



RH80E HYDRAULIC CRAWLER
EXCAVATOR

OPERATION AND MAINTENANCE MANUAL

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LTD.

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ATTENTION

kenstoneHeavyMachinerycompanywarnsusersofexcavator
maintenanceandaccessoriesprecautions

1. First of all, welcome to use Ken stone excavators and thank you for your strong cooperation in business.
2. This is to inform our customers that excavators should be repaired by Ken stone Company or a maintenance company designated by Ken stone Company using genuine Ken stone accessories.
3. We found that counterfeit and shoddy Ken stone products entered the market by illegal means, and found that companies and individuals who were not authorized and trained by Ken stone Company were carrying out maintenance activities. We have received many reports of fatal damage and serious performance degradation of equipment due to the use of non-genuine Ken stone accessories. At the same time, many legacy problems caused by maintenance by unauthorized and untrained personnel have seriously affected the performance and service life of the equipment.
4. In view of the above situation, we especially warn our customers to pay attention to:
 - 1) The use of non-genuine accessories may not have a significant impact on the equipment at the time, but it will definitely cause a series of adverse consequences in the future. In order to avoid causing equipment damage, performance degradation, and causing more serious losses, do not use non-genuine Ken stone accessories.
 - 2) When purchasing parts, customers must purchase from Ken stone Company or companies authorized by Ken stone Company to operate parts, and make special screening. If there is any suspicious phenomenon, please contact our company for confirmation.
 - 3) If the customer needs to repair the equipment, please contact Ken stone or a designated repair company authorized by Ken stone.
 - 4) If the equipment fails due to the use of non-genuine accessories or repair by a company not authorized by Ken stone, even within the warranty period, our company will not be responsible for the warranty business.
 - 5) Thank you again for your usual business cooperation.

Shandong Ken Stone Heavy Machinery Co., Ltd.

Ken Stone Heavy Machinery has the right to continuously improve its products and bring the best products to the market. These improvements may be implemented at any time, but we will not change the materials for the products currently on sale. Consumers are especially reminded to contact distributors regularly to obtain the latest information on the equipment they want to purchase.

These information may include auxiliary equipment and optional equipment that are not included in your equipment. If you need other equipment, please contact Ken Stone Heavy Machinery's sales organization.

The illustrations used in this manual are only for the purpose of describing the relevant parts of the equipment in a figurative manner and may differ from the actual equipment.

safety

1. Instructions for operating ken stone Heavy Machinery excavators

 **Dangerous** Improper operation of the excavator can result in serious injury or death. Failure to follow the following safety rules during operation, maintenance, and equipment movement or loading can cause serious fatal injuries or serious damage to the equipment and its surroundings.

For your safety and the safety of others, please carefully examine the various important factors that may lead to danger.

safety warnings

 **Preparation**  Understand all operating and safety instructions

This is a safety warning signal. When you start working, make sure all personnel understand the terms used to warn people of the dangers. Follow recommended safety measures and safe operating procedures. Learn the signal words used in safety warning signs.

Learn the warning words used in safety warning labels.

The words "Caution", "Warning" and "Danger" used in this manual and on the excavator safety labels indicate the danger levels of hazards and unsafe operations, so there are three danger levels to indicate the degree of safety. Whenever you see the safety warning triangle sign, no matter which warning term is behind it, you must read the warning content carefully.

 **Caution** CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It is also used to remind people to prevent common unsafe operating factors when working.

warning

WARNING indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death. It is also used to warn against more serious unsafe operations.

 **Danger** DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or extremely serious injury. It is also used to warn that equipment may explode or rupture if handled improperly.

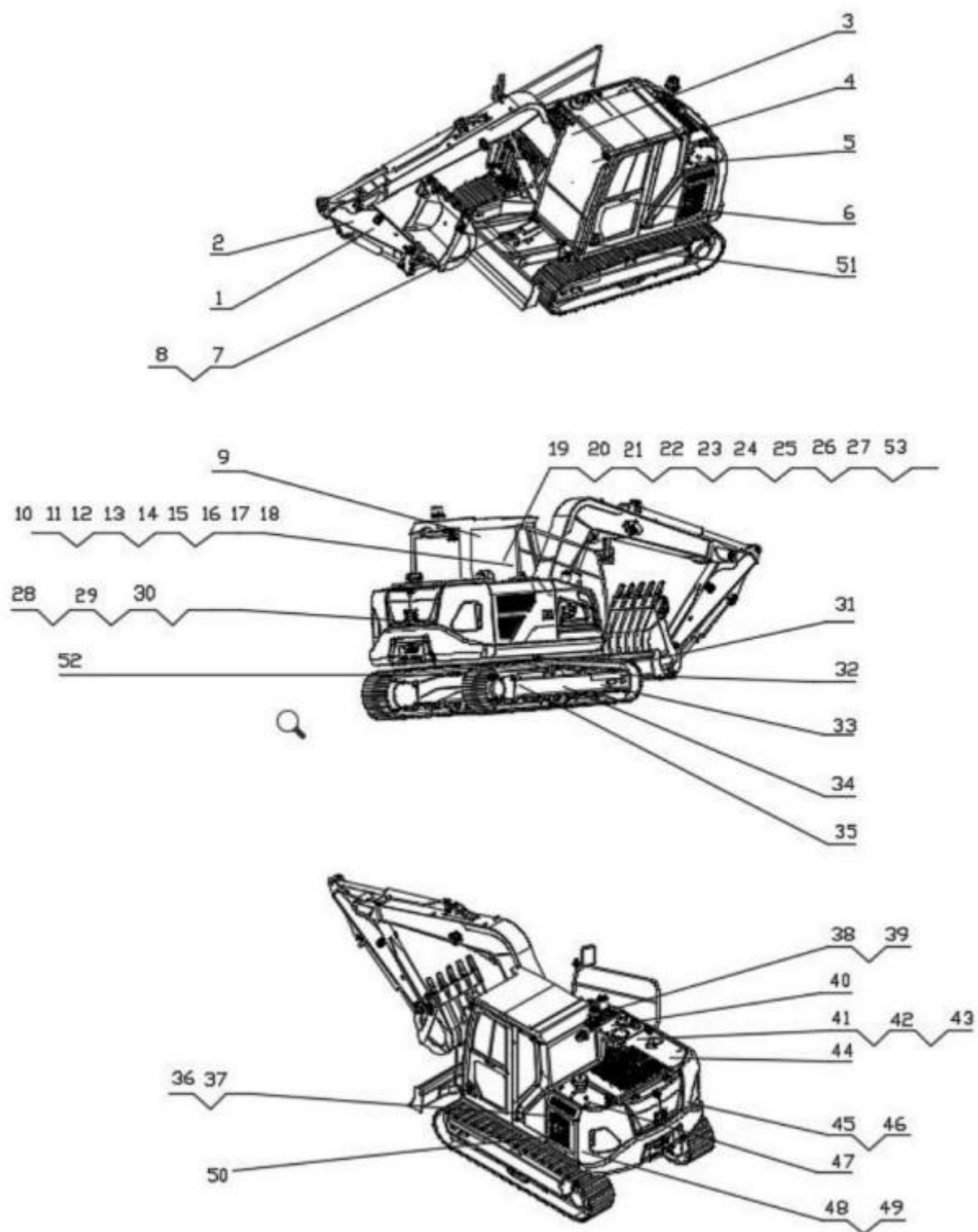
2. Basic security overview

Additional functions

Excavators are primarily designed for earthwork with buckets. If you want to use them for other purposes, please ask Kenstone Heavy Machinery for appropriate devices and apply. Excavators are prohibited from being used for lifting operations.

When using hydraulic hammers (breakers) on hard ground to perform crushing operations or other dangerous operations, additional protective frames need to be installed to protect the operator.

3.safety Label Location



Keep the label clean. If the label is lost or damaged, replace it with a new one in time. If there is a danger, these labels can provide basic safety information to the owner and operator in time.

Safety labels may be in Chinese or provide safety warnings other than those listed below. Please contact the Ken Stone dealer to confirm the meaning of the provided label.

1.Arm warning sign



Fi g 1-1

2. Anti-smash signs



Fi g 1-2

3.Unlock sign



Fi g 1-3

4. Windshield wiper anti-collision warning sign



Fig 1-4

5. Air filter warning sign

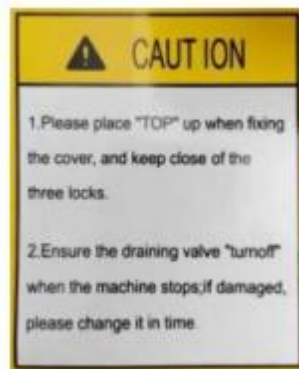


Fig 1-5

6. Unlock sign

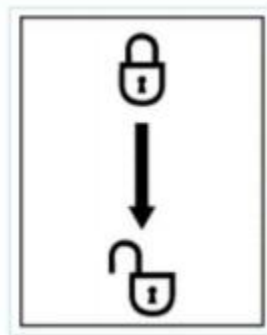


Fig 1-6

7. Slewing reducer refueling mark

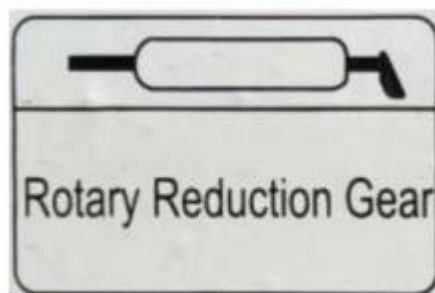


Fig 1-7

8.Rotary gear oiling mark

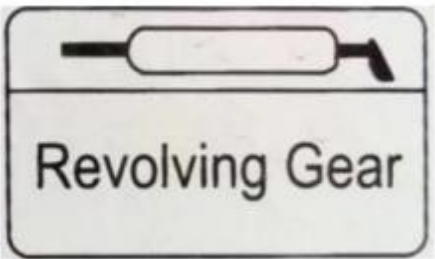


Fig 1-8

9.Emergency exit signs



Fig 1-10

10.Lubrication chart

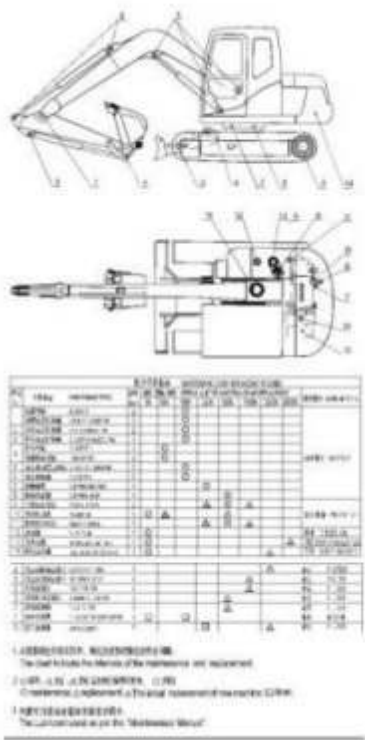
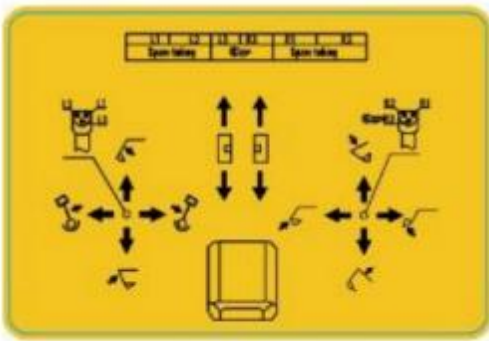


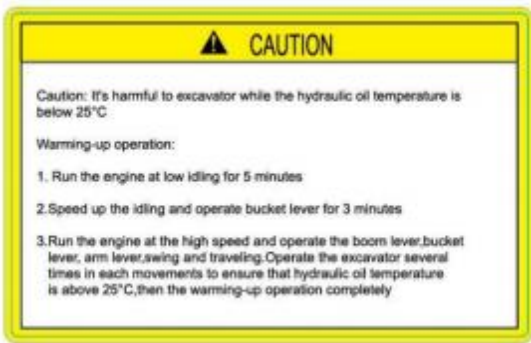
Fig 1-11

11.Operational indicator



Fi g 1-12

12.Preheating warning sign



Fi g 1-13

13.Sign prohibiting bulldozer from being subjected to unilateral force



Fi g 1-14

14.Oil level label



Fi g 1-15

15. Check the instruction manual warning sign



Fig 1-16

16. Key power off warning sign



Fig 1-17

17. High voltage avoidance warning sign



Fig 1-18

18. Seat safety warning sign



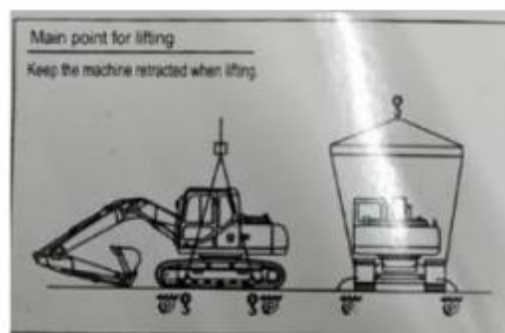
Fig 1-19

19. Clean the radiator label regularly



Fi g 1-20

20.Lifting Tips



Fi g 1-21

21.No climbing warning sign



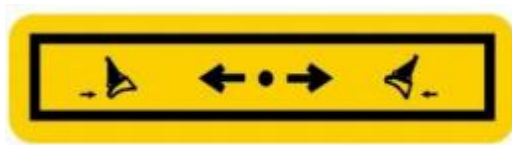
Fi g 1-22

22.Battery power off warning sign



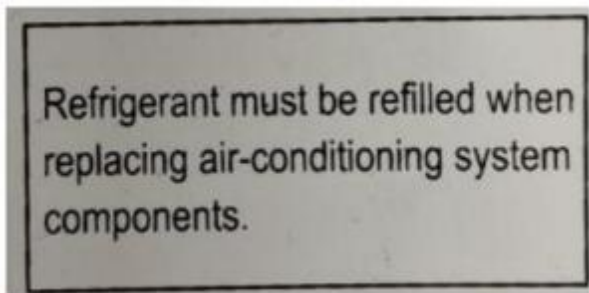
Fi g 1-23

23.Bulldozer operating sign



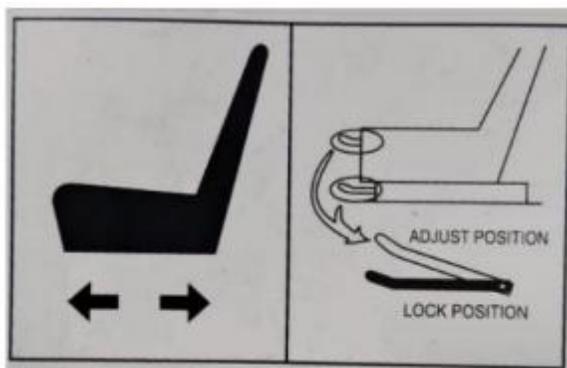
Fi g 1-24

24、Refrigerant Replacement Instructions



Fi g 1-25

25、Seat adjustment sign



Fi g 1-26

26、Fuel filter waterproof warning label



27、Warning sign for boarding



Fi g 1-28

28、Oil filling warning label



Fi g 1-29

29、Fan Beater Warning Sign



Fi g 1-30

30、Belt safety warning signs



Fi g 1-31

31、32、35、Hook point sign



Fi g 1-32

33、Tensioner warning



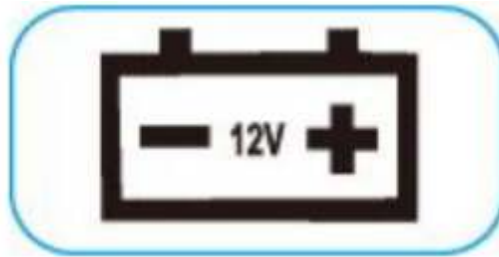
Fi g 1-33

34、Direction sign



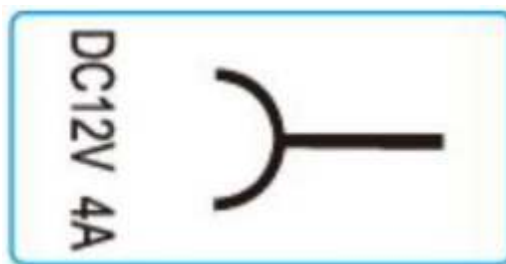
Fi g 1-34

36、Power supply identification



Fi g 1-35

37、Power socket identification



Fi g 1-36

38、41、No standing warning sign



Fi g 1-37

39、Fuel tank marking



Fi g 1-38

40、Hydraulic oil tank marking



Fi g 1-39

42、Splash warning sign



Fi g 1-40

43、Hot warning sign



Fi g 1-41

44 、 Anti-fall warning sign



Fi g 1-42

45 、 Rear reflective film



Fi g 1-43

46 、 Weight warning



Fig 1-43

47、Anti-fall warning sign



Fig 1-44

48、Rear reflective film



Fig 1-45

49、Weight warning



Fig 1-46

50、Battery switch mark



Fi g 1-47

51、External noise indicator



Fi g 1-48

52、Transport tie-down point marking



Fi g 1-49

53、Lifting load warning sign



Fi g 1-50

4. Excavators are prohibited from being used for lifting and towing operations

 **Warning**
The excavator does not have the safety equipment required for lifting operations, so it is prohibited to use the excavator for lifting operations.

 **Warning**
The excavator does not have the safety equipment required for towing, so it is prohibited to use the excavator for towing operations.

 **Warning**
If you need information on safe operation, proper performance of special work or working in various environments, please contact your local Kenshi Heavy Industry sales agency.

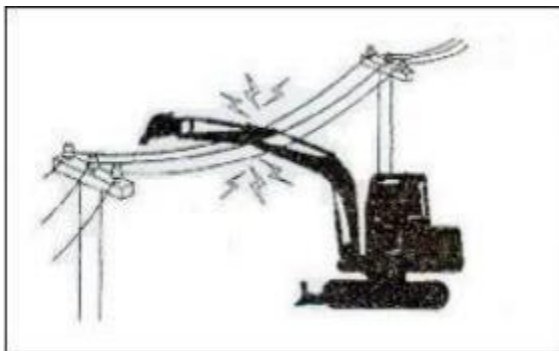
5. Things to note in the workplace

working device precautions

The optional devices are provided by the distributor. If you need single-acting and double-acting hard pipes, valve auxiliary control device information, please contact Kenstone. Because Kenstone cannot predict, verify or test all the working devices that customers want to install, please contact Kenstone to obtain authorization and working device approval and equipment and working device compatibility.

Becarefulwithhighvoltagegelines

When the machine is in contact with or close to the wire, it may cause serious fatal accidents. Therefore, it is forbidden to bring the working device close to the wire. When the operator cannot see clearly, rely on observers and sign language to stay away from the wire. The minimum safe distance is shown in the following table Figure 1-1: Any object close to the arm is potentially dangerous, which may catch the operator off guard and cause an accident. When working near bridges, telephone lines, scaffolding or other obstacles, there must be observers and signalmen.



Fi g 1-1

Voltage	Mn. safety distance
6. 6kV	3m
33. 0kV	4m
66. 0kV	5m
154. 0kV	8m
275. 0kV	10m

Fi g 1-2

The minimum distance is for reference only in Figure 1-2. When voltage and weather conditions change, even if the boom or bucket is 4-6m away from the wire, a strong electric shock will occur. High voltage or rainy weather will greatly reduce the safety margin.

NOTE: Before performing any type of work near electrical wires (above ground or underground cables) you should contact the power company and work with them to develop a safety plan.

Excavationworkrequirespermission

Excavation work may damage natural gas pipelines, water pipes, tunnels and underground buildings. Before starting the work, you should first understand what is underground at the work surface.

Beware of high obstacles

Be especially careful when working on soft surfaces

When working with heavy loads on soft, uneven or cracked terrain, there is a possibility of tipping over when subjected to lateral force. Walking is also dangerous. When working or walking on frozen soil, pay attention to wet and dark areas when the temperature changes, avoid ditches, protruding objects and other weak surfaces. If working on a poorly supported area, stop working first and install support pads or blocks.

use of solids support blocks

Do not rely on jacks or other inadequate supports when working, and block the front and rear of the track to prevent movement.

Working under overhangs is dangerous

When the working surface is under a cliff or under the edge of a lot, you must first understand the height and extension limit of the excavator, make plans in advance, and avoid moving around during operation to avoid danger. If a steep cliff is formed, move the working surface. When working around deep pits, high walls or trenches, support blocks are required, especially after heavy rain or spring thaw. When stopping work, park the excavator away from overhanging objects.

precautions for working on slopes

Level the work surface as much as possible and gradually level any slopes that exist. If leveling is not possible or if you must work on a slope, reduce the swing radius and speed. When on a slope, be sure to stop the machine before swinging, stay alert, and avoid unstable situations. For example, avoid fully extending the bucket downhill.

Lifting the bucket too high or too close to the machine when it is pointed upward can also cause danger.

Be alert for people walking through the work area

- Always know the truck driver's location when loading.
- When loading, the load must not exceed the cab. Even if the driver is in a safe area, others may enter the work for some reason, so avoid working in a place with a poor view.

- When loading, the load must not exceed the cab. Even if the driver is in a safe area, others may enter the work for some reason, so avoid working in a place with a poor view.

pay attention to comply with local regulations

Some areas are subject to government regulations for minimum insurance levels, work permits or certifications, guardrails around work areas, operating hours, etc. There may be reference standards or restrictions on equipment when performing certain work.

Check and comply with local requirements for underground utility and cable safety.

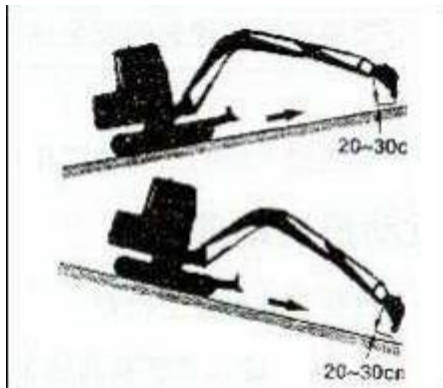


Fig 1-3

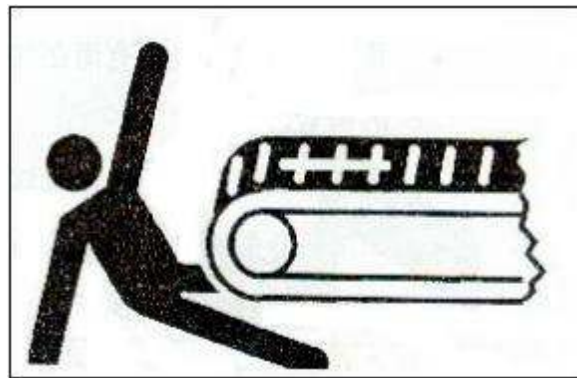


Fig 1-4

6. operation

You can only operate the excavator while sitting in the seat

Never operate the machine outside the window. Do not operate the machine unless in the designated position. Stay alert and concentrate on your work at all times, but do not leave your seat when you need to observe the work behind or beside you.

When you cannot see clearly or there is something behind you, you must have an observer or commander to assist you. Replace damaged or lost safety labels and damaged operating manuals.

No one who has not received systematic safety and operating training should operate the equipment.



Fig 1-5

Before starting the engine

Perform a pre-startup safety check.

- Before entering the cab, walk around the vehicle and check for signs of leaks, loose parts, improper adjustment of parts, or possible damage.
- When operating an excavator, to prevent accidents, all covers and safety protection devices must be complete.
- Check the work area for potential hazards or other factors that could threaten the safety of any property during operation.
- Do not start the engine during maintenance or repair, or when a warning sign is displayed on the operator's control lever.

- If the machine has not been used recently or the temperature is particularly low, it needs to be preheated and maintained before starting.
- Before starting, check whether the instrument monitor displays and sounds are normal. When starting operation, be alert to potential unsafe factors.

It is strictly forbidden to use ether for auxiliary starting

When starting from cold, using glow plugs to preheat, the heating element can cause ether or other starting fluids to explode.

stop and move

Do not get on or off a moving machine, do not jump up or down, and keep the cab clean and free of mud and oil when entering or leaving. The parking location must be firm and safe. When getting on or off, use the handrail, pedal, and track shoe to ensure at least three points of contact. Do not use the control lever as a handle. When the engine is running, do not leave the seat, the operating position, or get off the excavator.

Follow general safety rules

Only those who have been trained and authorized and have extensive knowledge and are familiar with safe operating procedures can operate the equipment or perform repairs and maintenance.



Fig 1-6



Fig 1-7

All persons in the work area must know their respective responsibilities and tasks, and the communication and sign language used must be understandable to everyone.

All personnel in the work area must pay attention to the terrain and soil conditions, nearby traffic conditions, weather-related hazards and obstacles above and below the ground.

Engine ventilation

Engine exhaust can cause fatal injuries and deaths, and can cause people to lose consciousness, vigilance, judgment and control, thus causing serious accidents. Before starting the engine in a closed area, make sure that the ventilation is good.

Be careful of open doors and windows, as exhaust gas may enter through them or be blown in by the wind, causing danger.



Fig 1-8

keep a good view

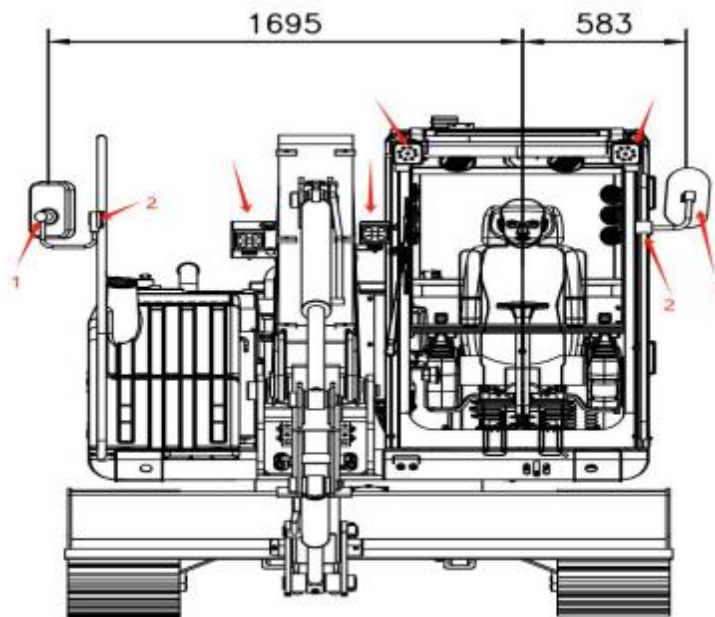


Fig 1-8A

Stop working when the visibility is poor. Rain, snow, fog, or dust in the work environment can make the visibility worse. It is best to wait until the weather changes or the dust settles before working. If the visibility in the work area is limited at night, work lights should be installed on the equipment or site before working.

Wipe away the dust on the windows and lights to ensure a clear field of vision, adjust the reflector so that you can see the situation behind the car from the cab, and keep the fuel nozzle and the fuel pipe in contact at all times to ensure good grounding. And keep the reflector clear.

The rearview mirror fixed joints 1 and 2 can be rotated. The operator can view the rear view through the rearview mirror while sitting in the driver's seat. By adjusting the left and right rearview mirrors, the operator can better observe the left and right rear blind spots.

Changes made to the rearview mirror by the machine user will result in limited machine visibility and must be verified in accordance with ISO 14401-2.

Fire protection of diesel, engine oil and hydraulic oil

When filling fuel, engine oil, antifreeze and hydraulic oil, the site should be well ventilated. After stopping, the lights, control levers and start switches should be turned off. The equipment must be kept away from flames and heating parts, and auxiliary heating elements and equipment that can cause sparks must be extinguished, turned off and away from the equipment.

Static electricity can produce sparks at the fuel nozzle. In cold, dry or other conditions that are prone to static electricity, the fuel nozzle and the fuel pipe should always be in contact to ensure good grounding.

The tank caps of fuel and other liquids should be tightened, and it is forbidden to start the equipment before tightening.

Auxiliary starting or battery charging

Before connecting the wires to the battery, turn off all electrical equipment, including the battery charger switch or the auxiliary starting device switch. If you use other equipment or vehicles to assist in starting, do not let the two devices touch each other. The cable of the auxiliary device or charger must be connected to the positive terminal, and the negative terminal of the auxiliary battery is connected to the metal frame of the charging or auxiliary charging device. Please refer to the operating education

procedures and instructions in this manual. When connecting the wires, connect the positive terminal first, and when removing, remove the cable of the negative terminal first. The auxiliary wire or charging wire that is finally connected to the metal frame of the equipment should be away from the battery pack.

possible reverse motion caused by walking operation

Before operating the equipment, check the direction of the crawler frame. The usual walking structure is that the crawler travel motor is under the engine and counterweight at the rear of the equipment. If the cab is rotated 180 degrees, the travel motor will be under the cab, in front of the crawler frame. At this time, push the joystick to move backward.

When traveling, the warning lights must be turned on, and the relevant laws and regulations of various provinces and regions, such as warning flags and signal lights, must be observed. The cab should be above the guide wheel, which will ensure that the travel is in the intended direction, while keeping the original direction of the lights and the flags and signals in place.



Fig 1-9

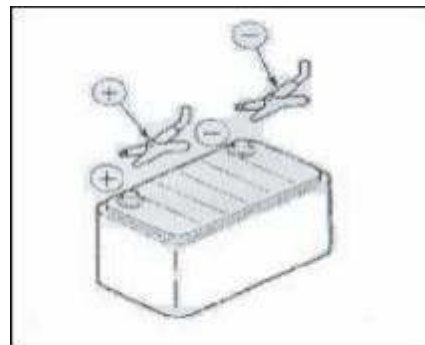


Fig 1-10

Be careful when turning and reversing

When reversing in heavy traffic or where the operator's vision is poor, there must be a signalman to ensure that no one enters the turning radius.

People near the crawler frame or working device are in danger of being caught in moving parts. Never let anyone ride on any part of the machine or working device, including any part of the turntable and the cab.

walking precautions

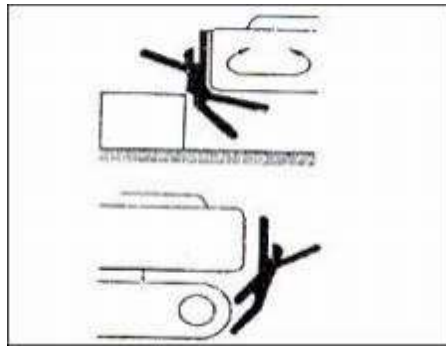


Fig 1-11

Do not operate the working device joystick while walking, and do not change the walking mode while walking. (High speed/low speed) Put away the working device, so that the outer end of the boom is as close to the machine as possible and 203-304mm above the ground. Never walk on obstacles or slopes that may overturn, and go around slopes or obstacles with a slope of more than 10 degrees.

Important

The continuous walking distance cannot exceed 2km. If the distance exceeds 2km, it needs to be towed by a trailer. If it is greater than 2km and a long distance must be walked, it is best to walk for 10 minutes and rest for 5 minutes.

Be careful when operating on snow, ice, or very cold weather.

In cold weather, avoid sudden walking and do not enter very slippery slopes. The equipment may suddenly slide to one side.

Snow accumulation may imply or create potential dangers, so operate carefully or use the equipment to remove snow first.

In order to avoid slow movement and reduced working performance, it is necessary to slightly warm up the engine.

Rapid or large-scale movement of the boom and working device in low temperatures will cause vibration or impact loads, which will cause severe stress, so it is necessary to reduce the working speed and load.

Do not use the device during thunderstorms to prevent lightning strikes

stop engine

After work is completed, avoid sudden shutdown or stoppage.

The excavator must be parked on a firm surface, away from traffic lines and high walls, cliffs, pools and drainage ditch edges. If it must be parked on a slope, the tracks must be blocked to prevent movement, and the bucket or other working device must be lowered to the ground or support base, and there should be no possibility of accidental movement.

control cut-off function

After the machine is parked in the night storage position, all switches and operating levers must be turned off, the control safety lever must be locked, the left console must be raised, and the pilot control function must be cut off.

All brakes and locking devices on the equipment must be used effectively.

▲ Important

When maintenance must be performed on the hydraulic system, it should be known that the accumulator in the system still contains pressurized fluid after shutdown, even if the control panel has been raised. After shutdown, the pressure is released by operating the control lever until the pressure in the pilot circuit disappears completely.

7. Equipment

strenuous work requires safety measures

Working in mines, tunnels, deep pits or on soft, wet surfaces may be dangerous from falling rocks or flying objects. It is necessary to install protective equipment on the cab and it must comply with the relevant regulations in the form of flying object protection structure or window protection device.

Any reinforcement system installed must pass the safety certification standard and have corresponding labels and data. For example, the reinforcement device often installed must meet or exceed the performance of the excavator falling object protection device specified in the Society of Automotive Engineers standard SAEJ1356. It is prohibited to change or modify any form of protection structure, reinforcement device. For example, drilling, welding, reinstalling or reinstalling fasteners. All protection systems that have been severely impacted or damaged need to be re-qualified. If necessary, re-reinforce and certify or replace the system.



Fi g 1- 13

If necessary, install safety devices

When working with a breaker or performing crushing operations, a protector is required on the front windshield. Depending on the specific needs and working conditions, the windshield protector may not be OPS certified. In special cases, thin plates are required to protect the front side and rear windows.

If there is a risk of being hit or hit by an object in the cab, please contact a Kenshi branch to obtain a safety protection device or relevant advice to confirm that other people in the working area are away from the excavator and are not threatened by potential dangers.

Action Alert

If the excavator is equipped with a travel sound alarm or a swing alarm (flashing light), check the alarm device every day. The alarm should sound when the travel starts, and the alarm should flash when the swing starts.

wear seat belts at all times

When the engine is running, the operator should sit in the seat and wear the seat belt properly.

Fire extinguisher

It is recommended that a multifunctional "A/B/C" fire extinguisher of equivalent size (2.7Kg or larger) be installed in the cab and that the fire extinguisher be regularly inspected and maintained. Make sure that all personnel on the construction site have received adequate training in its use.

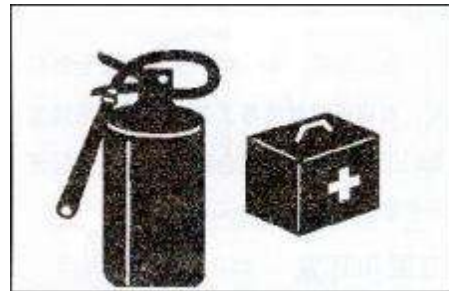
standard safety equipment should be kept in good condition

Mechanical guards and surface covers must be in place and rotating parts must be kept clean. Cooling fan and generator belts can catch hair or loose and large clothing.

Damaged or unclear safety labels must be replaced. The information on the labels provides important safety tips to everyone on the construction site.



Fi g 1-14



Fi g 1-15

parts that have reached their safety limits must be replaced within a certain period of time

The following parts that are in contact with flammable materials should be replaced immediately when they are worn or reach the specified service life, regardless of whether there is obvious damage.

- Fuel system hoses, tank overflow hoses and tank caps.
- Hydraulic system hoses, especially the pump output pipes and the branch pipes of the front and rear pumps.
- The brackets, hoses and cables should be tied tightly according to the direction.
- The bends in the direction of the hoses should be smooth.

Hydraulic high-pressure pipes can store huge amounts of energy

The hoses on the boom and lower arms will react explosively when hit by falling rocks, overhead obstacles or other objects. Therefore, never allow the hoses to be impacted, bent or interfered with.

The cab and turntable should be kept clean

Removing accumulated grease and dust will help extend the life of the equipment. Cleaning will also help with inspection. Minor damage should be repaired or corrected before a serious accident.

Tools and personal items should be kept away from the console and cab floor.

The machine is not intended for use in unhealthy environments, such as contaminated locations.

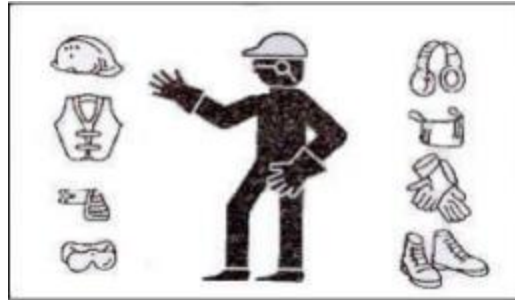
If the earth-moving machine is intended to be used in a contaminated environment, special precautions are required to protect the operator (e.g. fresh air filtration systems or systems to provide breathing air for the operator) if there is a risk (see also 4.3.1.1).

wear goggles and work clothes

Goggles, helmets, safety shoes and gloves are required on the construction site. When repairing equipment, do not use tools that are not strong enough, otherwise they may break or slip, causing injury or the installation may not meet the requirements.

Masks and earplugs

Don't ignore factors that may not pose an immediate risk to your health. Exhaust and noise pollution are invisible but can cause disability or permanent injury.



Battery fluid and explosive gases are deadly

If acid splashes into eyes, rinse with water for 10 to 15 minutes. If acid is ingested, seek medical attention immediately and contact a poisoning service. Water and ice cream are better than treatments that induce vomiting. (Vomiting may cause secondary injury to human tissues).

Accidental contact and sparks from static discharge can cause battery gas to explode. When handling batteries, turn off all switches, stop the engine, and secure the battery terminals. Loosely connected terminals and terminals can produce sparks that can cause explosions.

when welding, remove the battery first.

When removing wires, remove the negative terminal first, and when installing the battery, connect the wires to the positive terminal first.

use low-heat mobile lighting

The hot surfaces of emergency lights or moving light sources can cause explosive gases to form in fuel and batteries.

vibration

The hand-arm vibration value is 2.5 m/s^2 . The uncertainty of measurement is 0.5 m/s^2 .

The whole-body vibration value is 0.5 m/s^2 . The uncertainty of measurement is 0.1 m/s^2 .

Noise

The A-weighted emission sound pressure level at the operator's station is XX dB(A). The uncertainty of measurement is 2.5 dB.

The A-weighted emission sound power level is 95 dB(A). The uncertainty of measurement is 1.5 dB. Measured according to 2000/14/EC.

8. Maintenance

use warning signs during maintenance: "No operation"

During maintenance, remind others to pay attention. Place warning signs on the control levers in the cab and other places where the equipment is needed. Use a chain or rope of a certain length to fully pull up the left console so that it cannot move.

The engine cannot be run while one person is performing maintenance work

If the engine must be running for maintenance, at least two people should work together, and one person should be in the seat, ready to operate or stop the machinery and stop the engine.



Fig 1-17



Fig 1-18

use adequate support or pads

Do not allow hanging weight and equipment loads, lower all objects to the ground before leaving the seat, do not use hollow, cracked, unstable and shaky supports. Do not work under self-supporting equipment.

Donot perform maintenance on the engine cooling system and hydraulic system when they are hot.

After the engine has completely cooled, place the excavator on a solid surface, and lower all working devices to the ground before stopping and cutting off the control circuit. When changing the engine oil, gear oil or other lubricants, wait until the temperature drops to a suitable level.

Note: The oil will drain faster and more thoroughly after it is slightly heated. Do not drain liquids above 95° C (203F), but do not allow it to cool completely.

Allow the radiator and fuel tank to cool completely before checking

Before maintaining the engine radiator and hydraulic oil tank, stop the engine to let the heat dissipate. There are vents for releasing air pressure next to the control ventilation rod or filling cap of the equipment. Before opening the cover, loosen the ventilation control rod and slowly loosen the cover.



Fig 1-19

Leaking pressurized oil is dangerous

Fluid leaks from hydraulic pipes or pressure parts may be difficult to detect, but the pressurized fluid has enough pressure to pierce the skin and cause injury.

Use a wooden board or card to check for hydraulic fluid leaks, never use your hands or fingers.



Fig 1-20

If hydraulic fluid punctures the skin, seek immediate medical attention

▲Warning

If not treated in time, it will lead to decay and other more serious human damage.

use genuine replacement fasteners and achieve the proper torque

The tightening torque is given in the chapter "General Maintenance" in the marketing manual. It is recommended to tighten gradually several times and use genuine products. Low strength or incorrect fastener connection may damage the working part.

proper handling of petroleum oil-like fluids

Direct contact with engine oil, hydraulic oil, and lubricating oil poses a threat to health. Wipe off oil residue on your hands immediately. Engine oil, etc. is an environmental pollutant and can only be recycled with approved tools. Never discharge petroleum-based products onto the ground or into ordinary waste containers, or into urban drainage systems or rural irrigation systems.

Check provincial and local regulations for other requirements.

Track Tension Adjustment warning

Never remove the grease fitting nut from the track tensioner spring. Do not attempt to remove the adjuster or disassemble the grease fitting and valve assembly when changing the track tension by releasing pressure.

Keep your body and face away from the valve and refer to the Adjustment Method section in the Operation and Maintenance Manual or Marketing Manual.

9. Loading and Transportation

comply with provincial and local highway transportation regulations

Before preparing for transport, check state and local regulations regarding load weight, length and width restrictions. The transport vehicle, trailer and load must comply with the transportation provisions specified in local regulations. Disassembly or removal of excavator components may be necessary when transport restrictions or special working conditions are encountered. See the Component Removal chapter in the Marketing Manual.

Refer to the Shipping and Transportation chapter of this manual for information on loading, unloading and towing.

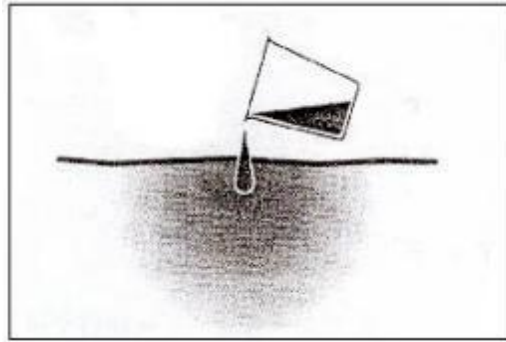


Fig 1-21

operation control

operational controls" include the following

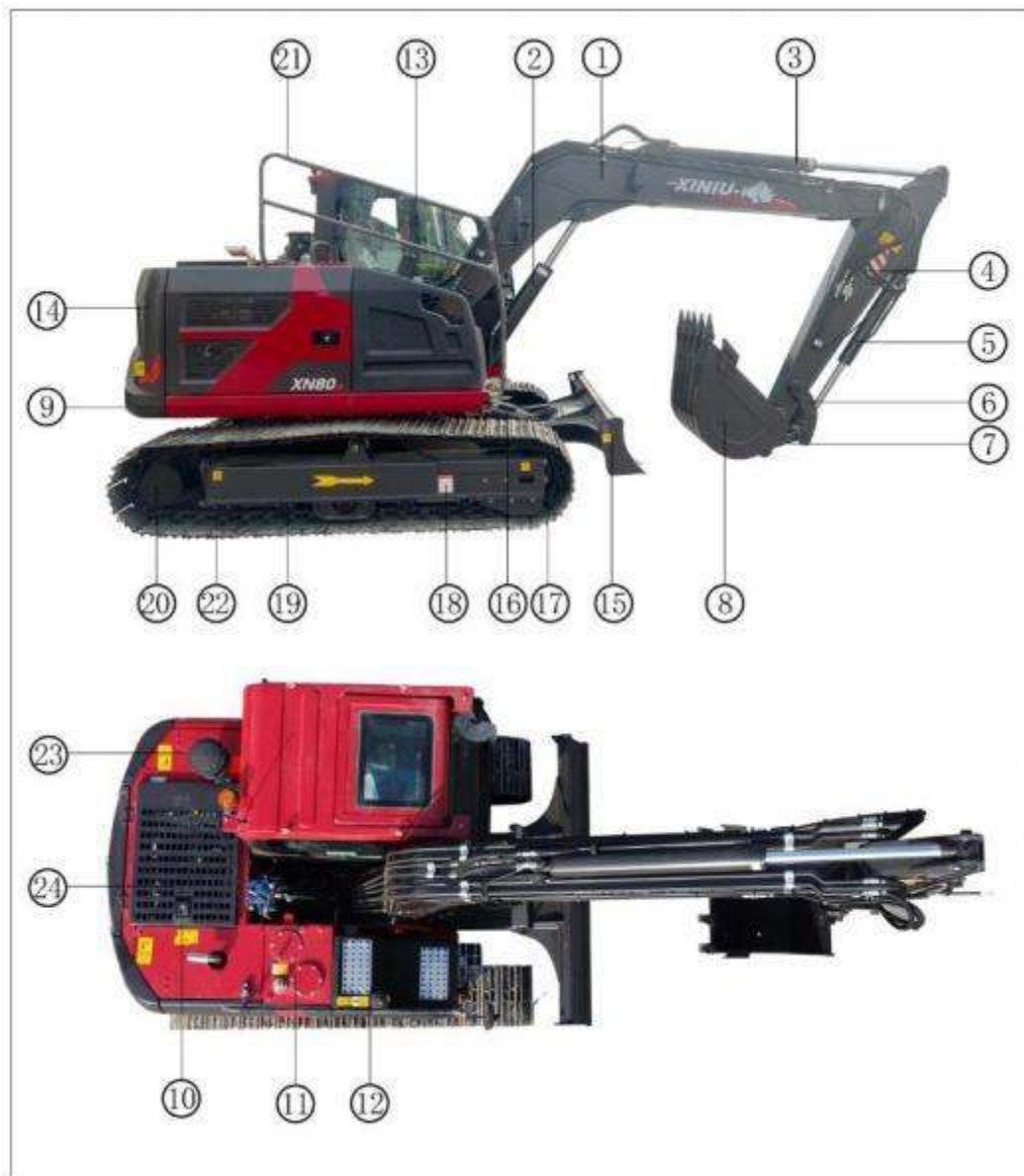
1. Component location
2. Cab
3. Instrument panel
4. Rocker switch
5. Heating and air conditioning system
6. Adapter plate
7. Audio
8. Seat adjustment
9. Seat belt
10. Door opening/locking lever
11. Cab interior

Each part is explained by drawing or photo, and each control switch, instrument and control valve are described. The instrument on the instrument panel is equipped with indicator lights, which the operator uses to monitor the working condition of the machine. These indicator lights will show the occurrence of faults.

Warning

~~Warning light or buzzer:~~ If any one or more warning lights on the console light up or the buzzer sounds an alarm, please stop operating immediately, cut off the power supply, and investigate and eliminate the fault before continuing the operation.

1.component location



1. Boom	7. Connecting rod	13. Cab	19. Roller
2. Boom cylinder	8. Bucket	14. Counterweight	20. Travelling motor
3. Arm cylinder	9. Rotating platform	15. Bulldozer	21. Armrest
4. Arm	10. Engine hood	16. Bulldozer cylinder	22. Track
5. Bucket cylinder	11. Fuel tank	17. Guiding wheel	23. Radiator wheel
6. Pushing rod	12. Hydraulic oil tank	18. Tensioner	24. Engine

2. cab



Fig 2—1

- | | | | |
|--------------------------|---------------------------|-------------------------------|----------------------------|
| 1. Display | 5. Start switch | 9. Radio | 13. Seat |
| 2. Emergency stop switch | 6. Rocker switch assembly | 10. Bulldoze adjustment lever | 15. left travelling lever |
| 3. Right joystick | 7. A/C panel | | 16. Right travelling lever |
| 4. Throttle | 8. Cigarette lighter | 11. Joystick | |
| | | 12. Safety lever | |

Emergency stop switch

The emergency stop button in the right picture can be used as a protective measure by quickly pressing this button in case of an emergency.

When the emergency stop button is effective: the flame, air brake, and safety valve are turned off, and all other electrical appliances are in a power-off state. The emergency stop button indicator light is on, and the emergency stop button indicator light goes out only when the one-button start switch is turned off.



Fi g 2- 3

start switch

start switch and electronic throttle

A. Start: Turn the yellow button counterclockwise from "0" to "1" and then press the middle button to start. The electrical system is powered on, and the charging indicator and oil pressure indicator on the dashboard are on in this position.

B. Shutdown: Turn the engine clockwise from "1" to "0" to shut down the engine and cut off the electrical system

C. "Preheat" position - Use this position for starting in cold weather. After preheating, the preheating completion indicator on the dashboard will light up. Start immediately after this light comes on.

D. The gray knob is the throttle. Turn this knob when you need to accelerate while driving.



Fig 2-4

▲Warning

The starter switch has a self-locking function to prevent the engine from restarting when it is in operation. The next time you restart, the switch must first return from the "1" position to the "0" position before switching to the "Start" position for starting.

When using the preheating system, you cannot use the starting fluid, as the preheating system can cause the starting fluid to explode.

Horn control button (right joystick)

Pressing the button on the right control joystick sounds the horn.



Fig 2-5

Rocker switch



Figure 2-6

1. Front working lights
2. Working lights
3. Rear working lights
4. Warning light
5. High and low speed
6. Wiper
7. Wiper spray
8. DPF regeneration
9. Disable DPF regeneration
10. Parking

▲Warning

When the front window is dry, please spray the glass cleaning fluid before using the wiper, otherwise the glass or wiper blades will be damaged.

When the front window is stained with mud and sand, please clean the mud and sand first and then spray the glass cleaning fluid before using the wiper, otherwise the glass or wiper blades will be damaged.

Do not use the windshield washer without cleaning fluid, otherwise the windshield washer motor will be damaged. Check the glass cleaning fluid level in the windshield washer and add fluid in time.

If soapy water or detergent is used instead of glass cleaning fluid, it will damage the wiper blades or the surface of the wiper. Use special glass cleaning fluid.

Heating and air conditioner control panel

aa、 Air conditioner switch (Figure2-7right knob)

The excavator is in heating mode when it leaves the factory. You need to manually turn the heating/air conditioning switch to set it to air conditioning mode. Rotate the air conditioning panel to blow out cold air and the red light will come on.

b、 Air volume switch (Figure2-7left knob)

The air volume switch is used to adjust the air volume at the air outlet. It is divided into three selection sections: O position, the fan stops working; L position: low air volume; M position: medium air volume; H position: high air volume. Rotate the air outlet direction to the appropriate position as required to select the appropriate air outlet direction; Figure 2-8



Fig 2-7



Figure 2-8

C、 As shown in Figure 2-7, turn the air conditioner switch clockwise to the appropriate position (when turned clockwise, the cooling will be enhanced; when turned clockwise to the rightmost position, the cooling will be maximum; when the cooling is too great, turn counterclockwise to reduce the cooling; in addition, the cooling can be adjusted by adjusting the wind speed).

Adjust wind speed, wind direction and cooling degree according to actual conditions to obtain a comfortable environment;*

Note*: In not very hot weather, if the air conditioner feels too cold after being turned on for a while, the correct way to operate it is: first turn the air conditioner switch counterclockwise to an appropriately small cooling position. After a while, if the wind feels too strong, use the wind speed switch to reduce the wind speed.

precautions:

1. For air conditioning box assemblies with dust screens, the dust screens must be cleaned regularly, otherwise dust and dirt will clog the dust screens, preventing the air in the car from passing through the heat exchanger smoothly, affecting the air conditioning effect.

2. When using the refrigeration system in summer and the ventilation system in spring and autumn, the warm water valve should be closed first; when using the heating system in winter, the ball valve should be opened first and the air conditioner switch should be turned to the O position.

3. The heater core is connected to the engine water tank, so once the heater core leaks, it will cause the water tank to lack water and the engine to overheat. In winter, it is equally important to protect the heater core from freezing. To prevent the coolant from freezing and causing the heater core or water tank to freeze, please use the coolant specified by the main engine manufacturer. If necessary, in winter when the coolant can freeze, if the downtime is long, please release the coolant! Please note: The heater core that freezes in winter will not be covered by the three guarantees service..

4. Refrigerants can easily freeze the skin, especially the eyes. In addition, refrigerants will release toxic phosgene when exposed to open flames. Therefore, whenever you need to dismantle the refrigeration system you must ensure that the refrigerant will not spray onto the skin and eyes. First, recover or release the refrigerant, and then dismantle the refrigeration system. The entire process must ensure that there is no open flame.

If you do not use the air conditioner for a long time, please operate the air conditioner system once every half a month, and operate it for 5 to 10 minutes each time.

Left-hand lever (handle) with left and right rotation switch

This lever controls the rotation of the clamp and the operation of the dipper arm (not standard). Figure 2-9

Right hand operating lever (handle), with clamp opening and closing, horn switch

This operating lever controls the clamp opening and closing and arm operation (not standard).

Figure 2-10



Fig 2- 9

Engine electronic throttle

This rotary switch controls the engine speed.

A: High speed: Turn clockwise to increase the speed.

B: Low speed: Turn counterclockwise to decrease the speed.



Fig 2- 11

Bulldozer control lever

The bulldozer blade control lever is located on the left rear side of the cab seat.

A: Pull back the lever to raise the bulldozer blade.

B: Push the lever forward to lower the bulldozer blade



Fig 2- 12

Travel control lever (right and left)

These two operations are used to control the machine to move forward or backward. One operating lever controls one track.

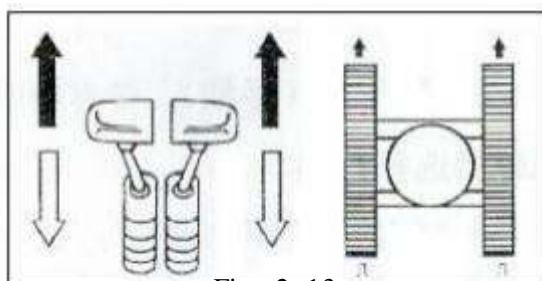


Fig 2- 13

safetybar

This operating lever① is used to lock the hydraulic control handle. Lifting it up will operate the control handle, and pressing it down will not cause any movement of the control handle..



cigarette lighter

When the cigarette lighter plug is pressed into the cigarette lighter seat cover, the plug will automatically pop up within 10 to 18 seconds. At this time, you can pull out the plug to light a cigarette.

Press the cigarette lighter plug, please release it immediately.

If it does not pop up after pressing the cigarette lighter for 20 seconds, please pull out the cigarette lighter plug by grabbing the plastic handle of the plug and wait for the plug and the cigarette lighter seat cover to cool completely before repairing or replacing it to avoid burns.

If the cigarette lighter plug is pressed and the plug pops up immediately after releasing it, it means that the cigarette lighter is broken. Please contact the dealer designated by Ken Stone Company to replace the cigarette lighter with the same specifications.

Display

A system overview

The excavator color screen electronic monitor uses 260,000-color TFT wide-temperature liquid crystals and STM32 series industrial control microcontrollers as the core to monitor and control the coordinated matching of the engine and hydraulic system. It uses highly reliable imported components, intelligent control, and a simple and efficient human-computer dialogue interface to achieve long-term efficient, and low-consumption stable operation of the entire machine.

B system working environment parameters

Working voltage : 9V~18V

Working temperature : - 20℃~+75℃

Storage temperature : - 40℃~+85℃

Relative humidity : (30~90) %RH

Vibration intensity: 10-55Hz/1.5mm-p Impact intensity:
1800m/s² • 2ms Atmospheric pressure in three directions of X,
Y, and Z: 86~106Kpa

Electromagnetic immunity: Complies with IEC 61000-4-4
international standard

Protection level : Complies with SAE J-1455 international
standard

Communication method: Adopts J1939 CAN transmission protocol

Instructions

keyDescription	
	 Menukeyandconfirmation key
	 Mute andbackbuttons
	 Reversing image/dowkey
	 Idle/upkey
The instrument has a touch function. you can use key controls or touch screen keys to select menus or enter numbers.	

(1)Main interface description



No.	Function	No.	Function
1	Time	7	Engine speed
2	Date	8	Water temperature gauge
3	Hour meter	9	Text prompt area
4	System voltage	10	Function indication
5	Function alarm	11	Key Display Area
6	Fuel quantity		

1 Time Displays Beijing time, which can be set in the user menu.

2 Date

3 Hourmeter

Displays the current working hours. When timing is in progress, the white icon switches to the green icon. When not timing, the icon remains unchanged. This can be set in the system menu.

4 System voltage

The scale indicates the voltage change. When the alarm point is reached, the red area is indicated, and the icon flashes with a buzzer and text prompts.

5 Function alarm

In normal condition, the icon is gray; in alarm condition, the icon flashes, the buzzer sounds, and the text prompt area is accompanied by text prompts.

Icon							
Function	Oil pressure	Charge	Oil temperature	Air filter	Engine failure	Water in oil	Brake pressure

6 Fuel

The scale indicates fuel changes. When the alarm point is reached, the red area is indicated, and the icon flashes with a buzzer and text prompts.

7 Engine speed

CAN signal. Displays the engine speed.

8 Water temperature gauge

CAN signal. The scale indicates the water temperature change. When the alarm point is reached, the red area is indicated, the icon flashes, and there is a buzzer and text prompt.

9 Text prompt area

When there is an alarm the alarm text is displayed. When there are multiple alarms, they are displayed in a loop.

10 Function indication

Icon							
Function	Parking brake	Safety lock	Auto Idle	Preheat	Climbing	Engine RPM	Mute

11 Key Display Area

Indicates the function of the current key

Icon							
Function	Idle	Mute	Menu	Up	Down	Return	Confirm

D Main menu

Press the menu button from the main interface to enter. Contains:

- (1) Operating parameters
- (2) Time and date settings
- (3) Fault information
- (4) System settings
- (5) DPF regeneration view
- (6) Start password settings
- (7) Language
- (8) Input and output signal status

(1) Operating parameters

Display real-time monitoring values





(2) Time and date settings

To adjust the time and date, use the up and down selection keys to increase or decrease the number. When you reach the corresponding number, press the confirmation key. The system will automatically move the cursor to select the corresponding number.



Add Up	Minus Down	Return	Confirm

(3) Fault information

Fault information includes fault code and fault record submenu; when there is an engine fault, the user can enter this menu to query the engine fault code, the interface is as shown below; the fault record records the fault phenomenon, if there is no record, it will prompt that there is no record.



(4)systemsettings

To enter the system settings page, you need to enter the password (332211). The password is generally kept by the manufacturer's technicians and service personnel and must not be disclosed to the user. The manufacturer's technicians set the working hours and clear the fault records. The instrument is a touch screen. When entering the password, you can directly touch the numbers on the screen to enter; you can also use the up and down selection keys to select numbers, select the corresponding number, press the confirmation key to enter, and the system automatically moves the cursor to the next number. If all numbers are entered correctly, you can enter the menu; if the password is incorrect, it will prompt "Wrong password, please re-enter!". Press the confirmation key to re-enter.



workinghours setting

Enter the working time setting interface (password required), and you can manually set the working time after entering. It consists of 5 integers and 1 decimal. It is usually used to adjust to the current working hours after replacing the instrument.



Fault record clearing

This page is used to clear fault records (password required to enter).

Enter the page. If you need to clear the fault records, press the "Confirm" key, press the "Return" key to exit the page.



(5)DPFregeneration view

Used to view regeneration information, perform DPF regeneration according to prompts and precautions during regeneration.



(6) start password settings

Used to control the start of the excavator with a one-button start switch. If the start password is set, the start switch red means that the start is prohibited, and green means that the start is allowed. Users can set the password by themselves, and turn on, off or change the start password by themselves.

To prevent others from tampering with the excavator, the user can turn on the start password. To turn on or modify the password, you need to enter the same password twice to turn it on successfully. After turning it on successfully, you must remember the start password. Each time you power on, you must enter the password correctly before you can start the excavator, otherwise the excavator cannot be started.



(7) Language

Used to switch the display language. After selection, the Chinese and English interfaces will switch between each other (if the instrument is bilingual)

(8) input and output signal status



Reverse image

When the instrument detects the reversing signal, the main interface automatically switches to the reversing image interface

FAfter-sales service information

Under normal operation according to the instructions in the manual, if a malfunction occurs, it can be repaired free of charge within the warranty period.

When repairing this product, please bring the warranty and go to the sales point for repair.

Repair costs will be incurred in the following cases:

In the absence of a warranty.

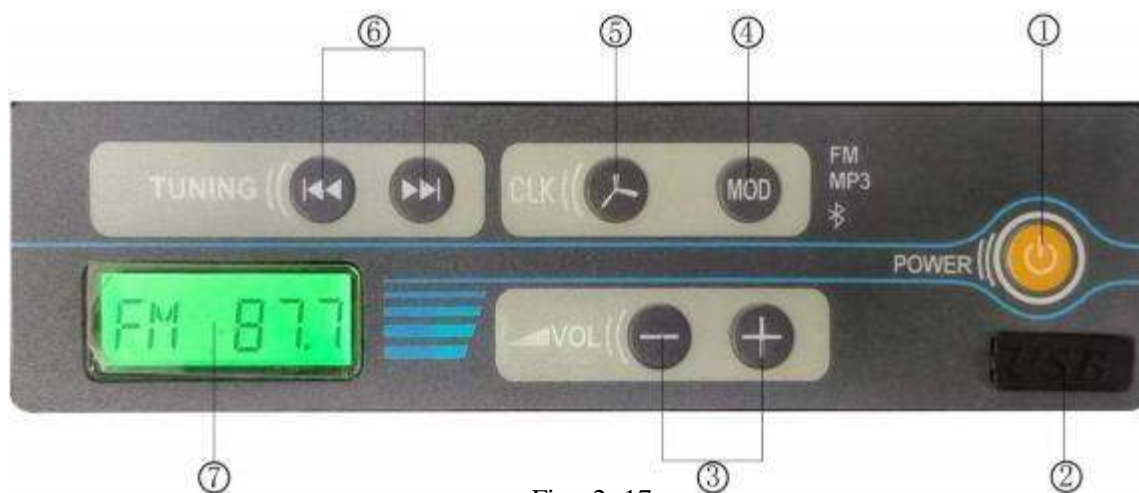
Failure caused by improper use of the machine or unauthorized disassembly, repair, or modification of the machine.

Failure caused by the user dropping the machine during transportation after purchase.

Failure caused by fire, earthquake, gas leak, wind disaster, lightning, abnormal voltage, etc.

In the case where the purchase time, customer name, or text is modified without recording this manual.

Audio



Fi g 2- 17

(1)controllers and switches

- | | | |
|--------------------|------------------------|-------------------|
| ①Power switch | ④Mode | ⑦ Digital display |
| ②USB connector | ⑤Display switch | |
| ③Tone control knob | ⑥Station preset button | |

(2)Radio tuning method

Press the power switch ① to turn on the radio, and the tuned frequency will be shown on the digital display ⑦. Use the tuning button ⑥ to select the

desired station. The volume control button ③ can decrease or increase the volume.

precautions:

To avoid traffic accidents, please set the volume to an appropriate level.

seat adjustment

Move the adjustment lever to adjust the front and rear position of the seat, the adjustment range is 160mm

① The knob can adjust the seat suspension.



Fig 2-18

seat back adjustment

Lift the lever on the left side of the seat to adjust the seat back to the desired angle.

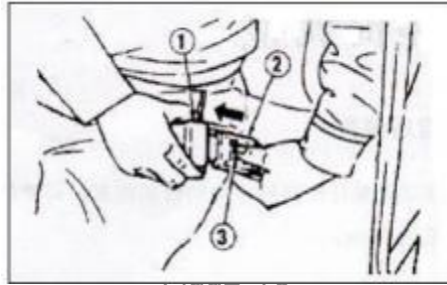
seat belt

 Warning
The seat belt is to ensure the safety of the operator and should be fastened at all times during work. Before work, adjust the seat to the required position to make the operation more comfortable and easier to operate, and then fasten the seat belt. The seat belt must be adjusted and fastened in the specified place to reduce the possibility of accidents or the degree of injury. Do not fasten the seat belt on the abdomen, and do not stand in the cab to operate the excavator. When the equipment is moving, the seat position cannot be adjusted, which will cause loss of control. Before fastening the seat belt, check the condition of the seat belt and the seat belt fixing frame. Do not use the seat belt when it is kinked, and replace damaged or broken seat belts.

Locking and releasing the seat belt

Insert the end of the safety belt ① into the holder ② and pull the safety belt to confirm that it is fixed. (Figure 2-19)

Adjust the length of the safety belt so that it can comfortably fix the operator's body. press the button ③ located in the holder ② to pull out the safety belt ①. (Figure 2-19)



Door opening/locking lever

Press the door lock operating lever in the direction indicated in Figure 2-23 to unlock the door.



Fi g 2- 23

warning

When operating the machine, to ensure the driver's safety, the cab door must be closed.

cab interior lights

Turn on the switch ① in Figure 2-24 and the ceiling light will turn on.



Fi g 2- 24

Radio speaker in cab

Turn on the radio and this speaker will transmit the sound.



Fi g 2- 25

cab interior sunshade

The sunshade can be pulled open horizontally and buckled on the hook, or it can be pulled open vertically to achieve the effect of sunshade.



Fi g 2- 26

3.Adapter plate

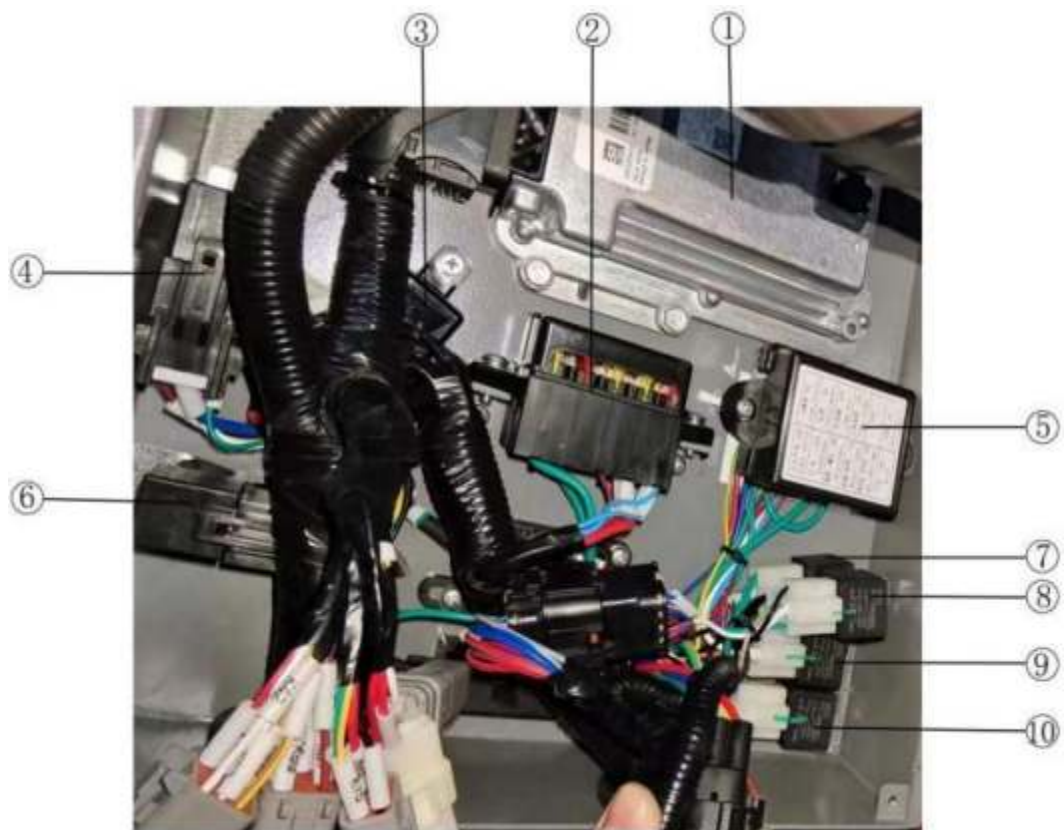


Fig 2- 16

- | | | |
|--|----------------------|------------------|
| 1、ECU | 5、Line fuse assembly | 9、Power-on relay |
| 2、Engine fuse box | | 10、Horn relay |
| 3、EGR Exhaust Gas Recirculation System | 6、Start relay | |
| 4、Preheat relay | 7、Regeneration lock | |
| | 8、Safety Relays | |

operation

1.New machine operation instructions

All Kenstone Heavy Machinery excavators are inspected and adjusted before leaving the factory, but during the initial running-in process, the following steps still need to be followed, otherwise the excavator will be damaged and performance will be reduced.

Hours	Load
First 50 hours	Maintain 60%-70% of full load (engine speed: 60%-70% of rated speed)
After 50 hours	full load

If full load operation is carried out before the running-in period, it will have an adverse effect on service life and safe operation, and eventually cause failure.

Notice :

1. Check coolant, engine oil and hydraulic oil for leaks every day.
2. Check the lubricating oil every day and add lubricating oil when necessary.
3. During operation, always pay attention to the display of the instrument panel and various instruments.
4. Avoid engine overload.
5. Maintain 60%-70% load until the engine and other components reach operating temperature.
6. Pay attention to whether the working equipment is normal during work.
7. Check whether any parts are loose or damaged during transportation.
8. Check whether the wires or terminals are loose, whether the instrument is working, and whether the battery fluid is sufficient.

Lubricating fluid and filter

1. After 50 hours of operation, replace the engine oil and oil filter.
2. After 100 hours of operation, clean the hydraulic line filter.

3. After 500 hours of operation, replace the travel or reduction gear oil.

Note: When replacing lubricating oil or grease, refer to the "Inspection and Maintenance" section of this manual.

2.startup and shutdown

Engine pre-start inspection

Warning

~~If flammable items such as leaves and paper accumulate on~~
high-temperature parts such as the muffler and intake pipe, it may cause a fire. Leakage of fuel, lubricating oil and hydraulic oil may also cause a fire.

Before starting the engine, check the following items:

1. Electrical System 1. Check whether the wires are damaged, loose or have missing terminals.
2. Fuel system - Drainage or impurities from the fuel tank.
3. Hydraulic system Check whether the hydraulic oil leaks, whether the pipes are damaged, and whether there are any interference points in each component.
4. Lubrication: Carry out daily or regular maintenance carefully, and perform maintenance according to the reading of the timer.
5. Safety check around the machine. Before starting, make sure there is no one under the equipment or that it is undergoing maintenance.
6. Check whether the working conditions and functions of all operating levers and components are normal. Before continuing to work, stop the machine and repair abnormal functional components.

pre-startup operational checks

warning

~~When leaving the seat, the safety lever is placed in the locked~~
position to prevent accidents caused by accidentally moving the operating lever.

1. The safety lever is in the "locked" state when placed in this position. (Figure 3-1)

2. Fasten the safety belt and check whether the work and various conditions are normal.



Fi g 3- 1

3. Make sure the travel lever ① and bulldozer lever ② are in the "neutral position" (Figure 3-2).

Note: When starting the engine, be careful not to touch any switch.



Fig 3-2

4. Rotate the yellow button counterclockwise from "0" to "1" and then press the middle button to start. (As shown in Figure 3-3)



Fig 3-3

Check that all display lights are on, except for the following ones, the other lights will be off.
As shown in Figure 3-4

- Time, date
- Oil pressure light
- System voltage
- Fuel gauge
- Water temperature gauge
- Speed



Fig 3-4

Note: If all indicators are off after power on, it means there is a fault. The buzzer will sound for 2 seconds.

5. Check the exhaust system

- Colorless or light blue - normal engine operation
- Black - incomplete combustion, check the cause.
- White or dark blue - oil burning, check the cause.

Check the engine vibration and noise, if there is noise and vibration, check the cause.

Note: If the engine coolant temperature gauge shows red during operation, take the following measures:

Stop working and reduce the engine speed to the lowest idle speed. Open the engine cover to facilitate ventilation. When the engine temperature gauge returns to the green area, turn off the engine. After the engine cools down, check the coolant level to see if there is any leakage or blockage; whether the heat sink (heat dissipation hole) is covered with dirt; whether the fan belt is properly tightened.

starting at low temperature

Warning

Do not use starting fluid when using the preheating system. The preheating system will cause the starting fluid to explode, so it is forbidden to use starting fluid.

6. After starting the engine, check all operating indicators to ensure that the engine system (oil pressure, coolant, etc.) is working properly. If any problems are found, shut down the engine immediately.

7. Refer to "Hydraulic System Heating - Low Temperature State" to perform heating operations. Page 57

Important

~~The electrical system is a 12V negative grounded battery, and the auxiliary starting uses a 12V boost battery of the same energy.~~

When starting, if the battery is discharged, use the auxiliary or booster battery to start as follows.

1. Use the booster wire ① (Figure 3-5) to connect the positive terminal of the auxiliary battery to the positive terminal of the used battery of the excavator.
2. Use the booster wire ② (Figure 3-5) to connect the negative terminal of the auxiliary battery to the ground point of the upper platform. Do not connect directly to the negative terminal of the battery.
3. Perform the normal engine starting procedure.
4. After the engine starts, move the booster wire from the negative terminal to the positive terminal.

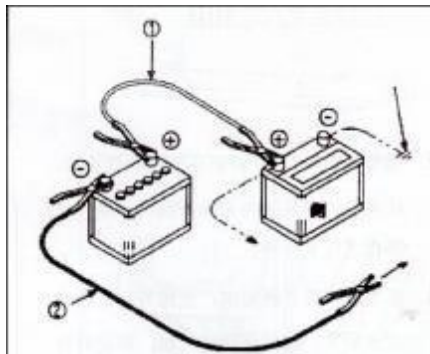


Fig 3-5

Hydraulic system preheating

▲Warning

~~If there is a malfunction or abnormal operation, stop the machine immediately. Allow the excavator to reach normal temperature before starting work, especially in low temperature conditions.~~

The normal operating temperature of hydraulic oil is 50-80°C (120-170F). Proceed as follows:

1. Let the engine run at medium speed without load for 5 minutes.

2. Put the safety lever① (Figure 3-6) in the "unlock" position.
3. Slowly move the boom, dipper and bucket cylinder 5 times to allow the hydraulic oil to circulate once in the system without load. This operation should be carried out for 5 minutes.
4. Check the clearance of the working device and raise the front working device completely. Turn clockwise three times and then counterclockwise three times.
5. On a level hard ground, support the working device so that one side of the crawler is off the ground. At high speed and low speed, turn the drive wheel forward and backward two times each. Check the crawler on the other side in the same way.



Fig 3-6



Fig 3-7

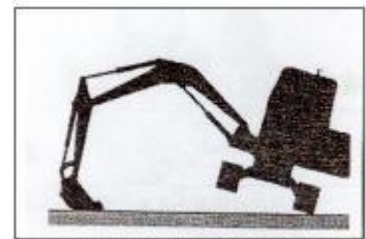


Fig 3-8

Heating of hydraulic system at low temperature

1. Let the engine run at idle speed (no load) for 5 minutes
2. Let the engine run at medium speed and no load for about 5 minutes.
3. Put the safety lever ① (Figure 3-6) in the "unlock" position (connect the pilot oil source).
4. Slowly move the boom, dipper and bucket 5 times under no load to make the hydraulic oil circulate once in the system without load. This operation is carried out for 5 minutes.

Note : The cylinder movement does not reach two dead points.

5. Turn the engine throttle to "highest idle speed"
6. Repeat "step 3" for 5 minutes. If the operating temperature is still low, continue to operate, but be extra careful because the performance of the equipment may be unstable.
7. Raise all the front working devices, check the clearance, and then slowly rotate clockwise and counterclockwise for 3 circles each.
8. Use the working device to support one track off the ground, and rotate the drive wheel forward and backward for two circles each at high and low speeds. Check the other track in this way.

stop

Note: When stopping, let the engine run at idle speed for 3-5 minutes.

Otherwise, energy may accumulate and damage the engine. The engine idling can play a role in heat dissipation.

1. Park the excavator on a level and hard ground.
2. Put the working device on the ground and make sure all operations are in the "neutral position".
3. Put the engine throttle lever in the "lowest idle speed" and let the engine run at idle speed for 3-5 minutes.
4. Turn the start button counterclockwise to "0" to turn off the engine.
5. Press the safety lever down, that is, "lock" the operating action state.



Fig 3-10

Inspection and confirmation after shutdown

1. If the excavator has coolant or oil leakage, repair it.
2. Check whether the front working device and the vehicle are normal and eliminate the fault.
3. Add fuel.
4. Remove flammable materials accumulated around the engine, such as leaves, paper, etc.
5. Remove mud from the lower part of the vehicle and the tracks, and ensure that all pedals, handles and cabs are clean and free of dirt.

3.safety lever

Warning

When stopping or leaving the driver's seat, lock the safety lever, otherwise accidentally touching the operating lever may cause a serious accident.

When leaving the driver's seat, make sure the engine is turned off (the key switch is in the "off" position) and the safety lever is locked.

When pulling up or lowering the safety lever, be careful not to touch the operating lever. The safety lever can lock all working control levers.

Therefore, if you accidentally touch the working control lever, there will be no effect.

1. Pull up the safety lever and let the left console rise to the locked position. Make sure that the safety lever is locked in the raised position. When the safety lever is in the locked position, the front working device cannot work.

Note: Lower the bucket (front working device) to the ground and put all control levers in the "neutral position" to stop.

2. Push the safety lever down to the "unlock" position before starting work.

Note: When the engine is not running, the safety lever is in the "unlock" position, and the start switch is in the "ON" position, push the handle to operate. The accumulator can provide pressure to control the movement of the valve core.

Note: If the safety lever is in the "unlock" position and all operating levers are in the "neutral position", the front working device can still move. Push the safety lever to the "lock" position, turn off the engine switch, and contact the nearest Kenstone dealer. There is a fault in the system



Fig 3-11



Fig 3-12

4. Travelling

▲Warning

1. Before operating the travel lever, you must know the direction in which the machine is parked and look at the end of the crawler assembly. If you can see the travel motor while sitting in the cab, it means that you are looking at the rear end of the crawler assembly. (Or you are looking backwards). At this time, the direction of the operating lever movement is opposite to the normal travel direction.
2. Before walking, make sure that there is no one on the road and on the machine, and honk the horn to warn other workers that the equipment is about to move.
3. When walking, make sure there is no debris in the passing area.
4. When reversing, pay special attention to confirm that there is no debris behind the machine.
5. Operate the travel lever on a smooth surface to avoid sudden starting or stopping.
6. Before leaving the seat, lock all control systems and turn off the engine to avoid accidents.
7. Do not use high gear when going downhill.

1. Set the engine electronic throttle to the required speed.
2. Lift the safety lever ① to the "unlock" position (connect the pilot oil source). Figure 3-13
3. Retract the front working device and raise it to 40-50 cm from the ground, see Figure 3-14.
4. Make sure the bucket is fully lifted.
5. Walk on hard and flat ground as much as possible, avoid sudden movements and small angle turns.
6. When walking on irregular ground, choose a low speed (1.0-1.5km/h) to reduce the engine speed and avoid impact loads. Be careful not to overload the equipment due to hitting or pressing on stones.
7. Slow down when walking on irregular, frozen or uneven ground.



Fig 3-13

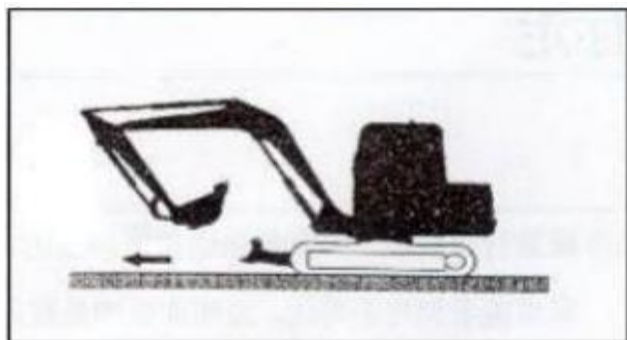


Fig 3-14

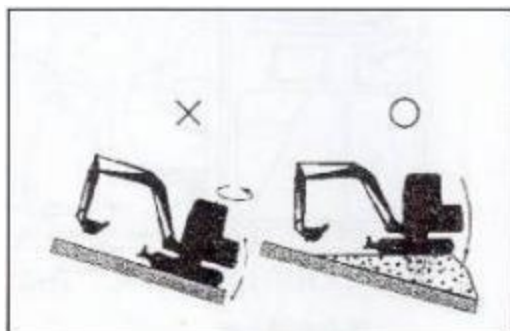
▲Warning

~~When walking, keep the bucket 200~300 mm above the ground.~~

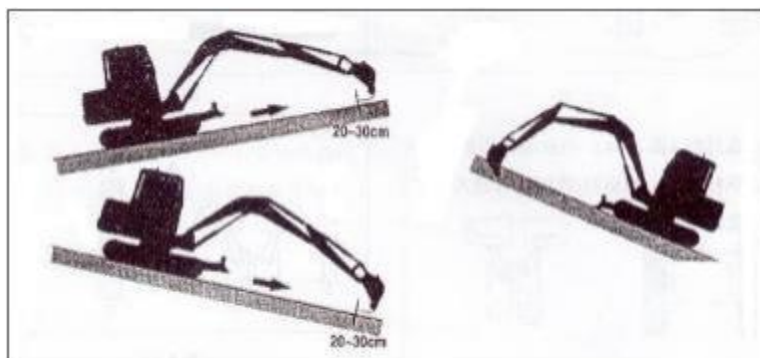
- Do not reverse on a slope.
- Choose a safe route when climbing a slope.
- Do not cross or turn on a slope.
- If the excavator starts to slide or become unstable, immediately insert the bucket into the ground to brake.
- Avoid working on a slope, because the imbalance caused by front work or rotation may cause rollover.
- It is quite dangerous to rotate down the slope with a load.
- In unavoidable circumstances, fill the slope first so that the machine can work on a horizontal surface as much as possible, see Figure 3-15. To avoid rollover, do not walk on a slope of more than 30 degrees.

8 Go up or down the slope, but not across it, see Figure 3-16. Extend the dipper stick, lower the boom and keep the bucket about 300 mm off the ground. If the equipment starts to slide or become unstable, drop the bucket to deepen control. If the engine stalls, lower the bucket, make sure all handles are in the middle position and restart the engine. Note: On a slope, even if the engine is turned off, do not perform a swing operation, because the accumulator can swing the machine. Note: On a slope, do not open or close the cab door, and the door must be fixed.

9. If there is dust or mud on the crawler frame, support the crawlers on both sides and swing them several times to remove it.



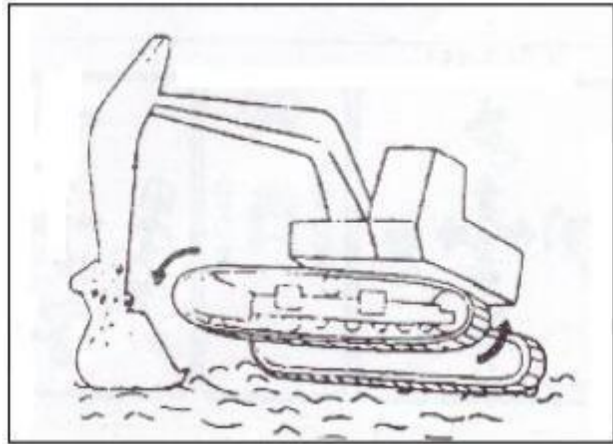
Fi g3- 15



Fi g 3- 16

▲Warning

If you want to use the boom or dipper stick to support any part of the equipment, turn the bucket so that the round surface contacts the ground, and the angle between the boom and dipper stick should be 90 degrees.



Confirm that the attached sludge has been removed, see Figure 3-17 and Figure 3-18.

10. When traveling straight (Figure 3-19), push or pull the joystick/pedal forward or backward. The greater the joystick/pedal travel, the faster the travel speed.

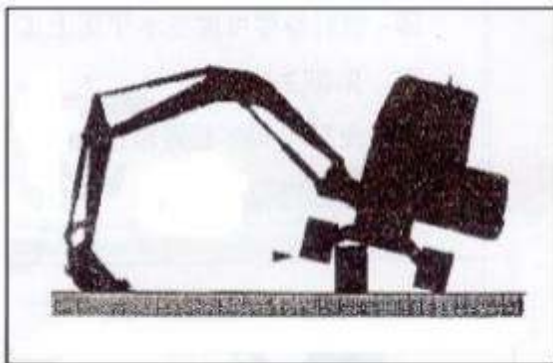


Fig 3-18

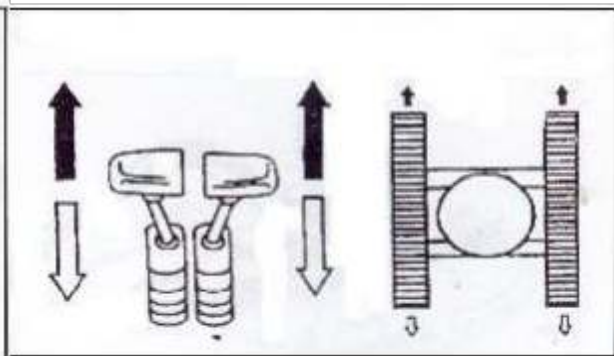


Fig 3-19

▲Warning

When the moving distance exceeds 2km a trailer is required. When moving within 2km the movement should be intermittent: walk for 10 minutes and rest for 5 minutes, otherwise it will cause serious damage to the excavated parts.

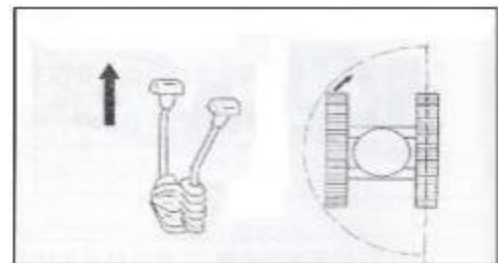


Fig 3-20

11. When only one crawler track is operated to rotate forward or backward, the machine will rotate with the stationary crawler track as the rotation axis. As shown in (Figure 3-20)

12. When one crawler track rotates forward and the other crawler track rotates backward, the equipment will rotate around the center point. (Figure 3-21)

13. Stop walking (Figure 3-22) When the walking control lever returns to the middle position, the excavator automatically brakes and stops.

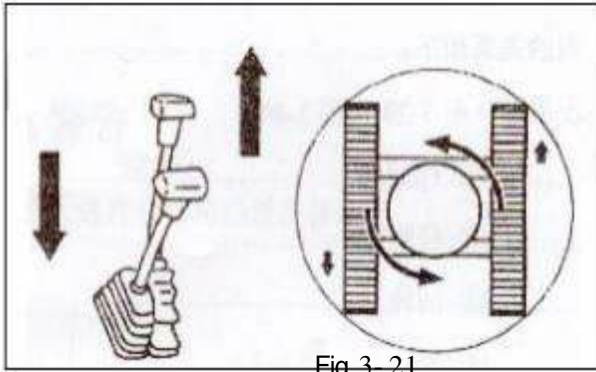


Fig 3-21

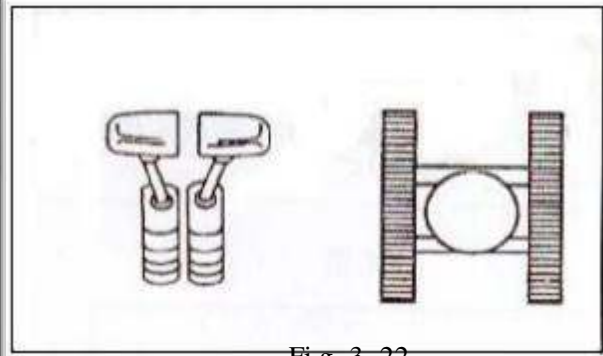


Fig 3-22

operating Instructions for ISO Type operating Lever (Handle)

▲Warning

~~Check all around before swinging, and be careful when operating the handle during automatic idling because the engine speed will increase rapidly.~~

The handle structure of this equipment complies with ISO standards. Do not change the valve and hose parts to maintain the standard settings. There is an operation sign on the right side of the cab. See Figure 3- -23.

Note: When starting work, move the handle slowly and check the swing action and the front working device.

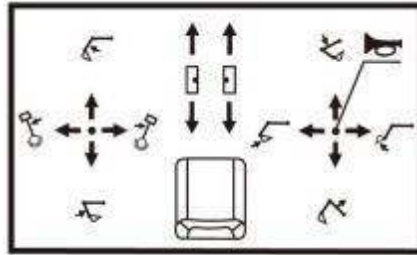


Fig 3-- 23

The relationship between the movement of the boom, dipper and bucket and the movement direction of the operating lever is as follows:

Left handle (Figure 3-23 and Figure 3-24)

- ① Extend arm ② Retract arm ③ Rotate ④ Rotate



Fig 3-23

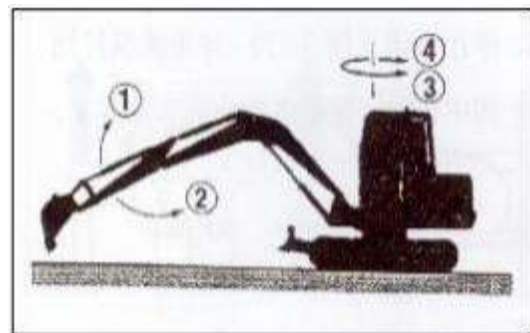


Fig 3-24

Note: The swing brake is realized by spring and hydraulic release. When the handle is in the middle position or the engine stops, the excavator realizes the swing brake.

Note: The following phenomenon is not a mechanical failure but a normal phenomenon of the excavator: when the bucket arm moves, there may be a pause; when the bucket arm moves, the bucket arm moves faster due to its own weight, which may cause insufficient oil supply.

Right handle: (Figure 3-25 and Figure 3-26)

- ⑤ Boom down ⑥ Boom up ⑦ Bucket digging ⑧ Bucket unloading soil

Note: Even when the machine is stopped, the operating handle can still lower the front device to the ground, set the safety lever to the "unlock" position, and turn the key switch to the "open" position.

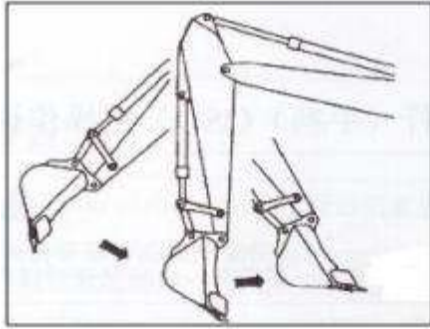
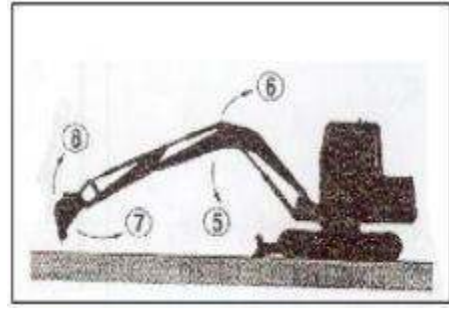


Fig 3—25



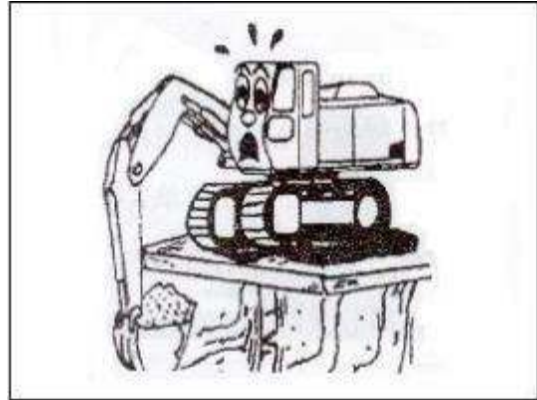
Fi g 3—26

5.operation Instructions

▲ warning

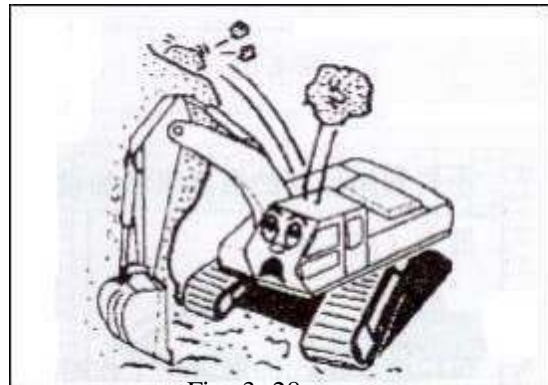
~~Do not place your feet on the pedals while the machine is operating normally, as this could cause the equipment to move unexpectedly.~~

1. Before starting work, understand the terrain and soil conditions and level it if necessary.
2. Install window guards if there is a possibility of being hit by falling rocks or other objects.



Fi g 3-27

3. Check the strength of the work surface before working. If it is insufficient, reinforce it first. If you have any doubts about its structural strength, do not work on it.



Fi g 3-28

4. During excavation operations under certain conditions, the boom arm or bucket may come into contact with the upper or lower part of the machine itself.

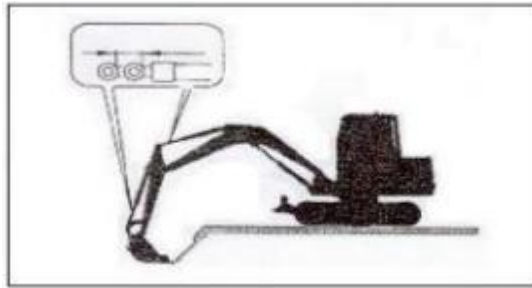


Fig 3-29

6. Do not extend the hydraulic cylinder completely continuously. The complete extension and retraction of the cylinder may damage the machine. For example: the arm cylinder is fully extended and then the bucket cylinder is extended for excavation.

7. When the bucket encounters special resistance on the ground, do not walk or swing (Figure 3-30).

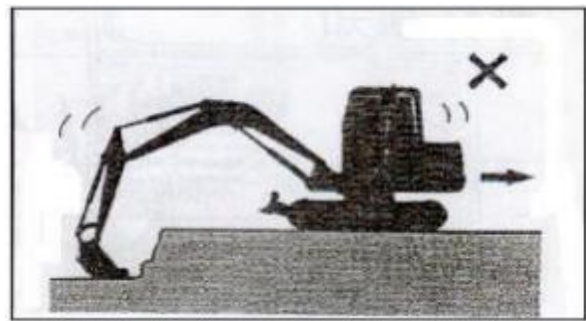


Fig 3-30

8. Do not use the weight of the equipment to increase the digging force of the equipment (Figure 3-31).

When working on soft or muddy ground, prevent the machine from sinking.

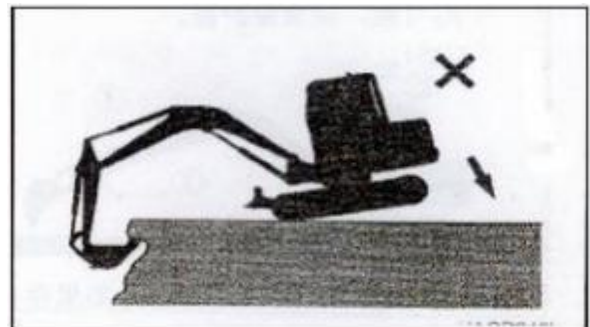
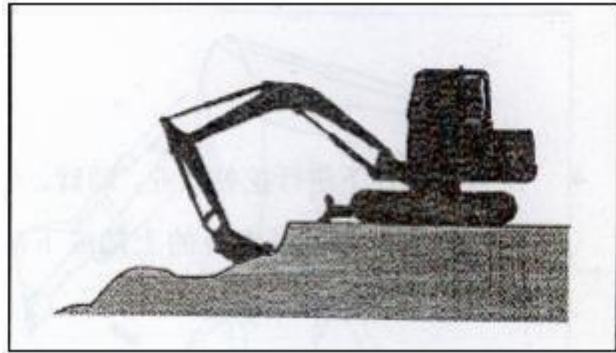


Fig 3-31

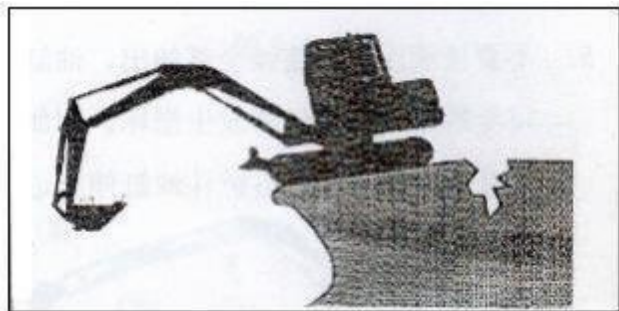
9. When the machine is working on the roadside or near a cliff, ensure that the ground is hard. In complex terrain conditions, do not operate alone, keep the travel motor at the rear of the equipment, the bucket at

the front, and the crawler track at the correct angle to the road surface (Figure 3-32).



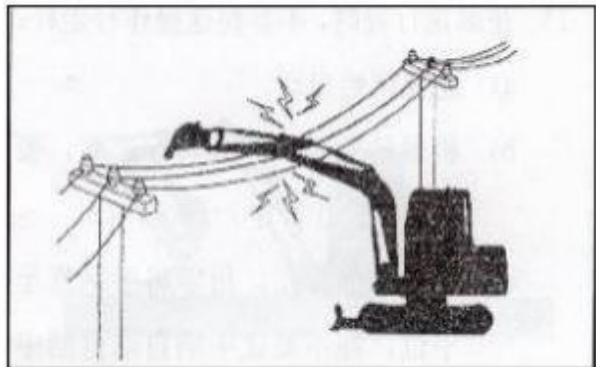
Fi g 3- 32

10. Do not dig under the excavator (Figure 3-33).



Fi g 3- 33

11. Make sure there is a sufficient distance between the excavator and overhead power lines. See Figure 3-34.



Fi g 3- - 34

12. When the excavator is working in a tunnel or building, be careful not to hit the top and ensure good ventilation. See Figure 3-35.

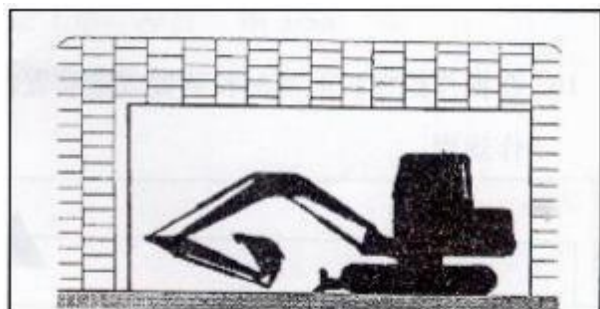


Fig 3--35

13. Do not use the bucket as a hammer or pile driver, as this is dangerous and may cause damage to the front device. See Figure 3-36

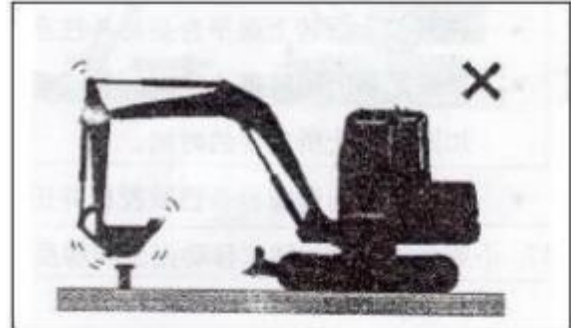


Fig 3-36

14. Do not perform excavation when the crawler tracks are off the ground, otherwise the machine and structural parts may be damaged. See Figure 3-37

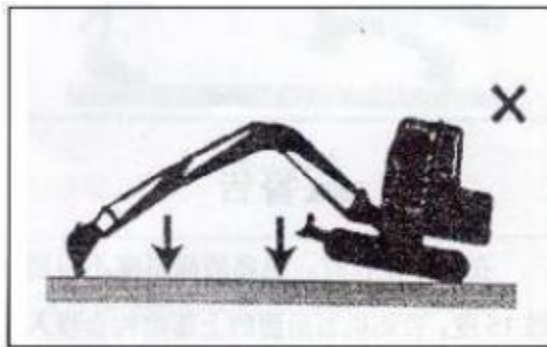


Fig 3-37

15. When driving at high speed, do not operate the travel lever quickly:

- a) Avoid sudden start.
- b) Before the machine turns to the opposite direction, stop walking completely.
- c) Avoid sudden stops and push the handle to the middle position by hand instead of letting the handle return to the middle position automatically.

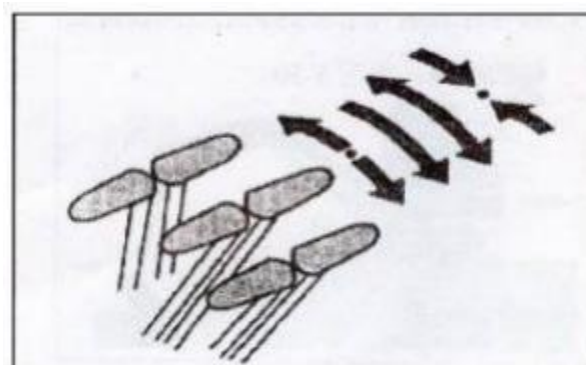


Fig 3-38

16. When operating the front extension or heavy device of the excavator, keep the machine balanced and comply with the operating procedures of these additional devices.

▲Warning

- When going downhill, do not raise the front working device.
- Do not cross the slope, go straight when going uphill or downhill.
- Be extra careful when swinging the upper platform on a slope.
- There must be enough space for swinging and stopping. The extra momentum generated by the long or heavy front working device when swinging will increase the time required to stop the swing.
- Make sure all optional equipment is authorized and installed correctly.

17. Do not use the machine's rotation to move soil and objects, as this will cause damage to the machine's structure.

working in water

warning

~~When working in water, the inclination of the machine should not exceed 15 degrees, otherwise the upper structure behind the machine will be immersed in water, causing damage to the radiator and fan.~~

1.If the riverbed is uneven or the water flow is very fast, be especially careful. The water depth must not exceed the height of the track shoe above the guide wheel side. Do not let water, mud, or sand penetrate into the center joint or slewing bearing.

2. The machine may sink when working on a soft and uneven surface.

Note: Check the working condition of the track and the surface of the riverbed. Note: If water or mud penetrates into the center joint, stop working and move the machine to a hard, dry ground. After appropriate observation and maintenance, continue working.



Fig 3-38

Working on weak surfaces

1. Avoid walking on surfaces with poor bearing capacity as much as possible.
2. The crawler tracks should be in full contact with the ground as much as possible, and the crawler tracks should not sink too deep into the ground, otherwise they cannot be pulled out. If walking becomes difficult, lower the bucket to the ground, retract the front device and use a winch to pull the machine out.

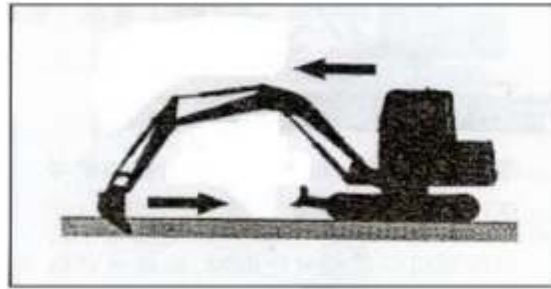


Fig 3-39

▲Warning

~~When jacking up the excavator with the front device, be careful not to let the machine tip to one side.~~

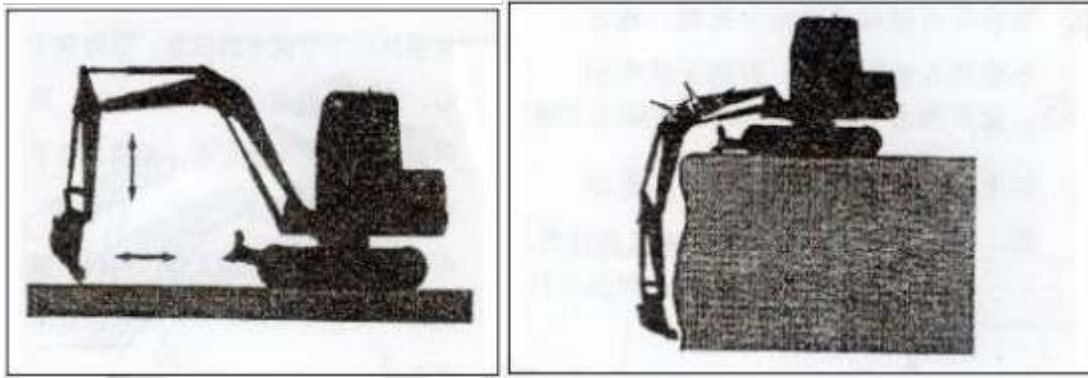
3. ~~If mud or sand enters the crawler and stops the machine, use the front device to support one crawler and rotate the crawler forward and backward to remove the debris.~~
4. If the machine stops and the road condition is good, use a rope to tow the machine. See page "Towing Procedure".

Leveling

Important

~~Do not use the bucket too much to level the road surface, otherwise the components will be overloaded and the machine will be damaged.~~

1. ~~Use the bulldozer to fill the road backwards and level the road surface.~~
2. Comprehensive use of boom dipper and bucket
 - A. When leveling the road from front to back, lift the boom and move the dipper slowly. When the dipper is next to the machine, lower the boom steadily and move the bucket horizontally.
 - B. When leveling the road from back to front, the operation sequence is opposite to that of the first step.
 - C. When leveling earthen structures such as walls (such as dams), follow the comprehensive operation techniques described in the first step.



pay attention to the position of the bulldozer

1. When the bulldozer moves forward, it may be hit by the boom cylinder or bucket, so be careful.
2. When the excavator is digging deep, move the bulldozer backward to ensure safety.

precautions to be taken when using a bulldozer

1. The bulldozer can only be used for pushing soil, not for digging soil, otherwise it will damage the bulldozer or the track system
2. The bulldozer cannot bear huge or unstable weights, otherwise it will damage the bulldozer or the track system
3. When walking, the bulldozer cannot hook any object, otherwise it will damage the bulldozer or the track system
4. When using the bulldozer to lift the machine, ensure that the road surface is flat. The bulldozer is in steady contact with the ground.

Be careful when stowing the front attachment

1. When retracting the front device, be careful not to let the bucket hit the bulldozer.

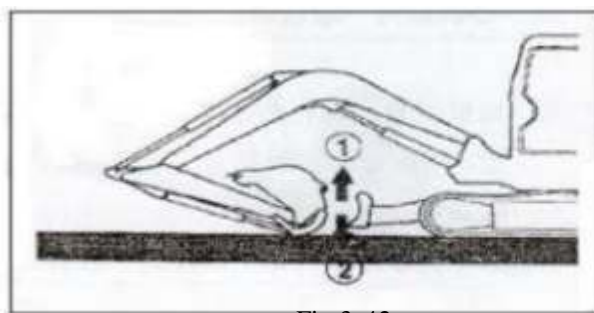


Fig 3-42

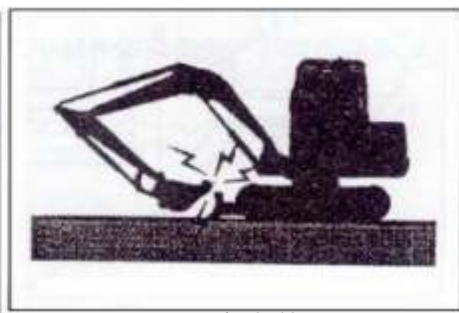


Fig-3-43

Be careful not to let the bulldozer hit obstacles

1. Do not let the bulldozer hit obstacles, otherwise the bulldozer, cylinder or other parts of the machine will be damaged.

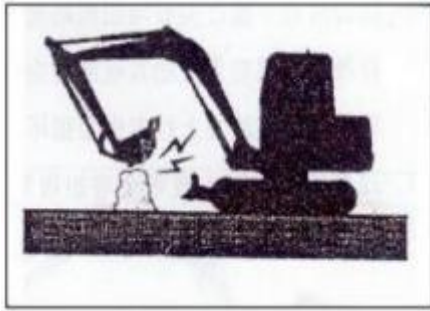


Fig 3-44

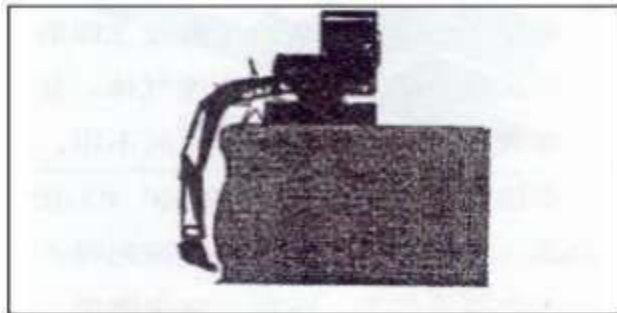


Fig 3-45

Instructions for operating rubber tracks

Important

Because rubber tracks are relatively soft, they are not as stable as steel tracks. Be especially careful when operating on the roadside.

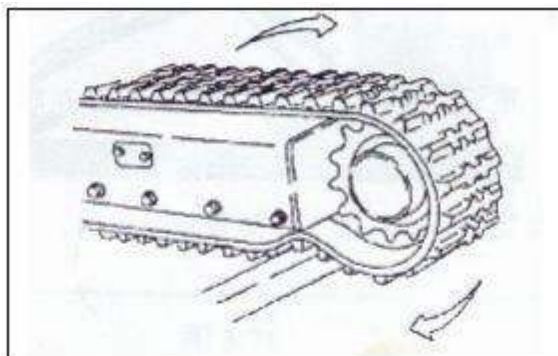


Fig 3-46

Avoid damage to the track caused by the road surface. If the following precautions are not taken, the track will be damaged:

1. The machine track cannot be driven or turned when it is on sharp objects. The protruding objects may burst or damage the track.
2. Rubber tracks cannot be driven on roads with sharp stones. This will damage the track and other parts of the track system. Running rubber tracks on sand will also damage the track system.

3. Too much debris entering the track will increase the operating load of the track and cause damage.

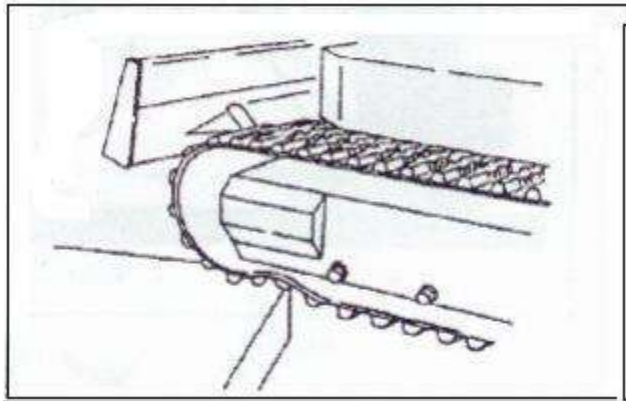


Fig 3- 47

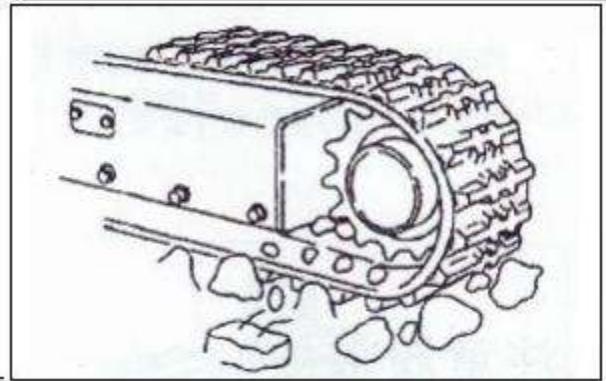


Fig 3- 48

4. Avoid sudden turns on roads with strong friction.
5. Remove fuel or hydraulic oil from the track immediately.
6. Try to avoid salt water or salt gas, as salt will corrode the steel shaft of the track.
7. If the track is not used for a long time, store it in a cool and dry place.
8. Do not operate on the ground with a temperature higher than 60°C (140 ° F), which will damage the track or the road surface.
9. When one track and the front device are jacked up, do not use the other track to walk, which will cause wear.
10. When walking, the track cannot be loose, otherwise the track may fall off or be damaged.
11. Important: Because the rubber track is soft, be particularly careful when operating the upper body on the track.
12. Carefully lower the working device and jack up the machine.



Fig 3- 49

13. If the rubber track is scratched or the internal steel cable belt is scratched, contact the nearest Kenstone distributor for repair.

“A” ---Rolling edge “B” --Ground edge①---Steel track bracket②---
Rubber track③---Steel cable belt

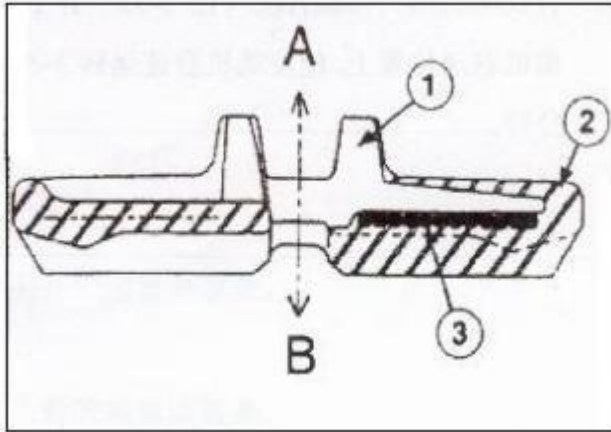


Fig 3-50

6. parking of excavators

▲Warning

~~Park the excavator on a firm and level surface, not on a slope. If you must park on a slope, secure the tracks with rocks and insert the bucket into the ground.~~

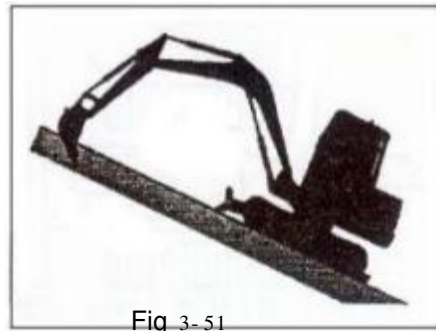


Fig 3-51

1. Stop the excavator on a solid and level surface and lower the bucket and bulldozer, as shown in Figure 3-52.

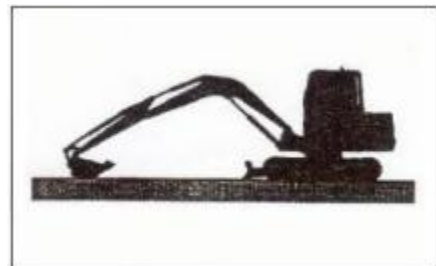


Fig 3—52

2. Turn the engine throttle to the lowest idle position and let the engine idle for 3-5 minutes.
3. Turn the throttle clockwise from "1" to "0" to shut down the engine and cut off the power to the electrical system
4. Put the safety lever (Figure 3--54) in the "lock" position.



Fi g 3-53



Fi g 3-54

7. Towing

▲Warning

Do not use damaged cables or chains, as they may break and cause accidents.

Wear gloves when handling chains or cables.

When towing an excavator, use ropes or chains that can withstand sufficient load.

Tie the chain or cable to the crawler main frame as shown in Fig 3-55.

Do not tow the machine using the light towing hole behind the bulldozer, otherwise it may cause damage.

Insert a protective object (such as a block of wood, etc.) between the rope and the vehicle body to prevent the rope from being lost.

If the tracks inevitably get stuck in the mud, connect the machine to another machine with a cable tied to the machine frame, using wooden blocks at the corners to prevent damage to the machine or the cable.

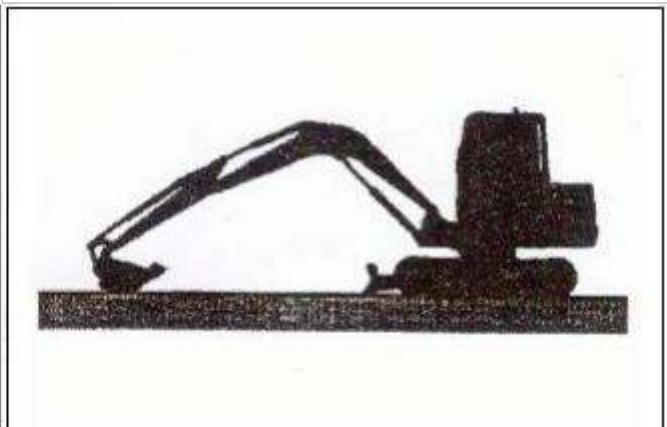
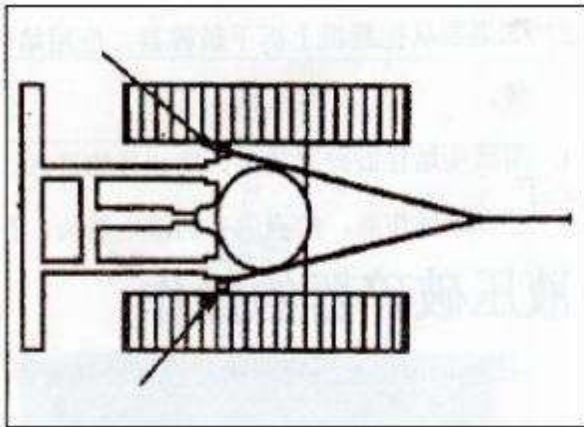


Fig 3-55

8. Breaker

Important

Severe functional failure caused by installing hydraulic breakers and pipelines without authorization from Ken stone is not covered by the excavator warranty.

selection of hydraulic breaker

If a hydraulic breaker is to be installed, the stability of the equipment and suitability for such a modification should be considered, as well as the appropriate pressure and flow. To select a suitable hydraulic breaker, consult the Kenshi sales department. Hydraulic hoses and pipes for the breaker.

1. When installing a hydraulic breaker, install it according to the drawings provided with the device.
2. If the breaker is to be removed from the excavator, plug the hoses and pipes with plugs to prevent foreign matter from entering the hydraulic system.
3. Plug the breaker joints with plugs to prevent foreign matter from entering.
4. Before starting operation, check all hydraulic joints for leaks and looseness.

Hydraulic breaker operation

NOTE: Hydraulic oil pressure and flow settings may need to be changed, refer to the Maintenance section of this manual for details.

1. Be sure to read and understand the breaker manual.
2. Check all mechanical and hydraulic connections.
3. Do not use the breaker as a hammer, see Figure 3-56.

Do not drop the breaker from a great height. The breaker is relatively heavy and falls quickly, so do not drop the breaker from a great height, otherwise it will damage the upper structure.

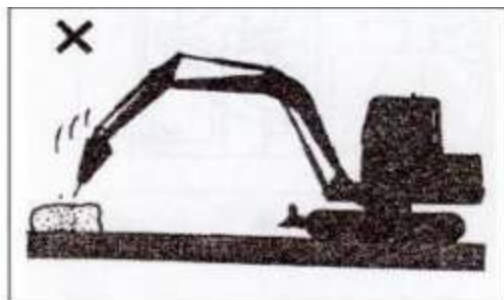


Fig 3-56

4. When operating the breaker, do not fully extend the boom and arm cylinders, see Figure 3-57. The gap between the end of the cylinder rod and the cylinder head should be kept above 50mm so as to prevent the cylinder from being damaged when operating the breaker.
5. If the cylinder hose vibrates too violently, do not use the breaker (see Figure 3-58). Check whether the hydraulic accumulator of the breaker is damaged and whether it needs to be repaired. If the excavator works in this situation, the structural components and hydraulic components may be damaged.

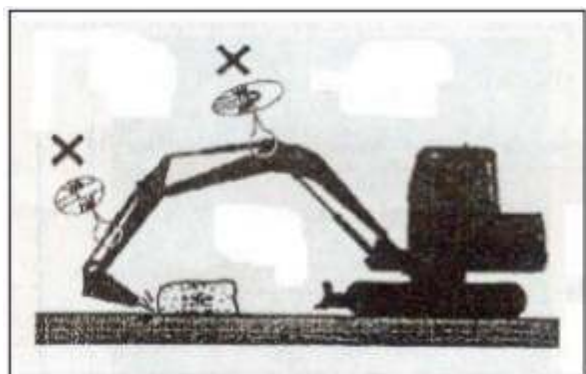


Fig 3-57

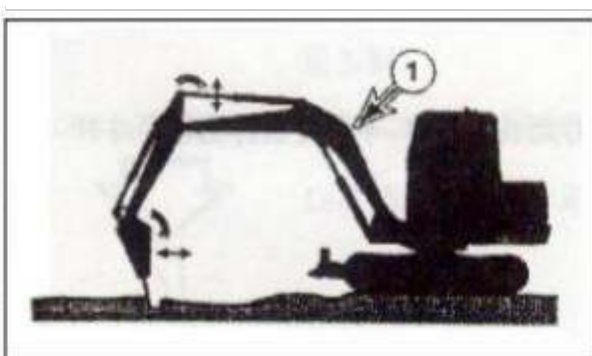


Fig 3-58

6. The breaker body cannot be put into underwater operation without installing related equipment. Underwater operation will damage the seal of the breaker and rust. Foreign objects or water entering the hydraulic system will cause damage. Only the breaker head can be inserted into the water. See Figure 3-59
7. Do not use the breaker to lift or drag any object. See Figure 3-60

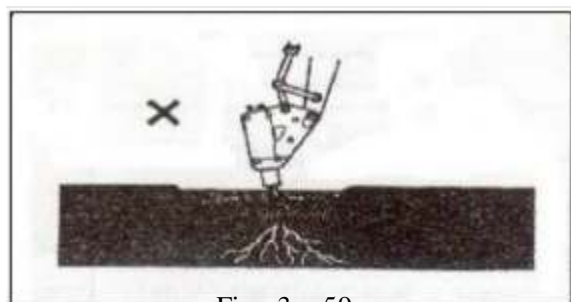


Fig 3--59

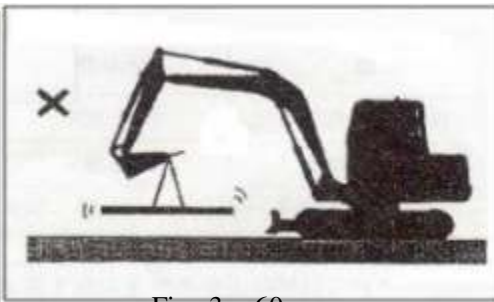


Fig 3--60

8. The breaker can only work at the front or rear of the excavator. Do not use the breaker on either side of the excavator, and do not rotate it back and forth during operation. See Figure 3-61

▲warning

If the excavator upper body is at 90 degrees to the crawler tracks, operating the breaker may shorten the life of the machine or cause the machine to tip over.

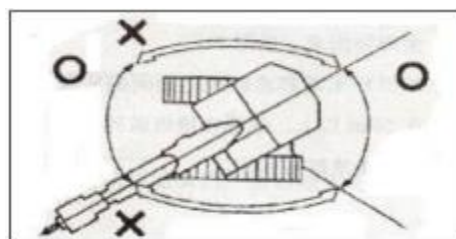


Fig3-61

9. When traveling or parking, do not retract the crusher to the arm or boom. See Figure 3-62.

10. Do not use the crusher or bucket to move the crushed object, especially avoid using the rotation force to move it, otherwise the boom, arm, rotation mechanism and crusher will be damaged. See Figure 3-63.

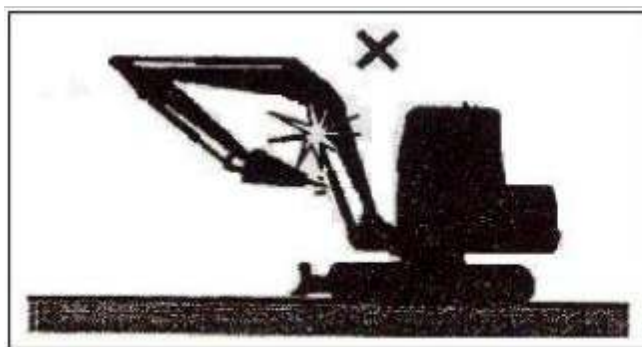


Fig 3—62

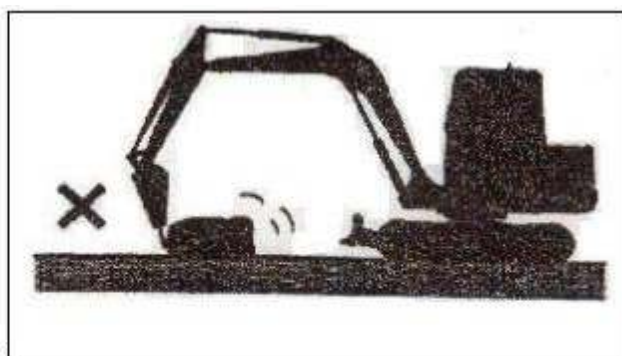


Fig 3-63

Hydraulic oil and filter replacement cycle

When using a hydraulic breaker, the hydraulic oil will quickly become contaminated and the viscosity will decrease because the working conditions at this time are much worse than those during excavation work. Refer to the table below to replace the hydraulic oil and filter element to prevent the service life of the hydraulic parts (especially the main pump) from being shortened due to changes in the hydraulic oil composition.

Working device	Working hours	Hydraulic oil	Filter
Breaker working	50%	900 hours	100~150 hours
	100%	600 hours	100~150 hours
Lubricate the front working device	When operating with a breaker, lubricate the front working device every 50 hours		

Note: The replacement intervals of hydraulic oil and filter element depend on the time of use of hydraulic breaker. These intervals should be carried out strictly according to the regular maintenance time.

Inspection, maintenance and adjustment

In order to keep the excavator in normal working condition, it is necessary to maintain and inspect the excavator. The following content lists the inspection time interval, the location of each system or component and the inspection method.

Note: The following content lists the maintenance inspection content and its time interval. The maintenance cycle may be shortened according to actual conditions. Extremely hot or dirty environments require more frequent maintenance. The maintenance cycle refers to the engine operating time displayed on the instrument on the console side of the cab.

serial n0.

There are two serial number plates attached to the excavator body. The main serial number plate (Figure 4-1) is located in front of the cab, and other related numbers are attached to the left side of the boom. The engine serial number and engine model (Figure 4-2) are attached to the engine body. Other engine-related instructions are on a label on the engine body. Please pay attention to these numbers and their locations at all times. They are very important for the normal operation of warranty work.

safety Tips

1. To prevent unexpected operations during maintenance, make sure that the hydraulic system control has been locked and a warning sign (warning sign) has been hung.
2. Make sure that the spilled liquid is cleaned up, especially the liquid around the engine.
3. Check all fuel lines, check whether the joints, pipes, filters and O-rings are tightened, and whether there are signs of wear or damage.
4. If the inspection or test procedure requires starting the engine, make sure that all irrelevant personnel have left.
5. Check whether the channel device has signs of wear or damage (including anti-slip surfaces).



Fi g 4- 1



Fi g 4- 2

1.preparation and settings before equipment maintenance

When performing maintenance as specified in this manual, stop the machine as required below.

Note: Certain repairs require different parking methods for the machine, but after the repairs are completed, be sure to return the machine to the position described below.

1. Place the machine on a level and solid ground, extend the forearm and lower the bucket to the ground as shown in Figure 4-3.
2. Turn off the engine.
3. After stopping, turn the start switch to the "on" position, move all the control levers (including the travel lever) back and forth several times at the limit position to release the residual hydraulic pressure, and then remove the key.
4. Check the oil level. The oil level mark is between the specified marks. If necessary, add hydraulic oil.

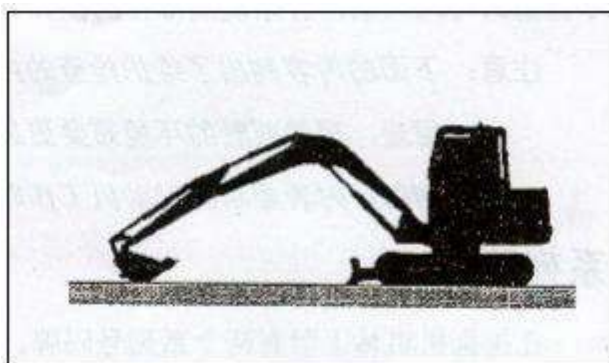


Fig 4-3

warning

If the engine must be run during maintenance, be extremely careful. Always have one person in the cab without leaving while the engine is running.

5. Put the red safety lever (Figure 4-5) in the "locked" position.



Fi g 4- 4



Fi g 4- 5

6. Before starting maintenance work, hang a warning sign on the cab door or work pole: "Do not touch during inspection and maintenance"

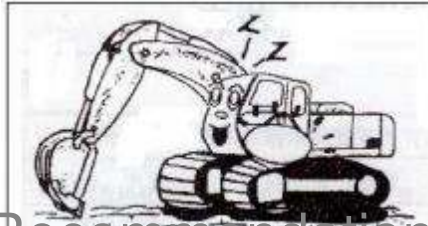


Fig 4-6

2. Lubricant Recommendation Table

Important

Do not use unrecommended lubricants or products not approved by Ken Stone company

NOTE: Refer to the maintenance interval table to lubricate the specified locations.

Brand	Hydraulic oil	Engine oil	Grease	Gear Oil
Callex	Callex HD 32	Callex RPM Delo 300	Multifac EP	Multi-Purpose EP90
Idenit / su Kosan	Daphne Kosan 46WR	Apopoil motires300	Daphne # Corrone#2	Apor oil Gear HE 90
*Mobil	Mobil DTE 14M (all-temp) or DTE 25(summer)	Delvac 1300 Super 15W40 or Delvac 1 Or Straight	Mobil FAW#2 Or cold temp use Mobil FAW#1	Mobilube HD 80 W00
Nippon Sei ki yu	Super Highland \$26 or 32	High D. S3 Straight Weight	Lipanoce Grease	Nseki SP90 or EP 90
Shell	Tellus 32	Rotella T 15 W40 or T3 0(winter) or	Alvania EP#2	Spirax HD 80W00 or DONAXTD
Total	Total Equivis	Tbtal	Tbtal Multiris	Total
Note: * is lubricating oil for Kenshi Heavy Industry excavator				

Important

Do not mix oils from different manufacturers. Kenshi Heavy Industries does not recommend the use of other brands of oils. If other oils are selected, the oil standards should meet or exceed our standards. Kenstone Heavy Machinery excavators use Mobil DTE25 hydraulic oil when they leave the factory, so it is required to use the same oil as the original vehicle to avoid mixing different oils when changing oils.

However, for hydraulic oil temperature fluctuations daily or once a week, or when operating in sub-zero temperatures, please choose a lubricant with a small specific gravity. The best advice is to choose the lubricant according to the temperature conditions.

Kenstone Heavy Machinery requires the use of pure lubricants, including greases.

3.Maintenance cycle

10hours/dailymaintenance

- Inject grease into the pins of the boom dipper arm and front device
- Check the engine oil level) • Check the oil level of the hydraulic oil tank
- Check the hydraulic system for leaks. Check the fuel level • Check the oil-water separator
- Check the fuel system for leaks
- Check the cooling system and add coolant as required
- Check the level of the window washer fluid
- Check the bucket teeth and side teeth for wear
- Check the engine fan belt for cracks and wear and whether the tension is appropriate
- Check whether the structural parts have cracks or open welds
- Check all operating switches
- Check all external lights, horns, control indicators, and monitor lights
- Start the engine, check the engine starting performance, check the exhaust color when starting and the exhaust color during normal operation, and check for noise
- Check all operating controls
- Check the bolts and nuts to prevent loosening and loss
- Check the tension of the track part, whether there is looseness, noise or damage (track chain links, track shoes, sprocket wheels, guide wheels)
- Clean the engine air filter guard

50 hours/weekly maintenance

- Perform daily maintenance checks every 10 hours (inject butter into the shaft connection hole)
- Inject butter into the slewing bearing and check the fuel tank drain valve
- Replace engine oil and filter element
- Inspect the water tank, oil radiator and air conditioning condenser core)
- Check battery fluid and charge level
- Clean the fuel tank refueling filter

100 hours maintenance

- Perform 10-hour/daily maintenance and 50-hour maintenance checks
- Clean the air filter element
- Replace the hydraulic oil filter element)

200 hours maintenance

- Perform all 10-hour/daily, 50-hour/weekly and 100-hour maintenance checks
- Change engine oil and filter

250 hours/monthly maintenance

- Perform all 10-hour/daily and 50-hour/weekly maintenance checks
- Drain debris from hydraulic oil tank
 - Inspect front attachment pins and bushings for wear
 - Inspect fuel system hose clamps

500 hours/three months maintenance

- Perform all 10-hour/daily, 50-hour/weekly, 100-hour, and 250-hour maintenance checks
- Replace the fuel filter
- Replace the radiator coolant
- Replace the hydraulic oil filter
- Replace the air filter
- Check the oil level of the travel reduction gear on both sides

1000 hours/six months maintenance

- Perform all 10-hour/daily, 50-hour/weekly, 100-hour, 250-hour, and 500-hour maintenance checks
- Clean the oil filter
- Replace the travel reduction gear oil (each side)
- Inspect and adjust the purge valve
- Check if the bolts are loose

1200 hours maintenance

Perform all 10, 50, and 100 hour maintenance checks

2000hours/yearly maintenance

- Perform all daily, 50, 150, 250, 500 and 1000 hour maintenance checks
- Inspect the generator and starter motor
- Inspect all anti-vibration rubber blocks
- Perform and record the results of each cycle test
- Inspect the machine welds for cracks or open welds or other structural damage

4000hours/maintenance every two years

Important parts-periodic replacement

10hours/dailymaintenance

Boom, arm and front connecting pin

1. Add grease to the front connecting pin every 10 hours.

As shown in the figure below, lower the working device to the ground and turn off the engine. Press the grease nozzle and use a grease gun to inject grease to the designated point.

2. After filling, clean the discharged waste oil.



Fig 4- 7

- | | | |
|---|--------------------------------------|--|
| 1、 Boom pi ns | 5、 Ar m cy l i n d e r pi ns | 9、 Buck e t pi ns |
| 2、 Boom cy l i n d e r pi ns | 6、 Buck e t cy l i n d e r pi ns | 10、 Bul l d o z e r cy l i n d e r pi ns |
| 3、 Ar m cy l i n d e r pi ns | 7、 Pi ns | |
| 4、 Boom and ar m
connect i n g pi ns | 8、 Pi ns | |

Check the engine oil level

1. Stop the engine and check after 15 minutes. This way, the oil can all flow back to the oil pan.
2. Check the engine oil level using the oil level gauge.
3. The engine oil level should be between H and L on the oil level gauge.
4. You can add oil from the oil cap.

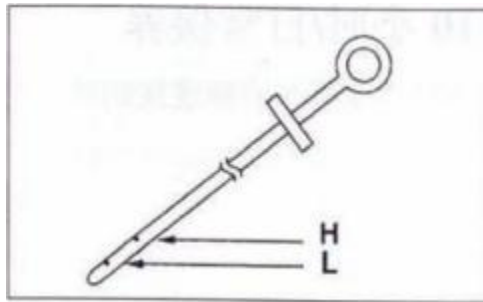


Fig 4- 8

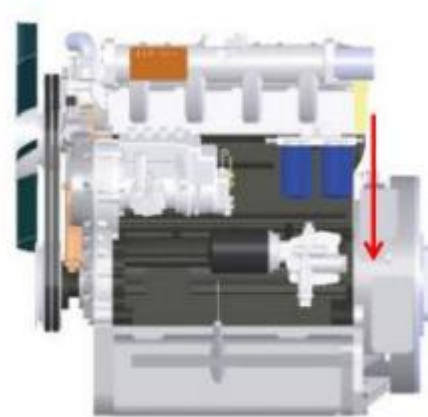


Fig 4- 9

check the oil level in the hydraulic tank

▲warning

After the hydraulic oil works normally, the oil temperature rises. Before maintaining the hydraulic components, the oil temperature should be lowered. The gas in the hydraulic oil tank is under pressure. First, slowly loosen the screw plug on the hydraulic oil tank to release the air pressure in the tank, and then you can safely remove the filling cap or upper plate cover.



Fig 4-10

1. Place the machine on a level and solid ground, extend the forearm as shown in the figure and lower the bucket to the ground.
2. Turn off the engine.
3. After stopping, turn the start switch to the "on" position, move all operating levers (including the travel lever) at the limit position several times to release the residual hydraulic pressure and then turn it off.
4. Check the oil level. The oil level mark line is between the specified marks. If it is below the lower limit, add hydraulic oil.

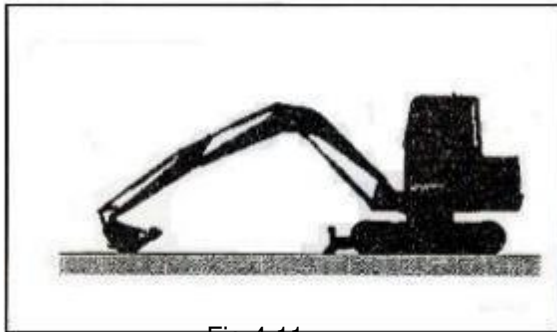


Fig 4-11



Fig 4-12

Important

The amount of oil added is generally 4-8 grids. Overfilling will cause equipment damage and oil leakage. Release the excess oil from the oil drain nozzle ① at the bottom of the oil tank. (Figure 4-12)

check for leaks in the hydraulic system

After each day's work, check to make sure there are no signs of leakage in hoses, pipes, joints, cylinders and motors. If there are, check for leaks and repair them

check the fuel level

▲warning

When refueling, special safety measures should be taken to prevent explosion and fire, and spilled oil should be cleaned up immediately.



Fig 4- 13

1. Before refueling, make sure the refueling hose is fixed on the excavator. Check the oil level to confirm the amount of fuel to be refilled, and fill the fuel tank with fuel suitable for the work through the oil pipe. The capacity of the fuel tank is 180 liters.

2. Do not refill excessive fuel.

3. Tighten the refueling cap after refilling.

4. Note: If the breather hole is blocked, a vacuum will form in the tank. The fuel cannot be fully supplied to the engine. Therefore, keep the breather hole clean.

5. Check the fuel indicator in the cab for normal operation.

Note: Of course, when the oil reaches 12 liters or less, the fuel level warning light will light up.

Note: Fuel can only be added after the work is completed. The capacity of the fuel tank is 180 liters.

check the oil-water separator

1. Open the hood and check the oil-water separator (see Figure 4-15).

If there is water in the container ① (Figure 4-15), the red float will float.

2. Release the water when it floats to the warning line ⑧ (Figure 4-15).

3. Loosen the drain valve ④ at the bottom of the container (Figure 4-15).

4. Close the valve carefully after draining the water.

5. The plug ⑤ (Figure 4-15) on the top of the oil-water separator cannot be reused. If the plug is loose, replace it and tighten it.

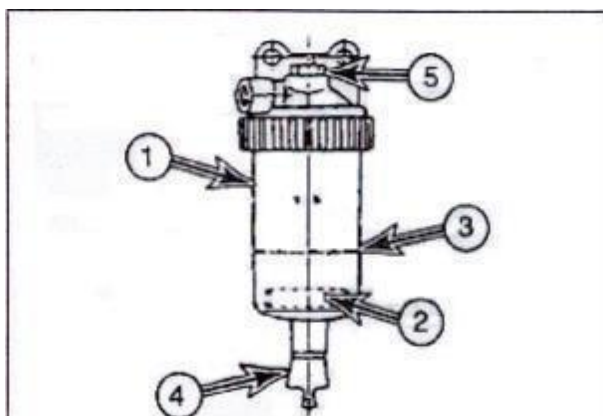


Fig 4-15

check the fuel system for leaks

Check all parts of the engine to make sure there are no leaks in the fuel system. If there are leaks, check the cause and repair them.

Check the cooling system and add coolant if necessary.



Before opening the engine cover, let the engine cool down and loosen the cover slowly to avoid residual pressure. When cleaning the water tank while the engine is running, be especially careful when standing next to or working on the running engine. When working, make sure all parts are firmly fixed.

Do not open the water tank cover easily and observe the coolant level in the reserve water tank.

1. When the engine is cold, open the cap of the water tank and check the coolant level. If necessary, add coolant to the water tank as shown in the following table. Adding coolant can play a protective role.

Ambient temperature	Cooling water	Antifreeze
-10°C (15 ° F)	80%	20%
-15°C (5 ° F)	73%	27%
-20°C (-5 ° F)	67%	33%
-25°C (-15 ° F)	60%	40%
-30°C (-20 ° F)	56%	44%
-40°C (-30 ° F)	50%	50%

checking the windshield cleaner fluid level

1. Check the glass washer fluid level on the right side behind the seat in the cab.
2. Open the filling cap and add fluid.

Note: Use different washer fluids according to the season to prevent the washer fluid from freezing when working at low temperatures.

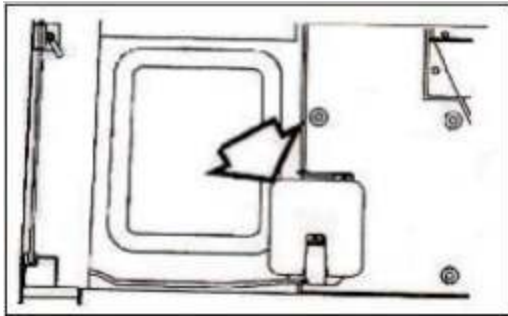


Fig 4-16

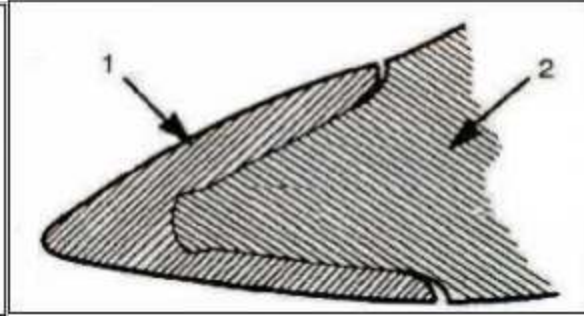


Fig 4-17

check whether the bucket teeth and side teeth are worn.

1. Check the wear of bucket teeth 1 every day.
2. The bucket teeth to be replaced must not be worn, otherwise the tooth seat 2 will be exposed.

check the engine fan belt for wear or overtightening

Important

If the fan belt is too loose, the engine will overheat, fail to work properly, and cause wear. If it is too tight, it will cause damage to the water pump, generator bearings and belts.

1. Check every 10 hours.
2. Turn off the engine and press the belt between the fan pulley and the generator pulley to check its tension. When the pressure is 98 Newtons (10kg), the belt drops 8-12 mm See Figure 4-18. Adjust the belt if necessary.
3. Check whether the engine belt is worn or broken, and whether the connection is damaged. If the above situation occurs, replace the new belt.

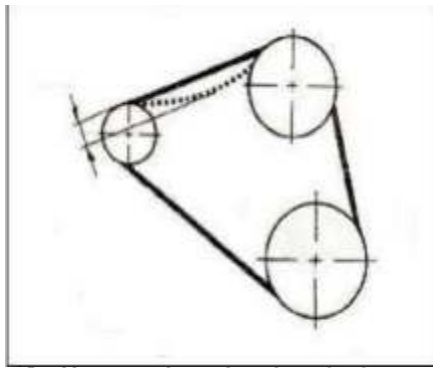


Fig 4-16

Adjust the belt tightness

Note: If the belt is skewed, adjust it.

1. Loosen the adjustment bolts of the adjustment plate and the generator fixing bolts.
2. Tilt the generator to adjust the belt tension.
3. After adjustment, tighten the adjustment bolts and fixing bolts.
4. Run the engine at idle speed for 5 minutes and readjust the belt tension.

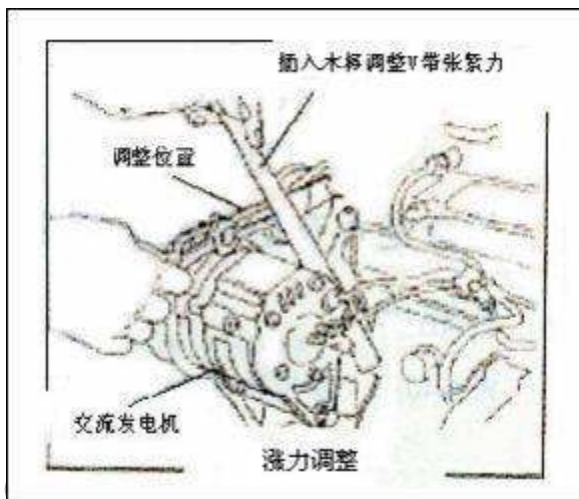


Fig 4-19

cracks and weld

Check for damage when you inspect and lubricate the machine daily. Repair or replace before operating. Check the working condition of all switches Before starting the machine, check the working condition of all switches.

check the working condition of all exterior lights, horn and control indicators

1. Turn the starter switch to the "on" position and observe the indicator lights.
2. Repair all bulbs that are not lit at this time.

3. Press the horn and repair or replace if there is a fault.
4. Turn on and check all external working lights, replace damaged monitors, burned or damaged bulbs and broken lampshades.

Start the engine, check the starting condition and observe the exhaust color when starting and running, and check for abnormal noises.

check the working status of all controllers

Important

~~When working at low temperatures, the hydraulic oil must be fully heated before working. Refer to the heating steps in the operation section of this manual. The hydraulic oil must be circulated once in each component (including all cylinders, travel motors and swing motors). The low-temperature hydraulic oil in the pipelines and components must be heated before normal operation. Otherwise, the hydraulic cylinder and hydraulic motor will be damaged.~~

1. Check each controller when the engine is at a certain speed.
2. Turn on the low-temperature hydraulic system to start warming up.
3. Remember all slow operations or abnormal movements. Find the cause and fix it before starting work.

check for loose or fallen bolts and nuts

See “Inspection of Bolts and Nuts” on page 116

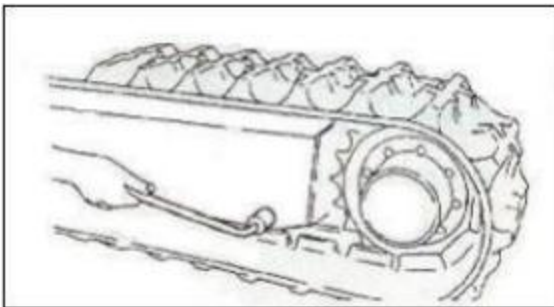


Fig 4—20

check whether there are any parts of the track that are too tight, too loose, worn or damaged (track links, track shoes, rollers, guide wheels, drive wheels)

1. Check all parts including the crawler track every day for missing, damaged or worn parts. See page 113 "Crawler tension"
2. Lift up both crawlers and test at two motor travel speeds.

clean the engine air intake filter

1. Remove the retaining spring cover.
2. Clean the inside of the air filter.

50 hours/week maintenance

perform all 10-hour/daily maintenance checks

Lubrication of slewing bearing

1. Inject grease into the grease nozzle two or three times.
2. Lift the bucket 20 cm above the ground, rotate the turntable twice, 90 degrees each time, and lubricate the slewing bearing.

Fuel tank drain port

Open valve ① (Figure 4-21) at the bottom of the fuel tank to drain water and debris.



Fig 4-21

Replace engine oil and filter

After the initial 50 hours of operation, replace the engine oil and filter element, and every 200 hours thereafter.

clean the oil radiator, water tank and air conditioning condenser

▲warning

Clean the radiator with high pressure steam or water, making sure the personnel concerned are standing in the proper working position.

Excessive pressure can damage the radiator and oil cooler.

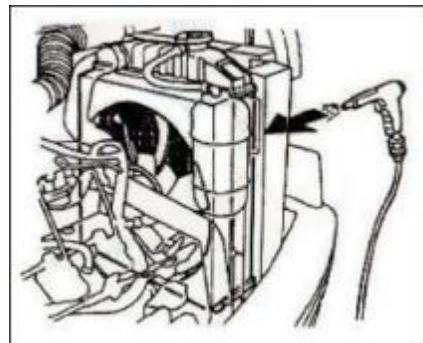


Fig 4-22

1. During the cleaning process, the staff should wear appropriate safety equipment. (Safety glasses, safety shoes, etc.).
2. Use high-pressure steam or water to clean the outside of the radiator and water tank. Clean from the outside of the engine components to the inside, and then from the inside to the outside to remove dust and debris.

Note: Cover the inlet of the air filter assembly to prevent water and other media from entering the engine.

check the battery fluid level and status

Check the battery status, see page 108 "Battery".

clean the fuel tank inlet

Open the fuel tank cap① (Figure 4-23),
and clean any impurities in the fuel filter②
Clean the fuel filter with special equipment.

100-hour maintenance

Perform all 10-hour/daily and 50-hour/weekly maintenance checks

cleaning the air filter element

▲Warning

Do not clean or move the air filter while the engine is running. If compressed air is used to clean parts, use appropriate eye protection.

1. Install the air filter element, remove the inlet cover, and install the filter element of the air filter element.

Note: If the indicator panel shows "On", the air filter must be turned on.

Note: Replace the filter element every 500 hours/three months.

2. Use compressed air to clean the filter element from the inside out. The air pressure cannot exceed 205kPa (0.2Mpa).

3. Clean the air filter housing and side cover.

4. Install the air filter element and side cover correctly, and tighten the side cover wing nut by hand, do not tighten it with any tools.

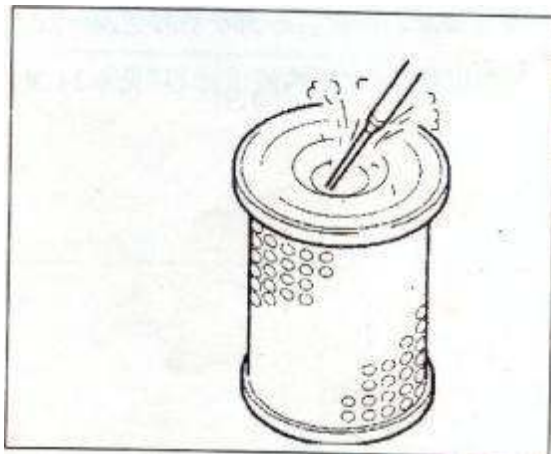


Fig 4- 24

Replace hydraulic oil filter

▲warning

After the machine is working normally, the hydraulic oil is very hot. Before maintaining any hydraulic parts, the hydraulic oil must be fully cooled.

There is air pressure in the hydraulic oil tank. Slowly loosen the screw plug on the hydraulic oil tank to release the pressure; then you can safely remove the filling cap or cover plate and drain the water from the tank.

Important

Make sure to remove all moisture and debris from the top of the hydraulic oil tank, especially the filling port and filter element installation port.

Refer to the replacement procedure "Replacing the hydraulic filter element"

Note: Replace the hydraulic oil filter element after the first 100 hours of operation and every 500 hours thereafter.

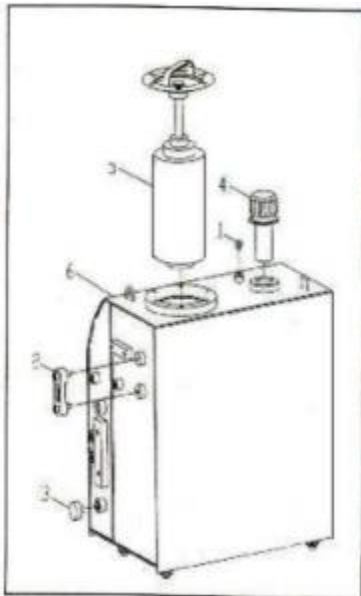


Fig 4-25

200 hours maintenance

perform all 10-hour/daily, 50-hour/weekly and 100-hour maintenance checks

Replace the oil and filter

Note: Replace after the first 50 hours of operation and every 200 hours thereafter.

▲Warning

Do not change the oil when the engine is hot. Allow the engine to cool down before changing the oil or filter.

1. Remove the drain plug① (Figure 4-26) from the lower part of the oil pan under the engine, drain the oil into the container, and install the drain plug.
2. Replace the oil filter element. The oil filter element is a rotating installation type (see Figure 4-29). Remove the filter element.
3. Install the new filter element, apply a small amount of oil around the oil filter ring, rotate the filter element until the top contacts the gasket, and then tighten it more than 3/4 turns.
4. Fill the correct type of oil. Refer to the recommended lubricant table in this manual for selection.
5. Start the engine and check the oil pressure.
6. Turn off the engine and check whether there is any leakage at the oil filter element.

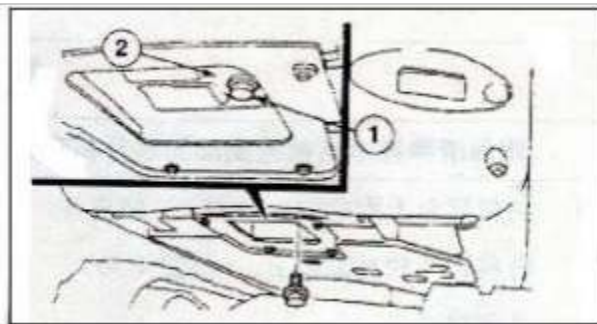
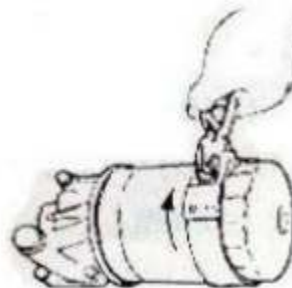


Fig 4—26



Fi g 4-27

250 hours/month maintenance

perform all 10-hour/daily and 50-hour/weekly maintenance checks

Draining water and debris from the hydraulic tank



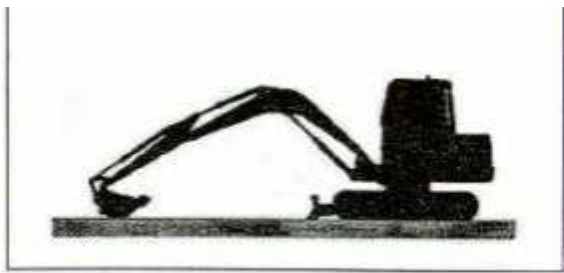
After the machine is working normally, the temperature of the hydraulic oil tank is very high. The hydraulic oil should be cooled before maintaining the hydraulic parts.

There is air pressure in the hydraulic oil tank. Gently loosen the screw plug on the top of the hydraulic oil to vent the air and release the pressure. Then you can safely remove the filling cap or cover plate and drain the water from the tank.

Important

Make sure to remove any moisture and debris from the bottom of the hydraulic tank, especially around the fill port.

1. Place the machine on a fixed horizontal surface, straighten the dipper arm and place the bucket on the ground. (As shown in Figure 4-28)
2. Turn off the engine.
3. Turn the screw plug ① on the hydraulic oil tank to release air, then press it down to release the pressure and add hydraulic oil.



Fi g 4- 28



Fi g 4- 29

Check the connection pin and sleeve of the front working device for wear. Check the clamping condition of the fuel system hose..

500 hours/three months maintenance

Perform all 10-hour/daily, 50-hour/weekly, 100-hour and 250-hour maintenance checks

Replace the fuel filter



▲warning

After the engine has cooled down, replace the filter element. Be careful of fire and smoking is strictly prohibited.

1. Install the fuel filter inside the engine.
2. Place a small container under the fuel filter.
3. Unscrew the fuel filter housing from the filter seat and remove the fuel filter.
4. After cleaning the top filter, install a new fuel filter and rotate the fuel filter until the gasket contacts the top and then rotate 1/2 turn.

Note: Apply fuel to the fuel filter gasket.

Note: Fill the fuel filter cover with clean fuel, which can exhaust the air in the fuel system

5. Start the engine, run the engine for 1-2 minutes, stop it, and check for leaks.

Replace radiator coolant



▲warning

Allow the engine to cool before loosening the radiator cap, and loosen the cap slowly to reduce internal pressure.

Clean the radiator while the engine is running. Be careful when working on or near a running engine, make sure the safety lever is in the locked position, and hang a sign to remind people that the excavator is being serviced.

Do not remove the radiator cap unless necessary, and observe the coolant level in the storage tank.

1. Slowly open the radiator cover ① (Figure 4--31) to release the pressure.
2. Place a container under the radiator and unscrew the drain valve ② (Figure 4--31).
3. After draining the coolant, close the drain valve.
4. Fill the cooling system with cleaning fluid.
5. Run the engine at idle speed until the coolant temperature gauge reaches the "green zone", and then run for 10 minutes.
6. Cool the engine.
7. Drain the cleaning fluid and fill the system with water.
8. Run the engine to circulate the water thoroughly.
9. Drain the water and fill the system with antifreeze that is suitable for the ambient temperature. Refer to the coolant configuration table. (See page 117)
10. Without installing the radiator cap, run the engine to exhaust the air and fill the radiator with liquid to 50mm below the top.
11. Drain the coolant in the reserve tank and then fill it with new liquid.

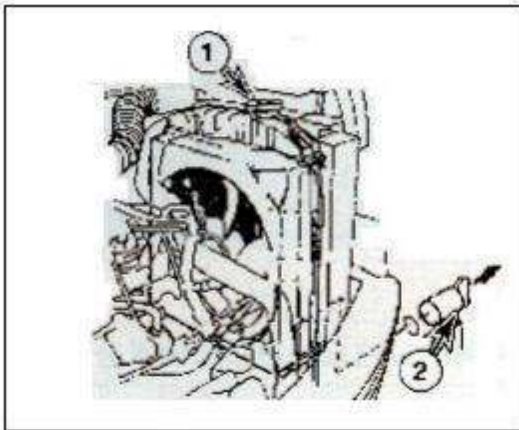


Fig 4-31

Replace hydraulic oil filter

▲warning

~~After the machine is working normally, the hydraulic oil is very hot.~~
At this time, the working system should be stopped to allow the oil to cool down fully.

Before removing the motor housing and the screw plug at the inspection hole, slowly loosen the screw plug to release the pressure.

Important

Make sure to remove all moisture and debris from the top of the hydraulic oil tank, paying special attention to the filling port and filter installation port.

Note: Replace the hydraulic oil filter element after the first 100 hours of operation and every 500 hours thereafter.

1. Slowly loosen the screw plug 1 to exhaust the air, then loosen the air filter 4;
2. Unscrew the bolt 8, remove the upper cover 9 and the sealing gasket, then loosen the nut 7 and remove the dirty filter element 5.
3. Discard the filter element.
4. Install the new filter element and O-ring, and install the valve, spring and upper cover.
5. Let the engine idle for 10 minutes to exhaust the gas.
6. Turn off the engine.
7. Check the fluid level in the hydraulic oil tank and add hydraulic oil if necessary.

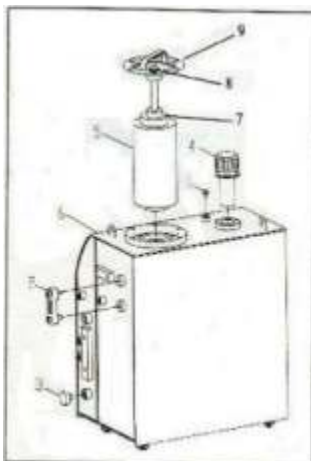


Fig 4-32

Replace the air filter element

Replace every 500 hours of operation/three months

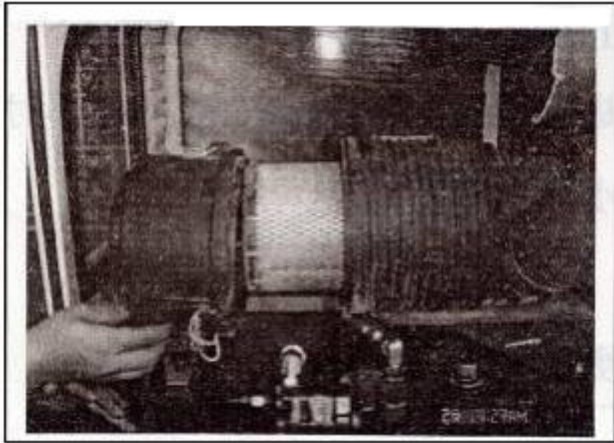


Fig 4-33

check the oil level of the travel reducer on both sides of the travel device

▲warning

~~After the machine is running, the lubricating oil is very hot. Cut off all working systems to cool it down. Before removing the screw plug on the casing, slowly loosen the bolts to release the air pressure.~~

~~Note: Drain the old oil after the first 500 hours of operation and replace it every 1000 hours of operation thereafter.~~

1. Make sure the machine is working on a solid and level working surface.
2. Turn the crawler until the oil ports ①, ②, ③, (Figure 4-34) are in the position shown in the figure.
3. Remove the screw plug ②, (Figure 4-34), add oil until the oil level reaches the oil port ②, and install the screw plug ②.
4. Repeat this step on the other travel motor.

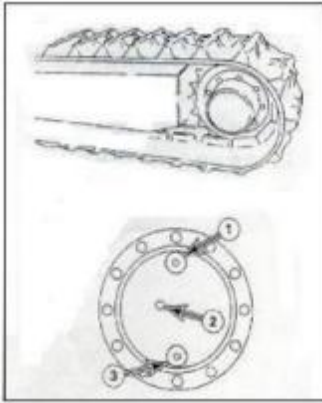


Fig 4-34

Replace the travel reducer oil (one on each side)

▲Warning

~~After the equipment is working, the lubricating oil is very hot.~~
Stop the working system to let it cool down. Before removing the screw plug at the inspection hole of the motor housing, slowly loosen the screw plug to release the pressure.

Note: Drain the old oil after the first 500 hours of operation, and then every 1000 hours.

Note: The gear phase capacity is 0.6 liters, and the oil cannot be mixed.

1. The machine is parked on a solid level surface.
2. Rotate the track until the screw plugs ① to ③ (Figure 4-41) are in the position shown in the figure.
3. Place a container under the screw plug ③, remove the screw plugs (① and ③) and drain the oil.
4. Install the screw plug ③, then remove the screw plug at hole ②, inject new oil from hole ① until the oil level reaches hole ②, and install the screw plugs (① and ②).
5. Repeat the above steps on the other travel motor.

Note: The upper and lower screw plugs of the knob are 46-51Nm/4.7-5.2Kg.m and the middle screw plug is 11.77-12.5Nm/1.27-1.30Kg.m Check, adjust and clean the valve. Check the bolt torque ★★★★★ by the designated agent of Kenshi Heavy Industry.

check, adjust and clean valves

check bolt torque



completed by the designated agent of kenstone Heavy
★★Machinery.

1200 hours maintenance

Perform all 10-hour/daily, 50-hour/weekly and 100-hour maintenance checks

2000 hours maintenance

Perform all daily, 50, 150, 250, 500 and 1000 hour maintenance checks. Check the generator and starter motor (to be completed by the designated agent of KSHI). Check all rubber anti-vibration devices. Perform and record the results of periodic inspections.

Check welded structural parts for cracks, open welds or damage

4000 hours maintenance

Important parts/periodic replacement

To ensure the safety of operation and work, periodic inspections should be carried out. Also, to increase safety, the following parts should be replaced. These parts are susceptible to wear, heat or fatigue. Even if these parts look good, they should be replaced within the set period.

Related parts such as gaskets and O-rings should be replaced frequently, and only genuine products should be used.

Important parts

		Parts that should be replaced periodically	Replacement time
Engi ne		Fuel hose (tank to filter)	Two years or 4,000 hours
		Fuel hose (tank to fuel injection pump)	
		Heating hose (heater connected to engine)	
Hydraulic system	Body	Pump suction hose	
		Pump discharge hose	
		Swing hose	
	Working device	Boom cylinder hose	
		Arm cylinder hose	
		Bucket cylinder hose	
		Pilot oil line hose	

4. Electrical system

Note: It is strictly forbidden to disassemble electrical circuits and components. Consult with the Kenstone Heavy Machinery agency before maintenance.

Battery



~~Before maintaining the battery, make sure the engine has stopped and the starter switch is in the "OFF" position.~~

Batteries can produce hydrogen. Especially uncharged batteries are at risk of explosion. Make sure flames, burning materials and sparks are away from the battery. The electrolyte is diluted sulfuric acid. Be careful when placing the battery. The electrolyte is easy to cause combustion. When the electrolyte gets on clothes or skin, rinse with plenty of water immediately. If the electrolyte gets into the eyes, rinse with plenty of water immediately and see a doctor as soon as possible.

When installing the battery, always wear safety glasses.

When disassembling the battery, first remove the "-" pole or the ground terminal, which will avoid sparks or arcs and explosions. When installing the battery, first connect the "+" pole and then the "-" pole. Make sure the terminals are reliably connected.

1. In cold winter, when starting the engine and preheating, the battery consumes a lot of energy, and when the temperature drops, the battery performance decreases.

2. In particularly cold weather, the battery can be removed at night and placed in a warm place, which will help improve the battery performance.

3. Check the battery fluid level.

Note: The battery installed in the factory is maintenance-free, and the battery fluid is only maintained at an appropriate level under normal conditions.

4. Check the charging status of the battery ① (Figure 4-40) by observing the brightness of the indicator ② set inside.

- Green: Normal Figure 4-40
- Black: Insufficient charging, check the generator.

Transparent: Insufficient electrolyte, replace with a new battery.

Note: The color displayed varies according to the manufacturer's instructions, please refer to the relevant instructions of the battery.

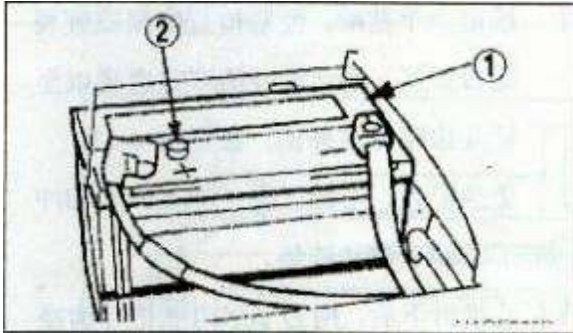


Fig 4-40

5. Bucket

Teeth replace

▲Warning

Because metal objects may fly out, you should wear a helmet, protective gloves and eye protection when replacing bucket teeth. Fold the bucket upward, place the back surface of the bucket arc firmly on the ground, stop the engine, lock the control handle, and then replace the bucket teeth.



Fig 4-41

1. Determine a benchmark and frequently check whether the wear or crack is expanding. Do not allow the bucket teeth to be severely worn so that the bucket tooth seat leaks out, refer to Figure 4-41.
2. Replace the bucket teeth and remove the pins and lock washers with a hammer ① (Figure 4-42) and a punch ②.
3. After removing the bucket teeth, use a knife to scrape the bucket tooth seat as clean as possible.
4. Insert the new bucket teeth and install the lock pin.

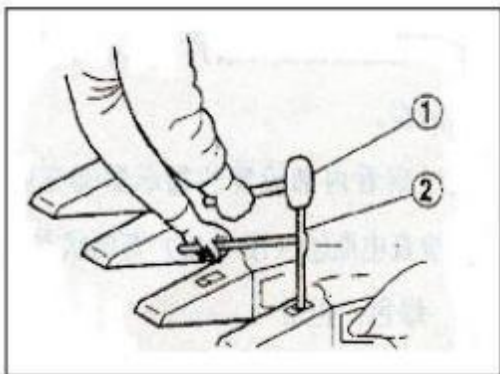


Fig 4-42

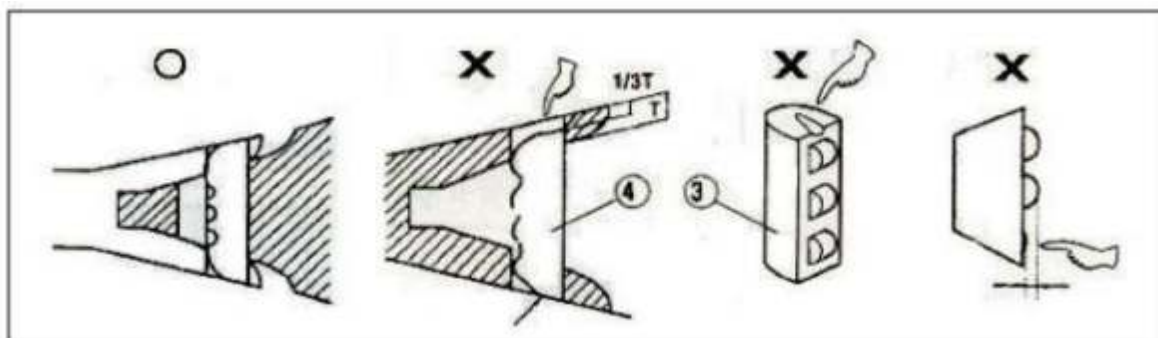


Fig 4-45

Squeezing the steel ball causes the ball to retract inside.

1. Check the lock pin. Replace the lock pin if the following conditions exist.
2. When the two surfaces are aligned, the lock pin is too short.
3. The rubber track has side seams, and the steel ball is prone to side sliding.

Replace the bucket O-ring

▲Warning

Because metal objects may fly, always wear gloves, safety glasses, and a hard hat when replacing pins.

1. Check the bucket O-ring. If worn, replace it if necessary.
2. Move the O-ring 1 (Figure 4-45) to the bushing 2, then remove the bucket pin 3 and pull out the bucket rod or bucket connecting rod pin.
3. Remove the old O-ring and install the new O-ring 1 (Figure 4-46) on the bushing 2. Make sure that the O-ring groove on the connecting rod 3 and the bucket bushing have been cleaned.
4. Align the bucket connecting rod and the bucket rod pin hole and install the bucket pin.
5. Roll the O-ring 1 into the O-ring groove (see Figure 4-47)

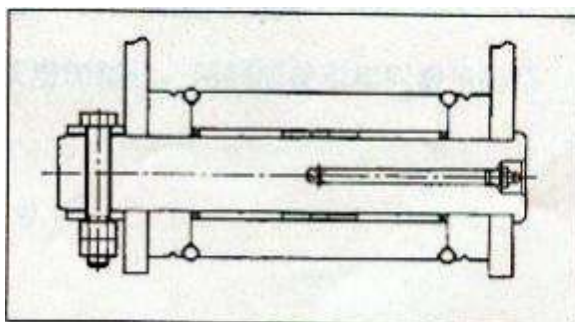


Fig 4-44

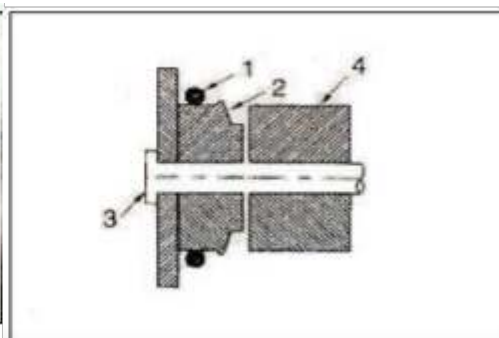


Fig 4.45

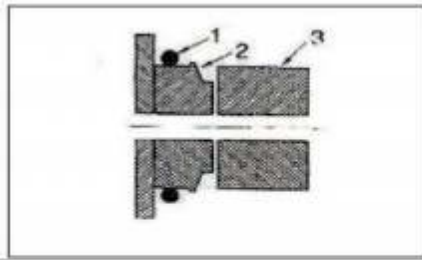


Fig 4.46

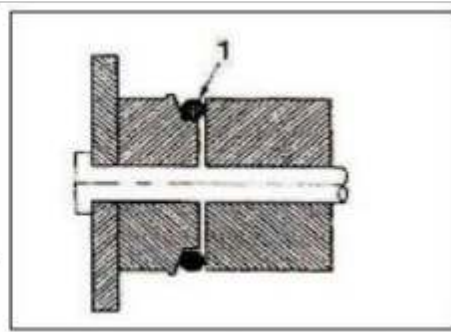


Fig 4-47

6. Bucket adjustment method

Install new bucket

1. If you install a new bucket, you should measure the inner ear dimensions of the bucket and the width of the bucket arm bushing.
2. Subtract the two dimensions to get the size of the gaskets added on both sides.

▲warning

When checking the gap at the bucket connection, the bucket is in a free state. At other times, lower the bucket to the ground or fix the bucket with support blocks, stop the engine, lock the control mechanism, and hang a warning sign to prevent the bucket from moving.

HOW to add gaskets when installing and replacing buckets

1. When the bucket is connected, the bucket is retracted and the bucket arm is extended outward. Lower the boom so that the bucket teeth are 50~100mm from the ground. This position is convenient for dimensional measurement.
2. After the ring is installed, push the bucket to one side and check the gap between the other side of the bucket and the bucket arm bushing. The total gap between the bucket inner ear and the bushing section should be 0.2 to 0.7mm. Too tight fit will increase wear, too large a gap will produce excessive noise and loose movement.

2. Force the bucket to the other side and check the above gap again.
3. If adjustment is required, remove the bolts and pins, remove or add gaskets as needed, and use the same number of gaskets on both sides.

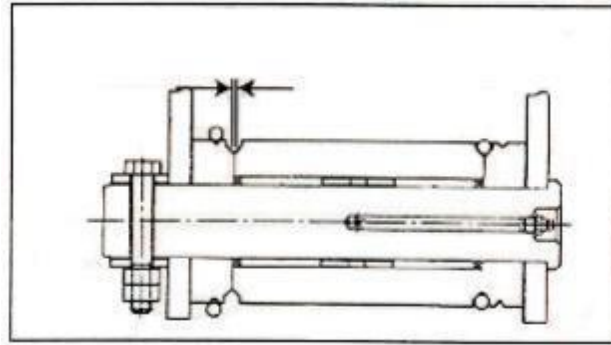


Fig 4- 48

7.Track tension

▲warning

It takes two people to safely measure the tension of the track. One person drives the excavator to lift one side of the track off the ground, while the other person measures the size. Be very careful to prevent the machine from moving or acting. Before doing the above work, you should first "ease" the engine and drive the excavator to a flat ground. If necessary, use support blocks. The pressure in the track adjustment cylinder is very high, so do not let the pressure drop suddenly. Do not loosen the grease cylinder valve body a full turn at a time. The pressure should be released slowly, and at the same time, keep your body away from the valve body.

The track link pins and bushings are worn during normal operation, which reduces the tension of the track. Therefore, periodic adjustment is necessary and is also required for normal operation.

1. Lift one side of the track to check the tension, as shown in Figure (4-49).

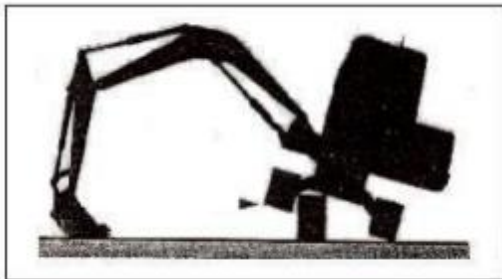


Fig 4-49

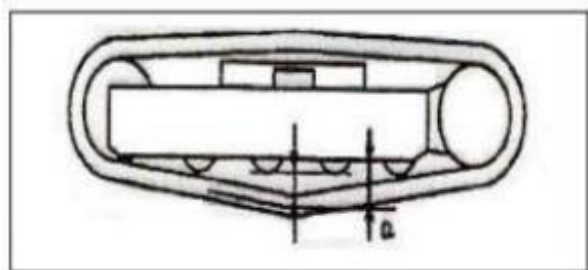


Fig 4-50

2. Measure the clearance between the maximum outer wheel edge of the chassis supporting wheel and the upper plane of the lowest crawler shoe chain track. The recommended value is 10-20mm (equivalent to $a=180\sim190\text{mm}$).

Note: If there is too much dirt, dust or other substances on the chassis assembly, the measurement will be inaccurate, so the chassis should be cleaned before measurement.

Note: For machines with rubber belts (optional), the inspection and adjustment steps are the same.

3. If the gap between the intermediate roller bearing surface and the upper plane of the track chain link is measured, it should be 20~35mm (see Figure 4-51). The rubber track (Figure 4-51) has a gap of 15-20mm

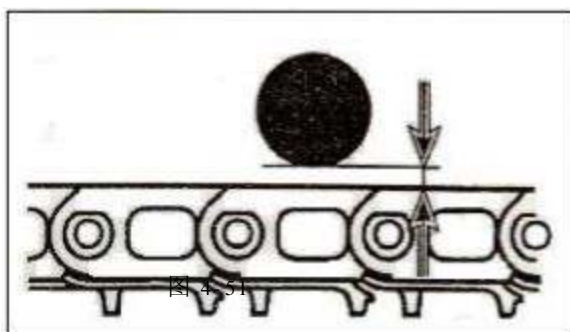


图 4-51

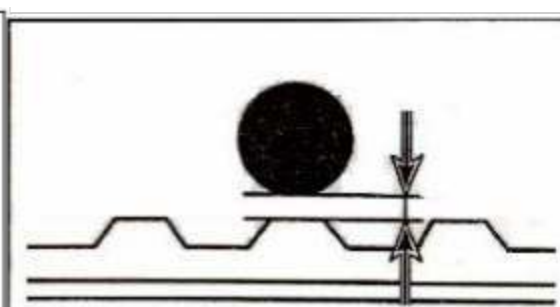


图 4-52

8.Maintenance under special conditions

Conditions	Maintenance requirements
Working in mud, water or rain	1. Walk around the machine to check for loose joints. 2. After work, clean the mud, rocks, and gravel on the machine, and check whether the welds are damaged or cracked, and whether the parts are loose. 3. Complete daily lubrication and maintenance. 4. If working in acid rain or corrosive substances, rinse the affected parts with clean water
Working in extremely dusty or hot environments	1. Clean the air intake filter more frequently. 2. Clean the oil radiator and water tank and remove embedded dust and dirt. 3. Clean the fuel and filter more frequently. 4. Check and clean the starter motor and generator if necessary.

Working in rocky environments	1. Check the chassis and track assembly for damage or excessive wear. 2. Check the joints and bolts for looseness or damage. 3. Loosen the track further. 4. Check the bucket or breaker more frequently for damage or excessive wear. 5. If necessary, install a top frame and front frame to prevent damage from falling objects.
Working in extremely cold regions	1. Use fuel, hydraulic oil and lubricating oil that are suitable for the ambient temperature. 2. Check the antifreeze with a hydrometer to ensure that it has the appropriate antifreeze performance. 3. Confirm the temperature environment of the battery. When it is particularly cold, remove the battery at night and store it in a warm place. 4. Remove the mud on the body in time to prevent damage to the equipment when freezing.

9.Bolt and nut inspection

Check all fasteners after the first 50 hours of operation and every 250 hours of operation. If any are loose or missing, tighten them again or install new ones. Be sure to use a torque wrench.

Important

Clean the fasteners before tightening.

If the counterweight bolts are loose, consult with the Kenstone Heavy Machinery agent to resolve the issue.

Note: When installing, remove rust, sand, dust and mud. When installing, lubricate to reduce wear.

NO	checking point		Bolt diameter mm	QTY.	Bolt head size	Torque	
						Grade	N·m
1	Engine shock absorber mounting bolts	front	14	2	22	8.8 (10.9)	125 (185)
		rear	14	2	22	8.8 (10.9)	125 (185)
2	Hydraulic and fuel tank mounting bolts		12	6	19	8.8	79
3	Hydraulic hose and pipe connections		PF1/4				26.5~29.4
			PF3/8				46~51
			PF1/2				56~62
4	Oil pump fixing bolts		16	2	24	10.9	280
5	Control valve fixing bolts		8	4	13	10.9	34
6	Control valve bracket mounting bolts		10	4	17	8.8 (10.9)	46 (68)
7	Slewing part mounting bolts		16	7	24	10.9	280
8	Cab mounting nuts		16	4	24	8.8	195
9	Slewing bearing mounting bolts	To platform	16	24	24		280
		To chassis	16	24	24		280
10	Traveling device and crawler frame fixing bolts		14	24	22	10.9	185
11	Traveling device and crawler frame fixing bolts		14	24	22	10.9	185
12	Roller mounting bolts		12	40	18	10.9	117

13	Top cover bolts	8		13	8.8	23
		10		16	8.8	46
14	Counter weight fixing bolts	20	4	30	8.8 (10.9)	390 (560)

10. Long-term parking

Condition	Maintenance requirements
Cleaning	Clean the chassis and track assembly with a high-pressure water gun.
Lubricating	1. Perform all normal lubrication contents. 2. Apply a layer of oil to the surface of exposed metal parts, such as hydraulic cylinder piston rods, etc. 3. Apply oil to all control connections and control cylinders (control valve cores, etc.).
Battery	After fully charged, remove the battery or battery wire and store it.
Cooling system	1. Check the antifreeze level in the coolant reserve tank. 2. Check the antifreeze level of the antifreeze or coolant with a hydrometer every 90 days or every 750 hours of work, and add antifreeze according to the required level.
Hydraulic system	Refer to the "Hydraulic System Warming Method" specified in this manual and start the engine once a month.

Transportation

Excavator transportation should comply with local and national regulations. If you have any questions, you can ask the relevant departments of the local government.

Check the width, load limit and traffic restrictions of the road to be passed. Special applications and permits may be required.

Loading and unloading



When transporting a machine, be aware of its width, height, length and weight.

Loading and unloading a machine is a dangerous operation. Be especially careful and run the engine and travel at low speed.

The ramp must be able to bear the weight of the machine. If necessary, add pads under the slope to increase the support.

Make sure there is no grease, mud, etc. on the ramp to prevent the machine from slipping.

When loading and unloading a machine, the trailer should be parked on a solid and level ground.

When operating the machine on the trailer, keep the engine speed to the lowest and travel at the lowest speed. Secure the machine to the trailer in accordance with local transportation regulations.

Loading

1. Make sure the trailer is parked on a solid and level surface, see Figure 5-1.
2. Check the wheels to ensure they do not move during loading and unloading.
3. The ramp used should be able to bear the weight of the machine. If necessary, add support blocks under the ramp to increase the support force.
4. The angle of the ramp should not be greater than 15° . A large angle will cause trouble during loading and unloading.
5. Use the lowest travel speed and engine speed when loading the machine.

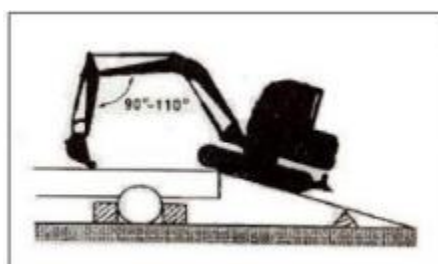


Fig 5- 1

6. Be careful when loading and unloading, do not touch the bulldozer, raise the bulldozer and put it at the back. When the machine is moved onto the vehicle, use the bucket to protect the track to prevent sudden tipping.
7. When transporting, gently lift the bucket, retract the forearm and slowly rotate the upper body of the machine 180 degrees.
8. The engine runs at the "minimum idle speed".
9. Add wooden blocks under the bucket.
10. Fully lower the bulldozer.
11. Put the safety lever ① (Figure 5-3) in the "locked" position. (Pilot operation disconnected)
12. Stop the machine and turn the switch button back to zero.

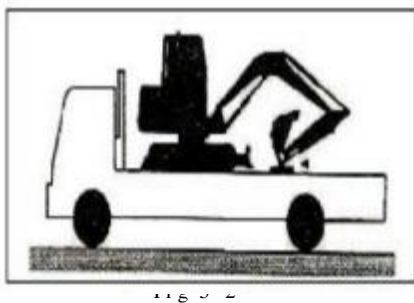


Fig 5- 3

13. Before transporting, ensure that the excavator is safely mounted on the trailer, add wooden blocks in front and behind the tracks, and secure them with ropes or chains according to local regulations.

Note: Do not tie the ropes to the tracks, as shown in Figure 5-4. Pass the ropes through the tying points and secure them

14. Refer to the transport dimension table and the excavator full width and full height dimension table, and secure the excavator as shown in the figure.

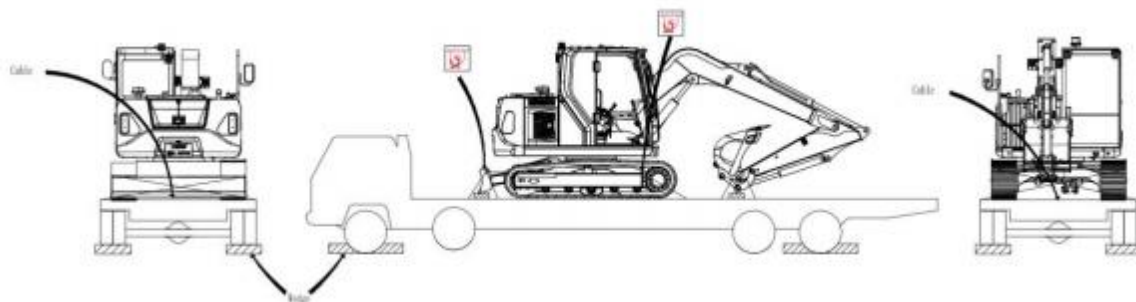


Fig 5- 4

unloading

warning

When unloading the machine, be careful of the point where the rear side of the towing vehicle body contacts the slope: the machine may tilt when passing through this point.

1. When unloading, keep the dipper and boom at an angle of 90 to 110 degrees and move slowly.
2. Remove the machine from the ramp until the bucket touches the ground.
3. After the machine is completely unloaded, raise the front device and walk slowly.

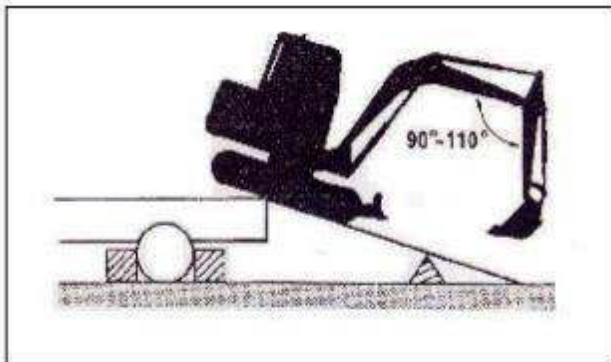


图 5-5

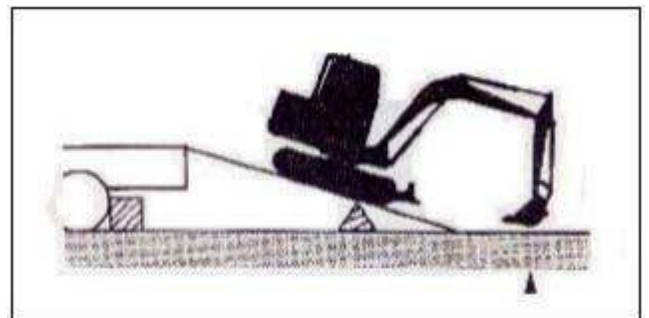


图 5-6

Troubleshooting

If any problem is found during the inspection, timely measures should be taken to adjust and repair the hydraulic or electrical system and the designated agent of Ken Stone Heavy Machinery should be contacted nearby.

1.Main valve

Fault	Reason	Solution
Operational weakness	Valve core crack	Replace the valve body
	The overflow valve has cracks	Disassemble, clean or replace
Valve core stuck	Foreign matter causes hydraulic oil to overheat	Remove foreign matter
	Hydraulic oil contamination	Replace hydraulic oil and clean hydraulic system
	Overtightening of hydraulic circuit components causes valve body deformation	Replace the valve body
Oil leakage from sealing ring	Foreign matter on valve core	Cleaning or replacing
	Pressure is too high	Check and adjust with pressure gauge
	Reset spring is damaged	Replace
	Valve temperature is unstable	System temperature rises
	Debris in the seal	Cleaning the seal
	Return oil pipeline resistance in the valve is too high	Increase pipe diameter
	Debris in the seal	Cleaning
	Damaged valve core	Replace valve body
	Damaged seal	Replace

The valve core does not move	Debris in valve	Cleaning
	Valve core cover is contaminated	Replace valve cover seal
	Valve core has cracks	Replace valve body

2. Relief valve

Fault	Reason	Solution
Insufficient pressure	Valve core is sticking and always open	Disassembly and cleaning
Unstable pressure	Damaged seal ring of pilot valve core	Replace
	Valve core of pilot valve piston is sticking	Disassembly and cleaning
Pressure rises and falls suddenly	Foreign matter causes wear and system contamination	Replace oil and worn components
	Locking nut and adjustment spring are damaged	Adjust pressure
Oil leakage	Seal ring has cracks, O-ring is worn	Replace worn parts
	Foreign matter causes parts to stick	Disassembly, inspection, cleaning

3. central swivel joint

Fault	Reason	Solution
Insufficient traction	Bad seal on center joint	Replace
	Damaged rotor on center joint	Replace
	Bad seal	Replace seal

4.

Working

Fault	Reason	Solution
Slow operation	Lack of engine power	Adjust the engine
	Worn hydraulic pump	Replace
	Bad main relief valve	Adjust pressure or replace
	Low hydraulic oil level	Add oil
	Low viscosity of hydraulic oil	Replace oil with appropriate viscosity
	Bad hydraulic pump	Replace hydraulic
Bad tightness		

whole machine		pump
	Low hydraulic oil level	Add oil
Weak operation	Relief valve pressure is too low	Adjust pressure
	Damaged hydraulic cylinder seal ring	Replace
	Damaged hydraulic cylinder piston or rod	Replace
Bad sound coming from the connection of the device	Insufficient grease	Add oil
	Replace bushing or pin	Replace bushing or pin

5. Hydraulic motor

Fault	Reason	Solution
Hydraulic motor does not rotate	Low hydraulic oil level	Add oil
	Faulty hydraulic pump	Replace pump
	Hydraulic motor leaks oil	Replace motor
	Output shaft overloaded	Determine and eliminate the cause of overload
	Low viscosity of hydraulic oil	Replace
Hydraulic motor does not rotate in one direction	Control valve relief valve is not working properly	Clean or replace relief valve
Low speed	Low hydraulic oil level	Add oil
	High temperature and oil leakage	Lower oil temperature
	Air in the system	Exhaust
	Motor leaks oil	Replace motor
Hydraulic motor makes abnormal sound	Low hydraulic oil level	Add oil
	Air in motor	Exhaust
	Hydraulic motor is worn	Replace motor
	Improper shaft installation	Adjust

6. Hydraulic cylinder

Fault	Reason	Solution
Insufficient cylinder force	Relief valve pressure is too low	Adjust pressure
	Cylinder oil leakage	Replace hydraulic oil seal
	Piston or piston rod damage	Replace piston or rod

	Control valve oil leakage	Replace valve core
Cylinder leakage	Hydraulic cylinder seal is bad	Replace seal
Unstable piston movement	High hydraulic oil temperature	Cool down
	Air in the system	Refill oil and tighten the oil filling port

7. Hydraulic pump

Fault	Reason	Solution
Poor oil supply	Low hydraulic oil level	Add oil
Lack of pressure	Hydraulic pump leaks	Replace pump
	Air in pump	Add oil or check oil filling hose
	Min relief valve pressure is too low	Adjust pressure
	~~Vacuum is formed at the~~	
Hydraulic pump makes abnormal sound	filling port due to low oil level and air enters the system	Add oil and tighten the oil nozzle
	Vacuum is formed by high oil viscosity	Change oil
	Failure of pump and engine connection	Adjust the coupling
	Air in hydraulic oil	Drain
Pump leaks	Faulty hydraulic pump seal ring	Replace seal ring

8. Travelling

Fault	Reason	Solution
Insufficient walking force	Low pressure in main relief valve	Adjust pressure
	Speed limiting valve is bad	Replace speed limiting valve
	~~Hydraulic motor is not~~ working properly	Replace hydraulic motor

	Center joint seal is damaged	Replace seal
	Hydraulic pump is bad	Replace hydraulic pump
	Control valve is leaking	Replace valve core
Unsteady walking	Track is too loose	Adjust tightness
	Stone enters track	Remove
	Speed limiting valve is bad	Replace valve
	Hydraulic motor is not working properly	Replace hydraulic pump
	Air in hydraulic motor	Hydraulic motor exhaust
Machine cannot go straight	Two tracks are not of the same tightness	Adjust to make the tightness consistent
	Hydraulic pump is not working properly	Replace hydraulic pump
	Hydraulic motor is not working properly	Replace hydraulic motor
	Control valve is leaking	Replace valve core
	Center joint seal is damaged	Replace seal

9. Rotary system

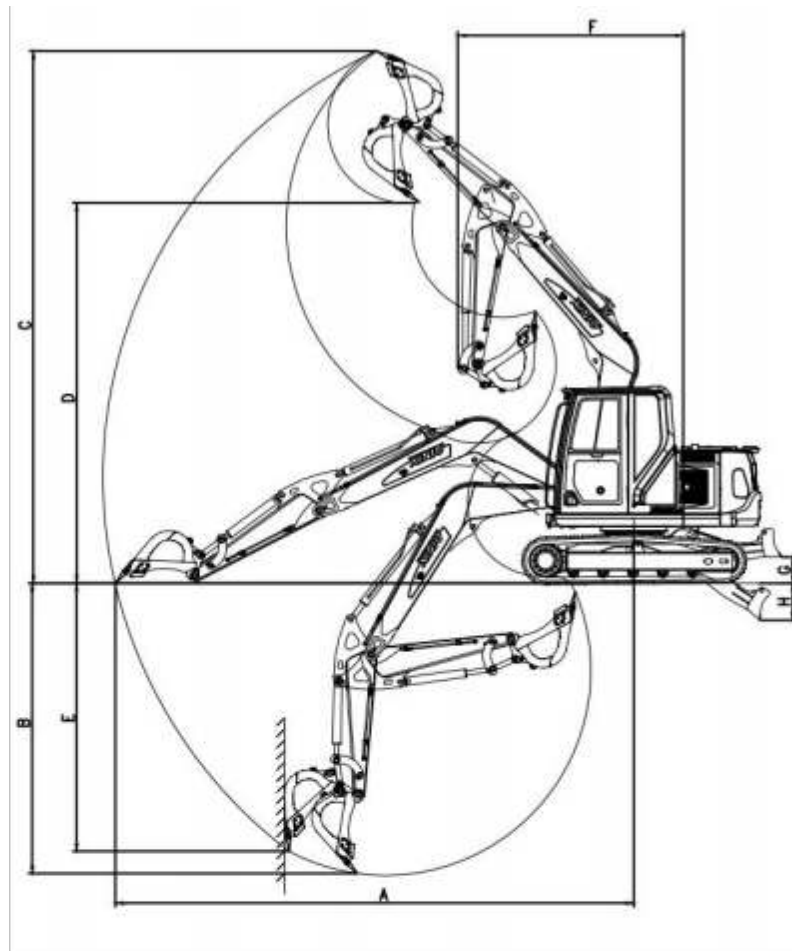
Fault	Reason	Solution
Poor rotation force	Poor hydraulic motor	Replace hydraulic motor
	Slewing bearing blocked	Inject grease or replace slewing bearing
Poor bulldozer operation	Low pressure on bulldozer	Adjust pressure
	Foreign matter in bulldozer valve or relief valve port	Purge valve
Poor rotation stop	Low pressure on relief valve port or bulldozer valve	Adjust pressure
	Foreign matter in bulldozer valve or relief port	Purge valve
Abnormal sound	Air in the system	Add oil
	Lack of lubricant in slewing bearing	Inject grease

standard technical parameters

1.Reference

Parameters		Unit	
Machine weight		kg	7200
Bucket Capacity		m ³	0.3
Width of bucket		mm	770
Engine	Model		Yanmar 4TNV98C-WSY
	Displacement	L	3.319
	Rated power	kw/r/min	44.2KW 220RPM
	Maximum Torque	N.m/r/min	229-241N.m/1300 ±25rpm
Speed	Low speed	km/h	2
	High speed	km/h	4
	Rotary speed	rpm	9
	Max. Gradeability		19°
	Max. Digging force	kN	52
Dimension	Total length	mm	6065
	Total width	mm	2150
	Total height	mm	2460
Tracks	Ground pressure	Kp	39
Hydraulic oil tank		(L)	150
Engine oil capacity		(L)	10
Fuel tank		(L)	180
Coolant capacity		(L)	20

2.The scope of work



Working range			Unit:mm
A	Max. Ground digging radius	6435	
B	Max. digging depth	3600	
C	Max. digging height	6615	
D	Max. dumping height	4725	
E	Max. vertical digging depth	3330	
F	Min. rotating radius	2180	
G	Max. lifting height of dozer	370	
H	Max. digging depth of dozer	440	



DECLARATION OF CONFORMITY

Original Declaration

MANUFACTURER:

Name: Shandong Ken Stone Heavy Machinery Co., Ltd.
Address: South of National Highway 309#, Dingyuanzhai Town, Guanxian
County, Liaocheng City, Shandong Province, China

AUTHORIZED REPRESENTATIVE:

**AUTHORIZED TO HOLD TECHNICAL FILE ON BEHALF OF MANUFACTURER
ABOVE**

HEREBY DECLARES THAT THE BELOW MENTIONED MACHINE:

DESCRIPTION OF MACHINERY

PRODUCT NAME: HYDRAULIC WHEEL EXCAVATOR
MODEL/TYPE:
SERIAL NO.:
MANUFACTURER YEAR:

IN ACCORDANCE WITH:

MACHINERY DIRECTIVE	2006/42/EC EN 474-1:2022; EN 474-5:2022+AC:2022
EMC DIRECTIVE	2014/30/EU EN ISO 13766-1:2018; EN ISO 13766-2:2018

**AS WELL AS TO THE FOLLOWING OTHER DIRECTIVES AND THE
CORRESPONDING NATIONAL REGULATIONS:**

NOISE DIRECTIVE 2000/14/EC & 2005/88/EC, DLGS 262/02

EQUIPMENT ACCORDING TO THE DEFINITION GIVEN BY ANNEX I, ITEM 20 OF
NOISE DIRECTIVE.

CONFORMITY ASSESSMENT PROCEDURE FOLLOWED: ANNEX VII OF 2000/14/EC

NOTIFIED BODY: EUROPEAN CERTIFYING ORGANIZATION S.P.A. NB 0714, VIA
MENGOLINA 33, FAENZA(RA), ITALY

HOLDER OF THE TECHNICAL DOCUMENTATION: MANUFACTURER

MEASURED SOUND POWER dB(A)
LEVEL:

GUARANTEED SOUND dB(A)
POWER LEVEL:

SIGNED ON Shandong Ken Stone Heavy Machinery Co., Ltd.
BEHALF OF:



STAMP&SIGNATURE:

NAME:
POSITION:
PLACE:
DATE:

OPERATION AND MAINTENANCE MANUAL

RH80E HYDRAULIC CRAWLER EXCAVATOR

**Publishing editor: Li
Qingbo Sun Min
2024.02**

The information in this manual is subject to change without notice.

**Version 1, February, 2024
Original Instruction**

Shandong Ken Stone Heavy Machinery Co., Ltd.
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