PREFACE

We appreciate your purchasing Gt hydraulic breaker.

To ensure the best performance of the Gt breaker, we have included all of the maintenance procedures required for its operation, assembly and disassembly, and adjustment in this handbook.

This handbook illustrates completely all the information you need for achieving best performance and minimizing down time of your equipment.
All other inquires that may arise for the operation, will be forwarded to GIANT through your dealer.

We can assure you of our continuous support and guarantee customer satisfaction.

WARNING

- Pay particular attention to all safety messages.
- Contamination of hydraulic oil can be damaged main hydraulic components such as working pump or motor, control valve.
- Check nitrogen (N_2) gas pressure regularly.
  The blowing power reduces if the gas pressure is lower than stipulated parameter
- This manual instructs you on your Gt breakers and its safe operation and maintenance. Study this manual before installing, operating or maintaining this equipment. Do not operate this equipment before you read and fully understand this manual.
- Backhead gas is not charged during operation.
  - Charge Backhead nitrogen (N_2) gas before use.
- Attached CAUTION sticker (Accumulator is not charged.) on accumulator charging plug.
  - In case of air flight nitrogen (N_2) gas must be discharged.
  - Remove the warning sticker.
  - Charge Accumulator Nitrogen (N_2) gas before use.

FOREWORD

This manual contains safety operation, lubrication, and maintenance information.
This manual is a reference for the new operator and refresher for the experienced personnel.
Read, understand and keep it with the breaker.
Some pictures or illustrations on this publication may show details that are different from your breaker. For example, a bracket may have been removed of purposes of illustration.
Continuing improvement and advantage of product design may have caused changes to your breaker that are not included in this publication.

Whenever a question arises regarding your breaker, or this publication, please consult to your GIANT dealer.

SAFETY

The safety section contains basic safety and operation precautions.
Read and understand the basic precautions listed in the safety section before operating and performing lubrication, maintenance, and repair on this product.

OPERATION

This section includes a discussion of work preparation and operation techniques.
The operation techniques outlined in this publication are basic. Skill and techniques develop as the operator gains knowledge of the breaker and capabilities.

MAINTENANCE

Maintenance section is a guide careness of the equipment.
Illustrated, step-by-step instructions are grouped by service intervals. Items without specific intervals are listed under “When required” topics.
Items in “maintenance intervals” chart refers for detailed instructions follow.

MAINTENANCE INTERVALS

Use the service hour meter of main machine to determinate servicing intervals. Periodical intervals shown (daily, weekly, monthly, etc…) may be used instead of service hour meter intervals, if they provide more convenient servicing schedules and approximate the indicated service hour reading.
Recommended service should always be performance at the intervals that occur first.
Under extremely severe operating conditions, more frequent lubrication than specified in the “Maintenance interval” instruction may be necessary.
Performing service on items at multiples of the original requirement, for example: “Every 50 operating hours or weekly” and “every 10 operating hours or Daily”.

PRECAUTIONS WHEN USING HYDRAULIC BREAKERS

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!.

WARNING

- When leaving the excavator lower the breaker to the ground and turn the engine off.
- Never attach a cable or sling to the breaker to host a load.
  Doing so is extremely dangerous.
- Keep people and equipment away from the breaker during operation.
  Rocks flying from the breaker during operation may cause accidents.
- Ear, eye and breathing protection must be used at all times when operating the breaker.
- Do not touch any part of the machine while the hydraulic oil is hot.
  It may cause your hands to burn.

IMPORTANT

- Check that there is sufficient hydraulic oil and that is not contaminated.
- Check that hoses, bolts and nuts are secure.
- Grease the shank part of the tool.
- Do not use the breaker in water.
  (Special specifications are available for underwater work)
- Do not continuously blow the same place for more than one minute.
- Do not operate the breaker when the cylinders of your excavator are located at their stroke end.
- Do not charge gases other than nitrogen gas into back head (gas chamber) and accumulator.
- Do not operate the breaker unless all safety decals described in this manual are in place. The decals must be inspected periodically to ensure that wording is legible. The decals must be replaced if illegible. Replacement decals can be obtained from your authorized GT breakers distributor.

GENERAL SAFETY PRECAUTIONS

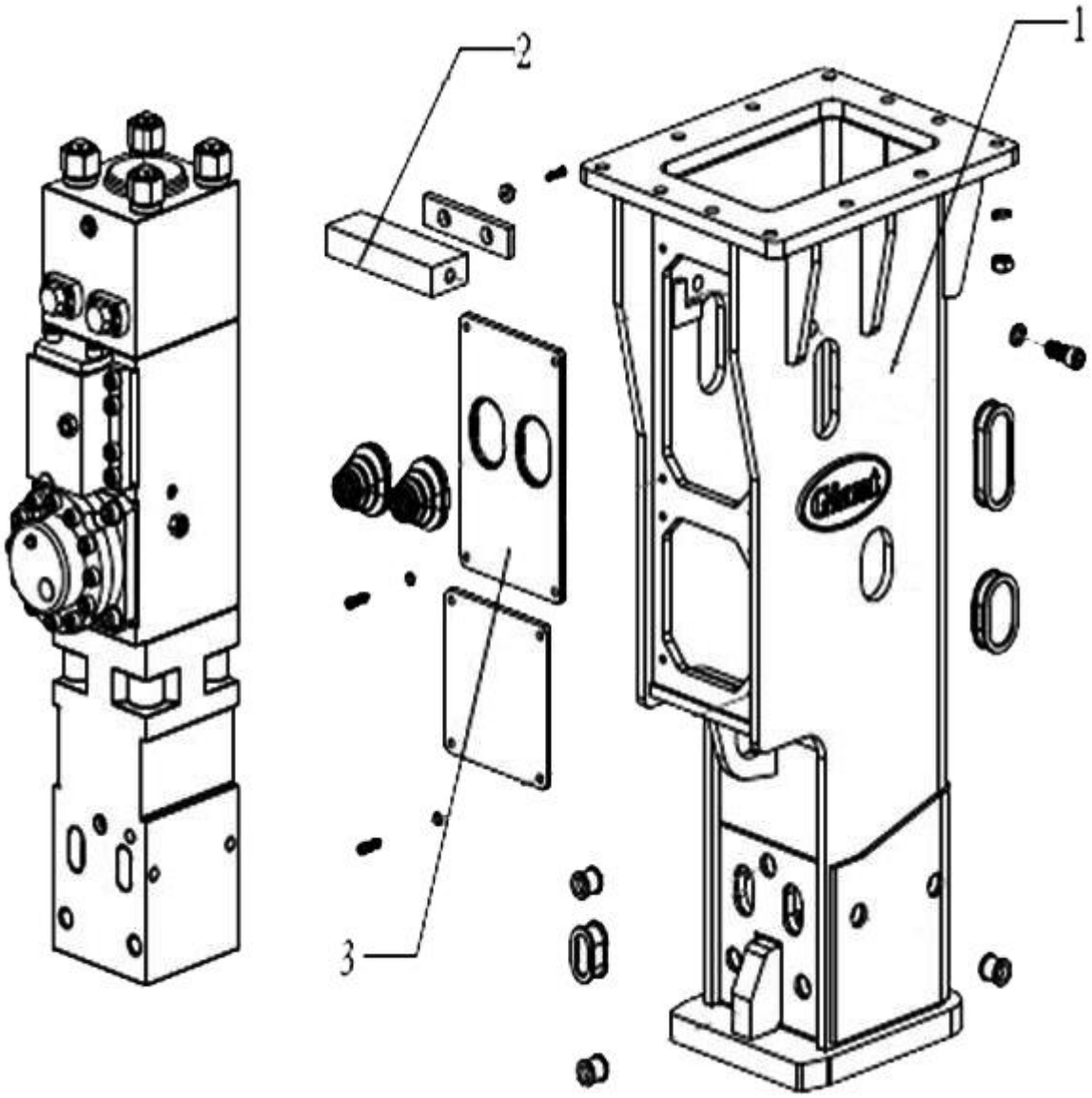
1. Operate the breaker in accordance with all laws and regulations which affect you, your equipment and the work site.
2. Do not operate the breaker unless you have read the carrier equipment manual and thoroughly understand all safety, operation and maintenance instructions.
3. Ensure that all maintenance procedures recommended inthis manual are completed before using the equipment.
4. Know the limits of your equipment.
5. Establish a Training program for all operators to ensure safe operation.
6. Do not operate the breaker unless thoroughly trained or under the supervision of an instructor.
7. Become familiar with the carrier controls before operating the carrier and the breaker.
8. While learning to operate the breaker and carrier, do so at a slow pace. If necessary, set the carrier mode selector to the slow position.
9. Make sure all controls are in the neutral position before starting the carrier.
10. Before leaving the carrier, always lower the boom and ensure the carrier is stable. Never leave the machine with the engine running. Always engage the parking brake.
11. Do not operate the breaker at oil temperatures above 175/80. Operation at higher temperatures can cause damage to the internal components of the breaker and backhoe/excavator, and will result in reduced breaker performance.
12. Do net operate a damaged, leaking, improperly adjusted, or incompletely assembled breaker.
13. Do net modify the breaker in any manner.
14. Only use breaker tools manufactured by GIANT breaker, Use of breaker tools produced by another manufacturer may damage the equipment and will void the warranty.
15. To avoid personal injury or equipment damage, all breaker repair, maintenance and service must only breaker dealer for assistance.
16. If you do not understand how to safely operate your breaker, contact an authorized GIANT breaker dealer for assistance.
17. Keep this manual with the breaker.
18. Do not operate this equipment if you are taking medication which may affect your mental judgement or physical with the breaker.
19. Do not operate this equipment if you are under the influence of drugs or alcohol.
20. Remove breaker from carrier during transport.
21. Be familiar with the work area and surroundings.

SAFETY DEVICES AND TREATMENT OF BREAKER

1. SAFETY DEVICES

1) STRUCTURE OF BREAKER

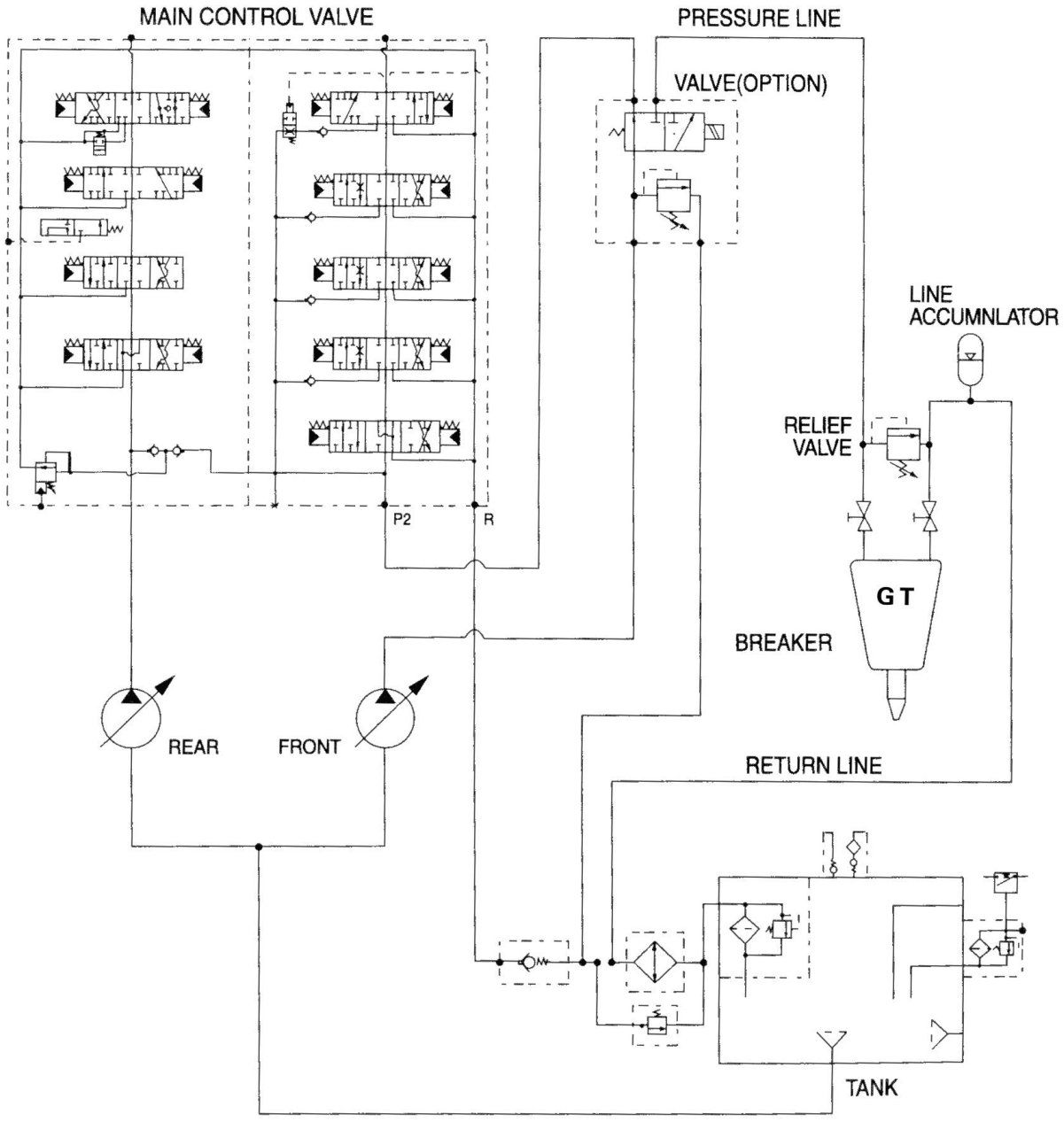
REF. NO.	SAFETY DEVICES
1,2,3	MAXIMIZATION OF INTERNAL PARTS SEPARATION AS BOX TYPED BRACKET AND MAIN BODY SUPPORT.



2) CONTROL METHOD OF HYDRAULIC OIL FLOW & PRESSURE SUPLIED TO BREAKER

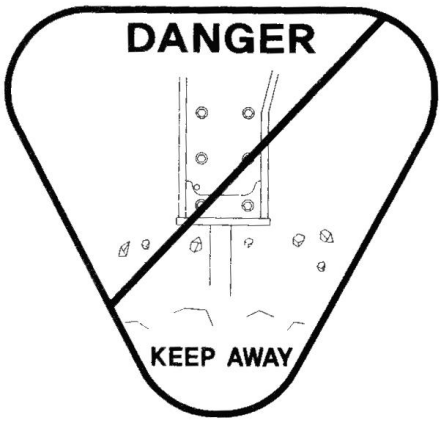
SAFETY DEVICES (OPTION)
INSTALLATION PACKAGE VALVE (FROM CONTROL VALVE) KEEPING OPERATING SAFETY AND BREAKER PROTECTION

1- NO SPARE PART (OPTION PART) IN EXCAVATOR



SAFETY TREATMENT

ATTACHED WARNING STICKER FOR MAIN PARTS.
WARNING NOTICE OF DANGEROUS FACTORS



- Do keep over 20 m away from work site as flying debris can make person dangerous.

- As spraying pressure of N_2 gas can result in loss of eyesight.
- Do work after discharge of N_2 gas.

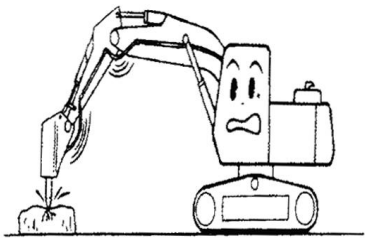
- In case of air flight N_2 gas must be discharged.

- Do wear ear protection and keep 10 m distance away as over 80db can make hearing disorder.

3) SAFETY OPERATION

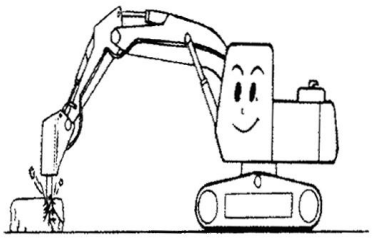
> Improper operation or maintenance could result in injury or death
> Do not operate or work this machine unless you are properly trained.
> Read and understand the operation and maintenance manual.
> Additional manuals are available from GIANT breaker dealers.

1) HOSE VIBRATING



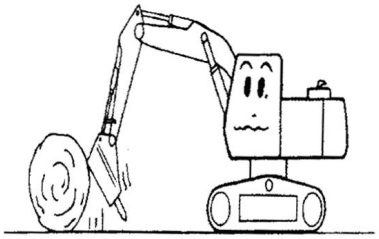
- Before starting machine, check all controls and warming devices for proper operation.
- Stop working immediately when hydraulic hose is severely vibrating. It may be possible caused by damaged accumulator lowered gas pressure.
- Running in this condition may result to loose bolts or hydraulic pump damage.

2) NO IDLE BREAKER



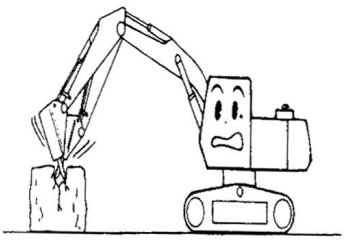
- Do not breaker or air-stop operating immediately when the hammering object is broken.
- If you continue, the idle hammering could result in excessive wearing of major component or parts damage.

3) NO SIDE STRENGTH



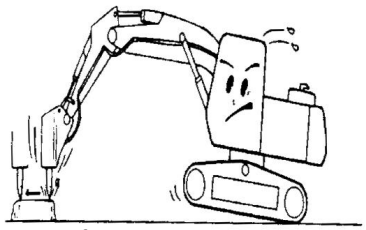
- Do not move a rock with the bracket side and rod end.

4) NO USE AS A LEVER



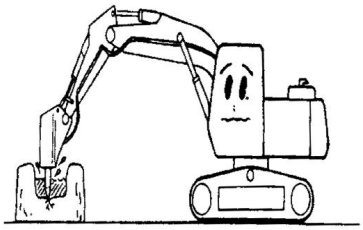
- Never use tool as a lever.
- Excessive wearing or damage of through bolt, Rod or front cover.

5) MOVE BREAKING POINT



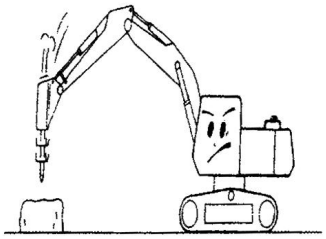
- Move the breaking point, if no breakage occurs at the same point breaking over 30 seconds.
- Do not lever the breaker during hammering.

6) NO OPERATION IN THE WATER



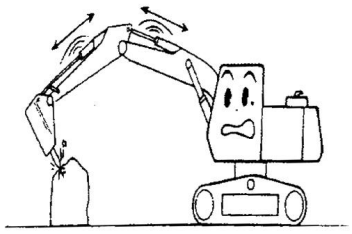
- Do not apply breaker in the water.
- Corrosion of breaker or dust could result in further damage of hydraulic component.

7) NO DROP HITTING



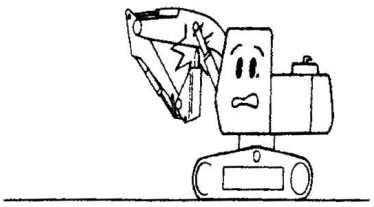
- No drop hitting-Hydraulic breaker is more operated severer than a bucket.
- Drop hitting could result in damage of front head or swing mechanism of the main machine.

8) NO FULL STROKE OPERATION



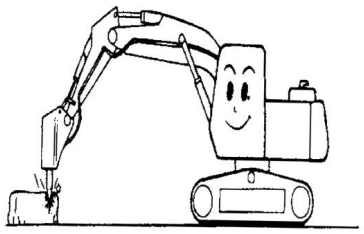
- Never use the breaker on the full stroke of boom & arm cylinders.
- It may result in operation shock of breaker and damage of the cylinders and front head.
- Reserve 100 mm at least.

9) NO HIT BOOM



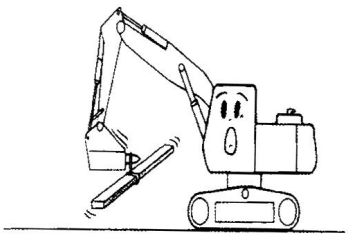
- Be careful not to hit boom with breaker rod when main machine's arm is folding.

10) ATTACH FROM SIDE



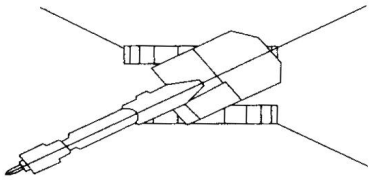
- Attack work piece from the side, if you have a big and/or hard rock.

11) NO LIFTING WITH BREAKER



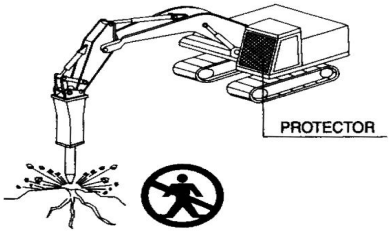
- No lifting with breaker
- It may cause turn over of main machine or possible Breaker damage

12) NO SIDE DIRECTIONAL WORK



- Avoid side directional working of main machine.
- It may possibly result in turn over of the main machine or damage of crawler mechanism.

13) SAFETY TREATMENT BEFORE WORK



- Install protector and keep away.

Other basic rules:

- When you are working with a hydraulic breaker coupled to hydraulic excavator you must have special attention to: High voltage lines, water pipes, gas pipes, fibre optic cables, etc.

- Do not operate the machine if you have taken in alcohol or drugs.
- If you have to replace any pin or to change the hydraulic breaker, be sure to replace it on a flat ground to prevent from accidents. If any hose is damaged or loosed can be burst open and blow out hydraulic oil during operation, and serious injury or death can result from it.

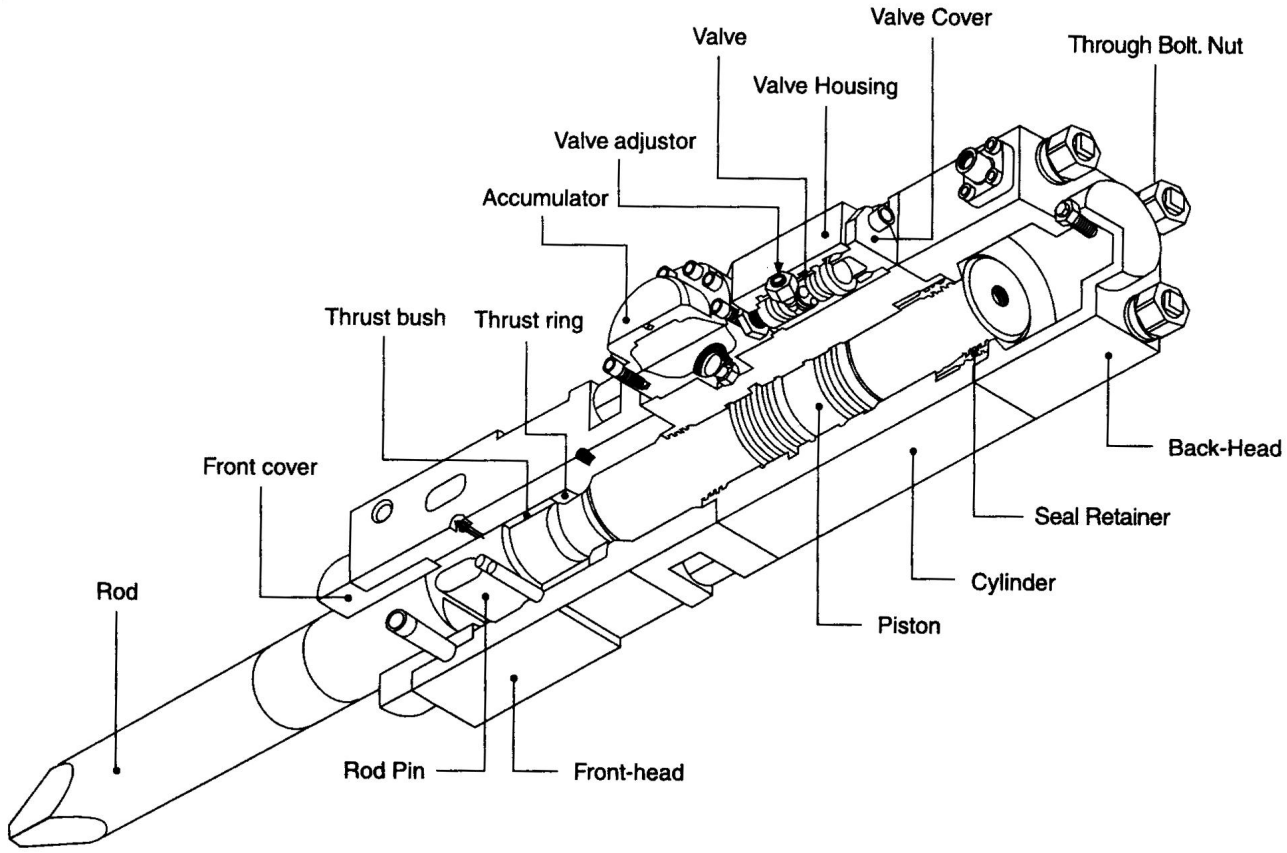
GT BREAKER SPECIFICATION

Model	Dia.of Tool (mm)	Weight of Tool (kg)	Operating Weight (kg)	Operating Flux (l/min)	Operating Pressure (bar)	Impact Rate (bpm)	Applicable Excavator	
							Capacity (m^3)	Weight (ton)
GT08	40	4	132	15-30	90-120	700-1200	Less than 0.07	0.8-2.5
GT10	45	6	195	20-40	90-120	700-1200	0.03-0.10	1.2-3.0
GT20	53	9	260	25-50	90-120	600-1200	0.06-0.20	2.5-4.5
GT30	70	19	390	40-70	110-140	500-900	0.15-0.30	4.0-7.0
GT40	75	24	480	50-90	120-150	400-800	0.20-0.35	6.0-9.0
GT50	85	32	648	60-100	130-160	400-800	0.25-0.50	7.0-14
GT60	100	57	917	80-110	150-170	350-700	0.40-0.60	11-16
GT70	120	89	1358	90-120	150-170	350-650	0.50-0.70	12-18
GT75	125	98	1415	90-120	150-170	350-650	0.50-0.75	14-20
GT80	135	131	1712	100-150	160-180	350-600	0.60-1.00	18-23
GT90	140	142	1947	120-180	160-180	350-500	0.85-1.20	19-25
GT100	140	140	2018	150-190	160-180	350-500	0.85-1.20	20-28
GT130	150	164	2145	150-190	160-180	350-500	1.10-1.15	25-32
GT150	155	183	2676	180-240	160-180	300-450	1.20-1.60	28-35
GT160	155	197	2691	190-250	160-180	300-450	1.20-1.60	30-40
GT190	160	200	2791	190-250	160-180	300-450	1.30-1.80	35-45
GT200	175	263	3532	210-290	160-180	200-350	1.40-2.00	40-55

Note: Information said-above can be altered in pursuit of the qualities of products.

STRUCTURE

- MAIN BODY



1) **Cylinder assembly**
   This contains the moving piston which strikes the chisel. Also the seals for both ends of the piston are located in the cylinder. The seals for the upper end of piston are located in a removable cylinder bush, while the seals for the lower end of the piston are located in grooves machined directly into the cylinder.

2) **Piston**
   The piston transfers impact power to the chisel which is generated by hydraulic power.

3) **Seal retainer**
   The bush has oil seals to seal back head gas and to prevent leakage of hydraulic oil.

4) **Valve housing**
This guides the valve, which consist of inlet and outlet passages and chambers.

5) **Valve assembly**
Our control valve takes out a patent for design.
Assembled to the cylinder is the control valve which controls the oil flow through the breaker and therefore the movement of the piston.
Located directly above the control valve are the inlet and outlet hose adapters. Valve controls the reciprocal action of piston with hydraulic fluids distribution.
The valve assembly is mounted on the cylinder assembly.
The valve housing is marked with an "I" for pressure and "O" for tank to designate the location of the hose adapters and running for the lines to the breaker.

6) **Valve cover**
The valve cap limits the stroke of the valve and guides the valve.

7) **Pressure adjust valve**
The pressure adjust valve adjust the drain pressure of the breaker during raising the piston.
By controlling the working pressure the blowing power can be increased or decreased.
Turn the setting screw clockwise to increase the working pressure, counter clockwise to decrease it.

8) **Accumulator assembly**
The accumulator is a gas charged storage device designed to hold a reserved quantity of hydraulic fluid under pressure. Accumulators are used in hydraulic circuits in a similar fashion as condensers (or capacitors) are used to collect, store and main electrical energy in circuit.
In a hydraulic circuit, minor variations or lags in pump output that might otherwise cause unsteady or irregular operation are made up from the supply of pressurized oil in the accumulator.
Accumulators are solidly constructed to resist the high operating pressure of the fluids. They have only three main moving parts: a valve assembly at the top allows charging or discharging gas from the compressible, precharged upper chamber; a valve assembly at the bottom of the accumulator allows the hydraulic fluid to pass in and out, and an elastic diaphragm separates the two chambers.
The flexible diaphragm changes shape to conform to the changing pressures and volumes of the upper and lower chambers.

9) **Front head assembly**
This retains the chisel using the chisel pins. By removing these pins, the chisel can be changed quickly.
Four through bolts assembled into the front head hold the cylinder and the front head assemblies together with the back head.

10) **Front cover and rod**
They guide the rod and the Front cover limits uppermost position of the rod.
They are consumable parts, check them for wear limits. If needed, replace them.

11) Rod

This transfers blowing power of the piston to objects.
We recommended that by the working circumstance, various shape of tool could be selected.

12) Rod pin

This is installed on the front head; it keeps the rod from coming off.

13) Back head assembly

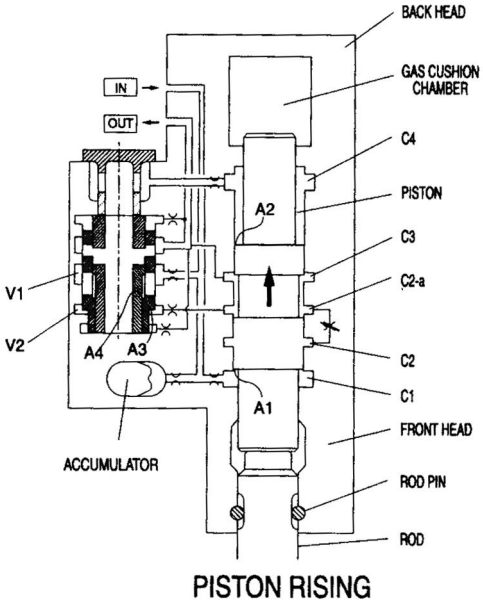
This contains the cushion chamber charged with nitrogen gas that will compress during the upward stroke of the piston and serves to provide maximum absorption of piston recoil and to store this energy for the next blow energy and efficiency.

14) Through bolt

This is used to assembled the front head and the cylinder and the back head, have to keep tightening torque. Inspect the bolt for loosening and retightening them weekly.

WORKING PRINCIPLE

WORKING PRINCIPLE FOR GT80 / GT100 / GT160 / GT190



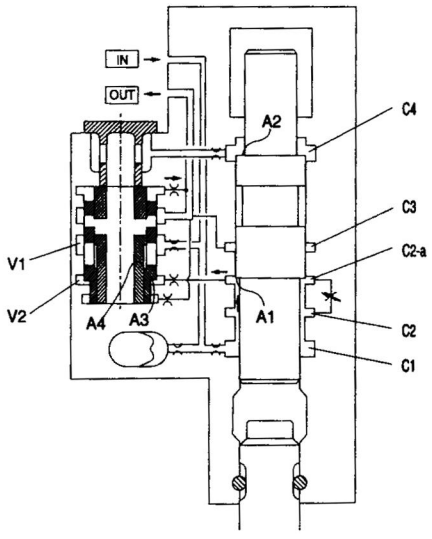
PISTON RISING

1) Set cup

Chamber C3, C2 keep always low pressure because they are connected to the tank.
Camber V1, C1 and accumulator keep always high pressure because they are connected to the working pump.
Camber V2 pressure is changed to low pressure or high pressure depending on the piston position.

2) Piston rising

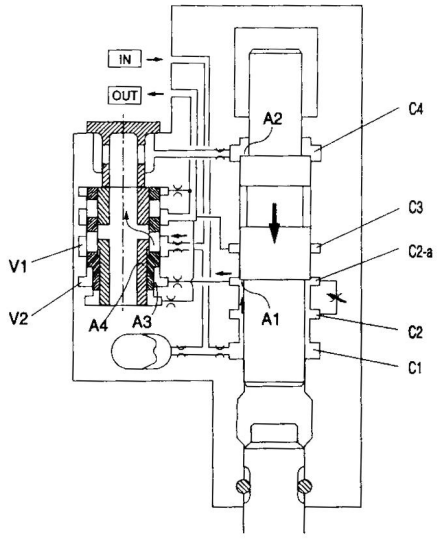
Oil enters into “IN” port, begins to be accumulated up to force which rise piston, hydraulic force applies on A1 of the piston lower flange, The piston begins to raise, oil from C4 chamber returns to the tank through the control valve.



VALVE RISING

3) Valve rising

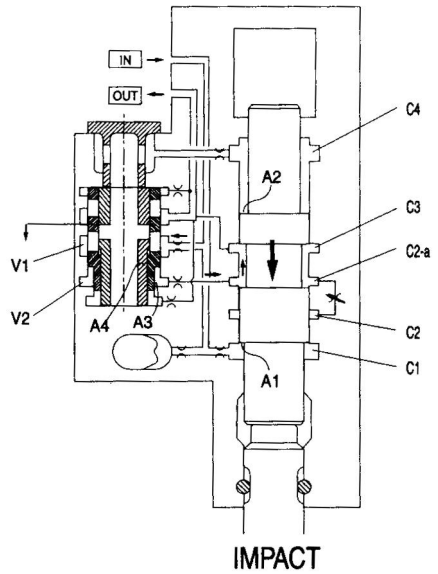
When the piston rises up to around upper limits, A1 of the piston lower flange reaches at the chamber C2 and the back head nitrogen gas is compressed.
At this time, oil from chamber C2 goes to chamber V2.
Area of A3 is larger than area of A4, but applying pressure of area A3 is the same with applying pressure of A4.
Therefore, the valve begins to rise because of the area difference between A4 and A3.



PISTON DESCENDING

4) Piston descending

When the valve reaches around the upper limits, chamber C4 become high pressure because oil from working pump goes to chamber C2 through holes of the control valve.
Area of A2 is larger than area of A1, but applying pressure of area of A4 is the same with applying pressure of A1. Therefore, the piston begins to descend because of the area difference between area A2 and A1.
At this time, descending speed of the piston is accelerated by compressed nitrogen gas pressure and weight piston.



IMPACT

5) Impact

Chamber V2 is changed in low pressure and connecting chamber C2 with C3 during the piston descending. But V1 is always high pressure.
Therefore, the valve begins to descend.

6) Continuous strike

After the piston strikes on the top of the chisel, status of all circuits are changed like “piston rising”.
The piston begins to start to rise by pressure flowed into “IN” port and the cycle is repeated again.

BREAKER INSTALLATION & REMOVAL

The pictures show the installation of a “side breaker”, which is also available from GIANT.
The installation of the purchased top connection type breaker is identical to the side breaker design.

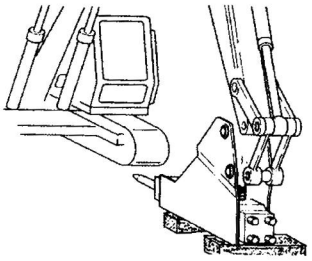
BREAKER INSTALLATION

WARNING

Personal injury could result from dropping the pins during installation.
Wear safety shoes to protect your feet.

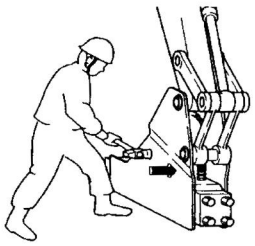
1) Set the breaker on clear, flat, level ground.

2) Remove the bucket, referring to operator’s manual of the excavator.

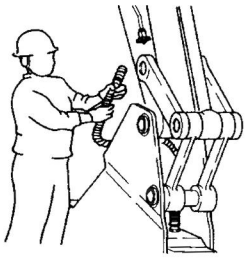


3) Insert the arm pin of the excavator and assemble the fasteners.

4) Set the engine speed to the low idle and slowly move the arm and make alignment the arm holes with the mounting holes.



5) Move the bucket cylinder and make alignment the bucket linkage holes with the mounting holes. Assemble the fasteners.
6) Remove the end caps from the stop valves and remove the plugs from the hoses and connect the hoses to the stop valves at both sides of the arm.
7) Turn stop valves to “ON” position.



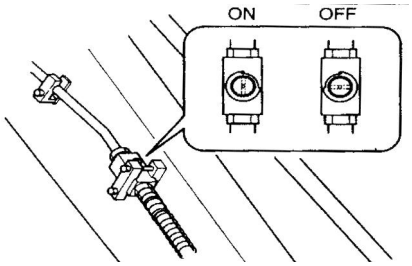
BREAKER REMOVAL

WARNING

Personal injury could result from dropping the pins during installation.
Wear safety shoes to protect your feet.

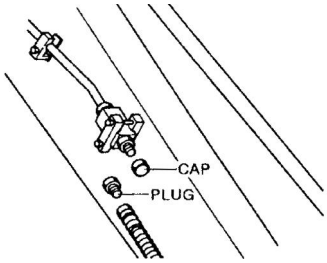
1) Set the breaker on clear, flat, level ground.

2) Turn the stop valves to “OFF” position.



3) Disconnect the hydraulic hoses from the stop valves.
Pay attention not to leak from the hoses and the stop valves.

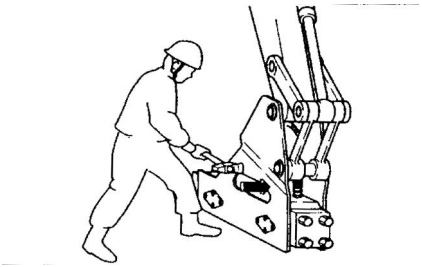
4) Apply end caps and plugs to the hose ends and fittings to prevent contamination.



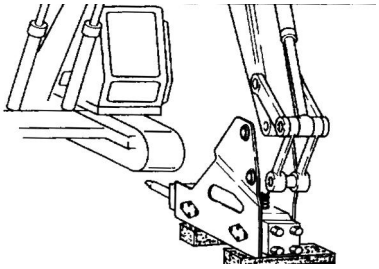
5) Remove the fasteners fixing the pins.

6) Remove the pins.

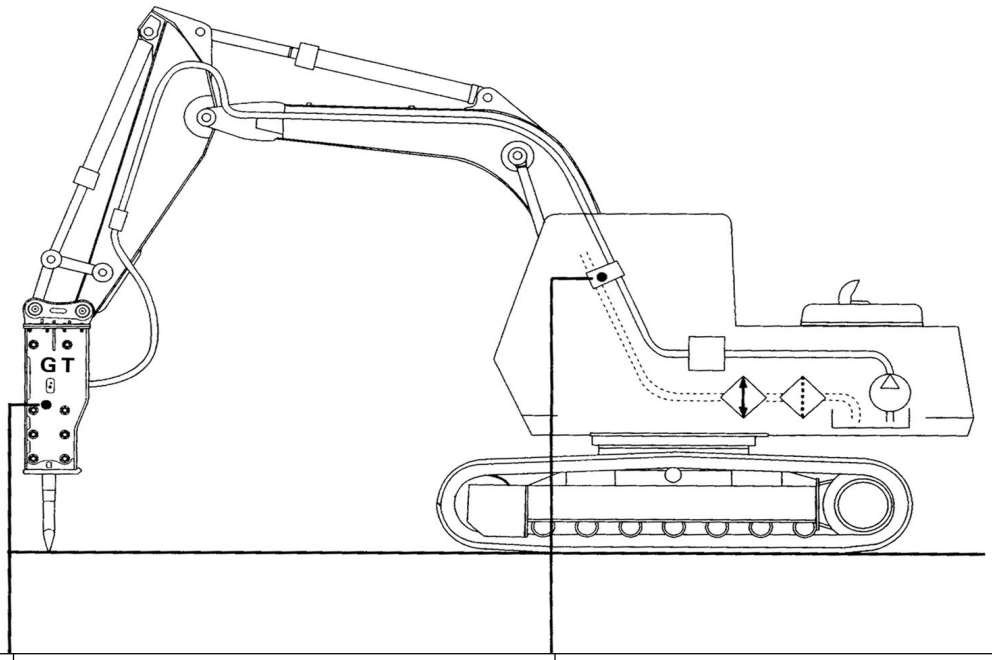
7) When the pin has been with drawn, move the operating joystick slightly to take weight off the remaining link pin.



8) Lift the arm away from the breaker so that the breaker can be carried away or another attachment can be put on the excavator.



WORKING PRESSURE & RELIEVE VALVE SET PRESSURE



MODEL	WORKING PRESSURE(bar)	RELIEVE VALVE SET PRESSURE(bar)
GT10	90-120	140
GT20	90-120	140
GT30	110-140	160
GT40	120-150	160
GT50	130-160	180
GT60	150-170	180
GT70	150-170	200
GT75	150-170	200
GT80	160-180	200
GT90	160-180	220
GT100	160-180	220
GT130	160-180	220
GT150	160-180	240
GT160	160-180	240
GT190	160-180	260
GT200	160-180	260

SPECIFICATION OF N_2 GAS PRESSURE

1) SPECIFICATION

MODEL	BACK HEAD	ACCUMULATOR
GT 10	12-14bar	-
GT 20	12-14 bar	-
GT 30	12-14 bar	-
GT 40	12-14 bar	-
GT 50	12-14 bar	-
GT 60	12-14 bar	-
GT 70	6-8 bar	55-60 bar
GT 75	12-14 bar	-
GT 80	6-8 bar	55-60 bar
GT 90	14-16 bar	-
GT 100	6-8 bar	55-60 bar
GT 130	8-10 bar	55-60 bar
GT 150	14-16 bar	55-60 bar
GT 160	8-10 bar	55-60 bar
GT 190	8-10 bar	55-60 bar
GT 200	18-20 bar	55-60 bar

2) TEMPERATURE REFERENCE TABLE

USE THE FOLLOWING EQUATION OR QUICK REFERENCE TABLE FOR OTHER AMBIENT TEMPERATURE

Nitrogen gas pressure (10 bar) = P10 = 9.32 +0.03 * tºC (bar)
(15 bar) = P15 = 13.98 + 0.05 * tºC (bar)
(20 bar) = P20 = 18.64 + 0.07 * tºC (bar)
(60 bar) = P60 = 55.90 + 0.03 * tºC (bar)

Ambient Temperature	-20ºC	-10ºC	0ºC	10ºC	20ºC	30ºC	40ºC
Gas pressure (bar)	8.7	9.0	9.6	9.3	10.0	10.2	10.5
	13.0	13.5	14.0	14.5	15.0	15.5	16.0
	17.2	17.9	18.6	19.3	20.0	20.7	21.4
	51.7	53.8	55.9	58.8	60.0	62.2	64.3

PIPING LINES

IMPORTANT

Check the piping line for suitability such us pressure, flows or pressure loss if the carrier has the breaker piping line.
The secondary relief valve has to be installed if there is no secondary relief valve on the control valve.

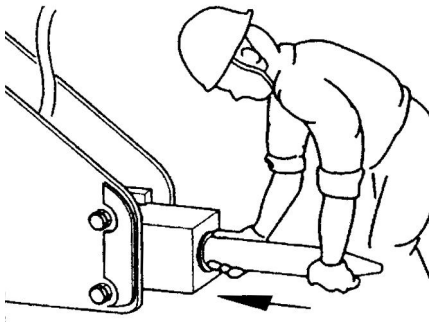
SPECIFICATION OF PIPING LINES.

MODEL	PIPE DIMENSION	HOSE DIMENSION	REMARKS
GT10	13mm	H13(4SP)/M22X1.5（ф16）-1500+RS	
GT20	13mm	H13(4SP)/M22X1.5（ф16）-1500+RS	
GT30	13mm	H13(4SP)/M27X1.5（ф18）-1600+RS	
GT40	13mm	H13(4SP)/M27X1.5（ф18）-1600+RS	
GT50	19mm	G19 (4SP) /G3/4”-1800+RS	
GT60	19mm	G19 (4SP) /G3/4”-1800+RS	
GT70	25mm	H25(4SP)/M39X2（ф28）-2300+RS	
GT75	25mm	H25(4SP)/M39X2（ф28）-2300+RS	
GT80	25mm	H25(4SP)/M39X2（ф28）-2300+RS	
GT90	25mm	H25(4SP)/M39X2（ф28）-2300+RS	
GT100	25mm	H25(4SP)/M39X2（ф28）-2500+RS	
GT130	25mm	H25(4SP)/M39X2（ф28）-2500+RS	
GT150	32mm	G32(4SP)/ G1 1/4”-2500+RS	
GT160	32mm	A32(4SP)/ M52X2-F/ ф54-2500+RS	
GT190	32mm	A32(4SP)/ M52X2-F/ ф54-2500+RS	
GT200	32mm	G32(4SP)/ G1 1/4”-2500+RS	

INSTALLATION

1) Set the breaker on level ground

2) Make sure that the excavator's transition is neutral and the parking brake is engaged.



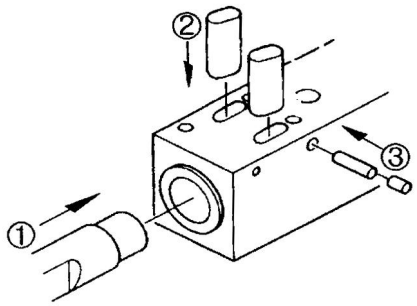
3) Stop the engine.

4) Release the back head gas pressure.
Refer to "Nitrogen (N_2) gas charging and releasing"
(see page 36-39 for details)

5) Install the rod (1), aligning it's cavity with the hole for easy fitting he rod pins (2) later.

6) Install the two rod pins (2).

7) Insert the locking pin & plug (3) to the right side, pushing it through hole.

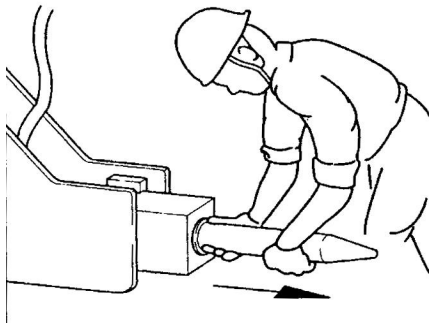


8) Charge the back head gas pressure.
(see page 21 for details)

REMOVAL

1) Set the breaker on level ground

2) Make sure that the excavator's transition is neutral and the parking brake is engaged.



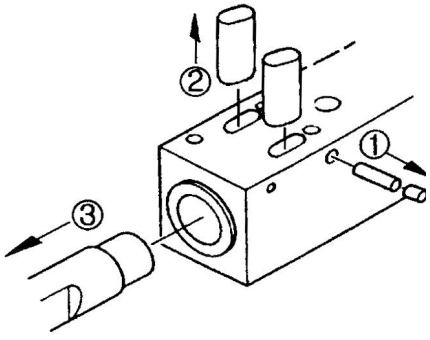
3) Stop the engine.

4) Release the back head gas pressure.
Refer to "Nitrogen (N_2) gas charging and releasing"

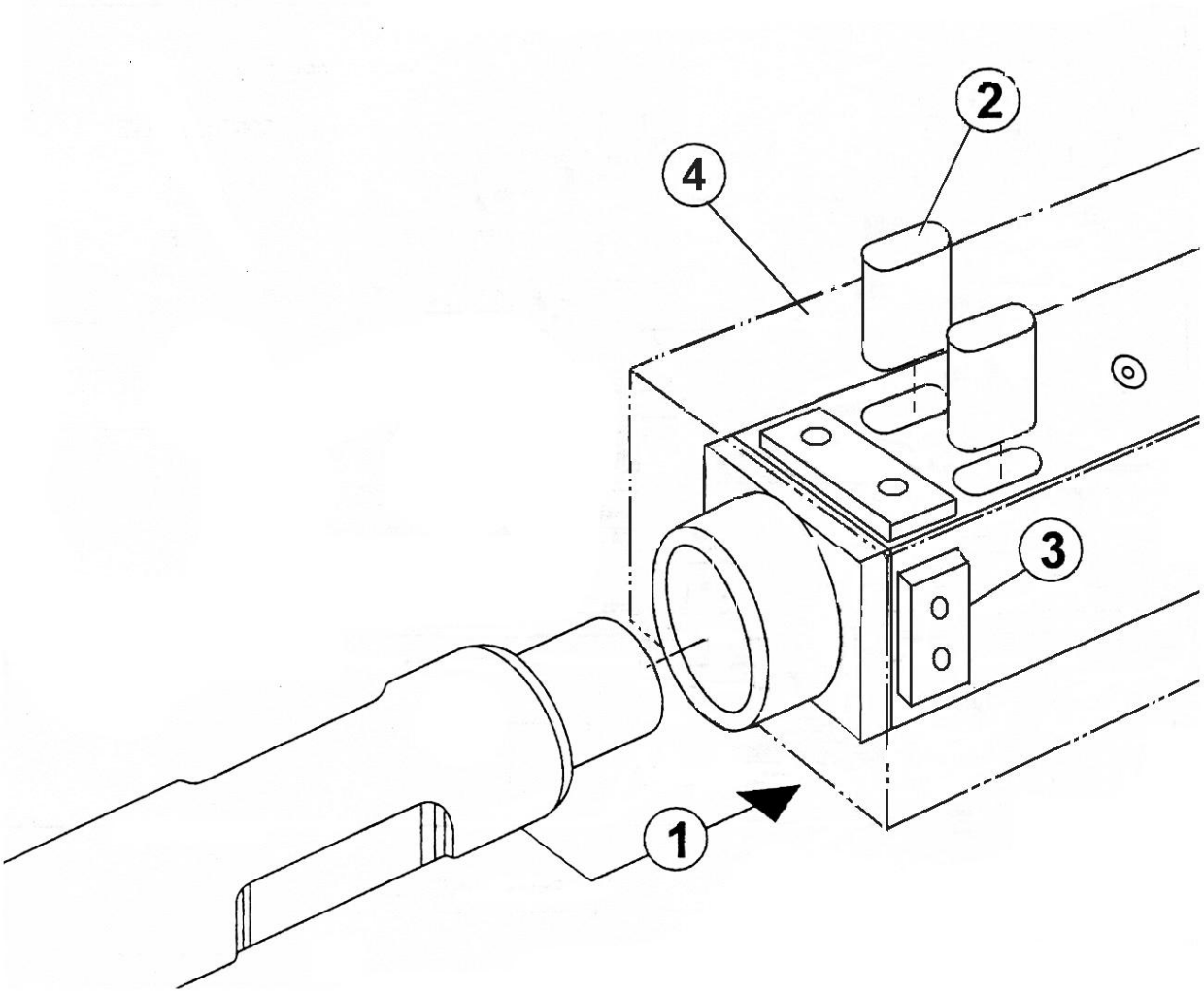
5) Remove the locking pin & plug (1) to the left side, pushing it through hole.

6) Remove the two rod pins (2).

7) Remove the rod (3).



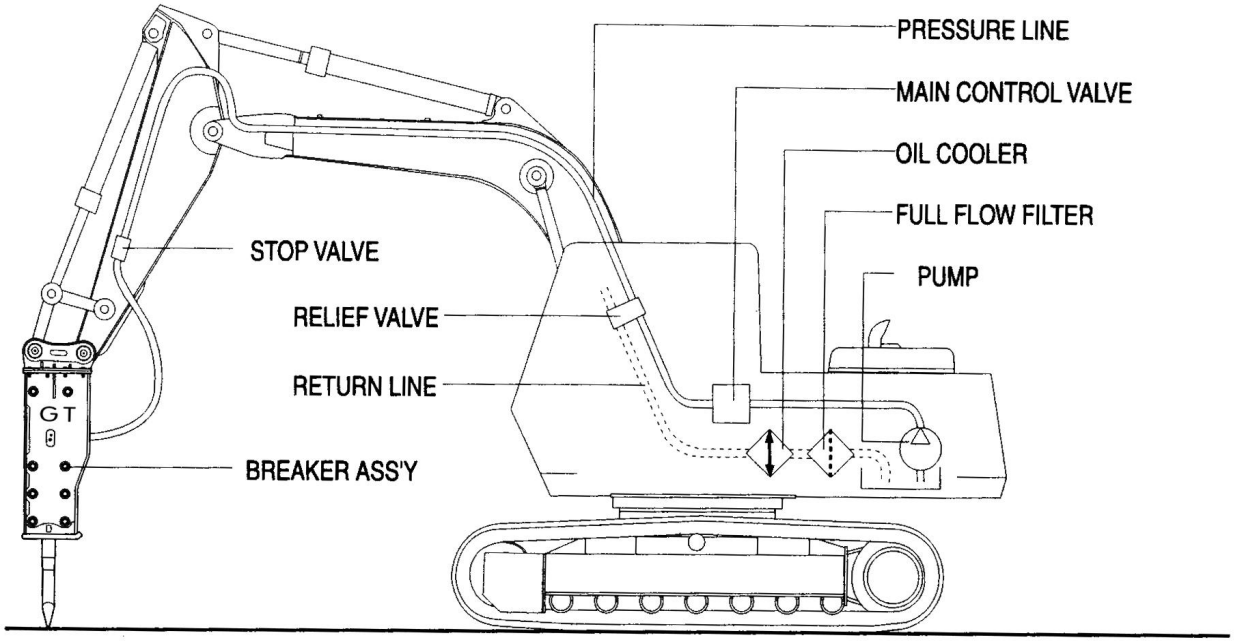
GT80, GT100, GT160, GT190 ROD INSTALLATION



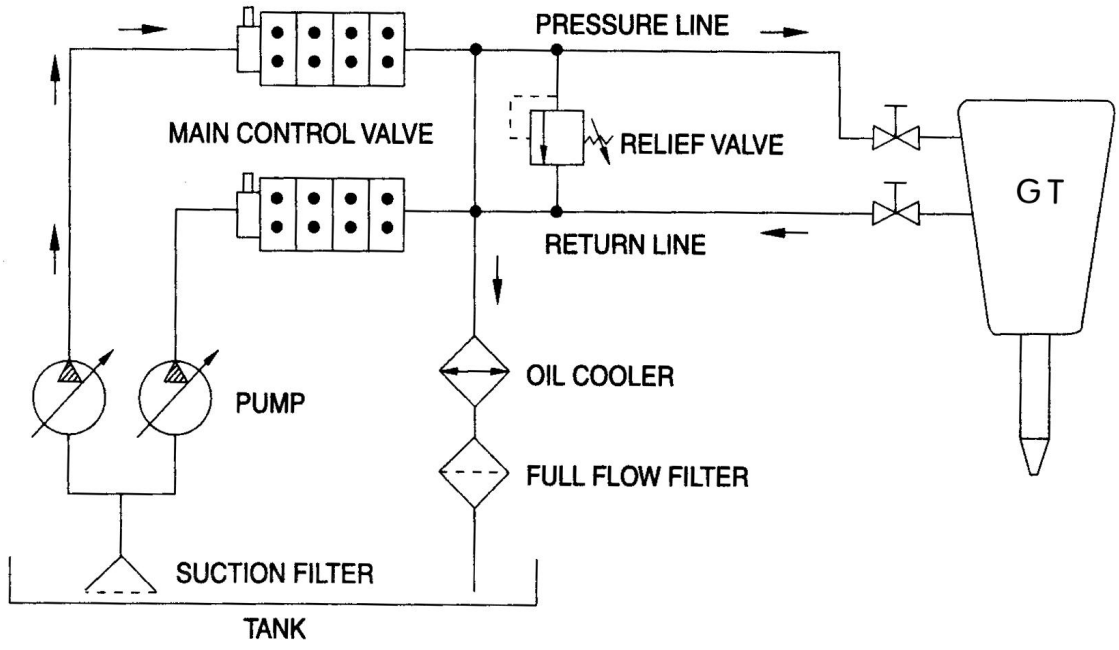
1) Set the breaker on the level ground.
2) Stop the engine.
3) Install the rod (1), aligning it's cavity with the hole for easy fitting the rod pins (2) later.
4) Install the two rod pins (2).
5) Buffer Pad(3) & Silence Bracket(4)

HYDRAULIC CONNECTION & INSTALLATION (BASIC)

1- EXCAVATOR DRAWING.



2- HYDRAULIC CIRCUIT DIAGRAM.



CHECKING BEFORE OPERATION

- Checking of stop valves
  Check stop valves. The stop valves must be open before operation.

- Checking of nitrogen (N_2) gas
  Check nitrogen (N_2) gas before operation. If needed, recharge or discharge nitrogen (N_2) gas. See "Nitrogen (N_2) gas pressure charges" for details.

- Conversion table for charging nitrogen gas pressure to back head.
  (Depends on the temperature of the back head surface)

- GT80

Back head gas pressure	Ambient temperature (ºC/ºF)				
	0/32	10/50	20/68	30/68	40/104
bar	14	1.5	13	12.5	12
psi	198	191	184	177	170

- GT100 / 160

Back head gas pressure	Ambient temperature (ºC/ºF)				
	0/32	10/50	20/68	30/68	40/104
bar	17.6	17.1	16.3	15.9	15.4
psi	250	243	231	226	219

1) Conversion table for charging nitrogen gas pressure to accumulator.

Back head gas pressure	Ambient temperature (ºC/ºF)				
	0/32	10/50	20/68	30/68	40/104
bar	61	60	55	52	50
psi	867	824	780	739	711

WARNING

Use only Nitrogen (N_2) gas charging the accumulator and the back head.
Never use oxygen or shop air.

- CHECKING OF HYDRAULIC OIL

1) Recommended Hydraulic Oil

Normally any hydraulic oil originally intended for the carrier can be used in the GT-Series breaker.
However, since working with the hydraulic breaker will heat the oil much more than the usual excavation work, therefore the viscosity of the oil must be checked.
When the breaker is used continuously, the temperature of the oil normalizes at a certain level depending on conditions and on the carrier.
At this temperature, the viscosity of the hydraulic oil should be 20-40 cST.

Some recommended oil types from major oil manufactures.

Maker	Hydraulic oil				Grease
	Viscosity grade				NLGI NO.2
	Summer	SAE68	Winter	SAE46	
Essol	Nuto H68		Nuto H46		Alvania Grease 2
Shell	Shell Tellus T68		Shell Tellus T46		Beacon Q2
Mobil	Mobil DTE 16		Mobil DTE 16		Mobil Grease special
Gulf	Harmony 68		Harmony 46		Gulf Crown EP2
Caltex	Lando CZ68		Lando CZ46		

CAUTION

Do not mix oils from different manufactures.
GIANT does not endorse specific brands but does suggest that owners select quality oils whose suppliers provide assurance that required standards will always be met exceeded.

2) Changing interval of Hydraulic Oil.

The contamination of hydraulic oil may result in parts damage, not only of the breaker but also of the excavator main components. We recommended replacing the hydraulic oil and oil filters as shown in the following table which is based on 100% of breaker operation.

Hydraulic oil	Every 600 hours	Based on 100% breaker operation
Oil filter	Every 100 hours	

3) Hydraulic oil

The breaker must not be started if the viscosity of the hydraulic oil is above 1000 cST or operated when the viscosity of the hydraulic oil below 15 cST.

Oil too thick

- Difficult start up.
- Stiff operation.
- Breaker strikes irregularly.
- Danger of cavitations in the pump and hydraulic breaker.
- Stick valves.
- If the filter is extreme contaminate, hydraulic components could be damaged due to open bypass valve.

Oil too thin

- Efficiency losses by internal leaks.
- Damage to seals, O-rings.
- Accelerated wearing parts, because of decreased lubrication efficiency.

Do not replace the pressure and return hoses until the oil is cold. Use gloves, because if the hydraulic oil gets into skin, get emergency medical treatment immediately or death may result. Use protective glasses to protect your eyes and use a container to collect the waste.

After you have finished the hydraulic breaker or hydraulic excavator maintenance, dispose of refusal oils, fuels, or parts using a container to collect this waste, keeping the EC environmental regulations.

4) Checking of grease

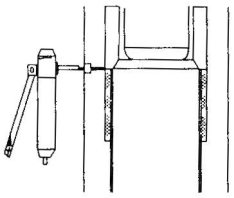
CAUTION

Insufficient greasing may cause abnormal wear of rod bush and chisel and breakage.

IMPORTANT

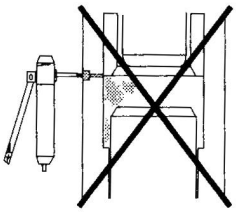
Do not lubricants other than those recommended, without prior written approval from GIANT.

- Apply grease on the rod bush and the rod every two hours.
- Adapter interval and amount of grease to wear rate of rod and working condition.
- Rod shank must be lubricated before installing the rod.



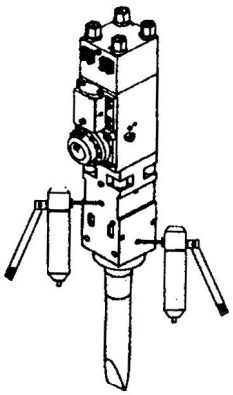
Greasing

- While greasing, the breaker must be upright against the rod to ensure that the grease will penetrate between the rod and the rod bush.



Recommended lubricant Grease

Manufacturer	Grease
Total	Total EP#2
Shell	Alvania EP#2
Mobil	Mobil FAW#2 or cold temp Mobil FAW#1
Yukong	Crown EP2
Caltex	Multipac EP2



OPERATING TEMPERATURE

The operating temperature of the hydraulic oil is -20ºC to +80ºC (-4ºF to + 176ºF).
If the temperature is lower than -20ºC (-4ºF), the breaker and chisel has to be preheated before starting operation in order to avoid breakage of the accumulator membrane and the rod.
To preheat the hydraulic oil, operate the excavator (without running the breaker), until the oil temperature reaches the allowable operating temperature range.
During operation they will remain warm.
If the hydraulic oil temperature exceeds the allowable limit, please stop the equipment and do not start operation until the oil cools down to the allowable operating temperature range.

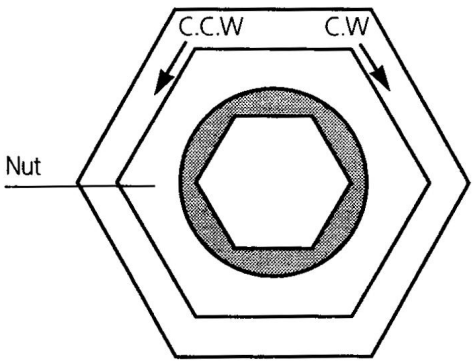
COOLING

The maximum permitted hydraulic oil temperature in continuous breaker use is 50-80ºC (120-175ºF) depending on the viscosity of the oil in the system.
Therefore a reliable hydraulic oil thermometer is necessary.
If there is no thermometer on the carrier, it must be installed. The temperature of the hydraulic oil depends on the ambient conditions, the cooling system efficiency of the carrier and on the used capacity of the breaker.
When the hydraulic breaker is used continuously, it is necessary to have cooling system with extra cooling capacity compared with normal excavation work.

ADJUSTER VALVE SETTING (SPEED CONTROL)

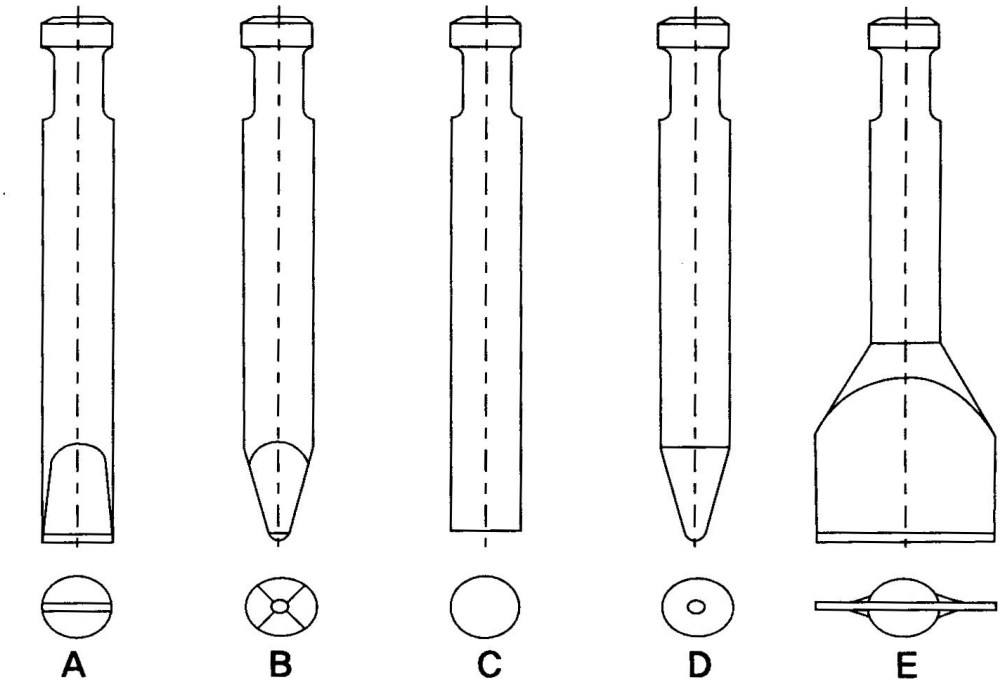
1. Please loosen nut with spanner.
2. Adjuster setting
   - Turn adjuster clockwise for low speed operation.
   - Turn adjuster counter clockwise for high speed.
3. When adjuster setting is over and tighten nut with spanner.

Note: Caution – If the adjuster is turned fully clockwise then the breaker will cease to operate.



GUIDE TO ROD CHOICE

The correct choice of the most suitable tool for a certain job is crucial not only increasing breaker productivity, but also for the life of the Rod itself.



A. WEDGE
Suitable for all kinds of digging or narrow trenching on soft/medium stratified rocks.

B. MOIL POINT (PYRAMID POINT)
Suitable for fine /medium concrete demolitions or for soft, non stratified rocks.
Second mining of soft / medium hard blocks.

C. BLUNT (FLAT END)
Suitable for breaking blocks of up to medium hardness or cut the size of small blocks.

D. CONE
Universal.

E. WIDE CHISEL

INSPECTION AND MAINTENANCE

WARNING

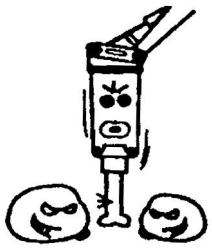
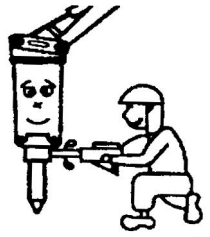
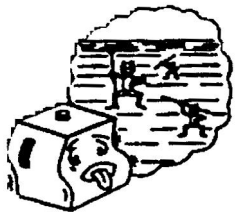
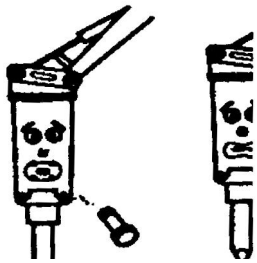
- When disassembling or repairing the breaker; the charging valve plug may come off due to gas pressure. This is very dangerous. Be sure to release gas out from the charging valve plug before disassembling. Before filling the charging valve plug with gas, be sure to completely tighten the bolt.
- When replacing the gas valve; the gas valve body may come off due to gas pressure: be sure to completely release internal gas out before replacing the gas valve.
- When filling the gas cushion chamber or the head cap with nitrogen (N_2) gas; the tool may jump out to avoid accidents. Do not stand in front of the tool.
- Before servicing, make sure residual hydraulic pressure is released.

IMPORTANT

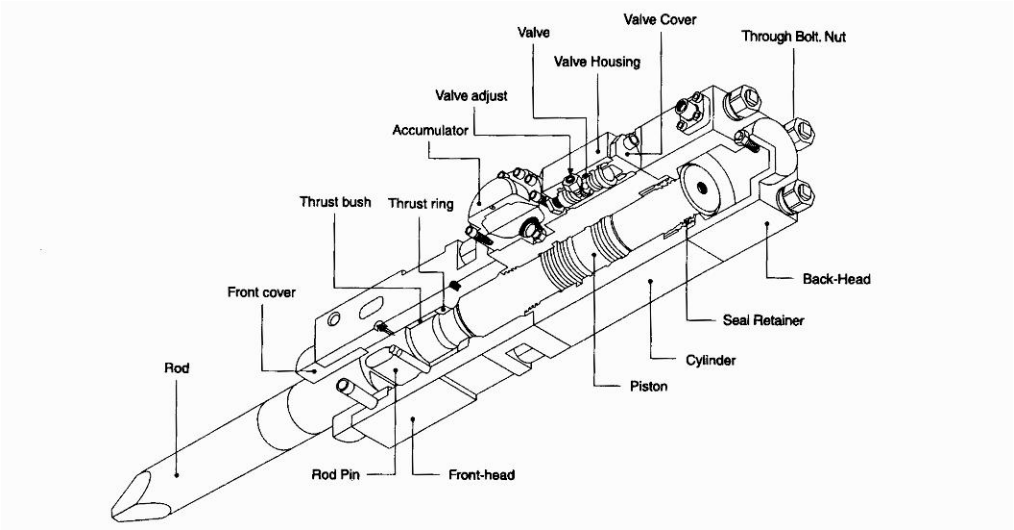
- Use only the hose nozzle to relieve the pressure: Using nails, screwdrivers or similar objects will damage the filling valve.

HYDRAULIC BREAKER MAINTENANCE LIST AND POINT.

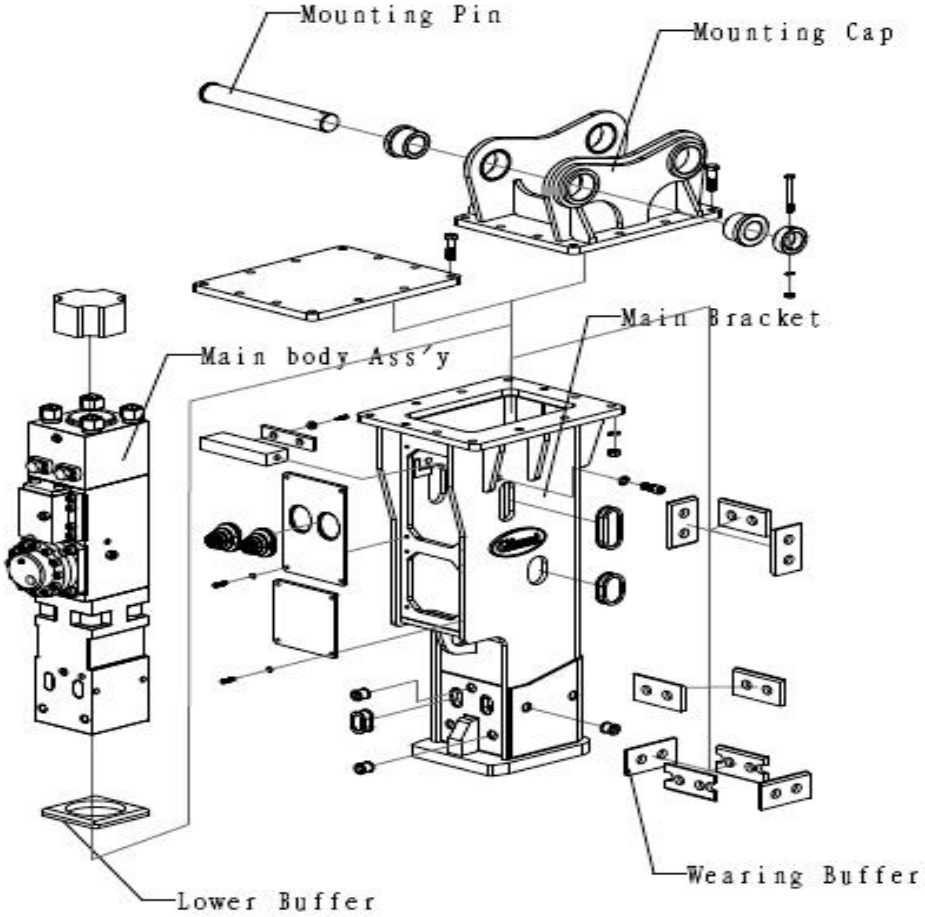
Inspection item	Inspection point	Inspection interval	
• Looseness, missing and/or damage to bolt and nuts	• Tid roods. • Bracket mounting bolts. • Accumulator bolts.	Every day	
• Looseness of hose fittings, visible damage to hose and oil leakage.	• Hydraulic pipes for breaker. • Oil hoses	Every day	
• Abnormal oil leakage	• Connections of back head to cylinder. • Clearance between front head & tool. • Replacement of seal kit every 600 hours.	Every day	

Inspection item	Inspection point	Inspection interval	
• Abnormal wear and cracks on tool	• Tool	Every day	
• Greasing	• Grease at start and every 2-3 hours using head grease pump. • Pumping: 5-10 times.	Every day	
• Hydraulic oil level and contamination	• Condition of hydraulic oil. • Replacement of filter: every 100 hours. • Replacement of hydraulic oil: every 500 hours.	Every month	
• Missing rubber plugs and snap rings.	• Rubber plugs. • Snap rings.	Every day	
• Back Head gas and accumulator gas	• Filling back head gas and accumulator	Every day	

STRUCTURE OF GT – SERIES BREAKERS



BRACKET ASS'Y



TORQUE SPECIFICATION

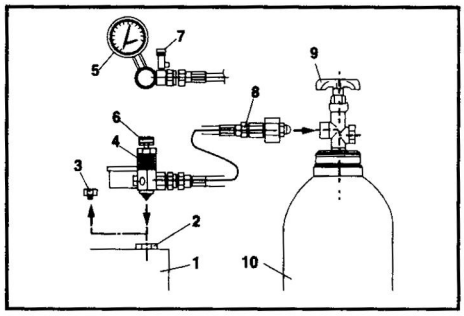
SPEC.	HEAD SIZE	TORQUE		REMARKS
		Kgf*m	N*m	
PT1/8	5 HEX SOCKET	3-4	30-40	
PT1/8	8 HEX SOCKET	8-10	80-100	
PT1/4	6 HEX SOCKET	4-6	40-60	GREASE NIPPLE
PT1/2	10 HEX SOCKET	12-14	120-135	
PT1/4	14 HEX HEAD	5-6	50-60	
PT1/4	6 HEX SOCKET	2-2.5	20-25	
PT1/4	12 HEX SOCKET	4-6	40-60	
PT1/2	10 HEX SOCKET	10-12	100-115	
PT3/4	12 HEX SOCKET	20-25	195-245	
PT1/2	27 HEX HEAD	20-25	195-245	
PT1/2	30 HEX HEAD	20-25	195-245	
PT3/8-PF3/8	22 HEX HEAD	15-20	150-195	
PT1/2-PF1/2	27 HEX HEAD	20-25	195-245	
PT3/4-PF3/4	36 HEX HEAD	30-35	295-345	
1 1/16 -12UN-PF1	41 HEX HEAD	50-55	490-540	
1 11/16 – 12UN-PF 1 ¼	50 HEX HEAD	50-55	490-540	
M16X1.5	8 HEX SOCKET	4-6	40-60	
M20X1.5	17 HEX SOCKET	50-55	490-540	
M22X1.5	10 HEX SOCKET	8-10	80-100	
M10X1.0	19 HEX HEAD	3-4	30-40	
M16X1.5	24 HEX HEAD	15-18	150-175	
M20X1.5	32 HEX HEAD	20-25	195-245	
M20X2.5	30 HEX HEAD	30-40	295-390	
M30X2	46 HEX HEAD	80-100	780-980	
M36X3	55 HEX HEAD	100-120	980-1180	
M30X3.5	46 HEX HEAD	80-100	780-980	
M36X4	55 HEX HEAD	100-120	980-1180	
M30X3.5	41 HEX HEAD	80-100	780-980	
M20X2.5	30 HEX HEAD	30-40	295-390	
M30X2	46 HEX HEAD	80-100	780-980	
M20X2.5	30 HEX HEAD	40-45	390-440	
M22X2.5	36 HEX HEAD	45-50	440-490	
M27X3	41 HEX HEAD	80-85	780-830	
M36X3	55 HEX HEAD	150-160	1470-1570	
RD42X 1/6	65 HEX HEAD	240-250	2350-2450	
RD48X 1/6	75 HEX HEAD	300-310	2490-3040	
RD52X 1/6	75 HEX HEAD	350-360	3430-3530	

NITROGEN (N_2) GAS PRESSURE SETTING

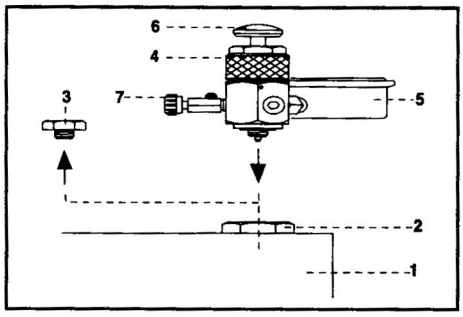
PRESSURE CHARGING METHOD

WARNING

- PERSONAL INJURY OR FATAL WOUND COULD BE RESULTED IF ACCUMULATOR GAS AND BACK HEAD GAS CHARGED INCORRECTLY.
- PROPER INSPECTION, CHARGING EQUIPMENT, AND TRAINING IN USING THE EQUIPMENT ARE NECESSARY TO AVOID EXPLOSION.
- PERSONAL INJURY OR FATAL WOUND COULD BE RESULTED IF YOU ARE STANDING IN FRONT OF THE ROD DURING ACCUMULATOR GAS PRESSURE INSPECTION.
- DO NOT USE ANY GAS OTHER THAN NITROGEN GAS.



GAS CHARGING KIT



GAS INSPESTION KIT

1. Remove Plug (3) and connect the treaded port (4) of charging kit to the back head or accumulator gas charging valve (2).
2. Connect the hose end (8) of gas charging kit to the port of nitrogen bomb.
3. Turn the exhaust valve (9) of gas bomb unclockwise slightly as charging a small amount of gas on the accumulator and back head, and lock it.
4. Open the exhaust valve (7) and pull down the button (6) as discharging completely gas with air in the chamber.
5. Turn the exhaust valve (9) of gas bomb unclockwise slightly a moment and turn clockwise then read pressure gauge (5). Read the pressure gauge and compare with specification.
6. If pressure is high, discharge it with opening exhaust valve (7) of charging kit until the gauge indicate at normal pressure.
7. Remove gas charging kit and securely close exhaust valve (9) of gas bomb.
8. To keep exact gas pressure, measure the gas pressure with inspection kit and make within +/- 10% of specified gas pressure.
9. Remove inspection kit and securely close plug (3)
10. Open exhaust valve (7) of gas charging and inspection kit to vent the inside gas.
11. Check for gas leakage at plug (3) by applying a small quantity of oil around the plug.

NITROGEN (N_2) GAS CHARGING AND RELEASING

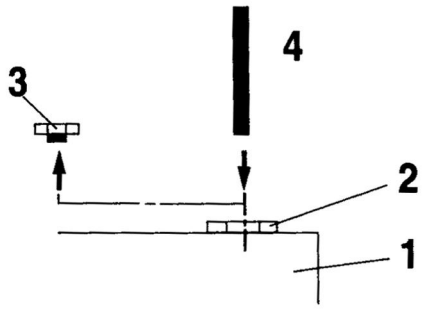
Charging is providing from GIANT for standard parts.

1. Back Head gas pressure releasing.

WARNING

When releasing the gas pressure, keep your eyes away from the gas valve.
Debris could result in serious injury for your eyes.

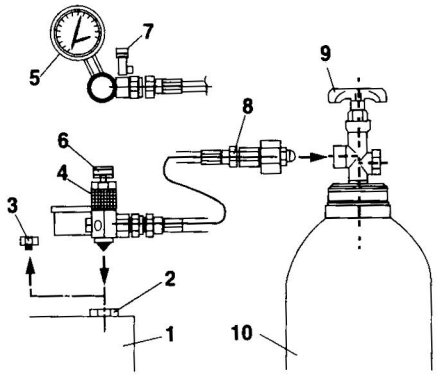
1. Remove the plug (3) from the gas valve (2) on the back head (1).
2. Press down the check valve through the gas charging valve hole using a clean metal stick (4).
3. Keep it holding down until there is no sound coming from the valve.



2. Back Head gas pressure charging.

WARNING

When charging the back head gas pressure, the chisel may jump out.
Do not stand in front of the chisel to avoid accidents.



Use the same values for bar or Kgf/cm^2 gauge readings

1.) Remove the cap nut (or bolt) (3) from the gas charging valve on the back head (1).

2.) Set the gas pressure charging kit as shown the above picture.

3.) Connect the threaded port (4) of kit to the back head gas charging valve.

4.) Open the valve (9) slowly, keeping the button (6) pressing down and read the gauge indicator (5).

5.) Compare reading value with the specifications.
If the measured gas pressure difference is over 10% from specified pressure, discharge using the vent valve (7) or charge nitrogen gas.

6.) Disconnect the fittings.

7.) Re – install the cap nut (or bolt) (3).

8.) Check the O-ring for damage.

9.) Apply soap solution on the valve and check for gas leakage.

3. Accumulator gas inspection and charging.

WARNING

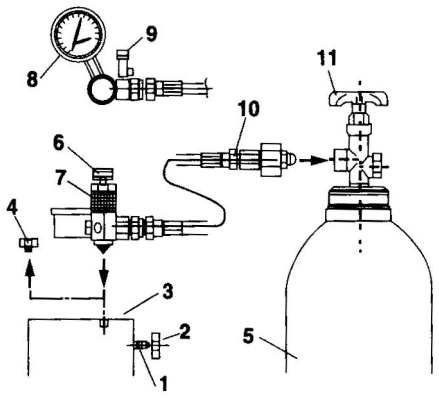
Personal injury or death could result if accumulator gas is charged incorrectly.
Proper inspection, charging equipment, and training in using the equipment are necessary to avoid explosion

DANGER

Personal injury or death could result if you are standing in front of the chisel during accumulator gas pressure inspection.

CAUTION

Never use oxygen or shop air for charging.
Release all pressure prior to servicing or disassembly.
Release all service and operation instructions before using the breaker.
Do not over charge gas pressure.
Do not weld or modify the accumulator in any way.



Use the same values for bar and kgf/cm^2 gauge readings

1.) Remove charging plug(4) of gas charging port and loosen the valve cap (2) of charging valve of accumulator and the valve (1)

2.) Screw in adapter (7) of nitrogen gas charging kit securely to the charging adapter (3).

3.) Open the valve (11) slowly, keeping the button (6) pressing down and read the gauge indicator (8).

4.) Read the gas pressure and compare with specification, shown on the above graph. If the measured gas pressure difference is over or under 10% form the specified pressure, discharge or charge nitrogen gas.

5.) Leave hand from the button and securely close the valve (11).

6.) Remove inspection kit and securely close plug (4).

7.) Tighten the valve (1) and the valve cap (2).

8.) Open discharge valve (9) of charging kit to vent the gas.

9.) Apply soap solution on the valve and plug and check for gas leakage.

THROUGH BOLT INSPECTION AND REPLACEMENT

CAUTION

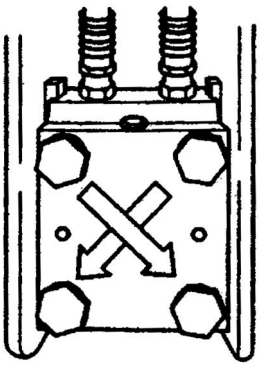
Release the gas pressure of back head prior to loosen the through bolts.
Jumping out the back head when removing the trough bolts could results in a severe injury.

1.) Discharge nitrogen gas of back head completely prior to loosen the through bolts.

2.) Remove all through bolts and inspect presence of any crack on the through bolts.

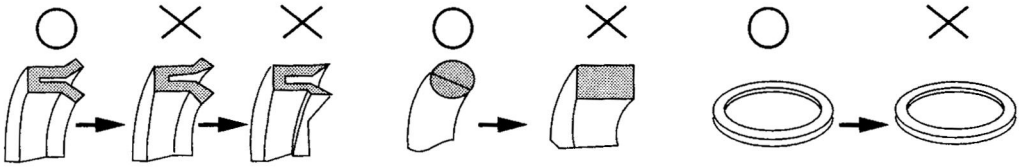
3.) When installing the through bolts, tighten the bolts by step of “one and across one” with 2 or 3 turn times, not completely at once.

4.) Use torque wrench with specified range. Refer to “SPECIFICATION (see page 36)”



SEAL INSPECTION AND REPLACEMENT

1.) If you found some hydraulic oil leakage from the breaker, you need to replace the bad seal.
To figure out the bad seals, refer to the following drawings:



O-ring - deformed, worn, distorted, defeat

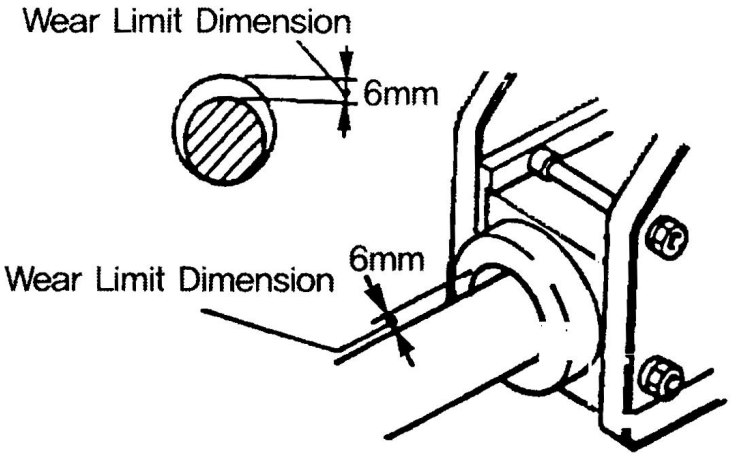
Backup ring - worn, distorted

Packing & dust seal worn, deteriorative

2.) When you have a bad seal, you have to find the cause of damage and need to rectify it.

3.) When you change step seal, apply grease to seal and seal seat and hold the seal with thumb, index and middle fingers, where arrow is marked.
Be careful not to break the seal with over deformation.

ROD AND FRONT COVER WEARING INSPECTION



If the clearance between the rod and the front cover is too big, it could be a cause of damage or breakage of rod by the irregular contact with piston.

If wear of the rod exceed 2mm or the front cover exceed 4 mm, replace it with a new one.

The following table is an illustration of the standard dimension of the Rod and the front Cover for your reference:

Rod and Front Cover standard dimension.

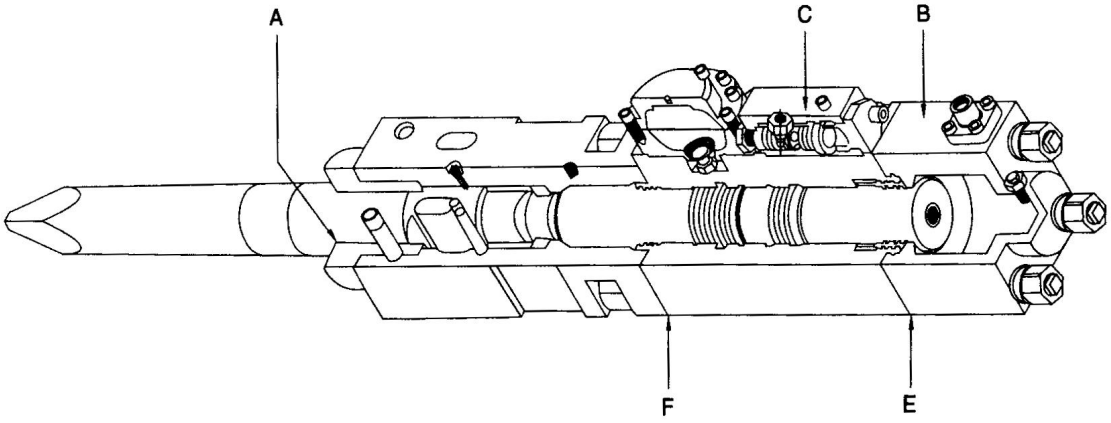
Model / Item	GT10	GT20	GT30	GT40	GT50	GT60	GT70	GT75
Rod	$\phi 45^{-0.3}_{-0.5}$	$\phi 53^{-0.3}_{-0.5}$	$\phi 70^{-0.3}_{-0.5}$	$\phi 75^{-0.3}_{-0.5}$	$\phi 85^{-0.3}_{-0.5}$	$\phi 100^{-0.3}_{-0.5}$	$\phi 120^{-0.3}_{-0.5}$	$\phi 125^{-0.3}_{-0.5}$
F/Cover	$\phi 45^{+0.5}_{+0.2}$	$\phi 53^{+0.5}_{+0.2}$	$\phi 70^{+0.5}_{+0.2}$	$\phi 75^{+0.5}_{+0.2}$	$\phi 85^{+0.5}_{+0.2}$	$\phi 100^{+0.5}_{+0.2}$	$\phi 120^{+0.5}_{+0.2}$	$\phi 125^{+0.5}_{+0.2}$
Model / Item	**GT80**	**GT90**	**GT100**	**GT130**	**GT150**	**GT160**	**GT190**	**GT200**
Rod	$\phi 135^{-0.3}_{-0.5}$	$\phi 140^{-0.3}_{-0.5}$	$\phi 140^{-0.3}_{-0.5}$	$\phi 150^{-0.3}_{-0.5}$	$\phi 155^{-0.3}_{-0.5}$	$\phi 155^{-0.3}_{-0.5}$	$\phi 160^{-0.3}_{-0.5}$	$\phi 175^{-0.3}_{-0.5}$
F/Cover	$\phi 135^{+0.5}_{+0.2}$	$\phi 140^{+0.5}_{+0.2}$	$\phi 140^{+0.5}_{+0.2}$	$\phi 150^{+0.5}_{+0.2}$	$\phi 155^{+0.5}_{+0.2}$	$\phi 155^{+0.5}_{+0.2}$	$\phi 160^{+0.5}_{+0.2}$	$\phi 175^{+0.5}_{+0.2}$

GAS LEAKAGE

TROUBLE	CAUSE	REMEDY
A. Gas leakage from the top of charging valve	Defective o-ring in charging valve	Replace
	Defective or damaged in charging valve	Repair or replace charging valve
B. Gas leakage between charging valve and back head	Defective o-ring in charging valve	Replace
	Charging valve loose in back head	Re-tighten
C. Gas leakage between cylinder and back head	Defective o-ring in back head	Replace
D. Gas leakage from drain plug hole	Defective gas seal in seal retainer	Replace
	Defective step seal in seal retainer	Replace
	Seizing of piston and seal retainer	Repair or replace seal retainer and piston. (When repaired replace packing)

OIL LEAKAGE

Even if oil is leaking, there is no use to replace parts at all times. Check the following points listed in the chart bellow. The user can check the marked points before calling dealer.



AREA OF OIL LEAKAGE		CONDITION	CAUSES& REMEDIES
A	Between the tool and lower bush	A large amount of oil is leaking. Check if it is coming from oil or grease	Seals damaged REPLACE
B	Surface of breaker	Oil leaking from the hose & flange adapter portion	Loose breaker hoses and bolts RETIGHTEN
C	Valve housing bolts & cap bolts	Oil leakage from reassembly of breaker after overhaul	NORMAL: • During assembly from lubrication oil & anti-rust oil applied.
D	Between main valve & surface of cylinder	Oil leakage from reassembly of valve after overhaul	NORMAL: • Clean oil • Check that seal is damaged • Loosen bolts • Replace with new seal
E	Between cylinder and back head	Oil leakage	Loose tie rod nuts RETIGHTEN
		Oil leaks again	REPLACE Damaged o-ring
F	Between cylinder and front head	Oil is leaking	Loose plugs assembled on the surface of cylinder RETIGHTEN Replace damaged seals.

TROUBLE SHOOTING

Problems in operation

- If the breaker does not work or blow frequency and blow power get worse, check the arranging method, and then inspect according to the following order.

Phenomena	Cause	Required action
No blow out	1. Too high back head gas pressure 2. Stop valve(s) is closed 3. Lack of hydraulic oil 4. Wrong adjustment of pressure reducing valve 5. Wrong connection of hydraulic hoses 6. Oil is mixed to back head inside	1. Re-adjusting of nitrogen gas pressure. 2. Open stop valve. 3. Fill hydraulic oil 4. Valve re-adjustment 5. Tighten or replace 6. Replace back head o-ring or step seal of cylinder bush
Low impact power	1. Line leakage or chocked 2. Clogged filter tank return line 3. Lack of hydraulic oil 4. hydraulic oil contamination or deterioration by heat 5. Poor performance of excavator pump 6. Low back head nitrogen gas 7. Low flow rate by mis-adjustment of flow control pressure reducing valve. 8. Out of range of chisel for blowing position	1. check lines 2. Washing filter or replace 3. Fill hydraulic oil 4. Replace hydraulic oil, rise tank and replace hydraulic oil inside of lines. 5. Call a authorized service man 6. Refill nitrogen gas 7. Re-adjusting of reducing valve 8. Push down chisel by excavator operation
Irregular impact	1. Low gas pressure of accumulator or bad accumulator. 2. Bad sliding surface of piston or valve 3. Piston move down up to blank blow breaker chamber	1. Refill nitrogen gas 2. Call a authorized service man 3. Push down chisel by excavator operation
Bad rod over neat	1. Chisel out diameter is not correct 2. Jammed chisel and pin by chisel pin wearing 3. Jammed front bush and chisel 4. Deformed contact area. Chisel and piston	1. Replace chisel with genuine parts 2. Remove rough surface of chisel 3. Remove rough surface of front bush inside 4. Replace chisel
Sudden reduced power and pressure line vibration	1. Accumulator gas leakage 2. Accumulator diaphragm damage	1. Replace o-ring or refill nitrogen gas 2. Replace diaphragm
Oil leak between front head and chisel	1. Cylinder bush seal worn out	1. Replace seal
Gas leakage	1. O-ring damage of related parts	1. Replace o-ring