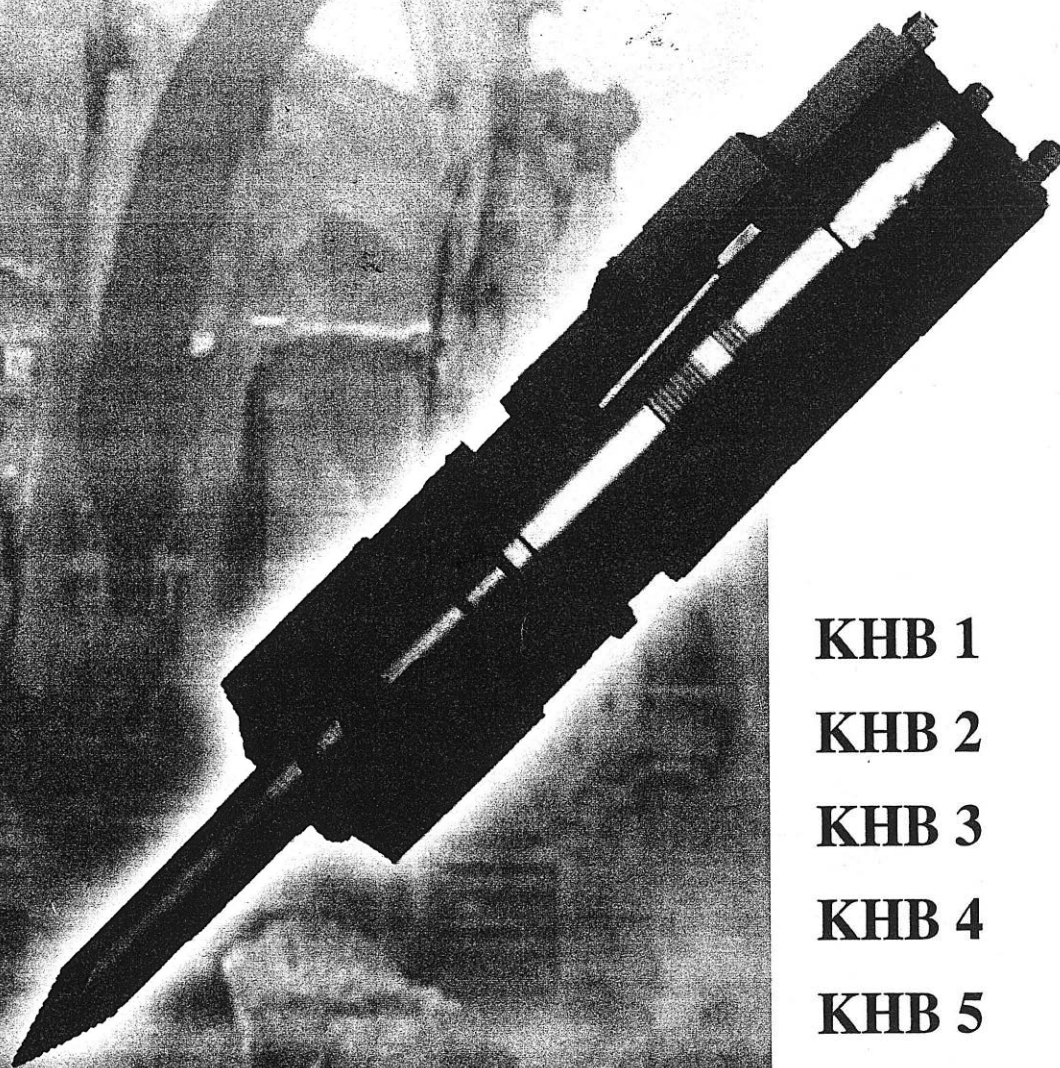


KHB SERIES



KHB HYDRAULIC BREAKER

OPERATION & MAINTENANCE MANUAL



KHB 1

KHB 2

KHB 3

KHB 4

KHB 5

KHB 6

KHB 15

Daesan Materials Co.

KHB SERIES



KHB HYDRAULIC BREAKER

OPERATION / MAINTENANCE MANUAL

KHB1

KHB2

KHB3

KHB4

KHB5

KHB6

KHB15

Daesan Materials Co.

EC DECLARATION OF CONFORMITY

According to EC Machinery Directive 98/37/EC

Daesan Materials Co.,
A-1416, Twin Tower Bldg., 275-3, Yangae-dong, Seocho-ku, Seoul, Korea,

We hereby declare the listed product complies with the principal protection requirements of the directive.

Product : Hydraulic Breaker

Model(s) : KHB1, KHB2, KHB3, KHB4, KHB5, KHB6, KHB15

Serial No. :

Tested according to : EN 292-1:1991
EN292-2/A-1:1995
EN414 : 2000
EN954-1:1996
EN982:1996
prEN 13778:1999

EC-Attestation of Conformity No. M8 04 07 53511 001

Date/Authorized Signature :



Title of Signatory :

Y. K. Kim / President

PREFACE

Our Breaker has been designed and built to provide durable operation. In order, however to obtain the best performance of the breaker under any working conditions you need to do proper handling, regular inspection and maintenance.

This operating instructions and list of spare parts provide you with all the information you need to correctly use for maintenance. Please read carefully this publication prior to installation and operation in order to prevent any possible mishandling of the breaker and minimize the down time of the equipment.

We guarantee that a faithful compliance of the instruction will contribute to the best operational conditions. Customers are, therefore, required to keep in mind that we are not responsible for troubles caused by not following our instructions or not using the genuine parts.

Note!

This manual contains safety, installation, operation and maintenance information. For more detailed information you need, please contact DSM or its dealer near you.

Some photographs or illustrations in this manual may differ from the breaker due to some changes and improvement or upgrading.

Specification presented in this manual is subject to change without prior notice.

IMPORTANT NOTICE

READ AND UNDERSTAND THIS MANUAL PRIOR TO INSTALLING, OPERATING OR MAINTAINING THE BREAKER.

OPERATE THE BREAKER IN ACCORDANCE WITH ALL LAWS AND REGULATIONS WHICH AFFECT YOU, YOUR EQUIPMENT AND WORKSITE.

KEEP IN MIND THAT SERIOUS INJURY MAY HAPPEN DUE TO NEGLECT OF SAFETY REGULATION, PRECAUTIONS OF THIS MANUAL.

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1. SAFETY PRECAUTIONS

1.1. GENERAL PRECAUTIONS

- The KHB Hydraulic Breaker will provide safe and dependable service if operated in accordance with the instructions given in this manual. Read and understand this manual, any decals and tags attached to the breaker before operation. Failure to do so could result in personal injury or equipment damage.
- ① Operate the breaker in accordance with all laws and regulations which affect you, your equipment, and the worksite.
- ② Do not operate the breaker until you have read this manual and thoroughly understood all safety operation and maintenance instructions.
- ③ Do not operate the breaker until you have read the carrier equipment manual and thoroughly understood backhoe or excavator or similar equipment used to operate the breaker. The word "carrier", as used in this manual, means a backhoe or excavator or similar equipment used to operate the breaker.
- ④ Ensure that all maintenance procedures recommended in this manual are completed before using the equipment.
- ⑤ The operator must not operate the breaker or carrier if any people are within the area where they may be injured by flying debris or movement of the equipment.
- ⑥ Know the limits of your equipment.
- ⑦ make sure all controls (levers and pedals) are in the neutral position before starting the carrier.
- ⑧ Before leaving the carrier, always lower the boom and insure the carrier is stable. Never leave the machine with the engine running. Always engage the parking brake.
- ⑨ Stop the engine before attempting to make any repairs, adjustments or servicing to either the carrier or the breaker.

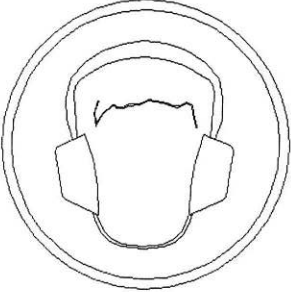
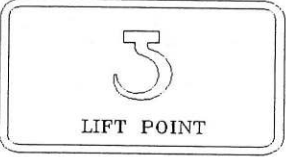

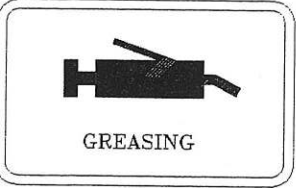
- ① Do not operate the breaker at oil temperature above 175°F/80°C. Operation at high temperature can damage the internal components of the breaker and carrier and will result in reduced breaker performance.
- Ⓚ Do not operate a damaged, leaking, improperly adjusted, or incompletely assembled breaker.
- ① Do not modify this breaker in any manner.
- Ⓜ Keep this manual with the breaker.

**WARNING**

SERIOUS INJURY OR DEATH COULD RESULT FROM THE IMPROPER REPAIR OR SERVICE OF THIS BREAKER. REPAIRS AND / OR SERVICE TO THIS BREAKER MUST ONLY BE DONE BY AN AUTHORIZED AND CERTIFIED DEALER.

1.2. LABEL LIST AND PLACE ON BREAKER

Stickers and decals placed on the breaker at time of manufacturing are shown to the below and decals have been placed on the breaker to aid the operator with safety and general maintenance. The information listed on these stickers and decals must be legible at all times. Always replace any sticker or decal that has become worn or damaged.

SYMBOL	REFERENCE	SAFE GUARD
	Head wearing ear protection	Use ear protection
	Lifting Mark	
	Danger(Warning) Sticker Manual	Keep away the breaking area while the breaker works Read operation manual
	Grease gun	An injection point of greasing

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80

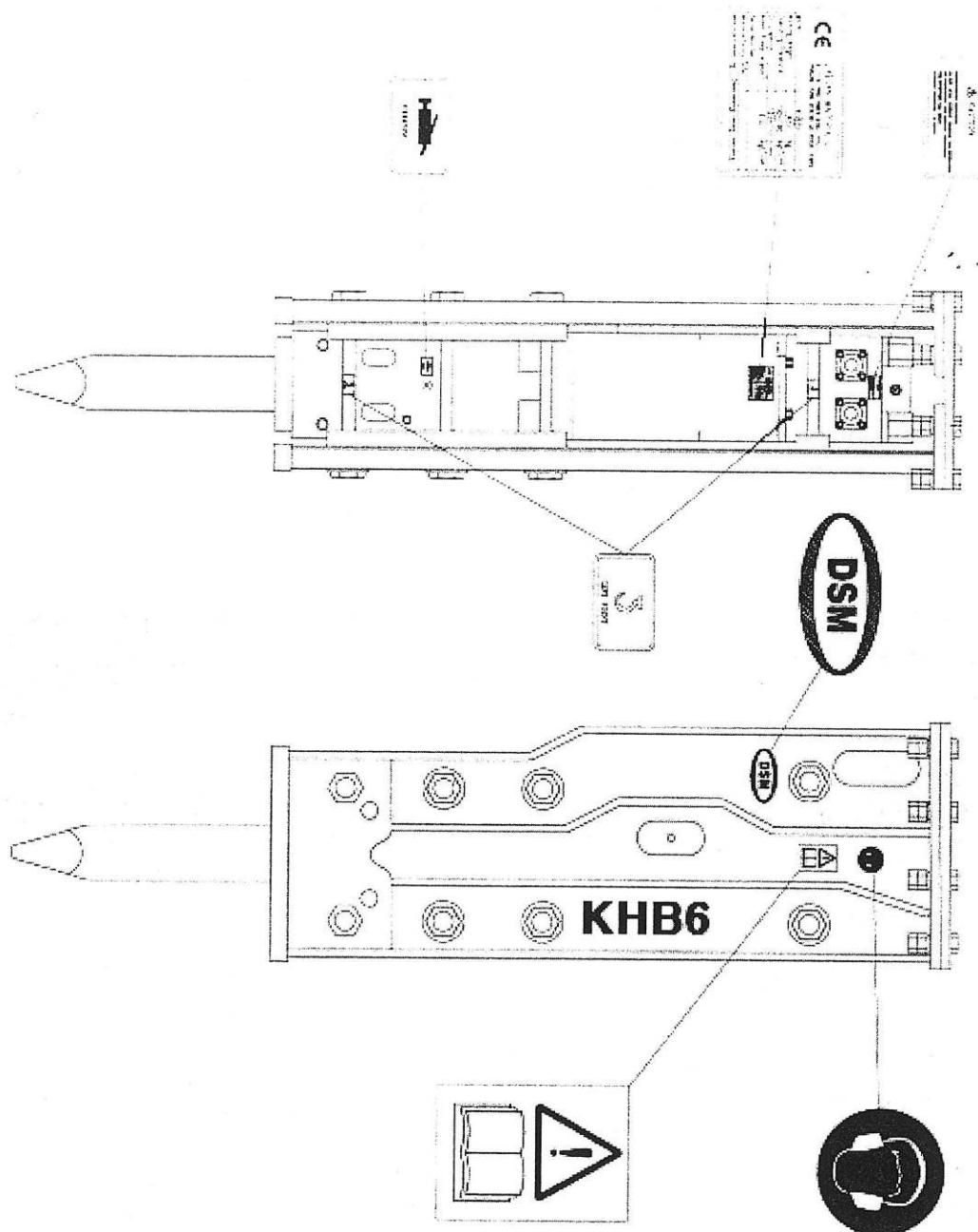
CE

DAESAN MATERIALS

Model	A
Working Weight	B kg
Operating Pressure	C kg/cm ²
Oil Capacity	D l/min
Relief Pressure(Max.)	E kg/cm ²
Serial Number	
Manufacturing Date	
Manufactured by : Daechong Heavy Industry	
MADE IN KOREA	

60 60

Model Name (A)		KHB1	KHB2	KHB3	KHB4	KHB5	KHB6	KHB15
Operating Weight (Top) (Box) (B)	kg	75	93	132	250	477	855	1090
		92	108	161	298	494	883	1138
Operating Pressure (C)	kg/cm ²	80 ~110	80 ~110	90 ~120	100 ~130	130 ~150	140 ~170	150 ~170
Required Oil Flow (D)	l/min	15~25	20~30	25~45	30~50	45~85	80 ~120	90 ~120
Relief Pressure (Max.) (E)	kg/cm ²	140	140	150	170	180	200	200



2. SPECIFICATIONS

2.1. STANDARD SPECIFICATIONS

		Unit	KHB1	KHB2	KHB3	KHB4
Body Weight	including Rod	kg	56	67	90	167
		lb	124	149	200	371
Operating Weight	Top Type	kg	75	93	132	250
		lb	167	207	290	550
	Side Type	kg	73	93	137	267
		lb	162	207	301	587
	Box Type	kg	92	108	161	298
		lb	204	240	354	656
Required Oil Flow		ℓ/min	15-25	20-30	25-45	30-50
		gal/min	4-7	5-8	6.6-11.9	7.9-13.2
Operating Pressure		kg f/cm²	80-110	80-110	90-120	100-130
		psi	1138-1565	1138-1565	1280-1706	1422-1848
Impact Rate		bpm	820-1220	620-1020	570-970	450-750
Hose Diameter		in	1/2	1/2	1/2	1/2
Rod Diameter		mm	40	50	58	70
		in	1.57	1.97	2.3	2.8
Relief Pressure		kg f/cm²	140	140	150	170
N₂ Gas Pressure - Back head		kg f/cm²	14-15	14-15	14-15	14-15
N₂ Gas - Accumulator		kg f/cm²	N/A	N/A	N/A	N/A
Applicable carrier		ton	0.8-2.5	1.2-3.0	2.5-4.5	4.0-7.0
Noise		dB	Below 80	Below 80	Below 80	Below 80

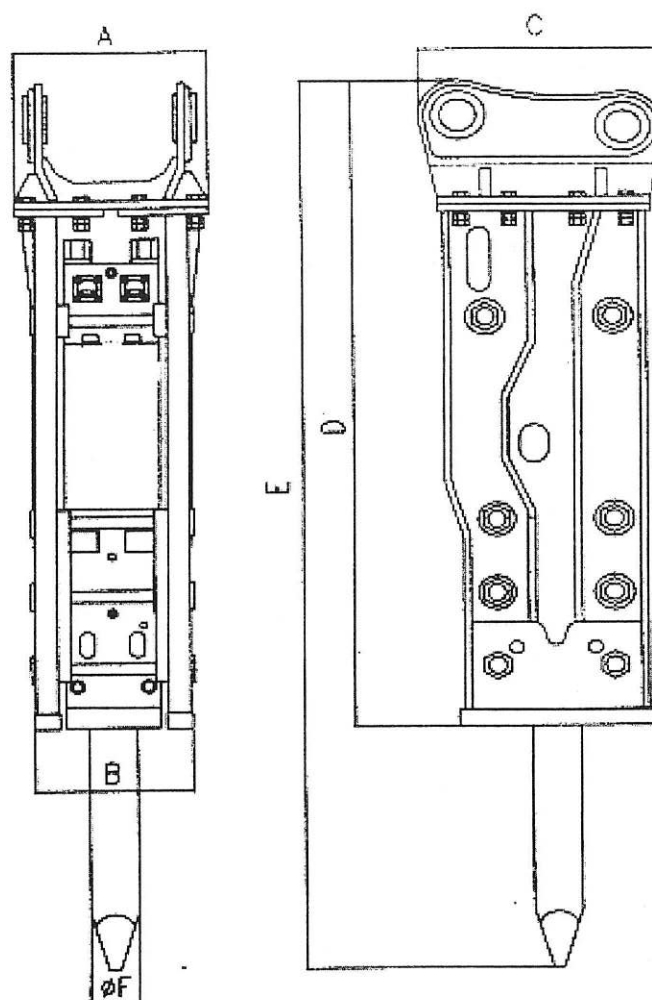
2.1. STANDARD SPECIFICATIONS

		Unit	KHB5	KHB6	KHB15
Body Weight	including Rod	kg	270	479	630
		lb	600	1064	1400
Operating Weight	Top Type	kg	477	855	1090
		lb	1060	1881	2422
	Side Type	kg	520	867	1258
		lb	1155	1907	2795
	Box Type	kg	494	883	1138
		lb	1098	1943	2528
Required Oil Flow		ℓ/min	45-85	80-120	90-120
		gal/min	12-22	21.1-31.7	24-32
Operating Pressure		kg f/cm²	130-150	140-170	150-170
		psi	1848-2133	1990-2417	2133-2418
Impact Rate		bpm	400-800	450-630	400-530
Hose Diameter		in	3/4	3/4	1
Rod Diameter		mm	85	100	125
		in	3.3	3.9	5
Relief Pressure		kg f/cm²	180	200	200
N₂ Gas Pressure - Back head		kg f/cm²	16-17	16-17	16-17
N₂ Gas - Accumulator		kg f/cm²	N/A	N/A	N/A
Applicable carrier		ton	7-14	11-16	15-18
Noise		dB	Below 80	Below 80	Below 80

⊙ The above specifications are subject to change without prior notice for quality enhancement.

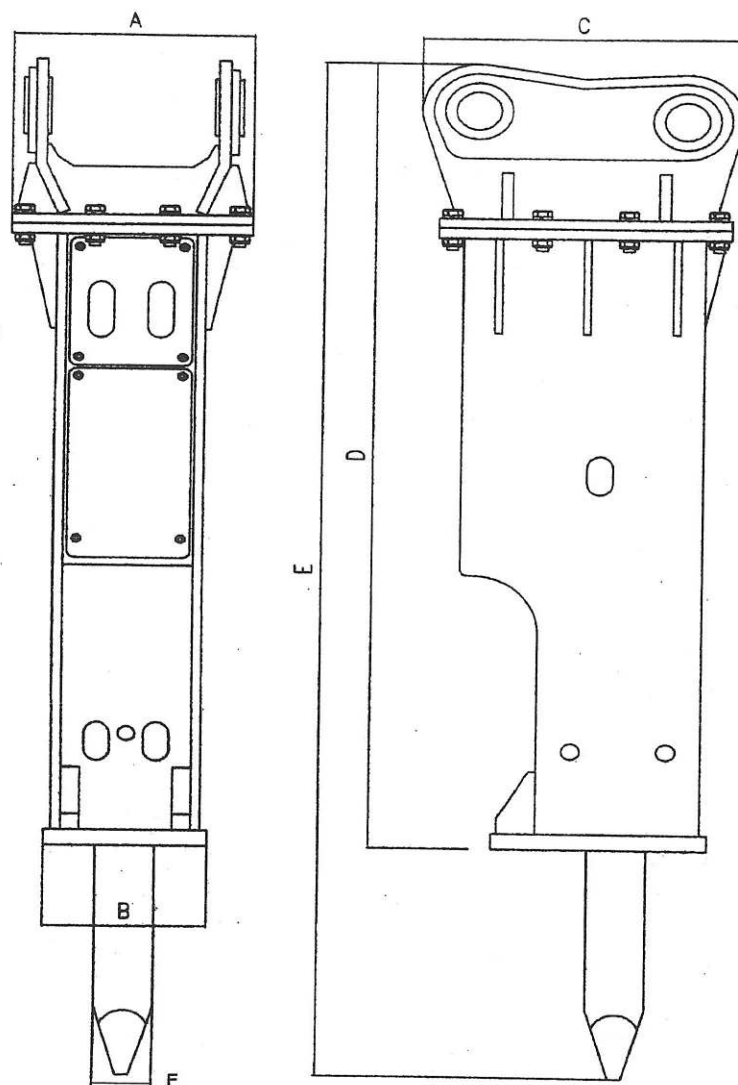
2.2. EXTERNAL DIMENSION

● Top Type



	(mm)					
MODEL	A	B	C	D	E	F
KHB1	164	151	230	780	1050	40
KHB2	178	157	256	871	1124	45
KHB3	225	166	300	982	1300	58
KHB4	294	213	420	1218	1431	70
KHB5	360	254	506	1600	2070	85
KHB6	420	298	550	1801	2253	100
KHB15	480	370	616	1997	2663	125

● Box Type

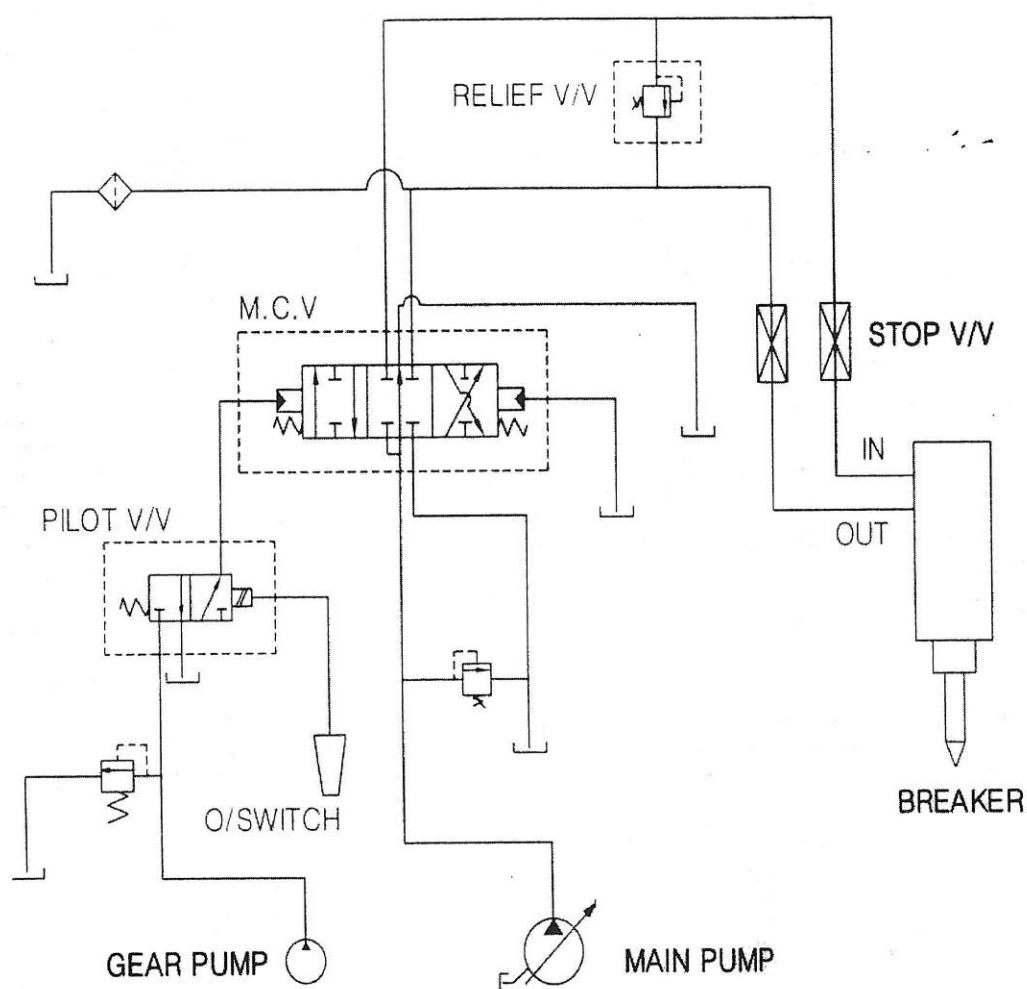


MODEL	A	B	C	D	E	F
KHB1	256	160	276	836	1106	40
KHB2	268	174	280	931	1184	50
KHB3	275	212	285	1050	1370	58
KHB4	330	234	410	1251	1631	70
KHB5	400	268	505	1642	2112	85
KHB6	430	334	580	1857	2210	100
KHB15	514	352	616	1960	2598	125

3. INSTALLATION

3.1. HYDRAULIC CIRCUIT & SETTING PRESSURE

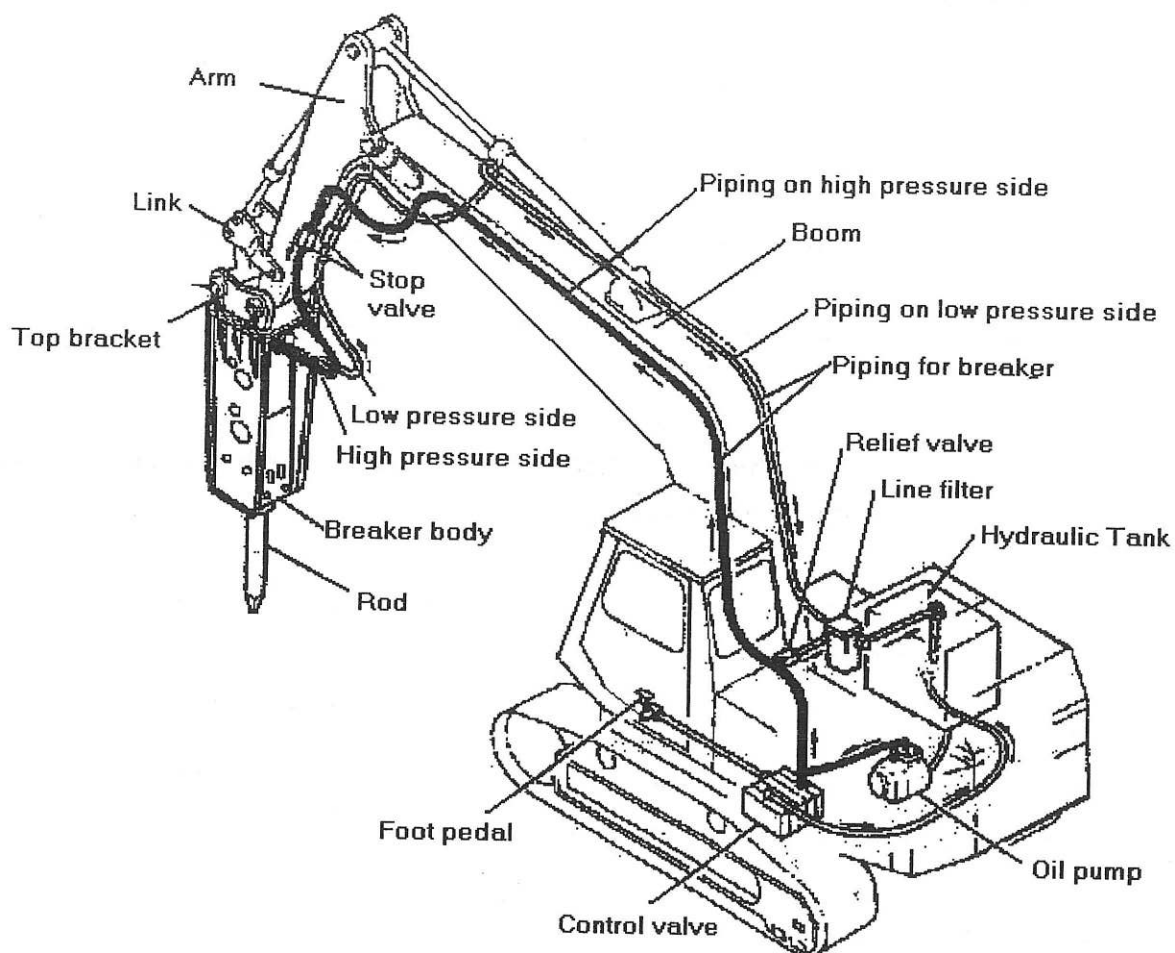
- Hydraulic Circuit



- Recommended circuit relief setting pressure and back pressure

	Unit	KHB1 KHB2	KHB3	KHB4	KHB5	KHB6 KHB15
Relief Setting pressure	kg f/cm ²	140	150	170	180	200
Back pressure	kg f/cm ²	0-10	0-10	0-10	0-10	0-10

3.2. INSTALLATION



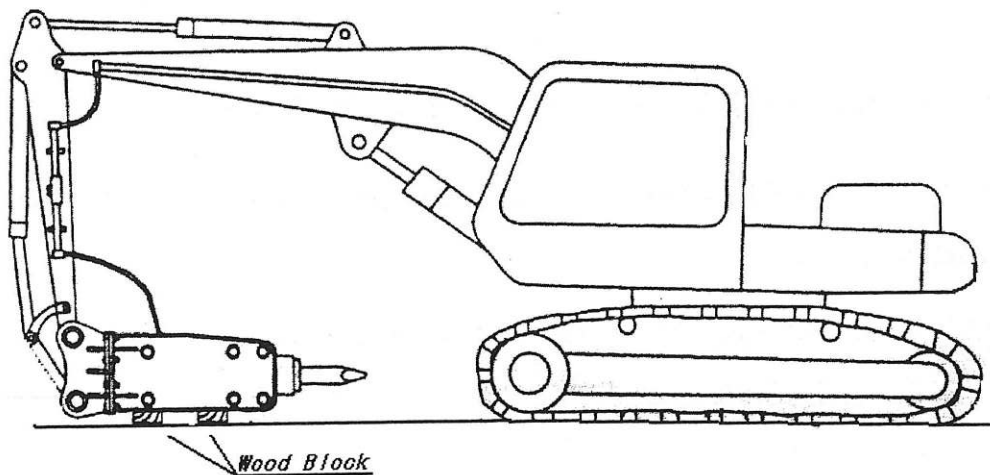
BE SURE THE FLUID IN THE HYDRAULIC SYSTEM IS CLEAN.

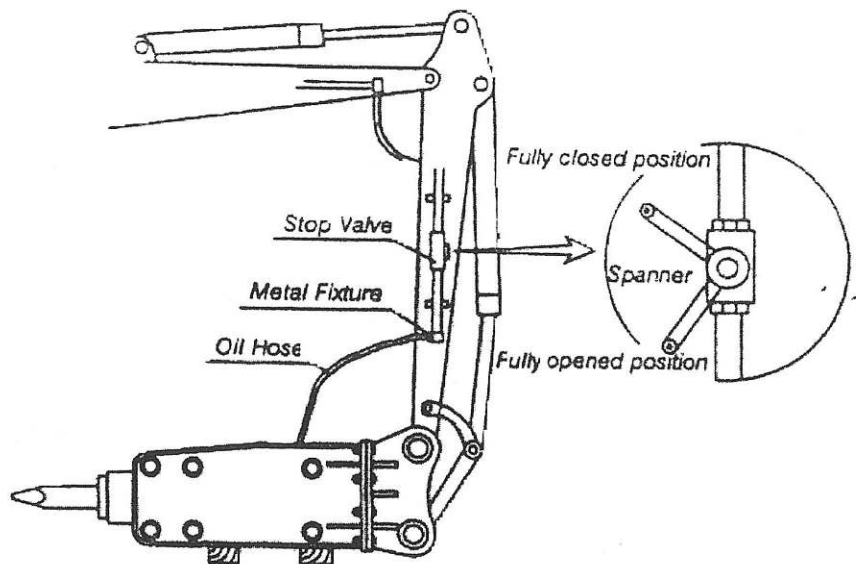
CHECK THE HYDRAULIC FILTER. REPLACE THE FILTER IF DIRTY OR DETERIORATED.

CHECK THE GAS PRESSURE OF BACK HEAD.

3.3. INSTALLATION PROCEDURE

- ① Put the breaker on wooden square bars laid on flat surface ground.
- ② Set the N_2 gas pressure in back head of breaker in accordance with the specific value of breaker. Please refer to the value shown on 2-1.
- ③ Adjust relief valve in order to control the setting pressure of breaker under the condition of closing stop valve of carrier.
- ④ **If carrier does not have a relief valve for breaker, please attach it to equipment and control the setting pressure.**
- ⑤ Stick to carrier with two breaker pin, fasten bolt and nut together with stop ring. During installation, be careful to keep both pin bush and hole of carrier straight using hand signals.
- ⑥ Open the union cap of stop valve and connect hoses of breaker. At this time, the remaining oil in pipes is subject to flow out, so prepare to capture the oil.

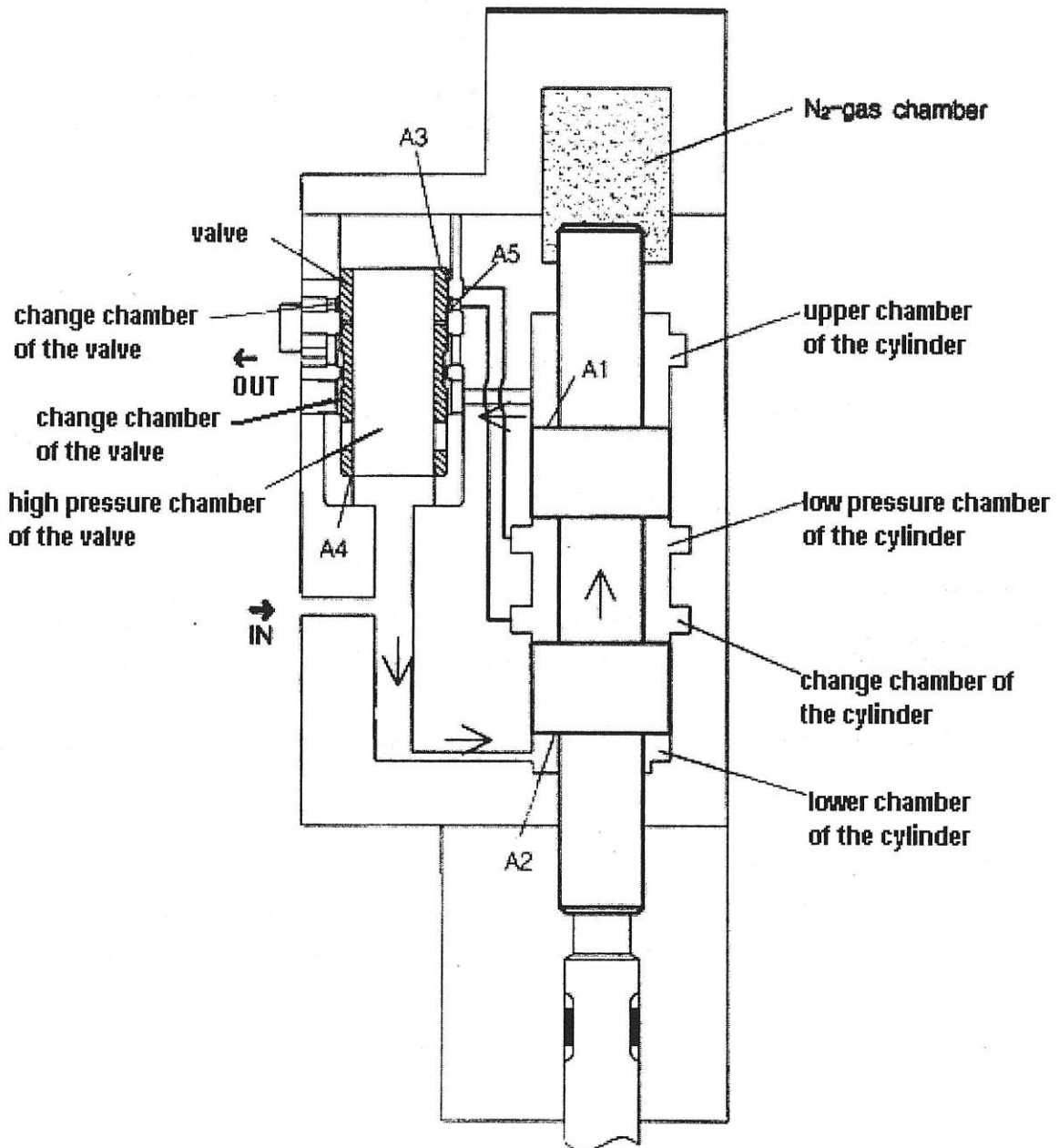




- ⑨ Open stop valve and operate breaker after warming up enough.
- ⑨ Check the operating pressure and number of blow. If less blow, check the flow rate.
- ⑩ Check oil leakage from connecting area such as pipes, hoses and fittings. If there is any leakage, please retighten or replace seals.
- ⑪ Pay attention to grease injection into tool. If needed, inject again.
- ⑫ If the carrier has quick link system, please put a breaker to carrier in accordance with installation method of quick link maker.
- ⊙ When dismantling, the procedures are reversal to method of assembly.

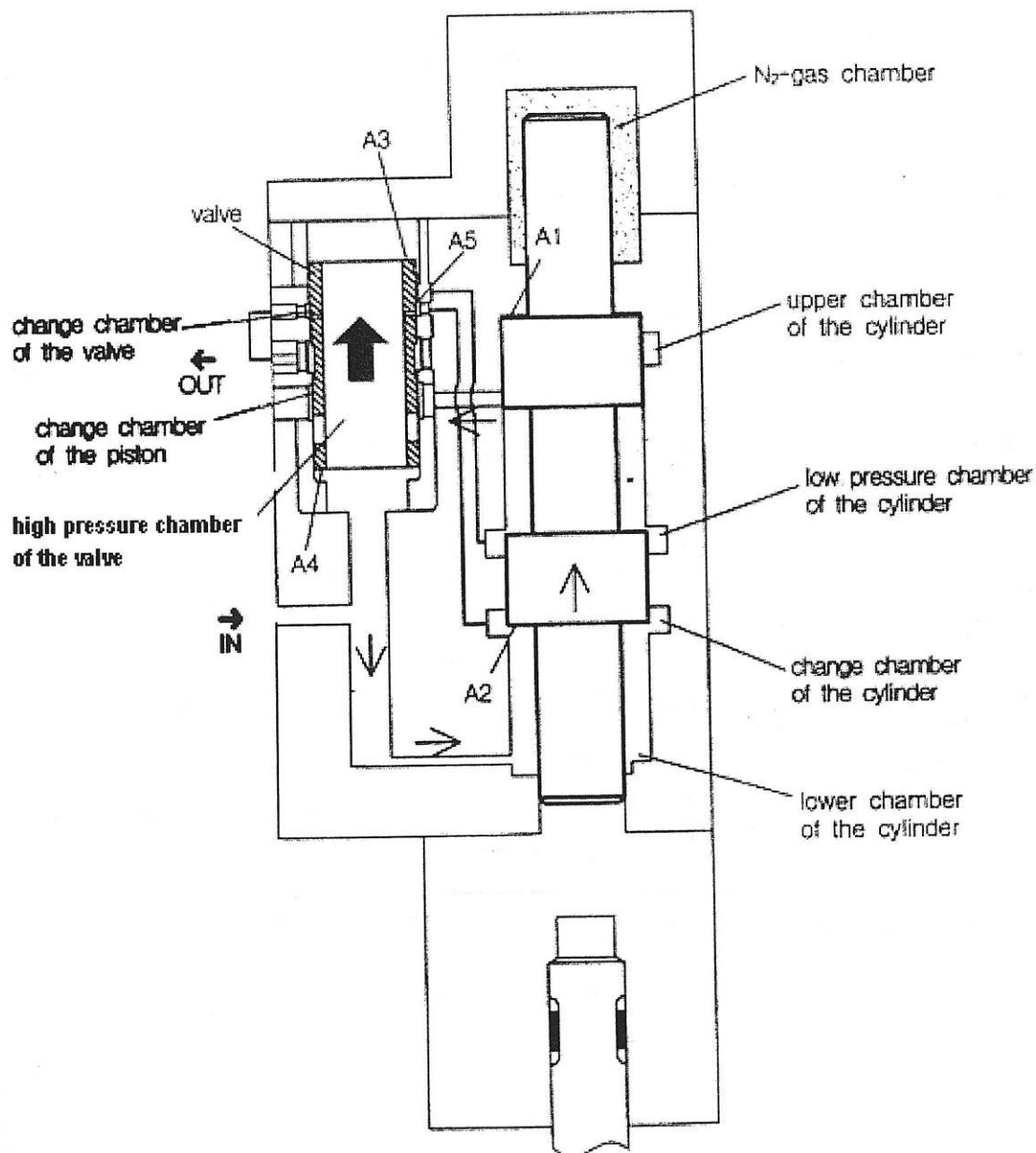
3.4. THE PRINCIPLE OF OPERATION

The relation between the area $A1$ (affecting the pressure from the upper chamber of the piston) and $A2$ (affecting the pressure from low chamber of the piston) is $A1 > A2$ and high pressure always applies to $A2$. When $A1$ is changed from high to low pressure, piston moves upward. The inside of the back head is charged with high pressured Nitrogen Gas and it effects on the piston during impact (down stroke of piston).

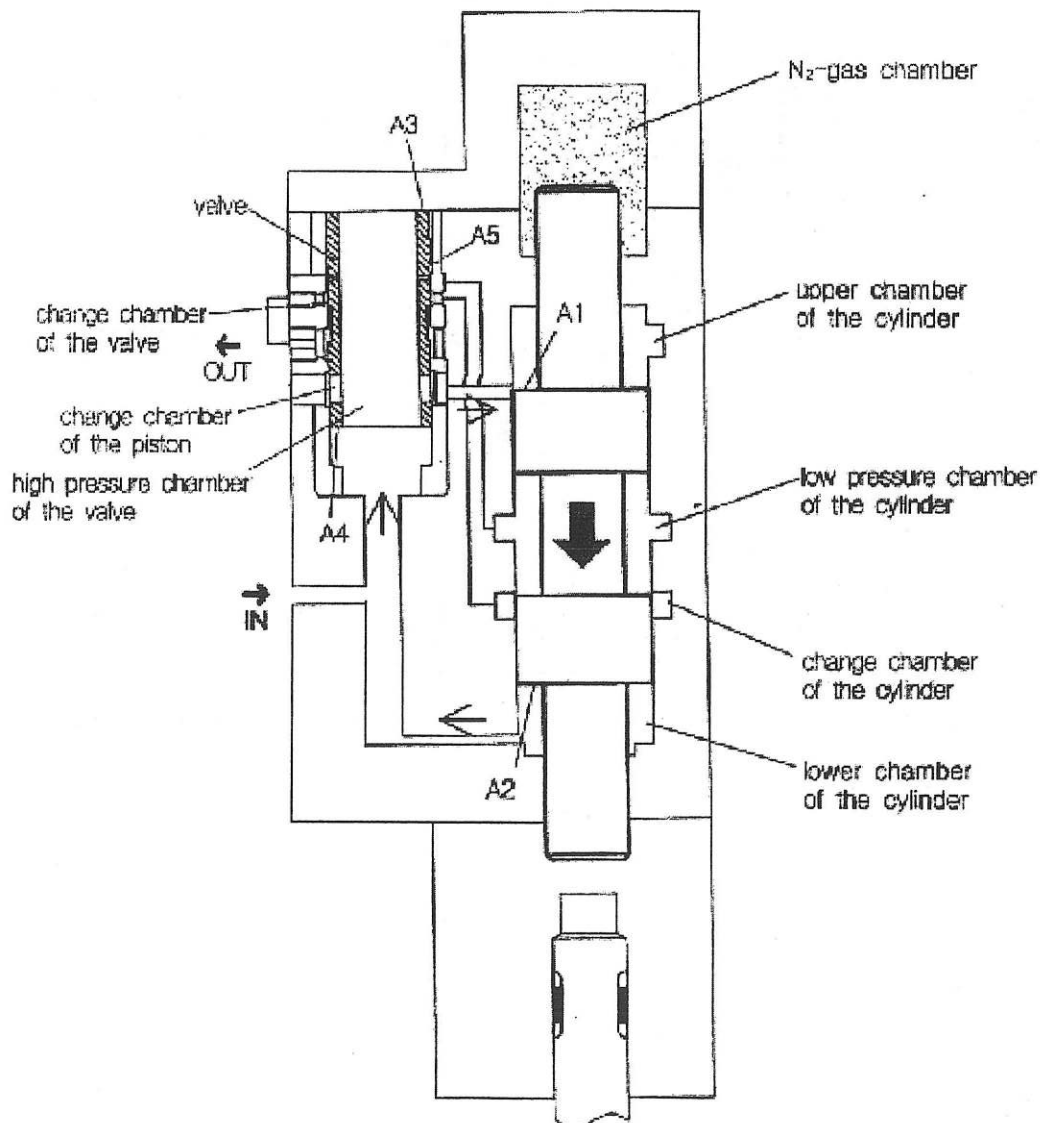


● Up-stroke of the valve

- ① When the piston reaches top end of position, the lower chamber of the cylinder is connected to the change chamber of the cylinder. Then, the change chamber of the valve (see the picture) is converted to high pressure.
- ② When the change chamber of the valve is in high pressure, A3, A4 and A5 are in high pressure too. However, the relation between the valves are $(A4 + A5) > A3$ so it forces up-stroke of the valve. This process completed in a short moment

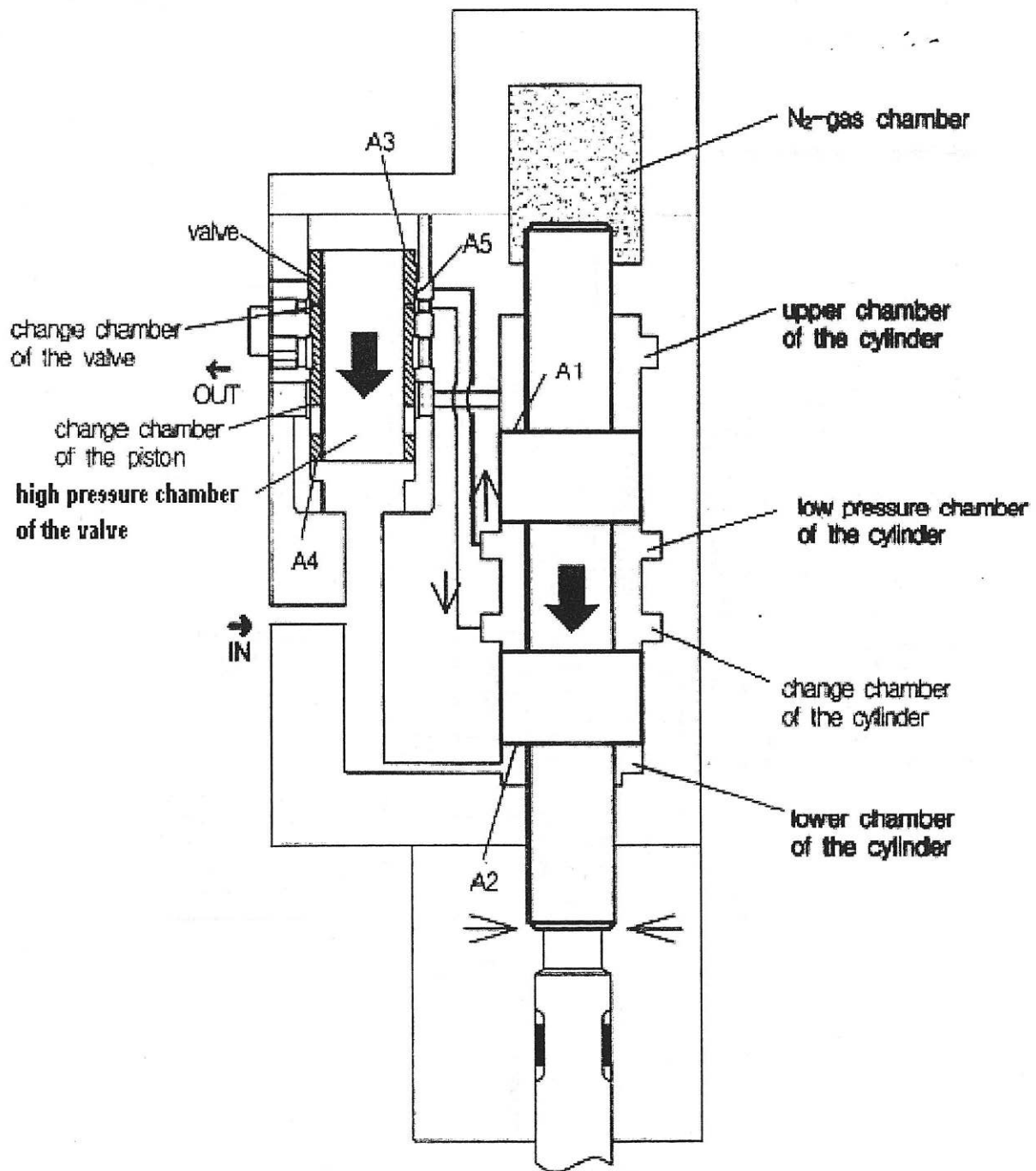


- Down-stroke of the piston
 - ① As the valve is in the highest up-stroke position, the change chamber of piston is connected with the high pressure chamber of the valve, so the upper chamber of the cylinder is changed to high pressure.
 - ② The upper chamber and lower chamber of the cylinder is in high pressure condition. However, the relation of the areas of piston ($A_1 > A_2$) affects down-stroke of the piston.
 - ③ The compressed Nitrogen gas in back head adds forces of down-stroke of piston, so the piston downs rapidly



- Down –stroke of the valve

- ① The change chamber of the cylinder is connected with the low pressure chamber of the cylinder.
- ② Relation between A_3 and A_4 is $A_3 > A_4$. The valve starts down-stroke.



- Impact of the piston
 - ① At the same time of down-stroke of valve, piston impacts tool(rod).
 - ② When the down stroke of valve is finished, piston moves up.
- The breaker repeats the above procedure continuously in order to operate.

4. OPERATION

4.1. PRECAUTION

- Warm-up of machine prior to operation.
 - ① Do not operate the machine right after starting the engine. Idle the machine for warm-up. Warm the hydraulic oil sufficiently especially in winter or in the cold place.
 - ② Especially in winter, the carrier's engine should be warmed up for 5 to 10 minutes before breaker operation.
 - ③ When operating the hydraulic breaker, idle the engine and operate the hydraulic breaker slowly with a light load.
- Operate the breaker at proper engine speed.

Break rocks at the specified engine speed. Raising engine speed more than necessity does not strengthen hammering force but increase oil temperature to the detriment of piston and valve.
- When operating the breaker you must wear a eye protection, ear protection and breathing protection.



WARNING

DO NOT OPERATE WHILE UNDER THE INFLUENCE OF ANY DRUGS AND ALCOHOL.

4.2. OPERATING GUIDELINE

- Do not break continuously in one place.

Continuous penetration in the same area for lengthy period will create excessive temperatures at the tip of rod resulting in loss of temper (hardness) of the rod and causing mushrooming of the tip of the rod. And it may lead to failure of the rod.

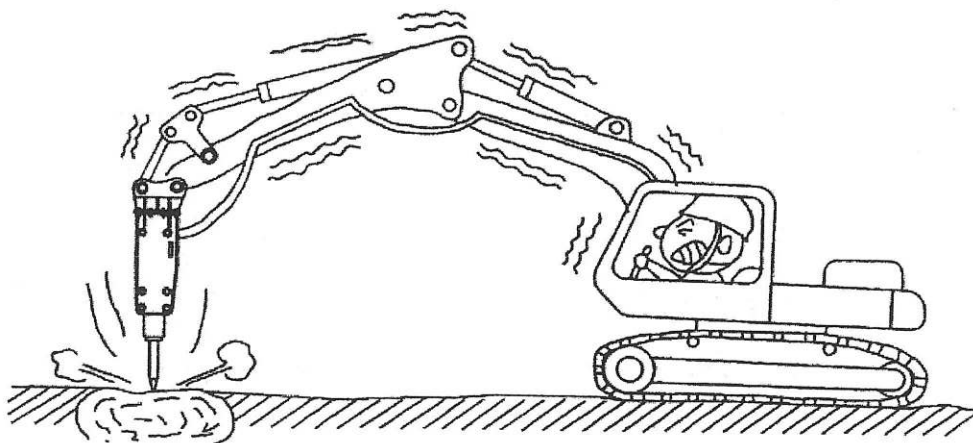
- Avoid blank hammering.

Blank hammering accelerates wear and tear on breaker and carrier components and may result in failure of one or more components. Excessive blank hammering may be considered equipment abuse and may result in voiding warranties. In case of blank hammering, hammering sound changes.

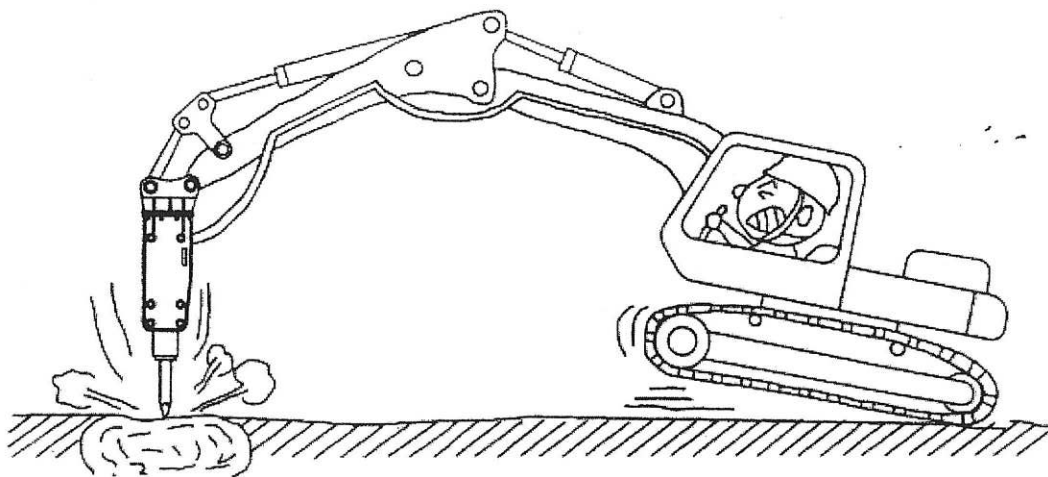
- Stop operation when hoses are vibrating abnormally.

Check the hoses between carrier and breaker for abnormal vibration. If they are vibrating abnormally, contact the nearest KHB dealer.

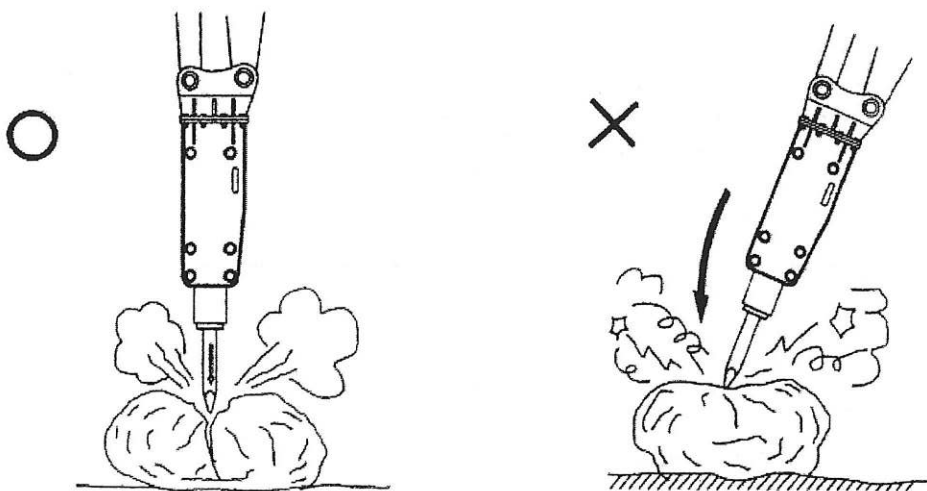
- Proper position must be applied for an effective usage of breaking force. When position is incorrect, hammering energy of the piston is too weak to break rocks. Instead, hammering force applies shocks to breaker body, arm and boom of the base machine, thereby resulting in damage to those parts.



- On the contrary, when position is excessive enough to break rocks with front of the base machine raised, the machine may suddenly tilt forward at the moment rocks are broken. Then, the breaker body or the end of bracket may violently hit against rocks and result in damage.

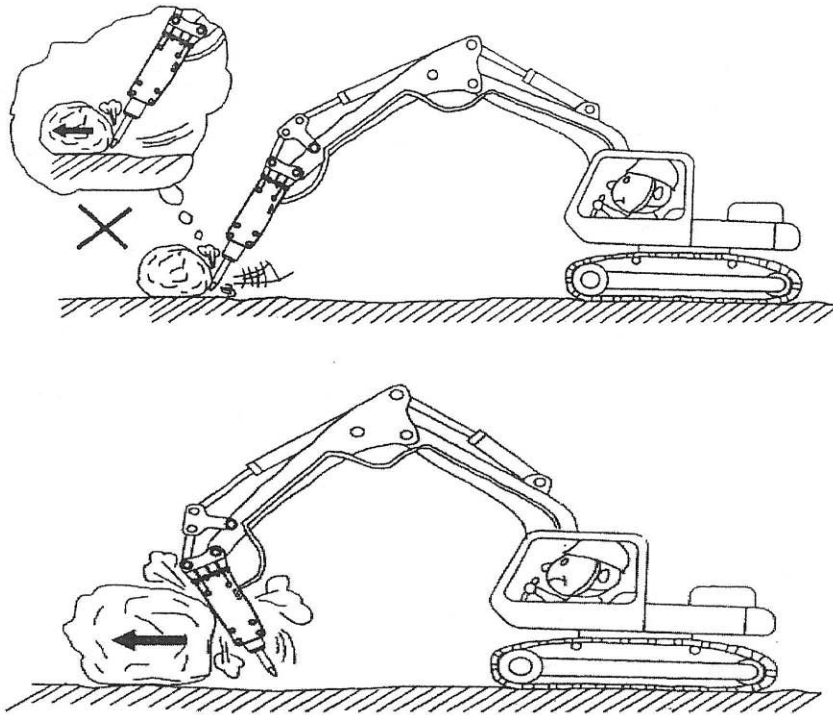


- Apply same direction of boom force in line with the rod and place the rod in the rock with hammering surface as vertical as possible. If hammering surface is oblique, the rod may slip during hammering. This causes the rod to seize and to be broken and piston to be damaged. When breaking, fully stabilize the rod first and then select the point of a rock on which hammering can be performed in a stable condition



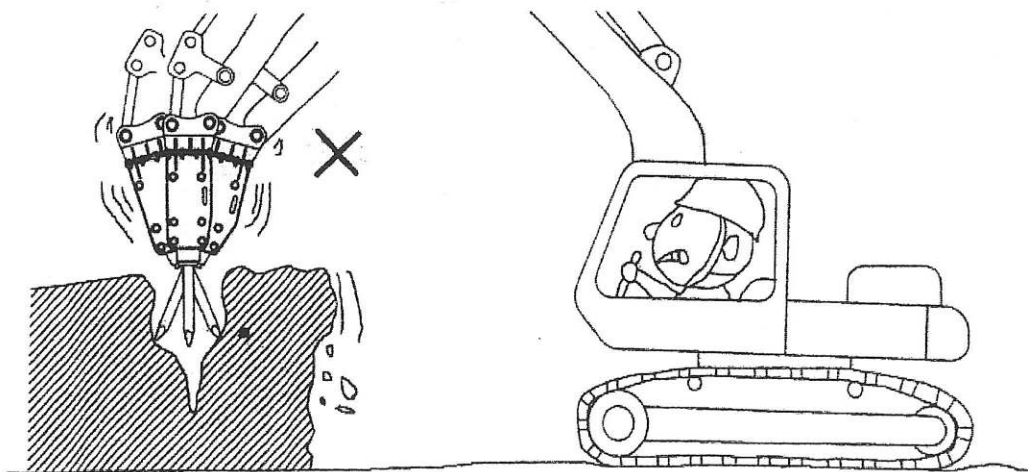
- Do not move rock.

Rolling or falling a rock with the rod end or bracket side by using the boom or arm of the carrier as shown in the figure will result in breakage of the breaker mounting bolt or bracket, breakage of rod, and damage to the arm and boom. Do not move rock. It is strictly prohibited to travel when the breaker is in contact with rock.



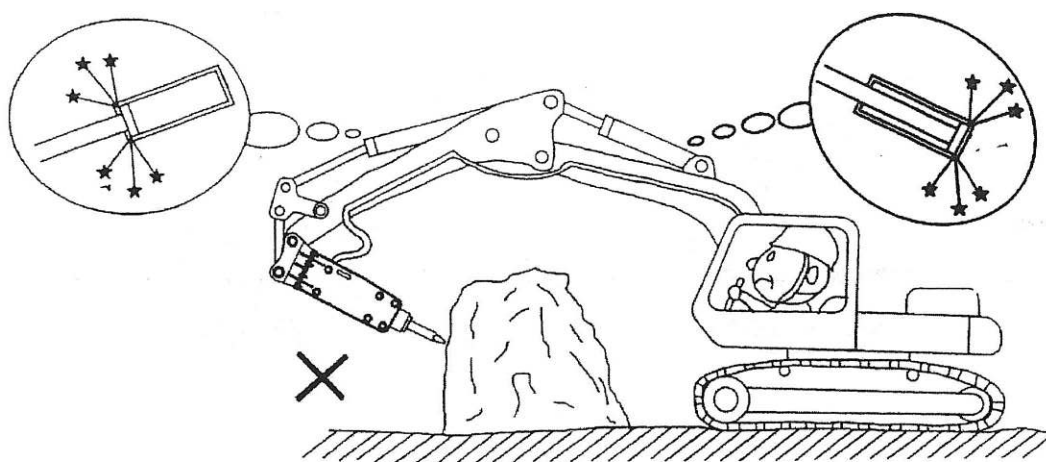
- Do not use the tool as a lever.

When a rock is broken by using the tool as a lever as shown, the bolts and tool may be broken or the bracket will be damaged.



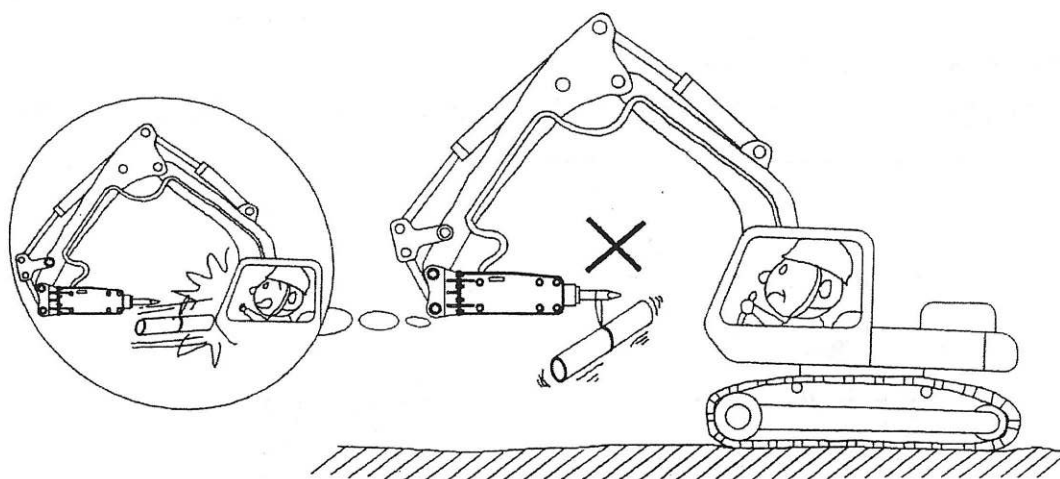
- Do not do breaking operation at the stroke end of the carrier cylinder.

Breaking operation conducted at the stroke end (when the cylinder is extended or retracted to a maximum extent) of respective hydraulic cylinders of the carrier will lead to damage to the cylinders and other parts of the carrier.



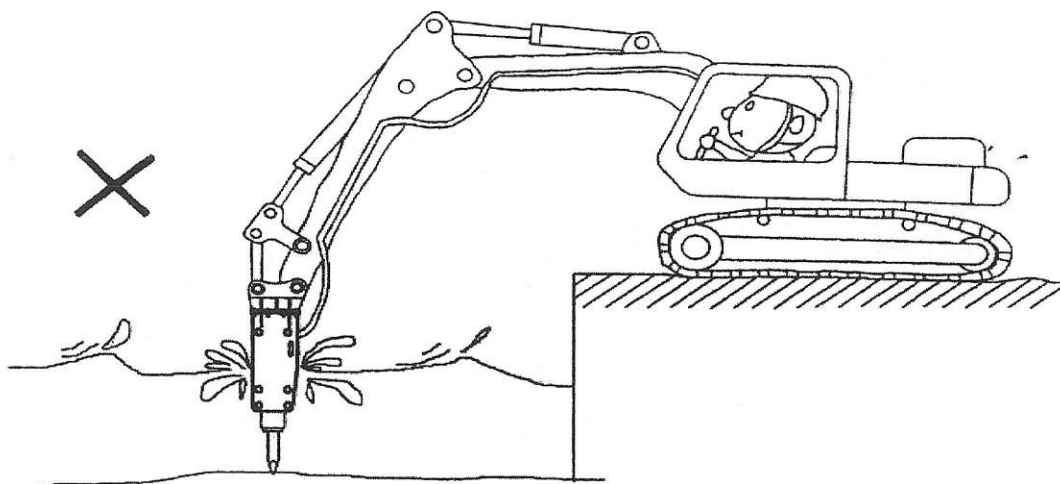
- Do not lift things with the breaker.

Lifting things by hanging wire in the bracket or rod not only causes damage to the breaker but also is very dangerous.



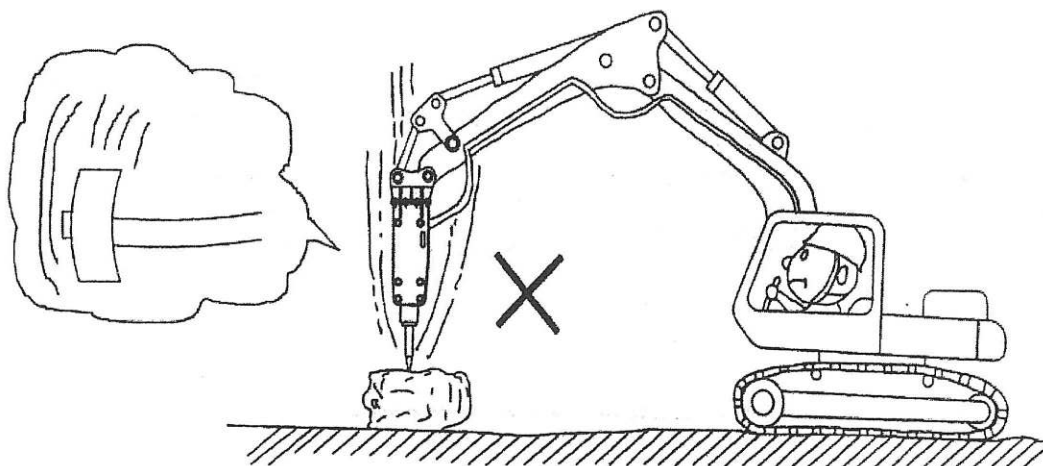
- Do not operate the breaker in water and mud.

Do not operate the breaker in water and mud. If not, the piston or the similar components may be damaged. In case of operation under the water, it is necessary to equip under water operation kit or consult us.



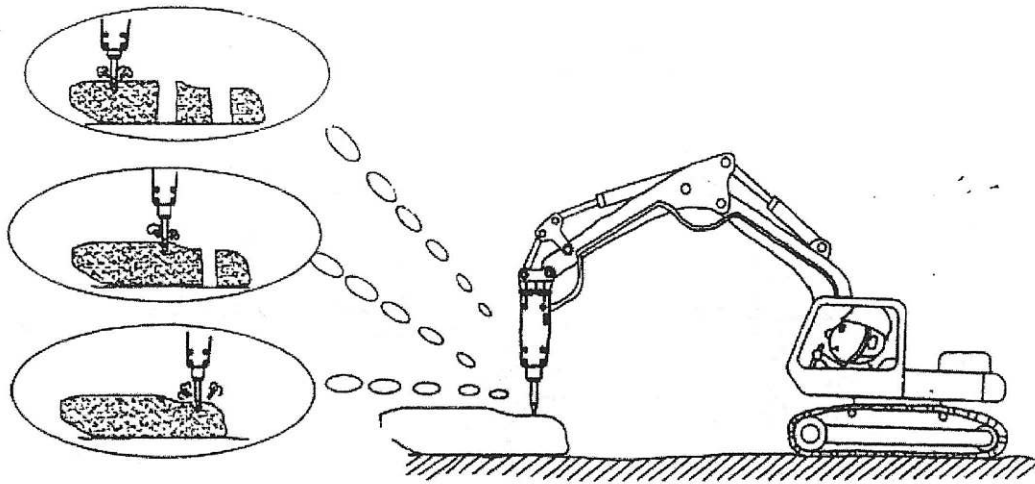
- Do not allow the breaker to fall to a rock.

Falling down the breaker will apply excessive force to the breaker or the carrier, causing damage to the parts of the breaker and carrier.



- Start breaking at the end point.

Beginning to hammer at the crack or the end will enable even a big rock to be broken comparatively easily.



5. MAINTENANCE

5.1. MAINTENANCE CHECK SCHEDULE

During the shift	Daily	Weekly	Every 2 weeks	As required
Lubricate the chisel every 2 hours	Tighten screw connections (during first 50 operating hour)	Tighten screw connections	Check chisel for wear	Replace any damaged hoses, bent and squashed pipes
Check lubricating nipple is OK	Check hydraulic lines for leak	Check adapter pins for wear	Check bushes for wear	
	Check pipe clamps still fit correctly	Check locking bolts on retaining bars for tight fit	Check bracket for wear	
	Check adapter and bracket	Check impact surface of chisel		
	Check gas pressure	Check sealing plugs		
		Check retaining bars		
		Check impact surface of piston.		



WARNING

- Check for loose bolts and nuts

The bolts and nuts can easily become loosened, which is the cause of severe damage to several component parts. Thus, check torque periodically on the basis of the table shown in 5-2.

Note : It is essential to check all bolts and nuts after the first 10-15 hours of actual operation.

- Check oil quantity in tank and keep hydraulic oil clean.

Make sure there is a sufficient amount of oil in the tank at all times.

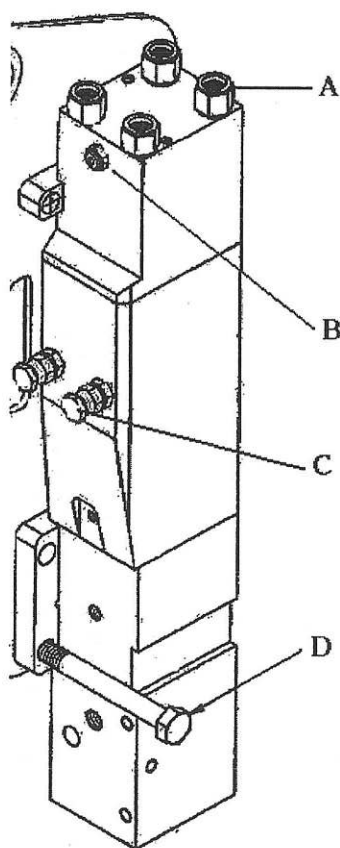
If the hydraulic oil is dirty, the valve and piston will be operated improperly.

Period of changing Hydraulic Oil : every 500hrs.

Line Oil Filter : every 100hrs.

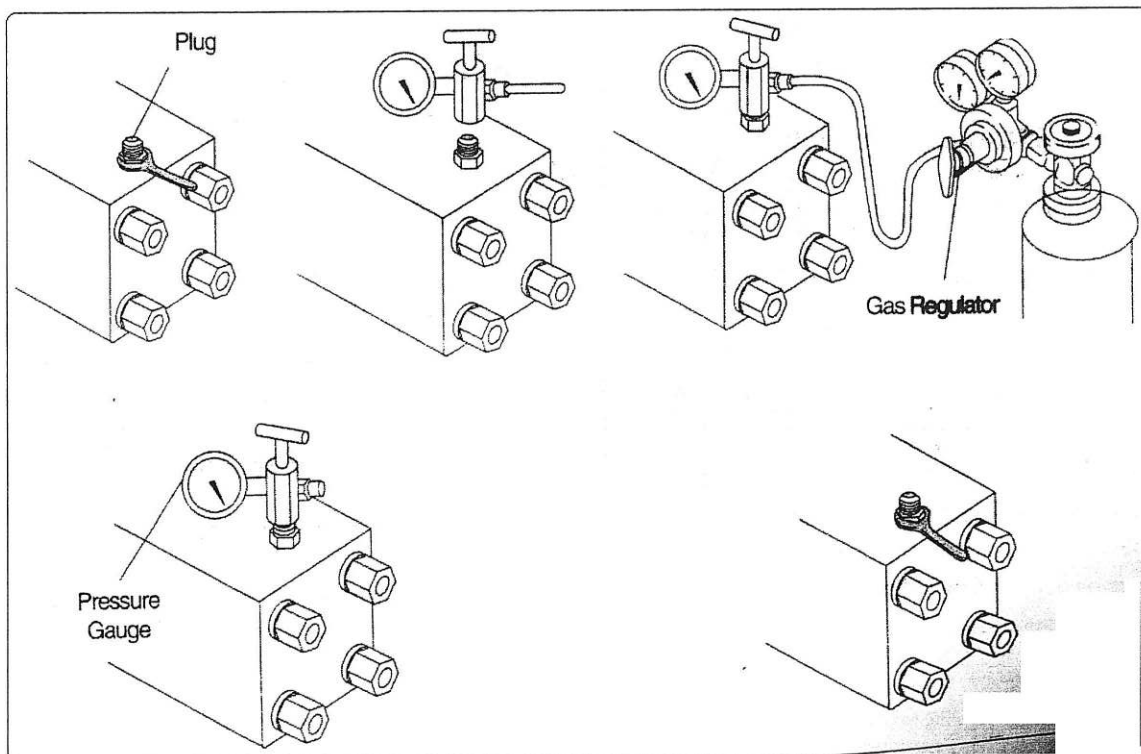
5.2. TIGHTENING TORQUE & GAS PRESSURE

Item	Model Position	Unit	KHB1	KHB2	KHB3	KHB4	KHB5	KHB6	KHB15
Through Bolt	A	kg-m	30	30	30	40	100	150	240
Charging Valve	B	kg-m	35-140	35-40	35-40	35-40	35-40	35-40	35-40
Back Head Gas Pressure	B	kgf/cm ²	14-15	14-15	14-15	14-15	16-17	16-17	16-17
Adapter	C	kg-m	16-18	16-18	16-18	16-18	24-26	24-26	32-35
Bracket fixing Bolt	D	Kg-m	60	60	80	100	145	146	200



5.3. CHARGING N₂ GAS

- Ⓐ Remove gas valve plug.
- Ⓑ Insert 3-way valve with pressure gauge assembled.
- Ⓒ If gas is insufficient, adjust to specified valve as shown in the 5-2.
- Ⓓ Adjust the pressure slowly decreasing by using the pressure gauge.
- Ⓔ Tighten gas valve plug. Do not cut the o-ring.
- Ⓢ N₂ Gas Charging method into gas chamber
 - Remove charging valve cap.
 - Set recharging valve with 3-way into charging valve.
 - Turn handle clockwise in order to check gas.
 - After fastening the recharging valve, put together with hose of N₂ gas barrel.
 - As turning the handle clockwise, N₂ gas goes into chamber.
 - On checking, the needle of gauge indicates specific values alleged, turn the handle counter clockwise to stop.
 - Put off the recharging valve and assemble the cap of the cap of charging valve.

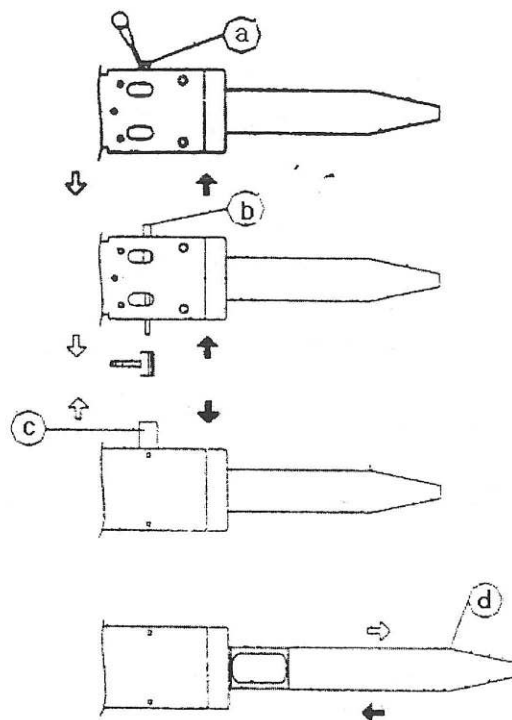


5.4. REMOVAL AND INSTALLATION OF TOOLS

● Removal

- A) Place the hammer on level ground
- B) Make sure that the carrier's transmission is in neutral and the parking brake is engaged.
- C) Stop the engine.
- D) Remove rubber plug ①, using screw driver.
- E) Remove the locking pin ②.
- F) Remove tool pin ③.
- G) Remove the tool ④.

⇨ REMOVAL ⇨ INSTALL



● Installation

- A) Clean and lubricate the tool and the tool pin.
- B) Install the tool ④, tool pin ③ and locking pin ②.
- C) Check that the tool pin ③ is secured by the locking pin ②
- D) Install the rubber plug ①.



WARNING

Do not attempt to disassemble and assemble this equipment before reading through this chapter of the manual first.

5.5. WEAR TOLERANCE

Wear tolerance of each kind expendable parts come to decide. The usage of exceeding the wear tolerance causes fatal damage to breaker. Prevent the damage through the regular inspection and exchange of expendable parts including seals and all kinds of bushes. Here is a guideline for expendable parts.

● SEAL and O-RING

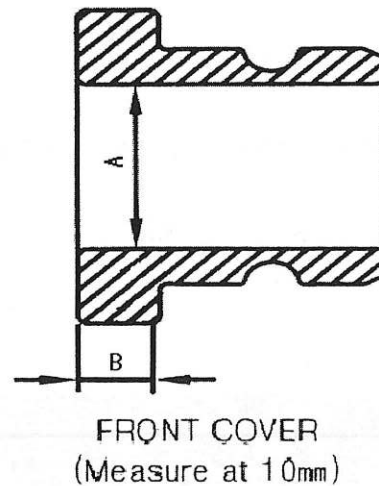
Quality Guaranteed Period : 3 months

Since hydraulic breaker operates at high-pressure and high-temperature, leakage or scratch could be occurred by friction, wear and breakage of seals. Considering pressure, temperature, viscosity of oil, a little leakage is accepted as normal. But in case of abnormal leakage, replace with a new one. To prevent fatal defect, periodical replacement is recommended to be carried out every 3 months without external leakage of breaker.

Although the breaker is not operated in a long time, replace seals periodically to prevent rust, corrosion of oil and transformation of seals.

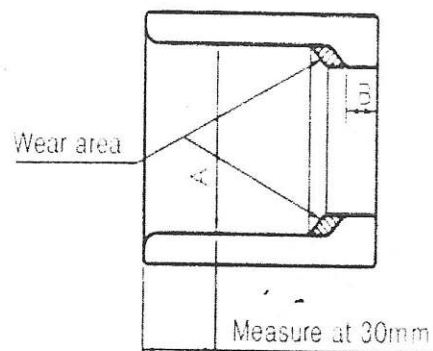
● FRONT COVER

MODEL	Unit(mm)	
	NEW Inside Dia (A)	LIMIT Inside Dia (A)
KHB1	40	42
KHB2	50	52
KHB3	58	61
KHB4	70	73
KHB5	85	89
KHB6	100	105
KHB15	125	130



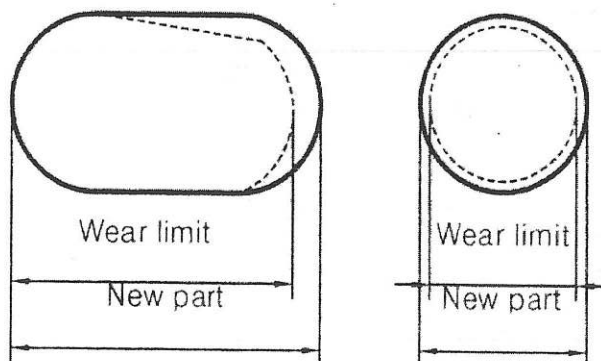
● RING BUSH

MODEL	Unit (mm)			
	NEW Inside Dia (A)	LIMIT Inside Dia (A)	NEW Inside Dia (B)	LIMIT Inside Dia (B)
KHB1	40	42	8.75	7
KHB2	50	52	10.25	8
KHB3	58	61	8.5	6
KHB4	70	73	10.5	7.5
KHB5	85	89	24	21
KHB6	100	105	17	14
KHB15	125	130	31	28



● ROD PIN

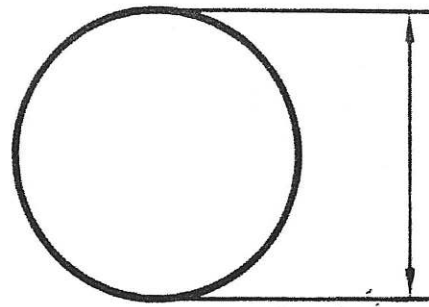
MODEL	Unit (mm)	
	NEW Length	LIMIT Length
KHB1	22	10
KHB2	24	22
KHB3	24	22
KHB4	29	27
KHB5	54	51
KHB6	60	57
KHB15	75	72



● STOP PIN

Unit (mm)

MODEL	NEW Outside Dia	LIMIT Outside Dia
KHB1	-	-
KHB2	-	-
KHB3	10	8
KHB4	16	14
KHB5	17.5	15.5
KHB6	17.5	15.5
KHB15	17.5	15.5

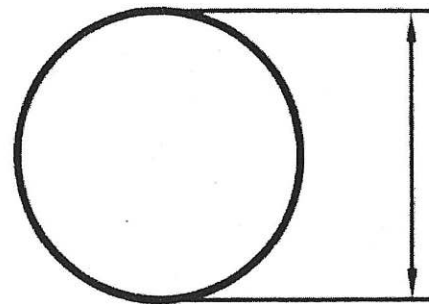


Measure Diameter

● FRONT HEAD PIN

Unit (mm)

MODEL	NEW Outside Dia	LIMIT Outside Dia
KHB1	-	-
KHB2	-	-
KHB3	-	-
KHB4	-	-
KHB5	20	18
KHB6	26	24
KHB15	26	24

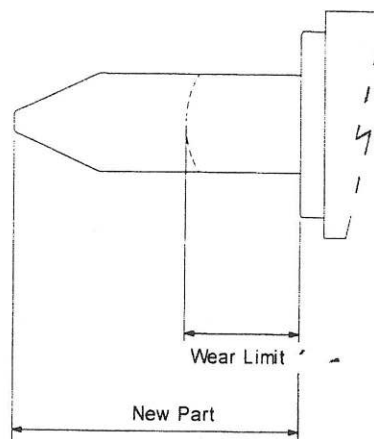


Measure Diameter

● ROD

Unit (mm)

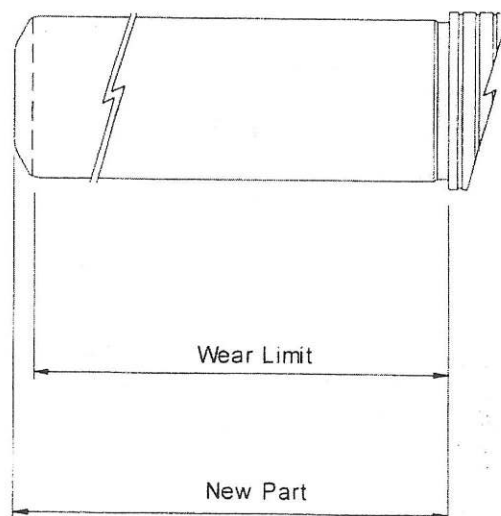
MODEL	NEW (Length)	LIMIT (Length)
KHB1	297	200
KHB2	326	200
KHB3	330	200
KHB4	405	250
KHB5	504	250
KHB6	561	250
KHB15	650	300



● PISTON

Unit (mm)

MODEL	NEW (Length)	LIMIT (Length)
KHB1	159	158
KHB2	169	168
KHB3	168	167
KHB4	189	188
KHB5	285	284
KHB6	275	274
KHB15	340	338



5.6. HYDRAULIC OIL

● Selection Oil

Selection of hydraulic oil determines the efficiency of hydraulic breaker performance.

Please consult with our service station under following conditions.

- (1) When used in special regions where climate is severe (extremely cold or hot weather)
- (2) When recommended brands of hydraulic oil are not available
- (3) When hydraulic oil supplied for the base machine differs from the recommended one.

● Hydraulic Oil and Grease

Recommended Oil and Grease for Hydraulic Breaker

LUBE&SPEC MANUFACTURER	HYDRAULIC OIL			GREASE
	SUMMER	WINTER	ALL SEASON	(MOS2)
	ISO VG 46	ISO VG 32	ISO VG 46	NLGI No2
MOBIL	MOBIL DTE 25	MOBIL DTE 24	MOBIL DTE 15M	MOBIL GREASE SPECIAL
	MOBIL SHC 525 ¹⁾			MOBIL SHC 220
	MOBIL EAL SYNDRAURIC 46 ²⁾			
BP	ENERGOL HP46	ENERGOL HP32	ENERGOL HP46	-

1) Synthetic Lubricant

2) Environmentally Friendly Synthetic Lubricant

※ Replacement of filter : after first 50 hours and every 100 hours thereafter

※ Replacement of hydraulic oil : every 500 hours

- Criteria of Oil Contamination and Malfunction
(General Analysis)

Analysis Item	Criteria	Cause and Effects when exceed the criteria
Adhesiveness	Within $\pm 10\%$ (40 °C cst)	Entry of different kinds of oil may reduce the adhesiveness which contributes to raising oil temperature, wear and scratch of piston, cylinder.
Oxidizing Level	Less than 0.3 (mg KOH/g)	Oxidizing level rises mainly due to high temperature (above 60 °C) or Oil ageing. Sludge will be produced during the process and it leads to malfunction, corrosion and ageing of components.
Moisture	Less than 0.1 (%)	Moisture causes rust, wear and scratch. Considerable rust may start at 0.3% level and Direct damage of component may happen over the level of 0.5%.

- Criteria of Malfunction of Hydraulic Oil Color
(Simple discrimination by ASTM color)

Hydraulic oil turns black as the breaker fails to display best performance.

The old oil is assumed to be contaminated when there is a visual difference between the old and new oil color.

Functions begin to deteriorate when hydraulic oil turns darker than the new oil color (ASTM number) by more than two.

6. TROUBLE SHOOTING

6.1 BREAKER DOES NOT START

Cause	Required Action
1. Pressure and return lines have been mixed up	Connect them correctly
2. Shut-off valve	Open shut-off valve
3. Gas pressure in back head too high	Readjust nitrogen gas pressure
4. Damaged screw couplings are blocking pressure or return lines	Replace with new one
5. Defective screw couplings are blocking pressure or return lines	Call authorized service man.
6. Defective magnet of valve switch	Replace magnet
7. Operating pressure too low	Inspect the engine speed of carrier and adjust the operating pressure
8. Lack of hydraulic oil	Fill hydraulic oil

6.2. HIGH FREQUENCY AND LOW BLOW POWER

Cause	Required Action
1. No gas in back head : Defective ring of the upper set.	Replace seal ring
2. O-ring is damaged	Replace o-ring

6.3. WORKING FREQUENCY AND LOW BLOW POWER

Cause	Required Action
1. Oil is not sufficient	Replace seal ring
2. Oil flow of the carrier to the breaker is excessive	Reduce the speed of the engine Adjust the oil pump
3. Temperature is high, but breaker is not connected to oil cooler	Connect to oil cooler
4. Defective relief valve	Replace with new relief valve.

6.4. LOW BLOW FREQUENCY

Cause	Required action
1. Oil flow insufficient.	Adjust the speed of engine
2. Coupling of hydraulic pipe lines are loose.	Re-tighten.
3. Shut-off valve is partially closed.	Open it fully.
4. Pressure in back head is low.	Charge the gas and adjust the pressure.
5. Tool shank is seizing or tool does not work smoothly.	Check the surface of the tool and round bush. If the tool is seizing, repair it with grinder.
6. Oil temperature exceeds 80 °C	Check and refill the hydraulic oil.
7. Flow resistance of oil filter and oil cooler is high.	Wash or replace oil filter and cooler.
8. Inner diameter of return line is small.	Replace return line
9. Return pressure is high.	Check the pressure.
10. Return line connects to control valve.	Return line must be connected directly to the oil tank or filter.
11. Hydraulic oil pressure is low.	Check the pressure and replace with new pressure relief valve, if necessary.

6.5. OIL LEAKAGE

Cause	Required action
1. Loose screw connection. Defective O-Ring	Tighten screw connection. Replace with new one.
2. Seals are worn out.	Replace seal and grease the tool every 2 or 3 hours during operation.

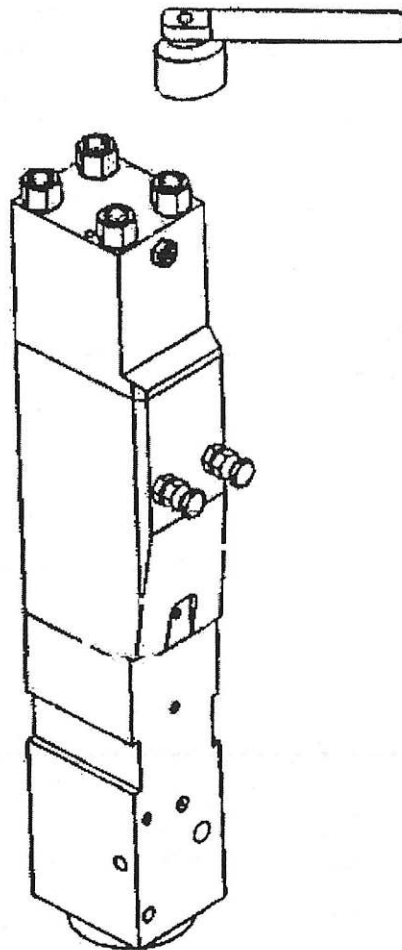
6.6. REDUCED BLOW POWER AND FREQUENCY

Cause	Required action
1. Shut-off valve is not open completely.	Open shut-off valve
2. Defective couplings of hydraulic pipe lines	Replace couplings defected.
3. Poor main pump performance.	Call authorized service man.

7. DISASSEMBLY AND ASSEMBLY OF COMPONENTS

7.1. LOOSENING AND TIGHTENING THROUGH BOLTS

- Loosening
 - Through bolts & nuts can be disconnected in use of power wrench or hammer wrench. But do only until it can be turned with hand.
- Tightening
 - Clean the through bolts and the contact surface of through bolt.
 - Grease the screw threads of through bolts.
 - Tighten it at a half degree of regular torque in diagonal sequence.
Tighten it at the regular torque.



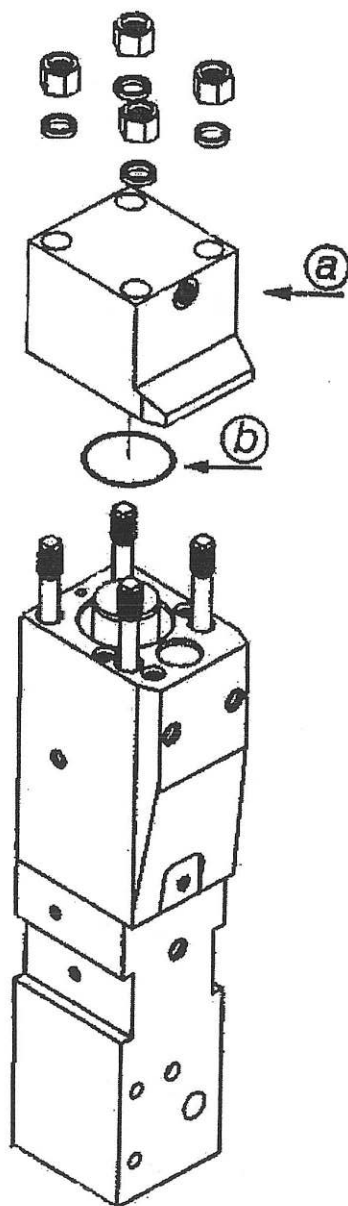
7.2. DISASSEMBLY AND ASSEMBLY OF THE BACK HEAD

● Disassembly

- Separate back head in use of hoist chain block - (a)
- Take out O-ring - (b)

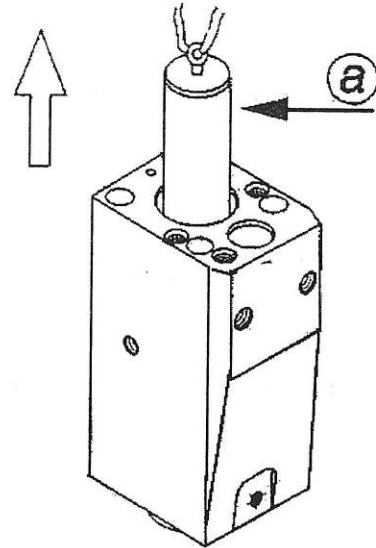
● Assembly

- Put O-ring to back head, fit O-ring to the top of cylinder and apply grease to it. (b).
- Insert joint ring into the top of back head connecting in with cylinder, using hoist or chain block (a).



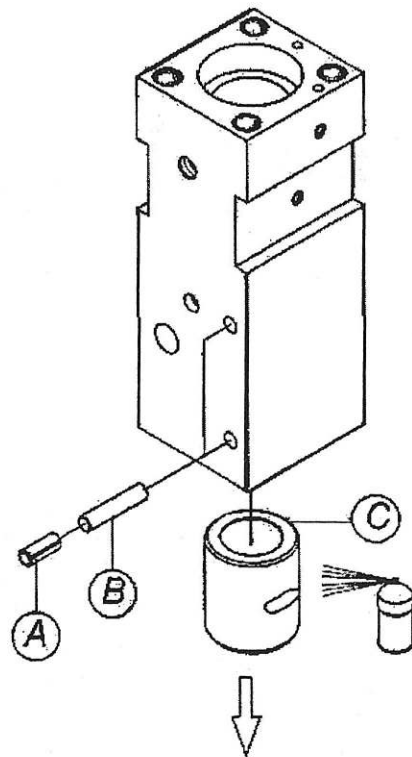
7.3. DISASSEMBLY AND ASSEMBLY OF PISTON & SEAL HOUSING

- Disassembly
 - Lift it up vertically with hoist - (a)
 - It can be laid according to job site condition.
 - Stand Piston removed, and separate Seal housing from Piston topping in use of rubber hammer.
- Assembly
 - Strike seal housing by rubber hammer into Piston.
 - Put piston into cylinder slowly, using hoist or chain block -(a)-



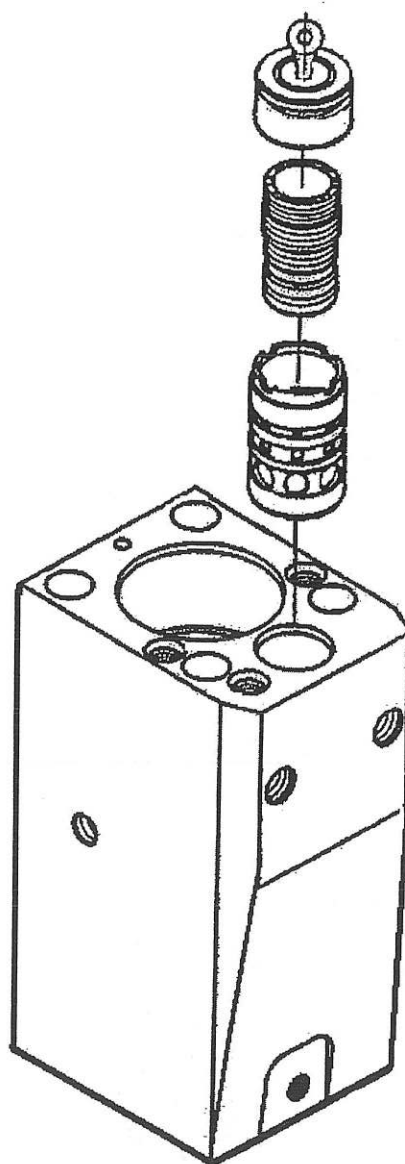
7.4. DISASSEMBLY AND ASSEMBLY OF RING BUSH

- Disassembly
 - Remove the spring pin A.
 - Remove the stop pin B.
 - Remove the ring bush C.
 - If the ring bush is too tight, warm under part of the front head.
 - Check tool and ring bush for wear.
- Assembly
 - Clean all parts.
 - Apply MoS2 spray to the contact surface of ring bush and front head.
 - Install ring bush C.
 - Install front stop pin B.
 - Install spring pin A.



7.5. DISASSEMBLY AND ASSEMBLY OF VALVE ASS'Y

- Disassembly
 - Insert the M16 bolt into the upper part of control valve plug and pull out control valve upward.
- Assembly
 - Install O-ring into control valve plug and brush control valve with hydraulic oil.
 - Check the movement condition after inserting control valve.



DELIVERY & INSTALLATION REPORT

DATE :

REF. NO. : _____

CUSTOMER : NAME _____ TYPE OF JOB SITE _____		
<u>BASE CARRIER</u> MAKER / MODEL : _____ OPERATING WEIGHT : _____ OPERATING HOURS : _____	<u>BREAKER</u> MODEL : _____ S/NO. : _____	
MAJOR CHECK POINTS	BREAKER LINE FLUSHING	
	CHANGE OF OIL FILTER	
	RELIEF VALVE SETTING	
	CONNECTION RETURN LINE TO OIL COOLER	
	MEASURING BREAKER OPERATING PRESSURE & FLOW	(kgf/cm2, Lpm)
	MEASURING BACK PRESSURE	(kgf/cm2)
	MEASURING N2 GAS PRESSURE (BACK HEAD & ACCUMULATOR)	(kgf/cm2 kgf/cm2)
OTHER JOBS IN INSTALLATION		
PERFORMANCE RESULTS		
COMMENTS (If Any)		
<div style="display: flex; justify-content: space-between; margin-bottom: 10px;"> <div>Installed by and date</div> <div>By</div> <div>Date & Signature</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Approved By and date (Customer)</div> <div>By</div> <div>Date & Signature</div> </div>		
DSM USE ONLY		

Daesan Materials Co.,

DSM-KHB-002

DR

KHB Hydraulic Breaker
PARTS LIST

KHB1

KHB2

KHB3

KHB4

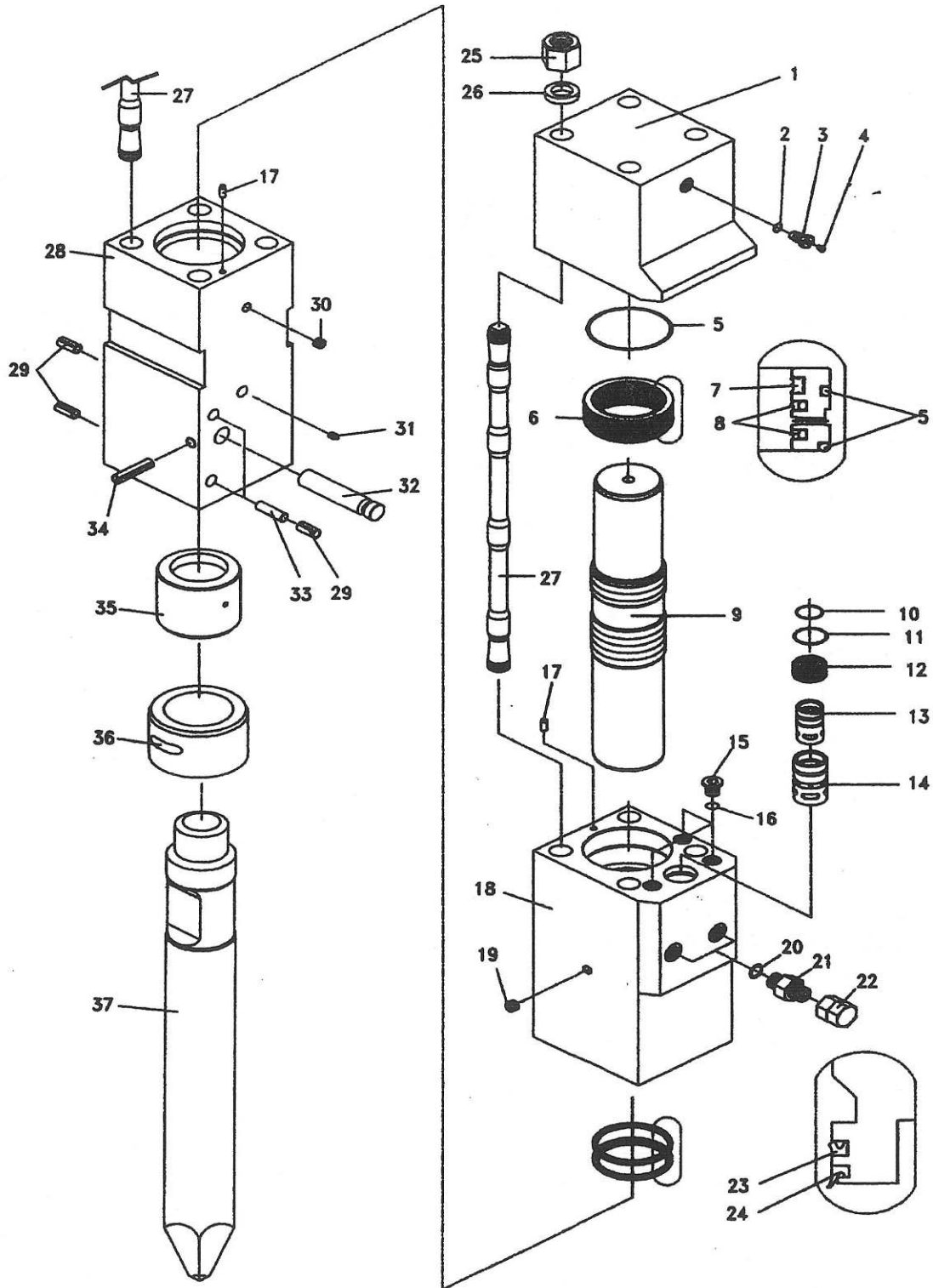
KHB5

KHB6

KHB15

Daesan Materials Co.

KHB 1 – Main Body



KHB1 Main Body Parts List

Item	Part Name	Part No.	Q'ty	Remarks
------	-----------	----------	------	---------

Back Head Assembly		KHB1-31000	1 Set	
1	Back Head Block	KHB1-31001	1	
2	O-Ring	9111-11018	1	1AP18
3	Gas Charging Valve	KHB20-31005	1	
4	Plug	KHB20-31006	1	

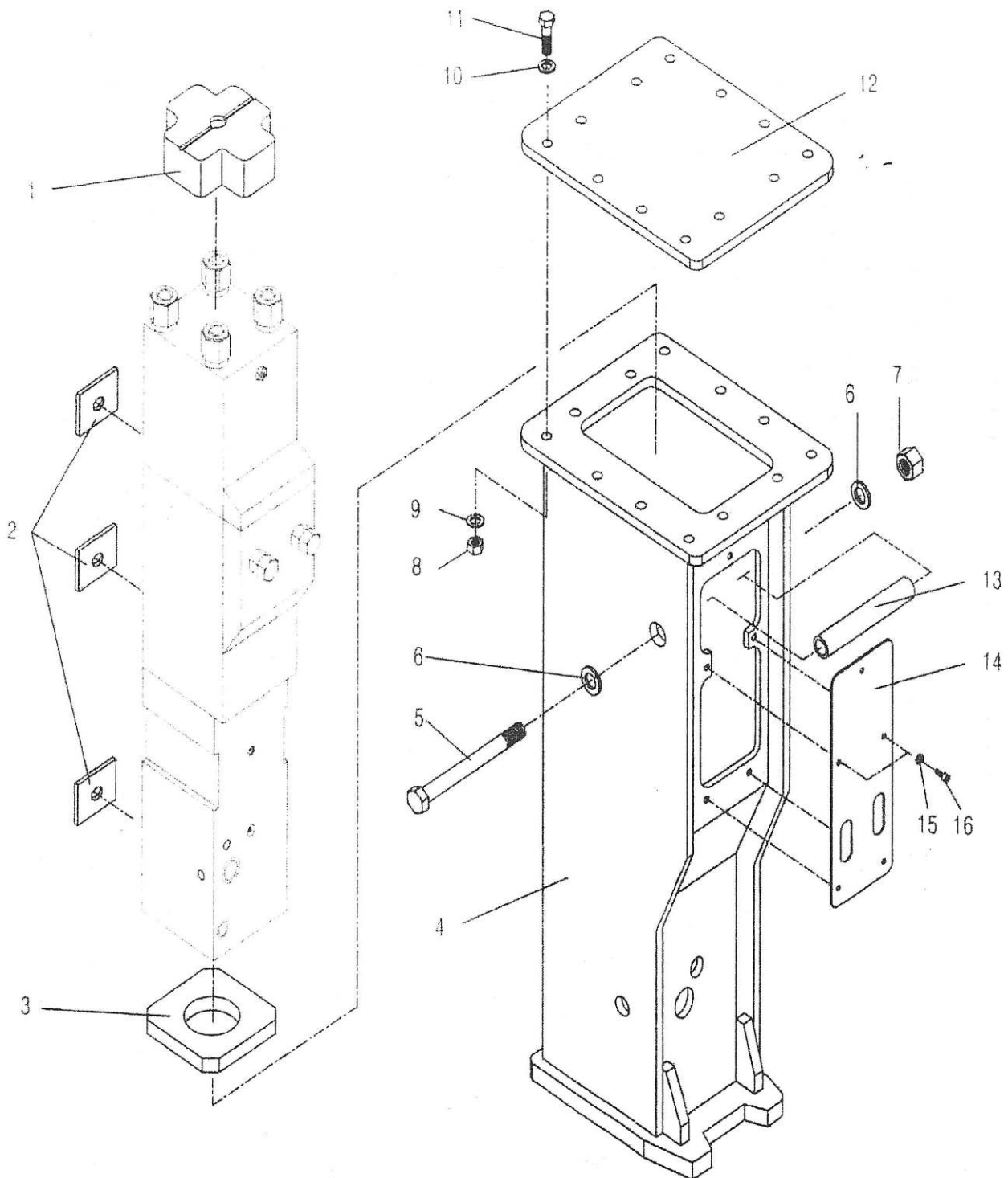
Cylinder & Valve Assembly		KHB1-10000	1 Set	
5	O-Ring	9111-22060	3	1BG60
6	Seal Retainer	KHB1-10004	1	
7	Gas Seal	KHB1-11037R	1	
8	Step Seal	KHB1-11037P	2	
9	Piston	KHB1-10050	1	
10	O-Ring	9111-12022	1	1BP22
11	O-Ring	9111-22030	1	1BG30
12	Valve Cap	KHB1-10010	1	
13	Valve	KHB1-10011	1	
14	Valve Sleeve	KHB1-10012	1	
15	Plug	KHB1-10013	3	
16	O-Ring	9111-12014	3	1BP14
17	Knock Pin	KHB1-10005	2	
18	Cylinder Block	KHB1-10001	1	
19	Plug	KHB1-10014	1	
20	O-Ring	9111-12014	2	1BP14
21	Adapter	KHB1-10015	2	
22	Cap	KHB1-10016	2	
23	U-Packing	KHB1-11040U	1	
24	Dust Seal	KHB1-11040D	1	

Through Bolt Assembly		KHB1-40000	4 Sets	
25	Hex Nut	KHB1-40004	4	
26	Washer	KHB1-40003	4	
27	Through Bolt	KHB1-40001	4	

Front Head Assembly		KHB1-32000	1 Set	
28	Front Head Block	KHB1-32001	1	
29	Spring Pin	KHB1-32015	4	
30	Plug	KHB20-32005	1	PF 1/2
31	Grease Nipple	KHB20-32004	1	
32	Rod Pin	KHB1-32012	1	
33	Stop Pin	KHB1-32010	2	
34	Spring Pin	KHB1-32013	1	
35	Ring Bush	KHB1-32002	1	
36	Front Cover	KHB1-32006	1	

37	Moil point	KHB1-90001	1	
	Wedge point	KHB1-90002	1	
	Flat Rod	KHB1-90003	1	
	Ball Point Rod	KHB1-90004	1	

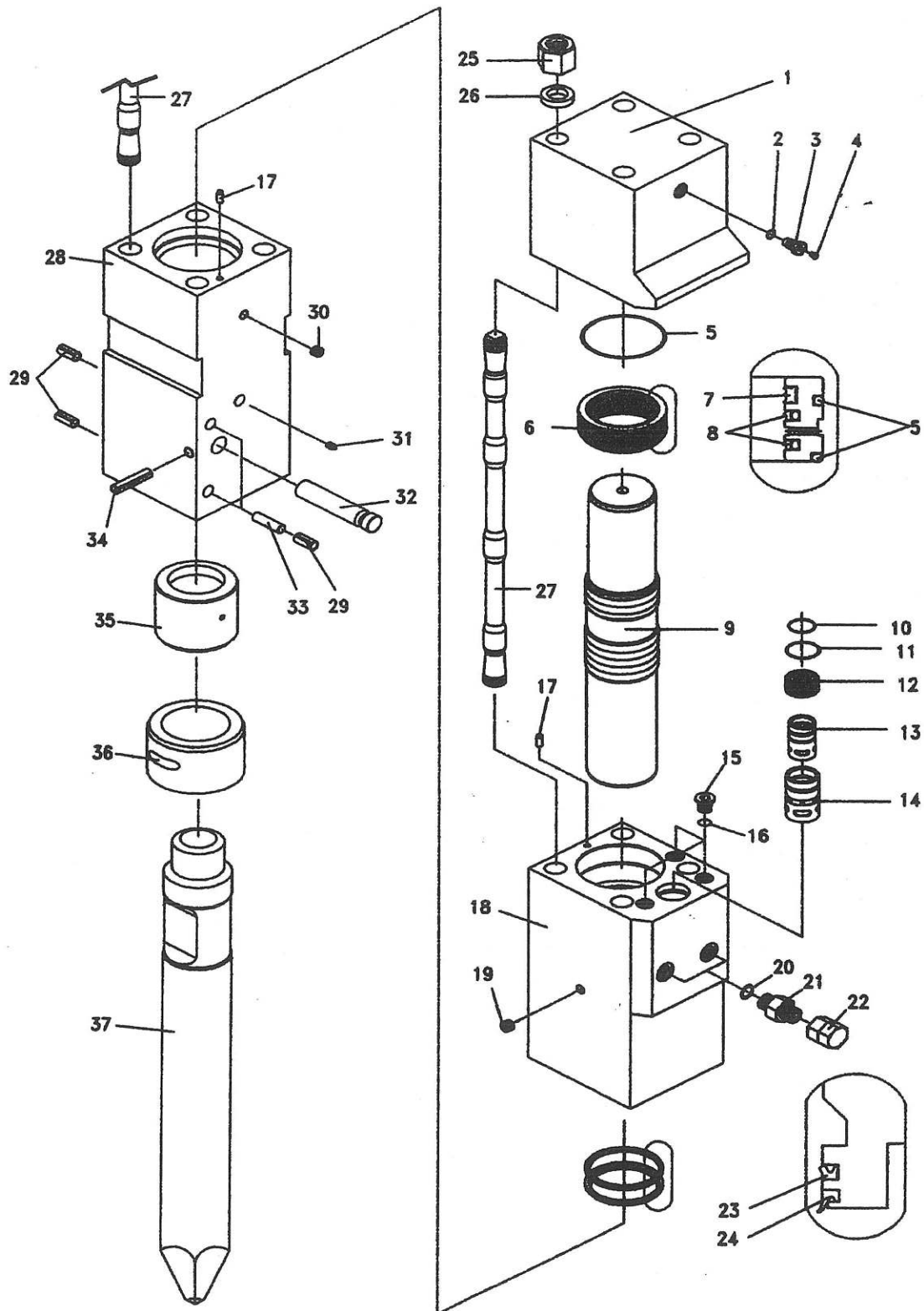
KHB 1 – Box Type Frame



KHB1 Box Type Frame Parts List

Item	Part Name	Part No.	Q'ty	Remarks
Box Bracket Assembly		KHB1-53000	1 Set	
1	Upper Cushion	KHB1-53001	1	
2	Side Damper	KHB1-53002	3	
3	Lower Cushion	KHB1-53003	1	
4	Frame	KHB1-53003	1	
5	Holding Bolt	KHB1-53004	1	
6	Washer	KHB1-53005	2	
7	Hex Nut	KHB1-53006	1	
8	N Nut	KHB1-53007	12	M12
9	Spring Washer	KHB1-53008	12	
10	Washer	KHB1-53009	12	
11	Hex Bolt	KHB1-53010	12	
12	Top Cover	KHB1-53011	1	
13	U Sleeve	KHB1-53012	1	
14	Cover Plate	KHB1-53013	1	
15	Washer	KHB1-53014	5	
16	Socket Bolt	KHB1-53015	5	

KHB 2 – Main Body



KHB2 Main Body Parts List

Item	Part Name	Part No.	Q'ty	Remarks
------	-----------	----------	------	---------

Back Head Assembly		KHB2-31000	1 Set	
1	Back Head Block	KHB2-31001	1	
2	O-Ring	9111-11018	1	1AP18
3	Gas Charging Valve	KHB20-31005	1	
4	Plug	KHB20-31006	1	

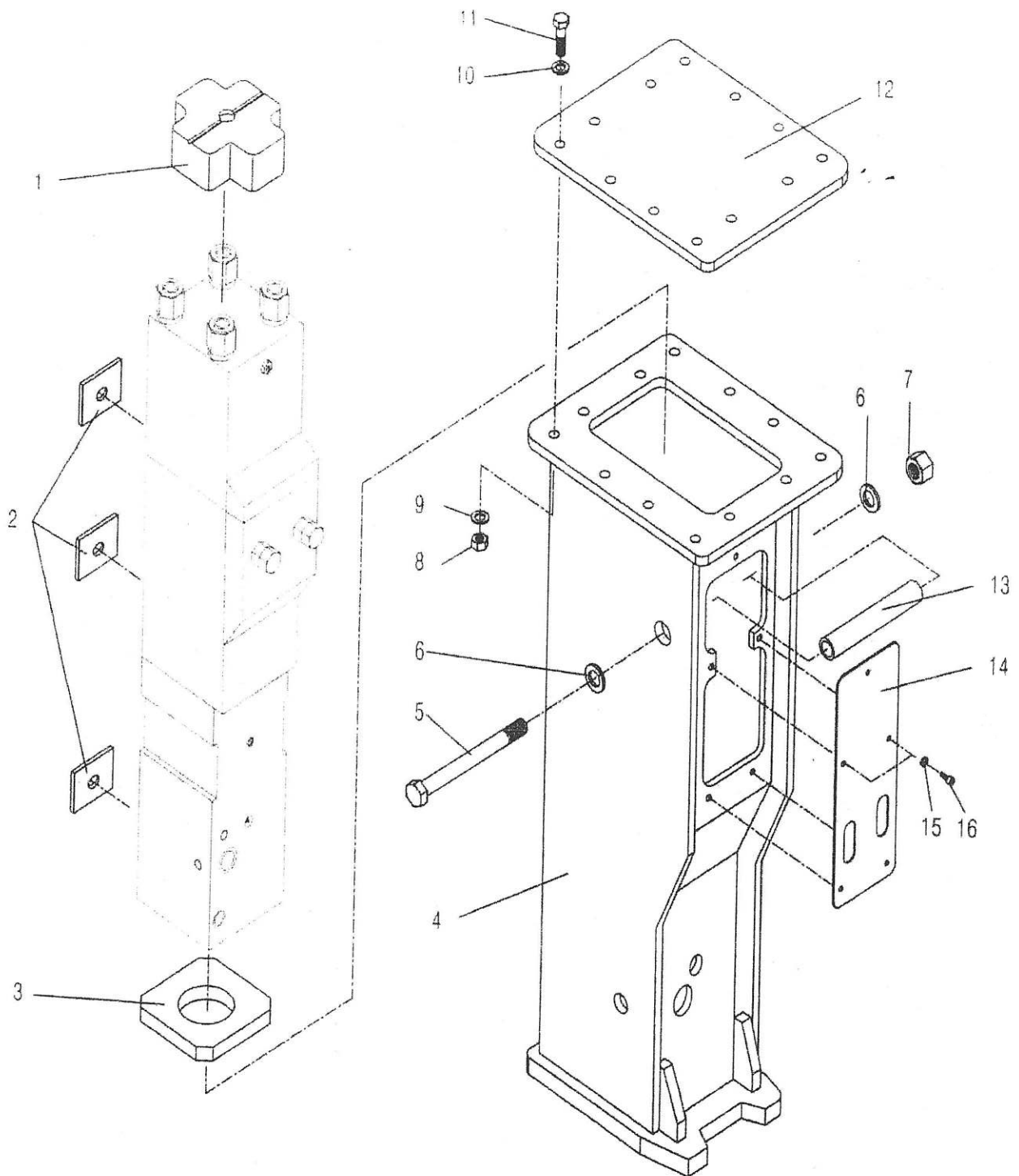
Cylinder & Valve Assembly		KHB2-10000	1 Set	
5	O-Ring	9111-22065	3	1BG65
6	Seal Retainer	KHB2-10004	1	
7	Gas Seal	KHB2-11042R	1	PPY42
8	Step Seal	KHB2-11042P	2	
9	Piston	KHB2-10050	1	
10	O-Ring	9111-12022	1	1BP22
11	O-Ring	9111-22030	1	1BG30
12	Valve Cap	KHB2-10010	1	
13	Valve	KHB2-10011	1	
14	Valve Sleeve	KHB2-10012	1	
15	Plug	KHB1-10013	3	
16	O-Ring	9111-12014	3	1BP14
17	Knock Pin	KHB1-10005	2	
18	Cylinder Block	KHB2-10001	1	
19	Plug	KHB1-10014	1	
20	O-Ring	9111-12014	2	1BP14
21	Adapter	KHB1-10015	2	
22	Cap	KHB1-10016	2	
23	U-Packing	KHB2-11045U	1	
24	Dust Seal	KHB2-11045D	1	

Through Bolt Assembly		KHB2-40000	4 Sets	
25	Hex Nut	KHB2-40004	4	
26	Washer	KHB2-40003	4	
27	Through Bolt	KHB2-40001	4	

Front Head Assembly		KHB2-32000	1 Set	
28	Front Head Block	KHB2-32001	1	
29	Spring Pin	KHB1-32015	4	
30	Plug	KHB20-32005	1	
31	Grease Nipple	KHB20-32004	1	
32	Rod Pin	KHB2-32012	1	
33	Stop Pin	KHB2-32010	2	
34	Spring Pin	KHB1-32013	1	
35	Ring Bush	KHB2-32002	1	
36	Front Cover	KHB2-32006	1	

37	Moil point	KHB2-90001	1	
	Wedge point	KHB2-90002	1	
	Flat Rod	KHB2-90003	1	
	Ball Point Rod	KHB2-90004	1	

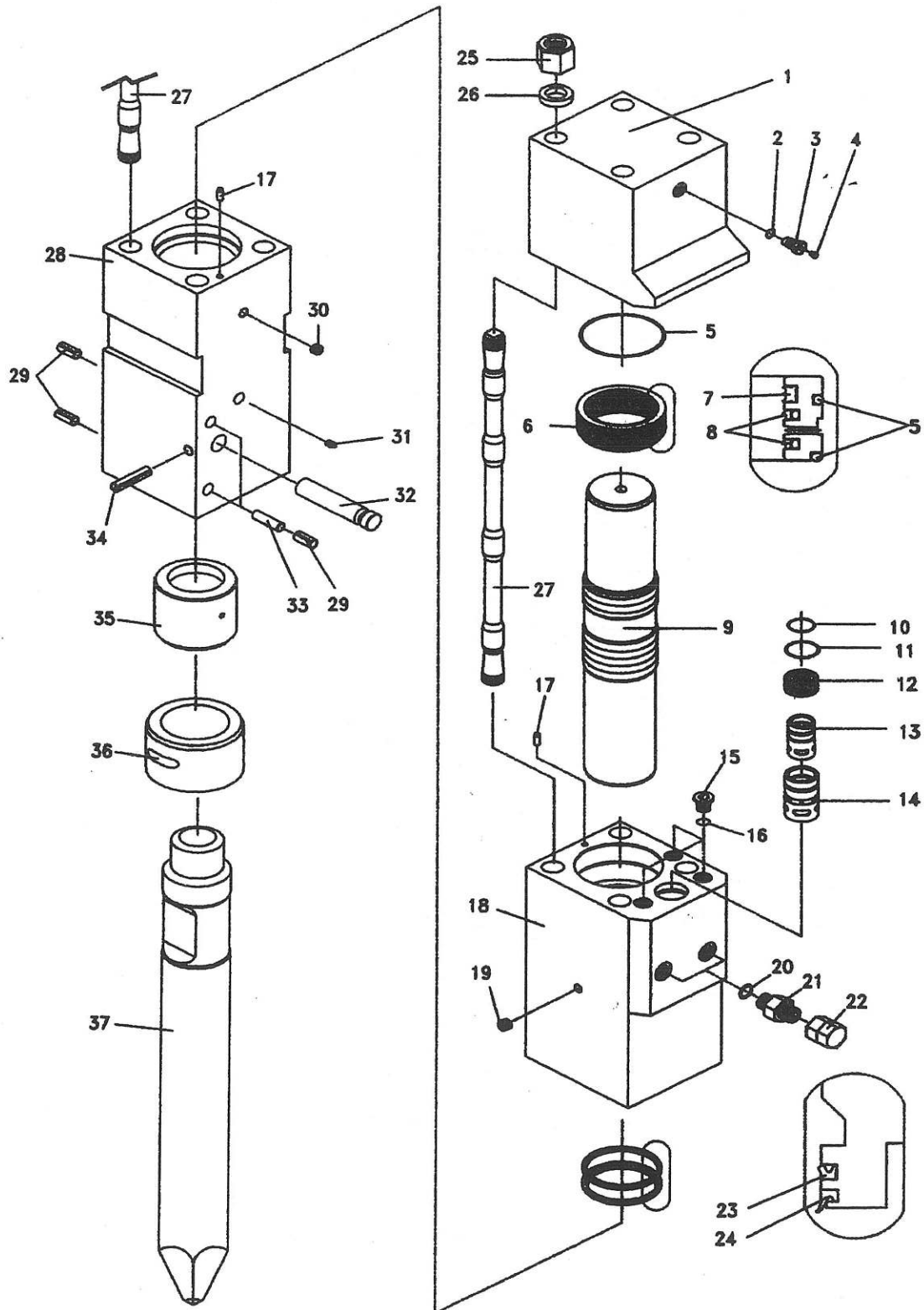
KHB 2 – Box Type Frame



KHB2 Box Type Frame Parts List

Item	Part Name	Part No.	Q'ty	Remarks
Box Bracket Assembly		KHB2-53000	1 Set	
1	Upper Cushion	KHB2-53001	1	
2	Side Damper	KHB2-53002	3	
3	Lower Cushion	KHB2-53003	1	
4	Frame	KHB2-53003	1	
5	Holding Bolt	KHB2-53004	1	
6	Washer	KHB2-53005	2	
7	Hex Nut	KHB2-53006	1	M 20
8	N Nut	KHB2-53007	12	
9	Spring Washer	KHB2-53008	12	
10	Washer	KHB2-53009	12	
11	Hex Bolt	KHB2-53010	12	
12	Top Cover	KHB2-53011	1	
13	U Sleeve	KHB2-53012	1	
14	Cover Plate	KHB2-53013	1	
15	Washer	KHB2-53014	5	
16	Socket Bolt	KHB2-53015	5	

KHB 3 – Main Body



KHB3 Main Body Parts List

Item	Part Name	Part No.	Q'ty	Remarks
Back Head Assembly		KHB3-31000	1 Set	
1	Back Head Block	KHB3-31001	1	
2	O-Ring	9111-12018	1	1BP18
3	Gas Charging Valve	KHB20-31005	1	
4	Plug	KHB20-31006	1	

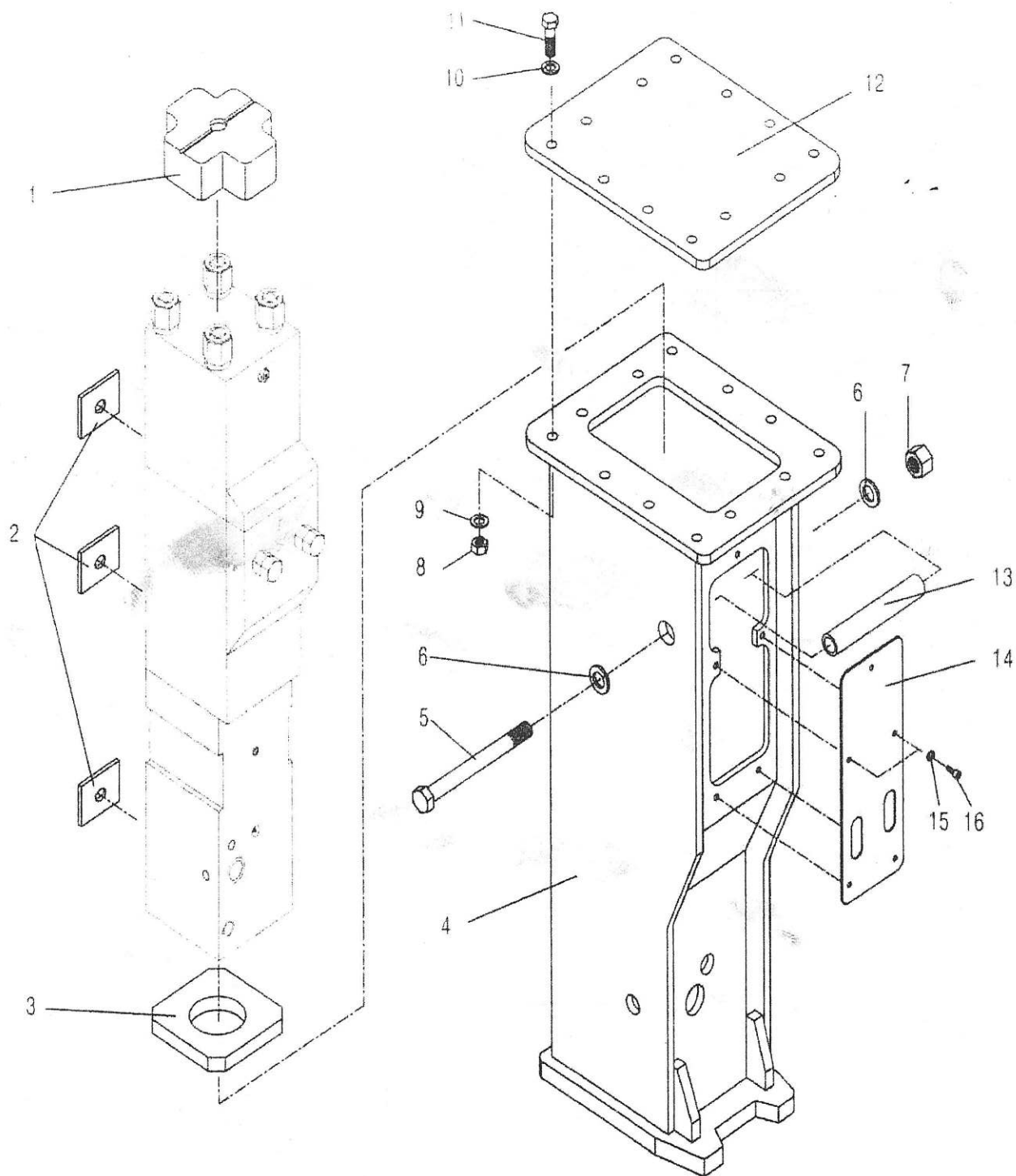
Cylinder & Valve Assembly		KHB3-10000	1 Set	
5	O-Ring	9111-22070	3	1BG70
6	Seal Retainer	KHB3-10004	1	
7	Gas Seal	KHB3-11050R	1	
8	Step Seal	KHB3-11050P	2	
9	Piston	KHB3-10050	1	
10	O-Ring	9111-22025	1	1BG25
11	O-Ring	9111-12032	1	1BP32
12	Valve Cap	KHB3-10010	1	
13	Valve	KHB3-10011	1	
14	Valve Sleeve	KHB3-10012	1	
15	Plug	KHB3-10013	3	
16	O-Ring	9111-12011	3	1BP11
17	Knock Pin	KHB1-10005	2	
18	Cylinder Block	KHB3-10001	1	
19	Plug	KHB3-10014	1	
20	O-Ring	9111-12018	2	1BP18
21	Adapter	KHB3-10015	2	
22	Cap	KHB3-10016	2	
23	U-Packing	KHB3-11053U	1	
24	Dust Seal	KHB3-11053D	1	

Through Bolt Assembly		KHB3-40000	4 Sets	
25	Hex Nut	KHB3-40004	4	
26	Washer	KHB3-40003	4	
27	Through Bolt	KHB3-40001	4	

Front Head Assembly		KHB3-32000	1 Set	
28	Front Head Block	KHB3-32001	1	
29	Spring Pin	KHB3-32015	4	
30	Plug	KHB20-32005	1	
31	Grease Nipple	KHB20-32004	1	
32	Rod Pin	KHB3-32012	1	
33	Stop Pin	KHB3-32010	2	
34	Spring Pin	KHB3-32013	1	
35	Ring Bush	KHB3-32002	1	
36	Front Cover	KHB3-32006	1	

37	Moil point	KHB3-90001	1	
	Wedge point	KHB3-90002	1	
	Flat Rod	KHB3-90003	1	
	Ball Point Rod	KHB3-90004	1	

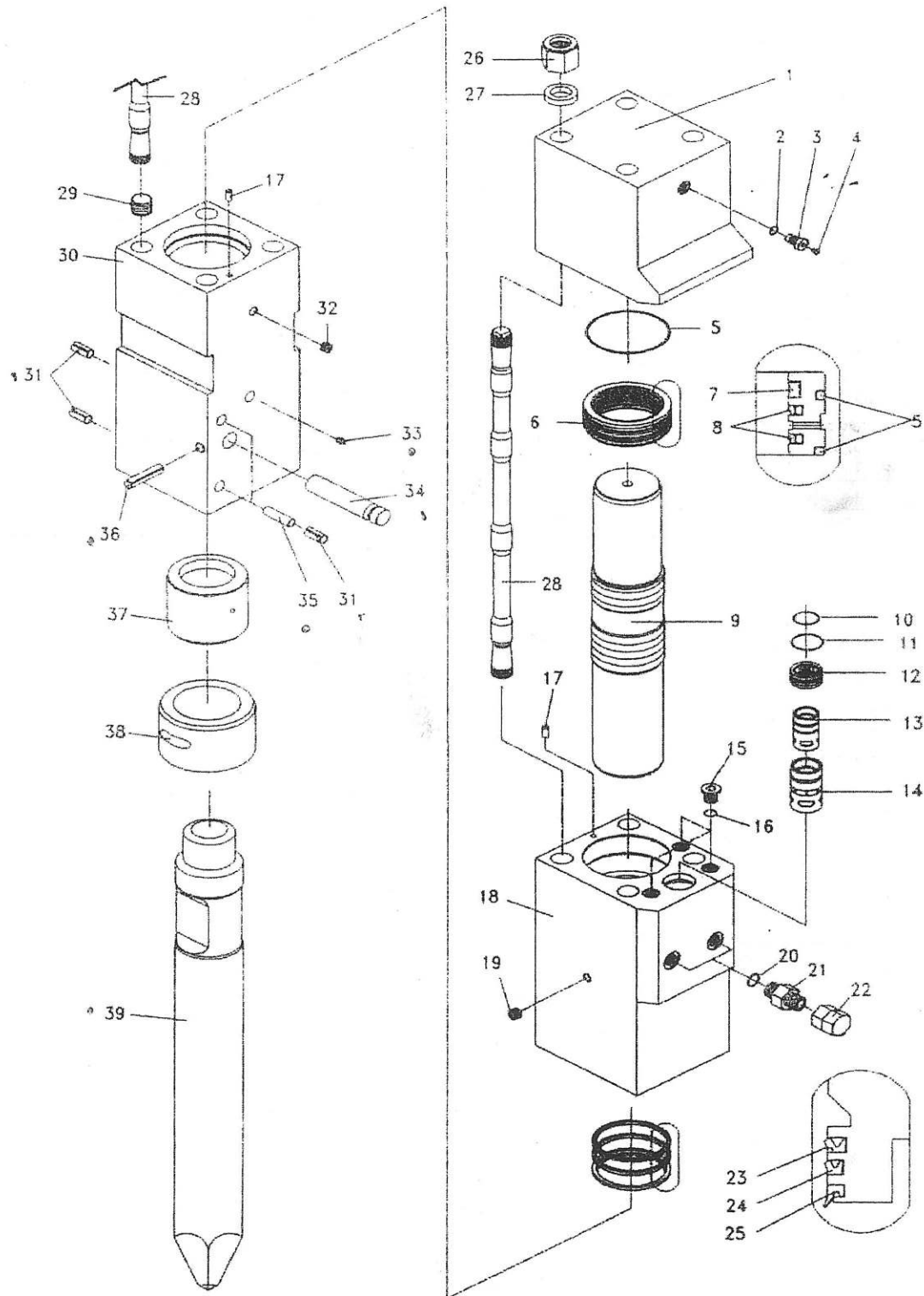
KHB 3 – Box Type Frame



KHB3 Box Type Frame Parts List

Item	Part Name	Part No.	Q'ty	Remarks
	Box Bracket Assembly	KHB3-53000	1 Set	
1	Upper Cushion	KHB3-53001	1	
2	Side Damper	KHB3-53002	3	
3	Lower Cushion	KHB3-53003	1	
4	Frame	KHB3-53003	1	
5	Holding Bolt	KHB3-53004	1	
6	Washer	KHB3-53005	2	
7	Hex Nut	KHB3-53006	1	M24
8	N Nut	KHB3-53007	12	
9	Spring Washer	KHB3-53008	12	
10	Washer	KHB3-53009	12	
11	Hex Bolt	KHB3-53010	12	
12	Top Cover	KHB3-53011	1	
13	U Sleeve	KHB3-53012	1	
14	Cover Plate	KHB3-53013	1	
15	Washer	KHB3-53014	5	
16	Socket Bolt	KHB3-53015	5	

KHB 4 – Main Body



KHB 4 Main Body Parts List

Item	Part Name	Part No.	Q'ty	Remarks
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Back Head Assembly		KHB4-31000	1 Set	
1	Back Head Block	KHB4-31001	1	
2	O-Ring	9111-12018	1	1BP 18
3	Gas Charging Valve	KHB20-31005	1	
4	Plug	KHB20-31006	1	

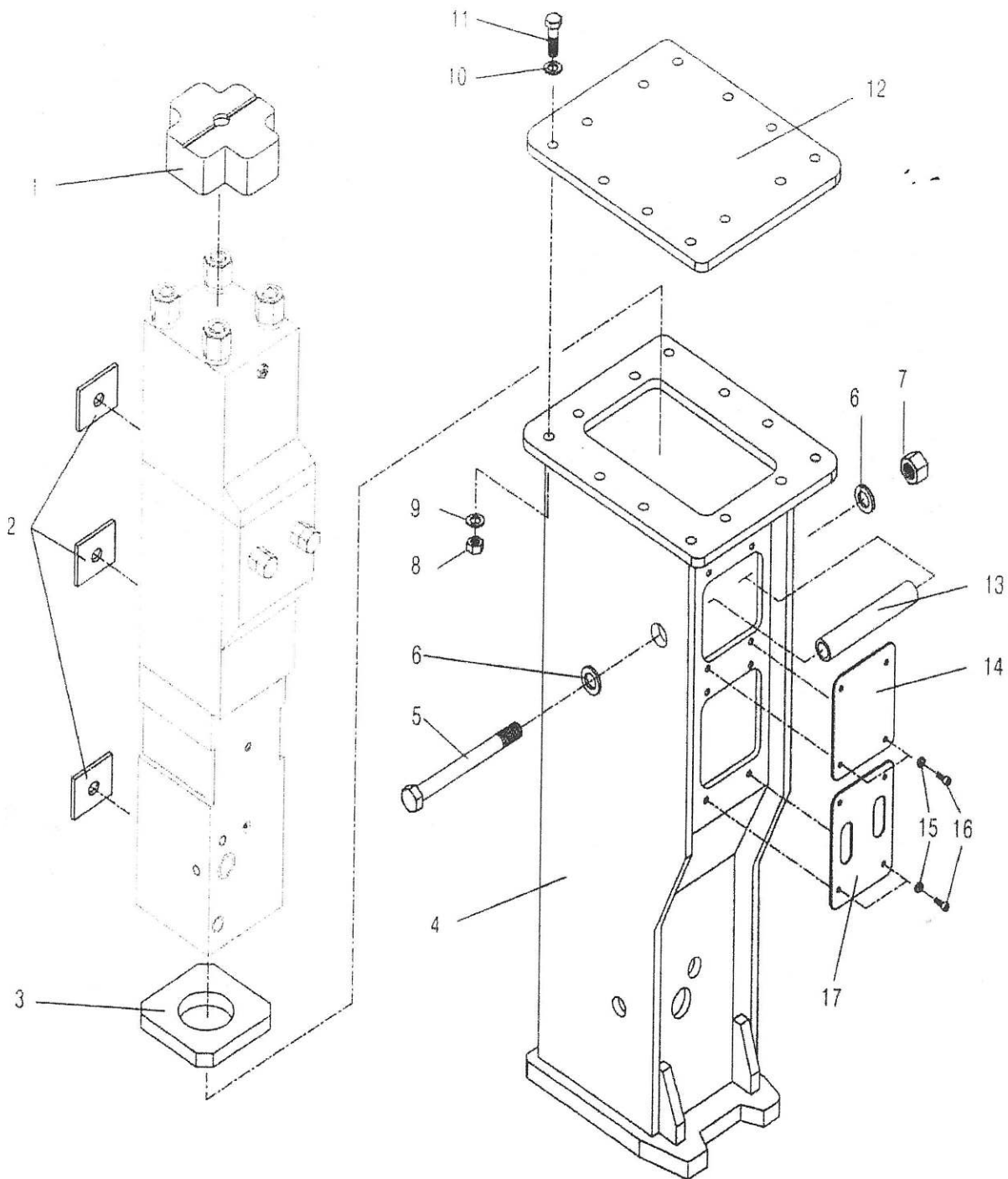
Cylinder & Valve Assembly		KHB4-10000	1 Set	
5	O-Ring	9111-22095	3	1BG95
6	Seal Retainer	KHB4-10004	1	
7	Gas Seal	KHB4-11068R	1	
8	Step Seal	KHB4-11068P	2	
9	Piston	KHB4-10050	1	
10	O-Ring	9111-22035	1	1BG35
11	O-Ring	9111-22040	1	1BG40
12	Valve Cap	KHB4-10010	1	
13	Valve	KHB4-10011	1	
14	Valve Sleeve	KHB4-10012	1	
15	Plug	KHB4-10013	3	
16	O-Ring	9111-12016	3	1BP16
17	Knock Pin	KHB1-10005	2	
18	Cylinder Block	KHB4-10001	1	
19	Plug	KHB3-10014	1	
20	O-Ring	9111-12018	2	1BP 18
21	Adapter	KHB3-10015	2	
22	Cap	KHB3-10016	2	
23	Buffer Seal	KHB4-11070B	1	
24	U-Packing	KHB4-11070U	1	
25	Dust Seal	KHB4-11070D	1	

Through Bolt Assembly		KHB4-40000	4 Sets	
26	Hex Nut	KHB4-40004	4	
27	Washer	KHB4-40003	4	
28	Through Bolt	KHB4-40001	4	

Front Head Assembly		KHB4-32000	1 Set	
29	Heri Certi Coil	KHB4-32017	4	
30	Front Head Block	KHB4-32001	1	
31	Spring Pin	KHB4-32015 ✓	4	
32	Plug	KHB20-32005	1	
33	Grease Nipple	KHB20-32004	1	
34	Rod Pin	KHB4-32012 ✓	1	
35	Stop Pin	KHB4-32010 ✓	2	
36	Spring Pin	KHB4-32013 ✓	1	
37	Ring Bush	KHB4-32002	1	
38	Front Cover	KHB4-32006	1	

39	Moil point	KHB 4-90001	1	
	Wedge point	KHB 4-90002	1	
	Flat Rod	KHB 4-90003 ✓	1	
	Ball Point Rod	KHB4-90004	1	

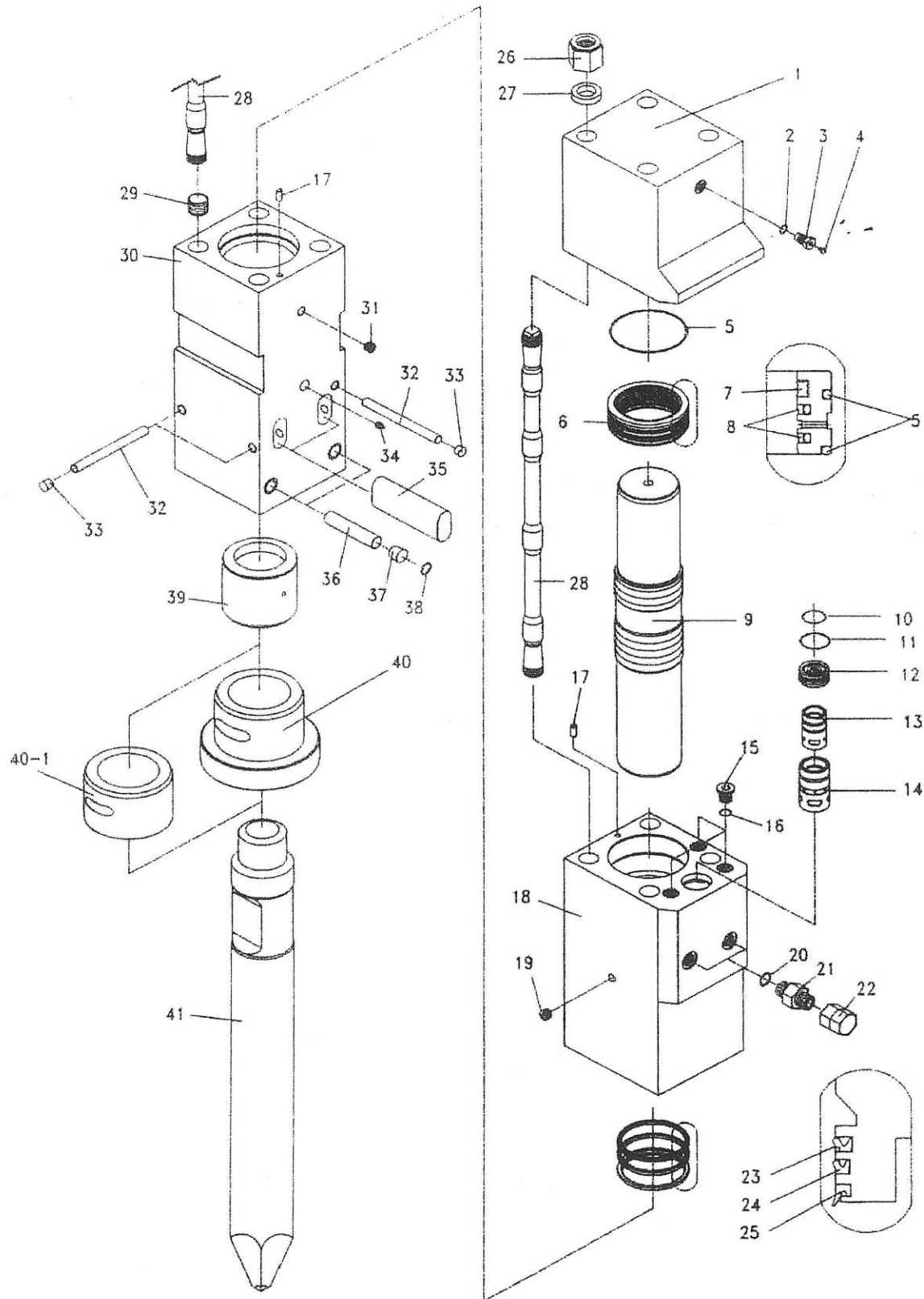
KHB 4 – Box Type Frame



KHB 4 Box Type Frame Parts List

Item	Part Name	Part No.	Q'ty	Remarks
Box Bracket Assembly		KHB4-53000	1 Set	
1	Upper Cushion	KHB4-53001	1	
2	Side Damper	KHB4-53002	3	
3	Lower Cushion	KHB4-53003	1	
4	Frame	KHB4-53003	1	
5	Holding Bolt	KHB4-53004	1	
6	Washer	KHB4-53005	2	
7	Hex Nut	KHB4-53006	1	M 24
8	N Nut	KHB4-53007	12	
9	Spring Washer	KHB4-53008	12	
10	Washer	KHB4-53009	12	
11	Hex Bolt	KHB4-53010	12	
12	Top Cover	KHB4-53011	1	
13	U Sleeve	KHB4-53012	1	
14	Upper Cover Plate	KHB4-53013	1	
15	Washer	KHB4-53014	8	
16	Socket Bolt	KHB4-53015	8	
17	Lower Cover Plate	KHB4-53016	1	

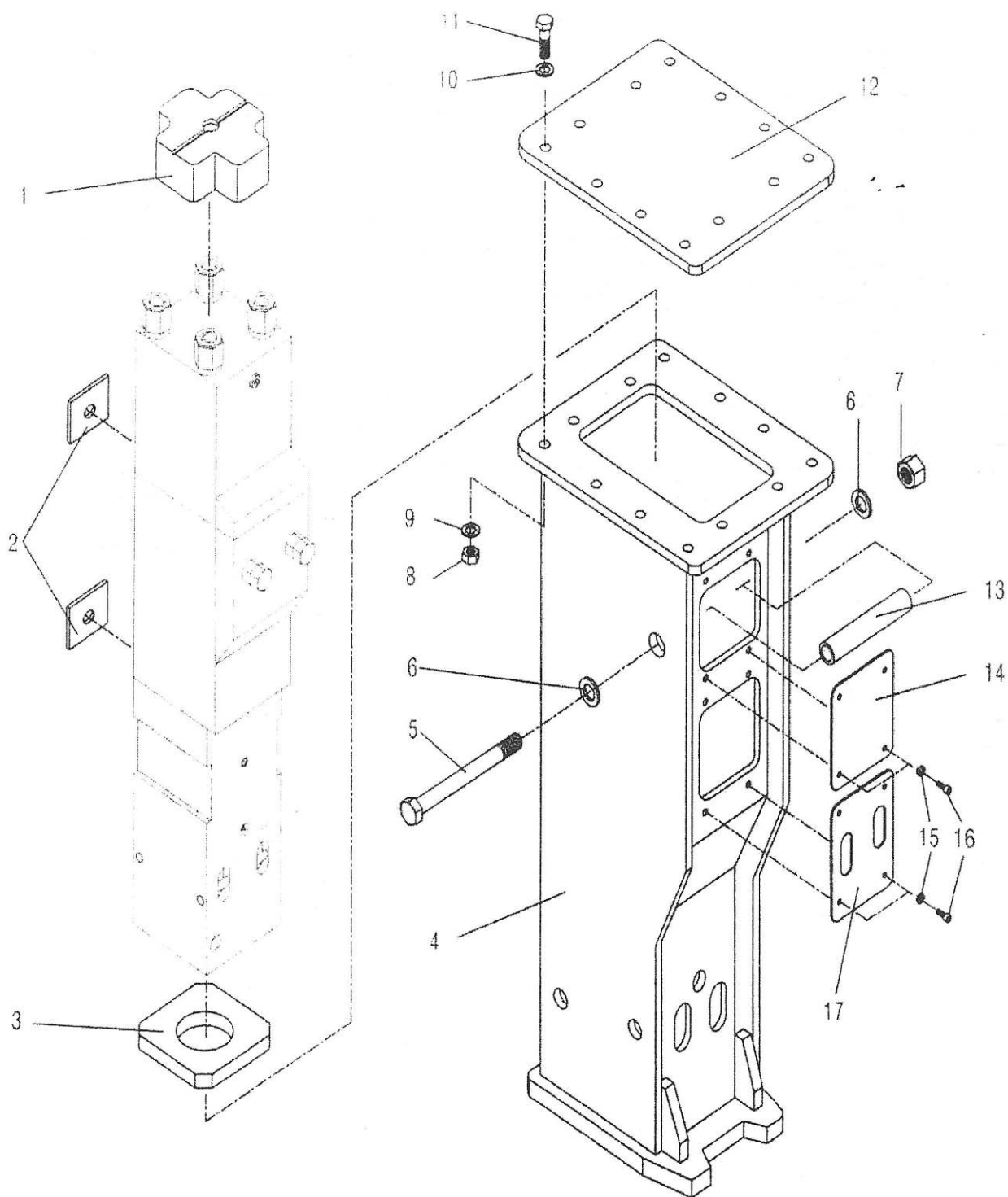
KHB 5 – Main Body



KHB 5 Main Body Parts List

Item	Part Name	Part No.	Q'ty	Remarks
Back Head Assembly		KHB5-31000	1 Set	
1	Back Head Block	KHB5-31001	1	
2	O-Ring	9111-12018	1	1BP 18
3	Gas Charging Valve	KHB20-31005	1	
4	Plug	KHB20-31006	1	
Cylinder & Valve Assembly		KHB5-10000	1 Set	
5	O-Ring	9111-22115	3	1BG115
6	Seal Retainer	KHB5-10004	1	
7	Gas Seal	KHB5-11084R	1	
8	Step Seal	KHB5-11084P	2	
9	Piston	KHB5-10050	1	
10	O-Ring	9111-22030	1	1BG30
11	O-Ring	9111-22045	1	1BG45
12	Valve Cap	KHB5-10010	1	
13	Valve	KHB5-10011	1	
14	Valve Sleeve	KHB5-10012	1	
15	Plug	KHB5-10013	3	
16	O-Ring	9111-12018	3	1BP 18
17	Knock Pin	KHB1-10005	2	
18	Cylinder Block	KHB5-10001	1	
19	Plug	KHB3-10014	1	
20	O-Ring	9111-12024	2	1BP 24
21	Adapter	KHB5-10015	2	
22	Cap	KHB5-10016	2	
23	Buffer Seal	KHB5-11085B	1	
24	U-Packing	KHB5-11085U	1	
25	Dust Seal	KHB5-11085D	1	
Through Bolt Assembly		KHB5-40000	4 Sets	
26	Hex Nut	KHB5-40004	4	
27	Washer	KHB5-40003	4	
28	Through Bolt	KHB5-40001	4	M33
Front Head Assembly		KHB5-32000	1 Set	
29	Heri Certi Coil	KHB5-32017	4	
30	Front Head Block	KHB5-32001	1	
31	Plug	KHB20-32005		
32	Stop Pin	KHB5-32010	3	
33	Rubber Plug	KHB5-32018	3	
34	Grease Nipple	KHB20-32004	1	
35	Rod Pin	KHB5-32012	2	
36	Front Head Pin	KHB5-32007	2	
37	Rubber Plug	KHB5-32008	2	
38	Snap Ring	KHB5-32009	2	
39	Ring Bush	KHB5-32002	1	
40	Front Cover	KHB5-32006	1	
40-1	Bront Cover - Box	KHB5-32006B		
41	Moil point	KHB5-90001	1	
	Wedge point	KHB5-90002	1	
	Flat Rod	KHB5-90003	1	
	Ball Point Rod	KHB5-90004	1	

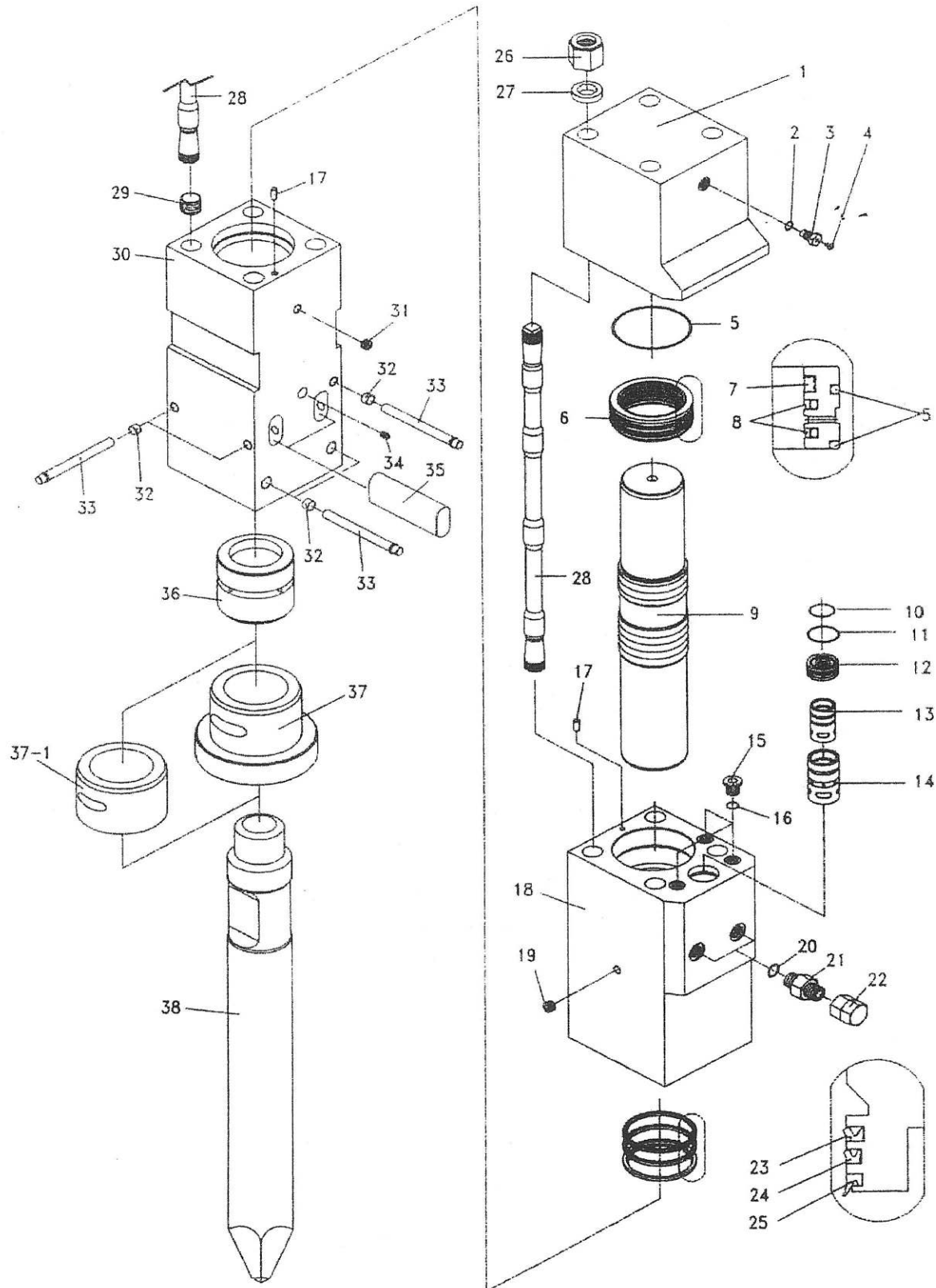
KHB 5 – Box Type Frame



KHB5 Box Type Frame Parts List

Item	Part Name	Part No.	Q'ty	Remarks
Box Bracket Assembly		KHB5-53000	1 Set	
1	Upper Cushion	KHB5-53001	1	
2	Side Damper	KHB5-53002	2	
3	Lower Cushion	KHB5-53003	1	
4	Frame	KHB5-53003	1	
5	Holding Bolt	KHB5-53004	1	
6	Washer	KHB5-53005	2	
7	Hex Nut	KHB5-53006	1	M 24
8	N Nut	KHB5-53007	12	
9	Spring Washer	KHB5-53008	12	
10	Washer	KHB5-53009	12	
11	Hex Bolt	KHB5-53010	12	
12	Top Cover	KHB5-53011	1	
13	U Sleeve	KHB5-53012	1	
14	Upper Cover Plate	KHB5-53013	1	
15	Washer	KHB5-53014	8	
16	Socket Bolt	KHB5-53015	8	
17	Lower Cover Plate	KHB5-53016	1	

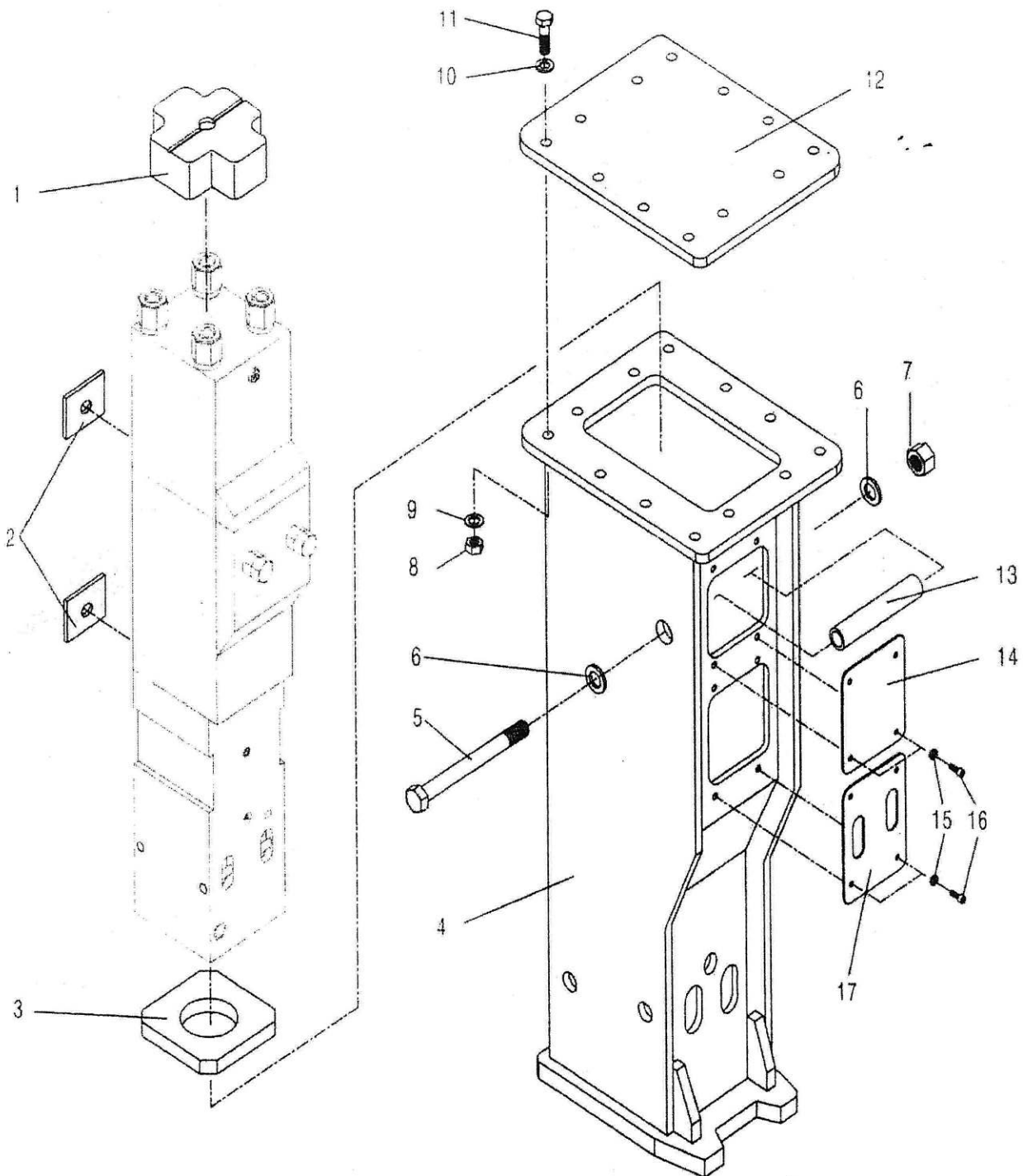
KHB 6 – Main Body



KHB 6 Main Body Parts List

Item	Part Name	Part No.	Q'ty	Remarks
Back Head Assembly		KHB6-31000	1 Set	
1	Back Head Block	KHB6-31001	1	
2	O-Ring	9111-12018	1	1BP18
3	Gas Charging Valve	KHB20-31005	1	
4	Plug	KHB20-31006	1	
Cylinder & Valve Assembly		KHB6-10000	1 Set	
5	O-Ring	9111-22135	3	1BG 135
6	Seal Retainer	KHB6-10004	1	
7	Gas Seal	KHB6-11098R	1	
8	U-Packing	KHB6-11098U	2	
9	Piston	KHB6-10050	1	
10	O-Ring	9111-22035	1	1BG 35
11	O-Ring	9111-12052	1	1BP52
12	Valve Cap	KHB6-10010	1	
13	Valve	KHB6-10011	1	
14	Valve Sleeve	KHB6-10012	1	
15	Plug	KHB6-10013	3	
16	O-Ring	9111-12022	3	1BP 22
17	Knock Pin	KHB1-10005	2	
18	Cylinder Block	KHB6-10001	1	
19	Plug	KHB3-10014	1	
20	O-Ring	9111-12024	2	1BP 24
21	Adapter	KHB5-10015	2	
22	Cap	KHB5-10016	2	
23	Buffer Seal	KHB6-11100B	1	
24	U-Packing	KHB6-11100U	1	
25	Dust Seal	KHB6-11100D	1	
Through Bolt Assembly		KHB6-40000	4 Sets	
26	Hex Nut	KHB6-40004	4	
27	Washer	KHB6-40003	4	
28	Through Bolt	KHB6-40001	4	
Front Head Assembly		KHB6-32000	1 Set	
29	Heri Certi Coil	KHB6-32017	4	
30	Front Head Block	KHB6-32001	1	
31	Plug	KHB20-32005	1	
32	PU Sleeve	KHB6-32018	5	
33	Stop Pin	KHB6-32010	5	
34	Grease Nipple	KHB20-32004	1	
35	Rod Pin	KHB6-32012	2	
36	Ring Bush	KHB6-32002	1	
37	Front Cover	KHB6-32006	1	
37-1	Front Cover - Box	KHB6-32006B		
38	Moil point	KHB6-90001	1	
	Wedge point	KHB6-90002	1	
	Flat Rod	KHB6-90003	1	
	Ball Point Rod	KHB6-90004	1	

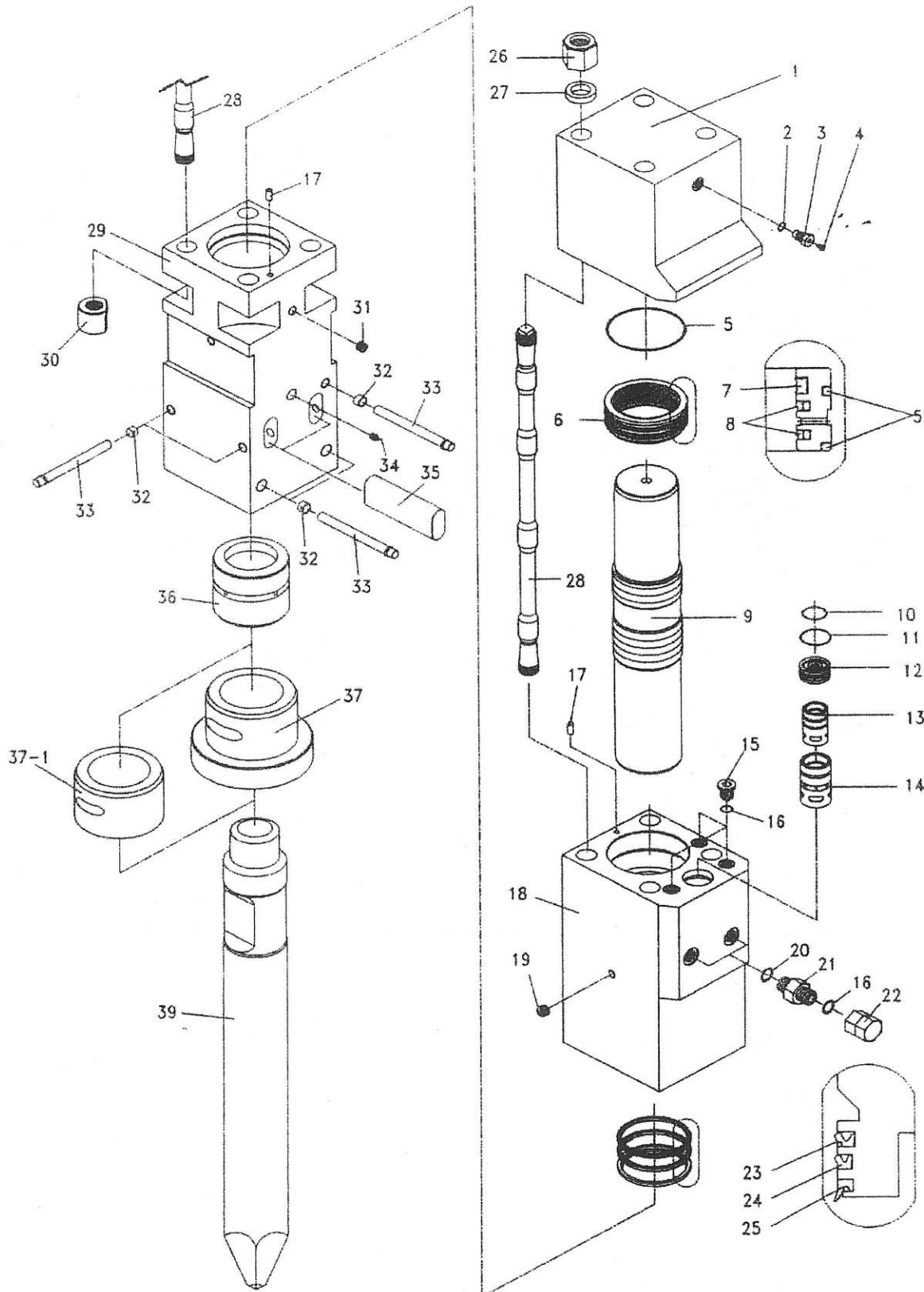
KHB 6 – Box Type Frame



KHB6 Box Type Frame Parts List

Item	Part Name	Part No.	Q'ty	Remarks
Box Bracket Assembly		KHB6-53000	1 Set	
1	Upper Cushion	KHB6-53001	1	
2	Side Damper	KHB6-53002	2	
3	Lower Cushion	KHB6-53003	1	
4	Frame	KHB6-53003	1	
5	Holding Bolt	KHB6-53004	1	
6	Washer	KHB6-53005	2	
7	Hex Nut	KHB6-53006	1	M 24
8	N Nut	KHB6-53007	12	
9	Spring Washer	KHB6-53008	12	
10	Washer	KHB6-53009	12	
11	Hex Bolt	KHB6-53010	12	
12	Top Cover	KHB6-53011	1	
13	U Sleeve	KHB6-53012	1	
14	Upper Cover Plate	KHB6-53013	1	
15	Washer	KHB6-53014	8	
16	Socket Bolt	KHB6-53015	8	
17	Lower Cover Plate	KHB6-53016	1	

KHB 15 – Main Body



KHB 15 Main Body Parts List

Item	Part name	Part No.	Q'ty	Remarks
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Back Head Assembly		KHB15-31000	1 Set	
1	Back Head Block	KHB15-31001	1	
2	O-Ring	9111-12018	1	1BP18
3	Gas Charging Valve	KHB20-31005	1	
4	Plug	KHB20-31006	1	

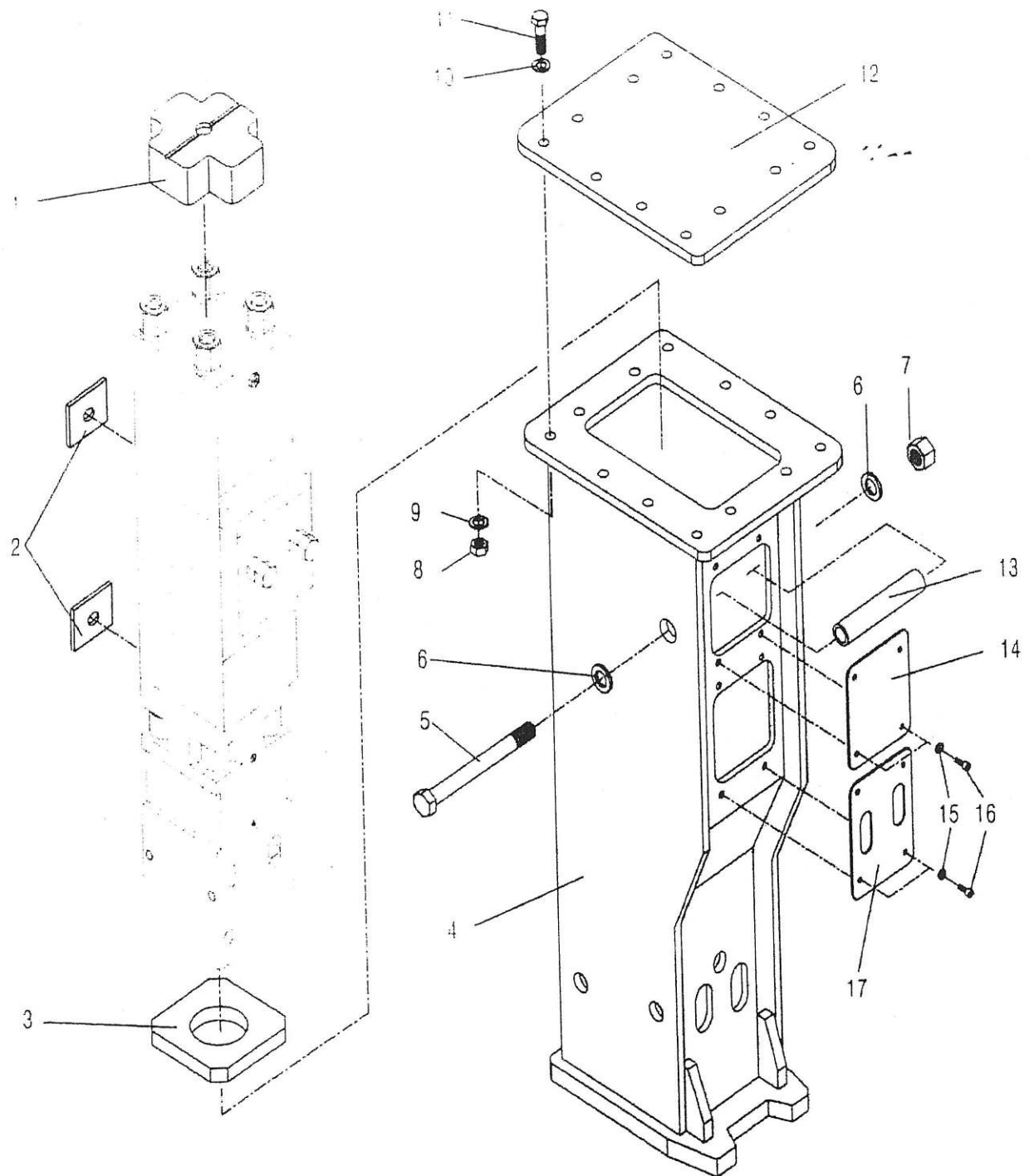
Cylinder & Valve Assembly		KHB15-10000	1 Set	
5	O-Ring	9111-22150	3	1BG 150
6	Seal Retainer	KHB15-10004	1	
7	Gas Seal	KHB15-11123R	1	
8	Step Seal	KHB15-11123P	2	
9	Piston	KHB15-10050	1	
10	O-Ring	9111-22045	1	1BG 45
11	O-Ring	9111-22065	1	1BG 65
12	Valve Cap	KHB15-10010	1	
13	Valve	KHB15-10011	1	
14	Valve Sleeve	KHB15-10012	1	
15	Plug	KHB15-10013	3	
16	O-Ring	9111-12022	3	1BP 22
17	Knock Pin	KHB1-10005	2	
18	Cylinder Block	KHB15-10001	1	
19	Plug	KHB3-10014	1	
20	O-Ring	9111-12024	2	1BP 24
21	Adapter	KHB15-10015	2	
22	Cap	KHB15-10016	2	
23	Buffer Seal	KHB15-11125B	1	
24	U-Packing	KHB15-11125U	1	
25	Dust Seal	KHB15-11125D	1	

Through Bolt Assembly		KHB15-40000	4 Sets	
26	Hex Nut	KHB15-40004	4	
27	Washer	KHB15-40004	4	
28	Through Bolt	KHB15-40003	4	
30	Round Nut	KHB15-40001	4	

Front Head Assembly		KHB15-32000	1 Set	
29	Front Head Block	KHB15-32001	1	
31	Plug	KHB20-32005	1	
32	PU Sleeve	KHB6-32018	5	
33	Stop Pin	KHB15-32010	5	
34	Grease Nipple	KHB20-32004	1	
35	Rod Pin	KHB15-32012	2	
36	Ring Bush	KHB15-32002	1	
37	Front Cover	KHB15-32006	1	
37-1	Front Cover - Box	KHB15-32006B		

38	Moil point	KHB15-90001	1	
	Wedge point	KHB15-90002	1	
	Flat Rod	KHB15-90003	1	
	Ball Point Rod	KHB15-90004	1	

KHB 15 – Box Type Frame



KHB 15 Box Type Frame Parts List

Item	Part Name	Part No.	Q'ty	Remarks
	Box Bracket Assembly	KHB15-53000	1 Set	
1	Upper Cushion	KHB15-53001	1	
2	Side Damper	KHB15-53002	2	
3	Lower Cushion	KHB15-53003	1	
4	Frame	KHB15-53003	1	
5	Holding Bolt	KHB15-53004	1	
6	Washer	KHB15-53005	2	
7	Hex Nut	KHB15-53006	1	
8	N Nut	KHB15-53007	12	
9	Spring Washer	KHB15-53008	12	
10	Washer	KHB15-53009	12	
11	Hex Bolt	KHB15-53010	12	
12	Top Cover	KHB15-53011	1	
13	U Sleeve	KHB15-53012	1	
14	Upper Cover Plate	KHB15-53013	1	
15	Washer	KHB15-53014	8	
16	Socket Bolt	KHB15-53015	8	
17	Lower Cover Plate	KHB15-53016	1	