

UTILITOUGH



HYDRAULIC BREAKERS HYDRAULIC POST DRIVERS OPERATORS MANUAL

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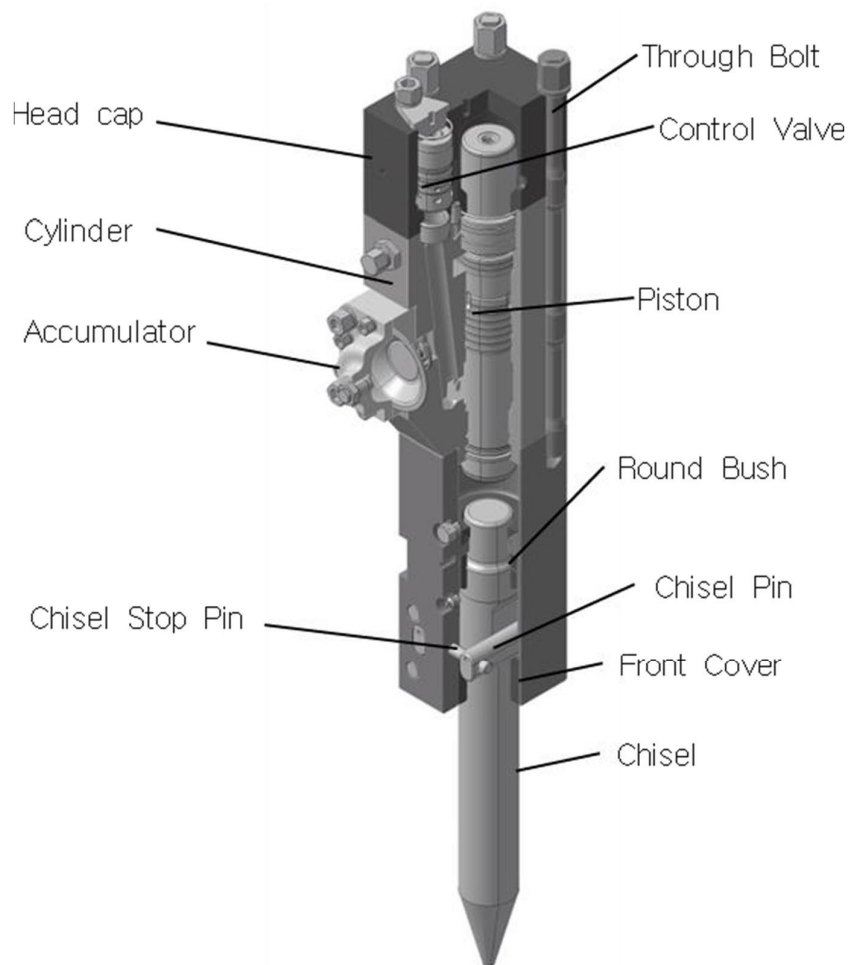
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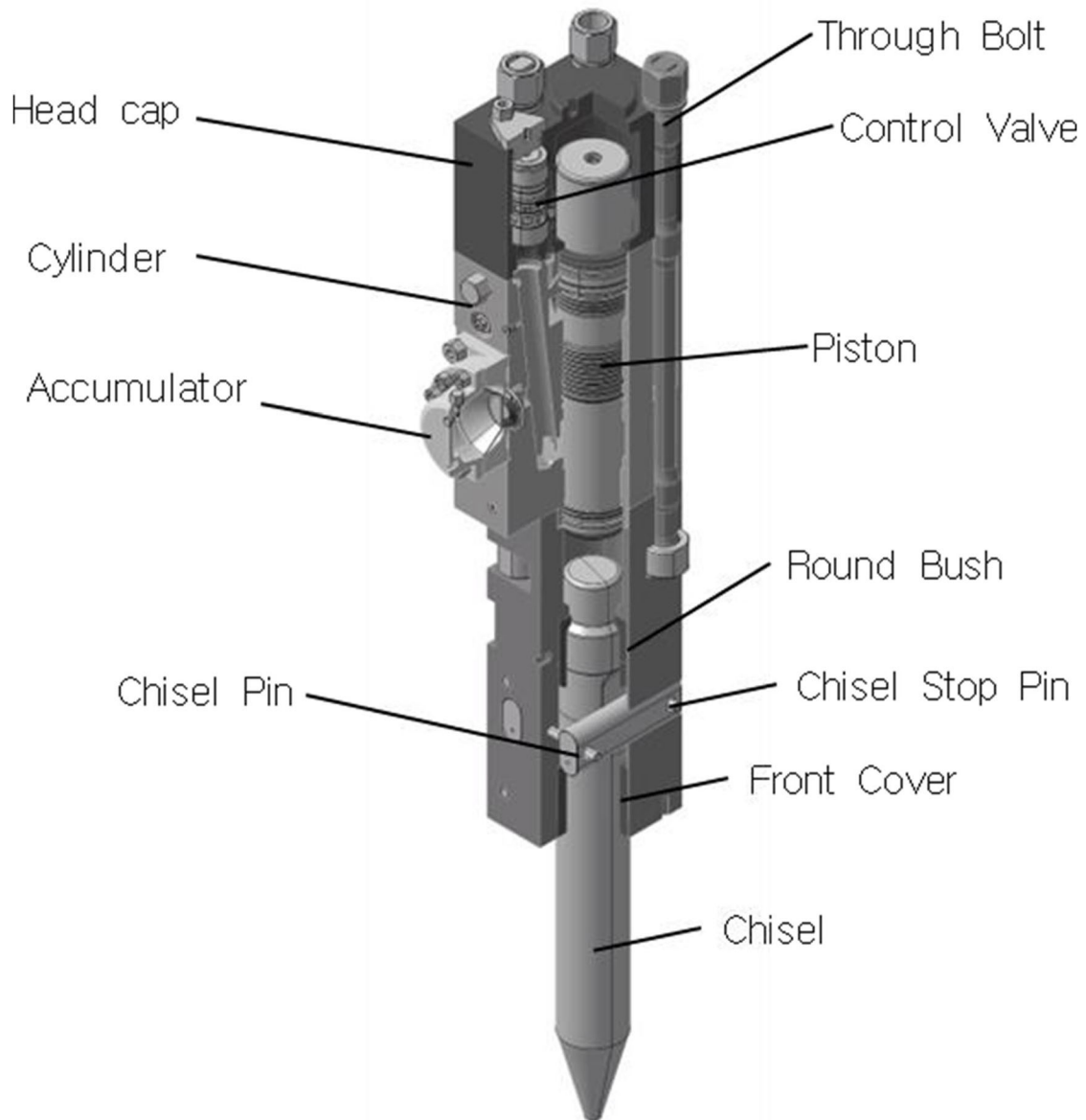
1-1. MAIN STRUCTURE OF UT225 to UT850 HYDRAULIC BREAKER



UtiliTough Hydraulic Breaker consists of five main sections:
Cylinder, Piston, Control Valve, Front Head and Head Cap.

1. The cylinder contains a piston.
2. Four through bolts are assembled and hold cylinder and head cap together with front head.
3. A Piston strikes the chisel by oil and gas pressure.
4. Control valve is inside of head cap to regulate piston movement.
5. Chisel Pin is inside of front head and it prevents the chisel coming out.
6. Head cap has charged nitrogen gas.

1-2. MAIN STRUCTURE OF UT1000 to UT8000 HYDRAULIC BREAKER



1-3. RECOMMENDED SPARE PARTS FOR EACH MODEL

NO	PARTS NAME	MODEL: 225, 500, 650, 850, 1000 QTY	MODEL: 1200 QTY	MODEL: 1800, 2200, 2800 QTY
1	CHISL PIN	2	1	2
2	T/BOLT SET	1	1	1
3	SEAL KIT	1	1	1
4	GAS VALVE SET	1	1	1
5	FRONT COVER	1	1	1
6	DIAPHRAGM	1	1	1

NO	PARTS NAME	MODEL: 225, 500, 650, 850, 1000 QTY
1	STOPER PIN	2
2	RUBBER PLUG	2
3	CHISEL PIN	1
4	DIAPHRAGM	2
5	T/BOLT SET	1
6	SEAL KIT	1
7	GAS VALVE SET	1
8	FRONT COVER	1

Skid Steer Loader Models

Impact Energy Class	Ft/Lb.	225	500	650	850	1000
Operating Weight	Lb.	359	551	716	1,069	1,179
Hose Length	In	.5 x 90	.5 x 110	.5 x 110	.75 x 110	.75 x 110
Blow Rate (Long Stroke)	BPM	540-1,000	600-1,490	550-1,300	380-1,100	380-1,000
Required Oil Flow	GPM	3.97-9.25	5.28-18.49	7.92-18.49	10.03-29.05	11.88-36.98
Operating Pressure	Psi	1,280-1,707	1,280-2,702	1,565-2,702	1,707-2,702	1,991-2,702
Tool Diameter	In	1.77	2.24	2.75	2.95	3.14
Suitable Carrier	Ton	.8-2.5	1.5-4.0	3.0-6.0	4.5-8.0	4.5-8.0
	Lb.	1,600-5,000	3,307-8,818	6,614-14,330	9,921-17,637	9,921-17,637

Excavator Models Whisper Series

Impact Energy Class	Ft/Lb.	225	500	650	850	1000
Operating Weight	Lb.	269	419	618	772	1,124
Hose Length	In	.5 x 90	.5 x 100	.5 x 100	.75 x 100	.75 x 100
Blow Rate	BPM (Long stroke)	540-1,000	600-1,490	550-1,300	380-1,100	490-1,100
	BPM (Short stroke)	-	-	-	-	-
Required Oil Flow	GPM	3.96-7.92	5.2-10.5	7.9-17.1	10-21.1	10-23.7
Operating Pressure	Psi	1,280-1,707	1,280-1,707	1,565-2,347	1,707-2,347	1,991-2,418
Second-Relief Setting Pressure	Psi	2,489	2,500	2,500	2,500	2,500
Tool Diameter	In	1.77	2.24	2.75	2.95	3.14
Accumulator Gas Pressure	Psi	-	-	570-710	570-710	570-710
Suitable Carrier	Ton/Lb.	.8-2.5	1.5-4	3-6	4.5-8	4.5-8.8
		1,600-5,000	3,000-8000	6,000-12,000	9,000-16,000	9,000-17,600

Excavator Models Whisper Series

Impact Energy Class	Ft/Lb.	1200	1800	2200	2800	3200	4000
Operating Weight	Lb.	1,245	1,873	2,029	2,580	3,218	1,600
Hose Length	In	.75 x 100	.75 x 100	.75 x 100	.75 x 100	1 x 100	1 x 100
Blow Rate	BPM (Long stroke)	480-1,000	360-650	350-600	320-550	320-480	320-480
	BPM (Short stroke)	490-1,100	600-950	600-900	400-700	400-650	400-600
Required Oil Flow	GPM	11-25	17-30	18.4-33	23.7-34.3	26.4-35.6	31.6-40.9
Operating Pressure	Psi	1,991-2,418	1,991-2,560	1,991-2,560	2,276-2,702	2,276-2,702	2,276-2,702
Second-Relief Setting Pressure	Psi	2,500	3,000	3,000	3,000	3,000	3,000
Tool Diameter	In	3.54	3.74	4.13	4.52	4.92	5.31
Accumulator Gas Pressure	Psi	570-710	780-850	780-850	780-850	780-850	780-850
Suitable Carrier	Ton/Lb.	6.0-10	8.0-12.5	10-15	12-18	16-22	18-24
		12,000-20,000	16,000-25,000	20,000-30,000	24,000-36,000	32,000-44,000	36,000-48,000

Impact Energy Class	Ft/Lb.	4500	5000	6000	8000	11000	16000	18000
Operating Weight	Lb.	1,820	2,050	2,500	2,800	3,400	3,900	7,100
Hose Length	In	1 x 90.5	1.25 x 110	1.25 x 120	1.25 x 120	1.25x120	1.625 x 120	1.625 x 120
Blow Rate	BPM (Long stroke)	340-450	250-380	230-400	230-345	270-400	230-330	280-350
	BPM (Short stroke)	420-550	300-450	270-470	270-410	330-500	270-500	320-500
Required Oil Flow	GPM	31.6-43.5	38.3-55.4	46.2-64.6	50.1-66	60.7-73.9	63.4-84.5	92.4-111
Operating Pressure	Psi	2,276-2,702	2,276-2,702	2,276-2,702	2,276-2,702	2,276-2,702	2,276-2,702	2,418-2,987
Second-Relief Setting Pressure	Psi	3,000	3,000	3,300	3,000	3,000	3,300	3,556
Tool Diameter	In	5.31	5.70	5.90	6.10	6.49	6.88	8.07
Accumulator Gas Pressure	Psi	780-850	780-850	780-850	780-850	780-850	780-850	780-850
Suitable Carrier	Ton/Lb.	20-26	25-36	24-36	28-42	34-50	40-60	60-100
		40,000-52,000	44,000-60,000	48,000-72,000	56,000-84,000	68,000-100,000	80,000-120,000	120,000-200,000

2-1. SAFETY

The hydraulic breakers are safely assembled according to the safety guidelines of the manufacturer and technical characteristics and can be fit into excavators, mini-excavators, backhoe loaders, skid loader and etc. for following guideline 3-11 to 3-16.

2-2. SAFETY INSTRUCTIONS

SAFETY IS THE OPERATOR'S RESPONSIBILITY

UtiliTough, Inc. Hydraulic Breaker is designed to give maximum safety, but no machine design can prevent operator error or carelessness.

READ THIS MANUAL BEFORE YOU OPERATE UTILITOUGH HYDRAULIC BREAKER.

Untrained operators and failure to obey warnings can cause injury or death.

SAFE OPERATION REQUIRES A QUALIFIED OPERATOR

- The written instructions from UtiliTough, Inc. include the delivery report, Operation and Maintenance Manual, and machine decals.
- Check the rules and regulations at your locations. The rules UtiliTough include an employer's work safety requirements. Regulations UtiliTough identify a hazard such as an underground utility line.

2.3 CONDUCT TRAINING WITH ACTUAL OPERATION

- Operation training must consist of a demonstration and verbal instruction. The UtiliTough, Inc. dealer gives this training before the hydraulic breaker is delivered.
- The new operator must start in an area without bystanders and use all the controls until he can control the excavator with hydraulic breaker safely under all conditions of the work area.

A QUALIFIED OPERATOR MUST DO THE FOLLOWING WHEN OPERATING:

1. SAFETY FIRST

- When leaving the hydraulic excavator, lower the breaker to the ground and turn the engine off.
- Never attach a cable or sling to the breaker to hoist a load. Doing so is extremely dangerous.
- Remove the chisel before transporting the breaker.
- Keep all persons and equipment away from the breaker during operation. Rock flying from the breaker can cause serious injury.

2. PRIOR INSPECTION

- Check that there is sufficient hydraulic oil and that it is not contaminated.
- Check that hoses, bolts and nuts are secure.
- Grease the shank part of the chisel.

3. ATTACHING THE HYDRAULIC BREAKER

- When attaching the hydraulic breaker, an assistant is required who must be instructed by an excavator driver. All directions, signals etc. must agree on beforehand.
- The hydraulic breaker should only be attached to an excavator with sufficient load capacity. If the excavator is too light it may become unstable under load and fall over.
- Do not touch any parts when the boom is moving.
- Check the pressure relief valve on the hydraulic system.
- Do not run any hydraulic lines through the driver's cab. These lines may start to leak or even burst. During operation, the hydraulic oil becomes very hot. Never touch the breaker.







4. FITTING / REMOVING THE CHISEL

- Always wear protective glasses and a safety helmet when fitting or removing the chisel. Metal splinters may chip off when the spring dowel sleeves are hammered out.
- Never use your fingers to check alignment of the recesses on chisel to the slots for the retaining bars.

5. BREAKER OPERATION

- If the noise level exceeds 90 dB(A), all workers in the immediate area, including the excavator driver, must wear hearing protection.
 - Stop the breaking immediately if any one moves into the danger area, which is much larger for breaker operation than for excavator operation due to the risk of flying rock and other debris.
 - Check the oil temperature constantly. Temperature of the hydraulic oil must never exceed 80°C. If higher temperatures are measured in the tank, oil cooler must be fitted.
 - At temperatures lower than minus 20°C, the hydraulic breaker should not be put into operation with cold hydraulic oil, the seals in the hydraulic breaker may become damaged. Have warming the engine up and moving the boom to higher temperature before operate hydraulic breaker.
 - Only approved hydraulic oil should be used.
- ※ For an operator to be qualified, he must not use drugs or alcohol which change his alertness or coordination while working. An operator who is taking prescription drugs must get medical advice to determine if he can safely operate a machine.

2-4. MACHINE SIGNS (STICKER)

Reference	Image Content	Signs
Hearing protection must be worn.	Head wearing ear protection	
Consult manual for proper service procedures.	Technical manual	
Keep always the breaking area while the breaker works.	A working breaker with diagonal slash	
Inject grease into the hole with grease gun periodically.	Grease gun	
"HIGH PRESSURE" is charge prior to disassembly.	Accumulator	
Keep always as the breaker is extremely "HOT"	High Temperature	

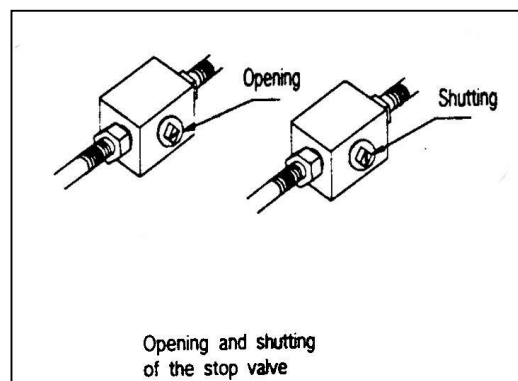
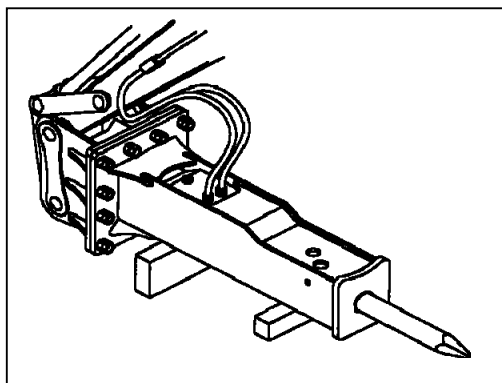
2-5. REMOVAL and INSTALLATION OF THE HYDRAULIC BREAKER

WARNING:

- The assistant must be instructed by the excavator operator and all signals and directions agreed upon beforehand.
- The hydraulic breaker should only be attached to an excavator with sufficient load capacity. If the excavator is too light, it may become unstable under load and fall over.
- Do not touch any parts when the boom is moving.
- Collect any oil which leaked out and dispose of it correctly.
- Check that the pressure relief valve on the hydraulic system has been approved by the relevant authorities.
- Check that the hydraulic pipe lines which connected on from the base machine the hydraulic breaker.
- Do not touch any parts for a while when the hydraulic oil keeps on being hot. It may cause your hands to be burned.
- **Never use your fingers to check the alignment of the bores.**

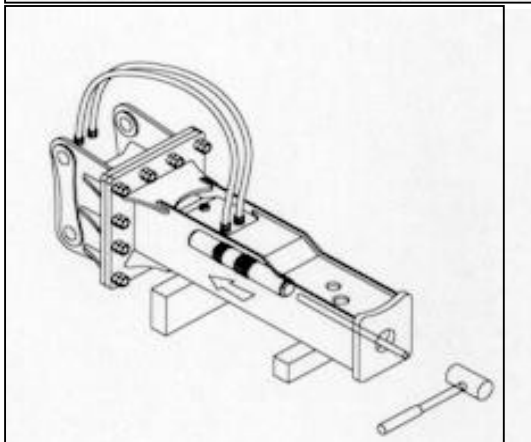
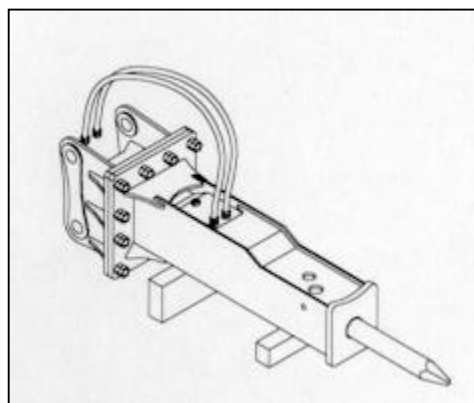
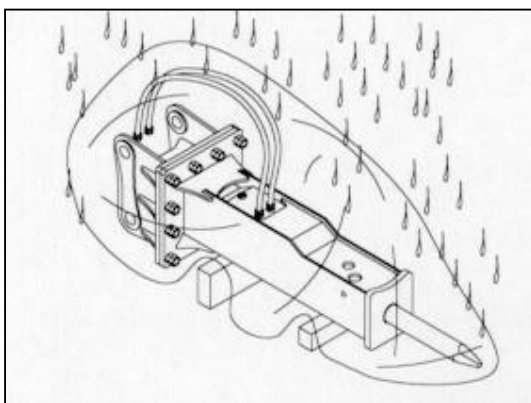
2-6. REMOVAL OF THE HYDRAULIC BREAKER

1. Remove the hydraulic hose connected with the stop valve on the boom and the breaker.
2. Shut off the hose and the stop valve with caps in the toolbox.
3. Replace the breaker and the bracket with the bucket in the same order of the bucket replacement.
4. Follow the reverse order when installing the breaker.



2-7. STORING

1. Be sure to shut the caps of the dismantled breaker hoses.
2. Avoid getting wet in the rain. Preserve inside or cover.
3. Apply enough grease to the chisel.
4. Follow these steps to prevent getting rust on the piston for long preservation:
 - Dismount the chisel from the front cover.
 - Deflate the nitrogen gas of head cap completely from the gas valve of head cap.
 - Push up the piston after arranging the round stick with the stroke piston by light hammering from the front cover.
 - Let the residuary gas pressure out of head cap.
 - Apply grease to the inside of front cover and chisel then attach to the front cover.



The hydraulic breaker should be stood vertically. Secure the hydraulic breaker during lengthy periods of non- use to ensure that it cannot fall over.

2-8. OPERATION

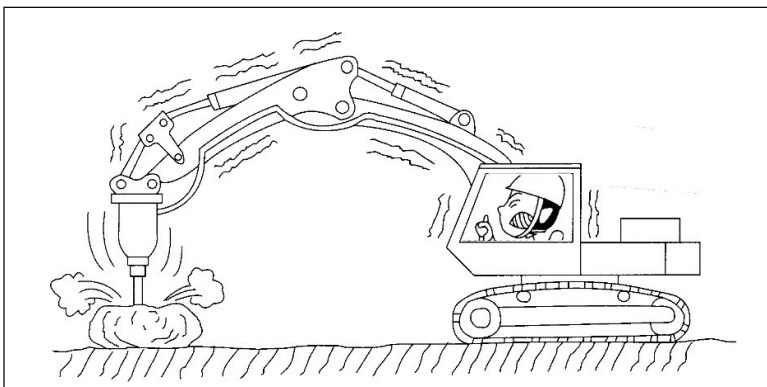
First of all, precautionary measures should be taken to the rule out the risk of accident.

- Only operate the hydraulic breaker from the driver seat in the excavator cab.
- Close the front screen / windshield on the drivers cab to avoid injury from flying rocks.
- Wear ear protection to prevent hearing impairment. Anyone in the immediate vicinity of breaker operations should also wear ear protection.
- Switch off the hydraulic breaker immediately if any one moves into the danger zone. That is within a radius of at least a 20-yard (60 feet) radius of the hammer. Depending on the application greater distances may be required.

2-9. PROPER WAY OF OPERATION

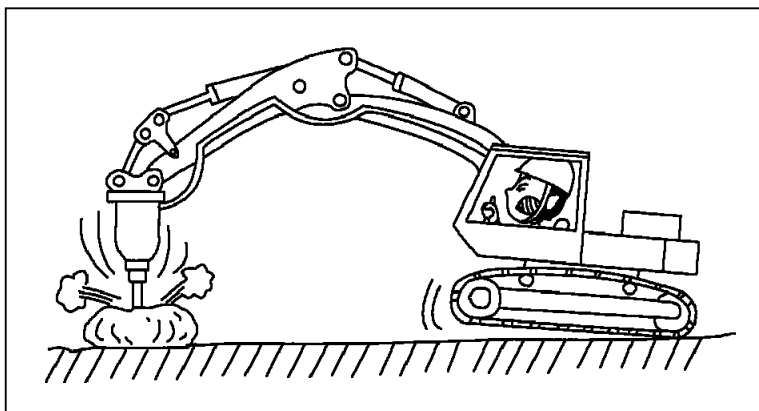
1. Proper thrust

To break effectively, a proper thrust must be applied to the breaker. If thrust is insufficient, the hammering energy of the piston is not efficient for breaking rocks. Hammering force is then



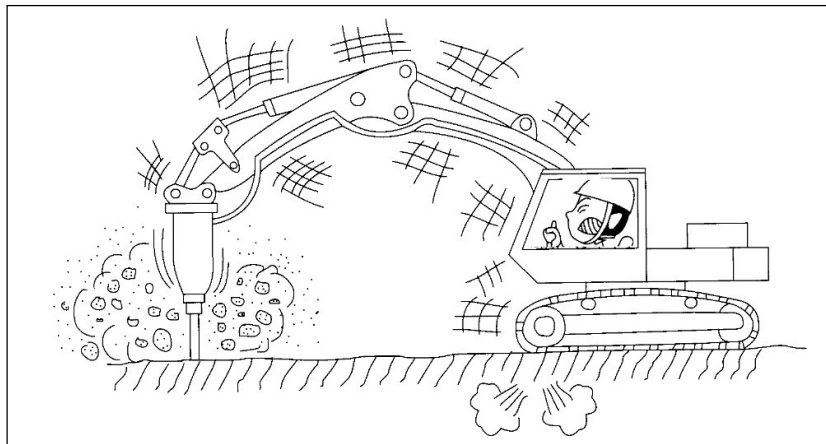
transferred to the breaker body, arm and boom of the base machine which results in damage of the parts.

However, if thrust is excessive or breaking is performed with the boom of the base machine raised, the machine may suddenly tilt toward the movement, rocks are broken and the breaker body may hit against rocks resulting in damage.



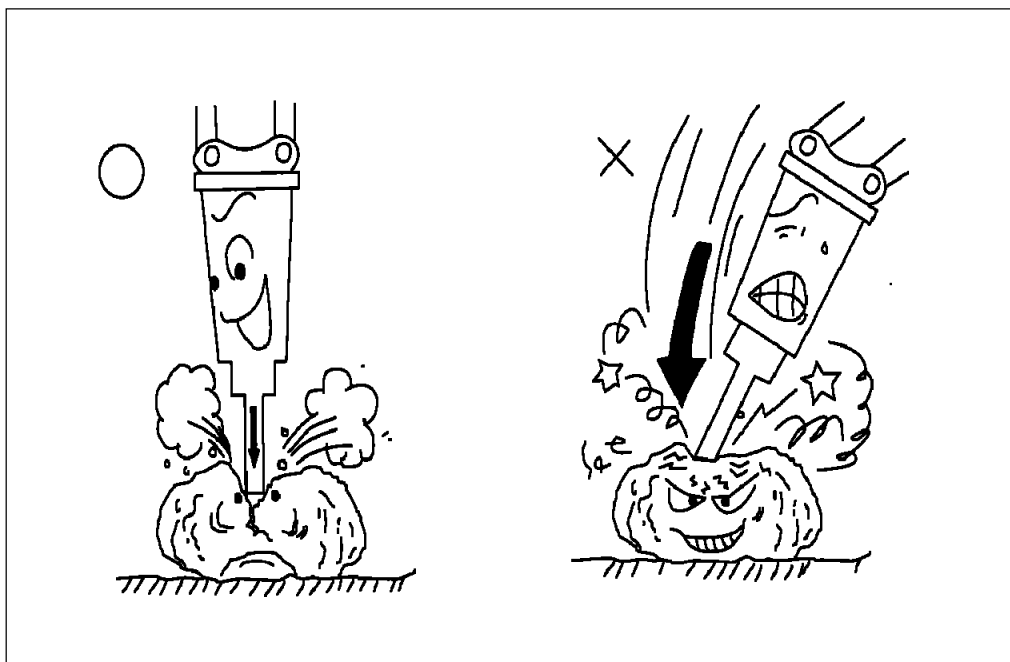
If hammering is performed under such conditions, vibrations may occur in the tracks which should be avoided in order to ensure no damage to the tracks.

Do not hammer without proper applied thrust.



2. Direction of thrust

Apply pressure in a straight line with the tool placed on a rock with the hammering side as vertical as possible. If the hammering side is at an angle, the tool may slip during hammering and cause the chisel and piston to be broken, or destroyed. When breaking, select the point of a rock in which hammering can be performed and fully stabilize the chisel to hammer.



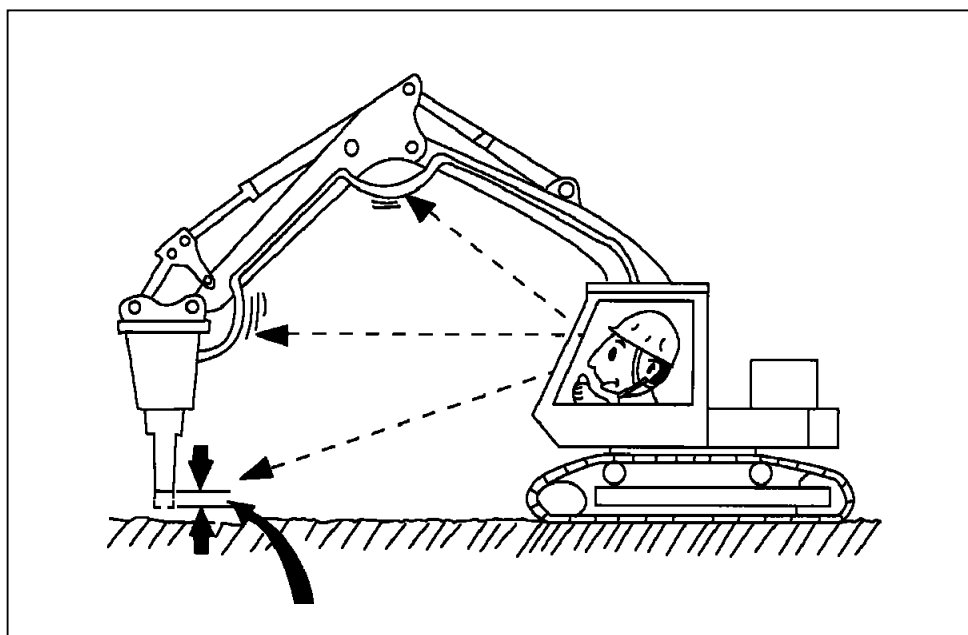
2-10. PRECAUTION FOR OPERATION

The operator should pay attention to the following during operation:

2-10-1. Stop the operation as soon as the hoses vibrate excessively.

Check to see if the high- and low-pressure hoses of the breaker vibrate excessively. If so, the accumulator may be defective. Contact the service department with your dealer in your territory for repair.

Further check oil leakage at the hose fitting points, if oil oozes, re-tighten the hose fittings. Visually inspect to see if there is a surplus of tool, during operation as illustrated (See below). If not, the tool must be seized in the front head. Disassemble the front head, and inspect the components and repair or replace defective parts.



2-10-2. Chisel Stroke

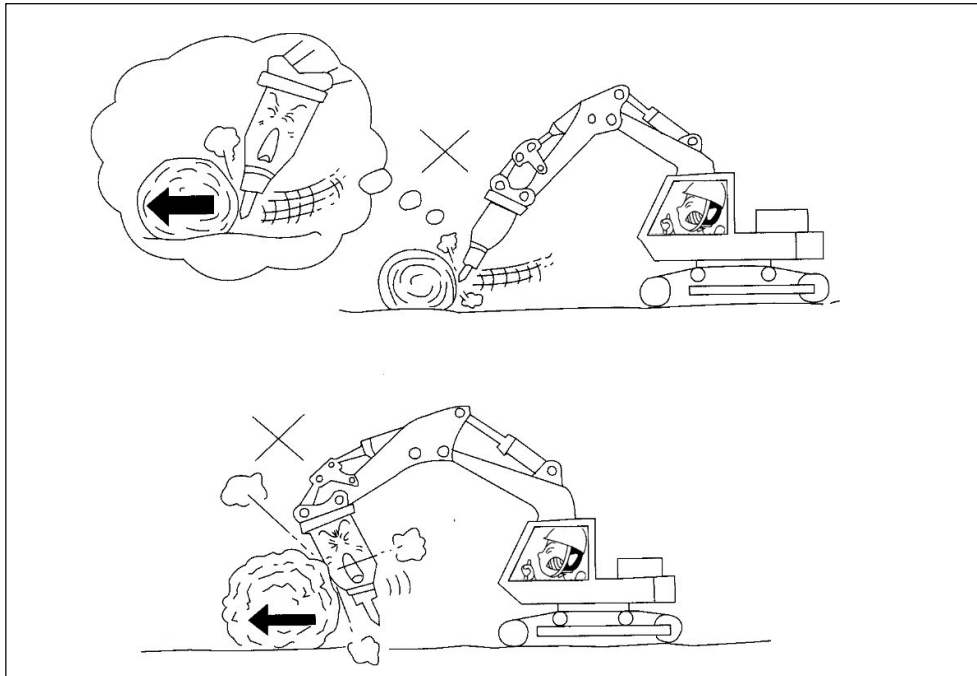
Hammer model	Chisel Stroke mm	Chisel Stroke inch
UT225	40	1.57
UT500	46	1.81
UT550	39	1.54
UT850	43	1.69
UT1000	45	1.77
UT1200	50	1.96
UT2200	42	1.65
UT2800	44	1.73
UT3200	59	2.32
UT4000	45	1.77
UT4500	60	1.77
UT5000	60	1.69
UT6000	61	1.77
UT8000	70	1.97
UT11000	72	1.93
UT16000	69	1.81
UT18000	90	2.32

2-10-3 Stopping (Avoid idle hammering)

As soon as rocks are broken, stop hammering. If idle hammering is continued, the accumulator may be damaged, the bolts loosened or broken and, furthermore, the base machine is also adversely affected. When proper pressure is not applied to the breaker, or the chisel is used as a lever, idle hammering occurs (In idle hammering, the hammering sound is not normal.)

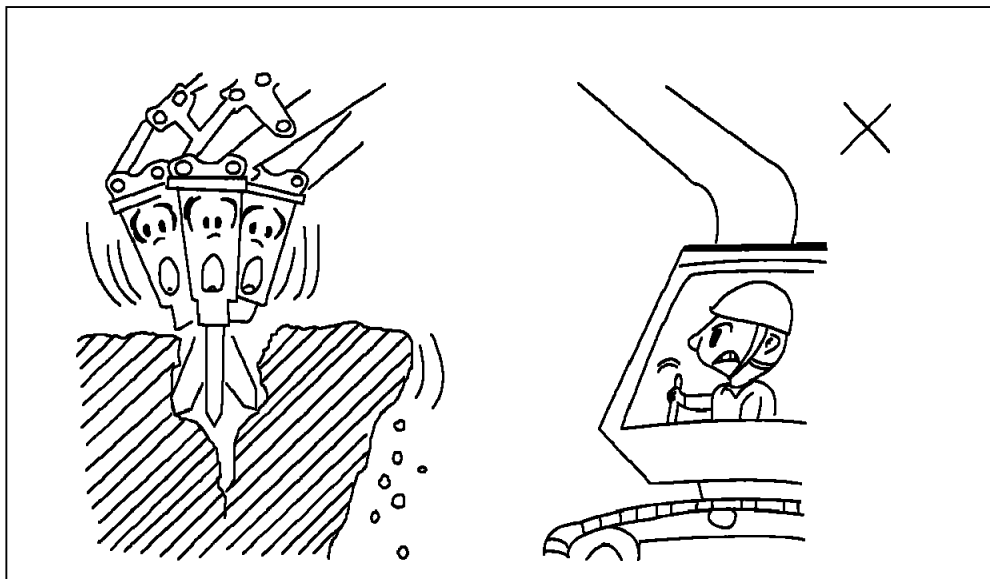
2-10-4 Never use to move rocks.

As shown in the picture, do not roll or throw down rock with the end of the chisel or the side of the bracket using the oil pressure for the base machine boom, arm, bucket, swing or moving because the bolts of breaker may be broken, the bracket damaged, the chisel broken or scuffed, and the boom or arm damaged. Avoid moving rocks. Especially, never move the machine with the tool in a rock.



2-10-5 Never lever with the breaker.

Never attempt to use the hydraulic breaker as a crowbar, as this will cause the working tool to break.

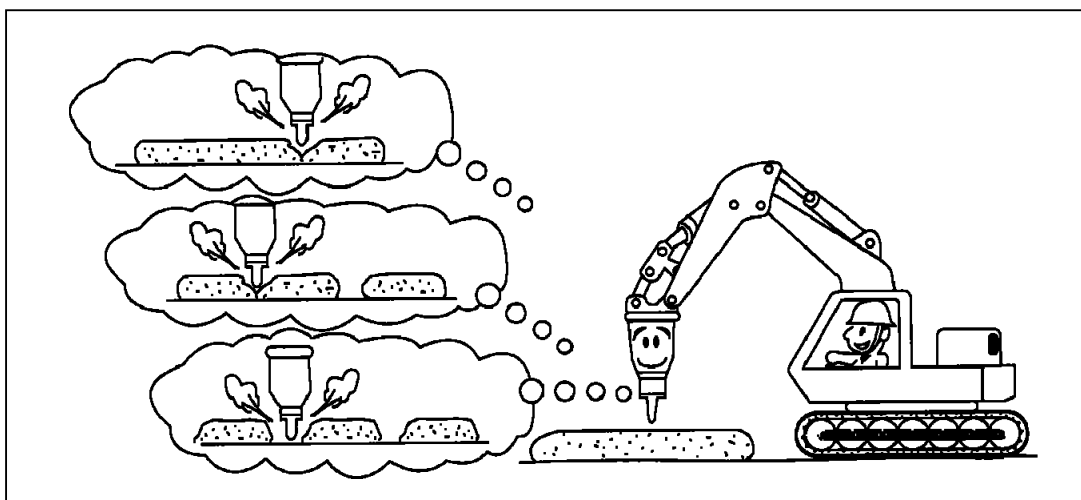


2-10-6 Breaking never to exceed 30 seconds.

When rocks are hardened, do not hammer in the same place to exceed 30 seconds but change the point to be hammered. Hammering for long periods of time raises the oil temperature resulting in a damaged accumulator and causes the chisel to be excessively worn.

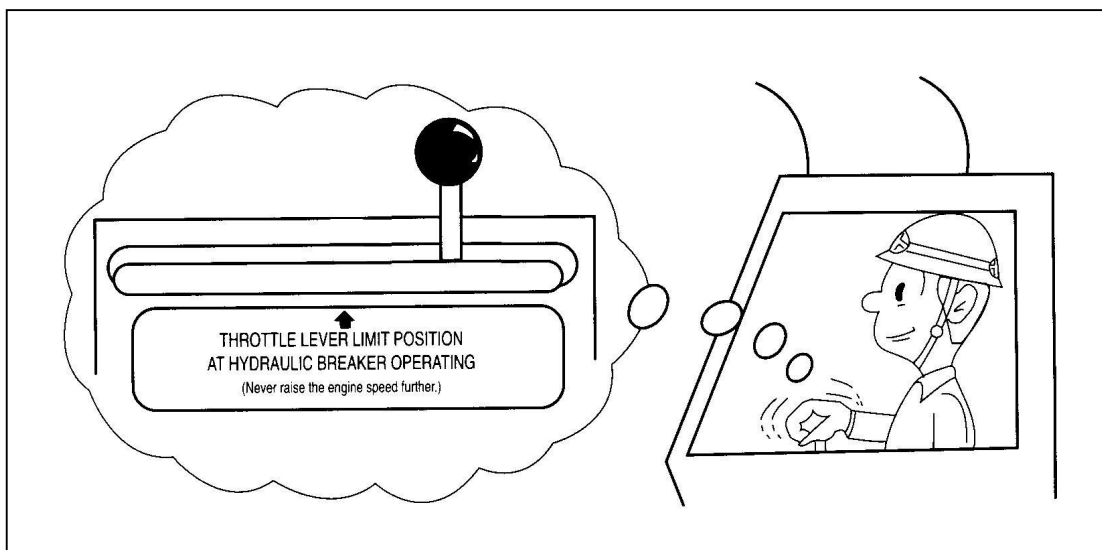
2-10-7 On a hard, large rock, start breaking at the end point.

Hammering at a crack or the end will enable even a big rock to be broken comparatively easily. Advancing in large steps will not improve working results. Advancing in small steps is more effective.



2-10-8 Operate the breaker at a proper engine speed.

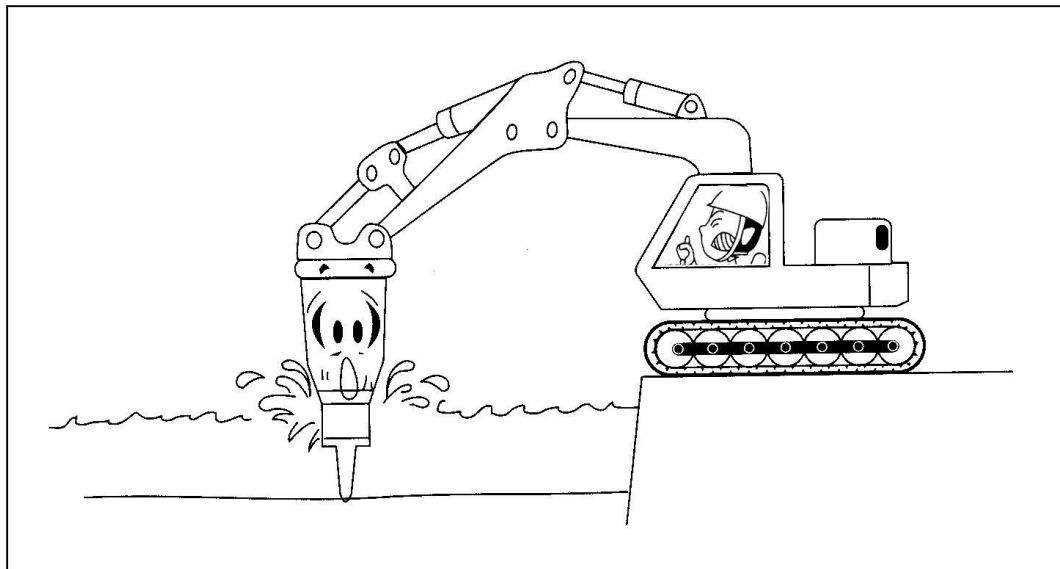
Breaker rocks at the specified engine speed. Raising the engine speed more than necessary does not increase the hammering force but raises the oil temperature to result in the damaged equipment.



2-10-9 Must never be used in or under water or mud without prior conversion.

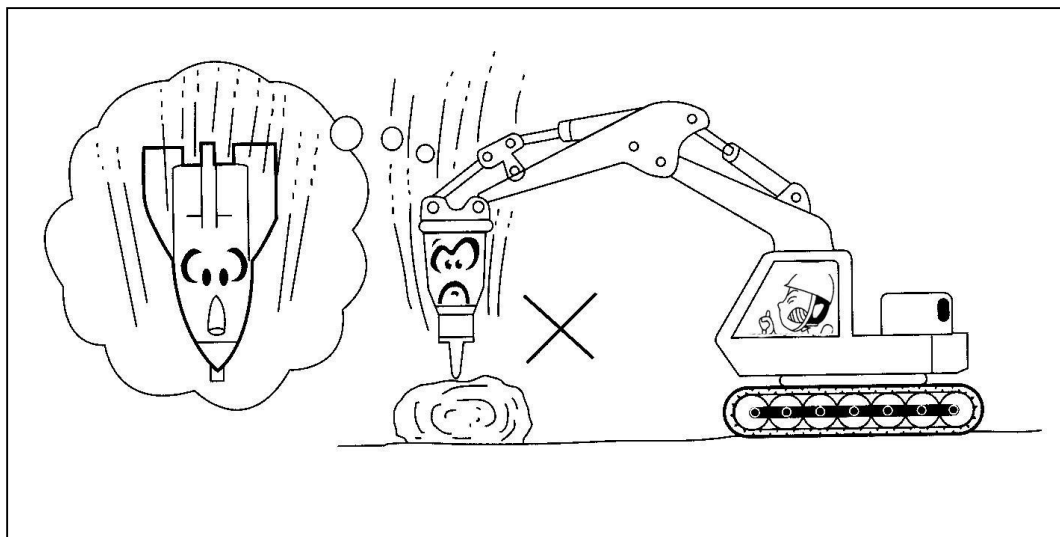
If water were to penetrate the percussion chamber, each blow would create a pressure wave. These pressure waves will cause unreparable damage to the stripper and seals on the hydraulic breaker, and in addition the lower percussion piston zone will rust. Water could also penetrate the carrier's hydraulic system.

In order to avoid damage to the hydraulic breaker, a underwater kit must be installed.



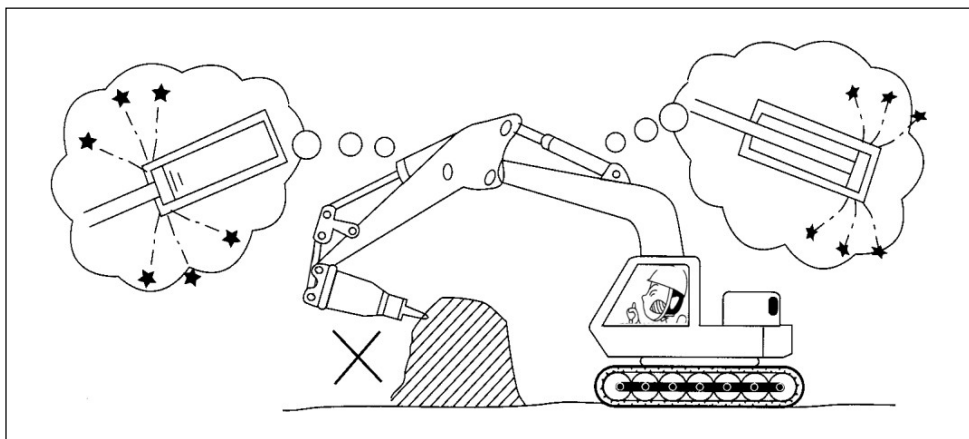
2-10-10. Never use as a sledgehammer.

Before starting up, place the breaker on the ground. Never attempt to use the breaker and excavator boom as a sledgehammer to break material. This will cause damage to each part of the base machine.



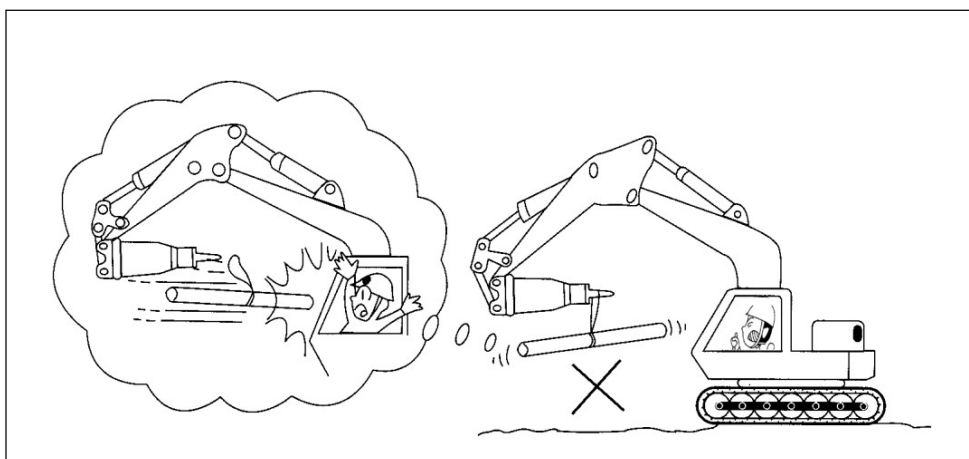
2-10-11. Never break with the cylinders of base machine extended to the end of stroke.

The excavator may be easily damaged when the break material is broken with the cylinders of base machine stretched to the end.



2-10-12. Never use for transport or lift purposes.

The hydraulic breaker is not designed to lift or transport loads. The breaker may easily damage and it is very dangerous.



2-10-13. Host machine requires warming up in cold weather.

If the breaker is operating with low oil temperature in winter, the piston and seals may easily be damaged. It is required that warming up the engine of base machine from five to twenty minutes and moving the boom. Oil temperature must reach to min. 30°C.

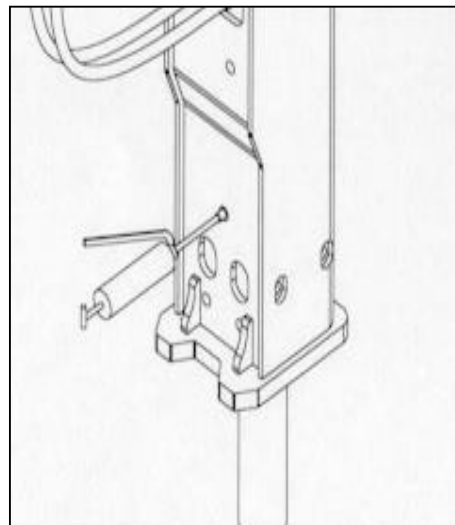
(Refer to Instruction Book for Host Machine)

2-11. OIL AND LUBRICATION

UtiliTough, Inc. hydraulic breaker requires proper viscosity of hydraulic oil and grease as below when using oil extremely cold or hot weather.

Lubricate to the contact faces in the lower breaker part between the working tool and the wear bushes.

Hydraulic Oil		Grease
High Temperature	Low Temperature	NLGI No.2 (265-295)
ISO VG 68 (61.2-74.8 cst)	ISO VG 46 (41.4-51.6 cst)	



Grease gun application

Model	No. of Pumps	cc/hour
UT500-UT1200	5 – 7	15cc
UT2200-UT4500	11 - 15	30cc
UT8000	17 - 20	40cc
UT11000- UT18000	20 - 25	50cc

2-12. WORKING IN HIGH-TEMPERATURE CONDITIONS

The temperature of the hydraulic oil must be monitored to ensure it does not exceed 80°C. If higher temperatures are measured in the tank, oil cooler must be fitted. Only use hydraulic oils of sufficient viscosity. In summer and tropical climates, the minimum requirement is a hydraulic oil type HLP 68.

2-13. WORKING IN LOW-TEMPERATURE CONDITIONS

There are no special regulations for temperatures down to 20°C below freezing, the hydraulic oil must be warmed up before operating. This is achieved by:

- Starting up the excavator motor.
- Moving the boom.

This raises the oil temperature. Once it has risen above 0°C, the hydraulic breaker can be started.

Leave the motor and the pumps of the excavator running while breaker is working.

Please note:

The hydraulic breaker and excavator do not operate to full capacity until the oil temperature has reached at least 60°C.

WARNING:

Feeding hydraulic oil to an extremely cold hydraulic breaker will cause internal stresses in the unit resulting in failure. If the breaker is used without preheating the hydraulic oil, the hammer seals may fracture and the diaphragm in the high-pressure accumulator may tear. (Please observe the excavator manufacturer's regulations.)

2-14. CHISEL (TOOL)

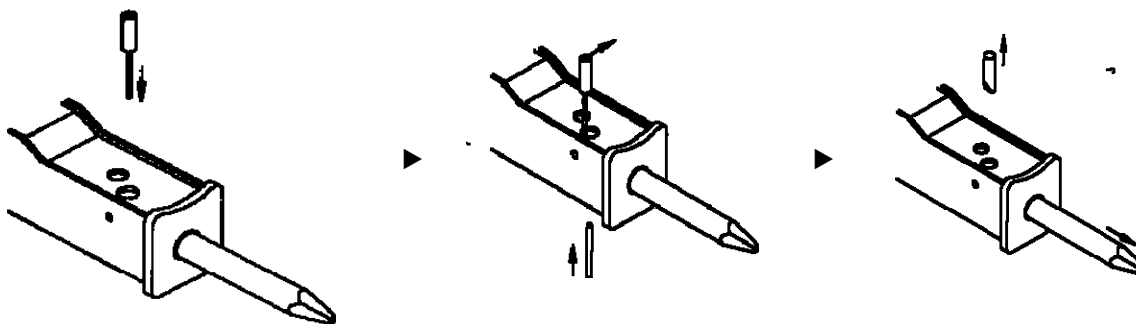
WARNING: For safety reasons, the carrier must be switched off before performing the following work.

- Never use your fingers to check if the recesses on the working tool shaft are aligned to the slots for the chisel pin.
- Always wear protective glasses when fitting or removing the tool, since metal splinters may fly off when hammering out the stopper pins.
- Clean always any dirt adhering to the working tool in the insert zone.
- Lubricate the contact faces in the lower breaker part between the working tool and the wearbushes.
- The chisel should only be fitted correctly.

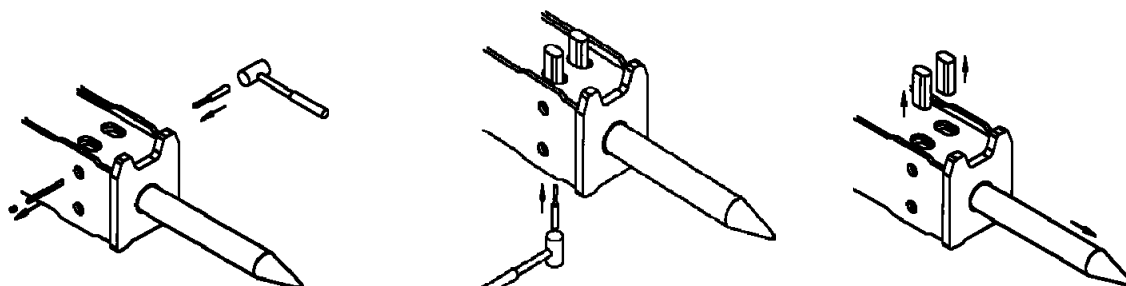
2-15. REPLACEMENT OF THE CHISEL

1. UT500-UT650, UT1200: Push the spring pin back into the hole with the pin punch.
UT850, UT1000-UT8000: Knock the stopper pin and rubber plug out of the upper chisel pins out with a hammer pin punch.
2. Take the chisel pin out by using a pin punch to push the chisel pin out from under of the breaker.
3. Replace the new chisel after removed.
The chisel is heavy, so careful attention needed.

UT225, UT500-UT650, UT1000, UT1200



UT850, UT1800-UT8000

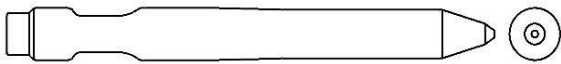
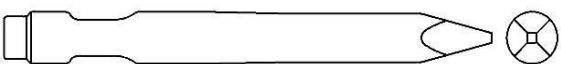
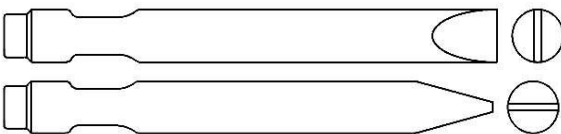
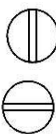
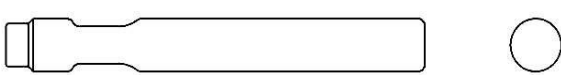


2-16. ESSENTIAL POINTS IN USE

Follow the warnings below to prevent of failure or crack on the chisel and holder bushing:

- Avoid lifting, twisting and hitting.
- Avoid condensation, water, rain.
- Avoid getting injured from hitting between the chisels and other hard objects.
- Avoid heating.

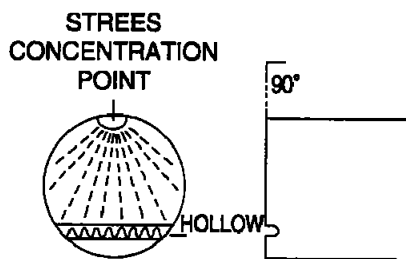
2-17. CHISEL TYPE BY SHAPE

Type of Chisel	Application
Conical (Universal) 	Breaking concrete, rock and pavement
Moil (Pyramid) 	Breaking concrete, rock and pavement
Wedge H  Wedge V 	Mining, foundation, trenching, demolition, finishing slopes
Flat end (Blunt) 	Mining, breaking oversize, demolition

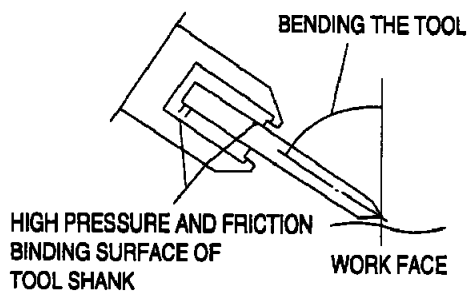
***Must use UtiliTough, Inc. chisel. Use of other manufacturers chisel will void warranty. UtiliTough, Inc. will not warranty nor be responsible for parts, chisels or breaker if other point is installed.**

2-18. CAUSE OF TOOL DAMAGE

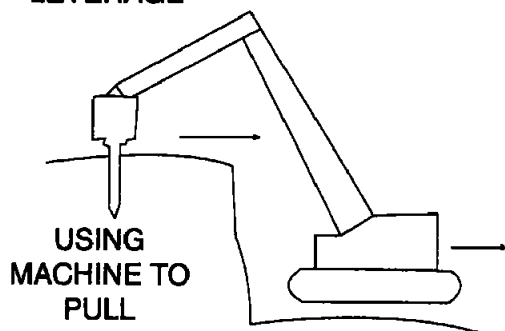
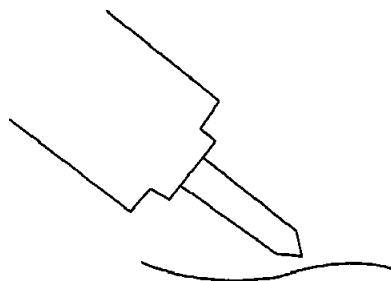
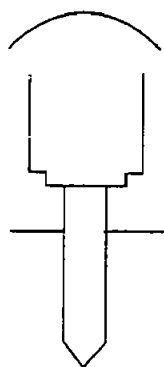
1. Continuous side pressure due to leverage, incorrect driving angle and using the hammer to pull heavy objects.
2. Free running leading to the damage on the chisel pin.
3. Low temperature causing the tool to be more susceptible to fatigue failure.
4. Overheating of tool by the friction caused by improper lubrication and excessive bending.
5. Excessive wear of front cover making piston blow on the top face of the chisel by inclined direction causing the damage on the tool head as well as on the bottom of the piston.



BREAKAGE BY HIGH STRESS



BENDING BY HIGH PRESSURE



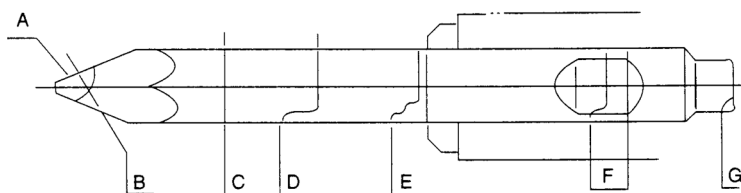
EXAMPLES OF MIS-HANDLING

2-19. CHISEL WARRANTY GUIDE

The purpose of this guide is to enable you to advise your customer as to the correct application of UtiliTough, Inc. chisels and assist you to resolve complaints immediately as they occur.

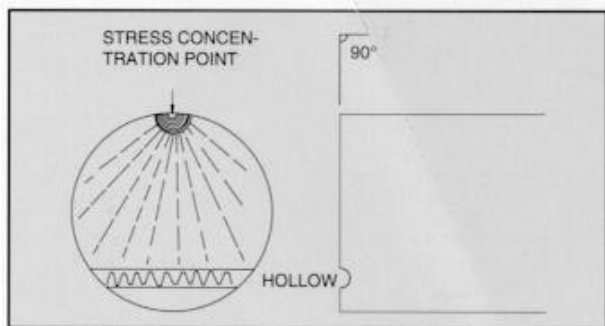
GUIDE TO WARRANTY CLAIMS

1. Bending or breakage of rods due to incorrect operation:
Operator always has to hammer rod in vertical on breaking objectives.
Rejected for Warranty Claim.
2. Normal wear due to hammering:
Wear is influenced by ground conditions.
Rejected for Warranty Claim.
3. Softening of rod point (Mushrooming) due to hammering on the same point for a long period of time: Do not hammer more than 30 seconds on the same point.
Rejected for Warranty Claim.
4. Chipping of rod point:
Mishandling by hammering at unstable setting.
Rejected for Warranty Claim.
5. When rods are deformed due to overheating with welding.
Rejected for Warranty Claim.
6. Damaged on the impact area, breakage and bending of rods due to abnormal wear of bush has worn over 8mm.
Rejected for Warranty Claim.
7. Breakage and abnormal wear in F area due to blank firing.
Rejected for Warranty Claim.



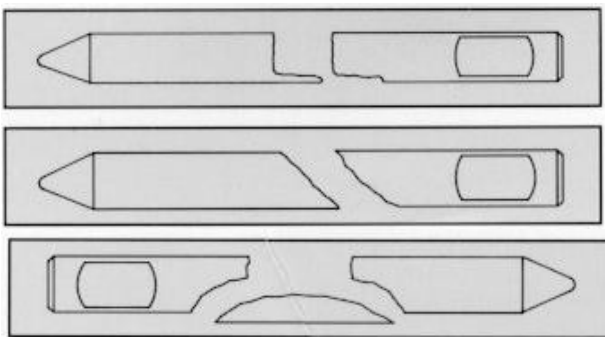
8. Typical of a high stress fracture, usually caused by using the machine to "pull".

Rejected for Warranty Claim.



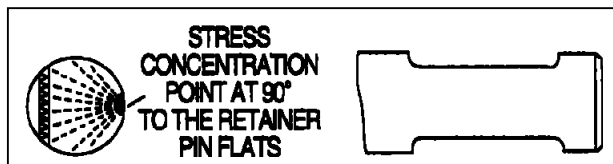
9. Typical fractures caused by excessive bending of the demolition tool.

Rejected for Warranty Claim.

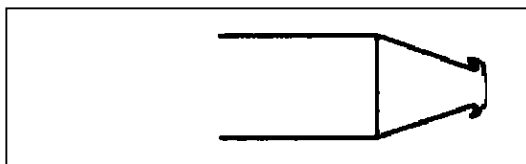


10. Typical fracture caused by levering tool while buried in the burden.

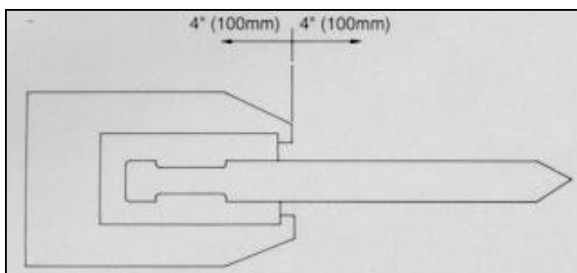
Rejected for Warranty Claim.



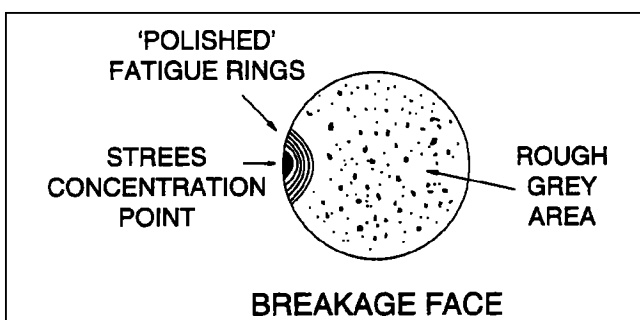
11. Mushrooming; this is caused by driving the point into hard dense material for too long a period of time without penetration. This generates intense heat, softening the point, thus causing it to "mushroom". **Rejected for Warranty Claim.**



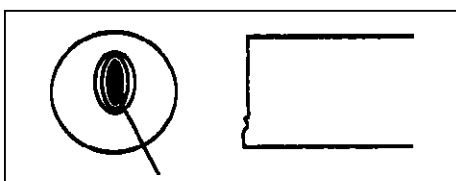
12. A chisel fatigue failure will generally occur approximately 100mm (4") either side of the chuck frontface.
Rejected for Warranty Claim.



13. The polished semi-circular arc in the blow picture is the fatigue area and generally starts from a damage mark or other stress raiser on the outside of the chisel and spreads inwards.
Rejected for Warranty Claim.



14. Note fatigue lines originate from internal point, not outer diameter: Caused by manufacturing defects.
Accepted for Warranty Claim.



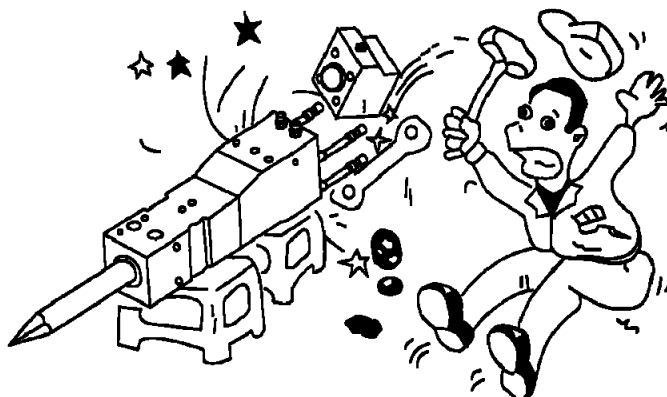
3. SERVICING

3-1. INSPECTION and MAINTENANCE

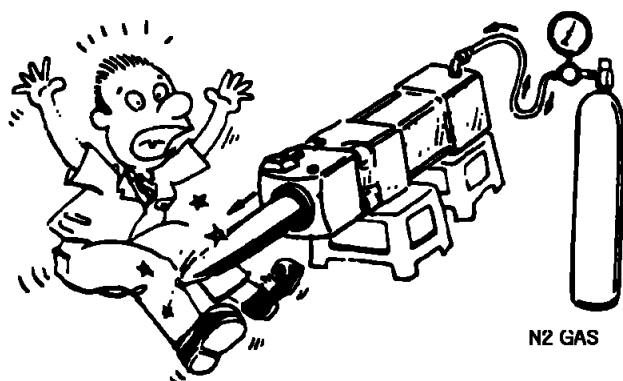
WARNING:

- When disassembling the head cap: It may spring out of the head cap very suddenly due to gas pressure in the head cap:
 - Be sure to release gas out from the head cap before disassembly.
 - Be sure to completely tighten the through bolts with the specified torque before gas charging.

Be sure to release gas out from the head cap before disassembling gas valve.



It may spring the chisel out when charging the nitrogen gas into head cap. Do not stand in front of the chisel to avoid accidents.



- Discharge the gas pressure with “L” wrench (5mm) from gas valve after released the plug of gas valve.

3-2. BOLTS

The bolts may easily be loosened when the breaker has been in operation for long periods of time. The bolts should be checked often, and re-tightened when needed. Regular checking required. In case of frequent loosening, contact the service department of your dealer or UtiliTough, Inc.

3-3. GAS PRESSURE AND CHARGING NITROGEN GAS

UtiliTough, Inc. hydraulic breaker operates with hydraulic oil and gas pressure.

WARNING:

Fill with nitrogen only. Filling with air or oxygen runs the **RISK OF AN EXPLOSION!**

- If gas pressure becomes over optimum gas pressure, the breaker gets overloaded. But if the gas pressure is lower than optimum gas pressure, the breaker will have poor performance.
- The gas pressure varies in accordance with the working conditions. Gas pressure should be within optimum gas pressure while operating the breaker.
- Check the O-ring, even If recharged gas pressure, it is decreased in gas pressure.
- If the working oil has leaked into the head cap from cylinder, replace the gas seal or O-rings in the cylinder bush and check for a scratch on the piston.
- The pressure in the head cap should be set according to the chart as follows:

Gas Pressure	UT500-UT650	UT850-UT2200	UT2800-UT8000	UT500-UT650 for Skid Steer Loader
Head Cap (kg/cm ²)	12 - 14 (172-200 psi)	12 - 14 (172-200 psi) *UT850: 14-16	14 - 16 (200-230 psi) *UT8000: 10-14	12 - 14 (172-200 psi) *UT850: 10-12
Gas Pressure	UT500	UT650-UT850	UT2800-UT8000	UT650-UT850 for Skid Steer Loaders
Accumulator (kg/cm ²)	-	40-50 (570-710psi)	55-60 (780-850psi)	75 Return line: 20

※ Gas pressure should only be checked with the chisel protecting from the front cover to its full extent.

3-4. WEAR PARTS

The following items are considered as wear parts and are not covered under warranty, but need to be replaced.

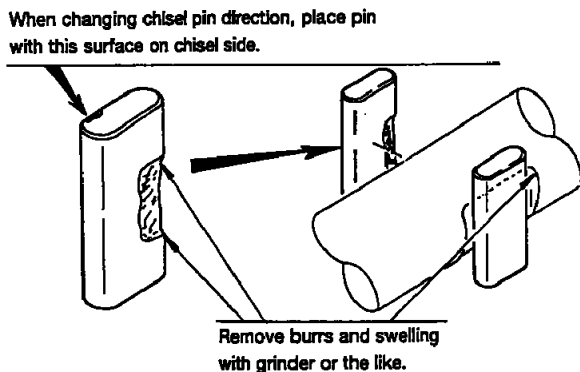
When damaged or worn, your attention is highly recommended to replace these items and recommend the user to stock wearing parts as follows.

- ① Chisel
- ② Front Cover and Round Bush
- ③ Chisel pins
- ④ Hydraulic Seals
- ⑤ Through Bolts
- ⑥ Hydraulic Hoses

Replace hydraulic seals every 500 hours of actual operation as well as when just kept over 6 months in storage. Chisel Pins: When each chisel pin is excessively deformed, it is difficult to replace chisel. Therefore, every 100 to 150 hours of operation, change the face of each pin that comes in contact with the chisel

(The two faces of each pin can be used).

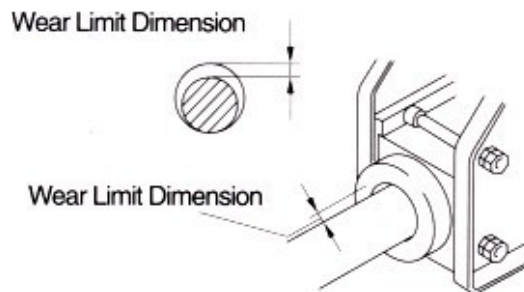
If the chisel use is not the genuine part, we cannot guarantee the breaker parts for their good performance.



3-4-1. FRONT COVER

Wear Limit of Chisel and Front Cover:

When the clearance between the chisel and Holder bush becomes large, it is strongly recommended to replace these parts to prevent from wear. Exceeding the following value may damage other component parts, such as the piston and cylinder.



Model		UT500-UT850	UT1000-UT4000	UT4500-UT8000	UT11000-UT16000
Wear	mm	6	8	10	12
Limit	Inch	0.23	0.315	0.394	0.472

3-5. WORKING PRESSURE

If the working pressure of the breaker is regular pressure and if the pressure of the excavator itself is regular pressure, a relief valve is not needed.

If the pressure is over regular pressure the breaker gets more impact and creates a problem for the breaker and the excavator.

Model	UT500-UT1200	UT1800-UT16000
Relief Valve Setting Pressure	175 kg/cm (2500 psi)	210 kg/cm ² (3000 psi)

3-6. OIL TEMPERATURE

The oil temperature varies according to the working condition but it is normally 50~80°C. If it is over 80°C it results in the making the life of both the accumulator rubber and the life of O-ring span shorter.

Be cautions of the following to avoid the rise of oil temperature:

1. Avoid continuous blowing at the same point over 30" seconds.
2. The amount of oil needed in the breaker within the using pressure is regular. In spite of more engine rotation the blow frequency does not increase, rather the oil flows out by the relief valve so the oil temperature rise and the continued ratio become high. While hammering the breaker, if the engine rotation increases to some degree, the increase happens no more.
3. Keep clean the cooler to avoid falling a cooling effect.

3-7. ACCUMULATOR

Replace the accumulator if there is big tremor on the hose of high-pressure line. Ask your UtiliTough, Inc. dealer when replacing the accumulator and the O-ring, face seal and back up ring as well. Also check whether oil is leaking or not around accumulator. After replacement and inspection, the socket bolts that fix the accumulator should be tightened by the torque wrench.

3-8. OIL LEAKAGE

Check for oil leakage from connected parts. A small amount of oil leakage, between the chisel and front cover can be disregarded as it helps smooth the chisel. In the case of a lot of leakage, check and replace the seals, apply the working oil to the seal kit and the seal groove.

The following should be inspected when replacing the packing:

1. Check for any scratches on the seals, make sure they are well pressed and are not pushed out.
2. Be cautious of dirt and other debris in the oil flow.
3. If the seal is damaged, check the seals and stroke piston.
4. When the seals that placed in cylinder bush get damaged, lots of oil leaks out. Replace each seal and O-ring when this occurs.
Require the service of your UtiliTough, Inc. dealer, even if replaced new seals, oil leaks out continue.

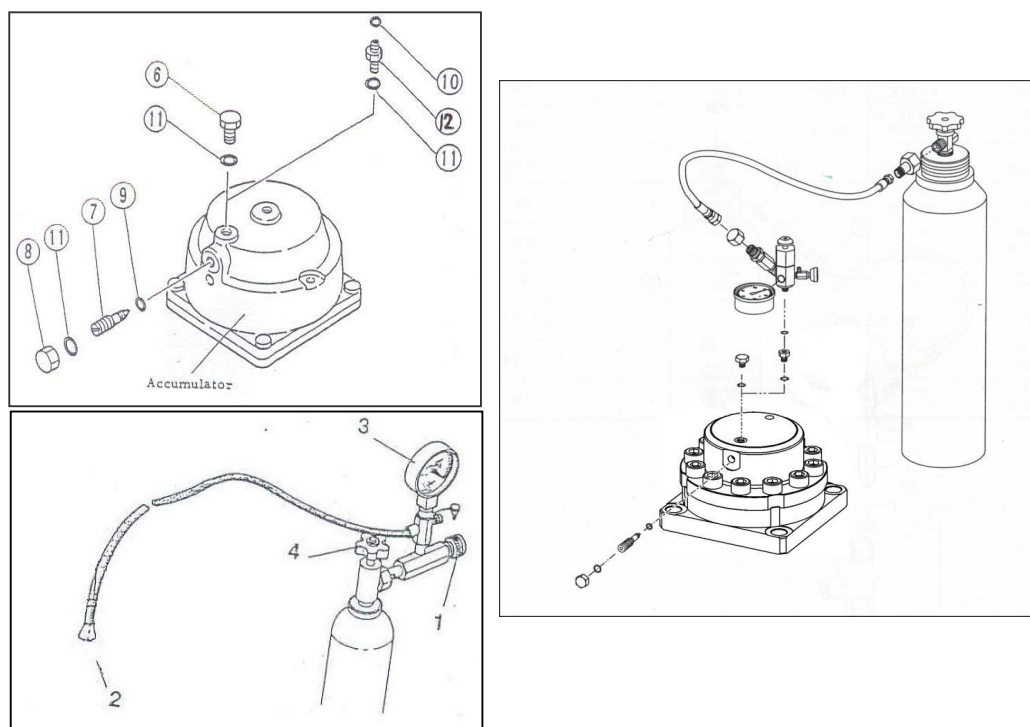
5.9. THE CONTAMINATION OF WORKING OIL

The contamination of working oil becomes the cause of problems with the control valve, and flows in the stroke piston. Always keep the working oil clean and free of debris. Replace the filter of excavator per 100 hours and the working oil 600 hours. When installing the breaker in the old excavator, replace the working oil and recharge the working oil if necessary.

3-10. CHECKING GAS PRESSURE IN THE ACCUMULATOR / HEAD CAP AND CHARGING

The gas in head cap and accumulator may only be filled with nitrogen.

When filling the gas, ensure no one is standing in the area of the working tool. If the tool has jammed, it may spring out of the lower hammer part very suddenly.

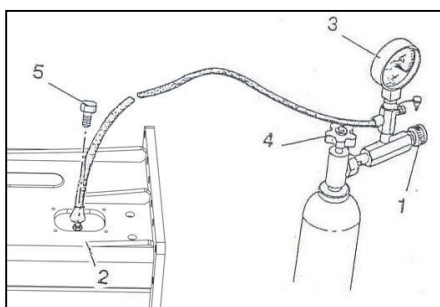


How to charge accumulator with nitrogen gas

1. Remove gas valve cap (6) screwed in the accumulator and tighten the hex busing (12) completely which is connected to insert nozzle (2).
2. Remove needle cap (8) screwed side of accumulator and loosen needle pin (7) about one turn.
3. Charge the accumulator with nitrogen gas by controlling the gas cylinder valve (4). Check whether the gas pressure is correct or not
4. Tighten the needle pin (7) completely and needle pin cap (8).
5. Remove the adaptor (12) and tighten gas valve cap (6).

Please note (VERY IMPORTANT)

When filling the gas, the hammer must be lying flat with no contact pressure applied to the working tools as well in cold condition as at operating temperature.



1. Pressure relief valve
2. Insert nozzle
3. Press gauge (regulator)
4. Gas cylinder valve
5. Gas valve cap

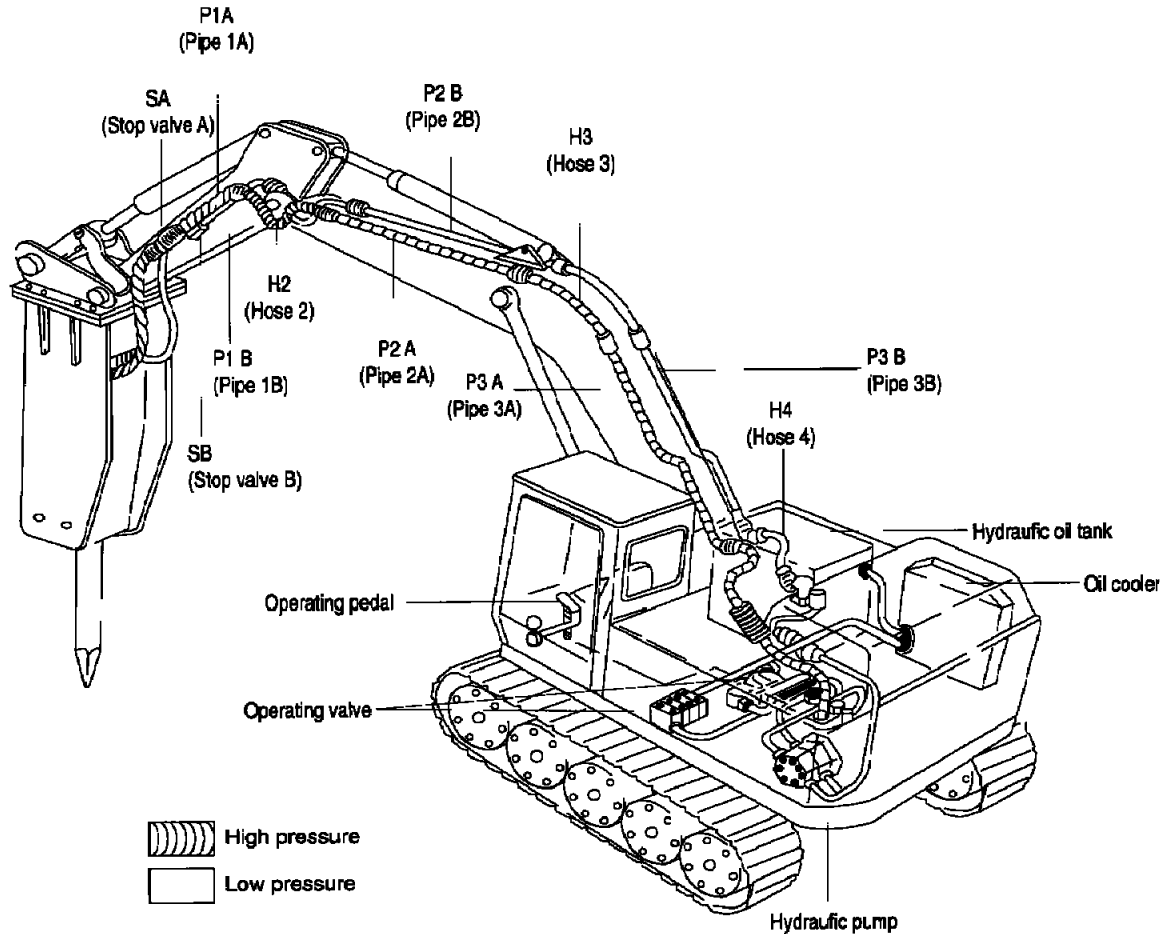
How to connect gas charging kit

1. Connect gas regulator with nitrogen gas cylinder.
2. Remove the gas valve cap (5) on head cap and connect the hex busing (12) and insert nozzle (2) to the gas regulator.
3. Check whether the gas pressure is correct or not.

⚠ Must put the cap on gas bottle to avoid damage to valve of gas bottle. Check the valve of gas has closed while keeping. Especially, do not expose the gas to the sun for long periods of time.

3-11. MOUNTING and INSTALLATION

3-12. GENERAL VIEW OF BREAKER INSTALLATION TO BASE MACHINE



Hydraulic Breaker is not self-powered so it makes use of hydraulic power systems of the carriers on which it is mounted, such as excavator, mini-excavators, backhoe loaders etc. To enable carriers to operate with such attachments, the hydraulic power system has to be converted accordingly.

UtiliTough, Inc. hydraulic breaker requires proper oil flow and pump pressure.

There are required Setting Pressures to operate UtiliTough, Inc. hydraulic breakers as below, which is 10kg/cm² less than main relief pressure.

- * **UT500~UT1200: 175kg/cm²**
- * **UT2200~UT6000: 210 kg/cm²**
- * **UT8000~UT16000: 230 kg/cm²**
- * **UT18000: 210 kg/cm²**

3-13. PRECAUTIONS OF INSTALLATION

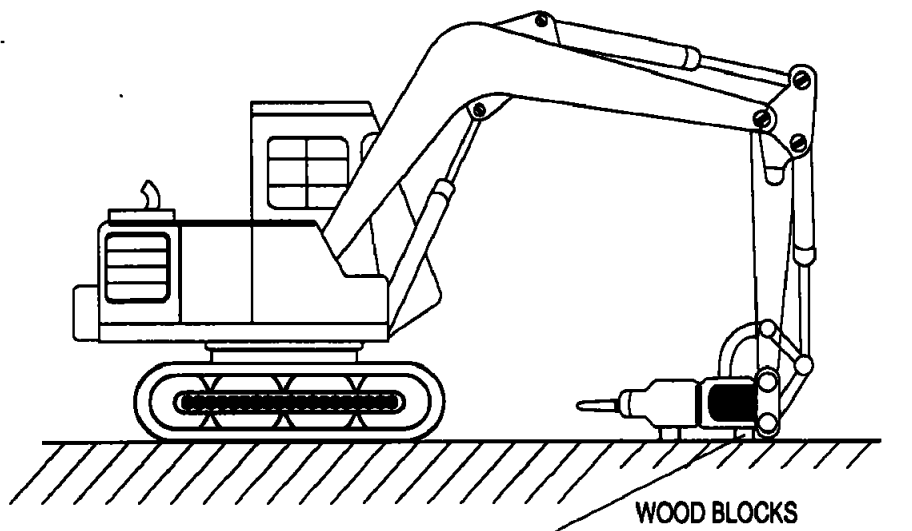
When the bucket and breaker operation are performed alternately, the hydraulic breaker is connected to the base machine with the two pins, therefore the bucket and breaker can easily be replaced with each other. However, as the hydraulic circuit is easily apt to be damaged by contamination, remove and install in the following procedures with care.

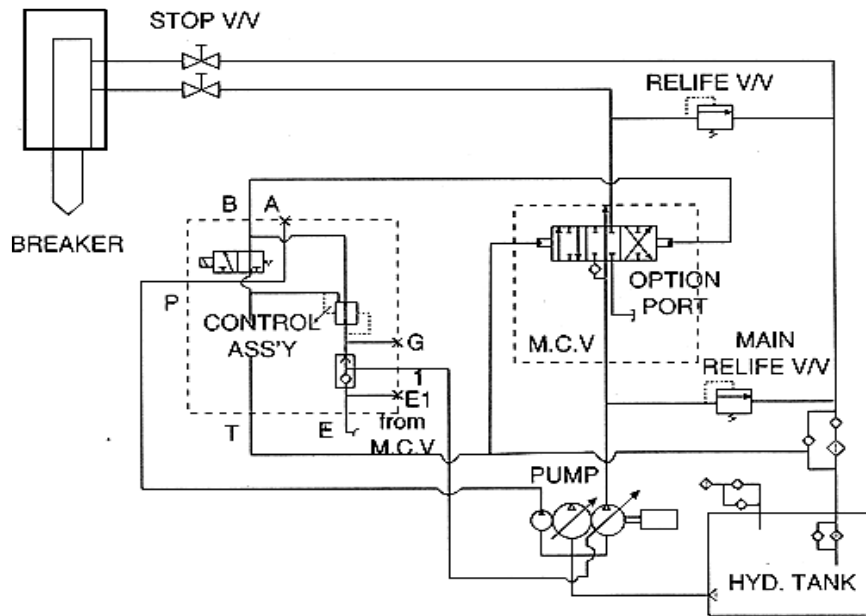
SELECT A LEVEL GROUND WHERE IS FREE FROM MUD, DUST AND DIRT. A DEALER SERVICE CENTER IS RECOMMENDED.

After moving the base machine to location, stop the engine and turn off the main switch. Further, if the hydraulic tank of base machine may be pressurized, bleed pressurized air from the oil tank. At this time, the base machine is positioned as shown the picture; the breaker and bucket can easily be replaced.

CAUTION:

Must shut the stop valve off before remove the breaker from excavator





3-14. HYDRAULIC SYSTEM

1. Proper input oil flow

Must attach a package valve for breaker or equivalent valve to control output flow from pump so as to acquire appropriate number of blows and reduce peak pressure to control output flow.

2. Pressure pulse (Pump to Breaker input line)

- Average operating pressure of

Indispensable condition:
 The average value of operating pump pressure is much less than that of compensating pressure.
 Purpose:
 Prevent an abrasion of regular and swash plate supporter of pump.

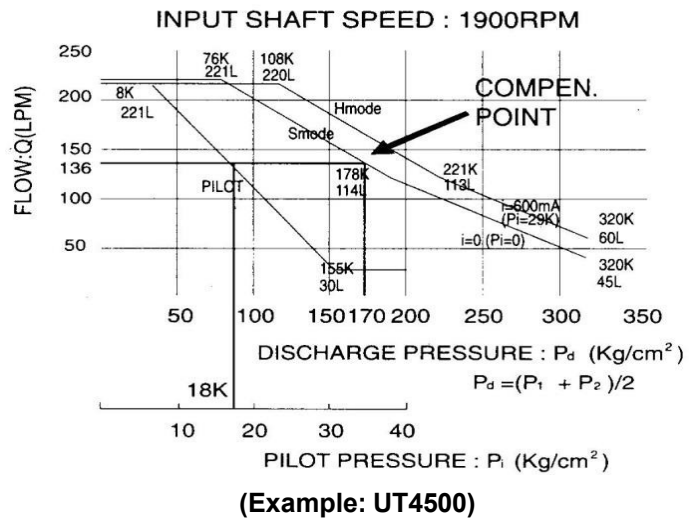
- Outlet pressure pulse of pump (Pmin. to Pmax.)

Indispensable condition:
 Pressure displacement is within 80 bar in 1 cycle of blow except an instantaneous peak pressure within 10m/s.

Purpose:
 Acquiring durability of pump.

- Outlet pressure pulse of pump (Pmin)

Indispensable condition: Information of average operating pressure instantaneous peak pressure dropped to negative pressure direction is within 40 bar, when measuring at supply line.



(Example: UT4500)

Purpose: Acquiring durability of pump.

- Pressure pulse (Pmin, Pump and Pmin, Breaker)

Indispensable condition: On operating breaker, minimum value of peak pressure of pump outlet is higher than that of breaker inlet or so. (Pmin, Pump \geq Pmin, Breaker)

Purpose: Checking control valve load and protecting valves.

- Inlet pressure pulse of breaker (Pmin, Breaker)

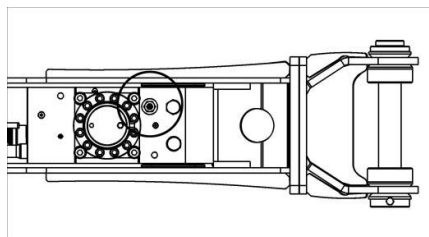
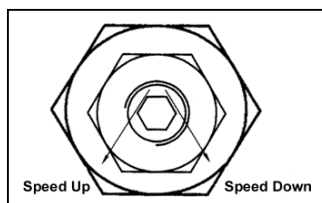
Indispensable condition: On operating breaker, minimum value of peak pressure of breaker inlet keep on higher than diaphragm pre-charge pressure (60bar) or so. (Pmin, Breaker \geq 60 bar)

Purpose: Protecting hydraulic components as to achieve efficiency of diaphragm.

3-15. ADJUSTER VALVE TO CONTROL IMPACT BLOWS

The blow of breaker is adjusted by oil flow of excavator, and reducing pressure valve in control valve at breaker line controls oil flow of excavator.

(UT1000-UT18000)



The blows of breaker can be adjusted with following procedure:

1. Release the nut of adjuster.
2. High speed (Low power): turn adjuster to counter-clockwise. Low speed (High power): turn adjuster to clockwise.
3. Tighten the nut of adjuster after setting.

CAUTION:

The max, effect of high speed is just one counter-clock wise turning of the adjuster. No effect, if over turning more than one. One eighth of a rounding to adjuster can blow about 10~15 bpm, so a turn adjuster with very much care.

3-16 HYDRAULIC PIPE LINES AND CONTROLS

1. The following devices and equipment of the host machine are used in common for breaker:
 - Hydraulic oil tank
 - Oil pump
 - Hydraulic control valve (When a spare valve is available in control valve bank of host machine.)
2. The following devices and equipment have to be newly installed for breaker:
 - Hydraulic control valve (When a spare valve is not available in control valve bank of a base machine.)
 - Control pedal or lever: for breaker control.
 - High pressure pipe lines: for supply of high-pressure oil to breaker.
 - Low pressure pipe lines: for return of low-pressure oil to hydraulic oil tank.
 - Stop valve: for shutting off oil lines when breaker is replaced with bucket etc.

CAUTION:

- If excavator has a suitable hydraulic system, check the normal width of the hydraulic lines.
- Check the connections on the hydraulic breaker and the breaker hoses.
- The connecting threads must be undamaged and free of sand or similar foreign bodies.
- Check that the pressure relief valve on the hydraulic system has been approved by the relevant authorities.
- Ensure that the pressure relief valve has been set correctly, i.e., to the maximum permissible operating pressure of the hydraulic breaker, and then leaded. (Operating pressure + min 30bar)
- Do not run any hydraulic lines through the driver's cap, since they may start to leak or even burst.
- The hydraulic oil becomes very hot during operation.
- As the hydraulic circuit varies with the base machine, hydraulic pressure, oil capacity pressure loss, etc. of the base machine are inspected and the hydraulic circuit is provided by UtiliTough, Inc. dealer service engineer.
- As the hydraulic pipe lines (hoses, pipes and fittings) are made of materials carefully selected in consideration of durability use genuine parts when replacing the parts.

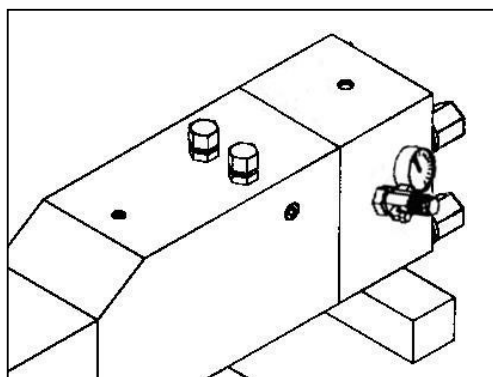
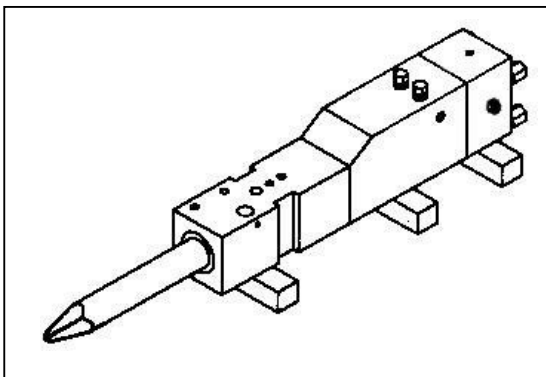
3-17. DISASSEMBLY and REASSEMBLY

WARNING:

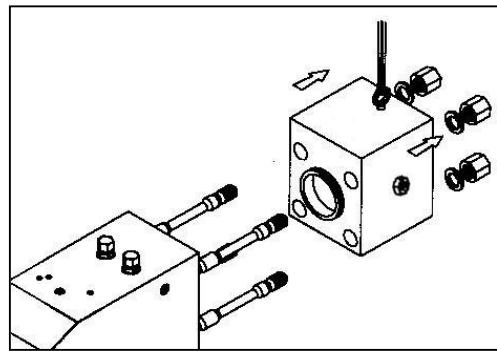
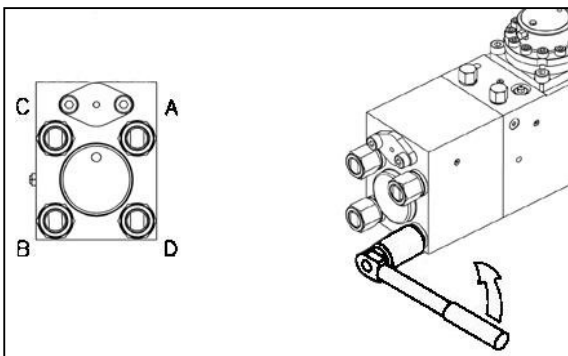
If there is any gas in the hydraulic breaker, it could be very dangerous.

3-18. DISASSEMBLING

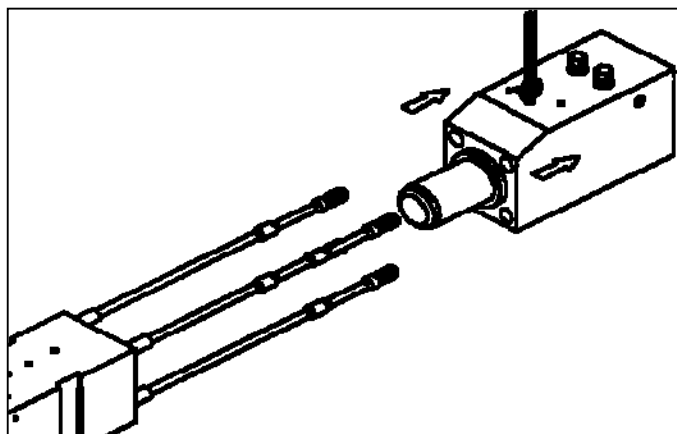
1. Put body on wooden supports with the equivalent size.
2. Deflate N2 gas in head cap to avoid the risk.



3. Release nuts of through bolts from main body.
4. Disassemble head cap with hoist or chain block.

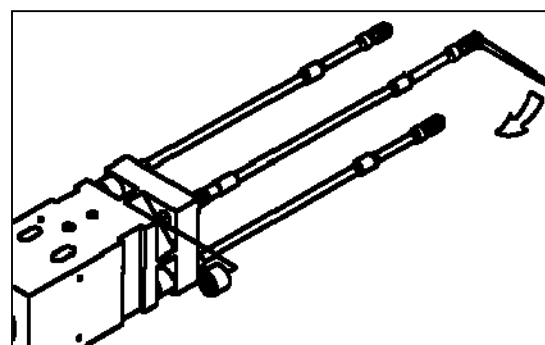
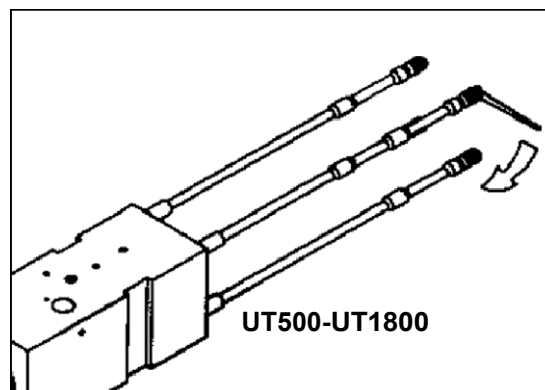
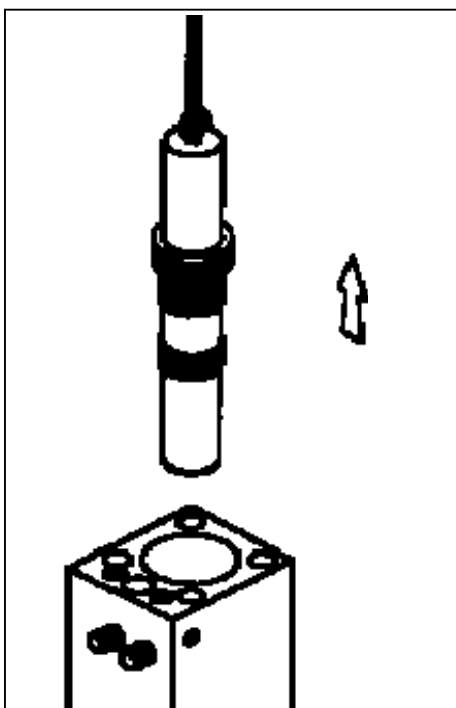


5. Disassemble cylinder with eyebolt and using hoist or chain block to arrow direction as shown picture.



6. Disassemble piston with eyebolt toward upper vertically using hoist or chain block to arrow direction as shown in picture.

7. Release the through bolts from front head with spanner.



8. Removal of seals and O-rings

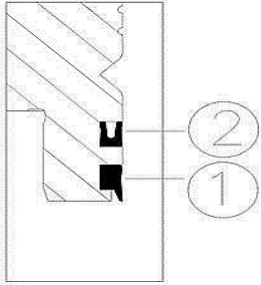
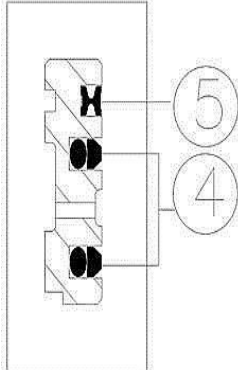
Using a screw driver carefully, remove dust seal, u-packing, buffer ring, step seal, and gas seal from in the lower sealing zone of the cylinder and cylinder bush.

WARNING:

Excessive kinking will cause cracks and subsequent failure.

CAUTION:

- Once seals and O-rings are removed, they should not be used again.
- Use only new and genuine UtiliTough, Inc. parts.
- After snapping into the groove, check the fit of the seal is facing the oil side.
- Lightly coat sealing elements with oil before fitting.

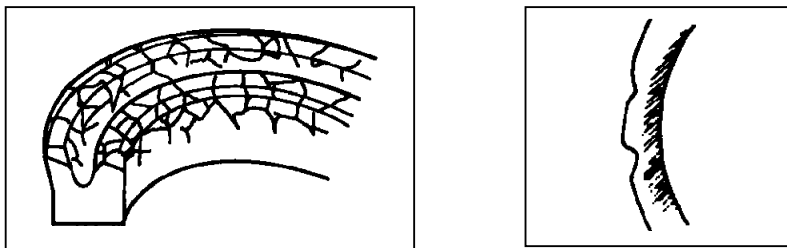
MODEL	CYLINDER	CYLINDER BUSH	DESCRIPTION
UT500			① Dust Seal ② U-Packing ③ Buffer Ring ④ Step Seal ⑤ Gas Seal
UT650			
UT850			
UT1000			
UT1200			
UT1800			
UT2200			
UT2800			
UT3200			
UT4000			
UT4500			
UT5000			
UT6000			
UT8000			
UT8000			
UT11000			
UT16000			

※The part no. and shape of seals and O-rings differ from each model. Therefore, please refer to part lists in this manual for detail review.

9. Inspection

① Seals

While seals are still in their original position, check for scratches and deformation. Do not remove to check. Even a small scratch will lead to oil leakage.



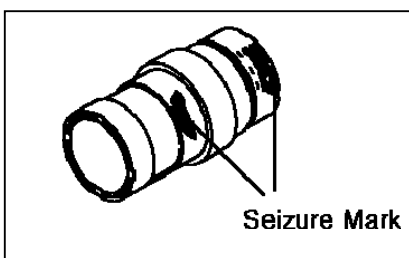
Damaged Seals

※ Replace hydraulic seals every 500 hours of actual operation as well as just kept over 6 months in storage.

② Control Valve

Inspect valve for signs of seizure or scuffing. If marks left by the seizure are even small, polishes by using the fine oilstone or sand paper (#1000~1200).

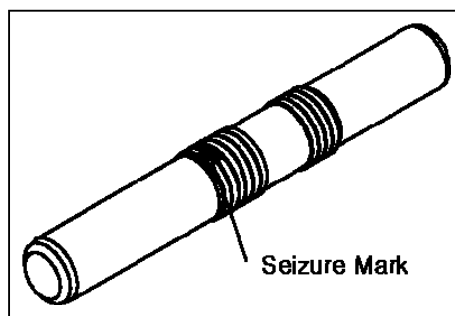
The corresponding marks on the valve bush or valve cap should be removed in the same manner.



If seizure or scratch is excessive, replace immediately with a new control valve assembly.

③ Piston

Periodically the lower end of piston deformed must be checked.



Check piston for seizure marks and scuffing. If such marks are on the section, remove by polishing with an oilstone or sand paper (#1000~1200). Corresponding marks on the mating part should also be treated in the same manner.

3-19. ASSEMBLING

1. Assemble the seals.

Once cylinder bush and cylinder bore have been washed clean and lightly coat sealing elements with hydraulic oil before fitting.

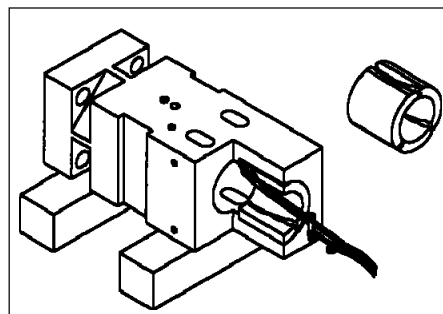
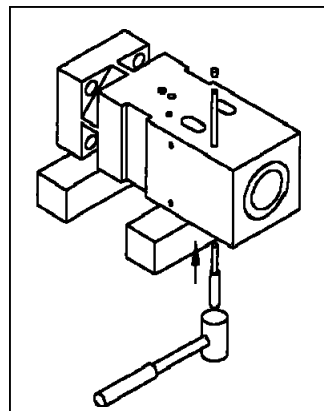
2. Assembly of the round bush and front cover.

- ① Knock out the rubber plugs and stopper pins using hammer and pin punch.
- ② Disassemble the worn front cover and worn round bush, choose a disassembly method among 3 kinds of the following:

WARNING: Wear A Safety Approved Eye Protection.

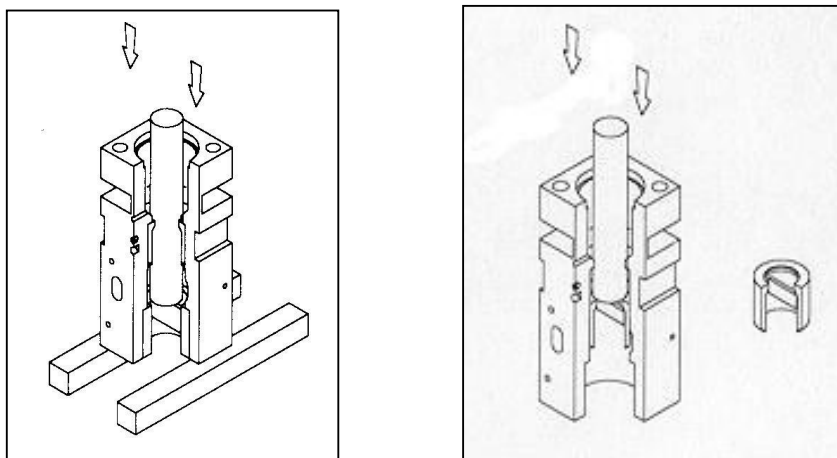
A. Remove the bushes using oxy-arc cutting.

Require a skilled worker not to allow too much hitting effect to front head.



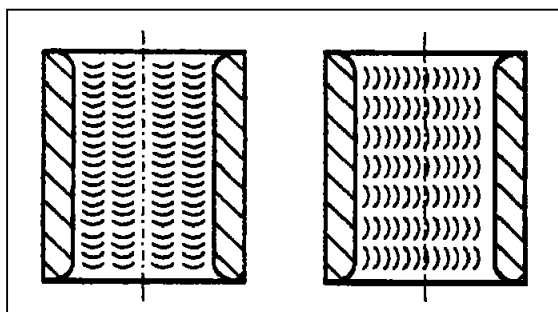
B. Press out the bushes after the removal plate welded into front cover and round bush as shown picture.

This work can only be performed in a well-equipped workshop with a hydraulic press of 200 tons or higher capacity.



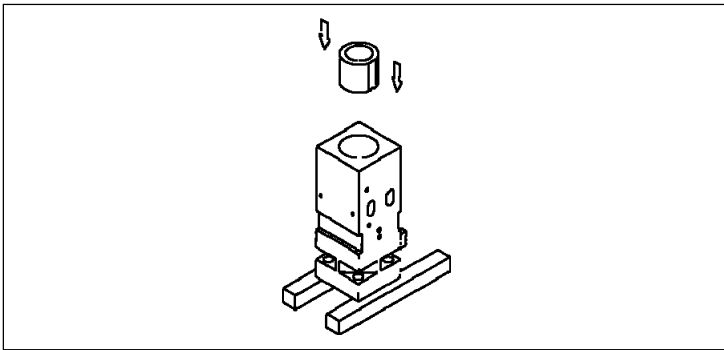
C. If no oxy-arc cutting and press are available to remove the bushes, the following procedure is possible.

- Apply thick axial or radial welding beads inside the worn wear bush using an electrode welder
- Upon cooling the wear bush contracts and loosens in its seat.

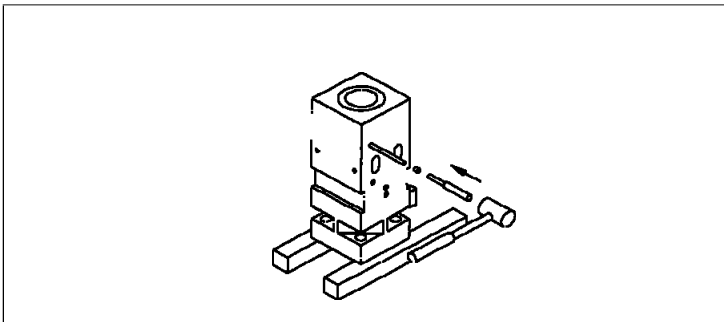


- ③ Before fitting the round bush and front cover, heat the around of front cover to make oversize or super- cool bushes in liquid nitrogen (N₂) to make undersize for fitting.

CAUTION: • Refrain from overheating the front cover as it causes weakness.



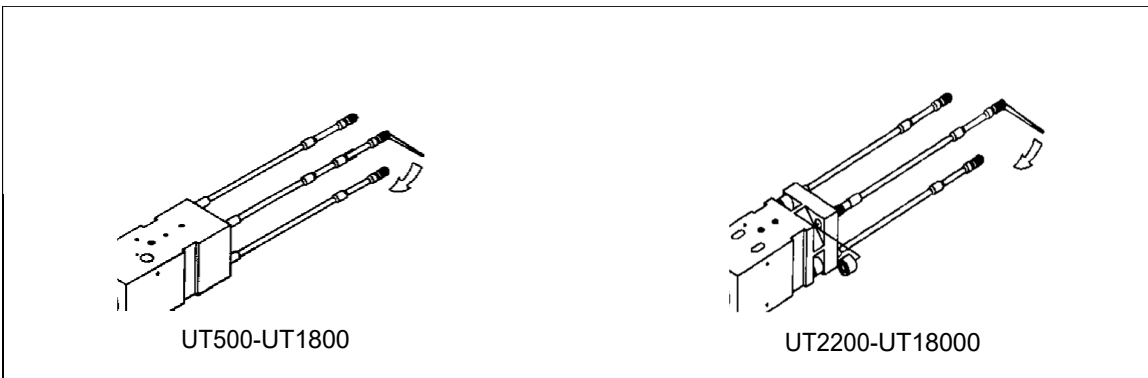
1. Keep the contact face lower front cover clean and free of debris



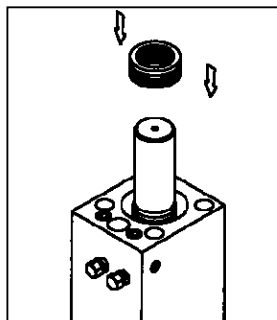
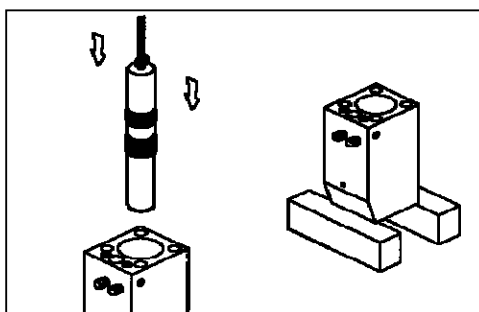
2. Replace the stopper pins and rubber plugs

3. General assembly

- ① Screw the through bolts to front head.
- ② Replace the seals in lower sealing of the cylinder and cylinder bush.



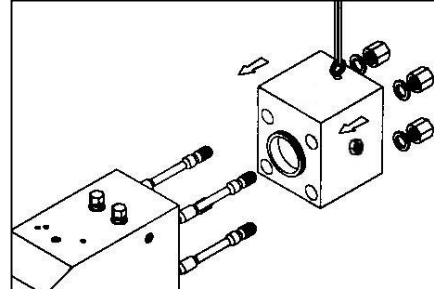
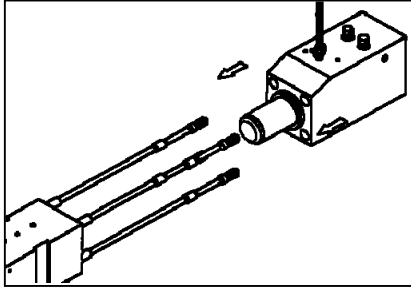
- ③ Put piston into cylinder after lubricating piston and cylinder thoroughly
- ④ Put cylinder bush onto piston as shown picture using a rubber hammer



- ⑤ Put approximately 40~700CC of hydraulic oil inside of head cap.

Model	Amount of hydraulic oil (cc)
UT500	50 cc
UT650	60 cc
UT850	80 cc
UT1000	150 cc
UT1200	220 cc
UT1800	200 cc
UT2200	220 cc
UT2800	230 cc
UT3200	300 cc
UT4000	340 cc
UT4500	340 cc
UT5000	400 cc
UT6000	500 cc
UT8000	500 cc
UT11000	500 cc
UT16000	700 cc
UT18000	1150 cc

- ⑥ Connect the cylinder, Front head and Head cap with through bolts, and tighten the nuts of through bolts to their specified torque.
- ⑦ Fill the hydraulic oil into cylinder through ports on cylinder.
- ⑧ Tighten the hose adapters to ports on cylinder.
- ⑨ Tighten gas valve to its specified torque.
- ⑩ Inflate nitrogen gas into inside of head cap.
- ⑪ Place the assembled main body into the bracket.



4. Disassembling bracket (Box Type)

- ① Take upper urethane out after removing the plate on bracket.
- ② Take the main body out from bracket using crane or hoist.
- ③ to assemble bracket, perform the above procedure in the reverse manner.

5. Replace of the chisel

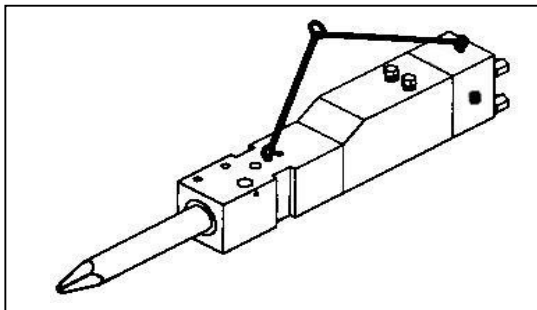
UT500-UT650, UT1200: Push the spring pin back into the hole in the cylinder body. Using a punch, push out the retaining pin to release the chisel. in spring with the pin punch.

UT850, UT1000-UT18000: Knock the stopper pins and rubber plugs out of the cylinder body. Using a hammer and punch, drive the retaining pins out to release the chisel.

- ① Take the chisel pin out by using a pin punch to push the chisel pin out from underneath breaker.
- ② Replace the new chisel after removed.

The chisel is heavy, so careful attention is required.

6. Breaker lifting point



7. Suitable eyebolt for breaker main body

Model	Weight (kg)	Eyebolt	Allowed Weight (kg)
UT500	100	M10	150
UT650	140	M10	150
UT850	200	M12	220
UT1000	250	M16	450
UT1200	310	M16	450
UT1800	406	M20	630
UT2200	520	M20	630
UT2800	620	M20	630
UT3200	725	M24	950
UT4000	830	M24	950
UT4500	980	M24	950
UT5000	1130	M24	950
UT6000	1300	M30	1500
UT8000	1550	M30	1500
UT11000	1760	M36	2300
UT16000	2010	M36	2300
UT18000	2010	M36	2300

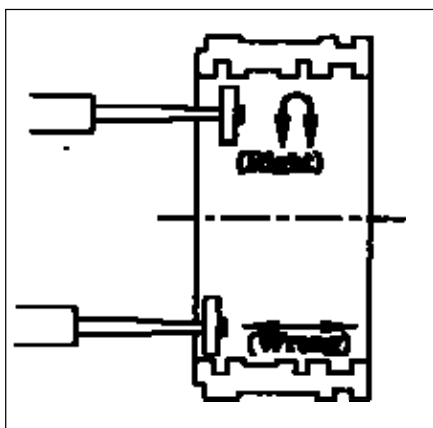
3-20. REPAIRING

When correcting faults on sliding surfaces, finish surfaces as smooth as possible using an oilstone, emery paper and flex hone. Keep in mind that overworking may cause malfunctioning.

Tool for correction

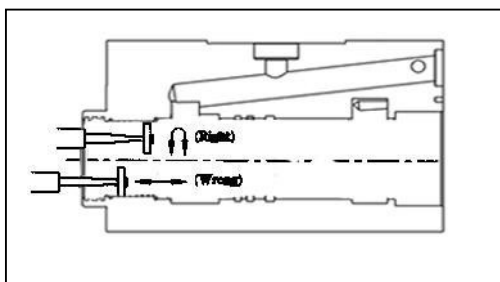
Name of Tool	Grain size or Type		Operating Method
	Rough Finish	Finish	
Oilstone	Rough and medium grain	Fine grain	Polish perpendicular to a sliding direction.
Emery Paper	#100, #160, #240	#400, #600	

1. Cylinder bush



When using a buffing grindstone, move the grinder in the correct direction relative to the circumference. If the grinder is led straight ahead, circularity of the bore will be ruined. Wash the parts thoroughly after grinding operation.

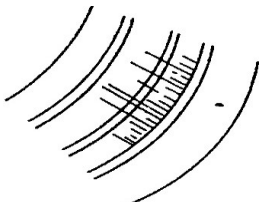
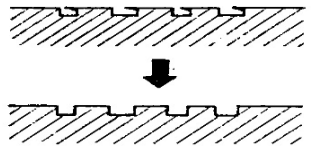
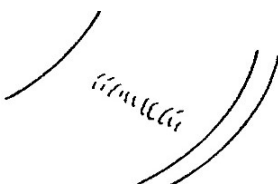
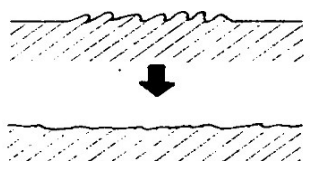
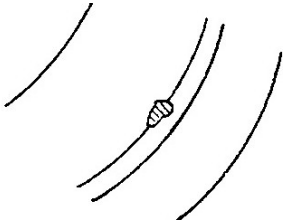
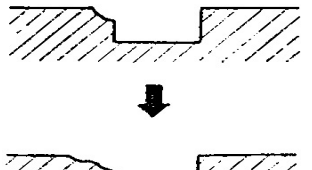
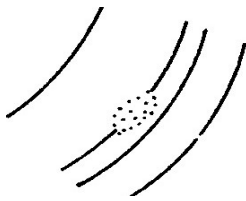
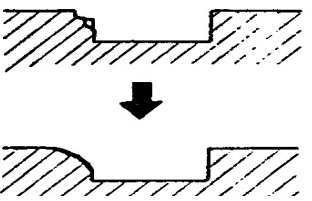
2. Cylinder



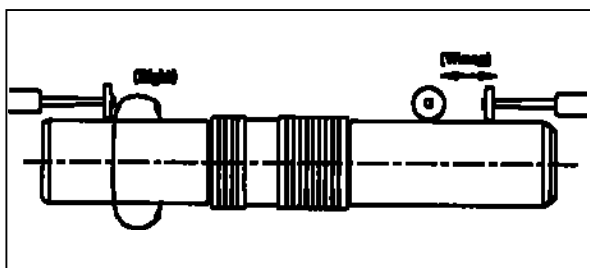
Faults on the sliding surface may cause malfunctioning and oil leakage of the cylinder, and disable the breaker in worst cases if did not left remedy.

Correct faults at an early stage, using an oilstone and emery paper.

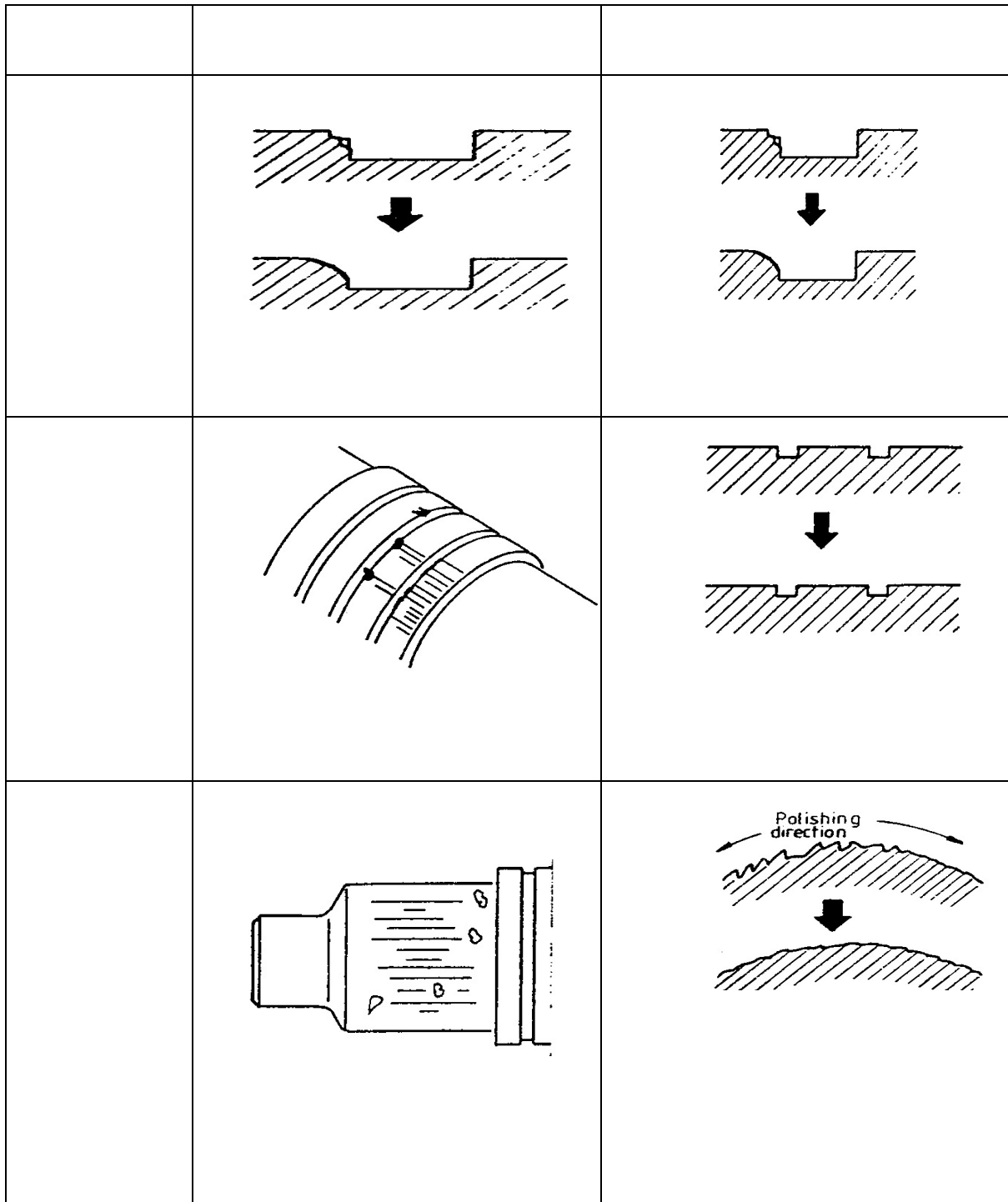
CAUTION ON USING THE BUFFER GRINDER

Kind of Fault	Condition	Remedy
<p>Vertical Scratch</p>	 <p>A stripped fault running in the sliding direction of the blow piston.</p>	 <p>If burrs stick out above labyrinth grooves, remove burrs and correct vertical faults with oil stone and/ or emery paper.</p>
<p>Galling</p>	 <p>A localized fault that is wider than the vertical scratch and is caused by sliding motion.</p>	 <p>Finish galling with an oil stone till no step exists on the outer surface and then finish with fine emery paper.</p>
<p>Chipping</p>	 <p>Corner of sliding section is chipped.</p>	 <p>Finish an edge produced by chipping smoothly with an oilstone.</p>
<p>Vermin</p>	 <p>A vermin-like fault by cavitations located at the corner of a sliding part.</p>	 <p>A vermin causes galling if left uncorrected. Remove it with an air grinder and finish it smoothly with an oilstone.</p>

3. Piston



Correct faults at an early stage, using an oilstone and emery paper.

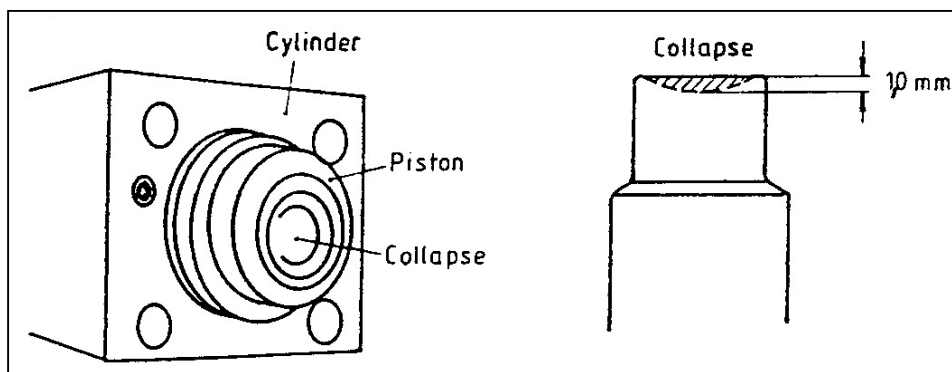


4. Damage on the blowing surface

Damage on the blowing surface has adverse effect on the chisel. Correct it at an early stage or replace the blowing piston with a new one.

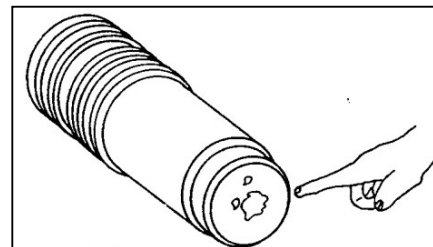
① Collapse:

If the blowing surface has collapsed of 2.0mm or over in depth, replace the piston with a new one. If the blowing surface has a step of less than 1.0mm in depth, smooth the area.

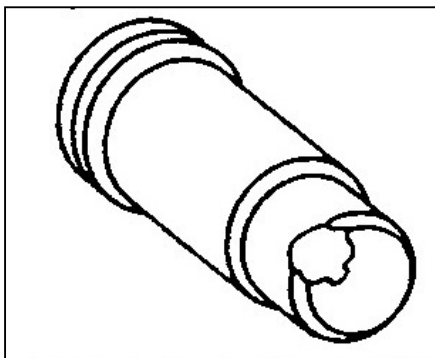


② Chipping an peeling-off

If the blowing surface shows localized chipping or a peeling-off, correct the area smoothly to prevent the progress of the peeling-off.



③ Chipping-off at edge of blowing surface



Replace piston quickly with a new one.

3-21. MAINTENANCE BY THE OPERATOR

DAILY MAINTENANCE

- Tighten loose connections.
- Grease chisel shank and chisel bushings.
- Observe oil temperature, all lines and connections as well as impact efficiency and evenness of operation.

WEEKLY MAINTENANCE

- Remove retaining pin(s) and check condition.
- Remove chisel and check chisel shank for wear.
- Remove burrs from retaining pin groove of the chisel.
- Check that the chisel has received sufficient greasing.

MONTHLY MAINTENANCE

- Check chisel bushings for wear.
- Check condition of vibration damping mechanism.
- Check condition of other wear parts and hoses.

WHEN CHANGING CHISEL OR APPROX. 4 TIMES PER YEAR MAINTENANCE

- Check wear to working chisel.
- Check wear to lower wear bushes.
- Check adapter and breaker bracket for cracks.
- Check impact face of piston for wear or damage.
- Check impact face of working chisel for damage.
- Check retainer bars for burring.
- Check chisel for burring.

AS REQUIRED

- Replace bent and squashed pipes.
- Replace damaged hoses.
- Check pressure in piston accumulator.
- Check adapter bolts for wear.

3-22. TROUBLESHOOTING GUIDE

3-23. MALFUNCTION

Prerequisites for the normal operation and long life of UtiliTough, Inc. Hydraulic Breaker series:

- Supply of rates (Pressure „P“ and flow rate „Q“) to hydraulic breaker of this series.
- Use of clean hydraulic oil.
- Proper operation as per operating and maintenance manual.

Dealers concerned are requested to take prompt actions when they receive trouble reports from their customers. Skilled technicians of dealers should grasp condition of troubles exactly and set forth adequate countermeasures by checking their possible causes. The repair of minor troubles would be better entrusted to customer, and appropriate steps should be taken if their causes cannot be detected.

If the hydraulic breaker is not working correctly, check the hydraulic system of the excavator thoroughly before making any repairs on the breaker. Hydraulic breaker problems can be affected by a hydraulic system that is not operating to specifications or such problems as a plugged fuel filter or hydraulic filter in the excavator. Connect a flow meter to the excavator to check the hydraulic pump output, relief valve setting and tube lines to check flow and pressure.

The following tabulation on the causes and countermeasures of troubles may help for a good disposition of troubles encountered.

1. Base machine (Excavator, Backhoe, Skid loader) and piping

Condition	Causes	Countermeasures
Breaker does not work	Low set pressure on relief valve.	Check and control set pressure on slow side.
Breaker easily damaged due to too strong impact power.	High set pressure on relief valve.	Check and control set pressure on slow side.
	Gas pressure is too high.	Check the gas pressure.
Rapid increase in oil temperature	Poor heat radiation of base machine.	Have excavator manufacturer check.
	Premature wear of pump.	Have excavator manufacturer check.
	Clogged piping.	Required flushing.
Hose pulsation on the return side	The amount of oil flow is too low.	Check oil flow.
Hose pulsation on the high-pressure line	Gas pressure is too low or high	Check the gas pressure.
Emulsification of hydraulic oil	Entering of water into oil.	Immediately replace hydraulic oil.
Excessive decrease in engine RPM	Insufficient output of engine.	Decrease the gas pressure and increase RPM.
	Drop of engine performance.	Have excavator manufacturer check.
	Excessively low temperature of oil.	Required warming-up.

2. Main body (Breaker)

Condition	Causes	Countermeasure
Breaker will not work	Insufficient power ($P \times Q$)	Check power.
	Insufficient down pressure on chisel.	Proper instructions.
	Clogged piping.	Check and repair (Flushing).
	Seizure of breaker.	Repair or replace worm parts.
	Filling –up of hydraulic oil in head cap.	Replace gas seal and check the piston.
	Lack of hydraulic oil.	Refill oil.
Stop hammering or erratic action in approx. 30~90 min. operation	Insufficient power ($P \times Q$)	Check power.
	Clogged piping.	Check and repair (Flushing).

	Gas pressure is too high.	Check gas pressure.
	Damaged seals.	Replace seals.
	Filling –up of hydraulic oil in head cap.	Replace gas seal and check the piston.
Breakage of chisel	Use of hammering chisel in bent condition.	Apply down force in tool direction.
	Use of chisel as lever, move rocks with chisel.	Check if any excessive play on arms, link and pins.
Melting of chisel point	Long time continuous hammering in one place.	Relocate.
Cracking of chisel point	Full power operation from the outset.	Low speed operation for first 30 minutes.
Difficulty in attach and removing chisel point	Deformation of chisel pin.	Regular check and grinding needed.
Excessive play between bracket and breaker body	Excessively worn urethane (Box type).	Replace.
	Loose the side bolts (Side type).	Retighten bolts.
Premature wear of front cover	Lack of grease.	Proper instruction.
Low number of blows	Insufficient power (P x Q)	Check power.
	Insufficient down pressure on chisel.	Proper instructions.
	Gas pressure is too high.	Check gas pressure.
Weak impact force	Gas pressure is too low.	Recharge the N2 gas.
	Insufficient down pressure on chisel.	Proper instructions.
	Insufficient power (P x Q)	Proper instructions.
	Breakage of chisel in front cover.	Replace tool and check the piston.

3-24. OIL LEAKAGE

Even if oil leaks, there is no need replacing at all times. Check the following point listed in the below. The user can check the remedy before calling dealer.

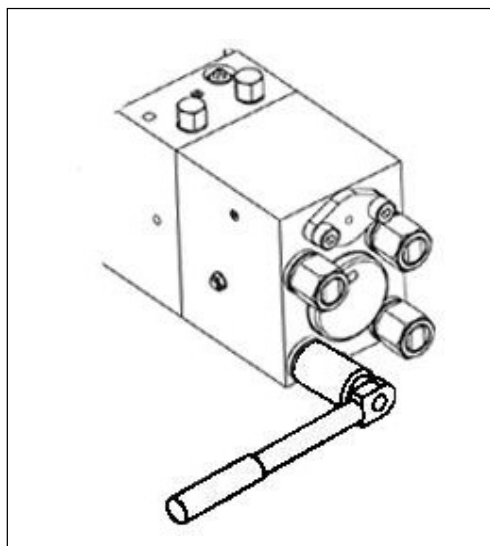
Area of Oil Leakage	Condition	Causes and Remedies
Between the chisel and front cover	A large amount of oil is leaking.	-Seals are damaged: Replace.
Upper part	Oil leaking from hose adapter portion.	-Loose breaker hoses and adapter: Replace.
Between the cylinder and head cap	Oil leakage from reassembly of Valve or Ro-plug after overhaul.	-Check that O-ring is damaged: Replace.
	Oil leakage	-Loosed through bolts and nuts Retighten.
	Oil leakage (also gas leakage)	-Check that gas seal and O-ring are damaged and oil and piston condition: Replace.
Between cylinder and front head	Oil leakage	-Check that seals of cylinder are damaged. Replace.

3-25. POOR OPERATION OF BREAKER

Condition	Major causes	Remedy
Does not impact	Oil temperature is too low.	Required warming sup the engine of base machine from five to twenty minutes and moving the boom. Oil temperature must reach to min. 30°C.
	Main control valve (excavator) does not operate properly.	Check conditions of M.C.V and power cable.
	N2 gas pressure is too high in head cap and setting pressure of relief valve is low.	Check gas pressure and relief valve.
	Poor performance of hydraulic pump. (Excavator)	Contact excavator manufacturer immediately.
Irregular blows it operates normally at the beginning.	Oil temperature increased due to lack of hydraulic oil.	Supplement of hydraulic oil.
	Gas pressure in head cap is too high.	Check gas pressure.
	Relief valve is set too low.	Check pressure of relief valve.
	Not enough down pressure on chisel.	Apply enough down pressure with arm or boom of base machine.
	The clearance between the chisel and front cover are too large.	Check the clearance between chisel and front cover.
	Wear on top of chisel.	Disassemble chisel to check.
	Poor performance of hydraulic pump and backpressure are too high.	Have excavator manufacturer check.
	Foreign material inside main valve.	Disassemble and clean.
	Seizure of piston and cylinder.	Overhaul and check.
Lack of blows	Low gas pressure in head cap.	Check gas pressure.
	Gas pressure is too high.	Check gas pressure.
	Not enough down pressure on chisel.	Apply enough down pressure with arm and boom.
	Setting pressure of relief valve is too low.	Check pressure of relief valve.
	Poor performance of Hydraulic pump	Have excavator manufacturer check.
	Operating pressure is too high.	Check setting pressure or gas pressure.

3-26. TORQUE

Before starting work, check all the bolts tightness and also be sure to retighten loose bolts to the specified torque referring to the manual. The tightening torque of each bolt is as follows:



3-27. TORQUE FOR EACH PART

MODELS	THROUGH BOLT (TIE RODs) (Kg. / Nm.)	TOP MOUNTING BOLT (Kg. / Nm.)	ACC ^o BODY BOLT (Kg. / Nm.)	ACCUMULATOR BOLT COVERS (Kg. / Nm.)	ACC ^o FILLING VALVE CAP (Kg. / Nm.)
UT500	35~40 / 343~392	45 / 410	None	None	None
UT650	45~50 / 441~490	45 / 410	40 / 392	25 / 245	5-49
UT850	45~50 / 441~490	45 / 410	40 / 392	25 / 245	5-49
UT1000	90~95 / 882~931	48 / 470	40 / 392	25 / 245	5-49
UT1200	90~95 / 882~931	48 / 470	40 / 392	25 / 245	5-49
UT1800	120~130 / 1176~1274	48 / 470	40 / 392	35 / 345	5-49
UT2200	140~150 / 1372~1470	48 / 470	50 / 490	35 / 343	5-49
UT2800	190~200 / 1862~1960	48 / 470	85 / 833	35 / 343	5-49
UT3200	260~270 / 2548~2648	48 / 470	85 / 833	35 / 343	5-49
UT4000	260~270 / 2548~2646	48 / 470	85 / 833	40 / 392	5-49
UT4500	320~330 / 3136~3234	48 / 470	85 / 833	40 / 392	5-49
UT5000	320~330 / 3136~3234	48 / 470	85 / 833	50 / 490	5-49
UT6000	370~380 / 3626~3724	48 / 470	110 / 1078	50 / 490	5-49
UT8000	380~390 / 3724~3822	48 / 470	110 / 1078	50 / 490	5-49
UT11000	540~550 / 5292~5390	45 / 410	110 / 1078	50 / 490	5-49
UT16000	540~550 / 5292~5390	45 / 410	110 / 1078	50 / 490	5-49

3-28. SIZE FOR BOLTS OF HYDRAULIC BREAKERS (mm)

MODELS	THE SIZE OF THROUGH NUT	BULK CAPS	SIDE BOLTS	ACCUMULATOR BODIES	ACCUMULATOR COVER
UT225, UT500	30	27	NON		
UT650	36	27	32	14(L)	12(L)
UT850	36	27	32	14(L)	12(L)
UT1000	46	27	NON	14(L)	12(L)
UT1200	46	27	NON	14(L)	12(L)
UT1800	55	30	NON	17(L)	14(L)
UT2200	60	30	NON	17(L)	14(L)
UT2800	65	32	NON	19(L)	14(L)
UT3200	70	32	NON	19(L)	14(L)
UT4000	70	32	NON	19(L)	14(L)
UT4500	75	32	NON	19(L)	14(L)
UT5000	75	32	NON	19(L)	17(L)
UT6000	75	32	NON	22(L)	17(L)
UT8000	80	32	NON	22(L)	17(L)
UT11000	90	50	NON	22(L)	17(L)
UT18000	90	50	NON	22(L)	17(L)

Note: "L" → L Wrench

4. AUTO LUBRICATION SYSTEM

(Optional on UT225-UT850, Standard on models UT1000 and up)

Lubrication of the chisel and bushings can be performed automatically with a UtiliTough, Inc. Auto Lubrication System.

Benefits:

- Chisel bushing longevity
- Longer tool life
- Higher utilization rate of UtiliTough, Inc. hydraulic breaker.

5. WARRANTY REGISTRATION and WARRANTY CLAIMS

FILING OF WARRANTY REGISTRATION CARD

☞ Warranty registration card must be completed by dealer / distributor at the time of delivery and at time of sale of the product to the end user.

☞ Copy A form warranty registration form must be completed online at www.UtiliTough.com within 15 days after the installation inspection is performed.

☞ No warranty claims will be handled prior to receipt of the warranty registration card.

☞ Distribution

1st copy A – Manufacturer

2nd copy B- Distributor

3rd copy C - Customer / End User

After you have completed, return your card for faster service.



WARRANTY REGISTRATION CARD

MODEL	SERIAL NUMBER	GAS PRESSURE (HEAD CAP) KG/CM ²	GAS (ACCUMULATOR) PRESSURE KG/CM ²
CUSTOMER NAME		CUSTOMER ADDRESS	
DEALER / DISTRIBUTOR NAME		LOCATION/LOCATION OF DELIVERY	
DATE OF DELIVERY / /		DATE OF INSPECTION / /	

ACCESSORIES

NO	ACCESSORIES	
1	BREAKER TOOL	YES <input type="checkbox"/> , NO <input type="checkbox"/>
2	GAS CHARGING KIT	YES <input type="checkbox"/> , NO <input type="checkbox"/>
3	GAS BOMB	YES <input type="checkbox"/> , NO <input type="checkbox"/>
4	SPRING GUARD HOSE	YES <input type="checkbox"/> , NO <input type="checkbox"/>

NO	ACCESSORIES	
5	MAINTENANCE TOOLS	YES <input type="checkbox"/> , NO <input type="checkbox"/>
6	TOOL BOX	YES <input type="checkbox"/> , NO <input type="checkbox"/>
7	OPERATION MANUAL	YES <input type="checkbox"/> , NO <input type="checkbox"/>

TYPE AND CONDITION OF BASE CARRIER

MAKE	MODEL	MFG YEAR / /	TOTAL WEIGHT TON	MAX. OUTPUT OF PUMPS SUPPLYING L/MIN
OPERATING PRESSURE		KG/CM ²	OPERATING OIL FLOW	L/MIN
MAIN RELIEF SET PRESSURE		KG/CM ²	2 ND RELIEF SET PRESSURE	KG/CM ²
		YES <input type="checkbox"/> NO <input type="checkbox"/>	OIL FILTER	YES <input type="checkbox"/> NO <input type="checkbox"/>

WARRANTY

DATE OF START / /	EXPIRATION DATE / /	COMMENTS:

--	--	--

ACKNOWLEDGEMENT AND COMMENT:	SIGNATURE
	NAME DATE:
I hereby acknowledge that the product has been delivered in satisfactory condition and operates satisfactorily, and that I received all items as checked above, and that all aspect of the standard warranty and suggestions in use has been fully explained to me.	SIGNATURE
	NAME DATE:

6. SERVICE REPORT

1. CUSTOMER AND DATES RELATED

CUSTOMER NAME	CUSTOMER ADDRESS				
DISTRIBUTOR NAME	DELIVERY DATE TO	DISRRIBUTOR	LOCATION OF PRODUCT		
DATE OF FAILURE	DATE OF REPAIR (SERVICE)	PERIOD OF WARRANTY			
/ /	/ /	/ / ~ / /			
2. TYPE AND CONDITION OF BASE CARRIER					
MAKE	MODEL	MFG. YEAR	MAX. OUTPUT OF PUMPS SUPPLYING	L/MIN	
		/ /			

3. TYPE AND CONDITION OF PRODUCT

MODEL and SERIAL NO. (S/N;)	OPERATING HOURS	OPERATING PRESSURE KG/CM ²	B/H GAS PRESSURE KG/CM ²
	L/MIN	2 ND RELIEFSET PRESSURE KG/CM ²	ACC' GAS PRESSURE KG/CM ²

4. FAILURE INFORMATION

OUTLINE: CAUSE: STEP and RESULT:	DETAILED REPORT <input type="checkbox"/> ATTACHED PHOTOS <input type="checkbox"/> ATTACHED
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5. WARRANTY CLAIM PARTS

PART NAME	PART NO	QTY	PART NAME	PART NO	QTY

6. DECISION AND COMMENT:

NOTE:

- PLEASE TYPE COMPLETELY AND RETURN TO UTILITOUGH, INC. PO BOX 96, SILVERSTREET, SC 29145 OR EMAIL BREAKERS@UTILITOUGH.COM.
- PLEASE SUBMIT TO UTILITOUGH, INC. WITHIN 15 DAYSS AFTER REPAIRS ARE COMPLETE.

7. WARRANTY POLICY

UtiliTough provides Distributors, which purchases hydraulic breakers or parts from UtiliTough with following warranty.

- VALIDITY

This warranty policy applies to products which leaves UTILITOUGH's factory from July 1, 2022. The products which had left UTILITOUGH's factory before July 1, 2022 will be applied to the old version of warranty policy.

- BASE WARRANTY

UtiliTough's products to be well-made, durable and of good material are warranted for Thirty-Six (36) months from the date of delivery of such new products to the actual and original buyer (end user), but no more than forty-two (42) months from the date of shipment from UtiliTough's factory for the failure by the reason of defective material or poor workmanship, except wear and sealing items such as stipulated in the 'Limited Warranty'.

Thirty-Six (36) Months 4600 hrs. Warranty Parts (whichever comes first)

- Cylinder
- Back Head (Head Cap)

Twelve (12) Months 1500 hrs. Warranty Parts (whichever comes first)

- Front Head
- Accumulator cover and body
- Control Valve Set
- Piston
- Through Bolt
- MC Pad
- Auto Greaser (without Cartridge)
- Grease Cover
- Bracket (without Head Plate)

LIMITED WARRANTY

a. 6 Months or 500hrs Warranty Parts (whichever comes first)

- | | | |
|-----------------------------------|-----------------|--------------------|
| - Front Cover | - Cylinder bush | - Upper Damper |
| - Seal kits | - Head Plate | - Poppet Valve set |
| - Accumulator Bolts and Diaphragm | - Round Bush | |

b. Three Months or 270hrs Warranty Parts (whichever comes first)

- | | | |
|----------------------|-----------------|--------------------------|
| - Hose Cover | - Gas valve Set | - Bottom Damper |
| - Side bolt | - Hoses Adapter | - Bracket Pin and Bushes |
| - Hoses and Fittings | | |

c. Parts not covered in Warranty – Consumable Parts

- Chisel Pin -Stop Pin - Grease Cartridge
- Rubber Plugs and other Rubber Items and small bolts and nuts.
- Hammer Tool (refer to chisel warranty guide in this manual)
- Other wearing and consumable parts

d. Multi-shift work

UtiliTough guarantees the defect and failure caused by UtiliTough's fault under the normal condition of work which means that customer should comply with maintenance schedule, precautions and 8 hours (day shift) working a day in case that the hammer is operated with multi-shift (day and night shift) working, the warranty period will be cut by half.

*** Remark**

Warranty is not applied to the damages or defects made by miss-using or handling contrary to Operation manual. The wearing parts after normal usage is not included into warranty

The above warranty will be applied on condition that GENUINE PARTS (chisel, seal kit etc.) should be used during hammer operation under normal conditions and hammer must be installed as UTILITOUGH breaker required such as 2nd relief valve setting pressure, oil flow etc. All UTILITOUGH dealers are requested to send the "warranty registration card" and the record sheet of breaker (to check when parts are replaced or repaired) by fax or e-mail to UTILITOUGH as soon as hammer is delivered to customer.

The warranty shall not apply in the following circumstances, even if within the above warranty period.

1. The damages caused by excessive blank hammering, incorrect usage and unauthorized modification or change
2. Any scratches on piston, cylinder and control valve by using contaminated hydraulic oil coming from Excavators.
3. The damages happened by poor working performance of old excavator
4. The damages or defects by the rusts made by improper storage of breakers in wet condition for long time. The breakers have to be inspected before using again after two weeks storage
5. Wearing parts are excluded from warranty period.
6. A/S expenses such as transportation, meals, labor costs etc. paid by distributor / dealer

CHISEL WARRANTY

Chisel is guaranteed according to the contents of chisel warranty shown on the UTILITOUGH manual.

THE CONTENTS OF WARRANTY

All delivered products will be checked for defects, damages or missing parts to assure performance upon arrival. The distributor has to inform UTILITOUGH with a written claim on any missing or damaged parts within 14 days after receipt of products.

Damages occurred by transportation shall be claimed by the receiver directly to transportation company. The damages shall be recorded on the shipping documents and the claim has to be made immediately.

UTILITOUGH will not warrant any damage that is occurred by incorrect or careless handling, excessive stress, normal wear and tear or similar cases not due to faults of UTILITOUGH.

(Please refer to the exception of warranty)

UTILITOUGH will reimburse as the same part(s) as follows in case warranty claim is accepted.

- Spares on UTILITOUGH account
- Airfreight up to 20 kgs on UTILITOUGH account
- Sea freight on UTILITOUGH account

The distributor will keep the damaged products for a maximum period of one year for inspection and analysis by UTILITOUGH Engineer.

Reimbursement will be made within 15 days after UTILITOUGH's decision whether any written claim report with photos is applied to warranty or not.



Only breaker on the market offering auto-lube as standard on models UT1000 and above

28

28 breaker models that cover the entire CE industry carrier range from 0.5 to 140 ton



Five models exclusively designed for skid steer loaders



Suitable for light-to-medium to hard- and severe-duty rock breaking applications



Three year full warranty (wear parts excluded)



Mounting brackets available on all models (Skid Steer, Excavator Quick-Attach, and Excavator Pin-On)



Complete replacement parts inventory

Features and Advantages

Durability

- Longer chisel point and larger through bolt to improve durability
- Minimized welding on bracket fabrication process to strengthen durability

Performance

- Applied two-step stroke and idle blow preventing structure system
- Stronger impact power
- Low noise

Enhancements

- Prevention of chisel stop pin loosening
- No oil loss when changing the control valve
- Lower vibration and tighter fastening between power cell and bracket
- Models UT1000 and above include auto-greasing system

Convenience of use

- Operator-friendly design
- Simple assembly and disassembly
- Control valve can be replaced on-site with ease and speed
- Easy maintenance (time and cost saving)
- Longer lifetime of parts

All Models Include



Two Working Tools



Adequate Length Hydraulic Hoses and Fittings



Hose Set and Gas Charging Kit



Repair Tool Box



Owner's Manual



Parts Breakdown