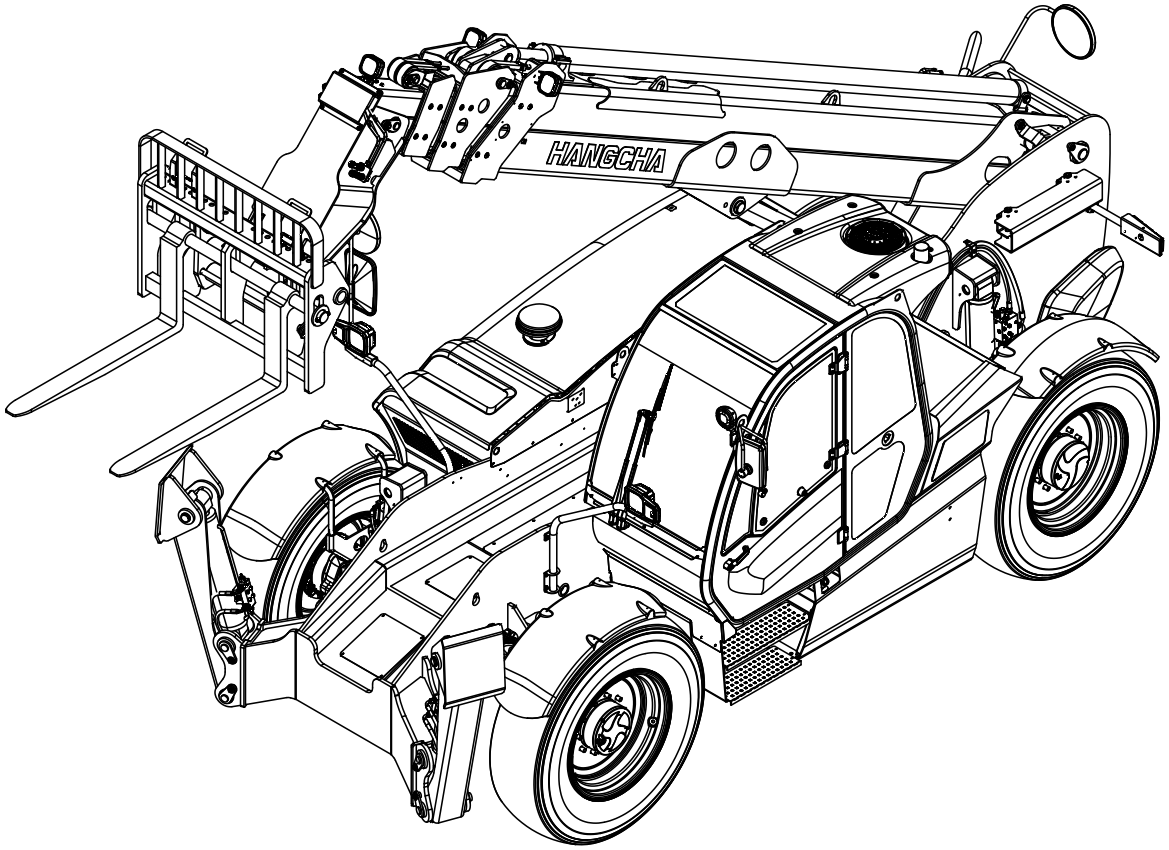
T Series

Telehandler

T40-180XH16D

Operation and maintenance manual



Hangcha Group Co., Ltd

Apr, 2025

Preface

Thank you very much for purchasing a machine from Hangcha Group! Before operating the machine, it is essential that you fully understand the requirements for its use and operation.

All operations of the machine carry inherent risks. Only by mastering safety regulations and operating with care and attention to detail can we effectively prevent personal injury, property damage, and unexpected accidents. Your safety is our shared responsibility.

This manual provides comprehensive information regarding the telehandler's safety instructions, operation, transportation, lubrication, general structure, and maintenance methods. It is mandatory that all operators, maintenance personnel, and equipment management staff carefully read and fully understand this manual before using the machine.

Only trained and authorized personnel are permitted to operate the machine.

As product designs are continuously improved and updated, the contents of this manual may differ slightly from the specifications of the machine you have received.

If you have any questions or require further assistance, please contact Hangcha Group Co., Ltd. Sales Company or your local authorized dealer.

Hangcha Group provides a national customer service hotline**: 400-884-7888,** which includes after-sales service information: Press **3** for after-sales service support; Press **4** for parts inquiries. After dialing and following the voice prompts, an operator will provide you with the contact details of the nearest Hangcha after-sales service branch or authorized service center for convenient local assistance. For spare parts procurement, please press **4**; the operator will guide you to the nearest authorized parts supplier. We strongly recommend purchasing genuine Hangcha parts.

Warning

a. It is strictly prohibited to use two vehicles simultaneously to lift a single load. It may result in tipping or overturning, leading to serious safety accidents.
b. Do not operate the telehandler under severe weather conditions, such as sandstorms, snowfall, lightning, heavy rain, or strong winds.
c. Inspection and maintenance of the engine and its related components must be performed by personnel who have received specialized training and certification.
Internal inspection and maintenance of the engine must be carried out by qualified manufacturers.
d. Do not perform any inspection, maintenance, or servicing on the engine or its components until the engine has completely cooled down.
e. All inspection, maintenance, and servicing activities must strictly follow the relevant safety precautions, operating procedures, safety regulations, and must be performed using appropriate personal protective equipment (PPE) and tools as outlined in this manual.

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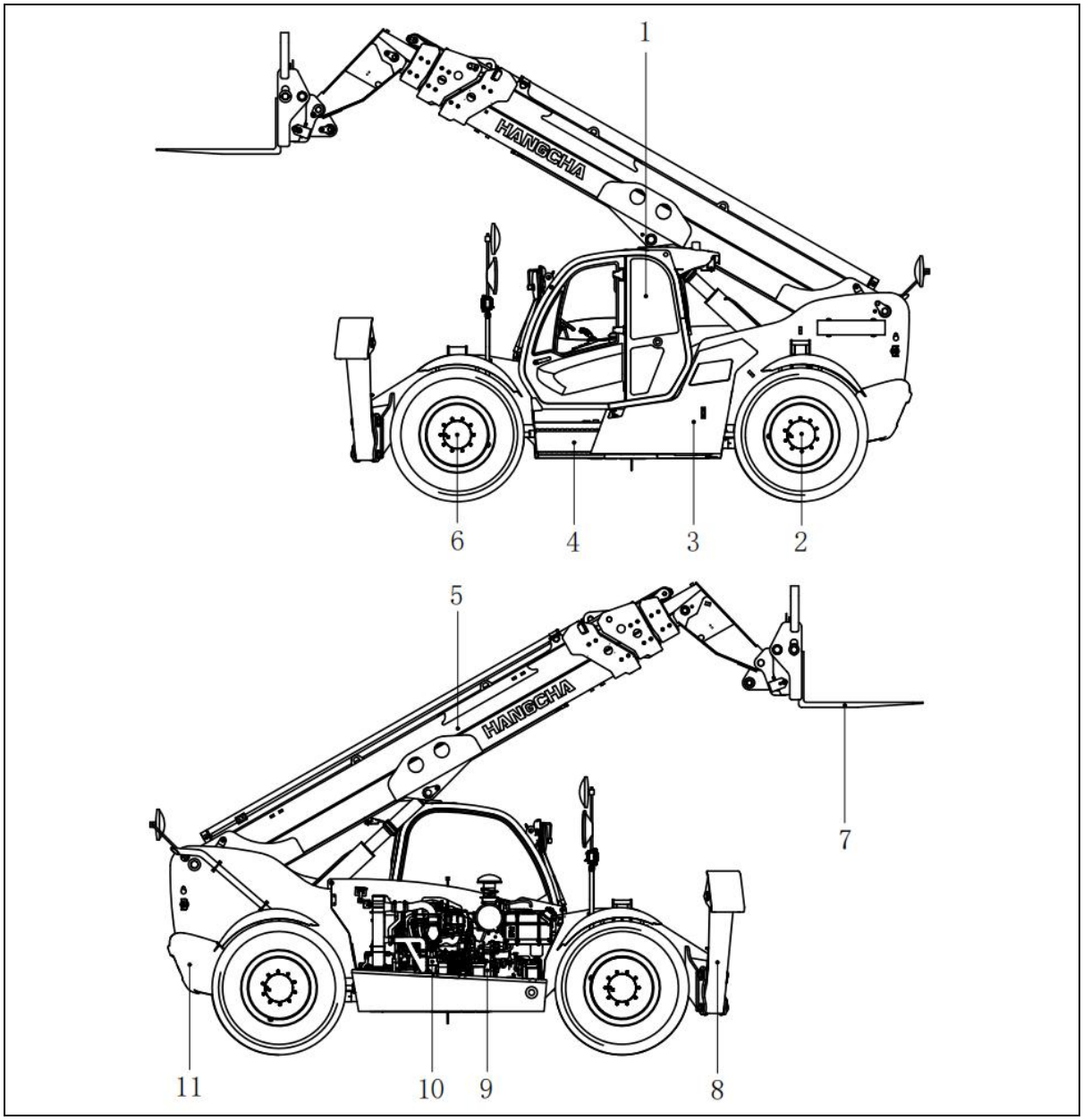
Chapter 1 Product Introduction

1.1. Machine Overview

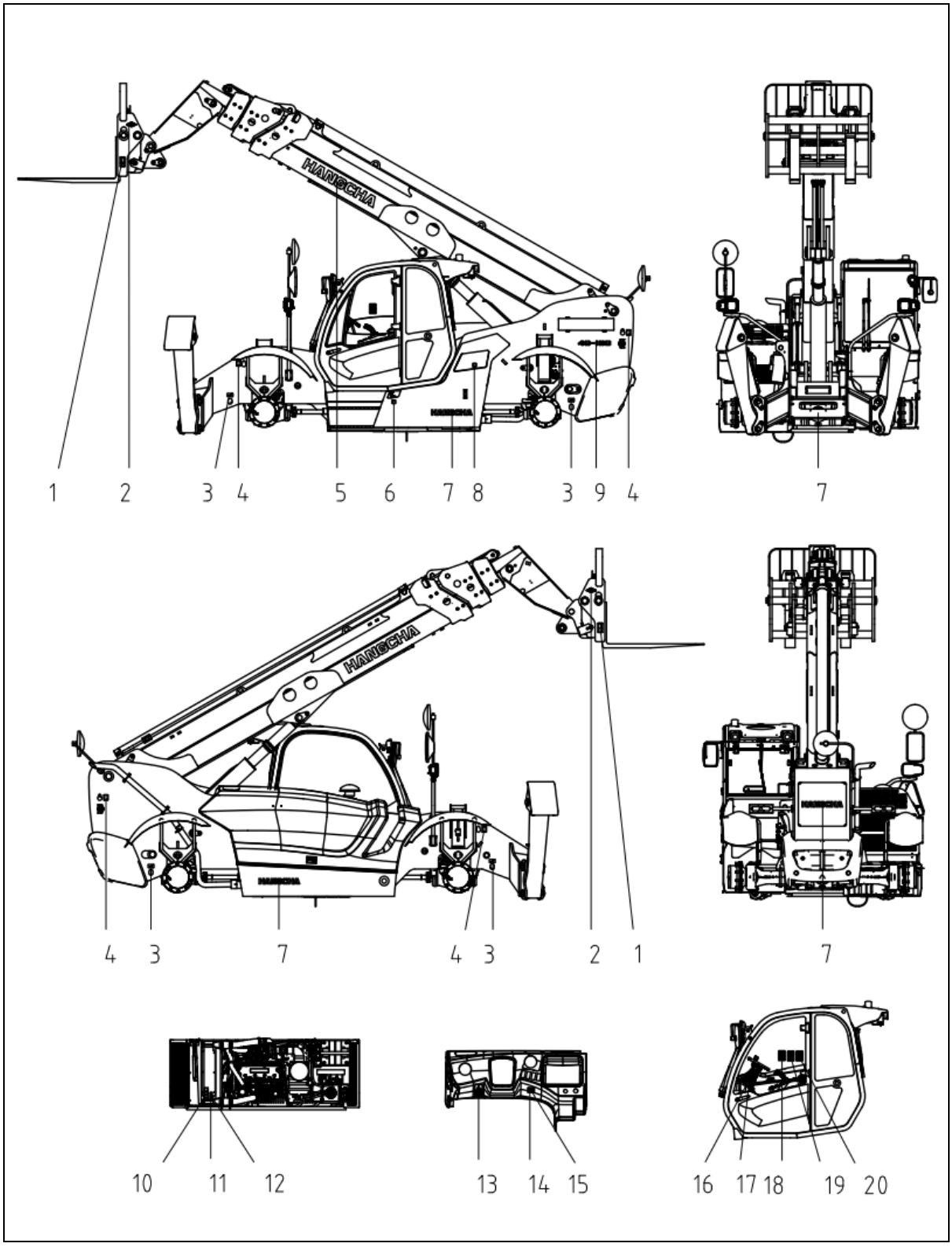
Diesel-Powered Model (Example: T40-180XH16D)



No.	Name	No.	Name
1	Cab	7	Boom
2	Rear Axle	8	Outrigger System
3	Hydraulic Oil Tank	9	Transmission
4	Fuel Tank	10	Engine and Accessories
5	Front Axle	11	Counterweight
6	Attachment (Forks)		

1.2. Machine Identification

Diesel-Powered Model Identification (Example: T40-180XH16D)



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		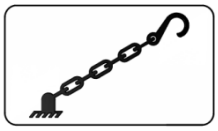	
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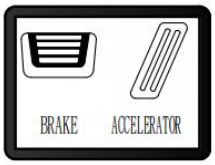
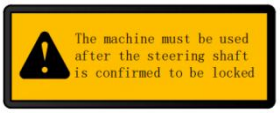
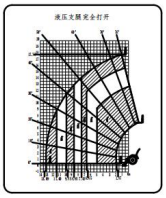
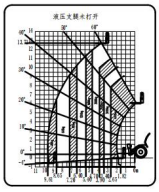
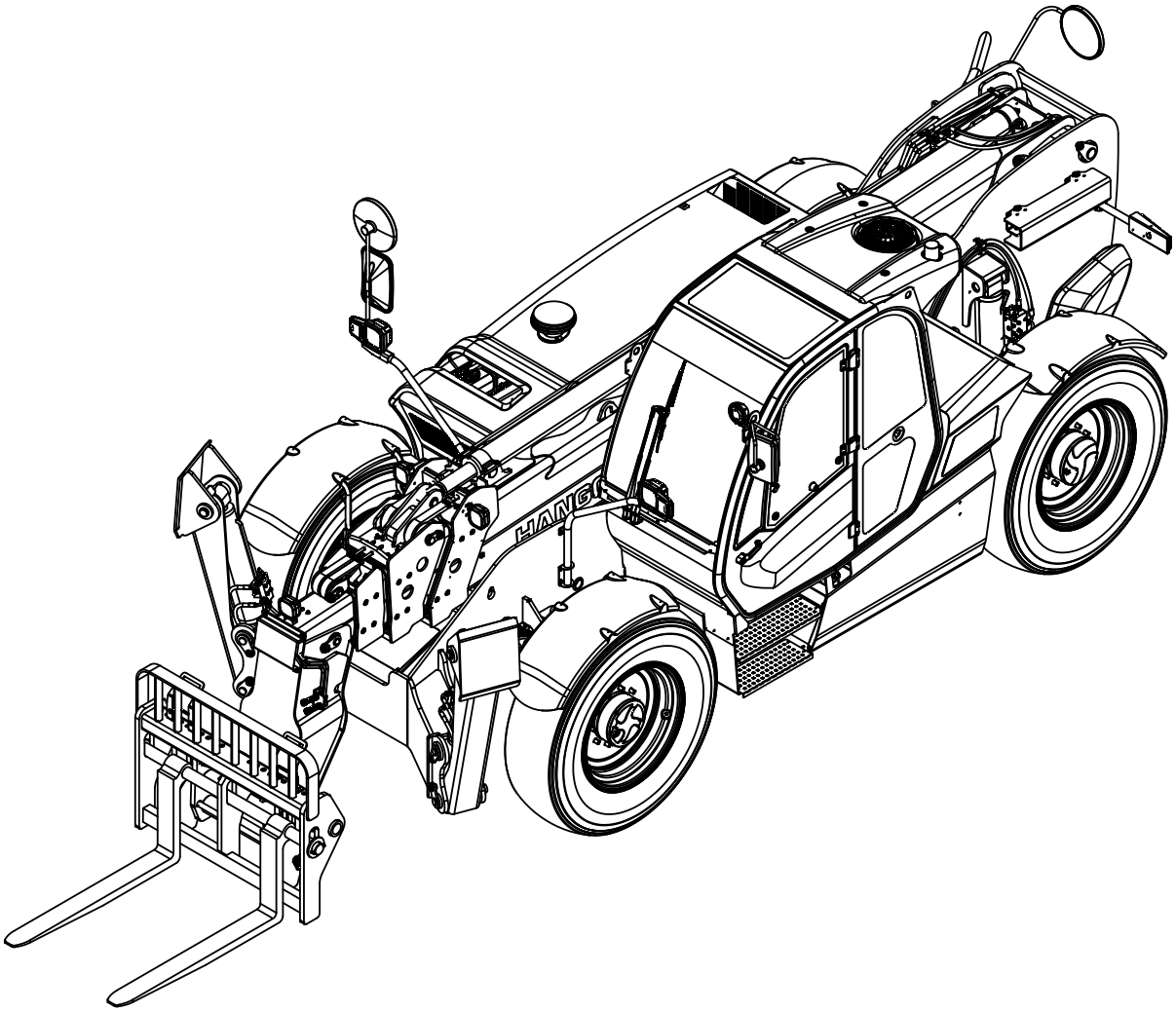
HANGCHA		HANGCHA	
9	10	11	12
40-180			
13	14	15	16
			
17	18	19	20
			

No.	Description	No.	Description
1	Mast Warning Label	11	Coolant Label (Chinese)
2	Hangcha Logo Decal	12	Coolant Label (English)
3	Tie-Down Point Label	13	Safety Instructions Label
4	Lifting Point Label	14	Control Instructions Label (Chinese)
5	Hangcha Lettering Decal (Boom)	15	Control Instructions Label (English)
6	Fuel Label	16	Steering Wheel Warning Label (Chinese)
7	Hangcha Lettering Decal	17	Steering Wheel Warning Label (English)
8	Hydraulic Oil Label	18	Control Lever Label
9	Load Capacity Label	19	Load Chart Plate (Outriggers Extended)
10	Hand Injury Hazard Label	20	Load Chart Plate (Outriggers Retracted)

1. 3. Application of the Machine

This machine is a telehandler equipped with a telescopic boom, designed for lifting, transporting, and placing materials.



Warning

a. Any other use or modification must be approved by Hangcha Group Co., Ltd.
b. Operation on soft, unstable, or cluttered ground is strictly prohibited.
c. Operation is strictly prohibited under conditions exceeding the maximum permitted wind speed, in explosive environments, during storms, or in areas with strong magnetic fields.

1.4. Machine Specifications

T40-180XH16D Machine Specifications

(1) Machine Performance Specifications

Item		Parameter	Item	Parameter
Rated Load (kg)		4000	Main Boom Raising Time (s)	17
Machine Weight (kg)		13700	Main Boom Lowering Time (s)	15
Maximum Working Height (m)		17.7	Telescopic Boom Extension Time (s)	20
Maximum Horizontal Reach (m)		13.1	Telescopic Boom Retraction Time (s)	16
Forward	1st Gear Speed(km/h)	5.0	Leveling Cylinder Extension Time（s）	6
	2nd Gear Speed(km/h)	11.0	Leveling Cylinder Retraction Time（s）	6
	3rd Gear Speed(km/h)	22.5	Outrigger Cylinder Extension Time（s）	15
	4th Gear Speed(km/h)	35.0	Outrigger Cylinder Retraction Time（s）	15
Reverse	1st Gear Speed(km/h)	5.0	Frame Leveling Time（s）	10
	2nd Gear Speed(km/h)	11.0	Arm amplitude angle(°)	-4～72
	3rd Gear Speed(km/h)	22.5	Carriage tilt angle(°)	-114～12
Minimum Turning Radius（m）		4.3	Towing Capacity（kN）	80
Maximum Braking Distance（m）		10.0	Theoretical Maximum Gradeability (Unladen)	40%
Drive Type		Four-Wheel Drive Four-Wheel Steering	Frame Tilt Angle (Left/Right)	±10°

(2) Main Dimensions

Item	Parameter	Item	Parameter
Overall Length（mm）	6560	Wheelbase（mm）	3450
Overall Width（mm）	2450	Track Width（mm）	2050
Overall Height（mm）	2500	Minimum Ground Clearance（mm）	400

(3) Powertrain System

Item			Parameter/Content
Transmission	Type		Manual
	Number of Gears		4 Forward, 3 Reverse
	Gear Ratio	Forward	4.47/2.05/1.00/0.57
		Reverse	4.47/2.05/1.00

Front Axle	Final Drive Ratio	23.25
	Brake Type	Oil-Immersed Multi-Plate Hydraulic Auxiliary Brakes
Rear Axle	Final Drive Ratio	23.25
	Brake Type	Oil-Immersed Multi-Plate Hydraulic Auxiliary Brakes
Wheel Assembly	Tire Specification	400/75-28
	Inflation Pressure（MPa）	0.525

(4) Engine System

Item	Parameter	Item	Parameter
Model	Cummins F3.8	Rated Speed(r/min)	2200
Displacement（L）	3.8	Maximum Torque/Speed (N·m/rpm)	500/1500
Rated Power (kW)	90	Emission Standard	StageV/Tier4 final

(5) Hydraulic System

Item	Parameter/Content
Type	Load-Sensing
Working Pump Displacement（ml/r）	5～63
Brake Pump Displacement （ml/r）	16
Maximum Working Pressure（MPa）	25
Steering System Pressure（MPa）	18
Brake System Pressure（MPa）	8

(6) Electrical Control System

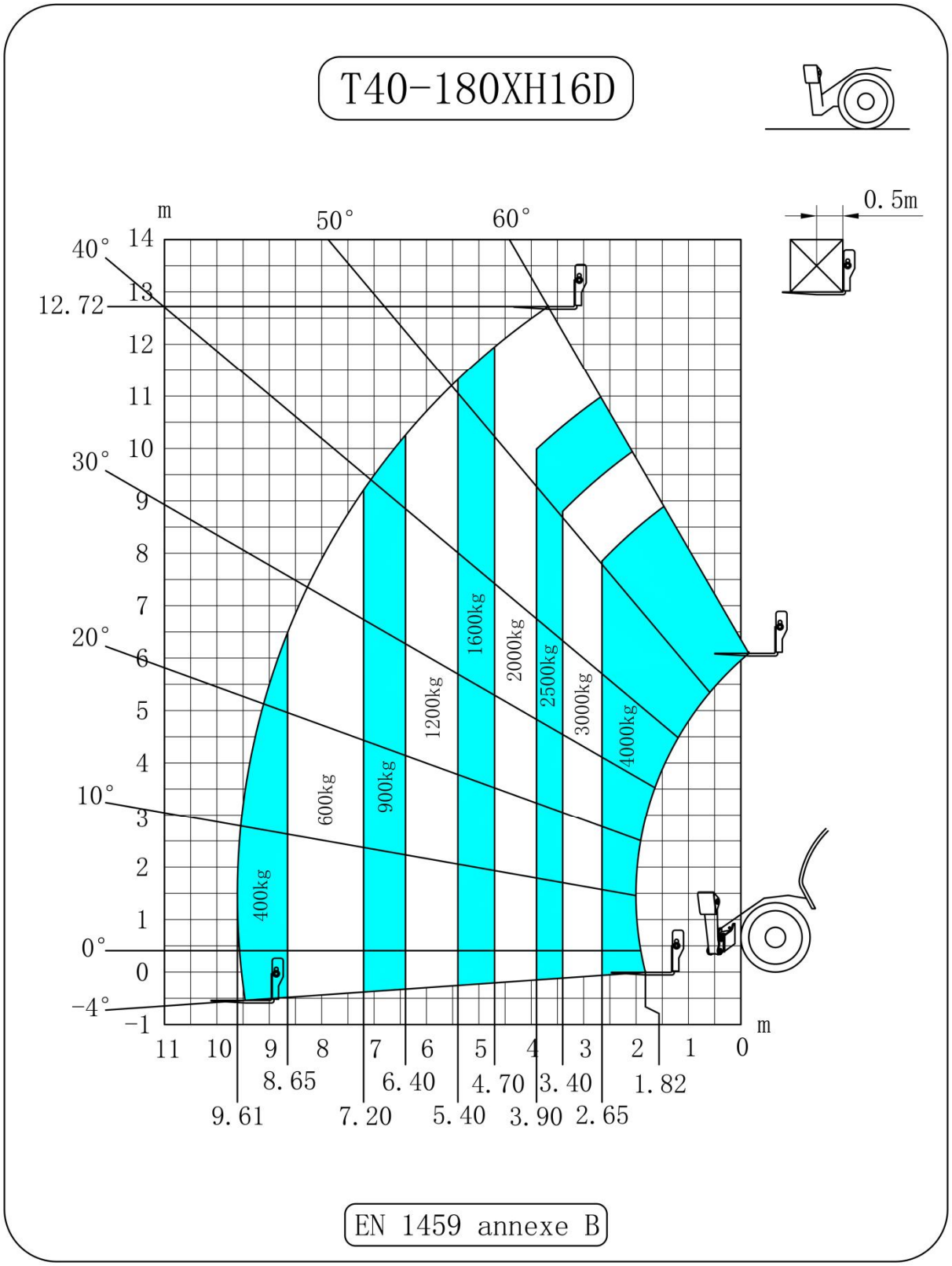
Item	Parameter	Item
Battery	Output Voltage（V）	24
	20-Hour Ampere-Hour Rating（Ah）	90
Control system	Voltage（V）	24

(7) Fuel Capacity

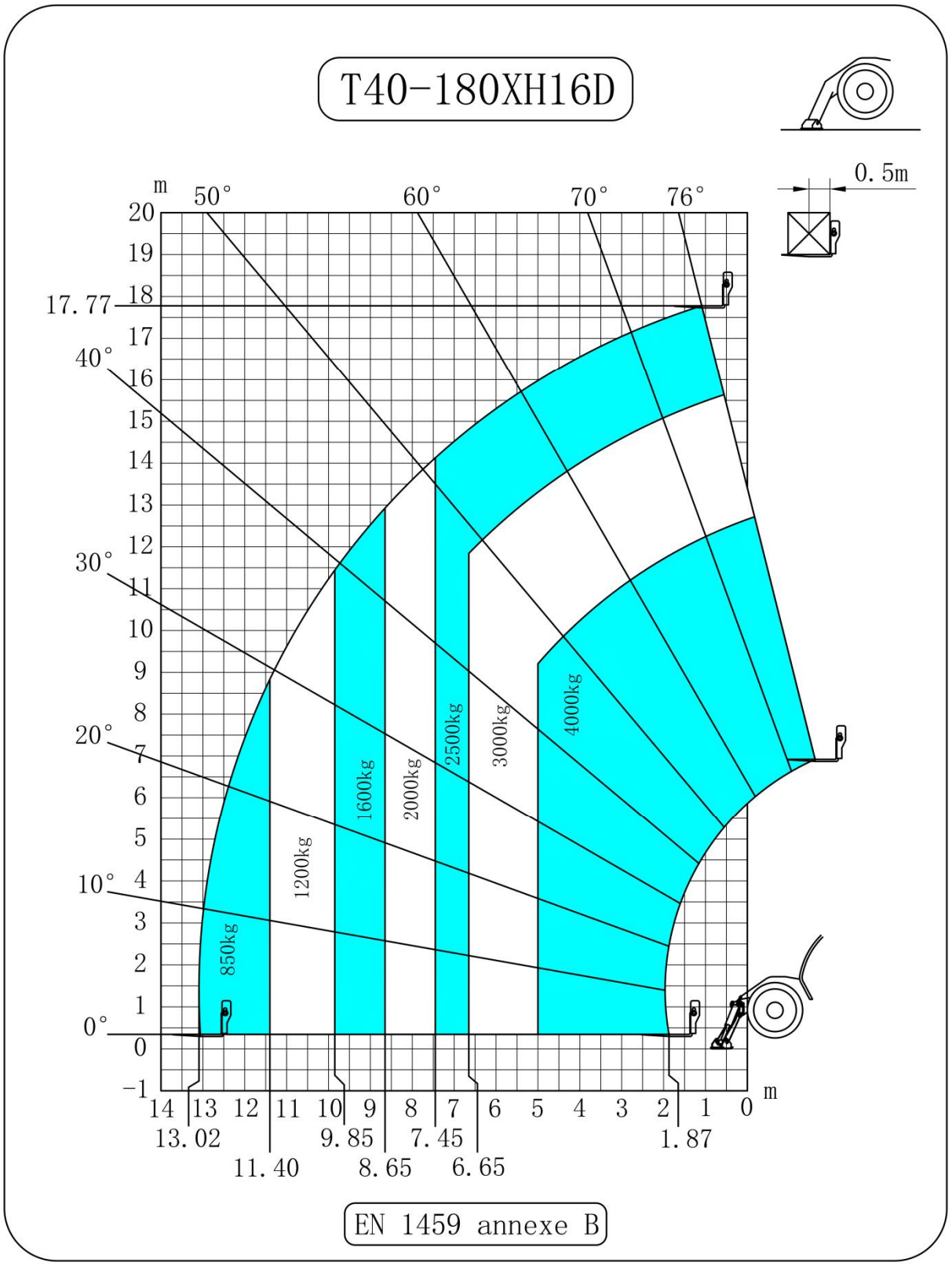
Item	Parameter	Item	Parameter
Hydraulic Oil	196L	Front and Rear Axle Gear Oil	30L
Diesel	160L	Transmission Gear Oil	15L
Engine Oil	14L	Coolant	24L

(8) Work Range Diagram（T40-180XH16D）

Hydraulic Stabilizers Not Extended:



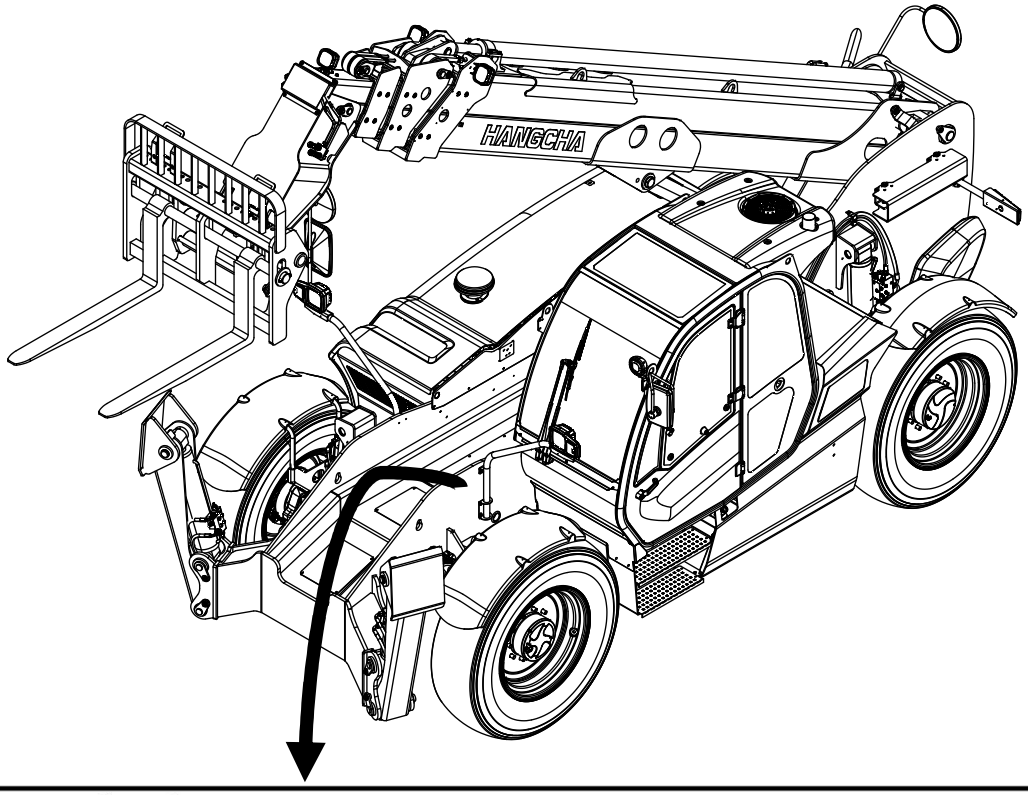
Hydraulic Stabilizers Fully Extended:



1.5. Vehicle Identification Number

Vehicle Nameplate

The vehicle nameplate is located on the side surface of the frame, in front of the cabin.

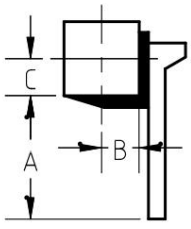


CE ROUGH TERRAIN TELESCOPIC HANDLER

MODEL-TYPE	T40-180XH16D	SERIES NO.	
ATTACHMENT	/	FORK LENGTH	1200 mm
NOMINAL LOAD CENTER	500 mm	RATED CAPACITY	4000 kg
SYSTEM VOLTAGE	24 V	ENGINE POWER	90 kW
YEAR OF MANUFACTURE	2025		

Capacity with mast vertical or mast tilted forward and equipped as shown

Load Height Dim A	Maximum Capacity Mast Vertical	Load Center Dim B	Load Center Dim C
17700 mm	2500 kg	500 mm	500 mm
12710 mm	4000 kg	500 mm	500 mm
mm	kg	mm	mm
mm	kg	mm	mm



HANGCHA GROUP CO., LTD.
Add: 666 Xiangfu Road,Hangzhou,Zhejiang,China(311305)

Figure 1.5-1 Vehicle Nameplate

Chassis Number

Each vehicle has a unique chassis number (serial number) printed, located at the front of the chassis.

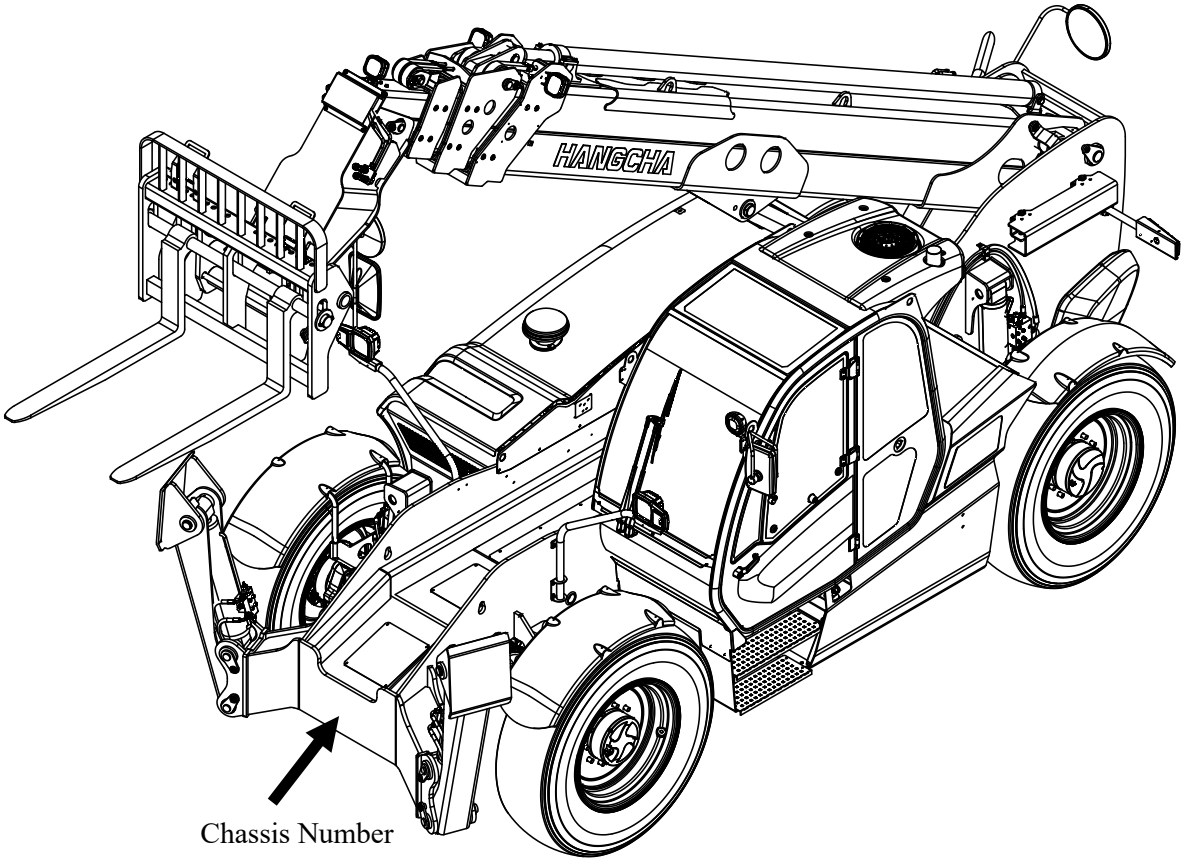


Figure 1.5-2 Chassis Number

Chapter 2 Important Safety Instructions

Warning

a. Failure to follow the instructions and safety rules in this manual may result in personal injury.
b. It is strictly forbidden for individuals under the influence of alcohol, drugs, or reaction-impairing medications to approach or operate the machine.
c. Do not operate the machine unless:

- You have studied and practiced the machine safety operation principles contained in this manual:
  ① Avoid hazardous situations;
  ② Always perform pre-operation inspections;
  ③ Always conduct functional tests before use;
  ④ Inspect the work site;
  ⑤ Use the machine only for its intended purpose.
- You have read, understood, and complied with all applicable national and local laws and regulations.
- You have received appropriate training for the safe operation of the machine and have been properly authorized.
- You have read, understood, and followed the operator safety rules and site regulations.
- You are equipped with personal protective equipment (PPE) such as a safety helmet, safety harness, protective footwear, safety goggles, and protective gloves, and you are in good physical condition.

2.1. Unauthorized Installations

Any modification may result in hazardous situations. Please consult Hangcha Group Co., Ltd. before making any modifications to the machine. Hangcha Group Co., Ltd. assumes no responsibility for any damage resulting from unauthorized modifications.

2.2. Accident Notification

In the event of any accident involving equipment manufactured by Hangcha Group Co., Ltd., the Company must be notified immediately.

Even if no personal injury or property damage occurs, Hangcha Group Co., Ltd. must be contacted by phone with all necessary details provided.

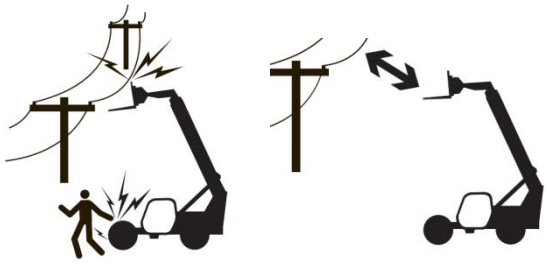
Failure to notify the manufacturer within 48 hours of an accident involving Hangcha equipment may result in the voiding of the product warranty.

Warning

After any accident, the machine and its functions must be thoroughly inspected. Lifting operations with the telehandler are strictly prohibited until all damage and malfunctions have been fully repaired.

2.3.Classification of Hazardous Situations

 Electric Shock Hazard:



- This machine is not electrically insulated and is not equipped with electric shock protection features.
- The minimum safe distance from live electrical parts above the ground should comply with national or local regulations. If no such requirements exist, the minimum safe distances for live electrical parts listed in the table below should be followed.

Table 2.3-1 Minimum Safe Distance from Live Electrical Parts

Voltage Range (Phase to Phase)	Minimum Approach Distance
0～50kV	3m(10ft)
50kV～200kV	5m(15ft)
200kV～350kV	6m(20ft)
350kV～500kV	8m(25ft)
500kV～750kV	11m(35ft)
750kV～1000kV	14m(45ft)

- The movement of the forks, swinging or drooping of wires, and strong winds or gusts should be taken into consideration.
- If the machine comes into contact with live electrical wires, stay away from the machine. Personnel are prohibited from touching or operating the machine until the relevant power supply is disconnected.
- Do not operate the machine during lightning or storms.
- Do not use the machine as a welding ground.

⚠ Rollover Hazard:

- Ensure that the load weight is within the machine's rated load capacity, as shown in the load range chart.
- Always lift the load strictly according to the load curve chart.
- The load's center of gravity should not exceed the rated load center distance indicated in the load range chart.
- All loads shown in the load range chart assume that the machine is on solid ground, with the frame in a level position, forks evenly positioned on the fork frame, the load's center of gravity aligned with the center of the forks, correct tire size, proper inflation, and the telehandler is in good working condition.

- Ensure that the ground can support all forces exerted by the machine; otherwise, do not lift the load.
- When the boom angle exceeds 30°, the torque percentage exceeds 70%, or the outreach exceeds 8m, the vehicle's speed should only be set to the first gear.

Attention !

After the speed limit is imposed for the reasons mentioned above, the speed restriction can only be lifted if all of the following three conditions are met:
a. The torque percentage is less than 60%;
b. The boom angle is less than 27 degrees;
c. The boom extension length is less than 7.4m.

- The reading of the machine's horizontal level indicator should be 0°. Do not raise the boom unless the machine is in a level position.
- Do not use the legs or the vehicle leveling cylinders to flip the machine. The leveling cylinders and legs are only intended to level the machine.
- Actions should be smooth when starting or stopping the machine.
- Do not increase the exposed surface area of the fork carriage or load to the wind, as this will reduce the stability of the machine.
- Do not use the machine in wind speeds of Level 6 (Beaufort scale) or higher.

Table 2.3-2 The Beaufort Wind Scale

Wind Force	Description	Wind Speed (m/s)	Wind Speed (mile/h)	Ground Conditions
0	Calm	＜0.3	0-0.5	Calm, smoke rises vertically.
1	Light air	0.3-1.5	1-3	Smoke shows wind direction.
2	Light breeze	1.6-3.3	4-7	Wind felt on bare skin. Leaves rustle.
3	Gentle breeze	3.4-5.4	8-12	Leaves and small twigs continuously sway.
4	Moderate breeze	5.5-7.9	13-18	Dust and paper lifted by the wind; small twigs bend.
5	Fresh breeze	8-10.7	19-24	Small trees sway back and forth; ripples on the surface of lakes.
6	Strong breeze	10.8-13.8	25-31	Large branches move; power lines and vents produce sound; difficult to use an umbrella.
7	Near gale	13.9-17.1	32-38	Whole trees sway; walking against the wind becomes difficult.
8	Gale	17.2-20.7	39～46	Branches break; vehicles may be pushed off course by the wind.
9	Strong gale	20.8-24.4	47～54	Minor structural damage to buildings.

- In high-speed driving mode, only the front wheels should be used for steering to ensure safety.
- Exercise extra caution and move slowly when driving the machine over uneven terrain such as gravel, unstable or slippery surfaces, and near holes or steep slopes.
- Always keep the tire pressure within the normal range.
- Do not use tires of different specifications or grades to replace the original tires on the vehicle.

⚠ Fall Hazards：

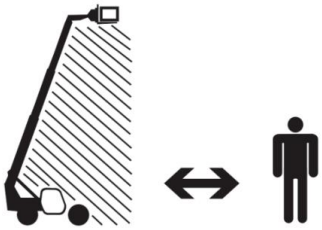
- Use appropriate handrails and steps to enter the cab; always maintain three points of contact (hands and feet) while using the handrails and steps to safely enter or exit the cab.
- Do not use the steering wheel or any control device as a handhold or support.
- When operating the machine, the operator should not leave the cab at will and must always wear the seatbelt.

- Do not use the telehandler to lift personnel unless it is equipped with an approved work platform attachment.
- Do not allow any person to ride on the machine body.

- Ensure the load's center of gravity is positioned close to the inside of the forks.
- Before lifting a load, make sure it is properly positioned on the forks or securely fastened to the attachment.
- When lifting a load with the machine, control the driving speed to keep the load under control.
- Avoid sudden starts, stops, or sharp turns while operating the machine; operate smoothly to prevent the load from tipping or falling.
- Drilling, heating, or welding on the forks is strictly prohibited.

Collision Hazards:

- Do not shift the gear selector to neutral unless the parking brake is engaged.
- Keep all unauthorized personnel and equipment out of the work area.
- Before raising, lowering the boom, or driving, check the work area and ensure there are no obstacles beneath or around the boom.



- Do not work, stand, or walk under a raised boom. If anyone is located beneath or near a raised boom, regardless of whether the machine is carrying a load, operation of the machine is prohibited.
- When the vehicle is moving, non-operators must stay clear of the vehicle.
- Adjust the boom position while driving to maintain the best possible visibility and to minimize blind spots.
- Operators must fasten their seat belts while driving.
- When operating the vehicle, always account for braking distance, environmental visibility, and blind spots that may affect safety.
- Do not operate the machine in poor visibility conditions, such as heavy fog or snow.
- Do not operate the machine in insufficient lighting.
- Do not operate the machine without mudguards, to avoid flying debris from damaging glass or injuring the operator.
- Do not operate the machine if the backup alarm is malfunctioning.

Crushing Hazards:

- When inspecting or servicing the machine underneath the boom, use the maintenance support arm provided with the telehandler.

- When operating the machine, stay clear of any movable parts and areas that may pose a risk of crushing, such as fans, belts, tires, telescopic boom, etc.
- Before leaving the machine, engage the parking brake, place the gear shift in neutral, and lower the forks or other attachments to a position close to the ground.

Driving Hazards:

- When lifting a load, always keep the boom elevated while driving. When the machine is unloaded, keep the attachment close to the ground while driving.
- Plan the vehicle's driving path considering factors such as ground conditions, traction, slope, personnel positions, and any other potential hazards, and adjust the vehicle's speed accordingly.
- Check the functionality of the rearview mirrors and ensure all mirrors are in proper working condition.
- Before driving the machine, ensure the road is clear and sound the horn to signal your presence.
- The steering mode should only be changed when the machine is stationary and the wheels are aligned.
- Do not shift the transmission to neutral while going up or down slopes.
- Control the vehicle's speed while turning, and avoid turning on a slope.
- Do not operate the vehicle on slopes that exceed its rated gradient.
- Do not operate the machine on unstable ground.
- Do not drive the vehicle at high speeds while descending slopes.
- Do not drive the vehicle quickly in narrow or cluttered areas.

Burn Hazard:

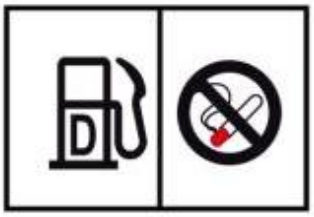
- Before touching or servicing any parts of the telehandler, wait for the relevant components to cool down.
- When the telehandler has just completed its operation, the engine and other components, including fluids, will still be very hot and may have residual pressure. Do not open the fuel tank cap, radiator cap, drain oil or water, or replace filters during this time, as it may cause severe burns. Wait until the temperature has dropped before performing these operations and follow the relevant regulations.

- Lead-acid batteries contain acidic substances. When maintaining the battery, wear protective clothing and safety goggles.
- Avoid any spillage of acidic substances from the battery or contact with them. If

necessary, a mixture of baking soda and water can be used to neutralize any spilled acid from the battery.

⚠ Danger of explosion/fire:

- Do not operate the machine in environments with flammable or explosive gases or particles.



- Perform maintenance, refuel, and charge the battery in a well-ventilated open area, away from sparks, open flames, or lit cigarettes and other sources of fire.
- Do not refuel the engine while it is running.

- Do not expose the battery or other electrical components to water (e.g., high-pressure water guns or rain).
- The hydraulic accumulator installed on the telehandler is a pressurized device. Disassembling the accumulator and its piping system is a dangerous operation and must be performed by authorized technicians.
- Before maintenance, release the pressure in the brake system's accumulator: parking the machine on a solid, level surface, retracting and lowering the boom, stopping the engine, and placing chocks under the wheels. Then, repeatedly press and release the drive brake pedal and repeatedly engage and disengage the parking brake.

⚠ Chemical hazards:

- Do not operate the engine in enclosed or confined spaces, as this can lead to the accumulation of toxic gases (such as carbon monoxide).
- Engine fuel is highly flammable, which could lead to fire or explosion. Do not allow the fuel system to operate near open flames, sparks, or high-temperature areas.
- Do not attempt to repair or disassemble any hydraulic system lines or fittings while the engine is running or the hydraulic system is under pressure.
- Do not check for hydraulic leaks with your hands; use cardboard or paper to locate the leakage points.
- When checking the hydraulic system, wear gloves and safety goggles to protect against splashes that could cause personal injury.

⚠ Misuse Hazards:

- Do not use machines that are faulty or not properly maintained.
- Do not use machines that are defective or damaged.
- Do not use the machine to support other structures to enhance stability.
- Do not carry personnel or heavy loads on the engine cover.
- Do not replace critical components for machine stability with parts of different specifications.
- Do not alter or disable any components that affect the machine's safety and stability.
- Do not replace the manufacturer's original tires with tires of different specifications or layers.
- Avoid sudden starts, stops, steering, or boom movements.
- When cleaning the machine, do not direct the water gun at the engine air intake, exhaust, battery, or electrical components.

⚠ Uncontrolled Movement Hazard:

- Do not use machines that are faulty or damaged.
- If a machine malfunction is detected, stop using it immediately and make a record of the issue.
- Maintain a safe distance from high-voltage power lines.
- Keep a sufficient distance from sources of electromagnetic interference, such as generators, radar systems, and electromagnetic fields.

⚠ General Hazards:

- Always use spare parts approved and authorized by the manufacturer.
- Keep the cab door closed during operation to reduce noise exposure.
- The operator’s seat is a key component for reducing vibration transmission. If replacement is needed, consult the manufacturer.
- The machine is designed to operate in ambient temperatures from -20°C to 40°C, with a maximum relative humidity of 90% at 20°C.

Chapter 3: Vehicle Operation Instructions

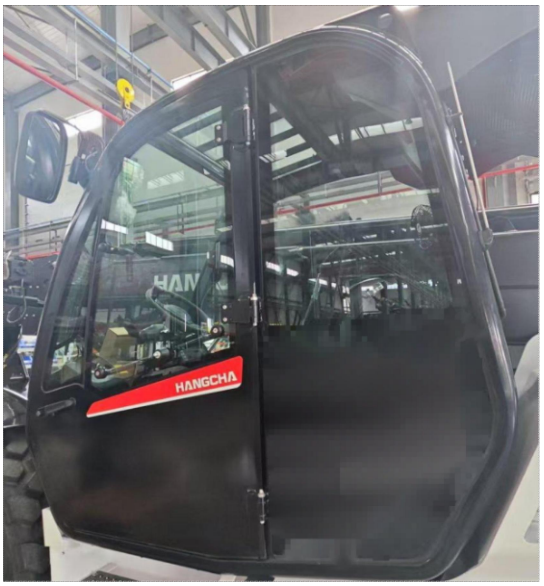


Figure 3.1 – Door

Figure 3.1.1 Door switch (exterior)

Figure 3.1.2 Door switch (inside the car)

3.1. Doors and Windows

Warning

Never drive the vehicle before the doors are properly closed!

3.1.1.Using the door switch from outside the vehicle

As shown in Figure 3.1.1:

Opening the door: If the door is unlocked, pull the handle outward to open the door. If the door is locked, insert the key and turn it 180 degrees clockwise, then pull the handle outward to open the door.

Closing the door: Push the door inward until it latches to close it securely.

Locking the door: After closing the door, insert the key and turn it 180 degrees counterclockwise, then remove the key. Once locked, the door cannot be opened by pulling the outer handle.

3.1.2.Using the door switch from inside the vehicle:

As shown in Figure 3.1.2:

Opening the door**:**

Press the interior door lock block upward and then push the door outward to open it.

Closing the door**:**

Pull the door inward until it latches to close it properly.

Figure 3.1.3-1 Cab side window handle

Figure 3.1.3-2 Side window door suction head and unlock button

Figure 3.1.4 Rear window handle

3.1.3.Door side window

Open the side window: First lift the handle backwards to turn on the lock switch, then lift the handle horizontally to open the side window outwards.

Fully open the side window: After opening the side window, rotate it 180 ° to lock the door suction head on the side window glass after it contacts the suction cup on the rear glass, and then the door side window can be fully opened.

Close the side window: Press the unlock button located at the corresponding position of the suction cup (inside the cab, behind the left seat) to unlock the door suction head and suction cup; Then turn the car window to the side door, use the side window handle to close and lock the side window.

Attention !

a. The opening and closing of the side windows should be done when the vehicle is stationary.

b. When leaving the vehicle, please make sure that the doors and windows are closed and locked.

c. Valuable items should be carried with you and not placed in the cab.

3.1.4.Rear window handle

The rear window handle is located inside the cab at the rear window. Rotate the handle upwards (counterclockwise) to open the cab rear window outward.

In an emergency situation, if the car door cannot be opened to leave the cab, you can open the rear window handle and push open the rear window, using it as an emergency exit.

Figure 3.2.1 Seat (with armrest)

3.2.Internal devices in the cab

3.2.1.Seat

The T40-180XH16D model is equipped with seats with armrests.

Table 3.2.1-2 Main Parameters of Seats

Item	Parameter
Seat width	444mm
Seat height	625mm
Forward and backward adjustment stroke	±90mm
Backrest angle adjustment	Forward tilt 65 °
	Backward tilt 38 °
Weight regulation range	50～130kg
Shock absorption adjustment range	±35mm
Armrest adjustment range	Forward tilt 90°
	Backward tilt 10°

Seat adjustment operation method:

1) Shock absorption effect adjustment: According to the driver's weight and road conditions, rotate the weight adjustment handle 1 and adjust it to the appropriate position.

2) Forward and backward slip adjustment: Lift up the forward and backward adjustment handle 2, adjust the seat cushion to the desired position, and release the slide rail handle.

3) Backrest angle adjustment: Turn up/down adjustment handle 3 to adjust the backrest to the desired position, then release the handle.

4) Armrest angle adjustment: Rotate the armrest angle adjustment knob to fine tune the armrest angle to the desired position

5) Dirt may have a negative impact on the normal functioning of the seat. Therefore, please keep the seat clean.

Figure 3.2.2 Telescopic Seat Belt

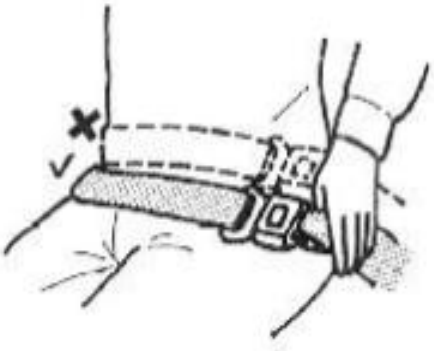


Figure 3.2.2-2 Wearing a seat belt

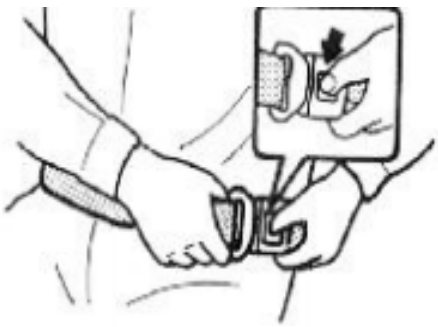


Figure 3.2.2-3 Unzip seat belt

3.2.2.Safety belt

Fasten the seat belt.

- When fastening the seat belt on the car, the back and waist of the body should be as close to the seat as possible. Do not fasten the seat belt on the abdomen.
- Do not tilt the seat back too much, otherwise the seat belt will not extend correctly.
- Do not use knots or entanglements with straps.

Unfastening the seat belt

- Press the red button (with the word PRESS) on the seat belt socket to unlock it.

Check the seat belt

- Regularly check if the seat belt fixing bolts are loose.
- Do not let the seat belt be pressed against hard or fragile objects, and do not rub against sharp blades to avoid damage.
- All components on the seat belt must not be disassembled arbitrarily.
- Frequent use of seat belts requires regular visual inspections. If any abnormalities are found, the belts should be replaced immediately. The lifespan of seat belts is 3 years, and any abnormalities should be scrapped in advance.

Warning

In any case, if there is a defect in the safety belt of a telehandler (such as fixing, locking, cutting, tearing, etc.), the telehandler should not be used and the safety belt should be repaired or replaced immediately.

Figure 3.2.3 Key switch

Figure 3.2.4 Emergency Stop Button

3.2.3.key switch

	Diesel model
Model	T40-180XH16D
Close gear	Initial Position
Running gear	Vehicle system operation (excluding engine)
Starting gear	Engine start (automatically reset to running gear)

3.2.4.Emergency stop button

The emergency stop button is located on the right side of the cab near the car window. In case of a dangerous situation, pressing the emergency stop button will immediately stop all movements of the telehandler.

Before restarting the vehicle, the emergency stop button must be reset, otherwise it cannot be started.

Warning

Before pressing this button, be sure to be prepared for all vehicle movements to suddenly stop.

Figure 3.2.5-1 Main Power Switch

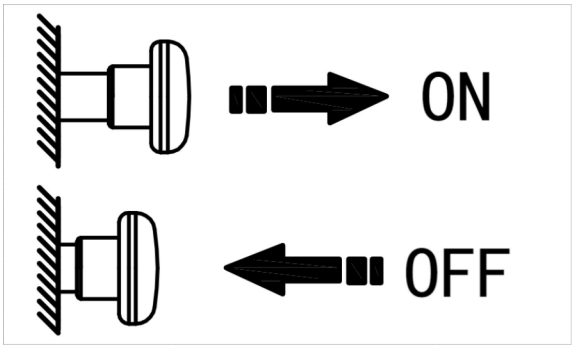


Figure 3.2.5-2 Schematic diagram of switch

3.2.5.Main power switch

The main power switch for diesel models is located on the front side of the right box on the engine side of the vehicle.

1) **Release position:** indicates power on.
2) **Press position:** indicates power disconnection.

Attention !

When the vehicle is not in use for a long time, please turn off the main power switch to avoid accidents.

Warning

a. When conducting circuit inspections or welding operations, the main power switch should be disconnected.
b. The main power switch can only be turned off when the engine has stopped working and the key switch is in the off position, otherwise it may damage the engine.

Figure 3.2.6 Bypass Switch

3.2.6.Bypass switch

When the vehicle alarms and restricts movement, turning on the bypass switch can force the vehicle to move.

Warning

When forcing the vehicle to move, it is not allowed to operate the vehicle for dangerous actions, such as extending the boom or lowering the boom before fully retracting it.

3.2.7.Dashboard

After the system is powered on, the display will automatically jump to the initial interface, as shown in Figure 3.2.7-1; After 3 seconds of power on, it automatically switches to the main interface, as shown in Figure 3.2.7-2.

Figure 3.2.7-1 Initial Interface

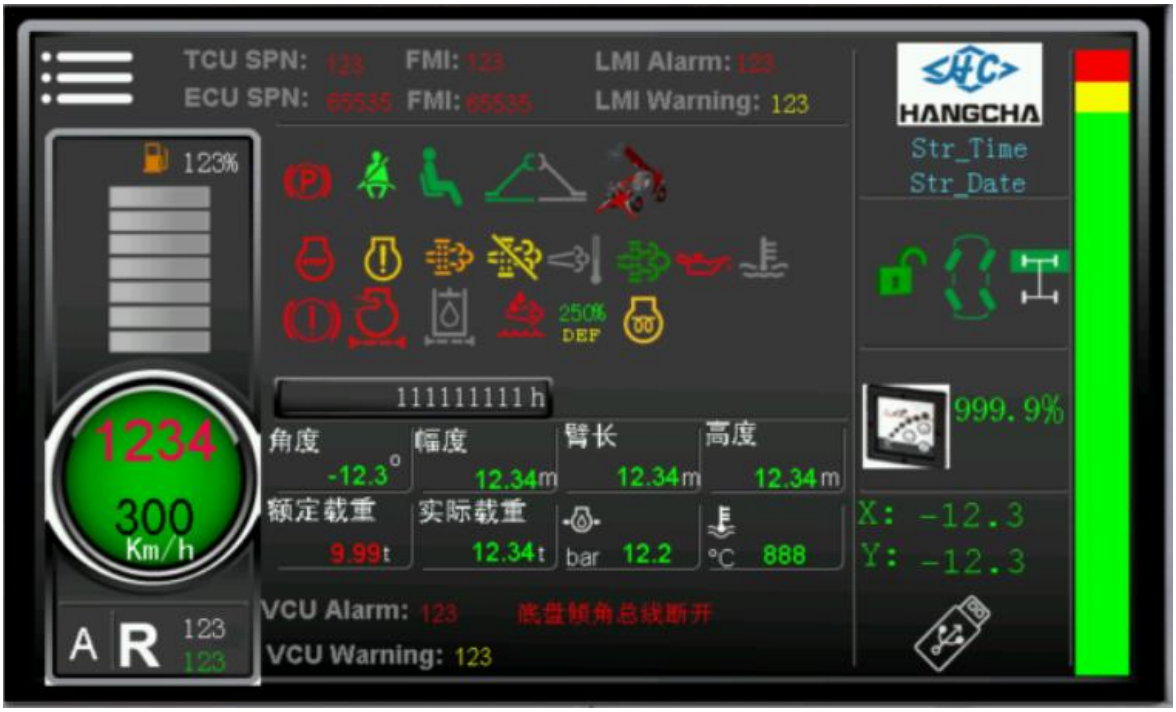


Figure 3.2.7-2 Main Interface

3.2.7.1.Main interface description

1. Main interface parameter description

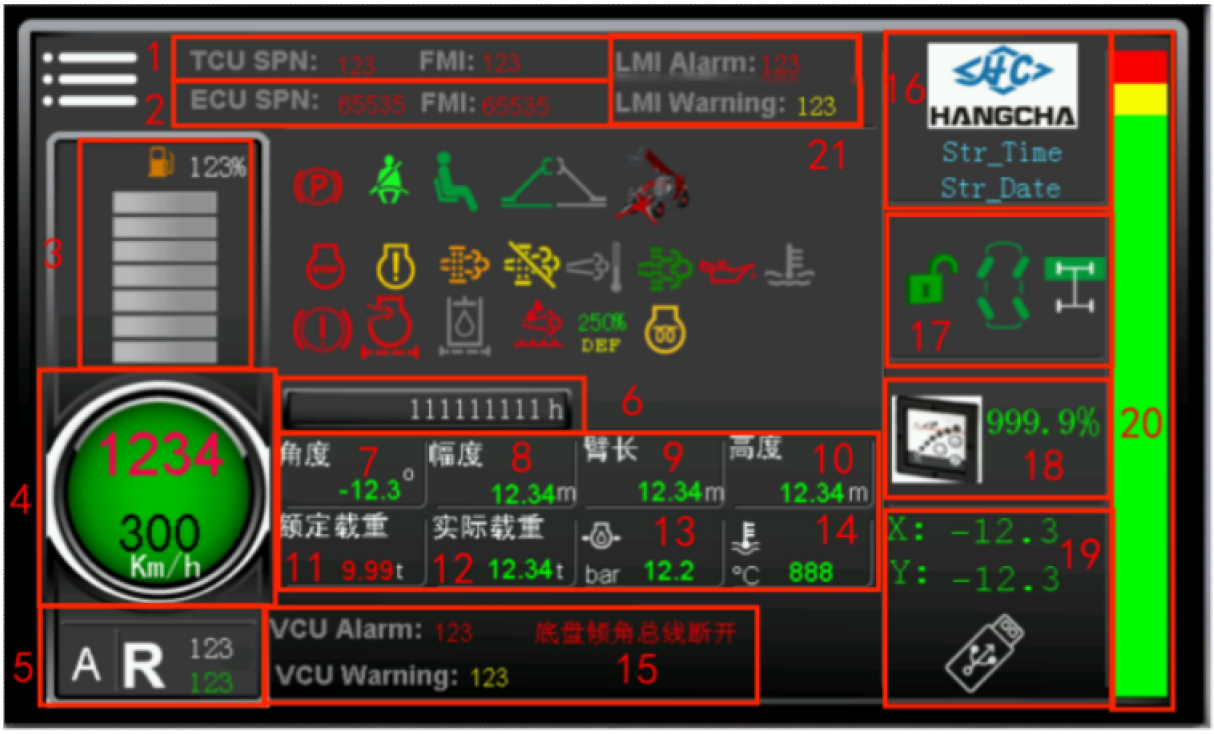


Figure 3.2.7.1 Schematic diagram of main interface parameters

Table 3.2.7.1-1 Main Interface Parameters Table

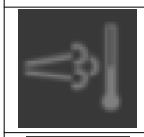
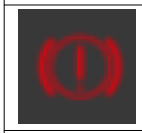
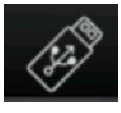
No.	Description	Instruction
1	Transmission TCU malfunction and alarm	SPN： Specific parameter number; FMI： Fault mode identification
2	Engine ECU malfunction and alarm	SPN: Specific parameter number; FMI: Fault Mode Identification
3	Fuel volume	Fuel percentage and quantity
4	Vehicle speed and engine RPM	Rotational speed unit：rpm；
5	Speed gear	Forward, backward, and speed gears
6	Accumulated working time	Accumulated working hours of vehicles, unit: h
7	Boom lifting angle	The relative angle to boom, unit: °
8	Horizontal extension distance of boom	Unit：m
9	Current length of boom	Unit：m
10	Boom lifting height	Unit：m
11	Rated load	Unit：t
12	Actual load	Unit：t

13	Oil pressure	Unit：bar
14	Coolant temperature	Unit：℃
15	VCU faults and alarm prompts	Red: VCU has a serious malfunction, and after the fault is resolved, it needs to be powered off and restarted Yellow: VCU alarm. After the fault is resolved, the prompt message is eliminated
16	Current date and time	Default is Beijing time
17	Steering mode display area	Including steering enable, steering mode, tire centering indicator light
18	SAR	SAR percentage value
19	Vehicle chassis tilt angle display	Display the longitudinal and lateral tilt angles of the vehicle chassis
20	Force limit value	Power limit range, green normal, yellow approaching limit, red exceeding limit
21	Force limit fault and alarm	

2. Description of main interface symbols

Table 3.2.7.1-2 Main Interface Indicator Table

Symbol	Description	Instruction
	Parking status	Red P status, parking brake activated; Gray P status, parking brake off
	Seat belt status	Red flashing status, not wearing a seat belt; Gray status, seat belt fastened
	Person in seat state	Green status, there is someone on the seat; Gray status, no one on the seat
	Front wheel alignment	The front wheels are aligned with the body of the vehicle
	Rear wheel alignment	The rear wheels are aligned with the body of the vehicle
	The front and rear wheels are aligned	The front and rear wheels are aligned with the body, and the vehicle steering mode can be switched at this time
	Front and rear wheels not aligned	The front and rear wheels are not aligned with the body of the vehicle
	Front wheel steering mode	Front wheel steering, rear wheel centering
	Crab shaped steering mode	The steering direction of the front and rear wheels is the same
	Front and rear wheel steering mode	The front and rear wheels turn in opposite directions
	Engine shutdown	Red status, severe engine malfunction; Gray status, no serious engine malfunction

	Engine alarm	Yellow status, engine alarm; Gray state, no engine alarm
	Post processing prompt	Orange status, requiring DEF regeneration; Gray state, no DEF regeneration required
	Regeneration prohibition	Yellow status, DEF regeneration is prohibited; Gray state, allowing DEF regeneration
	Regeneration state	Green status, DEF regeneration in progress; Gray state, DEF regeneration not performed
	DEF liquid level	Red status, DEF level too low; Gray status, DEF level is normal
	Exhaust pipe temperature	Red status, high exhaust pipe temperature; Gray state, normal exhaust pipe temperature
	Oil pressure	Red status, high oil pressure; Gray state, normal oil pressure
	Coolant temperature	Red status, coolant temperature too high; Gray state, normal coolant temperature
	Air filter blockage	Red status, air filter blockage; Gray state, air filter not clogged
	Oil filter malfunction status	Red status, oil filter malfunction; Gray state, normal oil filter
	Fault state of accumulator	Red status, accumulator malfunction; Gray state, normal accumulator
	Preheat indicator lamp	Yellow status, preheating turned on; Gray state, preheating turned off
	SAR anti overturning system	SAR anti overturning system activated
	Torque limiter system	The torque limiter system is activated
	Leg working status	Green status, leg support working; Gray status, legs not working
	Steering switch enable	Green status, allowing switching of steering mode; Gray state, prohibit switching steering mode.
	USB working status	Display whether the USB interface is connected

2. Main interface button instructions

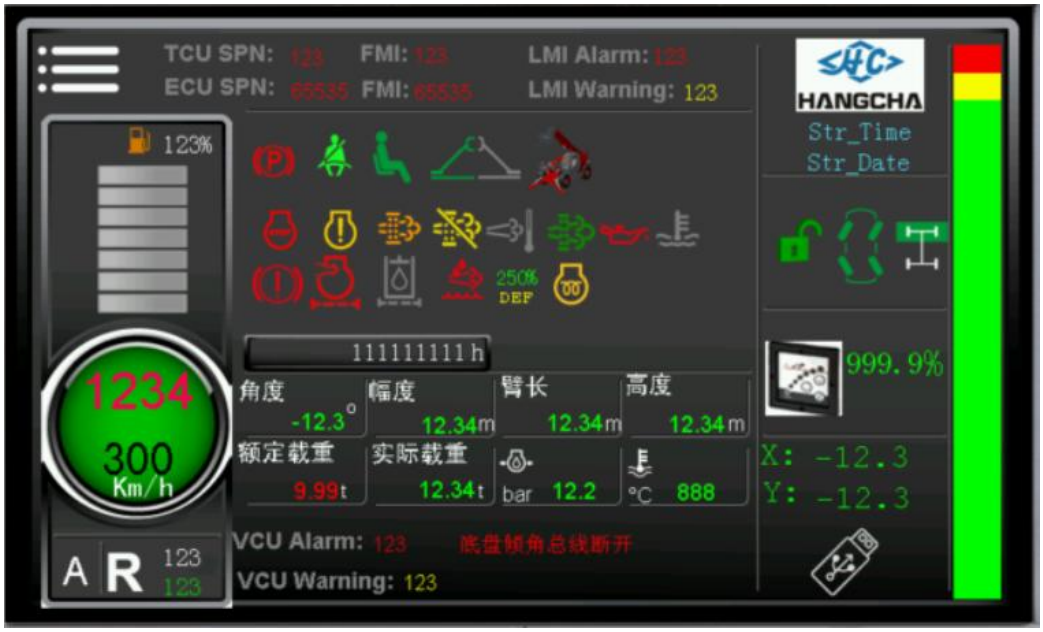


Figure 3.2.7.1-2 Schematic diagram of main interface buttons

The button functions in the main interface are as follows:

- F1：Enter the main menu page.

Attention !

When on the main interface, except for the above buttons, all other buttons are invalid.

When entering the LMI calibration interface and settings interface, a password is required. The password interface is shown in the following figure:

Figure 3.2.7.1-3 Schematic diagram of password interface

1) Number input: Press the "up" button to input numbers, starting from 0 and adding 1 every time when press the number;

2) Password confirmation: Press the Enter key to confirm the currently entered password.

Attention !

The default password setting is 2000. After entering the correct password, enter the corresponding interface.

3.2.7.2.Menu Description

1.Menu button:

(1) Cursor up key; (2) Cursor down key; (3) Return to the main interface; (4) Return to the previous interface; (5) Modify the confirmation key.

Figure 3.2.6.2-1 Schematic diagram of menu buttons

2.Main menu interface:

Figure 3.2.7.2-2 Schematic diagram of the main menu interface

Enter other interfaces from the main menu:

(1) Use the up and down keys to keep the cursor in its current position, and press the confirm key or F1 to enter the "diagnostic interface".

(2) Use the up and down keys to keep the cursor in its current position, and press the confirm key or F2 to enter the "Vehicle Status Interface".

(3) Use the up and down keys to keep the cursor in its current position, then press the confirm key or F3 to enter the "LMI Calibration Interface".

(4) Use the up and down keys to keep the cursor in its current position, and press the confirm key or F4 to enter the "Settings interface".

(5) Use the up and down keys to keep the cursor in its current position, and press the confirm key or F5 to enter the "black box interface".

(6) Use the up and down arrow keys to keep the cursor in its current position, and press the confirm key or F6 to enter the "maintenance interface".

(7) Use the up and down keys to keep the cursor in its current position, then press the confirm key or F7 to enter the "engine interface".

(8) Use the up and down keys to keep the cursor in its current position, and press the confirm key or F8 to enter the "post-processing system interface".

(9) Use the up and down keys to keep the cursor in its current position, press the confirm key to save the settings, and enter the save function. The display will show a prompt saying "Parameter Save...".

Attention !

After modifying the parameter settings on the monitor, a save operation must be performed before powering off, otherwise the modifications will be invalid.

3.Diagnostic interface description:

There are a total of 4 diagnostic interfaces, and the input and output pin status of the VCU and LMI controllers can be diagnosed online through the parameters in each interface.

Figure 3.2.7.2-3 Schematic diagram of diagnostic interface

4.Vehicle status interface:

The vehicle status interface displays vehicle rated load table, display screen software, main controller software, and the version codes of force limit controller software.

Figure 3.2.7.2-4 Schematic diagram of vehicle status interface

5.LMI calibration interface:

The LMI calibration interface requires a password to enter.

Figure 3.2.7.2-5 Schematic diagram of LMI calibration interface

1) Sensor calibration:

The sensor calibration can be selected by pressing the up and down keys on the cursor. Clicking the enter key, and then the corresponding calibration function can be selected by pressing the up and down keys on the cursor.

For example, if "Angle 0-point calibration (13)" is selected in the following figure, the boom needs to be adjusted to a horizontal position. After confirmation, press the enter key to start the boom 0-degree calibration. The command value is 13. After completing the calibration, save the settings, otherwise the modifications will be invalid after power failure.

Figure 3.2.7.2-6 Schematic diagram of sensor calibration interface

1) LMI calibration:

Press the "up and down" keys to select sensor calibration. Click the enter key, as shown in Figure 3.2.6.2-8, and then use the "up and down" keys to select the corresponding calibration function.

Attention !

The prerequisite for LMI calibration is to correctly complete sensor calibration, otherwise LMI calibration is invalid.

Figure 3.2.7.2-7 Schematic diagram of LMI calibration interface

LMI calibration steps instructions:

1) Use the up and down keys to move the cursor and select the function to be executed. Power off is prohibited during the calibration process, otherwise a restart is required.
2) Before each LMI calibration needs to be restarted, the "initialization" function operation needs to be performed first.
3) During the calibration process, it is forbidden for the boom to reach its limit position and be in a state of pressure buildup, otherwise it will cause calculation deviation and affect the accuracy of weighing measurement.
4) After the above calibration is completed, a save operation must be performed, otherwise the calibration will be invalid after power failure.

6. Setting interface

To access the settings interface, a password is required. The settings interface is shown in Figure 3.2.7.2-8 below:

Figure 3.2.7.2-8 Setting Interface

1) Place the cursor at position 1 by pressing the up and down keys, and enter the "Parameter Settings" interface by pressing the confirm key or F1;
2) Use the up and down keys to position the cursor at position 2, then press the confirm key or F2 to enter the "Language Settings" interface;

3) Place the cursor at position 3 by pressing the up and down keys, and enter the "Time Settings" interface by pressing the confirm key or F3;
4) Use the up and down keys to position the cursor at position 4, then press the confirm key or F4 to enter the "Torque Limit Selection" interface;

Figure 3.2.7.2-9 Parameter Setting Interface

Figure 3.2.7.2-10 Language Setting Interface

Figure 3.2.7.2-11 Time Setting Interface

Figure 3.2.7.2-12 Torque Limit Selection Interface

7. Black box interface

The black box interface requires a password to enter, as shown in Figure 3.2.5.2-15:

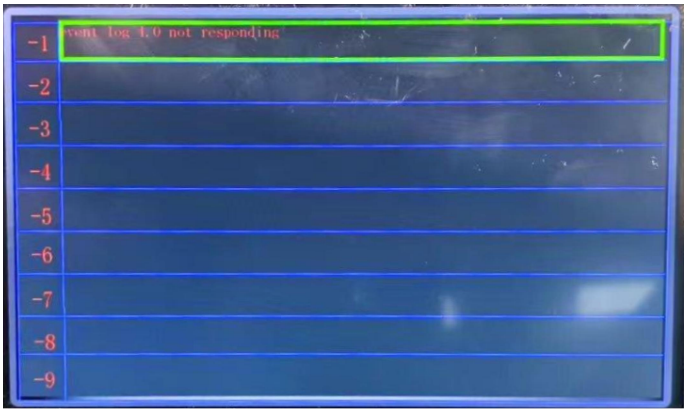


Figure 3.2.7.2-9 Black Box Interface

The black box interface records and saves the vehicle's driving data, and historical driving data of the vehicle can be queried through this interface.

8. Maintenance interface

The maintenance interface displays the current running time of the vehicle and the time point when maintenance is required.

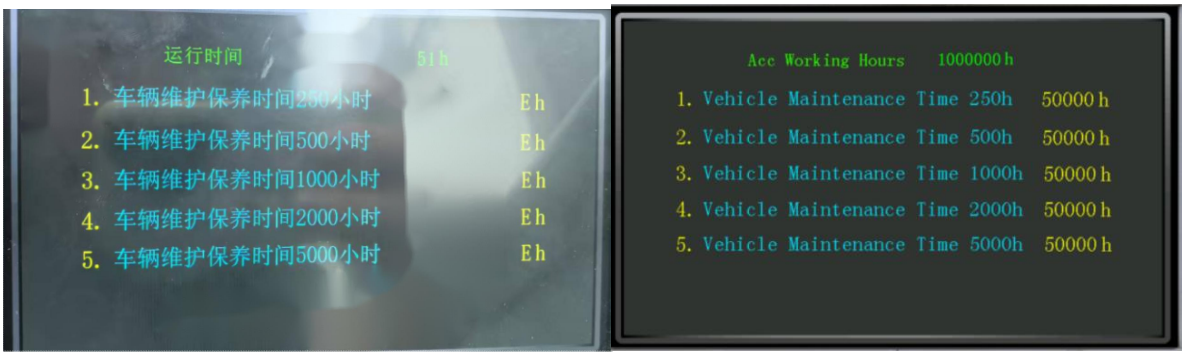


Figure 3.2.7.2-10 Maintenance Interface

9. Engine interface

The engine interface displays parameters such as engine speed, torque, accelerator pedal, power supply voltage, oil pressure, coolant temperature, running time, as well as transmission TCU and engine ECU alarm fault information.

Figure 3.2.7.2-11 Engine Interface

10.Post processing system interface

The post-processing system interface allows for settings related to DEF regeneration.

Figure 3.2.7.2-12 Post processing System Interface

1) Prohibit Regeneration: Disables the automatic regeneration function of the DPF exhaust aftertreatment system.
2) Cancel Prohibit: Enables the automatic regeneration function of the DPF exhaust aftertreatment system.
3) Regeneration Request: Initiates manual regeneration of the DPF exhaust aftertreatment system.

3.2.8. Rocker switch

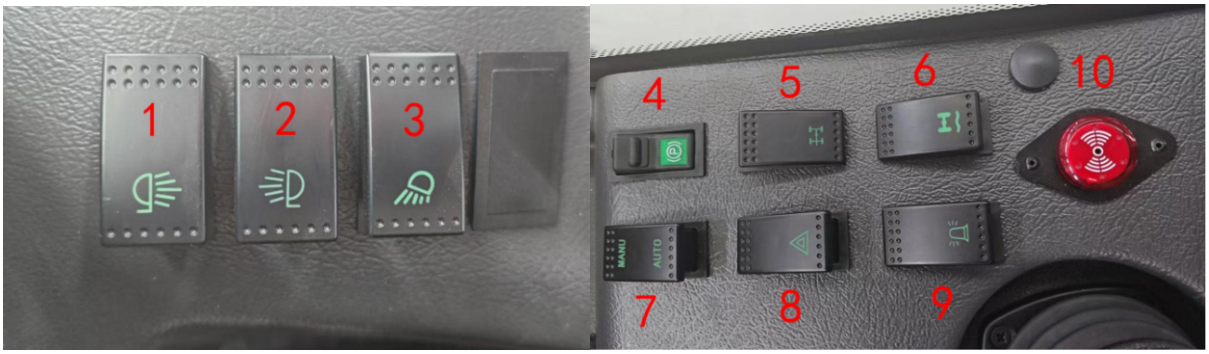


Figure 3.2.7-2 Right front rocker switch in the cab

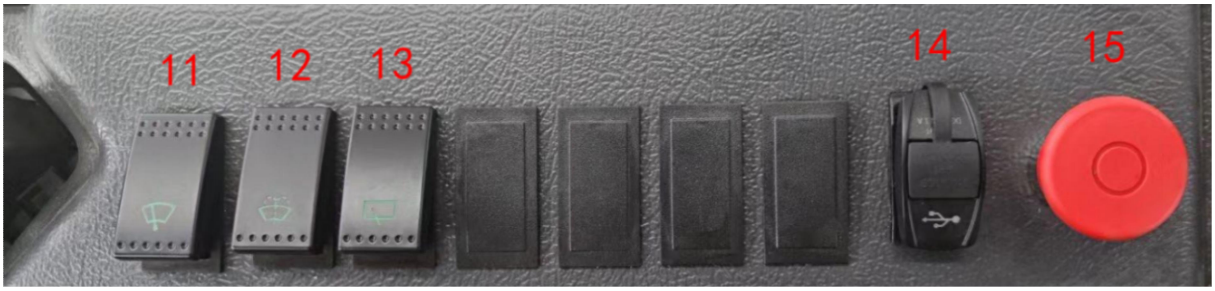


Figure 3.2.7-1 Right side rocker switch in the cab

No.	Name	Status	Function	Remark
1	Front work light rocker switch	0	Front work light function turned off	
		1	Front work light function activated	

2	Rear work light rocker switch	0	Rear work light function turned off	
		1	Rear work light function activated	
3	Boom work light rocker switch	0	Boom work light function turned off	
		1	Boom work light function activated	
4	Parking brake switch	0	Parking brake closed	
		1	Parking brake activated	
5	Steering enable rocker switch	0	Prohibit switching steering mode	
		1	Allow switching steering modes	
6	Vehicle suspension rocker switch	0	Turn off the vehicle suspension function	
		1	Activate the vehicle suspension function	
7	Manual automatic rocker switch	0	Speed gear manual switching mode	
		1	Speed gear automatic switching mode	
8	Alarm rocker switch	0		
		1	Manually activate the alarm	
9	Alarm light rocker switch	0		
		1	Manually turn on the alarm light	
10	Alarm lamp	0	Alarm lights off	
		1	Alarm lights on	
11	Front window wiper rocker switch	0	Front window wiper off	
		1	Front window wiper on	
12	Front window wash rocker switch	0	Front window washing closed	
		1	Front window washing on	
13	Rear window wiper rocker switch	0	Rear window wiper, wash off	
		1	Rear window wiper, wash on	
14	USB interface		USB interface	
15	Emergency stop switch	0		
		1	Immediately stop all operations	

Figure 3.2.9 Combination switch handle

Figure 3.2.10 Locking handle

3.2.9.Combination switch

3.2.9.1.Turn light

Pull up the combination switch handle to turn on the left turn signal;
Pull down the combination switch handle to turn on the right turn signal.

3.2.9.2.Headlights

Turning the combination switch light knob can adjust the on and off of the vehicle's headlights:

(1) The upward position is to turn on the low beam;
(2) The middle position is to turn on the high beam;
(3) The downward position is to turn off the headlights.

3.2.10.Locking handle

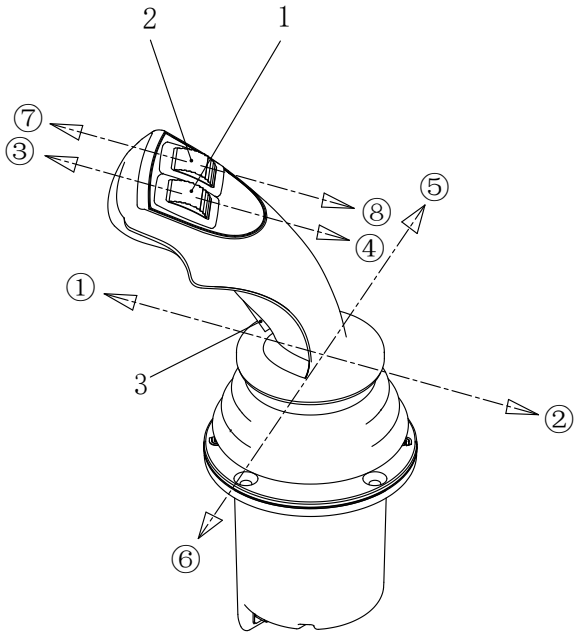
Rotate the locking handle counterclockwise to release the steering column clamping device, adjust the front and rear positions of the steering column to the appropriate position, and then rotate the locking handle counterclockwise to lock the position of the steering column.

Warning

Only when the position of the steering column is locked, can the steering wheel be used to drive the vehicle.

Figure 3.2.11-1 Hydraulic Control Handle

Figure 3.2.11-2 Enable Key



1. Arm frame telescopic roller; 2. Backup roller; 3. Enable key

Figure 3.2.11-3 Hydraulic Control Handle

3.2.11.Hydraulic control handle

Enable key

When performing operations such as boom amplitude, telescopic, and fork adjustment, it is necessary to hold down the enable button.

Attention !

When the enable key is released, any operation of the hydraulic control handle is invalid.

1) Press and hold the enable switch 3;
2) Boom lift (amplitude):
① Move the hydraulic control handle forward to lower the boom;
② Move the hydraulic control handle backwards to lift the boom.
1) Boom telescopic:
③ Roll the telescopic roller 1 of the arm frame forward (counterclockwise), and the arm frame will extend;
④ Roll the telescopic roller 1 of the arm frame forward (counterclockwise), and the arm frame will extend.
2) Fork leveling:
⑤ Move the hydraulic control handle to the right, and the fork frame will tilt forward (counterclockwise).
⑥ Move the hydraulic control handle to the left, and the fork frame will tilt backwards (clockwise).
3) Accessory functions:
⑦ Roll the spare roller 2 forward (counterclockwise) to perform the accessory function;
⑧ Roll the spare roller 2 forward (counterclockwise) and execute the accessory function in reverse.

1. Vehicle body leveling switch 2. Left leg switch 3. Right leg switch

Figure 3.2.12-1 Left and Right Legs and Vehicle Leveling Button

Figure 3.2.12-2 Schematic diagram of vehicle body leveling

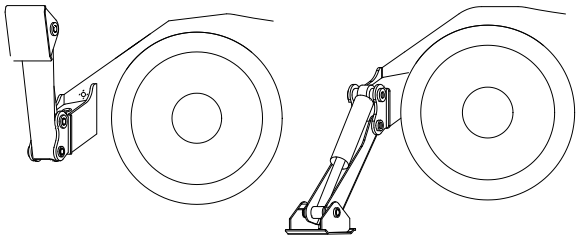


Figure 3.2.12-3 Leg Retraction and Leg Extension

3.2.12.Vehicle body leveling and leg switch

The T40-180XH16D model uses the body leveling thumb switch for body leveling.

Vehicle body leveling operation:

1) Move the body leveling switch/operate the dashboard forward to tilt the telehandler body to the left;
2) Move the body leveling switch/operation dashboard backwards to tilt the telehandler body to the right;
3) Reasonably use the car body leveling function and adjust the horizontal level of the car body in combination with the horizontal level.

Attention !

The following conditions must be met for the vehicle body leveling operation:
a. The amplitude angle of the boom is less than 30 °;
b. The vehicle did not lift the load.

Operation of left and right legs:

1) Move the left and right leg switches (2, 3) forward to control the extension of the left and right legs;
2) Move the left and right leg switches (2, 3) backwards to control the retraction of the left and right legs.

Warning

When the support legs are extended and the arm frame is extended, the arm frame needs to be retracted first, and then the support legs need to be retracted;

Figure 3.2.13 Manual automatic switch and its indicator light

Figure 3.2.14 Shift Switch

3.2.13.Manual automatic switch

1) Press forward to manually switch the speed gear, the indicator light shows "M", and the gear shift switch can be used to directly switch the speed gear;
2) Press back, the speed gear will automatically switch, and the indicator light will display "A".

Attention !

When selecting automatic transmission, the maximum speed gear is the current speed gear of the shift switch.

3.2.14. Speed gear

Warning

The gear should be selected correctly according to the vehicle model and operating conditions. Improper selection may lead to a rapid increase in transmission oil temperature and damage to the transmission.

The internal combustion telehandler can switch speed gears by rotating the knob of the shift switch, with 4 speed shift:

- When driving on a flat road, start in third gear, and if the road conditions permit, switch to 4th gear.
- When driving on bumpy roads, start in 2nd gear. If the road conditions permit, you can switch to 3rd gear;
- When the trailer is on the road, start in 2nd gear. If road conditions and conditions permit, switch to 3rd gear;
- When transporting earthworks, select gear 1; When transporting forage, fertilizers, etc., choose gear 2.

Figure 3.2.15 Shift Switch

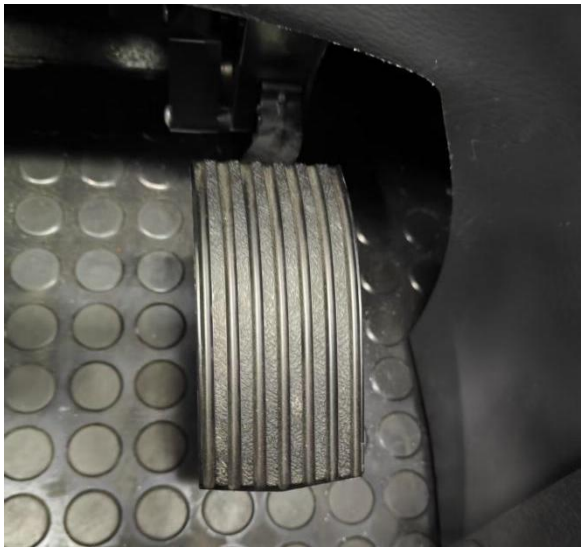


Figure 3.2.16 Accelerator Pedal

Figure 3.2.17 Service Brake Pedal

3.2.15.Forward/Neutral/Reverse

Forward gear (F gear)

Move the gear shift switch forward from neutral (middle position) to switch to forward gear.

Neutral gear (N gear)

If the shift switch is held in the middle position, it is neutral at this time.

Reverse gear (R gear)

Turn the gear shift switch from neutral (middle position) to reverse gear, and the reverse lights and alarm will turn on at the same time, indicating that the vehicle is reversing.

Attention !

a. When shifting gears from forward to reverse or vice versa, first shift to neutral and pause briefly.
b. When shifting gears, the vehicle should be kept stationary. After pressing the service brake pedal, switch gears again.

3.2.16.Accelerator pedal

The accelerator pedal controls the vehicle's driving speed.

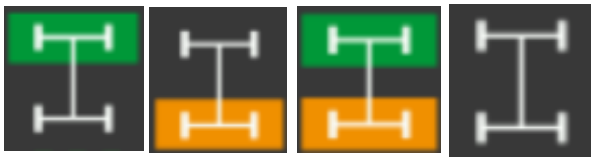
3.2.17.Service brake pedal

The service brake pedal acts on the front and rear wheels through a hydraulic assisted braking system, slowing down or stopping the vehicle.

Figure 3.2.18-1 Steering Switching Enable Switch

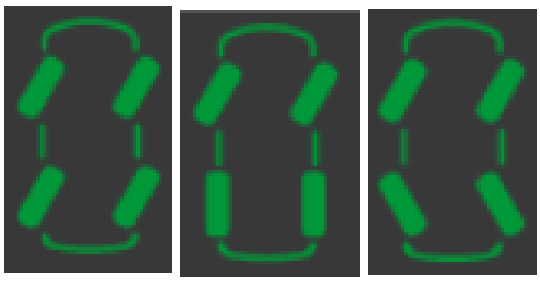
Figure 3.2.18-2 Steering switch enable signal light

Figure 3.2.19-1 Steering Mode Switch (Internal Combustion Vehicle)



Front wheel Rear wheel Front and rear Front and
Alignment Alignment Wheel alignment rear wheel
Not aligned

Figure 3.2.19-2 Wheel alignment indicator light



（1）Crab steer（2）Front wheel steer
（3）Foul wheel steer

Figure 3.2.19-3 Steering Diagram

3.2.18.Steering switch enable switch

1. Steering switch enable switch

The drive mode rocker switch has two states:

1) Pressing forward does not allow switching steering modes;

2) Press back to allow switching of steering mode.

2. Steering switch enable indicator light

The driving mode indicator light is shown in Figure 3.2.16-2:

3.2.19.Steering mode

1. Steering mode switch

1) Press forward/1st gear for four-wheel steering mode;

2) Pressing/2nd gear backwards is the crab steering mode;

3) The center/3rd gear is the front wheel steering mode.

2. Wheel alignment indicator light

The wheel alignment indicator light indicates the positioning status of the wheels relative to the vehicle body, as shown in Figure 3.2.17-2:

Attention !

Only when the front and rear wheel centering indicator light is on, indicating that both the front and rear wheels are aligned with the body, can the vehicle steering mode be switched.

3. Steering mode indicator light

1) Crab steering: The front and rear wheels turn in the same direction.
2) Front wheel steering: Front wheel steering, rear wheel centering.
3) Four wheel steering: The front and rear wheels turn in opposite directions.

Figure 3.2.20 Parking brake switch and its indicator light

Figure 3.2.21 Vehicle Suspension Switch

3.2.20.Parking brake switch

The parking brake switch is located on the right side of the driver's seat, as shown in Figure 3.2.20:

1) Press forward to activate the parking brake;

2) Press back to turn off the parking brake.

The parking brake indicator light is located on the dashboard of the driver's cab, as shown in Figure 3.2.20:

1) The red P status indicates that the parking brake has been activated;

2) The Gray P status indicates that the parking brake has been released.

Warning

Do not start the vehicle until the parking brake indicator light is off!

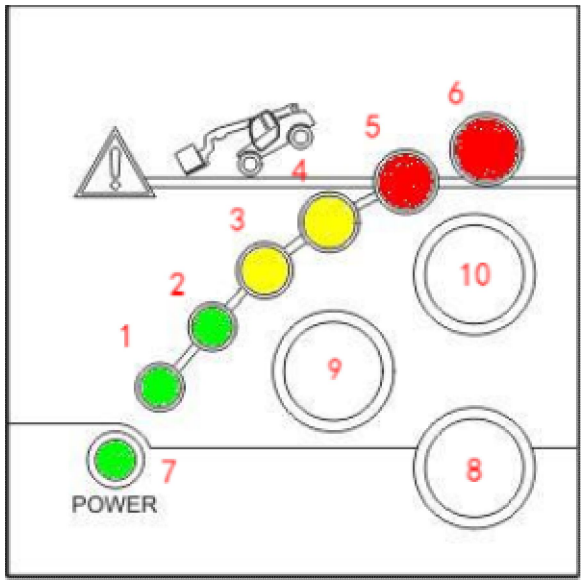
3.2.21.Vehicle suspension switch

The vehicle suspension switch is located on the right side of the driver's seat, as shown in Figure 3.2.20:

1) Press forward to disable the vehicle suspension function;

2) Press back to turn off the vehicle suspension function.

Figure 3.2.22-1 Longitudinal Stability Limiting Device (SAR)



7. **Power indicator light:** displays the power status;

8. **Interaction key:** Confirm key;

9. **Reduce key;**

10. **Add key/leg indicator light:** displays whether the leg is touching the ground.

Figure 3.2.22-2 Longitudinal Stability Panel

3.2.22. Longitudinal stability limiting device

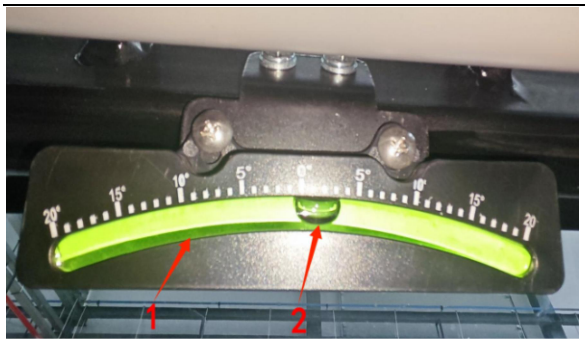
The longitudinal stability limiting device is located on the front right side of the cab, displaying the longitudinal stability status of the vehicle. The various states of the device under different load ranges are as follows:

1. **The green indicator light** is on, there is no sound, and the vehicle is not overloaded;
2. **The green indicator light** is on, there is no sound, and the vehicle is not overloaded;
3. **The yellow indicator light** is on, the alarm sounds intermittently, and the vehicle is approaching overload;
4. **The yellow indicator light** is on, the alarm sounds intermittently, and the vehicle is very close to overloading;
5. **The red indicator light** is on, and the alarm sounds continuously, indicating that the vehicle is overloaded;
6. **The red indicator light** is on, and the alarm sounds continuously, indicating that the vehicle is severely overloaded;

Warning

a. When the vehicle is overloaded, it is prohibited to operate the boom to lower the amplitude; The boom should be fully retracted first, and the boom can only be lowered after the overload alarm is lifted.

b. The longitudinal stability limiting device is directly related to the stability of the machine and cannot be modified or calibrated without authorization. If modification or calibration is required, please contact our service personnel.



(1) Angle indicator disc (2) rolling liquid beads

Figure 3.2.23 Lateral Level

Figure 3.2.24 Cab Light Switch

Figure 3.2.25 Fan

3.2.23.Lateral level

The lateral level display is located above the front window of the cab, with a measurement angle range of ± 20 °, and the displayed value is the horizontal inclination angle of the cab.

Suggest using the lateral angle of the vehicle body measured by the horizontal level to assist telehandler operation.

Warning

The boom can only be operated when the value of the lateral level gauge is 0 (horizontal of the frame).

3.2.24.Cab light switch

The cab light switch is located at the left rear of the cab, as shown in Figure 3.2.24:

Press upwards to turn off the interior lighting of the cab;

Press down to turn on the interior lighting of the cab.

3.2.25.Fan

The fan inside the cab is located at the right rear of the cab, and you can turn it on or off by turning the switch (1).

1. Wind volume knob: turn on/off the air conditioner; Adjust the air volume;
2. Temperature knob: set temperature;
3. Digital tube: displays the temperature/fault code inside the driver's cabin;
4. Heating key: turn on/off heating mode;
5. Cooling button: turn on/off the cooling mode;
6. Fresh air button: Turn on/off the fresh air device.

Figure 3.2.26 Air conditioner panel

Figure 3.2.27-1 Reverse Radar Display Screen

Figure 3.2.27-1 Reverse Radar Camera

3.2.26.Air-conditioner

Air conditioner operation

1) Turn on/off the air conditioner: Rotate the air volume knob to non-zero to turn on the air conditioner. Rotate the air volume knob to zero to turn off the air conditioner;

2) Set temperature:

- Rotate the temperature knob to set the temperature value;
- Temperature setting range: 18-30 ℃.

3) Mode switching: Press the **heating button/cooling button/fresh air button** to turn on or off the corresponding mode. When the mode is turned on, the corresponding indicator light will light up;

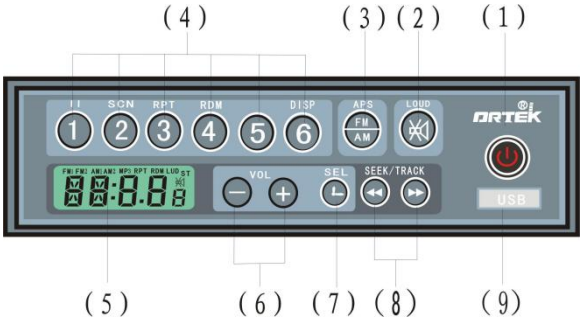
4) Air volume switching: Rotate the **air volume knob** to switch the air volume, there are 3 levels in total, with level 1 being the smallest and level 3 being the largest;

Table 3.2.23-2 Air Conditioning Fault Code Table (Type 2)

Fault code	Fault description
ER1	Overvoltage (voltage ≥ 32V+0.5VDC)
ER2	Undervoltage (voltage ≤ 18 ± 0.5VDC)
ER3	System pressure malfunction
ER4	Defrost temperature sensor open circuit or short circuit
ER5	Indoor temperature sensor open circuit or short circuit

3.2.27.Parking sensor

The main function of a reversing radar is to assist the driver in detecting obstacles behind them while reversing, and to enhance reversing safety by providing distance and direction through sound or visual cues.



(1) Power switch/mode conversion key
(2) Mute/Equal Loudness Key
(3) APS automatic storage/band key
(4) Preset radio button
(5) LCD display screen
(6) VOL+/- volume adjustment key
(7) SEL sound effect/clock setting key
(8) Radio search/track selection key
(9) USB port

Figure 3.2.28 Radio Panel

3.2.28.Radio

Operating instructions

1) Power/mode conversion key

- Power switch, short press this button to turn on the device, and long press this button to turn off the device while it is turned on.

(Short press: less than 2 seconds, long press: greater than 2 seconds)

2) Mute/Equal Loudness Key

- Short press: mute on/off
- Long press: turn on/off at equal volume.

3) Band/automatic storage button

- Short press to switch bands between FM1/FM2/AM1/AM2.
- Long press to automatically search for radio stations from the low end of the frequency in the current band, and the found radio stations will be stored in the preset radio stations one by one.

4) Preset radio button

- When receiving audio, short press to select the corresponding preset radio station to listen to. Long press to save the listening frequency to the corresponding preset radio station.

5) VOL+/- volume adjustment key

- Press the VOL+/- key to increase or decrease the volume.

6) SEL sound effect/clock setting key

- Short press to display clock, press this button for 5 seconds to enter sound effect settings.
- When the clock is displayed, long press this button to enter clock adjustment.
- If no button is pressed within 5 seconds, return to the playback information display.

7) Radio search and MP3 song selection key

- When listening to a radio station, it is used to search forward and backward.

Figure 3.3.1-3 Front combination headlight/driver's cab front work light

Figure 3.3.1-1 Rear Combination Headlights/Vehicle Rear Work Lights

Figure 3.3.1-2 Rear work lights/warning lights in the cab

Figure 3.3.2-1 Rear View Mirror

Figure 3.3.2-2 Wide angle lens

3.3.External devices of the cab

3.3.1. Work lights

1. Front combination headlights (including turn signals, low beams, and high beams);
2. Front work lights in the driver's cab;
3. Rear combination headlights (including position lights, brake lights, reverse lights, and turn signals);
4. Rear work lights of the vehicle body;
5. Rear work lights in the cab;
6. Alarm lights.

3.3.2.Rearview mirror and wide-angle lens

1. Rearview mirrors: located on the left and right sides in front of the driver's cab. Before driving, the position of the rearview mirror should be adjusted to the appropriate angle.
2. Wide angle mirror: located in the middle of the rear of the vehicle and above the right side rearview mirror (if equipped).

Figure 3.3.3 Traction Pin

Figure 3.3.4 Glass water filling port

Figure 3.3.5-2 Hood Assembly

3.3.3.Traction pin

This device is located at the rear of the telehandler and is used to connect trailers and tow loads.

Before using a telehandler to tow a trailer, it is necessary to check whether the trailer's working condition is normal (tire condition, electrical connections, braking system, etc.).

Attention !

a. Do not tow trailers that are in poor working condition.

b. Under harsh conditions, towing a trailer can affect the steering and braking performance of the telehandler, thereby affecting safety.

3.3.4.Glass water tank

The glass water tank is located at the front frame of the cab, and the liquid level of the glass water should not be lower than 1/4.

Attention !

Ordinary water or other cleaning solutions must not be added, professional windshield washer fluid must be added.

3.3.5. Hood assembly

The telehandler is equipped with a large opening hood for easy maintenance and repair services.

1) Open: With the help of the gas springs on both sides inside the hood, a small force can be used to fully open the hood upwards.

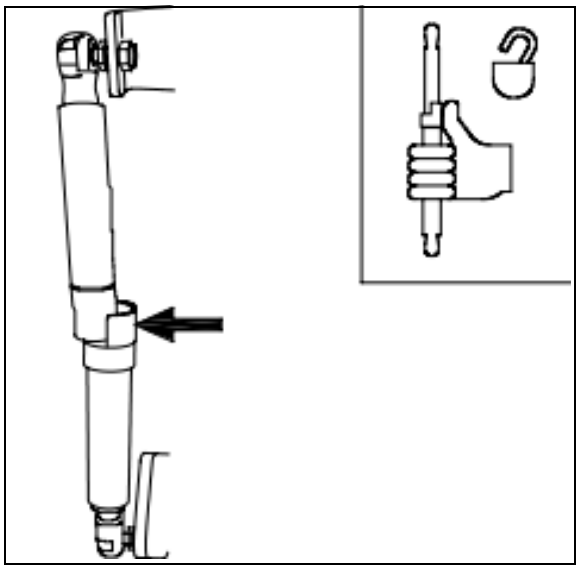
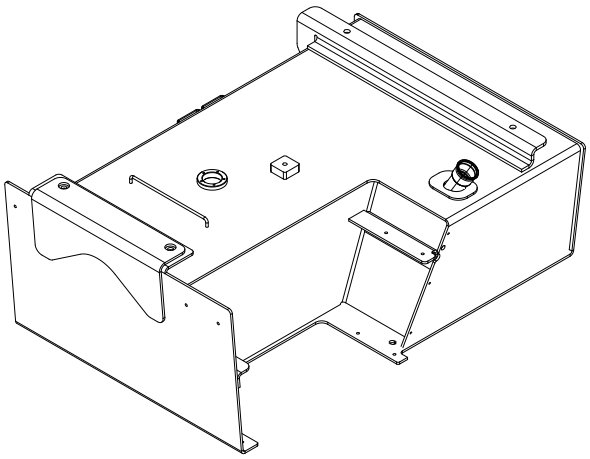


Figure 3.3.5-2 Gas Spring

2) Close: First press the red button on one side of the gas spring cylinder, then slightly press down on the hood; Then press the red button on the other side of the gas spring again, and all the locks will be released. Press down firmly on the hood to close it. After hearing a clicking sound, it means that the hood is locked.

Warning

Do not step on the hood, as it cannot carry cargo.



3.3.7 Fuel Tank

3.3.6.Fuel tank

Fuel filling:

1) Check the fuel level through the dashboard;.
2) If necessary, add fuel through the filling port;
3) Visually inspect the fuel tank and fuel pipes for leaks;
4) During low temperature weather, it is advisable to fill the fuel tank as much as possible to minimize the impact of diesel condensation.

Warning

Do not add fuel while the engine is running, and do not allow the fuel system to work near open flames, sparks, or high temperature areas, as this may cause fire and explosion accidents.

Chapter 4 Engine

For details on the engine and aftertreatment system, please refer to the accompanying Cummins F3.8 manual.

Table 4 Engine related performance parameters

Item	Unit	Datas
Manufacturer		Cummins
Engine model		F3.8
Emission		EU StageV/EPA Tier4 final
Technology roadmap		TCI+CR+DOC+DPF+SCR
Displacement	L	3.8
Number of cylinders - cylinder diameter x stroke	mm	4-102×115
Rated power	kW/r/min	90/2200
Maximum torque	N·m/r/min	50/1500
Idle speed	r/min	850±20
Maximum speed	r/min	3750
Calibrated power point fuel consumption	g/kW·h	≤220
Net weight of engine	kg	360±10
Noise	dB(A)	≤90

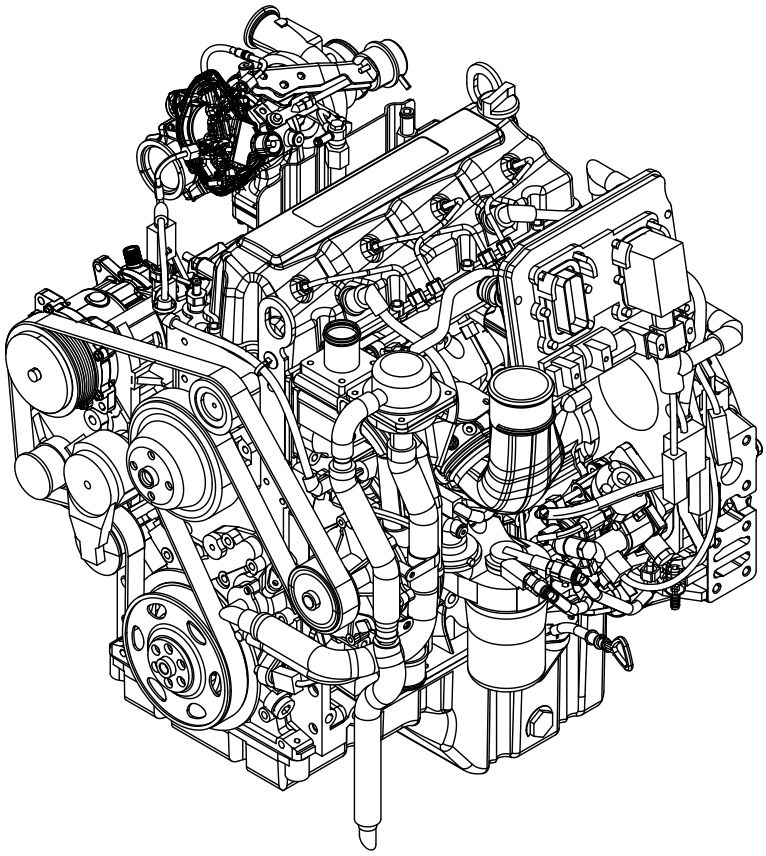


Figure 4 Schematic diagram of engine assembly

Chapter 5 Lead acid battery

5.1. Lead acid batteries and their applications

As a starting power source for engines, batteries are used for voltage stabilization and as a substitute for overloaded generators. They have the characteristics of low internal resistance, stable terminal voltage, high power supply current, low water consumption, large capacity, good low-temperature starting performance, light pole corrosion, small size, light weight, low failure rate, and easy use and maintenance.

The maintenance free battery is equipped with a power display (electric eye) and two ventilation holes on the side (allowing a small amount of gas generated by the battery to overflow). In addition, all maintenance free batteries are sealed. There is also a battery level display on the maintenance battery, and a liquid filling port is left on the battery cover, equipped with corresponding vent plugs.

5.2. Storage and maintenance of batteries

5.2.1. Battery Storage

When the vehicle is stopped, the battery needs to be removed from the vehicle and stored in a clean, dry, and ventilated environment, and the battery needs to be charged every 3 months.

5.2.2. Battery maintenance

- Ensure that the battery terminals are not corroded, the connection parts are not loose, there are no cracks on the outside, and the fixing clips are not loose.
- Regularly check and clean the battery vent holes to ensure that they are not blocked. In winter, it is also necessary to regularly check and clean the accumulated water in the vent holes to prevent them from being blocked by ice water.

5.3. Inspection and maintenance of batteries

Inspection of maintenance free batteries

The maintenance free battery is equipped with a power display:

1. When the battery capacity is normal and the electrolyte density meets the standard, observe that the display status of the electric eye turns green;

2. When the battery capacity is insufficient and the density of the electrolyte decreases, observe that the display status of the electric eye turns white;

3. If the display status of the electric eye turns red, it indicates a severe shortage of electrolyte, and the casing should be carefully inspected for any cracks, leaks, or battery malfunctions.

Figure 7.2.2-2 Battery Display

4. The display status of lead-acid batteries can be found in the instructions on the battery label.

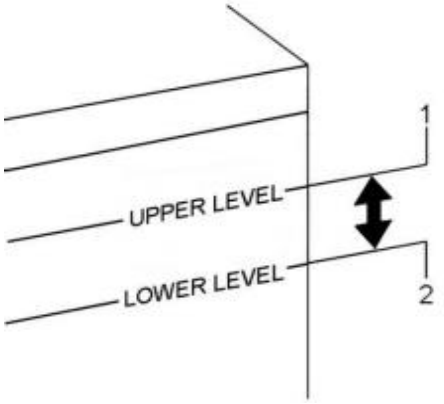
Maintenance of maintenance free batteries

1) Ensure that the green status is visible on the built-in power display (electric eye) of the lead-acid battery;
2) Disconnect the negative grounding wire of the battery to prevent battery discharge caused by additional current discharge;
3) When the battery cannot be removed from the vehicle, it should be kept fully charged;
4) Develop a regular schedule to charge the battery every 30-45 days;
5) When the green status cannot be seen through the electric eye, the battery should be checked, charged or replaced.

Maintenance free battery inspection

Due to the high temperature environment in which telehandlers are used, the battery is prone to water consumption. Please pay attention to the liquid level during use.

The battery cover has a liquid filling port. When the liquid level is below LOWER LEVEL, please add distilled water to UPPER LEVEL. Do not add too much, otherwise the electrolyte will overflow and corrode the vehicle!



1: High position; 2: Low position

Figure 7.2.2-1 Liquid Level Diagram

Check the liquid level is between UPPER LEVEL and LOWER LEVEL. If the liquid level is at or below the low level, distilled water needs to be added.

There is also a battery level display on the maintenance free battery:

1. When the battery capacity is normal and the electrolyte density meets the standard, observe that the display status of the electric eye turns green;

2. When the battery capacity is insufficient and the density of the electrolyte decreases, observe that the display status of the electric eye turns white;

3. If the display status of the electric eye turns red, it indicates a severe shortage of electrolyte, and the casing should be carefully inspected for any cracks, leaks, or battery malfunctions.

4. For the display status of lead-acid batteries, please refer to the instructions on the battery label.

Maintenance free batteries

1) Ensure that the electrolyte level of the lead-acid battery is at UPPER LEVEL and the green status is visible on the power display (eye);
2) Disconnect the negative grounding wire of the battery to prevent battery discharge caused by additional current discharge;
3) When the battery cannot be removed from the vehicle, it should be kept fully charged;
4) Develop a regular schedule to charge the battery every 30-45 days;
5) When the electrolyte level of the lead-acid battery is lower than the lowest level LOWER LEVEL, please add distilled water to the highest level UPPER LEVEL, then reinstall the vent plug and tighten it.

Attention !

When adding distilled water, avoid adding too much, otherwise water may overflow during the recharging process and cause corrosion.

5.3.1. Before recharging

When recharging, the hydrogen gas generated by the battery is a flammable and explosive gas. Therefore, the following precautions should be taken before operation:

1) If recharging the battery still installed in the vehicle, be sure to disconnect the grounding cable.
2) When connecting or disconnecting the charger cable connected to the battery, ensure that the power switch on the charger is turned off.

Attention !

a. The safe place for battery charging should be in an open area. Do not

charge batteries in poorly ventilated garages or enclosed rooms.

b. Do not charge the battery while the engine is running. Be sure to close all attachments.

5.4. Precautions for battery use

Batteries can produce explosive gases, the electrolyte is corrosive, and the battery can generate a current that can burn the skin. When handling or working near batteries,the following precautions should be followed:

Warning

a. When working near batteries, safety goggles should be worn.
b. Do not use tools to touch the battery terminals and generate sparks.
c. Do not expose the battery to open flames and sparks.
d. When connecting the battery to electrical equipment, attention should be paid to the correct connection of the positive and negative poles of the electrical equipment and the battery to prevent burning out the electrical equipment or battery.
e. Do not cover the battery with conductive materials to prevent short circuits.
f. Avoid splashing electrolyte onto eyes, skin, or clothing.
g. Do not let children get close to the battery.

Emergency measures for electrolyte

1) If the electrolyte accidentally splashes into the eyes:

Rinse your eyes with clean water for at least 15 minutes and seek medical attention immediately. If possible, continue to use absorbent sponges or cloths to clean the eyes during medical treatment.

2) If the electrolyte splashes onto the skin:

Thoroughly clean the area. If there is burning pain, seek medical attention immediately.

3) If the electrolyte splashes onto clothes:

It may penetrate clothing and stick to the skin. Take off your clothes immediately and take the above measures if necessary.

Chapter 6 Operating Instructions

6.1.Precautions

- Regular daily maintenance.
- Ensure that the car lights, indicator lights, windshield, and wipers are working properly.
- Ensure that the rearview mirror is in good working condition, clean, and positioned correctly.
- Ensure that the horn is working properly.
- When entering and leaving the cab, always face the vehicle and maintain three-point contact (hands and feet).
- Do not use headphones when operating the machine.
- Do not operate the machine when oily substances are stuck on your hands or feet.
- It is prohibited to adjust the seat status while the vehicle is in motion.
- Do not extend your arms, legs, or any part of your body out of the cab while operating the machine.
- When operating the machine, it is necessary to wear a safety belt.
- Prohibit carrying additional personnel on telehandler.
- No one is allowed to approach the working area of the telehandler or pass under the arm and load.
- Before lifting or removing the load, ensure that the ground beneath the wheels and legs is stable and firm.
- Do not stack goods on sloping ground, otherwise the goods may overturn.

6.2.Pre operation inspection

Basic principle

- Pre operation inspection and routine maintenance are the responsibilities of operators.
- The pre operation inspection is a very intuitive inspection process, which is performed by the operator before each job change. The purpose of inspection is to detect any obvious problems with the machine before use.
- Pre operation checks can also be used to determine whether routine maintenance procedures are required. Operators can only perform routine maintenance tasks as specified in the manual.
- Please review and check each item in this chapter.
- If the machine is found to be damaged or has any unauthorized changes that differ from its factory condition, the use of the machine should be recorded and stopped.
- Only qualified maintenance technicians can repair machines. After the repair is completed, it is necessary to perform a pre operation inspection.
- According to the manufacturer's regulations and the requirements listed in the manual, regular maintenance checks should be performed by qualified maintenance technicians.

Pre operation inspection items

- Ensure that the manual is complete, easy to read, and properly stored. If you need to replace the manual, please contact the customer service personnel of Hangcha Group Co., Ltd.
- Ensure that all markings are clear, easy to read, and positioned appropriately. Please refer to the **"1.2 Whole Machine Identification"** section for the location and form of the identification. If you need to change the logo, please contact the customer service personnel of Hangcha Group Co., Ltd.

- Please refer to the "Maintenance" section to check for hydraulic oil leaks and the appropriate oil level, and add hydraulic oil as needed.
- Check if the battery fluid leaks and if the wiring is secure.
- Please refer to the "Maintenance" section to check if the engine oil leaks and if the oil level is appropriate, and add oil as needed.
- Check whether the engine fuel leaks and whether the fuel level is appropriate. When the fuel level is low, please add fuel in a timely manner.
- Check the engine malfunction indicator light. If the indicator light is on, immediately shut down the engine and record the machine malfunction. Contact service personnel for checking.
- Please refer to the "Maintenance" section to check if the engine coolant is leaking and if the coolant level is appropriate. Add coolant as needed.
- Check the following components for damage, improper installation, looseness, loss, and unauthorized changes:

1) Electrical plugs, wiring, and cables;
2) Control handle, seesaw switch;
3) Tilt angle sensor, long angle sensor, pressure sensor;
4) Display screen, alarm indicator light, warning light, horn;
5) Valve block, hose, hydraulic connector, oil cylinder, motor; Reducer;
6) Hydraulic oil tank, cooling water tank, glass water tank;
7) Arm slider, tire pressure, slewing support;
8) Front and rear axles;
9) Support legs;
10) Batteries and their accessories;
11) Rearview mirror;
12) Batteries and their accessories;
13) Rearview mirror;
14) Forks and other accessories;
15) Nuts, bolts, and other fasteners.

- Check the entire machine to find:

1) Cracks in welds or structural components;
2) Dents or damage to the machine;
3) Severe rusting, corrosion, or oxidation phenomena.

- Ensure that all structural components and other critical parts are intact, all relevant fasteners and pins are in the correct position and tightened, and after inspection, ensure that the hood is properly positioned and locked.

6.3.Workplace inspection

Basic principle

- Workplace inspections help operators determine whether the workplace can ensure safe operation of machines. Before moving the machine to the workplace, the operator should first perform this task.
- Understanding and remembering the hazards in the workplace is the responsibility of operators, who should pay attention to and avoid these issues when moving, installing, and operating machines.

Workplace inspection items

- Pay attention to and avoid the following dangerous situations:
  (1) Steep slopes or openings;
  (2) Protrusions, ground obstacles, or debris;
  (3) Sloping surfaces that exceed the vehicle's leveling capability;
  (4) Unstable or slippery surfaces;
  (5) Aerial obstacles and high-voltage power lines;
  (6) A surface support that is insufficient to withstand all the load force

applied by the machine;
(7) Wind conditions with excessive instantaneous wind speed;
(8) The environmental temperature and humidity do not meet the requirements;
(9) Unauthorized personnel are present in the work area;
(10) Other possible unsafe situations.

6.4.Start

6.4.1.Safety precautions

1) Only when the operator is sitting in the cab, adjusting and fastening the seat belt, can the telehandler be started or operated;
2) Do not start the telehandler by pushing or pulling it. This operation may cause serious damage to the gearbox. If necessary, when towing a telehandler in emergency situations, the gearbox must be placed in neutral;
3) If an emergency battery is needed, please use a battery with the same characteristics as the original battery. First, disconnect the power switch and pay attention to the polarity of the battery when connecting. Connect the positive terminal first and then the negative terminal;
4) Check the closure and locking of the engine hood;
5) Check if the cab door is completely closed;
6) Check if the shift switch is in neutral.

6.4.2.Initiation step

1) Off gear: "0" is the position where the key is inserted and removed, and the engine stalls when the key is in this position.
2) Run mode: When the start key is turned to "Run", the circuit is connected and the vehicle system is powered on.
3) Start gear: When the key is turned to "start", the engine starts. After releasing it, it will automatically reset to the running gear position.

Attention !

a. When the engine is stopped, do not keep the key in "running" for a long time to avoid discharging the battery.
b. When the engine is running, do not turn the key to the "start" position to avoid damaging the starter motor.
c. When starting, the starting motor should not rotate continuously for more than 10 seconds, and there should be a 120 second interval between two starts.

6.5.2.Drive

6.5.1.Safety precautions

1) Please comply with local traffic rules;
2) It is prohibited to operate beyond the rated load of the telehandler or the carrying capacity of the fork;
3) Retract the arm and lower the accessory close to the ground;
4) Only load balanced and correctly positioned or fixed loads on attachments to avoid load shedding;
5) Do not operate the boom while the vehicle is in motion;
6) Do not change the steering mode while the vehicle is in motion;
7) Do not change the forward/reverse gear of the shift switch while the vehicle is in motion;
8) When braking, the service brake pedal should be used reasonably according to the actual situation, and suddenly sudden braking should be avoided;

9) Do not drive on the edge of ditches or steep slopes;
10) Drive slowly on damp, slippery, or uneven terrain;
11) Ensure that the service brakes are working properly.

6.5.2.Drive

1) Retract and lower the arm frame;
2) Choose the appropriate gear;
3) Select the appropriate steering mode. Before changing the steering mode, please align the wheels first. For the operation of wheel alignment, please refer to section **3.2.17 on steering modes;**
4) Press the horn before driving to alert others that the vehicle is about to start;
5) Step on the service brake pedal;
6) Turn off the parking brake;
7) According to the direction of travel, select the forward/reverse mode, slowly release the service brake pedal, the vehicle obtains initial speed, and then slowly accelerates, using lights and rearview mirrors reasonably.

6.5.3.Brake

Attention !

a. When the vehicle comes to a stop, the parking brake must be activated!
b. Do not start the vehicle until the parking brake indicator is turned off!
c. In some cases, the braking force of the parking brake may not be sufficient to stop a fully loaded vehicle on a slope, so when parking on a slope, use pads to cushion the wheels.

To make the vehicle stop smoothly, the following steps should be followed:

1) When driving, if braking is required, the accelerator pedal should be released first to reduce the speed of the vehicle;
2) As you approach the parking spot, gently step on the service brake pedal to bring the vehicle to a slow stop;
3) After the vehicle comes to a complete stop, first apply the parking brake and then place the gear shift switch in neutral position.

When braking, pay attention to the following:

1) When braking, if there is no emergency situation, sudden braking should be avoided. If the service brake pedal is rapidly and violently pressed to the bottom without being released, it may cause vehicle accidents, resulting in component damage or personal injury;
2) During driving, if the fault indicator light of the brake system's accumulator lights up, the vehicle should be stopped immediately, and the problem should be found and resolved.

6.6.Park

Warning

If the engine is not shut down correctly, it can lead to a reduction in the lifespan of the turbocharger and even damage.

1) Park the vehicle steadily and activate the parking brake;
2) Place the gear shift switch in neutral position;
3) Fully retract the boom and lower the fork to the ground;
4) Turn off the vehicle lights;
5) After prolonged operation of the

machine, the engine should be idle for 3 to 5 minutes to allow the pistons, cylinders, bearings, and turbocharger to cool sufficiently;

6) Turn off the engine, wait for 100 seconds, then cut off the vehicle's main power, remove the key, and lock the doors.

Attention !

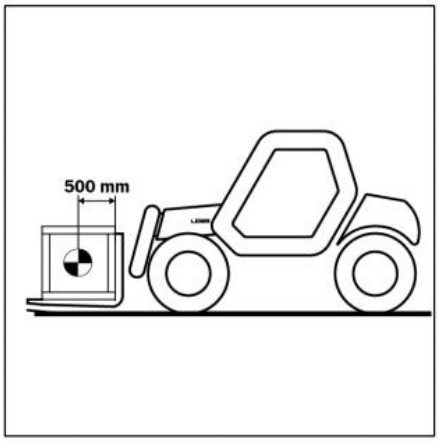
a. For engines equipped with electronic control modules (ECM), it should be ensured that the vehicle's main power supply is disconnected at least 100 seconds after the engine is turned off.

b. If the engine cannot be shut down properly after turning the key switch to the off position, please contact an authorized repair point.

6.7.Load

6.7.1.Mass and center of gravity of the load

1) Before transporting goods, you must know its approximate mass and center of gravity position;



2) The load chart is applicable to loads where the longitudinal position of the center of gravity and the distance between the forks are less than or equal to 500mm.

Warning

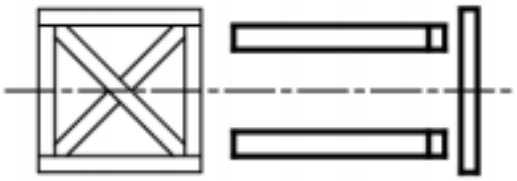
a. It is prohibited to move the weight beyond the load specified on the telehandler load gauge.

b. For loads with a moving center of gravity (such as liquids), the change in center of gravity should be considered.

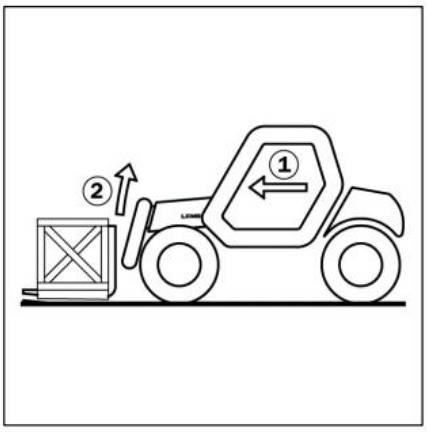
c. When picking up and placing goods, always pay attention to the lateral stability and longitudinal stability alarm devices of the vehicle.

6.7.2.Take and place ground goods

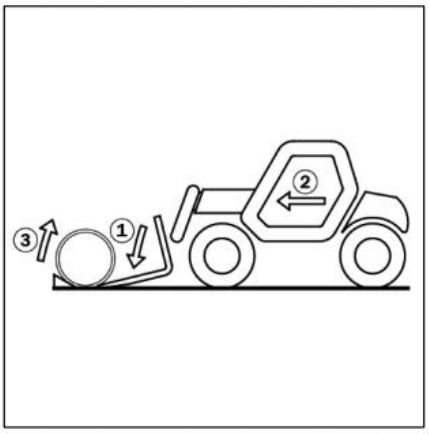
1) Retract and lower the arm frame to make the forks horizontal, and adjust the fork spacing according to the load situation;



Do not use a single fork to lift goods.



2) Slowly move the telehandler forward and slightly lift the boom to the transport position. Tilt the fork backwards to ensure the stability of the cargo;



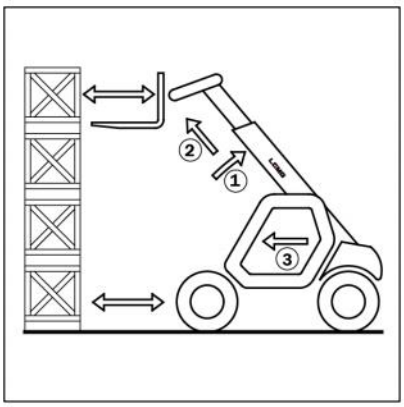
3) For non pallet loads: Before lifting the load, tilt the fork forward, insert the fork under the load, and then tilt the fork backward to lift the load (if necessary, measures should be taken to prevent the load from moving).

6.7.3.Take and place goods at high places

Attention !

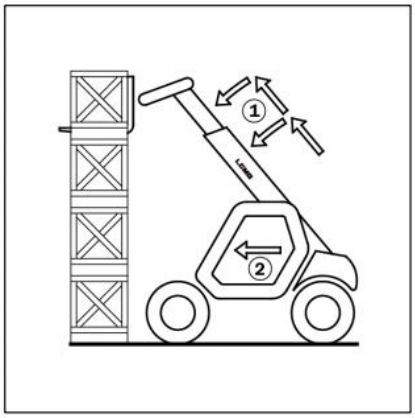
Before lifting the boom, the lateral position of the telehandler should be checked to ensure it is level.

Lifting goods:

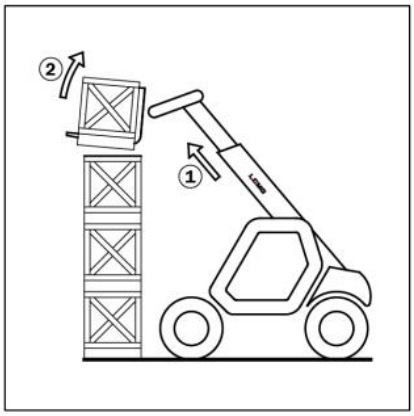


1) Lift and extend the boom until the fork is level with the load, and if necessary, slowly move the telehandler forward;

2) Always maintain a certain distance between the goods and the forklift, and minimize the extension length of the boom;

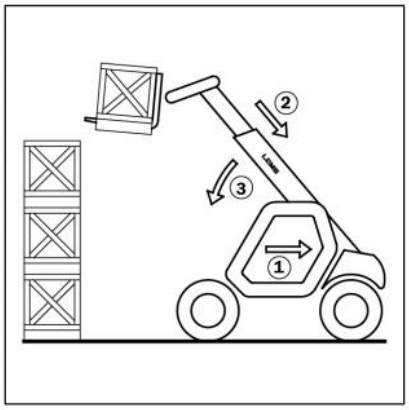


3) By alternately telescoping the boom or moving the fork forward, insert the fork into the bottom of the cargo, then activate the parking brake and place the shift switch in neutral;



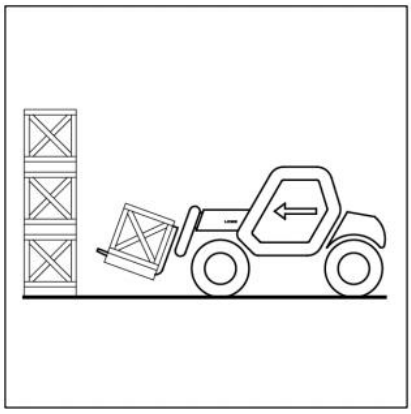
4) Slightly increase the load and tilt the fork

backwards to stabilize the load. If the load is too heavy, it should be returned to its original position;

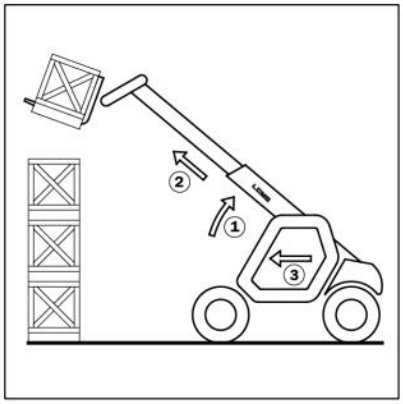


5) Move the vehicle backwards (if necessary), retract and lower the boom to bring the goods into the transport position.

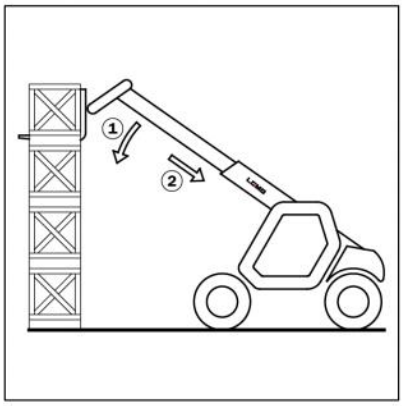
Placing goods:



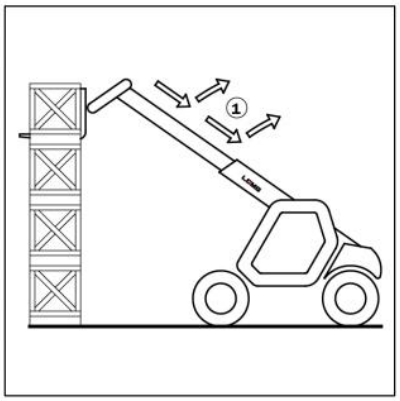
1) Drive the machine close to the place where goods need to be placed;
2) Activate the parking brake and set the gear shift switch to neutral;



3) Lift and extend the arm until the fork reaches above the loading position, allowing the vehicle to move forward;



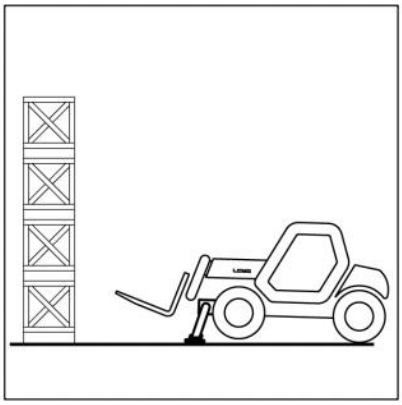
4) Keep the load in a horizontal position. Place goods by lowering and retracting the arm frame;



5) Retract and lower the arm to retract the fork, allowing the goods to reach the transport position and move the vehicle backwards

6.7.4.Leg usage

Lift the legs when the fork is in the transport position:



1) Adequate distance should be maintained

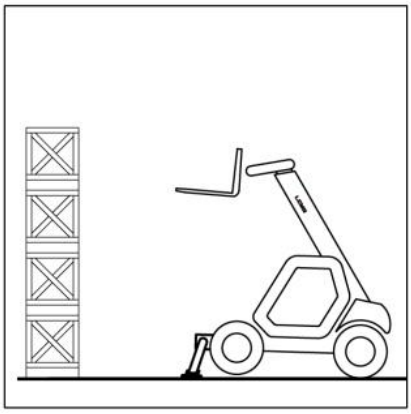
between the vehicle and the cargo;

2) Activate the parking brake and set the gear shift switch to neutral;
3) Lift the support legs to keep the front wheels off the ground and level the vehicle body;
4) Pick up or release goods.

Warning

When raising the support legs and lifting the boom, the telehandler should be kept in a stable horizontal position.

Raise the support legs in the raised state of the arm frame:

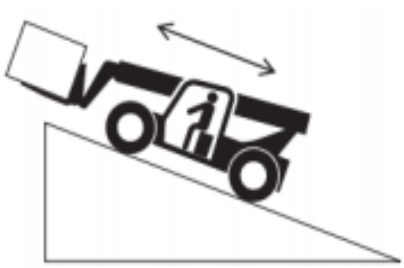


1) Keep the boom raised and fully retracted;
2) Activate the parking brake and set the gear shift switch to neutral;
3) Slowly raise the legs and maintain a horizontal position horizontally;
4) Pick up or release goods.

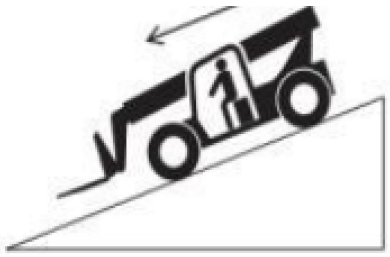
6.8.Operating on a slope

To ensure sufficient traction and braking performance of the telehandler when driving on a slope, please follow the instructions below:

1) Reasonably control the force of stepping on the accelerator and brake pedals when going up and down hills;



2) When going uphill, whether in an unloaded or loaded state, the direction along the fork should be uphill;



3) When going downhill, if it is empty, go downhill in the direction of the fork downwards; If there is a load, descend the slope in the upward direction along the fork.

Attention !

a. When going downhill, downshift to a lower gear and use the service brake if necessary to maintain low-speed driving.
b. If the vehicle must be parked on a slope, it is necessary to use pads to support the wheels.

6.9.Safe support usage

Instructions for using safety support

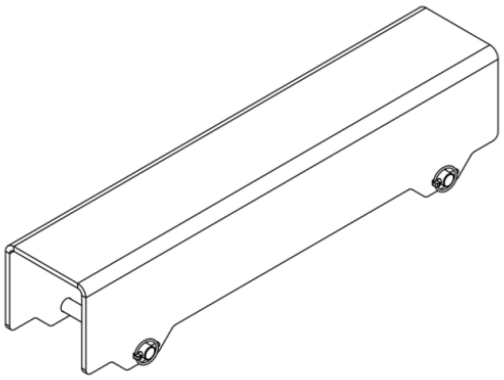


Figure 4.9-1 Boom Safety Support

The telehandlers are equipped with boom safety supports. When working in the area below the boom, it must be installed on the piston rod of the main slewing oil cylinder.

Install safety support:

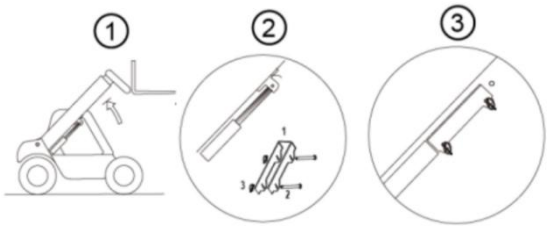


Figure 4.9-2 Safety Support Usage Instructions

1) Fully raise the arm frame;
2) Assemble the safety support on the piston rod of the main variable amplitude oil cylinder and fix it with a pin shaft;
3) Slowly lower the boom and stop lowering it before it comes into contact with the safety support, allowing the safety support to provide protection.

6.10.Aftertreatment system

DPF regeneration instructions

1) When the DEF regeneration request indicator light is on, it indicates that the DPF device may be blocked and requires regeneration treatment to restore its normal function;
2) Park the vehicle in an open area away from flammable and explosive materials, and avoid placing personnel within the vehicle's thermal emission range;
3) Activate the parking brake, place the gear shift switch in neutral, retract and lower the arm frame to bring the attachments close to the ground;
4) Let the engine idle for a few minutes, then activate the DEF regeneration function through the dashboard;
5) Please avoid operating the vehicle during DEF regeneration, do not step on the accelerator pedal or perform other control operations;
6) The DEF regeneration request indicator light is off, indicating that the DPF regeneration process is complete.

6.11.Scrap description

Metal

- The metal on the vehicle can be 100% recycled.

Plastics

- Most plastic components on vehicles are made of "thermoplastic" plastics, which are easy to recycle through melting and granulation.

Rubber

- Tires and seals can be ground to obtain reusable particles or used to manufacture cement.

Glass

- Glass products can be disassembled, removed, and collected for recycling by glass processing plants.

Worn or damaged parts

- Prohibited from being discarded at will.
- Please handle worn or damaged parts in an environmentally friendly manner.

Oils

- Do not dump at will.
- Please handle the oil in an environmentally friendly manner.

Battery

- Do not dispose of batteries at will, as they contain metals that are harmful to the environment.
- Please dispose of the battery in an environmentally friendly manner.

6.12.Fault code

(1) VCU alarm code

Alarm Type	Fault code	Name	Description
Severe malfunction	1	A01_VPWAOff	Controller output power supply 1 is disconnected
	2	A02_VPWBOff	Controller output power supply 2 open circuit
	3	A03_VPWCDOff	Controller output power supply 34 open circuit
	4	A04_JoystickOff	Controller bus disconnected
	5	A05_ACQ_CanbusOff	ACQ bus disconnected
	6	A06_TC_CanbusOff	Transmission bus disconnected
	7	A07_RH_StabilizerJoyOff	Right leg handle disconnected
	8	A08_LH_StabilizerJoyOff	Left leg handle disconnected
	9	A09_LevelingJoy_Off	The body leveling handle is disconnected
	10	A10_MidacOff	LMI controller bus disconnected
	11		Left leg misoperation
	12		Right leg misoperation
	13	SAR CANBUS Off	SAR bus disconnected
	14	CBO CANBUS Off	Chassis tilt angle bus disconnected
	15	CBO Faulty	Chassis tilt angle fault
	16	Amp Joy Faulty	Variable amplitude handle analog fault
	17	Telescopic Joy Faulty	Analog malfunction of telescopic handle
	18	Leveling Joy Faulty	Leveling handle analog malfunction
	19	LH Joy Faulty	Left leg handle analog malfunction
	20	RH Joy Faulty	Right leg handle analog malfunction
Prompt	1	W01_ByPassOp	The forced switch has been turned on
	2	W02_SarCutOff	SAR cut-off
	3	W03_FuelLevelLow	Low fuel level
	4	W04_FuelSensorFaulty	Fuel sensor malfunction

	5	W05_EnergyWarning	Fault alarm of accumulator
	6	W06_LMI_CutOff	Force limiter cut-off alarm
	7	W07_LH_StabSensorFaulty	Left leg pressure sensor malfunction
	8	W08_RH_StabSensorFaulty	Right leg pressure sensor malfunction
	9	W09_SwlOver95	Torque percentage exceeds 95%
	10	W10_OilFilterWarning	Oil filter alarm
	11	W11_AirFilterWarning	Air filter alarm
	12	W12_StabDwTravel	Leg not in position for walking
	13	W13_BrakeOpErr	Parking operation is invalid

(2) LMI alarm code

Alarm code	Name	Description	Termination method
1	AL_E2promAlarm	MIDAC PLUS controller E2PROM malfunction	Power off and restart
2	AL_Can1_InitErr	MIDAC PLUS controller CAN LINE 1 initialization error	Power off and restart
3	AL_Can0_InitErr	MIDAC PLUS controller CAN LINE 0 initialization error	Power off and restart
4	AL_Mds_InitErr	MIDAC PLUS controller low-level software configuration MDS unit initialization error	Power off and restart
5	AL_E2P_InitErr	MIDAC PLUS controller E2PROM initialization error	Power off and restart
6	AL_DataExc_InitErr	Initialization error of data exchange between master and slave CPUs in MIDAC PLUS controller	Power off and restart
7	AL_Task1_InitErr	TASK 1 initialization error of MIDAC PLUS controller main CPU	Power off and restart
8	AL_Task2_InitErr	TASK 2 initialization error of MIDAC PLUS controller main CPU	Power off and restart
9	AL_Task3_InitErr	TASK 3 initialization error of MIDAC PLUS controller main CPU	Power off and restart
10	AL_Task4_InitErr	TASK 4 initialization error of MIDAC PLUS controller main CPU	Power off and restart
11	AL_FlashInt_InitError	Initialization error of internal FLASH storage chip in MIDAC PLUS controller	Power off and restart
12	AL_ERam_NError	MIDAC PLUS controller RAM self-test error	Power off and restart
13	AL_DExc_Error	MIDAC PLUS controller master-slave CPU data exchange error	Power off and restart

14	AL_CFlash_NError	MIDAC PLUS controller FLASH EP100 storage chip error	Power off and restart
15	AL_TWdo_VIn_A	MIDAC PLUS controller watchdog supply voltage below 8vdc	Power off and restart
16	AL_TIn_Error	MIDAC PLUS controller input terminal low-level detection error	Power off and restart
17	AL_Outputs_Error	MIDAC PLUS controller output terminal low-level detection error	Power off and restart
18	AL_TWdo_Reset	MIDAC PLUS controller disconnected due to watchdog APP layer requirements	Power off and restart
40	AL_C1_InitRamAlarm	MIDAC PLUS controller CPU1 RAM initialization error	Power off and restart
41	AL_C1_IntFlashCRCError	MIDAC PLUS controller CPU1 FLASH chip CRC error	Power off and restart
42	AL_C1_IOSysTaskStatus	MIDAC PLUS controller CPU1 underlying hardware failure	Power off and restart
43	AL_C1_E2promAlarm	MIDAC PLUS controller CPU1 underlying hardware failure	Power off and restart
44	AL_C1_CAN_Init_ErrorCode	MIDAC PLUS controller CPU1 underlying hardware failure	Power off and restart
45	AL_C1_DataExc_InitError	Initialization error of data exchange between master and slave CPUs in MIDAC PLUS controller	Power off and restart
46	AL_C1_DExc_FrmError	MIDAC PLUS controller CPU1 underlying hardware failure	Power off and restart
47	AL_C1_DExc_NCrcError	MIDAC PLUS controller CPU1 underlying hardware failure	Power off and restart
48	AL_C1_DaM_Idle_RunError	MIDAC PLUS controller CPU1 underlying hardware failure	Power off and restart
49	AL_C1_DaM_Task3_RunError	MIDAC PLUS controller CPU1 underlying hardware failure	Power off and restart
50	AL_C1_SqM_Error	MIDAC PLUS controller CPU1 underlying hardware failure	Power off and restart
101	LM_MCyl_PL_A_Fault_TMin	Main cylinder rodless chamber channel A open circuit (analog value below 3000)	Power off and restart
102	LM_MCyl_PL_A_Fault_TMax	Main cylinder rodless chamber channel A short circuit (analog value above 21000)	Power off and restart
103	LM_MCyl_PH_A_Fault_TMin	The main oil cylinder has a rod chamber channel A open circuit (analog value below 3000)	Power off and restart
104	LM_MCyl_PH_A_Fault_TMax	The main oil cylinder has a short circuit in the rod chamber channel A (analog value higher than 21000)	Power off and restart
105	LM_MCyl_PL_B_Fault_TMin	Main cylinder rodless chamber channel B open circuit (analog value below 3000)	Power off and restart
106	LM_MCyl_PL_B_Fault_TMax	Main cylinder rodless chamber channel B short circuit (analog value above 21000)	Power off and restart

107	LM_MCyl_PH_B_Fault_TMin	The main oil cylinder has a rod chamber channel B open circuit (analog value below 3000)	Power off and restart
108	LM_MCyl_PH_B_Fault_TMax	The main oil cylinder has a short circuit in the rod chamber channel B (analog value higher than 21000)	Power off and restart
109	LM_CCyl_PL_A_Fault_TMin	Compensation cylinder rodless chamber channel A open circuit (analog value below 3000)	Power off and restart
110	LM_CCyl_PL_A_Fault_TMax	Compensation cylinder rodless chamber channel A short circuit (analog value higher than 21000)	Power off and restart
111	LM_CCyl_PH_A_Fault_TMin	Compensation cylinder has rod chamber channel A open circuit (analog value below 3000)	Power off and restart
112	LM_CCyl_PH_A_Fault_TMax	Compensation cylinder has rod cavity channel A short circuit (analog value higher than 21000)	Power off and restart
113	LM_CCyl_PL_B_Fault_TMin	Compensation cylinder rodless chamber channel B open circuit (analog value below 3000)	Power off and restart
114	LM_CCyl_PL_B_Fault_TMax	Compensation cylinder rodless chamber channel B short circuit (analog value higher than 21000)	Power off and restart
115	LM_CCyl_PH_B_Fault_TMin	Compensation cylinder has rod chamber channel B open circuit (analog value below 3000)	Power off and restart
116	LM_CCyl_PH_B_Fault_TMax	Compensation cylinder has rod chamber channel B short circuit (analog value higher than 21000)	Power off and restart
117	LM_MCyl_PL_D_Fault_MaxDiff	Main oil cylinder rodless chamber redundancy fault	Power off and restart
118	LM_MCyl_PH_D_Fault_MaxDiff	The main oil cylinder has a redundant rod chamber fault	Power off and restart
119	LM_CCyl_PL_D_Fault_MaxDiff	Compensation cylinder rodless chamber redundancy fault	Power off and restart
120	LM_CCyl_PH_D_Fault_MaxDiff	Compensation cylinder has rod cavity redundancy fault	Power off and restart
121	LM_A1A_Fault_RMin	The angle value of arm angle channel A relative to the chassis is lower than the minimum angle	Power off and restart
122	LM_A1A_Fault_RMax	The angle value of arm angle channel A relative to the chassis is higher than the maximum angle	Power off and restart
123	LM_A1B_Fault_RMin	The angle value of arm angle channel B relative to the chassis is lower than the minimum angle	Power off and restart
124	LM_A1B_Fault_RMax	The angle value of arm angle channel B relative to the chassis is higher than the maximum angle	Power off and restart
125	LM_A1D_Fault_MaxDiff	Arm angle dual channel redundant fault	Self reset
126	LM_S1A_Fault_TMin	The analog value of arm length channel A is below the minimum value of 20	Power off and restart
127	LM_S1A_Fault_TMax	The analog value of arm length channel A is higher than the maximum value 1000	Power off and restart
128	LM_S1A_Fault_RMin	The calibration value of arm length channel A is lower than the minimum length value	Power off and restart

129	LM_S1A_Fault_RMax	The calibration value of arm length channel A is higher than the maximum length value	Power off and restart
130	LM_S1B_Fault_TMin	The analog value of arm length channel B is below the minimum value of 20	Power off and restart
131	LM_S1B_Fault_TMax	The analog value of arm length channel B is higher than the maximum value 1000	Power off and restart
132	LM_S1B_Fault_RMin	The calibration value of arm length channel B is lower than the minimum length value	Power off and restart
133	LM_S1B_Fault_RMax	The calibration value of arm length channel B is higher than the maximum length value	Power off and restart
134	LM_S1D_Fault_MaxDiff	Arm length dual channel redundant fault	Self reset
135	LM_AL_TOut_U2AMU_C1_A	U2AMU tilt sensor channel A bus timeout	Power off and restart
136	LM_AL_TOut_U2AMU_C1_B	U2AMU tilt sensor channel B bus timeout	Power off and restart
137	LM_AL_C1_A_Fault	U2AMU tilt sensor channel A fault	Power off and restart
138	LM_AL_C1_B_Fault	U2AMU tilt sensor channel B fault	Power off and restart
139	LM_ACXD_Fault_MaxDiff	U2AMU tilt angle X-axis dual channel redundant fault	Power off and restart
140	LM_ACYD_Fault_MaxDiff	U2AMU tilt Y-axis dual channel redundant fault	Power off and restart
149	LM_AL_TOut_Acq1A	Length angle sensor channel A bus timeout	Power off and restart
150	LM_AL_TOut_Acq1B	Length angle sensor channel A bus timeout	Power off and restart

(3) TCU alarm code

The transmission alarm codes are detailed in the "ECON.A312 Error Code List" table.

(4) ECU alarm code

The engine alarm codes are detailed in the F3.8 Stage V fault code table.

Chapter 7 Maintenance

Serious and comprehensive maintenance can keep the telehandler in good working condition. Ensure telehandler safety, which means ensuring your work and life safety.

7.1.Maintenance Overview

(1) Telehandlers need regular inspection and maintenance to keep them in good performance condition.
(2) Inspection and maintenance are often overlooked, and problems should be detected early and resolved promptly.
(3) Use genuine spare parts from Hangcha Group.
(4) Do not use different types of oil when replacing or adding oil.
(5) The replaced waste oil and cooling waste liquid should not be dumped at will and should be disposed of in accordance with local environmental laws and regulations.
(6) Develop a comprehensive maintenance and repair plan.
(7) A complete record should be kept after each maintenance and repair.
(8) Without training, repairing telehandler is prohibited.
(9) Modifying forklift trucks by users may introduce hazards or risks that the manufacturer has not considered, rendering existing risk assessments ineffective. Telehandler modification outside of Europe must comply with regional requirements (see ISO/TS3691-8).

Attention !

a. Fireworks is strictly prohibited!
b. Before maintenance, the key switch should be turned off first. (Except for partial obstacle elimination examinations).
c. Please use compressed air to clean the engine and electrical components, do not clean with water.
d. Do not insert your hands, feet, or any part of your body between the door frame and the dashboard.

7.2.Regular maintenance schedule

D=Every 8 hours of operation (or every day)

W=Every 40 hours of operation (or weekly)

M=Every 250 hours of operation (or every one and a half months)

T=Every 500 hours of operation (or every three months)

S=Every 1000 hours of operation (or every six months)

Y=Every 2000 hours of operation (or annually)

2Y=Every 4000 hours of operation (or every 2 years)

Attention !

Inspection and maintenance should only be carried out when there is a power outage, and safety precautions and operating procedures should comply with the safety precautions and operating procedures of telehandler.

Attention !

The maintenance content related to the engine can be found in the Daily Maintenance and Routine Maintenance sections of the engine user manual that comes with the vehicle.

○—Check, calibrate, and adjust ×—Replace

Maintenance item	Maintenance content	Tool	D	M	T	S	Y
Engine	Visually inspect the engine operation status (sound, exhaust, etc.)		○	○	○	○	○
	Clean or replace the air filter element		○	○	○	×	×
	Drainage in oil-water separator			○	○	○	○
	Check the crankcase and remove dirt				○	○	○
	Check and adjust the valve clearance	Plug gauge		first time○	○	○	○
	Tighten the cylinder head bolts	Torque wrench		first time○	○	○	○

	Check the compression pressure of the cylinder	Pressure gauge					
	Is the accelerator pedal working properly		○	○	○	○	○
	Add qualified fuel products		○	○	○	○	○
Lubrication system	Is the engine leaking oil		○	○	○	○	○
	Check the oil level and cleanliness		○	○	○	○	○
	Change engine oil			× First time 100h	×	×	×
	Replace the engine oil filter element			× First time 100h	×	×	×
Fuel system	Visually inspect whether the oil pipes, oil pumps, and oil tanks are leaking oil		○	○	○	○	○
	Replace the fuel filter			First time ×	×	×	×
	Check the nozzle and adjust the pressure status	Bedstand			○	○	○
	Fuel tank drainage				○	○	○
	Clean the fuel tank					○	○
	Check fuel quantity		○	○	○	○	○
Cooling system	Coolant volume		○	○	○	○	○
	Leakage situation		○	○	○	○	○
	Clean and replace the coolant						×
Other	Check the tension and damage of the fan belt		○	○	○	○	○
	Clean the exterior of the water tank				○	○	○
	Performance and installation of water tank cover			○	○	○	○
	Aging condition of inlet and outlet rubber hoses					○	○

Note:1. During summer, clean the exterior of the water tank once a month.

2.The antifreeze coolant should be replaced every 2-4 years and the liquid level should be checked regularly.

Electrical system

Maintenance item	Maintenance content	Tool	D	W	M	T	S	Y	2Y
Emergency power-off button	Work and installation situation		○	○	○	○	○	○	○
Seat sensing system	Work and installation situation		○	○	○	○	○	○	○
Rocker switch	Work and installation situation		○	○	○	○	○	○	○
Reverser	Work and installation situation		○	○	○	○	○	○	○
Combination switch (steering, lighting)	Working condition of left and right steering switches		○	○	○	○	○	○	○
	Light level and working condition		○	○	○	○	○	○	○
Horn	Work and installation situation		○	○	○	○	○	○	○
Lights and bulbs	Work and installation situation		○	○	○	○	○	○	○
Reverse buzzer	Work and installation situation		○	○	○	○	○	○	○
Instrument	Instrument operation status		○	○	○	○	○	○	○
Low voltage wiring harness	Damage and looseness of wiring harness		○	○	○	○	○	○	○
	Loose circuit connections		○	○	○	○	○	○	○
High voltage cable	Cable damage and aging situation		○	○	○	○	○	○	○
	Loose cable connections		○	○	○	○	○	○	○

Attention !

Inspection and maintenance should only be carried out when there is a power outage, and safety precautions and operating procedures should comply with the safety precautions and operating procedures of telehandler.

Vehicle body system

Maintenance item	Maintenance content	Tool	D	W	M	T	S	Y	2Y
Frame and side doors	Is the frame cracked				○	○	○	○	○
	Is the right door lock buckle component working properly		○	○	○	○	○	○	○
	Is the right door open properly				○	○	○	○	○
	Tightening condition of protective pole		○	○	○	○	○	○	○
Overhead guard	Is the installation secure	Testing hammer	○	○	○	○	○	○	○
	Check for deformation, cracking, and damage		○	○	○	○	○	○	○
Seat	Check if the bolts are damaged or loose					○	○	○	○
	Check if the seat belt is loose, damaged, or broken		○	○	○	○	○	○	○
Balance weight	Check for loose bolts at the connection with the frame				○	○	○	○	○

Wheels (front and rear)

Maintenance item	Maintenance content	Tool	D	W	M	T	S	Y	2Y
Tire	Inflation pressure	Barometer	○	○	○	○	○	○	○
	Wear, cracks or damage		○	○	○	○	○	○	○
	Are there nails, stones, or other foreign objects on the tires				○	○	○	○	○
	Wheel rim damage situation		○	○	○	○	○	○	○
	Check the tightening torque of the front wheel nut (450-500) N · m	Torque wrench	○	○	○	○	○	○	○

Steering and transmission system

Maintenance item	Maintenance content	Tool	D	W	M	T	S	Y	2Y
Steering wheel	Check the gap		○	○	○	○	○	○	○
	Check for axial looseness		○	○	○	○	○	○	○
	Check for radial looseness		○	○	○	○	○	○	○
	Check the operation status		○	○	○	○	○	○	○
Steering gear	Check if the installation bolts are loose				○	○	○	○	○
Steering knuckle	Check if the main sales are loose or damaged				○	○	○	○	○
	Check for bending, deformation, cracks, or damage				○	○	○	○	○
	Check the installation status	Testing hammer			○	○	○	○	○
Steering cylinder	Check the operation status		○	○	○	○	○	○	○
	Check for leaks		○	○	○	○	○	○	○
	Check for looseness during installation and articulation				○	○	○	○	○
Steering drive axle	Is there any noise		○	○	○	○	○	○	○
	Check for leakage		○	○	○	○	○	○	○
	Replace gear oil (axle, gearbox, main reducer)						×	×	×
	Check for loose wheel hub bearings and noise			○	○	○	○	○	○
	Check the deformation, cracks or damage of the bridge body				○	○	○	○	○
	Check for loose bolts at the connection with the frame				○	○	○	○	○

Note: The first time to replace the gear oil: 50 hours.

Brake system

Maintenance item	Maintenance content	Tool	D	W	M	T	S	Y	2Y
Brake pedal	Noncutting stroke	Dividing rule	○	○	○	○	○	○	○
	Pedal stroke		○	○	○	○	○	○	○
	Operation situation		○	○	○	○	○	○	○
	Is there air in the brake pipeline		○	○	○	○	○	○	○
Parking brake control	Is the braking safe, reliable, and has sufficient travel		○	○	○	○	○	○	○
	Maneuverability		○	○	○	○	○	○	○
Pole, cable, etc	Maneuverability				○	○	○	○	○
	Is the connection loose				○	○	○	○	○
	Wear condition of the connection joint with the gearbox					○	○	○	○
Piping	Damage, leakage, and rupture				○	○	○	○	○
	Connection, clamping position, and looseness situation				○	○	○	○	○
Brake master pump sub pump	Leakage situation		○	○	○	○	○	○	○
	Check the oil level and change the oil		○	○	○	○	×	×	×
	Action status of master and sub pumps					○	○	○	○
	Leakage and damage of the main and sub pumps					○	○	○	○
	Replace the worn and damaged piston cups and one-way valves of the master pump and sub pump							×	×
Wet brake	Brake performance inspection		○	○	○	○	○	○	○
	Damage, leakage, and rupture			○	○	○	○	○	○
	Friction pad and brake pad assembly inspection								×

Lifting system

Maintenance item	Maintenance content	Tool	D	W	M	T	S	Y	2Y
Chain sprocket	Check the tension status of the chain, whether it is deformed, damaged, or corroded		○	○	○	○	○	○	○
	Chain lubrication		○	○	○	○	○	○	○
	Rivet pins and looseness situation		○	○	○	○	○	○	○
	Deformation and damage of sprocket				○	○	○	○	○
	Is the sprocket bearing loose				○	○	○	○	○
Attached Tools	Check if the status is normal				○	○	○	○	○
	Check the wear of the friction block (with built-in lateral displacement)						○	○	○
Hydraulic cylinder	Whether the piston rod, piston rod threads, and connections are loose, deformed, or damaged	Testing hammer	○	○	○	○	○	○	○
	Operation situation		○	○	○	○	○	○	○
	Leakage situation		○	○	○	○	○	○	○
	Wear and damage of steel back bearings in pins and oil cylinders		○	○	○	○	○	○	○
Forks	Damage, deformation, and wear of forks		○	○	○	○	○	○	○
	Damage and wear of positioning pins		○	○	○	○	○	○	○
	Cracking and wear of the welding part of the hook at the base of the fork		○	○	○	○	○	○	○
Roof protection frame and shelving	Is the installation secure	Testing hammer	○	○	○	○	○	○	○
	Check for deformation, cracking, and damage		○	○	○	○	○	○	○
Arm frame and fork frame	Is there any cracking or damage at the welding point between the lifting cylinder bracket and the boom		○	○	○	○	○	○	○
	Is there any poor welding, cracking, or damage at the welding point between the compensating oil cylinder bracket and the arm bracket		○	○	○	○	○	○	○
	Are there any poor welding, cracking, or damage to the arm supports at all levels		○	○	○	○	○	○	○
	Is the fork frame poorly welded,		○	○	○	○	○	○	○

	cracked, or damaged								
	Is the roller loose		○	○	○	○	○	○	○
	Wear and damage of each supporting bearing of the arm frame		○	○	○	○	○	○	○
	Is the fixing bolt of the arm frame slider loose	Testing hammer	○	○	○	○	○	○	○
	Are the ear plate fixing bolts of the lifting cylinder and compensating cylinder pin shaft loose	Testing hammer	○	○	○	○	○	○	○
	Cracking and damage of rollers, shafts, and welding parts		○	○	○	○	○	○	○
Lifting components	Check the looseness of the fixing bolts connected to the drive axle				○	○	○	○	○

Hydraulic system

Maintenance item	Maintenance content	Tool	D	W	M	T	S	Y	2Y
Hydraulic oil tank	Oil level check and oil change		○	○	○	○	○	×	×
	Clean the oil suction filter element						○	○	○
	Replace the return oil filter						×	×	×
	Remove foreign objects						○	○	○
Control valve stem	Is the connection loose		○	○	○	○	○	○	○
	Operation situation		○	○	○	○	○	○	○
Multi-way valve	Oil leakage		○	○	○	○	○	○	○
	Operation status of safety valve and tilt self-locking valve				○	○	○	○	○
	Measure the pressure of the safety valve	Oil pressure gauge	○	○	○	○	○	○	○
Pipeline joint	Leakage, looseness, rupture, deformation, and damage				○	○	○	○	○
	Replace the pipe								×
Hydraulic pump	Is there any oil leakage or noise in the hydraulic pump		○	○	○	○	○	○	○

7.3. Regularly replace critical safety components

1) Some parts may be difficult to detect damage or break by regular maintenance. In order to further improve safety, users should replace the parts listed in the table regularly.
2) If these parts become abnormal before the replacement time arrives, they should be replaced immediately.

Name of critical safety components	Service life (years)
Brake hose or hard pipe	1～2
Hydraulic hose for lifting system	1～2
Lifting chain	2～4
High pressure rubber hoses and hoses for hydraulic systems	2
Brake master pump cylinder head and dust cover	1
Internal seals and rubber components of hydraulic system	2

7.4.Tightening torque of bolts

Table 5.3 List of Bolt Tightening Torque

Unit：N·m

Nominal diameter of bolt mm	Bolt strength grade			
	6.8	8.8	10.9	12.9
6	7～9	9～12	13～16	16～21
8	17～23	22～30	30～36	38～51
10	33～45	45～59	65～78	75～100
12	58～78	78～104	110～130	131～175
14	93～124	124～165	180～201	209～278
16	145～193	193～257	280～330	326～434
18	199～264	264～354	380～450	448～597
20	282～376	376～502	540～650	635～847
22	384～512	512～683	740～880	864～1152
24	488～650	651～868	940～1120	1098～1464
27	714～952	952～1269	1400～1650	1606～2142
30	969～1293	1293～1723	1700～2000	2181～2908
33	1319～1759	1759～2345	2473～3298	2968～3958
36	1694～2259	2259～3012	2800～3350	3812～5082
39	1559～2079	2923～3898	3812～5082	4933～6577

Attention !

a. All important connections are with 12.9 level screws
b.The bolt grade can be found at the head, otherwise it is 8.8 grade.

7.5.Telehandler Oil List

Model	Name	Brand and code	Capacity（L）	Remark
T40-180XH16D	Hydraulic oil	Typical Season：L—HV46 High-frigid condition ：L—HV32	196	Hydraulic oil tank
	Low sulfur diesel		160	Fuel tank
	Hydraulic Transmission Oil	Mobilfluid 424	32	Transmission
	Gear oil	85W-90 GL-5	30	Front and rear axles
	Engine oil	T600 CK-4 15W-40	14	Engine
	Coolant	Caltex antifreeze	24	A mixed solution of 50% water and 50% ethylene glycol
	Lubricating grease	3 # General lithium based lubricating grease for automobiles		Each lubrication point

Attention !

When replacing and adding hydraulic transmission oil, gear oil, and engine oil to the telescopic telehandler, the oil should be added to the specified scale first, then the vehicle should be started to circulate the oil several times, and then observe whether the oil capacity decreases. If it decreases, it is necessary to continue adding oil to the specified scale.

Replace hydraulic oil

Hydraulic oil is generally replaced once a year, and for vehicles with high dust environments or frequent use, it should be replaced six months in advance.

Operation steps:

1) Safely park telehandlers according to regulations;
2) Dismantle the attachments and tilt the transition frame forward to the bottom;
3) Fully retract and lower the arm frame;
4) Unscrew the hydraulic oil tank cover and dipstick assembly;
5) Place an oil pan under the frame, unscrew the oil drain plug and sealing gasket at the bottom of the frame, and drain all the old oil;
6) Take away the oil pan and dispose of the waste oil according to local environmental regulations. Do not dump it arbitrarily;
7) Unscrew the drain plug and sealing gasket, add new hydraulic oil, and check for leaks;
8) Start the telehandler, lift and telescopic the boom 3-5 times, and tilt the fork forward and backward 3-5 times;
9) Add hydraulic oil to the specified mark (the minimum liquid level shall not be lower than the L mark, and the maximum liquid level shall not be higher than the H mark).

Arm lubrication

According to the regular maintenance schedule, regularly apply lubricating grease to the upper and lower slide rails of each level of arm support.

The interval of lubrication should be adjusted according to the operating conditions. During busy months of work, the frequency of lubricating components should be increased.

Appropriately extend the boom and cooperate with the lifting and other operations of the telehandler, evenly apply a layer of lubricating grease on the contact track surfaces of the upper and lower sliders and the boom (i.e. the upper and lower surfaces of the boom).

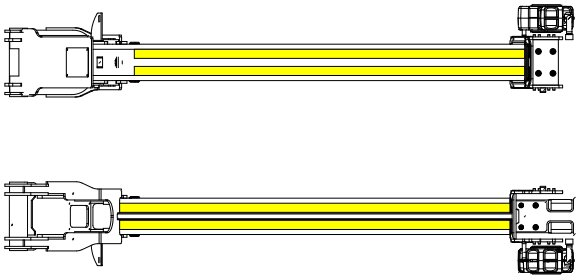


Figure 7.5 Arm lubrication (upper and lower surfaces)

Warning

a. When adding lubricating grease, the vehicle must be parked on a flat road surface, the parking brake must be turned on, and the main power switch must be turned off.
b. When adding lubricating grease, prevent hands and body from getting caught, and prevent falling during high-level lubrication.

Chain lubrication

Spray the chain directly with chain spray or take a brush to stick engine oil on both sides of the chain.

7.6. Replace tires

When the tire is worn to the limit or damaged, it should be replaced in a timely manner, and the tire can only be replaced in pairs. After replacing the tire and running for 10 hours, it is necessary to check whether the wheel nuts are tightened.

Attention !

a. Ensure that the minimum load-bearing capacity of the jack is 2/3 of the total weight of the telehandler.
b. Suitable tools such as wedges, hardwood supports, etc. must be used to secure the jack in place to prevent the risk of accidental rolling or tipping over.

Replace any pair of tires:

1) Park the telehandler on a level and solid ground, apply the parking brake, and place wooden pads behind the other pair of wheels to prevent the telehandler from moving;
2) Place the jack under the center of the axle or at the cut surface at the bottom of the counterweight, and slowly lift the telehandler with the jack until the pair of wheels are completely off the ground;
3) Place sturdy wooden blocks under the frame to support it;

Warning

a. When removing the tire from the wheel hub, the wheel rim bolts and nuts can only be removed after deflation;
b. Ensure that the wooden pad used to support the telehandler is a single piece and sufficiently solid.
c. When only using wooden blocks to support the telehandler, personnel must not enter under the telehandler.

4) Loosen the wheel hub nut, remove the wheel, and replace it with a new tire;
5) Install the new wheel onto the hub and tighten the hub nut symmetrically and cross (T=596-714N · m);
6) Remove the wooden blocks under the frame, slowly lower the telehandler to the ground, and remove the wooden pads and jacks at the rear of the other pair of wheels.

7.7.Inspection and maintenance of cooling system

Check the coolant volume of the cooling system

Figure 7.7 Coolant Level Observation Window

Warning

The inspection and maintenance of the cooling system can only be carried out after the engine has completely cooled down!

Observe the coolant level in the auxiliary water tank through the coolant level observation window while the engine is cooling.

If the liquid level is below the observation window position (i.e. the coolant cannot be seen through the observation window), it indicates that the coolant level in the water tank is insufficient. The coolant should be replenished to the visible position of the observation window through the coolant filling port. The attached water tank is located above the radiator near the engine side.

Attention !

a. Add coolant to the attached water tank, which is a mixture of 50% water and 50% ethylene glycol.
b. During hot seasons, special attention should be paid to the water tank and cooling system.

c. The diameter of solid particles in the coolant is not allowed to exceed 0.45mm, and the weight of pollutants in the waterway is not allowed to exceed 30mg.

Replace the coolant

1) Open the water tank cover and drain plug, drain the coolant, and then flush the cooling system.
2) Tighten the drain plug.
3) Add coolant to the water tank until the filling port is reached.

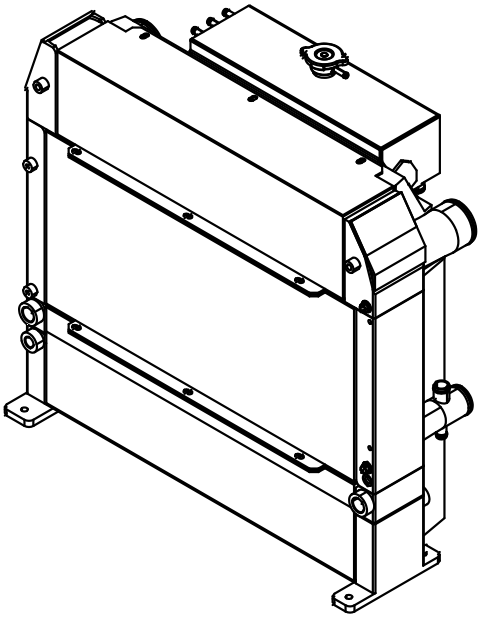


Figure 7.7 Schematic diagram of cooler

4) Let the motor run fully.
5) Stop the motor and wait for it to cool completely. Then, add coolant to the water tank until it reaches the filling port, and add coolant to the storage tank until it reaches the "MAX" position.
6) Check if there is any leakage in the drain plug.

Warning

a. Do not open the water tank cover when the coolant temperature is above 70 ℃. Press the lid and slowly turn left to let the steam overflow. Place a thin cloth on it and unscrew it.

b. Wear gloves to twist the water tank cover to prevent burns from high-pressure hot water during accidental operation.

c. The coolant contains harmful substances to the human body. If accidentally swallowed, induce vomiting immediately and seek medical attention.

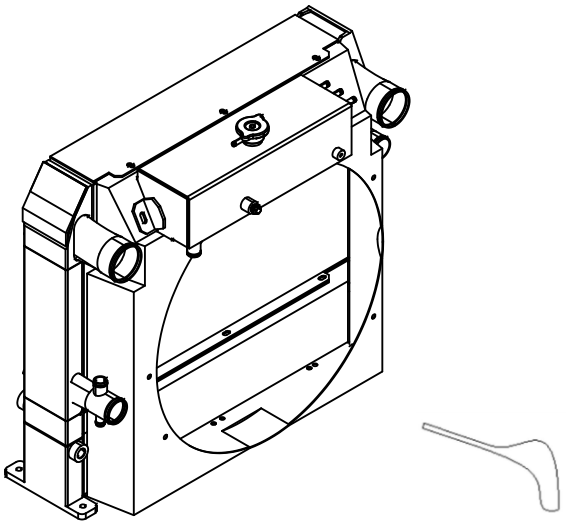
d. Do not allow unauthorized personnel to approach the coolant.

Clean the heat sink

If the heat sink is blocked, it will cause overheating, so if necessary, compressed air or water should be used to clean the heat sink.

Warning

When cleaning the heat sink, dust may enter the eyes, so protective goggles or dust goggles should be worn.



Attention !

When cleaning the heat sink with compressed air, align the nozzle at a right angle to the heat sink.

Chapter 8 Storage

8.1.Daily storage

Daily storage steps:

1) Stop the telehandler at the designated position and use wedges to cushion the wheels;
2) Set the gear shift lever to neutral;
3) Activate the parking brake;
4) Turn off the power of the entire machine;
5) Remove the key and store it in a safe place.

Warning

Once a telehandler malfunction is detected, it should be reported to the management personnel and repaired immediately.

Daily storage requires the following maintenance:

- Clean the oil and grease on the vehicle body with a cloth and water.
- Check the overall condition of the vehicle, especially whether the tires are damaged and whether foreign objects such as iron nails are embedded.
- Fill the fuel tank with the specified fuel.
- Check for leaks in hydraulic oil, engine oil, fuel, and coolant.
- Add lubricating grease.
- Check whether the joint surface of the wheel hub nut and the oil cylinder piston rod is loose, and whether there are scratches on the surface of the piston rod.
- Check if the rollers in the boom rotate smoothly.
- Lift the lifting cylinder to the top to fill it with oil.
- In winter or cold environments, long-lasting antifreeze does not need to be drained. If it is coolant, it needs to be drained.

8.2.Long term storage

Attention !

The long-term storage time of the machine generally cannot exceed 12 months. If the storage time of the machine exceeds 12 months, the long-term storage maintenance program needs to be executed again.

Clean the telehandler

- Inspect and repair any areas where fuel, oil, coolant, or other liquids may leak.
- Clean the dust on the paint surface of the telehandler and touch up the paint if necessary.

Machine Safeguarding

- Wooden blocks should be used to cushion the rear of the forklift and the balance weight to reduce the load on the rear wheels.

Warning

a. The wooden block must be a single piece, very strong enough to support the weight of the telehandler.
b. Do not use wooden blocks taller than 300mm (11.81 inches).
c. Raise the vehicle just enough to place it on the supporting wooden block.
d. Place wooden blocks of the same size under the left and right sides of the frame.
e. After supporting the telehandler with wooden blocks, swing the vehicle back, forth, left, and right to check for safety.

- If necessary, the telehandler can be placed on the axle frame to prevent the

tires from contacting the ground and turn off the parking brake.
- Ensure that all oil cylinders are in the retracted position.
- Release the pressure in the hydraulic circuit.
- Use protective devices to protect hydraulic cylinders that do not retract under normal conditions from corrosion.
- Wrap the tire up.
- Cover the vehicle with waterproof cloth.

Engine protection

- Drain and replace the coolant.
- Let the engine idle for a few minutes, then turn it off.
- Replace the engine oil and oil filter.
- Add a protective agent to the engine oil.
- Run the engine for a short period of time to complete the circulation of oil and coolant inside the engine.
- After fully charging the battery, disconnect it and store it in a warm room.
- Seal the exhaust port with waterproof tape.
- Remove the belt and store it in a safe location.

Attention !

For detailed information on the engine, please refer to the engine user manual that comes with the vehicle.

Reuse after long-term storage

- Remove the waterproof tape.
- Reinstall and reconnect the battery.
- Remove the protective device from the oil cylinder.
- Perform daily maintenance.
- Activate the parking brake and remove the axle frame and axle bracket.
- Drain and replace the fuel, and replace the fuel filter.
- Install the belt.
- Fully lubricate the telehandler.
- Before starting the telehandler, ensure that the area is well ventilated.
- Carefully conduct a pre start inspection to check the starting, forward, backward, steering, lifting, lowering, forward and backward tilting functions of the telehandler.
- Test run all hydraulic movements, preferably reaching the limit position.

Chapter 9 Transportation

9.1.Lifting

Lifting machine:

1) Only qualified crane and rigging assemblers can assemble rigging and hoist machines;
2) Ensure that the lifting capacity of the crane is sufficient to lift the machine, and that the ropes or chains are sufficient to support the weight of the machine. Please refer to the "nameplate" for the specific weight of the machine;
3) Retract and lower the arm frame to bring the accessory close to the ground, and remove all parts and items on the machine that may accidentally move;
4) Connect the rigging to the designated lifting point on the machine body;
5) Adjust the position of the rigging to keep the machine level and avoid damaging the machine;
6) After ensuring reliable connection, slowly lift the vehicle.

Warning

a. Only use lifting tools with sufficient load capacity.
b. When lifting the vehicle, be sure not to wrap the wire rope and the roof guard together.
c. The steel wire rope and lifting device should be very sturdy enough to safely support the vehicle.
d. Do not use the cab frame (roof guard) to lift the vehicle.
e. When lifting a telehandler, do not enter under the vehicle.

Vehicle diagram (taking T40-180XH16D as an example)

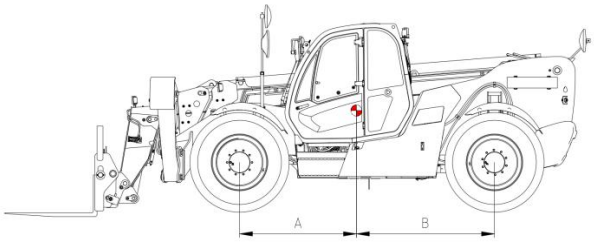


Figure 4.11 Schematic diagram of telehandler （T40-180XH16D）

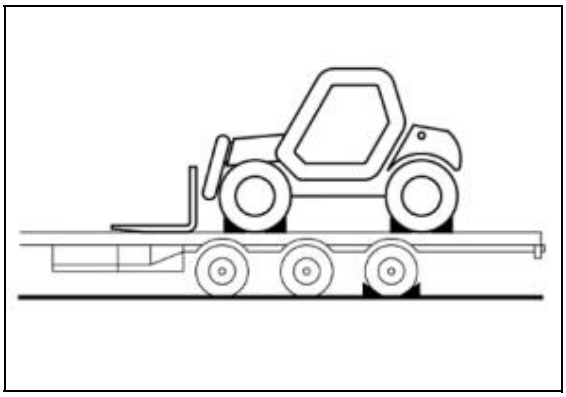
The center of gravity position of the telehandler is shown in the following table:

Table 4.11 Center of gravity position of telehandler

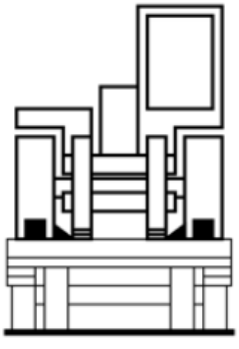
Model	A	B
T40-180XH16D	1582mm	1868mm

9.2.Transport

Fixed machine

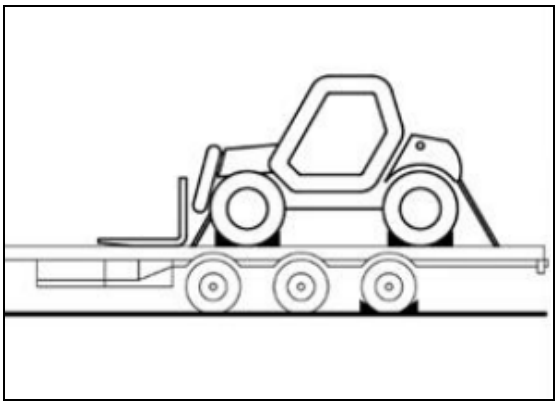


1) Fix the cushion block on the platform in front and behind each tire;



2) Fix the cushion block on the inner side

of each tire on the platform;



3) Use sufficiently sturdy ropes;
4) Use ropes to connect the front and rear fastening points of the telehandler to the transport platform;
5) Tighten the rope and secure the telehandler onto the platform.

Warning

a. When fixing telehandler, effective measures must be taken according to specific situations to ensure transportation safety.
b. Telehandlers must be properly secured when using trucks or trailers for transportation.
c. Secure the telehandler with wedges to prevent accidental movement.
d. Only tension belts or tight belts with sufficient nominal strength can be used to secure telehandlers.

9.3.Tow

The towing pin device is located at the rear of the forklift and is used to connect the trailer and tow the load. When towing, it is necessary to first pull out the towing pin, then install the steel wire rope, and finally reinstall the towing pin.

9.3.1.Towing the trailer

Before using a telehandler to tow a trailer, it is necessary to check whether the trailer's working condition is normal (tire condition, electrical connections, steering system, braking system, etc.).

Attention !

a. Do not tow trailers that are in poor working condition.
b. Under harsh conditions, towing a trailer can affect the steering and braking performance of the telehandler, thereby affecting safety.

9.3.2.Towing the telehandler

When the telehandler cannot be moved due to malfunctions or other reasons, if possible, the machine should be repaired on site.

Forcefully towing the vehicle may cause serious damage to the transmission, so only when other options are not feasible, should the towing telehandler be chosen:
1) When the telehandler is suddenly damaged on the work road, it is necessary to urgently move the telehandler;
2) Telehandlers are stuck and cannot be driven out of trouble (such as wheels getting stuck in potholes).

Warning

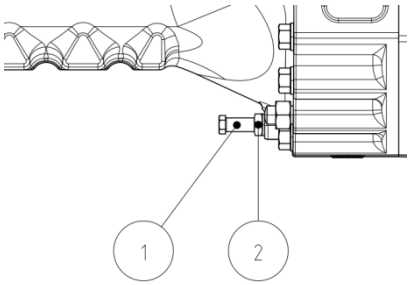
a. Do not tow telehandlers with abnormal steering systems or damaged braking systems.
b. Do not suddenly apply a load on the steel wire rope.
c. When the vehicle is powered on, towing the telehandler may damage the controller.
d. Do not tie the steel wire rope in an

unspecified position.

If it is necessary to tow the vehicle:

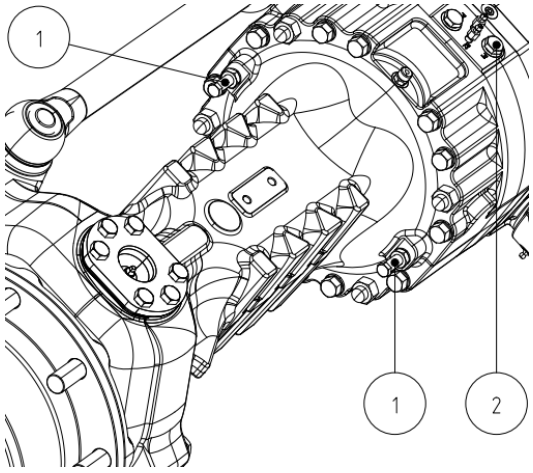
1) Turn off the parking brake;
2) Set the gear shift switch to neutral;
3) Select the two wheel steering mode;
4) Connect the rigid traction device to the traction point position on the frame;
5) Traction of vehicles at low speeds (≤ 5km/h) and short distances.
6) If the parking brake cannot be turned off through the control system of the faulty vehicle, the parking brake should be manually unlocked.

Manually unlock the parking brake of the faulty machine:



①Parking brake release bolt;②Fastening nut
Figure 4.9-1 Parking brake release bolt and fastening nut

1) Loosen the fastening nut ② counterclockwise and move the nut back about 8mm;



①Parking brake release bolt;②Oil injection port
Figure 4.9-2 Position of Parking Brake Release Bolt

2) Tighten the parking brake release bolt ① clockwise (4 on both sides) to release the brake disc, tightening 1/4 turn each time until the torque suddenly drops and the wheels can rotate freely.

Attention !

After disabling the parking brake, mechanical devices such as wheel chocks should be used reasonably to secure the wheels and prevent accidental movement of the vehicle.

Re activate the parking brake:

1) Remove the bolts with nuts and seals. Replace the seals, apply silicon-based Tecno lubricant or 101 grease to the screws, and then reinstall all parts;

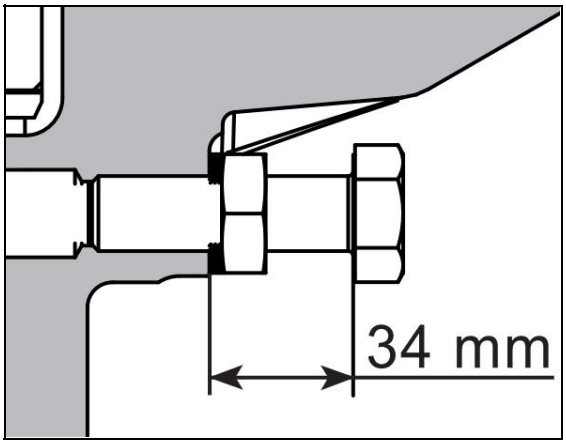


Figure 4.9-3 Schematic diagram of bolt spacing release

2) Adjust the release bolt so that the distance between its bottom surface and the axle surface is 34 ± 0.5mm;
3) Tighten the fastening nut with a torque of 45N · m;

Chapter 10 Attachments

10.1.Fork rack and fork

T40-180XH16D model：

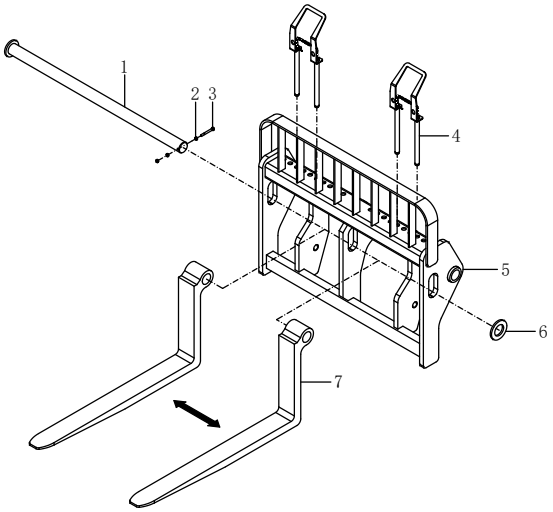


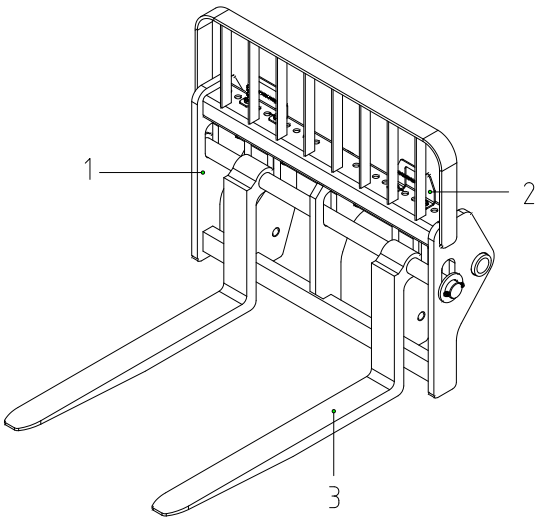
Figure 10.1-1 Fork Installation

1.Fork installation shaft 2.Nut 3.Limit bolt

4.Limit plug socket 5.Fork rack 6.Retaining Ring

7.Fork

Fork installation shaft 1 is fixed on fork frame 5 by nut 2, limit bolt 3, and retaining ring 6. Fork 7 is installed on fork frame 5 through fork installation shaft 1, limited by limit plug socket 4, and adjusted to fit the hole position on the fork frame.



1. Fork rack; 2. Limit socket; 3. Forks

Figure 10.1-2 Fork Assembly (Type 2)

Steps for adjusting the distance of the fork:

1) Remove the fork limit socket 2 from fork rack 1 and unlock the fork position;

2) Adjust the position of fork 3 symmetrically towards both ends based on the centerline of the fork frame;

3) After adjusting the distance between the forks, reinstall the limit socket pin in the corresponding positioning hole of the fork position to limit the fork position.

10.2.Installation and disassembly of attachments

Taking the installation and disassembly of attachments as an example with a fork frame.

Warning

a. The attachments of the telehandler are all heavy components, so special care should be taken when disassembling and assembling. Personnel should stay away from the boom and attachments, and take appropriate preventive measures;

b. It is prohibited to use any equipment other than the work platform to lift personnel.

Steps for adjusting the distance of the fork:

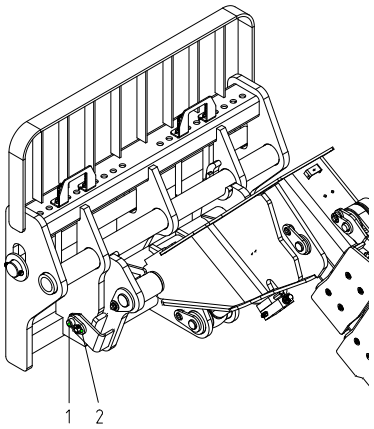
1) Pull up the limit pin of the fork by the limit socket installed board, and the fork will be unlocked.

2) Adjust the fork position symmetrically towards both ends based on the centerline of the fork rack.

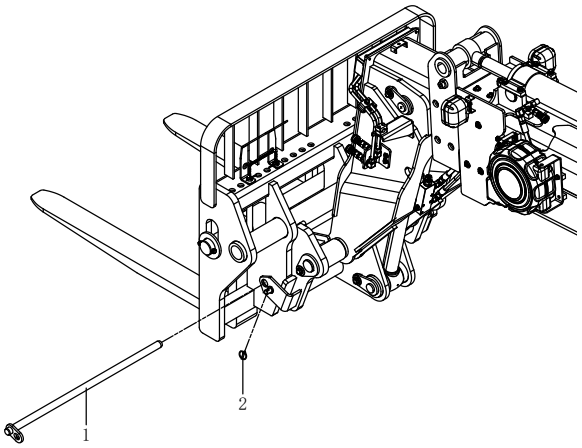
3) After adjusting the spacing between the forks, reinstall the limit socket pin into the corresponding positioning hole of the fork position

Quick change operation steps for attachments:

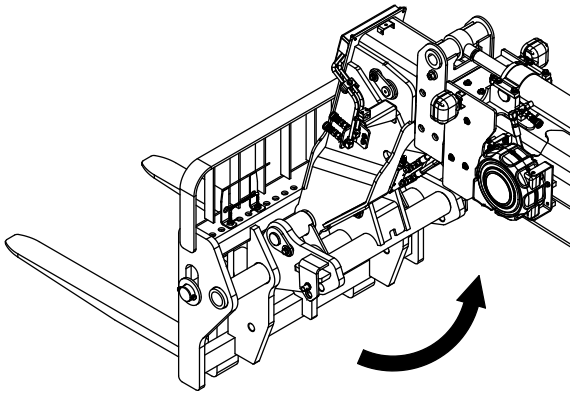
1) Retract and lower the telescopic arm (for ease of operation, the telescopic arm can be extended appropriately by 0-500mm), so that the attachments is close to the ground;



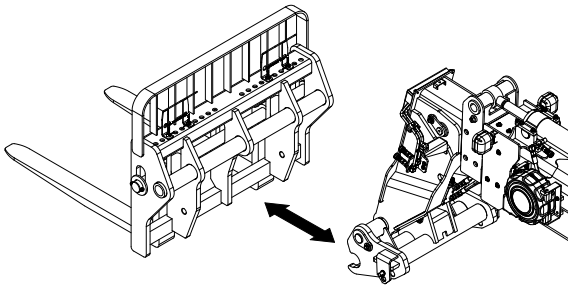
2) Remove the O-shaped pin (2), then pull out the limit pin shaft (1), and the transition frame and the attachments can rotate relative to each other;



3) Lift the telescopic arm appropriately (up to 10 °), and then use the hydraulic control handle to tilt the transition frame counterclockwise to the bottom (as indicated by the arrow in the figure);



4) Operate the vehicle to retract backwards or retract the telescopic arm, causing the transition frame to detach from the attachments installation shaft and complete the quick disassembly of the attachments;



5) Follow the steps 4) → 3) → 2) in reverse to complete the quick installation of the attachments.

Appendix Maintenance Record

Date	Maintenance content	Signature	Remark

Appendix Maintenance Record

Date	Maintenance content	Signature	Remark

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