 Check oil level of the gearbox-rear axle

- Check oil level of the lifter

Oil filler position for the tractor lifter is as shown in Fig. 3-27. Insert the dipstick into the lifter housing, the oil level should be maintained between two scale marks.

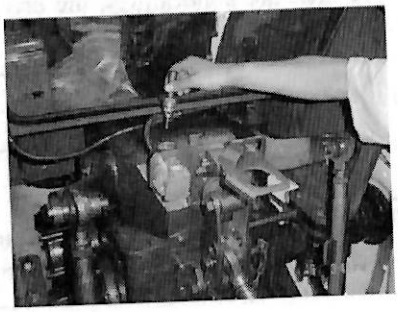


Fig. 3-27 Check oil level of the lifter

- Check oil level of the steering oil reservoir

The steering oil reservoir is in the engine hood in the front of the tractor. Check the oil level and replenish timely when oil volume is insufficient (the steering cylinder should be filled with oil).

Fig. 3-28 Check oil level of the steering oil reservoir

3.4.1.2 Turn on the fuel tank sediment bowl switch (if it is equipped)

The position for sediment bowl switch is as shown in Fig. 3-29.

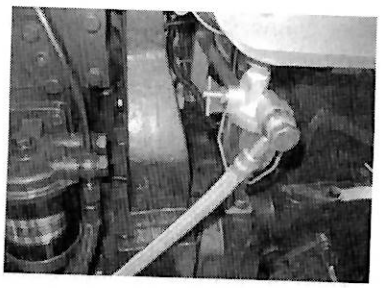


Fig. 3-29 Sediment bowl switch

3.4.1.3 Pull the flameout cable locking device for flameout cable return. At the moment, the injection pump is locating at oil supply position.

3.4.1.4 Operate the hand throttle to make the hand throttle half-opened.

3.4.1.5 Check the gearbox control lever and PTO shaft control handle and place them at neutral position and hydraulic control handle at lowering position.

3.4.1.6 In the case of long-term disuse or cold start of the tractor, it is necessary to unscrew bleed screw on the high-pressure oil pump, press the delivery pump handle manually to bleed air the oil line completely and then retighten the bleed screw.

Important:

1. Remove foreign matters on water tank grille to prevent the engine from faults caused by poor heat dissipation.
2. Since heat dissipation condition is poor during field operations, when the tractor is equipped with a packsack harvester, it is recommended to install an auxiliary radiator at a proper position as to guarantee long-term continuous engine operation and prevent the engine from service life reduction as a result of overheating.

3.4.2 Start the engine

Attention: Prior to engine start, make sure that main and auxiliary gear levers, front drive control lever are all located at neutral position and distributor control lever located at lowering position to avoid tractor sudden start and out of control as a result of self actions which may bring unexpected dangers.

3.4.2.1 Start the engine with battery

- Start at a normal temperature

Start at a normal temperature [when the ambient temperature is avove -5℃(centigrade)]: Turn the key clockwise to ON position (ignition position) to power on the vehicle circuit and then turn the key to ST position(start position) to start the engine; After starting then engine, release it immediately and the keycap return to ON position (ignition position) automatically. When there is a safe starting switch, please depress the main clutch pedal firstly and then turn the key for engine start.

Fig. 3-30 Engine start

- Start at a low temperature

Start at a low temperature [when the ambient temperature is lower than -5℃(centigrade)], start the engine according to operations as follows:

■ For the tractor which is not equipped with a preheating circuit and does not apply antifreeze, prior to the engine start under an extremely cold temperature, fill its water tank with hot water which is over 90℃ (centigrade) until there is hot water outflowing from the drain valve of the cylinder body and then close the drain valve. After that, fill the complete cooling system with hot water. Drain engine oil of the oil sump (it is preferred to drain the oil when the engine is just shut down and still hot) into a container with a cover. Heat the drained oil until oil temperature reaches (70~90) ℃ (centigrade) and refill the oil sump with the heated oil. It is not allowed to bake the oil sump with fire. Place the hand throttle at its large opening position and turn the key clockwise to ST position (start position) to start the engine; Release the key immediately after starting the engine and the key returns to ON position (ignition position) automatically. Then, place the hand throttle at its small opening position.

■ For the tractor with a preheating circuit, start the engine according to operations as follows:

Place the hand throttle at large opening position and turn the key clockwise to H position (preheating position) and hold for (15~20) s (second) and then turn the key to ST position (start position) to start the engine; Release the key immediately after starting the engine and the key returns to ON position (ignition position) automatically. Then, place the hand throttle at its small opening position.

■ Preheating and start for the model with preheating control circuit:

Insert the key into the electric lock and turn it clockwise to H position (preheating position) to switch on the preheating circuit:

If the air temperature is higher than -5℃ (centigrade), relevant indicator lamp will not light up and controller will not operate. Then start the engine directly via turning the key to start position;

If the air temperature is lower than -5℃ (centigrade), relevant indicator lamp will light up and controller will start to operate. At the moment, glow plug is power-on for preheating. Preheating time for the glow plug depends on the battery voltage. In general, the time is about 30s (second).

After the completion of preheating, the indicator lamp flashes with the frequency of 1 time/s and the engine is ready to start. When the indicator lamp flashes with the frequency of 1 time/s, turn the key to the start position [min. battery voltage should not lower than 6.5V (volt)], the indicator lamp is changed into normally on and the fuel solenoid valve is opened for oil supply.

If the key is not turned to start position during indicator lamp flashing, the preheating device will stop operating automatically 30s (second) after indicator lamp flashing.

After the completion of starting, the controller will implement postheating process automatically and the process lasts (60~140) s (second) generally (the controller will determine the time automatically according to the ambient temperature).

3.4.2.2 Tow start

The towed tractor should adopt high III gear or high IV gear. For safety, the speed for towing the tractor should not exceed 15km/h (kilometer/hour). Once the engine starts, depress the main clutch pedal immediately and reduce throttle opening as well.

Important: In the case of tow start the tractor, once the engine operates, depress the main clutch pedal immediately and reduce throttle opening as well to avoid engine flameout.

Important:

1. Once the engine starts, release the key immediately and the key returns to "ON" position automatically. Otherwise, the starter will be driven by the engine after starting and this will lead to motor damage.
2. Continuous start-up time should not exceed 5s (second). If it is failed to start within 5s (second), wait for 15s (second) and start the engine once again. In the case of three continuous starting failures, find out the cause before another starting to avoid engine component damages.
3. After starting the engine, keep it idling for several minutes with the speed of 800r/min (revolution/minute) approximately. When the oil pressure indicator lamp goes out and water temperature rises, the tractor is allowed to be started as to avoid engine component damages.
4. After starting the engine, oil pressure should not lower than 98kPa (kilopascal) in any case. If not, find out the cause and eliminate the fault to avoid engine component damages.

3.5 Start the tractor

Starting operations for the tractor are as follows:

- Whistle and determine there are no obstacles around.
- Keep the engine runs with a low speed, depress the clutch pedal and then place the gear lever of gearbox to a required position.
- Increase engine speed gradually and release the clutch pedal slowly for smooth starting of the tractor. After starting, release the clutch pedal rapidly to avoid clutch slips.
- Increase foot throttle 1 opening gradually to reach the required operating speed for the tractor.
- It is not allowed to reduce tractor traveling speed with the clutch half-engaged. Do not place your foot on the clutch pedal during driving to avoid wears of quick release lever and friction lining.

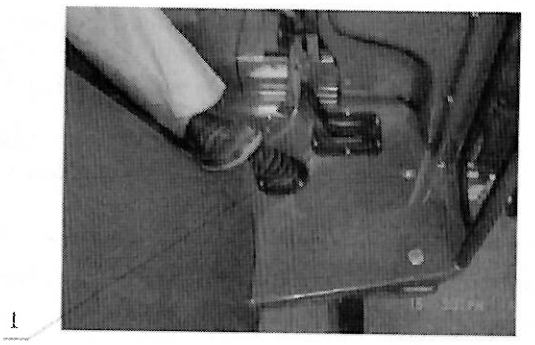


Fig. 3-31 Start the tractor

1.Foot throttle

Important:

1. It is not allowed to start with high gears engaged to avoid gear impact of the gearbox drive gear and clutch early wears.
2. Prior to starting, it is necessary to release the parking brake to avoid operating component damages.
3. It is necessary to release the main clutch via depressing the clutch pedal in the case of gear engagement or gear shift to avoid gear impact of the gearbox drive gear and clutch early wears.

3.6 Tractor steering

- In the case of tractor steering on highroad, it is necessary to press down turn signal indicator lamp switch for corresponding steering direction firstly and then operate the horn switch at the center of steering wheel to give a warning by whistling before steering. If the vehicle speed is high, it is necessary to speed down. In the case of a gradual turn, turn the steering wheel earlier and slowly and turn and return it slightly. In the case of a sharp turn, turn the steering wheel later and quickly and turn and return it largely.
- In the case of tractor small turning or turning on soft ground, there may be steering failure due to front wheel sideslip. At the moment, turn the steering wheel and depress the brake pedal at the corresponding side simultaneously to help steering.

Warning:

1. It is not allowed apply single-side brake for a sharp turn when the tractor is running with a high speed;
2. In the case of front wheel steering with a large steering angle, if there is squeak during hydraulic steering system relief valve operating, please turn back the steering wheel slightly at the moment to avoid hydraulic steering system damages caused by long-term overload and even accidents as results of steering failure;
3. In the case of tractor turning in field operations or prior to tractor reversing, it is necessary to lift operating components of the agricultural implement off the ground in order to avoid agricultural implement damages or casualties.

3.7 Tractor gear shift (for the model with 8+2 speed gearbox)

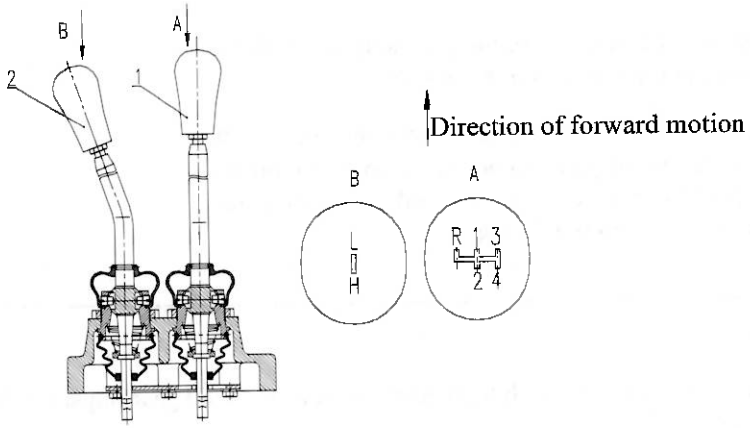


Fig. 3-32 8+2 speed gearbox gear position diagram

1.Main gear lever 2.Auxiliary gear lever

In the case of tractor gear shift, depress the clutch pedal firstly to release the main clutch and then shift the gearbox gear lever to the position required. In the case of gear shift, it is necessary to depress the clutch pedal to release the main clutch completely so as to avoid gear impact during gear shift. Do not apply an excessive force on the gear lever during gear shifting or components like gear shift limiting plate will be damaged and this will lead to disordered gear engagement.

3.8 Gear shift description for optional 16+4 speed gearbox (for the model with 16+4 speed gearbox only)

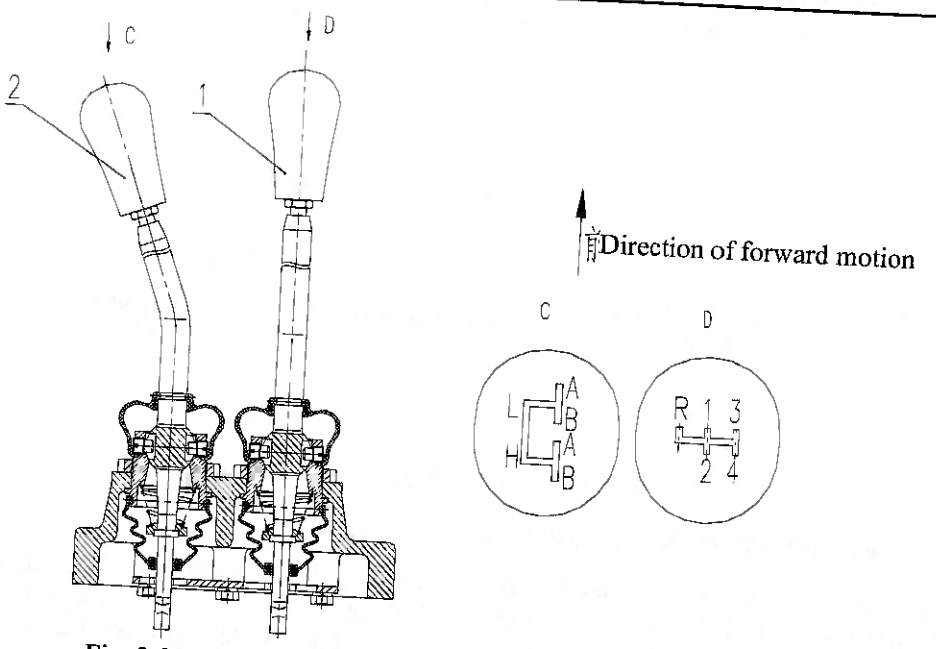


Fig. 3-33 16+4 speed gearbox gear position diagram

1.Main gear lever 2.Auxiliary gear lever

3.8.1 Gear position description for gear lever

- On the main gear lever 1: 1 refers to forward I gear, 2 refers to forward II gear, 3 refers to forward III gear, 4 refers to forward IV gear and R refers to reverse gear.
- On the auxiliary gear lever 2: L refers to single-reduction low gear, H refers to single-reduction high gear, A refers to double-reduction low gear and B refers to double-reduction high gear.

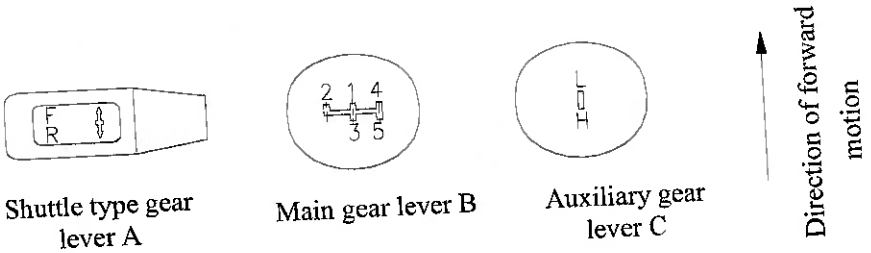
3.8.2 Operation instruction for auxiliary gear lever

To minimize the quantity for control levers and make tractor gear shift convenient, the auxiliary gearbox and creeper gear are controlled by one auxiliary gear lever in this model. Specific operation method and precautions for the auxiliary gear lever are as follows:

- In the case of operating with low gear (L gear) engagement, place the auxiliary gear lever at L (low) gear position and then implement A or B gear engagement to realize low range operation with the combination of main gearbox gear engagement.
- In the case of operating with high gear (H gear) engagement, place the auxiliary gear lever at H (high) gear position and then implement A or B gear engagement to realize high range operation with the combination of main gearbox gear engagement.
- In the case of gear shift, it is necessary to depress the clutch pedal to release the main clutch completely so as to avoid gear impact during gear shift. Do not apply an excessive force on the gear lever during gear shifting or shift shaft travel limiting plate will be fractured and this will lead to disordered gear engagement.

Note: In the case of gear engagement with the auxiliary gear lever, it is necessary to engage sigh (H) gear or low (L) gear firstly and then engage double-reduction A or B gear, that is, it is necessary to shift double-reduction (A/B gear) at neutral position before high/low gear (H/L gear) engagement. When the auxiliary gear lever is located at double-reduction (A/B) gear position, if it is required to engage single-reduction (H/L gear), it is necessary to disengage A or B gear, place the double-reduction (creeper gear) at neutral position and then engage high (H) or low (L) gear.

3.9 Gear shift description for optional 10+10 speed shuttle gearbox (for the model with 10+10 shuttle type gearbox only)



Shuttle type gear lever A | Main gear lever B | Auxiliary gear lever C

Fig. 3-34 10+10 speed gearbox gear position diagram

3.9.1 Gear shift description for gear lever

Tractor gear shift is separately controlled by 3 control levers for shuttle gear shift, main gearbox and auxiliary gearbox, realizing 10+10 speed. The shuttle gear shift control lever A possesses 2 gears for forward and reverse motion; the main gear lever B possesses 5 gears (1, 2, 3, 4 and 5); the auxiliary gear lever C possesses 2 ranges (L refers to low range and H refers to high range).

3.9.2 Operation instruction for gear lever

- Depress the main clutch pedal and operate the shuttle type gear lever A. Push the gear lever backward from the neutral position to reverse R gear position while push it forward to forward F gear position.
- Depress the main clutch pedal and operate the main gear lever B. Move the gear lever from the neutral position leftward to the leftmost end and then push it forward to get to 2 gear position; return the gear lever to the neutral position in the center and push it forward to get to 1gear position while push it backward to get to 3 gear position; Move the gear lever from the neutral position rightward to the rightmost end and push it forward to get to 4 gear position while push it backward to get 5 gear position.
- Depress the main clutch pedal and operate the auxiliary gear lever C. Push the gear lever forward from the neutral position to get to low range position L while push it backward to get to high range position H.
- Please select proper tractor operating speed for this may not only provides you with the optimal production rate and economy but also lengthens the service life of the tractor. Do not carry out overloaded operations of the tractor frequently and allow the engine to possess certain power reserve. For the selection of speed for tractor field operations, it is preferred to keep the engine running with the load of 80% of its rated one approximately. In the case of light-duty tractor operations with a relatively low operating speed, select high I gear engagement with small throttle opening in order to save the fuel.

Important:

1. During engine running, it is necessary to depress the main clutch pedal completely several seconds before gear shifting to avoid poor engagement of the gearbox sliding sleeve and even "gear impact".
2. Implement reverse gear engagement only when the tractor is in static condition to avoid gear damages.
3. Do not place your hand on the gear lever during tractor running or pressure from the hand may be delivered to the shift fork in the gearbox and this will lead to premature wears of the shift fork.

3.10 Tractor braking

Pay attention to the followings during tractor braking:

- In general, it is necessary to reduce the throttle opening firstly, depress the clutch pedal and then depress the brake pedal gradually according to specific condition to stop the tractor stably.
- In the case of emergency stop, depress the clutch and brake pedals Simultaneously. It is not allowed to depress the brake pedal alone to avoid brake friction lining rapid wears or engine flameout.
- In the case of normal tractor running, left and right brake pedals should be locked together with a interlocking plate.

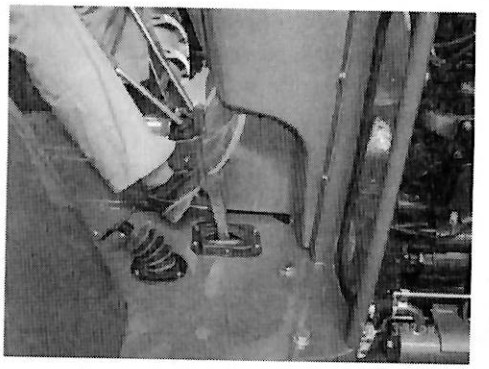


Fig. 3-35 Braking operations for tractor

Warning:

1. It is necessary to check the brake oil reservoir for sufficient oil volume and check brake line for oil leakage prior to every driving. If there is little oil in the oil reservoir or oil leakage in the line, find out the cause and troubleshoot timely. Otherwise, there will be major accidents like brake failures.
2. In the case of normal tractor running, left and right brake pedals should be interlocked to avoid tractor deviation and even rollover.

3.11 Tractor stopping and engine flameout

- Reduce throttle opening and tractor traveling speed.
- Depress clutch pedal and then depress brake pedal. When the tractor stops, place gear lever of the gearbox at neutral position.
- Release the clutch pedal and brake pedal and reduce the throttle opening for engine idling.
- Pull flameout control lever backward, oil pump stops supplying oil and the engine shuts down immediately. After that, push the lever to the position for oil supply.

Attention:

1. After stopping the tractor, driver is not allowed to leave before engine flameout to avoid sudden tractor start which may bring unexpected dangers;
2. When it is inevitable to park on a slope, implement gear engagement (for upslope position, apply forward gear engagement while for downslope position, apply reverse gear engagement) and make sure to apply parking brake and wedge rear wheels with triangle wedge blocks to avoid tractor sudden start and out of control as a result of self actions which may bring unexpected dangers.

Important:

1. When air temperature is lower than 0℃ (centigrade) in winter, for the tractor without antifreeze, its water tank should be drain valve should be opened under the condition of engine idling and water coolant for the engine should be drained completely through the drain cock and then shut down the engine to avoid frost cracks of the engine body as a result of water coolant freezing.
2. If the water outlet of the water tank is higher than the water inlet of the water pump, it is recommended to open the engine drain cock, place flameout handle at flameout position, power on the engine with the battery and keep the engine running for 2~3 times with duration of 15s (second) for each time and interval of (2~3) min (minute) for complete water drainage for water pipes in order to prevent these water pipes from frost cracks caused by residual water in water outlet pipe of the water tank.

3.12 Tractor running-in

Before using the tractor, it should run for a time of period according to specified lubricating, speed and load conditions. Meanwhile, the tractor should be checked, adjusted and maintained for normalization of its technical state. Such a series of operations is called running-in.

Attention: Drivers should learn and master control method and usage of tractors before implementing tractor running-in. Otherwise, there will be accidents as results of misoperation!

Important: In the case of tractors just leave the factory or be overhauled, they should be put into service after running-in or their service life will be shortened.

3.12.1 Preparations for running-in

- Check external bolts and nuts for the tractor and tighten them timely if they are loose.
- Fill all lubricating points with grease according to the lubrication chart.
- Check oil level in engine oil sump, gearbox-rear axle, lifter, front axle, steering oil reservoir and air filter and fill them with grease or lubricant according to the lubrication chart.
- Add fuel and water coolant.
- Open the sediment bowl cock.
- Check tire pressure.
- Check electrical circuit for good connection.
- All control handles should be located at neutral position and the hydraulic handle should be located at lowering position.

3.12.2 Engine idling running-in

Start the engine according to specified sequence in the manual. After starting, keep the engine idling for 5min (minute) and check it for normal operation. Then, increase engine speed to the rated once for engine idling.

During engine idling running-in, listen carefully for abnormal sound in the engine and check the engine for water leakage, oil leakage and air leakage. Check all instruments for normal reading and stop the tractor for troubleshooting in the case of any fault.

Engine idling running-in time is 30min (minute).

3.12.3 PTO device running-in

Place the engine throttle control handle at half-open position, keep the engine operates with a medium speed and operate the PTO shaft with a low speed and high speed for 5min (minute) separately to check for abnormalities.

After running-in, it is necessary to place the PTO shaft at neutral position.

3.12.4 Hydraulic suspension mechanism running-in

Start the engine, operate the lifter handle to lift and lower the suspension mechanism for several times and Check the hydraulic system for being stuck and air suction. Then, mount an agricultural implement or a pouring weight with a weight less than 500kg (kilogram) and operate the lifter handle to stably lift and lower the agricultural implement for more than 50 times under the rated engine speed.

3.12.5 Tractor no-load running-in

In the case of engine idling running-in, the complete machine running-in should be implemented after PTO device and hydraulic suspension mechanism running-in with the confirmation of normal technical state for the tractor. During no-load running-in, properly apply the single-side brake in turing with a low speed and test emergency brake application when running with a high speed. The running-in sequence and time should be in accordance with running-in specifications as shown in Table 3-2, Table 3-3 and Table 3-4.

During the process of running-in, the engine speed should be maintained at 1500r/min (revolution/minute) approximately and pay attention to the followings simultaneously:

- Check electrical equipments and various instruments for normal reading.
- Check the engine for normal running.
- Check the clutch for smooth engagement and complete release.
- Check the gearbox for easy and flexible gear shift without disordered gear engagement or automatic gear disengagement.
- Check the brake for reliable operation.
- Check the differential lock for reliable locking and unlocking.
- Check the front drive axle for reliable engagement and release.
- When faults are detected, eliminate them and then go on implementing running-in.

Table 3-2 8+2 speed tractor gear position and time comparison table for no-load running-in

Gear position	Low I	Low II	Low III	Low IV	High I	High II	High III	High IV	Reverse I	Reverse II
Running-in time [min(minute)]	30	30	30	30	30	30	30	30	30	30

Table 3-3 16+4 speed tractor gear position and time comparison table for no-load running-in

Gear position	General low I	General low II	General low III	General low IV	General high I	General high II	General high III	General high IV	General reverse I	General reverse II
Running-in time [min(minute)]	30	30	30	30	30	30	30	30	30	30
Gear position	Creeper low I	Creeper low II	Creeper low III	Creeper low IV	Creeper high I	Creeper high II	Creeper high III	Creeper high IV	Creeper reverse I	Creeper reverse II
Running-in time [min(minute)]	30					30			30	30

Table 3-4 10+10 speed tractor gear position and time comparison table for no-load running-in

Gear position	Forward low I	Forward low II	Forward low III	Forward low IV	Forward low V	Forward high I	Forward high II	Forward high III	Forward high IV	Forward high V
Running-in time [min(minute)]	30	30	30	30	30			30	30	
Gear position	Reverse low I	Reverse low II	Reverse low III	Reverse low IV	Reverse low V	Reverse high I	Reverse high II	Reverse high III	Reverse high IV	Reverse high V
Running-in time [min(minute)]	30	30	30	30	30		30	30		

3.12.6 Tractor loaded running-in

After the no-load running-in, implement loaded running-in only when tractor technical state gets normal completely. The load should be increased from small to large and speed should be increased from low to high gear by gear. The running-in sequence and time should be in accordance with running-in specifications as shown in Table 3-5, Table 3-6 and Table 3-7.

For the tractor with optional creeper gear, creeper gear engagement running-in can be implemented; In the case of I~IV gear loaded running-in for four-wheel drive tractor, engage the front drive axle while for running-in of other gears, release the front drive axle.

During the process of running-in, pay attention to the followings:

- Check electrical equipments and various instruments for normal reading.
- Check the engine for normal running.
- Check the clutch for smooth engagement and complete release.
- Check the gearbox for easy and flexible gear shift without disordered gear engagement or automatic gear disengagement.
- Check the brake for reliable operation.
- Check the differential lock for reliable locking and unlocking.
- Check the front drive axle for reliable engagement and release.
- When faults are detected, eliminate them and then go on implementing running-in.

Table 3-5 8+2 speed tractor load, throttle opening, gear position and time comparison table for loaded running-in

Load	Throttle opening	Running-in time for each gear [h(hour)]						Total (h)(hour)
		Low III	Low IV	High I	High II	High III	High IV	
With a trailer loaded 3t(ton)	3/4	2	3	4	4	4	3	20
With a trailer loaded 6t	Fully-open	4	4	4	4			16
With a plough [tilling depth (16~20) cm(centimeter)]	Fully-open	7	7	5				19

Table 3-6 Load, throttle opening, gear position and time comparison table for loaded running-in of 16+4 speed tractor with a creeper gear

Load	Throttle opening	Running-in time for each gear [h(hour)]						Total (h)(hour)
		General low III	General low IV	General high I	General high II	Creeper high III	Creeper high IV	
With a trailer loaded 3t(ton)	3/4	3	3	4	4	2	2	18
With a trailer loaded 6t	Fully-open	4	4	4	4			16
With a plough [tilling depth (16~20) cm(centimeter)]	Fully-open	7	6	6				19

Table 3-7 Load, throttle opening, gear position and time comparison table for loaded running-in of 10+10 speed tractor with a shuttle gear

Load	Throttle opening	Running-in time for each gear [h(hour)]						Total (h)(hour)
		Forward low V	Forward high I	Forward high II	Forward high III	Forward high IV	Forward high V	
With a trailer loaded 3t(ton)	3/4	3	3	4	4	2	2	18
With a trailer loaded 6t	Fully-open	4	4	4	4			16
With a plough [tilling depth (16~20) cm(centimeter)]	Fully-open	7	6	6				19

3.12.7 Technical maintenance after running-in

After tractor running-in, there will be some metal particles or contaminations mixed with lubricant of the drive system, lubrication system and hydraulic system. Therefore, it is necessary to carry out cleaning and change all lubricant and hydraulic system oil. Tractors are allowed to be put into service only after the completion of necessary technical maintenance. Technical maintenance contents are as follows:

- After engine shutdown, drain lubricant in the engine oil sump when it is hot, clean diesel oil filter, oil filter and air filter and then add fresh lubricant.
- Maintain and adjust the diesel engine according to its instruction.
- Drain lubricant in the gearbox-rear axle housing when it is hot, add some light diesel oil, put up rear wheels, keep the engine idling with II gear engagement for (2~5)min(minute), shut down the engine and drain the light diesel oil immediately. After that, add lubricant according to relevant specification.
- Drain hydraulic oil in the hydraulic lifter and steering oil reservoir when it is hot, clean their filters separately and fill them with fresh hydraulic oil.
- Change the water coolant.
- Fill all lubricating points with grease according to the lubrication chart.
- Check front wheel toe-in as well as clutch pedal and brake pedal free travel and adjust when necessary.
- Check and tighten all external fixing bolts and nuts.

Important: Please check and adjust release pull rod length for the clutch regularly to guarantee there is a free travel of (35~45) mm(millimeter) for the clutch to leave a clearance of 2.5mm(millimeter) between three release lever heads and the clutch release bearing. Otherwise, the clutch release bearing and friction linings will be burnt.

3.13 Differential lock operation

Differential lock operations are as follows:

During tractor traveling or operating, if it is trapped or slips and the tractor fails to move forward, you can engage the differential lock according to the following procedures for rigid connection of left and right drive shafts and then drive out the slippery district with a constant engine speed.

- Depress the main clutch pedal and shift the gear lever to a low gear position. Differential lock control location plan
- Pull the throttle control handle to the position for the max. fuel supply. Engagement Disengagement
- Depress the differential lock control pedal with your right foot.
- Release the clutch pedal smoothly to start the tractor smoothly.
- After pulling out of the slippery district, release the differential lock pedal and unlock the differential lock automatically.

Fig. 3-36 Differential lock operation

Important: It is not allowed to use the differential lock during normal traveling and turning of the tractor to avoid part damages and quick tire wears.

3.14 Front drive axle usage

In the case of heavy-duty field operations, operations on wet and soft soil or paddy field operations for the tractor, its front drive axle is engaged to improve the tractor adhesion performance. For easy engagement and release of the front drive axle, please comply the following operation procedures:

- Front drive axle engagement

For flat-floor model, pull up the front drive control handle to engage the front drive axle; For general-floor model, push down the control handle to engage the front drive axle.

In the case of any difficulty, hold the handle and operate it slowly and simultaneously control the tractor to make both gears for front drive engagement move relatively. In the case of front drive axle engagement, the tractor should be in non-traction and low-speed forward running condition.

- Front drive axle disengagement

Control the front drive handle in the reverse direction for front drive axle engagement mentioned above, front drive axle for its disengagement.

Fig. 3-37 Front drive axle operation

Important:

1. It is not allowed to engage the front drive axle during general transport operation for the tractor on a hard road surface or there will be early tire wears for front wheels. Engage the front drive axle only when it is rainy or snowy or when road surface is slippery. After pulling out of the difficult road section, front drive axle of the tractor should be disengaged.
2. In the case of tractor transport operations, if front wheel tires are worn quickly and tread patterns for them on both left and right sides are uneven, replace left and right tires for usage according to specific conditions.
3. To avoid tire premature wears, it is necessary to make tire inflation pressure meet specified requirements.

3.15 Hydraulic output device operation and usage

Single-plate or double-plate slide valve type hydraulic output multi-way valve can be alternative for the tractor according to relevant demands (as shown in Fig. 3-38), being separately controlled by 1 and 2 control handles To control both double-acting cylinders on the control machine.

The multi-way valve assembly is fixed on the multi-way valve fixing plate 5 by 4 M10 bolts. This fixing plate is connected with rear axle shaft housing.

Oil inlet and oil return opening for the multi-way valve are connected with gear pump and lifter separately while oil outlet is connected with distributor oil inlet. There are 2 M22×1.5 quick-change female connectors A1, B1 and A2, B2 (as shown in Fig. 3-38) for every control valve. In the case of their disuse, please seal them with seal caps. In the case of their usage, connect standby male connectors (which are placed in spare part kit) with cylinder oil inlet and oil outlet of the hydraulic agricultural implement firstly and then connect with quick-change female connectors. Control handle I controls the first hydraulic output circuit A1 and B1 while control handle II controls the second hydraulic output circuit A2 and B2. If it is connected with single-acting cylinder, oil pipes for the cylinder should be connected with the first circuit outlet A1 or the second circuit outlet A2. Move control I and handle II up and down, single-acting or double-acting cylinder will implement corresponding actions.

Both hydraulic output valves can be screwed in or out the multi-way valve as shown in Fig. 3-39 and single and double-acting change-over screw E will realize single-acting hydraulic output or double-acting hydraulic output. Screw out screw E counterclockwise to realize single-acting hydraulic output. On the contrary, completely screw in screw E to realize double-acting hydraulic output.

When connecting with the hydraulic quick-change connector, implement the following operations before insert the agricultural implement male connector into quick-change female connector:

- Shut down the engine.
- Lower the hanging agricultural implement.
- Move hydraulic output valve control handle forward and backward to eliminate internal pressure of hydraulic quick-change connector.
- Take down seal cap of the quick-change connector and clean the connector.

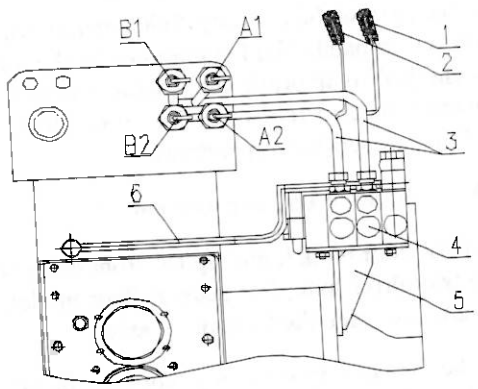


Fig. 3-38 Hydraulic output device application drawing

1.Control handle I 2.Control handle II
3.Multi-way valve oil pipe
4.Multi-way valve assembly
5.Multi-way valve fixing plate
6.Oil return pipe

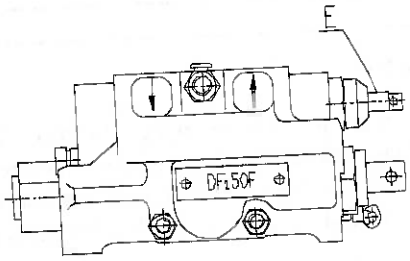


Fig. 3-39 Multi-way valve assembly

Important:

1. For single-acting cylinder, the cylinder oil pipe should be connected with A1 or A2quick-change connector for hydraulic output device. Otherwise, relevant parts will be damaged as a result of misconnection.
2. In the case of hydraulic output device disuse, quick-change connectors should be sealed with seal caps to prevent dust from entering.
3. After the completion of hydraulic output device operation, it is necessary to place the control handle at neutral position or there will be hydraulic system overheating.

3.16 Counterweight usage

3.16.1 Rear counterweight usage

During tractor field operations, cast-iron counterweights are installed on rear wheel spokes for tractor operating performance improvement and traction increase generally.

Mass for every piece of cast-iron counterweight is [45kg (kilogram)]. On one side, there can be 2 pieces of [90kg (kilogram)], 4pieces of [180kg (kilogram)] or 6pieces of [270kg (kilogram)].

Fig. 3-40 Rear counterweight

Warning: Before dismounting rear wheels with rear counterweights from the tractor, it is necessary to dismount these rear counterweights from tires firstly to avoid the hazard of unstability.

3.16.2 Front counterweight usage

To adjust front and rear weight for the tractor, it is necessary to install front counterweight blocks at tractor front.

The mass for front counterweight frame is 45kg (kilogram).

The tractor can be equipped with 11 cast-iron front counterweight blocks at most [with the mass for each is 22kg (kilogram) or 30kg (kilogram)].

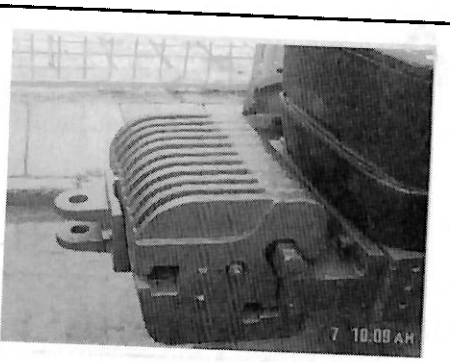


Fig. 3-41 Front counterweight

3.17 Driver's seat adjustment

Operating travel and rigidity for the driver' seat are adjustable. For the guarantee of safety, the seat should not be adjusted to be too soft, especially when driving on rough road.

3.17.1 Forward and backward adjustment of driver's seat

Adjust forward and backward adjusting handle 1 at the right lower side of the driver's seat according to the driver's height for the realization of forward and backward seat adjustment.

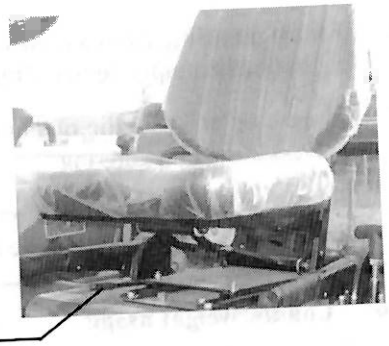


Fig. 3-42 Forward and backward adjustment of driver's seat

1. Forward and backward adjusting handle

3.17.2 Rigidity adjustment of driver's seat

Adjust hand wheel 1 of the driver's seat according to the driver's height and weight.

Fig. 3-43 Rigidity adjustment of driver's seat

1. Hand wheel of the driver's seat

Attention:

1. For safety, seat adjustment should be carried out when the tractor is in static state to avoid unexpected accidents.
2. Seat rigidity should not be too low and please pay attention to this when driving on a rough road to avoid unexpected accidents due to obstructed driver's sight.

3.18 Tractor covering parts

Tractor cover parts mainly consists of: hood, cab, mudguards, instrument desk, floor and accessories, etc.

3.18.1 Tractor hood

Engine hood of the tractor adopts elegant streamline metal plate structure.

3.18.1.1 Open operation of tractor hood

Pull the cable head at left lower part of the instrument desk (the first generation metal-hood model) or the open handle at the left side of hood lower cowling to unlock the hood lock (updating metal-hood model) and the hood lock is unlocked. Then, grab the hood handle, lift it up and the hood opens automatically via being pushed by two air springs on the left and right.

Fig. 3-44 Open operation of tractor hood

3.18.1.2 Close operation of tractor hood

Push down the tractor hood and the hood will be locked up by the hood lock automatically when being lowered to a certain angle.

Fig. 3-45 Close operation of tractor hood

3.18.2 Instrument desk

Electrical appliance control switch and combination instrument For the tractor are installed on the instrument desk. Meanwhile, the Instrument desk serves as a bracket, decoration and seal.

Fig. 3-46 Instrument desk

3.18.3 Cab (optional)

Cab for the tractor is a frame welded by tubular profiled bars and is inlaid with a large area of space curved glass.

Just as shown in Fig. 3-47, the cab possesses interior trims and a fan.

Fig. 3-47 Cab

3.18.4 Cab interior trims

Cab interior trims includes mudguard interior trims, floor mat, instrument desk, inner ceiling lining, etc. as shown in Fig. 3-48.

Fig. 3-48 Cab interior trims

3.18.5 Doors

Doors adopt profiled bar door frames which are inlaid with a whole piece of curved glass so that they blend with the whole streamline cab, not only serves as a foil for capacious and comfortable driving space but also greatly improving the vehicle aesthetics.

When opening the door from exterior, turn door key 1 clockwise by 90°(degree), hold door handle 6 after taking down the key and press door lock 2 with your thumb inward to unlock the door lock. Meanwhile, pull the door handle 6 outward to open the door. When closing a door, carry out operations in the reverse order to lock the door.

When opening the door from interior, pull up door handle 5 and push the door outward simultaneously to open it.

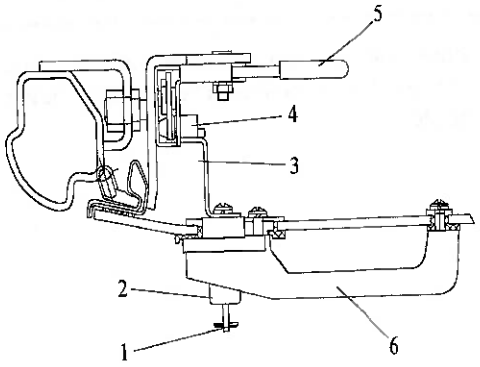


Fig. 3-49 Door structural drawing

1.Door key 2.Door lock

3.Bracket 4. Fastening screw

5.Open handle 6.Door handle

3.18.6 Left and right side windows

All-glass structure is adopted. In the case side window open, lift lock-up handle and push the window outward simultaneously until the it is stuck and then lift the lock-up handle gently so as to open the side window and limit to a certain place. Besides, the max. side window distance is the effective length for the lock-up handle.

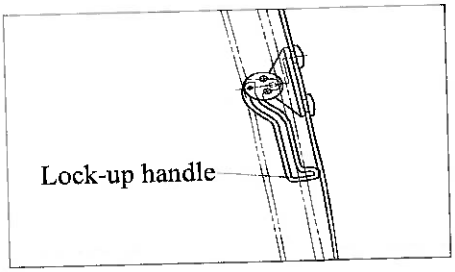


Fig. 3-50 Left and right side windows

3.18.7 Sun roof

The sun roof adopts glass reinforced plastic structure. In the case of sun roof open, hold the handle and press the sun roof lock with your thumb simultaneously and then the lock will be unlocked automatically. Push the sun roof outward gently and it opens automatically with the effect of left and right air springs. In the case of its closing, carry out operations in the reverse order.

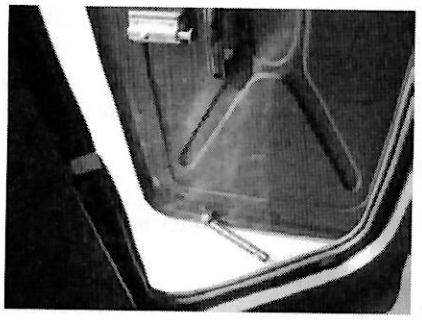


Fig. 3-51 Sun roof

3.18.8 Rear window

Tractor rear window is a upper-half semi-automatic open type with its open states are divided into general and maximum states.

- General state: Rotate handle 1. Push handle 1 outward when preiection in the handle front slips off its groove until the preiection in the handle rear reaches the groove and then rotate the handle 1 once again to slip the rear preiection into the groove so as to keep the rear window open and maintain a certain opening angle. In its closing, operate in the reverse order.
- Max. state: Rotate handle 1. Push handle 1 outward when preiection in the handle front slips off its groove until the pulling force from air spring 2 is overcome. Air spring 2 is changed from "pulling" into outward "pushing". Then, the rear window reaches its max. opening position automatically. In the case of its closing, pull the handle inward to overcome "pushing" force from air spring 2 and then air spring 2 is changed from outward "pushing" into inward "pulling" and then the rear window closes automatically.Rotate the handle once again to slip the front preiection Into its groove for it lock-up.

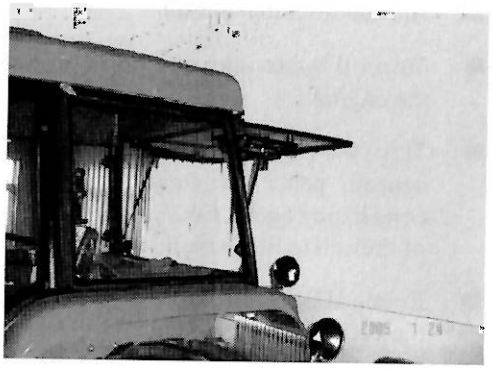


Fig. 3-52 Rear window diagram form 1

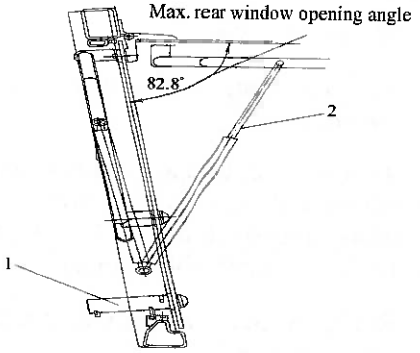


Fig. 3-53 Rear window diagram form 2

1. Handle 2.Air spring

3.18.9 Cab HVAC (heating ventilation and air conditioning) (optional)

The dual-purpose air conditioner possesses 2 air outlets in the cab. You can rotate cover plates for these air outlets to adjust air volume and blowing direction; At the leftmost side of the HVAC is its control panel which possesses control modes as follows:

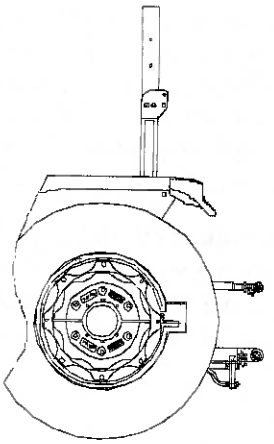
- Separate ventilation control
  - Turn off water inlet and outlet switch for the air heater on the engine.
  - Turn off compressor switch at the leftmost side of the control panel.
  - Rotate air speed switch in the middle of the control panel to adjust air speed so as to obtain natural wind.
- Air conditioning control
  - Turn off water inlet and outlet switch for the air heater on the engine.
  - Turn on compressor switch at the leftmost side of the control panel to activate the compressor filled with condensing agent. Cooled air can be provided to the interior of the cab to decrease interior temperature.
  - Rotate HVAC temperature control switch at the right side of the control panel to adjust the interior temperature.
  - Rotate air speed switch in the middle of the control panel to adjust the air speed.
- Air heater control
  - Turn off compressor switch at the leftmost side of the control panel.
  - Turn on water inlet and outlet switch of the air heater on the engine and warm water starts to its circulation in the air heater. Heated air can be provided to the interior of the cab to increase interior temperature.
  - Rotate air speed switch in the middle of the control panel to adjust air speed.

Fig. 3-54 Air conditioner

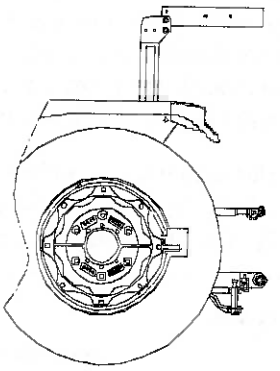
Fig. 3-55 HVAC control panel

3.18.10 Roll bar

Tractor roll bar is a frame welded by rectangular tubes and it can be overturned and folded.



Roll bar extension position schematic diagram



Roll bar enfoldment position schematic diagram

Fig. 3-56 Roll bar

3.19 Operation of tractor operation device

This series tractors mainly covers the following operating device: (partial optional)

- Hydraulic lifter: mainly used for lifting and lowering agriculture implement.
- Simply hydraulic output: mainly used for hydraulic trailer etc.
- Hydraulic output device: used for hydraulic reversible plough, hydraulic harrow etc.
- Suspension mechanism: mainly used for hooking agricultural implement etc.
- PTO device: Mainly used for power needed agricultural implement etc.
- Pendulum towing device: mainly used for harrow, mower, tractor-powered seeder etc.
- Towing rack: mainly used for signal-axle trailer and double-axle trailer etc.

3.19.1 Control of semi-separated hydraulic lifter

During hydraulic lifer working, the agricultural implement could be lifted and lowered by the control handle to control the tilling depth. Semi-separated hydraulic lifter is functioned by position control, force and position control and floating control etc. The force and position control is preferential for plough working to ensure working effect.

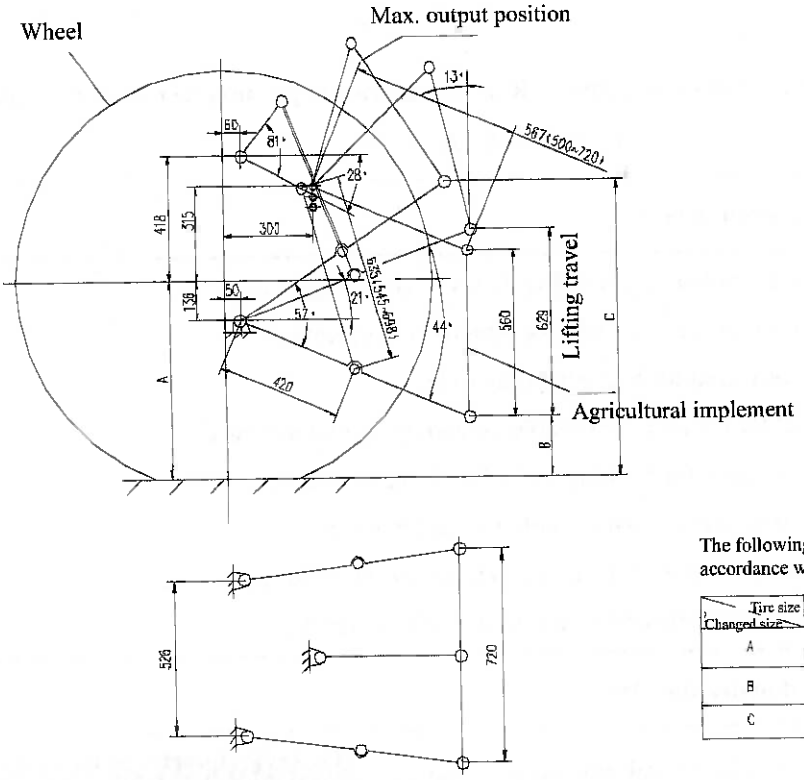
- Force and position control means simultaneously controlling the force and position. It is mainly suitable for working in field with higher resistance change. If meeting that the specific resistance of soil is sharply lowering, adopting so should prevent the agricultural implement front forcefully dropping, causing the deep raw soil going up to surface. During working, the tilling depth could be controlled by control handle. Within composite control scope, the more the control handle moves forward, the deeper the tilling is. Reversely the shallower the tilling depth is. When adjusting to the specified tilling depth, loosen the butterfly nut on the control panel.

Fig. 3-56 Control of semi-separated hydraulic lifter.

Move the stop to the control handle position, and tighten the butterfly nut. Doing so could ensure the control handle can touch with stop after lowering the agricultural implement each time, stabilizing the tilling depth.

- Position control: when the tractor begins to rotary tilling, mowing and harvesting etc with the agricultural implement, the upper pull rod is pulled, causing force control spring out of function. At this time, please adopt the position control. Within position control, the lifting/lowering amount of agricultural implement is proportional to forward/backward moving amount of control handle. The more the control handle moves forward (lowering direction), the more the agricultural implement lowers. Inversely, the more the control handle moves backward (raising direction), the more the agricultural implement rises.
- Floating control: if the agricultural implement working with depth roller, please adopt floating control. Place the control handle to floating position to keep the hydraulic system in floating state. Then the lifting arm could sway freely. The tilling depth is controlled by depth roller, with ground profiling.

3.19.2 Suspension system size



The following variable dimensions are in accordance with equipped tires:

Changed size \ Tire size	12.4–28	14.9–28	14.9–30
A	590	640	665
B	125	175	200
C	917	967	992

Fig. 3-57 Suspension system size

Important: When using the agricultural implement with PTO, raising agricultural implement excessive high could enlarge the angle between the PTO shaft and drive shaft of agricultural implement. This could damage it. It is best to keep the agricultural implement at unaffected lifting height at field edge.

3.19.3 Simple control of hydraulic output

- Push the control handle to the lowering position to let the hanged lever at lowest position.
- Clockwise tighten the hand wheel "A" used for lowering speed to close pipe to the lifter cylinder.
- Screw down the hydraulic output hollow bolt "B" on cylinder head and then sleeve. Connect the high pressure oil pipe.
- Position the control handle at the "lifting" to send the hydraulic oil into hydraulic output device. If returning the hydraulic oil, place the control handle to the lowering position.

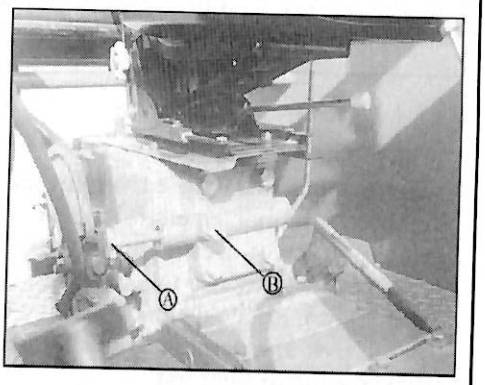


Fig. 3-58 Simple control of hydraulic output

3.19.4 Suspension mechanism usage

LOVOL-TA series tractor adopts rear-positioned three-point suspension to connect to the agricultural implement.

- Before connecting, please check the sway type towing rod or other possible objects for interference. Move it forward or dismantle it as needed.
- The tractor runs to the agricultural direction to align with the towing point. Place the main gear lever to neutral position, depress the brake pedal and simultaneously lift the hand brake.
- Place the hand accelerator to the lowest position to idle for 1-2min, then shut down engine to connect the agricultural implement.

3.19.4.1 Connection of lifting rod

Generally, the lifter length is proper. Left and right lifting rods are adjusted by rotating the sleeve at the middle position clockwise. Rotate the sleeve1 clockwise to extend the lifting rod. Reversely shorten it. Adjust lifting rod The horizontal position and tilling depth of agricultural implement could be adjusted by lifting rod.

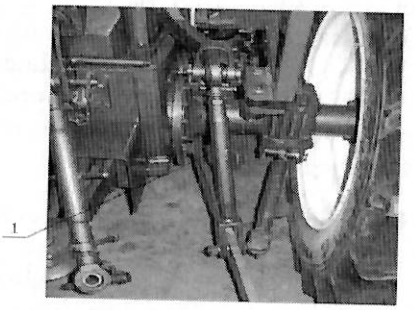


Fig. 3-59 Lifting rod usage

1. Sleeve

3.19.4.2 Connection of upper pull rod

There are three holes selected for connecting the upper pull rod with support. Select proper holes according to the column height of agricultural implement or the actual state. Adjusting length of upper pull rod is mainly to adjust the longitudinal position of agricultural implement. (See agricultural implement instructions)

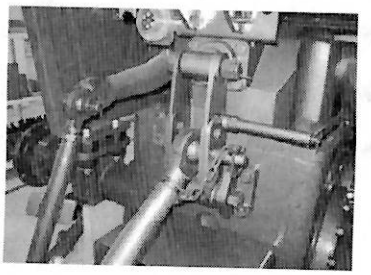


Fig. 3-60 Connection of upper pull rod

Note: the purpose of upper pull rod clamp: if the upper pull rod does not connect the agricultural implement, the rod is fixed with its clamp. When needing to connect to the agricultural implement, turn the clamp upward to avoid hitting it if raising agricultural implement to max. height.

3.19.4.3 Limit rod adjustment

Limit rod 1 is mainly used to limit the horizontal swaying amount of agricultural implement (viz. lower pull rod). Insert the pin into the slot hole of sleeve to let the limit rod be of some free movement. While insert the pin into the round hole of sleeve to fix the limit rod. Rotate the limit sleeve with thread to adjust the length of limit rod. The rear round hole is functioned as temporary hole to adjust the pin of limit rod.

The moving amount of limit rod could be selected according to working mode of agricultural implement. If mounted with plough, harrow etc, limit rod should be of moving amount to ensure the working performance of tractor. If mounted with rotary tiller, mower etc, limit rod should be fixed.

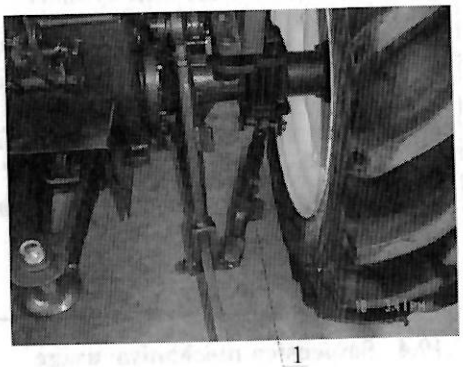


Fig. 3-61 Limit rod adjustment

1. Limit rod

Important: If the tractor with agricultural implement transferring for a long distance, please shorten the upper pull rod and adjust the limit rod to avoid swinging of agricultural implement. Whilst tighten the nuts from the upper pull rod and limit rod to avoid damaging suspension mechanism.

3.19.5 PTO control

The independent and dual-speed PTO shaft could work in moving or stay state. PTO shaft is completely independent. When depressing down clutch pedal, tractor traveling is stopped, but the PTO shaft is still working. If pulling up the auxiliary clutch handle, the PTO shaft will be stopped working, whilst the tractor could go no. If the agricultural implement needing PTO, please follow the following steps:

Fig. 3-62 PTO control

- Select the PTO shaft speed as needed. If pushing PTO control handle the forward, you can obtain high gear of 760 r/min [or1000r/min]. If continuously engage the PTO control handle through neutral position, you can obtain low speed 540r/min.
- Connect the agricultural implement to suspension mechanism, pull up the auxiliary clutch handle and place the PTO control handle to neutral position.
- Screw off the PTO shaft protective cover and then connect the universal joint of agricultural implement to PTO shaft.
- Confirm the PTO protective cover is already installed.
- Position the lifter control handle to "Lifting" to raise agricultural implement.
- If power output is not required, PTO control handle should be at neutral position and reinstall the PTO shaft protective cover.

Warning: when engaging PTO shaft, no one is allowed to approach agricultural implement to ensure personal safety.

3.19.6 Hooking agricultural implement

Place the control handle to lowest position. The tractor slowly approaches agricultural implement. Connect the upper pull rod from the right to left to lock it with pin.

Attention: If the tractor reversing, PTO shaft control handle should be placed at neutral position. Otherwise, it will cause agricultural implement damage or unexpected accident.

3.19.7 Rotary tiller usage

- Connect the rotary tiller to specification.
- Rotary tilling depth adjustment

-- Slowly move the handle upward to raise the rotary tiller until the handle is at max. height.

-- Slowly move the handle downward to lower the rotary tiller from the max. height. If the tooth is distanced to ground by 10cm, power the rotary tiller to rotate the teeth. If the rotary tiller is pitched into soil, it enters into rotary tilling state. Moving the handle downward continuously to increase tilling depth to specified tilling depth. Please use the positioning hand wheel below sector to block the handle to lock the hand wheel.

Important: If turning at the field edge, please firstly disengage the PTO shaft, then raise the rotary tiller to avoid damaging the machine.

3.19.8 Plough working mode selection and control

- Height adjustment mode

The height adjustment is defined as: use the ground roller of plough to control tilling depth. Moving the control handle upward to max. height could raise plough to max. height. Moving the control handle downward to lowest position to lower the plough. The lowering distance is controlled by ground roller rather than handle.

- Force and position control mode

Take the ground roller of plough off. If the control handle moving downward to some position, the plough will corresponding move downward to some position. The force and position control mode is defined as: the tilling depth is dependent on variable positions of control handle on the sector. Adjust the positioning hand wheel below the sector to set the plough tilling depth, ensuring equal tilling depth at each tilling cycle.

Warning: if raising the hooked heavy-duty agricultural implement, slowly move the control handle upward to avoid tractor rollover.

3.19.9 Forced separated hydraulic suspension system control (optional)

● structural features

This system adopts 4-position 6-way distributor and double-acting hydraulic cylinder with four working positions of "Lifting" "Neutral" "Lowering" and "Floating". You can locate all position with exception of "Lowering". At "Lowering" position, auto reset will be done in pressure state.

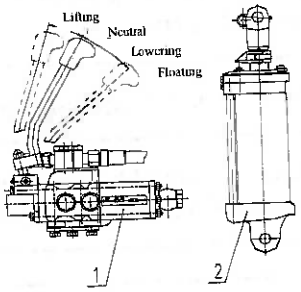


Fig. 3-63 Forced separated hydraulic suspension system

1.Distributor assembly
2.Cylinder assembly

● Function of forced separated hydraulic suspension system

Lifting the agricultural implement; forcing agricultural implement into soil; floating control of tilling depth to ensure the agricultural implement is relatively positioned to tractor.

● Forced separated hydraulic suspension system usage

Pull the control handle to "Lifting" "Neutral" "Lowering" and "floating", as shown in Fig. 3-63. Control handle

When pulling the control handle from "Neutral" to highest position (you can obviously feel the control handle is locked), the suspension mechanism begins to rise until the finished position, then the control handle automatically reset (return to neutral position).

When pulling the control handle downward from "Neutral" (at this time, the control handle is not at lowest position), the suspension mechanism begins to lower. But once the control handle is loosened, the handle will return to "Neutral", stopping lowering.

If control handle is pulled to lowest position from "Neutral" position (you can obviously feel the control handle is locked), it indicates the suspension mechanism has already fell to end position and is at "Floating" state.

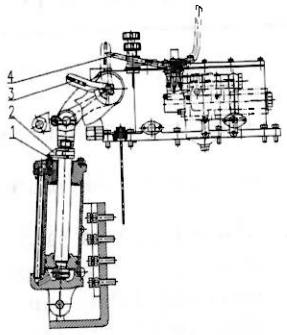


Fig. 3-64 Forced cylinder

1. Positioning valve
2. Positioning clamp block
3. Limit baffle 4. Limit push rod

● Lowering distance adjustment

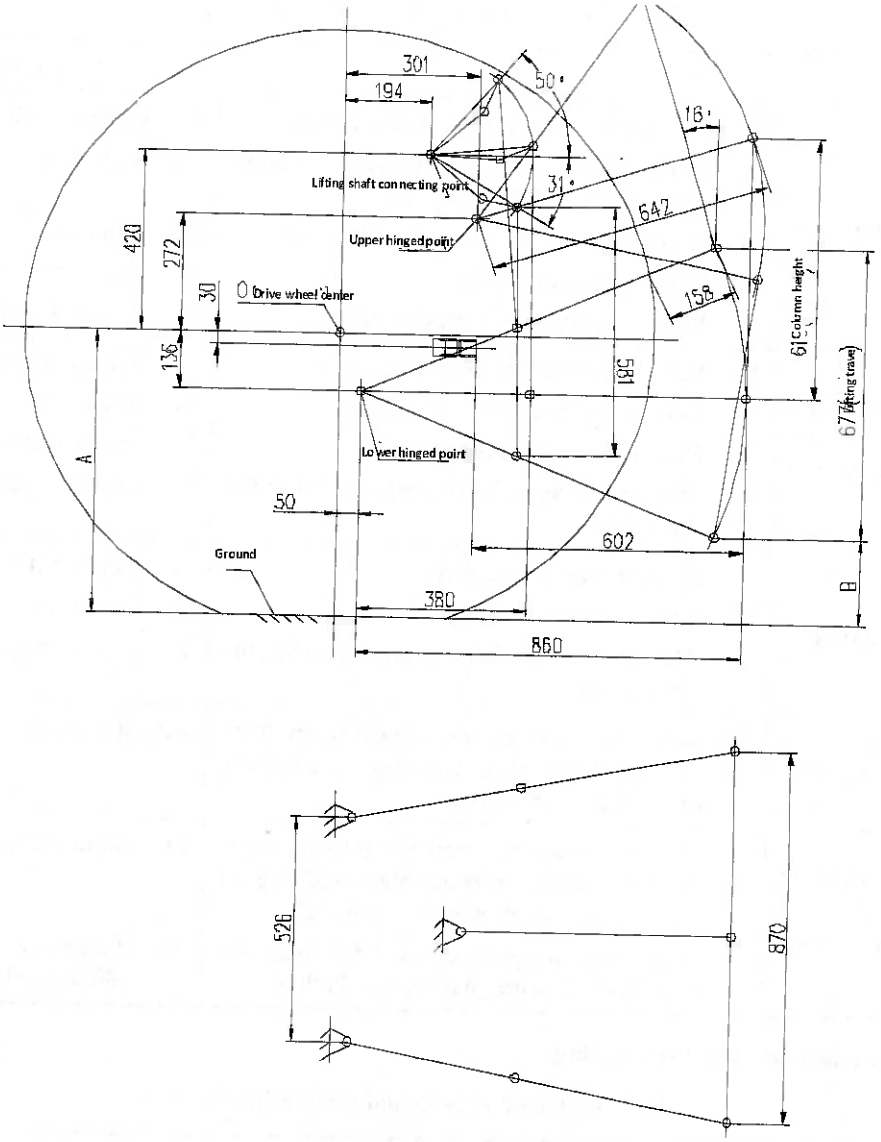
The lowering distance is controlled by positioning valve 1 and positioning clamp block 2 on the cylinder, as shown in Fig. 3-64.The positioning clamp block 2 could be adjusted upward and downward on the piston. The lower the block 2 is, the less the lowering amount is. Reversely, the more the lowering amount is. During lowering, if the positioning clamp block pressing the positioning valve, the lowering will be stopped.

● If the tractor with agricultural implement traveling for a long distance, please lock the cylinder to fix the agricultural implement at some height. Two methods are shown:

-- Raise the agricultural to extreme position, adjust the positioning clamp block 2 (the more the block 2 approaches lug of cylinder, the lower the agricultural implement fixed height). Place the distributor control handle to lowering position, the upper and lower chambers of cylinder will be sealed by the positioning clamp block 2 pressing the positioning valve 1.The agricultural implement could stay at some height.

-- Loosen the fixing bolt on the limit battle 3 and clockwise rotate the limit stop 3. The bigger the rotating angle, the lower the agricultural implement raising height is. If the required height is reached, lock the fixing bolt of limit baffle 3.Working principle: place the distributor control handle to "Lifting", wherein the limit baffle 3 will touch limit push rod 4, causing the control handle returning to neutral position under force. The sealing the hydraulic oil in upper and lower chambers of cylinder will be realized and the agricultural implement will be lifted to fixed height.

3.19.10 Forced separated hydraulic suspension system size



Variable sizes are shown as follows depending on equipped tires:

Changed size \ Tire size	12.4-28	14.9-28	14.9-30
A	586.5	636.5	661.5
B	125	175	200

Fig. 3-67 Forced separated hydraulic suspension system size.

3.20 Common failures and troubleshooting

3.20.1 Clutch failures and troubleshooting

Table 3-8 Clutch failures and troubleshooting

Failure	Cause	Troubleshooting
1. Clutch is slippy	1) Friction lining is contaminated with oil 2) Friction lining wear is excessive, causing the appearance of rivet head. 3) Diaphragm spring pressure is dropped. 4) Driven disc is warping. 5) Pedal free travel is disappearing.	1) Clean it with gasoline. 2) Replace it 3) Replace it 4) Repair of replace it 5) Adjust to specification
2. Clutch could not completely be released. Engaging gives noise.	1) Pedal free travel is excessive large. 2) Driven disc is excessive warping. 3) Driven disc spline is too tight. 4) The three release lever heads are not at the same level.	1) Adjust to specification 2) Replace it 3) Smooth spline. 4) Adjust to specification
3. Clutch is joggling	1) Friction lining is broken. 2) Driven disc is warping. 3) The three release lever heads are not at the same level.	1) Replace it 2) Replace it 3) Adjust to specification
4. When releasing main clutch, PTO shaft stops rotating.	The clearance between the release screw head of main pressure plate and lug of auxiliary pressure plate is too narrow.	Adjust to specification
5. When flooring clutch pedal, PTO shaft could not stop rotating.	1) The clearance between the release screw head of main pressure plate and lug of auxiliary pressure plate is too wide. 2) The three lug grooves used for installing auxiliary pressure plate is too shallow.	1) Adjust to specification 2) Properly increase number of adjusting shim.

3.20.2 Gearbox Fault and troubleshooting

Table3-9 Gearbox fault and troubleshooting

Failure	Cause	Troubleshooting
1. Auto disengaging	1) Pressure of shift shaft self-locking spring is not sufficient. 2) Spline hole is of conical degree, developing axial force and excessive clearance. 3) After engaging, the driving and driven gears could not completely engage. 4) Tooth direction is not correct or gear surface wear is not evenly	1) Replace spring 2) Replace gear 3) Check the gear travel and gear position 4) Replace gear
2. Disorderly engagement	Limit plate of shift shaft travel is broken.	Exchange them
3. Engaging is difficult, or gear engagement failure	1) Main clutch releasing is not thorough. 2) Fillet of gear end is wear or damaged 3) Engaging between the slipper gear and spline shaft is too tight.	1) Adjust it 2) Replace gear 3) Use oilstone to make the engaging is mild.

Failure	Cause	Troubleshooting
4. Gearbox gives abnormal sound	1) Lubricant is insufficient. 2) Bearing and gear wear is severe. 3) There is rug or hard point on gear surface.	1) Fill to specified oil level. 2) Replace gear and bearing 3) Clean it with oilstone.
5. The oil enters gearbox block and clutch chamber.	1) Oil seal of engine crankshaft is failure. 2) The oil seals of 1st bearing block and 1st shaft in gearbox are failure.	1) Replace it 2) Replace it
6. The oil emerges from the gear lever.	The vent of rear axle or gearbox cover is clogged by dust.	Clean filter element

3.20.3 Rear axle fault and troubleshooting

Table3-10 Rear axle fault and troubleshooting

Failure	Cause	Troubleshooting
1. Main drive gives abnormal sound	1) Main drive gear engagement is abnormal. 2) Clearance between the driving spiral bevel gear and differential is too narrow.	1) Adjust the gear pair engagement mark and backlash. 2) Adjust clearance
2. Rear axle housing is over hot.	1) Oil level is too low. 2) Clearance of bearing or gear is too narrow.	1) Fill to specified oil level. 2) Adjust to specification
3 Differential lock handle could not return.	1) Differential lock return spring is failure. 2) Differential lock push rod is locked.	1) Replace it 2) Dismantle and clean it, and get rid of rug.

3.20.4 Brake fault and troubleshooting

Table3-11 Brake fault and troubleshooting

Failure	Cause	Troubleshooting
1. Loss of braking	1) Friction lining is stuck with oil 2) Brake friction lining wear is too large. 3) Brake pedal free travel is excessive large.	1) Check and replace the brake oil seal. 2) Replace it 3) Adjust to specification
2. When braking, the tractor defects to one side.	1) Left brake pedal is not same with and right one. 2) The oil enters into one side of brake.	1) Adjust to specification 2) Dismantle and clean it.
3. Clutch could not completely be released. Brake is hot.	1) Brake pedal free travel is too short. 2) Brake pressure plate return spring is failure. 3) Brake friction lining clearance is too narrow. 4) Brake pedal could not return.	1) Adjust to specification 2) Replace it 3) Adjust to specification 4) Check return spring for failure.

3.20.5 Traveling and steering system Fault and troubleshooting

Table3-12 Traveling and steering system Fault and troubleshooting

Failure	Cause	Troubleshooting
1. Front wheel sways	1) Guide wheel stand bushing is wear. 2) Steering tie rod ball pin or ball head seat is wear. 3) Front axle bracket gasket is wear. 4) Toe-in adjustment could not follow the specification. 5) Front wheel rim is not aligned. 6) Air enters steering cylinder.	1) Replace it 2) Replace it 3) Adjust of replace it 4) Adjust to specification 5) Correct of replace it 6) Check the oil level of steering cylinder and exhaust.
2. Front wheel is early wear	1) Toe-in adjustment could not follow the specification. 2) Front wheel pressure is insufficient.	1) Adjust to specification 2) Inflate to specification
3. Hydraulic steering leaks oil.	1) The rubber washer of oil pipe connection or bolt is loose. 2) There may be damage from hydraulic steering gear valve body, spacer plate, stator and rubber washer of rear cover interface. 3) The rubber washer of shaft journal is damaged. 4) Bolt attaching steering gear is loose.	1) Replace rubber washer or tighten the bolts 2) Clean and replace rubber washer. 3) Replace rubber washer. 4) Tighten bolts
4. Hydraulic steering is heavy.	1) Gear pump oil supply is insufficient. There is leak inside of gear pump. The filter screen in steering oil reservoir is clogged. Slowly steering is light and quick steering is fast. 2) There is air in steering system. When rotating the steering wheel, the cylinder moves sometimes. 3) The oil level in steering oil reservoir is insufficient. 4) Relief valve spring elastic force weakens. The steel ball sealing is failure. Light-duty steering is light and heavy-duty steering is heavy. 5) Oil viscosity is too thick. 6) The ball check valve in valve body is failure. The steering wheel is heavy and powerless. 7) Steering system leaks oil, including inside and outside of cylinder.	1) Check gear pump for normal and clean filter screen. 2) Empty air in system and then check whether there is air in the oil suction pipe. 3) Add oil to specified level. 4) Clean relief valve and adjust spring pressure of relief valve 5) Use specified oil level. 6) Maintain, clean or replace it 7) Check and troubleshoot the oil leaking points.

Failure	Cause	Troubleshooting
5. Hydraulic steering is failure	1) The taper pin is broken or failure. 2) Opening of linkage shaft is broken or distortion. 3) Rotor and linkage shaft are reversely installed. 4) Steering cylinder piston or piston seal ring is damaged.	1) Replace the taper pin. 2) Replace the linkage shaft. 3) Reinstall it. 4) Replace piston or piston seal ring.
6. If hydraulic steering, steering wheel could not return to neutral position	1) Spring leaf is broken. 2) Steering shaft and steering column sleeve are not concentric, with large rotating resistance. 3) Steering shaft peaks against the valve core. 4) The pressure reduction is large at neutral position or the steering gear does not unload (opt to deflection to one side) when the steering wheel stops rotating. 5) Steering shaft and valve core are not concentric.	1) Replace spring leaf. 2) Repair of replace it 3) Repair it 4) Repair of replace it 5) Adjust to specification
7. Hydraulic steering is powerless.	1) The clearance between rotor and stator is excessive wide. 2) The sealing of cylinder piston is poor. If power steering, the driver could not obviously feel that the piston is already at extreme position. When power- steering, steering wheel rotates but the cylinder does not.	1) Replace rotor and stator 2) Replace piston seal ring.

3.20.6 Hydraulic suspension system fault and troubleshooting

Table3-13 Hydraulic suspension system fault and troubleshooting

Failure	Cause	Troubleshooting
1. It could rise with no load. While it could not rise or rise slowly in load state.	1) Oil filter screen is clogged. 2) Cylinder leaking is severe. 3) Relief valve is leaking.	1) Clean the filter screen. 2) Replace piston seal ring. 3) Correct the pressure.
2. Agricultural implement rises without limit.	1) Lift valve is stuck at lifting position. 2) Sensing lever is loose.	1) Replace control valve oil seal couple. 2) Adjust to specification
3. Agricultural implement could not rise.	1) The cylinder is damaged. 2) Distributor sensing lever is loose. 3) Relief valve is leaking. 4) Cylinder leaking is severe. 5) Oil filter screen is clogged. 6) Agricultural implement is too heavy or tilling depth is too deep.	1) Replace cylinder. 2) Adjust to specification 3) Correct the pressure or change it. 4) Replace piston seal ring. 5) Clean the filter screen. 6) Use proper agricultural implement and tilling depth

Failure	Cause	Troubleshooting
4. Raising agricultural implement is jogging.	1) The oil pipe is loose. 2) There is air in oil pipe. 3) Oil inlet one-way valve of distributor is of poor seal.	1) Tighten the joint. 2) Empty the air. 3) Repair of replace one-way valve.
5. There is no hydraulic output or powerless output from the cylinder head.	1) The inlet pipe to cylinder is not cut off. 2) Seals of between descending speed control valve front taper and taper hole are poor. 3) Lifter is at the lifting neutral position.	1) Tighten the descending speed control hand wheel clockwise. 2) Repair the sealing between the descending speed control valve front taper and taper hole. Or replace the descending speed control valve. 3) Push the lifter control handle to the lowering position to let the outer lifting arm at lowest position, cutting the inlet pipe to cylinder. Lift the control handle to lifting position.

3.20.7 Electrical system fault and troubleshooting

3.20.7.1 Starter fault and troubleshooting

Table3-14 Starter fault and troubleshooting

Failure	Cause	Troubleshooting
1. Starter does not rotate.	1) Battery power is insufficient. 2) Battery terminal is dirty or the cable is loose. 3) Cable joint is loose or ground wire is rusted. 4) The control circuit such as ignition switch is open. 5) Carbon brush and communtator are not will connected. 6) Interior starter circuit is open, short circuit or grounded. 7) Improper operate or connect the safe starting switch.	1) Charge the battery to specification 2) Remove the foreign material, tighten the connection. 3) Tighten the connection to keep it reliable. 4) Check the circuit for reliability. 5) Maintain, readjust and clean it. 6) Repair the starter. 7) Check the starting switch for reliability.
2. Starter starting is powerless or could not start the engine.	1) Battery power is insufficient. 2) Cable is not well connected. 3) Communtator surface is burned or contaminated with oil. 4) Carbon brush wear is excessive, or carbon brush pressure is insufficient, causing poor connection of communtator. 5) Main contact of solenoid switch is burned. 6) Bearing is severe burned.	1) Charge the battery. 2) Adjust it 3) Smooth the communtator surface to clean oil contamination. 4) Replace or adjust it 5) Service and smooth it. 6) Replace bearing.

Failure	Cause	Troubleshooting
3. If loosing the starting switch, the starter continuously rotates.	1) Main contact of switch is stuck.	1) Check the main contact in the switch and smooth the rug.
	2) Starting gear contact of ignition lock is stuck.	2) Replace ignition lock.
	3) Starting relay contacts is stuck.	3) Replace starting relay.

3.20.7.2 Generator fault and troubleshooting

Table3-15 Generator Fault and troubleshooting

Failure	Cause	Troubleshooting
1 Generator could not generate the power	1) Cable is not well connected or reversely connected or disconnected.	1) Check and repair the circuit.
	2) Rotor circuit is open.	2) Repair of replace generator assembly.
	3) Commutation diode is damaged.	3) Replace diode.
	4) Carbon brush is not well connected.	4) Clean the dirty and replace carbon brush.
	5) Regulator is damaged.	5) Replace regulator.
2 Generator charge is insufficient.	1) V-belt is slack.	1) Adjust rubber belt tension to specification.
	2) Carbon brush is not well connected. There is oil contamination on slip ring.	2) Adjust and clean it.
	3) Regulator is damaged.	3) Replace regulator.
	4) Battery electrolyte is excessive low or sulfuration is severe or the battery is too old.	4) Refill the electrolyte to specified height. If the sulfuration is severe and can out be replaced, replace it.
3. Generator charging current is too high, opting to burn the bulb.	1) Regulator regulating voltage is too high.	1) Adjust voltage to specification.
	2) Regulator magnet coils are not welded, losing its function.	2) Repair the magnet coils and weld the needed points.

3.20.7.3 Battery Fault and troubleshooting

Table3-16 Battery fault and troubleshooting

Failure	Cause	Troubleshooting
1. Discharging current is too high.	1) There is foreign material in electrolyte	1) Replace battery.
	2) There is short circuit outside of battery.	2) Find out short circuit and solve it.
	3) Electrolyte is spilled out of battery, causing shortcut of positive and negative poles.	3) Use alkaline water or warm water to clean battery table and terminal. (Attention: alkaline water or water cannot enter inside of battery.).
	4) Place the metal tool or lever between the positive pole and negative pole, causing severe shortcut.	4) Never lay metal rod or tool in front of battery table.
	5) The active material is off of pole plate or the active material deposits too much, causing the shortcut of pole plate. The insulator is damaged, causing shortcut of pole plate. The pole plate is warped, causing battery shortcut.	5) Replace battery or repair it by professional

Failure	Cause	Troubleshooting
2) Battery power is insufficient.	1) There is sulfuration on the pole plate (Insufficient charging lasts for long periods. The battery electrolyte is too low. Electrolyte specific gravity is too high or not pure.) 2) The terminal is not well connected. There is too much oxidate on the pole. Charging power is insufficient.	1) Replace battery 2) Tighten the connection. Clean the oxidate. Coat a thin layer of Vaseline on the pole.
3. The casing is damaged.	1) The vent is clogged, causing the gas generated by charging could not be drained. The pressure in the battery is too high. 2) Battery discharges sharply, quick raising electrolyte temperature and the electrolyte and gas fast inflate. 3) Battery is not well fixed, causing vibration during traveling.	1) Replace battery. Check vent for smooth. 2) Replace battery, check and troubleshoot shortcut outside of battery. 3) Replace battery, fix the battery.

3.20.7.4 Instrument fault and troubleshooting

Table3-17 Instrument fault and troubleshooting

Failure	Cause	Troubleshooting
1. Water temperature gauge pointer always points to low temperature.	1) Circuit is open. Connector is not well connected. 2) Water temperature sensor is damaged. 3) Water temperature gauge is failure.	1) Check the circuit and clean the sand in the connector. 2) Replace water temperature sensor. 3) Replace water temperature gauge.
2. Water temperature gauge pointer always points to high temperature.	1) Water temperature sensor is open or damaged. 2) There is shortcut. 3) Water temperature gauge is failure.	1) Replace water temperature sensor. 2) Check and solve shortcut. 3) Replace water temperature gauge.
3. Fuel gauge could not indicate normally.	1) There is shortcut or open. 2) Fuel level sensor circuit is open, shortcut or not well connected. 3) Fuel gauge is failure.	1) Troubleshoot it. 2) Repair of replace sensor. 3) Replace fuel gauge.
4. Hour counting of tachometer is abnormal.	1) Instrument is damaged.	1) Replace it
5. Oil pressure gauge indicating is not normal.	1) The circuit is open, causing the pointer pointing the full level. 2) Sensor circuit is open, shortcut or not well connected.	1) Troubleshoot it. 2) Repair of replace sensor.

3.20.7.5 Lighting fault and troubleshooting

Table3-18 Lighting fault and troubleshooting

Failure	Cause	Troubleshooting
1. There is only high beam in headlamp	1) There is shortcut or open or the fuse is burnout. 2) Lighting switch and dimmer switch are not well connected or damaged. 3) Bulb is burnout. Its quality is poor.	1) Check and connect the circuit. 2) Repair or replace it 3) Replace with high quality bulb.
2. Rear lamp could not be lighted.	1) There is shortcut or open or the fuse is burnout. 2) Rear lamp switch is not well connected or damaged.	1) Check and solve shortcut or open problem. 2) Repair or replace it

3.20.8 Front drive axle fault and troubleshooting

Table3-19 Front drive axle fault and troubleshooting

Failure	Cause	Troubleshooting
1. The noise is large.	1) Main drive gear is not well engaged. 2) Main drive bearing clearance is too large or damaged. 3) Differential bearing is damaged or seized. 4) Planetary gear or shim is wear. 5) Final drive gear pair is not well engaged.	1) Adjust the meshing mark of new gear. 2) Repair of replace it 3) Replace differential shaft. 4) Replace planetary gear or shim 5) Readjust final drive gear.
2. Drive shaft is hot.	1) Drive shaft is severely distorted. 2) Intermediate bearing block is loose.	1) Correct of replace drive shaft. 2) Tighten bearing block.
3. Front wheel severe wears out.	1) Rim and spoke is severely distortion. 2) Toe-in is not proper. 3) Steering knuckle and two pivots of cylinder is severely worn. 4) Tire inflation is insufficient during transportation. 5) Front drive axle is not disengaged during transportation.	1) Replace front wheel rim and spoke 2) Adjust toe-in. 3) Replace pivot. 4) inflate to specification 5) Front drive axle should be disengaged during transportation.

3.20.9 Hydraulic output device fault and troubleshooting

Table3-20 Hydraulic output device fault and troubleshooting

Failure	Cause	Troubleshooting
1. Cylinder lifting speed is slow or no action in load state.	1) Relief valve is leaking. 2) The cylinder is of low efficiency.	1) Clean the relief valve. Remove the foreign material, readjust pressure or replace it. 2) Replace cylinder.

Failure	Cause	Troubleshooting
2. The cylinder is suddenly powerless in load state.	1) The hydraulic oil is contaminated, causing the relief valve is stuck at open. 2) There is oil leaks in system 3) The cylinder is damaged.	1) Replace the hydraulic oil or replace relief valve assembly. 2) Check it 3) Readjust of replace cylinder
3. There is no pressure during cylinder lifting in load state.	1) Relief valve pressure is low. 2) Oil pump is of low efficiency. 3) System pressure is low.	1) Replace relief valve. 2) Replace oil pump. 3) Check system.
4. There is leak between the valve plates, or connection between the front and rear cover.	Seal ring is damaged.	Replace seal ring.

3.20.10 Air brake system fault and troubleshooting

Table3-21 Air brake system fault and troubleshooting

Failure	Cause	Troubleshooting
1) Air pressure is insufficient.	(1) Air is leaking out of pipe. (2) Intake or exhaust valve plate of air pump is worn or the spring is damaged. (3) Air pump piston ring or cylinder liner is severely worn. (4) Relief valve closing is not tight.	1) Check and troubleshoot the air leaking points. 2) Replace it 3) Replace piston ring and cylinder liner. 4) Check and replace relief valve.
2. Air cut-off brake valve does not reset.	(1) Dust enters air cut-off brake valve. (2) Oil or water enters air cut-off brake valve.	(1) Clean air cut-off brake valve. (2) Drain the oil or water in air reservoir. Clean air cut-off brake valve.
3. Air cut-off brake valve does not exhaust.	(1) Tappet is stuck. (2) Return spring is broke or its elastic force is weakened.	(1) Repair it to make tappet movement flexible without stuck. (2) Replace return spring.

4. Accessories, Spare and Wearing Parts

4.1 Accessories

Tractor accessories consist of air heater, floor mat, mudguard gasket, tilting tow bar and roll bar and so on.

4.1.1 Air heater (optional)

The air heater on the tractor is installed on front top of cab, on which the switch is set up. When turning on the power, the air heater can start operation immediately. It is necessary to ensure a comfortable working temperature in the cab.

When ventilation is needed in the cab (especially in summer), simply activate air heater switch after heat cycle water outlet valve is closed; Now the fan starts to operate.

The two small tilting gates on both sides of air heater is used to regulate airflow directions in the cab.

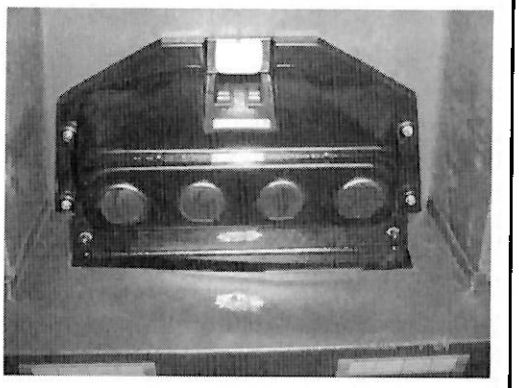


Fig. 4-1 Air heater

4.1.2 Floor mat (optional)

Floor mat is made of soft and comfortable rubber mould. The entire floor mat either have 4 small mats (non-flatbed machine), or is only one large mat (flatbed machine), up to 10mm in thick. They are all fastened on the floor with plastic rivets. When removing them as needed, pry slowly rivet with screwdriver to remove corresponding floor mat directly. When re-padding floor mat, simply fasten original rivets on it.

4.1.3 Mudguard gasket (optional)

It is molded by using PVC foam surface absorption materials. The entire mudguard gasket is fastened on left and right mudguard with plastic rivets. It is usually not necessary to be removed.

4.1.4 Tilting tow bar (optional)

The tilting tow bar is only used as trailing implement. The aft tow bar is connected to Implement by traction pin. This tow bar can horizontally swing to hook with implement in an easy way. In operation, the tow bar can swing from left to right. However, locating pin (1) must be inserted in the bore on towing plate to prevent it from swinging when tractor trailing implement reverses.

The height of towing point can be changed by turning over towing bar in order to reach appropriate height for supporting implement.

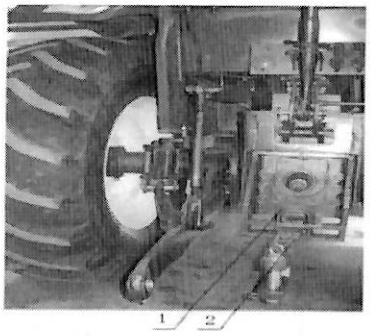


Fig. 4-2 Tilting tow bar
1. Locating pin 2. Tow bar

4.1.5 Roll bar (optional)

OECD roll bar can be equipped to avoid cab driver from injury due to occasional turnover accident. The roll bar of tractor consists of several frames welded by rectangular tubes, and can be folded backward. The GRP (glass reinforced plastic) sun shade can be optional.

Fig. 4-3 Roll bar

Important: The tractor, on which air heater or air conditioner is installed for use, must adopt antifreeze fluid to prevent engine and cooling system from damage due to chilled weather in winter.

4.2 Spare parts

4.2.1 Vehicle spare parts

Table 4-1 Vehicle spare parts

Item No.	Code	Name	Unit	Quantity	Remark
1		Engine spare parts	Set	1	Provided by matching parts manufacturer
2	DE2383.51.6-04	10 A Fuse	Piece	2	
3	DE2383.51.6-05	15 A Fuse	Piece	2	
4	DE2383.51.6-06	20 A Fuse	Piece	2	
5	FT654.58.010a	Quick-change coupler	Piece	1	Optional, used for simple hydraulic output, fitted with common lifter and metric connector
				3	Optional, used for simple hydraulic output and one-way valve output, fitted with common lifter and metric connector
				5	Optional, used for simple hydraulic output and multi-way valve output, fitted with common lifter and metric connector
				4	Optional, used for simple hydraulic output and multi-way valve output, fitted with forced lifter and metric connector
6	FT354.58A.030	Quick-change coupler	Piece	1	Optional, used for simple hydraulic output, fitted with common lifter and metric connector
				3	Optional, used for simple hydraulic output and one-way valve output, fitted with common lifter and metric connector
				5	Optional, used for simple hydraulic output and multi-way valve output, fitted with common lifter and inch connector
				4	Optional, used for simple hydraulic output and multi-way valve output, fitted with forced lifter and inch connector
7	TA600.96-01	Oil absorption filter element	Piece	1	
8	TA600.96-02	Oil return filter element	Piece	1	

Item No.	Code	Name	Unit	Quantity	Remark
9	FT700.55D.109	Respirator cartridge	Piece	1	For common or pressure lifter respirator
10	FT65.48.080	Back trailer latch	Piece	1	Used to lead out wires for signal light behind trailer when hooking trailer
11	FT65.80.018	Quick connector	Piece	1	Optional, only used for pneumatic brake
12	QC/T 350	Plastic split rivet - 6	Piece	5	Optional, used to install cab
13	QC/T 350	Plastic split rivet – 8	Piece	5	
14	TD800.482.2	Working lamp plug	Piece	1	Optional, used for machines with working lamp socket
15		Lift cylinder repair kit	Set	1	Optional, only used for pressure lifter, provided by fuel tank factory
16		Lifter repair kit	Set	1	Optional, only used for common lifter, provided by the lifter manufacturer
17	FT65.37.134	Adjusting shim	Set	4	
18	FT700.37.139	Adjusting shim	Set	4	
19	FT65.38.107	Adjusting shim	Set	4	
20	FT65.38.123	Adjusting shim	Set	4	
21	FT700.38.125	Adjusting shim	Set	4	
22	FT700.38.153	Adjusting shim	Set	4	
23	FT650.38E.246	Adjusting shim	Set	4	
24	TD800.481.2	Fusible wire assembly (1.0)	Set	1	

4.2.2 Vehicle tools

Table 4-2 Vehicle tools

Item No.	Code	Name	Unit	Quantity	Remark
1	QB/T 2564.4	1×5.5×125P Slotted-head screwdriver	Piece	1	
2	QB/T 2564.5	6×150P Cross recessed head screwdriver	Piece	1	
3	GB/T 3390.1	10×12.5L Hand square wrench socket	Piece	1	
4	GB/T 3390.1	13×12.5L Hand square wrench socket	Piece	1	
5	GB/T 3390.1	16×12.5L Hand square wrench socket	Piece	1	
6	GB/T 3390.1	18×12.5L Hand square wrench socket	Piece	1	
7	GB/T 3390.1	21×12.5L Hand square wrench socket	Piece	1	
8	GB/T 3390.1	24×12.5L Hand square wrench socket	Piece	1	
9	GB/T 3390.1	27×12.5L Hand square wrench socket	Piece	1	
10	GB/T 3390.1	30×12.5L Hand square wrench socket	Piece	1	
11	GB/T 3390.1	H12.5 Hand square wrench slide head handle	Piece	1	

Item No.	Code	Name	Unit	Quantity	Remark
12	GB/T 3390.1	JG12.5×250 Hand socket wrench rod	Piece	1	
13	JB/T 7942.1	A200 lever type grease guns	Piece	1	
14	GB/T 5356	8×160 inner hexagon spanner	Piece	1	
15	GB/T 4388	8×10×119 stud dead spanner	Piece	1	
16	GB/T 4388	13×16×159 stud dead spanner	Piece	1	
17	GB/T 4388	18×21×199 stud dead spanner	Piece	1	
18	GB/T 4388	24×27×247 stud dead spanner	Piece	1	
19	GB/T 4388	30×34×295 stud dead spanner	Piece	1	
20	GB/T 4388	36×41×343 stud dead spanner	Piece	1	
21	QB/T 2349	165mm Slip joint pliers	Piece	1	
22		Engine toolkit	Set	1	From the engine manufacturer

4.2.3 User self-serviced tools

Table 4-3 User self-serviced tools

Item No.	Code	Name	Unit	Quantity	Remark
1	GB/T 6295.1	Pliers	Piece	1	
2	GB/T 4440	300×36 adjustable spanner	Piece	1	
3	SG 216	Fitter hammer 1 LB	Piece	1	

4.2.4 Vehicle document list

Table 4 Vehicle document list

Item No.	Code	Unit	Quantity	Remark
1	The User Manual of Tractor	Piece	1	
2	The Technical Document for Engine	Piece	1	Provided by the engine manufacturer
3	Product Qualification Certificate	Piece	1	
4	Tractor Parts Schematic	Piece	1	
5	Warranty Services certificate	Piece	1	
6	The Packing List of Vehicle Items	Piece	1	
7	The User Manual of Air Conditioner	Piece	1	Packed with air conditioner
8	The User Manual of Air heater	Piece	1	Packed with air heater
9	The Product Certificate of Engine	Piece	1	Provided by the engine manufacturer
10	The User Manual of Retraction Jack	Piece	1	Packed with retraction jack

Note: For acceptance inspection of the tools, spare parts and documents provided with engine, it is necessary to comply with packing list of diesel engine.

4.3 Wearing parts

The wearing parts of LOVOL-TA series wheeled tractor include: e.g. all fuses and light bulbs used in the machine as shown in table 4-5.

Table 4-5 List of Wearing parts used in the machine

Item No	Code	Name	Quantity/set	Use position
1	GE20H4.34.14-01	Fuse 5 A	2	Central electric box
2	DE2383.51.6-05	Fuse 10 A	8	Central electric box
3	DE2383.51.6-04	Fuse 15 A	2	Central electric box
4	DE2383.51.6-06	Fuse 20A	3	Central electric box
5	12V-H4-55/60W	Distance-light double filament bulb	2	Headlamp
6	12V-1141-21W	Steering bulb	6	Headlamp, handrail light (cab model), rear light
7	12V-89-5W	Position Lamp	6	Headlamp, handrail light (cab model), rear light
8	12V-H3-55W	Rear work lamp bulb	2	Rear work lamp
9	12V -35W	Top work lamp bulb	4	Top work lamp
10	12V-1141-21W	Brake bulb	2	Tail lamp
11	TD800.481.2	Fusible wire assembly (1.0)		

Important instruction:

1. All various spare parts, tools and wearing parts are special parts used for this machine. Take good care to store and prevent from loss in order to use, repair and maintenance for machine; if they are lost carelessly, it is possible to lead machine functions and performance degradation.
2. During maintenance and service for machine, you must use standard accessories provided by official manufacturer; if used non-standard accessories, the machine will be impacted on functions, performance and service life, even creating a potential safety hazard.

5. Maintenance Instruction

Technical maintenance covers a series of technical maintenance such as cleaning, checking, lubricating, fastening each part or replacing some parts etc. Good technical maintenance could slow down the deterioration of technical state for each part to reduce the failure and to prolong the service life, which could ensure the tractor works in good state.

Important:

1. All maintenance should be carried out by the person specially trained and be familiar with machine features to avoid the damage of tractor.
2. Please strictly follow the technical maintenance procedures to ensure the tractor normal work and to prolong its service life.
3. During the warranty, if the person, who is non-professional or not familiar with the machine features, carries out the maintenance or the maintenance is not done within the service period, thereby the tractor is damaged
4. Never adjust the relief valve opening pressure of engine, hydraulic system and air brake system, safety overflow pressure of constant overflow pump overflow valve and opening pressure of radiator cap without permission. Otherwise it will damage the tractor, reduce the machine performance and then lose related "Three Guarantees"

5.1 Technical maintenance procedures:

According to the accumulated working hours, the technical maintenance procedures are classified into the following level: Every10h, 50h, 200h, 400h, 800h, 1600h, special maintenance in winter and maintenance for long-time storage.

5.1.1 Technical maintenance each shift.

- Clean the dust and oil contamination on the tractor and clean the air cleaner if working in the dusty environment.
- Check and secure all fasteners outside of tractor if needed, especially the fixing nuts from the front and rear wheels
- Check the fluid level in oil sump, radiator, fuel tank, hydraulic steering reservoir and hydraulic lifter, and fill it if necessary. If checking the oil level in oil sump, please park it at flat ground and then wait for 15min after stopping.
- For adding the grease, please refer to technical maintenance sheet 5-1.
- Check the front and rear tires pressure and inflate if necessary.
- Check and adjust the free travel of both main/auxiliary clutch pedals and service brake pedal.
- heck the tractor for leaks of air, oil, water etc. If so, please troubleshoot.
- Please service the diesel engine according to the "Daily technical maintenance each shift" in "Diesel engine use and maintenance instruction".

5.1.2 Technical maintenance Every 50h

- The whole content of technical maintenance each shift should be completed.
- For adding the grease, please refer to technical maintenance sheet 5-1.
- Check and dedust the oil surface of oil-bath type air cleaner.
- Please service the diesel engine according to the "Stage I technical maintenance" in "Diesel engine use and maintenance instruction".

5.1.3 Technical maintenance Every 200h

- The whole content of 50h technical maintenance should be completed.
- For adding the grease, please refer to technical maintenance sheet 5-1.
- Please change lubricant of diesel engine oil sump and then clean the oil sump and filter screen.
- Clean the hydraulic oil filter of lifter and replace the filter element if necessary.
- Clean and service the oil basin of oil-bath type air cleaner.
- Please service the diesel engine according to the "Stage II technical maintenance" in "Diesel engine use and maintenance instruction".

5.1.4 Technical maintenance Every 400h

- The whole content of 200h technical maintenance should be completed.
- For adding the grease, please refer to technical maintenance sheet 5-1.
- Check the fluid level in main drive and final drive of front drive axle, fill it if necessary;
- Check the fluid level in drive system and lifer, fill it if necessary;
- Check the free travel of parking brake handle, adjust it if necessary;
- Clean and maintain the filter of hydraulic steering reservoir;
- Please service the diesel engine according to the "Stage II technical maintenance" in "Diesel engine use and maintenance instruction".

5.1.5 Technical maintenance Every 800h

- The whole content of 400h technical maintenance should be completed.
- For adding the grease, please refer to technical maintenance sheet 5-1.
- Change the oil used in hydraulic steering system.
- Change the oil used in drive system and lifter.
- Check the valve clearance of diesel engine.
- Check the fuel injecting pressure of injection pump.
- Clean and maintain the fuel tank.
- Please service the diesel engine according to the "Stage III technical maintenance" in "Diesel engine use and maintenance instruction".

5.1.6 Technical maintenance Every 1600h

- The whole content of 800h technical maintenance should be completed.
- For adding the grease, please refer to technical maintenance sheet 5-1.
- Clean and maintain the cooling system of diesel engine.
- Replace the lubricant in main drive and final drive of front drive axle.
- Check, adjust and maintain the starting motor.
- Please service the diesel engine according to the "Stage III technical maintenance" in "Diesel engine use and maintenance instruction".

5.1.7 Special maintenance for winter

- Change with the lubricant and fuel for winter.
- Please add the antifreeze in the cooling water; if not, please empty the cooling water during night parking.
- Before working each shift, please follow the requirements for winter to start the engine.
- In winter, the battery discharging rate of battery should not be more than 25%, please keep higher charging rate.
- If operation completed, please park it in windshield warm shed.

5.1.8 Technical maintenance for long-time storage

- If storing the tractor for less than 1month and the changed oil has not been used for 100h, special precautions will not be needed.
- If storing for more than 1 month, please carry out the special technical maintenance according to "6 storage"

Attention: after maintaining, cleaning or repairing the tractor, please reinstall all the protection cover and protective shield. If not, the potential hazard will exist!

5.1.9 Tractor technical maintenance sheet

Sheet 5-1 TA series Tractor technical maintenance sheet

Index:	Maintenance parts	Maneuvering content	Frequency	Maintenance intervals
1	Engine oil sump	Check the oil level	1	Each shift
2	Oil-bath type air cleaner	Check the oil level	1	Each shift
3	Hydraulic steering reservoir	Check the oil level	1	Each shift
4	Radiator (water tank)	Check the oil level	1	Each shift
5	Engine water pump shaft	Adding grease	1	Each shift
6	Injector pump	Check the oil level	1	Each shift
7	Rear hub	Adding grease	2	Each shift
8	Main/ auxiliary clutch	Adjust the free travel	1	Each shift
9	Service brake	Adjust the free travel	2	Each shift

Maintenance Instruction

Index:	Maintenance parts	Maneuvering content	Frequency	Maintenance intervals
10	Fan rubber belt	Check its tension	1	Every 50h
11	Steering cylinder	Adding grease	1	Every 50h
12	Kingpin sleeve, front shaft	Adding grease	2	Every 50h
13	Pendulum shaft, front axle of 4DW	Adding grease	2	Every 50h
14	Central sway pin sleeve, front shaft	Adding grease	1	Every 50h
15	Diesel filter	Replace filter element	1	Every 200h after the running-in is over.
16	Rotary type oil filter	Replace filter	1	Every 200h after the running-in is over.
17	Hydraulic suction oil filter, lifter	Replace or clean filter element	1	Every 200h
18	Hydraulic return oil filter, lifter	Replace or clean filter element	1	Every 200h
19	Injector pump	Change lubricant	1	Every 200h
20	Engine oil sump	Change lubricant	1	Every 200h
21	Oil basin of oil-bath type air cleaner	Maintain and clean it	1	Every 200h
22	Drive system and lifter	Check the oil level	1	Every 400h
23	Parking brake	Adjust the free travel	1	Every 400h
24	Breather filter	Clean filter element	2	Every 400h
25	Front wheel	Adding grease	2	Every 400h
26	Main clutch pedal hub	Adding grease	1	Every 400h
27	Auxiliary clutch pedal hub	Adding grease	1	Every 400h
28	Brake pedal hub	Adding grease	2	Every 400h
29	Main drive, front drive axle	Check the oil level	1	Every 400h
30	Kingpin oil cup, front drive axle	Adding grease	2	Every 400h
31	Final drive, front drive axle	Check the oil level	2	Every 400h
32	Filter, hydraulic steering reservoir	Maintain and clean it	1	Every 400h
33	Hydraulic steering reservoir	Change lubricant	1	Every 800h
34	Fuel tank	Maintain and clean it	1	Every 800h
35	Intake and exhaust, engine	Adjust valve clearance	8	Every 800h
36	Injector pump	Adjust fuel injecting pressure	4	Every 800h
37	Drive system and lifter	Change lubricant	1	Every 800h
38	Engine cooling system	Maintain and clean it	1	Every 1600h
39	Engine cooling system with antifreeze adopted	Change antifreeze	1	Two years or Every 1600h
40	Main drive, front drive	Change lubricant	1	Every 1600h
41	Final drive, front drive axle	Change lubricant	1	Every 1600h
42	Brake fluid in the brake system	Change brake fluid	1	Half year

5.2. Clutch adjustment and maintenance

5.2.1 Adjustment of clutch and maneuvering system

The wear of clutch friction lining and pressure plate will gradually shorten the clearance between the release lever head of clutch and release bearing end (normal clearance is (2-2.5) mm), even will cause the clutch release lever head touches with release bearing end. At last the free travel of pedal will disappear, clutch will slip and the release bearing will be burned. At this case, please adjust the maneuvering system.

5.2.1.1 Adjustment of free travel of clutch pedal.

Loosen the lock nut1. rotate the pull rod assembly 2 (or the adjusting sleeve 2) of clutch anticlockwise to set the free travel of clutch pedal as (35~40) mm(the clearance between the clutch release lever head and release bearing should be (2~2.5) mm). Then tighten the nut1.

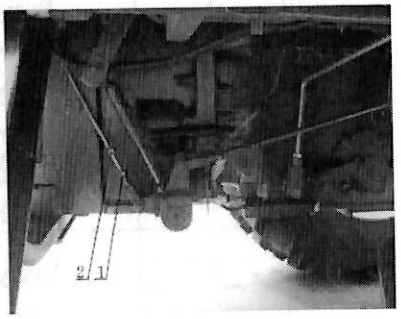


Fig. 5-1. Adjustment of clutch pedal free travel (non-flat floor type)

1. Lock nut 2.Pull rod assembly

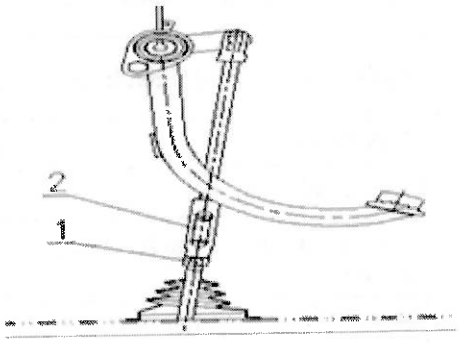


Fig. 5-2. Adjustment of clutch pedal free travel (flat floor type)

1. Lock nut 2. Adjusting sleeve

5.2.1.2 Adjustment of second-clutch handle free travel

Loosen the lock nut 2 and adjust the cable to have the clutch handle free travel set at (55～65)mm [the clearance between the clutch release lever head and the release bearing is (2～2.5)mm]. Then, tighten the nut 1.

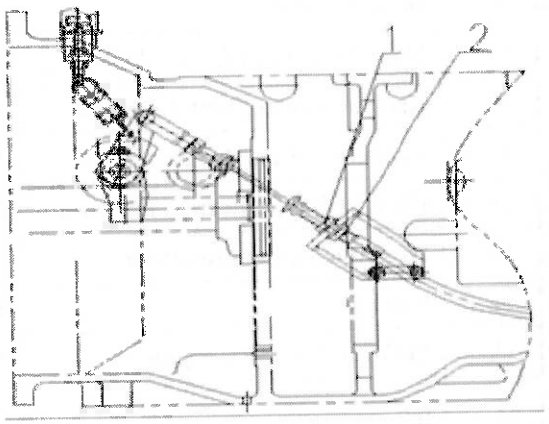


Fig. 5.3 Adjustment of second-clutch handle free travel

1. Lock nut 2. Lock nut

5.2.1.3 Adjustment of clutch release level

If (35~40) mm of free travel could not be reached with the above adjusting method, it indicates that the release bearing moves back to touch with 1st bearing seat shoulder. Please adjust it as follows:

- Remove the plate with access hole for clutch of gearbox.
- Loosen the nut, adjust the adjusting screw of release lever with wrench to keep the clearance between the release lever head and release bearing within (2~2.5) mm. as to the else two clearances, they are similar as the above. The three release levers of clutch pressure plate should be at the same level with the tolerance within 0.2mm.
- After adjusting, please lock the nut. Then check whether the pedal free travel is within (35~40) mm. .
- Reinstall the plate with access hole.

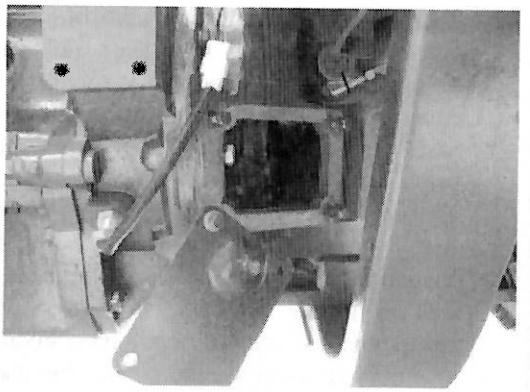


Fig.5-4 Removal of the plate with access hole

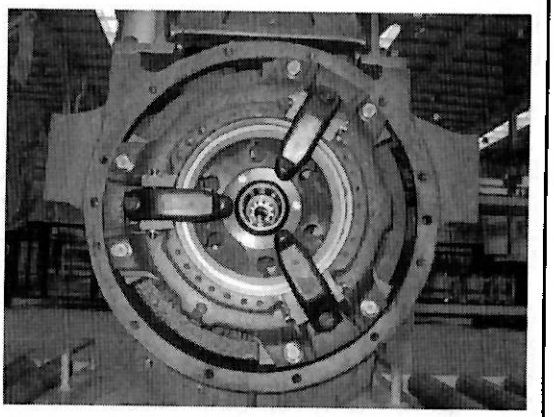


Fig.5-5 Adjustment of release lever

5.2.1.4 Adjustment of main clutch release travel

- There should be proper pedal travel from release of the main clutch to the starting release of auxiliary clutch to prevent the auxiliary clutch from early releasing or no releasing..
- To obtain the proper travel, please keep the clearance between the three adjusting screws 2 end of clutch main pressure plate and the three lugs 1of auxiliary friction pressure plate within 1.7mm. During adjusting, please loosen the lock nut 3, and then rotate the adjusting screw to keep the clearance between the adjusting screw head and lug of auxiliary friction lining pressure plate within 1.7mm measured by feeler gauge.
- After adjusting, please lock the nut.

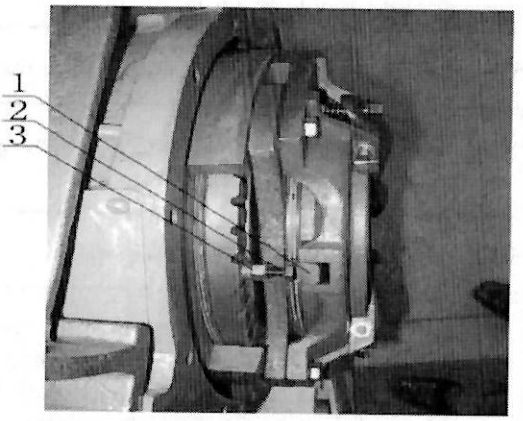


Fig. 5-6 Adjustment of main clutch release travel

1. Lug 2. Adjusting screw 3. Lock nut

5.2.1.5 Adjustment and installment of clutch during tractor overhauling

- There is a set of lune type adjusting shims respectively between the engine flywheel and auxiliary friction lining, also between auxiliary friction lining and clutch cover. During the overhauling, if the wear of main and auxiliary clutches is relatively large, please take off some adjusting shims to ensure that the disc spring is of adequate pressure.●When installing the clutch assembly, firstly mount it on the core shaft, then insert into flywheel bearing hole. The spline hole of main clutch friction lining assembly is concentric to the corresponding one of auxiliary clutch friction lining assembly to facilitate the connection and installment of engine and gearbox.

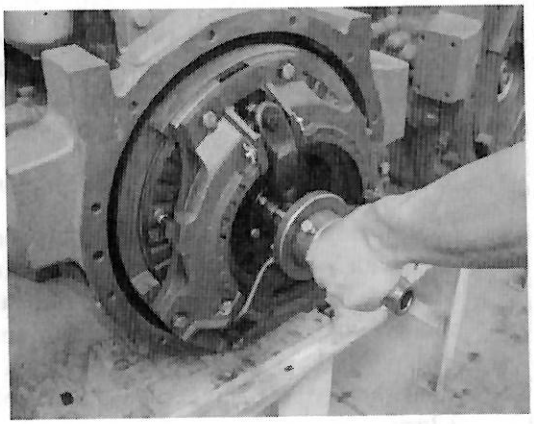


Fig. 5-7 Adjustment and installment of clutch during the tractor overhauling

5.2.2 Clutch use and maintenance

- Frequently check the cotter pin at the bottom of gearbox for oil leak. If any, please check rear seals of engine crankshaft, 1st shaft of gearbox and seals of drive shaft.
- Regularly coat grease on the release bearing seat.

Important:

1. Please pay attention: disengaging should be fast and thorough and engaging should be gentle and smooth to avoid early damage of clutch.
2. During traveling, do not put your foot on the clutch pedal. Do not semi-engage clutch to slow down the tractor. Do not forcefully engage clutch to rush onto a hill or over an obstacle. Otherwise, the above will damage the clutch.
3. The surface of clutch friction lining should be free of oil contamination. If any, clean it with gasoline and dry it to avoid early wear of clutch.

5.3. Gearbox adjustment and maintenance

Generally, it is unnecessary to adjust the gearbox. But pay attention the following items during use and maintenance.

5.3.1 Inspection of gearbox oil side

The gearbox lubricant is connected to the rear axle. Its oil filler is positioned on the lifter housing. Please see fig.5-8.If checking the oil level, please park the tractor on the flat ground and shut down the engine. Please screw out the oil dipstick at the rear end of rear axle, wipe it and insert it into gearbox. If the oil level is below the lower scale of dipstick, please refill the lubricant until it reaches between the top and bottom scales(wait for 5min to measure the oil level.).

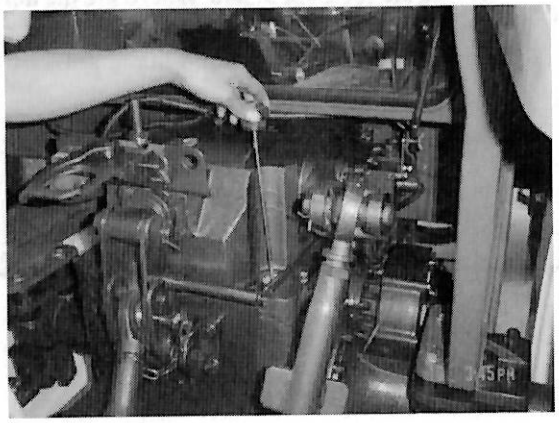


Fig.5-8 Inspection of gearbox oil side

5.3.2 Change of gearbox lubricant

If replacing lubricant, please remove the drain plug1 (as shown in fig.5-9)at the bottom of gearbox to empty the dirty oil. Clean inside of gearbox with diesel and reinstall the cleaned plug to the original position. At last fill the gearbox with new lubricant.

(for adding mount, please refer to instruction 8 technical specification)

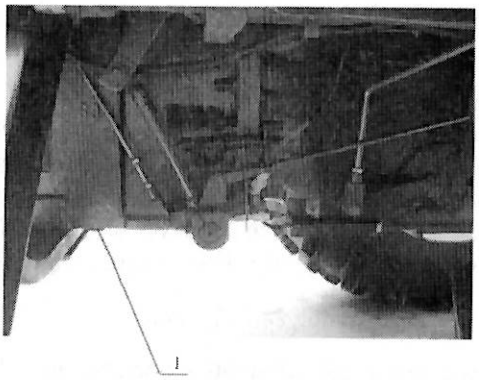


Fig.5-9 Change of gearbox lubricant
1. Drain plug

5.4. Rear axle adjustment and maintenance

The rear axle consists of main drive, differential, differential lock, final drive, axle shaft (LH, RH) and maneuvering mechanism etc.

5.4.1 Adjustment for spiral bevel gear of main drive

If the bearings 30309 and 32310 is of axial clearance, please loosen the thrust shim1 and tighten the round nut 2 until the rotating drive spiral bevel gear3 could develop (0.75~1.5) N·m of preload. At last lock the thrust shim 1.

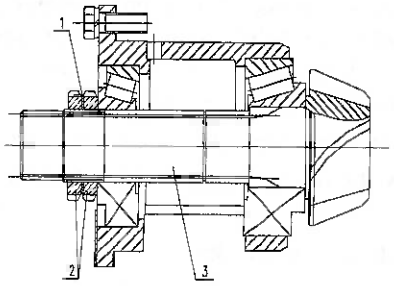


Fig. 5-10 Adjustment for spiral bevel gear of main drive

1. Thrust shim 2. Round nut 3. Drive spiral bevel gear.

5.4.2 Adjustment for bearing in differential assembly

Adjustment for bearing 30215in differential assembly is as follows: • Clearance adjustment

If the differential assembly bearing 30215 is of axial clearance, please take off the shim 2 with thickness equalized, and then tighten the bolt attaching axle shaft bearing seat 1. Pull the driven spiral bevel gear with hand (remove the drive spiral bevel gear and final drive gears at both sides). It is best to apply slight force.

● Pre-tightening and adjustment

Please install the differential assembly into the rear axle case. Coat the lubricant on the bearing and gear face. The outer ring of bearing 30215 should be respectively pressed into the axle shaft assembly (LH,RH) that (without adjusting shim) then is mounted into box holes, which could support the differential assembly. Firstly tighten the two countersunk head screws on the left side and tighten the five exclusive M12x25 screws to 60N.m torque.

Screw the five exclusive screws M12X25 into the right short axle shaft to develop resistance torque of (1.5~2.5) N·m on the differential (including resistance torque of drive bevel gear). You could use a thin thread to twist the differential housing, the pull force measured by spring scale should be (70~100)N.

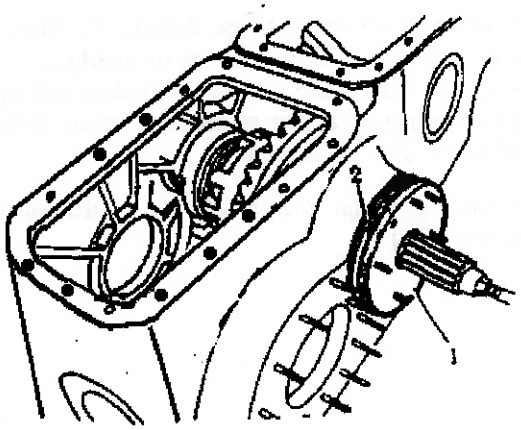


Fig. 5-11 Adjustment for bearing in differential assembly

1.Bearing block, short axle shaft (LH, RH) 2.Shim

5.4.3 Adjustment for gear pair of main drive

• Backlash measurement

Meshed normal clearance of main drive gear pair is within(0.2~0.35)mm. Its measuring method is classified into the following two items:

The first method: Please position the micrometer head on the larger gear face of driven spiral bevel gear (the micrometer head moving direction should be perpendicular to gear face). The drive spiral bevel gear should be fixed and the driven spiral bevel gear should be turned in rotary direction. At this time, the reading of micrometer should be meshed backlash.

The other method: Please place the lead sheet with length of (15~20)mm and thickness of 0.5 mm into the space between the concave face of drive spiral bevel gear and convex face of driven spiral gear. The thickness of lead sheet squeezed near larger end is the meshed normal clearance.

The measured positions should not be less than three points, and should be symmetrically distributed around the gear circumference.

• Backlash adjustment

The backlash should be adjusted by increasing or reducing the adjusting shim at the bearing seat of driven spiral bevel gear. The correct backlash should be (0.2~0.35)mm.

• Inspection and adjustment of mesh zone

Apply a thin and uniform red lead on the two gear faces of driven spiral bevel gear. The whole gear is symmetrically separated into four pieces with 3-4 teeth each piece. Rotate the gear clockwise and anticlockwise for a few circles. At this time, the mark affixed on drive spiral bevel gear is mesh mark. The meshed tooth length should not be less than 55%of tooth width. The meshed tooth height should be less than 60% of tooth

height. The mesh zone should at the middle part of gear face, and it is slightly near the smaller end, with the distance of at least 5mm to smaller end.

- For adjusting method of mesh zone, please see fig. 5-12.

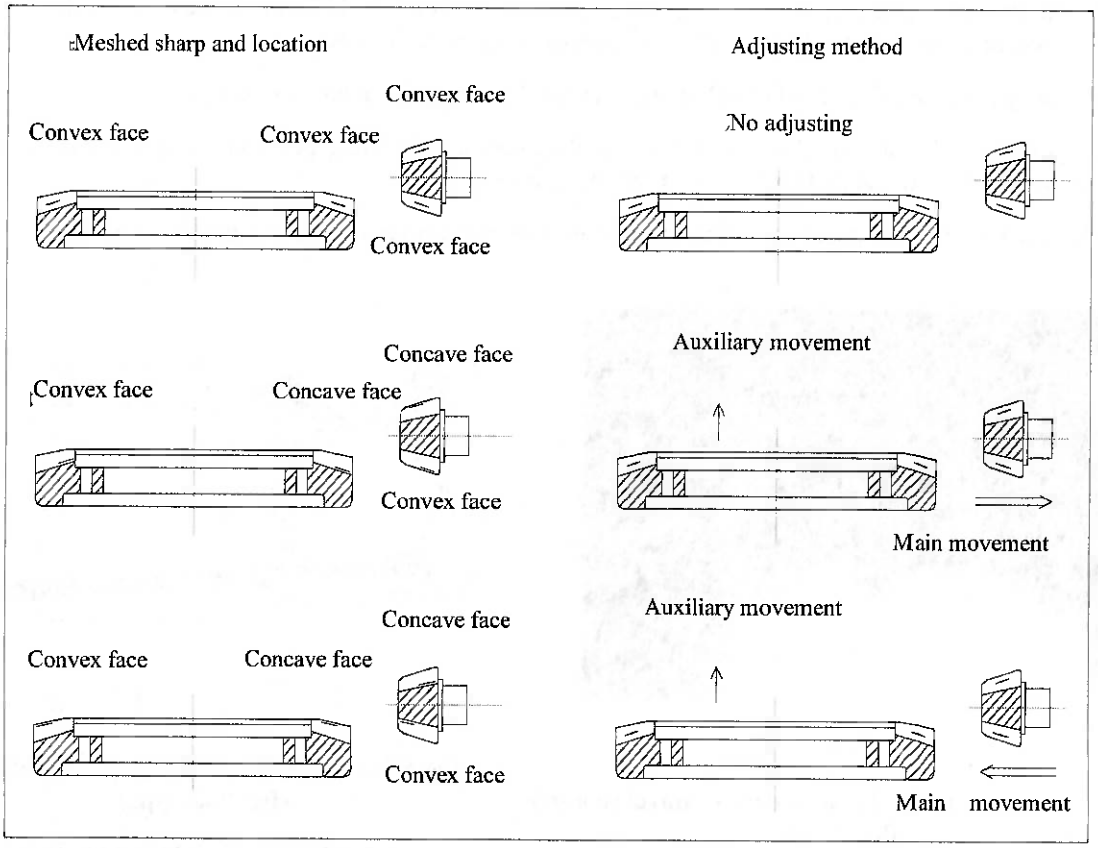


Fig.5-12 Adjustment for gear pair of main drive

5.4.4 Rear axle adjustment and maintenance

- For the main drive, the drive and driven spiral bevel gear pairs should be used in pair.
- When using the differential lock, the tractor should run straightly and the steering wheel should be used to avoid damage of related parts.
- Please regularly check the oil level. For inspection method, please see 5.3.1.
- Please regularly change the lubricant in rear axle. See 5.3.2 for changing method.

5.5. Brake adjustment and maintenance

There are two disc brakes symmetrically mounted on left and right short axle shaft at the two sides of rear axle housing. The brake is connected to its maneuvering mechanism.

5.5.1 Adjustment of brake and its maneuvering mechanism

5.5.1.1 Adjustment for free travel of brake pedal

In non-brake state, the opposite surface between the friction lining assembly and pressure plate should be (1~1.4)mm, the corresponding total travel of brake pedal should be (90~120)mm. If wear of the friction lining, the free travel of brake pedal will be lengthened, causing poor braking effect.

At this time, please adjust the total travel of brake pedal. The adjusting method is as follows:

- Loosen the lock nut 1 on the connecting rod, then turn the adjusting pull rod 2 clockwise to shorten the free travel of brake pedal. If inversely, it will be lengthened.
- The free travel of left pedal should be same as the one of right pedal, then tighten the lock nut 1.

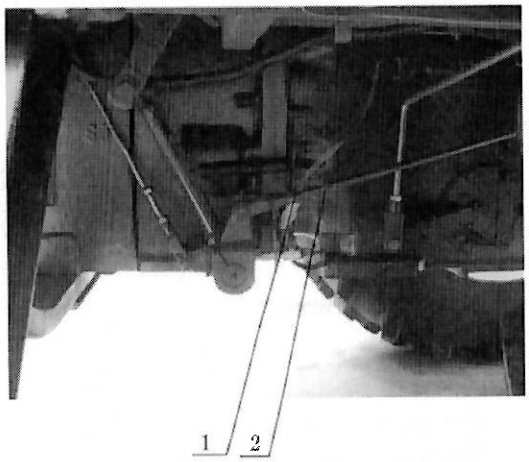


Fig. 5-13. Adjustment of brake pedal free travel (non-flat floor type)

1. Lock nut 2. Adjusting pull rod

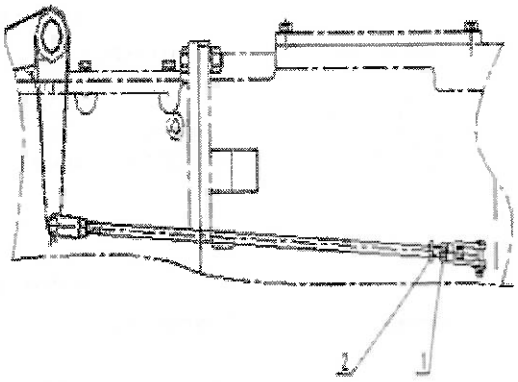


Fig. 5-14. Adjustment of brake pedal free travel (flat floor type)

1. Lock nut 2. Adjusting pull rod

5.5.1.2 Total clearance adjustment of brake friction lining (LH,RH)

If total clearance of left brake friction lining is slightly different with the one of right friction lining, the above method could not be applied. At this time, you could increase or reduce the number of adjusting shim 1. the above adjustment should be done only after the total clearance is set. See fig.5-15.

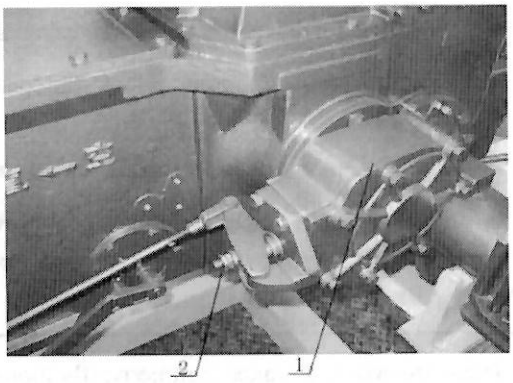


Fig.5-15 Total clearance adjustment of brake friction lining (LH,RH)

1. Adjusting shim 2. Adjusting nut

5.5.1.3 Braking effect adjustment (LH, RH)

The braking effect of the left and right brakes should stay the same. If braking on the cement road, the braking length of left and right tires should also stay the same.

Adjusting method: Adjust the position of two lock nuts 2 (see fig.5-15)on the pull rod of brake disc, and then lock them.

5.5.2 Brake use and maintenance

- If there is oil contamination on the friction lining surface, please clean it with gasoline, let it dry and reassemble.
- Frequently check the oil seals on the brake housing and cover for sealing. If failure, please replace it timely.

Warning:

1. The travels of left and right brake pedals should stay the same. Otherwise, the tractor will sharply deflect to one side, causing possible accidents.
2. For safety, the braking test should be carried out after the adjustment of brake maneuvering mechanism. Its procedure is as follows: interlock the right and left brake pedals and park the tractor on the dry and flat ground. Under high-speed straightly traveling condition, carry out the emergency brake with brake after releasing the main clutch. Then stop vehicle to measure the brake trace. If the mark of the left tire is the same as that of the right tire (the two marks should be featured with straight line, parallel to each other and equal length.), it indicates the adjustment is proper. Or else readjust. If failure after repeatedly adjusting, please check the inside of brake.

5.6. Steering system adjustment and maintenance

This tractor adopts separated full-hydraulic steering, and consists of cycloid rotary valve type full-hydraulic steering gear, steering cylinder, oil reservoir, tie rod, constant overflow pump and oil pipe etc. It is unnecessary to adjust during normal work. When maintaining it, please check the constant overflow pump, oil reservoir. Tighten the inlet, outlet and each connection of both oil pipe and steering cylinder to avoid leaks. If so, please check whether the shim or seals for damage. If damaged, please replace it.

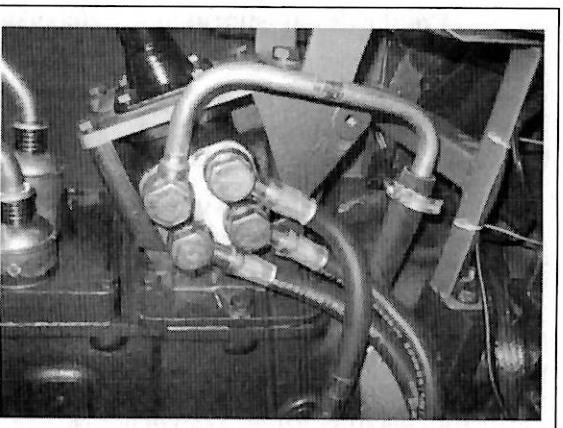


Fig. 5-16 Steering system

Important:

1. The safe overflow pressure of overflow valve from the constant overflow pump is already set. Do not dismantle or adjust it by oneself.
2. After maintenance, please loosen the two pipe joints on the cylinder, rotate the oil pump at low speed to bleed until the bubble disappears. This could ensure each parts normal work.

5.6.1 Steering oil reservoir adjustment and maintenance

For steering oil reservoir, see fig.5-17. Open its cap(with dipstick) to observe if there is oil trace on the dipstick. If any, it indicates that hydraulic oil is insufficient. Find out the cause of oil leak. Remove the oil reservoir to fill oil until reaching middle scale on the dipstick. At last reinstall to the original position. Ensure there is no leaks from the steering oil reservoir, oil pipe and each connection. Or else, the steering will not work. Regularly clean and replace the filter screen in oil reservoir.

If checking oil level, ensure that the breather (rivet type) (located on center position of oil reservoir cap)rising and lowering should be quick. Please clean it if there is oil contamination.

Fig. 5-17 Steering oil reservoir

5.6.2 Steering tie rod assembly adjustment and maintenance

Frequently check the ball pin of tie rod and pins at both sides of steering cylinders for looseness. If any, please replace it timely.

The left and right ends of steering tie rod are connected with screw holes. the tie rod length is adjustable. If adjusting, firstly loosen the left and right lock nuts, then lengthen or shorten then tie rod by rotating it to meet the toe-in requirements. (refer to front wheel track adjustment)

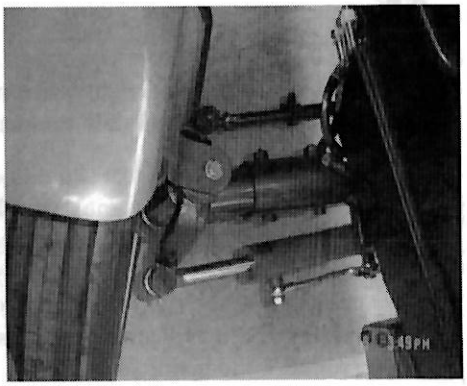


Fig. 5-18 Steering tie rod assembly

5.7. Front axle adjustment and maintenance

The front axle is functioned to support the front weight of tractor through front wheels mounted on it. The adjusting and maintenance is very important.

5.7.1 Front wheel toe in adjustment

To reduce the wear of front tires, please regularly check and adjust the front wheel toe-in. Its adjusting method is as follows:

- As to tractor with two drive wheels:

-- Turn the front wheels straight ahead.

-- Respectively measure the front-end distance and rear-end distance at the same height.

-- Unscrew the nut1 at both-ends of tie rod and rotate the tie rod 2 to make the front-end distance is smaller than rear-end distance by (4~12) mm.

-- screw up the nut1 at both-ends of tie rod.

- As to tractor with four drive wheels: The method is similar as the note above. The A-B value should be (0~3) mm.

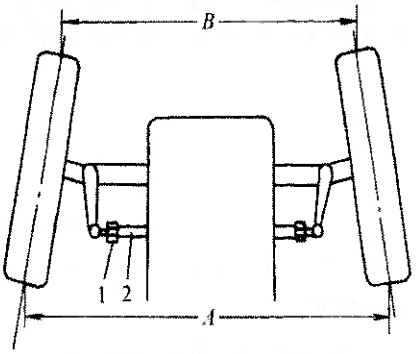


Fig.5-19 Front wheel toe-in

1. Nut 2. Tie rod

5.7.2 Front wheel bearing clearance adjustment

Any wear of front wheel bearing will enlarge the clearance and cause bearing damage if not adjusting timely.

During adjusting, please jack up the front shaft to let the front bearing free of any load. Remove the front wheel hub cover 1, take off cotter pin 2, tighten the slotted nut3 and return it back by 1/10~1/30 circle. At last, install cotter pin and front wheel hub cover 1.

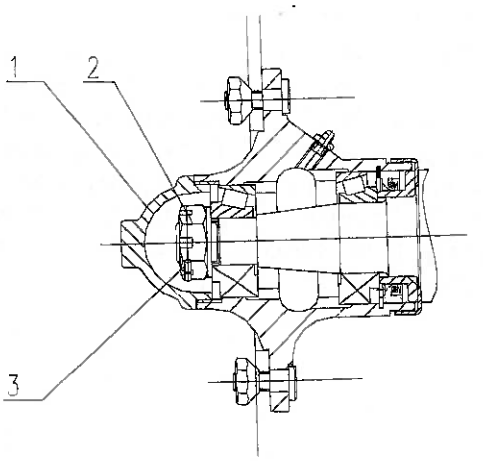


Fig.5-20 Front wheel bearing clearance adjustment

1.Front wheel hub cover 2. Cotter pin 3. Nut

5.7.3 Adjustment and maintenance for front axle of tractor with four drive wheels

The tractor front axle is divided into 3 oil chambers: central oil chamber, left-end drive oil chamber, right-end drive oil chamber.

5.7.3.1 Adjustment and maintenance for central oil chamber from front axle of tractor with four drive wheels

The central oil chamber is located in middle part of tractor front axle. Regularly check the oil level through oil filler 1 located on the left upper position of front axle. If the oil level is obviously reduced, please fill the lubricant until the oil overflows from the filler. .If changing oil, screw out the drain plug located at the bottom of front axle, empty the used oil and then tighten the drain plug. Fill up the lubricant through filler 1 and then tighten the filler cap.

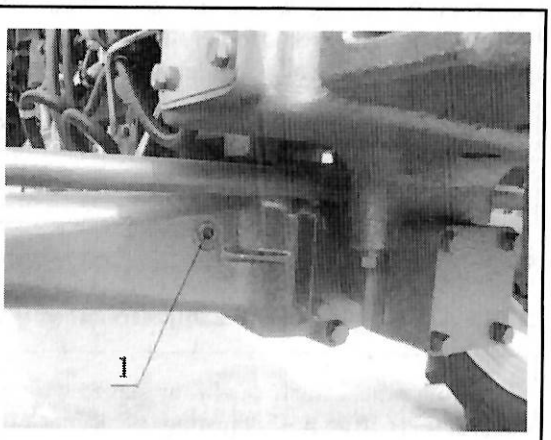


Fig.5-21 Adjustment and maintenance for central oil chamber from front axle

1. Oil filler

5.7.3.2 Adjustment and maintenance for left/right-end drive oil chamber from front axle of tractor with four drive wheels

When checking the both-end drive oil level, rotate the tire to make the plug 1 be parallel with center line of front wheels. Screw out the plug to check whether the oil is at plug hole. If not, please add the oil. If changing oil, rotate the front wheel to keep the plug at the lowest position. Screw out the plug to empty the used oil. Rotate the tire again to let the plug be paralled with center line of front wheels, fill the new oil to plug hole and tighten plug.

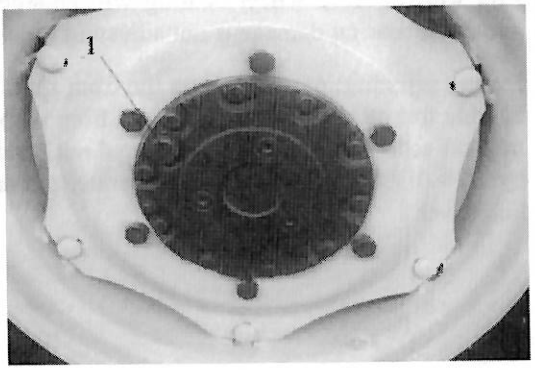


Fig.5-22 Adjustment and maintenance for left/right-end oil chamber from

1. Plug

5.8. Transfer case adjustment and maintenance

If the tractor is of four drive wheels, the drain plug of drive system is located at the side of transfer case. The used oil in drive system will be emptied only through this drain plug.

5.9. Wheel adjustment and maintenance

Wheel tire, as wear parts, must be carefully used and serviced to extend its life as long as possible .

Improperly driving will cause early wear or damage of tires. During traveling, please avoid crossing the obstacle at high speed, forcefully braking and sharp turning. If traveling on macadam pavement, please avoid the tire slip turning as possible as you can.

During traveling, please keep the tires away from chemical corrosion such as oil, acid or alkali etc. Solarization is not allowed to avoid the rubber aging. Frequently check the front wheel alignment and tie-in for normal position to avoid tire eccentric wear. If the tire wear is not uniform, exchange the left and right tires.

5.9.1 Wheel track adjustment

5.9.1. 1Front wheel track adjustment of two drive wheel

The front wheel track is of four stages with adjusting range of (1350~1650)mm. If adjusting, please jack up the front end of tractor to let the front wheel be free of ground. Loosen the telescopic tube nut 1, pull out bolts 2, remove the cylinder pivot 3 and loosen the adjusting bolt4 of tie rod. .Please move the guide wheel stand to the needed tread, then insert the bolt and tighten the nut. .After setting the tie rod to the corresponding length, tighten the adjusting bolt of tie rod. Tighten the cylinder pivot 2, insert the cotter pin and lock the nut.

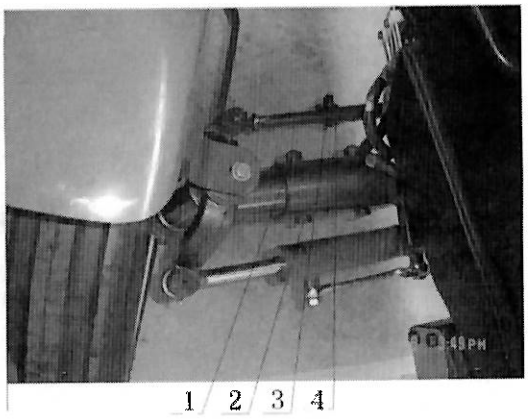


Fig.5-23 Adjustment of front wheel track

1. Telescopic tube nut 2. Bolt

3. Cylinder pivot. 4. Adjusting bolt of tie rod

Fig.5-1 Adjusting range of front wheel track

Model	Tire specification	Wheel track adjusting range (mm)
TA550/TA600	6.00-16	1400 (common use), 1500, 1600, 1700
TA650/TA700/TA750/TA800/TA820/TA850	6.50-20	1400, 1500 (common use), 1600, 1700

Note: The front wheel track of four drive wheel is fixed value of 1450mm.

5.9.1.2 Adjustment of rear wheel track

The rear wheel track adjusting method: change the assembly of rim and spoke or exchange the left and right wheels(the tire rotating direction marker should be line with wheel rotating direction during the tractor going forward.)

Adjusting method: the six wheel tracks could be obtained via different connection of spoke, hub and rim.

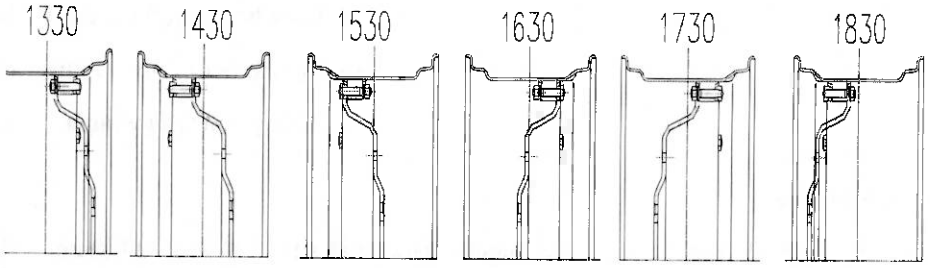


Fig.5-24 Adjustment of rear wheel track

Fig.5-2 Adjusting range of rear wheel track

Model	Tire specification	Wheel track adjusting range (mm)
TA550	12.4-28	1330, 1430, 1530 (common use),1630, 1730, 1830
TA554/TA600/TA604	14.9-28	1430, 1530 (common use), 1630, 1730, 1830
TA650/TA654/TA700/TA704/TA750/TA754/ TA800/TA804/TA820/TA824/TA850/TA854	14.9-30	1430, 1530 (common use), 1630, 1730, 1830

5.9.2 Wheel track adjustment as to stepless adjustment type.

5.9.2.1 Front wheel track adjustment as to stepless adjustment type.

- Two drive wheel type

Please raise the front axle of tractor with jack. Dismantle main/ auxiliary telescopic tube lock bolt 1,2 and lock bolt 4 and cylinder fixing bolt 3. Adjust the auxiliary tube, cylinder position and tie rod length to the needed position. At last reinstall and tighten all removed bolts. There are six selections by changing bolt position without turnover of spoke: 1470mm, 1570mm, 1670 mm, 1770mm, 1870mm. There are six selections by changing bolt position after spoke turnover: 1606mm, 1706mm, 1806mm, 1906mm, 2006mm and 2106mm

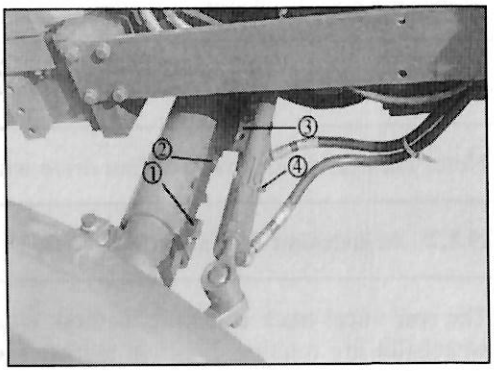


Fig.5-25 Front wheel track adjustment as to two drive wheel type.

1. Lock bolt of left auxiliary telescopic tube
2. Lock bolt of right auxiliary telescopic tube
3. Fixing bolts of cylinder 4. Lock bolt

- Four drive wheel type

There are eight selections of wheel track by changing spoke and rim, 1402mm, 1450mm,1502mm,1550mm, 1588mm, 1636mm, 1688mm, 1736mm. As shown at following figure. If by adding the connecting jacket between the spoke and front axle at each state of wheel track to increase 270mm, you can get another eight wheel tracks at each state of 1672mm, 1720mm, 1772mm, 1820mm, 1858mm, 1906mm, 1958mm and 2006mm.

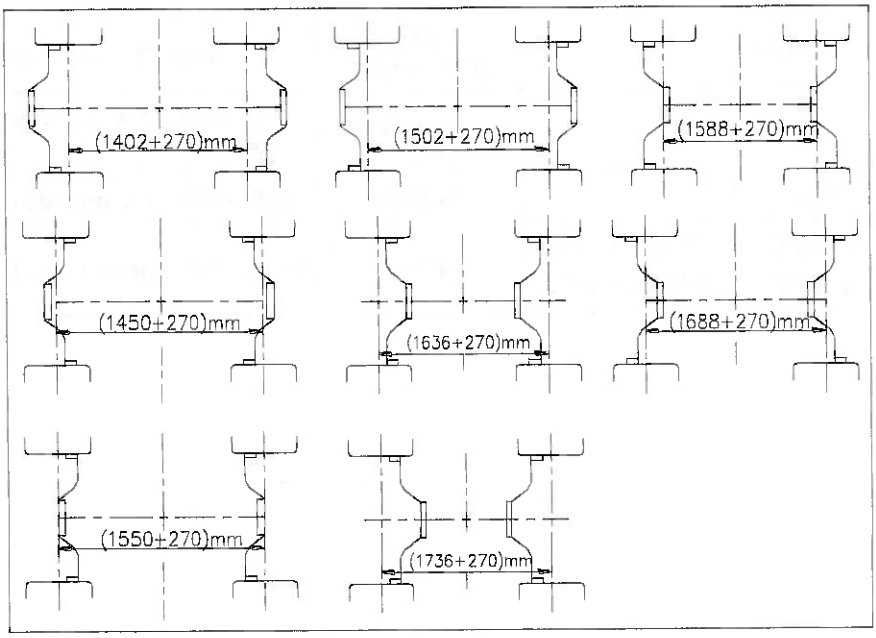


Fig.5-26. Front wheel track adjustment of four drive wheel type

5.9.2.2 Rear wheel track adjustment as to stepless adjustment type.

The tread commonly used is 1535mm. There are six selections according to different positions of spoke, hub and rim. At each position selection, you can obtain seven kinds of wheel tracks by adjusting hub and hub seat.

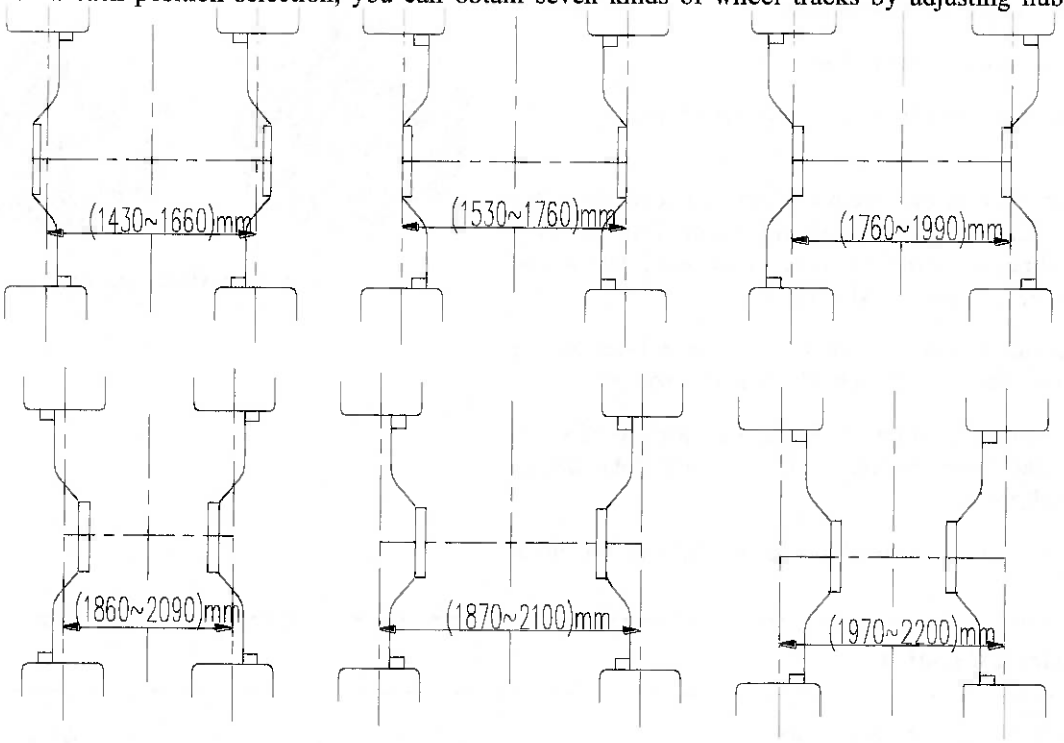


Fig.5-27 Rear wheel track adjustment as to stepless adjustment type.

5.9.3 Tire use and maintenance

- The tire pressure should meet the specifications:

  Two drive wheel type: tire pressure of guide wheel: field work is of (167~186) KPa and transportation is of (225~245) KPa.

  Tire pressure of drive wheel: Field work is of (118~138) KPa and transportation is of (167~176) KPa.

  Four drive wheel type: tire pressure of front and rear drive wheels: field work is of (118~138) KPa and transportation is of (167~176) KPa.
- If the drive wheel is severely slippy, the tractor is not allowed to work.
- Do not drive on rough road with high speed. Do not cross macadam and coal cinder at high speed. Do not use emergency brake as possible as you can.
- If the tire wear is not uniform, exchange the left and right tires.
- Keep the tires away from fuel, lubricant and other contaminations. if any, please wash it with water and wipe out.
- If the tractor out of use for long term, please jack up the tractor to free the pressure of tire.

Attention: the excessive high/low tire pressure will shorten the tire life, causing harmful effect on tractor traveling and maneuvering.

5.9.4 Tire removal and installation

5.9.4.1 Tire removal

The removing steps are as follows:

- Empty the air in inner tube.
- Press the outer tube end into the groove of wheel rim.
- Insert the crowbar into the wheel rim, lever the outer tube near the core out of wheel rim. Then use two crowbars to lever the outer tube until the whole outer tube is free of wheel rim.
- Take out the core via wheel rim hole and remove the inner tube out of the wheel rim and outer tire.
- Press one side of outer tube into the groove of wheel rim and lever the other side of outer tube out of wheel rim.
- When using the crowbar, do not damage the inner tube.

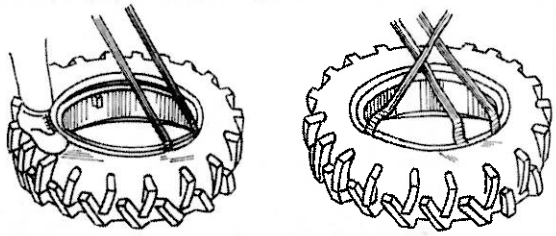


Fig. 5-28 Tire removal

5.9.4.2 Tire installation

The installing steps are as follows:

- Apply a thin pulvistalci on the inside of outer tube and outside of inner tube.
- Flat the wheel rim (the core side should face upward), install the outer tube into the wheel rim with crowbar or hammer.
- Lift the tube and wheel rim, push the outer tube to one side and install the inner tube into the outer tube (firstly core should be passed through wheel rim hole, the cap should be tightened or the core will be fastened with lead wire.)
- Push the wheel rim to the one side and step on the other side of outer tube. Press the outer tube into groove of wheel rim with feet. At last the outer tube end should be levered into wheel rim with crowbar.

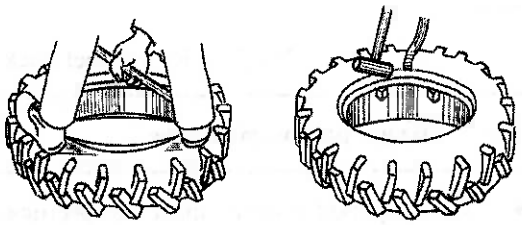


Fig 5-29 Tire installation

Warning: Never remove the bolts of tire, drive wheel hub and wheel rim under inflation state, otherwise the bolts may be rushed out to hurt people.

5.10. Electrical system adjustment and maintenance

This electrical system adopts 12v of voltage, silicone rectification generator, negative ground and single-wire system. The system consists of engine starting equipment and illuminating and signal equipment.

Engine starting equipment consists of starting motor, charging generator(for above equipments use and maintenance, please see diesel manual), battery and ignition switch.

Illuminating and signal equipment consists of front combination lamp, rear lamp (ceiling lamp if equipped with cab), handrail lamp (steering and position), rear tail lamp assembly (steering, position and braking), combination instrument, horn, fuse box etc.

For electric circuit schematic, see 5-39.

5.10.1 Battery

The battery is located in the front of tractor, see fig.5-30

Fig.5-30 Battery position

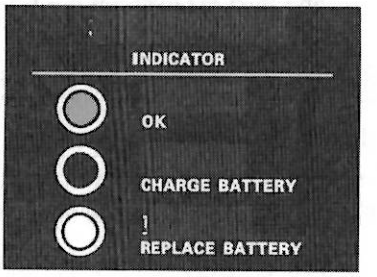
Warning:

The battery electrolyte is of corrosion. Therefore do not splash in eyes or on skin or clothes. If splashed, please immediately clean it with water and go to hospital to avoid accidental hazard.

5.10.1.1 Maintenance –free lead-acid battery maintenance

- Maintenance-free battery does not need to be specially service.

The indicator shows that: Green: the battery power is enough; Dark: the battery power is insufficient; white: loss of battery power. Battery If the dark is lighted, it indicates the battery is needed to be charged. if the white is lighted, it indicates the battery is needed to be replaced. Battery



5-31 Battery state inspection.

- Precautions for maintenance-free battery use and maintenance

1. The battery should be stored in 5~40℃ temperature, clean and well-ventilated site.
2. The battery should be shaded and away from heat source by 2m or more.
3. The battery should be free of foreign material such as rain and dust, avoiding outer short circuit to discharge the battery.

4. Place the battery on flat level, with no reversely and horizontal putting position. Avoid any mechanical impact, heavy pressure and scratching.
5. The battery should be stored with enough power rather than loss of power. Check the battery every three months. If the voltage is less than 12.5V, please charge it timely. This could avoid difficult charging after long-term storage and shortening battery life.
6. During battery use and storage, please frequently check the vent hole for smooth to avoid battery distortion or explosion.
7. Charging and discharging should be carried out at well-ventilated site to dissipate acid fog and the combustible gas generated during charging. This could ensure indoor air is fresh, reduce the acid fog corrosion to person and equipment and avoid the burning of combustible gas.
8. Frequently check the color of electric charge density meter on the battery cover, and accordingly maintain and replace it.

- Charging mode of maintenance-free battery

Battery charging kinds are of constant current, constant voltage limit current etc. It is recommended to adopt constant voltage limit current charging for maintenance-free battery.

1. Constant current charging

Charge the battery to 16V of voltage by $0.1C_{20}A$ (12A)current, then change to use $0.05C_{20}A$(6 A) current. If the voltage of battery is steady for 1-2h, the charging is completed (the voltage difference of two times should be less than0.03V). If charging battery to 16v of battery, please change to use 6A current to charge for 3-5h. Then it's over.

2. Constant voltage charging

Constant voltage is 14.8~15.5V and the max. current should not be more than $0.25C_{20}A$(30A). It is best to charge for 3h after the current is less than 0.5 A. The total charging time should be within 24 h.

- Precautions during charging

1. The positive pole of battery is connected to the positive pole of charger, so is the negative pole. Never connect them reversely.
2. The battery should be placed at flat level. The charging connection should be secure.
3. The battery temperature should not be more than during 45℃charging. Otherwise, take any necessary measures such as water bath, reducing charging current or voltage.
4. The charging room should be of well ventilation. Because the hydrogen will be developed during charging, and then explosion will occur if accumulated 4%~7% of hydrogen meeting open fire.No smoking or open fire in charging room.
5. Pay attention to avoid short circuit during connection for charging.

5.10.2 Front combination lamp

For combination lamp position, please see fig. 5-32.

Fig.5-32 Front combination lamp position

5.10.3 Rear lamp and rear tail lamp

For positions of rear lamp and real tail lamp (steering, position, braking), see fig.5-33.

Fig.5-33 Real lamp and real tail lamp assembly position

5.10.4 Headlamp grading adjustment

The light distribution curve is suitable for right hand drive, as shown in figure 5-31. Check and adjust headlamp light distribution performance according to the following steps:

- Ensure tire pressure to specifications: The tractor (with no load) should be placed on flat ground and should face to clean even wall.
- Mark the center line of front headlamp on the wall with two "┼" type.
- The tractor is distanced to wall by 5m, then turn on the low beam switch.
- The reference point P-P should be located under the "┼"by 5cm.
- Rotate the adjusting screw of headlamp to adjust the light distribution curve of headlamp.

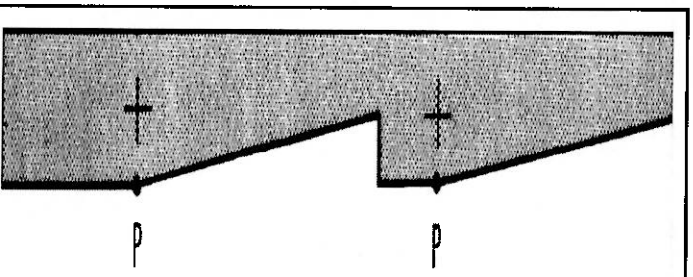


Fig. 5-34 Headlamp and light distribution adjustment

5.10.5 Ceiling lamp

There is four ceiling lamps in cab, located in the front upper and rear upper of cab.

For ceiling lamps in front of cab, see fig.5-35.

For ceiling lamps behind cab, see fig.5-36.

You can rotate the ceiling lamp as requirements to divert the light.

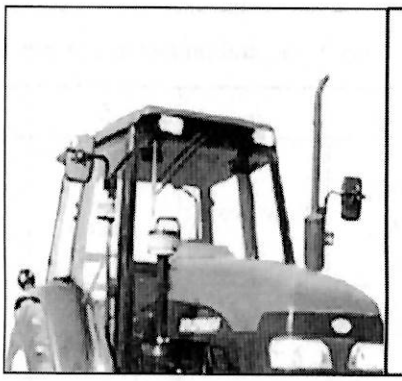


Fig. 5-35 Front ceiling lamp

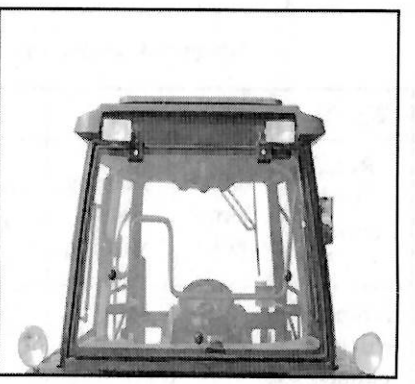


Fig.5-36 Rear ceiling lamp

5.10.6 Fuse box

For the non-flat floor type, the fuse box has 10-way fuse sheets, with each sheet working current and corresponding appliance shown in table 5-3. for the flat floor type, the fuse box has 9-way fuse sheets ,with each sheet working current and corresponding appliance shown in table 5-4. If any electrical element is cut off, firstly check the fuse. If any damage of the fuse, please replace with spare one of equal current (copper wire is not allowed) to ensure the electrical equipment free of damage.

Fig. 5-37 Fuse box (non-flat floor type)

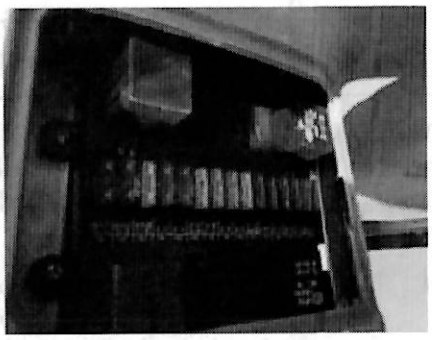


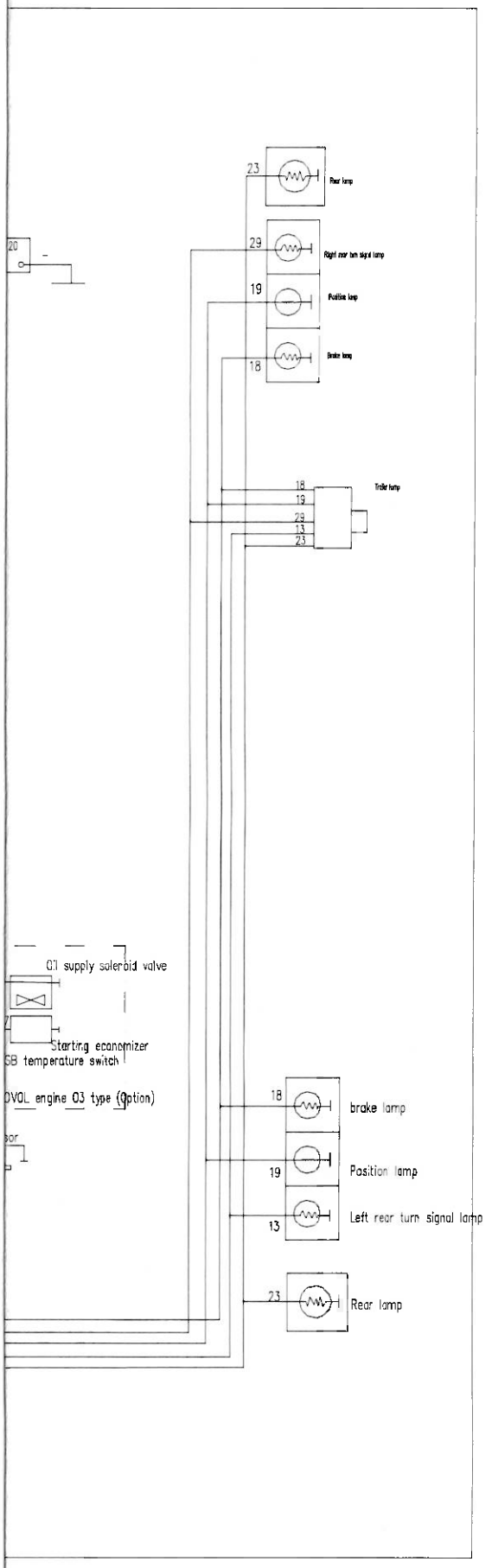
Fig. 5-38 Fuse box (flat floor type)

Sheet 5-3 work current each way and protected electrical elements (non-flat floor type)

Way No.	1	2	3	4	5	6	7	8	9	10
Rated work current (A)	10	15	30	10	10	15	15	15	20	10
Protected electrical elements	Brake lamp and horn	Steering lamp	Heater and A/C, Fan and wiper	Headlamp Low beam	Headlamp High beam	Power suppliers of all instruments and relay coils	Position lamp	Ceiling lamp	Preheating device	Rear lamp

Sheet 5-4 work current each way and protected electrical elements (flat floor type)

Way No.	1	2	3	4	5	6	7	8	9
Rated work current (A)	Brake lamp horn	Steering lamp warning	Wiper A/C	Low beam	High beam	Accessory power	Position lamp	Lamp relay	Rear lamp
Protected electrical elements	10A	10A	20A	10A	10A	20A	5A	15A	10A


23
Rear lamp
20
29
Right rear turn signal lamp
19
Position lamp
18
Brake lamp
18
19
29
13
23
Trailer lamp
G1 supply solenoid valve
Starting economizer
GB temperature switch
DVQL engine 03 type (Option)
18
brake lamp
19
Position lamp
13
Left rear turn signal lamp
23
Rear lamp

Note:

1. If trailer braking is lagged behind main vehicle, it may cause overturn risk of vehicle.
2. The two adjusting screws on pull arm of brake valve has been calibrated on special test stand in the factory, and marked with red coat. No twist allowed, avoiding from causing collision, rollover accidents.

Important instruction:

1. When tractor is working in the field, the brake valve, air cylinder and air pipes shall be dismounted in order to improve ground clearance.
2. Open drain valve after the work has been completed every day, drain the water in air cylinder, and avoid connected components from damage due to corrosion.

5.12 Maintenance of hydraulic suspension system

When tractor is shipped out of factory, the lifter has been set up in a good state, and doesn't need to be adjusted by user. However, the original setting state of lifter may be changed easily due to rod piece drive gear pair wearing and fastener loosening during operation, thus to cause working improperly. Otherwise, the lifter needs to be adjusted during assembling after repaired.

When the force regulating spring assembly for semi-separate hydraulic lifter is installed, adjust spring by using adjusting shims to ensure the regulating spring neither has deformation, nor exists clearance after it is assembled.

5.12.1 Adjustment of control lever and feedback lever (semi-separate hydraulic lifter)

- The lifter is installed on the tractor, connect to pipe lines and fill with hydraulic oil.
- Install suspension lever, and suspend suitable counterweight at the lower suspension point, about （200～300）kg.
- Put control lever in the lowest position.
- Start engine with throttle in neutral position.
- Move control lever upward slowly, while lift arm and counterweight is also going up. When the stick is moved to the top position, lift arm and horizontal pane shall have an angle of 53°. If this angle is less than 53°, it shall be adjusted.
- If lift arm and pane have an angle under 53°, adjusting screw (1) on feedback linkage, increase the length of feedback lever until attaining a suitable specification.
- Tighten the relevant locknut (2) after adjusting.

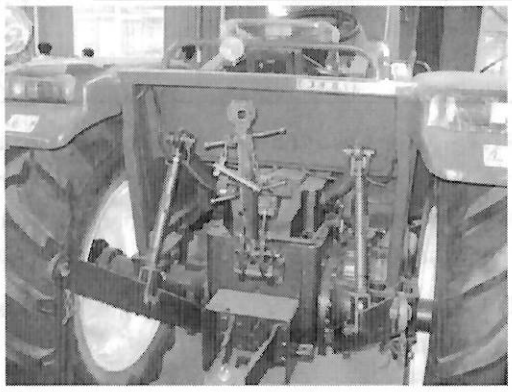


Figure 5-41 Hydraulic suspension system

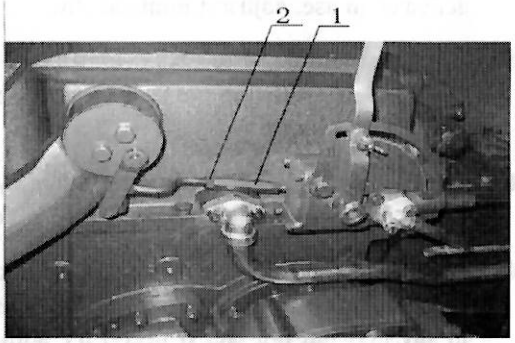


Figure 5-42 Adjustment of feedback lever shall be adjusted

1. Adjusting screw, 2.Locknut.

5.12.2 Application of hydraulic system (select to install on the machine with semi-separate press hydraulic lifter)

- When control lever is moved from "neutral" position to foremost Position (obviously feel the stick is fixed), the suspension mechanism starts to ascend. When it goes up to the end position, control lever resets automatically, i.e. return to the neutral position.
- Hold control lever to move it backward from "neutral" position (now it stops in the end position), the suspension mechanism starts to decline, the Floating, Lowering, Neutral, Lifting control lever will rebound to "neutral" position and stop once it is released.
- When control lever is moved from "neutral" position to end position (obviously feel the stick is fixed), the suspension mechanism declines to end position with "floating" state.

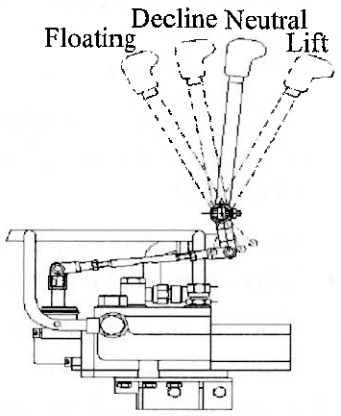


Figure 5-43 Application of hydraulic system

5.12.3 Lifter Height Limiter Application (optional on the machine with semi-separate press hydraulic lifter)

5.12.3.1 Functions of the limiter for the semi-separate press hydraulic lifter and structure schematic

By adjusting the limiter (see the Adjustment Method section), the farming implement can be controlled at any height. As improper operation will lead farming implement to be lifted too high, in order to prevent the power output shaft of the farming implement from fracture, the user shall operate in right steps as stated in figure 5-40, and adjust it as required by the following specific method.

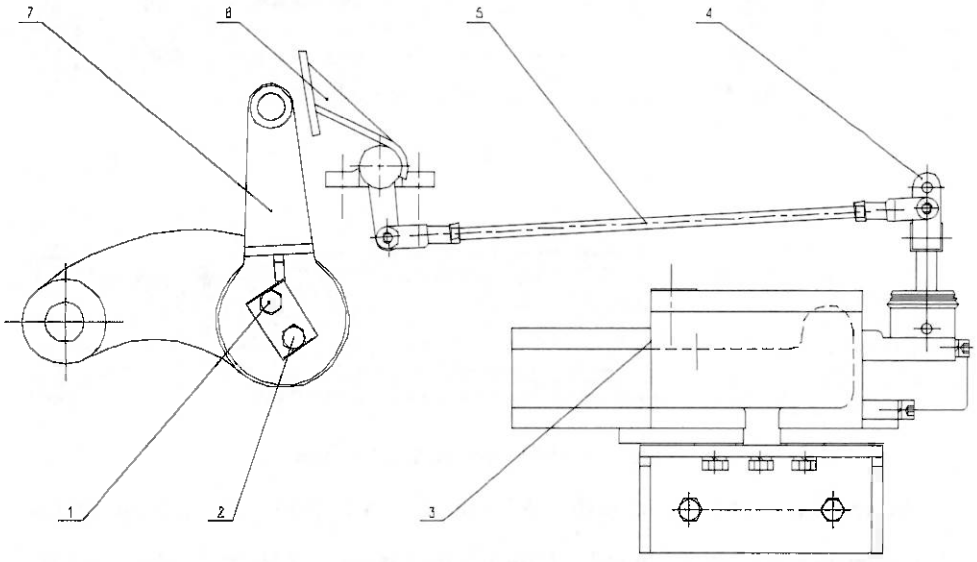


Figure 5-44 Lifter Height Limiter

1. Nut 1 2. Nut 2 3. Distributor 4. Maneuvering device

5. Feedback lever 6. Height limitation feedback lever 7. Limit push plate

5.12.3.2 Adjustment method and requirement for the limiter on the semi-separate press hydraulic lifter

- The height can be achieved by adjusting limit push plate on the right side of lifter shaft as shown in figure 5-44. Unscrew the nut (1) and nut (2), adjust limit push plate counterclockwise, the higher it is lifted when the limiting push plate for limiter is adjusted counterclockwise, vice versa.
- When operating by supporting drive implement, adjust lifting height at headland turning point: it is required the implement shall leave the ground by the height of (150-250) mm, whereby to limit the length of push plate.
- Adjustment while long-distance moving or road transiting: Adjust the position of limit push plate, and the lifting height must meet the requirement that the lowest height from ground is greater than 250mm.
- After it is adjusted, tighten all fasteners anywhere.

5.12.3.3 Application and adjustment for double-acting cylinder of the semi-separate press hydraulic lifter

For safety reason when transporting, positioning clamp shall be adjusted with normal valve (8) at the bottom while the agriculture implement is going up to the top position. The oil in downstream cylinder is blocked in order to avoid it overflow by using normal valve.

The oil drop level is controlled by the normal valve and positioning clamp stop on the cylinder. The positioning clamp slider is movable up and down on piston rod, that is, the lower the slider is, the less the oil level is descending, vice verse.

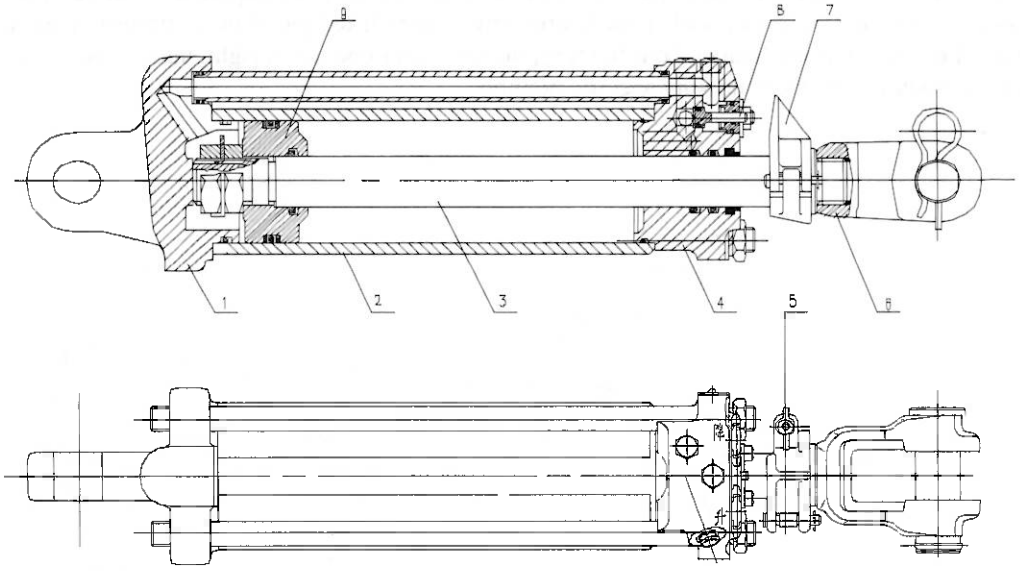


Figure 5-45 Double-acting Cylinder

1.Lower cover 2.Cylinder body 3.Piston rod 4.Upper cover 5.Butterfly nut

6. Connecting fork of piston rod 7.Positioning clamp 8.Normal valve 9.Piston

Important: When adjusting distance between positioning clamp slider and normal valve, the adjusting values for two cylinders shall be consistent with difference of 0-0.5mm, in order to avoid the parts such as agriculture implement from damage due to more difference.

5.12.3.4 Oil and Maintenance of hydraulic suspension system

- The lifter housing is oil reservoir of hydraulic suspension system, fill the reservoir with hydraulic oil specified in this manual according to different areas of application.
- The lifter housing shall be checked every 50h to see if the oil level falls in the range of dipstick.
- The respirator shall be regularly cleaned, open respirator to remove the filter element, place this part for cleaning in gasoline and wash it off. Then blow with compressed air. If the filter element is difficult to clean or damaged, replace it with new one.

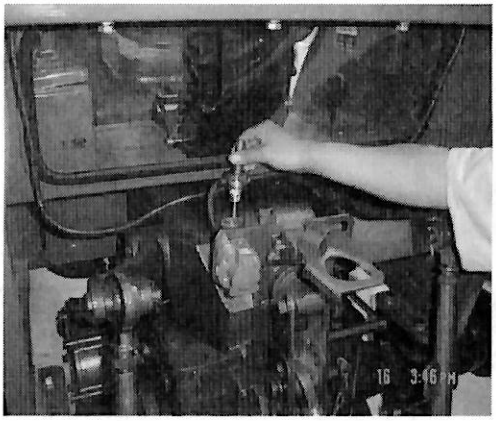


Figure 5-46 Oil and maintenance of hydraulic suspension system

5.12.3.5 Maintenance of oil filter

During operation of the tractor, check the oil filter (1) on hydraulic suspension system every 50h, and clean filter element. Maintenance method: unscrew the rear cover of oil filter, remove screen filter element, place it in gasoline and wash it off, and then blow with compressed air. If the filter element is difficult to clean or damaged, replace it with new one.

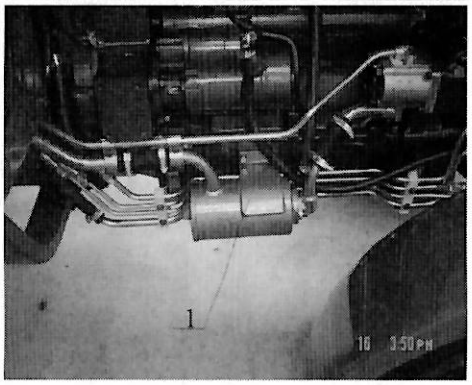


Figure 5-47 Oil filter
1. Oil filter

5.13 Application and maintenance of dry air filter

When the alarm for clogging lights up, the Filter element of dry air filter must be maintained.

The maintenance interval of the air filter depends on the conditions in application environment such as dust, and this work shall be done by frequently. If more dusts have bee accumulated, we recommend the maintenance work is done once every 8h.

Check device every day or at the time of filling fuel to ensure the connector between air filter and engine is fully sealed, including all hose fittings and end cover of air filter housing. If any crack is found there, fix immediately and make a note in machine repair and maintenance journal.

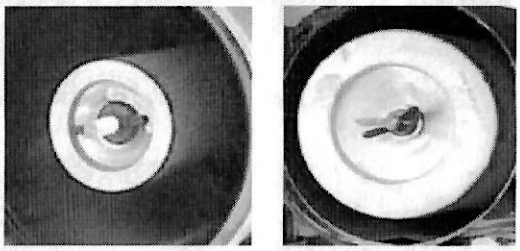


Figure 5-48 Dry air filter
1.Safety filter element 2.Level 1 filter element

The built-in dry air filter element is divided into two levels, level 1 filter element and safety filter element.

During maintenance, dismount level 1 filter element carefully, and avoid the dust to fall into the filter housing.

We recommend that safety filter element shall be replaced once every three times of level 1 filter element replacements. If safety filter element looks very clean before replacement date, do not loosen butterfly nut and change installation state of safety element.

If the safety filter element needs to be replaced, check butterfly nut to ensure it in fastening state. At this point, do not loosen locknut. Clean filter housing with safety filter element installed, clear away dusts fallen from safety filter element. Don't use compressed air to clean air filter housing.

When replacing safety filter element, dismount butterfly locknut and shim, and remove filter element from

housing carefully. Before installing new safety filter element, wipe up installation surface of safety filter element with clean and wet cloth.

Check every new filter to ensure that the new filter is correct with model. Then check if all the parts internal and external to filters have any damages, outworn lining or broken gaskets, if any, dispose damaged parts and install new filter element, then tighten them with shims and butterfly locknuts. Ensure rubber shim for new filter elements is installed between butterfly locknut and filter element, while air inlet restriction indicator is ensured for installation.

Reassemble air filter in reverse order. Install end cap, and ensure it in accurate position before tightening clamp or butterfly locknut.

Important: Prohibit to wash the filter element with oil and water to avoid its damage.

5.14 Maintenance of oil-bath air filter

When the alarm for clogging lights up, the Filter element of air filter must be maintained.

The maintenance interval of the air filter depends on the conditions in application environment such as dust, and this work shall be done by frequently. In normal working environment with less dust, do so every 50h. In heavy dusty environment, it is recommended to do so every 15-30h.

Check device every day or at the time of filling fuel to ensure the connector between air filter and engine is fully sealed, including all hose fittings and end cover of air filter housing. If any crack is found there, fix immediately and make a note in machine repair and maintenance journal.

External wet-type air cleaner maintaining method: (see fig.5-49)

a loosen the wet-type air cleaner buckle and remove the oil basin.

b take out the filter element, clean it with gasoline and kerosene.

c pour the dirty oil in basin and clean it.

d add the clean diesel engine oil to oil surface line on oil basin. Use 15W/40 oil for summer, use 10W/40 oil for winter

e check whether the sealing part is damaged. If so, Reinstall the clean filter element.

f secure the oil basin and check the connection of intake system for reliability.

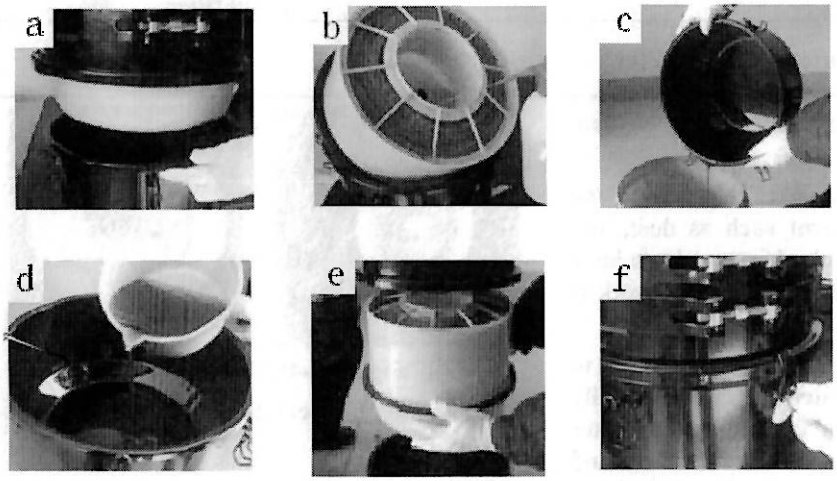


Fig 5-49 Wet-type air cleaner maintenance schematic.

Important:

1. As the air filter application and maintenance will relate to the service life of engine, it must always be kept clean.
2. When operation in agriculture field, it shall be checked and cleaned after every operation is completed. After the maintenance work has been made, the air filter element shall be ensured to fit tightly with air filter in order to avoid presence of clearance, thus prevent failures such as engine scuffing, abnormal wear, downward exhaust severity due to dusts or dirties entering engine.

6 Storage

After the tractor has completed field operation, or for some reasons, needs to be stopped for a lone time (more than one month), it shall be properly kept or sealed for safekeeping to prevent mechanical parts from corrosion, aging and distortion.

To seal up the tractor for safekeeping, the first step is to clean the tractor thoroughly, adjust and tighten all connecting pieces, then complete required technical maintenances in working hours to make the tractor in good technical state.

Important: During period of long-term shutdown, it is more necessary to have a scientific storage and special maintenance for the tractor. Otherwise, the technical deterioration time of tractor will be faster than working period.

6.1 The reasons of tractor damage in shutdown period

- Corrosion: during shutdown period, dusts and water vapor in the air diffuse into machine by the cracks, holes, etc. to make the parts to be contaminated and corroded; the relative motion surfaces, such as pistons, valves, bearings, gears, etc., will lose mobility and pressure protection from lubricant films after they have been in a stationary state for a long time, thus to produce corrosion, rust, cementation obstruction or stagnation, so scrapped.
- Aging: The rubber, if bathed in sunshine, the rubber, plastic and other parts will be easy to aging, deteriorating, become brittle so as to lose activation, or to be corroded.
- Distortion: If pressed for a long time, the parts such as drive belt and tire might appear plastics distortion.
- Others: The electric components are caused self-discharge.

6.2 Storage of tractor

- Prior to storage, check the tractor carefully, and eliminate all existing failures to maintain it in good technical conditions. Then clean up external surface of tractor.
- Drain antifreeze and antirust liquid in the heat radiator, cylinder and water pump, and drain the lubricant from power train and hydraulic oil from hydraulic system to let them run out until empty.
- Remove the battery and the lubricating grease and store them in a dark and ventilated room at a temperature higher than 10℃.
- Drain the oil out of engine while it is hot, refill new oil, and allow small throttle running for several minutes, so that the oil can evenly attach to the surface of all moving parts.
- Apply the lubricating grease on all lubricating points.
- Heat dehydration Vaseline up to 100~200℃, and apply it on the contacts, connectors of electric components and on the surface of metal parts unpainted.
- Loosen fan belt on the engine or remove it when necessary, and wrap it up and store it separately. Then spray antirust agent in the pulley slot. Repair the paint where the paint has fallen off on the tractor.
- Drain and clean the diesel tank.
- Use protective material (such as canvas, waterproof cloth and oil paper) to seal up the pipe ends of engine, such as inlet, outlet, to eliminate the entry of foreign substances, dusts and water.
- Place all the control sticks in neutral position (including electric system switch) with the front wheel in

right direction and suspension rods in lower position.

- Use wooden frame to support the tractor, in order to release the loads on the front wheel. And regularly check the tire pressure.
- The tractor shall be parked in a hangar or car shed with ventilated and dry air. Prohibit to be put them with corrosive substances and gas together. If the conditions are not met, you must choose the dry platform in higher ground for storage when parking in open places, and to cover it with tarpaulin.
- Clean up all the parts and provided tools removed from the tractor and wrap them up carefully, then store them in a warehouse with dry air.

6.3 Maintenance during period of sealing-up for safekeeping tractor

- During sealing-up period for safekeeping tractor, all the above requirements must be met.
- Check once every a month to see if the tractor and parts appear corrosion, aging and distortion, etc., if any, take actions for troubleshooting immediately.
- Rotate engine crankshaft for 10~15 turns every 2 months to prevent internal parts from corrosion. Remove the old lubricating grease where the parts need to refilled and put new lubricating grease.
- Start tractor to drive for 20-30 minutes once every 3 months, and check all the parts for exception functions at idle speed.
- Use a dry cloth wipe up the top surface of battery regularly, and check the battery status in accordance with 5.10.1.1 "Maintenance of battery" on a regular basis. The battery will be self-discharged when unused, recharge it once every 3 months.

Important: If the user doesn't have the conditions for antirust disposal, and the tractor needs to be shutdown for several months or more, replace oil, oil filter at least, and start it once every 2 months, then check all parts for abnormal functions when driving 20-30 min at idle speed. While keep the surface of tractor clean, dry to prevent machine parts from damage due to corrosion.

6.4 Unseal tractor

- Remove the grease used for antirust.
- Unclose all pipe ends and clean tractor.
- Fill with coolant, oil, diesel and each lubricating point with the grease according to specifications.
- Check the battery status and install battery subject to 5.10.1.1 "Maintenance of battery".
- Clear antirust agent in fan pulley slot and install pulley belt. Adjust drive belt tension according to technical specification (see the user manual for engine operation and maintenance).
- Install battery, and apply Vaseline on connecting terminal.
- Check tightness of all circuits, pipelines.
- Operate tractor as required in the manual.

Note: More information for sealing-up and unseal engine, see "Operation and Maintenance Manual for the Engine".

7 Delivery, Acceptance and Transportation

7.1 Delivery and Acceptance

When the user purchases tractor, acceptance inspection shall be performed for the following terms:

- Whether vehicle documents are complete or not

  Vehicle documents include: Tractor Operation Manual, The Product Certificate, Three-Guarantee Service Certificate, Pack List of Vehicle Items, The Air conditioner Operation Instruction (equipped on machine with air conditioner), The Heater Operation Manual (equipped on machine with heater) and the "Technical Document for Engine" (from the engine manufacturer), Tractor Parts and Components Schematics. Check whether the numbers for Product Certificate, Three-Guarantee Service Certificate and Technical Document of Engine are consistent with appropriate machine numbers.

- Whether vehicle items are complete or not

  Check items with tractor in accordance with Pack List of Tractor Items. These items include spare parts and tools for tractor. These are standardized with specifications of the "Technical Documents for Engine" (if you have any questions, contact with the dealer).

- Whether the tractor is in a good operation state

  The machine might be changed in technical features by shipment. The machine features shall be identified further by user on purchase of machine.

7.2 Transportation

When driving, strictly follow traffic rules for self-propelled movement on the road. The space between two vehicles is at least 60m in order to avoid collision caused by accident; if adopting load shipment, you should ensure:

- Loading and unloading works of tractor are completed on the flat ground.
- Loading and unloading works are performed by special unloading deck. .
- There are on-site assistant in charge of guidance work, and the personnel shall be away from unloading area.
- After loading work has been completed, suspension rod shall be put on the lowest position, pull up hand brake, and engage reverse gear, then pull out start key and lock the door, turn off the switch.
- Position 4 tires by "Eight" type with iron wires, and pad wedges to secure tires, then hook rear axle with iron wire.
- Turn rear-view mirror clockwise as far as possible, or remove it if necessary while the hood, cab door and window are all closed. If the machine is equipped with safety shelf, place the shelf to folded position and secure it firmly.
- Note whether the high limitation is beyond or not when driving over culverts and bridges, and fully decelerate when turning around.
- Release hand brake when unloading goods, engage forward gear, and drive away at lowest speed.

Note:

1. When loading and unloading goods for tractor, the throttle shall be fully depressed and front and rear wheels shall be firmly secured to avoid tractor and operating personnel from sudden overturned accident caused by unexpected start of truck.
2. When performing loading and unloading works, tractor shall drive at lowest speed to avoid tractor overturning from upside or goods falling down caused by higher speed.

8 Technical Specifications

8.1 Product model

The meaning for LOVOL-TA series tractor product models is as follows:

TA □□ □ ○ ○

- Distinction mark which is indicated with capital Latin letters.
- Function code In the case of no indication, it refers to general agricultural tractor while T refers to transport tractor.
- Type code 0 refers to rear wheel drive four-wheel tractor; 4 refers to four-wheel drive tractor
- Power code is the integer representation which equals to the value that engine Rated power value [with unit of kW (kilowatt)] multiplies with 1.36.
- Series code

Corresponding powers for product models are as follows:

TA550/TA554 wheeled tractor rated power is 43kW (kilowatt) (55 horsepower);

TA600/TA604 wheeled tractor rated power is 46kW (kilowatt) (60 horsepower);

TA650/TA654 wheeled tractor rated power is 48kW (kilowatt) (65 horsepower);

TA700/TA704 wheeled tractor rated power is 51.5 kW (kilowatt) (70 horsepower);

TA750/TA754 wheeled tractor rated power is 55kW (kilowatt) (75 horsepower);

TA800/TA804 wheeled tractor rated power is 59kW (kilowatt) (80 horsepower);

TA820/TA824 wheeled tractor rated power is 60.3 kW (kilowatt) (82 horsepower);

TA850/TA854 wheeled tractor rated power is 62.5 kW (kilowatt) (85 horsepower).

Fig.8-1 LOVOL-TA series tractor

Product executive standard: Q/LWZ 001 LOVOL Wheeled Tractor.

8.2 Product technical specifications

8.2.1 Two-wheel drive type product technical specifications

Table 8-1 Main product technical specifications for two-wheel drive type products

Item			Unit	LOVOL							
				TA550	TA600	TA650	TA700	TA750	TA800	TA820	TA850
Type			--	4×2 wheeled tractor							
Rated traction			kN (kilonewton)	10.5	11	13	13.5	14.5	15.5	16	17
PTO shaft power			kW(kilowatt)	36.4	39.6	43.2	46.4	49.5	53.1	54.3	56.3
Overall dimension	Length(including front counterweight and rear suspension)		mm (millimeter)	4200		4200				4285	
	Width(In the case of common-used wheel tread, it refers to the width between outer sides of standard tires)			1845	1910	1910					
	Height (In the case of standard tires, the height refers to that to the top of the muffler)			2690	2745	2760					
Wheelbase			mm(millimeter)	2188						2273	
Wheel tread	Front wheel		mm(millimeter)	1400, 1500, 1600, 1700							
	Front wheel adjustment		——	Step adjustable							
	Rear wheel		mm(millimeter)	1430, 1530, 1630, 1730, 1830							
	Rear wheel adjustment		——	Step adjustable							
Ground clearance		Min. clearance	mm(millimeter)	395 (at front axle tie rod)		430 (at front axle tie rod)					
Min. turning radius		Without one-sided brake application	m(meter)	3.7		3.8				3.9	
		With one-sided brake application	m(meter)	3.3		3.4				3.5	
Structural weight		Without the cab	kg(kilogram)	2300	2560	2670				2845	
		With the cab	kg(kilogram)	2535	2775	2885				3060	
Min. operating weight		without the cab	kg(kilogram)	2500	2775	2900				3075	
		with the cab	kg(kilogram)	2715	2990	3115				3290	
Load distribution	Front wheel	without the cab	kg(kilogram)	1040	1265	1200				1230	
		with the cab	kg(kilogram)	1105	1330	1245				1330	
	Rear wheel	without the cab	kg(kilogram)	1460	1510	1700				1845	
		with the cab	kg(kilogram)	1610	1660	1870				1960	
Counterweight		Front counterweight	kg(kilogram)	240							
		Rear counterweight	kg(kilogram)	360		540					
Engine technical specifications	Engine type		--	in-line and 4-stroke							
	Connection mode between engine and gearbox		--	Direction connection							
	Manufacturer		——	YTO (Luoyang) Power Machinery Co., Ltd., Tianjin Lovol Engines Co., Ltd., Yuchai Machinery Co., Ltd., Anhui Tanli Engine Co., Ltd. and YTO (Luoyang) Diesel Engine Co., Ltd.							
	Trademark or brand		——	YTO, Lovol Engines, Yuchai, Quanchai and YTO							

Technical Specifications

Item			Unit	LOVOL							
				TA550	TA600	TA650	TA700	TA750	TA800	TA820	TA850
Engine technical specifications	Engine model		--	YTR4105(YTO Luoyang Engine), 4JR3(Quanchai) and 1004-4RT (Lovol Engines).		YTR4108, YTRC4108(YTO Luoyang Engine), LR4108(Luochai), YC4A(Yuchai), 4JR3(Quanchai) and 1004-4TRT(Lovol Engines)		LRC4108 (Luochai), YC4A(Yuchai), 4JR3(Quanchai) and 1004-4TRT (Lovol Engines).			LR4B5 (Luochai)
	Number of cylinders		--	4							
	Bore×Stroke		mm(millimeter)	105×120(YTR4105), 105×125(4JR3) and 100×127(1004-4RT).		108×120(YTR4108), 108×125(YTRC4108), 108×125(LR4108), 108×132(YC4A), 105×125/105×135 (4JR3) and 100×127(1004-4TRT).		108×135(LRC4108), 108×132(YC4A), 105×135/108×135 (4JR3) and 100×127(1004-4TRT).			108×135(LR4B5)
	Displacement		L(liter)	4.16(YTR4105), 4.33(4JR3) and 4.00(1004-4RT).		4.40(YTR4108), 4.58(YTRC4108), 4.58(LR4108), 4.84(YC4A), 4.33/4.68(4JR3) and 4.00(1004-4TRT).		4.95(LRC4108), 4.84(YC4A), 4.68/4.95(4JR3) and 4.00(1004-4TRT).			4.95(LR4B5)
	Compression ratio		——	17(YTR4105), 17(4JR3) and 16.5(1004-4RT).		17(YTR4108), 17(YTRC4108), 17(LR4108), 17.5(YC4A), 17(4JR3) and 17.5(1004-4TRT).		17(LRC4108), 17.5(YC4A), 17(4JR3) and 17.5(1004-4TRT).			17(LR4B5)
	Rated power		kW(kilowatt)	43	46	48	51.5	55	59	60.3	62.5
	Rated speed		r/min (revolutions per minute)	2200							2400
Engine technical specifications	Max. torque/speed		N·m/ (r/min) [(Newton·meter)/ (revolutions per minute)]	255/ (1400~1600)		270/(1400~1600)		320/(1400~1600)			
	Fuel consumption for total power at a fixed point		g/kW·h (gram/ kilowatt·hour)	≤248							
	Fuel consumption in rated operating condition		g/kW·h (gram/ kilowatt·hour)	≤1.6							
	Lubrication mode		--	Pressure lubrication							
	Starting mode		--	Electrical starting or electrical starting with auxiliary device for preheating							
	Air filter type		——	Wet or dry type							
	Cooling system type		——	Water cooled							
Fuel tank	Operating pressure		KPa(kilopascal)	30							
	Capacity		L(liter)	78							100
Drive system	Clutch		--	Dry, single-disc double-acting clutch							
	Gearbox		--	Combined Iz type planetary reduction gear							
	Rear axle	Main drive	--	Helical spiral bevel gear pair							
		Differential	--	Closed type, 4 planetary bevel gears							
		Differential lock	--	Pin type							
		Final drive	--	External engaged and built-in type							

Technical Specifications

Item				Unit	LOVOL							
					TA550	TA600	TA650	TA700	TA750	TA800	TA820	TA850
Drive system	Front drive axle		Drive shaft	--	--							
			Main drive	--	--							
			Differential	--	--							
			Final drive	--	--							
Traveling system	Frame			--	Frameless type							
	Front suspension			--	Rigid suspension							
	Front axle			--	Telescopic tube step adjustable type							
	Tire pressure		Front wheel	kPa (kilopascal)	167~186(field operations),225~245(transport operations)							
			Rear wheel		118~138(field operations),167~176(transport operations)							
	Tire specification		Standard: front wheel/rear wheel	--	6.00-16/ 12.4-28	6.00-16/ 14.9-28	6.50-20/14.9-30					
	Tire specification		Optional: front wheel/ rear wheel	--	6.00-16/14.9-28;6.00-16/11-28 (paddy field);6.5-20/ 11-32(paddy field).	6.00-16/11-28 (paddy field);6.5-20/ 11-32(paddy field).	6.5-20/16.9-28;6.5-20/11-32 (paddy field).					
Steering system	Toe-in			--	4~12							
	Front wheel camber angle			--	2°							
	Kingpin inclination angle			--	9°							
	Kingpin caster angle			--	0°							
	Front axle swing angle			--	12°							
	Steering system mode			--	Front wheel hydraulic steering							
	Steering gear			--	Orbit rotary valve type full-hydraulic steering gear							
Brake system	Service brake system			--	Dry, disc and mechanical controlled brake							
	Parking brake			--	Dependent hand brake							
	Trailer brake			--	Air cut-off air brake							
Operating device technical specification	Hydraulic system type			--	Open-center, semi-separated or separated type							
	Hydraulic oil pump type and model			--	Gear pump, CB-F316L; or gear pump, CB-F320L.							
	Distributor			--	4-position, 6-way slide valve type							
	Oil cylinder		Bore	mm(millimeter)	φ110							
			Travel	mm(millimeter)	130(single-acting) or 200(double-acting)							
			Type	--	single-acting(semi-separated type) or double-acting(separated type)							
	Suspension mechanism	Type		--	Rear three-point suspension, Type 1 or Type 2.							
		Upper suspension point	Connecting hole	mm(millimeter)	φ25.7							
			Width	mm(millimeter)	51							
		Lower suspension point	Connecting hole	mm(millimeter)	φ28.7							
			Width	mm(millimeter)	45							
	Tilling depth adjustment			--	Semi-separated type lifter: Comprehensive force and position adjustment, floating control; Or separated type lifter: Height adjustment, floating control.							
	Max. system lifting capacity [at a place 610mm(millimeter) behind the suspension point]			(KN) (kilonewton)	Semi-separated type lifter: ≥15; Or separated type lifter: ≥20.							
	Open pressure for system relief valve			MPa (megapascal)	17.5~18.0							
	Hydraulic output		Type	--	Rear-mounted, optional							

Technical Specifications

Item			Unit	LOVOL							
				TA550	TA600	TA650	TA700	TA750	TA800	TA820	TA850
Operating device technical specification	Hydraulic output	Quantity	--	Two circuits (separated type lifter); or two circuits with one additional single-acting hydraulic output(semi-separated type lifter)							
		Specification	mm(millimeter)	M22X1.5							
	PTO shaft	Type	--	Rear-mounted semi-independent or rear-mounted independent type							
		Specification	--	φ35,6-tooth rectangular spline shaft; or φ38,8-tooth rectangular spline shaft							
		Speed	r/min (revolutions per minute)	Standard: 540/1000; Optional: 540; or 540/760; or 760; or 1000.							760/850
	Traction device	Type	--	Swing link type							
		Ground clearance	mm (millimeter)	315							
	Towing device		--	U-hook							
	Cab		--	Cab, with fan; Or with air heater or air conditioner.							
	Roll bar		--	Two-pillar type (Optional for models without cabs)							
	Driver's seat		--	Mechanical suspension type, PVC surface layer with adjustable height, forward/backward position and seat back							
Electrical instrumentation	Electrical system type			12V negative grounded double-wire system							
	Generator	Voltage	V(volt)	14							
		Power	W(watt)	1000							
	Regulator	Adjusting voltage	V(volt)	14							
	Starting motor	Voltage	V(volt)	12							
		power	kW(kilowatt)	3.7							
	Battery	Model	--	6-QW-120							
		Capacity	A·h (ampere-hour)	120							
		Voltage	V(volt)	12							
		Quantity	--	1							
Electrical instrumentation	Lighting and signaling device	Headlamp	--	60/55W(watt) double-filament bulb (two for left and right respectively)							
		Rear lamp	--	55W(watt) (two for left and right respectively)							
		Cab ceiling lamp		35W(watt) (4)							
		Horn	--	Single horn							
		Front turn signal lamp	--	21W(watt) (two for left and right respectively)							
		Tail lamp assembly	--	Turn signal lamp 21W(watt), brake lamp 21W(watt) and width lamp 10W(watt) (two for left and right respectively)							
		Steering width lamp (At handrails of the cab)	--	Turn signal lamp 21W(watt), width lamp 5W(watt) (two for left and right respectively)							
	Monitoring and warning device	Combination instrument	--	water temperature gauge, fuel gauge, speedometer and oil pressure gauge							
		Warning device	--	On the instrument: charge indicator lamp, high beam indicator lamp, left and right turn signal indicator lamp, position lamp indicator lamp and air brake fault warning lamp (optional for models with air brakes); safety warning sign; reflector.							
	Fuse box		--	10-way fuse type							
Air brake system	Air braking device type		--	Air cut-off brake							
	Air cylinder capacity		L(liter)	23							
	Brake valve exhaust opening clearance		mm (millimeter)	1.0~1.5							

Technical Specifications

Item		Unit	LOVOL							
			TA550	TA600	TA650	TA700	TA750	TA800	TA820	TA850
Air brake system	Brake valve operating pressure	MPa (megapascal)	0.60~0.64							
	Open pressure for relief valve	MPa (megapascal)	0.8±0.05							
Filling capacity	Fuel tank	L(liter)	78							100
	Engine oil sump	L(liter)	16							
	Oil for drive system	L(liter)	49							
	Hydraulic lifter	L(liter)	21							
	Oil for steering system	L(liter)	2.5							
	Water radiator	L(liter)	15							
	Oil radiator	L(liter)	5		--					
	Air filter	L(liter)	1.4							
	Front drive axle	L(liter)	11.5							

Table 8-2 Speed table for two-wheel drive model with 8+2 speed gearbox (standard tire configuration)

Item				Unit	LOVOL						
					TA550	TA600	TA650	TA700	TA750	TA800	TA820
Theoretical speed	Forward gear	Low gear	I	km/h (kilometer/hour)	2.72	2.95	3.06				
			II		3.65	3.95	4.10				
			III		5.79	6.27	6.50				
			IV		7.79	8.44	8.75				
		High gear	I		9.81	10.62	11.01				
			II		13.13	14.23	14.75				
			III		20.84	22.57	23.40				
			IV		28.04	30.37	31.49				
	Reverse gear	Low gear	R I		3.09	3.34	3.47				
		High gear	R II		11.11	12.04	12.48				

Table 8-3 Speed table for two-wheel drive model with optional 16+4 speed gearbox (standard tire configuration)

Item					Unit	LOVOL							
						TA550	TA600	TA650	TA700	TA750	TA800	TA820	TA850
Theoretical speed	Creeper gear	Low gear	Forward gear	I	km/h (kilometer/hour)	0.62	0.67	0.69					0.69
				II		0.82	0.89	0.93					0.96
				III		1.31	1.42	1.47					1.54
				IV		1.76	1.91	1.98					1.97
			Reverse gear			0.70	0.76	0.78					0.79
		High gear	Forward gear	I		2.72	2.95	3.06					2.50
				II		3.65	3.95	4.10					3.45
				III		5.79	6.27	6.50					5.54
				IV		7.79	8.44	8.75					7.11
			Reverse gear			3.09	3.34	3.47					2.84

Item					Unit	LOVOL							
						TA550	TA600	TA650	TA700	TA750	TA800	TA820	TA850
Theoretical speed	Direct gear	Low gear	Forward gear	I	km/h (kilometer/ hour)	2.21	2.40	2.49					3.08
				II		2.97	3.21	3.33					4.24
				III		4.71	5.10	5.28					6.82
				IV		6.33	6.86	7.11					8.75
			Reverse gear			2.51	2.72	2.82					3.50
		High gear	Forward gear	I		9.81	10.62	11.01					11.08
				II		13.13	14.23	14.75					15.27
				III		20.84	22.57	23.40					24.53
				IV		28.04	30.37	31.49					31.49
			Reverse gear			11.11	12.04	12.48					12.59

Table 8-4 Speed table for two-wheel drive model with optional 10+10 speed shuttle type gearbox (standard tire configuration)

Item				Unit	LOVOL							
					TA550	TA600	TA650	TA700	TA750	TA800	TA820	TA850
Theoretical speed	Forward gear	Low gear	I	km/h (kilometer/ hour)	2.70	2.96	3.06				3.08	
			II		3.62	3.96	4.10				4.24	
			III		4.48	4.90	5.07				5.37	
			IV		5.74	6.28	6.50				6.82	
			V		7.72	8.45	8.74				8.75	
		High gear	I		9.71	10.63	11.00				11.08	
			II		13.01	14.25	14.74				15.27	
			III		16.13	17.66	18.27				19.32	
			IV		20.65	22.61	23.39				24.53	
			V		27.79	30.42	31.47				31.49	
	Reverse gear	Low gear	I		3.19	3.49	3.61				3.64	
			II		4.27	4.68	4.84				5.01	
			III		5.30	5.80	6.00				6.34	
			IV		6.78	7.42	7.68				8.05	
			V		9.12	9.98	10.33				10.34	
		High gear	I		11.49	12.57	13.01				13.09	
			II		15.39	16.85	17.43				18.04	
			III		19.07	20.88	21.60				22.83	
			IV		24.41	26.73	27.65				29.00	
			V		32.85	35.96	37.20				37.21	

8.2.2 Four-wheel drive type product technical specifications

Table 8-5 Main product technical specifications for four-wheel drive type products

Item			Unit	LOVOL							
				TA554	TA604	TA654	TA704	TA754	TA804	TA824	TA854
Type			--	4×4 wheeled tractor							
Rated traction			kN (kilonewton)	12.5	12.5	14	15	16	17	17.5	18
PTO shaft power			kW(kilowatt)	36.4	39.6	43.2	46.4	49.5	53.1	54.3	56.3
Overall dimension	Length (including front counterweight and rear suspension)		mm(millimeter)	4200		4200				4235	
	Width (In the case of common-used wheel tread, it refers to the width between outer sides of standard tires)			1910		1910					
	Height (In the case of standard tires, the height refers to that to the top of the muffler)			2735		2760					
Wheelbase			mm(millimeter)	2236						2273	
Wheel tread		Front wheel	mm(millimeter)	1450							
		Front wheel adjustment	——	Fixed type							
		Rear wheel	mm(millimeter)	1430, 1530, 1630, 1730, 1830							
		Rear wheel adjustment	——	Step adjustable type							
Ground clearance		Min. clearance	mm(millimeter)	290 (at the transfer case)		335 (at the transfer case)					
Min. turning radius		Without one-sided brake application	m(meter)	4.8	4.8	4.8				4.9	
		With one-sided brake application	m(meter)	4.3	4.3	4.3				4.4	
Structural weight		Without the cab	kg(kilogram)	2580	2650	2740				3135	
		With the cab	kg(kilogram)	2795	2880	2955				3350	
Min. operating weight (including front counterweight frame)		Without the cab	kg(kilogram)	2795	2955	3030				3365	
		With the cab	kg(kilogram)	3010	3170	3245				3580	
Load distribution	Front wheel	Without the cab	kg(kilogram)	1290	1310	1270				1345	
		With the cab	kg(kilogram)	1355	1475	1300				1430	
	Rear wheel	Without the cab	kg(kilogram)	1505	1645	1760				2020	
		With the cab	kg(kilogram)	1655	1695	1945				2150	
Counterweight		Front counterweight	kg(kilogram)	240							
		Rear counterweight	kg(kilogram)	180	360	540					
Engine technical specifications	Engine type		--	in-line , 4-stroke							
	Connection mode between engine and gearbox		--	Direct connection							
	Manufacturer		——	YTO (Luoyang) Power Machinery Co., Ltd., Tianjin Lovol Engines Co., Ltd. , Yuchai Machinery Co.,Ltd., Anhui Tanli Engine Co., Ltd. , YTO (Luoyang) Diesel Engine Co., Ltd.							
	Trademark or brand		——	YTO , Lovol Engines, Yuchai, Quanchai, YTO							
	Engine model		--	YTR4105(YTO Luoyang Engine), 4JR3 (Quanchai), 1004-4RT (Lovol Engines).		YTR4108 , YTR4108(YTO Luoyang Engine), LR4108(Luochai), YC4A(Yuchai), 4JR3 (Quanchai), 1004-4TRT (Lovol Engines).		LRC4108(Luochai), YC4A(Yuchai), 4JR3(Quanchai), 1004-4TRT (Lovol Engines).		LR4B5(Luochai)	
	Number of cylinders		--	4							

Technical Specifications

Item			Unit	LOVOL							
				TA554	TA604	TA654	TA704	TA754	TA804	TA824	TA854
Engine technical specifications	Bore × Travel		mm(millimeter)	105×120(YTR4105), 105×125(4JR3), 100×127(1004-4RT)		108×120(YTR4108), 108×125(YTRC4108), 108×125(LR4108), 108×132(YC4A), 105×125/105×135(4JR3), 100×127(1004-4TRT).			108×135(LRC4108), 108×132(YC4A), 105×135/108×35(4JR3), 100×127(1004-4TRT).		108×135 (LR4B5)
	Displacement		L(liter)	4.16(YTR4105), 4.33(4JR3), 4.00(1004-4RT).		4.40(YTR4108), 4.58(YTRC4108), 4.58(LR4108), 4.84(YC4A), 4.33/4.68(4JR3), 4.00(1004-4TRT).			4.95(LRC4108), 4.84(YC4A), 4.68/4.95(4JR3), 4.00(1004-4TRT).		4.95(LR4B5)
	Compression ratio		——	17(YTR4105), 17(4JR3), 16.5(1004-4RT).		17(YTR4108), 17(YTRC4108), 17(LR4108), 17.5(YC4A), 17(4JR3), 17.5(1004-4TRT)			17(LRC4108), 17.5(YC4A), 17(4JR3), 17.5(1004-4TRT).		17(LR4B5)
	Rated power		kW(kilowatt)	43	46	48	51.5	55	59	60.3	62.5
Engine technical specifications	Rated speed		r/min (revolutions per minute)	2200							2400
	Max. torque/speed		N·m/ (r/min) [(Newton·meter)/ (revolutions per minute)]	255/ (1400~1600)		270/ (1400~1600)		320/(1400~1600)			
	Fuel consumption for total power at a fixed point		g/kW·h (gram/ kilowatt·hour)	≤248							
	Fuel consumption in rated operating condition		g/kW·h (gram/ kilowatt·hour)	≤1.6							
	Lubrication mode		--	Pressure lubrication							
	Starting mode		--	Electrical starting or electrical starting with auxiliary device for preheating							
	Air filter Type		——	Wet or dry type							
	Cooling system Type		——	Water cooled							
Fuel tank	Operating pressure		KPa (kilopascal)	30							
	Capacity		L(liter)	78							100
Drive system	Clutch		--	Dry, single-disc double-acting clutch							
	Gearbox		--	Combined Iz type planetary reduction gear							
	Rear axle	Main drive	--	Helical spiral bevel gear pair							
		Differential	--	Closed type, 4 planetary bevel gears							
		Differential lock	--	Pin type							
		Final drive	--	External engaged and built-in type							
	Front drive axle	Drive shaft	--	Middle-mounted drive shaft							
		Main drive	--	Helical bevel gear wheeled tractor							
		Differential	--	Closed type, 2 planetary bevel gears							
		Final drive	--	Single-stage planetary gear wheeled tractor							
Traveling system	Frame		--	Frameless type							
	Front suspension		--	Rigid suspension							
	Front axle		--	Dual-universal joint single-stage planetary reduction final drive type							
	Tire pressure	Front wheel	kPa (kilopascal)	118~138(field operations),167~176(transport operations)							
		Rear wheel		118~138(field operations),167~176(transport operations)							

Technical Specifications

Item				Unit	LOVOL							
					TA554	TA604	TA654	TA704	TA754	TA804	TA824	TA854
Traveling system	Tire specification	Standard: front wheel/rear wheel		--	8.3-20/14.9-28			8.3-24/14.9-30				
		Optional: front wheel/rear wheel		--	8.3-20/12.4-32; 8.3-24/16.9-28; 8.3-24 (paddy field) /11-32 (paddy field); 9.5-24 (paddy field) /11-32(paddy field).			8.3-24/16.9-28; 8.3-24(paddy field)/11-32(paddy field); 9.5-24(paddy field)/11-32(paddy field).				
Steering system	Toe-in			--	0~3							
	Front wheel camber angle			--	1°							
	Kingpin inclination angle			--	7.5°							
	Kingpin caster angle			--	3°							
	Front axle swing angle			--	12°							
	Steering system mode			--	Front wheel hydraulic steering							
	Steering gear			--	Orbit rotary valve type full-hydraulic steering gear							
Brake system	Service brake system			--	Dry, disc and mechanical controlled brake							
	Parking brake			--	Dependent hand brake							
	Trailer brake control			--	Air cut-off air brake							
Operating device technical specifications	Hydraulic system Type			--	Open-center, semi-separated or separated type							
	Hydraulic oil pump Type and model			--	Gear pump, CB-F316L; or gear pump , CB-F320L.							
	Distributor			--	4-position, 6-way slide valve type							
	Oil cylinder	Bore		mm(millimeter)	φ110							
		Travel		mm(millimeter)	130(single-acting) or 200(double-acting)							
		Type		--	single-acting(semi-separated type) or double-acting(separated type)							
	Suspension mechanism	Type		--	Rear three-point suspension, Type 1 or Type 2.							
		Upper suspension point	Connecting hole	mm(millimeter)	φ25.7							
			Width	mm(millimeter)	51							
		Lower suspension point	Connecting hole	mm(millimeter)	φ28.7							
			Width	mm(millimeter)	45							
	Tilling depth adjustment			--	semi-separated type lifter : Comprehensive force and position adjustment, floating control; Or separated type lifter: Height adjustment, floating control.							
	Max. system lifting capacity[at a place 610mm(millimeter) behind the suspension point]			(KN) (kilonewton)	semi-separated type lifter : ≥15; Or separated type lifter: ≥20.							
	Open pressure for system relief valve			MPa (megapascal)	17.5~18.0							
	Hydraulic output	Type		--	Rear-mounted, optional							
		Quantity		--	Two circuits (separated type lifter); or two circuits with one additional single-acting hydraulic output(semi-separated type lifter)							
		Specification		mm(millimeter)	M22X1.5							
	PTO shaft	Type		--	Rear-mounted semi-independent or rear-mounted independent type							
		Specification		--	φ35,6-tooth rectangular spline shaft; or φ38, 8-tooth rectangular spline shaft							
		Speed		r/min (revolutions per minute)	Standard:540/1000; Optional: 540; or 540/760; or 760; or 1000.							760/850
	Traction device	Type		--	Swing link type							
		Ground clearance		mm(millimeter)	315							
	Towing device			--	U-hook							

Table 8-8 Speed table for four-wheel drive model with optional 10+10 speed shuttle type gearbox (standard tire configuration)

Item				Unit	LOVOL							
					TA554	TA604	TA654	TA704	TA754	TA804	TA824	TA854
Theoretical speed	Forward gear	Low gear	I	km/h (kilometer/ hour)	2.96		3.06				3.08	
			II		3.96		4.10				4.24	
			III		4.90		5.07				5.37	
			IV		6.28		6.50				6.82	
			V		8.45		8.74				8.75	
		High gear	I		10.63		11.00				11.08	
			II		14.25		14.74				15.27	
			III		17.66		18.27				19.32	
			IV		22.61		23.39				24.53	
			V		30.42		31.47				31.49	
	Reverse gear	Low gear	I		3.49		3.61				3.64	
			II		4.68		4.84				5.01	
			III		5.80		6.00				6.34	
			IV		7.42		7.68				8.05	
			V		9.98		10.33				10.34	
		High gear	I		12.57		13.01				13.09	
			II		16.85		17.43				18.04	
			III		20.88		21.60				22.83	
			IV		26.73		27.65				29.00	
			V		35.96		37.20				37.21	

8.3 Comparison table for previous and current models of LOVOL-TA series wheeled tractors

Table 8-9 Comparison table for previous and current models of LOVOL-TA series wheeled tractors

S/N	Previous models	Current models
1	FT550	TA550
2	FT554	TA554
3	FT600	TA600
4	FT604	TA604
5	FT650	TA650
6	FT654	TA654
7	FT700	TA700
8	FT704	TA704
9	FT750B	TA750
10	FT754B	TA754
11	FT800B	TA800
12	FT804B	TA804
13	FT820B	TA820
14	FT824B	TA824

9 Disassembly and Disposal

In favor of your safety and social environment protection, the used machine shall be returned to the recycling company with professional license for disassembly and disposal after the service life of complete machine expires.

During disassembling, the machine shall be disassembled in turn from up to down and then from exterior to interior. When dismounting large or heavy objects, special hoister must be used. The used battery shall be returned to the professional battery recycling company. Waste oil shall be collected for reasonable disposal. Do not freely dump anywhere to pollute environment.

Warning: If the battery electrolyte is corrosive, be careful to prevent it from splashing into eyes, skin and clothes. If this is the case, wash them away with clean water, and then seek medical treatment immediately in order to prevent unexpected accident.

Notice: The used oil is waste fuel oil. Do not discard it anywhere in order to prevent unexpected injury.

Notice: We remind you that improper displacement when or after the machine is disassembled may cause injury in the absence of special tools for disassembly or if you have no practical operational experience.

Warning: When dismounting large or heavy objects, you should use special lifting slings to ensure personal safety!

10 Guarantee Items

10.1 Basis for product guarantee

LOVOL-TA series wheeled tractors are guaranteed according to the following documents and regulations.

Repair, Exchange and return Liability Provisions for Agricultural Mechanical Products SETC Quality [1998] No.123 Document

Product Quality Law of The People's Republic of China

Law of the PRC on the Protection of the Rights and Interests of Consumers

10.2 Conditions for guarantee nonperformance

According to relevant laws and regulations, some conditions are excluded from the range of guarantee. For details, please refer to Chapters involved with Three-Guarantee Service Certificate.

Note: Some behaviors may lead to invalidation for guarantee items. For details, please refer to Three-Guarantee Service Certificate.

Note: Any unauthorized tractor modification carried out by users or tractor application which is out of its purpose specified in the operation manual are not included in the guarantee range provided by the manufacturer. Please pay attention to this.

Note:

1. When providing guarantee service, the user should offer his Three-Guarantee Service Certificate so that the certificate should be kept properly;
2. If there are faults in the machine, please inform distributors with contents as follows for guarantee: product model, manufacturing no., engine model and type, contents included in product nameplate, service time as well as specific fault descriptions;
3. Repair part supply expiry date for three guarantees: it is guaranteed that repair part supply will not stop within five years since the stop production for the product and three-guarantee parts are still in the guarantee range. However, the delivery date for special parts should be determined after consultation within three-guarantee period; after the expiry date for three-guarantee part supply, price and delivery date for supplied parts should be discussed;
4. Make sure to use special parts and oils for the product.

11 Appendixes

11.1 Oil, fuel and solution used for tractor

Oil, fuel and solution used for tractor should meet the specifications in the following table

Table 11-1 Oil, fuel and solution used for tractor

<table>
<tr><td>Used parts</td><td colspan="8">Oil, fuel and solution</td></tr>
<tr><td rowspan="2">Fuel tank</td><td rowspan="2">Domestic standard</td><td rowspan="2">Meet GB/T 252 light diesel</td><td>Over 20℃</td><td>(4~20)℃</td><td>(-5~4)℃</td><td>(-14~-5)℃</td><td>(-29~-14)℃</td><td>(-44~-29)℃</td></tr>
<tr><td>10#</td><td>0#</td><td>-10#</td><td>-20#</td><td>-35#</td><td>-50#</td></tr>
<tr><td>International standard</td><td colspan="7">Adopt American Society for Testing and Materials fuel D-975, with grade of 2-D at normal temperature and with grade of 1-D at ambient temperature of below 5℃.</td></tr>
<tr><td rowspan="2">Engine oil sump</td><td>Domestic standard</td><td colspan="7">Fill fuel according to engine instruction</td></tr>
<tr><td>International standard</td><td colspan="7">In accordance with Society of Automotive Engineers,
Viscosity is classified into SAE10W-40 below -5℃,
and SAE15W/40 over -5℃. Shell Rimula R2 15W/40 diesel engine or Mobil Delvac Super 15W/40.
Quality should be meets American Petroleum Institute API CD standard.</td></tr>
<tr><td>Engine radiator</td><td colspan="8">If ambient temperature of 4℃ or more, use clean soft water for tractor cooling system.
If ambient temperature of 4℃ or less, use antifreeze for tractor cooling system.
If min. ambient temperature of -15℃or more, adopt -25# long effective antifreeze(SH/T0521);
If min. ambient temperature of -25℃or more, adopt-35#long effective antifreeze(SH/T0521);
If min. ambient temperature of -35℃or more, adopt -45# antifreeze(SH/T0521);
If min. ambient temperature of -45℃or more, adopt Shell full effective antifreeze(OAT)-45℃;</td></tr>
<tr><td rowspan="2">Oil-bath type air cleaner</td><td>Domestic standard</td><td colspan="7">Use 10W/30 if -5℃ or less, use 15W/40 multigrade oil if -5℃or more.
CC or CD grade in GB 11122-2006.</td></tr>
<tr><td>International standard</td><td colspan="7">In accordance with Society of Automotive Engineers,
Viscosity is classified into SAE10W-40 below -5℃,
and SAE15W/-40 multigrade oil over -5℃. Shell Rimula R2 15W/40 diesel engine or Mobil Delvac Super 15W/40.
Quality should be meets American Petroleum Institute API CD standard.</td></tr>
<tr><td rowspan="2">Gearbox-rear axle
Hydraulic lifter
Front drive axle</td><td>Domestic standard</td><td colspan="7">N100D dual-purpose oil used for drive and hydraulic system. Executive standard: Q/LWZ B119.</td></tr>
<tr><td>International standard</td><td colspan="7">MF1135 from Massey Ferguson
Or M2C 86A from Ford
Or HY-GARD™ or J20A、J20B、J20C from John Deer
Or Shell Spirax S3 TLV</td></tr>
<tr><td rowspan="2">Steering oil reservoir</td><td>Domestic standard</td><td colspan="7">N100D dual-purpose oil used for drive and hydraulic system. Executive standard: Q/LWZ B119.</td></tr>
<tr><td>International standard</td><td colspan="7">QUATROL oil or other oil should be used, meeting Dier JDMJ20A or JDMJ20B standard. Use polar region oil APICC/SC, MIL-L-46/67 or Shell Tellus 32 hydraulic oil.
Or Spirax S3 TLV or Nuto H32 corrosion proof hydraulic oil.</td></tr>
</table>

Used parts	Oil, fuel and solution	
Oil cup	Domestic standard	Use vehicle general purpose lithium based grease, meeting GB/T 7324
	International standard	SAE general purpose grease is added with 3~5% molybdenum sulfide. Use polar region grease (MIT-G-10924C) if below -30℃. Adopt National Lubrication Grease Institute NJGI grease D-217 with 2 viscosity grade. Shell Gadus S2 V100 3 grease or Mobilux ep 3.
Brake system	Domestic standard	Triple-purpose oil used for drive, hydraulic and brake systems. Executive standard: Q/LWZ B119.
	International standard	SAE10W-40 oil, Shell Spirax S3 TLV
Windshield	Use -45# antifreeze cleaning washer if -10℃. (SH/T0521).	

Note:

1. The dual-purpose oil for drive and hydraulic systems, diesel, diesel oil should be deposited for at least 48h to keep its cleanness and ultimate machine performance.
2. During the engine running, do not fill fuel tank. If tractor working under hot or sunlight, do not fill up fuel tank. Once the fuel is spilled, please wipe it at once.
3. Never blend the fuel of different grades and different manufactures to maintain the engine performance.
4. Choose the tractor with heater. Antifreeze must be used for winter to avoid freezing the heater or A/C.

11.2 Main bolt/ nut tightening torque table

Table 11- 2 Main bolt/ nut tightening torque table

Assembly Parts	Thread specification	Tightening torque (N·m)
Bolts attaching gearbox to rear axle	M14	120~160
Bolts attaching engine to gearbox	M12	80~110
Bolts attaching axle shaft sleeve to rear axle	M12X1.25	80~110
Bolts attaching tie rod to steering knuckle arm	M12X1.25	199~243
Bolts attaching differential support to drive bevel gear bearing block	M12	73~89
Bolts attaching front axle inner tube to outer tube	M12X1.25	199~243
Bolts attaching lifter housing to rear axle	M12	73~89
Bolts attaching front axle support to engine	M16	182~222
Bolts attaching towing brackets	M16	182~222
Bolts attaching front wheel hub and from wheel spoke.	M12X1.25	126~154
Bolts attaching rear wheel spoke to wheel rim.	M16	182~222
Bolts attaching rear axle differential housing to driven bevel gear.	M14X1.5	126~154
Bolts attaching long axle shaft to spoke.	M16X1.5	199~243
Bolts attaching lifting arm to rocker arm pressure plate.	M10	41~51
Fixing bolts of lifting cylinder	M18X1.5	287~336
Dual round nuts on the driving spiral bevel gear	M45X1.5	300~350

Index:	Standard code	Name and code	Mounting position	Number
2	GB/T 3452.1	O-ring 31.5×2.65G	Connection between oil filter and oil suction short hose	1
		O-ring 21.2×2.65G	Connection between the oil suction long hose and lifter	1
		O-ring 11.8×2.65G	Connection between the pressure long hose and lifter	1
			Joint of return oil pipe from multi-way valve	1
		O-ring 103×3.35G	lifter cylinder cover	1
		O-ring 11.8×3.55G	lifter cylinder	1
		O-ring 55×5.3G	Lifting arm shaft of lifter	2
		O-ring 100×5.3G	Lifter cylinder piston	1
		O-ring 12.5×2.65G	Inlet and outlet on lifter cylinder cover	2
		O-ring 16×2.65G	Descending speed control valve on lifter cylinder cover	1
			Connection between the multi-way valve outlet and hollow bolt	1
		O-ring 23.6×2.65G	Relief valve on lifter cylinder cover	1

Note: this table does not cover non-standard oil sealing and O-ring.

11.5 Tractor agriculture implement list

Table 11-5 Tractor agriculture implement list

Type	Tractor model	Agriculture implement name	Agriculture implement Type	Main technical features:	Company
Tilling machinery	TA550/TA554	Mounted 4- furrow plow	1L-425	Tilling depth (18~24) cm	Baoding Shuangying Agricultural Machinery Co., Ltd. Henan Weishi County Baichuan Plough Factory Liaoning Heishan Jiyin Plough Factory Nanjing Yongjiang Machinery Co., Ltd
		Mounted 4- furrow plow	1L-427	Tilling depth (18~24)cm	
		Mounted 3- furrow plow	1LF-330	Tilling depth (22~26)cm	
		Mounted reversible 2-furrow plow	1LF-235	Tilling depth (22~28)cm	
	TA600/TA604 TA650/TA654 TA700/TA704 TA750/TA754	Mounted 3- furrow plow	1L-335	Tilling depth (22~28)cm	
		Mounted 4- furrow plow	1L-430	Tilling depth (22~26)cm	
		Mounted 5- furrow plow	1L-527	Tilling depth (18~24)cm	
		Mounted 5- furrow plow	1L-525	Tilling depth (18~22)cm	
		Hydraulic reversible type	1LF-430	Tilling depth (22~26)cm	
		Hydraulic reversible type	1LF-330		

Appendixes

Type	Tractor model	Agriculture implement name	Agriculture implement Type	Main technical features:	Company
Tilling machinery	TA800/TA804 TA820/TA824 TA850/TA854	Hydraulic reversible type	1L(F)-430 1LF-335	Tilling depth (22~26)cm	
	TA600/TA604 TA650/TA654 TA700/TA704	Variable speed, rotary tilling type	1GQNB-200	Tilling depth (12~18)cm	Xian City Rotary Seeder Factory
		Rotary tilling machine	1GQN-200	Tilling depth (12~18)cm	Hebei Dingzhou Kaiyuan Machinery Co., Ltd. Nanchang Rotary Tilling Machine Factory Lianyungang Rotary Tilling Machine Factory
	TA800/TA804 TA820/TA824 TA850/TA854	Rotary tilling machine	1GQN-210	Tilling depth (12~18)cm	Hebei Dingzhou Kaiyuan Machinery Co., Ltd Nanchang Rotary Tilling Machine Factory Lianyungang Rotary Tilling Machine Factory
	TA550/TA554	Rotary tilling machine	1GQN-180	Tilling depth (12~18)cm	Hebei Dingzhou Kaiyuan Machinery Co., Ltd Nanchang Rotary Tilling Machine Factory Lianyungang Rotary Tilling Machine Factory
		Variable-speed rotary tilling machine	1GQNB-180	Tilling depth (12~18)cm	Xian City Rotary Tilling Machinery Factory
	TA series	Paddy drive harrow	1BSQN-300	Paddy area, opting to tilling depth (10~16)cm	Nanchang Rotary Tilling Machine Factory Lianyungang Rotary Tilling Machine Factory Xuzhou Huaxing Agricultural Machinery Co., Ltd.
		Drive disc plough	1LYQ-722	Tilling depth(12~20)cm	
		Drive disc plough	1LYQ-625	Opting to tilling depth (16~25)cm	
Tilling machine	TA550/ TA554	Medium mounted 16-disc harrow	1BJX-1.7	Tilling depth (10~14) cm, tilling wide 170 cm or 200 cm	Xuzhou Huaxing Agricultural machinery Co., Ltd. Jiamusi North Machinery Manufacturing Co., Ltd. Heilongjiang Neijiang Agriculture Machinery Factory
		Medium mounted 18-disc harrow	1BJX-2.0		
	TA600/TA604 TA650/TA654 TA700/TA704	Medium mounted 18-disc harrow	1BJX-2.0	Tilling depth (10~14) cm, Tilling width 200 cm (centimeter) or /220 cm	
		Medium mounted 20-disc harrow	1BJX-2.2		

Appendixes

Type	Tractor model	Agriculture implement name	Agriculture implement Type	Main technical features:	Company
Tilling machine	TA750/TA754 TA800/TA804 TA820/TA824 TA850/TA854	Medium mounted semi-mounted 24-disc harrow	1BJX-2.5	Tilling depth (10~14) cm, Tilling width 250 cm	
		Heavy mounted 20-disc harrow	1BZP-2.2	Tilling depth (14~18) cm, Tilling width 220 cm	
Seeding machine	TA650/TA654 TA700/TA704 TA750/TA754 TA800/TA804 TA820/TA824 TA850/TA854	Air suction type, precise seeding medium-mounted harrow	2BQ-6	Seeding and medium harrowing type: 6/7; row spacing (50~70)cm; working wide: (360~420)cm	Heilongjiang Baihua Tilling Machinery Factory Harbin Hongwei Science and Technology Company
		Air suction type, till-free, precise cover seeder	2BQM-6D	Seeding type: 6; row spacing (60~70)cm; working wide: (360~420)cm	
Seeding machine	TA550/TA554 TA600/TA604	Air pressure type, precise seeder	2BJ-4	Seeding type: 4; row spacing (60~70)cm; working wide: (240~280)cm	Shijiazhuang Agricultural Machinery Co., Ltd. Harbin Hongwei Science and Technology Co., Ltd.
	TA550/TA554 TA600/TA604	Rotary seeding, plant root fertilizer	SGTNB-180Z4/8A8	Tilling depth (10~16)cm	Xian City Rotary Tilling Machinery Factory Hebei Dingzhou Kaiyuan Machinery Co., Ltd.
Seeding machine	TA550/TA554 TA600/TA604	Rotary seeder	SGTNB-180Z4/8	Tilling depth (10~16)cm	Xian City Rotary Tilling Machinery Factory
	TA650/TA654 TA700/TA704	Rotary seeding, plant root fertilizer	SGTNB-200Z4/8A8	Tilling depth (10~16)cm	Xian City Rotary Tilling Machinery Factory Hebei Dingzhou Kaiyuan Machinery Co., Ltd.
		Rotary seeder	SGTNB-200Z4/8		
Seeding machine	TA750/TA754 TA800/TA804 TA820/TA824 TA850/TA854	Rotary seeding, plant root fertilizer	SGTNB-200Z4/8A8	Tilling depth (10~16)cm	Xian City Rotary Tilling Machinery Factory Hebei Dingzhou Kaiyuan Machinery Co., Ltd.
		Rotary seeder	SGTNB-200Z4/8		
Straw returning on soil fertility	TA850/TA854	Straw shredding and returning machine	4J-180/172	Working width: 180/172cm; stubble: (2~8)cm	Hebei Dingzhou Kaiyuan Machinery Co., Ltd. Shandong Dezhou Chinese North Agriculture Machinery Factory Shijiazhuang Agricultural Machinery Co., Ltd.
	TA700/TA704 TA750/TA754 TA800/TA804 TA820/TA824	Straw shredding and returning machine	4JH-1.72	Working width: 172cm; stubble: (2~8)cm	

Appendixes

Type	Tractor model	Agriculture implement name	Agriculture implement Type	Main technical features:	Company
Straw returning on soil fertility	TA650/TA654 TA600/TA604 TA550/TA554	Straw shredding and returning machine	4JH-1.6	Working width: 150cm; stubble: (2~8)cm	
			4JHY-1.5	Working width: 150cm; stubble: (2~8)cm	
			4JH-1.5	Working width: 150cm; stubble: (2~8)cm	
Combination machine	TA700/TA704 TA750/TA754 TA800/TA804 TA850/TA854	Stubble-breaking rotary- tilling ridging soil-preparation machine	SGTN-180 SGTN-200 SGTN-210	Working width: 180cm; ridging number: 3; tilling depth: (12~18)cm	Lianyungang Yunshan Rotary Tilling Machinery Factory Shenyang Huayuan Machinery Manufacturing Co., Ltd.

Important:

1 Before selecting agricultural implement, please refer to this list according the working conditions (soil resistance, agricultural requirements) to choose the machine type and model. Then consult dealer and manufacturers. Read the "Operation and Maintenance Manual" in detail to be familiar with the structure, performance, using method and scope of application etc.

2. Determine the main technical parameters according the working condition (soil resistance and agricultural requirements) and suggestions, realizing reasonable matching. Otherwise, this could affect the machine performance.

3. If working condition (soil resistance and agricultural requirements etc) is different, the working efficiency and effect of same agricultural implement is also different. Please determine proper working speed and working wide etc according local conditions.

Warning: before using the matched agricultural implement, the operator should read the "Operation and Maintenance Manual" in detail to be familiar to structure, performance, operating method and reasonable matching to avoid the agricultural implement and personal accidents.

Customer Feedback Information Sheet

Dear customers

Thank you for your patronage and welcome to select and use LOVOL TA series wheeled tractors. We'd like to provide you with wholehearted service and solve your problems during tractor application to fulfill your demand to the greatest extent and provide excellent customer service.

We'd like to delivery this "Customer feedback information sheet" with the tractor instruction to you. Please fill in the form with regular script and send it in a registered letter to three-guarantee service department of LOVOL Heavy Industry Co., Ltd. at No.192 Beihai Road (south), Weifang, Shandong, China. Post code: 261206. Our company will input your Customer Feedback Information Sheet into computer and save it up for the following implementation of "three-guarantee service" for you.

Thank you for your cooperation and support!

Customer Feedback Information Sheet

Product model		Tractor Manufacturing No.			Engine manufacturer		
Engine No.		Date of manufacture			Purchase date		
Customer		Age		Educational level		Years of driving experience	
Home address				Telephone No.		Post code	
Main purpose after purchase				Tractor load			
Time and cause for fault occurrence							
Name and status for damaged parts							
Comments and suggestions for product improvement							

Note: This feedback information sheet should be filled by the machine owner (or operator) truthfully for our easy understanding tractor service condition for our better customer service. This feedback information sheet is still valid in its copy. Therefore, please fill in the copied sheet.

Handover Training Sheet- Tractor

LOVOL	Tractor Handover Training Sheet				
* Model		*VIN		* Engine S/N	
Country		Name of distributor			
Owner Information					
* Name of contactor		* Contactor Phone		Industry	
* Contactor Address					
* Handover date			* Name of staff in charge of handover		
Evaluation (mark "√" in □)	□ Content □ General □ Discontent		* User signature		
Items of Handover Training					
The customer shall master all the followings after training (mark √ at the rear of item)					
1. Introduction to the complete machine nameplate; sort out the on-board spare parts, tools, technical documents and others.					
2. Introduction to procedures of application for warranty, requirements and precautions					
3. Introduction to precautions and meanings of safety markers.					
4. Introduction to fuel/oil model required by the manufacturer					
5. Introduction to names, functions and mounting positions of main components					
6. Introduction to how to correctly operate the tractor					
7. Introduction to how to correct run-in the tractor and the maintenance requirements after running-in.					
8. Introduction to the tractor daily maintenance, methods and precautions.					
Attention: 1. The red marked parts in this sheet must be correctly filled up. 2. For details, refer to the on-board Operation and Maintenance Manual					

S/N	Item	Contents	General Items	Key Items
1	On-board Information	Check the complete vehicle information		■
		List the on-board spare parts, tools, certifications, operational manual, parts catalog.	■	
2	Safety	Warning markers on the muffler, differential lock handle, PTO handle and hydraulic handle	■	
		Warning markers on radiator, instrument panel, mudguard, PTO shaft		■
3	Product Instruction	1. Brief introduction to engine hood, radiator, engine, floor, safety rack, cab, transmission and rear axle based on the actual layout. 2. Brief introduction to A/C, heaters, seats, electrical system switches, wipers, radios, warning lamps, use of battery and adjustment of safety rack	■	
		1. Precautions to use the shuttle gear lever, primary and secondary transmissions, four drive, brake, clutch, PTO, differential lock, multi-way valve, lifter (general, compulsory pressure and electrical control) and suspension. 2. Precautions to use the oil pressure gauge, water temperature gauge, charger, RPM meter and hourmeter		■
4	Running-in	1. Inspection prior to running-in 1.1 Check the outside fasteners; 1.2 Check the oil level; 1.3 Check the tire pressure; 1.4 Add the grease 2. The running-in period is dependent on the operational instruction. 2.1 engine idle running-in (high, medium and low speeds); 2.2 PTO running in (high and low speed); 2.3 Hydraulic system running-in (loaded); 2.4 Tractor running-in (loaded and unloaded) 3. Precautions for running-in Check if the engine, chassis, hydraulic system, control system, electrical system and others could work normally and give the introduction to how to troubleshoot.	■	
5	Maintenance after running-jin	Drain out the oil before cooling down to 60 ℃, and add the new fluid. Replace the filter element and change the engine oil; clean the air cleaner, the oil return filter element and the oil pickup filter element. For the inspection after running-in, refer to the inspection prior to running-in.		■

S/N	Item	Contents	General Items	Key Items
6	Periodic maintenance	Daily maintenance: cleaning, inspection, adjustment and tightening Periodic preventive maintenance: ：50h (each week), 200h （each month）, 400h (each season), 800h (each half a year) and 1600h (every year) 50h maintenance: clean the air cleaner; check the primary and secondary clutches and the brake travel; 200h maintenance: add the grease to the frequently moving parts; change the engine oil; replace the engine oil filter element; replace the fuel filter element; maintain the air cleaner. 400h maintenance: check the oil levels in chassis, front axle and hydraulic system; add the grease; clean the filter element of steering oil reservoir 800h maintenance: change the hydraulic oil, the steering system oil and the chassis oil; clean the fuel tank; check the valve clearance and the fuel injector pressure. 1600h maintenance: clean the cooling system; change the front axle oil and the brake fluid.		■
7	Primary methods of maintenance	1. How to completely drain the fluid / oil out of engine, transmission, rear axle, transfer case, final drive, front drive axle, steering gear and hydraulic system; 2. Method to clean the filter element; 3. Method to inspect and adjust the toe-in. 4. Method to adjust the brake travel and the clutch travel 5. Requirements of adding grease		■
8	Service procedures	After-sale service procedures	■	

Compulsory Insurance Service Sheet – Tractor

LOVOL		Tractor Compulsory Insurance Service Sheet –			
* Model		*VIN		* Engine S/N	
Country		Name of distributor			
* Name of contactor		* Contactor Phone		Industry	
Contactor Address					
*Maintenance date		* Working hours		Name of staff in charge of maintenance	
Evaluation (mark "√" in □)	□ Content □ General □ Discontent			*User signature	

Maintenance Items	
1. Change the engine oil and its filter element and clean the related parts.	
2. Change the fluid in the transmission, front axle and lifter and clean the related parts;	
3. The technical maintenance on diesel engine shall be done according to 'Operation and Maintenance Instruction for Diesel Engines'	
4. Clean the engine cooling system and change the coolant according to the requirements;	
5. Check the front wheel toe-in and the free travels of clutch and brake, and adjust them if needed;	
6. Check and tighten all the outside bolts, nuts and screws;	
7. Add the grease to each parts according to the maintenance instruction;	

1. Mark √ in the check box following the each item.
2. The red marked parts in this sheet must be correctly filled up.
3. For details, refer to the on-board Operation and Maintenance Manual