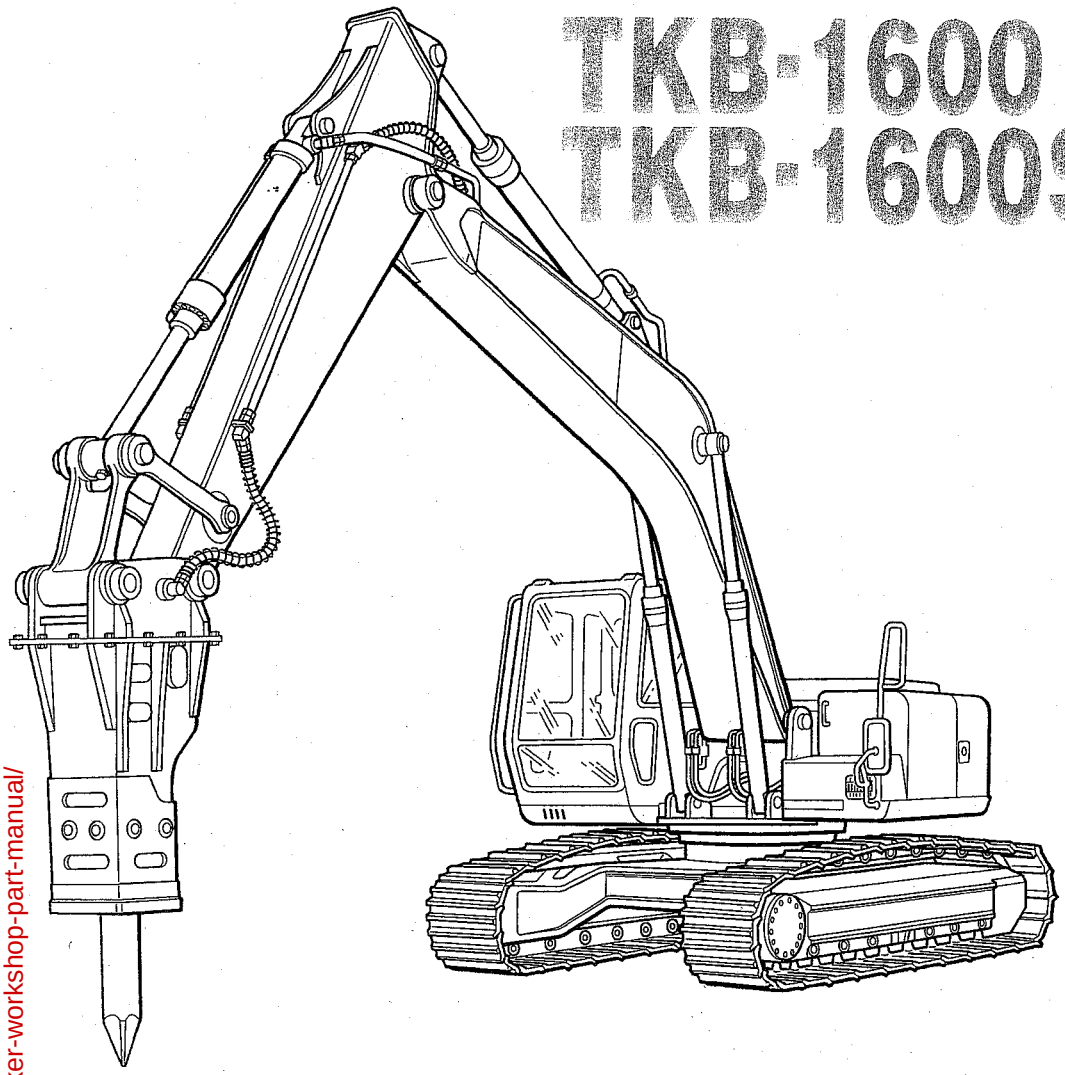
TAKEUCHI

HYDRAULIC BREAKER

Instruction Manual
Parts List

TKB-1600
TKB-1600S



TAKEUCHI MFG.CO.,LTD.

⚠ WARNING

Inproper use of the breaker may cause serious injury or death. Operators and maintenance personnel must read this manual before operating or maintaining the breaker. This manual should be kept in the Cab of the excavator for reference and periodically reviewed by all personnel concerned.

NOTICE

Takeuchi has operation and maintenance manuals written in several languages. If a manual in another language is required, contact your Takeuchi distributor.

Thank you for purchasing a Takeuchi Hydraulic Breaker.

Please be sure to read this Operation Manual through before use.

- This manual contains important information regarding the safe and correct use of the Takeuchi Hydraulic Breaker. Please familiarise yourself with the instructions to avoid accidents resulting in serious injury or death to the operator or other employees and to avoid damage/break down to the breaker or excavator.

- The manufacturer disclaims all liabilities arising through accidental loss or damage incurred or inadequate maintenance carried out. In the event of this manual being mislaid or lost, contact your local Takeuchi distributor for a replacement.

※ If you have any inquiry about the contents of this manual, contact with the distributor in your area.

PRIMARY SAFETY MATTERS TO BE OBSERVED

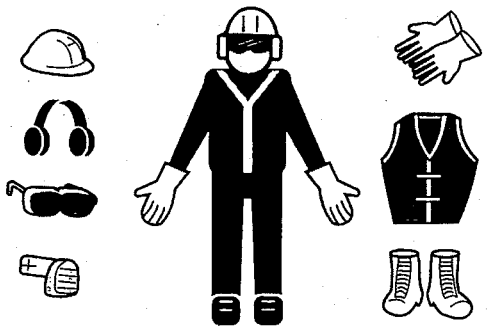
Serious injury or death may occur if safety rules for breaker operation, maintenance and repair procedures are not understood. To prevent accidents, be sure to read this manual carefully and understand it fully before operating the breaker for the first time or carrying out maintenance/repairs.

DANGER **WARNING** **CAUTION** **SAFETY WARNING**

Please observe these signes throughout the manual. Failure to do so may result in serious injury or death to the operator or other employees.

■ SAFETY CLOTHES

When operating the breaker or carrying out any maintenance or repair work, always wear protective items appropriate for the job in hand. Some of the items shown below are mandatory on ALL Sites.



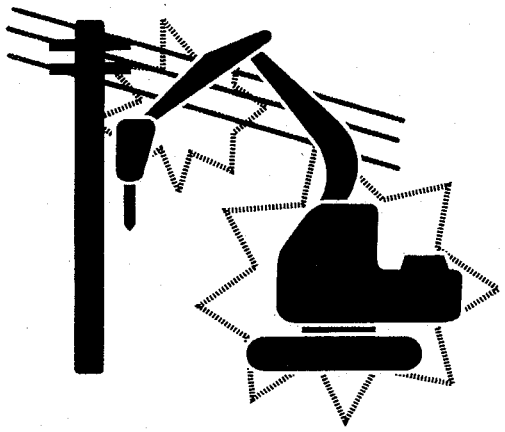
DANGER

■ PAY ATTENTION TO AN OBSTACLE

Extreme caution must be taken when working near electric power lines.
Keep the minimum safe distance from the electric lines.
Ask the electric power company in advance for the voltage of power lines at the site.

MINIMUM SAFE DISTANCE FROM POWER LINES

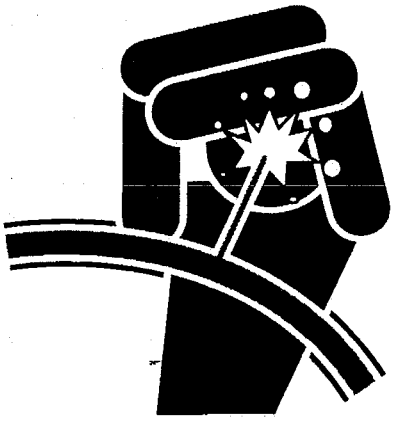
TRANSMISSION VOLTAGE (V)	MINIMUM SAFE DISTANCE (m)
Service Wire	
6,600	3
Transmission Line	
33,000	4
66,000	5
154,000	8
275,000	10



WARNING

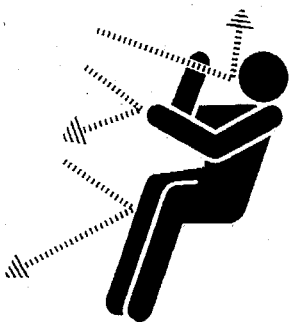
■ PAY ATTENTION WHEN REMOVING HYDRAULIC PARTS

The oil in the hydraulic tank is under high temperature and high pressure during operation, so care must be taken when removing caps, hoses, etc.
Always release the pressure in the tank before removing any parts.



■ PAY ATTENTION TO FALLING OR SCATTERING OBJECTS

To provide protection from falling objects, flying rock splinters, etc., always secure safety guards to the cab of the excavator and wear the appropriate safety items.



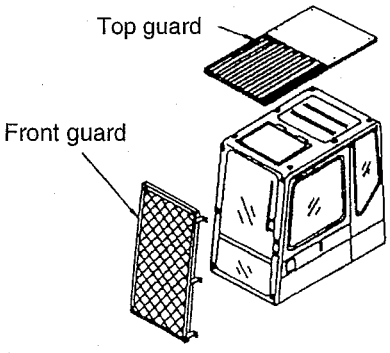
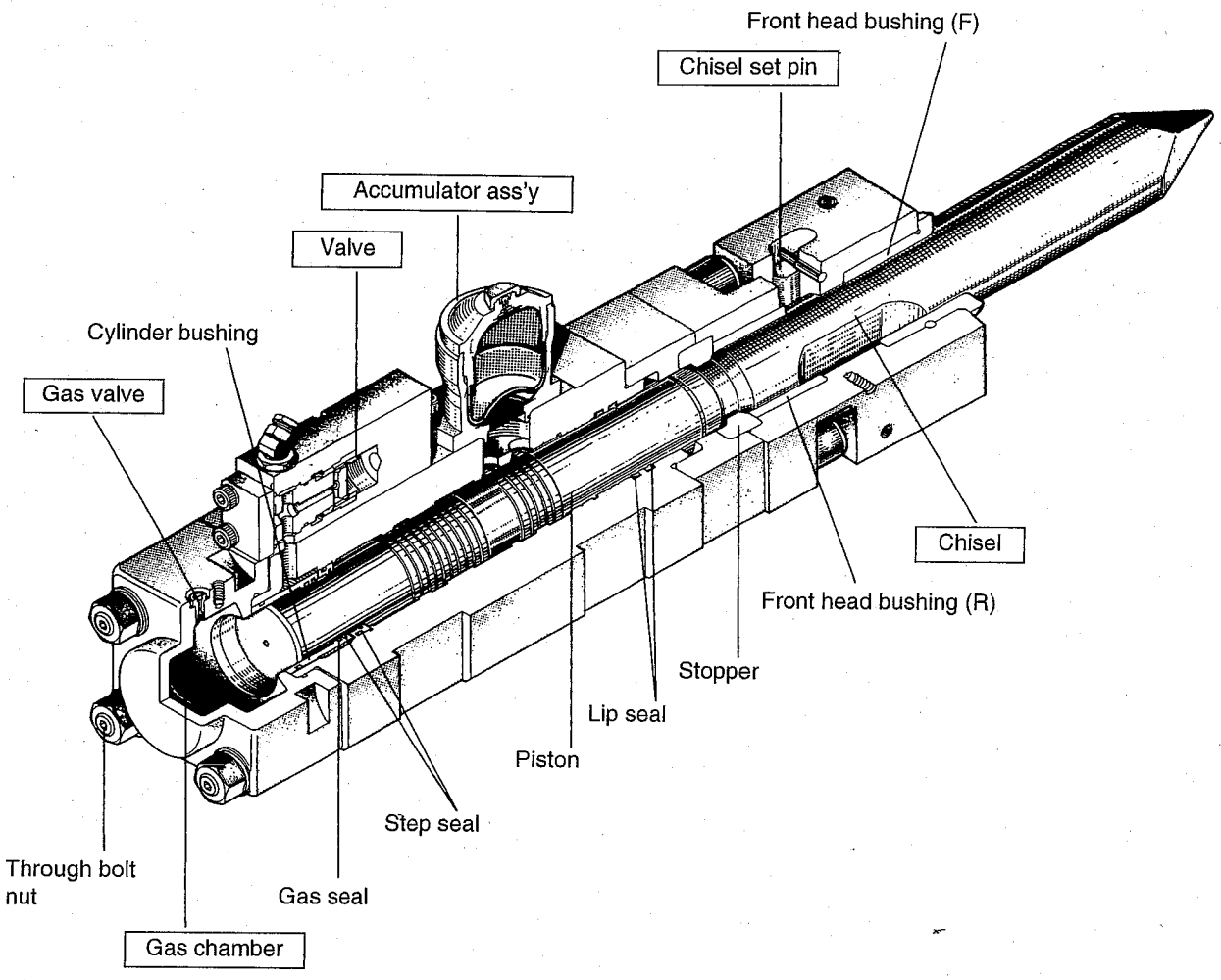


Table of Contents

Name and Function of Each Part

■ Structural figure



Accumulator Ass'y, Gas chamber

Chamber enclosing N_2 (nitrogen gas)

- Gas energy to provide blowing power
- Absorbs surge pressure from piston reaction
- Break action for stable hydraulic pressure

Valve

Switches hydraulic circuit in the piston rear chamber.

Gas valve

Injection port for nitrogen gas
Required pressure:
At low temp. 0.2~0.29 MPa
At high temp. 0.25~0.34 MPa

Chisel

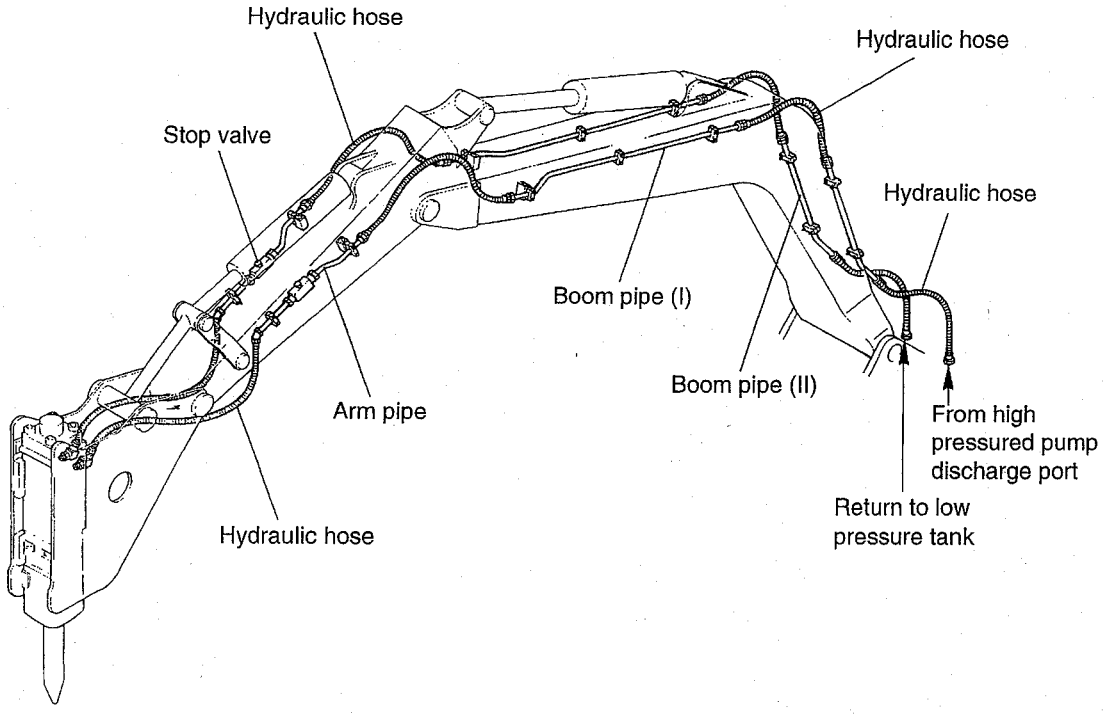
Point type, flat end type chisels are available.
Select either one according to the application.

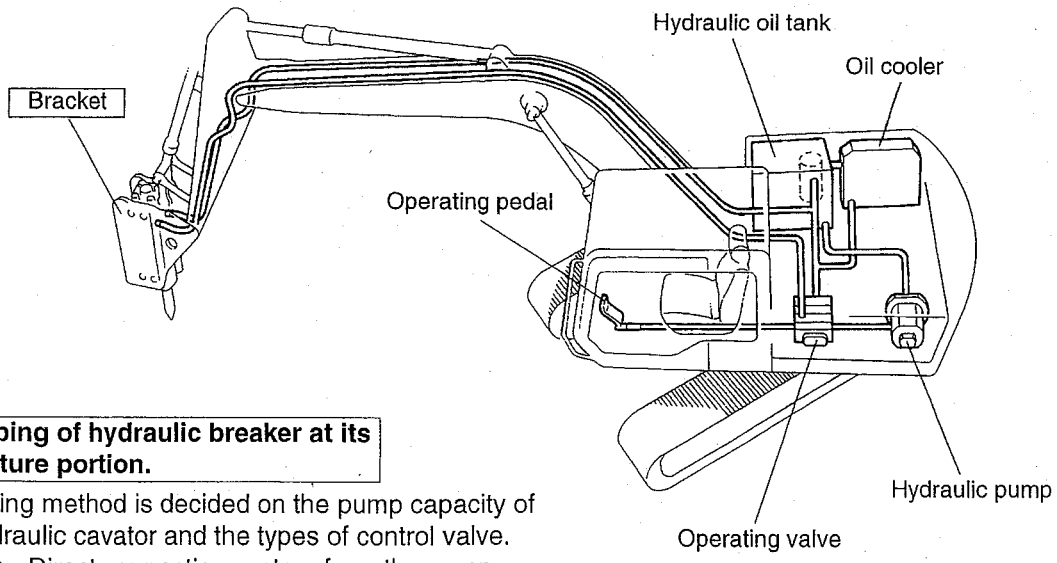
Chisel set pin

Retains chisel in bush housing.

■ Hydraulic piping

Before fitting the breaker, ensure the excavator is piped with a breaker circuit. This is a seperate circuit to operate the breaker only. If the excavator does have a breaker circuit or if you are unsure, please contact your local Takeuchi distributor.





Piping of hydraulic breaker at its fixture portion.

Piping method is decided on the pump capacity of hydraulic cavator and the types of control valve.

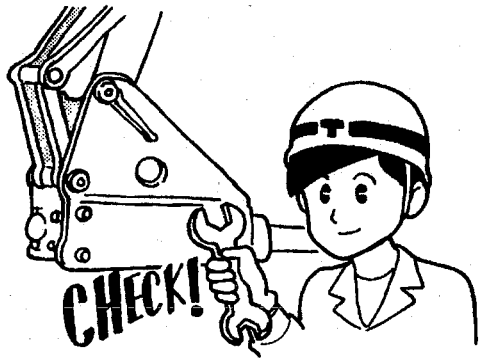
- Direct connection system from the pump.
- Sub valve method.
- Switching from drive method.

Do's and Don'ts

Safety check before operation

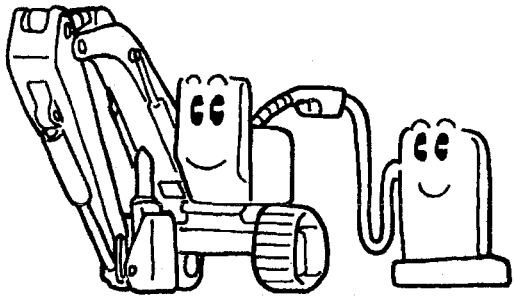
Did you check it?

BOLTS AND NUTS



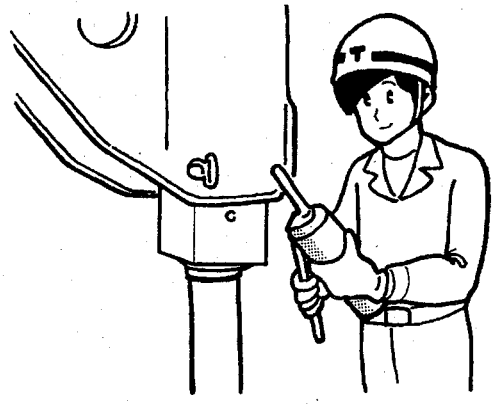
Please check that all bolts are tightened to the correct torque setting.
(For the tightening torque, see page 14 for 'bolts for each parts')

HYDRAULIC OIL LEVEL



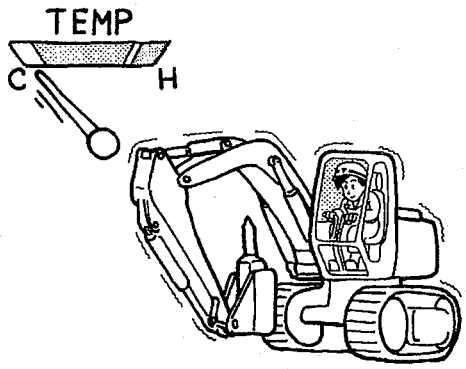
Please check oil level in hydraulic tank and top up if necessary.

GREASING UP



Apply grease to front head section of Breaker.
(For further details, see page 15 for 'greasing')

WARMING-UP (IDLING) OPERATION



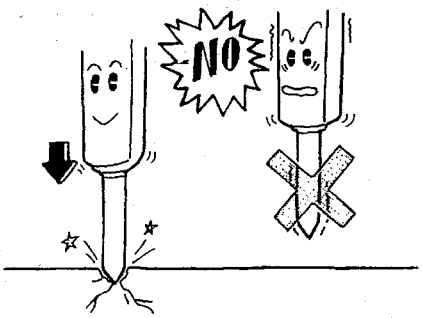
Allow excavator to idle for a few minutes and check temperature gauge is functioning before operating the breaker.

Do's and Don'ts

Safety check during operation

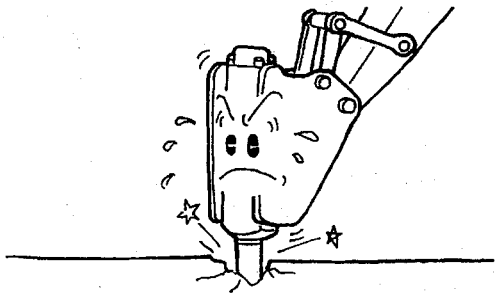
NEVER DO THIS, PLEASE!

Idling blows not permitted!



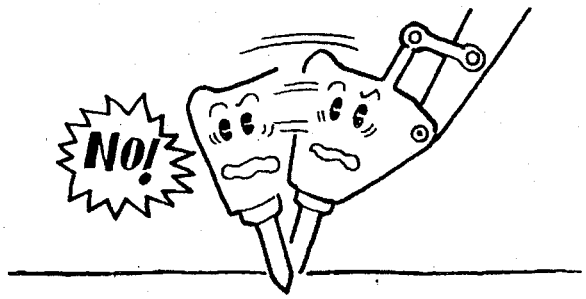
'Idling blow' means operating the breaker without the chisel contacting the material or the contact pressure is too light. This will cause wear, breakage or loosening of bolts and nuts.

Do not blow continuously



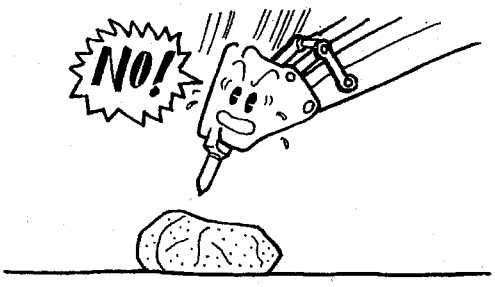
Please refrain from continuous blowing in the same point. This will cause premature wear to the chisel and other parts. If the material does not break after approx. one minute please advance to a different point.

Do not move the breaker back and forth once the naferial has been penetrated



This will cause wear to through bolts, chisel and front bushing, and breakage may occur.

Do not strike the material violently



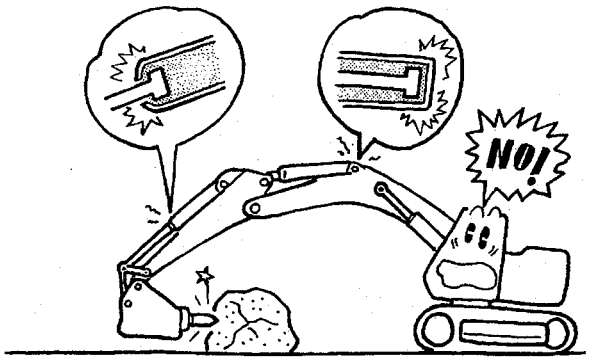
The hydraulic breaker is much heavier than the bucket. Please operate the excavator slowly and do not strike the material violently. This will cause damage to the excavator and breaker.

Do's and Don'ts

Safety check during operation

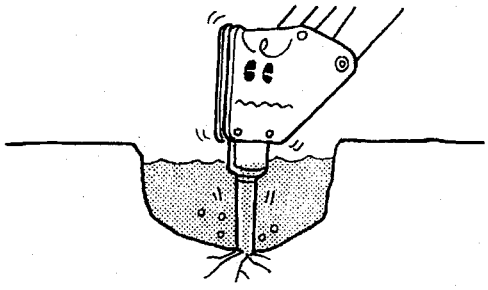
NEVER DO THIS, PLEASE!!

Please do not blow the object with cylinder stroke-end.



Operating the breaker with the cylinder rams at stroke-end may cause damege to the rams and front section of excavator.

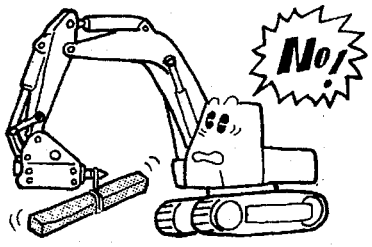
Do not operate the breaker under water.



Do not operate with the breaker body under water. It will cause serious damage to the breaker. Only certain models are designed to be used nuder water but only when a special kit is used. For further information, contact your Takeuchi distributor.

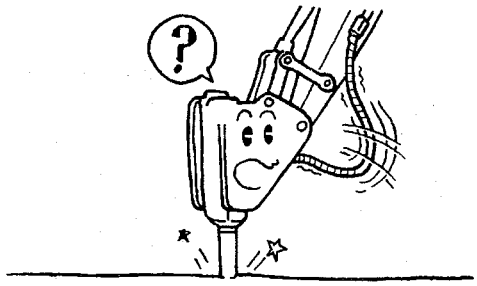
DO YOU KNOW!

Do not use breaker for lifting the object.

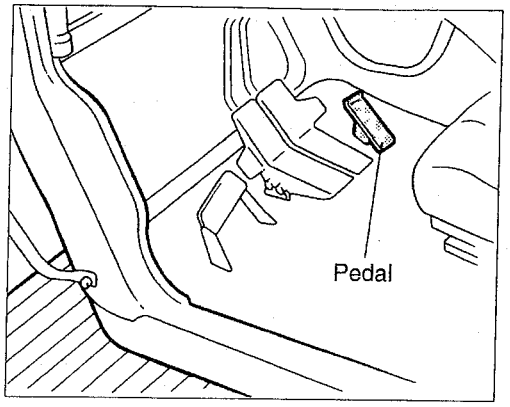


Please do not use breaker, bracket or chisel for lifting or carrying items. It will cause damage and wear to the breaker or excavator front section.

When hydraulic hose swing abnormal....



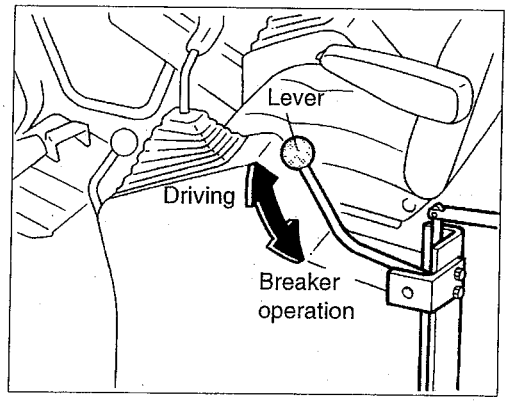
Its cause may be leakage of nitorogen gas from back head gas chamber. In such case, check promptly the gas pressure and fill to the required pressure.



Operation method of breaker

There are two methods for operation, depending on the type of control valve of pump (of excavator).

■ Pedal method (Direct connection system from the pump & Sub-valve system)



■ Valve switching method. (Switching from drive method.)

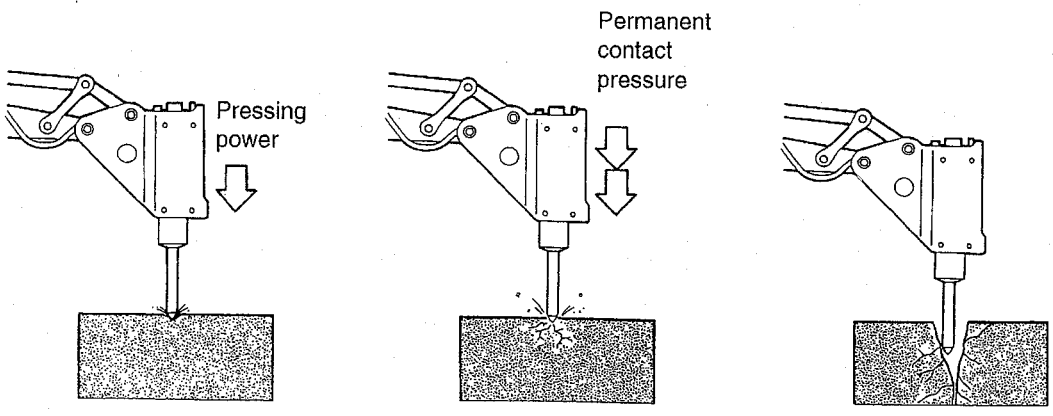
Change switching valve (which is on side of drivers seat) to breaker position. Push the driving lever forward to operate the breaker. Change switching valve to the drive position to move excavator forward.

Operation of the breaker

❶ Apply contact to the material.

❷ Keep the chisel at perpendicular position, and operate the breaker.

❸ Stop blowing when the material is broken.



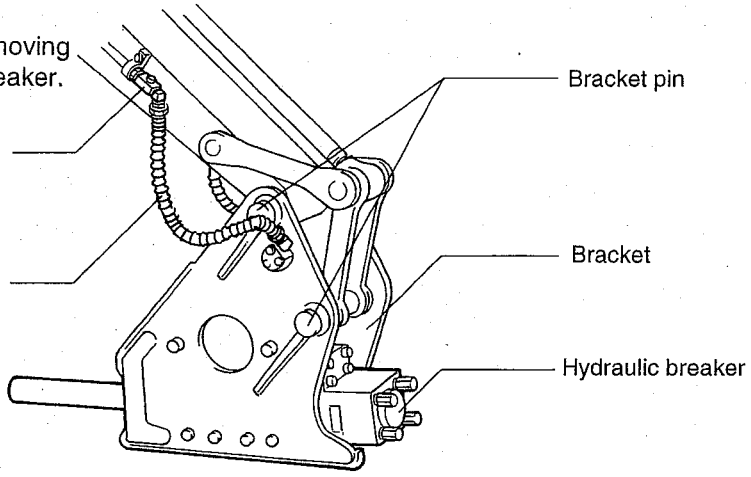
Caution

1. Please allow excavator to idle before operating breaker.
   Check to see if the needle of temp. Gauge is functioning.
2. Set the r.p.m. (revolution per minute) below the designated level.

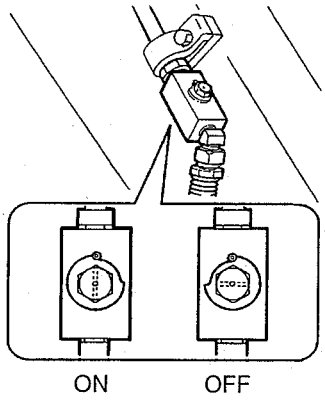
Removing & Attaching the Breaker

Procedure to remove the breaker

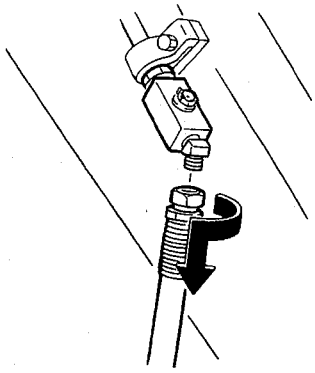
❶ Position when removing or attaching the breaker.



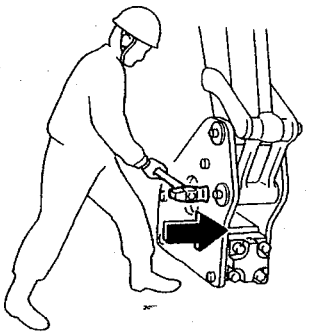
❷ Turn stop valve to 'off' position.



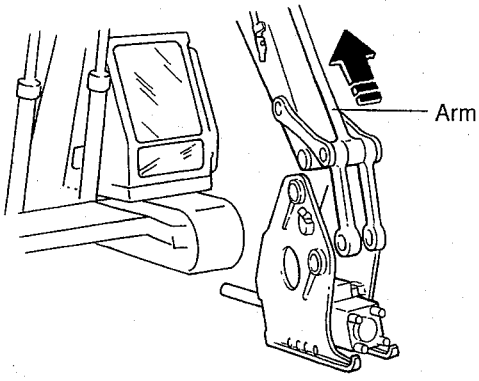
❸ Remove the hose from piping on the arm.



❹ Remove two bracket pins.



❺ Raise the arm slowly and remove the breaker.



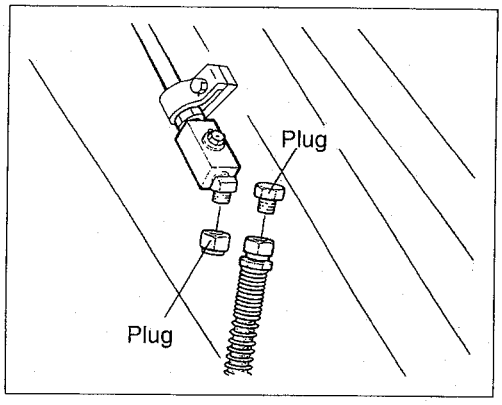
Caution! Remember to fit blanking plugs to the ends of the pipes on the excavator and to the hoses on the breaker to prevent dirt etc. from entering.

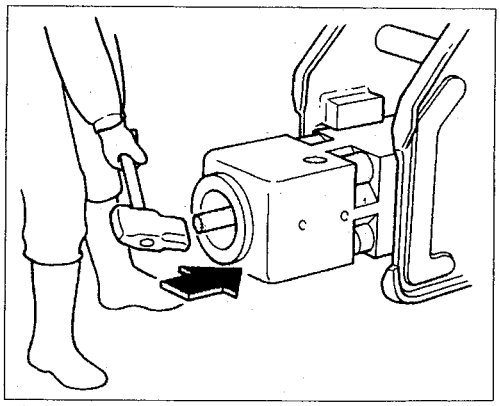
Procedure to attach the breaker

❶ Adjust the center of breaker bracket and excavator arm. Lower down the arm slowly and align holes.

To adjust the center of breaker bracket and arm, decrease r.p.m. of engine and operate the boom & arm slowly.

❷ First fix the pin (at arm side) and then fix the pin (at link side) by operating bracket cylinder.
❸ Remove blanking plugs and connect breaker hoses to the pipes on the excavator.
❹ Turn stop valve to 'on' position.





Storage and maintenance of breaker

When storing the breaker for a long observe the following steps:

❶ Be sure to fix a plug to hoses and other metal fittings.
❷ Release nitrogen gas (in the gas chamber) from the gas valve.
(See "When gas pressure is high:", page 11.)
❸ Remove chisel.

❹ Retreat the piston by positioning a suitable bar against the blowing end and strike it with a hammer.

If you loosen the plugs on the hoses, the piston will easily retreat.

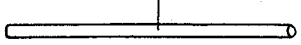
❺ Apply grease to front head section.
(See page 15 for 'greasing')

Caution! Store the breaker in a safe, secure garage or workshop and cover with suitable sheeting to protect from precipitation.

How to Change Chisel

Procedure to remove the chisel

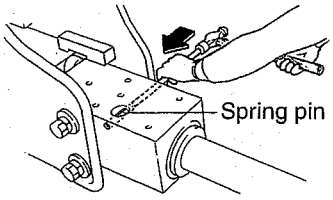
Special pin (7909–90–0110)

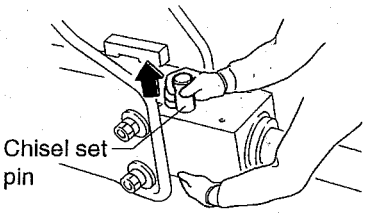


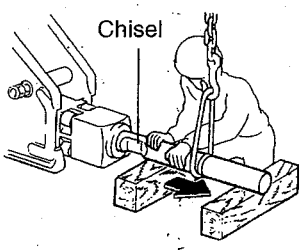
❶ Place the breaker in a horizontal position and remove spring pin by using special pin (in the manner shown in the illustration).

❷ Remove chisel set pin

❸ Remove chisel

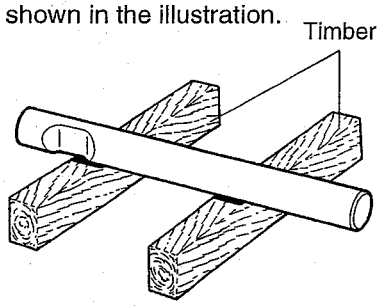




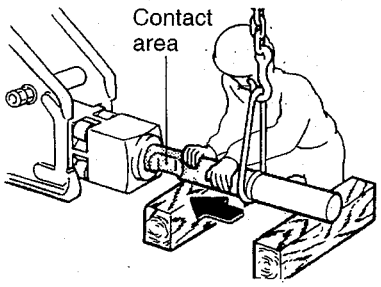


Procedure to attach the chisel

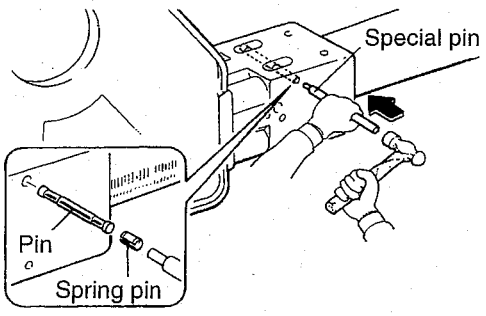
❶ Place chisel on timber blocks as shown in the illustration.



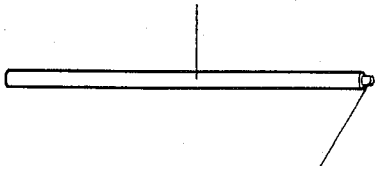
❷ Coat the contact area of chisel with sufficient grease, and fix the chisel in the reverse order to removing.



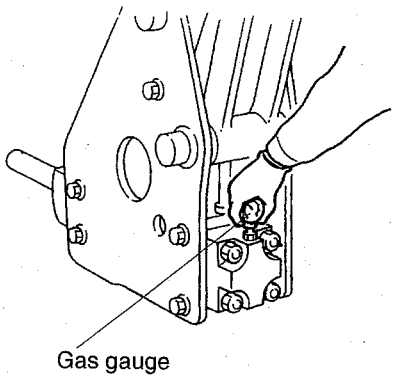
❸ Insert the chisel set pin and strike spring pin (ensure the slit is facing upwards) into the aperture with hammer.



Special pin (7909–90–0090)



Caution!
- The spring pin must be fitted with the slit facing upwards. Insert in the manner shown in the illustration.
- Use only a genuine Takeuchi hydraulic breaker chisel.



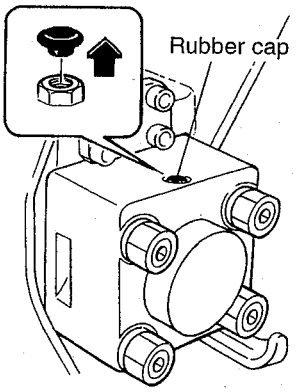
Inspection of gas pressure (Back head gas chamber)

At normal ambient temperature, gas pressure should by in the range of 0.2~0.29MPa.

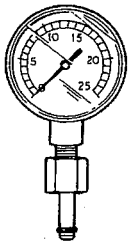
- When inspecting the gas pressure, ensure that no contact pressure is applied.
- It is normal for the gas pressure to increase during operation due to the rise in oil temperature.
  However, when the number of strokes decrease, keep the pressure below 0.34MPa.

Inspection procedure of sealed gas

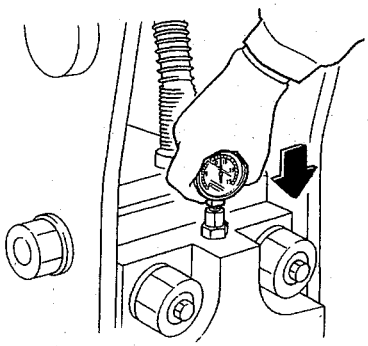
❶ Remove rubber cap from back head.



❷ Insert the gas gauge.



❸ Read the gas pressure.



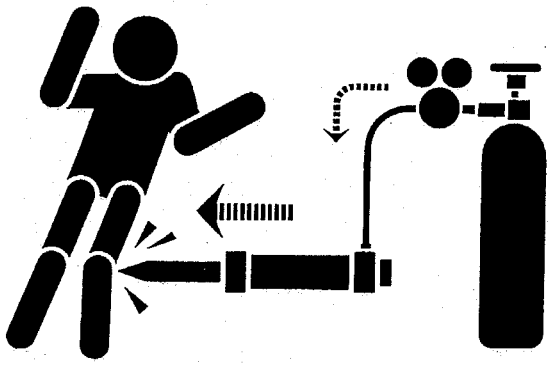
When gas pressure is high:

❶ Release the gas until the correct pressure is obtained, by inserting a round bar with a diameter of approx ..
❷ Fix rubber cap.

Adjusting gas pressure

When gas pressure is low (Method to fill gas chamber)

❶ Connect gas hose ass'y and regulator ass'y to nitrogen gas cylinder as shown in the illustration.

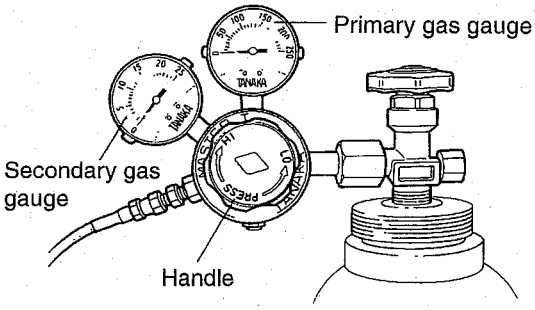


Protrusion of chisel

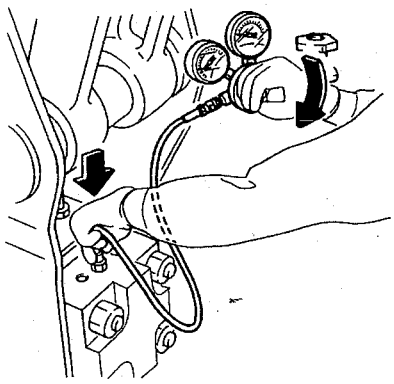
WARNING

Ensure that nobody is standing in front of the chisel when filling the gas chamber. The increase in gas pressure may cause the chisel to suddenly release itself.

❷ Loosen the handle of regulator ass'y.
❸ Open the valve of nitrogen gas cylinder.
❹ Remove rubber cap of back head and insert gas hose ass'y.



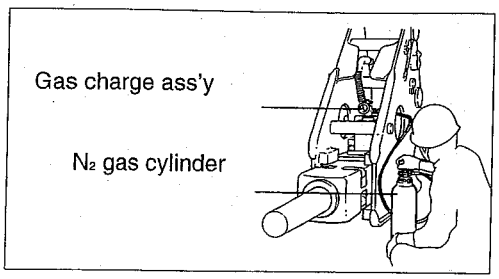
❺ Tighten the handle of regulator ass'y until secondary gas gauge shows 0.29 MPa.



❻ Fill in the gas for 15 to 20 seconds.
❼ Loosen the handle to regulator ass'y, and remove gas hose ass'y.
❽ Confirm gas pressure by checking with gauge. (0.29 MPa)
❾ Fix the rubber cap.

Caution!

1. When the temperature of the breaker is high, set the gas pressure to 0.34 MPa.
2. When removing regulator ass'y from nitrogen gas cylinder, do so after releasing the remaining pressure by tightening the handle of regulator ass'y. (Confirm gauge reads zero.)
3. Gas other than nitrogen gas should not be used. Use of air or oxygen may result in explosion.
4. Nitrogen gas is filled in a high pressure container at 14.7 MPa as regulated by law. Handle it with care.
5. Nitrogen gas is inflammable. However, do not place it in the vicinity of fire or expose it directly to sunlight.

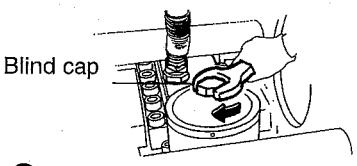


Checking the filled-in gas pressure (accumulator)

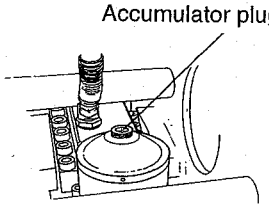
The filled-in gas pressure is normal if it falls in the range of 3.92~4.41 MPa at normal temperature.

Inspection procedure of sealed gas

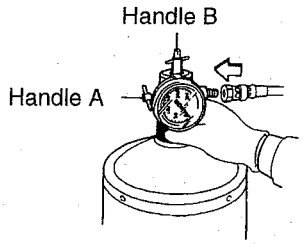
❶ Remove the blind cap of accumulator.



❷ Rotate the accumulator plug about 1/8 turn and loosen it with a box wrench.



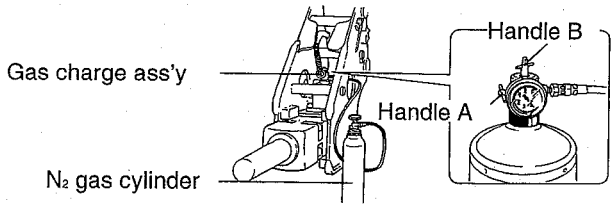
❸ Fasten the gas charge ass'y against shell B by hand.



❹ Close handle A.
❺ Loosen handle B.
❻ Pressure gauge indicates filled-in pressure.

Caution!
- If the filled-in pressure is found to be normal, adjust it to a proper level.
- After confirming the filled-in pressure, do not forget to refill gas as the gas pressure in the accumulator falls.

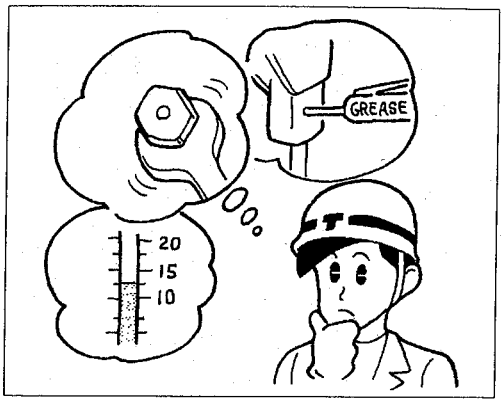
When gas pressure is high (method of releasing gas)

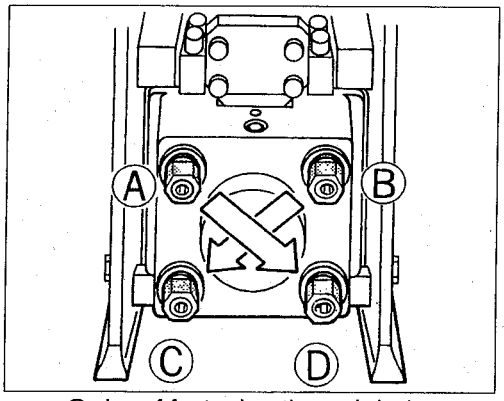


❶ Loosen handle A slowly, looking at the pressure gauge. Close handle A when pressure gauge reading gets at 3.92 MPa.
❷ Close handle B, loosen handle A and release gas out of the gas charge ass'y.
❸ Dismantle the gas charge ass'y.
❹ Retighten the accumulator plug to a specified torque (49 N · m).
❺ Attach the blind cap.

When gas pressure is low (method of filling in gas)

❶ Close handle A and loosen handle B till the pressure gauge reading goes up.
Loosen the valve of the N_2 gas cylinder slowly and close the valve when pressure gauge reads about 4.41 MPa.
❷ Loosen handle A slowly, looking at the pressure gauge and release gas through the gas vent hole.
❸ Close handle A when pressure gauge reads 3.92 MPa.
❹ Close handle B and loosen handle A and release gas out of the gas charge ass'y.
❺ Dismantle the gas charge ass'y.
❻ Retighten the accumulator plug to a specified torque (49 N · m).
❼ Attach the blind cap.





Order of fastening through bolts
Ext.: A→D, B→C

Inspection items

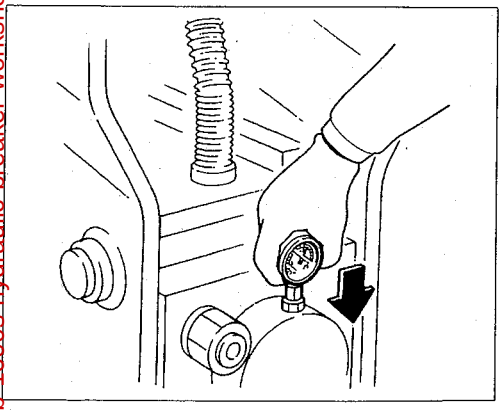
Inspection items	Prior to work	Regular inspection	Remarks
Loosening of bolts	○	○	
Hydraulic oil and oil volume	○	○	Replace every 600 hrs.
Oil leak	○	○	
Flaw on hydraulic hose	○	○	
Injecting grease	○	○	
Breakage of chisel set pin	○		
Clogging of filter		○	Replace every 100 hrs.
Gas pressure in back head gas chamber		○	Gas: 0.2~0.29 MPa
Gas press in accumulator		○	Gas 3.92~4.41 MPa

Bolts

Please check all bolts prior to work.
Loose bolts will cause excessive load on other bolts and lead to malfunction. Please tighten up periodically to specified torque.

Name of Part	Tool Size	Specified Torque N·m
Through bolt of breaker	Offset wrench 65	2205
Accumulator mounting bolt	Hex. key wrench 19	686
Gas valve	Spanner 24	98
Grease nipple	Box wrench 17	108
Mounting bolts for bracket and breaker	Offset wrench 50	2940
Hose joint of breaker	Spanner 60	686

Caution!
When changing more than two thru bolts:
1. Release gas from gas chamber completely.
2. Bolts which are being reused must still be loosened.
3. Tighten bolts in the sequence shown above.



Gas pressure in the back head gas chamber

Blowing force of breaker equals hydraulic energy plus gas pressure of back head gas chamber. Gas pressure of back head gas chamber should be kept within the range of 0.2~0.29 MPa.