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HR 90

HAMMEROG



Operation Maintenance Manual & Part List

HAMMEROG Corp.



Serial no. HR90-09G-1001

Operation
Maintenance
Manual & Part Book

HR90

HAMMEROG Corp.

CONTENTS

1. SPECIFICATIONS

1-1. General specifications (open)	5
1-2. General specifications (box)	6
1-3. Tool specifications	7
1-4. Structure detail	8

2. PART LIST

2-1. Housing (open)	9
2-2. Housing (box)	11
2-3. Hammer ass'y (standard type)	13

3. OPERATION

3-1. Product numbers	17
3-2. Selection of tools	18
3-3. Principle of breaking	18
3-4. Correct working methods	19
3-5. Operating temperature	20
3-6. Other important points	20
3-7. Storage	21
3-8. Mounting and dismounting the hammer	22
3-9. Setting of operating pressure	23
3-10. Specification of hoses and pipes	24
3-11. Hydraulic circuit	24

CONTENTS

4. LUBRICATION

4-1. Manual lubrication	25
4-2. Hydraulic oil	26

5. MAINTENANCE

5-1. Removal and installation of tools	28
5-2. Changing tool bushing	29
5-3. Wear limits for tool and tool bushing	30
5-4. Wear limits for tool	30
5-5. Disassembling and assembling hammer ass'y	31
5-6. Assembling and installing accumulator set	32
5-7. Disassembling and assembling in cover bushing	34
5-8. Charging accumulator set	35
5-9. Removal and installation valve housing	36
5-10. Loosening and tightening side rods	37
5-11. Disassembling and assembling cylinder	38
5-12. Disassembling and assembling front head	39
5-13. Torques	40
5-14. Workshop tool list	41

CONTENTS

6. TROUBLE SHOOTING GUIDE

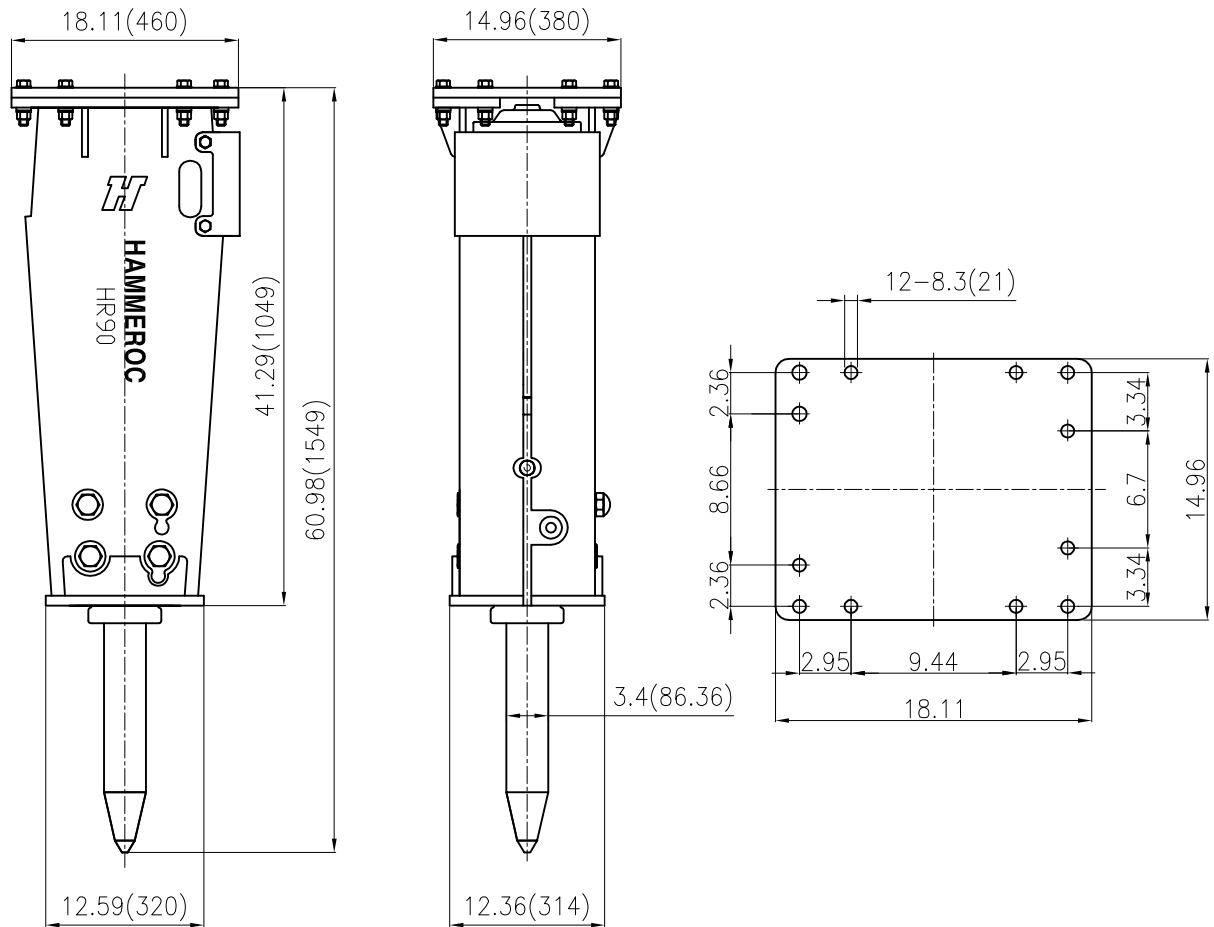
6-1. The breaker does not start	42
6-2. The breaker operates irregularly but the blow has full power	43
6-3. The breaker operates poorly and the blow has no power	43
6-4. Impact rate slows down	44
6-5. Oil overheats	45

7. GENERALS AND SAFETY INFORMATIONS

7-1. General	46
7-2. Safety	46

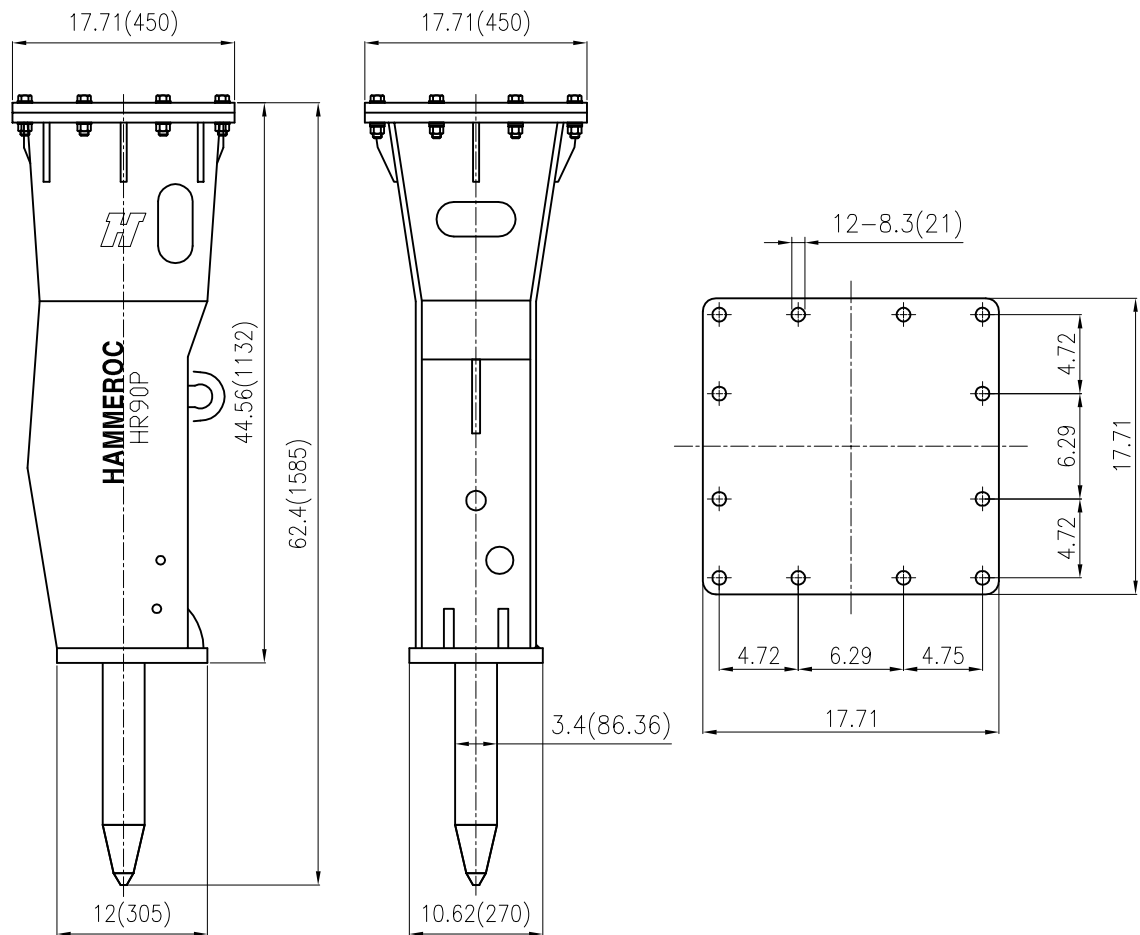
1. SPECIFICATION

1-1. General specifications (open)



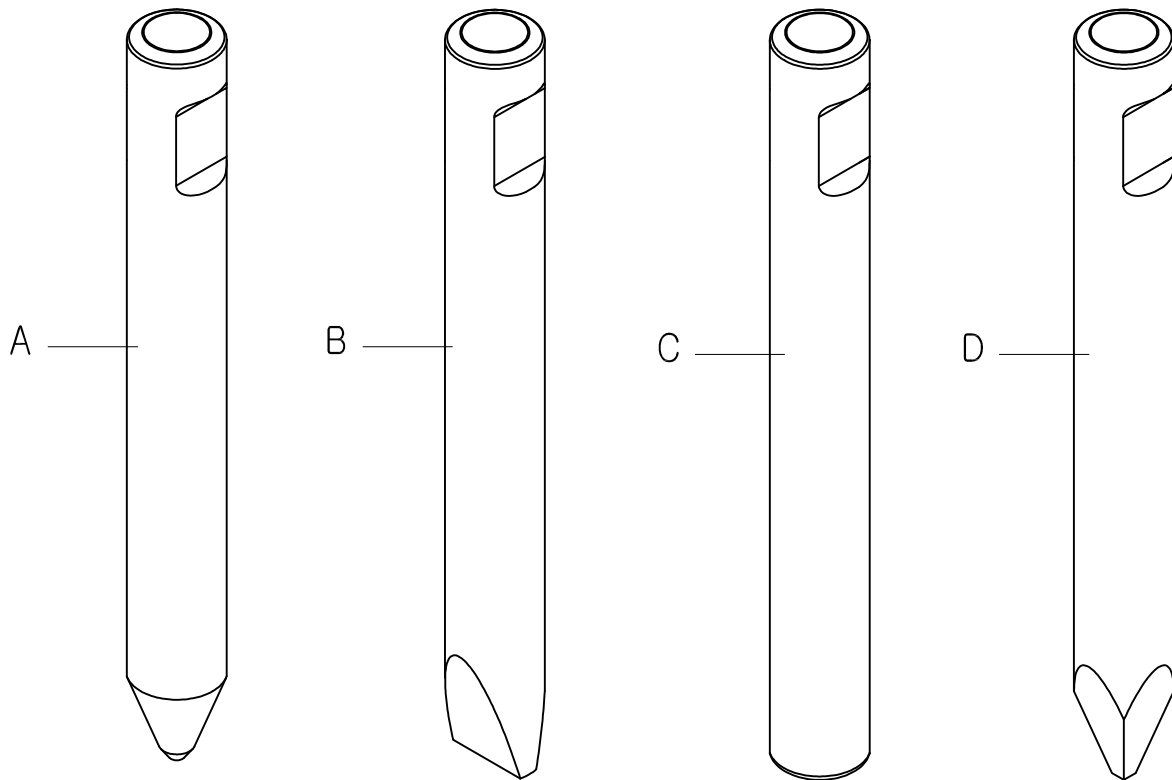
Item	Specifications
Working weight	1020 lb (462 kg)
Impact frequency	500 ~ 900 BPM
Operating pressure	1600 ~ 1900 psi (110 ~ 130 bar)
Relief pressure	2300 ~ 2600 psi (160 ~ 180 bar)
Oil flow	13 ~ 26 gpm
Back pressure	145 psi (10 bar)
Tool diameter	3.4 in (86.36 mm)
Oil temperature	-20 ~ +80 °C (-4 ~ +176 °F)
Hydraulic oil viscosity	1000 ~ 15 cSt (131 ~ 2.35 °E)
Pressure line size	3/4in (19 mm)
Return line size	3/4in (19 mm)
Carrier weight	8800~ 22000 lb

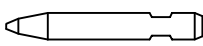
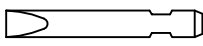
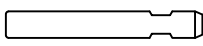
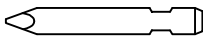
1-2. General specifications (box)



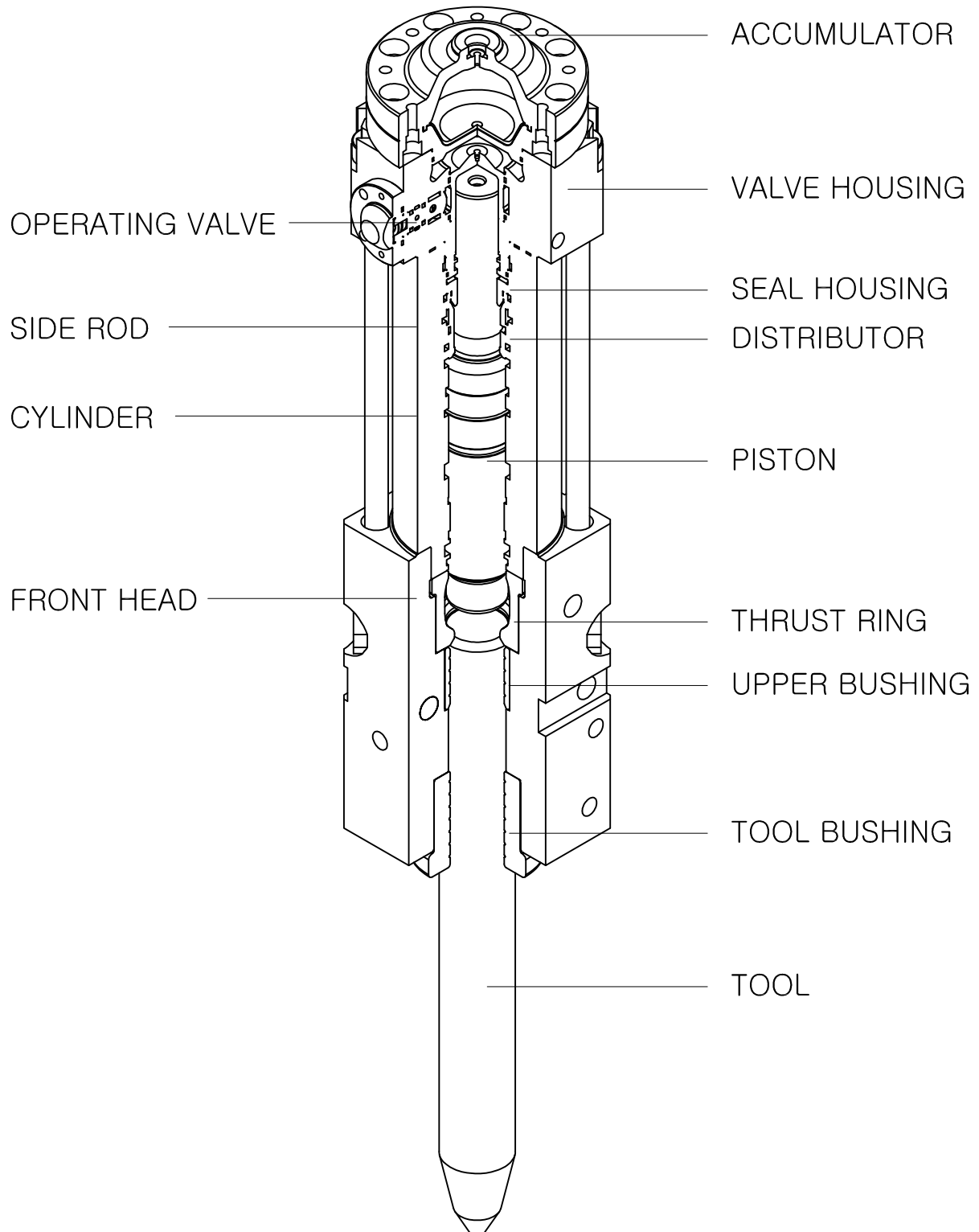
Item	Specifications
Working weight	1025 lb (465 kg)
Impact frequency	500 ~ 900 BPM
Operating pressure	1600 ~ 1900 psi (110 ~ 130 bar)
Relief pressure	2300 ~ 2600 psi (160 ~ 180 bar)
Oil flow	13 ~ 26 gpm
Back pressure	145 psi (10 bar)
Tool diameter	3.4 in (86.36 mm)
Oil temperature	-20 ~ +80 °C (-4 ~ +176 °F)
Hydraulic oil viscosity	1000 ~ 15 cSt (131 ~ 2.35 °E)
Pressure line size	3/4in (19 mm)
Return line size	3/4in (19 mm)
Carrier weight	8800 ~ 22000 lb

1-3. Tool specifications



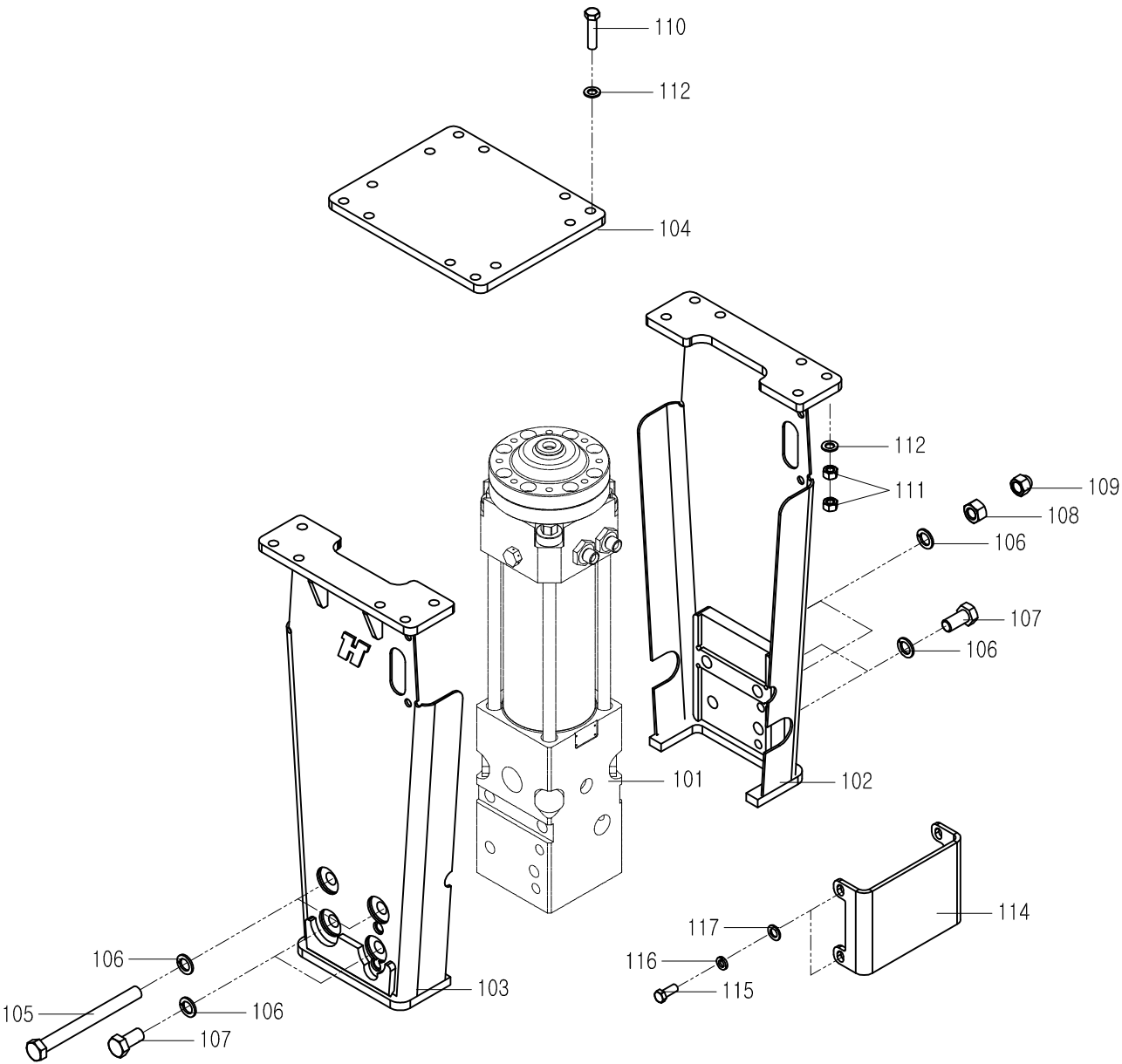
	Name	Length in (mm)	Weight lb (kg)	Diameter in (mm)	Remarks
◎ 	Cone tool (A)	31.1 (790)	70.5 (32)	3.35 (86)	
⊕ 	Chisel tool (B)	31.1 (790)	72.8 (33)	3.35 (86)	
○ 	Blunt tool (C)	31.1 (790)	75 (34)	3.35 (86)	
⊗ 	Moil tool (D)	31.1 (790)	68.3 (31)	3.35 (86)	

1-4. Structure detail



2. PART LIST

2-1.HOUSING (OPEN)



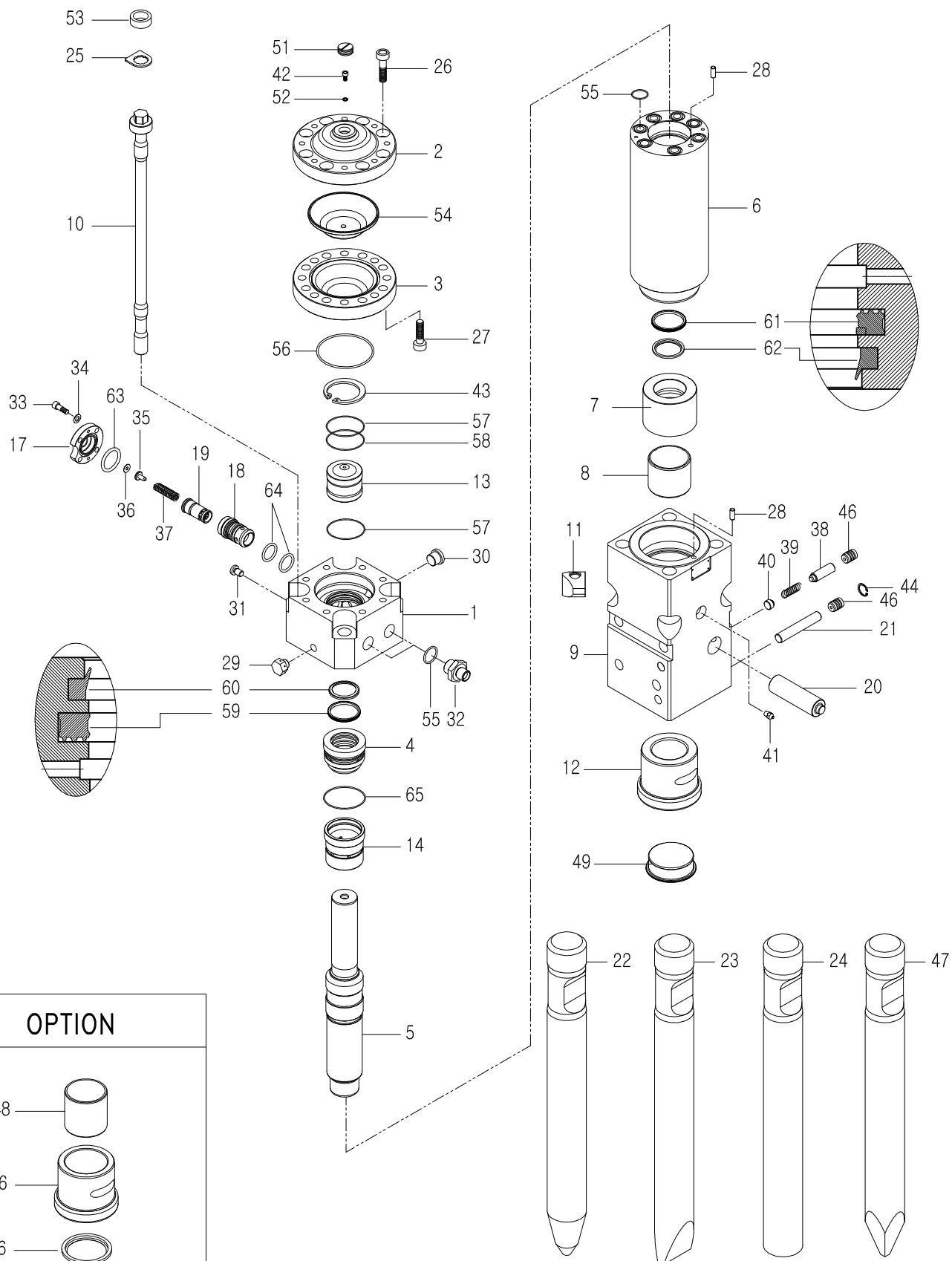
HR90 HOUSING (OPEN) PART LIST

[illegible]

HR90P HOUSING (BOX) PART LIST

[illegible]

2-3. HAMMER ASS'Y



HR90 HAMMER PART LIST

NO	PART NO.	PART NAME	Q'TY	REMARK
1	B0806010	VALVE HOUSING	1	
2	B0806020	ACC. COVER	1	
3	B0806030	ACC. BOTTOM	1	
4	B0806040	SEAL HOUSING	1	
5	B0806050	PISTON	1	
6	B0806060	CYLINDER	1	
7	B0806070	THRUST RING	1	
8	B0806080	UPPER BUSHING	1	
9	B0806490	FRONT HEAD	1	
10	B0806100	SIDE ROD	4	
11	B0806110	SIDE ROD NUT	4	
12	B0806120	TOOL BUSHING	1	
13	B0806130	IN COVER BUSHING	1	
14	B0806140	DISTRIBUTOR	1	
15	B0806150	TOOL INNER BUSHING	1	
16	B0806160	TOOL BUSHING	1	
17	B1006170	OPER. VALVE COVER	1	
18	B1006180	OPER. VALVE GUIDE	1	
19	B1006190	OPER. VALVE SPOOL	1	
20	B0806200	TOOL PIN	1	
21	B0806210	BUSHING PIN	1	
22	B0806220	TOOL – CONE	1	
23	B0806230	TOOL – CHISEL	1	
24	B0806240	TOOL – BLUNT	1	
25	B0806250	LOCK WASHER	4	
26	SB1825070	ACC. COVER BOLT	8	
27	SB1615045	ACC. BOTTOM BOLT	8	
28	B4006370	GUIDE PIN	2	
29	A0306190	AIR BREATHER	1	
30	B2506520	SOCKET PLUG	1	

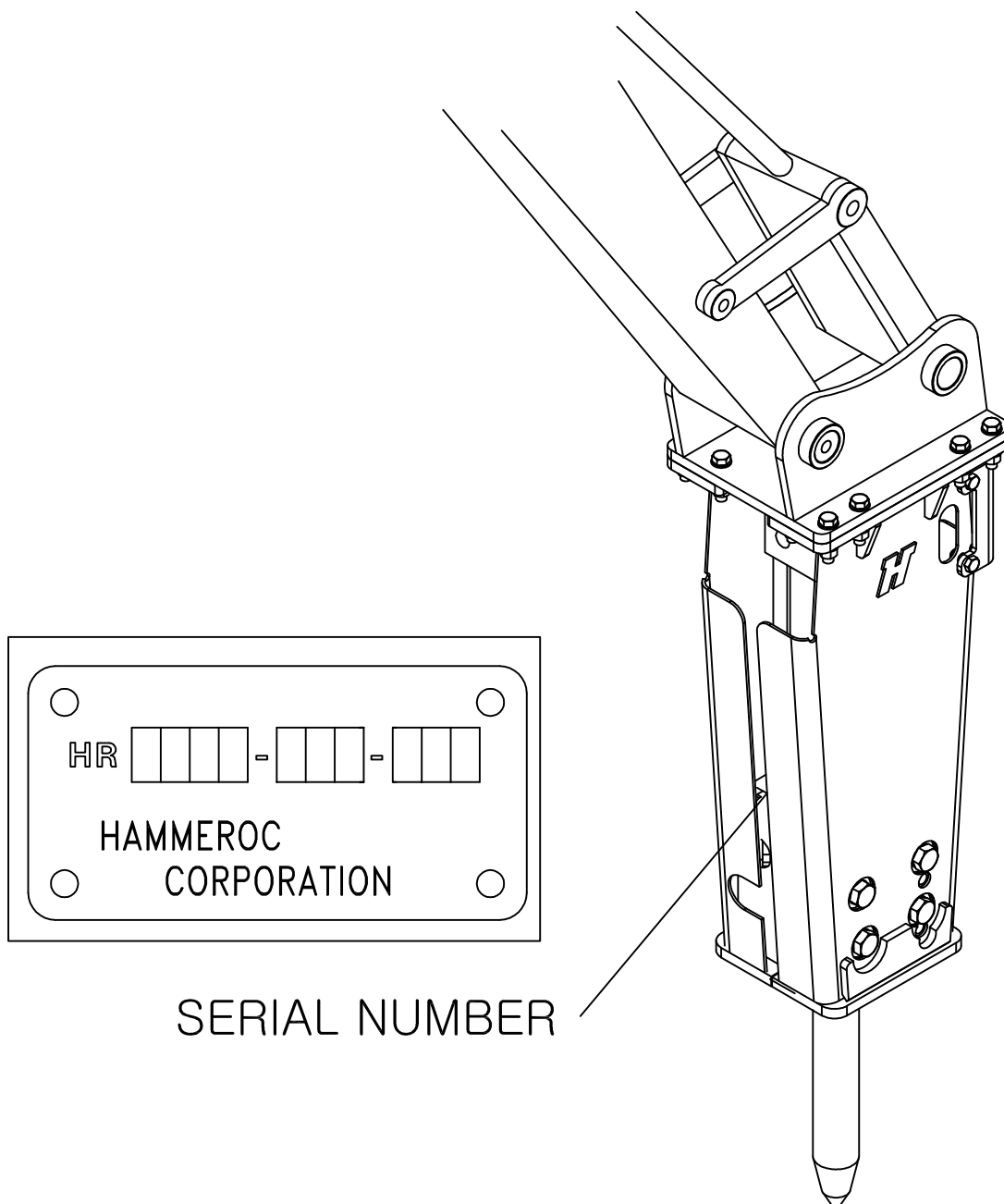
NO	PART NO.	PART NAME	Q'TY	REMARK
31	B4006450	SOCKET PLUG	1	
32	B1306320	ADAPTER	2	
33	SB1015030	OPER. VALVE COVER BOLT	4	
34	CW100000	WASHER	4	
35	B1306350	OPER. VALVE SPRING GUIDE	1	
36	B1306360	OPER. VALVE SHIM PLATE	1	
37	B1306370	OPER. VALVE SPRING	1	
38	B0806380	LOCK PIN	1	
39	B1006390	LOCK PIN SPRING	1	
40	B1306400	LOCK PIN SPRING GUIDE	1	
41	B4006560	GREASE NIPPLE	1	
42	B4006420	ACC. GAS BOLT	1	
43	B0806430	SNAP RING	1	
44	B1006440	SNAP RING	1	
46	B1306460	RUBBER PLUG	2	
47	B0806470	TOOL – MOIL	1	
48	B0806480	TOOL INNER BUSHING(PLASTIC)	1	
49	B0806500	TOOL BUSHING CAP	1	
51	B1307010	ACC. CAP	1	
52	B4007020	USIT RING	1	
53	B0807030	RUBBER RING	4	
54	B0807040	MEMBRANE	1	
55	A2007110	O-RING	9	
56	A1207010	O-RING	1	
57	B4007240	O-RING	2	
58	B0807080	BACKUP RING	1	
59	B0807090	SEAL	1	
60	B0807100	WIPER	1	
61	B1307090	SEAL	1	

3. OPERATION

3-1. Product numbers

The serial number is stamped on the front head.

It is important to make correct reference to the serial number of the attachment when making repairs or ordering spare parts. Identification of the serial number is the only proper means of maintaining and identifying parts for a specific product.



3-2. Selection of tools

HAMMEROC can offer the selection of standard and special tools to suit each application.

The correct type of the tool must be selected to get the best possible working result and the longest life time for tool.

1) Blunt

- * For igneous(e.g. granite) and tough metamorphic rock(e.g.gneiss)into which the tool doesn't penetrate.
- * Concrete
- * Breaking boulders.

2) Chisel, cone,moil

- * For sedimentary(e.g. sandstone) and weak metamorphic rock into which the tool penetrates.
- * Concrete
- * Trenching and benching

3-3. Principles of breaking

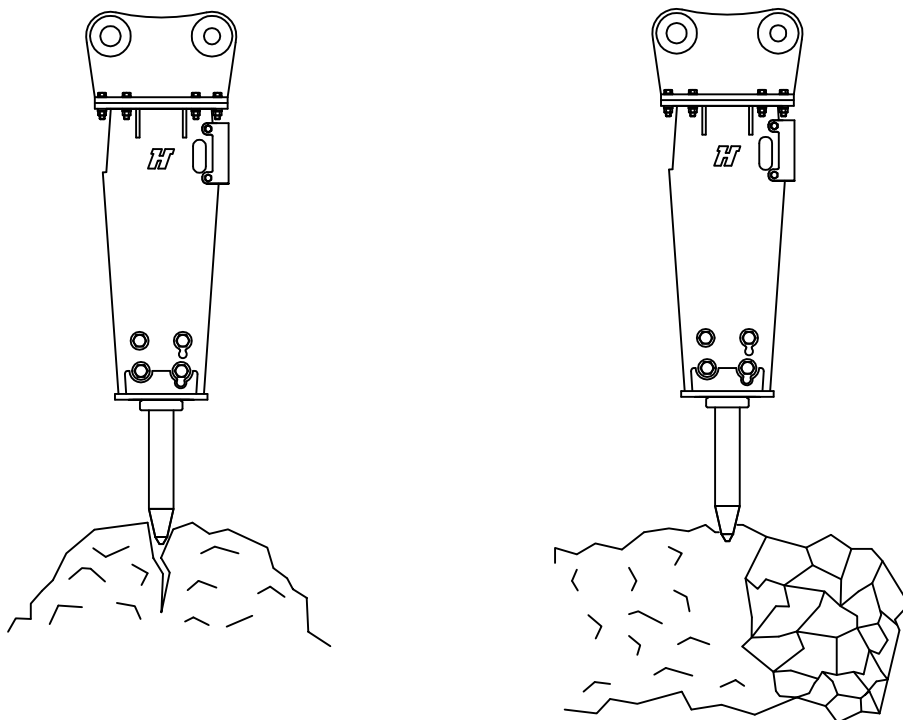
- * There are basically two ways of breaking with a hydraulic breaker.

1) Penetrative(or cutting)breaking

- * In this form of breaking the cone point or chisel tool is forced inside the material. This method is most effective in soft, layered or Plastic, low abrasive material.

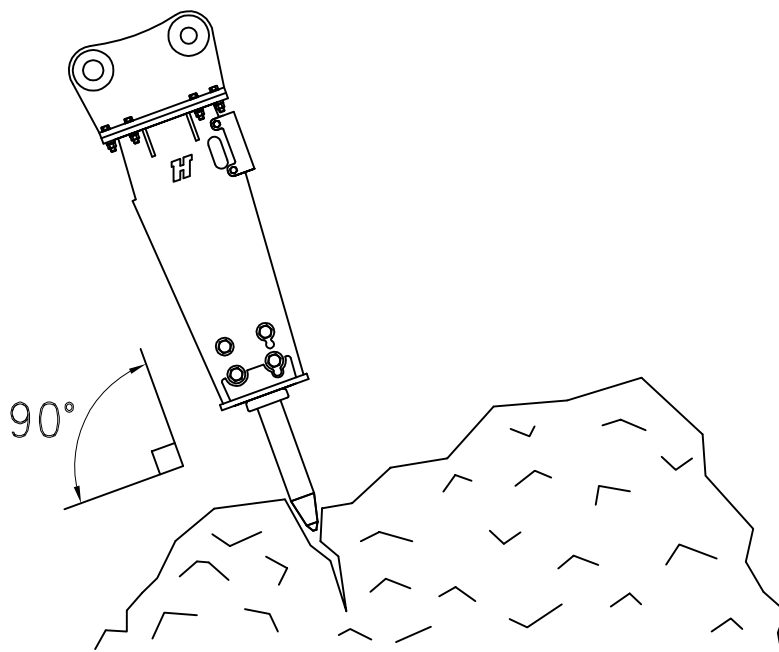
2) Impact breaking

- * In impact breaking, material is broken by transferring very strong mechanical stress from the tool into material to be broken.
- * Best possible energy transfer between the tool and object is achieved with a blunt tool.
- * Impact breaking is most effective in hard, brittle and very abrasive materials.



3-4. Correct working methods

- 1) Prepare the carrier as for normal excavation work.
 - a. Move the carrier to required position.
 - b. Engage the parking brake.
 - c. Set the drive to neutral.
 - d. Disengage the boom lock(if fitted).
- 2) Set the engine speed to the recommended engine RPM.
- 3) Place the tool against the object at 90 degrees.
 - a. Avoid small irregularities on the object which will break easily and cause either idle strokes or incorrect working angle.
 - b. Incorrect working methods may cause failure in the operation of the breaker or housing.
- 4) Use the excavator boom to press the breaker firmly against the object.
 - a. Do not pry the breaker with the boom.
 - b. Do not press too much or too little with the boom.
- 5) Start the breaker.
- 6) Do not let the tool move outwards from the breaker when it penetrates.
 - * Feed the breaker all the time with the excavator boom.
- 7) Keep the tool at 90 degrees all the time.
 - a. If object moves or its surface breaks, correct the angle immediately.
 - b. keep feed force and tool aligned.



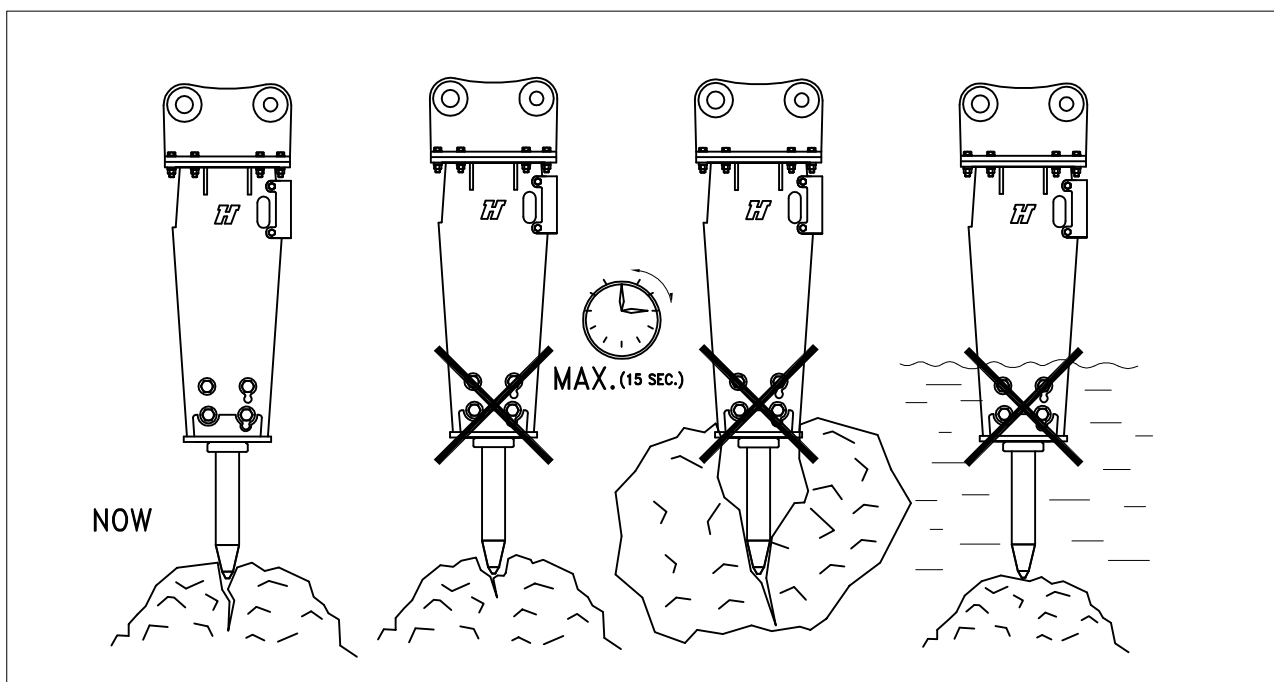
3-5. Operating temperature

- 8) Stop the breaker quickly.
- Do not allow the breaker to fall down, make idle strokes when the object breaks. The constant idle strokes have a deteriorating effect on the breaker.
 - If breaker falls down, side-plates could be worn out more quickly.
- 9) Do not strike one spot for more than 15 seconds at a time.
- * If the object does not break, stop the breaker and change the position of the tool which dampens the impact effect and cause the tool to overheat.
- 10) When breaking concrete, hard or frozen ground, never strike and bend with the tool at the same time.
- This action may cause the tool to break.
 - Bending may be caused by a stone which is inside hard or frozen ground.
 - Stop striking if you find sudden resistance under the tool.

- * The operating temperature is $-20^{\circ}\text{C} \sim 80^{\circ}\text{C}$
If the temperature is lower than $-20^{\circ}\text{C} (-4^{\circ}\text{F})$, the breaker and tool must be preheated before starting the operation in order to avoid breakage of the accumulator membrane and the tool.
During operation they will remain warm.

3-6. Other important points.

- Listen to the breaker's sound while you are using it.
- * If the sound becomes thinner and the impact less efficient, the tool is misaligned with the material and/or there is not enough "pressing" force on the tool.
 - * Realign the tool and press the tool firmly against the material.
- The breaker as a standard assembly, must not be used under water.
- * If water fills the space where the piston strikes the tool, a strong pressure wave is generated and the breaker may be damaged.



3-7. Storage

Long term storage

Observe the following points when the hammer is stored.

In the way the vital parts of the attachment are protected from rust and the machine is ready to be used whenever necessary.

1. The storage area must be dry.
2. The tool must be removed from the hammer.
3. The lower end of the piston, tool and tool bushing must be well protected with grease in all hydraulic hammers.
4. Connections must be sealed with clean plugs to prevent oil leakage and dirt from getting into couplings.
5. The product must be stored in the vertical position.
6. Make sure the product can not fall.

3-8. Mounting and dismounting the hammer

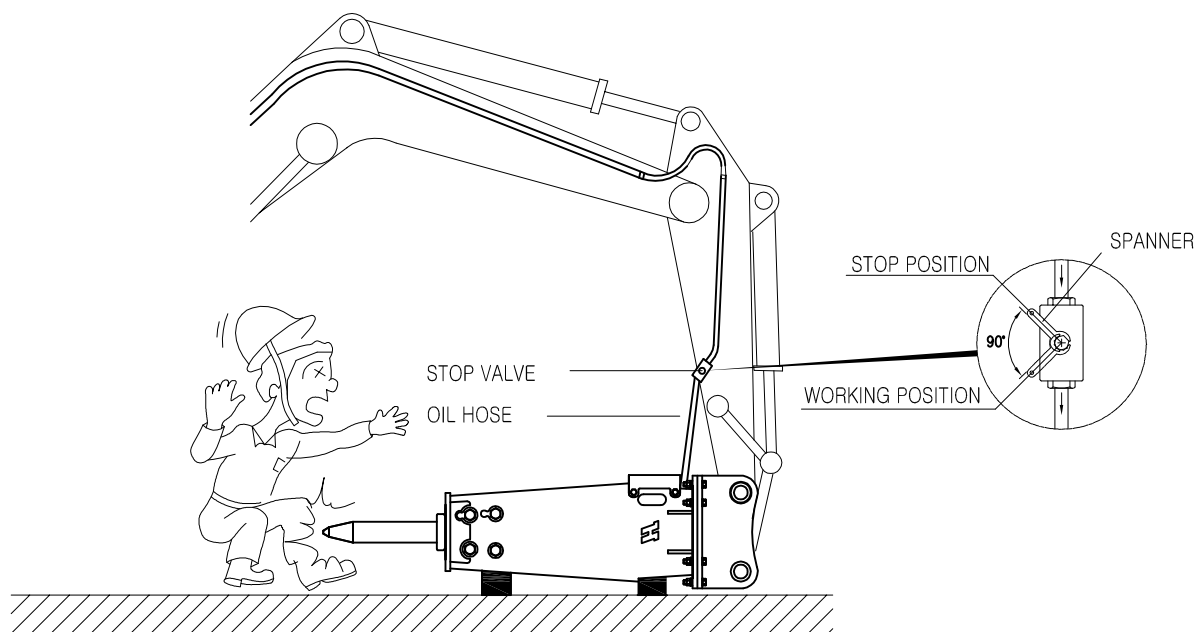
Removal from carrier

1. Position hammer horizontally on the floor and remove the tool.
2. Stop carrier engine. Operate boom and hammer controls to release pressure trapped inside hoses. Wait ten minutes for oil pressure to drop.
3. Close hammer inlet and outlet lines. If quick couplers are used, disconnection automatically closes hammer lines.
4. Disconnect hoses, plug the hoses and the hammer inlet and outlet ports.
5. Remove bucket pins and other parts.
6. The carrier can be moved aside.

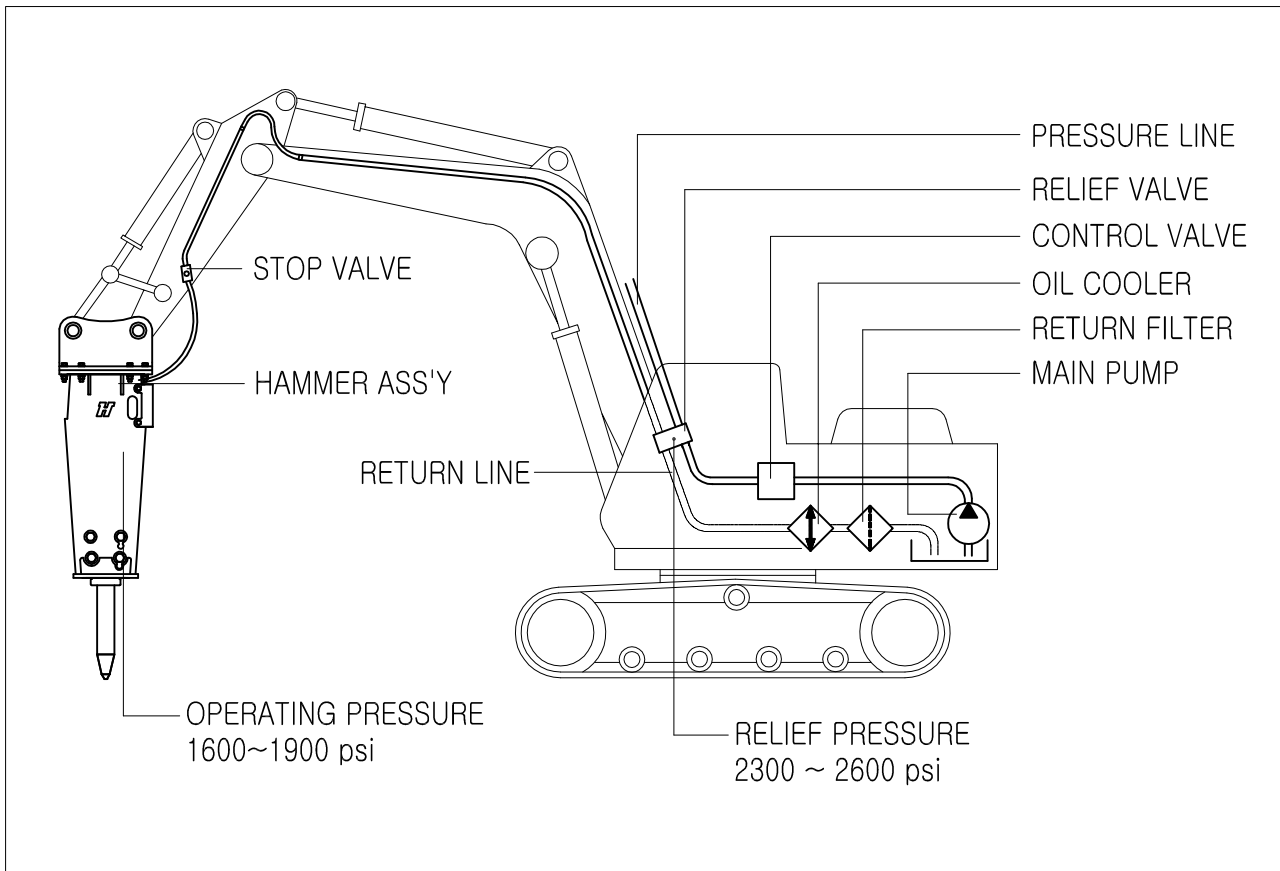
Installation

1. Install hammer in the same manner as mounting a bucket. Install bucket pins.
2. Connect hoses. Hammer inlet port is marked on the back head with "IN" and outlet port with "OUT".
3. Open hammer inlet and outlet lines.

WARNING!



3-9. Setting of operating pressure.



1) Operating pressure

- a. Stop the carrier engine.
- b. Assemble the high pressure gauge to the high pressure measuring port. Start the engine.
- c. Set the tool of the breaker e.g. on a thick steel plate.
- d. Adjust operating engine revolution and start to operate the breaker.
- e. Read the average pressure from the high pressure gauge operating pressure.
- f. Operating pressure is preadjusted at the factory and there should be no reason to adjust it.
- g. Stop the carrier and remove the gauge.
- h. Tighten the plug of the pressure measuring point.

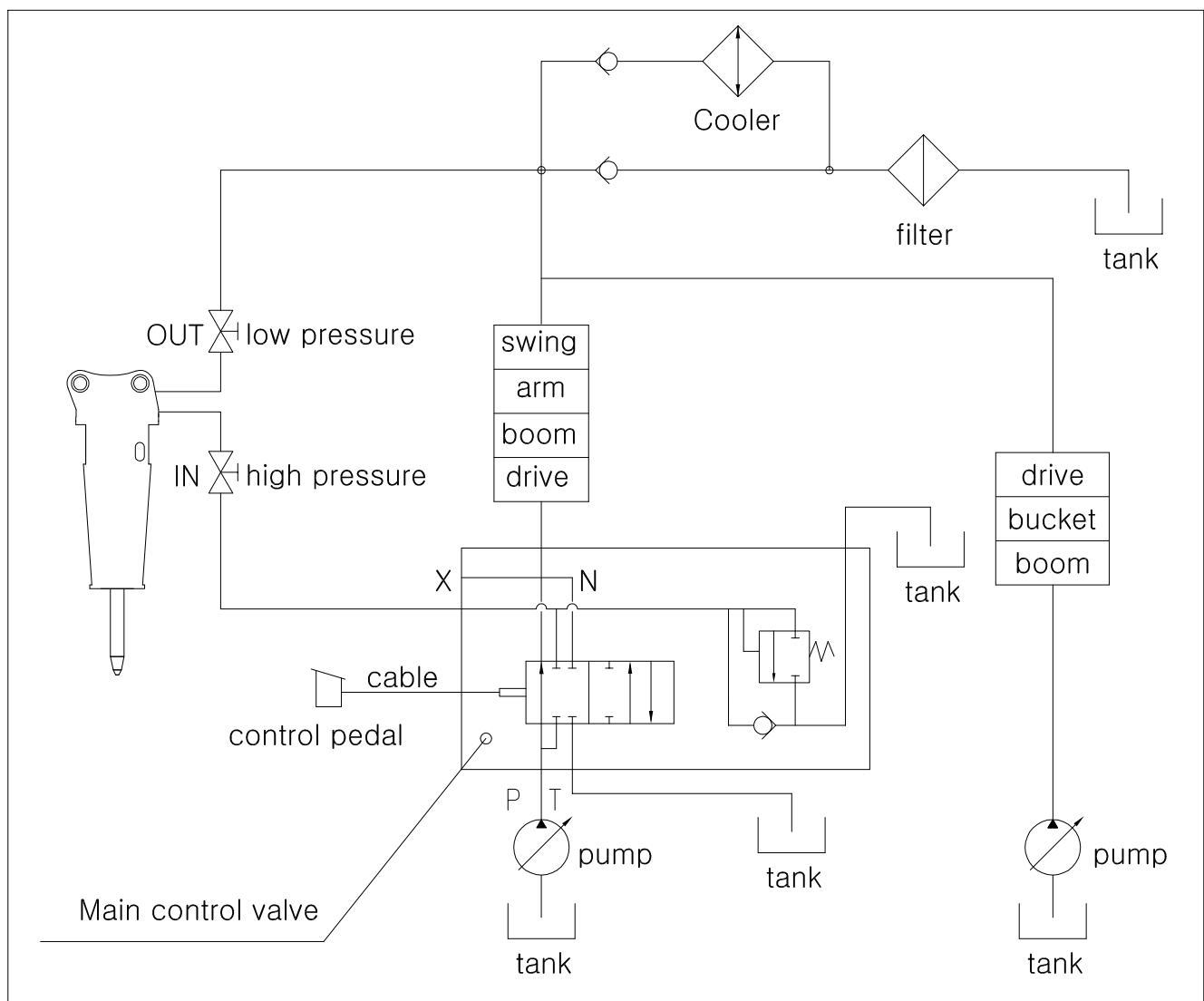
2) Relief valve

- a. The relief valve is a safety device which is used to protect the breaker when the pressure rises in hydraulic circuit.
- b. The operating pressure of the breaker determines the setting of the relief valve in the pressure line.
- c. The relief valve setting should be acceptable as per the specifications of each HAMMEROC models.

3-10. Specification of hoses and pipes

MODEL	HOSE ASSEMBLY		PIPING LINE SIZE		REMARK
	IN	OUT	IN	OUT	
HR90	PF 3/4"	PF 3/4"	PF 3/4"	PF 3/4"	

3-11. Hydraulic circuit



4. LUBRICATION

4-1. Manual lubrication

* Grease interval

1. Tool shank must be well lubricated before installing tool at regular intervals.
2. 5~10 strokes from grease gun to tool bushing and tool at regular intervals.
3. Adapt interval and amount of grease to decrease wearing of tool and good working conditions.

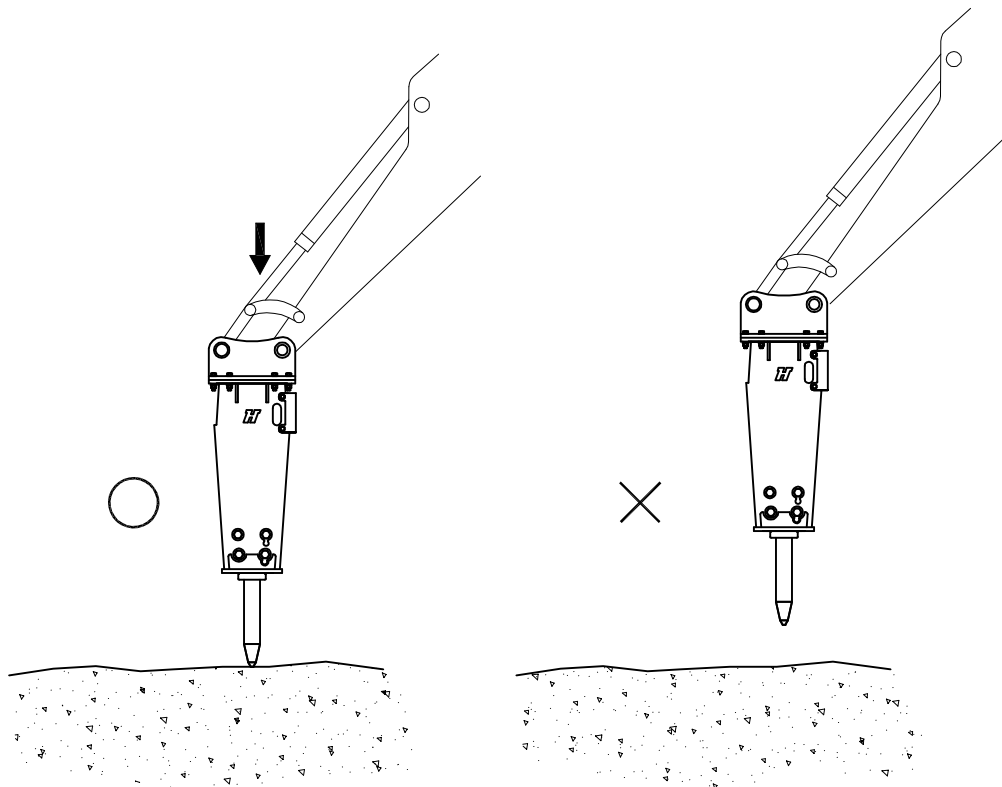
This should be done every 2 hours.

Insufficient greasing or improper grease may cause:

- Abnormal wear of tool bushing and tool
- Tool breakage

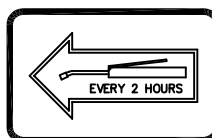
Technical data :

- NLGI grade2
- Synthetic oil base with aluminium complex soap
- Approximately 15% graphite copper solids to reduce metal to metal contact damage
- Dropping point 500°F (260°C)
- Viscosity 15 cSt
- Temperature range -20°F ~ 450°F (-30°C~230°C)



GREASING POINT

The greasing point on the hammer has been marked with the following sticker.



4-2. Hydraulic oil

* When the breaker is used continuously, the temperature of the hydraulic oil normalize at a certain level depending on conditions and on the carrier. At this temperature, the viscosity of the hydraulic oil should be 20~40 cSt (2.90~5.35°E).

* The HAMMEROC hydraulic breaker must not be started if the viscosity of the hydraulic oil is above 1000cSt(131°E) or operated when the viscosity of the hydraulic oil is below 15cSt(2.35°E)

1) When the oil is too thick, the following problems may occur:

- Difficult start up.
- Stiff operation.
- Breaker strikes irregularly and slowly.
- Danger of cavitations in the pumps and hydraulic breaker.
- Sticky valves.
- Filter bypass, impurities in oil not removed.

2) When the oil is thin, the following problems may occur;

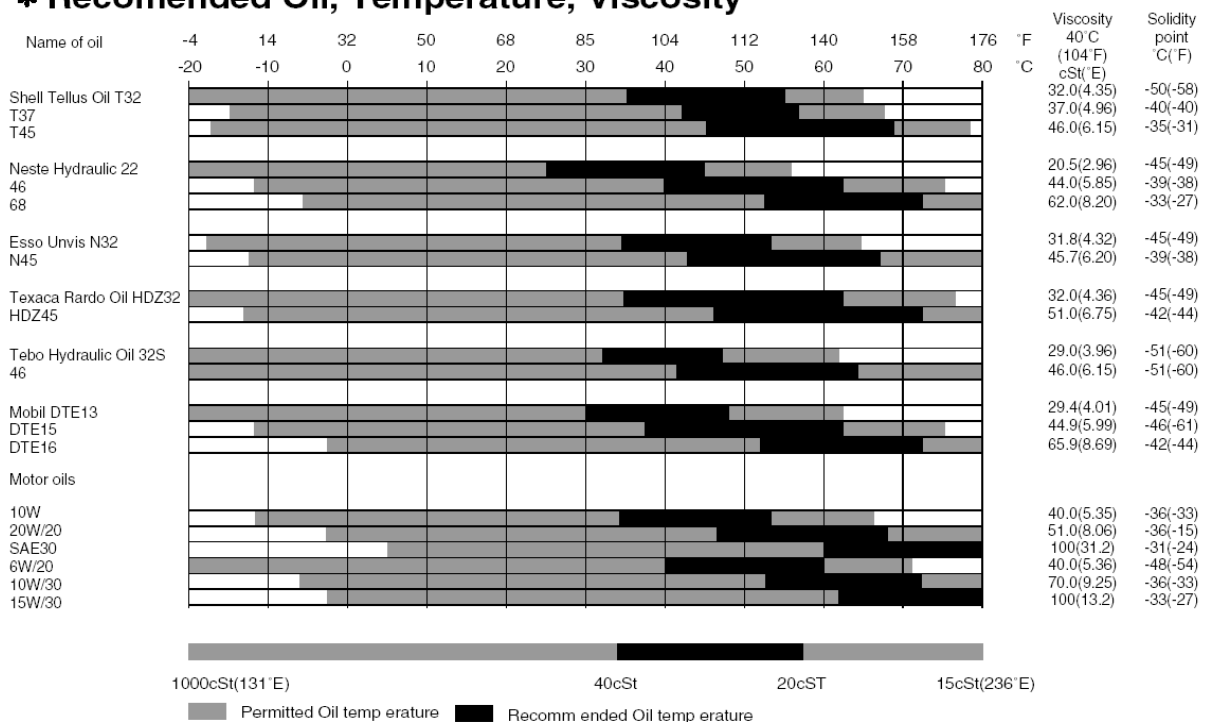
- Efficiency losses(internal leaks).
- Damage to gaskets and seals leaks.
- Accelerated wearing of parts, because of decreased lubrication efficiency.

3) Special oils

* In some cases special oils(e.g. biological oils and non-inflammable oil) can be used, please observe following aspects when considering the use of special oil;

* The viscosity range in the special oil must be in the given range of 15~1,000cSt (2.35~131°E)

* Recomend Oil, Temperature, Viscosity



4) Cleanness of hydraulic oil

- * The hydraulic oil filter of the carrier will clean the oil flowing through the breaker.
- * The purpose of the oil filter is to remove impurities from the hydraulic oil since they cause accelerated component wear, blockages and even seizure.
- * Impurities also cause the oil to overheat and deteriorate.
- * Air and water are also impurities in oil.

5) Oil filter

- * When working with hydraulic breaker, the carrier oil filter must fulfill the following specifications:
 - a. The oil filter must be rated at 25 microns maximum.
 - b. The oil filter must be a standard return line filter rated to maximum working pressure.
 - c. The oil filter must have a volume flow capacity of at least twice the breaker's maximum flow.
 - d. The cooler must withstand a dynamic pressure of 290 psi(20 bar).
 - e. If the carrier's oil cooler is too small either the original cooler must be replaced with a larger one or an auxiliary cooler must be installed.

6) The auxiliary hydraulic cooler can be installed:

- a. In front of the radiator, in which case an additional fan is not required, ie. maximum rise of the cooling air is 5 °C(40 °F).
- b. Any other suitable place, using a fan either hydraulically or electrically driven.

7) Damage caused by hydraulic oil

contamination in the carrier and breaker circuits;

- a. The working life of the pumps is significantly shortened.

- Premature wear of parts
- Cavitation

Recommended Oil, Temperature, Viscosity

- b. Valves do not function properly.

- Spools bind
- Premature wear of parts
- Blocking of small holes

- c. Wear of cylinders and gaskets.

- d. Reduced breaker efficiency.

- Premature wear of moving parts and seals
(Danger of piston seizing up Oil overheats)

- e. Shorten working life and reduced efficiency of hydraulic oil.

- Oil overheats
- Oil quality deterioration
- Electrochemical changes in hydraulic oil

5. MAINTENANCE

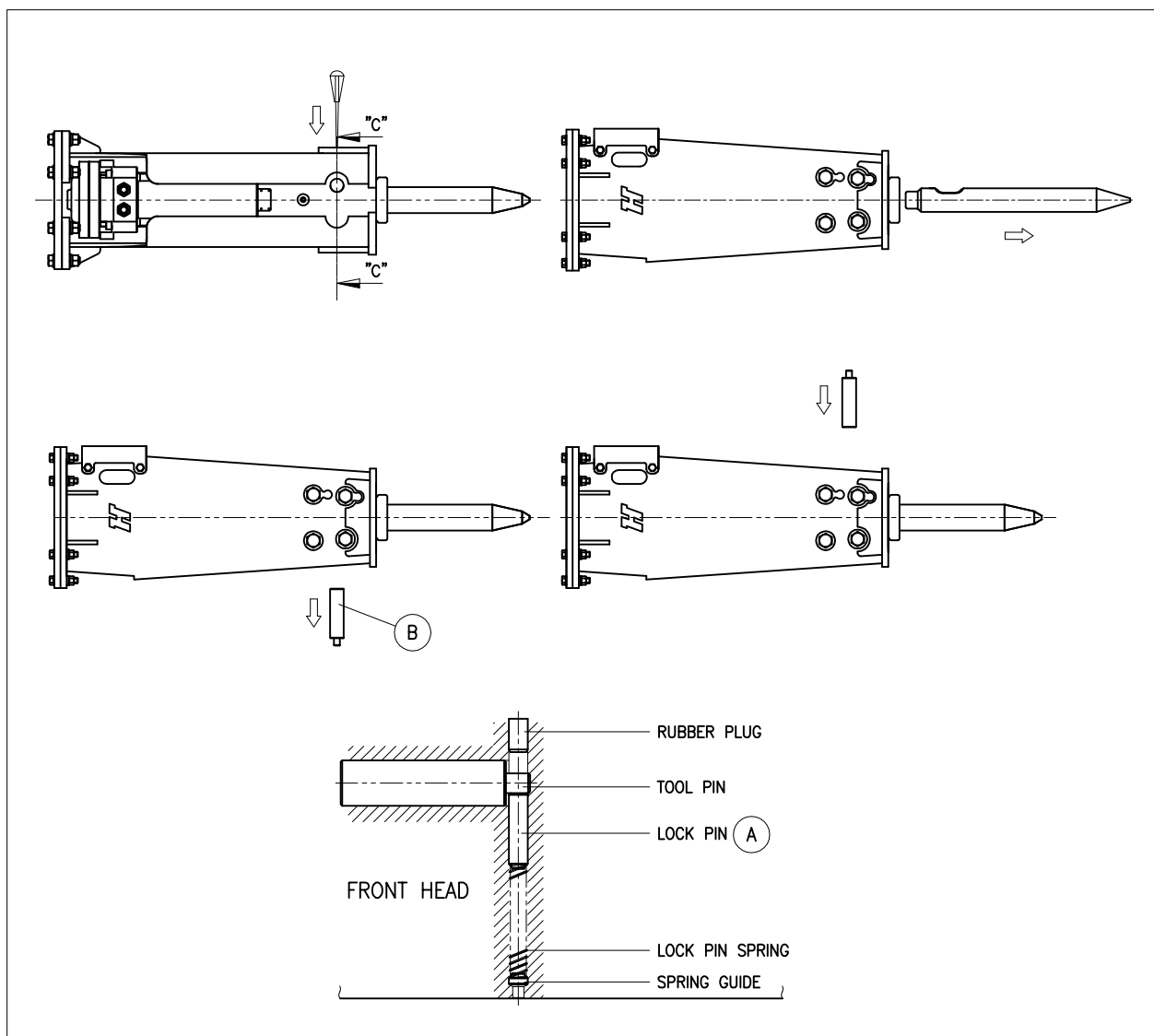
5-1. Removal and installation of tool

1) Removal

- a. Place the breaker 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. Push the lock pin A as far as it will go.
- e. Remove the tool pin B
- f. Remove the tool

2) Installation

- a. Clean all parts.
- b. Clean and lubricate the tool and the tool pin B. Check the wear of used tool.
- c. Check that the tool pin B is secured by the lock pin A.



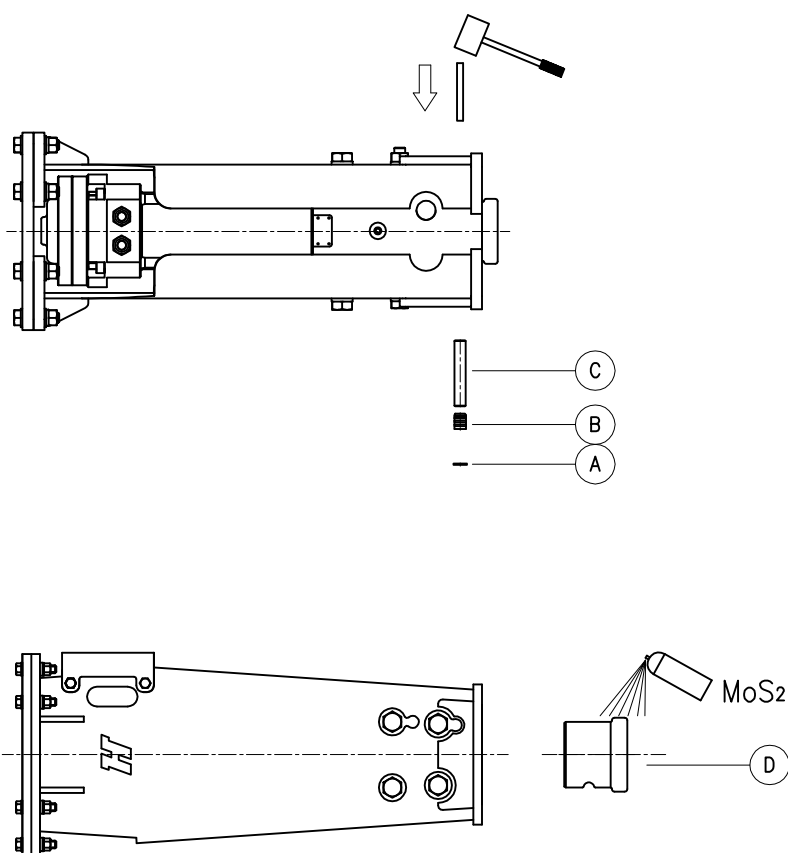
5-2. Changing tool bushing

1) Removal

- a. Place the breaker 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 the snap ring A.
- e. Remove the rubber plug B.
- f. Remove the bushing pin C.
- g. Remove the tool bushing D.

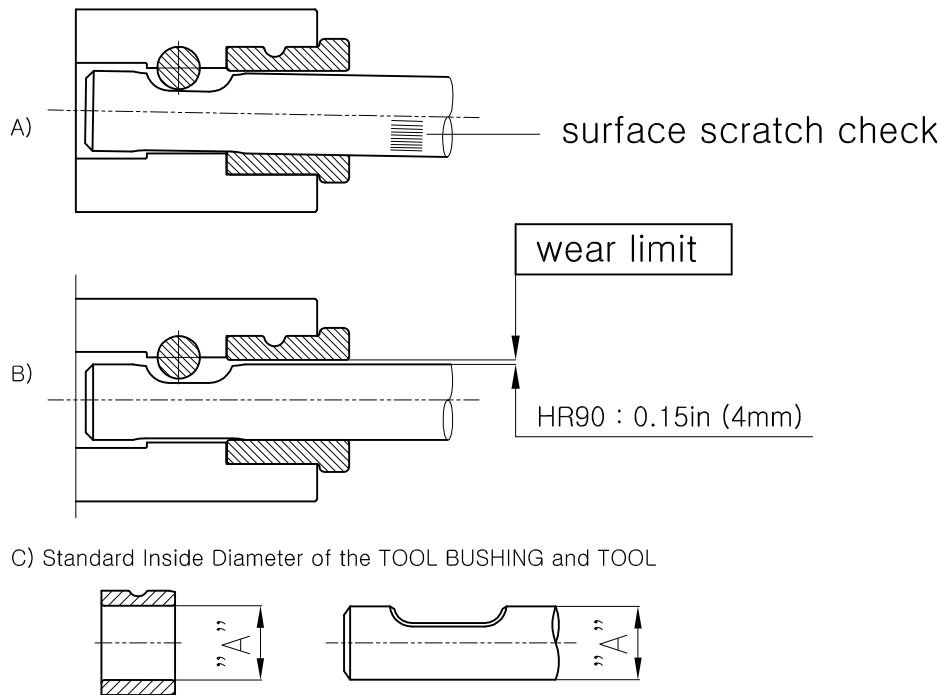
2) Installation

- a. Clean all parts.
- b. Apply Mos2 spray to the contact surface of the tool bushing and the front head.
- c. Install the tool bushing D.
- d. Install the bushing pin C.
- e. Install the rubber plug B.
- f. Install the snap ring A.



5-3. Wear limits for tool and tool bushing

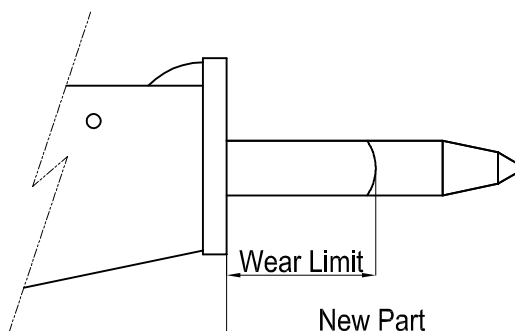
- 1) The normal clearance between the tool and the tool bushing is 0.15in(4mm).
In case the tool is contacting the tool bushing or there happens some scratch on the tools.
Please check the wear condition of the tool bushing inside the tool bushing and change it with the new tool bushing.
- 2) The tool bushing can be used continuously unless a serious wear is found it.



C) Standard Inside Diameter of the TOOL BUSHING and TOOL

	UNIT(inch)		
	NEW	REJECT	REMARK
TOOL BUSHING	3.34	3.42	
TOOL	3.34	3.26	

5-4. Wear limit for Tool



	UNIT(inch)	
MODEL	NEW	REJECT
HR90	17.83	9.84

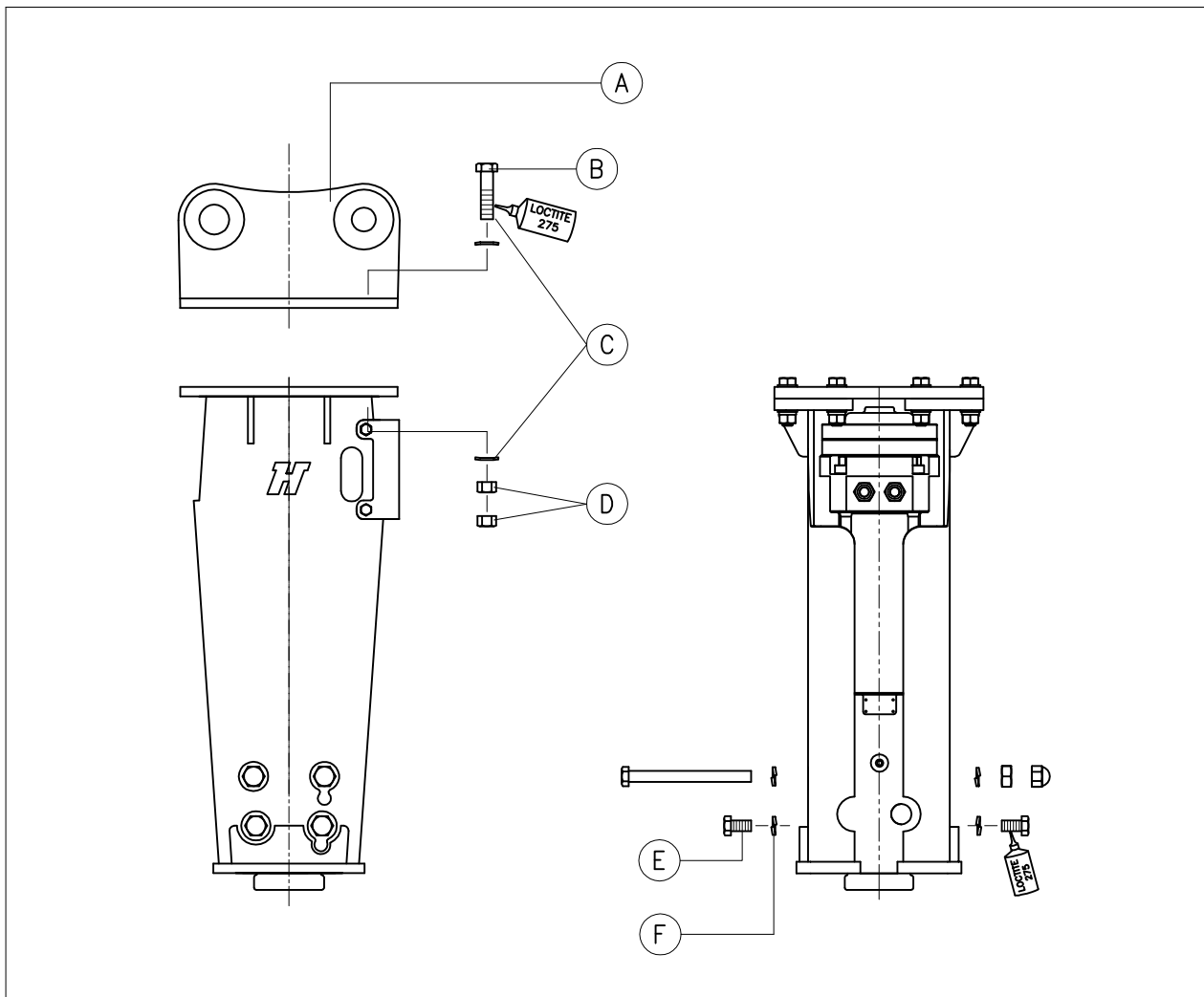
5-5. Disassembling and assembling hammer ass'y

1) Disassembling

- a. Remove the tool and set the breaker to vertical position on the floor.
- b. Disconnect the hoses and plug them as well as the breaker inlet and outlet.
- c. Loosen the mounting bracket bolt B, plane washer C, nut D to remove the mounting bracket A from the breaker.
- d. Remove fronthead joint bolt E, and washer F.
- e. Remove the side brackets.

2) Assembling

- a. Set the hammer ass'y to vertical position on the floor.
- b. Install the side brackets.
- c. Install the washers under housing joint bolts and the front head joint bolts and tighten the bolts
- d. Connect the mounting bracket by tightening the mounting bracket bolts.
- e. Remove the plugs from the hoses and then connect the hoses and the breaker inlet and outlet.
- f. Connect pressure and return lines.



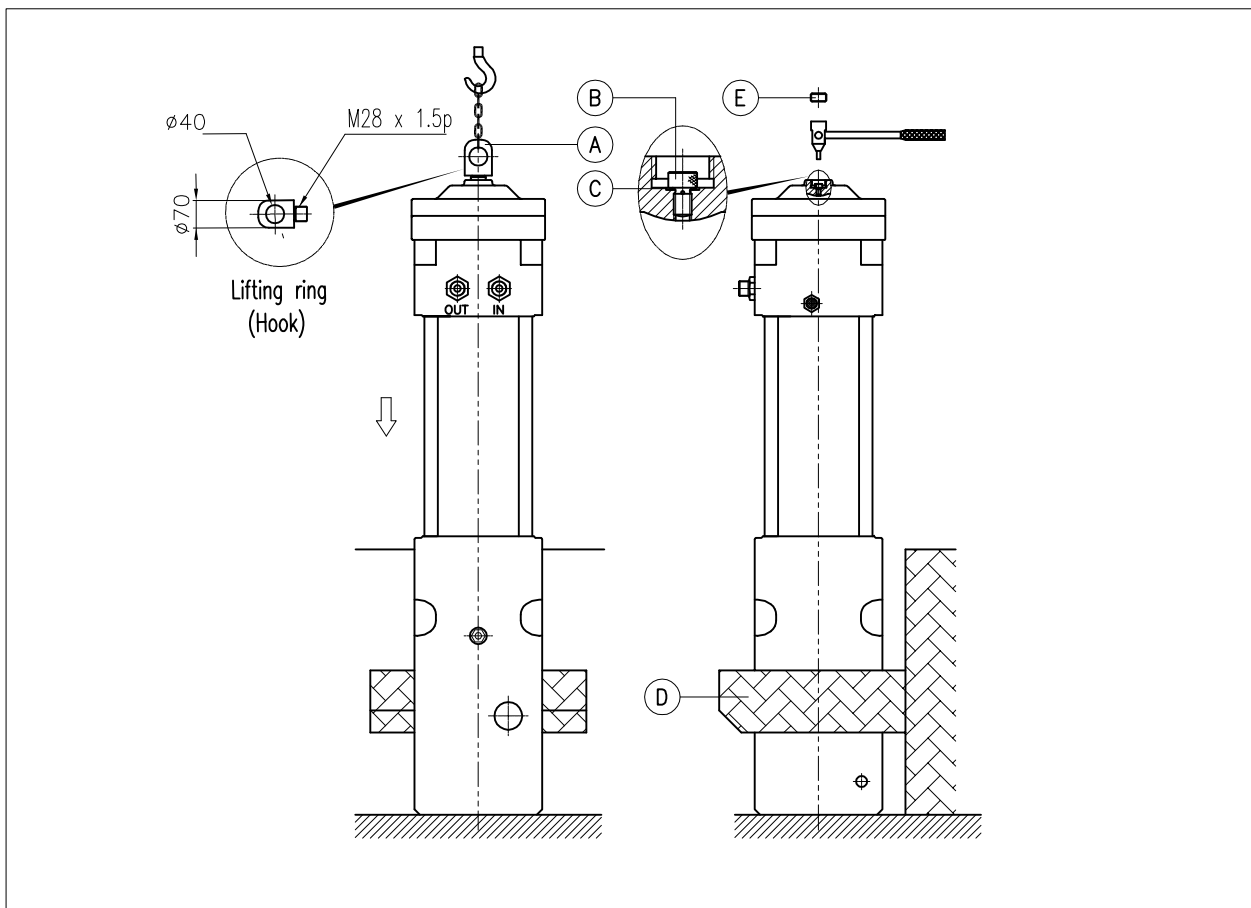
5-6. Assembling and installing accumulator set

1) Releasing the pressure from the accumulator set

- a. Remove the breaker from the side brackets.
- b. Set the hammer ass'y into the assembly stand D by removing the accumulator cap E from the pressure accumulator set and lifting the hammer ass'y with a lifting ring A
- c. Remove the ling A
- d. Carefully open the accumulator gas bolt B and usit-ring C when there is no pressure in the accumulator.
- e. If you can not understand how to proceed this work, please contact your dealer in your territory or manufacturer.

2) Removal

- a. Loosen the accumulator cover bolt D. (8 pcs)
- b. Lift the accumulator set K from the hammer ass'y .
- c. Remove the o-ring E.
- d. Set the accumulator set on the assembly stand J.
- e. Loosen the accumulator bottom bolt F. (8 pcs)
- f. Remove the accumulator bottom I and the membrane H.

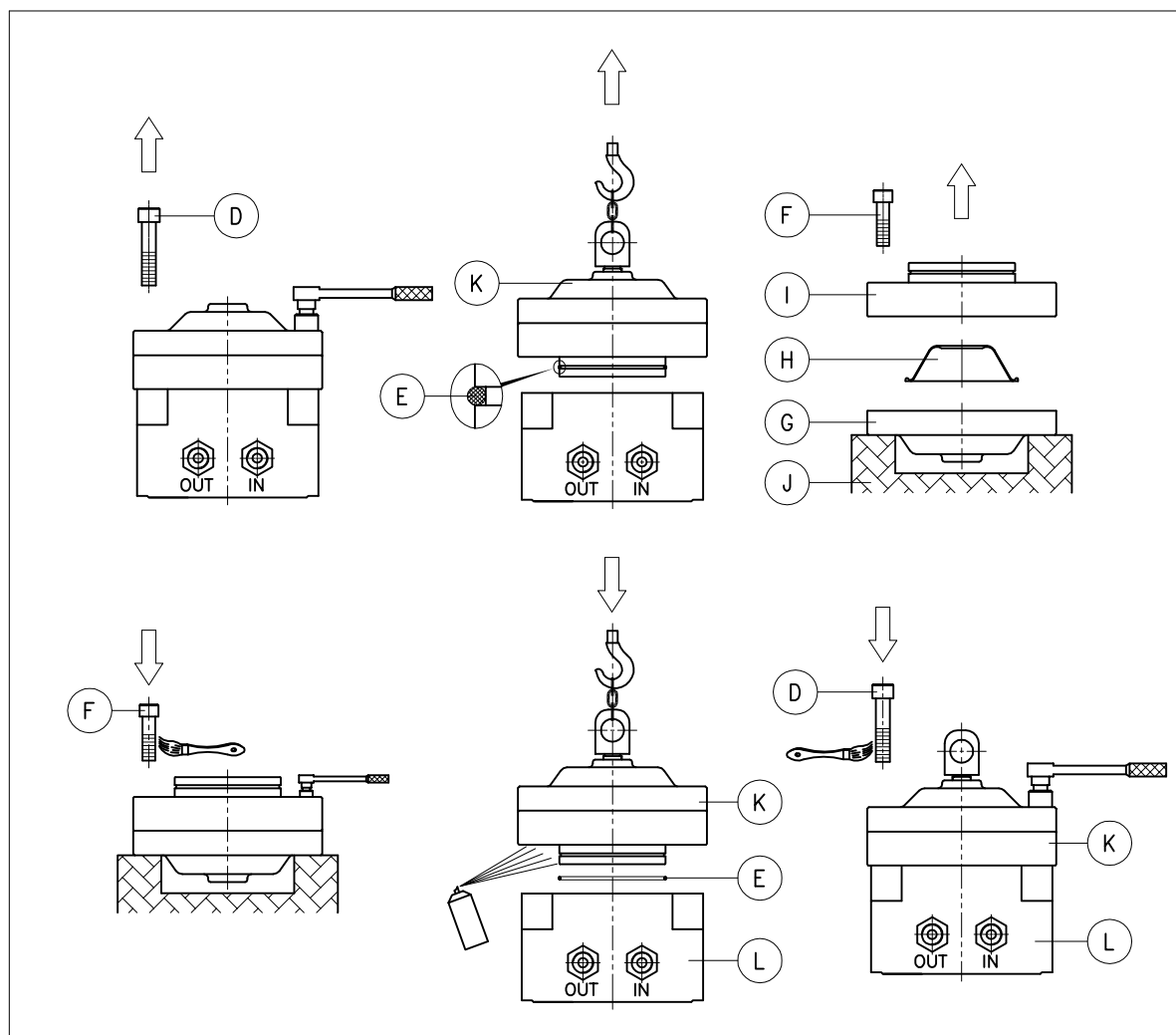


3) Assembling

- a. Clean and dry parts carefully.
- b. Set the accumulator cover G on the assembly stand J.
- c. Fit a new membrane H in place, apply silicon grease on the gas side of the membrane as well as on the accumulator bottom I.
- d. Install the accumulator bottom I.
- e. Apply some thread grease to the thread area on the accumulator bottom bolt F. (8 pcs)
- f. Install the accumulator bottom bolt F and tighten the accumulator bottom bolt F with torque wrench.

4) Fitting the accumulator set

- a. Install the o-ring E into the groove in the bottom of the accumulator set K apply some o-ring grease on the o-ring.
 - b. Apply Mos2 spray on the contact surface of the accumulator set K and the valve housing L.
 - c. Lift the accumulator set K in place.
 - d. Install the accumulator cover bolt D.
- Tighten the accumulator cover bolt D with torque wrench.



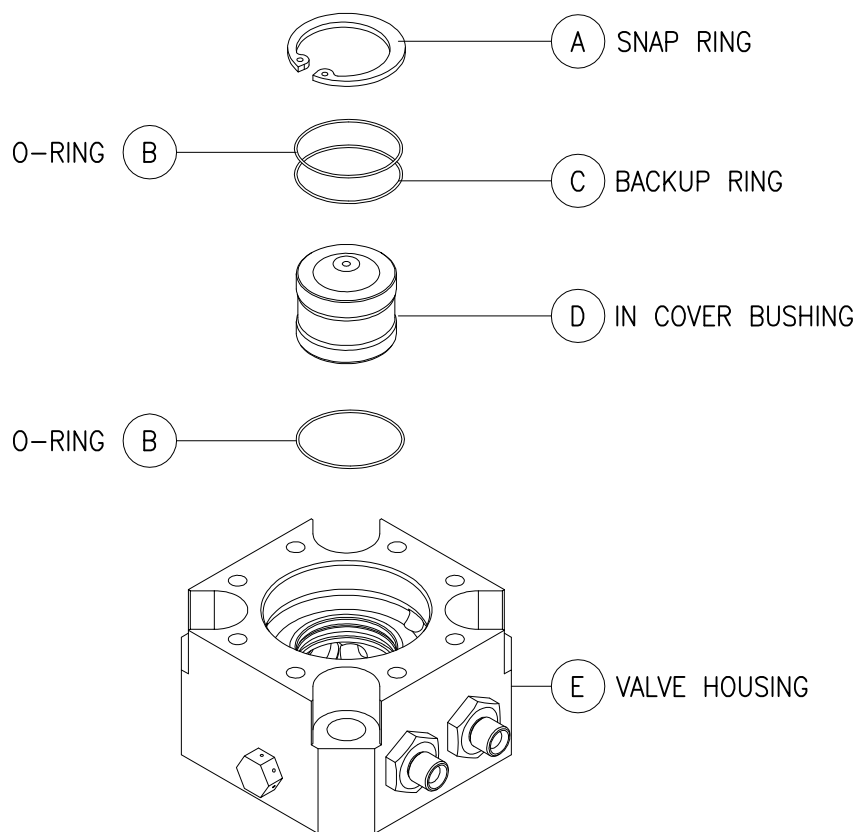
5-7. Disassembling and assembling in cover bushing

1) Disassembling

- a. Remove the snap ring A
- b. Install eye bolt in the in cover bushing and desert the in cover bushing D.
From the valve housing E.
- c. Remove the o-rings B and the backup ring C.

2) Assembling

- a. Install the o-ring B and the backup ring C inside valve housing E.
- b. Insert the in cover bushing D, by using eye bolt M12 into the valve housing E.
- c. Install the snap ring A.

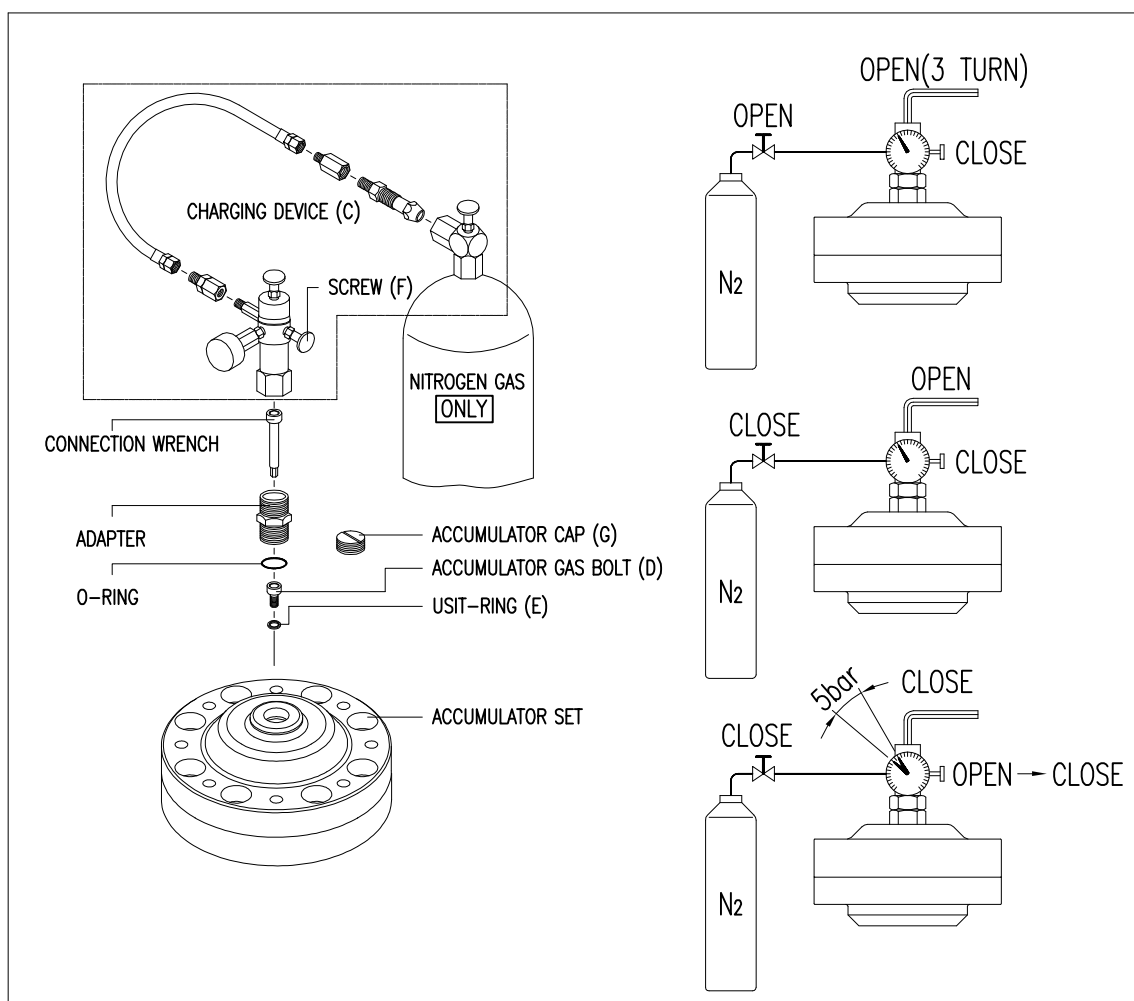


5-8. Charging accumulator set

- a. Furnish the accumulator ass'y with a new usit-ring E and the accumulator gas bolt D.
- b. Connect the gas charging device C to the accumulator.
- c. Open the accumulator gas bolt D through the gas charging device.
- d. Open the valve of the nitrogen bottle and observe the gage pressure.
- e. Set the pressure to that shown in column A and shut the bottle valve.
- f. Wait gas 2 minutes to allow the pressure to stabilize.
- g. Adjust the pressure to that shown in column B by releasing screw F.
- h. Shut the accumulator gas bolt D, tightening torque 20N.m.
- i. Release the pressure from the hose and remove the gas charging device.
- j. Check for leakage at the accumulator gas bolt D by dropping a small quantity of oil around the accumulator gas bolt D.
- k. Place the accumulator cap G.

SETTING OF NITROGEN GAS PRESSURE.

MODEL	A	B
HR90	943psi(65bar)	870psi (60bar)



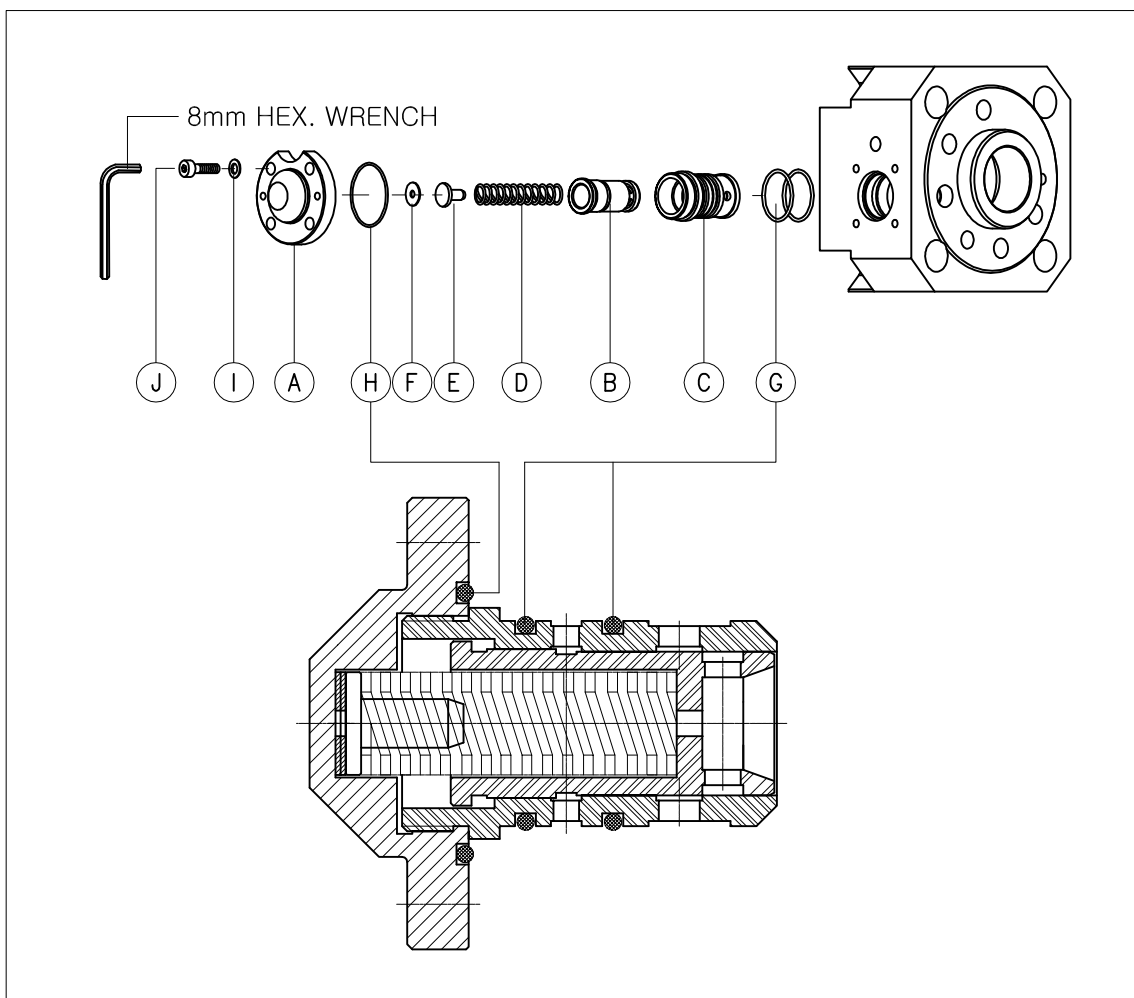
5-9. Removal and installation valve housing

1) Removal

- a. Loose operating cover bolt and J, I by using 8mm hex. wrench.
- b. Remove G, H
- c. After disassembling A, C firstly, later on, disassemble B, D, E and F as one by one.

2) Installation

- a. Put shimplate which need to adjust oil pressure into the center hole inside operation valve cover.
- b. Put B, D and E inside C as drawing.
- c. Assemble above "a" ass'y and above "b" ass'y by manual.
- d. After put new o-ring H, G to each o-ring groove, apply grease on o-ring surface. And assemble valve housing.
- e. After greasing to the surface of operating valve cover bolt, fix the bolt by 8mm hex. wrench.



5-10. Loosening and tightening side rods

1) Loosening

- Remove the accumulator set.
- Remove the rubber rings A (4 pcs) and the lock washers B (8 pcs).
- Mark each side rod C and its nut D as pairs.
- Remove the nut D, do the not turn nuts D up side down.

2) Tightening

- Use a crack detecting equipment to check if there are any cracks on side rods.
If there are, change the side rod and its nut.

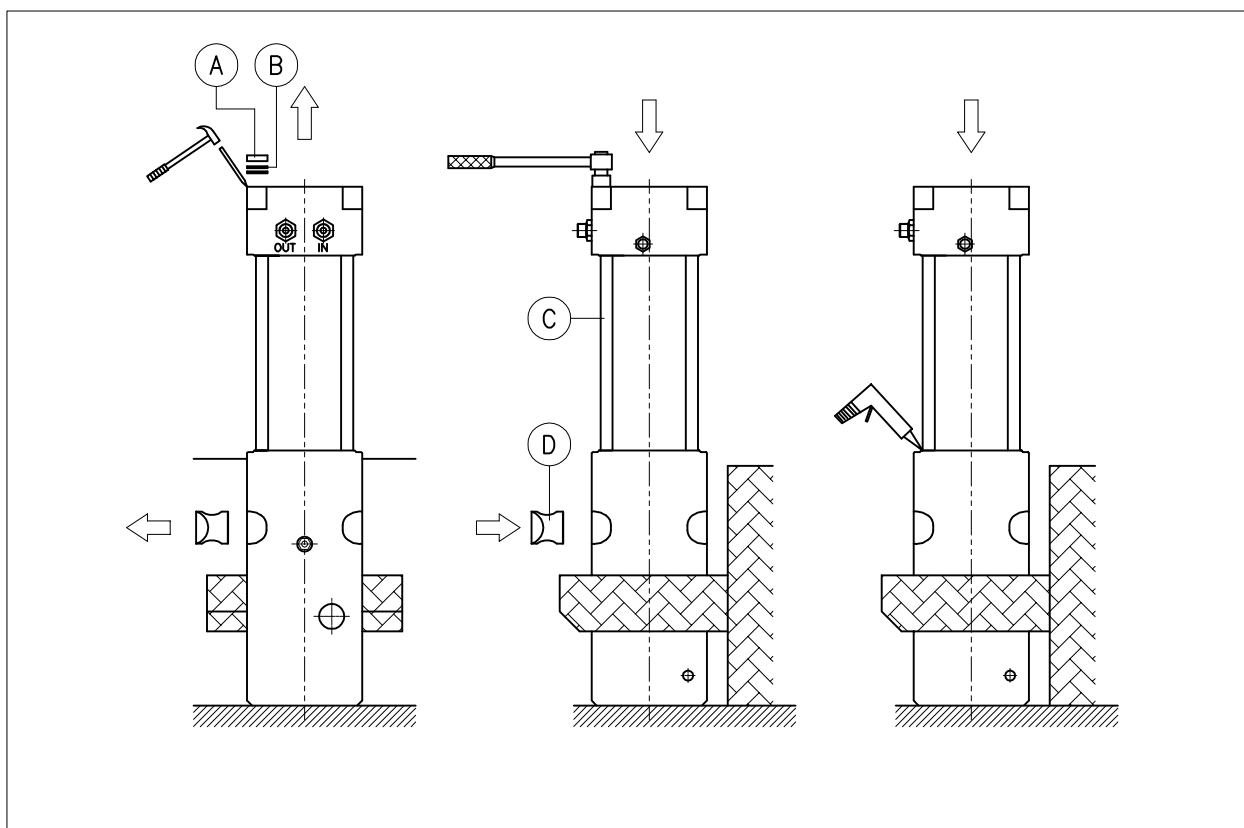
- Clean the side rods and apply thread grease to the screw threads and the contact surface of the side rods and valve housing.
- Install side rods C.
Check that each side rod has the correct nut as its pair. Do not turn nuts D upside down.
- Using a torque wrench, tighten the nuts in three or four steps.
- Install the lock washer B is not loose for avoiding the looseness of the side rods.
Install rubber ring A.
- Fill the groove between the side rods and the front head with silicon compound.

* Hydraulic Hammer Side Rod Tightening Torque.

TORQUE(N.M) MODEL	1st	2nd	3rd
HR90	150	300	600

* Side Rod Hexgon Socket Size.

MODEL	HR90
SIZE	27 mm



5-11. Disassembling and assembling cylinder

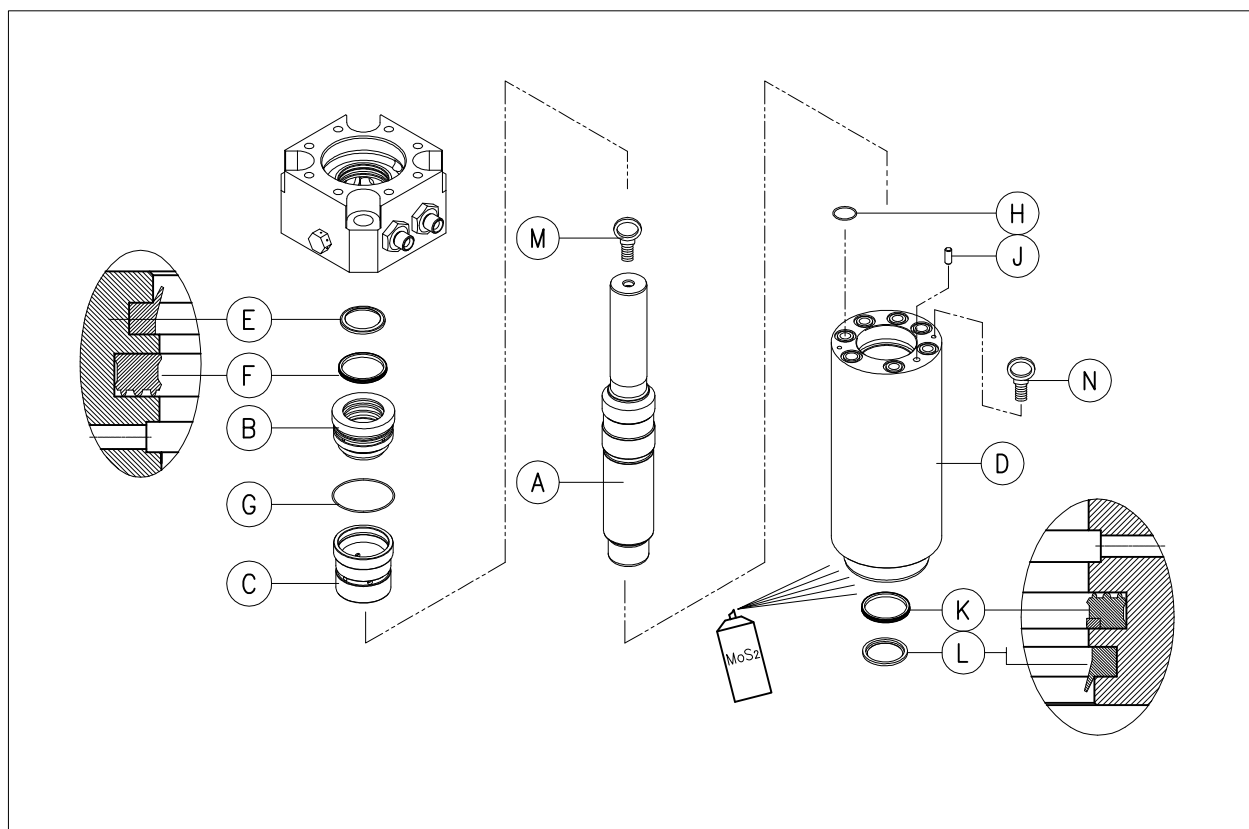
1) Disassembling

- a. Remove the accumulator set and side rods.
- b. Remove valve housing.
- c. Install the screw M12 lifting eye bolt M in the tap hole of piston A and lift them carefully out with seal housing B and distributor C.
- d. Install the screw M10 eye bolt N (2 pcs) in the tap hole of cylinder D and carefully remove in the front head.
- e. Remove from the seal housing seal F, wiper E, and o-ring G.
- f. Remove from the cylinder D guide pin J, seal K, wiper L, and o-ring H.

2) Assembling

- a. Check the condition of the piston A, seal housing B, distributor C, and cylinder D.
If necessary, use fine emery cloth or grinding agent. Clean and oil parts carefully.

- b. Install the new seal K and wiper L into the cylinder.
- c. Install the M10 lifting eye bolt N (2 pcs) into the hole of the cylinder and move it from end. And install it into the front head.
Apply Mos2 spray on the contact surface of the cylinder D, front head.
Fit guide pin J, o-ring H in place.
Apply some o-ring grease on the o-ring.
- d. Install the M12 lifting eye bolt M in the tap hole of piston A and install the piston A and cylinder D.
Apply some grease on the contact surface of the piston A and the cylinder D.
- e. Install the distributor C into the cylinder.
Apply Mos2 spray on the contact surface of the distributor C and the cylinder D.
- f. Install seal F, wiper E and o-ring G in place.
Apply Mos2 spray on the contact surface of the cylinder D and valve housing.
- g. Install the side rods and accumulator set.



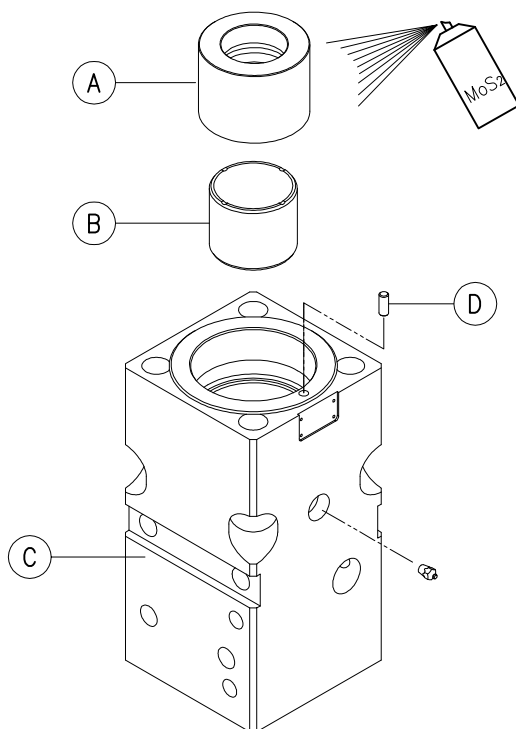
5-12. Disassembling and assembling front head

1) Disassembling

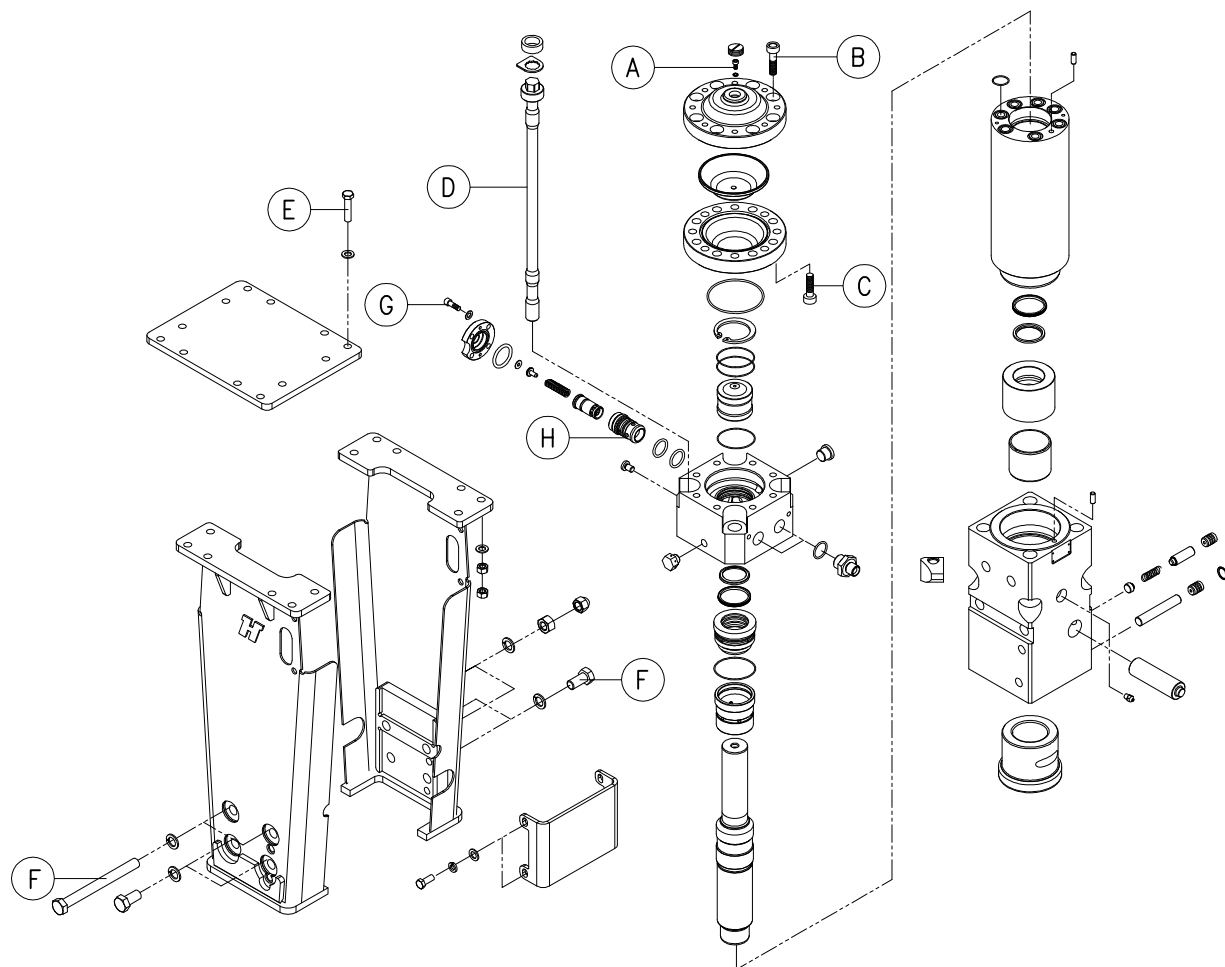
- a. Remove accumulator ass'y, side rods, valve housing, piston, seal housing, distributor, cylinder.
- b. Remove the thrust ring A and the upper bushing B. (the upper bushing B will wear only two sides. If the biggest diameter is 2mm (0.079 in) more than the standard specification, the upper bushing has to be rejected.)
Using the sleeve puller, pull the upper bushing out. If the upper bushing is tight, warm the under parts of the front head C.
Standard inside diameter of upper bushing.
- c. Remove guide pin D.

2) Assembling

- a. Check the condition of thrust ring A, upper bushing B and front head C. If necessary, use fine emery cloth or grinding agent. Clean and oil/grease parts carefully.
- b. Check upper bushing B for wear.
- c. If necessary frozen the upper bushing B, apply some loctite 275 on the outside of it, and install it into the front head C.
- d. Install the upper bushing B so that the grooves are upwards.
- e. Install the thrust ring A.
Apply Mos2 spray on the contact surface of thrust ring A and front head C.
- f. Install the guide pin D.
- g. Install cylinder, piston, distributor, seal housing, valve housing, side rods and accumulator set.



5-13. Torques



ITEM	N.m	kg.m	ft.lb	Remarks	Q'ty
A	20	2	15	Accumulator gas bolt	1
B	300	31	221	Accumulator cover bolt	8
C	250	26	184	Accumulator bottom bolt	8
D	600	61	443	Side rod	4
E	300	31	221	Top cover bolt	12
F	850	87	627	Front head joint bolt	6
G	80	8	58	Operating valve cover bolt	4
H	30	3	22	Operating valve guide	1

5-14. Workshop tool list

PART NAME	SPECIFICATION	Q'TY	REMARK
GAS CHARGING DEVICE	–	1	
ADAPTER	–	1	
CONNECTION WRENCH	–	1	
O-RING	1BP 18	1	
TORQUE WRENCH	100 – 770 N.m	1	
PRESSURE GAGE	100 BAR	1	
	250 BAR	1	
LIFTING CHAIN BLOCK	–	1	
WORKING TABLE	–	1	
GREASE GUN	–	1	

PART NAME	SPECIFICATION	Q'TY	REMARK
L-WRENCH	6 mm	1	
	8 mm	1	
	12 mm	1	
	14 mm	1	
SPANNER	24 mm	1	
	27 mm	1	
	32 mm	1	
	38 mm	1	
EYE BOLT	M10 X 1.5	2	
	M16 X 1.75	2	
	M18 X 2.5	2	
HOOK	M28 X 1.5	1	
HEX. SOCKET	24 mm	1	
	27 mm	1	
	32 mm	1	
	36 mm	1	
GAS CHARGING DEVICE	BOSCH / HYDAC	1	
TORQUE WRENCH	100 – 770 N.m	1	

6. TROUBLE SHOOTING GUIDE

6.1 Hammer does not start

PISTON IS IN ITS LOWER HYDRAULIC BREAKER

- Keep the hammer control valve open and force the tool against the object.
The tool head will push the piston out of its area.

HAMMER CONTROL VALVE DOES NOT OPEN

- (When operating the hammer control valve, check that the pressure line pulsation this indicates the hammer control valve is opened.) (If the valve does not operate, check the operating means : mechanical connections, pilot pressure or electrical control.)

RELIEF VALVE IN HYDRAULIC CIRCUIT IS OPENED AT A LOW PRESSURE.

- Check the installation. Check the relief valve operation. Adjust the relief valve in hydraulic circuit. Measure the high pressure in the hammer inlet line.

LEAKAGE FROM RETURN LINE IN CARRIER HYDRAULIC CIRCUIT.

- Check the installation. Check the pump and the other hydraulic components.

PRESSURE AND RETURN HOSES INSTALLED BACKWARDS

- Change the pressure and return hoses.

FAILURE IN HAMMER VALVE OPERATION

- The hammer must be serviced in an authorised HAMMEROC service shop.

PISTON FAILURE

- The hammer must be serviced in an authorised HAMMEROC service shop.

6.2 The hammer operates irregularly but the blow has full power

RELIEF VALVE IN HYDRAULIC CIRCUIT OPENS AT A LOW PRESSURE.
HAMMER OPERATING PRESSURE IS NOT REACHED

- Check the installation. Check the relief valve operation. Adjust the relief valve in hydraulic circuit. Measure the high pressure in the hammer inlet line.

FAILURE IN HAMMER VALVE OPERATION

- The hammer must be serviced in an authorized HAMMEROCC service shop.

NOT ENOUGH FEED FORCE FROM THE CARRIER

- Refer to correct working methods.

6.3 Hammer operates poorly and blow has no power

RELIEF VALVE IN HYDRAULIC CIRCUIT OPENS AT A LOW PRESSURE.
HAMMER OPERATING PRESSURE IS NOT REACHED

- Check the installation. Check the relief valve operation. Adjust the relief valve in hydraulic circuit. Measure the high pressure in the hammer inlet line.

PRESSURE LOSS IN THE ACCUMULATOR

- The hammer must be serviced in an authorized HAMMEROCC service shop.

THE WORKING METHOD IS NOT CORRECT

- Refer to correct working methods.

PRESSURE CONTROL VALVE SETTING IS INCORRECT

- The hammer must be serviced in an authorized HAMMEROCC service shop.

6.4 Impact rate slow down

OIL OVERHEATED (over 176°F/80°C)

- Check for a fault in the oil cooling system or an internal leakage in the hammer. Check the hydraulic circuit of the carrier. Check the relief valve operation in the carrier. Check the line size. Assemble an extra oil cooler.

RELIEF VALVE IN HYDRAULIC CIRCUIT OPENS AT A LOW PRESSURE.
HAMMER OPERATING PRESSURE IS NOT REACHED

- Check the installation. Check the relief valve operation. Adjust the relief valve in hydraulic circuit. Measure the high pressure in the hammer inlet line.

LEAKAGE FROM RETURN LINE IN CARRIER HYDRAULIC CIRCUIT

- Check the installation. Check the pump and the other hydraulic components.

PRESSURE LOSS IN THE ACCUMULATOR

- The hammer must be serviced in an authorized HAMMEROCC service shop.

FAILURE IN HAMMER VALVE OPERATION

- The hammer must be serviced in an authorized HAMMEROCC service shop.

HYDRAULIC VISCOSITY IS TOO LOW

- Check hydraulic oil.

6.5 Oil overheats

RELIEF VALVE IN HYDRAULIC CIRCUIT OPENS AT A LOW PRESSURE.
HAMMER OPERATING PRESSURE IS NOT REACHED

- Check the installation. Check the relief valve operation. Adjust the relief valve in hydraulic circuit. Measure the high pressure in the hammer inlet line.

LEAKAGE FROM RETURN LINE IN CARRIER HYDRAULIC CIRCUIT

- Check the installation. Check the pump and the other hydraulic components.

INTERNAL OIL LEAK IN THE HAMMER

- The hammer must be serviced in an authorized HAMMEROCC service shop.

HYDRAULIC VISCOSITY IS TOO LOW

- Check hydraulic oil.

COOLING CAPACITY OF THE FACTORY OIL COOLER IS TOO LOW

- Assemble an extra oil cooler.

7. GENERALS AND SAFETY INFORMATIONS

7-1. General

Do not use or install the breaker until you can use the carrier. Do not rush the job of learning.

Take your time and learn safety.

- * If there is anything you do not understand, ask your HAMMEROC service center for advice.
- * The breaker serial number is stamped on a metal plate, which is on the backhead, nearby the inlet connection.
- * Correct reference to the serial number of the breaker is important in case of repairs or ordering spare parts. Identifying parts for specific breaker is possible only through serial number.

7-2. Safety

1) Manuals

- a. Read this manual before installing, operating or maintaining the breaker. If there is anything you HAMMEROC don't understand, ask your employer or your dealer to explain it.
- b. Keep this manual in good condition.

2) Clothing

- a. You can be injured if you do not wear proper clothing. Loose clothing can get caught in the machinery.
Wear protective clothing to suit the job.
Example are : a safety helmet, safety shoes, safety glasses, well-fitting overalls, ear-protectors and industrial gloves.
Keep cuff fastened.

3) Work site

- a. Inspect the site before working on it.
- b. Check for potholes, weak ground, hidden rocks etc.
- c. Check for utilities(electric cables, gas and water pipes etc.)

4) Metal splinters

- a. You can be injured by flying splinters when driving metal pins in and out.
- b. Always wear safety glasses.

5) Accumulator

- a. The accumulator is pressurized even when there is no hydraulic pressure in the breaker.
- b. Attempting to dismantle pressure accumulator without first releasing the pressure can cause serious injury.
- c. Do not try dismantle pressure accumulator, contact your HAMMEROC service center first.

6) Hydraulic pressure

- a. Hydraulic fluid at system pressure is dangerous.
- b. Before disconnecting or connecting hydraulic hoses, stop the carrier engine and operate the control to release pressure trapped in the hoses.
- c. Keep people away from the hydraulic hoses during breaker operation.

Regulation and laws

- * Observe all laws, work-site and local regulation which affect you and your equipment.

Practice

- * You and others can be seriously injured if you carry out unfamiliar operations without practicing them first.
- * Practice away from job-site, on a clear area.
- * Keep other people away.
- * Do not perform new operations until you are sure you can do them safely.

Equipment condition

- * Defective equipment can injure you or others.
Do not operate equipment which is defective or has missing parts.
- * Make sure the maintenance procedures in this manual are completed before using the equipment.

Equipment limits

- * Operating the equipment beyond it's design limits can cause damage. It can also be dangerous.
- * Do not operate the equipment beyond it's limits.
- * Do not try to upgrade the equipment's performance by non-approved modifications.



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