Tele-truck

Operation and Maintenance Manual

FTH25-30N(2.5-3T) Telehandler

FTH50-60N(5000-6000lb) Telehandler

Contents

1. Preface

1.1 About this manual

1.1.1 About this manual

This manual provides information on the operation, maintenance, and technical specifications of the tele-truck of model MTF. This manual must be kept on the machine or readily available to be used by the operator. This manual must be provided for the new owner if the machine is sold. Provide the maintenance personnel with an operation and maintenance manual for repairing the machine.

警告 Warning

Read and understand this manual before operation or maintenance. All personnel related to this machine should regularly read this manual to understand operation and maintenance information.

The projects introduced in this manual are intended to assist operators or maintenance personnel in:

- Understanding the different controls and operations of the machine.
- Identifying potential hazardous situations that may arise during operation or maintenance of the machine.
- Improving the efficiency of machine operation.
- Extending machine life.
- Reducing maintenance costs.

Continuous design improvement to this machine may result in changes not covered by this manual. Please contact the dealer for the latest available information about the machine or answers to any questions related to the information in this manual.

- The product complies with all specifications and standards of the destination country.
- Please contact the dealer before operating the machine to verify whether the machine meets the specifications and standards of your country.

1.1.2 Scope of application

1.1.2.1 Scope of application

All procedures and precautions outlined in this manual

Only applicable for the intended use of this machine. Do not use or operate the machine under no circumstances as prohibited in this manual.

1.1.2.2 Intended purpose

Tele-trucks are mainly used for transporting and handling cargo.

Do not lift or transport a load that is heavier than the maximum load capacity of the machine. (Please refer to the "Load Capacity Diagram" on pages 4-38 for more information.)

In all cases, operators and maintenance personnel must comply with the expected approved usage rules of the machine.

Users are responsible for any hazards caused by applications unauthorized by the manufacturer.

This manual covers various operations of the machine under normal conditions. Please contact the dealer if you are not sure about the security of certain programs.

1.1.2.3 Unintended use

Unintended use includes:

- Transporting personnel - There is only one operator seat in the cab. Do not transport other personnel.
- Transport personnel inside or on containers.
- Transport or lift objects through cables, chains, or other items connected to the boom.
- Operate in areas with explosion hazards.
- The machine is overloaded, meaning it exceeds its maximum lifting capacity – refer to the "Load Capacity Diagram" on pages 4-38 for more information.
- Transport non- centered loads
- The machine is unattended and suspended with a load

Note: The manufacturer shall not be responsible for any damage, death, or serious injury caused to personnel, the environment, or the machine due to improper use.

Note: Unauthorized modification of the machine may endanger the performance or lead to potential hazards. Improper operation may result in machine damage, death, or serious injury. The manufacturer shall not be liable for such losses.

1.1.3 Machine authorization

Port machinery meets the requirements of the following regulatory authorities:

- ANSI (North America)
- GOST (Russia)

All machines and equipment manufactured by the company (except for equipment installed on machines or installed with second-hand spare parts) are labeled with CE to prove that they comply with the EU Machinery Safety Directive.

1.1.4 Document package

1.1.4.1 Document package:

This document is only applicable to this machine and cannot be used on any other machine. The documents for the machine include the following items.

1.1.4.2 Operation and maintenance manual

Always keep an operation and maintenance manual in the cab.

Provide the maintenance personnel with an operation and maintenance manual for repairing the machine.

Note: The maintenance log lists the regular maintenance items carried out by operators or maintenance personnel. Record in the maintenance log maintenance on the machine.

1.2 Manual structure

1.2.1 Contents

This section lists the general titles and page numbers of each chapter in this manual.

1.2.2 Introduction:

This section provides an overview of the remaining content of this manual, serial number, and contact information for factory.

1.2.3 Safety

This section provides safety information of general and specialized product related to this machine. It explains the hazard warnings used in the manual

1.2.4 Machine control devices

This section provides an overview of all control devices and operating systems.

1.2.5 Machine operation

The maintenance log lists the regular maintenance items carried out by operators or maintenance personnel. Record in the maintenance log maintenance on the machine.

1.2.6 Maintenance

This section provides routine maintenance procedures and fluid specifications.

1.2.7 Parameters

This section provides general dimensions and weight parameters of the machine, as well as performance parameters of the system/components. Please note that the parameters of different models may be different.

1.2.8 Optional devices

The maintenance log lists the regular maintenance items carried out by operators or maintenance personnel. Record in the maintenance log the maintenance on the machine

1.3 Terms

Terms	Description
Accumulator	Reservoir for storing (accumulating) pressure (e.g. for hydraulic functions)
Corrosion preventive compound	Prevent oxidation (e.g. rust prevention)
Attachment	Machine components that grab loads during lifting
Axle spacing	Distance between drive axle and steering axle
Bar	Unit representing pressure
Accumulator off	Cut off the current of sound alarm of the battery buzzer to alert the operator
Buzzer	Audible alarm to alert the operator
Control valve	Valves used to control hydraulic systems (such as releasing pressure to lower the mast)
Daily inspection	Daily operation to make sure the normal operation of the machine
Display	Digital display screen displaying information on the steering wheel panel
Drive axle	Transfer rotational energy from the transmission system to the wheels
Transmission system	The parts involved in power transmission, engine, torque converter, transmission, transmission shaft, and transmission shaft with differential and hub reducer in the machine
Dust collector	The air filter collects rough particles in the dust collector and automatically empties them during operation
Electrolyte liquid level	Liquid level inside the battery cell
Environmental waste	Dispose of used engine oil, liquids and filters in accordance with local environmental regulations
Expansion tank	Tank body for filling and checking coolant level

Heavy forklift	The machine equipped with special accessories is used for handling heavy cargo or containers
Lifting weight	Lifting weight
Wheel edge deceleration	The final transmission type (usually close to the drive wheel) can reduce the speed and increase the torque of the transmission system
Hydraulic oil	Oil for hydraulic system
Hydraulic pump	Pumps used in hydraulic systems
Hydraulic system	A system that transmits power to different functions through hydraulic oil pressure
Indicator light	Mechanical or electronic display for activating or deactivating functions
Load capacity	The maximum load capacity of the machine
Lifting point	Connection points for lifting objects
Low-emission engine	Engines with low emissions of harmful substances. Manufacture according to regulatory requirements
Machine model	Machine types are represented by different numbers, letters, or combinations of both to indicate differences from other machines within the same machine group
Main fuse	Electrical safety devices that provide protection for circuits
Maintenance	Periodic actions on the machine make sure safe operation without unexpected interruptions for a long period of time
Operating hours	The number of hours for the running of the machine is displayed on the service meter in the cab
Planetary gear	Gear reduction assembly
Proportional valve	Electromagnetically controlled valves. The valve will activate in proportion to the amplitude of the current if current is applied.
Refrigerant	Liquids or gases used in air conditioning systems.
Serial number	Unique device identification. Located on the machine nameplate
Station	Safe positioning of the machine before maintenance
Servo pressure	Lower control pressure for controlling higher pressure
Solenoid valve	Solenoid control valve
Start	The process of starting operation or movement through control and/or monitoring systems
Steering axle	Axle that controls the direction of the machine
Torque converter	A hydraulic device that transmits or multiplies torque (such as variable clutch)
Engine oil of transmission	Oil for transmission and torque converter
Variable displacement	Adjustable volume (capacity) of the pump
Variable pump	Pump with adjustable flow rate
Dry brake	Shoe brake drum

1.4 Equipment information

1.4.1 Equipment information

1.4.1.1 Equipment information

Please inform the dealer of the following information when ordering replacement parts for equipment or requiring assistance

1.4.1.2 Machine nameplate

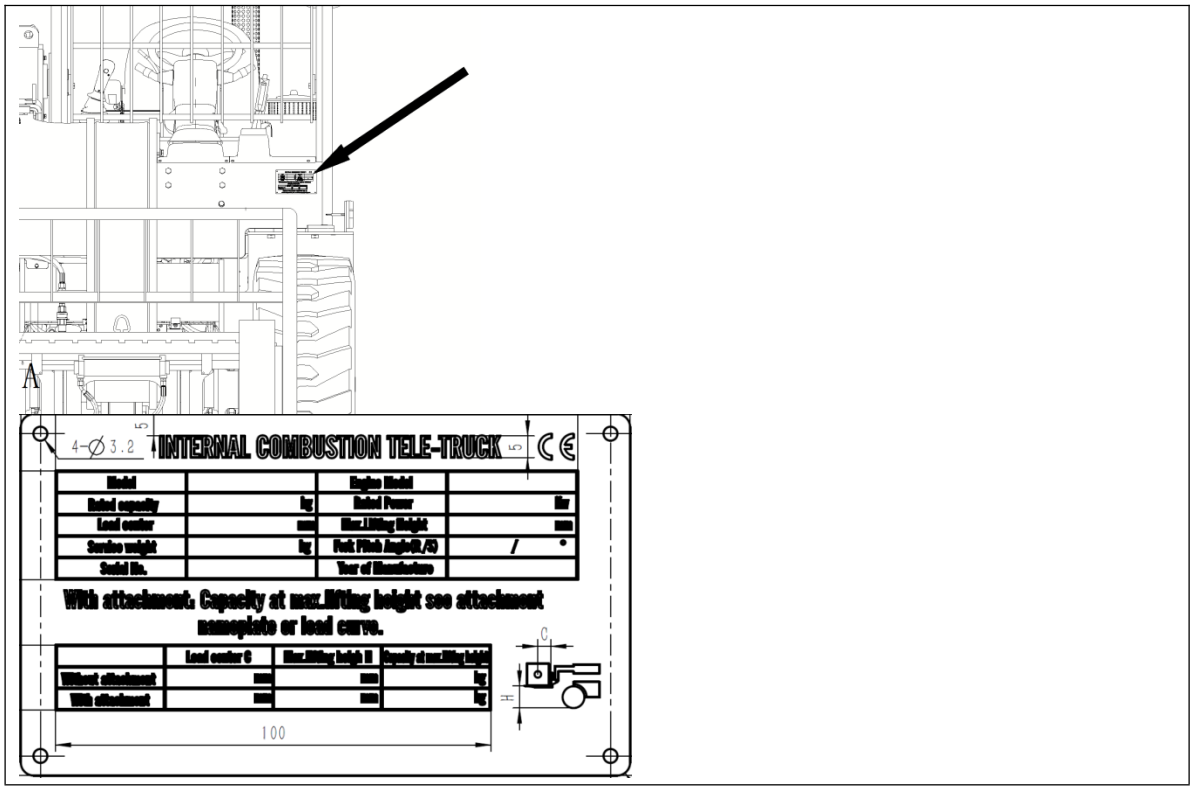
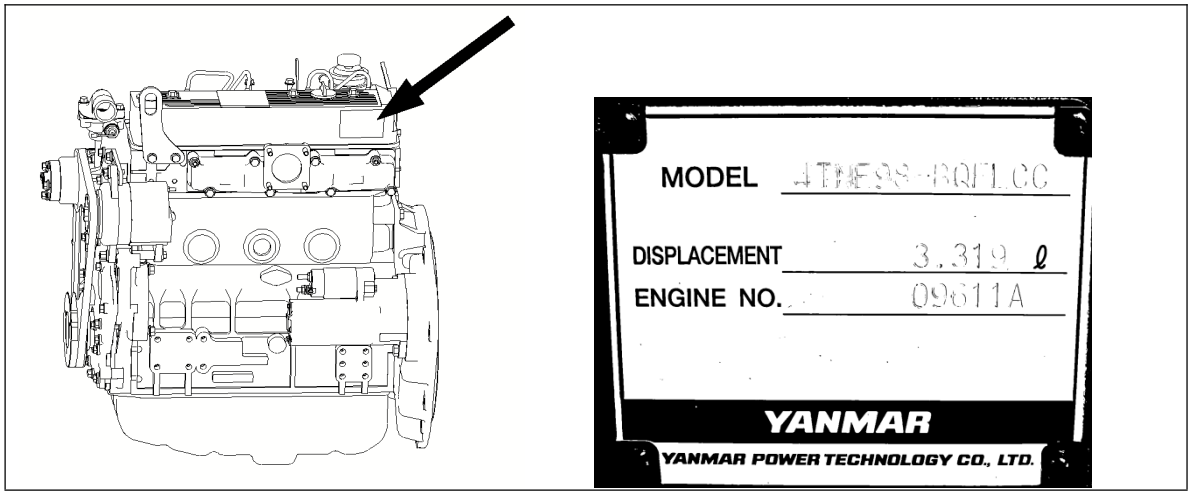


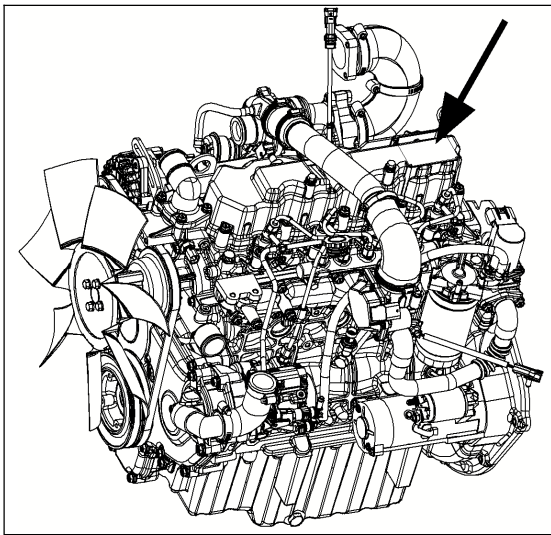
Fig.

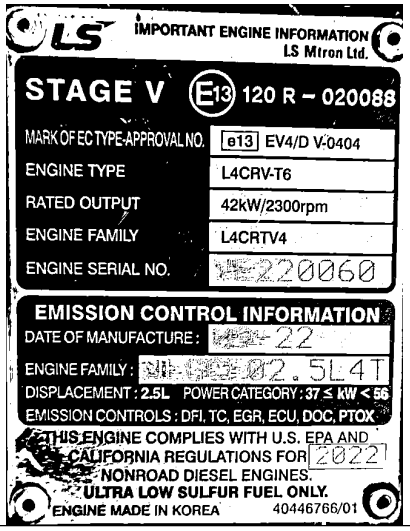
1.4.1.3 Nameplate of engine

Yanmar 4TNE98 engine nameplate



LS engine




IMPORTANT ENGINE INFORMATION
LS Mtron Ltd.
STAGE V
E13 120 R – 020088
MARK OF EC TYPE-APPROVAL NO.
e13 EV4/D V-0404
ENGINE TYPE
L4CRV-T6
RATED OUTPUT
42kW/2300rpm
ENGINE FAMILY
L4CRTV4
ENGINE SERIAL NO.
220060
EMISSION CONTROL INFORMATION
DATE OF MANUFACTURE :
22
ENGINE FAMILY :
2.5L4T
DISPLACEMENT : 2.5L POWER CATEGORY : 37 ≤ kW < 56
EMISSION CONTROLS : DFI, TC, EGR, ECU, DOC, PTOX
THIS ENGINE COMPLIES WITH U.S. EPA AND
CALIFORNIA REGULATIONS FOR 2022
NONROAD DIESEL ENGINES.
ULTRA LOW SULFUR FUEL ONLY.
ENGINE MADE IN KOREA
40446766/01

1.4.1.3.1 Yanmar engine parameters

Parameter \ Model			4TNE98
Type			4 cycle water-cooled, cylinder in line, vertical overhead valve
Cylinder	Number of Cylinders – Cylinder Diameter × Stroke		4-98×110
	Total Displacement		3.319
	Compression Ratio		21.3
Rated Power/Speed			42.1kw/2300rpm
Max Torque/Speed			206N.m/1700rpm
No-Load Min Speed			750rpm
The lowest fuel consumption rate			265 g/kw.h
Movement Direction			In Clockwise Direction Looking from the End of Fan
Whole Length × Whole Width × Whole Height			728×526×707
Weight			225kg
Firing Order			1-3-4-2
Cooling System			Forced circulation with water pump
Lubricating System			Forced Lubrication
Main components	Fuel Pump		Distribution type
	Fuel injector		Throttle type
	Air Filter		Paper Filtration
	Engine Oil Pump		Trochoid pump
	Water Pump		Vortex type
	Thermostat		Wax-pill type
	Alternator	Voltage	12V
		Current	42A
		Means to produce electricity	AC generation, silicon rectification
	Starter	Voltage	12V
		Output Power	2.3kw
	Battery		12V/90Ah

1.4.1.3.2 LS engine parameters

Parameter \ Model			LS L4CRTV4
Type			4 cycle water-cooled, cylinder in line, vertical overhead valve
Cylinder	Number of Cylinders – Cylinder Diameter × Stroke		4-88×103
	Total Displacement		2.505
	Compression Ratio		17:1
Rated Power/Speed			56.3kw/2300rpm
Max Torque/Speed			208N.m/1600rpm
No-Load Min Speed			800rpm
The lowest fuel consumption rate			235 g/kw.h
Movement Direction			In Clockwise Direction Looking from the End of Fan
Whole Length × Whole Width × Whole Height			815×570×724
Weight			220kg
Firing Order			1-3-4-2
Cooling System			Forced circulation with water pump
Lubricating System			Forced Lubrication
Main components	Fuel Pump		Distribution type
	Fuel injector		Throttle type
	Air Filter		Paper Filtration
	Engine Oil Pump		Trochoid pump
	Water Pump		Vortex type
	Thermostat		Wax-pill type
	Alternator	Voltage	12V
		Current	70A
		Means to produce electricity	AC generation, silicon rectification
	Starter	Voltage	12V
		Output Power	2.2kw
	Battery		12V/90Ah

1.4.1.3 Transmission nameplate

Nameplate of four-wheel drive transmission

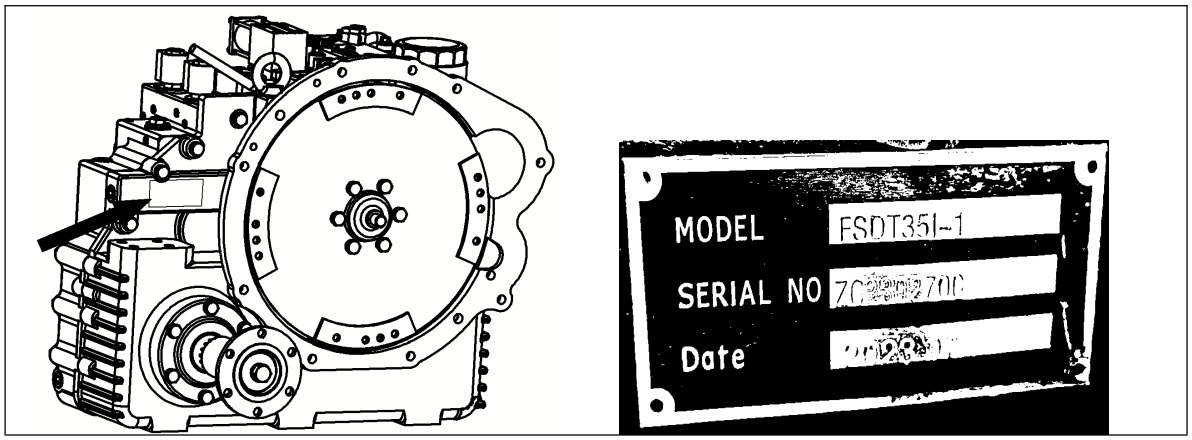


Fig.

1.4.1.5 Nameplate of drive axle

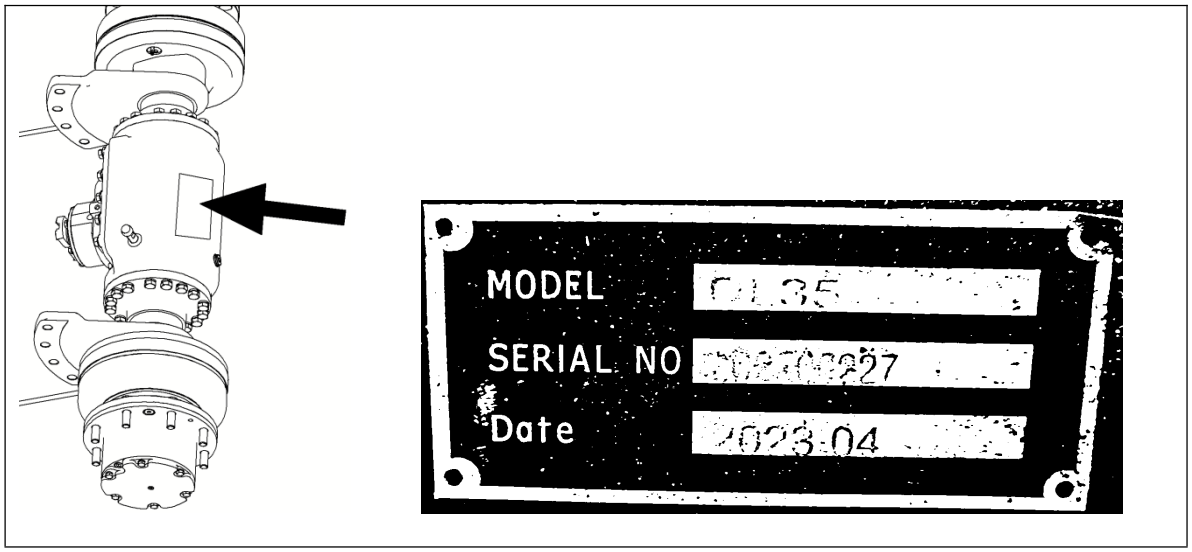


Fig.

Nameplate of drive axle

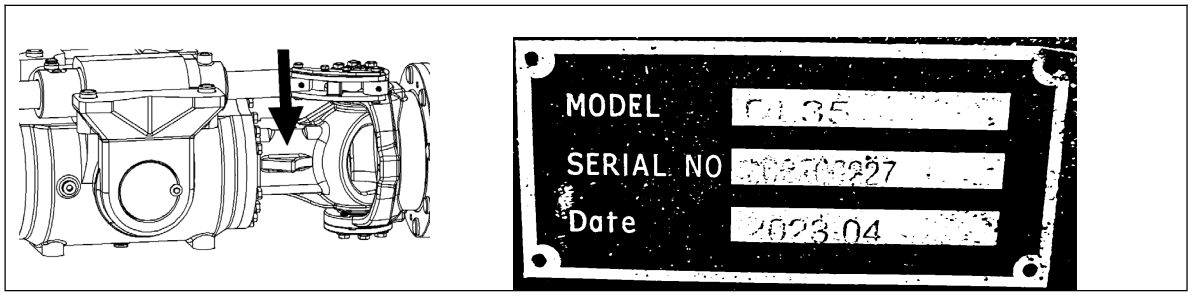


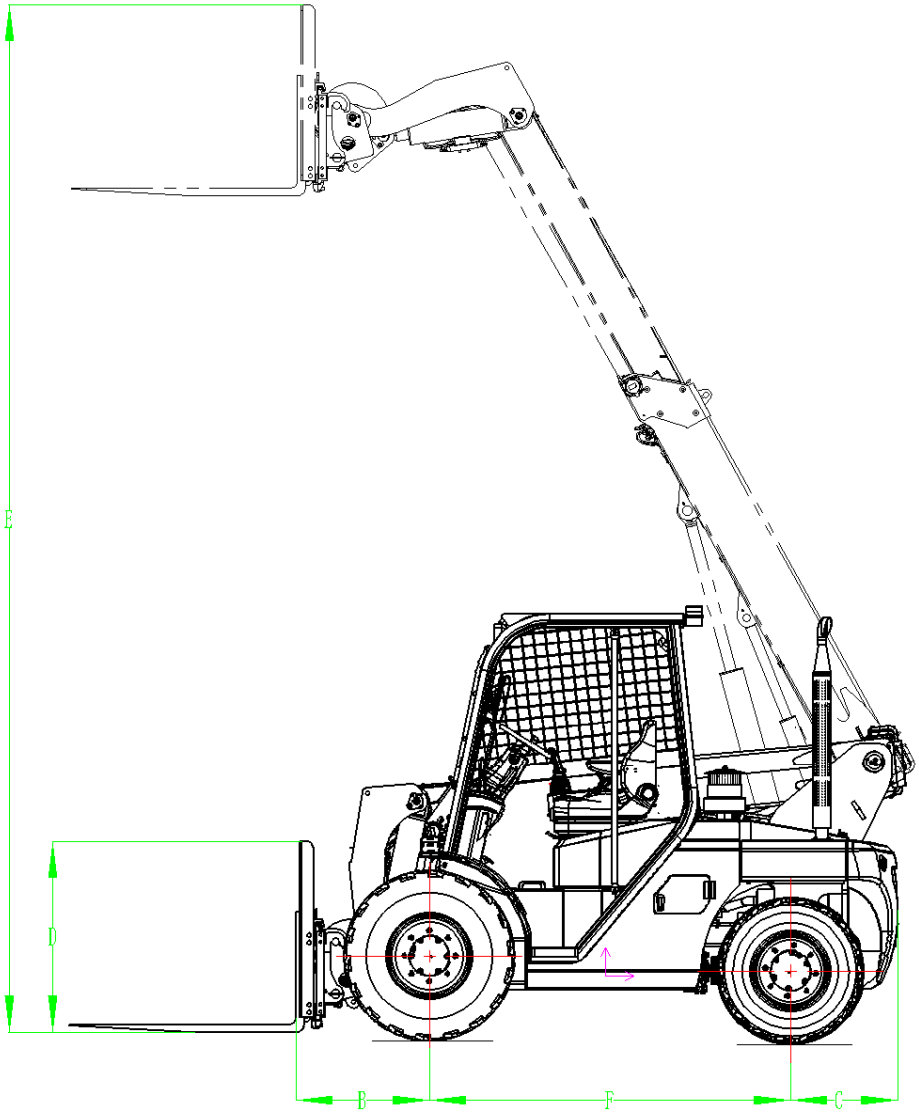
Fig.

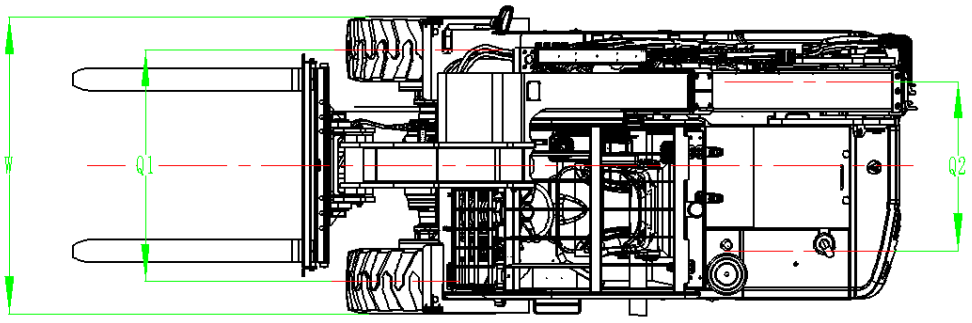
1.4.2 New machine running-in

The machine has been thoroughly adjusted and tested before leaving the factory. However, it will seriously affect its performance or shorten its service life if the machine is initially operated under harsh conditions. Therefore, Hongzhi recommends that you run in the new machine for a period of 100 working hours (according to the hour meter instructions). Make sure that you understand the complete manual and pay attention to the following points during running-in:

- Start engine and idle it for 3- 5 minutes. Do not operate the joystick during this period. Then adjust the throttle to 1,500 rpm and slowly drive the machine until the coolant temperature reaches 140 degrees Fahrenheit (60 degrees Celsius).
- Do not operate under heavy loads or high speeds.
- Avoid sudden starts and stops.

1.5 Equipment parameters





Note: Taking Yanmar 98 as a sample, other engines will not be listed one by one

Parameter \ Model			MTF15-60	MTF25-50	MTF25-60	MTF30-45
Performance parameter	Rated Capacity kg		1500	2500	2500	3000
	Load Center mm		500	600		
	Lifting Height mm		6000	5000	6000	4500
	Free Lift Height mm		1200			
	Tilt angle of boom		-5~65º			
	Lifting Speed mm/s	Full-Load	600	500	485	500
	Running Speed km/h	Full-Load	18	18	18	18
		No-Load	20	20	19	19
	Max Traction Force (Full-Load) N		38000			
	Gradeability (Full-Load) %		45	45	45	
	Efficiency % of differential lock		45	45	45	
	Min Turning Radius R mm		3250	3250	3250	
Dimension parameter	Total Length L (Without Fork) mm		2990	3126	3141	
	Total Width W mm		1450	1600		
	Total Height D (Boom retraction) mm		2256	2256	2330	
	Total Height E (Boom extends with a backrest) mm		4150	4175	4305	
	Wheelbase F mm		1880			
	Track Width	Front Q1 mm	1123	1250		
		Rear Q2 mm	1190			
	Front Overhang B mm		510	585	600	
	Rear Overhang C mm		300	600		
	Fork Dimension	Length mm	1070	1070	1070	
		Width mm	100	122	125	
		Height mm	35	40	45	
	Lateral adjustment of fork mm		200-1315	250-1310	250-1500	
	Ground Clearance (Boom) mm		273	270	270	
	Selfweight kg		4800	5600	5500	

2 Safety

2.1 General safety

2.1.1 General safety

This section of this manual provides detailed information on the basic safety precautions to be followed during operation and maintenance of the machine.

2.1.2 Safety signs in this manual

The hazard alarms in this manual are used to remind operators, work supervisors, maintenance personnel, and on-site workers to comply with operating regulations and maintenance procedures in case of hazards. Hazard warnings are used throughout the manual. Hazard warnings contain hazard warning symbol and signal word to identify the severity of the hazard when the message is ignored.

The following (ANSI/ISO) signal words are used to indicate potential hazards; It may result in damage, personal injury, or even death if it is not avoided. Different signal words or icons are used to indicate potential hazard levels in this manual and machine labels.

Note: Used to indicate actions unrelated to personal injury.

Warn users not to do something through the symbol in the graphic.

2.1.3 Machine nameplate

All safety and warning signs must be in place, undamaged, and clearly visible. Get fully familiar with the location and content of all labels on the machine. Walk around the machine and review the labels one by one. The labels provide important instructions and warnings, which must be carefully read and understood before operation or maintenance. The local dealer of Hongzhi can replace labels if necessary.

Make sure that the label is placed in the correct position when replacing it. If you have any questions about its meaning and location, please contact the Hongzhi dealer.

2.1.4 Operator safety information

It is impossible to develop a list of safety precautions that cover all situations. However, it is necessary to follow the following basic principles when operating this machine:

- Only qualified personnel who have received specialized training can operate and/or work on this machine.
- Assistance devices for operator such as warning lights, horns, or buzzers, as well as display information on monitors, are designed to remind the operator of potential issues. Relying solely on these assistance devices for operator, rather than correct operating procedures, may lead to accidents. Check the assistance devices for operator of this machine every day to make sure that they are in normal working condition. Reported to the Hongzhi dealer in case of any fault. Stop work immediately if any assistance device for operator is not working properly.
- All accident prevention guidelines and operating instructions are based on authorized use of the machine.
- Please read and understand this manual and any accompanying manuals before operating this machine.
- This manual must be available to the operator at all times and must be left in the cab during machine use.
- Make sure that all personnel in the work area around the machine are very familiar with the safety operating procedures described in this manual.
- Review local, state, and federal regulations and standards regarding the operation of this machine.

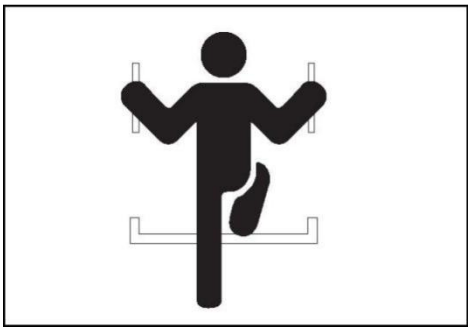
Work practice requirements may vary depending on government regulations, industry standards, and employer policies. It is necessary to comprehensively understand all these relevant work rules before operating or maintaining this machine.

- Check the maintenance log before the start of each workday shift. Make sure that daily maintenance has been carried out according to the instructions in this manual. Do not operate damaged or poorly maintained machines.
- Only the operator can stay on the machine when the machine is running.

2.1.5 Machine installation and disassembly

Installation or disassembly may cause hazards. Please note the following:

- It is important to make sure that the machine completely stops state before attempting to enter or leave the machine. Do not jump on or off the machine.
- Do not leave or enter the cab by any other means except for the equipped handles and steps.



- Always face the machine when installing and disassembling the machine.
- Always maintain three- point contact (with both feet and one hand or with one foot and two hands) with the handle, steps, and deck to make sure proper support.
- Wear shoes with soles made of anti- slip materials.
- Do not walk on any surface when the anti -slip material on the sole is missing or excessively worn, shown in Fig. 2-1. Do not step on the surface of the machine that is not allowed to walk or work. Keep all walking and working surfaces of the machine clean, dry, and slip resistant.
- Always keep handles, steps, and walkway areas clean and free of mud, oil, grease, or similar debris. Please repair or replace these areas immediately if they are damaged.

2.2 Equipment safety

2.2.1 Equipment safety

2.2.2 Authorized use of the machine

Tele-trucks are designed for transporting and handling cargo.

2.2.3 Unauthorized use of machine

Unauthorized use includes but not limited to:

- Transport personnel through a machine or cab.
- Transport objects through cables, chains, or other items connected to the machine.
- Dragging or pushing vehicles, trailers, or containers.
- The machine is overloaded, meaning it exceeds its maximum load capacity.

2.2.4 Unauthorized machine modification

Do not modify the machine in the unauthorized way.

2.2.5 Escape tools

Be sure to place escape tools in the driver's cab as preventive measure.

Note: Regularly inspect the escape tools and replace them if they are damaged or cannot be used to break the cab window to form an emergency exit.

2.2.6 Fire safety

Fuel, oil, and coolants are flammable. Please note the following points:

- Make sure that open flames, airborne sparks, and combustion ashes are kept away from the machine.
- Turn off the engine without smoking when refueling or repairing the machine.
- Add oil, fuel, or coolant in a well ventilated area.
- Immediately clean up any spilled liquid or coolant.
- Check the machine daily for excessive debris accumulation.
- Check the oil pipes for oil leakage every day. Carry out troubleshooting and cleaning before starting the machine if so.

2.2.7 Electric fire

Short circuit, damage, or over-charging of the electrical system can cause a fire. Please note the following points:

- Please check the wiring on the machine for damage for pre-start inspection. Please repair or replace the damaged wires if so.
- Do not install after-sales electrical equipment without the approval of the Hongzhi dealer.

2.2.8 Fire extinguisher

Fire extinguishers are always equipped inside the cab. Make sure to update the inspection label of the fire extinguisher as required and get familiar with the correct use of the fire extinguisher. Make sure that the fire extinguisher is a "A, B, C" class fire extinguisher weighing at least three pounds (NFPA 10 portable fire extinguisher standard).

2.2.9 In case of fire

Please escape the machine according to the following instructions if the machine catches fire:

- Immediately press the emergency stop button to shut down the machine. Do not attempt to move or continue operating the machine. Immediately leave the area and stay away from the machine until you can access the machine permitted by the fire department.
- Please seek help immediately after leaving the machine. Always align the nozzle with the source of the fire when using a fire extinguisher. Keep a list of emergency phone numbers available for use in the event of a fire or accident.

2.2.10 Extrusion danger

Do not extend any part of the body out of the window or outside the door during operation or driving. Moving or falling objects from work equipment may cause personal injury. Install all protective devices on the machine in place. Do not remove the side window or grille of the machine. Replace the side window with a grille or glass immediately if it is damaged or broken. Block the machine operation area and prohibit all non- essential personnel from entering the area.

2.2.11 Diesel engine exhaust

Engine exhaust can cause illness or death. Exhaust the exhaust gas outdoors through the extension of exhaust pipe if it is necessary to run the engine in a closed area. Open the door and supply external air to the building with a fan if there is no extension of exhaust pipe.

2.3 Maintaining safety

2.3.1 Maintaining safety

It is impossible to foresee all situations that may cause potential hazards during operation or maintenance. Therefore, some hazard warnings in this manual and on the machine may not include all possible safety precautions. Please make sure that such steps and measures can be safely carried out without damaging the machine or causing injury if any steps or measures not specified, recommended, or allowed in this manual are implemented. Please contact factory or its dealer if you are unsure if some programs are safe. Please read all safety information related to the specific program on the machine before repair. Please wear and use appropriate personal protective equipment. Personal protective equipment includes but not limited to safety shoes, helmets, and goggles. It is important to reach an agreement on the operating procedure before starting the operation when two or more workers perform any operation at the same time. Please be sure to inform colleagues before starting any operational steps. Please hang a lock out/tag out label in the driver's cab before work. Please keep all tools in good condition, understand usage, and use the correct tools. Please thoroughly inspect all tools before starting any procedures. Park the machine on a hard and level surface, and block the wheels to prevent the machine from moving before maintenance or repairs. It is necessary to release pressure to prevent fluid from spraying out before disconnecting or disassembling hydraulic or coolant system components. The coolant and oil in the circuit may be in the high temperature state after the engine stops, so be careful to prevent burns. Wait for the oil and coolant system to cool before work. Be careful to avoid getting entangled in rotating or moving parts when checking the machine during engine operation (i.e. measuring oil pressure, speed, temperature, etc.). Please turn the battery isolation switch to the "off" position unless required by the program.

lose all openings with caps and plugs when removing hoses or pipelines. Please clean any fuel or oil drips on the floor immediately if so.

Make sure the high-pressure hose is not twisted during installation. Damaged hoses are very dangerous. Be careful when installing the high-pressure circuit hose. Make sure to correctly install and tighten fittings.

Be sure to tighten parts according to the specified torque during assembly or installation. When installing protective parts (such as protective covers) or parts that severely vibrate or rotate at high speed, it is necessary to check whether they are installed correctly.

2.3.2 Lockout/tagout procedure

Lock/tag out the machine according to local regulations.

2.3.3 Clean machine

It is necessary to clean machine parts with hot water and mild, non flammable, degreasing soap or cleaning agents. Do not use flammable or corrosive cleaning agents. Do not clean the machine with a high-pressure steam cleaner. Be sure to remove any water or soap residue and thoroughly lubricate the machine after cleaning.

2.3.4 Oil system

2.3.4.1 Oil system

2.3.4.2 Add oil to the machine

Please note that the oil system is in a high-pressure and high-temperature state if you need to add oil to the machine.

2.3.4.3 Add fuel

Please turn off the machine and remove the fuel tank cap before adding fuel. Fuel leakage can cause danger if it is not cleaned immediately. It is necessary to refuel in well ventilated areas. Do not smoke or use open flames nearby when refueling the machine. Do not mix gasoline with diesel. Gasoline is highly flammable and may cause an explosion. It is necessary to reserve space for fuel expansion when refueling

the fuel tank.

2.3.4.4 High pressure fluid pipeline

Do not inspect or replace parts when any system is under pressure. Working on pressure systems may result in serious injury. Do not check or search for leakage with hands. Be sure to wear safety glasses and leather gloves, and use wood or cardboard when checking for leakage. Check whether the pipeline or hose is broken and whether the hose is expanding.

Note: The surrounding area will be wetted in case of leakage in the pipeline or hose. Please replace the pipelines and hoses immediately in case of leakage or malfunction. Seek medical care immediately if high-pressure oil penetrates the skin or enters the eyes.

2.3.5 Electrical system

2.3.5.1 Electrical system

Be sure to clean the electrical system with electrical cleaning agents approved by factory. Do not clean the electrical system with corrosive soap, high-pressure water, or steam cleaning devices, otherwise, it can damage the system or cause intermittent system malfunctions.

2.3.5.2 Battery safety

Be sure to use batteries in a well-ventilated area. Batteries can pose a danger, especially after a long period of use. The followings are some basic precautions for working around batteries:

- Always wear personal protective equipment.
- Battery gas is highly explosive. Smoking, sparks, or open flames can cause explosion. There should be sufficient time for battery gas to escape after opening the battery box.
- Rinse the corroded area with a mixture of baking soda and warm water if the battery shows signs of corrosion.
- Immediately rinse the contact area with clean water and seek medical care promptly if battery acid comes into contact with skin or eyes. Check the condition of the battery with appropriate testing equipment only.

2.3.5.3 Disconnect battery

Always disconnect the negative (-) cable first, and then the positive (+) cable when disconnecting the battery.

2.4 Work safety

2.4.1 Work safety

The owner and/or operator are responsible for replacing any safety labels on the machine that are damaged or lost. Do not keep the machine running when it is left unattended. Always park the machine in a safe and flat area, lower any work equipment to the ground, lock the control devices, and secure the machine to prevent unauthorized tampering. Please turn off the engine before leaving the machine. Make sure that all personnel maintain a safe distance from all points of the machine before operation, travel, or maintenance procedures. Do not allow anyone to stand near the machine during operation, maintenance or repair. The employer of the operator is responsible for conducting safety training regularly and ensuring that all personnel are familiar with emergency procedures. Please drive slowly and honk the horn if there are pedestrians in the area. Make sure that all relevant personnel understand all industry standard gestures to be used when working with others at the workplace. The operator should only respond to operational signals issued by appropriate signalmen, but always listen to stop signals issued by anyone. The operator must always be able to see the working position. A signalman must be used if it is not possible. Stop the operation immediately if visibility is obstructed for any reason. If the machine is equipped with assistance device for operator, it is necessary to use the device when operating the machine as required by the Occupational Safety and Health Administration. The steering modes include two- wheel steering, four-

wheel rotary steering, and four- wheel crab steering. Do not change the steering mode while moving. The steering mode must be changed when the tele-truck is stationary. When driving at high speeds, only use front wheel steering (if steering mode is optional). Tele-truck equipped with solid or foam filled tires shall not be used in applications requiring excessive road travel or long-distance travel. Non suspended load: Do not travel while the boom is raised. The suspension load of the tether will limit movement. Do not attempt to level with the vehicle frame tele-truck to compensate for load oscillation. Do not drag the load; Vertical lifting. When traveling with suspended load:

- Slowly start, move, turn, and stop to prevent load oscillation.
- Do not extend the boom.
- Do not raise the load more than 300mm (11.8 inches) above the ground or cause the boom angle to exceed 45 degrees.
- Do not exceed walking speed. Only approved personnel work platforms should be used for lifting personnel, and appropriate load-bearing capacity charts should be displayed in the cab. Do not drive the machine in the cab when there are people on the work platform. Do not stand under the tele-truck. Keep away from moving parts when the engine is running.

2.4.2 Personal protective equipment (PPE)

2.4.2.1 Personal protective equipment (PPE)

Please make sure that the personal protective equipment is in good condition and able to perform the task before using it.

2.4.2.2 Hearing protection

Prolonged exposure to noisy environment may lead to hearing loss. Wear appropriate hearing protection to prevent the impact of noise.

2.4.2.3 Danger reminder

Observe the rated load capacity table in the cabin. Do not exceed the rated lifting capacity. Do not use accessories without the appropriate load capacity table installed on the tele-truck approved by the original equipment manufacturer. Make sure that the ground conditions are sufficient to support the machine. Pay attention to wind conditions. Wind may cause load oscillation and dangerous lateral loads. It may lead to a tipping hazard. Do not raise the boom unless the frame is in a horizontal state (0 degree), unless otherwise specified on the load capacity table. Do not flush the machine with a load that is 11.8 inches (300 mm) or more above the ground. Always maintain appropriate tire pressure. The machine may tip over if the appropriate tire pressure is not maintained. Always fasten the seat belt.

2.4.3 Driving and operation precautions

There may be hazards during machine operation. Please make sure to drive the machine in a safe and controllable manner and always remain vigilant. Make sure that the area around the machine is clearly visible.

Please drive at low speed and steer carefully on uneven ground. Try to avoid driving over obstacles or protruding areas. Driving over obstacles or protruding areas may cause the machine to lose control or get damaged. Always maintain low speed when driving over protruding areas. Avoid any sharp turns or sudden stops.

Please always maintain a safe distance from people and surrounding objects during driving. Be sure to check to make sure that areas such as bridges or roads can support the weight of the machine before attempting to cross. Please verify with the relevant authorities and follow their instructions before entering a public area.

2.4.4 Avoid reverse accidents

Keep the windows, rearview mirrors, and lighting fixtures clean and in good condition. Please make

sure that there are no bystanders on the expected path before moving the machine. Please warn others with a horn before moving the machine. Please use a signalman if the line of sight is obstructed when reversing. Make sure that the signalman is always in sight.

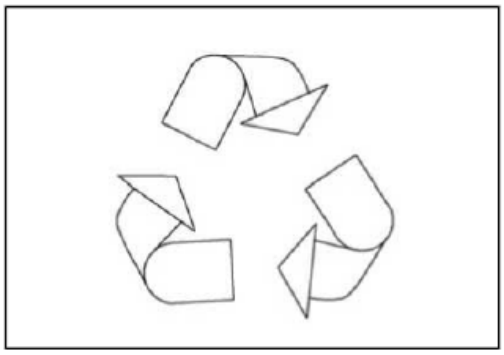
2.4.5 Dust and chemical hazards

When harmful dust or chemicals are released or mishandled, the contact with these substances can pose serious hazards. All relevant workers should use approved personal protective equipment and comply with all environmental safety regulations. Please refer to the Material Safety Data Sheet for guidance on personal protective equipment, proper handling and cleaning, and proper reporting to institutions if necessary.

2.4.6 Notes for environmental protection

Pouring oil and coolant onto the ground, into water bodies, rainwater channels, or into trash cans (even in sealed containers) can pollute soil, groundwater, streams, and rivers.

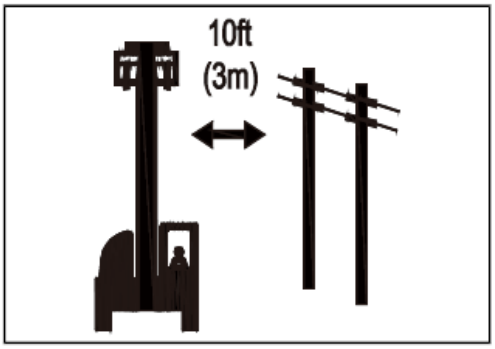
Recycling waste oil, coolant, and filters not only saves natural resources but also benefits environmental protection.



Dispose of harmful substances (such as engine oil, fuel, filters, batteries, hydraulic oil, or old parts) in line with local regulations.

2.4.7 Precautions for operation in high-voltage areas

Stay away from elevated transmission lines to avoid electrical hazards. Consider all elevated transmission lines live and un-insulated.



Warning

Elevated transmission lines carry high voltage and can discharge electricity to the ground through the machine without direct contact with the machine structure. Avoid direct contact with high-voltage transmission lines during operation.

The contact with high voltage may cause equipment damage, death or serious injury to personnel.

2.4.8 Precautions for operation in the wind

Wind has a significant impact on the load that fork truck can lift. The impact of wind on the machine varies depending on the direction of the wind. Suggestion from factory: Do not operate the machine when the wind speed exceeds 30 miles per hour (48 kilometers per hour).

3. Machine control

3.1 Main machine parts

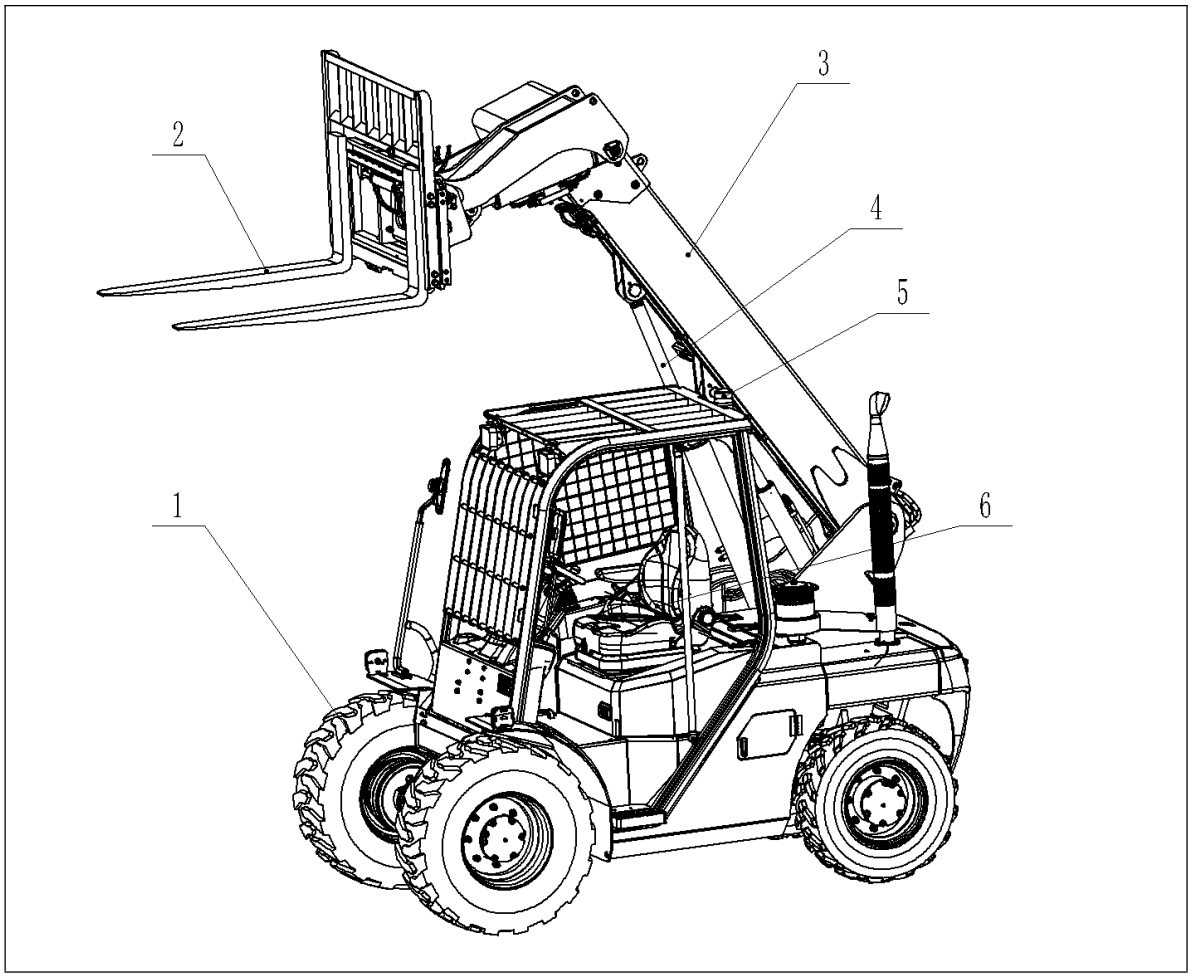


Fig. 3-1

S/N.	Items	Function
1	Chassis assembly	The chassis is the main supporting structure of the machine, with all other components installed on the chassis.
2	Attachment assembly	As main working mechanism, accessories are used for transporting objects.
3	Boom assembly	The boom assembly becomes the main mechanism of the tele boom.
4	Hydraulic system	The hydraulic system provides power for steering, braking, and forks.
5	Electrical system	The electrical system consists of control circuits for driving, driving, and operating mechanisms. The circuit controls the operation mechanism.
6	Cab and operating system	The operator sits in the cab and controls the machine functions through the operating system.

3.2 Operator control device

3.2.1 Operator control device

It is necessary to fully understand the operating methods of the control device to operate the machine correctly and safely.

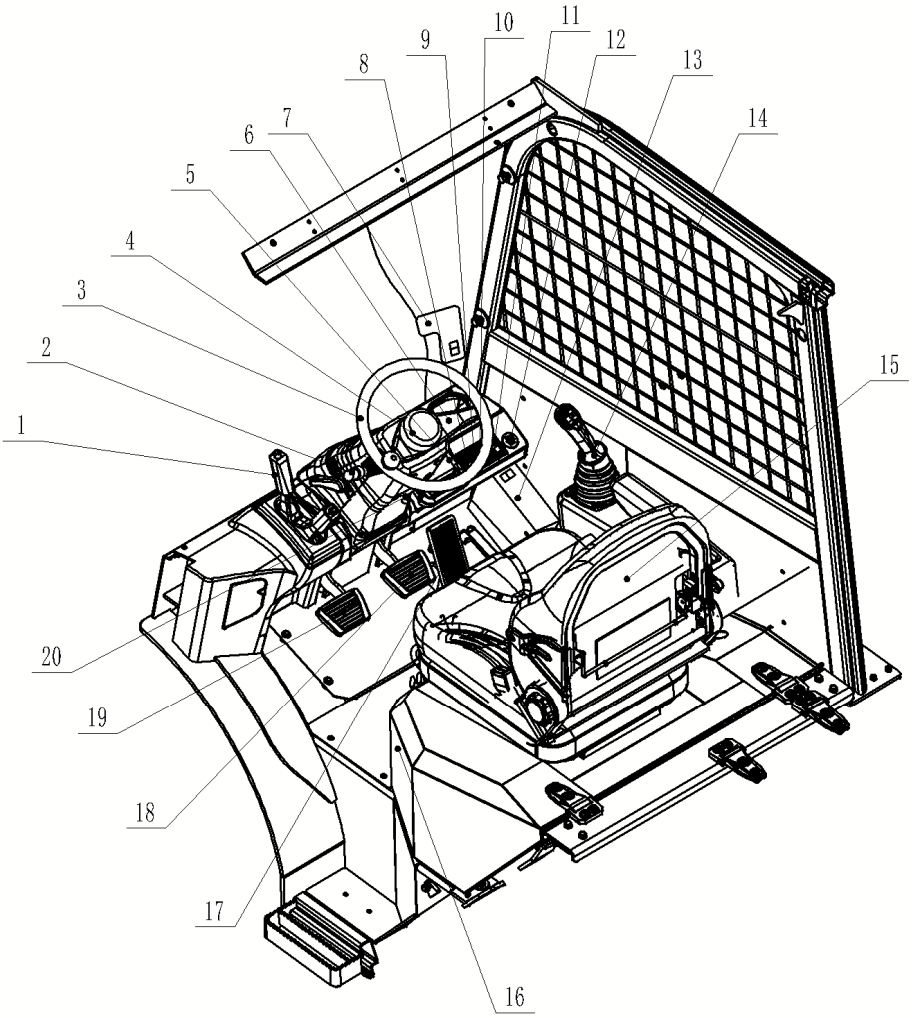


Fig. 3-2

S/N.	Items
1	Hand brake switch
2	Transmission lever
3	Steering wheel
4	Horn switch
5	Display
6	Steering lever
7	Windscreen wiper switch
8	Four-wheel drive switch
9	Rear work light switch
10	DPF post-processing switch (other)
11	Windscreen wiper spray switch
12	USB socket
13	Heater switch
14	Operating handle
15	Seat
16	Hood lock
17	Accelerator pedal

18	Foot brake pedal
19	Clutch pedal
20	Ignition switch

3.2.2 Steering column

3.2.2.1 Steering column

The main components of the steering column:

- Steering column angle- adjustment pedal (1)
- Transmission control lever (2)
- Steering wheel (3)
- Turn signal lamp / lamp post (4)

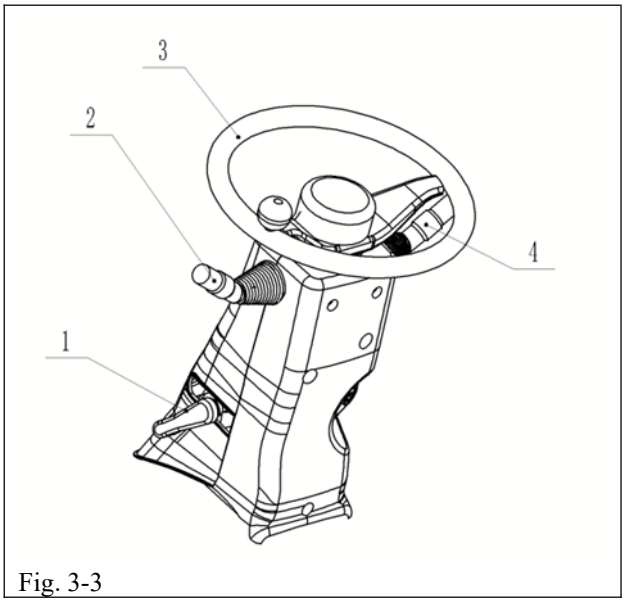


Fig. 3-3

3.2.2.2 Turn signal controller

Move the turn signal controller (1) forward to operate the left turn signal light; Alternatively, move backward to operate the right turn signal light.

Note: Turn signal lights are used to warn nearby personnel that the direction of the machine is about to change.

Note: When the turn signal light is illuminated, the turn signal indicator will alert the operator.

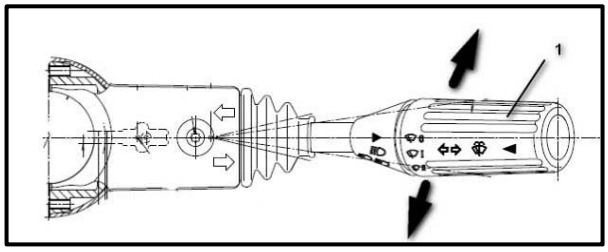


Fig. 3-4

Push the turn signal lever forward. The left turn signal light on the front fender and the left turn indicator light on the display in the cab will begin to flash.

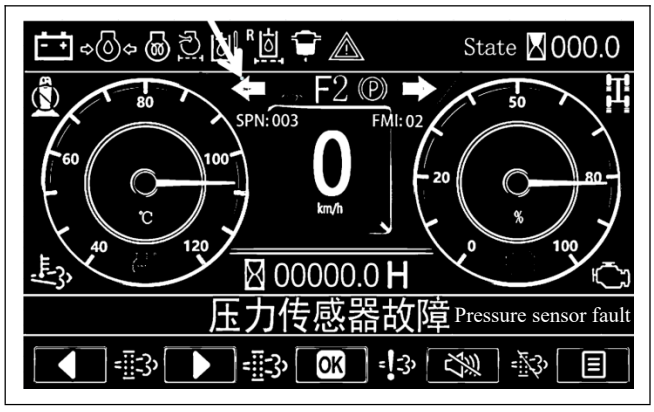


Fig. 3-5

Pull the turn signal lever backward. The right turn signal light on the front fender and the right turn signal light on the display in the cab will begin to flash.

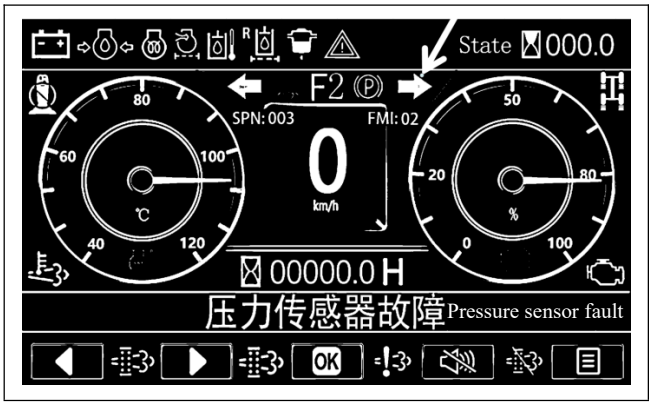


Fig. 3-6

3.2.2.3 Horn button

The horn button is located at both ends of the gear lever and turn signal lever. Trumpet is made when pressing the horn button.

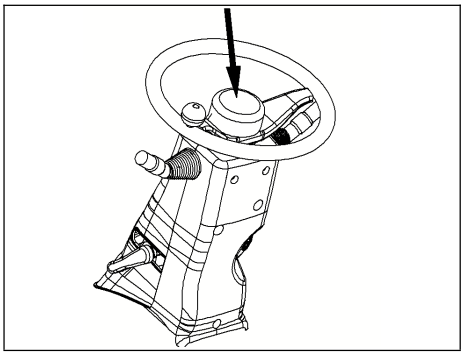


Fig. 3-7

3.2.2.4 Steering wheel angle adjustment handle

When adjusting the angle of steering wheel:

1) Press the steering wheel adjustment handle to adjust the steering wheel to the desired position.
2) Release the steering wheel adjustment handle.

3.2.2.5 Transmission control lever

Drive forward or backward through the transmission control lever.

- Push the control lever forward to F1 gear, and the machine will drive forward; Push the control lever forward to F2 gear, and the machine will drive forward quickly; Pull the control lever backward to R gear, and the machine will drive backward; Move the control lever to the neutral position and engage in neutral.
- Select forward or backward travel in any gear.
- The backup alarm will automatically sound when you drive backward.

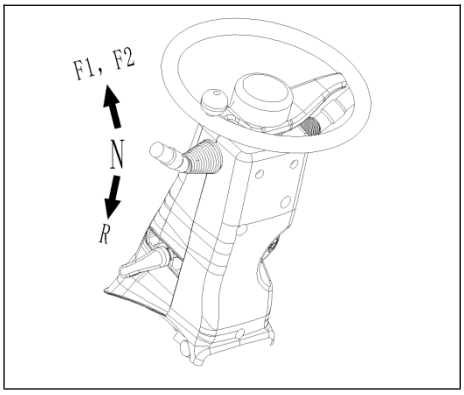


Fig. 3-8

- Drive slowly when reversing or turning.
- It is prohibited to achieve higher hydraulic performance by increasing the engine speed and pressing the service brake when the transmission is in forward or reverse gear unless the transmission release button is activated. Otherwise, it may cause abnormal machine operation.

The gear selection function is located on the rotary knob of the transmission control lever.

- Select a gear by turning the rotary handle.
- The transmission has four forward gears and three reverse gears.
- Select the appropriate gear based on the task to be executed. Adopt lower gears for transportation of heavy objects. Only select higher gears for long-distance driving without load.

- Slow down first before downshifting. At most one gear down at a time.

3.2.2.6 Start and stop the key switch

1) Startup and shutdown

Before starting the engine, make sure that the gear lever is in neutral position. At this time, the instrument shows neutral (N), otherwise, the engine will not start. This is because the tele-truck is provided with a startup protection function to prevent any danger.

When the key switch is in the OFF position, the key may be inserted/removed. When the engine is already started, turn the key switch back to OFF and the engine will automatically turn off.

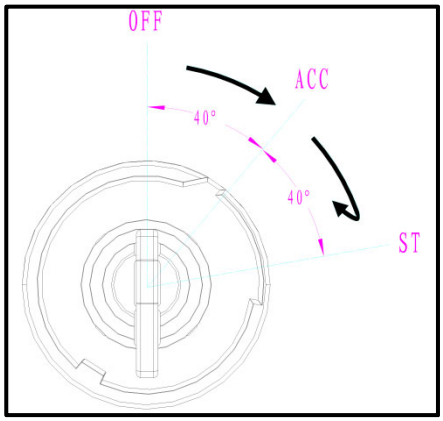


Fig. 3-9

Turn the key switch clockwise one gear to ACC gear so that the tele-truck is powered on, the preheating system works automatically, the air is heated, and the preheating indicator light is lit to indicate the state of the preheating system After 8~12s, the preheating is completed and the preheating system automatically stops working. Turn the key switch clockwise one gear again to ST gear, and start the engine. After the engine starts, release the key switch to reset the key switch to ACC gear automatically.

Caution:

① After the engine stops, do not place the key switch in ACC position to avoid storage battery power loss;

② When the engine is running, do not turn the key switch to ST gear to prevent any damage to the starting motor;

③ For starting, the time of one start shall not be longer than 5s, and the interval between two starts shall be more than 120s. If the engine cannot be started after three consecutive starts, the cause should be identified before starting.

3.2.2.7 Windshield washer button

The windshield washer button is located at the end of the turn signal lever.

- Press the button as shown in the picture to spray cleaning solution onto the windshield.
- Hold the button to continuously spray cleaning solution.
- Release the button to stop spraying.

Turn the controller to one of the four gears (O, I, and II) to control the wipers.

- O-Stop brushing
- I - Continuous brushing according to option 1 speed
- II - Continuous brushing according to option 2 speed

3.2.3 Display

3.2.3.1 Introduction of main interface

The main interface of the monitoring display mainly includes alarm icons, pointer dial, and text alarm display, working status and working time. The specific contents are as follows:

1) Alarm information display area: The alarm icons displayed on the top left, from left to right, include charging, oil pressure, pre-heating, air filter, oil temperature, water temperature, oil level, plateau valve, etc.

2) Display area of instrument panel: They are the display areas for the water temperature pointer and the oil level pointer from left to right.

3) Working status display area: Display the current vehicle status as waiting to start, starting, and working.

4) Text alarm area: Display current important fault alarms, such as engine water temperature, oil pressure, etc.

冷却液温度过高，请停车检查

Please stop the vehicle for inspection as the coolant temperature is too high

5) Display of instrument working time:

Fig. 1.4 Working time display

6) Display of stage working time: Hold the OK key on the main interface to reset.

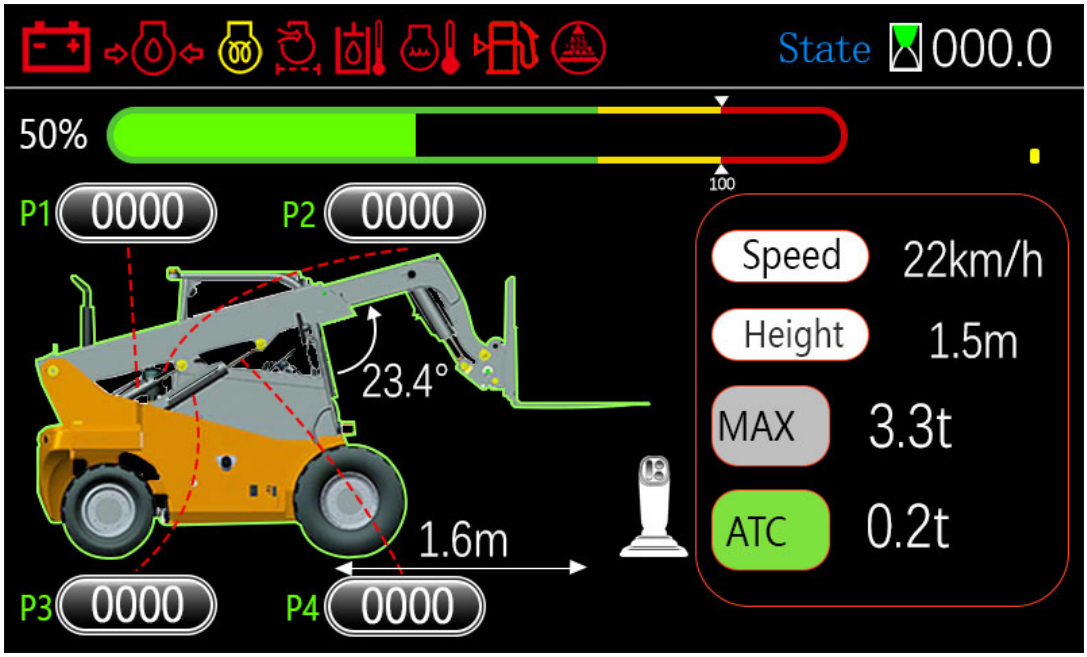
Fig. 1.5 Display of stage working time

7) Key function area: Represents the function corresponding to the buttons on the current page.

Fig. 1.6 Key function area

3.2.3.2 Introduction to the system menu

Press the left and right buttons  on the main interface to switch between the fork mounted work interface and the engine parameter interface. Enter password 5678 in "System Settings", and the cylinder pressure value (in bar) can be displayed. Display vehicle speed, forward reach, load height, maximum load MAX at current position, and actual load at current position on this interface



3.2.3.3 Introduction to the system menu

Press the OK key  on the main interface to enter the system menu selection interface.

Fig. 1.7 Operation interface

This interface includes vehicle information, user settings, system settings, and instrument management.  key is used to adjust the menu cursor position, OK key  is used to enter the next level submenu, and return key  is used to return to the main interface.

3.2.3.4 Detailed interface of monitoring display

3.2.3.4.1 Vehicle information

Select the "Vehicle Information" option through the menu  key through the operation interface shown in Fig. 1.7 and press the OK key  to enter the vehicle status interface. You can view the locomotive parameters of the current vehicle on this interface: Handle status, tilt angle status, fault information, fault records, etc.

Fig. 1.71 Operation interface

Select the "Locomotive Parameters" option through the menu  key through the operation interface shown in Fig. 1.71 and press the OK key  to enter Fig. 1.71-1 to view system voltage, water temperature, oil temperature, oil level, speed, etc.

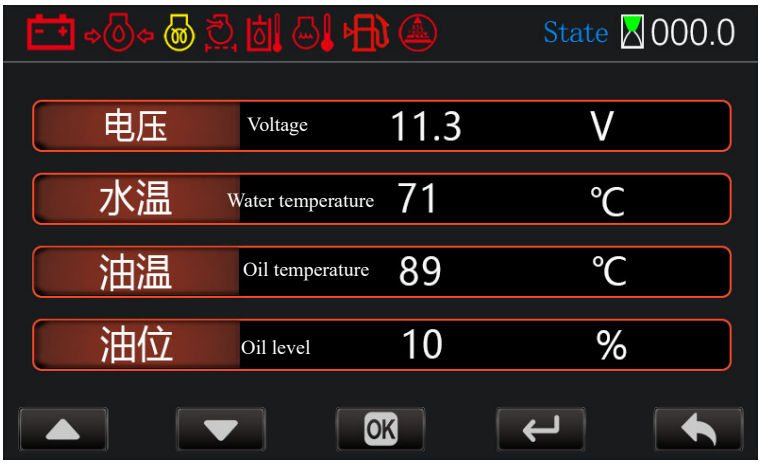


Fig. 1.71-1

Select the "Handle Status" option through the menu  key through the operation

interface shown in Fig. 1.71 and press the OK key  to enter Fig. 1.71-2. (Enter the system setting password to enter this menu)

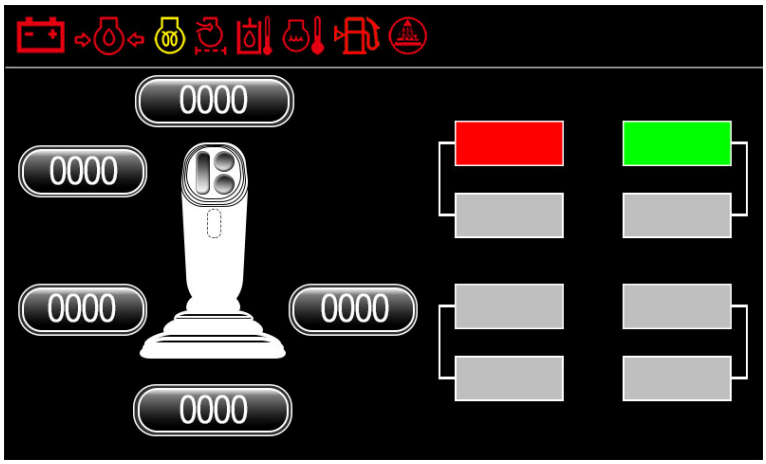


Fig. 1.71-2

Select the "Inclination Status" option through the menu  key through the operation interface shown in Fig. 1.71 and press the OK key  to enter Fig. 1.71-3. (Enter the system setting password to enter this interface and hold the OK key to initialize the rope sensor)

Fig. 1.71-3

Select the "Fault Information" option through the menu  key through the operation interface shown in Fig. 1.71 and press the OK key  to enter Fig. 1.71-4.

Fig. 1.71-4

3.2.3.4.2 User settings

Select the "User Settings" option and press the OK key to enter the power -on password to enter the user settings interface to set whether to enable power- on password login and modify the power- on password. (Default user login password 1234)

 Key is used to modify the current cursor number,  key is used to move the cursor position, and  key is used to confirm password input.

Fig. 2.2 Password input

Press  to switch whether to enable the power- on password

Press  to modify the power-on password, enter the submenu with the OK key, and return to the higher-level menu with the return button.

Fig. 2.3 User password setting interface

3.2.3.4.3 System settings (operated by manufacturer personnel)

Select the "System Settings" option and press the OK key  to enter the password input interface.

Enter password 5678 to enter the system settings submenu and enter the password to return to the fork mounted interface to display the cylinder pressure. Fig. 3.1 System Settings submenu, where you can view the basic information settings of the current vehicle, alarm status settings, sensor parameter settings, power-on password reset, and language settings.

Fig. 3.1 System settings submenu

3.2.3.4.3.1 Basic information settings

Select the "Basic Information Settings" option through the menu key through the operation interface shown in Fig. 3.1 and press the OK key to enter Fig.

Fig. 3.2 Basic information settings

As shown in the figure, enter the basic information setting interface, modify the current cursor number with the key, move the cursor up with the key, and move the cursor down with the key.

3.2.3.4.3.2 Alarm status settings

Select the "Alarm Status Settings" option through the menu key through the operation interface shown in Fig. 3.1 and press the OK key to enter Fig. 3.3

Fig. 3.3 Alarm status settings

Enter the alarm status interface as shown in the figure to set whether to activate the corresponding alarm status.

For example, if the water temperature alarm is changed to 0, the alarm function related with water temperature will be turned off.

Preheating output: Setting it to 5 means that the system will automatically shut down after pre-heating for 5 seconds after being powered on, and setting it to 0 will not output.

Start-up control: Setting it to 1 means 'Australian Standard' and requires weight sensing, power on, and seat belt fastening before starting. There is no order if it is set to 0.

3.2.3.4.3.3 Sensor parameter settings

Select the "Sensor Parameter Settings" option through the menu key through the operation interface shown in Fig. 3.1 and press the OK key to enter Fig. 3.4.

Fig. 3.4 Sensor parameter settings

3.2.3.4.3.4 Power- on password reset

Select the "Sensor Parameter Settings" option through the menu key through the operation interface shown in Fig. 3.1 and press the OK key to enter Fig. 3.5.

Fig. 3.5 Power- on password reset

3.2.3.4.3.5 Language setting

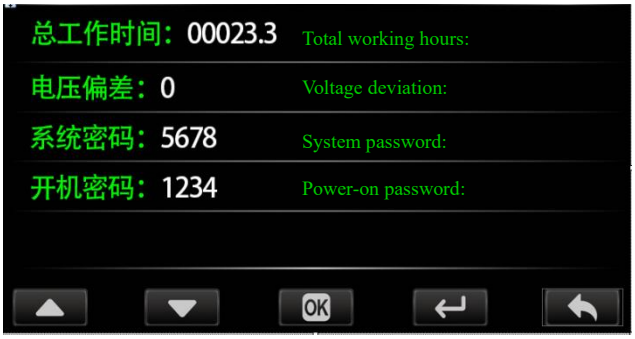
Select the "Sensor Parameter Settings" option through the menu key through the operation interface shown in Fig. 3.1 and press the OK key to enter Fig. 3.6.

Fig. 3.6 Language setting

Currently, the main work interface can be modified in Chinese and English

3.2.3.4.4 Instrument management

Select the "Instrument Management" option and press the OK key  to enter the system settings submenu in Fig. 4.1, as shown in Fig. 4.1



As shown in Fig. 4.1

3.2.3.5 Mute

Press F4 on the main interface to display the mute sign  to turn off the buzzer alarm sound when the buzzer alarms. Press the F4 key again to cancel the mute function.

3.2.3.6 Analog calibration term

This page mainly includes two sensor signal calibrations: Initial length calibration, initial angle calibration.

1. Length calibration: Shrink the boom to the shortest position, read the simulated value of the initial length on the right side (50) (enter the system setting password to enter this interface), and press and hold the OK button on the instrument to complete the length calibration (0)
2. Angle calibration: Place the tele-truck on a flat road surface, retract the boom, and place the boom at the bottom. The simulated value of the boom angle under the main interface (theoretical value is -5 °). The angle correction is required if there is a deviation between the boom angle and the theoretical value.

3.2.4 Rocker panel

The rocker switch group is used to control various electrical components of the tele-truck.

1) For controlling warning lights: Turn on the warning light to flash, turn off the warning light to turn off;
2) Used to control the status of the rear work light: Open it, and the rear work light will light up when the shift lever is placed in reverse gear. Close it, and the rear work light will not light up under any

conditions;

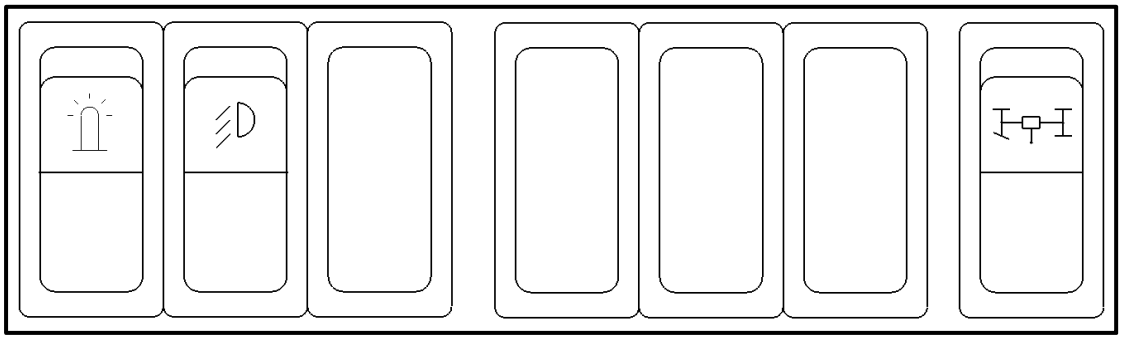
3) Reserved switch;

4) Reserved switch;

5) Reserved switch;

6) Reserved switch;

7) Used to control the switching of four-wheel drive and second-wheel drive and control the electromagnetic valve block by the electrical signal of the switch. When the switch is turned on, the electromagnetic valve coil is powered on, causing its valve core to close and the oil circuit to be unobstructed. The oil circuit controls the operation of the rear wheel drive of the vehicle, thereby achieving the effect of simultaneous four-wheel drive.

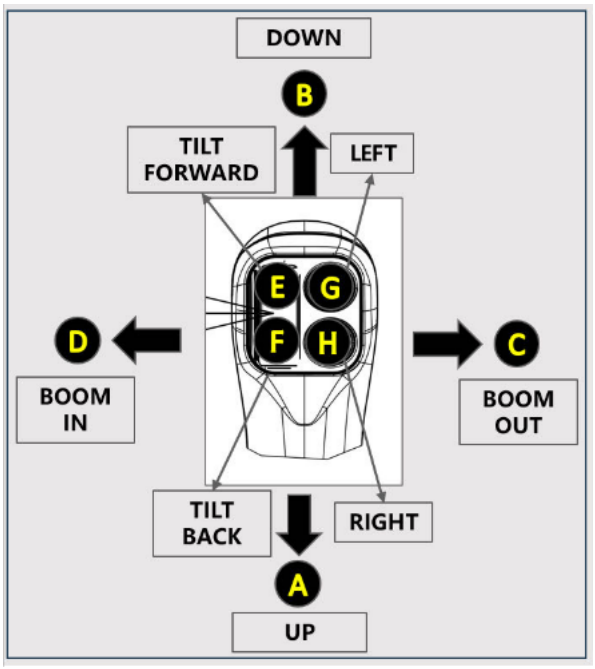


3.2.5 Joystick

The joystick is located on the right side of the operator's seat. The joystick controls the functions of the boom and accessories;

- Boom function

Move the joystick backward to lift the boom; Move the joystick forward to lower the boom; Move the joystick towards the right to extend the boom; Move the joystick to the left to retract the boom.



The speed of the boom function depends on the amount of movement of the joystick in the corresponding direction. Increasing the engine speed will also increase the speed of the boom function.

Move the joystick between the quadrants for two simultaneous boom functions. For example, moving the joystick forward and left will simultaneously lower and retract the boom.

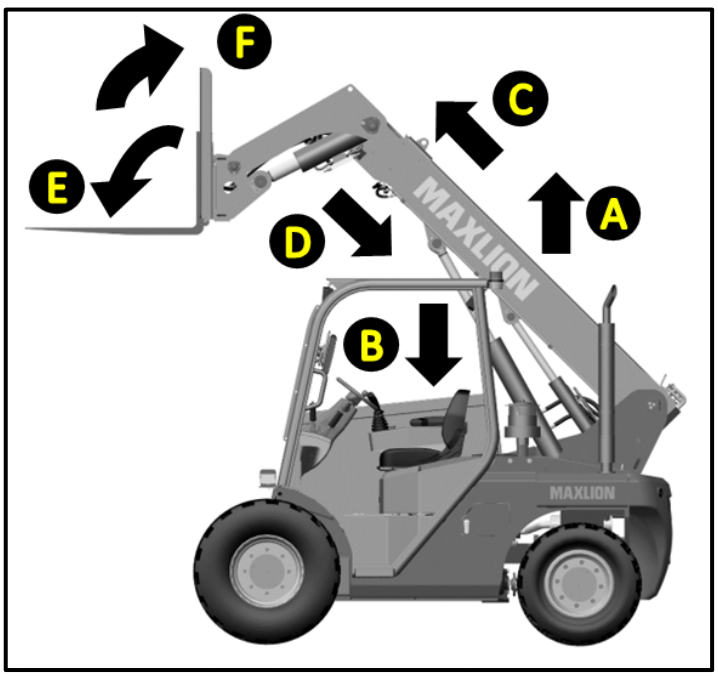
- Attachment function

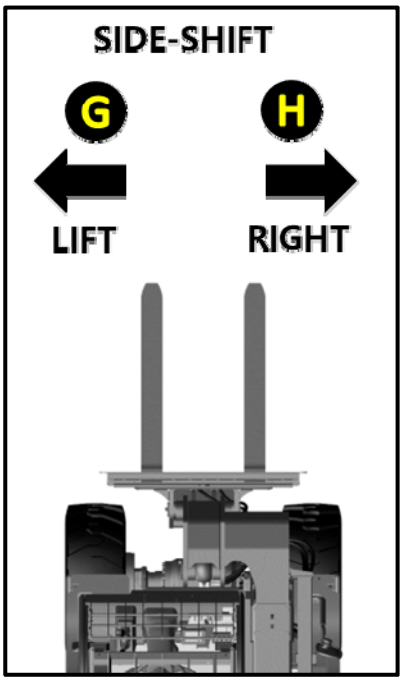
The inclination of the attachment is controlled by the roller switch (1)

1) Press the roller switch E upwards to tilt the attachment downwards; 2) Press the roller switch F downwards to tilt the attachment upwards.

The lateral movement of the attachment is controlled by the auxiliary button switch (2)

1) Press button G to move the attachment to the left; 2) Press button H to move the attachment to the left; The lateral movement speed can be controlled by pressing the time;

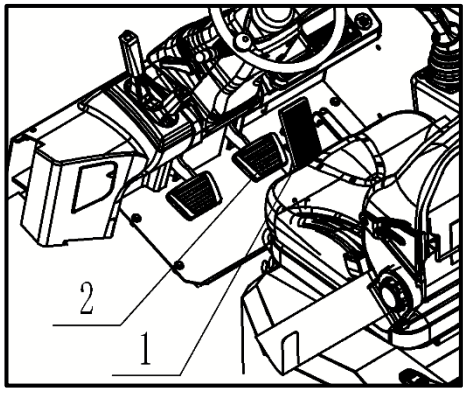




3.2.6 Pedal

3.2.6.1 Accelerator pedal

Increase the engine speed through the accelerator pedal (1).

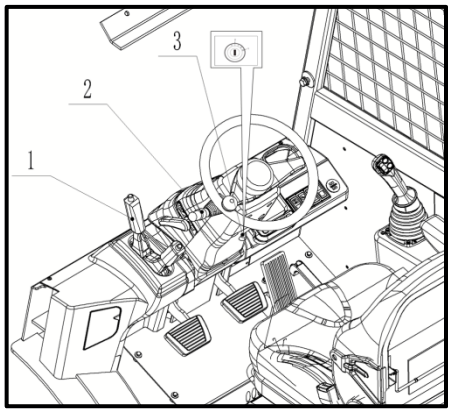


3.2.6.2 Brake pedal

Slow down or stop completely through the brake pedal (2).

3.2.7 Parking braking

Start and release the parking brake (1) before the forklift can travel; Apply the parking brake to prevent slipping after the forklift stops.



3.2.7 Seats and seat belts

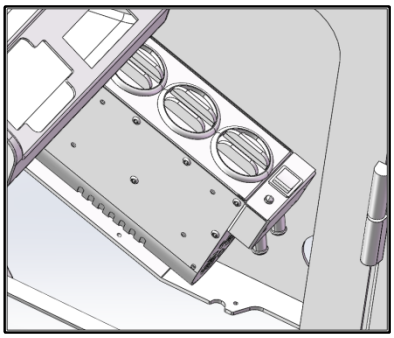
Provide multiple adjustable shock- absorption seats to make sure that operator feels comfort. Adjust the operator seat as follows:

Fasten the seat belt as follows:

1) Grasp the two free ends of the seat belt and make sure that the seat belt is not twisted or entangled.
2) Sit with your back straight and connect the retractable end (male end) of the seat belt to the receiving end (buckle) of the seat belt.
3) Place the seat belt buckle on the body as low as possible, and pull the retractable end of the seat belt away from the buckle until the seat belt is completely tightened.
4) Press the red button on the buckle and pull the free end out of the buckle to release the seatbelt buckle.

3.2.8 Heater switch

Press the heater switch after the engine starts, and the heater grille will open to provide hot air supply.



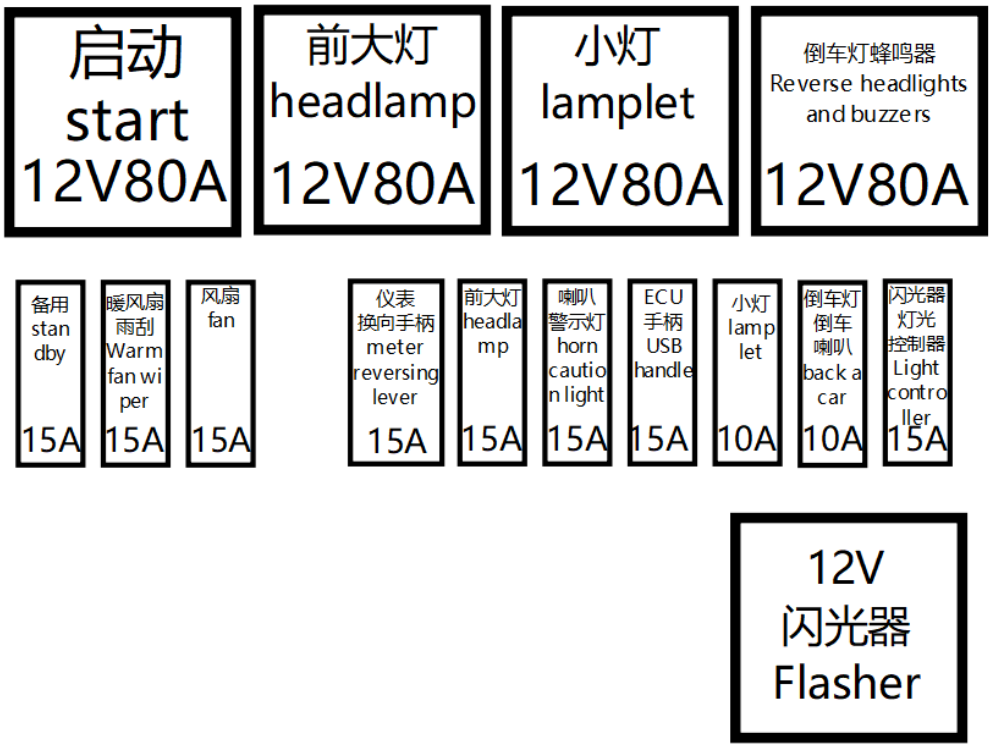
3.3 Electrical control cabinet

The important electrical control components are located inside the small door on the right side of the frame, including the main controller and electrical box of the entire machine.

Electrical box is shown as the following figure. Replace electrical parts with brand new parts of the

same specification. Electrical diagnosis requires professional skills and must be carried out by qualified personnel. Please contact the dealer for maintenance information on the electrical control cabinet;

The electrical box is used for installing chip fuses and relays. Chip fuses are used to protect circuits and prevent electrical appliances and wires from being burned in the event of short circuit. Relays are used to expand the switch capacity, so that small capacity switches can control high-power appliances.



4. Machine operation

4.1 Work area

4.1.1 Work area

A work area is a place where actual work functions are performed. The work area includes hazardous areas. Hazardous areas refer to areas adjacent to machines where personnel may be in danger due to machine operation or movement.

All personnel in the work area must wear personal protective equipment.

The machine operator is responsible for the safety of all personnel in the hazardous area.

4.1.2 General work safety

Please refer to "Work Safety" on pages 2-10 for more information.

4.1.3 Operators qualifications

Machine operators shall not operate the machine until they have read this manual, completed training, and completed the operation under the supervision of experienced and qualified operators. Working within the United States requires training in accordance with OSHA 1910.178.

The operator of this device must hold a valid and applicable driver's license, in good physical and mental condition and with normal reflex and reaction time, good vision, depth perception, and normal hearing. Operators shall not use drugs that may impair their abilities, nor shall they be affected by alcohol or any other anesthetics during the shift.

In addition, operators must read, understand, and comply with the instructions contained in the following materials provided by the material manager:

- The Operation and Safety Manual
- All guidance stickers and sections
- Any optional equipment manual

Operators must also read, understand, and comply with all applicable rules, standards, and regulations from employer, industry and government.

4.2 Working unit

4.2.1 Operators’ responsibilities

The machine operator must perform as follows:

- Refuse to enter the work site if you have safety concerns.
- Please familiarize yourself with the work area and surrounding environment before starting work.
- Please read and fully understand the instructions in this manual before operation.
- Understand and comply with all operating procedures, applicable laws and regulations.
- Understand and follow safety operation requirements.
- Understand and use the required safety precautions and protective devices.
- Understand and use the correct gesture signals to be used between machine operators and signalmen.
- Immediately stop operating the machine in case of defects that endanger safety.
- Always completely control the machine.
- Make sure that all control devices are set to neutral or idle positions and that the battery isolation switch is in the off position before leaving the cab.
- Issue an alarm signal if necessary.

- Wear all necessary personal protective equipment.

4.3 Inspection and adjustment before start

4.3.1 Inspection and adjustment before start

Please check the maintenance log to verify whether it has been checked for maintenance as required before operating the machine.

Check the machine for structural damage, loose equipment, leaks, or other situations that should be immediately corrected to make sure safe operation.

The operator should check the following items before starting the machine to make sure that the machine is in good condition and ready.

4.3.2 Preparation, check and maintenance

Please check the maintenance log to verify whether it has been checked for maintenance as required before operating the machine.

Check the machine for structural damage, loose equipment, leaks, or other situations that should be immediately corrected to make sure safe operation.

The operator should check the following items before starting the machine to make sure that the machine is in good condition and ready.

Check and maintenance				
Type	Frequency	Major responsibility	Maintenance qualification	References
Check before operation	Before shift or when changing operators	User or operator	User or operator	Operation and maintenance manual
Check before delivery	Before sale, lease, or lease delivery	Owners, dealers, or users	Qualified technician	Operation and maintenance manual
Preventative maintenance	Follow the intervals specified in the maintenance manual or maintenance table on the machine	Owners, dealers, or users	Qualified technician	Repair manual and maintenance table

Note: Checklist available

4.3.3 Pre-operation inspection

Note: Please complete all necessary maintenance before operating the device.

The pre- job inspection carried out before shift or when changing operators should include:

1) Check all surfaces for leakage (oil, fuel, or battery electrolyte) or foreign objects. Report it to the relevant maintenance personnel in case of leakage.
2) Inspect the machine structure for dents, damage, cracking of welds or base materials, or other defects.
3) Make sure that all safety labels are clear and readable. Clean or replace if necessary.
4) Make sure that the operation and safety manual and AEM safety manual (ANSI only) are included in the driver's manual folder.
5) Walk-around inspection
6) Check the levels of fuel, urea solution, hydraulic oil, engine oil, and coolant. Remove all dirt and grease from the orifice before removing the filler cap or plug. If dirt enters the aforementioned orifice,

it may significantly shorten the lifespan of the component.

7) Make sure that the tele-truck is equipped with an appropriate load gauge. Please refer to the attached operation and safety manual for specific inspection, operation, and maintenance instructions.

8) Conduct pre-heating and operational checks on all systems in an area free from high altitude and ground obstacles after the walk-around inspection.

4.3.4 Inspect the liquid level

4.3.4.1 Windshield washer fluid level

Note: Please use the recommended winter windshield washer fluid. The windshield washer fluid bottle (1) is located below the rear floor of the cab. Check the fluid level and add cleaning solution as needed.

4.3.4.2 Liquid level of the coolant

The engine coolant expansion tank is located behind the cab. The expansion tank is directly connected to the engine radiator to accommodate the coolant discharged from the radiator during operation. The coolant level in the expansion tank indicates the cooling dosage in the radiator.

The coolant level should be visible in the sight glass (1). Add coolant to the expansion tank if the coolant level is low.

1. Clean the dust and debris on the coolant expansion tank.
2. Make sure that the temperature of the coolant expansion tank is touchable.
3. Slowly open the cover of coolant expansion tank (2) and release all remaining pressure in the cooling system. Release all pressure and remove the cover.
4. Add coolant until it is visible in the sight glass. Install the cover of coolant expansion tank.

4.3.4.3 Check engine oil level

Be sure to check the engine oil level before starting the engine. (See: "**5.5.3.1** Check engine oil level" on pages **5-28**)

4.3.4.4 Oil level of transmission

Perform a daily inspection of the transmission oil level at the engine speed of 900-950 rpm and oil temperature of 140-149 °F (60-65°C). Maintain the oil level at the H mark. (See: "**5.13.1** Check the hydraulic oil level" on pages **5-79**)

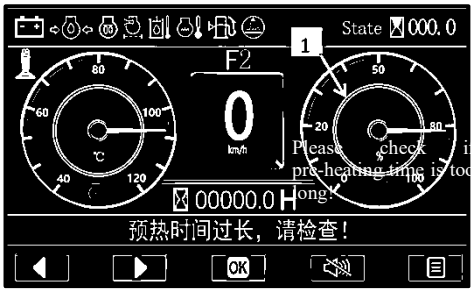
4.3.4.5 Hydraulic oil level

Check the hydraulic oil level once a day. It is necessary to maintain the correct hydraulic oil level to make sure the normal operation of the hydraulic system. The hydraulic oil level directly determines whether the hydraulic system can operate normally. (See: Page " ")

4.3.4.6 Fuel level

1. Turn the key-switch to the ON position, but do not start the machine.
2. Inspect the fuel level (1).
3. Turn key switch to O position.

Note: Proceed to the next step if the fuel level is low. The inspection is completed if there is no need to add fuel.



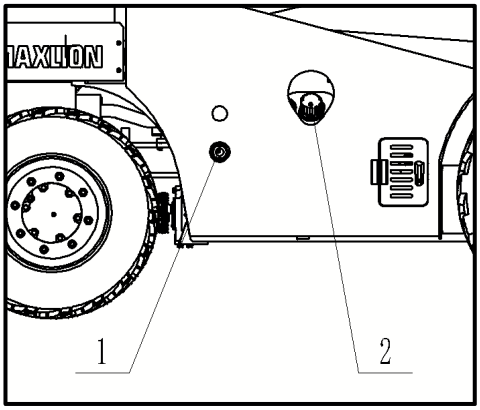
(Press F2 on the main interface to enter the instrument display interface)

4. Remove the fuel tank cap (2) from the fuel tank.
5. Fill the fuel tank until the required fuel level is reached.
6. Install fuel filler cap.

4.3.4.7 Hydraulic fluid level

The hydraulic oil tank is located on the right side of the frame. Check the hydraulic oil level through the oil level gauge (1) of the hydraulic oil tank.

Retract the boom back to its initial position and lower it to the lowest position to maintain the hydraulic fluid level in the middle position between the observation windows.



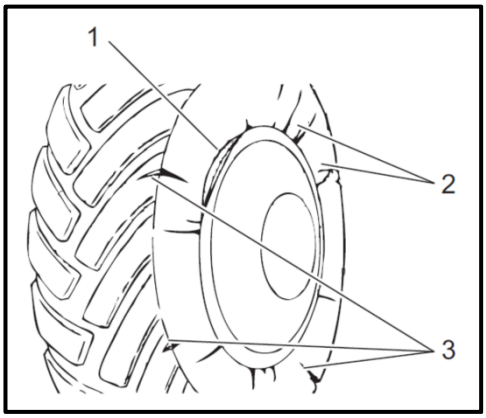
It is necessary to unscrew the oil tank cap (2) and add hydraulic oil until the middle position of the oil level gauge is reached if the oil level is too low.

4.3.5 Check tire

Visually check the wheel. Make sure that the rim and hub cover (1) are not damaged.

Check whether the tire sidewalls (2) and tread (3) are damaged or excessively worn.

Check the tire pressure. Always maintain the tire pressure of 79 pounds per square foot to 81 pounds per square foot (5.4 MPa to 5.6 MPa).



4.3.6 Check electrical components

4.3.6.1 Check electrical components

Check the following electrical components:

Note: If the fuse frequently fails, it may be due to a short circuit in the cable or device, resulting in an increase in the electrical load of the circuit. Please identify the cause and fix the problem.

- Check the fuse for damage. Make sure that the fuse rating is suitable for the circuit.
- Check whether all wires and cables are damaged.
- Make sure that the battery terminal connectors are clean and safe.
- Make sure that the battery and battery holder are free of dust or debris.
- Make sure that the ventilation holes of the battery cover are free of dirt and dust.

4.3.6.2 Work light

1) Check whether the work lights are dirty and damaged. Clean or replace if necessary.

2) Turn the key switch to position I.

3) 1, 2 and 3) Press to the open position.

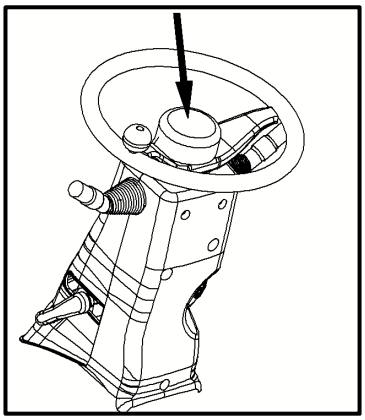
4) Make sure that the work lights are on.

5) O position.

Note: Check the bulb and electrical connector if the work light is not on. Please contact the Hongzhi dealer for more services if the work light still does not light up.

4.3.6.3 Horn

1. The horn switch is located in the center of the steering wheel.
2. Press the horn button. The horn should emit a sound.

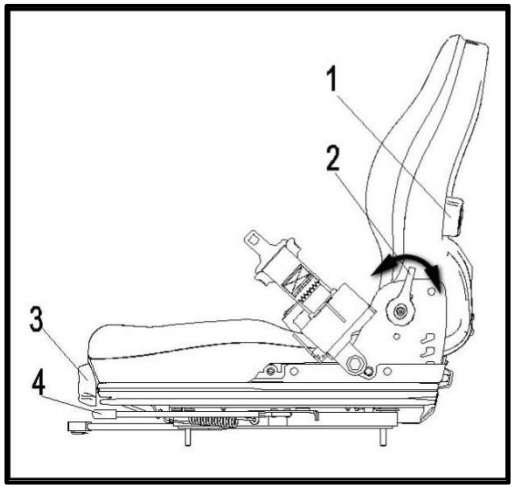


4.4 Seats and seat belts

4.4.1 Seats and seat belts

Provide multiple adjustable seats to make sure that operator feels comfort. Adjust the operator seat as follows:

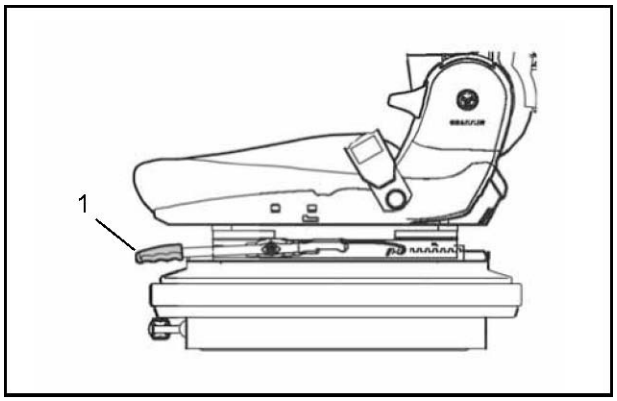
1) Adjustment of backrest angle
2) Adjustment of front and rear positions of seat (relative to the control console)
3) Seat suspension adjustment



4.4.2 Adjustment of backrest angle

Note: The adjustment range of backrest angle is 75~140°.

Pull the handle (1) upwards and tilt the backrest to the desired position when adjusting the backrest angle. Release the handle and lock it in place.



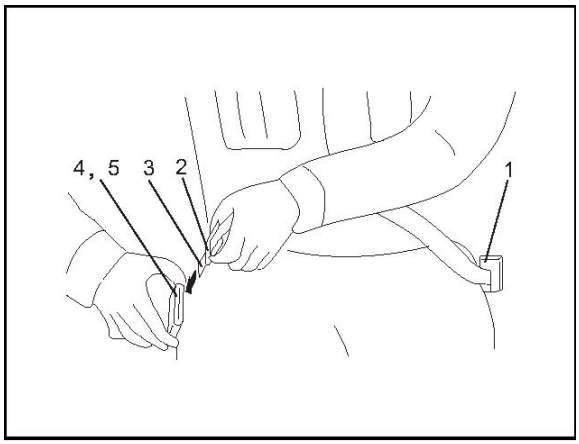
4.4.3 Adjust the back/forth position of the seat

Pull the control lever (1) and slide the seat forward or backward as needed. Release the control lever to lock.

4.4.5 Check seat belt

4.4.5.1 Check seat belt

The retraction assembly is connected to the seat belt. The retraction assembly can eliminate any slack on the seat belt and lock it to limit the operator's position. It can also retract the seat belt when it is not used.



4.4.5.2 Buckle the seat belt

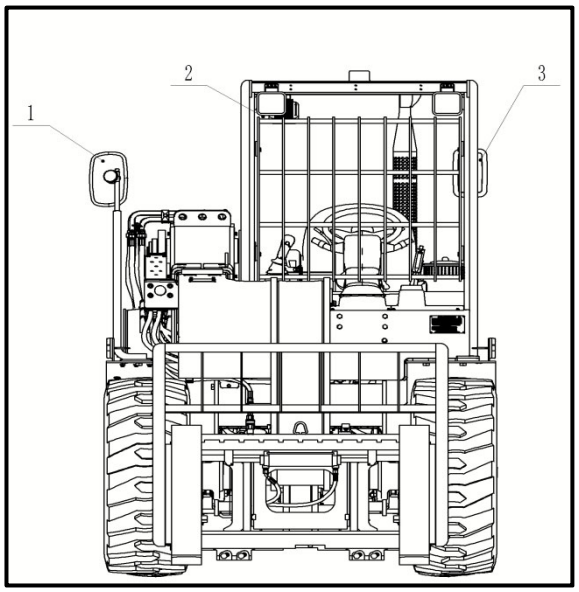
1) Pull the seat belt out of the recoil assembly (1). Make sure that the seat belt is not twisted.
2) Insert the locking tab (3) into the buckle (4).
3) Pull on the seat belt to make sure it is securely locked.

4.4.5.3 Unfasten the seat belt

1) Press the button (5) on the buckle.
2) Pull out the locking tab from the buckle.

3) Grasp the locking tab (2) and slowly guide the seat belt as it retracts into the retraction assembly.

4.4.6 Adjustment of the rearview mirror



Adjust the rearview mirror to clearly see the situation behind the machine. Keep the rearview mirror clean and in good condition.

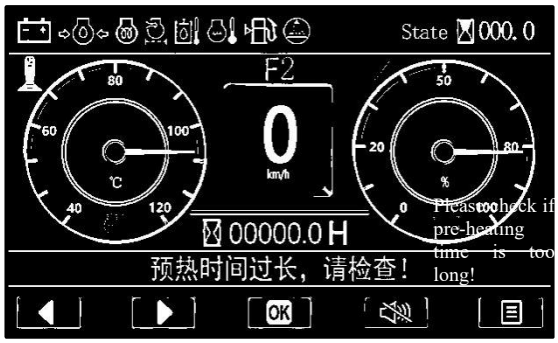
Adjust the rearview mirror to the desired position.

- Loosen the adjustment cap screw and re-position the rearview mirror if the rearview mirror cannot be adjusted. Tighten the adjustment cap screw when the rearview mirror is in the desired position.
- Repair or replace the rearview mirror as necessary if it is not maintained in the adjusted position.

4.5 Starting of the machine

4.5.1 Starting of the machine

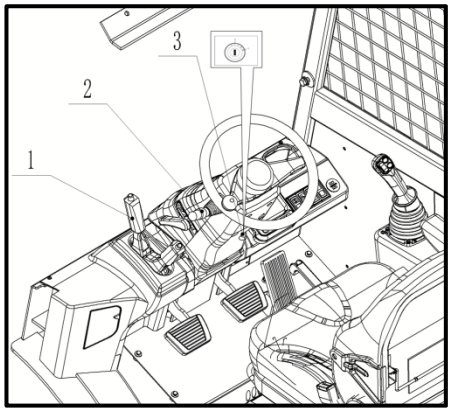
4.5.2 Startup in normal weather



The following conditions must be met before starting the engine:

- Repair and clear the fault as necessary if an alarm is displayed.
- Make sure that the engine parameters are within the specified range. (Please refer to the "Engine Information Menu" on pages 3-15 for more information.)

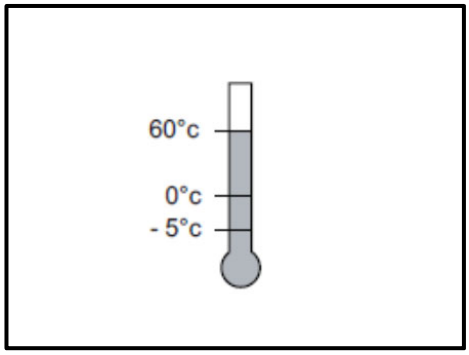
1) Place the gear lever (2) in the neutral position.
2) Use the parking brake (1).
3) Turn the key-switch (3) to I position.



Note: Do not rotate the engine crankshaft for more than fifteen seconds. Stop and cool the starting motor for at least ten seconds before attempting to restart it if the engine still cannot start after fifteen seconds. Failure to follow the caution may damage the machine or cause it to malfunction.

Note: Please contact the dealer if the engine still cannot start after 5 attempts.

4. Turn key switch to start position (2). Release the key immediately after starting the engine.

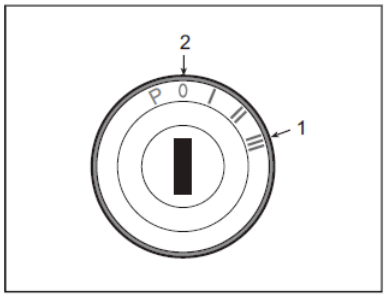


Note: Check if there are any error codes on the engine instrument panel and display screen after starting. Turn off the engine if an error code is displayed on the display. Immediately shut down the engine in case of black exhaust smoke, loud noise, or excessive vibration. Do not operate the engine at high acceleration or full load until the engine temperature reaches 140 degrees Fahrenheit (60 degrees Celsius).

4.5.3 Starting at low temperature

Note: Be careful to start the engine if the temperature is below 50 degrees Fahrenheit (10 degrees Celsius). Take other precautions when operating in low- temperature weather:

- Keep the machine away from ice and snow.
- Do not operate any hydraulic functions until the hydraulic oil reaches normal working pressure.
- Keep the battery fully charged.



- Please use lubricating oil with viscosity that is consistent with the ambient temperature range in which the machine operates.

Use a hydraulic oil heater when the machine is operating in low-temperature environment (temperature below 32 degrees Fahrenheit (0 degrees Celsius)). The pre-heating light will light up to indicate that preheating is in progress, and the indicator light will turn off after approximately 1 minute.

Make sure to use oil with viscosity that matches the ambient temperature. The pour point of diesel fuel must be 10 degrees Fahrenheit (6 degrees Celsius) lower than the minimum expected temperature of the environment in which the machine operates.

It is necessary to operate the various functions of the machine to make sure that the oil has been fully preheated before work.

The following conditions must be met when starting the engine at extremely low temperature (below 32 degrees Fahrenheit [0 degrees Celsius]):

- Observe all alarm messages displayed on the display. Please resolve the issue and clear the fault if an alarm is displayed.
- Make sure that the engine parameters are within the specified range. (Please refer to the "Engine Information Menu" on pages 3-15 for more information.)
- Place the gear lever in neutral.

1) Place the gear lever (2) in the neutral position.
2) Release the emergency stop button (1).
3) Turn the key-switch (3) to I position.
4) Check the engine information menu on the display. (Please refer to "Engine System Menu" on pages 3-15 for more information.)

Note: The preheating indicator light will light up to indicate that the engine is preheating and will turn off approximately one minute after the preheating is completed.

5) Turn the key switch to the "preheating" position (1) (if equipped).

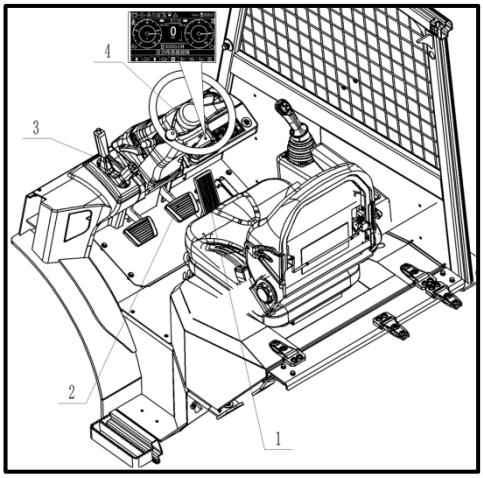
Note: Startup duration of the engine shall not exceed 15 seconds. Stop the operation and cool the starting motor for at least 10 seconds before attempting to start again if the engine still cannot start after 15 seconds. Failure to follow the caution may damage the machine or cause it to malfunction.

4.6 Stop the machine

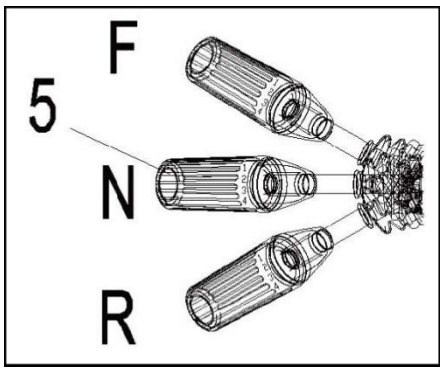
4.6.1 Stop the machine

4.6.2 Engine stop procedures

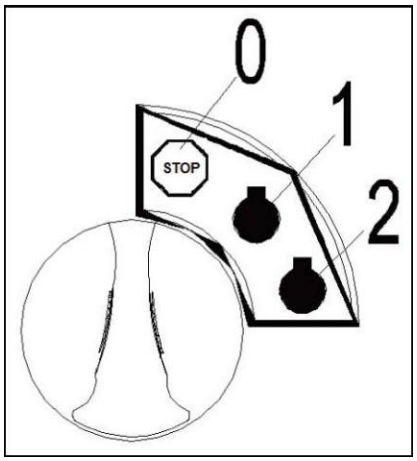
1. Release the accelerator pedal (1) to slow down the machine.
2. Press the brake pedal (2) to stop the machine from moving.
3. Apply the parking brake (3) when the machine stops. The parking brake indicator light (4) in the display is on.



4. Place the gear lever (5) in neutral.



5. Lower the forks or accessories to the ground.
6. Let the engine idle for a few minutes if the engine is running under load for a long time.
7. Turn the key-switch to position P to stop the engine.
8. Remove the key from the key-switch before leaving the machine.
9. Make the wheels unable to move (if necessary).



10. It is necessary to turn off the large power switch (LS vehicle) to power off the entire machine if you keep away from the machine for a long time.

4.7 Drive machine

4.7.1 Speed control

Adjust the speed based on visibility, driving surface, and load.

Be careful of driving on slippery surfaces (such as snow and ice).

The machine must always be operated at a certain speed so that it can be safely stopped.

4.7.2 Working on slopes

Please follow the following rules when working on slopes:

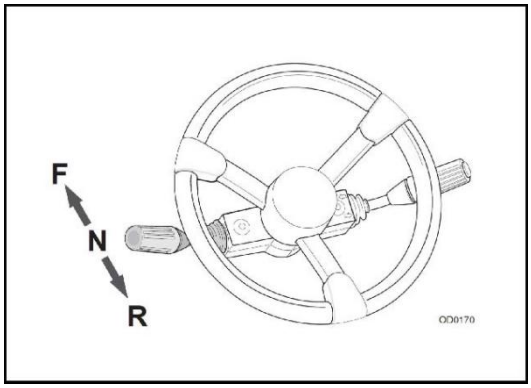
- Drive on slopes at a slow and stable speed.
- Do not attempt to turn on slopes.
- Do not make sharp turns on slopes. Please do not cross the slope.
- Heavy object must be directed backward on the machine when the slope reaches or exceeds 10°.

4.7.3 Drive control

4.7.3.1 Selection of driving direction

Drive forward or backward through the transmission control lever.

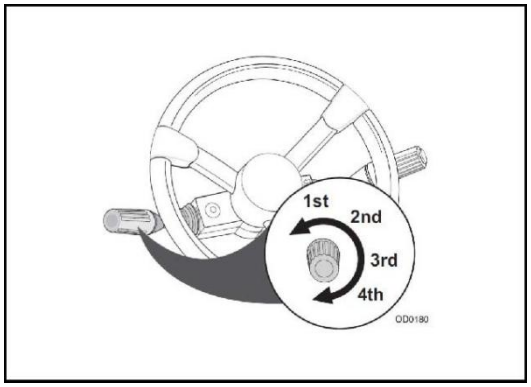
- Push the control lever forward, and the machine will drive forward; Pull the control lever backward and the machine will drive backward. Move the control lever to the neutral position and engage in neutral.
- Select forward or backward travel in any gear.



- The backup alarm will automatically sound when you drive backward.
- Drive slowly when reversing or turning.
- It is prohibited to achieve higher hydraulic performance by increasing the engine speed and pressing the service brake when the transmission is in forward or reverse gear unless the transmission release button is activated (please refer to Pages 3-21). Otherwise, it may cause abnormal machine operation.

4.7.3.2 Gear selection

- Select a gear by turning the rotary handle.
- The transmission has four forward gears and three reverse gears
- Select the appropriate gear based on the task to be executed. Adopt lower gears for transportation of heavy objects. Only select higher gears for long-distance driving without load.



- Slow down first before downshifting. At most one gear down at a time.

4.7.4 Drive forward

1. Release the parking brake (2).
2. Push the gear lever (1) forward.
3. Press the accelerator pedal (3) to accelerate the machine smoothly.

Note: Make sure that the engine speed is high enough to prevent the machine from rolling backward when the brake pedal is released when starting on a slope.

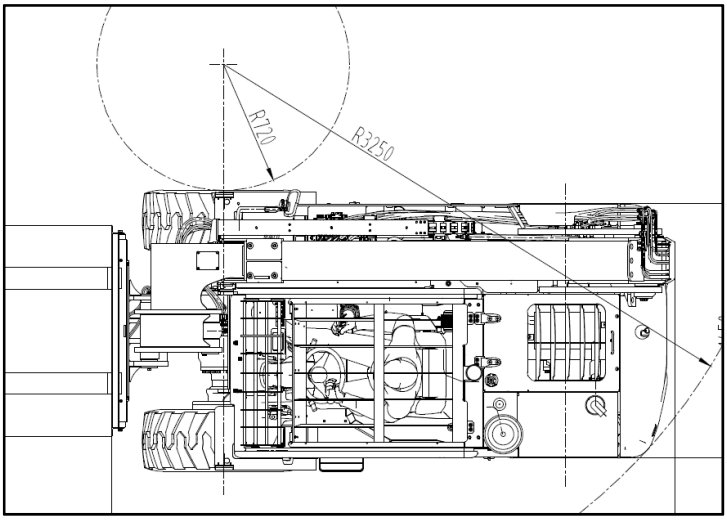
4.7.5 Drive backward

1. Pull the gear lever (1) backward.
2. Press the accelerator pedal (2) to accelerate the machine smoothly.

4.7.6 Steering

The machine adopts rear wheel steering and is equipped with hydraulic power steering system. The system reduces the operating force required for the operator to turn the steering wheel.

Do not turn the steering wheel while the machine is stationary to minimize tire wear.



Do not continue to turn the steering wheel when it reaches its limit of rotation to avoid overheating of the steering components.

4.7.7 Four-wheel drive

4.7.8 Parking brake

The parking brake system is located on the front axle. The transmission shaft will not rotate after using

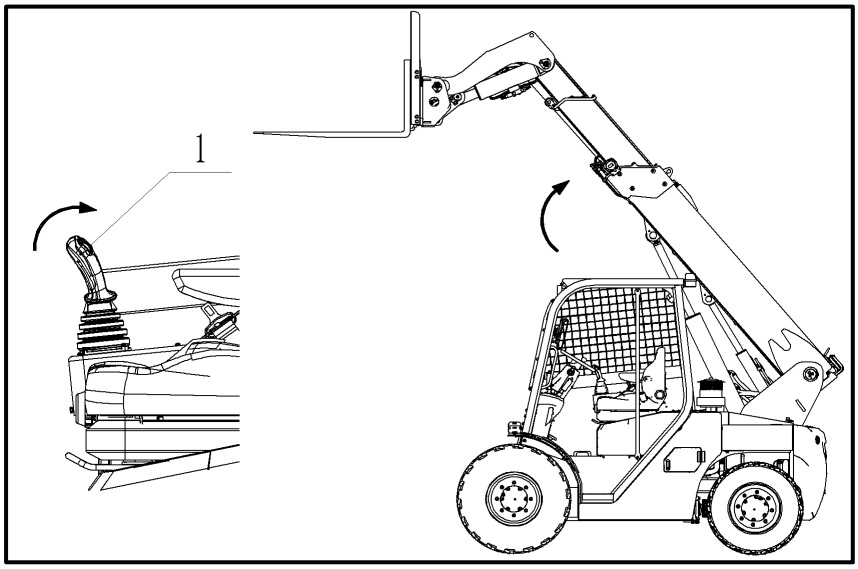
the parking brake. Do not stop the machine with the parking brake unless the situation is urgent. Continuing to drive after using the parking brake may damage the drive axle;

4.8 Operation

4.8.1 Operating control

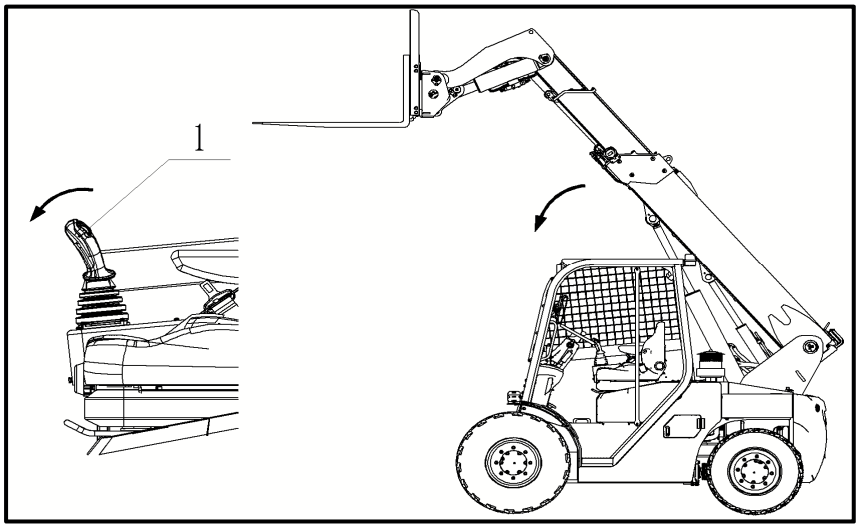
It is necessary to press the unlocking handle before performing the arm rest action each time when the machine is started.

4.8.2 Lift the boom



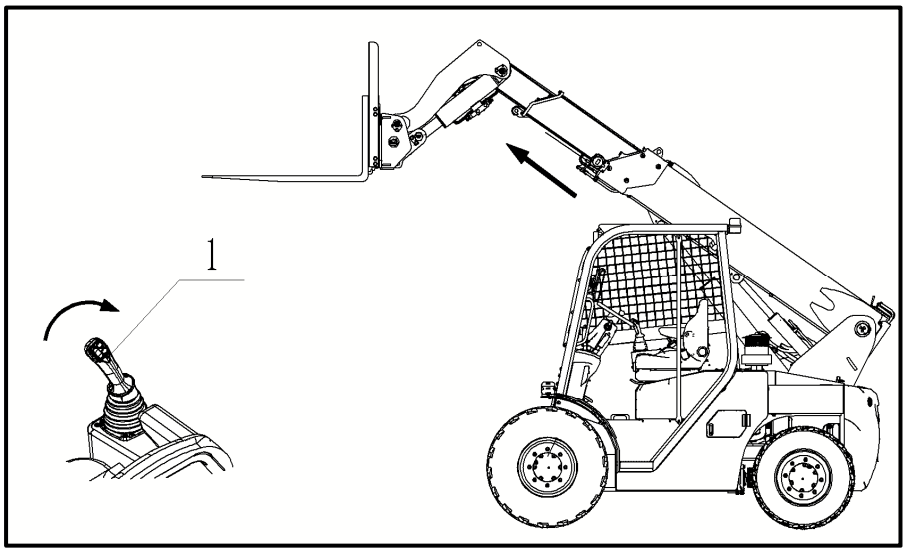
Pull the lever (1) backward to lift the boom.

4.8.3 Lower the boom



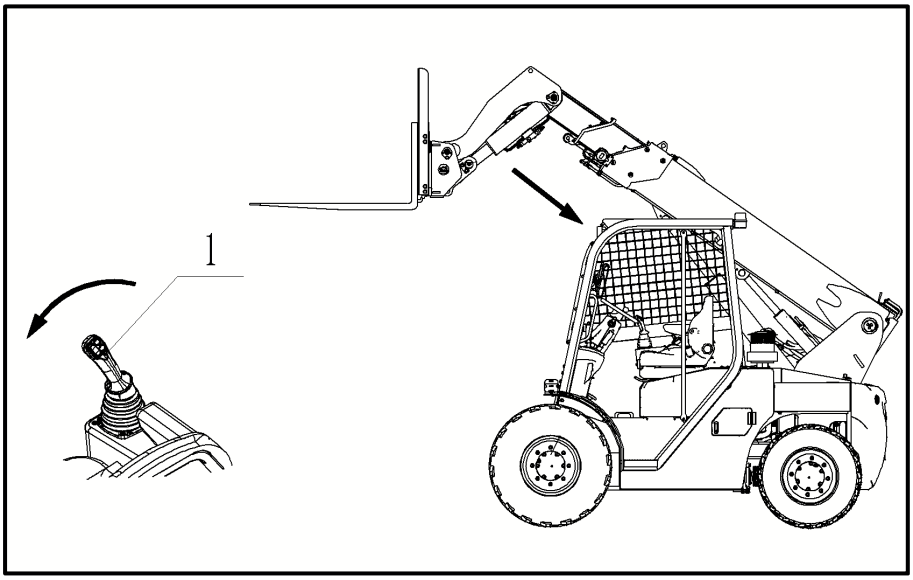
Push the joystick (1) forward to lower the boom.

4.8.4 Boom extension



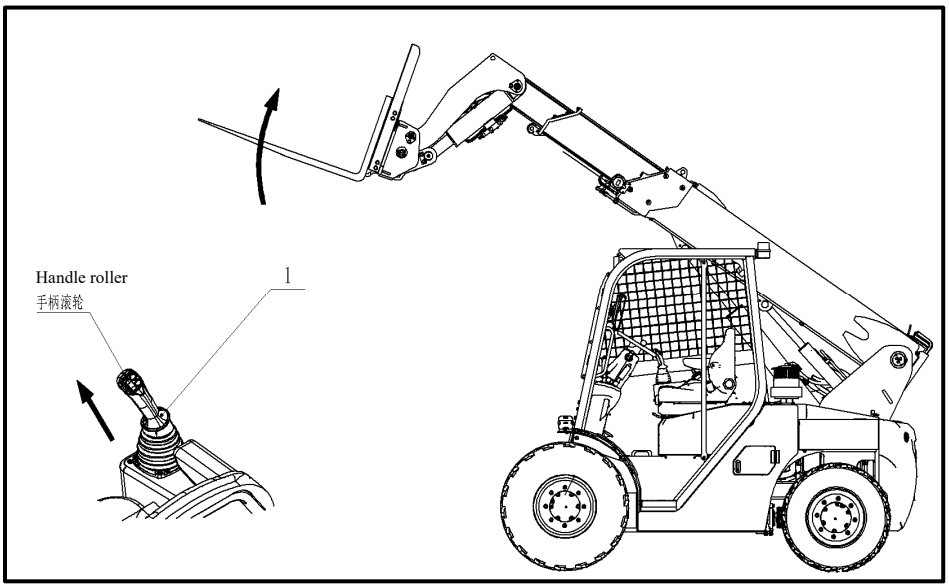
Push the joystick (1) towards the right to extend the boom.

4.8.5 Boom retraction



Push the joystick (1) towards the left to retract the boom.

4.8.6 Upturn attachment

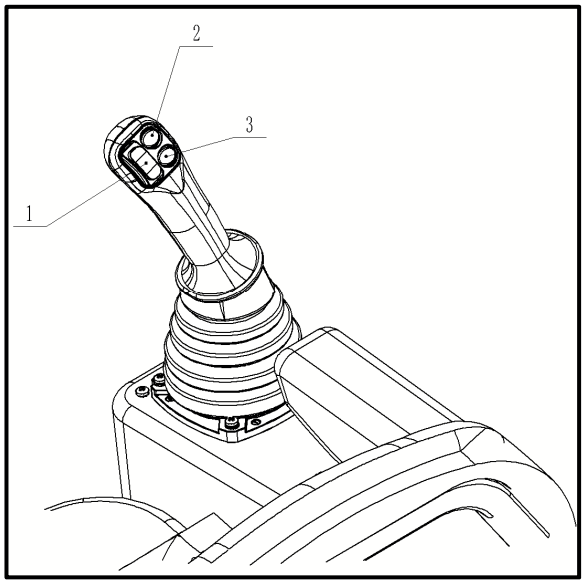


Move the rotating roller (1) backward to lift the fork.

4.8.7 Lower attachment

。

Move the rotating roller (1) forward to lower the fork.



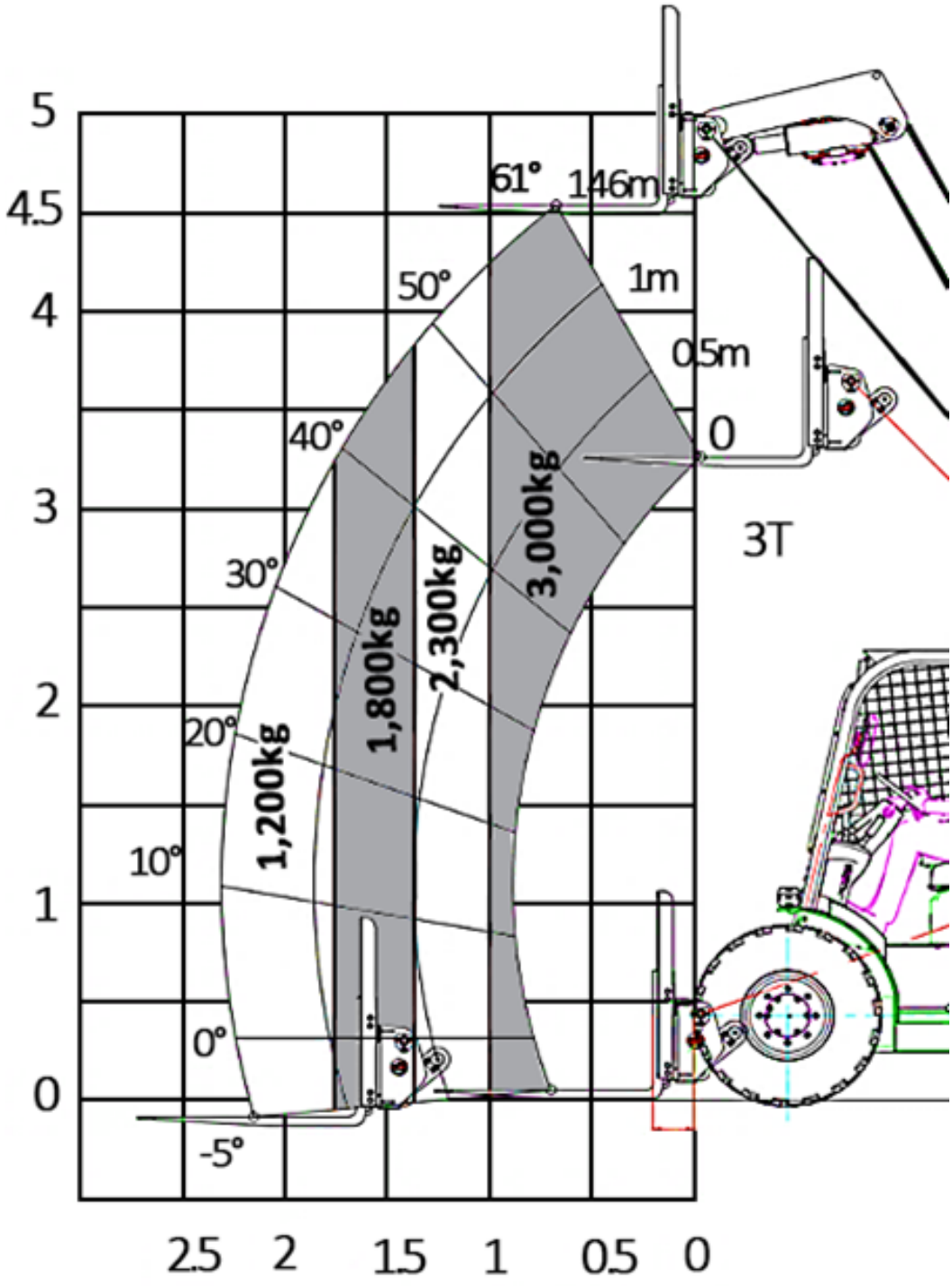
4.8.8 Move the attachment to the left

Press the handle key (2) to move the attachment to the left.

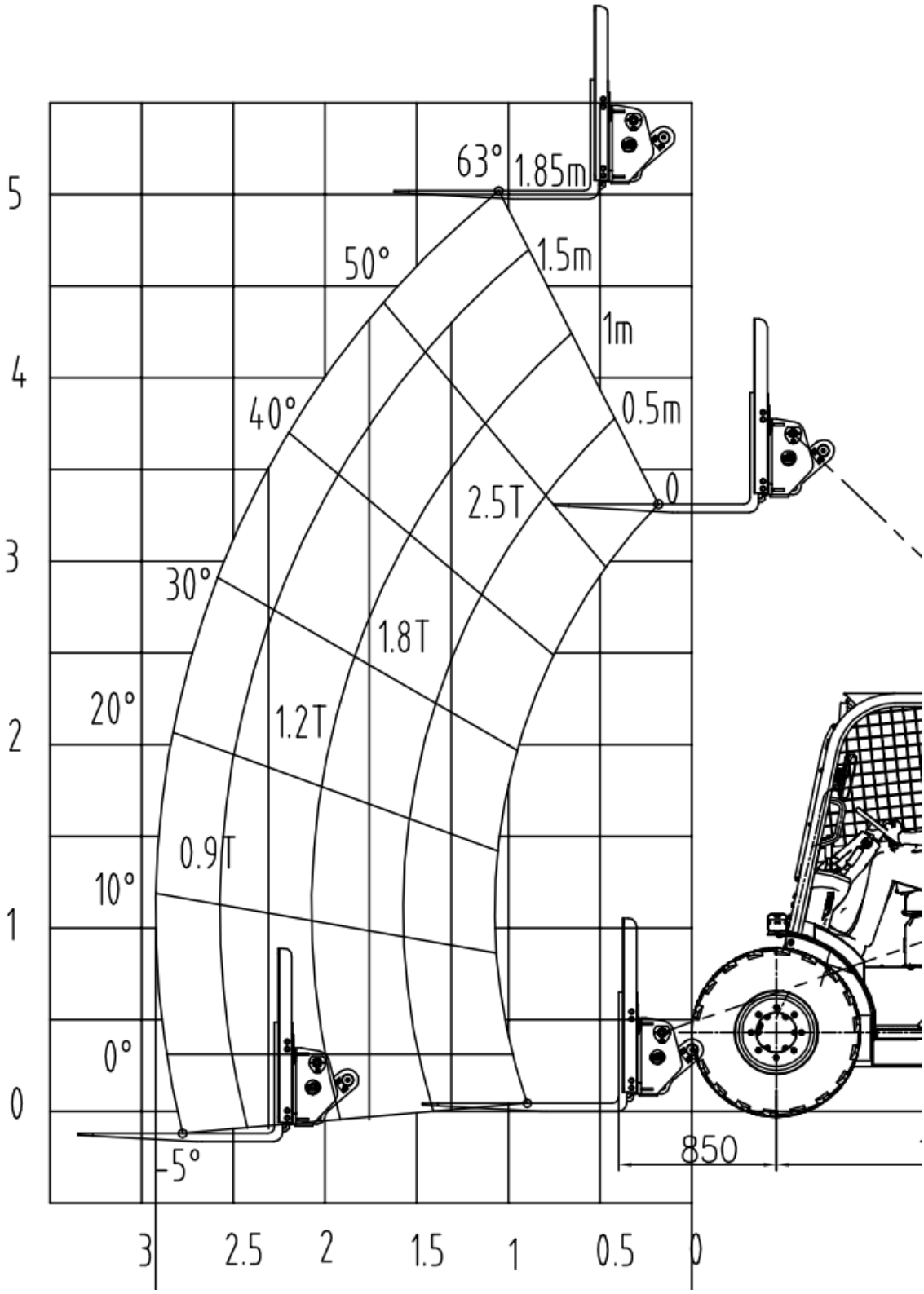
4.8.9 Move the attachment to the right

Press the handle key (3) to move the attachment to the left.

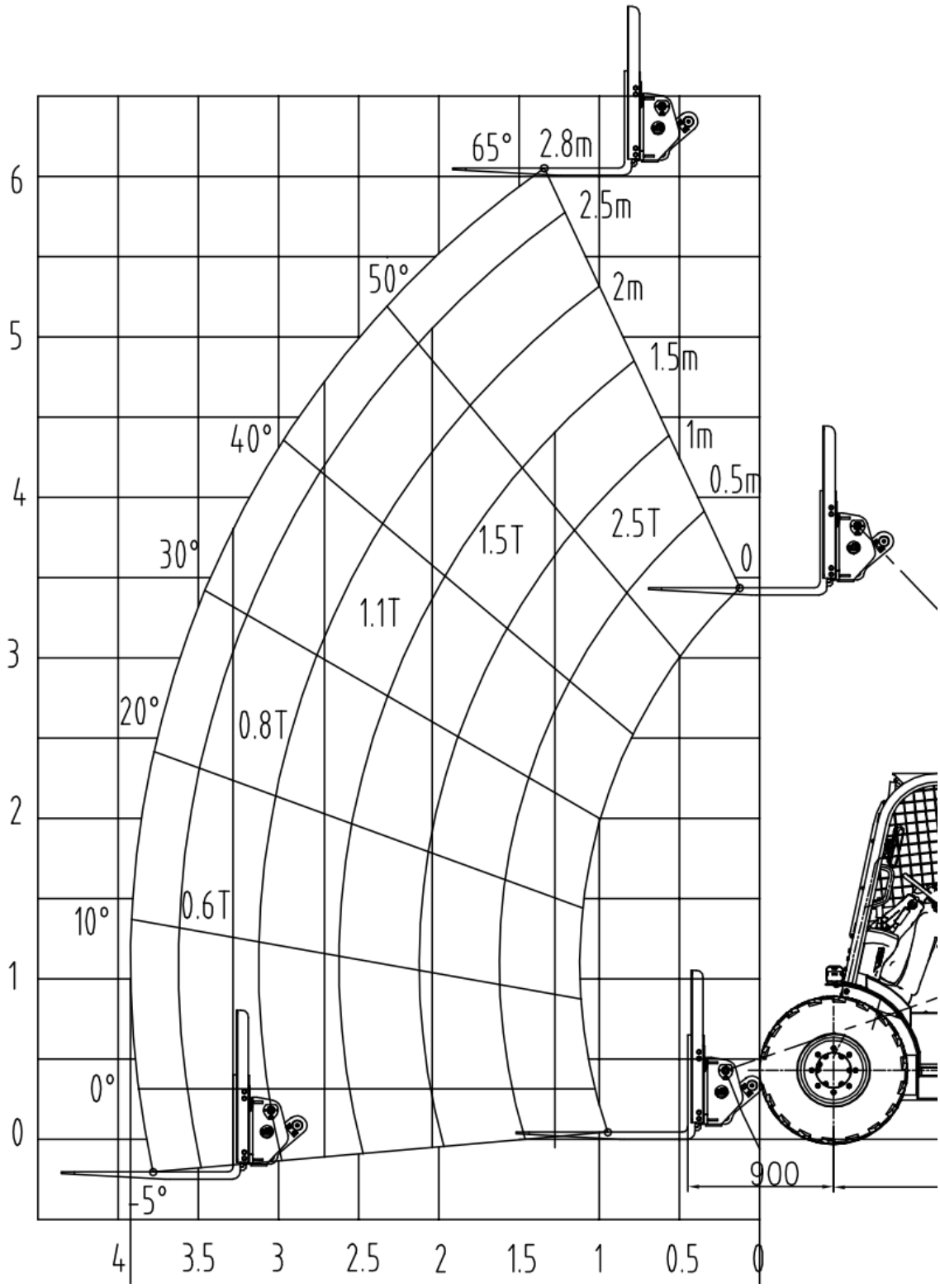
4.9.1 MTF30-45 Machine Lifting Load Diagram



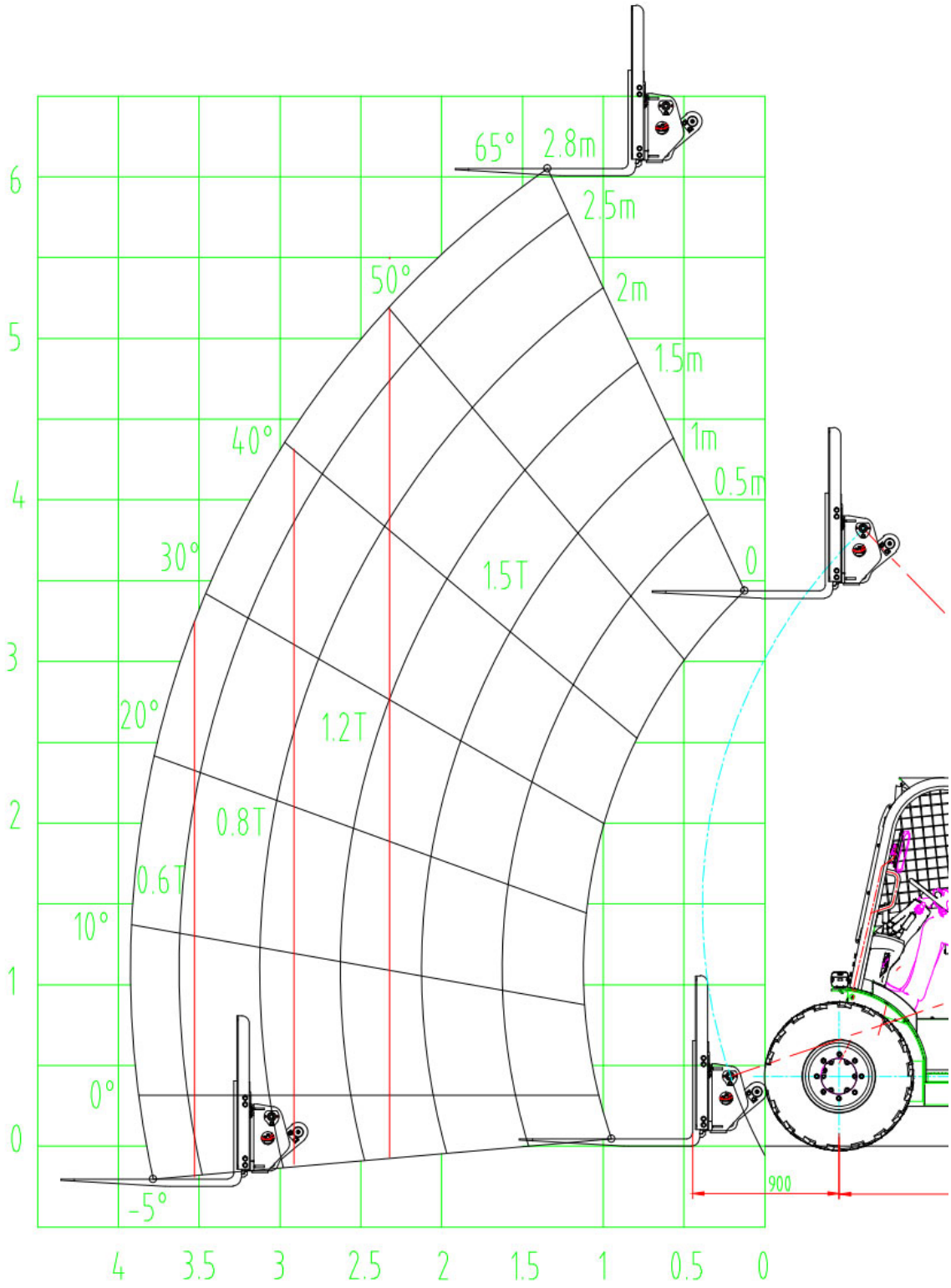
4.9.2 MTF25-50 Machine Lifting Load Diagram



4.9.3 MTF25-60 Machine Lifting Load Diagram



4.9.3 MTF25-60 Machine Lifting Load Diagram



4.10 General operating method

4.10.1.1 Lift heavy objects

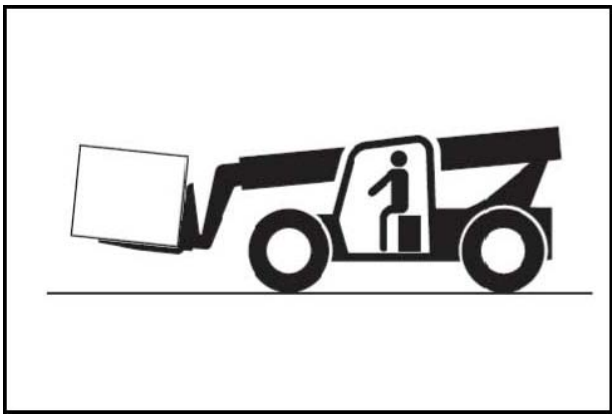
Be aware of the weight and load center of the heavy object to be lifted. Please contact supervisor or material supplier if you are unsure about the weight and load center. Understand the rated load capacity of tele-truck and determine the safe working range for lifting, transporting, and placing heavy objects.

4.10.1.2 Freightload driving

- Pay attention to the terrain conditions. It is necessary to adjust the driving speed and reduce the cargo volume if conditions permit.
- Avoid lifting double- layered cargo.
- Make sure that there are no obstacles around the cargo.
- Adjust the spacing between forks to lift the pallet or load the cargo with the maximum width.
- Make the fork tip straight and level, and slowly and steadily approach the cargo. Do not attempt to lift the cargo with just one fork.
- Do not operate the tele-truck fork if there is no appropriate clear load gauge in the driver's cab for the combination of tele-truck /accessories.

4.10.1.3 Place cargo

1. Approach the cargo to be lifted as carefully and accurately as possible.
2. Place the boom in a proper position.
3. Raise or lower the fork carriage to the correct height.
4. Adjust the fork span if necessary.
5. Insert the fork under the cargo, center the cargo and make contact with the fork surface. Do not touch adjacent cargo.
6. Apply the parking brake.
7. Lift the boom until the cargo rests on the fork.
8. Tilt the fork carriage slightly back.
9. Release the parking brake.



4.10.1.4 Transport heavy objects

Load the heavy object, place it against the backrest, and tilt the object back into position for driving.

4.10.1.5 Place cargo

Before placing any cargo, please make sure that:

- The landing point can safely support the weight of the cargo.
- The landing point is level in front, back, left, and right.
- Determine the safe extension range of the boom based on the load capacity table.
- Align the fork horizontally with the cargo to be placed, and then slowly lower the boom to keep the cargo just above the area to be placed.
- Lower the boom to secure the cargo in place and the fork can be retracted freely.

4.10.1.6 Release of cargo

Please take the following steps after safely placing the cargo at the landing point:

- The boom can be retracted when the fork is not loaded.
- Lower the fork carriage.
- Drive the tele-truck from the landing point to continue the operation.

4.10.1.7 Adjust/move forks

Forks can be placed in different positions on the fork carriage. Reposition the forks by two different methods according to the structure of the fork carriage.

1. Sliding fork:
2. Ensure that accessories are installed correctly.
3. Loosen the fork locking bolt if equipped.
4. Lift the attachment to approximately 5 feet (1.5 meters) and tilt the fork carriage forward until the fork heel separates from the attachment.
5. Stand on one side of the fork carriage. Please push the fork near the fork eye to slide the fork towards the center of the fork carriage. Please pull the fork near the fork eye to slide the fork towards the edge of the fork carriage. Do not place your fingers or thumbs between the fork and the fork carriage structure to avoid pinch injuries.
6. Tighten the fork locking bolt if equipped.

If it is necessary to remove the fork rod:

1. Place the fork on the ground.
2. Loosen the fork locking bolt if equipped.
3. Remove the fork rod.
4. Reposition the fork.
5. Reinstall the fork rod and fork rod locking mechanism.
6. Tighten the fork locking bolt if equipped.

4.10.1.8 Before leaving the tele-truck

1. Lower the cargo and lower the fork carriage.
2. Make the fork contact the ground.
3. Apply the parking brake.
4. Stop the engine and pull out the key.
5. Lock the cab door (if equipped).

4.11 Machine storage

4.11.1 Over-night storage

1. Park the machine on a flat, level, and stable surface.
2. Lower the attachment to the ground.
3. Wait for 3~5 minutes to cool down the engine. The cooling time should be extended in hot weather.
4. Turn off the engine.
5. Remove the key when the engine comes to a complete stop.
6. Close and lock the window.

7. Exit the cab and lock the cab door.

4.11.2 Short -term storage

Note: Short -term storage refers to a storage period not exceeding 30 days. Complete the "over-night storage" procedure above, and then proceed to the following steps.

1. Clean the machine.
2. Keep the machine dry.
3. Keep the machine sufficiently lubricated.
4. Turn the battery disconnect switch to the OFF position and remove the battery disconnect switch key.
5. Cover the machine to prevent dust.

4.11.3 Long term storage

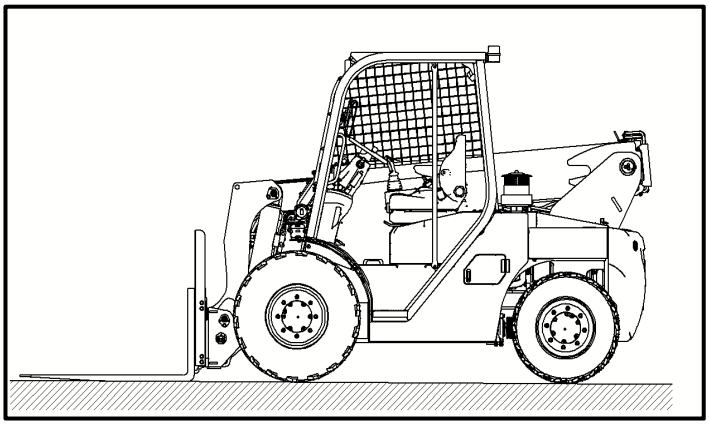
4.11.3.1 Long term storage

Note: Long -term storage refers to a storage period exceeding 30 days.

4.11.3.2 Preparation

Note: Proper long-term storage preparation can help reduce the likelihood of machine damage and degradation.

1. Park the machine on a flat, level, and stable surface.
2. Lower the attachment to the ground.



3. Wait for 3~5 minutes to cool down the engine. The cooling time should be extended in hot weather.
4. Turn off the engine.
5. Remove the key when the engine comes to a complete stop.
6. Close and lock the window.
7. Leave the cab and lock the door.
8. Fill the fuel tank to the maximum level.
9. Apply lubricant to any exposed piston rod of hydraulic cylinder.
10. Replace the engine oil
11. Turn the battery isolation switch to the "off" position and remove the battery disconnect key.

4.11.3.4 Monthly

1. Start the machine. (Please refer to the "Start the machine" on pages 4-16 for more information.)
2. Drive the machine for short distances.
3. Cycle each cylinder for several times, apply a layer of oil to the piston rod and seal it.
4. Apply lubricant to the exposed piston rod to prevent it from being corroded.
5. Turn on the air conditioner and keep it running for 3~5 minutes to lubricate the compressor and related

parts.

6. Restore the machine to its storage location and condition.

4.11.3.5 Depot repair

1. Check whether fuel and oil are contaminated by water. Drain and replace all fluids as needed.
2. Check the exterior of the machine for signs of rust or damage, and repair as necessary.
3. Start the machine and test all operations. (Please refer to "Start the machine" on pages 4-16 for more information.)

4.12 Transportation and assembly

4.12.1 Guide

Fork trucks are used in ports, docks, and yards as special equipment. It cannot be driven directly on the road. It is necessary to use trucks for transportation. Hongzhi's professional transportation team will disassemble and package the machine for delivery. You should first disassemble the machine before transferring it to another work location.

4.12.2 Transportation

4.12.2.1 Land transportation

Fork trucks cannot be driven directly on the road as specialized transportation machinery and must be transported to the final destination by truck or other means:

4.12.2.2 Shipping transportation

3,250mm in length (excluding forks and buckets), 1,650mm in width, and 2,280mm in height, the tele-truck and can be transported in containers;

Without disassembly, the entire unit can be transported in a 40- foot frame container.

4.13 Disassembly of machine

4.13.1 Disassembly guide

4.13.1.1 Disassembly guide

Please disassemble the machine according to the following rules:

- Mark the plugins and connectors to be removed. Put it in a plastic bag and seal it to prevent moisture during transportation.
- All hydraulic hoses and cables that have not been removed should be tied tightly and fixed to the main frame. The fixed position should be covered, protected, and marked for re-assembly.
- Place all removed hardware in a plastic bag and secure the plastic bag to the corresponding parts. Place the hardware bag in the shipping crate.
- Place all removed hardware in a plastic bag and secure the plastic bag to the corresponding parts. Place the hardware bag in the shipping crate.

5 Maintenance and repair

5.1 General information

5.1.1 General information

Do not maintain and/or repair unless the relevant procedures are described in this manual. Be sure to follow all safety precautions.

5.1.2 Timer reading

Record the reading of the timer every day. Confirm the timer reading through the required maintenance schedule listed in this manual.

5.1.3 Original replacement parts

Repair or replace machine components with original replacement parts. Otherwise, it may lead to premature failure of the system or components.

5.1.4 Original lubricant

Always use lubricants and coolants approved by the manufacturer. Do not mix lubricants of different brands or viscosities.

The use of unauthorized lubricants and coolants or the mixing of lubricants of different brands or viscosities may lead to a shortened service life of the machine or system failure.

5.1.6 Inspection of oil and filter

Be sure to check the discharged oil and used filters for signs of metal particles and impurities. Report to the supervisor in case of any foreign objects in the filter or oil.

5.1.7 Fuel prefilter

Be sure to install a fuel pre-filter before refueling the machine.

5.1.8 Weld, drill, cut, or grind on machines

- Turn off the ignition and wait for one minute before disconnecting the battery. Remove the negative cable from the negative terminal (-) of the battery.
- The welding grounding cable must be connected within 3.3 feet (1 meter) of the welding area. Welding cables must be directly connected to the parts to be welded. Do not ground through bearings, hydraulic cylinder pins, or work equipment pins.
- N Welding voltage shall not exceed 200V.

Failure to disconnect the battery case from the ground may result in machine damage, personal property damage, or failure of the machine.

5.1.9 Protection against pollution

It is necessary to remove dirt, dust, and debris from the filler cap or container before opening. It is necessary to make sure that no objects fall into the container and contaminate the oil during maintenance. If any object falls into any container, please immediately remove it. Otherwise, it may cause component failure, machine damage, or abnormal machine operation.

5.1.10 Dusty environment

Clean or replace the following components:

- Please immediately repair the air filter and air filter housing in case of alarm of the air filter for maintenance.
- Regularly clean the heat sink and other heat dissipation components to avoid overheating.

- Replace the fuel filter regularly or as needed. Check the fuel tank sediment cup and clean it as necessary.
- Clean electrical components, especially starting motors and alternators, to prevent dust accumulation. Check the terminal for corrosion.
- Please park the machine in a dust-free area before repair to avoid the opened components from being contaminated.

5.1.11 Fixation of access covers and cabin doors

Open the access cover or cabin door and fix the access cover or cabin door in the open position with a locking lever before repairing the machine. If the access door or cabin door is not locked after opening, it may accidentally close and cause injury.

5.1.12 Hydraulic system air bleeding

The trapped air in the hydraulic system should be discharged when replacing hydraulic components after repair and before resuming operation. Make sure that there is no leakage in the system and that hoses and/or pipelines do not rub against other components.

5.1.13 Hydraulic pipeline installation

Disassemble parts sealed with O-rings or washers and clean the surface before installing new parts. Be sure to install new O-rings and washers.

Do not kink the hydraulic hoses during disassembly or installation. Twisted hydraulic hoses may cause internal damage, greatly shortening the service life of the hoses.

5.1.14 Stationary engine hood

Complete maintenance or repair, close the engine hood and lift the hood slightly to check if it is locked in the closed position.

5.1.15 Clean machine parts

Do not clean the machine with corrosive chemicals or steam cleaning devices. Clean the machine with mild soap and pressure cleaning devices only. It is important to protect electrical components when cleaning the machine. Do not flush the interior of the cab through water or pressure. Use non- flammable cleaning solvents only. Do not clean parts or any machine components with flammable liquids.

5.1.16 Check the machine after maintenance or repair

It is essential to complete the following items after maintenance or repair of the machine:

- Make sure that the parts that have been maintained or repaired work properly.
- Check the system for leakage or overheating.
- Make sure that the engine or hydraulic system does not make any abnormal noises.
- Make sure that all parts remain tight.

5.1.17 Post-operation inspection (engine shutdown)

Maintain or repair the machine as necessary:

- Be sure to inspect every component of the machine.
- Make sure that no tools, parts, or other objects fall into the machine.
- Check for coolant or oil leakage.
- Make sure all fasteners are tight.

5.2 Torque specification

5.2.1 Torque specification

If the fasteners or couplings are not tightened according to the correct torque specifications, it may lead to premature component failure. All fasteners, hoses, pipelines, and couplings on this machine are equipped with torque specifications.

5.2.2 General torque specifications

5.2.2.1 General torque specifications

5.2.2.2 Fastener torque specifications

Please refer to the charts in this section for torque specifications if torque specifications are not listed for fasteners or couplings.

5.3 Recommended lubricants and coolants

5.3.1 Recommended lubricants and coolants

It is recommended to use the lubricants and coolants listed in this section. The use of unapproved lubricants and coolants may lead to premature wear and shorten machine life. The lubricant level must be checked and smoothed according to the maintenance intervals. Maintain the machine as needed before operation.

The quality of lubricants varies from manufacturer to manufacturer and may contain different additives with different properties.

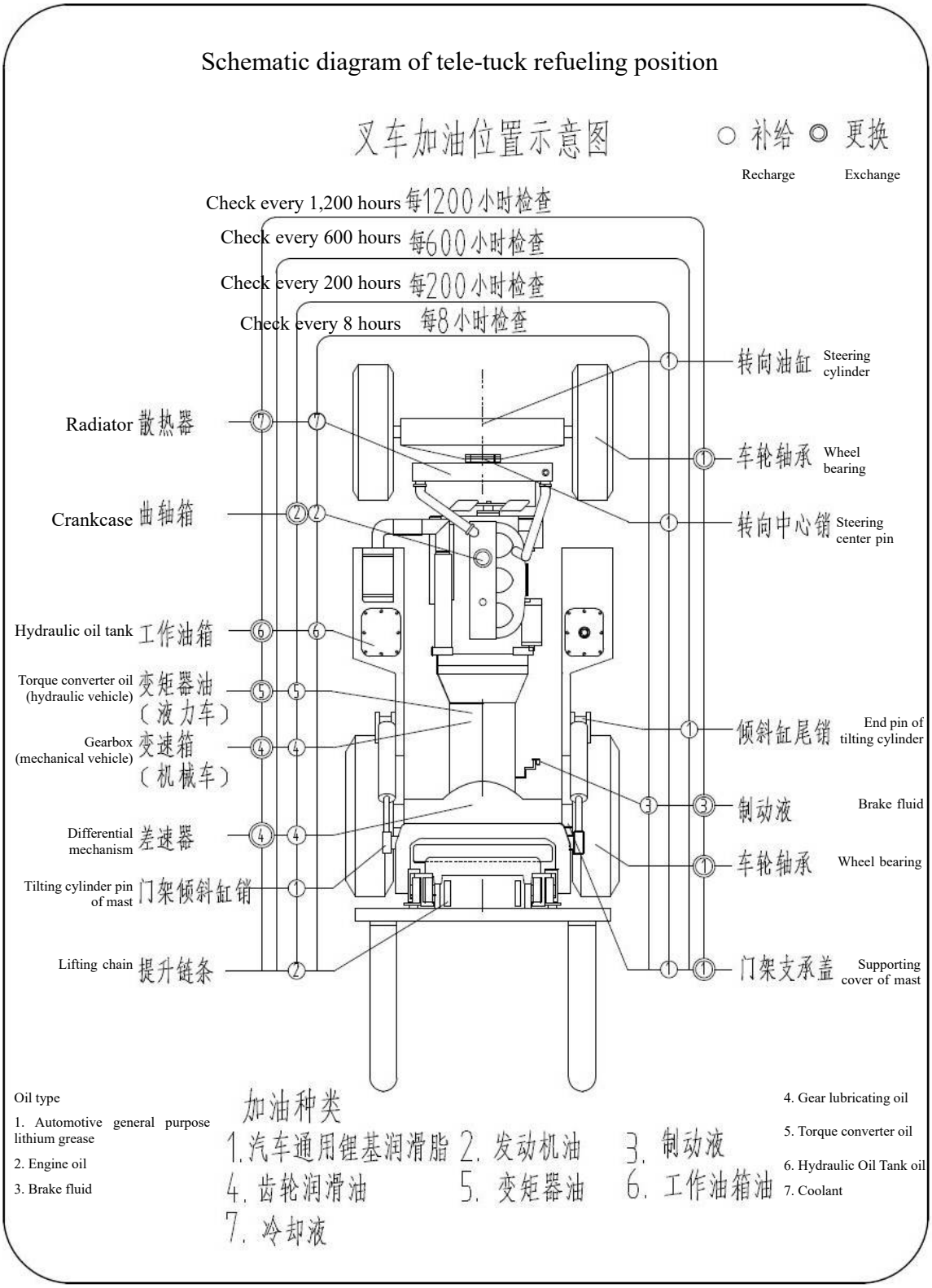
Lubricating oil with higher or lower viscosity (weight) needs to be used if the air temperature exceeds the range of air temperature listed in the table below.

Note: It may be necessary to pre-heat the engine and hydraulic oil to prevent the engine and hydraulic system from being damaged before starting the engine in cold weather.

Name	Trade mark, code (Domestic)
Diesel	Select according to the Diesel Engine Use and Maintenance Manual or the requirements of GB252-2015 Light Diesel; 0# for summer and - 10~- 35 # for winter
engine oil	Select according to the Engine Use and Maintenance Manual, or the standard provisions of diesel engine GB11122-2006, and its strict degree of the working condition.
Hydraulic oil	L-HM32
Hydrodynamic drive oil	6# Hydrodynamic drive oil
Gear oil	85W/90
Brake fluid	ZSM207 DOT3 Synthetic brake fluid
Lubricating oil	3# Drop point of lithium based grease 170

5.3.2 Table of lubrication system

Schematic diagram of tele-tuck refueling position



5.5 Engine

5.5.1 Engine adjustment

It is necessary to adjust the engine speed as the engine speed has an impact on the operating efficiency of the traveling speed and lifting speed of the tele-truck. It is necessary to adjust it by the following method when the engine speed cannot reach the specified value.

(1) Adjust idle speed (for diesel engines)

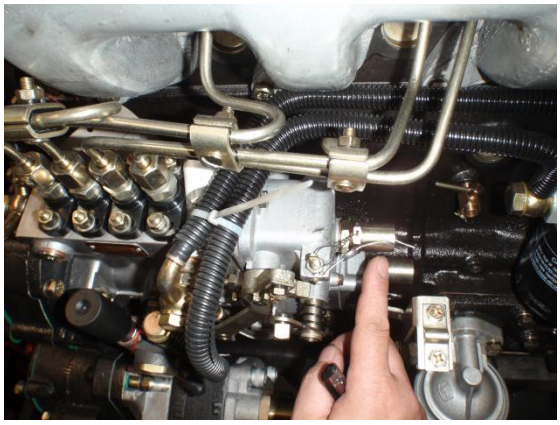


Fig. 1-1

The speed of the diesel engine is controlled by the fuel injection pump governor, which is usually adjusted on the test bench and cannot be adjusted after the engine is installed. The steps for adjustment through the test bench are as follows (for reference):

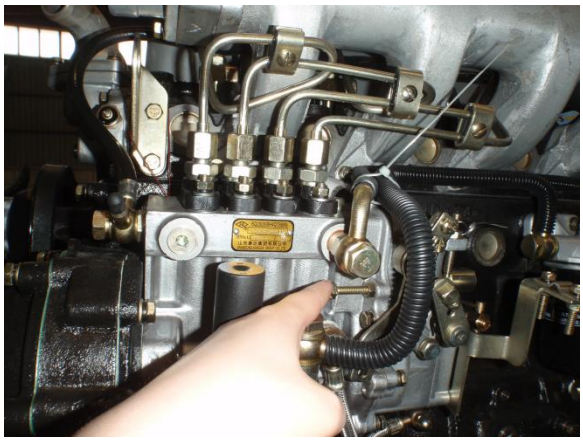
a) Adjust the zero position of the control gear rack, install the control gear rack of the measuring device onto the end face of the control gear rack of the fuel injection pump, and align the zero position of the control gear rack of the measuring device with the zero position of the scale;

b) Fully tilt the control rod in the direction of fuel increase and make sure that the control rack extends more than 15mm, then fully tilt the control rod in the direction of fuel stop and make sure that the control rack is less than 1mm on the scale;

c) Adjust the injection timing and injection speed;

d) Adjust the pressure from the lowest negative pressure.

(2) Refer to Fig. 1-2 and adjust the negative pressure of the fuel injection pump with the adjustment rack to check for air leakage.



(3) Adjust the smoke level through the smoke level adjustment screw. Operators should note: Do not adjust imported engines arbitrarily while they are running normally.

5.6 Fuel system

The fuel system is composed of fuel tank, fuel quantity sensor and fuel gauge indicating oil level (Figure 1-3)

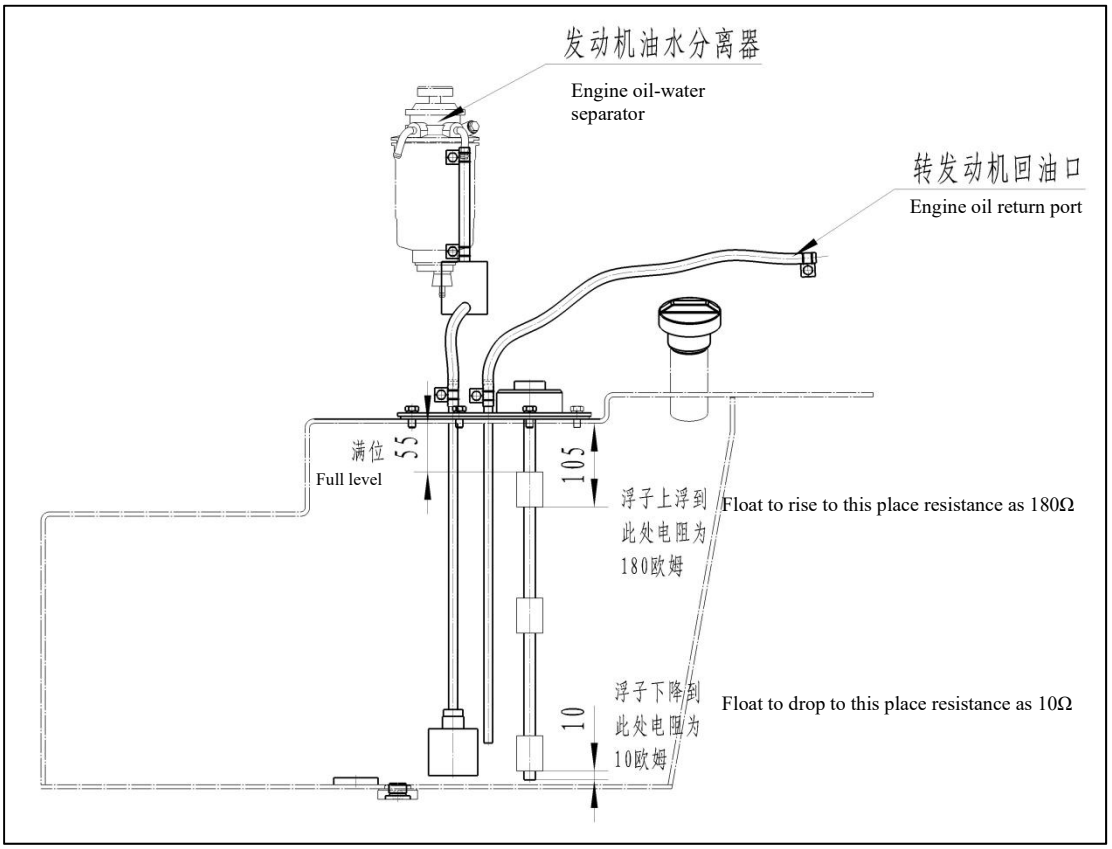


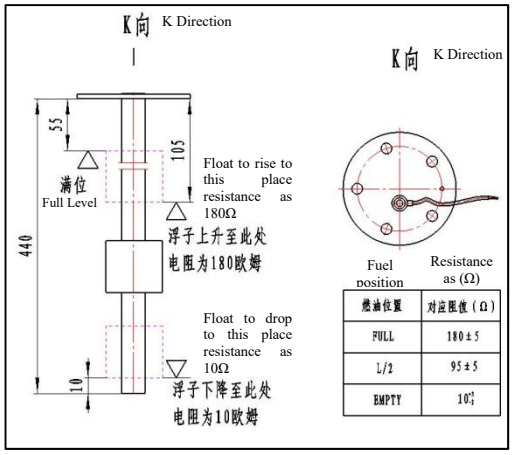
Fig. 1-3 Fuel tank

5.6.1 Fuel tank

The fuel tank is a whole welded structure integrated with the frame, located on the left side of the frame; the capacity of 1.5-3t hydraulic four-wheel drive tele-truck is about 60 liters, and the fuel quantity sensor is installed on the lid of the fuel tank to detect the fuel level.

5.6.2 Oil quantity sensor

The fuel quantity sensor is to convert the remaining fuel quantity in the fuel tank into voltage, see Figure 1-4. By using alloy steel wire as a sliding resistor connected to the float, when the float moves up and down, the resistance value will change, and the fuel quantity in the fuel tank can be read out from the instrument panel through the electromagnetic fuel gauge.



1.3.3 Maintenance of fuel system

One maintenance shall be made for the fuel system as per the following methods every 100 hours' operation and the fuel tank shall be cleaned every 600 hours' operation.

(1) Fuel filter

The fuel filter is used to remove the dirt and impurities in the fuel, the fuel filter is located between the fuel tank and the injection pump.

(2) Diesel fuel filter maintenance

The filter is cylindrical (See Fig. 1-5), generally non-removable, and should be replaced as a set when needed.

a) For every 100 hours of work, remove the cartridge shell with special tools and take out the filter element;

b) The entire filter shall be replaced every 600 hours' operation;

c) Attention should be paid to checking for fuel leakage after reassembly.

d) Pay attention to checking the working condition of the relief valve 1.

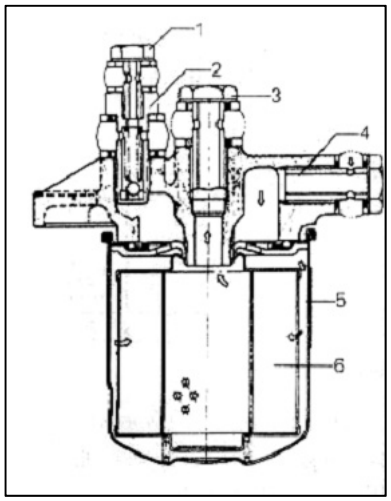


Fig. 1-5

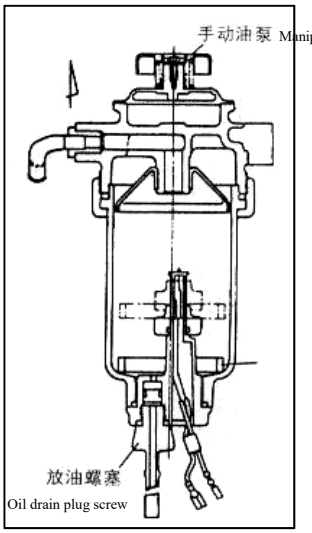


Fig. 1-6

(3) Oil-water separator (sediment cup)

Because the interior of VE type injection pump is lubricated with fuel, the water in the fuel must be separated out. Therefore, a sediment cup (i.e., oil-water separator) is used. If the oil-water separator indicator light turns on during operation, drain it. (Fig. 1-6)

a) Drainage

Loosen the drain plug to drain water by hand. Then tighten the drain plug and start the pump several times. Make sure there is no oil leakage and the engine starts and the alarm light goes out. Tighten the drain plug securely.

b) Exhaust

Loosen the drain plug (relief valve) of the injection pump and snap the main pump until no air comes out. To assure oil tight.

(4) Clean of fuel tank

Clean the fuel tank every 600 hours of operation.

5.7 Transmission

Belonging to the new power transmission system of four-wheel drive tele-truck, the power transmission system of the FSDT25/35 tele-truck mainly consists of FSDT35 I-1 gearbox (25/35 general), FSDT25/35 II gearbox, FSDT25/35 III front main reducer, and FSDT25/35 IV rear main reducer. With two front gears and one rear gear, it can achieve time-sharing four-wheel drive according to actual usage needs. The torque converter installed in the FSDT35 I-1 transmission is a single- stage, two- phase, three –working- wheel comprehensive hydraulic torque converter, which enables the transmission to have automatic adaptability to hydraulic transmission output. It can change its output torque and speed accordingly with changes in external loads, and absorb and eliminate impact vibrations from the engine and external loads on the transmission system; the use of electro-hydraulic shift with inching valve and buffer valve makes operation simple, convenient, and smooth, greatly reducing the fatigue strength of operation. Controlled by an electromagnetic valve, the off-bridge mechanism converts between two- wheel drive and four -wheel drive through a hydraulic clutch. Equipped with differential locks, the FSDT25/35 III front final drive and FSDT25/35 IV rear final drive can automatically control according to road conditions, greatly improving the off-road capability of tele-trucks.

Product model	FSDT25	FSDT35
Input rotation direction (facing the input end)	Clockwise	
Front- axle end	Gear F1/F2/R	
Rear- axle end	Gear F1/F2/R	
Torque converter model	YJH265	
Transmission working fluid	L-TSA32GB11120 turbine oil or No. 6, No. 8 hydrodynamic drive oil	
Lubricating oil for transmission and final drive	85W/90 heavy load gear oil	

5.7.1 Notes for installation and use

5.7.1.1 The main oil pressure of the gearbox is 1.1~1.4 MPa, the inlet oil pressure of the torque converter is 0.4~0.6 MPa, and the return oil pressure is 0.1~0.3 MPa.

5.7.1.2 The normal working oil temperature is between 70℃ and 90℃, with the maximum working oil temperature not exceeding 120℃ and duration not exceeding 5 minutes.

5.7.1.3 The working fluid shall be kept clean and free of impurities. The working fluid shall be replaced after 100 hours of initial operation at normal oil temperature. The working fluid shall be replaced after each 1,000 hours of use or after long-term deactivation.

5.7.1.4 Check the working oil level of the gearbox 3 minutes after the engine is started, and the oil level should be within the specified range of the dipstick; The height of the lubricating oil level in the transmission box is based on the oil level plug on the box; The height of the lubricating oil level of the front and rear final drives is based on the oil level plug on the axle.

5.7.1.5 When the vehicle shifts gears, the inching valve shall be closed firstly, and then the gear shift can be conducted; close the inching valve first before braking to prevent clutch damage or brake failure.

5.7.2 Fault and troubleshooting

Fault items	Fault causes and troubleshooting methods
Efficiency drops and oil temperature is too high	1 The friction plate is stuck or worn. Check if the friction plate is scoring, uneven touching or warping. 2 The oil supply of the converter is not enough. Check if the oil pump has friction or the oil level is under normal position. 3 The bearing is damaged. Replace the bearing. 4 Check if the lubricating oil way is blocked. 5 The one-way wheel of the converter is stuck.
Oil leakage	1 The sealing gasket is damaged. Replace the sealing gasket. 2 Rubber parts are aging or damaged. Replace parts.

	3	Parts damage and crack. Replace.
The pressure of clutch is low or the swing is to big	1	Oil level is low. Check the oil level, and add it to the normal level.
	2	Input axis assembly and the sealing ring on the piston is worn or the joint is wedged tightly during assembling. Attention should be paid during changing the sealing ring or assembly.
	3	The oil pump is worn. Replace the oil pump
	4	Whether the inching valve rod is reset.

5.8 Rear steering drive axle

5.8.1 Operation, maintenance and repair

1) The pre-tightening torque of fasteners at all parts shall be rechecked and the lubricating oil shall be replaced upon 1,500km running in of the new axle.

2) Remove dirt and dust from the vent plug on the rear axle housing on a regular basis.

3) Regularly check the plug of the oil filling hole and the plug of the oil drain hole, and tighten it in a timely manner or replace the end face sealing gasket in case of leakage.

4) Fill the grease fittings with 2 # lithium based grease after driving for every 2,000km and clean the ventilation plug; Check the oil level of the axle housing and wheel gear (open the oil level plug before check).

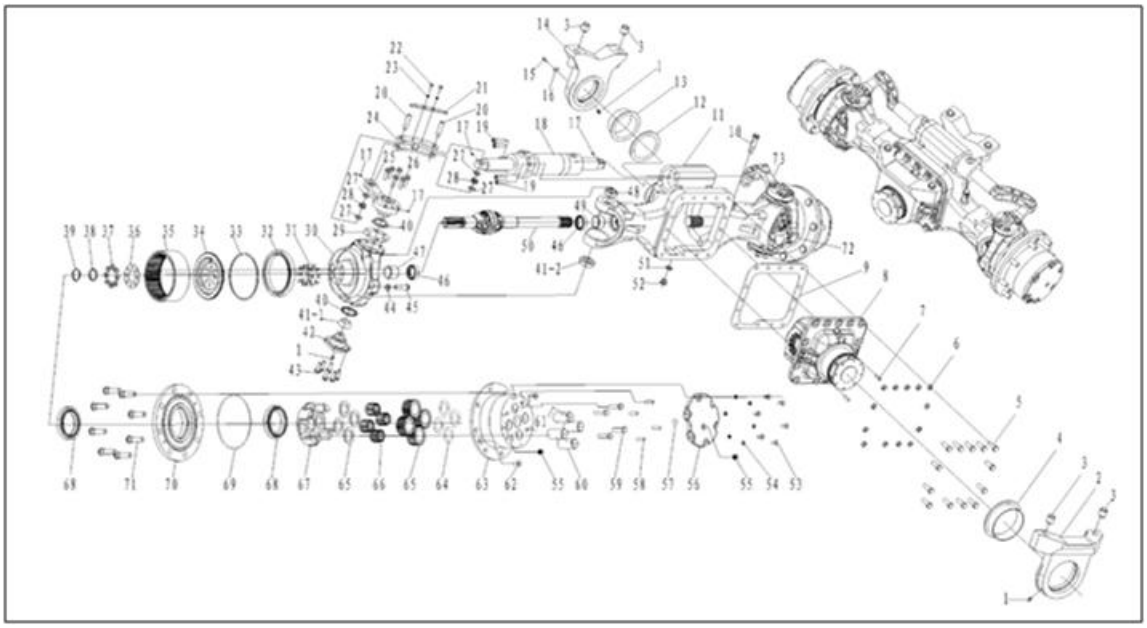
5) Check the condition of fasteners after driving for every 8,000-10,000km; Check the clearance of hub bearing; Check the quality of the gear oil inside the axle housing and replace the oil should in a timely manner in case of discoloration, thinning, or other deterioration. The initial oil- change mileage is 2,000km, and change the gear oil again after driving for every 24,000km.

5.8.2 Method of refueling

1) Add GL-5 heavy load gear lubricating oil (85W/90) from the axle housing oil filling port to the main reducer until the axle housing oil filling port overflows (about 8L); Turn the oil filling and drain hole of the wheel reducer to the vertical position, which is facing the end cover of the wheel reducer, and the oil filling and drain hole of the wheel reducer is above. Fill GL-5 heavy load gear lubricating oil (85W/90) from the oil filling and drain hole of the wheel reducer until the overflow of oil hole at the wheel edge (the oil filling amount of a single wheel-side reducer is about 0.85L).

2) Fill sufficient 2 # lithium base grease at each grease fitting.

5.8.3 Maintenance standards of main parts



1. Tightening torque of main bolts and screws (N•m)

	List	N·M
1	Fastening bolts of rear main reducer assembly (No. 5)	180-220
2	Fastening bolts of steering cylinder assembly (No. 19)	115-140
3	Fastening bolts of baffle (No. 22)	20-25
4	Fastening bolts of left and right steering knuckle arms (No. 26)	125-150
5	Fastening bolts of lower supporting pin (No. 43)	125-150
6	Gear ring support fastening nuts (No. 37)	85-100
7	Fastening nuts of steering limit bolt (No. 44)	140-150
8	Oil filling/drain plug of main pressure reducer (No. 53)	40-50
9	End cover fastening bolts (No. 54)	45-55
10	Wheel-side oil filling/drain plug (No. 56)	25-30
11	Planet carrier support fastening bolts (No. 61)	180-220
12	Planet carrier connecting bolts (No. 64)	80-90

2. Main maintenance standards

Items	Maintenance standard	Remarks
Starting force of rear hub	30-55N	Measure along the tangent direction of the hub bolt
Starting force of steering knuckle	< 10N	Measure along the tangent direction of the double- head bolt

5.8.4 Assembly and adjustment

5.8.4.1 Dismounting and mounting of assembly

5.8.4.1.1 Dismounting and mounting of planet carrier assembly

(1) First, drain the gear oil in the wheel rim.

(2) Remove the hexagon socket countersunk screw (No. 64) with an Allen wrench.

(3) Rotate the planet carrier slightly, and pull it out with force. Meanwhile, knock it gently on the planet carrier to loosen it. After the planet carrier gets loose, remove the planet carrier, in this case attention is paid to the heavy weight of this assembly to avoid breaking or crushing people.

The installation of planet carrier assembly is in the reverse order of the above process; however, attention should be paid to the tightening torque of the hexagon socket countersunk screws.

5.8.4.1.2 Removal method of hub assembly

(1) First, remove the shaft retainer ring (No. 39) from the half -shaft assembly through circlip pliers.

(2) Remove the outer half- shaft outer retainer ring (No.38).

(3) Use a wrench to remove the hexagon nut (No. 37).

(4) Remove the outer half- shaft inner retainer ring (No. 36).

(5) Take out the gear ring assembly (gear ring retainer ring (No. 33), gear ring support (No. 34), and gear ring (No. 35)) through a pull code.

(6) Rotate the hub assembly slightly, pull it out with force, and knock on the hub slightly to loosen the inner ring of the outer bearing. After the inner ring of outer bearing gets loose, remove the hub assembly, in this case attention should be paid to the heavy weight of hub assembly to avoid breaking or crushing people and any damage to the inner ring of outer bearing.

The installation of hub assembly is the reverse of the above process. Pay attention to the tightening torque and bearing pre-tensioning force of the hexagon nut (No. 37).

5.8.4.1.3 Removal method of knuckle assembly

(1) Use a wrench to remove the hexagon bolt (No. 22).

(2) Remove the baffle (No. 21).

(3) Take out the connecting rod pin (No. 20).

(4) Take down the connecting rod (No. 24).

(5) Remove the hexagonal flange bolts (No. 26 and No. 43) with a wrench.

(6) Remove the left steering knuckle arm (No. 25), right steering knuckle arm (No. 75), and lower support pin (No. 42).

(7) Hold the ATLH (No. 51) and pull out the left knuckle (No. 30) and right knuckle (No. 74) with force. Be careful not to remove the ATLH. Pay attention that this knuckle assembly is heavy, to avoid breaking or crushing people.

The installation of left and right knuckle assembly is the reverse of the above process. However, it should be noted that no damage will be caused to the oil seal lip in the left and right knuckles, and attention is paid to the tightening torque of the hexagon flange bolts (No. 26 and No. 43) and the hexagon bolt (No. 22).

5.8.4.1.4 Removal method of steering cylinder assembly

(1) Use a wrench to remove the hexagon bolt (No. 5).

(2) Pull out the steering cylinder assembly (No. 18) with force and pay attention to the heavy weight of the steering cylinder assembly to avoid breaking or crushing people.

The installation of steering cylinder is the reverse of the above process. But, attention should be paid to the tightening torque of the hexagon socket cap head screw (No. 19).

5.8.4.1.5 Removal method of rear main reducer assembly

(1) Pull the ATLH (No. 51) outwards with force; but, it should be noted that the inner semi-axis will not damage the oil seal lip in the axle housing and this ATLH is heavy, to avoid breaking or crushing people.

(2) Use a wrench to remove the hexagon bolt (No. 5).

(3) Jack up the rear main reducer assembly (No. 8) with two hexagon bolts (No. 5).

(4) Pull out the rear main reducer assembly (No. 8) with force, but pay attention to the heavy weight of the rear main reducer assembly, to avoid breaking or crushing people.

The installation of the rear main reducer assembly is in the reverse order of the above process. But, pay attention to the tightening torque of the hexagon bolt (No. 5) and install the locating pin (No. 7).

5.8.4.2 Adjustment of axle

5.8.4.2.1 Adjustment of clearance between rear axle body and steering knuckle

(1) Install the half- shaft assembly into the axle body first.

(2) Insert the left and right steering knuckles (No. 30 and No. 75) onto the half shaft assembly and rear axle body (No. 11).

(3) Press the inner ring of the angular contact joint bearing (No. 41-1) into the lower support pin (No. 42).

(4) Insert the dust ring into the lower support pin, apply a thin layer of lubricating grease on the surface of the inner ring (convex) ball of the joint bearing, align the bolt holes, install the lower support pin into the steering knuckle and rear axle body, and tighten the hexagonal flange bolt (No. 43).

(5 Insert the appropriate adjustment plate (No. 29) into the left and right steering knuckle arms and adjust the gap to ensure that the gap is within 0.1.

(6) Apply a thin layer of lubricating grease to the outer surface of the left and right steering knuckle arms, align the bolt holes of the left and right steering knuckle arms, and install them into the steering knuckle and rear axle body and tighten the hexagonal flange bolts (No. 26).

(7) Measure the starting force of the steering knuckle at the tangent direction of the double- head bolt, and measure it separately on the left and right sides before injecting lubricating grease. The starting force should be less than 30N. As shown in Fig. 1

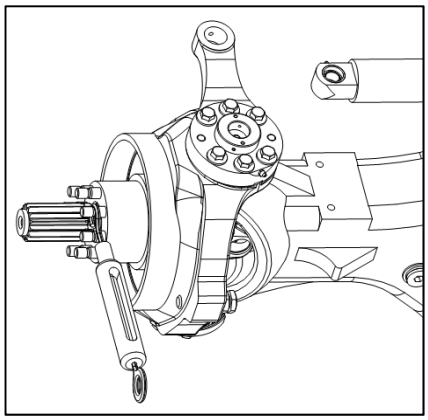


Fig. 1

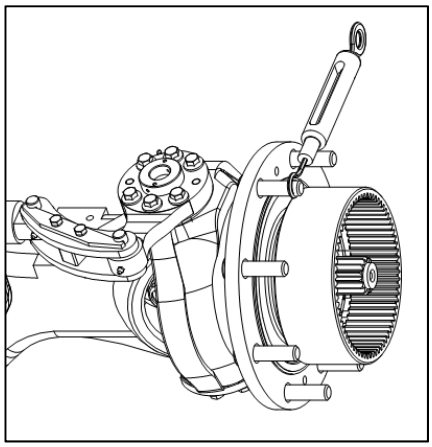


Fig. 2

5.8.4.2.2 Adjustment of pre-tensioning force of rear axle hub bearing

(1) Install the rear axle hub assembly into the steering knuckle.

(2) Rotate the hub for 2-3 turns to correctly place the bearing

(3) Install the gear ring assembly into the steering knuckle.

(4) Install the outer half -shaft inner retainer ring (No. 36) into the steering knuckle.

(5) Apply thread tightening adhesive to the double -head stud (No. 31), and then tighten the hex nut (No. 37) with a tightening torque of 100N. m.

(6) Rotate the hub for 2-3 turns and measure the starting force of the hub at the tangent direction of the hub bolt. The starting force of the hub should be between 20-55 N. As shown in Fig. 2

5.8.4.2.3 Adjustment of steering angle

(1) Adjust the limit bolt (No. 45) of the steering angle to provide the maximum turning angle of inner wheel at 61.59°.

(2) After adjusting the limit bolt, tighten the lock nut (No. 44).

(3) When the maximum turning angle of inner wheel is greater than 30°, it is not recommended to use four-wheel drive.

5.8.5 Common faults and troubleshooting in use

Fault representation	Cause analysis	Troubleshooting method
The hub bearing is slow	1. The bearing is short of lubrication or lubricating oil used is incorrect	Add or replace the gear oil
	2. The bearing gets dirty by the dust	Clean or strengthen lubrication
Heavy steering operation, steering shimmy	1. Excessive clearance between knuckle arm and bushing	Check and replace the parts to adjust the clearance
	2. Joint bearing at the lower support pin is worn or damaged	Check and replace
	3. Link pin wear or damage	Replacement
	4. Joint bearing at the link pin is worn or damaged	Replacement
	5. Lack of lubrication of rear steering drive axle components	Add the lubricating grease
	6. Tire pressure is too low	补充到规定压力 Make up to the specified pressure
	7. Excessive tire wear	Replacement of tire
	8. The hub bearing is worn	Replace the bearing
	9. Steering cylinder oil leak	Replace the steering cylinder
	10. Steering cylinder oil pressure is too low	Adjust the oil pressure
	11. The compression double-headed bolt of the gear ring assembly is loose	Tighten the double-headed bolt
	12. The compression nut of the gear ring assembly is loose	Tighten compression nut

5.8.6 List of Vulnerable Parts

Serial No.	Code	Name	Quantity	Remarks
1	H24C4-32061	Knuckle bearing	4	(No. 28)
2	CFW	SIMRIT combination oil seal 155X190X17.5/19	2	(No. 32)
3	SQH35000004	Dust ring	4	(No. 40)
4	GAC35S	Angular contact knuckle bearing 35X62X18	2	(No. 41)
5	CFW	SIMRIT combination oil seal 45X60X16	4	(No. 46)
6	SQH35020003B	Sliding bearing 45x50x40	2	(No. 47)
7	SQH35000017	Lining 35X52X16.5	2	(No. 49)
8	SQH35000008	Sliding bearing 45X50X30	2	(No. 50)
9	TIMKEN	Conical roller bearing JL819349/JL819310 (95X135X20)	4	(No. 70)

5.9 Front drive axle

5.9.1 Operation, maintenance and repair

1) After the new axle is installed in the vehicle, the pre-tightening torque of fasteners at all parts shall be rechecked and the brake clearance shall be readjusted, upon 1,500km running in.

2) Remove dirt and dust from the vent plug on the rear axle housing on a regular basis.

3) Regularly check the plug of the oil filling hole and the plug of the oil drain hole, and tighten it in a timely manner or replace the end face sealing gasket in case of leakage.

4) Fill the grease fittings with 2 # lithium based grease after driving for every 2,000km and clean the ventilation plug; Check the oil level of the axle housing and wheel gear (open the oil level plug before check).

5) Check the condition of fasteners after driving for every 8,000-10,000km; Check the clearance of hub bearing; Check the quality of the gear oil inside the axle housing and replace the oil should in a timely manner in case of discoloration, thinning, or other deterioration. The initial oil- change mileage is 2,000km, and change the gear oil again after driving for every 24,000km.

5.9.2 Method of refueling

Add GL-5 heavy load gear lubricating oil (85W/90) from the axle housing oil filling port to the main reducer until the axle housing oil filling port overflows (about 8L); Turn the oil filling and drain hole of the wheel reducer to the vertical position, which is facing the end cover of the wheel reducer, and the oil filling and drain hole of the wheel reducer is above. Fill GL-5 heavy load gear lubricating oil (85W/90) from the oil filling and drain hole of the wheel reducer until the overflow of oil hole at the wheel edge (the oil filling amount of a single wheel-side reducer is about 0.85L).

5.9.3 Maintenance standards of main parts

1. Tightening torque of main bolts and screws (N•m)

	List	N·m
1	Fastening bolts of front main reducer assembly (No. 1)	180-220
2	Fastening bolts of left and right brakes (No. 12 and No. 13)	200-240
3	Round nut retaining screw (No. 28)	20-25
4	Oil filling/drain plug of main pressure reducer (No. 6)	40-50
5	End cover fastening bolts (No. 45)	45-55
6	Wheel-side oil filling/drain plug (No. 43)	25-30
7	Planet carrier support fastening bolts (No. 38)	180-220
8	Planet carrier connecting bolts (No. 34)	80-90

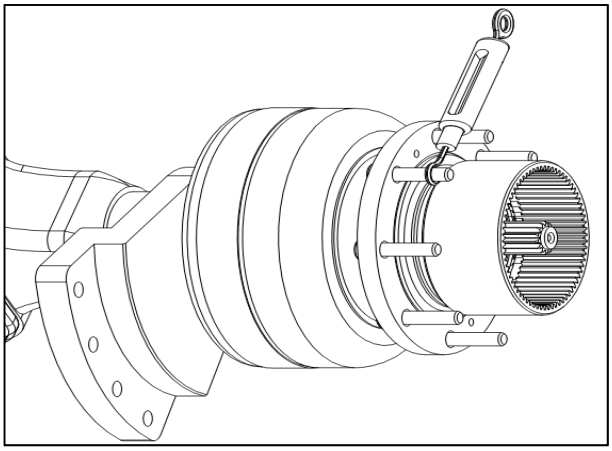
2. Main maintenance standards

Items	Maintenance standard	Remarks
Starting force of front hub	30-55N	Measure along the tangent direction of the hub bolt

5.9.5 Assembly and adjustment

(I) Dismounting and mounting of assembly

1. Dismounting and mounting of planet carrier assembly



(1) First, drain the gear oil in the wheel rim.

(2) Remove the hexagon socket countersunk screw (No. 34) with an Allen wrench.

(3) Rotate the planet carrier slightly, and pull it out with force. Meanwhile, knock it gently on the planet carrier to loosen it. After the planet carrier gets loose, remove the planet carrier, in this case attention is paid to the heavy weight of this assembly to avoid breaking or crushing people.

The installation of planet carrier assembly is in the reverse order of the above process; however, attention should be paid to the tightening torque of the hexagon socket countersunk screws.

2. Removal method of front axle wheel brake drum assembly

(1) Gently extract the half shaft (No. 39).

(2) Remove the hexagon socket head cap screw (No. 28) with an Allen wrench.

(3) Remove the round nut (No. 27) with a special wrench.

(4) Pull out the gear ring assembly (gear ring retainer ring (No. 24), gear ring support (No. 25), and gear ring (No. 26)) with force, remove the gear ring assembly and gently tap the gear ring assembly.

(5) Turn the hub brake drum assembly slightly, pull it out with force, and knock it gently on the brake drum at the same time. When the hub brake drum assembly gets loose, remove the hub brake drum. Now, pay attention to the heavy weight of the assembly to avoid breaking or crushing people. Meanwhile, it should be noted that no damage will cause to the inner ring of outer bearing.

The installation of rear hub brake drum assembly is in the reverse order of the above process; however, attention should be paid to the adjustment of tightening torque of round nut (No. 27) and pre-tensioning force of bearing.

3. Removal method of brake assembly

(1) Remove the positioning bolt (No. 12) and the hexagon bolt (No. 13) with a wrench.

(2) Pull out the left brake assembly (No. 11) and the right brake assembly (No. 8) with force.

The installation of the left and right brake assemblies is in reverse order of the above process; however, attention should be paid to the tightening torque of the bolts, the adjustment of the friction plate clearance, and the left and right brake assemblies. The left brake cable is shorter than the right one.

4. Removal method of front main reducer assembly

(1) Use a wrench to remove the hexagon bolt (No. 1).

(2) Jack up the front main reducer assembly (No. 4) with two hexagon bolts (No. 5).

(3) Pull out the front main reducer assembly (No. 5) with force, but, pay attention to the heavy weight of the front main reducer assembly to avoid breaking or crushing people.

The installation of the front main reducer assembly is in the reverse order of the above process. But, pay attention to the tightening torque of the hexagon bolt (No. 1) and install the locating pin (No. 3).

(II) Adjustment of axle

1. Adjustment of brake clearance

When the clearance between the brake pad and the brake drum is too large or too small, it will affect

the braking performance of the whole vehicle. Use a screwdriver to adjust the brake ratchet, with the clearance at 0.25-0.4mm.

2. Adjustment of pre-tensioning force of hub bearing

First, remove the hex socket cap screw (No. 28) with an Allen wrench, adjust the gap between the brake pad and the brake drum to the maximum, and then tighten the round nut (No. 27) with a special wrench, with a tightening torque of not less than 200N • m. Rotate the brake drum for 2-3 turns to make sure that the bearing is properly in place, and then tighten it with a torque of not less than 200 N • m. Next, reverse the round nut by 1/4-1/6 turns, rotate the brake drum by 2-3 turns, and pull the wheel hub bolt along the tangent direction with a spring scale to measure the starting force. The value should be 30-55N, as shown in Fig. 1. Finally, screw in the hexagonal socket head cap screw (No. 28).

5.9.6 Common faults and troubleshooting in use

Fault representation	Cause analysis	Troubleshooting method
Abnormal noise of main drive	1. Inappropriate clearance between differential gear	Replace the gasket or gear
	2. Excessive gear clearance between driving and passive gears	Replace the gasket or gear
	3. The pre-tightening force of driving gear bearing is too small	Adjustment of pre-tensioning force
	4. Semi-axis gear, planetary gear, universal joint pin, thrust washer, etc. are worn or damaged	Defective parts are corrected or replaced
	5. Oil level is too low	Additive lubricating oil
The lubricating oil is leaked	1. Oil seal is worn, loose or damaged	Replace the oil seal
	2. Loose reducer fastening bolts or damaged sealant	Tighten the bolts to the specified torque and re-apply the sealant
	3. The bearing block fastening bolt is loose	Tighten the bolts to the specified torque
	4. The drain plug is loose or the gasket is damaged	The plug screw is tightened as per the specified torque or the gasket is replaced
	5. The axle housing is deformed because of overload	The axle housing is corrected or replaced
	6. The vent plug is blocked or damaged	The vent plug is cleaned or replaced
The hub bearing is slow	1. The pre-tightening force of hub bearing is overlarge	Adjustment of pre-tensioning force
	2. The bearing is short of lubrication or lubricating grease used is incorrect	Strengthen lubrication or replace the lubricating grease
	3. The bearing gets dirty by the dust	Clean or strengthen lubrication
Insufficient brake force	1. Damaged brake wheel cylinder	Replace brake cylinder
	2. Insufficient or inadequate brake pressure	Check the pipeline and the brake master cylinder
	3. The brake friction plate is overheating or goes bad	Replace the friction plate
	4. Excessive clearance between the brake friction plate and the brake drum	Check and adjust the clearance between the friction plate and the brake drum
	5. The brake friction plate is fitted improperly	Correct the fitting position or running in of the friction plate
	6. There is any lubricating oil on the friction plate or brake drum	Clean the oil stain and replace the friction plate
	7. Water enter the drum brake	During the driving, gently step on the pedal to drain the water
	8. Brake connecting bolts loose or damaged	Tighten the brake connecting bolt or

		replace the connecting bolt

5.9.7 List of Vulnerable Parts

S/N.	Code	Description	Qty.	Remarks
1	SIMRIT	CFW combination oil seal 110X140X14.5/16	2	(No. 18)
2	TIMKEN	Tapered roller bearing JL819349/JL819310	2	(No. 19)
3	TIMKEN	Tapered roller bearing 37431A/37625	1	(No. 22)

5.10 Steering system

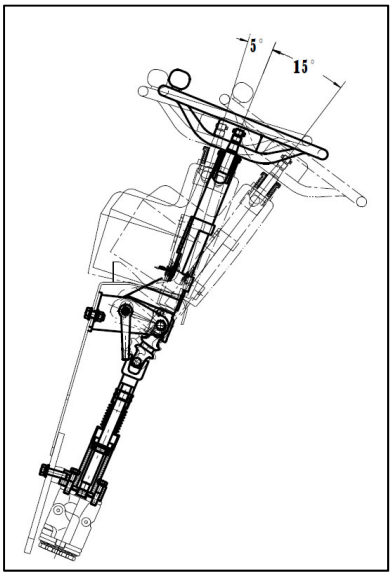
5.10.1 Overview

The steering system is mainly composed of steering device, steering cylinder, etc.

(1) Steering device（Figure 4-1）

It mainly includes cycloidal full-hydraulic orbitrol (see Figure 4-2), steering column and steering wheel. The steering column and steering wheel can be turned forward 5º and backward 15º to meet the needs of different drivers.

The full-hydraulic orbitrol can measure the pressure oil from the priority valve to the steering cylinder through the hydraulic pipeline according to the rotation angle of the steering wheel. If the oil pump cannot supply oil when the engine is off, the steering can be completed manually.



(2) Steering cylinder (Figure 4-3)

The steering cylinder is a through double-acting type cylinder. Both ends of the piston rod are connected to the steering knuckle through a link. The pressure oil from the full hydraulic orbitrol moves the piston rod to the left and right through the steering cylinder, thereby achieving left and right steering.

5.10.2 Check after the steering system is reinstalled

(1) Turn the steering wheel to the left and right as far as possible to check whether it is uniformly applied force and rotates smoothly;

(2) Check whether the oil piping layout is correct and the left and right steering pipes are installed conversely;

(3) Jack up the rear-wheel and slowly turn the steering wheel to the left and right for several times to exhaust the air in the hydraulic pipeline and cylinder.

5.10.3 Troubleshooting for steering system

Problems	Causes analysis	Troubleshooting method
The steering wheel doesn't turn	Oil pump is damaged or fails	Replace
	Priority valve is blocked or damaged	Clean or replace
	The rubber hose joint is damaged or the pipe is blocked	Replace or clean

Difficult steering	The pilot pressure of priority valve is too low	Adjust the pressure
	Air exists in oil circuit.	Element air
	The orbitrol fails to reset; the positioning spring leaf is broken or the elasticity is insufficient	Replace the spring leaf
	The inner leakage of steering cylinder is too much	Check the piston seal
Snake shaped or swinging of tele-truck	Excessive internal leakage of steering cylinder, loose cylinder pin or bent rod	Check the piston seal, cylinder pin and cylinder rod
Abnormal noise	Oil level in oil tank is low	Refueling
	Suction tube or oil filter is plugged	Clean or replace
Oil leakage	Steering cylinder guide sleeve seal is damaged or pipe or joint is damaged	Replace

5.11 Brake system

5.11.1 Overview

The brake system is double front wheels brake system and consists of the brake master pump, brake and brake pedal mechanism.

5.11.2 Brake master cylinder

Brake master cylinder includes one valve seat, one one-way valve, and one return spring, primary packing cup, piston, and secondary packing cup. The end part is fixed using thrust washer and snap ring, while and external part is protected through rubber dust cap. The master cylinder piston move with the help of a push rod operated by the brake pedal. When brake pedal is activated, the push rod pushes forward the piston, and the brake fluid in the cylinder body flows back to oil tank through return oil port, until the primary packing cup blocks the return oil hole. After primary packing cup has pushed the return oil port, the brake fluid in front cavity of master cylinder is compressed and opens the one-way valve, thus to flow to the wheel cylinder through bypass pipeline. In this way, the pistons of respective wheel cylinders extend outwards, for the friction plate of Brake shoes and the brake drum contacts each other, to achieve the effect of deceleration or brake. At this point, the rear cavity of piston is supplemented with the brake fluid from return oil port and oil inlet port. When brake pedal is released, the piston is pressed by return spring, and at the same time the brake fluid in respective brake cylinders are likewise compressed by return spring of Brake shoes, for brake fluid to return to the master cylinder (the front cavity of piston) through one-way valve. The piston will return to original place, the brake fluid in master cylinder will flow back to oil tank through return oil port, and the pressure of one-way valve is adjusted to certain proportion to the remaining pressure in brake cylinders, so that the secondary packing cup of wheel cylinder is correctly placed to prevent oil leak, and to eliminate air in the brake system that may possibly arise during emergency brake.

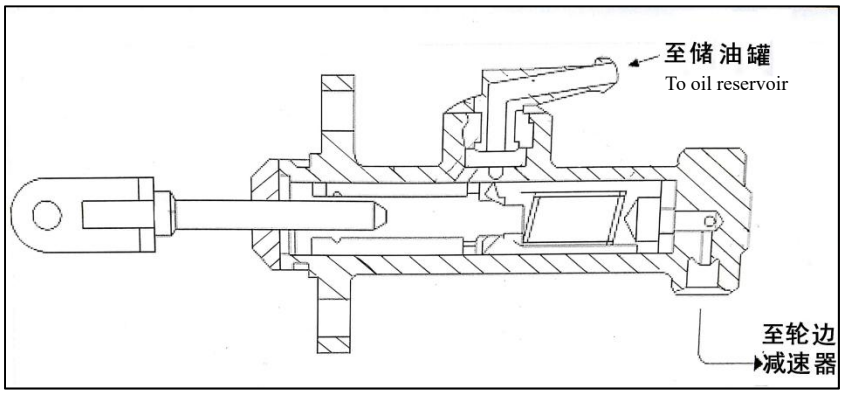


Fig 5-1 Brake Master Cylinder

5.11.3 Wheel Brake

Wheel brake is internal expansion, hydraulic type, and it is composed of Brake shoes, spring, wheel cylinder, adjuster, and bottom plate. The two brakes are respectively mounted on the two ends of front axle. One end of Brake shoes is connected with support pin, while the other end is connected with clearance regulator, and bears down onto the bottom plate by spring and tension spring pull rod. Lever L H Brake is mounted on primary Brake shoes, while adjustment pull rod for automatic clearance regulator is fitted on secondary Brake shoes. Refer to Fig 5-2.

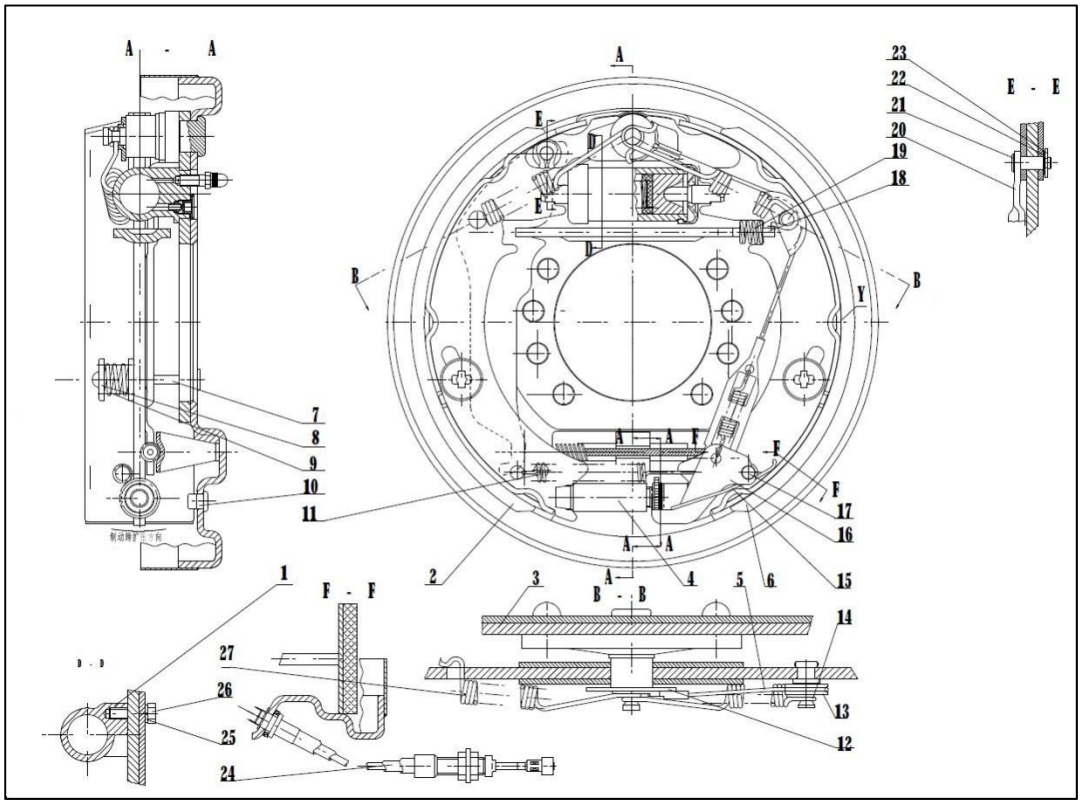


Fig 5-2 Wheel Brakes

S/N	Description	S/N	Description
1	Brake wheel cylinder assembly	15	Torsional spring
2	Brake shoe with friction plate assembly	16	Pawl
3	Assembly of the brake bottom plate	17	Pin
4	Clearance adjuster assembly	18	Left hand brake pushrod
5	Spring stay device	19	Spring
6	Brake shoe with friction plate	20	Hand brake pull rod
7	Compressed spring pull rod	21	Pin
8	Compressed spring seat	22	Resilient shim
9	Compressed spring	23	Pole pin retainer ring
10	Rubber plug	24	Brake cable wire assembly
11	Pull spring	25	Washer
12	Guide plate	26	Bolt
13	Guide block	27	Return spring
14	Return spring (rear)	28	

The action of forward brake is indicated as in Fig 5-3, and through operating brake wheel cylinder, the primary brake shoe and the secondary brake shoe are respectively effected by two forces of the same degree but in reverse directions, for friction plate and brake drum to get into touch with each other. The primary shoe bears down on the regulator by virtue of frictional force between friction plate and brake drum, and thereby the clearance regulator generates a larger force than that when the wheel cylinder is originally operated to push the secondary brake shoe, to force the upper end of the secondary brake shoe to bear down on the support pin with a strong force, thus to get relatively large braking force. The action of reversing brake is shown as in Fig 5-4. The braking action during backward movement is taken in a reverse direction, but the braking force is the same as that for forward movement.

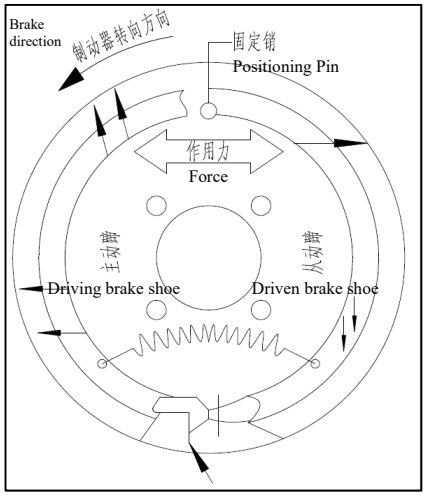


Fig 5-3 Brake Actions during Forward Running Process

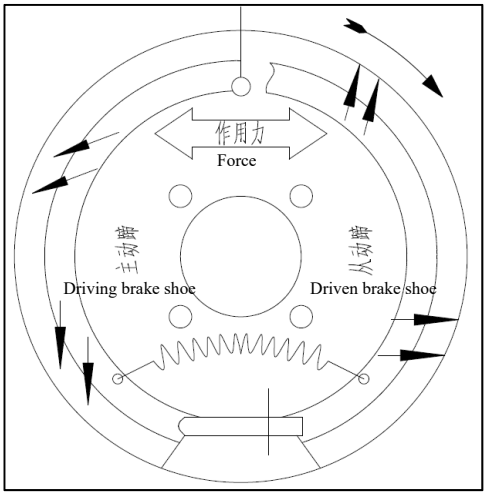


Fig 5-4 Brake Actions during Reversing Process

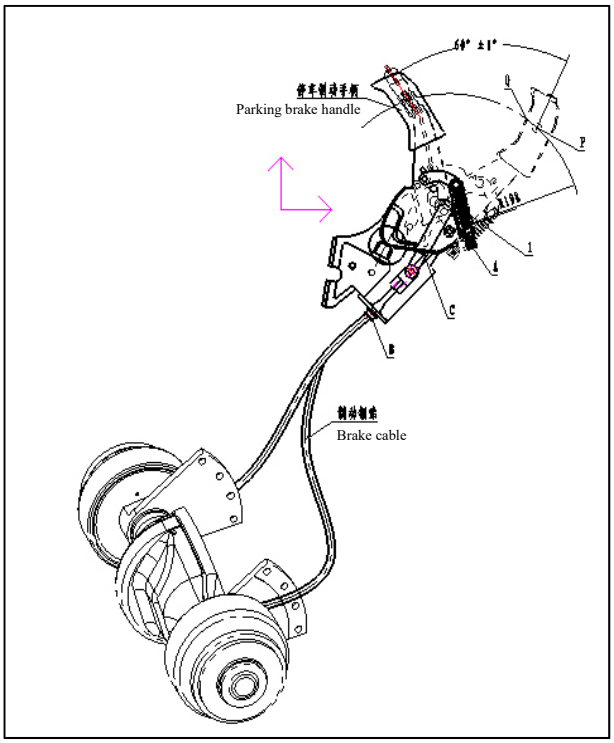
5.11.4 Automatic clearance adjuster

The automatic clearance regulator enables the clearance between friction plate and brake drum to be automatically maintained between 0.25-0.4 mm, but this regulator will only act during reverse brake. During backward movement, the brake shoe will disengaged once the brake pedal is pushed down, and thereby the secondary brake shoe and the primary brake shoe get into contact with brake drum and turn together, until the upper end of primary brake shoe begins getting into contact with the support pin.

Meanwhile, when secondary brake shoe leaves the support pin, the Part A of adjusting lever is relatively pulled (Refer to Fig. 5-5), thus for the adjusting lever to rotate around the Part B, so as to drop the Part C. The Part D of the regulator takes left-hand rotation, to achieve the purpose for automatic adjustment. When brake shoe is further pushed down, the pressure applied to the both ends of regulator will turn to be higher, thus to increase the resistance to thread rotation, so that the force of adjusting lever is unable for Part D to rotate.

5.11.5 Parking brake

The parking brake device has a manual flexible shaft mechanism, which shares an automatic power assisted shoe brake acting on the front wheel together with the service brake. Use the parking brake only when parking a tele-truck.



Before adjusting the parking brake, make sure that the drive axle brake system functions normally. 1) Adjust the nut B to make the length equal to 68mm, and then tighten the lock nut B. 2) Adjust the nut A to adjust the hand brake's tension. The tension is that: The tension at point P in the Q direction of the locking handle is 147-196 N. 3) After the hand brake lever is adjusted correctly, release it to ensure that the brake is completely released. 4) Make sure that the manual parking brake works normally after the above adjustment.

Caution: Apply a proper amount of lithium base grease to the guide rail C, and keep applying it regularly.

5.6 Adjustment of Brake Pedal

Adjust the stop bolts, so that the pedal location is shown in the following and the distance between the front floor and it is 113mm and the pedal stroke is 20mm. Tighten the stop bolts, to ensure that the foot brake can work properly.

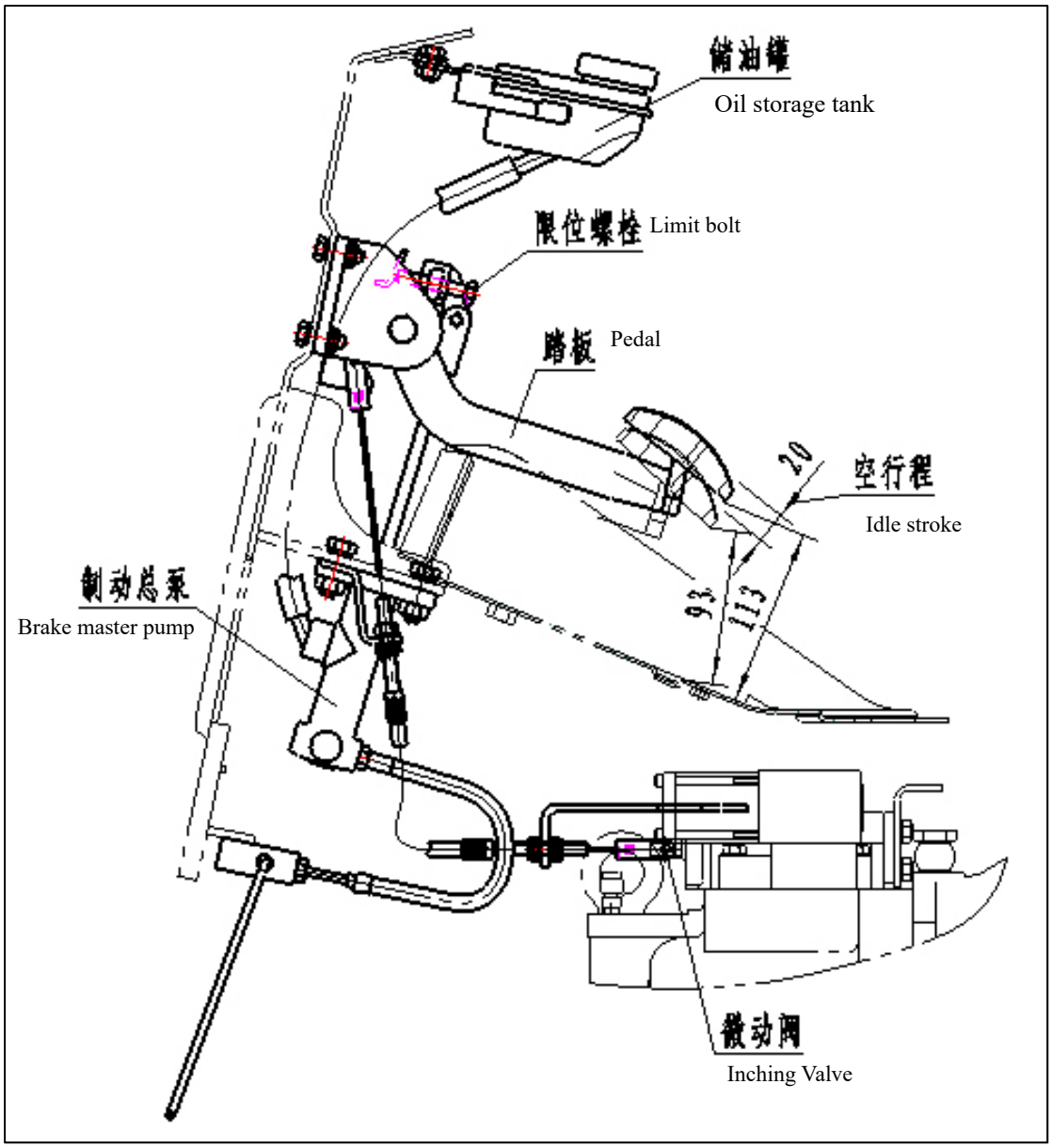


Fig. 5-6 Adjustment of brake pedals

5.11.7 Maintenance

This section covers the process for disassembly, reassembly, and adjustment of brake.

5.11.7.1 Disassembly of Wheel Brake

(1) Remove the fixed spring of secondary Brake shoes, and take off the adjusting lever, top lever, and the top lever return spring (Fig 5-7);

Fig 5-7

(2) Remove the return springs for the two Brake shoes (Fig 5-8);

Fig 5-8

(3) Remove the other three fixed springs (Fig 5-9);

Fig 5-9

(4) Detach the primary Brake shoes and the secondary Brake shoes, and at the same time remove the spring for adjuster. (Fig 5-10);

Fig 5-10

(5) Loosen the hardware that holds the wheel cylinder, then remove the mounting bolts from wheel cylinder, and separate the wheel cylinder from the bottom plate. (Fig 5-11);

Fig 5-11

(6) Remove the E-shaped retainer ring that fastens the brake cable to the backing plate then remove the backing plate hardware and then remove the backing plate from the axle. (Fig 5-12).

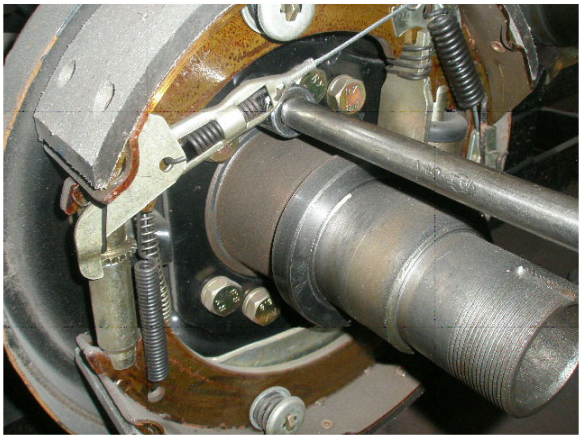


Fig 5-12

(7) Remove the shield from wheel cylinder, and push out all the parts inside the cylinder (Fig 5-13)

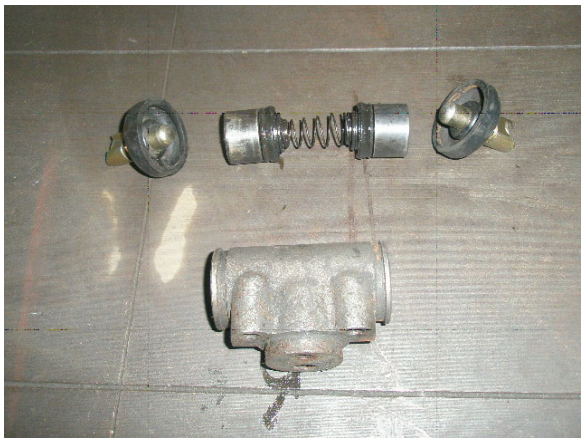


Fig 5-13

5.11.7.2 Examination of Wheel Brake

Examine whether or not all the parts are worn out or damaged, and they shall be repaired or replaced, if incompliant.

(1) Examine whether or not the inner surface of wheel cylinder body and the surface of piston column are rusted, and then measure the clearance between piston and cylinder body;

Specified Value: 0.065mm-0.150mm;

Maximum Value: 0.15mm.

(2) Visually check whether or not the wheel cylinder cup is damaged or distorted and replace if necessary;

Outer diameter of cup Φ30.1-0.2

The standard value of cup interference is 1.52, and the minimum value thereof is 0.42

(3) Examine the free length of wheel cylinder spring, and replace it is improper;

It is specified that the free length of the wheel cylinder spring is 58mm;

(4) Examine the thickness of Brake shoes, and replace it if it is found to be excessively worn out;

Specified Thickness: 8.8mm; Minimum Thickness: 5.0 mm

(5) Examine the inner surface of the brake drum to understand if the drum needs to be replaced or resurfaced;

Standard Value: 314mm; Maximum Value after Resurfacing: 316mm

(6) Measure the free length and installed load of return spring for Brake shoes (Fig. 5-14);

Free length: L=115.1mm

Installation length: 122mm

Installation loads: 225N

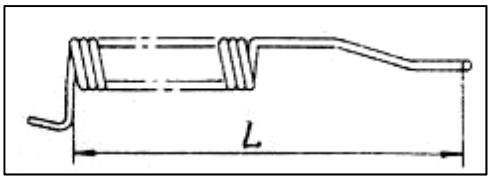


Fig. 5-14

(7) Measure the free length and installation load of the ejector rod return spring (Figure 5-15);

Free length	124.5mm
Installation length	130mm
Installation loads	245N
Forklift tonnage	1.5-3t

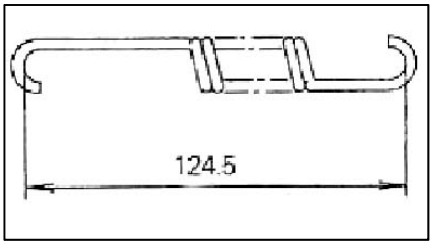


Fig. 5-15

Measure the free length and installation load of the adjuster spring (Figure 5-16);

Free length: 121mm

Installation length: 137mm

Installation loads: 71.5N

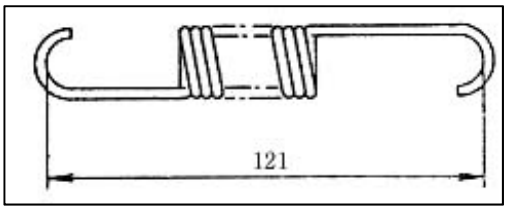


Fig. 5-16

(9) Measure the free length and installation load of the ratchet spring (Figure 5-17); Installation loads: 14.7N

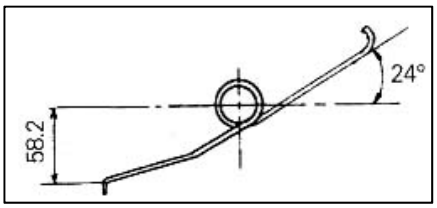


Fig. 5-17

(10) Examine whether or not the adjusting mechanism is damaged, how the operating status is, and also examine whether or not the contact of adjusting lever is damaged and needs replacing.

5.7.3 Reassembly of Wheel Brake

(1) First, soak the secondary packing cup and piston with brake fluid, then install the spring, leather bowl, piston and cover in turn;

(2) Mount the wheel cylinder on backing plate;

Attention: Ensure that respective parts are all at the correct position during installation, and the bolt tightening torques are 17.6-26.5N.m;

(3) Mount the backing plate onto the front axle;

Bolt Tightening Torque: 120-140N.m

(4) Add #2 calcium base lubricating grease at a, b, c, d respective lubricating points as indicated in Fig 5-18, and be careful not to allow this grease to be adhered on Brake shoes;

a. Bottom Plate Bearing Surface

b. Support Pin for Handbrake Rod

c. Support Pin

d. Regulator Thread and other Turning Parts

e. Contact Surface of Brake Shoe and Pressure Spring Seat

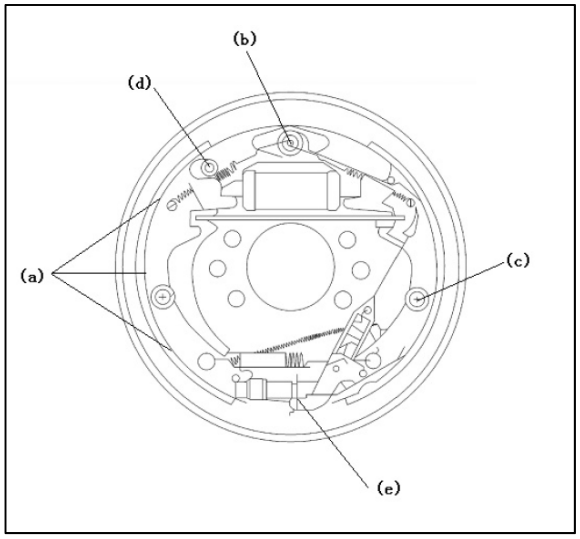


Fig. 5-18 1.8t-3.5t tele-truck

(5) Mount the brake cable assembly onto the bottom plate using E-shaped retainer ring;

(6) Mount the Brake shoes onto the bottom plate using fixing spring, but the bottom part of secondary Brake shoes shall be mounted with fixing spring after the washer, cup and the adjusting lever have been properly installed, to ensure that the pressure seat is fitted in the holes of Brake shoes and adjusting lever (Fig 5-19);

Fig. 5-19

(7) Mount the compressed spring onto the hand brake push rod, and then install the push rod onto the Brake shoes;

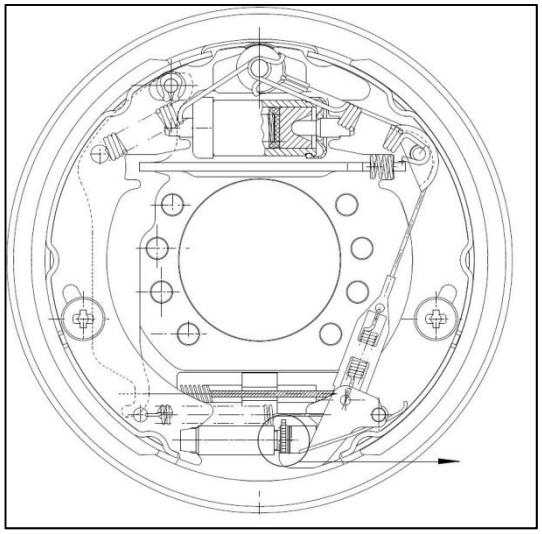
(8) Mount the guide plate of Brake shoes onto the support pin, and then install the return spring of Brake shoes (Fig 5-20).

(9) Install adjuster, adjuster spring, top rod, and return spring for top rod (Fig 5-21);

Pay attention to the following respective items:

a) Adjuster Thread Direction and Its Installation Direction (left-hand thread is used for left brake, while right-hand thread is used for right brake.);

b) Adjuster Spring Direction (It is not allowed for the tooth part of adjuster to contact the spring.);



c) Top Rod Return Spring Direction (At the end of support pin, the spring hook shall be fixed on the opposite side of top rod.);

d) The ejector rod and its return spring shall be fixed in the groove of the support pin;

e) Make sure that the lower end of adjusting lever shall be in contact with the gear of turn brake adjuster.

(10) Connect the brake oil pipe onto the wheel cylinder;

(11) Measure the inner diameter of brake drum, and adjust the adjuster for the differences between the inner diameter of brake drum and the surface of the brake shoes: 0.5-0.8mm.

5.8 Operating Test on Automatic Clearance Regulator

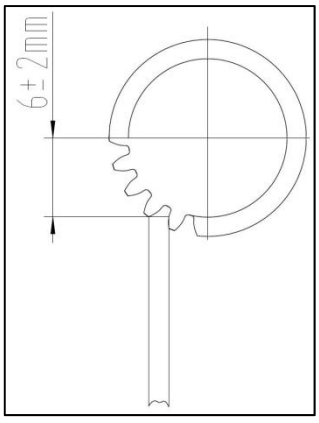
(1) Primarily allow the diameter of Brake shoes to approach the installation size, and pull the adjusting lever with hand in the direction as indicated by the arrow in Fig 5-22 for adjust to rotate. When the hand is released, the adjusting lever returns to its original position and the adjusting gear does not turn.

Attention: Even if the regulator gear returns with the adjustment lever when the hand is released, the regulator can still work normally after loading.

(2) In the case when adjusting lever is pulled, and the adjuster cannot do the abovementioned action, the following items shall be examined:

a) Firmly install the adjustment lever, ejector rod, spring of ejector rod and compressed spring plate;

b) Check whether the arrangement relationship between the adjusting lever and the adjusting gear is correct, as shown in Figure 5-23. If not satisfactory, replace the parts. Additionally, check whether the lever is in contact with the gear;



c) Examine whether or not the return spring for ejector rod and the spring for regulator are damaged, and then examine the rotating status of regulator gear and whether or not the engaged part is over-worn or damaged.

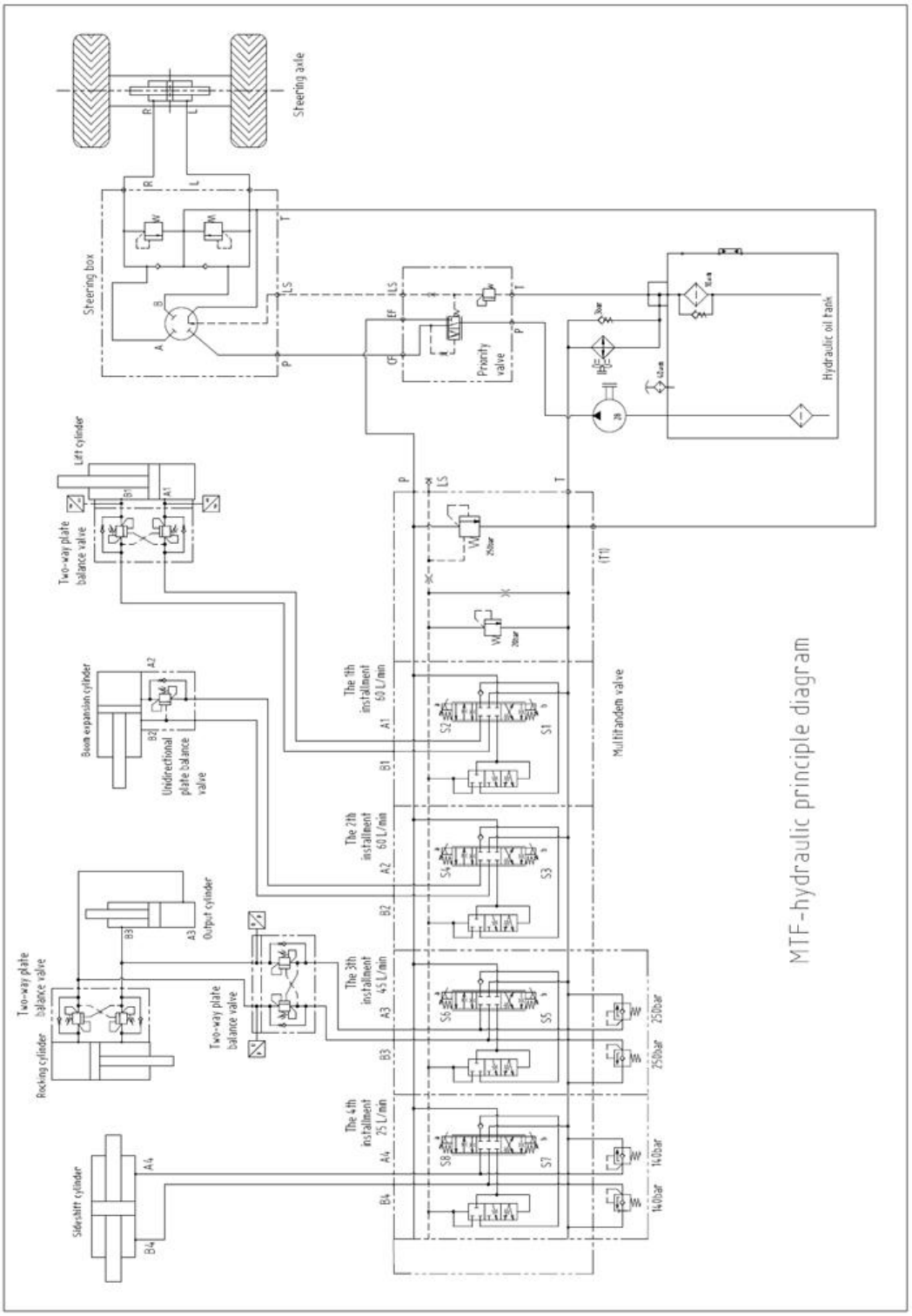
5.11.9 Wheel Brake Failure

Problem	Cause analysis	Solution

Brake too Spongy	1. Fluid leak in brake system 2. Clearance of Brake shoes not properly adjusted 3. Brake too hot 4. Contact between brake drum and Brake shoes under poor condition 5. Debris found embedded in Brake shoes 6. Debris found in brake fluid 7. Inching Brake Pedal not working properly	Repair Adjust brake adjuster Examine whether or not skidding exists Readjusted Repair or replace Adjust brake adjuster Adjustment
Noisy Brakes	1. Surface of Brake shoes hardened or impurity attached on it 2. Bottom plate distorted or bolt loosened 3. Brake shoes distorted or installation incorrect 4. Brake shoes worn 5. Wheel Bearing Loose	Repair or replace Repair or replace Repair or replace Replace Repair
Uneven brake	1. There is oil contamination on surface of friction plate 2. Clearance of Brake shoes not properly adjusted 3. Wheel cylinder failure 4. Brake shoes return spring damaged 5. Brake drum failure	Repair or replace Adjust brake adjuster Repair or replace Replace Repaire or replace
Brake Weak	1. Oil leak with brake system 2. Clearance of Brake shoes not properly adjusted 3. Air in Brake fluid 4. Adjustment of brake pedal incorrect	Repaire or replace Adjuster adjusted Air bled Readjusted

5.12 Hydraulic System

5.12.1 Hydraulic principle diagram


MTF-hydraulic principle diagram
Steering axle
Steering box
Priority valve
Hydraulic oil tank
Left cylinder
Two-way plate balance valve
Boom expansion cylinder
Unidirectional plate balance valve
Output cylinder
Rocking cylinder
Sideshift cylinder
Multi-tandem valve
The 1th installment 60 L/min
The 2th installment 60 L/min
The 3th installment 45 L/min
The 4th installment 75 L/min
250bar
140bar

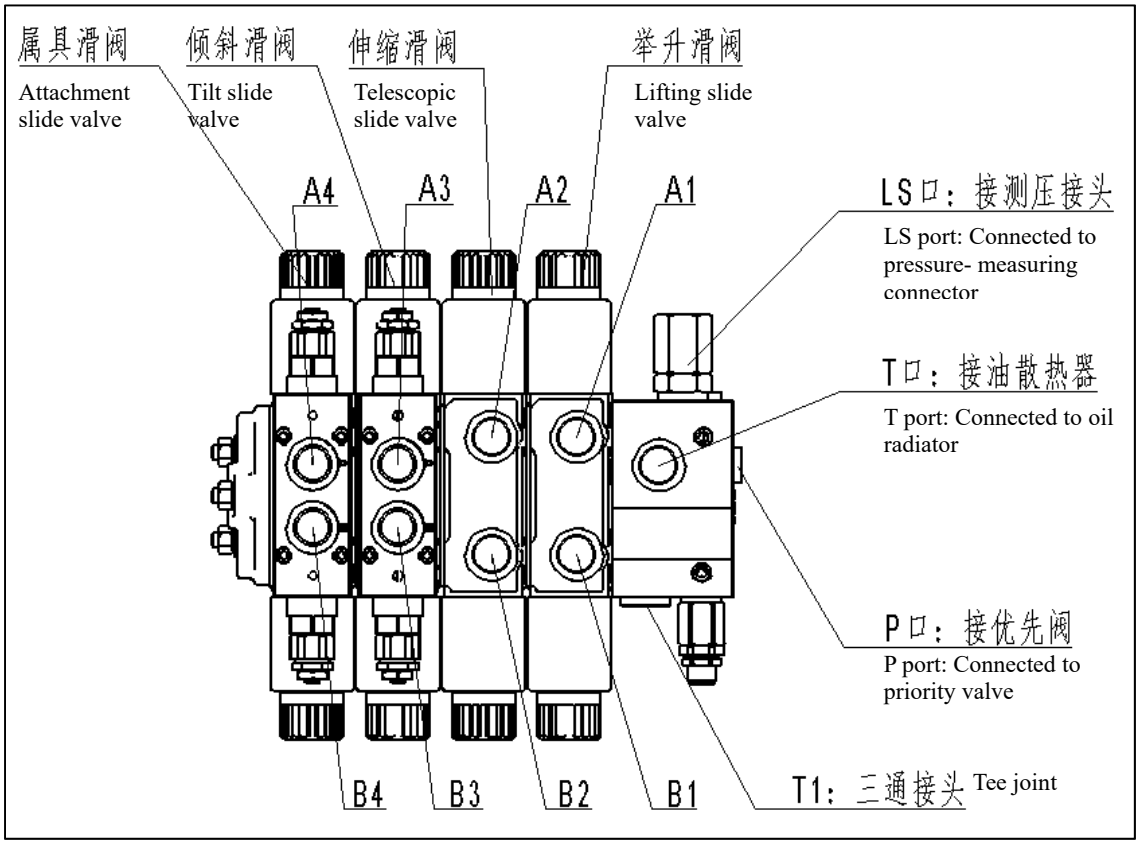
5.12.2 Overview

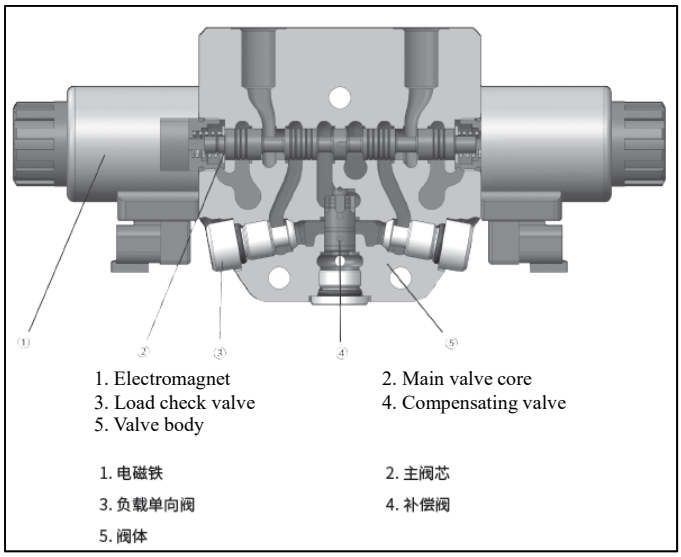
The hydraulic system consists of gear oil pump, steering priority valve, electric proportional multi-way valve, lifting cylinder, tilt cylinder, servo cylinder, swing cylinder, orbitrol, return oil filter, and oil pipe. The power take-off (PTO port) of the engine directly drives the main oil pump.

The high-pressure oil from the main oil pump reaches the steering priority valve, which is divided into two parts: One part of high-pressure oil is distributed into the boom cylinder, and the other part is distributed to the orbitrol to control the steering cylinder. In the load sensing type steering system, the sensing type orbitrol of load has a Ls port connected to the Ls port of the priority valve, so that the steering load pressure signal of the orbitrol is transmitted to the Ls port of the priority valve through the oil pipe for the control system to provide the oil supply to the orbitrol. When the load sensor is in the neutral position, only a small amount of oil in the steering system is directly returned to the oil tank, which fully realizes the energy saving effect. (Fig. 6-7)

5.12.3 Electric proportional multi-way valve

The multi- way valve adopts a four- piece integrated type. Controlled by the multi- way valve core, the hydraulic oil from the working oil pump is distributed to the working cylinder. There is safety valve inside the multi-way valve. The safety valve is located on the upper side of the oil inlet of the multi-way valve to control the system pressure; A one-way valve is installed between the oil inlet and the suction port of the lifting valve plate, as well as between the oil inlet of the lifting valve plate and the oil inlet of the tilting valve plate.





5.12.4 Failures Removal Methods

Issue	Possible Cause	Remedy
Failure of Oil Pump for Oil to Come	Oil level in oil tank to the low	Oil to be added to the specified oil level
	Oil filter of suction side pipeline blocked	To be cleaned, and oil to be replaced if it is dirty
The gear pump cannot be pressurized	Bearings are worn, and bearing seal ring 9 or packing seal rings 10 and 11 are defective	To be replaced
	Mis-adjustment of overflow valve	Rely on the pressure gauge to increase the pressure
	Air blended into pump	1) Loosened joint at the side of suction

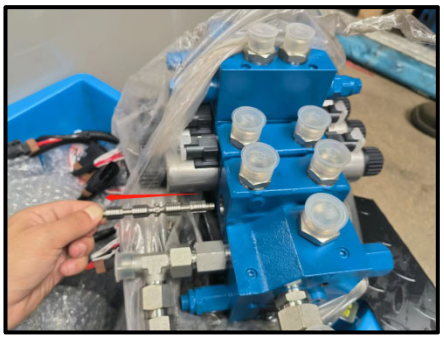
		pipe to be re-tightened 2) Oil to be added into oil tank 3) Oil seal of pump to be examined 4) Pump to be only turned on until there is no more air bubble in oil tank
Big Noise with Gear Pump	The hose on the oil suction side is twisted, or cavitation is caused by the blockage of oil filter	Clean the oil filter or adjust the hose
	Joint at the side of suction pipe loosened, leading to air indraft	Each joint to be re-tightened
	Oil viscosity too high, giving rise to empty cavity	1) Oil of proper viscosity to be used 2) Work to be started only when oil temperature is normal
	Decentraction	Make them concentric
	Air bubble present in hydraulic oil	Cause for generation of air bubble to be examined, and to be repaired
Oil Leak with Pump	1) Oil seal and seal ring 8 of pump at fault 2) Sliding surface worn out (internal leak aggravated)	To be replaced

5.12.5 Replacement of valve core

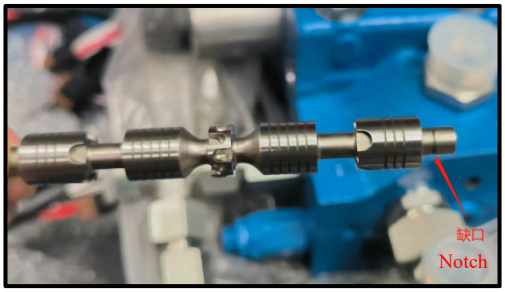
When the valve core becomes stuck and cannot return to the center position of the multi- way valve, it needs to be replaced. The steps are as follows (the following is the replacement of the valve core for the first connection of the multi -way valve, for reference)

1) Unplug the wiring harness plug of the multi -way valve and remove the electromagnet;

2) Take out the main valve core;

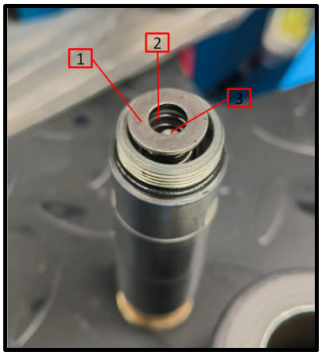


3) Wipe the installation surface clean, install the new main valve core into the valve, push the main valve core left and right to slide smoothly without jamming and install the side of the valve core with a notch on the right side of the multi- way valve;



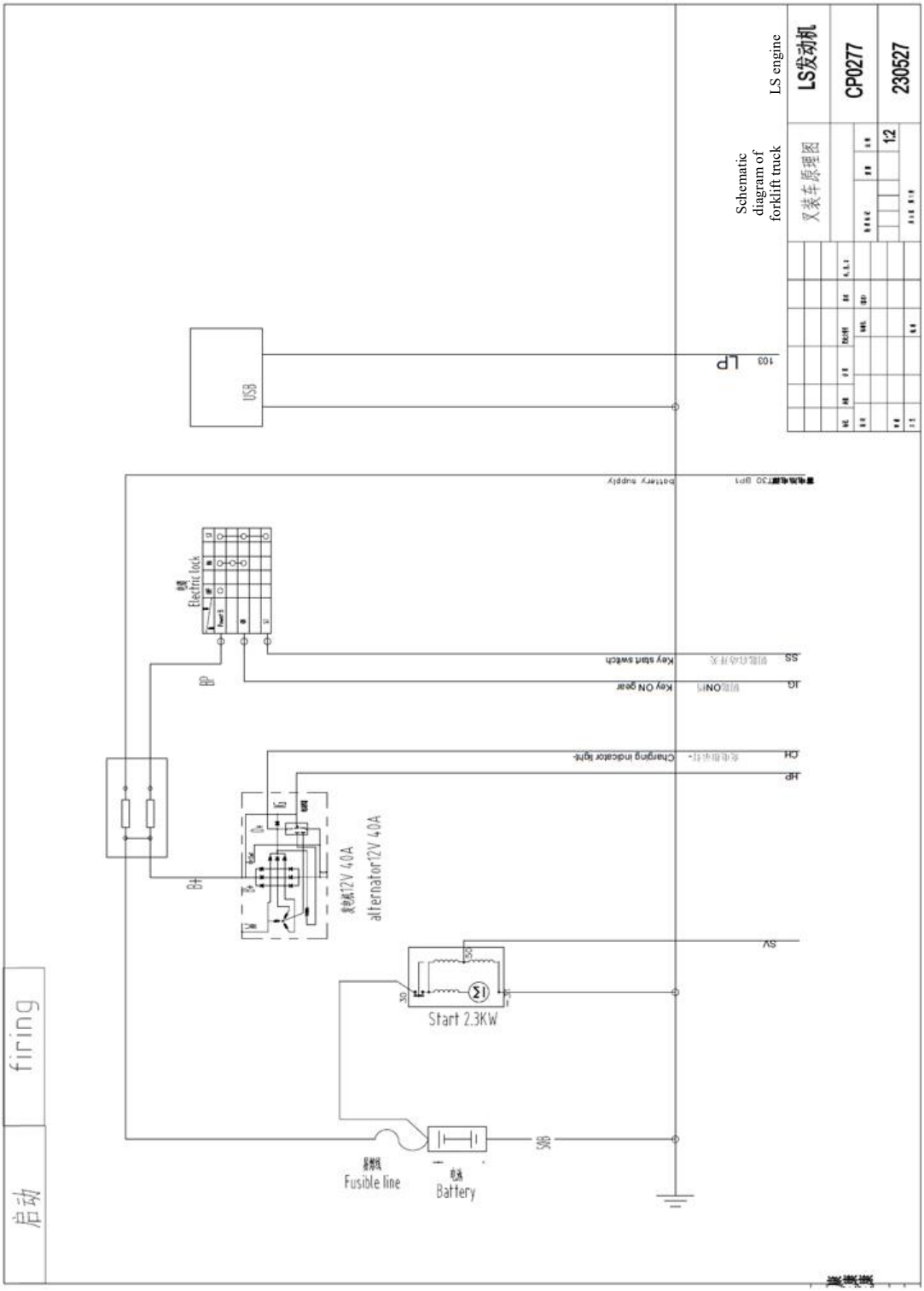
4) Insert the push needle (3), spring (2), and flat washer (1) in sequence, screw them into the multi -way valve, and tighten them in place

5) Then install the electromagnet, O-ring, and black nut in sequence, and then insert the multi -way valve.



5.13 Electrical system

5.13.1 Electrical schematic diagram



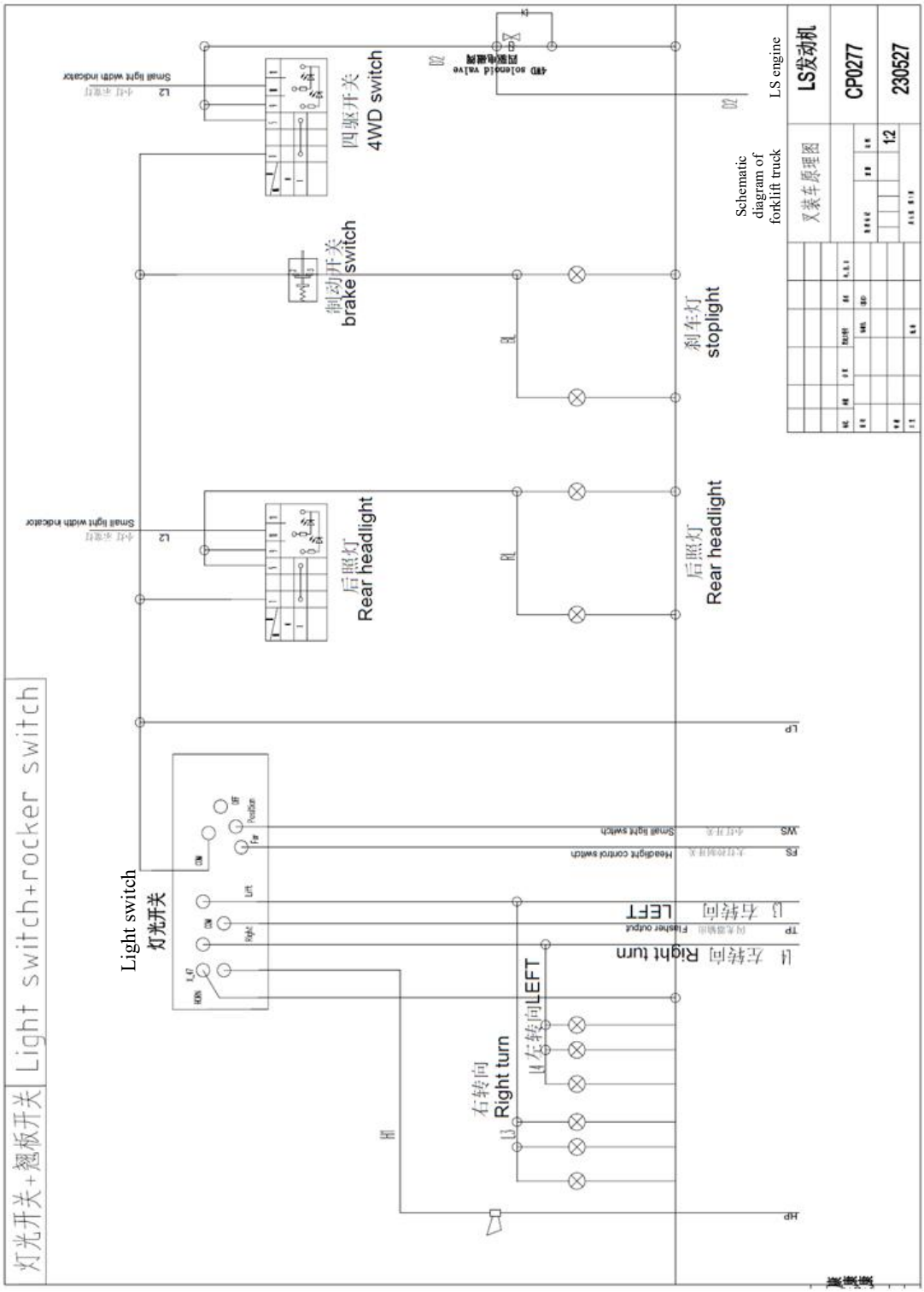

灯光开关+翘板开关 Light switch+rocker switch
Light switch
灯光开关
4WD solenoid valve
四驱电磁阀
四驱开关
4WD switch
制动开关
brake switch
刹车灯
stoplight
后照灯
Rear headlight
Small light switch
Headlight control switch
Flasher output
Right turn
LEFT
右转向
Right turn
左转向LEFT
Schematic diagram of forklift truck
叉装车原理图
LS engine
LS发动机
CP0277
230527
1:2

Fig. 5.13.1-2

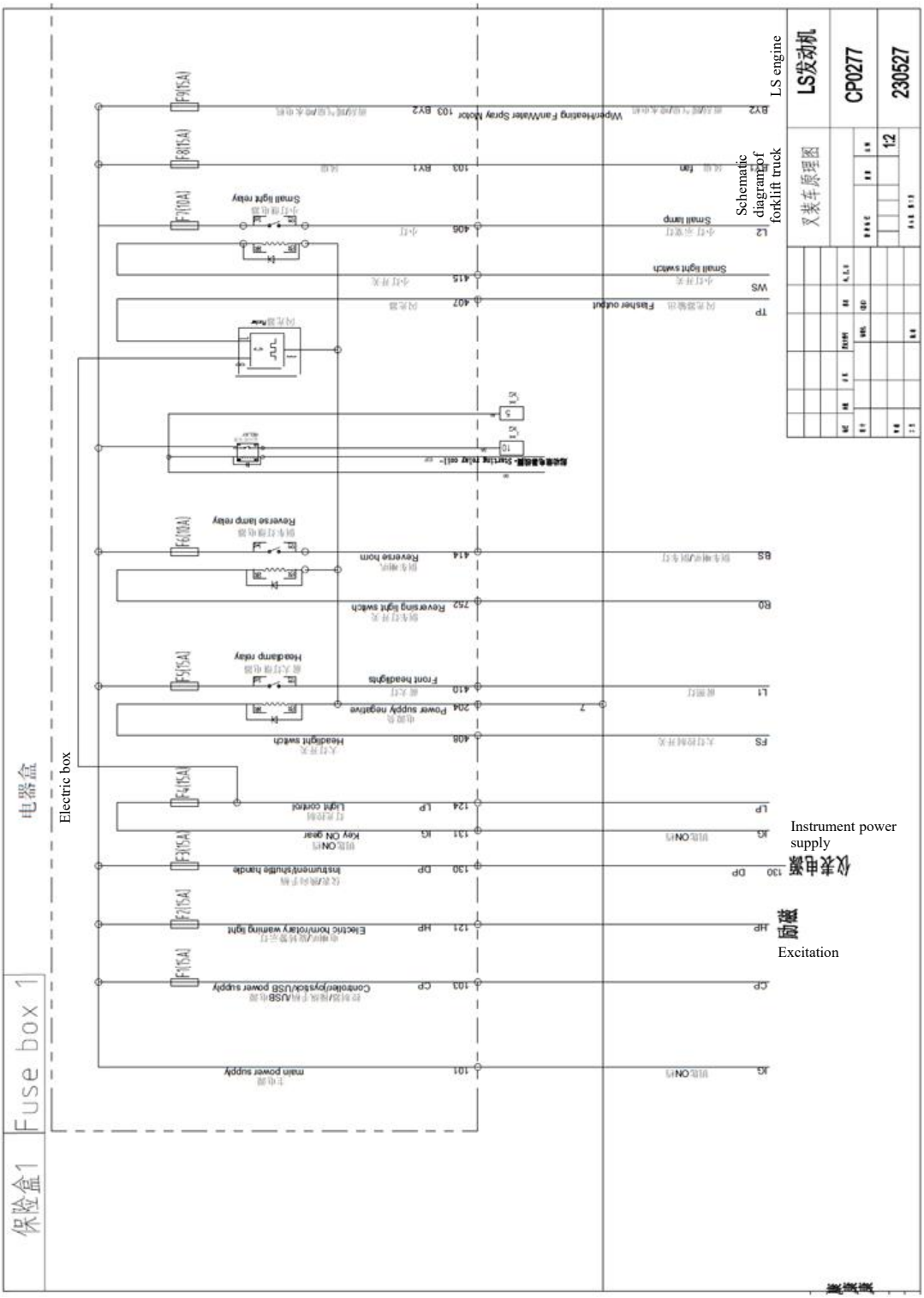

LS engine
Schematic diagram of forklift truck
Electric box
Fuse box 1
Instrument power supply
Excitation

Fig. 5.13.1-3

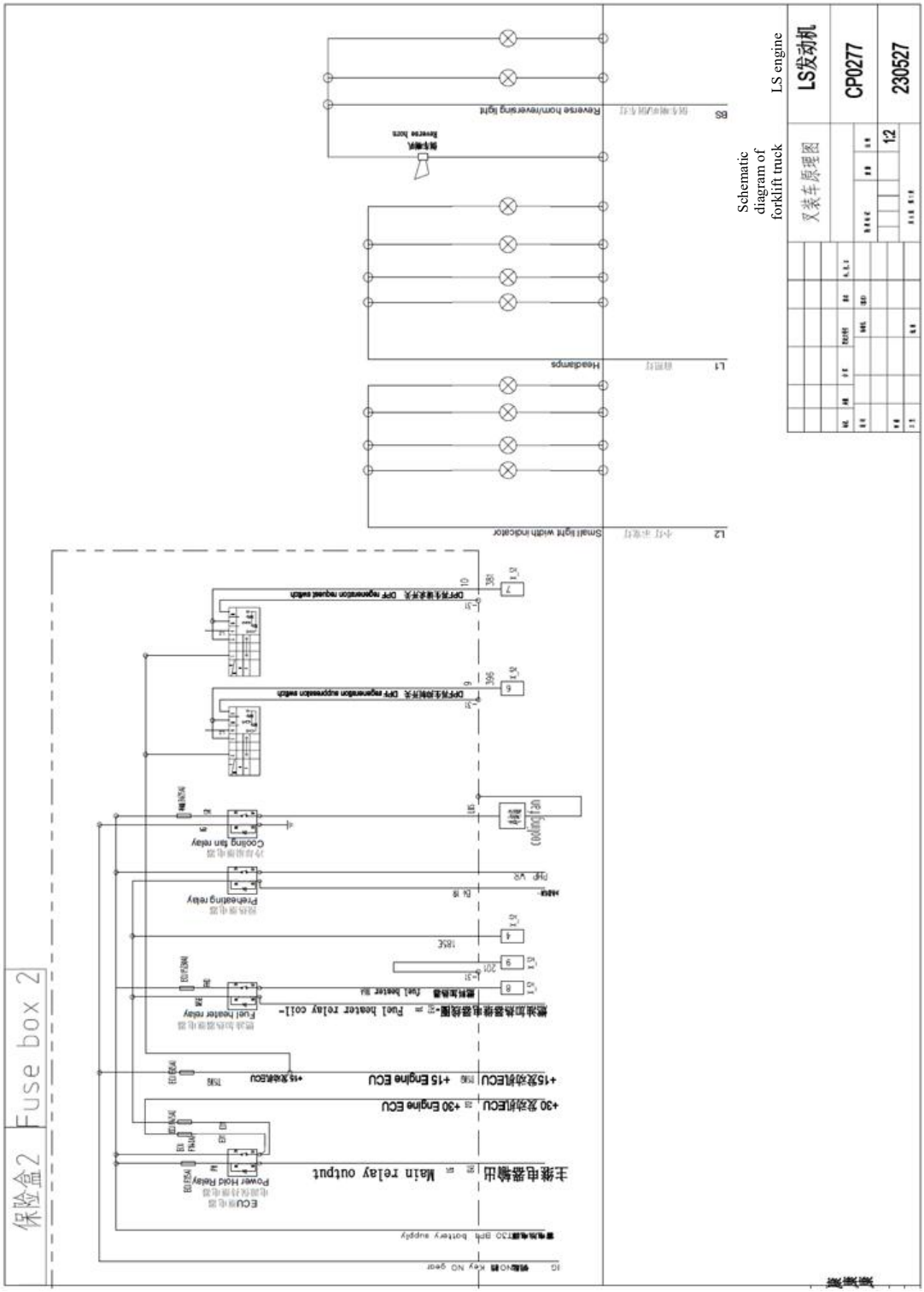

LS engine
Schematic diagram of forklift truck
LS发动机
叉装车原理图
CP0277
230527
1/2
Reverse horn/reversing light
Headlamps
Small light width indicator
Fuse box 2
保险盒2
Main relay output
Power Hold Relay
+30 Engine ECU
+15 Engine ECU
Fuel heater relay
Preheating relay
Cooling fan relay
Key NO gear

Fig. 5.13.1-4

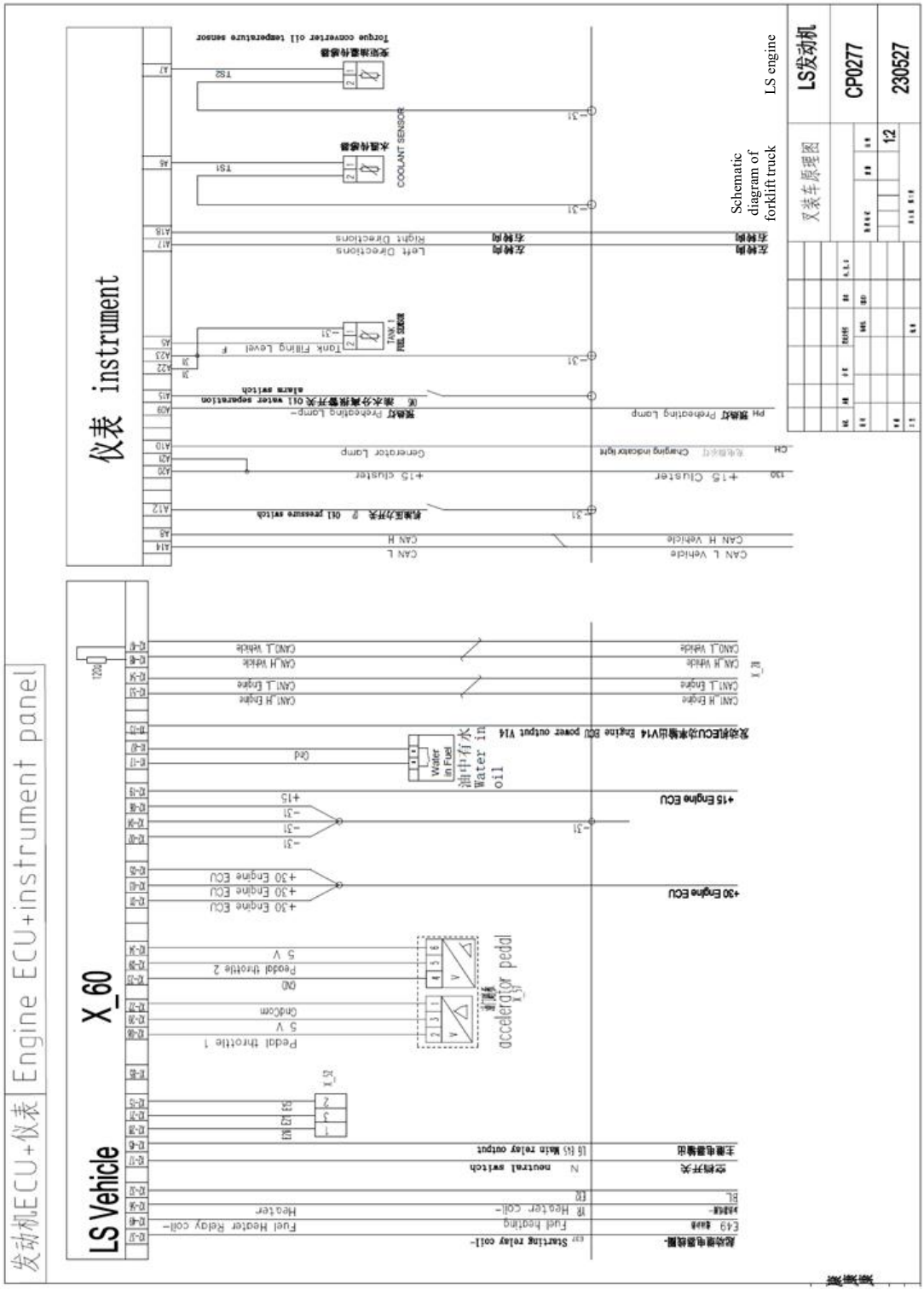

发动机ECU+仪表 Engine ECU+instrument panel
LS Vehicle
X_60
仪表 instrument
Schematic diagram of forklift truck
叉车原理图
LS engine
LS发动机
CP0277
230527
1:2
Starting relay coil-
Fuel heating
Heater coil-
Fuel Heater Relay coil-
Heater
neutral switch
Main relay output
CAN L Vehicle
CAN H Vehicle
CAN H
CAN L
Charging indicator light
Generator Lamp
+15 cluster
Tank Filling Level
COOLANT SENSOR
Torque converter oil temperature sensor
Left Directions
Right Directions
Pedal throttle 1
Pedal throttle 2
accelerator pedal
Water in Fuel
油中有水
Water in oil
+30 Engine ECU
+15 Engine ECU

Fig. 5.13.1-5

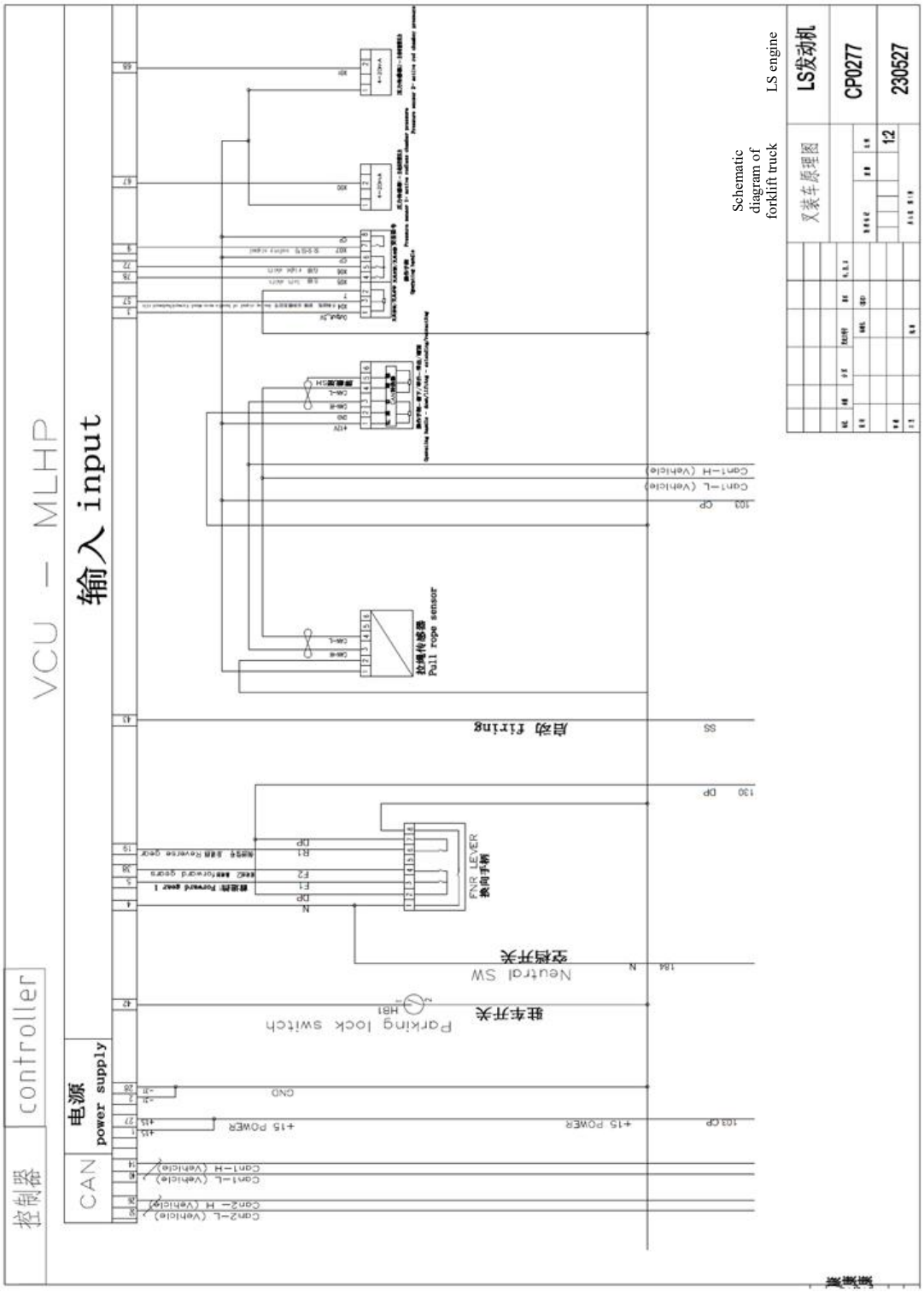

VCU – MLHP
控制器 controller
输入 input
CAN
电源 power supply
Schematic diagram of forklift truck
叉装车原理图
LS engine
LS发动机
CP0277
230527
1:2
Parking lock switch
驻车开关
Neutral SW
空挡开关
FNR LEVER
换向手柄
Pull rope sensor
拉绳传感器
启动 firing
+15 POWER
GND
Can1-H (Vehicle)
Can1-L (Vehicle)
Can2-H (Vehicle)
Can2-L (Vehicle)

Fig. 5.13.1-6

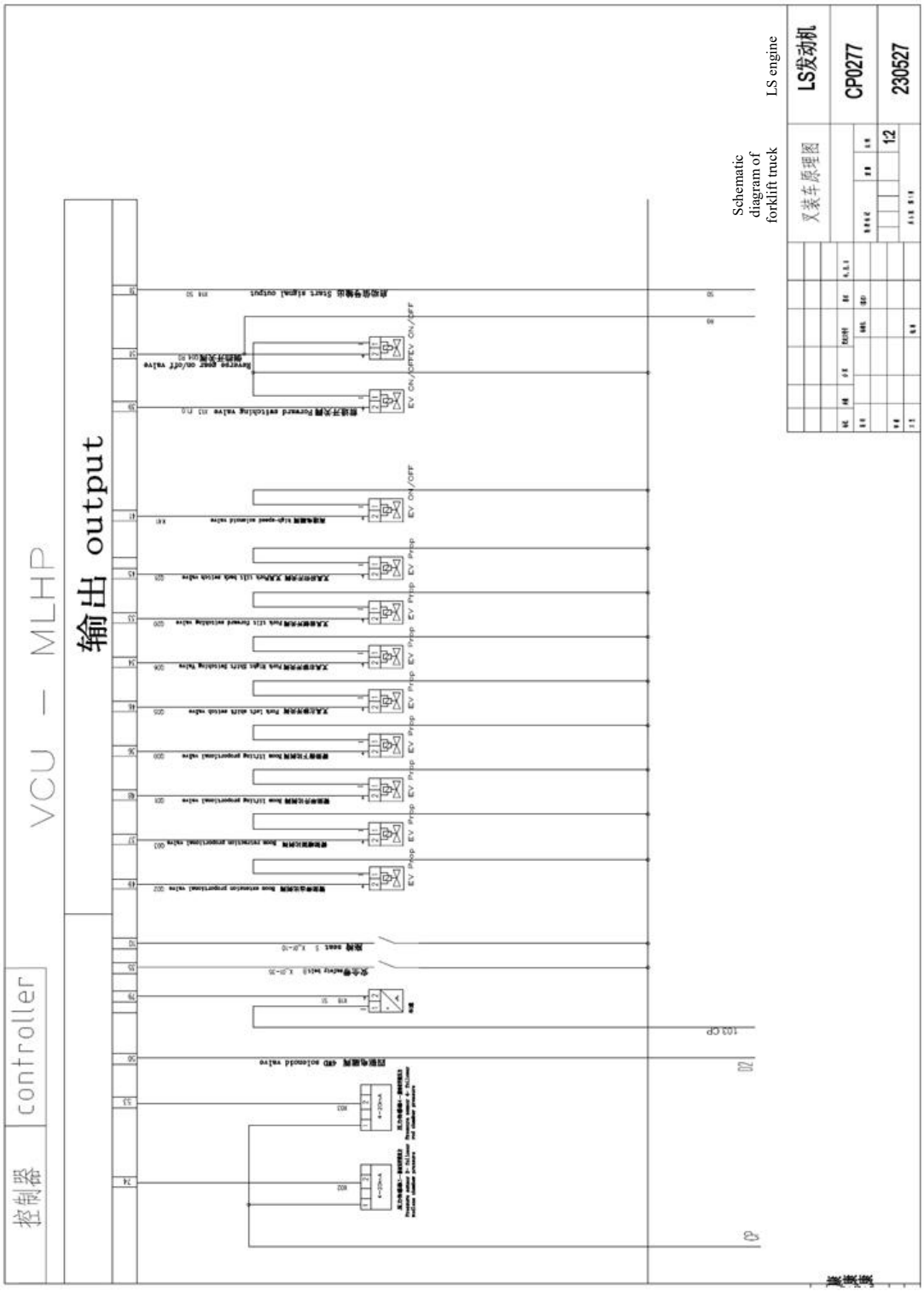
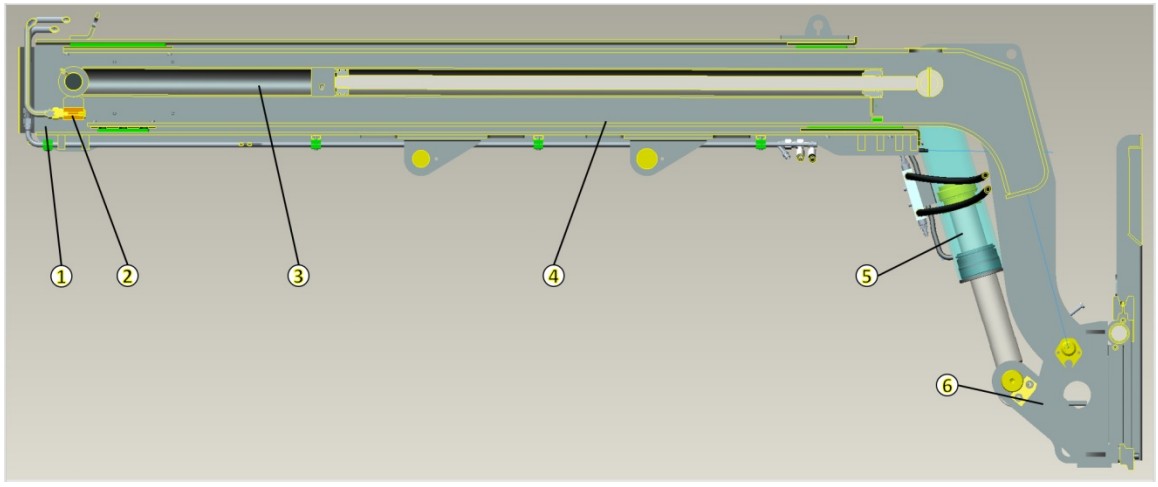

Schematic diagram of forklift truck
LS engine
LS发动机
CP0277
230527
叉装车原理图
控制器 controller
VCU — MLHP
输出 output

Fig. 5.13.1-7

5.14 Boom system

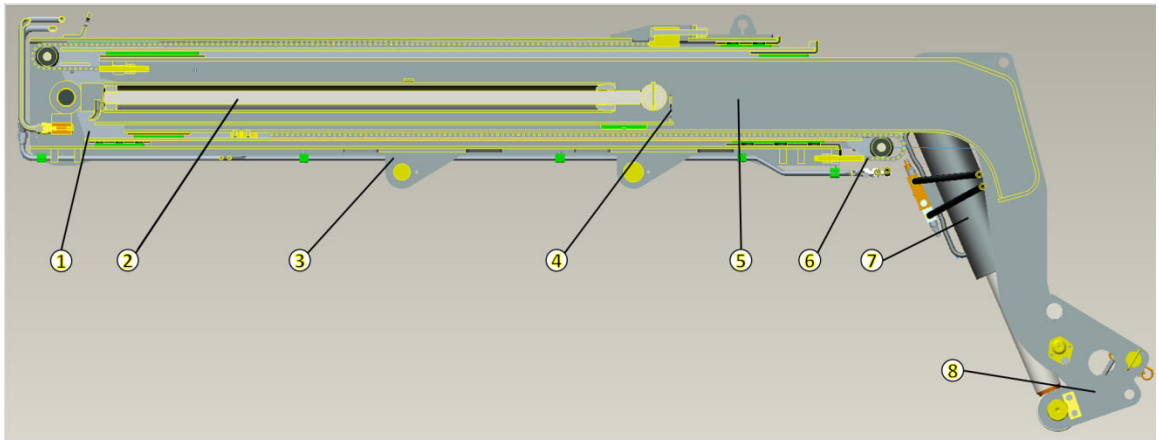
5.14.1 Introduction to structure of two- section arm

The two-stage boom system consists of: basic arm joint (1), balance valve group (2), telescopic cylinder (3), telescopic arm joint (4), tilting cylinder (5), and fixed fork carriage (6).



5.14.2 Introduction to structure of three-section arm

The three -stage boom system consists of: second arm section (1), telescopic cylinder (2), basic arm section (3), cylinder groove (4), first arm section (5), chain (6), tilting cylinder (7), and flipping frame (8).



5.14.3 Boom maintenance

5.14.3.1 Sliding block lubrication

Lubricate the boom sliding block every 50 hours under normal conditions. Check and lubricate every 25 hours under dusty conditions;

Apply lubricating grease to the scratches around the telescopic arm;

5.14.3.1 Lubrication and maintenance of the chain

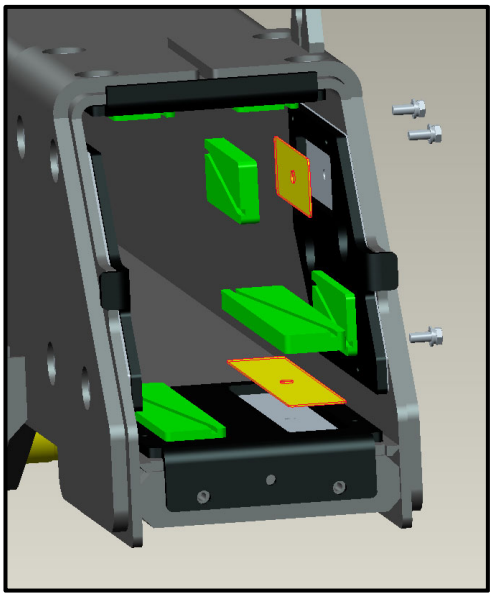
The lubrication of the boom chain depends on the working environment. Check and lubricate the boom chain every 100 hours under normal conditions. Check and lubricate every 50 hours under dusty conditions;

5.14.4 Sliding block replacement and clearance adjustment

1) The offset boom will be deformed with load, which is within the normal range of the boom force;

2) The sliding block wears out and the boom shakes significantly after the boom has been running for a period of time (over 1,000h). The sliding block pad can be added to control the gap between the tele-truck and the basic arm, or the sliding block can be directly replaced;

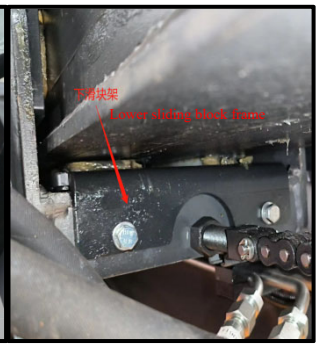
3) Place 1~2 long and short shims under the corresponding sliding block to control the initial posture of the head of the tele-truck when the head of the tele-truck droops, as shown in the Fig.;



Replacement steps of sliding block

1. Replace the front sliding block of the boom - lower/upper sliding block

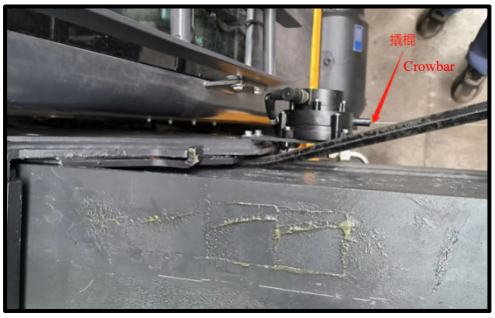
Extend the boom to a certain length, first remove the upper sliding block, lift the front end of the first level arm through a 2T or more line crane, remove the lower sliding block frame, install the lower sliding block frame with the replaced sliding block - lower the line crane - install the upper sliding block frame with the replaced sliding block;

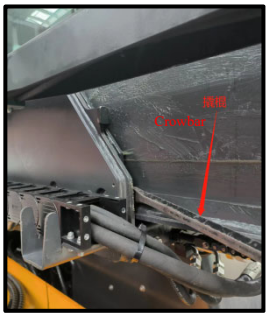


2. Replace the front sliding block of the boom - left (or right)

Tilt the secondary arm to the right (left) - remove the left (or right) sliding block frame- replace the sliding block - install the sliding block frame

Note: Replace the sliding block safely and lubricate new sliding blocks with an appropriate amount of butter. The replacement method for the sliding block at the front end of the boom is the same as steps 1 and 2.

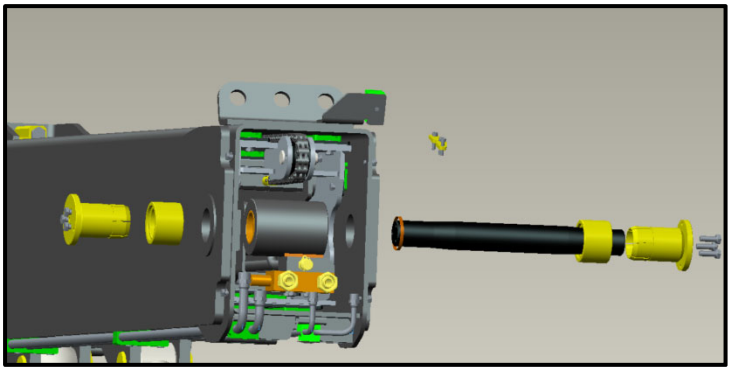




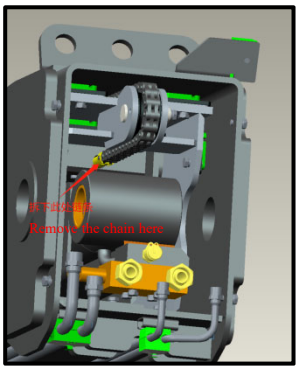
4. Replacement of the rear sliding block of the boom (or replacement of structural components of boom).

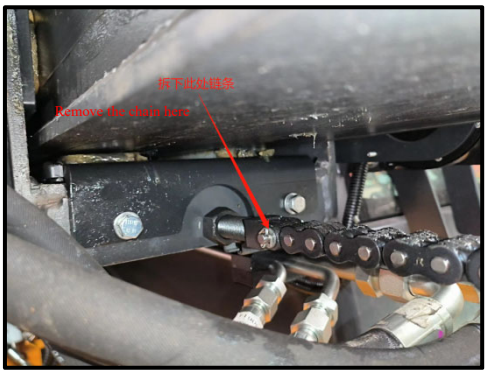
1) Lift the boom (low in front and high in back);
2) Remove the boom hose and transition steel pipe;
3) Remove the lifting cylinder and follow the cylinder;

4) Screw in M10×60 bolt to drive out the spacer sleeve, knock out the long shaft and remove the long spacer ring;



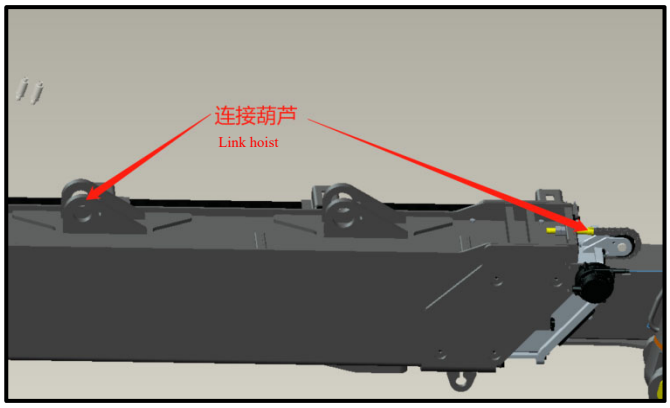
5) Lift the boom out;
6) Remove the chain of boom;



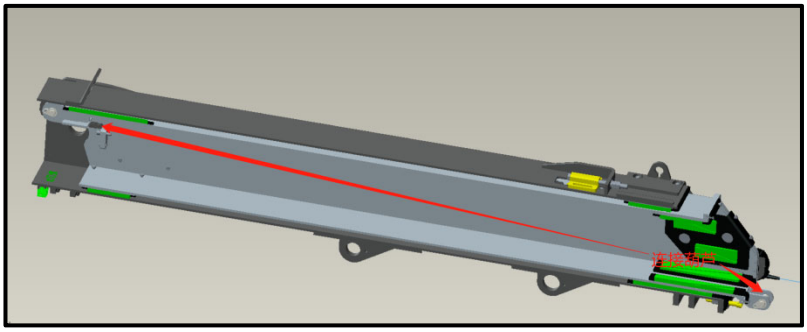


7) Pull out the first level arm with a hoist for a certain distance, remove the cylinder groove, remove the

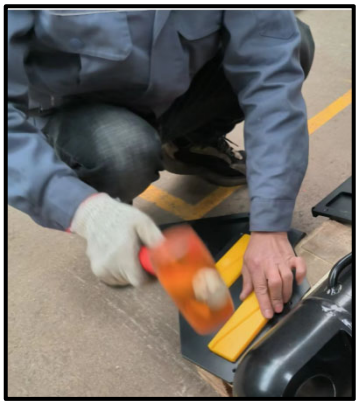
front sliding block frame of the boom, first extract the first level arm, and then extract the cylinder groove;



8) Connect the tail of the upper chain to the hoist, connect the other end of the hoist to the sprocket shaft, and slowly pull out the secondary arm by manipulating the hoist;



9) Remove the old sliding block, tap the new sliding block into the sliding block frame, and replace it with a new one (apply an appropriate amount of butter);



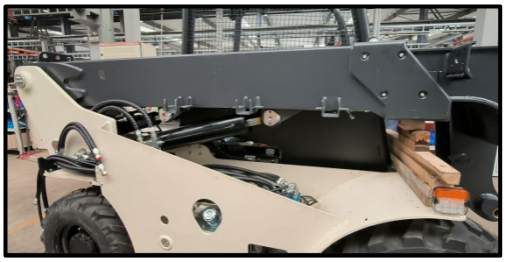
10) Assembly and installation of boom (referring to parts catalog)

1. Insert the secondary arm into the basic arm, and install the front sliding block of the basic arm;

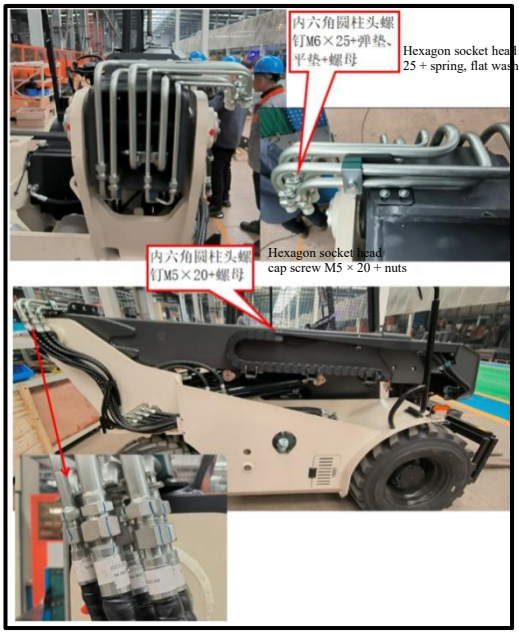
3. Insert the cylinder groove into the first level arm, then insert the first level arm into the second level arm, install the front sliding block of the second level arm, fix the cylinder groove with the second level arm in place, connect the upper chain with the first level arm chain joint, and connect the lower chain with the basic arm;

4. Boom installation: Install the basic arm assembly into the frame, tap in the long shaft, long spacer ring, and spacer sleeve;

5. Installation of cylinder: First, tap in the servo cylinder shaft, and then tap in the lifting cylinder shaft;



6. Boom pipeline connection: Connect the transition steel pipe and fix in place, connect the rubber hose of boom correctly, and fix the pipe joint tightly in place.



11) Start the vehicle, extend the boom to its limit, and apply an appropriate amount of butter on the outside of the first level arm and the second level arm.