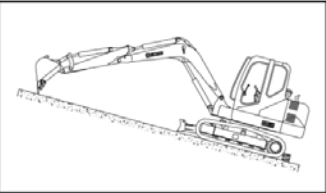
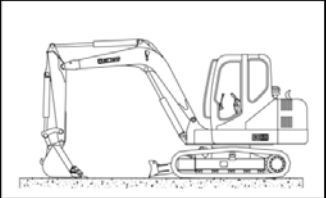
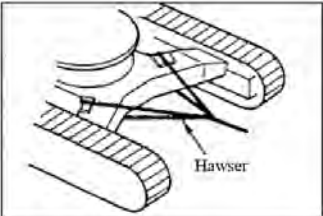


5.7.5 Risks when parking

 Warning!	Follow the advice to prevent risks of injury and/or property damage
  	 Park the machine on a firm and level road surface instead of a slope. If forced to park on a slope, fix the crawlers with seat pads, and insert the bucket into the ground. – Set the engine accelerator rod to “the lowest” idle speed position and idle the engine for about 3 minutes. – If you touch any controls inadvertently, serious accident may result. Shut off the engine and set the safety lever to “locked” position before leaving the cabin

5.7.6 Warning – Towing Operation

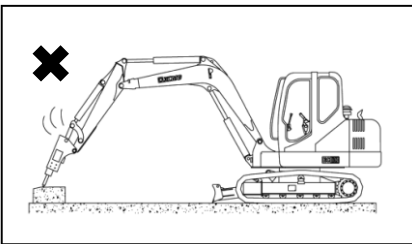
 Warning!	Follow the advice to prevent risks of injury and/or property damage
	– Do not use damaged mooring ropes or chains to minimize the risk of accidents. – Wear gloves when handling chains or mooring ropes. – Use ropes or chains strong enough to bear the load. – Tie the chains or mooring ropes on the track frame as shown in the figure. – Do not use the light towing holes at the back of the frame to tow the machine or damage may result. – Insert protective objects (e.g. wood blocks, etc.) between the ropes and the vehicle body to protect them from damage. – When the machine is stuck or the crawlers are trapped in slurry while the machine still works, use a mooring rope to connect the machine to another one to pull it out. – As shown in the figure, connect the drag rope. To avoid the wire rope being damaged, put some protective materials (e.g. wood blocks, etc.) between the travel frame and the wire rope. – Make sure that the wire rope has been connected to the main travel frames on both machines. – Use the other machine to the distressed one to a firm ground.

5.7.7 Risks when operating the hammer

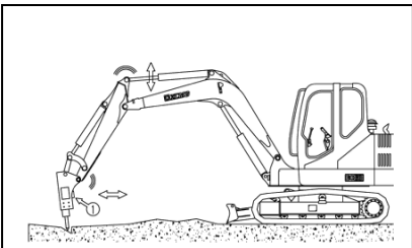
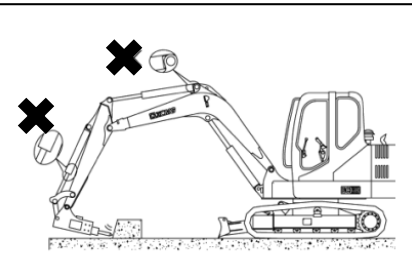


Warning!

- Installing a hydraulic knapper and its line without authorization from XCMG dealer may cause serious malfunctions. This is beyond the warranty coverage of the excavator.

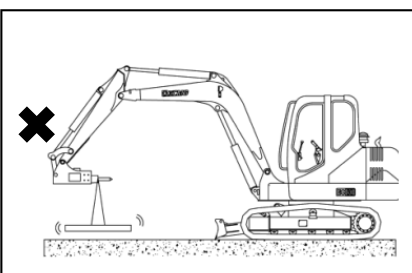
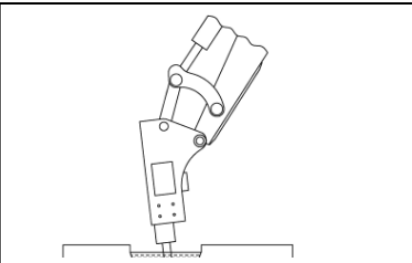


- Selecting hydraulic knapper
 - o If you want to install a hydraulic knapper, take the stability of the equipment into account, and ensure that this modification is appropriate. Also, proper pressure and flow should be allowed for. Then, you can contact an agent to select an appropriate hydraulic knapper.
- Hydraulic hoses and steel tubes of the knapper
 - o When installing the hydraulic knapper, do the job according to the drawings coming with the unit.
 - o If you want to remove the knapper from the excavator, close hoses and hard tubes with plugs and covers to prevent entry of foreign materials into the hydraulic system.
 - o Close the knapper joints with covers and plugs to prevent entry of foreign materials.
 - o Before start of operation, check all hydraulic joints for leakage or looseness.

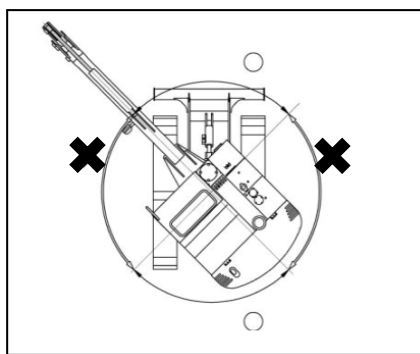


- Hydraulic knapper operations

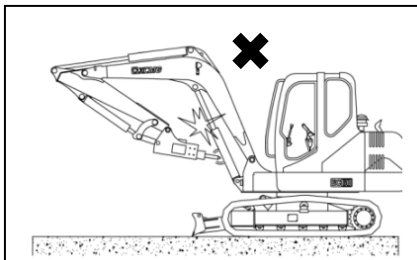
Notice: Settings of hydraulic oil pressure and flow may require modifications.



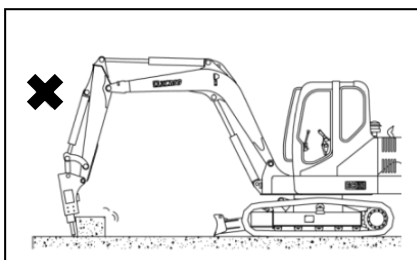
- o Be sure to read and comprehend the owner's manual of the knapper.
- o Check all mechanical and hydraulic connections.
- o Do not use the knapper as a hammer. The knapper is comparatively heavy and drops fast, so, do not drop the knapper from a very high place; otherwise, its top structure will be damaged. When operating the knapper, do not extend the boom or arm cylinder completely. A 50 mm or larger clearance should be maintained between the cylinder rod end and the cylinder end so as to prevent the cylinder from damage when you operate the knapper.
- o If the cylinder hoses vibrate excessively, do not use the knapper. Check the hydraulic accumulator of the knapper for damage; if needed, repair it. If the excavator works in such conditions, its structure and hydraulic package may be damaged.
- o If related equipment is unavailable, working underwater will not be allowed. When the knapper body immerses into water, the knapper seals will be damaged and become rusty so that the external materials or water can enter the hydraulic system to cause failure. Only head of the knapper can be inserted into water.
- o Do not use the knapper to lift or haul any object.



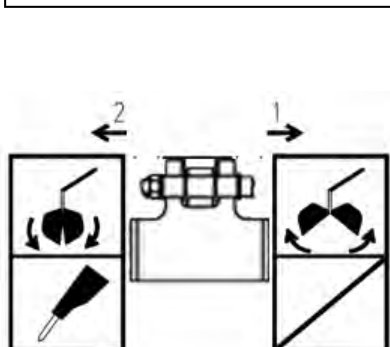
- The knapper can work only when mounted at front or tail of the excavator. Do not mount it at left or right side for the purpose.
- When operating, do not swing back and forth.
- If the upper structure of the excavator is vertical to the crawler, the knapper operation may cut service life of the machine or result in machine rollover.



- During travel or parking, do not retract the knapper to the bucket cylinder or boom.



- Do not use the knapper or bucket to move crushed objects, especially, avoid moving using turning power; otherwise, the boom, bucket cylinder and knapper will be damaged.



- **Starting knapper**
 - o Set the knapper in the section 5.5.
 - o Place head of the knapper to required position, press and hold the rocker switch on top of right joystick to left, and then release the switch after the knapper finishes its job.

5.7.8 Warning – Operation in Special Conditions

⚠ Warning!	Operating in Special environmental Conditions
	Operations in extremely cold conditions – If the excavator works in extremely cold days, protective measures must be taken to ensure normal operation. – The following detailed inspection can ensure normal operation of the excavator at extremely low temperature. - o Check if correct antifreeze is added in the cooling system at extremely low temperature. Check the cooling system carefully and record status of leakage. - o Keep the battery fully charged to prevent freezing. - o Maintain the engine at optimum so that it is easy to start and operate the engine even at extremely low temperature. - o Select engine oil of proper specification according to temperature. Refer to “Lubrication and Specifications” in engine manual for details. - o Before operation, drain condensate in the fuel tank and water separator, then refill. - o Take out and service the fuel filter element, drain concretions (e.g. wax), and ensure that the solid point of the fuel used is lower than the lowest ambient temperature. - o Lubricate the excavator fully according to “Lubricants and Maintenance Schedule” or the lubrication diagram on the machine. - o Start the engine to warm it up to normal temperature before load-on operation. - o When the excavator is under idle speed, if dirt and ice are frozen on travel motor gears, heat up to thaw the frozen substances before excavator operation attempt. - o Operate the hydraulic units with care until the temperature that normal operation requires is reached. - o Check all machine control units and their functions to ensure normal working. - o In cold days, see the items concerning start in cold days in “Engine Start” in this manual if assisted start is unavoidable. - o To prevent ice coating. Clean up all dirt, snow and water. When possible, cover the machine with canvas and prevent edge of the canvas from being frozen on ground.

Operations in very hot areas

- ⚠ In very hot days, continuous running to the machine will cause overheat. Make sure to monitor the engine temperature and stop the machine to allow it to cool down when needed.
- ⚠ Under high temperature, the dirt inside the cooling system will accumulate faster. Change antifreeze yearly to maintain the resistance to corrosion.
- ⚠ Flush the cooling system regularly to keep its pipes clean. Avoid the use of highly alkaline water; to prevent easier formation of dirt and rust inside the pipes.
- ⚠ Check the electrolyte level daily. In a high-temperature environment, use less concentrated electrolytes. Dilute the electrolyte with specific gravity of 1.280 (unit missing) into that with specific gravity of 1.200~1.240 (missing unit), and then charge it fully.
- ⚠ Recharge the battery whenever reading of specific gravity reaches 1.160 (missing unit). If stored for a longer time under high temperature, the battery will discharge automatically at high rate.
- ⚠ Do not store acid batteries near large numbers of tires as the acid gases will do harm to the rubber.
- ⚠ Lubricate according to "Lubricants and Maintenance Schedule" or the lubrication labels attached on the machine.
- ⚠ When parking for an extended period of time, do it below a shelter to prevent exposure to sunlight, dirt and dust.
- ⚠ If no appropriate covering is available, use a canvas to prevent dust from entering the engine or the hydraulic system.
- ➔ In hot and humid climate, the machine components will corrode faster, especially during the rainy season.
- ➔ Rust and paint bubbles will build up on metal surfaces and spots may appear on other components' surfaces, too.
- ⚠ Apply corrosion resistant lubricant on unpainted or exposed surfaces.
- ⚠ Protect onductors and terminals with insulating mixture.

Apply paint or appropriate antirust materials on damaged surfaces to prevent the rust from spreading.

	<u>Operations in dusty or sandy areas</u> ⚠ Operation will produce dust in most places. Take extra protective measures when working in dusty or sandy environments. ⚠ Wear safety goggles when using compressed air for cleaning. ⚠ Clean the machine with compressed air frequently to keep the cooling system and the cooling zone clean. ⚠ When servicing the fuel machine, take extra care to prevent dust or sand from entering the oil circuit. ⚠ Always keep the air cleaner in good shape. Check its clogging indicator everyday. ⚠ Prevent dust and sand from entering engine parts and/or components as well as possible. ⚠ Lubricate and service according to “maintenance schedule” or the lubrication diagram attached on the machine. ⚠ Before lubrication, clean all the lubrication connections. ➔ Sand mixing in with the lubricant will cause the parts to wear faster. Keep the machine as sand- and dust-free as possible. Park the excavator under a shelter or cover it with a tarpaulin to prevent potential damage caused by sandstorms.
	Working in rainy and humid environment ⚠ The notices for working in rainy environments are similar to those described above for working in high-temperature conditions. ⚠ Coat all exposed surfaces with lubricant, pay extra attention to damaged or unpainted ones, and apply lubricant to the places where paint cracks occur as soon as possible to prevent corrosion.

Notice	Protection against flying debris or parts
	If the fragments are filled into the eye or bounced to any other part of body, they will cause the severe injuries to body. – Use the safety goggles or safety glasses to avoid injuries due to flying particles, fragments or debris of any material. – Prevent others from entering the working place in case of hazard of flying objects. <u>During the maintenance process:</u> – Warn the others that any unexpected machine movement may cause severe injuries and hang up the warning plate “No Operation” on the control joystick before maintaining the machine. <u>Support machine parts in a safe manner:</u> – Always secure the affected machine parts safely before starting maintenance or repairs on them. – Always lower the equipment to the ground before maintaining and repairing the machine. – Do not use slag bricks, cord tires or racks to secure the machine parts that need maintenance or repairs. Those may topple or even break under the parts' steady load. – Do not work below machine parts secured with a single jack.
	<u>Keep away from rotating parts:</u> – The entrapment of limbs within rotating parts causes severe injuries. – In case of working next to rotating parts, do not let your limbs, clothes or hair get sucked-in by the rotation.
	<u>Avoid flying parts:</u> <u>Warning!</u> The grease within the crawler's tensioning device is under high pressure. In case that you do not observe the following matters, severe injuries, like blindness, or death may be caused: – Do not remove any of the grease coupler or valve body. – Keep your body and face far away from valve body since it may fly out suddenly at any time. <u>Pressure hazards with the traction reducer:</u> <u>Warning!</u> Keep away from the air bleed bolts, as they may suddenly pop out and cause severe injuries due to sudden acceleration. – The gear oil is hot. Avoid contact to prevent burns or scalds. – After cooling the gear oil, loosen the air bleed plug gradually to release the pressure.

Notice	Safe storage of fittings
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	⚠ The machine parts assembled with bearings (e.g.: bucket, knapper, grafter) may suddenly loosen up and fall, causing serious injuries to unaware people nearby. ⚠ To prevent this hazard, always disassemble and store the interchangeable equipment if it is not used for a longer period of time safely to avoid falling, so the children and other personnel should be far away from the storage area.
Notice	Pay attention to hot fluids
 	— Avoid burns caused by sprayed high-temperature fluid. After the operation, the engine's cooling water is hot and pressurised. There is hot water or steam inside the engine or the radiator, too. If the skin contacts the spilled hot water or steam, the severe skin burns will be caused. — Prevent burns from hot water. Do not open the cover of radiator before the engine has cooled down. When opening the cover, turn the cover to bottom slowly, and remove the cover after the pressure is completely released. — Pressure exists in the hydraulic oil tank. Ensure that the pressure is released before removing the cover. — High-temperature fluid and surface. During the operation, engine oil, gear oil and hydraulic oil may become hot; engine, hose, pipe and other parts will also become hot. — After the oil and parts cooled, start to check or maintain them.
Notice	Periodic replacement of rubber hose
	— Due to ageing, fatigue and wear, the rubber hose containing flammable fluid may be broken under the pressure. It's difficult to judge the poorness of rubber hose due to its ageing and wear and replace the rubber hose at regular intervals. — Irregular replacement of rubber hose may cause the fire, the injection of fluid into skin or the knock of working device to persons around it will cause severe heat injury, dermal gangrene, other injuries or death.
Notice	Pay attention to high-pressure fluid
	— If the fuel, hydraulic oil or other fluids injected under high pressure can penetrate the skin or rip into the eyes, it will cause severe injury, blindness or death. - o Release the pressure before removing the hydraulic or other pipes to avoid this risk. - o Fasten all connections before repressurizing. - o Use cardboard to find leaks, and protect your hands and body from high-pressure liquids. Wear the face mask or safety goggles to protect your eyes. - o In case of any accident, let the doctor who's familiar with this type of wound cure immediately. — Any fluid injected into skin must be removed through surgery within several hours, otherwise the dermal gangrene will be caused.

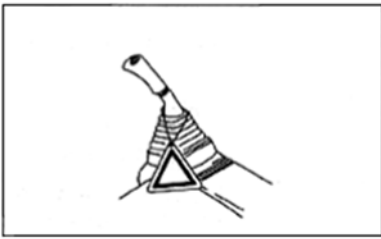
Notice	Treatment of accumulator
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	– The pilot control system is equipped with an accumulator filled with high-pressure nitrogen, so the pressure of machine must be relieved during the maintenance of pilot control system. It's very dangerous in case of incorrect operation. - o Do not drill on the accumulator, or do not make it contact the flame, fire or heat source. - o Do not weld the accumulator, or do not attach any article on it. - o In case of removing, maintaining or treating the accumulator, the filled gas must be discharged. Contact with our company or supplier. - o In case of treating the accumulator, wear the safety goggles and protective gloves. The high-pressure hydraulic oil will stab the skin and cause the injury.
Notice	Safety maintaining air-conditioning system
	– The splash of refrigerant on skin will cause the frost injury. - o During the maintenance of air-conditioning system, use Freon correctly as per the instructions for Freon container. - o Adopt the recovery or recirculation machine to prevent Freon from discharging into the atmosphere. - o Do not make Freon fluid contact the skin.
Notice	Correct treatment of discards
	– Any improper treatment of discards will harm the environment and ecology, and the potential harmful discards include hydraulic oil, fuel, engine oil, coolant, filter and battery, etc. - o In case of discharging the fluid, use the leak-proof container. Do not use the food or drink vessel, because it may cause the wrong drinking. - o Do not pour the waste liquid on the ground, into sewerage or any water source. - o The air-conditioning refrigerant is leaked into the air, which will damage the atmospheric layer of the earth. According to the government regulations, an air-conditioning service center with desired certificates may be required to recover and regenerate the air-conditioning refrigerant. - o Inquire the correct recovering or treatment methods of discards from local environmental protection or recovery center or your assigned dealer.

6.2 Inspection Checks before Starting



Warning!



- **Warning labels**
- **“No Operation” warning label must be hung on the working (arm, bucket and boom) joysticks in the cab to warn that someone is maintaining the excavator.**
- When the warning sign is not in use, put it in the tool box.
- During maintenance, if someone starts the engine, touches or operates the working (arm, bucket and boom) joysticks, it may cause serious personal injury or damage to the machine.

Notice!

Keeping the work area clean and tidy

- Do not scatter the hammer or other tools in the work area. Wipe off all slippery grease, oil or other substances. Keep the work area clean and tidy, so as to secure the working process. If the work area is not kept clean and tidy, persons may stumble, slip or drop, and cause injury.
- Top window which is made by organic glass (polycarbonate) should be cleaned with water, and not with any alkaline solvent. If benzene, toluene, methanol or other basic solvent are used, chemical reaction will be caused, like that glass is dissolved or decomposed, and polycarbonate will age.

The location of the safety labels on the machine

There are several special safety labels on the machine, here indicates their exact locations and the harms of accidents.

- Please get familiar with all these safety labels.
- Ensure that you can see all the safety labels clearly.
- If the words of a safety label are unclear, clean the label or replace it.
- If the illustrations of a safety label are unclear, replace them. Clean the safety labels with cloth, water and soap. It's prohibited to clean the safety labels with solvents, gasoline or caustic chemical agents, they can make the labels loose, cause them to fall off.
- If any safety label is damaged or lost, it must be replaced immediately. If the part to be replaced has a safety label, ensure that the part to be replaced with also has the safety label.



When working with others, one conductor should be appointed.

- When repairing the machine or when disassembling or installing working devices, a conductor should be appointed and follow his command during the operation.
- When working together, persons that not familiar will cause serious accidents.

Notice!



Shut off the engine before maintenance

- The machine should be stopped on solid and flat ground.
- The place with unfallen stones, collapses or is of no danger of being submerged should be chosen.
- Lower the working device completely to the ground and shut off the engine
- Put stopper blocks under the crawler tracks in order to prevent the excavator moving.

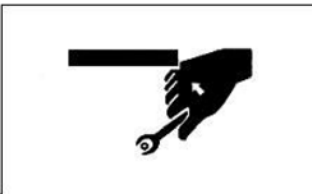
Notice!



When the engine is running, two persons carry out the maintenance

- To prevent injury, do not carry out the maintenance when the engine is running. If the maintenance must be carried out when the engine is running, operate it with at least two people, and follow the rules below:
- One people must sit in the operator's seat and be ready to shut off the engine. All people must keep in communication with each other.
- Pull(or push) the safety lever to the locked position.
- When operating near the fan, the fan belt or other rotating parts, the operator must pay special attention to prevent being coiled.
- Prohibit touching any operating lever. If necessary, the operator needs to send signals to other people to warn them to move to a safe place.
- It is forbidden to drop or insert tools or other objects into the fan or fan belt, otherwise the parts may break or fly out.

Notice!



Suitable tools

- Proper use of suitable tools, such as the use of damaged, inferior, defective, temporary tools or unsuitable tools may cause serious personal injury.

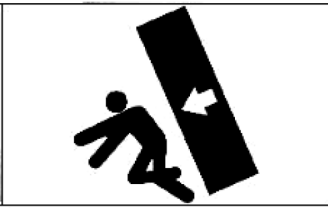


Energy container (accumulator)

- **The energy container is filled with high pressure nitrogen.**
- When operating the energy container, the careless operation will cause explosion, and cause serious injury or damage. Therefore, the following matters must be observed:
 - o Do not decompose the energy container.
 - o Do not approach the energy container to the fire.
 - o Do not punch and weld on the energy container, or use the welding torch on the energy container.
 - o Do not collide or roll the energy container, and do not make the energy container suffer any impact.
 - o When disposing of the energy container, gas must be discharged. Please contact with XCMG dealer to deal with this task.

Personnel

- Only trained personnel is allowed to maintain or to repair the excavator, Untrained personnel is not allowed to enter this area. If necessary, an observer can be arranged



Accessories

- Before removing or installing the accessories, a conductor will be appointed.
- The accessories which are removed from the excavator should be put in a stable place where the accessories do not fall. Measures should be taken to prevent unauthorized persons from entering storage area.



Working under the excavator

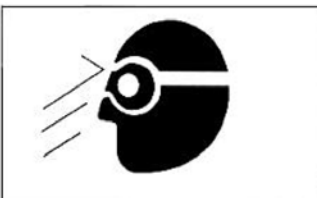
- If you need to carry out maintenance under the machine or working equipment, firmly support the working equipment and machine with pads and brackets strong enough to support the weight of the working equipment and machine.
- If the crawler tracks leaves the ground, the machine is only supported by the working equipment; if the control levers or hydraulic pipes are accidentally touched, the equipment or the machine may suddenly fall. If the pads or the frames are not used to support the machines, working under the machine is prohibited.



Noise

- If the noise of the machine is too loud, temporary or permanent hearing problems can be caused.
- When persons maintain the engine and suffer the noise for a long time, ear covers or earplugs should be worn.

Notice!



Using the hammer

- When using the hammer, pins may fly out, metal particles may scatter, the serious damage can be caused, and then, the following steps need to be followed:
 - o If the hammer is used to strike hard metal parts, such as pins, bucket teeth, blade or bearings, fragments may scatter and cause harm, and therefore, goggles and gloves should be worn during operating.
 - o When striking the pins or the bucket teeth, the fragments may fly out, ensure there are no people around to avoid personnel injury.
 - o If struck strongly, the pins may fly out and cause injury to surrounding people.

Welding operation

- Only the proper device can be used, and the operation shall be performed by qualified welders.

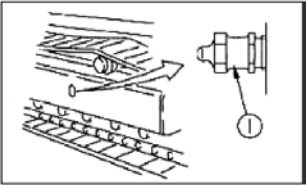
Removing the battery terminals

- When repairing electrical systems or welding, the terminals of the battery negative electrode (-) will be dismantled, which prevents the current from flowing.



Checking the machine

- To avoid injury, carry out a patrol inspection around the machine before starting it per day or per shift.
- When inspecting around the machine, you must inspect according to the chapter “inspection before starting” of this operation and maintenance manual.



When the crawler tracks tension is adjusted with high-pressure grease, the safety need to be paid attention to.

- The grease is pressed into the crawler tracks tension adjustment system under high pressure. When adjusting, if the maintenance procedure is not observed, the grease emission plug ① will fly out, which will cause serious injury or damage.
- In order to relax the crawler tracks tension, the grease emission plug ① is loosened, the emission plug which is loosened is not turned over one lap, and simultaneously, the grease emission plug must be loosened slowly.
- Do not bring the face, hands, feet or other parts of the body close to the grease emission plug ①.



Do not remove the buffer spring

- The buffer spring assembly is used to alleviate the impact force of tension pulley, the buffer spring includes a high-tension spring, if the high-tension spring is removed in a wrong way, the spring will fly out, which causes serious injury or death.

Notice!



Relevant safety rules of high-pressure oil

The internal part of the hydraulic system always has pressure; when checking or replacing pipes or hoses, the pressure in the hydraulic oil pipe must be checked whether it has been released or not. If oil pipe still has the pressure, serious injury or damage can be caused, so the following rules need to be obeyed:

- When the hydraulic system has the pressure, before releasing the pressure, do not carry out check or replace.
- If the surrounding area of the pipes or the hoses is wet, the pipes or the hoses should be checked for break, and the hoses for inflation.
- When checking, goggles and leather gloves should be worn.
- The high-pressure oil which leaks from small orifices can penetrate skin and may cause blindness if contact eyes directly. If skin or eyes contacted with the high-pressure oil were injured, skin or eyes should be flushed by clean water and go to hospital for treatment immediately.

Safe Operation of High-pressure Hose

- If the hose leaks, it may cause fire or faulty operation, resulting in serious injury or damage.
 - o If the bolt looseness is found, stop operations and fasten the bolts to the specified tightening torque. If there is any damage to the hose, stop the operation immediately, and contact with the dealer of XCMG.
- If there is any of the following problems, replace the hose:
 - o Damage or leakage of hydraulic pipe connection.
 - o Cladding frayed or disconnected, and or strengthening layer wire exposed.
 - o Cladding expands in some places.
 - o Movable parts distorted or crushed.
 - o Impurities inside cladding.



Waste

To prevent pollution, attention should be paid to the treatment of waste:

- Discharge the oil from the machine into the container; do not discharge it directly to the ground, or into the sewers, rivers, oceans or lakes. When dealing with hazardous materials, such as engine oil, fuel oil, cooling fluid, solvents, filter and batteries, it is necessary to comply with the laws and regulations.
- According to the requirements of laws and regulations, the whole machine, parts and accessories that need to be disposed of must be properly handled in accordance with laws and regulations.

Air Conditioner Maintenance

- If the air conditioner refrigerant gets into the eyes, it may cause blindness; if the refrigerant comes into contact with skin, it can cause frostbite.

Compressed air

- When cleaning with compressed air, it may be caused by flying particles causing personal injury or machine damage.
- When using compressed air to clean the filter element or radiator, wear goggles, dust masks, gloves and other protective equipment.

Notice!

Periodic Replacement of Safety-critical Parts

- For long-term safety of in operation of the machine, there is need for regular lubrication and maintenance. To further enhance security, the safety-related parts such as hoses, seat belts should be periodically replaced.
- When exceeds the allotted time, the material of parts will naturally change. Reuse will cause deterioration, wear and damage. Finally, these parts may break down and cause serious injury or damage. During the operation, it is difficult to judge how long these parts can keep working according to an external inspection or touch, so replace it regularly
- If there are any defects in safety-critical parts, replace or repair it even it has not reached the allotted time.

6.3 Installation for the accessories and other safety instructions

Notice!

Installation for the accessories and other safety instructions

- When installing the optional parts or accessories, please contact the **XCMG** distributor in advance. Any injury, accident or product fault caused by using the accessories or parts without approval from **XCMG**. will be unrelated with this company.
- When installing and using the accessories, combine the operating accessories according to the operation and maintenance manual about the accessories and the general instruction about the accessories in this manual.
- Due to the different types or combinations for the equipment, there is the risk that the equipment collides with the driver' cab or other parts of the machine. Before using the unfamiliar equipment, check whether there is the risk to influence each other and operate it carefully.



TOPS, FORS/ROPS

- The different types of guards are used to protect the operator.
- The machine and the machine application determine the type of guard that should be used.
- The ROPS/FOPS Structure (if equipped) on your machine is specifically designed, tested and certified for that machine (in accordance with the standard ISO 10262:1998, ISO 12117-2:2008).
- TOPS (Tip-Over Protection Structure) is another type of guard that is used on compact excavators(in accordance with the standard ISO 12117:1997)
- A danger will occur when some falling stones or flying objects crash onto the cab on the construction site.
- Please choose the protection device which is suitable for the operation condition to protect the driver.
- When working on a mine, tunnel, dell or mellow and humid surfaces, you may be in the danger caused by falling stones or flying objects. So it is very necessary to install protection devices on the cab which shall meet the requirements on FOPS (Falling Object Protective Structure) or window protection devices.
- It is forbidden to reform or change the protection structures of any type by strengthening devices, such as drilling, welding, or resetting the fasteners. All of the protection system which suffers severe impact or damage shall be reappraised. If necessary, re-install, re-certify or replace the system.
- Purchase necessary optional devices without any statement. The machine of standard cab is not equipped with ROPS/FOPS. If it is necessary, please explain the situation to the agent or contact **XCMG**. and use the device according to the right installation and application range.
- The cab which is equipped with FOPS/ROPS devices cannot be dismantled at will, and the cab without protection devices will lose its protection function. If any plastic deformation or breakage appears in any part of the protection structure (e.g., it is affected by rolling, falling object or dumping), please contact the agent and let the authorized professionals replace the protection structure.



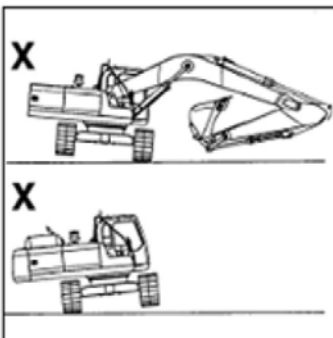
Brief description on replacing FOPS/ROPS:

- Check whether the soleplate of the protection device is rusted or damaged. If any, please contact the distributor appointed by **XCMG** and let the authorized professionals to do the repair.
- Equip appropriate hoisting tools to take down the original protection device carefully and save it safe or hand it over to some specially assigned person.
- Install the new undamaged protection device carefully and tighten up the fasteners with necessary tools.
- Never operate the excavator without the protective structure.

Modification without approval

- Any modification without approval from Xuzhou XCMG Excavator Mechanical Co., Ltd. is possible to cause danger. Therefore, before modifying, please contact the distributor of **XCMG**.
- For any injury, accident or product fault caused by modification without approval from **XCMG**, the company will not bear any responsibility.

Notice!



Removal of counterweights and front-end equipment

- Warning: Removal of counterweights or front-end equipment or any other component from the machine will affect its stability and this will result in its sudden move causing serious injury and death.
- You can remove counterweights or front-end equipment only when the top structure and the bottom structure are disposed of in the same direction. Once counterweights or front-end equipment is removed, do not rotate the top structure

Safety in the workplace

- Before operating, check the work area thoroughly for dangers.
- When operating near the flammable materials (cottage roof, dry leaves or grasses) stored, it is possible to cause a fire, so it is necessary to be careful during operating.
- Check the ground situation in the workplace and finalize the safest operation method. It is forbidden to operate in the place with collapses or falling stones.
- If there are water pipes, gas pipes or high voltage electrical wires buried under the workplace, please contact the related companies and mark their positions, note: do not break or damage any pipe and wire.
- It is forbidden for any unauthorized person to enter the working area, some necessary warning measures should be taken.
- Before moving or operating in the shallow water or on the soft ground, check the types and situation of the sill and the depth and the flow rate of the water.

6.4 Lubrication and Repair



Warning!

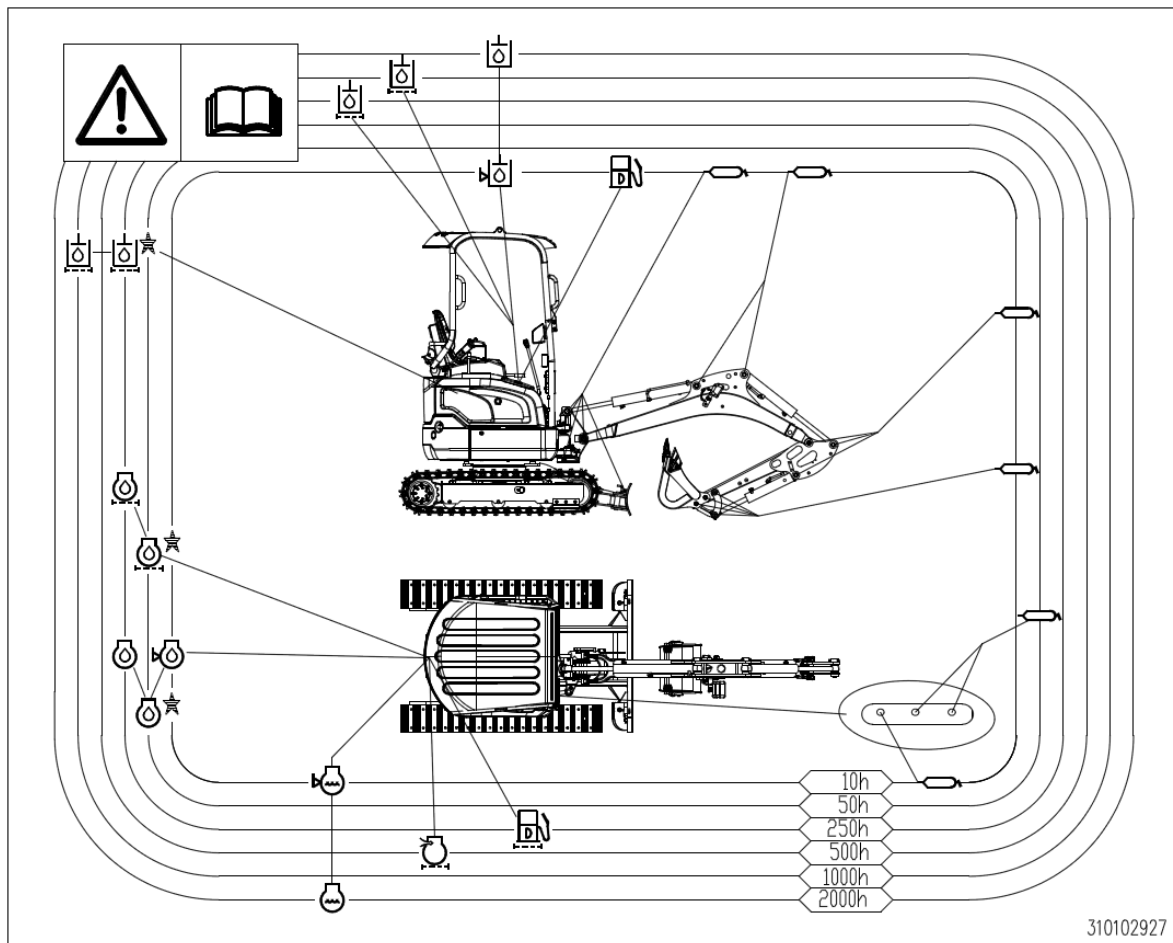
- Only those trained and qualified can repair and maintain this machine.
- Before any maintenance, read carefully the related content in this book.
- If diesel engines are running indoors, ensure good ventilation condition.
- For the details of diesel engine, see **OPERATION MANUAL OF DIESEL ENGINE**, which is included in the documents along with the excavator.
- While carrying out maintenance or repair for this machine, the related record should be made and saved.
- For the excavator, it is important to maintain and ensure its normal function. So the machine should be kept clean so that any failure such as leakage, looseness of screw or connection will be spotted.
- Pay attention to environmental protection! Don't let oil and other harmful things to pollute our environment. The waste liquor should be disposed of according to the local laws and regulations and it is not permitted to discharge waste liquor casually.
- The content of this chapter includes items related to regular check, maintenance and repair.
- The operator of excavator should carry out according to the regulations.

Notice!

- **Correct procedures of maintenance and check**
 - In order to maintain and repair the machine correctly, follow the correct maintenance and check procedures described in this manual.
 - a) Check the machine before starting it every day.
 - o 1) Check the controller and instruments.
 - o 2) Check the levels of coolant, fuel and hydraulic oil.
 - o 3) Check the hoses and pipes for leaks, twists, wears or damages.
 - o 4) Make a patrol inspection of common conditions, noises or heat around the machine.
 - o 5) Check the part for looseness or missing.
 - o 6) If anything is wrong with the machine, repair it before the operation, or contact with your assigned dealer.
- **Important:**
 - o 1) Adopt the correct oil products, grease and anti-freeze fluid.
 - o 2) Any use of incorrect oil in the grease or sterling part will lead to the loss of product warranty.
 - o 3) Don't adjust the engine speed limiter or hydraulic system safety valve.
 - o 4) Avoid any contact of electric component with water and steam.
 - o 5) Don't disassemble the main controller, sensor or other electric components.
- **b) Check the hour meter frequently:**
 - o 1) Determine the time of machine check and maintenance according to the operating hours shown by the engine working hour meter.
 - o 2) The intervals shown in List of Maintenance Periods are determined as per the normal operation and maintain the machine in shorter interval in case of running the machine under the bad conditions.
 - o 3) Make a periodic check and adjustment of lubrication or maintenance as per the readings of periodic maintenance meter on the inner side of tool-box cover.
 - o 4) When the hours of hourmeter reach the replacement time of recommended lubricant and filter element, or during the periodic check every day or every month, replace the lubricant and filter element.
- c) Adopt the correct oil products, lubricant and anti-freeze fluid.
- Important: adopt the correct oil products, grease and anti-freeze fluid always, otherwise the machine will be damaged, and the warranty of this machine will be lost.

6.5 Maintenance Scheduels

6.5.1 Lubrication Period



Symblo	Description
	Lubrication
	Gear oil (Swing device, Travel device)
	Engine oil
	Engine oil filter
	Hydraulic oil

Symblo	Description
	Coolant
	Air cleaner element
	Fuel filter
	Gear oil (Axle)
	Hydraulic oil filter

SERVICE DATA											
No.	Items to check		Service	Qty.	Service interval						
					8	50	100	250	500	1000	2000
1	Work device	Bucket and link pin	Grease	9	▲						
2		Others	Grease	11	▲						
3	Swing bearing		Grease	2		▲					
4	Swing reducer gear		Grease			▲					
5	Swing device oil-bath		Grease	-		▲					
8	Hydraulic oil suction strainer		Strainer	1						●	
9	Hydraulic oil		Hydraulic oil	28L	C/▲						●
10	Hydraulic oil return filter		Element	1				○	●		
11	Pilot filter		Element	1				○		●	
12	Breathing valve filter		Element	1					●		
13	Water separator		Element	1	C			●			
15	Fuel filter		Cartridge	1		○		●			
16	Engine oil		Engine oil	3.8L	C/▲	○		●			
17	Engine oil filter		Cartridge	1		○		●			
18	Radiator		Coolant	4L	C/▲						●
19	Air cleaner (outer)		Element	1				△		●	
	Air cleaner (inner)		Element	1						●	
21	Fuel tank		Diesel	17L	C/▲				△		
22	Crawler tension device		Grease	2		▲					
25	Alternator		Check	-	Please contact your XCMG dealer.						C
26	Starter motor		Check	-	Please contact your XCMG dealer.						C
27	Fuel injection pump		Check	-	Please contact your XCMG dealer.						C
28	Coolant hose		Change	-	Replaced every 2 years. Please contact your XCMG dealer.						
29	Coolant hose clamps		Change	-							
30	Fuel lines		Change	-	Replaced every 2 years. Please contact your XCMG dealer.						
31	Air intake hoses		Change	-							
32	Safety belt		Change	-	Replaced every 3 years. Please contact your XCMG dealer.						
33	Hydraulic hoses		Change	-							
34	Dozer blade pin		Grease	4	▲						
C	Check.										
△	Cleaning.										
▲	Maintenance and refill or add.										
○	First time exchange only.										

●	Replacement on every interval.
F	Every 8 hours for first 100hours.
W	Every 8 hours if operating in water.
	Note: When using a breaker over 20%, replace hydraulic oil every 1600h. When using a breaker over 40%, replace hydraulic oil every 800h. When using a breaker over 60%, replace hydraulic oil every 600h. When using a breaker over 80%, replace hydraulic oil every 400h.

Safety points for attention and precautionary measures

 Caution!	– Safety points for attention – Summarize the working hours correctly to determine the lubrication time. – Stop in case of filling the grease, and don't apply any lubrication work if not parked as per the requirements of this manual. – Adopt the fire-prevention measures during the lubrication. – Prevent hot oil and harmful substances from harming the operators. – Avoid mixing the lubricating oils of different brands. – Clean the lubricated parts and vent hole, etc before filling; keep the tightness of seal ring after filling. – Clean or replace the filter at regular intervals, make a mark after draining the engine oil, and don't start the filter without oil. – Remove the spilled lubricant. – Refilling of slewing bearing gear face, rotate one time about every 90 degrees, refilling for four times and each point for 50g grease.
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6.5.2 Operator Maintenance checklist

Check items		Service	Maintenance intervals
Walk-around inspection		check	Daily
Hydraulic oil level		check,add	Daily
Control panel and pilot lamp		check,add	Daily
Hydraulic hoses and pipes	Leak or crack	check,clean,tighten	Daily
	Crack or bend,etc	Check,repalce	250h
Fuel level		check,refill	Daily
Engine oil level		check,add	Daily
Water separator		check,clean	Daily
Fuel tank		drain	Daily
Fuel hoses and air intake hoses	Leak or crack	check,clean,tighten	Daily
	Crack or bend,etc	Check,repalce	250h
Coolant level		check.add	Daily
Coolant radiator and oil cooler core or intercooler		check.clean	200h
Front mesh enclosure of oil cooler		check,add	500h
The air conditioner condenser		check,clean	500h
Fan belt tension and damage		check,adjust	Daily
Bucket teeth for wears and loosening		check,replace	Daily
Bucket connection(bolt.etc)		check,adjust	Daily
Seat belt for proper operation		check,replace	Daily
Air cleaner(outer,inter)		check,clean	250h
Cylinder head bolt		check,tighten	Daily
Electrical equipment		check	Daily
Battery		check	50h
Lubricate the front-end attachments	Boom,arm and front attachment pins	Check,grease	Daily
	Swing bearing	grease	50h
	Swing reducer gear and device oil-bath	Check,grease	50h
Crawler tension		Check,setting	50h

- If there is a lot of dust,the air filters and the fresh air filters must be cleaned and/or replaced more often.

6.6 Lubrication of equipment

 Warning!	– High-quality lubricant should be added according to appointed quantity. – Excessive lubricant or grease may lead to overheating and even speed up the abrasion.
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6.6.1 New machine

New machine used and filled with following lubricants.

Item	Specification
Engine oil (API CJ-4, ACEA-E9)	SAE 10W-40
Hydraulic oil	ISO VG 46
Fuel	ASTM D975 No.2
Grease	NLGI No.2
Coolant	Add antifreeze (50% antifreeze-50% distilled water)
Gear oil	SAE 80W-90

SAE: Society of Automotive Engineers
API: American Petroleum Institute
ISO: International Organization for Standardization
NLGI: National Lubricating Grease Institute
ASTM: American Society of Testing and Material

 Warning!	– If the excavator works in specially high or cold condition, special lubricant should be used. You are suggested to contact with excavator dealer appointed by XCMG. – If the above requirements can't be satisfied, please contact with XCMG excavator agent or its after-market department.
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6.6.2 Recommended oils

Use listed below or equivalent only. Do not mix different brand oil.

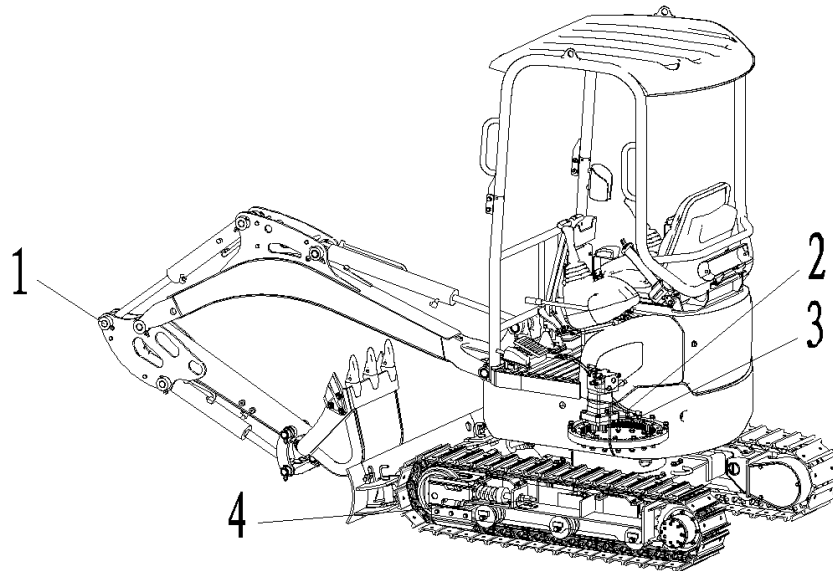
Service point	Kind of fluid	Capacity /(imperial gal)	Ambient temperature °C / °F									
			-50	-30	-20	-10	0	10	20	30	40	
			-58	-22	-4	14	32	50	68	86	104	
Engine oil pan	* Engine oil	3.8(0.86)			SAE 10W-30							
					SAE 10W-40							
					SAE 15W-40							
Hydraulic oil tank	*** Hydraulic oil	Tank: 18(4.1) System: 10(2.3)			ISO VG 32							
					ISO VG 46							
					ISO VG 68							
Fuel tank	**** Diesel fuel	17(3.9)			ASTM D975 No.2							
					ASTM D975 No.1							
Grease fitting	Grease	As required			NLGI No.1							
					NLGI No.2							
Cooling system	Coolant	4(0.91)		Add antifreeze (50% antifreeze-50% distilled water)								

* Engine oil must meet ACEA-E5 or API-CI-4
*** Hydraulic oil change interval is 2,000hours, only when XCMG Genuine Oil is used. If other brand of oil is used, guaranteed change interval is 1,000 hours.
**** Diesel fuel must be ultra low sulphur diesel. Sulfur content ≤ 15 ppm.
SAE: Society of Automotive Engineers
API: American Petroleum Institute
ISO: International Organization for Standardization
NLGI: National Lubricating Grease Institute
ASTM: American Society of Testing and Material

 Warning!	– High-quality lubricant should be added according to appointed quantity.
	– Excessive lubricant or grease may lead to overheating and even speed up the abrasion.

 Caution!	1. Do not mix oil from different manufacturers. XCMG does not endorse specific brands but does suggest that owners select quality oils whose suppliers provide assurance that required standards will always be met or exceeded..
	2. Fluctuating daily or weekly extremes of temperature, or operation in subzero freezing weather may make it impractical to use straight weight lubricants. Use good judgement in selecting lubricant types that are appropriate for climate conditions.

6.6.4 Lubrication Points



Serial number	Position		Quantity
1	Connection points of equipment	Bucket, arm and pin of connection rod	14
2	Swing bearing		1
	Rotation device oil-bath		1
3	Tension device		2

6.6.5 Connection points of equipment

Notice!

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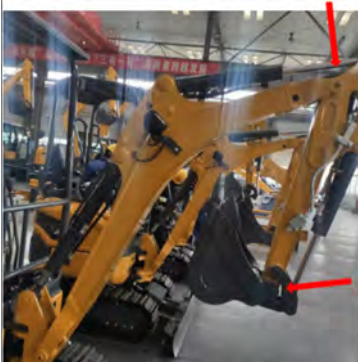


6.6.5.1 Bucket, arm and pin of connection rod

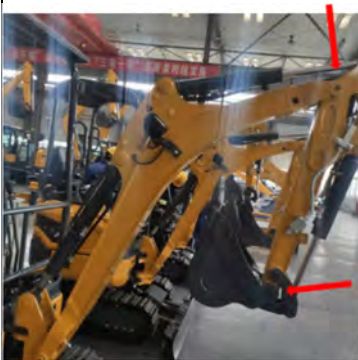
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6.6.5.2 Pin at the root of boom



6.6.5.3 Connection pin between boom and arm, hydraulic cylinder piston and bottom pins of arm



6.6.5.4 Bottom of boom cylinder



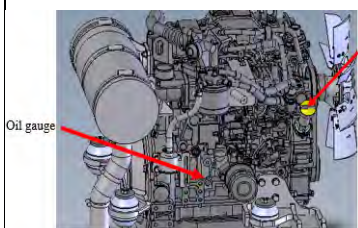
6.6.5.5 Pin of boom cylinder and bottom pin of arm cylinder



6.6.5.6 Rotary bearing



6.6.5.7 Rotation device oil-bath



6.6.5.8 Engine

6.7 Maintenance of Hydraulic System

Caution!

During the operation, the parts of hydraulic system will become very hot, and cool the machine before check or maintenance.

- During the maintenance of hydraulic device, ensure that the machine shall be placed on the flat or hard ground.
 - o b) Lower the bucket to the ground and shut the engine off correctly.
 - o c) Maintain the hydraulic device after cooling the machine part, hydraulic oil and lubricating oil fully, because the residual heat and pressure will exist in the hydraulic device soon after finishing the operation.

6.7.1 Hydraulic Components

Notice!

Hydraulic components

- Discharge the air in the hydraulic oil tank to release its inner pressure
- Cool the machine. Check and maintain the high-temperature or high-pressure parts, because they may cause the sudden flyout or spray of parts or hydraulic oil and the personal injury.
- In case of removing the plug, don't make your body and face against them, because any hydraulic part may still have a certain pressure even if the part has been cooled.
- Don't try to maintain or check the traction or rotary motor circuit on the slope, because they can have high pressures due to their own weights.
- During the connection to the hydraulic hose and pipe, pay special attention to the seal surfaces to ensure no dirt exists on them, and avoid the damages to them.

Remember the following points:

- Clean the inner face of hose, pipe or oil tank with cleaning fluid, and dry them thoroughly before connecting them.
- Use non-destructive or defective O-rings, and don't damage them during the assembling.
- During the connection of hose, don't make the high-pressure hose distorted, because the lifetime of twisted hose will be greatly reduced. Tighten the low-pressure hose clamp cautiously and ensure they can't be screwed too tight.
- In case of filling the hydraulic oil, use the oil of the same brand always, and don't mix the oils of different brands.
- In case of wishing to use the oil listed in “**Brands and Names of Recommended Hydraulic Oils**”, ensure that all the hydraulic oil in the system is fully replaced.
- Don't run the engine without oil in hydraulic oil tank.

Caution!

Do not run the engine without oil in hydraulic oil tank!

6.7.2 Hydraulic Oil – Oil Filter - Oil Change

Notice!

Hydraulic Oil Level Check



Caution!

The hydraulic oil tank has a certain pressure!

- Release the pressure of oil tank and remove the cover carefully before removing the oil tank cover!
- Release the pressure firstly, don't loosen the drain plug before cooling the oil, because the oil may be hot and cause the severe scald injury!

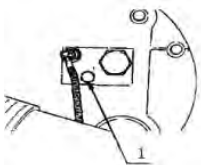
The hydraulic oil may be hot, and the oil must be cooled before starting the work

Notice!

Hydraulic Oil Level Check



- Check the level of hydraulic oil every day.
 - o Park the machine on the flat ground.
 - o Retract the state positioner fully with arm hydraulic cylinder and stretch it out fully with a bucket hydraulic cylinder.
 - o Stop the engine as per the shutdown steps of engine.
 - o Pull the safety locking rod to LOCK (Lock).
 - o Open the access door at the hydraulic pump, check the liquid-level meter on hydraulic oil tank.
- The oil level must be between the marks on the level meter, otherwise add the hydraulic oil.



1 – Dirt drain plug

- Add the hydraulic oil and check the level meter again.
- Attach the cover and ensure the components of filter and hanger rod are correctly positioned.
- After cooling the oil, loosen the drain plug in the bottom of hydraulic oil tank, and drain the water and deposits.
- Don't remove the plug fully, and you'd better loosen it enough to drain the water and deposits.
- After draining the water and deposits, tighten the drain plug again.

Notice!

Drain the dirt reserve tank of hydraulic oil tank

Important: don't run the engine without oil in hydraulic oil tank.

- Drain the dirt reserve of hydraulic oil tank every 250 hours.
- For the convenience of access, rotate the upperstructure by 90°, and park the machine on the flat ground.
- Stop the engine as per the shutdown steps of engine.

Important: if the shutdown steps of engine are incorrect, the turbo supercharger may be damaged.

- Pull the safety locking rod to LOCK (lock).

Notice!

Replacement of Hydraulic Oil or Cleaning of Oil Suction Filter



Caution!

- The hydraulic oil may be hot, and the oil must be cooled before starting the work
- The hydraulic oil tank has a certain pressure.
Release the pressure, and then remove the oil tank cover
- Starting the engine without hydraulic oil in hydraulic pump, it will damage the hydraulic pump.

Notice!

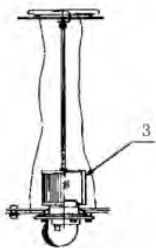
Replacement of hydraulic oil or cleaning of oil suction filter



1-Oil tank cover-



2-Oil drain plug-



3—Components of oil suction filter and hanger rod



4-air bleed plug-

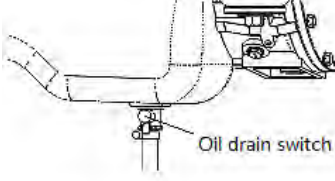
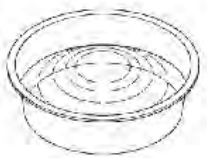
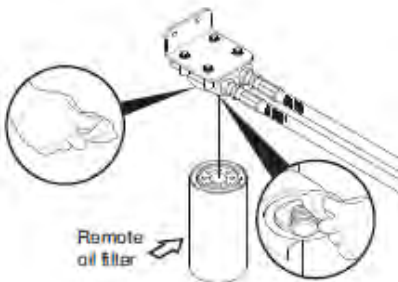
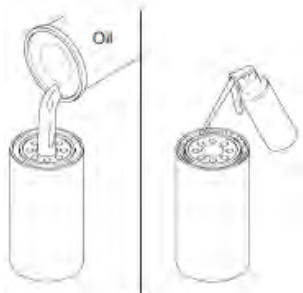
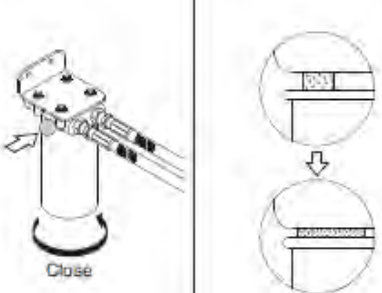
- Replace hydraulic oil and oil suction filter element every 2000 hours.
 - o For the convenience of access, rotate the upperstructure by 90°, and park the machine on the flat ground.
 - o Retract the state positioner fully with arm cylinder and stretch it out fully with a bucket cylinder.
- Stop the engine as per the shutdown steps of engine.
Important: if the shutdown steps of engine are incorrect, the turbo super charger may be damaged.
 - o Pull the safety locking rod to LOCK (lock).
 - o Clean the top of hydraulic oil tank and prevent the dirt from intruding into the hydraulic system.
- Remove the oil tank cover.
- Draw off the hydraulic oil with a pump.
- The **capacity of hydraulic oil in the tank: XE40: 70L.**
- Remove the drain plug to discharge the hydraulic oil.
- Take out the components of oil suction filter and hanger rod.
- Clean inner sides of filter and oil tank. In case of replacing the filter, attach a new filter to the hanger rod as shown in the right figure.
- Attach the components of filter and hanger rod, and ensure the filter is correctly fixed on the outlet.
- Replace the oil filter of hydraulic oil tank (refer to “List of Maintenance Periods”).
- Clean, attach and tighten the drain plug.
- Fill the hydraulic oil up to its level between the marks of level meter.
- Attach the oil tank cover and ensure the components of filter and hanger rod are in correct positions.
- Remove the air bleed plug from the top of hydraulic pump.
- Fill up the hydraulic pump with hydraulic oil through the hole of air bleed plug.
- Attach the air bleed plug.
- Start the engine and run it at low speed and empty load.
Hang “No Operation” nameplate to the safety locking rod and ensure the safety locking rod in LOCK (lock) position.
- Loosen the air bleed plug slowly to discharge the accumulated air. When the flow of air stops and the oil is discharged out of the plug hole, tighten the plug.
- Run the engine at low speed and empty load, and actuate the operating lever slowly or stably for 15 minutes to discharge the air out of the hydraulic system.
 - Retract the state positioner fully with arm cylinder, and stretch it out fully with a bucket cylinder.
 - Stop the engine as per the shutdown steps of engine.
 - Pull the safety locking rod to LOCK (lock).

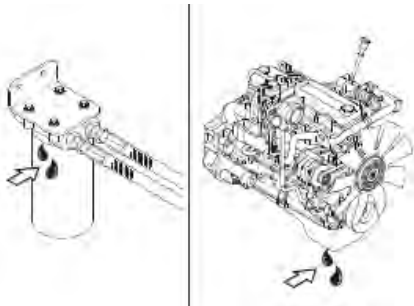


- Check the level meter of hydraulic oil tank. If necessary, open the oil tank cover to add in the oil.

6.8 Maintenance of Oil System

6.8.1 Replacement of engine oil and oil filter

Notice	Replacement of engine oil and oil filter
 Oil drain switch   Remove oil filter  Oil  Close	- Operate the engine until the coolant temperature reaches 60°C. Shut off the engine. - Turn the oil drain switch to drain the oil immediately to be sure all the oil and suspended contaminants are removed from the engine. A drain pan with a capacity of 30 liters will be adequate. - Open the right door. Clean the area around the lubricating oil filter head. - Use oil filter wrench to remove the oil filter. - Clean the gasket surface of oil filter head. NOTE: The O-ring can stick to the filter head. Be sure it is removed before installing the new filter. - Apply a light film of lubricating oil to the gasket sealing surface before installing the filter. NOTE: Fill the filters with clean lubricating oil. - Install the filter to the filter head. Tighten the filter until the gasket contacts the filter head surface. Tighten 3/4 to 1 turn after the gasket makes contact with the filter head. NOTE: Mechanical over-tightening may distort the threads or damage the filter element seal. - Shut the oil drain switch off. - Open the engine cover and fill the engine with clean oil to the proper level. Quantity: 11L.

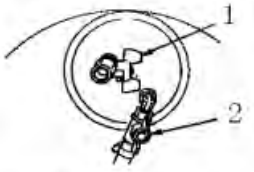


10. Operate the engine at low idle and inspect for leaks at the filter and the drain switch. Shut the engine off and check the oil level with the dipstick. Allow 15 minutes for oil to drain down before checking.

6.9 Maintenance of Fuel System

6.9.1 Fuel Tank

Notice!



1 – Drain ball valve

2 – Fuel ball valve

Fuel Tank – Dirt Drain

- **Drain the dirt reserve tank of fuel tank every day.**
- For the convenience of access, rotate the upperstructure by 90°, and park the machine on flat ground.
- Stop the engine as per the shutdown steps of engine.
- Pull the safety locking rod to LOCK (lock).
- Open the drain plug at the bottom of fuel tank for several seconds to discharge the water and deposits, and then close the plug.

6.9.2 Water Separator

Notice!



Water Separator Check

- **Check the water separator before the operation every day.**
- The water separator may mix the water in fuel. The water separator contains a floating body that will float up during the accumulation of water to ensure the water separator starts to drain when the floating body reaches the mark of “drain water” on the outer side of water separator.
- Important: if the fuel contains excessive water, shorten the check interval of water separator.

Drain steps

- The water separator is located at the rear of the engine compartment, and nearby the air cleaner.
- Loosen the air bleed plug on the top of fuel prefilter, and anticlockwise loosen the drain plug in the bottom of water separator to drain the water accumulated in water separator.
- After draining the water, tighten the air bleed plug and drain plug. Turn the fuel ball valve to its original position.
- Start the engine, and check whether there is leakage of the plug and air bleed plug.

Note: ensure that the air is bled out of the hydraulic system after draining the water.



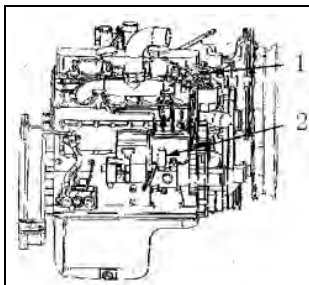
Caution!

The air in fuel system may cause the starting difficulty or abnormal starting of engine.

After draining the water and deposits in water separator, replacing the fuel filter or drying the fuel tank, ensure the air must be bled out of hydraulic system.

Notice!

Bleed the water out of Fuel System



1—Air bleed plug



Fuel supply pump.

- Determine that the drain plug and air drain plug of water separator are tightened.
If the air bleed plug is not tightened, the air in fuel system won't be exhausted.
 - Ensure the fuel ball valve in the bottom of fuel tank has been opened.
 - Loosen the air bleed plug on the fuel filter.
 - Loosen the hand wheel on fuel supply pump and move the plunger up and down until no air bubbles are seen from the air bleed plug.
 - Tighten the air bleed plug and continue to move the plunger of fuel supply pump up and down until the load becomes heavier.
 - Push down the hand wheel of fuel supply pump and tighten it.
- Start the engine and run it at low speed** and empty load.
- Hang “No Operation” nameplate to the operating lever.
 - Pull the safety locking rod to Lock position.
 - Check the hydraulic system for leaks.

6.9.3 Fuel Filter

Notice!



Fuel supply pump

Cartridge
filter

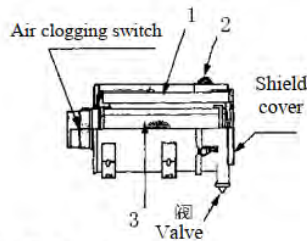
Replacement of fuel filter

- **Replace the fuel filter every 250 hours.**
- For the sake of safety and environmental protection, use the proper containers always for draining the fuel. Don't pour the fuel on the ground, into the ditch, river, pond or lake, and treat the waste fuel properly.
- Remove the cartridge filter with a filter spanner.
- Apply a thin layer of clean fuel to the gasket of new cartridge filter.
- Tighten the cartridge filter by hands until the gasket contacts the seal face.
- Turn the cartridge filter by 2/3 circle with a filter spanner to tighten it, but it shall not be screwed too tight.
- After replacing the cartridge filter, bleed the air out of fuel system.
- The above methods are for the replacement of second-class fuel filter on the engine side, and those of first-class fuel filter on the pump chamber side are the same as the above methods.

6.10 Maintenance of Clean Air System

6.10.1 Air Cleaning Filter

Notice!



- 1—Outer filter element
2—Fixing clip
3—Inner filter element

Cleaning/Replacement of Outer Air-Filter Element

— Cleaning:

- Clean the outer element of air filter every 250 hours or when the warning lamp of air filter element brightens, clean the outer element of air filter.

Replacement of inner and outer elements of air filter:

— After six-time cleanings or one year, replace inner and outer elements of air filter.

- Park the machine on flat ground.
- Stop the engine as per the shutdown steps of engine.
- Pull the safety locking rod to LOCK (lock).
- Loosen the fixing clip and remove the end cover.
- Remove the outer filter element.
- Flap outer filter element lightly by hands.
- In case of cleaning outer filter element with compressed air, blow outward from inner side of outer filter element.
- Attach the outer filter element.
- Attach the end cover and tighten the fixing clip.
- Start the engine and run it at low speed and empty load.
- Check the warning indicator of air filter element on the monitor. If the indicator goes on, stop the engine immediately and replace the outer filter element.

In case of replacing the element of air filter, replace inner and outer filter elements together.

- Remove the outer filter element; clean the inner sides of filter before removing the inner filter element; remove the inner filter element; install the inner filter element, and then install the outer filter element.

6.11 Maintenance of Engine Cooling System



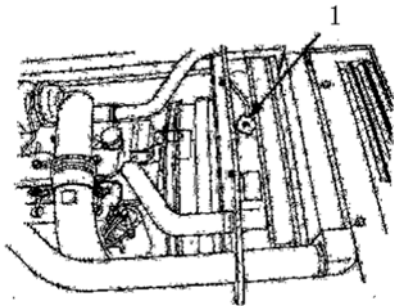
Caution!

- Unless the system has been cooled, don't loosen the radiator cap!
- Release the whole pressure before removing the cover, and then screw it off slowly!
- Protect your eyes and wear the gloves

6.11.1 Coolant Level

Notice!

Coolant Level Check

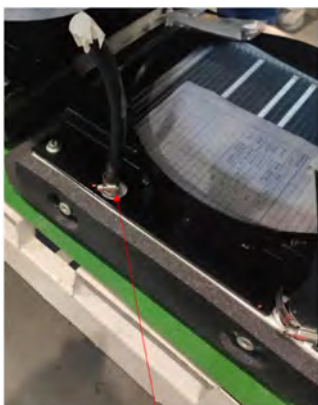


- Check the level of coolant every day!
- The level of coolant must be between the marks FULL and LOW on coolant tank. The water tank shall be located behind the radiator shed door. If the coolant level is below LOW mark, add the coolant into the water tank. If the water tank is empty, add the coolant into the water tank after adding the coolant into the radiator.

6.11.2 Cleaning and Coolant Exchange

Notice!

Cleaning



Radiator drain cock

- During the replacement of coolant, clean the inner side of radiator.
- Remove the radiator cap, open the drain cocks of radiator and engine body to empty the coolant.
- Close the drain cock, add fresh water and radiator cleaner into the radiator, start the engine and run it at the speed higher than low idle speed. When the pointer of cooling water thermometer enters into the green area, continue to run the engine for over ten minutes.
- Close the engine, open the drain cock, and flush the cooling system with fresh water until the drained water becomes clean so as to remove the dirt and deposits.
- Close the drain cock, add the fresh water, and add the antirust agent and antifreeze agent into the radiator as per the specified mixing ratio. In order to prevent the air bubble from mixing into the system, add in the coolant slowly.
- Run the engine to bleed the air of cooling system fully.
- After adding in the coolant, make the engine running for several minutes. Check the level of coolant again and add in the coolant again according to the demands.

6.12 Electric and Control System

⚠ Caution!	– The installation of improper radio communicators and accessories will influence the electronic elements of machine and cause the unexpected movement of machine. – The installation of improper electric devices may also cause the fault or accidental fire. – During the installation of radio communicators or additional electric components or replacement of these components, be sure to consult with the assigned dealer. – Don't attempt to disassemble or modify any electric or electronic component. – If it's necessary to replace or modify these components, contact with the assigned dealer.
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6.12.1 Battery

⚠ Caution!	– The gas of battery can cause the explosion, prevent the spark and flame from approaching the battery.
Notice!	– This machine adopts the maintenance-free battery, so it's unnecessary to add in the water frequently. – Check the capacity of battery frequently to increase its lifetime.

Notice!	– Battery Check – Check the capacity of battery at least once every month. – Park the machine on flat ground. – Stop the engine as per the shutdown steps of engine. – Check the capacity of battery. Observe the densimeter from the upper part of battery. – If the following circles are seen from round porthole: – Green circle—indicates the normality of battery – Black circle—indicates the low capacity of battery that needs to be charged – White circle—indicates the discarding of battery that needs to be replaced. – Keep the terminal of battery clean always to avoid the discharge of battery. Check the terminals for loosening or rusting, and apply the grease or Vaseline to avoid the corrosion
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Position of battery.

1—Level meter 2—Porthole

Notice!	– Battery Replacement – There are two negative (-) grounded 12V batteries on the machine.
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- If one battery of 24V system fails but the other is still good, replace the failed battery with the battery of the same type.
- For example, replace the failed and maintenance-free battery with new battery.
- The charging speeds of batteries in different forms may be different, which may make one of these batteries fail due to overload.

6.12.2 Electric Fuses

Notice!

Fuse Replacement

- If the electric device doesn't work, check the fuse at first.
- **The fuse box is located behind the seat**, open the fuse box cover up, and the spare fuse is located under the cover.
- Important: avoid the damages to electric device due to overload, and install the fuse with correct amperage.

钥匙开关 10A Key switch	备用 10A Spare
熄火阀 R 5A Flameout valve R	熄火阀 W 30A Flameout valve W
预热继电器 5A Preheat relay	监控器 10A Monitor
安全阀 5A Monitor	换速阀 5A H/L Speed
切换阀 5A Dozer/Cauge	喇叭 10A Harn
燃油填充泵 5A Fuel pump	臂灯 10A Arm lamp
备用 30A Spare	备用 5A Spare

Name	Rated Current	Name	Rated Current
Key switch	10A	Spare	10A
Flameout valve R	5A	Flameout valve W	30A
Preheat relay	5A	Monitor	10A
Monitor	5A	H/L Speed	5A
Dozer/Cauge	5A	Harn	10A
Fuel pump	5A	Arm lamp	10A
Spare	30A	Spare	5A

6.13 Bucket Maintenance



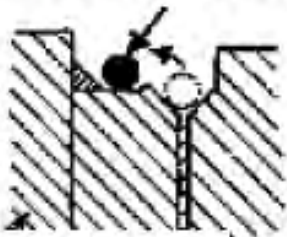
Caution!

- Avoid the injury caused by the flyout of metal filling or fragments in case of hitting out or in the connecting pin
- Wear the safety goggles/safety glasses, gloves and safety appliances applicable for operation.

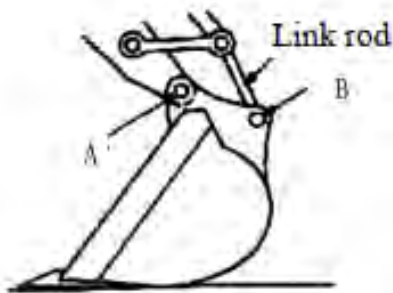
Notice!

Replace the bucket

Movement of O-ring



Bucket sleeve



- Park the machine on flat ground. Lower the bucket to ground, fix its plane on the ground, and ensure the pin shaft can't be rolled after removing the pin shaft.
- Slide O-ring out as shown in Figure.
- Remove bucket pin shafts A and B, separate the arm and bucket, clean pin shaft and pin hole, and apply enough lubricating oil to pin shaft and pin hole.
- Align the arm and new bucket, and ensure the bucket can't roll.
- Attach the bucket pin shafts A and B.
- Attach the lock pin and retaining ring to pin shafts A and B.
- Adjust connecting clearance of bucket at pin shaft A (see "Adjust connecting clearance of bucket").
- Apply the grease to pin shafts A and B.
- Start the engine and run it at low idle speed. Turn the bucket slowly in both directions to check if the rotation of bucket is disturbed. Don't use any disturbed machine. If any disturbance, deal with it in time.

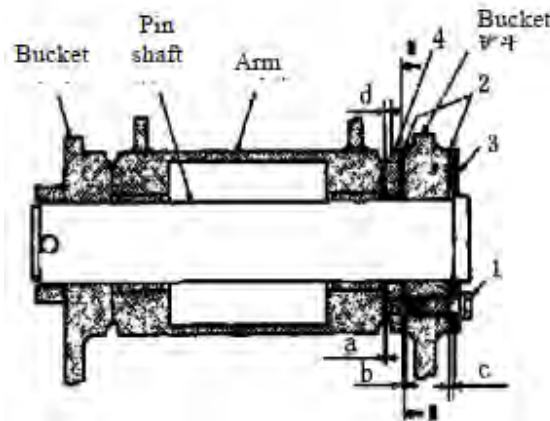
Notice!

Adjustment of bucket joint gap

- There is a regulation system of bucket connection gap capable of eliminating the connection slashing. When the connection slashing is increased, remove or attach the tab as described below.
- Park the machine on flat ground, lower the bucket to ground with its plane down to avoid rolling the bucket.
- Run the engine at low idle speed, turn the bucket clockwise on the ground until left boss top of bucket contacts the arm.
- Stop the engine. Pull the safety locking rod to LOCK (lock).
- Note: in case of removing the tab, don't remove the bolt (Item 1 shown in Figure). The tab is half round, so it's easy to push them out with a screwdriver after loosening the bolt.



- 1-Bolt
- 2-Adjusting shim
- 3-Pressure plate 4-Cam

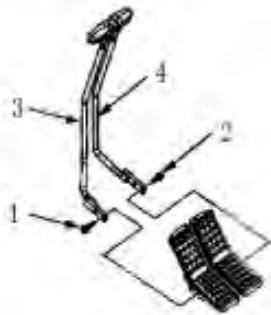


- Loosen the bolt slightly with a spanner. Push out all the tabs in the clearance c between the pressure plate and bucket.
 - Push the bolt to one side of arm, and eliminate the whole clearance a between arm and cam. Push the cam onto the arm to increase the clearance b, and measure the clearance b with a feeler gauge, which shall not be adjusted below 0.5mm.
 - Attach the adjusting shims as much as possible in the clearance b.
- Note: be sure to attach the residual adjusting shims in the clearance c to avoid the damages to arm tail end face or bolt.
- Attach the residual tabs in the clearance c and tighten the bolt.
- Note: the total number of tabs is 12 (6 pairs).
- If the measured value d is below 5mm, replace the cam.

6.14 Traction Maintenance

6.14.1 Traction Operating Lever

Notice!



1, 2—Bolt

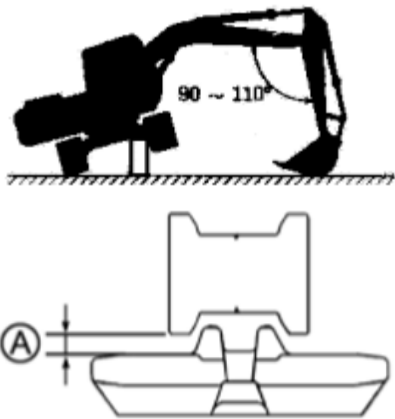
3, 4—Traction control lever

Removal of traction operating lever

- If necessary, remove the traction operating lever.
- Lower the bucket to ground.
- Stop the engine as per its shutdown steps.
- Pull the safety locking rod to LOCK (lock).
- Remove the bolts 1 and 2, and remove the traction operating levers 3 and 4 from the control valve.

6.14.2 Track Sag

Notice!



Check of track sag

- **Check the track sag every day.**
 - o If the crawler are too light, wear is increased.
 - o If the crawler are too loose, wear is increased and the crawler may come off.
- As shown in Figure, rotate the upperstructure by 90°, and then lower the bucket to lift the track approx. 200 mm off the ground, keep the angle between the boom and arm within 90° to 110°, place the arc part of bucket on the ground, place the cushion block under the frame of chassis to support the machine, rotate the track back by two circles, rotate it forward by two circles, and measure the distance A (between the track roller and the inside surface of the track) from the middle part of chassis frame.

Requirements of track sag:

Crawler type	A(sag)/mm
Rubber	10-15
Steel	75-80

- If the crawler loosen more than 25mm (rubber) or 50mm(steel), readjust the crawler.
- If necessary, tighten or loosen the crawler.
- Start the excavator and rotate the lifted crawler carefully.

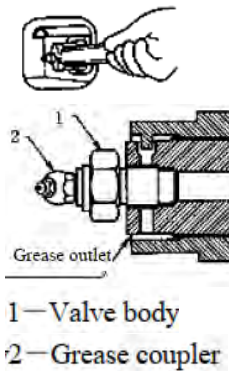
Note:

- Check the slag of track after removing the soil on the track plate.
- Clean all parts of the running gear, paying particular attention to stones between the crawler and sprocket or idler. Clean the area of the crawler tension cylinder.

6.14.3 Track Adjustment



Caution!



- Don't loosen the valve body rapidly or excessively, otherwise the grease in the tensioner will spray. Loosen the valve body carefully, and don't make the body and face against it.
- Don't loosen the grease coupler.
- Important: if the crushed stones or soils are clipped between the sprocket and track remove them after loosening the track.
- If the track is still too tight after tightening the valve body anticlockwise, or it is still loose after applying the grease into the grease coupler, this is abnormal.
- At this time, don't try to remove the track or track-tension device, because the high-pressure grease of track-tension device is dangerous.
- Therefore, overhaul it or contact with your assigned dealer.

Notice!

Adjust the sag of track.

- Points for attention for adjusting the track sag
- If the track sag is not within the desired range, loosen or tighten the track as per the steps below.
- During the adjustment of track sag, lower the bucket to ground, and jack the track on one side.
- Apply the same method to the track on the other side. Place the cushion block under the frame every time to support the machine.
- After adjusting the track sag on both sides, move the machine forward and backward several times.
- Check the sag of track again. If the track sag can't reach the specified value, continue to adjust it until it's satisfactory.
- Loosen the track.
- In case of loosening the track, rotate the valve body slowly anticlockwise with a deep socket wrench, and the grease will be drained out of its outlet.
- Rotate the valve body by 1 to 1.5 circles enough to loosen the track.
- If the grease can't be smoothly drained, lift the track away from the ground, and rotate the track slowly.
- After reaching the proper track sag, tighten the valve body clockwise.
- Tighten the track.
- If it's necessary to tighten the track, connect the grease gun to grease coupler, add in the grease until the track sag reaches the specified value.

6.15 Safety Seat-Belt

Notice!



1-Safety belt 2-Lock latch

3-Connector

Check and replacement of safety belt

- Check the safety belt every day; replace the safety belt every 3 years.
- Keep the safety belt always good, and replace it if necessary to ensure its good performance.
- Check the safety belt; lock latch and connector thoroughly before the operation.
- If the safety belt or its part is damaged or worn, replace it before the operation.
- We suggest that the safety belt shall be replaced every three years, regardless of its conditions.

6.16 Bolt Tightening Torques

Notice!

- **Check the tightening torques of bolt and nut every 250 hours.**
- After the first 50 hour breaking-in period of machine, check the tightness of bolt and nut, and then check it every 250 hours. If loose, tighten the bolt up to the torque shown in Tightening of Bolt. In case of replacement, replace it with the same or higher-class bolt and nut. For the bolt and nut outside Tightening of Bolt, refer to “Tightening Torques”.
- Important: check or tighten the bolt and nut with a torque wrench.

Bolt specification	Size of socket wrench Mm	Size of inner hexagonal wrench mm	Torque Nm	
			10.9 class	8.8 class
M8	13	6	30	20
M10	16	8	70	50
M12	18	10	120	90
M14	21	12	195	140
M16	24	14	300	210
M18	27		410	300
M20	30	17	600	400
M22	34		800	550
M24	36	19	1000	700
M27	41		1500	1050
M30	46	22	1850	1450
M36	55	27	3000	2450

Note: the desired tightening torque is expressed in Nm.

For example, in case of tightening the bolt or nut with a 1m long wrench, turn the tail end of wrench by a force of 120N, and create the following torques:

1m X120 N=120 Nm

In case of creating the same torque with a 0.25m wrench:

0.25m × = 120Nm

The desired force shall be: 120 / 0.25 = 480 N

S/N	Item		Bolt diameter mm	Qty	Sleeve size mm	Torque Nm
1	Fixing nut of engine vibration isolating rubber gasket		10	8	16	70
2	Fixing bolt and nut of engine bearer		10	8	16	70
3	Fixing bolt of hydraulic oil tank		10	2	18	70
4	Fixing bolt of fuel tank		8	2	13	30
5	Fixing bolt of hydraulic pump		12	2	18	120
6	Fixing bolt of multi-way valve		8	3	16	30
7	Fixing nut of cab		16	4	24	210
8	Fixing bolt of swing bearing (upper)	XE17U	12	16	18	120
	Fixing bolt of swing bearing (lower)	XE17U	12	18	18	120
9	Fixing bolt of sprocket		10	8	16	70
10	fixed bolt of carrier side plate		8	16	13	30
11	Fixing bolt of carrier roller		12	6	18	120
12	Fixing bolt of track roller	XE17U	10	6	16	70
13	Counterweight mounting bolt	XE17U	16	2	24	210

6.17 Hammer-Breaker Maintenance

Notice!	Hammer Breaker
	– The operation of hydraulic hammer breaker will accelerate the pollution and deterioration of hydraulic oil. Therefore, in comparison with the machine with a bucket, require to replace the hydraulic oil and hydraulic oil tank filter frequently, otherwise the hammer breaker, hydraulic oil pump and other components of hydraulic system may be damaged, and adopt the following recommended replacement intervals.

Table 2-6 Replacement Intervals (Hours)

Accessory	Utilizing rate	Hydraulic oil	Filter element
Bucket	100%	2000	500
Hammer crusher	20%	400	100
	40%	600	100
	60%	800	200
	80%	1600	200

Notice	Change periods of hydraulic oil and filter element - Follow the advice:
	– The change periods of the hydraulic oil and/or its filter element depend on the hydraulic knapper's duration and intensity of use. These change intervals usually coincide with the regular maintenance intervals. – When using the hydraulic knapper, the hydraulic oil will be contaminated rapidly. Its viscosity will drop faster since the operating condition is more stressful for the system than for digging. – Refer to the table below to change hydraulic oil and replace the filter element. It will help to avoid shortening the lifespan of hydraulic parts due to the hydraulic oil contamination (especially in the main pump).

6.18 Special Maintenance Conditions

Operating conditions	Maintenance cautions
Mud field, rainy or snowy	Pre-operation: check if the screw plug and all the drain plugs are tightened. After-operation: clean the machine, and check if there are broken, damaged, loose or missing nut and bolt, and lubricate all the required parts immediately.
Seaside	Pre-operation: check if the screw plug and all the drain plugs are tightened. After-operation: clean the machine thoroughly with clean water to remove the salt content, and maintain the electric appliances frequently to avoid their corrosion.
Dusty air	Air filter: clean the filter elements at regular service intervals. Radiator: clean the mesh enclosure of oil cooler to avoid the blockage of radiator core. Fuel system: clean the filter elements and sieve at regular short service intervals. Electric appliances: clean them at regular intervals, especially the terminals of AC generator and starting motor.
Frosty weather	Fuel: adopt the appropriate low-temperature high-quality fuel. Lubricant: adopt the high-quality low-viscosity hydraulic oil and engine oil. Engine coolant: be sure to adopt the anti-freezing agent. Battery: charge the battery up at short regular intervals. In case of not charging the battery up, the electrolyte may be frozen. Track: keep the track clean, and park the machine on the hard ground to avoid freezing the track on the ground.
Stony ground	Track: careful operation. Check if there are broken, damaged or missing bolts and nuts frequently, and loosen the track a little looser than usual. Equipment: in case of digging the stony ground, the standard accessories may be damaged, adopt the front reinforced bucket or heavy-duty bucket.
Falling rocks	Cab: if necessary, install the cab roof support to avoid the damages of falling rocks to the machine.

6.19 Maintenance of Engine

Notice!

See "Operating Instructions of Engine" in details

7 Faults and Troubleshooting

Notice!

Correct procedures of maintenance and check

In order to maintain and repair the machine correctly, follow the correct maintenance and check procedures described in this manual.

7.1 Periodic Replacement of Parts

Notice!

Periodic replacement of parts

In order to ensure the safety of operation. Check the machine at regular intervals. If any of the following parts is damaged, it may cause a severe accident or fire. The deterioration or damage of these parts is difficult to determine via a visual check, so these parts shall be replaced at the intervals shown in the table below, however, if they are found to be poor during the check, they shall be replaced before the operation of machine, regardless of the interval of replacement. In case of replacing the hose, it's also required to check their pipe clips for deformations, breakage or damages, and replace them according to the demands. Check all the following hoses at legal regular intervals and replace or tighten any poor part as per the demands.

7.2 Engine

Trouble	Cause	Remedy
Engine rotates, but it can't be started or difficult to start.	No fuel	Add in fuel, and exhaust the air.
	Wrong fuel	Empty the oil tank, and adopt the correct fuel.
	Polluted fuel	Empty the oil tank, and add in clean fuel.
	Low capacity of battery	Charge or attach a new battery.
	Trouble of injection pump	Contact with the assigned dealer of XCMG (Xuzhou XCMG Excavator Machinery Co., Ltd.)
	Trouble of preheat circuit or igniter plug	Contact with the assigned dealer of XCMG (Xuzhou XCMG Excavator Machinery Co., Ltd.)
	Poor contact of circuit	Clean and fix the connection of battery and starting motor.
	Trouble of starting motor	Replace the starting motor.
	Wrong engine oil	Drain the oil, and adopt the correct oil.
	Blockage of air filter	Replace the filter elements.
	Blockage of fuel filter	Bleed the air out of fuel system, and clean the sieve of fuel tank.
	Low compression ratio of engine	Contact with the assigned dealer of XCMG.
	Dirty nozzle or incorrect operation	Contact with the assigned dealer of XCMG.
	Trouble of fuel cutoff linkage	Adjust or repair the linkage.
	Leakage of fuel system	Check the connection of fuel system.
	Air exists in fuel system.	Bleed the air.
	Pop-up of fuel supply pump plunger	Push down and tighten the hand wheel.
	Dirty transfer pump sieve	Clean or replace
Shot noise, abnormal running or stoppage of engine	Low level of engine oil	Add in engine oil.
	Blockage of air suction system	Clean the filter system.
	Dirty transfer pump sieve	Clean or replace
	Off-time of injection pump	Contact with the assigned dealer of XCMG.
	Blockage of fuel filter	Renew the filter.
	Low temperature of cooling water	Incorrect operation of thermostat or it's too cold.
	Water, dirt or air exists in fuel system	Drain the air out of fuel system, and clean the outlet sieve of fuel tank.
	Dirt or trouble of nozzle.	Contact with the assigned dealer of XCMG.
	Fuel cutoff linkage trouble	Adjust or repair the linkage.
The engine can't function fully.	Blockage of air filter	Replace the filter elements.
	Blockage of fuel pipe	Repair or replace the fuel pipe.
	Polluted fuel	Empty the fuel tank and clean the outlet sieve, and add in the oil again.

	Blockage of fuel filter	Replace the filter.
	Blockage of fuel tank cover vent hole	Clean or attach a new cover.
	Dirt or trouble of fuel nozzle	Contact with the assigned dealer of XCMG.
	Adjustment required for injection pump linkage	Contact with the assigned dealer of XCMG.
	Wrong fuel	Adopt the correct fuel.
	Wrong engine oil	Adopt the correct engine oil.
	Trouble of turbo charger	Contact with the assigned dealer of XCMG.
	Off-time of injection pump	Contact with the assigned dealer of XCMG.
	Blockage of emission	Remove the muffler and run the engine.
	Overheat or overcooling of engine	See below
	Trouble of engine	Contact with the assigned dealer of XCMG.
	Leaks of air suction or bleeding system	Contact with the assigned dealer of XCMG.
Overheat of engine	Low level of cooling water	Add in cooling water.
	Trouble of thermostat	Contact with the assigned dealer of XCMG.
	Overload of engine	Check the hydraulic safety valve.
	Wear of radiator cap	Attach a new cap.
	Blockage of radiator core and oil cooler core	Clean the radiator and oil cooler.
	Blockage of radiator mesh enclosure	Clean the mesh enclosure.
	Off-time of injection pump	Contact with the assigned dealer of XCMG.
	Damage of fan	Replace the fan.
	Blockage of air filter	Clean the air filter.
	Loosening of AC generator and fan belt	Tension the belt or attach a new belt.
	Wear of belt pulley	Replace the belt pulley
	Dirty cooling system pipe	Flush the cooling system.
	Trouble of thermometer or transfer unit	Contact with the assigned dealer of XCMG.
Overflow temperature of cooling water	Trouble of thermostat	Contact with the assigned dealer of XCMG.
	Trouble of thermometer or transfer unit	Contact with the assigned dealer of XCMG.
Low pressure of engine oil	Trouble of engine oil pump or pump drive	Contact with the assigned dealer of XCMG.
	Low level of engine oil	Add in engine oil.
	trouble of engine oil pressure control valve	Contact with the assigned dealer of XCMG.
	Blockage of oil pump suction mesh enclosure	Contact with the assigned dealer of XCMG.
	Blockage of oil filter	Renew the oil filter.

	Leak of engine oil	Leak check.
	Engine oil is diluted by fuel or cooling water.	Contact with the assigned dealer of XCMG.
	Overhigh temperature of engine	Check the cooling system.
	Wrong engine oil	Drain the oil, and adopt the correct oil.
Excessive consumption of engine oil	Wrong engine oil	Drain the oil, and adopt the correct oil.
	Leak of engine oil	Check the engine oil drain plug.
	Overheat of engine	Check the cooling system.
	Blockage of air filter	Clean the filter element or attach new filter elements.
	Wear of inner parts of engine	Contact with the assigned dealer of XCMG.
Excessive consumption of engine fuel	Blockage or dirt of air suction system	Clean the air suction system.
	Wrong fuel	Adopt the correct fuel.
	Dirty fuel nozzle	Contact with the assigned dealer of XCMG.
	Off-time of injection pump	Contact with the assigned dealer of XCMG.
Too black or grey exhaust fume	Wrong fuel	Empty the oil tank, and adopt the correct fuel.
	Blockage or dirt of air suction or discharge system	Clean the air suction or discharge system.
	Off-time of injection pump	Contact with the assigned dealer of XCMG.
	Dirty fuel nozzle or its incorrect operation	Contact with the assigned dealer of XCMG.
	Trouble of engine body	Contact with the assigned dealer of XCMG.
Failure of engine	Trouble of battery	Charge or replace.
Insufficient capacity of battery	Loose connection or corrosion	Clean, tighten or replace the battery.
	Loosening of AC generator belt	Tension the belt or attach a new belt.
	AC generator fails to charge.	Contact with the assigned dealer of XCMG.
	Broken fuse	Replace the fuse.
	Trouble of key switch	Replace the key switch.
Starting motor can't rotate.	Insufficient capacity of battery or damaged	Charge or replace the battery.
	Poor connection of battery circuit	Clean the connection.
	Broken fuse	Replace the fuse.
	Trouble of key switch	Contact with the assigned dealer of XCMG.
	Trouble of starting relay	Contact with the assigned dealer of XCMG.
	Trouble of starting motor magnetic coil	Contact with the assigned dealer of XCMG.
	Trouble of starting motor	Repair or replace the starting motor.
	The starting motor pinion is clamped in the flywheel gear.	Repair or replace starting motor.
	Trouble of engine body	Contact with the assigned dealer of XCMG.

Magnetic vibration of starting motor	Poor connection of battery or starting motor circuit	Clean the connection part.
	Low capacity of battery	Charge or replace battery
	Opening of starting motor magnetic "hold" coil	Contact with the assigned dealer of XCMG.
The starting motor rotates but it can't be started.	Disengagement of starting motor pinion with the flywheel gear	Contact with the assigned dealer of XCMG.
	Seizure or trouble of pinion shift mechanism	Contact with the assigned dealer of XCMG.
	Fracture of pinion teeth	Contact with the assigned dealer of XCMG.
	Fracture of flywheel gear teeth	Contact with the assigned dealer of XCMG.
Slow starting of engine	Inner damages or fracture of battery leads	Check and replace the leads.
	Loosening of battery or starting motor connection or corrosion	Clean and tighten the connection.
The engine bleeds white gas.	Wrong fuel.	Empty the oil tank, and adopt the correct fuel.
	Low temperature of engine	Run the engine until it becomes hot.
	Trouble or overcooling of thermostat	Contact with the assigned dealer of XCMG.
	Off-time of injection pump	Contact with the assigned dealer of XCMG.
	Leak of cooling water into the cylinder of engine	Contact with the assigned dealer of XCMG.
Large noise or vibration of turbo charger	Bearing is not lubricated.	Insufficient oil pressure, check the blocked oil pipe of turbo charger
	Worn bearing	Contact with your assigned dealer.
	Air leaks of engine, suction or drain pipe	Check or repair.
	Improper gap between the turbine and turbine case	Contact with the assigned dealer of XCMG.
	Breakage of turbine blade	Remove the exhaust elbow and air inlet hose, and check them.
Oil dripping of turbo charger joint	Damage or wear of bearing and (or) worn seal	Contact with the assigned dealer of XCMG, check and clean the air filter, check if the service interval of engine is proper or dirt enters into the engine.
	Overhigh pressure of crankcase	Check the vent pipe, ensure the pipe is not blocked, and clean it.
	Blockage of turbo charger return pipe at the exhaust pipe	Remove the pipe, and check or clean it.
Too large resistance of turbo charger rotating member	The combustion deposits cause the blockage of coal behind the turbine.	check or clean
	Leaks of air suction pipe cause the blockage of dirt behind the compressor wheel.	check or clean

	Overhigh temperature, unbalanced impeller, dirty oil, lack of oil or insufficient lubrication causes the seizure, dirt and wear of bearing.	Contact with the assigned dealer of XCMG.
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7.3 Electric System

Electric System cont'd

Trouble	Cause	Remedy
Slow starting of engine	Current leakage of battery or it can't hold the charge capacity.	Replace the battery.
	"Draggle" of starting motor	Contact with the assigned dealer of XCMG.
	Low voltage of battery	Charge or replace battery
The starting motor continues to run after starting the engine.	Trouble of starting relay	Contact with the assigned dealer of XCMG.
	Suction of starting motor magnetic coil	Contact with the assigned dealer of XCMG.
	The starting motor can't be disconnected.	Contact with the assigned dealer of XCMG.
	Trouble of key switch	Contact with the assigned dealer of XCMG.
The charging indicator goes on during the running of engine.	Loosening or slipping of AC generator belt	Check the belt, if slipped, replace it; if loose, tighten it.
	Low speed of engine	Adjust the speed to the specified value.
	Attached accessories cause the electric overload.	Remove the attached accessories or install higher-output AC generator.
	Loosening of battery, grounding steel strip, starting motor or AC generator, corrosion of electric connection	Check, clean or tighten the electric connection.
	Low voltage of battery	Charge or replace the battery.
	AC generator trouble	Contact with the assigned dealer of XCMG.
	Trouble of monitor	Contact with the assigned dealer of XCMG.
Fracas of AC generator	Worn driving belt	Replace the belt.
	Worn belt pulley	Replace the belt pulley and belt.
	Improper adjustment of belt pulley	Adjust the installation of AC generator
	Trouble of AC generator bearing	Loosen the belt of AC generator, and turn the belt pulley by hands. In case of feeling difficult to turn, repair AC generator.
Indicator of monitor can't go on.	Trouble of monitor	Contact with the assigned dealer of XCMG.
	Trouble of electric wiring	Contact with the assigned dealer of XCMG.
	Damaged fuse	Replace the fuse.
	Trouble of sensor.	Check the sensor.
	Damaged fuse	Replace the fuse.

The cooling water thermometer fails to work.	Trouble of thermometer		Contact with the assigned dealer of XCMG.
	Trouble of temperature sensor		Check the sensor of cooling water thermometer.
	Trouble of electric circuit		Contact with the assigned dealer of XCMG.
The automatic idling indicator goes out.	Damaged fuse		Replace the fuse.
	Trouble of automatic idling switch		Contact with the assigned dealer of XCMG.
The fuel meter can't work.	Damaged fuse		Replace the fuse.
	Damaged fuel meter		Contact with the assigned dealer of XCMG.
	Trouble of electric circuit		Contact with the assigned dealer of XCMG.
Working mode toggle fails to work.	Trouble of mode toggle		Contact with the assigned dealer of XCMG.
	Damaged electric joint		Contact with the assigned dealer of XCMG.
	Trouble of monitor		Contact with the assigned dealer of XCMG.
Fast/slow driving speed deactivates.	Trouble of driving mode switch		Contact with the assigned dealer of XCMG.
	Trouble of monitor		Contact with the assigned dealer of XCMG.
	Trouble of solenoid valve		Contact with the assigned dealer of XCMG.
	Damaged running motor		Contact with the assigned dealer of XCMG.
Automatic idling deactivates.	Damaged fuse		Replace the fuse.
	Trouble of pilot pressure switch		Contact with the assigned dealer of XCMG.
	Trouble of electric circuit		Contact with the assigned dealer of XCMG.
	Trouble of engine control motor		Contact with the assigned dealer of XCMG.
	Trouble of main controller		Contact with the assigned dealer of XCMG.
The trouble indicator flashes.	Once or brighten.	Contact with the assigned dealer of XCMG.	Contact with your assigned dealer.
	Twice	Abnormal current of motor	Contact with the assigned dealer of XCMG.
	Three times	Pause of motor action	Contact with the assigned dealer of XCMG.
	Four times	Motor poor in the range of action	Contact with the assigned dealer of XCMG.
	Five times	Broken circuit or short circuit of built-in potentiometer of motor	Contact with the assigned dealer of XCMG.

	Six times	Set broken circuit or short circuit of potentiometer	Contact with the assigned dealer of XCMG.
	Seven times	Abnormal current of magnetic coil	Contact with the assigned dealer of XCMG.
	Eight times	Overflow speed of engine	Contact with the assigned dealer of XCMG.
	Extinguish	Trouble of controller	Contact with the assigned dealer of XCMG.

7.4 Hydraulic System

Hydraulic System cont'd

Trouble	Cause	Remedy
Slow hydraulic function	Low level of hydraulic oil	Fill the hydraulic oil up to full scale.
	Low temperature of hydraulic oil	Preheat the machine.
	Wrong use of hydraulic oil	Empty the oil tank, and adopt the correct hydraulic oil
	Overload speed of engine	Accelerate or contact with your assigned dealer.
	Wear of hydraulic pump	Contact with the assigned dealer of XCMG.
	Blockage of pump suction pipeline	Contact with the assigned dealer of XCMG.
Overheat of hydraulic oil	Wrong use of hydraulic oil	Adopt the correct hydraulic oil
	Air leak of pump oil suction pipeline	Contact with the assigned dealer of XCMG.
	Blockage of hydraulic pipeline	Contact with the assigned dealer of XCMG.
	Low level of hydraulic oil	Fill the hydraulic oil to full scale.
	Blockage of filter	Attach a new filter
	Wear of hydraulic pump	Contact with the assigned dealer of XCMG.
	Blockage of radiator or oil cooler	Clean and straighten the blade.
	Bypass of oil cooler	Contact with the assigned dealer of XCMG.
	Trouble of safety valve	Contact with the assigned dealer of XCMG.
	Polluted hydraulic oil	Drain the oil and fill it up.
	Improper adjustment of hydraulic components	Contact with the assigned dealer of XCMG.
Foaming of hydraulic oil	Air leak of the pipe from oil tank to pump	Contact with the assigned dealer of XCMG.
	Twist or depression of hydraulic pipeline	Check the pipeline.
	Wrong hydraulic oil	Adopt the correct hydraulic oil.
	Water in hydraulic oil	Replace the hydraulic oil.
	Overhigh or overflow oil level	Calibrate the oil level.
Low or no oil pressure	Wrong hydraulic oil	Adopt the correct hydraulic oil.
	Improper adjustment of hydraulic components	Contact with the assigned dealer of XCMG.
	No hydraulic oil in the system	Fill up the correct hydraulic oil.
	Worn hydraulic cylinder packing	Contact with the assigned dealer of XCMG.
	Trouble of safety valve	Contact with the assigned dealer of XCMG.
No hydraulic function (fracas of pump)	Wear of hydraulic pump	Contact with the assigned dealer of XCMG.
	Reduction of set pressure of main safety valve of control valve	Contact with the assigned dealer of XCMG.
	Low level of hydraulic oil	Fill up the hydraulic oil.
	Damage of oil suction pipeline or hose	Contact with the assigned dealer of XCMG.

	Blockage of suction filter, and air sucked in oil suction.	Clean the filter system.
The hydraulic cylinder acts but it can't lift the load.	Wear of hydraulic pump	Contact with the assigned dealer of XCMG.
	Low pressure of main safety valve	Contact with the assigned dealer of XCMG.
	Low level of hydraulic oil	Fill up the hydraulic oil.
	Blockage of suction filter	Clean the filter system.
	Leakage of pump suction pipeline	Check the oil suction pipeline.
One operating lever fails to work.	Low pressure of safety valve	Contact with the assigned dealer of XCMG.
	Damage of pipe or hose	Repair or replace
	Loosening of hydraulic joint	Tighten.
	Damage of O-ring in the joint	Attach a new O-ring.
	hydraulic pump trouble	Contact with the assigned dealer of XCMG.
	Trouble of pilot valve	Contact with the assigned dealer of XCMG.
	Damage of pilot pipeline	Repair or replace
One hydraulic cylinder fails to work.	Control valve column is damaged or polluted by dirt.	Contact with the assigned dealer of XCMG.
	Damage of hydraulic pipeline	Repair or replace
	Loosening of joint	Tighten.
	Damage of O-ring in the joint	Attach a new O-ring.
	Trouble of pilot valve	Contact with the assigned dealer of XCMG.
	Damage of pilot pipeline	Repair or replace
One hydraulic cylinder fails to work or almost deactivates.	Leakage of hydraulic cylinder seal	Contact with the assigned dealer of XCMG.
	Damage of hydraulic cylinder lever	Contact with the assigned dealer of XCMG.
	Damage of pilot pipeline	Repair or replace
	Trouble of pilot valve	Contact with the assigned dealer of XCMG.
	Trouble of circuit	Contact with the assigned dealer of XCMG.
Two travel motors fail to work.	Trouble of center sub body	Contact with the assigned dealer of XCMG.
One travel motor fails to work	Trouble of travel motor	Contact with the assigned dealer of XCMG.
	Unreleased of brake	Contact with the assigned dealer of XCMG.
	Trouble of pilot valve	Contact with the assigned dealer of XCMG.
	Damage of pilot pipeline	Repair or replace
Unstable travel	Adjustment required for track	Adjust the track sag
	Damage of idler, track roller or carrier roller	Contact with the assigned dealer of XCMG.
	Bend of chassis frame	Contact with the assigned dealer of XCMG.
	Seizure of stone block or soil in the chassis frame	Remove and repair.
	Unreleased of moving brake	Contact with the assigned dealer of XCMG.
Rotation deactivates	Trouble of rotary motor	Contact with the assigned dealer of XCMG.
	Trouble of pilot valve	Contact with the assigned dealer of XCMG.

Unsmooth rotation	Trouble of rotary gear	Contact with the assigned dealer of XCMG.
	Trouble of rotary bearing	Contact with the assigned dealer of XCMG.
	Lack of grease	Add in the grease.

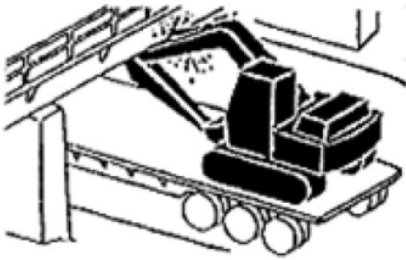
Periodic replacement parts

Parts replaced at regular intervals			Replacement interval
Engine		Fuel hose (from fuel tank to filter)	Every two years
		Fuel hose (from fuel tank to injection pump)	Every two years
		Oil filter hose (from engine to oil filter)	Every two years
Hydraulic system	Basic body	Oil pump inlet hose	Every two years
		Oil pump outlet hose	Every two years
		Hydraulic hose of rotation gear	Every two years
	Accessories of equipment	Hose of boom hydraulic cylinder pipeline	Every two years
		Hose of arm hydraulic cylinder pipeline	Every two years
		Hose of bucket hydraulic cylinder pipeline	Every two years
		Hose of pilot pipeline	Every two years

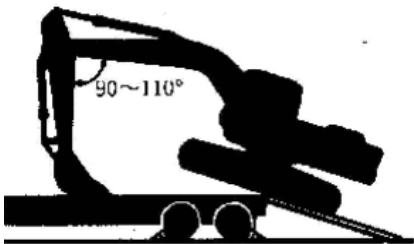
8 Transport, Storage and Protection

 Caution!	During the attachment of machine to the platform of truck or trailer, or removal of machine from them, be sure to follow the local laws and regulations.
Notice!	– Provide the appropriate truck or trailer for the convenience of machine transport. Cautions of machine removal – Choose the firm or flat ground. – Be sure to adopt the platform or slope. – During the removal of machine from trailer, there must be a signalman. – Choose the slow-speed mode with a travel mode toggle to avoid high-speed.
 Caution!	The steering on the slope is very dangerous and avoids the steering when going up or down the slope.
Notice!	– If the steering is required, transport the machine back to the ground or trailer platform, and drive it on the slope after rectifying the direction. .
	– In case of driving up or down the slope, don't use any other operating lever other than the traction operating lever. – The intersection of slope top and trailer platform is convex, and drive the machine by this intersection. – Avoid the possible injuries caused by the turnover of machine during the rotation of upper car. – Keep the arm retracted down and rotate the upper structure slowly to achieve the optimum stability. – Fix the frame of machine with a chain or rope. – Be careful not to touch the dozer when getting on/off the vehicle or unloading the cargo. – Attention when loading/unloading machines with rubber crawlers or parts of rubber crawler, skid should be avoided during operating as these crawlers are relatively flat. Loading/unloading operation must be carried out after the crawlers are cleaned up, especially when there is clay on them.
 Caution!	– Do not use sloping plate with inclination over 15° during loading /unloading
	– In case that air gets into the oil suction pipe and blocks the cycle of machine oil, and result in engine's abnormal wearing out and improper working. – It's also prohibited to use the dozer to support the machine to get on/off the truck.
 Caution!	– It's very dangerous to swing on the sloping plate when loading /unloading vehicles, and it must be avoided!
	– If the rotation is necessary, it must be performed after returning to the ground or on the platform of the truck, go through the sloping plate until the direction is adjusted! – There is a heave on the joint of the sloping plate and the truck, please drive with extra care. – When swinging on the trailer platform, pay extra attention to prevent a roll-over.

8.1 Road transport

Notice!**– Road transport**

- During the transport of machine on the road, learn of and follow all the local laws and regulations.
- During the transport of trailer, verify the length, width, height and weight of trailer for loading the machine.
- Note: the transport weight and size may be different due to the type installed track plate or front equipment.
- Observe the conditions of transport route in advance, e.g. size, weight limit and traffic regulations. In case of disassembling the machine, meet the local specified size or weight limit.

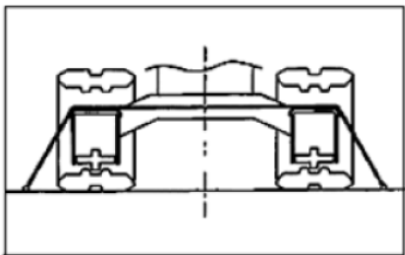
Notice!**Removal of trailer**

- Remove the machine always on firm and flat ground.
- Note: be sure to use the platform or slope during the loading and unloading.
- Adopt the slope or platform.
- Clean the slope or platform and trailer platform thoroughly before loading and unloading, the risk of slipping may exist on them with oil dirt, soil or ice.
- During the use of slope or platform, place the damp block under the wheel of front body and trailer.
- The slope or platform must have enough width, length and strength to make the inclination angle of slope or the gradient of platform below 15°.

8.2 Loading

Notice!	Loading
– The direction of machine is down: with front-end equipment: move the equipment forward with it placed on front body; without front-end equipment: travel in reverse direction as shown in above figure. – The centerline of machine shall be on the centerline of trailer. – Drive the machine slowly on the slope. With front-end equipment: – Support the plane bucket on the trailer, and the angle between bucket rod and movable arm should be within 90° to 110°. – Upon inclining the machine to trailer platform, support the bucket to the trailer, move the machine slowly forward, until the whole track moves on the trailer and contacts the platform. – Lift the bucket slightly, retract the bucket rod and make it under the machine, and rotate the upper structure slowly by 180°. – Lower the bucket to sleeper. – Stop the engine, and remove the key from key switch. – Move the operating lever several times until the whole pressure of hydraulic cylinder is released. – Pull the safety locking rod to LOCK (lock). – Close the window, skylight and door of cab, and cover the air outlet to prevent the wind and rain from entering. In the cold weather, be sure to heat the machine before loading/ unloading it.	

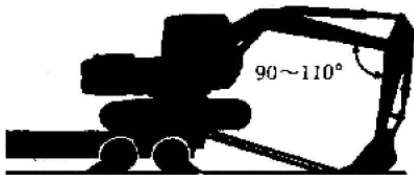
8.3 Transport

Notice!	Transport
	– Prior to the transportation - tie the chain or rope to the frame of machine, and don't make the chain or rope pass through or pressed on the hydraulic pipe or hose. – Place the damp blocks before and behind the track to fix the machine. – Fix four corners of machine and front-end equipment to the trailer with a chain or rope.

8.4 Unloading

Notice!

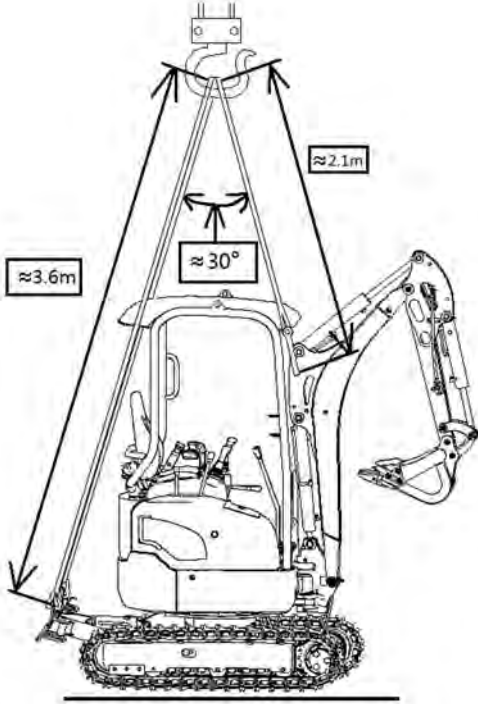
- Unloading make the intersection of trailer platform rear end and slope convex, and drive the machine by it carefully.
- Important: avoid any possible damage of front-end equipment. During the unloading, keep the angle between the arm and boom within 90° to 110° always, retract the arm, and any unloading may cause the damages to machine.



- Upon moving the tail end of machine through the trailer to the slope or platform, support the bucket plane on the ground, and make the angle between arm and boom within 90° to 110° .
- Important: avoid any possible damage of hydraulic cylinder, and avoid any fierce collision of bucket to the ground.
- Place the bucket on the ground before the machine starts to incline forward. During the forward movement of machine, lift the boom and stretch the arm until the machine is fully under the slope or platform.



8.5 Lifting the Machine

 Caution!		– Lifting steel ropes and other lifting tools may be broken, which results in the serious personal injuries. Don't use any damaged or aged steel rope or lifting tool.
		– For correct lifting methods, types or sizes of lifting steel cables and lifting tools, contact with the assigned dealer. – Pull the safety locking rod to LOCK (lock), and avoid any unexpected movement of machine during the lifting. – Incorrect lifting methods and incorrect mounting of steel rope will cause the movement of machine during the lifting, which results in machine damages and personal injuries. – Don't lift the machine rapidly, otherwise the lifting steel ropes and lifting tools will be overloaded and may lead to their fracture. – Don't let any person approachable to the lifted machine or drive under it. – The gravity center marked on the machine is for the machine of standard specifications, but the actual gravity center will be changed as per the type of installed accessory or chosen device and their position. Therefore, ensure the balance of machine can't be lost in case of lifting the machine.
		– When lifting the machine body, please operate according to the following main points. – Rotate the upper rotating body, and make sure dozer blade forms an angle of 180 degrees oppositely with working device. – Lift the dozer blade to the highest position. – Lift the boom and pull the bucket and arm to the most extent, and then place the locking lever of joystick on "lock" position. – Make the swing pedal on the neutral position without swinging the boom, then cover the pedal and stop the engine. – Install the rings on the holes at the both sides of dozer blade, hang the steel wire and meanwhile hang the steel wire on the boom position as the picture has shown. – Maintain the lifting angle of steel wire as 30 degrees and the length of steel wire is shown as the right figure. –

8.6 Storage and Protection

Notice!	Daily and short-term storage and protection
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- Check the machine, repair the worn and damaged parts. If necessary, attach new parts.
- Clean the air filter element.
- If possible, retract all the hydraulic cylinders; if impossible, apply the grease to the exposed rod of hydraulic cylinder.
- Lubricate all the lubrication points.
- Place the track on the long and stable damp block.
- Clean the machine.
- After charging the battery up, remove the battery and store it at dry and safe place. If not, separate the connection of battery negative-pole cable on the wiring terminal (-).
- Add the anti-rust agent into engine coolant. In winter, adopt the anti-freezing agent or drain the coolant off. If the cooling system is emptied, be sure to hang a nameplate “No Water of Radiator” in conspicuous position.
- Loosen the belts of AC generator and cooling fan.
- Apply the paint to desired positions to avoid rusting.
- Store the machine at dry and safe place. In case of storing it outdoor, adopt the water shield.

Notice!

Long-term storage and protection

Storage place

- Commonly store in the ventilated and dry warehouse.
- If the device is stored in open air, park it on the concrete ground easy to drain the water, cover and fix the canvas or hood, and store it at the place that can't be invaded by natural disaster and without corrosive or harmful substance or gas.

Storage

- Use the hydraulic functions of moving, rotation and digging twice to three times every month to lubricate all the parts. Check the level of coolant and lubrication state before the operation.
- Check the appearance quality, protection side and anti-corrosion substances, and etc at regular intervals.

8.7 Use preparation after storage

Notice!

Use preparation after storage

- Remove the coverings.
- Remove the protective substances painted on the exposed part.
- Charge the battery, mount or connect it.
- After draining the oil of engine crankcase, renew the oil.
- After draining the gear oil in the rotary and traction reducer, renew the gear oil.
- Drain the inclusions and mixed water out of the hydraulic oil tank and fuel tank.
- Apply the grease to each hinged position.
- Fill in the coolant as per the specification.
- For the check before the operation, refer to the relevant regulations of operation.

9 Lift Capacity Calculation of the Excavator

9.1 Brief introduction and choosing the lift working condition:

Notice!

- Brief introduction: knowing from the calculation, the excavator force bearing badly when it's under the digging condition, so this calculation will not calculate the lift load determined by the assembly intensity of the working device, swing platform and the bracket.
- Choosing the working condition:
- In this calculation, the lift point is at the bucket pivot mounting pin on the arm, the maximum lift weight not including the bucket weight.
 - o Under the still load tipping limit condition, the rated lift load is 75% of the maximum load;
 - o Under the hydraulic limit condition, the rated lift load is 87% of the maximum load;
- Lift scope figure of excavator is shown as the following Figure1:

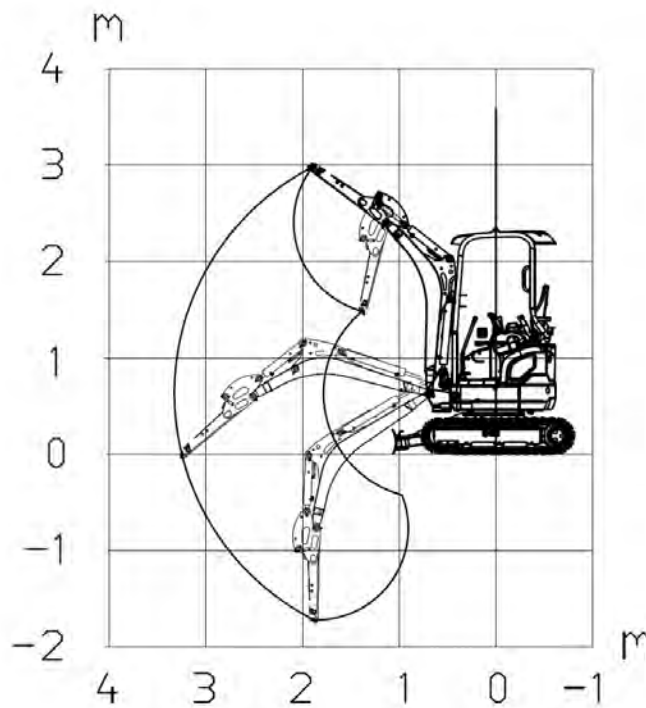


Figure 1

Notice!

As well as the lifting conditions, the length of the arm also affects the permitted lifting capacities and the stability of the machine. Compare the dimensions of the machine arm with the details given in the lifting capacity tables, in order to use the correct lifting capacity table for your machine.

9.2 Lifting attachment

Notice!

- The lifting operation is only permitted when the excavator is equipped with the following safety systems as per EN474-5:
 - o Pipe safety valve on the boom cylinder
 - o Pipe safety valve on the arm cylinder
 - o Overload warning system
- If the dozer is being used to increase the machine's stability, an additional pipe safety valve must be installed in accordance with EN 474-1.
- The overload warning system of the lifting operation is optional. If the machine is used for lifting, please contact your XCMG dealer, and confirm whether the system has been installed. If not, it is forbidden to use it for lifting. Otherwise, any accident occurred has no responsibility with XCMG.

Notice!

- The lifting attachment is to be fastened to the attachment or to other parts of the excavator in such a manner as to exclude the possibility of the lifting rope accidentally unhooking.
- The installation on the attachment or the equipment must be such as to guarantee the optimum field of vision between the operator and the guide[the person who fastens the lifting rope to the lifting attachment].
- The lifting attachment is to be positioned so that the lifting rope is not deflected from its vertical direction of tension by other parts of the machine.
- The lifting attachment must be formed and positioned in such a manner as to exclude the possibility of the lifting rope accidentally slipping.
- Care must be taken when positioning the lifting attachment that is no risk of restriction during normal operation of the excavator or when working on any particular object.
- Load suspensions may only be welded on by suitably skilled personnel. For this type work, please contact your XCMG dealer.
- At every point of the attachment or the boom, the lifting attachment must withstand a load of two-and-a-half times its rated load.

9.3 Load suspension device

Notice!

- A load suspension device with all the characteristics listed below is required.
- The system must withstand a load two-and-a-half times its rated lifting load, regardless of the point at which that load is applied.
- The system must be designed in such a way as to practically prevent any objects that have been lifted from falling from the lifting attachment, for example by means of a protective attachment designed for this purpose.
- The system must not allow the lifting attachment to slip from the attachment being lifted.
- Do not lift loads that exceed the values indicated in the lifting capacity tables.
- Always observe the maximum permissible lifting capacity of the hoisting gear. Lifting loads over the maximum permissible lifting capacity is not allowed.
- The values indicated in the tables only apply to level and hard grounds. When working on soft ground, the machine can tip over easily, as the load is concentrated on one side only and the crawler or the dozer can dig into the ground.
- The values indicated in the tables only apply for loads without a bucket. If a bucket is used, the weight of the bucket must be subtracted from the values in the tables. The weight of mounted accessories must be subtracted from the lifting capacity.
- During lifting operations, the boom may not be swiveled to the left or right. The machine could tilt. In order to avoid inadvertent actuation, lower the locking flap for the boom swing pedal.
- During lifting operation, driving/moving the crawler chassis is not permitted.
- Use utmost care to avoid any risk of tipping, slipping, or other potential risks implied when lifting loads.
- The operator must pick up the load at the centre, avoid sudden movements, and make sure the load does not swing.

9.4 Calculation model and known specification

Notice!

1) Calculation model

- In this calculation, the excavator **should be parked on firm and level ground.**
To calculate the lift capacity of the 2 states:
 - o the rated lift capacity at straight ahead the excavator, shown as the Figure2
 - o the rated lift capacity at positive side of the excavator, shown as the Figure3

2) Lift capacity determined by stability

- The calculation of lift capacity at the straight ahead
- When lifting at the straight ahead the excavator, the tipping point is located over the edge at the front outrigger, see the Figure 2:

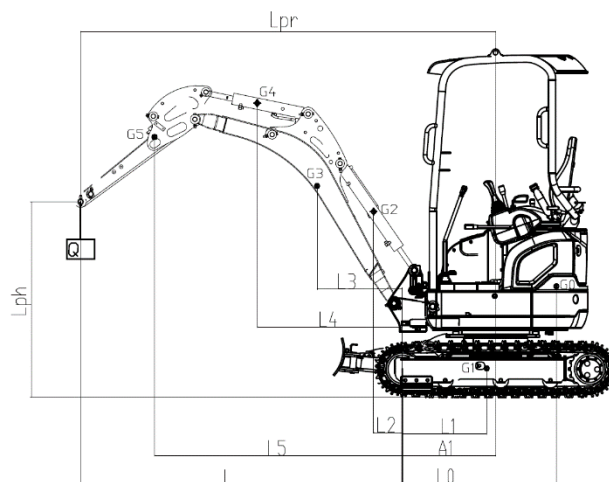


Figure 2

3) Calculation of the lift capacity at the over-side

- When lifting at the over-side of the excavator, the tipping point is located at the middle line of the outrigger, see the Figure 3:

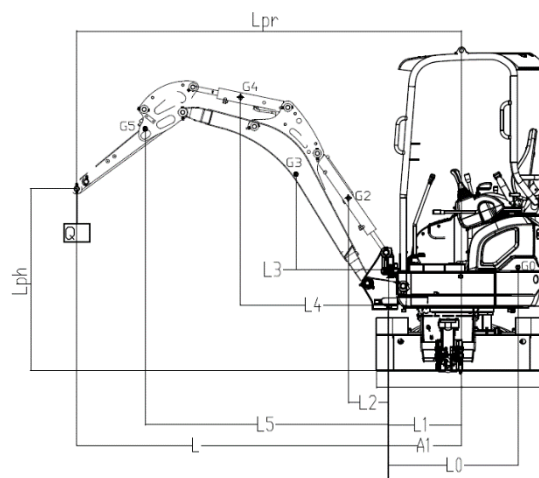


Figure 3

9.5 Table of lift capacity

Table of lift capacity (0.95m arm)						
Do not attempt to lift or hold any load that exceeds rated load capacity at the specified lift radius and height. The lift point is located at the lifting eye of the arm.						
Lph (m/ft)	Rated lift capacity – Straight ahead (back) (kg/lb)					
	Lpr (m/ft)					Lift capacity at maximum radius
	1/3.3	2/6.6	3/9.8			
2/6.6		*296.2/653				313.2/690.5
1/3.3		536.2/1182.1	296.7/654.1			258.3/569.5
Ground		500.6/1103.6	285.8/630			256.8/566.1
-1/-3.3	*970.1/2138.7	497.3/1096.4				316.9/698.6
Capacities marked with an asterisk(*) are limited by hydraulic capacities.						
Lph (m/ft)	Rated lift capacity – over-side (kg/lb)					
	Lpr (m/ft)					Lift capacity at maximum radius
	1/3.3	2/6.6	3/9.8			
2/6.6		*296.2/653				256.8/566.1
1/3.3		427.8/943.1	242.3/534.2			211.2/465.6
Ground		394.7/870.2	231.7/510.8			208.9/460.5
-1/-3.3	*970.1/2138.7	391.6/863.3				255.6/563.5
Capacities marked with an asterisk (*) are limited by hydraulic capacities.						
The weight of slings and any auxiliary lifting device must be deducted from the rated lift capacity to determine allowable net lifting load. Lift capacities are based on the machine standing on a firm, uniform level ground. The user shall consider the job conditions such as soft or uneven ground. Before operating the machine, the operator should be fully acquainted with the operator's manual and the operating safety manual provided by the manufacturer.						
NOTE 1 Lift capacities are indicated without the interventional thrust from the outside.						
NOTE 2 The lift capacities shown in this table do not exceed 75% of minimum tipping loads or 87% of hydraulic capacities.						
NOTE 3 The critical stable position is at the over-side.						
NOTE 4 Lift capacities only apply to the machine that originally manufactured and normally equipped by the manufacturer.						
NOTE 5 The total mass of the machine is 1795kg. Included 1.828m booms, 0.95m arm, 192kg counterweight, 40kg bucket, all operating fluids and a 75 kg operator.						
NOTE 6 Lift capacities are in compliance with ISO 10567:2007.						

Table of lift capacity (1.12m arm)

Do not attempt to lift or hold any load that exceeds rated load capacity at the specified lift radius and height. The lift point is located at the lifting eye of the arm.

Lph (m/ft)	Rated lift capacity – Straight ahead (back) (kg/lb)					
	Lpr (m/ft)					Lift capacity at maximum radius
	1/3.3	2/6.6	3/9.8			
3/9.8						*290.9/641.3
2/6.6			*299.9/661.2			*299.7/660.7
1/3.3		*508.4/1120.8	*329.1/725.5			*280.4/618.2
Ground		*586.1/1292.1	*327.6/722.2			*261.7/576.9
-1/-3.3	*905.4/1996.0	*450.1/992.3				*248.1/546.9

Capacities marked with an asterisk(*) are limited by hydraulic capacities.

Lph (m/ft)	Rated lift capacity – over-side (kg/lb)					
	Lpr (m/ft)					Lift capacity at maximum radius
	1/3.3	2/6.6	3/9.8			
3/9.8						*290.9/641.3
2/6.6			246.5/543.4			230.5/508.2
1/3.3		424.1/934.9	237.6/523.8			192.7/424.8
Ground		386.5/849.9	225.5/497.1			190.5/419.9
-1/-3.3	*905.4/1996.0	380.7/839.3				228/502.6

Capacities marked with an asterisk (*) are limited by hydraulic capacities.

The weight of slings and any auxiliary lifting device must be deducted from the rated lift capacity to determine allowable net lifting load. Lift capacities are based on the machine standing on a firm, uniform level ground. The user shall consider the job conditions such as soft or uneven ground. Before operating the machine, the operator should be fully acquainted with the operator's manual and the operating safety manual provided by the manufacturer.

NOTE 1 Lift capacities are indicated without the interventional thrust from the outside.

NOTE 2 The lift capacities shown in this table do not exceed 75% of minimum tipping loads or 87% of hydraulic capacities.

NOTE 3 The critical stable position is at the over-side.

NOTE 4 Lift capacities only apply to the machine that originally manufactured and normally equipped by the manufacturer.

NOTE 5 The total mass of the machine is 1795kg. Included 1.828m booms, 1.12m arm, 192kg counterweight, 40kg bucket, all operating fluids and a 75 kg operator.

NOTE 6 Lift capacities are in compliance with ISO 10567:2007.

10 Cleaning

10.1 Cleaning the system

Notice!

Property damage due to sharp water jet!
Do not hold the water jet of the high-pressure cleaner directly on the seals.

Notice!

Damage due to cleaning agents!

- Do not use harsh detergents on plastic surfaces.

➞ Clean system with high-pressure cleaner or water hose.

11 Warranty

Warning!

In the event of personal injury or material damage, the manufacturer is liable only for proven defects in the system.

- The warranty expires in the following cases:
- In case of improper or unintended use as defined in this user's manual
- In case of improper operation
- In case of insufficient care and maintenance
- When using improper spare parts
- For unallowed or unapproved technical changes
- Any change or modification must be agreed in written with the manufacturer.
- Be stolen

Danger!

indicates an immediate danger that may cause death or serious injuries if it is not avoided

Warning!

indicates a possible dangerous situation that may cause death or serious injuries if it is not avoided.

Caution!

indicates a possible dangerous situation that may cause moderate or light injuries if it is not avoided.

Notice!

indicates a possible dangerous situation that may cause property or environmental damage if it is not avoided.

12 Decommissioning and disposal

Decommissioning and disposal guidelines

12.1 Properly disassemble the unit

**Warning!**

Improper disassembly can cause an increased danger of accident.

- Contact your XCMG partner for proper disassembly of the unit.
- Disassemble the unit into single parts according to the instructions of your XCMG partner.

12.2 Disposal.

**Warning!**

Clean all oily and greasy parts before disposal. Oil and grease must not be released into environment.

Comply with the locally applicable laws when disposing of the unit's single parts and consumables.

- Clean all oily and greasy parts.
- Dispose of the components according to their nature (steel, plastic, electric and electronic parts, and etc.).
- Dispose of all consumables-even biodegradable ones-in an environmentally friendly way.
- Contact your XCMG partner regarding the purchase of a new unit.

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For this reason, we may from time to time need to make changes to figures and descriptions in this documentation which do not reflect products that have already been delivered and that will not be attached on these machines.

Technical data, dimensions and weights are only given as an indication. Responsibility for errors or omissions is not accepted. Non-metric weights and measurements are approximate. Translation of original Operation and Maintenance Manual.

The cover features the machine with possible optional equipment.

Photographs and graphics are symbolic representations and may differ from the actual products.

The Operation and Maintenance Manual and any amendments to it must be constantly available at the place of use of the vehicle. Possible amendments are included at the end of the Operation and Maintenance Manual.



XUZHOU XCMG EXCAVATOR MACHINERY CO., LTD.

Add: No.39 Gaoxin Road Economy Technology Development Zone Xuzhou, Jiangsu, P.R.China

Tel: +4921518209351

Fax: +4921518209359

Service hotline: 4001109999

Post Code: 221004

Website: <http://www.xcmg.com>

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XUZHOU XCMG EXCAVATOR MACHINERY CO., LTD.

Add: No.39 Gaoxin Road Economy Technology Development Zone Xuzhou, Jiangsu, P.R.China

Tel: +86 (0) 516 8311 1838

Fax: +86 (0) 516 8311 1896

Service hotline: 4001109999

Post Code: 221004

Website: <http://www.xcmg.com>

XCMG European Sales & Services GmbH

Add: Europark Fichtenhain B 4, 47807 Krefeld, Deutschland

Tel: +49 (0) 21 51-82-09-351

Fax: +49 (0) 21 51-82-09-359

E-mail: Europe@xcmg.com