Hydraulic Breaker

TOKU

TNB-08M	**TNB-6M**	**TNB-27K/190LU2**
TNB-1M	**TNB-6E**	**TNB-230LU2**
TNB-2M	**TNB-7J**	**TNB-310LU1**
TNB-3MB	**TNB-16K/110**	**TNB-60K/400LU2**
TNB-4M	**TNB-141LU**	
TNB-5M	**TNB-151LU2**	

MANUAL

INSTRUCTION MANUAL

⚠ WARNING

Unsafe use of this machine may cause serious injury of death. Operators and maintenance personnel must read this manual before operating or maintaining this machine. This manual should be kept near the machine for reference and periodically reviewed by all personnel who will come into contact with it.

TOKU PNEUMATIC CO., LTD.

No.17

●FOREWORD

Thank you very much for your purchasing of a Toku hydraulic breaker.

This instruction manual is a guidebook to the TOKU Hydraulic Breaker as well as helps deepen your understanding of Toku hyd. breaker better for those who own a TNB breaker. Before operating the Breaker, operators and maintenance personnel should read this manual carefully making sure that they understand the contents. Keep this manual handy and ensure all personnel read it periodically.

The TOKU Hydraulic Breaker is fitted to a hydraulic excavator as an attachment and this manual is considered to be used together with an excavator manual. Therefore this must be kept together with your hydraulic excavator manual.

⚠ WARNING

Improper operation can be hazardous and could result in serious injury or death. Operators and maintenance personnel should read this manual carefully before operating or maintaining this machine and always keep it near the machine. All involved personnel should read it periodically.

- Do not operate the product unless you understand and comply with the contents of the instruction manual.
- Operators and maintenance personnel should read this manual periodically and always keep it handy.
- If this manual is lost or becomes damaged, ask for a manual at TOKU Pneumatic Co., Ltd or a Toku distributor nearby by ordering.
- If you transfer the breaker to another source, make sure that you give this manual to the new owners.
- When you rent this breaker, make sure that this manual must be handed over to a user.

●INTRODUCTION

0-1. SAFETY INFORMATION

We use our safety messages and labels in following way in order for you to understand the manual and the safety labels better.

⚠ DANGER: **If not avoided, result in death or serious injury.**

⚠ WARNING: This word is used on safety messages and safety labels where there is a potentially dangerous situation which could result in serious injury or death if the hazard is not avoided. These safety messages or labels usually describe precautions that must be taken to avoid the hazard. Failure to avoid this hazard may also result in serious damage to the machine

⚠ CAUTION: This word is used on safety messages and safety labels for hazards, which could result in minor or moderate injury if the hazard is not avoid. This word might also be word for hazards where the only result could be damages to the machine

★ NOTICE This word is used for precautions that must be taken to avoid actions, which could shorten the life of the machine

TOKU cannot predict every circumstance that might involve a potential hazard in operation and maintenance. Therefore the safety message in this manual and on the machine may not include all possible safety precautions.

0-2. APPLYING WORKS

⚠ WARNING

Never use TNB breakers other than applying works

Mainly apply TNB breakers for following works.

- Demolition of Concrete and secondary breaking.
- Demolition of Asphalt and secondary breaking.
- Demolition of Rock.
- Quarry applications.
- Road Construction.
-
- Please consult us in case of tunnel work, under water works, works in extreme heat, cold or dusty environment or any other " special application.

0-3. OPERATION AND QUALIFICATIONS

Operators must be trained before operating TOKU BREAKER and must obey all rules at the worksite and local regulations, which affect the operator and equipment.

●SAFETY

1-1. GENERAL PRECAUTIONS FOR SAFETY

⚠ WARNING

When operating the hydraulic breaker, read the instruction manual for the hydraulic excavator and obey the safety requirements.

⚠ WARNING -SAFETY RULES AT THE WORK SITE-

- Only trained and authorized personnel can operate and maintain the machine.
- Follow all safety rules, precautions and instructions when using the breaker.
- Follow the rules for group work when more than 2 people are working together.

⚠ WARNING -CLOTHING AND PERSONAL PROTECTION ITEMS-

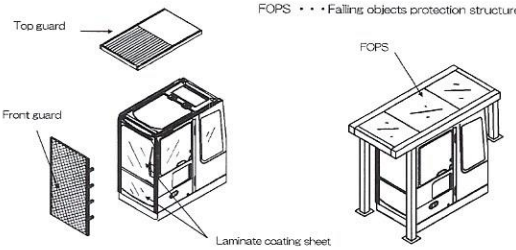
- It is essential to wear a hard hat, protective goggles, safety boots, a mask and gloves.

  Especially when operating a mini-excavator where a cabin is not installed on the machine.

⚠ WARNING -PROTECTION AGAINST FALLING OR FLYING OBJECTS-

- When operating a hydraulic breaker, install a front guard on the windscreen. Also place a laminate coating sheet over the windscreen.
- For work in mines, tunnel or other places where there is a danger of falling rocks, fit a FOPS (falling object protective structure). Also place a laminate coating sheet over the windscreen.
- When operating a breaker, make sure that you close the front window.
- During operation, make sure all personnel are out of range of materials, which may fly up.

FOPS • • • Falling objects protection structure



⚠ WARNING DON'T DISASSEMBLE

The hydraulic breaker contains a high volume of pressurized nitrogen gas. It can therefore be dangerous if the breaker is not dismantled correctly. As a result, if the breaker needs service, please contact TOKU or an authorized distributor/ service depot.

⚠ WARNING UNAUTHORIZED MODIFICATION

- Non-approved modifications can cause injury and damage.
- Consult your TOKU dealer for advice before making any modifications. TOKU will not accept responsibility for any injury or damage caused by any unauthorized modifications.

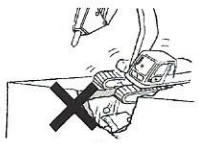
1-2. SAFETY OPERATION

⚠ WARNING Checking work site

When working on embankments or near excavated ditches, there is a hazard that the weight and vibration of the machine will cause the soil to collapse. Before starting operations, take steps to ensure that the ground is safe and to prevent the machine from rolling over falling.

⚠ WARNING Safety secure at work site !

When working on the structure, it may happen collapse or floor. Check the strength of floor before operation. Reinforce the floor if it' s necessary.

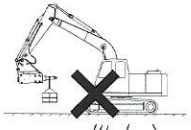


⚠ WARNING

Do not raise up too high.
It may cause damage of excavator or falling accident when excavator becomes unbalanced after breaking an object.

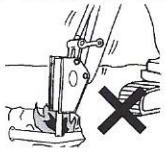
⚠ WARNING

Do not lift materials with the breaker.
This may cause damage to the breaker and breaker bracket and is a dangerous maneuver.



⚠ WARNING -SAFETY AT JOBSITE-

Before starting operations, thoroughly check the area for any unusual conditions that could be dangerous.



- When carrying out operations near combustible materials such as thatched roofs, dry leaves or dry grass, there is a hazard of fire, so be careful when operating.
- Check the terrain and condition of the ground at the worksite, and determine the safest method of operation. Do not operate where there is hazard of landslides or falling rocks.

⚠ WARNING -IF ABNORMALITIES ARE FOUND-

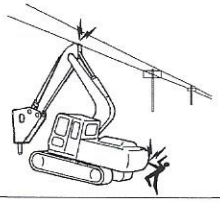
If you find any abnormality in the machine during operation or maintenance (noise, vibration, smell, incorrect gauges, smoke, oil leakage, etc., or any abnormal display on the warning devices or monitor), report to the person in charge and have the necessary action taken. Do not operate the machine until the abnormality has been corrected.

⚠ WARNING -DISTANCE TO HIGH VOLTAGE CABLES-

Do not travel or operate the machine near electric cables.There is a hazard of electric shock, which may cause seriousinjury or property damage. On jobsites where the machine maygo close to electric cables, always do as follows.Before starting work near electric cables, inform the localpower company of the work to be performed, and ask them totake the necessary action. Even going close to high-voltage cables can cause electricshock, which may cause serious burns or even death. Always maintain a safe distance (see the table on the right) between the machine and the electric cable. Check with the local powercompany about safe operating procedure before startingoperations.To prepare for any possible emergencies, wear rubber shoesand gloves. Lay a rubber sheet on top of the seat, and becareful not to touch the chassis with any exposed part of yourbody. Use a signalman to give warning if the machine approachestoo close to the electric cables.When carrying out operations near high voltage cables, donot let anyone near the machine.If the machine should come too close or touch the electric cable, to prevent electric shock, the operator shouldnot leave
The operator's compartment until it has been confirmed
That the electricity has been shut off. Also, do not let anyone near the machine.

Safety distance to high voltage cables

Voltage of cables	Safety distance
0 - 60,000V	more than 3m
66,000V	more than 4m
154,000V	more than 5m
500,000V	more than 11m



⚠ WARNING -NOISE-

When carrying out maintenance of the breaker and you are exposed to noise for long periods of time, wear ear covers or ear plugs while working.
If the noise from the machine is too loud, it may cause temporary or permanent hearing problems.

1-3. PRECAUTION FOR MAINTENANCE

⚠ WARNING

The hydraulic breaker is an attachment for the hydraulic excavator. Before maintaining the hydraulic breaker, read and understand the manual for the hydraulic excavator.

⚠ WARNING

Always wear protection such as hard hat, safety glasses, safety shoes and mask, and gloves. When tightening the bolt and nut by an impact spanner, debris of metal may fly out or be scattered. It may cause serious injury for eyes.

⚠ WARNING

When you leave an abnormal on the hydraulic breaker, it may cause serious injury. Repair immediately when an abnormal is found.

⚠ WARNING

Do not carry out when the hydraulic oil temperature is high. After operating the breaker many parts are still hot. If the hose is removed immediately, it may cause serious burn injury.

⚠ WARNING High temperature oil

Do not remove the hydraulic hose immediately after stopping the hydraulic breaker. The oil reaches a very high temperature during operation and may possibly cause burns. Remove hose only when the temperature has dropped. When you leave an abnormal on the hydraulic breaker, it may cause serious injury. Repair immediately when an abnormal is found.

⚠ WARNING Using suitable tools

It is very dangerous to use worn and broken tools and to misuse tools. Use the proper tools for maintenance.

⚠ WARNING Position of the hydraulic breaker

Place the hydraulic breaker in a stable and flat place so as to prevent from over turning

⚠ WARNING Use a crane when handling heavy materials

- Carry out maintenance on a flat and solid ground surface.
- When the operation is carried out by two or more workers, choose the leader and follow leaders instructions.
- A crane should be used for handling heavy material (over 25 kg)
- When using a crane, make sure that the material is well balanced.
- Do not work on materials that are being lifted. Put them on a worktable.
- When assembling and disassembling the hydraulic breaker, make sure that the breaker is balanced.
- Never remain under material which is being lifted by crane. Keep away from material.

⚠ WARNING

When hammering the pin, always wear protective goggles, hard hat, gloves, mask and safety boots due to the possibility that metal chips will fly off and may enter your eye causing serious injury.

⚠ WARNING

Do not touch the chisel right after operating the hydraulic breaker.
The chisel becomes very hot during operation and you may get burnt.

⚠ WARNING

When aligning the pin, do not put your finger or hand into the pin hole. The arm or hydraulic breaker can move and this may lead to loosing your finger or hand.

⚠ WARNING

Do not use any other gas except nitrogen gas. If other gases are used, it may explode and is dangerous.

When filling nitrogen gas, the chisel may suddenly come out. Therefore, keep away from the chisel when refilling with nitrogen gas.

⚠ WARNING

Various parts will be very hot after operation of the engine. Do not change the filter element immediately. Change the element after the hydraulic oil and various parts have cooled off.

⚠ WARNING

Various parts will be very hot after operation of the engine. Do not change the hydraulic oil immediately. Change the hydraulic oil after the oil and various parts have cooled off.

1-4. PRECAUTIONS FOR LIFTING THE HYDRAULIC BREAKER

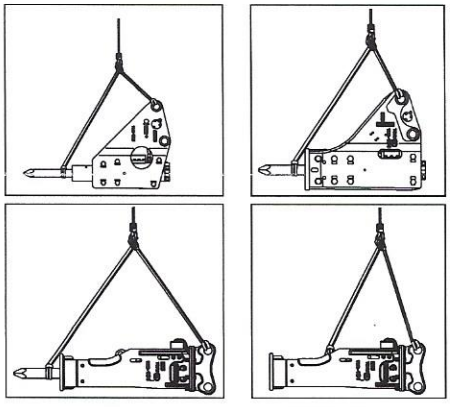
⚠ WARNING

- Crane operation qualification is necessary to do lifting work.
- Do not lift if person is still working on/around the breaker.
- Use appropriate size/diameter/strength of wire rope per breaker weight/model.
- Lift slowly and keep the breaker level & horizontally as shown below.
- Keep away from the lifting area, and Never go underneath the breaker.

Lift the breaker properly & safely as shown below.
There is a risk of losing the balance of the breaker.

⚠ CAUTION

Lift the breaker properly & safely as shown below.
Hydraulic hose can be damaged, if breaker is not properly lifted.



●OPERATION

2-1. SPECIFICATIONS

Model TNB-			08M	1M	2M	3MB	4M
Working Weight	Side Mount Bracket	kg	65	85	105	175	235
	Top Mount Bracket 1P.C	kg	75	85	110	190	220
	Top Mount Bracket 2P.C	kg	75	100	140	210	255
	BOX Bracket	kg	85	125	170	250	340
	Side Mount Silenced Bracket	kg	-	-	160	235	285
Oil Flow		L/min	18~25	20~30	20~35	25~45	30~55
Operating Pressure		MPa	6~13	7~14	8~15	10~15	10~16
Line Relief Pressure		MPa	18	19	20	20	21
Cracking Pressure(*1)		MPa	14 at minimum	15 at minimum	16 at minimum	16 at minimum	17 at minimum
Impact Rate		bpm	930~1300	700~1200	600~1150	550~1000	580~1060
Tool Diameter		mm	ϕ40	ϕ45	ϕ50	ϕ58	ϕ64
Hose Size		inch	3/8	1/2	1/2	1/2	1/2
Gas Pressure(*2)		MPa	0.8	0.8	0.8	0.8	0.8
Base Machine		ton	0.7~1.5	1~2	1.5~2.5	2.4~4	3~4.5

NOTE) Working Weight does not include bracket bushings and bracket pins.
Always operate the breaker with proper oil flow and working pressure shown above.

*1) Cracking pressure means a pressure observed constant flow after the relief valve starts opening by the pressure increased at the inlet port of the relief valve.

*2) When the Breaker body temperature is 40℃ (104F).

2-5. GREASE SELECTION AND CONTROL

2-5-1 SELECTION OF GREASE

- Use the inorganic high temparature grease for chisel greasing

Maker	Name of items
Idemitsu Kosan Co.,Ltd.	Daphne Polylex Grease NLGI No.2
Shell Lubricants Japan K. K.	Shell Stamina Grease HDP2
COSMO OIL LUBRICANTS Co.,Ltd.	COSMO TAINETSU GREASE B No.2

⚠ CAUTION

Do not use Molybdenum content grease.
In case the Molybdenum composition gets into the hydraulic oil circuit of hyd. breaker through the lower seal section, it can cause the premature wear of piston.

2-5-2 SELECTION OF HYDRAULIC OIL

⚠ CAUTION

Use the maker of a shovel designated hydraulic oil.

2-5-3 HYDRAULIC OIL TEMPERATURE CONTROL

⚠ CAUTION

Carry out warm-up !

Do not operate immediately after starting engine. Carry out warm-up operation.
Begin the breaker operation after the oil temperature get s 40℃.
Operate the breaker in the temperature range from 40 to 60 degree Celsius.
If the hydraulic oil temperature becomes over 80 degree Celsius, the oil becomes low viscosity. And then it influents the performance of hydraulic breaker, shorten the seal life and deterioration of oil. When the breaker is operated in warm ambient temperature condition, the oil control is very important.
When the breaker is used under more than 80℃ of oil temperature, it is necessary to check the each seal.

2-5-4 HYDRAULIC OIL CONTAMINATION CONTROL

⚠ CAUTION

If the hydraulic oil is contaminated, it causes operating failures not only to the breaker but also to the excavator. It leads to damages of internal parts. So the oil contamination control is very important.
Replace the hydraulic oil within the change interval. Clean the inside of hydraulic tank, cylinders and piping when replacing the oil. Also check the oil condition when changing the filter elements.

- The required cleanliness for hyd. oil of a breaker is ※NAS 9 class level.
- When you have questions on the hyd. oil contamination, consult with our designated distributors.

※NAS (National Aerospace Standard Committee) 1638
This is the international norm for hyd. oil contamination.

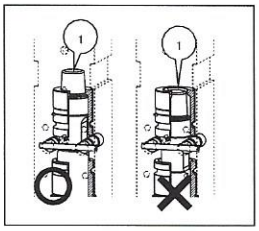
2-9. LUBRICATION OF CHISEL

⚠ CAUTION

If the grease is not applied correctly, it may cause a seizure of Chisel bushing and Chisel.

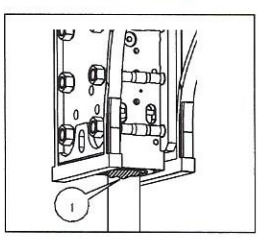
⚠ WARNING

When greasing, make sure the chisel (1) is firmly pressed into the chisel holder and do not apply the grease excessively. Otherwise, the grease will go into the top of the chisel, which could damage the dust and oil seal installed at the lower cylinder due to its pressurization. This would lead not only a cause for malfunction of the breaker but also contaminate the hydraulic oil and deteriorate the pump performance of an excavator.
After greasing the hammering must be only downward for 5 minutes.

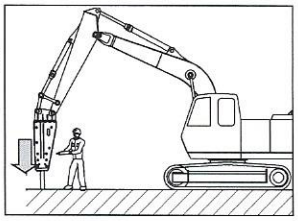


⚠ CAUTION

When the breaker is brand new or right after reassembly, push the chisel into the breaker and grease until the grease comes out from the bottom of chisel bush(1).
When there is no grease between chisel and chisel bush it will cause seizure between the chisel and the bushing.
Please operate the breaker with vertical position for 5 minutes after the grease-up.



Apply grease to the grease nipple on the chisel holder by using a grease gun every two hours.
Grease in the morning before starting work and grease in the afternoon before starting work. With below amount as bench mark.
Afterward every 2 hours grease the same amount.



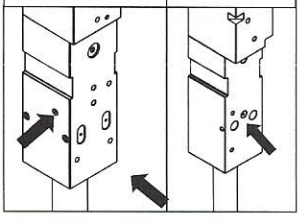
⚠ CAUTION

Do not use Molybdenum content grease.
It may lead the hydraulic breaker, excavator pump and other components failure.

Model TNB-	Number of times to push the grease gun /gram
08M	1~2 (1g~2g)
1M	2~3 (2g~3g)
2M	2~3 (2g~3g)
3MB	2~3 (2g~3g)
4M	2~3 (2g~3g)
5M	5~6 (5g~6g)
6M	5~6 (5g~6g)
6E	7~8 (7g~8g)
7J	8~10 (8g~10g)
16K/110	10~12 (10g~12g)
141LU	20~22 (20g~22g)
151LU2	20~22 (20g~22g)
27K/190LU2	22~24 (22g~24g)
230LU2	24~26 (24g~26g)
310LU1	30~35 (30g~35g)
60K/400LU2	35~40 (35g~40g)

●Position of Grease Nipple

TNB-7J, 151LU2, 230LU2, 60K/400LU2	16K/110, 27K/190LU2, 310LU1,	Other Models



NOTICE

- Make sure the chisel is completely in contact with the piston and in the deep back position before greasing, otherwise, grease will stay between the chisel and the piston and it could cause damage to the hammer.
- Before greasing, place chisel of the hydraulic breaker on the ground, lower the boom of the excavator and press the chisel into the chisel holder.

2-10. INSPECTION PRIOR TO OPERATION

The hydraulic breaker is an attachment to the hydraulic excavator. Read the instruction manual for the hydraulic excavator carefully and carry out an inspection prior to operation. Also carry out the inspection on a hydraulic breaker in accordance to the periodic inspection table shows in the chapter of Inspection and Maintenance.

⚠ CAUTION

Inspection must be done before operation begins.
Lack of inspection before operation causes damage and poor operation of the hydraulic breaker.

2-12. OPERATION OF HYDRAULIC BREAKER

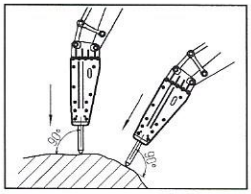
⚠ CAUTION

- When operating the hydraulic breaker, ensure to use the piping for the hydraulic breaker.
- If there is a " Hydraulic Breaker Mode" on the excavator, change to the mode.
- If a piping of the excavator is set up for the hydraulic crusher, 1) the excessive hydraulic oil might be supplied to the hydraulic breaker. 2) Wrong pedaling creates the high pressure to the low pressure piping of the hydraulic breaker. In both cases, it could cause damage to the hydraulic breaker.

- The hydraulic breaker is an attachment to the hydraulic excavator. Follow the instruction manual for the hydraulic excavator when starting the machine.
- Set up the excavator to operate the hydraulic breaker. If there is a "Hydraulic Breaker Mode" on the excavator, change to the mode. Position the throttle of the excavator (engine RPM) at the mark for the hydraulic breaker.

Then, follow the excavator manual for operation.

- Place the breaker against the object at a 90-degree angle.



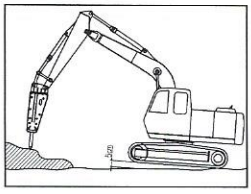
⚠ CAUTION

When the angle is not 90 degree, the breaker will be slipped. It cause the chisel breakage, seizure of bush. Choose stable surface to beating. Avoid any excessive force.

⚠ CAUTION

Ensure that the front part of the excavator is not raised too high.
After the material is broken, take caution since the balance of the excavator becomes unstable.

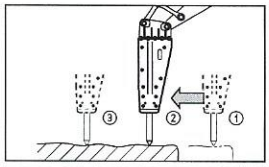
- When operating the breaker, raise the chisel against the object and the front portion of the excavator about 5 cm (2 inch) from the ground.



⚠ CAUTION

When pushing force is not enough, it will lead blank blows. Blank blows will give a big impact to the breaker and excavator, and cause serious damage and the breakdown.

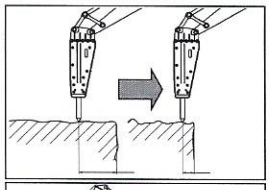
- When breaking up an object, which is large and hard, start, where the rock can be easily broken.



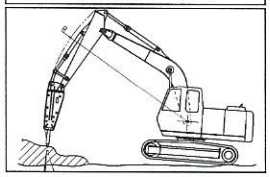
- After striking against the same point continuously for 30 seconds without the rock breaking, change to another area of the rock.

⚠ CAUTION

Striking the same place more than 30 seconds shortens the life of the chisel and the bracket parts by heat.



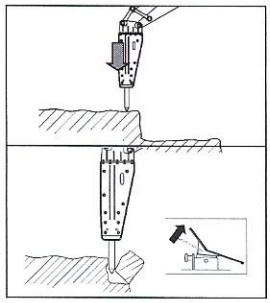
- When the breaker is set to demolish an object, always set the breaker at 90 degrees to the object you are demolishing.



- During impact, prevent blank blows by using the breaker properly. Stop the pedal immediately when the object is broken.

⚠ CAUTION

When pushing force is not enough, it will lead blank blows. Blank blows will give a big impact to the breaker and excavator, and cause serious damage and the breakdown.



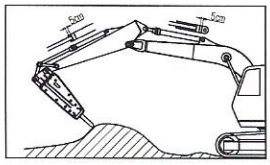
- As soon as the material has broken, immediately remove your foot from the operating pedal to stop striking the material.

2-13. PRECAUTIONS DURING OPERATION

Do not use the breaker in the following manner since this will reduce the life of the breaker and may result in reduced safety.

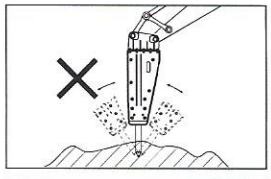
⚠ CAUTION

Do not operate the breaker when the cylinder on the excavator is fully extended (stroke-end). It is essential to have about 5 cm (2 inch) of stroke in the cylinder.
Ignoring this instruction will lead to the hydraulic cylinder being damage.



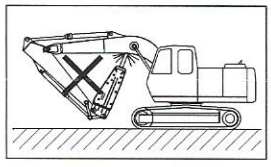
⚠ CAUTION

Do not pry the chisel after it has penetrated into the material.
This will lead to side bolt or chisel breakage. Also premature wear of the chisel bushing may occur.



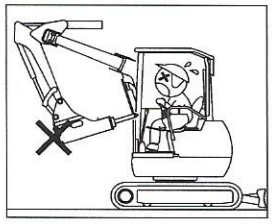
⚠ CAUTION

Make sure that you do not hit the boom with the chisel during operation.
This will lead to damage to the hydraulic breaker and excavator.



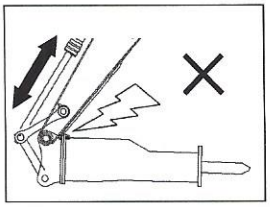
⚠ WARNING

Operate the breaker carefully so that the chisel cannot hit the cabin.
Careless operation of hydraulic breaker may result in serious injuries or severe damage to the carrier and hydraulic breaker.
*Esoecially when using with non-standard arms.



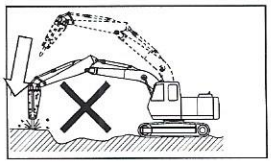
⚠ CAUTION

Operate the breaker so that the bracket does not contact the arm etc.
Do not extend bucket cylinder to the stroke end, the breaker contacts the excavator arm, and causes malfunction of the excavator and the breaker.
*Especially please pay attention when using with non-standard arms.



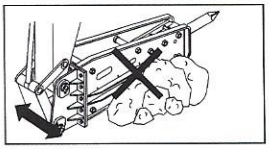
⚠ CAUTION

Avoid hitting the material abruptly with the chisel.
This can cause damage to the breaker, bracket, boom and swing parts on the excavator.



⚠ CAUTION

Do not use the breaker to move material.
This can cause damage to the breaker, breaker bracket, excavator boom, arm and swing parts.



⚠ WARNING

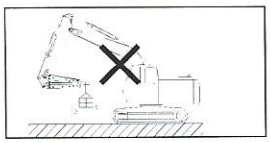
Do not use traveling for moving the material such as large rock.

⚠ CAUTION

In case the breaker hose shakes abnormally, stop the operation immediately.
Then contact our customer service.

⚠ CAUTION

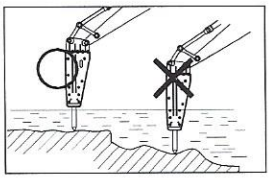
Do not lift materials with the breaker.
This will cause damage to the breaker and breaker bracket and is a dangerous maneuver.



⚠ CAUTION

- Do not operate the breaker under water.
- Do not put any part of the breaker into water except for the chisel.

This may cause damage to the hydraulic breaker and excavator.



When using the breaker under water, refer to the instructions for "UNDERWATER APPLICATION"

2-14. DISMANTLING THE BREAKER

⚠ WARNING

When hitting a pin with a hammer, always wear safety goggles, hard hat, heavy-duty gloves, mask and safety boots due to the possibility of bits of material flying off which could enter your eye and cause serious injury.

⚠ WARNING

- Assembly and disassembly work should be performed in a flat area.
- A signal must be decided in advance for the work if more than two people are involved.
- Make sure that a crane is used for lifting if the material weight exceeds 25kg (55lb).
- When dismantling heavy parts, support the part as it is removed.
- Do not work on materials that are being lifted by one means or another; put them on a worktable.
- When assembling and disassembling the hydraulic breaker, make sure that the breaker is well balanced.
- Never remain under material, which is being lifted by crane.
- Keep away from material, which is being lifted.

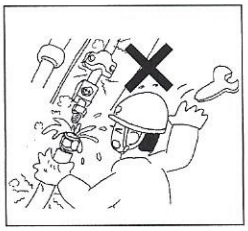
IMPORTANT
A license is required to operate a crane. Do not operate the crane without a license.

⚠ CAUTION

Do not touch the chisel right after operating the hydraulic breaker.
The chisel becomes very hot during operation and you may get burnt.

⚠ WARNING

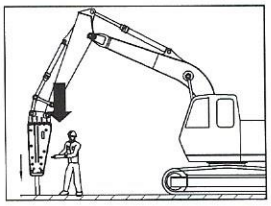
When removing the hydraulic hose, do not remove it immediately after stopping the breaker. The hydraulic oil will still be hot and may cause burns. Remove the hose after the hydraulic oil has had time to cool.
Do not remove the hydraulic hose immediately after stopping the breaker as on removing the hose, high-pressure oil may squirt out. Stop the engine of the excavator and remove the excess pressure in the line before removing the hose.



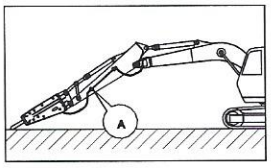
⚠ CAUTION

When greasing, make sure the chisel is firmly pressed into the chisel holder and do not apply the grease excessively. Otherwise, the grease will go into the top of the chisel, which could damage the dust and oil seal installed at the lower cylinder due to its pressurization.
This would lead not only a cause for malfunction of the breaker but also contaminate the hydraulic oil and deteriorate the pump performance.

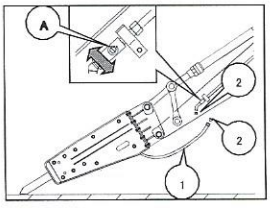
1. After pushing the chisel into the chisel holder properly, begin greasing this area as specified in this manual.



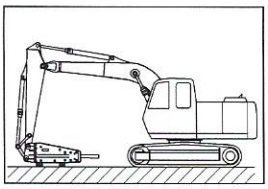
2. Place the breaker near the ground and locate the top of the arm where the stop valve (A) can be reached.
3. Stop the excavator engine and remove the excess pressure in the hose.



4. Turn the stop valve (A) to the off position.
5. Remove the hydraulic hose (1) from the stop valve.
6. Apply the plugs (2) to the hose adapters to that dirt does not enter the hoses.

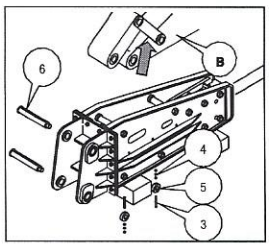


7. Start the excavator engine.



8. Operate the excavator and place the hydraulic breaker on the large wood pieces which are located on the flat and firm ground.
   At this moment pay attention the breaker not to fall down.

9. Remove the bolt (3), nut (4) and bracket ring (5) from the bracket pin (6).



⚠ WARNING

A crane should be used for handling heavy material.

10. Remove the 2 bracket pins (6).

11. Lift the arm (B) and remove the hydraulic breaker from the excavator.

● MAINTENANCE AND INSPECTION

⚠ WARNING

The TNB hydraulic breaker is an attachment for a hydraulically operated excavator. All maintenance and service personnel should carefully read the instruction manual for the hydraulically operated excavator before carrying out maintenance and inspection of the TNB hydraulic breaker.

⚠ WARNING

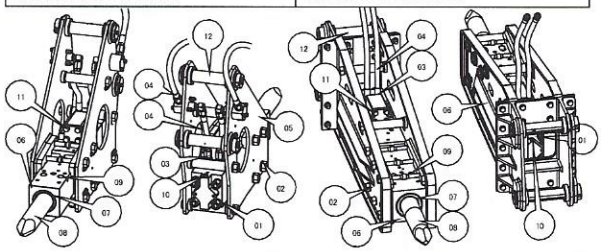
The metal chips produced when hitting a pin into a hole using a hammer may fly off and enter your eye resulting in serious injury. Always wear a hard hat, protective goggles, safety boots, mask, gloves and other protective equipment during operation.

3-1 DAILY CHECK (pre-start inspection) · PERIODIC INSPECTION · REGULAR MAINTENANCE

3-1-1 DAILY CHECK (pre-start inspection) · PERIODIC INSPECTION

Please check each part according to the inspection table.
Please repair and exchange immediately when abnormality is found.

SIDE MOUNT BRACKET | TOP MOUNT BRACKET

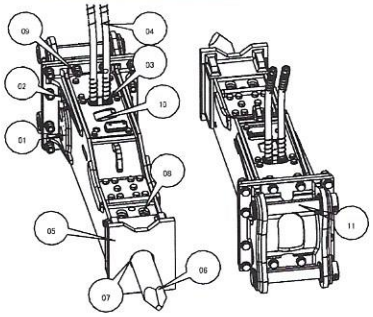


Inspection Items	Substance	Countermeasure	Period
01) Side Bolt Nut	Eye mark gap, clearance and wear	Repair, replacement	Every day
02) Bracket Bolt Nut	Looseness, damage and loss	Retightening, replacement, repair	
03) Hose Adapter	Looseness, damage and oil leakage	Retightening, replacement	
04) Hydraulic Hose	Looseness, damage and oil leakage	Retightening, replacement	
05) Bracket	Wear, damage and crack	Repair, replacement	
06) Chisel Holder	Wear and crack	Replacement	
07) Chisel Bushing	Wear and damage	Replacement	
08) Chisel	Wear of length, damage and oil leakage	Replacement	
Bolts / Nuts	Looseness, damage and loss	Retightening, replacement, repair	
Hydraulic Oil	Shortage, deterioration and contamination	Refill, replacement	
08) Chisel	Wear of outer diameter and striking face crack	Replacement	100 hour or one month
09) Retainer Pin / Stopper Pin	Wear, damage and breakage	Repair, replacement	
10) Gas Valve Body/ Gas Valve Plug	Gas leakage, looseness and damage	Recharge, retightening, replacement	
11) Control Valve Box / Cap Bolt	Looseness and loss	Retightening, repair	
Oil Filter Element (*)	Clogging	Replacement	
12) Bracket Pin	Wear and damage	Replacement	300 hours or 3 months

DAILY CHECK (pre-start inspection) · PERIODIC INSPECTION

Please check each part according to the inspection table.
Please repair and exchange immediately when abnormality is found.

BOX BRACKET



Inspection Items	Substance	Countermeasure	Period
01) Side Bolt Nut	Eye mark gap, clearance and wear	Repair	Every day
02) Guide Bolt / Nut	Looseness, damage and loss	Retightening, replacement, repair	
03) Hose Adapter	Looseness, damage and oil leakage	Retightening, replacement,	
04) Hydraulic Hose	Looseness, damage and oil leakage	Retightening, replacement,	
05) Bracket	Wear, damage and crack	Repair, replacement	
06) Chisel	Wear of length, damage and oil leakage	Replacement	
Bolts / Nuts	Looseness, damage and loss	Retightening, replacement, repair	
Hydraulic Oil	Shortage, deterioration and contamination	Refill, replacement	
06) Chisel	Wear of outer dameter and striking face crack	Replacement	100 hour or one month
07) Chisel Bushing	Wear and damage	Replacement	
08) Retainer Pin / Stopper Pin	Wear, damage and breakage	Repair, replacement	
09) Gas Valve Body/ Gas Valve Plug	Gas leakage, looseness and damage	Recharge, retightening, replacement	
10) Control Valve Box / Cap Bolt	Looseness and loss	Retightening, repair	
Oil Filter Element (*)	Clogging	Replacement	
11) Bracket Pin	Wear and damage	Replacement	300 hours or 3 months

5-3. POOR OPERATION OF BREAKER

Condition	Cause	Countermeasure
Does Not Impact	Temperature of the hydraulic oil is too low.	Warm up the hydraulic excavator.
	Nitrogen gas pressure in the cylinder cover is too high or low.	Adjust the nitrogen gas to the correct pressure
	Stop valve is closed.	Open the stop valve
	The hose connection, IN and OUT is inverse.	Connect the hose properly
	Pressure setting for the relief valve is too low.	(*) Set the relief valve to the correct pressure setting.
	Poor performance of the hydraulic pump on the excavator.	(*) Have the hydraulic excavator manufacturer to check the pump performance. If the performance is poor, repair or replace.
Erratic Blows. (At the beginning breaker operates normally but later blow erratic and stop.).	Lack of down pressure onto the chisel.	Operate the arm and bucket so that pressure is applied to the chisel
	The operating mode is not set to B mode.	Switch to B mode.
	Seizure of control valve.	(*) Repair or replace control valve
	Seizure of piston and cylinder.	(*) Repair or replace piston and cylinder
	Relief valve for the excavator is set too low.	(*) Set the relief valve to the correct pressure setting.
	Poor performance of the hydraulic pump on the excavator.	(*) Have the hydraulic excavator manufacturer to check the pump performance. If the performance is poor, repair or replace
	Nitrogen gas pressure in the cylinder cover is too high or low.	Adjust the nitrogen gas to the correct pressure
Lack of Power	Nitrogen gas pressure in the cylinder cover is too low	Fill the nitrogen gas to the correct pressure
Decrease of Blows.	Shortage of hydraulic oil	Fill the hydraulic oil to the designated volume
	Nitrogen gas pressure in the cylinder cover is too high or low.	Adjust the nitrogen gas to the correct pressure
	Lack of down force on the chisel.	Operate the arm bucket so that the down force on the chisel is rightly applied.)
	Pressure setting for the relief valve is too low.	(*) Reset the relief valve to the correct pressure
	Poor performance of the hydraulic pump on the excavator.	(*) Have the hydraulic excavator manufacturer to check the pump performance. If the performance is poor, repair or replace
	Backpressure is too high due to clogging hydraulic piping.	(*) Repair or replace

(*) marked work is necessary to disassemble a breaker and repair as well as special tools and equipment is necessary.

Contact TOKU or TOKU' s designated distributor.