HTM

CONSTRUCTION EQUIPMENT ATTACHMENTS

HTM HYDRAULIC ROCK BREAKER

OPERATION MANUAL, INSTALLATION, MAINTENANCE & PART BOOK

HTM

CONSTRUCTION EQUIPMENT ATTACHMENTS

HTM SERIES HYDRAULIC ROCK BREAKER SPECIFICATION

HTM BRAND HYDRAULIC ROCK BREAKER MODEL	Imapact Rate	Working Pressure	Required Oil Flow	Back-Head Pressure	Accumulator Pressure	Noise 85db(A) Disstance	Hose Diameter	Chisel Diameter	Chisel Length	Applicable Excavator
	b.p.m	Kg / Cm2	L / Min	Mpa	Mpa	m	inch	mm	mm	Ton
HTM 680	400-800	120-150	50-90	1.4 ~ 1.7		6 ~ 12	½	68	750	6-9
HTM 750	400-800	120-150	50-90	1.4 ~ 1.7		6 ~ 12	½	75	750	6-9
HTM 1000	350-700	150-170	80-110	1.4 ~ 1.7		7 ~ 14	¾	100	1050	11-16
HTM 1400	350-550	160-180	100-140	1.6 ~ 1.9		16 ~ 25	1	140	1300	18-21
HTM 1400 A	350-550	160-180	100-140	1.6 ~ 1.9	5.5 ~ 6.0	16 ~ 25	1	140	1300	18-21

HTM "Series"

Our Hydraulic Rock Breaker Features:

Available for 0.5 - 55 Ton machines

Noise Reduction Technology

1 Year Warranty as per guidelines

Meets all quality standards

24/7 Service and parts service

Contact Us

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HTM HYDRAULIC ROCK BREAKER

OPERATION MANUAL INSTALLATION, MAINTENANCE & PART BOOK

HYROTECH MINING & DRILLING PVT. LTD.,

⚠ DANGER

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

Model	
Serial Number	
Year of Construction	

⚠ DANGER

DO NOT OPERATE THE BREAKER UNLESS THE FOLLOWING SAFETY INSTRUCTIONS HAVE BEEN THOROUGHLY READ AND UNDERSTOOD! READ THIS MANUAL BEFORE INSTALLING, OPERATING OR MAINTAINING THIS EQUIPMENT.

- Flying debris form the hydraulic breaker or other material may cause serious or fatal injury to the operator, Personal protection equipment must be used.

- Flying debris hydraulic breaker or other materials may cause serious or fatal injury to bystanders.
  Never operate the grab when bystanders are in the working area.

- On machines/carriers, the hydraulic breaker can enter the operator's compartment under specific hydraulic breaker position.
  Make sure that suitable impact shields are used when operating the hydraulic breaker with this type of equipment.

- Do not operate the breaker unless all safety decals described in this manual are in place.
  The decsls must be inspected periodically to ensure that all wording is legible.
  The decals must be replaced if illegible.
  Replacement decals can be obtained from your authorized HTM Distributor.

- The hydraulic breaker will become very hot during operation.
  Allow time for hydraulic breaker to cool down before touching hydraulic breaker parts.

- If this machine is transferred, be sure to attach this manual to machine.

- For safety, common items are described "SAFETY PRECATUIONS", and others are mentioned in the succeeding pages.

PREFACE | *" HTM " Series - Hydraulic Rock Breaker*

Hydrotech Mining and Drilling Private Limited wishes for dealing with "HTM" Series silenced type Hydraulic Rock Breaker for your suitable Hydraulic Excavator as an attachment Tool.

This service manual has been designed to help you achieve the maximum performance from your HTM Series model Hydraulic Rock Breakers. In this Manual Book inside you will find a full details of your model choice breaker diagram and parts list.

The HTM Hydraulic Breaker designed and built to provide durable operation under any working conditions, has been developed by HTM Company with excellent engineering techniques with accumulated experiences for many years.

HTM stresses that in the event of a breakdown, only genuine HTM parts should be used. This not only ensures that you receive high quality equipment along with maximum efficiency of the Hydraulic Rock Breaker, but that all the parts are under standard guarantee as per "Warranty Guide Lines". If, however, any repairs are made using parts made elsewhere, HTM will not accept responsibility for the failure of the breaker and are not liable for the life of the breaker.

If you have any further queries, please do not hesitate to contact our Head office / Technical team staff will be happy to assist you further.

HYDROTECH MINING AND DRILLING PVT LTD

HTM SERIES HYDRAULIC HAMMER PARAMETER

BREAKERR MODEL - HTM SERIES	ROD PIN Diameter	ROD PIN Length	Imapact Rate	Hose Diameter	Back-Head Pressure	Accumulator Pressure	Applicable Excavator	Required Oil Flow	Working Pressure	Noise 85db(A) Disstance
In Units										
Model	mm	mm	Beats per Minute (BPM)	inch	Mega Pressure Unit (Mpa)	Mega Pressure Unit (Mpa)	Ton	Liters / Min	Kg / Cm2	Decibels (dB)
HTM 680	68	750	400-800	½	1.4 ~ 1.7	—	6-9	50-90	120-150	6 ~ 12
HTM 750	75ϕ	750	400-800	½	1.4 ~ 1.7	—	6-9	50-90	120-150	6 ~ 12
HTM 1000	100ϕ	1000	350-700	¾	1.4 ~ 1.7	—	11-16	80-110	150-170	7 ~ 14
HTM 1400	140ϕ	1300	350-550	1	1.6 ~ 1.9	—	18-21	120-140	160-180	16 ~ 22
HTM 1400 A	140ϕ	1300	350-550	1	1.6 ~ 1.9	5.5 ~ 6.0	18-21	120-140	160-180	16 ~ 22
HTM 1650	165ϕ	1600	250-400	1 ¼	1.8 ~ 2.1	5.5 ~ 6.0	30-45	200-260	160-180	35 ~ 40
HTM 1800	180ϕ	1650	150-250	1 ¼	2.5 ~ 2.8	5.5 ~ 6.0	40-60	280-330	160-180	40 ~ 48
www.htmspares.com										

HTM HYDRAULIC ROCK BREAKER

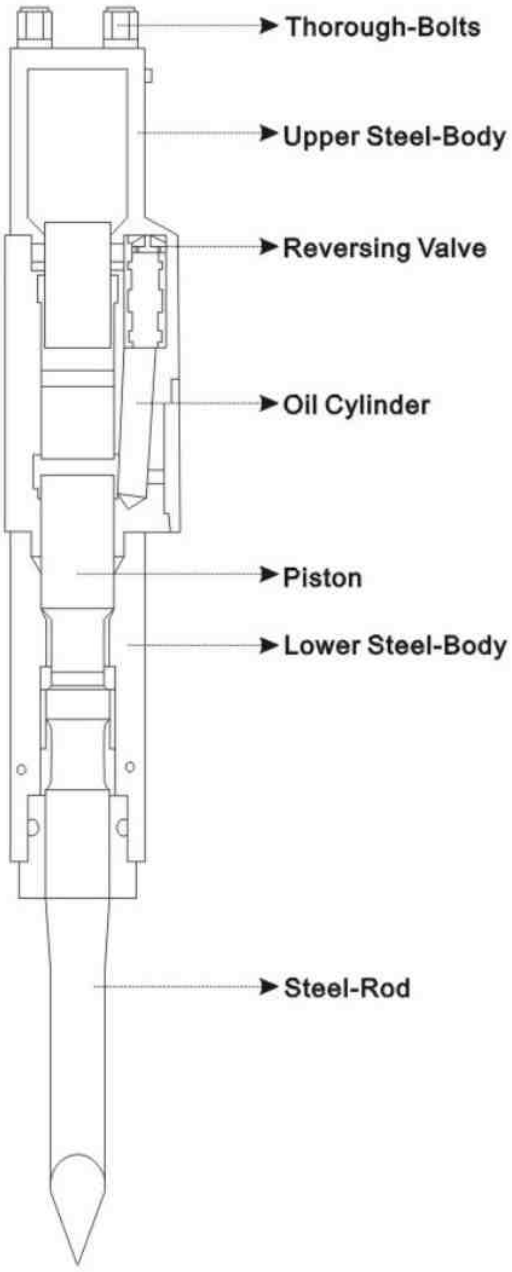
HTM Hydraulic Rock Breaker

Our Hydraulic Rock Breaker Features:

- Available for 0.5 - 55 Ton machines
- Noise Reduction Technology
- 1 Year Warranty as per guidelines
- Meets all quality standards
- 24/7 Service and parts service

HTM

Structure&Main Parts of Breaking Hammer



- **Thorough-Bolts**
  The four bolts connecting the upper steel-body, breaker cylinder and lower steel-body together.

- **Upper Steel-Body**
  It is mainly used for storing nitrogen.

- **Reversing Valve**
  It controls piston to move up and down at certain frequency.

- **Oil Cylinder**
  As the heart of the breaker, it includes hydraulic circulating system to control reciprocation of the piston.

- **Piston**
  It converts hydraulic kinetic energy into that of striking, to strike the rod for breaking purpose.

- **Lower Steel-Body**
  It supports the oil cylinder and fixes the rod to prevent oil cylinder from being damaged due to the counter-vibration force during striking.

- **Steel-Rod**
  The rod has received special strengthening treatment to bear the friction from direct striking.
  Optional parts are available as per each real case: ①plane type ② "type ③pyramid type.

Warning on the Side-Panel

All safety instructions and danger warnings must be completely and clearly indicated on the equipment.

Make sure that safety instructions and danger warnings are visible on the equipment, which is the responsibility of the owner and operator of the equipment; immediate measures should be taken should the above indications be damaged or not clear.

One must wear earplugs or keep above 7.5m away from operating zone. Human sense of hearing may be injured in case of over 85dB.

One should stay more than 20M away from operating zone to prevent injury of shivers on humans during operation.

When nitrogen is discharged, the pressure burst forth from the nitrogen may result in blindness of the eyes.

The outpour of nitrogen, in case of being struck, may cause explosion.

Fig2–1

*This manual is about safe operation and maintenance of ***"H T M"*** breaking hammers.

*Read this manual carefully prior to installation, operation and maintenance of breaking hammers.

*Improper use of steel-rod can cause injury since it is a hazard.

*Ensure proper use of breaking hammer.

*Operation as described in Chapter 3 will offer you a safe use of breaking hammer.

*Special care should be taken for anything related to safety that may cause danger.

Warning

* Attention should be paid to any potential risks.
* Injury / Damage should be prevented or avoided.

Warning

* Safe working habit should be maintained.
* Careless use of breaking hammer may lead to human injury or equipment problems .

* You should be a skillful excavator operator to ensure proper use of breaking hammer. You are not allowed to use or install breaking hammer before you are able to use an excavator. Do not rush to how to operate. Spare time to learn about safety.
* Should you have any enquiry, please contact your HTM helpline- 24/7.
* Model numbers and product serial numbers of breaking hammer.
* This operation and maintenance manual of"H T M "breaking hammer is elaborately prepared for users.
* " HTM "breaking hammer is also designed to strike into pieces large rocks, dismantle buildings with reinforcing steel bar structure.
* The weight of"H T M" breaking hammer includes steel-rod and connecting-disc.
* The impact energy of breaking hammer is a constant, free from control of excavator's hydraulic system.
* Product serial numbers of breaking hammer is stamped on the valve close to longitudinal joint-body.
* The correct serial number is very important in case repairing or ordering spare parts is required; special breaking hammer may only be traceable by serial number for maintenance and confirmation of spare parts.

* Use of this manual
* This manual is to ensure your complete understanding and safe operation of breaking hammer, it also includes maintenance and technical parameters.
* You should read this manual for a complete understanding before operation or maintenance. Should you have any enquiry or anything not clear, please contact your "H T M" center -24/7. Do not take anything for granted.
* Read carefully all related to safety. Ensure careful and safe operation.

Warning

* Be careful and cautious.
* Take special care at any time of the operating handle each time you operate the breaking hammer. Guard against any risk.

Safety

*Any equipment may have danger due to any careless or improper operation of breaking hammer.
*Read and understand the warning message of this manual to avoid any injury. Should you have any enquiry, please consult your executive, "H T M" dealers, or A/S center.
*Safety is never anything to deal with warnings.
*You have to take into consideration the potential risks and how to avoid them when operating "H T M" breaking hammer.
*Never operate a breaking hammer if you are not very sure about operation.
*Never start or operate a breaking hammer unless you are sure of a safe and reliable environment.
*Never make a reckless operation before you are pretty sure of how to operate a "H T M" breaking hammer. Make a thorough check over the breaking hammer first.

Warning

* Read carefully the following warning messages. These will make you aware of risk and how to stay away from it.
* Injury could happen if proper prevention is not rendered.

1) Manual

a) Read this manual carefully prior to installation, operation and maintenance; should you have anything not clear, please consult your executive, "H T M" dealers, or A/S center for detailed information.
b) Please keep this manual clean.

2) Overalls

a)You must put on protective overalls to avoid any possible injury. Too loose clothes may be stuck into machine. E.g, you have to wear helmet, safety goggles, earplugs, safety shoes, fitted overalls, gloves and mask.
b)Never use a necktie or a scarf. Wind up your long hair.

* Hoisting equipment.
* Injury may occur due to improper operation of a hoisting equipment.
* Make sure the hoisting equipment is in good condition.
* Make sure the hoisting equipment conforms to the local legal regulations and your operation requirements.
* Ensure that there is enough performance strength with the hoisting equipment and understand how to use the hoisting equipment.

Warning

* Read carefully the following safety messages. Neglect of thefollowing safety practice will cause injury of operator or related personnel, and lead to errors with equipment.

◆ Laws and Regulations◆

* Use of the equipment should follow local laws and regulations.

◆ Practice ◆

* You may cause serious injury to yourself or others if you start operation you are not familiar with without due practice.
* Practise on a piece of clean and flat ground, away from operating field.
* Make sure you are able to make safe operation for any new operation.

◆ Status of Equipment◆

* A breaking hammer with defect may result in injury to you and others.Never operate or use a breaking hammer with defect or any part missing.
* Follow the operation procedure of this manual strictly before use of this breaking hammer.

◆ Application Scope of Breaking Hammer◆

* Operation beyond the designed scope of breaking hammer is considered risky.
* Never operate a breaking hammer beyond the application scope.
* No refitting is allowed for the breaking hammer for purpose of improving performance, without permission.

3) Message delivering

a)Failure to deliver correct message may lead to an accident.

b)Personnel should keep watch around where you are operating.

c)Make sure your hand gesture can be understood while working with others.

d)Remember that loud noise often stays on the operating field. Never give an order by talking to each other.

4) Operating field

a)Operating field is risky.

b)Make an inspection to the operating field prior to any operation.

c)Check if there is any pothole, anything not firmly fixed, or hidden stone, etc.

d)Check and take care of the public facilities nearby the operation (like cables, air or water tubes, etc)

5) Crushed rocks and fragments

a)Fragments flying off during operation may hurt you.

b)You must wear safety goggles.

6) Hillocks and ditches

a)Collapse may happen due to operation at a hillock or ditch.

b)Never operate close to a hillock or ditch, which is risky and may cause a collapse.

7) Safety fence

a)It is very dangerous to operate in a public area without safety fence.

b)Set safety fence around breaking hammer to keep people from getting close whenoperating in a public area or where operator cannot have a clear sight.

Caution!

* Operate as required by safety regulations to avoid any potential risks.

Caution!

* Apply grease evenly to the breaking hammer when operating.
* Never operate the breaking hammer in water, which will cause malfunction.
* Take special care when lifting and delivering.

8) Maintenance

a)Never attempt any repairing or maintenance that you are clear of.

b)Never make any repairing or maintenance over breaking hammer without permission.Otherwise, injury or damage may occur.
Contact your "H T M" A/S center for consultation before any repairing or maintenance over a breaking hammer.

9) Accumulator

a)Some redundant high-pressure enters the accumulator when breaking hammer is working.

b)The accumulator can compensate the pressure required for breaking hammer even if hydraulic loop is in lack of pressure.

c)Never attempt to dismantle accumulator before pressure is discharged. Otherwise, serious injury/damage may occur.

d)Never attempt to dismantle accumulator with pressure.

10) Hydraulic system

a)The pressure flowing in the hydraulic oilway is very risky.

b)Turn off engine and discharge the remaining pressure inside the tube controlling operation before dismantling and connecting hydraulic oil tubes.

c)People concerned should keep away from hydraulic oil tubes while breaking hammer is working

Operating Principle

<Relation between pressure actions>

Pressure A_1 in the back cavity of piston is greater than that of A_2 in the front cavity; high-pressure oil always acts on cavity A_2. When oil pressure is working, the pressure of A_1 goes drops from a higher level, and vice versa. Piston C_2 is therefore reciprocating. Similarly, high-pressure cavity A_3 of valve < A_4, then high-pressure oil continuously acts on cavity $A_3$and A_4. Valve then moves to A_4, and vice versa. The shift of valve C_4 also changes pressure of piston's back cavity B_1 from high-pressure side to the low one and vice versa. Valve C_4 and piston C_2 are having the same reciprocation. Besides, the upper body is filled with nitrogen. When piston moves backward, the nitrogen is compressed and air-energy is stored. When piston is working, the air energy is then converted into kinetic energy of piston.

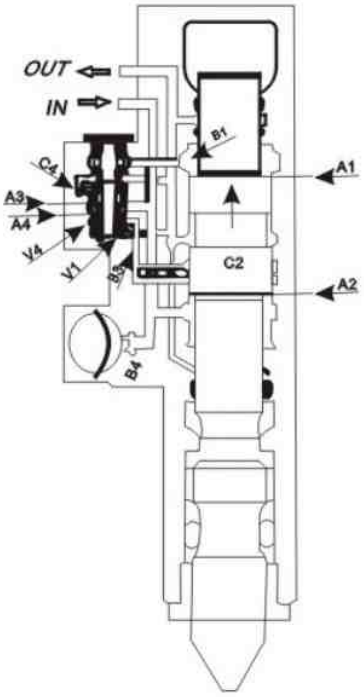


Fig 2–2

<Piston startup>

When high-pressure oil flows into the intake "IN" of hydraulic braking hammer, high-pressure oil will act on the front cavity A_2 of piston. High-pressure cavity V_1 will then control the valve. And when back-cavity B_1 is connected through "OUT" oil outlet and changed to low-pressure, high-pressure oil will act on the front cavity A_2 of piston, and piston C_2 will move backward. Meanwhile, the nitrogen in the upper body will then be compressed into air pressure and stored into accumulator C_5.

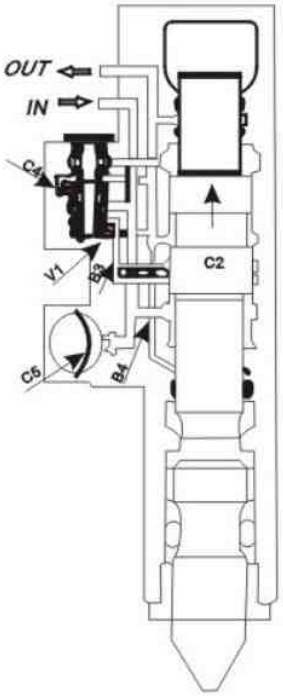


Fig 2–3

<Valve pressure filling>

When piston moves backward, back-cavity B_1 is connected with valve shift-port B_3, high-pressure oil will act on the change-cavity V_4 of the valve to effect changes over the valve.

In the mean time, back-cavity B_1 is disconnected from low-pressure cavity V_3 and is connected with high-pressure cavity of valve V_1. The pressure inside back-cavity B_1 will then be increased.

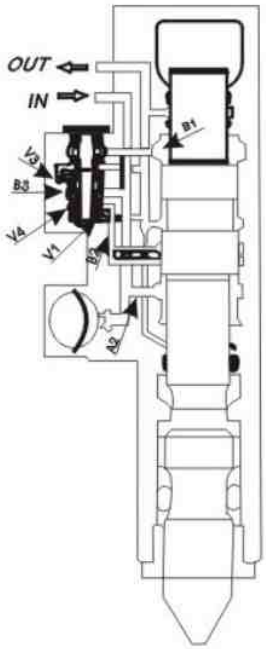


Fig 2–4

<Continuous striking of piston>

When piston C_2 reaches the dead point at the top, the high-pressure oil from high-pressure cavity of valve V_1 will continuously act on the back-cavity B_1, which will make a continuous striking of piston; meanwhile, the energy stored inside accumulator C_5 will then be converted into the energy of compressed air and enter the upper body. The effect of high-pressure oil of high-pressure cavity V_1 and change-cavity V_4 of the valve leads to the efficient turn-on of the valve.

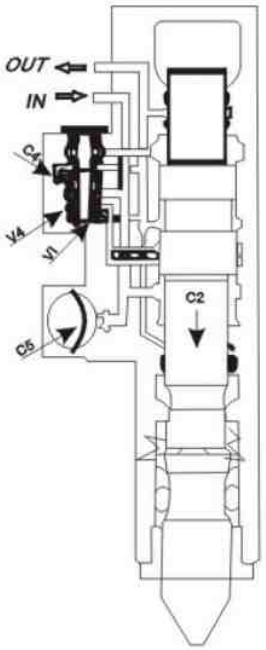


Fig 2–5

Precautions

- Protective shield against fragments should be installed in front of the driver's cab to prevent from any injury/damage due to shivers during operation.

- All personnel on site, including excavator driver, must wear earplugs and face-mask during the course of operation.

- The driver should operate the breaking hammer by sitting on the seat. Breaking hammer can only be used when both excavator and breaking hammer are in normal state.

- In case anyone enters the dangerous area of operation, stop the breaking hammer immediately; compared with excavator, the breaking hammer in operation may cause more possible injury to people with the fragments flying off.

- Operate excavator as required by manufacturer's safe operation regulations when operating with a breaking hammer. Ensure to use a well-installed and properly adjusted breaking hammer.

- Never operate a breaking hammer when reaction is shown due to drinking alcohol or taking drugs.

- Ensure stable working conditions and lower operating device when conducting maintenance and inspection/repairing.

3.1Proper Operation Mode

1) Appropriate Breakdown Power

To effectively break down, breaking hammer should be used with appropriate breakdown strength. If the breakdown strength is not strong enough, the hammering energy of piston will not effectively crush stones; the counterforce of this kind of hammering will be transferred to the hammer itself, the large and small arms of excavator, and will therefore damage these components.

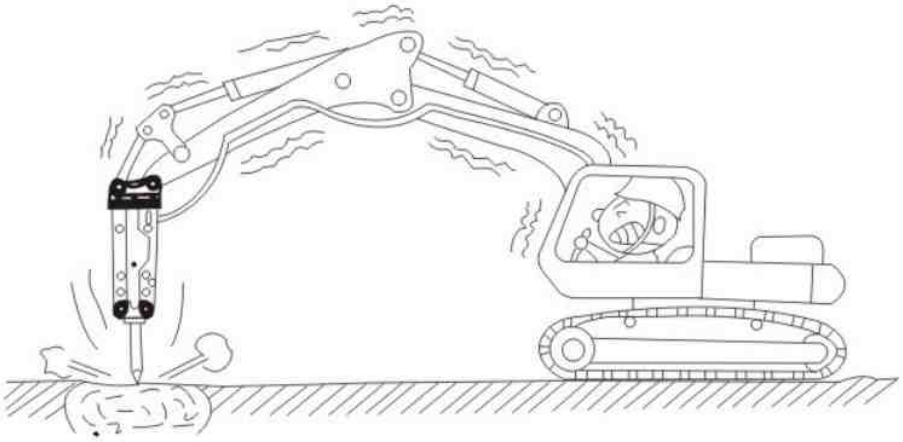


Fig 3–1

On the other hand, while lifting the large excavator arm, if using excessive breakdown strength during crushing operation, the machines may suddenly tilt during crushing stones, the fierce crash of hammer to the stones will cause severe damage to the hammer; if crushing under these circumstances, the vibration will spread to the caterpillar track of excavator, so in such a situation operation should be avoided in order to protect the track.

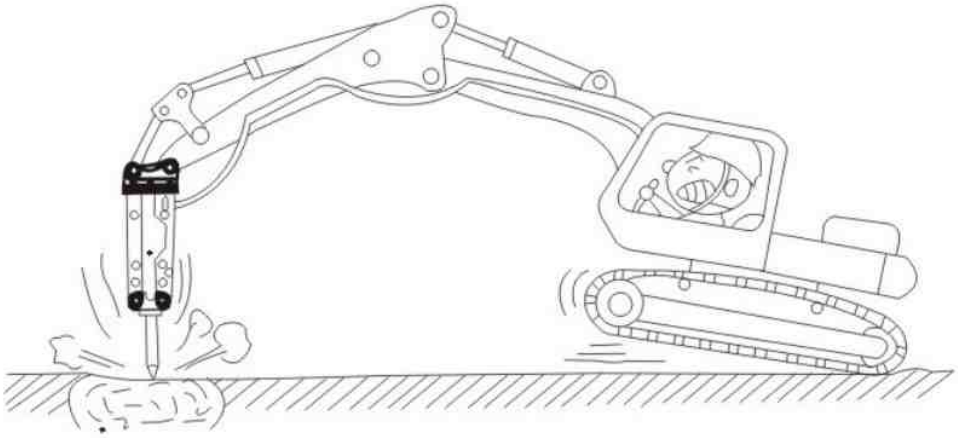


Fig 3–2

Therefore during striking period, attention must be paid to the breakdown strength of breaking hammer at all times. Do not operate if breakdown strength is not appropriate.

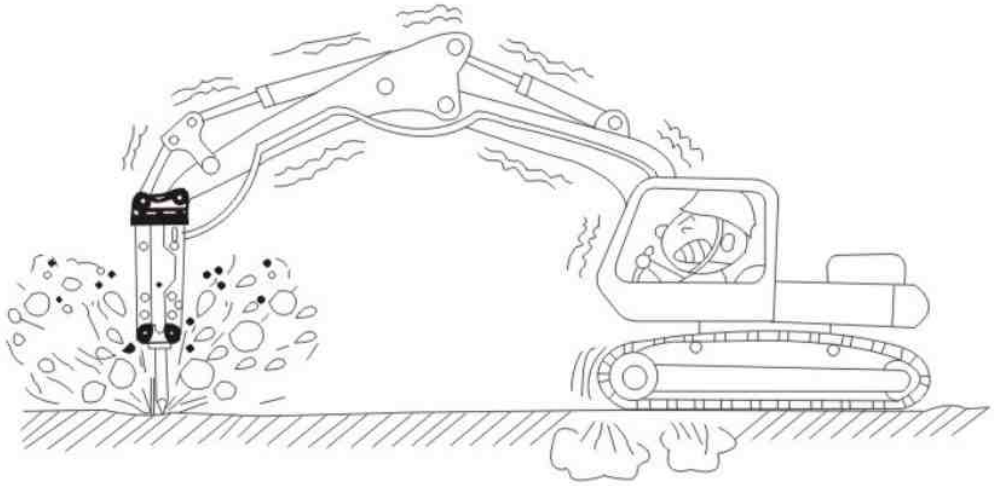


Fig 3–3

2) Breakdown Direction

Breakdown direction should be in a straight line with the steel-rod. When the steel-rod crushes rocks, it should maintain the vertical direction to carry on the work as much as possible. If hammering direction inclines, then during hammering operation, the steel-rod may slide, causing the steel-rod and piston broken or to get stuck. Therefore while carrying on crushing operation, breakdown points should be carefully chosen, in order to ensure the stable hammering.

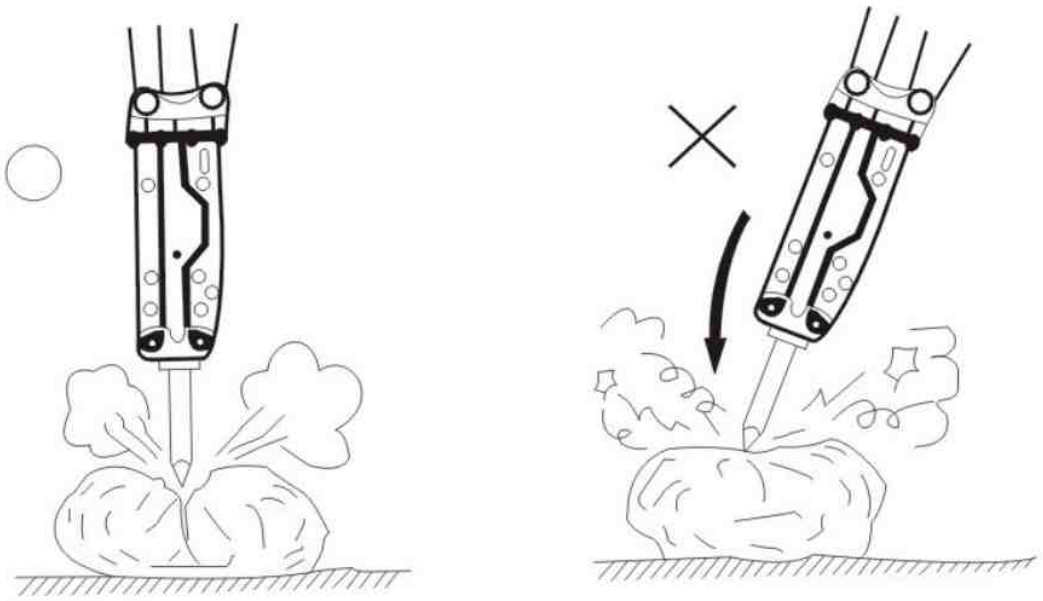


Fig 3–4

3) Precautionary Measures During Operation

During breaking hammer operation period, operators should pay attention to the followings:

a)Operation should be stopped if hoses are in severe vibration

Check if the vibration of high and low pressure hoses of breaking hammer is too drastic. If yes, it might be because the accumulator fails, you should immediately contact your local service office authorized by us to obtain repair service. You should further inspect if there is oil leaking at the hose joints, if so, re-tighten the joints. As illustrated by Figure 3-5, visual check if there is some allowance of the steel-rod during operation; if there is no allowance, it must be stuck in the lower body. Dismantle the lower body, check if the part needs repairing or the failed part needs replacing.

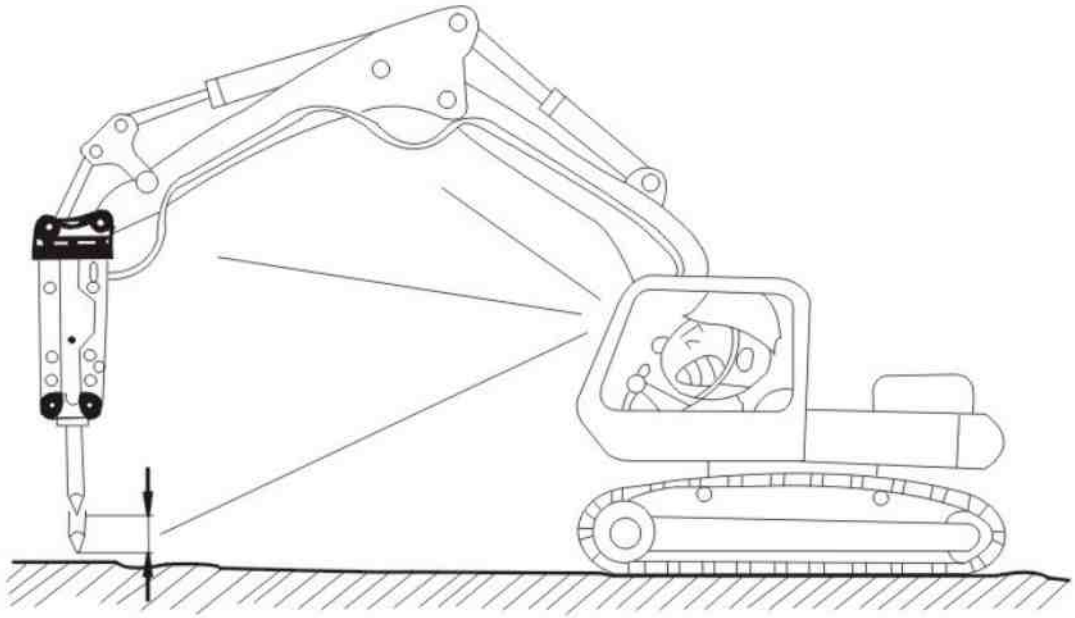


Fig 3–5

b)Stop operations (to avoid excessive empty strikes)

Stop hammering immediately once stones are crushed. If continuing the empty strikes, the accumulator might be damaged, bolts will be loosened or broken, even the excavator will be adversely affected. When using hammer with improper breakdown strength or using steel-rod as a pry bar, it will cause empty strikes. (The crushing sound will change when striking empty)

c)Breaking hammer can not be used to remove stones

As shown in Figure 3-6 and 3-7, do not use the end of steel-rod or the side of the support to roll or push stones. Because at that moment, oil pressure comes from large and small arms, bucket, swinging or sliding operations of excavator, therefore the large and small arms will be damaged. In the meantime, the bolts of breaking hammer may be broken, support may be damaged, and steel-rod may be broken or scratched; one should avoid using breaking hammer to move stones. In particular, excavator should never move when the steel-rod is inserted into the stones.

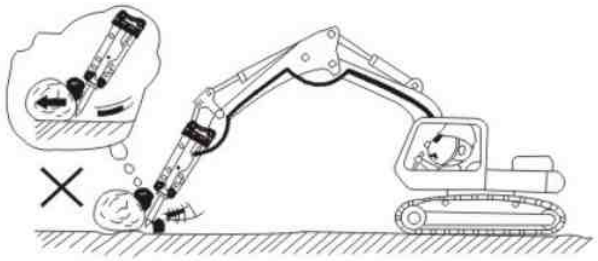


Fig 3–6

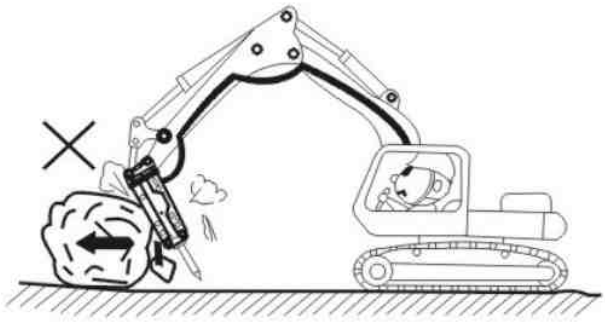


Fig 3–7

d)Never use steel-rod as a pry bar

As illustrated by the figure, if using steel-rod as a pry bar during crushing the stones, the bolts and steel-rod may break.

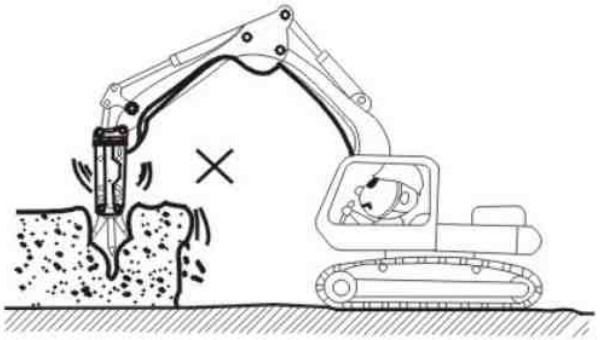


Fig 3–8

e)Do not strike continuously for more than one minute

When striking hard rocks, do not continue crushing the same place for over one minute, then change to another place. Prolonged operation will increase the oil temperature, which would lead to accumulator damage and excessive wearing of steel-rod.

f)For long and hard large stones, start crushing it from the end.

For those longer stones, one may start the crushing from cracks or their ends, which is relatively easy to break stones.

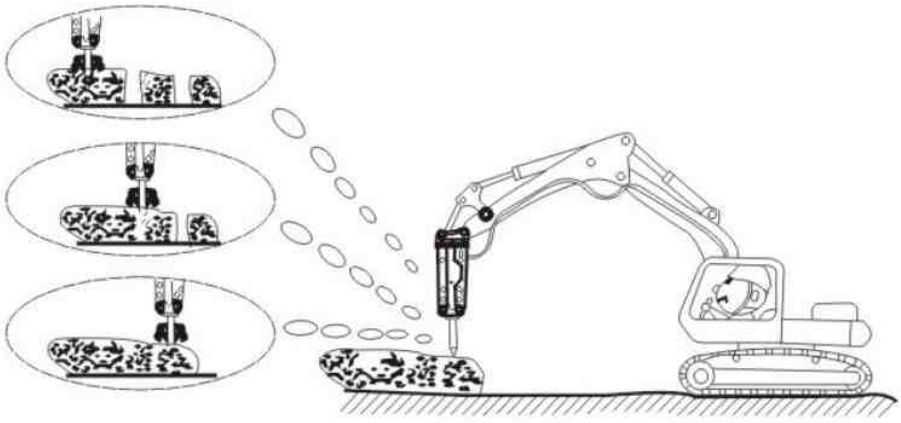


Fig 3–9

g)Breaking hammer should be operated at appropriate engine speed

During crushing operation, the engine speed should meet the required value; the engine speed over the operation requirement will not increase breakdown strength, but the raised oil temperature will lead to damaging equipment.

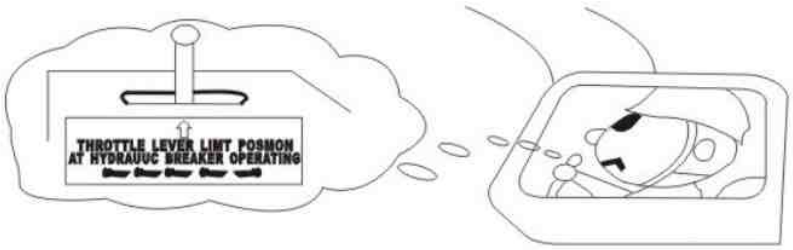


Fig 3–10

h)Breaking hammer could not work in water or mud

Do not use breaking hammer in water or mud; Otherwise, the piston or similar components may rust and lead to permanent damage. If in or under water operation is required, order special underwater breaking hammer.

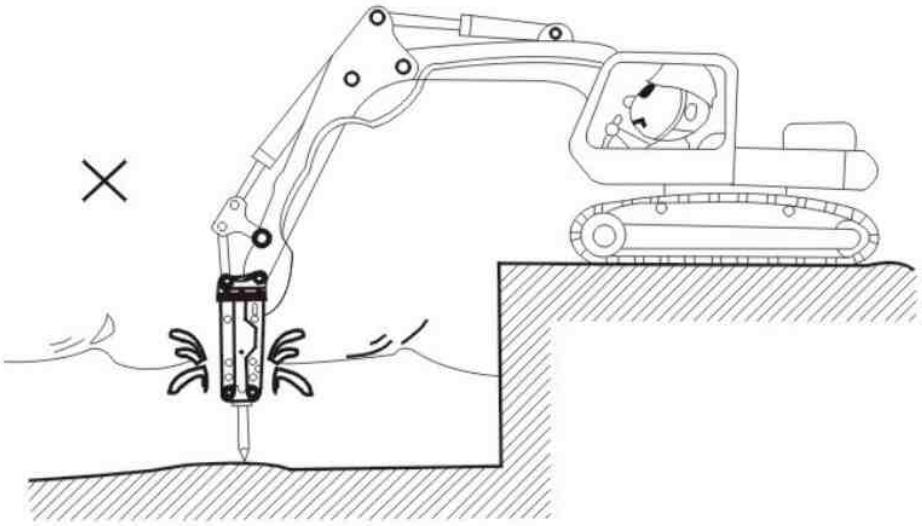


Fig 3–11

l)Do not allow breaking hammer to fall directly to crush stones.

If the breaking hammer falls directly to crush stones, hammer or excavator will bear too much power, which will easily damage excavator parts.

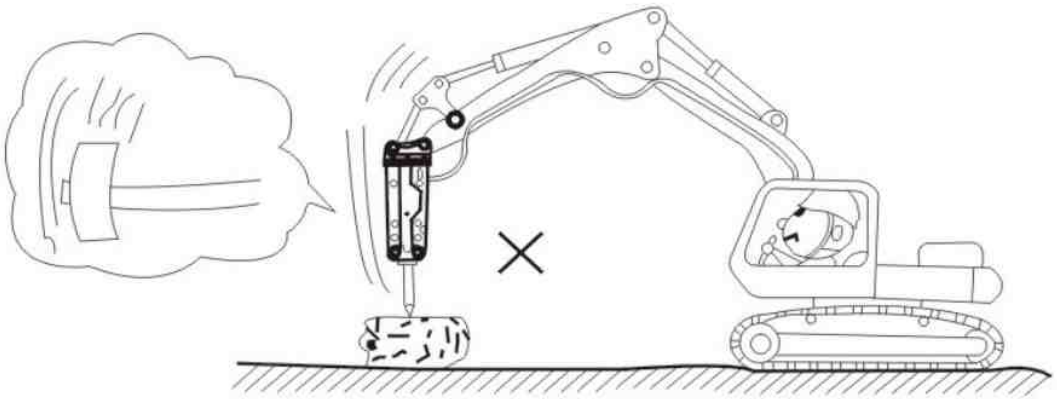


Fig 3–12

j)When oil cylinder rod on the excavator's large arm has its maximum stroke, do not start striking operation.

When oil cylinder rod has its maximum stroke (rod is fully extended or retracted), if Conducting crushing operation, it will damage oil cylinders and various components of excavator.

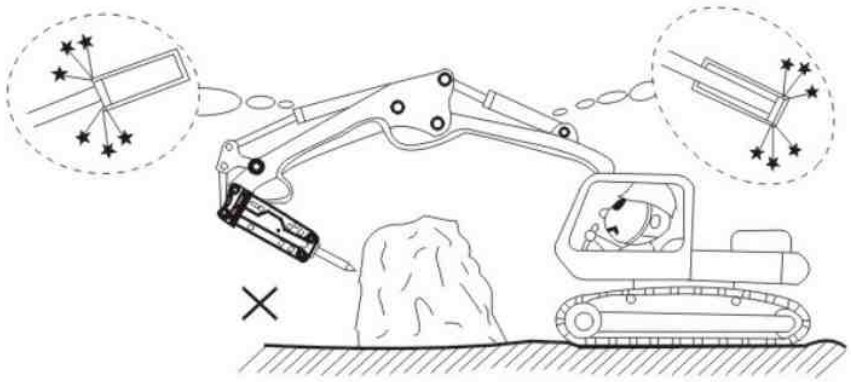


Fig 3–13

k) Do not use breaking hammer to hang objects

Do not tie ropes to the breaking hammer, supports and steel-rod to hang objects; this will easily damage the breaking hammer, supports and steel-rod, and this is also a very dangerous operation.

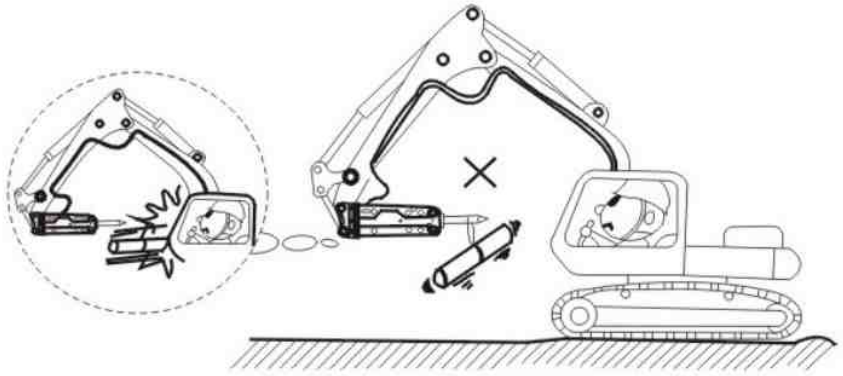


Fig 3–14

i)It is worth mentioning that in winter, the engine should be started for 5-20 minutes to warm up before operating the breaking hammer.

The engine should be preheated according to the maintenance instructions of excavator; if without engine preheating and operating crushing at low temperature, it could easily damage various parts of breaking hammer, such as piston and seals, etc.

Operating Temperature

Operating temperature should be between -20℃～80℃（-40F～1760F）

When temperature drops below -20℃(-40F), preheat the breaking hammer and steel-rod before hammer starts operations, in order to avoid damage to accumulator, rubber cup and steel-rod; breaking hammer must maintain a normal operating temperature during operation.

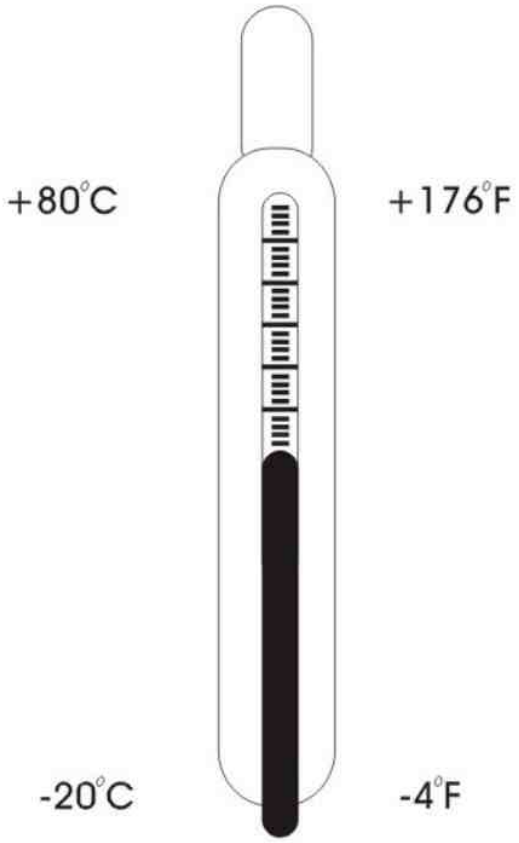


Fig 3–15

Important Notice

When the temperature is below -20℃, and hydraulic oil is in the state of low temperature, hydraulic breaking hammer should not be put into use; otherwise, it will lead to hammer's oil seal broken and the high pressure of accumulator will tear up the rubber cup. Pay attention to relevant provisions of excavator manufacturers.

Replacement time limits for steel-rod lower body wrap

If there is a bigger clearance between steel-rod and lower body wrap, it will cause irregular contacts of pistons and easily cause damage, even the steel-rod will be broken too.

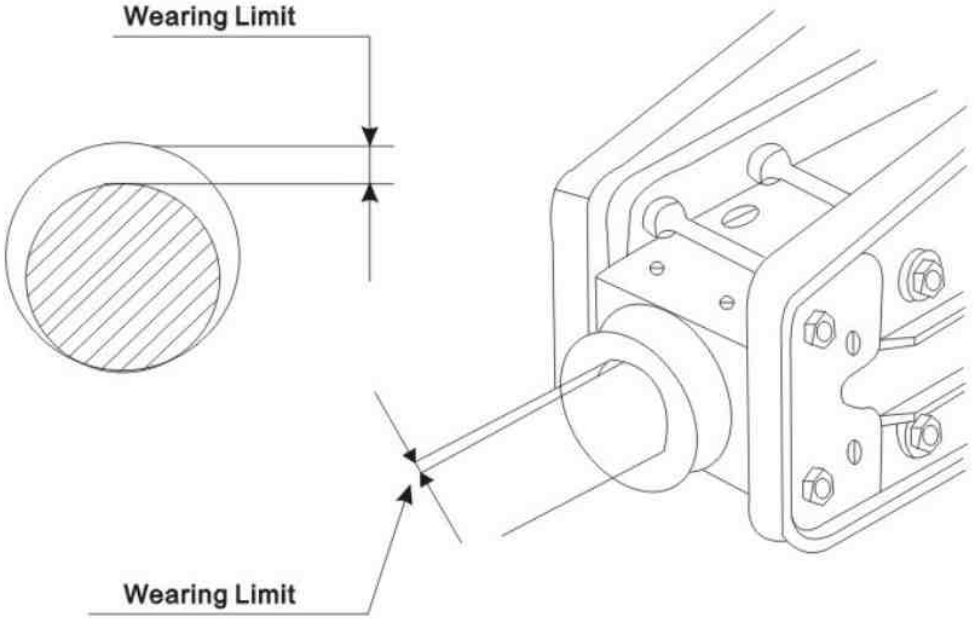


Fig 3–16

*Replacement Time Limit of Lower body （mm）

Parameters / Model	Dimensions		Wearing Limit (cm)
	Lower Wrap of Steel-Rod	Steel-Rod Diameter	
HTM1350	ϕ135	ϕ135	5
HTM1400	ϕ140	ϕ140	5

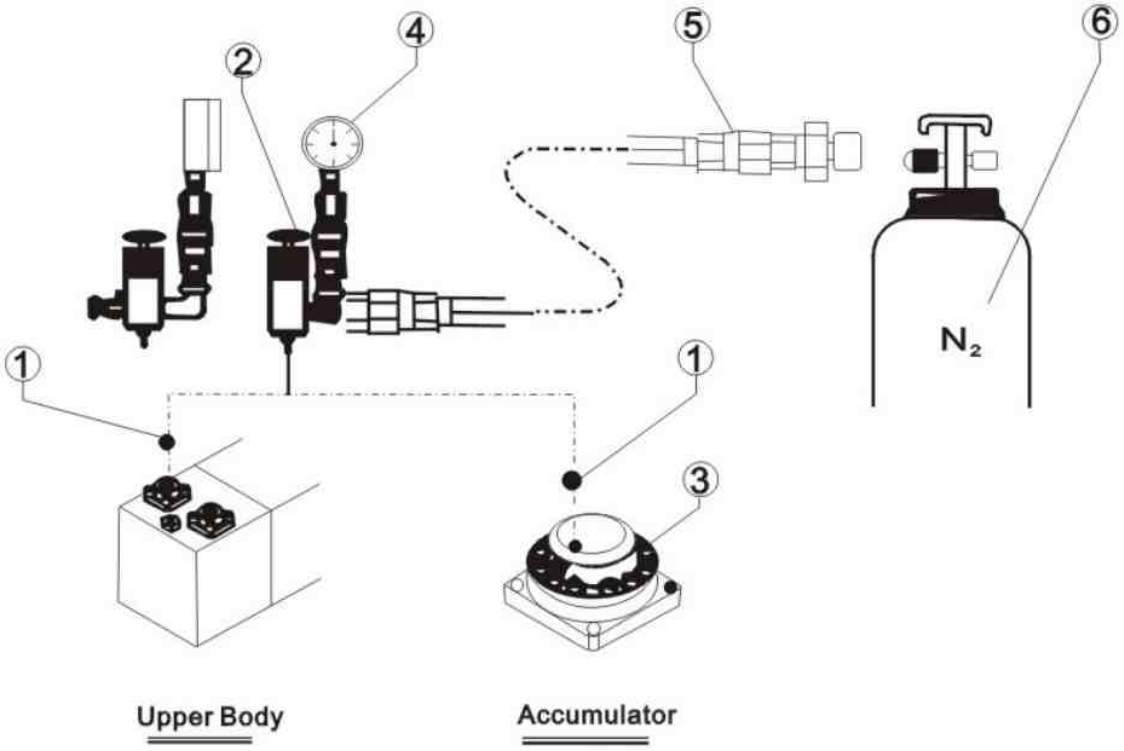
How to Charge Nitrogen (N_2)

1.Connect the hose (5) on the nitrogen (N2) steel cylinder (6)

Warning

The accumulator can only be charged with nitrogen (N2). Charging other gas(es) is extremely dangerous, and the accumulator, the upper body can possibly explode.

2. Loosen the charging valve cap (1)
3. Accumulator, connect the upper body to the charging equipment
4. Tighten the triple valve switch (2) on the charging equipment
5. Rotate the regulator switch (3), and observe the charging pressure value displayed on the pressure gauge (4)
6. When the nitrogen (N2) pressure is less than or close to the stipulated value, please slowly rotate the regulator switch.
   (Warning: if there is no overflow valve in the charging equipment, the overflow air pressure is very dangerous.)
7. Tighten the triple valve on the charging equipment, the accumulator pressure value is 60bar, and the upper body pressure value is 6bar.
8. Tighten the nitrogen (N2) charging switch.
9. Adjust accumulator and upper body to appropriate pressure value.
10. Release the pressure inside hoses and charging equipment.
11. Please check if there is any gas leak, check if there is oil leak from charging valve.
12. Tighten the charging valve cap (1).
13. Give appropriate pressure value (bar).



*Nitrogen pressure charging table for upper steel body and accumulator (unit: kg/cm^2)

HTM SERIES HYDRAULIC HAMMER PARAMETER

BREAKERR MODEL - HTM SERIES	ROD PIN Diameter	ROD PIN Length	Imapact Rate	Hose Diameter	Back-Head Pressure	Accumulator Pressure	Applicable Excavator	Required Oil Flow	Working Pressure	Noise 85db(A) Disstance
In Units										
Model	mm	mm	Beats per Minute (BPM)	inch	Mega Pressure Unit (Mpa)	Mega Pressure Unit (Mpa)	Ton	Liters / Min	Kg / Cm2	Decibels (dB)
HTM 680	68	750	400-800	½	1.4 ~ 1.7	—	6-9	50-90	120-150	6 ~ 12
HTM 750	75ϕ	750	400-800	½	1.4 ~ 1.7	—	6-9	50-90	120-150	6 ~ 12
HTM 1000	100ϕ	1000	350-700	¾	1.4 ~ 1.7	—	11-16	80-110	150-170	7 ~ 14
HTM 1400	140ϕ	1300	350-550	1	1.6 ~ 1.9	—	18-21	120-140	160-180	16 ~ 22
HTM 1400 A	140ϕ	1300	350-550	1	1.6 ~ 1.9	5.5 ~ 6.0	18-21	120-140	160-180	16 ~ 22
HTM 1650	165ϕ	1600	250-400	1 ¼	1.8 ~ 2.1	5.5 ~ 6.0	30-45	200-260	160-180	35 ~ 40
HTM 1800	180ϕ	1650	150-250	1 ¼	2.5 ~ 2.8	5.5 ~ 6.0	40-60	280-330	160-180	40 ~ 48
www.htmspares.com										

Fig-3-17

Dismantling and Reassembling of Steel-Rod

1) Dismantling

a)Place breaking hammer at a flat working field
b)Please confirm the gearbox of excavator is in neutral and has fully stopped.
c)Turn off the engine.
d)Use screwdriver to dismantle the rubber plug screw a
e)Dismantle lock pin b of steel-rod
f)Dismantle flat pin c of steel-rod
g)Dismantle steel-rod d

2) Reassembling

a)Clean and lubricate steel-rod and flat pin
b)Install steel-rod d, flat pin c and lock pin b of steel-rod
c)Check if flat pin c is locked tightly by lock pin b.Screw on rubber plug screw a

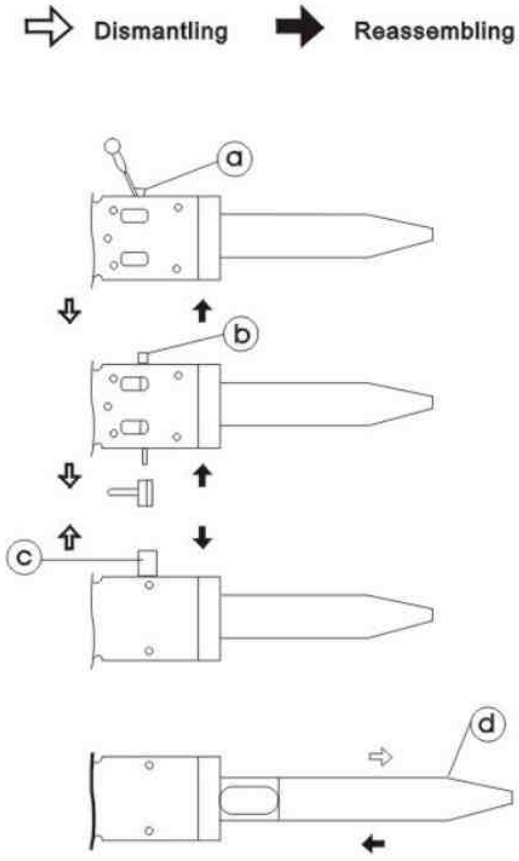


Fig 4–1

Warning

Do not try to dismantle or assembly these equipments before you finish reading this chapter.

Charging and Discharging of Nitrogen (N_2) for Upper Body

Warning

Never attempt to dismantle or assembly upper body.

1) Upper body nitrogen (N_2) discharging

* Completely discharge the nitrogen (N2) in upper body. Otherwise it might explode if bolts are loosened.
* Observe the following charging steps.

2) Upper body nitrogen (N2) charging

* Install the charging joints of charging valve, connect N2 steel cylinder and charge the upper body.
* Connect charging valve cap to the upper body

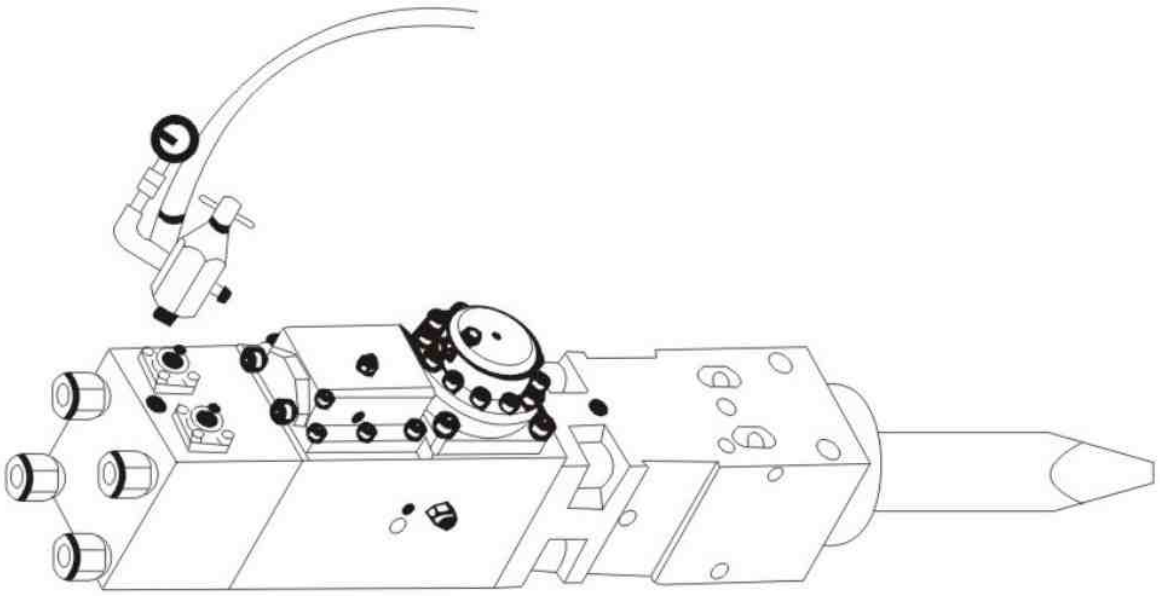


Fig 4–2

Dismantling and Reassembling of Accumulator Ass'y

1) Dismantling

* First, dismantle accumulator cap.
* Discharge nitrogen (N2).
* Place the accumulator ass'y flat as Figure 4-3, then use an inner hexagon spanner to dismantle them.
* Dismantle the O-ring.

2) Reassembling

* Fasten the O-ring.
* Use torque spanner with the torque strength of 600N.M to screw up all the inner hexagon bolts in diagonal direction.

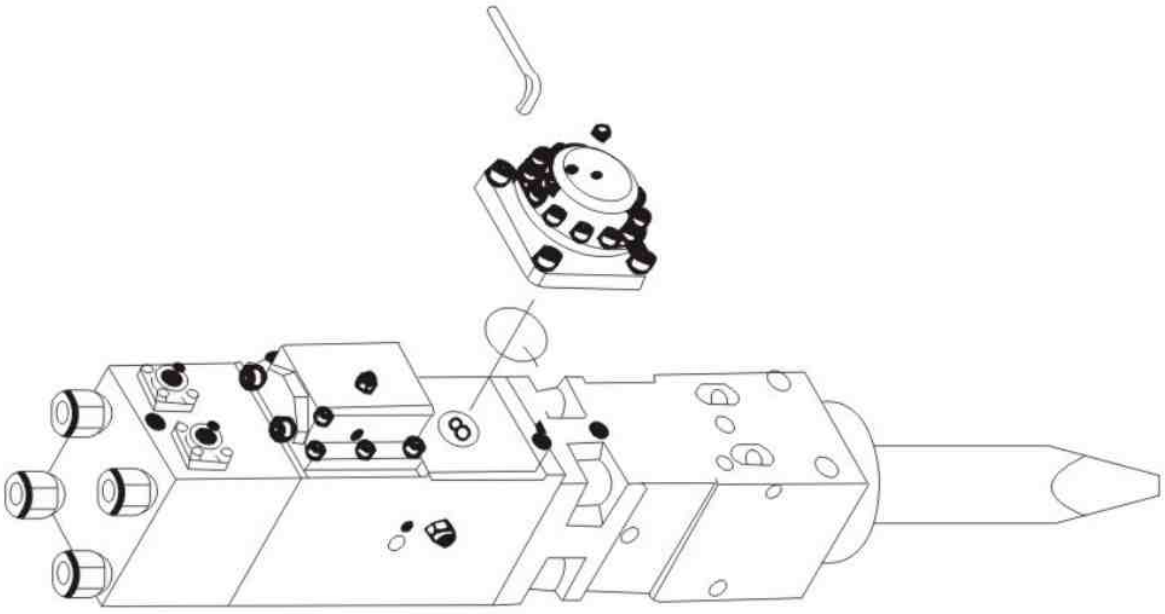


Fig 4–3

Loosening and Tightening of Thorough-Bolts

1) Loosening

* To loosen the nuts of thorough bolts requires a strong spanner or percussion wrench. But once they get loosened, we can use hands to screw them off.

2) Screwing up

* First, clean thorough bolts and their contact surface.
* Grease the thorough bolts.
* When the thorough bolts are screwed halfway, use the same degree of torque strength to screw them up in diagonal direction.
  Screwing up the thorough bolts requires torque wrench.

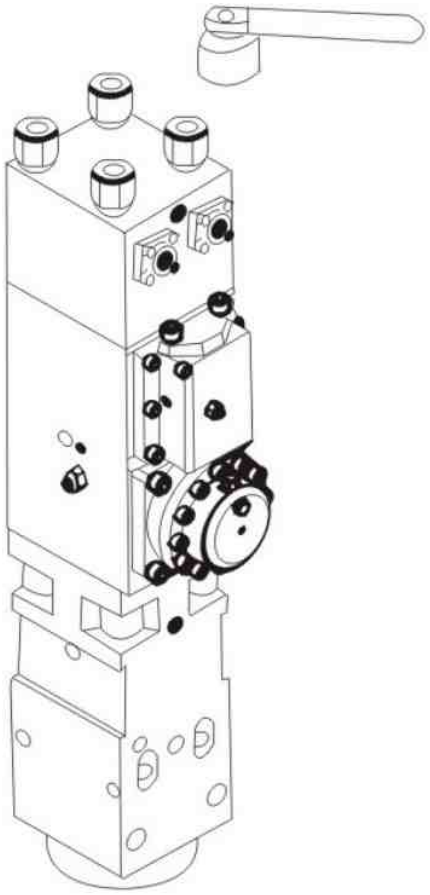


Fig 4–4

Dismantling and Reassembling of Upper-Body

1) Dismantling

* Require crane/overhead trolley conveyer to dismantle the upper body-a
* Dig out O-ring -b

2) Assembling

* After greasing the O-ring of upper body, place it on the top of the oil cylinder, it should perfectly fit into b.
* Connecting the top of upper body and oil cylinder requires crane/overhead trolley conveyer a.

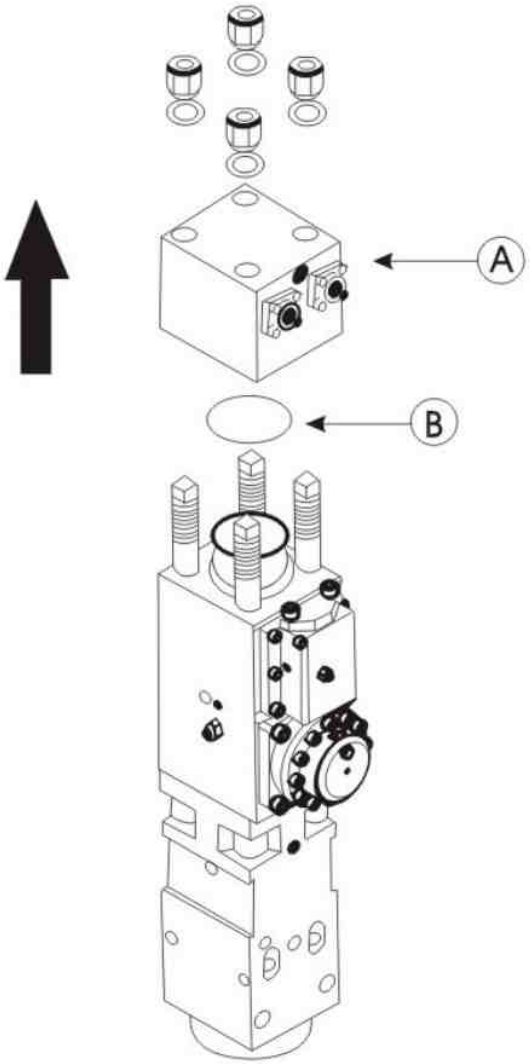


Fig 4–5

Dismantling and Reassembling of Piston / Seal-Seat

1) Piston and seal seat dismantling

*Use crane to vertically lift piston C. Choose position according to the conditions of working room.

* Vertically place the dismantled piston, use rubber hammer to slowly pound the seal seat from the bottom of the piston to the top, then dismantle it.

2) Piston and Seal Seat Reassembling

* Use crane/ overhead trolley conveyer to put piston C slowly into the oil cylinder

* Plastic or rubber hammer should be used to pound the seal seat to enter it into the rubber groove and completely inserted inside.

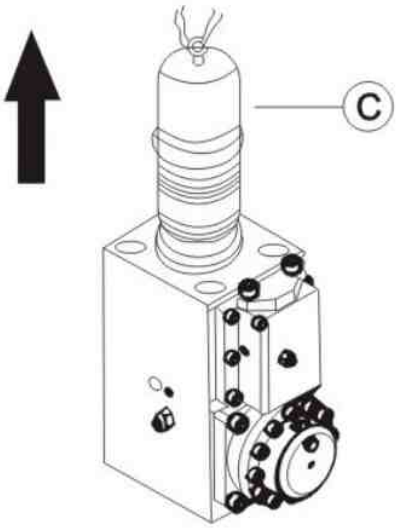


Fig 4–6

Dismantling and Reassembling of Steel-Rod Under-Bushing

1) Dismantling

* Dismantle rubber plug screw D
* Dismantle lock pin E of under-bushing
* Dismantle under-bushing F of steel-rod
* If the under-bushing is hard to dismantle, please heat the bottom of the lower body
* Check the degree of wearing of steel-rod and under-bushing.

2) Reassembling

* Clean all parts
* Spray supramoly over the contact surface between steel-rod under-bushing and the lower body

*Install steel-rod under-bushing F

*Install lock pin E of lower-body

*Install rubber plug screw D

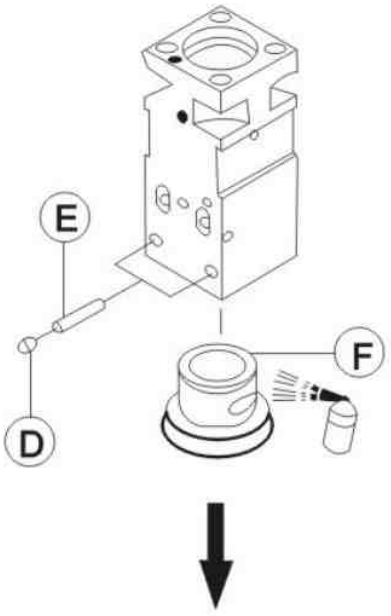


Fig 4–7

Dismantling and Reassembling of Control Valve Ass'y

1) Dismantling

* Dismantle bolt (M24)
* Dismantle the seal cap of control valve
* Dismantle the O-ring of seal cap
* Dismantle valve plug and valve

2) Reassembling

* Brush off the hydraulic oil on seal cap of control valve and insert it into the control valve.
* Grease the O-ring and place it in the seal cap.
* Use inner hexagon wrench to screw up the bolt of control valve cap.

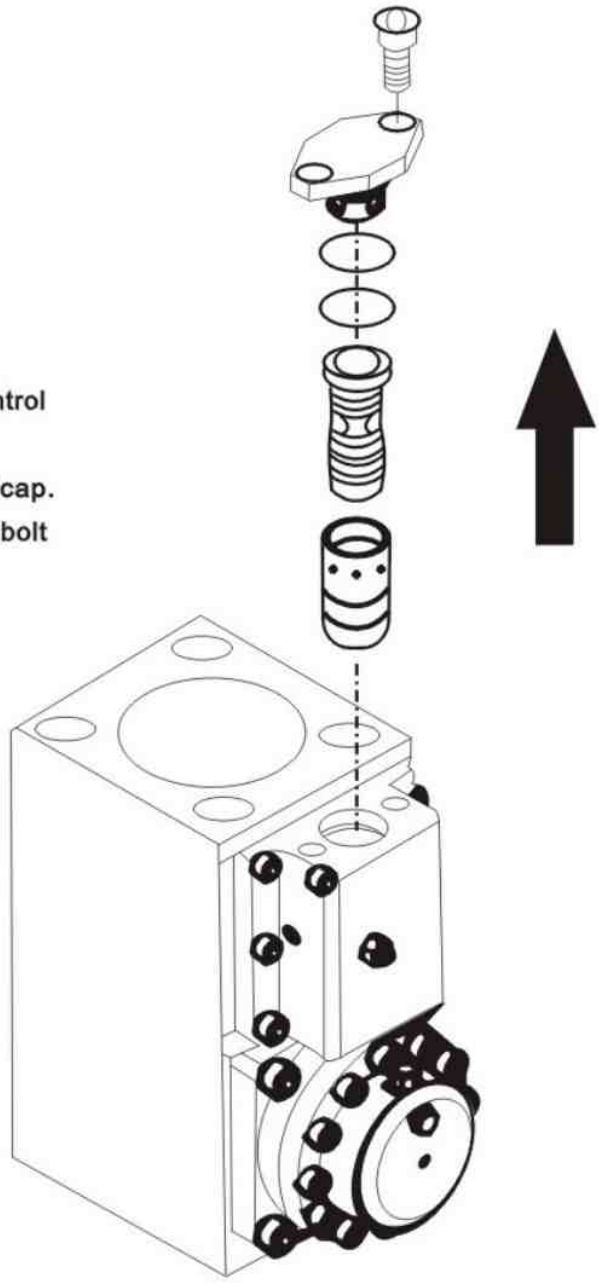


Fig 4–8

Dismantling and Reassembling of Accumulator Rubber-Cup

1) Dismantling the accumulator

* When dismantling the accumulator, nitrogen (N_2) should be completely released before taking the next step.
*Fix the accumulator to the working table, then dismantle the charging valve, dismantle the charging valve with a sleeve ratchet-handle wrench of counter back-turning.

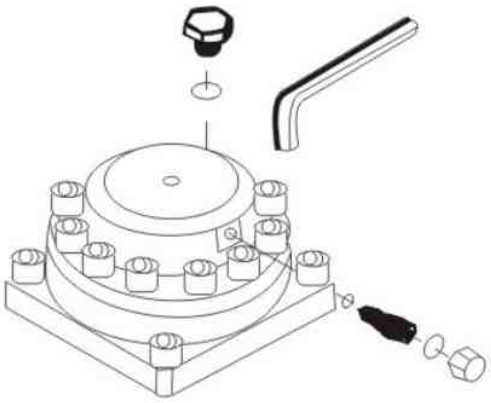


Fig 4–9

2) Rubber cup reassembling

* Place accumulator body on the working table, put it into the rubber cup, fix it closely to the edge of accumulator with fingers.
*Assembly accumulator seal cap, put the cap on the top of rubber cup, insert it and fix the bolts, use inner hexagon wrench to screw these bolts. Use torque wrench with the exact same torque strength to screw up the bolts in diagonal direction.

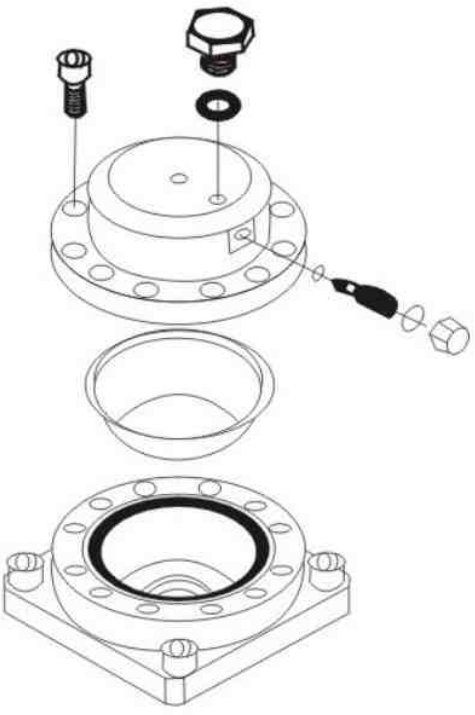


Fig 4–10

Normal Installation

- Put the square shape wooden frame on the smooth ground, put breaking hammer on the wooden frame.
- Set up nitrogen pressure valve in the upper body according to the stipulated pressure value of the breaking hammer; if it requires to regulate all pressure values of breaking hammer, please contact our technical personnel or authorized personnel.
- If the breaking hammer has an accumulator, set up gas pressure in the accumulator to 60KG/CM.
- In the close state of stop valve of excavator, overflow valve should be regulated to control the set pressure of breaking hammer.
-If the excavator does not have an overflow valve for breaking hammer, please install one overflow valve to control the set pressure.
- Use two support shaft pins, tightening bolts and nuts and stop ring to install breaking hammer onto the excavator; during installation, use excavator carefully.
- Open stop valve, operate the breaking hammer after fully preheated.
- Check working pressure and striking frequency; if the striking frequency is relatively low, check the flow of working oil.
- Check if there is oil leak at the joints of hard hose and soft hose, if so, please screw them up or replace the sealing parts.
- Make sure to grease the steel-rod evenly, if necessary, grease it again.
- If excavator has quick connection system, the breaking hammer can be quickly installed to excavator as required by the manufacturer of quick connection joint.
- After completing all the above steps, please fill in delivery report and installation report and mail them to our company.
- The steps of dismantling the breaking hammer from the excavator are the exact opposite of the steps of installing.

Installed onto an Excavator

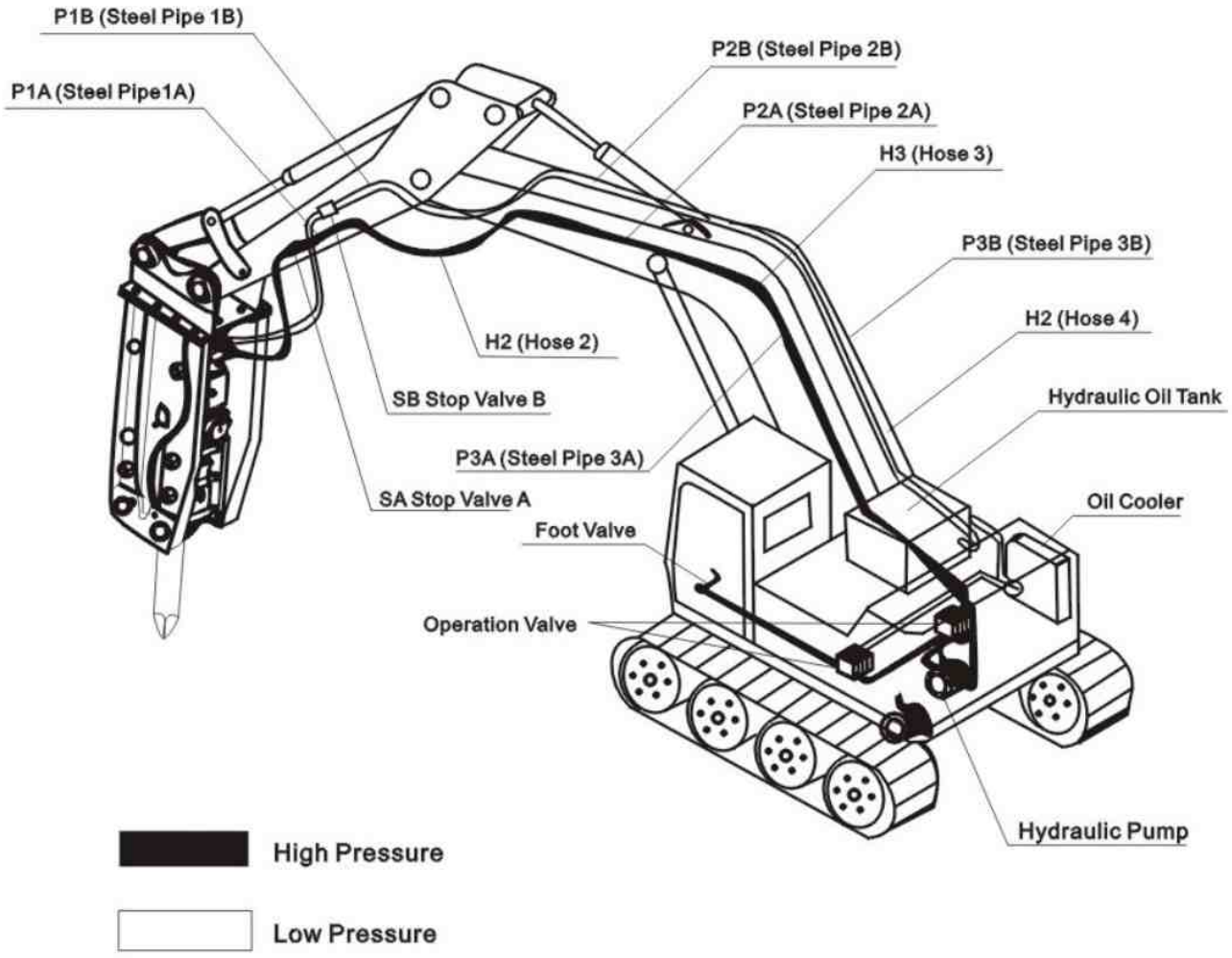


Fig 5–0

Precautions for Installation

When bucket and breaking hammer work in turns, the breaking hammer is connected to excavator with two hydraulic oil tubes and two shaft pins; therefore the bucket and the breaking hammer are very easy to replace each other.

But impurities are very easy to be mixed into the hydraulic oil duct, so follow the steps below when dissembling and installing:

1) Choose a smooth and clean place, better in the repairing shop; after the excavator is driven in, turn off the engine and master switch. After that, if the pressure of excavator hydraulic oil tank is high, then release the pressed air in the tank. Then place the excavator according to Figure 5-1. This makes it very easy to replace breaking hammer and bucket.

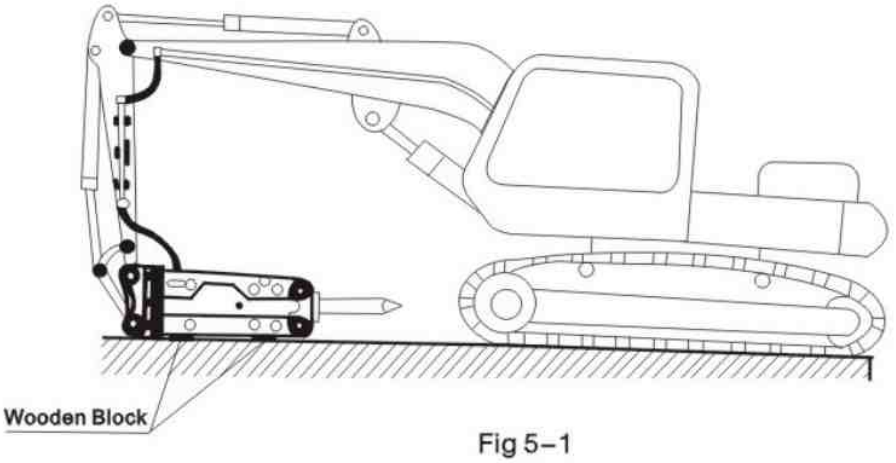


Fig 5–1

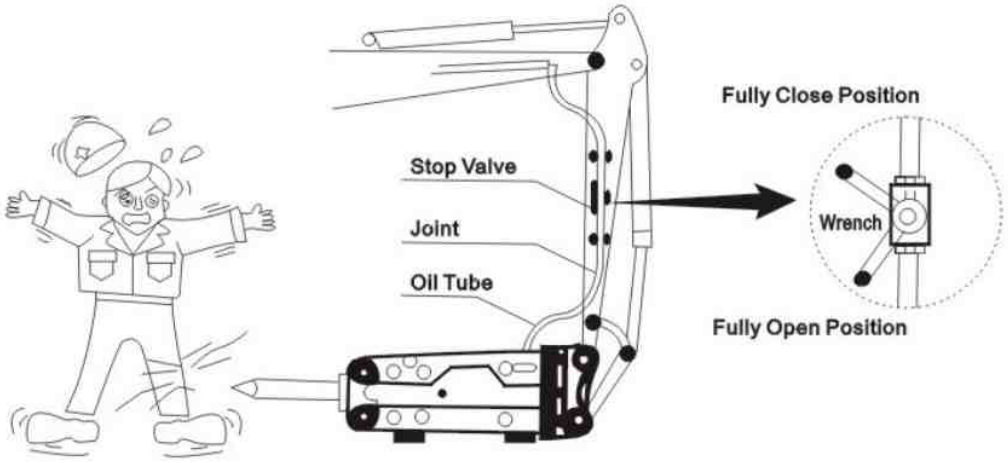


Fig 5–2

2) Rotate the stop valve at 90° which is installed at the end of the small arm to prevent hydraulic oil outflow.

3) Turn loose the hydraulic hose joints at the side of the small arm, at this time, there will be a small amount of hydraulic oil overflow, use an empty container.

4) To prevent mud, soil, dust and other impurities from getting into the tubing and joints, caps should be put on straight joints and 60° elbow joints and screwed up.

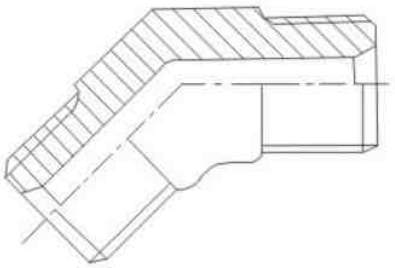


Fig 5–3

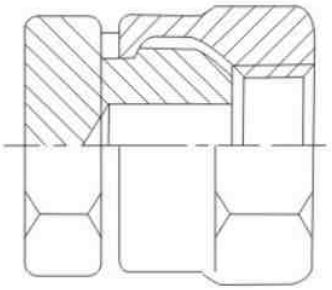


Fig 5–4

These joints are used to connect low pressure and high pressure hoses. While the bucket is working, use joint caps to cover the joints at the side of the small arm and prevent the dust.

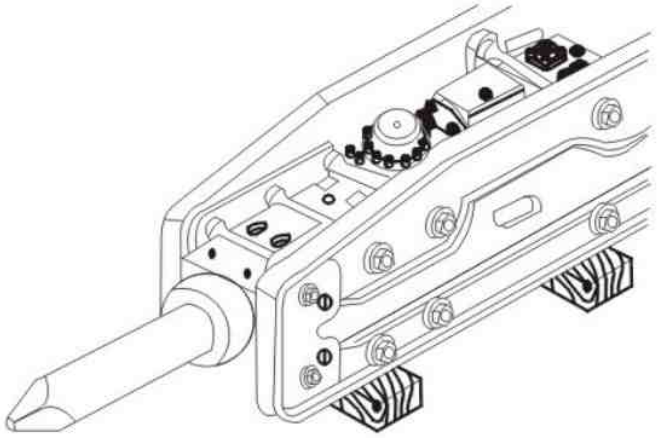


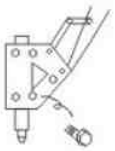
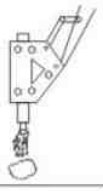
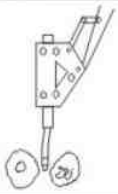
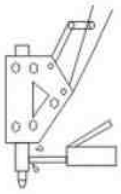
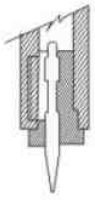
Fig 5–5

5) Draw out the shaft pin that connects the bucket and the small arm, then dismantle the breaking hammer, replace the bucket and go back to work; when the hammer is placed outdoors, it should be cushioned with wooden blocks, and covered with canvas or similar waterproof fabrics. Furthermore, if the hammer is not going to be used for a while, all parts should be cleaned and lubricated and then stored indoors.

6) The steps of installing the breaking hammer are the exact opposite of the dismantling; clean the bucket or other operational hoses and joints if they are dirty; please use authorized or recommended light oil or detergent for the cleaning.

Routine Inspection

Before operation, please confirm the following points have been checked.

Check Items	Check Points	How to Maintain
Loosening or Loss of Bolts and Screw Caps 	• Main Body Screw • Guard Plate Screw	Check if it is loose Screw up the bolts again
Hose parts are loose, hose damaged and oil leaking 	• Oil pressure duct of breaking device • Oil pressure hose	Re-screw up the loose parts Replace the severely damaged parts
Abnormal oil leakage 	• Connection part of back body and oil cylinder • Front body and steel-rod	Please contact your local sales or service offices
Abnormal steel-rod wearing and damage. 	• Steel-rod	Damaged, broken or worn-out steel-rod should be immediately replaced or repaired. The excessively damaged steel-rod should be replaced and should not be used again.
Lubrication 	• Lubricate with lubricant both before work and after working continuously for two and three hours each time,. • Pour lubricant five to ten times	Pour lubricant from lubricant input hole of front body 
Volume and contamination of hydraulic oil 	• Conditions of hydraulic oil	The quality change of hydraulic oil varies with different working environments. The simplest way to judge the quality change is to observe the oil color. If the quality deterioration is severe, please get rid of the oil from the tank immediately and after cleaning the tank, fill new hydraulic oil.
Loss of rubber pin and fixing ring 	• Rubber Pin • Buckle	Immediate repairing should be made to avoid risk.

Precautions for Delivery

As Hi-Tech series hydraulic pressure breaking hammer is delivered out of the plant, its upper body has no N_2 filled. Once its upper body is filled with N_2, the piston's front part will stretch out of cylinder. In such a case, the piston will get rusty as breaking hammer is idling for a long time.

Warning

When delivering breaking hammers, the following steps should be taken for filling its upper body with N_2 and operating it.

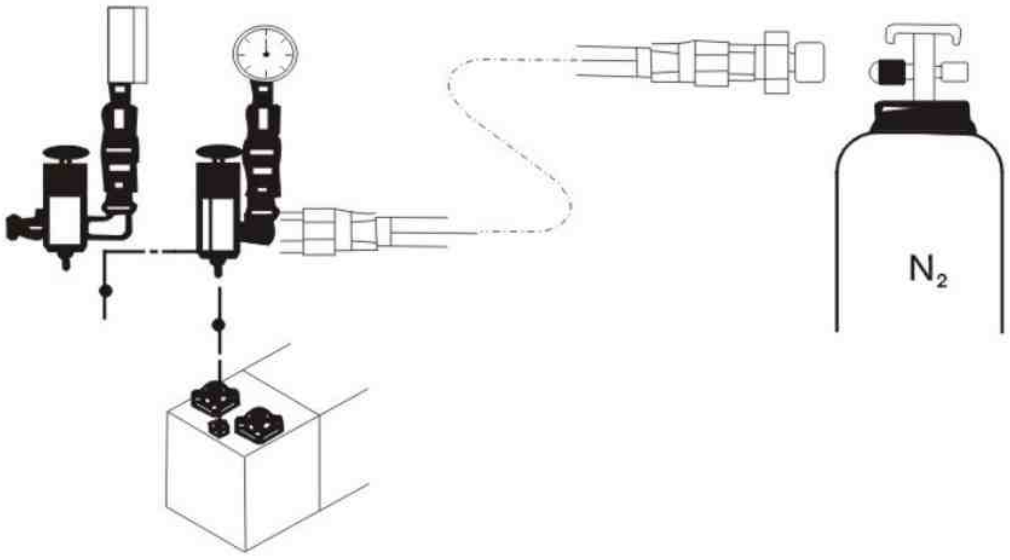


Fig 6–1

Check Nitrogen (N_2)'s Refilled into Upper Body

Warning

Prior to filling N_2, check equipment surroundings to ensure its safety, and upper body does not allow filling of other gas, except N_2. As upper body is filled with N_2, do not get close to the front part of steel-rod. When finished, the steel-rod of breaking hammer will stretch out automatically.

1) Connect a pressure gauge with triple valve, then turn the handle of triple valve anti-clockwise.
2) Connect charge hoses with nitrogen cylinder.
3) Dismantle plug screw from breaking hammer, then install triple valve on the charge valve of upper body. (Ensure triple valve is installed with O-ring.)
4) Connect the other end of charge hose to triple valve.
5) Turn upper valve handle of anti-clockwise to discharge N_2, then slowly turn the handle of triple valve clockwise to the set charge pressure.
6) Turn the handle of triple valve counter-clockwise to close, then turn the valve handle of nitrogen cylinder clockwise to turn off N_2.
7) Charge hose dismantled from triple valve should be covered with its cap.
8) Turn the handle of triple valve clockwise, and check the charge pressure in upper body again.

Notice

When finishing gas filling for upper body based on Step 1-8, turn the handle of triple valve anti-clockwise first, and remove the triple valve of charge valve of upper body later. However, if pressure in upper body needs to be regulated, the next Step 9-13 should be taken.

9) Remove charge hoses from triple valve.
10) Install triple valve tightly on charge valve.
11) When turn the handle of triple valve clockwise, pressure value in upper body will appear on pressure gauge.
12) If N_2 pressure is a bit lower, Step 1-8 should be taken again till pressure rises to the set value.
13) If N_2 pressure is too high, turn the regulator of triple valve anti-clockwise slowly, with atmospheric pressure discharged out of upper body; when pressure gauge shows appropriate correct pressure value, close the regulator clockwise. Once pressure too high, breaking hammer can not work normally. Ensure atmo spheric pressure conforms to the set pressure value, and ensure triple valve is installed with O-ring.

Check N_2 filled into accumulator

Warning

Accumulator can only be used for N_2, and other gases are not permitted

For how to check the charge pressure of N_2 in accumulator and how to fill accumulator A285 with N_2, please refer to the following:

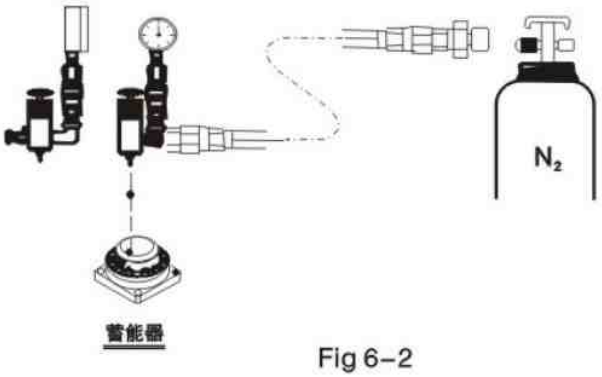


Fig 6–2

1) Check charge pressure

(1) Install adaptor and pressure gauge to triple valve.
(2) Turn the handle of triple valve anti-clockwise.
(3)Remove the plug screw of accumulator and turn triple valve tightly.
(4) Turn the regulator (2) anti-clockwise slowly, and observe the chargepressure value indicated on pressure gauge.
(5) Ensure the charge pressure value, and tighten the regulator (2) completely.
(6) Loosen the regulator (2) to discharge N_2 in triple valve.
(7) Remove triple valve, and tighten plug screw and cap. (Ensure plug screw and cap is installed with O-ring.)

2) Fill accumulator with N_2

(1) Check charge pressure based upon the above-mentioned same steps, then remove the cap of triple valve.
(2) Connect both ends of charge hose with triple valve and N_2 steel cylinder separately.
(3) Turn the handle of triple valve clockwise.
(4) Turn the valve handle of N_2 tank anti-clockwise to fill accumulator with N_2.
(5) Tighten the regulator (2) entirely.
(6) Turn the valve handle of N_2 tank clockwise till tap is turned off.
(7) Loose the regulator of triple valve to discharge the rest N_2 in charge hose.
(8) Remove charge hoses out of triple valve and N_2 cylinder.
(9) Remove charge hose, then regulate pressure according to the method stated on Step 1 <Check charge pressure>.
(10) Fill accumulator with N_2, check each screw hole, regulation valve, etc. on its main body to see if there is gas leaking.

Check and Replace Fastening Bolts

Notice

Prior to loosening fastening bolts, discharge all gas pressure in upper body Entirely. Otherwise, when fastening bolts are removed, upper body will spring out and lead to severe consequences.

1)Before loosening the fastening bolts, discharge N_2 in upper body entirely.

2)Remove all fastening bolts and meanwhile check them whether cracked and damaged.

3)When fastening bolts are installed, tighten them at diagonal direction one after another, rather than tighten a bolt at one go.

4) Use the set spanning torque wrench, see the moment form at Section 6-4(2)

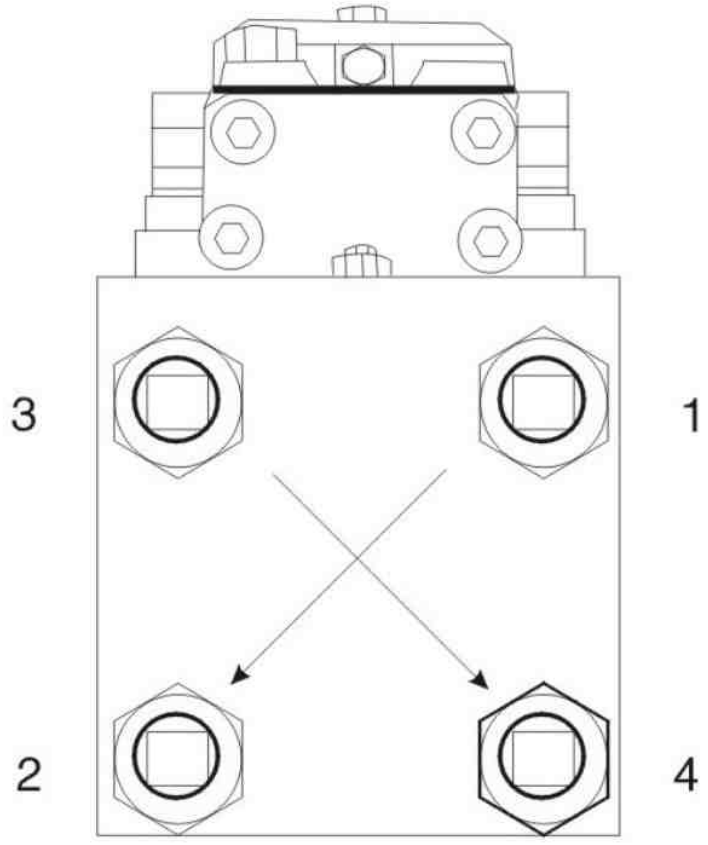


Fig 6–3

Moment

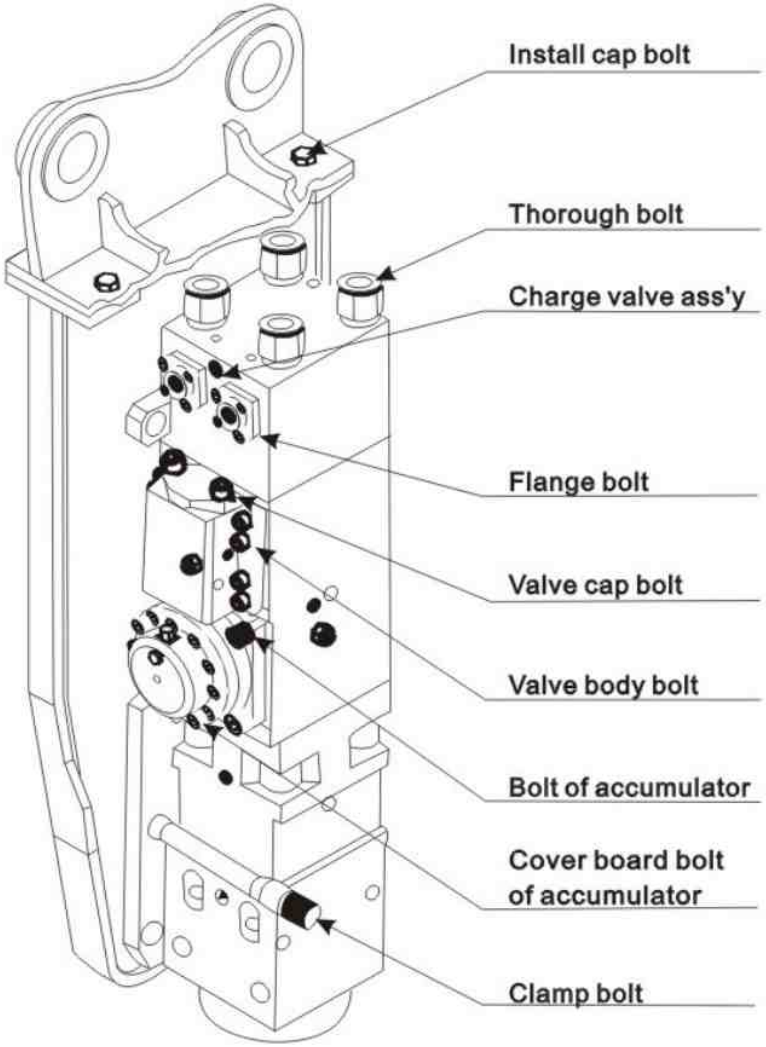


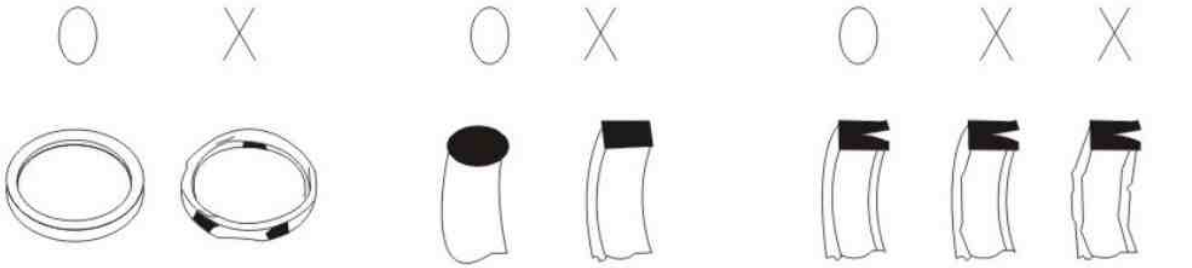
Fig 6–4(1)

Classification / Model	Install cap bolt K.g.m (N.m)	Thorough bolt K.g.m (N.m)	Charge valve ass'y K.g.m (N.m)	Flange bolt K.g.m (N.m)	Valve cap bolt K.g.m (N.m)	Valve body bolt K.g.m (N.m)	Bolt of accumulator K.g.m (N.m)	Cover board bolt of accumulator K.g.m (N.m)	Clamp bolt K.g.m (N.m)
HTM 1400A	225 (2250)	150 (1500)	35 (350)	20 (200)	60 (600)	45 (450)	60 (600)	45 (450)	250 (2500)
HTM 1650	250 (2500)	160 (1600)	35 (350)	20 (200)	45 (450)	45 (450)	60 (600)	45 (450)	305 (3050)

Fig 6–4(2)

Check and Replace Sealing Elements

1) Once hydraulic oil leaking is found with breaking hammer, change damaged sealing elements immediately. To clearly identify the damaged place of sealing elements, please see the picture blow:



Supporting ring-worn out

O-ring and dust-proof seal ring worn out and damaged

U type expansion ring, damping vibration reduction ring and sealing ring deformed, worn out, twisted and damaged

Fig 6–5

2) When sealing elements is found damaged, causes must be trased and handled in time.

3) When exchanging sealing elements, apply grease on sealing elements and sockets, and tow by middle finger based on marks, grasp with thumb and insert the sealing socket tightly. Never use too much strength to deform sealing elements.

Notice

In actual work, sealing elements should be changed every 1000h.

How to Reset the Striking Frequency

Regulator that is used for regulating striking frequency is the authorized equipment for our breaking hammer.

Striking frequency should be changed at any time as per work condition for a more efficient striking operation. And its basic theory is to regulate striking frequency through changing piston stroke, and at the same time, keeping work pressure and hydraulic oil flow unchanged.

Regulator should be installed on the right side of oil cylinder of breaking hammer.

For regulating striking frequency, use wrench to remove the nut at the front part of regulating screw of regulator, and then revolve regulating screw to the inside bottom so as to get the lowest striking frequency, and at the time, turn the regulating screw externally 2 circles to get the max striking frequency.

After necessary striking frequency regulation, please install the nut at the front part of regulating screw to its original place and tighten it.

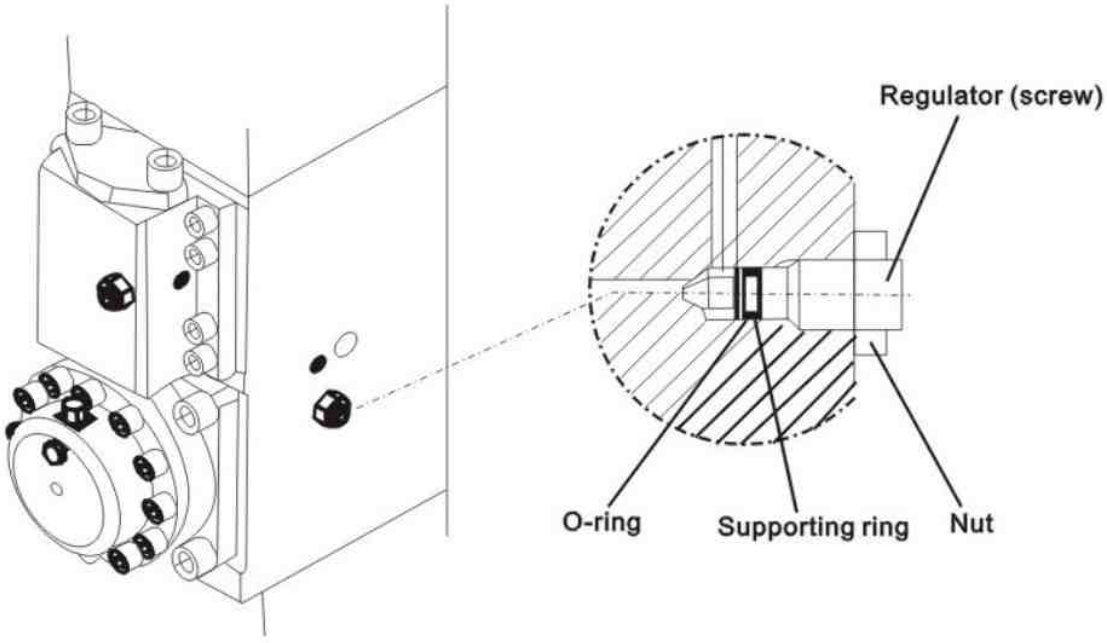


Fig 6–6

Adjust Oil Supply with Control Valve

How to operate:

When excavator provides breaking hammer with insufficient oil, control valve receives rated operating pressure by lowering striking frequency. On the contrary, when there is too much oil supply is, control valve keeps rated operating pressure by improving striking frequency. As to Hi-Tech 800 type Hi-Tech breaking hammer, turn the regulator on control valve anti-clockwise 4-5 circles in advance to get the pre-set standard operating oil capacity. For Hi-Tech 1000 breaking hammer, turn 3-6 circles anti-clockwise.

How to regulate control valve:

When control valve closes entirely to stop operating oil flow, regulate the notch on control valve aiming at the place marked with "1" as shown in the following picture. For the present place, we generally recognize it as "O" operating oil flow condition. If the regulator on control valve is loosened, then operating oil capacity can be started to increase.

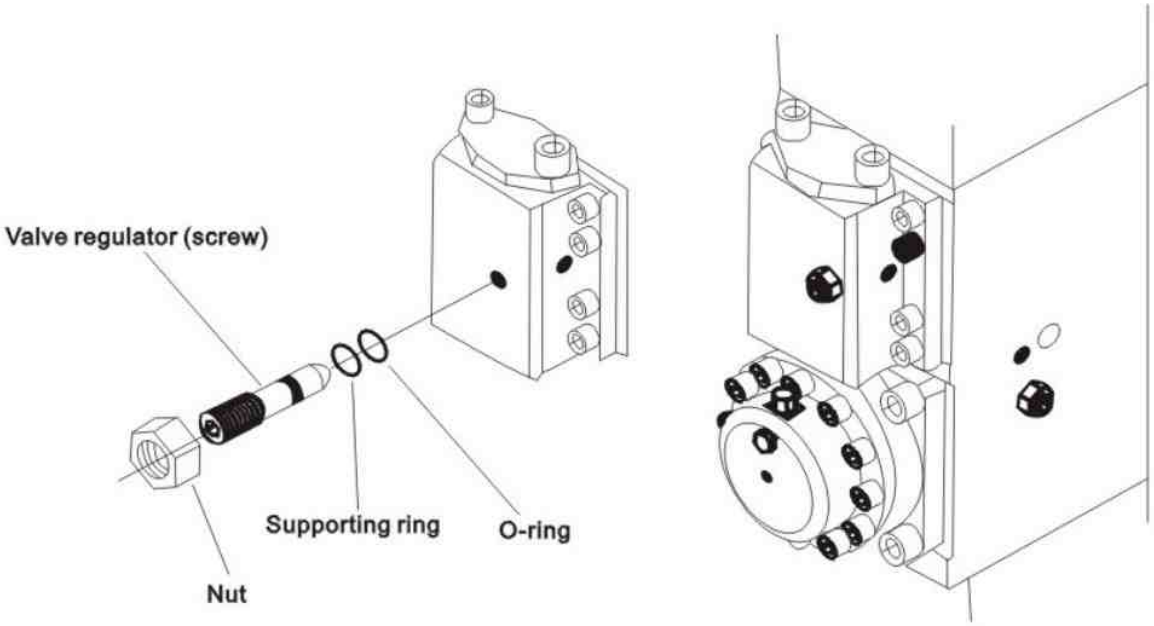


Fig 6–7

Wearing Parts

1) When they are damaged or worn out, we greatly recommend you to change the following items:

-Steel-rod
-Lower body (it has to be replaced in maintenance shop)
- Flat-pin of steel-rod
- Lock pin (lock pin of steel-rod)
-Rubber plug screw (lock pin)
- Hydraulic sealing elements
- Bolt at support side
-Hydraulic hoses

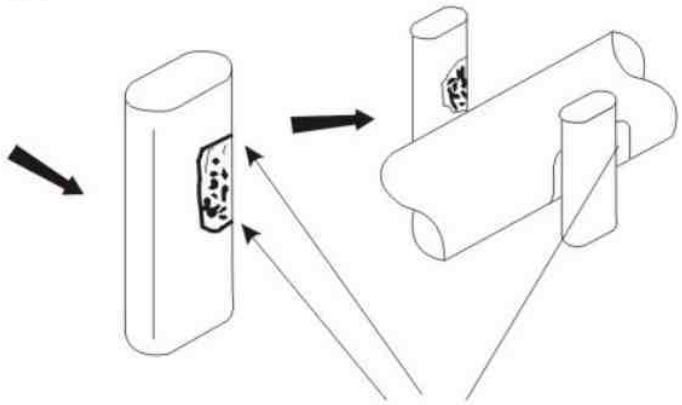
2) We recommend users should prepare wearing spare parts, such as flat-pin and lock pin of steel-rod, rubber plug screw, bolt and hydraulic hoses.

3) When actual work reaches every 600h, hydraulic sealing elements change is required.

4) Flat-pin of steel-rod

- When flat-pin of steel-rod is seriously deformed, the change becomes quite difficult.

Therefore, the interface between its flat-pin and steel-rod should be changed after every 100-150h operation, thus both surfaces of flat-pin of steel-rod can be totally used. If the used steel-rod is not a genuine one, we can not guarantee the good operation condition of relevant parts for breaking hammer.



Abrade burr and high spot on the surface by grinder or dresser

Fig 6–8

As regulating the direction of flat-pin of steel-rod, its surface should be placed on the side of steel-rod.

-As changing wearing parts, check the worn condition of wearing elements such as crack and scrach, particularly after abrading burr of flat-pin and high spot on the surface, more check should be done carefully.
-First of all, abrade worn parts of lower body and flat-pin of steel-rod, and then change steel-rod; abrade bruised and damaged parts of lower body, then change new flat-pin of steel-rod.

Notice for Long-Term Storage

-Breaking hammer should be stored at the place with little temperature change.
-Remove steel-rod and discharge N_2 inside.
-Apply grease on piston end, and steel-rod and lining should be applied with antirust oil.
-As no lubricating can be done, steel-rod must be constricted so that piston can enter oil cylinder.
-The adapter connecting excavator and main parts should be covered with cap so as to prevent dust from oil ducts.
-Leave the breaking hammer upright. If impossible, breaking hammer should lie on the flat floor with square timber sticks underneath.
-If breaking hammer lies above square timer sticks more than 6 months, please check the corrosion condition of all sealing parts and bolts in oil cylinder before operation.

1) Storage method

Cycle	Measures
Every 3 months	To ensure good operation condition with sealing elements, leave the breaking hammer top side down
Every6 months	Check corrosion condition of all sealing parts and bolts inside oil cylinder

2) Prior to work

Cycle	Measures
Every 3 months	Check sealing elements
Every6 months	Check sealing elements and corrosion condition

Notice

If breaking hammer lies above square timer sticks more than 6 months, please check the corrosion condition of all sealing parts and bolts in oil cylinder before operation.

Operating Oil and Filter

1) Operation oil

-Breaking hammer uses the same operation oil as excavator does.
-When breaking hammer operates continuously, oil temperature will rise, so please check oil viscosity at this moment.
-The too high viscosity of operation oil will result in un-smooth operation, irregular strike while air pocket in operation pump and viscose with big valve may occur.
-If the viscosity of operation oil is too thin, low operation efficiency may occur due to inner leaking, and oil seal and liner may be damaged due to high temperature.
-In the operating period of breaking hammer, supply operation oil before dipper works, because impurity oil can cause operation disorder with hydraulic parts, breaking hammer and excavator, which will lower their operation efficiency.
-Operation hydraulic oil should be added after breaking hammer's initial operation work for 250h and every 500h later on.

2) Oil duct filter

- Because impurity in hydraulic oil will shorten the service life of hydraulic parts and even cause oil duct stop, oil filter should be used for removing impurity from oil.
- Oil duct filter should be changed Initial operation work for 50h and the next every 125h.
-Because of spare parts worn out, repair and maintenance as well as oil change and reoiling, impurity, dusts and others can enter hydraulic tubes.
-Installing oil duct filter, the rated capacity of filter should suit to the maximum oil-return capacity of operation pressure.

3) Oil duct cooler

-The purpose of using oil duct cooler is to lower operation temperature of hydraulic oil.
-During hammering operation, it is recommended to change the original oil duct cooler or install auxiliary cooler if oil temperature rises too high.

Leakage of Hydraulic Oil

Even if oil leakage occurs, it's unnecessary to change parts in every case; check the leaking condition as per the following form. Users can handle it by themselves before calling their distributors.

	Oil leaking area	Condition	Causes and measures
A	Between steel-rod and front cover	For severe oil leak, check whether it is hydraulic oil or grease	Change damaged sealing elements
B	Breaking hammer surface	Oil leaking at the connection between big valve and hose	Tighten again the loosened hose and bolt of breaking hammer
C	Valve body and bolt cap	Oil leaking with re-installed valve body after overhaul	Normal condition: outflow of lubricant and anti-rust oil applied during installation
D	Between main valve and the surface of oil cylinder	Oil leaking with re-installed valve body after overhaul	Normal condition: Clean the oil used, and if checking finds damaged oil seal, change another seal.
E	Between oil cylinder and upper body	Oil leaking due to loose thorough-bolt and nut	Re-tighten
		Oil leakage	Change damaged O-ring
F	Between oil cylinder and upper and lower bodies	Oil leaking now	Installed bolts on oil cylinder surface are loosened and should be tightened again while oil seal should be changed.

Breaking Hammer Not Performing Well

Condition	Main causes	Measures
Breaking hammer can't strike	Too low oil temperature	Oil temperature must reach at least 30℃
	Inappropriate operation of main valve	Check the operating buttons of breaking hammer in driver's cab
	Pressure in upper body and overflow Lower pressure set for valve	Check pressure of N_2 and overflow valve
	Hydraulic oil pump is not working with good performance	Contact excavator manufacturer immediately
Striking frequency gets normal first, but strikes irregularly later on.	Oil shortage resulting in rising oil temperature	Add hydraulic oil
	Too higher pressure in upper body	Check atmospheric pressure
	Too lower pressure set for overflow valve	Check overflow valve pressure
	Insufficient lowering pressure of steel-rod	Check small and big arms of excavator to supply enough lowering pressure
	Too big clearance between steel-rod and front cover	Check the clearance between steel-rod and front cover
	Excessive wearing on the top of steel-rod	Remove steel-rod to check
	Hydraulic oil pump is not working with good performance with much higher back pressure	Ask excavator manufacturers to check oil way
	Main valve with impurity inside	Remove main valve for cleaning
	Piston and oil cylinder getting stuck	Check and overhaul
weak striking power	Lower atmospheric pressure in upper body	Check atmospheric pressure
Low striking frequency	Atmospheric pressure too high	Check atmospheric pressure
	Insufficient lowering pressure of steel-rod	Check small and big arms of excavator to supply enough lowering pressure
	Pressure set by overflow valve is too low	Check overflow valve pressure
	Hydraulic oil pump does not operate with proper performance	Ask excavator manufacturer to check oil way
	Too higher operation pressure	Check set pressure

Frequent Problems

Preconditions for normal operation and prolonged service life for Hi-tech series breaking hammers:

- use such grades of hydraulic oils (Grade P with frequency Q)
- use clean hydraulic oils
- conduct proper maintenance as per operation and maintenance manual.

When an agent receives a user's malfunction report, user would normally request agent for the quickest possible actions for trouble shooting. The experienced engineer(s) dispatched by the agent shall check for possible causes, confirm the trouble state so that sufficient measures can be taken to eliminate the malfunction.
It is recommended to entrust user to remove small trouble(s). should they fail to find out the causes, separate proper counter-actions can be taken to solve it.

You may follow the corresponding measures for checking and solving problems in case there is any:

Items	State	Causes	Actions
Main Body	Breaking hammer not working	-Insufficient power (P×Q) -Insufficient falling pressure with rod -Blocked tube -Breaking hammer stuck -Hydraulic oil sinking into upper cover cavity - Insufficient hydraulic oil	-Check power -Follow correct instructions -Inspect and repair -Check and replace worn parts -Replace sealing components -Add hydraulic oil
	Striking gets abnormal or stops & grease enters cylinder during 30 -90 min operation	-Insufficient power (P×Q) -Blocked tube -Too high pressure in upper body cavity -Oil seal damaged - Immense grease flows into cylinder	-Check power -Inspect and repair -Make adjustment -Replace oil seal -Discharge grease as required
	Rod broken	Conduct striking slantwise, removing stones with the rod as crowbar	Exert force downward along the direction of rod to check the clearance of small-arm, connecting-rod and flat-pin.
	Rod-head softened	Continuous striking at a certain spot for long time	Find another breaking spot
	Rod-head broken	Max force used for striking from beginning	Striking with lower speed for the first 30min
	Difficult to dismantle or install rod flat-pin	Flat-pin deformed	Check whether normal

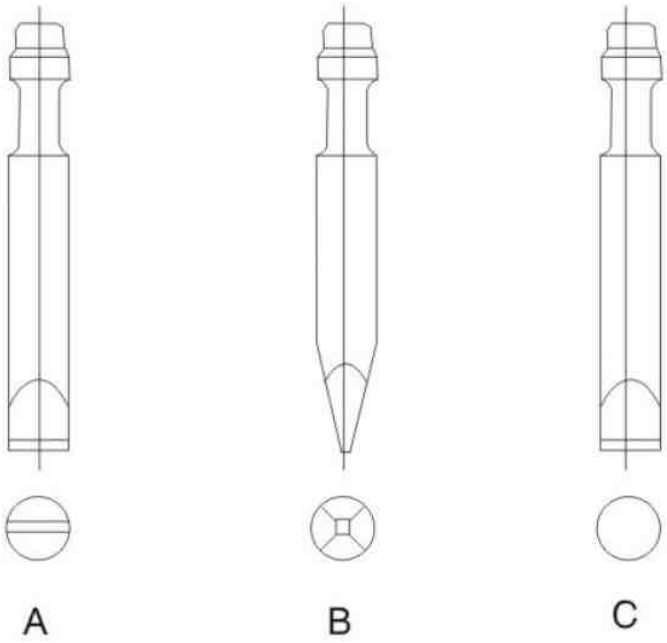
Items	State	Causes	Actions
Main Body	Too big clearance betweensupport and breaking hammer	Bolts of clip plate loosened	Re-tighten the bolts
	Prematurely worn front cover	Lacking grease lubrication	Replace lower bushing or bushing
	Low striking frequency	-Insufficient power (P×Q) -Insufficient falling pressure with rod -Too high pressure in upper body cavity -Pressure drop in upper body cavity	-Check power -Follow correct instructions -Set to required air pressure value -Add again Nitrogen (N_2)
	Weak striking force	-Insufficient falling pressure with rod -Insufficient power (P×Q) -Rod broken in front cover	-Follow correct instructions -Check power -Replace rod and piston
	-Oil leak with I/O tube -Oil leak betwn control valve and cylinder -Oil leak betwn rod and front cover -Oil leak betwn upper cover and cylinder	-Adopter loose and O-ring & support ring damaged -Adopter loose and O-ring & support ring damaged -Oil seal worn and damaged -Hexagon-socket bolt damaged or thorough bolt nut loosened	-Tighten adopter and replace O-ring & support ring -Tighten adopter and replace O-ring & support ring -Replace oil seal -Replace hexagon-socket bolt and tighten thorough bolt nut
	See if breaking hammer operates with fluctuation	Error in setting pressure of overflow valve	Check and slowly increase pressure
	Too fast with oil temperature rise	Not well ventilated with excavator. Hydraulic pump worn prematurely and tube blocked	Reset breaking hammerCheck and replace hydraulic pump
	Hose vibrating from oil input	Too low oil input	Check oil quantity
	Hose vibrating from oil return	Air-pressure too low or too high	Reset air-pressure
	Not well positioned while breaking stone with rod	Too big clearance betwn small-arm, connecting-rod or flat-pin and shaft lining, causing premature wearing.	Check rod and fix it tightly to breaking hammer
	Emulsification with hydraulic oil	Water in oil	Replace hydraulic oil immediately
	Too much drop with engine rotation	-Insufficient output power -Drop with engine performance -Too low oil temperature	-Reduce pressure inside upper-body cavity -Lower position of accelerator -Ask for check by excavator manufacturer -Pre-heat operation

Warranty Instructions for Steel-Rod

1) Selection of steel-rod

Attention

* A proper selection of steel-rod suitable for operation is extremely important not only for improving the working efficiency of breaking hammer but for prolonging the service life of the steel-rod as well.



A: "-" head type of steel-rod
- applicable for excavation and ditch-digging with various soft and neutral lamination rocks

B: "+" head type of steel-rod
-applicable for crashing granule and neutral concrete or soft non-lamination rocks.
- also applicable for secondary blasting and crashing for soft and neutral hard rocks

C: Tack steel-rod
- Applicable for crashing medium-hardness racks or small cracking rocks, making them even smaller.

2) Claim standards for steel-rods

Hi-Tech steel-rods are manufactured through strict process and quality control, not only in terms of acceptance of materials processed but grinding and even final finishing as well. Documents of steel-rods are well preserved, covering the whole quality tracing records from shipment of steel-rods up to their normal service life. However, the service life of rods vary greatly with the working conditions, operation mode or the types of rocks to be crushed, apart from the factors related to rod quality itself. It is therefore difficult to determine the standard service life of steel-rods.

The following claim standards apply to each of the malfunctions listed below during use of breaking hammers, so that users may have a proper use of our products and their service life can be maintained.

(1) Damage with the striking face of plunger or with contact point of rod flat-pin (Fig 8-2, 3)

It rarely happens that the striking face of plunger or with contact point of rod flat-pin is damaged. This damage occurs because there is not a proper parallelism with the striking point of plunger and rod, which has resulted in an excessively concentrated striking force to the angle of rod. Claim can be made in this case.

(Fig 8–2)

(Fig 8–3)

(2) Damage with the striking face of plunger or with contact point of rod flat-pin (Fig 8-4)

Adopting first-class material, Hi-Tech steel-rods receives proper heat treatment and therefore possesses great strength against stress. In case of a too thin and long plunger, the rod tip may have plastic deformation. Brittleness occurs due to insufficient strength or improper heat treatment. All these contribute to malfunction, which can be claimed for.

(Fig 8–4)

If fatigue crack start appears inside the rod as shown in Fig 8-5, this indicates defects with material. It is therefore claimable in this case.

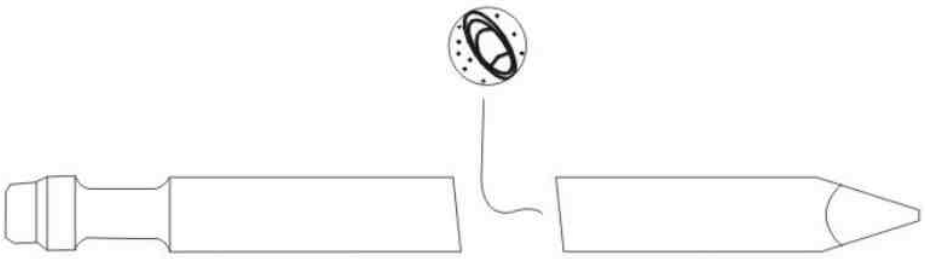


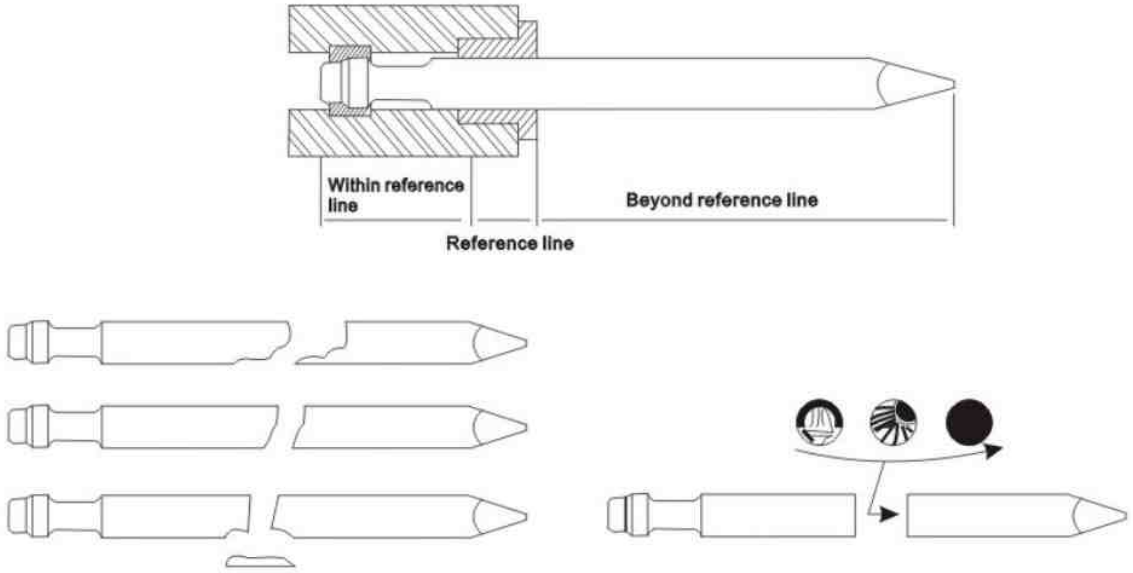
Fig 8–5

If there is any crack in any direction somewhere with the sleeve of the steel-rod, as indicated in Fig 8-6, this shows defects with material or improper heat treatment. Use can claim for this breakage problem.

Fig 8–6

(3) Crack/Damage beyond reference line (Figs 8-8, 9)

If there is any crack/damage somewhere beyond the front bush of the rod (as shown in Fig 8-8, refer to the reference line Fig 8-7). This may be due to the excessive bending overload the rod has taken. When the rod in inserted into something crashed and pulled or pushed, or when the rod cannot strike in from the surface of the crashed articles and get stuck to receive pushing, the rod then will take bending load. Generally, cracks would appear as shown in Fig 8-9, together with crack/damage of clam-shape due to concentrated stress because of bending load. They will spread around quickly from the crack. This may also happen if cracks occur to the rod during operation. Claim for crack/damage beyond the reference line will not be accepted.



(Fig 8–7,8, 9)

(1) Steel-rod head is squeezed flat (Fig 8-10)

With good heat-treatment, the steel-rod of Hi-Tech breaking hammer has a sound performance against wearing and cracking, and therefore it cannot be squeezed flat (Fig 8-10) in normal working condition. However, if the rod strikes continuously for a long time but still cannot crush or penetrate the object, plastic deformation (squeezed flat) may occur, rather than worn-out. Therefore, improper operation is the main reason for the above phenomenon. And consequently this does not fall into the scope of claim.

Fig 8–10

Regulations on After-Sales Service

The following articles are formulated for purpose of convenient management by the company, to ensure a more reasonable and orderly performance with after-sales service.

一、Within warranty period:

1、According to quality inspection standard of pukun：Such parts are entitled to one year warranty period: piston and hydraulic cylinder, such parts are entitled to six months warranty period: valve, fore body and rear body.While others three months.(Wearing parts,damages caused by human factors or using parts that are not recognized by"HTM"Company are not included.)Warranty period is calculated from the date of installation.(Detailed List for Wearing Parts enclosed)

2、In warranty period, if the product breaks down due to its own reasons, agents of Pukun Machinery in local area shall be responsible for providing after-sales service and a timely feedback of relevant information to"HTM" Company in order to solve breakdown quickly and efficiently.

3、In warranty period, if the product breaks down due to its own reasons concerning the quality of pipe/tube parts, shaft and shaft sleeve, etc., the manufacturer will offer parts for free and users need to change by themselves.

4、In warranty period, the manufacturer will conduct irregular sampling maintenance and inspection for all users.

5、This warranty is not applicable for the following situations, even if within warranty period:

- Damages caused by human reason(s), accidents, improper usage, negligence or natural disaster.
- Damages caused by using parts which are not recognized by"HTM" Company or adding accessories which are not recognized in writing by"HTM"Company.
- Refitting and changing equipment or its components without approval from"HTM" Company, which may affect performance or stability for original design of equipment.
- Equipment is not maintained and serviced regularly such as changes for wearing parts, lubrication for each position, fastening for bolts and controlling for nitrogen pressure as well.

二、Beyond warranty period:

1、Manufacturer has the obligation to assist users in solving various difficult problems and arranging visiting service as per actual condition.

2、Parts required by customers shall be ordered in advance while payment for the parts shall be remitted into our account in the meantime. We will deliver goods in 4 working days when we receive payment. Alternatively, customers can directly contact agents for purchasing.

3、Service staff shall carefully complete the detailed information for breakdown, measures to repair, detailed list for changed parts. User shall sign for conformation.

三、Interpretation right for the above articles is reserved by **Hydrotech Mining and Drilling Private Limited.**

Hydrotech Mining and Drilling Private Limited,
Hyderabad, Telangana -501 505, India.

HTM HYDRAULIC ROCK BREAKER PART BOOK

HTM Hydraulic Rock Breaker

Our Hydraulic Rock Breaker Features:

- Available for 0.5 - 55 Ton machines
- Noise Reduction Technology
- 1 Year Warranty as per guidelines
- Meets all quality standards
- 24/7 Service and parts service

HTM

HTM 680 - 68 DIA-CHISEL-MAIN BODY PARTS LIST

HTM

MODEL NAME: HTM 680 - 68 DIA-CHISEL-MAIN BODY PARTS LIST

PARTS NO.	PARTS NAME	SPECIFICATION	Q'TY	REMARKS
68100	**CYLINDER ASSEMBLY**			
HTM-IR68101	CYLINDER	145 * 192 * 367	1	
HTM-IR68102	PISTON	Ø 68 * Ø 77 * Ø 70 * 483	1	
HTM-IR68103	BUFFER RING	HBY 68 * 85.5 * 6	1	
HTM-IR68104	U-PACKING	IUIS 68 * 80 * 6	1	
HTM-IR68105	DUST SEAL	LBI 68 * 80 * 6 * 8	1	
HTM-IR68106	CYLINDER PLUG	M18 * P 1.5	3	
HTM-IR68107	CYLINDER PLUG O-RING	1BP - 16	3	
HTM-IR68108	IN/OUT ADAPTER	G 1/2'	2	
HTM-IR68109	IN/OUT ADAPTER COVER	G 1/2'	2	
HTM-IR68110	IN/OUT ADAPTER O-RING	1BP-18	2	
HTM-IR68111	EXHAUST VALVE	G 1/2'	1	
HTM-IR68112	EXHAUST VALVE O-RING	1BP-18	1	
HTM-IR68113	GUIDE PIN	Ø 12.5 * 30	3	
68200	**VALVE ASSEMBLY**			
HTM-IR68201	VALVE COVER	Ø 45 * 24.5	1	
HTM-IR68202	VALVE	Ø 31.5 * Ø 33 * Ø 30 * 70	1	
HTM-IR68203	VALVE SLEEVE	Ø 45 * 76.5	1	
HTM-IR68204	O-RING	1BG - 40	1	
HTM-IR68205	O-RING	1BG - 25	1	
68300	**PISTON BUSH ASSEMBLY**			
HTM-IR68301	PISTON BUSH ASSEMBLY	Ø 98 * 46	1	
HTM-IR68302	GAS SEAL	1KH 68 * 78 * 5.5	1	
HTM-IR68303	STEP SEAL	SPNS 68	2	
HTM-IR68304	O-RING	HTM 568 - 239	2	
68400	**BACK HEAD ASSEMBLY**			
HTM-IR68401	BACK HEAD	145 * 192 * 154	1	
HTM-IR68402	O-RING	HTM 568 - 239	1	
HTM-IR68403	GAS CHARGING VALVE	G 1/2'	1	
HTM-IR68404	O-RING	1BP - 18	1	
HTM-IR68405	GAS CHARGING VALVE COVER	M10 * P 1.0	1	
HTM-IR68406	O-RING	1 BP - 12	1	
68500	**FRONT HEAD ASSEMBLY**			
HTM-IR68501	FRONT HEAD	145 * 156 * 398	1	
HTM-IR68502	THRUST BUSH	Ø 68 * Ø 90 * 99	1	
HTM-IR68503	CHISEL BUSH	Ø 68 * Ø 90 * 109	1	
HTM-IR68504	(SILENCED CHISEL BUSH)			
HTM-IR68505	CHISEL PIN	Ø 35 * 155	1	
HTM-IR68506	BUSHING PIN	Ø 16 X 97	2	
HTM-IR68507	CHISEL	Ø 68 * 700	1	
HTM-IR68508	RUBBER PLUG	Ø 16 X 20.5	3	
HTM-IR68509	LOCKING PIN	Ø 16 X 107	1	
HTM-IR68510	GREASE NIPPLE	G 1/4'	1	
HTM-IR68511	PROCESS PLUG	M12 * P1.75 * 10	1	
HTM-IR68512	BOLT	ST27 * 2 * 40mm	4	
68700	**THROUGH BOLT ASSEMBLY**			
HTM-IR68701	THROUGH BOLT	Ø 27 * 572	4	
HTM-IR68702	SCREW NUT (UPPER)		4	
HTM-IR68703	WASHER		4	

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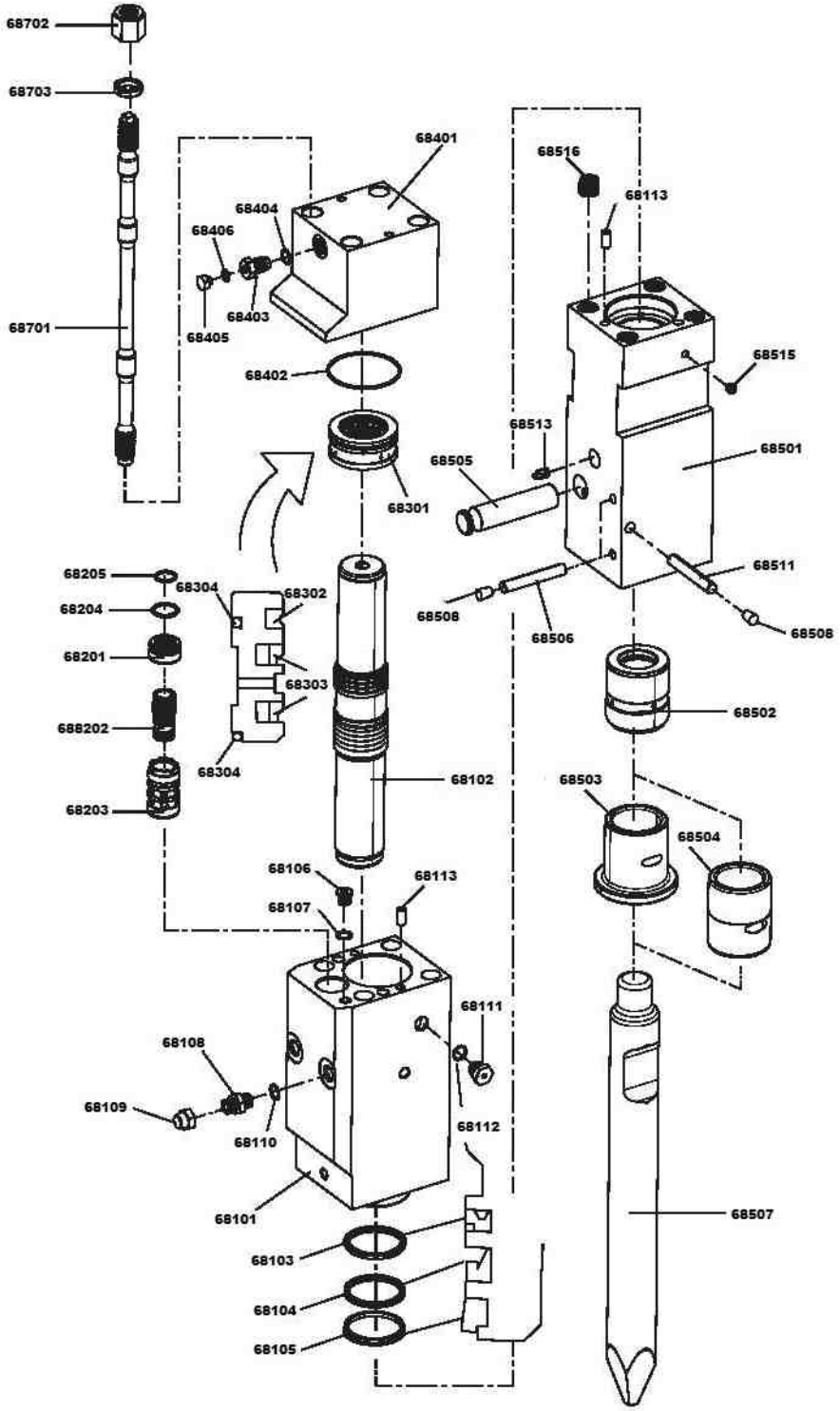
HTM 680 - Main Body Parts List (68100 - 68703)



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HTM 750 - 75 DIA-CHISEL-MAIN BODY PARTS LIST

HTM

MODEL NAME: HTM 750 - 75 DIA-CHISEL-MAIN BODY PARTS LIST

PARTS NO.	PARTS NAME	SPECIFICATION	Q'TY	REMARKS
75100	**CYLINDER ASSEMBLY**			
HTM-IR75101	CYLINDER	165 * 204 * 426	1	
HTM-IR75102	PISTON	Ø 73 * Ø 81 * Ø 75 * 560	1	
HTM-IR75103	BUFFER RING	HBY 75 * 90.5 * 6	1	
HTM-IR75104	U-PACKING	IUIS 75 * 85 * 6	1	
HTM-IR75105	DUST SEAL	LBI 75 * 85 * 6 * 8	1	
HTM-IR75106	CYLINDER PLUG	M18 * P 1.5	3	
HTM-IR75107	CYLINDER PLUG O-RING	1BP - 16	3	
HTM-IR75108	IN/OUT ADAPTER	G 1/2'	2	
HTM-IR75109	IN/OUT ADAPTER COVER	G 1/2'	2	
HTM-IR75110	IN/OUT ADAPTER O-RING	1BP-18	2	
HTM-IR75111	GUIDE PIN	Ø 12.5 * 30	2	
75200	**VALVE ASSEMBLY**			
HTM-IR75201	VALVE COVER	Ø 45 * 30	1	
HTM-IR75202	VALVE	Ø 33.2 * Ø 34 * Ø 32.5 * 7	1	
HTM-IR75203	VALVE SLEEVE	Ø 45 * 80.5	1	
HTM-IR75204	O-RING	1BG - 40	1	
HTM-IR75205	O-RING	1BG - 25	1	
75300	**PISTON BUSH ASSEMBLY**			
HTM-IR75301	PISTON BUSH ASSEMBLY	Ø 105 * 48	1	
HTM-IR75302	GAS SEAL	1KH 73 * 82.5 * 7.3	1	
HTM-IR75303	STEP SEAL	SPNS 73	2	
HTM-IR75304	O-RING	1BG - 100	2	
75400	**BACK HEAD ASSEMBLY**			
HTM-IR75401	BACK HEAD	165 * 204 * 209	1	
HTM-IR75402	O-RING	1BG - 100	1	
HTM-IR75403	GAS CHARGING VALVE	G 1/2'	1	
HTM-IR75404	O-RING	1BP - 18	1	
HTM-IR75405	GAS CHARGING VALVE COVER	M10 * P 1.0	1	
HTM-IR75406	O-RING	1 BP - 12	1	
75500	**FRONT HEAD ASSEMBLY**			
HTM-IR75501	FRONT HEAD	165 * 165 * 438	1	
HTM-IR75502	THRUST BUSH	Ø 75 * Ø 91.5 * 84	1	
HTM-IR75503	CHISEL BUSH	Ø 75 * Ø 108 * 114.5	1	
HTM-IR75504	(SILENCED CHISEL BUSH)			
HTM-IR75505	CHISEL PIN	Ø 35 * 164	2	
HTM-IR75506	BUSHING PIN	Ø 16 X 127	3	
HTM-IR75507	CHISEL	Ø 75 * 700	1	
HTM-IR75508	RUBBER PLUG	Ø 16 X 20.5	3	
HTM-IR75509	GREASE NIPPLE	G 1/4'	1	
HTM-IR75510	BOLT	ST27 * 2 * 40mm	4	
75700	**THROUGH BOLT ASSEMBLY**			
HTM-IR75701	THROUGH BOLT	Ø 27 * 687	4	
HTM-IR75702	SCREW NUT (UPPER)		4	
HTM-IR75703	WASHER		4	

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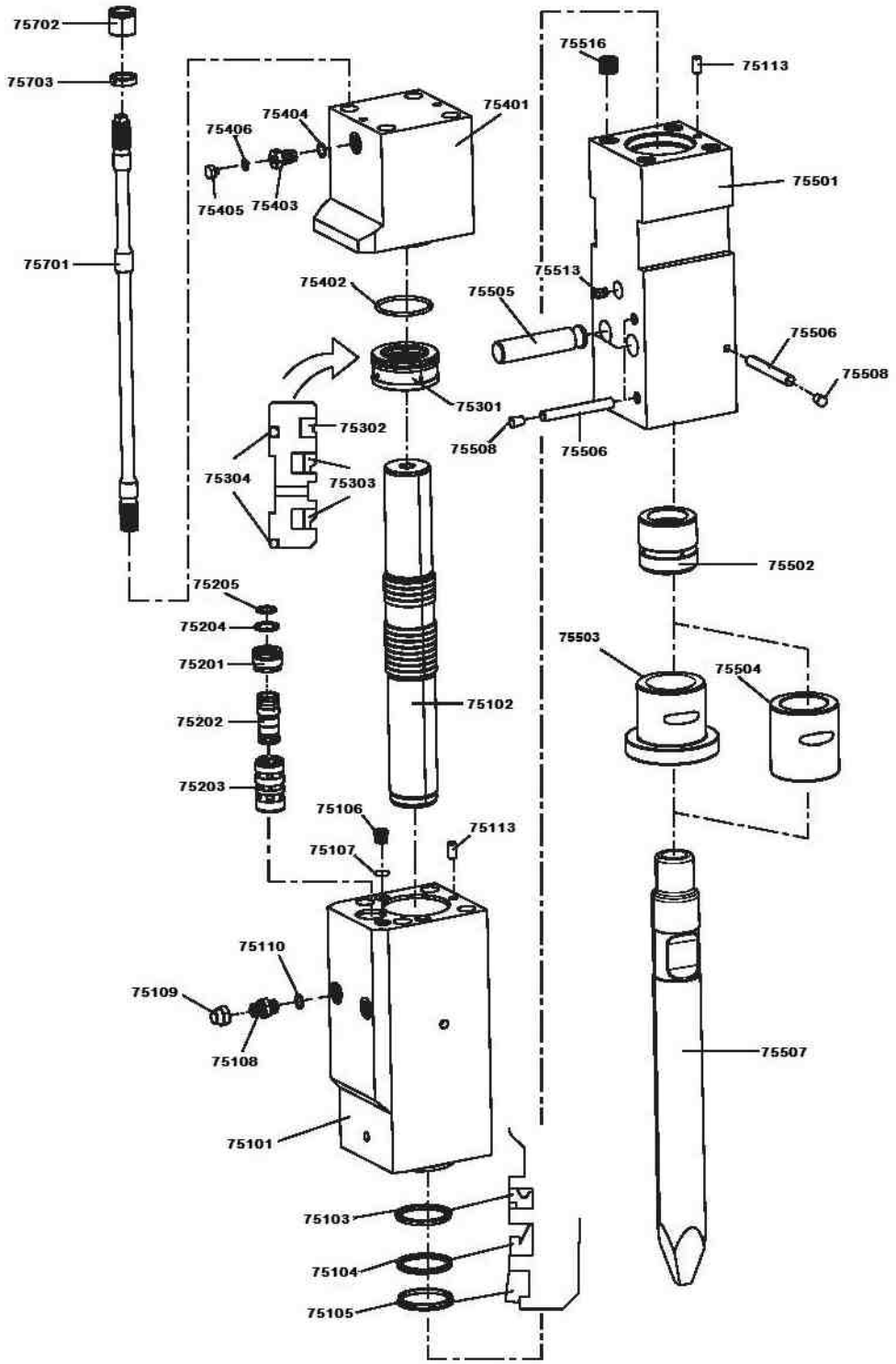
HTM 750 - Main Body Parts List (75100 - 75703)



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HTM 1000 - 100 DIA-CHISEL-MAIN BODY PARTS LIST

HTM

MODEL NAME: HTM 1000 - 100 DIA-CHISEL-MAIN BODY PARTS LIST				
PARTS NO.	**PARTS NAME**	**SPECIFICATION**	**Q'TY**	**REMARKS**
100100	**CYLINDER ASSEMBLY**			
HTM-IR100101	CYLINDER	210 * 267 * 533	1	
HTM-IR100102	PISTON	Ø 98 * Ø 108.5 * Ø 100 * 67	1	
HTM-IR100103	BUFFER RING	HBY 100 * 115.5 * 6	1	
HTM-IR100104	U-PACKING	IUIS 100 * 115 * 9	1	
HTM-IR100105	DUST SEAL	LBI 100 * 110 * 6 * 8	1	
HTM-IR100106	CYLINDER PLUG	M24 * P 2.0	4	
HTM-IR100107	CYLINDER PLUG O-RING	1BP - 22	4	
HTM-IR100108	IN/OUT ADAPTER	G 3/4'	2	
HTM-IR100109	IN/OUT ADAPTER COVER	G 3/4'	2	
HTM-IR100110	IN/OUT ADAPTER O-RING	1BP - 24	2	
HTM-IR100111	EXHAUST VALVE	G 1/2'	1	
HTM-IR100112	EXHAUST VALVE O -RING	1BP - 18	1	
HTM-IR100113	GUIDE PIN	Ø 12.5 * 30	2	
100200	**VALVE ASSEMBLY**			
HTM-IR100201	VALVE COVER	Ø 62 * 42	1	
HTM-IR100202	VALVE	Ø 47.4 * Ø 49 * Ø 46 * 97	1	
HTM-IR100203	VALVE SLEEVE	Ø 62 * 93	1	
HTM-IR100204	O-RING	1BG - 52	1	
HTM-IR100205	O-RING	1BG - 35	1	
100300	**PISTON BUSH ASSEMBLY**			
HTM-IR100301	PISTON BUSH ASSEMBLY	Ø 140 * 61	1	
HTM-IR100302	GAS SEAL	1KH 98 * 107.5 * 7.3	1	
HTM-IR100303	STEP SEAL	SPNS 98	2	
HTM-IR100304	O-RING	1BG - 135	2	
100400	**BACK HEAD ASSEMBLY**			
HTM-IR100401	BACK HEAD	210 * 267 * 253	1	
HTM-IR100402	O-RING	1BG - 135	1	
HTM-IR100403	GAS CHARGING VALVE	G 1/2'	1	
HTM-IR100404	O-RING	1BP - 18	1	
HTM-IR100405	GAS CHARGING VALVE COVER	M10 * P 1.0	1	
HTM-IR100406	O-RING	1 BP - 12	1	
100500	**FRONT HEAD ASSEMBLY**			
HTM-IR100501	FRONT HEAD	210 * 232 * 551	1	
HTM-IR100502	THRUST BUSH	Ø 100 * Ø 121.5 * 117	1	
HTM-IR100503	CHISEL BUSH	Ø 100 * Ø 143 * 155	1	
HTM-IR100504	(SILENCED CHISEL BUSH)			
HTM-IR100505	CHISEL PIN	60 *32 * 232	2	
HTM-IR100506	BUSHING PIN	Ø 17.5 X 167	1	
HTM-IR100507	CHISEL	Ø 100 * 1000	1	
HTM-IR100508	RUBBER PLUG 1	Ø 17.5 X 20.5	2	
HTM-IR100509	CHISEL BUSH PIN	Ø 26 X 147	2	
HTM-IR100510	RUBBER PLUG 2	Ø 26 X 20.5	2	
HTM-IR100511	LOCKING PIN	Ø 17.5 X 167	1	
HTM-IR100512	GREASE NIPPLE	G 1/4'	2	
HTM-IR100513	PROCESS PLUG	M12 * P1.75 * 10	1	
HTM-IR100514	SNAP RING	Ø 26	2	
100700	**THROUGH BOLT ASSEMBLY**			
HTM-IR100701	THROUGH BOLT	Ø 39 * 887	4	
HTM-IR100702	SCREW NUT (UPPER)		4	
HTM-IR100703	WASHER		4	
HTM-IR100704	SCREW NUT (LOWER)		4	
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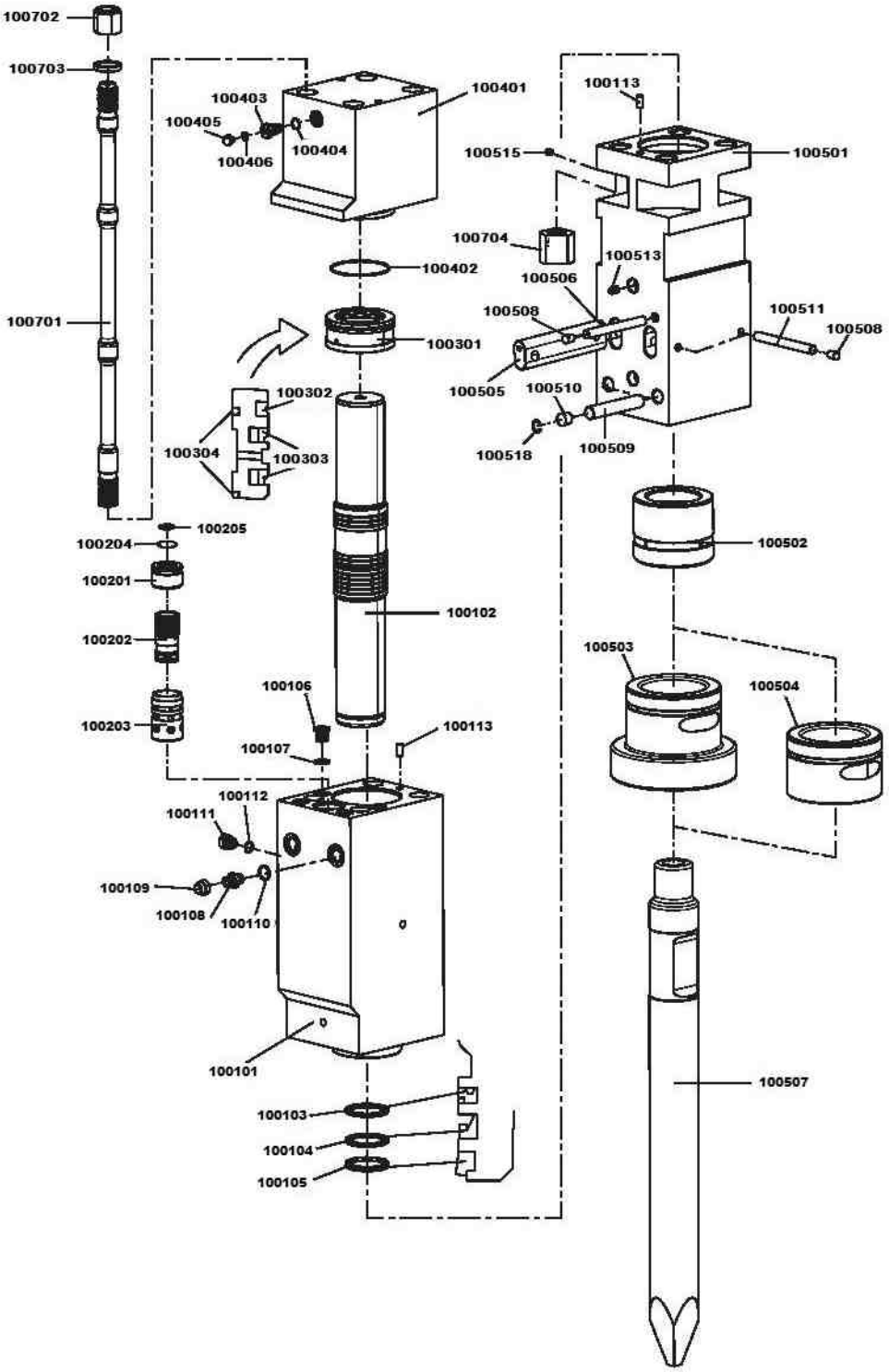
HTM 1000 - Main Body Parts List (100100 - 100704)



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HTM 1400 - 140 DIA-CHISEL-MAIN BODY PARTS LIST

HTM

MODEL NAME: HTM 1400 - 140 DIA-CHISEL-MAIN BODY PARTS LIST

PARTS NO.	PARTS NAME	SPECIFICATION	Q'TY	REMARKS
1400100	**CYLINDER ASSEMBLY**			
HTM-IR140101	CYLINDER	257 * 350 * 551	1	
HTM-IR140102	PISTON	Ø 138 * Ø 150. 5 * Ø 140 * 790	1	
HTM-IR140103	BUFFER RING	HBY 140 * 155. 5 * 5. 8	1	
HTM-IR140104	U-PACKING	IUIS 140 * 155 * 9	1	
HTM-IR140105	DUST SEAL	LBI 140 * 155 * 6 * 8. 9	1	
HTM-IR140106	CYLINDER PLUG	M27*P2. 0	3	
HTM-IR140107	CYLINDER PLUG O-RING	1BP-24	3	
HTM-IR140108	IN/OUT ADAPTER	G 1'	2	
HTM-IR140109	IN/OUT ADAPTER COVER	G 1'	2	
HTM-IR140110	IN/OUT ADAPTER O-RING	1BP-29	2	
HTM-IR140111	EXHAUST VALVE	G 1/2'	1	
HTM-IR140112	EXHAUST VALVE O-RING	1BP-18	1	
HTM-IR140113	GUIDE PIN	Ø 12. 5 * 30	2	
HTM-IR140114	BOLT	ST24 * 3 * 30mm	4	
1400150	**VALVE ADJUSTER ASSEMBLY**			
HTM-IR140151	FRONT VALVE	M18 * P1. 5 * 72	1	
HTM-IR140152	FRONT VALVE NUT	M18 * P1. 5 * 14	1	
HTM-IR140153	FRONT VALVE O-RING	1BP-11	1	
HTM-IR140154	FRONT VALVE WHITE RING	T3P 11	1	
1400200	**VALVE ASSEMBLY**			
HTM-IR140201	VALVE COVER	Ø 75*34	1	
HTM-IR140202	VALVE	Ø 11. 5 * Ø 59. 5 * Ø 57 * 144	1	
HTM-IR140203	VALVE SLEEVE	Ø 75 * 149	1	
HTM-IR140204	O-RING	1BG-70	1	
HTM-IR140205	O-RING	1BG-55	1	
1400300	**PISTON BUSH ASSEMBLY**			
HTM-IR140301	PISTON BUSH	Ø 190 * 54	1	
HTM-IR140302	GAS SEAL	1KH 138 * 150. 6 * 10	1	
HTM-IR140303	STEP SEAL	SPNS 138	2	
HTM-IR140304	O-RING	1BG-180	2	
1400400	**BACK HEAD ASSEMBLY**			
HTM-IR140401	BACK HEAD	257 * 350 * 353	1	
HTM-IR140402	O-RING	1BG-180	1	
HTM-IR140403	GAS CHARGING VALVE	G 1/2'	1	
HTM-IR140404	O-RING	1BP-18	1	
HTM-IR140405	GAS CHARGING VALVE COVER	M10 * P1. 0	1	
HTM-IR140406	O-RING	1BP-12	1	
1400500	**FRONT HEAD ASSEMBLY**			
HTM-IR140501	FRONT HEAD	257 * 306 * 688	1	
HTM-IR140502	THRUST BUSH	Ø 140 * Ø 170 * 183	1	
HTM-IR140503	CHISEL BUSH	Ø140 * Ø 200 * 150	1	
HTM-IR140504	(SILENCED CHISEL BUSH)			
HTM-IR140505	CHISEL PIN	89 * 45 * 306	2	
HTM-IR140506	BUSHING PIN	Ø 20 * 217	1	
HTM-IR140507	CHISEL	Ø 140 * 1300	1	
HTM-IR140508	RUBBER PLUG1	Ø 20 * 21	2	
HTM-IR140509	CHISEL BUSH PIN	Ø 30 * 205	2	

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MODEL NAME: HTM 1400 - 140 DIA-CHISEL-MAIN BODY PARTS LIST				
PARTS NO.	**PARTS NAME**	**SPECIFICATION**	**Q'TY**	**REMARKS**
HTM-IR140510	RUBBER PLUG2	Ø 30 * 24	2	
HTM-IR140511	LOCKING PIN	Ø 20 * 217	1	
HTM-IR140512	GREASE NIPPLE	G 1/4'	2	
HTM-IR140513	PROCESS PLUG	M12 * P1. 75 * 10	1	
HTM-IR140514	SNAP RING	Ø 30	2	
1400700	**THROUGH BOLT ASSEMBLY**			
HTM-IR140701	THROUGH BOLT	Ø 52 * 1055	4	
HTM-IR140702	SCREW NUT (UPPER)		4	
HTM-IR140703	WASHER		4	
HTM-IR140704	SCREW NUT (LOWER)		4	
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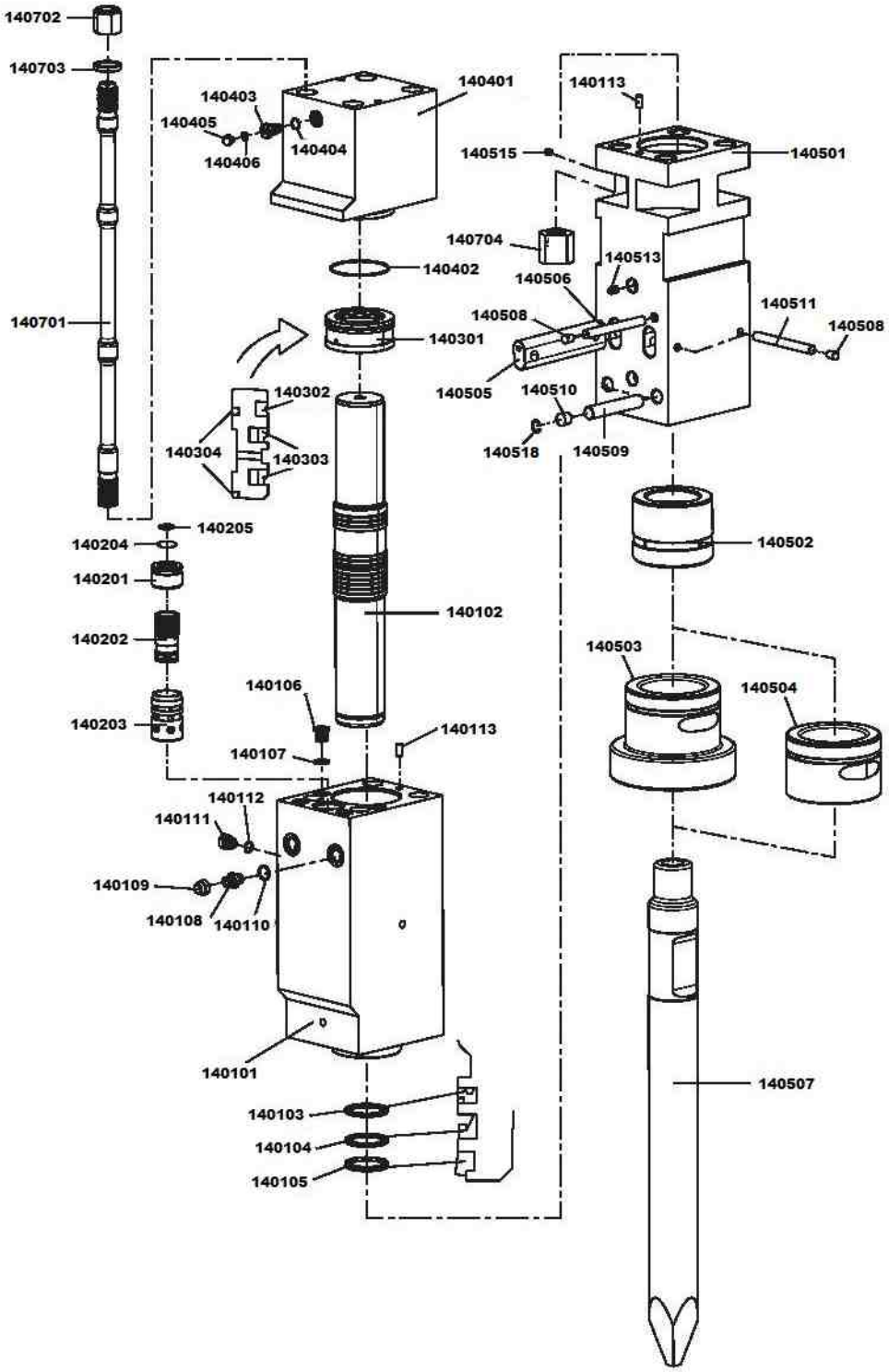
HTM

HTM1400 - Main Body Parts List (140100 - 140704)



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HTM 1400A - 140 DIA-CHISEL-MAIN BODY PARTS LIST

HTM

MODEL NAME: HTM 1400A - 140 DIA-CHISEL-MAIN BODY PARTS LIST

PARTS NO.	PARTS NAME	SPECIFICATION	Q'TY	REMARKS
1400A100	**CYLINDER ASSEMBLY**			
HTM-IR140A101	CYLINDER	257 * 350 * 551	1	
HTM-IR140A102	PISTON	Ø 138 * Ø 150. 5 * Ø 140 * 790	1	
HTM-IR140A103	BUFFER RING	HBY 140 * 155. 5 * 5. 8	1	
HTM-IR140A104	U-PACKING	IUIS 140 * 155 * 9	1	
HTM-IR140A105	DUST SEAL	LBI 140 * 155 * 6 * 8. 9	1	
HTM-IR140A106	CYLINDER PLUG	M27*P2. 0	3	
HTM-IR140A107	CYLINDER PLUG O-RING	1BP-24	3	
HTM-IR140A108	IN/OUT ADAPTER	G 1'	2	
HTM-IR140A109	IN/OUT ADAPTER COVER	G 1'	2	
HTM-IR140A110	IN/OUT ADAPTER O-RING	1BP-29	2	
HTM-IR140A111	EXHAUST VALVE	G 1/2'	1	
HTM-IR140A112	EXHAUST VALVE O-RING	1BP-18	1	
HTM-IR140A113	GUID PIN	Ø 12. 5 * 30	2	
HTM-IR140A114	BOLT	ST24 * 3 * 30mm	4	
1400A150	**VALVE ADJUSTER ASSEMBLY**			
HTM-IR140A151	FRONT VALVE	M18 * P1. 5 * 72	1	
HTM-IR140A152	FRONT VALVE NUT	M18 * P1. 5 * 14	1	
HTM-IR140A153	FRONT VALVE O-RING	1BP-11	1	
HTM-IR140A154	FRONT VALVE WHITE RING	T3P 11	1	
1400A200	**VALVE ASSEMBLY**			
HTM-IR140A201	VALVE COVER	Ø 75*34	1	
HTM-IR140A202	VALVE	Ø 11. 5 * Ø 59. 5 * Ø 57 * 144	1	
HTM-IR140A203	VALVE SLEEVE	Ø 75 * 149	1	
HTM-IR140A204	O-RING	1BG-70	1	
HTM-IR140A205	O-RING	1BG-55	1	
1400A300	**PISTON BUSH ASSEMBLY**			
HTM-IR140A301	PISTON BUSH	Ø 190 * 54	1	
HTM-IR140A302	GAS SEAL	1KH 138 * 150. 6 * 10	1	
HTM-IR140A303	STEP SEAL	SPNS 138	2	
HTM-IR140A304	O-RING	1BG-180	2	
1400A400	**BACK HEAD ASSEMBLY**			
HTM-IR140A401	BACK HEAD	257 * 350 * 353	1	
HTM-IR140A402	O-RING	1BG-180	1	
HTM-IR140A403	GAS CHARGING VALVE	G 1/2'	1	
HTM-IR140A404	O-RING	1BP-18	1	
HTM-IR140A405	GAS CHARGING VALVE COVER	M10 * P1. 0	1	
HTM-IR140A406	O-RING	1BP-12	1	
1400A500	**FRONT HEAD ASSEMBLY**			
HTM-IR140A501	FRONT HEAD	257 * 306 * 688	1	
HTM-IR140A502	THRUST BUSH	Ø 140 * Ø 170 * 183	1	
HTM-IR140A503	CHISEL BUSH	Ø140 * Ø 200 * 150	1	
HTM-IR140A504	(SILENCED CHISEL BUSH)			
HTM-IR140A505	CHISEL PIN	89 * 45 * 306	2	
HTM-IR140A506	BUSHING PIN	Ø 20 * 217	1	
HTM-IR140A507	CHISEL	Ø 140 * 1300	1	
HTM-IR140A508	RUBBER PLUG1	Ø 20 * 21	2	
HTM-IR140A509	CHISEL BUSH PIN	Ø 30 * 205	2	

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MODEL NAME: HTM 1400A - 140 DIA-CHISEL-MAIN BODY PARTS LIST

PARTS NO.	PARTS NAME	SPECIFICATION	Q'TY	REMARKS
HTM-IR140A509	RUBBER PLUG2	Ø 30 * 24	2	
HTM-IR140A510	LOCKING PIN	Ø 20 * 217	1	
HTM-IR140A511	GREASE NIPPLE	G 1/4'	2	
HTM-IR140A512	PROCESS PLUG	M12 * P1. 75 * 10	1	
HTM-IR140A513	SNAP RING	Ø 30	2	
1400A600	**ACCUMULATOR ASSEMBLY**			
HTM-IR140A601	ACCUMULATOR BOTTOM	230 * 234 * 77	1	
HTM-IR140A602	ACCUMULATOR COVRE	Ø 228 * 81	1	
HTM-IR140A603	DIAPHRAGM	Ø 170 * 35	1	
HTM-IR140A604	INNER VALVE ASSEMBLY	Ø 65 * 8 / Ø 60 * 7 /12	1	
HTM-IR140A605	GAS CHARGING ADJUSTER	M12 * P1. 25	1	
HTM-IR140A606	GAS CHARGING O-RING	1BP-5	1	
HTM-IR140A607	GAS CHARGING CAP	M12*P1. 25	1	
HTM-IR140A608	GAS CHARGING CAP O-RING	1BP-14	1	
HTM-IR140A609	ACC' COVER CAP	M10 * P1. 0	1	
HTM-IR140A610	ACC' COVER CAP O-RING	1BP-12	1	
HTM-IR140A611	INNER COVER HEX. SOCKET BOLT	M18 * 1. 5 * 45	12	
HTM-IR140A612	INNER BOTTOM HEX. SOCKET BOLT	M24 * P3. 0 * 60	4	
HTM-IR140A613	O-RING	1BP-95	1	
HTM-IR140A614	WHITE RING	4BP-95	1	
1400A700	**THROUGH BOLT ASSEMBLY**			
HTM-IR140A701	THROUGH BOLT	Ø 52 * 1055	4	
HTM-IR140A702	SCREW NUT (UPPER)		4	
HTM-IR140A703	WASHER		4	
HTM-IR140A704	SCREW NUT (LOWER)		4	

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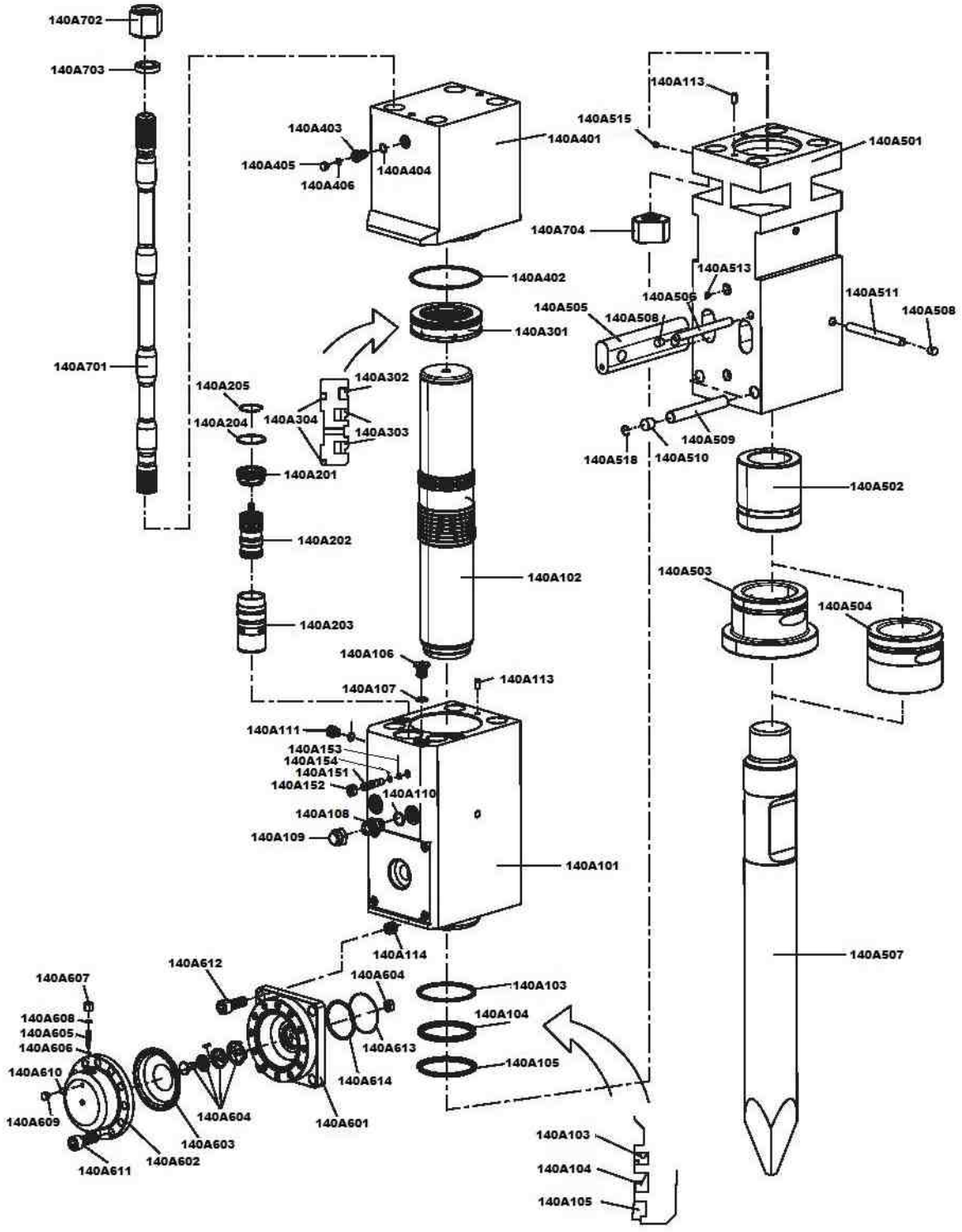
HTM

HTM 1400A - Main Body Parts List - (140A100 - 140A704)



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HTM 1650 - 165 DIA-CHISEL-MAIN BODY PARTS LIST

HTM

MODEL NAME: HTM 1650 - 165 DIA-CHISEL-MAIN BODY PARTS LIST

PARTS NO.	PARTS NAME	SPECIFICATION	Q'TY	REMARKS
165100	**CYLINDER ASSEMBLY**			
HTM-IR165101	CYLINDER	298 * 382 * 686	1	
HTM-IR165102	PISTON	Ø 167 * Ø 184. 5 * Ø 170 * 915	1	
HTM-IR165103	BUFFER RING	HBY 170 * 185. 5 * 6	1	
HTM-IR165104	U-PACKING	IUIS 170 * 185 * 9	1	
HTM-IR165105	DUST SEAL	LBI 170 * 183 * 7 * 9. 5	1	
HTM-IR165106	CYLINDER PLUG	M36 * P3. 0	3	
HTM-IR165107	CYLINDER PLUG O-RING	1BP-32	3	
HTM-IR165108	IN/OUT ADAPTER	G 1 1/4'	2	
HTM-IR165109	IN/OUT ADAPTER COVER	G 1 1/4'	2	
HTM-IR165110	IN/OUT ADAPTER O-RING	1BP-38	2	
HTM-IR165111	EXHAUST VALVE	G 1/2'	1	
HTM-IR165112	EXHAUST VALVE O-RING	1BP-18	1	
HTM-IR165113	GUID PIN	Ø 12. 5 * 30	2	
HTM-IR165114	BOLT	ST24 * 3 * 30mm	4	
165150	**VALVE ADJUSTER ASSEMBLY**			
HTM-IR165151	FRONT VALVE	M22 * P1. 5 * 75	1	
HTM-IR165152	FRONT VALVE NUT	M22 * P1. 5 * 18	1	
HTM-IR165153	FRONT VALVE O-RING	1BP-14	1	
HTM-IR165154	FRONT VALVE WHITE RING	T3P 14	1	
165200	**VALVE ASSEMBLY**			
HTM-IR165201	VALVE COVER	Ø 85 * 38	1	
HTM-IR165202	VALVE	Ø 15 * Ø 71 * Ø 68 * 147	1	
HTM-IR165203	VALVE SLEEVE	Ø 85 * 190	1	
HTM-IR165204	O-RING	1BG-80	1	
HTM-IR165205	O-RING	1BG-55	1	
165300	**PISTON BUSH ASSEMBLY**			
HTM-IR165301	PISTON BUSH	Ø 220 * 60	1	
HTM-IR165302	GAS SEAL	1KH 167 * 179. 1 * 10	1	
HTM-IR165303	STEP SEAL	SPNS 167	2	
HTM-IR165304	O-RING	1BG-210	2	
HTM-IR165305		SRTN 167	1	
165400	**BACK HEAD ASSEMBLY**			
HTM-IR165401	BACK HEAD	298 * 382 * 380	1	
HTM-IR165402	O-RING	1BG-210	1	
HTM-IR165403	GAS CHARGING VALVE	G 1/2'	1	
HTM-IR165404	O-RING	1BP-18	1	
HTM-IR165405	GAS CHARGING VALVE COVER	M10 * P1. 0	1	
HTM-IR165406	O-RING	1BP-12	1	
165500	**FRONT HEAD ASSEMBLY**			
HTM-IR165501	FRONT HEAD	298 * 328 * 839	1	
HTM-IR165502	THRUST BUSH	Ø 165 * Ø 202 * 212	1	
HTM-IR165503	CHISEL BUSH	Ø 165 * Ø 238 * 200	1	
HTM-IR165504	(SILENCED CHISEL BUSH)			
HTM-IR165505	CHISEL PIN	96 * 52 * 326	2	
HTM-IR165506	BUSHING PIN	Ø 20 * 257	1	
HTM-IR165507	CHISEL	Ø 165 * 1600	1	
HTM-IR165508	RUBBER PLUG1	Ø 20 * 21	2	
HTM-IR165509	CHISEL BUSH PIN	Ø 26 * 257	2	

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The above specifications are subject to change without prior notice for the specification data modification.

MODEL NAME: HTM 1650 - 165 DIA-CHISEL-MAIN BODY PARTS LIST

PARTS NO.	PARTS NAME	SPECIFICATION	Q'TY	REMARKS
HTM-IR165510	RUBBER PLUG2	Ø 26 * 21	2	
HTM-IR165511	LOCKING PIN	Ø 20 * 257	1	
HTM-IR165512	GREASE NIPPLE	G 1/4'	1	
HTM-IR165513	PROCESS PLUG	M12 * P1. 75 * 10	1	
165600	**ACCUMULATOR ASSEMBLY**			
HTM-IR165601	ACCUMULATOR BOTTOM	257 * 257 * 77	1	
HTM-IR165602	ACCUMULATOR COVRE	Ø 255 * 73. 5	1	
HTM-IR165603	DIAPHRAGM	Ø 192 * 40	1	
HTM-IR165604	INNER VALVE ASSEMBLY	Ø 65 * 8 / Ø 60 * 7 /10	1	
HTM-IR165605	GAS CHARGING ADJUSTER	M12 * P1. 25	1	
HTM-IR165606	GAS CHARGING O-RING	1BP-5	1	
HTM-IR165607	GAS CHARGING CAP	M12*P1. 25	1	
HTM-IR165608	GAS CHARGING CAP O-RING	1BP-14	1	
HTM-IR165609	ACC' COVER CAP	M10 * P1. 0	1	
HTM-IR165610	ACC' COVER CAP O-RING	1BP-12	1	
HTM-IR165611	INNER COVER HEX. SOCKET BOLT	M16 * P2. 0 * 40	14	
HTM-IR165612	INNER BOTTOM HEX. SOCKET BOLT	M24 * P3. 0 * 60	4	
HTM-IR165613	O-RING	1BP-75	1	
HTM-IR165614	WHITE RING	4BP-75	1	
165700	**THROUGH BOLT ASSEMBLY**			
HTM-IR165701	THROUGH BOLT	Ø 56 * 1211	4	
HTM-IR165702	SCREW NUT (UPPER)		4	
HTM-IR165703	WASHER		4	
HTM-IR165704	SCREW NUT (LOWER)		4	

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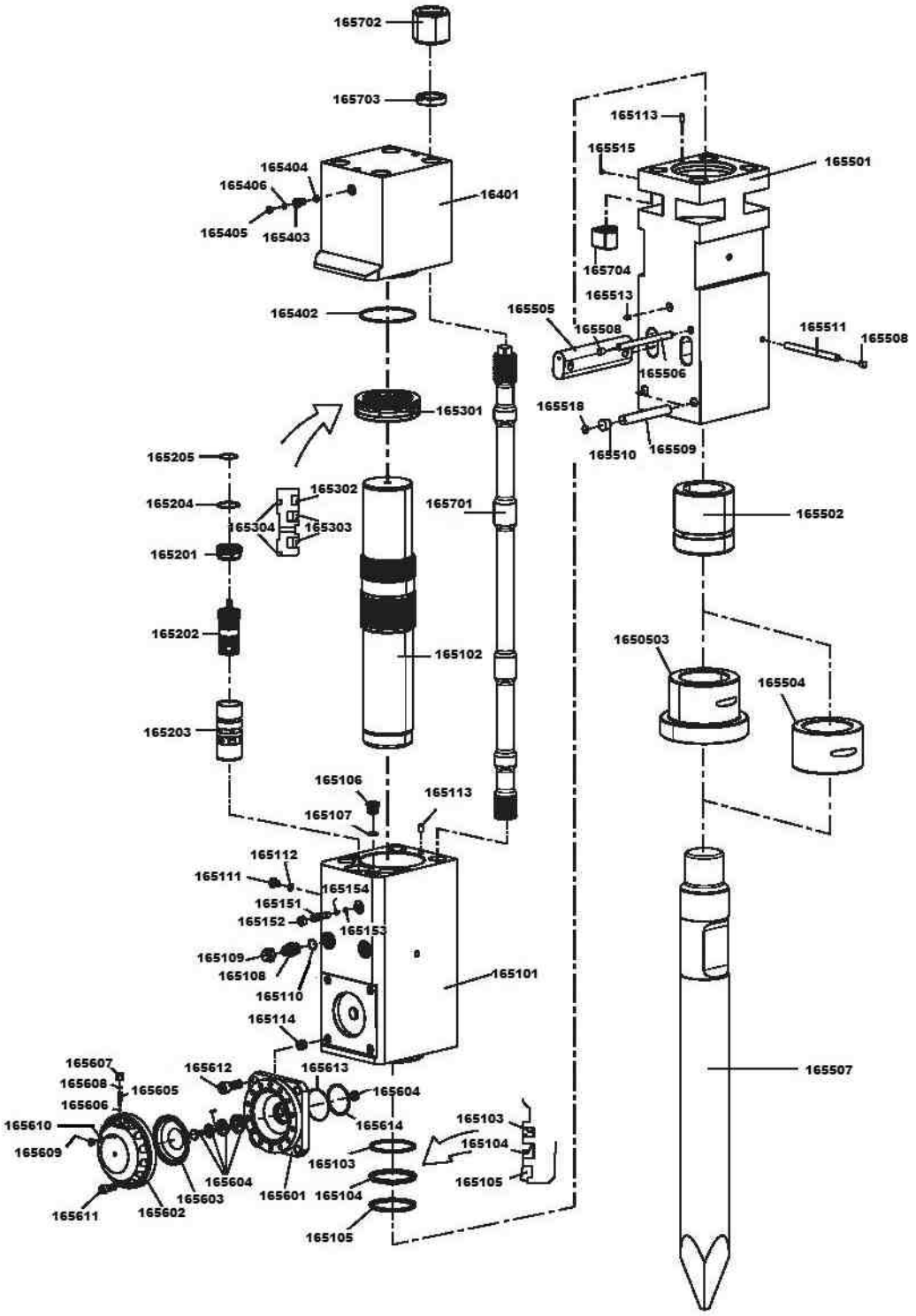
The above specifications are subject to change without prior notice for the specification data modification.

HTM

HTM 1650 - Main Body Parts List - (165100 - 165704)



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HTM 1800 - 180 DIA-CHISEL-MAIN BODY PARTS LIST

HTM

MODEL NAME: HTM 1800 - 180 DIA-CHISEL-MAIN BODY PARTS LIST

PARTS NO.	PARTS NAME	SPECIFICATION	Q'TY	REMARKS
180100	**CYLINDER ASSEMBLY**			
HTM-IR180101	CYLINDER	350 * 380 * 839	1	
HTM-IR180102	PISTON	Ø 186 * Ø 198 * Ø 177 * 1280	1	
HTM-IR180103	BUFFER RING	HBY 186 * 200. 5 * 10	1	
HTM-IR180104	U-PACKING	ISI 186 * 206 * 14	1	
HTM-IR180105	DUST SEAL	DSI 186 * 201 * 7 * 8	1	
HTM-IR180106	CYLINDER PLUG	3/4 * 14	3	
HTM-IR180107	CYLINDER PLUG O-RING	1BP-38	3	
HTM-IR180108	IN/OUT ADAPTER	G 1 1/4'	2	
HTM-IR180109	IN/OUT ADAPTER COVER	G 1 1/4'	2	
HTM-IR180110	IN/OUT ADAPTER O-RING	1BP-38	2	
HTM-IR180111	EXHAUST VALVE	G 1/2'	1	
HTM-IR180112	EXHAUST VALVE O-RING	1BP-18	1	
HTM-IR180113	GUID PIN	Ø 12. 5 * 30	2	
HTM-IR180114	BOLT	ST24 * 3 * 30mm	4	
180150	**VALVE ADJUSTER ASSEMBLY**			
HTM-IR180151	FRONT VALVE	M27 * P2. 0 * 93	1	
HTM-IR180152	FRONT VALVE NUT	M27 * P2. 0 * 22	1	
HTM-IR180153	FRONT VALVE O-RING	1BP-18	1	
HTM-IR180154	FRONT VALVE WHITE RING	T3P 18	1	
180160	**VALVE ADJUSTER ASSEMBLY**			
HTM-IR180161	SIDE ADJUSTER	M27 * P2 * 93	1	
HTM-IR180162	SIDE ADJUSTER NUT	M27 * P2 * 22	1	
HTM-IR180163	SIDE ADJUSTER O-RING	1BP-18	1	
HTM-IR180164	SIDE ADJUSTER WHITE RING	T3P-18	1	
180200	**VALVE ASSEMBLY**			
HTM-IR180201	VALVE COVER	Ø 80 *114 * 216 *115	1	
HTM-IR180202	VALVE	Ø 46 * Ø 65 * Ø 79 * 200	1	
HTM-IR180203	VALVE SLEEVE	Ø 65 * Ø78 * 145	1	
HTM-IR180204	O-RING	1BG-100	1	
HTM-IR180205	O-RING	1BG-80	1	
180300	**PISTON BUSH ASSEMBLY**			
HTM-IR180301	PISTON BUSH	Ø 230 * 125	1	
HTM-IR180302	GAS SEAL	1KH 180 * 193. 3 * 10. 5	1	
HTM-IR180303	STEP SEAL	SPNS 187	3	
HTM-IR180304	O-RING	1BG-215	3	
180400	**BACK HEAD ASSEMBLY**			
HTM-IR180401	BACK HEAD	350 * 380 * 410	1	
HTM-IR180402	O-RING	1BG-210	1	
HTM-IR180403	GAS CHARGING VALVE	G 1/2'	1	
HTM-IR180404	O-RING	1BP-18	1	
HTM-IR180405	GAS CHARGING VALVE COVER	M10 * P1. 0	1	
HTM-IR180406	O-RING	1BP-12	1	
180500	**FRONT HEAD ASSEMBLY**			
HTM-IR180501	FRONT HEAD	350 * 350 * 926	1	
HTM-IR180502	THRUST BUSH	Ø 180 * Ø 216 * 220	1	

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The above specifications are subject to change without prior notice for the specification data modification.

MODEL NAME: HTM 1800 - 180 DIA-CHISEL-MAIN BODY PARTS LIST				
PARTS NO.	**PARTS NAME**	**SPECIFICATION**	**Q'TY**	**REMARKS**
HTM-IR180503	CHISEL BUSH	Ø 180 * Ø 250 * 250	1	
HTM-IR180504	(SILENCED CHISEL BUSH)			
HTM-IR180505	CHISEL PIN		2	
HTM-IR180506	BUSHING PIN	Ø 26 * 290	1	
HTM-IR180507	CHISEL	Ø 180 * 1650	1	
HTM-IR180508	RUBBER PLUG1	Ø 26 * 20. 5	2	
HTM-IR180509	CHISEL BUSH PIN	Ø 36 * 250	2	
HTM-IR180510	RUBBER PLUG2	Ø 36 * 25. 5	2	
HTM-IR180511	LOCKING PIN	Ø 26 * 250	1	
HTM-IR180512	GREASE NIPPLE	G 1/4'	1	
HTM-IR180513	PROCESS PLUG	M12 * P1. 75 * 10	1	
HTM-IR180514	SNAP RING	Ø 36	2	
180600	**ACCUMULATOR ASSEMBLY**			
HTM-IR180601	ACCUMULATOR BOTTOM	295 * 295 * 103	1	
HTM-IR180602	ACCUMULATOR COVRE	Ø 310 * 105	1	
HTM-IR180603	DIAPHRAGM	Ø 205 * 37	1	
HTM-IR180604	INNER VALVE ASSEMBLY	Ø 65 * 8 / Ø 60 * 7 /12	1	
HTM-IR180605	GAS CHARGING ADJUSTER	M12 * P1. 25	1	
HTM-IR180606	GAS CHARGING O-RING	1BP-5	1	
HTM-IR180607	GAS CHARGING CAP	M12 * P1. 25	1	
HTM-IR180608	GAS CHARGING CAP O-RING	1BP-14	1	
HTM-IR180609	ACC' COVER CAP	M10 * P1. 0	1	
HTM-IR180610	ACC' COVER CAP O-RING	1BP-12	1	
HTM-IR180611	INNER COVER HEX. SOCKET BOLT	M16 * P2. 0 * 40	16	
HTM-IR180612	INNER BOTTOM HEX. SOCKET BOLT	M24 * P3. 0 * 60	4	
HTM-IR180613	O-RING	1BP-75	1	
HTM-IR180614	WHITE RING	4BP-75	1	
180700	**THROUGH BOLT ASSEMBLY**			
HTM-IR180701	THROUGH BOLT	Ø 58 * 1350	4	
HTM-IR180702	SCREW NUT (UPPER)		4	
HTM-IR180703	WASHER		4	
HTM-IR180704	SCREW NUT (LOWER)		4	
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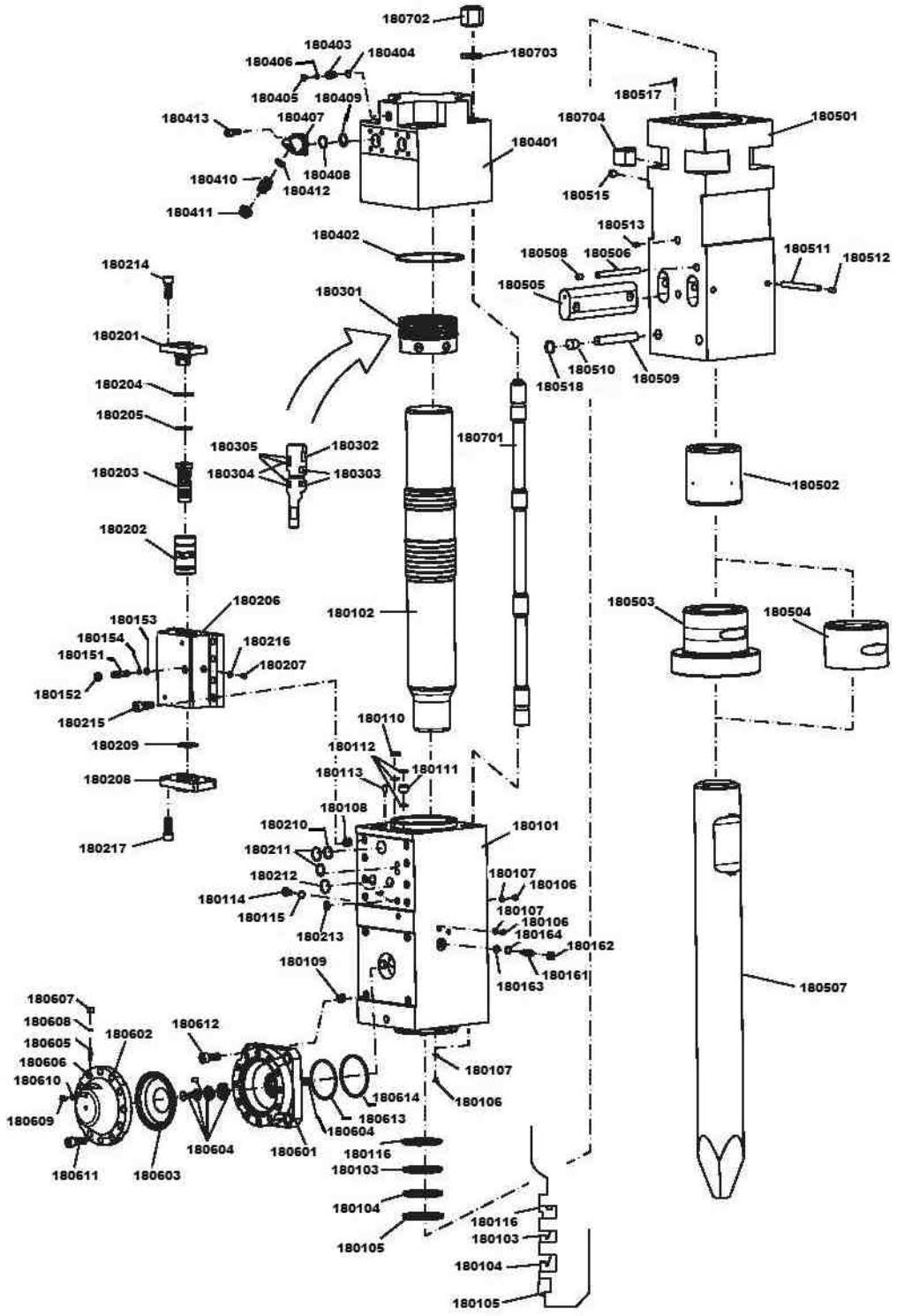
The above specifications are subject to change without prior notice for the specification data modification.				

HTM

HTM 1800 - Main Body Parts List - (180100 - 180704)



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Appendix: List of Wearing Parts

- Thrust bush (Front Cover)
- Ring bush
- Rod pin
- Stop pin
- Frout head pin
- Rod
- Diaphragm
- Front Bush
- Front Cover
- Back Cover
- Seal kit
- Relieve Valve
- Stop Valve
- Controlvalve

The above wearing parts normally in use may vary with different users' operation mode and objects for operation. We have listed the wearing scope for the most often used wearing parts. In case of exceeding the scope, in-time replacement will be required.

Replacement of seal ring: when leakage of oil or nitrogen occurs.

Replacement of rod: great different influence over rod may occur due to different operation modes. In case of discrepancy, the quality assurance standard of Pukun Company shall prevail.

Maintenance Schedule

Pre Shift

	Verify correct operation of all machine functions.
	Check for leaks, damaged hoses or clamps.
	Check that all electrical components are in operational condition.
	Grease the breaker tool, retainer pins and plugs with Chisel Paste. If equipped with auto lube system, ensure there is adequate grease in the reservoir.

Every 2 Hours

	Verify correct operation of all machine functions.
	Grease breaker tool bushing. Pump grease in until it is visible around tool and retainer pins.
	Check general condition of machine and surrounding work area.

Every 8 Hours – Daily

	Check all screw connections for tightness (during first 50 hours of operation). Refer to "Torque Specifications"
	Check hydraulic oil level in carrier reservoir.
	Check lubrication system.
	Check all hardware and bolts for tightness.
	Check all hydraulic lines, fittings and clamps for leaks or damage.
	Check breaker for damage, loose fittings, or hydraulic leaks.

Every 50 Hours – Weekly

	Check torque on all fasteners.
	Check mounting pins for wear.
	Check impact surface of tool for deformation.
	Remove the breaker tool and retaining pins. Inspect the wearing surfaces Remove any burrs before reinstalling. Refer to Service section if scuffing marks are found on the tool.
	Inspect upper isolator.
	Use a hammer to ping (knock) the tie rods. The same tone will resonate if the tie rods are torque equally. A loose tie rod will be immediately evident.

Every 100 Hours

	Remove the breaker tool and inspect the wearing surface. Remove any burrs before reinstalling.
	Inspect the tool retainer pins. Remove the pins, rotate 180 degrees and reinstall.
	After initial 100 hours of operation, change hydraulic pressure and return line filter elements.
	Check tool bushing clearance.
	Check that the pressure/return filter indicators on the carrier hydraulic system are functioning correctly and not in by-pass.

Every 500 Hours

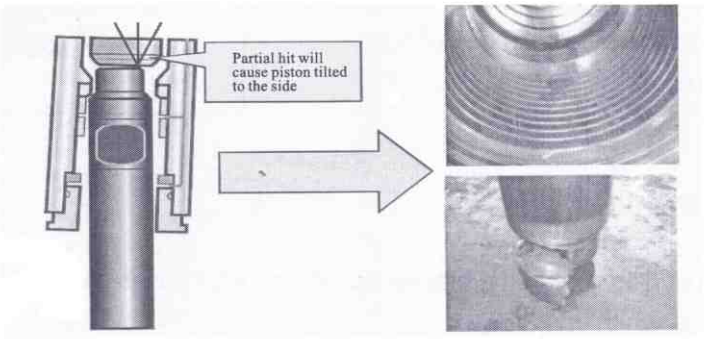
	Take a sample of the hydraulic oil. Review the results and determine if an increase in filter change interval and/or oil change is required. File the results.
	Check cushion chamber nitrogen gas pressure. Refer to "Cushion Chamber Gas Pressure – Checking"
	Perform all breaker checks above as required.
	Check that the retainer pins, cross pins and stopper plugs are not damaged and are in place.
	Check that the upper isolator and tie rod nuts are in place and tight. Check for wear.

Every 1000 Hours or Yearly

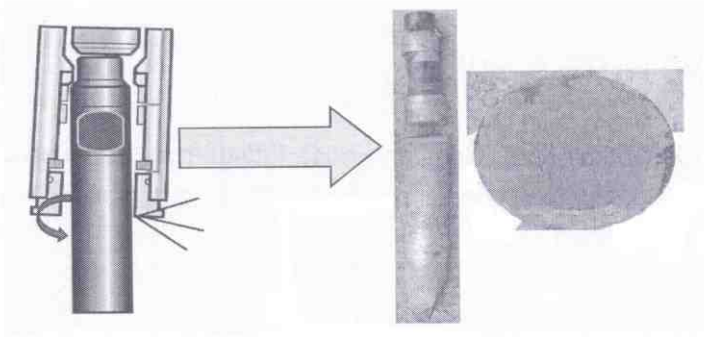
	Replace the retainer pins.
	Perform all breaker checks listed above as required.
	Disassemble the breaker to replace all seals. Replace upper and lower breaker isolators inside the housing.
	Measure the wear limit on the Front and Rear Bushings. Replace each bushing if the allowable tolerances are exceeded.
	Check Hydraulic flow to breaker and operating pressure. Adjust as necessary.

1.Regular Replacement of Outer Bush and Inner Bush

Piston partial hit will strain piston and hitted parts.

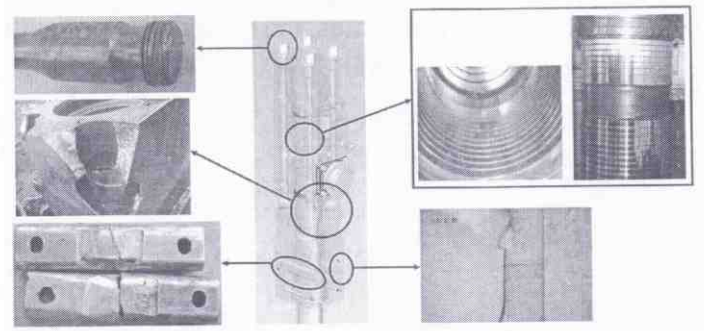


2.The wear of outer bush and inner bush will wreck chisel.

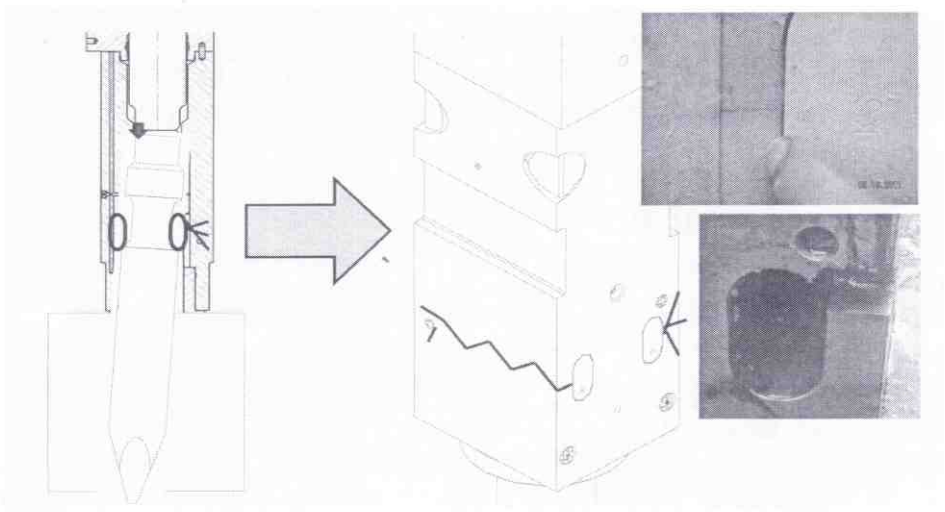


Minimize the frequency of empty strike

Empty strike will accelerate wear of breaker and base machine spare parts, Frequencely empty strike will casue following problem:

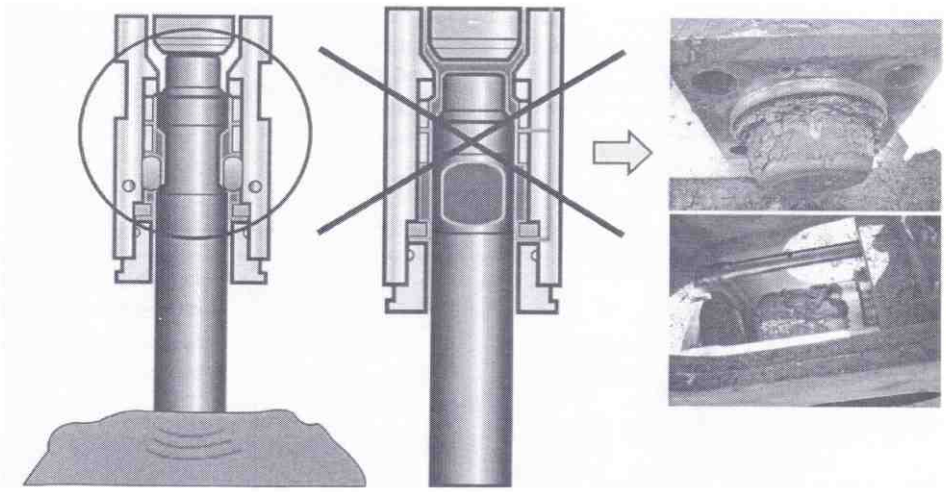


The wear of chisel pin will cause crasks on cylinder



5.Upright breaker and internal chisel to inner bush during injecting grease oil

If the grease oil go into the excavator through hammer,
it will damage the whole hydraulic cylinder and contaminate the oil.



HTM HYDRAULIC BREAKER WARRANTY GUIDE

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HTM BASIS OF WARRANTY

1. PERIOD

Warranty period for breaker assembly is differently applied by "Warranty period for parts", and basis date should be fixed from installation date of the breaker when distributor submits installation information in advance to manufacturer.

If no prior information about installation, please note that the warranty period should be applied from Ex-Works (Ex-Factory) date.

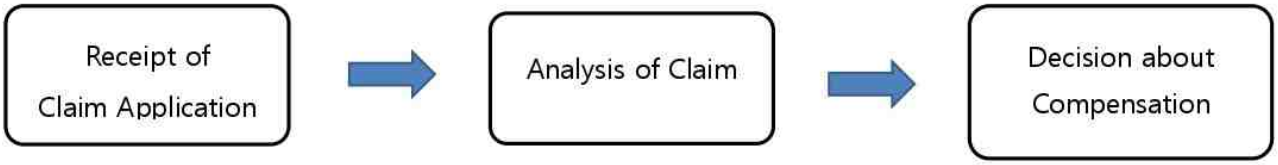
Also, please make sure just half period of warranty that is listed in "Warranty period for parts" would be applied to the working for a long time with exceeding of 12Hrs in a day.

2. RANGE

In case of any trouble, malfunction and breakdown in our product within warranty period under the proper operation and maintenance, customer's warranty claim is acceptable.

And, any quality problem that is clearly proved manufacturer's defect by technical analysis is also acceptable as warranty claim

3. PROCEDURE OF CLAIM APPLICATION



① Present to took related and detailed pictures for defected part.

② Submit the pictures with serial number on label that is attached in breaker frame.
(If it's not possible, please prove the number by e-mail or fax message.)

③ Show the picture that includes serial number for the defected part.
(If it's not possible, please prove the number by e-mail or fax message.)

④ Send some pictures for wearing status in front cover and ring bush.

⑤ Also, send us the picture for impact side of piston.

⑥ Impact side of chisel and rod pin pictures are needed.

⑦ **FXJ** QA team analyze cause of claim with mentioned pictures and documents in above, and discuss about compensation under the procedure.

※ 1) Claim notice without mentioned procedure ①,②,③ is not acceptable.
2) Any Claim with violation of above procedure would be not acceptable.

4. WARRANTY PERIOD FOR EACH PART(From Installation Date)

REFER WARRANTY CARD

5.『 JUDGMENT BASIS OF CYLINDER DEFECT 』

PROBLEM	PHOTO	CAUSE OF PROBLEM	PREVENTION COUNTER-PLAN	WARRANTY
Inside Crack		Occurrence by excessive heat-treatment between each holes inside of cylinder	Caution in producing	Acceptable
Outside Crack		Excessive heat-treatment to inside and outside of cylinder	Caution in producing	Acceptable
Inside Scratch		①Not to keep the regulation in maintenance manual such as handling, operation, mainte-nance, checking points. ②Excessive scratching by any dust from inside.	①Operator's compliance ②Caution in producing	① Not Acceptable ②Acceptable in case of claim within 3 months

※ Other warranty claim by manufacturer's defect is acceptable.

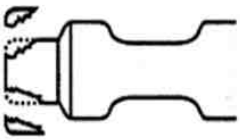
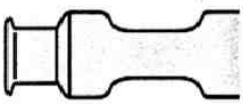
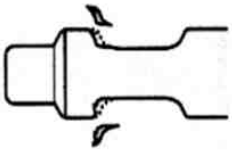
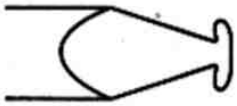
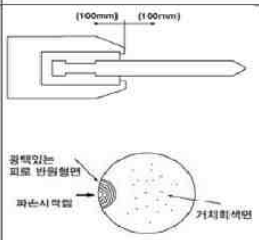
6. 『 JUDGMENT BASIS OF PISTON DEFECT 』

PROBLEM	PHOTO	CAUSE OF PROBLEM	PREVENTION COUNTER-PLAN	WARRANTY
Horizontal Crack		Long time working with oil-film breakdown between cylinder and piston. In this case, surface hardness is to be fallen-down with generation of heat, after then piston is cracked.	Compliance of mechanic-al properties (Breakdown of seals, Vibrating and prevention of dust from outside)	Generally Not Acceptable (Same problem within 3 months from installation date is acceptable.)
Vertical Crack		Expansion of micro-crack in steel material through heat treatment and continuous working	Selection of proper steel material	Acceptable (In case of excessive scratching on piston surface, re-discussion is needed.)
Separation of hitting part		① Problem from steel material ② Fatigue damage due to long time working	①Proper material select-ion, regulation compliance of heat-treatment. ②Compliance of recommended daily working hours	①Acceptable ②Not Accpetable

Breakage of hitting part		① Edge lined impact of piston and chisel due to operator's hazard or abrasion of Front Cover and Ring Bush ②Problem from steel material or heat-treatment	①Operator's regulation compliance for operating and replacement cycle of consumption parts ②Proper material selection,regulation compliance of heat-treatment.	①Not Accpetable ②Acceptable
Cave in impact part		①Decline of surface hardness by heating in continuous and long term working ②Problem from steel material or heat treatment	①Prohibit of consecutive Working ②Proper material selection, regulation compliance of Heat-treatment.	①Not Acceptable ②Acceptable
Surface scratching		①Not to keep the regulation in maintenance manual such As handling, operation, main-tenance, checking points, how to stock and replacement cycle of consumption parts ②Excessive scratching by any dust from inside.	①Operator's Compliance for operating instruction ②Caution in producing	①Not Acceptable ②Acceptable in case of a claim within 3 months from installation date

※ Other warranty claim by manufacturer's defect is acceptable

7. 『 JUDGMENT BASIS OF CHISEL DEFECT 』

PROBLEM	PHOTO	CAUSE OF PROBLEM	PREVENTION COUNTER-PLAN	WARRANTY
Breakdown in impact part		① In case of normal working, it is due to defect from material or heat treatment. ②Breakdown from unstable working between each impact side of piston and chisel	①Proper material selection, regulation compliance of heat treatment. ②Regular replacement of pin and bushings.	① Acceptable ②Not Acceptable
Cave in Impact part		①Excessive long-time and non-stop Working. ②Problem from steel material or Heat treatment.	①Prohibit of long-time impact ②Proper material selection,regulation compliance of heat treatment.	①Not Acceptable ②Acceptable
Damage of groove for Rod Pin		Excessive blank-firing and unstable impact between each impact side of piston and chisel	①Regular replacement of pin and bushings. ②No more blank-firing	Not Acceptable
Squashing of Chisel end		Softening after excessive heating in chisel end due to non-stop impact more than 30 seconds at hard point.	Prohibit of non-stop impact in any hard point.	Not Acceptable
Breakage at the outside of Front Cover		①Levering ②Scratching by insufficient greasing to chisel	① Prohibit Levering ②Compliance of maintenance instruction	Not Acceptable
Breakage of chisel end		Levering	Prohibit Levering	Not Acceptable

※ ① Abrasion of chisel around 150mm from endpoint (in case of Blunt type, 50mm from endpoint) is not acceptable.

② Other warranty claim by manufacturer's defect is acceptable.

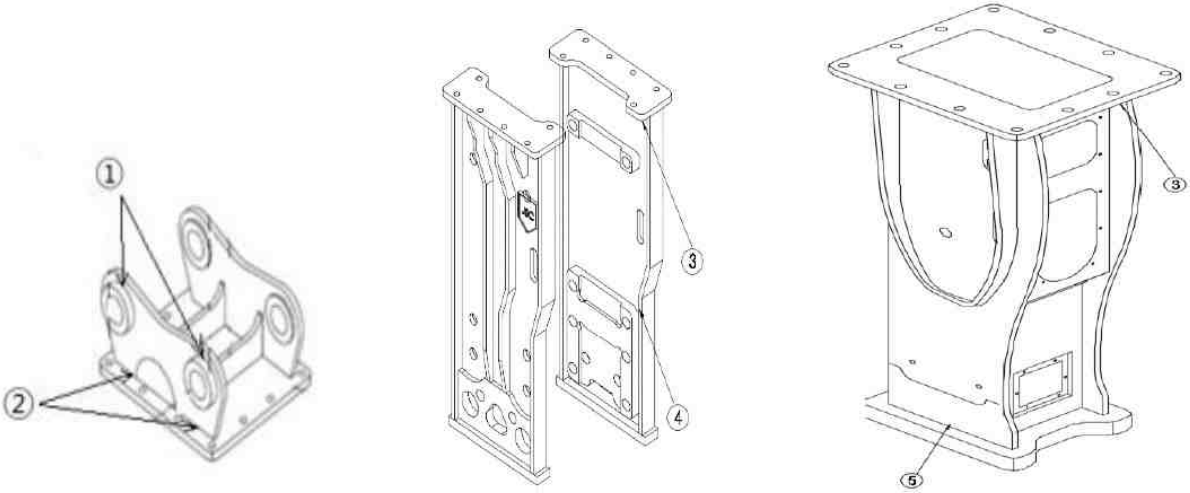
8. BRACKET (FRAME, HOUSING)

Accepted warranty claim within warranty period is to be compensation by local repairing, and replacement is not available in this case in principle.

However, replacement is available with discussion in case of critical loss or hard restoring in the field such as becoming open and wider of welding bush, chipping -off of reinforcement part in frame.

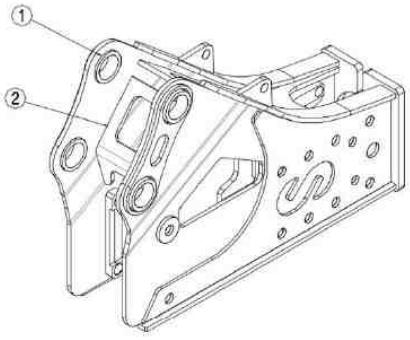
※ Scope of critical welding crack

(1) BOX, TOP TYPE BRACKET



① Crack in welding bush and welded part in mount cap
② Welded part crack between square plate and pin bracket
③ Welded part crack between square plate and bracket frame
④ Welded part crack between bracket frame and set plate
⑤ Welded part crack between bracket frame and front plate

(2) SIDE TYPE BRACKET



① Crack in welding bush and welded part
② Welded part crack between main frame plate and connecting plate

Acceptance Report

Receiving Date: _____

Inspection Date: _____

1. Dealer & Customer

Dealer:		Customer:	
Address:		Address:	
Telephone:		Telephone:	

2.Check item

Model number		Serial number	
Varnish		Spare parts	
Tool box		Other	

3.Comments for acceptance

Dealer	Only for Hi-Tech:
Dealer's signature	

Acceptance Report

This report is applicable for checking if there are missing parts and components and also the delivery condition of breaking hammer or parts. This report should be sent to Pukun Company by fax in 3 days since a dealer receives breaking hammers or parts & components. Otherwise it will be considered as smooth receiving (no defects) and we will not settle relevant expenses.

Notice:

◆ Date of Receiving: Receiving date for breaking hammers or part & components.

◆ Date of Inspection: The date when dealers inspect breaking hammers or part & components.

◆ Model: the model of breaking hammer.

◆ Machine No.: The machine number of breaking hammer.

◆ Painting: the color of painting.

◆ Remarks: inspect spare parts and missing parts.

◆ Tool Box: check if there is any missing tool.

Acceptor's Comments: further detailed list and status for missing parts can be added while suggestions/comments from users for breaking hammers or parts & components delivered are also welcome.

Installation & Commissioning Report

1. Dealer & Customer

Dealer:		Customer:	
Address:		Address:	
Telephone:		Telephone:	

2.Excavator & Breaker

Breaker's model	Serial Number:	Date of installation:	L/T:
Excavator's model:	Serial Number	Date in use:	Pipe kit:

3.Pressure

Back head pressure:		Relief v/v pressure	
Work pressure		Work discharge	

4.Test report & Remark

5. Signature

Installer´ s signature	Custome r ´ s signature

For Pukun Company

Post	General manager	Head of department	Person-in-charge
Comments			

User's Statement: I now declare that delivery of the breaker is satisfactory and the equipment was well installed on _____, with smooth running. Acceptance is therefore granted through commissioning and inspection. We also acknowledge receipt of spare parts manual and operation manual, as well as guidance in terms of correct operation, preventive maintenance and service; we have been provided with complete and clear explanation regarding warranty.

Installation Report

This report is applicable for checking if shipping and installation of breaking hammer is normal. Dealers should properly complete this report since it is the main foundation for any claim in future.

The report should be sent to Pukun Company by fax within 3 days after breaking hammer is installed, and should be mailed to Pukun Company by EMS within 10 days. Otherwise,Pukun Company will not clear servicing expenses for agents.

- ◆ Manufacturer / Model: Manufacturer and model of machine (excavator)
- ◆ Model and No.: Model and No. of breaking hammer
- ◆ Working Pressure: Actual working pressure
- ◆ Pressure Set for Overflow Valve: Applicable for actual set pressure for overflow valve of breaking hammer.
- ◆ Work Flow: Actual working oil required
- ◆ Nitrogen Pressure: Actual pressure in accumulator or air cavity.
- ◆ Starting Date of Warranty: Shipping date of breaking hammer.
- ◆ Expiration Date of Warranty: Date when half a year expires after breaking hammers are shipped to customers.

Maintenance Service Report

1. Dealer & Customer

Dealer:	Telephone:	Customer:	Telephone:
Address:		Address:	

2.Excavator & Breaker

Breaker's model	Serial Number	Date of installation
Excavator's brand & model	Excavator's model	Days in use:

3. Failure information

Date of Failure:	Date of Arrival:	Date of settlement:
Failure Decision & comment		

4. Claim parts

Part number	Partname	Q´ ty	Unit price	Amount	Remark

5.Signature

Installer´ s signature	Custome r´ s signature

For Pukun Company

Post	General manager	Head of department	Person-in-charge
Comments			

Service Report

1) Agent and User

◆ Name of Agent: Name of agent's company

◆ Address of Agent: Address of agent's company

◆ Telephone: Telephone of agent's company

◆ Name of Customer: Name of customer's company

◆ Address of Customer: address of customer's company

◆ Telephone: Telephone of customer's Company

2) Excavator and Breaker

◆ Model of Breaker: such as **HTM 1400A**

◆ Breaker No.: Number of breaker delivered out of the manufacturer

◆ Date of Installation: Date of installing a breaker

◆ Matching Model: Such as **Komatsu, Hitachi, Volvo, Cat,JCB etc**

◆ Excavator Model: Model of excavator delivered out of the manufacturer

◆ Operation Hours: Actual or estimated working hours when malfunction occurs

Fill in actual working hours: A× × × Hrs

Fill in estimated working hours: E× × ×Hrs

3) Malfunction

◆ Date of malfunction: Date when a malfunction happens

◆ Date of Arrival at Site: Date when service staff arrive at malfunction site.

◆ Date of Disposal Completion: Date of completing troubleshooting by service staff.

◆ Disposal Instruction for Malfunction: malfunction will be described in details.

4) Part Changing

◆ Describe in details the quantity of parts changed.

HTM

www.htmspares.com