

FL35-70HP Series Wheeled Tractors

Operation Manual

FL354/FL354C

FL400/ FL400C/FL404/FL404C

FL450/FL450C/FL454/FL454C

FL500/FL500C/FL504/FL504C

FL554/FL554C/FL554-1/FL554C-1

FL604/FL604C/FL704-1/FL704C-1

Deutz-Fahr Machinery Co., Ltd.



Table for Product Identification Marks

Product brand:
Model of product:
Tractor Factory No:
Engine Factory No:
Chassis Factory No:
Dealer:
Delivery date:
Name of manufactory: Deutz-Fahr Machinery Co., Ltd.

Notice: 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 FL35-70HP Series Wheeled Tractors

Prepared by Deutz-Fahr Machinery Co., Ltd.

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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

	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.
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- 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.
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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.

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

Expected Use

- FL35-70HP series wheeled tractor is a middle-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 this brand 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 15370.1 General requirement of agricultural tractors - Part 1: under 50 kW wheeled tractors

GB/T 15370.2 General requirement of agricultural tractors - Part 2: 50 kW~130 kW wheeled tractors

- The manual is mainly compiled based on existing products, which has mainly introduced universal 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 Mark
- Product Description
- Operation Instructions
- Wheels
- Electrical System
- On-board Spare Parts, Tools and Quick-wear Parts
- Maintenance Specification
- Troubleshooting
- Storage and Starting of the Tractor
- Delivery Acceptance and Transportation
- Disassembly and Disposal
- Main Technical Specifications of the Tractor
- Warranty Contents
- 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 ²	千克力/平方厘米
17	Temperature	°C	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

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.



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

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.

The tractor is used in a safe and reliable way.



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

The operation 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.

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. You shall guarantee utilization and repair ways selected by you will not damage the tractor or cause danger.

You shall guarantee 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.

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

2.1. Read Before Operation

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

Fig. 1-1

2.2.

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

2.3.

3. General Safety Regulations

- You shall abide by all general safety and accident prevention regulations in addition to commands in the *Operation 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 Rollover Protection System, when the Rollover Protection System is at low position, safety belt cannot be fastened.

Fig. 1-3

Fig. 1-4

Fig. 1-5

- Check whether the tension of the safety belt is suitable or not. Guarantee 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.

- 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.

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



Danger:

You shall guarantee that rubber protective layer is installed on relay of starting motor.

-
- 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 down and the starter key will be removed. Oil cannot be filled when the engine is operated.
- Fuel oil 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 oil or engine oil overflows, it will be cleared with clean duster cloth.
- 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.

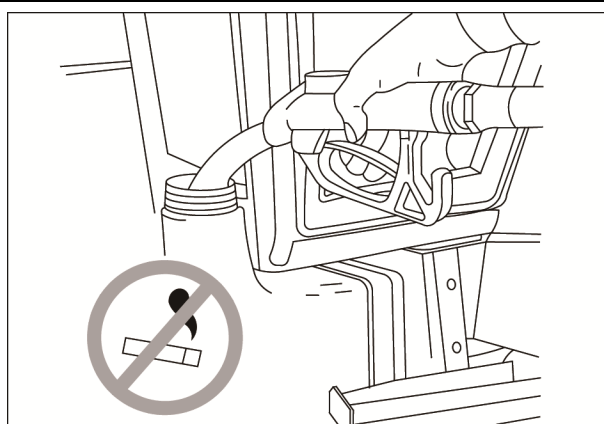


Fig. 1-7

- Only specific tractor (as per local law) can be equipped with stipulated additional passenger seat. Otherwise, it is prohibit to transport passenger.

- Passenger seat allows one passenger to travel comfortably under safe condition, but cannot interfere, affect and hinder driver to operate. Child 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 activated, engine will be shut off, the tractor will be at 1st gear (on the tractor with implement gearbox). 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”.

Fig. 1-9

- When the tractor in under operation, any person cannot be close to the drive axle, hook of the trailer, traction rod, connecting arm, power output shaft, lifting oil cylinder, belt, pulley and any other moving parts. Please guarantee 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 traveling, 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.

	Danger: Engine should be shut off and ignition key removed when there is independent repair work for cardon shaft and PTO shaft.
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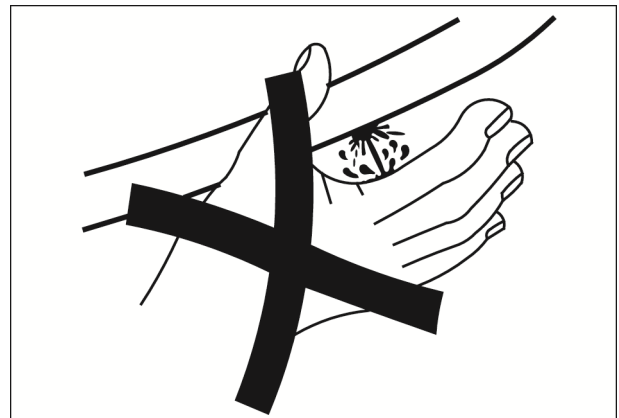
- The tractor may be equipped with radar to measure speed to the ground. Radar system will send low strength radio wave. When the radar is under operation, you shall keep away from emission area.

Fig. 1-10

- 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 oil 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.



- 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).

4. Accident Prevention and Safety



Notice:

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, which will be installed before starting the tractor.

5.

5.1. Safety clothes and equipment

When operating, proper protective clothes and safety equipment will be worn.

➤ **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;
- ◇ Reflective clothes;
- ◇ Safety shoes;



Fig. 1-13

- It is wise to install 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

5.2. 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 *Operation 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.

5.3. Protective and safety equipment

- Guarantee all safety equipment of the tractor is properly installed at their positions. Guarantee 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;
 - ◇ Rearview mirror;
 - ◇ Slow traffic sign, additional protective device, additional lamp and identification;
 - ◇ Triangle warning sign for danger.

5.4. 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. Overturning 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 will be conducted 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.

- Guarantee all implements or accessories are installed properly. If it is PTO drive implement, the revolving speed per minute of PTO must be consistent with the revolving speed of the implement.
- Check will be conducted to confirm 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 *Operation Manual* will be executed.
- Performances of traveling and parking brakes will be checked. If necessary, parking brake wire will be adjusted or contact your authorized service center.
- Check and guarantee that the cover of PTO shaft have 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.



Notice:

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.

-
- 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.
- Guarantee all flexible pips are installed correctly.
- Cooling device and system of the engine will be checked.



Notice:

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.

5.5. 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).

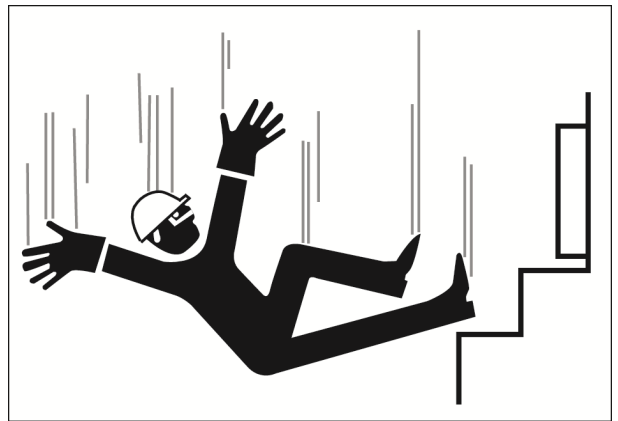


Fig. 1-15

- 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 stopping the tractor, below operations will be executed:**
 - Activate 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.
 - Stop engine.
 - The tractor equipped with implement mechanical gearbox 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.

5.6. Parking 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.

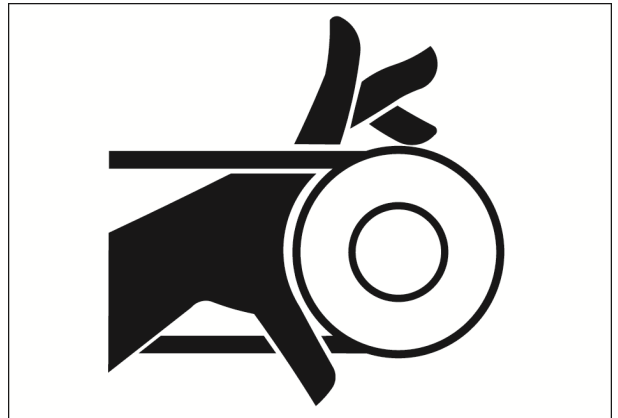


Fig. 1-16

◇

➤ **Parking when engine is shut off.**

- Activate 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.
- Stop engine.
- Shift to gear I if the tractor that is equipped with implement gearbox.

➤ **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
- 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.

Fig. 1-17

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 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 pad.

>

5.7. Clean the tractor

- Keep clean under bonnet 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.

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, down slope 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 overturning 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, you shall check that all control devices of the tractor are 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 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".

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 in accordance with demand.
- Fasten the safety belt.
- Activate 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.

5.2. Indicator lamp will be checked

- After starting, all indicator lamps and instruments will be checked. Check will be conducted 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.

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

5.4.

	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.
--	---

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 activated, 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 gearbox is placed at neutral gear, the parking brake is activated, 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 power output axle is rotating. It will cause serious injury or death.

-
- Check that the 3-point linkage is adjusted correctly (see paragraph "Adjustment of the 3-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.



Notice:

Implement on front end (with fork or bucket) must be equipped with load control device (round bales, rolls of fencing, wire, etc.) to prevent the load from overturning down from the lift arms onto the driving position and crushing the driver. driver arm when it is raised. Objects and loads that are not adequately secured may fall and injure personnel near the tractor.

-
- 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.

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.

**Notice:**

When a trailers is hitched to the tractor, before you leave the driving seat remember to put all the controls in neutral, apply the handbrake, shut off the engine, engage first gear (if the tractor has a mechanical transmission) and remove the key from the 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.

-
- When trailers are hitched to the tractor, before you leave the driving seat remember to put all the controls in neutral, apply 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 closed and securely fastened. Never tow the tractor at speeds in excess of 10 kph. An operator must stay in the driving position to steer and brake the tractor.

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 connecting bolt 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, overturning 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 overturning danger.
- Lift all implements to their lowest transportation positions and lock at their positions.
- Disengage the power take-off 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 working lamp 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.

5.7. Overturning

	Notice: DO NOT disengage the clutch or change gear after starting to drive down a slope.
---	--

5.8.

	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 roll-over protection system (roll bar or cab) and seat belts. Its form is non-foldable overturning protection rack 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 indicate.

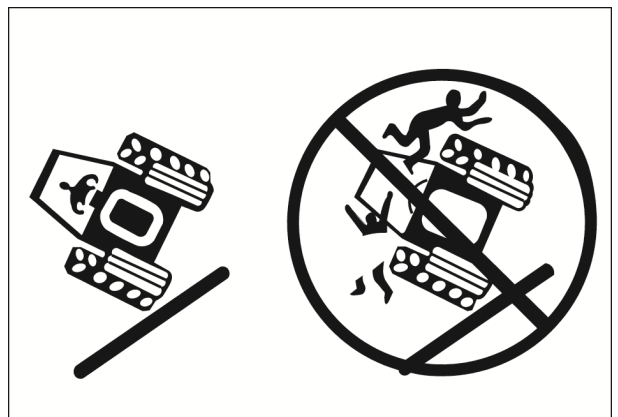


Fig. 1-19

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 overturning 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.

Fig. 1-20

- Always drive straight up or down slopes, as traversing slopes across the gradient could cause the tractor to overturn

- When going down or uphill (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.

- DO NOT freewheel down a slope with the clutch disengaged or the gearbox in neutral.

- When carrying out tasks requiring high tractive force, engage 4WD, if available

Fig. 1-21

- Only loads suited to the tractor power output 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 3-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.
- DO NOT use the tractor to herd animals.

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.
- Repair cannot be conducted when the engine is still under operation, when the tractor is still very hot or when the tractor is still under operation.

Fig. 1-22

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

6.2.

- Before operating the jack, all contents of the operation 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 underneath front support; other parts cannot be used to support it.

Fig. 1-24

1. Front support 2. Left half axle casting 3. Right half axle casting

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.

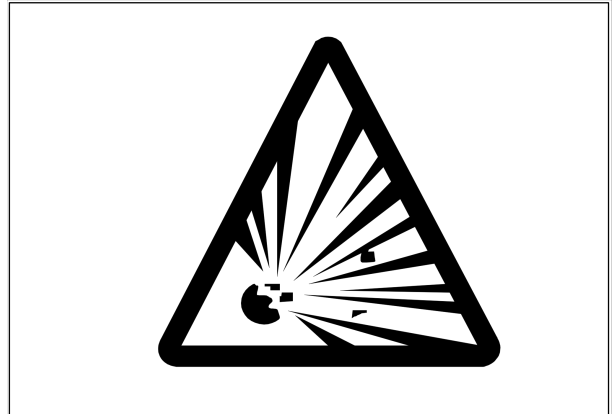


Fig. 1-25

- 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.

Fig. 1-26

➤ **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

6.3.

- 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

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

- 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

- 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 overturning 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).

6.4. Loosen the cover of the radiator

When the engine is still hot, you shall be very careful to open the cover of the radiator. After it has been under idle running for several minutes, the engine will be shut off for cooling. Then, the cover of the radiator will be loosened to the first level position. The cover① will be removed after reducing pressure.

Fig. 1-30

6.5.

	Notice: When clearing water tank, the engine should be shut off and fuel tank is cooled before clearing to avoid burning accident and damaging water tank.
--	---

6.5. Safely replace working liquid

- Braking oil tank will be regularly checked and the braking oil tank will be filled all the time. Guarantee 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 discard arbitrarily.

6.6. 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 operation manual. If necessary, you can entrust professional personnel to replace.
- When connecting other devices to the tractor, you shall carefully read safety sign and operation 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.

6.7. Placement of waste oil liquid and waste

Improper disposal of waste oil liquid and waste will threat the environment and ecology.

Fig. 1-31

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 oil, 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.

6.8.

7. Roll Over Protection System and Safe Cab

7.1. Roll over protection system

ROPS (roll over protective system) refers to structural elements that can prevent driver with safety belt protection from being injured when the vehicle is overturning.

At present, all tractors must be equipped with overturning over protective system or safe cab. However, if the driver has not been correctly used, existing safety equipment cannot guarantee complete protection.



Fig. 1-32

7.2.

7.2. Safety Cab

Cab, it is not only the driver's workplace but also an important 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.

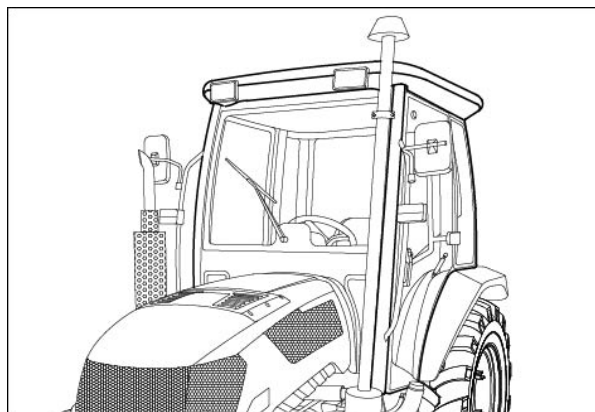


Fig. 1-33



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.

7.3.



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.

7.3. 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.

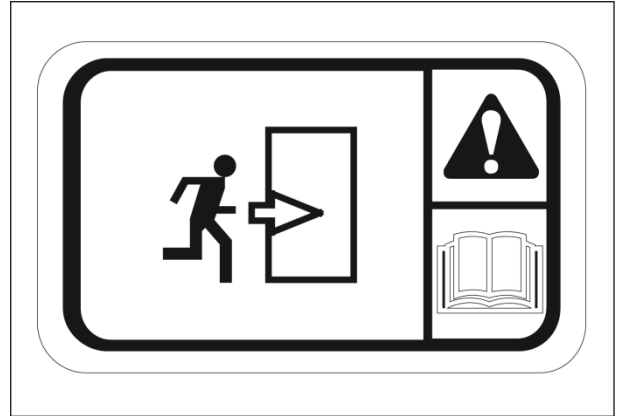


Fig. 1-34

7.4.

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

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

7.4. 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 drive 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 distributor before working so that it can install suitable protective devices.
---	---

7.5. 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 distributor before working so that it can install suitable protective device on the tractor.
---	--

7.6. 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⁻¹).
- ◇ 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.

	Danger: Suitable personal protective device will be used in accordance with requirements of laws and regulations of your country.
--	--

●

➤ **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/overturning over protective system	FL35-70HP Series
Protection type of hazardous substance (cab)	2

◇

7.7. 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.

8. Stop and Dispose the Tractor

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.

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, aluminium 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 lifting device will be used in accordance with relevant regulations and laws.
---	---

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.
---	--

10.

	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.
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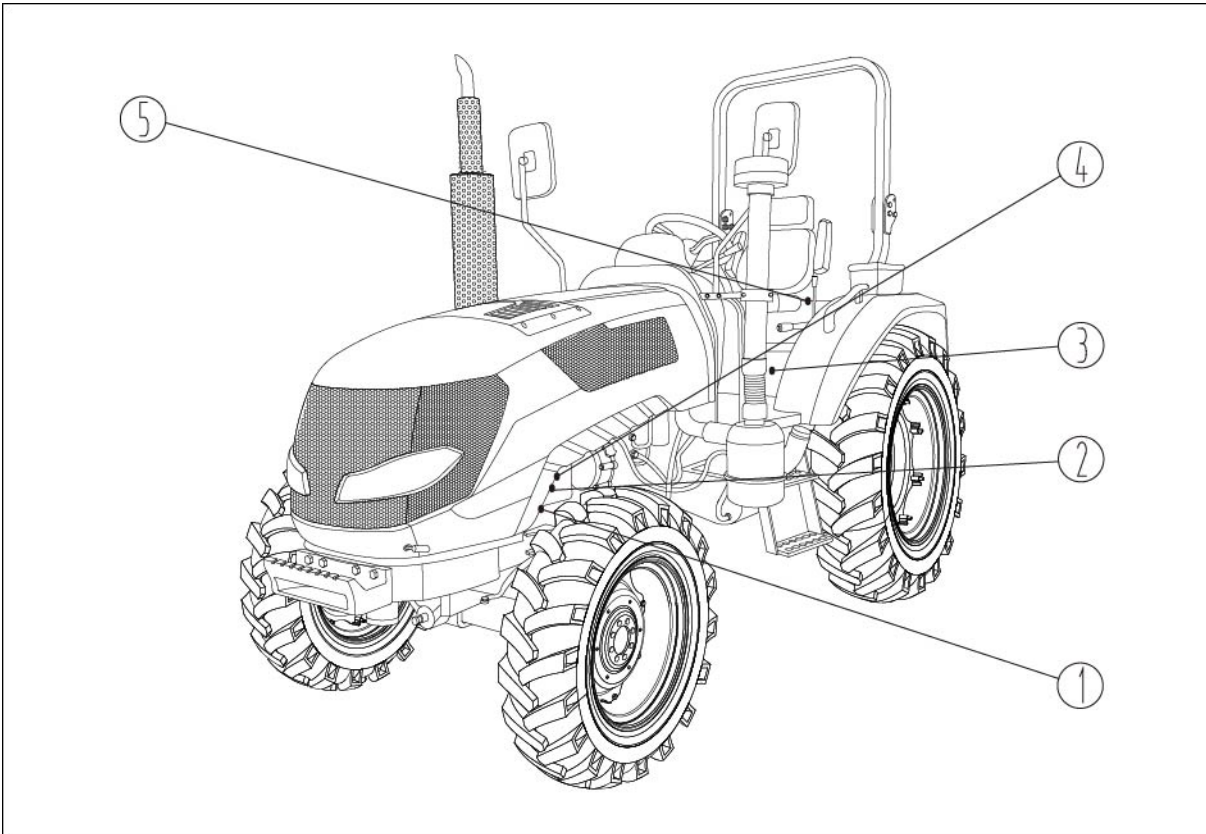


Fig. 1-35

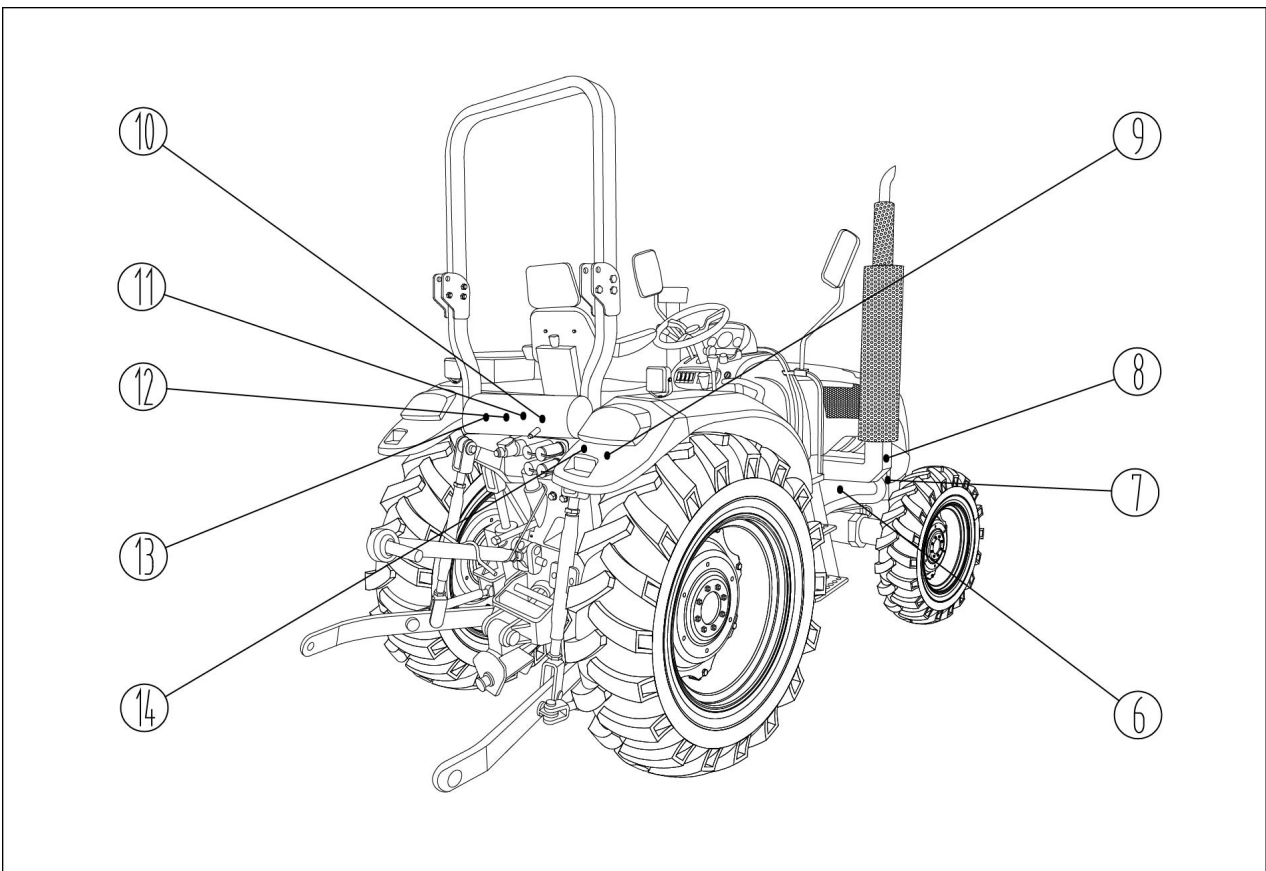


Fig. 1-36

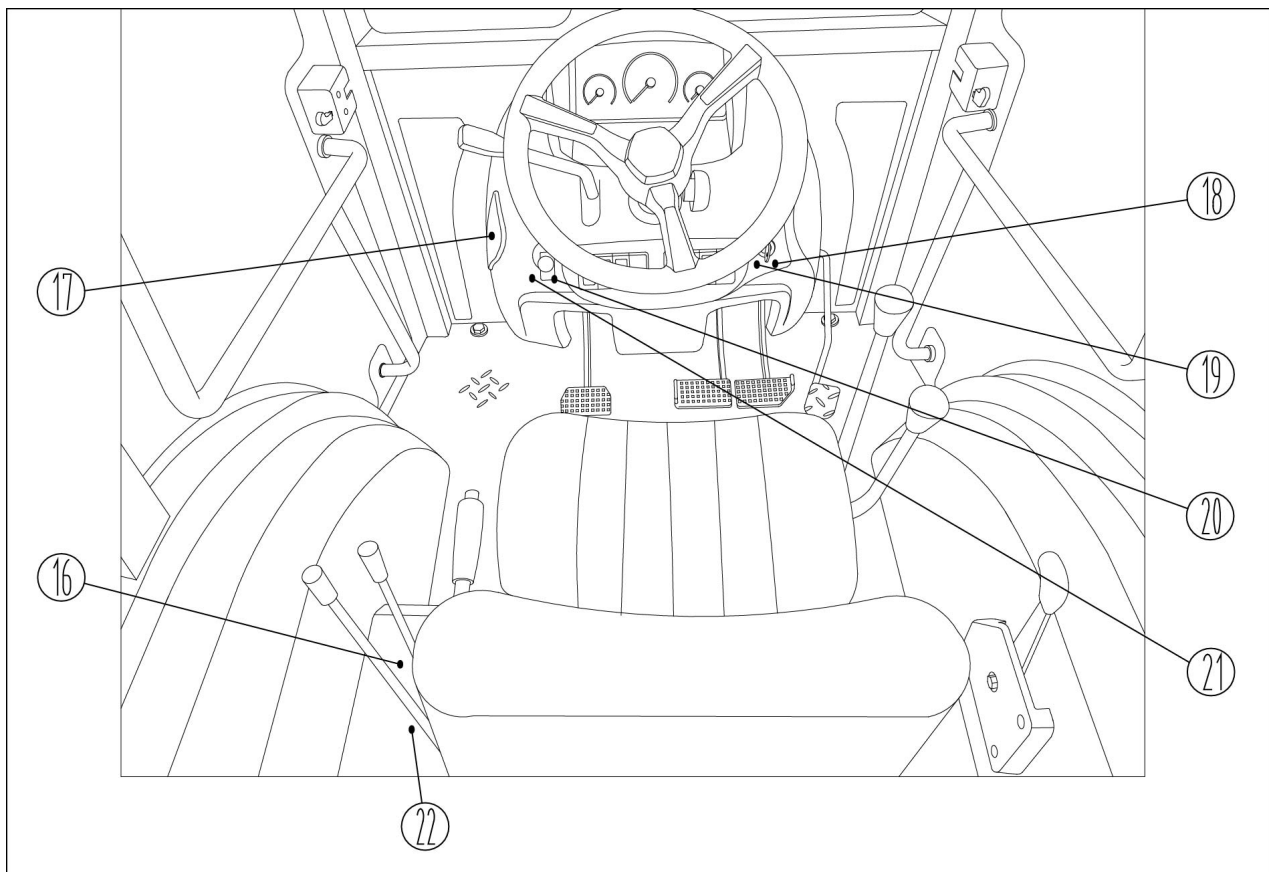


Fig. 1-37

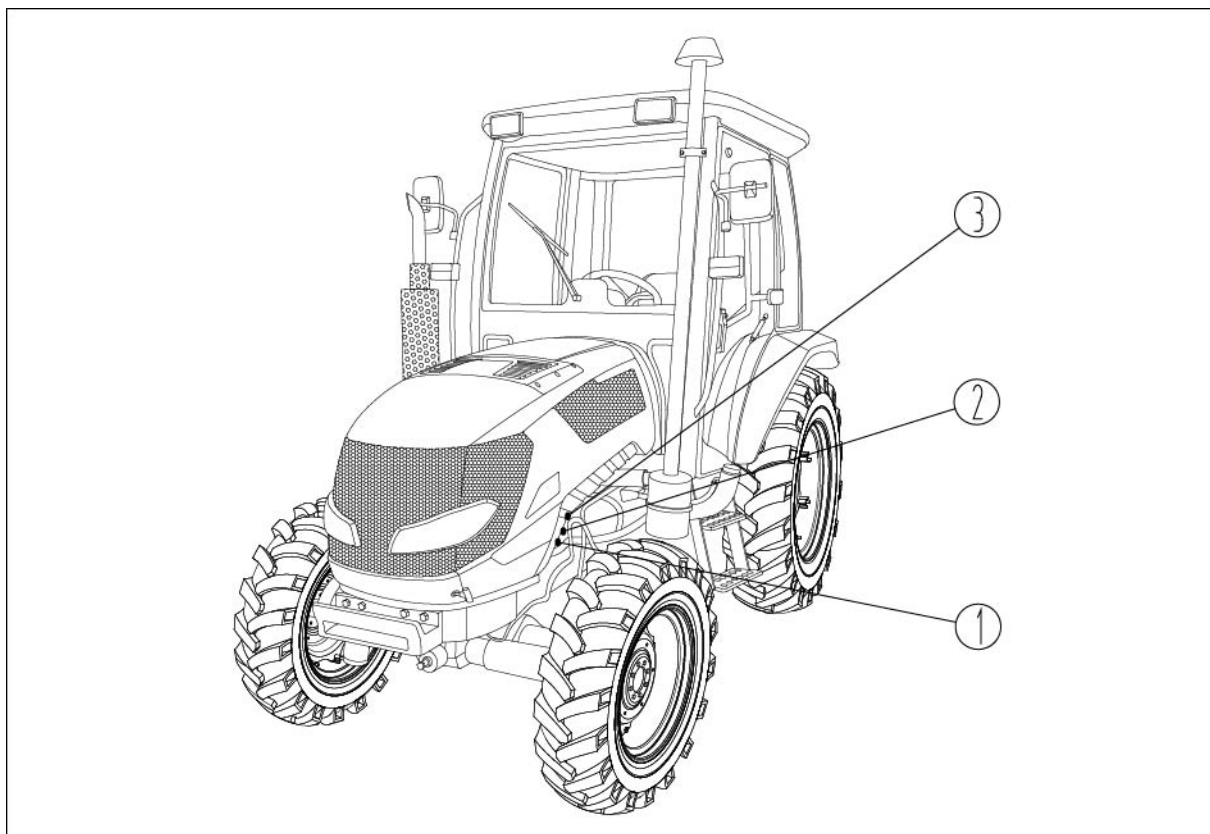


Fig. 1-38

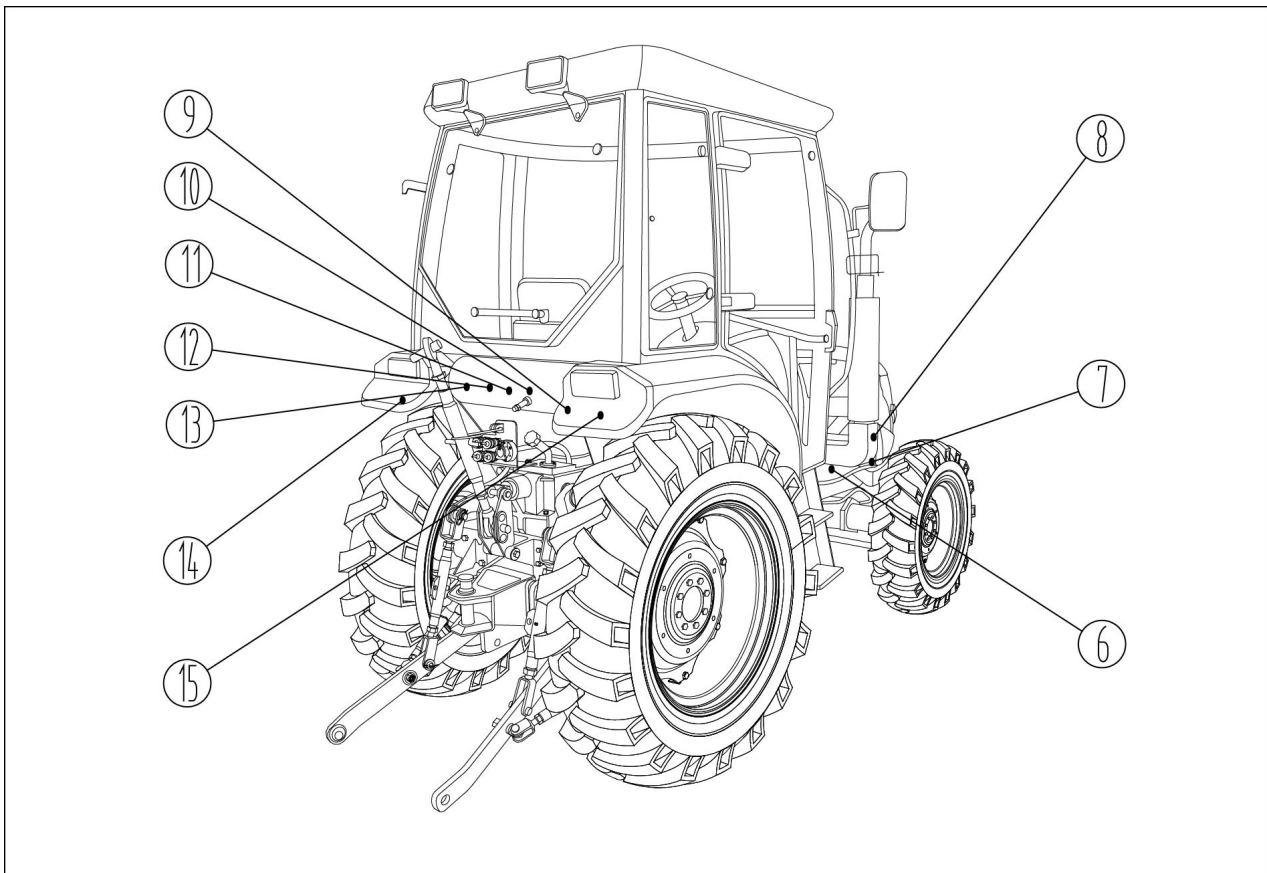


Fig. 1-39

1. Position: Near the storage battery.

Name	Meaning	Images
Identification of the storage battery	Battery electrolyte is highly corrosive.	

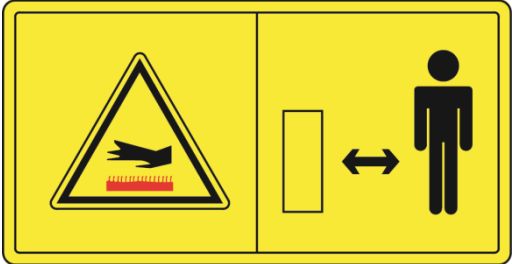
2. Position: On the radiator.

Name	Meaning	Images
Cooling system label	Drain all coolant from the engine before leaving the tractor not in service for a long period with ambient temperature $\leq 0^{\circ}\text{C}$.	 环境温度 $\leq 0^{\circ}\text{C}$ 长时间 停车时，应在发动机 怠速状态下将水排尽， 以免冻裂发动机和有 关零部件，否则应加 防冻液。

3. Position: Lower front of seat

Name	Meaning	Images
Transmission oil level detection label	Using an oil dipstick, regularly check the oil level at the end face of rear axle housing to avoid oil level falls below the lower limit of oil dipstick. Failure to do so could cause damage to the parts of power train.	

4. Position: Side of radiator

Name	Meaning	Images
Label indicating caution against scald caused by high temperature	You shall keep away from the heat surface of the machine when it is working to prevent personal injury. To prevent personal injury, do not ride or stand here.	

5. Position: Rear transverse board of floor

Name	Meaning	Images
------	---------	--------

Rear transverse board safety label	To prevent personal injury, do not ride or stand here.	 为 了 防 止 人 身 伤 害 ， 此 处 禁 止 乘 坐 和 脚 踏 。
---	---	---

6. Position: On the fixing plate of oil suction filter

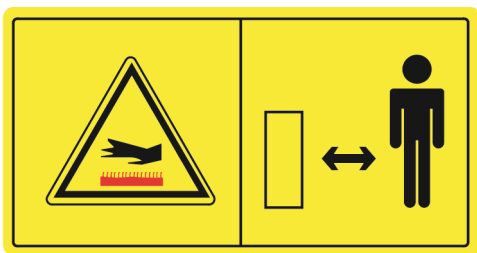
Name	Meaning	Images
Oil suction filter maintenance label	Clean the oil suction filter according to requirements. Check for damaged filter element and ring seal. Replace them promptly if any.	 吸油滤清器的保养 拖拉机累计工作125h进行首次清洗；此后工作累计每500h清洗一次，同时检查滤网、密封圈，若有损坏应及时更换。

7. Position: On protective cover of the generator.

Name	Meaning	Images
Safety warning label VII	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.	

8. Position: Outside the silencer

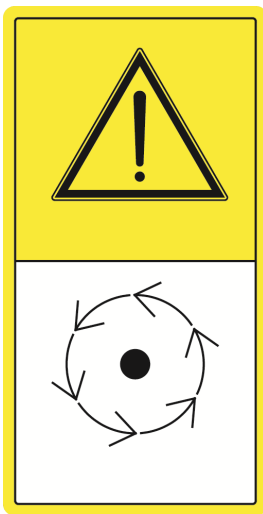
Name	Meaning	Images
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Label indicating caution against scald caused by high temperature (small)	you shall keep away from the heat surface of the machine when it is working to prevent personal injury.	
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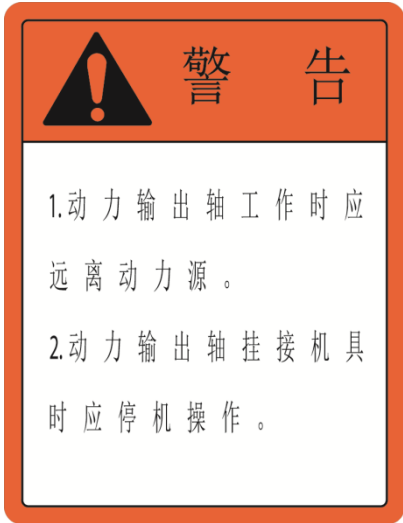
9. Position: Behind the rear right wheel cover

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

10. Position: On protective cover of PTO

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.	

11. Position: On upper of protective cover of PTO

Name	Meaning	Images
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.	

12. Position: Near the PTO

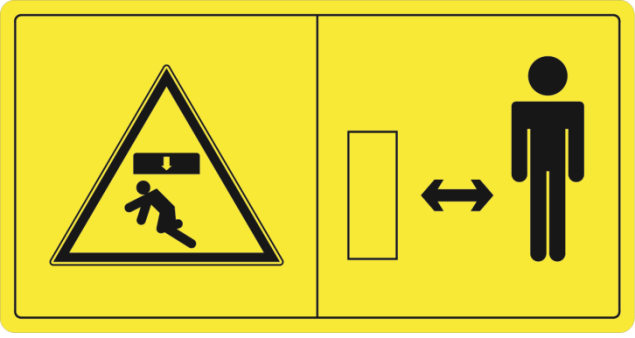
Name	Meaning	Images
PTO safety label III	See the picture on the right.	

13. Position: On the right stop rod

Name	Meaning	Images
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Stop pin safety label	Instructions for the stop pin mounting position	 配带犁、耙作业时，限位销插在非限位孔上；配带旋耕机、割草机等作业时，限位销插在限位孔上。
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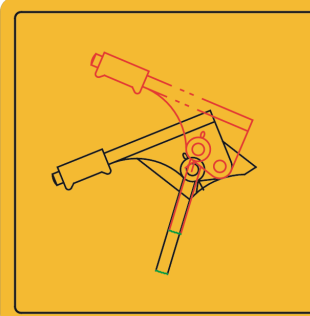
14. Position: Behind the left wheel cover

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

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

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

16. Position: Near the handbrake handle

Name	Meaning	Images
Identification of hand brake	Handbrake position	 警告 为了避免拖拉机意外运动造成人身伤亡事故的发生： 1、拖拉机停车时使其处于制动状态。 2、拖拉机在坡地停车时，应挂档（上坡位置挂前进档，下坡位置挂倒档），防止拖拉机随坡下滑。

17. Position: Near the electrical box

Name	Meaning	Images
Label for fuse safety	To prevent damage to electrical components or fire hazard, install fuses in strict accordance with applicable requirements.	 为了防止损坏电器元件或引起火灾，请严格按照规格插接保险丝。

18. 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.	

19. Position: Front face of the instrument panel.

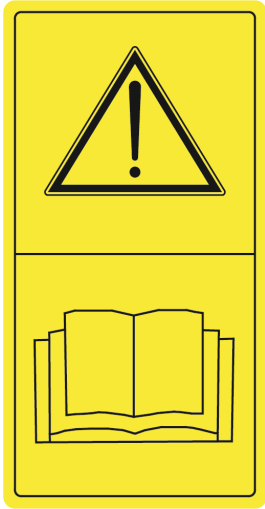
Name	Meaning	Images
Label for safe startup	To start the engine, the driver must in the driver's seat. To avoid personal injury, never start the engine by short-circuiting the starter.	

20. Position: Front face of the instrument panel.

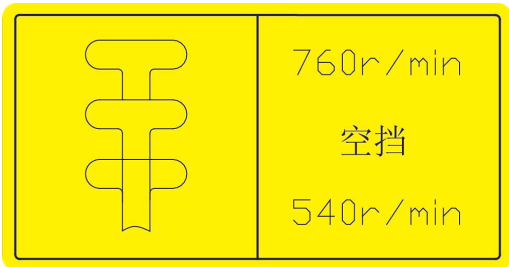
Name	Meaning	Images
Label for safety fluid levels in steering fluid tank and braking fluid tank	Before performing field work, check carefully the fluid level in the steering fluid tank.	

21. 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.	
---	---	--

22. Position: Near the PTO handle

Name	Meaning	Images
Control identification of PTO	Control identification of PTO	



2. Product Mark



2.1. Tractor Nameplate

The product nameplate is an important effective identification mark of a tractor 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 Model		标定功率 (12小时) Rated Power (12h)	kW
产品代号 Code		最小使用质量 Minimum Operation Mass	kg
出厂编号 No.		生产日期 Production Date	
产品执行标准 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

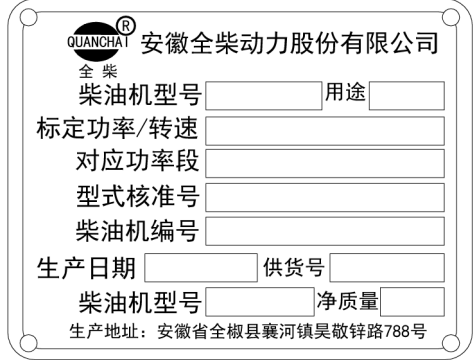
2.2.

The product nameplate is located on the left of the tractor instrument panel, arrow position as shown in the figure.

Fig. 2-2

2.2. Engine Nameplate

The engine product nameplate is an important effective identification mark for power supporting device of a tractor and the service staff will check the nameplate before services, so please keep it clean and safe in place.



QUANCHAI® 安徽全柴动力股份有限公司
全柴
柴油机型号 用途
标定功率/转速
对应功率段
型式核准号
柴油机编号
生产日期 供货号
柴油机型号 净质量
生产地址：安徽省全椒县襄河镇吴敬锌路788号

Fig. 2-3

2.3.

It is located on the engine and under the tractor hood.

Fig. 2-4

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 type, number of cylinders, displacement and static braking power.

Fig. 2-5

It is located on the engine and under the tractor hood.

2.4.

2.4. Vehicle Model and Factory Number

Before a tractor is delivered, its vehicle model and factory number are carved near the clutch which on the lower left side of instrument panel, specifically as shown in Figure①.

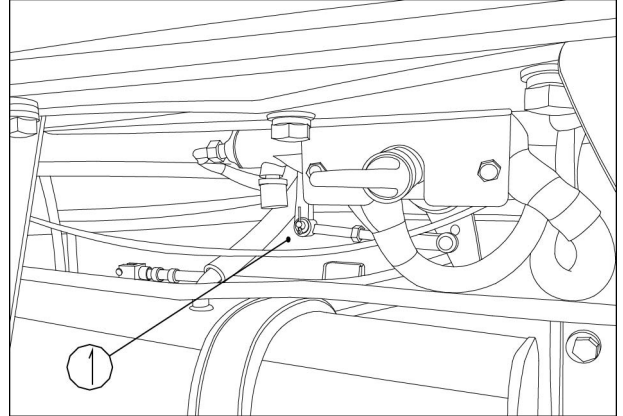


Fig. 2-6

2.5.



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3. Product Description

3.1. Tractor External View

3.1.1. Appearance of tractor equipped with rollover protection structure

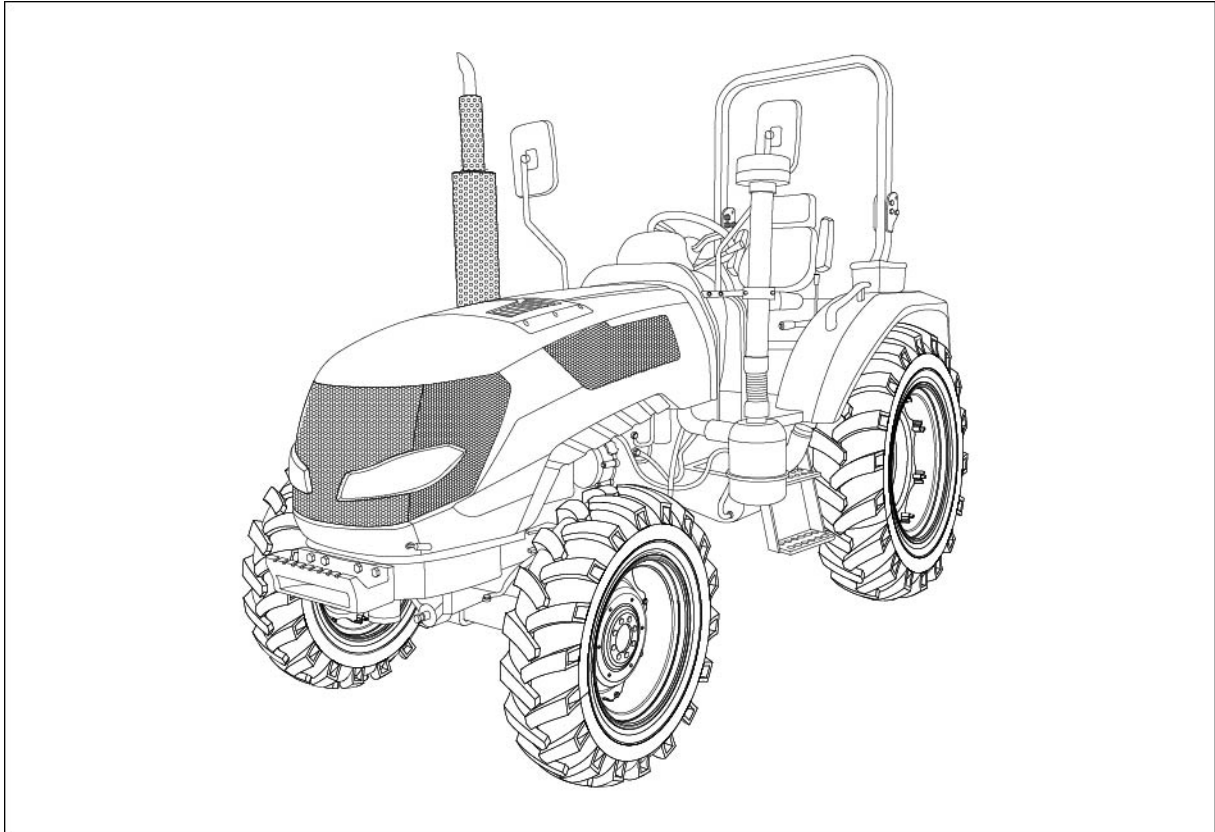


Fig. 3-1

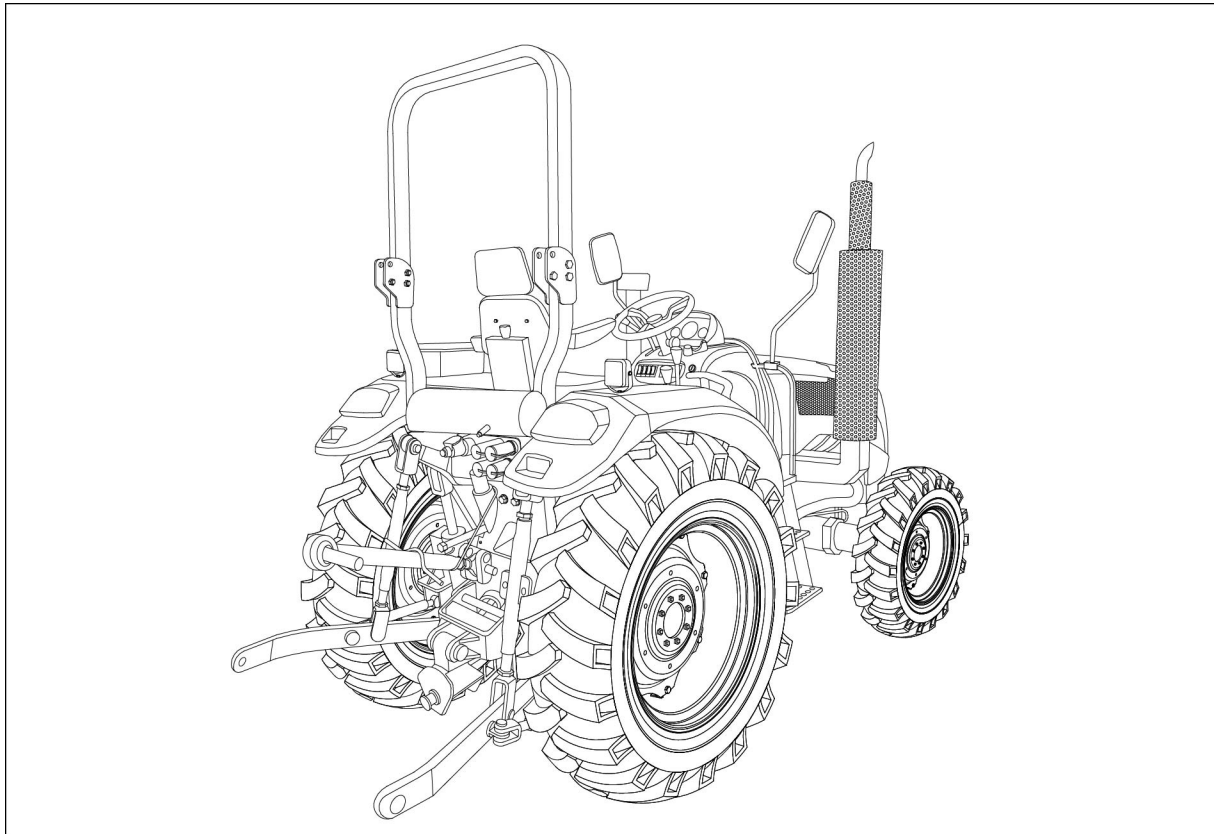


Fig. 3-2

3.1.2. Appearance of tractor equipped with cab

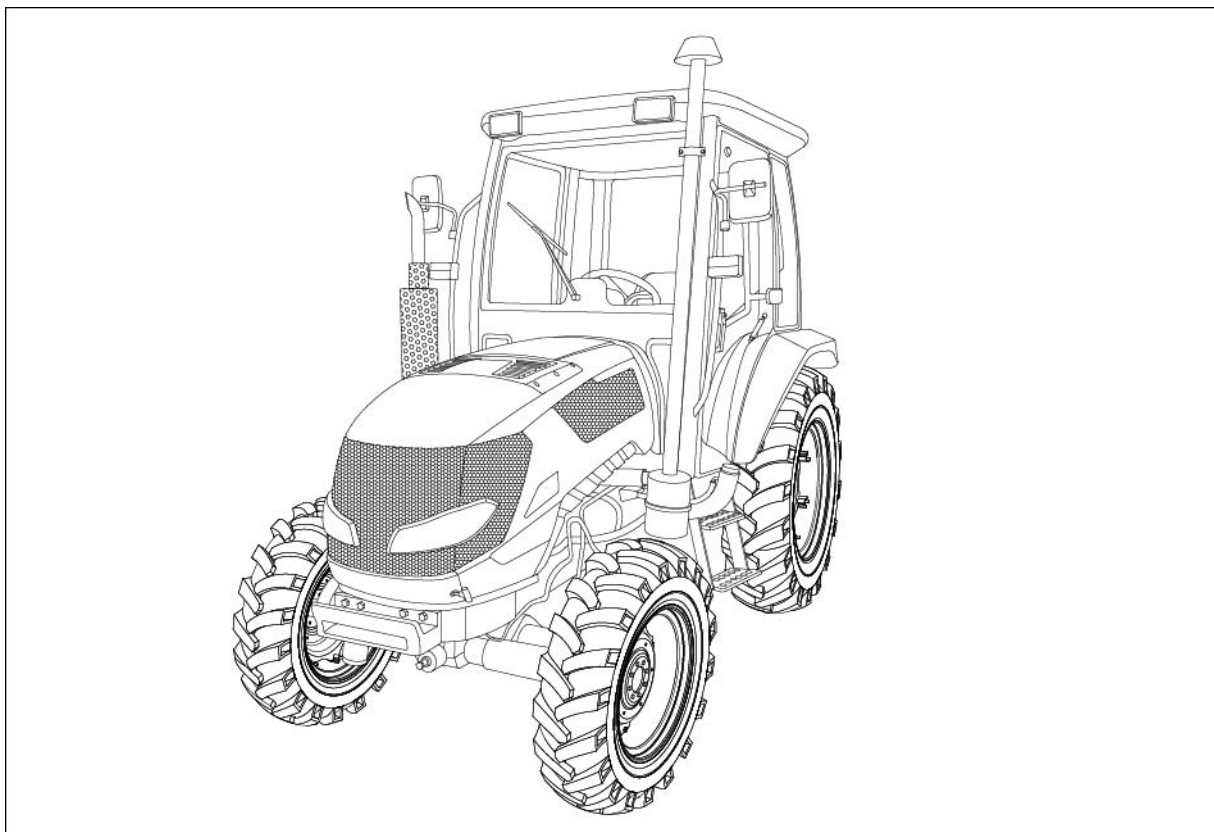
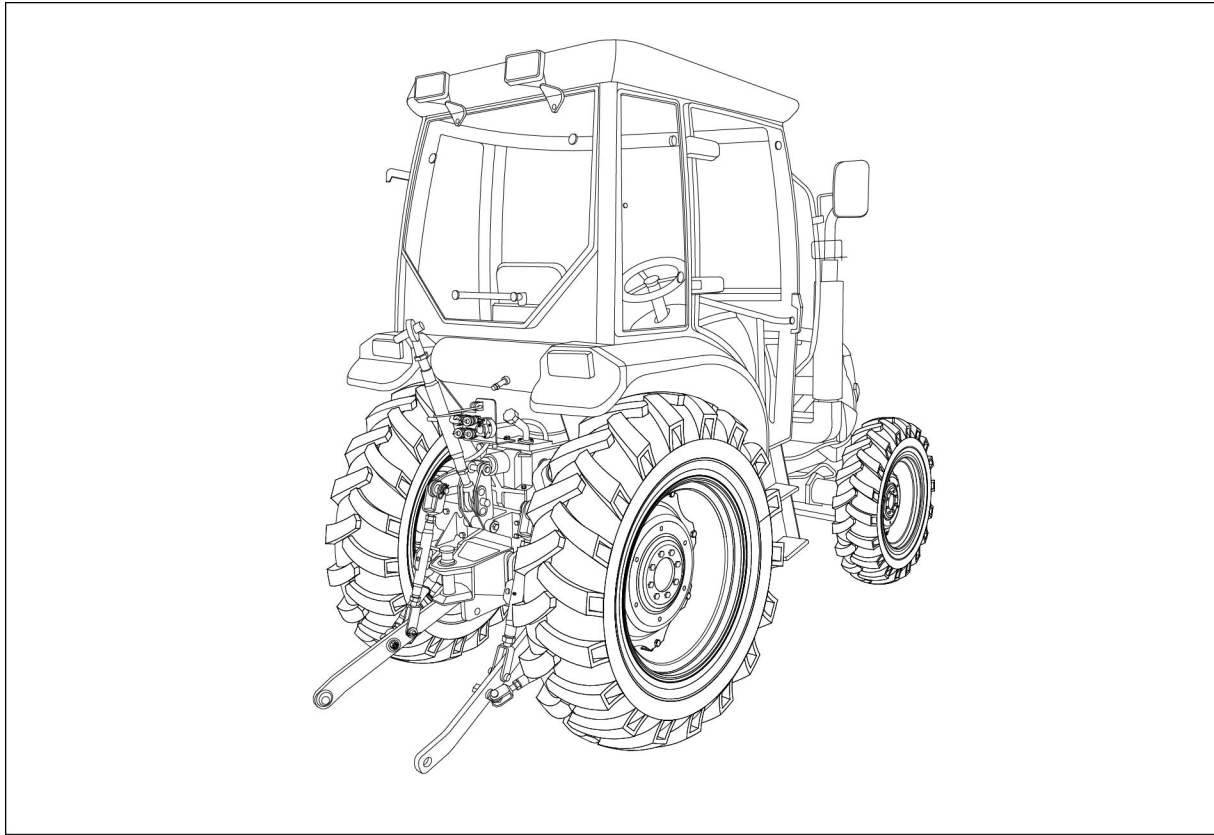
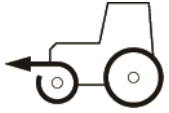
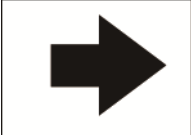
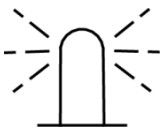


Fig. 3-3

Fig. 3-4

3.2.Common Identifiers

Symbol	Meaning	Symbol	Meaning	Symbol	Meaning
	Safety alert symbol		Hazard indicator light		Loudspeakers
	Front wheel drive		Trailer braking		Fast
	Hand brake/braking liquid level – Low		Engine oil pressure		Slow

	Air filter clogging		Battery charging status		Windscreen wiper
	Left turn indicator		Right turn indicator		Rear wiper
	Clearance lamp		Low beam lamp		High beam lamp
	PTO disengagement		Hydraulic oil filter		Preheating
	Rear PTO revolving speed		Differential lock		Parking brake
	Oil/water separation		Engine coolant temperature		Transmission oil filter
	Transmission oil pressure		Fuel oil level		Warning lamp

3.3.

Table 3-1

Product descriptions

This operating manual introduces the use, maintenance, adjustment and troubleshooting, etc. of the FL35-70HP series wheeled tractors including

FL354/ FL 354C/ FL 400/ FL 400C/ FL 404/ FL 404C/ FL 450/ FL 450C/ FL 454/ FL 454C/ FL 500/ FL 500C/ FL 504/ FL 504C/ FL 554-1/ FL 554C-1/ FL 554/ FL 554C/ FL 604/ FL 604C/ FL 704-1/ FL 704C-1.

FL35-70HP series wheeled tractors are a kind of multipurpose medium-sized agricultural wheeled tractors. Such products feature compact structure, convenient manipulation, flexible steering, large lifting force, easy maintenance and other excellent characteristics.

3.3.Hood

3.3.1.Hood without cabin

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

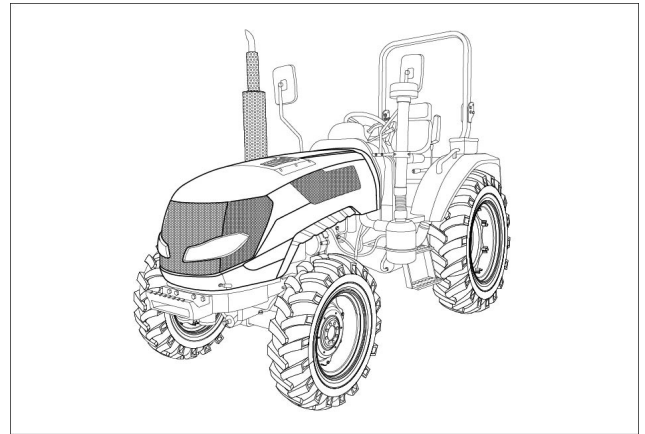


Fig. 3-5

3.3.2.

3.3.2.Hood with cabin

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

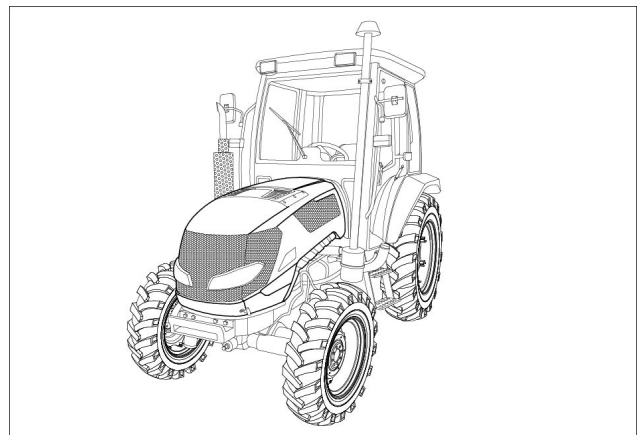


Fig. 3-6

3.3.3.

3.3.3.Hood opening and closing

Open the hood lock on the engine hood, then seize beneath the hood and lift it up gently and the hood will be driven by the two gas springs (left and right) to open automatically.

Pull the hood downward and the hood lock will be locked automatically when the hood is lowered to a certain angle.

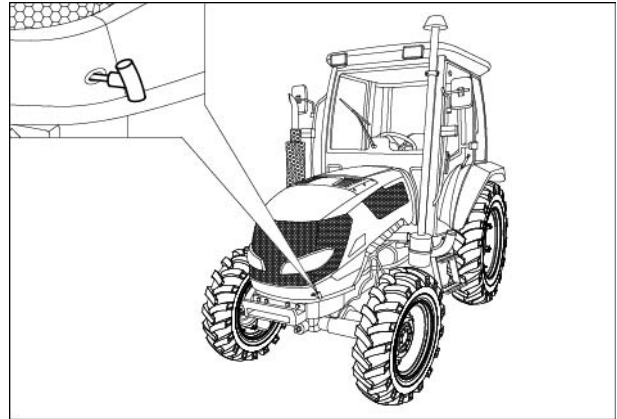


Fig. 3-7

3.3.4.

3.4.Tractor Control Mechanism

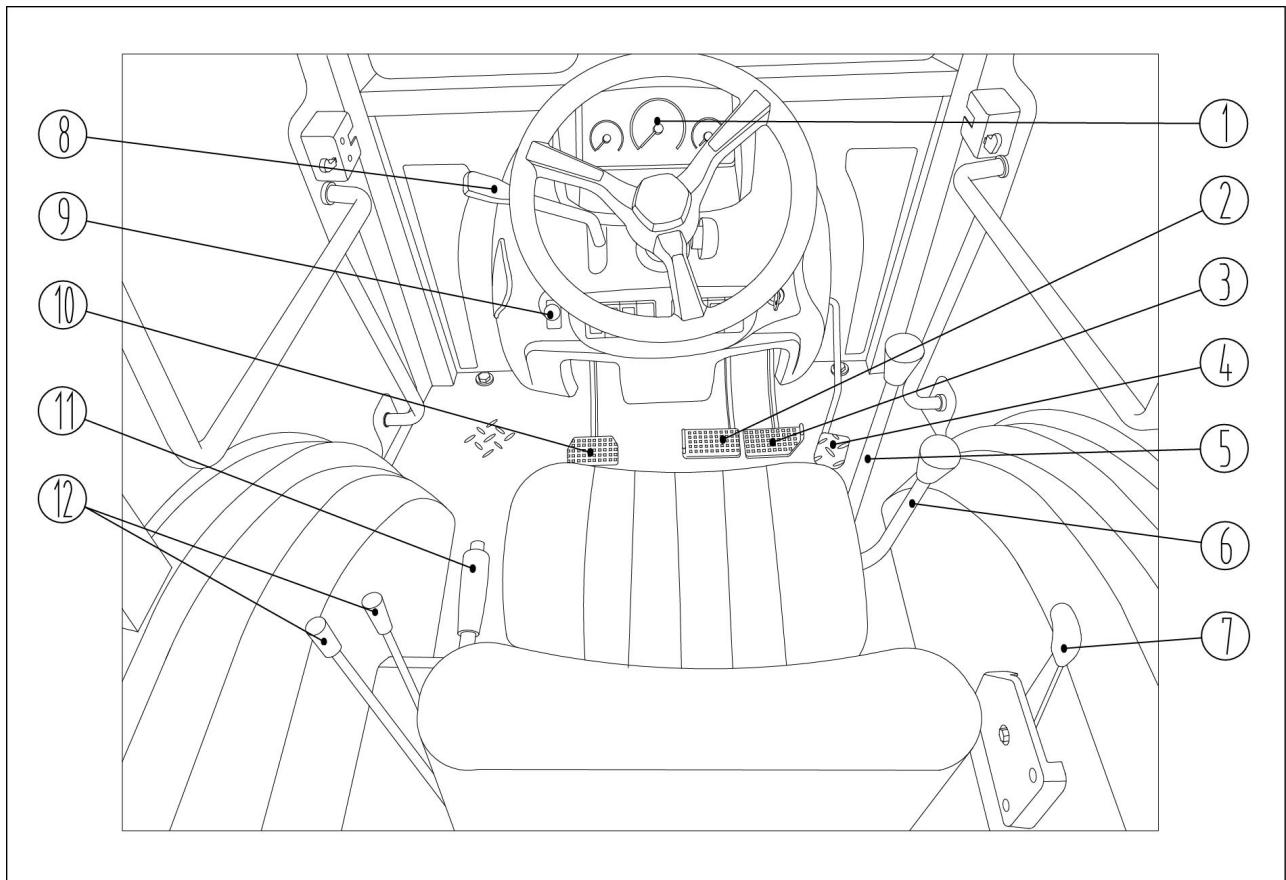


Fig. 3-8

1. Dashboard	2. Left brake pedal	3. Right brake pedal	4. Foot accelerator	5. Range shift lever
6. Main gear shift lever	7. Hand throttle control lever	8. Shuttle shift control lever	9. Shutdown cable	10. Clutch pedal
11. Parking brake handle	12. Hydraulic output control lever			

3.5.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. 3-9

3.6.Steering Wheel

The steering wheel is located as shown in the figure.

Fig. 3-10

3.7.



Notice:

Check whether the steering wheel is fixed firmly before driving.

3.7.Instrument and Switch

Instrument panel instrument and switch

1. Left rocker switch combination;
2. Right rocker switch combination;
3. Ignition lock;
4. Combination instrument assembly.

Fig. 3-11

3.7.1.Combination instrument assembly

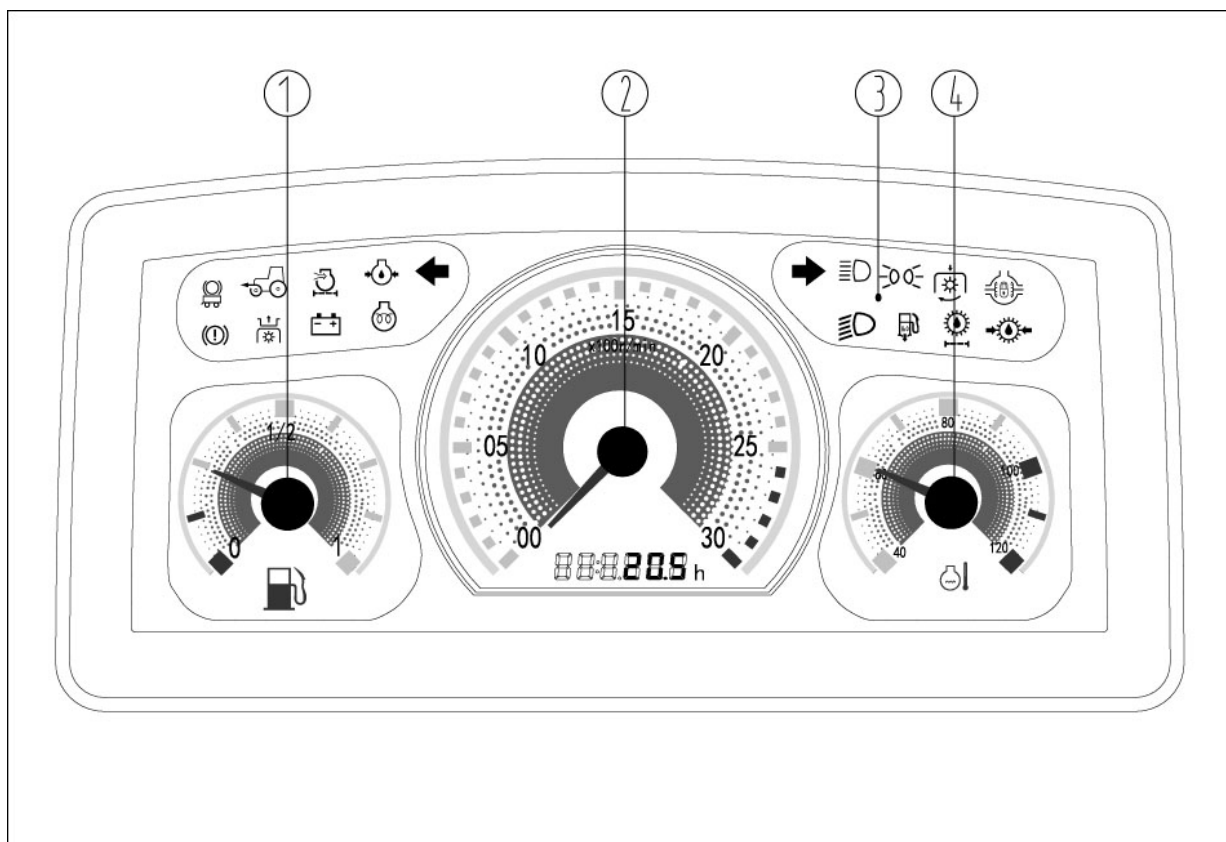


Fig. 3-12

1. Fuel gauge	2. Tachometer	3. Indicator	4. Water temperature gauge
---------------	---------------	--------------	----------------------------

The combination instrument contains various indicating devices, such as the tachometer, fuel gauge, water temperature gauge, direction indicator lamp, high/low-beam headlamp indicator, position indicator, charging alarm light and engine oil pressure alarm light and air pressure alarm light for users to timely monitor the working conditions of the complete vehicle.

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

Tachometer

After startup of engine, it indicates engine speed (r / min, representing revolutions per minute). The value on the LCD represents the operating hours of engine.

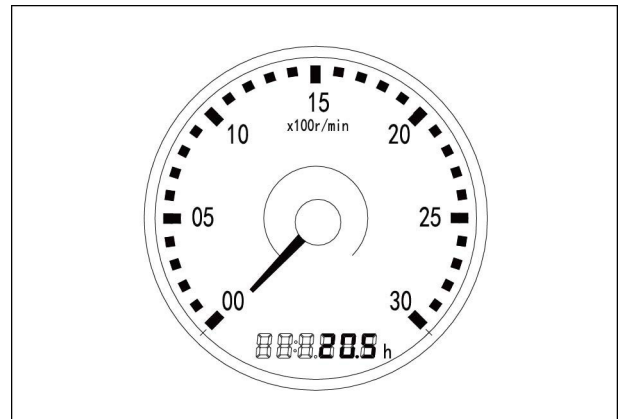


Fig. 3-13

Fuel gauge

Fuel gauge is used to indicate remaining fuel in the fuel tank.

The pointer moving to the right indicates that the tank is full of fuel. The pointer moving to the left (red zone) indicates that the remaining fuel in the fuel tank is less than 1/8 the fuel tank capacity.

During use of the tractor, there being no or little fuel in fuel tank with the pointer being still in the right green zone indicates occurrence of short circuit of the fuel level sensor or fuel gauge; the fuel tank being full with the pointer being still in the left red zone indicates occurrence of open circuit of the fuel level sensor or fuel gauge. In both cases, inspection and repair are required.

Fig. 3-14

Water temperature gauge

Water temperature gauge indicates engine coolant temperatures with scales.

Different coolant temperature ranges are indicated using different colors:

- ◇ Green area = normal operating temperature
- ◇ Red area = engine overheating

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

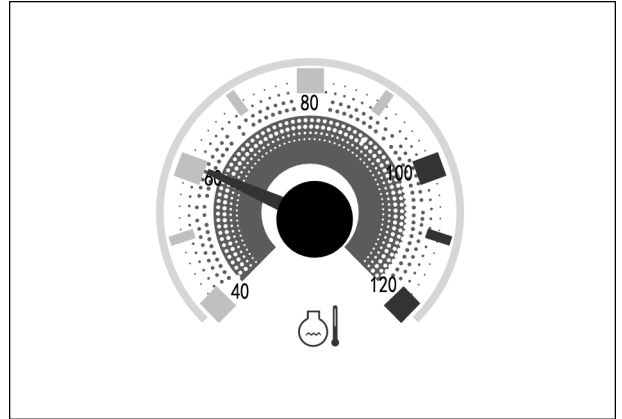


Fig. 3-15

	Notice: Shut down the engine immediately if the pointer moves to the red zone.
--	---

Trailer brake lamp (red)

	When the trailer brake system has failed during operation, this indicator lamp will light up. When the air brake system has its pressure lower than 0.4Mpa, this indicator lamp will light up, it indicates a fault of the brake gas path and immediate troubleshooting should be needed. If the air pressure is found insufficient when the key is turned on but the engine has not been started, it is normal when this indicator lamp is on.
--	--

Front-wheel drive indicator (yellow)

	When the front-wheel drive is applied, this indicator lamp will light up.
--	--

Air filter clogging indicator (red)

	When the air filter is clogged, this indicator lamp will light up. When the air filter clogging indicator gives alarms, you must clean the filter or replace the air filter element.
--	--

Oil pressure indicator (red)

	This light comes on if the ignition key is turned to the position START. After startup of the engine, this light goes out, indicating the pressure in lubrication system is normal. This light could come on during the engine is running at idle speed. It is a normal phenomenon due to low pressure in the lubrication system. If this light comes on while the engine is running at normal operating speed, stop immediately the engine running for inspection. If this light does not come on when the ignition key is turned to the position START, inspect and repair its bulb.
--	--

Hand brake/brake fluid level low indicator (red)

	When the parking brake system is at the state of braking, this indicator lamp will light up. When the braking oiler has its liquid level low, this indicator lamp will light up.
---	--

PTO disengagement indicator (yellow)

	When PTO is disengaged, this indicator lamp will light up
--	--

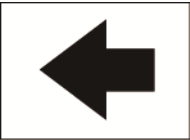
Charge lamp (red)

	If this indicator lamp goes out after the engine is started, it indicates that the generator is working normally. If the indicator lamp does not go out, you should stop for troubleshooting; if this indicator lamp is not on before the engine is started, then you should repair the bulb in the instrument.
--	---

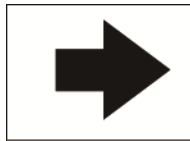
Preheating indicator (yellow)

	When a tractor is preheating, this indicator lamp will light up.
--	---

Left steering indicator (green)

	When the left steering switch is connected when a tractor is turning left, this indicator will light up.
--	---

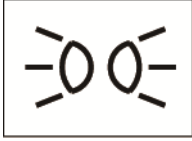
Right steering indicator (green)

	When the right steering switch is connected when a tractor is turning right, this indicator will light up.
---	---

High-beam indicator (blue)

	When the light switch is locating at position “2” and the dimmer switch is locating at position “2”, this indicator will light up. It shows that the high-beam headlamps are enabled at this time.
---	---

Clearance lamp indicator (green)

	When parking a tractor on the highway at night, in order to ensure the traffic safety and remind the drivers behind, you should turn on the lamp lets and have the light switch at position "1" and at this moment, the parking clearance indicator lamp will have all its lamp lets on.
---	---

Rear PTO speed indicator (yellow)

	When the PTO control lever is at the neutral position, this indicator lamp will go out. When the PTO control lever is at any gear position other than the neutral one, this indicator lamp will light up.
--	---

Differential lock indicator (yellow)

	When the differential lock is applied, this indicator lamp will light up.
--	--

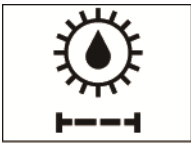
Low-beam indicator (green)

	When the light switch is locating at position "2" and the dimmer switch is locating at position "0", this indicator will light up. It shows that the low-beam headlamps are enabled at this time.
--	--

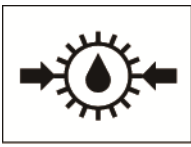
Oil-water separation indicator (red)

	When the fuel system contains too much water, this indicator lamp will light up. At this time, you should open the drain valve of the oil-water separator to drain.
---	--

Transmission case oil filter indicator (red)

	When the transmission oil filter is clogged, this indicator lamp will light up. When the transmission oil filter indicator gives alarms, you must clean the filter or replace the filter element.
---	---

Transmission oil pressure indicator (red)

	When the transmission hydraulic oil pressure is insufficient, this indicator lamp will light up. At this time, you should stop for troubleshooting.
---	--

	Notice: According to different models, some of the above-mentioned indicator lamps are reserved devices. Consult your dealer for details.
--	--

3.7.2. Left rocker switch combination

1. Dimmer switch
2. Lamp switch
3. Top working lamp switch

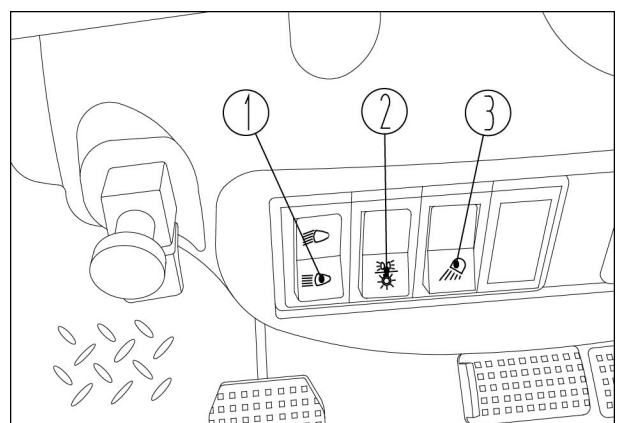


Fig. 3-25

3.7.3.

➤ Dimmer switch

Position “2”: High beam lamp will light up.

Position “0”: Low beam lamp will light up.

Position “1”: The high beam lamp will light up (able to spring back).

Notice: The high/low-beam switching is controlled by the lighting master switch.

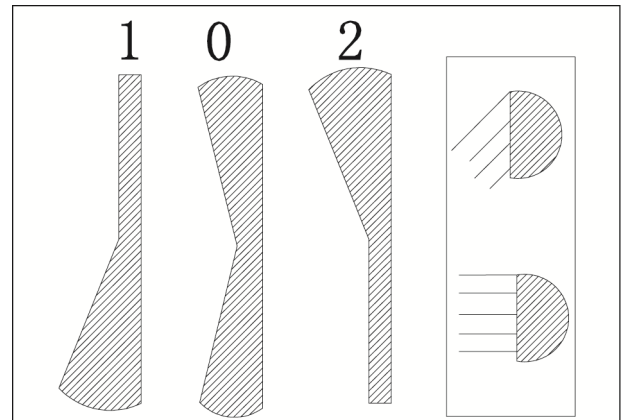


Fig. 3-17

➤

➤ **Lighting master switch**

Position “0”: Cut off the power supply.

Position “1”: The clearance lamp will light up.

Position “2”: The headlamp power supply is under control, and if “2” is connected, then you can use the dimmer switch to control the headlamp high/low beams.

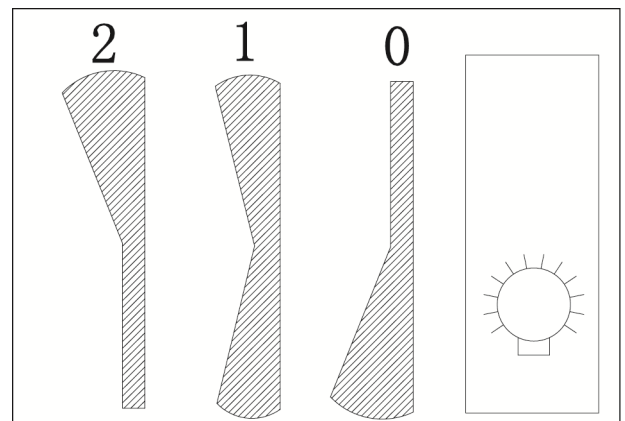


Fig. 3-18

➤

➤ **Top/ rear lamp switch**

Position “0”: Cut off the power supply.

Position “1”: The working light at cab roof comes on (if there is a cab).

Position “2”: Working light will light up.

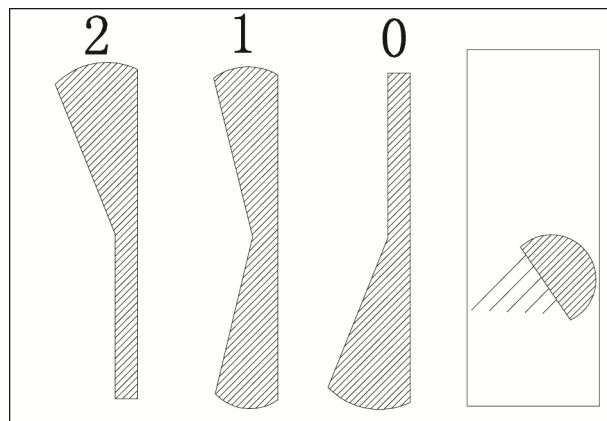


Fig. 3-19

	Notice: Never have the working lamp enabled when a tractor is driving on roads.
---	--

➤

3.7.3.Right rocker switch combination

1. Electric horn switch
2. Hazard warning lamp switch
3. Steering switch

Fig. 3-20

3.7.4.

➤ Horn switch

Position “1”: The horn will ring out.

Position “0”: The horn will be turn off.

It is used to give sound warning.

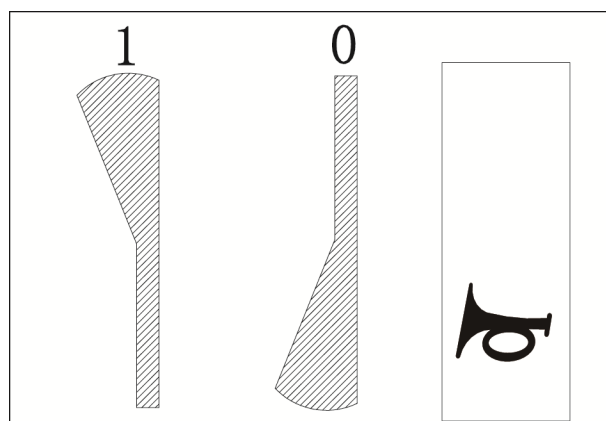


Fig. 3-21

➤

➤ Hazard warning lamp switch

Position “1”: The front, rear, left and right steering lamps, the left and right steering lamps on the instrument and the indicator lamp 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.

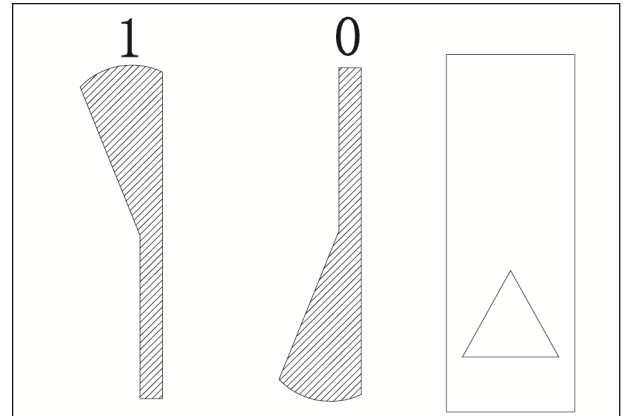


Fig. 3-22

➤

	Notice: This function can be enabled if it is necessary to warn the vehicles and pedestrians around for preventing traffic accidents when a tractor has stopped on the road due to failures or any other reason.
---	---

➤ Steering switch

Position “1”: Connect the right steering lamps.

Position “0”: Cut off the power supply.

Position “2”: Connect the right steering lamps.

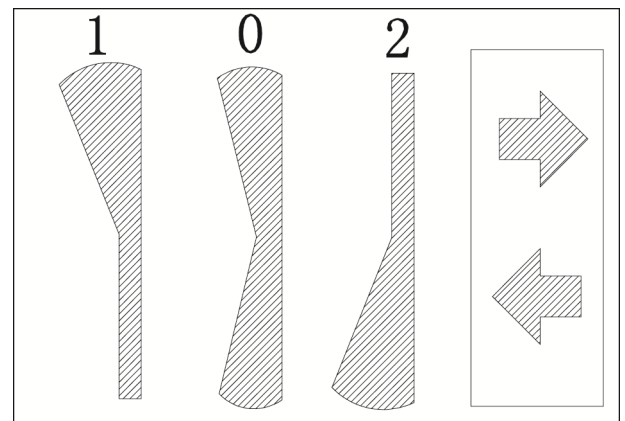


Fig. 3-23

➤

3.7.4. Ignition lock

Insert the key into the ignition lock and turn the key clockwise in order to achieve such functions as follows:

ACC position (auxiliary) – Connect the auxiliary electrical components, such as: heater, wiper and fan; ON position (ignition) - Connect the power supply of the vehicle circuits; ST position (starting) - Start the vehicle for work and the key will return to the “ON” position after the engine has been started; at this time, the “ON” and “ACC” are connected at the same time to provide power supply to all onboard electrical components.

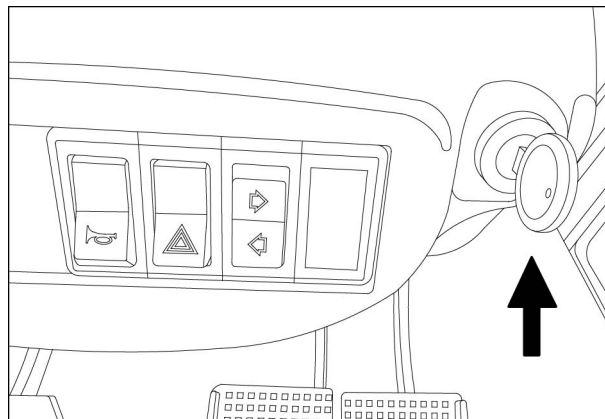


Fig. 3-24

3.7.5.

	Notice: 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.
--	--

3.7.5.Wiper Switch

The wiper switch as shown in figure ①.

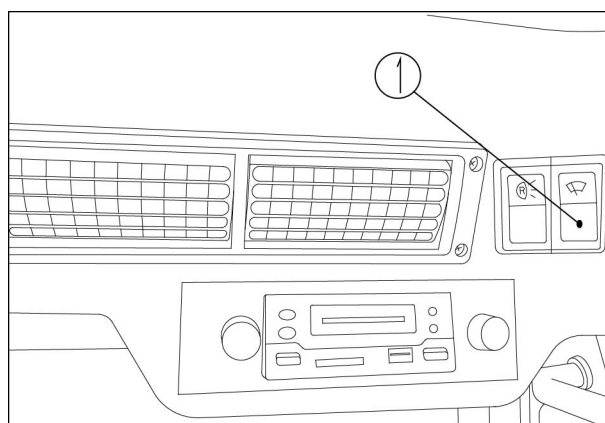


Fig. 3-25

Position 2: Fast wiper speed

Position 1: Normal wiper speed

Position 0: Wipers off

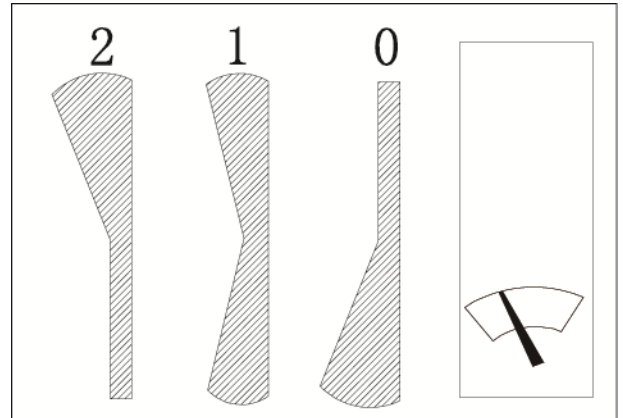


Fig. 3-26

3.8.Cab (Optional)

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.

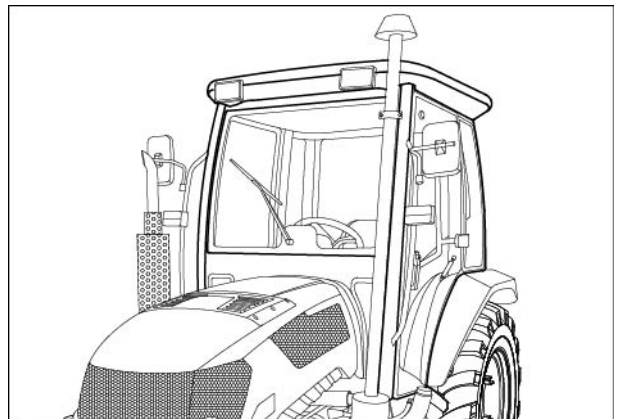


Fig. 3-27

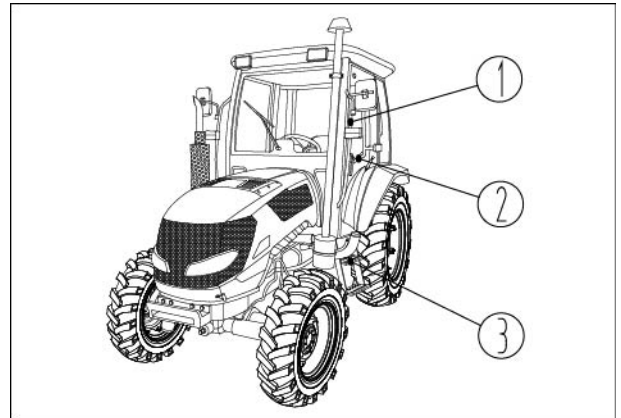
3.9.

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

3.9.1.Cab entrance

➤ Entrance Steps and Handrails

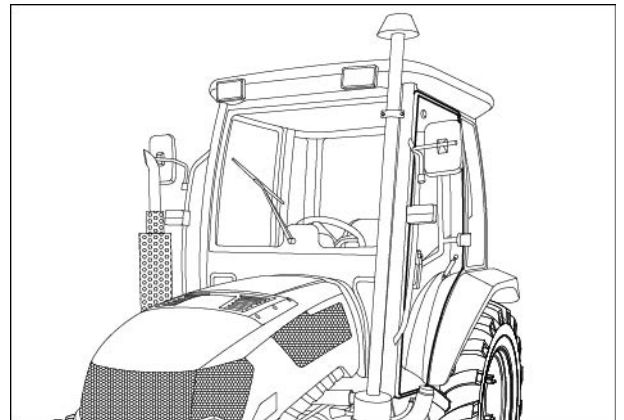
The cab is equipped with non-slip steps③ and two handrails. One handrail is on the door (position ② in the figure), and the other is on the pillar next to the cab door lock (position ① in the figure).

*Fig. 3-28*

➤

3.9.2.Cab door

The cab door frame is made of profiled metal. 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. 3-29*

3.9.3.

3.9.3.Cab locks

The double locks can prevent accidental opening of the door.

To open the door, turn the key clockwise by 90°, remove the key, grab the door handle, push inward the movable part (at the slot for key) with thumb to release the lock, meanwhile, pull outward the door handle.

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

Fig. 3-30

3.9.4.

3.9.4.Safety lock of cab door

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

Fig. 3-31

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 by key. Moving down the handle can cause the door to open automatically.

3.9.5.

3.9.5. Interior trims of the cab

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

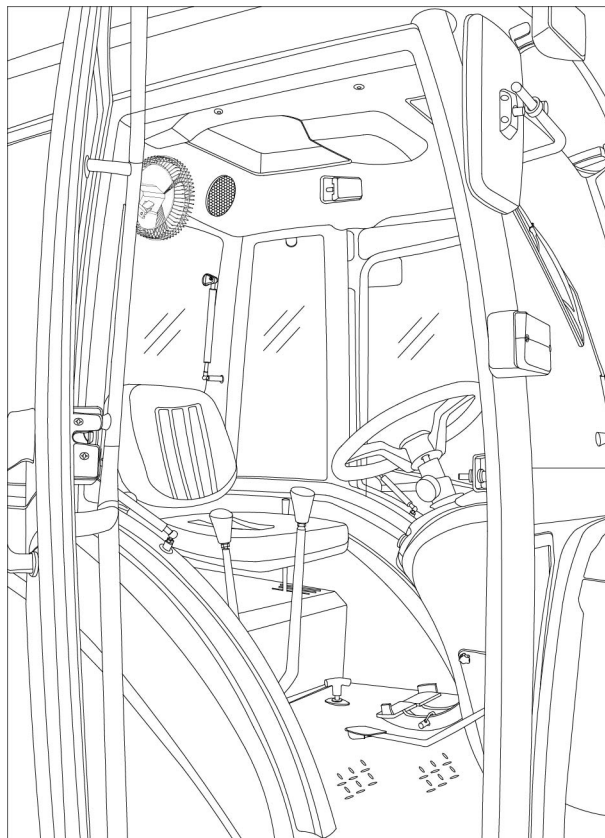


Fig. 3-32

3.9.6.

3.9.6. Rear window hatch

The rear window hatch of tractor can be opened upward, semi-automatically.

Fig. 3-33

3.9.7.

➤ **Open and Close rear window hatch**

Fig. 3-34

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.

3.9.7.Roof hatch

The roof hatch can be opened for ventilation.

Fig. 3-35

Hold the handle and rotate it clockwise to unlock the safety lock. Gently push outward the roof hatch. It will open automatically, under the action of the left and right air springs.

To close the roof hatch, operate in the reverse order as opening the roof hatch.

3.9.8.

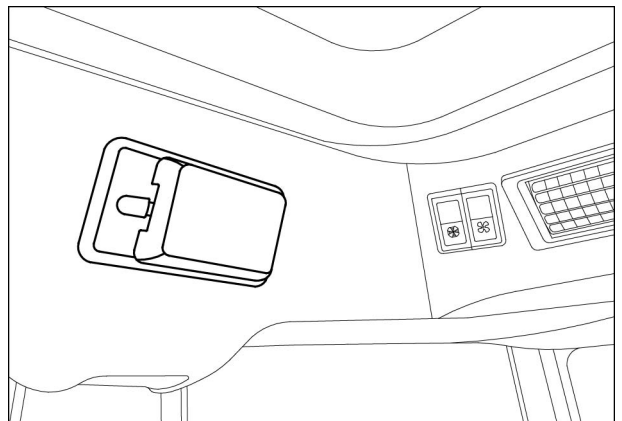
3.9.8.Interior illuminating light

Interior illuminating light may be turned on and off using the slide switch at the upper part of the light.

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

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

Move the switch to the right 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. (Notice: This function is temporarily not available.)

*Fig. 3-36*

3.9.9.

3.9.9.Built-In Radio

Radio is an optional device. Radio is located to the right of the cab interior roof lining.

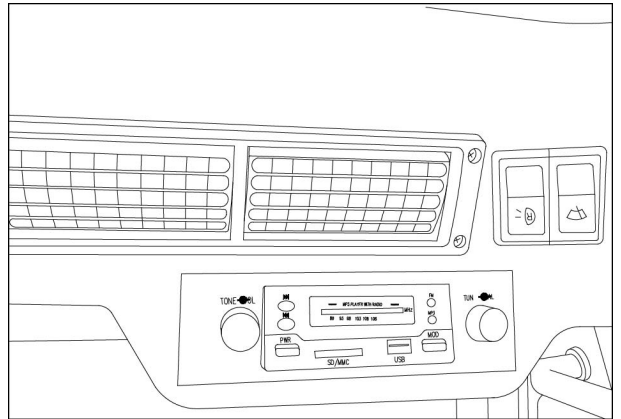


Fig. 3-37

3.9.10.

3.9.Heating System (Optional)

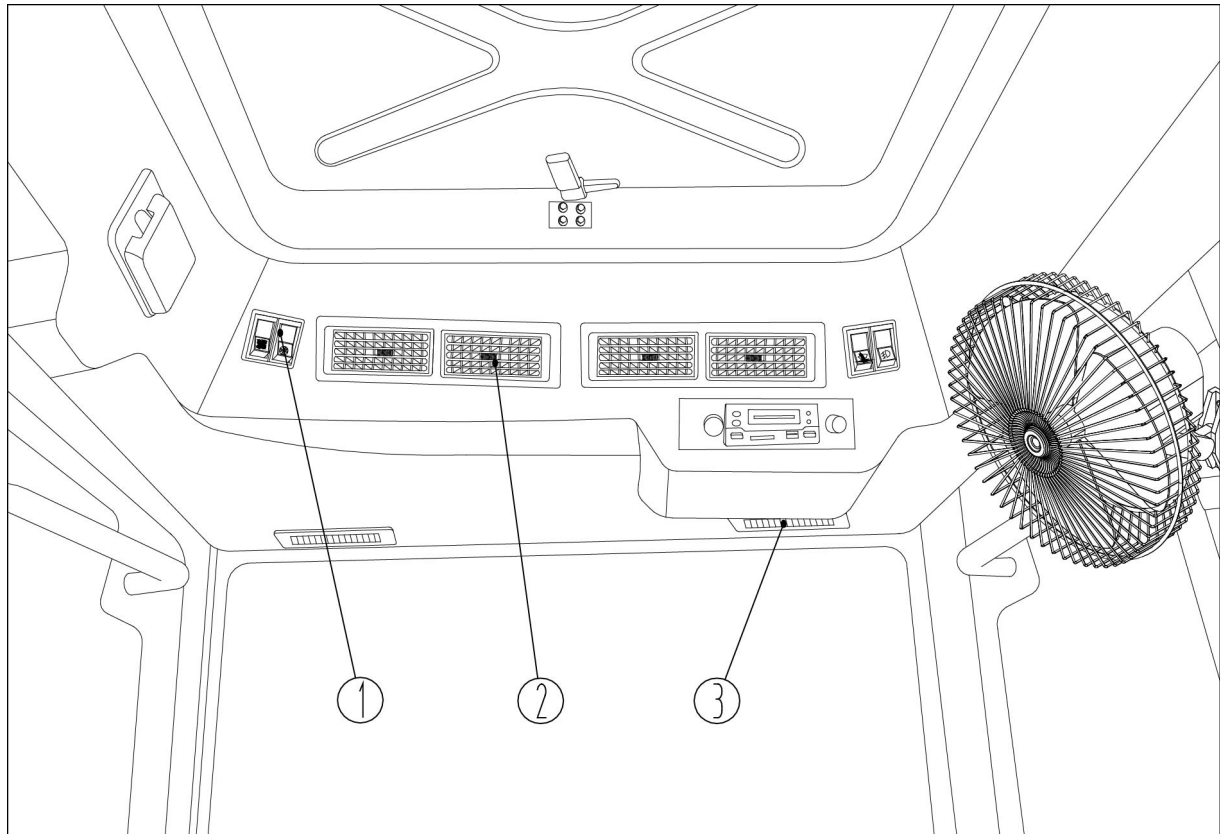


Fig. 3-38

1. Control switch	2. Air outlet 1	3. Air outlet 2
-------------------	-----------------	-----------------

3.9.1.Heating system control switch

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

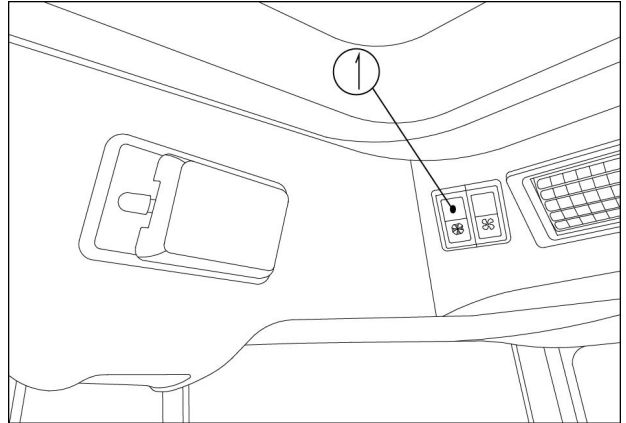


Fig. 3-39

3.9.2. 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.

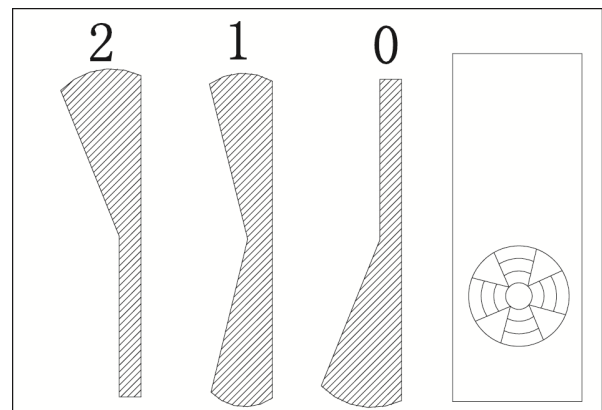


Fig. 3-40

3.9.3.

3.9.3. Tips for using the heating system

- Before starting the engine, make sure the ventilation system is turned off (you can simply 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, simply turn the control switch to max 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.

3.9.4.Cab fan

The cab is equipped with a fan, as shown in the figure.

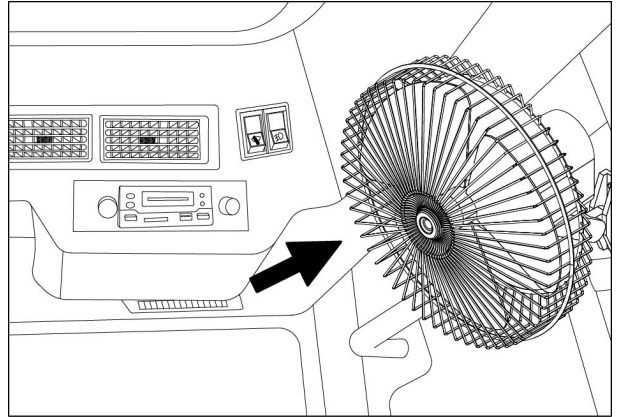


Fig. 3-41

3.9.5.

3.9.5.Fan Switch

The fan switch is shown in position ① in figure.

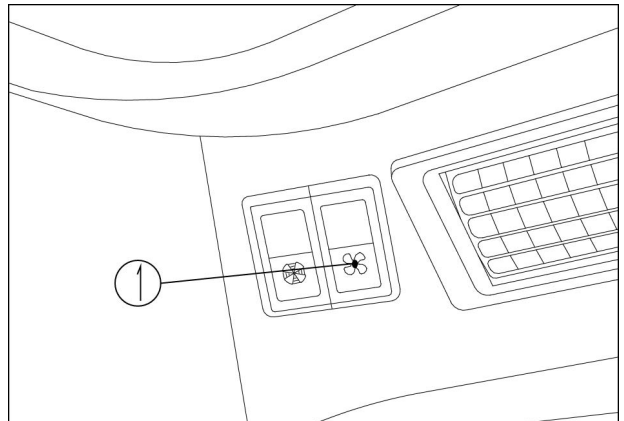


Fig. 3-42

3.9.6.

3.10.Cab Air Conditioning Filter (Not Apply to This Model)

The purpose of the cab air conditioning filter is to remove dust from air. But it cannot remove the chemical vapor emitted by the pesticide sprayer.

When disposing of used filters, follow the regulations applicable locally regarding disposal of cartridges contaminated with harmful substances.

**Notice:**

The cab ventilation system filter must always be of the “paper” type, exclusively when working with hazardous substances (e.g. pesticide spraying), this filter must be replaced with a specific filter for the type of operation.

If the cab is not able to contain the required air pressure level, carry out the following checks to identify the causes:

- Set the blower to maximum speed and close the cab doors, rear window hatch, and windows. If the tractor is equipped with a roof hatch, check that it is properly closed.
- Check that the air filters are not clogged or obstructed.
- Check the conditions of the seals around the doors and windows of the cab.
- Check the hole diameter of connecting levers with pass to the outside of the cab.

If it is not possible to identify the cause by the above checks, contact an authorized Service Center.

Special filters**Notice:**

Before working with harmful substances the external cab air filters (and internal, if installed) must be replaced with special filters (e.g. activated carbon filters).

**Notice:**

When spraying pesticides, follow the instructions provided by the manufacturer of chemical products and related to the sprayer, to prevent injury.

**Notice:**

Injury or death could result from prolonged periods of exposure to pesticides. When replacing the cab filters, use exclusively original cartridges.

**Important:**

These filters can never offer total protection against toxic substances.

**Important:**

Special filters are removed and refitted in the same way as normal filters.

When spraying chemical substances, the cab interior can be slightly pressurized. When the cab ventilation is activated, the air pressure inside the cab will increase relative to the outside air pressure; this pressure difference helps prevent the ingress of harmful vapor. However, we strongly recommend that you scrupulously adhere to the safety instructions provided by the manufacturer of the chemical products.

Advice on safe working procedures:

- When replacing the filters, wear all the required personal protective equipment, and replace the standard dust filter with the special filter only if this is required by the operation to be carried out.
- After each use, the filter should be removed from the cab and replaced in its original packaging, and the standard dust filter should be installed. The activated carbon filter should be carefully sealed in its packaging in order to maintain its efficiency.
- This filter, providing it is used for a total of no more than 200 hours, has a maximum service life of 36 months from the time the package is first opened (the date of manufacture is marked on the filter).
- The filters should be removed during use of the tractor for any applications other than spraying indicated by the manufacturer. Otherwise, dust would clog the filter element in a very short time.
- Do not wash the filter with water or clean it with compressed air.
- Used filters must be consigned to specialized waste disposal centers.

**Danger:**

After using two hundred hours or 36 months later, replace the activated carbon filter. If the odors of any toxic substances used become noticeable inside the cab, immediately change the filter and check the seal.

•



Warning:

When spraying pesticides, always follow the instructions of the manufacturer of the chemical product and the sprayer.

3.11.Driver's Seat

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

3.11.1.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. 3-43

3.11.2.Rigidity adjustment of the driver seat

Adjust the rigidity regulating handle① to achieve more comfortable sitting according to the height and weight of the operator.

Fig. 3-44



Danger:

For safety, never adjust the seat before the tractor is in its stationary state.



Danger:

The seat rigidity cannot be adjusted too soft, especially when you are driving on rough roads.

3.11.3.Seat belt



Warning:

Always fasten your seat belt. The seat belt can be used to reduce the risk of serious injuries at the time of the accidents.

3.11.4.

3.12.Passenger Seat



Notice:

Your tractor is designed only to accommodate one person. In some countries, the passenger seat provided by the manufacturer is allowed. First check whether the tractor is allowed to accommodate passengers.

3.13.



Danger:

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.



Notice:

During the field work, the driver is only allowed in the cab.

3.13.Rear View Mirrors

3.13.1.Exterior Rear-view Mirrors (with cab)

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

Adjustment:

Adjust the rearview mirrors on both sides.

Fix the rearview mirrors so that a clear vision could be available behind the tractor and implements from the driver seat.

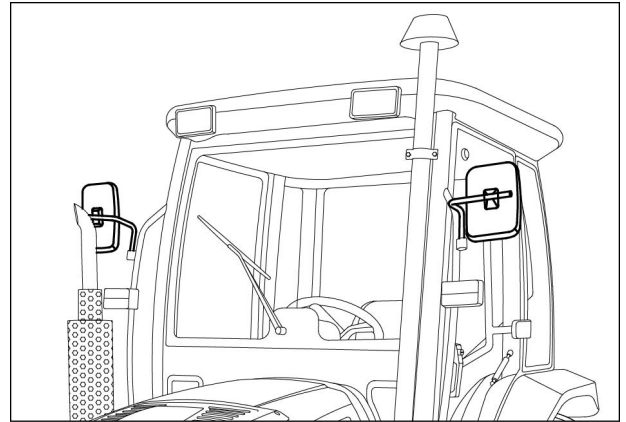


Fig. 3-45

3.13.2.

3.13.2.Rear-view mirrors (without cab)

See the figure as follows for such a cab with no rearview mirror provided.

Adjustment:

Adjust the rearview mirrors on both sides.

Fix the rearview mirrors so that a clear vision could be available behind the tractor and implements from the driver seat.

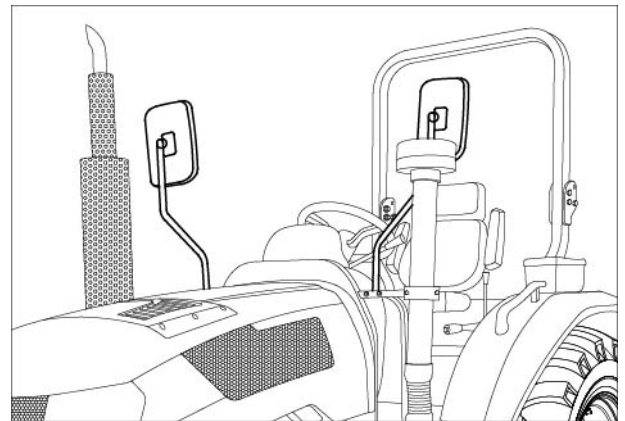


Fig. 3-46

3.13.3.

	Warning: If one or two rearview mirrors are accidentally folded inward (for example, due to collisions), stop the tractor immediately and adjust the rearview mirror back in place.
---	--

3.14.Other Control Devices

3.14.1. Control pedal

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

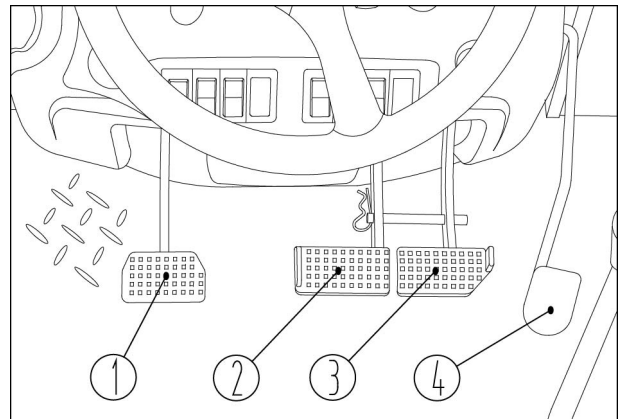


Fig. 3-47

3.14.2.

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.
--	--

3.14.3.

	Warning: When driving downhill, never press down the clutch pedal or put the transmission in its neutral position.
---	--

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

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

When the clutch pedal on the left of the driver is stepped down, the clutch will be disengaged.

When you want to disengage the clutch, first lower the engine speed and then completely step down the clutch pedal.

When the pedal is released after a speed gear is selected, step down the accelerator pedal appropriately to avoid sudden bumps when the tractor is moving.

Once the clutch is released, you should remove your foot from the clutch pedal, because even slight stepping-on can also speed up the clutch wear.

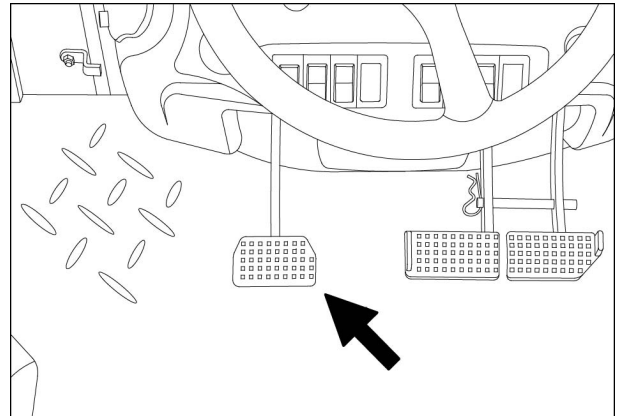


Fig. 3-48

3.14.3.Brake pedal



Notice:

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.

3.14.4.



Notice:

Never step on one brake pedal only in such conditions as follows: The differential lock is enabled and high speed traction and towing is applied.

The tractor is equipped with a brake on the rear axle shaft of the final reducer.

When the brake pedal is stepped on, the rear wheel brakes on both sides will work at the same time.

The service brake adopts a mechanical control wet disc brake.

If you loosen the interlocking plate to connect the two brake pedals, the right and left brakes can controlled independently.

1. Left brake pedal
2. Brake pedal interlocking plate
3. Right brake pedal

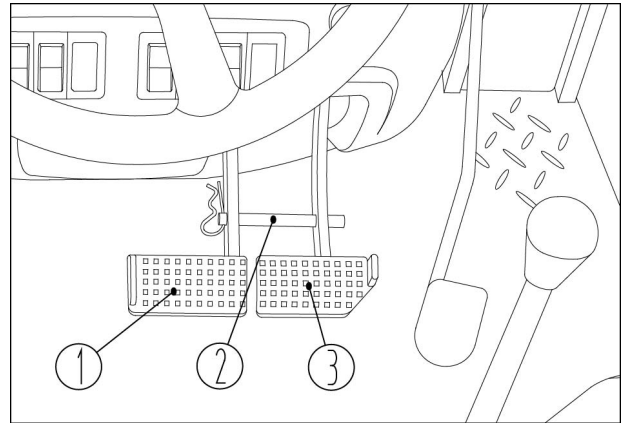


Fig. 3-49

3.14.4. Parking brake handle

	Warning: 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.
---	--

3.14.5.

	Warning: When the parking brake is applied, the control lever must always be kept at its “PULL-UP” state.
---	--

Pull the brake handle backwards when using it.

To release the parking brake, step down the brake pedal and simultaneously push the handle forward.

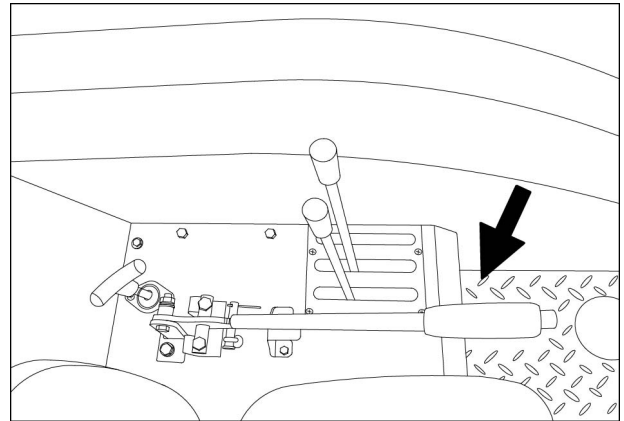


Fig. 3-50

Information about the parking brake: (This function is temporarily unavailable)

- When the parking brake is activated, the parking brake lamp (position ① in the figure) on the tractor instrument will light up.

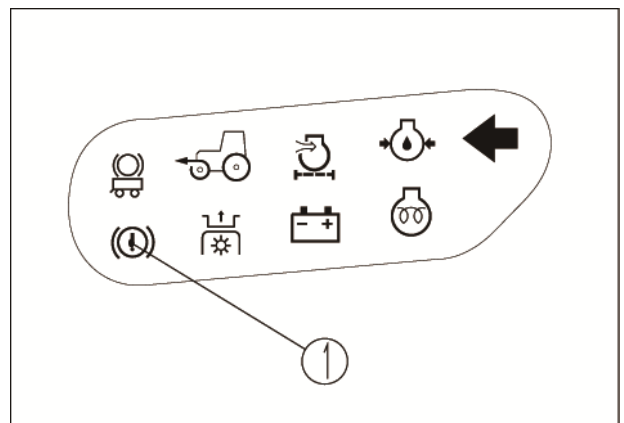


Fig. 3-51

3.14.5.Shutdown Cable

The shutdown cable is located as shown in Figure.

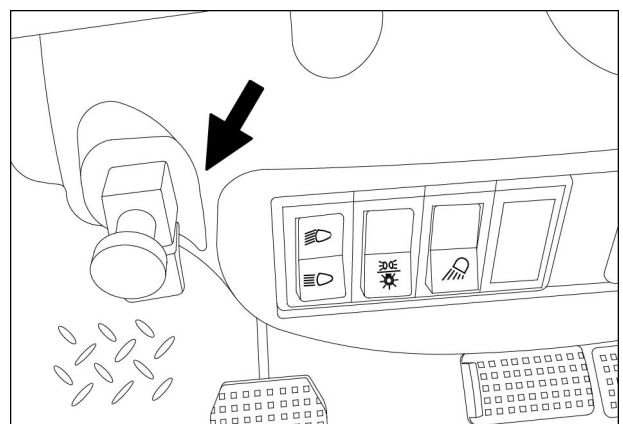


Fig. 3-52

3.14.6.

Shutdown Cable

To shut down the engine, pull out the shutdown handle ① to the shutdown position. To start the engine, pull up the shutdown cable locking device ②, the shutdown handle will automatically move to the startup position.

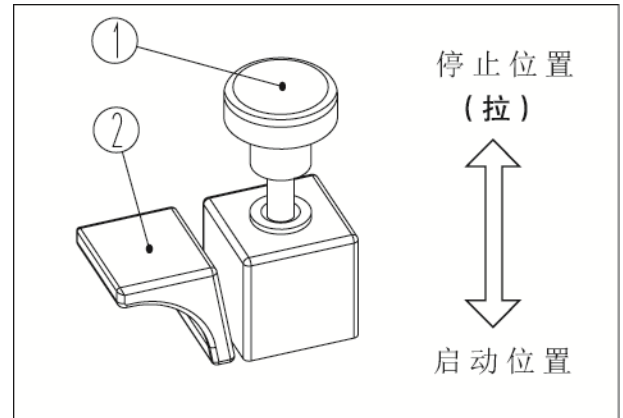


Fig. 3-53

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
- All control devices will be adjusted to neutral gear.
- Three-point linkage and implement which hitching the tractor will be declined to the ground.
- Stop engine.
- Shift to gear I if the tractor that is equipped with implement gearbox.

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
- 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 your tractor must be stopped on a steep slope (even temporarily), put a chocks under the four wheels to prevent the tractor moving. But, it is suggested that you don't park on a steep 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 pad.

3.14.6. Throttle Control Pedal

Use this control device to change the engine speed.

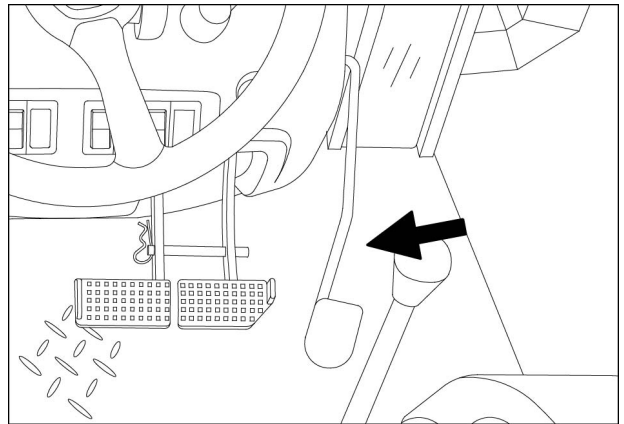


Fig. 3-54

3.14.7.

3.14.7. Throttle Control Handle

The hand throttle control handle is located on the right side of the driver.

The hand throttle is used to increase or reduce the engine speed. There is an icon beside the control handle to indicate the engine speed changing.

Push the control handle backward to increase the engine speed or pull it forward to reduce the engine speed. The engine speed is decided by where the control handle is located.

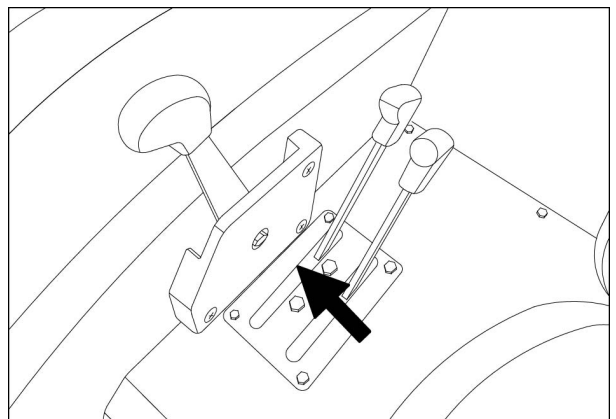


Fig. 3-55

3.14.8.

	Notice: 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.
---	---

3.14.8. Gearbox control device as follows

	Warning: Please don't leave if the engine is working, unless forced to. In this case, place all gear shift levers in the neutral positions and pull up the parking brake. For more information on safety operation, please refer to the section of "Tractor Parking" in the safety-related chapters in this Manual.
---	--

3.14.9.

Three configurations of the gearbox control unit are provided for FL40 / 55 / 70-1 series tractors.

Configuration I: 8 + 4 speed-gear configurations

- 8 forward gears + 4 reverse gears
- The transmission consists of such different parts as follows:
 - ◇ One main gear shift lever (1,2,3,4).
 - ◇ One range shift lever (L- H - R).

Configuration II: 8 + 8 speed-gear configurations

- 8 forward gears + 8 reverse gears
- The transmission consists of such different parts as follows:
 - ◇ One main gear shift lever (1,2,3,4).
 - ◇ One range shift lever (L - H)
 - ◇ One shuttle shift lever (F-R)

Configuration III: 12 + 12 speed-gear configurations

- 12 forward gears + 12 reverse gears
- The transmission consists of such different parts as follows:
 - ◇ One main gear shift lever (1,2,3,4).
 - ◇ One range shift lever (L-H-M).

- ◇ One shuttle shift lever (F-R)

3.14.9.Main gear shift lever

As shown in the figure.

There are four gear positions, respectively as: 1,2,3,4.

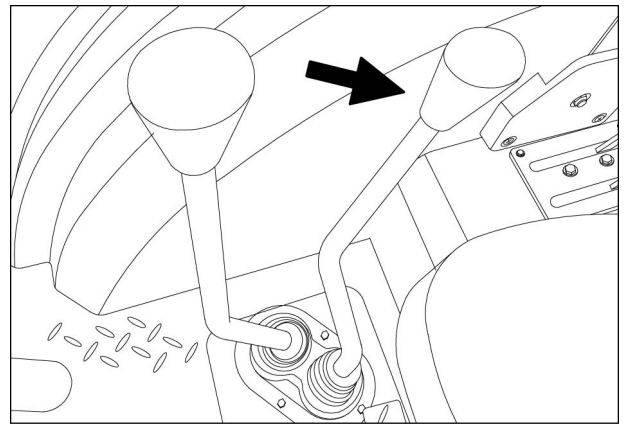


Fig. 3-56

3.14.10.Range shift lever

As shown in the figure.

Selection from three configurations may be made depending on the tractor model. See the "Power train device" for details.

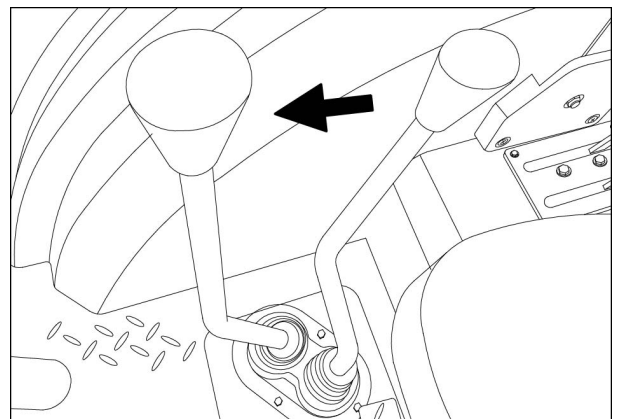


Fig. 3-57

3.14.11.

3.14.11.Shuttle shift lever

See the figure for the shuttle shift lever.

The shuttle shift lever is configured only in some models. See the " Power train device " for details.

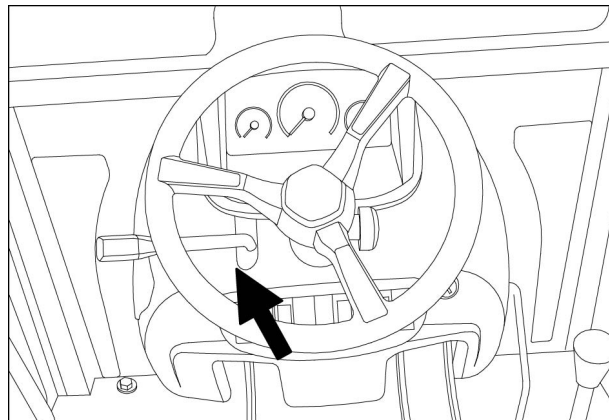


Fig. 3-58

3.14.12.

3.14.12.Differential lock control pedal

See the figure for the differential lock control pedal.

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.

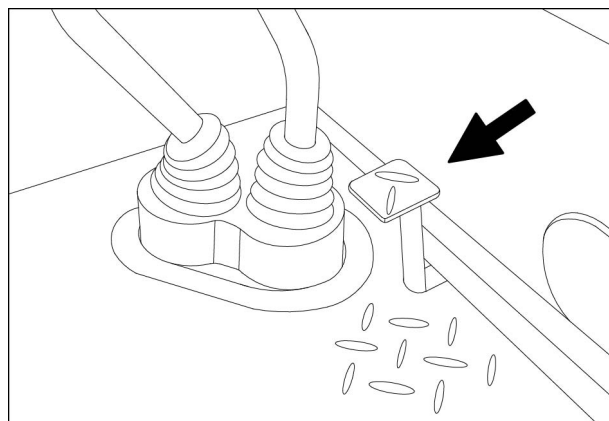


Fig. 3-59

3.14.13.

3.14.13.Four-wheel drive control handle

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

Pull up and the tractor 2WD mode will be changed into its 4WD mode.

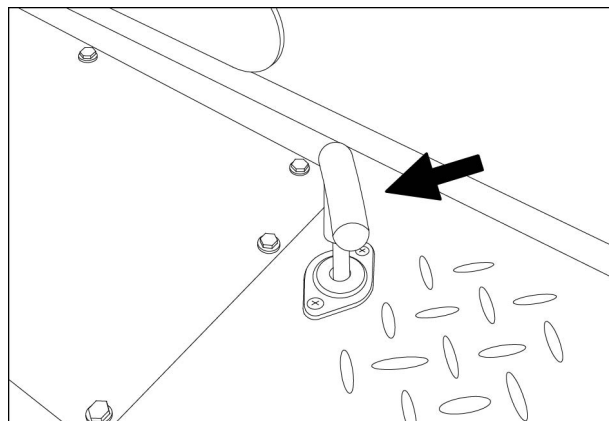


Fig. 3-60

3.14.14.

3.14.14.PTO control handle

See the figure for PTO control handle. The PTO control handle has three gear positions:

Pull up and then there will be a power output: 540 r/min.

The middle position is neutral.

Push down and then there will be a power output: 760r/min.

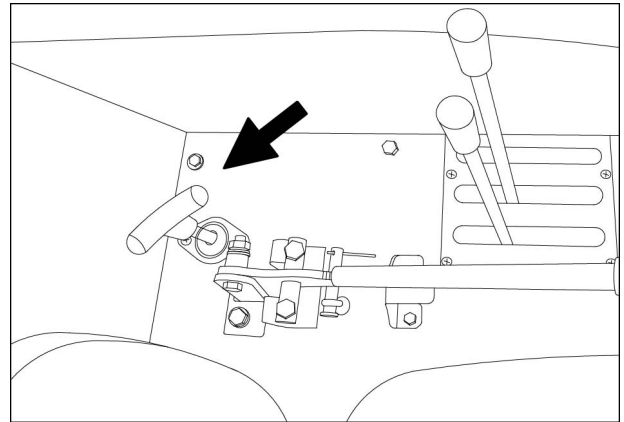


Fig. 3-61

3.14.15.



Important:

For different tractor models are provided different PTO speeds: 540(1000)r/min, 540(760)r/min.

3.14.15.Lifter Control **Handle (non-enforced-type)**

The control levers of the lifter include the position adjustment lever and force adjustment lever.

The position adjustment lever is shown in the illustration.

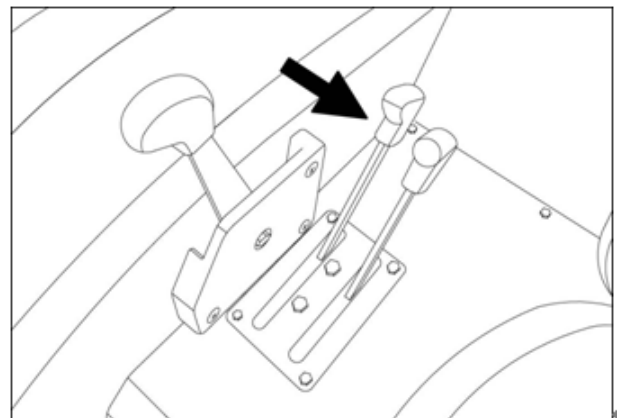


Fig. 3-62

The force adjustment lever is shown in the illustration.

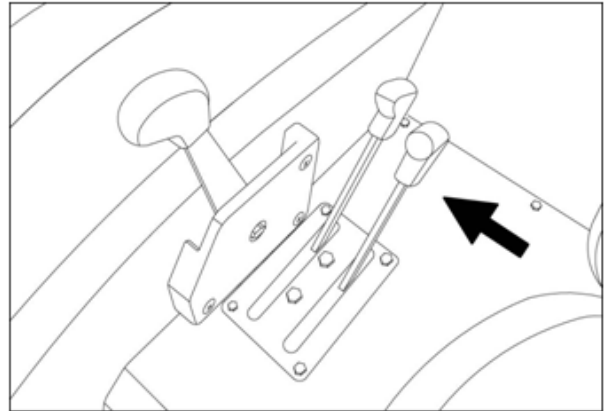


Fig. 3-63

3.14.16.Lifter Control Handle (pusher-type)

See the figure for the pusher-type lifter control handle.

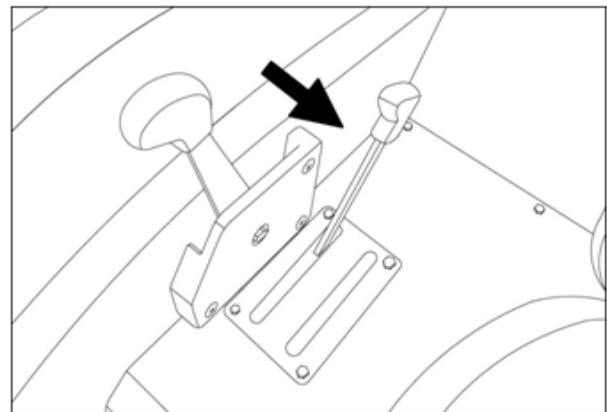


Fig. 3-64

3.14.17.

3.14.17.Multi-way Valve Control Handle (non-enforced-type)

See the figure for the multi-way valve control handle.

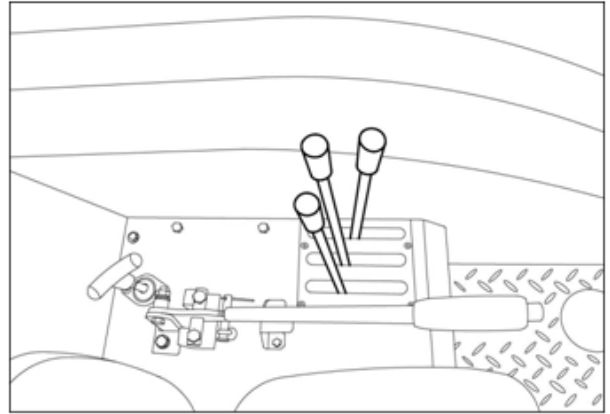


Fig. 3-65

3.14.18.

3.14.18.Multi-way Valve Control Handle (enforced-type)

See the figure for the multi-way valve control handle.

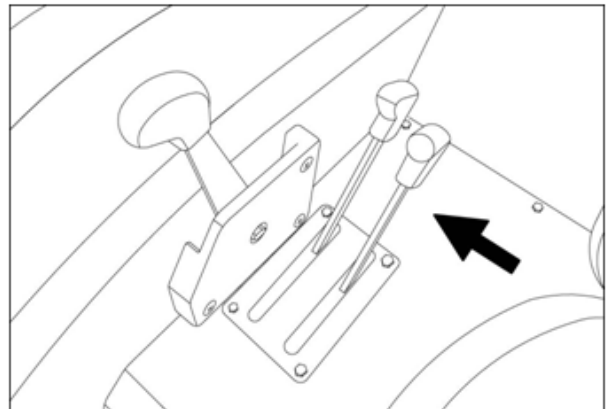


Fig. 3-66

3.14.19.

3.14.19.Fuel Tank

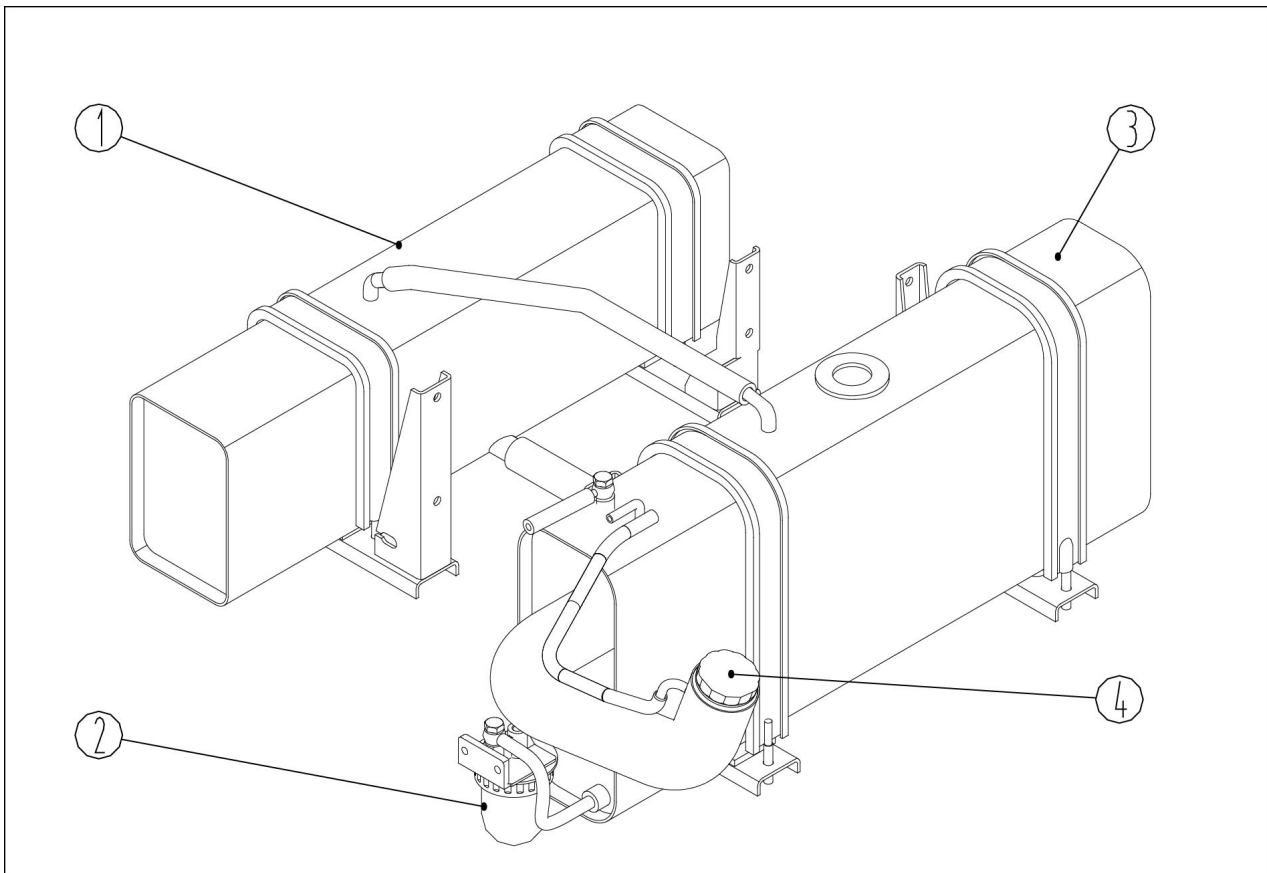


Fig. 3-67

1. Auxiliary Fuel Tank;	2. Filter;	3. Main fuel tank;	4. Oil filler
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3.14.20. Triangle hazard warning sign

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

3.14.21. 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.

3.14.22.

The fire extinguisher should be prepared by the user itself.

3.14.22. Operation 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.

3.14.23.Tool Kit

Tool kit is located on the left fender. (Floor model)

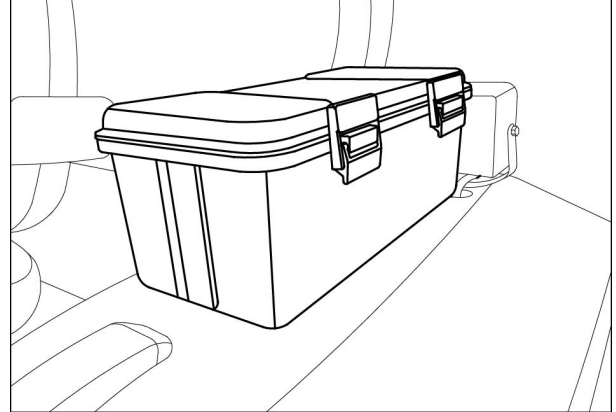


Fig. 3-68

3.14.24.

4. Operation Instructions

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 use of the 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;
- Before switching 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
 - ◇ Engine oil replacement
 - ◇ Renewal 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.
---	---

4.3.

4.3.1.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 lubricating oil level of engine oil pan, tractor transmission, rear axle and hydraulic system. Replenish sufficient cooling water in the water tank 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 lever and PTO shaft control handle, and set the main shift lever, PTO control handle, front drive axle control handle to neutral position, and the distributor control handle to neutral position.
- Pull up the shutdown cable locking device so that the shutdown cable 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 diesel engine. The method is as follows: First loosen the vent screw of the diesel filter, and use a hand pump to pump fuel to remove the air trapped in the pipe section from the fuel tank to the diesel filter, until no air bubbles exist in the drained fuel. Then, tighten the vent screw of the diesel 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.



Important:

Foreign bodies should be removed regularly from the water tank screen, so as to avoid fault due to improper heat radiation of the engine.



Important:

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.

4.3.2.Start the engine



Notice:

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.

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. Use the hand brake.
4. Move the main shift lever and range shift lever to their respective neutral position.
5. Move the shuttle shift control handle to the neutral position.

Ignition key

Insert the key into the ignition lock, and turn the key in clockwise direction: ACC position (auxiliary position), connect auxiliary electric components, such as warm air, wiper, fan and etc.; ON position (ignition position), connect power supply of the complete vehicle circuit; ST position (starting position), enable the complete to start working; after the engine is started, the key returns to ON position, and at this moment, ON and ACC are connected simultaneously to power components of the complete vehicle.

Fig. 4-1

The ignition lock is located on right side of the dashboard.



Notice:

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.

Engine startup procedure

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

4.3.2.1.Starting battery:

- (1) Starting at room temperature (above -5°C): Turn the key in clockwise direction to "ON" position to connect the circuit, and then turn the key to "ST" position to start the engine; after that, the key returns to "ON" position automatically. If it is equipped with a safe startup switch, first depress the main clutch pedal, and then turn the key to start the engine.
- (2) Warm-up starting (only applicable to the model with warm-up circuit):

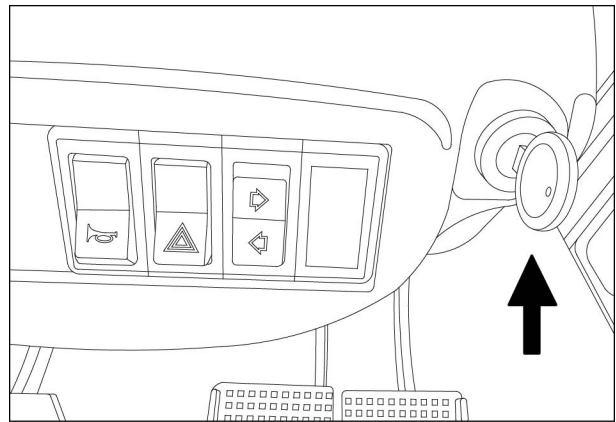


Fig. 4-2

- a. Insert the key into the ignition lock, and turn it in clockwise direction to the ignition position (ON) to connect the warm-up circuit:

If the atmospheric temperature is above 5°C , the indicator light is not on and the controller does not work, so the key can be turned to starting position (ST) to start the engine directly.

If the atmospheric temperature is below 5°C , the indicator light comes on, and the controller starts working; at this moment, the glow plug is powered for warming up;

- b. The warm-up time of the glow plug is related to the battery voltage, and is usually about 30s. After warm-up is finished, the indicator light flashes at frequency of 1 time/s, and the engine is ready to start;
 - c. When the indicator light flashes at frequency of 1 time/s, turn the key to the starting position (the minimum voltage of the battery should not be lower than 6.5V) so that the indicator light comes on and the fuel solenoid valve is open for fuel supply; if the key is not turned to the starting position when the indicator light flashes, the preheating device stops working after the indicator light flashes for 30s;
 - d. After successful startup, the controller will activate subsequent warm-up process automatically, and the subsequent warm-up process lasts for 60~140s, and is judged based on atmospheric temperature.
- (3) Low-temperature starting (only applicable to the model without warm-up circuit):

For the tractor without warm-up circuit, before starting the engine in cold weather, fill hot water with temperature above 90°C into the water tank until hot water overflows from the drain valve of the cylinder block; at this moment, close the drain valve, and top up hot water in the whole cooling system. Drain the oil in the oil pan (it is better to drain the oil after flame-out when the oil is not cool down) into a container with a cover, and heat it to 70~90°C, and then pour the hot oil into the oil pan. It is prohibited to bake the oil pan with fire. Set the hand throttle to the maximum throttle scale position, and turn the key in clockwise direction to ST position (starting position) to start the engine: After the engine is started, lose hold of the key to enable it to automatically return to ON position (ignition position), and then, set the hand throttle to the minimum throttle scale position.

**Important:**

After the engine is started, lose hold of the key immediately to enable the key to automatically return to "ON" position (see ignition lock picture). Otherwise, the engine will drive the starter motor, causing damage to the starter motor.

**Important:**

The time of every start should not be more than 5s, and the time interval between continuous starts should not be less than 15s. For maintaining charging performance of the battery, no more than 3 times of continuous start is allowed. In case of failure to start the engine for three times in succession, the engine cannot be started until the cause is investigated and handled.

4.3.2.2.Starting by a towing tractor:

When the engine is started by a towing tractor, the towed tractor should be engaged in the high gear 3th or 4th, and the towing tractor speed should not be more than 15km/h.

**Important:**

During starting by a towing tractor, the main clutch pedal should be pressed immediately when the engine starts running, and then the throttle opening scale should be reduced to avoid flame-out of the engine.

4.3.2.3.Use another battery as emergency battery to start the engine



Danger:

Ensure proper connection with the battery terminal. Short-circuit danger!

4.3.2.4.



Important:

You can use auxiliary battery of other tractor for this purpose; only the battery composed of same quantity of cells and at same voltage rating can be used for connection.



Danger:

Do not start the engine by means of shorting the terminals of the starter motor, because the tractor will start moving forward suddenly, causing potential personal injury to the driver.

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 electric 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

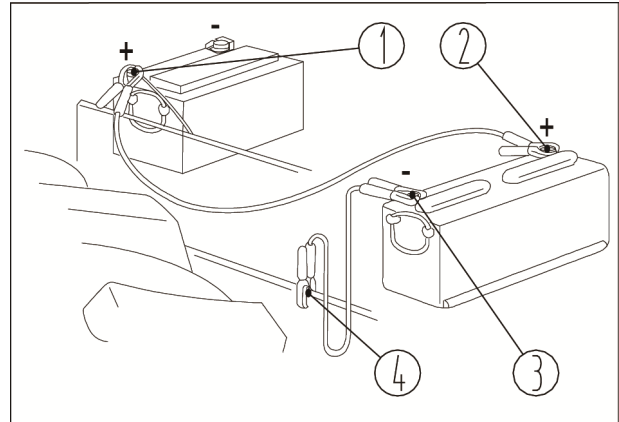


Fig. 4-3

4.3.3.Operation of engine

- After the engine is started, reduce the throttle opening immediately to enable the engine to be in idling state, and inspect the engine oil pressure at this moment to ensure that the engine oil pressure is not lower than 98kPa(1 kgf/cm²). At this moment, the oil pressure indicator light is off.
- After the engine is started, do not have the engine operated at full load immediately, but have the engine operated at middle speed for warm-up. When the coolant temperature is more than 60°C, the engine speed can be increased to the maximum value, and be operated at full load.
- The engine speed and load should be increased/decreased slowly, especially after the engine is started, do not allow to "fiercely step throttle" to make the engine to be run at high speed.
- When the engine is running, the engine pressure and coolant temperature should be inspected from time to time, and the cooling temperature during normal operating of the engine should be kept at about 85~95°C. The engine oil pressure should be 294~490 kPa.



Important:

The engine oil pressure cannot be lower than 98kPa in any circumstance, and if the pressure is lower than the same value, it is required to investigate causes and conduct troubleshooting.

4.3.4.Shut down the engine

Prior to shutdown of the engine, conduct following operation:

1. If the engine is very hot, have it idled for a while before shutdown.
2. To shut down the engine, pull out the shutdown handle.
3. Set the gear shift lever and shuttle shift control handle to the neutral position, and pull the hand brake.
4. Turn the ignition key to the position OFF.

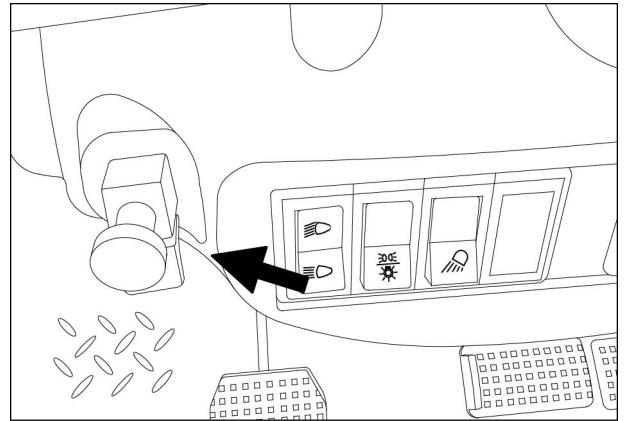


Fig.4-4

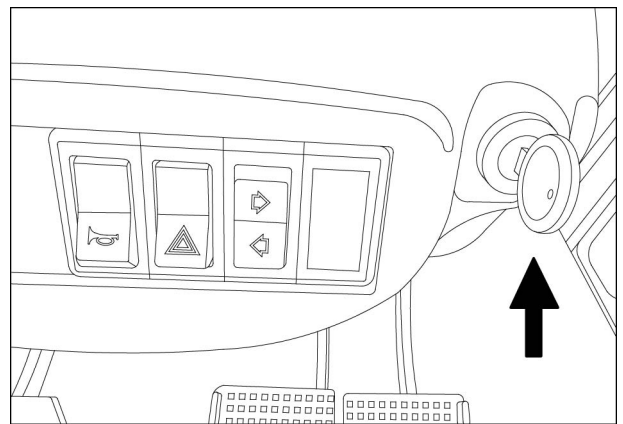


Fig. 4-5

4.3.5.

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.

Fig. 4-6

During operation, semi-engagement of the clutch is not allowed to reduce driving speed of the tractor. During driving, do not put your foot onto the clutch pedal always to avoid speeding up wear of the release lever and friction lining.

4.4.

	Important: 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. 2. Before the tractor starts to move forward, must release the parking brake to avoid damage to the working parts. 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.
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4.4.Steering of The Tractor

During steering of the tractor on the road, first turn on the corresponding turn signal and 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.

4.5.

4.5.1.Cycloid Rotary Valve Type Hydrostatic Steering

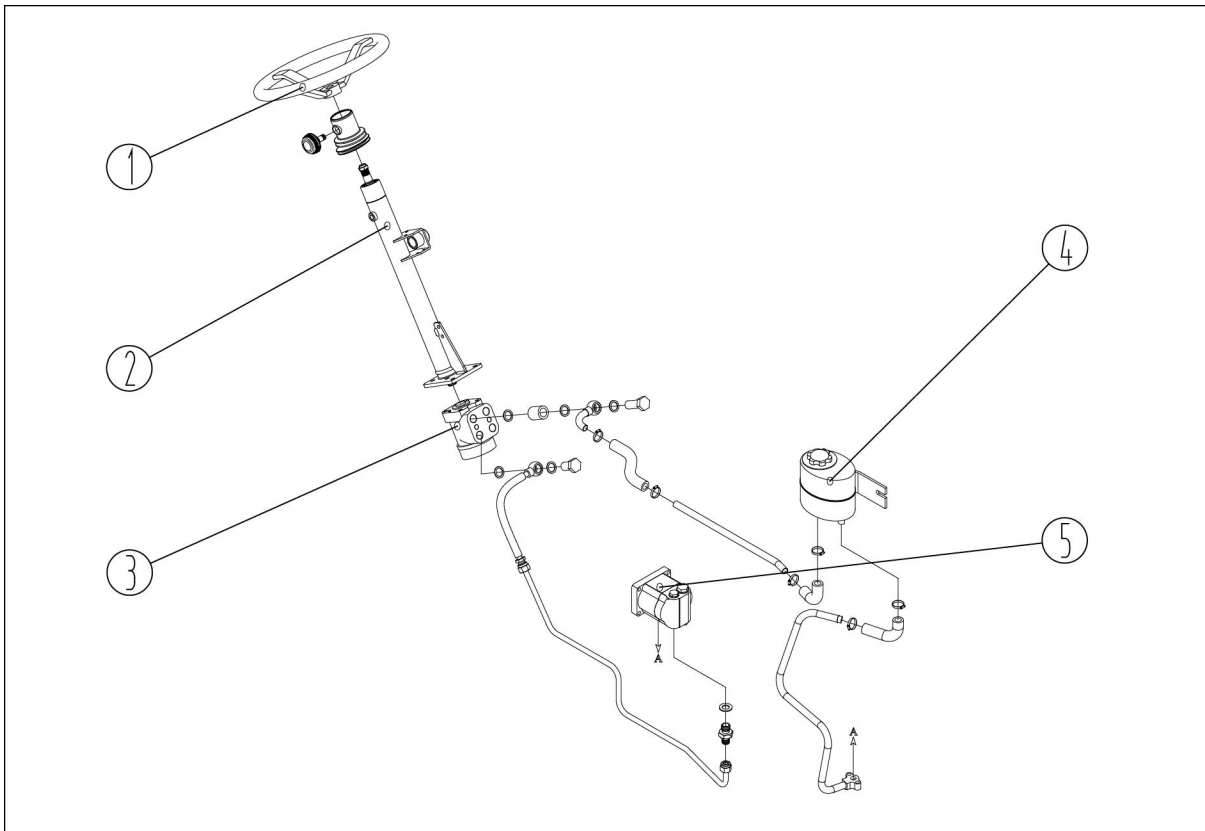


Fig. 4-7

1. Steering wheel	2. Steering column	3. hydraulic steering gear	4. Steering oil tank	5. Constant flow overflow pump
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Prior to delivery of the tractor, the steering system is adjusted properly. The user should pay attention to following matters during operation:

- Frequently inspect screw connections, and if the screw connections are loosened, tighten them in time.
During operation of the full hydraulic steering system, the connections cannot have leakage phenomena.

- Frequently inspect oil level of the steering oil tank.
- If the steering is heavy or failed during operation, first carefully investigate causes and cannot pull the steering wheel in a forced manner, and even do not dismantle the steering gear to avoid damage to parts. It is prohibited that the steering wheel is turned by two persons simultaneously.
- When a full hydraulic steering system is installed, the steering gear should ensure it is in line with the steering shaft, and an axial clearance exists. After installation, check the steering wheel for flexible return.
- Must ensure that the fluid is clean. For this reason, frequently inspect the filter element and fluid. Inspection method: Drop a fluid drip to a blotting paper; if the oil stain center is black, it indicates that the fluid should be replaced.
- After the hydraulic oil is replaced with new one, the gas in the oil cylinder should be removed completely. Gas removal method: Loosen the bolt joint of the steering oil cylinder to enable the oil pump to operate at low speed for out flowing until the drained oil does not contain foam. Dismantle the connection between the steering cylinder piston and direction wheel, and turn the steering wheel to enable the piston to move to the left or right position (it does not stop at both limit positions), and fill oil to the oil tank to the specified highest oil level. Tighten all threaded connections (which cannot be tightened under pressure) and connect the piston rod. Inspect whether the steering system operates normally in individual operating conditions.
- The constant /overflow pump is a precision part, and usually, no dismantling is allowed; if must be dismantled, it should be dismantled at a clean place, and cleaned with clean gasoline or kerosene.



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.Power Train Device

4.5.1.Power Train Device Configuration

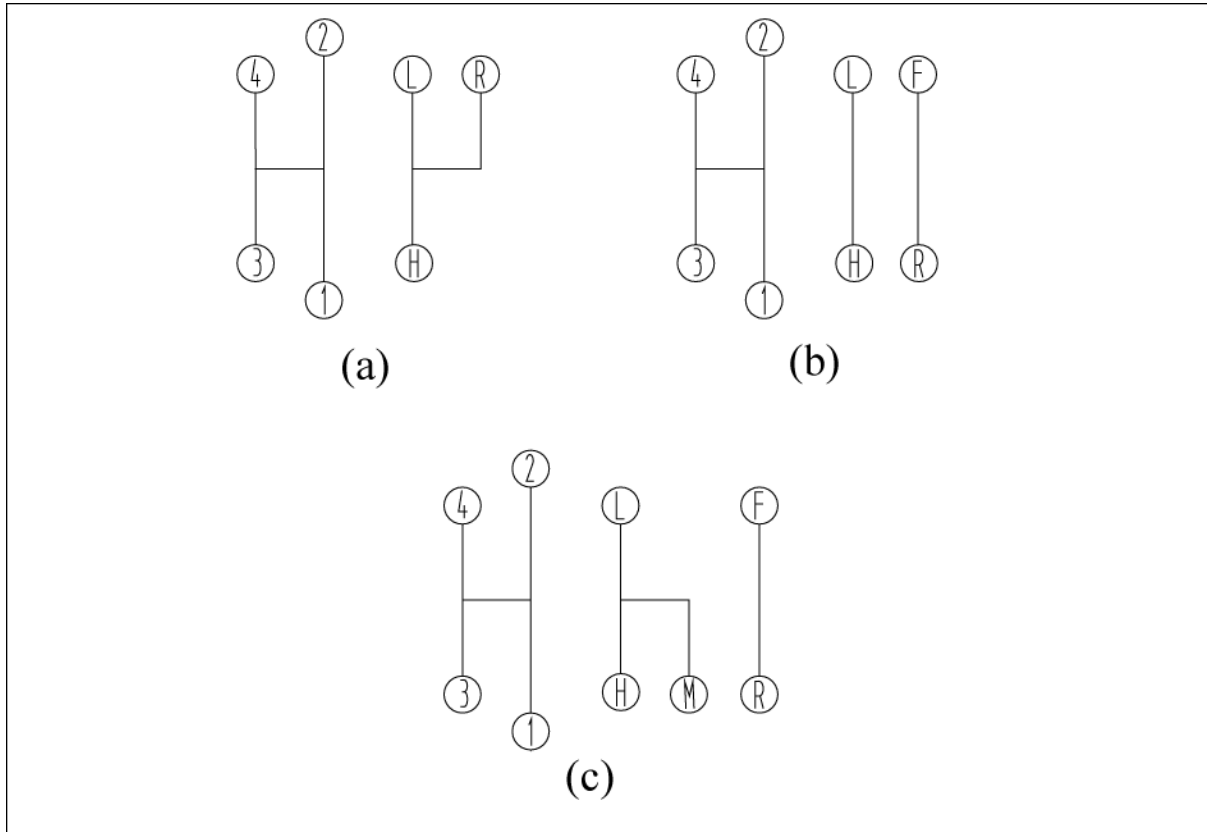


Fig. 4-8

Gear layout of FL35-70HP Series Tractor

- (a) Gear layout for the tractor models with "8 forward gears +4 reverse gears"
- (b) Gear layout for the tractor models with "8 forward gears +8 reverse gears"
- (c) Gear layout for the tractor models with "12 forward gears +12 reverse gears"

4.5.2.8+4 speed-gear configurations

- 8 forward gears + 4 reverse gears
- The transmission consists of such different parts as follows:
 - ◇ One main gear shift lever (1,2,3,4).
 - ◇ One range shift lever (L- H - R).

Main gear shift lever

The main gearshift lever can accomplish gear shift among four gear positions (1,2,3,4).

Depress the main clutch pedal, move the main shift lever from the neutral position to the right, then backward to the 1st gear or forward to the 2nd gear. Depress the main clutch pedal, move the main shift lever from the neutral position to the left, then backward to the 3rd gear or forward to the 4th gear.

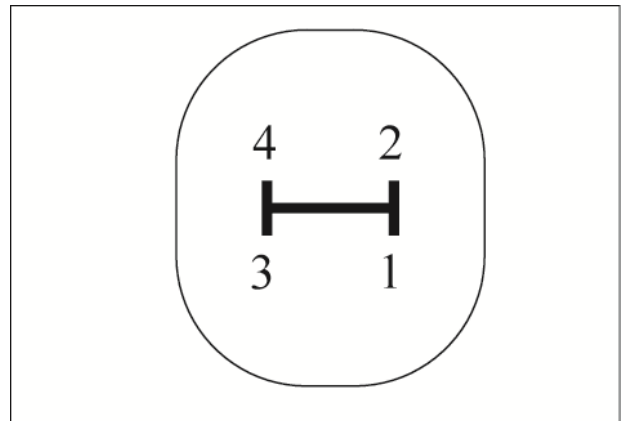


Fig. 4-9

Range shift lever

The range shift lever has three positions: 2 forward gears (L- low gear; H-high gear) and 1 reverse gear.

- L (Low speed)
- H (High speed)
- R (Reverse gear)

Depress the main clutch pedal, move the range shift lever from the neutral position to the left, then forward to the L gear or backward to the H gear. Depress the main clutch pedal, move the range shift lever from the neutral position to the right, then backward to the R gear.

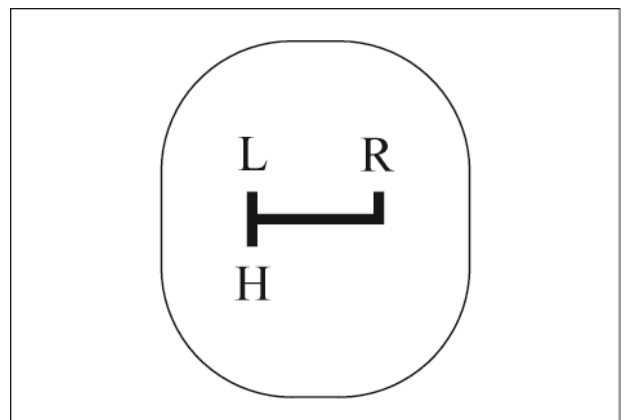


Fig. 4-10

4.5.3.8+8 speed-gear configurations

- 8 forward gears + 8 reverse gears
- The transmission consists of such different parts as follows:
 - ◇ One main gear shift lever (1,2,3,4).
 - ◇ One range shift lever (L-H)
 - ◇ One shuttle shift lever (F-R)

Main gear shift lever

The main gearshift lever can accomplish gear shift among four gear positions (1,2,3,4).

Depress the main clutch pedal, move the main shift lever from the neutral position to the right, then backward to the 1st gear or forward to the 2nd gear. Depress the main clutch pedal, move the main shift lever from the neutral position to the left, then backward to the 3rd gear or forward to the 4th gear.

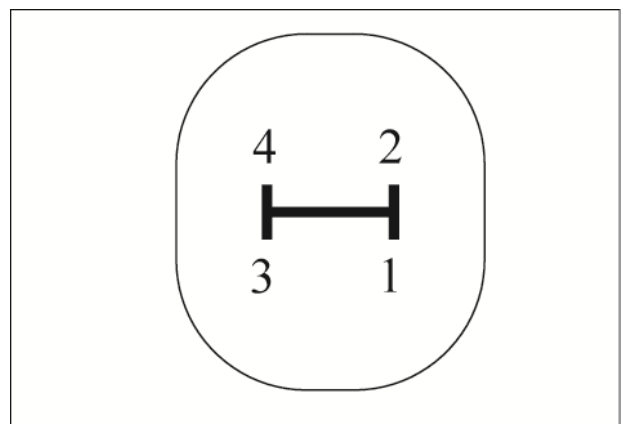


Fig. 4-11

Range shift lever

The range shift lever can accomplish gear shift between 2 speed ranges (L indicates low speed range, and H indicates high speed range).

- L (Low speed)
- H (High speed)

Depress the main clutch pedal, move the range shift lever from position neutral to L, or from neutral to H to get a high gear.

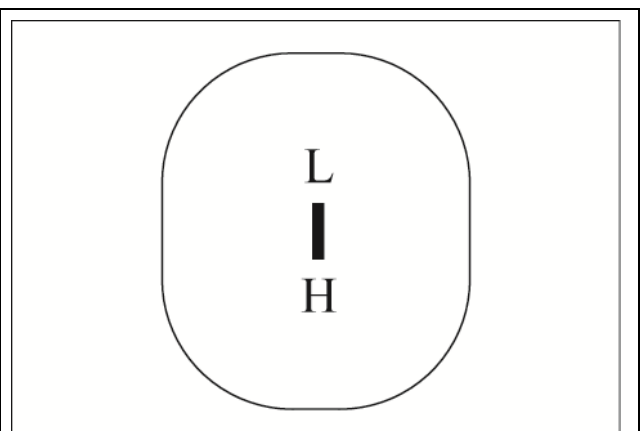


Fig. 4-12

Shuttle shift lever

The shuttle shift lever can accomplish gear shift between forward gear and reverse gear.

- F (Forward)
- R (Reverse)

Depress the main clutch pedal. Move the shuttle shift lever from the neutral position forward to get a forward gear, or backward to get a reverse gear.

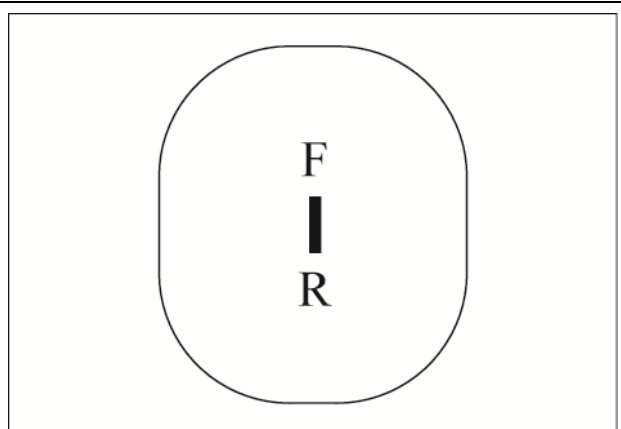


Fig. 4-13

4.5.4.12+12 speed-gear configurations

- 12 forward gears + 12 reverse gears
- The transmission consists of such different parts as follows:
 - ◇ One main gear shift lever (1,2,3,4).
 - ◇ One range shift lever (L-H-M).
 - ◇ One shuttle shift lever (F-R)

Main gear shift lever

The main gearshift lever can accomplish gear shift among four gear positions (1,2,3,4).

Depress the main clutch pedal, move the main shift lever from the neutral position to the right, then backward to the 1st gear or forward to the 2nd gear. Depress the main clutch pedal, move the main shift lever from the neutral position to the left, then backward to the 3rd gear or forward to the 4th gear.

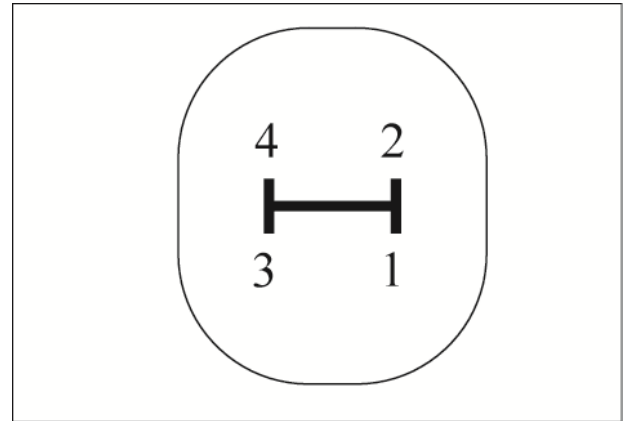


Fig. 4-14

Range shift lever

The range shift lever can accomplish gear shift among 3 speed ranges (L indicates low speed range, H indicates high speed range and M indicates middle speed range).

- L (Low speed)
- H (High speed)
- M (Middle speed range)

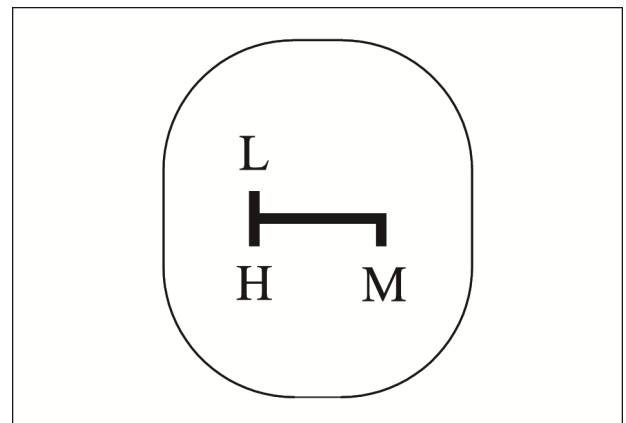


Fig. 4-15

Depress the main clutch pedal, move the range shift lever from the neutral position to the left, then forward to the L gear or backward to the H gear. Depress the main clutch pedal, move the range shift lever from the neutral position to the right, then backward to the M gear.

Shuttle shift lever

The shuttle shift lever can accomplish gear shift between forward gear and reverse gear.

- F (Forward)
- R (Reverse)

Depress the main clutch pedal. Move the shuttle shift lever from the neutral position forward to get a forward gear, or backward to get a reverse gear.

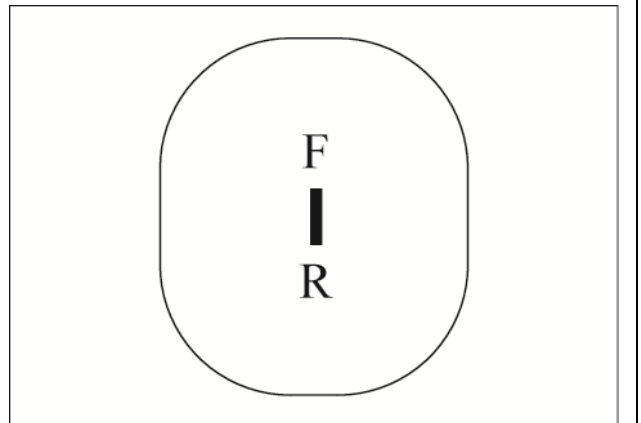


Fig. 4-16



Important:

Before starting the tractor, the shift lever must be in the neutral position.

4.6.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 should be unscrewed, 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 next higher gear and small throttle can be selected to save fuel.

**Important:**

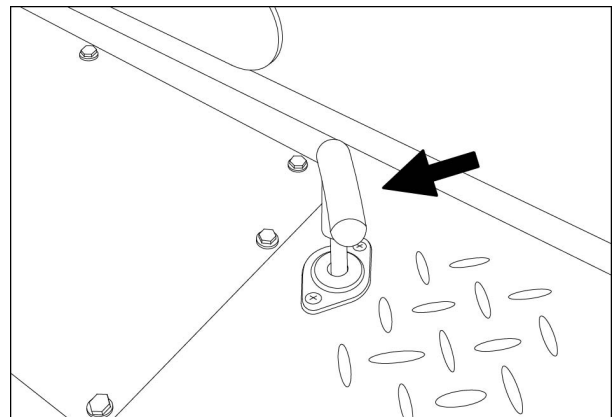
1. During operation of the engine, press the main clutch pedal fully before gearshift to avoid poor engagement of the engagement sleeve of the transmission, resulting in "Gear collision" phenomenon.
2. The reverse gear can be engaged only when the tractor is standstill.
3. When the tractor is operating, 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.

4.7.**4.7.Front Wheel Drive-Differential Lock****4.7.1.Four-wheel drive engagement**

FL35-70HP Series four-wheel drive tractor is driven only by the rear wheels when it works at heavy load in field or on humid and soft soil, the tractor's traction force may be insufficient; at this moment, coupling the front drive axle can increase traction force of the tractor and reduce the slippage rate, so as to enhance working suitability of the tractor. To engage and separate the front drive axle, the following operating procedures should be observed.

4.7.2.Engagement of the front drive axle

Depress the main clutch pedal, set the transmission to a proper gear. Pull up the four-wheel drive control lever to engage the four-wheel drive. If it is difficult to pull up the control lever, this could result in failure in four-wheel drive engagement. In this case, you can slowly release the clutch pedal. When the tractor moves a little, pull up the front drive axle control lever, to change the two-wheel drive into four-wheel drive.

*Fig. 4-17***4.7.3.****4.7.3.Disengagement of the front drive axle**

When uncoupling the front drive axle is required, press the main clutch pedal, and pull the front drive axle control handle downward to uncouple the front drive axle.

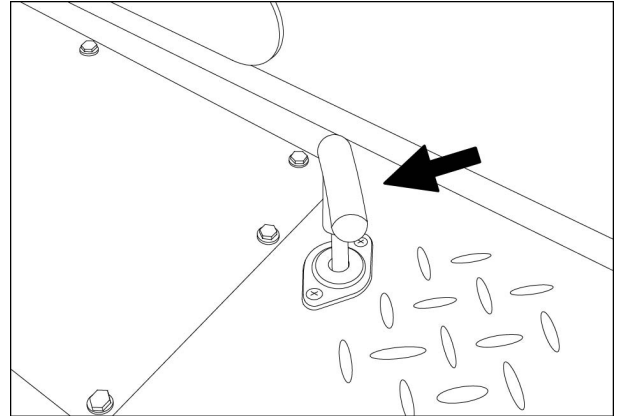


Fig. 4-18

4.7.4.

In addition to engagement of the rear-wheel drive, activating the front-wheel drive can enhance traction force during transportation on a steep road and uneven terrain.

	Important: When the tractor is used for ordinary transportation on a hard road, coupling the front drive axle is not allowed; otherwise it may cause early wear of the front wheels, increasing fuel consumption. The front drive axle can be coupled only in rainy and snowy weather, when the road is slippage, and the rear wheels of the tractor are prone to slippage during uphill driving. After the tractor drives out of the hard area, the front drive axle should be uncoupled.
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	Important: When the tractor is used for transportation, the front tires are worn rapidly, and both sides of the tire tread worn unevenly, the left tire can be exchanged with the right one as the case may be.
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4.7.4.Operation of the differential lock

If the tractor wheels are trapped or a single-side wheel slips or the tractor cannot move forward during driving or working of the tractor, the differential lock can be jointed as per following steps to enable the left/right drive shafts to be connected rigidly, so that the tractor can drive out of the slippage area at the same speed.

Fig. 4-19

- Depress the main clutch pedal to operate the gear shift lever to engage the low speed range.
- Pull the throttle control handle to the maximum fuel supply position.
- Depress the differential lock control pedal by your right foot.
- Smoothly release the clutch pedal to enable the tractor to start to move forward smoothly.

After the tractor drives out of the slippage area, release the differential lock pedal, and enable the differential lock to be self-disengaging automatically.

4.7.5.

	Important: Before locking the differential, usually depress the clutch pedal.
---	---

	Important: When activating the differential lock, the tractor cannot drive at high speed on the road. In such case, the steering is difficult, so that it may result in accident, injury or harm.
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Notice:

During normal driving or cornering of the tractor, it is prohibited to use the differential lock to avoid damage to the differential lock and relevant parts and speeding up wear of the tires.

4.8.Operation of the Trailer Brake System



Notice:

The tractor must be equipped with a trailer brake system that is properly connected to the trailer.

4.9.



Important:

Please contact an authorized service center to adjust the brake system.

The engine-driven air compressor delivers compressed air to the trailer brake system (see the diagram).

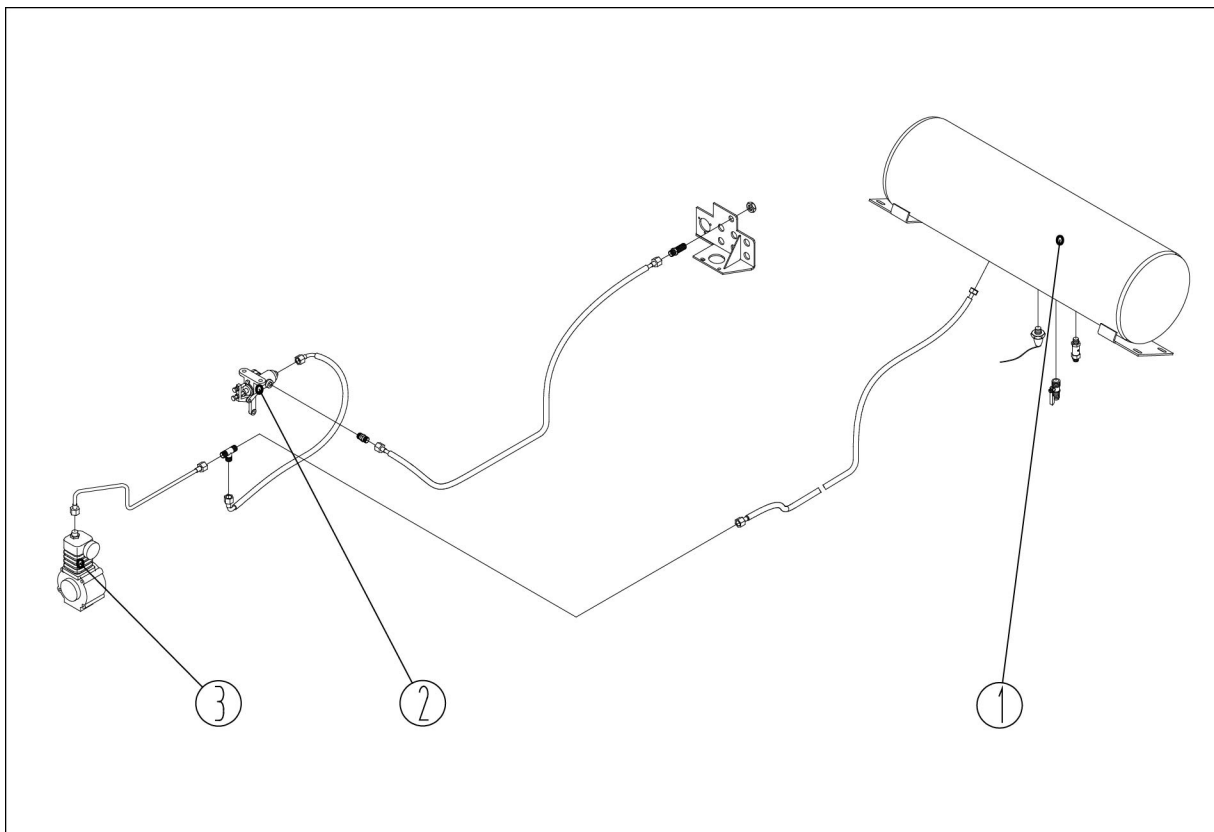


Fig. 4-20

1. Air reservoir assembly;	2. Air brake valve assembly;	3. Air compressor
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The trailer brake system of FL35-70HP series tractor is a “inflation” control system. The trailer must be accordingly equipped with a complete set of “inflation” control devices. For the trailer equipped only with an “inflation” control system including the brake air chamber and controller, the “inflation” control system must be modified into “deflation” control system, which can be used for the trailer.

- When the tractor is equipped with a trailer, observe the air pressure indicator. The air pressure of accumulator shall not be less than 0.44MPa (4.5kgf / cm²), otherwise, increase the air pressure to the specified value before the tractor moves off.
- In normal times, the balancing air pressure in the accumulator shall not be less than 0.70MPa (7kgf /cm²), otherwise, adjust the air pressure regulator. If air pressure gauge reading decreases rapidly when the engine stops running, air leakage could occur. Identify and remove the cause promptly.
- The Safety valve opening pressure of air reservoir shall be 0.75MPa-0.8MPa (7.5kgf /cm²-8kgf /cm²). Make timely adjustment to the system in the case of air pressure gauge reading exceeding this range.
- If the air reservoir pressure of tractor is normal, but the air reservoir pressure of trailer is low (indicated by inefficient trailer brake), adjust only the adjusting screw to the left of brake valve.
- If the air reservoir pressure is always in the range of 0.75MPa-0.8MPa (7.5kgf / cm²-8kgf/cm²) or a higher range, the Safety valve is incapable of relieving load, and thus requires timely cleaning or replacement.
- Before using the tractor-trailer combination, check its brake system. The brake system of trailer must operate at the same time as, or a little earlier than the brake system of tractor. The brake system of trailer shall not operate later than that of tractor. If necessary, adjust the adjusting screw of the brake valve to meet the above requirements.

After connecting the male end of connector at the hose of trailer to the female end of connector at the back of trailer, turn off the engine, and repeatedly depress and release the brake pedal, to check for air leakage at the connector.

**Important:**

The brake system of trailer must always operate a little earlier than that of tractor.



Important:

Do not detach the trailer from the tractor, unless it is sure that it has been unloaded.



Important:

Do not arbitrarily tighten or loosen the two adjusting screws on the brake valve stem, which have been adjusted using dedicated test rig and provided with a red marking before delivery of tractor out of factory, so as not to cause brake failure.



Important:

To ensure that the air brake system operates normally, open the drain valve to drain water from the air reservoir every 50 hours of tractor operation.

Check periodically

- Conditions of hose
- Operation of pressure gauge
- Tension of compressor drive belt
- Compressor oil leakage
- Cleanliness of connector and operation of valve in connector. (By checking whether air has reached the air reservoir of trailer).

4.9.PTO Configurations

4.9.1.PTO shaft



Notice:

When the engine speed exceeds rated speed, do not engage the PTO shaft. If the speed is too fast, it may cause damage to the implement, and cause injury.

4.9.2.



Warning:

When using a PTO to drive an implement, such as rotary mower, hay baler and flail, such implements must be installed with a free wheel clutch to avoid damage to the PTO brake.



Warning:

Before dismounting from the tractor, always disengage the PTO, lower implements to the ground, put the gearbox controls in neutral, apply the parking brake, shut off the engine, engage first gear (on tractors with mechanical gearboxes) and remove the key from the starter switch. For further information on safe working procedures, refer to the chapter “Parking the tractor” in the safety section of this manual.



Danger:

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.



Danger:

For safety reasons, the PTO shaft shield must never be removed. The shaft's safety cap must only be removed to couple the PTO shaft to the implement drive shaft with the engine stopped. We recommend that this cap is always replaced with the engine stationary when the PTO shaft is not to be used.



Danger:

When connecting or disconnecting the PTO drive shaft, shut off the engine and apply the parking brake. For further information on safe working procedures, refer to the chapter “Parking the tractor” in the safety section of this manual.

**Danger:**

After disconnecting the drive shaft from the PTO output shaft, always screw the cap back on to the output shaft tightly.

**Danger:**

Only change the PTO output shaft when the tractor engine is shut off and the key is removed from the starter switch.

**Danger:**

During operation of the PTO, access to the PTO or drive shaft by anybody is not allowed.

**Warning:**

When using the tractor with stationary implements driven by the PTO (e.g. irrigation pump), before leaving the tractor, make sure that all gear levers are in “neutral”, apply the parking brake fully and place chocks under the tractor wheels. For further information on safe working procedures, refer to the chapter “Parking the tractor” in the safety section of this manual.

FL35-70HP Series tractor is equipped with a 2- speed rear PTO (540rpm and 760rpm).

The PTO shaft of FL35-70HP series tractors is an independent type. The tractor is able to carry out working in a mobile manner or in a fixed manner. The PTO works independently. With the main clutch pedal depressed, the tractor stops moving, while the PTO shaft can continue running. By setting the PTO control handle to the neutral position, the PTO shaft stops working and the tractor is able to continue to move forward.

4.9.2.Steps for starting the PTO shaft

Model 1:

- Have the implement coupled with the hitch mechanism;
- Depress the clutch pedal, and set the PTO control handle to the neutral position;

- Select PTO shaft speed according to requirements.
- Depress the clutch pedal.

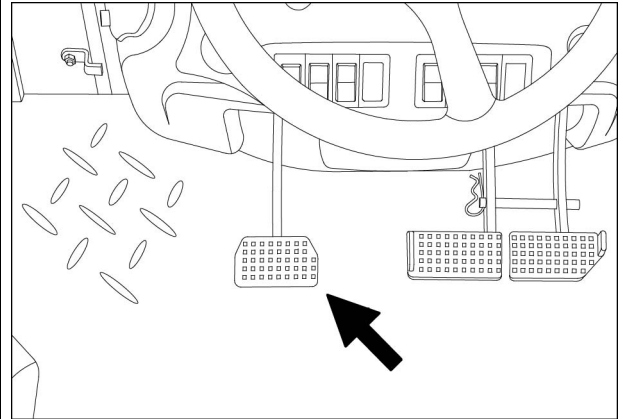


Fig. 4-21

- And press down the PTO control handle to engage the high speed gear of 760r/min; if it is pulled upward, the low speed gear of 540r/min is engaged.

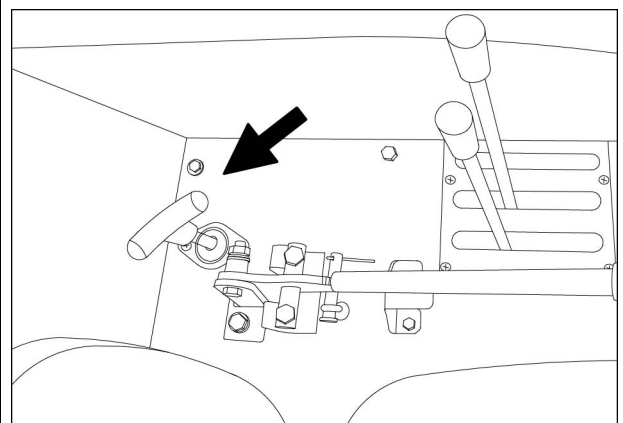


Fig. 4-22

- Unscrew the protective cover of the PTO shaft, and then couple the upper cardan joint of the implement with the PTO shaft;
- Install the PTO protective cover properly;
- Set the control handle of the lifter to "Up" position to lift up the implement;

Model 2:

- Have the implement coupled with the hitch mechanism;

- Pull up the auxiliary clutch lever, and set the PTO control handle to the neutral position;

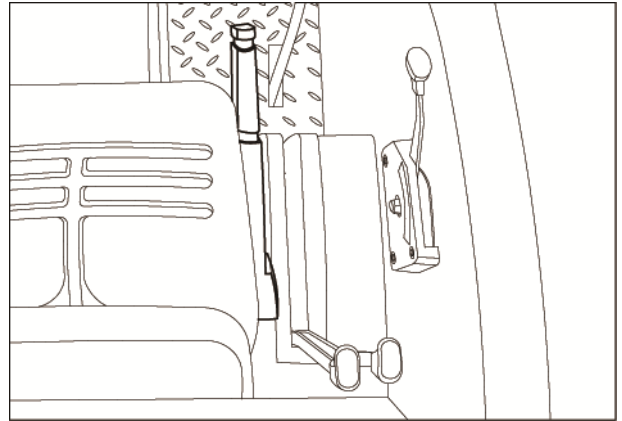


Fig. 4-23

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- Unscrew the protective cover of the PTO shaft, and then couple the upper cardan joint of the implement with the PTO shaft;
- Install the PTO protective cover properly;
- Set the control handle of the lifter to "Up" position to lift up the implement;

- Select PTO shaft speed according to requirements.
- Depress the clutch pedal, and press down the PTO control handle to engage the high speed gear of 760r/min; if it is pulled upward, the low speed gear of 540r/min is engaged.

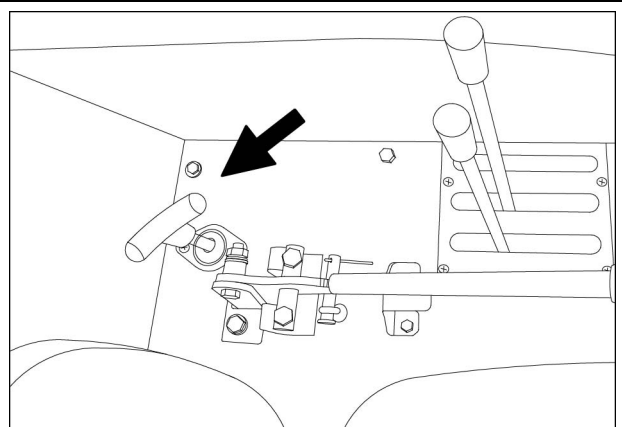


Fig. 4-24

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Model	35	40/50/55-1
Engine	Laidong	Quanchai/Xinchai
Engine rated speed (RPM)	2350	2400

Electrical system

PTO configuration	540/760		540/1000		540/760		540/1000	
PTO speed (RPM)	540	760	540	1000	540	760	540	1000
Gear ratio	0.29 (15/52)	0.35 (17/49)	0.26 (14/53)	0.45 (22/45)	0.29 (15/52)	0.35 (17/49)	0.26 (14/53)	0.45 (22/45)
PTO speed (RPM) @engine rated speed	678	815	621	1149	692	833	634	1173
Engine speed @PTO rated speed (RPM)	1872	2191	2044	2045	1872	2191	2044	2045
Percentage	80%	93%	87%	87%	78%	91%	85%	85%

Model	55/60/70							
Engine	Xinchai				Quanchai			
Engine rated speed (RPM)	2300				2400			
PTO configuration	540/760		540/1000		540/760		540/1000	
PTO speed (RPM)	540	760	540	1000	540	760	540	1000
Gear ratio	0.26 (12/46)	0.34 (15/44)	0.26 (12/46)	0.49 (19/39)	0.26 (12/46)	0.34 (15/44)	0.26 (12/46)	0.49 (19/39)

PTO speed (RPM) @engine rated speed	600	784	600	1121	626	818	626	1169
Engine speed @PTO rated speed (RPM)	2070	2229	2070	2053	2070	2229	2070	2053
Percentage	90%	97%	90%	89%	86%	93%	86%	86%



Warning

When the PTO is jointed, it is prohibited that anybody approaches the implement, so as to avoid occurrence of danger!

4.9.3.Steps for disconnecting the PTO shaft

- Adjust the engine to the idling state;
- Wait for a while until the engine gets standstill;
- Disconnect the PTO shaft;
- Depress the clutch pedal, and set the PTO control handle to the neutral position;



Warning

When the PTO is not required, the PTO control handle should be in the neutral position, and the PTO shaft sleeve should be re-installed and tightened firmly.

4.10.Hydraulic Lifter

**Notice:**

Before use of the hydraulic lifter, ensure that nobody stands near the implement.

**Notice:**

Always lower the implement to the ground when the tractor is not in operation or when carrying out maintenance, repairs or adjustments.

**Notice:**

Never tow implements by attaching them to the lower links. Only tow implements using the homologated tow bars or towing hitches. Towing or hitching to other points of the tractor can cause the tractor to overturn.

**Notice:**

Do not stand or allow anyone else to stand between the tractor and the implement, unless the engine is shut off and the key removed from the starter switch, the parking brake applied, a gear engaged and all attachments or implements lowered to the ground.

The rear lift unit for the control of mounted implements, semi-mounted implements, and trailed implements is composed of

- Lifter located on the PTO housing;
- A three-point linkage to which the implements for lifting are attached.

The hydraulic unit used for hydraulic control of the lifter has following functions:

- Select control type
- Adjust working depth
- Limit maximum lift height

4.10.1. Diagram for lifter (non-enforced-type)

Vertical movement of the Hydraulic Hitch system is controlled with the force and position adjustment levers.

Diagram for (non-enforced-type) lifter

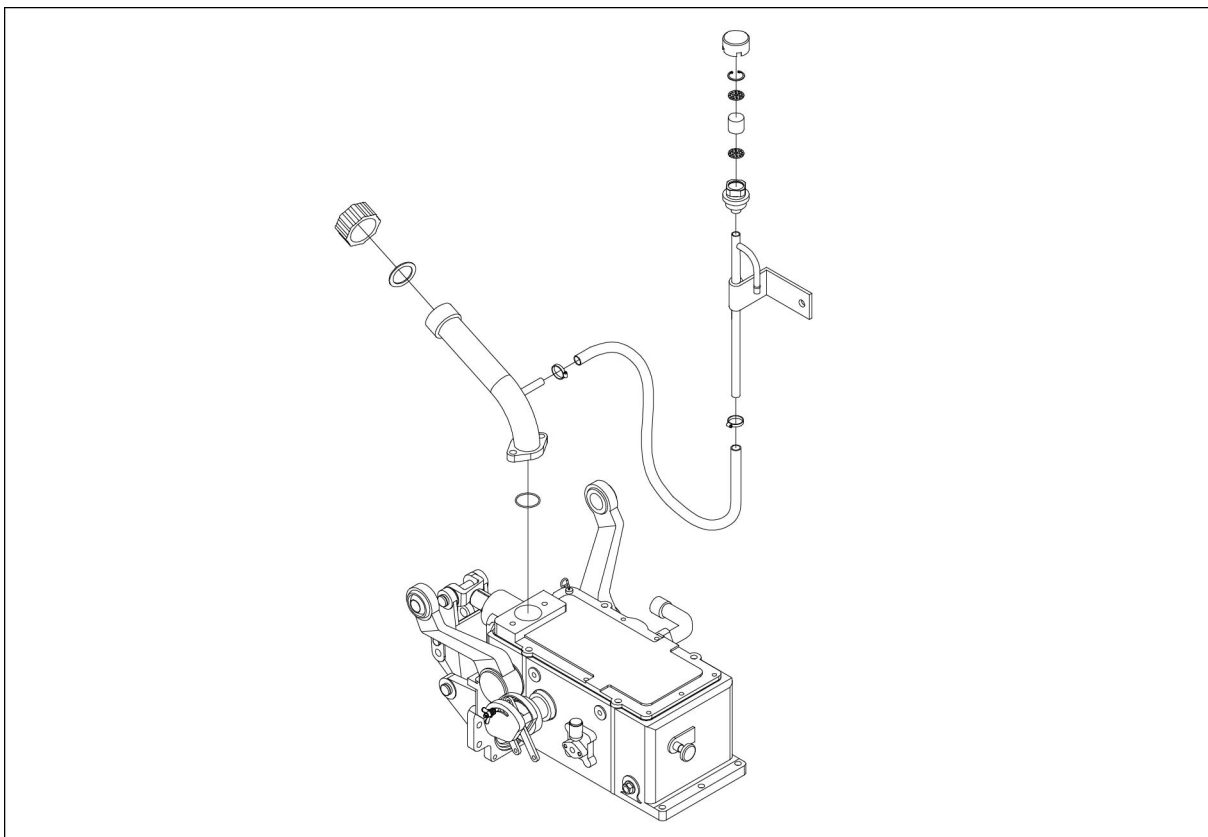


Fig. 4-25

None Pusher-type Lifter control device

The hydraulic lifter control handle is located to the right of the driver's seat, shown as the figure:

1. Force adjustment lever
2. Force adjustment lever

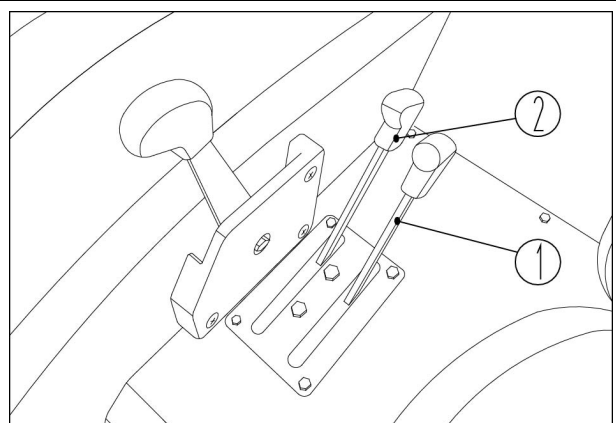


Fig. 4-26

Implement tillage depth adjustment

Implement tillage depth can be adjusted in two ways: force adjustment and position adjustment:

a) Draft adjustment

Draft adjustment is also known as resistance adjustment. The tillage depth is automatically controlled by variation in implement resistance. Generally, force adjustment is used for tillage. Set the draft adjustment lever to the Maximum Lift position. Move forward the force adjustment lever. The implement stops lowering at a proper tillage depth due to the adjustment mechanism. The required tillage depth can be selected while the tractor is moving. The more the force adjustment lever is moved forward, the more the implement lowers. The less the force adjustment lever is moved forward, the less the implement lowers. After selecting the required tillage depth, move the force adjustment lever locating device in place so that the force adjustment lever can always be moved to the same location to ensure consistent tillage depth. In case of uneven terrain or considerable variation in soil resistance, the implement tillage depth can be adjusted automatically.

If soil resistance increases, the implement slightly lifts to reduce tillage depth. If soil resistance decreases, the implement lowers to increase tillage depth.

b) Position adjustment

Position adjustment refers to adjusting the position of implement relative to the tractor. Generally, position adjustment is mainly used for rotary tillage, harvesting, sowing, and bulldozing. Position adjustment can be used for tillage across even terrain.

When using the position adjustment work force adjustment handle in the first end of the raised position, the position adjustment lever forward and drop implements. Each position of the position adjustment lever corresponds to a position of the implement relative to the tractor. The more the position adjustment lever is moved forward, the more the implement lowers. The required tillage depth can be selected while the tractor is moving. When the implement reaches the required tillage depth, move the position adjustment lever locating device in place so that the position adjustment lever can always be moved to the same location to ensure consistent tillage depth.

Adjusting the lowering speed of the implement

According to weight and type of the implement and hardness of the ground, select a proper lowering speed of the implement to avoid damage to the implement. By turning the lowering speed adjusting handle② of the lifter in clockwise direction, the lowering speed of the implement decreases; otherwise, the lowering speed of the implement increases.

1. Lifter housing
2. Lowering speed adjusting handle

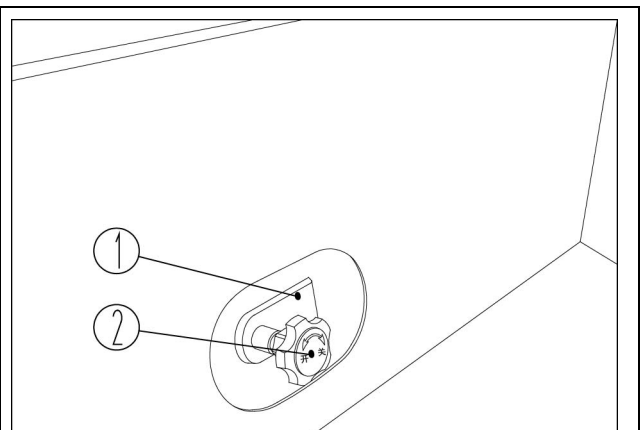


Fig. 4-27

4.10.2.Lifter (pusher-type)

Diagram for pusher-type lifter

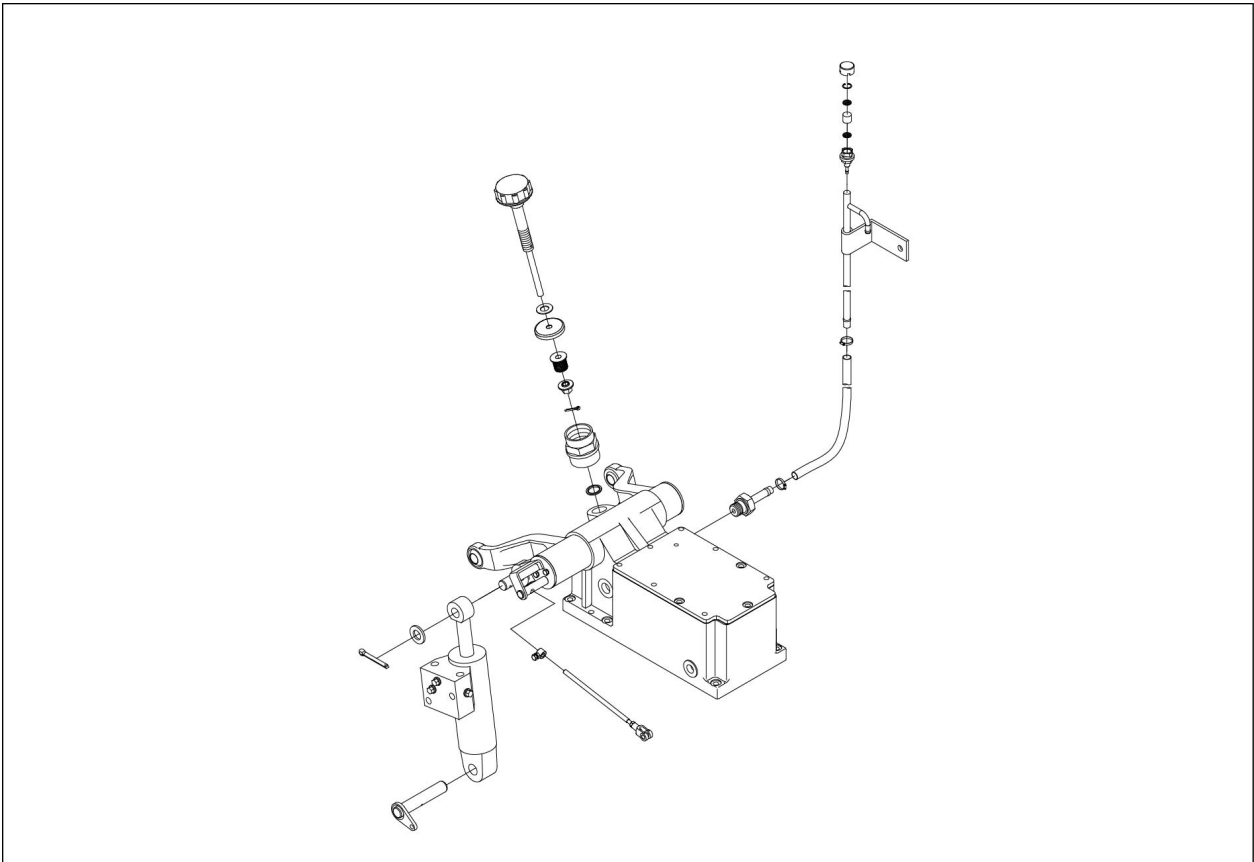


Fig. 4-28

Pusher-type Lifter control device

The hydraulic lifter control handle is located to the right of the driver's seat, shown as ① in the figure.

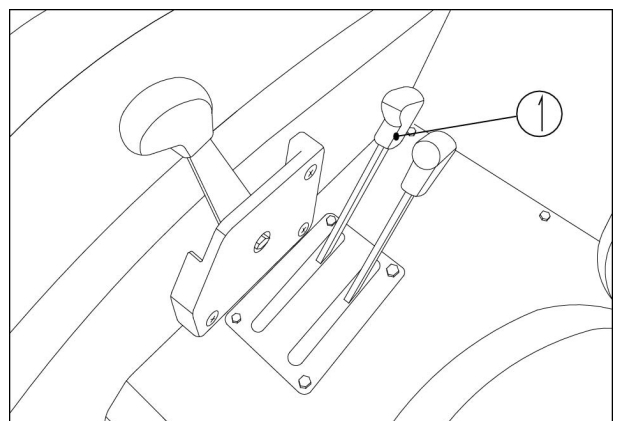


Fig. 4-29

Control Type

The independent hydraulic lift can realize position control and draft control. The control lever of hydraulic lift is used for lifting the implement and controverturing 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 lever. The more the control lever moves forward, the more the implement moves downward. The more the control lever 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 lever in the float control position can bring the hydraulic system to the draft 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.

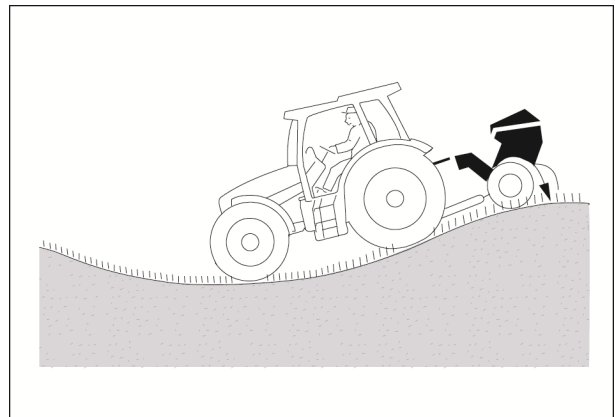


Fig. 4-30



Notice:

When the hydraulic cylinder is used as a single-acting cylinder, the float control position can also be used to lower the tiltable trailer body.



Notice:

When the tractor is not connected with the implement, the control handle should be in neutral position.



Important:

When an implement with a power take-off 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 shaft and the drive shaft of the implement.

4.11.Three-point Linkage

FL35-70HP Series tractors adopt a rear three-point linkage to connect the implement.



Notice:

Hooking on to the rear axle or any other point above the swinging drawbar or rear wheels can cause the tractor to tip over.



Notice:

When working with the 3-point linkage, ensure that anybody keeps far away from working radius of the lifting arm and any attached implement. This is to avoid personal injury in case of mis-operation.



Warning:

Always check that the weight of the implement is compatible with the maximum permissible load on the tractor axles.



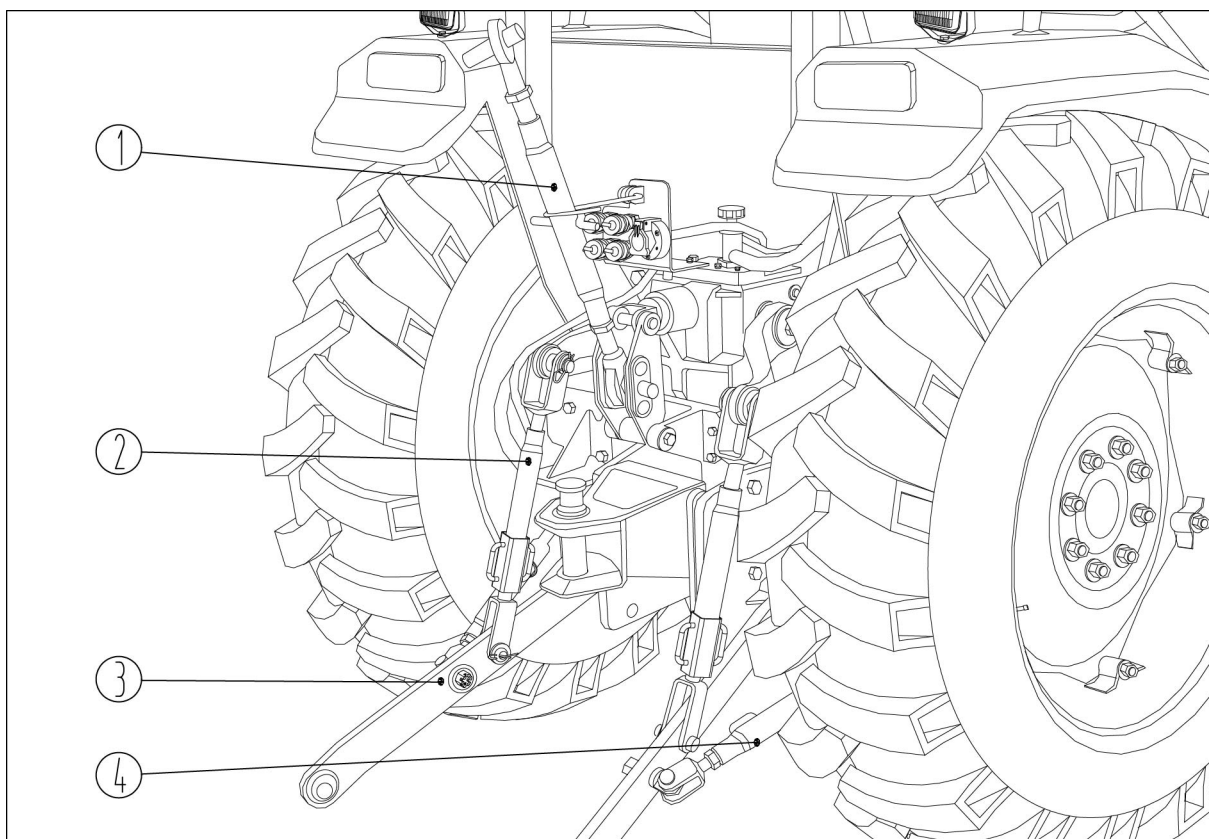
Important:

When adjusting the length of the top link of the 3-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.

The length of the upper link, lifting lever and limit lever can be adjusted via the threaded sleeve with a handle.

The Three-point linkage can be adjusted by following methods:

- Manual adjustment of the lifting lever
- Manual adjustment of the upper link
- Manual adjustment of the limit lever



Three-point linkage (Model 1)

Fig. 4-31

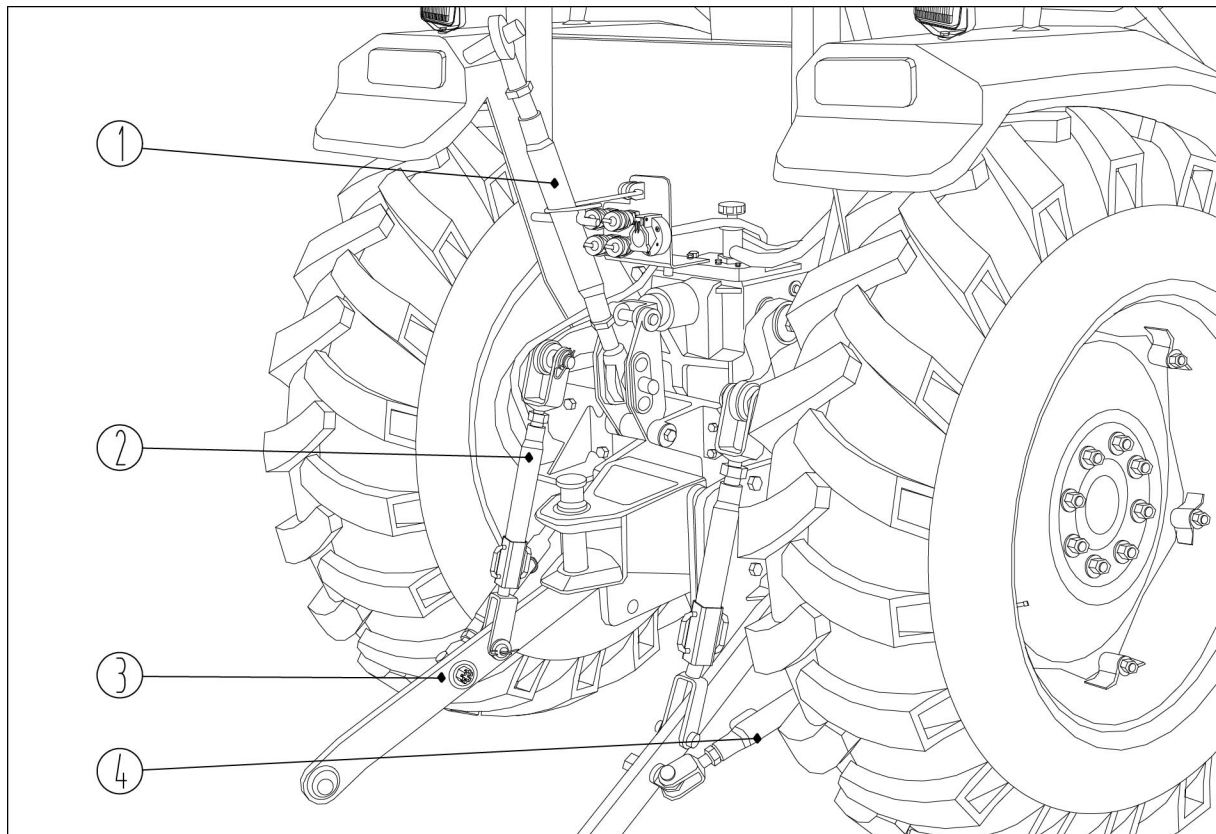


Fig. 4-32

Three-point linkage (Model 2)

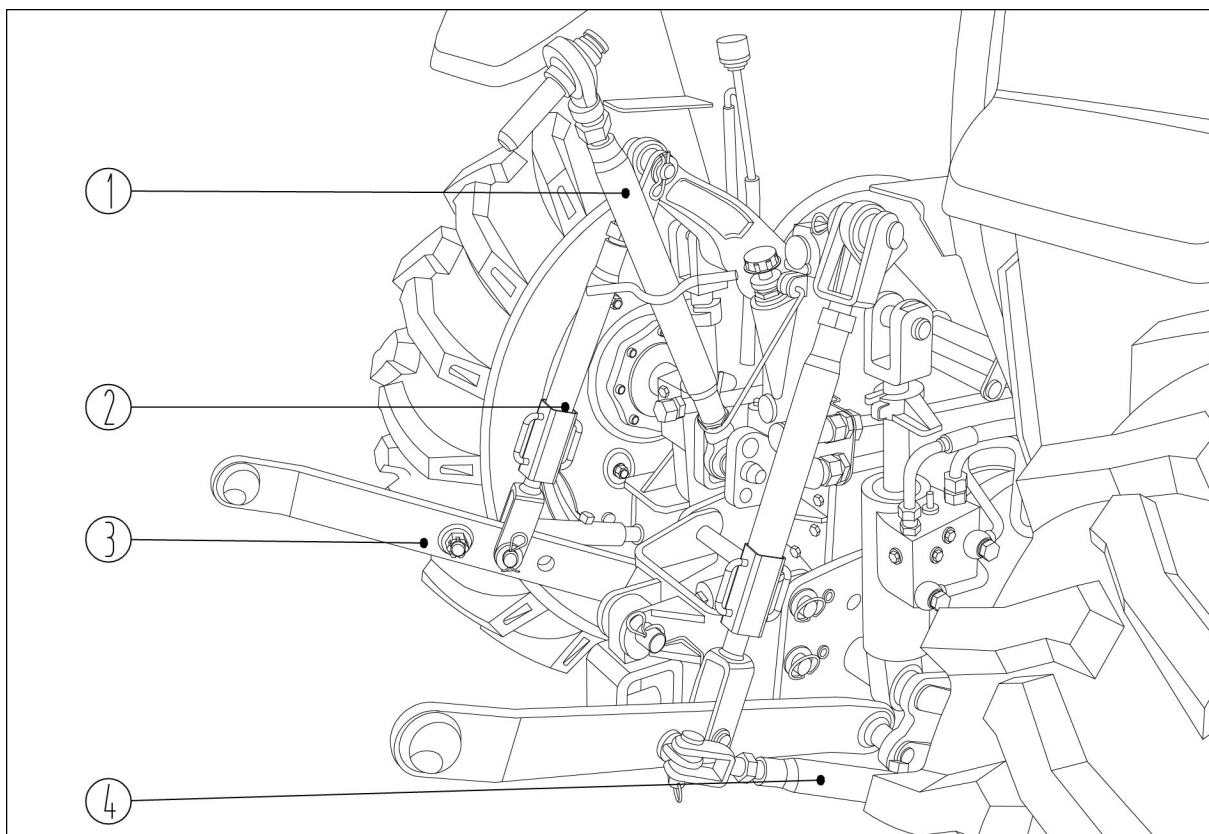


Fig. 4-33

Three-point linkage (Model 3)

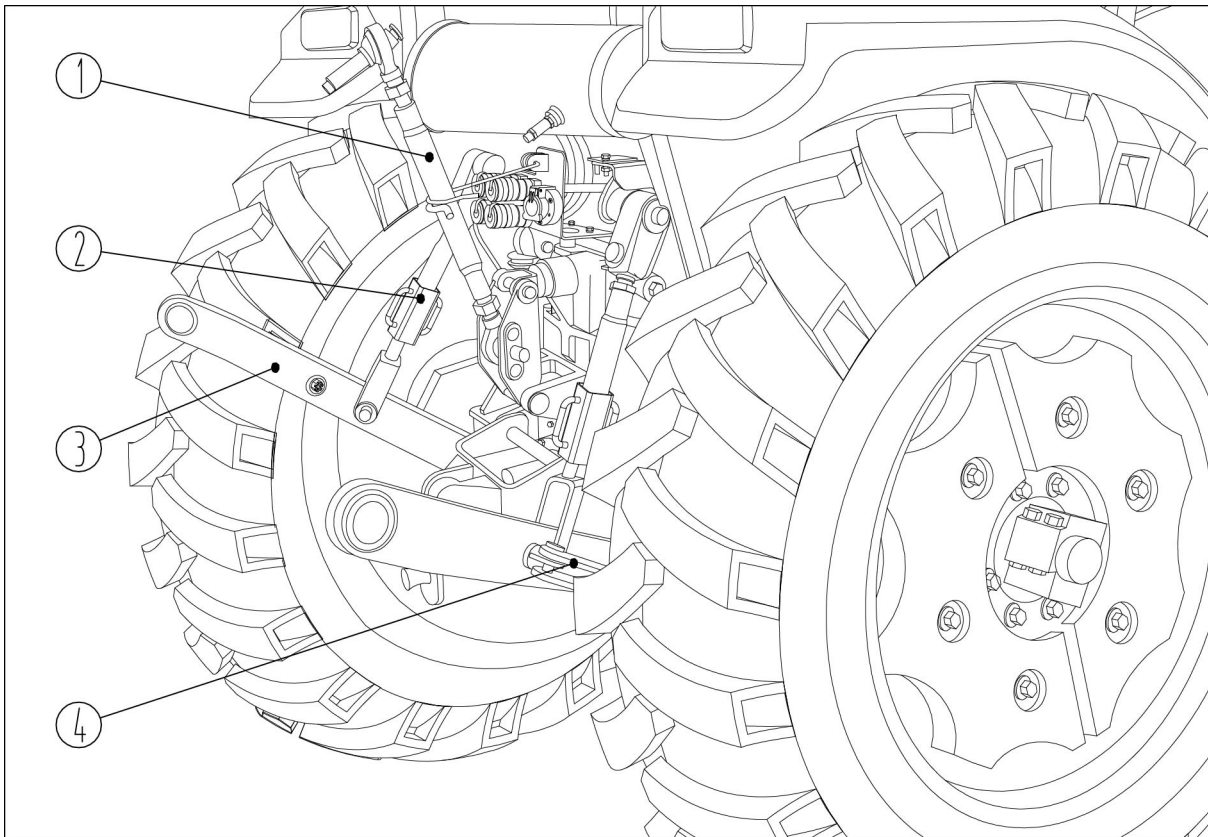


Fig. 4-34

Three-point linkage (Model 4)

1. Upper link assembly
2. Lifting lever assembly
3. Lower link assembly
4. Limit lever assembly

4.11.1. Maximum lifting stroke of the lower link:

1. Lifting lever assembly
2. Lower link assembly
3. Limit lever assembly

The lower link is connected with the lifting lever via the front hole "A", and the lower link connected with the limit lever via the rear hole "B".

Maximum lifting stroke of the lower link: Factory default: 624mm (The lifting lever is connected with "A" hole)

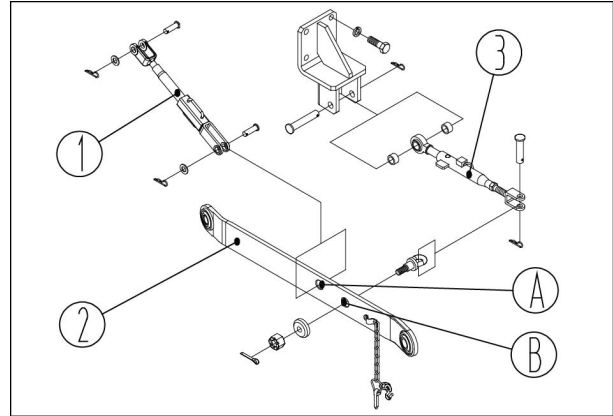


Fig. 4-35

4.11.2.

4.11.2.Manual adjustment of the lifting lever

- Length adjustment of the lifting lever determines deflection of the lower link.
- Adjustment of the lifting rod mainly refers to adjustment of horizontal position of the implement.
- The lifting height is increased through retracting the lifting lever (e.g. during transportation of when a plough implement requiring decrease in soil penetration is installed).

Generally, length of the lifting rod should be adjusted to its intermediate length.

The left and right lifting levers can be adjusted by turning the guide pipe weld unit of the middle lifting lever (① in the figure).

Turn it clockwise direction to extend the lifting lever; otherwise, retract it.

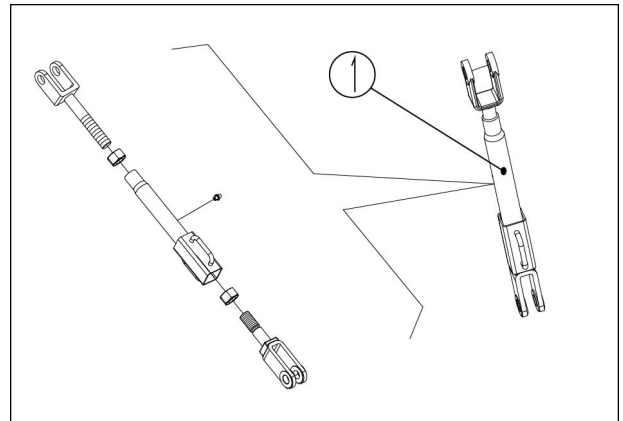


Fig. 4-36

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4.11.3.Manual adjustment of the upper linkage

Adjustment of the upper link is mainly carried out to adjust the longitudinal and horizontal position of the implement, and adjust consistency in the front and rear plowing depth.

After the implement is coupled with the tractor, adjust length of the upper link.

This is to position the implement to enable it to be at a proper height above the ground. Retract the upper link to increase its angle; extend the upper link to decrease the angle.

The upper lever can be adjusted by turning the guide pipe weld unit of the upper lever (① in the figure):

Turn it clockwise direction to extend the lifting lever; otherwise, retract it.

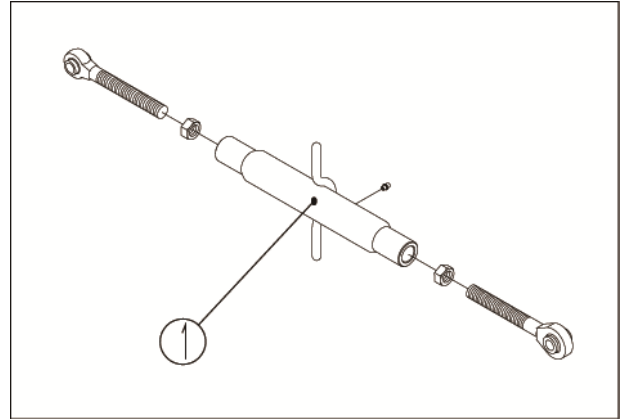


Fig. 4-37

4.11.4. Manual adjustment of the limit lever

The limit lever is mainly used to limit lateral oscillation of the implement (i.e. the lower link).

The stop rod length can be adjusted by rotating the threaded limit sleeve ①.

Inserting the lock pin into the long hole (B) in the extension rod ball joint assembly allows the limiting rod to move somewhat.

Inserting the lock pin into the round hole (A) in the extension rod ball joint assembly prevents the limiting rod from moving.

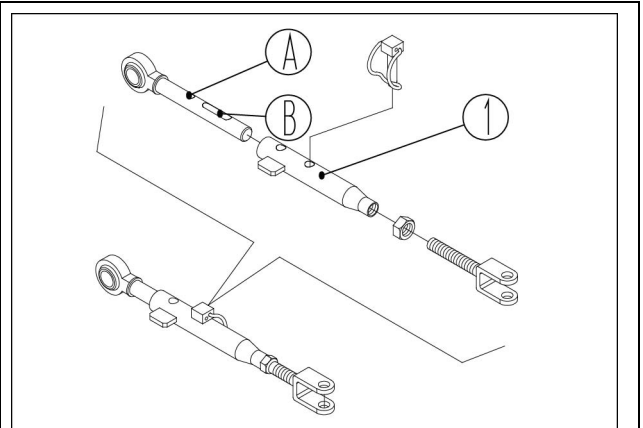


Fig. 4-38

The movement of the limit rod is selected according to working type of the implement. The limit rod should be moved within a certain range when the tractor with a plough and harrow is working, so that the tractor has excellent operating performance. The limit lever should be fixed when the tractor with a rotary plough or mower is working.

4.11.5. Diagram for movement of the hitch mechanism

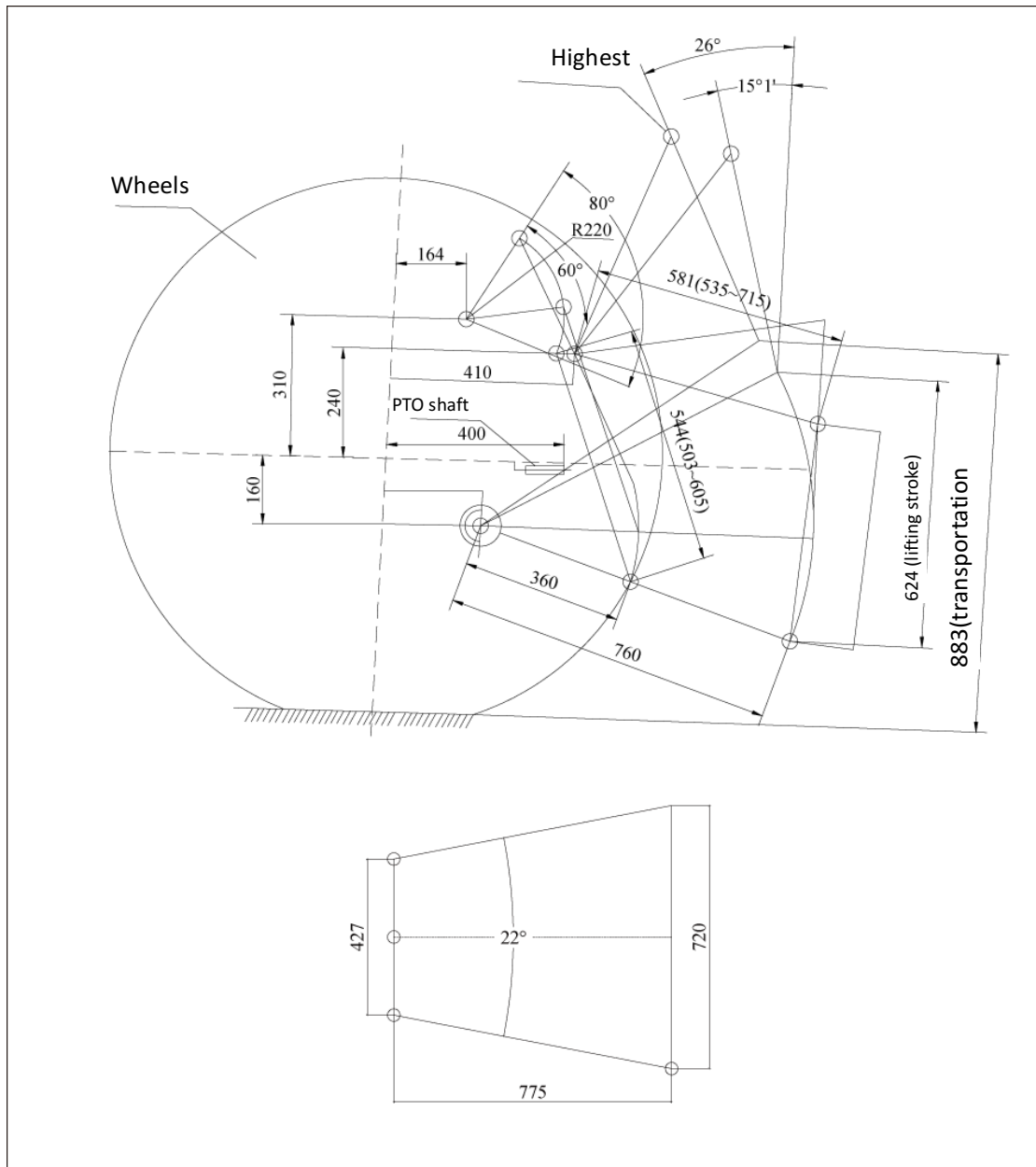


Fig. 4-39

Diagram for movement of the hitch mechanism (configuration 1)

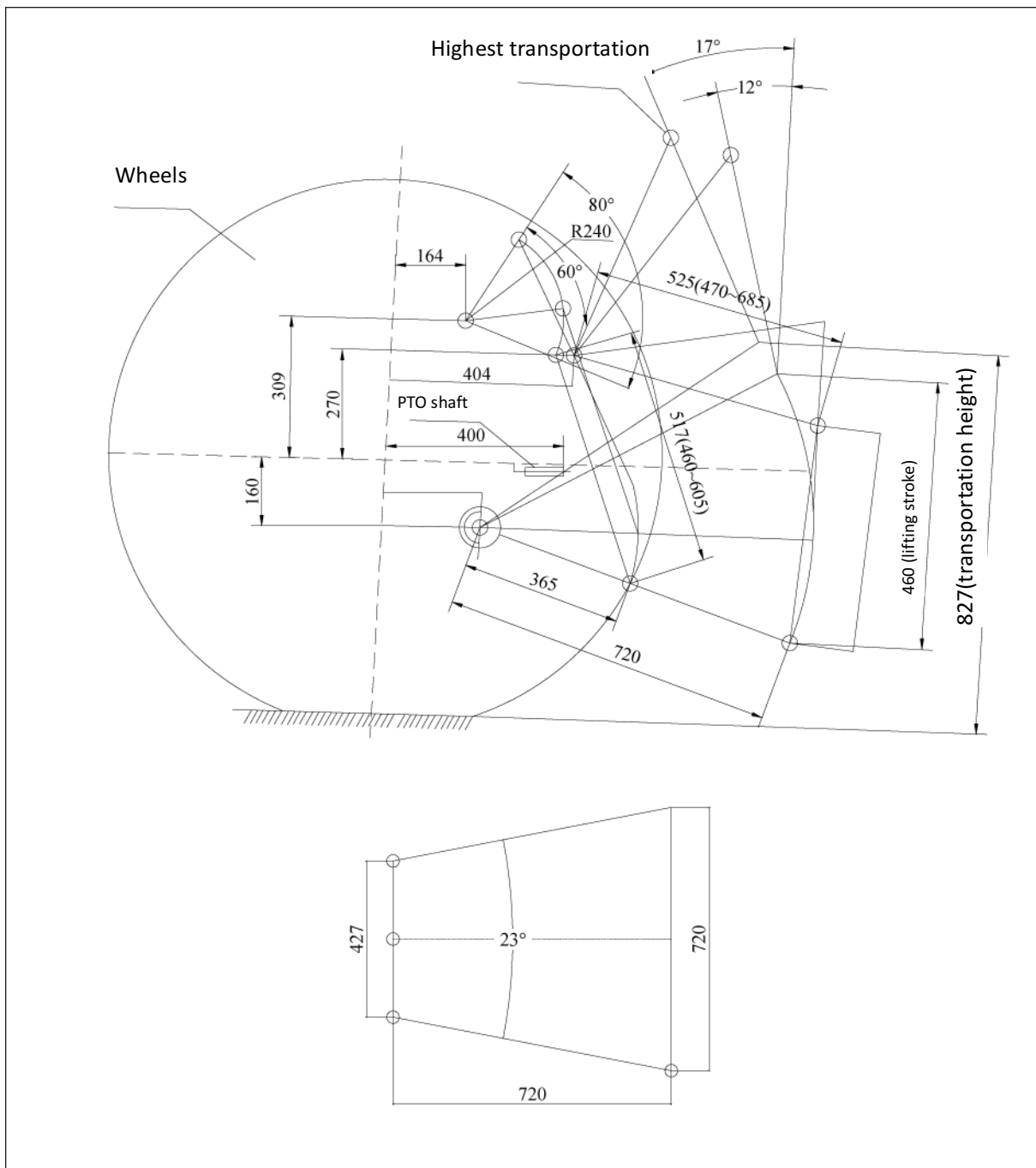


Fig. 4-40

Diagram for movement of the hitch mechanism (configuration 2)

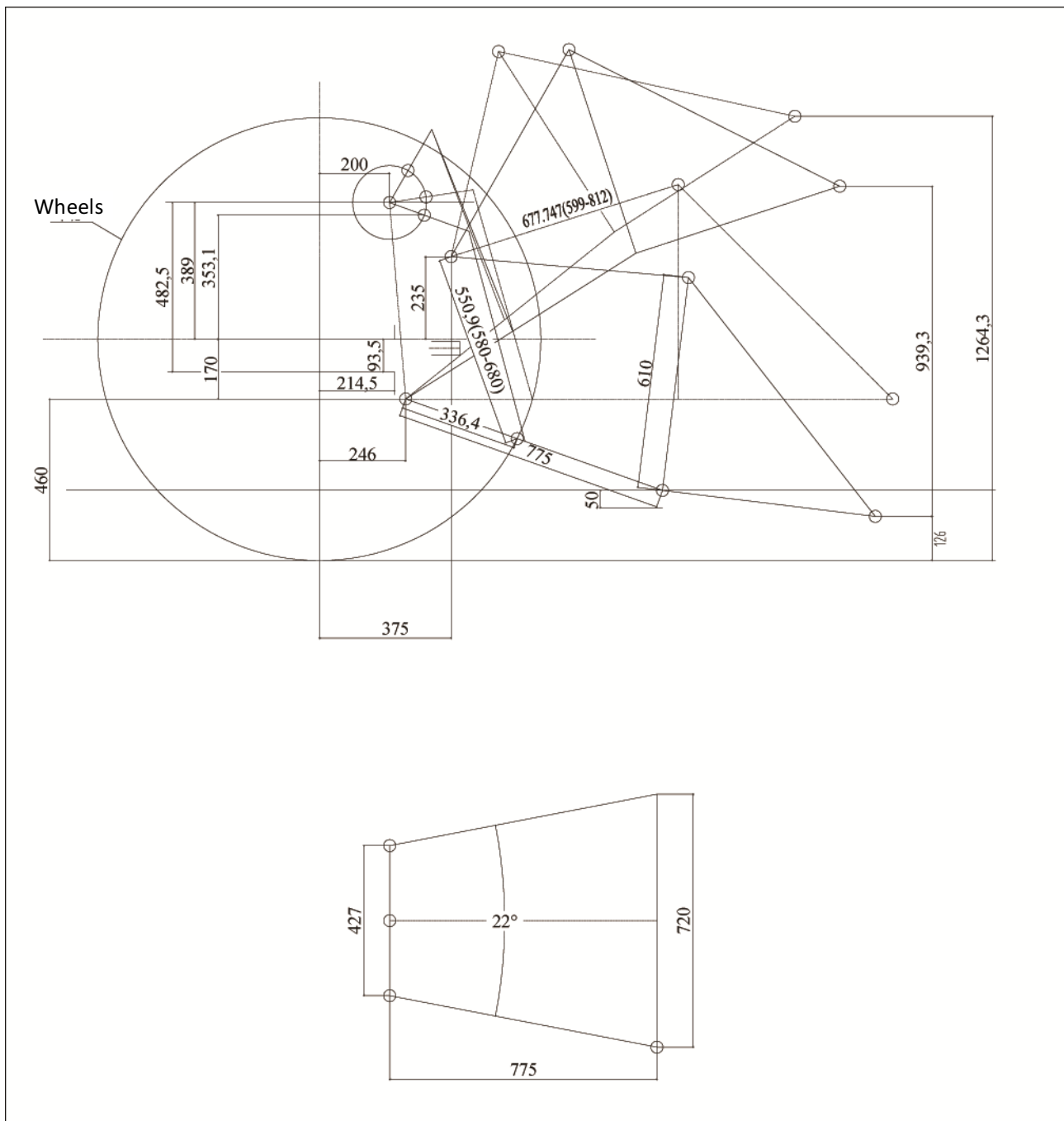


Fig. 4-41

Diagram for movement of the hitch mechanism (configuration 3)

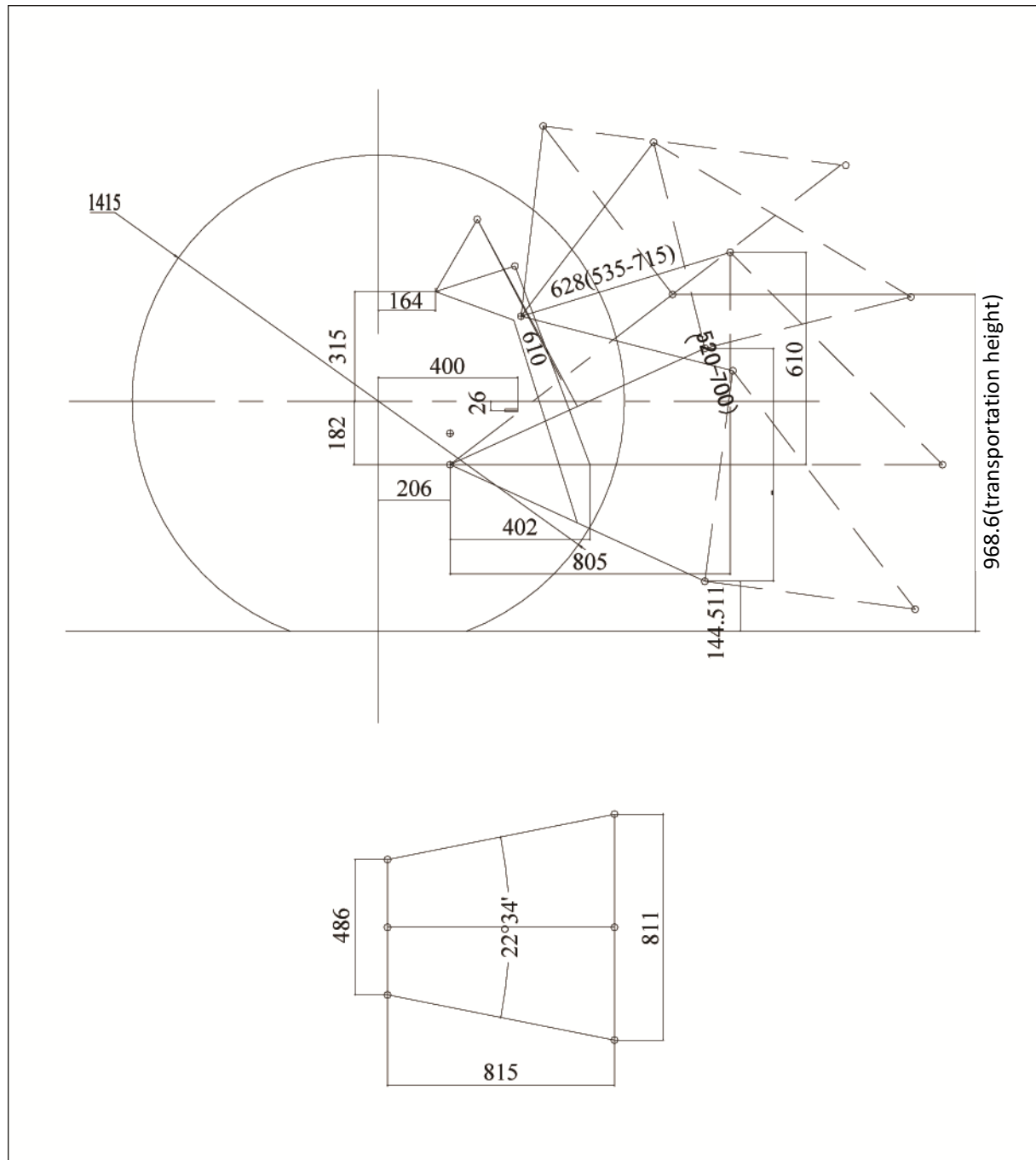


Fig. 4-42

Diagram for movement of the hitch mechanism (configuration 4)

4.11.6. Coupling, lifting and transfer of the implement

- Before the implement is coupled, must ensure that the swing type drawbar has no interference. The drawbar may be moved forward or dismantled as required, and it is required to inspect whether there is other possible

interference.

- Move the tractor backward to align the traction point. Then, put the main gear shift lever to neutral position, and depress down the brake pedal and pull up the hand brake.
- Set the hand throttle to the lowest position to enable the engine to idle for 1 to 2min before flameout; and then, couple the implement. First connect the left/right lower links, and then connect the upper link, and lock it with the hitch chain or pin.
- Operate the draft/position control lever, respectively, so as to lift up or down the implement.
- When the tractor with an implement is transported for a long distance, the draft /position control levers should be at up position, i.e. the maximum limit position.

4.11.7.Selection of front hinging point of the upper link

The front end of the upper link is hinged with the lifter end at upper, middle and lower points.

- When the position control lever is used to control plowing depth, the front end of the upper link should be connected to the lower hinging point:
- When the draft control lever is used to control plowing depth, the upper hinging point is used when the soil resistance is small or the plowing depth is shallow;
- When the soil resistance is big or the plowing depth is big, the middle hinging point is used.



Notice:

When the tractor starts moving, do not enter the area between the tractor and implement. Before stopping the tractor, must first lower the implement.



Notice:

When the tractor is with a suspended implement is transported for a long distance, retract the upper link to the shortest position, and adjust the limit lever to prevent the implement from being moved side to side, and must tighten the locknuts on the upper link and limit lever firmly.



Notice:

When the tractor is turned in the field, it cannot be turned unless the implement is lifted up, and the implement cannot be lowed until the tractor drives in straight line, for the purpose of avoid damage to

	the machine.
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4.12. Hydraulic System

	Notice: If the pump becomes noisy when the hydraulic system is hot, the hydraulic oil filter may be dirty. In this case, immediately replace the oil filter.
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4.13.

4.13.1. Hydraulic valve

The hydraulic valve is a device which is equipped with a control handle, and used to deliver oil to one or several outlets from a high pressure circuit, so that the implement can be controlled by it to meet all application requirements.

- The control valve is a double-action type.



Notice:

If high-pressure fuel 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. 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.

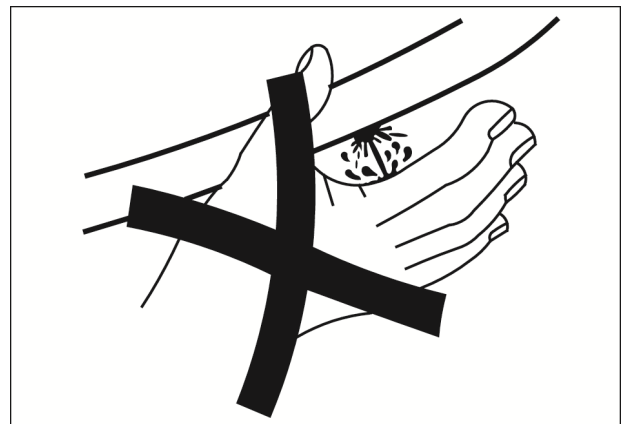


Fig. 4-43

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 position
- 2 - Outlet

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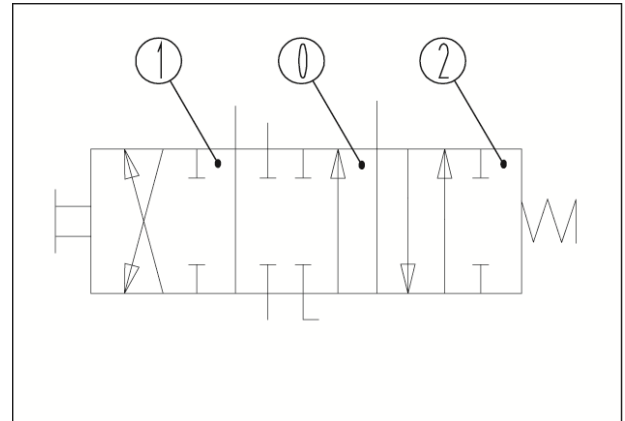


Fig. 4-44

Double-action device with a floating position

The double-action device with an additional position can realize connection of two outlets of the remote 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 position
- 2 -Return
- Floating

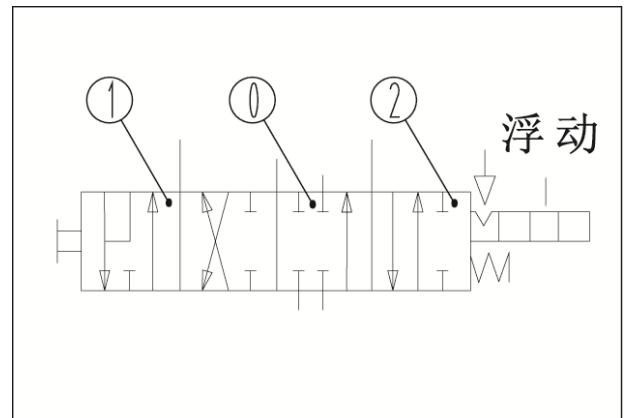


Fig. 4-45

Detent device

This is a mechanical detent that engages the control valve spool (which keeps the lever 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:

- 1 - Outlet
- 0 - Neutral position
- 2 -Return
- Detent

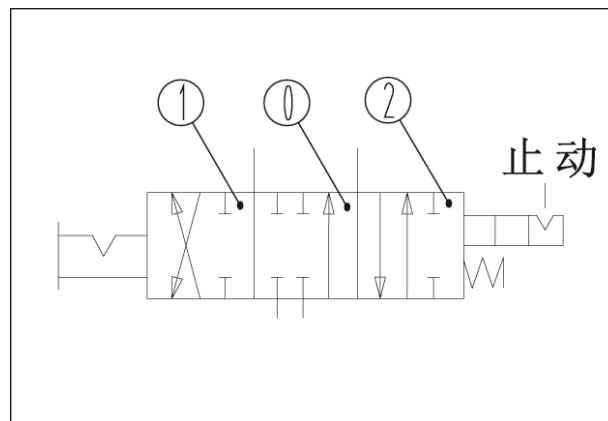


Fig. 4-46

Non-return valve

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

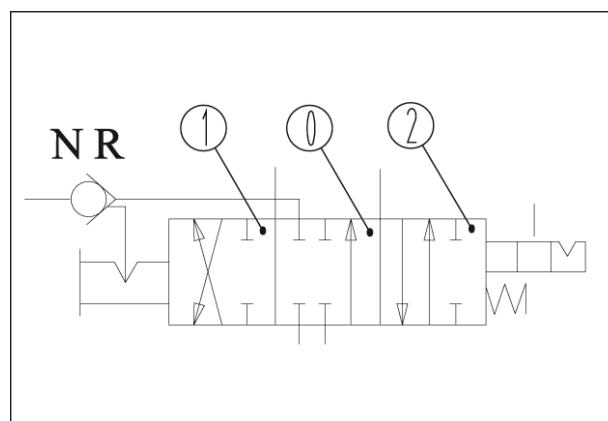


Fig. 4-47

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.

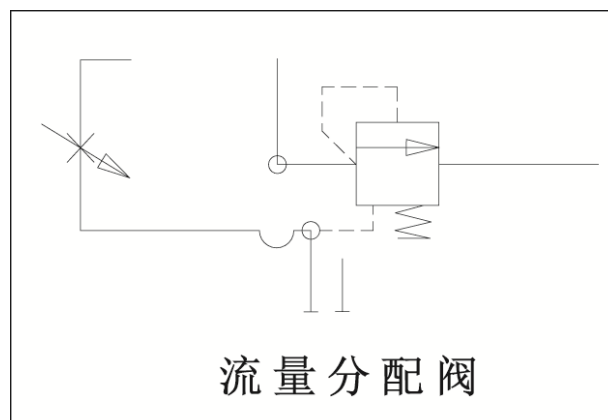


Fig. 4-48



Notice:

Do not stand underneath the hydraulic load or walk under the hydraulic load.

4.13.2.Type of hydraulic valve (three-way, non-enforced type)

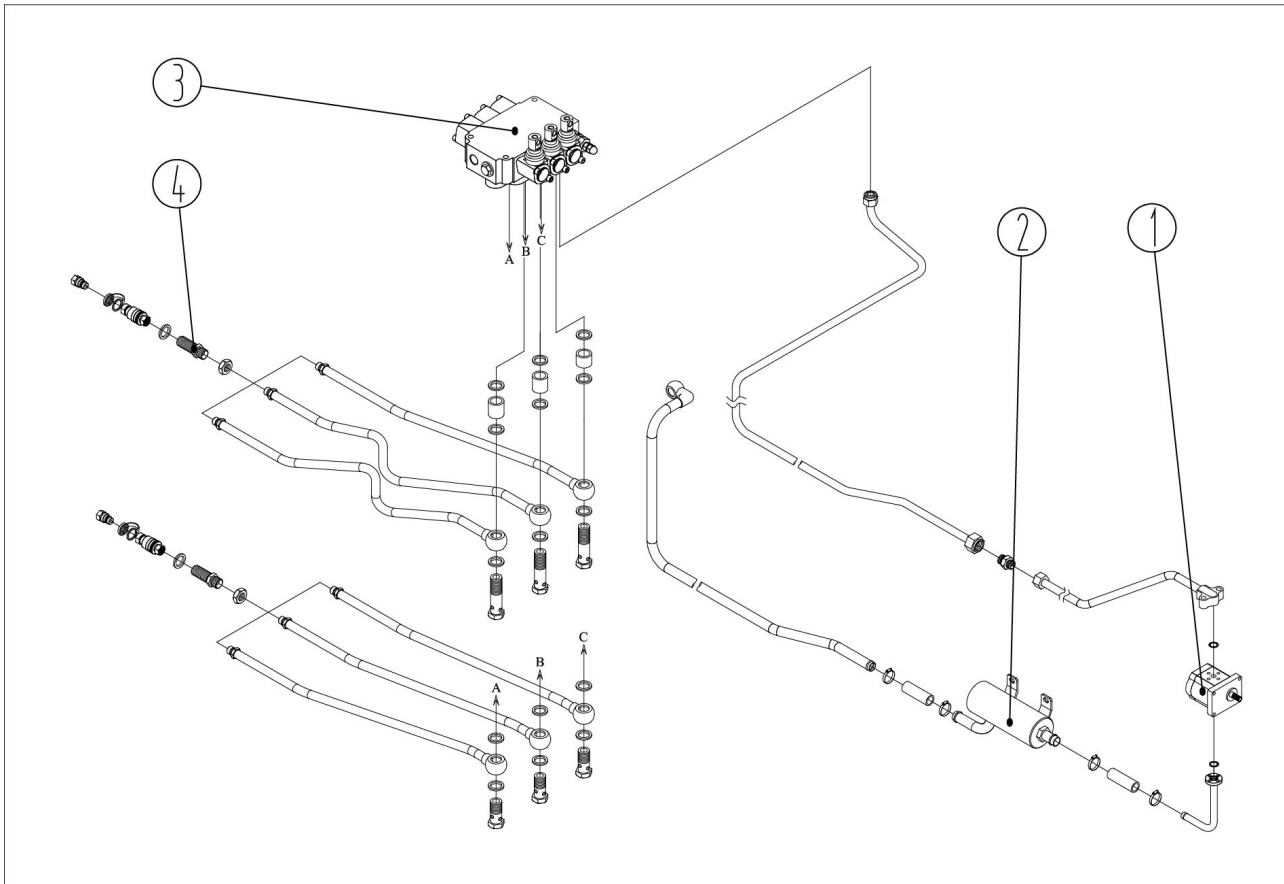


Fig. 4-49

1. Gear pump	2. Oil suction filter	3. Multi-way directional control valve	4. Quick-change connector
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4.13.3.Control of hydraulic valve (non-enforced type)



Notice:

The remote valve control levers must be returned to in their neutral positions as soon as the external rams reach their stroke limit, in order to avoid maintaining maximum pressure in the hydraulic circuit for longer than necessary, as this could dangerously overload the system.

4.13.4.

Control of hydraulic valve

1. Control handle for the hydraulic output device

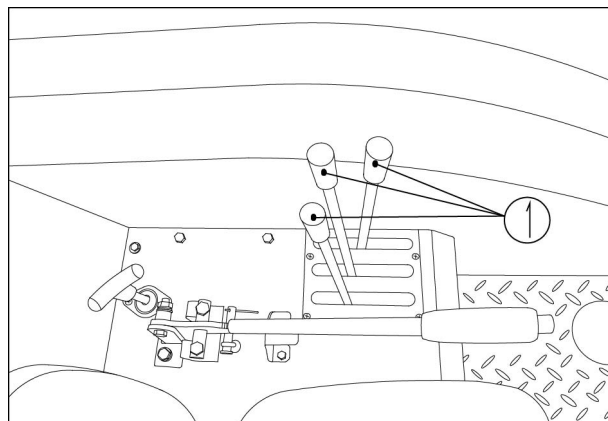


Fig. 4-50

2. Position adjustment lever of rear hydraulic lifter
3. Force adjustment lever of rear hydraulic lifter

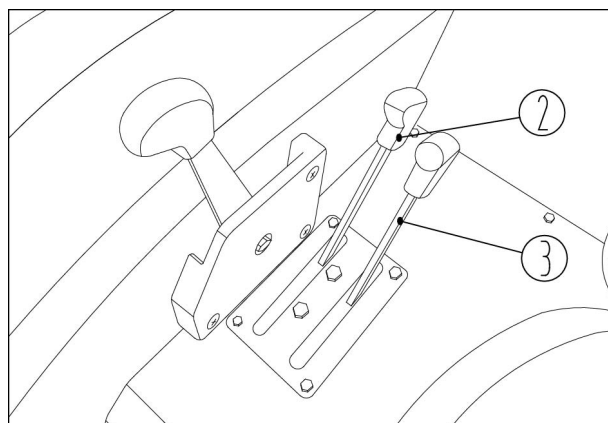


Fig. 4-51

Operation of the control valve for the control handle of rear hydraulic lift (non pusher-type)

Non-enforced type control handle can be divided into:

- Position adjustment lever
- Force adjustment lever

For details, refer to the section “4.10.1 Diagram for lifter (non pusher-type)”.

Operating control valve of the control handle of the hydraulic output device

The hydraulic output device has 3 oil output circuits, each of which is operated by an independent control handle.

Each control handle is provided with 2 control positions, by which hydraulic oil of respective return circuit is controlled.

For details consult "Manipulation and use of the hydraulic output device".

4.13.4.Operation and use of hydraulic output device (configuration 1)

Relationship between the control handle and rear hydraulic connectors

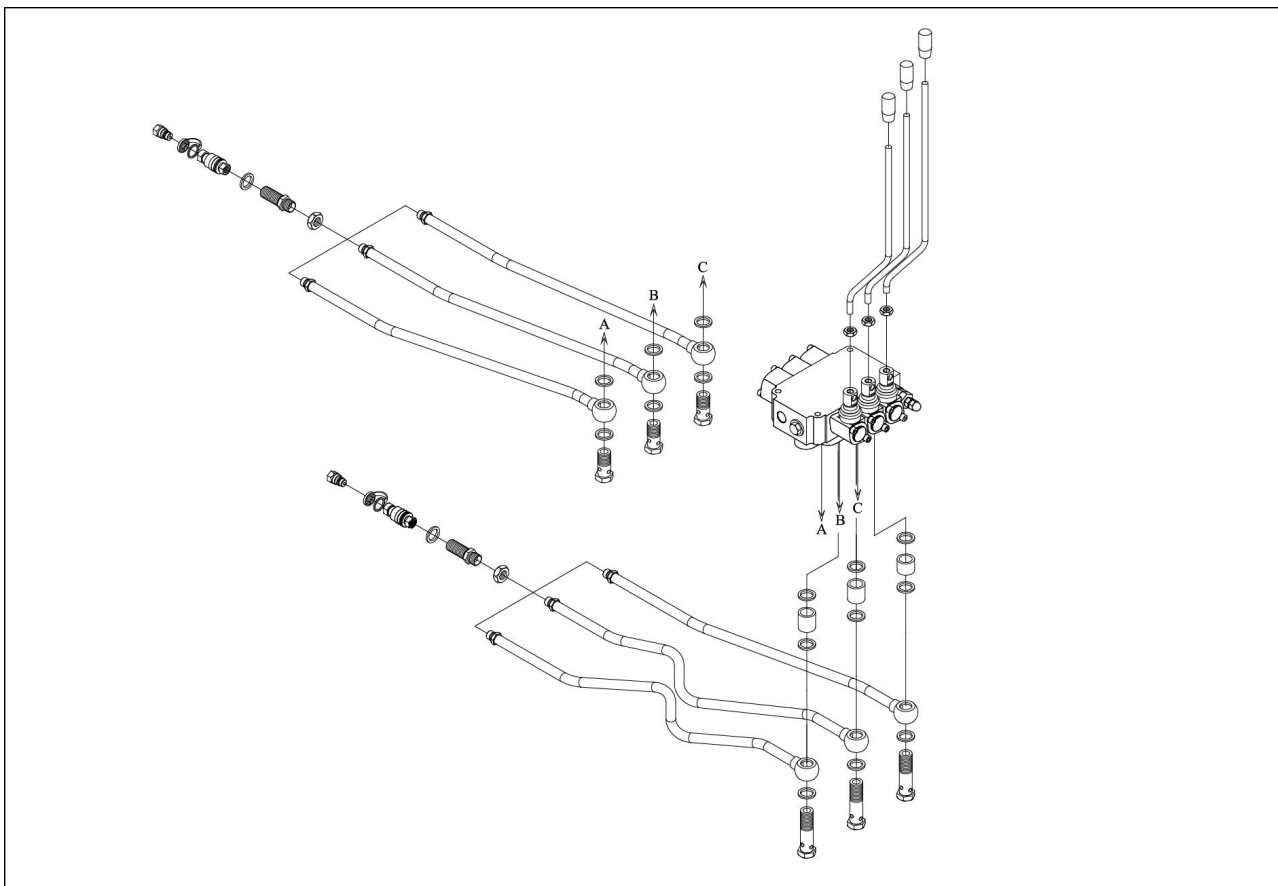


Fig. 4-52

When a hydraulic quick-change connector is used for connection, first accomplish following works, and then insert the female connector of the implement into the socket:

1. Stop the engine.
2. Lower the suspended implement.
3. Move the hydraulic output valve control handle to relieve the pressure in the hydraulic quick-change connector seat.
4. Remove the sealing cover of the quick-change connector, and clean the quick-change connector.



Important:

When the quick-change connector is not used, the seat hole must be covered with a dust-proof cover.



Notice:

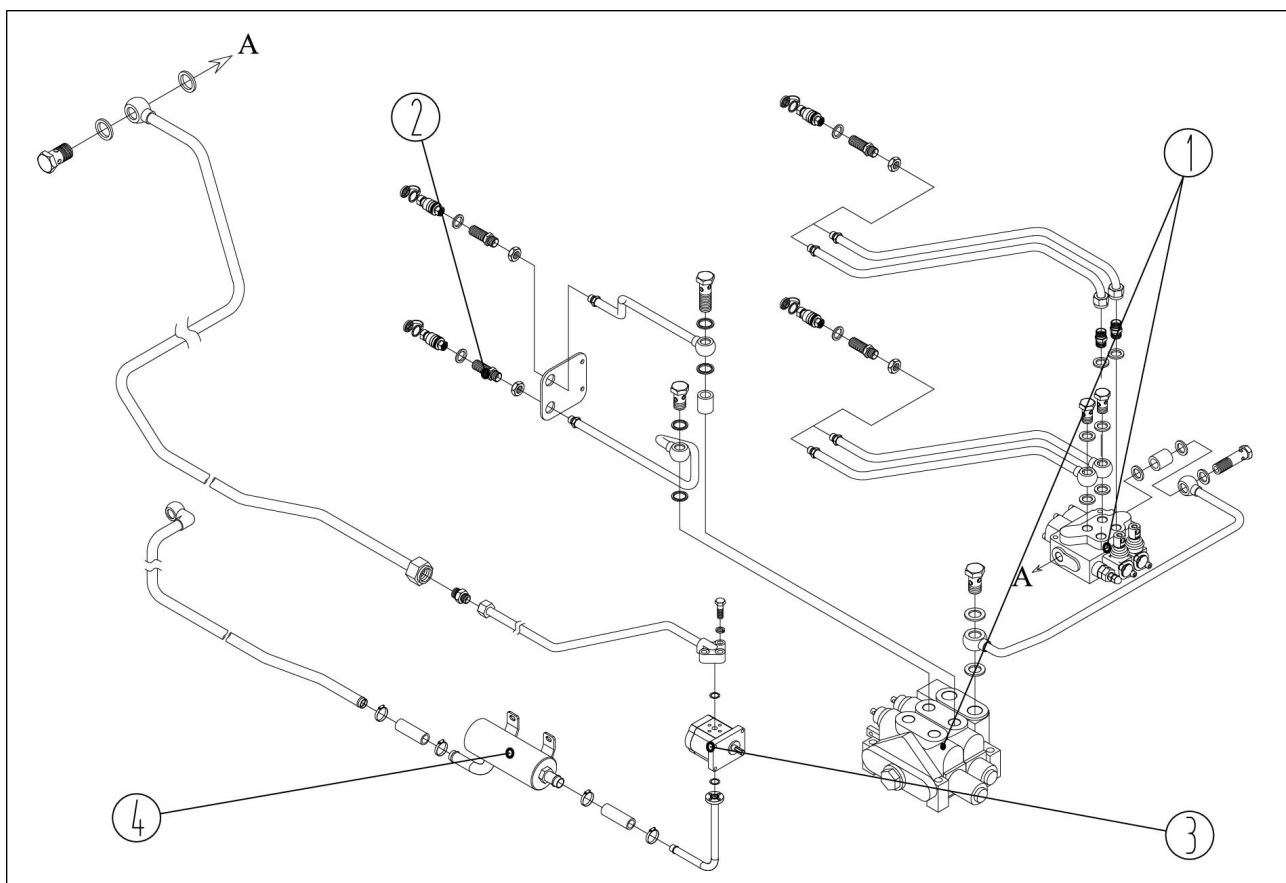
The lifter and hydraulic output device cannot be used simultaneously.



Notice:

After the hydraulic output valve is manipulated, the control handle must be returned to neutral position; otherwise, it may result in overheat of the hydraulic system.

4.13.5.Type of hydraulic valve (configuration 2)



4-53

1. Multi-way directional control valve;	2. Quick-change connector;	3. Gear pump;	4. Oil suction filter
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4.13.6. Control of hydraulic valve (configuration 2)

	Notice: The remote valve control levers must be returned to in their neutral positions as soon as the external rams reach their stroke limit, in order to avoid maintaining maximum pressure in the hydraulic circuit for longer than necessary, as this could dangerously overload the system.
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4.13.7.

Control of hydraulic valve

1. Control handle for the rear hydraulic lift
2. Control handle for the hydraulic output device

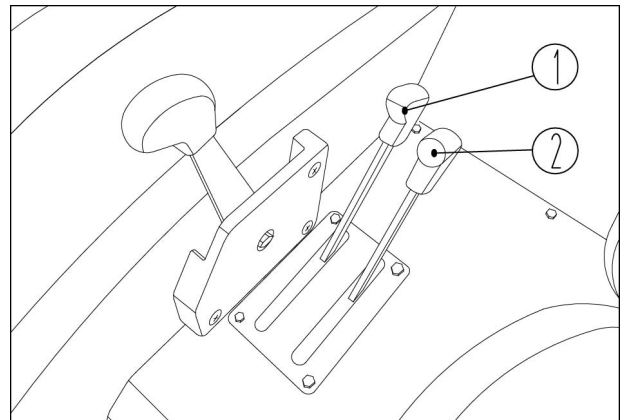


Fig. 4-54

3. Control handle for the rear hydraulic output device

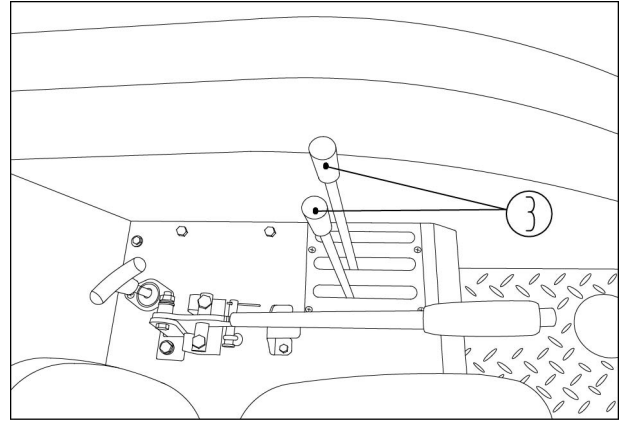


Fig. 4-55

Operation of the control valve for the control handle of rear hydraulic lift

Four positions are provided for the control handle of rear hydraulic lift:

- Lift up
- Neutral (neutral gear)
- Lower
- Floating

For details, refer to the section “Hydraulic Lifts”.

4.13.7.Operation and use of hydraulic output device (configuration 3)

Relationship between the control handle and rear hydraulic connectors

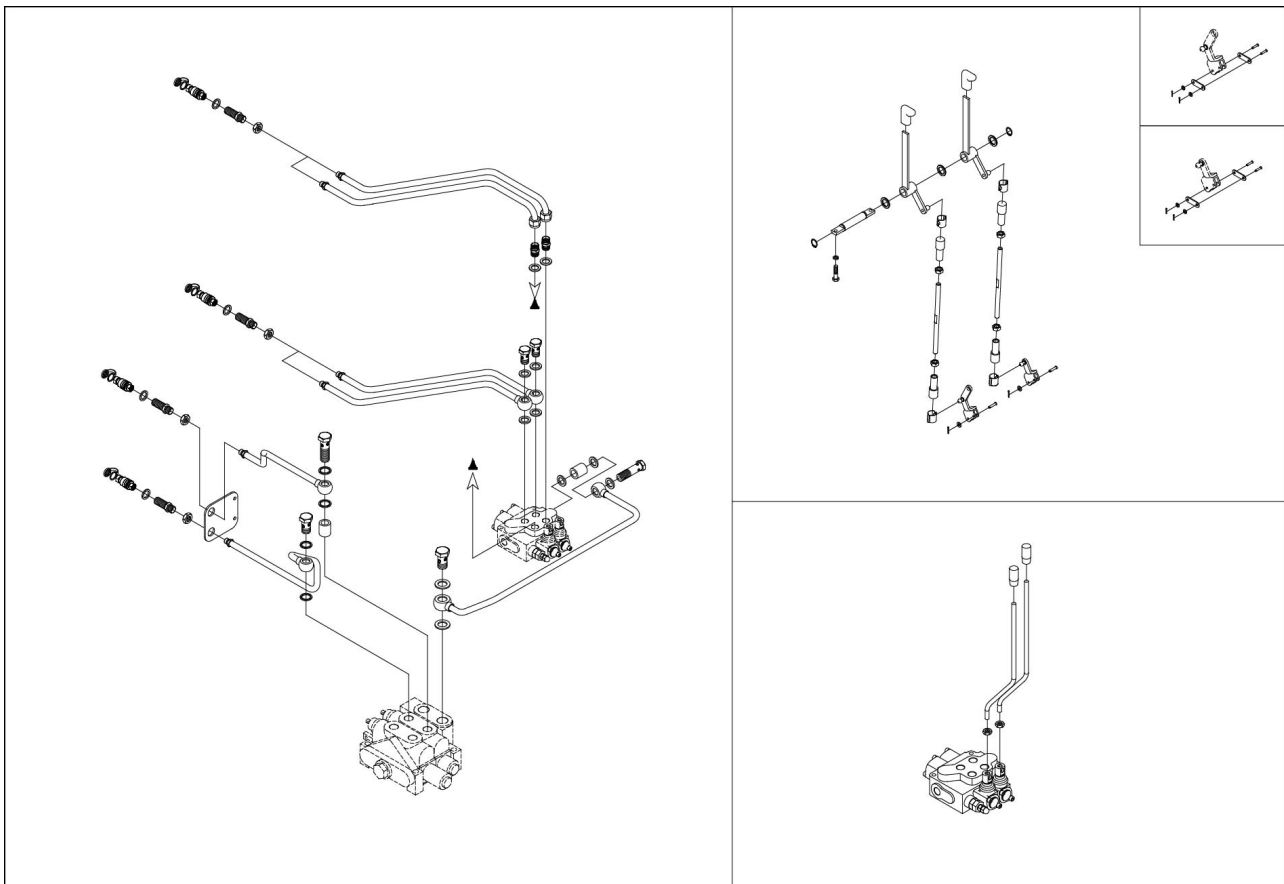


Fig. 4-56

When a hydraulic quick-change connector is used for connection, first accomplish following works, and then insert the female connector of the implement into the socket:

1. Stop the engine.
2. Lower the suspended implement.
3. Move the hydraulic output valve control handle to relieve the pressure in the hydraulic quick-change connector seat.
4. Remove the sealing cover of the quick-change connector, and clean the quick-change connector.



Important:

When the quick-change connector is not used, the seat hole must be covered with a dust-proof cover.

**Notice:**

The lifter and hydraulic output device cannot be used simultaneously.

**Notice:**

After the hydraulic output valve is manipulated, the control handle must be returned to neutral position; otherwise, it may result in overheat of the hydraulic system.

Each control valve has 2 M22×1.5 female quick-change connectors. When the connection is not used, have it sealed with a sealing cover. During use, connect the male connector (put in the spare parts box) with the female coupler of the quick-change connector, and then with the oil inlet and outlet of the oil cylinder of the hydraulic implement. By operating the control handle upward and downward, the double-action cylinder will complete corresponding action.

4.13.8.Operation of the remote control valve

Type of the hydraulic output connector

1. Hydraulic quick-change connector: M22*1.5.
2. Hydraulic quick-change connector: G=1/2.

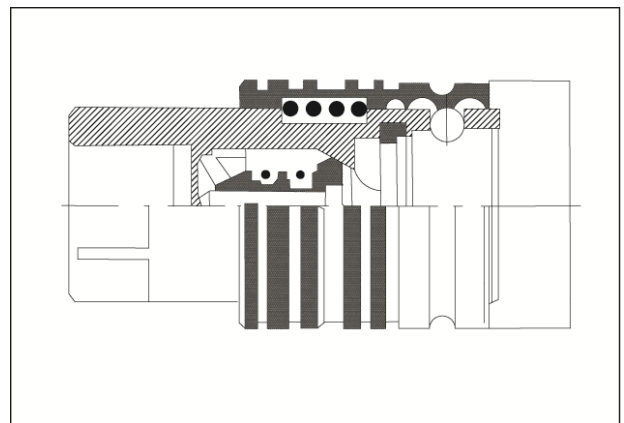


Fig. 4-57



Important:

The above-mentioned 2 types of hydraulic quick-change connectors can be connected with the male threaded pipe union of the implement hose in pressure conditions.

The connector also is designed such that it can be disconnected automatically in case of accidental removal.

Connection of the implement with the hydraulic output connector



Important:

Inspect whether the connecting hose has enough length. It is allowed the hose moves freely between the tractor and implement.

If connecting the hose to the hydraulic connector of the tractor, remove the sealing cover, and insert the male coupler into the socket.

If required to disconnect the hose, push the male coupler to the female coupler while pushing the connector ring forward and push it toward the tractor, and then pull it back quickly to have it separated from the coupler.

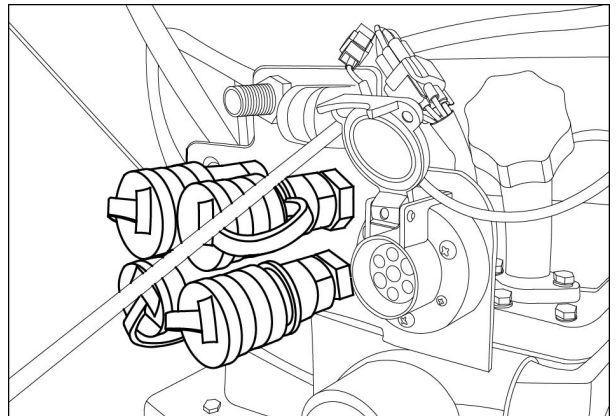


Fig. 4-58



Notice:

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.

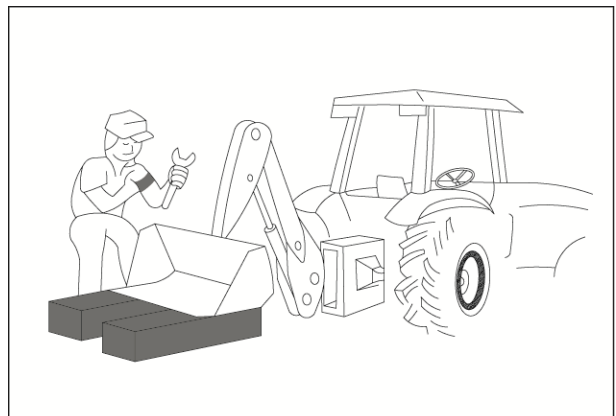


Fig. 4-59

Oil flow state in the hydraulic circuit of the drive fluid cylinder on the connector and implement

1. The pressurized oil is input to the hydraulic cylinder-
Lift up
2. The pressurized oil is output to the hydraulic cylinder-
Down

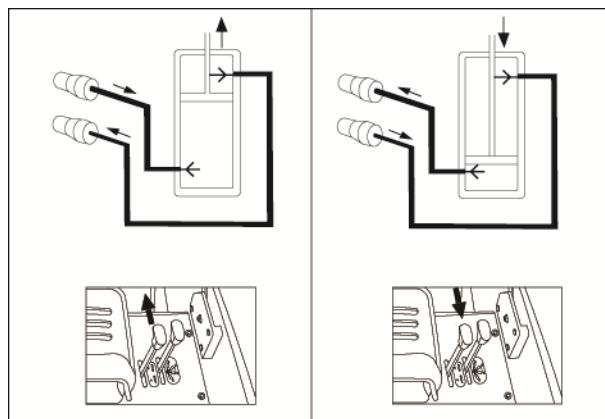


Fig. 4-60

Example for connection and operation of double-action cylinder

- (Turning of reversible plow)

If desired to turn the reversible plow, move the control handle forward or backward according to requirements for turning the plow in clockwise direction or counterclockwise direction.

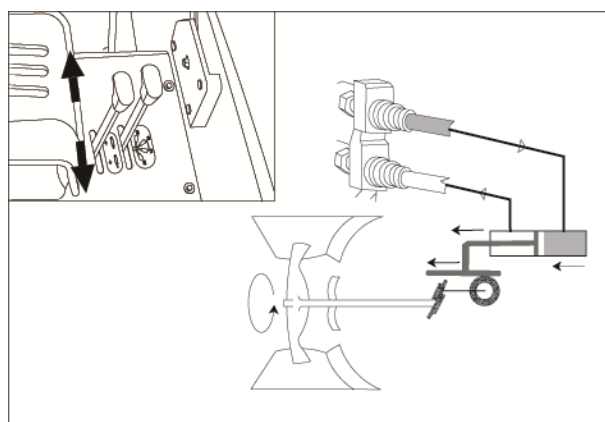


Fig. 4-61

Example for connecting the single-action cylinder

- Trailer with a hydraulic tipper

If desired to tilt the trailer, move the control handle to "Up" position.

If desired to lower the trailer, move the control handle to "Down" position.

If desired to lower the trailer, you also use "Floating" position.

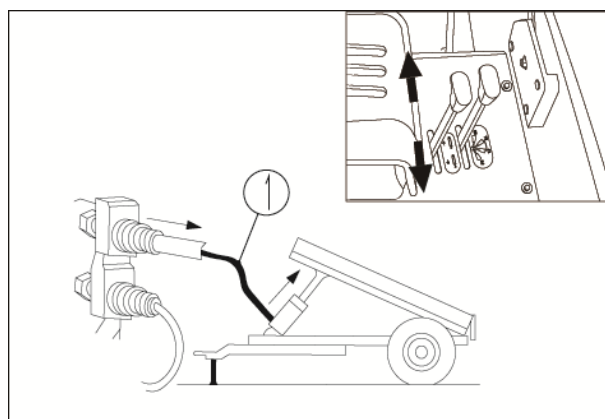


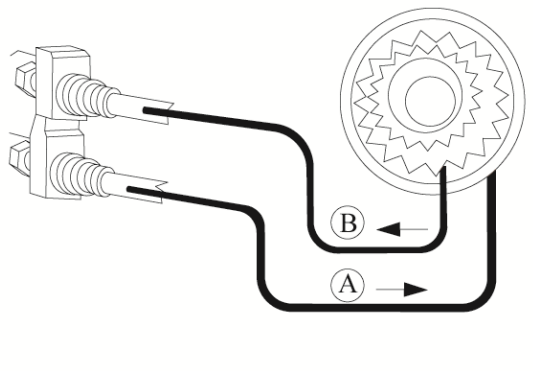
Fig. 4-62



Notice:

The hose (1) must be connected to the hydraulic output device at upper part of the control valve.

	Important: When the external cylinder reaches its limit travel, immediately open the control switch to relieve the pressure, so as to protect the maximum pressure of the hydraulic circuit from being maintained for a long time, resulting in overloading of the system.
---	---

Operation of hydraulic device requiring continuous oil flow. For example: Hydraulic motor When connecting the hydraulic motor, always follow the manufacturer's instructions. For a hydraulic motor that rotates only in one direction, the oil return port must be connected with the no-load discharge pipe. Connect the pressure pipeline with the control valve. For a hydraulic motor that may rotate in two directions, connectors required for the 2 control valve is usually used. Install an oil temperature sensor, and if necessary, install an oil cooler. The allowable maximum temperature is 110°C (230°F).	 <i>Fig. 4-63</i>
--	--

	Warning: Do not move the control valve to neutral position immediately, because the back pressure produced may damage the hose if the hydraulic motor is not equipped with a safety valve.
---	---

4.13.Towing Devices

	Warning: All the implements mounted on the tractor must be secured firmly and in accordance with the manufacturer's instructions. Use permitted devices only.
---	--

4.14.

	Notice: It is prohibited that the semi-mounted implement, trailer and agricultural machine is towed only by connecting the upper link of the three-point linkage. This may result in rear-up accident or backward roll-over of the tractor.
---	--

	Warning: When towing, always secure the hitch pin with a suitable locking pin with safety clip to prevent the hitch pin coming out the hitch. The locking pin must be fixed onto the hitch pin always.
---	---

	Warning: Overload is not allowed during traction or with a trailer coupled.
--	--

	Warning: During braking, the trailer is braked at time earlier than braking of the tractor.
---	--

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

- Swing drawbar
- hitch frame

4.14.1.Swinging towing device (optional)

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 towing device is shown as following figure:

- ① Dowel pin
- ② Drawing bracket weldment
- ③ Swing pin
- ④ Swing rod
- ⑤ Elastic locking pin
- ⑥ Spring pin
- ⑦ Connecting pin
- ⑧ Elastic locking pin

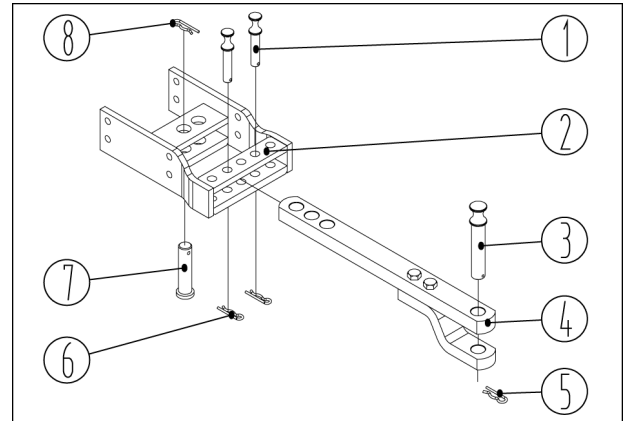


Fig. 4-64



Important:

Turning the drawbar over can change height of the towing point to obtain a towing height suitable for the mating implement.



Warning:

During operation, the drawbar can swing from side to side, but when the tractor tows the implement in reverse direction, the 2 dowel pins must be inserted into the hole of the drawplate to keep the drawbar standstill.

4.14.2. Towing device (configuration 1)

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 as following figure:

- ① Hitch pin;
- ② Hitch frame;
- ③ Elastic locking pin

During use, conduct following operations:

1. Remove the elastic locking pin;
2. Remove the hitch pin from the hitch frame.
3. Install the trailer.
4. Insert the hitch pin into the hitch frame
5. Install the elastic locking pin;

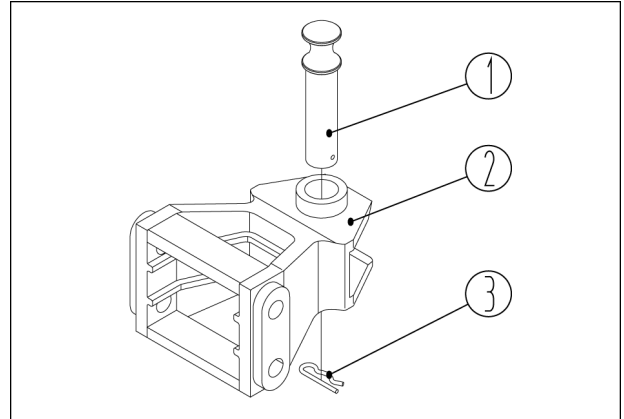


Fig. 4-65

4.14.3. Towing device (configuration 2)

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 as following figure:

- ① Hitch pin;
- ② Hitch frame;
- ③ Elastic locking pin

During use, conduct following operations:

1. Remove the elastic locking pin③;
2. Remove the hitch pin① from the hitch frame②.
3. Install the trailer.
4. Insert the hitch pin① into the hitch frame②.
5. Install the elastic locking pin③;

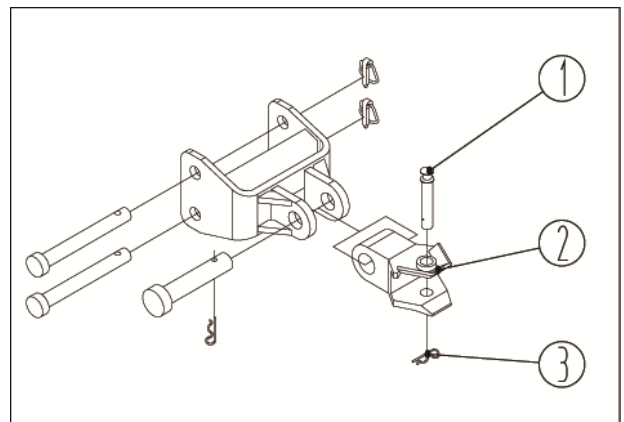


Fig. 4-66

5. Wheels

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 use 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.

**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.

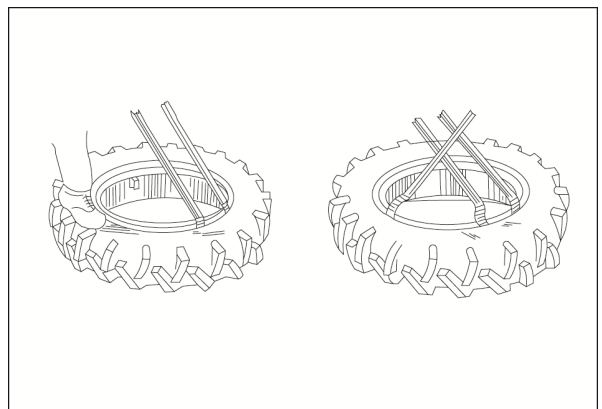


Fig. 5-1

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.

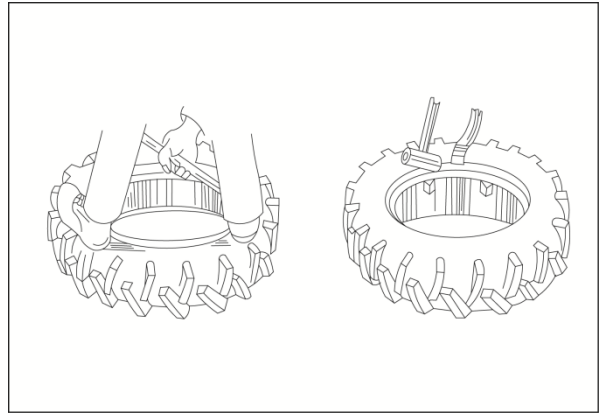


Fig. 5-2



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 track width 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.

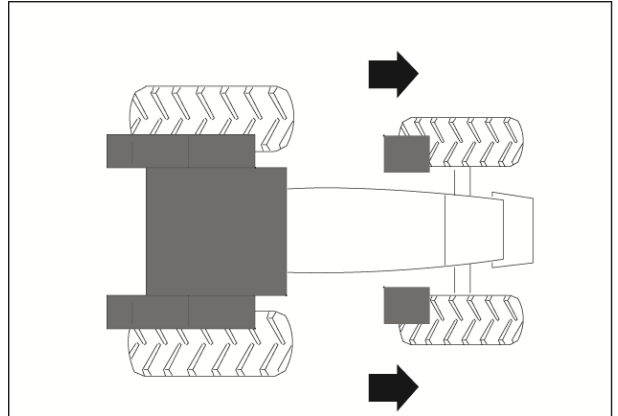


Fig. 5-3

	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.

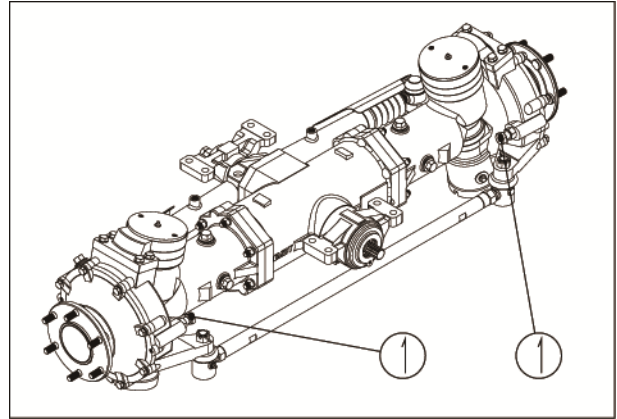


Fig. 5-4

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 bolts①.

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)

**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 200kPa (0.2 MPa). 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:**

Work on agricultural land requires maximum adhesion. The rear tire inflation pressure could be reduced accordingly. Check the manufacturer's minimum inflation pressure recommendations before lowering the pressure.

Maximum inflation pressure of an ordinary tire shall not exceed the value marked on the tire.



Important:

If a tractor is equipped with such type of tires, check the pressure compulsorily and often have the pressure kept identical to that as indicated in the maintenance table.

5.1.2.Wheel puncture

This kind of tractors will be equipped with two different types of tires:

- Radial tires (with the letter "R" marked for reference). This kind of tires has no inner tubes (with "Tubeless" marked for reference);
- Conventional tires all have inner tubes;

If any tire becomes flat, stop the tractor immediately and if you are driving on a city road, please stop your tractor at a roadside parking lot as soon as possible before troubleshooting.



Danger:

Please do not drive when any tire has become flat. Otherwise, irreparable damages may happen and your tractor may be out of control.

Only training tire experts can decide whether a tire should be repaired or replaced.



Important:

The tire repair can only be performed by qualified workshop professionals.

It should be ensured that all necessary tools have been well prepared before any tire is removed. Carry out safe operations according to the following instructions:

- Park your tractor on a solid ground where there is no vehicle driving, lock the wheels and apply the parking brake.
- Put a jack under the tractor and insert a block of solid wood between the tractor and the ground.
- Use the jack to lift the tractor high enough to ease the load during wheel removal, unscrew the studs completely and then remove the wheels.

**Important:**

Please do not leave the tractor after its wheels are removed. Non-professional workers are not allowed to stand close to the tractor.

5.1.3. Wheel nut/bolt tightening torque

In order to protect the vehicle, operators, passengers and other vehicles, please make sure that the rims have been properly installed on the wheels.

**Important:**

After the first 10 hours' working, please tighten the wheel nuts and bolts again. After every 50 hours' working, please tighten the wheel nuts and bolts according to the regulated torques.

After wheel tread adjustment or wheel replacement, please tighten the wheel nuts and bolts according to the regulated torques.

Table 5-1

Description	Grade	Tightening torque	Error
Bolt M 14 x 1.5	8.8	120 Nm (12.2 kgm)	±5%
Bolt M 16 x 1.5	8.8	184.5 Nm (18.8 kgm)	±5%
Bolt M 16 x 1.5	10.9	271 Nm (27.6 kgm)	±5%
Bolt M 18 x 1.5	10.9	395 Nm (40.3 kgm)	±5%
Bolt M 20 x 1.5	10.9	550 Nm (56 kgm)	±5%
Nut M 14 x 1.5	8	120 Nm (12.2 kgm)	±5%
Nut M 18 x 1.5	10	395 Nm (40.3 kgm)	±5%
Nut M 20 x 1.5	10	550 Nm (56 kgm)	±5%
Nut M 22 x 1.5	10	745 Nm (76 kgm)	±5%

5.2.Wheel Tread Calculation

5.2.1.Minimum wheel tread

Rear wheel tread

Depending on the width of the tires, it may not be possible to use all the track width settings listed here as the tire may foul the fender. Choose a track width setting that ensures sufficient clearance between the fender and the tire.

Front wheel tread

When the minimum front track width setting is used and the tractor is fitted with wide tires, the steering angle will be very limited. Check that the clearance between the engine hood and the fenders is sufficient. To do this, raise the tractor, and then raise and lower the steered front wheel; swing the axle and check that there is no interference.

Front axle width (regardless of the wheel width)

2WD front axle is 1300 mm in width.

4WD front axle is 1389 mm in width.

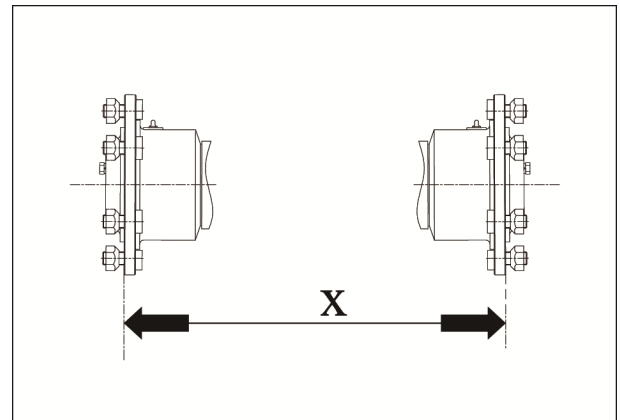


Fig. 5-5

Rear axle width (regardless of the wheel width)

The rear axle is 1390 mm in width.

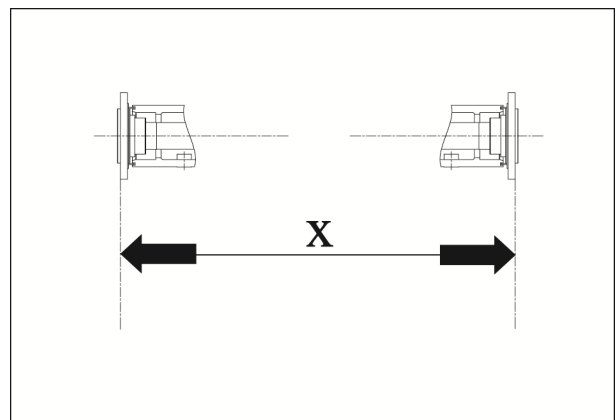


Fig. 5-6

5.3.Adjustment of Wheel Tread

5.3.1.Change the wheel tread

The wheel tread can be adjusted according to different crops spacing or with different implements.

Never use a tractor before its wheel rims have been completely fixed.

The distance from the outer edge of the area illuminated by the direction indicators, the side lights, the rear sidelights and upper reflectors, to the outer edge of the tires must not be greater than 400 mm; this rule is internationally universal.

The data contained in the vehicle registration document regarding the maximum track widths for use on both urban and rural public roads must be respected.

After any adjustment to the track width and whenever changing the wheels, tighten the nuts and bolts to the following required tightening torques:

- Front wheel
 - ◇ Bolt M16x1.5= 271 Nm (27.6 kgm),
- Rear wheel
 - ◇ Nut M20x1.5= 550 Nm (56 kgm);

Before replacing any wheel, please make sure that the tractor can't move and is appropriately supported.

When working with compressed air to bed in the tire on the rim always use an extension line of sufficient length to allow you to remain at the side of the tire. These operations must be carried out only by qualified personnel.

	Notice: When changing wheels or carrying out maintenance and repair operations, raise and support the tractor using specific equipment only.
---	---

Fixed wheels

When the wheel rims are fixed, you can apply two configurations to the wheels, so that two optional front and rear wheel treads can be available.

	Important: To change the wheel tread, please transpose the left and right wheels. In this way, the tires will not have the driving direction changed.
---	--

Assembly drawing of front wheels

This drawing shows different ways of wheel installation, so two front wheel treads are available.

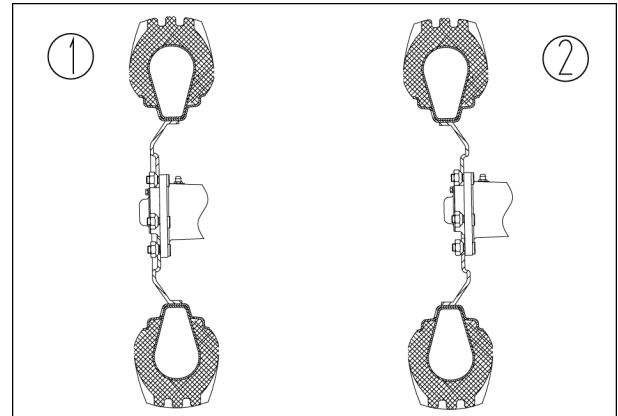


Fig. 5-7

Assembly drawing of rear wheels

This drawing shows different ways of wheel installation and two kinds of rear wheel treads.

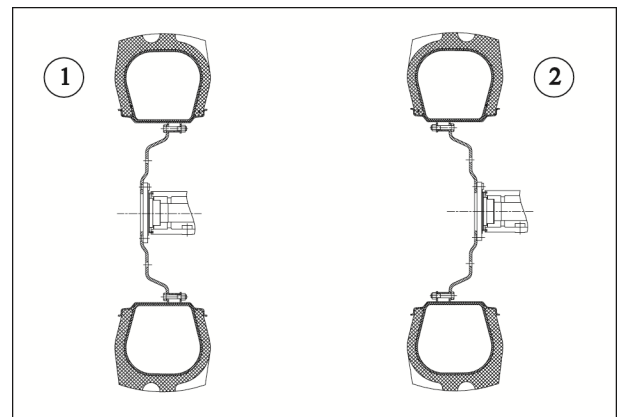


Fig. 5-8



Notice:

Widen the wheel tread when necessary to avoid overloading of the tractor.

Calculation of wheel tread when the wheel rims are fixed

5.3.2. Ordinary wheel tread adjustment

5.3.2.1. Front wheel tread adjustment

1. FL35-70HP Series Wheeled (rear-drive) Tractor - Adjustment to Front wheel track:

Using a jack, raise the front axle of the tractor. Remove the left and right locking bolts ① for the main and auxiliary sleeves. Remove the locking bolt ② and the cylinder fixing bolt ③. Adjust the positions of the auxiliary sleeve and cylinder. Adjust the length of tie rod. Finally install and tighten these bolts.

Four options for front wheel track: 1200mm, 1300mm, 1400mm, and 1500mm.

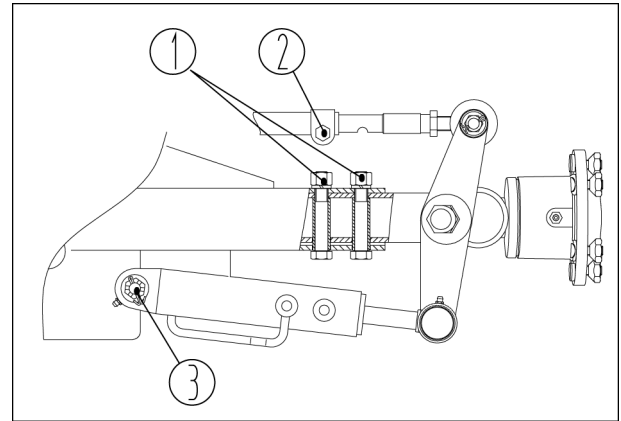


Fig. 5-9

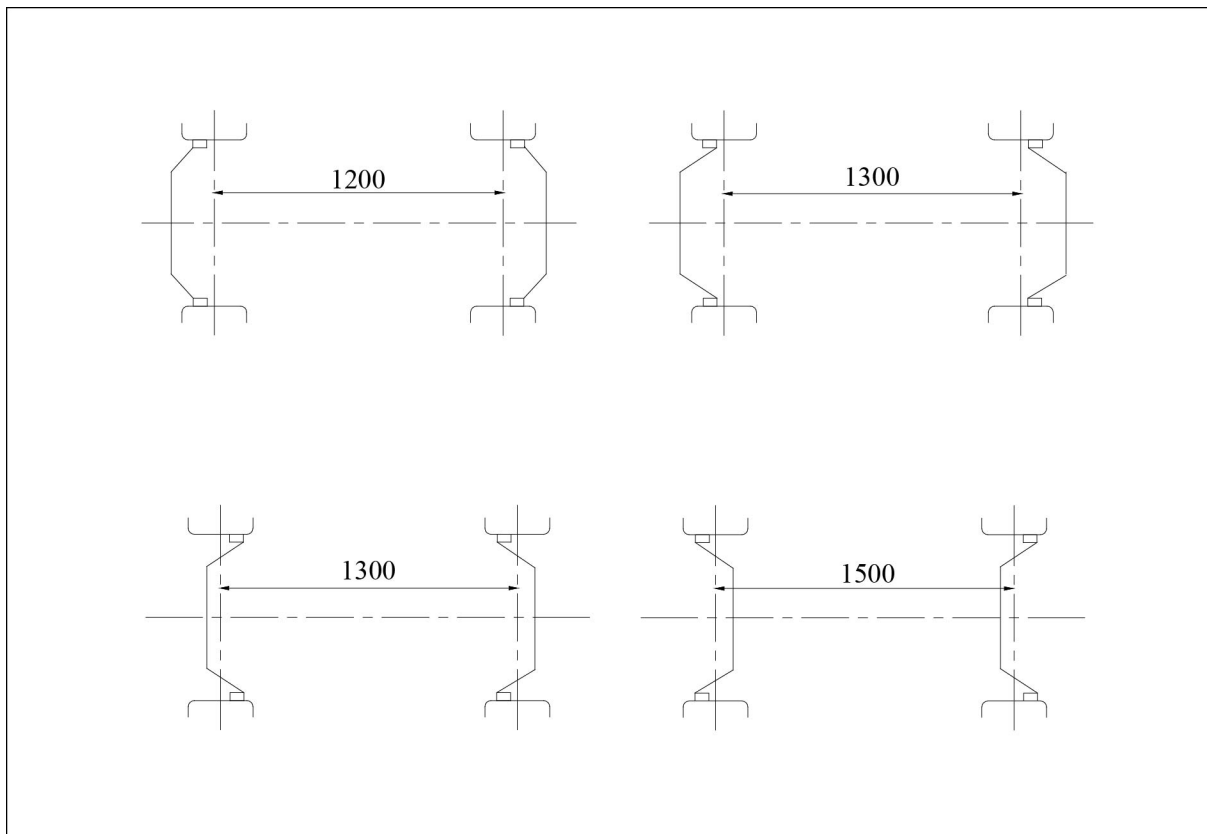


Fig. 5-10

2. FL35-70HP Series Wheeled (4WD) Tractor - The front tire rim is welded together with the wheel spoke, and which is non-adjustable.

5.3.2.2.Rear wheel tread adjustment

The common wheel tread is 1300mm and the four wheel treads as shown in the figure can be available from different connection positions of the wheel spokes and rims.

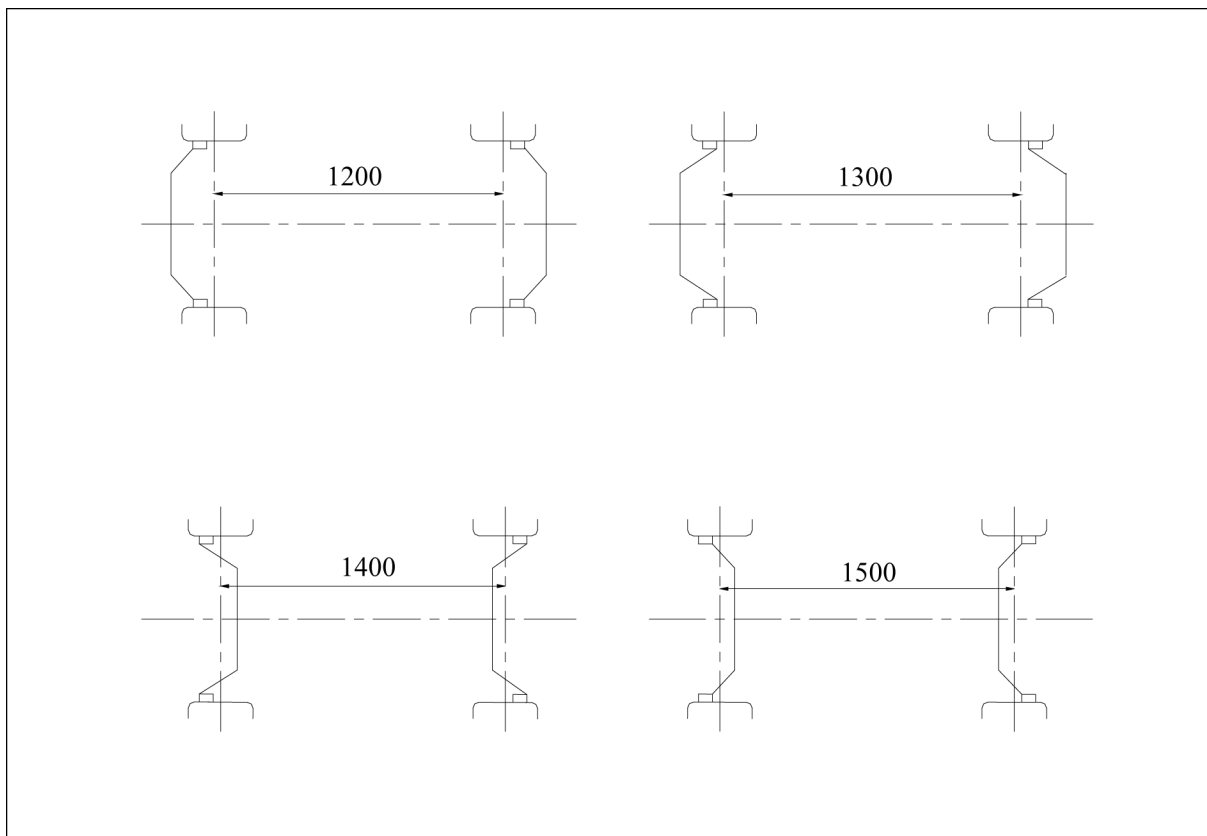


Fig. 5-11

	Notice: If the rear wheel track is changed from 1300mm to another value, the rear ballast cannot be used. The user shall select a proper wheel tract according to actual working conditions.
---	---

	Important: During rear wheel tread adjustment, do have the arrow marked on the tire side or the tip of the tire herringbone pattern pointing to the direction of driving forward and always ensure that the two front wheels and rear wheels are symmetrical to the center line of the tractor. In time of adjustment, first select the most appropriate rear wheel tread and then select the front wheel tread.
---	---

5.4.Adjustment of the Front Wheel Toe-in

Operation instructions:

Park your tractor on a horizontal ground, have its front wheels kept as the tractor is driving straight forward as shown in the figure and obtain the toe-in value $A - B = 4 \sim 8$ by adjusting the length of the tie rod②.

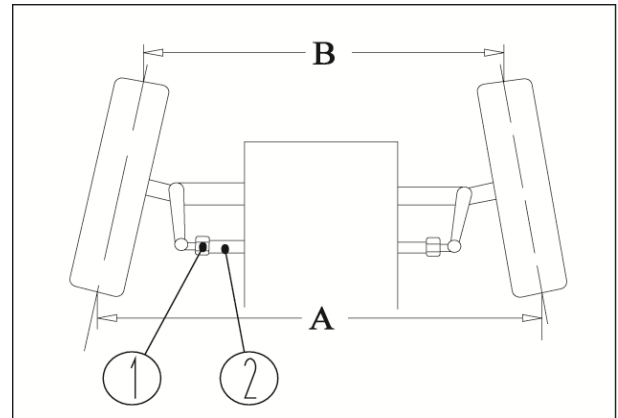


Fig. 5-12

5.5.



Notice:

After the front wheel toe-in has been inspected and adjusted, tighten the nuts① at both ends of the tie rod.

5.5.Half Axles with Removable Wheel Hub

This type of half axles can have tread change available in the absence of rim flanges.



Danger:

Pease change the wheel tread with the help of another operator.

Adjust the wheel tread width as follows:

- Park your tractor on a flat ground as described in the operating manual for tractor parking.
- Use a jack to lift one of the two wheels off the ground and place a suitable support.
- Unscrew the bolt ①, and ④ on the lower sleeve as well as the hub cover ② and the hub ③ and then move the wheel to take down the hub from the sleeve.
- Slide the hub cap ② and hub ③ on the drive shaft ⑤ to the specified position, and then fully tighten the bolts ① and ④.

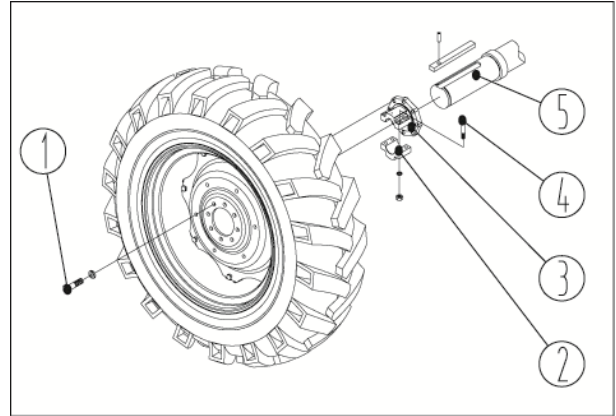


Fig. 5-13

	Important: Do adjust the two wheels in the same way.
---	---

5.6.Ballast

5.6.1.Capacity for carrying ballast

	Danger: We recommend that you use appropriate safety equipment as much as possible when carrying the ballast.
---	--

5.6.2.

According to the requirements of the statutory regulations, a man can carry the weight no more than 30kg while a woman no more than 20kg.

The tractor may carry different kinds of ballast:

- Cast iron "box-shaped" blocks;
- Use bolts to fix cast iron pieces;
- Intermediate plate;

- Integral type;
- Wheel metal disc;

Methods for installing different ballast

➤ **Cast iron "box-shaped" blocks**

This kind of ballast can be installed by one worker. The ballast shall be placed on the front bracket for installation.

	Danger: Please make sure to check the weight of each ballast. If it weighs more than the bearable limit (male: 30 kg, female: 20 kg), please use appropriate mechanical lifting devices.
---	---

➤ **Bolted cast iron pieces**

Such ballast must be installed by at least two workers – One undertakes to lift the ballast up in place while the other uses bolts to fix the ballast.

	Danger: Please make sure to check the weight of each ballast. If it weighs more than the bearable limit (male: 30 kg, female: 20 kg), please use appropriate mechanical lifting devices.
--	---

➤ **Intermediate plate**

The intermediate plate must be installed by at least two workers – One undertakes to lift up in place while the other uses bolts to fix the load block.

	Danger: Please make sure to check the weight of each load. If it weighs more than the bearable limit (male: 30 kg, female: 20 kg), please use appropriate mechanical lifting devices.
---	--

➤ **Ballast block**

Each ballast block must be installed by at least two workers, with the specific operation steps as follows:

- Lower the front lift arm;
- Drive the tractor forward slowly to the ballast;
- Raise the lift arm until the hooked hanger has engaged with the lateral positioning pin;
- Use pins to connect the upper link and the huge rock.



Important:

Remove the ballast need complete the above operation in an opposite manner.

•

➤ **Wheel metal disc**

The metal disc must be installed by at least two workers – One undertakes to lift the metal disc up in place while the other uses bolts to fix it.



Danger:

Please make sure to check the weight of each load. If it weighs more than the bearable limit (male: 30 kg, female: 20 kg), please use appropriate mechanical lifting devices.

5.6.2. Tractor ballast

➤ **Front ballast**



Notice:

When a tractor has large farm implement engaged in the rear, for your safety, it must be equipped with enough front ballast, otherwise, rollover risks may happen!

➤

In order to adjust the front and rear ballast distribution, it is necessary to install front ballast in the front of the tractor. For heavy-load ploughing or large sowing implement, etc. engaged, front ballast must be equipped in order to prevent the tractor head holding up and ensure the driving safety.

For the FL35-70HP series tractor, the ballast consists of a ballast bracket, a draw lug, and ballast blocks.

The ballast bracket must be directly fixed onto the tractor.

The bracket weight is 45kg.

1. Ballast bracket;
2. Mounting bracket
3. Fixing bolt

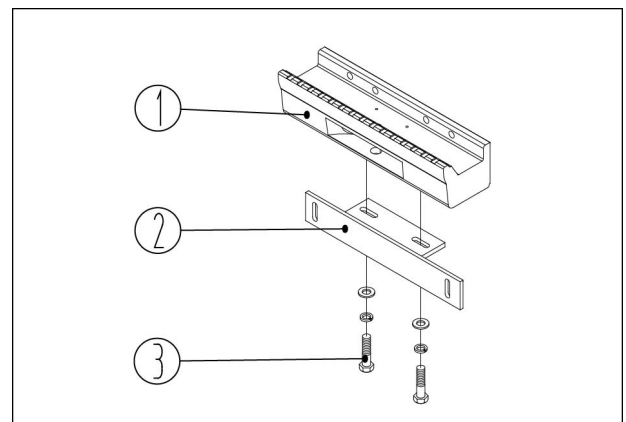


Fig. 5-14

Cast iron blocks can be mounted to the ballast bracket.

Eight cast iron blocks can be installed. Each weighs 18kg.

1. Ballast block;
2. Draw lug
3. Fixing bolt
4. Draw nut
5. Connecting bolt
6. Nut

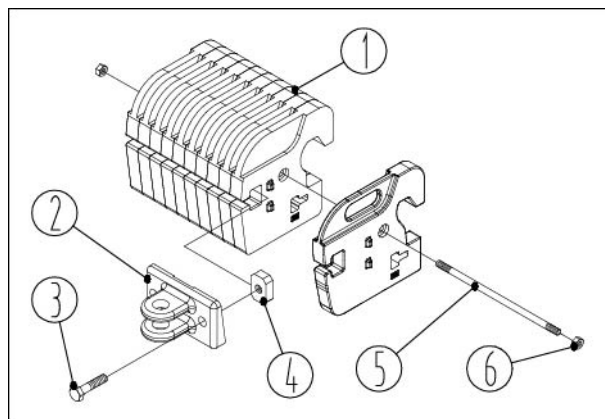


Fig. 5-15

Ballast configurations available:

- Ballast bracket - 45kg in total
- Ballast bracket, eight ballast block - 189kg in total

➤ Rear ballast

During field operation, cast iron ballast are usually installed on the rear wheel spokes to improve the tractor working performance and increase its traction.

Each cast iron ballast block is 30kg and 3 pieces, 5 pieces, 6 pieces can be installed at each side.

- a) If rear tires are selected to be 14.9 to 24 wide tires, each rear ballast weighs 45kg, and 2 or 3 ballasts may be mounted on each side.

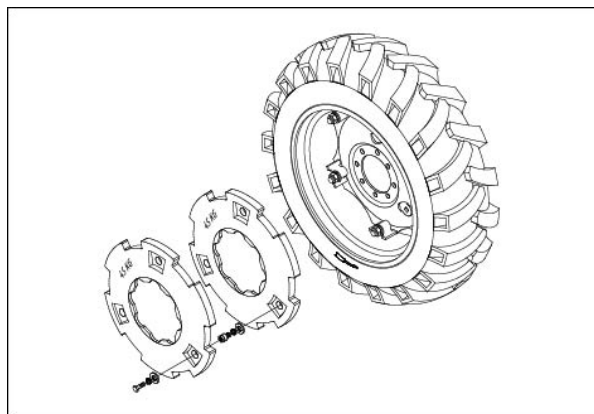


Fig. 5-16

➤



Notice:

Before removing the rear wheel with a ballast from the tractor, you shall first remove the ballast from the wheel, in order to avoid the risk of instability.



Warning:

While installing a ballast for a tractor, load the front axle to ensure safe steering (The front axle load cannot exceed 20% of the tractor overall weight).



Notice:

Please keep in mind that any additional implement/trailer or tractor onboard ballast may have great impact on manipulation, braking and performance.

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.



Notice:

The terminals and some components of the battery contain lead or lead compounds. Wash your hands carefully after handling the battery.

6.1.1.Accessing the battery

Access the battery on the front end of radiator water tank , proceed as follows:

- Open the hood lock;
- Open the hood.

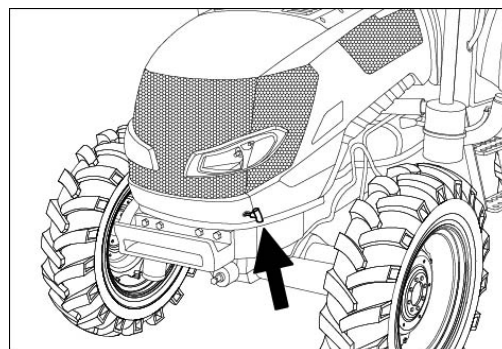


Fig. 6-1



Notice:

The battery can be charged only by using 12V voltage.

Dismantle battery



Notice:

Protective glasses must be worn when charging the battery or electrolyte is supplemented.

**Warning:**

Always disconnect the battery before carrying out any work on the electrical system. Disconnect the battery and all the Electronic Control Units whenever it is necessary to do any welding on the tractor or any of the equipment connected to the tractor.

**Danger:**

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.

To remove the battery, proceed as follows:

- Disconnect connection ② between ground terminal and negative terminal;
- Disconnect the power supply wire ① from the positive terminal;
- Completely loosen and remove nut and gaskets ③④⑤;
- Remove pressing plate ⑥ of the storage battery
- Remove the battery ⑦ from the holder;

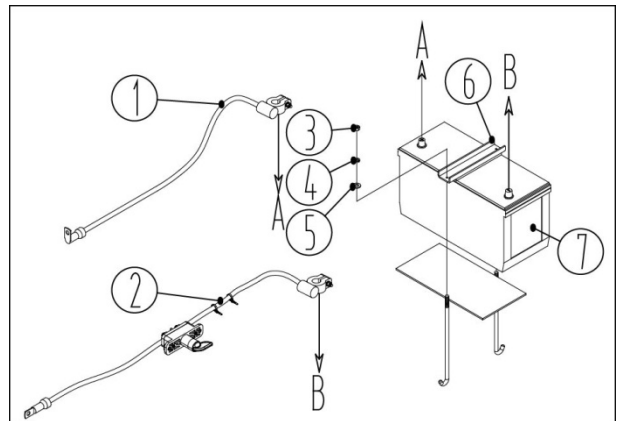


Fig. 6-2

To refit the battery, proceed as follows:

- Install battery ⑦ from the holder;
- Install pressing plate ⑥ of the storage battery;
- Install and tighten nuts and gaskets ③④⑤;
- Connect the power supply wire ① from the positive terminal;

- Connect connection ② between the ground terminal and negative terminal.

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 underneath the right step of the cab

To disconnect the battery from the electrical system, turn off the switch. To connect the battery to the electrical system, turn on the switch.

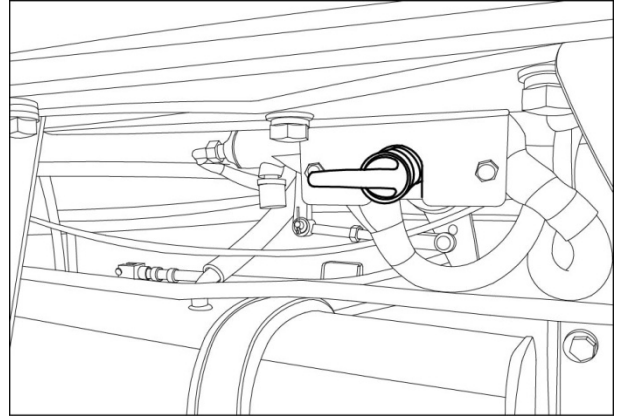


Fig. 6-3

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

Disconnecting the battery:

- Rapidly turn the switch counterclockwise to the position OFF;

Connecting the battery:

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

6.2.Fuse Box

The central electrical box mainly contains the main power supply relay, electronic flasher, lighting control relay, and 15-way fuse plate. The rated operating currents and corresponding protected electrical components are shown in the Figure.

When electric element is disconnected, fuse plate in the fuse box should be inspected at first, if fuse plate is damaged, one piece of standby use fuse plate which is matched with the same current should be immediately removed from circuit board to replace the damaged fuse in order to guarantee electric element is not damaged.

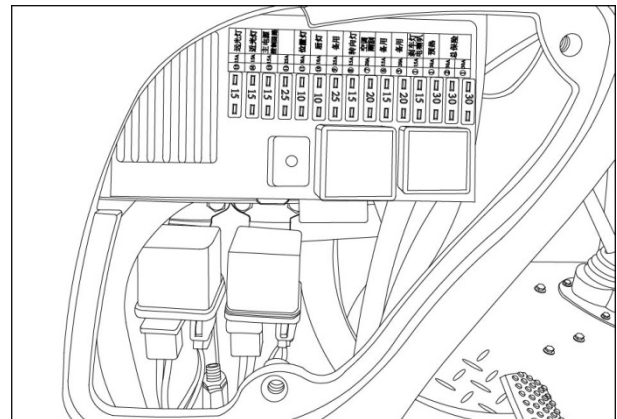


Fig. 6-4

6.3.

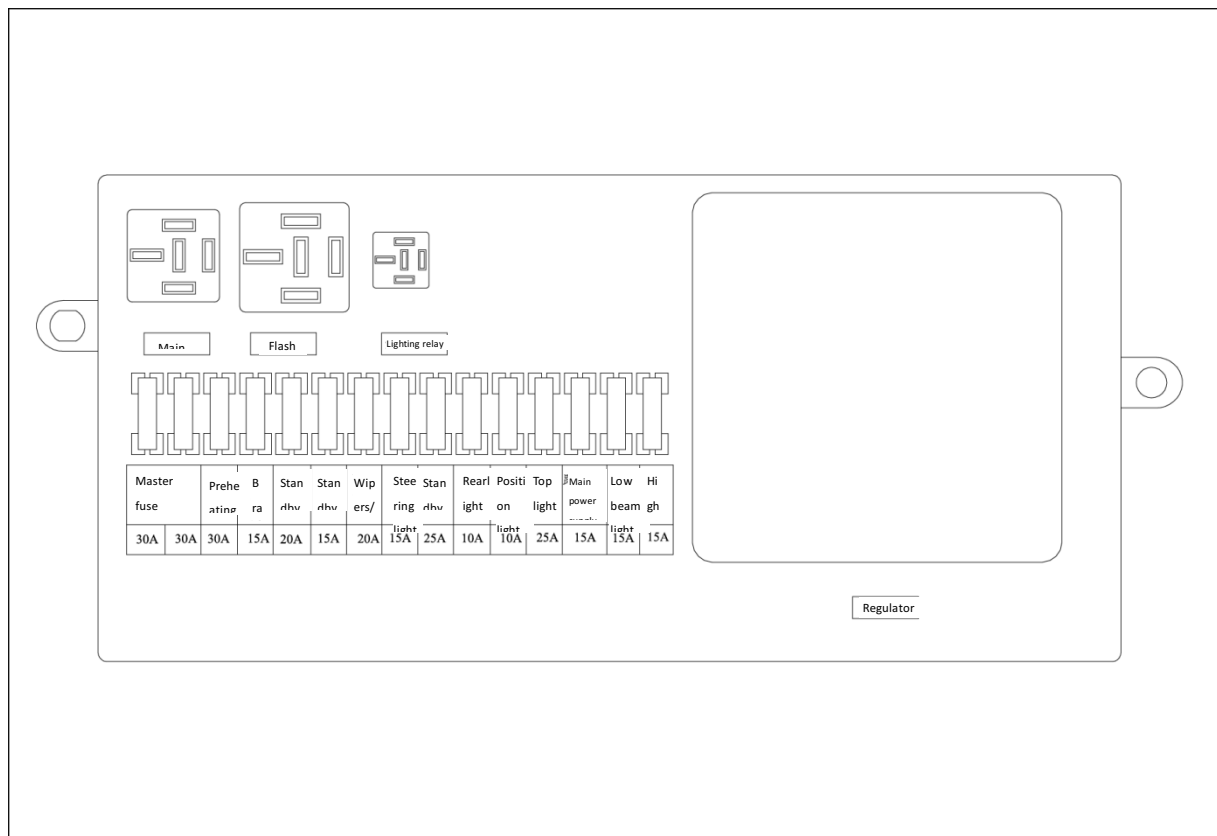
Table 4-1 Rated operating currents of fuse box and corresponding protected electrical components

Fuse box control position	One	Two	Three	Four	Five	Six	Seven	Eight	Nine	Ten	Eleven	Twelve
Rated working current	15A	15A	15A	25A	10A	10A	15A	20A	15A	30A	30A	30A
Protected electrical component	High beam light	Low beam light	Main power supply control circuit	Top light	Position light	Backlight	Steering light	Air conditioning/wipers	Brake lights/electric horn	Preheating	Master fuse	

Before changing one fuse with fault:

- Disconnect the power supply
- Repair fault that has burn-out fuse
- Replace the burn-out fuse

Fuse box illustration



Fuse box layout

Fig. 6-5

6.3. Light for Road Use

	Important: Clean the outside of the lights with water or specific commercial products.
---	---

6.4.

	Important: Avoid touching the inner surface of the reflector. Make sure no foreign material gets inside the reflector.
---	---

The tractor has been equipped with the following lights used on roads:

- Two head lights on the front panel (low-beam headlight and high-beam headlight)
- Two steering lights on the front panel
- Two clearance lamp on the front panel
- Two lamps that are composed of indicator light on the side and direction indicators on two sides (with cab)

- Two lighting sets above the fender in the tail of the vehicle



Notice:

Front and back lights will be turned off before cleaning.

6.4.1.High-beam and low-beam headlight

Light model used on roads of low-beam and high-beam headlight is 12V-H4-55/60W to provide enough width and far enough illumination for vehicles.

1. Low beam light and high beam light

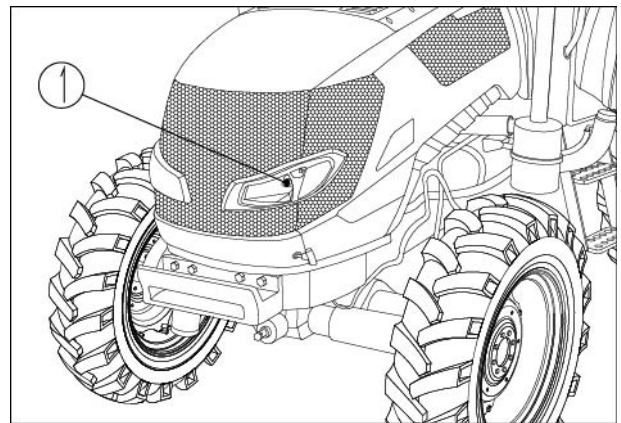


Fig. 6-6

6.4.2.

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 bonnet;
- Remove the power connector of bulb①;
- Remove the protective rubber cap ②;
- Slightly rotate the pinch cock ③ that has clamped the bulb socket, and then remove the bulb ④ from the reflector ⑤;
- Embed one new bulb to guarantee positioning mark number is consistent with the notch of reflector ⑤;
- Rotate pinch cock ③ and lock it;
- Re-fix rubber cap② to guarantee that it can be greatly installed on edges of the reflector;
- Connect the power connector of bulb①;
- Close the bonnet.

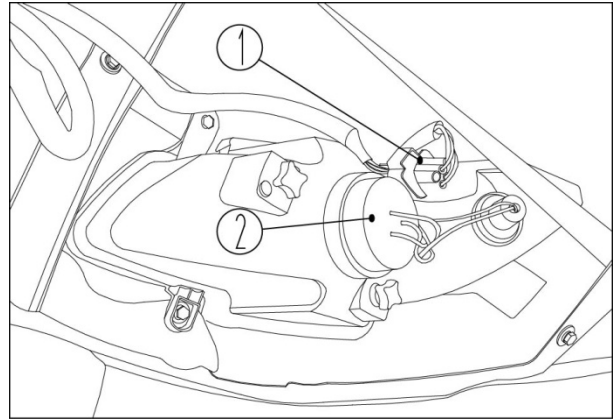


Fig. 6-7

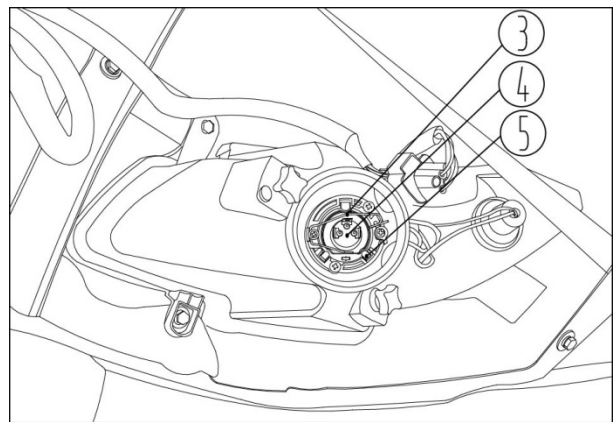


Fig. 6-8



Important:

Avoid touching the inner surface of the reflector. Make sure no foreign material gets inside the reflector.

6.4.2. Clearance light on the front panel

The left and right width lights on the front panel each consists of one 12V R5 halogen light.

1. Clearance lamp on the front panel.

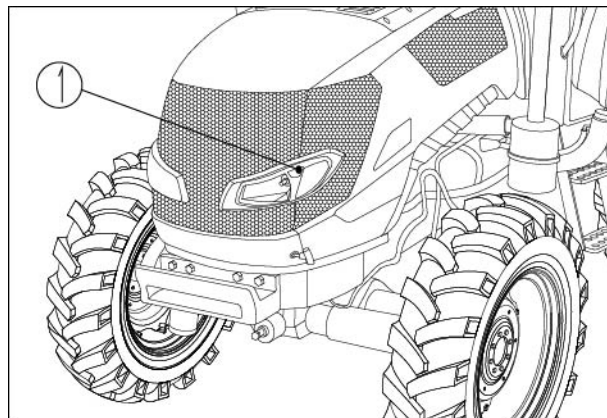


Fig. 6-9

6.4.3.

Bulb replacement

Steps for replacing bulb are as below:

- Lift Engine bonnet;
- Remove the bulb connector ②;
- Gently take out the bulb in position ①;
- Slightly embed new bulb and fix bulb;
- Insert the connector ② into the terminal of the bulb;
- Close the bonnet.

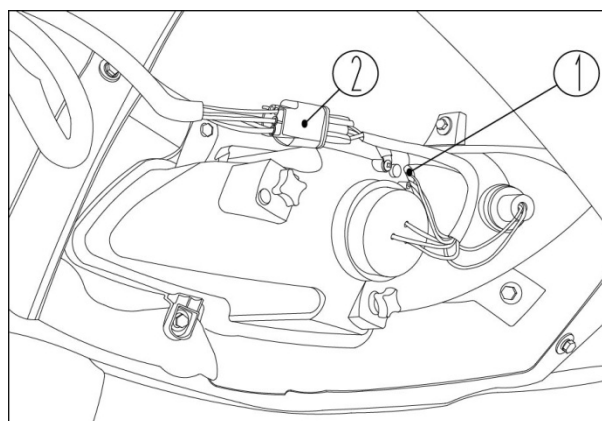


Fig. 6-10

6.4.3. Steering light on the front panel

Model of the steering light on the front panel is 12V-P21W.

1. Steering light on the front panel

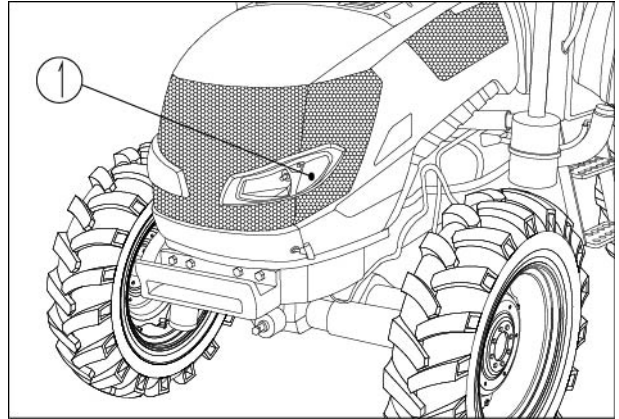


Fig. 6-11

6.4.4.

Bulb replacement

Steps for replacing bulb are as below:

- Lift Engine bonnet;
- Remove the bulb connector ①;
- Remove the protective rubber cap ②;
- Slightly remove the bulb;
- Slightly embed new bulb and fix bulb;
- Insert the connector ① to the terminal of the light;
- Close the bonnet.

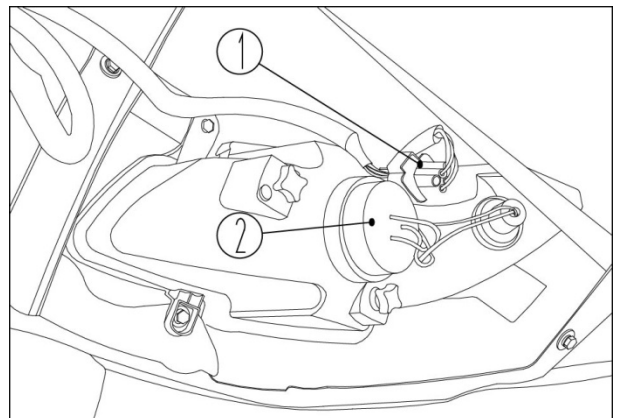


Fig. 6-12

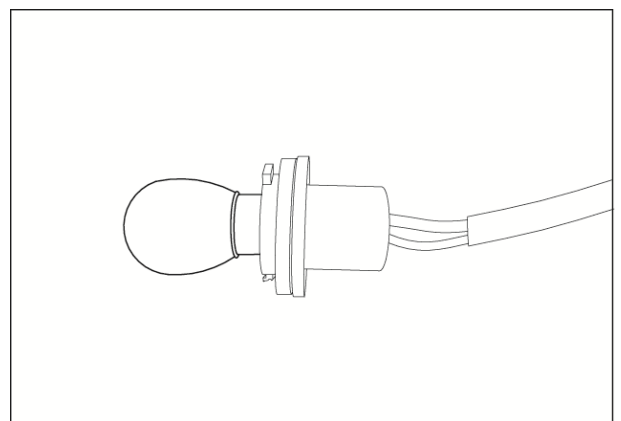


Fig. 6-13

6.4.4.Side direction indicators and side lights

The side direction indicators and side lights are composed of two separate bulbs enclosed in a single container on each side of the tractor:

- Direction indicator light① equipped with bulb type 12VP21W.
- Sidelight② equipped with bulb type 12VP10W.

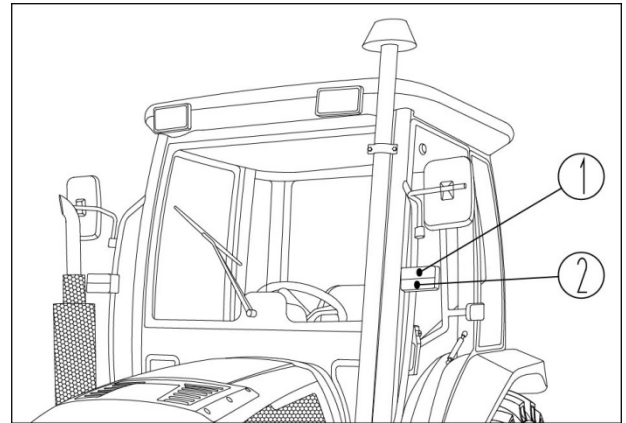


Fig. 6-14

6.4.5.

Bulb replacement

	Important: Only fit replacement bulbs of the same type and specification as those originally fitted.
--	---

Steps for replacing bulb are as below:

- One screwdriver is used to loosen and remove two bolts② that are used to tighten yellow and white transparent board①;
- Slightly remove the transparent board to reach the bulb;

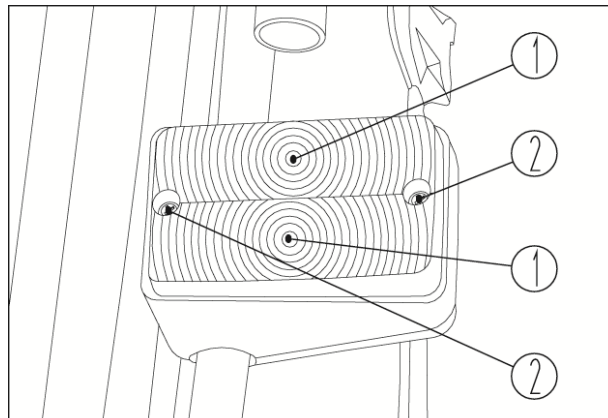


Fig. 6-15

- Slightly press the bulb that need be replaced, meanwhile, rotate to bulb ③ or ④ by anti-clockwise to break away from the bulb 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.

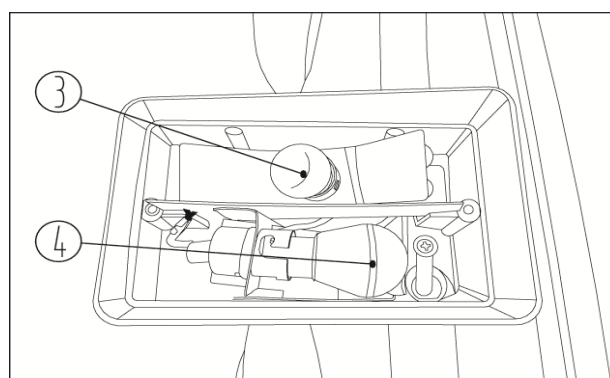


Fig. 6-16



Important:

Avoid touching the inner surface of the reflector. Make sure no foreign material gets inside the reflector.

5. Taillight

Taillight is composed of two separate bulbs on every fender of the tractor:

1. Light model of the taillight-brake/position indicator light is P21/5W12V.
2. Bulb model of taillight-direction indicator light is P12V/21W.

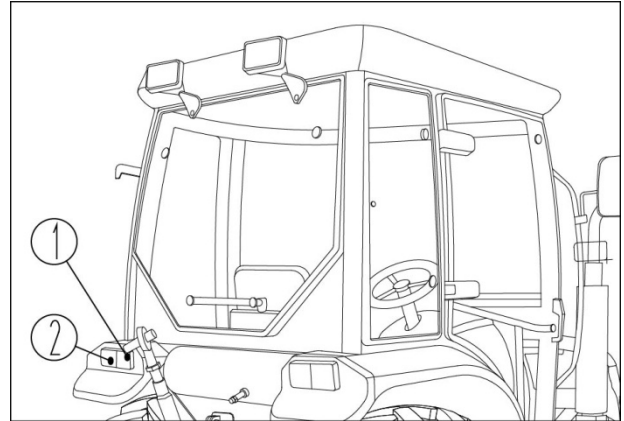


Fig. 6-17

Bulb replacement

	Important: Only fit replacement bulbs of the same type and specification as those originally fitted.
--	---

To replace the bulb, proceed as follows:

- One screwdriver is used to loosen and remove six screws① that are used to tighten red and yellow transparent board②;
- Slightly remove the transparent board to reach the bulb;
- Slightly press the bulb ③or ④ that need be replaced, meanwhile, rotate anti-clockwise to break away from the bulb socket;
- Gently rotate the new bulb clockwise until it does not move any more.
- Refit the transparent board, and then tighten it using six screws.

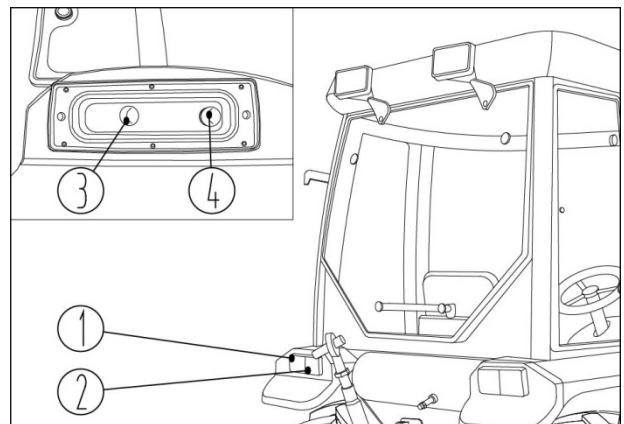


Fig. 6-18

6.4.6. Calibration of headlight

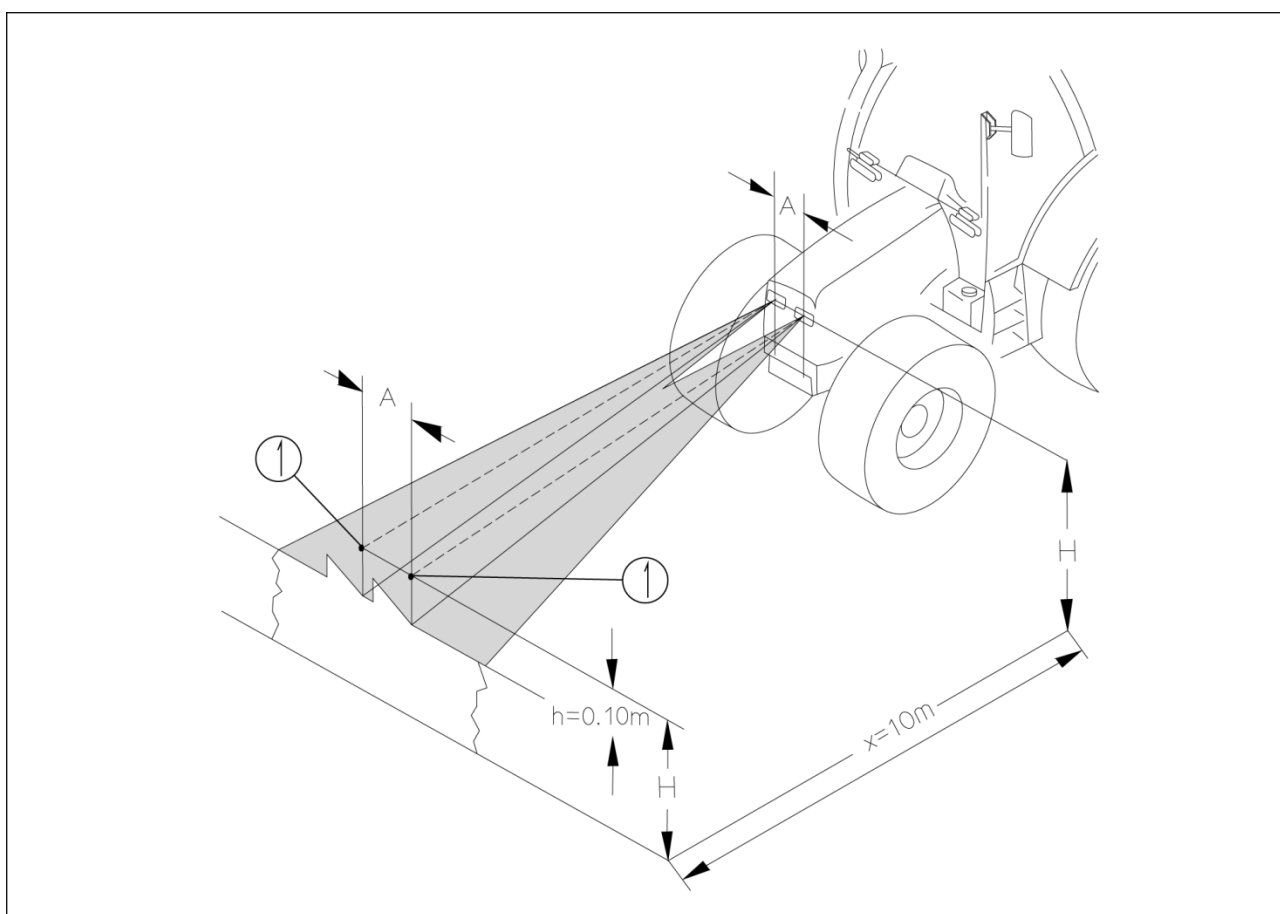


Warning:

The figure refers to use of the tractor on public roads in countries where the traffic drives on the right. If instead the tractor is to be driven on the left, the area on the wall shown in dark grey must be symmetrical to that in the figure (i.e. the points where the dark gray area enters the light area must always be directed towards the edge of the road).

6.4.7.

To adjust the headlight aim, the tractor must be parked on a level surface at a distance of 10 m from a vertical wall, in normal road transport condition; the tires must be inflated to the recommended pressures and the front wheels must be in the straight-ahead position. Switch on the low beam headlights.



The figure shows calibration of head light when driving on highway

Fig. 6-19

- ① points on the wall corresponding to the centers of the headlights
- A –distance among head lights
- H –height of head light
- h- distance from beam centre with respect to horizontal axis x.
- x –distance from head light to wall

Rotate bolt of regulator in the figure (① or ②) to move vertical or horizontal light beam. Where:

Bolt ① of the regulator is used to move light beam at the vertical direction.

Bolt ② of the regulator is used to move light beam at the horizontal direction.

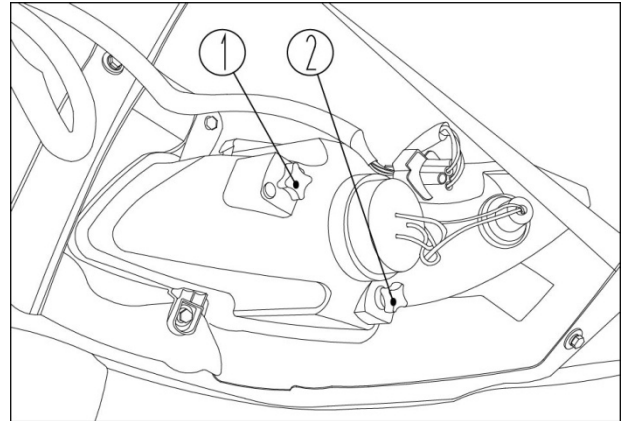


Fig. 6-20



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 dipped headlights on, mark the centers 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 10 cm apart as shown in the figure by (h).

6.4. Worklights

6.4.1. Worklights



Important:

Avoid touching the inner surface of the reflector. Make sure no foreign material gets inside the reflector.

6.4.2.

The tractor will be equipped with the following Worklights:

Tractor models equipped with a cab:

- Two front work lights on the top of cab
- Two rear work lights on the top of cab

Tractor models without cab

- Two worklights in the rear of the fender

Front work lights on the top of cab

Light model of front worklights on the top of cab is H3 12V 55W.

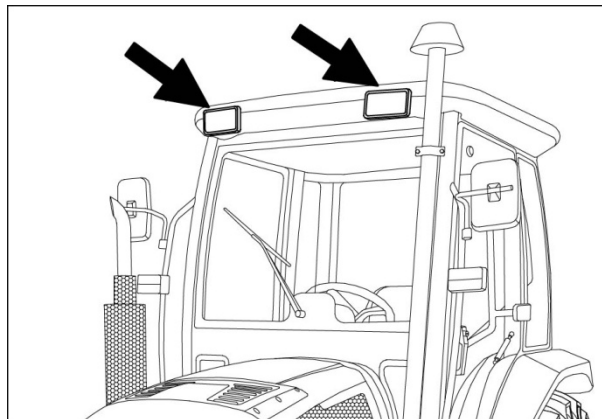


Fig. 6-21

Rear worklights on the top of cab

Light model of rear worklight on the top of cab is H3 12V 55W.

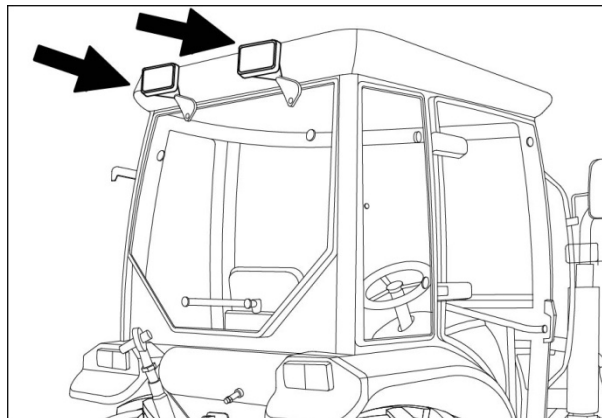


Fig. 6-22

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 work lights:

- Two front work lights on the top of cab
- Two rear work lights 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;
- Unscrew the screw ① at two sides of protection cover by using screwdriver to take off protection cover;
- Disconnect the light connector ② from the power supply;
- Using a screwdriver, loosen the screw ③, to separate the bulb socket from the reflector glass ④.
- Remove the bulb by rotating it counterclockwise.
- Install the bulb by rotating it clockwise.
- Using a screwdriver, tighten the screw ③, to securely attach the bulb socket to the reflector glass ④.
- Connect the bulb connector ② to the power supply.
- Refit the protective cover. Fix it using two bolts.

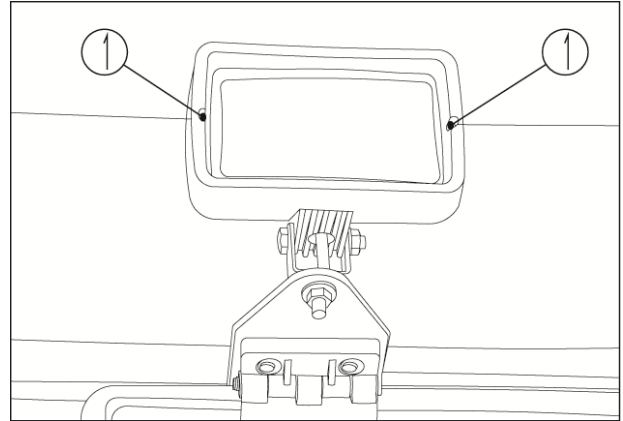


Fig. 6-23

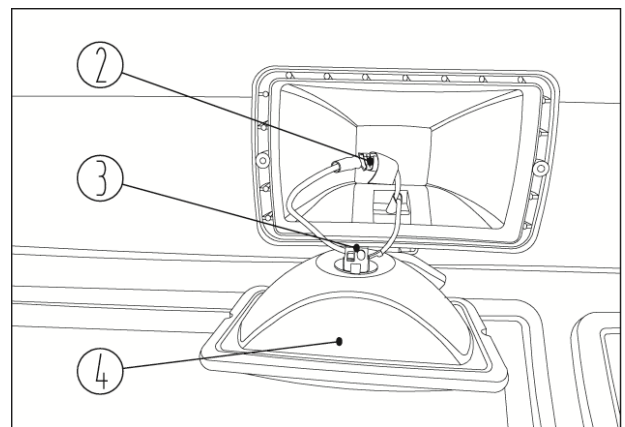


Fig. 6-24



Important:

Avoid touching the inner surface of the reflector. Make sure no foreign material gets inside the reflector.

Two work lights in the rear of the fender

Lamp model of two work lights in the rear of the fender is H3 12V 35W.

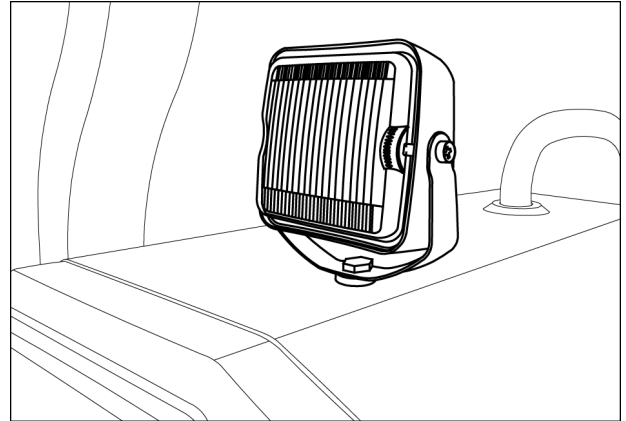


Fig. 6-25

Bulb replacement



Important

Only fit replacement bulbs of the same type and specification as those originally fitted.

Steps for replacing bulb are as below:

- Carefully clean the outside of the light unit to avoid the risk of dirt getting on the reflector during bulb replacement;
- Using a screwdriver, loosen the screw ② from the protective cover ① to access the bulb ③;
- Gently rotate the bulb ③, to remove it out of the reflector glass;
- Install new bulb
- Refit the protective cover ①. Fix it using screws.

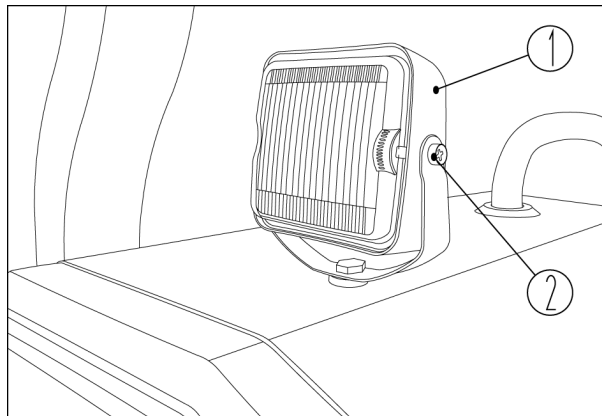


Fig. 6-26

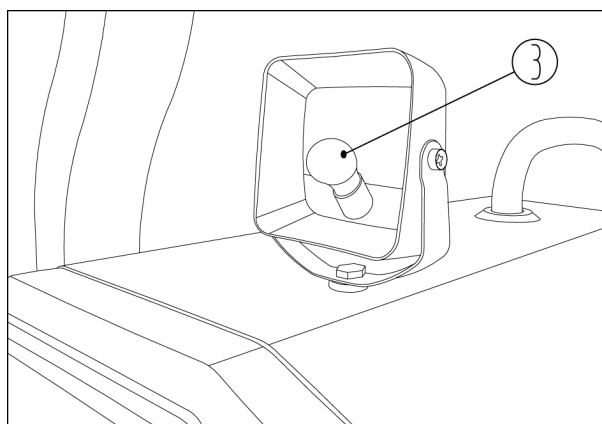


Fig. 6-27



Important:

Avoid touching the inner surface of the reflector. Make sure no foreign material gets inside the reflector.

6.4.2. Door-controlled interior illuminating light

The tractor is equipped with the following door-controlled interior illuminating light:

- Interior illuminating light

Interior illuminating light

Bulb model of the interior illuminating light is 12V 5W F-2.

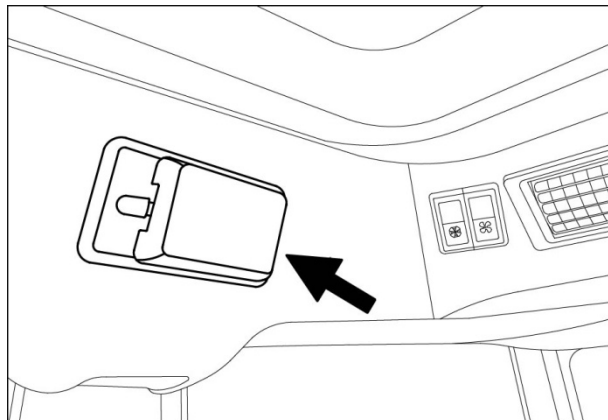


Fig. 6-28

Bulb replacement



Important:

Only fit replacement bulbs of the same type and specification as those originally fitted.

Steps for replacing bulb are as below:

- Remove light guard ① by pulling it outwards.

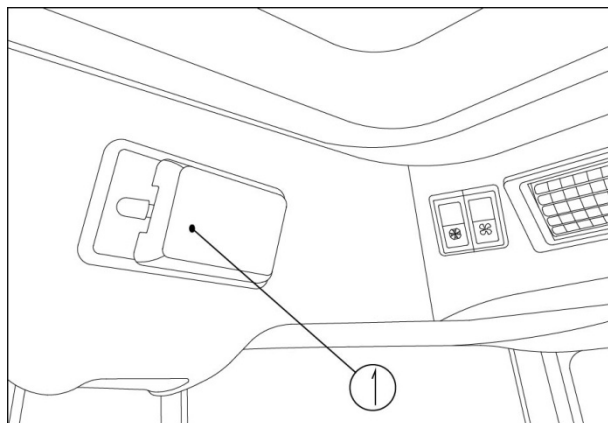


Fig. 6-29

- Press down the sheet metal ③;
- Remove the light bulb ②.
- Press down the metal strip ③. Install the new bulb ②.
- Loosen the metal strip, to secure the bulb ②.
- Install the light guard.

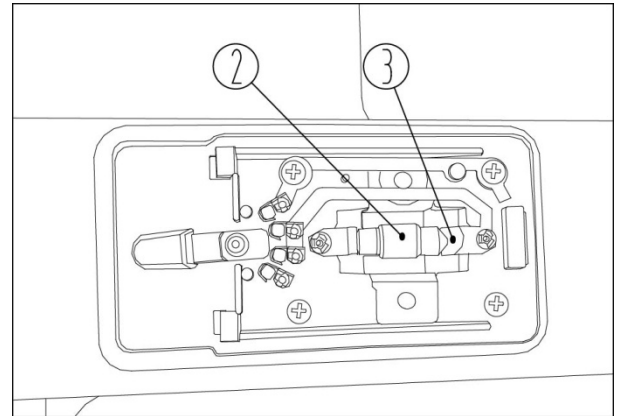


Fig. 6-30

6.5.Accessories

6.5.1.Power output socket

The tractor is equipped with power output socket of the back trailer.

The socket is installed on junction plate of quick-change connector in the rear of the tractor.

Specific position is shown in the figure.

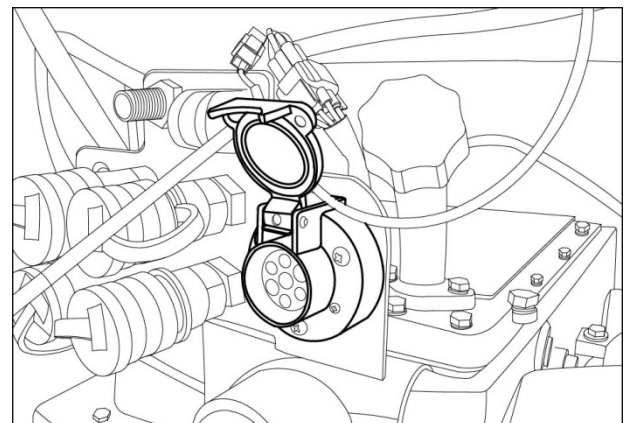


Fig. 6-31

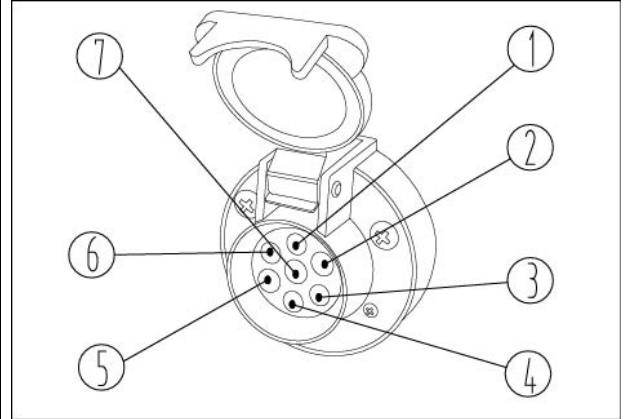
Power socket of the tractor, power socket of implement

Standard socket:

Power socket of the tractor with seven pins

Description of each pin:

1. Power line connected to left steering light;
2. Power line connected to brake lamp;
3. Grounded;
4. It is not used temporarily;
5. Power line connected to work light;
6. Power line connected to right steering light;
7. Power line connected to position light.


Fig. 6-32

6.5.2. 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.

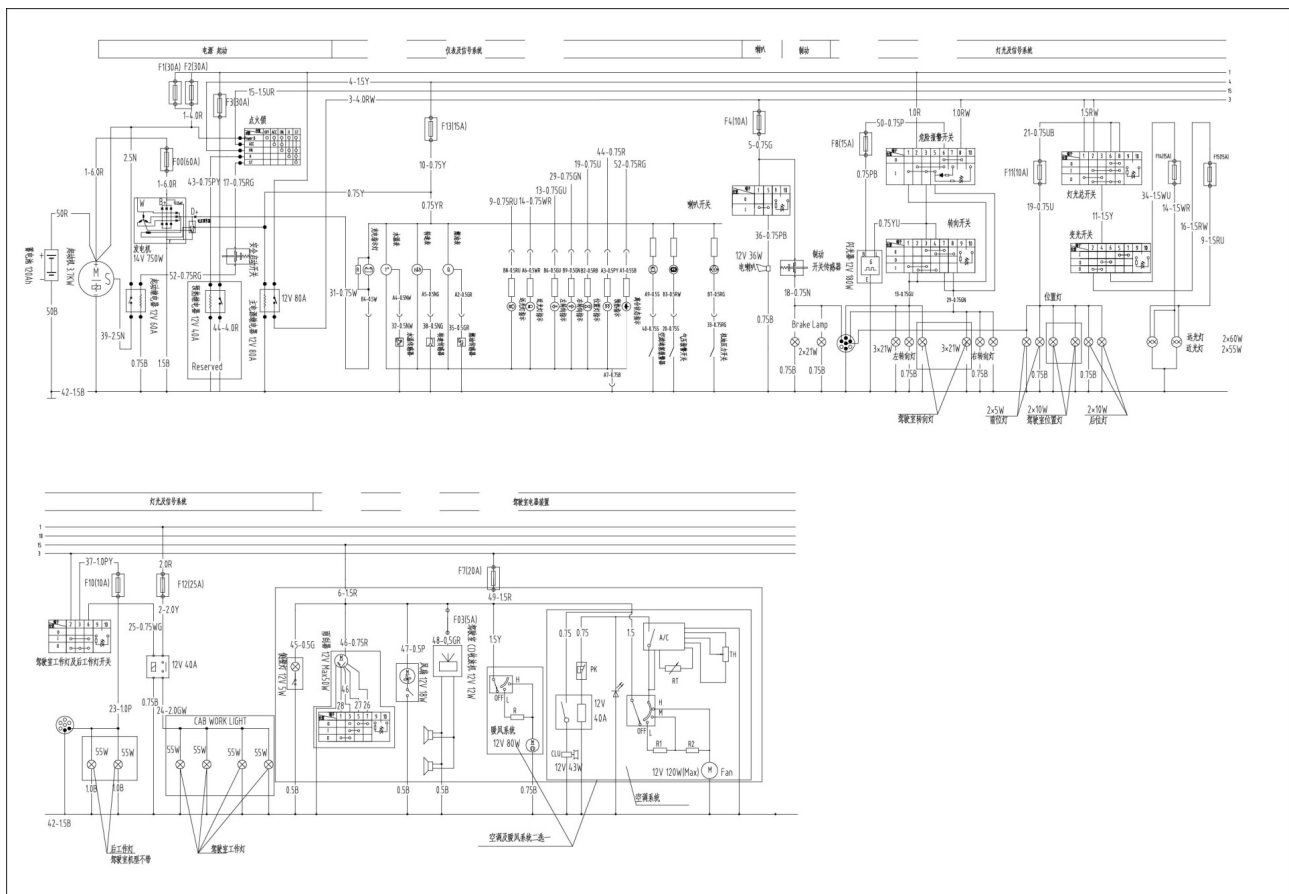
This is particularly a problem with the following types of equipment:

- 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.

6.6.Electrical Schematic Diagram



电源启动	Power supply and starter
仪表及信号系统	Instrumentation and signaling system
喇叭	Loudspeakers
制动	Brake
灯光及信号系统	Lighting and signaling system
点火锁	Ignition lock
功能	Function
位置	Position
电压调节器	Voltage regulator
发电机	Power generator

起动机	Starter
蓄电池	Storage battery
起动继电器	Starter relay
预热继电器	Preheating relay
安全启动开关	Safe starting switch
主电源继电器	Main power supply relay
燃油表	Fuel gauge
转速表	Tachometer
水温表	Water temperature gauge
充电指示灯	Charge lamp
燃油传感器	Fuel sensor
转速传感器	Speed sensor
水温传感器	Water temperature sensor
离合状态指示灯	Preheating indicator light
预热指示	Preheating indicator
位置灯指示	Position light indicator
右转向指示	Right steering indicator
左转向指示	Left steering indicator
近光灯指示	Low beam light
远光灯指示	High beam light
喇叭开关	Horn switch

机油压力开关	Oil pressure indicator switch
气压报警开关	Air pressure alarm switch
空滤堵塞报警器	Air filter clogging alarm
电喇叭	Claxon
端子	Terminal
位置	Position
制动开关传感器	Brake switch sensor
闪光器	Flasher
危险报警开关	Hazard warning light switch
转向开关	Steering switch
左转向灯	Left steering indicator
右转向灯	Right steering light
驾驶室转向灯	Cab steering light
前位灯	Front position light
位置灯	Position light
驾驶室位置灯	Cab position light
后位灯	Rear position light
灯管总开关	Master lighting switch
位置	Position
端子	Terminal
变光开关	Dimmer switch

端子	Terminal
位置	Position
远光灯	High beam light
近光灯	Low beam light
灯光及信号系统	Lighting and signaling system
端子	Terminal
位置	Position
驾驶室工作灯及后工作灯开关	Switch for work lights on cab or rear
后工作灯（驾驶室机型不带）	Rear work lights (not provided for tr
驾驶室工作灯	Work lights on cab
驾驶室电器装置	Electrical devices in cab
驾驶室CD收放机	CD player in cab
风扇	Fan
雨刮器	Windscreen wiper
端子	Terminal
位置	Position
侧壁灯	Side wall light
暖风系统	Heating system
空调系统	Air conditioning system
空调及暖风系统二选一	Select either air conditioning or heati

7. On-board Spare Parts, Tools and Quick-wear Parts

7.1. On-board Spare Parts and Tools

7.1.1. On-board spare parts

No.	Code	Name	Unit	Quantity	Remark
1	QC/T 420	Fusible link 10A (red)	piece	1	
2	QC/T 420	Fusible link 15A (light blue)	piece	1	
3	QC/T 420	Fusible link 20A (yellow)	piece	1	
4	QC/T 420	Fusible link 35A (light green)	piece	1	
5		Engine on-board spare parts, On-board tools and accessories	set	1	Provided by manufacturer of accessories of engine
6		Seal rings for lifter assembly	set	1	Provided by the lifter manufacturer (non pusher-type model)

7.1.2.

7.1.2. On-board spare tools

No.	Code	Name	Quantity	Remark
1	GB/T 3390.1	Sleeve 10×12.5 A L	1	
2		Sleeve 13×12.5 A L	1	
3		Sleeve 16×12.5 A L	1	
4		Sleeve 18×12.5 A L	1	
5		Sleeve 21×12.5 A L	1	
6		Sleeve 24×12.5 A L	1	

No.	Code	Name	Quantity	Remark
7		Sleeve 27×12.5 A L	1	
8		Sleeve 30×12.5 A L	1	
9	GB/T 3390.3	Slide handle 253 12.5	1	
10	GB/T 3390.4	Extension rod 204 12.5×125	1	
11	GB/T 4388	Double-end wrench 8×10	1	
12		Double-end wrench 13×16	1	
13		Double-end wrench 18×21	1	
14		Double-end wrench 24×27	1	
15		Double-end wrench 30×34	1	
16		Double-end wrench 36×41	1	
17	GB/T 4953	Slip-joint pliers 165mm	1	
18	GB/T 10640	Phillips screwdriver 1 100 3 B	1	
19	GB/T 10639	Screwdrivers for flat-tip screws 100×0.6×41-1P	1	
20	GB/T 1164	Lever type grease gun A400	1	
21	GB/T 5356	Allen wrench 8	1	
22		Engine on-board spare parts	1 Set	Provided by manufacturer of accessories of engine

7.1.3.

7.1.3. List of documents provided together with the tractor

No.	Document name:	Unit	Quantity	Remark
1	Tractor Operation Instructions	book	1	
2	Certificate of conformity of the tractor	book	1	
3	Atlas of drawings of parts and components of the tractor	book	1	
4	Voucher for limited warranty of the tractor	book	1	
5	Technical document of the engine provided together with the tractor	set	1	Provided by manufacturer of accessories of engine

7.1.4.

	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 Part

The quick-wear parts of FL35-70HP series wheeled tractor include: all the fuse plate , bulbs and all kinds of glass products listed in the following table are for the complete machine.

Quick-wear part

No.	Code	Name	Unit	Quantity	Remark
1		Front lower window glass	piece	2	
2		Rearview mirror assembly;	piece	2	
3		Front windshield	piece	2	Used for cab
4		Left front window glass	piece	1	Used for cab
5		Lower right front window glass	piece	1	Used for cab
6		Left door glass	piece	1	Used for cab
7		Right door glass	piece	1	Used for cab
8		Left widow glass	piece	1	Used for cab
9		Right widow glass	piece	1	Used for cab
10		Rear windshield glass	piece	1	Used for cab
11		Rearview mirror assembly;	piece	2	Used for cab
12		Fuse plate 10A	piece	2	
13		Fuse plate 15A	piece	2	
14		Fuse plate 20A	piece	2	
15		Fuse plate 25A	piece	2	
16		Fuse plate 30A	piece	1	

No.	Code	Name	Unit	Quantity	Remark
17	12V-H4-55/60W	Dual-filament bulb, high and low-beam	piece	2	
18	12V-P21W	Steering light bulb	piece	4	
19	12V-P21W	Cab steering light bulb	piece	4	
20	12V-10W	Cab position light bulb	piece	2	Used for cab
21	12-5W	Hood position light bulb	piece	2	
22	12V-H3-35W	Rear working light	piece	2	Used for tractor model equipped with a floor
23	12V-H3-55W	Top working light bulb	piece	4	Used for cab
24	12-P21W/5W	Rear position/ brake light bulb	piece	2	
25		Engine quick-wear part	piece	1	See the engine specification for details



Important:

1. All the spare parts, tools, and quick-wear 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.



8. Maintenance Specification

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 ignition lock.
- Please hang the warning mark of “don’t start up the machine” on the steering wheel.
- If necessary, place warning mark surrounding the tractor.



Notice:

Any maintenance operation must be conducted on suitable platform whose height is higher than 1500mm to guarantee safety.



Notice:

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 **MUST** be refitted before starting the tractor.



Danger:

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.



Warning:

Always wear proper work clothes; wear earplugs and safety glasses whenever necessary.

	Notice: Read the safety instructions at the start of this manual to protect the safety of the user.
---	--

	Notice: 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.
---	---

	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.

8.1.1.Maintenance cycle

The best repair 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.

8.1.2.Cleaning tractor and hitched implements



Notice:

The tractor can be cleaned after all parts have been cooled.

8.1.3.



Important:

Sprinkler on the pressure cleaning device cannot be directly pointed to the radiator/cooler, bearing or electronic components.



Important:

Before cleaning, implement will be hanged in accordance with all instructions in the manual.



As for cleaning of general tractor, the following instructions will be provided for utilization method of pressure cleaning device:

- The spray gun will be seized so that the nozzle is at least 80cm away from the tractor.
- Angle is between 45° and 90°.
- Maximum pressure is 30Mpa (0.3MPa)
- Maximum temperature is 50° C.

8.2.Liquid /oil and Filling Quantity (Unit: L)

	Warning: Be sure to observe environmental protection regulations. Any fluid (petroleum, diesel and cooling liquid) or filter and battery must be disposed in accordance with applicable laws and regulations.
---	--

8.3.

	Danger: Risk for disposing relevant liquid will be listed in accordance with instructions in the safety table provided for the manufacturer. You can also obtain from the distributor of DEUTZ-FAHR.
---	---

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 tractor will lose the warranty qualification.

Warning:

- Guarantee that any vessel for storing the lubricant is absolutely clean. The funnel and measuring cup will be covered to prevent dust from entering.
- Area surrounding lubricated part will be cleaned.
- When it is warm, lubricating part will make lubricating grease easier flow.
- The plug and the cap will be cleaned before re-installation.
- All operations will be conducted in accordance with proper safety guidelines.
- Maintenance can be conducted only when the engine is closed, key is removed and parking brake is used.
- Unless specially marked in the manual, work cannot be conducted when the engine is under operation.



- The capacity of fuel tank is shown in the chapter of “technical data”.
- The form demonstrates scope of oil and filling amount (liter) of the tractor.

Table 8-1 Technical data

							FL35-70HP
A0-fuel tank							70/60
National standards	Meet GB/T252 Light Diesel	Over 20°C	4°C~20°C	-5°C~4°C	-14°C~-5°C	-29°C~-35°C	
		No. 10	No. 0	No. -10	No. -20	No. -35	
International Standard	Fuel oil D-975 of American Society for Testing Material ASTM is used. Grade 2-D is used under general temperature, when the ambient temperature is below +5°C, grade -D shall be adopted.						
B0-engine oil sump							
National standards	As per engine specification						Please refer to engine specification
International Standard	Viscosity grade of engine oil sump, fuel injection pump, engine oil of speed controller and oil bath type air cleaner will comply with viscosity classification of Society of Automotive Engineers SAE. If the temperature is less than -5°C, SAE10W will be used, if the temperature is more than -5°C, SAE15W / 40 multi-grade oil that is generally used all the year around will be used. Quality grade complies with grade-CD standard of American Petroleum Institute API.						
C0-water radiator							
Ambient temperature above 4°C: Clean soft water Ambient temperature below 4°C: Must use anti-freezer Minimum ambient temperature above -15°C: Use -25# anti-freezer (FL/T 0521-1999) Minimum ambient temperature above -25°C: Use -35# anti-freezer (FL/T 0521-1999) Minimum ambient temperature above -35°C: Use -45# anti-freezer (FL/T 0521-1999)							12
D0-hydraulic steering							

National standards	NI00D dual-purpose oil for transmission and hydraulic pressure, execution standard: JB/T7282	0.8
International Standard	MF1135 of Massey Ferguso Company or M2C 86A of Ford Company or Common oil J20A of John Deer Company	
E0-transmission system		
National standards	NI00D dual-purpose oil for transmission and hydraulic pressure, execution standard: JB/T7282	20
International Standard	MF1135 of Massey Ferguso Company or M2C 86A of Ford Company or Common oil J20A of John Deer Company	
F0-lifter		
National standards	NI00D dual-purpose oil for transmission and hydraulic pressure, execution standard: JB/T7282	14
International Standard	MF1135 of Massey Ferguso Company or M2C 86A of Ford Company or Common oil J20A of John Deer Company	
G0-central drive of front drive axle		
National standards	NI00D dual-purpose oil for transmission and hydraulic pressure, execution standard: JB/T7282	7
International Standard	MF1135 of Massey Ferguso Company or M2C 86A of Ford Company or Common oil J20A of John Deer Company	
H0-final drive of front drive axle		
National standards	NI00D dual-purpose oil for transmission and hydraulic pressure, execution standard: JB/T7282	1.5 (every side)
International Standard	MF1135 of Massey Ferguso Company or M2C 86A of Ford Company or Common oil J20A of John Deer Company	
I0-oil cup		

National standards	Common lithium base grease of automobiles complies with GB/T 7324.	X
International Standard	Lubricating grease D-217 of National Lubricating Grease Institute NJG, viscosity grade is 2.	
J0-braking system		
National standards	N100D dual-purpose oil for transmission and hydraulic pressure, execution standard: JB/T7282	X
International Standard	SAE10W oil plants can be adopted, quality grade complies with grade-CD standard of American Petroleum Institute API.	

8.3.Service Cycle

Technical service cycle will be confirmed for FL35-70HP series tractor in accordance with number of accumulative working hours. Service is divided into technical maintenance per shift (working for every 10h), technical service when working for 50h, technical service when working for 200h, technical service when working for 400h, technical service when working for 800h and technical service when working for 1600h.

Recommended service cycle is as below:

	Important: Corresponding service of service number and instructions on the maintenance manual
---	--

	Important: Execution of operation can be referred to timetable of maintenance and check.
---	---

Table 8-2

Classification of maintenance	Cycle (hour)	Operation to be conducted
1°	10	Designated maintenance operation will be conducted when working every 10 hours.
2°	50	Designated maintenance operation will be conducted when working every 10,50 hours.
3°	200	Designated maintenance operation will be conducted when working every 10,50,200 hours.
4°	400	Designated maintenance operation will be conducted when working every 10, 50, 200 and 400 hours.
5°	800	Designated maintenance operation will be conducted when working every 10, 50, 200,400 and 800 hours.
6°	1600	Designated maintenance operation will be conducted when working every 10, 50, 200,400,800 and 1600 hours.

Table 8-3

Frequency	Items that will be maintained	Work to be conducted					Refer to index code of guideline
		Lubrication	Dry moisture	Inspection	Clean	Replace	
Every 10 work hours	Routine check of the tractor			X Demand			8.5.1
	Oil quantity of the engine			X Demand			8.5.2
	Air cleaner			X Demand			8.5.3

Frequency	Items that will be maintained	Work to be conducted					Refer to index code of guideline
		Lubrication	Dry moisture	Inspection	Clean	Replace	
	Storage battery			X Demand			8.5.4
	Hydraulic steering			X Demand			8.5.5
	Cooling liquid			X Demand			8.5.6
	Free stroke of clutch pedal			X Demand			8.5.7
	Service brake			X Demand			8.5.8
	Fuel oil quantity			X Demand			8.5.9
	Electronic system			X Demand			8.5.10
	Tire inflation pressure			X Demand			8.5.11
Every 50 work hours	Check belt tension of the engine			X Demand			8.6.1
	Two end shafts of steering cylinder	X Demand					8.6.2

Frequency	Items that will be maintained	Work to be conducted					Refer to index code of guideline
		Lubrication	Dry moisture	Inspection	Clean	Replace	
	Front shaft kingpin bushing	X Demand					8.6.3
	Four-wheel drive front-axle pendulum shaft	X Demand					8.6.4
	Front shaft central swing pin bushing	X Demand					8.6.5
	Bolts/nuts in key parts			X Demand			8.6.6
Reach 200 hours	Work to be performed when and after operating time reaches 200 hours						
	Fuel filter					X Demand	8.7.1
	Spin-on type oil filter					X Demand	8.7.2
	Hydraulic pressure oil suction Filter of lifter				X Demand		8.7.3
	Engine sump lubricating oil					X Demand	8.7.4

Frequency	Items that will be maintained	Work to be conducted					Refer to index code of guideline
		Lubrication	Dry moisture	Inspection	Clean	Replace	
	Oil bath air filter lubricating oil					X Demand	8.7.5
Every 400 work hours	Work to be performed when and after operating time reaches 400 hours						
	Hydraulic oil of the transmission system			X Demand			8.8.1
	Lifter hydraulic oil			X Demand			8.8.2
	Working stroke of parking brake			X Demand			8.8.3
	Respirator filter element				X Demand		8.8.4
	Front-wheel-drive lubricating grease (for tractor with 2WD)	X Demand					8.8.5
	Oil level of central drive of front drive axle			X Demand			8.8.6
	Lubricating grease of master pin oil cup of front drive axle	X Demand					8.8.7

Frequency	Items that will be maintained	Work to be conducted					Refer to index code of guideline
		Lubrication	Dry moisture	Inspection	Clean	Replace	
	Lubricating oil of front drive axle final drive			X Demand			8.8.8
	Filter of fuel tank of hydraulic steering			X Demand			8.8.9
Every 800 work hours	Work to be performed when and after operating time reaches 800 hours						
	Fuel tank of hydraulic steering and pipeline			X Demand	X Demand		8.9.1
	Fuel tank				X Demand		8.9.2
	Gap of exhaust valve of engine			X Demand			8.9.3
	Fuel oil injection pump			X Demand			8.9.4
	Lubricating oil of transmission system					X Demand	8.9.5
	Hydraulic oil of lifter					X Demand	8.9.6

Frequency	Items that will be maintained	Work to be conducted					Refer to index code of guideline
		Lubrication	Dry moisture	Inspection	Clean	Replace	
It will be conducted for once when working for every 1600 hours or in every year	Work to be performed when and after operating time reaches 1600 hours						
	Cooling system of the engine				X Demand	X Demand	8.10.1
	Cooling system of the engine that has used anti-freezing solution				X Demand	X Demand	8.10.2
	Central drive of front drive axle					X Demand	8.10.3
	Lubricating oil of front drive axle final drive					X Demand	8.10.4

Notice 1 - Check whether flexible pipe has leakage or not or whether it has been dismantled together with other components, whether bolt is loosened or not and whether sundries are accumulated or not. Before utilization, please block leakage to guarantee flexible pipe is pressed and to tighten loosening bolt.

Notice 2- Correct lubricant will be used, and product type is shown in the table “lubricant/liquid/its filling quantity”.

- Every ,1500 working hours (this operation can only be conducted by authorized service center)
- ◇ Check whether recirculation pipe of waste gas is clean or not
- ◇ Check valve clearance of the engine
- Every 3,000 working hours or at least two years (this operation can only be conducted by authorized service center)
- ◇ Replace the transmission belt of the engine



- ◇ Update air breather of crankcase
- Check tensioning elasticity of transmission belt after working for 3,000 hours (this operation can only be conducted by authorized service center)
- Every 3000 working hours (this operation can only be conducted by authorized service center)
- ◇ Check ejector
- ◇ Replace tightening pulley of transmission belt
- Comprehensive overhaul must be conducted for the engine after 12,000 working hours.

8.4. Enter into Engine Compartment

Lift hood



Danger:

Watch out that moved part has shear hazards when starting and closing hood or rising its position!



Danger:

Watch out heated part when rising the hood. Some parts of the engine may reach very high temperature, which is easy to cause burn.

- For tractors equipped with a new type of engine hood

Unlock the tractor engine hood.

Lift the engine hood to the maximum extent

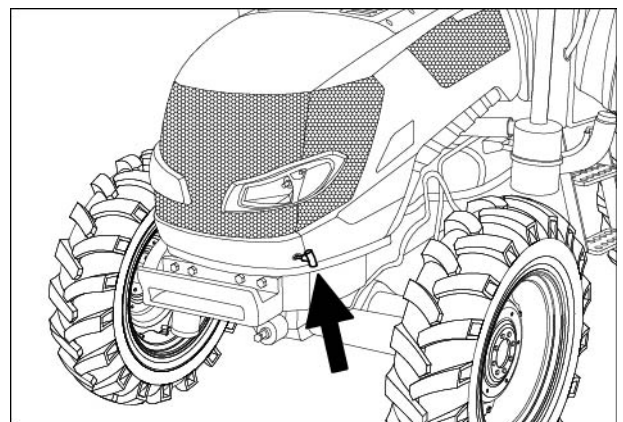


Fig. 8-1

●

8.5. Technical Maintenance Per Shift (10h)

8.5.1. Routine check of the tractor



Notice:

It can be touched when the engine is cooled. During the maintenance period, parking braking will be used or wheel will be blocked. After completing check and maintenance work, removed side plate, lens hood and any safety protective device or covering will be re-installed.

8.5.2.

- (1) Dust and oil dirt on the tractor will be cleared;
- (2) Check and fix all fasteners outside of the tractor, any loosening fastener shall be timely tightened, especially fastening nuts on front and rear wheels.
- (3) Check height of liquid level of engine sump of the engine, water tank, fuel tank, hydraulic steering oil tank, parking brake oil tank and storage battery of hydraulic lifter, if it is not enough, it will be increased. Check liquid level of engine oil sump, the tractor will be parked on the horizontal ground. Check will be conducted after the engine has stopped working for 15min.
- (4) Lubricating grease listed in the maintenance table 8-1.
- (5) Check inflation pressure of front and rear tires, if pressure is not enough, it will be inflated.
- (6) Check free stroke of main and auxiliary clutches and pedal of traveling brake
- (7) Check will be conducted to confirm whether the tractor has air leakage, oil leakage and water leakage or not. If it has “three leakages”, it shall be eliminated.
- (8) Diesel engine will be maintained in accordance with requirements of “technical maintenance per daily shift” in the “utilization and maintenance manual of diesel engine”.

8.5.2. Check oil level of the engine oil



Notice:

Waste oil will be collected and stored in suitable vessel before being sent to the authorized collection center.

8.5.3.



Notice:

Do not add oil of different type or viscosity into current oil



Danger:

When the engine is heated, there is burning danger! When the engine is cooled, repair, check or adjustment will be conducted.



Notice:

The tractor is parked on the horizontal ground when replacing oil or checking oil level.

The engine need be operated for several minutes before checking oil level of the engine oil. Shut off the engine, check oil level after one minute.

Check oil level of engine oil

Take out the oil gauge① in the front-left of engine oil sump, use dust-free duster cloth to clean oil dip rod, return and then take it out again to check oil level.

If it is between the maximum level② and minimum level ③ of oil dip rod, it is correct.

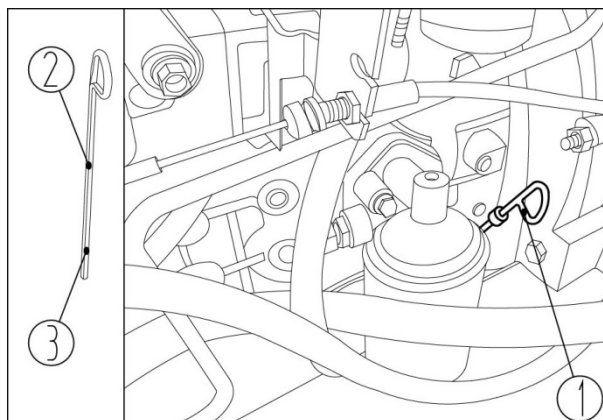


Fig. 8-2

If the oil level fails to reach the lower scale, the filler cap on the housing for timing gear of the engine will be removed and specific oil will be poured into top scale of the oil gauge.

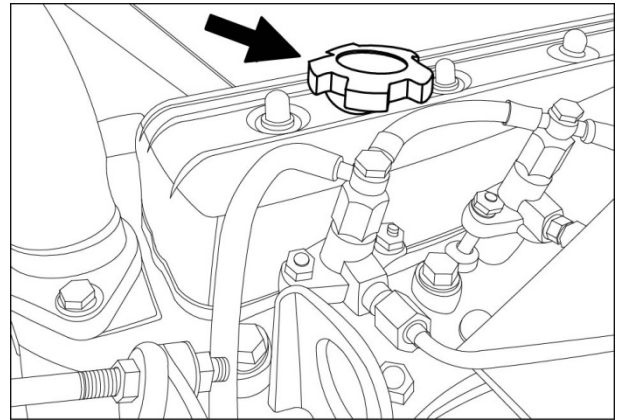


Fig. 8-3

8.5.3.Maintenance of air cleaner

> Maintenance of oil bath air filter

Unlock lower hook of filter, disassemble the bottom oil pan, and check the oil level. If the oil level is below the required level (marking shown by arrow), add lubricating oil to the specified level. And re-install it.

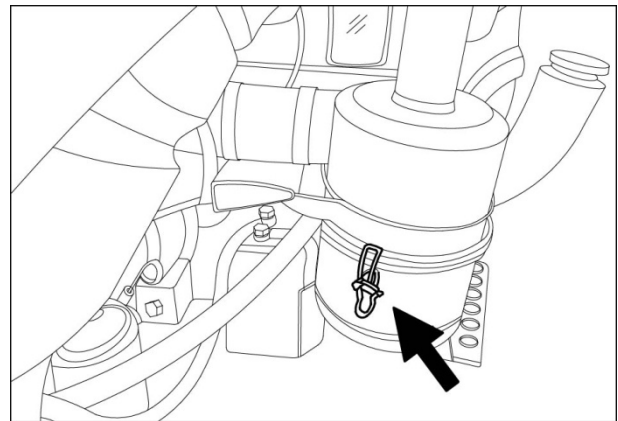


Fig. 8-4

>

	Important: The correct operations and maintenances of the air filter are directly related to the service life of engine. Ensure to keep clean the air filter. Check, clean, and replace oil once every work shift during farmland operations. When the tractor is working with harvester, elevating the position of primary filter by one level can achieve better performance. It's prohibited to flush filter element by oily water during maintenance of dry type air filter.
---	---

8.5.4.Maintenance of maintenance free 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.

8.5.5.



Notice:

Safety glasses will be worn when charging the storage battery.



Notice:

It will be charged by using 12V charger.



Danger:

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.



Warning:

Please cut off power supply when there is not electric operation. When welding the tractor or relevant equipment connected to it, please cut off the power supply and all ECU.

State check of storage battery



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.

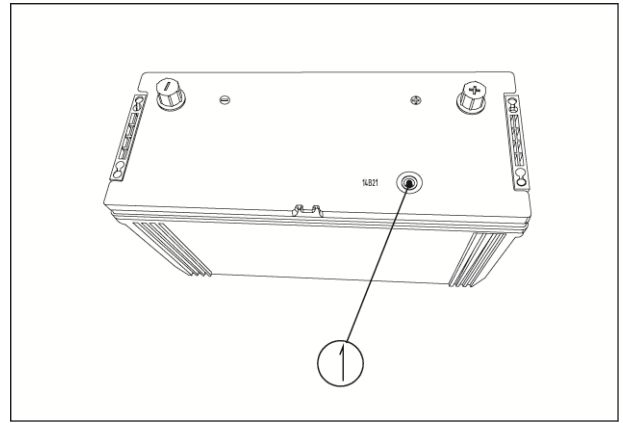


Fig. 8-5

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
- Output voltage of the engine will be regularly checked to confirm whether it complies with standard or not. Voltage is (14.2±0.25) V.

	Notice: 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.
--	---

	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.
---	--

8.5.5. Check and maintenance of hydraulic steering oil tank

The hydraulic steering oil tank is installed on the right side beneath the rear body of engine hood.

Open the oil tank cap (together with oil dipstick). Check the oil dipstick for oil trace. If no oil trace, it indicates that remaining oil in the tank is sufficient. Find out and remove cause for oil leakage. Remove the oil tank. Add oil until oil level reaches the intermediate scale on the oil dipstick. Then refit the oil tank.

Be sure there is no leakage of hydraulic steering oil tank, oil pipe and connections. Otherwise, steering failures will occur. Regularly clean and replace the hydraulic oil filter screen.

While checking oil level, be sure to check whether the vent valve (its shape looks like a rivet) located in the center of the oil tank cap can rise and fall smoothly. Oil stain which can affect movement of the vent valve shall be removed.

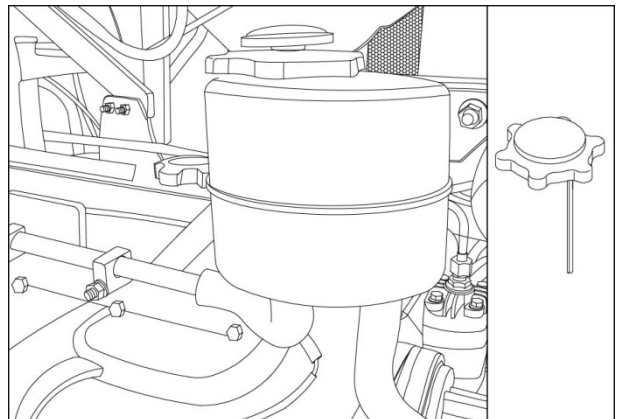


Fig. 8-6

8.5.6.

8.5.6. Check of height of cooling liquid



Warning:

Please abide by rules for environmental protection. Any fluid (petroleum, diesel and cooling liquid) or filter and battery must be discarded in accordance with applicable laws and regulations.

8.5.7.

Open the engine hood.

Check level of cooling liquid of the assembly of the radiator

If level of cooling liquid is low:

1. After the engine has been cooled.

2. Remove the cover ①, add cooling liquid via the filler.

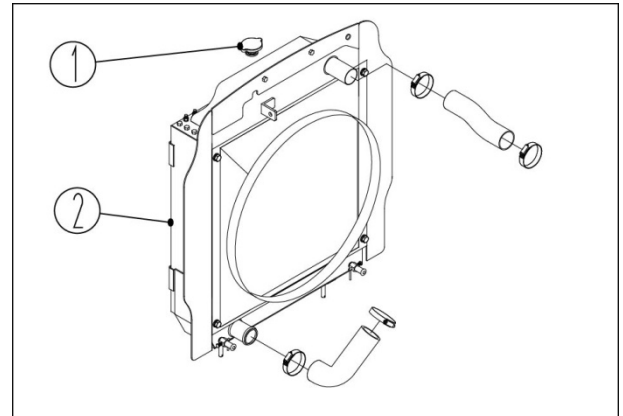


Fig. 8-7



Important:

1. In winter, frequently check the antifreeze concentration according to ambient temperature. If necessary, timely recover to normal concentration.

2. As for the tractor that has not used anti-freezing solution, when water temperature is reduced to below 70°C, water shall be discharged completely under the situation that the engine is under idle running to prevent cooling water from freezing and damaging the engine.



Warning:

Please inject No. 40 ethylene glycol cooling solution (FL0521-1999), three warranties will not be included if the radiator is corroded and leaked due to failing to comply with requirements.

8.5.7.Adjustment of free stroke of clutch pedal

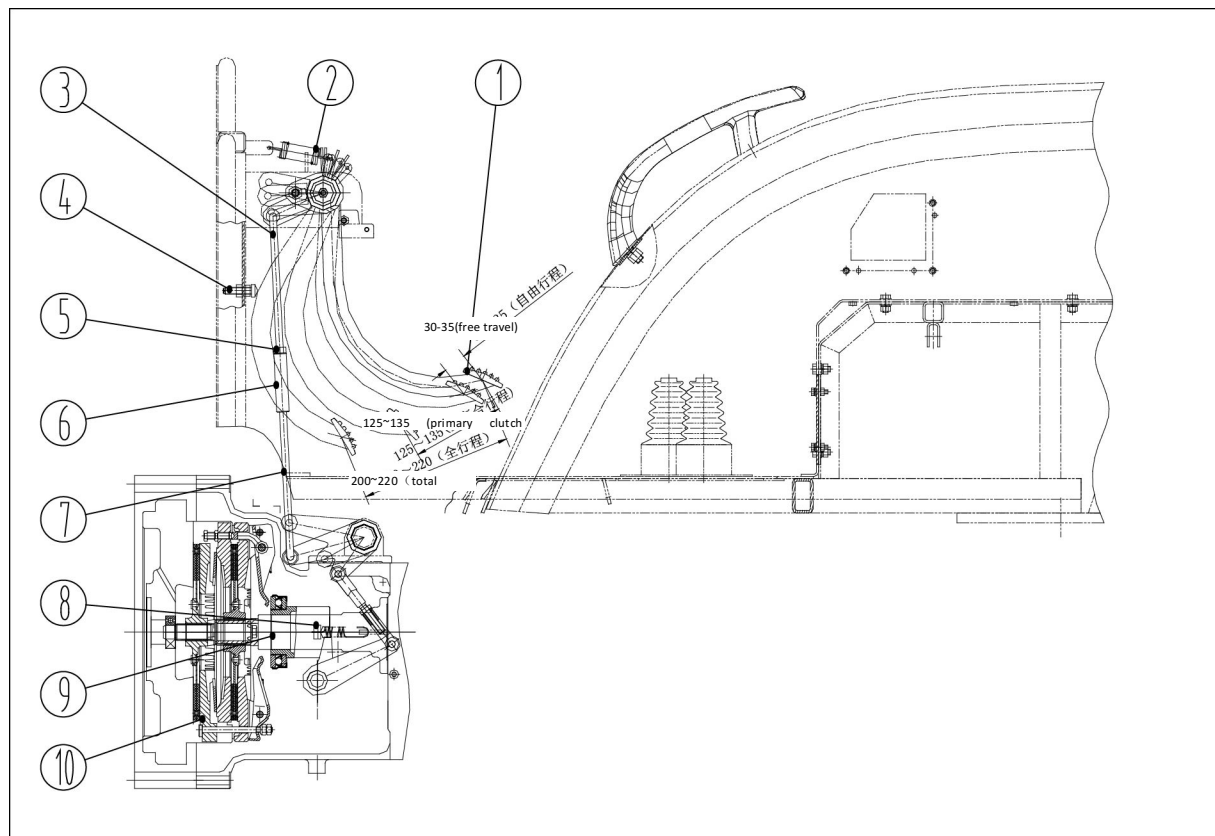


Fig. 8-8

1. Main clutch pedal subassembly	2. Pedal return spring;	3. Draw bar weldment	4. Bolt	5. Hex thin nut
6. Adjustment pipe	7. Left-handed-thread draw bar weldment	8. Return spring of bearing block	9. Release bearing block	10. Clutch subassembly

• Adjustment of clutch

Due to wear of friction plates produced in use of the clutch, the clearance between the release lever end and the release bearing end face decreases gradually even to zero. If this condition remains for a long term, this can result in the release bearing overheat hence the clutch malfunction. Therefore, it is necessary to regularly check and adjust the clearance.

- The gap between releasing lever and end clearance of release bearing of the clutch is between 2 and 2.5mm. Height difference of end sockets of three releasing levers is not more than 0.2mm.

Adjustment: Loosen the lock nut. Turn the adjusting nut so that the clearance between three release levers and the release bearing end face is (2 ~ 2.50) mm, and the height difference between the three release ends is less than 0.2mm. Then tighten the lock nut and adjusting nut.



> Clutch pedal free travel is 30 ~ 35mm (mm).

Adjustment: Loosen the lock nut on the draw bar of clutch. Turn the draw bar to change its length so that the free travel of clutch pedal reaches 30mm ~ 35mm. Tighten the lock nut on the draw bar.

> Limiting height H = (7 ~ 8) mm (mm).

Adjustment: Loosen the lock nut. Turn the adjusting bolt so that the distance between the hex head of the bolt and the clutch release fork arm (H) is equal to 7 to 8mm. Then tighten the nut.

- **Lubrication of bearing of clutch**

Fore bearing of the clutch will be coated with enough lubricating grease when assembling. Release bearing needn't be coated with lubricating grease under normal situation. After the tractor has been operated for 1000h (hour), or the bearing has abnormal sound in the process of utilization, the bearing will be dismantled for cleaning and immersed into melted high-temperature lithium base grease until the bearing is filled with lubricating grease. It will be taken out after it is cooled. Surface of it will be cleaned before installing it at the original position.

	Important: 1. When using the clutch, please pay attention to: rapidly and completely separate, and softly and smoothly contact to avoid early damage of the clutch. 2. Feet cannot be placed on the clutch pedal in the driving process of the tractor. Half-joint clutch cannot be used to reduce driving speed of the tractor. Abrupt-joint clutch cannot be used to dash slope or cross obstacle to avoid damaging the clutch. 3. The surface of the clutch friction plate cannot have oil dirt. Once it has oil dirt, it shall be cleaned with gasoline and used after it is dried to avoid early damage of the clutch.
--	---

8.5.8.Service brake

8.5.8.1.Adjustment of brake operating mechanism

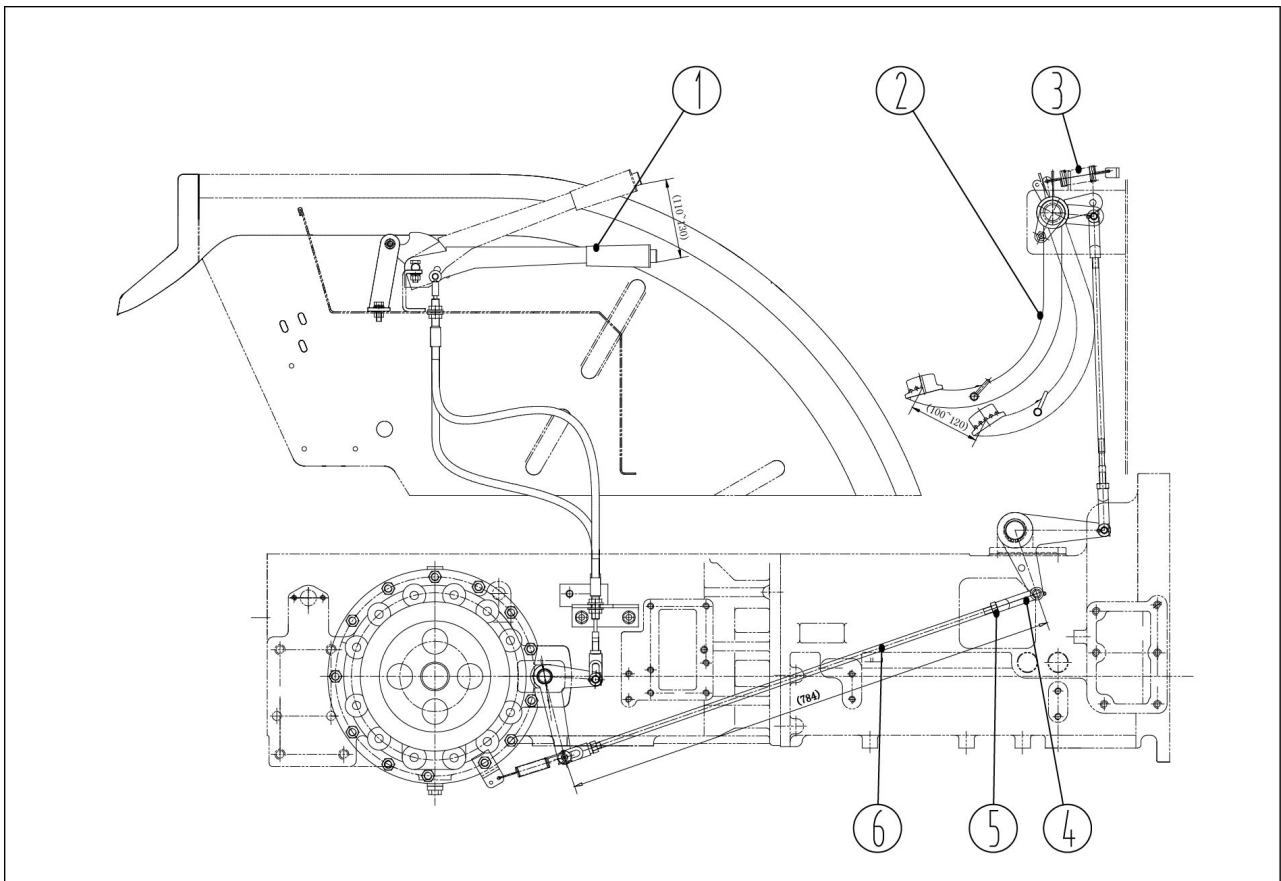


Fig. 8-9

1. Hand brake control lever	2. Pedal;	3. Return spring;
4. Left-handed-thread draw bar fork	5. Nut;	6. Draw bar

Working stroke of brake pedal is between 100mm and 120mm.

Specific adjustment method of actuating mechanism of brake is:

Loosen the nut ⑤. Adjust the draw bar ⑥ so that the total travel of brake pedal reaches 100mm ~ 120 mm and the free travels of left and right pedals are roughly equals. Tighten the lock nut ⑤.



Notice:

To guarantee reliability, after the control mechanism of the brake has been adjusted, brake test will be conducted too. The steps include: interlock left and right braking pedals, drive the tractor to dry and flat pavement, use the brake to emergency brake after the main clutch is separated under situation of high-speed straight driving, and then park for checking slip imprint of driving wheels on the pavement. If imprints of left and right driving wheels on pavement are consistent (imprints on two sides be in line and mutually parallel, length is equal), it means that adjustment is proper, otherwise, it need adjusted again. If it has not been adjusted properly for several times, interior part of the brake shall be checked.



Danger:

Free strokes of left and right braking pedals of the tractor must be consistent, otherwise, the tractor will suddenly turn to one side to cause accident when emergency braking.

8.5.9.Check of fuel oil amount

Fuel oil in the fuel tank will be checked to confirm whether it is enough or not, it cannot be dried.

Oil will be filled after using out in every day.



Warning:

Abide by safety regulations about oil storage in the fuel tank.



Danger:

When working near the diesel engine or flammable materials, please guarantee that dangerous spark will not be generated.



Warning:

When injecting oil, switch of the engine will be turned off and any leaked diesel on the tractor will be cleared.



Warning:

Don't use out fuel oil in the fuel tank when operating the engine. Should the engine stops running because fuel is used up, be sure to bleed air from the fuel injection system after refueling.



Notice:

Don't inject oil to fuel tank in places with open fire or in sealed place.

No smoking when filling oil. Please shut off the engine before filling oil!

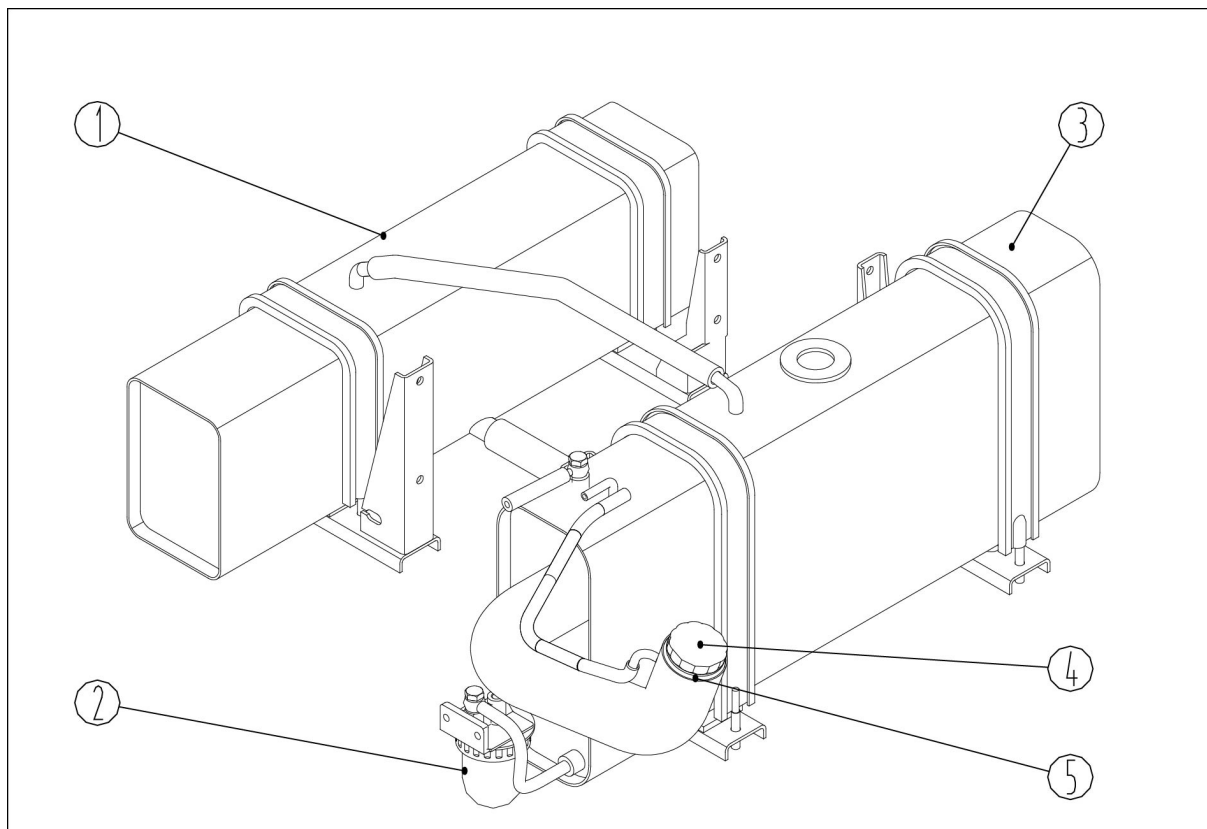


Fig. 8-10

1. Auxiliary Fuel Tank;	2. Filter;	3. Main fuel tank;	4. oil tank;	5. Oil filler
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Oil filler is shown in the figure

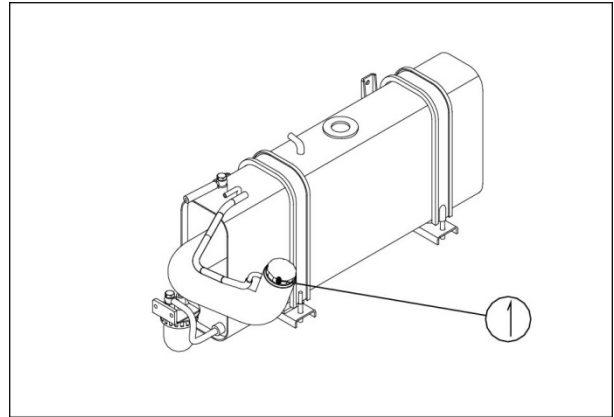


Fig. 8-11

- **Purge cock**

	Warning: Please abide by rules for environmental protection. Any fluid (petroleum, diesel and cooling liquid) or filter and battery must be discarded in accordance with applicable laws and regulations.
---	--

-

- **Drain water from Sedimentation glass**

Sedimentation glass must be regularly drained or after the tractor is put into use in the winter.



Discharging water from sedimentation glass will be conducted as per the following steps:

1. Place one vessel underneath the sedimentation glass①.
2. Take out the sedimentation glass and pour out liquid (fuel oil and water).
3. Re-install sedimentation glass.

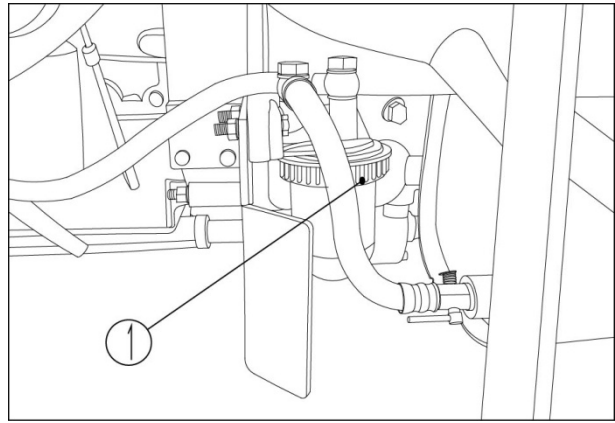


Fig. 8-12

8.5.10. Check of electronic system

Check all electronic systems including Low-beam headlamp and high-beam headlamp, direction indicator lamp, side lamp, working light and so on to confirm whether their functions are normal or not.

8.5.11. Check of tire inflation pressure

Tire pressure will be checked by using pressure meter. Inflation pressure of tire is shown in the technical specification of the tractor.

	Important: If tire pressure is too high or too low, it will shorten the lifetime of the tire and will cause adverse influence to driving and control of the tractor.
--	---

	Notice: When replacing tire or regularly maintaining or repairing, the tractor shall be put up by using safety stand.
--	--

Regularly check tire status. Please timely replace if necessary. The tire will be inflated in accordance with pressure data and specific utilization requirement provided by the manufacturer.

When fixing the wheel, please follow the tightening torque that has been recommended.

8.6. Maintain Every 50 Hours

8.6.1. Check belt tension of the engine

When adjusting belt tension, please operate as below:

	Notice: Please shut off the engine and take out the starting key before conducting any operation and maintenance.
---	---

	Warning: Check the whole belt, if any damage, please immediately replace.
---	---

	Warning: If the transmission belt of the cooling device has been damaged, the cooling system of the engine cannot be operated normally, it is prohibited to open the engine.
--	--

Transmission belt of the engine

Front view of the engine

1. Pulley of AC generator
2. Fan pulley
3. Idle pulley
4. Pulley crankshaft

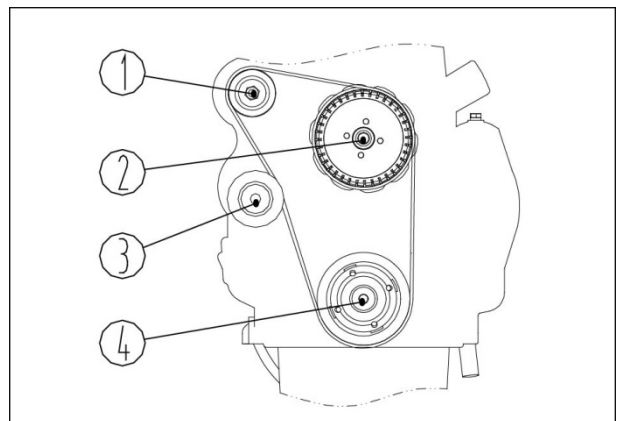


Fig. 8-13

Adjustment of tensivity of transmission belt of the engine

Use thumb to press the middle part of the belt of fan, force is between 29.4N and 49.0N, the pressing distance is $15\text{mm} \pm 3\text{mm}$. if it does not comply with this requirement, it shall be adjusted. Adjustment method is as below:

- Loosen fixed nut① on the regulating support of the generator;
- Wrench the generator② to tension the adhesive tape;
- Tighten fixed nut① on the regulating support of the generator;

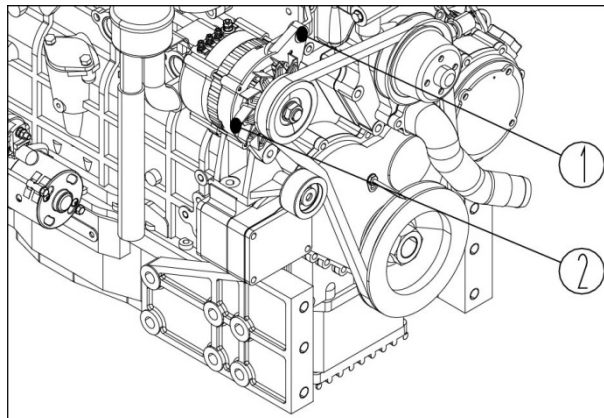


Fig. 8-14

8.6.2. Lubrication for two end shafts of steering cylinder

8.6.2.1. Two-wheel-drive tractor

Apply grease to nipple ① and ② using a grease gun

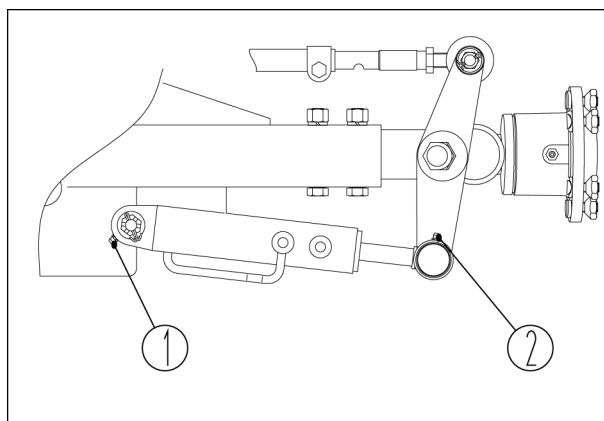


Fig. 8-15

8.6.2.2.

8.6.2.2. Four-wheel-drive tractor

Apply grease to nipple ① and ② using a grease gun

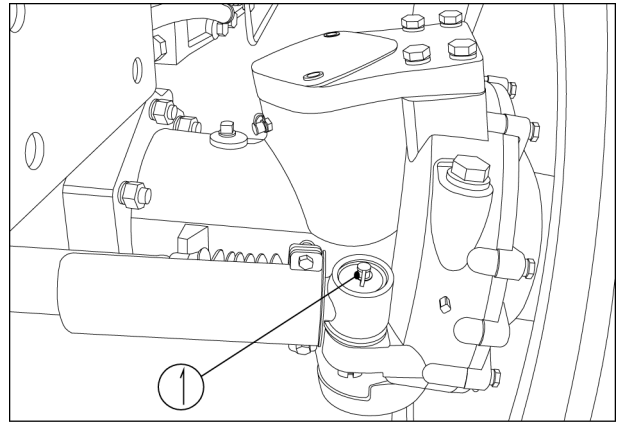


Fig. 8-16

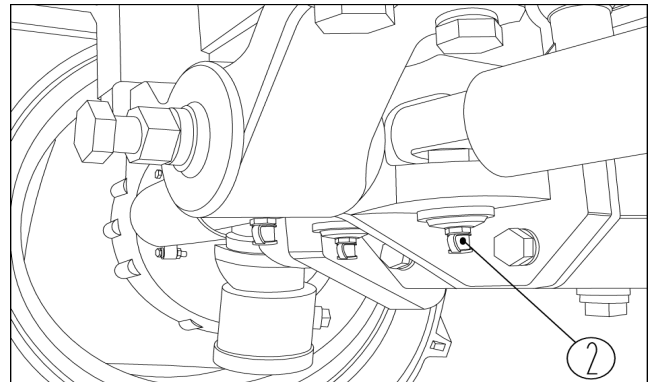


Fig. 8-17

8.6.2.3.

8.6.3. Front shaft kingpin bushing (for tractor with 2WD)

Apply grease to nipple ① using a grease gun

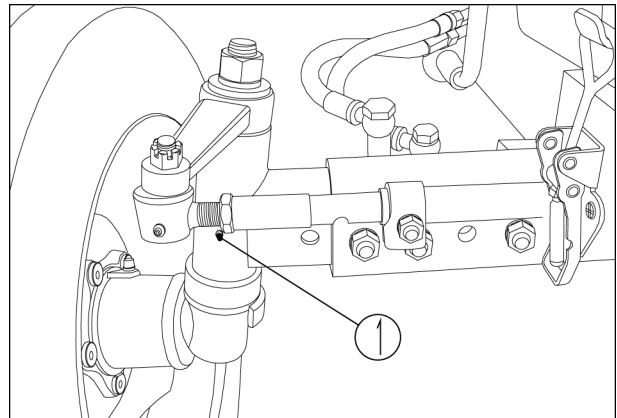


Fig. 8-18

8.6.4.

8.6.4. Four-wheel drive front-axle pendulum shaft

Lubricate the front support with pivot on the front shaft

Use lubricating grease pump to inject lubricating grease via the nozzle of the lubricating grease gun (position ① and ② shown in the drawing).

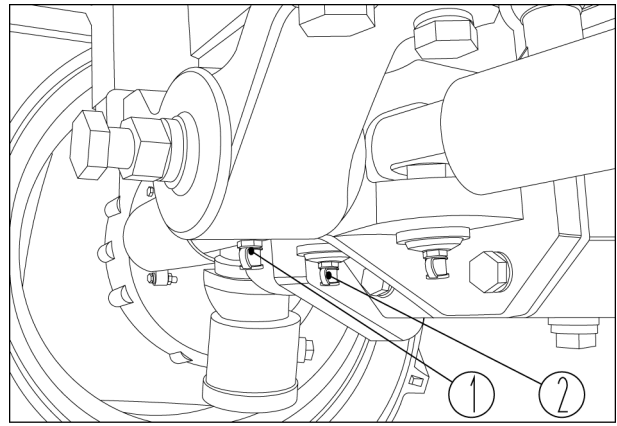


Fig. 8-19

Lubricate the front support with pivot on the front shaft

Use lubricating grease pump to inject lubricating grease via the nozzle of the lubricating grease gun (position ③ shown in the drawing).

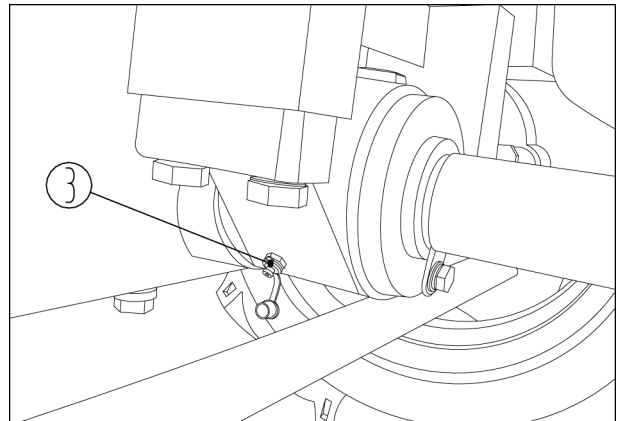


Fig. 8-20

8.6.5.

8.6.5.Front shaft central swing pin bushing (for tractor with 2WD)

Apply grease to nipple ① using a grease gun

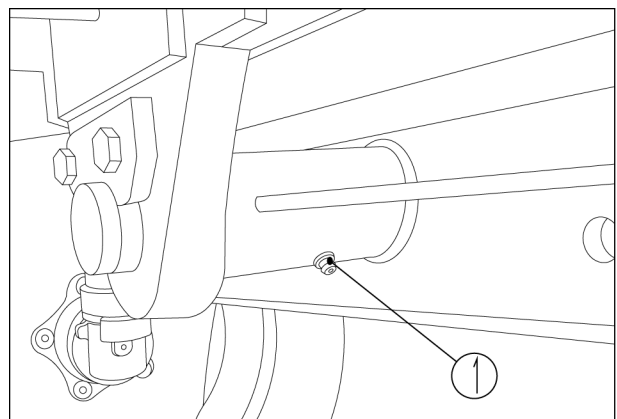


Fig. 8-21

8.6.6.

8.6.6.Check and tighten bolts/nuts of key parts to specified torque:



Warning:

To ensure the tractor is in good working condition, check and tighten the fasteners regularly.



Important matters:

Torque wrenches must be used when the main bolts and nuts of the tractor are tightened.

Check and tighten bolts/nuts of the following key parts to the specified torque every time after working 50 hours

➤ **Front wheel**

- ① Bolts/nuts between hub with wheel disk;
- ② Nuts between wheel disk with rim.

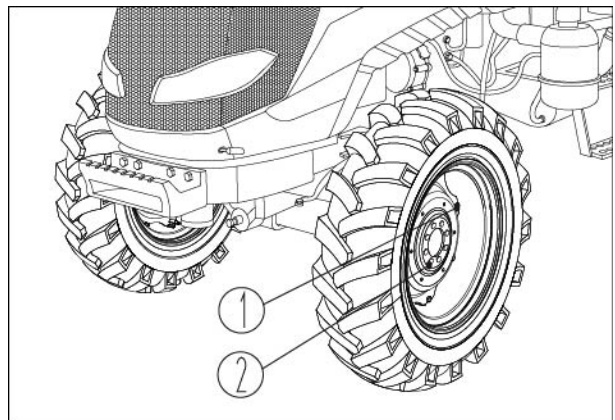


Fig 8-21-1



➤ **Rear wheel**

- Nuts between wheel disk with rim;
- Bolts/nuts between hub with wheel disk;
- Flange fastening bolts/nuts for stepless adjustable wheel hub.
- Bolts for rear ballast.

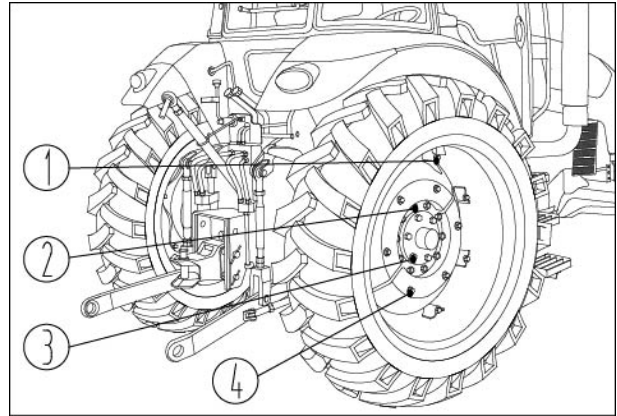


Fig. 8-21-2

➤

➤ Front ballast

- ① Bolts for fixing ballast support;
- ③ Bolts/Nuts for fixing ballast;

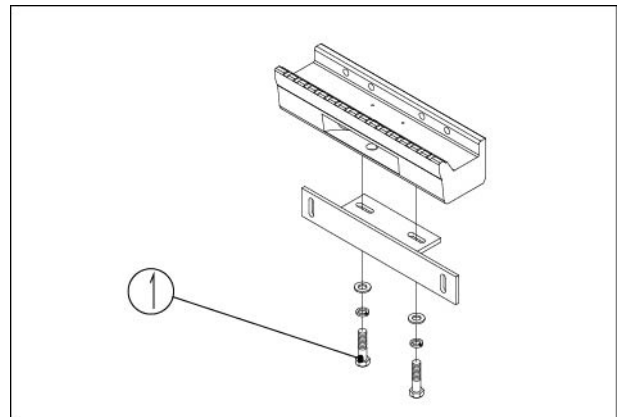


Fig.8-21-3

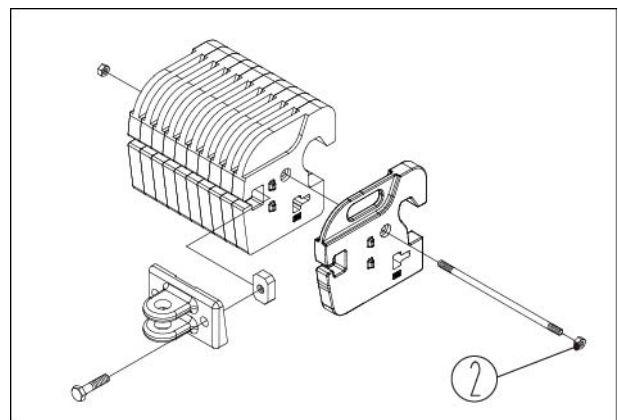


Fig.8-21-4

➤

➤ **Three-points linkage components**

- ① Bolts for fixing limiting link seat;
- ② Nuts for fixing lower link seat.

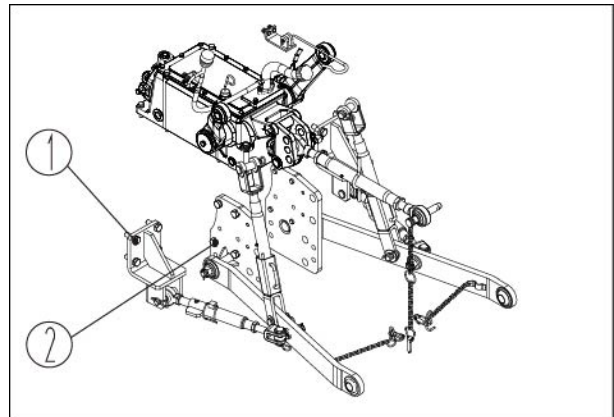


Fig.8-21-5

➤

➤ **Torque for each critical bolt/nut**

Assembly location		Thread specification	Tightening torque (N.m)
Front wheel	Rim and wheel disk	M16X1.5-10.9	270~320
		M16x1.5-8.8	199~243
		M14X1.5-10.9	178~218
	wheel disk and wheel hub wheel disk and wheel hub	M18X1.5-10.9	397~457
		M16X1.5-10.9	265~311
		M14X1.5-10.9	178~218
		M12X1.25-10.9	106~130
Rear wheel	Flanges for step less	M16X1.5-10.9	270~320

	extendible track	M14-8.8	122~149
	Rear Ballast	M16-8.8	182~222
		M14-8.8	122~149
Front ballast		M16-8.8	182~222
		M14-8.8	122~149
		M12-8.8	73~89
Bolt/Nut of 3 point linkage		M12	73~89
		M16	182~222



8.7.Maintain Every 200 Hours

8.7.1.Maintenance of fuel filter

	Warning: Liquid (petroleum, diesel, cooling liquid, and so on) and battery that need be wasted as per requirements of relevant provisions will be properly disposed in accordance with codes on environmental protection.
---	--

8.7.2.

	Notice: If high pressure fuel or petroleum contacts eyes, it may cause serious burn, blindness and even death. It is not easy to observe high pressure liquid leakage, which can be checked by using paperboard or wood chip. Keep your hands away from it. When checking please wear safety glasses to protect your eyes. If the skin is burned by liquid, please immediately seek for professional treatment.
---	--



Notice:

Don't inject diesel into diesel tank under sealed state or when there is open fire. Smoke is prohibited when injecting oil. Please shut off the engine before injecting oil.



Danger:

Don't manufacture dangerous spark near stores of diesel or relevant flammable materials.



Warning:

Engine cannot be used continuously if fuel is to be used out. If the engine shuts down for lack of fuel oil, please discharge air in the fuel injection system.



Warning:

Abide by safety regulations for storing fuel oil in the fuel tank.



Warning:

Please shut off the engine if oil need be added. Diesel splashed on the vehicle body will be cleared in time.



Important:

Please guarantee fuel is adequate before re-installing fuel filter.



Fuel filter is on the left side of the tractor.

Paper filter element cannot be cleaned. The filter element will be replaced after the engine has been worked for 200h.

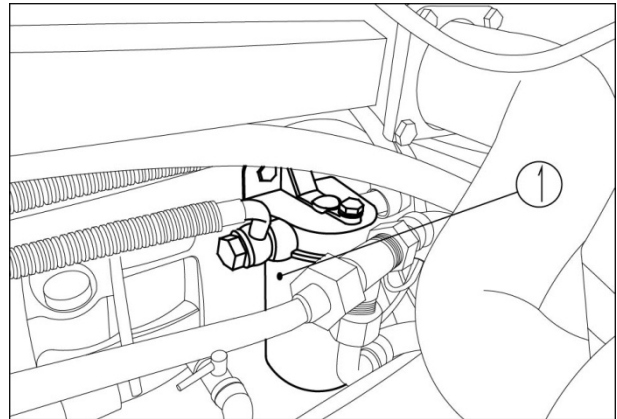


Fig. 8-22

8.7.2.Maintenance of spin-on type oil filter

	Notice: Filter contains compressed gas or oil. All repairs will comply with specification provided by the manufacturer.
---	--

	Notice: Collect oil that has been used in suitable vessel and send to authorized collection center.
---	--

	Danger: Please prevent heat oil from burning skin when discharging, please be careful!
---	---

Steps for replacing engine filter:

- 1 Park the tractor on flat ground
- 2 Place suitable vessel under the filter on the right side of the oil sump.
- 3 Remove old filter and replace with a new one (Overall replacement will be adopted for spin-on type oil filter.)
- 4 Tighten new filter
- 5 Re-start the engine, and check its sealing property after it has been under idler running for several minutes.

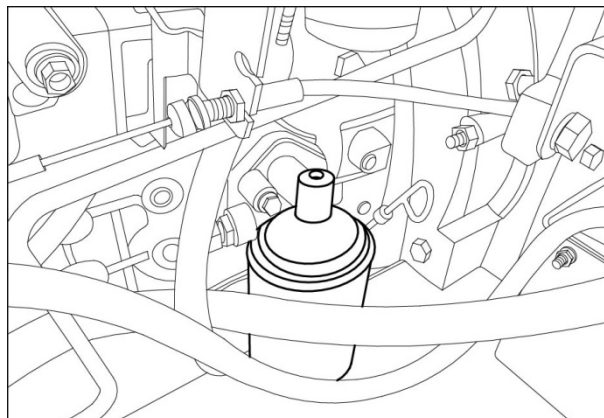


Fig. 8-23

Shut off the engine, re-check oil level after it is cooled, if necessary, and inject oil from oil filler.



Notice:

Don't inject oil that is different to existing oil (including type and viscosity).

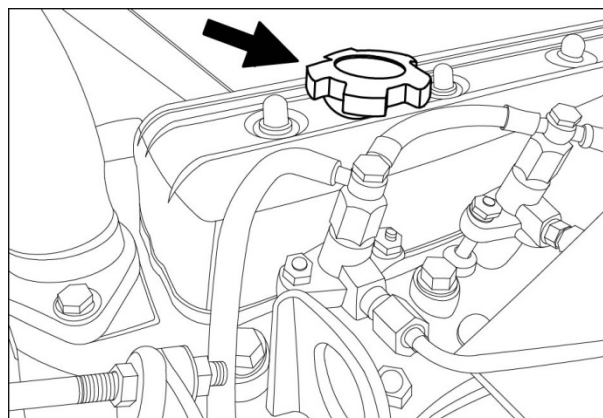


Fig. 8-24

8.7.3.Maintenance of hydraulic oil suction filter of lifter

Hydraulic pressure suction filter of lifter is the bottom right of the engine.

Maintenance is conducted in accordance with technical requirements. Method is as below:

Unscrew rear end cover of the hydraulic filter, take out the net filter element, use gasoline to clean and use compressed air to blow. When the filter element cannot be cleaned or has been damaged, it must be replaced with new filter element.

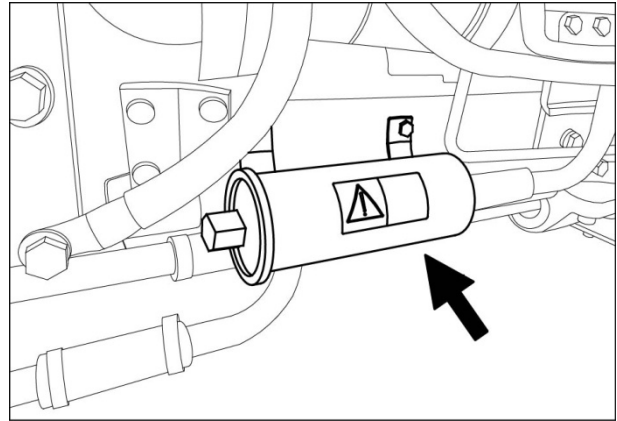


Fig. 8-25

8.7.4.

8.7.4.Lubricating oil of engine sump will be replaced.

	Notice: Collect oil that has been used in suitable vessel and send to authorized collection center.
--	---

8.7.5.

	Notice: Energy accumulator contains compressed gas or oil. Please refer to manual provided by the manufacturer before repair.
---	---

	Danger: When the engine is heated, there is burning danger! When the engine is cooled, repair, check or adjustment will be conducted.
---	---

	Notice: The tractor is parked on the horizontal ground when replacing oil or checking oil level.
---	--

Steps for replacing engine oil:

- 1 Park the tractor on flat ground for cooling the engine
- 2 Place suitable vessel underneath the fuel drain plug on the left side of the oil sump.
- 3 Loosen the fuel drain plug ① on the left side of the tractor.

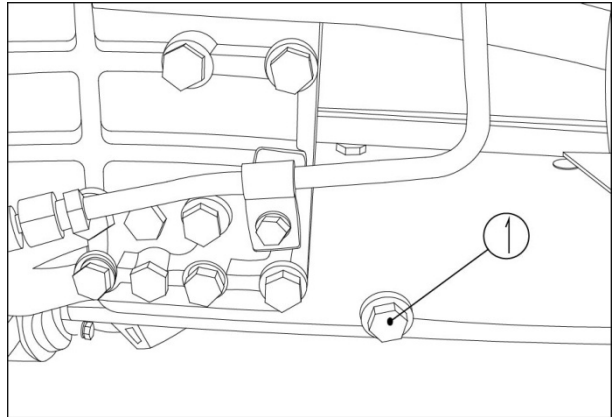


Fig. 8-26



Danger:

Please prevent heat oil from burning skin when discharging, please be careful!

- 4 After all oil has been discharged from the oil sump; sealing gasket of purge cock will be checked. If it need be replaced, it will be replaced before screwing the purge cock.

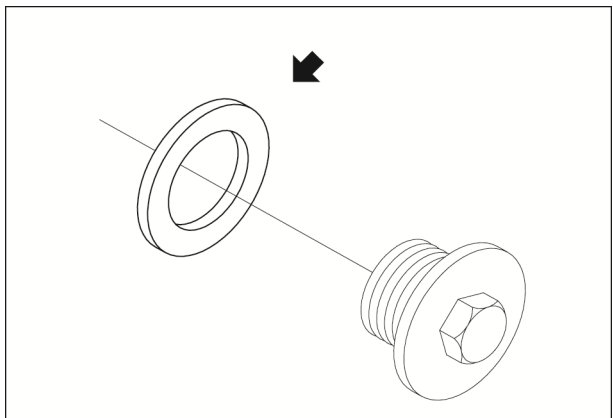


Fig. 8-27

5 Oil with specific amount will be injected into the oil sump from the oil filler so that oil amount is between maximum value and the minimum value of the oil gauge.

Re-start the engine and check sealing property of the fuel drain plug after idle running for several minutes.

Shut off the engine, re-check oil level after it is cooled, if necessary, and inject oil from oil filler.

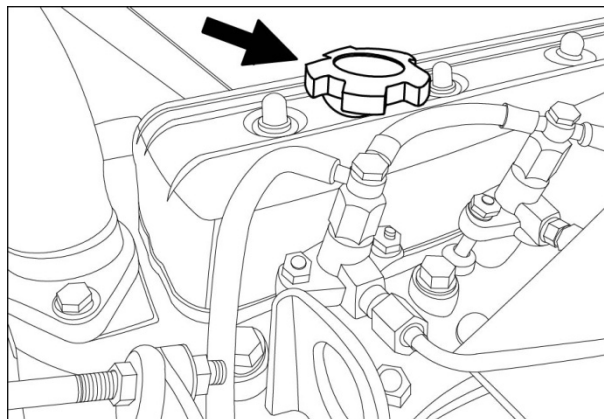


Fig. 8-28



Notice:

It is prohibited to inject oil that is different from existing engine oil (grade or viscosity).

8.7.5.Replacement of lubricating oil for oil bath air filter

Unlock the lower hook of filter, disassemble the bottom oil pan, fully discard the dirty oil, and thoroughly clean it with kerosene or diesel. Meanwhile, clean the filter element and add new engine oil to the required oil level. And re-install it.

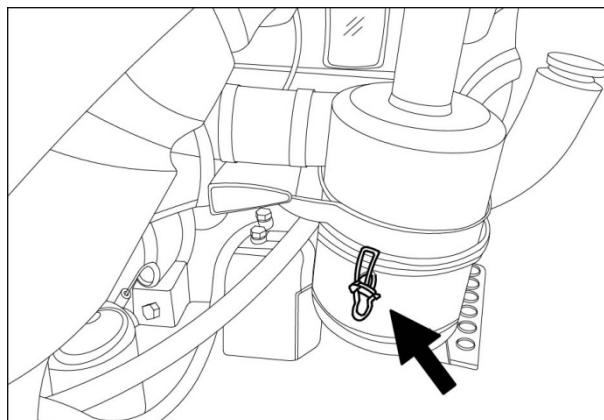


Fig. 8-29

8.7.6.

8.8.Maintain Every 400 Hours

8.8.1.Checking of hydraulic oil of the transmission system



Danger:

Be careful for discharging when using, hot oil may cause serious burning.

8.8.2.

Check whether oil level is normal or not, place the tractor under the following situations:

- Park the tractor on horizontal plane
- Engine must be closed for at least 5 minutes, parking brake must be used.
- Hydraulic control valve pole must be in the neutral position.
- All hydraulic cylinders must be retracted.

Pull out the oil dipstick ① as shown in right figure.

Oil gauge will be cleaned with dust-free duster cloth and placed back. Then, it will be re-taken out to check oil level;

Check whether oil level complies with requirements or not.

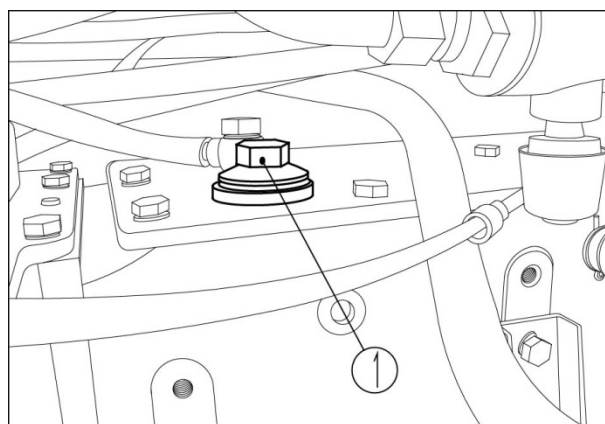


Fig. 8-30

If failing to comply with oil level requirement, please inject hydraulic oil specified in the table of “lubricant and reference dosage”.

Oil filler port is shown in the figure.

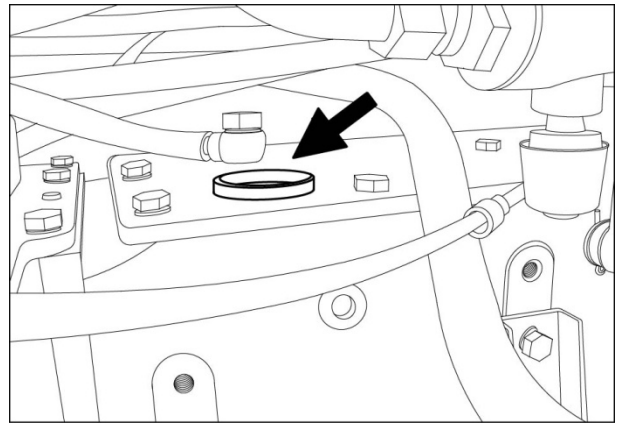


Fig. 8-31

8.8.2. Checking of lifter hydraulic oil



Danger:

Be careful for discharging when using, hot oil may cause serious burning.

8.8.3.

Check whether oil level is normal or not, place the tractor under the following situations:

- Park the tractor on horizontal plane
- Engine must be closed for at least 5 minutes, parking brake must be used.
- Hydraulic control valve pole must be in the neutral position.
- All hydraulic cylinders must be retracted.

Two configurations are shown in the figure.

Unplug the oil dipstick located on the lifter box;

Oil gauge will be cleaned with dust-free duster cloth and placed back. Then, it will be re-taken out to check oil level;

Check whether oil level complies with requirements or not:

A. Maximum oil level.

B. Minimum oil level.

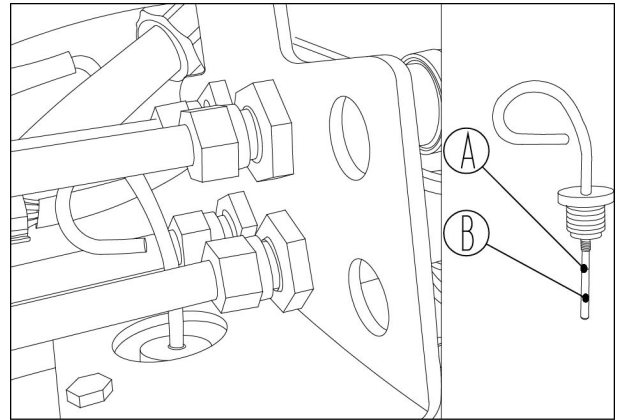


Fig. 8-32

If failing to comply with oil level requirement, please inject engine oil specified in the table of “lubricant and reference dosage”.

The oil filler port is located on the top of lifter box (as shown in figure).

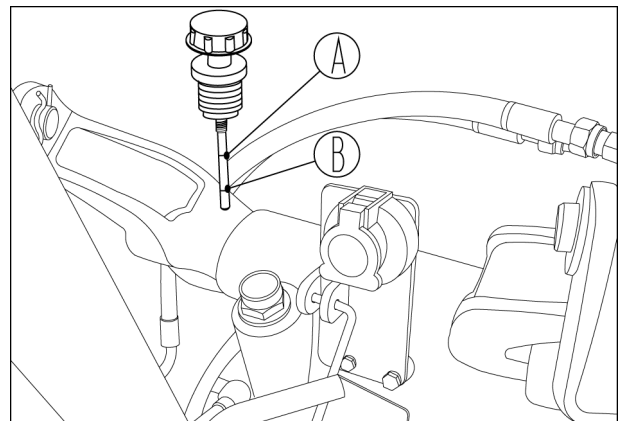


Fig. 8-33

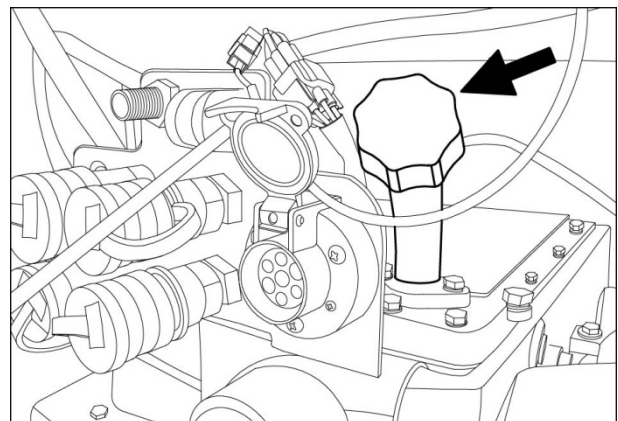


Fig. 8-34

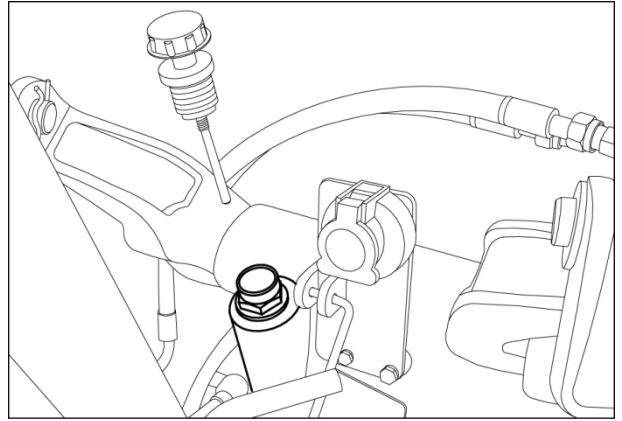


Fig. 8-35

8.8.3. Adjustment of working stroke of parking brake



Warning:

The braking control lever must be completely lifted when using parking brake.



Important:

If you need park on abrupt slope with the gradient of more than 15° (slope gradient 33%)-place chuck underneath rear wheel and fix the tractor. In any way, the tractor should not be parked on abrupt slope.

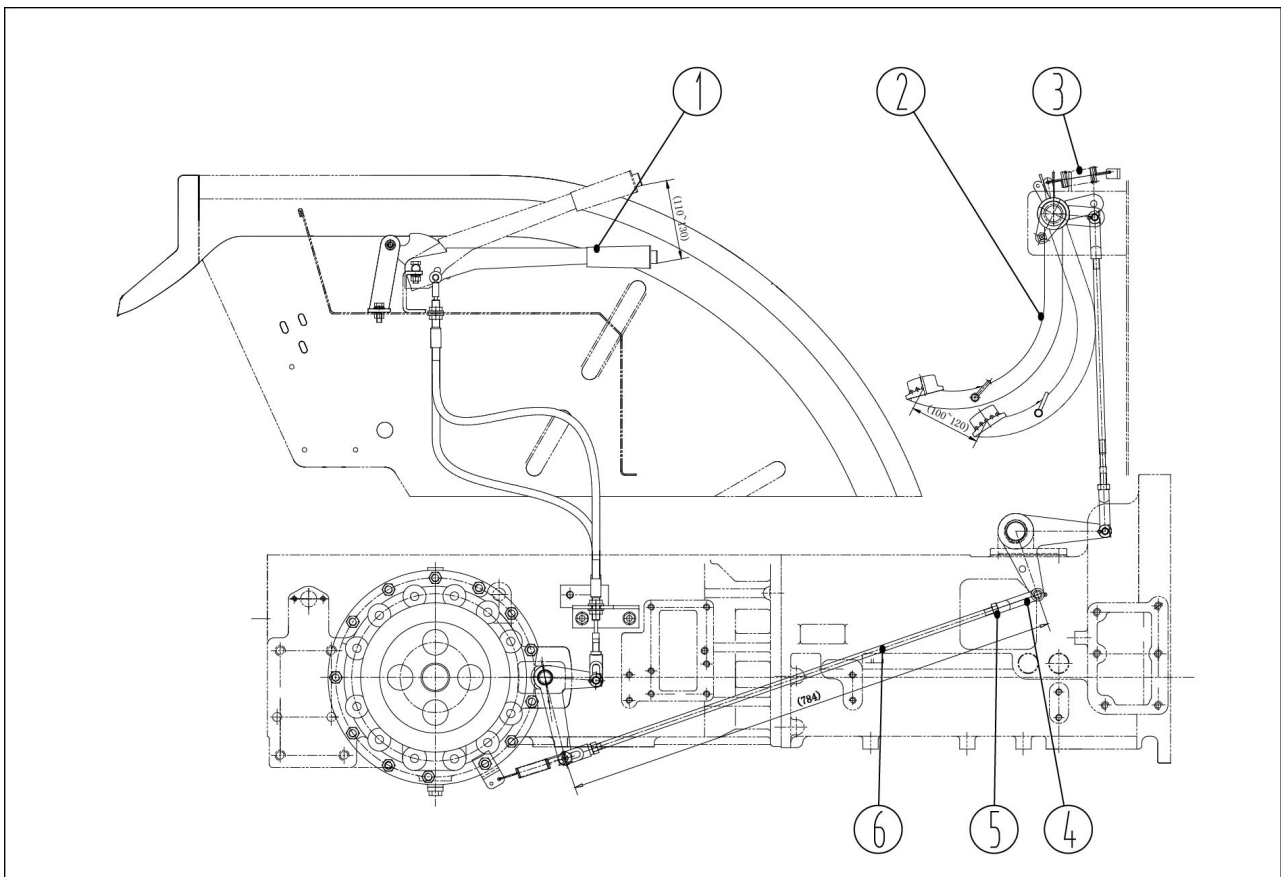


Fig. 8-36

1. Hand brake control lever	2. Pedal;	3. Return spring;	4. Left-handed-thread draw bar fork	5. Nut;	6. Draw bar
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Working stroke of hand brake control lever is 110mm~130mm. The length of hand brake lever will be adjusted to guarantee to reliably achieve parking brake within the specific working stroke scope.

8.8.4. Cleaning and maintenance of respirator filter element

The respirator filter element is located on the left rear end of the tractor. Clean this filter element as per technical specification once every 400 working hours. If this filter element is difficult to clean or is damaged, replace it with new filter element.

Specific steps are as below:

1. Unscrew the respirator cover ①.

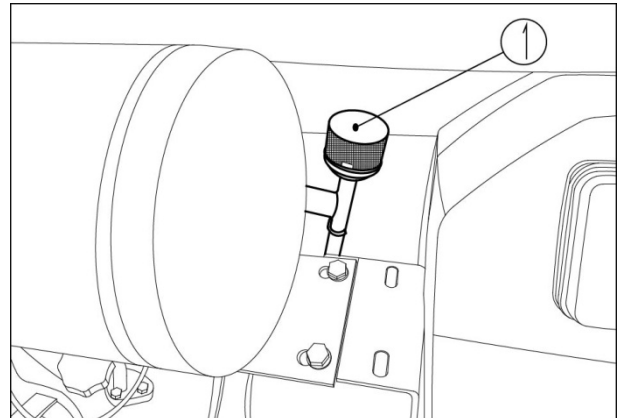


Fig. 8-37

1. Take out the respirator filter element ②.
2. Clean the respirator filter element and the respirator cover.
3. Install the respirator filter element and tighten the respirator cover.

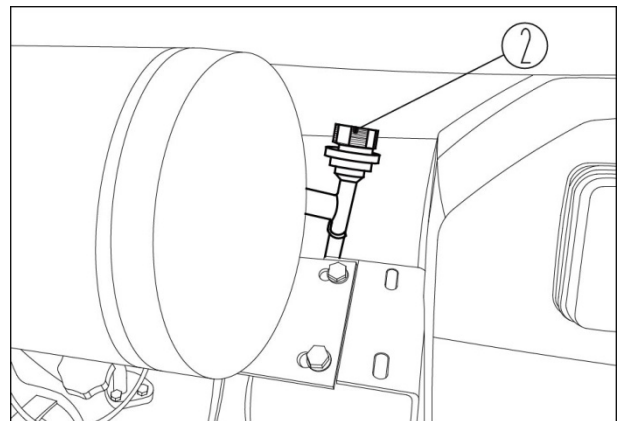


Fig. 8-38

8.8.5.

8.8.5. Adding of front-wheel-drive lubricating grease (for tractor with 2WD)

Apply grease to nipple ① using a grease gun.

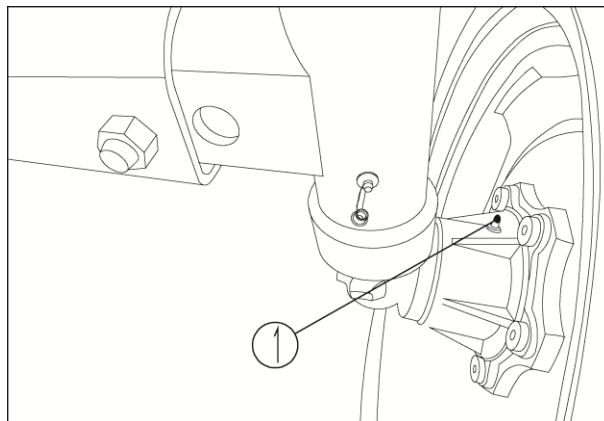


Fig. 8-39

8.8.6.

8.8.6.Oil level of central drive of front drive axle will be checked.

	Notice: Don't inject oil that is different to existing oil (including type and viscosity).
---	---

8.8.7.

	Notice: Collect oil that has been used in suitable vessel and send to authorized collection center.
---	--

	Notice: If skin or eye is injured by high pressure fuel and oil, it may cause serious burning, blindness and even death. Leakage of high pressure liquid may not be seen. When seeking for leakage, one piece of hard cardboard or wood will be used. It is prohibited to use both hands! Safety glasses will be worn to protect your eyes! If any liquid is permeated into skin, please immediately seek for treatment from medical workers with experience for handling special problems.
---	--



Notice:

The tractor will be parked on flat ground when replacing oil of the tractor or checking oil level.

After removing the screw-plug ①, oil level will be checked via the oil filler.

Add grease till the grease reaches the lower edge of filler port.



Important:

Sealing gasket will be replaced when removing the screw-plug.

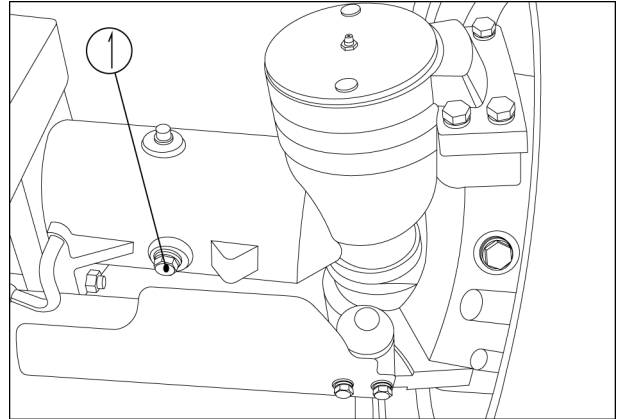


Fig. 8-40

Check vent valve

Regularly clear vent valve ②

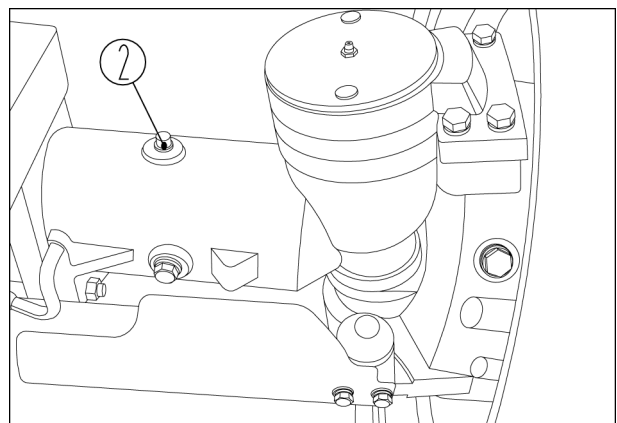


Fig. 8-41

8.8.7. Add lubricating grease of master pin oil cup of front drive axle

Apply grease to nipple ① using a grease gun.

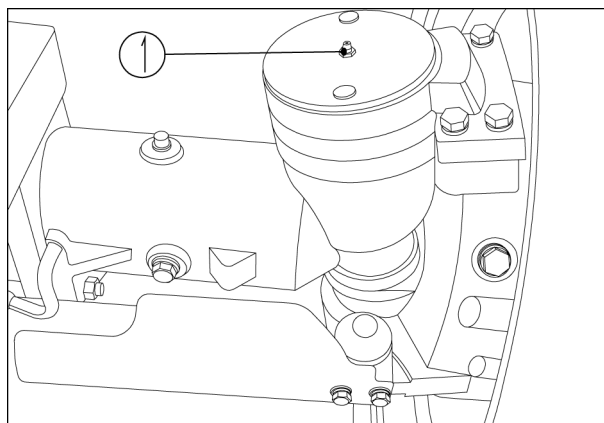


Fig. 8-42

8.8.8.

8.8.8. Checking of lubricating oil of front drive axle final drive

	Notice: If skin or eye is injured by high pressure fuel and oil, it may cause serious burning, blindness and even death. Leakage of high pressure liquid may not be seen. When seeking for leakage, one piece of hard cardboard or wood will be used. It is prohibited to use both hands! Safety glasses will be worn to protect your eyes! If any liquid is permeated into skin, please immediately seek for treatment from medical workers with experience for handling special problems.
---	--

8.8.9.

	Notice: The tractor will be parked on flat ground when replacing oil of the tractor or checking oil level.
---	---

Rotate the wheel hub to align the filler port/filler plug with the central level of the wheel hub. Add lubricating oil, till the oil reaches lower edge of filler port (Location ① as shown in the figure).

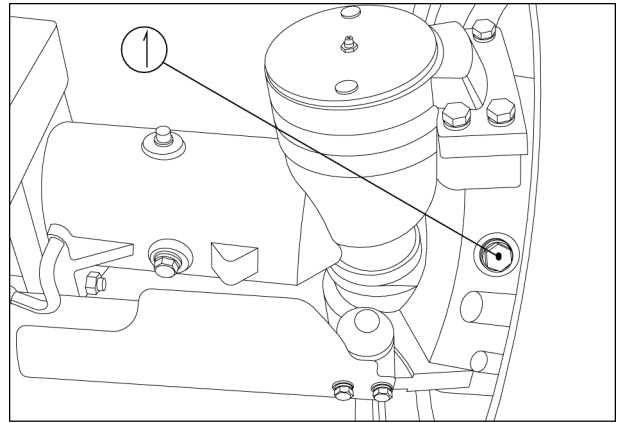


Fig. 8-43



Important:

Sealing gasket will be replaced when removing the screw-plug.

8.8.9.Cleaning and maintenance of filter of hydraulic steering oil tank

Filter of hydraulic steering oil tank will be cleaned and maintained after the tractor has been worked for 400 hours.

1. Cover of hydraulic steering oil tank
2. Filter screen;
3. Fixed hood of filter element;
4. Spring ;
5. Filter element ;
6. Hydraulic steering oil tank

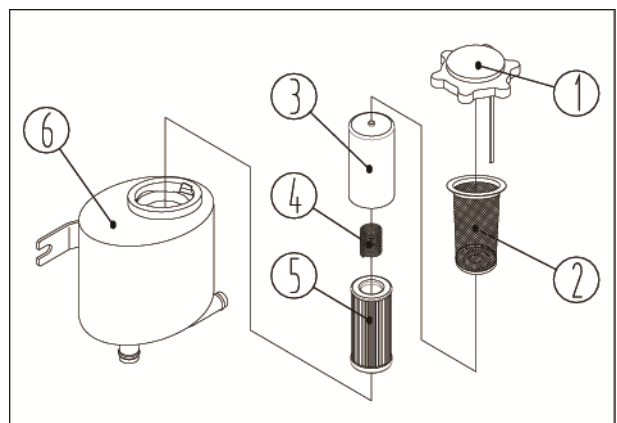


Fig. 8-44

Specific steps are as below:



1. Remove the cover① of hydraulic steering oil tank
2. Remove the filter screen② of hydraulic steering oil tank
3. Take out the filter element⑤ from hydraulic steering oil tank
4. Use gasoline to clean and dry with compressed air
5. Install the filter element in hydraulic steering oil tank
6. Install filter screen on hydraulic steering oil tank
7. Inject oil to required oil level.
8. Install cover of hydraulic steering oil tank

8.9.Maintain Every 800 Hours

8.9.1.Check and maintenance of hydraulic steering fuel tank and pipeline



Danger:

Please prevent heat oil from burning skin when discharging, please be careful!



Notice:

Collect oil that has been used in suitable vessel and send to authorized collection center.



Notice:

Energy accumulator contains high pressure gas or oil plants. All repairs will be referred to instructions offered by the manufacturer.



Notice:

If skin or eye is injured by high pressure fuel and oil, it may cause serious burning, blindness and even death. Leakage of high pressure liquid may not be seen. When seeking for leakage, one piece of hard cardboard or wood will be used. It is prohibited to use both hands! Safety glasses will be worn to protect your eyes! If any liquid is permeated into skin, please immediately seek for treatment from medical workers with experience for handling special problems.

Hydraulic oil need be replaced after the tractor has been worked for 800 hours. Specific steps are as below:

- Open the tank filler cap① of the oil tank and take out filter element in the oil tank for cleaning.
- Loosen inlet and outlet oil tubes of steering oil cylinder of the tractor ②, manually revolve steering wheel under parking state of the tractor to release steering hydraulic oil when it is heated.
- Add suitable hydraulic oil pressure after it has been discharged.
- Oil way will be deflated after oil has been injected.

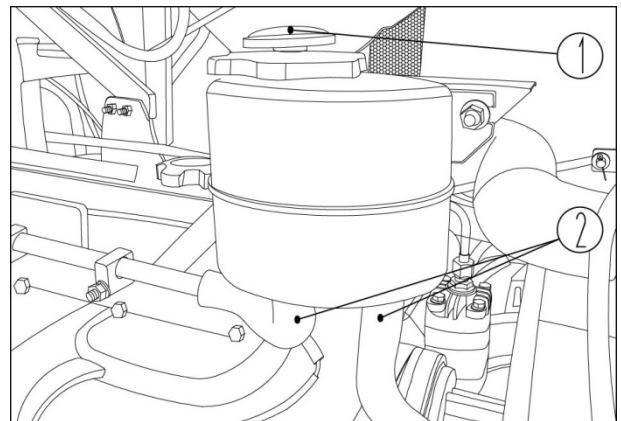


Fig. 8-45

Air bleeding method for oil lines:

Manually rotate steering wheel to one side, loosen corresponding steering oil tube if it is hard to steer. Oil tube will be locked tightly after bubble has been discharged completely, the other side will also be exhausted as per the same method.

Oil level of steering fuel tank will be checked after exhaust. If it is not enough, oil will be added to the middle of the oil level scale.

8.9.2.Maintenance and repair of fuel tank

Fuel tank can store oil plants and subside moisture and impurity, which shall be regularly cleaned to remove dirt when being used.

Park the tractor on a level surface. Turn off the engine. Remove the drain plug at the bottom of the fuel tank to drain deposits from the fuel tank.

	Important: If the cover is opened, fuel will be discharged more quickly.
---	---

	Warning: Abide by safety regulations about oil storage in the fuel tank.
---	---

	Danger: When working near the diesel engine or flammable materials, please guarantee that dangerous spark will not be generated.
---	---

	Warning: When injecting oil, switch of the engine will be turned off and any leaked diesel on the tractor will be cleared.
---	---

	Warning: Don't use out fuel oil in the fuel tank when operating the engine. If the engine of the tractor stops operation as fuel has been used out, air must be pumped from the fuel injection system.
---	---

	Notice: Don't inject oil to fuel tank in places with open fire or in sealed place. No smoking when filling oil. Please shut off the engine before filling oil!
---	--

- **Model of auxiliary fuel tank**

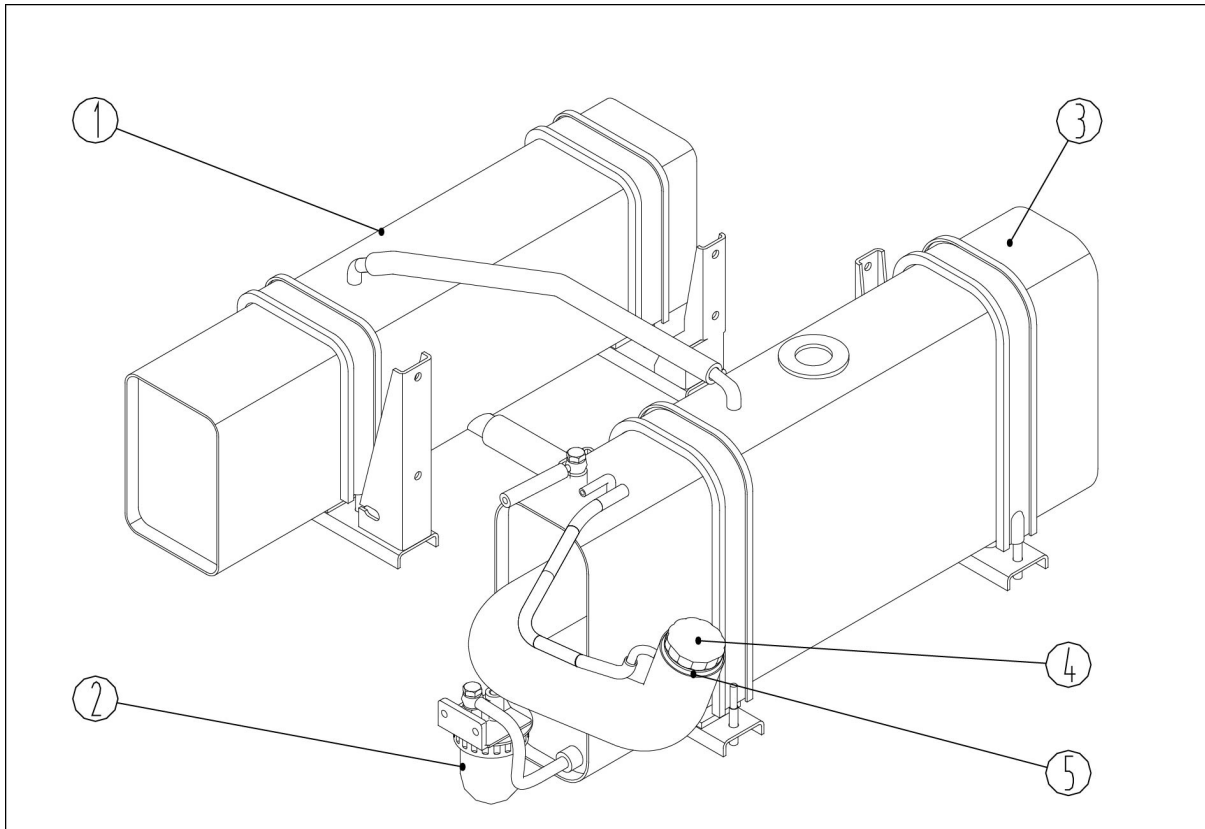


Fig. 8-46

1. Auxiliary fuel tank;
2. Filter;
3. Main fuel tank;
4. Fuel tank;
5. Oil filler

Steps for cleaning and maintaining fuel tank of the engine:

1. The tractor will be parked on the horizontal ground and engine will be closed for cooling.
2. One suitable vessel will be placed below oil drain outlet.
3. Remove purge cock.
4. Flush fuel tank
5. Install and tighten purge cock.
6. Add fuel from oil filler.

8.9.3.Adjust gap of air intake and exhaust valve of the engine



The authorized service center has the right to conduct this maintenance operation.

Refer to *maintenance manual* of the engine.

8.9.4.Maintenance and repair of fuel injection pump

	Notice: Smoke and ignition are prohibited when repairing or supplementing fuel to the fuel injection system.
---	---

8.9.5.

	Notice: If high pressure fuel or petroleum contacts eyes, it may cause serious burn, blindness and even death. It is not easy to observe high pressure liquid leakage, which can be checked by using paperboard or wood chip. Keep your hands away from it. When checking please wear safety glasses to protect your eyes. If the skin is burned by liquid, please immediately seek for professional treatment.
---	--

The authorized service center has the right to conduct this maintenance operation.

Refer to *maintenance manual* of the engine.

8.9.5.Replace lubricating oil of transmission system

	Warning: Abide by laws and regulations on environmental protection. All liquid (oil, diesel and cooling liquid), filter and battery must be discarded in accordance with applicable laws and regulations.
---	--

8.9.6.

	Notice: Energy accumulator contains high pressure gas or oil. Please refer to instruction in the specification provided by the manufacturer before any repair.
---	---



Notice:

The tractor will be parked on flat ground when replacing oil of the tractor or checking oil level.



Important:

Filter will be replaced when replacing hydraulic oil.

Steps for replacing lubricating oil of the transmission system are as below:

1. The tractor will be parked on flat ground; engine will be closed for adequate cooling.
2. Remove the cover of the oil delivery pipe



Notice:

If skin or eye is injured by high pressure fuel and oil, it may cause serious burning, blindness and even death. Leakage of high pressure liquid may not be seen. When seeking for leakage, one piece of hard cardboard or wood will be used. It is prohibited to use both hands! Safety glasses will be worn to protect your eyes! If any liquid is permeated into skin, please immediately seek for treatment from medical workers with experience for handling special problems.

3.

3 One suitable vessel will be placed underneath the oil drain outlet of rear axle.

4 Remove purge cock ① of oil drain outlet of rear axle.

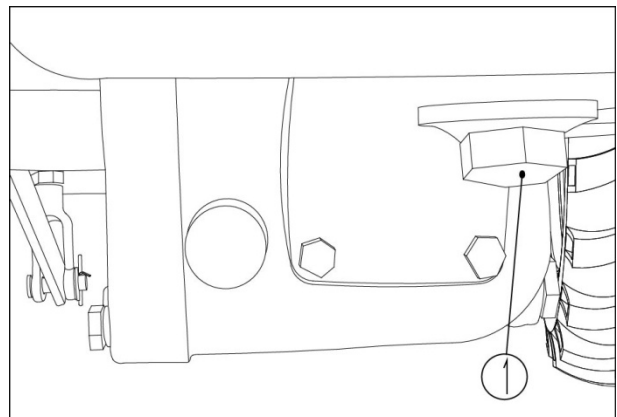


Fig. 8-47

5 One suitable vessel will be placed underneath the oil drain outlet of transfer case.

6 Remove purge cock ② of transfer case

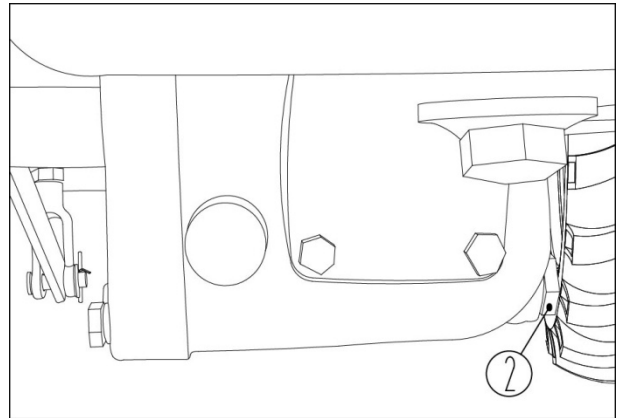


Fig. 8-48

7 Place a suitable container underneath each of the drain ports of left and right brakes.

8 Remove purge cock ③ of oil drain outlet of brake.

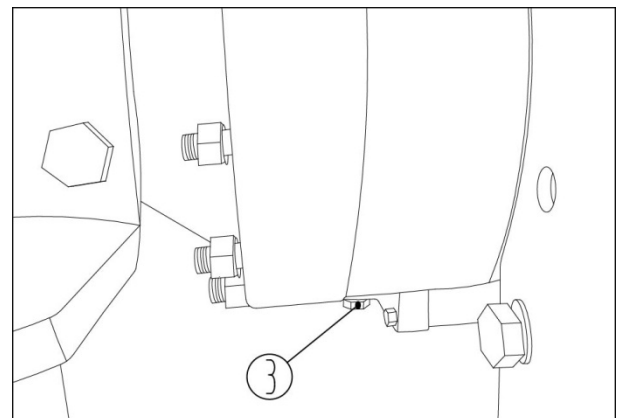


Fig. 8-49



Danger:

Please prevent heat oil from burning skin when discharging, please be careful!

9 After lubricating oil has been completely discharged, the purge cock ①,②,③ will be tightened.

10 Replace the oil filter on the right side of gearbox.

11 Lubricating oil will be injected to required liquid level from the oil filler. The cover of oil filler will be tightened.

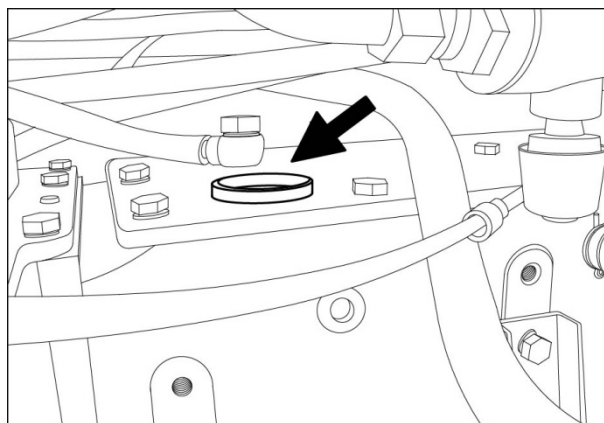


Fig. 8-50

12 The engine will be closed for adequate cooling after the engine has been operated for five minutes.

13 Check whether liquid level complies with requirements or not. If the liquid level is too low, oil will be added to required level.



Notice:

Sealing gasket will be replaced when removing the screw-plug.

8.9.6. Hydraulic oil of lifter



Warning:

Abide by laws and regulations on environmental protection. All liquid (oil, diesel and cooling liquid), filter and battery must be discarded in accordance with applicable laws and regulations.

8.9.7.



Notice:

Energy accumulator contains high pressure gas or oil. Please refer to instruction in the specification provided by the manufacturer before any repair.



Notice:

The tractor will be parked on flat ground when replacing oil of the tractor or checking oil level.



Important:

Filter will be replaced when replacing hydraulic oil.

Steps for replacing the hydraulic oil of lifter:

- 1 The tractor will be parked on flat ground; engine will be closed for adequate cooling.
- 2 Remove the cover of the oil delivery pipe



Notice:

If skin or eye is injured by high pressure fuel and oil, it may cause serious burning, blindness and even death. Leakage of high pressure liquid may not be seen. When seeking for leakage, one piece of hard cardboard or wood will be used. It is prohibited to use both hands! Safety glasses will be worn to protect your eyes! If any liquid is permeated into skin, please immediately seek for treatment from medical workers with experience for handling special problems.

- 3 One suitable vessel will be placed underneath the oil drain outlet of lifter.
- 4 Remove purge cock of oil drain outlet of lifter.

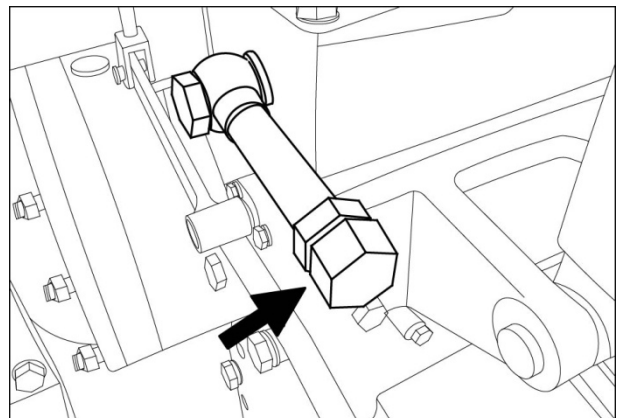


Fig. 8-51



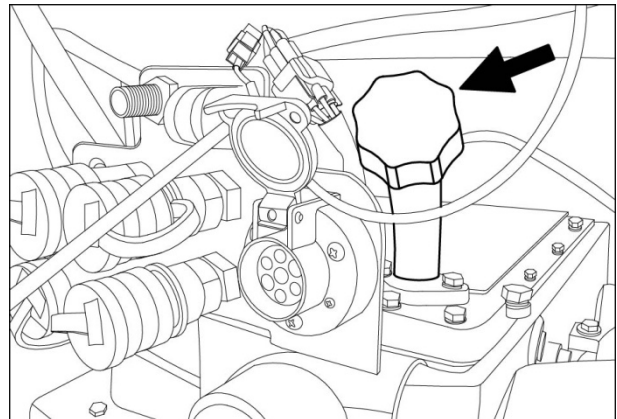
Danger:

Please prevent heat oil from burning skin when discharging, please be careful!

5 After hydraulic oil has been completely discharged, the purge cock will be tightened.

6 Hydraulic oil will be injected to required liquid level from the oil filler.

Configuration 1 oil filler is shown in the figure



Configuration 2 oil filler is shown in the figure

Fig. 8-52

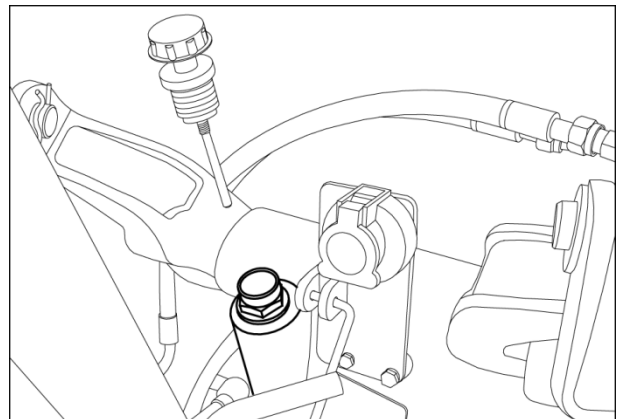


Fig. 8-53

7 The engine will be closed for adequate cooling after the engine has been operated for five minutes.

8 Check whether liquid level complies with requirements or not. If the liquid level is too low, oil will be added to required level.



Notice:

Sealing gasket will be replaced when removing the screw-plug.

8.10.Maintain Every 1600 Hours

8.10.1.Cleaning and maintenance of cooling system of the engine



Notice:

If the engine is still heated, don't take out the cover of the radiator. If heated radiator is opened under high pressure, boiling liquid and vapor will flow out, which will cause serious injury to the driver and other persons near it. Before removing the cover of radiator, the engine will be closed for cooling the circuit.

8.10.2.

- ① Cover of radiator
- ② Water tank of radiator
- ③ Water drain valve

Cleaning of incrustation of cooling system

Before maintenance, solution containing 750g caustic soda and 150g kerosene in every 10L water will be filled in the cooling system. The engine will be operated at intermediate speed for 5 min to 10min, solution will be stayed for 10h to 12h (attention: thermal insulation measures must be adopted in the winter to prevent freezing), then, the engine will be re-started for operating at intermediate speed for 20 min, and stopped for discharging cleanout fluid.

After the engine has been cooled, water pipe will be inserted into water tank ② for flushing and water drain valve ③ in the bottom of the water tank shall be opened. The water drain valve will be closed after cleaning. In addition, water will be added to make engine operate for several minutes, and then water will be discharged. After the engine has been cooled, new anti-freezing solution or cooling water will be added in accordance with provisions.

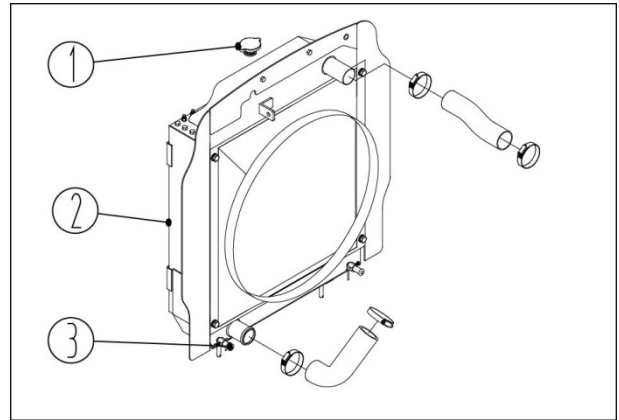


Fig. 8-54

8.10.2. Cooling system of the engine that has used anti-freezing solution

Effective period of anti-freezing solution is 2 years or 1600 h. if it exceeds this period, it shall be replaced and cooling system shall be flushed. Then, new anti-freezing solution will be added.

	Warning: Please abide by rules for environmental protection. Any fluid (petroleum, diesel and cooling liquid) or filter and battery must be discarded in accordance with applicable laws and regulations.
---	--

Steps for replacing cooling liquid and cleaning circuit

- 1 Park the tractor on flat ground

The engine must be closed and cooling liquid must be adequately cooled.
2. Suitable vessel will be placed under the plug screw.
3. Open the water drain valve ③ to discharge cooling liquid
4. Re-close the water drain valve ③, fill the circuit with mixture of cleanser via the injection port on liquid storage tank.

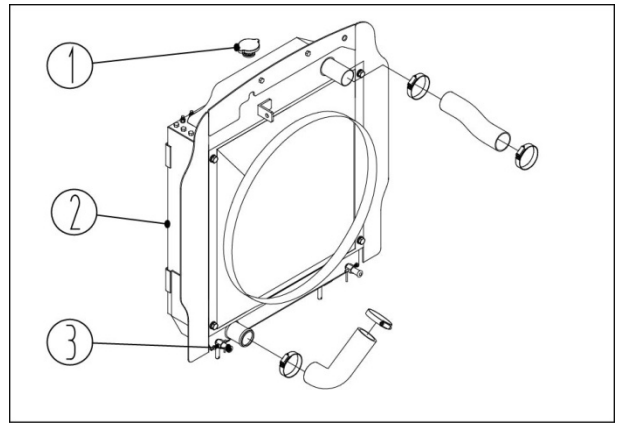


Fig. 8-55

5. Start the engine to make it under idle running for about half an hour.



Important:

When the engine is under operation, mixture of cooling liquid in the liquid storage tank has not been reduced to the minimum limit.

6. Shut off the engine, exhaust the system and fill it with water; and then re-start the engine to reach about 1000rpm and operate for 5 minutes.
7. Re-exhaust the system
8. Cooling liquid will be used to fill the circuit so that the engine will be operated for several minutes. If necessary, cooling liquid will be supplemented to the system.



Important:

1. In winter, frequently check the antifreeze concentration according to ambient temperature. If necessary, timely recover to normal concentration.
2. As for the tractor that has not used anti-freezing solution, when water temperature is reduced to below 70°C, water shall be discharged completely under the situation that the engine is under idle running to prevent cooling water from freezing and damaging the engine.

	Warning: Please inject No. 40 ethylene glycol cooling solution (FL0521-1999), three warranties will not be included if the radiator is corroded and leaked due to failing to comply with requirements.
---	---

8.10.3. Central drive of front drive axle

	Warning: Abide by laws and regulations on environmental protection. All liquid (oil, diesel and cooling liquid), filter and battery must be discarded in accordance with applicable laws and regulations.
---	--

8.10.4.

	Notice: Energy accumulator contains high pressure gas or oil. Please refer to instruction in the specification provided by the manufacturer before any repair.
--	---

	Notice: If skin or eye is injured by high pressure fuel and oil, it may cause serious burning, blindness and even death. Leakage of high pressure liquid may not be seen. When seeking for leakage, one piece of hard cardboard or wood will be used. It is prohibited to use both hands! Safety glasses will be worn to protect your eyes! If any liquid is permeated into skin, please immediately seek for treatment from medical workers with experience for handling special problems.
---	--

	Notice: The tractor will be parked on flat ground when replacing oil of the tractor or checking oil level.
---	---

Steps for replacing lubricating oil of central drive of the front drive axle are as below:

1. The tractor will be parked on the horizontal ground
2. One suitable vessel will be placed underneath the oil drain outlet.
3. Loosen the oil drain plug ① to discharge the liquid

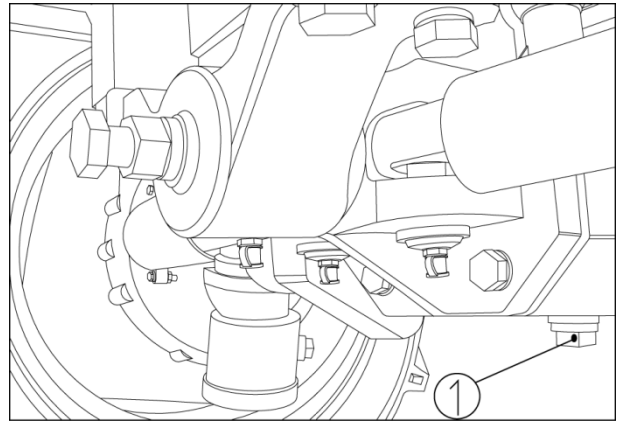


Fig. 8-56



Danger:

Please be careful in the process of oil drain; hot oil may cause serious burning.

4. Loosen the vent bolt ② to accelerate discharge of oil.

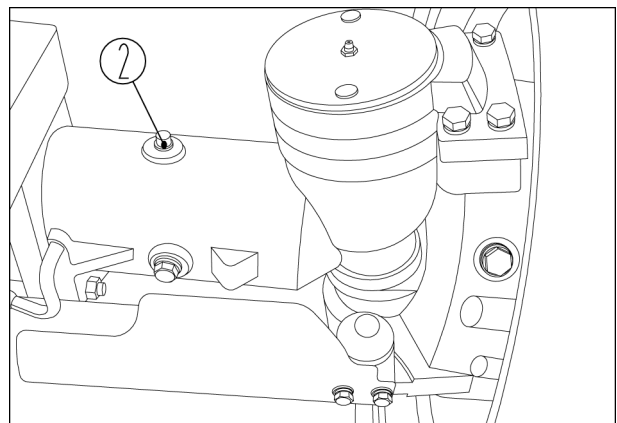


Fig. 8-57

5. After lubricating oil has been completely discharged, the purge cock ① and vent bolt ② will be re-installed.

6. After taking out the oil fill plug ③, lubricating oil will be added to lower edge of oil filler via the oil filler.
7. Re-install oil fill plug ③.

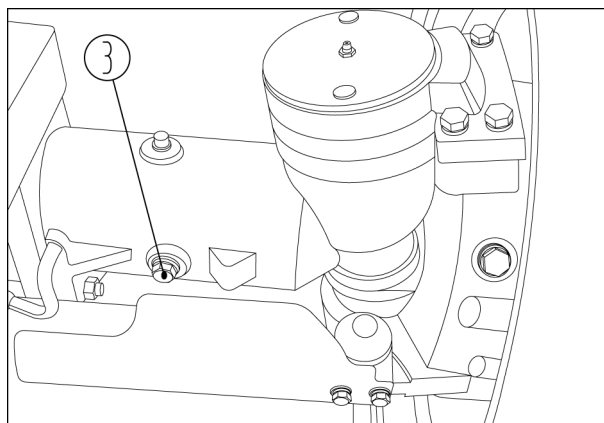


Fig. 8-58

6.

	Important: Sealing gasket will be replaced when removing the screw-plug.
---	---

	Danger: Oil that is different from original oil model (type or viscosity) cannot be injected.
---	--

8.10.4.Replacement of lubricating oil of front drive axle final drive

	Warning: Abide by laws and regulations on environmental protection. All liquid (oil, diesel and cooling liquid), filter and battery must be discarded in accordance with applicable laws and regulations.
---	--



Notice:

The contact of high pressure fuel or oil with your skin or eyes will probably cause serious harms, blindness, or even death. High pressure liquid leakage may be invisible. Use a paper board or wooden board to check leakage, instead of checking by bare hands. Wear protective goggles to protect your eyes. In event of permeation of any fluid into your skin, immediately seek for help from the medical personnel experienced in handling of such special problems.

Specific operation for replacement of lubricating oil of front drive axle final drive

- 1 Park the tractor on flat ground.
- 2 One suitable vessel will be placed underneath the oil drain outlet.

- 3 Rotate the wheel hub to place the screw plug ① on the bottom.

Disassemble the screw plug to drain the oil.

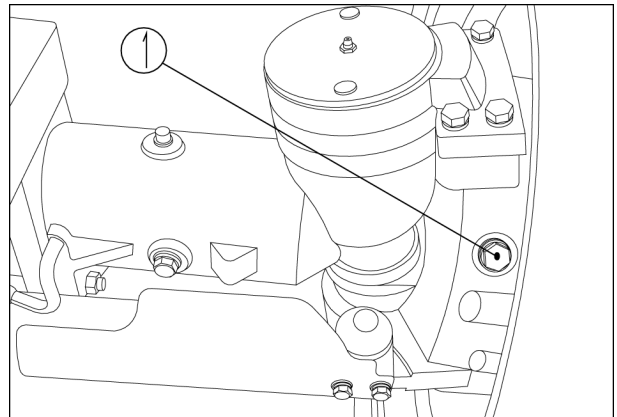


Fig. 8-59

- 4 After the full drainage of oil, rotate the wheel hub to align the screw plug ① with center of wheel hub horizontally.

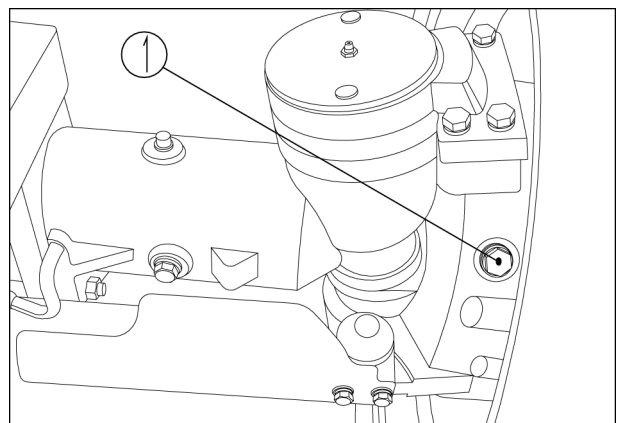


Fig. 8-60

- 5 Add oil, till the oil level reaches lower edge of oil port.

Refit the oil filler plug ①.



Important:

Replace the sealing gasket whenever the screw plug is disassembled.

8.11.Adjustment of Tractor Chassis

8.11.1.Adjustment of clutch

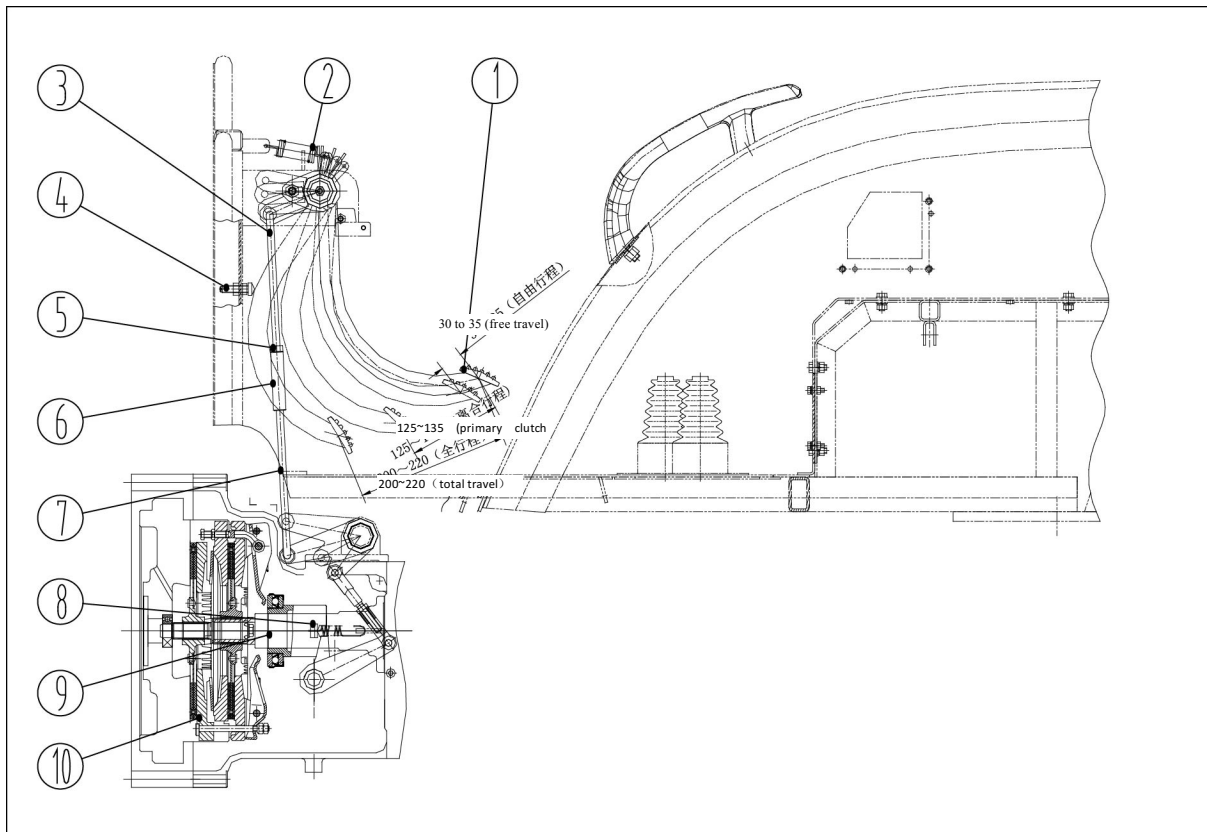


Fig. 8-61

1. Main clutch pedal subassembly	2. Pedal return spring;	3. Draw bar weldment	4. Bolt	5. Hex thin nut
6. Adjustment pipe	7. Left-handed-thread draw bar weldment	8. Return spring of bearing block	9. Release bearing block	10. Release bearing block

Adjustment to the double-acting clutch include that to the primary clutch and that to the secondary clutch.



- **Adjustment of main clutch**

The gap between releasing lever and end clearance of release bearing of the main clutch is between 2 and 2.5mm. Height difference of end sockets of three releasing levers is not more than 0.2mm.

Adjustment method: loosen tightened nut, adjust clutch and bolt so that the gap between releasing lever and end clearance of release bearing of the clutch is between 2 and 2.5mm and height difference of end sockets of three releasing levers is not more than 0.2mm.

Clutch pedal free travel is 30 ~ 35mm (mm).

Adjustment: Loosen the lock nut on the draw bar of clutch. Turn the draw bar to change its length so that the free travel of clutch pedal reaches 30mm ~ 35mm. Tighten the lock nut on the draw bar.

Limiting height H= (9.5 ~ 11) mm.

Adjustment: Loosen the lock nut. Turn the adjusting bolt so that the distance between the hex head of the bolt and the clutch release fork arm (H) is equal to 9.5 to 11mm. Then tighten the nut.

- **Adjustment of auxiliary clutch**

Distance between release lever end of primary clutch and release lever end of secondary clutch is 8mm. Height difference between release lever ends of secondary clutch is not greater than 0.2mm.

Adjustment: Loosen the lock nut. Adjust the ball nut so that the distance between release lever end of primary clutch and release lever end of secondary clutch is 8mm, and the height difference between release lever ends of secondary clutch is not greater than 0.2mm. Tighten the lock nut.

- **Lubrication of bearing of clutch**

Fore bearing of the clutch will be coated with enough lubricating grease when assembling. Release bearing needn't be coated with lubricating grease under normal situation. After the tractor has been operated for 1000h (hour), or the bearing has abnormal sound in the process of utilization, the bearing will be dismantled for cleaning and immersed into melted high-temperature lithium base grease until the bearing is filled with lubricating grease. It will be taken out after it is cooled. Surface of it will be cleaned before installing it at the original position.



Important:

1. When using the clutch, please pay attention to: rapidly and completely separate, and softly and smoothly contact to avoid early damage of the clutch.
2. Feet cannot be placed on the clutch pedal in the driving process of the tractor. Half-joint clutch cannot be used to reduce driving speed of the tractor. Abrupt-joint clutch cannot be used to dash slope or cross obstacle to avoid damaging the clutch.
3. The surface of the clutch friction plate cannot have oil dirt. Once it has oil dirt, it shall be cleaned with gasoline and used after it is dried to avoid early damage of the clutch.

8.11.2. Service brake

8.11.2.1. Check braking distance



Warning:

Regularly check oil level of brake fluid

8.11.2.2.

User need operate the brake to check the brake effect.

8.11.2.2. Adjustment of brake operating mechanism

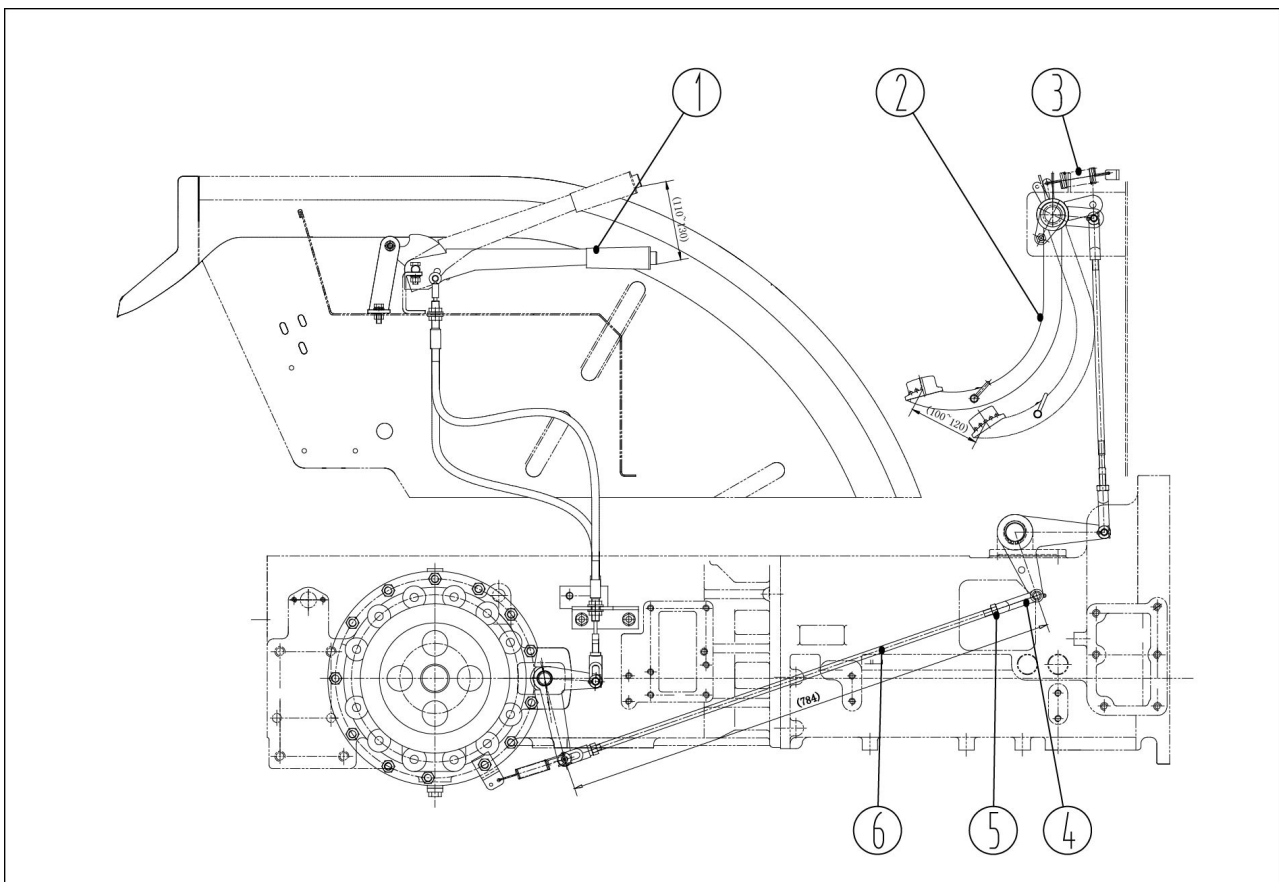


Fig. 8-62

1. Hand brake control lever	2. Pedal;	3. Return spring;
4. Left-handed-thread draw bar fork	5. Nut;	6. Draw bar

Working stroke of brake pedal is between 100mm and 120mm.



Specific adjustment method of actuating mechanism of brake is:

Loosen the nut ⑤. Adjust the draw bar ⑥ so that the total travel of brake pedal reaches 100mm ~ 120 mm and the free travels of left and right pedals are roughly equals. Tighten the lock nut ⑤.

	Notice: To guarantee reliability, after the control mechanism of the brake has been adjusted, brake test will be conducted too. The steps include: interlock left and right braking pedals, drive the tractor to dry and flat pavement, use the brake to emergency brake after the main clutch is separated under situation of high-speed straight driving, and then park for checking slip imprint of driving wheels on the pavement. If imprints of left and right driving wheels on pavement are consistent (imprints on two sides be in line and mutually parallel, length is equal), it means that adjustment is proper, otherwise, it need adjusted again. If it has not been adjusted properly for several times, interior part of the brake shall be checked.
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	Danger: Free strokes of left and right braking pedals of the tractor must be consistent, otherwise, the tractor will suddenly turn to one side to cause accident when emergency braking.
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8.11.2.3.Adjustment of gearbox

In general, the gearbox needn't be adjusted in the process of utilization, but attention shall be paid in the process of utilization and maintenance:

Lubricating oil of the gearbox and lubricating oil of rear axle are connected. Oil filler is on the lifter shell. When discharging oil, oil drain plugs of the gearbox and rear axle shall be respectively loosened and scrap iron adsorbed on the screw plug will be cleaned.

Use an oil dipstick to inspect the lubricating oil level.

8.11.3.Adjustment of rear axle

8.11.3.1.Adjustment to small bevel gear shaft bearing

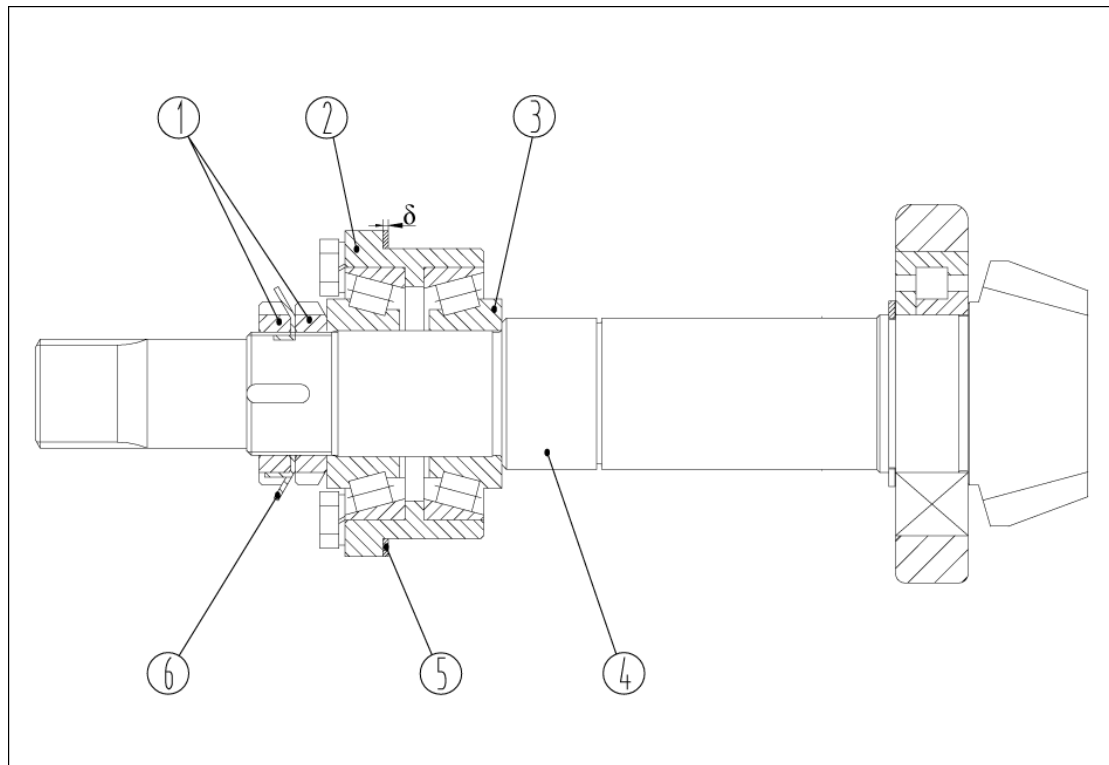


Fig. 8-63

1. Round nut;	2. Bearing block;	3. Tapered roller bearing;	4. Small bevel gear shaft	5. Adjustable pad;	6. Thrust washer;
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Two tapered roller bearings on the small bevel gear shaft ① are pre-loaded. Wear of the bearing can result in axial play of the small bevel gear. This can reduce the bearing pre-tightening force. Therefore inspection shall be performed periodically (at level-3 maintenance). Adjustment: Measure the width A between the two bearings. Apply an axial force of 350N to the bearings. Then measure the width B between the two bearings. Select a shim which is $\delta=A-B$ in thickness. Install the shim in place. Tighten the round nuts, and lock them using a washer.

8.11.3.2.Adjustment of differential bearings

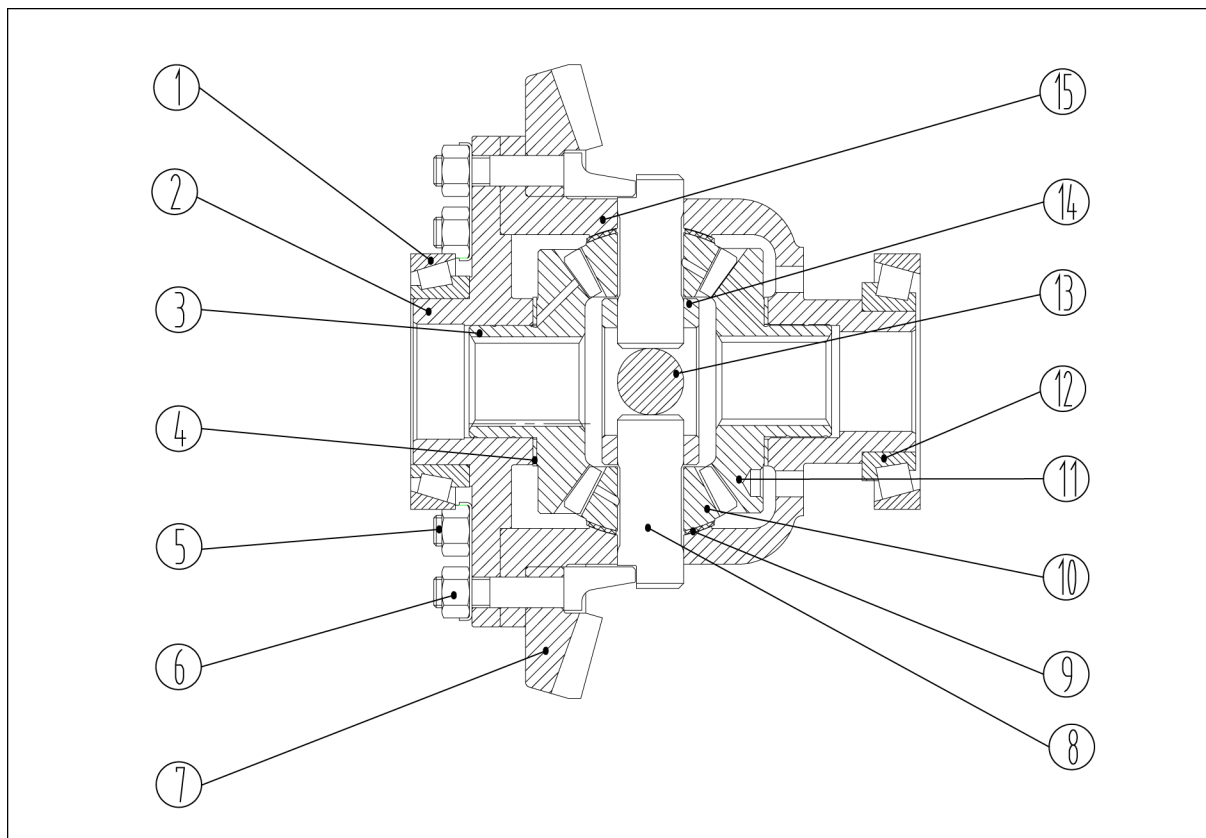


Fig. 8-64

1. Tapered roller bearing;	2. Differential cover;	3. Right half shaft gear;	4. Washer of half shaft gear;	5. Fixing bolt for large bevel gear
6. Planetary gear shaft retaining bolt;	7. Large bevel gear;	8. Short planetary gear shaft;	9. Planetary gear washer;	10. Planetary gear;
11. Right half shaft gear;	12. Tapered roller bearing;	13. Planetary gear shaft;	14. Center ring;	15. Differential housing;

The left and right bearing of the differential are also preloaded. Wear of the bearing can result in axial play of the big bevel gear. This can reduce the bearing pre-tightening force. Therefore inspection shall be performed periodically (at level-3 maintenance). Adjustment: Tighten the left and right adjusting nuts so that the axial pressure on the bearing is maintained at approximately 350N.

8.11.3.3.Adjustment to engagement of the central drive bevel gear

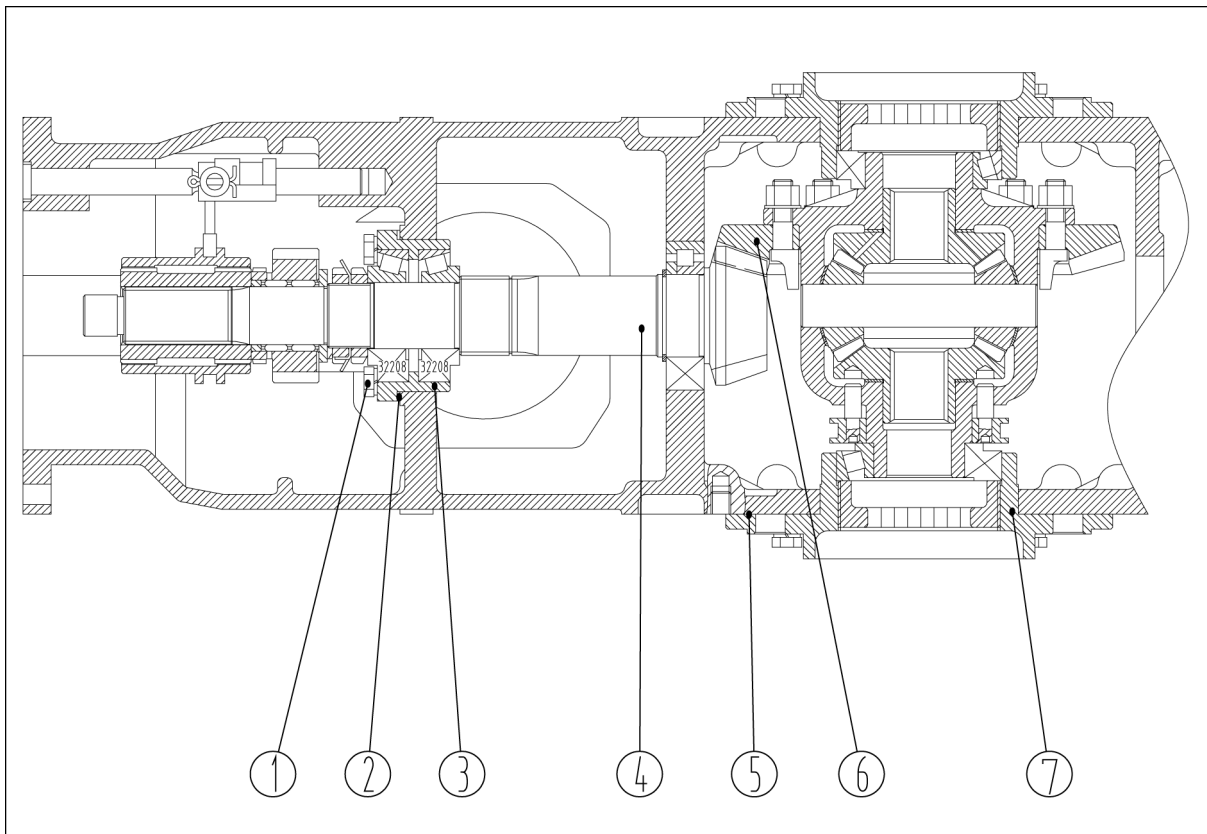


Fig.
8-65

1. Bolt;	2. Adjustable pad;	3. Front bearing block	4. Small bevel gear shaft;
5. Adjusting shim	6. Large bevel gear;	7. Differential bearing block	

Gear backlash increase due to gear wear will not affect normal operation of the gear. Wear of bearing can result in displacement of the bevel gear pair from original engagement position. Generally, if this does not affect normal operation of the gear, it is also allowed not to adjustment the bevel gear pair. In the case of overhaul, abnormality of gear, replacement of gears (differential gear and small bevel gear bearing), or replacement of spiral bevel gear pair, gear engagement adjustment shall be performed (after bearing pre-tightening).

• Checking gear backlash

Insert a lead sheet between the idle teeth of the large and small bevel gears. Rotate the gears to squeeze the lead sheet. Then take out the lead sheet, and measure its thickness at a point near the large end of gear (i.e. backlash), which shall be 0.15mm ~ 0.3mm. Make measurements at three points evenly distributed on the perimeter of gear. Backlash variation shall not be greater than 0.1mm.

If backlash does not meet the requirement, it can be adjusted by increasing or reducing the adjusting shims (5) in the differential bearing housing (7). If backlash is too large, take a shim out of the right side and add it to the left side. If backlash is too small, take a shim out of the left side and add it to the right side.

- **Checking gear engagement imprint**

On the tooth face of large bevel gear, apply a thin and uniform film of red lead oil. At the moment, force is applied to the concave of small bevel gear shaft (4). Apply red lead oil on the convex of large bevel gear (6). Rotate the gears, engagement imprints can be obtained on the small bevel gear. Proper engagement imprint location shall be in the vicinity of the pitch cone in the middle of tooth height, and a bit higher than the small end, and shall not be less than 3mm~4mm to the end edge. The engagement imprint length shall not be less than 60% tooth length, and the engagement imprint height shall not be less than 50% tooth height. Adjustment is made by changing the thickness of the shim (2) to cause axial movement of small bevel gear, and by adjusting the shim (5) to cause movement of large bevel gear. In order not to destroy differential bearing preload, be sure to add the shims removed from the bearing block to the bearing block on the other side so that the total number of shims of the left and right bearing blocks remains unchanged.

If backlash and engagement imprint cannot be adjusted to meet the requirements at the same time (i.e. when engagement imprint meets the requirement, backlash does not, or vice versa), engagement imprint shall prevail. Nonetheless backlash shall not be less than 0.15mm. When the gear assembly is disassembled for adjustment purpose, remember the locations and number of shims. Shims removed but not used in adjustment shall be preserved for future use.

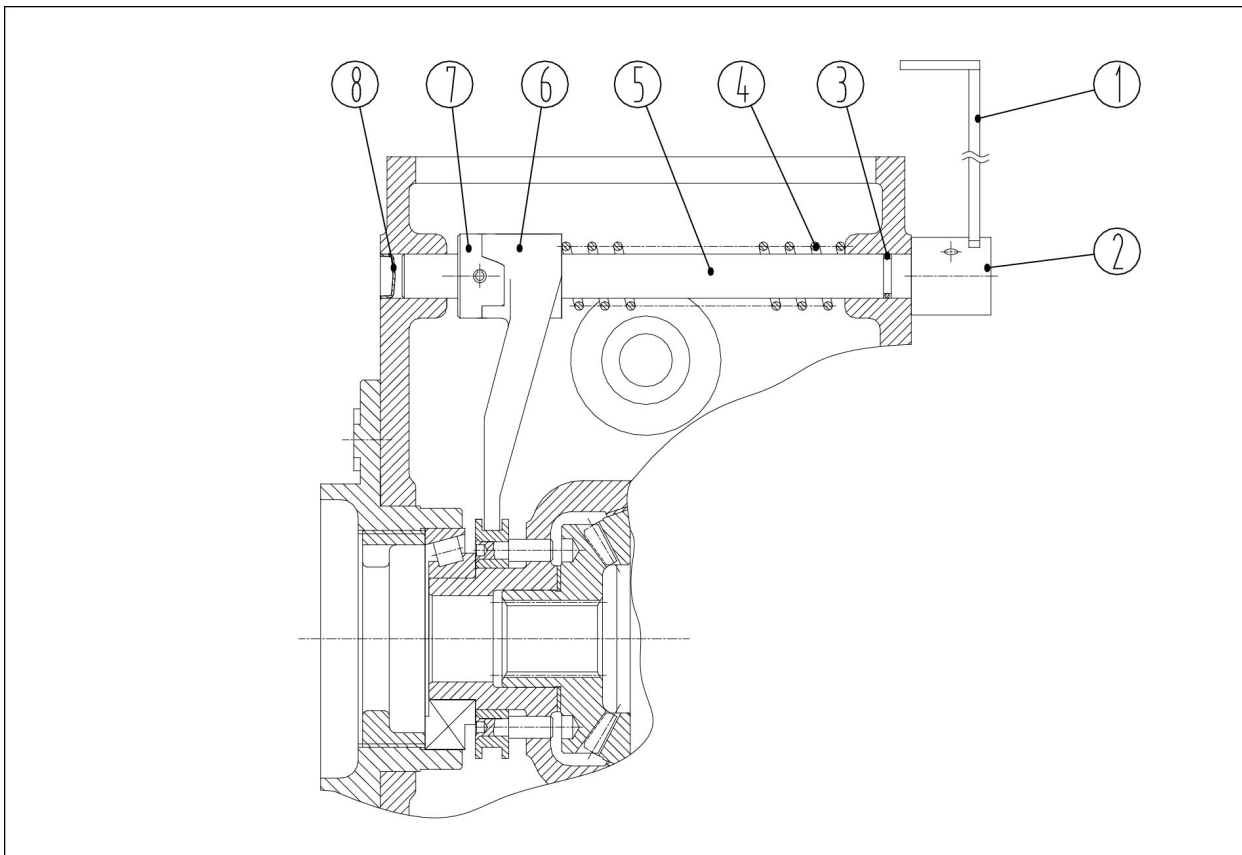


Fig. 8-66

1. Differential lock pedal weldment	2. Differential lock rocker arm weldment	3. O-ring	4. Differential lock return spring
5. Differential lock shift fork shaft	6. Differential lock shift fork	7. Differential lock shift block	8. Cup plug

Using 6 bolts and 2 planetary gear shaft thrust bolts, fix the large bevel gear (Figure 5-7) to the differential housing; both ends of the differential housing are provided with tapered roller bearings. The differential housing is installed to the rear axle housing using 6 screws, via the differential and bearing blocks. In the differential housing, there are 2 planetary gears and 2 half shaft gears. Shims are fitted between the planetary gears/half shaft gears and the differential housing. The planetary gears are on the planetary gear shaft. At one end of the planetary gear shaft, there is a cut. Both ends of the cut are clamped by thrust bolts, to prevent rotation and play of the planetary gear shaft.

The differential lock control mechanism is located on the right side of the tractor, which consists mainly of the differential lock pedal, shift fork shaft, shift fork, return spring, and differential lock.

8.11.4.Final drive Adjustment

8.11.4.1.Final drive structure

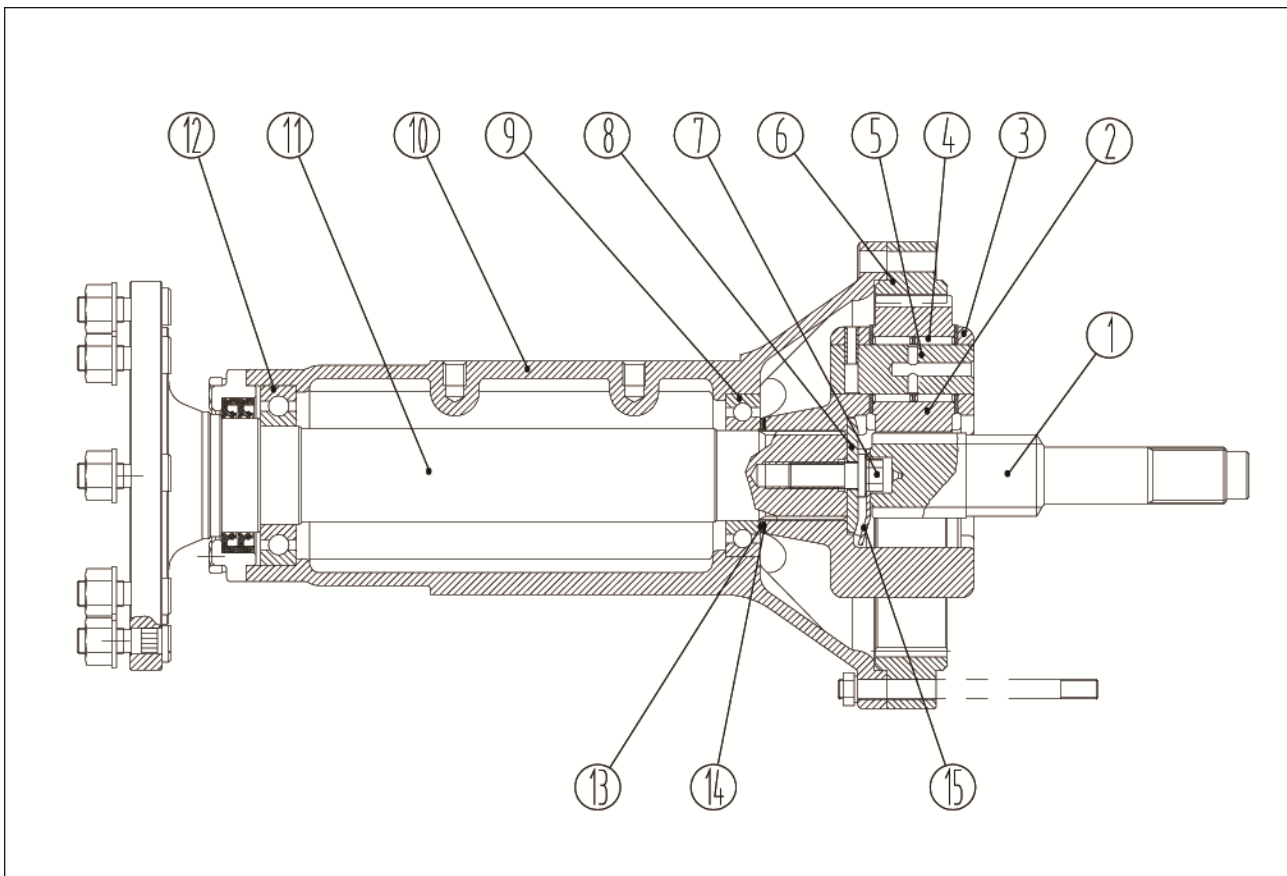


Fig. 8-67

1. Sun gear	2. Planet wheel	3. Planetary carrier	4. Needle roller	5. Planetary gear shaft	6. Ring gear
7. Bolt	8. Spacer bush	9. Overturning bearing	10. Drive shaft housing	11. Drive shaft	12. Overturning bearing
13. Spacer bush	14. Adjustable pad	15. Locking plate			

The final drive employs a planetary gear mechanism. The planetary gear mechanism consists of an active sun gear, a fixed ring gear, a driven planetary gear carrier, and planetary gears. The sun gear is integrated with half shaft. The spine at the front end engages with the half shaft gear. The ring gear is fixed between the drive shaft housing and the brake housing. The three planetary gears engaging with the sun gear and ring gear are installed to the planetary gear carrier via the needle bearings and planetary gear shaft. The drive shaft for the planetary gear mechanism is supported on the drive shaft housing by two radial ball bearings. The drive shaft is connected to the planetary gear carrier via spline, and fixed with the locking screw. In order to improve engagement of the sun gear with the planetary gears to achieve uniform load distribution, no fixed support is provided for the sun gear, in other words, the sun gear is at the floating status. A floating clearance $G = (0.2 \sim 0.3)$ mm exists between the planetary gear carrier and spacer.

8.11.4.2.Final drive Adjustment

Floating clearance between planetary gear carrier and spacer has already been factory adjusted as $G = (0.2 \sim 0.3)$ mm, removing necessity of adjustment during use of the tractor. However, in the case of overhaul of tractor or replacement of planetary gear mechanism, this parameter shall be adjustment. Adjustment: measure the distance from drive shaft to bearing end face A. Measure the planetary gear carrier spline hole depth B and the spacer thickness C. Calculate the adjusting shim thickness $\delta = A - (B + C + 0.2 \sim 0.3)$ mm. Place a shim of this thickness in the position shown in the figure. Tighten the drive shaft locking screw, and lock the drive shaft using the locking tab.

8.11.5.Adjustment of front wheel hub bearings

The normal play for the front wheel hub bearings of FL35-70HP series tractor is 0.05mm~0.15mm. During the use, due to the wear of bearings, this play will increase gradually. If this play is larger than 0.4mm, the adjustment is required. During the adjustment, elevate the front shaft by a jack to elevate the front wheels off the ground, disassemble the screw 2, bearing cap 3, and split pin 4, and screw the adjustment nut 5 to eliminate the bearing play and then unscrew it for 1/30~1/10 turn. In such case, the front wheels shall be capable of flexible rotation. Then, insert the split pin 4 and install the bearing cap 3.

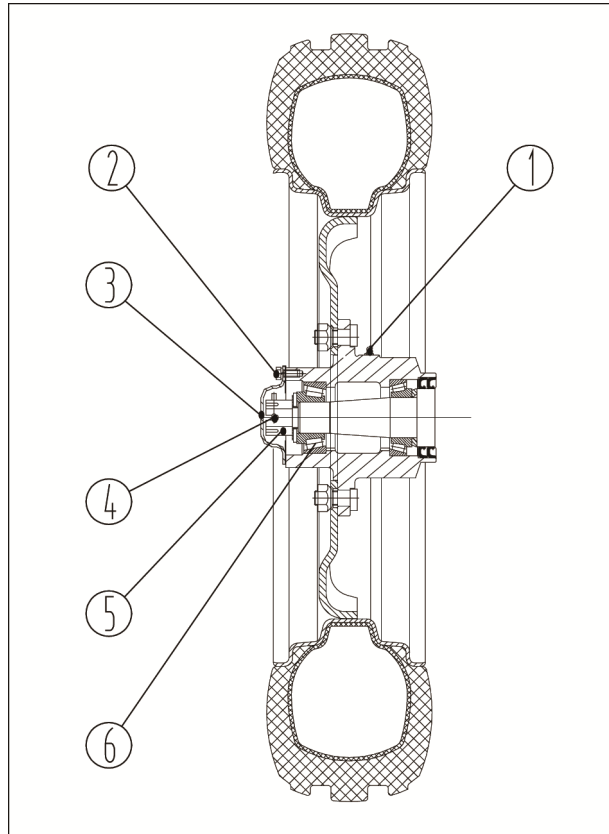


Fig. 8-68

3. Oil cup; Screw; Bearing cap;
6. Split pin; Adjustment nut; Bearing;

8.11.6.

8.12.Adjustment of Hydraulic Hitch System

8.12.1.Adjustment of safety valve of distributor

	Important: Safety valve of the distributor has been adjusted correctly when delivering. Users needn't adjust it. If it need be adjusted, it must be conducted on the test bed. Starting pressure of safety valve of the distributor is between 17.5 and 8MPa. The distributor is precision part, which cannot be arbitrarily dismantled. If it must be dismantled, it shall be conducted in clean place and shall be cleaned with clean gasoline or kerosene.
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8.12.2.

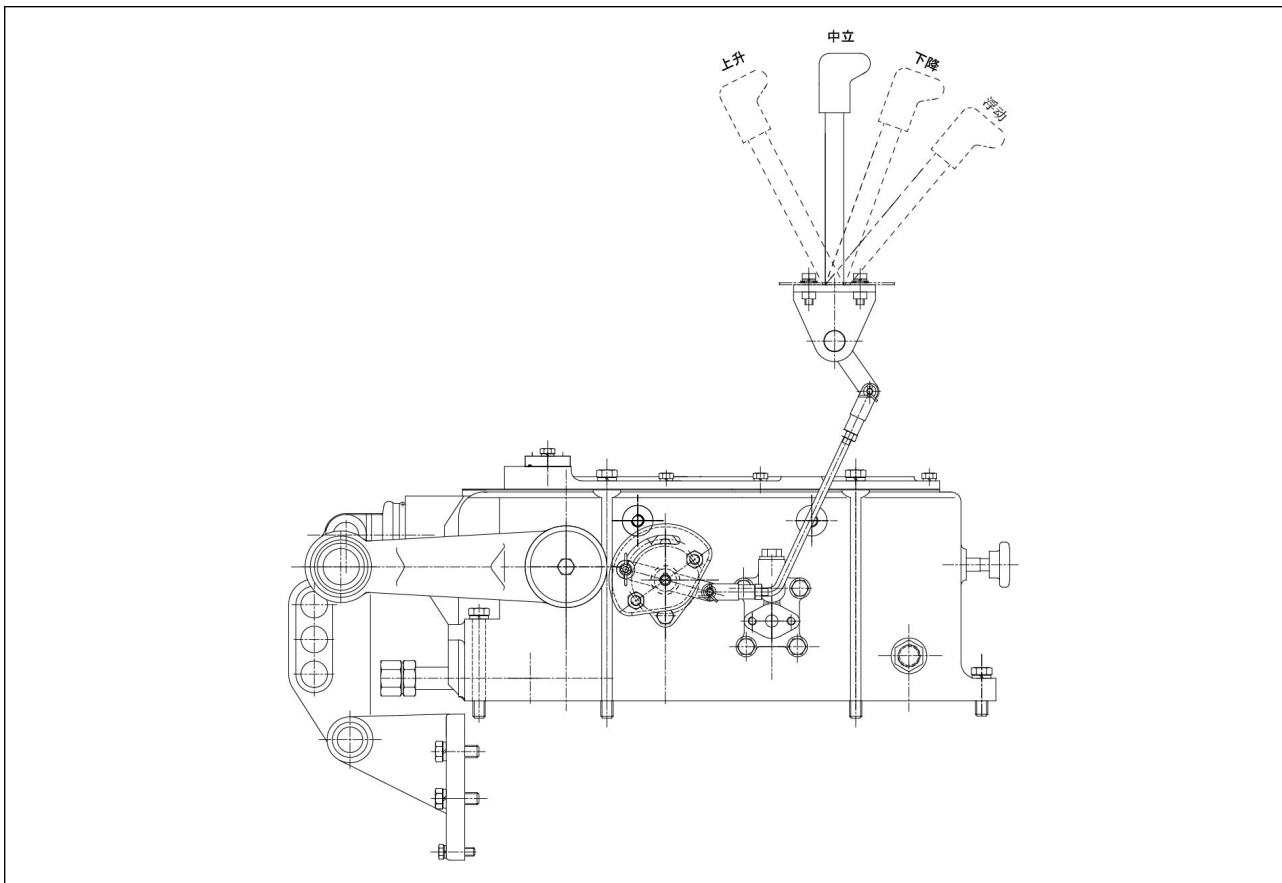


Fig. 8-69

- Operate the operating lever from “neutral” position to the highest position (in which case a clear feeling of oriented operating lever is present) so that the hitch mechanism starts lifting. When the lifting end is reached, the operating lever turns automatically (to the neutral position).
- Pull down the operating lever from “neutral” position (in which case the operating lever is not in the lowest position) so that the hitch mechanism starts lowering. In such case, once the operating lever is released, the operating lever immediately bounces back to “neutral” position and the lowering is stopped.
- If the operating lever is operated from the “neutral” position to the lowest position (in which case a clear feeling of oriented operating lever is present), the hitch mechanism lowers to the end and then stays under “floating” state.

8.12.2.Operations of pusher-type hydraulic system

8.12.2.1.Operation method for height limit of pusher-type lifter

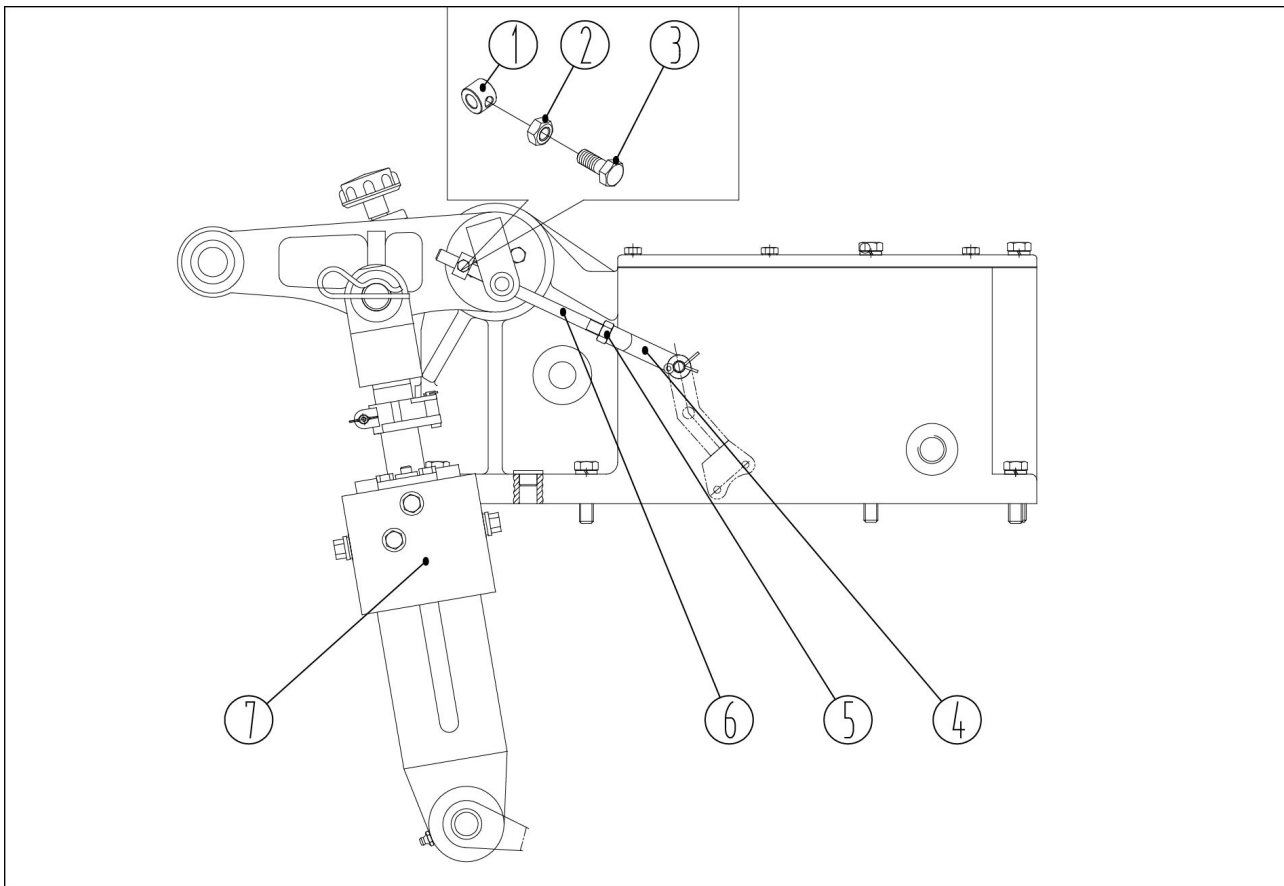


Fig. 8-70

1. Stopper	2. Nut	3. Bolt	4. Front fork of pull rod	5. Nut	6. Limit rod	7. Left lift cylinder assembly
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(1) Function and structural illustration of height limiting mechanism of FL40 / 55 / 70-1 series tractors

By adjusting the limit device (part adjustment method), the lifting height of the implement can be controlled freely. To prevent the excessive lifting of implement from causing breakage of power takeoff shaft due to improper operations during use, the users are requested to adjust as per the requirements of second adjustment method with reference to above figure during use.

(2) Adjustment method and requirements:

1. Adjust the lifting push plate on the right end of lifting shaft to adjust the height. Loosen the nut and adjust the limiting push plate counter-clockwise to increase the lifting height and clockwise to reduce.
2. While working with driven implement, adjust the lifting height for turning at turn-row in such manner that the ground clearance of the lifted implement is (150~250) mm.
3. Adjustment for long-distance transfer or road transfer: Adjust the position of limiting push plate in such manner

that the ground clearance is larger than 250mm at the lowest point of the lifted implement.

4. At completion of adjustment, tighten fasteners at all places.

8.12.2.2.Enforced-type oil cylinder adjustment:

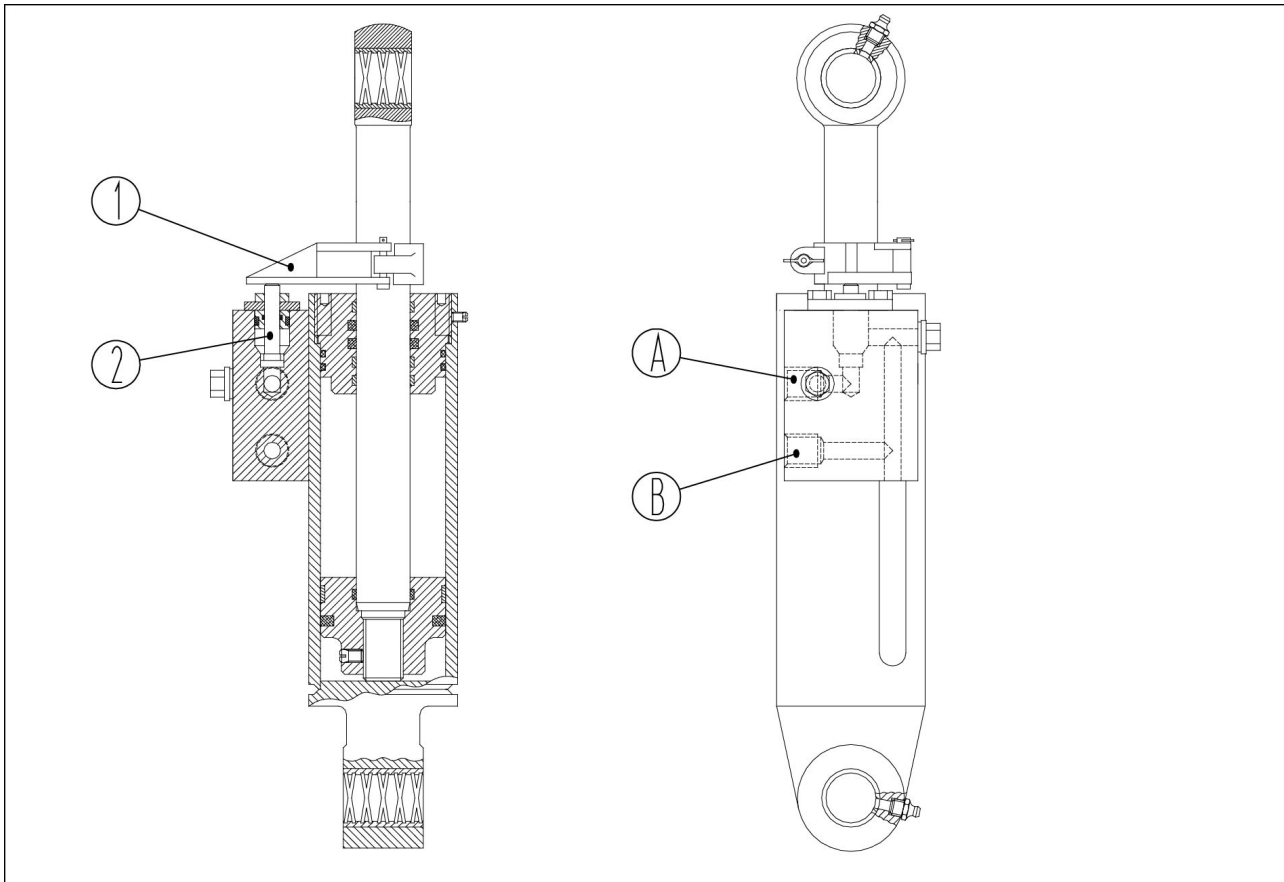


Fig. 8-71

Left lift cylinder assembly schematic

1. Locating clamp;	2. Locating valve;	A. Lower oil port;	B. Lift oil port;
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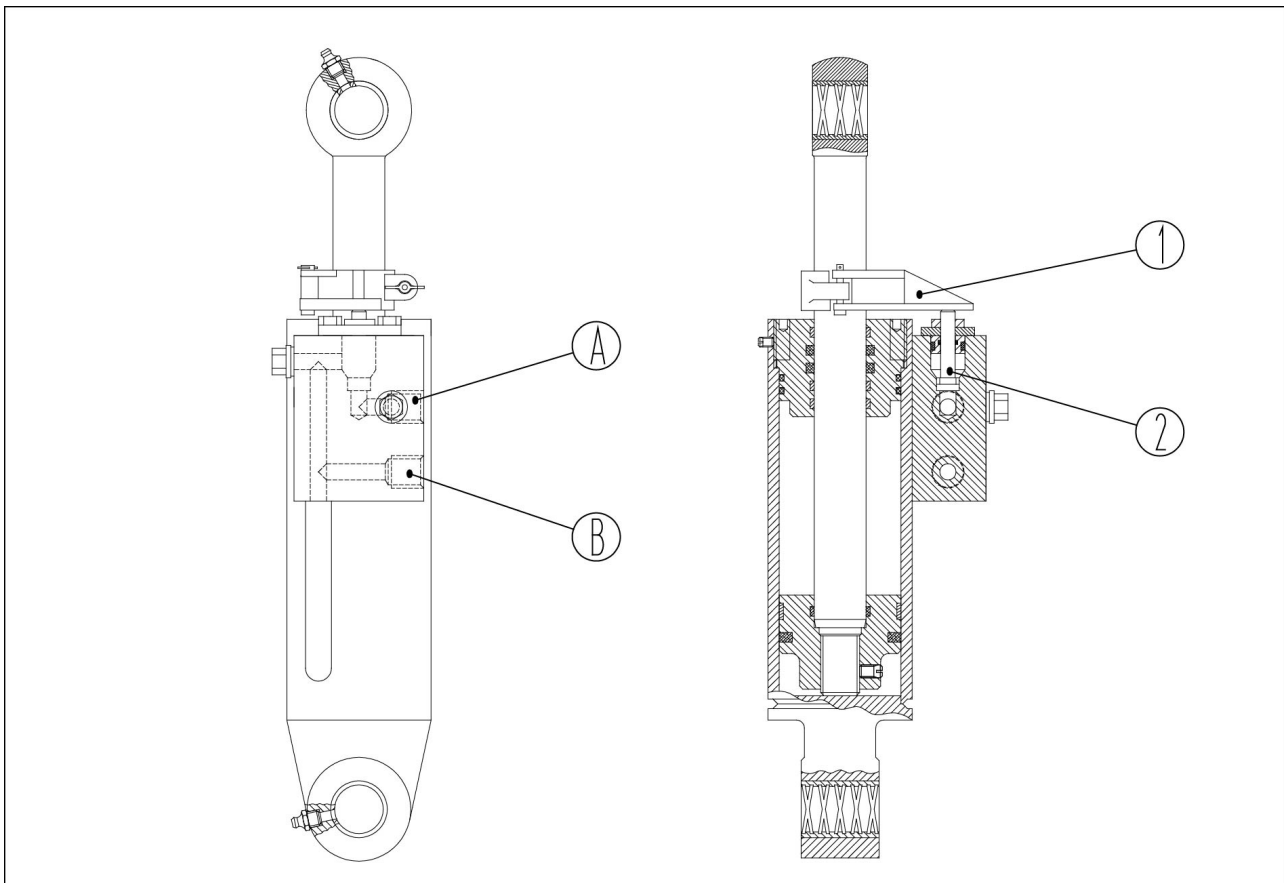


Fig. 8-72

Right lift cylinder assembly schematic

1. Locating clamp;	2. Locating valve;	A. Lower oil port;	B. Lift oil port;
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- **Shift to transport status:**

Lowering travel is determined by the positioning valves and positioning clip stoppers on the cylinders. The locating clamp block can be vertically adjusted on the piston rod. The lower its position is, the smaller the lowering extent is. The higher its position is, the larger the lowering extent is. During the lowering, if the locating valve is pushed by the locating clamp block, the lowering is stopped.

- **Adjustment:**

To guarantee the transport safety and reliability of implement, when the implement is lifted to the highest point, adjust the locating clamp ① to push down the locating adjustment valve ② to the end and block the oil line of cylinder lower chamber by locating valve, in order to prevent the further lowering.



Notice:

While adjusting the distance between locating clamp block and the locating valve, keep the consistent adjustment between two cylinders within an error of 0~0.5mm.

8.12.3. Structure and adjustment of the front shaft

8.12.3.1. Structure of the front shaft

With front wheel track adjustable, the front axle of tractor is a tube axle located in front of the diesel engine. The front axle bracket is connected to the diesel engine using six bolts. The sway shaft is supported by the front and rear ends of the bracket. The primary sleeve weldment assembly is put on the sway shaft. On both sides of the primary sleeve weldment assembly are the left and right secondary sleeves assemblies, which each are fixed with 3 bolts.

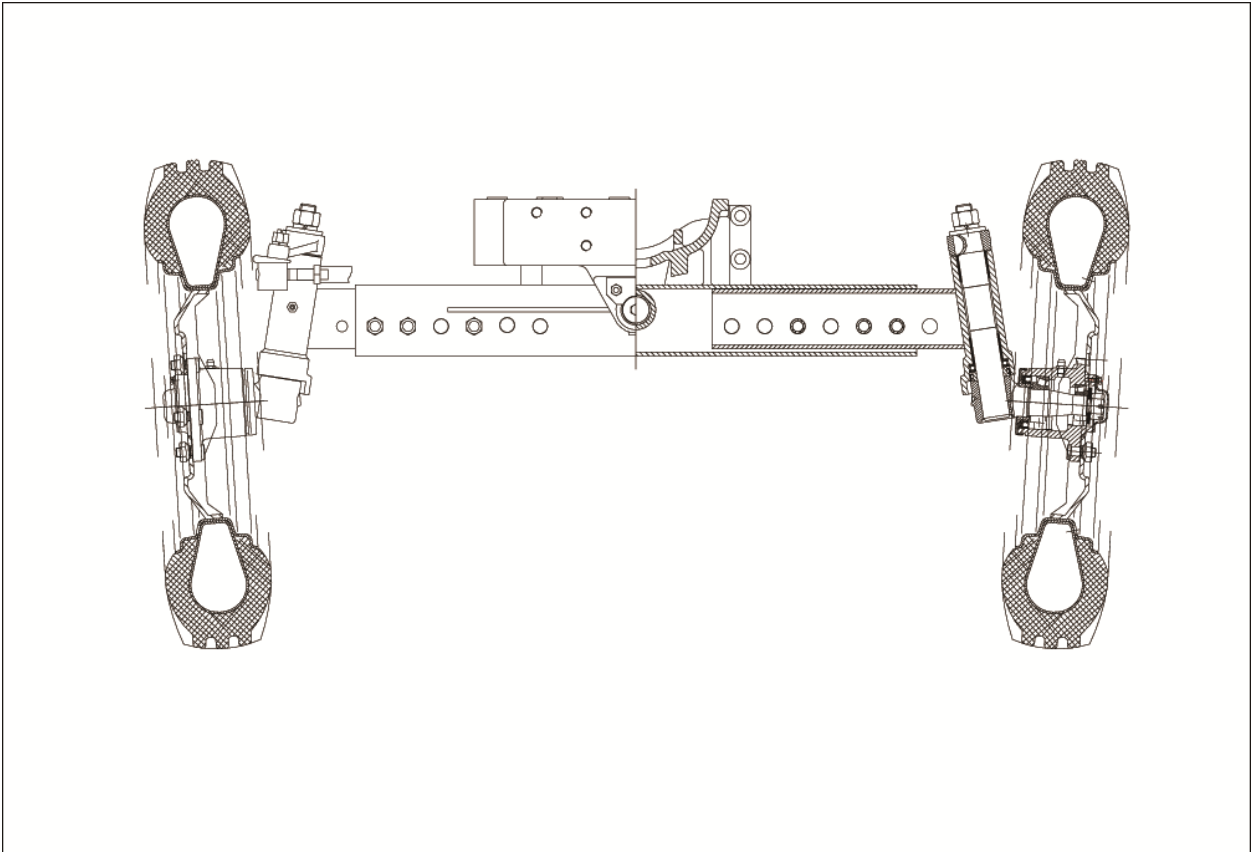


Fig. 8-73

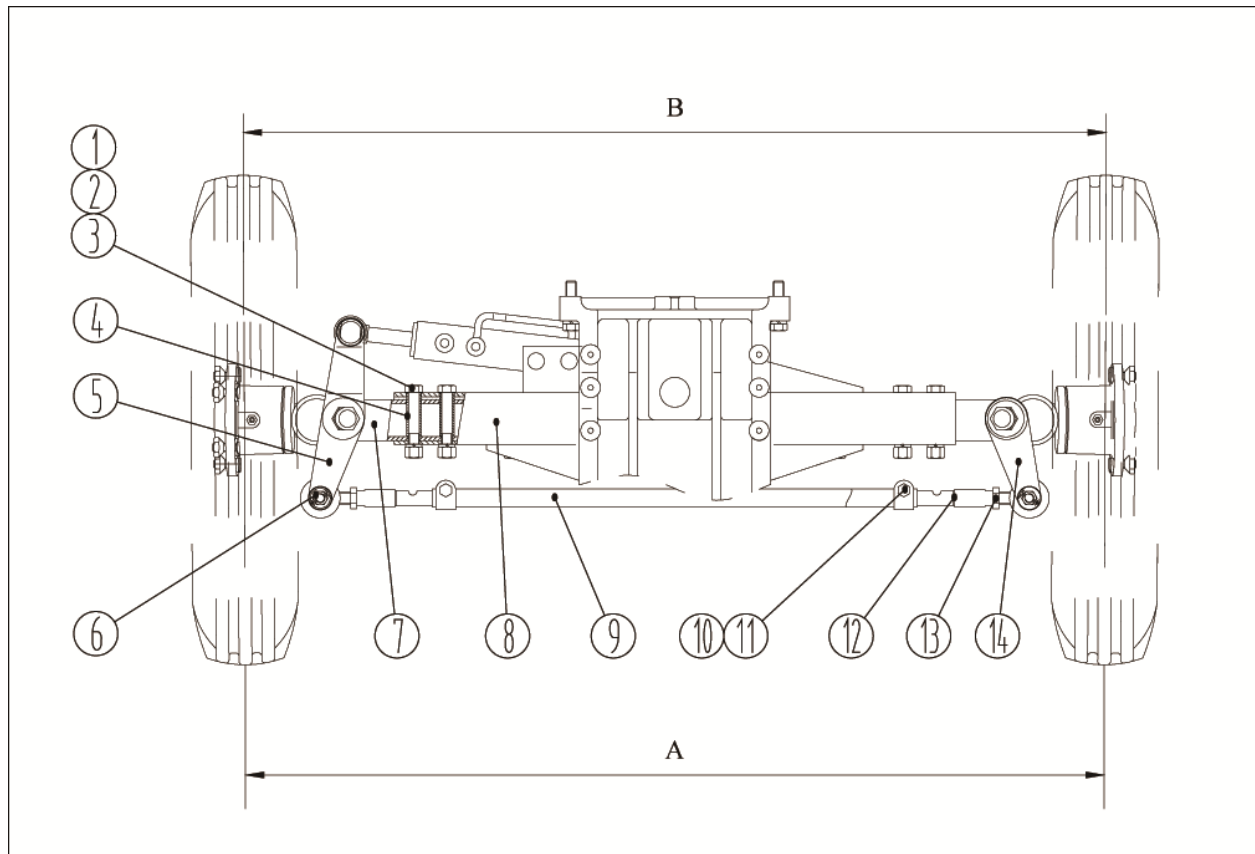


Fig. 8-74

1. Bolt	2. Nut	3. Washer	4. Cushion cover	5. Right steering arm	6. Nut	7. Auxiliary sleeve	8. Primary sleeve
9. Tie rod	10. Bolt	11. Nut	12. Left tie rod	13. Left-hand-thread nut	14. Left steering arm	15. Drag rod	

8.12.3.2.Adjustment of the front shaft

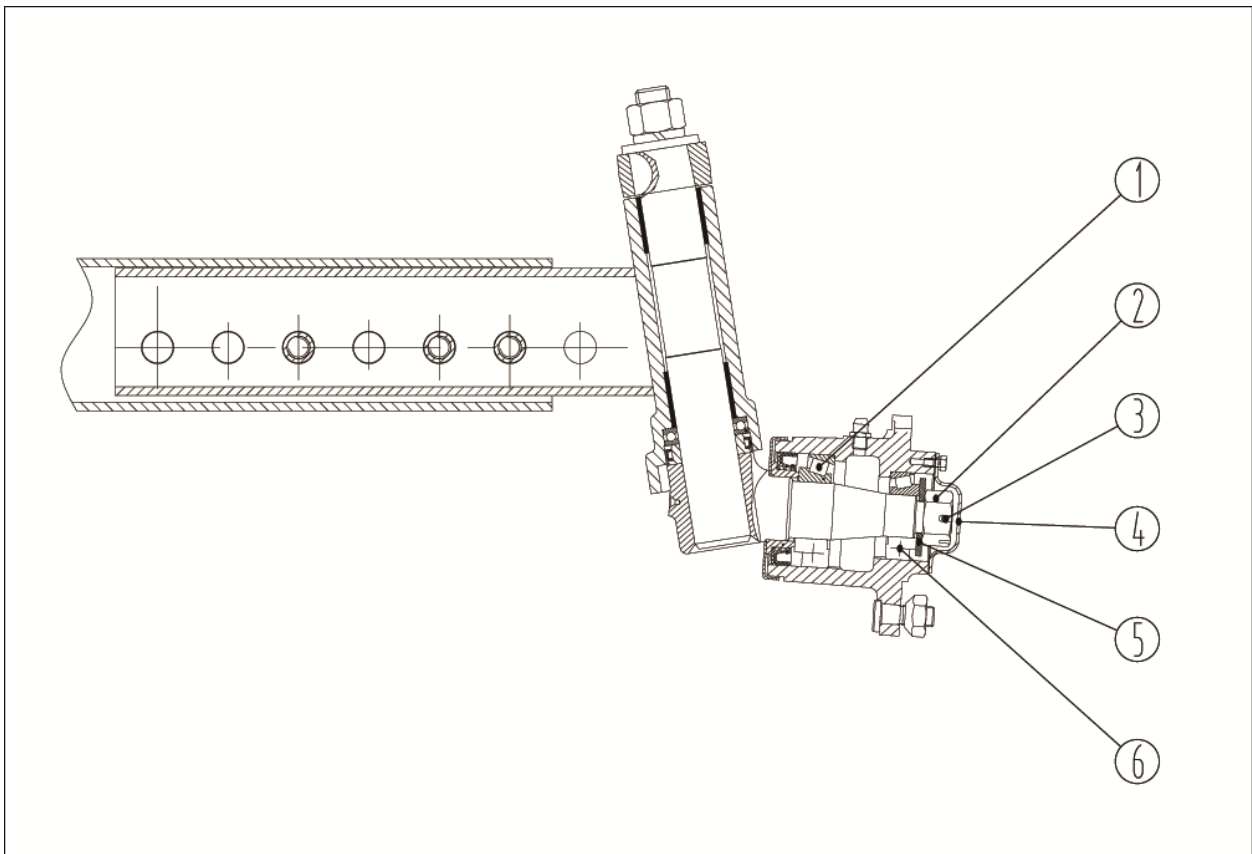


Fig. 8-75

1. Large bevel bearing	2. Slotted nut	3. Split pin	4. Bearing cap	5. Retainer ring	6. Small bevel bearings
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- **Adjustment to axial clearance of front wheel bearing:**

Normal axial clearance of front wheel bearing is (0.05 ~ 0.15) mm. If the clearance increases to 0.4mm (mm) during use of the tractor, adjustment shall be made to the bearing. Adjustment: jack up the front wheels off the ground. Remove the bearing cap, and pull out the cotter pin. Tighten the slotted nut until the bearing clearance disappears, then loosen the slotted nut by 1/30 to 1/10 turn. Refit the cotter pin and the bearing cap.

- **Adjustment of the front wheel toe-in:**

Front wheel toe-in shall be checked every 500 operating hours of tractor, or in the case of serious shake of front wheels or rapid wear of front tires. Correct toe-in shall be (4 ~ 8) mm. If actual value is outside the range, adjustment shall be made to the wheels. Adjustment: Park the tractor on the flat ground. Turn the steering wheel to the neutral position so that the two front wheels point straight ahead. Then loosen the left and right lock nuts of tie rod. Rotate the tie rod. At the height level with the axis of front wheels, and from the middle of tire width, measure the distance between the two measuring points when they face the front and when they face the rear. Record the two measurements as A and B, then the toe-in is equal to their difference, B-A, which shall be (4~8)mm. Adjust the

front wheels to achieve correct toe-in. Tighten the left and right lock nuts.

• Front wheel tread adjustment

Telescopic sleeve is used for adjusting wheel track, which shall be in the range of (1150 ~ 1450) mm, adjustable at increments of 100mm. Adjustment: Loosen the fixing nut of inner arm of front beam. Pull out the fixing bolt and bushing, as well as the tie rod fixing nut and bolt. Move the secondary sleeve assembly and secondary tie rod to desired position. Then tighten the bolts and nut.

8.12.4. Structure and adjustment of the steering unit

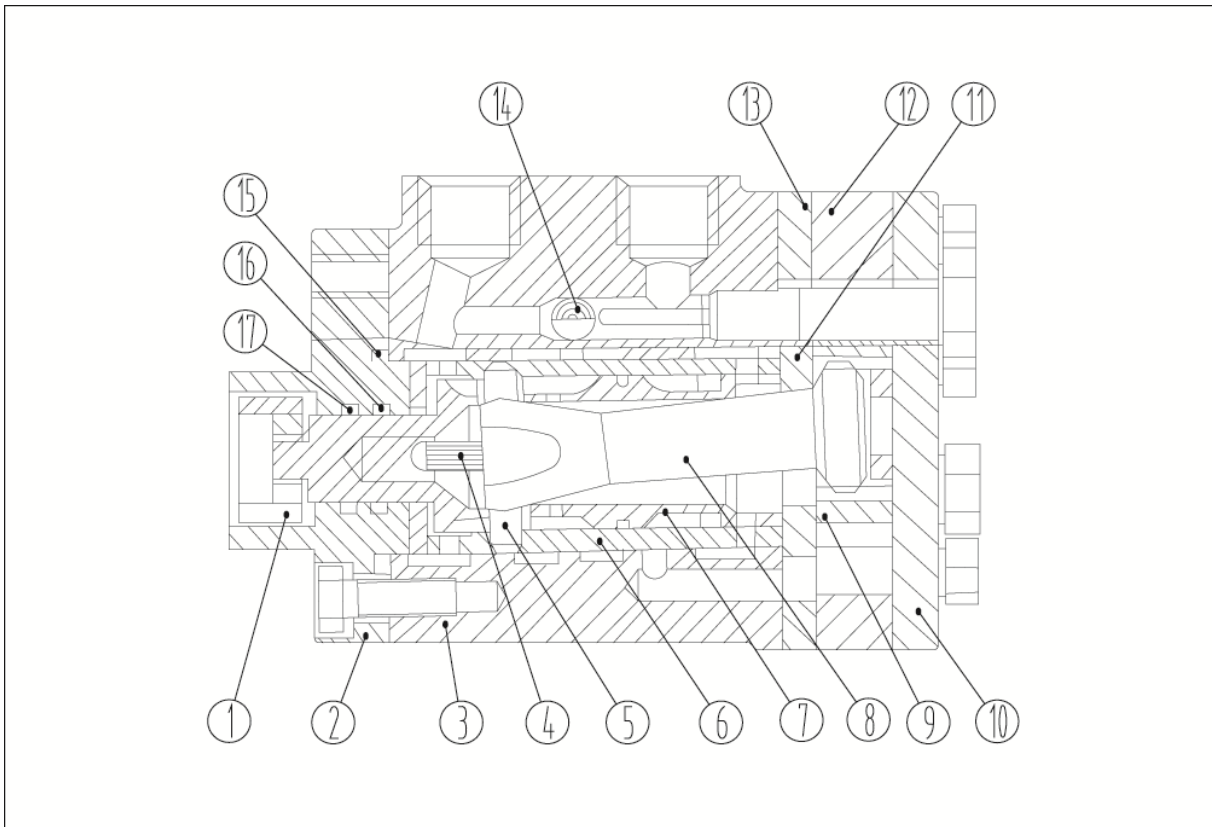


Fig. 8-76

Structure chart of hydrostatic steering unit

1. Cross-shaped link block	2. Front cover	3. Valve body	4. Spring piece	5. Pin	6. Valve bush
7. Valve element	8. Universal driving shaft	9. Rotor	10. Rear cover	11. Separating disk	12. Stator
13. O-ring	14. Steel ball	15. O-ring	16. X-ring	17. O-ring	

Prior to delivery of the tractor, the steering system is adjusted properly. The user should pay attention to following matters during operation:

- a) Frequently inspect screw connections, and if the screw connections are loosened, tighten them in time. During operation of the full hydraulic steering system, the connections cannot have leakage phenomena.
- b) Liquid level of the steering oil tank will be usually checked.
- c) If oil is not enough, oil will be added in accordance with requirements. In the process of utilization, if discovering hard steering or inflexible steering, reasons shall be carefully figured out (refer to the chapter II of the manual), the steering wheel cannot be moved with force and cannot be dismantled to prevent from damaging components. It is prohibited that the steering wheel is turned by two persons simultaneously.
- d) When a full hydraulic steering system is installed, the steering gear should ensure it is in line with the steering shaft, and an axial clearance exists. After installation, check the steering wheel for flexible return.
- e) Must ensure that the fluid is clean. Therefore, filter element of the filter and oil level shall be usually checked. Inspection method: Drop a fluid drip to a blotting paper; if the oil stain center is black, it indicates that the fluid should be replaced.
- f) After the hydraulic oil is replaced with new one, the gas in the oil cylinder should be removed completely. Gas removal method: Loosen the bolt joint of the steering oil cylinder to enable the oil pump to operate at low speed for outflowing until the drained oil does not contain foam. Dismantle the connection between the steering cylinder piston and direction wheel, and turn the steering wheel to enable the piston to move to the left or right position (it does not stop at both limit positions), and fill oil to the oil tank to the specified highest oil level. Tighten all threaded connections (which cannot be tightened under pressure) and connect the piston rod. Inspect whether the steering system operates normally in individual operating conditions.
- g) The constant /overflow pump is a precision part, and usually, no dismantling is allowed; if must be dismantled, it should be dismantled at a clean place, and cleaned with clean gasoline or kerosene.



Important:

Before delivery, safe overflow pressure of overflow valve of constant current overflow pump has been adjusted. Don't dismantle and adjust!

h)

8.12.5.Adjustment of Hydraulic Hitch system

8.12.5.1.Adjustment to the adjusting spring

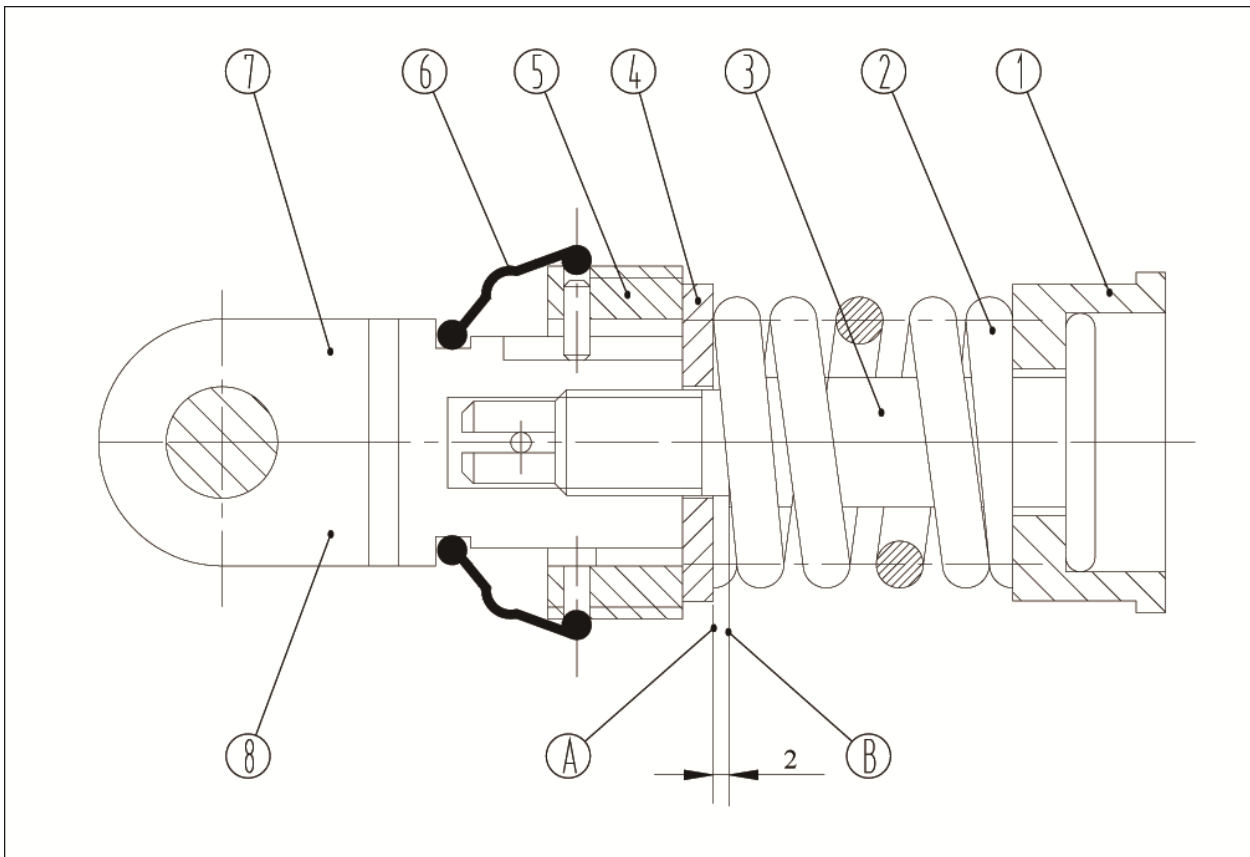


Fig. 8-77

Adjustment to the adjusting spring

1. Spring holder	2. Force-adjusting spring	3. Spring rod	4. Spring plate	5. Nut	6. Dust shield	7. Upper link joint	8. Pin
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Before placing the force-adjusting spring assembly in the lifter housing, rotate the upper link joint relative to the spring rod to eliminate clearance. Ensure the clearance between the plane A of spring plate and the plane B of spring rod is 2mm. Then insert the pin. Place the draft control spring assembly in the lifter housing. Rotate the nut so that the front end of the draft control spring assembly comes into contact with the plane E of the lifter housing. Then insert the pin through the nut hole.

8.12.5.2. Adjustment to the draft control lever and position control cam of lifter

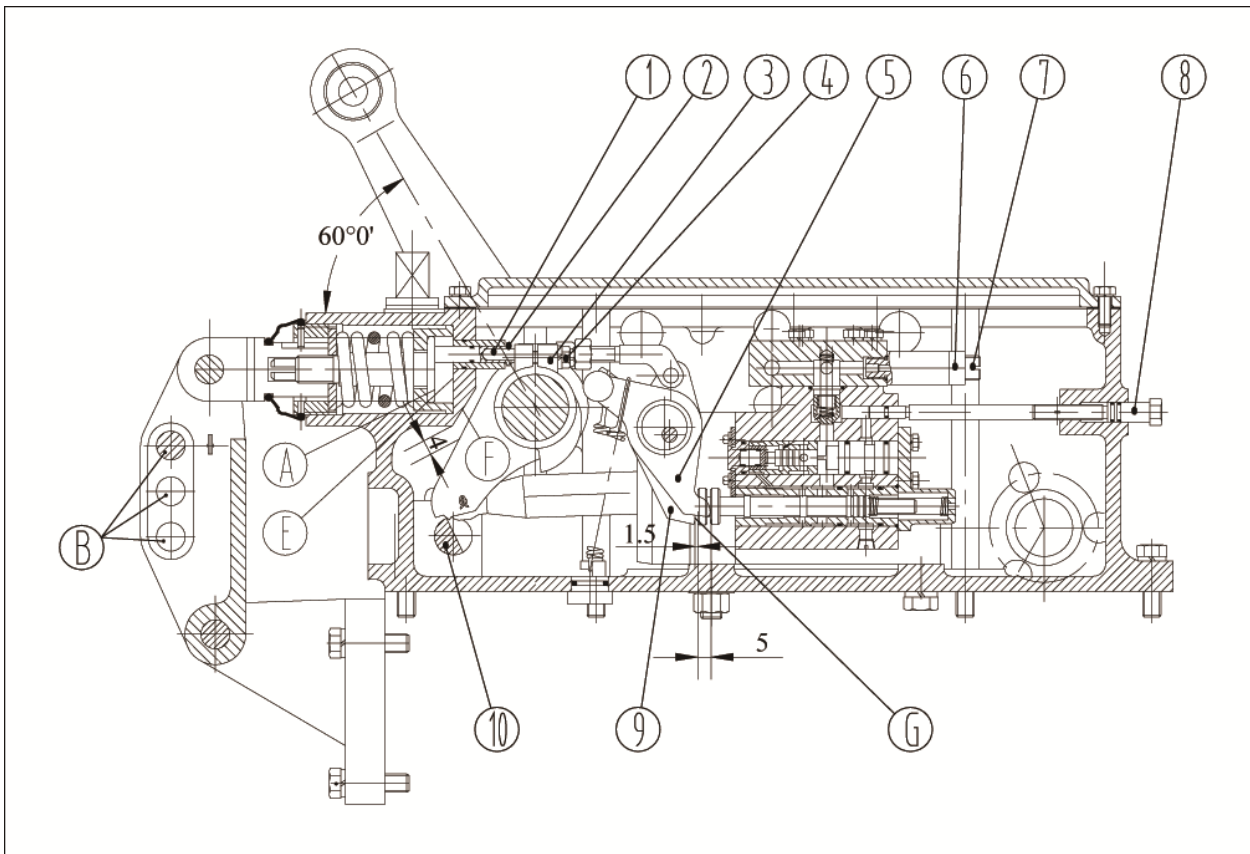


Fig. 8-78

Adjustment to draft control and position control

1. Draft control push rod	2. Draft control seal gland	3. Position control cam	4. Bolt	5. Position control lever
6. Lock nut	7. Pressure-adjusting stud	8. Cut-off valve and lowering valve adjusting lever	9. Draft control lever	10. Lock shaft assembly

Move the draft-adjusting handle and position-adjusting handle to the upper notch of sector plate (i.e. vertical to the lifter housing bottom), to achieve a clearance of 4mm between the inner lift arm and the rear inner surface of the lifter housing. At the moment, the outer lift arm forms an angle of 60° to the lifter housing bottom. Then adjust the draft-adjusting lever and the position-adjusting cam.

• Adjustment to the draft-adjusting lever

Adjust the force-adjusting push rod until the force-adjusting seal gland comes into contact with the plane A. Then adjust the force-adjusting push rod length to achieve a clearance of 1.5mm between the force-adjusting lever control end G and the main control valve end face (the main control valve is at the outermost position). Tighten the nut.

• **Adjustment to the position-adjusting cam**

Move the position-adjusting lever control end to the outermost position of main control valve. Rotate the position-adjusting cam to meet the roller of position-adjusting lever assembly. With the roller of position-adjusting lever in contact with the position-adjusting cam, rotate clockwise the position-adjusting cam until the position-adjusting lever control end pushes the main control valve to the neutral position(that is, the main control valve moves inwardly by 5mm from the outermost position). At the moment, the force-adjusting lever control end is 6.5mm apart to the main control valve end face. Then fix the position-adjusting cam to the lift shaft using the bolt.

8.12.6.Structure and adjustment of front drive axle

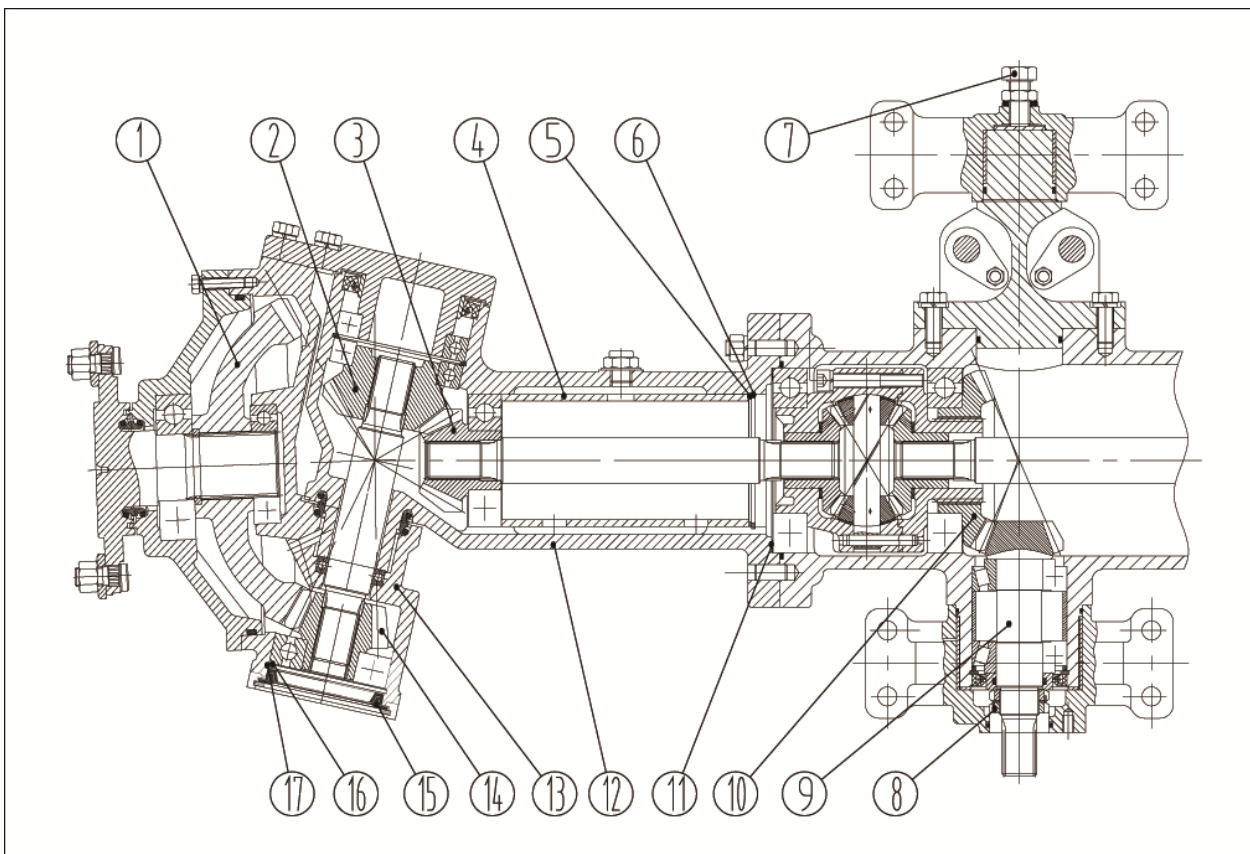


Fig. 8-79

Structure and adjustment of front drive axle assembly

1. Big gear wheel of final drive	2. Passive gear wheel	3. Semi-axis driving gear	4. Large spacer bush	5. Adjustable pad	6. Retainer ring
7. M16 adjusting bolt	8. Small round nut	9. Front central driving gear	10. Front central passive wheel gear	11. Adjustable pad	12. Axle shaft sleeve
13. Shell of	14. Driving gear of final	15. Sealed	16. Adjustable	17. Retainer	



final drive	drive	cap	ble pad	ring	
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8.12.6.1.Adjustment of toe-in

Adjustment method is the same to relevant contents of two wheel drive front axle assembly

8.12.6.2.Structure and adjustment of front drive axle assembly

The power of front drive is transmitted to the front central drive via transmission shaft by the transfer case. The front central drive will distribute power to semi-axle on two sides. Then, power will be transmitted to front and rear drives so that front driving wheel is rotating.

In the process of field operation, especially under situation that paddy filed operation condition is relatively severe, muddy water will easily enter into end faces of front and rear linings to damage end faces and increase axial movement. Normal axial movement can be maintained by adjusting M16 bolt in the front of the front supporting seat.

- **Adjustment of central drive part:**

After two bearings on driving gear of the front central drive has been used for certain period, axial displacement will be increased. Therefore, small round nut will be tightened to reduce axial displacement of the bearing. When adjusting, the bearing cannot have load. Small round nut will be tightened. Then, (1/25-1/15) ring will be returned. At last, small round nut will be tightened. Manually rotate and input bevel gear shaft that shall be rotated flexibly.

Gear back lash of bevel gear pair of front central drive and mesh imprint will obtain good mesh imprint by increasing or reducing adjusting pad (contact spot: it is not less than 50% along the direction of height of tooth and it is not less than 50% along the direction of length of tooth. In addition, it need be slightly close to little end) and suitable gear back lash (0.2-0.4) mm. Adjustment method is the same to adjustment method of contact imprint of central bevel gear pair and gear backlash. When the back lash between driving gear of front central drive and driven gear is enlarged, it can become normal by adding adjusting pad on the left side of the front differential mechanism.

Attention: large and small bevel pinions of central drive are supporting bevel pinions, which cannot be assembled in disorder. When replacing, it shall be replaced in pairs, which shall be replaced together with the bearing, otherwise, it will affect its lifetime.

- **Adjustment of two pairs of bevel gear pair**

Pinions on front and rear drives installed on the main pin and bevel gear and bearing installed on bearing and semi-axle will generate abrasion after being used for a long term so that the back lash of bevel gear pair will become bigger. Therefore, it must be adjusted. Adjustment method is as below: loosen purge cock on the lower end of the central drive, open the sealed cap on the rear drive shell and discharge lubricating oil.

A. After the axle shaft sleeve is separated from final drive casing, adjustment will be conducted in accordance with



gap of gear engagement (0.15-0.25)mm and contact spot (it is not less than 50% along the direction of height of tooth and it is not less than 50% along the direction of length of tooth). If the gasket is increased, the back lash will be reduced. After the gap of gear engagement and contact imprint has been adjusted, axle shaft sleeve and retainer ring for hole in the connecting terminal of final drive casing will be dismantled. Distance from the spacer bush and retainer ring groove will be measured, which is the height of the adjusting pad. Then the adjusting pad will be placed and retainer ring for hole will be installed.

B. Retainer ring and sealed cap will be dismantled underneath the main pin.. Adjustment will be conducted in accordance with gap of gear engagement (0.15-0.25) mm and contact spot (it is not less than 50% along the direction of height of tooth and it is not less than 50% along the direction of length of tooth). If the gasket is increased, the back lash will be reduced. After back lash and contact imprint of the wheel gear have been adjusted, the distance from 6308 bearing and retainer 90 for hole will be measured. This distance is also the thickness of the adjusting pad. Then, adjusting pad will be placed, retainer ring 90 for hole, sealed cap and retainer ring 102 will be installed.

After adjustment is completed, front axle will be recovered. Front wheel must be wrenched by hand, which shall be able to freely rotate and cannot have abnormal sound. Then, lubricating oil will be injected into the center of oil lever and screw plug of the oil filler will be tightened.

Operation Instructions

9. Troubleshooting

Operation Instructions

9.1.Towing the Tractor

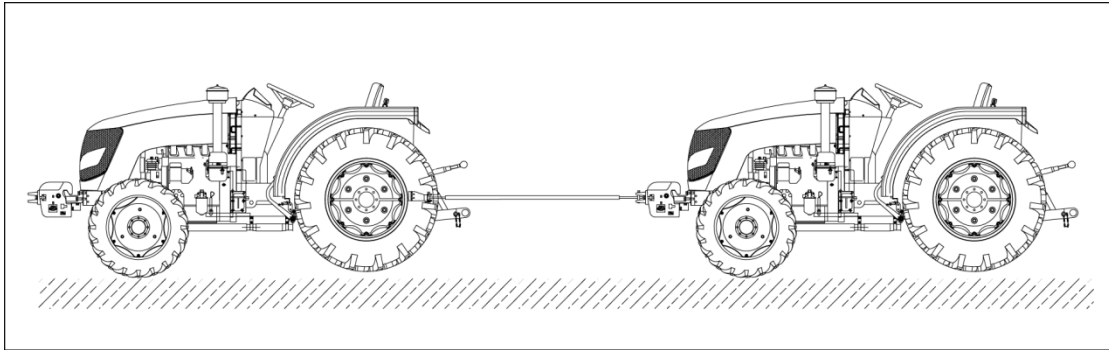


Fig. 9-1

The tractor can be towed for a short distance only ,e.g., tow the tractor out of a building.

The faulty tractor should be towed for a minimum and necessary distance to eliminate potential hazard.

Abide by all highway rules and relevant national laws and regulations regarding towing of the tractor.

	Notice: 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.
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	Notice: When the tractor is towed, a driver must remain in the tractor to control it.
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	Danger: During towing, access to the driver's seat is prohibited absolutely without authorization.
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9.1.1.Towing with the engine being operated

In case of being capable of ensuring forced lubrication of the transmission, the tractor can be towed with the engine being operated:

Operation Instructions

- Engine speed: 1200-1300rpm
- Maximum towing speed: 8km/h
- Maximum towing distance: 1km

Only the standard bar on the front drawhook approved by the manufacturer is used for towing of the tractor.

Ensure that the drawhook 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 shift 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.

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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.

Operation Instructions



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 down



Important:

Under the circumstance that the engine is shut down and the forced transmission lubrication system is failed, the tractor can only be loaded onto the transportation vehicle and transported to the service center.

9.1.3.

Under the circumstance that the engine is shut down 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

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 hitch 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 roll over protection, the roll over protection 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.

Operation Instructions

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.
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	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.
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	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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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

This section describes possible faults, causes and remedies, so as to solve problems related to the tractor clutch.

9.4.1.Chassis faults and troubleshooting

Operation Instructions

9.4.1.1.Clutch faults and troubleshooting

Symptoms	Causes	Solutions
The clutch is not disengaged thoroughly.	1. The idle stroke of the pedal is too big, and the working stroke is too small. 2. The driven plate is warped excessively. 3. Heads of 3 release levers are not in a same plane.	1. Re-adjust it as required. 2. Replace 3. Adjustment
The tractor jitters during startup	1. The main friction plate and driven plate is stained with grease. 2. The friction plate breaks. 3. The driven plate is warped. 4. The release levers are not in a same plane.	1. Wash it with gasoline. 2. Replace 3. Correction 4. Adjustment
The clutch slips.	1. The friction plate and pressure plate are oil stained. 2. The friction plate is worn unevenly or excessively, or the rivet is exposed. 3. The disc spring pressure becomes weak. 4. The free travel is small, and the release levers are not in a same plane. It comes into contact with the release bearing. 5. The driven plate is deformed.	1. Clean it with gasoline, and eliminate the oil leakage fault. 2. Have the friction plate replaced. 3. Replace 4. Re-adjust it as required. 5. Have the driven plate replaced.
When depressing the clutch pedal fully, the PTO shaft cannot stop rotating.	1. The pedal stop bolt is not at right position. 2. The pressure plate of the PTO shaft clutch is not separated fully.	1. Adjustment 2. Re-adjust it as required.

9.4.1.2.Transmission faults and troubleshooting

Symptoms	Causes	Solutions
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Operation Instructions

The transmission produces abnormal sound or knocking sound.	1. The gear tooth flank is worn excessively or the tooth flank peels off, or is cracked, or the gear tooth is broken. 2. The bearing is worn excessively or damaged. 3. The lubricating oil quantity is insufficient or the quality does not meet requirements	1. Replace the gear with a new one. 2. Replace the bearing 3. Replenish or replace the lubricating oil.
The gear is shifted difficultly or cannot be engaged.	1. The clutch is not disengaged thoroughly. 2. The engagement sleeve, spline shaft gear end is worn or notched.	1. Adjust the clutch 2. Repair or replace it.
Spontaneous out-of-gear	1. The locating groove of the fork shaft is worn. 2. The shift fork shaft locking spring becomes weak or broken. 3. The engagement sleeve spline is worn.	1. Repair or replace it. 2. Replace the locking spring. 3. Replace the sliding gear with engagement sleeve.

9.4.1.3.

9.4.1.3.Rear axle faults and troubleshooting

Symptoms	Causes	Solutions
The noise from the main drive gets louder.	1. A clearance between the driving helical bevel gear bearings appears. 2. The gear is engaged abnormally. 3. The differential shaft is worn or gets seized. 4. The planetary gear or gasket is worn. 5. The differential bearing is worn or damaged.	1. Adjust the clearance 2. Re-adjust the meshing marks and clearance; the backlash meets requirements specified in the instructions. 3. Replace 4. Replace 5. Replace
The driving helical bevel bearing and differential shaft is over-heated.	1. The bearing is pre-tightened excessively. 2. It is lubricated poorly.	1. Re-adjust it. 2. Check the oil level, and replenish it in case that the oil is insufficient.

9.4.1.4.

9.4.1.4.Brake faults and troubleshooting

Operation Instructions

Symptoms	Causes	Solutions
The brake is failed.	1. The friction plate is worn seriously or eccentrically. 2. The running clutch pedal travel is too big.	1. Replace 2. Adjustment
During braking, the tractor deviates from the lane.	1. The travel of the left/right brake pedals is different. 2. The brake friction plate on one side is damaged. 3. Pressure of two rear tires is different.	1. Adjustment 2. Replace 3. Have the tires inflated according to specified inflation pressure.
The tractor jitters during startup.	1. Free travel of the running clutch pedal is too small. 2. The return spring force of the pedal is too small.	1. Adjustment 2. Replace
The brake is not separated fully, and gets heat.	1. The parking brake is not released. 2. Free travel of the running clutch pedal is too small.	1. Release the parking brake. 2. Adjustment

9.4.1.5.

9.4.1.5.Front drive axle fault and troubleshooting (four-wheel drive model)

Symptoms	Causes	Solutions
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Operation Instructions

The front tires are worn seriously.	(1) The front wheel rim or spoke is deformed seriously. (2) The toe-in is adjusted improperly. (3) The connection between the steering knuckle and cylinder is worn seriously. (4) The tire pressure is insufficient when the tractor works for a long time. (5) The engaging handle of the front drive axle is not released during transportation. (6) The front drive wheel tires are installed reversely.	(1) Correct the front wheel rim or spoke. (2) Adjust the toe-in. (3) Replace the pin. (4) Check the tire pressure and inflate the tires as required. (5) Release the front drive axle. (6) Re-install the tires as required.
The front wheels wobbles.	(1) The clamping nuts and bolts of the ball pin, cylinder, steering swing arm get loosed. (2) The toe-in is adjusted improperly. (3) The clearance between bearings is too big or the bearing is worn seriously. (4) The steering kingpin is worn seriously. (5) The front wheel rim is deformed seriously.	(1) Check whether it is fastened securely. (2) Adjust the toe-in. (3) Adjust or replace the bearing. (4) Replace the steering kingpin. (5) Correct the front wheel rim.
The noise is too louder.	(1) The meshing mark of the front main drive gear is poor. (2) The clearance between main drive bearings is too big or the bearing is damaged. (3) The differential shaft is worn or damaged. (4) The planetary gear or gasket is worn. (5) The final drive gear pairs are meshed improperly.	(1) Re-adjust the meshing mark. (2) Adjust or replace the bearing. (3) Replace the differential shaft. (4) Replace the planetary gear or gasket. (5) Adjust the final drive gear.
The drive shaft and protective sleeve get heat.	(1) The drive shaft is bent or deformed seriously, or subject to friction. (2) The middle supporting bearing pedestal is loosened.	(1) Correct or replace the drive shaft. (2) Tighten it as required.

Operation Instructions

9.4.1.6.

9.4.2. Steering unit and running system fault and troubleshooting (four-wheel drive model)

Symptoms	Causes	Solutions
The free travel of the steering system is too big.	1. The thrust bearing of the steering gear is damaged. 2. The screws, nuts and balls of the steering gear are worn. 3. The toothed sector or rack is worn.	1. Replace the bearing or adjust it. 2. Replace the worn parts. 3. Adjustment
The mechanical and hydraulic steering is too heavy.	1. The upper ball race of the thrust bearing for the steering system is over-tightened. 2. The front tire pressure is too low. 3. The oil supply quantity of the gear oil pump is insufficient, internal leakage of the gear oil pump occurs, or the strainer in the steering oil tank is clogged. 4. Air is trapped in the steering system, so the oil cylinder does not work normally when turning the steering wheel. 5. The oil in the steering oil tank is insufficient. 6. The spring force of the safety valve is weak, or the ball loses sealing effect. The steering wheel is turned lightly at light load, and heavily with load being increased. 7. The fluid viscosity is too big. 8. The ball non-return valve in the valve body is failed, the steering wheel is turned heavily during fast or slow turning, and the steering is weak. 9. The steering system is subject to oil leakage, including internal leakage (oil cylinder) and external leakage.	1. Tighten the upper ball race correctly. 2. Have it inflated as required. 3. Check whether the gear oil pump works normally, and clean the strainer. 4. Remove the air trapped in the system, and check whether air enters the oil suction pipeline. 5. Refill the oil to the specified oil level. 6. Clean the safety valve and adjust the pressure spring of the safety valve. 7. Use the specified fluid. 8. Clean, maintain or replace it. 9. Check and eliminate the oil leakage.

Operation Instructions

Symptoms	Causes	Solutions
The front wheels wobbles.	1. The clearance between the bevel bearing of the front wheel is too big. 2. The steering ball head is worn seriously. 3. The gasket between the rocker shaft and bracket is worn. 4. The toe-in is adjusted improperly. 5. The front wheel is deformed seriously.	1. Adjust the clearance to the requirements specified. 2. Replace 3. Replace 4. Adjustment 5. Correction
Early wear of the tires takes place.	1. The toe-in is adjusted improperly. 2. The tire pressure is not appropriate. 3. The drive wheel tires are installed reversely.	1. Adjustment 2. Have the tires inflated as required. 3. Re-install them
The hydraulic steering gear is failed.	1. The release pin is broken or deformed. 2. The open end of the universal driving shaft is broken or deformed. 3. The rotor and universal driving shaft are not installed at right position. 4. The piston of the steering oil cylinder or the sealing ring of the piston is damaged.	1. Replace the release pin. 2. Replace the universal driving shaft. 3. Re-assemble them. 4. Replace the piston or sealing ring.
During hydraulic steering, the steering wheel cannot return to the neutral position automatically.	1. The leaf spring is broken. 2. The steering shaft is not concentric with the steering column casing, and the steering resistance is big. 3. The steering shaft is against the valve spool axially. 4. The pressure drop at the neutral position is too big or the steering gear is unloaded when the steering wheel stops turning. 5. The steering shaft is not concentric with the valve spool.	1. Replace the leaf spring. 2. Repair or replace it. 3. Repair it. 4. Repair or replace it. 5. Re-install and adjust them.

Operation Instructions

Symptoms	Causes	Solutions
Hydraulic steering without hand steering.	1. The clearance between the rotor and stator is too big. 2. The sealing performance of the oil cylinder piston is poor, and during power steering, the cylinder piston reaches the limit position and the driver cannot feel it apparently; when steering with a big force, the steering wheel	1. Replace the rotor and stator. 2. Replace the piston sealing ring.

9.4.3.

9.4.3.Hydraulic system faults and troubleshooting

Symptoms	Causes	Solutions
The lifting force is weak or the hydraulic system cannot lift the device.	1. The oil level is too low or the oil specification is not correct. 2. The oil suction filter is clogged. 3. The hydraulic system sucks air. 4. The oil pump is worn seriously, and internal leakage is serious. 5. The main control valve or oil return valve gets stuck. 6. The main control valve or oil return valve is worn seriously. 7. The safety valve is failed. 8. The oil leakage of the oil cylinder gets serious. 9. Oil leaks from sealing rings in the distributor.	1. Refill sufficient acceptable oil as required. 2. Clean the strainer. 3. Remove the air trapped, and tighten the coupling or replace the sealing ring. 4. Replace the sealing ring of the oil pump. 5. Raise the control handle of the lifter for several times, and use a driver to toggle the main control valve; if it is stuck continuously, remove it for cleaning. 6. Replace the worn parts. 7. Re-adjust or repair it. 8. Replace the sealing ring, and if necessary, replace the worn parts. 9. Replace the sealing ring

Operation Instructions

The implement cannot be lowered.	1. The main control valve or oil return valve gets stuck. 2. The lowering speed regulating valve or block valve is closed.	1. Operate the control handle of the lifter for several times in a reciprocated manner, and use a driver to toggle the main control valve; if it is stuck continuously, remove it for cleaning. 2. Open the valve.
The tractor wobbles during lifting of the implement.	1. The non-return valve is worn, and not closed tightly. 2. The distributor, oil cylinder and sealing rings have oil leakage problem.	1. Repair or replace the non-return valve. 2. Find out the oil leakage point, and replace the sealing ring.
During use of simple hydraulic output, no pressure oil is available or the oil pressure is too low.	1. The block valve has no cut-off oil pipeline. 2. The force control handle or position control handle is set at the lowering position. 3. The external lifting arm is at the lifting position. 4. During use of a quick-change connector, the valve spool with a female connector or male connector is stuck, and the oil line is blocked.	1. Tighten the block valve into the housing in sequence to block the oil line. 2. Set the force and position control handles to the lifting position. 3. Enable the external lift arm to be at lowering position. 4. Replace the quick-change connector

9.4.4.

9.4.4.Electric system faults and troubleshooting

Symptoms	Causes	Solutions
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Operation Instructions

The starter motor does not operate.	1. The wire is broken or contacts poorly. 2. The battery is power off or its voltage is too low. 3. The carbon brush comes contact with the commutator, or the commutator is contaminated. 4. The wire in the starter motor is broken, shorted or bonded.	1. Weld it or replace it with a new one. 2. Charge the battery. 3. Adjust the carbon brush spring pressure, and clean the commutator. 4. Check and eliminate short-circuit and breakage problems.
The starter motor gets weak, or the engine cannot be started.	1. The bearing is worn seriously, and the armature rubs against the housing. 2. Contact of the carbon brush with the commutator is poor. 3. The commutator surface is burned out or oil-stained. 4. The conductor contacts poorly. 5. The main contact of the electromagnetic switch is burned out, or it contacts poorly. 6. The battery is not charged sufficiently or its voltage is too low.	1. Replace the bearing with a new one. 2. Adjustment 3. Remove the oil stains, and use a No. 0 non-metal sand paper for polishing. 4. Tighten the nut firmly. 5. Remove the oil stains, and use a No. 0 non-metal sand paper for polishing. 6. Charge the battery.
The generator cannot produce power.	The armature is open.	Check and eliminate the open-circuit fault.
The generator is charged insufficiently or the current is unstable.	1. The V-belt of the fan slips, and the diesel engine speed decreases. 2. The line connection gets loosened. 3. The armature is failed. 4. The regulator is failed.	1. Adjust tensioning degree of the V-belt. 2. Tighten the screw firmly. 3. Check and eliminate the open-circuit fault. 4. Check and eliminate the open-circuit fault.

Operation Instructions

The battery is under-charged frequently.	1. The alternator or regulator is failed, or no charging current is available. 2. The wire in the charging line is loosened. 3. The pole plate is shorted.	1. Inspect the alternator or regulator, and if discovered that the regulator contact is in poor contact condition, it is required to used #0 non-metal sand paper for polishing. 2. Check whether the battery connector and connecting bolt are loosened, and if necessary, tighten them. 3. Maintenance
The battery is over-charged (the distilled water consumption is too much, and electrolyte is leaked from the vent).	The regulator cannot maintain normal voltage of the alternator.	Adjustment

9.4.5.

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 5 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.
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	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 oil and 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.
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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 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 10°C.
6. Empty oil in the engine when the engine is warm, and fill new oil, as well as have the engine operated at low speed for several minutes, so that the 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 diesel in the diesel 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 hitch 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.

17.

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 2 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 oil and 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.

7.

10.4.Unpackaging of the Tractor

1. Remove the anti-rusting grease.
2. Open the sealed ports. Clean the tractor.
3. Fill coolant, oil and diesel 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 the FL35-70HP series 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.

8.

Tractor Storage and Unpack

11. Delivery Acceptance and Transportation

Delivery Acceptance and Transportation

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 hitch 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.

Delivery Acceptance and Transportation

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 roll over protection, the roll over protection 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.

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 assemblies 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 oil should be disposed properly in a centralized manner, and cannot be poured at any place at will, so as to avoid environmental pollution.



Warning:

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.

Dismantling the discarded and damaged battery is prohibited, but should be carried out by a professional disposal organization.



Warning:

The fuel is a kind of combustible, and during disposal, smoke and open fire should be prohibited!



Warning:

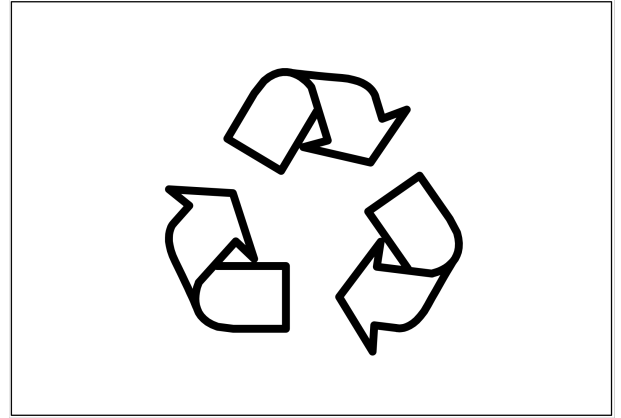
When dismantling the large object or heavy object, must use a special hoisting tool and pay attention to personal safety!



Danger:

Without special dismantling tool and actual operating experience, improper placement during and after dismantling may cause personal injury.

- 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 oil, fuel, 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.



Warranty Contents

13. Warranty Contents

Warranty Contents

13.1.Basis for Product Warranty

The FL35-70HP Series 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 1, 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 FL35-70HP Series tractors.

	Important: Some behaviors may invalidate the warranty conditions. For details, see the Three-guarantee Service Card.
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	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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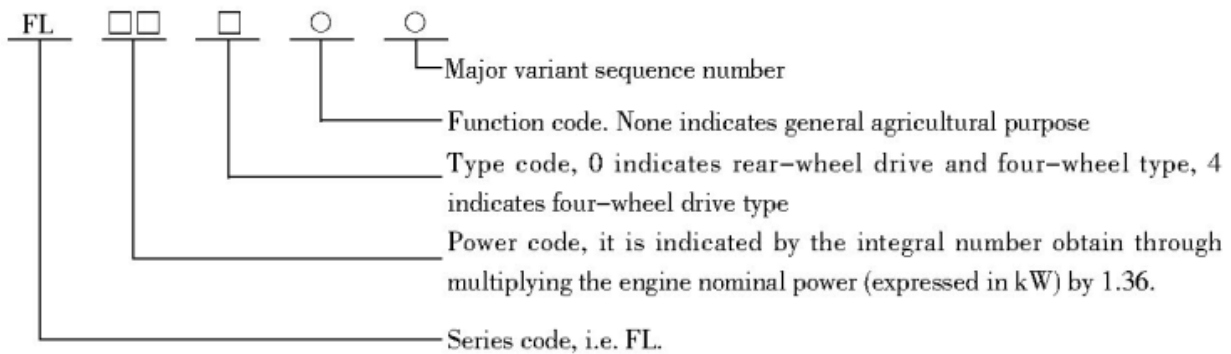
Main technical specifications of the tractor

14. Main Technical Specifications of the Tractor

14.1. Model of Product

The meaning of the tractor product model is as follows:

Main technical specifications of the tractor



Corresponding power is as follows:

Power corresponding to the product model:

The power rating of FL354/FL354C wheeled tractor is 25.8 kW (kilowatt) [35PS]

The power rating of FL400/ FL400C/FL404/FL404C wheeled tractor is 29.4 kW (kilowatt) [40PS]

The power rating of FL 450/ FL 450C/ FL 454/ FL 454C wheeled tractor is 33.1 kW (kilowatt) [45PS]

The power rating of FL 500/ FL 500C/ FL 504/ FL 504C wheeled tractor is 36.8 kW (kilowatt) [50PS]

The power rating of FL 554/ FL 554C/ FL 554-1/ FL 554C-1 wheeled tractor is 40.4 kW (kilowatt) [55PS]

The power rating of FL 604/ FL 604C wheeled tractor is 44KW (kilowatt) [60PS]

The power rating of FL 704-1/ FL 704C-1 wheeled tractor is 51.5KW (kilowatt) [70PS]

Executive standard:

GB/T 15370.1 General requirement of agricultural tractors—Part 1: below 50 kW wheeled tractors

GB/T 15370.2 General requirement of agricultural tractors - Part 2: 50 kW~130 kW wheeled tractors

14.2.Product Specifications

FL354/FL400/FL404/FL450/FL454

Main technical specifications of the tractor

Items		Unit	FL354	FL400	FL404	FL450	FL454
Type		——	4 × 4 wheeled tractor	4 × 2 wheeled tractor	4 × 4 wheeled tractor	4 × 2 wheeled tractor	4 × 4 wheeled tractor
Rated traction force		kN	10.5	8.3	11	8.5	11.3
Overall dimension	Length (including front ballast and rear hitch)	mm	3790	3790		3790	
	Width (common wheel track and measured from outer edge of standard tire)	mm	1585	1620		1620	
	Height (Measured from the ground to the top of the muffler, and standard tires)	mm	2105	2130		2130	
Wheel base		mm	1992	1968	1992	1968	1992
Wheel tread (standard tires)	Front wheel	mm	1250	1200-1500 (common 1300)	1250	1200-1500 (common 1300)	1250
	Front wheel adjustment mode	——	Fixed	Continuously adjustable	Fixed	Continuously adjustable	Fixed
	Rear wheel	mm	1200, 1300, 1400, 1500 (common 1300)/1300-1500				
	Rear wheel adjustment mode	——	Adjustable stepwise/adjustable steplessly				
Ground clearance	Minimum ground clearance	mm	265	400	325	400	325
	Agricultural ground clearance	mm	325	450	375	450	375
Minimum radius of turning circle	Conducting single-side braking	m	3.8±0.3	3.3±0.3	3.8±0.3	3.3±0.3	3.8±0.3
	No single-side braking is conducted	m	4.3±0.3	3.7±0.3	4.3±0.3	3.7±0.3	4.3±0.3
Structure mass		kg	1972	1710	1980	1710	1980
Minimum operating mass		kg	2112	1850	2120	1850	2120
Mass distributing	Front wheel	kg	950	725	950	725	950
	Rear wheel	kg	1162	1125	1170	1125	1170
Ballast	Front ballast	kg	108/144				
	Rear ballast	kg	90/180				
Transmiss	Clutch	——	Single disk, dry type, double-acting clutch				

Main technical specifications of the tractor

Items				Unit	FL354	FL400	FL404	FL450	FL454
ion	Transmission			——	Combined type; 4 × (2 + 1) gear, gear shift with sliding sleeve / combined type; 4 × 2 × (1 + 1) gear, gear shift with sliding sleeve/ combined type; 4 × 3 × (1 + 1) gear, gear shift with sliding sleeve				
	Rear axle	Main drive		——	Helical bevel gear pair				
		Differential unit		——	Two-planet-wheel, closed type				
		Differential lock		——	Pin type				
		Rear final drive		——	Planetary gear				
	Front axle	Front axle		——	——	Telescopic sleeve type	——	Telescopic sleeve type	——
	Front drive axle	Drive shaft		——	Drive shaft in the center	——	Drive shaft in the center	——	Drive shaft in the center
		Front main drive		——	Closed bevel gear	——	Closed bevel gear	——	Closed bevel gear
		Front differential unit		——	Closed type, two planetary bevel gears	——	Closed type, two planetary bevel gears	——	Closed type, two planetary bevel gears
		Front final drive		——	Spiral bevel gear	——	Spiral bevel gear	——	Spiral bevel gear
Running System	Frame			——	Without frame				
	Tire pressure	Front wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)	167 ~186 (field operations) / 225 ~ 245 (transport operations)	118 ~138 (field operations) / 167 ~ 176 (transport operations)	167 ~186 (field operations) / 225 ~ 245 (transport operations)	118 ~138 (field operations) / 167 ~ 176 (transport operations)
		Rear wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)				
	Tire specification	Standard:	Front wheel	——	7.50-16	6.0-16	8.3-20	6.0-16	8.3-20
			Rear wheel	——	11.2-28	12.4-28			
Brake	Service brake			——	Wet-type, disc brake				

Main technical specifications of the tractor

Items			Unit	FL354	FL400	FL404	FL450	FL454
system	Parking brake		——	Mechanical manual brake				
	Trailer brake control		——	Inflation , air brake				
Steering system	Method		——	Front wheel hydraulic steering				
	Steering unit		——	Cycloid rotary valve type full hydraulic steering				
Working device	Hydraulic system type		——	Center open; semi-split type / center open; split type				
	Hydraulic oil pump		——	Gear pump, CBN-E316FL				
	Distributor		——	Slide valve type				
	Oil cylinder	Diameter×stroke	mm	100×112/100×116/75×110				
		Type	——	Single-action/Double-action				
	Hitch point dimension		mm	Rear three-point hitch: Class 1 Connecting hole× width: Upper hitch point: φ19.3×44 Lower hitch point: φ22.4×35 /Rear three-point hitch: Class 2 Connecting hole× width: Upper hitch point: φ25.2×451 Lower hitch point: φ28.7×45				
	Plowing depth adjustment method		——	Force adjustment, position adjustment, force-position integrated control / position adjustment, floating control				
	Maximum lifting force of the system [610 mm after hitch point]		kN	5.8	6.62		7.5	
	Opening pressure of safety valve		MPa	17.5±0.5				
	Hydraulic output	Type	——	Simple hydraulic output or multi-way valve				
		Quantity	——	Simple hydraulic output / one pair of hydraulic outputs / 2 pair of hydraulic outputs / 3 pair of hydraulic outputs				
		Specifications	——	M22×1.5				
PTO shaft	Type		——	Rear non-independent or semi-independent				
	Specifications		——	Type 1 (φ35 × 6 teeth or φ38 × 8 teeth)				
	Revolving speed		r/min	540/760 or 540/1000				
	Lower limit of nominal power of PTO shaft		kW	21.9	25		28.2	
Towing device	Diameter of connecting pin		mm	40				
	Connecting pin		mm	577				
Electric instrumen	Electrical system		——	12V negative grounding, dual-wire system				
	Power generator	Model	——	JF11/JF1511/JFWZ17P-1W				

Main technical specifications of the tractor

Items			Unit	FL354	FL400	FL404	FL450	FL454
Electrical system		Voltage	V	14				
		Power	kW	0.35/0.5/0.75				
	Regulator	Model	—	Included in the electrical box				
		Regulating voltage	V	14				
	Starter	Model	—	QDJ157Y/QDJ1409/ QDJ1409E1-P				
		Voltage	V	12				
		Power	kW	3.2/3.0/3.7				
	Storage battery	Model	—	6-QW-120				
		Voltage	V	12				
		Capacity	A·h (Ampere hour)	120				
		Quantity	—	1				
	Light and signal device	Headlamp	—	12V, 55 / 60W combined type				
		Front steering light	—	12V, 21W, 2				
		Front position light	—	12V, 5W, 2				
		Rear combination light	—	Width lights 5W, turn signals 21W, brake lights 21W, and reflectors (red), one on each side				
		Rear working light	—	12V, 35W, 2				
		Trailer socket	—	1 seven-hole socket with a plug				
	Monitoring and warning device	Combination instrument	—	1 piece, with tachometer, engine hour meter, water temperature gauge, fuel gauge				
		Warning device	—	1. Charging indicator light, left and right turn indicator lights, indicator lights for position lights, and indicator light for high beam headlight; 2. Air brake fault warning light (select for tractor equipped with an air brake), and low oil pressure warning light; 3. Reflector; 4. Safety warning label.				

Main technical specifications of the tractor

Notice: The parameters given in the technical specifications table are based on standard configuration.

FL500/FL504/FL554-1

Items		Unit	FL500	FL504	FL554-1
Type		—	4 × 2 wheeled tractor	4 × 4 wheeled tractor	4 × 4 wheeled tractor
Rated traction force		kN	9	14	14.5
Overall dimension	Length (including front ballast and rear hitch)	mm	3790		3970
	Width (common wheel track and measured from outer edge of standard tire)	mm	1620		
	Height (Measured from the ground to the top of the muffler, and standard tires)	mm	2130		
Wheel base		mm	1968	1992	2041
Wheel tread (standard tires)	Front wheel	mm	1200, 1300, 1400, 1500 (common 1300)	1250	1250
	Front wheel adjustment mode	—	Continuously adjustable	Fixed	Fixed
	Rear wheel	mm	1200, 1300, 1400, 1500 (common 1300)/1300-1500		
	Rear wheel adjustment mode	—	Adjustable stepwise/adjustable steplessly		
Ground clearance	Minimum ground clearance	mm	400	325	325
	Agricultural ground clearance	mm	450	375	375
Minimum radius of turning circle	Conducting single-side braking	m	3.3±0.3	3.8±0.3	4.3±0.3
	No single-side braking is conducted	m	3.7±0.3	4.3±0.3	4.7±0.3
Structure mass		kg	1870	1965	2190
Minimum operating mass		kg	2030	2135	2360
Mass distributing	Front wheel	kg	830	885	1020
	Rear wheel	kg	1200	1250	1340
Ballast	Front ballast	kg	108 or 144		
	Rear ballast	kg	90/180		
Transmission	Clutch	—	Single disk, dry type, double-acting clutch		
	Transmission	—	Combined type; 4 × (2 + 1) gear, gear shift with sliding sleeve / combined type; 4 × 2 × (1 + 1) gear, gear shift with sliding sleeve/ combined type; 4 × 3 × (1 + 1) gear, gear shift with sliding sleeve		

Main technical specifications of the tractor

Items				Unit	FL500	FL504	FL554-1
	Rear axle	Main drive		——	Helical bevel gear pair		
		Differential unit		——	Four-planet-gear, closed type		
		Differential lock		——	Pin type		
		Rear final drive		——	Planetary gear		
	Front axle	Front axle		——	Telescopic sleeve type	——	——
	Front drive axle	Drive shaft		——	——	Drive shaft in the center	Drive shaft in the center
		Front main drive		——	——	Closed bevel gear	Closed bevel gear
		Front differential unit		——	——	Closed type, two planetary bevel gears	Closed type, two planetary bevel gears
		Front final drive		——	——	Spiral bevel gear	Spiral bevel gear
Running System	Frame			——	Without frame		
	Tire pressure	Front wheel		kPa	167 ~186 (field operations) / 225 ~ 245 (transport operations)	118 ~138 (field operations) / 167 ~ 176 (transport operations)	118 ~138 (field operations) / 167 ~ 176 (transport operations)
		Rear wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)		
	Tire specification	Standard:	Front wheel	——	6.0-16	8.3-20	8.3-20
			Rear wheel	——	12.4-28		
Brake system	Service brake			——	Wet-type disc brake		
	Parking brake			——	Mechanical manual brake		
	Trailer brake control			——	Inflation , air brake		
Steering system	Method			——	Front wheel hydraulic steering		
	Steering unit			——	Cycloid rotary valve type full hydraulic steering		
Working device	Hydraulic system type			——	Center open; semi-split type / center open; split type		
	Hydraulic oil pump			——	Gear pump,CBN-E316FL		
	Distributor			——	Slide valve type		
	Oil cylinder	Diameter×stroke		mm	100×112/100×116/75×110		
		Type		——	Single-action/Double-action		

Main technical specifications of the tractor

Items			Unit	FL500	FL504	FL554-1
	Hitch point dimension		mm	Rear three-point hitch: Class 1 Connecting hole× width: Upper hitch point: φ19.3×44 Lower hitch point: φ22.4×35 /Rear three-point hitch: Class 2 Connecting hole× width: Upper hitch point: φ25.2×451 Lower hitch point: φ28.7×45		
	Plowing depth adjustment method		——	Force adjustment, position adjustment, force-position integrated control / position adjustment, floating control		
	Maximum lifting force of the system (610mm after hitch point)		kN	≥8.3	≥9.1	
	Opening pressure of safety valve		MPa	17.5±0.5		
	Hydraulic output	Type	——	Simple hydraulic output or multi-way valve		
		Quantity	——	Simple hydraulic output / one pair of hydraulic outputs / 2 pair of hydraulic outputs / 3 pair of hydraulic outputs		
Specifications		——	M22×1.5			
PTO shaft	Type		——	Rear semi-independent type		
	Specifications		——	Type 1 (φ35 × 6 teeth or φ38 × 8 teeth)		
	Revolving speed		r/min	540/760 or 540/1000		
	Lower limit of nominal power of PTO shaft		kW	31.3	34.4	
Towing device	Diameter of connecting pin		mm	40		
	Connecting pin		mm	577		
Electric instrument system	Electrical system		——	12V negative grounding, dual-wire system		
	Power generator	Model	——	JF1511/JFWZ17P-1W	JFW17/JFW17P-01/JFW19	
		Voltage	V	14		
		Power	kW	0.5/0.75/1		
	Regulator	Model	——	Included in the electrical box		
		Regulating voltage	V	14		
	Starter	Model	——	QDJ1409E1-P/ QDJ1409	QDJ1409F-P/QDJ1409	
		Voltage	V	12		
		Power	kW	3.7		
	Storage battery	Model	——	6-QW-120		
		Voltage	V	12		
		Capacity	A·h (Ampere · hour)	120		
		Quantity	——	1		
	Light and signal device	Headlamp	——	12V, 55 / 60W combined type		
		Front steering light	——	12V, 21W, 2		

Main technical specifications of the tractor

Items			Unit	FL500	FL504	FL554-1
		Front position light	—	12V, 5W, 2		
		Rear combination light	—	Width lights 5W, turn signals 21W, brake lights 21W, and reflectors (red), one on each side		
		Rear working light	—	12V, 35W, 2		
		Trailer socket	—	1 seven-hole socket with a plug		
	Monitoring and warning device	Combination instrument	—	1 piece, with tachometer, engine hour meter, water temperature gauge, fuel gauge		
		Warning device	—	1. Charging indicator light, left and right turn indicator lights, indicator lights for position lights, and indicator light for high beam headlight; 2. Air brake fault warning light (select for tractor equipped with an air brake), and low oil pressure warning light; 3. Reflector; 4. Safety warning label.		

FL554/FL604

Items		Unit	FL554	FL604
Type		—	4 × 4 wheeled tractor	4 × 4 wheeled tractor
Rated traction force		kN	14.5	15
Overall dimension	Length (including front ballast and rear hitch)	mm	3970	
	Width (common wheel track and measured from outer edge of standard tire)	mm	1620	
	Height (Measured from the ground to the top of the muffler, and standard tires)	mm	2130	
Wheel base		mm	2041	2041
Wheel tread (standard tires)	Front wheel	mm	1250	1250
	Front wheel adjustment mode	—	Fixed	Fixed
	Rear wheel	mm	1200, 1300, 1400, 1500 (common 1300)/1300-1500	
	Rear wheel adjustment mode	—	Adjustable stepwise/adjustable steplessly	
Ground clearance	Minimum ground clearance	mm	325	325
	Agricultural ground clearance	mm	375	375

Main technical specifications of the tractor

Items				Unit	FL554	FL604
Minimum radius of turning circle	Conducting single-side braking			m	4.3±0.3	4.3±0.3
	No single-side braking is conducted			m	4.7±0.3	4.7±0.3
Structure mass				kg	2190	2190
Minimum operating mass				kg	2360	2360
Mass distributing	Front wheel			kg	1020	1020
	Rear wheel			kg	1340	1340
Ballast	Front ballast			kg	108/144	
	Rear ballast			kg	90/180	
Transmission	Clutch			——	Single disk, dry type, double-acting clutch	
	Transmission			——	Combined type, 4 × 3 × (1 + 1), Gear shift with sliding sleeve	
	Rear axle	Main drive		——	Helical bevel gear pair	
		Differential unit		——	Four-planet-gear, closed type	
		Differential lock		——	Pin type	
		Rear final drive		——	Planetary gear	
	Front axle	Front axle		——	——	——
	Front drive axle	Drive shaft		——	Drive shaft in the center	Drive shaft in the center
		Front main drive		——	Closed bevel gear	Closed bevel gear
		Front differential unit		——	Closed type, two planetary bevel gears	Closed type, two planetary bevel gears
		Front final drive		——	Spiral bevel gear	Spiral bevel gear
Running System	Frame			——	Without frame	
	Tire pressure	Front wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)	118 ~138 (field operations) / 167 ~ 176 (transport operations)
		Rear wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)	
	Tire specification	Standard:	Front wheel	——	8.3-20	8.3-20
			Rear wheel	——	12.4-28	
Brake system	Service brake			——	Wet-type disc brake	

Main technical specifications of the tractor

Items			Unit	FL554	FL604
	Parking brake		—	Mechanical manual brake	
	Trailer brake control		—	Inflation , air brake	
Steering system	Method		—	Front wheel hydraulic steering	
	Steering unit		—	Cycloid rotary valve type full hydraulic steering	
Working device	Hydraulic system type		—	Center open; semi-split type / center open; split type	
	Hydraulic oil pump		—	Gear pump,CBN-E316	
	Distributor		—	Slide valve type	
	Oil cylinder	Diameter×stroke	mm	100×116/75×110	
		Type	—	Single-action/Double-action	
	Hitch point dimension		mm	Rear three-point hitch: Class 2 Connecting hole× width: Upper hitch point: $\phi 25.2 \times 451$ Lower hitch point: $\phi 28.7 \times 45$	
	Plowing depth adjustment method		—	Force adjustment, position adjustment, force-position integrated control / position adjustment, floating control	
	Maximum lifting force of the system [610mm after hitch point]		kN	≥ 9.1	≥ 9.9
	Opening pressure of safety valve		MPa	17.5±0.5	
	Hydraulic output	Type	—	Simple hydraulic output or multi-way valve	
		Quantity	—	Simple hydraulic output / one pair of hydraulic outputs / 2 pair of hydraulic outputs / 3 pair of hydraulic outputs	
		Specifications	—	M22×1.5	
PTO shaft	Type		—	Rear semi-independent type	
	Specifications		—	Type 1 ($\phi 35 \times 6$ teeth or $\phi 38 \times 8$ teeth)	
	Revolving speed		r/min	540/760 or 540/1000	
	Lower limit of nominal power of PTO shaft		kW	34.4	37.5
Towing device	Diameter of connecting pin		mm	40	
	Connecting pin		mm	577	
Electric instrument system	Electrical system		—	12V negative grounding, dual-wire system	
	Power generator	Model	—	JFW17/JFW17P-01/JFW19	

Main technical specifications of the tractor

Items			Unit	FL554	FL604
		Voltage	V	14	
		Power	kW	0.75/1	
	Regulator	Model	—	Included in the electrical box	
		Regulating voltage	V	14	
	Starter	Model	—	QDJ1409F-P/QDJ1409	
		Voltage	V	12	
		Power	kW	3.7	
	Storage battery	Model	—	6-QW-120	
		Voltage	V	12	
		Capacity	A·h (Ampere · hour)	120	
		Quantity	—	1	
	Light and signal device	Headlamp	—	12V, 55 / 60W combined type	
		Front steering light	—	12V, 21W, 2	
		Front position light	—	12V, 5W, 2	
		Rear combination light	—	Width lights 5W, turn signals 21W, brake lights 21W, and reflectors (red), one on each side	
		Rear working light	—	12V, 35W, 2	
		Trailer socket	—	1 seven-hole socket with a plug	
	Monitoring and warning device	Combination instrument	—	1 piece, with tachometer, engine hour meter, water temperature gauge, fuel gauge	
		Warning device	—	1. Charging indicator light, left and right turn indicator lights, indicator lights for position lights, and indicator light for high beam headlight; 2. Air brake fault warning light (select for tractor equipped with an air brake), and low oil pressure warning light; 3. Reflector; 4. Safety warning label.	

Main technical specifications of the tractor

Items			Unit	FL704-1
Type			——	4 × 4 wheeled tractor
Rated traction force			kN	16.5
Overall dimension	Length (including front ballast and rear hitch)		mm	3970
	Width (common wheel track and measured from outer edge of standard tire)		mm	1828
	Height (Measured from the ground to the top of the muffler, and standard tires)		mm	2200
Wheel base			mm	2071
Wheel tread (standard tires)	Front wheel		mm	1250, 1350(common 1350)
	Front wheel adjustment mode		——	Fixed
	Rear wheel		mm	1300, 1450, 1500 (common 1450)/1300-1500
	Rear wheel adjustment mode		——	Adjustable stepwise/adjustable steplessly
Ground clearance	Minimum ground clearance		mm	370
	Agricultural ground clearance		mm	430
Minimum radius of turning circle	Conducting single-side braking		m	4.4±0.3
	No single-side braking is conducted		m	4.8±0.3
Structure mass			kg	2190
Minimum operating mass			kg	2360
Mass distributing	Front wheel		kg	1020
	Rear wheel		kg	1340
Ballast	Front ballast		kg	108/144
	Rear ballast		kg	160/320/480
Transmission	Clutch		——	Single disk, dry type, double-acting clutch
	Transmission		——	Combined type, 4 × 3 × (1 + 1), Gear shift with sliding sleeve
	Rear axle	Main drive	——	Helical bevel gear pair
		Differential unit	——	Four-planet-gear, closed type
		Differential lock	——	Pin type
		Rear final drive	——	Planetary gear
	Front axle	Front axle	——	——

Main technical specifications of the tractor

Items				Unit	FL704-1
	Front drive axle	Drive shaft		——	Drive shaft in the center
		Front main drive		——	Closed bevel gear
		Front differential unit		——	Closed type, two planetary bevel gears
		Front final drive		——	Spiral bevel gear
Running System	Frame			——	Without frame
	Tire pressure	Front wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)
		Rear wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)
	Tire specification	Standard:	Front wheel	——	8.3-24
			Rear wheel	——	14.9-30
Brake system	Service brake			——	Wet-type disc brake
	Parking brake			——	Mechanical manual brake
	Trailer brake control			——	Inflation , air brake
Steering system	Method			——	Front wheel hydraulic steering
	Steering unit			——	Cycloid rotary valve type full hydraulic steering
Working device	Hydraulic system type			——	Center open; semi-split type / center open; split type
	Hydraulic oil pump			——	Gear pump,CBN-E316
	Distributor			——	Slide valve type
	Oil cylinder	Diameter×stroke		mm	100×116/70×110
		Type		——	Single-action/Double-action
	Hitch point dimension			mm	Rear three-point hitch: Class 2 Connecting hole× width: Upper hitch point: φ25.2×451 Lower hitch point: φ28.7×45
	Plowing depth adjustment method			——	Force adjustment, position adjustment, force-position integrated control / position adjustment, floating control
	Maximum lifting force of the system [610mm after hitch point]			kN	≥12.4
	Opening pressure of safety valve			MPa	17.5±0.5
	Hydraulic output		Type	——	Simple hydraulic output or multi-way valve

Main technical specifications of the tractor

Items			Unit	FL704-1
		Quantity	—	Simple hydraulic output / one pair of hydraulic outputs / 2 pair of hydraulic outputs / 3 pair of hydraulic outputs
		Specifications	—	M22×1.5
PTO shaft	Type		—	Rear independent
	Specifications		—	Type 1 (φ35 × 6 teeth or φ38 × 8 teeth)
	Revolving speed		r/min	540/760 or 540/1000
	Lower limit of nominal power of PTO shaft		kW	43.75
Towing device	Diameter of connecting pin		mm	40
	Connecting pin		mm	577
Electric instrument system	Electrical system		—	12V negative grounding, dual-wire system
	Power generator	Model	—	JFW17/JFW17P-01/JFW19
		Voltage	V	14
		Power	kW	0.75/1
	Regulator	Model	—	Included in the electrical box
		Regulating voltage	V	14
	Starter	Model	—	QDJ1409F-P/QDJ1409
		Voltage	V	12
		Power	kW	3.7
	Storage battery	Model	—	6-QW-120
		Voltage	V	12
		Capacity	A·h (Ampere hour)	120
		Quantity	—	1
	Light and signal device	Headlamp	—	12V, 55 / 60W combined type
		Front steering light	—	12V, 21W, 2
		Front position light	—	12V, 5W, 2
		Rear combination light	—	Width lights 5W, turn signals 21W, brake lights 21W, and reflectors (red), one on each side
		Rear working light	—	12V, 35W, 2
		Trailer socket	—	1 seven-hole socket with a plug

Main technical specifications of the tractor

Items			Unit	FL704-1
	Monitoring and warning device	Combination instrument	——	1 piece, with tachometer, engine hour meter, water temperature gauge, fuel gauge
		Warning device	——	1. Charging indicator light, left and right turn indicator lights, indicator lights for position lights, and indicator light for high beam headlight; 2. Air brake fault warning light (select for tractor equipped with an air brake), and low oil pressure warning light; 3. Reflector; 4. Safety warning label.

FL354C/FL400C/FL404C/FL450C/FL454C

Items			Unit	FL354C	FL400C
Type			——	4 × 4 wheeled tractor	4 × 2 wheeled tractor
Rated traction force			kN	10.5	8.3
Overall dimension	Length (including front ballast and rear hitch)		mm	3790	3790
	Width (common wheel track and measured from outer edge of standard tire)		mm	1585	1620
	Height (to the cab roof, and equipped with standard tires)		mm	2483	2510
Wheel base			mm	1992	1968
Wheel tread (standard tires)	Front wheel		mm	1250	1200-1500 (common 1300)
	Front wheel adjustment mode		——	Fixed	Continuously adjustable
	Rear wheel		mm	1200~1500 (common 1300)/1300	
	Rear wheel adjustment mode		——	Adjustable stepwise/adjustable step	
Ground clearance	Minimum ground clearance		mm	265	400
	Agricultural ground clearance		mm	325	450
Minimum radius of turning circle	Conducting single-side braking		m	3.8±0.3	3.3±0.3
	No single-side braking is conducted		m	4.3±0.3	3.7±0.3
Structure mass			kg	2060	1890
Minimum operating mass			kg	2200	2030
Mass distributing	Front wheel		kg	920	760
	Rear wheel		kg	1280	1270
Ballast	Front ballast		kg	108/144	
	Rear ballast		kg	90/180	
Transmission	Clutch		——	Single disk, dry type, double-acting	
	Transmission		——	Combined type; 4 × (2 + 1) gear, 5 × 2 × (1 + 1) gear, gear shift with sliding sleeve	
	Rear axle	Main drive	——	Helical bevel gear pair	

Items				Unit	FL354C	FL400C
		Differential unit		——	Two-planet-wheel, closed type	
		Differential lock		——	Pin type	
		Rear final drive		——	Planetary gear	
	Front axle	Front axle		——	——	Telescopic sleeve type
	Front drive axle	Drive shaft		——	Drive shaft in the center	——
		Front main drive		——	Closed bevel gear	——
		Front differential unit		——	Closed type, two planetary bevel gears	——
		Front final drive		——	Spiral bevel gear	——
Running System	Frame			——	Without frame	
	Tire pressure	Front wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)	167 ~186 (field operations) / 225 ~ 245 (transport operations)
		Rear wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)	
	Tire specification	Standard:	Front wheel	——	7.50-16	6.0-16
			Rear wheel	——	11.2-28	12.4-28
Brake system	Service brake			——	Wet-type, disc brake	
	Parking brake			——	Mechanical manual brake	
	Trailer brake control			——	Inflation , air brake	
Steering system	Method			——	Front wheel hydraulic steering	
	Steering unit			——	Cycloid rotary valve type full hydraulic	
Working device	Hydraulic system type			——	Center open; semi-split type / center split type	
	Hydraulic oil pump			——	Gear pump,CBN-E316FL	

Items			Unit	FL354C	FL400C
	Distributor		—	Slide valve type	
	Oil cylinder	Diameter×stroke	mm	100×112/100×116/75×110	
		Type	—	Single-action/Double-action	
	Hitch point dimension		mm	Rear three-point hitch: Class 1 Connecting hole× width: Upper hitch point: φ19.3×44 Lower hitch point: φ22.4×35 Rear three-point hitch: Class 2 Connecting hole× width: Upper hitch point: φ25.2×51 Lower hitch point: φ28.7×45	
	Plowing depth adjustment method		—	Force adjustment, position adjustment, floating control	
	Maximum lifting force of the system [610mm after hitch point]		kN	5.8	6.62
	Opening pressure of safety valve		MPa	16.0±0.5	
	Hydraulic output	Type	—	Simple hydraulic output or multi-v	
		Quantity	—	Simple hydraulic output / one pair outputs / 3 pair of hydraulic output	
		Specifications	—	M22×1.5	
PTO shaft	Type		—	Rear non-independent or semi-ind	
	Specifications		—	Type 1 (φ35 × 6 teeth or φ38 × 8 t	
	Revolving speed		r/min	540/760 or 540/1000	
	Lower limit of nominal power of PTO shaft		kW	21.9	25
Towing device	Diameter of connecting pin		mm	40	
	Connecting pin		mm	577	
Electric instrument system	Electrical system		—	12V negative grounding, dual-wir	
	Power generator	Model	—	JFW17/JFW17P-01/JFW19	
		Voltage	V	14	
		Power	kW	0.75/1	
	Regulator	Model	—	Included in the electrical box	
		Regulating voltage	V	14	
	Starter	Model	—	QDJ1409F-P/QDJ1409	
		Voltage	V	12	
		Power	kW	3.7	

Items			Unit	FL354C	FL400C
	Storage battery	Model	—	6-QW-120	
		Voltage	V	12	
		Capacity	A·h (Ampere · hour)	120	
		Quantity	—	1	
	Light and signal device	Headlamp	—	12V, 55 / 60W combined type	
		Front steering light	—	12V, 21W, 4	
		Front position light	—	12V,5W,2 ;12V,10W,2	
		Rear combination light	—	Width lights 5W, turn signals 21W each side	
		Rear working light	—	12V, 55W, 4	
		Trailer socket	—	1 seven-hole socket with a plug	
	Monitoring and warning device	Combination instrument	—	1 piece, with tachometer, engine h	
		Warning device	—	1. Charging indicator light, 1 lights for position lights, and indic 2. Air brake fault warning li brake), and low oil pressure warni 3. Reflector; 4. Safety warning label.	

FL500C/FL504C/FL554C-1

Items			Unit	FL500C	FL504C	FL554C-1
Type			——	4 × 2 wheeled tractor	4 × 4 wheeled tractor	4 × 4 wheeled tractor
Rated traction force			kN	9	14	14.5
Overall dimension	Length (including front ballast and rear hitch)		mm	3790		3970
	Width (common wheel track and measured from outer edge of standard tire)		mm	1620		
	Height (to the cab roof, and equipped with standard tires)		mm	2510		
Wheel base			mm	1968	1992	2041
Wheel tread (standard tires)	Front wheel		mm	1200, 1300, 1400, 1500 (common 1300)	1250	1250
	Front wheel adjustment mode		——	Continuously adjustable	Fixed	Fixed
	Rear wheel		mm	1200, 1300, 1400, 1500 (common 1300)/1300-1500		
	Rear wheel adjustment mode		——	Adjustable stepwise/adjustable steplessly		
Ground clearance	Minimum ground clearance		mm	400	325	325
	Agricultural ground clearance		mm	450	375	375
Minimum radius of turning circle	Conducting single-side braking		m	3.3±0.3	3.8±0.3	4.3±0.3
	No single-side braking is conducted		m	3.7±0.3	4.3±0.3	4.7±0.3
Structure mass			kg	2005	2275	2500
Minimum operating mass			kg	2145	2415	2640
Mass distribution	Front wheel		kg	860	915	1050
	Rear wheel		kg	1285	1500	1590
Ballast	Front ballast		kg	108/144		
	Rear ballast		kg	90/180		
Transmission	Clutch		——	Single disk, dry type, double-acting clutch		
	Transmission		——	Combined type; 4 × (2 + 1) gear, gear shift with sliding sleeve / combined type; 4 × 3 × (1 + 1) gear, gear shift with sliding sleeve/ combined type; 4 × 2 × (1 + 1) gear, gear shift with sliding sleeve		
	Rear axle	Main drive	——	Helical bevel gear pair		
		Differential unit	——	Four-planet-gear, closed type		

Items				Unit	FL500C	FL504C	FL554C-1
		Differential lock		——	Pin type		
		Rear final drive		——	Planetary gear		
	Front axle	Front axle		——	Telescopic sleeve type	——	——
	Front drive axle	Drive shaft		——	——	Drive shaft in the center	Drive shaft in the center
		Front main drive		——	——	Closed bevel gear	Closed bevel gear
		Front differential unit		——	——	Closed type, two planetary bevel gears	Closed type, two planetary bevel gears
		Front final drive		——	——	Spiral bevel gear	Spiral bevel gear
Running System	Frame			——	Without frame		
	Tire pressure	Front wheel		kPa	167 ~186 (field operations) / 225 ~ 245 (transport operations)	118 ~138 (field operations) / 167 ~ 176 (transport operations)	118 ~138 (field operations) / 167 ~ 176 (transport operations)
		Rear wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)		
	Tire specification	Standard:	Front wheel	——	6.0-16	8.3-20	8.3-20
			Rear wheel	——	12.4-28		
Brake system	Service brake			——	Wet-type, disc brake		
	Parking brake			——	Mechanical manual brake		
	Trailer brake control			——	Inflation, air brake		
Steering system	Method			——	Front wheel hydraulic steering		
	Steering unit			——	Cycloid rotary valve type full hydraulic steering		
Working device	Hydraulic system type			——	Center open; semi-split type / center open; split type		
	Hydraulic oil pump			——	Gear pump,CBN-E316FL		
	Distributor			——	Slide valve type		
	Oil cylinder	Diameter×stroke		mm	100×112/100×116/75×110		
		Type		——	Single-action/Double-action		

Items			Unit	FL500C	FL504C	FL554C-1
	Hitch point dimension		mm	Rear three-point hitch: Class 1 Connecting hole× width: Upper hitch point: φ19.3×44 Lower hitch point: φ22.4×35 Rear three-point hitch: Class 2 Connecting hole× width: Upper hitch point: φ25.2×51 Lower hitch point: φ28.7×45		
	Plowing depth adjustment method		——	Force adjustment, position adjustment, force-position integrated control / position adjustment, floating control		
	Maximum lifting force of the system [610mm after hitch point]		kN	≥8.3		≥9.1
	Opening pressure of safety valve		MPa	17.5±0.5		
	Hydraulic output	Type	——	Simple hydraulic output or multi-way valve		
		Quantity	——	Simple hydraulic output / one pair of hydraulic outputs / 2 pair of hydraulic outputs / 3 pair of hydraulic outputs		
Specifications		——	M22×1.5			
PTO shaft	Type		——	Rear semi-independent type		
	Specifications		——	Type 1 (φ35 × 6 teeth or φ38 × 8 teeth)		
	Revolving speed		r/min	540/760 or 540/1000		
	Lower limit of nominal power of PTO shaft		kW	31.3		34.4
Towing device	Diameter of connecting pin		mm	40		
	Connecting pin		mm	577		
Electric instrument system	Electrical system		——	12V negative grounding, dual-wire system		
	Power generator	Model	——	JF1511/JFWZ17P-1W		JFW17/JFW17P-01/JFW19
		Voltage	V	14		
		Power	kW	0.5/0.75/1		
	Regulator	Model	——	Included in the electrical box		
		Regulating voltage	V	14		
	Starter	Model	——	QDJ1409E1-P/ QDJ1409		QDJ1409F-P/QDJ1409
		Voltage	V	12		
		Power	kW	3.7		
	Storage battery	Model	——	6-QW-120		
		Voltage	V	12		

Items			Unit	FL500C	FL504C	FL554C-1
		Capacity	A·h (Ampere · hour)	120		
		Quantity	—	1		
	Light and signal device	Headlamp	—	12V, 55 / 60W combined type		
		Front steering light	—	12V, 21W, 4		
		Front position light	—	12V,5W,2 ; 12V,10W,2		
		Rear combination light	—	Width lights 5W, turn signals 21W, brake lights 21W, and reflectors (red), one on each side		
		Rear working light	—	12V, 55W, 4		
		Trailer socket	—	1 seven-hole socket with a plug		
	Monitoring and warning device	Combination instrument	—	1 piece, with tachometer, engine hour meter, water temperature gauge, fuel gauge		
		Warning device	—	1. Charging indicator light, left and right turn indicator lights, indicator lights for position lights, and indicator light for high beam headlight; 2. Air brake fault warning light (select for tractor equipped with an air brake), and low oil pressure warning light; 3. Reflector; 4. Safety warning label.		

FL554C/FL604C

Items		Unit	FL554C	FL604C
Type		—	4 × 4 wheeled tractor	4 × 4 wheeled tractor
Rated traction force		kN	14.5	15
Overall dimension	Length (including front ballast and rear hitch)	mm	3970	
	Width (common wheel track and measured from outer edge of standard tire)	mm	1620	
	Height (to the cab roof, and equipped with standard tires)	mm	2510	

Items			Unit	FL554C	FL604C
Wheel base			mm	2041	2041
Wheel tread (standard tires)	Front wheel		mm	1250	1250
	Front wheel adjustment mode		——	Fixed	Fixed
	Rear wheel		mm	1200, 1300, 1400, 1500 (common 1300)/1300-1500	
	Rear wheel adjustment mode		——	Adjustable stepwise/adjustable steplessly	
Ground clearance	Minimum ground clearance		mm	325	325
	Agricultural ground clearance		mm	375	375
Minimum radius of turning circle	Conducting single-side braking		m	4.3±0.3	4.3±0.3
	No single-side braking is conducted		m	4.7±0.3	4.7±0.3
Structure mass			kg	2500	2500
Minimum operating mass			kg	2640	2640
Mass distributing	Front wheel		kg	1050	1020
	Rear wheel		kg	1590	1340
Ballast	Front ballast		kg	108/144	
	Rear ballast		kg	90/180	
Transmission	Clutch		——	Single disk, dry type, double-acting clutch	
	Transmission		——	Combined type, 4 × 3 × (1 + 1), Gear shift with sliding sleeve	
	Rear axle	Main drive	——	Helical bevel gear pair	
		Differential unit	——	Four-planet-gear, closed type	
		Differential lock	——	Pin type	
		Rear final drive	——	Planetary gear	
	Front axle	Front axle	——	——	——
	Front drive axle	Drive shaft	——	Drive shaft in the center	Drive shaft in the center
		Front main drive	——	Closed bevel gear	Closed bevel gear
		Front differential unit	——	Closed type, two planetary bevel gears	Closed type, two planetary bevel gears
		Front final drive	——	Spiral bevel gear	Spiral bevel gear
Running	Frame		——	Without frame	

Items				Unit	FL554C	FL604C
System	Tire pressure	Front wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)	118 ~138 (field operations) / 167 ~ 176 (transport operations)
		Rear wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)	
	Tire specification	Standard:	Front wheel	——	8.3-20	8.3-20
			Rear wheel	——	12.4-28	
Brake system	Service brake			——	Wet-type, disc brake	
	Parking brake			——	Mechanical manual brake	
	Trailer brake control			——	Inflation , air brake	
Steering system	Method			——	Front wheel hydraulic steering	
	Steering unit			——	Cycloid rotary valve type full hydraulic steering	
Working device	Hydraulic system type			——	Center open; semi-split type / center open; split type	
	Hydraulic oil pump			——	Gear pump,CBN-E316	
	Distributor			——	Slide valve type	
	Oil cylinder	Diameter×stroke		mm	100×116/75×110	
		Type		——	Single-action/Double-action	
	Hitch point dimension			mm	Rear three-point hitch: Class 2 Connecting hole× width: Upper hitch point: φ25.2×451 Lower hitch point: φ28.7×45	
	Plowing depth adjustment method			——	Force adjustment, position adjustment, force-position integrated control / position adjustment, floating control	
	Maximum lifting force of the system [610mm after hitch point]			kN	≥9.1	≥9.9
	Opening pressure of safety valve			MPa	17.5±0.5	
	Hydraulic output	Type		——	Simple hydraulic output or multi-way valve	
		Quantity		——	Simple hydraulic output / one pair of hydraulic outputs / 2 pair of hydraulic outputs / 3 pair of hydraulic outputs	
		Specifications		——	M22×1.5	
	PTO shaft	Type			——	Rear semi-independent type
Specifications			——	Type 1 (φ35 × 6 teeth or φ38 × 8		

Items		Unit	FL554C	FL604C
			teeth)	
	Revolving speed	r/min	540/760 or 540/1000	
	Lower limit of nominal power of PTO shaft	kW	34.4	37.5
Towing device	Diameter of connecting pin	mm	40	
	Connecting pin	mm	577	
Electric instrument system	Electrical system		—	12V negative grounding, dual-wire system
	Power generator	Model	—	JFW17/JFW17P-01/JFW19
		Voltage	V	14
		Power	kW	0.75/1
	Regulator	Model	—	Included in the electrical box
		Regulating voltage	V	14
	Starter	Model	—	QDJ1409F-P/QDJ1409
		Voltage	V	12
		Power	kW	3.7
	Storage battery	Model	—	6-QW-120
		Voltage	V	12
		Capacity	A·h (Ampere · hour)	120
		Quantity	—	1
	Light and signal device	Headlamp	—	12V, 55 / 60W combined type
		Front steering light	—	12V, 21W, 4
		Front position light	—	12V,5W,2 ; 12V,10W,2
		Rear combination light	—	Width lights 5W, turn signals 21W, brake lights 21W, and reflectors (red), one on each side
		Rear working light	—	12V, 55W, 4
		Trailer socket	—	1 seven-hole socket with a plug
	Monitoring and warning device	Combination instrument	—	1 piece, with tachometer, engine hour meter, water temperature gauge, fuel gauge

Items			Unit	FL554C	FL604C
		Warning device	——	1. Charging indicator light, left and right turn indicator lights, indicator lights for position lights, and indicator light for high beam headlight; 2. Air brake fault warning light (select for tractor equipped with an air brake), and low oil pressure warning light; 3. Reflector; 4. Safety warning label.	

FL704C-1

Items		Unit	FL704C-1
Type		——	4 × 4 wheeled tractor
Rated traction force		kN	16.5
Overall dimension	Length (including front ballast and rear hitch)	mm	3970
	Width (common wheel track and measured from outer edge of standard tire)	mm	1828
	Height (to the cab roof, and equipped with standard tires)	mm	2580
Wheel base		mm	2071
Wheel tread (standard tires)	Front wheel	mm	1250, 1350(common 1350)
	Front wheel adjustment mode	——	Fixed
	Rear wheel	mm	1300, 1450, 1500 (common 1450)/1300-1500
	Rear wheel adjustment mode	——	Adjustable stepwise/adjustable steplessly
Ground clearance	Minimum ground clearance	mm	370
	Agricultural ground clearance	mm	430
Minimum radius of turning circle	Conducting single-side braking	m	4.4±0.3
	No single-side braking is conducted	m	4.8±0.3
Structure mass		kg	2520
Minimum operating mass		kg	2660
Mass distributing	Front wheel	kg	1060
	Rear wheel	kg	1600

Items				Unit	FL704C-1
Ballast	Front ballast			kg	108/144
	Rear ballast			kg	160/320/480
Transmission	Clutch			——	Single disk, dry type, double-acting clutch
	Transmission			——	Combined type, 4 × 3 × (1 + 1), Gear shift with sliding sleeve
	Rear axle	Main drive		——	Helical bevel gear pair
		Differential unit		——	Four-planet-gear, closed type
		Differential lock		——	Pin type
		Rear final drive		——	Planetary gear
	Front axle	Front axle		——	——
	Front drive axle	Drive shaft		——	Drive shaft in the center
		Front main drive		——	Closed bevel gear
		Front differential unit		——	Closed type, two planetary bevel gears
		Front final drive		——	Spiral bevel gear
Running System	Frame			——	Without frame
	Tire pressure	Front wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)
		Rear wheel		kPa	118 ~138 (field operations) / 167 ~ 176 (transport operations)
	Tire specification	Standard:	Front wheel	——	8.3-24
			Rear wheel	——	14.9-30
Brake system	Service brake			——	Wet-type, disc brake
	Parking brake			——	Mechanical manual brake
	Trailer brake control			——	Inflation , air brake
Steering system	Method			——	Front wheel hydraulic steering
	Steering unit			——	Cycloid rotary valve type full hydraulic steering
Working device	Hydraulic system type			——	Center open; semi-split type / center open; split type
	Hydraulic oil pump			——	Gear pump,CBN-E316
	Distributor			——	Slide valve type
	Oil cylinder	Diameter×stroke		mm	100×116/75×110
		Type		——	Single-action/Double-action

Items			Unit	FL704C-1
	Hitch point dimension		mm	Rear three-point hitch: Class 2 Connecting hole× width: Upper hitch point: $\phi 25.2 \times 51$ Lower hitch point: $\phi 28.7 \times 45$
	Plowing depth adjustment method		—	Force adjustment, position adjustment, force-position integrated control / position adjustment, floating control
	Maximum lifting force of the system [610 mm after hitch point]		kN	≥ 12.4
	Opening pressure of safety valve		MPa	17.5 ± 0.5
	Hydraulic output	Type	—	Simple hydraulic output or multi-way valve
		Quantity	—	Simple hydraulic output / one pair of hydraulic outputs / 2 pair of hydraulic outputs / 3 pair of hydraulic outputs
		Specifications	—	M22×1.5
PTO shaft	Type		—	Rear independent
	Specifications		—	Type 1 ($\phi 35 \times 6$ teeth or $\phi 38 \times 8$ teeth)
	Revolving speed		r/min	540/760 or 540/1000
	Lower limit of nominal power of PTO shaft		kW	43.75
Towing device	Diameter of connecting pin		mm	40
	Connecting pin		mm	577
Electric instrument system	Electrical system		—	12V negative grounding, dual-wire system
	Power generator	Model	—	JFW17/JFW17P-01/JFW19
		Voltage	V	14
		Power	kW	0.75/1
	Regulator	Model	—	Included in the electrical box
		Regulating voltage	V	14
	Starter	Model	—	QDJ1409F-P/QDJ1409
		Voltage	V	12
		Power	kW	3.7
	Storage battery	Model	—	6-QW-120
		Voltage	V	12
		Capacity	A·h (Ampere hour)	120

Items			Unit	FL704C-1
		Quantity	—	1
	Light and signal device	Headlamp	—	12V, 55 / 60W combined type
		Front steering light	—	12V, 21W, 4
		Front position light	—	12V, 5W, 2 ; 12V, 10W, 2
		Rear combination light	—	Width lights 5W, turn signals 21W, brake lights 21W, and reflectors (red), one on each side
		Rear working light	—	12V, 55W, 4
		Trailer socket	—	1 seven-hole socket with a plug
	Monitoring and warning device	Combination instrument	—	1 piece, with tachometer, engine hour meter, water temperature gauge, fuel gauge
		Warning device	—	1. Charging indicator light, left and right turn indicator lights, indicator lights for position lights, and indicator light for high beam headlight; 2. Air brake fault warning light (select for tractor equipped with an air brake), and low oil pressure warning light; 3. Reflector; 4. Safety warning label.

Appendix

14.3. Main specifications of engine

FL354/400/404/354C/400C/404C

Items		Unit	FL354/FL354C	FL400/FL404 FL400C/FL404C	
Engine	Manufacturer	—	Shandong Laidong Internal Combustion Engine Co., Ltd.	Anhui Quanchai Engine Co., Ltd.	Zhejiang Xinchai Co., Ltd
	Trademark and brand	—	Laidong	Quanchai	Xinchai
	Model	—	4L23BT	QC490T40 (Quanchai)	C490BT-8
	Number of cylinders	—	4	4	
	Cylinder diameter ×stroke	mm	88×95	90×105	90×105
	Displacement	L	2.311	2.672	2.67
	Compression ratio	—	18:1	18:1	18.4:1
	Nominal power	kW	25.8	29.4	
	Nominal speed	r/min	2350	2400	
	Max. torque/speed	N·m/ r/min	≥129/1550~1750	155~160/ 1600~1800	155/1680~1800
	Fuel consumption rate in rated condition	g/kW·h	≤258	≤248	≤245
	Oil consumption rate in rated condition		≤2.04	≤1.6	≤1.2
	Lubricating method	—	Forced splash lubrication		
	Starting method	—	Electrical startup		
	Cooling method	—	Forced water cooled		
	Air filter type	—	Dry- or wet-type		

Notice: The parameters given in the technical specifications table are based on standard configuration.

FL450/FL454/FL450C/FL454C

Appendix

Items		Unit	FL450/FL454/FL450C/FL454C	
Engine	Manufacturer	—	Anhui Quanchai Engine Co., Ltd.	Zhejiang Xinchai Co., Ltd.
	Trademark and brand	—	Quanchai	Xinchai
	Model	—	QC495T45 (Quanchai)	A495BT
	Number of cylinders	—	4	4
	Cylinder diameter ×stroke	mm	95×105	95×105
	Displacement	L	2.977	2.98
	Compression ratio	—	18:1	18.5:1
	Nominal power	kW	33.1	
	Nominal speed	r/min	2400	
	Max. torque/speed	N·m/ r/min	170~175/ 1600~1800	173/1680~1800
	Fuel consumption rate in rated condition	g/kW·h	≤248	≤245
	Oil consumption rate in rated condition		≤1.6	≤1.2
	Lubricating method	—	Forced splash lubrication	
	Starting method	—	Electric startup	
	Cooling method	—	Forced water cooled	
	Air filter type	—	Dry- or wet-type	

FL500/ FL500C/FL504/ FL504C /FL554-1/FL554C-1/ FL554/FL554C

Items		Unit	FL500/ FL504 FL500C/ FL504C		FL554-1/FL554C-1 FL554/FL554C	
Engine	Manufacturer	—	Anhui Quanchai Engine Co., Ltd.	Zhejiang Xinchai Co., Ltd.	Anhui Quanchai Engine Co., Ltd.	Zhejiang Xinchai Co., Ltd.
	Trademark and brand	—	Quanchai	Xinchai	Quanchai	Xinchai
	Model	—	QC498T50	A498BT-6A	QC4105T55	A4K41T55-001
	Number of cylinders	—	4			
	Cylinder diameter ×stroke	mm	98×105	98×105	105×118	105×118
	Displacement	L	3.168	3.17	4.087	4.1
	Compression	—	18:1	18.5:1	17:1	17:1

Appendix

Items		Unit	FL500/ FL504 FL500C/ FL504C		FL554-1/FL554C-1 FL554/FL554C	
	ratio					
	Nominal power	kW	36.8		40.4	
	Nominal speed	r/min	2400		2400	2300
	Max. torque/speed	N·m/ r/min	190~195/1600~ 1800	198/1680~ 1800	227~233/1600~ 1800	228/1600~1725
	Fuel consumption rate in rated condition	g/kW·h	≤248	≤245	≤248	245
	Oil consumption rate in rated condition		≤1.6	≤1.2	≤1.6	≤1.2
	Lubricating method	—	Forced splash lubrication			
	Starting method	—	Electrical startup			
	Cooling method	—	Forced water cooled			
	Air filter type	—	Dry- or wet-type			

FL604/FL604C

Items		Unit	FL604/FL604C	
	Manufacturer	—	Anhui Quanchai Engine Co., Ltd.	Zhejiang Xinchai Co., Ltd
	Trademark and brand	—	Quanchai	Xinchai
	Model	—	QC4105T60	A4K43T60A
	Number of cylinders	—	4	4
	Cylinder diameter ×stroke	mm	105×118	108×118

Appendix

Items		Unit	FL604/FL604C	
	Displacement	L	4.087	4.3
	Compression ratio	—	17:1	
	Nominal power	kW	44	
	Nominal speed	r/min	2400	2300
	Max. torque/speed	N·m/ r/min	240~245/1600~1800	249/1600~1725
	Fuel consumption rate in rated condition	g/kW·h	≤248	245
	Oil consumption rate in rated condition		≤1.6	≤1.2
	Lubricating method	—	Forced splash lubrication	
	Starting method	—	Electric startup	
	Cooling method	—	Forced water cooled	
	Air filter type	—	Dry- or wet-type	

FL704-1/FL704-1C

Items		Unit	FL704-1/FL704-1C	
Engine	Manufacturer	—	Zhejiang Xinchai Co., Ltd	Anhui Quanchai Engine Co., Ltd.

Appendix

Items		Unit	FL704-1/FL704-1C	
	Trademark and brand	——	Xinchai	Quanchai
	Model	——	A4K43T70A	QC4108T70
	Number of cylinders	——	4	
	Cylinder diameter ×stroke	mm	108×118	
	Displacement	L	4.3	4.324
	Compression ratio	——	17:1	
	Nominal power	kW	51.5	
	Nominal speed	r/min	2300	2400
	Max. torque/speed	N·m/ r/min	279/1600~1725	265-275/1600-1800
	Fuel consumption rate in rated condition	g/kW·h	245	≤248
	Oil consumption rate in rated condition		≤1.2	≤1.6
	Lubricating method	——	Forced splash lubrication	
	Starting method	——	Electrical startup	
	Cooling method	——	Forced water cooled	
	Air filter type	——	Dry- or wet-type	

Appendix



Important:

The parameters given in the technical specifications table are based on standard configuration.

14.4.Theoretical speed of tractor

FL354/354C/400/400C/404/404C/450/450C/454/454C Theoretical speed of tractor

Unit: km/h

Model	FL354/FL354C		FL400/FL404 FL400C/FL404C		FL450/FL454 FL450C/FL454C	
Gear	8F+4R					
	Forward gear	Reverse gear	Forward gear	Reverse gear	Forward gear	Reverse gear
Low 1	2.33	3.45	2.65	3.94	2.65	3.94
Low 2	3.37	5.01	3.85	5.71	3.85	5.71
Low 3	4.61	6.83	5.25	7.79	5.25	7.79
Low 4	7.10	10.53	8.10	12.1	8.10	12.1
High 1	9.99	/	11.40	/	11.40	/
High 2	14.50	/	16.53	/	16.53	/
High 3	19.79	/	22.57	/	22.57	/
High 4	30.49	/	34.78	/	34.78	/
Gear	8F+8R					
	Forward	Reverse gear	Forward gear	Reverse gear	Forward gear	Reverse gear

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	gear					
Low 1	2.65	2.08	2.65	2.08	2.65	2.08
Low 2	3.37	3.01	3.37	3.01	3.37	3.01
Low 3	4.60	4.11	4.60	4.11	4.60	4.11
Low 4	7.10	6.34	7.10	6.34	7.10	6.34
High 1	9.99	8.93	9.99	8.93	9.99	8.93
High 2	14.50	12.95	14.50	12.95	14.50	12.95
High 3	19.79	17.68	19.79	17.68	19.79	17.68
High 4	30.49	27.24	30.49	27.24	30.49	27.24
Gear	12F+12R					
	Forward gear	Reverse gear	Forward gear	Reverse gear	Forward gear	Reverse gear
Low 1	2.33	2.08	2.65	2.37	2.65	2.37
Low 2	3.37	3.01	3.85	3.44	3.85	3.44
Low 3	4.60	4.11	5.25	4.69	5.25	4.69
Low 4	7.10	6.34	8.10	7.23	8.10	7.23
Medium 1	5.90	5.27	6.73	6.01	6.73	6.01
Medium 2	8.55	7.64	9.75	8.71	9.75	8.71
Medium 3	11.67	10.43	13.31	11.89	13.31	11.89
Medium 4	17.99	16.07	20.52	18.33	20.52	18.33

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High 1	9.99	8.93	11.40	10.18	11.40	10.18
High 2	14.50	12.95	16.54	14.77	16.54	14.77
High 3	19.79	17.68	22.57	20.16	22.57	20.16
High 4	30.49	27.24	34.78	31.08	34.78	31.08

Notice: 1. For the model 354/354C, theoretical speeds shown in the table are determined with engine speed of 2200r/min and standard rear tires.

FL500/500C/504/504C/554-1/554C-1 Theoretical speed of tractor

Unit : km/h

Model	FL500/ FL504 FL500C/ FL504C		FL554-1/FL554C-1	
Gear	8F+4R		8F+4R	
	Forward gear	Reverse gear	Forward gear	Reverse gear
Low 1	2.65	3.94	2.65	3.94
Low 2	3.85	5.71	3.85	5.71
Low 3	5.25	7.79	5.25	7.79
Low 4	8.10	12.1	8.10	12.1
High 1	11.40	/	11.40	/

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High 2	16.53	/	16.53	/
High 3	22.57	/	22.57	/
High 4	34.78	/	34.78	/
Gear	8F+8R		8F+8R	
	Forward gear	Reverse gear	Forward gear	Reverse gear
Low 1	2.65	2.08	2.65	2.08
Low 2	3.37	3.01	3.37	3.01
Low 3	4.60	4.11	4.60	4.11
Low 4	7.10	6.34	7.10	6.34
High 1	9.99	8.93	9.99	8.93
High 2	14.50	12.95	14.50	12.95
High 3	19.79	17.68	19.79	17.68
High 4	30.49	27.24	30.49	27.24
Gear	12F+12R		12F+12R	
	Forward gear	Reverse gear	Forward gear	Reverse gear
Low 1	2.65	2.37	2.65	2.37
Low 2	3.85	3.44	3.85	3.44
Low 3	5.25	4.69	5.25	4.69
Low 4	8.10	7.23	8.10	7.23
Medium 1	6.73	6.01	6.73	6.01

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Medium 2	9.75	8.71	9.75	8.71
Medium 3	13.31	11.89	13.31	11.89
Medium 4	20.52	18.33	20.52	18.33
High 1	11.40	10.18	11.40	10.18
High 2	16.54	14.77	16.54	14.77
High 3	22.57	20.16	22.57	20.16
High 4	34.78	31.08	34.78	31.08

Notice: 1. Theoretical speeds shown in the table are determined with engine speed of 2400r / min (r / min) and 12.4-28 standard rear tires.

FL554/554C/604/604C Theoretical speed of tractor

Unit: km/h

Model	FL554/FL554C		FL604/FL604C	
Gear	12F+12R		12F+12R	
	Forward gear	Reverse gear	Forward gear	Reverse gear
Low 1	2.25	1.97	2.25	1.97
Low 2	3.26	2.85	3.26	2.85
Low 3	4.44	3.90	4.44	3.90
Low 4	6.91	7.98	6.91	7.98

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Medium 1	5.66	4.96	5.66	4.96
Medium 2	8.20	7.19	8.20	7.19
Medium 3	11.20	9.81	11.20	9.81
Medium 4	17.39	20.10	17.39	20.10
High 1	9.72	8.52	9.72	8.52
High 2	14.10	12.36	14.10	12.36
High 3	19.25	16.88	19.25	16.88
High 4	29.91	26.22	29.91	26.22

FL704-1/704C-1 Theoretical speed of tractor

Unit: km/h

Model	FL704-1/FL704-1C		
Gear	12F+12R		
	Forward gear	Reverse gear	
Low 1	2.24	1.97	
Low 2	3.26	2.86	
Low 3	4.44	3.90	
Low 4	6.91	6.0	
Medium 1	5.66	4.95	

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Medium 2	8.20	7.19
Medium 3	11.20	9.81
Medium 4	17.39	15.25
High 1	9.72	8.52
High 2	14.10	12.36
High 3	19.25	16.87
High 4	29.91	26.22

Appendix

15. Appendix

15.1.Implements for FL40 / 55 / 70-1 Series Tractors

Table 11-5 Matched agricultural implements

Category	Tractor Model	Matched implements	Implement model	Main technical parameters	Supporting enterprises
Tillage implement	FL350/FL354	Suspended Five-spade plow	1L-520	Tillage depth (16~20) cm	Baoding Shuangying Agricultural Implement Co., Ltd. Henan Province Wei Shi County Baichuan Plough Factory Liaoning Heishan Implement Manufacturing Co., Ltd. Shanxi Qishan Agricultural Implement Manufacturing Co., Ltd. Shanxi Jishan Agricultural Implement Manufacturing Co., Ltd. Heilongjiang Nenjiang Agricultural Implement Factory
		Suspended three-spade plow	1L-325	Tillage depth (18~22) cm	
		Suspended three-spade plow	1L-427	Tillage depth (14~18) cm	
		Suspended four-spade plow	1L-425	Tillage depth (18~22) cm	
	FL400/FL404 FL450/FL454 FL500/FL504	Suspended four-spade plow	1L-425	Tillage depth (18~22) cm	
			1L-427	Tillage depth (14~18) cm	
		Suspended Five-spade plow	1L-520	Tillage depth (16~20) cm	
	FL550/FL554 FL604	Suspended three-spade plow	1L-330	Tillage depth (20~26) cm	
		Suspended four-spade plow	1L-425	Tillage depth (18~22) cm	
		Suspended Five/Six-spade plow	1L-527 / 62	Tillage depth (14~18) cm	
	FL350/FL354		1GQN-160	Tillage depth 12-15cm, Tillage width 160cm	Nanchang Rotary Plough Factory Lianyungang Rotary Plough Factory Xian Rotary Sowing Machine Factory

	FL400/FL404 FL450/FL454 FL500/FL504	Rotary cultivator	1GQN-170	Tillage depth 12-15cm, Tillage width 170cm	
	FL550/FL554 FL604	Rotary cultivator	1GQN-200	Tillage depth 12-15cm, Tillage width 180/200cm	
Agricultural chemical spraying machine	Whole series	Suspended agricultural chemical applying machine	3W-300/8	Agricultural chemical tank capacity: 300L Spraying width: 800cm	Heilongjiang Nenjiang Agricultural Implement Factory
Land preparation implement	FL350/FL354	Suspended 24-blade light harrow	1BQX-2.0	Tillage depth 8-12cm, Tillage width 200cm	Jiamusi Beifang Implement Manufacturing Co., Ltd.
	FL400/FL404	34-blade light harrow	IBY-3.4		Xuzhou Huaxing Agricultural Implement Co., Ltd.
	FL450/FL454 FL500/FL504 FL550/FL554 FL604	24-blade medium-duty harrow	1BJ-2.2	Tillage depth 8-12cm, Tillage width 340cm	Heilongjiang Nenjiang Agricultural Implement Factory Haerbin Hongwei Technology Co., Ltd Haerbin Woer Technology Co., Ltd
Sowing implement	FL350/FL354 FL400/FL404 FL450/FL454 FL500/FL504	Seeder	2BJ-4 (Soybean)	Sowing 4 rows per travel, with row spacing (50 ~ 70) cm	Heilongjiang Nenjiang Agricultural Implement Factory Shijiazhuang Agricultural Implement Co., Ltd. Xinjiang Agricultural & Animal Husbandry Implement Factory Akesu Linong Implement Manufacturing Co., Ltd.
			2BSW-2.4 (Wheat)	Sowing width 240cm	
			2BJ-4 (Soybean)	Sowing 4 rows per travel, with row spacing (50 ~ 70) cm	

	FL550/FL554 FL604		2BG-4/5(Soybean)	Sowing 4 rows per travel, with row spacing (50 ~ 70) cm	
	FL350/FL354 FL400/FL404 FL450/FL454 FL500/FL504	Rotary sowing machine	SGTNB-150Z3/6	Suitable for tilling soil in medium or low conditions, with tillage depth (10 ~ 15) cm	Xian Rotary Rotary Sowing Machine Factory Hebei Dingzhou Kaiyuan Implement Co., Ltd.
	FL550/FL554 FL604		SGTNB-160Z3/6		
Road construction implement	FL550/FL554 FL604	Mixing machine for highway construction	LBJ-160	Working width, 160cm	Shandong Yanzhou Lutong Implement Institute
Implements for paddy field work	FL400/FL404 FL450/FL454 FL500/FL504	Paddy field pulping machine	1ZSN-240	Tillage depth (8 ~ 10) cm	Hongxinglong Implement Factory Lianyungang Rotary Plough Factory
			1ZSN-260		
	FL550/FL554 FL604		1ZSN-260 1ZSN-280		
	FL400/FL404 FL450/FL454 FL500/FL504 FL550/FL554 FL604	Straw chopper	4JH-I.5	Working width 150cm, stubble (2 ~ 8) cm	
Combined implement	FL400/FL404 FL450/FL454 FL500/FL504	Stubble-breaking, rotary-tilling, ridging, and overturning machine	SGTN-140	Working width 140cm; forming 2 ridges per travel; tillage depth (12 ~ 15) cm	Shenyang Huayuan Agricultural Implement Manufacturing Co., Ltd. Lianyungang Rotary Plough Factory Nanchang Rotary Plough Factory
	FL550/FL554/FL604		SGTN-150 SGTN-160	Working width 150/160cm; forming 2 ridges per travel; tillage depth (12 ~ 15) cm	
Harvesting implement	FL400/FL404 FL450/FL454 FL500/FL504 FL550/FL554 FL604	Wheat carrying machine	4L-2.0	Cutting width: 200cm	Zibo Juming Implement Company Guilin Harvester Factory

Trailer	FL350/FL354	Agricultural trailer	7C-3	Rated capacity: 3 000kg	Qingdao Yakai Implement Factory Henan Weishi Baichuan Implement Company
	FL400/FL404 FL450/FL454 FL500/FL504 FL550/FL554 FL604		7C-5	Rated capacity: 5 000kg	

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 distributors, manufacturers of machines, and read “Instructions for Use and Maintenance” of machines to get familiar with the structure, performance, usage, range of application of agricultural implements etc.;
- To select implements suitable for tractor and soil, main technical parameters of implements must be determined according to the model (power) of tractor and the conditions of working area (such as soil resistance, and agronomic requirements), as well as taking into consideration of our recommendations. 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 the FL35-70HP 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, zip code: 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							

Notice:	
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Notice: 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.