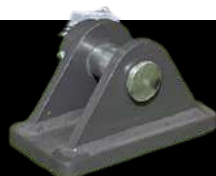


EXCAVATOR GRABS OPERATION MANUAL



Maintenance & Installation Checklist

Every 8 Hours	Completed?
Mechanical Grabs	
Check all nuts and bolts and make sure tight	
Lubricate all grease nipples	
Ensure stiff arm mount is correctly positioned to allow full cycle of bucket cylinder without the arm fouling/striking the excavator	
Non-Rotating Hydraulic Grabs	
Check all nuts and bolts and make sure tight	
Check hose fittings for leaks and make sure tight	
Start up 10 cycles before use	
Ensure any unused excavator lines are flushed prior to connection of grab	
Lubricate all grease nipples	

Maintenance & Installation Checklist

Every 8 Hours	Completed?
Rotating Hydraulic Grabs - Vane Type	
Check all nuts and bolts and make sure tight	
Hold down bolts to frame 380NM	
Clamp bolt (only tighten when hold down bolts loose 770NM)	
Check hose fittings for leaks and make sure tight	
Start up 10 cycles before use	
Ensure any unused excavator lines are flushed prior to connection of grab	
Lubricate all grease nipples	
Set rotation pressure to 2500PSI and 20 Litres per minute flow	
Set open close pressure to 3500PSI and flow to desired cycle speed (40-80litres per minute)	

Maintenance & Installation Checklist

Every 8 Hours	Completed?
Rotating Hydraulic Grabs - Ring Gear Type	
Check all nuts and bolts and make sure tight	
Check hose fittings for leaks and make sure tight	
Start up 10 cycles before use	
Ensure any unused excavator lines are flushed prior to connection of grab	
Lubricate all grease nipples	
Set rotation pressure to 2000PSI and 20Litres per minute flow	
1-8TON WEIGHT CLASS EXCAVATORS:	
Set open close pressure to 3500PSI and flow to desired cycle speed (40-80litres per minute)	
12-35TON WEIGHT CLASS EXCAVATORS	
Set open close pressure to 4500PSI and flow to desired cycle speed (80-140litres per minute)	

FOREWORD

Main purpose of the manual:

To help improve the safety and application accuracy of the grapple, and increase the economic benefits.

To help prevent and avoid danger to operator.

To help minimize maintenance costs and equipment downtime.

Maximize efficiency and equipment durability.

This manual shall be protected by the rules and regulations of the relevant country, supplemented by the relevant local regulations.

It is the obligation of every user to comply with the safety regulations of the equipment.

The operator must thoroughly understand the instructions provided by the manufacturer so that they can be consulted at any time.

The user of the grapple must fully understand the general safety instructions and operating instructions, and strictly follow the relevant instructions under the following working conditions .

Operation/preparation for work/maintenance/cleaning of equipment/replacement of parts

After-sales service/regular inspection and maintenance

During equipment transportation:

For safe operation, it is important to observe the instructions in this manual and to keep the equipment working within the specified limits. The equipment is designed and manufactured for specific use and performance. Do not use the equipment for any other purpose than that for which it is intended, or for excessive use in excess of its design capacity. The grapple must be installed on the excavator suitable for its model. It can only be used for material grabbing, loading and unloading. Not to be used for other purposes .

The manufacturer and supplier shall not be liable for malfunctions caused by improper use in the following cases:

Pulling/removing girders, supports, walls, and bulkheads may damage the grab and slewing bearing, and may cause the excavator to lose stability; Not be used for crushing and disassembly; Not be used to support a mobile excavator; Not be used for lifting and load transportation; Do not work underwater or in an explosive atmosphere .

The pressure setting of the hydraulic system of the excavator shall not be too high. Excessive pressure will cause damage to the hydraulic components of the grapple, and serious personal injury. Please consult the supplier before the first use to set proper pressure and flow of the excavator.

PRECAUTIONS

The equipment should only be used if the following safety instructions are fully understood. Operators should understand the operating instructions, equipment manuals and work procedures and regulations. Before starting operation, ensure that you are familiar with the installation, inspection and operation of the equipment.

1. The operator must have received professional training in excavator operation or have rich experience in using it.
2. When using the equipment, be careful to avoid injuries caused by splashing debris, loose waste materials or flying objects during the operation. Operators should wear safety protective equipment before starting work.
3. During operation, disassembly and assembly, broken scrap steel or pins may splash and harm people around them. Therefore, preventive measures must be taken to keep workers away from the construction site appropriately.
4. For safety reasons, it is recommended to install a protective cover in the cab. Before starting work, the operator should check whether there are any dangerous factors around the excavator and fully understand the type and shape of the attachment.
5. When using this equipment, the operator's eyes, ears and respiratory system should be protected. The operator should wear a well-fitting work suit, otherwise it may cause accidents and injury to the operator.
6. If the excavator is in a high temperature state, the hydraulic oil pipe may leak or burst, and the leakage will cause the hydraulic oil to be ejected under high pressure. Oil streams can penetrate human skin and cause permanent damage and death. Hot hydraulic oil can cause burns. Therefore: Do not use your hands to find the leak location; Keep the face away from potential leaks from beginning to end. If hydraulic oil seeps into the skin, ring 000 immediately.
7. The grapple is not insulated, so please do not work near the power supply. Prevent electric shock injury.
8. Damage to hydraulic components: Sand and dirt may enter the hydraulic lines and cause damage. Clean all hydraulic lines and attached hoses in advance. Warranty will be voided by a negative hydraulic sample and if contamination is found.

Shipping tips:

1. Please select a machine with appropriate capacity to transport the grapple, and overload transportation is not allowed. During the loading and unloading process, ensure that the grapple is stable and does not tilt. When it is transported in the truck, please fix it with a belt or chain to prevent it from slipping or turning over in the truck.
2. When the hydraulic hoses are removed, seal all hose ports and connections with the plugs and capped nuts provided.
3. If the hose is still connected to the grapple for transportation, make sure that the hose is inserted into the grapple to prevent damage .
4. **WARNING!** -The hot oil discharge hydraulic system is under high pressure. If the hydraulic connection is loose or disconnected, the hydraulic oil will be ejected under high pressure . This can result in serious injury. Make sure that the pressure in the hydraulic system is released before disconnecting the grapple .

Functional test:

Always perform a function test before using the grapple . Ensure that all hydraulic lines and connections are tight and that the grapple runs smoothly.

Prepare the grab for proper use .

Use the arm of the excavator to raise the grapple until it hangs vertically. Close and open the enclosure . Use the "Rotate the grab" function to rotate the grab left and right. hydraulic pipeline of the grapple works normally. Verify whether the hydraulic pipeline of the grapple works normally.

If oil leakage or other faults are found in the hydraulic pipeline, the grab shall be closed immediately. Release the pressure of the hydraulic system by releasing the pressure in the hydraulic oil tank.

Do not use the grab again until all leaks and faults have been corrected.

SAFETY WARNING

 DANGER	Danger indicates an imminent danger which, if not avoided, could result in death or serious injury. However, this sign is only issued in extremely dangerous situations. (Indicates risk of death or serious injury)
 WARNING	A warning indicates a hazard that, if not avoided, is highly likely to result in death or serious injury. (Indicating the possibility of death or serious harm)
 ATTENTION	Attention indicates a direct or indirect state of personal safety and property protection that requires attention. (Indicate the company's regulations or personal safety rules)

Most of the accidents on the work site are caused by the lack of comprehensive understanding of basic operation methods and inadequate maintenance services . Accidents mostly occur in places where users think they may be dangerous .

Therefore, necessary inspection and maintenance should be carried out before operating the equipment. The operator shall have sufficient experience in operating the equipment and shall fully understand the instructions in the manual in order to operate the equipment. If you are still unfamiliar with this manual, consult another expert for operation, service, and inspection . Read and fully understand this manual and the safety information in it prior to inspection, service, and operation . In order to better understand this manual and the warning signs of equipment safety, the safety level and meaning and other relevant information are listed below, and the user is required to fully understand its content and meaning.

This manual and each label and warning plate are very important for safety. Therefore, they should be kept clean and recognizable, and replaced with new ones when they are damaged. To avoid and prevent danger, follow the safety instructions. We cannot assume all dangerous working conditions in advance, and any rules or warning signs in this manual do not cover every situation related to safety. These operation, inspection or maintenance services do not cover all safety instructions. For the sake of safety, users should take necessary safety measures according to their respective working conditions.

It is not possible to anticipate all hazards that may arise in various operating conditions such as operation, assembly or service. Therefore, this manual does not cover any specific warnings and every situation related to safety.

BEFORE WORK

[SAFETY INFORMATION]



DANGER

Do not operate the grapple until you have carefully read and fully understood this manual.

Be sure to clearly understand the safe operation and correct maintenance service described in this operation manual, so that the equipment can continue to maintain good performance through maintenance in the future.

Observe the safety instructions described in this manual, as well as the safety rules of the site.

The working area of the equipment shall be located in a place where there is no potential danger to employees, and the operator shall move the excavator very carefully.

During the operation, please ensure that the personnel are at the specified safety distance in the working area of the excavator.

During any operation, be sure to wear work clothes, protective glasses, helmet, gloves and other protective tools. When installing the excavator grapple, the grapple may touch the cab. Use caution when the equipment is near the cab.

When the grapple is lifted, never walk under it.

If any problem is found during the operation, please stop the operation immediately, find out the cause, solve the problem and restart the work.

Check the equipment regularly and check the accessories according to this manual.

Before leaving the factory, the grapple has been tested. Therefore, the customer should not disassemble and change the equipment at will.

If there is any problem with the main accessories, please do not disassemble them by yourself, contact the manufacturer or the designated service provider.

Before conducting any maintenance ensure the grab is on the ground and the machine is isolated.

Read the warning clauses and follow the safety precaution instructions .

1. Before starting the operation, be sure to understand the regulations, warnings and work procedures described and follow them strictly.
2. Be sure to wear operator protective equipment, including helmet, safety shoes, work clothes, etc. Safety glasses, earplugs, safety gloves, and other protective equipment can also be used when needed.
3. Without permission, the user shall not change the equipment. In case of danger and failure, manufacturer shall not bear any responsibility, nor shall it compensate the second party or the third party for indirect damage .
4. Ground conditions and site geography shall be fully observed by visual inspection or photographs . Ensure that all factors that may contribute to the hazard are eliminated so that the work area can be cleared in an orderly manner.
5. Unauthorized personnel are not allowed to enter the work area .

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6. After starting to operate the equipment, the equipment will be heated to a very high temperature . If there is no protective equipment on the surface of the equipment, it will burn your hands when touching. Therefore, be sure to wait for the temperature to return to normal, and then check the oil pipe, oil pressure system, oil filter, coolant or repair and change the oil.
7. Before starting the operation, the equipment and excavator shall be kept isolated, and no other personnel shall be allowed in the working area .
8. If the operator's hands and feet are trapped in the running equipment, it will lead to serious accidents . Keep people at least 50m away from a working grab.
9. Any problem during the operation shall be reported to the relevant person in charge immediately, and the equipment can be operated only after the necessary maintenance is completed.
10. For the sake of safety, the owner of the equipment should check the equipment every 8 hours of operation.
11. Parts and materials in the equipment may wear out or change with the extension of working time. However, if the component is found to be defective or damaged, it should be repaired or replaced, even within the lifetime of the component.
12. Unauthorized personnel are not allowed to enter the working area of the equipment.
13. The internal pressure of the equipment is usually controlled by the hydraulic system . When the oil is supplied and drained from the oil pressure system, the engine shall be shutdown and wait until the oil is sufficiently cooled.
14. Do not operate the equipment if you are depressed or drunk.
15. Warning label:



(A) Use earplugs



(B) Use safety glasses

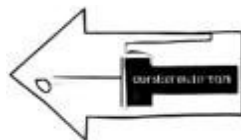


(C) Use a gas mask



(D) Read this manual carefully
before operating the equipment

Butter injection label:



16. Be sure to check the hydraulic system for any conditions that may cause oil leakage . Straighten the twisted hose before operating the equipment. Check that all nuts, nuts and grease fittings are in the correct position and check the pressure control valve . The pressure gauge must be in the correct position for proper operation .

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17. Check for signs of damage, such as cracks in welded parts and bending and bending of structural parts . Any signs of cracking and bending may damage the surface structure . Examine the area carefully. Do not use the equipment until the necessary repairs have been completed.
18. Any operation that is not within the scope of this specification and is overused is the wrong way to use it. Therefore, the manufacturer and supplier do not assume any responsibility for the loss caused by such incorrect use
19. A detailed description of the proper use of the equipment in the operation and maintenance manual. Opening and closing the grapple: When the grapple is attached to the excavator, the grapple can be operated by the excavator's hydraulic system. All functions that control the excavator remain unchanged. The grapple is opened and closed by electrical and hydraulic signals. Turn the safety switch of the grapple to the "OFF" position when leaving the excavator cab to avoid inadvertent actuation of the grapple.
20. Low Ambient Temperature Before using the grapple at an ambient temperature lower than -20°C, make sure that the excavator is fully warmed up. When not in use, the excavator and grab should be parked in the normal temperature area . Using the grapple while the hydraulic oil is still frozen will damage the seals of the hydraulic components . Do not use the disassembling and sorting grapple until the oil temperature is at least 0°C. Allow the excavator to warm up until it reaches the operating temperature specified by the excavator manufacturer.



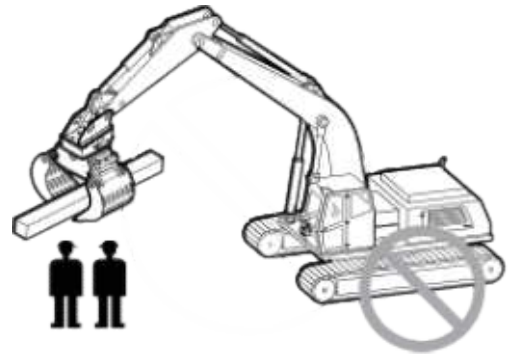
WARNING

- (1)Improper maintenance may seriously damage the equipment. Therefore, repair and maintenance shall be carried out by professionals authorized by the Company.
- (2)Please read this manual carefully and follow the instructions for maintenance, repair or cleaning.
- (3)Maintenance, repair or cleaning shall be carried out on a solid floor with few people and away from other workers.
- (4) Do not modify or disassemble the equipment at will, otherwise the structural configuration or performance will be affected. Please use original parts .

RISK OF FALLING OBJECTS

Falling objects can cause serious injury.

Never operate the grab above the cabin, other persons or other machines.



Unsafe surface RISK OF TIPPING

The excavator can tip over and cause injury and damage.

Only operate the grab when the excavator is on a safe, stable surface.



Using the chain RISK OF TIPPING

The excavator can tip over and cause injury and damage.

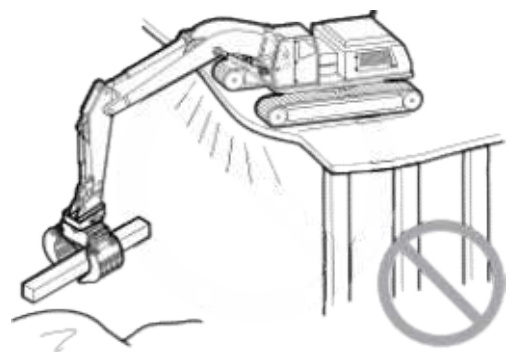
Only operate the grab when the excavator is on a safe, stable surface.



Non-bearing, suspended ceilings RISK OF COLLAPSE

The excavator can crash down and cause injury and damage.

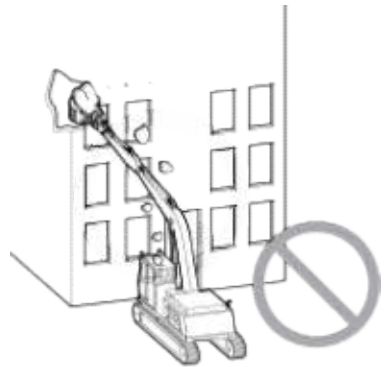
Only operate the grab when the excavator is on a load-bearing ceiling.



Working position FALLING DEBRIS

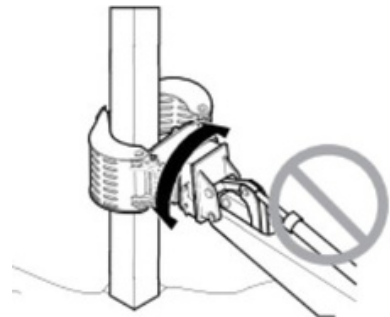
Large pieces of falling debris can cause injury and damage.

Never begin demolition works from the bottom or the middle of a structure.



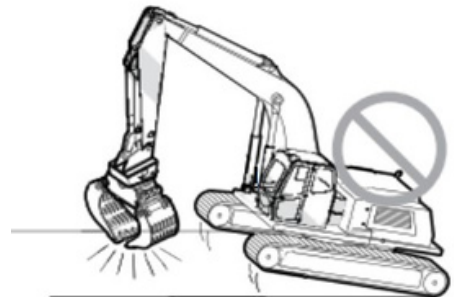
Rotating the demolition and sorting grab

Never rotate the demolition and sorting grab while operating the grab in a horizontal position. This can cause severe damage to the grab.



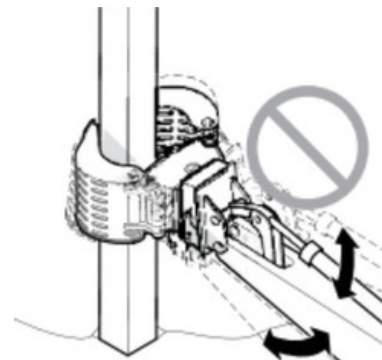
Moving the excavator

Never move the excavator sideways by placing the demolition and sorting grab on the ground to lift the excavator. This can cause severe damage to the grab.



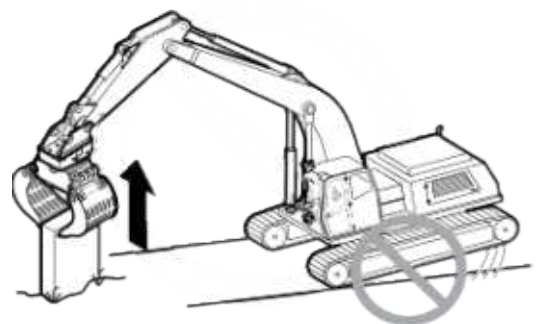
Extending the bucket cylinder

Never extend the cylinder while operating the grab. This action will make the grab unusable.



Pulling

Never use the grab to pull on support beams, supports walls or tree stumps. This could result in severe damage. Moreover, the excavator could lose stability and tip over.



STORAGE OF GRABS



WARNING

At the end of the work of the grab, the hydraulic oil and some parts still have high temperature residual heat, please be careful!

Before storage, add enough lubricating grease and store it in a dry place. Apply lubricating grease to the rust, too. Changes in humidity and temperature can cause rust and corrosion. If it is stored with a hose, seal the port with a plug. If the hose is not connected, seal the oil port with a nut to prevent leakage of hydraulic oil or entry of other substances. Place the grab onto the board and make sure that the board is strong enough and big enough to bear the equipment. When removing the hydraulic hose, if there is any hydraulic oil flowing out, it shall be handled according to the hazardous waste disposal regulations. If the equipment needs to be stored for a long time, clean and dry all parts and store them in a ventilated environment. Clean and lubricate functional parts at least once a month. Apply lubricating grease to the oil cylinder rod and other parts easily rusted.

SERVICE AND REPAIR

1. Daily Checkpoints: **Every 8 hours**

Check if the grab is damaged or deformed.

Check the hose connector for leakage.

Check whether the pin shaft and bushing are seriously worn, and replace them regularly.

Check whether the bolts and nuts are tightened or loosened.

Check whether the gear is loose.

Check whether the hydraulic oil is clean.

Check whether the circuit is worn or broken.

2. Routine Checkpoints:

The seals and rotating parts of the hydraulic cylinder will be worn out, so please replace them in time when they reach the service life. Parts shall be replaced with original parts.

Check whether there is enough lubricant on the rotating shaft and whether the bolts are fastened.

Check the tightening state of bolts, install new bolts, check after 8 hours of use, and ensure that the tightened bolts are not loose. Damaged bolts shall be replaced in time. Bolts should be replaced after approximately 1500 hours or 8-12 months of use after installation.

TROUBLESHOOTING

Phenomenon	Reason	Handle
No action	1.The solenoid valve is stuck, causing the oil circuit to be blocked. 2.The motor output shaft/linkage shaft is broken. 3.There is a problem with the control harness and no signal is received.	1.Check and open the stop valve . 2.Replace the fuse. 3.Check battery voltage and charge. 4.Replace the defective harness.
Cannot rotate	1.The solenoid valve is stuck, causing the oil circuit to be blocked. 2.The motor output shaft/linkage shaft is broken . 3.There is a problem with the control harness and no signal is received.	1.Clean or replace the solenoid valve. 2.Replace with a new shaft. 3.Replace the old wiring harness with a new one.
You can't open and close	1.The solenoid valve of the is stuck, causing the oil circuit to be blocked. 2. The pressure of the excavator is low, resulting in insufficient flow. 3.The cylinder is depressurized, causing the cylinder to be weak.	1.Clean or replace the solenoid valve. 2.Use the pressure gauge to adjust the pressure. 3.Replace cylinder oil seal/cylinder.
Weak or slow opening, closing and clamping	1.The hammer line pressure is low, causing the cylinder to be weak. 2.The cylinder is depressurized, causing the cylinder to be weak.	1.Regulating Hammer Line Pressure Valve 2.Replace cylinder oil seal/cylinder
Rotation speed is slow	1.The flow valve is adjusted too much, resulting in poor fuel supply. 2.The solenoid valve is stuck, resulting in poor fuel supply.	1.The regulates the flow valve 2.Clean/Replace Solenoid
The action is incoherent	1.The solenoid valve is stuck, resulting in poor fuel supply. 2.The control harness of the has a breakpoint, resulting in poor contact.	1.Clean/Replace Solenoid 2.Replace the harness

WARRANTY STATEMENT

The Warranty does not cover the following:

1. Normal wear and tear.
2. Faults or failures due to incorrect dealer assembly, pre delivery inspection or installation.
3. Faults or failures due to use under load conditions greater than the design specification.
4. Transportation costs of parts.
5. Consequential loss of any description.

Users must be operated in accordance with the recommended procedures and within the ranges specified on the GRAPPLE Unit and stated in the operating manual.

Any claims under this warranty must be made in writing within fourteen (14) days of the fault occurs.

Any claims not received within 14 days may be deemed invalid.

Any goods returned by the customer, under warranty or for repair, must be freight paid unless authorised in writing.