

KIPOR Machinery Co., Ltd.

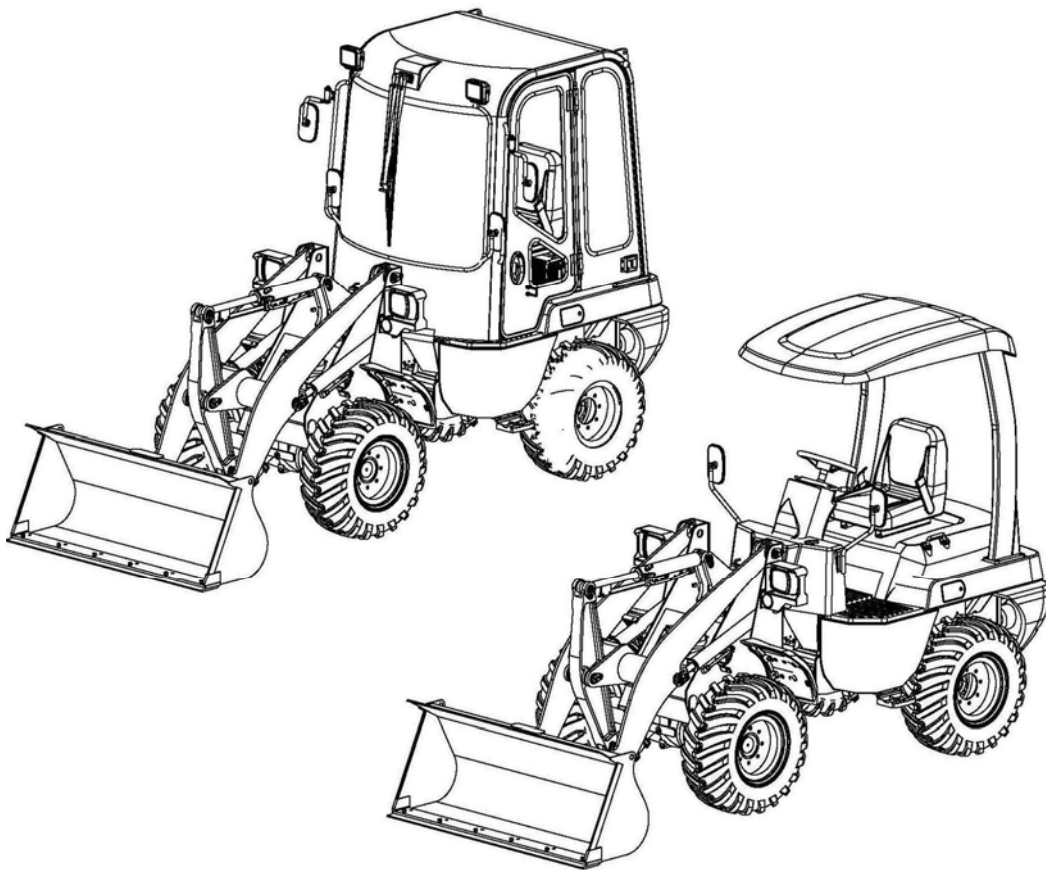
Operation Instructions

Please read it carefully.

It contains important operation guidance for safety.

KDD03/05/06/08/10

Loader



Foreword

Operation and Maintenance Instructions of KDD Wheel Loader is prepared for driver and servicemen of loader. It introduces operations of loader and contains some safety information. Therefore all operators, servicemen and management staff must read and understand it thoroughly so that loader can be operated effectively and safely.

Driver particularly shall read it carefully and operate the loader as specified herein. Operation and maintenance of diesel engine and other auxiliary components as well as selection of spare parts are described in respective Operation and Maintenance Instructions of Diesel Engine and Manual of Spare Parts as attachments. Instructions of loader must be attached with loader for possible usage reference.

We hope that driver can be aware of the importance of correct operation and periodic maintenance, which benefits the performance of functions, extends the duration, reduces unnecessary loss and creates better economic income for you.

Instructions will not be altered unless there are some great changes and it must be reprinted with improving and upgrading structure and technical performance of loader. If there is any discrepancy between loader and information herein, conditions of received loader shall prevail. Please note any revision or addition in reprinted Instructions in the future and thank you for understanding.

Your suggestions or comments on the Instructions and/or improvement of loader such as structure are warmly welcomed. Please mail them to us at any time. Then we can advance the quality of loader and serve you better.

If there is any doubt or question, please contact Sales Department of Wuxi KIPOR Machinery Co., Ltd. or your agent.

Wuxi KIPOR Machinery Co., Ltd.

Contents

1. Notes to Safety	
1.1 Basic information	1
1.2 Notes to pre-start	2
1.3 Notes to operations	2
1.4 Notes to post-operation	4
1.5 Notes to maintenance and service	4
2. Components and Safety Labels	
2.1 Components	6
2.2 Label	7
2.3 Maintenance of safety labels	9
3. Operation of components	
3.1 Safety components	10
Start the engine at the neutral position	10
Lock button of operating lever of bucket	10
Stop brake	10
Lock connection	10
Support of lifting cylinder	10
3.2 Name and function of components	11
Start key (stop with start lock)	12
Operating lever of forward and backward	12
Switch of turning lamp	12
Horn button	12
Fuse box	12
Instruments	12
Simple measures	13
Switch of head lamp	14
Switch of stop brake	14
Switch of high/ low speed shift	14
Alert switch	14
Throttle pedal	14
Brake pedal and pedal of stable movement	14
Fuel tank cover On/off	14
Operating lever of bucket	14
Lock button of operating lever of bucket	15
Automatic resetting of bucket	15
3.3 Leveler of bucket	15
Engine hood ON/OFF	15
3.4 Engine hood ON/OFF and driver's seat ...	15
Engine hood ON/OFF	15
Adjustment of driver's seat	15
Document box	15
3.5 Operation of cab	16
Door ON/OFF	16
Cab lamp	16
Buttons of windshield wiper and cleaner	16
Safety belt	16
4. Using and adjusting loader	
4.1 Running-in driving (operating new car)	17
4.2 Check before driving	17
4.3 Start engine	17
4.4 Start when it is cold	17
4.5 Preparation at low temperature	17
4.6 Precautions after operation in low temperature	18
4.7 Check after starting	18
Precaution of overheat	18
4.8 Stop motor	18
4.9 Start, drive and stop	19
Start	19
Changing speed	19
Rotate	19
Precautions during driving	19
Stop	20
4.10 Using method of soft moving pedal	20
Operation of soft moving pedal	20
Suitable operation method	20
4.11 Main operation using the loader	21
Digging and loading	21
Filling operation	21
Soil preparation	21
Loading on the truck	21
4.12 Exhaust of the fuel system	22
4.13 Exhaust of the brake fluid system	22
4.14 Replace shovel	22
5. Maintenance	
5.1 Check	23
5.2 Inspection before starting up	23
Check and filling of cooling water	25
Check list before starting up	24
Check and fill of engine oil	25
Clean and inspection of vehicle embedding in soil or marsh	25
Check and filling of hydraulic oil	26

Check and fill of fuel	26
Check and filling of oil level in brake fluid cup ..	26
Check of cleaning agent in windshield washer	26
Grease filling position at working machine of shovel	26
Grease filling on universal joint	27
Grease filling on center pin	27
Filling grease on shaft of connection device	27
Filling grease on steering cylinder pin	27
Check of tyre pressure, wearing, damage and loosened bolt	27
Check working of steering wheel	27
Check contamination and damages of license plate	27
Check each lamp and instrument	27
Check working status of horn	27
Rear mirror check	27
Oil or water leakage check	27
Check and cleaning of cooling fan and engine oil cooling fan	28
Check effectiveness of parking brake	28
Check function of brake pedal	28
Check and tightening each bolt and nut	28
Check for electrical wiring for any disconnection, short circuit and loosened joint	28
Cleaning of batteries, wiring and silencer	28
5.3 Precaution for vehicle washing	28
5.4 Periodic inspection and maintenance	28
List of period check and maintenance	29
5.5 Check and maintenance every 50 hours	30
Battery check	30
Drainage in fuel	30
Water drainage of oil-water separator	30
Replacement of element of engine oil filter	32
5.6 Check and maintenance every 200 hours ..	31
Check and adjusting of tension of fan belt	31
Check radiator pipe	31
Cleaning and check off air filter element	31
5.7 Check and maintenance every 250 hours ..	31
Check and tightening of nuts on tyre hubs	31
Replacement of engine oil	31
5.8 Check and maintenance every 500 hours ..	32
Replacement of suction filter element in hydraulic oil tank	32
Check and filling of oil in differential case at front	

and rear half shaft	32
Replacement of element of oil return filter	33
5.9 Check and maintenance every 1000 hours	33
Replacement of engine oil in differential case at front and rear half shaft	33
Replacement of oil-water separator filter	33
Replacement of hydraulic oil in working oil tank ..	34
5.10 Maintenance every 1000 hours or one year	34
Replacement of element of air filter	34
5.11 Check and repair once every 2000 hours ..	34
Check of DC generator and battery motor	34
5.12 Check and repair once every two years ...	34
Check and replace of pipes	34
Using method of antifreeze	35
5.13 Use of tyres	35
Tyres maintenance	35
Tyre pressure	35
Replacement of tyre	35
Installation direction of tyre	35
5.14 Check and use of batteries	36
Check and maintenance of battery	36
Precaution while battery charging	36
Check of battery fluid level	36
5.15 Periodic replacement of safety parts	37
5.16 Maintenance for long-term storage	37
Replacement of radiator pipe	34
Replacement of cooling water	34
5.17 Check of electrical wiring and use of fuse	37
Fuse replacement	37

6. Reason and solution

6.1 Engine failure	38
6.2 Driving	39
6.3 Hydraulic	40
6.4 Pulling method when failure occurs	41

7. Attached table

7.1 Main technology parameters	42
7.2 Recommended lubricate oil, lubricate and fuel	44
7.3 Selective parts and assistant tool	44

1. Notes to Safety

Please read the Operation Instructions carefully and understand it thoroughly before use. Following notes shall be observed for safety concern. In addition, it contains information on Danger, Warning and Caution.

※ Nevertheless it may contain some information not corresponding to your product. Please understand it (if any).

1.1 Basic information

1) Please read it and understand it thoroughly before use in order to ensure safe driving.

2) If the loader is lent to others, instruct the user operation methods in details and to read the Operation Instructions carefully in advance.

3) Do not make mechanical modifications willfully because it is dangerous. Otherwise unexpected incidents may occur and damage the safety of loader.

4) Wear safety helmet, shoes and clothing during driving, check and maintenance. If required by specific jobs, wear goggles, dust-proof respirator, sound-proof device, protective gloves, safety belt and others. However confirm functions of protective articles in advance. Keep the driving seat clean around. If there is any oil, grease, ice, snow or mud on the step or rail, driver may fall. Additionally check if mud or any foreign matter at the sole.

5) Please carry out pre-start check.

- Check if early operation causes such abnormal changes as oil/water leakage, loose bolt, nut or connection and broken wire on mechanical parts. Resolve abnormality (if any) immediately.

- Use specific fuel and grease.

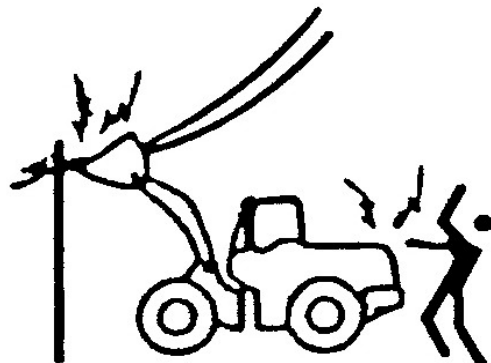
- Check pneumatic pressure, wear-out and damage of tyres.

6) Lubricate the loader. Stop the running engine during check and regulation. Forbid the open flame when filling the fuel and prevent the overflow of fuel.

7) Do not lift or drive any person with bucket of loader.

8) Forbid persons under lifting bucket.

9) Do not touch overhead wire or obstacles when lifting up the bucket. Touch may cause electric shock even death.



10) Do not drive it if driver drinks alcohol, takes some medicine or is unwell. Otherwise unexpected incidents may happen.

1.2 Notes to pre-start

- 1) Hold rails tightly to avoid the slip. Do not jump on or down the loader. It is danger! Do not hold operating levers when entering or leaving the cab.
- 2) Adjust the seat properly. Improper seat causes wrong operation and fatigue even unexpected incidents.
- 3) Please check followings before starting the engine.
 - Check if any person is around the loader.
 - Sit in the driver cab before startup.
 - Check if operating levers are at the neutral position
 - Check if shovel touches the ground and stop brake is normal.
 - Check if any inflammable materials around the engine.
- 4) Check working conditions of bucket, moving arm, driving and turning after engine starts in place free of person and block. If any abnormality, settle and repair it.

1.3 Notes to operations

- 1) Sit in the cab and drive the loader correctly. Do not gaze around, jump on or down the cab during driving. Forbid unessential operators in the cab.
- 2) Do not use it for unintended applications. Otherwise it may not only damage the loader but also cause unexpected incidents.
- 3) Check if the loader is exposed to any danger before start. Increase the rotation speed of engine and drive the loader slowly. Do not start and drive the loader quickly.
- 4) Prohibit the entry of any person in the operating area.

- 5) Fix the bucket tightly when loader runs on the road or a long distance. Unintentionally touching the operating lever will change the pose of running loader, leading to incidents. The correct pose of running loader is to keep bucket about 40m above the ground.
- 6) Abnormal drive such as quick start, brake, rotation, driving in the zigzag form and high speed will contribute to the turnover of loader and cause serious injury even death. In particular, quick rotation of loader at high speed can cause the turnover to side. It is extremely dangerous.
- 7) Lower the bucket as much as possible when loader delivers the sand to keep the center of gravity at a low level. Loader cannot keep the balance if bucket of running loader is raised beyond the upper limit. Loader is exposed to the danger due to higher center of gravity.
- 8) Uneven operating area may contribute to one factor of turnover incident. Therefore select the flat operation ground for driving. If there is any stone or obstacles on the route, do not pass it by inclining loader or at high speed. Such incorrect operation may lead to turnover. The correct way is to reduce the speed and run across an obstacle when stability of loader is ensured. Check the capacity of load of bridge or structure before loader drives on it. If capacity of load is insufficient, strengthen it.
- 9) Avoid any operation along a slope as much as possible. Loader will lose balance and be exposed to danger if excavating the inclined section.

10) According to Rule for Labor Safety and Health, machine must be provided with protective cover if it is used for application that labor is exposed to hazard such as falling stone. In such dangerous situation, do not use machine without protective covers.

11) To ascend an abrupt slope, select the Backward and keep the loader stable. Drive the loader slowly and lift the bucket about 20-40cm above the ground. To descend a slope, select the Forward and keep the loader stable. Drive the loader slowly with bucket close to the ground.

12) Do not make a turn on a slope as much as possible. Make a turn on the flat ground if possible.

13) Drive the loader at the relatively low speed in the confined space, room and place with stored matters. Meanwhile pay attention to surrounding conditions.

14) Consider the possibility of collapse when loader moves along cliff or abrupt slope. Strengthen it or take other appropriate measures if necessary. It turns more dangerous after it rained. Do not approach such places willfully and position where stone may slide down.

15) Soft ground may catch tyres, leading to imbalance. In such case, check the capacity of ground before operation. If loader descends a slope or slides to side and ground is soft, lower the bucket immediately as brake.

16) When loader drives or brakes on the snow-covered or frozen ground, skid or lateral slippage may occur. Do not carry out quick brake, start, rotation and other dangerous actions. Front wheels are typically furnished with anti-skid chains. In case of jobs under snowy conditions or requiring traction, both front and rear wheels must be fitted with anti-skid chains.

17) When speeding down a slope, do not brake wildly.

If pressing down the "low-speed securing" button, speed descends and shifts rapidly when loader drives at the high speed. Then rear section of loader may be lifted a little and float. Sometimes it causes danger. Reduce the rotation speed of engine and shift slowly.

(1) Stop the engine when descending a long slope. In such case, trigger the "low-speed securing" button and brake of engine at the same time.

(2) Operate the brake pedal for over-speed.18) Do not operate the Stop Brake when loader is running. Sudden stop is extremely dangerous.

19) It is very likely to happen that loader slides to side or loses the balance in case of inclined connection. It poses a great danger.

20) The steering wheel of loader is different from that in car. It cannot return to original position automatically after it is operated for turning.

Thus reset the steering wheel manually

21) If any tyre bursts, operate the loader as emergency stop or lower the speed mildly but not work the steering wheel in a hurry.

22) Goods may fall down to one side of cab if loader operates unstable goods or jobs at a relatively high level. Therefore do not lift bucket too high or lean back when loader operates unstable goods.

23) Turnover is very likely to happen due to counterforce in case of abrupt descending or emergency stop, particularly it is loaded.

24) Know positions of cable, gas pipe, running water pipe, sewer and other underground facilities before excavation.

25) Excavation under cliff is exposed to collapse, falling stone and other possible great risks.

26) Indoor job may generate the waste gas and cause toxic conditions. Ensure sufficient ventilation for indoor jobs (in the shelter). Check the loader outside in advance.

1.4 Notes to post-operation

- 1) Park the loader on the flat ground. If loader has to be parked on a slope, bucket shall fall down to the ground. And place stop blocks around wheels.
- 2) If driver leaves the cab,
 - Bucket falls to the ground.
 - Stop the engine and move operating lever to release the pressure.
 - Place operating lever of forward and backward at the neutral position and lock the operating lever of bucket at the neutral position.
 - Take away the triggering key.
- 3) Before storage, cool the silencer and other hot parts then close the protective hood. Otherwise it may cause fire accident.

1.5 Notes to maintenance and service

- 1) Check and clean the loader and operating parts. Stop the engine before each check, adjustment and leave. It is dangerous to check the running loader. Carry out any check at safe, solid and flat ground.
- 2) During check and maintenance, identify the serviced part with Label "In check and maintenance" in order to avoid unessential person from touching or operating the loader. Place some warning marks around the loader.
- 3) Do not use materials that easily ignite fuel or battery during mechanical maintenance and fuel supply.
- 4) Ensure sufficient ventilation if maintenance is done indoor or at place with poor ventilation conditions. Local ventilation is a must when exposure to waste gas, fuel, cleaning oil and paint.
- 5) Use the approved service kits. Unapproved service kits will not only reduce the working efficiency but also cause injury.

- 6) Support and fix the engine hood and other components before maintenance and check around the engine.
- 7) Place the start button at Off position when welding the loader. Do not place hazardous materials between welding and earthing parts because welding may generate heat and cause the electrical spark. Otherwise energized cylinder, sealing bearing and other devices may pose danger.
- 8) Water in the electrical system can cause the short circuit or abnormality. Keep battery, sensor, connection and other electrical parts away from water.
- 9) Wear goggles and position the oil leakage with heavy board if leakage is found in a invisible small aperture. If oil touches the skin, it may irritate skin seriously. Seek for physicians immediately.
- 10) Cool the engine completely before check, addition or change of cooling water in the radiator. Silencer is hot just after engine stops. Touch can cause the injury!
- 11) Lock the operating lever before check and maintenance on the lifting bucket. Use the support of lifting arm to prevent them from descending.
- 12) Do not lift the loader with bucket before service and maintenance. Do not allow persons under lifted loader. If some persons have to work under the lifted loader, place the safety mat and support in advance to avoid unexpected falling. And lock the operating lever.
- 13) Do not use any tyre with serious damage. Otherwise it may burst.
- 14) Consult the distributor of tyre, inner tube and wheel rim for replacement and repair. (Replacement and repair shall be done by specially trained expert if possible.)



Please read the Operation Instructions carefully for safety.

15) Gas in the battery may cause fire and/or explosion.

- Do not produce the spark near the battery or keep the battery away from open flame.

- Do not check the battery by shorting two poles. Use the voltmeter or specific gravity meter for check.

- Do not charge the frozen battery. Otherwise it may cause battery explosion. In such circumstance, heat the frozen battery above 15°C in advance.

- When indicator turns red, please replace the battery.

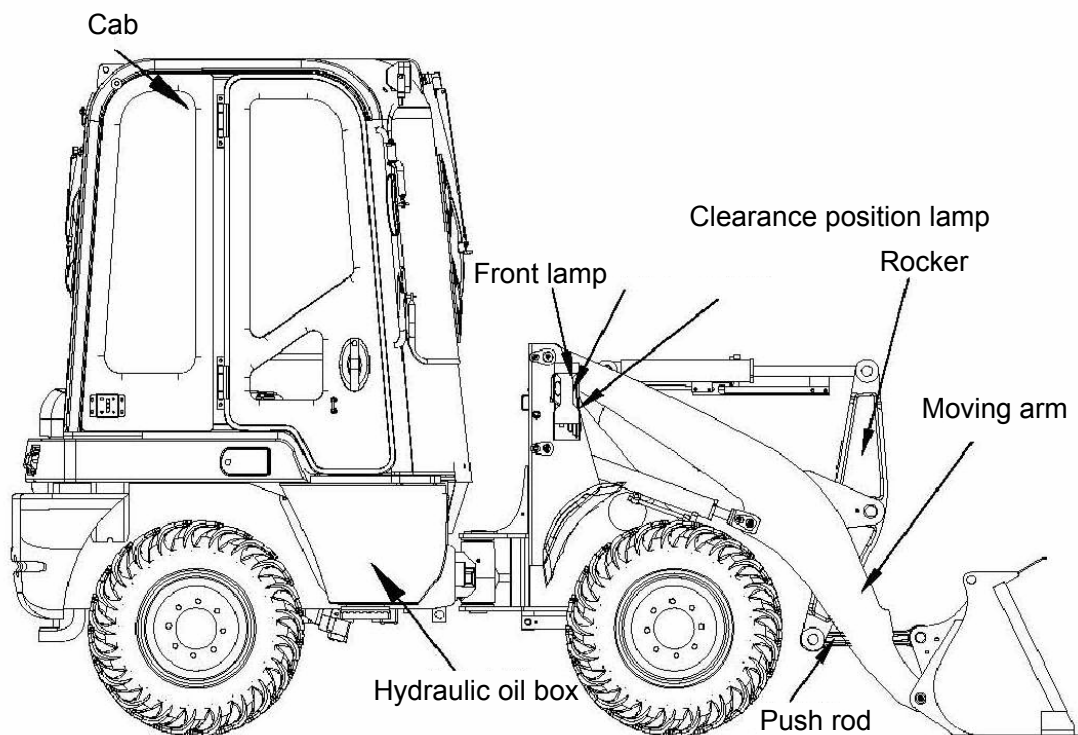
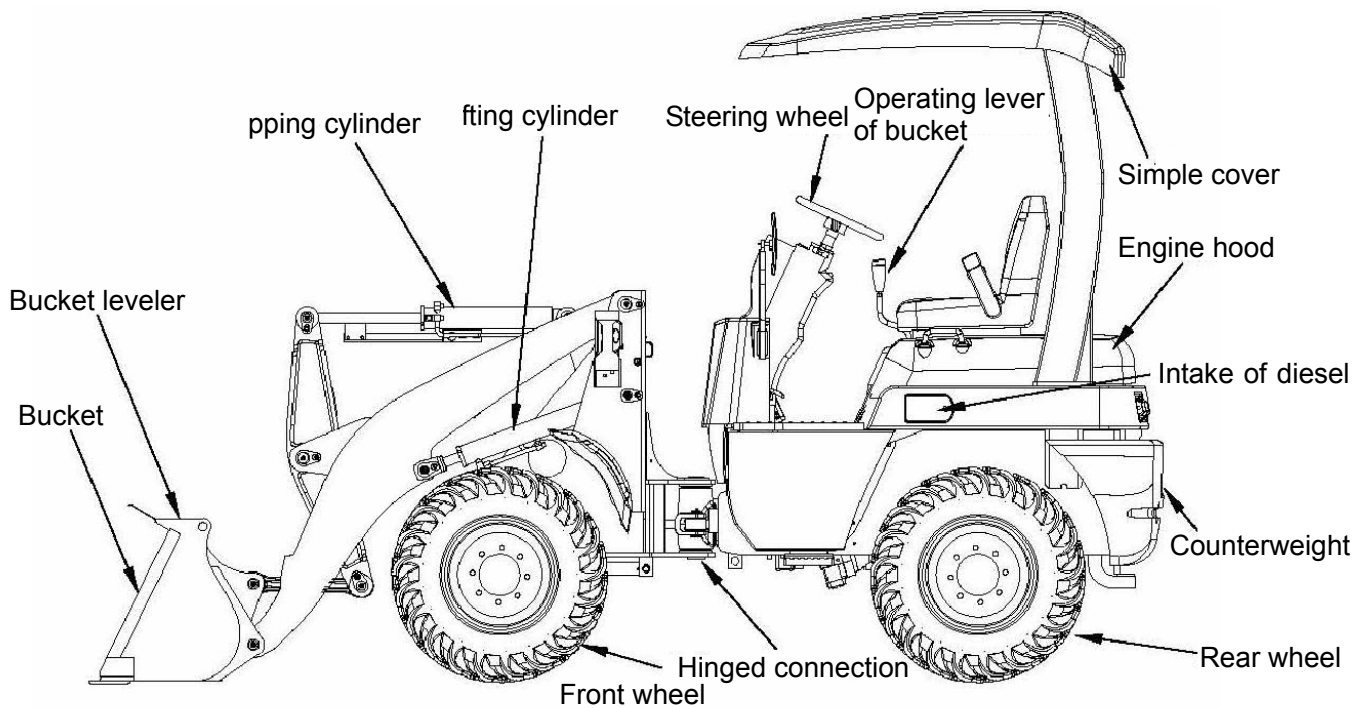
- Battery acid (thin H₂SO₄) can cause blindness or heat injury. Rinse skin or clothes with clean water if touching the battery acid. If touching the eye, wash eyes then seek for physician.

16) After the loader is started, all mechanical components, operating oil and lubricant are exposed to high temperature and pressure. Hot operating oil may cause scald. In addition oil spraying under pressure can penetrate the skin and cause serious injury. Ejected plugs and screws under pressure may also hurt persons. Therefore disassemble components in the hydraulic system after temperature fall down and pressure is released completely. Do not face any plug and/or screw to be loosened directly.

Do not stay near fuel and/or oil leakage because pressure is high. Touching oil and/ or fuel leakage is dangerous.

2. Components and Safety Labels

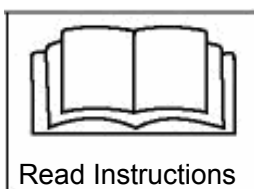
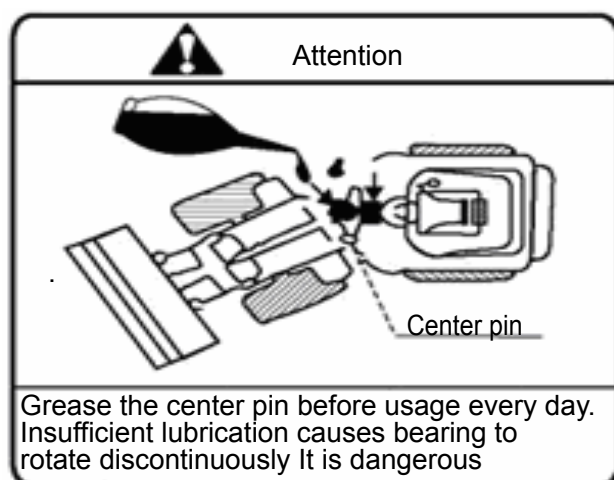
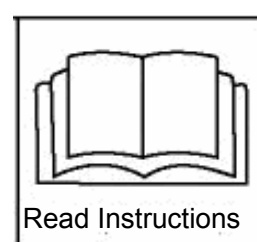
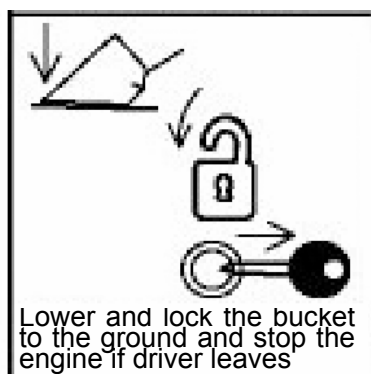
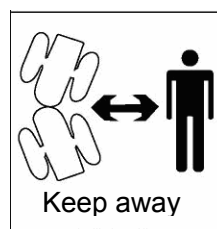
2.1 Components



2 Components and safety labels

2.2 Label

◆ There are many safety labels on the loader. Please read and understand them thoroughly before usage. Please read following information carefully.



2 Components and safety labels

Warning

According to Rule for Labor Health, the loader and auxiliary components cannot be used for unintended purpose. Read Instructions in advance and operate the loader safely.

- If the loader is used to lift goods as lifter, goods may fall down or loader may turn over. Forbid such dangerous usage.

Attention

Use special ISO VG32 brake oil but not common vegetable oil.

Warning



Please pay attention to followings during operation.

1. Sudden turning or rotation will cause turnover if bucket is lifted. Position the bucket as required during driving.
2. Turnover may occur when loader runs across a slope or changes the direction during running. Change of direction shall be done on the flat ground as much as possible.
3. Do not operate the loader near pool, reservoir, cave and other place exposed to risk of fall.

Attention

1. Read Instructions and understand the correct method of operation in advance.
2. Sound the horn to check if there is any person around the loader when engine starts.
3. Sit on the driver's seat and operate the loader.
4. Lower the bucket to the ground, trigger the Stop Brake, stop the running engine and take away the start key before leave.
5. Do not activate the Stop Brake when loader is running. Sudden brake poses a great danger.
6. It will be difficult to handle the steering wheel easily if engine stops when loader is running. Therefore do not stop the engine without reason.

Warning

· When loader is used to load or unload goods in a truck, please observe following practices for safety concern.

1. Load or unload goods at a high level.
 2. If access board is used, do not change the direction when loader is on the access board.
 3. The correct way of stop brake is to fit tyres with stop blocks and fix the loading space of truck and loader tightly with wires.
- Lock the operating lever and use the support of lifting arm for maintenance and check on lifting bucket in order to avoid the descent of bucket.

Warning

- Use the lock connection to fix front and rear carriages during maintenance, transportation and lift.
- Remove the lock connection and hide it as original when loader is on the way and in service. Loader cannot turn if carriage is fixed, possibly leading to injury incidents.



Scald



Not open



Scald



Not touch

2 Components and safety labels

2.3 Maintenance of safety labels

- 1) Keep the label clean. Do not contaminate or damage the label.
If there is any dirt on the label, clean it with soapsuds and dry it with soft cloth.
- 2) If loader is washed with high-pressure water gun, label may fall off. Do not inject the water stream directly against any label.
- 3) Order labels from your agent, if damaged or missed and apply good ones.
- 4) Clean any contamination and wait for dryness before sticking new labels on original positions correspondingly.
- 5) Replace labels with corresponding parts.

3. Operation of components

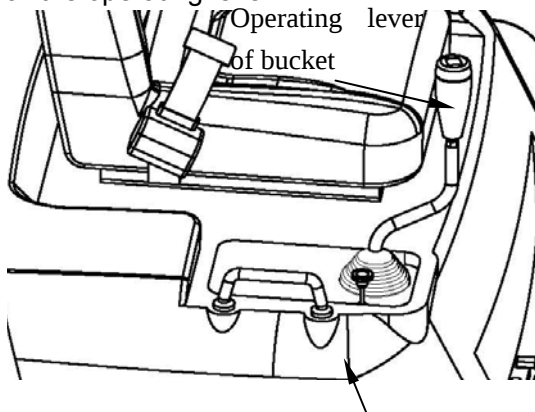
3.1 Safety components

■ Start the engine at the neutral position

It is the safety component to avoid the sudden start of loader when engine starts. It is allowed to start the engine only when forward and backward operating lever are at the neutral position. Return the operating lever to the neutral position in order to disconnect the loader with engine after parking.

■ Lock button of operating lever of bucket

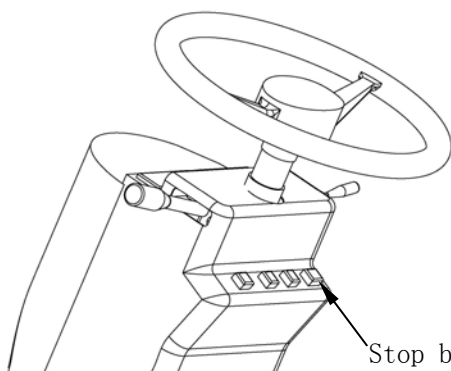
It is used to lock the operating lever of bucket. Place the operating lever of bucket to the neutral position and enter down the lock button to lock the operating lever.



Operating lever of bucket

■ Stop brake

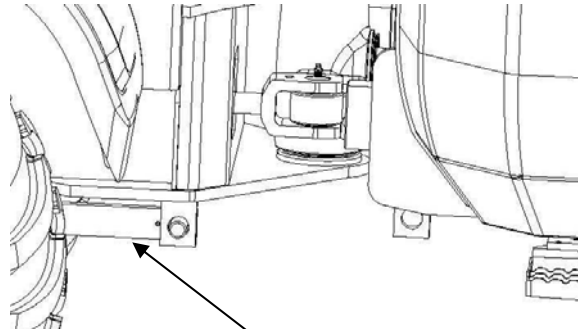
It is used to stop or park the loader. Stop brake is activated by pressing down the button of stop brake and alert indicator on the panel lights. It is mainly used when loader is stopped, serviced or transported or driver leaves the loader. Take all required measures for stop brake. Loader cannot start if stop button is not released.



Stop button

■ Lock connection

It is used to lock the front and rear carriages to avoid unintended turning of them during check, maintenance and transportation. Mount it on seats of front and rear carriages at the lower left and fix it with split pin. Then front and rear carriages are aligned. Remove the connection lock before loader drives normally and hide it in the front carriage. Drive with active lock connection will invalidate the steering wheel and lead to risks.



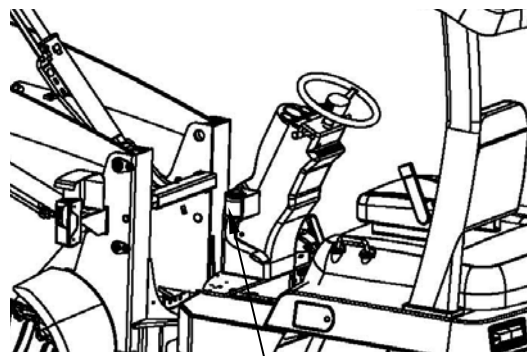
Hidden space

■ Support of lifting cylinder

It is used to support the moving arm during the check on lifted moving arm. It aims to prevent the descent of moving arm. It is hidden in the front carriage.

[Handling]

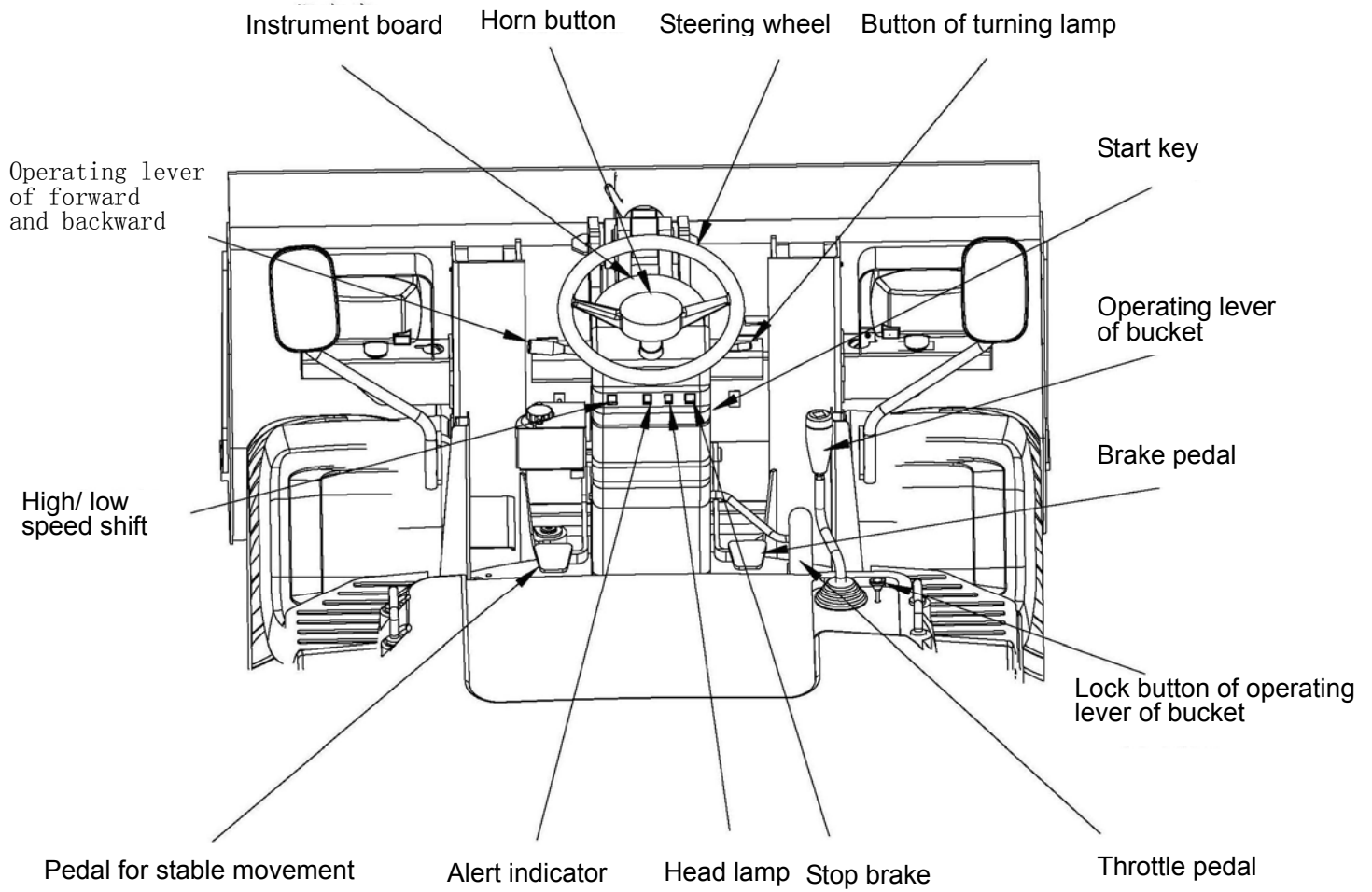
1. Raise the lifting cylinder to top.
2. Stop the running engine and take away the start key.
3. Raise the piston rod of cylinder to approach the support.
4. Insert the pin to fix it.
5. Lower the moving arm slowly till no gap is left.



Support device of lifting cylinder

3 Operation of components

3.2 Name and functions of components



3 Operation of components

■ Start key (stop with start lock)

- OFF

Insert the start key and disconnect all electrical units at OFF.

- ON

Turn the key to right from OFF to ON. Then all electrical circuits are energized.

- Start

Turn the key to further right from ON to Start, start motor rotates and engine starts.

Start key returns to ON automatically if it is released. Please release the start key after engine starts.

- Stop

Engine stops running when key is at OFF.

Additional information

- * When operating lever of forward and backward puts into gear, engine cannot start when neutral position is active. Operating lever must be at the neutral position when engine is started.
- * Sit on the driver's seat and start the engine.
- * Trigger the Stop Brake and take away the start key if driver leaves the cab.

◆ Operating lever of forward and backward

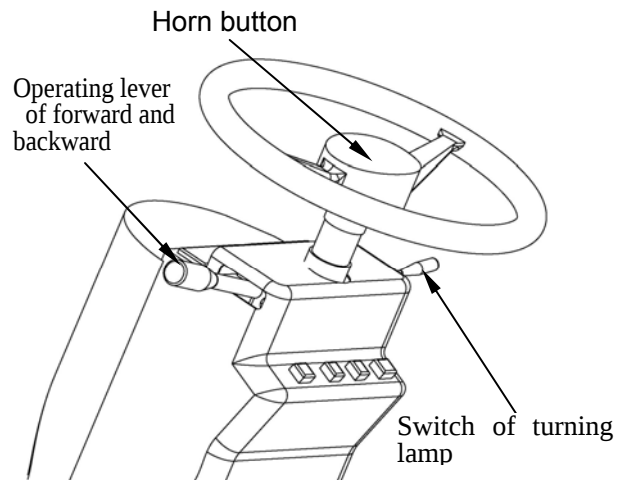
It is an operating lever to change the running direction of loader. Push the lever forward and loader runs forward. Pull the lever backward and loader runs backward.

Additional information

- * Place the operating lever at the neutral position when starting the engine.

◆ Switch of turning lamp

Turn the switch of turning lamp to left or right and corresponding turning lamp blinks. Reset the switch of turning lamp after loader turns left or right. Switch of turning lamp cannot return to the center automatically even if resetting the steering wheel.



◆ Horn button

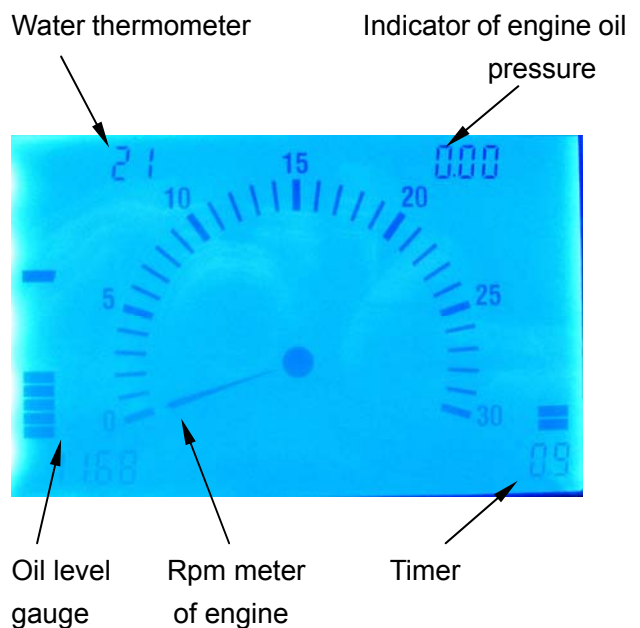
Press the center of steering wheel to sound the horn.

■ Fuse box

There are three 10A fuses, three 20A fuses and three 30A fuses as well as standby fuses in the box to guarantee the safety of electrical loop.

■ Instruments

Instruments can display values when loader starts. Instruments are in the middle of instrument board.



3 Operation of components

◆ Timer

Indicate the total runtime.

◆ Rpm meter of engine

Indicate the rpm of engine within one minute.

◆ Oil level gauge

When start switch is at ON, it will display the oil level in the fuel tank.

Importance

- If fuel level is too low, supply the fuel in advance. If fuel tank is empty, air will flow in the fuel system. In such case carry out the exhaust.

◆ Meter of water temperature

It displays the temperature of cooling water when start key is at ON and the real-time temperature of water when engine runs.

◆ Meter of engine oil pressure

It displays 0 when start key is at ON and the real-time pressure of engine oil when engine runs.

■ Simple measures



Indicator of head lamp

It lights when button of head lamp is operated.



Indicator of jammed air filter

It lights when air filter is jammed and start key is at ON. Check the air filter if it lights. It turns off when engine starts.



Indicator of charging

It informs the charging system of abnormality when engine runs.

It turns on when start key is at ON and turns off when engine starts. Illuminated indicator reminds the check on charging loop.



Indicator of jammed fuel filter

It lights when start key is at ON.

It turns off when engine starts. Check the oil/water separator when it turns on.



Indicator of engine oil pressure

It lights when pressure of engine oil is too low abnormally.

It lights when start key is at ON. It turns off when engine starts. Check the level of engine oil when it turns on.



Pre-heating indicator

It lights when start key is at ON and turns off in several seconds.

It turns off when engine starts.



Indicator of abnormal water temperature

It lights when water temperature is abnormal. In such case, carry out the check as follows:

1. If cooling water is empty or leaks
2. If fan belt is loose
3. If there is any soil or rubbish on the radiator

Stop the engine and cool it completely before check.



Indicator of turning

It lights when driver operates the turning handle and turns off when turning handle returns.



Indicator of abnormal oil temperature

It lights when temperature of hydraulic oil is abnormal. If it turns on, interrupt the job. Run the engine without load and wait until it turns off.

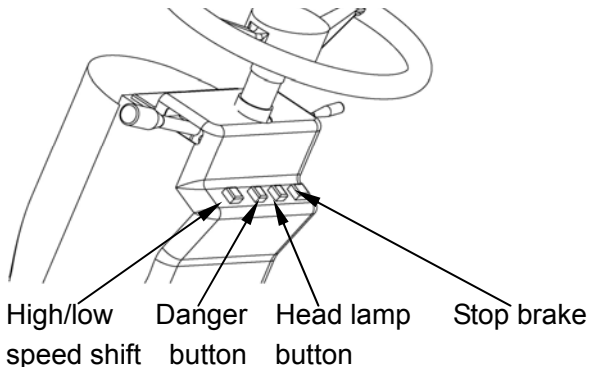
Importance

- * Daily check cannot be done just depending on simple measures.

3 Operation of components

■ Switch of head lamp

If driver holds the switch of head lamp, head lamp, clearance position lamp and panel turn on.



■ Switch of stop brake

Indicator of stop brake lights after it is pressed down to activate the stop brake. Then loader cannot run even if operating lever of forward and backward is operated. Re-press it and indicator turns off to release the stop brake.

■ Switch of high/ low speed shift

It is used to make a switchover between high and low speed.

■ Alert switch

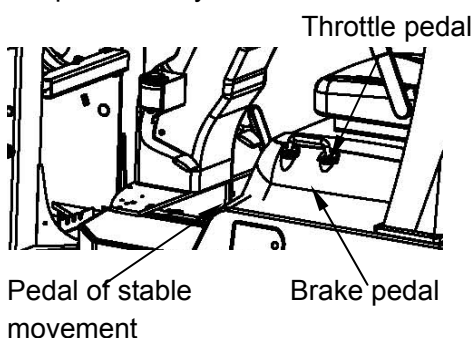
Turn on the alert switch when loader runs or stops on the road in order to avoid impacting person. Indicator of turning blinks if alert switch is held. Re-press the alert switch and indicator of turning turns off.

■ Throttle pedal

Operate the pedal to adjust the speed of loader and bucket in accordance with change in rotation of engine. Press down the pedal to increase the speed.

Additional information

- Start rpm of engine changes with conditions of ground. It is 1000-1200rpm normally if loader starts on the flat ground. Press down the pedal slowly to start the loader.

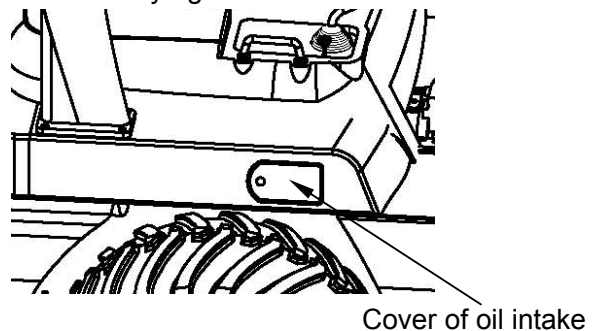


■ Brake pedal and pedal of stable movement

Hold the pedal to control the loader. As left and right pedals are linked, either of them can perform same control. Press down the pedal slightly and hydraulic system is in neutral. Special hydraulic brake is triggered and loader decelerates.

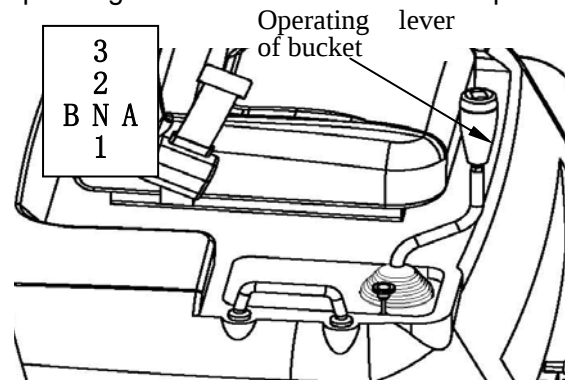
■ Fuel tank cover On/off

1. Insert the start key and turn it left to uncover the hood. Then turn the cover left and open it.
2. Turn the cover right and close it. And turn the start key right to close the hood.



■ Operating lever of bucket

Operating lever of bucket can complete all



actions of bucket and moving arm.

- 1 Lift the moving arm N At neutral
- 2 Descend the moving arm
- 3 Float (above the ground)
- A Turn over the bucket
- B Raise the bucket

3 Operation of components

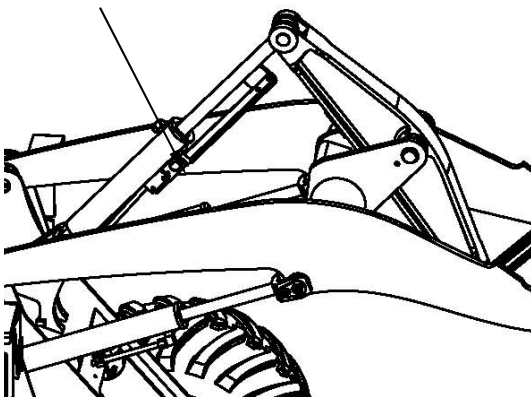
■ Lock button of operating lever of bucket

It is used to lock the operating lever of bucket. When operating lever of bucket is at the neutral position, press down the button forcefully to lock the operating lever.

■ Automatic resetting of bucket

When bucket is lifted to face upward, push the operating lever toward the lifting direction and operating lever will keep the position. Lift the bucket on the ground to face upward horizontally and operating lever automatically returns to N. Then descend the moving arm and bucket approaches the ground horizontally.

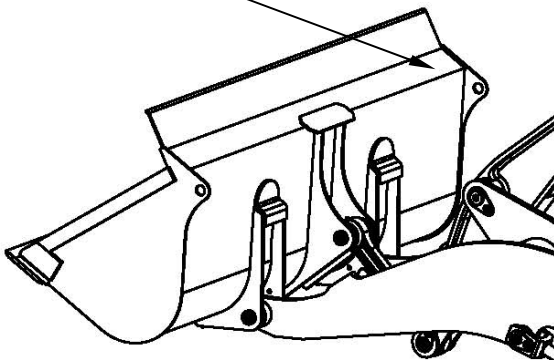
Automatic leveling sensor



3.3 Leveler of bucket

Leveler of bucket is in same wide as bucket so that it can level the bucket at left, right or center position. Align the surface of leveler and bottom of bucket.

Leveler

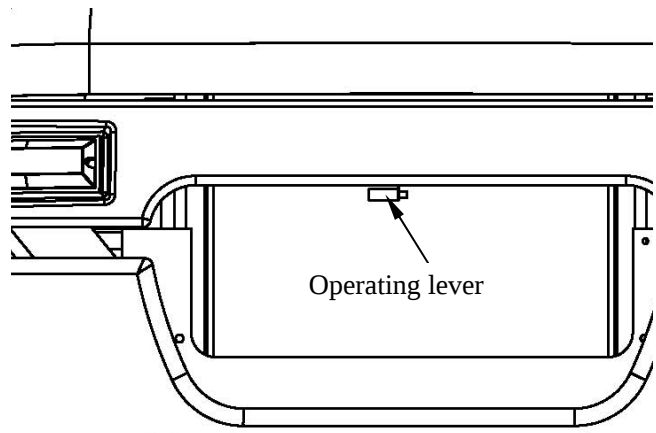


3.4 Engine hood ON/OFF and driver's seat

■ Engine hood ON/OFF

◆ Engine hood ON

Pull the operating lever upward and push the backrest of driver's seat upward. Engine hood is uncovered with driver's seat. Air spring can hold the uncovered engine hood. Therefore check if uncovered engine hood is held by air spring tightly before following operations are performed.



◆ Engine hood OFF

Lower the engine hood to level to close it.

■ Adjustment of driver's seat

1. Pull the adjustment handle of driver's seat when driver sits on the seat to move the seat forward or lean back.
2. Operate the regulating valve to driver's weight for seating comfort.

■ Document box

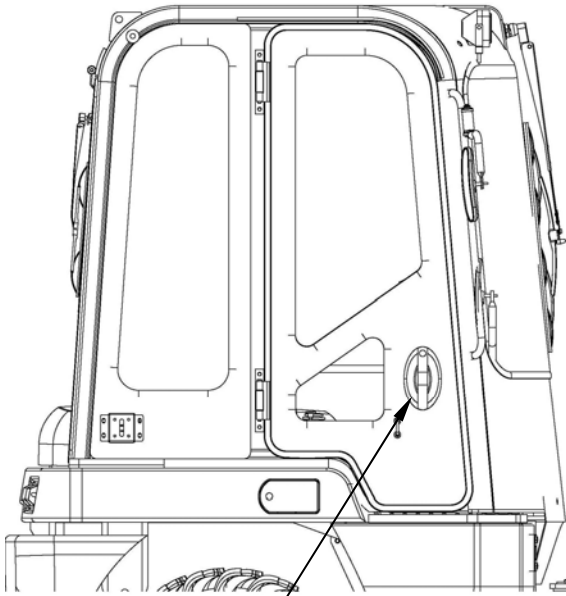
Document box is in the back of backrest and used to store Operation Instructions and magazines.

3 Operation of components

3.5 Operation of cab

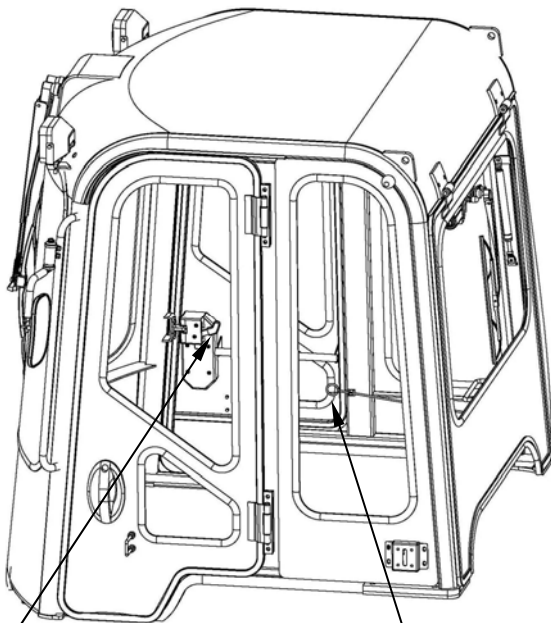
■Door ON/OFF

1. Unlock the door with key and hold the handle to open the door from outside. Push the door to the end and fix it.



Handle of door

2. Pull the lock and open the door from inside.



Lock

Fixed pull-rod

3. Work the fixed pull-rod to release the lock and turn off the door.

4. Lock the door if driver leaves the loader for a long time.

■Cab lamp

Cab lamp lights when both start key and button of cab lamp are at ON. Cab lamp is located at the ceiling of cab. It can be used as a switch to turn on or off the illumination too.

■Buttons of windshield wiper and cleaner

Press down the button of windshield wiper to trigger the motor when start key is at ON. Operate the button of windshield cleaner to activate the spraying cleaner. Even if start key is at OFF, spraying cleaner can work as described above.

- Do not operate the button of windshield cleaner if container of cleaning agent is empty. Otherwise it may damage the spraying pump.
- Windshield may be damaged if it is wiped without cleaning agent. Please spray the cleaning agent in advance.
- Check if rubber of windshield wipe is attached on the glass before usage in cold winter. If it is frozen, do not work the windshield wiper to avoid the damage of motor.

Buttons of cab lamp, windshield wiper and cleaner are located in the fixed panel of operating lever of bucket one after another.

■Safety belt

1. Adjust the length of safety belt and fasten it. Fasten the safety belt reliably when you drive the loader.

Chapter 4 Using and adjusting loader

4.1 Running-in driving (operating new car)

The new machine is delivered after fully adjusting and checking, but the wrong operation method at the beginning shall incur the reduction of performance ahead of time as well as the service lifetime. As a result, the first 100 hours (indicated by the manufacturer) is running-in driving.

4.2 Check before driving

1. Please take the check before driving (everyday before starting.)
2. Please make sure whether there are people around the machine.
3. Make sure the stop brake. Keep the forward and backwards handle bar and the shovel handle bar on [EMPTY]. Press the lock button to lock the shovel handle bar.
4. Whether the shovel is adhering on the ground.
5. Sit on the chair in right way. Try every pedal and handle bat. Adjust the chair to a comfortable position.

supplement

- * If the forward and backwards handle bar is not on [EMPTY], the center switch is on and the engine can not be started.

4.3 Start engine

1. Insert the key in the start switch.
2. Step on the accelerator pedal lightly.
3. Rotate the key to [ON] and the relevant indicating lamp of the instrument is on.
4. Rotate the key to "start"
5. After starting the engine, keep your hand away from the key. The key will return [ON] automatically.

Important

- * During the running of the engine, do not adjust the key to [start] for failure of the battery motor may incur.
- * For the battery is using high power current so try to avoid using it for more than 10 seconds continuously. Within 10 seconds, when it fails to start, switch it off and wait for more than 20 seconds and repeat the same operation.

4.4 Start when it is cold

1. Fully step on the accelerator pedal.
2. Rotate the start switch to [ON]. Preheat it for about 10 seconds after the lamp is off.
3. Rotate the key to [start].
4. After starting the engine, keep your hand away from the key. The key will return [ON] automatically.
5. After the engine revolution is increased, draw back the accelerator pedal bit by bit.

Important

*Even starting in cold days, stop the engine when the battery motor is used continuously and wait for within 30 seconds.

*As for the machine with heater, after starting the engine, step on the accelerator pedal for about 10 seconds to press the cycle of the warming water of the heater.

4.5 Preparation at low temperature

If the temperature is falling, the engine may be hard to start and the cooling water may freeze, so pay full attention to the operation of the machine.

1.Engine oil

Do replace the machine oil of the fixed viscosity.

2.Fuel

When the temperature is below -5°C 以 , please use No.-10 diesel oil or No. -20 diesel oil.

3.Battery

In low temperature, the engine electric power is decreased. If the battery is not fully charged, the battery fluid will freeze. As a result, after the operation and during stopping the engine, make sure the charge rate shall be above 75%, closing to 100% is preferred. Or pay attention to heat preservation and prepare for the starting in the following morning.

4.Cooling water

Please add antifreeze. During stopping the machine, if the temperature is below 0°C , add antifreeze in the cooling water; supply it in the radiator and backup box to avoid freezing.

4 Using and adjusting loader

• Table of the mixing percentage of water and antifreeze	-5	-10	-15	-20	-25	-30	-35	-40
Min. temperature (°C)								
antifreeze (%)	30	30	30	35	40	45	50	55
Amount of cooling water (%)	70	70	70	65	60	55	50	45

Important

- * Permanent antifreeze or long term preserved refrigerant is preferred.
- * letting out the cooling water, cleaning the watermark, add the mixed fluid of water and antifreeze.
- * No need to add antirust for the antifreeze contains antirust.
- * For the antifreeze is of incendivity, watch out the fire. If contacting skin, do wash with clean water.

4.6 Precautions after operation in low temperature

Clear the clay and water adhering to the machine. Keep the machine on the concrete ground or dry ground, especially the clay around the wheel, which may incur abnormal driving due to freezing. If there is no proper place to park the machine, place board or straw mat and park on it. If parking the machine directly on the earth, the wheel shall freeze on the earth in the next morning then the machine can not be driven normally.

Especially, wipe clear the drops on the surface of piston bar of hydraulic cylinder. If the drop and clay is taken into the cylinder, it may damage the airproof circle sometimes. Discharge the stored moisture in the fuel system by drainpipe to avoid freezing of moisture stored in the night.

4.7 Check after starting

1. After starting, take a 5 minutes warming machine running.

The performance of the engine and hydraulic oil can not be fully played when they are cooled. Do take the warm machine running before running the machine. Before the end of warm machine running, try to avoid urgently accelerated running of engine.

2. After the motor is warmed, do confirm the following items:

- ◎ Whether the engine oil lamp is off.
- ◎ Whether the battery charger lamp is off when increase the engine revolution.
- ◎ Whether the exhaust is normal in color, whether there is abnormal sound or vibration.
- ◎ Whether the pressure lamp of the hydraulic oil is off.

Any leak of oil, fuel or water.

◆ **stop the motor directly if any of the following occurs:**

1. Sharp drop or rise of the motor revolution.
2. Abnormal sound
3. Abnormal exhaust color.
4. The machine oil alarming lamp is on during the running of the motor.
5. The hydraulic oil lamp is on during the running of the motor.

Important

- * Having any doubt during inspection and maintenance, please contact the appointed service company and follow its instruction.

■ Precaution of overheat

Operate as following when the cooling water is close to boiling point or above (so-called overheat) :

1. Stop it in safe location.
(clear the load of the motor)
2. Do not stop the motor urgently but keep it rotating at medium speed. After cooling slowly, stop the motor.
3. Wait for 10 minutes or keep away from the machine when the steam is bursting out.
4. After the motor is fully cooled, solve overheating according to the [reasons and solutions of failure] and then restart the motor.

4.8 Stop motor

Keep the motor racing for 5 minutes or so. After cooling slowly and operate as following:

1. Move the bucket operation handle slowly and put the bucket on the ground.
2. Return the start key to [off] and make the motor stop running. Then pull out the key.

Important

- * Stop the motor urgently before it is cooled may decrease the service life of each part, thus urgent stop is not allowed except urgent situation.
- * The gun handle is of high speed so sometime the motor cannot be stopped. Please make the gun handle in low speed.

Important

- * Stop the motor urgently before it is cooled may decrease the service life of each part, thus urgent stop is not allowed except urgent situation.
- * Do not stop the engine immediately if it is over-heated. Run at medium speed and stop the engine after cooling it slowly.
- * Keep the forward and backwards handle bar on [EMPTY] when stopping, leaving or repairing machine and take the stopping brake. Keep the shovel contacting the ground, and keep the shovel handle bar on [EMPTY]; stop the engine. Press the lock bottom; make sure the shovel handle bar is locked. Do pull out the start key.

4 Using and adjusting loader

4.9 Start, drive and stop

■ Start

1. Adjust the lock bottom of the shovel handle bar on [OPEN].
2. Step on the accelerator pedal lightly and increase the engine revolution slowly.
3. Lift the shovel till it's 40cm high from the ground by handling the shovel handle bar. At the same time, keep the machine in driving position.
4. Relieve stopping brake.
5. Adjust the forward and backwards handle bar front or behind. Step on the accelerator pedal lightly and Increase the engine revolution slowly by the accelerator pedal. Meanwhile, start the machine slowly.

Note:

- * When starting the machine, do conform the situation around. Start after bulging and signaling.
- * After starting machine, make sure the brake and steering wheel is normal immediately.
- * When starting on a sharp ramp, on the low gear position, start slowly when stepping on the accelerator pedal lightly. Do avoid the machine moving backwards.

■ Changing speed

No need to stop the machine when changing speed with no gear←→ low speed and conversion of forward and backwards. Adjust the switch or forward and backwards handle bar to the expected position then all the above mentioned operation can be realized.

■ Rotate

During the driving, the machine rotates to the direction in which the steering wheel rotates.

1. The joint pin of the front framework and back framework is the center of the machine. Bending the front framework and back framework (front bridge and back bridge) as well as rotating the back wheel is through the same track the front wheel goes.
2. Rotate the sneering wheel light and cooperate with the rotation of the machine. When turning around completely, the sneering wheel reaches the end of the stroke, then do not rotate the sneering wheel till above the stroke.

- 3 For the steering wheel can not return automatically, the operation shall be completed manually.

Important:

- * Urgent rotation in high speed or rotation in sharp ramp may incur overturning of the machine, so do avoid such operation.

■ Precautions during driving

- * During the driving, if stopping the engine, the sneering wheel will be hard to control for the loss of power assistance. It is of special danger in the ramp. Do not stop the machine during driving.
- * On an aslant ground, when stopping the engine, though the stopping brake is automatically formed, step on the brake pedal immediately to make stopping brake for a caution. Then, adjust the forward and backwards handle bar on [EMPTY] and start the engine.

◆ Driving on ramp

1. If going down a long ramp, use engine brake. Using the pedal brake only will not only incur the wear and tear of the brake block ahead of time but also reduce the performance of the brake sharply due to radiation, which may incur unexpected danger.
2. When going down the ramp, pay attention to the over speed of the engine, which incurs failure of the engine. If over speed occurs, use the brake to go down the ramp.
3. For the inclined surface, going up and down aslant may incur lateral skidding.
4. On a ramp, the speed downhill is the same with the speed uphill.

◆ Driving on uneven ground

Drive at low speed on uneven ground and try to avoid turning urgently or frequently.

◆ Driving on icy or snowy ground

It is necessary to install tyre chain fittings if driving on icy or snowy ground. After the operation, do clear the ice and snow on the tyre chain.

4 Using and adjusting loader

◆ Note the allowable water depth

During operation in water, after conforming the airproof of each plug and piston, use the machine in the depth range of the differential shell.

Important

- * After the operation, do clean the clay on the machine and wash the machine. Then add oil and grease on the pivots.
- * During operation on the beach, pay special attention to washing the machine and cleaning the salt. Keep the electric assembly line in a good manner to avoid corrosion.

■ Stop

Avoid urgent stopping. Try to stop the machine slowly.

1. Keep your feet away from the accelerator pedal and the pedal will return the original position.
2. Step on the brake pedal and stop the machine.
3. Adjust forward and backwards handle bar on [EMPTY].
4. Do the stopping brake by stopping brake switch.
5. Adjust the handle bar of shovel on [FALL] and fall the shovel on the ground.
6. Adjust the lock bottom of the shovel on [LOCKED].

Supplement:

- * Choose the flat ground of good stand and avoid the dangerous place when stopping the machine. If having to stop the machine on a ramp, use fixed cushion on the wheel and keep the shovel contacting the ground.

4.10 Using method of soft moving pedal

Use the soft moving pedal effectively and properly according to the work site.

■ Operation of soft moving pedal (Micro drive pedal)

Use as the following way according to the goal.

◆ stopping the car during operation

1. The pedal is linked with the spouting amount control and brake of the hydraulic system pump.
2. During operation and to stop the machine safely, first, step on the pedal lightly. The hydraulic pump system enters [MEDIUM], and the machine will be stopped with decreased speed.
3. If more fully stepped, the main brake status is formed to stop the machine safely.

◆ Approaching the object

1. Gunning the engine and stepping on the soft moving pedal can approach the object.
2. If do not using the soft moving pedal, stepping and adjusting the gun pedal can approach the object.

◆ When digging deeply and off and on

1. Repeat deepening operation by soft moving pedal.
2. Fully step on the pedal and let the pedal return quickly. Adapt the pedal, and then the hydraulic pump reaches the medium status and spouts repeatedly. Do the operation thoroughly, off and on.

■ Suitable operation method

◆ Loading operation

1. Stepping on the soft moving pedal, approaching the object slowly. Only stepping and adjusting the gun pedal can approach the object slowly.
2. During the course of approaching the object by soft moving pedal, when using the shovel, operate with the engine rotating highly; the speed of the shovel will not be reduced
3. Step on the soft moving pedal on the midway; after approaching the stopping position slowly, fully step on the soft moving pedal to stop the machine safely.

◆ Filling operation

1. Step on the soft moving pedal on the midway; after approaching the stopping position slowly, fully step on the soft moving pedal to stop the machine safely on the object position.
2. If the outside load is increased, the speed of the machine will be decreased automatically to avoid stopping the machine.
3. During trapping, if the outside load of the shovel is released, the rotation of the wheel will return the original status.
4. To avoid wrong operation around the filling hole, step on the soft moving pedal and center the power on the working fittings and operate safely.

4 Using and adjusting loader

4.11 Main operation using the loader

Here, notice the basic operation using loader. In addition, by using a variety of subsidiary devices, open up new and practical operation. Pay attention to the following issues:

- * When loading soil with shovel, sudden rotation and brakes to lift the working fittings may cause rollover, so such a similar operation is prohibited
- * When digging with shovel, do not load just with one side of the shovel.
- * Never dig during the connecting state (when the machine is bent) for deepening.
- * When moving, keep the center of gravity as low as possible, about 40cm high from the ground.
- * When transporting sand on ramp or inclined surface with sand loaded, drive forward up and backwards down.
- * Usually, the work site should be cleaned up to flat ground.
- * Plugging and digging in high speed is very dangerous. Do avoid such operation.

■ Digging and loading

◆ Loading of accumulated sand

1. Adjust the knifepoint of the shovel level; push it into the accumulated sand when the machine is moving forward.
2. Fully plug the shovel into the sand and pull up the shovel when the machine is moving forward.
3. Shake the knifepoint up and down if it is not fully plugged into the sand.

◆ Digging and loading in a level state

1. Adjust the knifepoint of the shovel a little down from level; descend the shovel and dig down when the machine is moving forward. The proper digging depth at one time is 10~15cm.
2. Adjust the knifepoint up and down; meanwhile take the lifting operation and digging forward. At the same time, shell of sand at a time.

■ Filling operation

1. Adjust the knifepoint of the shovel level, facing the channel, move the accumulated sand.
2. Adjust the knifepoint of the shovel level facing the middle of the channel, then lean the shovel to pull the sand into the channel.

■ Soil preparation

1. Turn and swing the shovel repeatedly, and then turn the shovel strictly. Dispel the sand in the shovel during moving backwards the machine.
2. Secondly, turn the shovel to keep the knifepoint contacting the ground. Prepare the ground by scratching the ground and moving backwards.
3. Keep the shovel level. Place the handle bar of the shovel on the loader framework and keep it on [FLOATED]. Prepare the soil by moving backwards.

■ Loading on the truck

Conform the work site and choose the method of the least rotating and moving distance and the highest effect.

◆ Across loading

1. As for the deepening of loader, place the truck at the position of 60° and keep the truck waiting.
2. After digging and deepening by shovel, move backwards directly, then the truck is between the loader and the accumulated sand; load the sand.
3. This method takes the least time of cycle and of the highest effect so the time spending on loading is the least.

◆ V-type shifting loading method

1. As for the deepening of loader, place the truck at the position of 60° and keep the truck waiting.
2. When digging and deepening by shovel, moving backwards and control the sneering wheel, facing the truck, forming an upright angle. Move forward the truck again and place it on the truck.
3. Operate in a small angle is to reduce the cycle time which is the most effective way.

4 Using and adjusting loader

4.12 Exhaust of the fuel system

If the engine is running till the fuel runs out in the fuel tank, then do exhaust according to the following rules when adding fuel the next time. If not, the air will enter the oil pump, and the fuel can not be spouted so that the engine can not be started.

Exhaust in the same way when changing fuel filter.

1. Add fuel in the fuel tank.
2. Rotate the start switch right, the electromagnetic pump will work with the main switch and feed fuel.
3. Exhaust for about 10 seconds then start the engine.

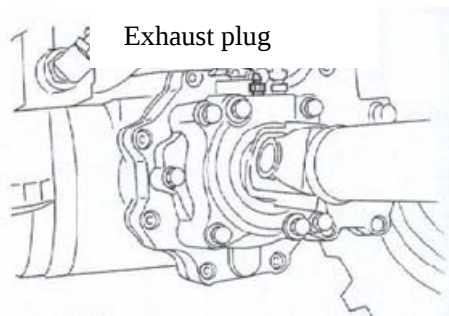
Supplement

* If the air is not fully exhausted in one time, the engine may stop automatically after starting. Then, repeat the above mentioned 2~3 operation.

4.13 Exhaust of the brake fluid system

After separating and repairing the brake, or reducing the brake fluid, or when air is mixed in the brake loop, do take the exhausting operation. (operate by 2 operators)

1. Fill the brake fluid cup with brake fluid.
Make sure the cup is half full of fluid before exhausting.



2. Take off the cover of the exhaust plug of the differential brake box. Plug a 1m long plastic pipe in the plug. Then collect oil from the top outlet.
3. Loose the exhaust plug by spanner; step on the brake pedal slowly and exhaust. If there is no bladder coming out from the pipe, draw back the pedal slowly.
4. If the air is not fully exhausted in one time, repeat the operation 3 till the air is fully exhausted.

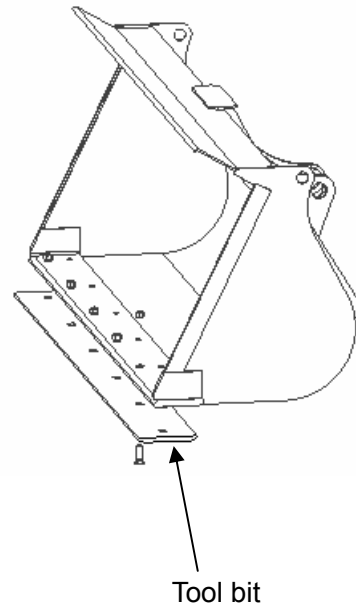
5. If the bladder is exhausted, fasten the exhaust plug fully and install the cover.
6. Add fixed amount of hydraulic work oil ISO VG32 in the brake fluid cup. The characteristic of fluid differs from different manufacturers, so do add the oil of the same brand.

4.14 Replace shovel

Replace shovel according to the following rules.

■ Replace shovel

1. Lift the shovel till a proper position for discharge.
2. Press the shovel lock bottom.
3. Loosen each bolt and replace each tool bit.



Supplement

* If delaying replacing, the tool bit shall be damaged. Replace the tool bit as soon as possible.

Chapter 5 Maintenance

5.1 Check

In order to use this machine safely and prevent any troubles, please carry out frequent check and periodic maintenance before use. The time in this instruction book is stipulated by manufacturer. Therefore, your maintenance shall be subject to this time point.

■ General instruction for maintenance and check

1. In case of any difficulties or confusion, please consult your local distributor or appointed company for detailed structural functions.
2. Clean up the vehicle for check any abnormalities. Particularly those grease filling parts and engine oil gauge to prevent any impurities from entering. And prevent water splashing on electrical device.
3. Select clean place to check and replace engine oil and apply clean containers to prevent any impurities.
4. Park the vehicle at smooth ground, check its oil level and fill in fuel. Please use the grease with same brand name.
5. It's dangerous to drain oil or water or replace filter immediately after parking; so carry out these after complete cooling. In case of cold engine oil, warm up it slightly and then drain it out.
6. Carry out exhaust operation after replacement of oil or filter element.
7. For filling opening with filter screen, do not remove the screen and fill.
8. Clean up the used lubricant after filling. Any sands or wastes adhered on machine may accelerate wearing.
9. When carry out engine oil and filter replacement, check drained oil and used filter for any metal powders and impurities.
10. Please apply incombustible cleaning agent or light oil for cleaning of parts.

■ Safety precautions for maintenance

- * Prevent poisoning of exhaust gas while the motor is working indoor. Pay special attention to ventilation measures.
- * Do not carry out check or maintenance during driving of vehicle or working of motor.

- * Before check or maintenance, put front and rear operation rod at [Neutral position] and parking brake. Let the shovel contact with ground, and put shovel control rod on [Neutral position] to stop engine working. lock shovel control rod with locking button and pull out the starting key.

- * Lock connecting rod with connection device and fix front support (front bridge) and rear support (rear bridge).

- * Install fixed cushion on wheel.

- * Remove connection of battery joint while carrying out check and maintenance of electrical system.

- * Do not use scrub tools instead of appropriate ones.

- * No smoking while check and maintenance of fuel system of filling fuel.

- * Keep cloth with grease and combustible oil at safety place without smoke.

- * Wear helmet, safety glasses, respirator and other safety protection device as per check and maintenance instruction.

5.2 Inspection before starting up

Carry out inspection of machine before starting up to prevent any troubles.

1. Walk around the vehicle and check for any trails oil and water leakage. In case of any leakage (joint of high-pressure pipe, hydraulic cylinder and fuel system pipes), find out detailed position and stop it. If still confusion, please ask your local distributor or appointed service company to do so.
2. Check all bolts and nuts for any loosen; if such loosened parts are found, tighten it immediately (particularly bolts of wheel hubs).
3. Check electrical wirings for any disconnection, short circuits and loosened joints.

5 Maintenance

■ Check list before starting up

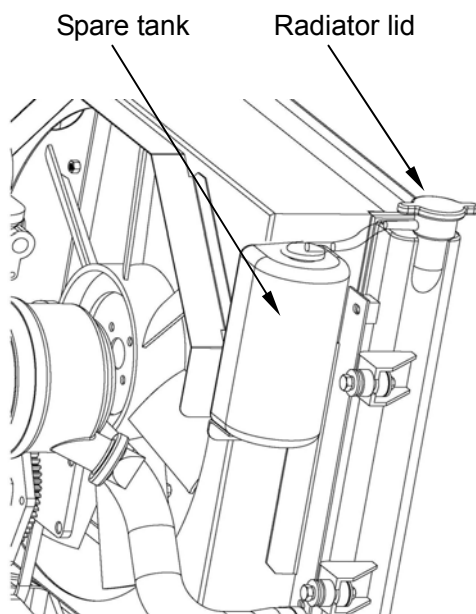
No.	Items		Qty.	Feeding or replacement of grease and parts	Reference page
1	Any troubles at previous day.		—	—	—
2	Check cooling water quantity in radiator and feed		1	Water or antifreeze	25
3	Check engine oil level at each part and feed	①Check engine oil level and feed	1	Engine oil	25
		②Check hydraulic oil level and feed	1	Hydraulic oil	26
		③Check oil level in fuel tank and feed	1	#0 diesel oil	26
		④Check oil level in brake fluid cup and feed	1	Brake fluid	26
		⑤Check cleaning fluid for windshields	—	Cleaning agent for windshields	26
4	Grease filling at working machine part of shovel	①Pin at installation position of moving arm	2	Lubricant	26
		②Pin at installation position of shovel	2		
		③Connecting pin of push-pull rod	1		
		④Rocker pin	3		
		⑤Bottom pin of dumper cylinder	1		
		⑥Connecting rod pin on lift cylinder	2		
		⑦Bottom pin of lift cylinder	2		
5	Check grease filling on universal joint pin	3			27
6	Check grease filling on center pin	1			27
7	Check grease filling on connection shaft	1			27
8	Check grease filling on steering cylinder pin	2			27
9	Check license plate for any contamination or damages	1	—	27	
10	Check all lamps and instrument	—	—	27	
11	Check operation of horn	1	—	27	
12	Check of rearview mirror	2	—	27	
13	Check for any oil or water leakage	—	—	27	
14	Check operation of steering wheel	1	—	27	
15	Check tyre pressure, wear and tear, damages or loosened bolts	4	—	28	
16	Check cooling fan and engine oil cooling fan for block and clean if any	—	—	28	
17	Check effective status of parking brake	1	—	28	
18	Check effective status of brake pedal	1	—	28	
19	Check and tighten all loosened bolts and nuts	—	—	28	
20	Check electrical wiring for any disconnection, short circuit or loosened joints.	—	—	28	
21	Cleaning of batteries, wirings and silencer	—	—	28	

5 Maintenance

■ Check and filling of cooling water

Spare tank is available on radiator for automatic filling of cooling water in case of insufficiency. Check cooling water level often and fill in immediately if insufficient.

At this moment, remove lid without taking down pipe. Pay attention to installation direction of lid. It means normal if the cooling water level is between upper and lower limits. If a plenty of water is needed, check for any leakage and take proper measures.



Important

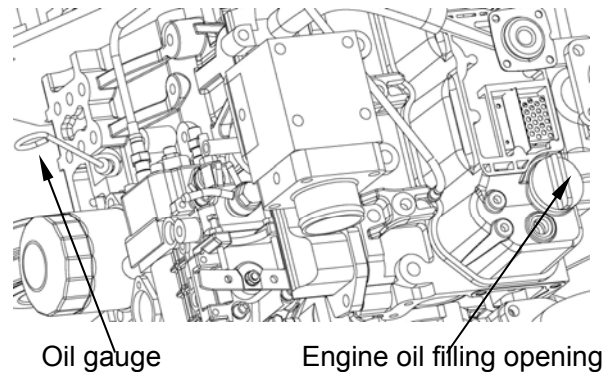
- * Cooling water level can never exceed max. limit of spare tank.
- * Slurry or sea water is strictly forbidden. Please use tap water (soft water) as possible.
- * Do not open radiator cover immediately after shut down of the machine. Because the hot water sprayed out may cause personal hurt.
- * Do not open radiator lid in ordinary work.
- * Check cooling water with spare tank during engine cooling.

Supplementary

- * Long-term storage coolant has been added into cooling water before delivery (mixing proportion: antifreeze: 50%; cooling water: 506).

■ Check and fill of engine oil

1. Check engine oil level to see if it reaches regulated level.
2. Check oil level with oil gauge. It means normal if it's between upper and lower limits.
3. In case of insufficiency, fill in immediately.



Important

- * Select engine oil with suitable viscosity as per air temperature.

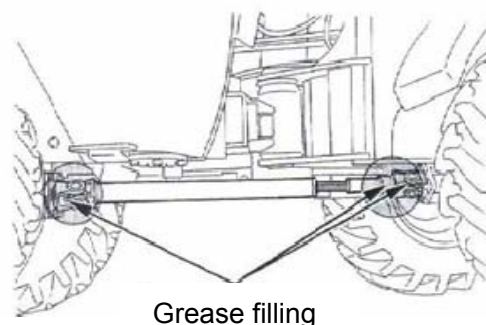
Supplementary

- * Do not measure engine oil level immediately after shut down of engine due to residual oil on each part.

Adjust the machine to horizontal direction and carry out inspection at least 5 minutes after shut down of engine.

■ Clean and inspection of vehicle embedding in soil or marsh

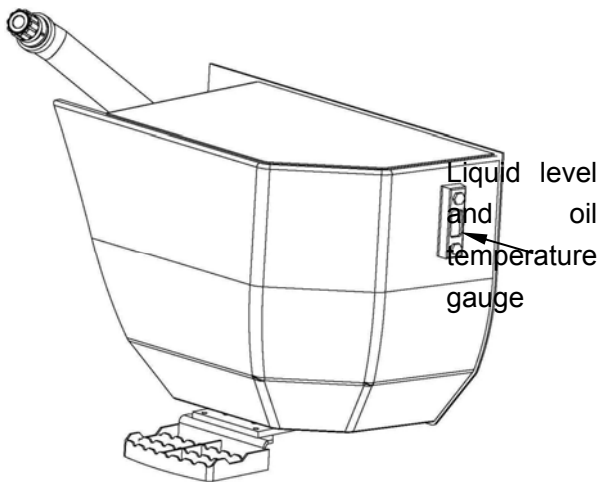
1. Flush directly and remove earth on vehicle if it runs into marsh or soil,
2. After flushing and cleaning, check the following parts:
 - ◎ Grease filling device on universal joint; 3 points.



5 Maintenance

■ Check and filling of hydraulic oil

1. Park the vehicle at ground level and make sure the shovel contact with ground.
2. Check hydraulic oil level to see if it reaches regulated quantity.
3. It means normal if liquid level is between indicated scope of oil gauge.
4. In case of insufficient oil, fill in oil from filling opening.



Use the hydraulic oil regulated on appendix.

Important

- * Remove all sands and wastes around and use hydraulic oil with same brand name.
- * Do not open filling opening immediately after shut down of engine. The sprayed hot oil is rather dangerous.

■ Check and fill of fuel

1. Check oil level with fuel gauge.
2. In case of insufficient fuel, unlock outer shield and fill in the fuel and then close the shield.

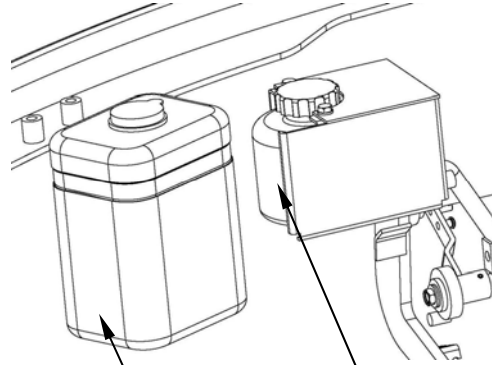
Supplementary

- * Fill in oil after working to avoid dew mixing into moisture.

■ Check and filling of oil level in brake fluid cup

Check oil level of brake fluid. In case of rapid reduction of brake fluid, please check for any

leakage. Use brake fluid equivalent to hydraulic working oil ISO VG 32. General plant brake fluid is strictly forbidden. The oil level must be between upper and lower limits.

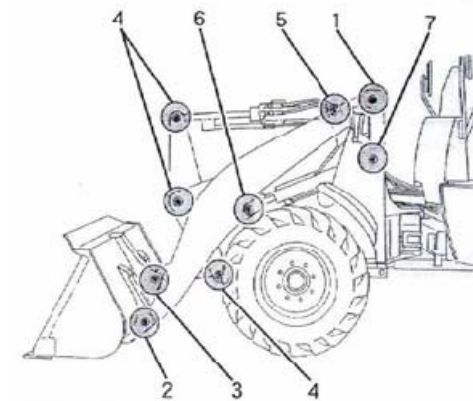


Spraying washing box for windfi9elds Brake fluid cup

■ Check of cleaning agent in windshield washer

Using windshield washer with empty tank may destroy electric machine. So fill in cleaning agent in advance.

■ Grease filling position at working machine of shovel



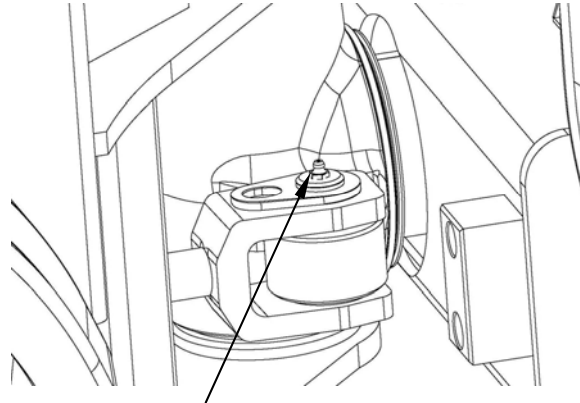
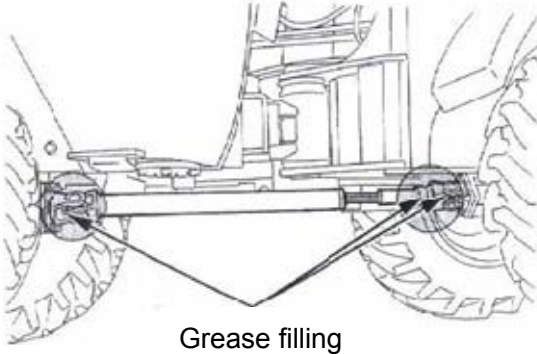
Apply grease on each oil cup with arrow.

1. Pin at installation position of moving arm (2 points)
2. Pin at installation position of shovel (2 points)
3. Connecting pin of push-pull rod (1 point)
4. Rocker pin (3 points)
5. Pin at bottom of dumper cylinder (1 point)
6. Connecting rod pin of moving arm cylinder (2 points)
7. Pin at bottom of moving arm cylinder (2 points)

5 Maintenance

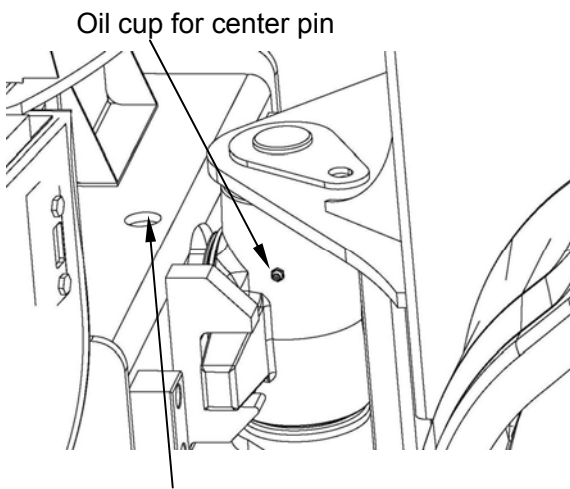
■ Grease filling on universal joint

3 points.



■ Grease filling on center pin

Fill grease at center pin before working everyday. In case of insufficient grease, steering device becomes sluggish. Add grease at oil cup showed in the picture below.



Oil cup for connection device

■ Filling grease on shaft of connection device

Fill grease at oil cup as per the diagram.

■ Filling grease on steering cylinder pin

Apply grease on steering cylinder pin.

■ Check of tyre pressure, wearing, damage and loosened bolt

Refer to operation of tyre and check the tyre (page 35).

■ Check working of steering wheel

1. Turn steering wheel to left and right after starting up engine to check working status of connection device.
2. In case of abnormality, contact with your local distributor or appointed service company and accept their inspection.

■ Check contamination and damages of license plate

■ Check each lamp and instrument

1. Check each lamp for flashing on and off status.
2. Check working status of each instrument.

■ Check working status of horn

Check sound and working status of horn.

■ Rear mirror check

Check rear mirror angle, any contamination or damages.

■ Oil or water leakage check

Walk around the vehicle and check for any leakage.

5 Maintenance

■ Check and cleaning of cooling fan and engine oil cooling fan

1. Open engine cover.
2. Check for any block of fan. In case of block, blow with compressed air (or steam).
3. Check rubber pipe.

In case of cracks or crisp, replace it immediately and also check hose clamp for any loosen parts.

■ Check effectiveness of parking brake

1. Check function of parking brake by using it.
2. In case of ineffectiveness, contact with your local distributor or designated service company for inspection.

■ Check function of brake pedal

1. Check effectiveness of brake pedal.
2. In case of ineffectiveness, contact with your local distributor or designated service company for inspection and adjustment.

■ Check and tightening each bolt and nut.

Walk around the vehicle and check for any loosen and tighten it.

■ Check for electrical wiring for any disconnection, short circuit and loosened joint

Electrical system failure any occur and check carefully.

■ Cleaning of batteries, wiring and silencer

In case that there're wastes or fuel stuck on the areas near batteries, wiring or silencer, fire may be caused. Remove them after check.

5.3 Precaution for vehicle washing

■ Personal injury or mechanical damages and failure may be caused by improper use of high pressure vehicle washer; so use the washer strictly according to its instruction book. In order to avoid mechanical damages, adjust nozzles to divergent status and keep distance over 2m.

In case of direct water spraying or inappropriate close-distance spraying:

1. Fire may be caused by damages and disconnection of electrical wiring shield.
2. Personal injury may be caused by high pressure oil sprayed out due to damage of hydraulic pipe.
3. Mechanical damages and failure may occur.

For instance:

1. Sealing appliqué is peeled.
2. Mechanical failure may occur due to water entering electronic parts, gear box and safety cable box.
3. Damages of rubber and resin parts like tyre and oil sealing as well as glasses.
4. Coating layer and gilding surface is peeled.

■ Mechanical failure may be caused by water sucked through air filter if washing the vehicle with engine started. Stop the engine first and then wash the vehicle. Prevent water from spraying on air filter or electrical installation.

5.4 Periodic inspection and maintenance

Fueling and maintenance has direct impact on mechanical failure and service life of the machine. So it's important to carry out periodic maintenance so as to save time and reduce cost.

The time recorded in the text in day, week or month refers to the time showed on timer. This time shall prevail.

In addition, under adverse working environment and condition, it's necessary to check and maintain earlier than the recorded time.

5 Maintenance

■ List of period check and maintenance

○: Check and feeding, [Initial time]: first time replace, □: replace, (Initial time): first time check, cleaning

No.	Equipment time (timer)	Initial time									From the date of purchase		Reference page
	Inspection items	50 h	100 h	500 h	Every 50 h	Every 200 h	Every 250 h	Every 500 h	Every 1000h	Every 2000 h	Once per year	Once every two years	
1	Check batteries for charging				○								30
2	Drainage in fuel tank				○								30
3	Drainage in oil-water separator				○								30
4	Replacement of engine oil	[initial]					□						31
5	Replacement of element of engine oil filter	[initial]					□						30
6	Check tension of fan belt and adjust it					○							31
7	Clean and check of air filter element	[initial]				○			□		□		31
8	Replacement, oil level check and feeding of engine oil in differential mechanism			[initial]				○	□				32
9	Replacement of suction filter element in hydraulic oil tank							□					32
10	Replacement of return filter element							□					33
11	Replacement of filter in oil-water separator								□				33
12	Replacement of hydraulic oil in working oil tank			[initial]					□				34
13	Check DC generator and battery motor									○			34
14	Replacement of cooling water	Twice a year (spring and autumn)											34
15	Check and replacement of pipes and clips in radiator					○						□	34
16	Replacement of fuel supply pipe											□	34
17	Replacement of rubber pipe of hydraulic system											□	34
18	Check and fastening of wheel hubs and nuts		[initial]				○						31
		(check and fastening every 100 hours after changing of tyre)											
19	Check any damages of electrical wiring and loosen parts of connection										○		37

5.5 Check and maintenance every 50 hours

■ Battery check

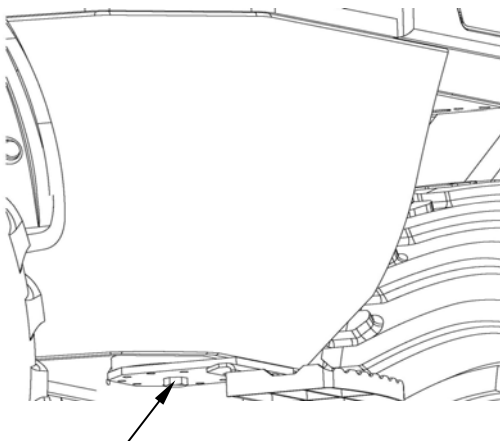
1. Open engine cover, and check display status of battery indicator.
2. If the indicator shows white, charge the battery; shows red, replace it; and blue means normal.

Supplementary:

- * Two battery types: one needs water replenishing and the other without water replenishing; the battery here is the latter one.
- * Keep battery fluid away from bodies and clothes. Otherwise, clean with water. Burn injury may be caused by battery fluid (dilute sulfuric acid).
- * Stop the engine and put starting up switch on "OFF" position while checking and removing battery.
- * Explosion may occur due to gas producing during charging. No smoke and sparkle. Remove all liquid column terminal in electro bath while charging.
- * Wear protection glasses working around battery.

■ Drainage in fuel

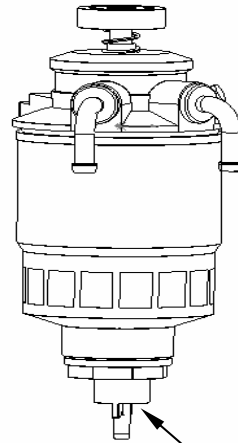
1. Remove drainage bolt at bottom and drain water and sediment along with fuel in tank (hexed sub-tenon length 22mm)
2. Close plug after drainage.



Drainage bolt

■ Water drainage of oil-water separator

Located at upper left of rear support. Loosen drainage nut in case of ponding; screw out 5mm and tighten it after drainage.



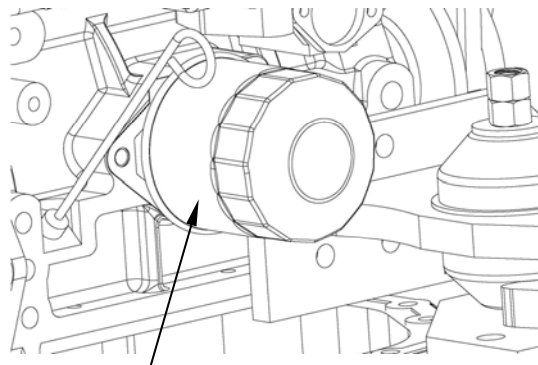
Drainage nut

Important

- Carry out exhaust after water drainage in filter (refer to [Exhaust of fuel system]).

■ Replacement of element of engine oil filter (50h for initial time and 250h afterwards)

1. Replace the element along with engine oil.
2. Remove the element with attached special wrench for filter.



Engine oil filter

3. Paint a thin layer of engine oil on type O ring of new element, tighten it without use of the wrench.
4. Fill the engine oil until regulated level.
5. Let the engine work 5 minutes and check alarm lamp for any abnormality and then stop the engine.
6. Check oil level again with oil gauge and fill in in case of insufficiency.

5 Maintenance

5.6 Check and maintenance every 200hours

Carry out the following inspection and maintenance every 50h.

■ Check and adjusting of tension of fan belt

1. Press the central part of driving belt wheel of fan and DC generator belt wheel with force of 10kgf and measure the deflection A.
 2. If the deflection exceeds standard value, loosen 2 bolts on DC generator. Move the DC generator and adjust tension of its belt.
- Deflection of fan belt wheel A.....Standard value: approx. 7~9mm/58.8~68.6N (6~7kgf)**
3. Check each belt wheel, type V slot and type V belt for any damages; particularly check type V belt to see if it contacts with bottom of type V slot.
 4. Belts become long losing adjustment function or have any cut wound or cracks; in case of any, please replace in time.

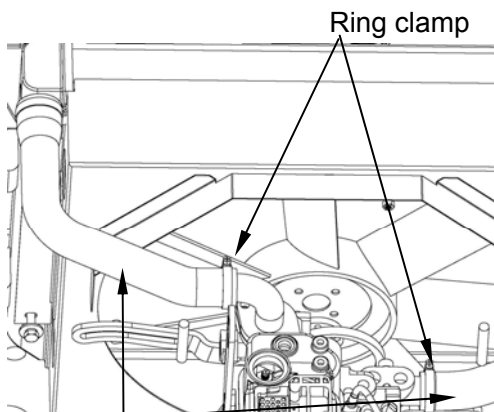
Important

* In case of working under weak tension of belt and continuous operating of the machine, the belt may slip to cause performance reduction of the engine and shorten its service life. Therefore, check and adjust belt tension.

* Stop the engine if charging lamp illuminates just caused by broken belt.

■ Check radiator pipe

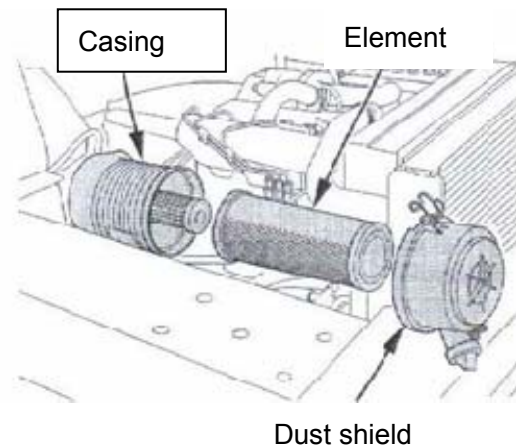
1. Tighten loosened ring clamp; in case of water leakage, tighten the ring clamp.
2. Replace the pipe in case of expansion, stiffening or cracks, and tighten the ring clamp.



Rubber pipe on radiator

■ Cleaning and check off air filter element

Open engine cover, remove dust shield and take out the element. Clean the element and dust shield as well as internal surface of casing.



◆ Cleaning method

Blow and clean exterior of element with dry compressed air [below 203kPa (2.1kgf/cm²)]; blow from interior to exterior to clean all dust and dirt. Wear protection glasses to prevent dust entering your eyes, especially working in places with many sands. Carry out cleaning and check as early as possible.

5.7 Check and maintenance every 250 hours

Carry out the following inspection and maintenance every 50h.

■ Check and tightening of nuts on tyre hubs

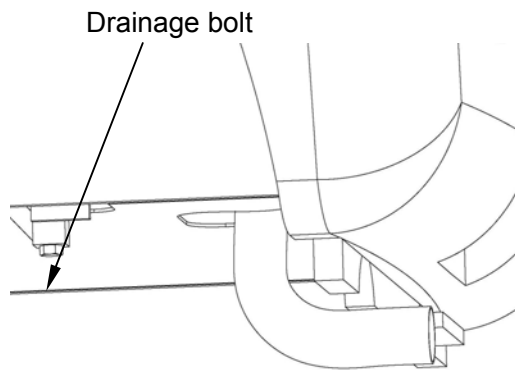
Refer to [Replacement of tyre] (page 35).

■ Replacement of engine oil

(50h for initial time)

1. Remove the drainage bolts on engine oil tray at bottom of engine, put them on lower left of rear support and drain out the engine oil.
2. Tighten each bolt after oil drainage.
3. Fill certain fresh engine oil through filling opening.
4. Keep the engine racing first and check oil level with oil gauge about 5 min after stopping racing.

5 Maintenance



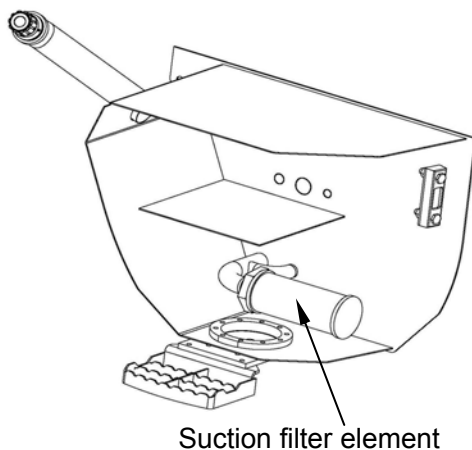
Important

- * Select engine oil with suitable viscosity as per air temperature.
- * Replace engine oil every 6 months despite working or not.
- * Please apply CD grade engine oil.

5.8 Check and maintenance every 500 hours

■ Replacement of suction filter element in hydraulic oil tank

1. Remove the drainage bolts with subtense of 22mm after temperature in hydraulic oil tank falls down; then drain out oil and tighten bolts after that. In case of replacement of hydraulic oil and element at different time, keep the oil clean while replacement.
2. Remove bottom pedal and cushion, replace the element.
3. After replacement, check cushion for any damages and install bottom pedal firmly. In case of damages of cushion, replace it with a new one.



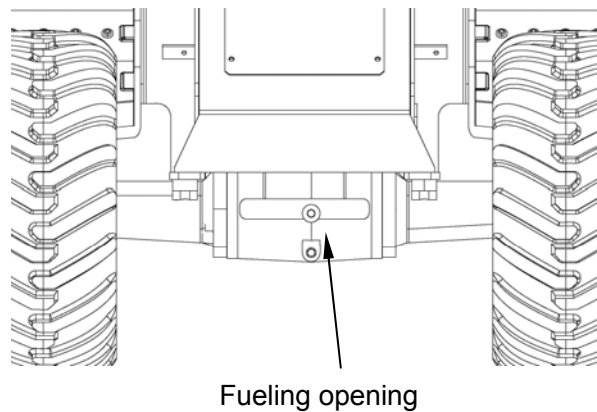
Important

- * Check oil level after element replacement. In case of insufficient oil, fill in immediately.

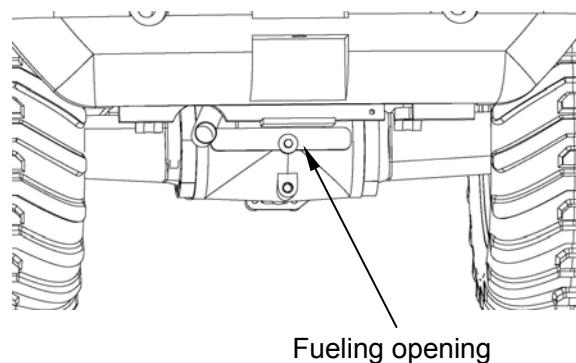
■ Check and filling of oil in differential case at front and rear half shaft

1. Remove the plug and check engine oil level to see if it is filled near lower line of plug hole (hexed plug with subtense length of 10mm).
2. In case of insufficient engine oil, fill in immediately.
3. After oil level check and oil filling, tighten all bolts.

Front



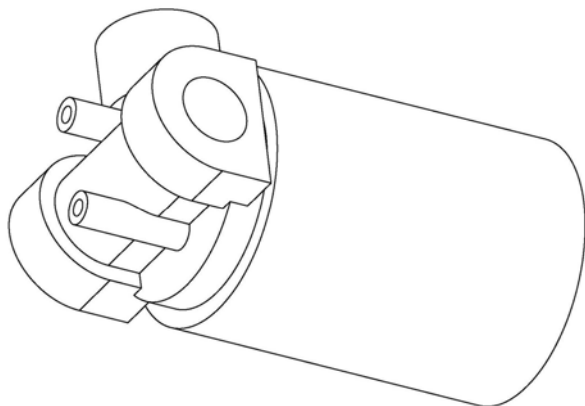
Rear



5 Maintenance

■ Replacement of element of oil return filter

The filter is installed at upper right of rear support. In case of temperature falling in working oil tank, remove the filter and replace element.



After element replacement, check oil level (fill oil if insufficient).

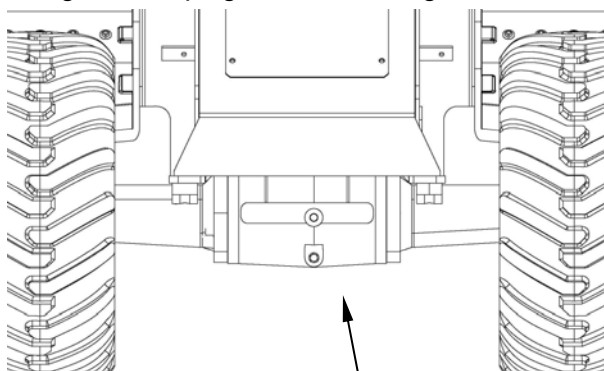
5.9 Check and maintenance every 1000hours

Carry out the following inspection and maintenance every 50h, 200h, 250h and 500h.

■ Replacement of engine oil in differential case at front and rear half shaft

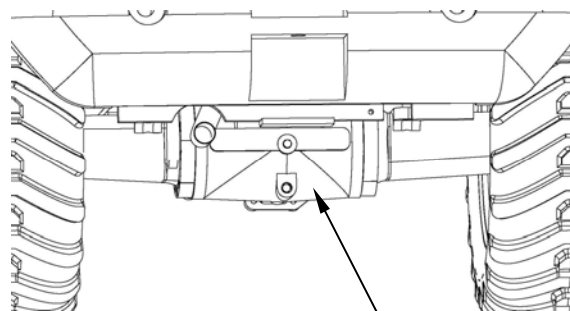
(replace after 500h for initial use)

1. Remove drainage plug and drain out used oil. (hexed plug with subtense 10mm)
2. Tighten the plug after oil drainage.



Front

Drainage plug



Rear

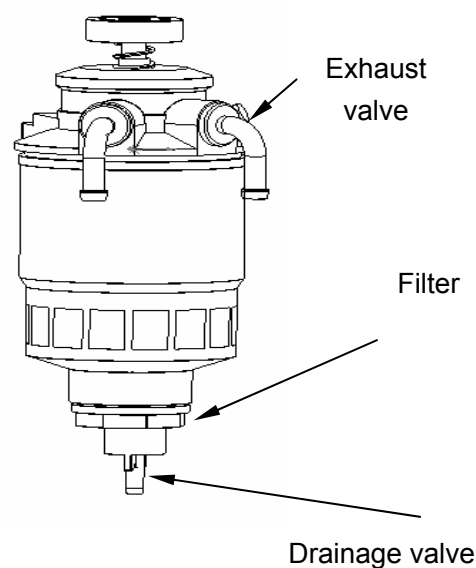
Drainage plug

3. Fill in gear oil to filling opening.

Position	Oil level
Front	3.0L
Rear	

■ Replacement of oil-water separator filter

1. Screw off drainage valve and loosen exhaust valve, and drain out fuel oil in filter.
2. Screw off the filter from pedestal.
3. Apply a little engine oil on sealing ring of the new filter, fill in diesel oil and install it on filter base.
4. Fill in oil with manual pump.
5. Drain out diesel oil from exhaust valve and tighten exhaust valve (exhaust air in fuel system) or exhaust with engine.
6. Start up engine, check for any leakage and tighten in case of any.



Exhaust valve

Filter

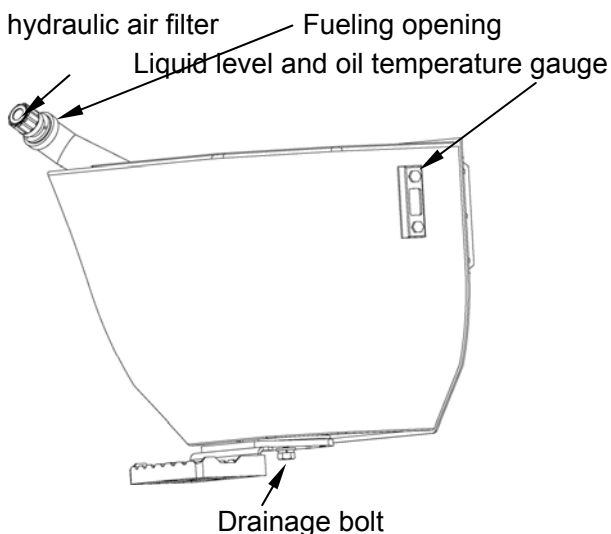
Drainage valve

5 Maintenance

■ Replacement of hydraulic oil in working oil tank

(Replace it after 500h for initial use)

1. Remove oil drainage bolt at bottom of oil tank and drain out oil. After that, tighten the plug. (hexed bolt with subtense length of 22mm)
2. Remove air filter at filling opening, check oil level and fill in certain hydraulic working oil.
3. After oil filling, tighten plug of filling opening. Keep the engine running at low speed, put front and rear operation rod to "Neutral position", operate parking switch between **ON**↔**OFF** for 2~3 times; keep circulating work of working part and driving part of shovel for about 5 minutes and then stop the engine, and make sure oil level with oil gauge. In case of overfull or insufficient oil, check with oil gauge and adjust it, ensuring oil level is about 50L.



Important

- * In case of sediment in oil tank, clean up carefully.
- * Prevent any impurities from entering oil tank.

Supplementary:

Check oil level as per following standard because hydraulic oil level may change with oil temperature.

Oil level is close to the middle of oil gauge before running (oil temperature 10~30°C).

Oil level is above upper limit of oil gauge when normal working (oil temperature 50~80°C).

5.10 Maintenance every 1000 hours or one year

■ Replacement of element of air filter

Open engine cover, remove dust shield, loosen butterfly nuts and take out element; replace it and then reassemble.

5.11 Check and repair once every 2000 hours

Carry out the following inspection and maintenance every 50h, 200h, 250h, 500h and 1000h.

■ Check of DC generator and battery motor

Carry out check and maintenance of every 2000h. Bushes are worn after 2000h, ask designated service company to repair. Incorrect disassembly of the machine may damage water-proofing device. So ask special company to do so. In case of working at night with frequent use of lamps, check the lamps every 1000h.

5.12 Check and repair once every two years

■ Check and replace of pipes

Fuel pipes or hydraulic rubber pipes are wearing parts, even not use. Replace them after two years or any wearing.

1. Check pipes or tighten any loosened or damaged ring clamp often.
2. Exhaust air when replacing fuel pipe.

Important

* Prevent waste into pipes or spraying pump during replacement. Otherwise, abnormality of spraying pump may occur.

■ Replacement of radiator pipe

Change radiator pipe and ring clamp every two years. In case of any expansion or stiffening or cracks within two years, replace it immediately.

■ Replacement of cooling water

(if long-term storage coolant is used)

1. Open plug at bottom of radiator and drain out cooling water.
2. Remove pipes at bottom of spare case and drain out water in the case.
3. Fill in cooling water through filling opening of radiator, open the plug and drain out water. Keep draining until clean water flows out from plug cock.

5 Maintenance

4. Close the plug and inject long-term coolant into radiator and spare case.
5. After injection of coolant, start up the engine and keep it racing for about 5min, and then stop it. Check coolant level.

■ Using method of antifreeze

(if long-term storage coolant is used)

Antifreeze is used to reduce freezing temperature so as to prevent any damages of cylinder or radiator caused by freezing of cooling water.

Add permanent-type antifreeze (type PT) and clean water into radiator and spare case if the temperature is under 0°C. [long-term storage coolant has been added before delivery (mixing proportion of original fluid 50%)]

Important

- * Use antifreeze as per temperature and its instruction book.
- * For other times without using of long-term storage coolant, replace antifreeze every spring and autumn.
- * Antifreezes with different brands cannot be used at same time.

5.13 Use of tyres

■ Tyres maintenance

Tyre pressure has great impact on service life of tyre; therefore, carry out periodic inspection of tyre pressure and adjust it properly. Check the pressure before working. Please also check tyre or wheel hub.

Supplementary :

- * Tyre pressure shall be subject to the regulated pressure recorded below. In case of over-high pressure, tyre cracking or personal injury may occur.
- * Tyre cracking may occur if there's cut on tyre; and replace it with a new one.
- * Consult your local distributor for information about inner tube or steel hub replacement.

■ Tyre pressure

Model	KDD03	KDD05	KDD06
Front wheel	0.63±0.09Mpa		0.56±0.08Mpa
Rear wheel	0.63±0.09Mpa		0.56±0.08Mpa
Model	KDD08		KDD10
Front wheel	0.48±0.07Mpa		
Rear wheel	0.48±0.07Mpa		

1. Over deflection may occur due to low pressure in tyre; thus wearing may be caused.
2. Tyre pressure shall be appropriate.
3. Over high pressure may reduce traction and cause slipping as well as cracking.

■ Replacement of tyre

◆ Tyre disassembly

1. Lower working machine, and park it and then stop the engine.
2. Loosen the bolts of hub for about one circle.
3. Lift tyre and insert a safety block under the tyre for supporting to prevent accident falling; loosen hub bolts and remove tyre, then replace it.

◆ Installation of tyre

1. Tighten hub bolts with care while the tyre is lifted.
2. Lower the tyre and tighten diagonal hub bolts as per circumferential order with certain torque.

[torque: 275~314N·m (28~32kgf·m)]

■ Installation direction of tyre

The flange surface of tyre ensures large traction and floatage even on soft ground. Pay attention to direction of tyre surface while installation.

5.14 Check and use of batteries

Stop the engine first, put starting switch on [OFF] position and check battery, pay attention to:

- * Short circuit may occur while removing battery cable; disconnect negative cable. And connect positive cable when installation.
- * No fire and smoke because igniting hydrogen produced in battery may cause explosion due to any smoke.
- * Keep metals or combustibles away from surrounding area of battery; in case of short circuit, explosion or fire may occur.
- * Blindness or burning may be caused by battery fluid (dilute sulfuric acid). Prevent the fluid splashing on your skin or clothes; in such case, wash with plenty water. If the fluid enters eyes, wash with clean water and accept medical care.
- * Remove all wiring post of each eletrobath before charging.
- * Wear eye protection glasses while working near battery; using booster cable and starting engine.

■ Check and maintenance of battery

The life of latest battery, with high performance, may be shortened and additional expenditure may be required resulted from improper operation. So use the battery as per its instruction to make full use of it.

1. Batteries are necessary for engine and illumination.
2. The engine cannot be started or the lamp will become dim with insufficient power. It's too late to charge at this time; so charge in advance.
3. Moisture in electrolyte may vaporize and fluid may reduce during charging. Insufficient electrolyte may cause damage of battery and overfull electrolyte may also damage the vehicle.
4. In case of long-term storage, remove the battery and charge it; and then keep it under dry condition without direct sunlight.
5. Battery is discharging by itself during storage. so charge it once a month.

■ Precaution while battery charging

1. Replace the battery in case of insufficient electrolyte. Battery for this vehicle is not water-supplementing type.
2. Avoid quick charge, which may shorten service life of battery.
3. Do not confuse (+) and (-) terminals while connecting cables. In case of confusion, failure of battery and electrical system may occur.
4. Remove (-) post while disconnection and connect the (+) post while installation. Otherwise, short circuit occurs once contacting with tool.
5. Charge the battery with common approach. For instance: connect (+) post of battery with that of charger and connect (-) post of battery with that of charger.
6. Quick charging is a method for supplementing partial power for discharging battery with large current. This method shall be used in case of emergency.
7. In addition to check and proportion determination of battery fluid, if battery is needed, remove cables on battery before operation.
8. Remove terminal posts of each electro bath.

■ Check of battery fluid level

Refer to [Maintenance every 50h] for check of battery fluid level.

5 Maintenance

5.15 Periodic replacement of safety parts

In order to ensure normal and safe operation, operator shall carry out periodic inspection and maintenance, and also replacement of some safety parts. Such periodic inspection and maintenance is very important to those wearing parts whose materials may degenerate as the time goes by. For the wearing or aging parts, check them and replace any worn ones to keep their safety functions even there's no failure being found. In case that any abnormality is found and the replacement time is undue, repair or replace the defective one immediately.

	Safety parts needing periodic replacement	Replacement time
1	Rubber pipes of brake	Every year
2	Rubber parts like piston gasket of brake main cylinder	Every two years
3	Brake fluid (equivalent to hydraulic working oil ISO VG30)	Every two years
4	Fuel pipe	Every two years
5	Special hydraulic pipe for steering cylinder	Every two years
6	Gasket, oil sealing and type O ring of steering cylinder	Every four years

5.16 Maintenance for long-term storage

◆ In case of long-term stop, keep as per the following requirements:

1. Clean and blow each parts and keep them in dry room; do not leave them in the open air. If they have to be put outside, select a smooth ground and cover all seats.
2. Prevent leakage while filling oil, applying grease and replacing engine oil.
3. Apply sufficient grease on exposed part of piston rod of hydraulic cylinder.
4. Remove the battery and keep in good condition.

5. Add antifreeze or drain out cooling water if the temperature is below 0°C.

6. Start up engine and move the vehicle in a short distance, operate working device to make lubricant reach each part in a monthly manner.

7. Charge the battery

◆ Following the operation below for reuse after long-term shut down

1. Clean up lubricating grease on connecting rod of hydraulic cylinder.

2. Start up engine and carry out trial-run of working device and travelling crane without loading. Make sure lubricant reach each part.

5.17 Check of electrical wiring and use of fuse

Disconnection and damage as well as of performance reduction of wiring may be caused by loosened terminal. And then short circuit, creepage or burning may occur. Replace it in advance, and repair the damage wire. Metal wires are not allowed for substitute of fuse in case of trip. Ask designated service company to carry out inspection and maintenance.

■ Fuse replacement

1. Cut off starting switch before fuse replacement.
2. Remove cover of fuse case and replace the fuse with a new one with same capacitance.

Chapter 6 Reason and solution

- Find the reason according to the following table if any failure occurs and solve it.
- If having any doubt, you can inquire the purchasing company or the fixed service company.

6.1 Engine failure

	Problem	Reason	Solution
Relation with motor	hard to start	(1) The job oil is stagnant	(1) Check the fuel tank and clean the impurities and water (2) Check the fuel filter. Change for a new one if it is dirty
		(2) Air or water is fixed in the oil transporting system	(1) Check the oil pipeline and tighten the clamp. Replace or repair it if it breaks (2) Discharge the air(refer to the [air discharge of fuel system])
		(3) Machine oil is too sticky to make the motor work when in low temperature.	(1) Put hot water in the radiator (2) use different machine oil according to the temperature(use machine oil SAE10W30 in winter)
		(4) Low battery causing weak rotation and not exceeding the compress strength.	(1) Charge the battery
	low outputting power	(1) fuel deficiency	(1) Supply enough fuel
		(2) blockage in air filter	(1) Clean the filter element
	sudden stop	(1) Fuel deficiency	(1) Supply enough fuel
	abnormally black exhaust	(1) Low quality of fuel	(1) Change for better fuel
		(2) Excessive machine oil	(2) Turn back to the normal oil quantity
	Thermometer alarming (motor overheated)	(1) leak in the water pump (2) stretch or break of the fan belt (3) Low efficiency of the radiator (4) Cooling water shortage (5) Blockage in the radiator net or mental (6) Rust on the cover or the Crankcase, the cooling water polluted (7) the radiator cover is not good for evaporation (8) Erosion of cooling water pipeline (9) Continuously overloading work (10) break of the lid gasket(causing the reduce of the cooling water (11) Machine oil shortage (12) Wrong time of the fuel eruption (13) Low quality of the fuel	(1) Change the pump (2) Repair or change the belt (3) Change the radiator (4) Supply enough water (5) Clean it (6) Change the cooling water and put rust preventive in. (7) Change the cover (8) Clean the pipeline (9) Lessen the load (10) Change the gasket (11) Add more oil to reach the standard quantity (12) Readjust it. (13) Change for better fuel.

6 Reason and resolution

6.2 Driving

Problem	Reason	Solution
Driving in bad manner (no moving when shifting speed)	Unsatisfied hydraulic system control valve performance Unsatisfied electric switch of the forward and backwards handle bar Unsatisfied following system cylinder of the pump	Inquire the company selling the product or the fixed service company.
	Insufficient work oil	Add to the fixed amount of the oil meter.
	Not Step on the accelerator pedal yet.	Step on the accelerator pedal.
Abnormal sound during driving	Loose of universal joint and flange installation bolt	Fasten.
	Unsatisfied holding-on of the differential gear	Adjust every gear of failure.
	Wear and tear, damage of the gear of the differential gear	Separate and check, then replace.
	Damage of the bearing of the differential gear	Separate and check, then replace.
Unsatisfied driving brake	Air fixed in the brake system	Exhaust.
	Oil leak in the main cylinder piston	Inquire the company selling the product or the fixed service company.
	Unsatisfied airproof of the brake system	Separate and check, then replace.
	Unsatisfied linkage and in-phase with the micro drive	Adjust the micro drive cable line.
Unsatisfied drawing back of the brake pedal	Lose of flexibility of the spring of the brake pedal	Separate and check, then replace.
	Jam of the oil hole of the main cylinder	Inquire the company selling the product or the fixed service company.
Feeling light of the brake pedal	Brake oil leak.	Check, replace and exhaust.
Unsatisfied stopping brake	Wear and tear of brake block	Check and replace.
Heavy to move the steering wheel	Oil leak of turning control valve	Inquire the company selling the product or the fixed service company.
	Unsatisfied axes of the turning axis	Check and replace
	Loose of the spline of the turning axis	
	Loose of the pin of the turning hydraulic cylinder	

6 Reason and resolution

6.3 Hydraulic

Problem	Reason	Solution
Can not lift or vibrate the shovel	Broken pump coupling.	Check and replace.
	Insufficient work oil.	Add work oil
	Suck in air from the interface of suction pipe.	Check the position where air enters and fasten the interface bolt or replace interface
The force of lifting and vibrating of the shovel is insufficient or the shovel is low in speed	Insufficient function due to the wear and tear of the hydraulic pump.	Check and replace.
	Set pressure drop in the port safety valve or keep in open.	Check and readjust or replace.
	Insufficient work oil or improper viscosity.	Add oil or replace.
	Suck in air from the interface of suction pipe.	Check the position where air enters and fasten the interface bolt or replace interface
	Broken bobbin of the control valve and oil leak.	Check and replace the part.
	Bobbin can not realize the full stroke due to the wrong adjusting of the control bar (cable).	Adjust handle bar (cable).
The force of lifting and vibrating of the shovel is insufficient	Wear and tear or damage of the hydraulic cylinder piston gasket leads to the internal oil leak.	Check and replace the gasket.
	Broken bobbin of the control valve and oil leak.	Check and replace the part.
	Set pressure drop in the port safety valve.	Check and readjust or replace.
Only complete one action	Oil leak of the interface of rubber pipe and tubing.	Replace.
	Parts of the control valve do not work. (Grab foreign material)	Check the position of the handle bar and repair it. Check the control valve and repair it.
	Broken bobbin of the control valve.	Separate and check; then replace the part.
	Broken tube, tubing or interface.	Replace.
Disagreement between the movement of the handle bar and the machine	Wrong connection of the tubing and rubber pipe	Reinstall the tubing and rubber pipe.
Abnormal sound	Insufficient work oil.	Add to the fixed amount of the oil meter.
	Suck in air from the interface of suction pipe.	Check the position where air enters and repair.
	Distortion of canal, tube and interface.	Repair or replace.
	Cavity of the gear pump. (cold)	Take warming machine running.
Temperature of the work oil is increased.	Viscosity of oil is too high.	Use the fixed oil.
	The pressure of the main safety valve is not adjusted in the right way.	Adjust in the right way.
	When overloaded running continuously.	Stop continuously overloaded running.
	The oil clarity rate in the pump or valve is reduced.	Check, clean and replace oil.
	The piston is moved till the end but the handle bar dose not return the holding position. (lightened continuously)	The handle bar shall return the holding position.

6 Reason and solution

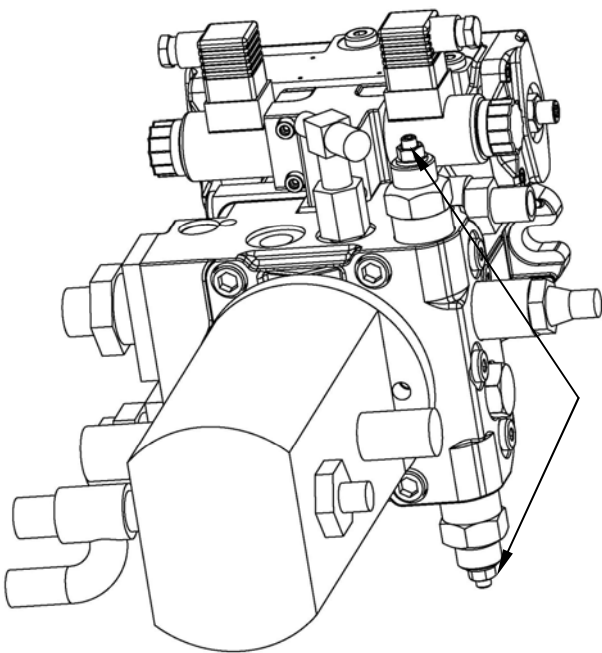
6.4 Pulling method when failure occurs

Inquire the company selling the product or the fixed service company if the machine can not be started because of failure.

At need, operate in the following order if the pulling is definitely necessary.

Important

1. Loosen the high pressure safety valve cover on and below the main variable plunger pump; loosen M8 nut and adjusting bolt. Do not take it off.



2. Loosen 2 stopping brake M12 bolt and take out 2 plain cushions. Fasten the bolt.

3. Pull the machine by balance weight pulling pin.
At this moment, the pulling speed is below 1km/h.

Chapter 7 Attached table

7.1 Main technology parameters

Model			KDD03		KDD05		KDD06		
Type			Tyre Swivel joint turning						
Operation weight (kg)			1300		2200		2850		
Engine	Model		KD373D			KD388D			
	Type		Vertical, water-cooling, four strokes and direct injection			Vertical, water-cooling, four strokes and direct injection			
	Rated power/ rotation speed [kW/rpm]		12/2600			18.1/2200		19.6/2400	
	Max. torsion (N·m)		45/2200			96/1800			
	Delivery capacity [L (cc)]		0.979 (979)			1.642 (1642)			
	Start setting		12V 1.5kw			12V 1.4kw			
	Battery		12V 60Ah			12V 80Ah			
	Cylinder number-cylinder bore×stroke (mm)		3-73×78			3-88×90			
Machine size	Length (with shovel on the ground) (mm)		2880			3620		4040	
	Width (shovel) (mm)		1250			1330		1575	
	Height (chair) (mm)		1710 (2300)			1800 (2440)		1850 (2460)	
	Min ground clearance (mm)		210			240		270	
	Wheel base (mm)		1220			1550		1780	
	Track (mm)		930			1080		1190	
Shovel	Discharge height (mm)		1710			1855		2270	
	Discharge distance (mm)		540			685		700	
	Operation time	Lifting (s)	3.8			4		5	
		Descending (s)	2.3			2.5		3	
		Anteverting (s)	0.8			0.8		1	
	Bucket capabilit (m³)		0.18			0.3		0.4	
	Rated loading weight (kg)		300			500		600	
Rotation	Machine rotation angle (°)		40						
	Min. rotation radius (mm)		2550			3000		3600	
Driving	Driving method		Four-wheel drive						
	Tyre		10-16.5			10-16.5		12-16.5	
	Driving speed	Onward (km/h)	0~10			0~15			
		Backwards (km/h)	0~10			0~15			
		Low speed	Onward (km/h)	0~5			0~5		
			Backward (km/h)	0~5			0~5		
		Climbing capacity (%)		40			40		
Max. pull [kN (kgf)]			8.83 (900)			15.7 (1600)		22.6 (2300)	
Hydraulic system	Moving type and rated pressure (MPa)		Variable plunger pump, variable motor 30						
	Work fitting type and rated pressure (MPa)		Gear pump 17						

7Attached table

Model			KDD08	KDD10		
Type			Tyre Swivel joint turning			
Operation weight (kg)			2850	3800		
Engine	Model		KD488D	KD488D		
	Type		Vertical, water-cooling, four strokes and direct injection	Vertical, water-cooling, four strokes and direct injection		
	Rated power/ rotation speed /[kW/rpm]		26.2/2400	26.2/2400		
	Max. torsion (N·m)		129/1800			
	Delivery capacity [L (cc)]		2.19 (2190)			
	Start setting		12V 1.4kw			
	Battery		12V 80Ah			
	Cylinder number-cylinder bore×stroke (mm)		4-88×90			
Machine size	Length (with shovel on the ground) (mm)		4420	4600		
	Width (shovel) (mm)		1690	1690		
	Height (chair) (mm)		1870 (2480)	1900 (2540)		
	Min ground clearance (mm)		315	315		
	Wheel base (mm)		1955	1955		
	Track (mm)		1250	1250		
	Shovel	Discharge height (mm)		2440	2700	
Discharge distance (mm)		790	820			
Operation time		Lifting (s)	5			
		Descending (s)	3			
		Anteverting (s)	1			
Bucket capability (m ³)		0.5	0.6			
Rated loading weight (kg)		800	1000			
Rotation	Machine rotation angle (°)		40			
	Min. rotation radius (mm)		3800	3900		
Driving	Driving method		Four-wheel drive			
	Tyre		15-16.5	17-16.5		
	Driving speed	Onward (km/h)		0~15		
		Backwards (km/h)		0~15		
		Low speed When fixed	Onward (km/h)		0~5	
			Backwards m/h)		0~5	
			Climbing capacity (%)		40	40
	Max. pull [kN (kgf)]		26.5 (2700)	26.5 (2700)		
Hydraulic system	Moving type and rated pressure (MPa)		Variable plunger pump, variable motor 30			
	Work fitting type and rated pressure (MPa))		Gear pump 17			

() is the method with driving room.

7 Attached table

7.2 Recommended lubricate oil, lubricate and fuel

Supply position	Type of fuel, oil and grease, water	Common mark
Fuel tank	Diesel oil	-20#、-10#、0#
Engine oil plate	Engine oil	15W-40
Front half axis differential gear box	Gear oil	85W—90
Back half axis differential gear box (gear-box too)	Gear oil	85W—90
Hydraulic work oil tank	Hydraulic oil	HM-68
Brake fluid cup	Hydraulic oil	ISO VG32
Outside the work machine, lubricate interface of each part	lubricate	2# synthesized Ca-lubricate
Radiator (standby box)	Cooling water	Antifreeze, tap water

* Replacing the diesel oil means replacing the new diesel oil after fully removing the old diesel oil.

* Please use the following diesel oil:

- summer: 0# diesel oil
- above -5℃: -10# diesel oil
- above -15℃: -20# diesel oil
- above -25℃: -30# diesel oil

* Select the antifreeze according to the temperature.

7.3 Selective parts and assistant tool

■Selective parts

To meet different requirements of customers', we provide the following selective parts: driving room, light sail, air conditioning, function of laying the shovel flat automatically.

■Assistant tool

To expand the operation range of the loader, the main assistant tools are: grass grab, wood grab and earth mover, etc.

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