

# **FL220 Series Wheeled Tractor**

## **User Manual**

**FL1804/FL2004/FL2204**

Deutz-Fahr Machinery Co., Ltd.

Table for Product Identification Marks

Product brand:
Model of product:
Tractor Factory No.:
Engine Factory No.:
Chassis Factory No.:
Delivery date:
Name of manufactory: Deutz-Fahr Machinery Co., Ltd.
Address of manufactory: Shandong Linshu County Economic Development Zone
Tel of manufactory: (0539) 6260626
After-sales service tel: (0539) 6260622
User or driver:

Note:

1. Fill in this form carefully in time of purchase;
2. The serial numbers in the form should be completely recorded (including letters).

Operation manual for FL1804-2004-2204 series wheeled tractors

Prepared by Deutz-Fahr Machinery Co., Ltd.

(Address: Shandong Linshu County Economic Development Zone\Postcode: 276715)

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# Foreword

This Manual describes the operation and maintenance of the tractors when most generally configured. The standard configurations vary from country to country for the tractor and its equipment. Please contact your local dealer for more information about this equipment on the market.

Please follow the instructions in this manual carefully.

For more instructions about the contents of this manual, please contact our service center immediately and you can easily get any information you need, in order to accurately and safely operate and maintain your equipment, and thus avoid personal injuries or damages.

The manufacturer shall not assume any responsibility for tractor damages incurred due to improper use or non-professional operation and maintenance beyond this manual or any operation disobedient to the prescribed procedures.

The *operation manual* is part of your tractor.

Take care to keep this manual, and if some day you resell this tractor, please hand over this manual to its new owner.

## Important Items



**Notice:**

Before any modification of this tractor, please consult the dealer. The manufacturer shall not bear any responsibility for any damage or injury caused by any unauthorized modification of this machine.

- Never operate this tractor before you have not yet read through or understood this manual. Any buyer or user shall have obligations to read this operation manual and comply with the safety recommendations, as well as operating and maintenance instructions.
- Please make sure to familiarize yourself with the safety instructions in the warning marks in this manual and on the tractor. If you do not understand any instruction, please contact your local authorized dealer for further explanation.
- If this tractor is lent or rent to others, its owner shall have duty to ensure that the users have read through and fully understood this operation manual before use and accepted the appropriate instructions related to safe and correct use of this tractor.
- The driver shall have the responsibility for routine inspection and maintenance of this tractor and ensure that he/she has repaired or replaced any part that may have this tractor become unsafe or damaged or that may result in early wear of other parts. Never repair or adjust it unless you are well qualified.
- Only original spare parts can be used to replace the faulty ones. The use of any non-original accessory will invalidate the manufacturer's warranty and also may cause significant damages of the tractor.
- This tractor is suitable for agricultural applications. Any application beyond its design will be regarded as improper use. The manufacturer shall not assume any damage or injury due to improper use of the tractor.

## Warning



**Notice:**

Before any modification of this tractor, please consult the dealer. The manufacturer shall not bear any responsibility for any damage or injury caused by any unauthorized modification of this machine.

The production process may be modified after this manual has been printed, so the instructions, illustrations, specifications or other information in this manual may not completely fit your tractor.

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The manufacturer in all cases shall reserve the right to modify the relevant products subject to no prior notice.

## **Expected Use**

- FL1804-2004-2204 series wheeled tractor is a large-size agricultural wheeled tractor with multiple functions. This machine is characteristic of compact structure, convenient control, flexible steering, large traction force, wide application and convenient maintenance and repair. It can be used in cultivation, harrowing, seeding and harvesting operations if being equipped with suitable agricultural tools; it can be used for transportation operation if being equipped with trailer. The trailer mass ratios (proportion of total mass of the trailer and the total mass of the tractor) shall not be more than 3; it can be operated jointly with the straw field returning machine via power output, and can also be used as original power of pump and thresher. Please correctly prepare supporting agricultural machines to obtain the maximum economic benefits in accordance with requirements of this manual. Users shall strictly abide by utilization, maintenance and repair conditions stipulated by the manufacturer and basic requirements of expected use. Use in other operations will violate expected use of the tractor.
- The tractor can only be operated, maintained and repaired by personnel who are familiar with characteristics of the tractor and have relevant safety operation knowledge.
- Rules for preventing accidents, other safety regulations and road traffic rules must be abided by all the time.
- The manufacturer will not be responsible for reliability reduction, machine damage or personal injury due to arbitrary change of the tractor or operation violating expected use of the tractor.
- It is prohibited to be engaged in operation that is not mentioned in the above.
- It is prohibited to be used overload cultivation and transportation.
- It is prohibited that the bucket of the tractor is loaded with person.

## **To Owner of the New Tractor**

Dear user:

Thank you for your confidence in our company for buying FL1804-2004-2204 series wheeled tractor manufactured by our company. Please pay attention to the following important information so that you can correctly, reasonably and high-efficiently use this tractor:

- You shall carefully read this manual before using the tractor no matter whether you have driving experience before. It will be helpful for you to more reasonably and effectively operate this tractor.
- You will carefully read the manual and operation manual of supporting engine and agricultural machine and strictly execute provisions of the manual to operate, maintain and repair the tractor for adequately performing performance of the tractor to create more economic benefits to you and prolong lifetime of the tractor.
- The tractor cannot be changed to avoid affecting performance of the tractor and accidents, otherwise, “three warranties” service cannot be performed.
- The tractor can only be operated, maintained and repaired by personnel who are familiar with characteristics of the tractor and have relevant safety operation knowledge.
- Rules for preventing accidents, other safety regulations and road traffic rules must be abided by all the time.
- Use shall not exceed provisions of the operation manual, otherwise, performance of the tractor may be reduced or the tractor may break down.
- This operation manual is not product quality guarantee, therefore, any requirement cannot be put forward based on data, figure and explanation in the manual.
- Execution standard of this series tractor is GB / T 15370.3 " General requirement of agricultural tractors—Part 3:Over 130 kW wheeled tractors ".
- The manual is mainly compiled based on existing products, which has mainly introduced universal

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models. Contents mentioned in it will be subject to product structure when it is published. If any change, notice will not be issued separately. User shall pay attention to.

- If user has problems about “Three Guarantees” maintenance and accessory supply, it can contact the nearest sales division of our company.

Sincerely welcome every user to purchase our product. Our company provides services for all users based on ideas of quality first, reputation first and user-oriented.

**Main chapters of the manual are as below:**

- Foreword
- Security Considerations
- Product Description
- Operation Instructions
- Wheels
- Electrical system
- Accessories, spare parts and quick-wear parts
- Maintenance Specification
- Troubleshooting
- Tractor Storage and Unpack
- Delivery Acceptance and Transportation
- Disassembly and disposal
- Warranty Contents
- Main technical specifications of the tractor
- Appendix

Theme index of every chapter is enclosed in the beginning of the manual.

Alphabetical index is enclosed in the end of the manual.

“Left”, “right”, “front” and “back” shown in the manual refer to view angle of the driver in the cab. Therefore, left side and right side of the tractor are respectively left side and right side of the cab.



## Chinese-English Comparison List for Common Units

No.	Unit Category	International Unit	Chinese Comparison
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	Moment	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 <sup>2</sup>	千克力/平方厘米
17	Temperature	X:	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	Volume	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	Capacity of the Storage Battery	A·h	安培·小时

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# **1- Security Considerations**

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## 1.1 Brief Introduction

The following signs such as “danger”, “warning” or “alarm” are applicable to the manual and tag attached to the tractor, which indicate risk degree. It may cause serious injury or death if no attention is paid to signs of “danger”, “warning” or “alarm”. These signs include suitable safety descriptions that are generally included in a box.

Don't ignore these descriptions. Otherwise, you will be in danger.



*Fig. 1*

	<p><b>Danger:</b> Indicates an imminently situation which, if not avoided, will result in death or serious injury.</p>
	<p><b>Notice:</b> Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</p>
	<p><b>Warning:</b> Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.</p>
	<p><b>Important:</b> Describes some items involved in damage to the machine.</p>

Any personnel who use this tractor must have carefully read this manual and completely understood working procedures under the premise of safety.

Please abide by all safety descriptions in the manual and safety warning identification on the tractor.

Use the tractor in a safe and reliable way.





It means: be careful when this sign appears. Be careful! You are in danger.

The *User Manual* of the tractor will be provided for every person who uses the tractor for the first time, which will be read for at least once in every year.

## 1.2 Practical Suggestions for Safety Operation Procedures

Comprehensively read the manual before using the tractor to guarantee you understand how to operate all control devices. All control systems and devices have operation limitations. Therefore, you must know all characteristics of the tractor before the tractor is put into operation, such as speed control, braking, steering, stability and load.

Safety information provided in the manual will not substitute safety standards specified in national laws and regulations or insurance article. Therefore, you shall check whether your tractor is correct equipment complying with local laws and regulations.

It is impossible to foresee all potential dangerous situations. Therefore, safety protective measures and danger warnings specified in the manual cannot guarantee all safety. If you select way that is not recommended to operate or repair the tractor, you will undertake the liability that you will not put personal safety of you or others in danger. Make sure that utilization and repair ways selected by you will not damage the tractor or cause danger.

Make sure that personnel who use the tractor have practical experience of operating the control device and they have understood repair and safety codes of the manual.

Make sure that all drivers have read and understood the manual. If you don't abide by these suggestions, it may cause serious injury and even death.

### 1.2.1 Read Before Operation

- Driver must adequately read and understand the *User Manual* and safety warning signs.
- You must remember correct operation and working methods.



Fig.1-1

### 1.2.2 Qualified Operator

- The driver must have enough judgment ability when operating the machine.
- Personnel, who feel sick, drink wine, don't have enough sleep and personnel who are color-blinded, pregnant and are less than 18 years old cannot operate the machine.
- Driver shall obtain driving license through professional training and accept audit in time and shall strictly abide by traffic rules when driving on roads.
- Personnel who operate it for the first time shall drive at low speed before it is familiar with it.



Fig.1-2

### 1.3 General Safety Regulations

- You shall abide by all general safety and accident prevention regulations in addition to commands in the User Manual.
- You shall abide by highway laws and regulations when driving on public roads.
- You shall be familiar with all control devices, descriptions and functions before working.
- The tractor is equipped with ROPS or cab to protect the driver.
- Before starting the engine, you shall check that all control devices of the tractor are under neutral gear.

- Fasten the safety belt. If the tractor is equipped with foldable ROPS, when the ROPS is at low position, safety belt cannot be fastened.
- Check whether the tension of the safety belt is suitable or not. Make sure that safety belt is not bent or limited in the cab seat before fastening.
- Usually check conditions of the safety belt. If it is damaged or abraded, it must be replaced

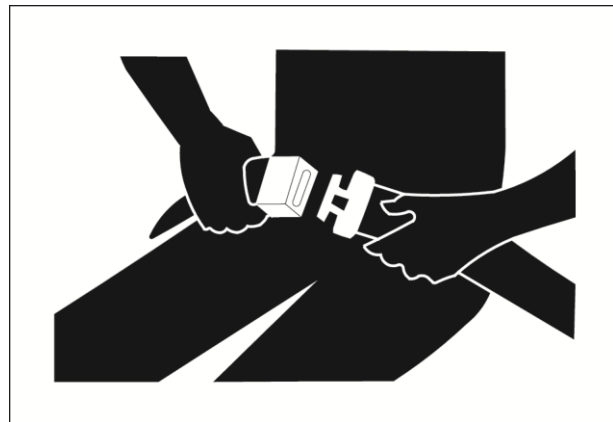


Fig.1-3

- The engine can be started only after sitting on the driving seat.
- The control device can be operated only after sitting on the driving seat.



图 1-4

- It is prohibited to connect the engine to the short circuit starting motor to avoid accidental operation of the tractor.


	<p><b>Danger:</b> Make sure that rubber protective layer is installed on relay of starting motor.</p>
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图 1-5

- When the tractor is started just now, you shall pay attention to whether there are barriers on road and whether any person is on the tractor and agricultural machine or among trailers or not and shall warn via bell to prevent accidental starting of the tractor and accident danger.
- There is lots of clean space surrounding the tractor for the cab, ROPS and implement.

- The engine cannot be started in sealed space. Area must have adequate ventilation.
- Any paint part cannot be welded or heated. Otherwise, toxic smoke will be emitted. Paint shall be removed before heating parts and these operations shall be conducted in areas with great ventilation.

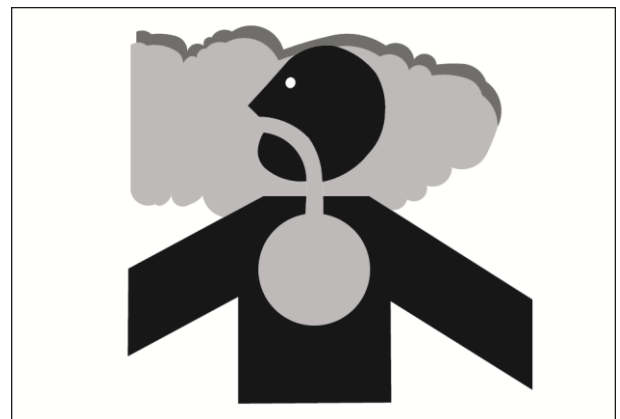


Fig.1-6

- Before filling oil, the engine will be shut off and the starter key will be removed. Oil cannot be filled when the engine is operated.
- Fuel is flammable material, and smoke is strictly prohibited when it is used.
- Smoke is prohibited or it is prohibited to be close to fire source when filling oil and overhauling fuel system.
- The fuel tank cannot be filled top up, and it shall reserve space for fuel expansion.
- Quality of fuel and lubricating oil will be executed strictly in accordance with provisions.
- The machine cannot have accumulated dirt, lubricating grease and fragment. When fuel or engine oil overflows, it will be cleared with clean duster cloth.

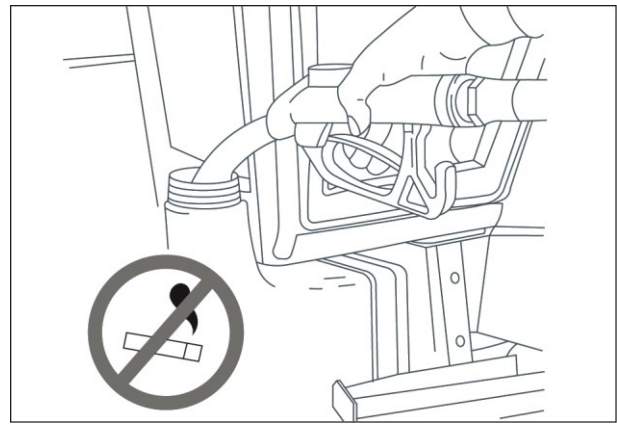


图 1-7



图 1-8

- Driver shall wear tight working clothes, cannot wear large coat and shirt and shall not wear tie, scarf or jewelry when working. If female driver has long hair, must wear her hair in a bun.
- Don't wear earphone to listen to radio or music when operating the tractor.



Fig. 1-8

- Only specific tractor (as per local law) can be equipped with stipulated additional passenger seat. Otherwise, it is prohibit transporting passenger.
- Passenger seat allows one passenger to use under safe condition, but cannot interfere, affect and hinder driver to operate. Children cannot use passenger seat.
- Any one cannot seat on ROPS or fenders.



**Notice:**

Any one cannot climb the machine or other equipment including trailer unless when one person or several persons are harvesting as per special design of specific harvesting machine (it is not applicable for transportation).

- Before leaving the driving seat, three-point linkage device or any implements installed on the tractor will be lifted down. All control devices will be at neutral gear and parking brake will be pulled up, engine will be shut off, the tractor will be at 1st gear (on the tractor with machinery transmission). The key will be removed from the starting switch. If there is the general battery switch, the battery switch will be switched over to “close”.
- When the tractor is under operation, any person cannot be close to the drive axle, hook of the trailer, traction rod, connecting arm, PTO shaft, lifting oil cylinder, belt, pulley and any other moving parts. Make sure that protective and preventive devices are correctly installed on their own positions.
- When the machine is under operation, it cannot be lubricated, maintained, repaired or adjusted. After all rotating machines stop operation, the above operations can be conducted.
- Hands, feet and clothes will be kept away from rotating parts.
- When the tractor is moving, any one cannot get on or off the tractor. When the engine is being operated, any one cannot check and repair underneath the tractor to prevent accident.



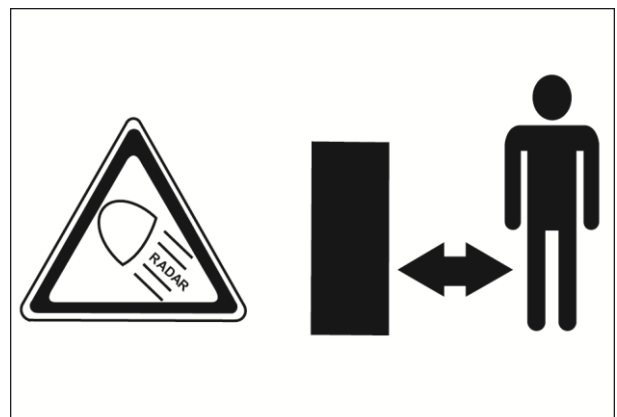
*Fig.1-9*



**Danger:**

Engine should be shut off and ignition key removed when there is independent repair work for cardon shaft and PTO shaft.

- The tractor may be equipped with radar to measure speed to the ground. Radar system will send low strength radio wave. When the radar is under operation, you shall keep away from emission area.



- It will generate flammable spray if heating near liquid pipeline with pressure, which will cause serious burning to yourself or onlookers. Don't heat near pipelines. It is prohibited to use electric welding, gas welding or heat welding torch near pressure liquid pipeline or other flammable materials. Heat radiation from flame will accidentally damage pipelines.



Fig.1-11

- Hands cannot be used to detect oil or check leakage of fuel but wood piece or cardboard. If any liquid of oil, liquid of hydraulic machine or pressure circuit contacts skin, you shall immediately seek for medical care.
- Pressure will be discharged before disconnecting any pressure circuit part.

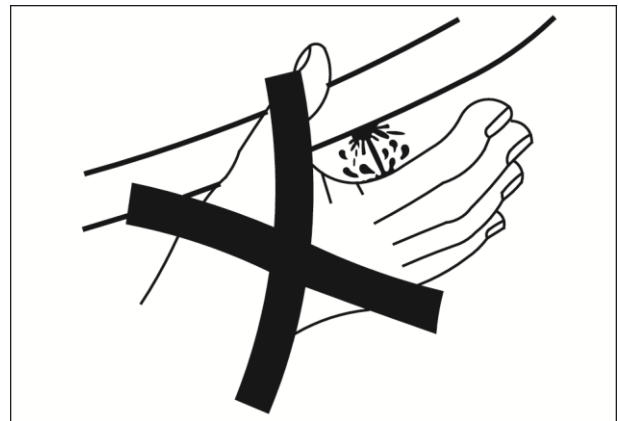



图 1-12

- Avoid contacting pesticide. Tractor that is equipped with cab cannot prevent you from absorbing hazardous pesticide. Please carefully read instructions of the manufacturer about using and disposing pesticide. You must wear necessary personal protective device in the indoor area (respirator, mask and so on).

## 1.4 Accident Prevention and Safety

	<p><b>Notice:</b></p> <p>The manual has provided some figures after removing panel of the tractor or protective device and panel to clarify. Unless these panels and protective devices are correctly installed on their own positions, otherwise, the tractor cannot be used. When repairing the tractor, if necessary, these panels or protective devices can be removed, this will be installed before starting the tractor.</p>
---	---

### 1.4.1 Safety Clothes and Equipment

Wear proper protective clothes and safety equipment when operating.

➤ **You shall be equipped with the following protective articles:**

- ✧ Safety helmet;
- ✧ Protective glasses or mask;
- ✧ Protective glove (chemical products will use polychloroprene, heavy work will use leather);
- ✧ Ear protective device;
- ✧ Mask or filter mask;
- ✧ Waterproof coat;
- ✧ Safety shoes;
- ✧ Reflective clothes.



Fig.1-13

- We suggested installing fire extinguisher and first-aid kit on the tractor for safety.
- When the tractor is engaged in harvesting, threshing and transporting flammable materials in fields, it shall be equipped with fire extinguisher to avoid accidental fire disaster.



Fig.1-14

### 1.4.2 Noise Exposure

The tractor and its auxiliary implement have constituted a noise source. Strength and frequency can be measured by proper instrument.

**Any person who uses the tractor must know:**

- Excessive exposure in sun or long-time noise will cause serious damage for listening and general health. The bigger the noise level, the bigger the exposure is, the bigger the danger will be. Combination of these factors can also be expressed by LEP (personal noise contact level).
- Therefore, you shall know noise level generated by the tractor. Please refer to the chapter of “technical parameters” of the User Manual for more information.
- When the noise level is more than certain value or the tractor has been operated for long time, ear protective device will be used. In general, personal exposure reaches or exceeds 85db, protective measures will be adopted. You can select various protective measures such as earmuff, earphone and helmet.

### 1.4.3 Protective and Safety Equipment

- Make sure that all safety equipment of the tractor is properly installed at their positions. Make sure

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that all protective, preventive and safety signs are installed correctly under good state as per their specifications.

- Some devices are indispensable and required by laws for safety of the tractor in accordance with local provisions.
- Don't remove or dismantle safety device.

➤ **Please check whether the tractor has been equipped with following devices to improve safety of the driver and other personnel:**

- ✧ Seat belt;
- ✧ PTO shaft cover;
- ✧ Rear view mirror;
- ✧ Slow traffic sign, additional protective device, additional lamp and identification;
- ✧ Triangle warning sign for danger.

#### 1.4.4 Check the Tractor and Implement

- Before working, the tractor will be checked to guarantee all devices are under good working state.
- Movement of all pedals shall not be hindered. All pedals must be reset to original position without barrier. Object that will hinder pedal stroke cannot be placed on the floor or underneath the pedal. Rolling or skidding object cannot be placed near the pedal. Additional banquet or other auxiliary pads cannot be placed surrounding the pedal to avoid affecting actions of the pedal and causing accidental danger.
- Check to guarantee that there is not loosening, damaged or lost part.
- ROPS and safety belt will be checked to confirm whether they are damaged or not.
- Damaged protective device and damaged and abraded safety belt must be replaced.
- Make sure that all implements or accessories are installed properly. If it is PTO driven implement, the revolving speed per minute of PTO must be consistent with the revolving speed of the implement.
- Check whether inflation pressure of tire and tire is cracked or expanded or not. Abraded or damaged tire must be immediately replaced.
- Check oil level, if necessary, it will be filled.



**Notice:**


As per what mentioned in the above, oil that is not the same (type or viscosity) cannot be filled.

- Repair and adjustment operations mentioned in the chapter of “repair” of the User Manual will be executed.
- Check performances of traveling and parking brakes. If necessary, parking brake wire will be adjusted or contact your authorized service center.
- Check and guarantee that the cover of PTO shaft has been installed when outputting power.
- Check and guarantee protective devices of all rotating parts are installed and are under good working




state.

- Check hydraulic system of the tractor and implement. If there is any leakage or damaged part, repair or replacement must be conducted.

	<p><b>Notice:</b></p> <p>If fuel or oil contacts skin or eyes under high pressure, it will cause serious injury, blindness and even death. High pressure liquid leakage may be invisible. One hard cardboard or wood will be used to seek for leakage. Don't use your hands! Protective glasses will be used to protect your eyes. If any liquid penetrates into your skin, please immediately consult medical personnel with similar experience</p>
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- Before pressurizing fuel or hydraulic circuit, fastening of connecting point, flexible pipe and connector will be checked. Before disconnecting any fuel or hydraulic circuit part, please guarantee circuit is under pressure decrease state.
- Make sure that all flexible pips are installed correctly.
- Cooling device and system of the engine will be checked. If necessary, it will be filled with coolant.

	<p><b>Notice:</b></p> <p>When the engine is still hot, the cover of the radiator cannot be removed. When it is still hot, the radiator is under pressure, if it is opened, boiling liquid and vapor will overflow, which will cause serious injury to you and surrounding personnel. Before removing the cover of the radiator, the engine should be shut off for cooling the circuit.</p>
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### 1.4.5 Get On or Off the Tractor

You can get on or off the tractor slowly from the driving position with the help of handrail and ladder by facing to the tractor.

To avoid falling down, please keep contacting three points (two hands hold the handrail and one foot stand on ladder or one hand holds the handrail and two feet stand on ladder).

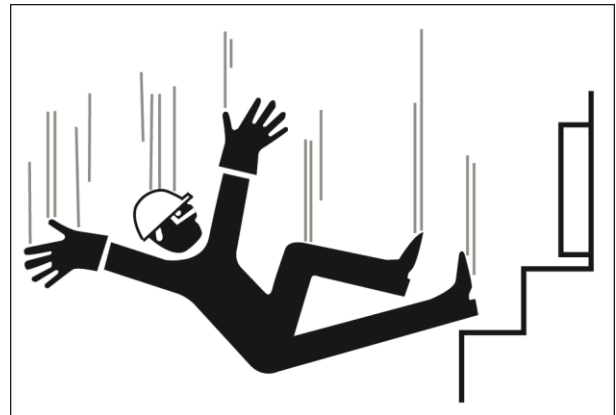


Fig.1-15

- Don't climb via the pedal.
- Don't get on or off the tractor when the tractor is under operation. Until it has completely stopped.
- Unless it is emergent, you cannot jump down from the tractor.

➤ **Before getting off from the tractor, below operations will be executed:**

- Pull up parking brake.
- All control devices will be adjusted to neutral gear (please remember to disengage PTO shaft).
- Three-point linkage and implement which hitching the tractor will be declined to the ground.

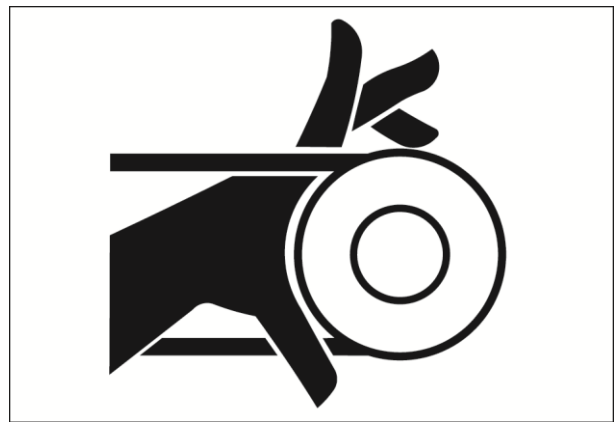
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- Shut off the engine.
  - The tractor equipped with machinery mechanical transmission is adjusted to the first gear; as for the tractor equipped with hydraulic gear box, place wood block under the wheels.
  - The starter key will be removed.
  - Alight from the tractor.

#### 1.4.6 Park the Tractor

##### ➤ Parking of the tractor will be different due to terrain and operation state of the engine

- ◇ Parking when engine is shut off.
- ◇ Parking when the engine is under operation.
- ◇ Park on abrupt inclined surface.

- Please watch out moving parts when getting of the tractor.



*Fig.1-16*

##### ➤ Parking when engine is shut off

- Pull up parking brake.
- All control devices will be adjusted to neutral gear.
- Three-point linkage and implement which hitching the tractor will be declined to the ground.
- Shut off the engine.
- Shift to first gear if the tractor that is equipped with machinery transmission.

##### ➤ Parking when the engine is under operation

- Check to confirm that there is no one surrounding the tractor.
- Check to confirm that the tractor is parked on horizontal ground.
- Pull up parking brake.
- All control devices will be adjusted to neutral gear.

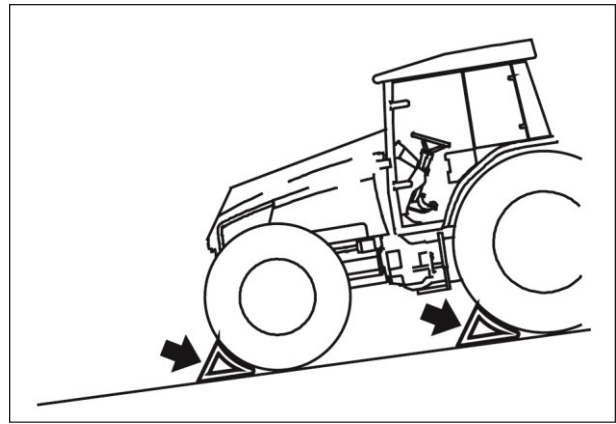
##### ➤ Parking on abrupt inclined surface

Just as what mentioned in the above, tractor will be parked as per position.

If the tractor need be parked on abrupt slope, even if it is just parked for a short time, two wood blocks will be respectively placed under rear and front wheels to prevent the tractor from movement. Suggestion: don't park the tractor on abrupt inclined surface.

In general, the assistant who always stand near tractor will place wood blocks under the pulley.

If there is not such an assistant, the driver must completely activate parking brake before getting off the tractor to guarantee the tractor will not be moved and then stand near the tractor for placing the pad.



*Fig. 1-17*

#### **1.4.7 Clean the Tractor**

- Keep clean under hood and driving seat.
- Clean the step, pedal and ground of the driving seat. Oil and grease will be cleaned. Dust and slurry will be cleaned. Snow and ice will be cleared in the winter.
- All tools, barrels, chains and hooks will be removed.

### **1.5 Operation**

- Don't operate the tractor under influence of alcohol or drug.
- Speed of the tractor must be always adapted to ground conditions. While it is upslope, downslope or crossing the slope, avoid sharp turn. Don't drive at high speed or make a turn with differential lock.
- When driving on inclined slope, the clutch pedal cannot be pressed or gear cannot be shift. It is strictly prohibited to coast downhill with neutral gear or clutch pedal is pressed. When driving on slope, it is strictly prohibited to shift gears to avoid rolling danger.
- The trailer or implement can only be hitched as per stipulated way. Tractor operation, steering and braking performances will be different when hitch implement, trailer or matching ballast. Check will be conducted to confirm whether steering and braking performances are good or not.
- Before starting the engine, all control devices of the tractor will be under neutral gear in order to prevent vehicle from accidental operation or engaging implement which actuated by PTO shaft.
- When drive the tractor to road, let the faster vehicles overtaking. Before steering, direction indicator lamp will be used and speed will be reduced. Guarantee all lamps on the tractor are clean.
- When the tractor works in the evening, lighting equipment will be installed to avoid affecting working effect of the tractor and avoid occurrence of accidents.
- Make sure that trailer without brake cannot be heavier than the weight of the tractor. Braking distance of the tractor will be increased with the increase of its speed, as inertia of traction load has been increased especially on the inclined slope.
- Implements will be connected only by using three-point linkage as per the design. Don't use it as trailer

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hook. Trailer hook in the rear will be used to drag vehicle (front hook-type hook can be only used for emergency). Hook of the trailer in the rear cannot be installed on position that is higher than the rear axle.

- Driving speed must be able to be completely controlled and the tractor can always keep stability. If possible, the tractor will not be operated near ditch, embankment and cave. The speed should be reduced when you drive on inclined slope, coarse, humid, slippery or muddy ground.
- For the sake of safety, it is a good method to adjust to proper low speed gear before driving on the inclined slope.
- When it is cold, don't use diethyl ether to start the engine. Abide by instructions in the paragraph of "starting and stopping of the engine".

### **1.5.1 Starting**

Carefully abide by procedures specified in the chapter of "starting and stopping of the engine" in the manual. The chapter of "starting and stopping of the engine" has described normal starting, low temperature starting and emergency engine starting of additional battery.

#### **Under all situations, before starting the engine:**

- The driving seat will be adjusted according to requirements.
- Fasten the safety belt.
- Pull up parking brake.
- All control handles are at "neutral gear".
- As for tractor equipped with mechanical lifter, position of the rod will be checked.
- In addition to above measures, special attentions will be paid to instructions for indicator lamp and starting liquid.

### **1.5.2 Check the Indicator Lamp**

- After starting, all indicator lamps and instruments will be checked. Check to confirm all equipment is under correct operation.
- If the tractor cannot correctly operate any control operation, it cannot be used until fault has been corrected.

### **1.5.3 Starting Liquid**

When it is cold, the tractor may be equipped with preheating starting; operation procedures are shown in the paragraph of “starting and stopping of the engine”.



*Fig.1-18*



**Danger:**

If the preheater is connected to the electric system, starting liquid cannot be used to start the tractor. If diethyl ether contacts the preheater, it will cause explosion to damage the engine and cause serious injury.

**1.5.4 Auxiliary Equipment**

- Only proper hook or traction mechanism can be used to hang implements and trailer on the tractor. Traction of the implement or the trailer may only be achieved by rear trailer hook (front hook can be only used under emergency situation). Rear trailer hook cannot be located at position higher than rear axle. Three-point linkage can be used only to connect implement, it cannot be used as trailer hook.



**Notice:**

Don't stand or allow others to stand between the tractor and implement, unless the engine is shut off, key is removed from the starting switch, parking brake is pulled up, it is adjusted to first gear and all accessories or implements are declined to the ground.

- As for application for using PTO to drive implement when the tractor is stationary, the transmission is placed at neutral gear, the parking brake is pulled up, and the wood block is leaned against the tire of the tractor and implement. Please refer to the paragraph of “parking tractor” in the chapter of “safety precautions” of the manual for more information about safety operation procedures.
- Don't use extended part of PTO shaft extensions that extended the drive shaft or cardon joint beyond the protection of PTO shield.
- Only use attachments and implements approved by the tractor manufacturer.




**Danger:**

Don't try to disconnect hydraulic connection or adjust implements when the engine is under operation and PTO axle is rotating. It will cause serious injury or death.

- Check that the three-point linkage is adjusted correctly (see paragraph “Adjustment of the three-point linkage”. in the Section “Use of the Tractor”) in order to ensure that a sufficient number of threads are engaged on the threaded couplings.

- When storing and handling chemicals, you shall abide by instructions of the manufacturer. Meanwhile, follow the instructions of the manufacturers of the implements designed for the application of chemical products.
- Before using attachments or implements, read the relative Instruction Manual carefully and follow all the safety instructions.


	<p><b>Notice:</b></p> <p>Implement on front end (with fork or bucket) must be equipped with safety protective device (round bales, rolls of fencing, wire, etc,) to prevent the load from rolling down from the lift arms onto the driving position and crushing the driver arm when it is raised. Objects and loads that are not adequately secured may fall and injure personnel near the tractor.</p>
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- Do not overload an attachment or towed implement. Use the proper ballast weights to maintain the stability of the tractor
- Use the safety chain when transporting implements to prevent them becoming detached from the drawbar. Using the appropriate adapters, attach the chain to the towing hitch support or to another anchor point on the tractor. The chain should have only enough slack to allow cornering. Use chains of suitable size and strength for the weight of the towed implement.
- Make sure that each towable implement is equipped with a safety chain to connect it to the tractor.

### 1.5.5 Towing Safely

For the maximum towable loads, refer to the paragraph “Maximum towable loads in the chapter of “technical parameters”.

- Maintain a suitable speed taking into account the weight of the towed load and the gradient, remembering that braking distances will be greater than with just the tractor. Towed loads with or without brakes that are too heavy for the tractor or that towed at too high speed may cause the operator to loose of control of the tractor.
- Always take into consideration the total weight of the implements and their loads.

	<p><b>Notice:</b></p> <p>When trailers are hitched to the tractor, before you leave the driving seat remember to put all the controls in neutral, pull up the parking brake, shut off the engine, engage first gear (with mechanical transmissions) and remove the ignition key from starter switch. If the tractor is not parked on level ground, ALWAYS place chocks under the wheels of both the tractor and the trailer. For further information on safe working procedures, refer to the chapter “Parking the tractor” in the safety section of this manual.</p>
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- When trailers are hitched to the tractor, before you leave the driving seat remember to put all the controls in neutral, pull up the handbrake, shut off the engine, engage first gear (with mechanical transmissions) and remove the ignition key. ALWAYS chock both the tractor and the trailer wheels.
- The best way to transport a tractor that has broken down is to tow it away on a flat bed truck. Always secure the tractor to the truck with chains. Before transporting the tractor on a flat bed truck or on a railway wagon, make sure that the engine hood, doors, openable roof (if present) and windows are all


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closed and securely fastened. Never tow the tractor at speeds in excess of 10 kph. A driver must stay in the driving position to steer and brake the tractor.

### 1.5.6 Driving on Highway

- Comply with the Highway Code, including regulations concerning speed limits, correct use of lights, hazard warning lights and slow moving vehicle warning signs.
- When driving the tractor on the road, insert the bolt lock to lock the two brake pedals together. This is to ensure effectiveness and bilateral braking.
- Speed will be reduced adequately in advance to avoid accident, rolling and collision when steering and making a turn. The tractor cannot make sudden turn when driving at high speed and it cannot make sudden turn by using lateral braking to avoid rolling danger.
- Lift all implements to their lowest transportation positions and lock at their positions.
- Stop the PTO and the differential lock.
- Use the correct pin for the towing hitch and secure with its locking cotter.
- Make sure that all necessary outline markings and the hazard warning lights (if required by local regulations) are in place and in working order.
- Clean all lights required for road use, front and rear, and make sure they are under normal operation state.
- The SMV (Slow Moving Vehicle) sign, the rotating beacon, flashing lights or other high-visibility equipment must be used in compliance with the statutory rules of the Highway Code.
- Fix the swinging towing hitch in a fixed position using the safety locks. If required by the rules of the Highway Code, affix the appropriate safety warnings to the load.
- Don't use Work light when driving on highway.
- Make sure that the load does not obscure the hazard warning lights or other lights
- The SMV notice must be visibly displayed on the rear of the tractor.
- Please be especially careful when driving on snowy or icy roads.
- You shall strictly abide by safety height allowed for wire, culvert and bridge to avoid accident.
- Guarantee all parts of the machine are solidly fixed to prevent loosening and electric shock when crossing household and industrial electric cables.
- It is strictly prohibited to collide with high pressure wire to avoid electric shock danger under situations of transportation, working and shutdown.

### 1.5.7 Overturning

	<p><b>Notice:</b> Don't disengage the clutch or change gear after starting to drive down a slope.</p>
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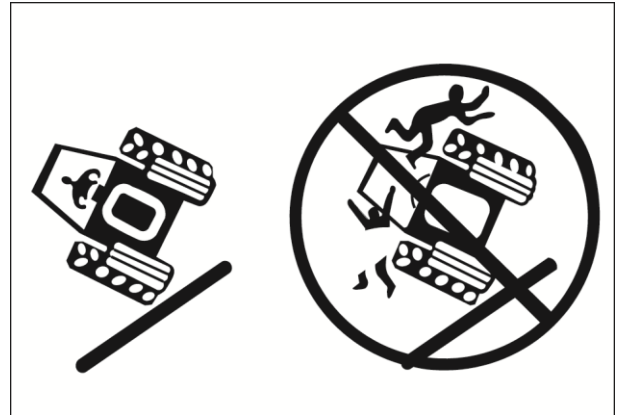


**Notice:**

Never tow implements, trailer or agricultural implement by attaching them to the top link of the three-point linkage. This could cause the tractor to overturn backwards.

For safety reasons, the tractor is equipped with a ROPS (roll bar or cab) and seat belts. Its form is non-foldable ROPS or safe cab and safety belt.

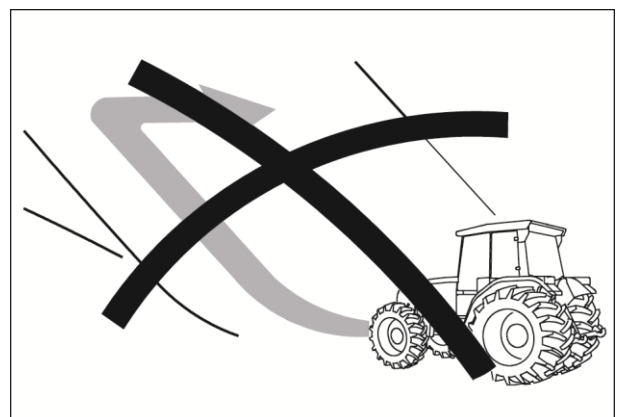
In the event of overturning, grip the steering wheel firmly and do not attempt to abandon the vehicle until it is completely stationary. If the cab doors do not open, leave the driving position through the emergency exit as the decal indicates.



*Fig. 1-19*

**The following measures shall be adopted to prevent possibility of tractor turning over:**

- Adjust the track width to suit the task in hand
- If the tractor is equipped with a front lift, keep the bucket and load as low as possible
- A tractor with a front loader should travel in reverse down a downhill slope and forwards on an uphill slope.
- Speed will be suitable to avoid losing driving control on uneven terrain.
- To avoid rolling over, the tractor will be carefully driven at safe speed, especially when making turn at loose ground, crossing ditch, crossing inclined slope or urgent corner.
- Don't make a turn at the corner at high speed.
- Be very careful when working on abrupt slope.
- Always drive straight up or down slopes, as traversing slopes across the gradient could cause the tractor to overturn
- When going down or up hill (on inclined slope), keep implements as close to the ground as possible.
- An unloaded tractor or a tractor with a rear-mounted implement should tackle uphill gradients slopes in reverse and downhill gradients travelling forwards.



*Fig. 1-20*



- DO NOT freewheel down a slope with the clutch disengaged or the transmission in neutral.
- When carrying out tasks requiring high tractive force, engage 4WD, if available
- Only loads suited to the tractor PTO may be towed, which is shown in the chapter of technical parameters.
- When towing a load at transport speed or in the field, lock the drawbar in the central position and use the safety chain.
- NEVER tow by hitching to the top link of the three-point linkage or from any point higher than the centre of the rear wheels
- Always use the towing hitches approved by the manufacturer and the corresponding lock pins.
- Use front ballast weights to increase the stability of the tractor when towing heavy loads or to counterbalance a heavy rear-mounted implement.
- If the tractor is hitched to a heavy load or a fixed object, improper use of the clutch can cause the tractor to overturn
- If the front of the tractor starts to rise up, reduce speed and, if necessary, disengage the clutch immediately
- Reduce your speed when working on loose or slippery ground and when unseen hazards could be hidden by branches or leaves.
- Don't use the tractor to herd animals.

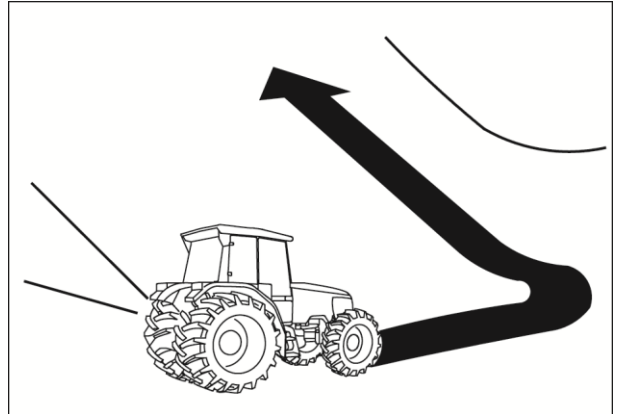


Fig. 1-21

## 1.6 Maintenance and Repair

- Before repair or adjustment, please consult your distributor. What's more, repair work must be arranged by professional technician.
- The tractor cannot work with faults, especially when there is not oil pressure, when oil pressure is too low, when water temperature is too high or when abnormal sound and odor occur. The tractor shall be parked in time for checking and removing faults.
- When lubricating, maintaining and adjusting in fields, the engine shall be shut off.

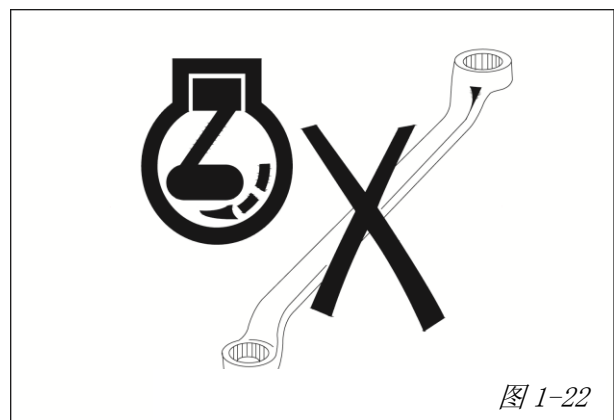


图 1-22

- Don't repair it when the engine is still under operation, when the tractor is still very hot or when the tractor is still under operation.

### 1.6.1 Correct Supporting of the Tractor

- Parts or equipment will be declined to the ground. If the tractor or its part must be lifted up, it will be safely supported.
- Equipment or tractor must be supported with suitable wood or rack. Machine cannot be supported with cinder, (hollow) brick, hollow ceramic tile or other supporting that may be cracked under continuous pressure.
- Don't work under the tractor that is supported by only one jack.

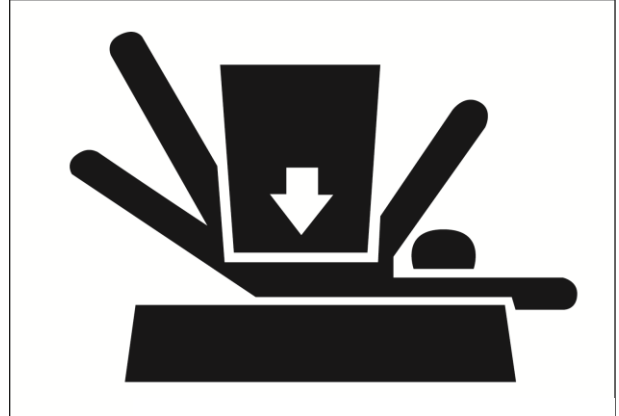


Fig. 1-23

- Before operating the jack, all contents of the User Manual need be read. It is prohibited to be used under overload. It can only be used only on the hard supporting face to prevent personal injury or property loss.
- When using the jack, it will be placed underneath the left and right half axle casings of rear axle and below front ballast bracket; other parts cannot be used to support it.

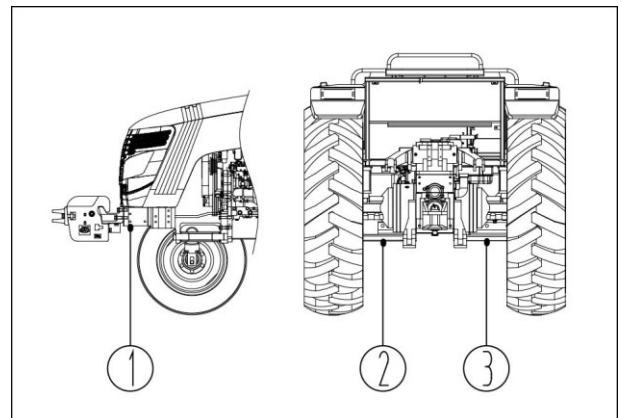


Fig. 1-24

1. Front ballast bracket; 2. Left shaft housing; 3. Right shaft housing.

### 1.6.2 Utilization and Maintenance of Storage Battery

- Gas overflowed from the storage battery may be exploded, so the storage battery cannot be close to open fire (matchstick, lighter or fire of cigarette).
- Electric wire cannot have short circuit and cannot generate spark.
- The storage battery is just used to start the engine and cannot be used for other purposes.

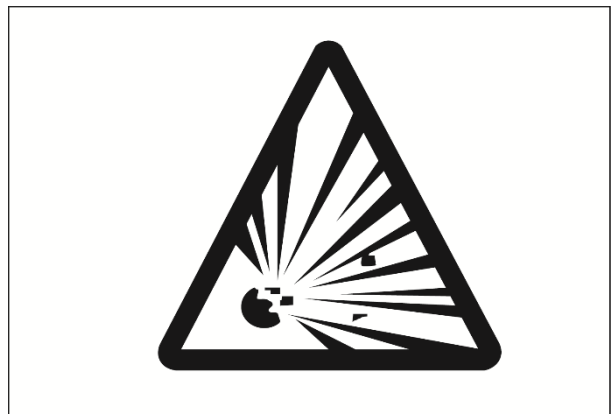
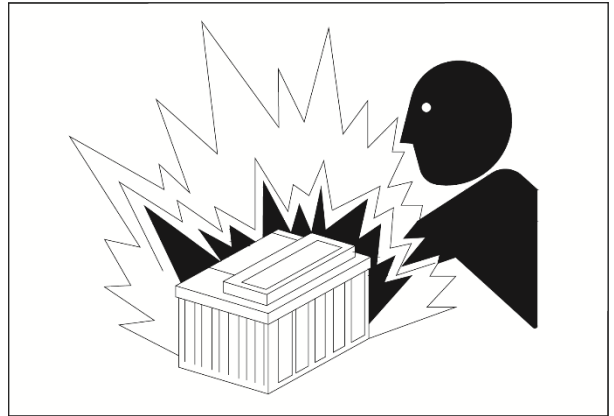


Fig. 1-25

- It is very dangerous to contact electrolyte (dilute sulphuric acid). If eyes, skin and clothes contact electrolyte, they shall be flushed with clean water at once; when they enter into eyes, eyes shall be flushed with clean water and you should see a doctor.

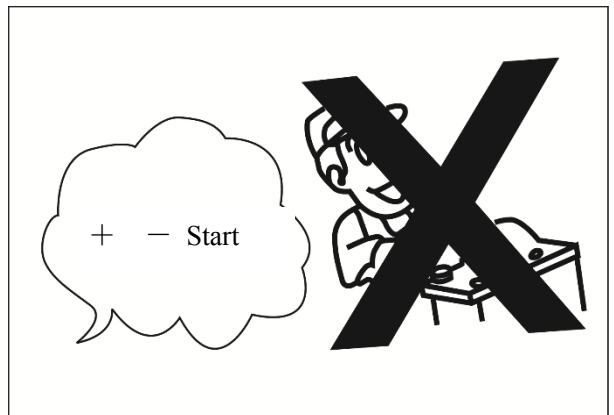
➤ **The following measures will be adopted to avoid injury:**

- ◇ Wear protective glasses and rubber glove.
- ◇ Avoid breathing smoke generated by electrolyte.
- ◇ Prevent electrolyte from splashing or leakage.
- ◇ Use correct parallel starting regulation.



*Fig. 1-26*

- When charging and replacing the storage battery, attention label of the storage battery must be read.
- When removing the storage battery, bond strap of negative pole (-) will be removed at first. After installing the storage battery, the cable of positive pole (+) will be installed at first.
- When charging the storage battery, it must be removed from the machine before charging.
- Before charging, vent hole of the end cover of the storage battery will be checked to confirm whether it is unblocked or not and whether surrounding air is smooth or not.
- Reasonable charging current will be selected as per rated capacity of the storage battery. After charging is completed, charging power supply shall be cut off at first. Then, the cable will be separated from the pole column of the storage battery to prevent spark from detonating the storage battery.
- Don't use battery not specified for the machine.
- Before adjusting or repairing electric system, conductor will be disconnected from binding post of storage battery at negative pole.



*Fig. 1-27*

### 1.6.3 Instructions for Repairing Electrical Parts

- Remove key of the ignition lock.
- Electrical equipment can be repaired after disconnecting the bond strap of the storage battery.
- When the tractor is being repaired by using electric welding, the bond strap of the storage battery must be disconnected, large connection plugs of engine, hydraulic computer controller (if have) will be removed, otherwise, it is easy to damage the storage battery, controller and combined instrument.

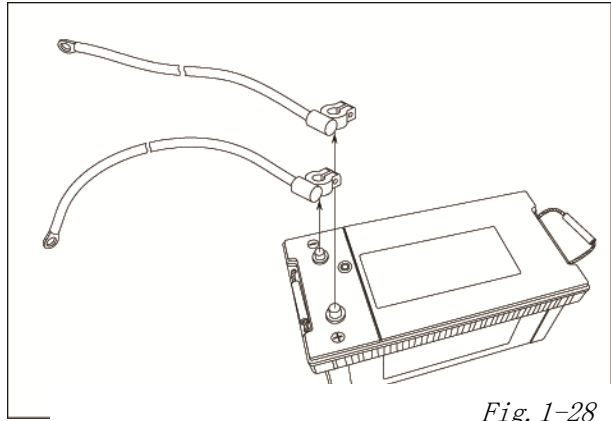


Fig. 1-28

### 1.6.4 Instructions for Repairing Hydraulic Parts

- High pressure hydraulic oil is powerful enough to penetrate and hit hand, eye and skin. Therefore, pressure of the hydraulic system will be discharged before checking and repairing hydraulic pipelines. Then, cardboard or wood plate will be used to check suspicious leakage parts to prevent hands and body from being damaged by high pressure liquid.
- If you are injured by leaked hydraulic oil, you shall immediately seek for medical treatment. If you don't get timely necessary treatment, it may cause serious infection and reaction.

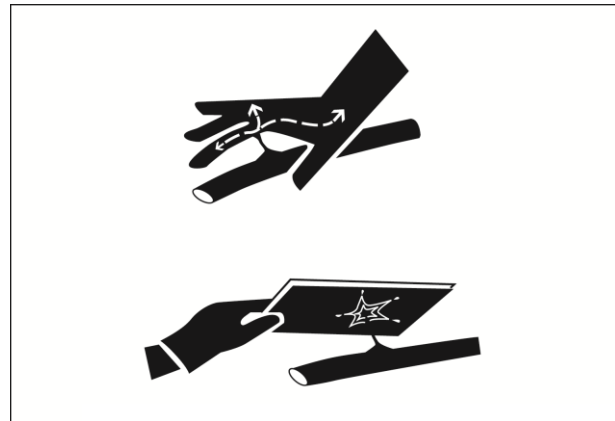


Fig. 1-29

### 1.6.5 Instructions for Repairing Wheel or Wheel Rim Parts

- Tire will be removed before welding or repairing wheel or wheel rim. Under any circumstance, if you don't have necessary equipment or experience for conducting this work under complete safety premise, please contact your authorized service center.
- Tightness of all nuts and bolts will be regularly checked, especially tightening torque of wheel and wheel rim to prevent rolling over, serious injury of operator and excessive damage of machine due to tire falling when the machine is working. Fasten stipulated torque (torque value is shown in the part of "tightening torque of nut /bolt of wheel" of wheel chapter and part of "table of tightening torque of main bolts and nuts" in the appendix chapter).

### 1.6.6 Loosen the Cover of the Radiator

When the engine is still hot, you shall be very careful to loosen the expansion cover of the radiator. After it has been under idle running for several minutes, the engine will be shut off for cooling. Then, remove the cover of the expansion radiator.

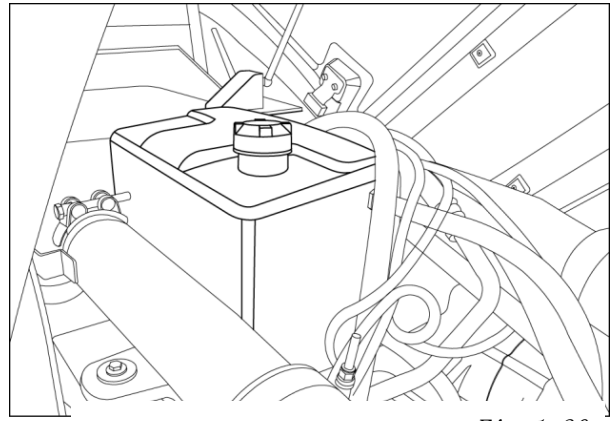


Fig. 1-30



**Notice:**

When clearing radiator, the engine should be shut off and radiator is cooled before clearing to avoid burning accident and damaging radiator.

### 1.6.7 Safely Replace Working Liquid

- Braking oil tank will be regularly checked and the braking oil tank will be filled all the time. Make sure that correctly adjusted, especially when dragging vehicle with traction force.
- Working liquid such as high pressure hydraulic oil, braking liquid and engine oil is dangerous, which will cause serious personal injury.
- The engine should be shut off before you replace working liquid. Smoke and fire are strictly prohibited. When working liquid overflows, it should be cleared with clean dust cloth.
- Replacement of working liquid must comply with liquid specified.
- Working liquid that has been replaced is waste oil, which cannot be discarding arbitrarily.

### 1.6.8 When Replacing Parts or Connecting the Tractor to Other Working Device

- When replacing parts, the engine must be shut off and park the tractor in safe place for replacement.
- Before selecting or replacing parts, please carefully read safety sign and User Manual. If necessary, you can entrust professional personnel to replace.
- When connecting other devices to the tractor, you shall carefully read safety sign and User Manual. If you lack necessary experience, it may cause personal injury. If necessary, you can entrust professional personnel to connect.
- Components with qualified quality must be selected for repairing the tractor to avoid affecting normal lifetime of the tractor.

### 1.6.9 Placement of Waste Oil Liquid and Waste

- Improper disposal of waste oil liquid and waste will threaten the environment and ecology.
- Anti-leakage vessel shall be used to discharge waste oil liquid. It is prohibited to use vessel for storing food and beverage to prevent others from drinking to cause accidental injury.
- It is prohibited to pour waste down to the ground and into water pipe and to discharge waste into other water sources.
- Don't discard waste engine oil, fuel, refrigerant, braking liquid, filter element or storage battery with potential hazards. Please consult local environmental protection department or recycling center to correctly recycle or dispose waste.

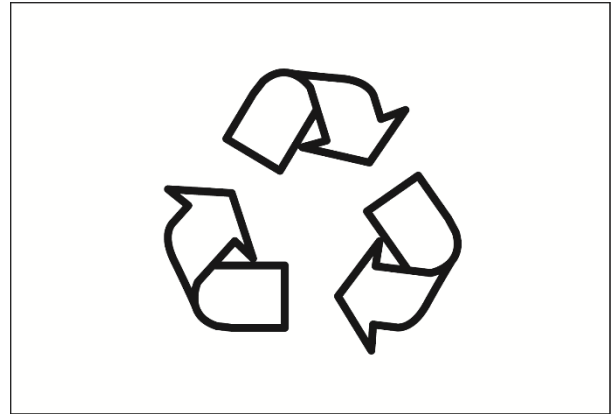


Fig. 1-31

## 1.7 Safety Cab

### 1.7.1 Safety cab

Cab, it is not only the driver's workplace but also part of the whole tractor. The general cab including the windows, doors, cockpit.

The cab provides convenience for the driver's operation and ride comfort to the driver and the passenger, protecting them from invasion of vibration, noise and exhaust gas of the running tractor and from impact of atrocious weather.

Some structural members and devices of the cab help enhance road safety and mitigate consequence of accidents.

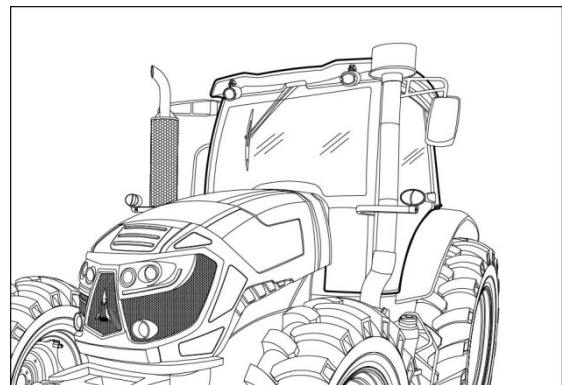


Fig. 1-32



**Notice:**

If the device is damaged or modified, the protection level of the safety cab will be reduced. If the cab has been involved in any rollover accident of tractor or modified in any manner, it shall be replaced immediately.



**Important:**

Perform a comprehensive inspection on the safety cab, driver's seat and all devices of the protection system. All damaged parts must be replaced. Do not attempt to repair or weld the ROPS. Do not make any changes to the safety cab. For example, never drill or weld the cab for installation of any auxiliary device.

### 1.7.2 Emergency Exit

If the cab side door exit is blocked (after an accident, for example, tractor rollover), select a safety exit as shown by the label.

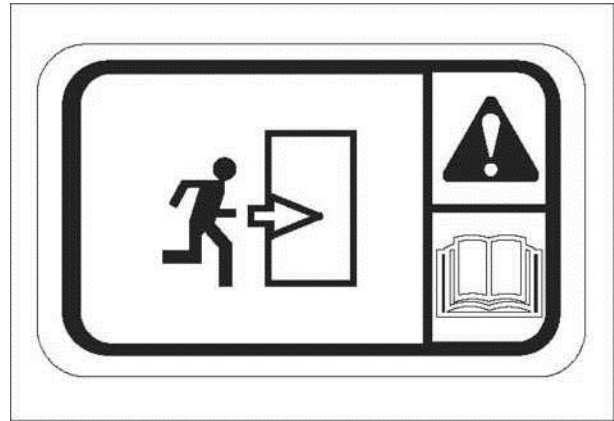


Fig. 1-34

➤ **Possible safety exits are as follows:**

- ✧ Rear window hatch (for all tractors).
- ✧ Windscreen hatch (for tractor with an openable windscreen hatch).

### 1.7.3 Falling Object Protective System (FOPS)

FOPS (Falling object protective system) refers to the device installed on the tractor that is used to reduce risk that the driver may be injured by falling object when normally using the vehicle.



**Danger:**

This tractor is not equipped with FOPS. If work must be conducted in place with the risk that object may fall down from the top to the bottom, you shall consult your dealer before working so that it can install suitable protective devices.

### 1.7.4 Operator Protective System (OPS)

OPS (operator protective system) refers to the protective system installed on the tractor that is used to minimize risk of driver injury as the object enters into operation area.



**Danger:**


This tractor is not equipped with OPS. If work must be conducted in places with object risk after entering into operation position, you shall consult your dealer before working so that it can install suitable protective device on the tractor.

### 1.7.5 Utilization of Hazardous Substances

➤ **The following terminology and definition shall be used:**

- ✧ Hazardous substances: refer to substances that may volatilize dust, vapor and aerosol that are hazardous for drivers when using plant protection product and liquid fertilizer.

- ✧ Dust: refers to general term of splitting, settled and crushed solid air particulates.
- ✧ Aerosol: solid state or liquid state suspended substance or solid state or liquid state particle in gas state substance declined at minor speed (in general, it is less than 0.25 ms<sup>-1</sup>).
- ✧ Vapor: gas state substance, its liquid or solid is not changed under 20° C and 0.1 MPa (absolute).
- Cab, even if it is closed, cannot prevent you from absorbing hazardous substances. If it is recommended in description about utilization of these substances provided by the manufacturer that you shall use personal protective device, you shall also wear these devices even if you are in the cab.

	<p><b>Danger:</b></p> <p>Suitable personal protective device will be used in accordance with requirements of laws and regulations of your country.</p>
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➤ **Classification of cab is as follows:**

- ✧ Category 1 : cab cannot prevent hazardous substance;
- ✧ Category 2: the cab just prevents dust;
- ✧ Category 3: the cab can prevent dust and aerosol;
- ✧ Category 4: cab can prevent dust, aerosol and chemical vapor.
- Cabs installed on this kind of tractor are classified as below in accordance with provisions of ISO 14269-5:
  - ✧ The engine is operated at the rated speed.
  - ✧ Maximum air flow absorbed from outside of the cab (circulation is under closure state).
  - ✧ Maximum speed set for the fan.

Cab/Rolling Over Protective System	DF1404/DF1554/DF1704
Protection type of hazardous substance (cab)	2

### 1.7.6 Avoid Contacting Insecticide

- The cab cannot prevent hazardous insecticide even if it is closed. If it is recommended in description about utilization of these substances provided by the manufacturer that you shall use personal protective device, you shall also wear these devices even if you are in the cab.
- Before leaving the cab, you shall wear personal protective devices listed in the description about utilization of these substances.
- Before entering into the cab, all dirty clothes and shoes will be removed to keep the interior clean.

## 1.8 Stop and Dispose the Tractor

### 1.8.1 Stop the Tractor

When the tractor cannot work normally, it will be transferred to a suitable place and it will stop operation. A clear and visible tag will be placed on it to remind shutdown state.

### 1.8.2 Stop and Dispose the Tractor

➤ **The tractor includes:**

- ✧ Liquid (hydraulic system, cooling system, and so on)
- ✧ Gas (air conditioning system, storage battery, and so on)
- ✧ Acid (battery)
- ✧ Machinery heavy part.



**Warning:**

The tractor must be dismantled by authorized and qualified company.

If you want to purchase new tractor, please directly give the tractor to the distributor.

Organization receiving the tractor (license, log and qualification certificate or supplementary document of the owner) must issue a certificate that relevant user will be exempted from liability when entrusting the tractor (penalty or accident) in accordance with laws of some countries. Document must demonstrate authorized detailed materials of the tractor.

The tractor is composed of iron, aluminum and plastic parts. Most of materials can be recycled. Therefore, scraping procedure includes material classification, reusing or differential disposal.

**Important:**

Materials of the tractor are not toxic or hazardous; therefore, they can be treated before adopting preventive measures.

**Notice:**

Lubricant and fuel must be disposed in accordance with environmental protection regulations.

**Notice:**

Suitable tools and lifter will be used in accordance with relevant regulations and laws.

## 1.9 Safety Warning Sign



**Notice:**

Safety warning sign shall be kept clear and visible. If it is polluted, it can be washed with soapy water and scrubbed with soft cloth.



**Notice:**

When safety sign is lost or is not clear, it will be replaced in time by contacting sales department or manufacturer.



**Notice:**

If components with safety warning sign need be replaced, the safety warning sign shall also be replaced when replacing the component.



**Notice:**

Contents reminded in the safety warning sign are involved in personal safety, which must be strictly executed.

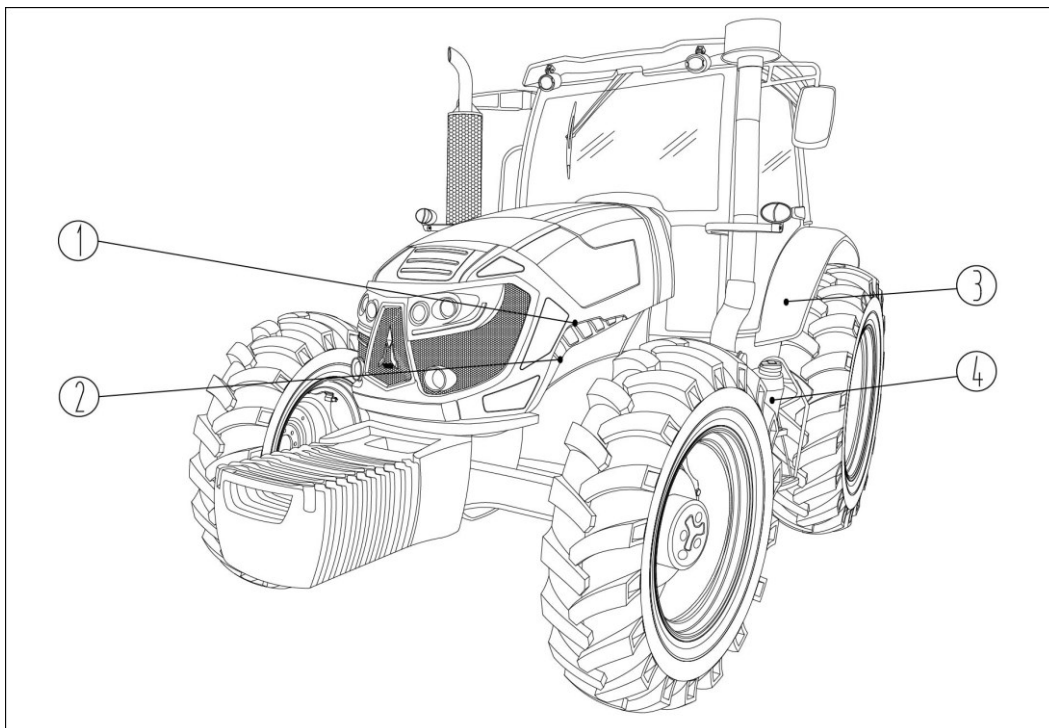


Fig.1-34

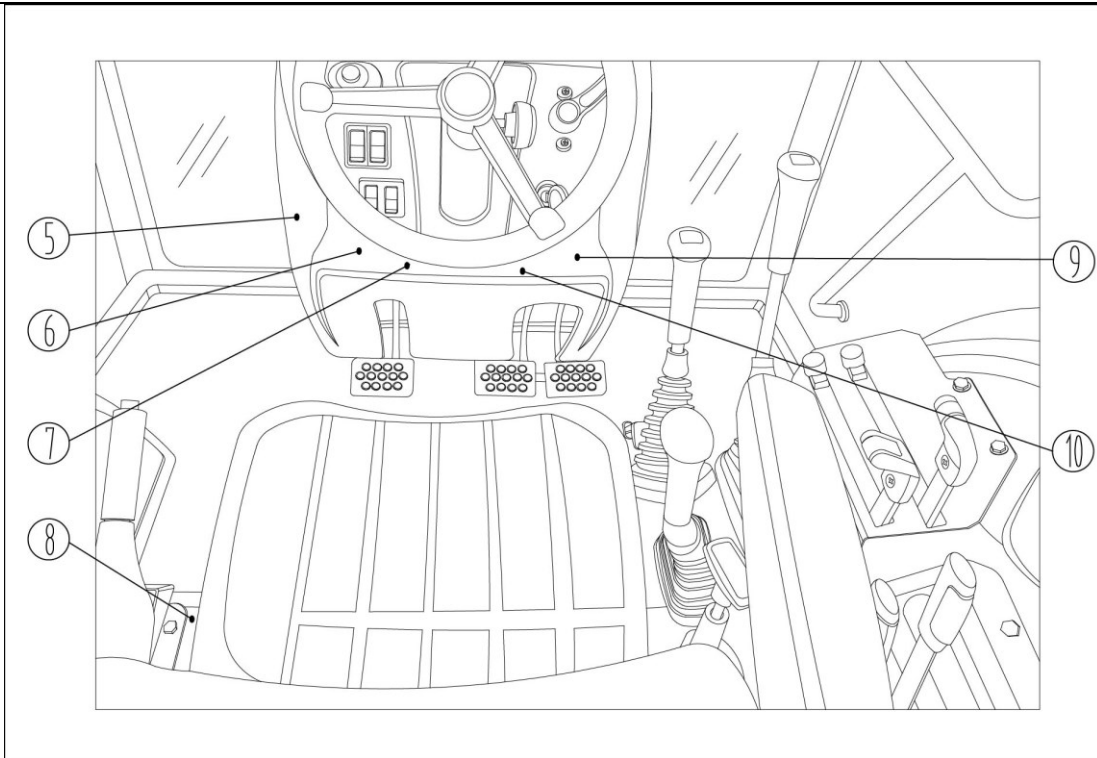


Fig.1-35

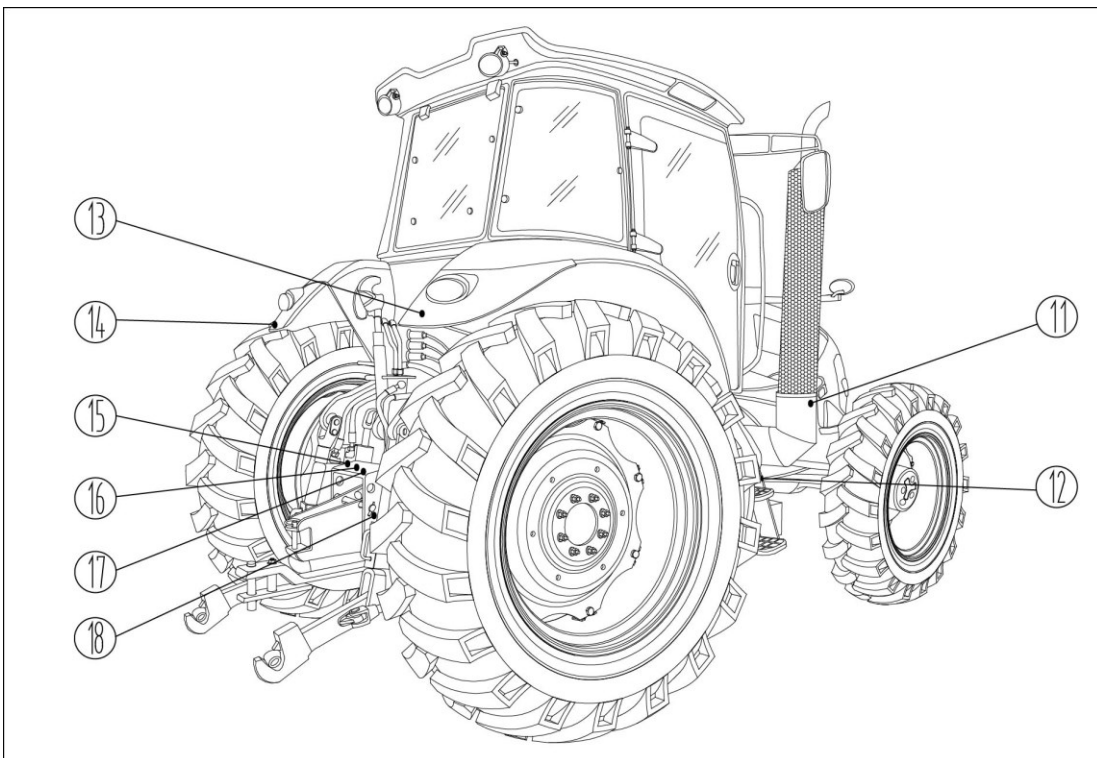



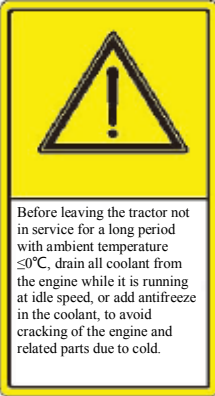
Fig.1-36

1. Position: On protective cover of the generator


Name	Meaning	Images
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<p>Safety warning label VII</p>	<p>When the engine is working, don't open or dismantle safety protective cover and don't put your hands into working area to prevent personal injury.</p>	
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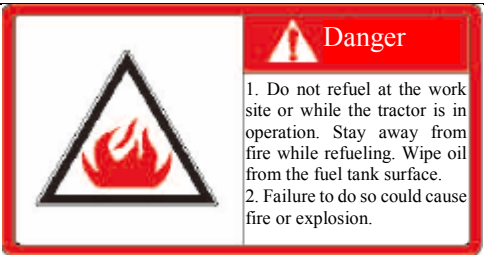
3. Position: On radiator

Name	Meaning	Images
<p>Cooling system label</p>	<p>Drain all coolant from the engine before leaving the tractor not in service for a long period with ambient temperature <math>\leq 0^{\circ}\text{C}</math>.</p>	 <p>Before leaving the tractor not in service for a long period with ambient temperature <math>\leq 0^{\circ}\text{C}</math>, drain all coolant from the engine while it is running at idle speed, or add antifreeze in the coolant, to avoid cracking of the engine and related parts due to cold.</p>


4. Position: In the front and rear of left and right wheel covers

Name	Meaning	Images
<p>Label against riding on fender</p>	<p>Do not ride on a non-occupant position in the tractor, so as not to obstruct the driver's view and cause injury.</p>	


4. Position: Near the filler port of fuel tank

Name	Meaning	Images
<p>Label indicating caution against fire while refueling</p>	<p>See the right figure.</p>	 <p><b>Danger</b></p> <ol style="list-style-type: none"> <li>1. Do not refuel at the work site or while the tractor is in operation. Stay away from fire while refueling. Wipe oil from the fuel tank surface.</li> <li>2. Failure to do so could cause fire or explosion.</li> </ol>


5. Position: Near the electrical box

Name	Meaning	Images
Fuse safety Position:	To prevent damage to electrical components or fire hazard, install fuses in strict accordance with applicable requirements.	 <p>To prevent damage to electrical components or fire hazard, install fuses in strict accordance with applicable requirements.</p>

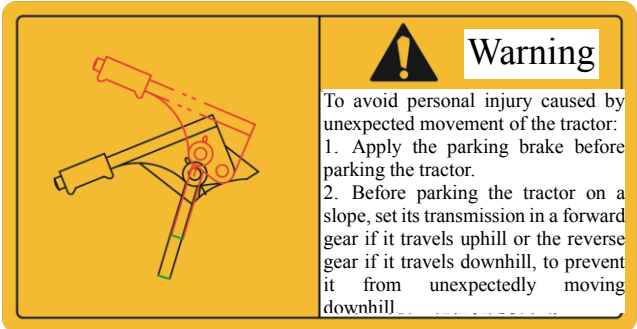
6. Position: Front face of the instrument panel

Name	Meaning	Images
Label for safety fluid levels in steering fluid tank and braking fluid tank	Before performing field work, check carefully the fluid level in the steering fluid tank.	 <p>Before performing field work, check carefully the fluid levels in the braking and steering fluid tanks. Add fluid if remaining fluid is insufficient.</p>


7. Position: Front face of the instrument panel.

Name	Meaning	Images
The reminder for reading the specification	Please read the operation manual and understand meanings of safety identifications without character to avoid personal injury.	


8. Position: Near the hand brake handle

Name	Meaning	Picture
Identification of hand brake	Position of hand brake	 <p><b>Warning</b></p> <p>To avoid personal injury caused by unexpected movement of the tractor:</p> <ol style="list-style-type: none"> <li>1. Apply the parking brake before parking the tractor.</li> <li>2. Before parking the tractor on a slope, set its transmission in a forward gear if it travels uphill or the reverse gear if it travels downhill, to prevent it from unexpectedly moving downhill.</li> </ol>


9. Position: Front face of the instrument panel

Name	Meaning	Images
Safety warning label I	Before repair, maintenance and adjustment, the engine shall be shut off at first, starter key shall be pulled out and operation will be conducted in accordance with requirements of the operation manual to avoid personal injury.	

10. Position: Front face of the instrument panel


Name	Meaning	Images
Label for safe startup	To start the engine, the driver must in the driver's seat. To avoid personal injury, never start the engine by short-circuiting the starter.	

11. Position: Outside the silencer


Name	Meaning	Images
Label indicating caution against scald caused by high temperature (small)	You shall keep away from the heat surface of the machine when it is working to prevent personal injury.	

12. Position: On fixing plate of oil suction filter


Name	Meaning	Images
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Suction filter maintenance label	Clean the suction filter according to requirements. Check for damaged filter element and ring seal. Replace them promptly if any damage.	 <p data-bbox="1075 174 1326 421">Maintenance of suction filter Clean the tractor for the first time when cumulative operation time reaches 125h. Thereafter clean the tractor once every 500h of cumulative operation. While cleaning the tractor, check for damaged filter element and ring seal. Replace them if any damage.</p>
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13. Position: In the rear of left or right wheel covers

Name	Meaning	Images
Safety warning label III	When the lifter working, keep a distance from the tractor. Otherwise crush accident could occur!	

14. Position: In the rear of left wheel covers

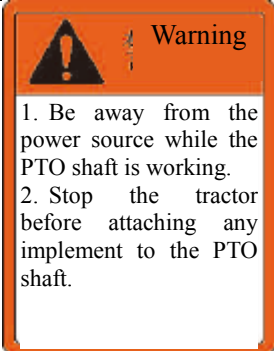
Name	Meaning	Images
Safety warning label II	Keep a safe distance from the tractor to avoid personal injury.	

15. Position: On the guard of PTO shaft

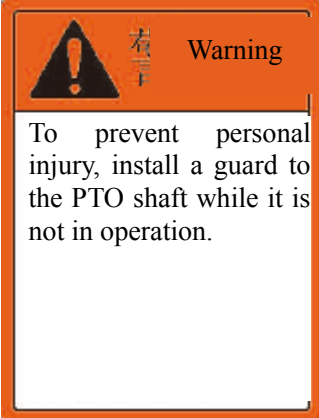
Name	Meaning	Images
PTO safety label II	Only when all parts of the tractor completely stop running can you contact the tractor so as to avoid personal injury.	

16. Position: Upper of the guard of PTO shaft

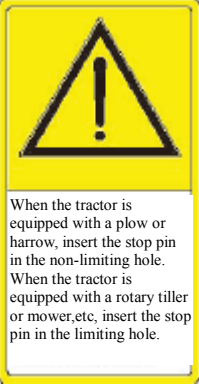
Name	Meaning	Images
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PTO safety label	Be away from the power source while the PTO shaft is working. Stop the tractor before attaching any implement to the PTO shaft.	
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17. Position: Near the PTO shaft

Name	Meaning	Images
PTO safety label III	See the right figure.	

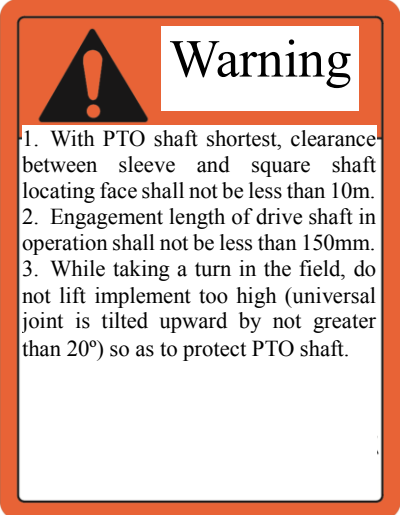
18. Position: On the left stop rod

Name	Meaning	Images
Stop pin safety label	Instructions for the stop pin mounting position	

19. Position: Behind the rear fender

Name	Meaning	Picture
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<p>PTO safety label IV</p>	<p>PTO warning label</p>	 <p><b>Warning</b></p> <ol style="list-style-type: none"> <li>1. With PTO shaft shortest, clearance between sleeve and square shaft locating face shall not be less than 10m.</li> <li>2. Engagement length of drive shaft in operation shall not be less than 150mm.</li> <li>3. While taking a turn in the field, do not lift implement too high (universal joint is tilted upward by not greater than 20°) so as to protect PTO shaft.</li> </ol>
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## **2- Product Mark**

## 2.1 Tractor Nameplate

The product nameplate is an important effective identification mark of a tractor, it is located on the left side of instrument panel, and the service staff will check the product nameplate before services, so please keep the product nameplate clear and safe in place.

		® 轮式拖拉机	
		Wheeled Tractor	
产品型号	<input type="text"/>	标定功率 (12小时)	<input type="text"/> kW
Model		Rated Power (12h)	
产品代号	<input type="text"/>	最小使用质量	<input type="text"/> kg
Code		Minimum Operation Mass	
出厂编号	<input type="text"/>	生产日期	<input type="text"/>
No.		Production Date	
产品执行标准	<input type="text"/>		
Standard			
道依茨法尔机械有限公司 Deutz-Fahr Machinery Co., Ltd. 厂址: 山东省临沭县经济开发区 Add: Economic Development Zone of Linshu County, Shandong Province, China			

Fig.2-1

## 2.2 Engine Nameplate

The product nameplate is an important effective identification mark of a tractor, it is located on the left side of instrument panel, and the service staff will check the product nameplate before services, so please keep the product nameplate clear and safe in place.

① Engine nameplate.

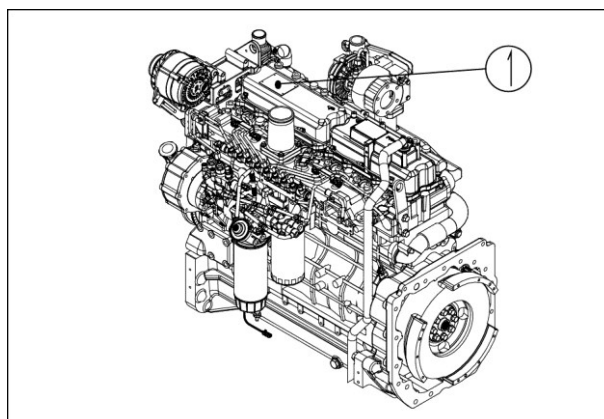


Fig.2-2

## 2.3 Engine No.

The engine model is an identification code prepared for a certain batch of the same products by the engine manufacturing enterprise in accordance with the relevant regulations and enterprise/industry practices as well as the engine properties for indicating the engine manufacturing enterprise, specifications, performance, characteristics, technology, use, product batches and other relevant information. Such as fuel oil type, number of cylinders, displacement and static braking power.

It is located under the tractor hood, behind water drain filter. As shown in the figure ①.

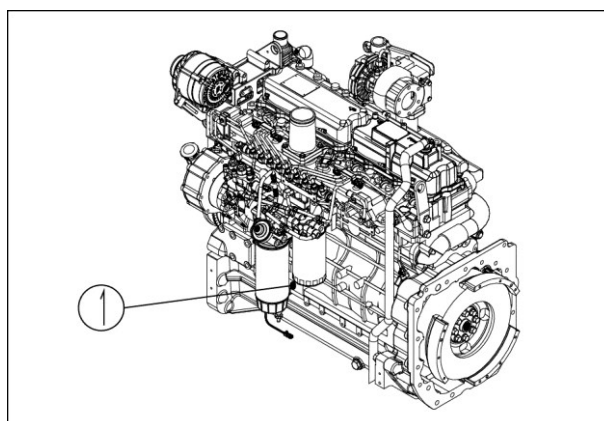
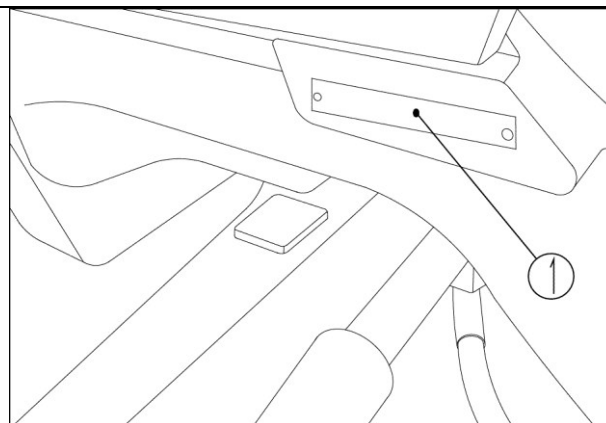


Fig.2-3

## 2.4 Complete Model and Factory Number

Before a tractor is delivered, its complete model and factory number are carved on the left of the front axle support, specifically as shown in the figure ①.



*Fig.2-4*

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---

## **3- Product Description**

### 3.1 Tractor External view



Fig.3-1

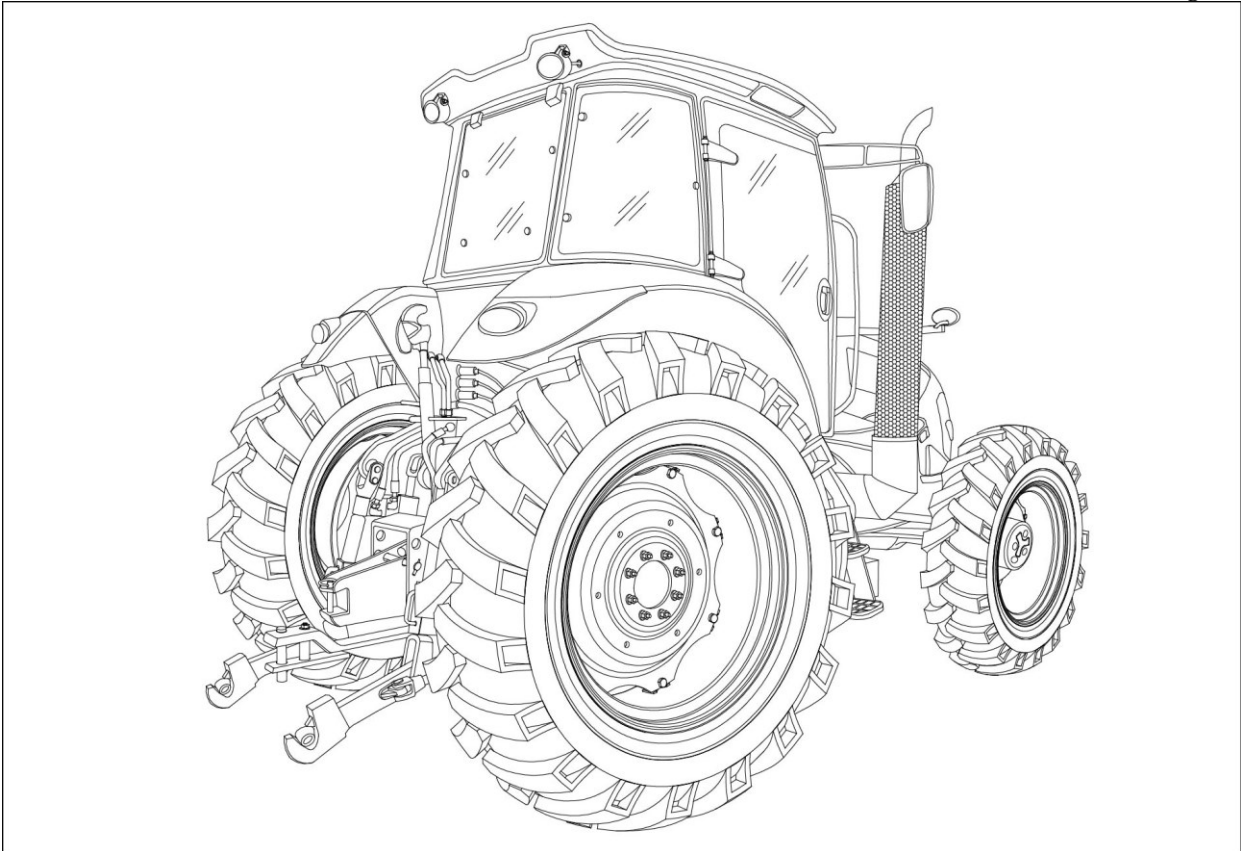

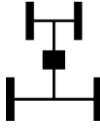


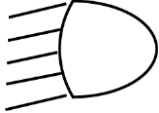




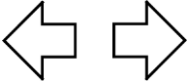











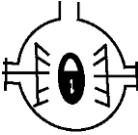

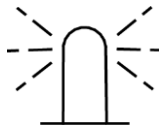


Fig.3-2

### 3.2 Common Identifiers

Table 3-1

Symbol	Meaning	Symbol	Meaning	Symbol	Meaning
	Safety alert symbol		Four wheel drive		Horn
	High beam lamp		Low beam lamp		Fast
	Engine oil pressure		Battery charging status		Slow
	Steering indicator		Washer		Position light
	Engine warm-up		Rear wiper		Windscreen wiper
	Air filter clogging alarm		Transmission oil clogging		Air brake failure fault / Hand Brake
	Engine coolant temperature		Fuel level		Parking brake
	Differential lock		Hazard indicator light		Warning lamp

### 3.3 Product Descriptions

This user manual introduces the use, maintenance, adjustment and troubleshooting, etc. of the FL1804-2004-2204 wheeled tractors.

FL1804-2004-2204 series wheeled tractor is a large-size agricultural wheeled tractor with multiple functions. This machine is characteristic of compact structure, convenient control, flexible steering, large traction force, wide application and convenient maintenance and repair.

### 3.4 Hood

#### 3.4.1 Appearance of Engine Hood

The tractor hood adopts elegant-appearance stream-line sheet metal structure.

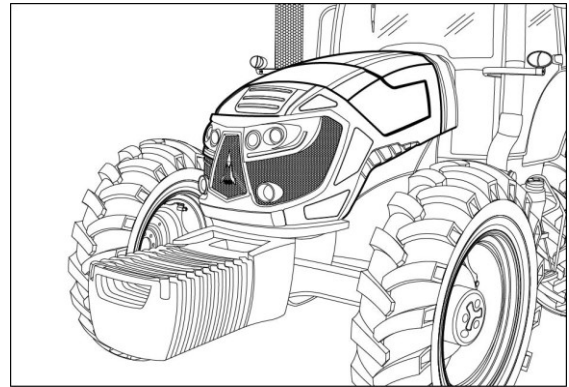


Fig.3-3

### 3.4.2 Lift the Engine Hood

Press the handle for hood lock of front engine hood. Engine hood will lift automatically when it is lifted lightly by hand.

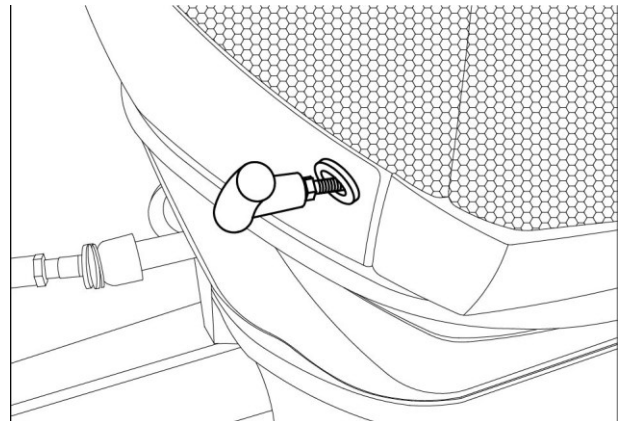


Fig.3-4

### 3.4.3 Close the Engine Hood

Engine hood shall be pressed down until the separation blades are engaged when you want to close engine hood.

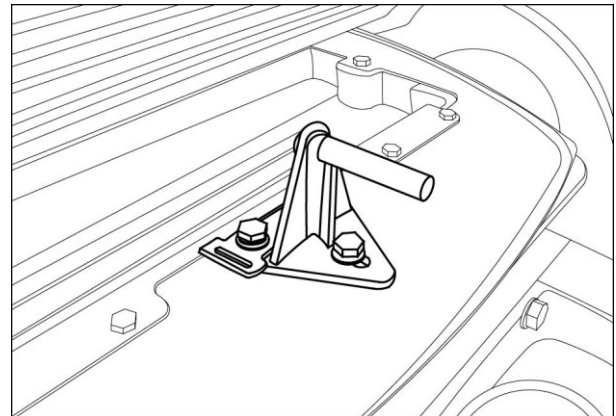


Fig.3-5

## 3.5 Tractor Control Mechanism

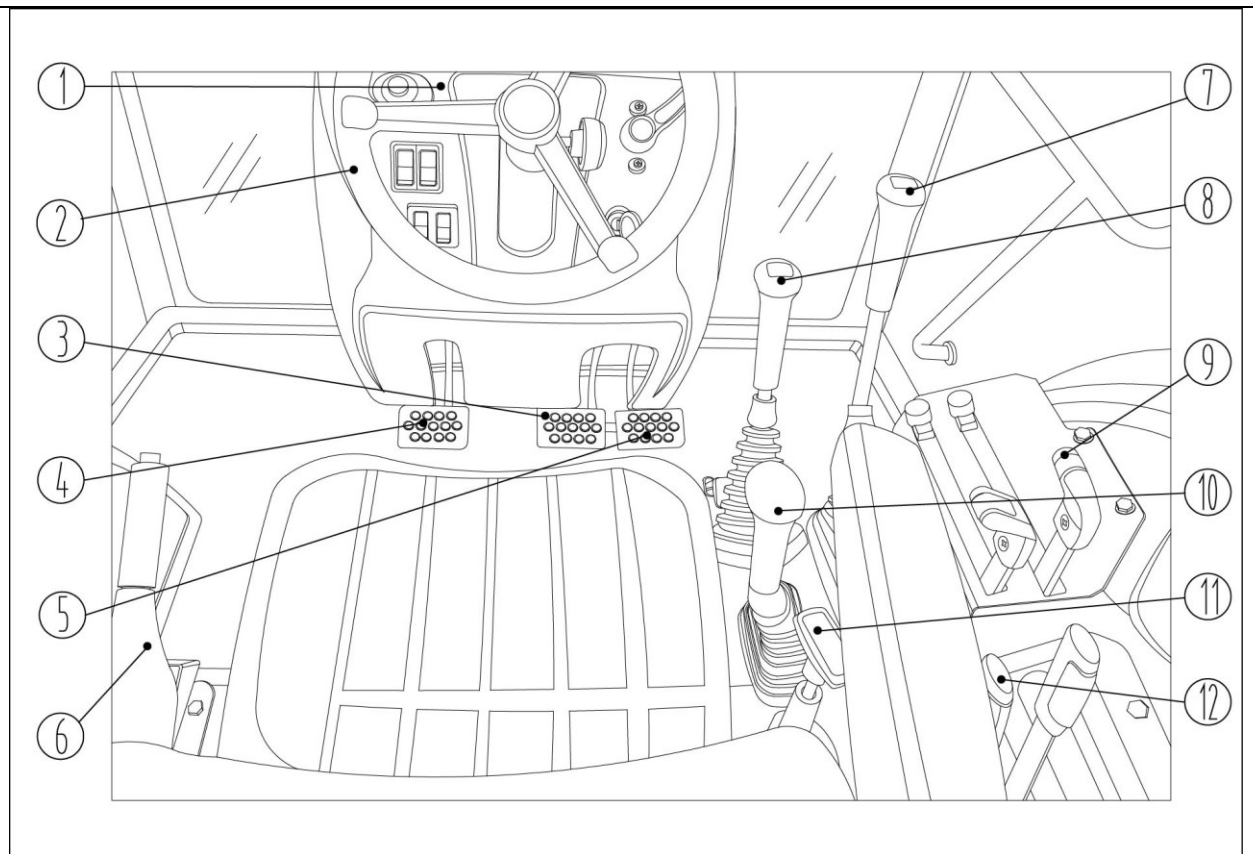


Fig.3-6

Figure: Handle and pedal of control mechanism

- |  |                                   |                                |                               |
|--|-----------------------------------|--------------------------------|-------------------------------|
| 1. Instrument panel instrument and switch; | 2. Steering wheel                 | 3. Left brake pedal;           | 4. Clutch pedal;              |
| 5. Right brake pedal;                      | 6. Parking brake                  | 7. Range shift control handle; | 8. Main shift control handle; |
| 9. Lifter control handle;                  | 10. High /Low gear control lever; | 11. Rear PTO control handle;   |                               |
| 12. Multi-way valve control handle         |                                   |                                |                               |

### 3.6 Instrument Panel

The tractor electric control switches and combination instruments are all installed on the instrument panel , which mainly serves as support of the control switches and decoration seal.

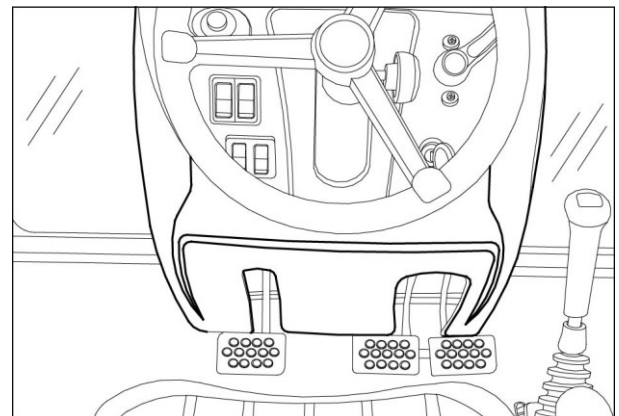


Fig.3-7

### 3.7 Steering Wheel

The steering wheel is located as shown in the figure.

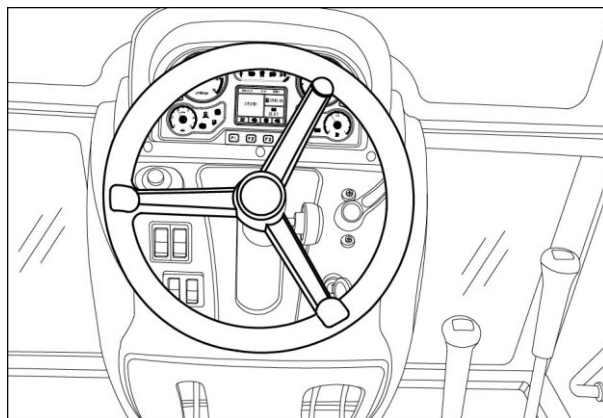


Fig.3-8

### Adjustment of steering wheel



**Danger:**

Do not adjust steering wheel during the process of driving the tractor. The steering wheel shall be checked for firm fixture only when the engine is shut off.

The steering column is retractable, which allows the adjustment of height of steering wheel.

Rotate the rotary knob in a counterclockwise direction to loosen the steering column, then to adjust the height. Fix the steering column to appropriate height, then rotate rotary knob in a clockwise direction to lock the steering column.

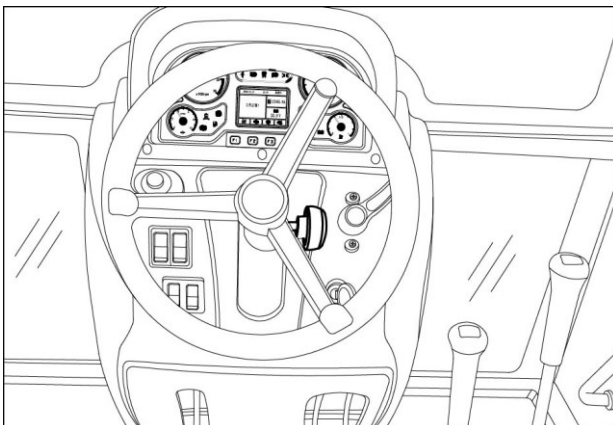


Fig.3-9

## 3.8 Instrument and Switch

### ➤ Instrument panel instrument and switch

1. Combination instrument assembly
2. Horn switch
3. Direction indicator (Turn left, right)
4. Headlamp combination switch
5. Combination switch one
6. Hand throttle
7. Combination switch two
8. Ignition switch

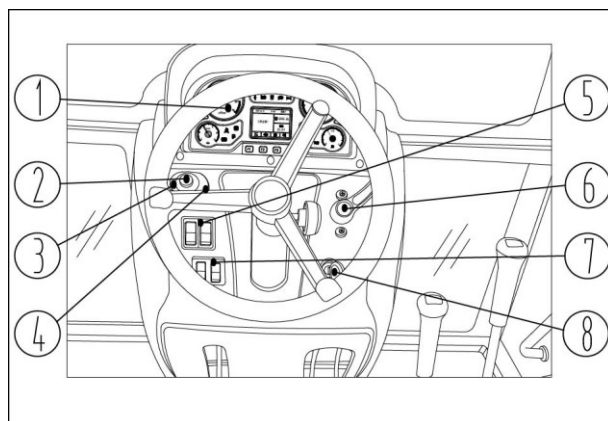


Fig.3-10

### 3.8.1 Combination Instrument Assembly

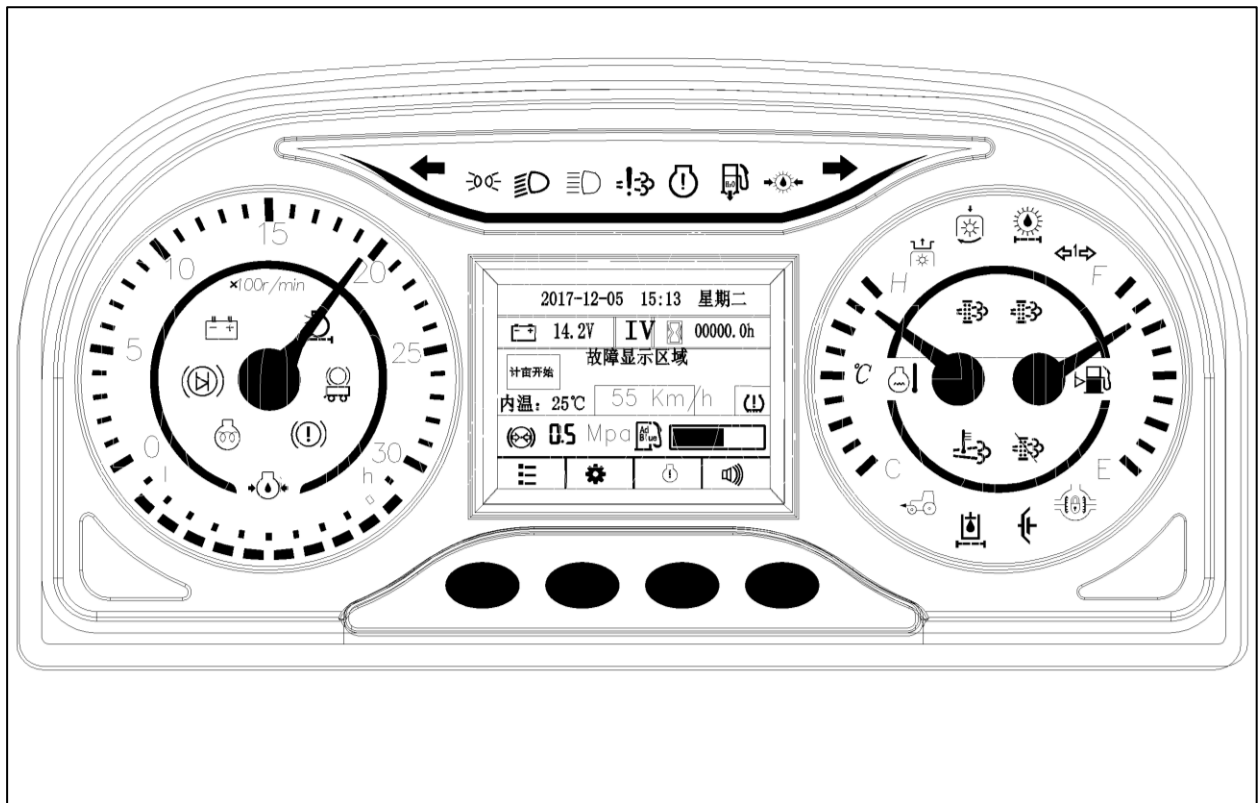




Fig.3-11

- |                              |                        |                    |                        |
|------------------------------|------------------------|--------------------|------------------------|
| 1. Engine tachometer         | 2. Oil pressure gauge; | 3. Command buttons | 4. Performance monitor |
| 5. Coolant temperature gauge |                        | 6. Fuel gauge      |                        |

The combination instrument includes fuel gauge, tractor speedometer, engine speed recorder, coolant temperature gauge, as well as direction indicator light, high beam light, charging alarm light, engine lubrication pressure warning light and other indicating and warning devices, which are helpful to monitoring the working conditions of the whole vehicle.

	<p><b>Notice:</b></p> <p>While the tractor is working, the driver should always pay attention to the various instruments and indicator lights, and if any abnormality occurs, stop it immediately for maintenance.</p>
---	--

	<p><b>Important:</b></p> <p>Indicator lights of tractor listed below may be unusable. For more information, please consult retailer or manufacturer.</p>
---	--

#### 3.8.1.1. Fuel Gauge

A fuel gauge⑥shows the amount of fuel left in the tank with a scale.

The pointer points to the green area, indicating that the tank is full of fuel; The pointer points to the red area, indicating that the tank is less than a quarter full.

In the use of tractors, if no oil or insufficient oil is found, the pointer is still in the green area, indicating that the oil sensor or oil gauge short circuit fault; When the tank is full, the pointer is still in the red area, indicating that the oil sensor or oil gauge has broken down and should be repaired.

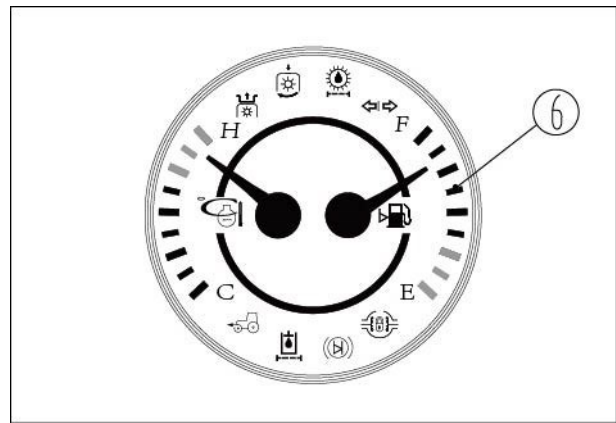


Fig.3-12



**Warning:**

Do not use up the fuel in fuel tank. The air in fuel injection equipment shall be discharged if the tractor engine stops for empty tank.

**3.8.1.2. Engine tachometer**

The engine tachometer is located at the upper left of the dashboard, showing the engine speed (unit: rpm).

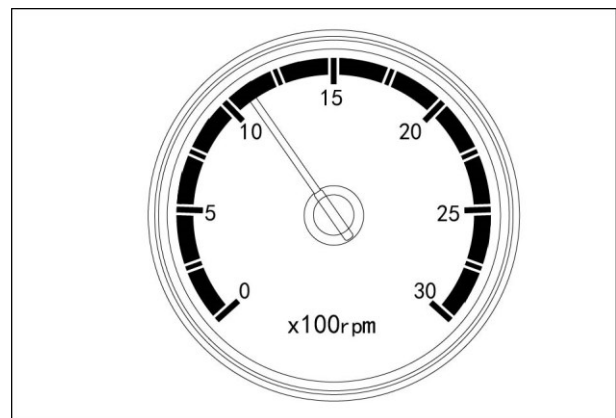


Fig.3-13

**3.8.1.3. Oil pressure gauge**

The oil pressure gauge ② indicates the pressure value of the oil supply and injection system.

The needle points to the left area, indicating that the pressure oil is too low. The needle points to the right area, indicating high oil pressure.

Oil pressure abnormal has great influences on engine work, which may cause faults like difficulty in starting, unable to start, hard to accelerate, bad acceleration, short of power, unstable idle speed, backfire, high fuel consumption, black smoke, jitters etc.

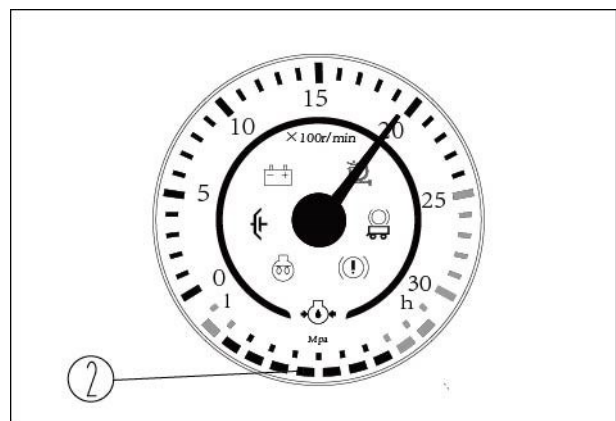


Fig.3-14



### 3.8.1.4. Overall timer

The timer shows the performance period of engine.

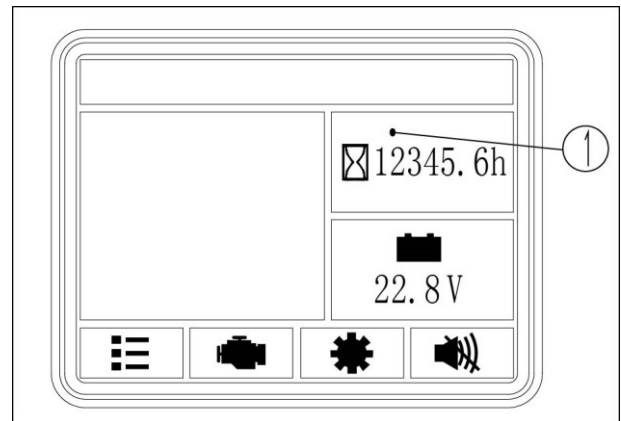


Fig.3-15

### 3.8.1.5. Coolant Temperature Gauge

The swivel plate shows the temperature of engine coolant.

**The loop line shows the temperature of refrigerant:**

1. The white part indicates normal operating temperature.

2. The red part means high temperature appears (engine is overheating).

Do not accelerate cold engine directly to maximum speed. Wait until it reaches normal operating temperature (the pointer moves to the green area).

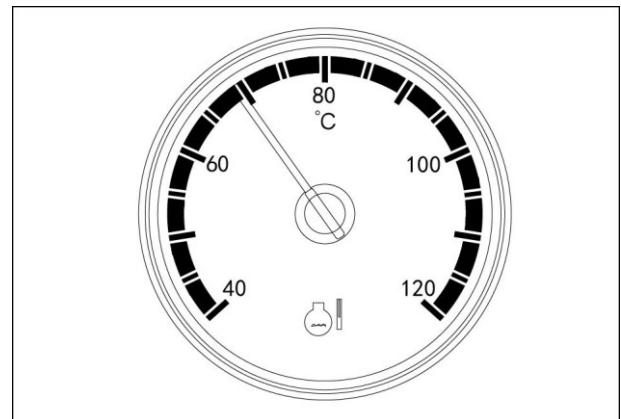
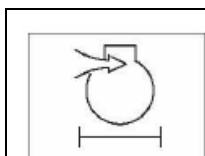


Fig.3-16

	<p><b>Warning:</b> Shut off the engine immediately if the pointer moves to the red zone.</p>
--	--

### 3.8.1.6. Indicator

1. Air filter clog warning light-red



Lights up - the air filter is blocked and shall be cleaned.

2. Engine warm-up indicator - red



Lights up – it means engine pre-warming is started.

### 3. Charging warning light- red



It will light up when ignition key is inserted, and will light off when engine is started (during operation of engine).

If the indicator lights up during operation of engine, please check whether the alternating-current generator driving belt is broken, or contact the Customer Service Center.

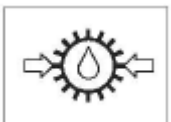
### 4. Engine lubrication pressure warning light -red



It will light up when ignition key is inserted, and will light off when engine is started (during operation of engine).

If the indicator lights up during engine operating, please shut off the engine immediately and contact the Customer Service Center.

### 5. Hydraulic oil pressure warning light - red



Lights up – it means the pressure of oil hydraulic circuit is low.

### 6. Low pressure warning light of trailer braking system - amber



Lights up – it means hydraulic oil pressure of trailer braking system is insufficient.

### 7. Indicator for low braking fluid level or started parking brake – red



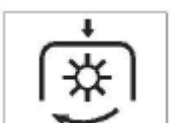
Lights up – it means braking fluid level is under the minimum liquid level, or parking brake is started.

### 8. Hydraulic oil filter warning light-red




Lights up – it means the oil filter shall be replaced.

### 9. Rear PTO control handle indicator- amber




Lights up – it means rear PTO is in operating status.


### 10. Fuel reserve – amber

	Lights up – it means the fuel level is low.
---	---

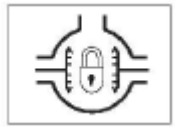
11. High beam lamp - blue

	Lights up – it means the high beam is turned on.
---	--

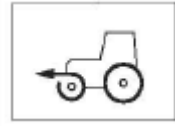
12. Direction indicator and hazard warning light of the tractor – green


	The light will light up during operation of direction indicator or when the warning alarm is given.
---	---

13. Differential lock warning light- amber

	Lights up – it means the differential lock is started and steering is restricted.
--	---

14. Front wheel drive warning light- amber

	Lights up – it means the front-wheel drive is started.
---	--

	<p><b>Warning:</b></p> <p>If the engine lubrication pressure warning light on after the engine is started, the engine shall be shut off immediately.</p>
---	--

### 3.8.2 Headlamp combination switch

It can be lighted up through rotating light combination switch:

- Headlamp master switch
- Switch off
- Low beam lamp
- High beam lamp

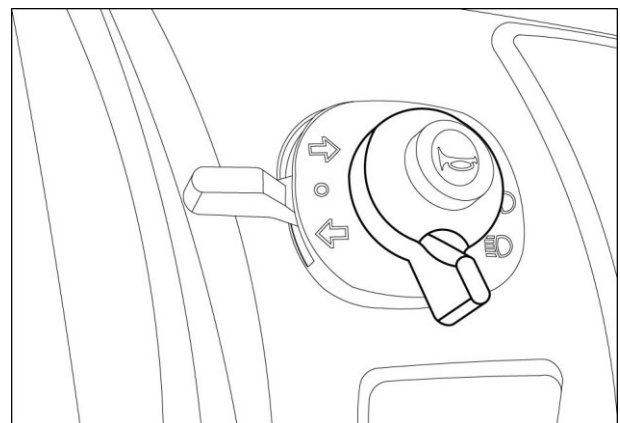


Fig.3-17

### 3.8.3 Combination switch I

“Combination switch one” includes a switch of hazard warning light, and one dipped headlights/rear worklight switch, and the position is shown in the figure



Fig.3-18

**Switch of hazard warning light:**

Position “1”: The front, rear, left and right steering lamps, the left and right steering lamps on the instrument and the indicator light on the hazard warning lamp switch will light up.

This switch can be available even if the engine has been stopped with the key removed.

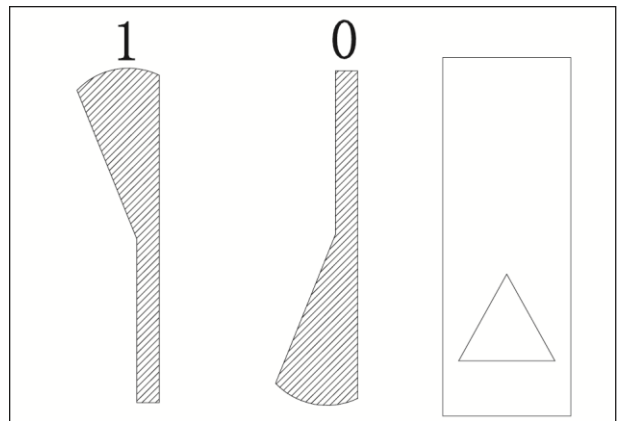


Fig.3-19

**The dipped headlights/rear worklight switch**

Position “0”: dipped headlights/rear worklight will light off.

Position “1”: rear worklight will light up.

Position “2”: dipped headlights will light up.

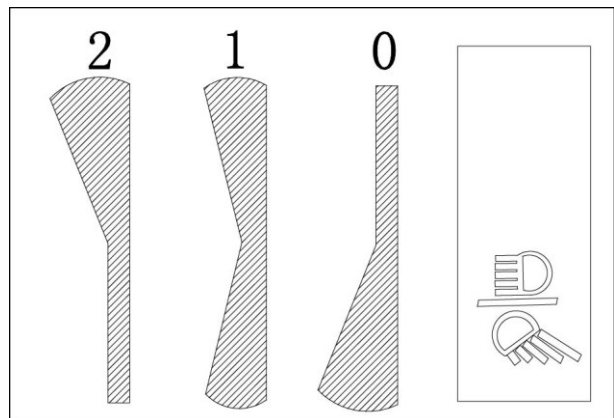


Fig.3-20

**3.8.4 Direction Indicator (Turn Left, Right)**

Left/ right turn light can be lighted up by rotating direction indicator. Specific operation as follows:

Rotate direction indicator upward: light up right turn light;

Rotate direction indicator to downward: light up left turn light.

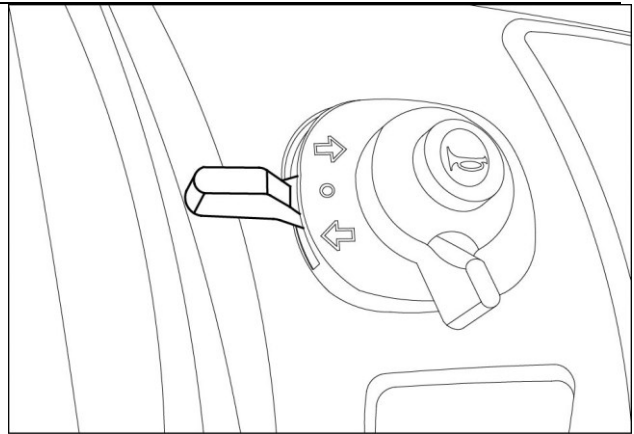


Fig.3-21

### **Parking the tractor**

Parking of the tractor will be different due to terrain and operation state of the engine

- Park the tractor when its engine has been stopped;
- Park the tractor when its engine is working;
- Park the tractor on a steep slope.

### **Parking when engine is shut off**

- Activate parking brake
- Adjust all control devices to neutral gear.
- Three-point linkage and implement for hitching the tractor will be declined to the ground.
- Shut off the engine.
- Shift to gear I if the tractor that is equipped with machinery transmission.

### **Parking when the engine is under operation**

- Check to confirm that there is no one surrounding the tractor.
- Check to confirm that the tractor is parked on horizontal ground.
- Activate parking brake
- Adjust all control devices to neutral gear.

### **Parking the tractor on abrupt inclined surface.**

- Just as what mentioned in the above, tractor will be parked as per position.
- If your tractor must be stopped on a steep slope (even temporarily), put a chocks under the rear wheel to prevent the tractor moving. But, it is suggested that you don't park on abrupt inclined surface
- In general, the assistant who always stand near tractor will place the chock under the wheel.
- If there is not such an assistant, the driver must completely activate parking brake before getting off the tractor to guarantee the tractor will not be moved and then stand near the tractor for placing the chock.

## **3.8.5 Horn Switch**

Horn switch is located on left side of instrument desk, and the horn will be connected through pressing the switch by hand when used.

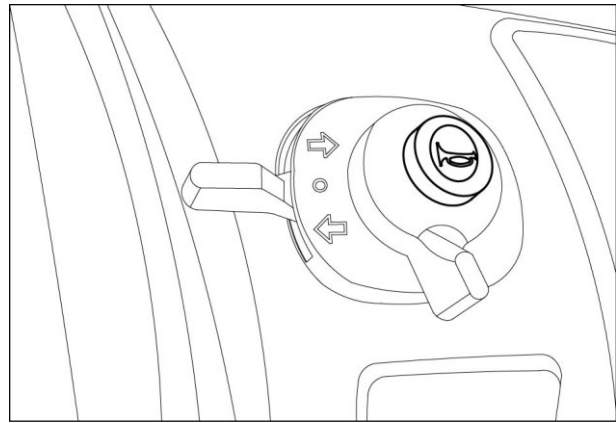


Fig.3-22

### 3.8.6 Combination switch II

“Combination switch two” includes an engine diagnose switch and a wiper switch.



Fig.3-23

### 3.8.7 Ignition Switch

This kind of tractors is equipped with electronic equipment which is used to secure start and stop engine. The key shall be inserted to the ignition switch and shall be turned to the sign of “ON”. All warnings in instrument panel: all lights will light up transitorily, which can be used to check conditions of all lights (test signal will be transmitted by buzzer).

In this location, red warning light means alternating-current generator is in operation, low engine lubrication pressure, low transmission oil pressure, while the yellow warning light means preheating system is still in operation.

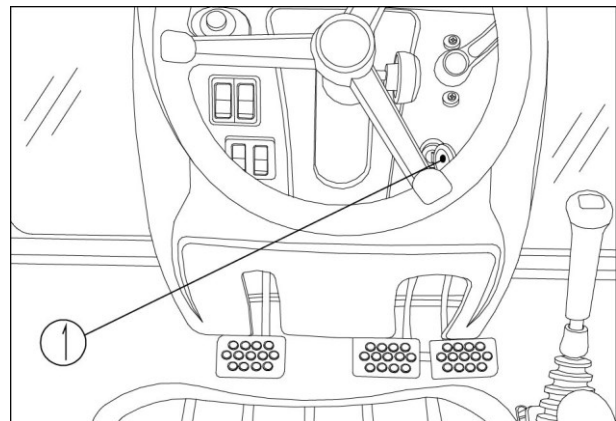


Fig.3-24

## 3.9 Cab

The cab of the tractor is composed of framework that is made of special tubular product through welding, which is embedded with a large area of space curved glass.

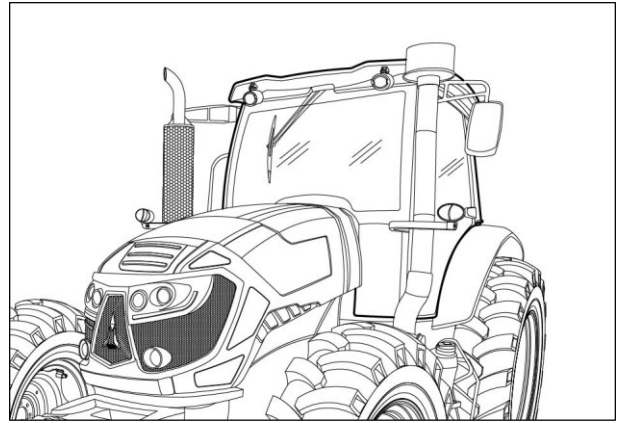


Fig.3-25



**Warning:**

Don't revise the cab. Don't drill or weld in the cab!

### 3.9.1 Cab entrance

#### ➤ Entrance steps and handrails

The path to driving position is constituted by broad stairs with 3 skid resistance pedals ④ and two handrails ①, ②, and the handrail ① is located in the side of front windshield beside door lock, and the handrail ② is mounted on the door.

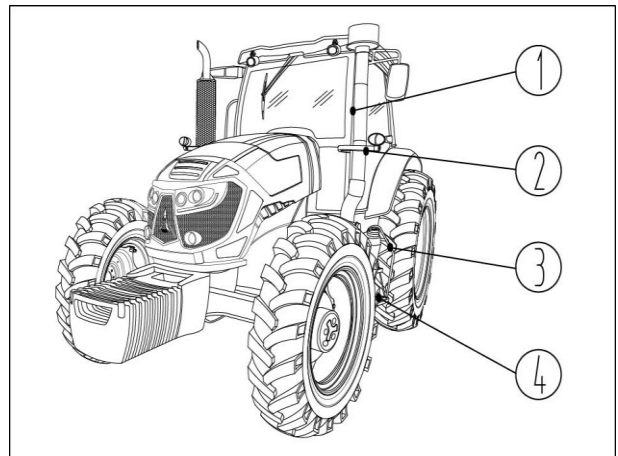


Fig.3-26

### 3.9.2 Cab Door

The cab door frame is made of profiles. The door panel is one piece of curved glass, harmony with the entire streamlined cab, and not only highlighting the spacious and comfortable driving space, but also improving greatly the appearance of entire tractor.

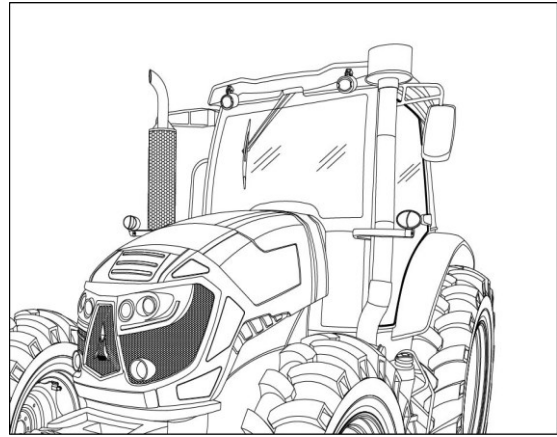


Fig.3-27

### 3.9.3 Cab Locks

The double locks can prevent accidental opening of the door.

If you want to open the door, you shall turn the door key to the left, take out the key, hold the door handle to pull out, then the door will be opened.

To close the door, operate in the reverse order as opening the door.

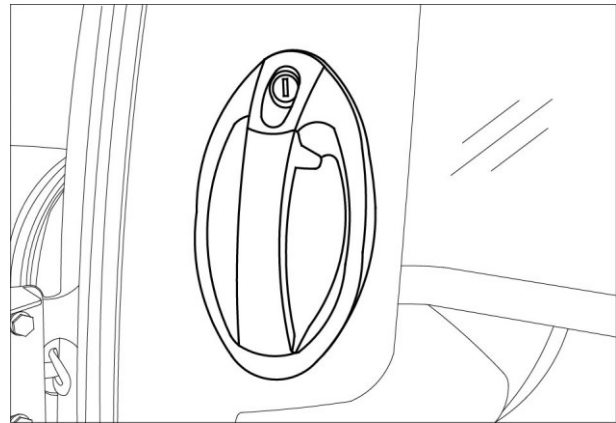


Fig.3-28

### 3.9.4 Safety Lock of Cab Door

The safety lock is used to prevent accidental opening of the door.

Door opening follows the following steps:

1. If the door is not locked, it can be opened from both inside and outside.
2. If the door is locked, it can only be opened from outside.

Moving upward the handle can cause the door to open automatically.

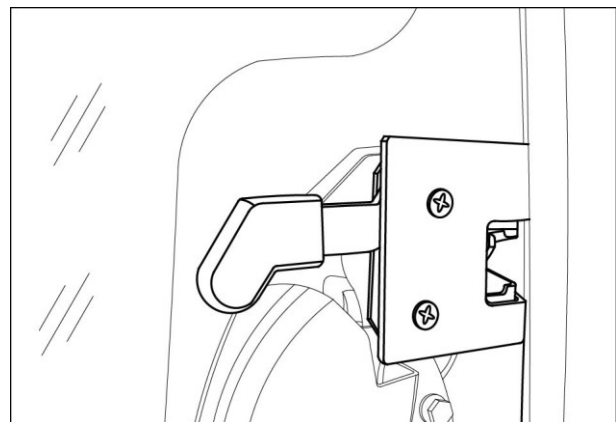


Fig.3-29

### 3.9.5 Interior Trims of the Cab



The interior trims of the cab include the interior trims of fenders, floor mats, instrument panel, and interior roof lining, as shown in Figure.

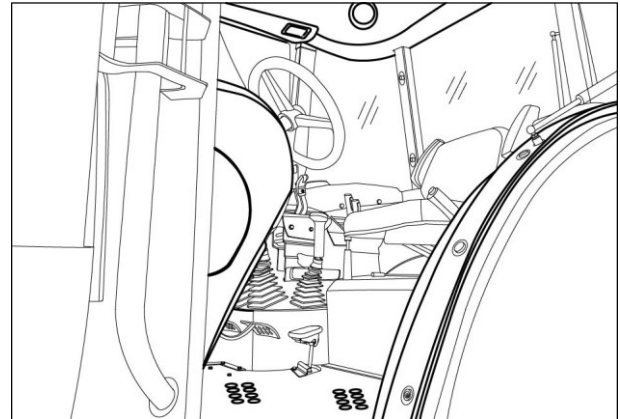


Fig.3-30

### 3.9.6 Rear Window Hatch

The rear window hatch of tractor can be opened upward, semi-automatically, to two positions: normal opening and maximum opening.

➤ **Normal opening state:**

Rotate the handle so that its front projection slides out of the slot. Push the handle outward until its rear projection reaches the slot. Rotate the handle again so that its rear projection slides into the slot. The rear window hatch will open by a certain angle and remain there.

To close the rear window hatch, operate in the reverse order.

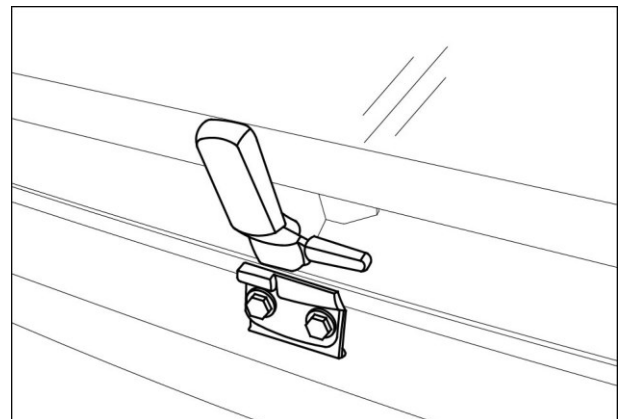


Fig.3-31

➤ **Maximum opening state:**

Rotate the handle so that its front projection slides out of the slot. Push the handle outward until the air spring "pull" is overcome. The air spring changes its state from "pull" inward to "push" outward. Thus the rear window hatch automatically opens.

To close the hatch, pull the handle inward until the air spring "push" is overcome. The air spring changes its state from "push outward" to "pull inward". Thus the rear window hatch automatically closes. Rotate the handle so that its front projection slides into the slot. The handle is thus locked.

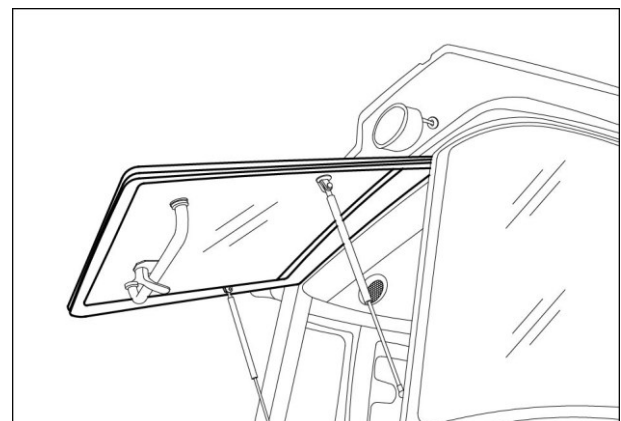
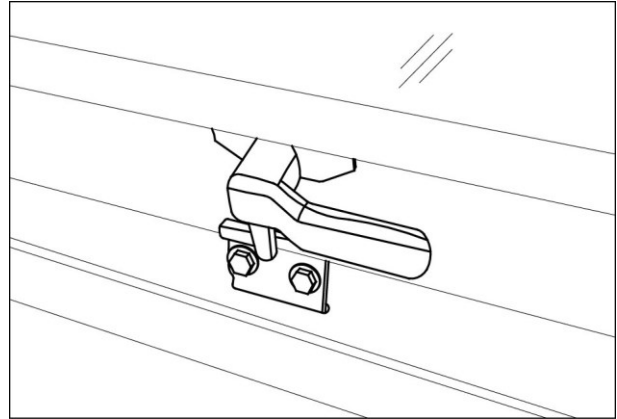


Fig.3-32

➤ **Rear window hatch locked**

Close the rear window hatch, and rotate the handle to let the front embossment slip into the recess, thus the rear window hatch is locked



*Fig.3-33*

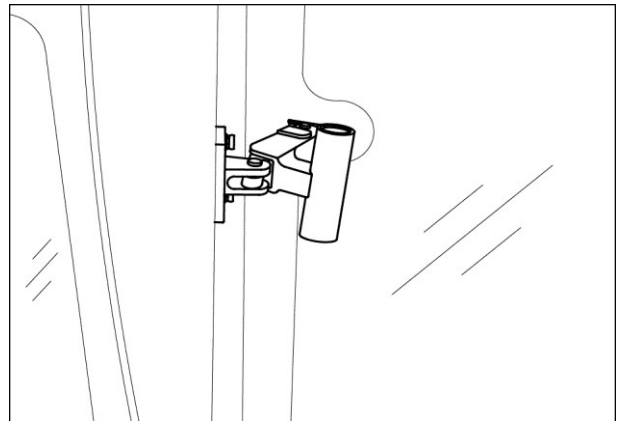
**3.9.7 Left and right side windows**

The left and right side windows are fully glass.

**Opening state**

When opening, lift the lock stop handle and push it outward, until it is stuck and then gently lift the lock to open and limit the side window.

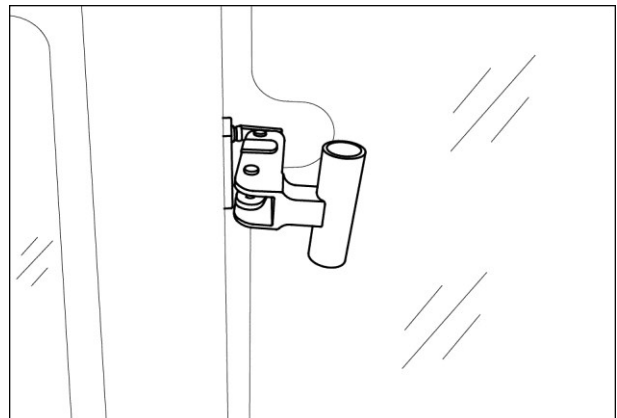
The maximum distance of the side window is the effective length of the lock stop handle.



*Fig.3-34*

**Closing state**

The closing state is shown in the figure.



*Fig.3-35*

**3.9.8 Interior Illuminating Light**

Interior Illuminating Light is located in the left side of inside roof lining of the cab.

Interior light may be turned on and off using the slide switch beside the light.

To turn on the light, move the switch to the position ON.

To turn off the light, move the switch to position OFF.

Move the switch to the position DOOR (door-controlled), and then the light comes on when the cab door is opened and goes out when the cab door is closed. (Note: This function is temporarily not available.)

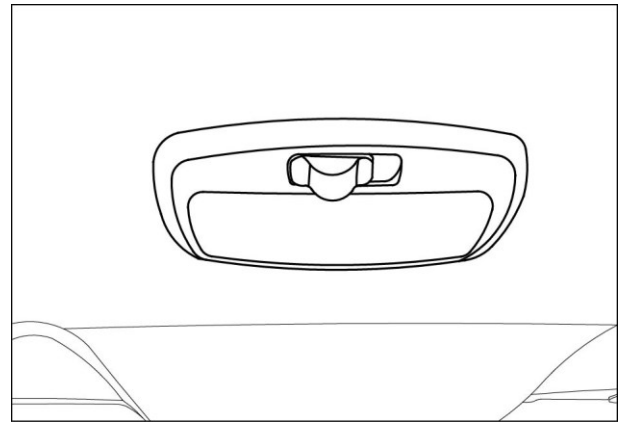


Fig.3-36

### 3.9.9 Built-In Radio

#### Radio control panel

Radio is an optional device. Radio is located on the right side of inside roof lining of the cab.

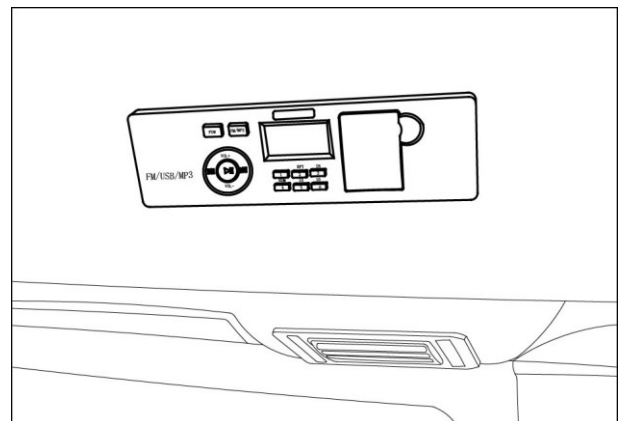


Fig.3-37

#### Radio horn

The tractor is equipped with two loudspeakers (each side has one) which are mounted on the rear side of the cab.

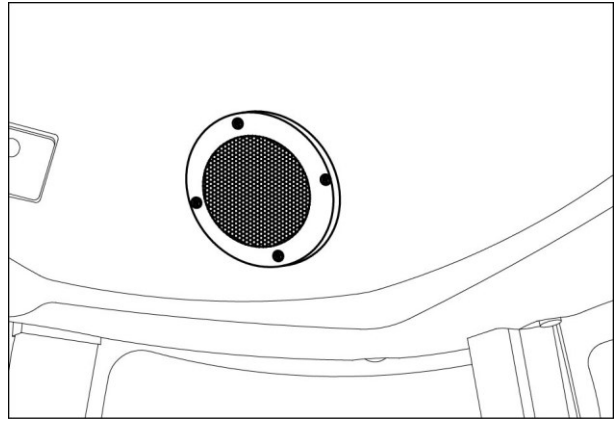


Fig.3-38

### 3.9.10 Ash Pan

Ash pan is located on left side of seat.

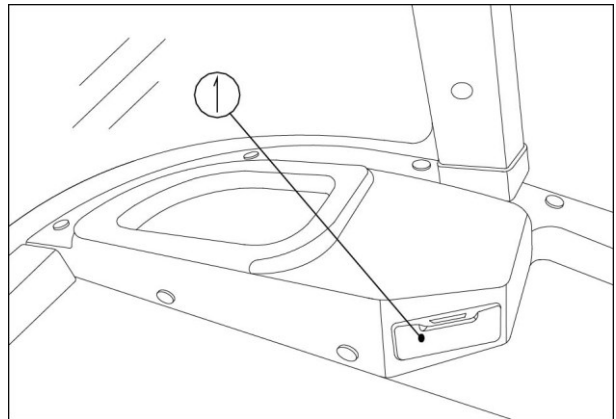


Fig.3-39

### 3.9.11 Storage Box and cup holder

Storage boxes are located in left and right side of seat in cab.

1. Left storage box is shown in the figure ①.

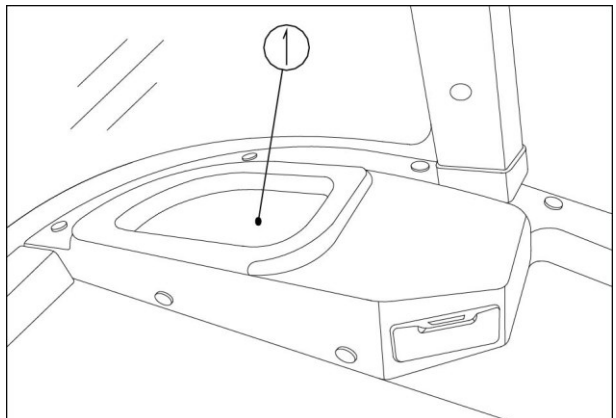


Fig.3-40

2. Right storage box is shown in the figure ②.

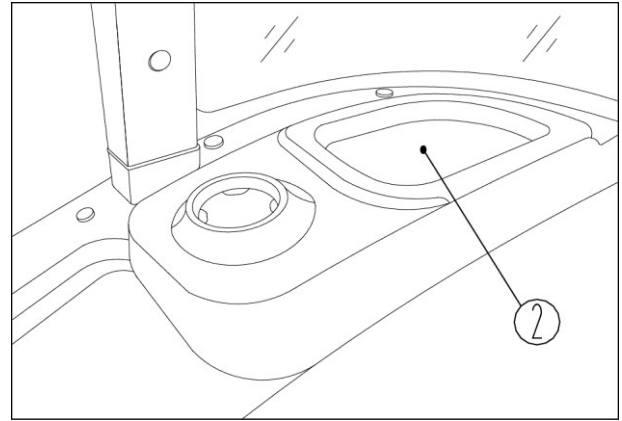


Fig.3-41

Cup holder is located in the right side of seat.

Cup holder is shown in the figure ③.

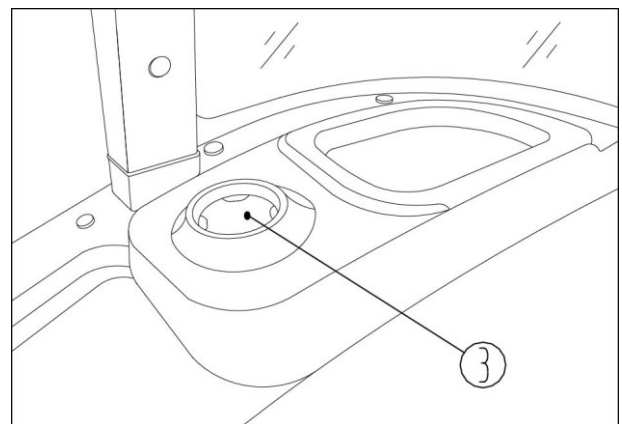


Fig.3-42

### 3.9.12 Other Control Switch on Cab

### 3.9.13 Left Rocker Switch Combination of Cab

Left Rocker Switch Combination of Cab is located on top of cab and left side of driver. Includes:

1. Fan switch;
2. Front working lamp switch;
3. Heater switch

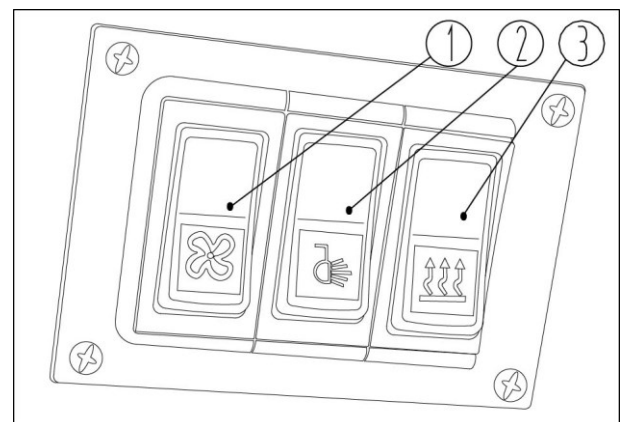


Fig.3-43

#### ➤ Fan switch

Fan switch is shown in the figure ①.

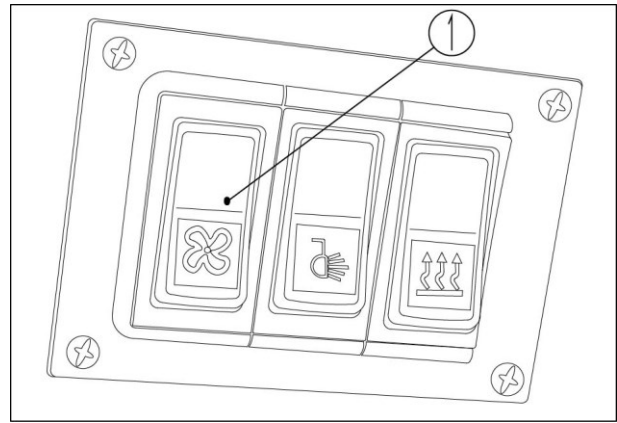


Fig.3-44

➤ **Front working lamp switch**

Position “1”: Front working lamp switch will light up.

Position “0”: Front working lamp will go out.

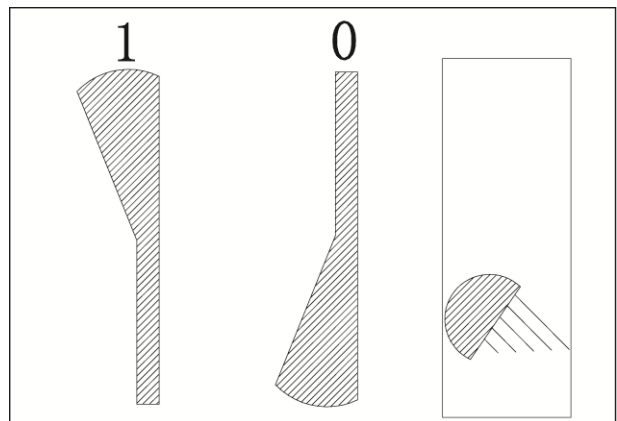


Fig.3-45

➤ **Heater switch**

Position “0” : Switch off the heating system;

Position “1”: Minimum air speed;

Position “2”: Maximum air speed.

In order to make the cab warmer quickly, you can choose the Maximum air speed first.

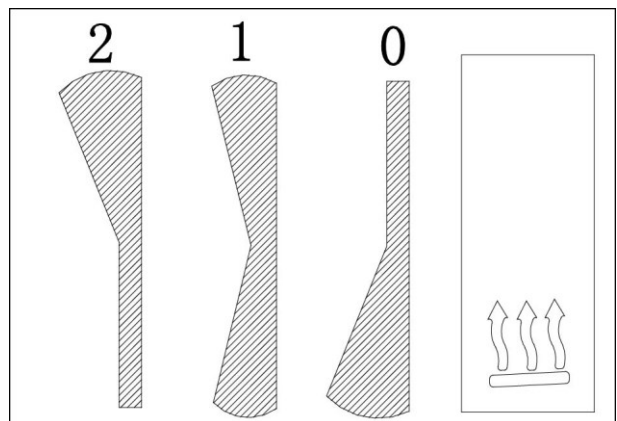


Fig.3-46

### 3.10 Heating System (with Fan and without Air Conditioning)

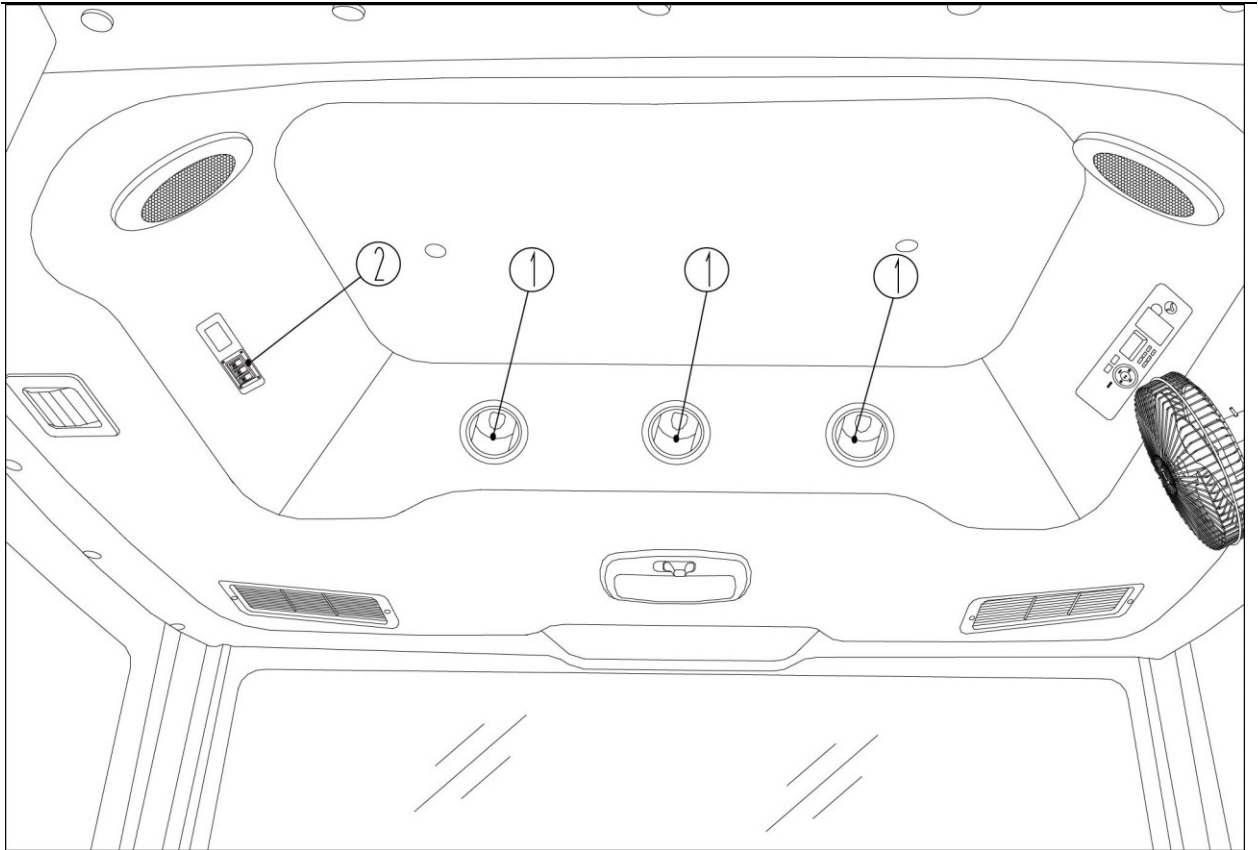


Fig.3-47

1. Air outlet; 2. Control switch

### 3.10.1 Heating System Control Switch

The heating system can be turned on and adjusted using the control switch ① at the cab roof.

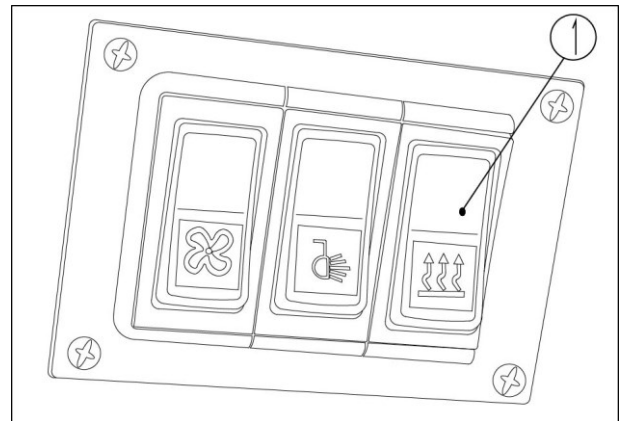


Fig.3-48

### 3.10.2 Description of Heating System Control Switch

Position “0”: Cut off the power supply.

Position “1”: The heating system is turned on with low air speed.

Position “2”: The heating system is turned on with high air speed.

To warm up the cab more quickly, move the switch to the position with high air speed.

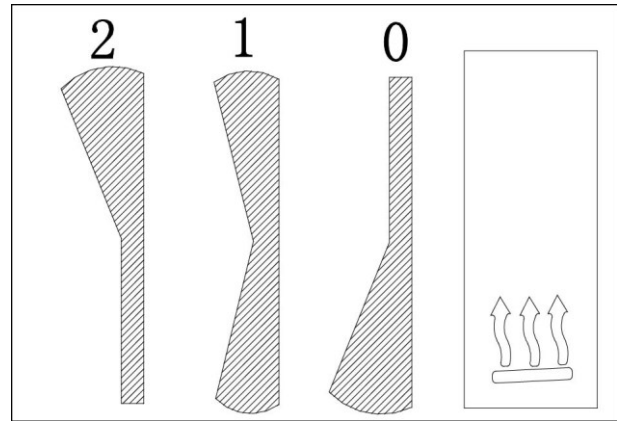


Fig.3-49

### 3.10.3 Tips for Using the Heating System

- Confirm whether heater switch is turned on before starting the engine. It is necessary to ensure that the ventilation system is turned off (just turn off the ventilation fan) to avoid the tractor battery operation under overload.
- If the ventilation system has been running at full power for a long time, do not turn it off immediately. Before turning it off, have it running at minimum speed for at least 20 seconds.
- With the heating system turned on, you can feel air flow immediately from the air outlet. If no air flow, turn off the system and locate the fault.
- To demist the windshield quickly, turn to the maximum wind speed. Open the outlet 3, and close the outlet 1. This ensures that the entire stream of warm air flows directly to the windshield.
- Do not use the heating system in a particularly dusty environment.

### 3.10.4 Cab Fan

The cab is equipped with a fan. See its specific position in the figure.

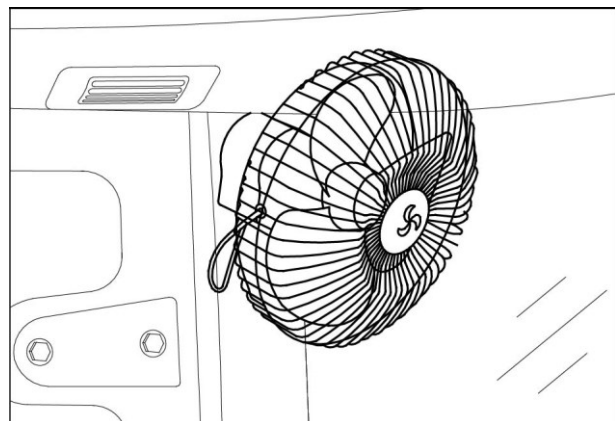


Fig.3-50

### 3.10.5 Fan Switch



The fan switch as shown in the figure (Position ②).

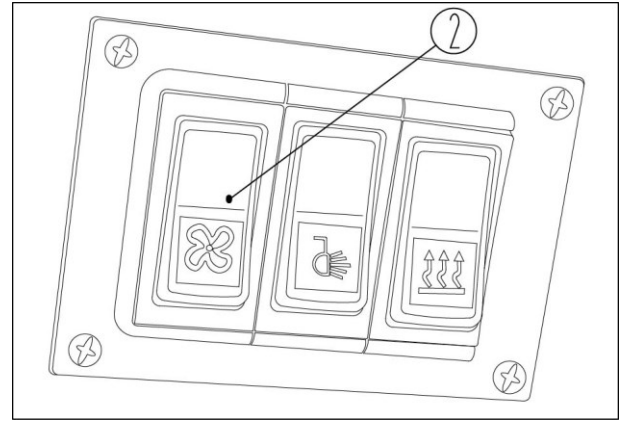


Fig.3-51

### 3.11 Heating and Air conditioning System (Optional)

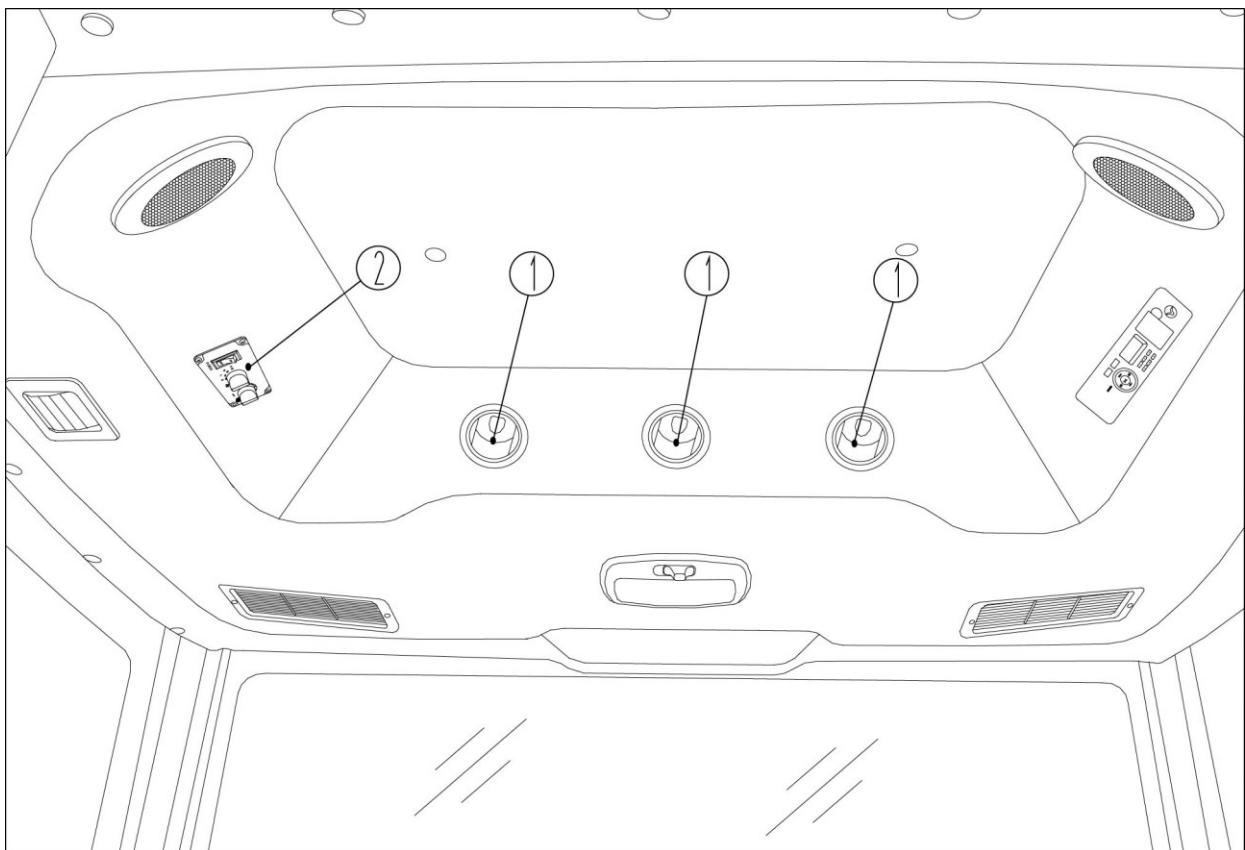


Fig.3-52

1. Air outlet    2. Control switch



**Notice:**

Refrigerants in the air-conditioning system can cause frostbite.

### 3.11.1 Heater Switch

The heating system can be turned on and adjusted using the control knob ② on the control panel at cab roof. When using the heating system, it shall be ensured that the heater switch at the heater water duct of the engine is turned on and the cooling switch (POWER) is OFF.

The control knob can be turned to any of the four positions: 0, L, M, and H. In which:

- Position “0” : Switch off the heating system;
- Position “L”: Minimum air speed;
- Position “M”: Medium air speed;
- Position “H”: Maximum air speed.

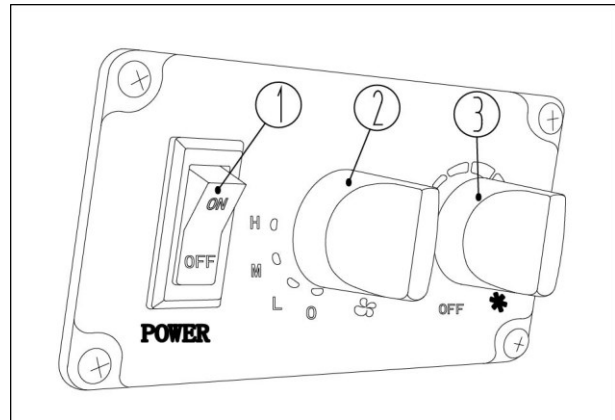


Fig.3-53

### 3.11.2 Air Conditioning System Switch

The air conditioning system can be adjusted using the control knob ① and ③ on the control panel at cab roof. Before cooling is applied, it is necessary to ensure that the heater switch at the heater water duct of the engine is turned off. Turn the cooling switch (POWER) on. Turn the wind speed knob and the cooling knob to the maximum position if it is necessary to accelerate cooling.

The control switch ① is used to turn on and off the refrigeration system. “ON” means “turned on”, and “OFF” means “turned off”.

The control knob ③ is used to adjust air temperature.

To cool down the cab quickly, turn clockwise the control knob 2 to extremity.

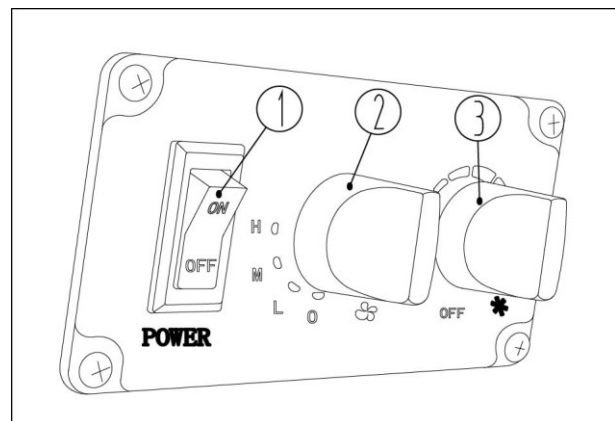


Fig.3-54

#### ➤ To cool down the cab, perform the following steps:


- Fully open the adjustable air outlets.
- Turn the ventilation control knob to a proper position. Turn on the air conditioning system.
- If the tractor has been in the sun for a long time, open the door, and leave it open a few minutes, allowing warm air to disperse from the cab.
- Close the door. Set the air circulation control device so that air only circulates inside the cab.
- Once the desired air temperature is reached, adjust the ventilation system and air circulation control device as required.
- Even the air conditioning system has been running for a certain period, the filtration dryer above the sight glass shall be clean and no air bubbles are seen there. Otherwise, turn off the air conditioning system and consult our professional.


### Using the Air Conditioning System


### Tips for using the air conditioning system:


- Recommendation is to avoid maintaining, repairing, or adjusting the air conditioning system yourself. Seek help for assistance.
- Do not take naked fire to the vicinity of air conditioning system. Possible refrigerant leak can cause fire hazard.
- Under no circumstances can any pipe joints be loosened or any pipes be tampered with. Moreover, do not remove the oil plug of the compressor because the corresponding circuit contains high-pressure gas.
- If you come into contact with the refrigerant, which can cause severe burns, seek professional medical care immediately.
- If the air conditioning system is working in a dusty environment, increase the air pressure inside the cab if necessary, to prevent ingress of dust from outside. In this case, it is wise to close the air recirculation ports.


### 3.11.3 Activated Carbon Air Filter (Optional)

	<p><b>Danger:</b></p> <p>Activated carbon filter shall be replaced after being used for 200 hours or 36 months. The filter shall be replaced, and the air-tightness shall be inspected if any odor of toxic materials can be smelt in the cab.</p>
---	--

	<p><b>Warning:</b></p> <p>Pesticides shall be sprayed according to instructions of manufacturers of chemicals and spraying machines.</p>
--	--


	<p><b>Important:</b></p> <p>The removing and repairing methods for activated carbon filter and normal filter are same.</p>
---	--

	<p><b>Important:</b></p> <p>This kind of filters cannot provide full protection against toxic materials.</p>
---	--

	<p><b>Warning:</b></p> <p>See that the filter of ventilation system in cab is “paper” type, and the filter can only be replaced by “activated carbon” filter when pesticides are sprayed.</p>
---	---

### How to operate a tractor

Air filter in cab is used to clear away dust in air, but cannot prevent the chemical vapor diffused by bactericide in sprayer.

	<p><b>Warning:</b></p> <p>Protection against relevant toxic materials shall be conducted according to the information provided by chemicals manufacturer.</p>
---	---



**Warning:**

The air filter shall be replaced by activated carbon filter before processing of toxic materials.

Used filters shall be processed according to local provisions for processing lining cores contaminated by toxic materials.

The pressure in cab shall be increased slightly during chemicals are sprayed. The air pressure in the cab shall be increased in proportion with outside air pressure during the ventilation of cab; the differential pressure can help to prevent toxic air from entering. However, we highly recommend that you shall comply with the safety instructions provided by chemicals manufacturer.

Contaminated clothes shall be cleaned carefully before entering the cab after the processing of toxic materials are completed to prevent accumulation of toxic materials in cab. Interior of cab and platform shall be cleaned with wet cloth frequently.

If air pressure in cab cannot reach the required level, the following inspects shall be conducted to determine the reasons:

- Set the blower to the maximum speed, and close cab door, rear window hatch and windows. If roof exit is provided to the tractor, the roof exit shall be inspected for proper closure.
- Inspect and insure that air filter is not blocked.
- Inspect the sealing situation of interior door and windows of the cab.
- Inspect the opening through which the control handles/ pull rods pass (to the outside of cab).

You shall contact authorized Service Center if the reasons cannot be determined through inspects motioned above.

**Suggestions on safe work procedures:**

- Protective gloves shall be worn during replacing normal dust filter with activated carbon filter.
- After using, activated carbon filter shall be removed from cab and be placed to original package, and normal dust filter shall be installed. Activated carbon filter shall be sealed carefully in its package to keep its effectiveness.
- If the filter is used correctly, and total time is no more than 200 hours, the maximum life span of filter is 36 months which shall be calculated from the date of first opening of package (manufacturing date is marked on the filter).
- Using of filter is prohibited in agricultural activities except for spraying insecticides: dust will block elements of filter in a very short time.
- It is prohibited to wash or clean filter with compressed air.
- Used filters must be transported to professional disposal center.
- Used filters shall be processed and disposed according to the instructions of manufacturer.

## **3.12 Driver Seat**

The working stroke and rigidity is adjustable for the driver seat.

### **3.12.1 Back-and-forth Adjustment of the Driver Seat**

Adjust the back-and-forth regulating handle ① at the lower right corner of the cab and the seat can be adjusted back and forth within 150mm according to the requirements of the driver.

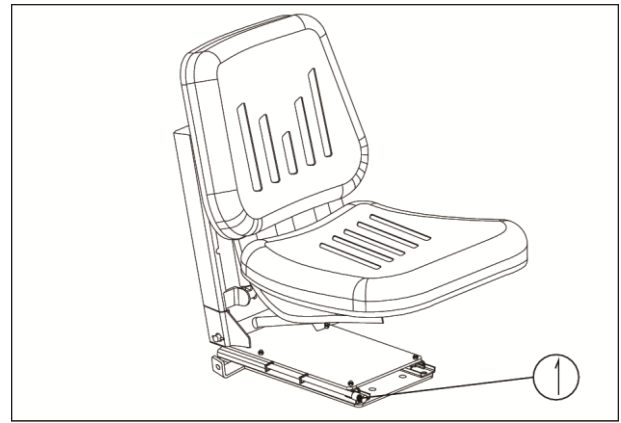


Fig.3-55

### 3.12.2 Rigidity Adjustment of the Driver Seat

Adjust the weight adjustment handle ② according to the weight of the driver so that the driver can feel more comfortable on the seat.

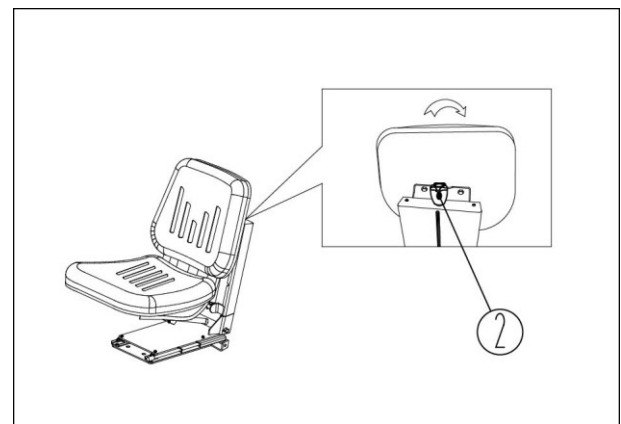




Fig.3-56

	<p><b>Danger:</b> For safety, adjust the seat when the tractor is in its stationary state.</p>
---	--

	<p><b>Danger:</b> The seat rigidity cannot be adjusted too soft, especially when you are driving on rough roads.</p>
---	--

### 3.12.3 Seat Belt

Tractor is equipped with adjustable safety belt.

**It shall be operated in the following steps before starting engine:**

Insert steel coupon ① into the slot ② to fasten safety belt. Unfasten safety belt by pressing button ③.

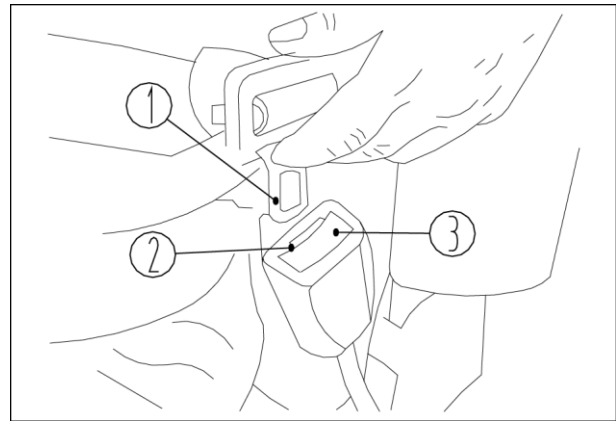


Fig.3-57

**Length adjustment of safety belt as follows:**

Tension end ④ to shorten safety belt.

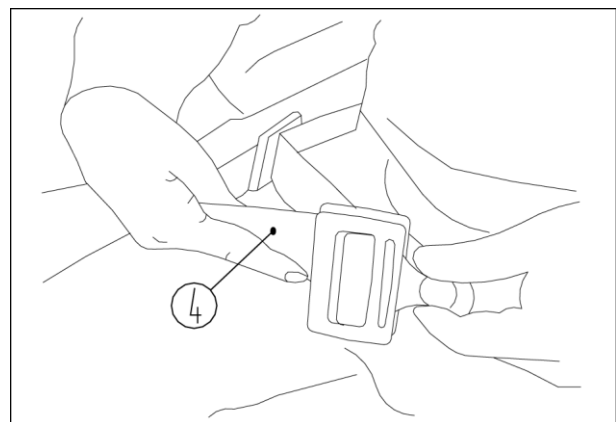


Fig.3-58

Pull out end ⑤ to lengthen safety belt.

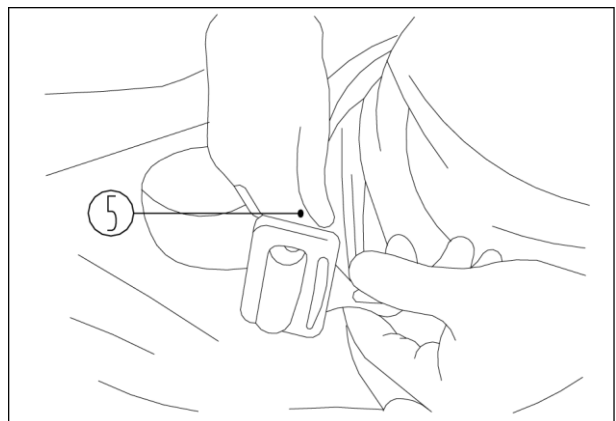



Fig.3-59





**Warning:**

Fasten the safety belt. Using of safety belt can reduce the risk of injury in accidents.

### 3.13 Passenger Seat

	<p><b>Notice:</b></p> <p>The tractor is designed only to accommodate one person. In some countries, the passenger seat provided by the manufacturer is allowed. First inspect whether the tractor is allowed to accommodate passengers.</p>
---	---

	<p><b>Danger:</b></p> <p>Unless your tractor is equipped with an appropriate seat, no passenger is allowed to accommodate. When a passenger seat is used, please comply with the local laws and regulations, including insurance company's provisions on occupational injuries.</p>
---	---

	<p><b>Notice:</b></p> <p>During the field work, only the driver is allowed in the cab.</p>
---	--

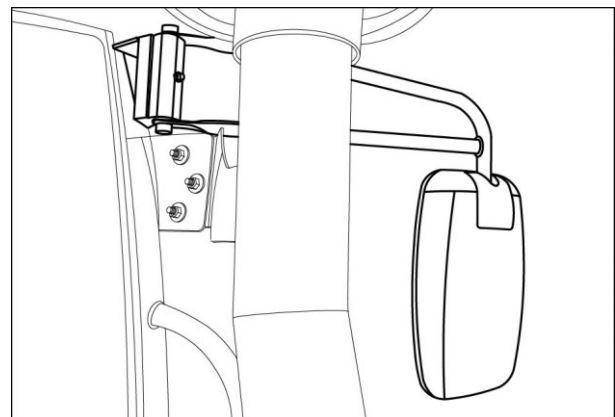
### 3.13.1 Rear View Mirrors

For maximum control when performing difficult maneuvers, it is vital that the rear view mirrors are correctly adjusted.


**Adjustment:**

Adjust the rear view mirrors on both sides.

Fix the rear view mirrors so that a clear vision could be available behind the tractor and tools from the driver seat.



*Fig.3-60*

	<p><b>Warning:</b></p> <p>If one or two rear view mirrors are accidentally folded inward (for example, due to collisions), stop the tractor immediately and adjust the rear view mirror back in place.</p>
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### 3.14 Other Control Devices

#### 3.14.1 Control Pedal

1. Clutch pedal
2. Left brake pedal
3. Right brake pedal

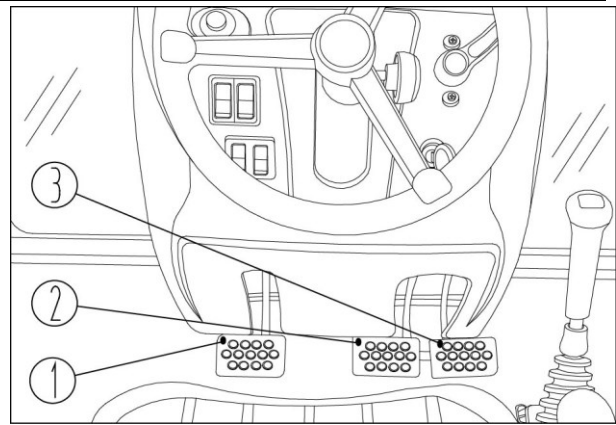


Fig.3-60

### 3.14.2 Clutch Control Device



**Warning:**

During driving, never put your foot on the clutch pedal or step it downward a lot; otherwise, the clutch plates will be early worn.



**Warning:**

When driving downhill, never press down the clutch pedal or put the gearbox in its neutral position.



**Warning:**

When a tractor is stationary, avoid stepping down the clutch pedal. Select the neutral position even for a brief stop.

See the figure for the positions of the main clutch pedal.

Clutch can be disconnected by holding down the clutch pedal ① in the left side of operator. When you want to disconnect clutch, you shall reduce engine speed and hold down clutch pedal completely.

Accelerator pedal shall be applied appropriately when the clutch is relieved after selection of gear to prevent sudden jounce of tractor during moving.

You shall remove your foot from clutch pedal once you relieved it for a slight pressure will cause premature wear of clutch disc.

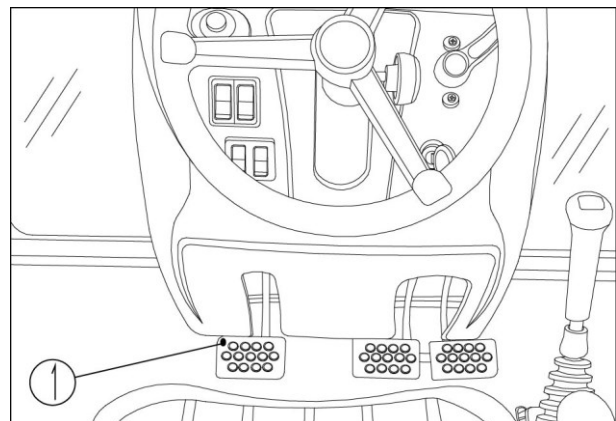




Fig.3-62

### 3.14.3 Brake Pedal



	<p><b>Notice:</b></p> <p>In time of downhill and especially in the process of towing implements or trailer, apply downshifts and engine brake but never step on the brake pedal for long.</p>
---	---

	<p><b>Notice:</b></p> <p>Never step on one brake pedal only in such conditions as follows: The differential lock is enabled; the tractor at high speed; when traction and towing.</p>
---	---

Service brake is hydrostatic drive wet disk brake.

Tractor is equipped with two rear axle brakes that are located in upstream of rear axle of main reducing gear. Press on the brake pedal to stop the rear wheels on both sides. If the latch ③ (which connects two pedals together) is loosened, the left and right brake can be operated individually.

1. Left brake pedal
2. Right brake pedal
3. Latch

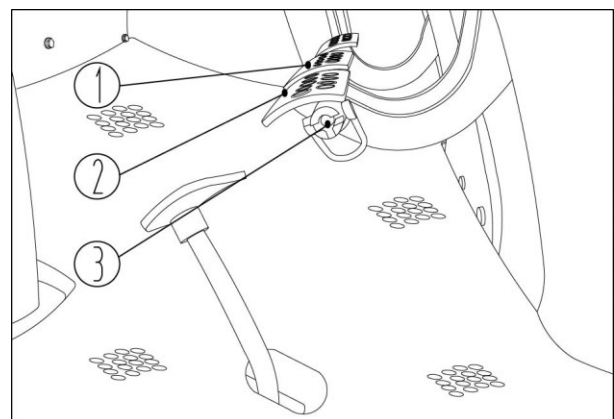




Fig.3-63

### 3.14.4 Parking Brake Handle

	<p><b>Warning:</b></p> <p>Before leaving your driving position after engine flameout, you need to pull up the parking brake. For further information about the procedures for safe operation, you should refer to the chapter of “Tractor parking” for safety control in the Manual.</p>
---	--

	<p><b>Warning:</b></p> <p>When the parking brake is applied, the control handle must always be kept at its “PULL-UP” state.</p>
---	---

Parking brake and service brake is completely independence, and brake handle shall be pulled up for using.

Button on the end of handle shall be pressed and push down brake handle when hand brake is loosened.

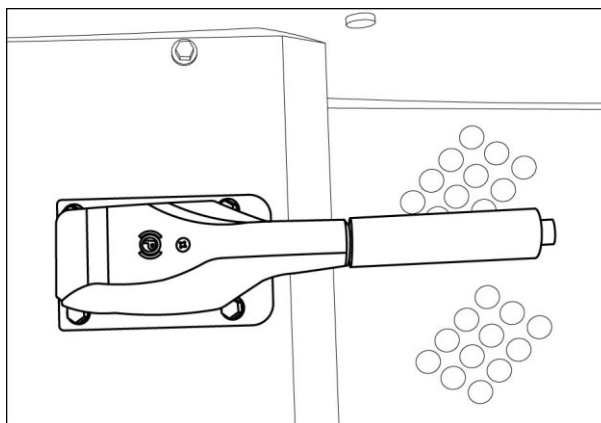



Fig.3-64

➤ **Instructions regarding parking brake:**

	<p>Warning light will light up when parking brake is used.</p>
---	--

**Parking the tractor**

Parking of the tractor will be different due to terrain and operation state of the engine.

- Park the tractor when its engine has been shut down;
- Park the tractor when its engine is working;
- Park the tractor on a steep slope.

**Parking when engine is shut down**

- Lock the parking brake.
- All control devices will be adjusted to neutral gear.
- Three-point linkage and implement which hitching the tractor will be declined to the ground.
- Shut down the engine.
- Shift to gear I if the tractor that is equipped with mechanical transmission.

**Parking when the engine is under operation**

- Inspect to confirm that there is no one surrounding the tractor.
- Inspect to confirm that the tractor is parked on horizontal ground.
- Lock the parking brake.
- All control devices will be adjusted to neutral gear.

**Parking the tractor on steep slope.**

- Just as what mentioned in the above, tractor will be parked as per position.
- If your tractor must be stopped on a steep slope (even temporarily), put a chocks under the rear wheel to prevent the tractor moving. But, it is suggested that you don't park on a steep slope.
- In general, the assistant who always stand near tractor will place the chock under the wheel.
- If there is not such an assistant, the driver must completely pull up parking brake before getting off the tractor to guarantee the tractor will not be moved and then stand near the tractor for placing the pad.

**3.14.5 Accelerator Petal**

Engine speed can be changed by using accelerator pedal.

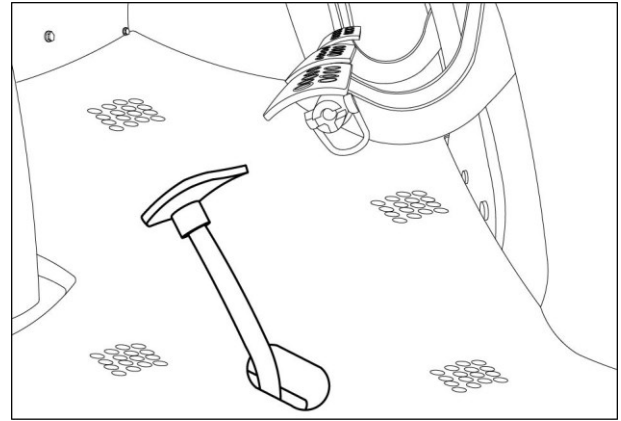


Fig.3-65

### 3.14.6 Hand Throttle



**Warning:**

Only accelerator pedal can be used, and manual accelerator is prohibited during driving on highway.

**Handle throttle**

The hand throttle control handle is located on the right side of the driver. Manual accelerator can be used to increase and reduce engine speed.

It is the graduated scale beside control handle that can show engine speed.

Push the control handle clockwise to increase the engine speed. Push the control handle anticlockwise to decrease the engine speed.

Location of control handle can determine the minimum engine speed.

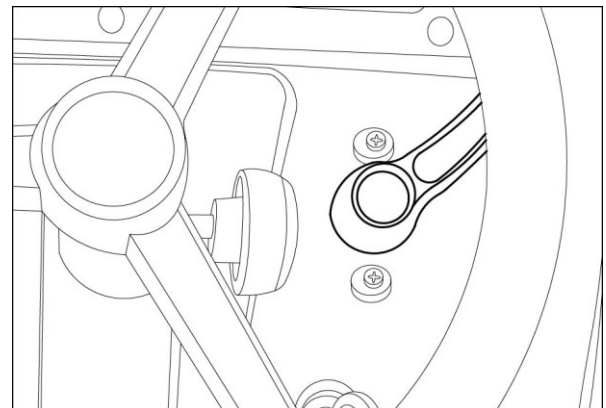


Fig.3-66



**Note:**

Use hand throttle to set a certain engine speed, and when the accelerator pedal is stepped down, the engine speed will increase accordingly, but when the accelerator pedal is released (or even completely released), the engine speed will return to the one set by hand throttle.

➤ **Engine speed control**

Mechanical accelerator system provides two additional control devices of engine speed for operators.

- Accelerator pedal
- Mechanical hand throttle control lever

➤ **Accelerator pedal**

This control device is constantly effective, and engine speed is related to pedal position.

➤ **Hand throttle**

Engine speed can be controlled by moving hand throttle in the same way of accelerator pedal.

**Danger:**

Components shall be cleaned with verified solution (non-inflammable and non-toxic). Gasoline, solvent and other inflammable solution are prohibited.

### 3.14.7 Transmission Control Device as Follows

**Warning:**

Do not leave the tractor during engine operation, unless it is absolutely necessary. In this instance, all gear shift lever shall be adjusted to “neutral position”, and parking brake control handle shall be pulled up immediately. For more information about safe work procedures, please refer to the Chapter “Tractor parking” in safety related sections of this manual.

This series transmission include two different configurations

**Configuration one: 24F+12R**

- One four-gear main gear shift (1-2-3-4).
- One three-gear range shift (L -N – V), low speed (L), middle speed (N) and high speed (H ).
- High/low gear, reverse gear.

**Configuration two: 16F+12R**

- One four-gear main gear shift (1-2-3-4).
- One three-gear range shift (L -N – V), low speed (L), middle speed (N) and high speed (H ).
- High-and low-speed gear and reverse gear (when engage creeper, range shift can only be on L position).

1. Main shift control handle;
2. Range shift control handle;
3. High/low gear, reverse gear control handle

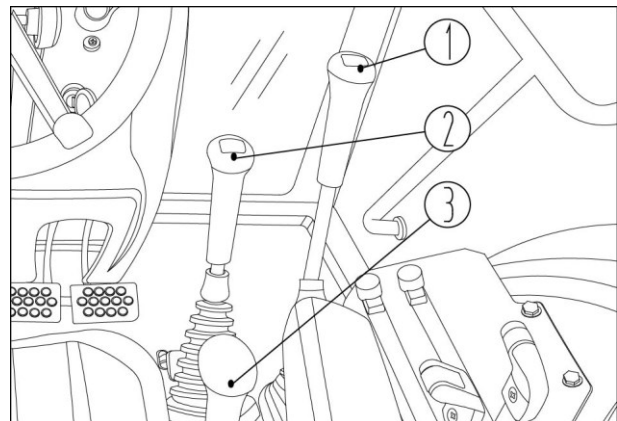


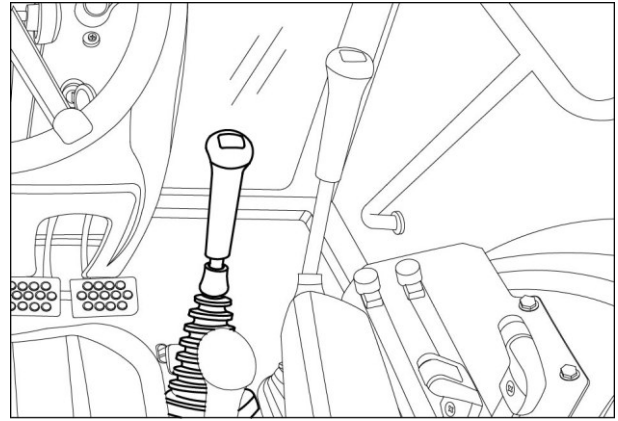
Fig.3-67



➤ **Main shift control handle**

See the figure for main shift control handle

There are four gear positions for main shift control handle, respectively as: 1, 2, 3, 4.

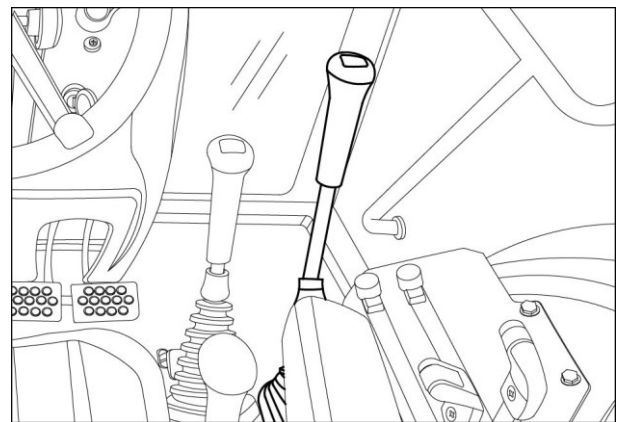


*Fig.3-68*

➤ **Range shift control handle**

See the figure for range shift control handle

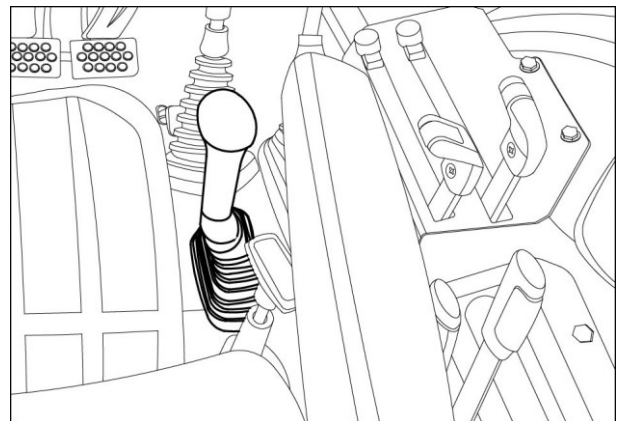
For the range shift lever are provided three positions: low speed (L), high speed (H) and middle speed (N).



*Fig.3-69*

➤ **High/low gear, reverse gear control handle**

See the figure for high/low gear, reverse gear control handle



*Fig.3-70*

### 3.14.8 Mechanical Connection of Front-wheel Driver

See the figure for the four-wheel drive control handle.

Four-wheel drive and two-wheel drive can be switched by handling four-wheel drive control handle.

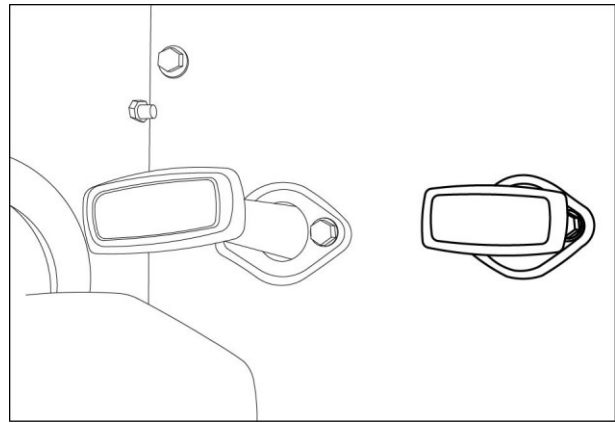


Fig.3-71

### 3.14.9 Rear PTO Speed Selector

The speed selector control handle is positioned on left side of the driver's seat (position in the figure).

The speed shift can be realized by manipulating the speed selector.

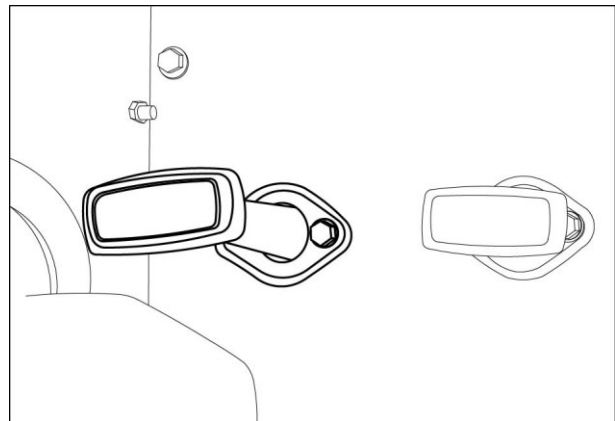


Fig.3-72

### 3.14.10 Front/Rear Differential Lock

The differential lock control pedal is shown in the figure.

When the differential lock control pedal is stepped down, then the differential lock will be engaged and the left and right drive shafts are connected in a rigid manner.

Release the differential lock control pedal and then the differential lock will disengage automatically.

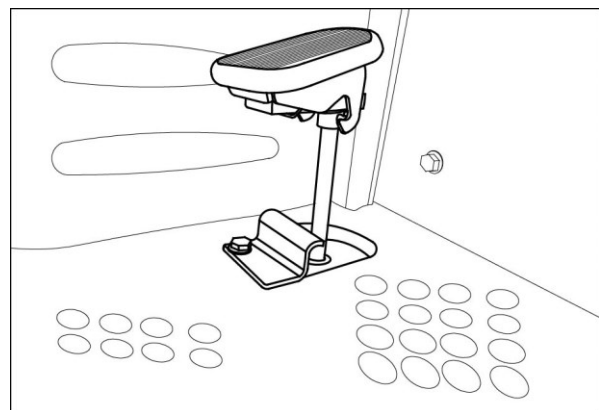


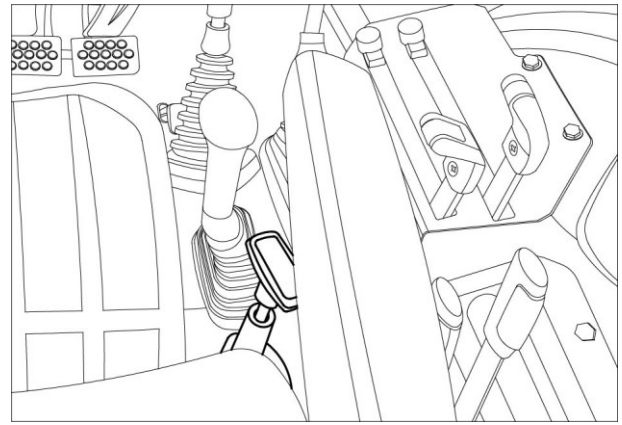
Fig.3-73

### 3.14.11 Rear PTO Clutch Connection/ Disconnection Control

Connect rear PTO by using mechanical control device (located on right side of operator), and pull control handle, and rotate it in clockwise direction to fix it in the position.

PTO can be disconnected by rotating control handle in counterclockwise direction and pressing it.

The panel above control handle is used to indicate how to use control device.

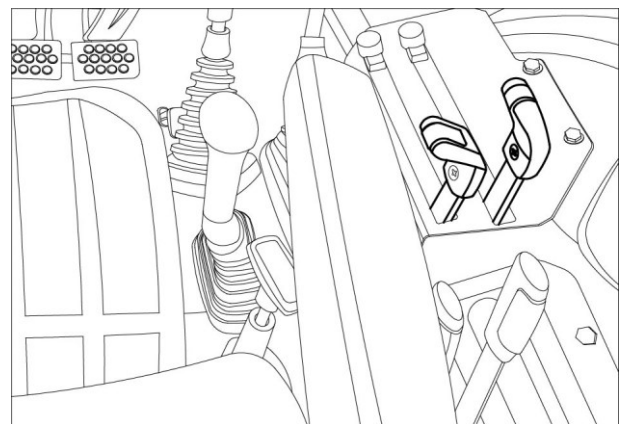


*Fig.3-74*

### 3.14.12 Lifter Control Handle

#### Lifter control handle (non-enforced type)

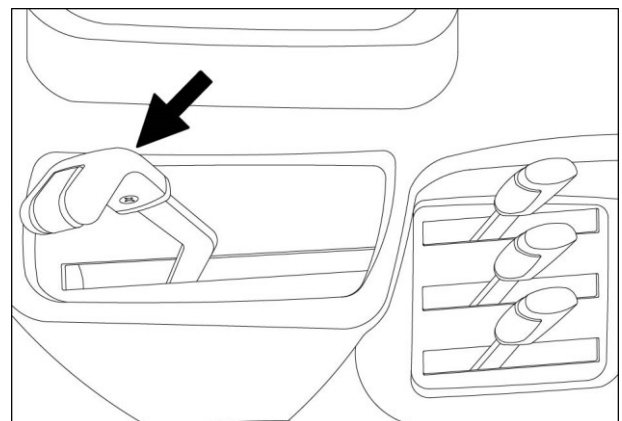
Lifter control handle control the rotation of lift arm, and then control the height of lower link.



*Fig.3-75*

#### Lifter control handle (enforced type)

The lifting control handle controls the lifting, lowering and floating of the lifting arm.



*Fig.3-76*

### 3.15 Wheel Chock



**Important:**

If the tractor has to be parked on a steep slope, wheel chocks shall be placed under rear wheels to prevent moving. It is advised not to park in steep slope as far as possible.

Wheel chocks shall be located in left and right side behind tractor.

**Use wheel chocks in the following situations:**

- When the tractor is parked on the slope;
- When the tractor is maintained or repaired.

### 3.16 Triangle Hazard Warning Sign

In accordance with relevant statutory provisions, a tractor must be equipped with one or two triangle hazard warning signs and stored at a suitable place.

Triangle hazard warning sign should be prepared by the user itself.

### 3.17 Fire Extinguisher



**Warning:**

The fire extinguisher must always be kept in a good working state and always installed at a specified place! Strictly abide by the maintenance and inspection intervals detailed by the fire extinguisher manufacturer.

The fire extinguisher should be prepared by the user itself.

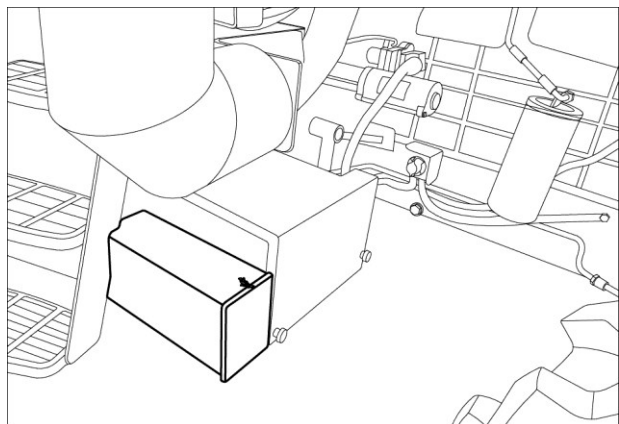
### 3.18 Operation Manual (User Manual)

The operation manual contains all necessary information for safe operation and maintenance of the tractor.

In order to prevent accidents, you should follow all safety regulations contained in the operation manual.

### 3.19 Tool Box

Tool box is located beside the battery. Specific position is shown in the figure.



*Fig.3-77*





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## **4- Operation Instructions**

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## 4.1 Introduction

### 4.1.1 Engine- First 50 Operating Hours

The tractor is delivered to the customer ready for use at full engine power thanks to the stringent testing phase that the engine undergoes in our test room.

However, in the first 50 hours of use do not subject the tractor to full power full load operation for prolonged periods in order to allow the piston rings to adapt properly to the cylinders and various moving parts to bed in correctly.

During this interval it is potentially harmful to run the engine at idle speed for prolonged periods and also to run it at high speeds in no load conditions; this would result in bedding in of engine components in a manner different from that which would deliver maximum efficiency throughout the full service life of the engine.



The safety seal on the engine governor is applied by the manufacturer and ensures that the power output of your tractor does not exceed the declared and approved value. Any tampering with this seal on the governor will void the warranty for the entire tractor with immediate effect.

**In the first hours of using machine, the following procedures must be adhered to:**

- At each start-up allow the engine to run at low speed for a few minutes;
- Do not use the engine continuously at low revs or at high revs with low loads;
- During the first 20 service hours do not use the engine with excessively high loads; use the tractor in full load conditions for periods that are gradually longer;
- Before shut off the engine allow it to idle for a few minutes;
- Special attention should be paid to following points when performing the checks and servicing operations listed below;
  - ✧ Engine oil level
  - ✧ Replacement of engine lubricating oil
  - ✧ Replacement of oil filter

## 4.2 Starting – Stopping the Engine




**Notice:**


Prior to use, careful and comprehensive inspection of the tractor can eliminate potential hazards and effectively prevent occurrence of accidents.

### 4.2.1 Preparation before Engine Startup


- Prior to startup, careful inspection should be conducted to confirm whether individual parts are connected firmly and reliably, individual control mechanisms work normally, individual pipe connections are tightened firmly, or oil leakage, water leakage or air leakage takes place.
- Inspect engine lubricating oil level of engine oil pan, tractor transmission, rear axle and hydraulic system. Replenish sufficient cooling water in the radiator. Enough fuel should be filled in the fuel tank.
- Pull the fuel circuit switch handle of the fuel tank to flow direction of the fuel pipe, so that the fuel circuit is connected.
- Inspect the transmission control handle and PTO shaft control handle, and set the main shift control handle, PTO control handle, front drive axle control handle to neutral position, and the distributor control handle to lower position.


- Pull up the flame-out stay wire locking device so that the flame-out stay wire withdraws and the fuel pump can supply fuel.
- Set the hand throttle to semi-opening state.
- For the tractor that is new, overhauled or is not used for a long time, remove air trapped in oil circuit prior to startup, so as to ensure smooth startup of the fuel engine. The method is as follows: First loosen the vent screw of the fuel filter, and use a hand pump to pump fuel to remove the air trapped in the pipe section from the fuel tank to the fuel filter, until no air bubbles exist in the drained fuel. Then, tighten the vent screw of the fuel filter, loosen the vent screw on the fuel injection pump, and remove the air by the same method until no bubbles exist in the drained fuel.

	<p><b>Important:</b></p> <p>Foreign bodies should be removed regularly from the radiator screen, so as to avoid fault due to improper heat radiation of the engine.</p>
---	---

	<p><b>Important:</b></p> <p>After the tractor is installed with a backsack harvester, due to bad radiation conditions during the field working, it is recommended that an auxiliary radiation device is installed at appropriate position on the tractor to ensure long-time continuous working of the engine.</p>
---	--


#### 4.2.2 Start the Engine

	<p><b>Important:</b></p> <p>When shut off the engine, the following function will be deactivated automatically: PTO shaft clutch.</p>
---	---




	<p><b>Notice:</b></p> <p>The auxiliary fluid for startup has high inflammability. During use, keep it away from source of ignition as far as possible (battery, connectors and etc.). Have it stored at a cool place.</p>
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**Before turning the ignition key, you must:**

1. Seat in the driver's seat before starting the engine.
2. Turn off all electric equipment powered by the battery (lights, direction indicator lights, fan, wiper, heating equipment and air conditioning equipment and etc.).
3. Have the transmission control lever moved to neutral position to receive startup signal.
4. Move the rear PTO and front PTO (if any) control device to the off position. The PTO clutch control device is also provided with a safety device to prevent engagement of PTO during startup of the engine.

	<p><b>Warning:</b></p> <p>The additive used for auxiliary startup is highly combustible goods. When they are used, have it kept far away from any possible ignition source (battery, connecting parts and etc.). Must put this kind of fluid at a shady and cool place.</p>
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The following abbreviations indicate position of the ignition key.

	Brake light: Engine off.
	On: Preheating stage.
	Start: Start the engine.

### Ignition switch

The ignition switch is located as shown in Figure.

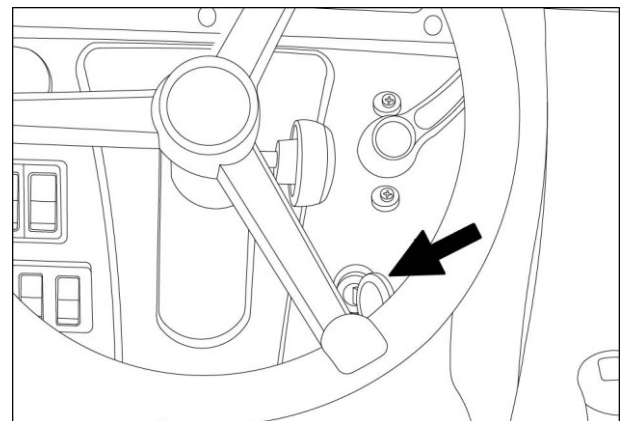



Fig.4-1

	<p><b>Notice:</b> Before starting the engine, make sure that it is adequately ventilated around. Please do not start the engine in a closed area. The emissions will cause choking.</p>
---	---

### 4.2.3 Engine Startup Procedure

**Important:**

Prior to startup of the engine, ensure that the main/range shift levers and front drive control handle are at neutral position, and the distributor control handle is at non-working (neutral) position to avoid sudden startup of the tractor resulting in accidental risks.

This kind of tractors is equipped with electronic equipment which is used to secure start and stop engine. Insert the key into the ignition switch and turn it to “On” symbol. All warnings in instrument panel: all lights will light up transitorily, which can be used to check conditions of all lights (test signal will be transmitted by buzzer). In this location, red warning light means alternating-current generator is in operation, low engine lubrication pressure, low transmission oil pressure, while the yellow warning light means preheating system is still in operation.

**Non-preheat startup**

- Depress the clutch pedal, and move the gear shift lever and reciprocating device control handle to neutral position.
- The engine can be started by turning the key to “Start” position and conducting proper acceleration.
- Upon startup of the engine, release the key and have it returned automatically to “On” position.

**Warming-up and startup**

- Have the clutch pedal depressed and move the transmission control lever to neutral position.
- Press the heating system control switch.
- The yellow indicator light will give off bright light to indicate that the electronic preheating system has been started. When the indicator light is off, the engine can be started by turning the key to “Start” position and conducting proper acceleration.
- Upon startup of the engine, release the key and have it returned automatically to “On” position.

**Starting the engine in cold condition****Warning:**

After the engine is started in low temperature condition, it is prohibited to have the engine accelerated at a speed more than 1800rpm before reaching its maximum operating temperature.

It is required to refill special fuel to the engine (general commercial type), and it should be operated according to applicable standards. When ambient temperature in winter is below 0°C, use of special fuel is extremely important in winter because the engine can operate normally at a temperature below -20°C. If summer special fuel is used in low temperature conditions, paraffin contained in the fuel will be deposited on the filter, so the filter will be blocked and the fuel cannot enter the fuel injection pump. Special winter fuel available for some markets contains special additive, which is suitable for use at temperature below -20°C.

**Important:**

It is prohibited to use ether-based product in cold conditions to help start the engine.

If no special winter fuel is available (or if it is used at temperature below  $-20^{\circ}\text{C}$ ), kerosine (paraffin) may be added based on the percentage shown in the figure.

- 1=Special summer fuel
- 2=Special winter fuel
- X=Percentage of kerosine added

Y=Environment temperature ( $^{\circ}\text{C}$ )

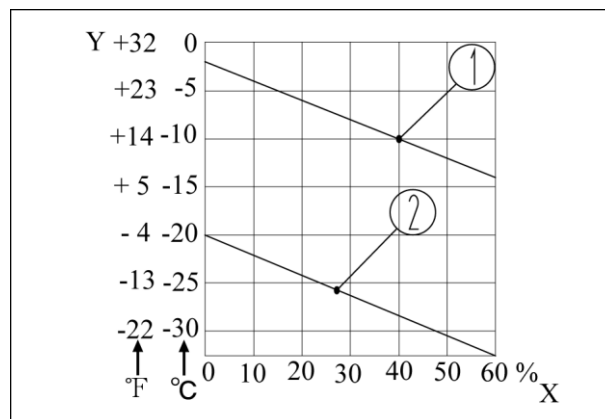


Fig.4-2

First, add the kerosine into the fuel, and then add fuel, as well as have both fuels mixed only in the tank. For more information, please contact authorized workshop, and your dealer or fuel supplier.

**Use the auxiliary battery to start the engine in case of emergency.**

	<p><b>Danger:</b></p> <p>Ensure that you have connected the battery terminal post correctly. Be cautious of short-circuit risk!</p>
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	<p><b>Danger:</b></p> <p>It is prohibited to start the engine by shorting the motor terminal because the tractor may drive forward suddenly, resulting in injury to the operator.</p>
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	<p><b>Important</b></p> <p>You can use the auxiliary battery in other tractor; only a battery pack with same voltage rating is connected (with same quantity of battery cells).</p>
--	---

**Before connecting the cable, please follow following safety instructions:**

- Ensure that no collision between two vehicles takes place;
- Turn off any unnecessary electronic devices;
- Have the transmission engaged in neutral position;
- Ensure that the battery requiring an external power supply is connected with the vehicle chassis, the cover has been assembled completely, and the electrolyte level remains normal.

**Connect two batteries as per following steps:**

- Connect the port of a cable to the positive pole of the power shortage battery, and then connect it to the positive pole of the auxiliary battery;
- Connect the port of the other cable to the negative pole of the auxiliary battery, and then connect it to the metal end of the earth wire for the tractor power shortage battery;
- If the auxiliary battery is on another tractor, first start the engine and have it accelerated to 1/4 of the maximum speed of the engine;
- Start the tractor equipped with a battery as per ordinary procedures;

- In case that the engine is started, disconnect the cable from the port as per reverse connecting sequence, first disconnect the cable from the port ④ and then the port③, ②, and eventually the port① .

If the engine cannot be started, wait for 15-20 seconds so that the starting device is able to stop; then, the engine can be re-started for three to four times at most. If the tractor still cannot be started, it is required to inspect the starter or the electrical system is failed (starting device and etc.).

**Diagram for connecting the battery with a jumper cable**

1. Positive pole of battery requiring an external power supply;
2. Positive pole of auxiliary battery;
3. Negative pole of auxiliary battery;
4. Terminal of the starter cable with ground of the tractor with the battery requiring extra power

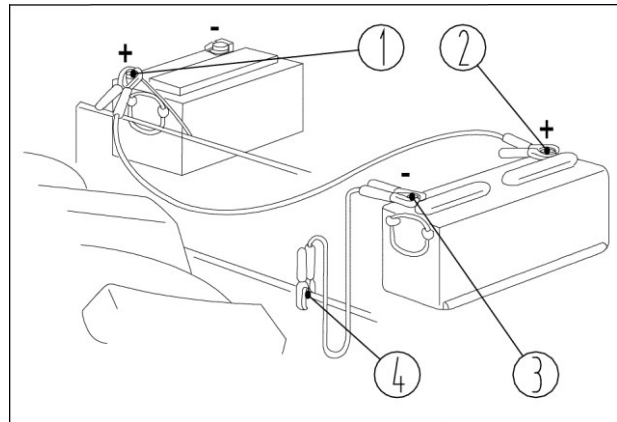


Fig.4-3

#### 4.2.4 Shut Off the Engine

- Turn the ignition key ① to “Stop” position.

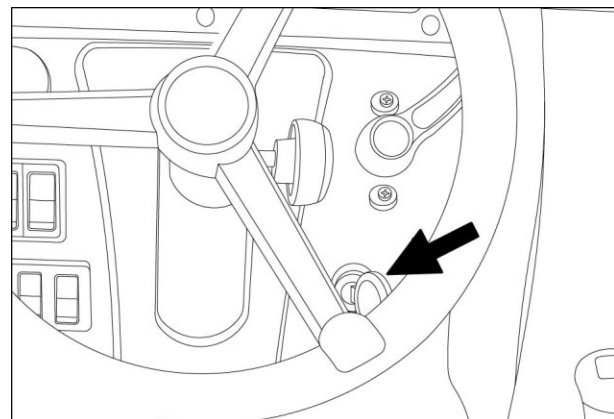


Fig.4-4

#### 4.2.5 Use a Turbocharger for Turbo-charging

The turbocharger functions to deliver a great deal of air to the hydraulic cylinder, and increase fuel flow proportionally, so as to increase engine power.

The turbocharger features a simple and reasonable design, which includes a turbine and a compressor. The turbine is driven by engine exhaust gas (kinetic energy of partial gas can be recovered, otherwise the gas will be dispersed), and the compressor is driven by the turbine. The compressor is used to compress intake air (which enters the air inlet manifold of the hydraulic cylinder via the air filter).

**Must strictly observe following operating instructions to avoid damage to the engine, especially the turbocharger.**

- Never accelerate to max revs with a cold engine. Run the engine a little above idle speed for -minutes to allow the oil to heat up gradually (the turbocharger is lubricated with engine oil) to ensure perfect lubrication of the turbine.
- Before stopping the engine after several hours of heavy duty service, run it at idle speed for a few minutes



to prevent the turbine from continuing to spin without sufficient lubrication; since the turbine runs at very high speed (70,000-110,000 rpm) at normal working speed, even a few minutes of insufficient lubrication can cause irreparable damage.

### 4.3 Starting of the Tractor

1. When the engine is at low speed state, press the clutch pedal, and then engage the gear shift lever of the transmission to the desired gear position.

2. Push down the hand brake handle, and release the parking brake.

3. Make a sound and observe the surroundings to confirm whether there are obstacles.

4. Gradually raise the engine speed, and slowly release the clutch pedal to enable the tractor to start to move forward smoothly. After the vehicle starts to move forward, release the clutch pedal immediately to avoid rubbing against the clutch.

5. Gradually enlarge the throttle opening to enable the tractor to reach desired operating speed.

6. During operation, semi-engagement of the clutch is not allowed to reduce driving speed of the tractor.

7. During driving, do not put your foot onto the clutch pedal always to avoid speeding up wear of the release lever and friction lining.

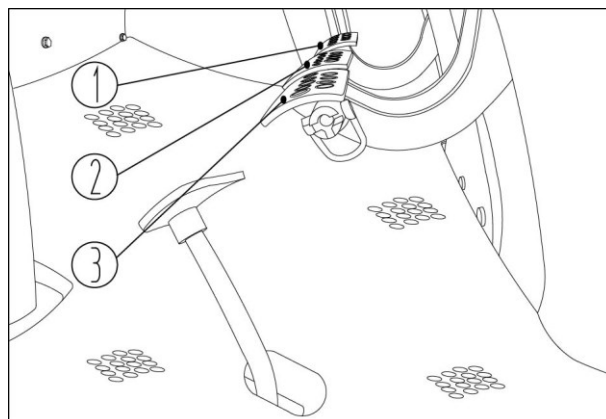



Fig. 4-5

	<p><b>Important:</b></p> <ol style="list-style-type: none"><li>1. Starting to move forward at high gear position is prohibited to avoid collision between drive gears of the transmission and early damage to the clutch.</li><li>2. Before the tractor starts to move forward, must release the parking brake to avoid damage to the working parts.</li><li>3. During gear engagement or shift, must press the main clutch to avoid collision between drive gears of the transmission and early damage to the clutch.</li></ol>
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### 4.4 Steering of the Tractor

During steering of the tractor on the road, first operate the horn switch to give an alarm sound, and then have the tractor steered. If the vehicle speed is high, it is necessary to speed down, turn the steering wheel earlier and slower with less forward followed by less back when the circle is slow. If the circle is fast, turn the steering wheel later and faster with more forward followed by more back.

When the tractor is steered at a short curve or on a soft field, and the steering is failed due to front wheel slippage, it is possible to press the brake pedal on corresponding side to help steering.

**Notice:**

When the tractor operates at high speed, it is prohibited to apply single-side brake for emergency cornering, so as to avoid roll-over accident.

**Notice:**

If squeak sound is produced from the activation of the safety valve of the hydraulic steering system when the front wheels turn in a long curve, the steering wheel should be moved backward slightly to avoid damage to the machine because the hydraulic steering system is overloaded for a long period.

**Notice:**

Prior to cornering or reversing of the tractor in the field, the working parts of the agricultural implement that is plowed into the soil must be lifted out of the ground, so as to avoid damage the implement or cause personal injury.

## 4.5 Transmission

### 4.5.1 Transmission Brief Introduction

Abbreviations related to the transmission control have following meaning:

- L = Low speed
- N= Middle speed
- V= Fast speed
- Turtle=Low speed
- Rabbit=High speed
- RM= Reverse gear

### 4.5.2 Different Configurations of Transmission

This series of gearbox control devices have two configurations.

**Configuration one: 24F+12R**

- Four-gear main gear shift lever (1-2-3-4) 。
- Three-range gear shift (L -N - V) , including slow speed (L), intermediate speed (N) and fast speed (V).
- High- and low-speed gear and reverse gear

**Configuration two: 16F+12R**

- Four-gear main gear shift lever (1-2-3-4) .
- Three-range gear shift (L -N - V) , including slow speed (L), intermediate speed (N) and fast speed (V).
- High-and low-speed gear and reverse gear (when engage creeper, range shift can only be on L position).

### 4.5.3 Configuration one: 24F+12R

## 24F+12R

- Four-gear main gear shift (1-2-3-4)
- Three-range gear shift (L -N - V)
- High-and low-speed gear

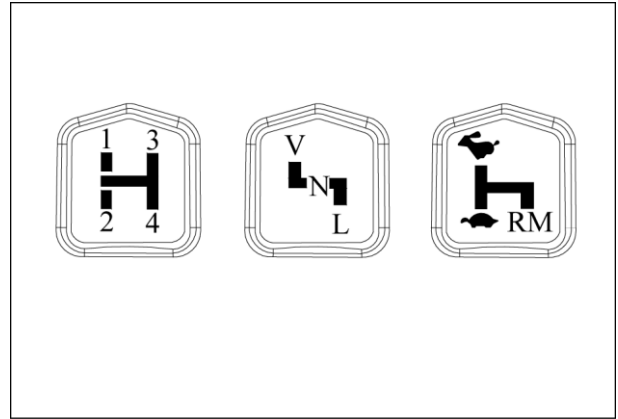


Fig. 4-6

### Main shift control handle

When the tractor is operating, use the main gearshift control handle ① to change drive ratio of the transmission. The tractor is equipped with a 4-gear transmission.

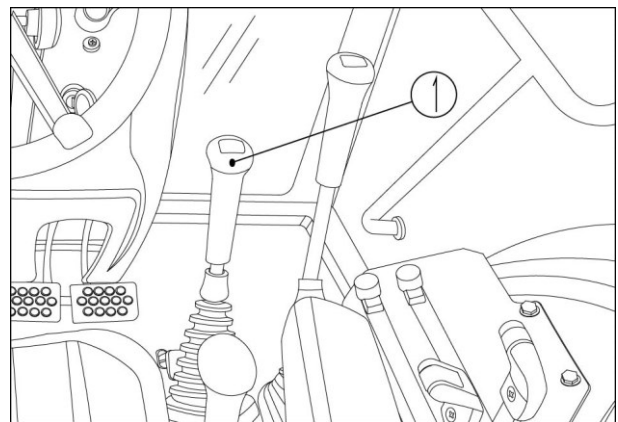


Fig. 4-7

### Range shift control handle

Use the range shift control handle ② to select the most appropriate speed range.

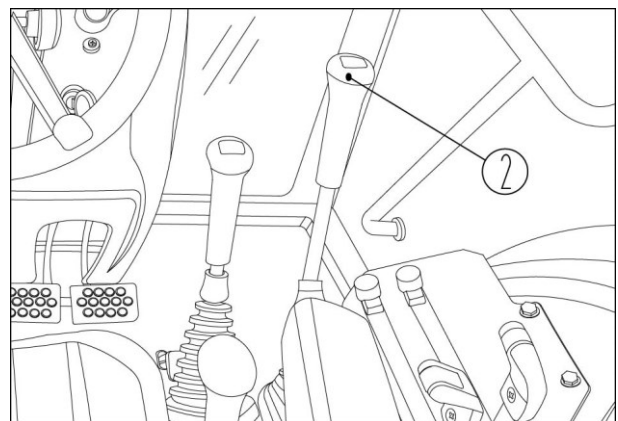


Fig. 4-8

### High/low gear, reverse gear control handle



#### Warning:

The high- and low-speed gear and reverse gear control handle can be operated only when the tractor is standstill and the clutch pedal is fully depressed.

Use of the high- and low-speed gear and reverse control handle ③ to select the forward or reversing gears.

The high- and low-speed gear, and reverse gear control handle can also be used to select deceleration or constant speed range (depending on configuration of the tractor).

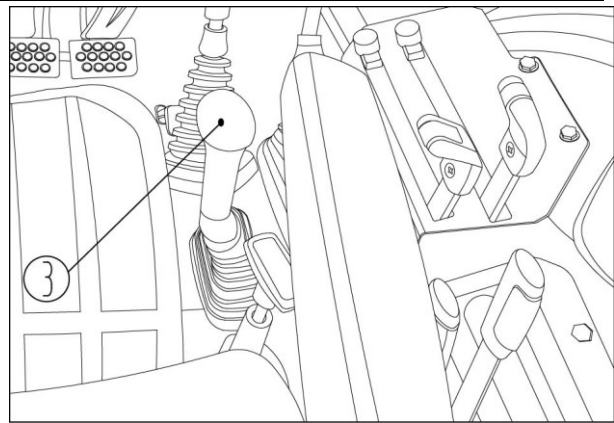


Fig.4-9

#### 4.5.4 Configuration two: 16F+12R

##### 16F+12R

- Four-gear main gear shift (1-2-3-4)
- Three-range gear shift (L-N-V)
- High-and low-speed gear and reverse gear (when engage creeper, range shift can only be on L position).

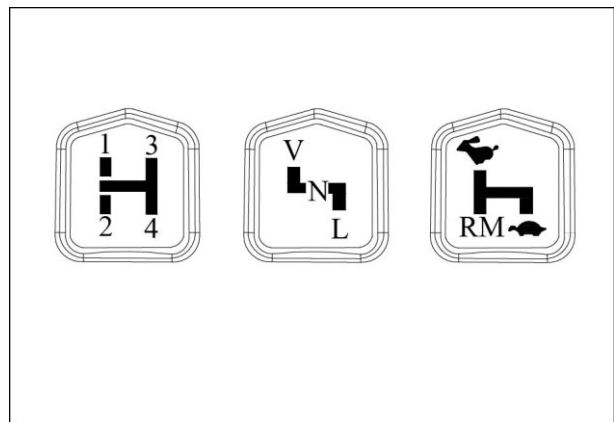


Fig.4-10

##### Main shift control handle

When the tractor is operating, use the main gearshift control handle ① to change drive ratio of the transmission. The tractor is equipped with a 4-gear transmission.

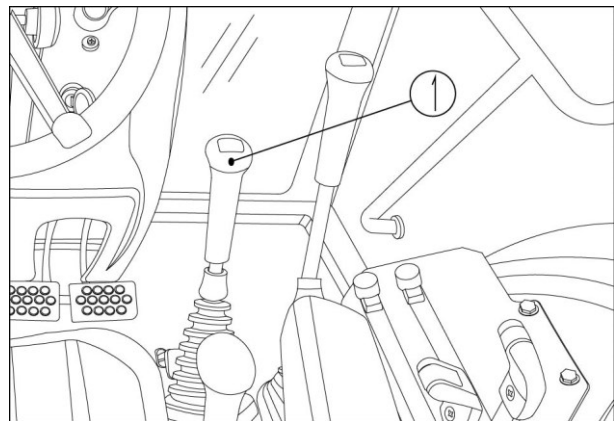


Fig.4-11

##### Range shift control handle

Use the range shift control handle② to select the most appropriate speed range.

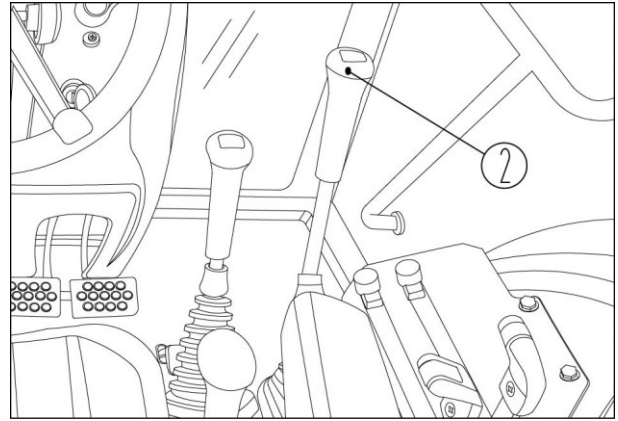


Fig. 4-12

### High/low gear, reverse gear control handle



**Warning:**

The high- and low-speed gear and reverse gear control handle can be operated only when the tractor is standstill and the clutch pedal is fully depressed.

Use of the high- and low-speed gear and reverse gear control handle③ to select the forward or reversing gears.

The high- and low-speed gear, and reverse gear control handle can also be used to select deceleration or constant speed range (depending on configuration of the tractor).

In this configuration, when the creeper is engaged, the range shift can only be in position L.

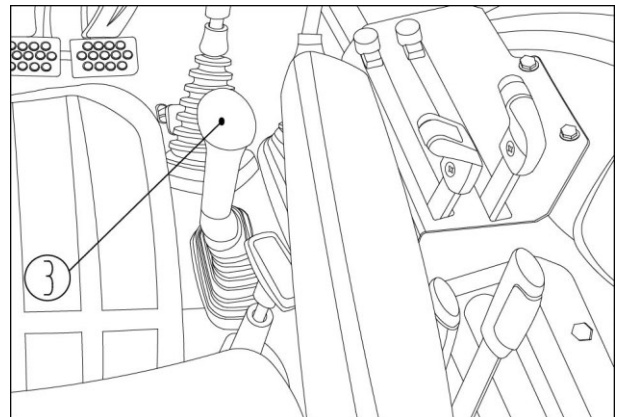


Fig. 4-13

### Creeper lever (optional)

To start it, the following sequence may be followed:

- Conduct braking, and have the engine kept started.
- Fully depress the clutch pedal.
- Set the main gear shift control handle to neutral position.
- Pull backward the main gear shift control handle.

---

**To have the gear disengaged, the following operating sequence is followed:**

- Conduct braking, and have the engine kept started.
- Fully depress the clutch pedal.
- Set the main gear shift control handle to neutral position.
- Wait for several seconds
- Pull forward the creeper gear


#### 4.5.5 Gear Shift of the Tractor

**The transmission usually requires no adjustment in its service life, however it is required to pay attention to following items during service and maintenance:**

The lubricating oil in the transmission can flow into the rear axle. The oil filler port is located on the rear axle housing, and during oil drainage, the oil drain bolt on the rear axle housing and transmission should be unscrewed respectively, and the scrap iron adhered to the oil drainage bolt should be cleaned. Use an oil dipstick to inspect the lubricating oil level.

Correctly selecting a tractor operating speed is not only able to obtain optimal productivity and economy, but also extend its service life. When the tractor is working, it should not be overloaded frequently, it is better make the engine has certain power margin. The working speed during operation of the tractor in field should be selected in such a manner that the engine is operated at about 80% load.


Where the tractor works at light load and low speed, the 1st gear and small throttle can be selected to save fuel.


	<p><b>Important:</b></p> <ol style="list-style-type: none"><li>1. During operation of the engine, press the main clutch pedal fully before gearshift, and then shift the gear after several seconds to avoid poor engagement of the engagement sleeve of the transmission, resulting in "Gear collision" phenomenon.</li><li>2. The reverse gear can be engaged only when the tractor is standstill.</li><li>3. When the tractor is operating, do not put your hand on the gear shift lever, otherwise the pressure exerted by your hand will be transferred to the gear shift fork in the transmission to cause early wear of the fork.</li></ol>
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## 4.6 Front Wheel Drive-differential lock

### 4.6.1 Have the Front-wheel Drive Engaged.

Except for permanent rear-wheel drive, engaging the front-wheel driver can enhance transport performance of the tractor on steep road and uneven terrain, and the front-wheel driver should be also engaged when it is required to increase traction force.

	<p><b>Important:</b></p> <p>We suggest that the front wheel driver is used only when it is required to increase traction force during road transportation, so as to avoid unnecessary tire wear.</p>
---	--

	<p><b>Important:</b></p> <p>The front wheel driver cannot be engaged and disengaged unless the tractor is fully stopped.</p>
---	--

**Mechanical connection of front-wheel driver**

By pulling upward the control lever (1) (positioned on left side of the operator), the front wheel driver can be engaged; the control handle will be kept locked.

By pressing downward the control handle (1), the front wheel driver can be disengaged, and it will return to the standstill position.

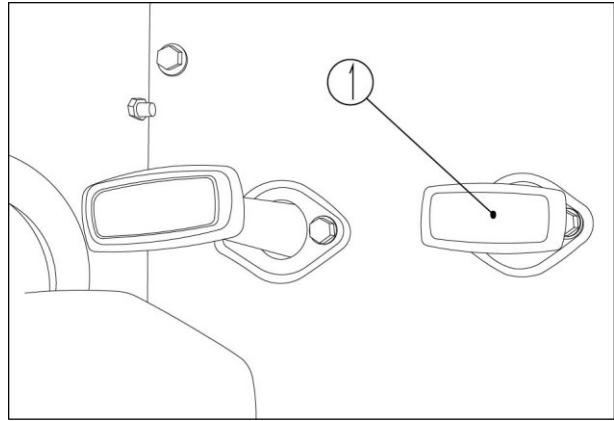


Fig. 4-14

A panel is provided at top of the control lever, which is able to indicate how to use the control device.

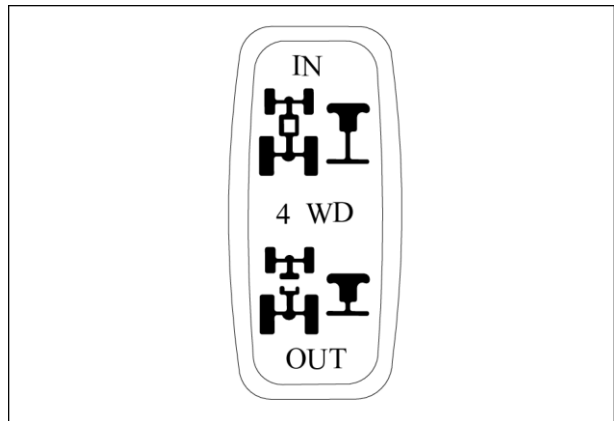


Fig. 4-15

	<p>Engagement of the Front-wheel Drive is indicated by the corresponding indicator light on the dashboard.</p>
--	--

**4.6.2 Front/Rear Differential Lock**

	<p><b>Warning:</b> Engagement of the differential lock is prohibited in following condition: At speed higher than 15km/h—When driving on curved road—A brake pedal is depressed.</p>
--	--

	<p><b>Important:</b> When a wheel is subject to serious slippage, it is prohibited to engage the differential lock. In this case, the clutch pedal should be depressed before engagement of the differential lock.</p>
--	--

	<p><b>Important:</b> When the differential lock has been engaged, it is prohibited that the tractor drives forward on road or at high speed. In such case, it is difficult to steer, resulting in accident, injury or damage.</p>
--	---

The tractor is usually provided with a front and rear differential lock, and the differential lock control device can lock the front/rear differential lock. The differential lock should be engaged only when the tractor drives straight and before the front wheels slide seriously.

The differential lock can be operated by mechanical method; depressing the pedal ① (positioned near the main gear shift control lever) can lock the differential lock.

To keep engagement of the differential lock, it is possible to press rear moveable part of the pedal, so that the latch can be engaged with the mounting bracket on the stand.

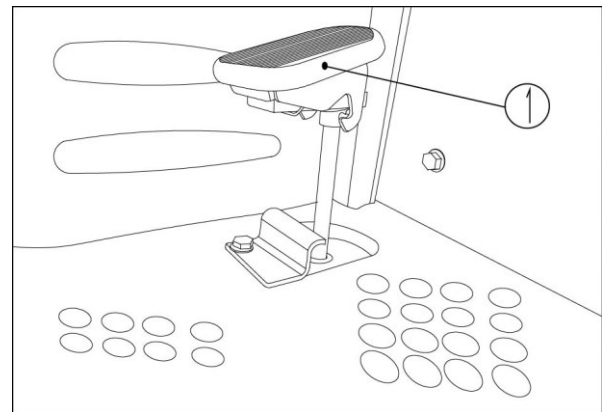


Fig. 4-16

	<p>Engagement of the differential lock is indicated by the corresponding indicator light on the dashboard.</p>
--	--

## 4.7 Brake

### 4.7.1 Hydraulic Trailer Braking

	<p><b>Warning:</b></p> <p>The tractor must be equipped with a trailer braking system, which must be connected to the trailer correctly.</p>
--	---

The tractor can be equipped with an optional hydraulic trailer braking system. Through a specific direction control valve, oil can be obtained from the main hydraulic circuit of the tractor. This direction control valve is operated via a valve (which is connected to the braking hydraulic control device of the tractor by hydraulic means).

	<p><b>Important:</b></p> <p>If required to adjust the braking system, please contact our authorized Service Center.</p>
--	---









## 4.8 PTO

The tractor can be equipped with the following PTO:

- Rear PTO
  - 540/1000 rpm PTO

	<p><b>Warning:</b></p> <p>When the PTO is not used, the PTO clutch control is set to neutral position to avoid unnecessary clutch wear.</p>
--	---



	<p><b>Warning:</b></p> <p>It is prohibited to operate the PTO when the engine speed exceeds rated speed. If the speed is too fast, it may cause damage to the implement, and cause injury.</p>
	<p><b>Warning:</b></p> <p>When a specific implement driven by the PTO (such as rotary mower, hay packing machine, flail and etc.), the implement must be equipped with an idling clutch to avoid damage to the PTO brake.</p>
	<p><b>Warning:</b></p> <p>Before being dismantled from the tractor, must have the PTO engaged, lower the implement to ground, set the transmission to neutral position, use the parking brake, shut off the engine, engage the first gear (for a tractor with a mechanical transmission) and remove the key on the start switch. For more information on safe operating procedure, refer to “Stopping” section related to safety in this manual.</p>
	<p><b>Danger:</b></p> <p>After disengaging the power take-off, the mounted implement may continue to operate due to inertia. Only when the implement is at a complete standstill and the engine has been switched off is it possible to come near to perform the required maintenance.</p>
	<p><b>Danger:</b></p> <p>For safety seasons, the PTO shaft shield must never be removed. The PTO shaft protective guard cannot be dismantled only when the PTO is connected to the implement driving shaft, and the engine is shut off. When no PTO shaft is available, we suggest that the protective guard is replaced when the engine is standstill.</p>
	<p><b>Danger:</b></p> <p>When the PTO driving shaft is connected or disconnected, shut off the engine and use the parking brake. For more information on safe operating procedure, refer to “Stopping” section related to safety in this manual.</p>
	<p><b>Danger:</b></p> <p>After the driving shaft on the PTO shaft is disconnected, set the protective guard on the output shaft.</p>
	<p><b>Danger:</b></p> <p>The PTO shaft cannot be replaced unless the engine is flamed out and the key is removed from the start switch.</p>



**Warning:**

If the tractor is equipped with a PTO clutch control device (with a control handle), make sure that the control handle is at neutral position before turning the key to start the engine. Otherwise, the engine cannot be started.



**Danger:**

During operation of the PTO, nobody is allowed to stay beside the PTO or its driving shaft.



**Warning:**

When a tractor with a stationary implement (which is driven by the PTO, such as irrigation pump) is used, ensure that all gear shift levers are at “Neutral” position before leaving the tractor, and the parking brake should be used fully and wheel chocks are placed under the tractor wheels. For more information on safe operating procedure, refer to “Stopping” section related to safety in this manual.

### 4.8.1 Rear PTO (540/1000rpm)

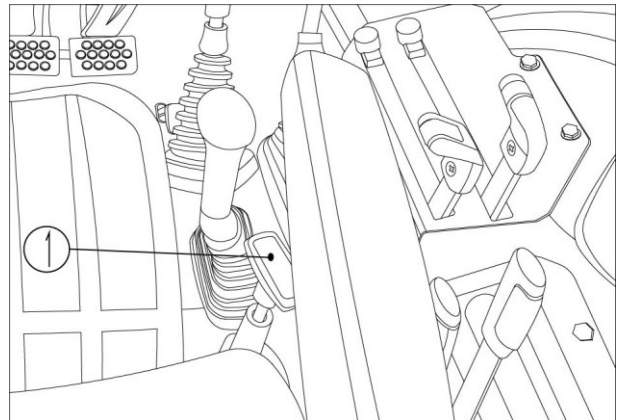
The tractor can be equipped with a 2-gear rear PTO: 540rpm and 1000rpm.

#### Rear PTO clutch connection/ disconnection control

Use a mechanical control device (on right side of the operator) to engage the rear PTO, pull appropriate control handle ①, and then have it kept at desired position.

Press the control handle ① to disconnect the rear PTO, so that the control handle will be returned to stop position.

The panel above control handle is used to indicate how to use control device.



*Fig.4-17*

A panel is provided at top of the control lever, which is able to indicate how to use the control device.

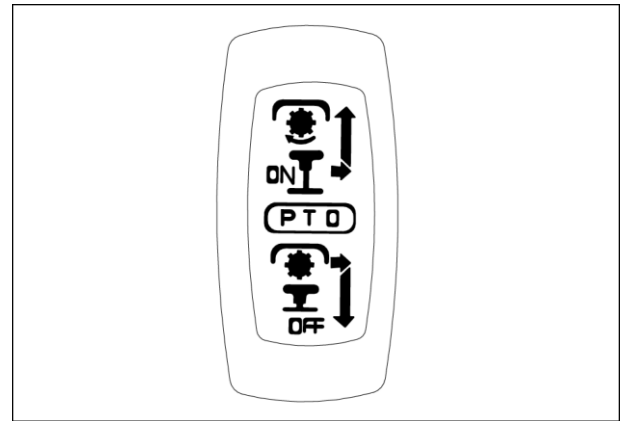
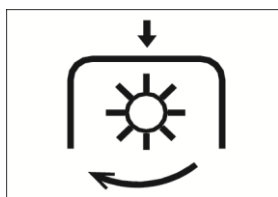


Fig.4-18



The indicator light on the dashboard gets on to indicate that the rear PTO is engaged.



**Important:**

After completing current work and before the PTO is disengaged, decrease the engine speed to idling speed, wait a while until the implement speed is decreased, and then move the control handle to disengage the PTO clutch. This measure will prevent overheating risk of the PTO brake when the driver is delivered to the shaft from the implement (through inertia).

#### 4.8.2 Rear PTO Speed Handle

The speed selector control handle is positioned on left side of the driver's seat (position ① in the figure).

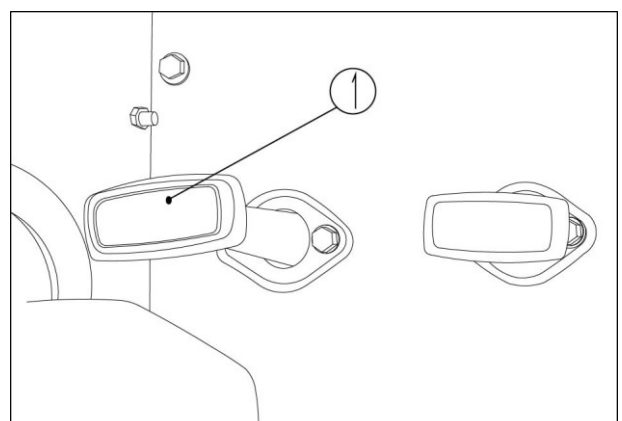


Fig.4-19

A panel is provided at top of the control lever, which is able to indicate how to use the control device.

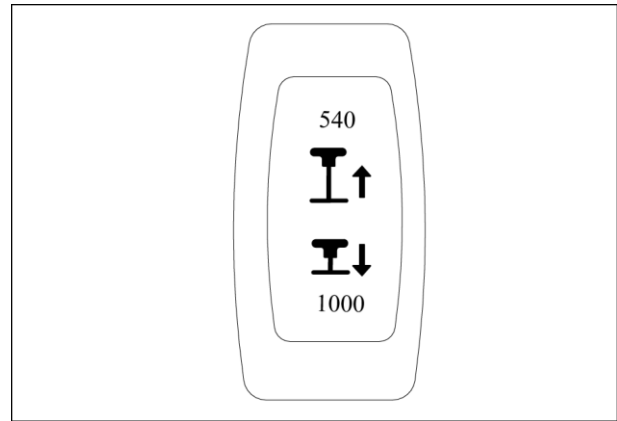



Fig.4-20


The corresponding relation of PTO speed and engine rated speed is as follows:


PTO rotate speed RPM)	540	1000
PTO speed @ engine rated speed (RPM)	596	1077
Engine speed @PTO rated speed (RPM)	2070	2300
%	90%	100%


	<p><b>Important:</b> The PTO speed selector is operated only when desired to shut off the engine.</p>
--	---


## 4.9 Rear Hydraulic Lifter


### 4.9.1 Hydraulic Lifter


	<p><b>Warning:</b> Before use of the hydraulic lift, ensure that nobody stays in the vicinity of the implement.</p>
---	---

	<p><b>Warning:</b> When the tractor is not in operation, or is being maintained, repaired or adjusted, lower the implement to ground.</p>
---	---

	<p><b>Warning:</b> It is prohibited to tow the implement by means of coupling it to the lower link. Only approved drawbar or draw hook is used to tow the implement. Drawing or hooking other point of the tractor may result in turnover.</p>
---	--

	<p><b>Warning:</b></p> <p>It is prohibited that anybody stands between the tractor and implement, except that the engine is flame-out, the key is removed from the start switch, the parking brake is applied, the gear is engaged and all accessories or implement are lowered to ground.</p>
---	--

	<p><b>Warning:</b></p> <p>Before startup of the engine, inspect position of the control handle for the lifting arm (Consistency inspection).</p>
---	--

	<p><b>Warning:</b></p> <p>Lower the lifter before stopping the engine.</p>
---	--

The tractor can be equipped with following lifters:

- Induced hydraulic rear lifter (with a mechanical control)

#### 4.9.2 Rear Lifter Controlled with Mechanical Load Sensor

Diagram for lifter

The rear lifter used to control suspended implement, semi-suspended implement and pull-type implement includes:

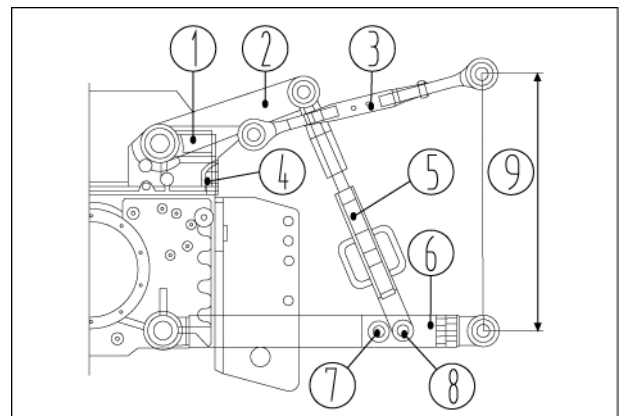
- Hydraulic device positioned above the PTO housing;
- Three-point linkage, used to connect the implement to be lifted.

The hydraulic lifter that is controlled mechanically has following function:

- Automatic control of implement position;
- Automatic traction force control;
- Combined traction force/position control;
- The system driven by a hydraulic valve automatically control descending speed of the implement;
- Quick coupling of the implement;
- Hydraulic control of the external implement.

Diagram for lift parts (three-point linkage)

1. Lifter cover;
2. Lifting arm
3. Upper link
4. Feedback device
5. Lifting lever
6. Lower link
7. When the lifting rod is mounted in the hole ⑦, the lifting height can be increased;
8. When the lifting rod is mounted in the hole




⑧, the lifting force can be increased;

Fig.4-21

9. Category 2-610mm; Category 3-685mm

### Lift control device

	<p><b>Danger:</b></p> <p>For a tractor with a mechanically-controlled lift, if the control device is operated during flame-out of the engine, the lifter will be actuated to move the lifting arm within shortest time period after startup of the engine.</p>
---	--

### The lift control handle includes:

- Position control handle, which is positioned on the dashboard on right side of the operator;
- Draft control handle, which is positioned on the dashboard on right side of the operator;

### Position control handle (Control handle 1)

Lifter control handle to control rotation of lift arm, and then control the height of lower link.

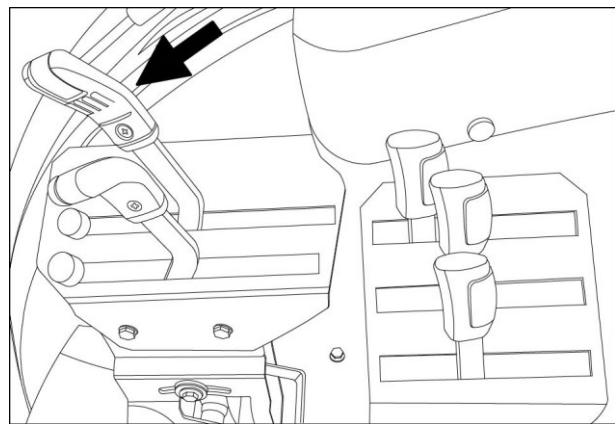


Fig.4-22

### The control handle travel range can be divided into colored sections which have different functions:

- Yellow section - Used to lift up/down the implement;
- Yellow/green section - Used to set working position required for the implement and used for combined force-position control;
- Blue section - Floating position, where the implement is set according to terrain section.

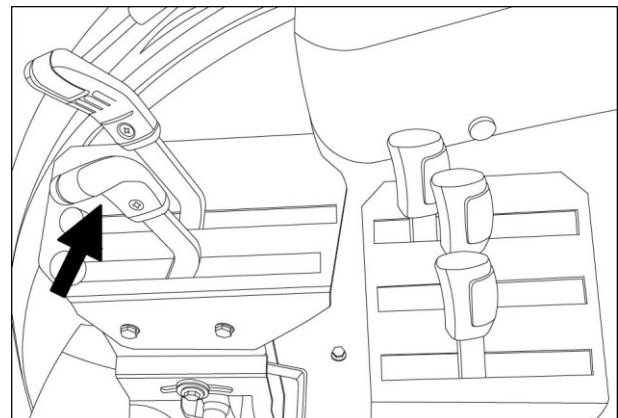
There is a stopper screw in the operating handle groove so that the operating handle can be moved to and off the same location repeatedly.

### Draft control handle (Control handle 2)

Draft control handle can be extended to the upper tie rod, so as to automatically control working height according to resistance to the implement by soil.

Moving range of the draft control handle is indicated by the green area, and the reading on the dial is 0 through 12.

The force handle groove is equipped with a stop screw, so as to easily and repeatedly turn the control handle to the same position.



### Lifting rod position in different working conditions

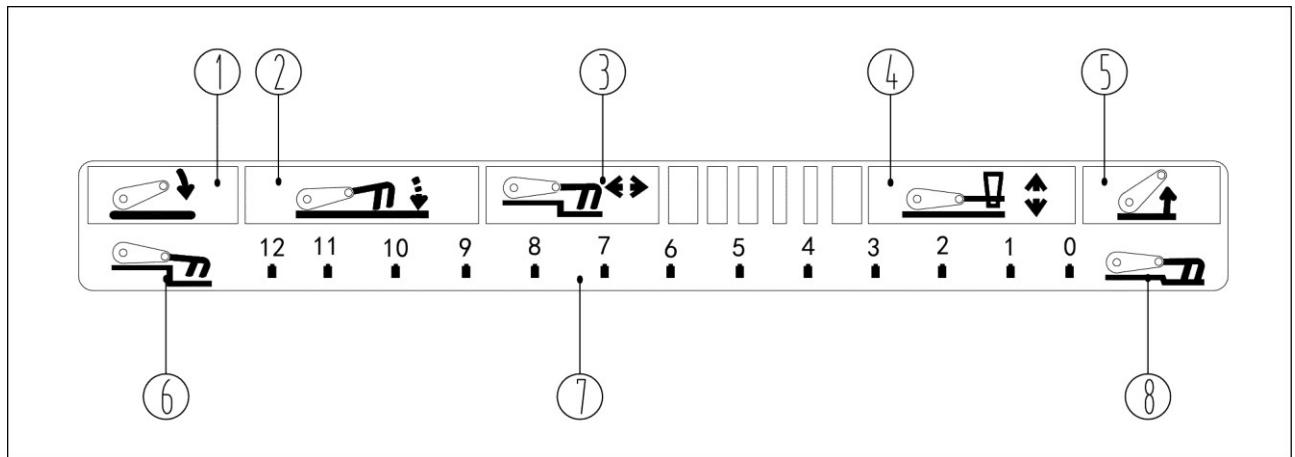


Fig. 4-24

### Control handle sections

- |          |                                   |                        |                                   |
|----------|-----------------------------------|------------------------|-----------------------------------|
| 1. Lower | 2. Floating-blue area             | 3. Mixed control       | 4. Position- yellow area          |
| 5. Lift  | 6. Maximum tractive force control | 7. Control- green area | 8. Minimum tractive force control |

### Implement lift/lower

- Lift the implement, and pull backward the control handle 1 (in yellow section) until required height is reached.
- Lower the implement, and push forward the control handle 1 until the limit value in the yellow section is reached.
- The control handle 2 should be set at No. 12 position in the section.

### Transportation of lifting implement

- The control handle 1 should be pulled backward completely.
- The control handle 2 should be set at No. 12 position in the section.

### Position control operation (Rotating handle, rotary cultivator, fertilizer distributor and etc.)

- The control handle 2 should be set at No. 12 position in the section.
- Move the control handle 1 along the yellow section until working position is reached; set a stop screw to enable it to return to the same working position in subsequent operation.

### Draft control operation (Plough, steel toothed cultivator, excavator and etc.)

- Move the control handle 2 to No. 4 or 5 position in the section.
- Pull the control handle 1 to blue “Floating section” to enable the implement to go deep in the soil quickly.
- Pull the control handle 1 to the green section (close to the blue section).
- Push forward the control handle 2 to obtain required working height, and set up a non-check screw to complete subsequent operation at the same working height.
- It is required to only pull backward the control handle 1 at the end of furrow. When starting plowing of next furrow, push the control handle 1 to blue “Floating” section, and have it kept at the same position until the implement reaches required working height at which the control handle must be returned to

---

green section immediately

#### **Operation of the implement working in the soil or at soil surface (combined traction force/position control)**

- When working in terrain with poor continuity, a position control handle should be provided to protect the implement from being trapped below the required working depth in the soft soil, and realize combined traction force/position control.
- To realize combined control, start working and set the control handle position to “Traction force control”, and then move backward the control handle 1 along the yellow section (with green section) until the implement starts ascending. At this moment, gently move backward the control handle (1-2mm) to fix the implement at current position.

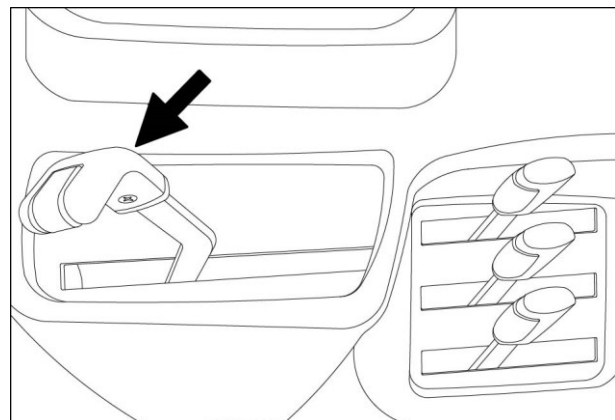
#### **Floating control operation (such as drill planter)**

- When you desire to have the implement moved forward along the terrain profile, push the control handle 1 to blue “Floating” section.
- The control handle 2 can be at any position among No. 6 through No. 12 position in the section.
- Every time when the transfer is started and finished, only the yellow control handle is applied to ascend and descend the implement.

### **4.9.3 Rear Lifter (Enforced Type)**

#### **Lifter control handle (enforced type)**

The lifting device handle controls the lifting, falling and floating of the lifting arm.



*Fig.4-25*

#### **Control Type**

The independent hydraulic lift can realize position control and float control. The control handle of hydraulic lift is used for lifting the implement and controlling working depth.

a) Position control:

It is used when the tractor equipped with a rotary implement performs rotary tillage, mowing, or harvesting, and the draw bar is subject to tension. In the case of position control, the up-down displacement variation of implement is directly proportional to the forward-backward displacement of the control handle. The more the control handle moves forward, the more the implement moves downward. The more the control handle moves backward, the more the implement moves upward.

b) Float control:

It shall be used when an implement equipped with a working depth limiting wheel is used. Placing the control handle in the float control position can bring the hydraulic system to the float control state, and the lift arm can thus swing freely. The working depth of implement is controlled by the working depth limiting wheel. The tractor moves following the terrain profile.



With an excavator, fork lift, or loader connected to the tractor, in the case of float control, the cylinder can move freely so that the bucket or fork can properly follow the terrain profile.

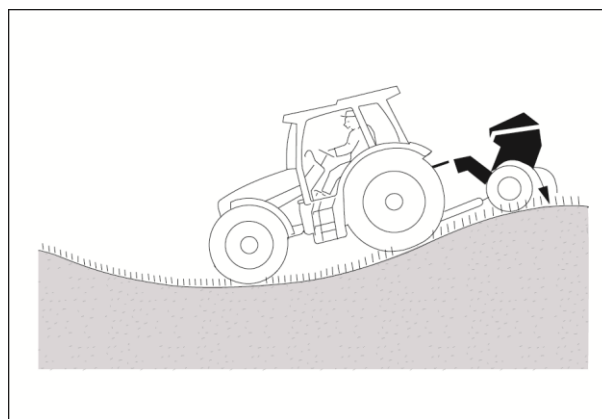


Fig.4-26

	<p><b>Notice:</b></p> <p>When the hydraulic cylinder is used as a single-acting cylinder, the float position can also be used to lower the tiltable trailer body.</p>
--	---

	<p><b>Notice:</b></p> <p>When the tractor is not connected with the implement, the control handle should be in neutral position.</p>
--	--

	<p><b>Important:</b></p> <p>When an implement with a PTO is required, it is required that the implement be at a height above the ground to ensure no influence on steering of the tractor in the field, for the purpose of preventing damage to the implement, due to excessive lifting height resulting in a bigger angle between the PTO and the drive shaft of the implement.</p>
--	--

## 4.10 Three-point Linkage

The three-point linkage of the tractor is used to connect the implement controlled by the hydraulic lift.

	<p><b>Danger:</b></p> <p>Hooking on to the rear axle or any other point above the swinging drawbar or rear wheels can cause the tractor to tip over.</p>
--	--

	<p><b>Notice:</b></p> <p>When adjusting the length of the top link of the three-point linkage, take care that it does not come apart and ensure that a sufficient length of the threaded end of the turnbuckle is screwed into the turnbuckle housing to withstand the tractive force applied when working.</p>
--	---

Upon proper adjustment, the tractor can be hitched with a category II and III implement.

The lower link and upper link are equipped with a quick-change connector which is used to quickly and

easily connect the implement.

It is possible to adjust length of the upper link and lifting rod via the threaded sleeve with a handle.

**The three-point linkage can be adjusted as follows:**

- Adjust lifting lever
- Adjust upper link
- Adjust limit rod.

#### 4.10.1 Mechanical Three-point Linkage

##### Three-point linkage

1. Upper link;
2. Lifting arm;
3. Lifting lever;
4. Limit rod;
5. Lower link

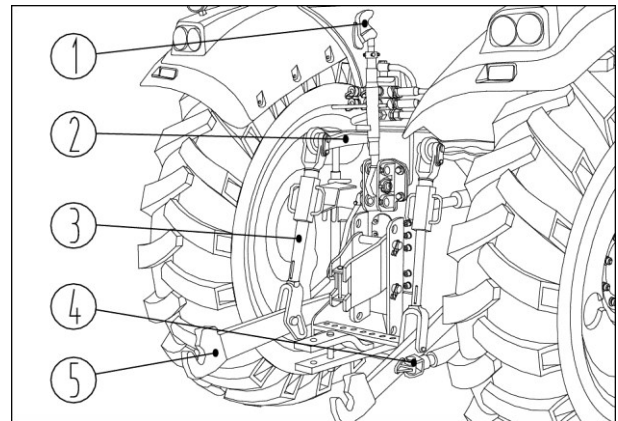


Fig.4-27

#### 4.10.2 Manual Adjustment of the Lifting Lever

Through adjusting the lifting rod, it is possible to change lateral angle of the implement.



**Warning:**

When the three-point linkage is operated, no visible object exist within operating radius of the lifting arm and nearby any connected implement, so as to avoid injury due to improper operation.



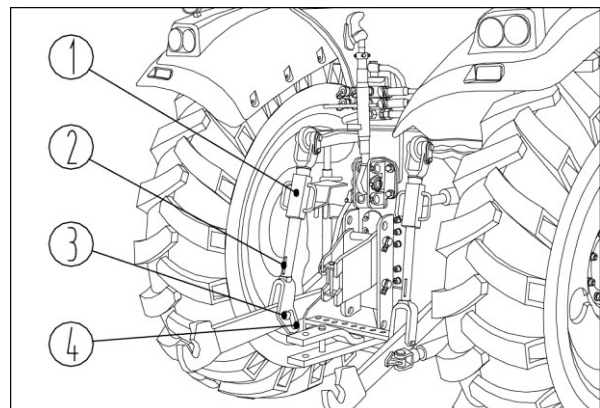
**Warning:**

Frequently inspect and ensure that the implement weight is within the maximum permissible load exerted on the tractor shaft.

**The lifting rod is adjusted by following method:**

- Dismantle the handle ① from the retaining piece ②;
- Turn the handle ① in clockwise direction to increase length of the lever, and in counterclockwise direction to shorten its length.

Fix the lifting rod to the lower drawbar via the pivot point ③ or slot ④. Use the slot ④ to simplify connection of the implement, and enable the wider implement to move along the ground profile easily. It is used for some special applications.



### 4.10.3 Manual Adjustment of the Upper Link

Through such adjustment, the implement can be placed on the ground at a right angle. By shortening the upper link, it is possible to increase the angle; and increase in length of the upper link can reduce the angle.

**The upper link is adjusted by following method:**

- Disassemble the upper link ② from the fixed seat ①;
- Turn the wheel lock ③ in counterclockwise direction to disassemble the upper link;
- Turn the upper link to obtain required length;
- Turn the wheel lock ③ in clockwise direction to lock the upper link;
- Hitch the upper link to the fixed seat ①.

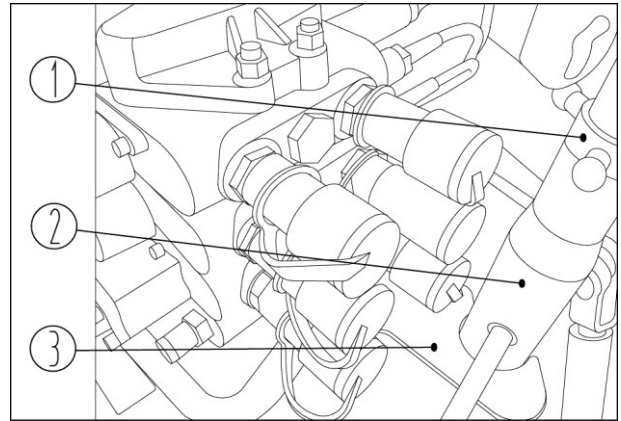


Fig.4-29

Generally, the lower link is at horizontal position, and the upper link should be inclined, whose rear end should be at upper side.

The distance between the lower link and upper link must not less than 610mm (Category 2 implement) and 685mm (Category 3 implement).

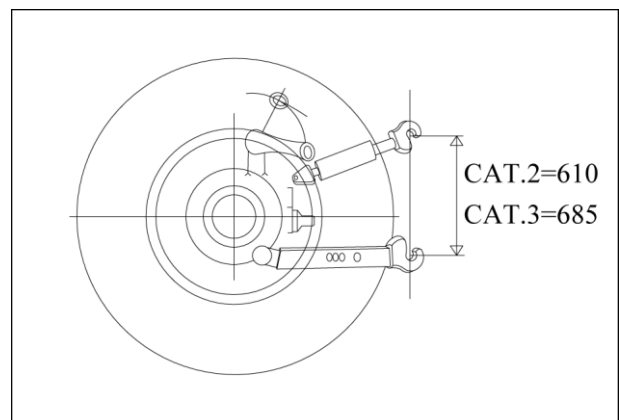



Fig.4-30

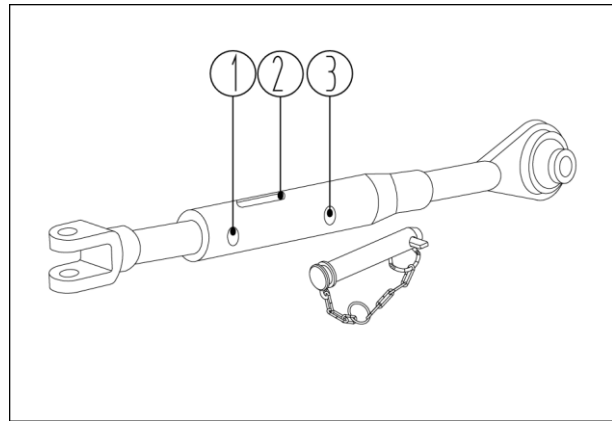
### 4.10.4 Adjustment of the Limit Rod

	<p><b>Warning:</b></p> <p>When the tractor starts moving, do not enter the area between the tractor and implement. Before shutdown of the tractor, lower the implement.</p>
---	---

The limit rod is used to prevent or limit lateral movement of the implement.

**The permissible movement range depends on pin position:**

- Stop movement - Insert the pin into the hole ①;
- Restrict movement - Insert the pin into the hole ②;
- The hole at middle of the sleeve ③ is used to turn the sleeve (through the insertion lever).



*Fig.4-31*

During implement transportation and operation of the land leveling shovel, excavator, roller, mower, seeder, drilling machine, and other similar machines, must lock the limit rod (the pin is inserted into the hole ①). When operating the cultivator, harrow, ditcher and similar machines or working in force mode, the limit rod can be moved within small magnitude (the pin is inserted in the hole ②). Remove the pin and turn the threaded sleeve to adjust length of the limit rod.

## 4.11 Hydraulic System

All hydraulic equipment on the tractor (except for the clutch and brake, it is provided with an independent hydrostatic system) uses a common hydraulic system. Pressurized oil is delivered by two hydraulic pumps (driven continuously by the engine). This pump is positioned on the transmission.

- The high-capacity pump is used to deliver pressurized oil to the trailer brake valve, hydraulic multi-way valve, and hydraulic rear lifter. It sucks oil from the transmission, and are provided with two 44 $\mu$ m filters for oil filtration.
- The small-displacement pump (14cc) delivers pressurized oil to the following equipment.
  - ◇ Hydrostatic steering gear.
  - ◇ Through the pressure relief valve, deliver the oil to the transmission at low pressure, so as to achieve forced lubrication of the gears and shaft.
  - ◇ Through the pressure relief valve, make the oil flow back to the cooler at low pressure.
  - ◇ Through the pressure relief valve, make the oil flow to the PTO clutch and brake.

A 44 $\mu$ m filter is used to filter the oil sucked into the pipeline; the oil returned in the hydrostatic steering control valve is cooled through the cooler (positioned in the heat radiator guard).

### 4.11.1 Hydraulic Valve



**Warning:**


It is prohibited to stand or pass through under the hydraulically supported load.

The hydraulic valve is equipped with a control handle, which can deliver the oil from the booster circuit to the oil outlet to ensure that the external implement can be controlled (with a hydraulic device) to meet all use requirements.

**Three kinds of main hydraulic valves are available:**

- Single-acting valve (not used any more),
- Double action valve,

- Double acting valve which can be converted to single-acting valve.

	<p><b>Notice:</b></p> <p>If high-pressure fuel or oil is splashed to your skin or eye, it may cause serious injury and blindness, even death. High pressure fluid leakage may be unapparent. Use a paper board or wood to detect the place where fluid leaks. Never use hands to detect leakage! Wear safety goggles to protect eyes. If any fluid is splashed to your skin, you should seek for help from an experienced doctor immediately.</p>
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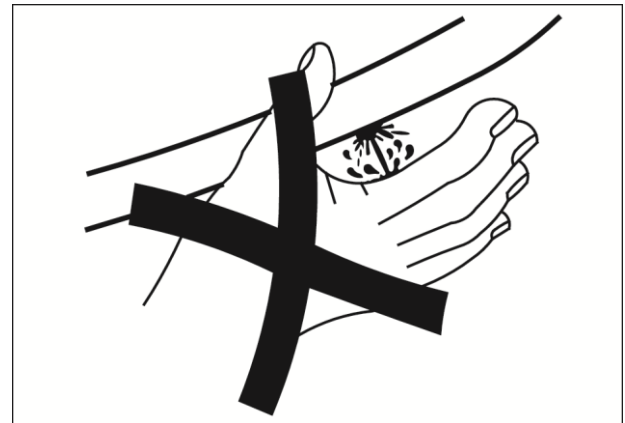


Fig.4-32

### Double-action hydraulic valve

When moving the control handle in a direction, the spool of the control valve moves, and the oil that is allowed to be pressurized flows out from one port, and then returned via another port.

When the control handle is operated in reverse direction, the oil flows in reverse direction.

#### The control handle has 3 positions:

- 1-Outlet
- 0 - Neutral
- 2- Outlet

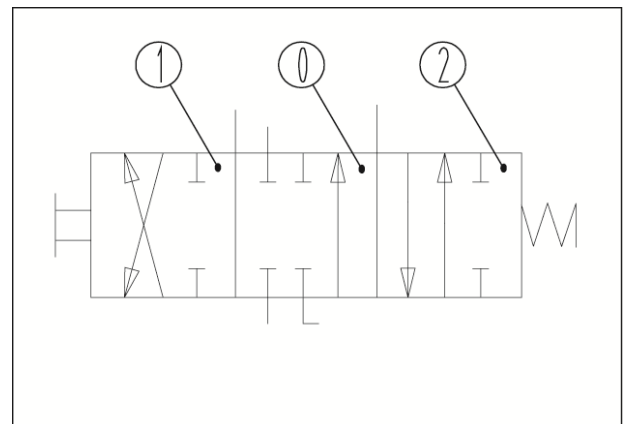


Fig.4-33

### Double-acting control valve which can be converted to single-acting valve.

The control valve can be converted to a single-acting valve through a kind of special screw.

When operating in single-acting mode, the valve will be connected to the driver through a hose (connected to the pressure outlet 1); this hose is used for booster circuit and oil return pipeline (when the control handle is at “Return” position).

#### The control handle have 4 positions:

- 1- Outlet
- 0- Neutral gear and returned

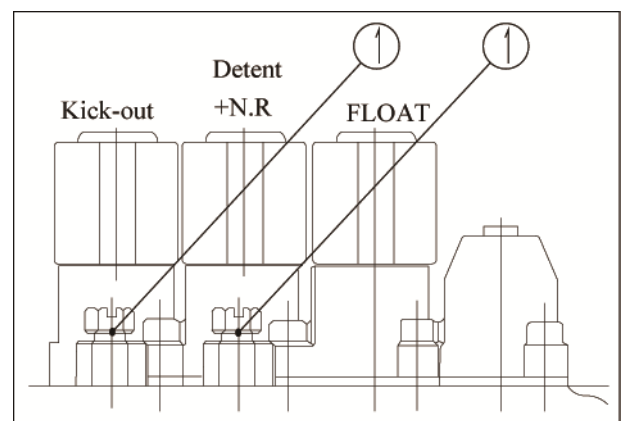


Fig.4-34

### Converted to a single-acting valve

Turn the screw (1) to permanently connect an outlet of the control valve to the oil return pipeline of the oil tank. In such case, the other outlet can be used to booster circuit and oil return pipeline.

### Double-action device with a floating position

The double-action device with an additional position can realize connection of two outlets of the hydraulic valve with the discharging port at the same time.

This enables the coupled implement to be floated freely based on the ground profile.

The control handle has 4 positions:

- 1-Outlet
- 0 - Neutral
- 2-Outlet
- Floating

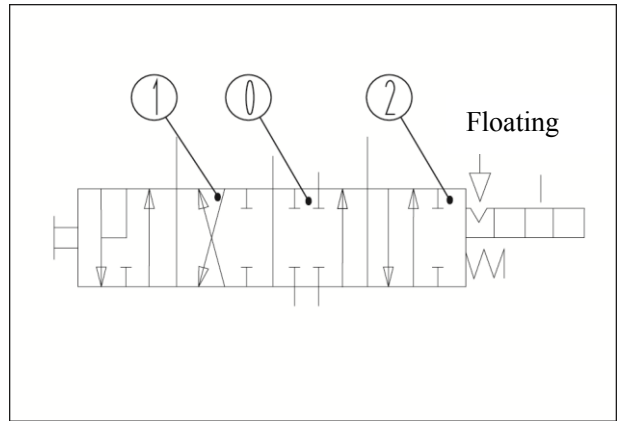


Fig.4-35

### Detent device

This is a mechanical detent that engages the control valve spool (which keeps the control handle in position) when the spool is moved to the end of its stroke. The device can only be released manually by operating the control lever.

If the spool is not equipped with a DETENT, the control lever will always return to the NEUTRAL position when released by the operator.

The control handle has 4 positions:

- Outlet
- 0 - Neutral
- Return
- Detent

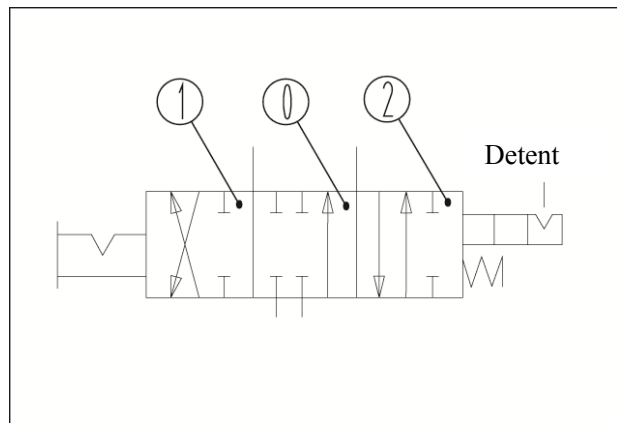


Fig.4-36

### Relieving load

The figure shown a mechanical detent. When the valve plate moves to the end of the travel, it can engage the valve plate (have the control handle kept at proper position). When pressure reaches spring calibration value, the equipment will be disengaged automatically, and the control handle will be returned automatically to neutral position.

The control handle have 4 positions:

- 1- Sports
- 0- Neutral
- 2-Return
- Relieving load

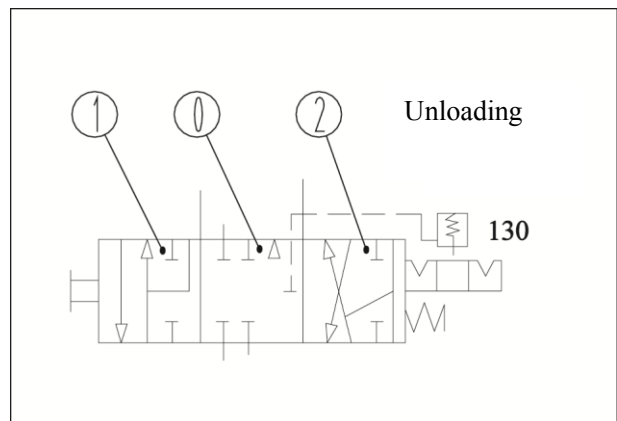


Fig.4-37

### Non-return valve

Mechanically operated check valve that prevents leakage past the control valve spool and thus undesired movements of the hydraulic cylinders.

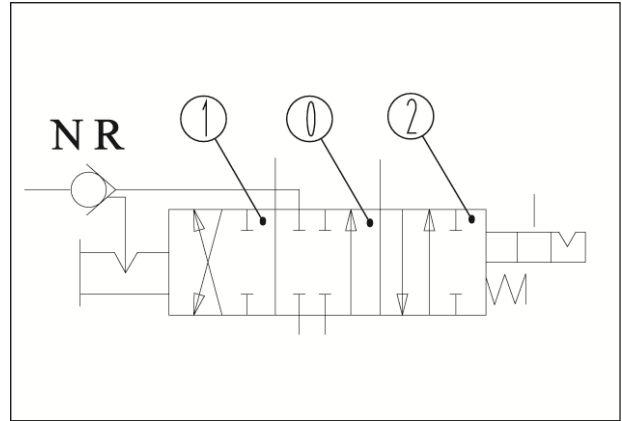


Fig. 4-38

### Flow distribution valve

Allows the oil flow rate to be set, independently of the pressure, in a certain port of the double-acting control valve.

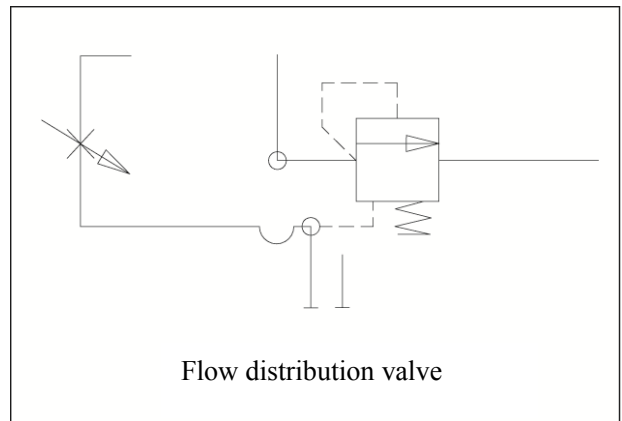


Fig. 4-39

## 4.11.2 Type of Hydraulic Valve

The tractor can be equipped with different types of hydraulic valve:

Hydraulic valve with 4 hydraulic output interfaces

Valve plate 1 - 2 double-acting circuits (with unloading and floating);

Valve plate 2 - 2 double-acting circuits (with a return spring).

Hydraulic valve with 6 hydraulic output interfaces

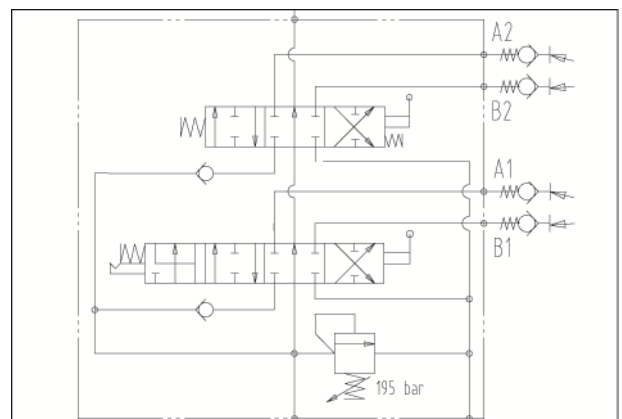
Valve plate 1 - 2 double-acting circuits (with unloading and floating);

Valve plate 2 - 2 double-acting circuits (with a return spring).

Valve plate 3 - 2 double-acting circuits (with a return spring)

### Hydraulic valve with 4 hydraulic output interfaces

- A1, B1- Hydraulic output quick-change connector
- A2, B2- Hydraulic output quick-change connector



**Hydraulic valve with 6 hydraulic output interfaces**

- A1, B1- Hydraulic output quick-change connector
- A2, B2- Hydraulic output quick-change connector
- A3, B3- Hydraulic output quick-change connector

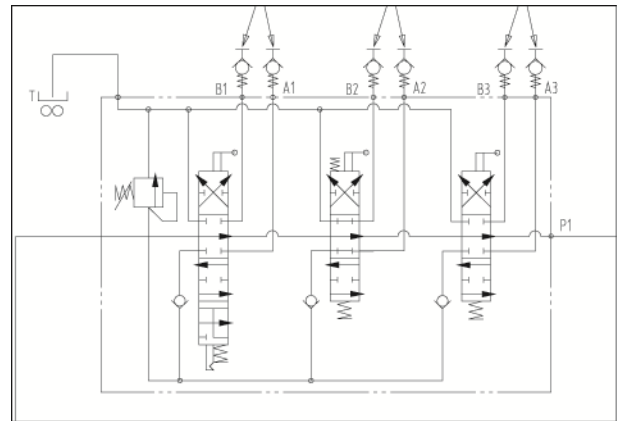


Fig.4-41

**Hydraulic valve with 8 hydraulic output interfaces (enforced type)**

- A1, B1 – Hydraulic output quick-change connector
- A2, B2- Hydraulic output quick-change connector
- A3, B3- Hydraulic output quick-change connector
- A4, B4- Hydraulic output quick-change connector

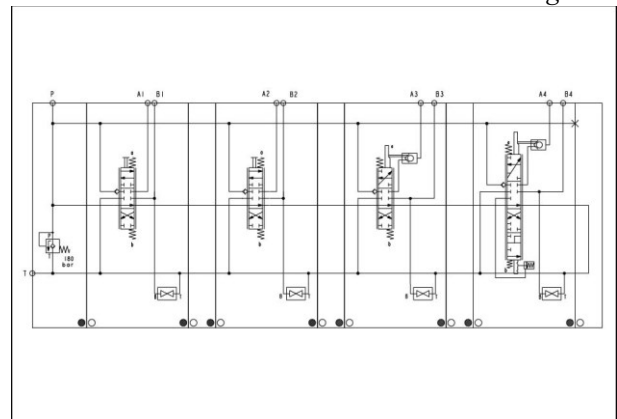


Fig.4-42

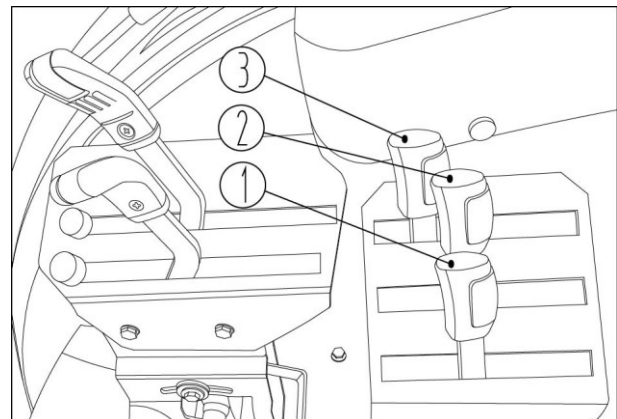
**4.11.3 Hydraulic Valve Control Device****Notice:**

To avoid maintaining the maximum pressure for a long time in the hydraulic circuit, the hydraulic valve control handle must be returned to neutral position as soon as possible when the external cylinder reaches its limit travel; otherwise, it is possible to exceed the system load, jeopardizing the system safety.

Manual control device of the hydraulic valve includes two control handles (used for the four-way control valve) and three control handles (used for the six-way control valve).

**Control handle of the hydraulic valve**

1. Control handle of valve 1;
2. Control handle of valve 2;
3. Control handle for valve plate 3 (only used for three groups of control valves)





**Such control handles have three or four positions (depend on the tractor configuration):**

**1. Neutral:**

Move the lever to “Middle position” of its section, and stop oil delivery to the lift cylinder and oil return from the lift cylinder.

**2. Lift:**

Move backward the lever to extend the cylinder and raise the implement.

**3. Lower:**

Move forward the control handle to retract the cylinder and lower the implement. If you operate the double-acting control valve, the implement is lowered by hydraulic means.

**4. Floating control:**

Move forward the control handle to enable it to surpass the descending point, so that the hydraulic cylinder can move freely, ensuring that the implement can move forward along the terrain profile easily. If the control valve is equipped with an unloading device, the control valve remains at current position when it is released. Other control handle is returned to neutral position by the spring.

#### 4.11.4 Relationship between the Valve Control Device and Hydraulic output quick-change connector

The relationship between the valve control device and Hydraulic output quick-change connector is as follows:

- A-Oil supply for hydraulic cylinder extension (Pull backward the lever)
- B- Oil supply for hydraulic cylinder extension (Push forward the lever)
- C- Control handle
- D-Hydraulic valve and rear Hydraulic output quick-change connector

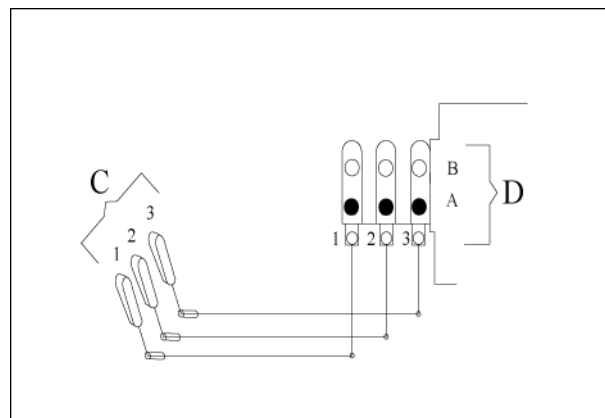


Fig.4-44

#### 4.11.5 Oil Flow in the Hydraulic Valve

##### Double-acting control valve

For the double-acting control valve

If the control handle is moved backward (the control handle number is in the red background), the oil can be delivered to the upper hydraulic output connector under influence of pressure (The marking is identical to that in the red background). The oil returned from the implement cylinder is discharged to the oil tank via the hydraulic output interface (whose number is same as that in the yellow background). On the contrary, if the control handle is operated forward (the control handle number is in the yellow background), the oil is delivered to the output interface under influence of pressure (the marking is same as that in the yellow background). The oil returned from the implement cylinder is discharged to the oil channel via the hydraulic output interface (whose number is same as that in the red background).

### Hydraulic cylinder pressure

- A-Pressurized oil delivered to the hydraulic cylinder-Lift
- B- Pressurized oil delivered to the hydraulic cylinder-Lower

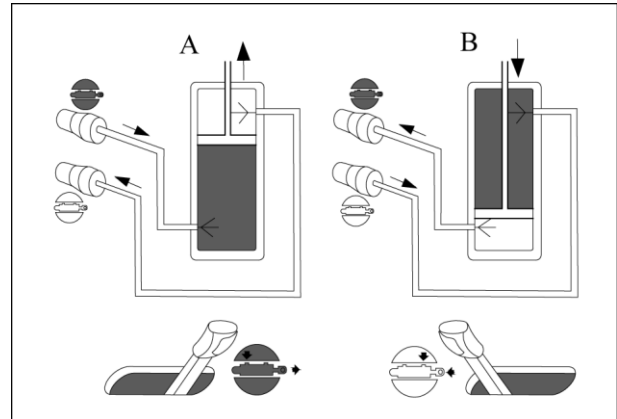



Fig.4-45

	<p><b>Notice:</b></p> <p>When connecting and uncoupling the implement, be careful very much. Use a support that is fixed adequately, avoid to use cement bricks or bricks. Access to the tractor by anybody is prohibited.</p>
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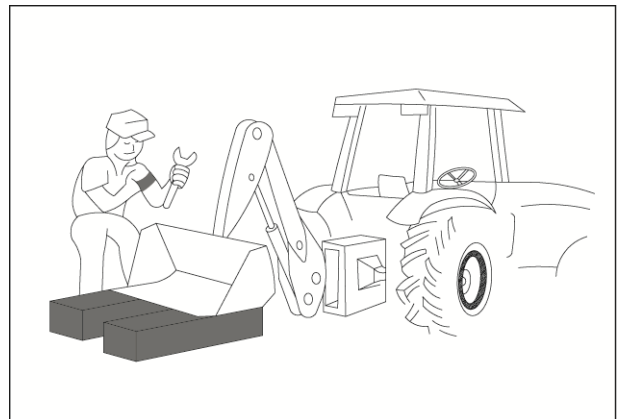


Fig.4-46

### Demonstration connection and operation of the double-acting cylinder

Turn-over of the pivot plow.

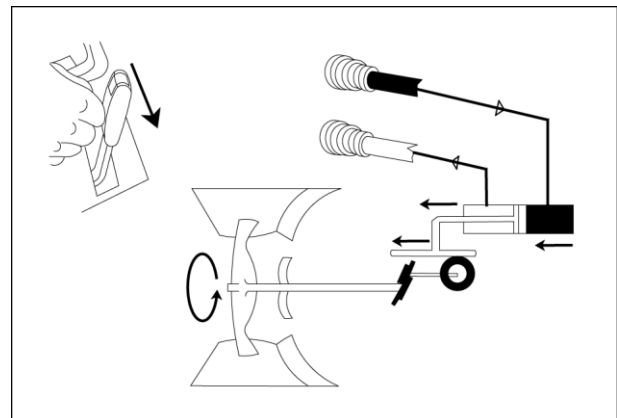


Fig.4-47

When using an excavator, shovel and tractor, move the control handle to the floating position to enable the hydraulic cylinder to move freely, so that the bucket can move forward along the terrain profile.

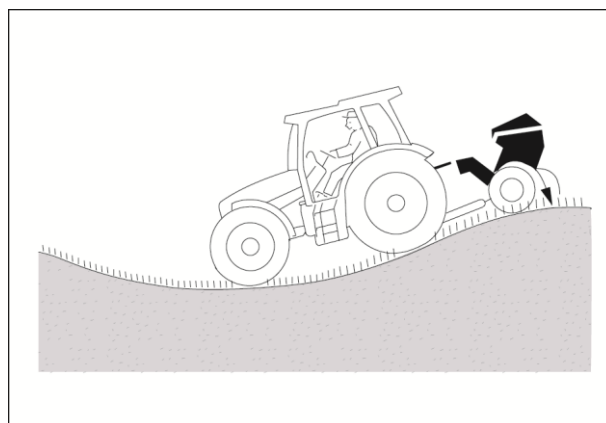


Fig.4-48

**Demonstration connection (to the single-acting hydraulic cylinder)**

For the trailer with a hydraulic damping platform, the hose A must be connected to the upper hydraulic output interface. Move backward the control handle (the control handle number is in the red background) to raise the trailer, and move forward the control handle (the control handle number is in the yellow background) to raise the trailer.

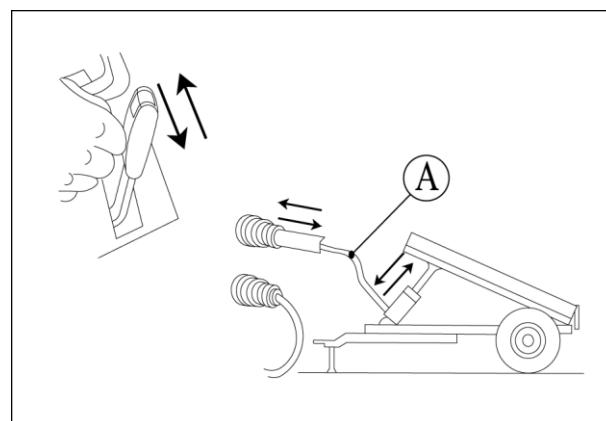


Fig.4-49

	<p><b>Important:</b></p> <p>When the single-acting hydraulic cylinder is used to operate the cylinder, the floating position can be used to lower the damping part of the trailer. In such case, the control valve can be first converted to single-acting type.</p>
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	<p><b>Important:</b></p> <p>The hydraulic circuit delivering oil to the hydraulic valve in a same tractor also delivers oil to the lift. So, it is impossible to operate the hydraulic valve and lift simultaneously.</p>
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**Coupling of the implement to the hydraulic output quick-change connector**

Hydraulic quick-change connector: G1/2 or M22\*1.5.

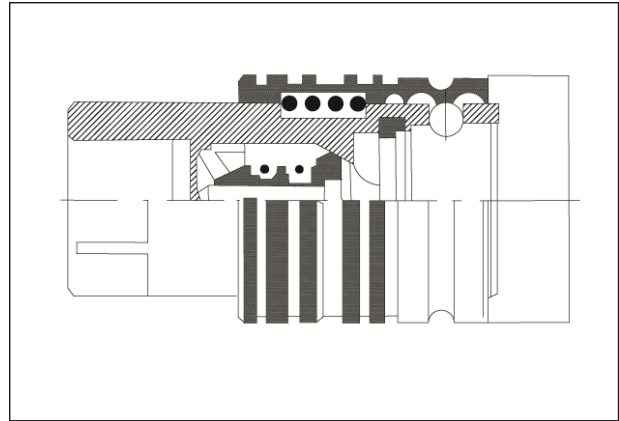





Fig.4-50

	<p><b>Important:</b></p> <p>The hydraulic output quick-change connector is equipped with a “1/2” female pipe union which is used to connect the raised fitting to the implement hose under influence of pressure. If it is pulled accidentally, the hydraulic output interface can also be disconnected automatically.</p>
	<p><b>Important:</b></p> <p>Inspect and ensure that the hose has enough length, so that the tractor and implement can be operated freely. To disconnect the hose, have the distributor control device to neutral position, so as to release all residual pressure in the system, and then loosen the part and remove the hose.</p>
	<p><b>Danger:</b></p> <p>When connecting the hydraulic part of the implement to the hydraulic output quick-change connector of the tractor, carefully follow instructions specified in the tractor panel and instructions in this manual. Wrong connection may result in reverse ascending and descending order, so as to cause serious damage.</p>

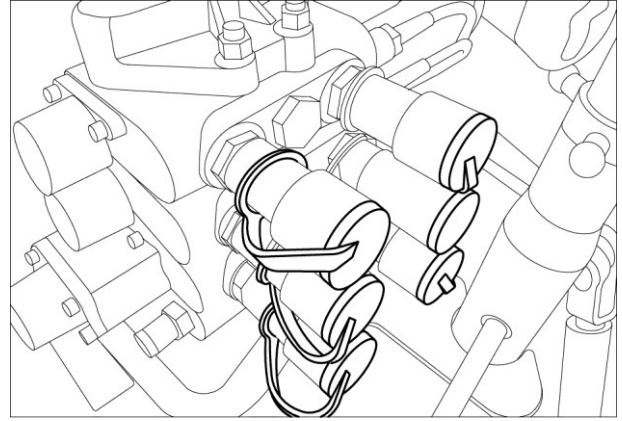


**Danger:**

Do not attempt to loosen the hydraulic connecting part, or adjust the implement during running of the engine and rotating of the PTO. This may cause serious injury and even death.

**Protect the hydraulic output quick-change connector**

After completing relevant works, carefully clean the part, and cover the proactive guard on the hydraulic output interface.



*Fig.4-51*



**Notice:**

Must keep cleaning of the hydraulic output quick-change connector, and must install a protective guard.



**Notice:**

Do not put different types of hydraulic oils at a place in confused manner. Ensure maximum cleanliness of the implement and tractor during hydraulic coupling. When hydraulic output interface is not used, it should be covered with a protective guard.



**Important:**

Before connecting the implement hose to the hydraulic output interface for inspection, shut off the engine, and inspect and ensure that the connecting parts are clean. After connecting the hose and starting the engine, inspect whether the hydraulic system operates normally. Then, after operating the cylinder for several times and balancing the pressure (move the control handle to descending position, and then the ascending position, and after that, have it returned to neutral position), inspect the driving oil level when the cylinder is extended (ascending) and retracted (descending). It is not absolutely allowed that the driving oil level is dropped to below the lowest level (cylinder extension), and the oil level cannot exceed the maximum oil level because quantity of oil delivered for external hydraulic inspection is kept the same.

### Operate the hydraulic unit requiring constant oil quantity

For example, it is used together with the hydraulic motor.

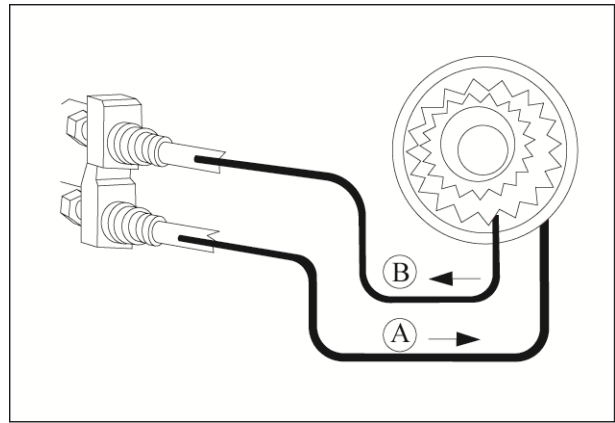


Fig.4-52

A double-acting control valve equipped with an unloaded (or detent) must be used to operate these devices.

Must connect the pressure line A to the corresponding lower hydraulic output quick-change connector, and connect the oil return pipeline B to the upper hydraulic output quick-change connector.

Through pulling forward the control handle, operate the hydraulic motor (downshift gear-yellow). To prevent oil flow, first move the control handle to the floating position until the hydraulic motor decelerates and stops fully. Then, move the control handle to neutral position.



**Warning:**

Do not move the control handle to the place close to the neutral position because if the hydraulic motor is not equipped with a safety valve, its back pressure may cause damage to the hose.

Install an oil temperature sensor and an oil cooler (if necessary). The permissible maximum temperature is 110°C (230°F).

## 4.12 Towing Device



**Warning:**

Must firmly fix all implements mounted onto the tractor according to the manufacturer's instructions. Only permissible device is used.








**Warning:**

Do not use the front draw hook for works requiring big traction force.



**Warning:**

For the trailer without brake, its weight cannot exceed that of the tractor.

	<p><b>Warning:</b></p> <p>When transporting a heavy load (with weight more than that of the tractor), must keep its rotating speed below 15km/h.</p>
	<p><b>Warning:</b></p> <p>Do not tow the implement by connecting the implement to the top tie rod of the three-point linkage. This may result in tip-back of the tractor.</p>
	<p><b>Warning:</b></p> <p>Do not tow the implement by connecting the implement to the top tie rod of the three-point linkage. This may result in tip-back of the tractor.</p>
	<p><b>Warning:</b></p> <p>During towing, an appropriate anti-loose safety latch (with a safety piece) is used from time to time to fix the hitch pin to prevent the hitch pin from being sided from the draw hook.</p>
	<p><b>Important:</b></p> <p>The maximum permissible traction load (for the single-shaft trailer), maximum permissible traction height for road use (for the trailer with one or more shafts) are specified in the tractor registration document. All problems arising out of failure to comply with these restrictions are responsible by the user.</p>

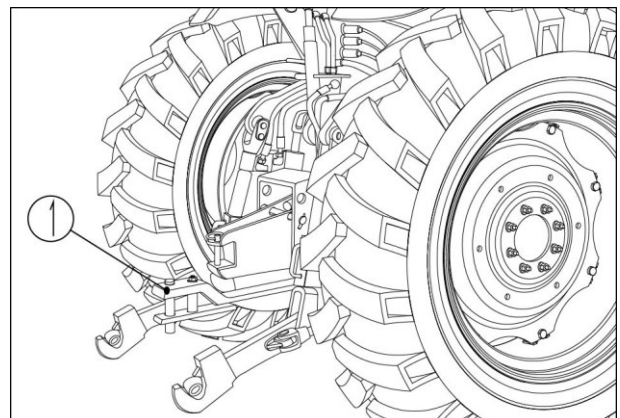
The tractor may be configured with either of following rear drawing devices:


- Swing drawbar
- Hitch frame


#### 4.12.1 Swinging Towing Device

The swinging towing device is only used for the pull-type implement. The rear end of the draw-bar is connected with the implement via the drawbar pin. The draw-bar can be oscillated laterally, and the implement can be coupled easily.

Main structure of the swinging towing device is shown in figure.



	<p><b>Important:</b></p> <p>Turning the drawbar over can change height of the towing point to obtain a towing height suitable for the mating implement.</p>
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	<p><b>Warning:</b></p> <p>During operation, the drawbar can swing from side to side, but when the tractor tows the implement in reverse direction, the dowel pins must be inserted into the hole of the drawplate to keep the drawbar standstill.</p>
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#### 4.12.2 Towing Device

The hitch is suitable for all types of trailers, and cannot be used along with the swinging drawbar.

Main structure of the towing device is shown in figure.

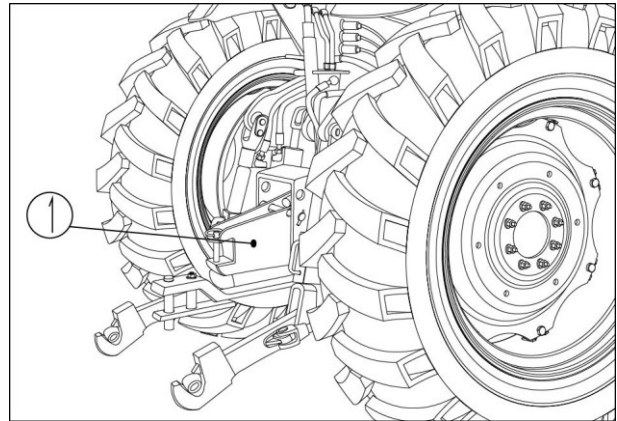


Fig.4-54



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## **5- Wheels**

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## 5.1 Introduction

### 5.1.1 Basic Introduction of Tires

#### 5.1.1.1. Optional Tires

Tires are the main quick-wear parts of tractors, so we must pay attention to the utilization and maintenance of tires, so that the service life could be prolonged as much as possible.

Each tire should have a specified load value, overload can make tires excessively deformed or broken easily due to lateral overbending; moreover, the tire body fabrics and buffer layers are apt to degumming, which will thus result in fabric layer looseness and even tire burst especially on rough roads or at the impact of obstacles.

During service, have tires not stained with oil, acid or alkali and other chemical corrosives and avoid exposure in the scorching sun, lest the rubber go bad due to aging. Often check whether the wheel alignment and toe-in is right, so as to prevent tire eccentric wear. When the wheel tread is unevenly worn, transpose the left and right tires before continuous use.

Permissible load and speed specifications shall be complied with if the tractor is equipped with spare tire. Because there are many different kinds of tires, for more information of spare tires and related type permission, load capacity, inflation pressure and wheel track, please consult the nearest dealer.



**Notice:**

The tire replacement is of risks, so such operation must be completed by professionals with professional equipment in accordance with the operating manual provided by the tire and wheel manufacturers. Mismatched tires and wheels may cause damages, tire explosion and even injuries or death. Never install or use any damaged tire or wheel.

#### 5.1.1.2. Steps for Correct Installation of Tires

##### Tire disassembly

Use special tools during tire disassembly but never use sharp or tough tools (such as screwdrivers) or hammers to knock at will, so as not to puncture the tires or damage the tire edges or wheel rims.

Before removing a tire, first deflate it, press the cover tire edges on both sides into the groove of the wheel rim, use a crowbar to force the tire edge on one side near the tire valve out from the wheel rim, and then use two crowbars to pry out the whole tire edge in an alternative manner. Remove the inner tube, then pry out the tire edge on the other side in the same way and finally remove the cover tire.

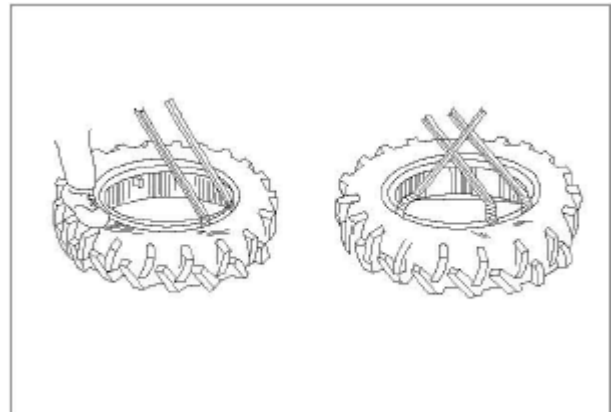


Fig. 5-1

## Tire installation

When installing a tire, first check whether the rim and tire are matched, make sure that there is no burr or serious deformation at the rim edge, clear the rust on the rim and then check whether there is any damage on the tire. Before installation, rub up all parts and apply a thin layer of talcum powder between the inner tube and the cover tire. Put the rim flat, mount the cover tire and step or use a crowbar to pry it into the rim. Put the inner tube in (the cover tire can be slightly padded up) and use a lead wire to fix the tire valve in the valve hole on the rim to prevent it slipping off. Use a crowbar to pry the other side of the cover tire into the wheel rim (it is most difficult at last, but you can use a hammer to tap the crowbar as shown in the figure). Finally check whether the valve position is skewed and whether the tire edge and rim fit tightly. During inflating, check whether the inner tube is broken, inflate it and use a hammer to knock at the cover tire until the regulated pressure has been achieved, and then half discharge and inflate it again, so that the inner tube could expand normally and eliminate cockles. While installing a tire onto the tractor, attention also must be paid to the direction of the tire pattern; otherwise it will affect the adhesion performance and wear resistance, and have mud easily gathering.

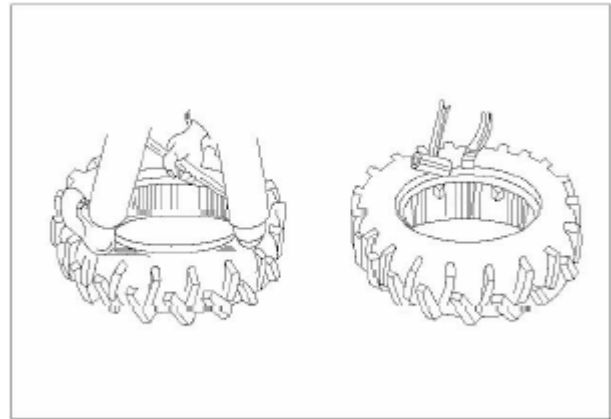


Fig. 5-2



### Danger:

Never dismantle any tire, wheel hub or spokes, as well as the connecting bolts between spokes and wheel rims; otherwise, the tire may fly out to cause injuries!

Tires must always be oriented in accordance with the tractor's direction of forward travel; you can change the wheel tread in the case of rims welded to the flange by shifting the wheel from left to right and vice versa, always ensuring that the "V" cleats on the tire tread point in the direction of forward travel, as shown in the figure.

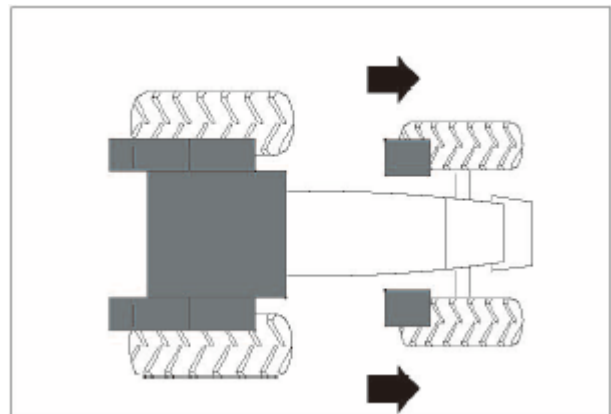


Fig. 5-3



### Notice:

Only allow trained personnel to change tires. Tire failure is usually the result of incorrect use, incorrect inflation pressure, overloading or speeds in excess of the maximum permitted speed. Follow the instructions of the manufacturer and check frequently the inflation pressure. Do not weld the rim or flange without having first removed the tire: it will explode under the action of such intense heat. Do not use flammable materials in making repairs. Never inspect tires by tapping them unless previously deflated.





**Notice:**

Always check that the tire is seated correctly on both sides. If not, deflate the tire completely and lubricate the seat on the rim, then re-inflate the tire. **DO NOT INCREASE THE PRESSURE TO HELP SEAT THE TYRE ON THE RIM.** Doing so can be extremely dangerous, and can lead to serious or even fatal injury.

**5.1.1.3. Adjustment of Steering Angle**

Once any front wheel is replaced, you should check its steering angle.

Do as follows:

- Apply the hand brake.
- Use wheel chock to immobilize the tractor.
- Lift the front of the tractor.
- Turn the steering wheel full lock to the left and subsequently to the right or vice versa and pivot the axle to its position of maximum oscillation.

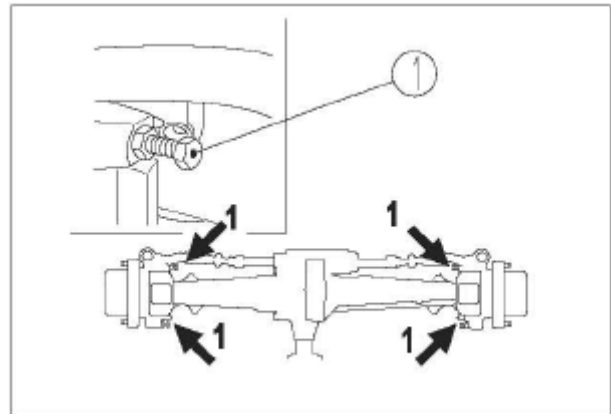


Fig. 5-4

When the front axle is in the condition of maximum oscillation and the wheels are turned to the maximum steering angle, there must be no interference between the fenders and engine hood. When necessary, you can adjust the steering angle by adjusting the bolts ①.

**5.1.1.4. Inflation Pressure**

The tire inflation pressure must conform to the relevant specifications and too high or low pressure will affect the service life.

Too low pressure may have the tire easily subject to excessive deformation and faster tread wear; moreover, the inner and cover tires may even be damaged in a short time and the tire valve may be cut off; at the same time, the driving resistance may increase accordingly. If the front tires suffer from too low pressure, it should be strenuous to control; if too high, the tire body fabrics will be excessively tensioned to cause fracture, accelerate the tread wear and increase the bodywork vibration. When working in the field, the tractor may have its tire pressure kept appropriately lower; however, higher in long-term road transportation. You should use a barometer to check the tire pressure at the room temperature, lest inaccurate measurement be achieved after working due to tire overheating. Improper driving operation will also make tires early worn or damaged. During driving, never run across obstacles at its high speed, brake deeply or turn sharply. Try to avoid tire slip when driving on gravel roads.



**Danger:**

Have the tire pressure kept normal. The inflation pressure must be calculated and adjusted according to the tire load and operating conditions. (You can ask the manufacturer for a load-pressure gauge)

**Warning:**

Tire inflation is prohibited when the pressure is higher than 2.5bar.

**Notice:**

The front and rear tires should be inflated identically for 4WD tractors to prevent abnormal tire wear.

**Notice:**

When carrying out any operations on the tires, do not enter the area in which the rim and flange could be propelled in the event of explosion. Always use metal containment cages or tire retainers on the rims and flange, because under some circumstances the trajectory of the rim and flange in case of explosion could change unexpectedly, with **SERIOUS DANGER OF INJURY AND DEATH.**

**Inflation pressure of radial tires****Notice:**

For the tire bead to seat correctly on the rim, the inflation pressure must never exceed 2 Bar (29psi). If the tire is not seated correctly on the rim, deflate it and repeat the operation. Higher inflation pressures may cause the tire/rim to explode. We recommend using all the appropriate safety devices when inflating tires.

**Notice:**

A tire inflated to less than 80% of the recommended inflation pressure can be damaged internally during use and explode on inflation to the optimal pressure **WITH DANGER OF SERIOUS INJURY OR DEATH.**

**Important:**

Inflation pressure of rear tires may reduce when tires shall run on agricultural land that requires the maximum road holding. Please check the minimum pressure specified by the manufacturer before discharging part of tire inflation. For standard inflation pressure of front and rear tires, please refer to the table of specification. These values may be reduced to permissible limits pro rata to insure the proper mechanical cooperation of front and rear wheels, if necessary.

**The maximum inflation pressure of common tires shall not exceed the pressure value indicated on the tire.****Important:**

If the tractor is equipped with this kind of tire, the frequency of checking pressure and repairing shall be higher than the frequency mentioned in the table.

**Tire damage**

In order to use tires safely for a long time, it is essential to: pressure caused by inflation in front and rear tires shall reach the proper pressure related to operation conditions.


If inflation pressure is lower than specified values constantly, the tire will be overheated, and the following dangers will appeared synchronously:

- Tire break;
- Deterioration of tire tread;
- Internal breakdown;
- Uneven wear and shortening of lifetime.

Overcharging of tire is more likely to cause damage, and it will result in deformation of rim or even tire explosion.

Tires installed in the tractor shall be checked regularly, and the following items can be referenced:

- Tire tread – even wear shall be shown;
- Side wall of tire – without fracture, expansion or wear.

	<p><b>Warning:</b></p> <p>Tire will deteriorate if tires are rarely or never used. Cracks in side wall of tire and occasionally accompanying swelling are the signs of deterioration. Tires of the tractor that has been parked for a long time are more likely to be deteriorated than tires being used frequently. In this occasion, the tractor shall be lifted from the land, and tires shall be protected against direct sunlight.</p>
---	---

## 5.1.2 Permissible Tire Combination

### 4WD tractor

Table 5-1 Permissible tire combination

No.	Front wheel	FL1804	FL2004	FL2204	Standard wheel tread (mm)
	Rear wheel				
1	16.9-28"-10 (420/85R28")	√	√	√	1900
	20.8-38"-10 (520/85R38")				1896
2	16.9-28"-10 (420/85R28")	√	√	√	1900
	18.4-42"-12 (480/80 R42)				1896
3	18.4-26"-12		√	√	1900


	20.8-38"-10				1896
4	14.9-26" medium height pattern tire	√	√		1800
	18.4-38" medium height pattern tire				1836


For each market, only permitted tire combinations for this region are available.

- (1) The width in this table refers to the standard wheel track of tractor.
- (2) Conventional tire.

This value may vary with the tire manufacturing and inflation pressure.

ID: The figures 1, 2, 3 in the first column refer to the tables in the following pages.

	<p><b>Important:</b></p> <p>Legal requirements of urban road required that the maximum width of the tractor shall be no more than <math>\sqrt{800}</math> (<math>\sqrt{\text{refers}}</math> to the sides of tractor and other positions).</p>
---	--

	<p><b>Warning:</b></p> <p>Only permitted tire combination that conforms to the transmission ratio between front and rear tires can be used. Usage of unpermitted tire combination may accelerate tire wear. Improper tire combination overload may damage axle and transmission.</p>
---	--

### 5.1.3 Wheel Tread Calculation

#### 5.1.3.1. Max. Wheel Tread

##### Rear wheel tread

According to the width of tire, all wheel track listed here may be unusable for tires may interfere with splash guard. Wheel track setting that can ensure sufficient clearance between splash guard and tires shall be selected.

##### Front wheel tread

Steering angel will be limited if the tractor is equipped with wide tire when the minimum front wheel track is selected. Check the clearance between engine hood and splash guard. For this purpose, the tractor shall be lifted, and controllable front wheels shall be lifted and lowered; rotate the axle to check whether there is interference.

##### Width of front drive axle (ignoring wheels)



For four-wheel driving tractor: 1900mm.

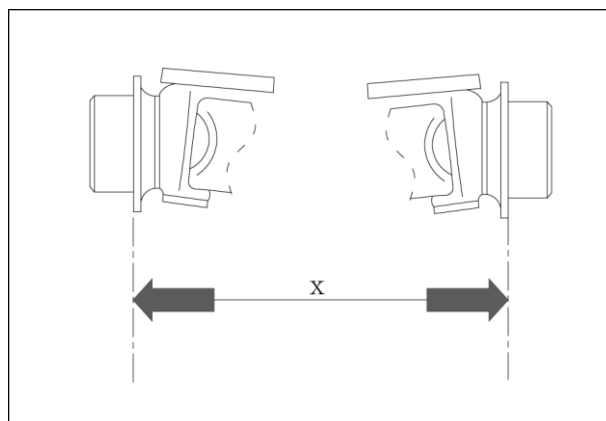


Fig.5-5

#### Width of rear axle (ignoring wheels)

- The width of rear axle is 1876 mm

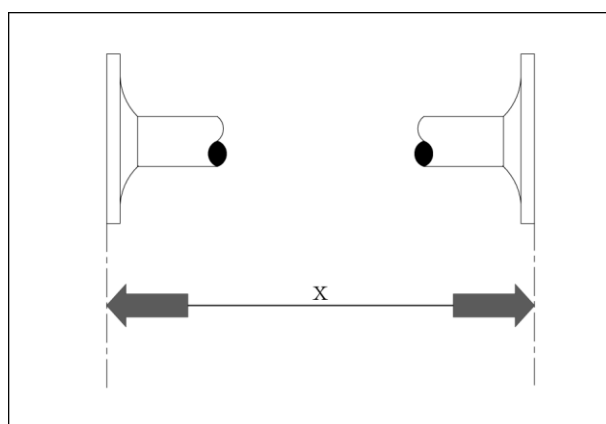


Fig.5-6

### 5.1.3.2. Adjustment of Wheel Tread

#### Change the wheel tread

The tractor with the wheel track that can be adjusted for working in different crop line spacing or using different machines and tools (such as plough etc.)

The tractor is available for fixed rim or adjustable crawler wheel. It can be selected from 8 available wheel track combinations according to the type of installed tire.

The distance from the outer edge of areas lighted by direction indicator, driving light, rear sidelights and upper reflecting mirror to outer edge of tires shall be no more than 400mm; this rule is applied internationally.

Data of maximum wheel track related to urban and rural public roads in vehicle registration documents shall be complied with.

**Nuts and bolts shall be tightened to the following required tightening torque after adjustment of wheel track or during replacement of wheel.**

- Bolts for four-wheel drive front wheels
  - ◇ M20X1.5= 58.1 kgm (570 Nm);
  - ◇ M16X1.5= 23 kgm (225.63 Nm);
- Fix the rim to the flange by using screw
  - ◇ M20X1.5= 58.1 kgm (570 Nm) ;

All nuts and bolts for fixing of front and rear wheels shall be tightened to the torque mentioned above after driving for 50 hours.

The tractor shall be fixed to prevent moving and be supported properly before changing wheels.

Line stretcher with sufficient length shall be used to ensure that operator stay beside the tire when compressed air is filled to the tires on rim. This operation shall be completed by professional staff.



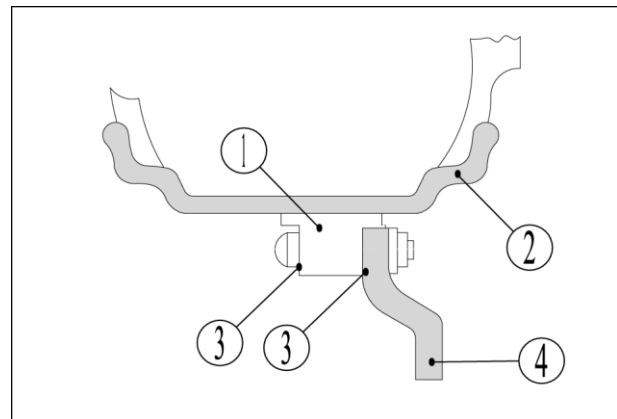
**Warning:**

The tractor shall be lifted and supported by specified devices during replacement of wheels or maintenance and repair.

**Changeable crawler wheel**

This adjustment is suitable for dish of wheel that is fixed to rim by screws during installation of wheels.

1. Flange;
2. Rim;
3. Width of flange;
4. Wheel spoke



*Fig.5-7*

Support lug (1) on rim (2) shall be welded to the deviation position of drop center rim center line (and tires).

The support can be installed on the vehicle (4) in any side during installation to achieve two alternative wheel tracks.

Another two wheel tracks can be obtained by reversing rim and dish of wheel (1).

This means that rim (2) can be mounted on the dish of wheel (4) in 4 ways.

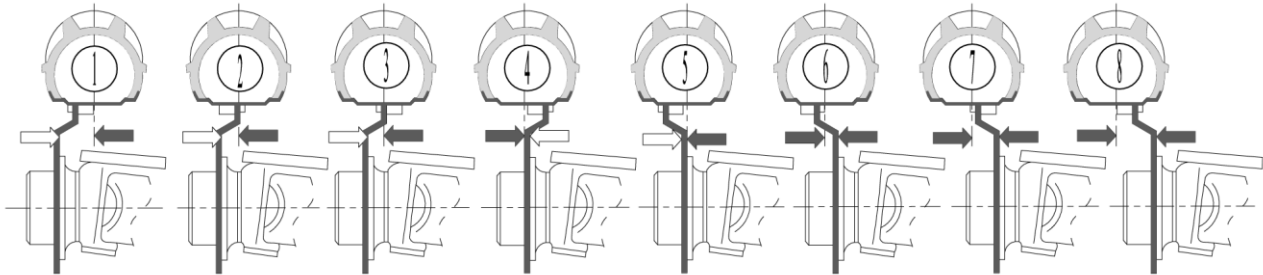
8 kinds of configurations for distance between the center line of wheel on hub or semi-axis flange and contact surface of rim can be obtained by fixing assembled rim on hub (or semi-axis) with the surface of belt facing inward or outward. Therefore, there are 8 kinds of possible wheel tracks.

**Assembly drawing for dish and rim of front wheels**

The following figure shows 8 methods for mounting dish of wheel on rim to obtain 8 kinds of front wheel tracks.

**Assembly drawing for dish and rim of front wheels**

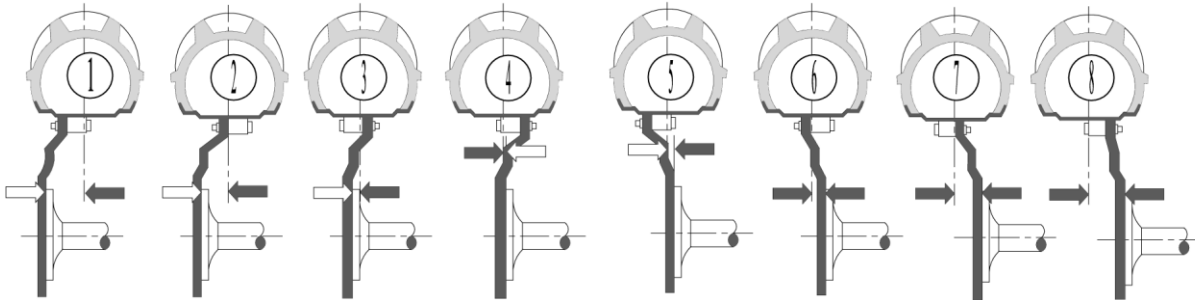
The following figure shows 8 methods for mounting dish of wheel on rim to obtain 8 kinds of front wheel tracks.




*Fig.5-8*

**Assembly drawing for dish and rim of rear wheels**

The following figure shows 8 methods for mounting dish of wheel on rim to obtain 8 kinds of front wheel tracks.




*Fig.5-9*


	<p><b>Warning:</b> Wheel track shall be prolonged if necessary to avoid overload of tractor.</p>
---	--

## 5.2 Ballast

### 5.2.1.1. Ballast

	<p><b>Warning:</b></p> <p>Balance weight that can be lifted or removed with the carrying capacity of steel wire rope or chain shall be used. As a safety precaution, balance weight shall be supported with holder during installation and removal. The system with enough strength shall be placed on a stable horizontal plane with appropriate size to lift and carry balance weight.</p>
---	--

### Front wheel ballast

	<p><b>Warning:</b></p> <p>Unbalanced tractor may turnover and result in casualties. It shall be insured that support for balance weight of front wheel, balance weight, as well as weight and balance weight on wheels conform to the specifications provided by manufacturer. Do not balance overloaded tractor by adding balance weight; it is required to reduce the load of vehicle. Driver's body shall be kept in the scope of driving position during operation of tractor.</p>
---	--

### Front ballast:

- Balance weight with cast iron pressing pieces (ten pressing pieces with total weight of 400 kg and each weights 40 kg)

### Wheel ballast:

- Metal dish of wheel

## 5.2.2 Front Ballast

This kind of ballast includes cast iron plate of 40 kg, which will be installed on front support. 10 cast iron plates with total weight of 400kg can be supplied.

1. Locking pin for ballast;
2. Front wheel ballast;
3. Ballast bracket;
4. Assembling unit of bolts and nuts

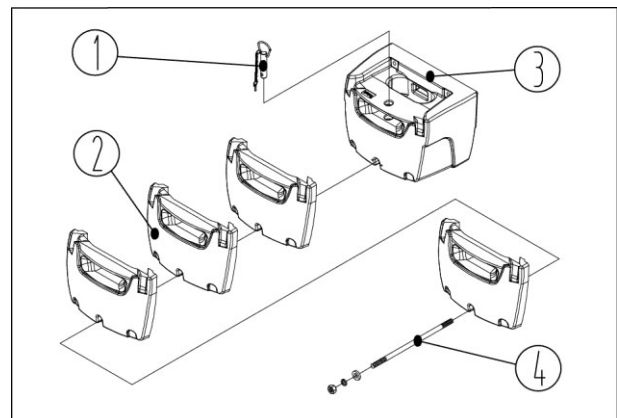


Fig.5-10

## 5.2.3 Wheel Ballast with Metal Dish of Wheel

This kind of ballast has two kinds' weights:

- Each ballast is 40 kg, and the total weight is 80 kg
- Each ballast is 43kg, and the total weight is 86kg



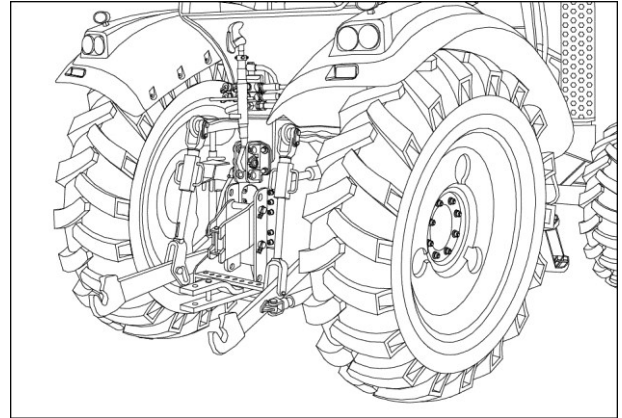
**Important:**

It shall be ensured that the same ballast are suitable for each rear wheel all the times.

This ballast includes metal dish of wheel that is suitable for rear rim.

**Metal dish of wheel is only suitable for the following tire sizes:**

- 28" wheel
- 30" wheel
- 34" wheel
- 38" wheel



*Fig.5-11*


---


## **6- Electrical System**

## 6.1 Battery

The tractor is fitted with a free-maintenance type battery. Therefore, under normal conditions of use, the battery does not require topping up with electrolyte.

At the start of the winter season check the battery charge level. Recharge if necessary.

	<p><b>Notice:</b></p> <p>Only 12V charger can be used for charging a storage battery.</p>
---	---

	<p><b>Notice:</b></p> <p>The terminals and some components of the battery contain lead or lead compounds. Wash your hands carefully after handling the battery.</p>
---	---

### 6.1.1 Accessing the Battery

Position of storage battery on tractor:

- The storage battery is located on right side of cab and under the pedal.

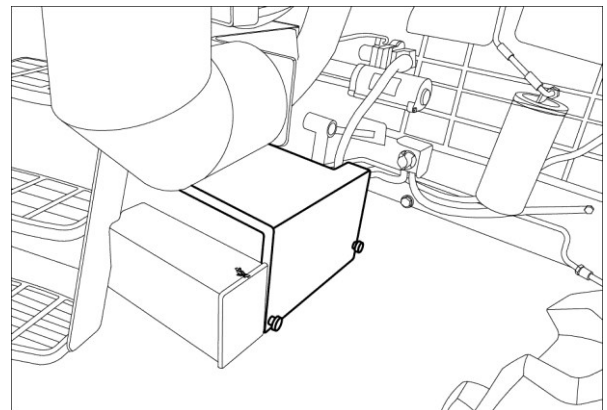





Fig.6-1

#### Dismantle battery

	<p><b>Notice:</b></p> <p>Protective glasses must be worn when charging the battery or electrolyte is supplemented.</p>
---	--

	<p><b>Warning:</b></p> <p>Always disconnect the battery before carrying out any work on the electrical system. Disconnect the battery and all the electronic device whenever it is necessary to do any welding on the tractor or any of the equipment connected to the tractor.</p>
---	---

	<p><b>Danger:</b></p> <p>The gases given off by the battery are highly explosive. Never cause a spark or allow a naked flame near the battery. Batteries must be stored and charged in a well-ventilated environment. Take care that the acid electrolyte does not come into contact with your skin or clothes.</p>
---	---


---


**The storage battery shall be dismantled according to the following procedure:**

- Cut off the power of storage battery firstly, and remove the protection cover of battery;
- Disconnect the grounding wire of negative electrode;
- Disconnect the positive wire of positive electrode;
- Unscrew four screws that are used to fix 2 supports of storage battery;
- Take off the storage battery from the supports.

**The storage battery shall be reassembled according to the following procedures:**

- Fix the storage battery to the support;
- Tighten up four screws for installation of 2 supports, to fix storage battery;
- Connect the positive lead to positive electrode;
- Connect the grounding wire to negative electrode;
- Install the protection cover.

	<p><b>Important:</b></p> <p>Keep terminals clean; petrolatum shall be applied to prevent corrosion.</p>
---	---

	<p><b>Important:</b></p> <p>Periodic inspection shall be conducted to ensure the storage battery is fixed to its supports firmly.</p>
--	---

## 6.1.2 Battery Disconnect

The tractor is equipped with a battery disconnection switch, which is used to disconnect the battery from the electrical system in emergency, to ensure the safety of operators who are performing repair and maintenance.

The battery disconnection switch is located below the right step of the cab

To disconnect the battery from the electrical system, turn on the switch “OFF”. To connect the battery to the electrical system, turn on the switch “ON”.

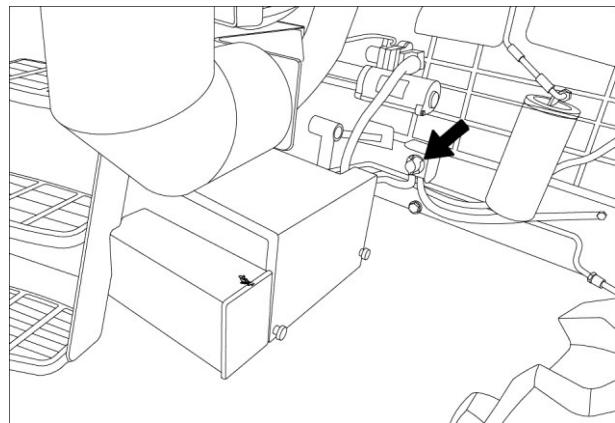


Fig.6-2

### **Disconnecting the battery from the electrical system in case of no emergency**

- Rapidly turn the switch anticlockwise to the position OFF;

### **Connecting the battery:**

- Rapidly turn the switch clockwise direction to the position ON;

## 6.2 Fuse Box



Dismantle the cover ① located in right side of instrument plate to access to the fuse box in electrical system of the tractor: unscrew 4 bolts that are used to fix the cover.

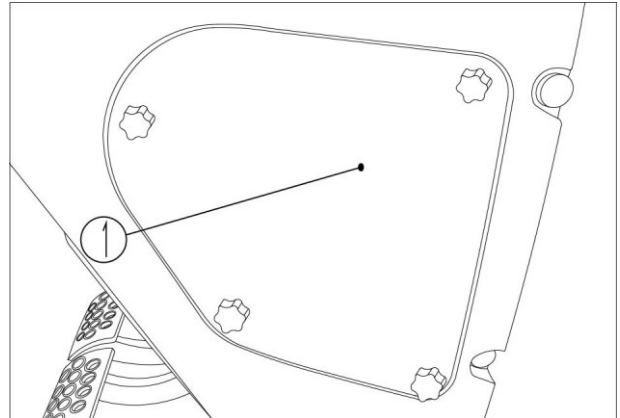


Fig.6-3

The power shall be cut off all the time during inspection of fuse box or relay.

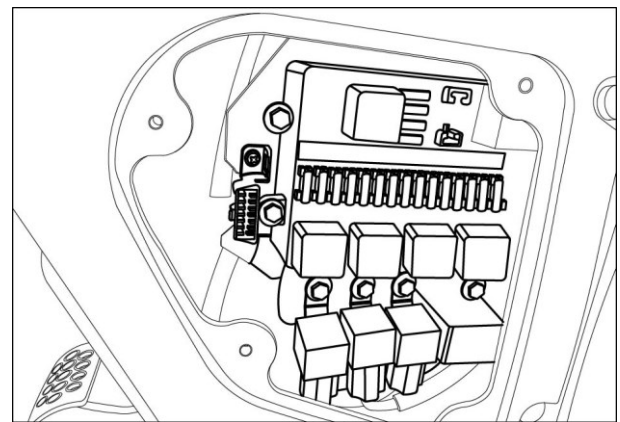


Fig.6-4

### Replace the blown fuse

- Disconnect the power supply;
- Eliminate failures that can result in blowout;
- Replace the blown fuse.



**Notice:**

Only original fuse can be used. Installation of improper fuse may cause irreparable damage to electrical system.

## Diagram of fuse box

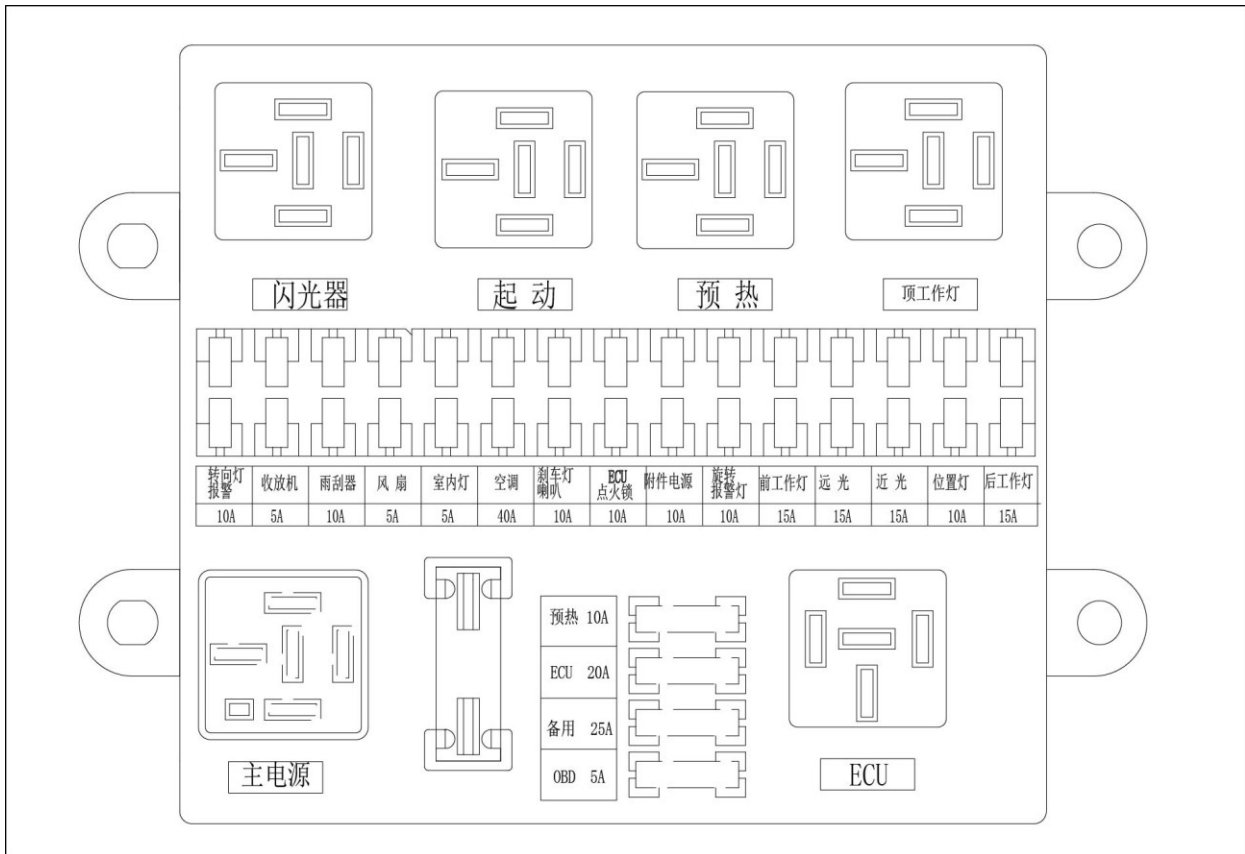


Fig.6-5

闪光器	起动	预热	顶工作灯
Lighting relay	Starting	Preheating	Top working light
转向灯报警	收音机	雨刮器	风扇
Steering alarm light	Radio	Windscreen wiper	Fan
室内灯	空调	刹车灯/喇叭	ECU 点火锁
Interior light	Air conditioner	Brake light/ Electric horn	EUC ignition lock
附件电源	旋转报警灯	前工作灯	远光
Accessory power supply	Rotating alarm light	Front working light	High beam
近光	位置灯	后工作灯	主电源
Low beam	Position light	Rear working light	Main power supply
预热	ECU	备用	OBD
Preheating		Reserve	

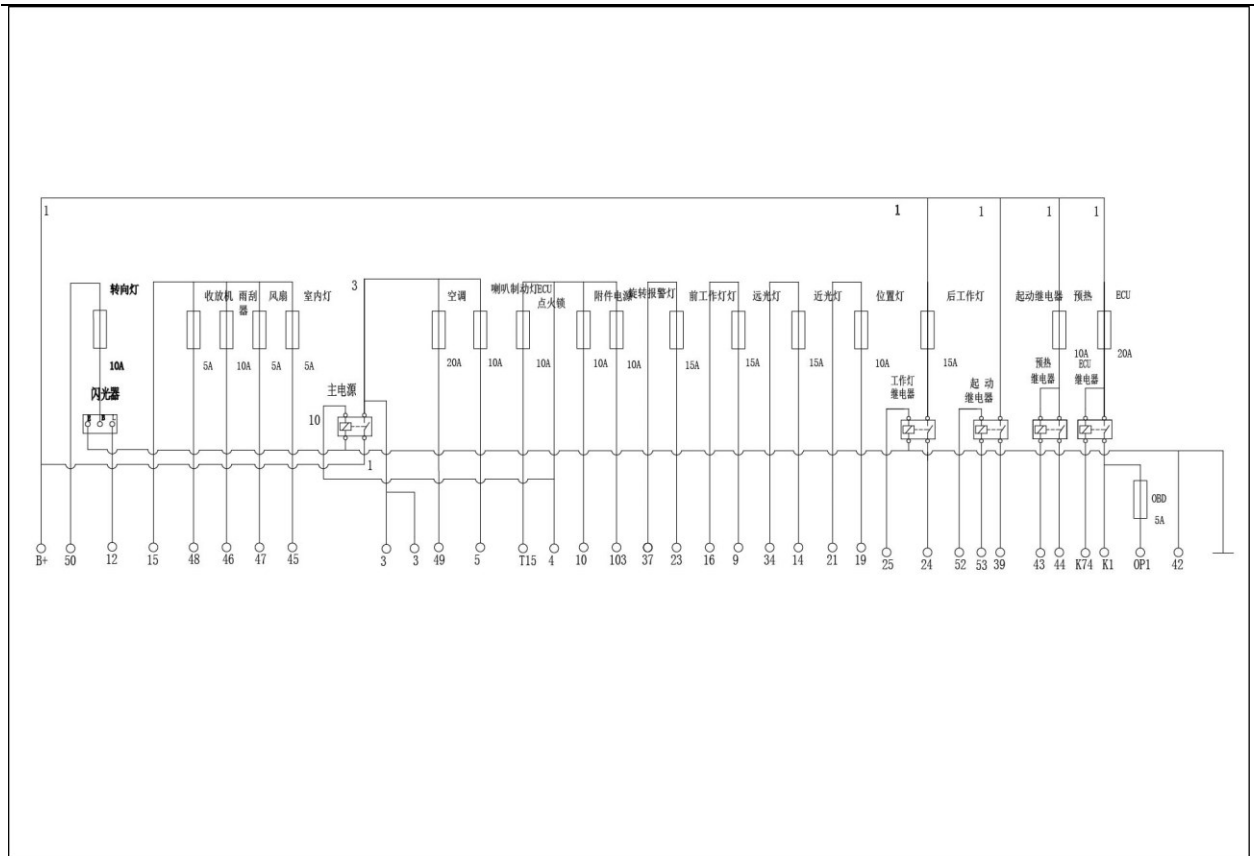


Fig. 6-6

转向灯	收放机	雨刮器	风扇	室内灯
Steering light	Radio	Windscreen wiper	Fan	Interior light
空调	喇叭/制动灯	ECU	点火锁	附件电源
Air conditioner	Brake light/ Electric horn		Ignition key	Accessory power supply
旋转报警灯	前工作灯	远光灯	近光灯	位置灯
Rotating alarm light	Front working light	High beam	Low beam	Position light
后工作灯	起动继电器	预热	ECU	闪光器
Rear working light	Starting relay	Preheating		Flasher
主电源	工作灯继电器	起动继电器	预热继电器	ECU 继电器
Main power supply	Working light relay	Starting relay	Pre heating relay	ECU relay

### Position and Diagram of Small Fuse Box

The small fuse box is as shown in Position ① in the figure.

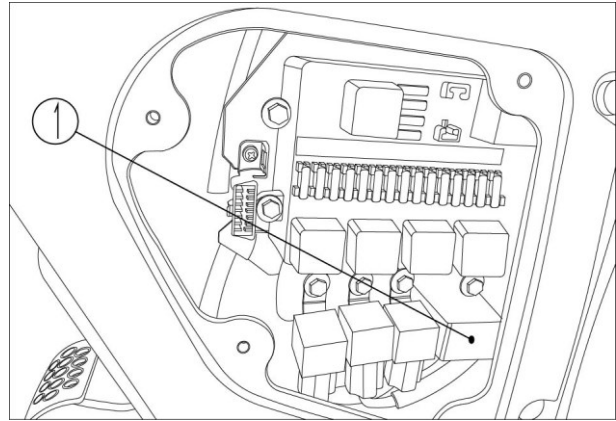


Fig.6-7

**Fuse specification in the small fuse box:**

30A	5A	5A	3A
ECU	OBD	KEY	PREHE

**6.3 ECU Position**

Unscrew all the 4 bolts on the guard panel① in the left side the dashboard, and remove the guard panel ①, you will see ECU of this model in this series.

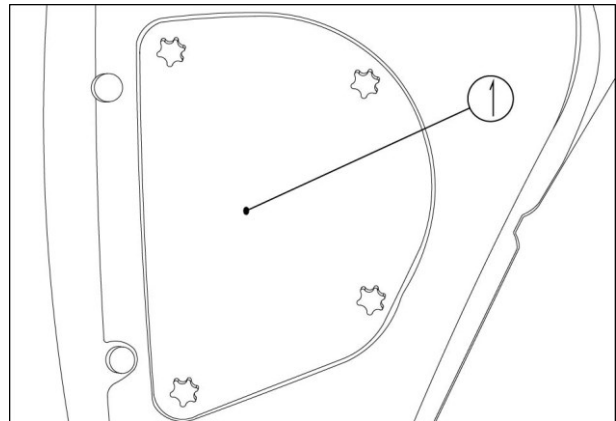


Fig.6-8

ECU position as shown in ②.

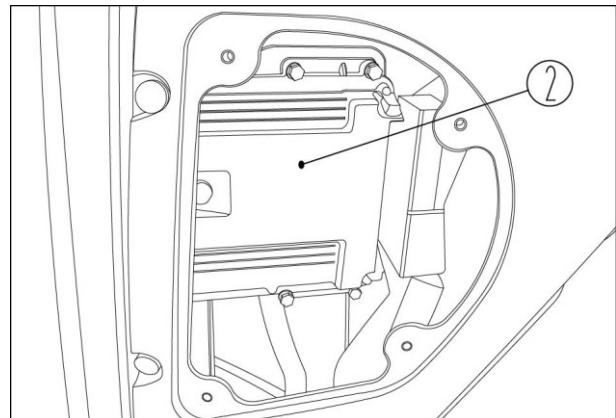


Fig.6-9

**6.4 OBD Interface**

The position of OBD interface is as shown in the figure.

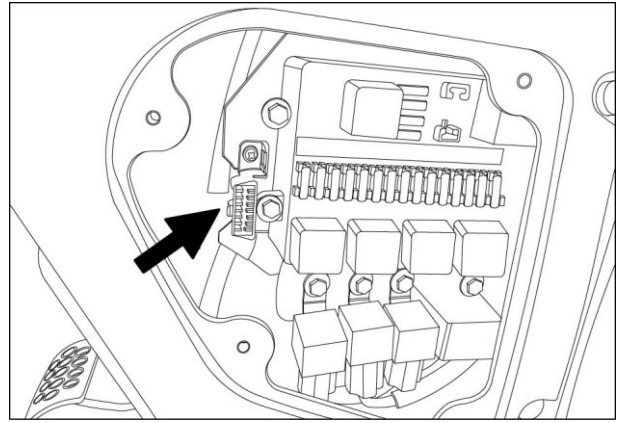


Fig.6-10

OBD interface appliance connection diagram (see the figure).

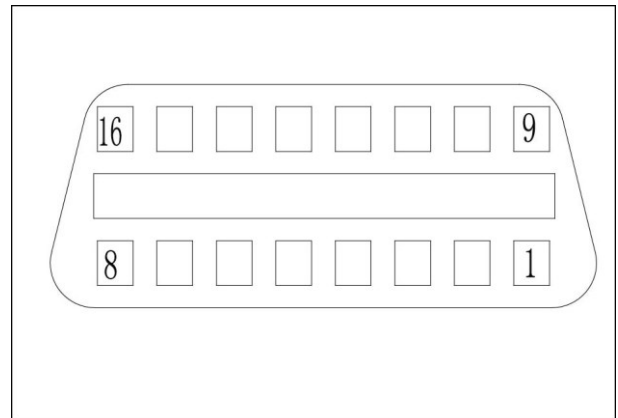


Fig.6-11

Plug-in module	Functions of plug-in module
14	Communication CAN L
6	Communication CAN H
7	K line
16	Positive pole of battery
4	GND

## 6.5 Road Utilization of Light

	<p><b>Important:</b> Clean the outside of the lights with water or specific commercial products.</p>
--	--

	<p><b>Important:</b> Avoid touching the inner surface of the reflector. Make sure no foreign material gets inside the reflector.</p>
--	--

The tractor shall be equipped with the following road lights:

- Two headlamps on the front panel
- Two clearance lamps on the front panel
- Two lighting sets shall be installed in rear and upper side of fender;
- Two lighting sets that are composed of side indicator lights and direction indicators on two sides (for driving)



**Warning:**

Relay light shall be turned on for the luminance of headlamps is insufficient when front-mounted implements are used to drive on public road in night.



**Note:**

Front and back lights will be turned off before cleaning.

### 6.5.1 High Beam and Low Beam

Lamp model used on roads of low beam and high beam headlamp is 12V-H4-55/60W, to provide enough width and far enough lighting for vehicles.

1. Low beam and high beam headlamp
2. Bonnet worklight

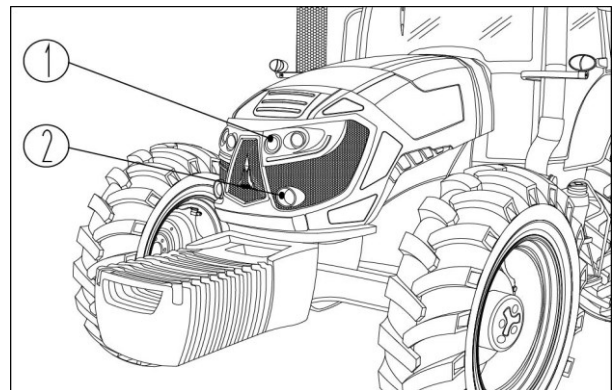


Fig.6-12

### Bulb replacement

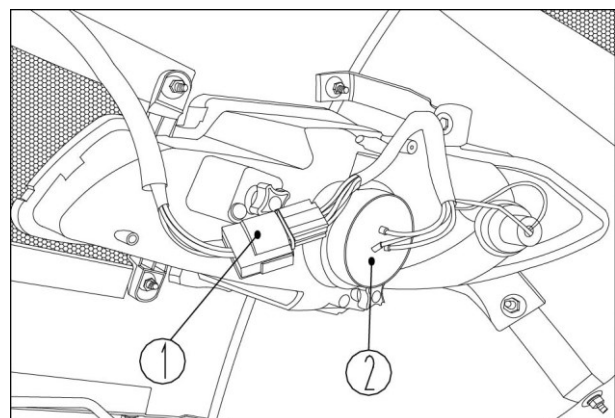


**Important:**

Only fit replacement bulbs of the same type and specification as those originally fitted

Steps for replacing bulb are as below:

- Lift engine hood;
- Remove the power connector ① of bulb ;
- Remove rubber protective cover②;
- Remove connector③
- Gently rotate the spring clip ④ of the bulb holder and remove the bulb ⑤ from the reflector⑥.
- Embed one new bulb, and ensure that the



positioning mark is consistent with the reflector notch;

- Rotate the spring clip ④ to lock;
- Connect connector ③;
- Re-install rubber protective cover ②, make sure it is well mounted on the edge of the reflector;
- Connect the bulb connector ① to the power supply.
- Close the bonnet.

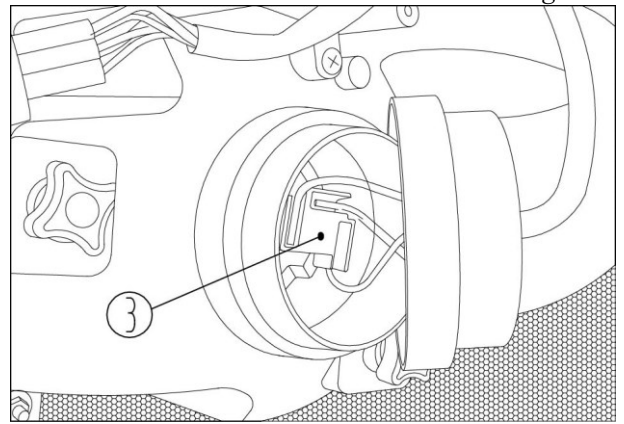


Fig.6-13

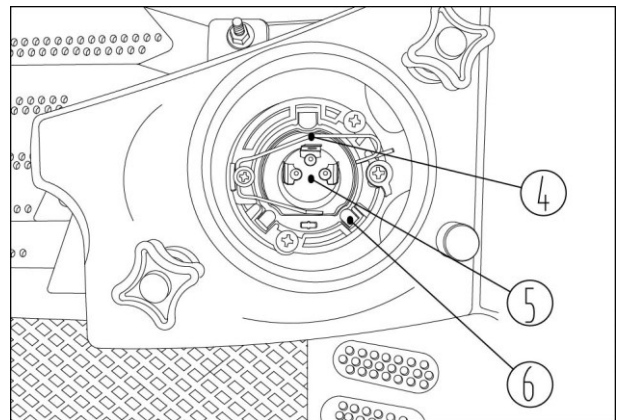


Fig.6-14

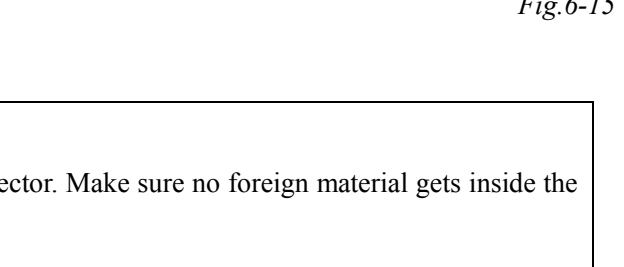


Fig.6-15



**Important:**

Avoid touching the inner surface of the reflector. Make sure no foreign material gets inside the reflector.

## 6.5.2 Side Position Indicator and Side Direction Indicator

Lateral position indicator light and side direction indicator light are located in both sides of the cab.

Position indicator light and side direction indicator light are constituted by two independent bulbs located in single unit.

- Side Direction Indicator ① is equipped with bulb of 12VP21W.
- Side Position Indicator ② is equipped with bulb of 12V-89-10W.

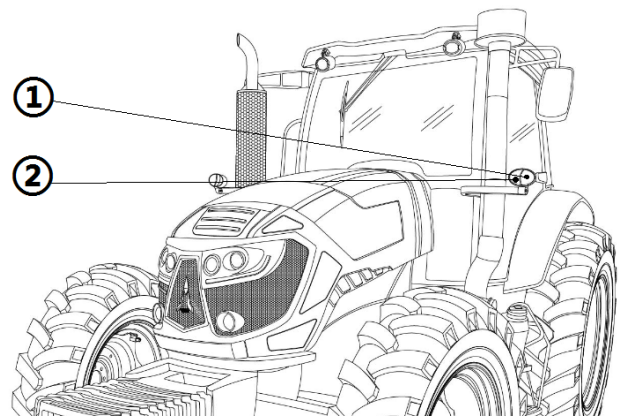



Fig.6-16

### Bulb replacement

	<p><b>Important:</b> Only fit replacement bulbs of the same type and specification as those originally fitted</p>
---	---

Steps for replacing bulb are as below:

- One screwdriver is used to loosen and remove two bolts ② that are used to tighten red and white transparent board ①;
- Slightly remove the transparent board to reach the bulb;

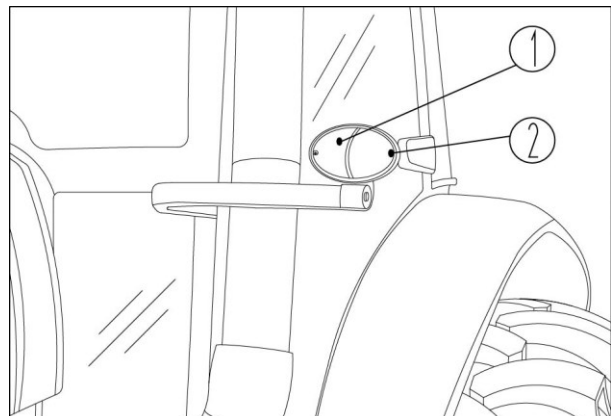


Fig.6-17

- Slightly press the bulb that need be replaced, meanwhile, rotate to bulb ③ or ④ by anti-clockwise to break away from the lamp socket;
- Slightly embed all new bulbs and rotate by clockwise until the bulb is locked tightly (refer to the figure);
- Fit the transparent plate back on and secure it with the two screws.

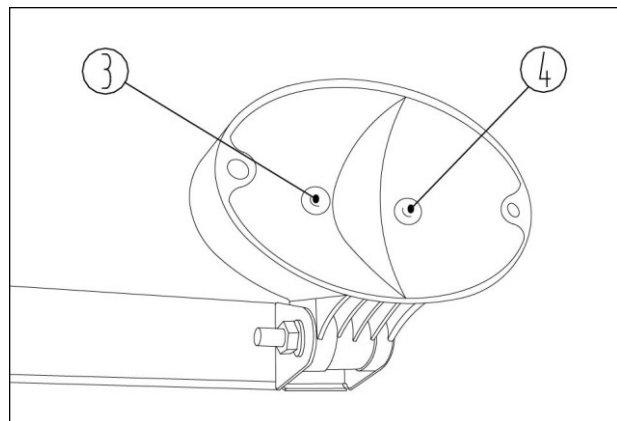


Fig.6-18





**Important:**

Bulbs can only be replaced with the bulbs of same type and specification



**Important:**

Avoid touching the inner surface of the reflector. Make sure no foreign material gets inside the reflector.

### 6.5.3 Taillight

Taillight is constituted by two independent bulbs, where one bulb is double filament (brake light and position light), and another one is independent (steering light), which are located in a single container above splash guard.

1. Taillight - brake/position indicator light indicating the tractor is braking (stopping) is equipped with bulbs of P21 5W 12V;
2. Taillight - direction indicator light is equipped with bulb of P12V 21W;

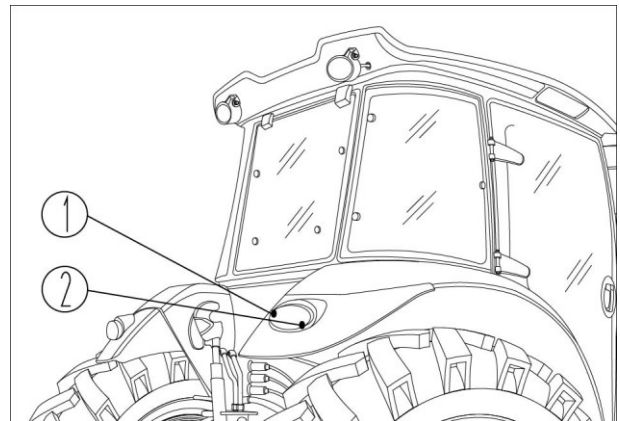


Fig. 6-19

#### Bulb replacement



**Important:**

Only fit replacement bulbs of the same type and specification as those originally fitted



**Important:**

Do not touch the internal surface of reflecting mirror to ensure no foreign matter enters into inside of the light.

Steps for replacing bulb are as below:

- One screwdriver is used to loosen and remove two bolts ① that are used to tighten red and white transparent board ②;
- Slightly remove the transparent board to reach the bulb;
- Slightly press the bulb that need be replaced, meanwhile, rotate to bulb ③ or ④ by anti-clockwise to break away from the lamp socket;
- Slightly embed all new bulbs and rotate by clockwise until the bulb is locked tightly.
- Fit the transparent plate back on and secure it with the two screws.

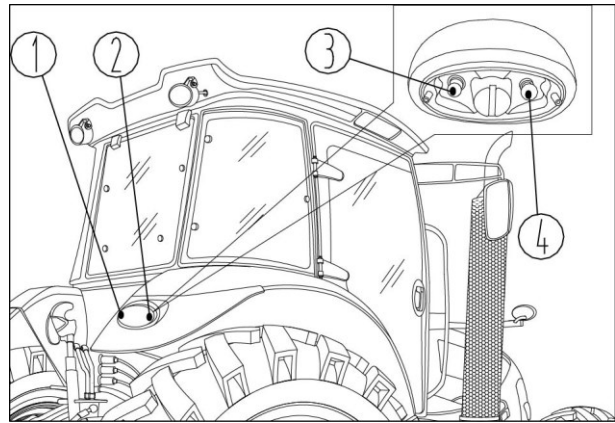


Fig.6-20

#### 6.5.4 Calibration of Headlamp



**Warning:**

This figure refers to countries where tractors will travel on right side of public roads. On the contrary, if the tractor travels on left side, wall area marked in “dark grey” must be symmetrical, which is shown in the figure (namely, point in the light area from dark grey area must be pointed to the edge of road).

The headlamp will be adjusted. Tractor must be parked on the horizontal ground that is 10 meters away from the front vertical wall. Under normal transportation situation, tire is inflated to recommended pressure. Front tire is at the standard position directly going forwards. Switch on low beam.

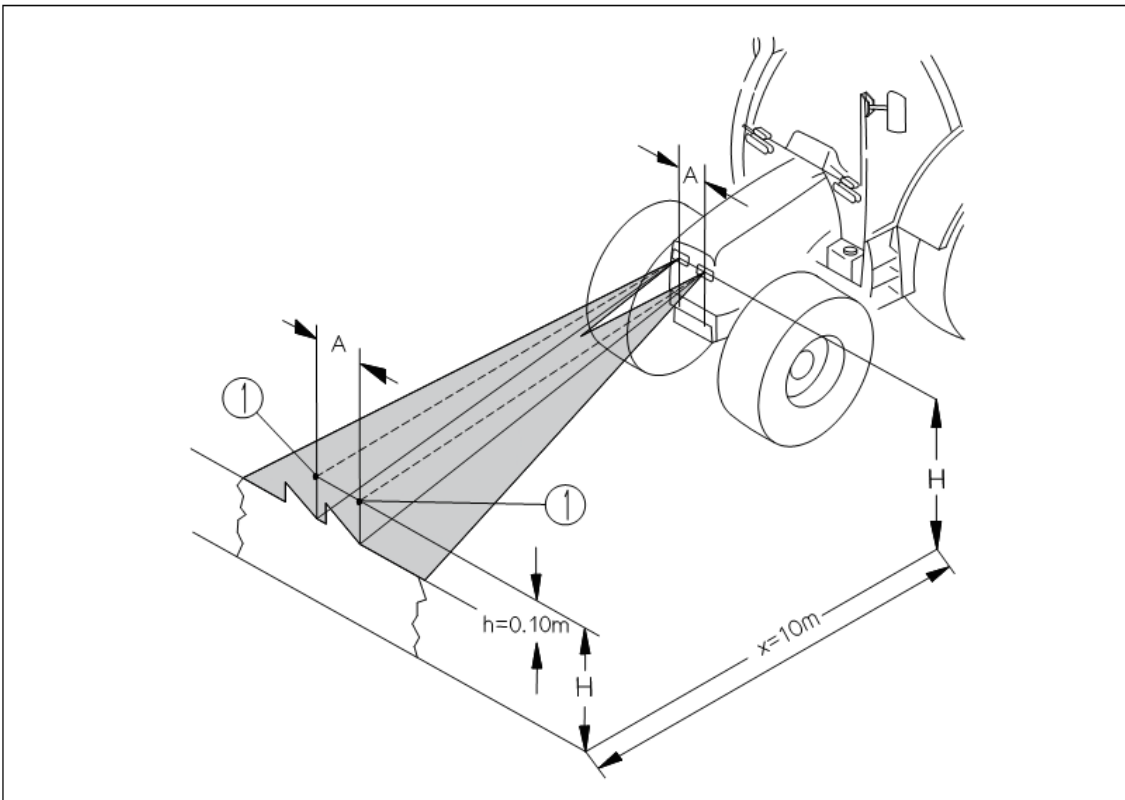


Fig.6-21

*The figure shows calibration of head light when driving on highway*

- 1- points on the wall corresponding to the centers of the headlamps
- A –distance among headlamps
- H –height of head light
- h-distance from light center to the horizontal axle
- x –distance from headlamp to wall

Rotate bolt of regulator (① or ②) in the figure to move vertical or horizontal light beam.

- Regulator bolt ① used to move light beam vertically.
- Regulator bolt ② used to move light beam horizontally.

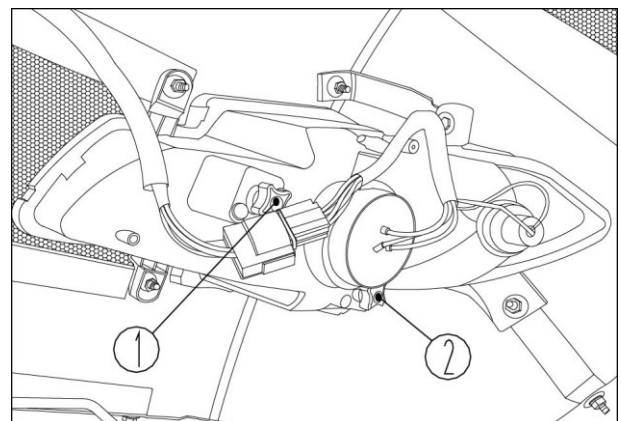


Fig.6-22

**Warning:**

In order to determine the points on the wall corresponding to the centers of the headlights, bring the tractor up to the wall with the low beam lamps on, mark the center ① on the wall and then reverse to a distance of 10 m from the wall.

**Horizontal adjustment of head light**

With the headlights switched on, the centers of the beams should be apart the distance A indicated in the figure.

**Vertical adjustment of head light**

With the headlights on, the lines delimiting the light and dark zones on the wall should be 10cm apart as shown in the figure by (h).

## 6.6 Worklights

### 6.6.1 Worklights

**Important:**

Avoid touching the inner surface of the reflector. Make sure no foreign material gets inside the reflector.

The tractor will be equipped with the following Worklights:

Tractor models equipped with a cab:

- Two front worklights on the top of cab
- Two rear worklights on the top of cab

**Front worklights on the top of cab**

Front worklight on the top of cab is equipped with the bulb of 12V-H3-55W.

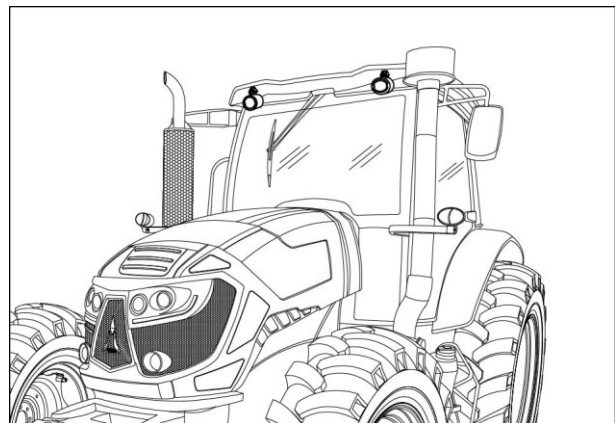


Fig.6-23

## Rear worklights on the top of cab

Rear worklight on the top of cab is equipped with the bulb of 12V-H3-55W.

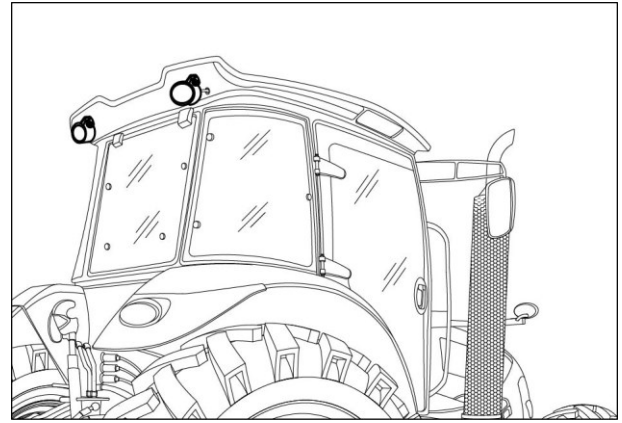


Fig.6-24

## Bulb replacement



### Important:

Only fit replacement bulbs of the same type and specification as those originally fitted.

The bulb replacement procedures hereinafter apply to the following worklights:

- Two front worklights on the top of cab
- Two rear worklights on the top of cab

Procedure for replacement of bulbs as follows:

- Carefully clean the outside of the light unit to avoid the risk of dirt getting on the reflector during bulb replacement;
- Disconnect power supply of the bulb;
- Unscrew the screw ① fixing protection cover by using screwdriver to take off protection cover ②;
- Remove the bulb by rotating it counterclockwise;
- Install the bulb by rotating it clockwise;
- Refit the protective cover. Fix it using two bolts①to fix ②;
- Connect power supply of the bulb.

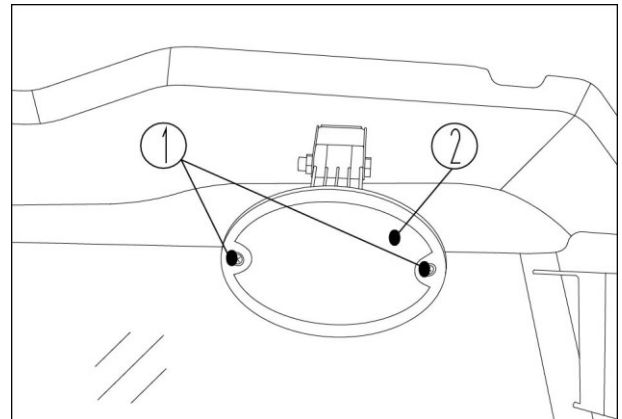


Fig.6-25



### Important:

Avoid touching the inner surface of the reflector. Make sure no foreign material gets inside the reflector.

## 6.6.2 Door-controlled Interior Illuminating Light

- The tractor is equipped with an indoor door control light.

### Interior light

Interior light is equipped with bulb of 12V 5W F-2.

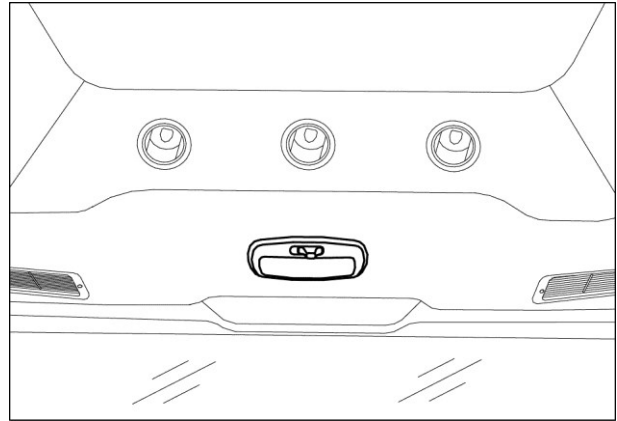




Fig.6-26

### Bulb replacement

	<b>Important:</b> Only fit replacement bulbs of the same type and specification as those originally fitted
---	---

	<b>Important:</b> Avoid touching the inner surface of the reflector. Make sure no foreign material gets inside the reflector.
---	--

Steps for replacing bulb are as below:

- Remove light shield ① by pulling it outwards;

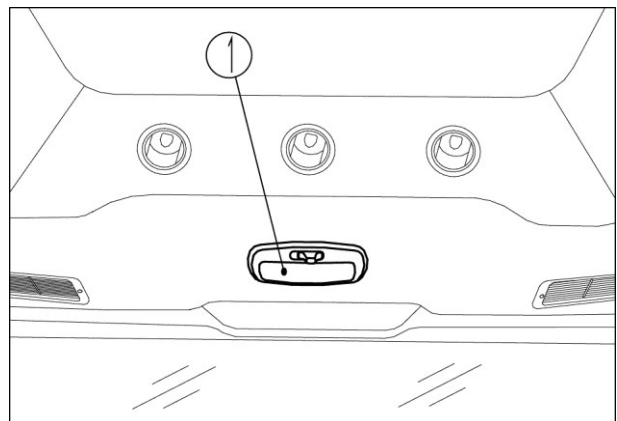


Fig.6-27

- Press down the sheet metal ②;
- Remove the light bulb ③;
- Press down the metal strip ② Install the new bulb;
- Loosen the metal strip, to secure the bulb ③.
- Install the light shield.

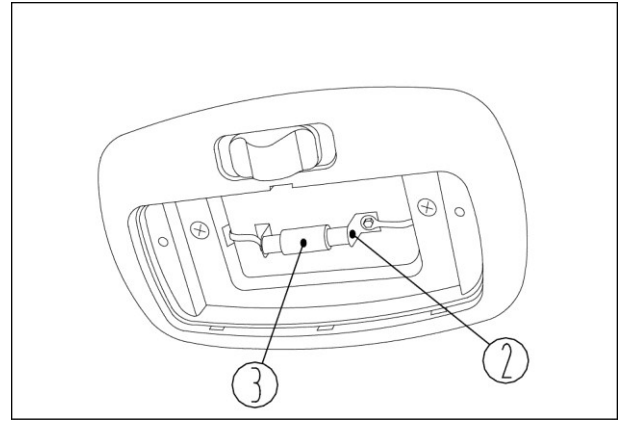


Fig.6-28

## 6.7 Accessories

### 6.7.1 Power Output Socket

The tractor is equipped with power output socket of the back trailer.

#### Standard socket:

Power socket of the tractor with seven holes

Description of each hole:

1. Power line connected to left steering light;
2. It is not used temporarily
3. Grounding;
4. Power line connected to right steering light;
5. Power line connected to position light;
6. Power line connected to brake lamp;
7. Power line connected to position light;

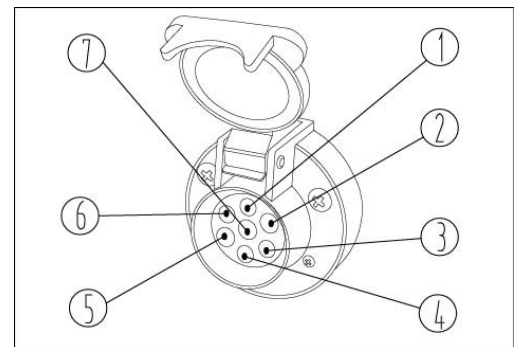


Fig.6-29

### 6.7.2 Installation of Other Electronic Elements or Equipment

The tractor is equipped with electronic parts and components whose functioning may be disturbed by electromagnetic emissions from other equipment. These emissions may put people in danger if the following safety guidelines are not followed.

In the case of installation of additional electrical or electronic components that are connected to the tractor's electrical system, the user is responsible for checking that the installation does not release emissions which interfere with the operation of the existing electronic or other components of the tractor.

This is particularly a problem with the following types of equipment:

- Radio.
- CB radio receiving equipment.
- Mobile telephone (ETACS, GSM, and so on)

- 
- As for installation of other mobile remote communication systems (such as: radio device, telephone), attentions must be paid to the following supplementary instructions:
  - Only equipment permitted in accordance with relevant national laws and regulations will be installed (such as: BZT permission of Germany).
  - Guarantee that device is installed solidly.
  - Portable or mobile device in the vehicle can be used only when it is solidly connected to antenna outside of the vehicle.
  - Antenna transmission element and electronic elements of vehicle must be installed respectively.

Antenna must be installed as per professional way. What's more, a very good connection must be available between the antenna and grounding point of the vehicle. Line device and maximum current must comply with relevant requirements.



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## **7- Packing list and Quick-wear Parts**

## 7.1 Packing list

Cat.	Nr.	Code number	Name	Unit	Qty.	Remark
Accompanying documents	1	/	User manual	book	1	
	2		Product quality certificate	book	1	
	3		Three guarantees service certificate	book	1	
Spare parts	4	ATS 5	ZEEMAN blade fuse 5A(light brown)	piece	4	
	5	ATS 10	ZEEMAN blade fuse 10A(red)	piece	7	
	6	ATS 15	ZEEMAN blade fuse 15A(light blue)	piece	4	
	7	ATS 25	ZEEMAN blade fuse 25A(white)	piece	2	
	8	ATS 40	ZEEMAN blade fuse 40A(orange)	piece	2	
	9	ATS 30	ZEEMAN blade fuse 30A(light green)	piece	1	
	10	ANS 80	ZEEMAN flat type fuse 80A	piece	1	
Accompanying attachments	11	0.760.3954.0	Bulb for cat.3 linkage	piece	2	
	12	0.016.7834.3	Cone cover for cat.3 linkage	piece	2	
	13	0.760.4552.0	Bulb for cat.2 linkage	piece	2	
	14	0.016.7833.3	Cone cover for cat.2 linkage	piece	2	
	15	2.1669.036.2	Pin for the third point	piece	1	
	16	0.009.2300.0	Bulb for the third point	piece	1	
	17	0.043.8662.0	PTO shaft Z.6	Piece	1	Domestic : Only when the order has specific requirements, can it be packed and shipped in the attachment box.
					1	Exprot:As sembly in line
	18	0.043.8661.0	PTO shaft Z.21	Piece	0	Domestic: Cancel PTO shaft Z.21
					1	Export:Required as attachment

	19	0.98309.51.3/10	Quick-adapt male joint	piece	as required	Mechanical control non-enforced lifter: 6 units for 3 groups; 8 units for four groups.
Accompanying tools	20	QB/T 2564.5	Cross screwdriver QB/T 2564.5 PH2-100P	piece	1	
	21	QB/T 2564.4	Slotted screwdriver QB/T 2564.4 A 0.6×4-100P	piece	1	
	22	QB / T3390.1	Hand operated socket wrenches-socket 18X 12.5	piece	1	
	23		Hand operated socket wrenches-socket 21 X 12.5	piece	1	
	24		Hand operated socket wrenches-socket 27X 12.5	piece	1	
	25	QB / T3390.3	Hand operated socket wrenches-driving parts 253 12.5	piece	1	
	26	QB / T3390.4	Hand operated socket wrenches-attachments JG12.5 X 250	piece	1	
	27	JB/T 7942.1	Lever type grease gun 400	piece	1	
	28	JB / T3411.47	Circlip pincer A2.5	piece	1	
	29	JB / T3411.48	Circlip pincer A2.5	piece	1	
	30	GB / T5356	Inner hexagon spanner 8	piece	1	
	31	GB / T4388	Double wrench 8×10	piece	1	
	32		Double wrench 10×12	piece	1	
	33		Double wrench 13×16	piece	1	
	34		Double wrench 16×18	piece	1	
	35		Double wrench 18×21	piece	1	
	36		Double wrench 21×24	piece	1	
	37		Double wrench 24×27	piece	1	
	38		Double wrench 30×34	piece	1	
39	ASME/ANSI B 18.3-2003	Inner hexagon spanner 3/8"	piece	1		
Engine accompanying articles	40		Engine accompanying documents, spare parts, accompanying tools, accompanying accessories	Set	1	From engine supplier(checked according to the engine packing list)

**Important:**

1. The tools, spare parts, and documents of the engine should be checked against the packing list of the diesel engine.
2. The list of tools and spare parts provided together with the engine is for reference only, and subject to change without notice.

## 7.2 Quick-wear Parts

The quick-wear parts of FL220 series wheeled tractor include: all the oil seals; all the bearings; all the ring seals (see the drawings); all the fuses and bulbs listed in the following table; and all rubber sleeves, glass products, and belts.

Note: This list is a general list, and the specific part number is subject to the configuration of the actual model.

List of quick-wear parts:

No.	Code	Name	Unit	Quantity	Remarks
1		Glass, front lower window	Block	2	
2		Rear windshield	Block	1	
3		Front windshield	Block	2	
4		Glass, left front window	Block	1	
5		Glass, right front window	Block	1	
6		Glass, left door	Block	1	
7		Glass, right door	Block	1	
8		Glass, left widow	Block	1	
9		Glass, right widow	Block	1	
10		Rear windshield	Block	1	
11		Glass, rear lower window	Block	1	
12		Fuse 7.5A	Piece	2	
13		Fuse 10A	Piece	1	
14		Fuse 15A	Piece	1	
15		Fuse 20A	Piece	1	
16		Fuse 25A	Piece	4	
17		Fuse 30A	Piece	1	

No.	Code	Name	Unit	Quantity	Remarks
18		Fuse 40A	Piece	3	
19	12V-H4-55/60W	Dual-filament bulb, high and low-beam	Piece	4	
20	12V-1141-21W	Front steering light bulb	Piece	4	
21	R10W	Front position light bulb	Piece	2	
22	12V-H3-55W	Rear working light bulb	Piece	2	
23	P21/5W 12V	Rear brake/position light	Piece	2	
24	P12V/21W	Rear steering light	Piece	2	
25		Engine fan belt	Piece	1	
26		Belt, compressor, air conditioning system	Piece	1	



**Important:**

1. All the spare parts, tools, and vulnerable parts listed above are dedicated parts for the tractor. Please use them properly in repair and maintenance, or store them properly to prevent loss. Installed parts getting lost could affect the performance of the tractor.
2. During repair and maintenance, use authentic parts specified by original equipment manufacturers. Use of parts from other sources could affect the functions, performances, and service life of the tractor.

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## **8-Maintenance Specification**







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## 8.1 Maintenance Operations

Series of technical maintenance measures including cleaning, check, lubrication, tightening, adjustment or replacement of some components will be regularly conducted for all parts of the tractor, which is called as technical maintenance. Technical maintenance work will be carried out, which can alleviate deterioration speed of technical condition of all components, reduce fault and prolong lifetime to guarantee the tractor works under good condition.

Before conducting any maintenance work, please note the following safety instructions:

- Take out of key from the startup switch.
- Please hang the warning mark of “don’t start up the machine” on the steering wheel.
- If necessary, place warning mark surrounding the tractor.

	<p><b>Notice:</b></p> <p>Any maintenance operation must be conducted on suitable platform whose height is higher than 1500mm to guarantee safety.</p>
	<p><b>Notice:</b></p> <p>Some of the illustrations in this manual show the tractor with panels or guards and panels removed for the sake of clarity. Never use the tractor unless these panels and guards are properly fitted in their correct positions. If it is essential to remove these panels or guards in order to repair the tractor, they <b>MUST</b> be refitted before starting the tractor.</p>
	<p><b>Danger:</b></p> <p>Never start the engine by shorting across the terminals of the starter motor as the tractor could suddenly move off, with a consequent risk of injury to the operator.</p>
	<p><b>Warning:</b></p> <p>Always wear proper work clothes; wear earplugs and safety glasses whenever necessary.</p>
	<p><b>Notice:</b></p> <p>Read the safety instructions at the start of this manual to protect the safety of the user.</p>
	<p><b>Notice:</b></p> <p>Internal combustion engine will easily cause fire disaster under high environment and areas covered with tree, lawn or agricultural crops. This tractor is not equipped with spark-proof device on exhaust pipe.</p>

**Warning:**

To keep normal operation of the tractor, maintenance operation must be conducted within the limited period. Lack of daily maintenance may cause unnecessary fault so that lifetime of the machine has been shortened.

**Danger:**

The engine can be started by using the key only sitting at the driving position. Don't try to use short-circuit starting motor terminal to start the engine. When the shift lever or safety circuit of the clutch is bypassed, the tractor will start to go forwards. It will cause serious hazards or death. Please guarantee that covering is always on solenoid of starting motor.

**Warning:**

Guarantee that it can be safely operated before starting the tractor even if it is travelling on public roads.

**Danger:**

Don't let your eyes expose in radar emitter region when radar is operating. When the radar is closed, the radar sensor can be maintained.

**Notice:**

Before starting the engine, the environment must have enough ventilation. Don't start the engine in sealed region. Gas that has been exhausted will cause stifle.

## 8.2 Maintenance Interval

The suggested maintenance interval period is applicable to situation of normal operation.

If the tractor undertakes extremely heavy work or is used in environment with lots of dust, regular maintenance frequency shall be enhanced. Strictly abide by recommended maintenance interval period. What's more, recommended lubricant and liquid can only be used.

## 8.3 Liquid/Lubricating Oil and Volume of Filling



**Warning:**

Abide by laws and regulations on environmental protection. All liquid (oil, fuel oil and coolant), filter and battery must be discarded in accordance with applicable laws and regulations.

Utilization of any other oil that has not been recommended may seriously damage the tractor.

If the tractor has not been maintained as per the recommended maintenance interval period and stipulated lubricant has not been used, the product quality guarantee will be invalid.

**Warning:**

- Guarantee that any vessel for storing the lubricant is absolutely clean. The funnel and measuring cup must be covered to prevent dust from depositing.
- Area surrounding lubricated part will be cleaned.
- Apply lubricating grease to lubricating part after heating to lubricating grease easier flow.
- The plug and the cover will be cleaned before re-installation.
- All operations will be conducted in accordance with instructions in the manual and proper safety guidelines.
- Maintenance can be conducted only when the engine is shut off, key is removed and parking brake is used.
- Unless specially marked in instructions, work cannot be conducted when the engine is under operation.
- The capacity of fuel tank is shown in the chapter of “technical data”.
- This table shows the lubricating oil and volume of filling for the tractors within this scope (unit: Liters)

**Technical Data**

	<b>FL1804/2004/2204</b>
<b>A0 – Lubricating point</b>	
Lubricating grease: DF lubricating grease EP2	√
<b>B0 – Engine</b>	
Lubricating oil for engine: Lubricating oil 15W-40 for DF super engine (ACEA E5, E3; APICH-4/CG-4/CF-4/CF; Deutz DQC2-05)	As per engine operation instruction
Anti-freezer: DF anti-freezer (stand by)	30
<b>D0 – Transmission</b>	
Lubricating oil for transmission: DF UTTO (API GL 4, JDM-20C, M1143, ZF TE-ML03E, 05F)	64
<b>F0 – Front drive axle</b>	
Lubricating oil for front drive axle: DF UTTO (API GL 4, JDM-20C, M1143, ZF TE-ML03E, 05F)	6
Lubricating oil for final drive: (API GL 4, JDM-20C, M1143, ZF TE-ML03E,05F)	1.5×2
E0-Clutch & brake system	
SDF brake oil (MB236.6;ZF TE 03D-04D-09A-11A-14A-17C)	2


(\* ) With filter + 1 Liter

[1]- Minimum specifications of lubricating oil for engine

[2]- Recommended specifications of lubricating oil for engine


Please refer to the instructions on the following page for the characteristics, specifications and safe use warnings of the anti-freezing agent:


See the Appendix

	<p><b>Warning:</b></p> <p>To avoid such problems, please do not replace the mineral oil [1] with synthetic lubricating oil [2].</p>
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## 8.4 Maintenance Cycle

Recommended maintenance cycle is as below:

	<p><b>Important:</b></p> <p>The maintenance number shall correspond with the instructions in the maintenance and quality assurance booklet.</p>
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	<p><b>Important:</b></p> <p>Please refer to the maintenance and inspection schedule for the relevant operating information to be implemented.</p>
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Classification of maintenance	Cycle (hour)	Operation to be conducted
1°	10	The specified operations shall be conducted every 10 hours.
2°	50	The specified operations shall be conducted once every other 10 hours and 50 hours.
3°	100	The specified operations shall be conducted every 10, 50 and 100 hours.
4°	300	The specified operations shall be conducted every 10, 50, 100 and 300 hours.
5°	600	The specified operations shall be conducted every 10, 50, 100, 300 and 600 hours.
6°	1200	The specified operations shall be conducted every 10, 50, 100, 300, 600 and 1200 hours.

## 8.5 Maintenance and Inspection Schedule

Frequency (unit: hour)	Items that will be maintained	Measures					Reference
		Apply lubricating grease	Discharge water	Check	Clean	Replace	
Every 10 hours	Tractor general inspection (Note 1)			X			8.7.1

	Engine lubricating oil level			X			8.7.2
	Coolant liquid level			X			8.7.3
	Fuel level			X			8.7.4
	Electrical system			X			8.7.5
Every 50 hours	Transmission oil level			X			8.8.1
	Driving shaft	X					8.8.2
	Front axle(4WD)	X					8.8.3
	Clutch and brake oil tank level (Note 2)			X			8.8.4
	Storage battery			X			8.8.5
	Rear three-point linkage	X					8.8.6
	Wheel and tire			X			8.8.7
	Bolts/nuts on critical positions(Note 3)			X			8.8.8
First 100 hour (the first maintenance)	Brake distance			X			8.9.1
	Tension of engine drive belt			X			8.9.2
	Lubricating oil for engine (Note 4)					X	8.9.3
	Filter cartridge of lubricating oil for engine (note 5)					X	8.9.4
	Radiator of the engine cooling system				X		8.9.5
	Fuel filter					X	8.9.6
	Fuel pre-filter					X	8.9.7
	Parking brake control handle			X			8.9.8
	Cab ventilation system				X		8.9.9
	Oil pipe - hydraulic steering			X			8.9.10
Every 300 hours	Firstly, conduct the specified operations every other 50 hours.						
	Front axle oil level			X			8.10.1
Every 600 hours	Firstly, conduct the specified operations every 50 and 300 hours.						
	Transmission oil filter					X	8.11.1
	Differential lock system			X			8.11.2
Every 1200 hours or at least once a year	Firstly, conduct the specified operations once every other 50 hours, 300 hours and 600 hours.						
	Fuel pump			X			8.12.1
	Air filter element of engine					X	8.12.2
	Starter motor			X			8.12.3
	Hydraulic brake system		X				8.12.4
	Cab heating system			X			8.12.5

	Cab air conditioning system			X			8.12.6
	Hydraulic clutch circuit (note 4 and note 6)		X				8.12.7
Once every other 1200 hours or at least two years	Coolant (Note 4)					X	8.13.1
	Transmission oil					X	8.13.2
	Front drive axle oil (note 4 and note 6)					X	8.13.3
General maintenance	Fuel circuit		X				8.14.1
	Fuel prefilter		X				8.14.2
	Hydraulic circuit of hydrostatic steering system		X				8.14.3

Note 1: Check the hoses in contact with the other parts for leakage, bolt looseness and debris buildup conditions. Repair the leakage before use so as to guarantee that the hoses are fixed and the loose bolts are tightened.

Note 2: When the warming light is light up.

Note 3: Check and tighten bolts/nuts of critical positions to specified torque.

Note 4: Learn about the correct product types by reference to the table “Liquid/Lubricating oil and volume of filling”.

Note 5: When replacing the lubricating oil.

Note 6: At least once a year.

Note 7: Where the sulfuric acid content inside the fuel exceeds 0.5%, the maintenance interval shall be reduced by half.

If the maintenance period related to the engine is different from that in Engine Operation Manual, the maintenance period in Engine Operation Manual shall prevail.



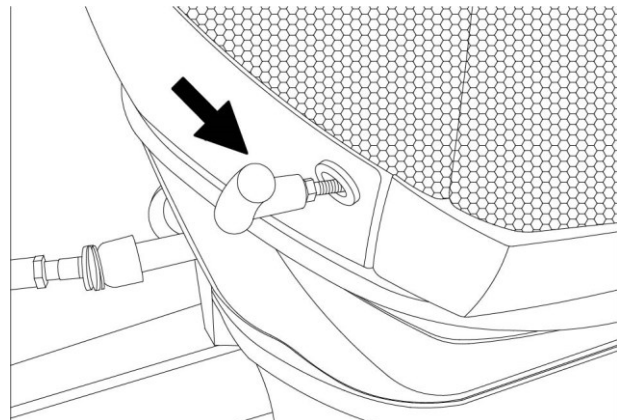
**Important:**

After changing the fuel from common fuel to bio-fuel, the fuel filter shall be replaced once every other 30- 50 working hours.

## 8.6 Enter into Engine Compartment

### 8.6.1 Lift the Engine Hood

Press the handle for hood lock of front engine hood Slightly lifting up the hood will cause the engine hood to rise up automatically.



## 8.6.2 Close the Engine Hood

Engine hood shall be pressed down until the separation blades are engaged when you want to close engine hood.

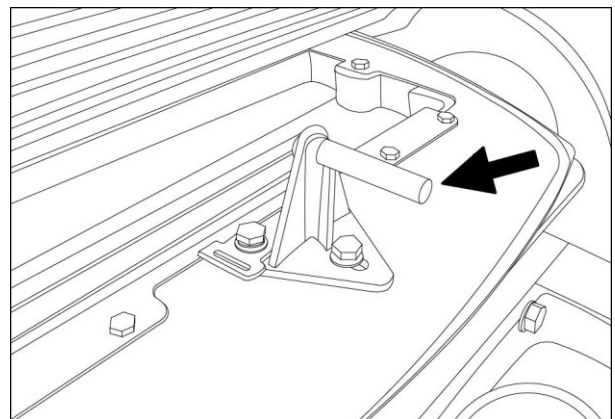


Fig.8-2

	<p><b>Important:</b> Check and confirm that seal strips in the surroundings of the hood used to separate the front bay and the engine are in good conditions, and are properly installed. This is very important for ensuring proper operation of the lubricating oil coolers in the engine cooling system and the front bay.</p>
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If necessary, replace seal strips.

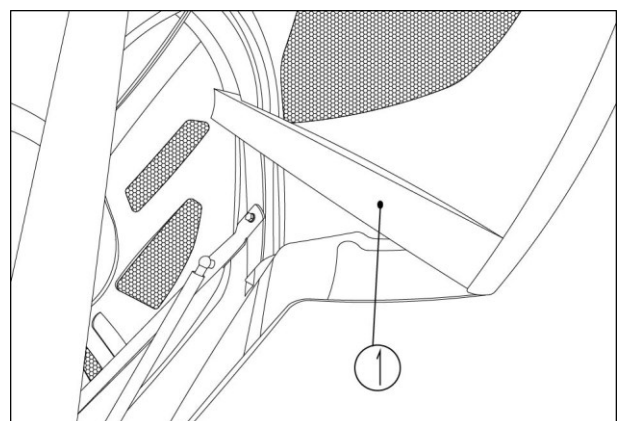


Fig.8-3

## 8.7 Daily Maintenance

### 8.7.1 Tractor General Inspection

**Warning:**

It can be touched when the engine is cooled. During the maintenance period, active the parking braking and place the wheel chocks to block the wheels. After completing check and maintenance work, engine hood and removed safety protective device or covering will be re-installed.

**Warning:**

Please inspect and fix all fasteners to ensure that the tractor is in good working status.

**Important:**

Torque wrench must be used to tighten major bolts and nuts of the tractor.

Before starting of work, check exterior of the tractor for oil leakage or other signs of fault. Clean all mud, straw and leaves on the tractor.

It is necessary to make an overall check on the tractor for every 10 operating hours to inspect all exterior fasteners of the tractor. Tighten the loose fastener when you find it.

If necessary, please contact your dealer after determining the fault position, and repair all the defects.

### 8.7.2 Check Oil Level of the Engine Oil

**Warning:**

Collect used lubricating oil and store in suitable vessel, and then send to the authorized collection center.

**Warning:**

It is prohibited to inject oil that is different from existing lubricating oil (grade or viscosity).

**Danger:**

If the engine heats, it indicates that it is at the risk of burning; please wait until the engine cooling down before conducting further maintenance, inspection or adjustment.

**Notice:**

Park the tractor on horizontal plane when replace lubricating oil or check oil level.

Before checking oil level of the engine, keep the engine running for several minutes; then shut off the engine, and wait for 1 minute around before check the oil level.

To check the oil level, first pull out the oil dip rod, and wipe it off with lint free cloth; insert it in, and then pull it out again so as check the oil level.

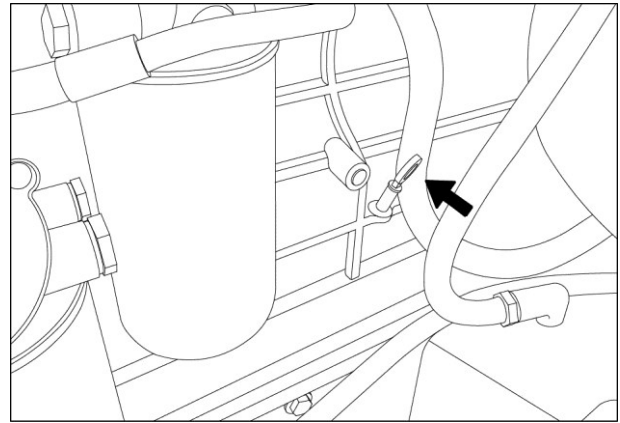


Fig.8-4

If the oil level falls between the two nicks, ① and ② of the oil dip rod, then it indicates that the oil level is normal.

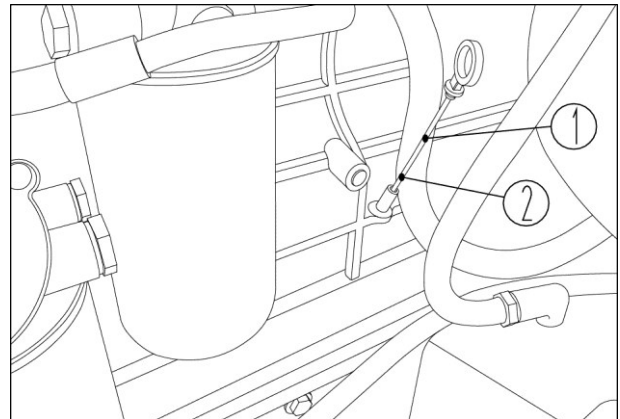


Fig.8-5

If necessary, fill the lubricating oil of specific specifications into the engine through the oil filler to make it reach the top nick on the oil dip rod.

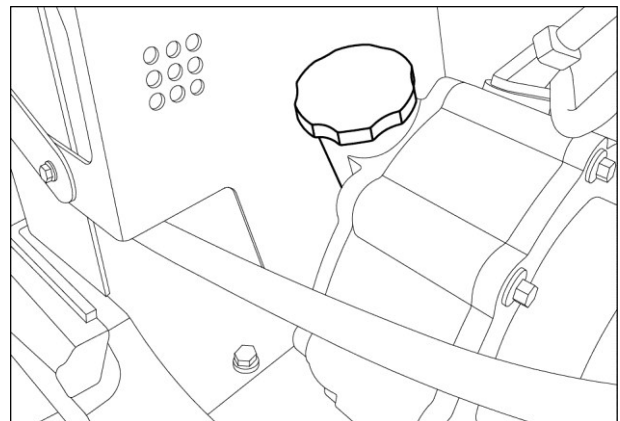


Fig.8-6

### 8.7.3 Check Coolant Level



**Warning:**

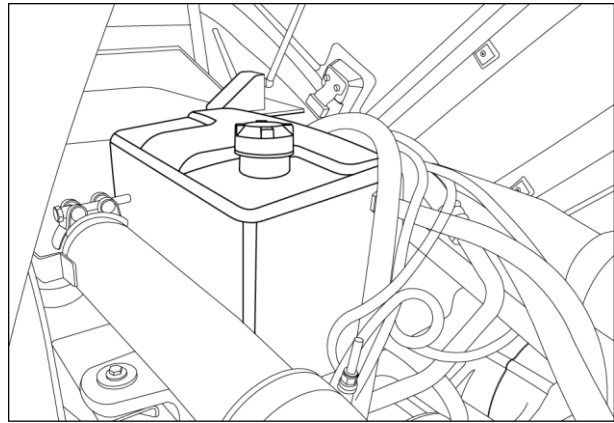
Abide by laws and regulations on environmental protection. All liquid (oil, fuel oil and coolant), filter and battery must be discarded in accordance with applicable laws and regulations.

#### Open the engine hood

Check level of the coolant inside the expansion tank.

**If the coolant is insufficient**


1. After the engine has been cooled.
2. After opening the engine hood, inject liquid of the same type as that in the expansion tank to a position between the maximum scale and the minimum scale through the water system filler.




*Fig.8-7*


**8.7.4 Check Fuel Level**


Check whether fuel inside the tank is sufficient randomly, and be sure not to run it out. Use special and recognized fuel the sulfur content of which is lower than 0.5. If the sulfur content exceeds the recommended value, then the replacement interval of lubricating oil specified in the maintenance schedule must be reduced by half.


	<p><b>Warning:</b> Observe the safety regulations, and store the fuel in the oil tank.</p>
--	--

	<p><b>Danger:</b> Be careful when working around the warehouses used to store the fuel or combustible materials, and avoid generation of dangerous sparks.</p>
---	--

**Oil will be filled after using out in every day.**

	<p><b>Warning:</b> When the fuel is injected, shut off the engine and clean off the fuel dropped or splashed onto the tractor at any time.</p>
---	--

	<p><b>Warning:</b> Before running out of the fuel, never continue operating the engine. If the engine stops due to running out of the fuel, it is necessary to drain the internal air off through the fuel injection system.</p>
---	--

	<p><b>Warning:</b> Never inject fuel into the fuel tank in a closed environment or in an open fire environment. Smoking is prohibited when fuel is injected, and before that, the engine shall be shut off.</p>
---	---



After finishing the work of a whole day, the fuel tank shall be full filled with fuel so as to prevent condensation in the night.

Fuel tank is located at left side of tractor.

Oil filler ①.

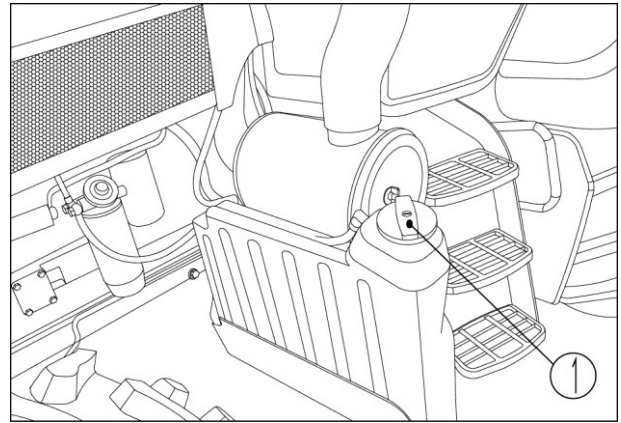


Fig.8-8

### Drain plug



#### Warning:

Abide by laws and regulations on environmental protection. All liquid (oil, fuel oil and coolant), filter and battery must be discarded in accordance with applicable laws and regulations.

The lowest part of the main fuel tank is equipped with fuel drain plug, and position is ① as shown in figure.

Where cover of the fuel tank filler is opened, the fuel emission speed will be accelerated.

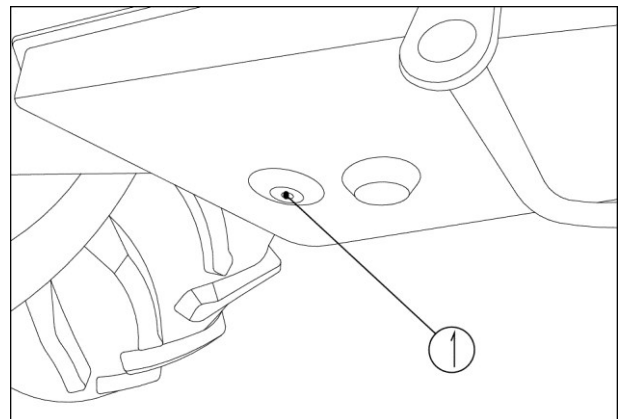


Fig.8-9

The lowest part of the auxiliary fuel tank is equipped with fuel drain plug, and position is ① as shown in figure.

Where cover of the fuel tank filler is opened, the fuel emission speed will be accelerated.

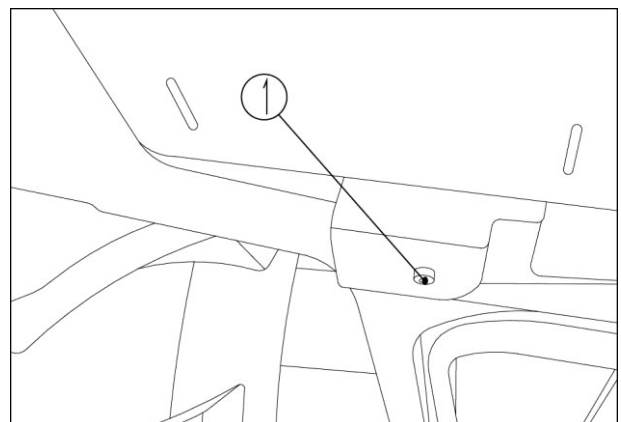


Fig.8-10

### Discharge water from fuel filter



**Notice:**

After winter, before putting the tractor into use again, be sure to drain the water off through the fuel filter.

**Steps are as below:**

1. Place a suitable container under the fuel pre-filter ①
2. Release the screw ② and wait until all water being drained out from the pre-filter ①.
3. Retighten the screw ②.

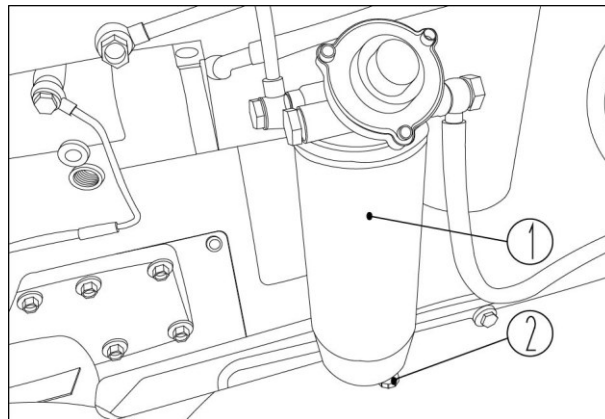


Fig.8-11

**Fuel pump air bleeding**



**Warning:**

If high-pressure fuel or oil is splashed to your skin or eye, it may cause serious injury and blindness, even death. High pressure fluid leakage may be cannot find by visual. Use a paper board or wood to detect the place where fluid leaks. Do not operate it by hand absolutely! Wear safety goggles to protect your eyes. If any fluid is splashed to your skin, you should seek for help from an experienced doctor immediately.

Pressing the operating pump top ③ for air bleeding.

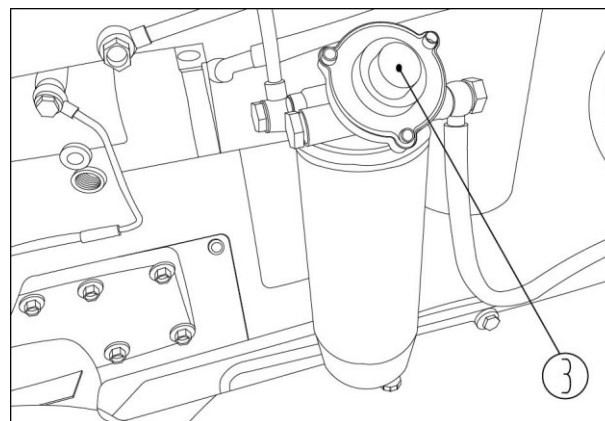


Fig.8-12

**8.7.5 Check Electrical System**

Check and confirm that the headlight, direction indicator and side light etc. all work normally.

**8.8 Every 50 Hours Maintenance**

**8.8.1 Check the Transmission Oil Level**

**Danger:**

Take care when draining the used oil as hot oil may lead to severe burn.

**Warning:**

Lubricating oil that is different from original oil model (type or viscosity) cannot be injected.

**To check whether the oil level is correct, please place the tractor according to the following requirements:**

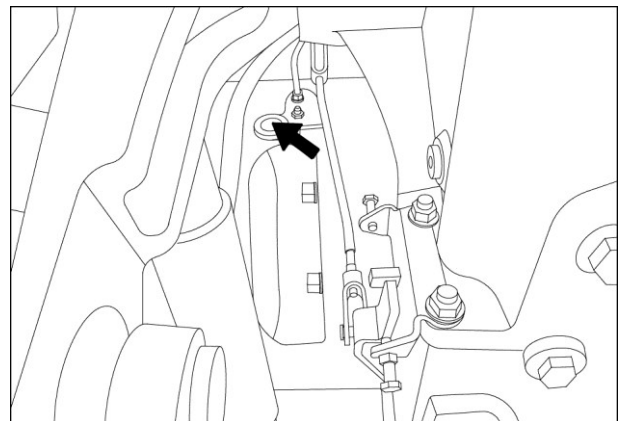
1. Park the tractor on horizontal ground.
2. Engine must be closed for at least 5 minutes, parking brake must be used.
3. The rear lifter must be dropped down.
4. Hydraulic valve control handle must be in the neutral position.

To check the oil level, unscrew the oil filler cover; it is equipped with the oil dip rod (1) on the rear left support near the transmission.

**Where oil is needed to be full filled, please operate according to the following steps:**

1. If necessary, use the lubricating oil specified in the “lubricating oil form” to fill the fuel tank to make its level reach the maximum level line on the oil dip rod; then well tighten the cover of the oil filler opening again.
2. Restart the engine, and keep it idling for several minutes; then shut off the engine, and check the oil level again.
3. After refilling the oil, use a plug that matches with the oil dip rod to seal the oil filler.

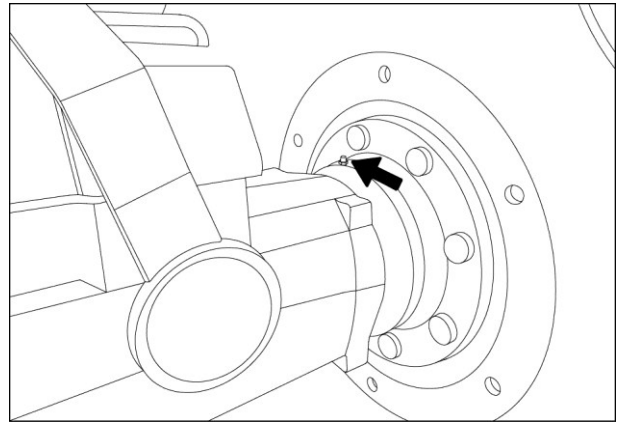
Gear box oil filler cover with dip rod.



*Fig.8-13*

## 8.8.2 Lubricate Drive Shaft

Lubricate the drive shaft bearing  
Fill lubricating grease with grease gun through the oil cup.

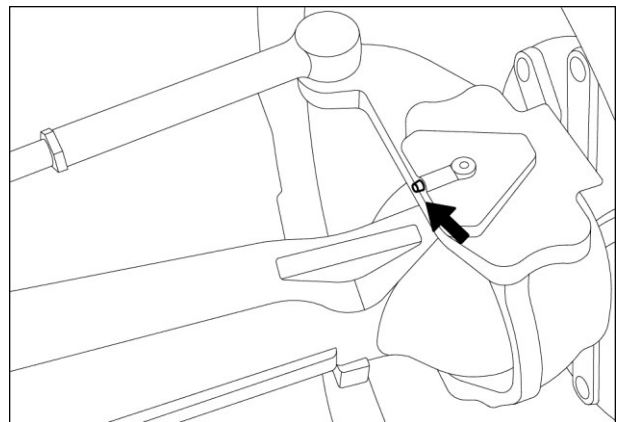


*Fig.8-14*

### 8.8.3 Lubricate the Front Drive Axle (4-wheel Drive)

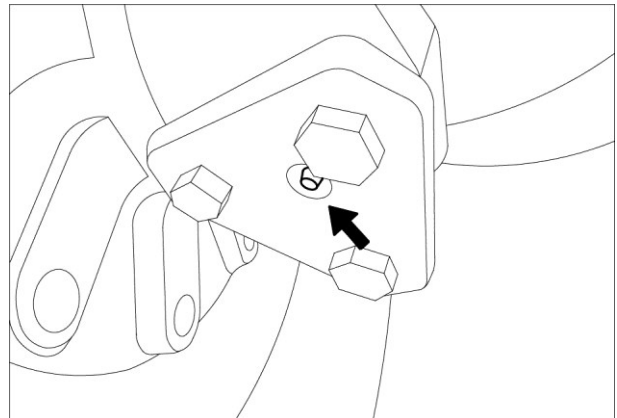
#### Lubricate the steering knuckle

Fill lubricating grease through the 2 oil cups on each steering knuckle with grease guns.



*Fig.8-15*

The oil cup is located on the kingpin of the steering knuckle.



*Fig.8-16*

**Lubricate the front support with pivot on the front drive axle**

Fill lubricating grease with grease gun through the oil cup.

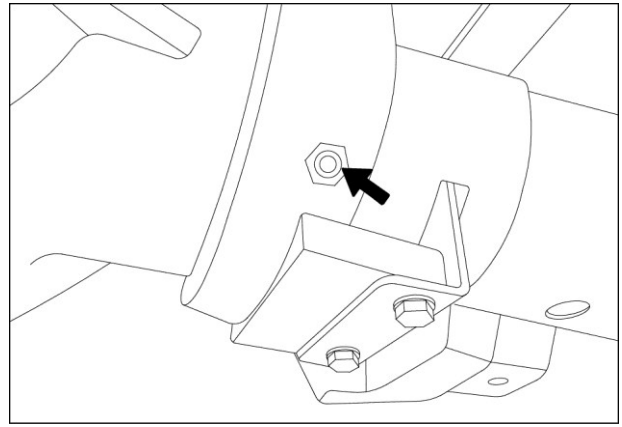


Fig.8-17

**Lubricate the front support with pivot on the front drive axle**

Fill lubricating grease with grease gun through the oil cup.

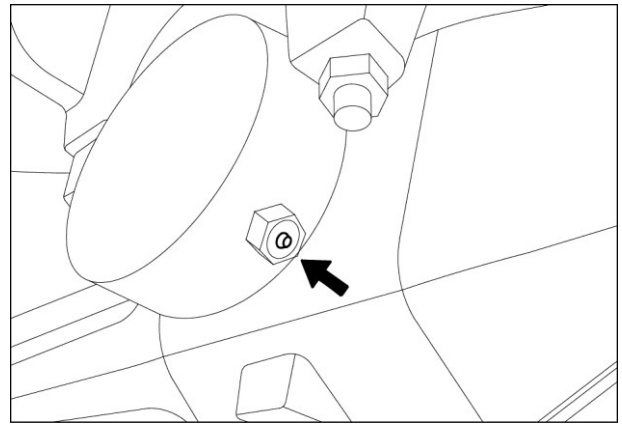





Fig.8-18

**8.8.4 Check Clutch and Brake Oil Tank Level**

**Check clutch oil tank level**

	<p><b>Warning:</b></p> <p>If high-pressure fuel or oil is splashed to your skin or eye, it may cause serious injury and blindness, even death. High pressure fluid leakage may be cannot find by visual. Use a paper board or wood to detect the place where fluid leaks. Do not operate it by hand absolutely! Wear safety goggles to protect your eyes. If any fluid is splashed to your skin, you should seek for help from an experienced doctor immediately.</p>
---	---

	<p><b>Warning:</b></p> <p>It is prohibited to inject oil that is different from existing lubricating oil (grade or viscosity).</p>
---	--

	<p><b>Notice:</b></p> <p>Park the tractor on horizontal plane when replace lubricating oil or check oil level.</p>
---	--



**Warning:**

Energy accumulator contains gas or lubricating oil under high pressure. For all maintenance, please first consult to the instructions given in the manufacturer's manual.

There is no need to adjust the pedal of the clutch for the hydraulic clutch control system.

To check the oil level in the clutch oil tank, please lift up the engine hood.

**Check oil level:**

1. Park the tractor on horizontal ground.

2. Screw off the oil plug ①, and check whether the oil level reaches nick ② of the maximum oil level; if not, please fill with the lubricating oil indicated in the table "Lubricating oil and reference dose"

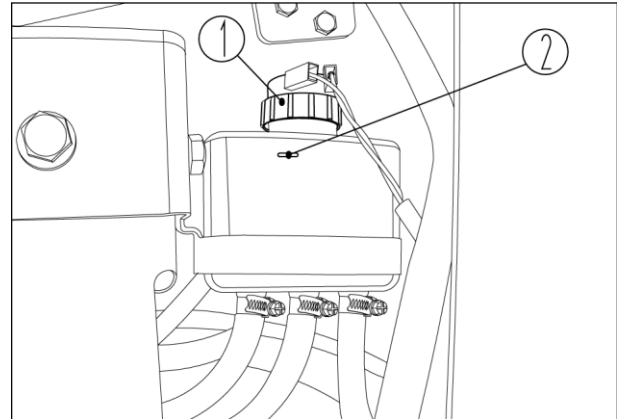


Fig.8-19



Monitor level of the oil in the oil tank through warning light on the instrument.

Where the warning light goes on, liquid shall be injected to make its level reach the maximum level nick.

Where the clutch fails, please contact the Service Center.

**Check the oil level of brake oil tank**

The brake fluid tank and the clutch oil tank are the same one.

Follow the steps given in the reference document "Check oil level in the clutch oil tank".

**8.8.5 Check the Storage Battery**




**Notice:**


Binding post of the storage battery and relevant composition of storage battery contain lead or lead compound. Some countries think that these compositions may be carcinogenic and cause birth defect and affect reproductive system, therefore, hands will be washed after contacting the storage battery.




**Notice:**

Safety glasses will be worn when charging the storage battery.

	<p><b>Notice:</b> It will be charged by using 12V charger.</p>
---	--

	<p><b>Danger:</b> Gas released from the storage battery is easily exploded; therefore, the storage battery must be kept away from electric spark or open fire. Battery storage or charged environment requires great ventilation. Prevent acid electrolyte from contacting skin or clothes.</p>
---	---

	<p><b>Warning:</b> Please disconnect the battery first before conducting any work in relation to the electrical system. Disconnect the battery and all the electronic control units while conducting any welding operations for the tractor or all devices connected to the tractor.</p>
---	--

### Check storage battery state

Special maintenance is not required for Maintenance-free storage battery.

Observe observation port of the specific gravity of hydrometer ( in the figure ①), if it shows:

- Green: electric quantity of battery is adequate;
- Black: it need be charged;
- White: storage battery need be replaced.

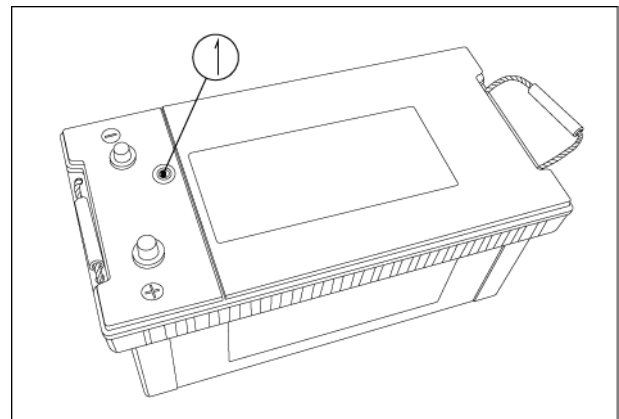



Fig.8-20

### Maintenance of storage battery

- The storage battery shall be stored in clean, dry and ventilated warehouse under the temperature of between 0 and 40°C.
- It will be handled with care to prevent collision. Keep upright!
- The terminal of the storage battery and connector of the power supply shall be connected solidly to prevent fusion and corrosion when starting. Amphenol connector shall be coated with Vaseline.
- Protect cleanliness of external terminal of storage battery
- Check whether output voltage of the generator meets the standard regularly.

	<p><b>Notice:</b> When the battery is being charged, indoor air will be smooth and far away from open fire. Electrolyte cannot be splashed to human body or clothes to avoid accidental injury and danger.</p>
---	--



**Notice:**

The temperature of electrolyte cannot be higher than 45°C in the charging process. If the temperature reaches 45°C, the charging current shall be halved to stopped to reduce the purpose to avoid occurrence of accidental danger, but charging time will be correspondingly prolonged.



**Notice:**

When charging is completed, the power supply shall be cut off at first before disconnecting the power supply from pole column to prevent spark from causing fire disaster or explosion.



**Notice:**

When storing the battery, the battery must be additionally charged for once in every month.

### 8.8.6 Lubricate Rear Three-point Linkage



**Important:**

Operate carefully when adjusting the length of the upper tie rod of the three-point hook to prevent them from being separated and to allow the threaded end of the sleeve nut sufficient length to be screwed into the sleeve nut housing so as to bear the traction applied during operation.

#### Non-enforced type

As provided in the maintenance schedule, it is necessary to lubricate the two lifting rods and the two horizontal limit rods

Use grease gun to fill the grease through the oil cup

- ① Upper link lubricating point
- ② Lifting rods lubricating point
- ③ Limit rods lubricating point

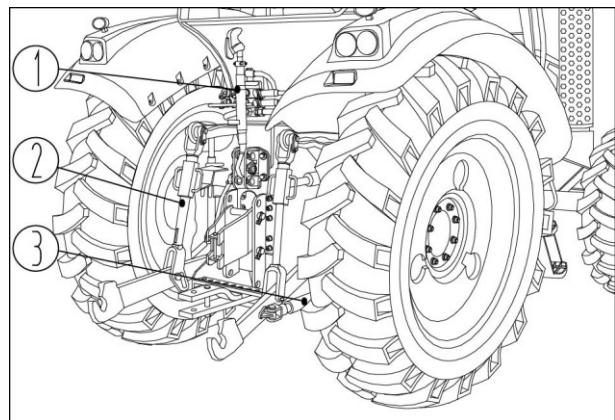


Fig.8-21

#### Enforced type

Use grease gun to fill the grease through the oil cup

- ① Upper link lubricating point
- ② Lifter lubricating point
- ③ Lifting rods lubricating point
- ④ Limit rods lubricating point

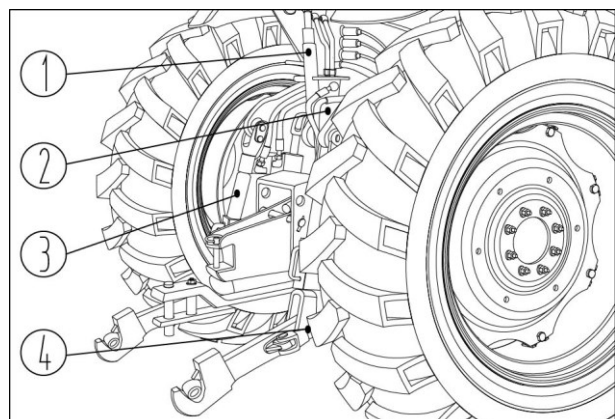


Fig.8-22





**Warning:**

Where replacement of wheels and certain maintenance and repair work are to be conducted, the tractor must be lifted up to get off the ground, and placed on a specific security frame.

### 8.8.7 Check the Wheel and Tire



**Warning:**

Where replacement of wheels and certain maintenance and repair work are to be conducted, the tractor must be lifted up to get off the ground, and placed on a specific security frame.

Regularly check tire status. Replace the tire if necessary. Tires shall be inflated according to the service conditions so as to make its pressure reach the level specified by the manufacturer. Be sure to follow the recommended tightening torque while installing the wheels.

### 8.8.8 Inspect and Tighten the Bolt/Nut of Critical Positions to the Specified Torque:



**Warning:**

Please inspect and fix all fasteners to ensure that the tractor is in good working status.



**Important:**

Torque wrench must be used to tighten major bolts and nuts of the tractor.

Inspect and tighten the following bolt/nut of key parts to the specified torque for every 50 operating hours:

➤ **Front wheel**

- ① Connection bolt/nut between the hub and the wheel disc
- ② Connection nut between the wheel disc and wheel rim

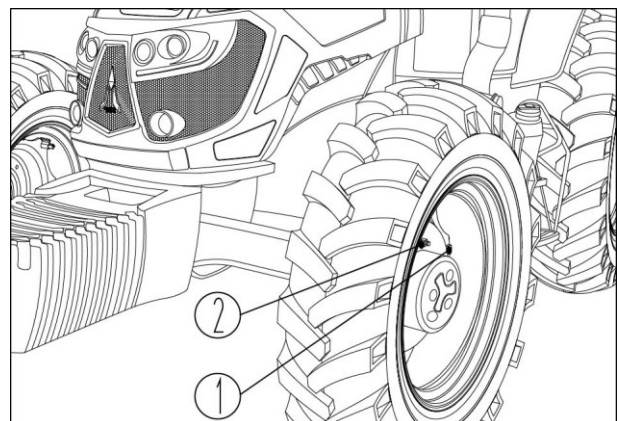


Fig.8-23

➤ **Rear wheel**

- ① Connection nut between the wheel disc and wheel rim
- ② Connection bolt/nut between the hub and the wheel disc
- ③ Connection bolt of the rear ballast

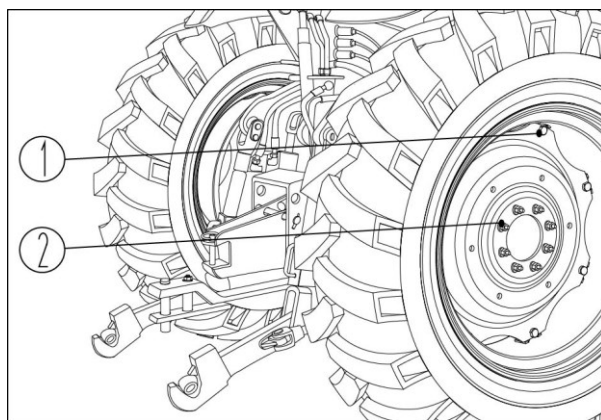


Fig.8-24

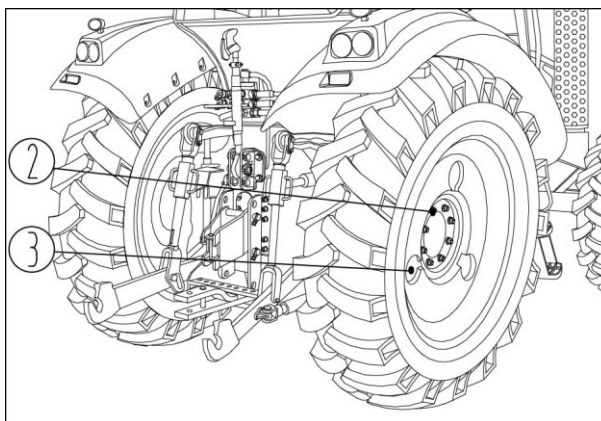


Fig.8-25

➤ **Front ballast**

- ① Connection bolt of the ballast bracket
- ② Connection bolt/nut of the ballast

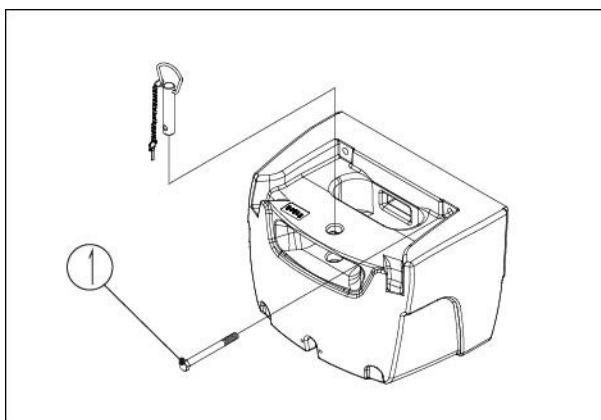


Fig.8-26

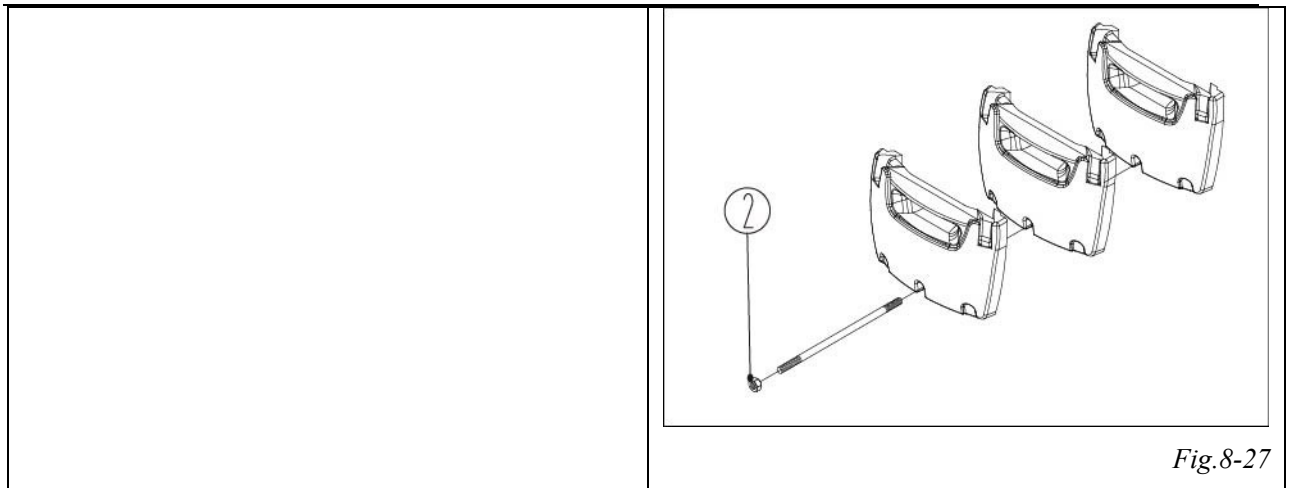


Fig.8-27

➤ **Three-point linkage components**

- ① Upper link base installation bolt
- ② Limit chain board installation bolt
- ③ Lower link base fixing nut

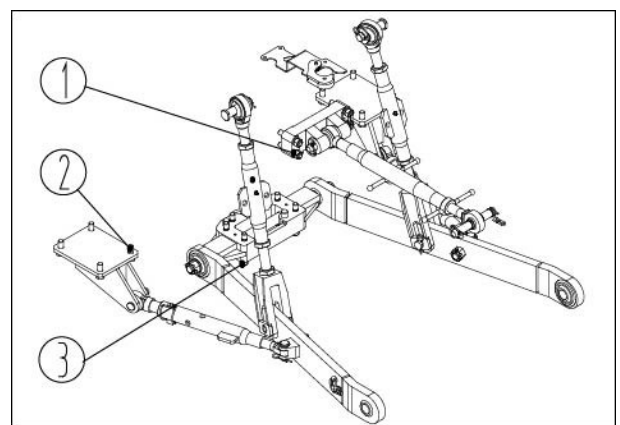



Fig.8-28

➤ **Tightening torque of bolt/nut for each component**

Assembling parts		Thread specification	Tightening torque (N.M)
Front and rear wheels	Wheel rim and wheel disc	M16X1.5-10.9	270~320
	Wheel disc and wheel hub	M20X1.5-10.9	540~596
Rear ballast		M22X1.5-10.9	680~860
		M16X1.5-10.9	265~311
Front ballast		M16X1.5-10.9	265~311
Three-point linkage		M20	389~456
		M18	243~285
		M16	182~222
		M12	73~89
		M10	41~51

## 8.9 100-hour Maintenance – First Time Maintenance

### 8.9.1 Check Braking Distance


	<p><b>Warning:</b> Regularly check oil level of brake fluid.</p>
---	--


The user shall operate the brake to test the braking effects.


Where faults exist with the brake, contact the Service Center for repair.

### 8.9.2 Check Tension of the Engine Drive Belt.

To adjust the tension of the drive belt, please conduct the following operations:

	<p><b>Warning:</b> Before conducting any maintenance or repair work, the engine shall be shut off and the ignition key shall be pulled out.</p>
---	---

	<p><b>Warning:</b> Check the whole drive belt. Replace a new one immediately if damaged.</p>
---	--

	<p><b>Warning:</b> Where belt of the ventilation component is damaged, the engine shall not be started for any reasons as this will cause the cooling system of the engine to stop working.</p>
---	---

#### Engine Belt

##### Front view of the engine (with air conditioner)

1. Fan belt pulley;
2. Pulley of AC generator;
3. Water pump pulley
4. Tensioning pulley
5. Crankshaft pulley;

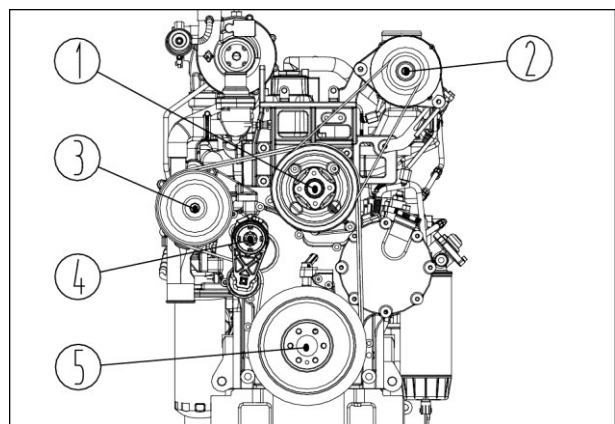


Fig.8-29

To check the tension, first open the engine hood.



**Warning:**

Such operations must be conducted after the engine being shut off and cooled down!

**Adjustment of engine belt tension**

● Fan drive belt

Release screw ①, ② and ④ on the AC generator.

Move the compressor through use of the control handle ③.

When pressing the center of the longest drive belt circle with the thumb, if the drive belt is deflected by 20mm, then the tension is correct. Then re-tighten the screw ①, ② and ④. If not, repeat the adjustment steps until the deflection falling within the specified range.

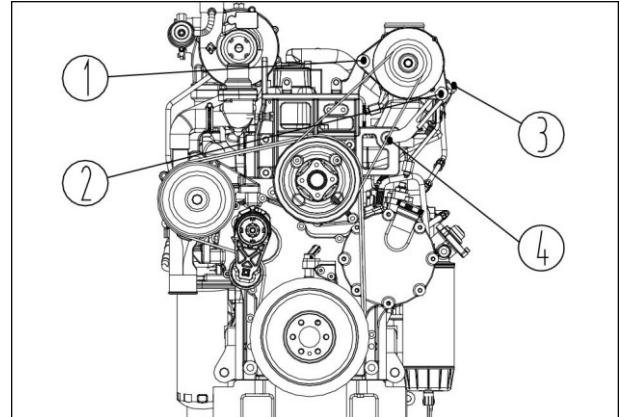


Fig.8-30

● Air compressor drive belt

The tensioning pulley ① has automatic adjustment function of the belt tensioning of air conditioning compressor without need manual adjustment.

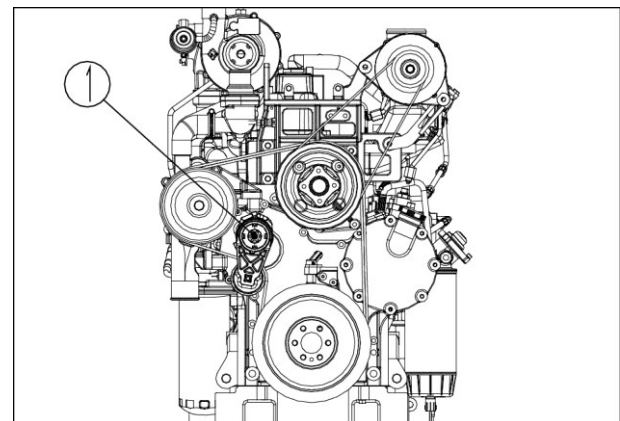


Fig.8-31

**8.9.3 Replace Engine Lubricating Oil**



**Warning:**

Collect used lubricating oil and store in suitable vessel, and then send to the authorized collection center.



**Warning:**

Energy accumulator contains gas or lubricating oil under high pressure. For all maintenance, please first consult to the instructions given in the manufacturer's manual.

**Steps for replacement of lubricating oil for the engine**

1. Park the tractor on flat ground for cooling the engine
2. Place suitable vessel below the fuel drain plug of lubricating oil tank.

3. Unscrew the oil drain plug in the lubricating oil tank under the oil dip rod.

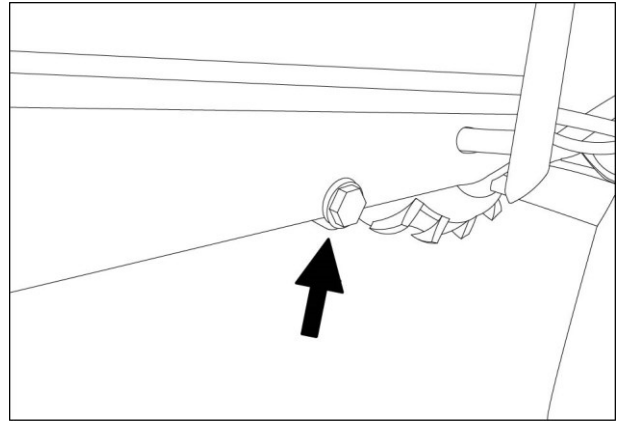


Fig.8-32



**Danger warning:**

Take care when draining the used lubricating oil as hot oil may lead to severe burn.

4. After draining off all the lubricating oil from the lubricating oil tank, check sealing parts of the oil drain plug, and if necessary, replace with a new drain plug before re-installing and tightening the oil drain plug.

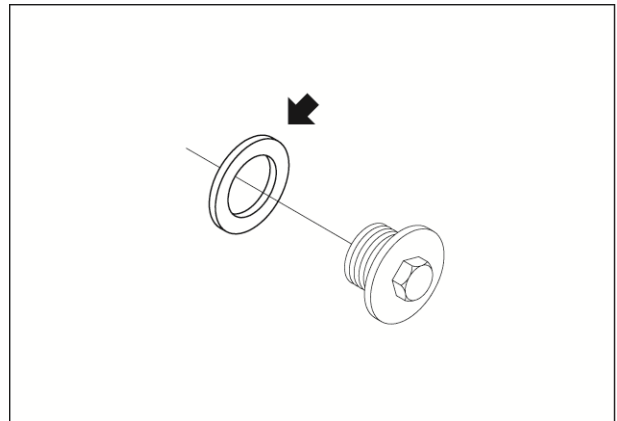


Fig.8-33

5. Inject specific amount oil into engine from the oil filler. (The appropriate oil amount is between maximum value and the minimum value of the oil dipstick).

Re-start the engine and check sealing property of the oil drain plug after idle running for several minutes.

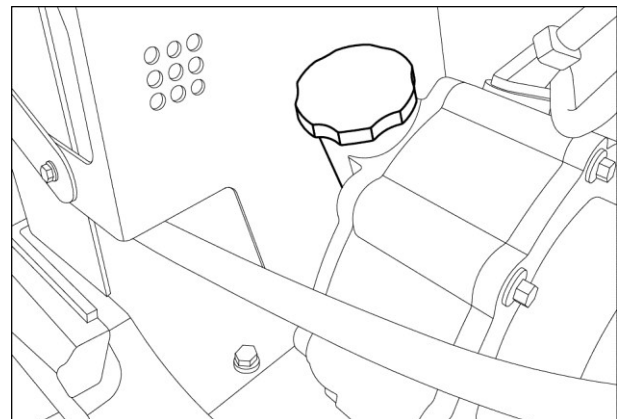


Fig.8-34

6. Shut off the engine, re-check oil level after it is cooled, if necessary, and fill oil to the middle scale of oil dipstick.

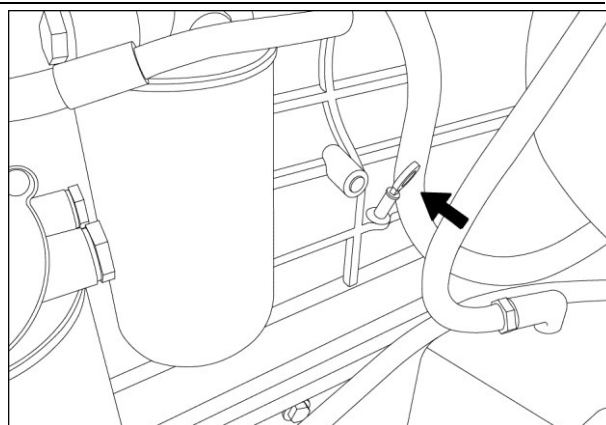


Fig.8-35



**Warning:**

It is prohibited to inject oil that is different from existing lubricating oil (grade or viscosity).

#### 8.9.4 Replace the Filter Element of the Engine Lubricating Oil Filter



**Warning:**

Energy accumulator contains gas or lubricating oil under high pressure. For all maintenance, please first consult to the instructions given in the manufacturer's manual.



**Warning:**

Collect used lubricating oil and store in suitable vessel, and then send to the authorized collection center.



**Danger:**

Take care when draining the used lubricating oil as hot oil may lead to severe burn.

#### Steps for replacement of the filter element of the engine lubricating oil filter

1. Park the tractor on horizontal ground.
2. Place suitable vessel under the filter.

3. Screw off the filter element (position ① in the figure).

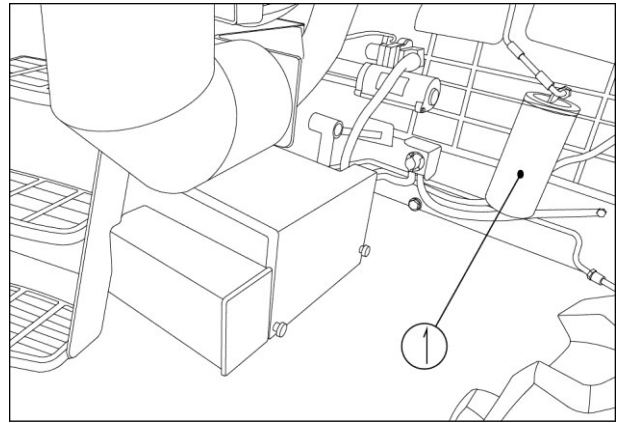


Fig.8-36



**Warning:**

Abide by laws and regulations on environmental protection. All liquid (oil, fuel oil and coolant), filter and battery must be discarded in accordance with applicable laws and regulations.

4. Apply lubricating oil the same as that used for the engine onto the new filter element washer, as shown in the figure.

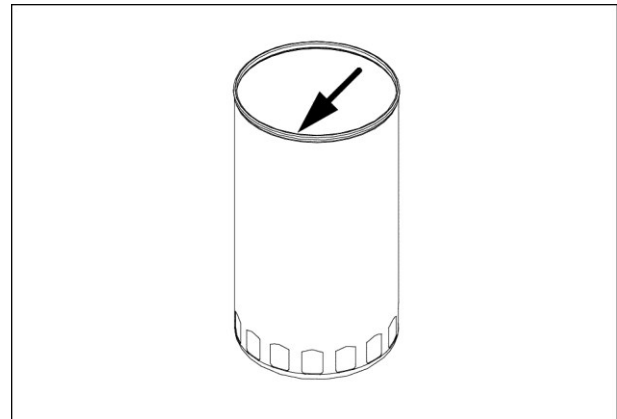


Fig.8-37

5. Screw on the new filter element with hand.

6. Re-start the engine and check sealing property of the washer after idle running for several minutes.

7. Shut off the engine, re-check oil level after it is cooled, if necessary, and fill oil to the middle scale of oil dispstick.

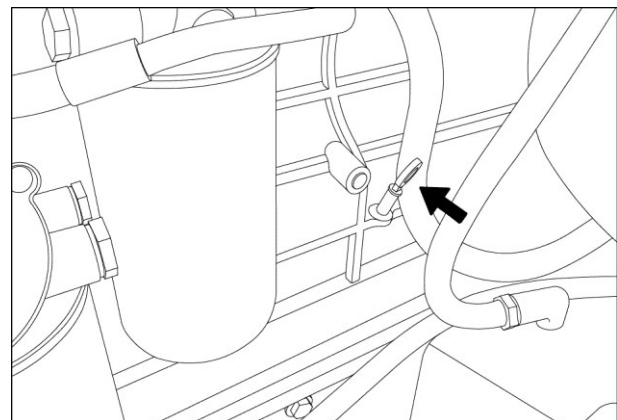


Fig.8-38





**Warning:**

It is prohibited to inject oil that is different from existing lubricating oil (grade or viscosity).

### 8.9.5 Check Cleanliness of the Radiator

#### Cooling system radiator and intercooler of the engine

The radiator is located at the front end of the tractor

1. Intercooler;

Cooling system (engine radiator and transmission lubricating oil cooler)

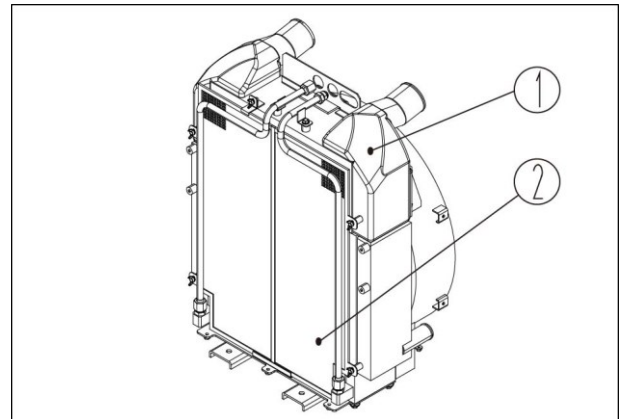


Fig. 8-39

Compressed air injector may be used to clean the cooler, or, if necessary, the steam injector (maximum pressure: 6bars) or the water injector may be used. If you want to clean the engine at the same time, the air filter, AC generator and starting motor need to be protected. Once all the removed parts are well installed again, let the engine run for several minutes to warm it up and dry all the wet parts.

#### Clean with detergent

When cleaning with detergent, be sure to choose commercial products that can dissolve the lubricating oil. Spray gun or brush may be used to spray the detergent/water solution.

After spraying the solution, wait for a few minutes before washing it with clean water.

#### Sweep with compressed air

Such cleaning method is applicable only to dust removal. Clean the grille of the engine compartment at any time or protect the cab filter with air injector in direction reverse to normal air flow.



**Important:**

Lack of cleaning may cause the lubricating parts to be overheated.



**Important:**

You must observe the applicable environmental protection regulations every time cleaning the tractor.

### 8.9.6 Replace the Fuel Filter



**Warning:**

Abide by laws and regulations on environmental protection. All liquid (oil, fuel oil and coolant), filter and battery must be discarded in accordance with applicable laws and regulations.



**Warning:**

If high-pressure fuel or oil is splashed to your skin or eye, it may cause serious injury and blindness, even death. High pressure fluid leakage may be cannot find by visual. Use a paper board or wood to detect the place where fluid leaks. Do not operate it by hand absolutely! Wear safety goggles to protect your eyes. If any fluid is splashed to your skin, you should seek for help from an experienced doctor immediately.



**Warning:**

Never fill fuel into the fuel tank in a closed environment or environment with open fire. Do not smoke when refueling, and the engine shall be shut off in advance.



**Danger warning:**

Be careful when working around the warehouses used to store the fuel or combustible materials, and avoid generation of dangerous sparks.



**Warning:**

Before running out of the fuel, never continue operating the engine. If the engine stops due to running out of the fuel, it is necessary to drain the internal air off through the fuel injection system.

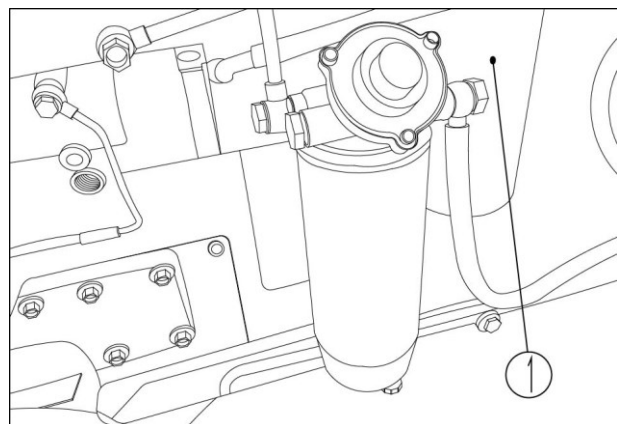


**Warning:**

Observe the safety regulations, and store the fuel in the oil tank.

**Replace the fuel filter**

Fuel filter①



*Fig.8-40*

**Procedures for replacement of fuel filter**

1. Park the tractor on horizontal ground.

2. Place a suitable container under the fuel filter①.

3. Unscrew the screw, and remove the filter element from the filter housing; install new filter element, and retighten the screws.



**Important:**

Before reinstallation of the fuel filter, be sure to refuel it.

### 8.9.7 Replace the Fuel Pre-filter



**Warning:**

Abide by laws and regulations on environmental protection. All liquid (oil, fuel oil and coolant), filter and battery must be discarded in accordance with applicable laws and regulations.



**Warning:**

If high-pressure fuel or oil is splashed to your skin or eye, it may cause serious injury and blindness, even death. High pressure fluid leakage may be cannot find by visual. Use a paper board or wood to detect the place where fluid leaks. Do not operate it by hand absolutely! Wear safety goggles to protect your eyes. If any fluid is splashed to your skin, you should seek for help from an experienced doctor immediately.



**Warning:**

Never fill fuel into the fuel tank in a closed environment or environment with open fire. Do not smoke when refueling, and the engine shall be shut off in advance.



**Danger warning:**

Be careful when working around the warehouses used to store the fuel or combustible materials, and avoid generation of dangerous sparks.



**Warning:**

Before the fuel tank being fully emptied, never continue operating the engine. If the engine stops due to running out of the fuel, it is necessary to drain the internal air off through the fuel injection system.



**Warning:**

Observe the safety regulations, and store the fuel in the oil tank.



**Warning:**

When the fuel is injected, shut off the engine and clean off the fuel dropped or splashed onto the tractor at any time.



**Important:**

Before installing the fuel pre-filter, ensure that the tractor is refueled.

**Fuel pre-filter used in cold climatic conditions**

In environment with extremely low temperature (for example, low to  $-30^{\circ}\text{C}$ ), correct winter fuel must be used. Use additives according to the manufacturer's instructions.

**See "Start the engine"**

Under the conditions of relatively low ambient temperature (cold climate), clean and replace the fuel pre-filter.

**Clean or replace fuel pre-filter**

Replace the fuel pre-filter according to the following steps:

1. Place an container under the pre-filter;
2. Open the fuel drain plug ②;
3. Drain the fuel;
4. Rotate and remove the pre-filter①;

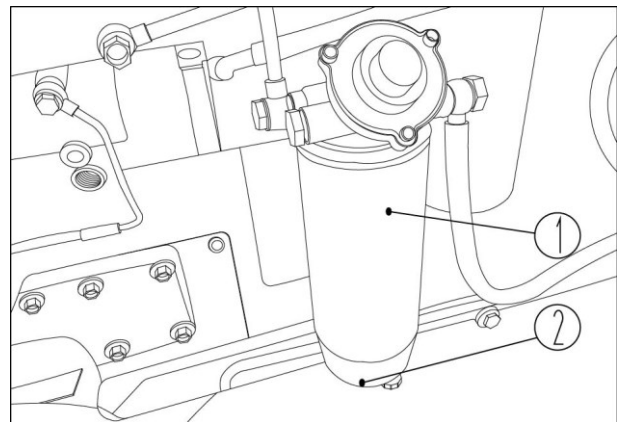


Fig.8-41

5. Screw off the drain water collection cup, and screw it into the new pre-filter;
6. Clean the sealing surface ③, and fill the pre-filter with clean fuel;

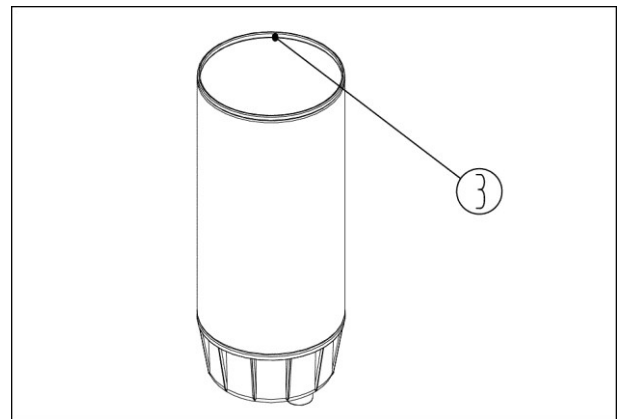


Fig.8-42

7. Place the new pre-filter into position, and rotate and tighten it;
8. Press the top pf fuel, and bleed air in the fuel system.

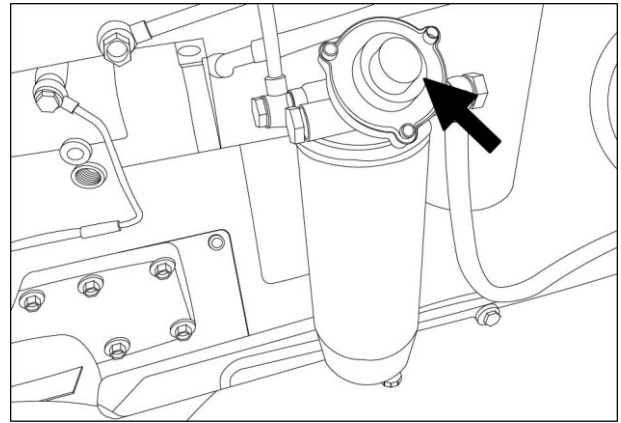


Fig.8-43

### Fuel prefilters in temperate climates

In normal ambient temperature, only clean fuel prefilters are required.

#### Drain water from fuel pre-filter

Drain the water through the fuel pre-filter, steps are as follows:

1. Place an container under the pre-filter;
2. Release the oil drain plug ① under the filter, and drain the liquid (fuel and water);
3. After clean fuel flowing out, retighten the oil drain plug ①.

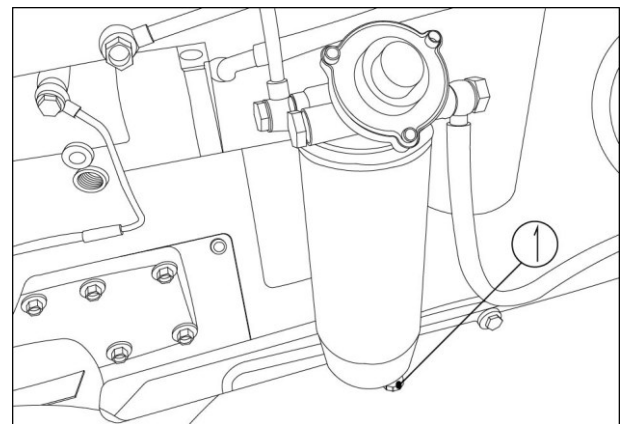



Fig.8-44

### 8.9.8 Check the control handle of the parking brake

	<p><b>Warning:</b> When activating the parking brake, the control handle must always be pulled upward.</p>
---	--

Check and confirm travel of the brake lever to be 150mm around;

If not, please contact the authorized Service Center, and adjust the front wheel connecting lever.

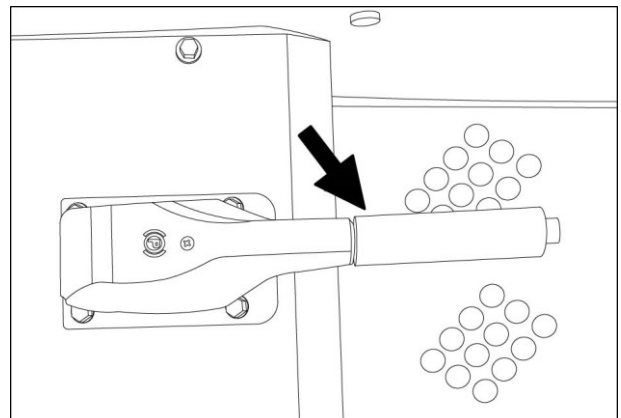


Fig.8-45

**Important:**

If you need to park the tractor on a slope – more than 15° (gradient is 33%), wheel chocks shall be placed under the rear wheels so as to fix the tractor. It is not recommended to park the tractor on a steep slope.



Check the warning light while the brake is operating.

### 8.9.9 Clean the Ventilation System Filter of the Driver's Cab.

**Warning:**

The ventilation system filter must always be “paper” type, and can be replaced with “activated carbon” filter only after being sprayed with pesticide.

**Danger:**

After operation for 200 hours or 36 months, the activated carbon filter shall be replaced. If odor of the toxic substances used can be significantly smelt, the filter shall be replaced immediately, and tightness shall be checked.

**Warning:**

Abide by laws and regulations on environmental protection. All liquid (oil, fuel oil and coolant), filter and battery must be discarded in accordance with applicable laws and regulations.

1. The fixed handle of the air filter ①.
2. The filter cover grille ②.

Approach the filter:

- Loosen and remove the 6 screws ① which used to fix air filter.
- Remove the filter cover grille ②.
- Take out cabin air filter.

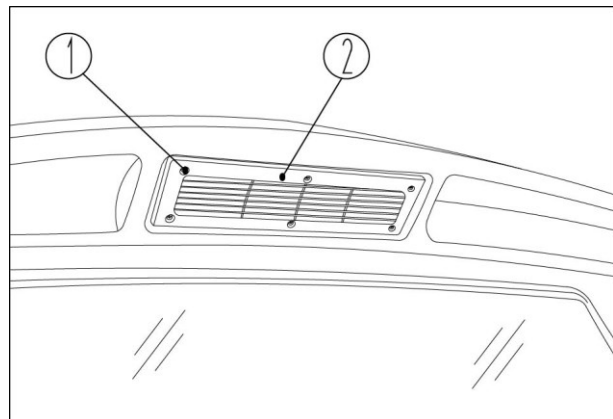


Fig.8-46

**Clean the filter according to the following steps:**

1. Blow the compressed air (maximum pressure, 0.6MPa) through the filter; air blow direction shall be reverse to the normal air flow direction aiming to remove all the dust thoroughly.
2. When reinstalling the filter, be sure that it can reach the upper and lower edges of the filter housing.



**Important:**

The filter must be replaced with a new one if it is damaged; it must be replaced in all circumstances after passing through 6 cleaning cycles.

**Clean the activated carbon air filter.**

Its removal and reinstallation operations are the same as the normal filter.

It is important to note that these filters probably are never able to provide comprehensive protection against the toxic substances.

After each use, these filters shall be removed, and replaced with common filters.

When replacing the activated carbon filter, chemical protective gloves shall be worn.

Where necessary, the used filter shall be brought to the professional waste treatment center for disposal.

Instructions established by the manufacturer in relation to handling and disposal of the wasted filters shall be followed in all circumstances.

### 8.9.10 Check Oil Pipe - Hydraulic Steering



**Warning:**

If high-pressure fuel or oil is splashed to your skin or eye, it may cause serious injury and blindness, even death. High pressure fluid leakage may be cannot find by visual. Use a paper board or wood to detect the place where fluid leaks. Do not operate it by hand absolutely! Wear safety goggles to protect your eyes. If any fluid is splashed to your skin, you should seek for help from an experienced doctor immediately.



**Warning:**

It is prohibited to inject oil that is different from existing lubricating oil (grade or viscosity).

Check the pipelines for cracks and ruptures; check the pipe fittings and surroundings of the hydraulic valves for leakage.

## 8.10 Every 300 Hours Maintenance

### 8.10.1 Check the Oil Level of the Front Drive Axle (4-wheel Drive)

#### Check lubricating oil level of the differential mechanism (4-wheel drive)



**Warning:**

It is prohibited to inject oil that is different from existing lubricating oil (grade or viscosity).



**Warning:**

Collect used lubricating oil and store in suitable vessel, and then send to the authorized collection center.



**Notice:**

Park the tractor on horizontal plane when replace lubricating oil or check oil level.



**Warning:**

If high-pressure fuel or oil is splashed to your skin or eye, it may cause serious injury and blindness, even death. High pressure fluid leakage may be cannot find by visual. Use a paper board or wood to detect the place where fluid leaks. Do not operate it by hand absolutely! Wear safety goggles to protect your eyes. If any fluid is splashed to your skin, you should seek for help from an experienced doctor immediately.

Remove the oil filler/level plug, and check the oil level. Oil level shall be flush with the bottom edge of the oil filler. Where necessary, full fill lubricating oil through the oil filler/level inspection hole.

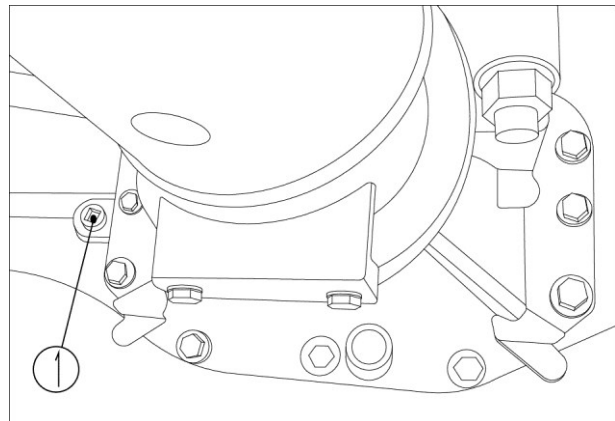


Fig.8-47

**Check the oil level of the side main reducer and the planetary reduction gear (4-wheel drive)**

Screw off the plug (1); check and confirm that the lubricating oil reaches the bottom edge (2) of the oil filler. This hole may serve as the oil filler for oil injecting and change as well.

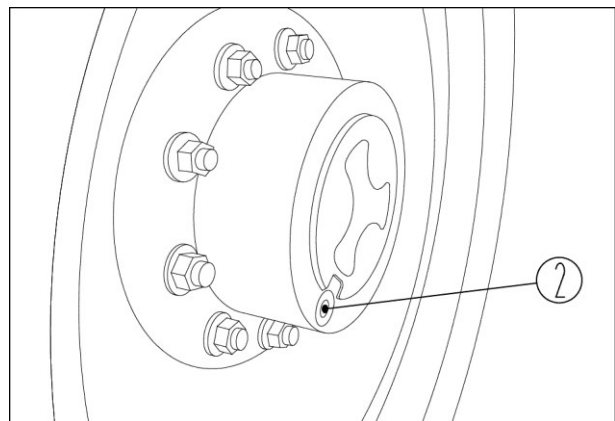


Fig.8-48

## 8.11 Every 600 Hours Maintenance


### 8.11.1 Replace the Transmission Oil Filter





**Danger:**

Take care when draining the used oil as hot oil may lead to severe burn.



	<p><b>Warning:</b></p> <p>Collect used lubricating oil and store in suitable vessel, and then send to the authorized collection center.</p>
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	<p><b>Warning:</b></p> <p>Energy accumulator contains gas or lubricating oil under high pressure. For all maintenance, please first consult to the instructions given in the manufacturer's manual.</p>
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	<p><b>Warning:</b></p> <p>If high-pressure fuel or oil is splashed to your skin or eye, it may cause serious injury and blindness, even death. High pressure fluid leakage may be cannot find by visual. Use a paper board or wood to detect the place where fluid leaks. Do not operate it by hand absolutely! Wear safety goggles to protect your eyes. If any fluid is splashed to your skin, you should seek for help from an experienced doctor immediately.</p>
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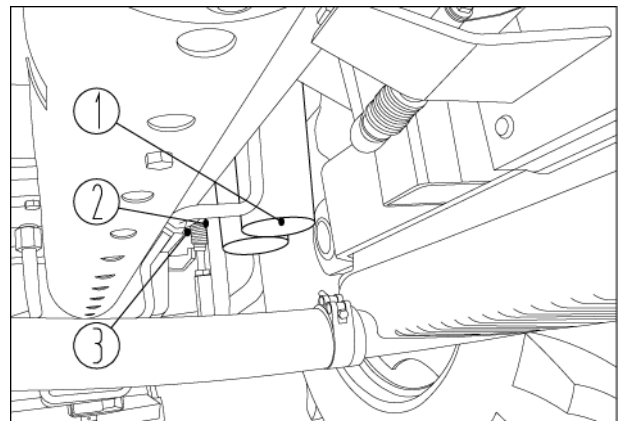
**The transmission is equipped with the following filters:**

- Two filters with interchangeable filter elements and filter capacity of 25 microns, on the right side of the tractor and on the oil suction pipes of hydraulic valve and the rear lifter.
- One filter with interchangeable filter element and filter capacity of 15 microns, on the right side of the tractor and on the oil supply lines of hydraulic pump, used for hydraulic steering system.
- One wire mesh filter, inside the transmission and on the oil suction pipes of pump used to supply the rear lifter.

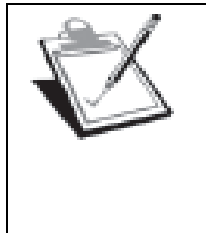
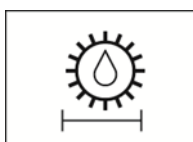
1. Filter, installed on the oil supply lines of the hydraulic valve and the rear lifter.

2. Filter, installed on the oil supply lines of the oil feed pump used to supply the hydraulic steering system.

3. Wire mesh filter, installed inside the transmission on the rear PTO hydraulic circuit.



*Fig.8-49*



**Important:**

Where the warning light keeps on when the lubricating oil is extremely hot and the engine operates at normal speed, it indicates that the lubricating oil filter of the transmission is blocked. However, it is normal that the warning light keeps on within several minutes after the engine being started.

**Replace the lubricating oil filter with an interchangeable lubricating oil filter.**

1. Park the tractor on horizontal ground.
  - Place a vessel under the filter.
  - Unscrew the filter element.
  - Apply lubricating oil the same as that used for the transmission onto the new filter element washer, as shown in the figure below.

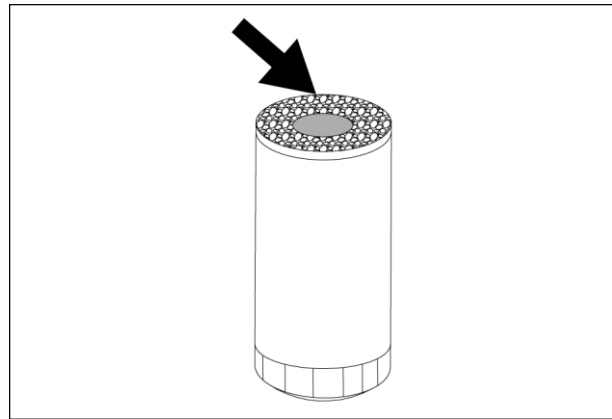


Fig.8-50

2. Screw on the new filter element with hand and tighten it thoroughly.
3. After start of the engine, check surroundings of the filter element sealing parts for leakage.
4. Check the level of the transmission oil.

**Refer to section 8.8.1“Check transmission oil level”**



**Important:**

Such operation must and can only be accomplished by the authorized professionals.

To remove the filter, please unscrew the plug under the transmission and take back the gauze filter (internal device, preventing the lubricating oil from flowing out of the transmission).

Wash the gauzes in the fuel and sweep them with compressed air injector.

Re-install filter.

### 8.11.2 Check the Differential Mechanism Lock System.

Such inspection shall be accomplished by the operator. Test the control device and check whether the differential mechanism lock can mesh and separate properly.


## 8.12 Every 1200 Hours or at Least Once a Year Maintenance

### 8.12.1 Maintenance of Fuel Injection Pump



**Warning:**


When injecting oil or repairing the fuel injection system, it is prohibited to smoke or use open fires in the surroundings.


	<p><b>Warning:</b></p> <p>If fuel or oil contacts skin or eyes under pressure, it will cause serious injury, blindness and even death. High pressure liquid leakage may be invisible. One hard cardboard or wood will be used to seek for leakage. Don't use your hands! Protective glasses will be used to protect your eyes. If any fluid is permeated to your skin, you should seek for help from an experienced doctor immediately.</p>
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Such maintenance operations must be conducted by the authorized Service Center.


## 8.12.2 Clean the Air Filter of the Engine – Replace the Filter Element


Air is filtered through the two filters; the filters have pleated paper protected by the housings which are contained in the metal casings of the air filters.


	<p><b>Warning:</b></p> <p>Abide by laws and regulations on environmental protection. All liquid (oil, fuel and coolant), filter and battery must be discarded in accordance with applicable laws and regulations.</p>
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	<p><b>Important:</b></p> <p>Design of the security filter element can prevent the solid particles from entering the air intake manifolds, and must not be washed.</p> <p>However, the security filter element must be replaced after the main filter element being washed for 3 times.</p>
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	<p><b>Important:</b></p> <p>Check efficiency of the dust evacuator valve of the air filter regularly.</p>
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	<p><b>Important:</b></p> <p>Check whether the housing and filter element of the engine air filter are damaged regularly. It is strictly prohibited to clean or wash the elements.</p>
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	<p><b>Important:</b></p> <p>Check conditions of the air filter housing and filter element regularly.</p>
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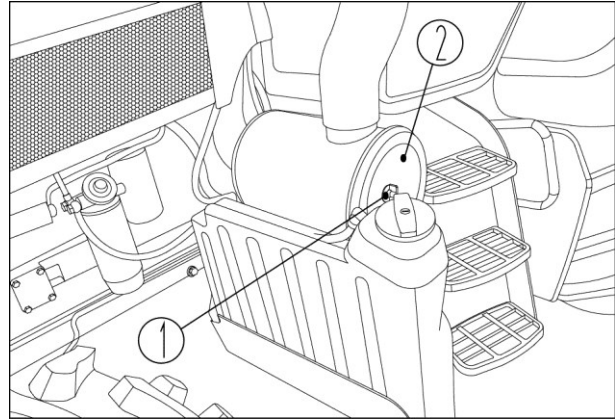
	<p><b>Important:</b></p> <p>It is strictly prohibited to use the tractors with no main filter element installed.</p>
---	--

**Important:**

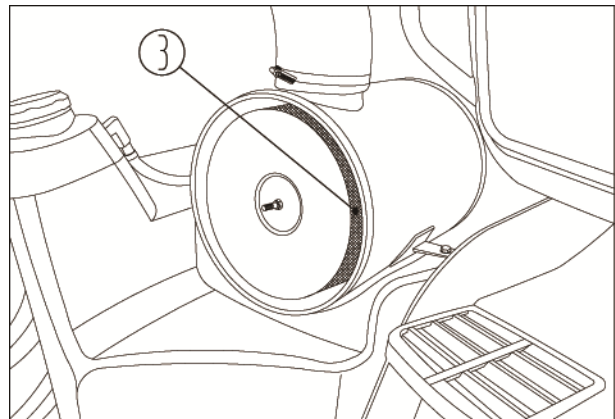
It is strictly prohibited to wash the elements with gasoline, oil, kerosene or solvent. It is strictly prohibited to blow the pipe shell with waste gas. It is strictly prohibited to fill fuel into a dry filter. It is strictly prohibited to use housing with damaged signs.

**Procedures for removal of air filter:**

1. Screw off the wing nut ①;
2. Remove the filter cover ②;

*Fig.8-51*

3. Take out the main filter element ③.

*Fig.8-52***Wash the dry-type air filter**

Where the air filter is blocked, the warning light goes on; the filter element shall be washed in case that the engine fails to work or the power is reduced and even damaged.

**Important:**

Ensure that the warning light works normally. To check its operation, the engine shall be started, and the air intake pipe of the air filter shall be temporarily blocked (do not operate with two hands). The filter element must operate in good conditions; it shall be cleaned or washed if problems exist with its operating conditions.

**Clean the air filter of the engine with compressed air**

When the filter is blocked by dust, such cleaning method may be used to inject compressed air from interior to exterior of the element (maximum pressure 6.8 bars), injecting along the folds of the paper until cleaning all the dust.

**Reinstall the element**

Wipe the air filter housing with a dry rag, and check the element for deformation. Place a lamp inside the paper element, and check whether ruptures or holes exist with the paper fabrics. Where no appropriate exhaustible source exists, the filter element shall be simply checked by observing the external surface of the pleated paper.

The internal security filter element shall not be cleaned. Anyway, the primary filter element must be replaced when it has been cleaned three times.

Reinstall the filter element into the container in the reverse order of the above operations.

Reinstall the filter housing and lock it.

**Whirlwind filter**

In the whirlwind filter, the centrifugal action serves as the pre-filter to remove the heavier particles, and the other articles will be pushed outward due to inertia. Then the air passes through the main filter and the relatively small particles will be filtered out.

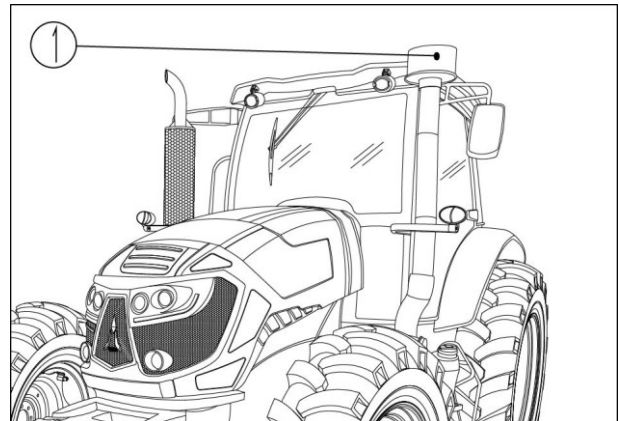


Fig.8-53

**8.12.3 Repair the Starting Motor**

Such maintenance operations must be conducted by the authorized Service Center.

	<p><b>Danger:</b></p> <p>It is strictly prohibited to start the engine through the motor terminals of the starter; otherwise, the tractor will be started suddenly and may cause serious injury to the operator.</p>
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**8.12.4 Drainage of Hydraulic Braking System**

	<p><b>Warning:</b></p> <p>Abide by laws and regulations on environmental protection. All liquid (oil, fuel and coolant), filter and battery must be discarded in accordance with applicable laws and regulations.</p>
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	<p><b>Warning:</b></p> <p>Energy accumulator contains high pressure gas or fuel oil. Please refer to instruction in the specification provided by the manufacturer before any repair.</p>
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	<p><b>Notice:</b></p> <p>Place the tractor on a horizontal surface when changing the lubricating oil or checking the oil level.</p>
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Where braking effects are not good, you may contact the authorized Service Center or check the air inside

the hydraulic circuit according to the following method:

Separate the two brake pedals through separating the connecting latches.

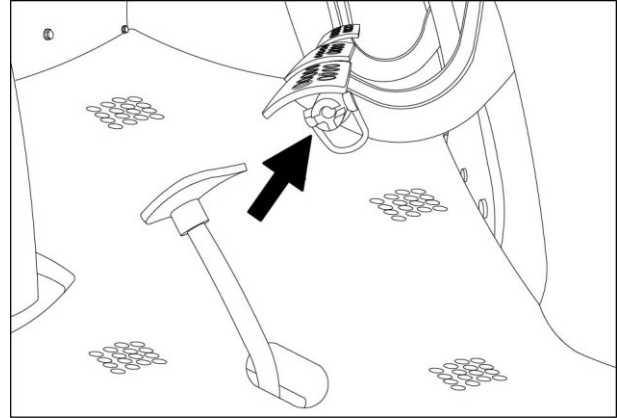


Fig.8-54

Operate the brake pedal on the right hand side for several consecutive times; then press down the pedal fully, slightly release and close the rear right hand braking vent screw again immediately. Repeat such operations until no air bubble flowing out of the vent screw from the clean oil.

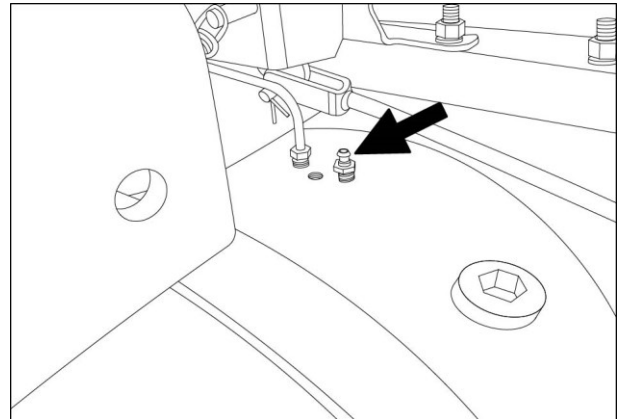


Fig.8-55



**Warning**

If fuel or oil contacts skin or eyes under pressure, it will cause serious injury, blindness and even death. High pressure liquid leakage may be invisible. One hard cardboard or wood will be used to seek for leakage. Don't use your hands! Protective glasses will be used to protect your eyes. If any fluid is permeated to your skin, you should seek for help from an experienced doctor immediately.

Perform the same procedures for the front left hand brake and the rear left hand brake, and release the relevant vent screws.

**8.12.5 Maintenance of Cab Heating System**

Use the heat from the coolant of the engine to generate hot air for the system.

Where changes occur to the coolant, the warm air system and the engine cooling system must be flushed.

During such operations, operator shall turn the heater switch to “OFF” completely.

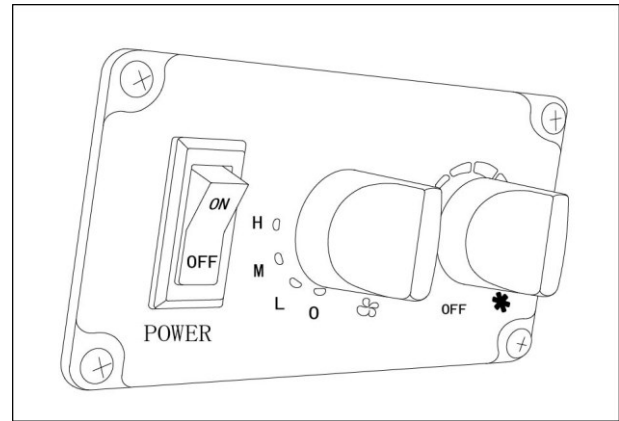


Fig.8-56

Check whether leakage exists with the oil supply and return pipes of the heater regularly.

Always ensure that neither the intake air pipes nor the air vents are blocked when the system is turned on. Air flow from the air vent shall be felt immediately after the system being turned on. If not, turn off the system immediately and find out the positions of problems.

Where the cab door is opened or especially in dusty conditions, do not use the warm air system.

	<p><b>Important:</b> Do not conduct any operations for the system when the engine is running.</p>
--	---

### 8.12.6 Maintenance of Cab Air Conditioning System

	<p><b>Warning:</b> Refrigerant of air conditioning system can cause solidification harmful.</p>
--	---

	<p><b>Danger:</b> Where significant leakage exists with the air conditioning system pipes, they shall be kept away from the open fires. This is because that the refrigerant gas is combustible, and will generate extremely toxic substances once burnt.</p>
--	---

	<p><b>Warning:</b> The air conditioning system must be repaired by the authorized Service Center.</p>
--	---

**The system includes:**

- One set of condenser; a fan is equipped on its top (middle section), an evaporator is equipped behind its cab, and a motor-driven compressor is equipped on the right hand side of the engine.

1. Air vent;
2. 4-speed fan;
3. Condenser;
4. Air filter;
5. Receiver drier;
6. Evaporator;
7. Compressor

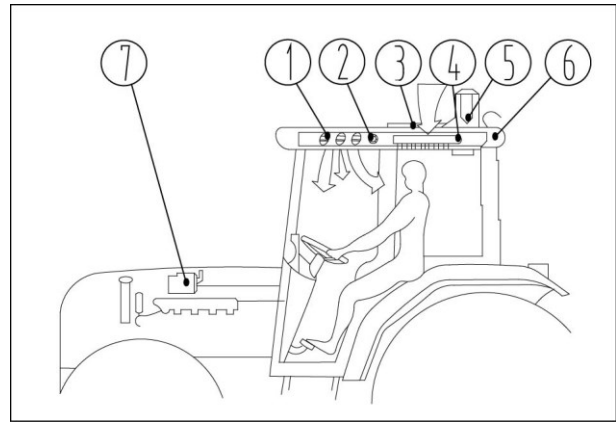


Fig.8-57

### Inspection of Air-Conditioning System

- It shall be checked by the professional workshop before start of the working days every year.

#### Both air and water inside the refrigerant circuit will affect the system efficiency:

- Unnecessary compression is conducted for the air and no refrigeration effect is generated.
- Water inside the circuit may get frozen in the cold area of the circuit, and generate barriers that affect the cooling efficiency.

Check the efficiency of the air conditioning system through inspection of the liquid flowing through the eye hole above the receiver drier.

When observing through the inspection hole, the refrigerant shall be clean liquid with no air bubble.

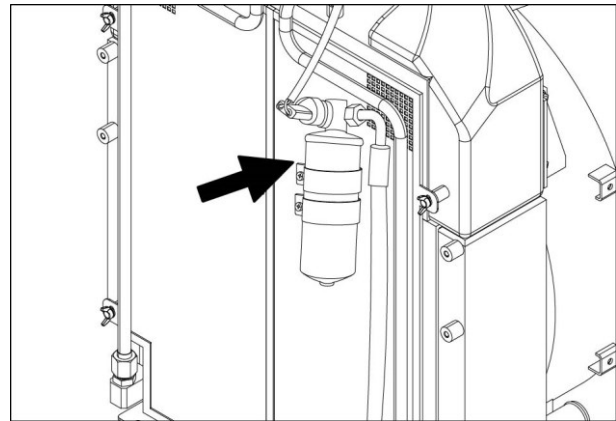


Fig.8-58

Check the tension of the drive belt.

#### See “Check the engine”..

Check whether the compressor is fixed on the tractor solidly, and combines accurately with the pulley in the same line.



#### **Important:**

Where the filter drier or the air conditioner needs to be removed, ends of the inlet and outlet pipes shall be plugged immediately so as to prevent the dust or water from entering the pipes.

### A/C compressor

The compressor must be securely fixed on the tractor. As pressure of the refrigerant circuit is increased, the air compressor shall not be turned on.

#### However, when handling with the refrigerant, certain basic safety precautions may be followed:

1. Avoid the direct contact with skin, otherwise it will probably cause such cold injuries.
2. Avoid contact with the eyes; if the refrigerant enters the eyes, seek for medical care immediately.
3. It is strictly prohibited to conduct welding operations in the refrigerant circuit or the nearby locations



directly. The refrigerant shall not be exposed to temperature more than 80°C.

### Manage and maintain the valve of the A/C circuit

The air conditioning system must be maintained or managed in a professional service center.

1. Constant pressure valve;
2. Compressor

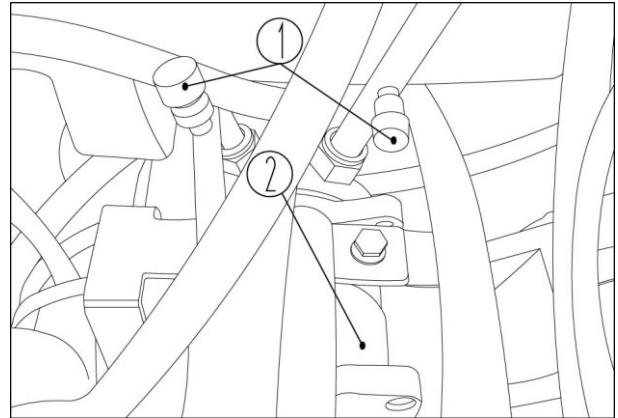






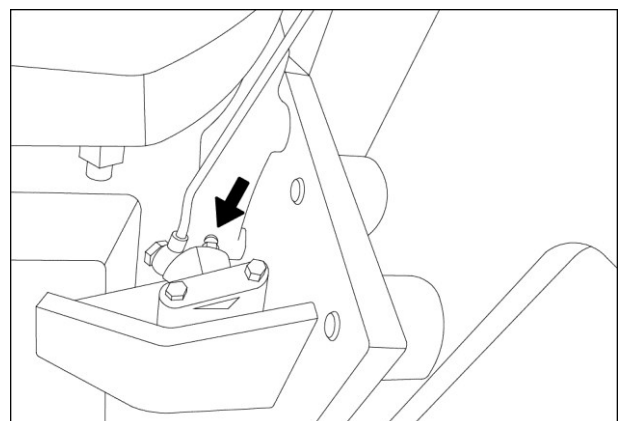
Fig.8-59

### 8.12.7 Hydraulic Clutch Circuit Drainage

	<p><b>Warning:</b></p> <p>Abide by laws and regulations on environmental protection. All liquid (oil, fuel and coolant), filter and battery must be discarded in accordance with applicable laws and regulations.</p>
	<p><b>Warning:</b></p> <p>It is prohibited to inject lubricating oil that is different from existing engine oil (grade or viscosity).</p>
	<p><b>Warning:</b></p> <p>Energy accumulator contains high pressure gas or fuel oil. Please refer to instruction in the specification provided by the manufacturer before any repair.</p>
	<p><b>Notice:</b></p> <p>Park the tractor on horizontal plane when replace lubricating oil or check oil level.</p>

Where faults occur to the clutch, contact the authorized Service Center or check the air inside the hydraulic circuit.

Remove the dust cover. Slightly release and then close the vent screw again immediately when the clutch pedal is pressed down.




Repeat such operations until no air bubble flowing out of the vent screw from the clean hydraulic fluid (vent screw is located inside the main tank).

## 8.13 Every 1200 Hours or at Least Once Two Years Maintenance

### 8.13.1 Replace Coolant and Flush Circuit

Flush the cooling circuit with particular detergent.

	<p><b>Warning:</b></p> <p>Where the engine is still heating, do not remove the radiator cover. If the radiator is still heating, it indicates that it still bears pressure; if it is opened at this time, the boiling liquid will flow out and cause serious injury to you or the nearby persons. Before removing the cover of the radiator, the engine should be shut off for cooling the circuit.</p>
---	---

#### Procedures for replacing coolant and flushing circuit

1. Park the tractor on horizontal ground. You have to shut off the engine and wait until it cooling down.

2. An appropriate Water Outlet Switch shall be set under the plug ①.

3. Drain the coolant in the cooling circuit through the open circuit plug ① on the left hand side of the engine.

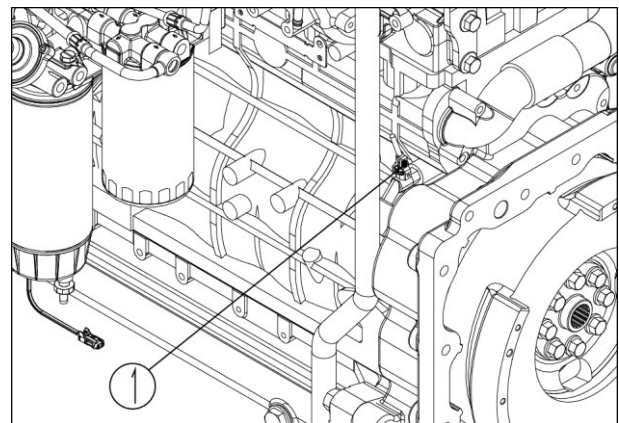


Fig.8-61

4. Open the vents under the radiator.

5. Drain the coolant in the radiator by switch on the Water Outlet Switch on the left hand side at the bottom.

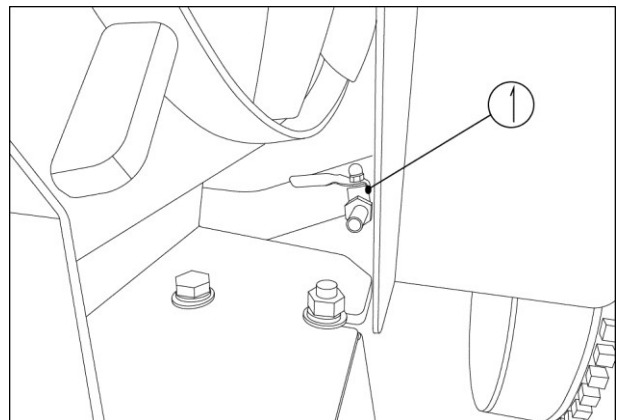



Fig.8-62

	<p><b>Warning:</b></p> <p>Abide by laws and regulations on environmental protection. All liquid (oil, fuel and coolant), filter and battery must be discarded in accordance with applicable laws and regulations.</p>
---	---

6. Switch off the Water Outlet Switch, and fill the coolant through the filling hole of the expansion tank.

Where cab heater is equipped with tractor, the heater shall be set to the maximum heat position so that the coolant is also circulated through the heat exchanger.

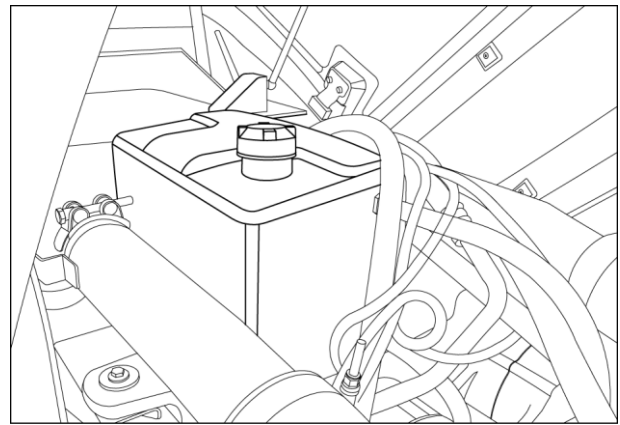



Fig.8-63

7. Start the engine, and keep it idling for one and a half hours around.


	<p><b>Important:</b></p> <p>When the engine is operating, check level of the detergent mixture to be no lower than the minimum level in the expansion tank.</p>
---	---


8. Shut off the engine, drain off the liquid in the system and then fill water into it; restart the motor, increase its speed to 1000rpm around and keep it running for 5 minutes.


9. Drain off the liquid in the system again.

10. Fill coolant into the circuit again, and let the engine operate for several minutes; if necessary, the system shall be full filled with coolant.

### 8.13.2 Replace the Transmission Oil

	<p><b>Warning:</b></p> <p>Energy accumulator contains high pressure gas or fuel oil. Please refer to instruction in the specification provided by the manufacturer before any repair.</p>
---	---

	<p><b>Important:</b></p> <p>Dispose the waste oil and the filter according to the applicable regulations. It is strictly prohibited to pour the oil onto the ground and into the unsealed sewage pipes or containers so as to protect the environment.</p>
---	--

	<p><b>Important:</b></p> <p>Replace the filter while changing the lubricating oil.</p>
---	--

### Procedures for change of transmission oil

1. Park the tractor on horizontal ground.
2. Unscrew the plug ① of the hydraulic lifter cover.

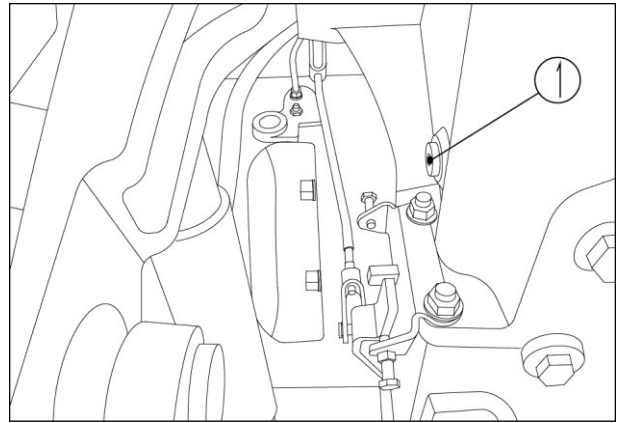


Fig.8-64



**Warning:**

If fuel or oil contacts skin or eyes under high pressure, it will cause serious injury, blindness and even death. High pressure liquid leakage may be invisible. One hard cardboard or wood will be used to seek for leakage. Don't use your hands! Protective glasses will be used to protect your eyes. If any liquid penetrates into your skin, please immediately go to medical personnel with similar experience.

3. Set appropriate containers under the drain plug ② on side of the bottom transmission and the drain plug ③ and ④ below the transmission, and release them to drain off the fuel.

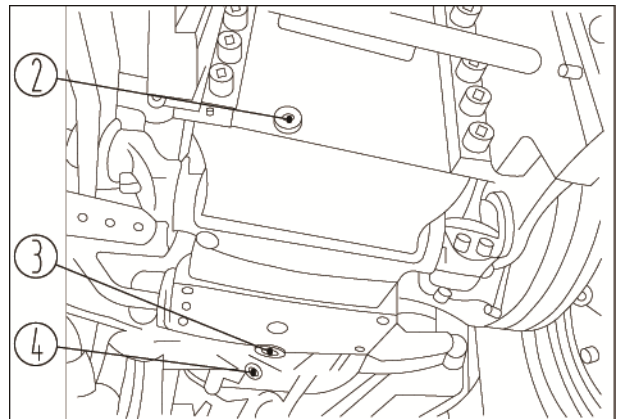


Fig.8-65



**Danger:**

Take care when draining off the oil as hot oil may lead to serious burn.

4. Replace the oil filter of the transmission.

See "Replace the transmission".



**Warning:**

It is prohibited to inject fuel oil that is different from existing fuel oil (grade or viscosity).

5. Reinstall and tighten the drain plug (1), (2) and (3), and fill the fuel into the transmission through the filler hole (4) above the top of the hydraulic lifter cover.

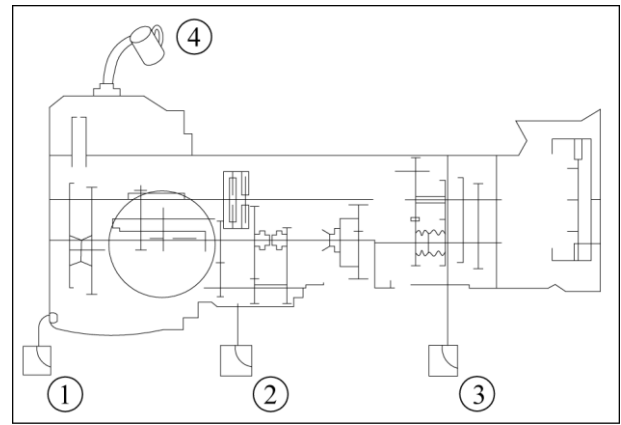


Fig.8-66

6. Reinstall the drain plug and fill lubricating oil into the PTO housing until it reaching the maximum level marked on the oil dip rod integrated with the drain plug, as shown ① in the figure.

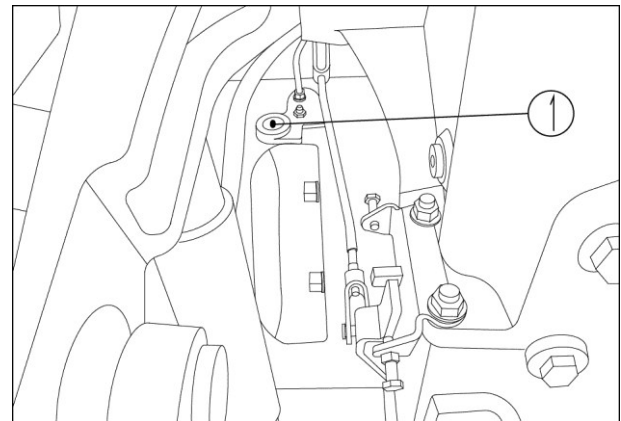


Fig.8-67

7. After full filling, screw in the oil filler plug and operate the engine for a few minutes.

8. Recheck the oil level and the top if necessary.

The tractor is equipped with transmission oil cooler. See the chapter “Check cleanliness of the radiator” for repair of the oil cooler.

	<p><b>Notice:</b> When checking the oil level, the rear and front lifter (if appropriate) must be lowered down fully.</p>
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### 8.13.3 Replace the Front Drive Axle Oil (4-wheel Drive)

Replace the different fuel and the final drive oil

	<p><b>Warning:</b> Abide by laws and regulations on environmental protection. All liquid (oil, fuel and coolant), filter and battery must be discarded in accordance with applicable laws and regulations.</p>
--	--



**Danger:**

Take care when draining off the oil as hot oil may lead to serious burn.



**Warning:**

Waste oil must be collected and stored in appropriate containers before being poured into the authorized collecting center.



**Warning:**

Energy accumulator contains high pressure gas or fuel oil. Please refer to instruction in the specification provided by the manufacturer before any repair.



**Warning:**

If fuel or fuel under pressure contacts skin or eyes under high pressure, it will cause serious injury, blindness and even death. High pressure liquid leakage may be invisible. One hard cardboard or wood will be used to seek for leakage. Don't use your hands! Protective glasses will be used to protect your eyes. If any liquid penetrated into your skin, please immediately consult medical personnel with similar experience.

Drain the waste oil from the oil discharge outlet ① of the central shaft shell.

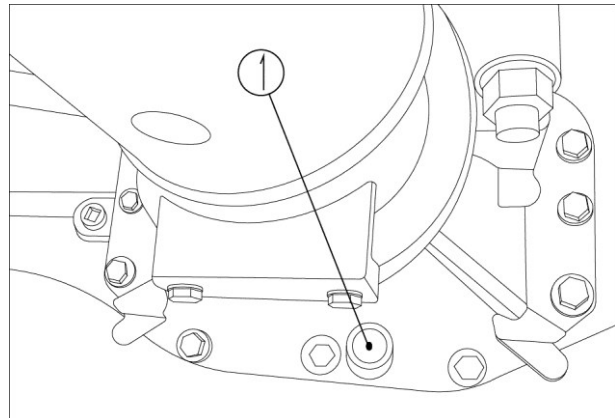
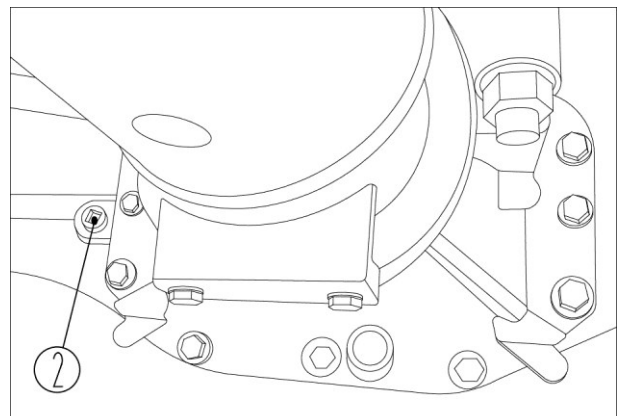
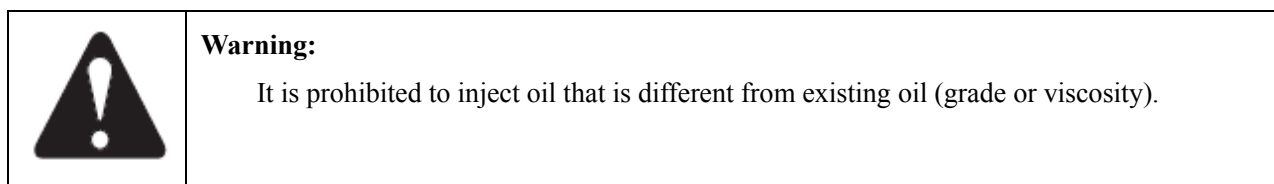


Fig.8-68

Fill in the fresh oil from filler ② on the left hand side until the oil level reaching the edges of the hole.





### Replace the final drive lubricating oil

Drain the waste oil out from the oil discharge outlet ③ at the bottom of the main reducer.

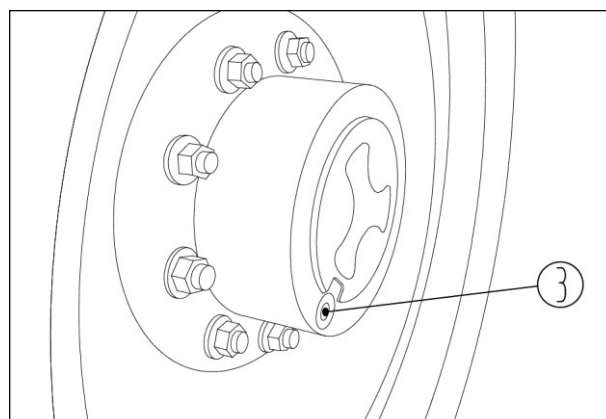


Fig.8-70

Fill in the fresh oil from the oil filler hole ④ until the oil level reaching the edges of the hole.

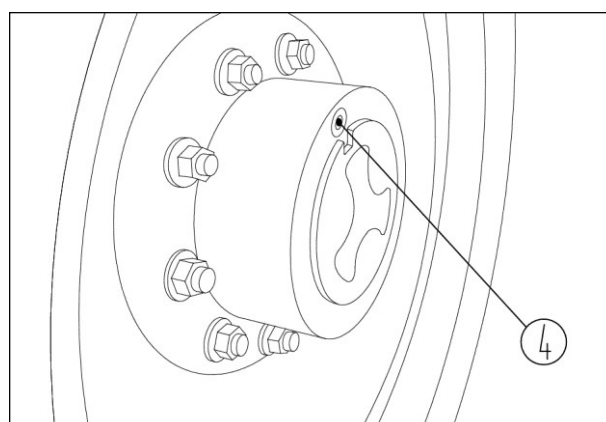
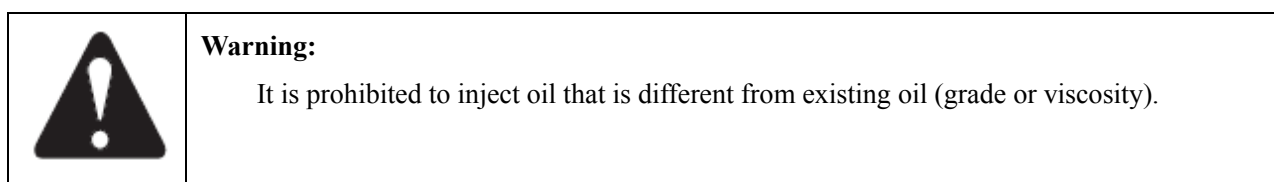


Fig.8-71



## 8.14 General Maintenance

### 8.14.1 Air Bleeding of Fuel Circuit

Such operations must be conducted when the air entering the fuel circuit (before entering the injection pump).

**Warning:**

Energy accumulator contains high pressure gas or fuel oil. Please refer to instruction in the specification provided by the manufacturer before any repair.

**Warning:**

If fuel under pressure or fuel is splashed to your skin or eye, it may cause serious injury and blindness, even death. High pressure fluid leakage may be unapparent. When seeking for leakage, one piece of hard cardboard or wood will be used. Don't use your hands! Protective glasses will be used to protect your eyes. If any liquid penetrates into your skin, please immediately consult medical personnel with similar experience.

**Warning:**

Before running out of the fuel in the fuel tank, never continue operating the engine. If the engine is stopped due to running out of the fuel, the air shall be drained from the fuel injection system.

**Warning:**

When injecting oil or repairing the fuel injection system, it is prohibited to smoke or use open fires in the surroundings.

**Possible reasons are as follows:**

1. Remove components
2. Fuel tank is run out
3. Tightness of the pipes and fittings is low

In these circumstances, the engine cannot be fully started, or will stop immediately once started.

**Important:**

It is strictly prohibited to release the union joints of the fuel lines used to connect the pump and the fuel spray nozzle as these union joints must be tightened to the specified torque setting, and fastened onto a special copper base; the union joints must be replaced if the fittings are broken.

**Important:**

The fuel pump lever will generate certain resistance when operated manually. Otherwise, start the engine so as to determine the starting location of the pump (cam on the camshaft at the top dead center).

**8.14.2 Air Bleeding of Fuel Pre-filter**

Such operations must be conducted when the air entering the fuel circuit (rising line from the filling pump)

**Warning:**

Energy accumulator contains high pressure gas or fuel oil. Please refer to instruction in the specification provided by the manufacturer before any repair.





**Warning:**

If fuel under pressure or fuel is splashed to your skin or eye, it may cause serious injury and blindness, even death. High pressure fluid leakage may be unapparent. When seeking for leakage, one piece of hard cardboard or wood will be used. Don't use your hands! Protective glasses will be used to protect your eyes. If any liquid penetrates into your skin, please immediately consult medical personnel with similar experience.



**Warning:**

Before running out of the fuel in the fuel tank, never continue operating the engine. If the engine is stopped due to running out of the fuel, the air shall be drained from the fuel injection system.



**Warning:**

When injecting oil or repairing the fuel injection system, it is prohibited to smoke or use open fires in the surroundings.

Possible reasons are as follows:

1. Remove components
2. Fuel tank is run out
3. Tightness of the pipes and fittings is low

In these circumstances, the engine cannot be fully started, or will stop immediately once started.



**Important:**

It is strictly prohibited to release the union joints of the fuel lines used to connect the pump and the fuel spray nozzle as these union joints must be tightened to the specified torque setting, and fastened onto a special copper base; the union joints must be replaced if the fittings are broken

### 8.14.3 Hydrostatic Steering System Hydraulic Circuit Drainage

Release the two union joints on the hydraulic oil cylinder and rotate the steering wheel in two directions if necessary to drain off the air in the steering circuit until the oil flowing out from the union joints with no air bubbles.

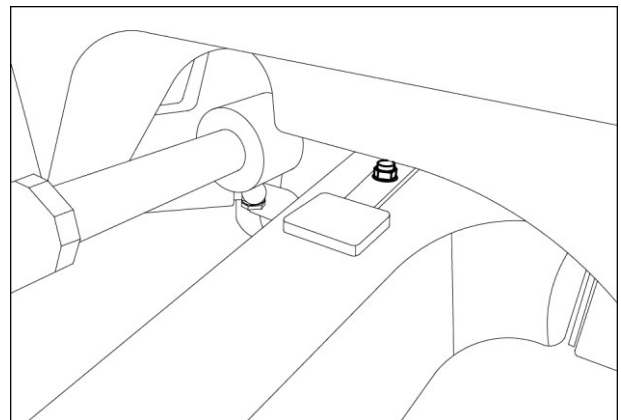


Fig.8-72

Screw up the union joints and full fill lubricating oil into the transmission through the oil filler ① behind the lateral bracing on the left side.

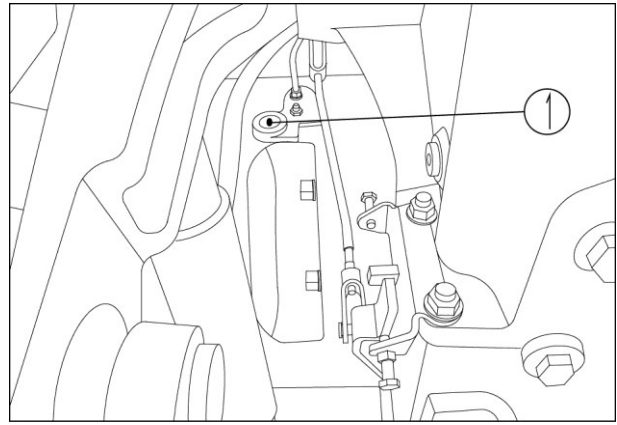


Fig.8-73



**Important:**

The hydraulic pump operating in no oil conditions even for a few minutes will cause the hydraulic pump stop running.

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## **9- Troubleshooting**

## 9.1 Towing the Tractor

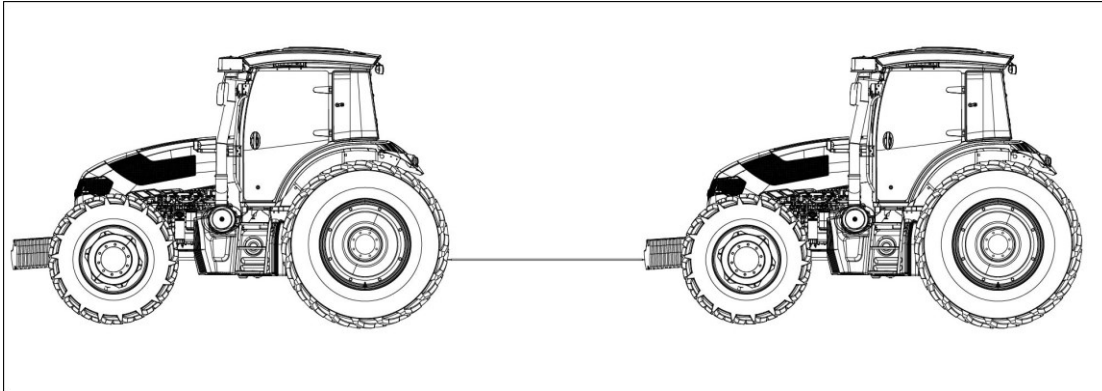





Fig.9-1

The tractor can be towed for a short distance only, e.g., tow the tractor out of a building. If the tractor shall be dragged for a long distance, it cannot be conducted on the public road with high traffic density. The faulted tractor shall be dragged for a short distance as far as possible, in order to avoid possible hazardous situations. An intact and firm chain shall be used when the tractor have to be dragged. Only tractor hook, backward hook or three-point linkage can be used to drag the tractor. Special devices and vehicles shall be used to drag the tractor. The operator shall stay on the driving position to control and stop the tractor as necessary.

	<p><b>Notice:</b></p> <p>We recommend that the tractor is transported by a drop-frame trailer for a long distance. Observe requirements for the maximum width and height specified in the road traffic regulations. Check and ensure that the trailer is suitable for transporting the tractor. ◦</p>
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	<p><b>Notice:</b></p> <p>When the tractor is towed, a driver must remain in the tractor to control it.</p>
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	<p><b>Danger:</b></p> <p>During towing, access to the driver's seat is prohibited absolutely without authorization.</p>
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### 9.1.1 Towing with the Engine under Operating

**In order to protect the un-lubricated transmission or other rotating components in the process of dragging:**

- The tractor can be towed for a short distance only;
- Keep the speed under 10km/h;
- Start the engine to activate the lubricating oil for power steering if possible;
- Locate the control handle of transmission and controller for reduction gear in neutral position.

Drive it carefully, slowly and stably.

No one can stay near the tractor hook.

The tractor can be dragged rather than transported in other ways only when the brake and steering wheel

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can work normally.

Only the standard bar on the front draw hook approved by the manufacturer is used for towing of the tractor.

Ensure that the draw hook is equipped with a right pin, and is protected safely with the same pin.

Clean all lamps including front lamps and rear lamps, required for road driving, and ensure they are in good working condition.

**Prior to towing, check following conditions:**

- Remove all tools on the tractor;
- Connect the two brake pedals with a connecting latch;
- Release the PTO and differential lock;
- Set the shuttle gearshift handle and gearshift lever to the neutral position;
- Shift the range lever to "Fast" position;
- Shift the creeper lever to "Neutral" position;
- Turn on the hazard warning lamp.



**Warning:**

Turn on the hazard warning lamp to indicate that the tractor is being towed. Follow relevant national requirements and local safety regulations.

**Follow following instructions during road transportation:**

- Drive on the road during light traffic on the road. Extra care should be taken near the crossings without traffic control management. Drive slowly until it is possible to ensure clear field of vision in front and rear directions.
- Maintain driving in a fixed lane, and drive the tractor close to roadside as far as possible. If traffic jam occurs behind your tractor, you should drive the tractor to the parking zone on roadside as soon as possible so that the vehicles behind your tractor can move forward smoothly.
- The tractor is stopped by use of the hand brake (in any case).
- The driving speed must be able to ensure that the tractor is controlled thoroughly and stably in any conditions.



**Danger:**

Do not attempt to use a rope (including wire rope) to tow the tractor because breakage of the rope may cause serious injury.

### 9.1.2 Towing with the Engine Being Shut off



**Important:**


Under the circumstance that the engine is shut off and the forced transmission lubrication system is failed, the tractor can only be loaded onto the transportation vehicle and transported to the service center.


Under the circumstance that the engine is shut off and the forced transmission lubrication system is failed, towing the tractor should not be carried out unless safety of the tractor is endangered.


## 9.2 Safe Transportation of the Tractor


If the tractor is loaded onto a trailer for transportation, following points should be met:


1. When loading/unloading the tractor, a flat place should be selected.
2. The tractor should be loaded/unloaded with the help of a special loading/unloading platform.
3. An assistant must be designated to provide guidance in the site, so that no unauthorized personnel approaches the site.
4. After loading, put the suspension lever to the lowest position, apply the hand brake, engage the reverse gear, remove the key, lock the door, and turn off the main power supply switch.
5. Use a wire to fix the four tires in an 8-shaped manner, and have the tires secured with wedge blocks, and pull the rear axle beam with a wire. Do not bind the belt or iron chain to the steering hydraulic oil cylinder or front drive shaft and other tractor parts that may be damaged.
6. Pull the rear view mirror inward as far as possible, and if necessary, remove it, and must ensure that the hood and cab door and windows are closed. For the tractor model with a safety frame, the safety frame can be folded and secured firmly wherever necessary.
7. When passing through a tunnel or bridge, take extra care that its height exceeds the specified height limit, and the tractor should be decelerated during cornering.
8. During unloading, first release the hand brake, engage the forward gear, and drive the tractor away from the trailer at minimum speed.


	<p><b>Danger:</b></p> <p>When loading the tractor onto the transport vehicle, do not enter the loading area.</p>
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	<p><b>Warning:</b></p> <p>When loading/unloading the tractor, the parking brake of the transport truck should brake the vehicle firmly and the front/rear wheels are fixed securely to avoid sudden startup of the truck resulting in risk in roll-over of the tractor or falling of the operator.</p>
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	<p><b>Warning:</b></p> <p>When loading/unloading the tractor, the tractor should drive at minimum speed to avoid risk in roll-over or falling of the tractor resulted from excessively high speed.</p>
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	<p><b>Warning:</b></p> <p>It shall be ensured that the engine hood, doors, openable roof and windows are closed and fixed firmly when the tractor is transported by low bed trailer or wagon.</p>
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	<p><b>Warning:</b></p> <p>Do not connect the chains to the drive shaft of front axle, hydraulic steering cylinder, front axle or other components of the tractor to protect them from being damaged by chains or overload.</p>
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	<p><b>Warning:</b></p> <p>For the tractor with turbocharger, terminal of exhaust pipe shall be covered to prevent the bearing from rotating and being damaged for the effect of wind. Free rotation of turbine in turbocharger (i.e. the rotation after the engine stopped) shall be prevented for the bearing is not lubricated in this case.</p>
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### 9.3 Hoisting the Tractor

Use a hoisting device with sufficient hoisting capacity to hoist the tractor (including all parts installed).

Before hoisting the tractor, ensure that the door, cab, hatch cover and other movable parts are fixed safely.

During hoisting, keep a safe distance from the tractor.

### 9.4 Common Faults and Troubleshooting of the Tractor

#### 9.4.1 Overhauling of Engine

Potential faults, reasons and corrective actions are described in this section to solve engine related problems of the tractor.

Fault	Possible Cause	Measure
poor	The starting procedure is incorrect.	Check the starting procedure.
	Fuel runs out or oil level is low.	Check the oil level.
	There is air in fuel pipe.	The air in fuel pipe shall be discharged.
	Environment temperature is low.	Use cold starter.
	Fuel system is contaminated.	Clean and discharge fuel system.
	Viscosity of engine fuel is incorrect.	The fuel with correct viscosity shall be used.
	Fuel filter is blocked.	Replace the filter.
	Operating trouble of fuel spray nozzle.	Contact authorized dealer.
	Low efficiency of fuel oil pump.	Check and confirm whether the operation of pump is normal.
	Fuel is unsuitable for operating temperature.	Fuel of correct type that conforms to the temperature condition shall be used.
	The storage battery interrupting device shall be activated.	Close the device.
	Motor speed of starter is low.	Check the motor and storage battery of starter.
	Fuel type is incorrect.	Discharge the fuel tank and the system. Contact the supplier of fuel.
	Engine electrical system failure or poor connection	Contact the authorized dealer
Engine speed is unstable or the engine stalls	Fuel filter is blocked.	Replace the filter.
	Fuel system is contaminated.	Clean the fuel system and discharge the fuel in fuel system.
	Fuel tank breather is blocked.	Fuel tank breather is blocked.
	Operating trouble of fuel spray nozzle.	Operating trouble of fuel spray nozzle.
Engine knock	Timing and synchronization error of filing pump.	Contact authorized dealer.
	Low engine lubricating oil level.	Fill it with fuel according to

		requirements.
The engine is under powered.	Overload of engine.	Change gears down, reduce the traction load.
	Air filter is blocked.	Repair air filter.
	Fuel filter is blocked.	Replace filter element (lining element).
	Fuel is unsuitable.	Fuel of correct type shall be used.
	Gap error of engine valve.	Contact authorized dealer.
	Operating trouble of fuel spray nozzle.	Contact authorized dealer.
	Operating trouble of filling pump.	Contact authorized dealer.
	Fast idle speed is low.	Contact authorized dealer.
	There is air leakage in intake and exhaust manifolds.	Check and adjust, or contact authorized dealer.
	Operation fault of turbocharger.	Contact authorized dealer.
	Adjustment of implement is incorrect.	Refer to the Operators Manual of machines and tools.
	Fuel feed pipe is blocked.	Contact authorized dealer.
	There is air in fuel system.	The air in fuel pipe shall be discharged.
	Engine flash code	Contact authorized dealer.
Engine is overheating	Level of engine coolant is low.	Check for leakage in cooling system.
	The thermostat breaks down.	Contact authorized dealer.
	The thermostat breaks down.	Clean.
	Overload of engine.	Change gears down, reduce the traction load.
	Boosting plug of radiator breaks down.	Replace the plug.
	Cooling system is blocked.	Contact authorized dealer.
	Fan belt is loose or worn.	Check the belt tension, and the belt shall be replaced if it is worn.
	Operation trouble of temperature transmitter or indicator.	Contact authorized dealer.
	The grille on shell is blocked.	Clean.
Engine operating temperature is low.	Operation trouble of thermostat.	Replace the thermostat.
	Operation trouble of temperature sensor or indicator.	Contact authorized dealer.
Engine lubrication pressure is low.	Oil level is low.	Fill the fuel according to requirements.
	The fuel grade or viscosity is incorrect.	Discharge the fuel and refill it with correct fuel.
	There is fracture in oil pump.	Contact authorized dealer.
	There is fracture in oil pressure sensor.	Contact authorized dealer.
Consumption of engine lubrication is high.	The fuel grade or viscosity is incorrect.	Discharge the fuel and refill it with correct fuel.
	Operation trouble of turbocharger.	Contact authorized dealer.
	Fuel leaks.	Contact authorized dealer.



	The level of engine lubricating oil is high.	Reduce the oil lever according to requirements.
	Valve pipe or sealing element is worn.	Contact authorized dealer.
	There is dust in it.	Check the air intake system, filter and manifold.
Fuel consumption is high.	Operation trouble of turbocharger.	Contact authorized dealer.
	Overload of engine.	Change gears down, reduce the traction load.
	Air filter is blocked.	Repair air filter.
	Fuel is unsuitable.	Fuel of correct type shall be used.
	Gap error of engine valve.	Contact authorized dealer.
	Operation trouble of fuel spray nozzle.	Contact authorized dealer.
	Adjustment of implement is incorrect.	Refer to manuals for operators of implement.
	Operation trouble of filling pump.	Contact authorized dealer.
	There is air leakage in inlet or outlet manifold.	Check and adjust it, or contact authorized dealer.
Timing of an engine fails.	Contact authorized dealer.	
White smoke is discharged from air exhausting device.	Fuel is unsuitable.	Fuel of correct type shall be used.
	Preheating system breaks down.	Check the preheating system.
	Operation trouble of turbocharger.	Contact authorized dealer.
Black smock from the air exhausting device	Operation trouble of fuel spray nozzle.	Contact authorized dealer.

## 9.4.2 Overhauling of Transmission

Potential faults, reasons and corrective actions are described in this section to solve transmission related problems of the tractor.

<b>Problem</b>	<b>Possible Cause</b>	<b>Measure</b>
Operating temperature of transmission is high	Oil level is too high	Check the oil level.
	Transmission oil cooler is blocked or dirtied (in applicable situations).	Clean.
	The fuel grade or viscosity is incorrect.	Discharge the fuel and refill it with correct fuel.
There is noise in transmission	Oil level is low.	Check the oil level, and fill it as necessary.
	The fuel grade or viscosity is incorrect.	Discharge the fuel and refill it with correct fuel.
	Bearing is worn or parts are damaged.	Contact authorized dealer.
There is trouble in gear engagement.	Clutch cannot disengage completely.	Contact authorized dealer.
	Adjustment of external control connection is improper or it is worn.	Adjust the connection, and replace worn parts, or contact authorized dealer.
	Gear selector fork or synchronizer is worn.	Contact authorized dealer.
	There is air in clutch control system.	Contact authorized dealer.
The tractor cannot move.	Check the correctness of settings	Contact authorized dealer.

	of all control devices.	
	Error code will display the origin of faults (for the version with electronic transmission).	Contact authorized dealer.
It is controlled poorly when the clutch pedal is used.	Time setting for filling transmission clutch is incorrect (for the version with hydraulic transmission).	Contact authorized dealer.
	Control mechanism breaks down.	Contact authorized dealer.
Falling from gears or being unable to disengage from gears.	Synchronizer/ coupling are worn. Adjustment of variable speed connection is incorrect.	Contact authorized dealer.
	Adjustment of external control connection is improper or it is worn.	Adjust connection, replace worn parts, or contact authorized dealer.
	Gear selector fork or synchronizer is worn.	Contact authorized dealer.
	Bearing is worn.	Contact authorized dealer.
Oil pressure of lubricating oil for transmission is low.	Transmission filter is blocked.	Replace the filter.
	The fuel grade or viscosity is incorrect.	Discharge waste fuel, and refilled with right fuel.
	Efficiency of oil chestnut is low/ oil chestnut breaks down.	Contact authorized dealer.
The clutch engagement that controls the driving orientation is steep or too flat.	Clutch engagement shall be adjusted.	Contact authorized dealer.
Clutch makes a noise during engagement.	The limited noise made by clutch plate is normal.	-
	A loud noise is given out suddenly.	Contact authorized dealer.

### 9.4.3 Overhauling of PTO

Potential faults, reasons and corrective actions are described in this section to solve transmission related problems of the tractor.

Problem	Possible Cause	Measure
Slip of the clutch	Check the clutch engaging device.	Overhaul the engaging device, contact authorized dealer.
	Clutch plate may be worn.	Overhaul the clutch assembly.
The clutch does not disengage	PTO does not stop when the clutch disengage.	Overhaul the engaging device, contact authorized dealer.
		Overhaul PTO braking device, contact authorized dealer.
	Check the clutch engaging device.	Overhaul the engaging device, contact authorized dealer.

### 9.4.4 Overhauling of Front Wheel Driver

Potential faults, reasons and corrective actions are described in this section to solve front wheel drive system related problems of the tractor.

Fault	Possible Cause	Measure
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Cross sections of cardan joint is worn excessively.	Oil leakage.	Replace faulted sealing element.
Early wear of the tires takes place.	Tire pressure is incorrect.	Check the tire pressure.
	Wheel inclines inward.	Consult authorized dealer.
	Rotating or mechanical ratio.	Consult authorized dealer.
	The wheel vibrates.	Check whether the knuckle is worn, and the knuckle shall be replaced as necessary. Consult authorized dealer.
	Service time of front-wheel driving can be extended during highway transportation.	Using of front-wheel drive shall be avoided as far as possible.

### 9.4.5 Overhauling of Brake

Potential faults, reasons and corrective actions are described in this section to solve brake related problems of the tractor.

Fault	Possible Cause	Measure
Brake travel is too long	There is leakage in brake deflation valve.	Consult authorized dealer.
	There is oil leakage in pipelines.	Consult authorized dealer.
	Brake disc is worn.	
	There is air in the system.	Discharge the air in the system. Consult authorized dealer.
	Gasket of brake piston is no longer in force.	Consult authorized dealer.
	Air breather of transmission is blocked.	Clean/ replace vent valve. Consult authorized dealer.
	Control system leakage.	Consult authorized dealer.
Brake pedal moves down	Pump control system leakage.	Consult authorized dealer.

### 9.4.6 Overhauling of Lifter

Potential faults, reasons and corrective actions are described in this section to solve Lifter related problems.

Fault	Possible Cause	Measure
Lifter does not move when control handle is operated	There is no flow velocity/ pressure in oil hydraulic circuit.	Consult authorized dealer.
	Control device is not used properly.	Check programs using lifter.
	Error code will display the origin of faults (for the version with electronic lifter).	Consult authorized dealer.
	Orientation for limit control of lifter is incorrect.	Adjust limit control of lifter.
	Inductive circuit of lifter breaks down.	Consult authorized dealer.
External control of lifter breaks down.	External control switch breaks down (for the tractor type with electric lifter).	Consult authorized dealer.

	Adjustment of control coupling is incorrect or control coupling breaks down	Consult authorized dealer.
Lifter cannot be lifted completely or raised slowly	Orientation for limit control of lifter is incorrect.	Adjust limit control of lifter.
	Lifter overload.	Reduce the load.
Lifter goes down slowly	Orientation of descent velocity control is incorrect.	Adjust descent velocity control.
Lifter responses to traction control load slowly.	Adjustment of location/ traction control is incorrect.	Adjust location/ traction control.
	Descent velocity is slow.	Adjust descent velocity control.
	Adjustment of machines and tools is incorrect.	Consult authorized dealer.
Lifter over-responds to traction control load.	Adjustment of location/ traction control is incorrect.	Adjust location/ traction control.
Machines and tools cannot reach the required depth	Raising rod is too short.	Adjust raising rod.
	No implement is inserted.	Refer to manuals for operators of implement.
Lifter descends quickly when dragger is shut off and engine is stopped.	There is leakage in circuit.	Consult authorized dealer.

### 9.4.7 Overhauling of Hydraulic System

Potential faults, reasons and corrective actions are described in this section to solve related problems of hydraulic system.

Fault	Possible Cause	Measure
Hydraulic system does not work	Error code will display the origin of fault.	Consult authorized dealer.
	Hydraulic oil level is low.	Fill the fuel according to requirements.
	Hydraulic oil filter is blocked.	Clean and replace the oil filter according to requirements.
	Interior leakage.	Consult authorized dealer.
Hydraulic oil is overheating.	Hydraulic oil level is incorrect.	Check and adjust oil level according to requirements.
	Coolant for hydraulic oil is blocked.	Clean.
	Auxiliary hydraulic orientation control valve cannot be activated in neutral position.	Check the position of control handle.
	Hydraulic load is unsuitable for the tractor.	Consult authorized dealer.
	Interior leakage of high pressure.	Consult authorized dealer.

## 9.4.8 Overhauling of Hydraulic Orientation Control Valve

Potential faults, reasons and corrective actions are described in this section to solve related problems of hydraulic orientation control valve.

Fault	Possible Cause	Measure
Recoiling escape speed of auxiliary orientation control valve is too fast	The oil pressure transmitted to connecting device is too high.	Consult authorized dealer.
	Design of block time is incorrect.	Set the time properly.
	There is mechanical fault in orientation control valve.	Consult authorized dealer.
Hydraulic ram of remote control device runs slowly.	Setting of flow control valve is incorrect (if any).	Set the flow control valve,
	Connection of hose is incorrect.	The pipes shall be connected properly.
	Load exceeds the system capacity.	The load shall be reduced or hydraulic ram with same size shall be used (consult authorized dealer).
	Travel of auxiliary orientation control valve rod is limited.	Adjust rod or consult authorized dealer.
Remote control hydraulic ram runs quickly or slowly.	Flow velocity is inappropriate.	Adjust flow velocity (if possible).
Remote control hydraulic ram runs in opposite direction.	Hose connection is inappropriate.	Hose connection shall be adjusted.
Hoses are mismatching	Fittings of male hose are mismatching.	It shall be replaced with ISO standard joint.
Hydraulic orientation control valve rod cannot be unlocked.	There is mechanical fault in valve rod.	Contact authorized dealer.

## 9.4.9 Overhauling of Cab

Potential faults, reasons and corrective actions are described in this section to solve related problems of cab.

Fault	Possible Cause	Measure
The dust enters in cab.	Surrounding sealing of filter element (lining element) is insufficient.	Check sealing situations.
	Filter is invalid or breaks down.	Replace the filter.
	Filter is blocked.	Cleaned and replace filter.
	Surrounding sealing elements of door, window or openable roof are damaged.	Sealing element shall be replaced.
	Excessive air leakage	Leakage shall be eliminated.
	Airflow of fan is weak.	Consult authorized dealer.
Low pressure steam	Filter is blocked.	Cleaned and replace filter.
	Components of evaporator or heater are blocked.	Consult authorized dealer.
Air conditioning equipment	Heating.	Check the heating control device

<b>Fault</b>	<b>Possible Cause</b>	<b>Measure</b>
cannot generate cold air	Driving belt falls down, or is worn or damaged.	Check belt situations. Contact authorized dealer.
	Material level of refrigerant is insufficient.	Consult authorized dealer.
	Condenser is blocked.	Condenser shall be cleaned.
	Compressor is blocked.	Consult authorized dealer.
Heater breaks down	Controller breaks down	Consult authorized dealer.
Damping device for seats	The fuse blows.	The fuse shall be replaced.
Radio breaks down	The fuse blows.	The fuse shall be replaced.

### 9.4.10 Overhauling of Electrical System

Potential faults, reasons and corrective actions are described in this section to solve related problems of electrical system.

<b>Problem</b>	<b>Possible Cause</b>	<b>Measure</b>
Starting speed is slow- the engine rotates slowly.	Terminal connection of storage battery is corroded or loose.	The connection shall be cleaned and tightened.
	Output of battery is low.	Consult authorized dealer.
	Viscosity of engine lubricating oil is incorrect.	It is necessary to use right fuel oil viscosity that is suitable to environment temperature.
Hydraulic motor of starter does not work.	The connection of storage battery or starter motor is eroded or loose.	The connection shall be cleaned and tightened.
	The power of storage battery is used up.	Charging or replace storage battery.
	Starting signal switch (or switch) trips.	Run the starting procedure again. Contact authorized dealer.
	The fuse blows.	The fuse shall be replaced.
	Operating arm is located on error position.	Run the starting procedure again. Contact authorized dealer.
During the operation of engine, alternating-current generator warning: the light is still on	Idle speed of engine is low.	Idle speed of engine shall be increased.
	Driving belt is damaged or loose.	Check/replace belt.
	Operating trouble of alternating-current generator.	Alternating-current generator shall be checked by authorized dealer.
Storage battery can't charge.	Operating trouble of alternating-current generator.	Alternating-current generator shall be checked by authorized dealer.
	Connection terminals are loose or eroded.	The connection shall be cleaned and tightened.
	Driving belt is loose or worn.	Check the belt.

		Replace if necessary.
	Operating trouble of storage battery.	Contact authorized dealer.
Illuminating system breaks down, but other electrical systems work normally.	The fuse blows.	The fuse shall be replaced.
The entire electrical system breaks down	Terminal connection of storage battery is corroded or loose.	The connection shall be cleaned and tightened.
	Short circuit of storage battery breaks away.	Re-open the switch.
	Storage battery is sulfated or worn.	Liquid level and density of electrolyte shall be checked.
	The fuse blows.	The fuse shall be replaced.
Fan breaks down	Fan breaks down.	All fuses for fans shall be checked. Contact authorized dealer.

### 9.4.11 Overhauling of Tractor

Potential faults, reasons and corrective actions are described in this section to solve related problems of the tractor.

<b>Fault</b>	<b>Possible Cause</b>	<b>Measure</b>
The tractor begins to swing or vibrate.	Water volumes in tires are incorrect (if filled).	Check the water level. Consult authorized dealer.
	The tire may be oval.	Check the central point of the tire. Consult authorized dealer.
	Weight distribution of tractor is incorrect.	Weight distribution shall be checked. Contact authorized dealer.





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## **10- Tractor Storage and Unpack**

After the tractor finishes field works, or required to be stored for a long time (more than one month) due to certain cause, must safeguard and store it properly. The tractor should be stored in a good environment to avoid rusting, aging and deformation of the parts.

Before the tractor is stored, must be cleaned thoroughly and adjusted, and tighten individual connecting parts, accomplish technical maintenances specified according to the time schedule (see Service and maintenance), so that the tractor is in good technical state.



**Important:**

During storage of the tractor for a long time, it is very important to carry out scientific storage and special care and maintenance. Otherwise, the tractor is deteriorated at a speed faster than that during the time when it is put into service.



**Important:**

If the user has not anti-rusting treatment conditions and the tractor will be idled for several months or longer time, at least the lubricating oil and lubricating oil filter should be replaced, and the tractor should be started every months and operate at low speed for 20~30min, so as to inspect whether individual parts have abnormalities. Then, keep exterior of the tractor clean and dry.

## 10.1 Causes for Damage to the Tractor in Storage Period

Main causes for damage to the tractor in storage period are as follows:

1. Rusting: During storage, ingress of airborne dust and moisture into the machine via gaps and holes takes place, resulting in contamination and rusting of the parts; the surfaces that moves in relation to each other, such as piston, valve, bearing, gear and etc., are prone to abrasion, rusting, blockage or seizure resulting in obsolescence because they are kept standstill at a position for a long time and are not protected by lubricating oil.

2. Aging: The rubber and plastic parts under direct sunshine will be aged, deteriorated, get brittle, be out of action or corroded or rotten under influence of the ultraviolet ray.

3. Deformation: For such parts as drive belts and tires that are subject to force for a long time, plastic deformation may take place.

4. Others: Electric parts are subject to moisture and the battery is self-discharged.

## 10.2 Storage of the Tractor

If the tractor is not used for a long time, we recommend that you conduct following operations to protect important parts of the tractor from being damaged during storage.

1. Before storage, carefully inspect the tractor, and eliminate possible faults, and keep it in good technical condition. Clean exterior of the tractor.

2. Start the tractor to inspect the fuel and injection systems, and ensure that they operate normally.

3. Empty anti-freezer and anti-rust fluid in the radiator, cylinder block and water pump, and lubricating oil in the lubricating system and the hydraulic system.

4. Replenish specified coolant to the radiator system, and fill anti-freezer and anti-corrosion agent.

5. Dismantle the battery, and apply lubricating grease to the poles, as well as store it in a well-ventilated room being protected from light and with temperature being not less than 0°C.

6. Empty lubricating oil in the engine when the engine is warm, and fill new lubricating oil, as well as have the engine operated at low speed for several minutes, so that the lubricating oil is evenly applied to surface of individual moving parts.

7. Inject lubricating grease to individual lubricating points.

8. Apply Vaseline (heated to 100°C ~200°C) to surfaces of electric contacts, connectors and metal parts that are not painted.

9. Loosen the engine fan belt, and if necessary, remove the belt and package it for storage, and then spray rust inhibitor to the pulley groove. The tractor surface with paint being peeled off should be re-painted.

10. Empty fuel oil in the oil tank and clean the oil tank.

11. Use protective material (such as canvass, water-proof cloth or oil paper and etc.) to seal the engine ports that are not sealed, such as air inlet and exhaust port, so as to prevent ingress of foreign bodies, dust or moisture into the engine.

12. Set all control handles to neutral position (including electric switch and parking brake), align the front wheels of the tractor, and put the suspension lever to the lowest position.

13. Support the tractor with a wooden frame to enable the tires to be unloaded. And, inspect tire pressure on a regular basis.

14. The tractor should be parked in a garage or car shed, and the storage place should be well-ventilated and dry. It is prohibited that it is stored together with corrosive articles and gases. If no conditions meet requirements and the tractor is stored outdoor, a platform that is at a high place and kept dry must be selected, and the tractor should be covered with waterproof cloth.

15. The exposed metal surface should be applied with lubricating grease to protect it from being rusted.

16. The parts removed from the tractor and the tools should be cleaned, packaged and stored in a dry warehouse.



**Important:**

The tractor must be stored in a suitable garage, and should not be exposed in a dusty place. If the tractor can be stored outdoor only, a film should be used to cover the tractor.

### 10.3 Maintenance of the Tractor during Storage

1. The tractor must meet individual requirements for storage of the tractor during storage.

2. Monthly inspect whether the tractor and parts are rusted, corroded, aged, deformed and have other abnormalities. In case of any abnormality, handle it in time.

3. Rotate the engine crankshaft (for 10~15 turns) every months to avoid internal rusting. The lubricating parts to be filled with lubricating grease should be filled with new lubricating grease after removing the used lubricating grease.

4. The tractor should be started every 3 months, and operated for 20~30min. Then, inspect whether individual parts operate normally.

5. Wipe away the dust at top of the battery on a regular basis. Even if the battery is not used, it also discharges, so the battery should be charged once every month.

6. When the tractor is transported by train or truck for a long distance, it cannot be engaged in the gear. Because the train or truck rocks during transportation, the tractor tires also moves forward or backward ceaselessly. In case that the tractor is engaged in the gear, the tire movement will drive the gear, bearing, crankshaft, piston and other parts without being lubricated, resulting in dry friction causing ablation of parts.



**Important:**

If the user has not anti-rusting treatment conditions and the tractor will be idled for several months or longer time, at least the lubricating oil and lubricating oil filter should be replaced, and the tractor should be started every months and operate at low speed for 20~30min, so as to inspect whether individual parts have abnormalities. Then, keep exterior of the tractor clean and dry.

Where the tractor is protected correctly pursuant to the above-mentioned requirements, it will not be corroded or damaged, usually. After use of the tractor for a period, our company will not

be liable for any possible damage to the tractor during storage.
--

## 10.4 Unpackaging of the Tractor

1. Remove the anti-rusting grease.
2. Open the sealed ports. Clean the tractor.
3. Fill coolant, lubricating oil and fuel oil as required, and inject lubricating grease to individual lubricating points.
4. Remove the rust inhibitor in the fan pulley groove, install the belt, and adjust tensioning degree of the drive belt according to technical requirements (See Instructions for Operation and Maintenance of Engine).
5. Install the battery, and apply Vaseline to the terminals.
6. Inspect whether electric circuits and pipelines are fastened.
7. Manipulate the tractor as per requirements specified in the Instructions.



**Important:**

For the reason that FL1804-2004-2204series tractors can be equipped with several kinds of engines, see "Instructions for Operation and Maintenance of Engine" for storage and re-use of the engine.

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## **11-Delivery Acceptance and Transportation**

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## 11.1 Delivery and Acceptance

When the user buys the tractor, the user should conduct acceptance of the machine purchased, and conduct inspection with respect to following aspects:

1. Inspect whether documents supplied with the machine are complete

The documents supplied with the machine include: instructions for operation of tractor, product certificate, three-guarantee (for repair, replacement and compensation of faulty products) service card, packing list for articles supplied with the machine and "technical document of engine supplied with the machine" (from the engine manufacturer), and tractor parts drawings. Check corresponding numbers on the product certificate, three-guarantee service card and "technical document of engine supplied with the machine" are consistent with that indicated on the machine.

2. Inspect whether the articles supplied with the machine are complete

Check the articles supplied with the machine as per the packing list for articles supplied with the machine. The articles supplied with the machine include spare parts and tools supplied with the machine. The articles supplied with the machine base on the requirements specified in the "Technical Document of Engine" (in case of any question, contact the dealer).

3. Inspect whether the machine is in good condition.

After the machine is transported, its technical conditions may vary, so the user may further confirm condition of the machine during purchase.

## 11.2 Transportation

During transfer of the tractor, it is required to strictly follow traffic rules if the tractor is driven and a distance of at least 60m between the tractor and another vehicle should be kept to avoid collision arising out of any accident;

If the tractor is loaded onto a trailer for transportation, following points should be met:

1. When loading/unloading the tractor, a flat place should be selected.
2. The tractor should be loaded/unloaded with the help of a special loading/unloading platform.
3. An assistant must be designated to provide guidance in the site, so that no unauthorized personnel approaches the site.
4. After loading, put the suspension lever to the lowest position, apply the hand brake, engage the reverse gear, remove the key, lock the door, and turn off the main power supply switch.
5. Use a wire to fix the four tires in an 8-shaped manner, and have the tires secured with wedge blocks, and pull the rear axle beam with a wire. Do not bind the belt or iron chain to the steering hydraulic oil cylinder or front drive shaft and other tractor parts that may be damaged.
6. Pull the rear view mirror inward as far as possible, and if necessary, remove it, and must ensure that the hood and cab door and windows are closed. For the tractor model with a safety frame, the safety frame can be folded and secured firmly wherever necessary.
7. When passing through a tunnel or bridge, take extra care that its height exceeds the specified height limit, and the tractor should be decelerated during cornering.
8. During unloading, first release the hand brake, engage the forward gear, and drive the tractor away from the trailer at minimum speed.
9. For the tractor model with a turbocharger, cover the exhaust pipe end to protect the rotor being rotated under influence of wind, resulting in damage to the bearing that is not lubricated in this case.



**Danger:**

When loading the tractor onto the transport vehicle, do not enter the loading area.



**Warning:**

When loading/unloading the tractor, the parking brake of the transport truck should brake the vehicle firmly and the front/rear wheels are fixed securely to avoid sudden startup of the truck resulting in risk in roll-over of the tractor or falling of the operator.



**Warning:**

When loading/unloading the tractor, the tractor should drive at minimum speed to avoid risk in roll-over or falling of the tractor resulted from excessively high speed






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## **12-Disassembly and Disposal**


When service life of the whole machine expires, hand the machine over to the licensed recovery company for disposal to ensure your personal safety and protection of the social environment.


The parts and assembles should be dismantled from the upper to lower, and from exterior to interior. When dismantling a large object or heavy object, a special hoisting device must be used.

The battery should be handed over to the professional battery recovery company, and the waste lubricating oil should be disposed properly in a centralized manner, and cannot be poured at any place at will, so as to avoid environmental pollution.

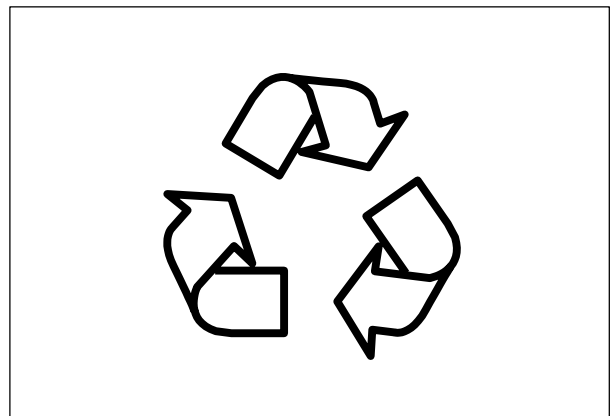
	<p><b>Warning:</b></p> <p>The battery is a maintenance-free type, whose electrolyte is corrosive and cannot be spilled into eyes and onto skin and clothes; in case of spillage to human body, clean it with clear water, and go to the hospital for treatment as soon as possible.</p> <p>Dismantling the discarded and damaged battery is prohibited, but should be carried out by a professional disposal organization.</p>
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	<p><b>Warning:</b></p> <p>The fuel oil is a kind of combustible, and during disposal, smoke and open fire should be prohibited!</p>
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	<p><b>Warning:</b></p> <p>When dismantling the large object or heavy object, must use a special hoisting tool and pay attention to personal safety!</p>
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	<p><b>Danger:</b></p> <p>Without special dismantling tool and actual operating experience, improper placement during and after dismantling may cause personal injury.</p>
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- Improper disposal of waste oil liquid and waste will threat the environment and ecology.
- When draining the waste fluid, a leakage-proof container should be used; it is prohibited to use a food or beverage container, so as to avoid drinking by other person, causing accidental injury.
- It is prohibited to pour waste down to the ground and into water pipe and to discharge waste into other water sources.
- The waste lubricating oil, fuel oil, refrigerant, brake fluid, filter element or battery that has potential hazard should not be discarded at will; please consult local environment protection department or recovery center to adopt correct method to recycle or dispose the wastes.



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# **13-Warranty Contents**

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## 13.1 Basis for Products Warranty

FL1804-2004-2204 wheeled tractors are warranted according to following documents and regulations.

The regulations on repairing, replacement and return of goods for agricultural machine products comes into effect on June, 2010:

Quality Law of the People's Republic of China;

Law of the People's Republic of China on the Protection of Consumer Rights and Interests.

## 13.2 Non-warranty Conditions

According to relevant regulations, warranty is not given in some conditions. For details, see the chapters related to three-guarantee service card for the Series tractors.



**Important:**

Some behaviors may invalidate the warranty conditions. For details, see the Three-guarantee Service Card.



**Important:**

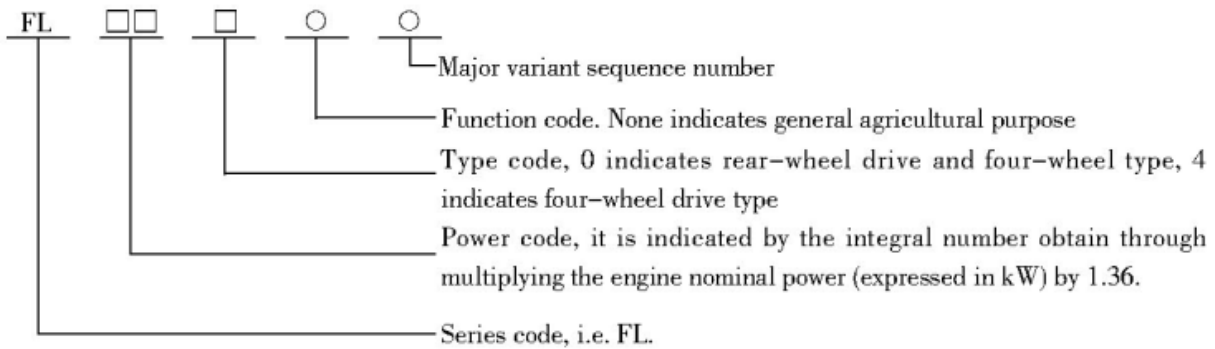
If the user modifies the tractor or uses it for other purposes other than that specified in the instructions, the tractor will not be covered under the warranty.

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## **14-Main Technical Specifications of the Tractor**

## 14.1 Product Model

The meaning of the Series tractor product model is as follows:



Corresponding power is as follows:

Power corresponding to the product model:	
FL1804 wheeled tractor	Power rating of 132.4kW(kilowatt) [180h]
FL2004 wheeled tractor	Power rating of 147kW(kilowatt) [200hp]
FL2204 wheeled tractor	Power rating of 161.8kW(kilowatt) [220hp]

Executive standard:

**GB /T 15370.3 General requirement of agricultural tractors - Part 3: wheeled tractors above 130 kW**

## 14.2 Product specifications

Item	Unit	Technical parameters			
		FL1804	FL2004	FL2204	
Type	—	4×4 wheeled tractor			
Rated traction force	kN	49	55	61	
Overall dimension	Length (including front ballast and rear hitch)	mm	5150	5150	5350
	Width (common wheel track, and measured from outer edge of standard tire)	mm	2510		
	Height (Measured from the ground to the top of the muffler, and standard tires)	mm	3207		
Wheel base	mm	2805			

Wheel track (standard tire)	Front wheel	mm	1680、1730、1790、1840、1860、1910、1970、2020	1680、1730、1790、1840、1860、1910、1970、2020	1680、1720、1770、1830、1880、1900、1950、2010、2060	
	Front wheel adjustment mode	—	Stepwise adjustable			
	Rear wheel	mm	1790、1800、1820、1830、1870、1900	1790、1800、1820、1830、1870、1900	1796、1826、1866、1876、1896、1906、1946、1976、2196、2226、2266、2296	
	Rear wheel adjustment mode	—	Stepwise adjustable			
Ground clearance	Minimum ground clearance	mm	480( Bottom of protection cover for connecting main and auxiliary fuel tanks )			
	Agricultural ground clearance	mm	430			
Radius of turning circle	When conducting single-side braking	m	5.5±0.2			
	When no single-side braking is conducted		6.3±0.2			
Structure mass		kg		6470	6960	
Min. operating mass		kg	6350	6350	6350	
Mass distributing	Front wheel	kg	2630	2630	2630	
	Rear wheel	kg	3720	3720	3720	
Ballast	Front ballast	kg	400	80	400	
	Rear ballast		830		510	
Transmission system	Clutch		—	14 inches dry-type constantly-engaged		
	Transmission		—	4× (2+1) ×3 mechanical/combined type		
	Rear axle	Main drive	—	Helical bevel gear pair		
		Differential unit		Four-planet-wheel, closed type		
		Differential lock		Pin type		
		Rear final drive		Single-stage planetary gear type		
Front drive	Front central	—	Helical bevel gear pair			

		drive			
		Differential unit	—	Four-planet-wheel, closed type	
		Differential lock	—	Non-slip /45%	
		Final drive	—	Single-stage planetary gear type	
Running System	Frame		—	Without frame	
	Tire pressure	Front wheel	kPa	160	
		Rear wheel	kPa	160	
	Tire specification	F/R	—	420/85 R28" / 520/85 R38"	
Brake system	Service brake		—	oil bathed/ hydrostatic	
	Parking brake		—	oil bathed, hand brake	
	Trailer brake		—	Optional, trailer hydraulic brake	
Steering system	Method		—	Front wheel hydraulic steering	
	Steering unit		—	Cycloid rotary valve type full hydraulic steering	
	Steering oil pump		/	Gear pump 16mL/r	
Working device	Hydraulic system type		—	Open center,semi-seperated/seperated	
	Hydraulic oil pump		—	Gear pump 28ml/r	
	Distributor		—	Slide valve type	
	Cylinder	Diameter × Stroke	mm	Main cylinder 145X149.4 auxiliary cylinder 50X173.1/ double-acting cylinder 110X182	
		Type	—	Single acting/ double-acting	
	Hitch point dimension		mm	Rear three-point linkage: Class 3 Connecting hole× width: Upper hitch point: φ25.5×51 Lower hitch point: φ28.7×45	
	Plowing depth adjustment method		—	Draft control, position control, draft and position comprehensive control,, float control	
	Maximum lifting force of the system (610mm after hitch point)		Kg	≥4700 (non-enforced type) /5282 (enforced type)	
	Opening pressure of safety valve		MPa	19±0.5	
	Hydraulic output	Type		—	Multi-way hydraulic output
		Quantity		—	Standard configuration 3groups
Specifications		—	M22×1.5		




PTO shaft	Type	—	Rear independent type		
	Specifications	—	Type 1 (φ38X8 or φ35X6 or φ35X21)		
	Rotation speed	r/min	540/1000 ( optional 760/850)		
	Lower limit of nominal power of PTO shaft	kW	112.5	125	137.5
Towing device	Connecting pin Diameter	mm	40		
	Connecting pin length	mm	215		
Electric instrument system	Electrical system		—		
	Power generator	Model	—	A510T1-3701100B	
		Voltage	V	14	
		Power	kW	1.4	
	Regulator	Model	—	Built-In alternator	
		Regulating voltage	V	14	
	Starter	Model	—	A70000-3708100	
		Voltage	V	12	
		Power	kW	5.5	
	Storage battery	Model	—	6-QW-200	
		Voltage	V	12	
		Capacity	A·h (Amper-hour)	200	
		Quantity	—	1	
	Electric instrument system	Light and signal device	Front headlamp	—	12V, 60W/60 W
Light and signal device		Front steering light	—	12V, 21 W, 2units(cabins)	
		Rear combination light	—	Rear position light 10W, left and right turn indicator 21 W, brake light 21 W, reflector (red), one on each side	
		Working light	—	12V,55W, model with cabin has 4 units; model with flat deck has 2 units	
		Trailer socket	—	Seven-hole socket with a plug	
		Combination instrument	—	With 1 water temperature, 1 fuel gauge, and 1 tachometer	

Monitoring and warning device	Warning device	—	<p>1. Instrument alarm indicator light: air blocking alarm; brake liquid level alarm; brake faults(optional for airbrake model), air suction filter blocking alarm(optional for electrohydraulic control); engine failure warning light; left and right turn indicator lights; dipped beam indicator; charging indicator light; pre-heating indicator; indicator lights for position lights; parking brake indicator.</p> <p>2. signal lamp and device: brake light; left and right turn indicator lights; front and rear position light; reflector; warning beacon on vehicle top;</p> <p>3. Safety warning label;</p>
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### 14.3 Main Specifications of Engine

Items	Unit	FL1804	FL2004	FL2204
Manufacturer	/	Guangxi Yuchai Machinery Co., Ltd.		
Trademark and brand	/	Yuchai		
Model	/	YCA07200-T302	YCA07235-T301	YCA07260-T305
Number of cylinders	/	6		
Cylinder diameter ×stroke	mm	108×125		
Displacement	L	6.871		
Compression ratio	—	17.5:1		
Rated power	kW	132.4	147	161.8
Rated speed	r/min	2300		
Max. torque/speed	N·m/ r/min	700-735/1700	735/1700	770/1700
Fuel consumption rate in rated condition	g/kW·h	≤250		225
Oil consumption rate in rated condition		≤1.0g/kw.h		≤0.5g/kw.h
Lubricating method	—	Forced lubrication		
Starting method	—	Electric startup		
Cooling method	—	Water cooled		
Air filter type	—	Dry -type		

	<p><b>Important:</b></p> <p>The parameters given in the technical specifications table are based on standard configuration.</p>
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### 14.4 Theoretical Speed of Tractor

FL1804/FL2004/FL2204

Unit: km/h

16F+12R Creeper						
Forward gear						
Gears	Low gear			High gear		
	S	N	F	S	N	F
1	0.43	-	-	1.24	3.93	12.47
2	0.64	-	-	1.85	5.86	18.62
3	0.95	-	-	2.75	8.73	27.71
4	1.34	-	-	3.85	12.23	38.84
Reverse gear						
1	1.03	3.29	10.44	-	-	-
2	1.54	4.91	15.58	-	-	-
3	2.30	9.30	23.18	-	-	-
4	3.22	10.23	32.49	-	-	-

16F+12R Ultra creeper						
Forward gear						
Gears	Low gear			High gear		
	S	N	F	S	N	F
1	0.20	-	-	1.24	3.93	12.47
2	0.30	-	-	1.85	5.86	18.62
3	0.44	-	-	2.75	8.73	27.71
4	0.62	-	-	3.85	12.23	38.84
Reverse gear						
1	1.03	3.29	10.44	-	-	-
2	1.54	4.91	15.58	-	-	-
3	2.30	9.30	23.18	-	-	-
4	3.22	10.23	32.49	-	-	-

24F+12R Common gear						
Forward gear						
Gears	Low gear			High gear		
	S	N	F	S	N	F

Gears	S	N	F	S	N	F
1	1.01	3.22	10.23	1.24	3.93	12.47
2	1.51	4.81	15.28	1.85	5.86	18.62
3	2.25	7.16	22.73	2.75	8.73	27.71
4	3.16	10.03	31.86	3.85	12.23	38.84
Reverse gear						
1	1.03	3.29	10.44	-	-	-
2	1.54	4.91	15.58	-	-	-
3	2.30	9.30	23.18	-	-	-
4	3.22	10.23	32.49	-	-	-



**Important:**

1. The above figures are based on the theoretical speed of 2300r/min (RPM) engine with standard rear tires (520/85r38).
2. The parameters given in the technical specifications table are based on standard configuration.



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## **15- Appendix**

## 15.1 Coolant

### Protective solution and anti-freezing agent

Appropriate coolant shall be used to protect the engine from being damaged.

The anti-freezing agent listed in the table of lubricating agent is the single ethylene glycol liquid. The aqueous solution of this liquid can be used as anti-freezing agent and coolant simultaneously and can be used to protect metal components of engine cooling system from being corroded. Anti-freezing solution does not contain nitrite, amine or phosphate (without NAP).

The cooling system shall be checked regularly.

### Characteristics and performance

- Anti-corrosion
  - Reduce the early damage and the requirements of replacing components of cooling system caused by early damage. Efficiency of cooling system can be maintained by prevent the forming of sediments and dirt.
- Optimization of heat transfer.
  - Reduce the preheating time of engine to increase the power and efficiency of engine.
- Reduce the freezing point
  - Expensive maintenance caused by worn components of cooling system shall be avoided.
- Enhance the boiling point
  - The risk of overheating in harsh environment is reduced.
- Without NAP
  - Environmental influence is little. Advanced technology of corrosion inhibitor is adopted to protect the components of engine.
- Hard water stability
  - The best feature can be maintained even it is diluted by tap water.
- Plan for prolonging service time
  - Permitted interval for replacing coolant is longer.

### Specifications

This coolant conforms to the latest international standard:

**Table 15-1**

BS 6580 (1992)
AFNORNFR 15-601 (1991)
ASTM D 3306

### Specifications permitted by the main producer or meeting the standard of main producer:

**Table 15-2**

KHD	Meet H-LV 01610188BS 6580 standard (1992)
MAN	324NF
Mercedes-Benz	325.0; DBL7700.00
Scania	Meets TB1451 standard
Volvo	Meets 1286083 standard
German federal	TK-BA2-3-6850-008

### Typical chemical and physical characteristics

**Table 15-3**

Concentrated solution
-----------------------

Appearance	Clear liquid
Color	Blue/Green
Density at 20 °C of ASTM D1122 standard	1.120 - 1.124 g/cm <sup>3</sup>
Dynamic viscosity at 20°C specified in DIIN51562 Standard	24-28 mm <sup>2</sup> /s
Refractive index at 20°C specified in DIIN51423 Standard	TK-BA2-3-6850-008
Boiling point specified in ASTM D1120 Standard	>165 °C
PH value of ASTM specified in D1120 Standard	7.1 - 7.3
Redundant alkalinity specified in HCIN/10ASTM D1121 Standard	13 - 15 ml
Dust content specified in ASTM D1119 Standard	Max. 1.5%
Water content specified in DIN51777 Standard	Max. 3.5%
Mutual solubility with water	Fully dissolved
Mutual solubility with hard water	Non-sediment
Mutual solubility with other anti-freezing agent	Dissolves in other commercial product
ASTM D1177 freezing point	-40°C (50% in water)
	-27°C (40% in water)
	-20°C (33% in water)
	-17°C (30% in water)
DIN51583 condensation point	-45°C (50% in water)
	-23°C (33% in water)
Frost prevention level can be obtained by calculating arithmetic mean value of the freezing point and the set point.	
Foaming performance specified in ASTM D1881 Standard	Max. 50ml/1-3s
Rubber swelling 80°C/ 168h-SBR and EPDM (50% soluble in water)	0-3% of the results is similar to the results obtained in pure water.

### Typical chemical and physical properties of coolant water mixture

Properties of water shall conform to the properties specified in the following table:


Table 15-4

Part of concentrated liquid (volume ratio)	Part of water (volume ratio)	Result of dilution	Frost preventing point (°C)	Viscosity (mm <sup>2</sup> /s) at 0°C	Viscosity (mm <sup>2</sup> /s) at 80°C
1	2	33% in water	-20.5	3.0 - 5.0	0.5 - 0.8
1	1	33% in water	-41.5	7.0 - 10.0	0.9 - 1.1

### Concentration of the anti-freezing solution delivered to users

The cooling system of the tractor shall be filled with the anti-freezing solution including 45% of coolant and 55% of water during delivery. This concentration can protect components even when the temperature dropped to minus 35 °C.

Percentage of anti-freezing agent in coolant shall be suitable for various temperatures.

	<p><b>Important:</b></p> <p>Please contact authorized Service Center when the temperature is below minus 35 °C.</p>
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### Safety information

The solution is divided into the class of “ingestion of harmful substances” for containing prohibited single ethylene glycol. It is not inflammable but can be ignited. There is a substance with weight of 25ppm in anti-freezing solution, which tastes bitter when it is eaten mistakenly. This substance only works in concentrated



product. It is necessary to add 25-30ppm (weight) to achieve the same effect during dilution.

## 15.2 Matched Agricultural Implements

Table 15-5

Category	Tractor model	Matched implements	Implements model	Main technical parameters	Supporting enterprises
Plowing machines	FL1804 FL2004 FL2204	Four-blade plough	MULTY-MASTER121	Operation width: 40cm Ground clearance of plow beam:75	Maschio (qingdao) Agricultural Machinery Co., Ltd. Kuhn
		Rotary plough	EL282-300	Operation width: 401cm Transportation width: 435cm Tilling depth: 22cm	
		Power driven harrow	DM-3500	Operation width: 350cm Transportation width: 355cm Tilling depth: 28cm	
		Stubble cleaning harrow	UFO300	24 disks, diameter of disk 610mm	
		Bulk subsoiler	ARTIGLIO300	Operation width: 300cm Transportation width: 305cm Tilling depth: 65cm	
		Field stubble cleaner	RM-480R	Operation width: 480cm Transportation width: 250cm(foldable), Tilling depth: 22cm	
Seeder	FL1804 FL2004 FL2204	Precision seeder of air-aspiration type	MT line	Line number: 12 Maximum line spacing: 55cm (adjustable) Capacity of seed case: 36L	Maschio (qingdao) Agricultural Machinery Co., Ltd. Kuhn
Stalk pulverizer	FL1804 FL2004 FL2204	Stalk pulverizer	TORNADO 230 Operation width: 280cm Transportation width:300cm Number of blades: 56		Maschio (qingdao) Agricultural Machinery Co., Ltd. Kuhn

### Special tips:

- Before selective purchasing of agricultural implements, the types and models of matched agricultural implements shall be selected preliminary by referring to this list according to the operating conditions (soil resistance, agricultural requirements etc.) in operation area, then consult dealers, manufacturers of machines, and read “Instructions for Utilization and Maintenance” of machines to get familiar with the structure, performance, usage, range of application of agricultural implements etc.;
- Models of agricultural implements and other main technical specifications shall be determined according to the operating conditions (soil resistance, agricultural requirements etc.) in operation area and advisory opinions, to achieve reasonable matching. The unit will be affected adversely if the matching is unreasonable.
- Users shall determine working speed, working width etc. reasonably for the working performances and effects of the same tool in different operating conditions (soil resistance, agricultural requirements etc.) are different.



**Notice:**

Before use of the supporting implement, the operator should carefully read "Instructions for operation and maintenance of the implement", and familiarize himself/herself with its structure, performance, operating method, and reasonable supporting devices, so as to avoid damage to the implement and personal injury.

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Dear users:

Thank you very much for your purchase of FL1804-2004-2204 series wheeled tractors, we are willing to serve you wholeheartedly, solve your problems in use timely and effectively and furthest satisfy your requirements for considerate services.

Now send the "User Information Feedback Form" to you along with the operation manual; please fill it in with regular scripts. Sent by registered airmail to: "Three Guarantees" of Deutz-Fahr Machinery Co., Ltd. in Shandong Linshu County Economic Development Zone, Postcode: 276715 This Company will enter the related information in the sheet of your feedback into the computer for storage, in order to implement high-quality "Three Guarantees" services.

For your cooperation and strong support, we express our heartfelt thanks!

## User Information Feedback Form

Model of product		Tractor Factory No.			Engine Manufacturer	
Engine No.		Manufacture Date			Date of purchase	
User's Name		Age		Level of Education		Length of Driving Service
Home Address				Tel		Postcode
Main Application				Tractor Load		
Name and Status of Damaged Parts						
Opinions and Suggestions for Improvement						
Improvement Opinions and Suggestions						

**Note:** This sheet of feedback should be truthfully filled in by the owner (or driver), in order to understand the use status of the tractor and do well in customer's services. Any copy of the feedback sheet is effective.