

MARUZEN

HYDRAULIC HANDHELD BREAKER

MODEL BH221 (230)

OPERATING MANUAL



CAUTION

FOR THE SAFETY PURPOSE, PLEASE READ THIS MANUAL THOROUGHLY BEFORE ATTEMPTING TO USE THIS BREAKER. ANY FALES OPERATING PROCEDURES WILL CAUSE DAMAGES OF THE MACHINE. ALWAYS KEEP THIS MANUAL TO AN EASILY ACCESSABLE PLACE.



MARUZEN KOGYO CO., LTD.

(Revised Mar.14, 2013)

FOREWORD

This manual is an important part of your equipment. It provides rules and guidelines which will help you use this machine safely and effectively. You **MUST** familiarize yourself with the functions and operations by reading the manual thoroughly before you begin using this machine. For your safety, it is especially important that you read and observe all precautions in this manual and labels on the machine. The precautions **MUST** be followed strictly at all times when performing operation and maintenance. * Fail to follow the guidelines and safety alerts in the manuals and on the machine, or use this machine in alternative ways from the manuals may result in system failure or serious personal injury.

Keep this manual with the equipment or in an easily accessible place in all times for future reference. Make sure all personnel involved in working on this machine can consult it periodically. In case this manual should be lost or damaged, immediately contact us or your dealer to purchase a new copy.

We recommend you always use Maruzen genuine components and parts. Replacing components and parts from other sources may cause damages to this machine and endanger operators.

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SAFETY INFORMATION

To enable you to use this machine safely, safety precautions and labels are given in this manual and affixed to the machine to give explanations of situations involving potential hazards and of the methods of avoiding such situations.

SAFETY ALERT CLASSIFICATIONS

The following safety alert symbols are used to inform you that there is a potential hazardous situation that may lead to personal injury or damage.

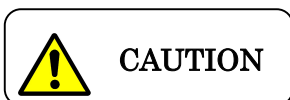
In this manual and on machines labels, the following safety alert symbol are used to express the potential level of hazard.



Indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

**** Safety alert symbols are to emphasize all operation which, if not strictly followed, could result in a life-threatening situation, bodily injury or damage to equipment.**

SAFETY ALERTS

DO NOT OPERATE THE MACHINE UNLESS THE FOLLOWING SAFETY INSTRUCTIONS HAVE BEEN THOROUGHLY READ AND UNDERSTOOD!



WARNING

Before operating the equipment, be sure to wear personal protective equipments such as follows:

1. Helmet
2. Protective goggles
3. Protective boots
4. Safety gloves
5. Hearing Protection



WARNING

Do not operate the equipment if you are or if your

1. taking medication, feeling drowsy, feeling unwell or feeling tired.
2. under the influence of drugs or alcohol.
3. hands, feet, lower back or other parts of your body hurt or being injured.

* Failure to observe this precaution can result serious injury or even death.

**CAUTION**

Do not touch the machine with your bare hands

1. The oil tank may become hot under continuous running.
Do not touch the equipment with your bare hands.

2. Tools may become hot under continuous use, make sure to wear gloves before any contact with the tools.

* Failure to observe this precaution can result getting burned

**CAUTION**

When lending someone the equipment

Make sure the safety instructions have been thoroughly read and fully understood by the person who is going to use the equipment.

**WARNING**

Avoid Blank Hammering

Operating the equipment horizontally may cause the chisel's sudden flying out.

Excessive blank hammering may be considered equipment abuse and may cause equipment damage.

Failure to observe this precaution can result damage to the breaker.



WARNING

Never operate the breaker when bystanders are in the work area

1. Do not operate the breaker if any people are within the area where flying debris or movement of the breaker may injure them.
2. For preventing flying debris, make sure protection fences are being set up.

Failure to observe this precaution can result personal injury.



WARNING

Be special cautions to high pressure gas

1. High pressure gas was held inside the accumulator of the breaker.
2. Do not loosen the nut unless it is necessary for maintenance.

Failure to observe this precaution can result serious injury

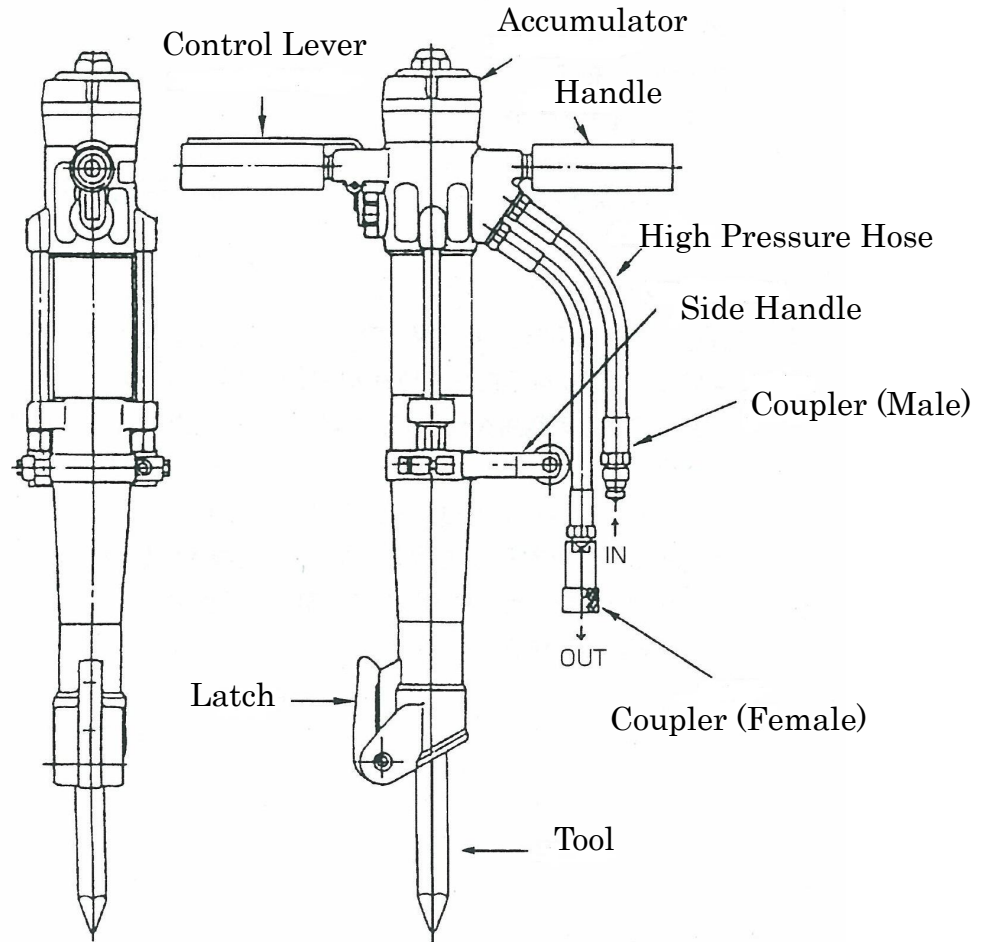
INTRODUCTION

1. This hydraulic breaker is designed to be used for the following purposes.
 - (1) Breaking concrete and asphalt
 - (2) Anchoring and pile driving
 - (3) Digging or breaking hard soil
 - (4) Compacting soil
 - (5) Cutting asphalt

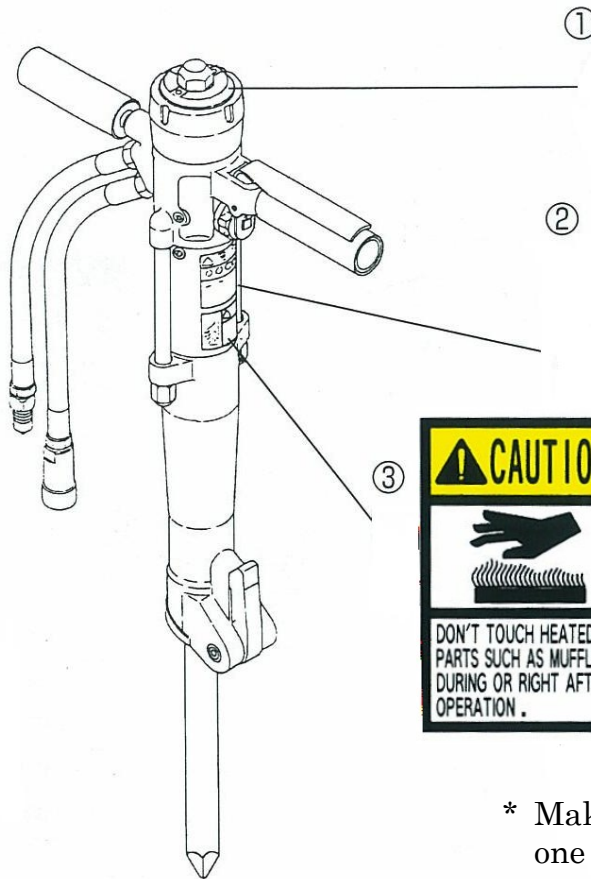
2. **DO NOT** operate this breaker on the following situations:
 - (1) drench part of the breaker or whole breaker into water or seawater.
 - (2) connect with power source which its oil flow and pressure exceeds prescribed.
 - (3) operating with oil temperature below 10°C or over 100°C.
 - (4) use shank which its size is different from prescribed
 - (5) attach to other construction machinery.
 - (6) use the equipment for purposes other than stated in this manual.

SPECIFICATIONS & DESCRIPTIONS

Overall Weight	22kg (Without tool)
Overall Dimensions	703mm X 421mm
Working Pressure	80~120kgf/cm ² (7.8~11.8Mpa)
Max. Pressure	210kgf/cm ² (20.6MPa)
Oil Flow	15~30L/min
Blow Per Minute	1100~1800bpm
Shank Size	Hex. 1" X 4 1/4"
Coupling	3/8" Couplers
Max. Hose Length	1/2" X 20m



PRECAUTION LABELS AND POSITIONS



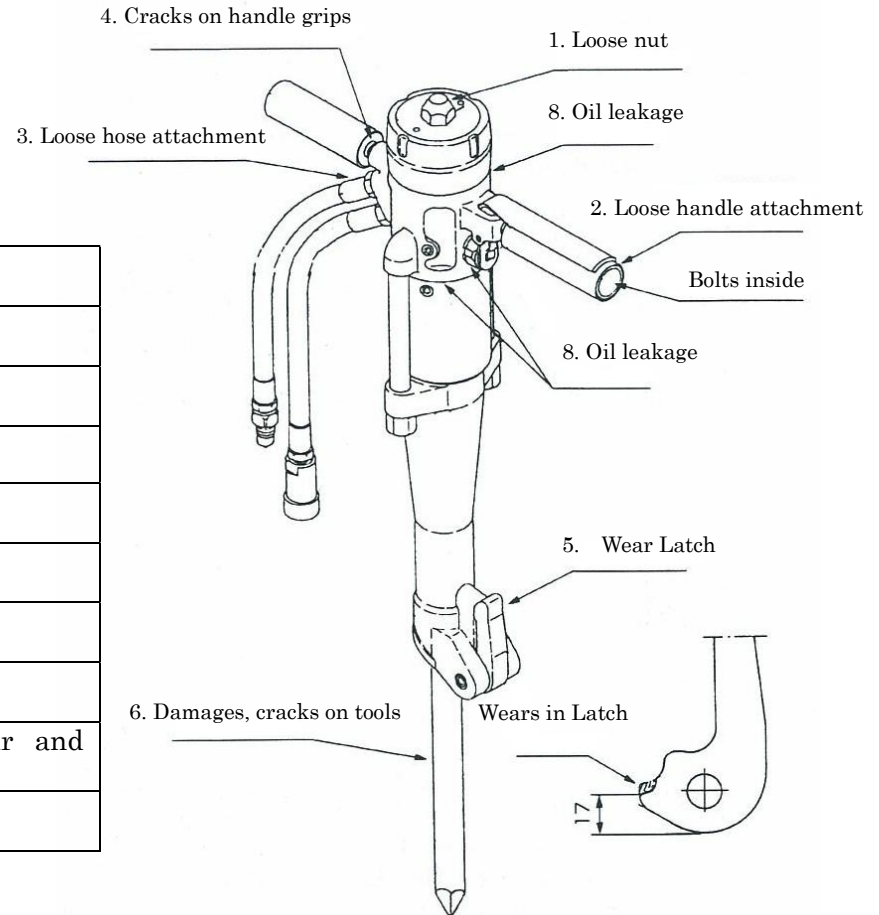
* Make sure labels are legible. Replace new one when they are illegible.

INSPECTIONS BEFORE EACH OPERATION

For the purpose of keeping the breaker in good condition, make sure the following inspection items are done each time before using. (Refer the drawing on the right)

Inspection Items	Countermeasures
1. Loose nut	Tighten the loosen nut
2. Loose handle attachment	Tighten handle attachment
3. Loose hose attachment	Tighten hose attachment
4. Cracks on handle grips	Replace new one
5. Wears found on Latch	Replace new one
6. Damage, cracks on tool	Replace new one
7. Loose bolts on side handle*	Tighten the loosen bolts
8. Oil leakage	Ask your dealer for repair and service
9. Cracks on control lever	Replace new one

* Optional



GUIDELINES

Following these guidelines while using this breaker:

1. When intend to use other power source (other than Maruzen hydraulic power units), make sure the pressure of the power source is in the range of 140 ~ 210kgf/cm² and oil flow is in the range prescribed
2. When connecting and disconnecting couplers, make sure dirt, dust and other foreign substance does not enter or attach to couplers and hoses.
3. Make sure the power source is OFF when connecting the breaker to the power source.
4. Maruzen original tools are highly recommended. Consult your dealer for more specifics of tools.
5. If the oil temperature is below 10°C, warm up the breaker before start operating.



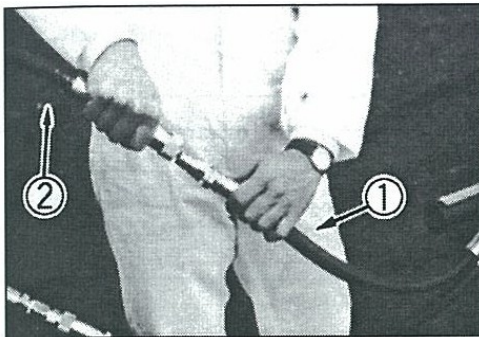
6. Pay attention to the followings while operating the breaker.
 - (1) Be cautious for not being injured by the front of the tool.
 - (2) Be cautious for not being tripped by the extension hoses.
 - (3) Make sure there are no obstacles at jobsite. (Be cautious not being tripped by obstacles while operating)
 - (4) While pulling out the breaker from the broken objects, be cautions for not being fall over.
 - (5) Make sure the breaker was placed in horizontally. Fail to place the breaker horizontally after operating can cause injury by sudden falling of the breaker.
 - (6) Be cautious not to injure your back while lifting the breaker.
7. In case of sudden hydraulic hose breakage and hydraulic oil belch out. STOP the power source IMMEDIATELY.
8. Replace new hoses when they are worn or when oil exudes from them.
9. When detach couplers, a small amount of oil may slip out. Make sure that surrounding area does not get dirty by oil.
10. When detach from power source, attach two hoses to each other.

11. When frequently attach and detach to the power source, hydraulic oil will decrease accordingly. Always make sure the hydraulic oil level before operating and refill if necessary.
12. After the operation, use tool to push up the piston.

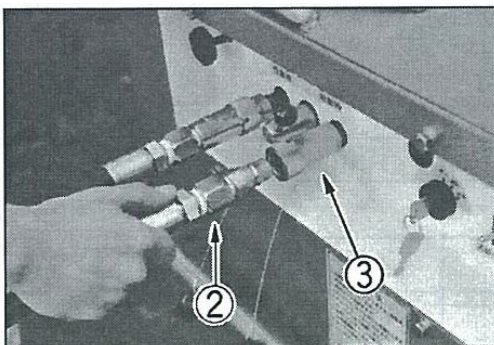


Immediately STOP the power source if the breaker does not stop after releasing the control lever. Ask Maruzen dealer for repair and service before the next operation.

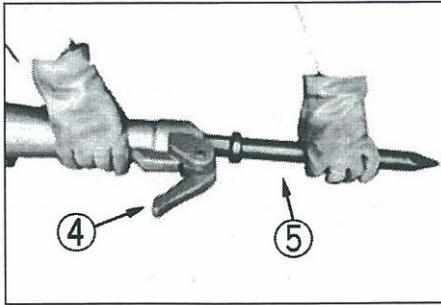
OPERATIONS



1. Connect hydraulic breaker's standard hose ① and extension hose ②

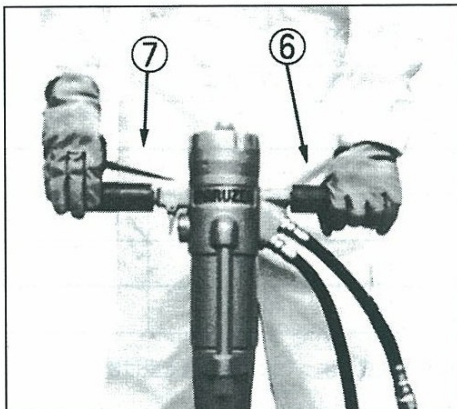


2. Connect the other side of extension hose ② to the power source ③



3. Unlock the latch ④ on breaker, load the tool ⑤ and lock the latch again.

4. Start engine in power source and let engine run for a while to warm up the machines.



5. Clasp the handle grip ⑥, bear down the breaker, clasp the control lever gently and let the breaker start running.

SUITABILITY OF HYDRAULIC POWER SOURCE AND BH163 BREAKER

Refer to the following charts while using with power source other than Maruzen power units.

(1) Suitability of oil flow (Pressure is in the range of 120 ~ 210kgf/cm²)

BH163	Activation	Performance	Effect on BH201 breaker	Recommendation	Countermeasure
Over 28L/min	△	×	×Damage of accumulator, valves and etc	×	Use of flow control valve
22~28L/min	○	△Strong recoil	△valves wear out easily	○	Reduce the number of rotation of the engine
18~22L/min	○	○	○	◎	—
14~18L/min	△	△	○	○	N/A
Under 14L/min	×	×	—	×	N/A

- Use of orifice is an alternative to adjust oil flow of the power source.

(2) Suitability of pressure (Oil flow is in the range of 20 ~ 25L/min)

Power Source	Activation	Performance	Effect on BH201 breaker	Recommendation	Countermeasure
Over 210kgf/cm ²	○	○	×Damage of accumulator, valves, hoses and etc	×	Pressure relief valve
140~210kgf/cm ²	○	○	○	◎	—
100~140kgf/cm ²	○	△	○	○	—
80~100kgf/cm ²	△	△	○	△	—
Under 80kgf/cm ²	×	×	—	×	N/A

* Oil flow has greater effects on breakers than pressure.

PERIODICAL INSPECTION






Ask your dealer for the periodical inspections.

Inspection Items	Operating Hours
Nitrogen gas charge in accumulator	300 hours or 1 Year
Replacement of accumulator diaphragm	500 hours or 2 years
Replacement of Valve Rod O ring	500 hours or 2 years
Replacement of U-cup packing	500 hours or 2 years
Replacement of each O ring	More than 3 years

INSTALLATION OF SIDE HANDLE

- (1) Place side handle on the flat part of front end of the breaker.
- (2) Set washers with bolts. Screw the bolts with torque $3.5\text{kgf} \cdot \text{m}$ ($34.3\text{N} \cdot \text{m}$)
- (3) Make sure if side handle has been installed firmly.

TOOLS AND APPLICATIONS

Tools	Dimensions	Applications
Moil Point	 L = 400mm	Breaking
Concrete Chisel	 L = 400mm	Breaking
Asphalt Chisel	 L = 400mm W = 76mm	Cutting and Breaking
Shovel	 L = 400mm W = 140mm	Cutting and digging out asphalt
Tamping Rammer	 L = 285mm W = 180mm	Compacting soil or sand

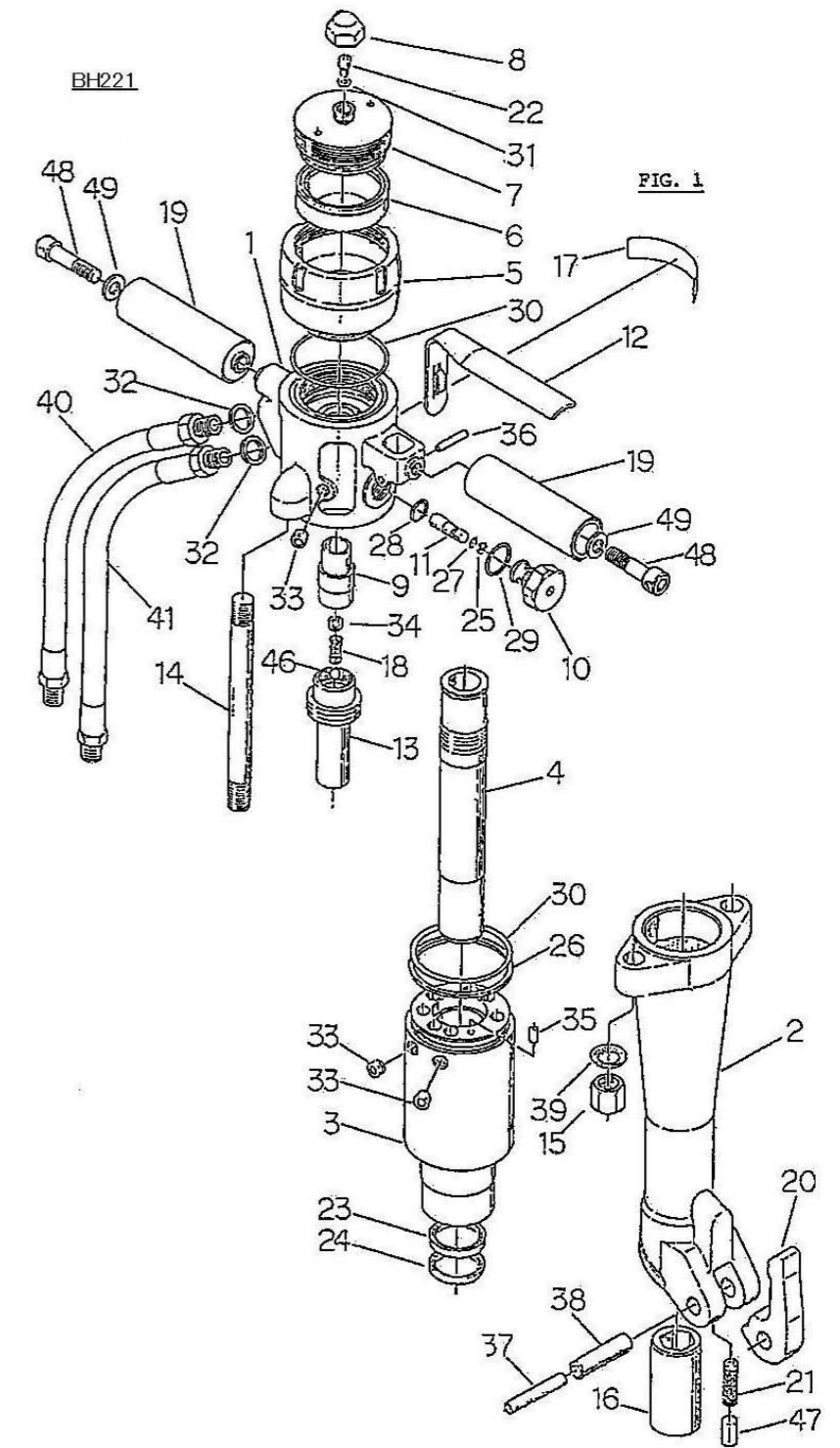
TROUBLE SHOOTING

Symptoms	Causes	Countermeasures
Grip the control lever but does not start	<ol style="list-style-type: none"> 1. Power source is off (Switch lever is not in ON position) 2. Hoses are not connected 3. Couplers are not connected properly 4. Relief valve pressure is set too low 5. Damage of control lever 6. Control lever is not functioning 7. High pressure side and oil return side was connected inversely 	<ol style="list-style-type: none"> 1. Start the power source (Turn the switch lever to On position) 2. Connect hoses 3. Check out if all the couplers have been connected properly 4. Adjust pressure to 140~210kgf/cm² (13.7~20.6MPa) * 5. Replace a new control lever * 6. Disassemble breaker, clean and remove dirt and dust between control lever and valve body * 7. High pressure hoses is connected to the upper side of the breaker
Functioning but weak hammering or low hammering speed	<ol style="list-style-type: none"> 1. Low rate of oil flow from power source 2. Pressure in relief valve in power source is set too low 3. Control valve does not function properly 4. Back pressure is too high 	<ol style="list-style-type: none"> 1. Turn the engine rotation rate up and increase the rate of oil flow (Adjust oil flow to the necessary rate) 2. Adjust pressure to the range of 140~210kgf/cm² (13.7~20.6MPa) * 3. Remove and clean the joint of control lever and valve body * 4. Use bigger Diameter hose for return side
Hammering in normal speed, but weak hammering	<ol style="list-style-type: none"> 1. Low accumulator gas pressure 2. Damage of accumulator diaphragm 	<ol style="list-style-type: none"> 1. Refill Nitrogen gas 40kgf/cm² (3.9MPa) * 2. Replace diaphragm *
Strong hammering and in high speed	<ol style="list-style-type: none"> 1. High rate of oil flow 	<ol style="list-style-type: none"> 1. Turn the engine rotation rate down to decrease the rate of oil flow

		(Adjust oil flow to the right range)
An abrupt stop during operation	<ol style="list-style-type: none"> 1. Couplers are not connected 2. Damage of control valve 	<ol style="list-style-type: none"> 1. Check each connected parts 2. Replace a control valve *
Oil leakage from control lever	<ol style="list-style-type: none"> 1. Damage, wear or harden of O ring 	<ol style="list-style-type: none"> 1. Replace O ring *
Profuse Oil leakage from front end	<ol style="list-style-type: none"> 1. Damage of U cup packing 2. Damage of U cup packing due to the scratch of piston rod. 	<ol style="list-style-type: none"> 1. Replace U cup packing * 2. Replace U cup packing, remove the scratch on piston rod *
Latch is nearly coming off	<ol style="list-style-type: none"> 1. Damage of lock spring 2. Ware of latch 	<ol style="list-style-type: none"> 1. Replace lock spring * 2. Replace latch *
High pressure hose shakes intensely	<ol style="list-style-type: none"> 1. Damage of accumulator diaphragm 	<ol style="list-style-type: none"> 1. Replace diaphragm *
Release the control valve but the breaker does not stop	<ol style="list-style-type: none"> 1. Foreign substance is caught in the valve rod 	<ol style="list-style-type: none"> 1. Disassemble, clean and adjust *

For items with *, ask Maruzen dealers for service and maintenance.

**EXPLODED VIEW
MODEL BH221**



BH221 Parts List

Ref. No.	Part No.	Part Name	Qty
1	MIKTB101B1	Valve Body	1
2	MIKTC102A1	Front End	1
3	MIKTD103C0	Cylinder	1
4	MIKTD104A0	Piston	1
5	MIKTD105A01	Shell	1
6	MIKTE106B1	Diaphragm w/ Metal Sheet	1
7	MIKTE107A0	Lid	1
8	MIKTE108A1	Cap	1
9	MORTE110A0	Control Valve	1
10	MIKTE110A1	Valve Guide	1
11	MIKTE111A1	Valve Rod	1
12	MIKTE112A1	Control Lever	1
13	MIKTE113B0	Inner Tube	1
14	MIKTE114A0	Stud Bolt	2
15	MIKTE115A1	Nut (M18)	2
16	MIKTE116A0	Chisel Bushing 1"x4-1/4"	1
17	MIKTE117A0	Name Seal	1
18	MIKTE118A0	Spring	1
19	MIKTE119A1	Handle Grip	2
20	1110-410-01B	Latch	1
21	1110-410-01	Lock Spring	1
22	1120-413	Cap Bolt	1
23	UP-355456	U-Cup Packing	1
24	DS-355435565	Dust Seal	1
25	OBP-5	Back-up Ring	1
26	OBG-75	Back-up Ring	1
27	OP-5	O-ring	1
28	OP-14	O-ring	1
29	OC-0621	O-ring	1
30	OG-75	O-ring	2
31	WS-06	Seal Washer	1
32	WS-18	Seal Washer	2

Ref. No.	Part No.	Part Name	Qty
33	PS--1	Plug	6
34	PS-02	Plug	1
35	PR-6x20	Pin	1
36	PR-5x36	Pin	1
37	PR-10x60	Pin	1
38	PR-16x60	Pin	1
39	WF-18	Washer	2
40	HH-0630	High Pressure Hose	1
41	LH-0645	Low Pressure Hose	1
46	QB-5/16	Steel Ball	1
47	CR-12x18	Roller	1
48	Bh-12x50	Bolt	2
49	WS-12	Washer	2