ROCKBLASTER HAMMERS

OPERATION MANUAL & PART LIST

RB HAMMERS CORP.
845-353-5042 OFFICE@RBHAMMERS.COM

⚠ 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 from the breaker, breaker tool, rock or other material may cause serious or fatal injury to the operator. Personal protection equipment must be used.

• Flying debris from the breaker, breaker tool, rock or other material may cause serious or fatal injury to bystanders. Never operate the breaker when bystanders are in the work area.

• On some machines / carriers, the breaker can enter the operator's compartment if it breaks loose and swings toward the operator. Make sure that suitable impact shields are used when operating the breaker with this type of equipment

• 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 all wording is legible. The decals must be replaced if illegible. Replacement decals can be obtained from your authorized Distributor.

• When operating the breaker ear, eye and breating protection must be used at all times.

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

1. Safety Precautions

- This manual contains safety, operation and routine maintenance instructions. It does not contain service disassembly and service assembly instructions. If needed, complete service disassembly and service assembly instruction are contained in service manual which can be ordered from your ROCKBLASTER Hydraulic breaker authorized and certified dealer.

- Please read the following warning.

⚠ DANGER

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

General safety precautions

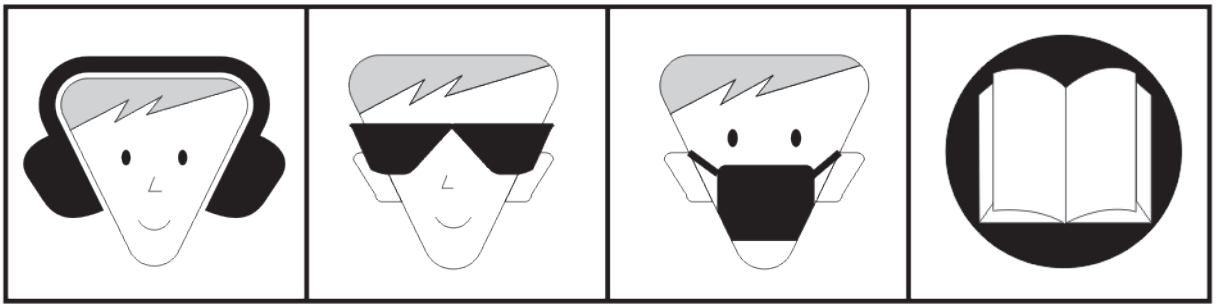
The ROCKBLASTER hydraulic Breaker series will provide safe and dependable service if operated in accordance with the instructions given in this manual. Read and understand this manual and any decals and tags attached to the breaker before operation. Failure to do so could result in personal injury or equipment damage.

- Operate the breaker in accordance with all laws and regulations which affect you, your equipment, and the worksite.
- Do not operate the breaker until you have read the carrier equipment manual and thoroughly understand all safety, operation and maintenance instructions.
- Ensure that all maintenance procedures recommended in this manual are completed before using the equipment
- The operator must not operate the breaker or carrier if any people are with in the area where they may be injured by flying debries or movement of the equipment
- Know the limits of your equipment
- Establish a training program for all operators to ensure safe operation.
- Do not operate the breaker unless thoroughly trained or under the supervision of an instructor.
- Become familiar with the carrier controls before operating the carrier and the breaker.
- While learning to operator and carrier, do so at a slow pace. If necessary, set the carrier mode selector to the slow position.

- Make sure all control (levers and pedals) are in the neutral position before starting the carrier.
- Before leaving the carrier, always lower the boom and insure the carrier is stable. Never leave the machine with the engine, running always engage the parking break.
- Stop the engine before attempting to make any repairs, adjustments or servicing to either the carrier or the breaker.
- Do not operate the breaker at oil temperatures above 175°F/80°C, Operation at higher temperatures can damage the internal components of the breaker and backhoe/excavator and will result in reduced breaker performance.
- Do not operate a damaged, leaking, improperly adjusted, or incompletely assembled breaker.
- Do not modify breaker tool in any manner.
- Use only breaker tool manufactured by ROCKBLASTER. Use of breaker tool produced by another manufacturer may damage the equipment and will void the warranty.
- To avoid personal injury or equipment damage, all breaker repair, maintenance and service must only be performed by authorized and properly trained personnel.
- If you do not understand how to safely operate your breaker, contact an authorized ROCKBLASTER Dealer for assistance.
- Keep this manual with the breaker.
- Do not operate this equipment if you are taking medication which may affect your manual judgment or physical performance.
- Do not operate this equipment if you are under the influence of drugs or alcohol.
- Remove breaker from carrier during transport.

• Warning sticker

- shown smaller then actual size



Use Hearing Protection | Use Eye Protection | Use Breathing Protection | Read the manual before usage

• Safety symbols

DANGER	WARNING	IMPORTANT
This safety symbol may appear on the breaker. It is used to alert the operator of an action that could place him/her or other in a life threating situation.	This safety symbol appears in these instruction to identify an action that could cause bodily injury to the operator or other personnel	This safety symbol appears in these instruction to identify an action or condition that could result in damage to the breaker or other equipment.

• Safety symbols are to emphasize all operator, maintenance and repair action which, if not stricity followed, could result in a life-threatening situation, bodily injury or damage to equipment.
• Always observe safety symbols. They are included for your safety and for the protection.

• Greasing sticker

GREASING

1. With breaker mounted on carrier, apply down pressure on tool.
2. Fill cavity with recommended grease.
3. Grease whenever tool looks dry.
4. When installing a new tool, liberally coat the upper 1/3 of the tool with grease before inserting.
5. Failure to comply with these instruction can result in damage to the breaker and will void the warranty.

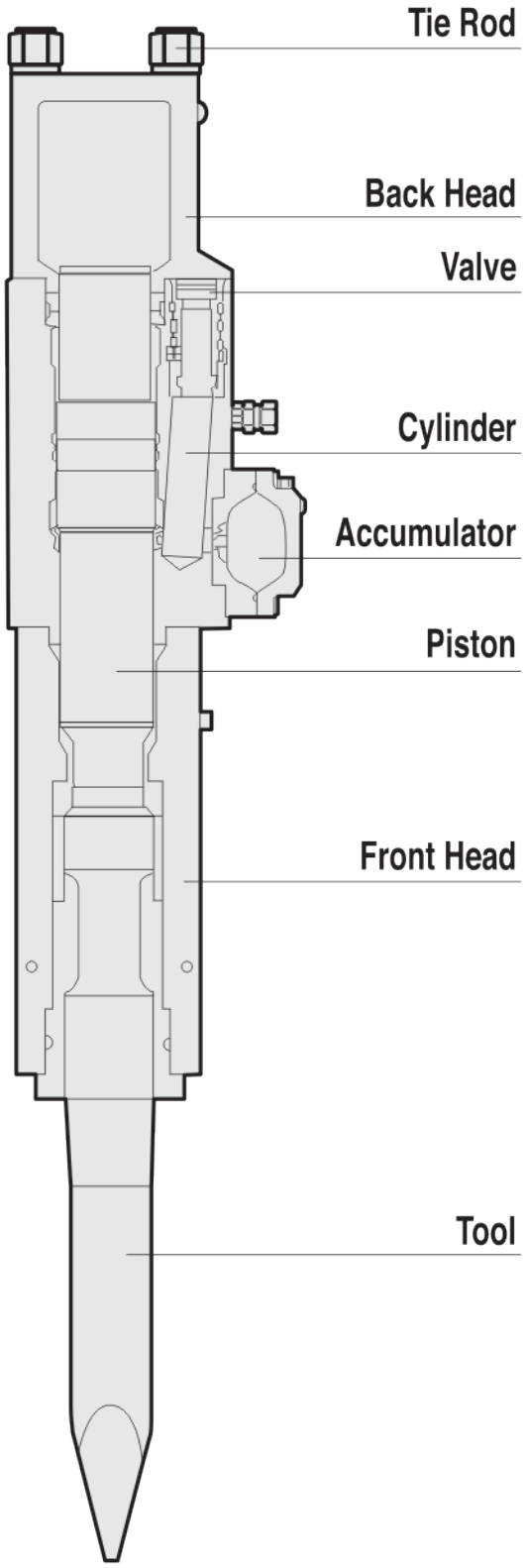
2. *Standard Specifications*

	Unit	RB50SSG	RB100G	RB125G	RB250G	RB500GG
Operating Weight	Kg	192	245	390	467	750
(Top type)	Lbs	423	540	858	1029	1650
Operating Pressure	Bar	90~120	95~130	95~130	130~150	150~170
	Psi	1280~1700	1350~1900	1350~1900	1845~2132	2133~2418
Required Oil Flow	lite/min	26~41	30~45	40~80	45~85	80~110
	Gal/min	7~11	8~12	10.5~21	12~22	21~29
Blows per minute	bpm	550~950	450~750	450~950	400~800	450~750
Hose Diameter	Inch	1/2	1/2	3/4	3/4	3/4
Tool(diameter)	mm	58	70	80	85	100
Suitable Excavator	ton	1.5~4	4~6	5~9	6~11	9~14
Impact Class		600	1000	1200	1500	2000

	Unit	RB750GG	RB1000GG	RB1300GG	RB1640GG	RB2250GG
Operating Weight	Kg	1100	1620	2300	2610	3900
(Top type)	Lbs	2420	3565	5060	5750	8580
Operating Pressure	Bar	150~170	160~180	160~190	160~190	160~180
	Psi	2175~2460	2275~2560	2275~2702	2275~2702	2275~2560
Required Oil Flow	lite/min	90~120	125~150	160~180	180~240	250~320
	Gal/min	24~32	33~40	43~51	51~65	68~86
Blows per minute	bpm	400~750	550~750	300~650	300~600	250~500
Hose Diameter	Inch	1	1	1	1-1/4	1-1/4
Tool(diameter)	mm	120	135	150	160	180
Suitable Excavator	ton	12~18	18~25	25~35	32~45	45+
Impact Class		3200	5000	6000	8000	12000

3. Construction and Main Parts

RB50SSG, RB100G, RB125G, RB250G
RB500GG



• Tie Rod
Front head, cylinder and back head of breaker body are tightly fixed with four tie rods.

• Back Head
Oil pressure inlet and outlet ports and Gas charging valve is built in and the inside is charged with N2-gas.

• Valve
Cylindrical control valve is built in the valve housing and controls piston reciprocation.

• Cylinder
The cylinder is the heart of the breaker containing hydraulic circuit for piston reciprocation.

• Piston
Kinetic energy of the piston is converted into hammering energy after hitting the tool. The hammering energy transmitted to the tool to break the rock.

• Front Head
The front head supports the whole breaker. Upper bushing prevents shock from the tool.

• tool
The specially heat-treated tool is directly applied to break rocks. It is used as moil point, wedge point and flat tool according to the application. (optional)

• Accumulator (Subject to model)
The accumulator compensates for pressure in the hydraulic circuit and prevents pulsation. It is not usually necessary to refill with N_2-gas only. (In main body)

The relation between the area (A1) affecting the pressure from the upper chamber of the piston and the (A2) affecting the pressure from the lower chamber of the piston is A1 > A2 and high pressure always applies to A2. When A1 change from high to low pressure or vice versa, Piston C2 reciprocates. Inside of back head is change with the high pressure gas and gas energy stored in the up stroke of the C2 effectively acts on the piston C2 during the impact.

1. POWER

When piston C2 reaches top dead center, high pressure oil from valve high-pressure port B3 applies to upper chamber of the piston A1 to change the piston stroke from upstroke to impact. At this time the relation between the area(A3) affecting the pressure from valve high pressure changes and the area(A4) of the valve change chamber is A4 > A3. The high pressure always applies to A4 and valve C4 remains in the upper position.

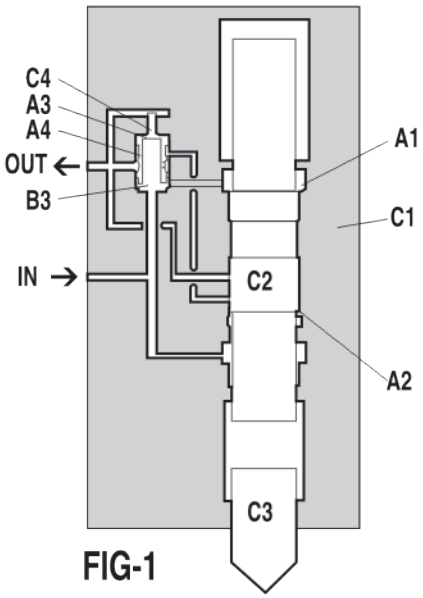


FIG-1

2. VALVE SHIFT

When cylinder low pressure port B1 is connected to cylinder change port B2, the pressure in valve change port B4 lowers. As force acting port C4 is the only pressure in valve high pressure chamber A3, valve C4 starts lowering. During the valve lowering stroke, valve high pressure port B3 is closed and valve low pressure port B5 is opened to the lower the pressure in the upper chamber of the pisition A1.

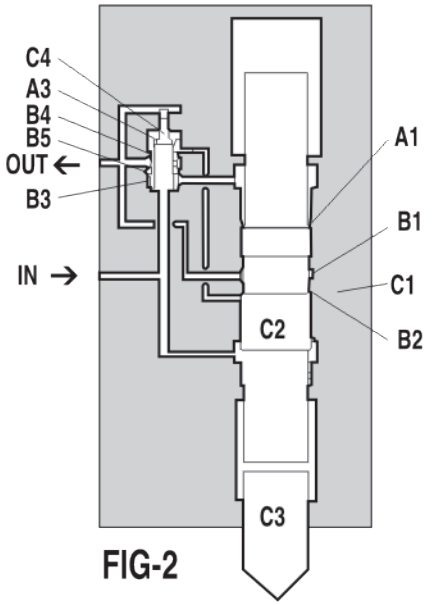


FIG-2

3. IMPACT

When piston C2 reaches impact point, kinetic energy obtained by piston C2 during the impact stroke is transmitted to the tool C3 for the impact energy required to break object. At this time, as high pressure applies only to the lower chamber of the piston A2, piston C2 starts reversing. Further, as high pressure applies only to the valve high pressure chamber A3, valve C4 is remaining in the lower position.

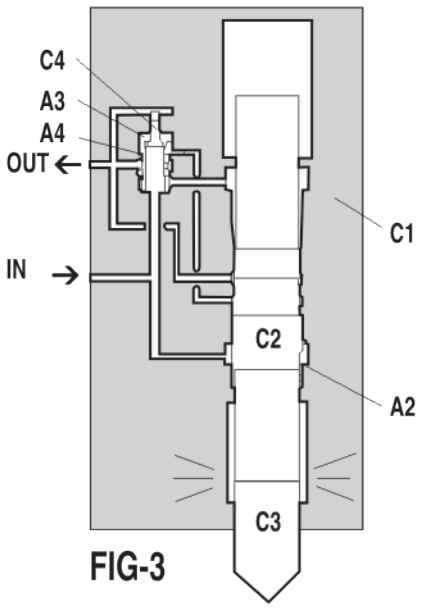


FIG-3

4. UPSTROKE

When cylinder change port B2 is connected to cylinder lower pressure port B1, high pressure oil applies to low pressure out let port valve C4 time valve low pressure port A1 this time valve low pressure port B5 is closed and valve high pressure B3 is opened to the upper chamber of the piston A1 to rise the pressure in the lower chamber of the pistion A1.

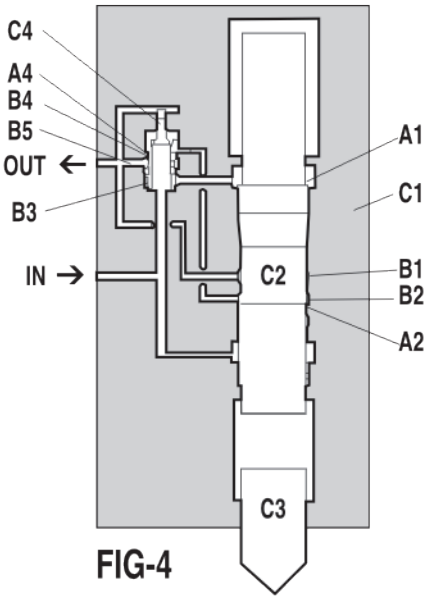
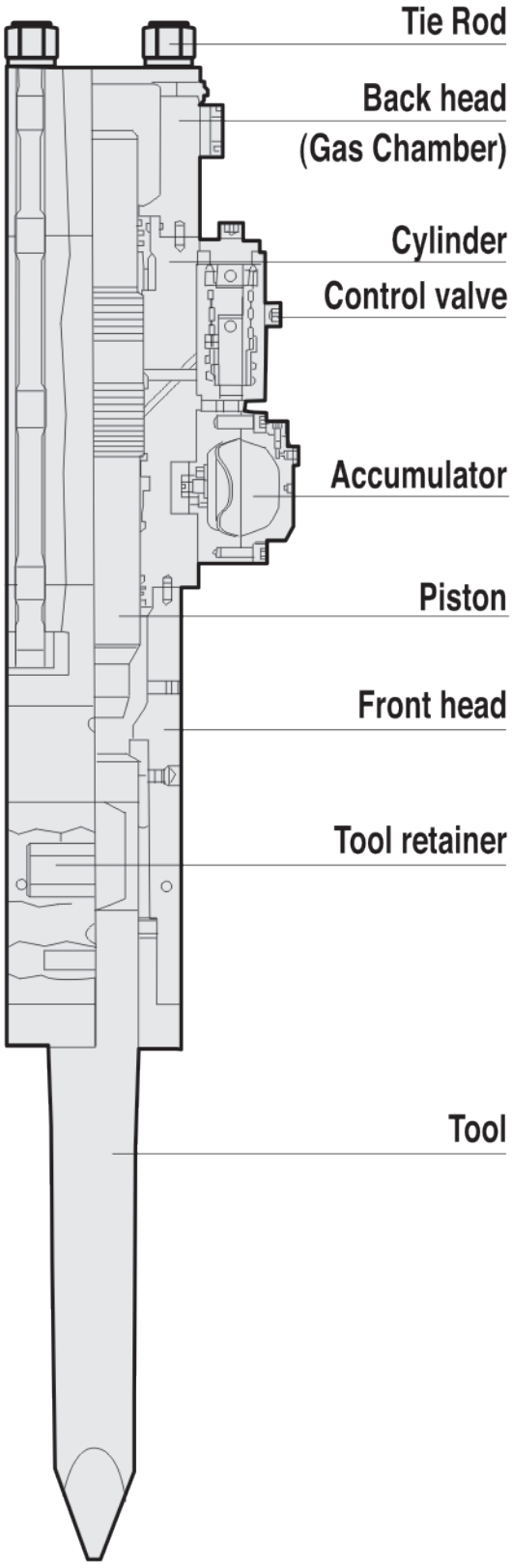


FIG-4

A1 : Area of the upper chamber of the piston
A2 : Area of the lower chamber of the piston
A3 : Area of valve high pressure chamber
A4 : Area of valve change chamber
B1 : Cylinder low pressure port
B2 : Cylinder change port
B3 : Valve high pressure port
B4 : Valve change port
C1 : Power cell
B5 : Valve low pressure port
C2 : Piston
C3 : Tool
C4 : Valve

4. Construction and Main Parts

RB750GG, RB1000GG, RB1300GG, RB1640GG, RB2250GG



• Tie Rod

Front head, cylinder and back head of breaker body are tightly fixed with four tie rods.

• Back Head

Gas charging valve is built in and the inside is charged with N_2 gas.

• Cylinder

The cylinder is the heart of the breaker containing hydraulic circuit for piston reciprocation.

• Control Valve

Cylindrical control valve is built in the valve housing and controls piston reciprocation.

• Accumulator

The accumulator compensates for pressure in the hydraulic circuit and prevents pulsation. It is not usually necessary to refill. Use N_2 gas only.

• Piston

Kinetic energy of the piston is converted into hammering energy after hitting the tool. The hammering energy transmitted to the tool breaks the rock, concrete, etc.

• Front Head

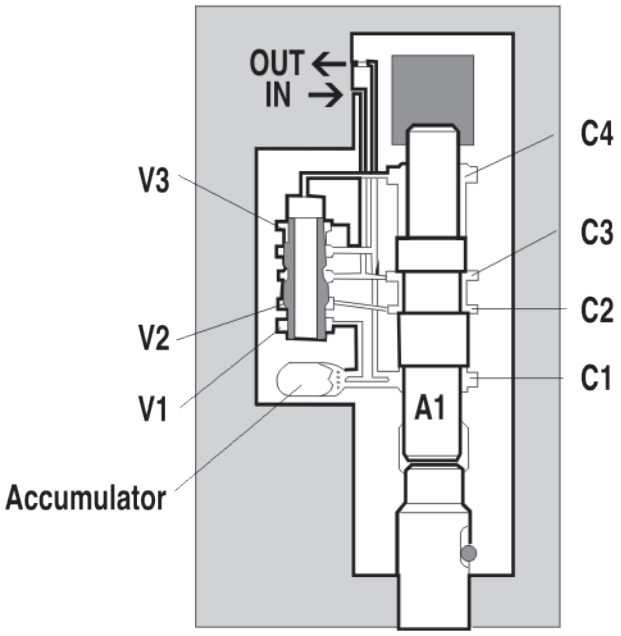
The front head supports the whole breaker. Upper bushing prevents shock from the tool.

• Tool

The specially heat-treated tool is directly applied to break rocks. It is in the form of a wedge, moil point, blunt, cone and wedge chisel appropriate to the application. (optional)

1. SET UP

Chambers C3, C2 always maintain low pressure, because they are connected to the output line. Cahmbers V3, V1, C1 and accumulator always maintain high pressure, because they are connected to the input line.
Chamber V2 pressure is changed to low pressure or high pressure depending on piston position.



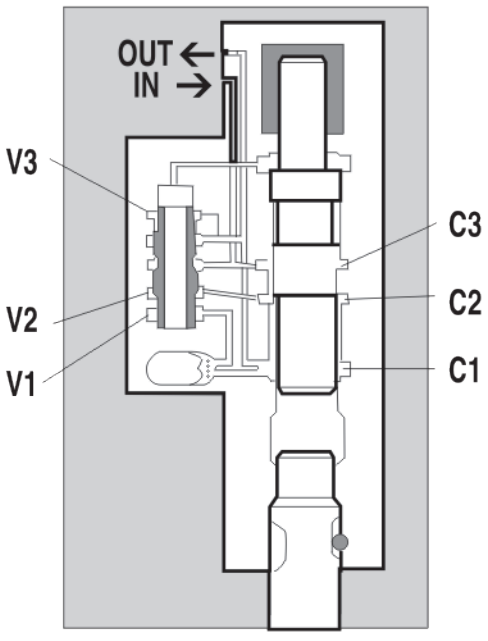
Piston Raise

2. PISTON RAISE

Oil enters into “IN” port, and begins to accumulate force to raise piston ; hydraulic force is applied on A1 of piston lower flange, and piston begins to raise.
When the piston begins to raise, oil from C4 chamber returns to the output line through the control valve.

3. VALVE RAISE

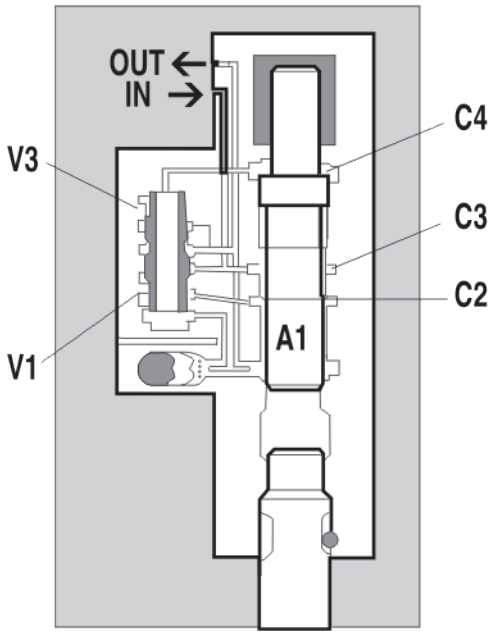
When piston raises to around upper limits, A1 of piston lower flange reaches chamber C2, and the back head nitrogen(N_2) gas is compressed.
At this time, oil from chamber C2 goes to chamber V2.
A3 area is larger than A4 area, but applied pressure of area A3 is the same as applied pressure of A4.
Therefore, the valve begins to raise, because of the area difference between A4 and A3.



Valve Raise

4. PISTON DESCENT

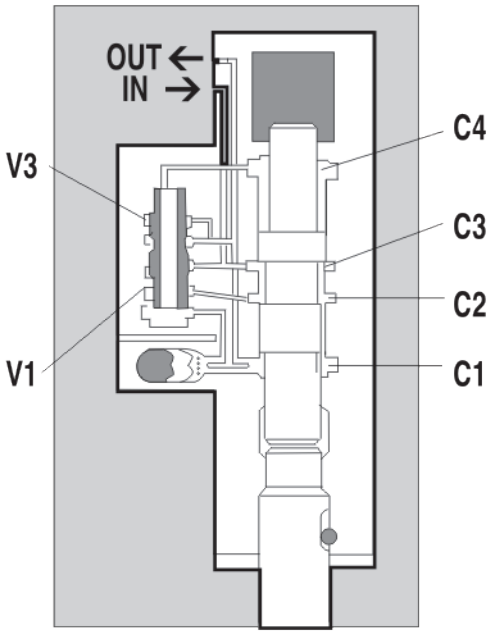
When the valve reaches the upper limits, chamber C4 becomes high pressure area, because oil from the working pump goes to chamber C2 through the control valve holes. A2 area is larger than A1 area, but pressure applied to A4 area is the same as the pressure applied to A1.
Therefore, the piston begins to descend, because of the area difference between A2 and A1.
At this time, piston descent speed is accelerated by compressed nitrogen(N_2) gas pressure and piston weight.



Piston Descent

5. IMPACT

Chamber V2 is changed in low pressure as chamber C2 is connected with C3 during piston descent.
But V3 is always high pressure. Therefore, the valve begins to descend.



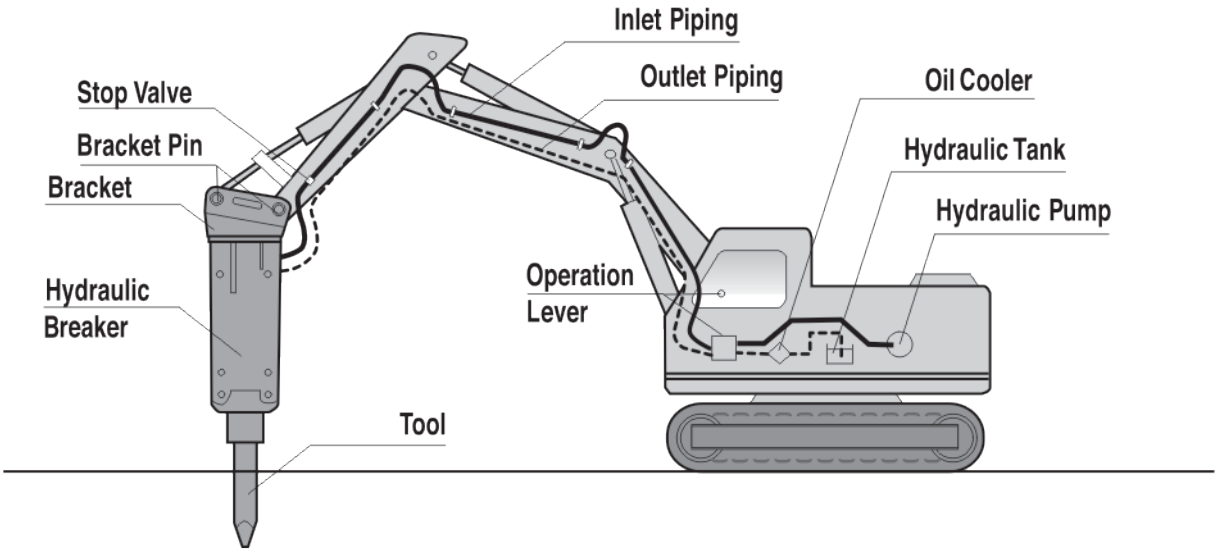
Impact

6. CONTINUOUS STRIKE

After the piston strikes the top of the tool, the status of all circuits are changed to “Piston Raising”
The piston begins to raise via status flowing into “IN”port, and the cycle is repeated again.

5. *Preparation for Installation and Operation*

1. GENERAL VIEW OF BREAKER INSTALLED



2. HYDRAULIC PIPE LINES FOR EXCLUSIVE USE

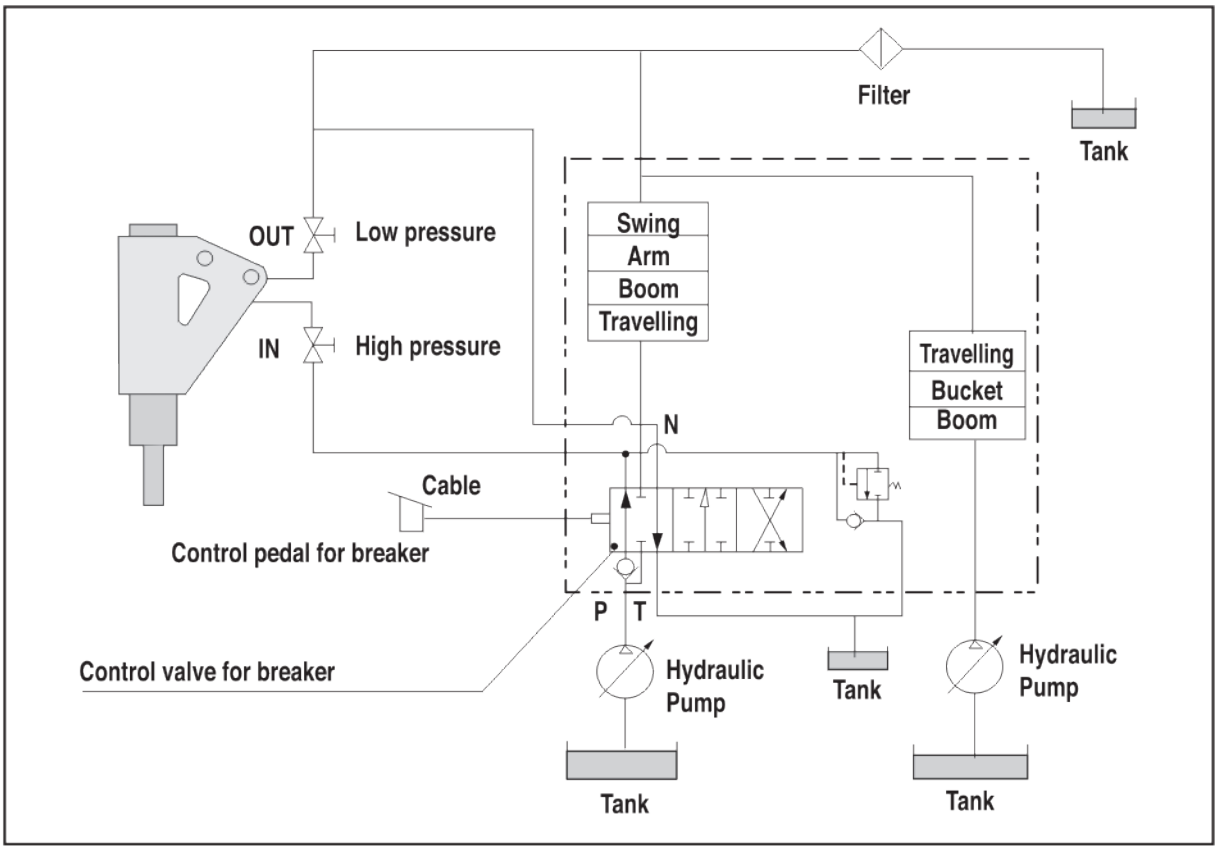
Operation of the hydraulic breaker requires installation of hydraulic pipe lines for exclusive use of the hydraulic breaker. As hydraulic pipe lines vary depending on base machines, our service engineer must first check hydraulic pressure, oil capacity, pressure loss and other conditions of the base machine before installing hydraulic pipe lines. Use only genuine parts in case of replacement because hydraulic pipe lines (hoses, pipes and fittings) are made of materials carefully selected in consideration of durability.

⚠ WARNING

THE HYDRAULIC SYSTEM TO THE BASE MACHINE MUST BE CHECKED BY AN AUTHORIZED HARDROCK SERVICE ENGINEER BEFORE FIRST USE AND AFTER ANY MODIFICATIONS.

⚠ WARNING

MAKE SURE THAT THE BREAKER VALVE OF HYDRAULIC SYSTEM IS PROPERLY SET



※ Hose & Tube pipe size

		RB50/100G	RB125G	RB250G	RB500GG	RB750GG	RB1000GG	RB1300GG	RB1640GG	RB2250GG
inner	mm	12.7	19.1	19.1	19.1	25.4	25.4	25.4	31.8	31.8
diameter	inch	1/2	3/4	3/4	3/4	1	1	1	1-1/4	1-1/4

3. CHECKING BEFORE INSTALLATION INSTRUCTIONS

⚠ WARNING

1. CHECK THE "SPECIFICATIONS" SECTION OF THIS MANUAL TO DETERMINE CORRECT BACKHOE AND EXCAVATOR SIZES, HYDRAULIC PRESSURE, AND HYDRAULIC FLOW REQUIREMENTS.
2. IF HYDRAULIC PRESSURE, HYDRAULIC FLOW ARE EXCEEDED, THE BREAKER WARRANTY IS NOT APPLIED.
3. CHECK THE NITROGEN GAS! - BACK HEAD AND ACCUMULATOR.
4. BE SURE THE FLUID IN THE HYDRAULIC SYSTEM IS CLEAN.
5. CHECK THE HYDRAULIC FILTER, REPLACE THE FILTER IF DIRTY OR DETERIORATED.
6. HOSE AND PIPING MUST BE FLUSHED.
7. THE CONTAMINATED PART MUST BE CLEANED WITHOUT DELAY. HYDRAULIC OIL OR LIGHT OIL IS HIGHLY RECOMMENED.

IMPORTANT

THE CIRCUIT RELIEF SETTING PRESSURE IS NOT FIXED. HOWEVER,
IT WILL BE ADJUSTED BY PUMP CAPACITY

• Recommended circuit relief setting pressure and back pressure.

RB50SSG, RB100G, RB125G, RB250G, RB500GG

	Unit	RB50SSG	RB100G	RB125G	RB250G	RB500GG
Relief setting pressure	kg/cm^2	150	160	180	190	190
	psi	2133	2275	2560	2702	2702
Back pressure (Max)	kg/cm^2	4-6	4-6	4-6	4-6	4-6
	psi	57-85	57-85	57-85	57-85	57-85

RB750GG, RB1000GG, RB1300GG, RB1640GG, RB2250GG

	Unit	RB750GG	RB1000GG	RB1300GG	RB1640GG	RB2250GG
Relief setting pressure	kg/cm^2	200	210	210	220	220
	psi	2845	2987	2987	3129	3129
Back pressure (Max)	kg/cm^2	4-8	4-8	4-8	4-8	4-8
	psi	57-114	57-114	57-114	57-114	57-114

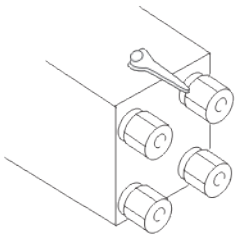
• Since RB hydraulic breaker operates with various kinds of hydraulic construction machines, it should be installed after our serviceman has carried out the necessary check on the base machine to utilize its full performance.

4. INSPECTION AND CHARGING N_2 GAS IN BACK HEAD

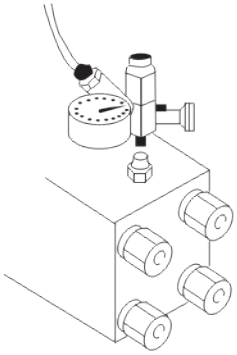
⚠ WARNING

1. CHARGING GAS PRESSURE CHANGES ACCORDING TO THE TOOL CONDITION. LAY DOWN THE BREAKER AND LET THE TOOL EXTEND FULLY TO CHARGE GAS.
2. STAY CLEAR OF THE TOOL WHILE CHARGING THE BREAKER WITH GAS. THE TOOL MAY BE IMPACTED BY THE PISTON AND FORCED OUT ABRUPTLY.
3. TAKE CARE WHEN THE TIE RODS ARE CHANGED OR THE BREAKER BODY IS DISASSEMBLED.
4. USE SPECIAL CARE TO HANDLE AND STORE THE N_2 GAS CYLINDER AS IT IS A HIGH-PRESSURIZED CONTAINER.
5. USE NITROGEN GAS ONLY.
6. SEE "CONVERSION TABLE FOR CHARGING N_2 GAS PRESSURE TO BACK HEAD"

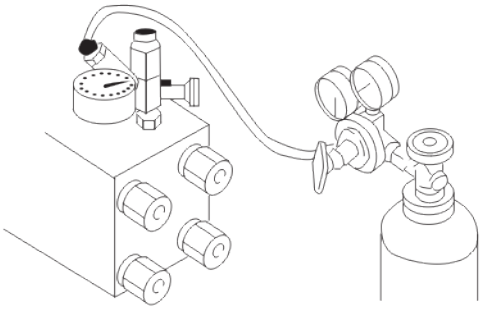
• Charging of N_2 gas into back head



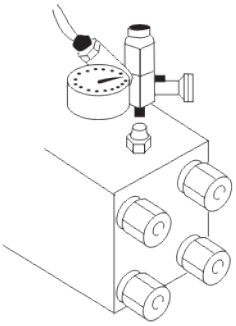
(1) Remove gas valve plug



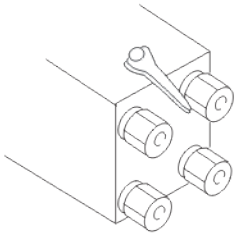
(2) Insert 3-way valve with pressure gauge assembled (Note. 1)



(3) If gas in insufficient, adjust to specified valve as shown in the previous page (Note. 2)



(4) Adjust the pressure slowly, decreasing it by using the pressure gauge if gas is sufficient



(5) Tighten gas valve plug (Do not cut O-ring)

Note

- Insert 3-way valve after its handle is fully turned counterclockwise.
- Turn the 3-way valve handle clockwise slowly. Stop turning it when the needle of the gauge starts to move. If it is turned clockwise too tightly, the valve may easily be damaged.

  Pay special attention to ensure that the nitrogen gas is not charged excessively.

• Conversion table for charging nitrogen gas pressure to back head

(Depends on the temperature of the back head surface)

RB50SSG, RB100G, RB125G,

Back head gas Pressure	Ambient Temperature (°C / °F)				
	0 / 32	10 / 50	20 / 68	30 / 86	40 / 104
kg/cm^2	13.5	14	14	15.5	16.5
psi	190	199	199	219	234

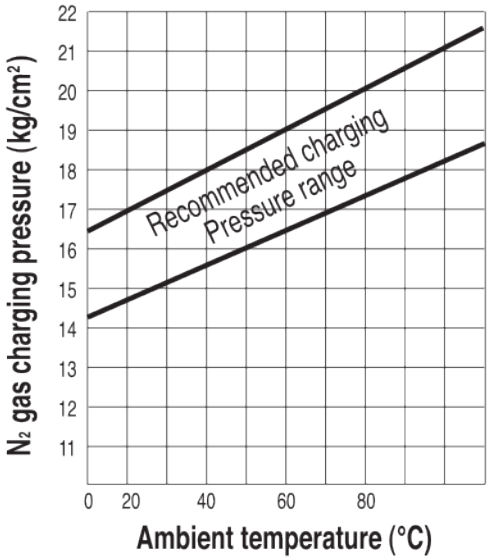
RB250G, RB500GG

Back head gas Pressure	Ambient Temperature (°C / °F)				
	0 / 32	10 / 50	20 / 68	30 / 86	40 / 104
kg/cm^2	15.5	15.9	16.3	16.8	17.3
psi	220	226	231	238	246

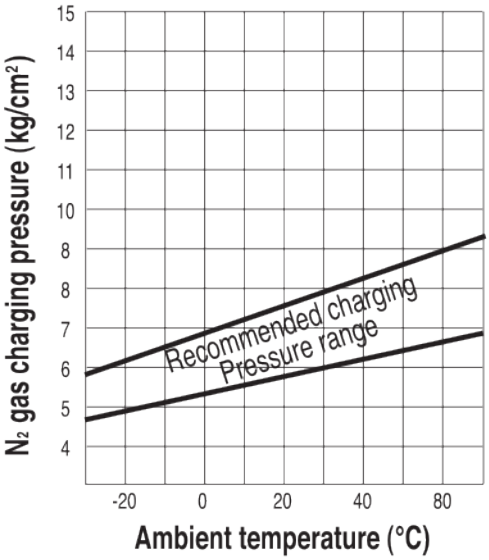
RB750GG, RB1000GG, RB1300GG (RB1640GG, RB2250GG)

Back head gas Pressure	Ambient Temperature (°C / °F)				
	0 / 32	10 / 50	20 / 68	30 / 86	40 / 104
kg/cm^2	5.8 (7.8)	6.0 (8.0)	6.2 (8.2)	6.4 (8.4)	6.6 (8.6)
psi	83 (111)	85 (114)	88 (117)	91 (120)	94 (123)

• RB50SSG, RB100G, RB125G, RB250G, RB500GG

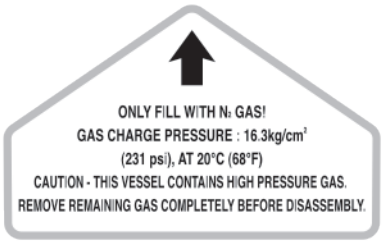


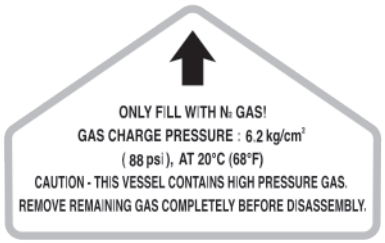
• RB750GG, RB1000GG, RB1300GG, RB1640GG, RB2250GG



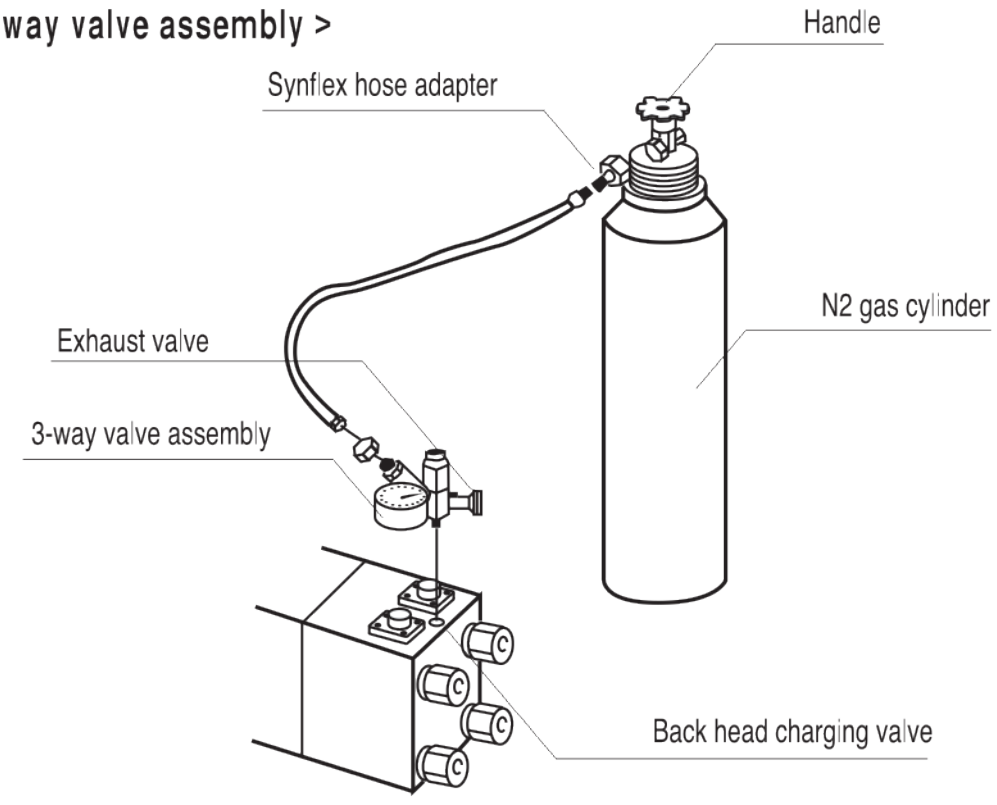
• Back head sticker symbol

- Appears on the back head charging valve





< 3-way valve assembly >



5. INSPECTION AND CHARGING N_2 GAS IN ACCUMULATOR

⚠ WARNING

- USE SPECIAL CARE TO HANDLE AND STORE THE N_2 GAS CYLINDER AS IT IS A HIGH-PRESSURIZED CONTAINER.
- USE NITROGEN GAS ONLY.
- SEE "CONVERSION TABLE FOR CHARGING N_2 GAS PRESSURE TO ACCUMULATOR"

Cautions for charging N_2 gas to the accumulator

- **Be sure to use the 3-way valve assembly for charging the N_2 gas. If charging gas leaks directly from the cylinder, the diaphragm may be broken off.**
- **If charging for handing N_2 gas to only the accumulator, make sure that the accumulator body and cover are tightened fully.**

- Make sure the cap and valve of the 3-way valve assembly are fully tightened.
- Remove the cap from the accumulator and tighten the charging valve fully.
- Check if O-rings are installed to the bushing. Remove the plug and screw in the bushing.
- Install the bushing to the 3-way valve assembly.
- Loosen the charging valve gradually. The charging pressure is indicated on the pressure gauge.
- Close the valve clockwise when the gas pressure is normal. When the gas pressure is higher, repeat loosening and tightening the valve of 3-way valve assembly. The pressure is lowered gradually.
- Loosen the valve of the 3-way valve assembly to discharge the N_2 gas in gas cylinder (bombe).
- Remove the 3-way valve assembly and tighten the plug and cap.

• Charging of N_2 gas into accumulator

- Connect the charging hose to N_2 gas cylinder after screwing the bombe adapter on to adapter, nut and installing to the N_2 gas cylinder.
- Connect the 3-way valve assembly to the charging hose after unscrewing the cap on the 3-way valve assembly.
- Remove the cap from the accumulator and tighten the charging valve fully.
- Check if O-rings are installed to the bushing Remove the plug and screw the bushing.
- Loosen the accumulator charging valve after checking if bushing is installed to the 3-way valve assembly.
- Turn the handle of the N_2 gas cylinder container clockwise slowly to charge gas.
- Charge gas in accordance with the conversion table for charging N_2 gas pressure to accumulator.
- Turn the handle of the N_2 gas cylinder clockwise to close the valve.
- Close the accumulator charging valve.
- Loosen the valve of the 3-way valve assembly to discharge the N_2 gas remaining in the charging hose.
- Remove the charging hose, 3-way valve assembly and bushing and tighten the plug and cap.

• Conversion table for charging nitrogen gas pressure to accumulator.

RB750GG, RB1000GG, RB1300GG, RB1640GG, RB2250GG,

Accumulator gas Pressure	Ambient Temperature (°C / °F)				
	0 / 32	10 / 50	20 / 68	30 / 86	40 / 104
kg/cm²	50	52	55	58	61
psi	711	739	780	824	867

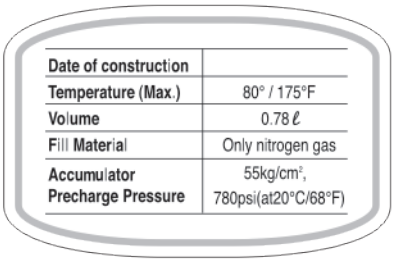
• Remarks: each specifications are shown in the accumulator sticker below.

• Acc sticker(A) symbol

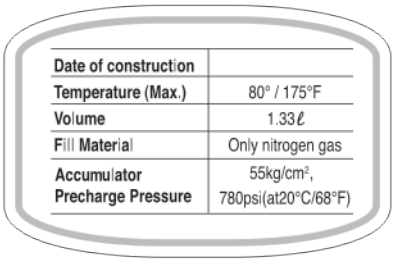
- Appears on the accumulator body

• Acc sticker(B) symbol

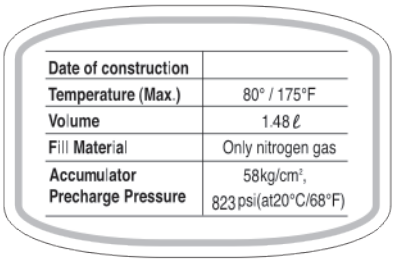
- Appears on the accumulator body



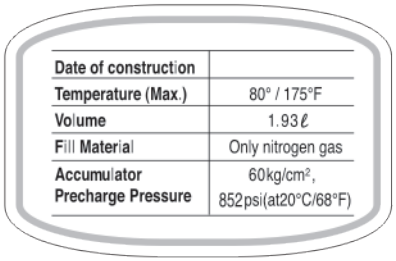
RB750GG



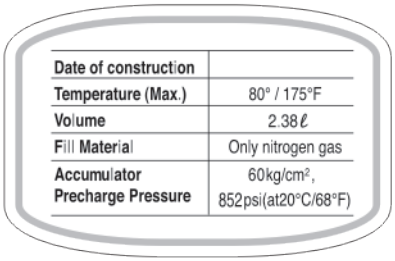
RB1000GG



RB1300GG

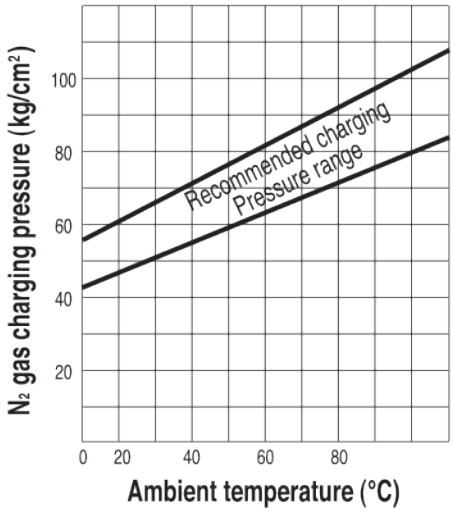


RB1640GG

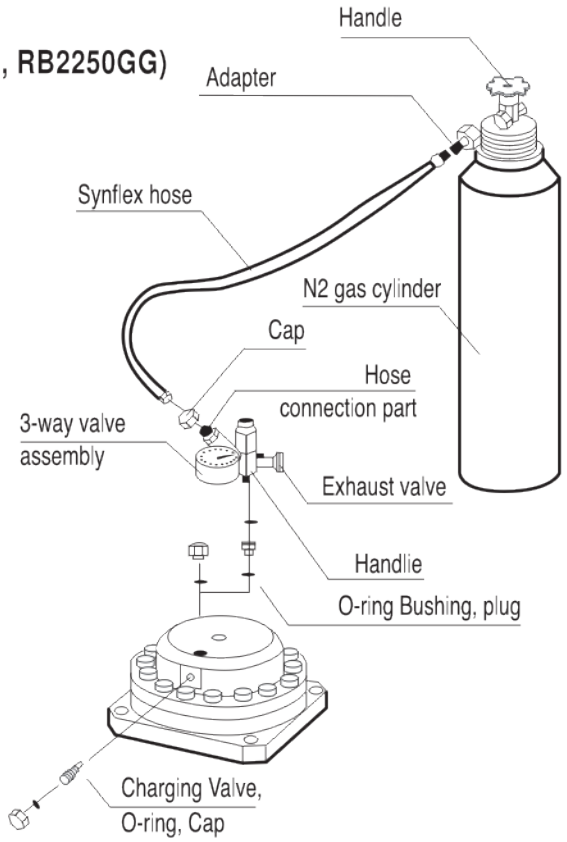


RB2250GG

• N_2 gas charging Pressure to Accumulator
(RB750GG, RB1000GG, RB1300GG, RB1640GG, RB2250GG)



• Conversion table for charging N_2 gas pressure to accumulator



6. HYDRAULIC OIL

• Selection of oil

Selection of hydraulic oil determines the efficiency of the hydraulic breaker performance. Please consult with our service station under following conditions.

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

• Hydraulic Oils and Greases

Recommended for Hydraulic Breaker by ROCKBLASTER

LUBE & SPEC / LUBRICANTS MANUFACTURER	Hydraulic Oil			Grease
	Summer	Winter	All Season	(MOS_2)
	ISO VG 46	ISO VG 32	ISO VG 46	NLGI No_2
MOBIL	MOBIL DTE 25	MOBIL DTE 24	MOBIL DTE 15M	MOBIL GREASE SPECIAL
	MOBIL SHC 525			MOBILTH SHC 220
	MOBIL EAL SYNDRAULIC 46			
LG-CALTEX	RANDO HD 46	RANDO HD 32	RANDO HD CZ	MOLYTEX EP2
BP	ENERGOL HP 46	ENERGOL HP 32	ENERGOL HP 46	-
SHELL	TELLUS 46	TELLUS 32	TELLUS T 46	RETINAX HDX-2

- Synthetic lubricant
- Environmantally friendly sysnthetic lubricant

• Oil Contamination

Contaminated oil results in malfunctions of the breaker as well as the base machine and cause damage to parts. Pay special attention to oil contamination.

Contaminated oil should be chaged without delay. When changing oil, thoroughly wash oil tank, cylinder and pipes. Cleaning or replacing oil filter also requires check for oil contamination.

- Replacement of filter : after first 50 hours and every 100 hours thereafter
- Replacement of hydraulic oil : every 500 hours

⚠ WARNING

• HYDRAULIC OIL TEMPERATURE AND VISCOSITY

Do not operate the hydraulic breaker at oil temperatures from 20°C / 68°F to 80°C / 176°F. operation at higher temperatures can damage the internal components of the breaker and excavator, there will result in reduced breaker performance.

• Criteria of oil contamination and malfunction

(General Analysis)

Analysis Item	Criteria	Causes and Effects when exceeds the criteria
Adhesiveness	Within 10% 40°C cst	Adhesiveness rarely decreases soley because of hydraulic oil. Entry of different kind of oil may reduce the adhesiveness which contributes to rising oil temperature, wear and stretch of bearings and gears and malfunctuon of hydraulic oil.
Oxidizing Level	Less than 0.3 (mg KOH/g)	Use of a lubricating oil in a long period of time of under high of a lubricating (higher than 60°C) will oxidize it.Oxidizing level rises as ozidization proceeds. Sludge will be produced during the process, leading to unsatisfactory operation of the breaker, erosion of metals or obsolescence of seal materials.
Moisture	Less than 0.1 (%)	Moisture causes rust, wear and stretch. Moisture of 0.3% gathers a considerable amount of rust and considerable amount of rust moisture of 0.5% or more will cause damage to the machine.

• Criteria of malfunction by hydraulic oil color

(Simple discrimination by ASTM color)

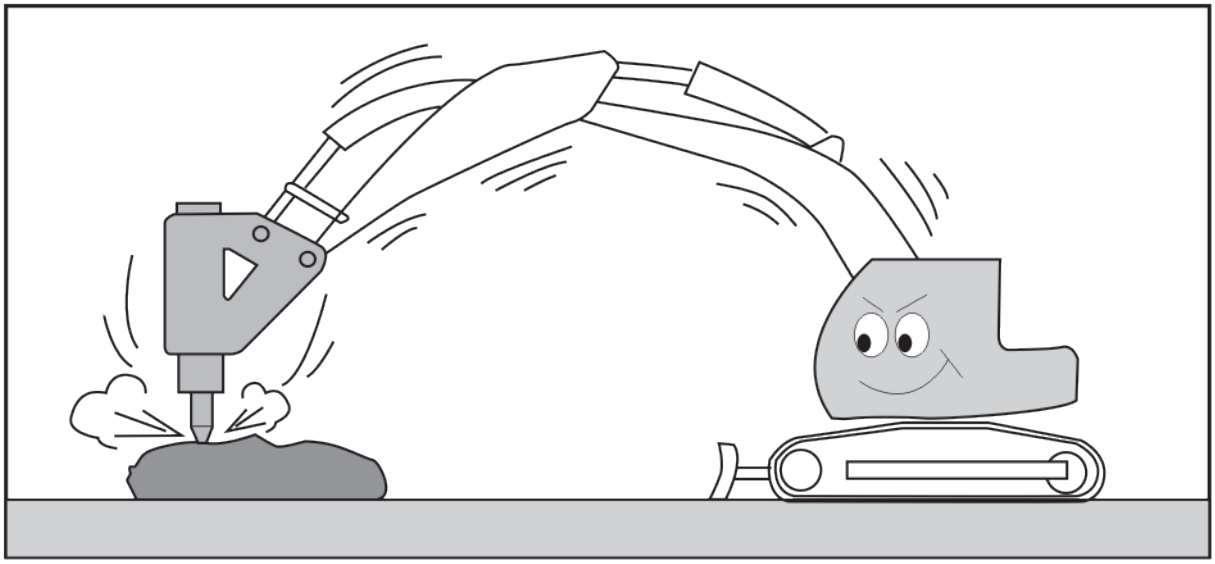
Hydraulic oil turns black as the breaker fails to display best performance.

The old oil is assumed to be contaminated when there is a visual difference between the old new oil color and functions begin to deteriorate when hydraulic oil turns darker than the new oil color (ASTM number) by more than two.

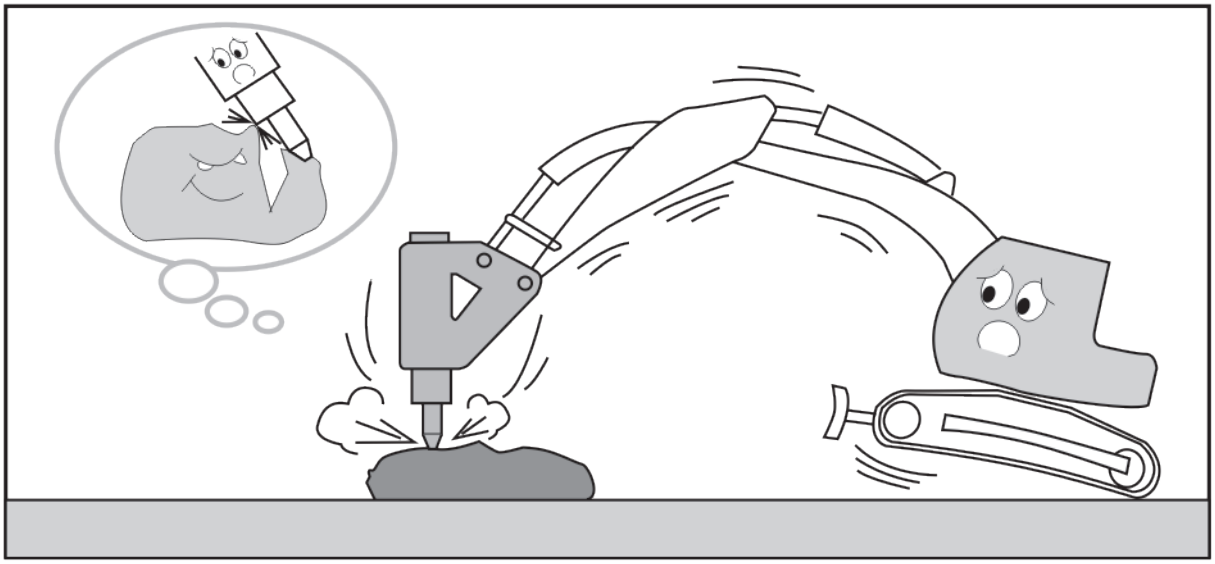
6. Operation (Breaking)

1. PROPER POSITION OF THE TOOL

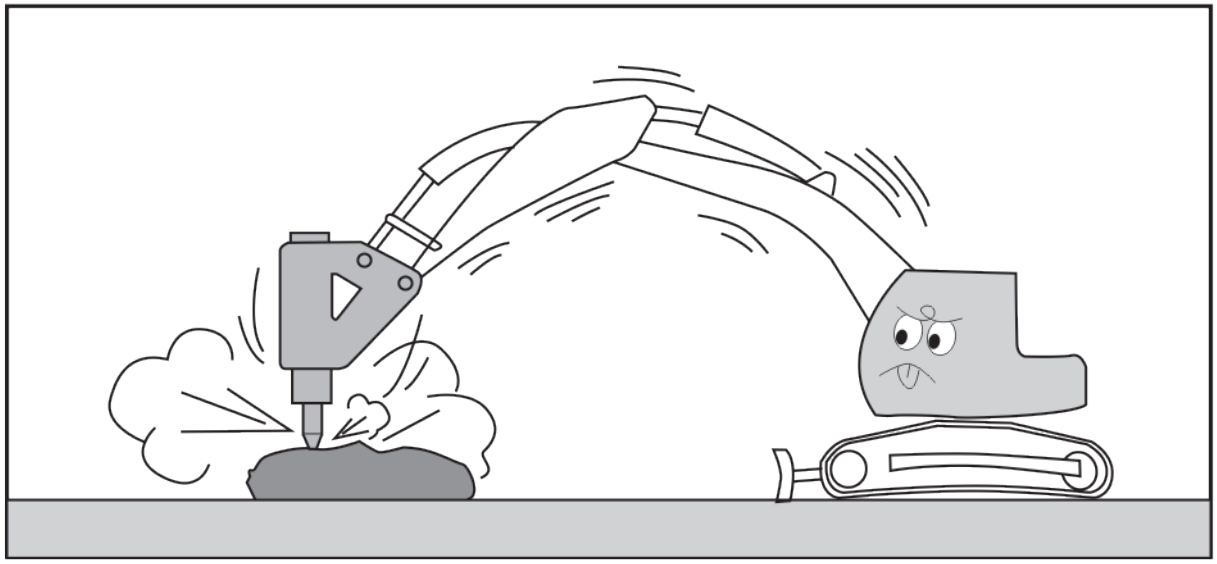
Proper position must be applied for an effective use of breaking force. when position is incorrect, hammering energy of the piston is too weak to break rocks.
Instead, hammering force applies shocks to the breaker body, breaker, arm and boom, and the base machine, thereby resulting in damage to those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



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

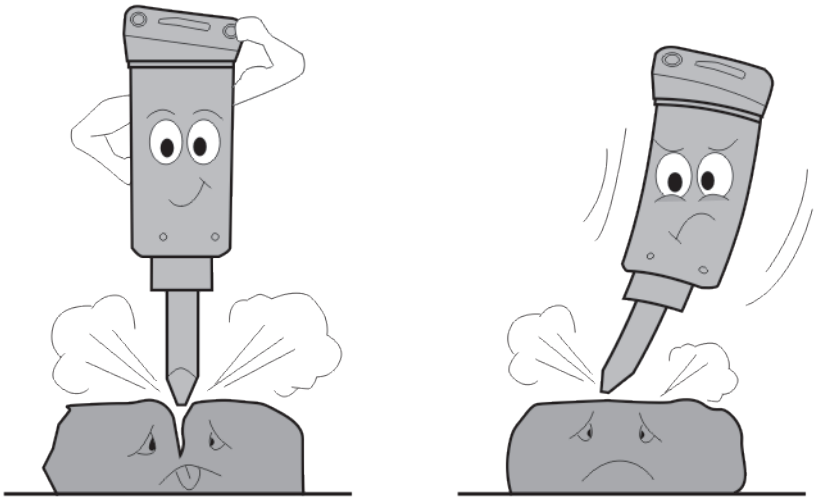


It is undesirable to carry out hammering under the below condition, because vibrations during hammering may be transmitted to tracks of the base machine.
During hammering, however, proper position must be always applied to the breaker.
Special care must be taken not to hammer under abnormal condition.



2. ALIGNMENT OF THE TOOL

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



3. OPERATION PRECAUTIONS

IMPORTANT

- APPLY DOWN FORCE TO THE BOOM / DIPPER UNTIL, THE FRONT OF THE BACKHOE AND CARRIER IS RAISED OFF THE GROUND.
- THE BREAKER IS MORE EFFICIENT WHEN ADEQUATE DOWN FORCE IS APPLIED.

IMPORTANT

- RELOCATE THE BREAKER OFTEN
- THE BREAKER TOOL SHOULD BE MOVED TO A NEW LOCATION OF THE WORK EACH TIME THE TOOL PENETRATES BUT DOES NOT CRACK THE MATERIAL

IMPORTANT

- DO NOT BREAK CONTINOUSLY IN ONE PLACE
- CONTINOUS PENETRATION IN THE SAME AREA FOR LENGTHLY PERIODS WILL CREATE EXCESSIVE TEMPERATURES AT THE END OF TOOL RESULTING IN LOSS OF TEMPER (HARDNESS) OF THE BIT AND CAUSE MUSHROOMING OF THE TIP OF THE BIT, AND MAY LEAD TO FAILURE OF THE BIT.

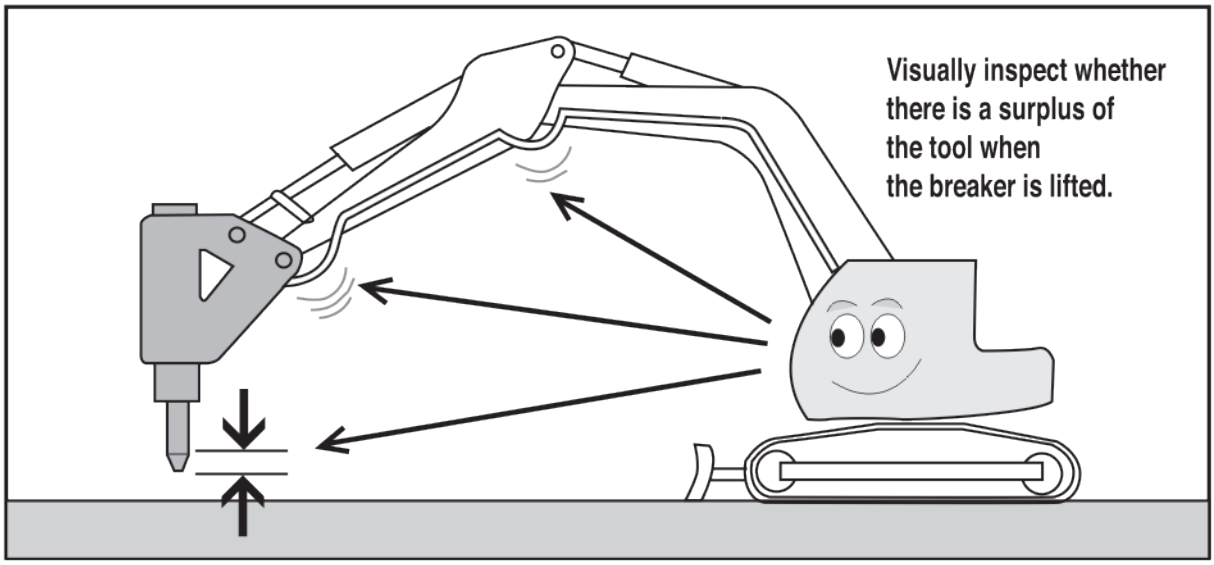
IMPORTANT

- THE CONTAMINAED PART MUST BE CLEANED WITH NO DELAY.
  HYDRAULIC OIL OR LIGHT OIL IS HIGHLY RECOMMENDED.

• Stop operation as soon as hose vibrate excessively.

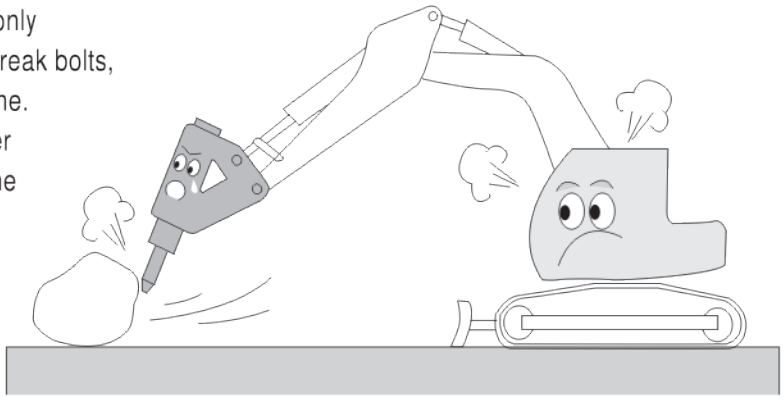
Excessive vibration of high and low-pressure hoses of breaker calls for an instant disassembly and repair. Contact the nearest serivice station appointed by ROCKBLASTER. For caution's sake, check oil leakage at back head.

- The operator is required to pay attention to following points during operation.



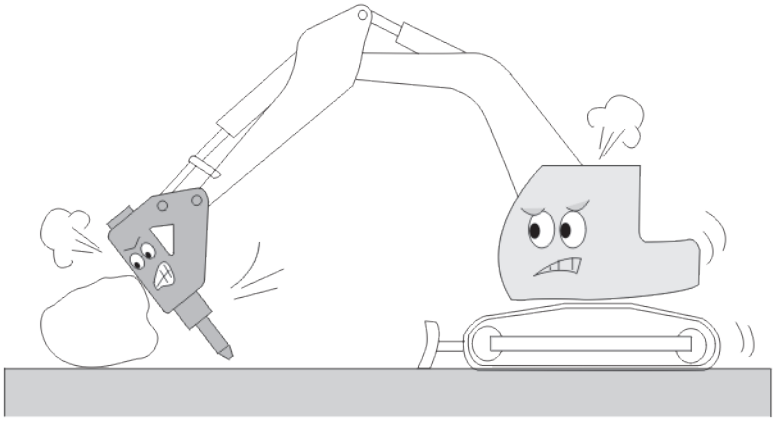
• Avoid all blank hammering.

As soon as rocks are broken, stop hammering. Continous blank hammering will not only damage front head and loosen and break bolts, but also adversely affect base machine. Blank hammering occurs when proper position of the tool is not applied to the breaker or the tool is used as a lever. (Hammering sound changes during blank hammering)



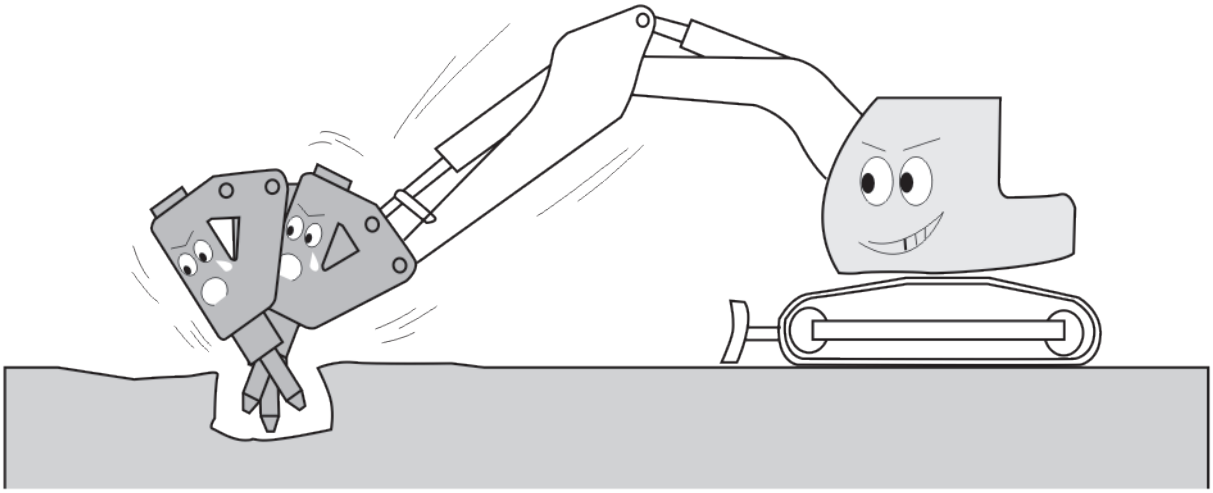
• Do not move rocks.

Avoid moving rocks with side of the bracket, because it is the major factor to break bolts installed on the bracket, tool and damage boom and arm.



• Do not use tool as a lever.

When breaking rocks by using tool as a lever, bolts and tool may be broken, too.

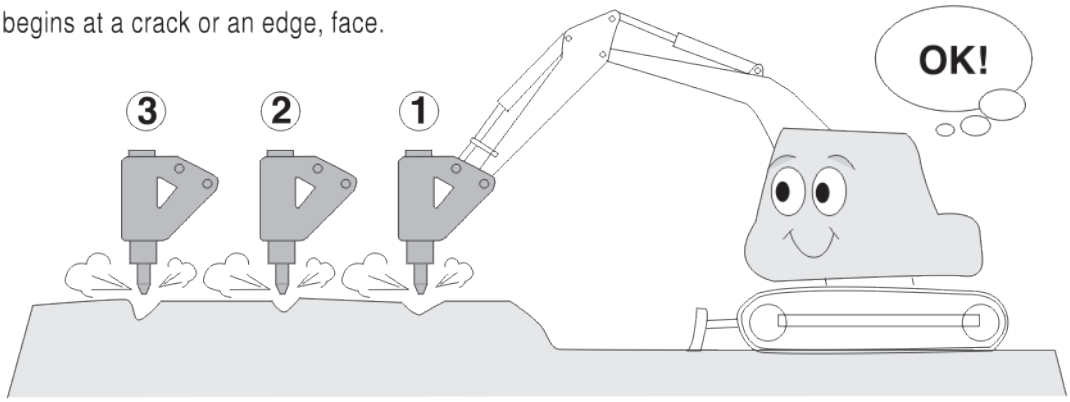


• Do not continue to hammer for more than one minute.

When rocks are not broken after more than one minute' hammering at the same point, change the place to be hammered. Extended hammering at the same place causes the tool to wear out excessively.

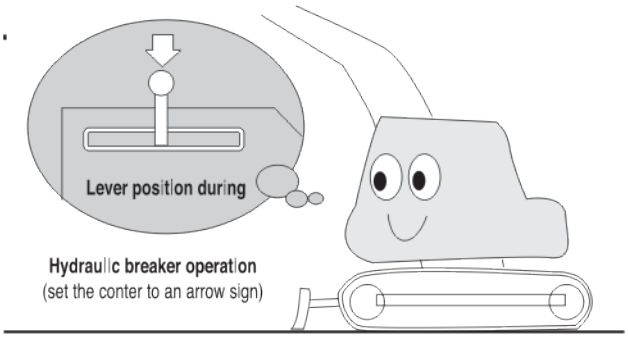
• On a hard and large rock, start breaking at an edge.

Even a hard and big rock can be relatively easily broken when hammering begins at a crack or an edge, face.



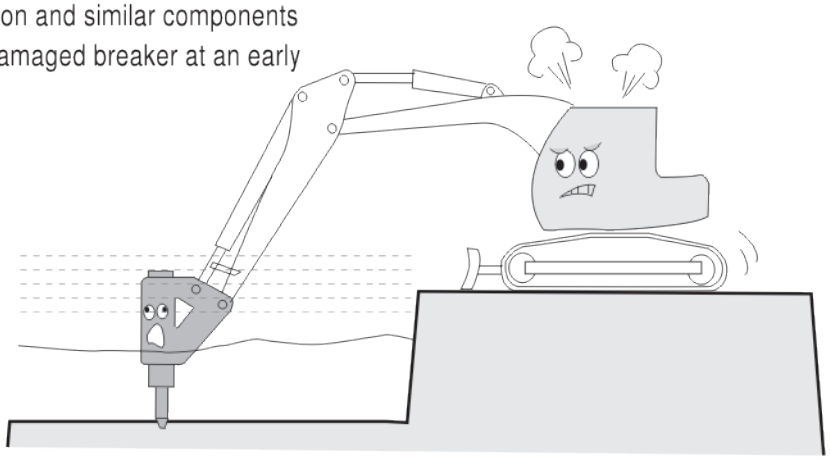
• Operate breaker at proper engine speed.

Break rocks at the specified engine speed. Raising engine speed more than necessary does not strengthen hammering force but increase oil temperature to the detriment of pistons and valves.



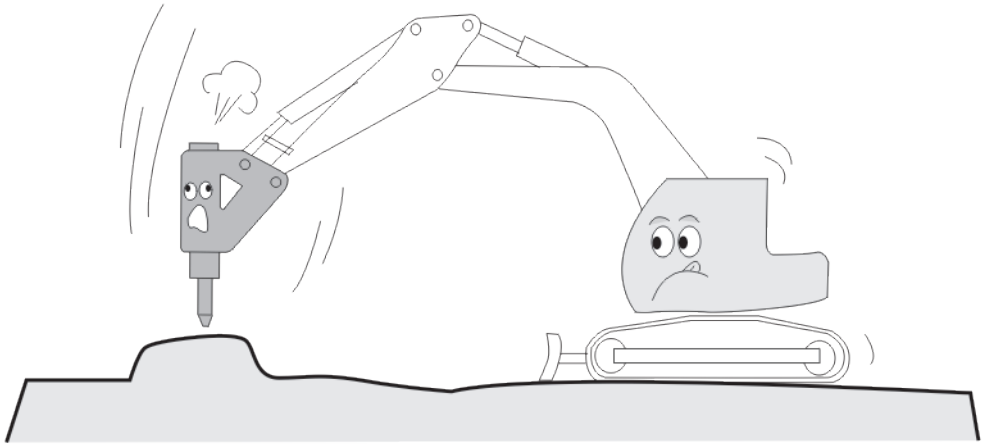
• Do not operate the breaker in water and mud.

When rocks are not broken after more than one minute'
Do not operate breaker when all components except tool are immersed in water and mud. Piston and similar components may gather rust and become a damaged breaker at an early stage.



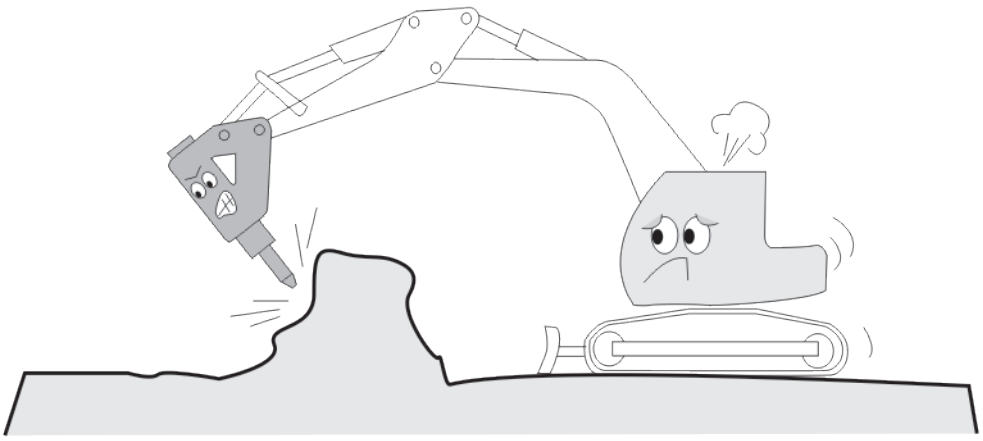
• Do not allow the breaker to fall to break a rock.

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



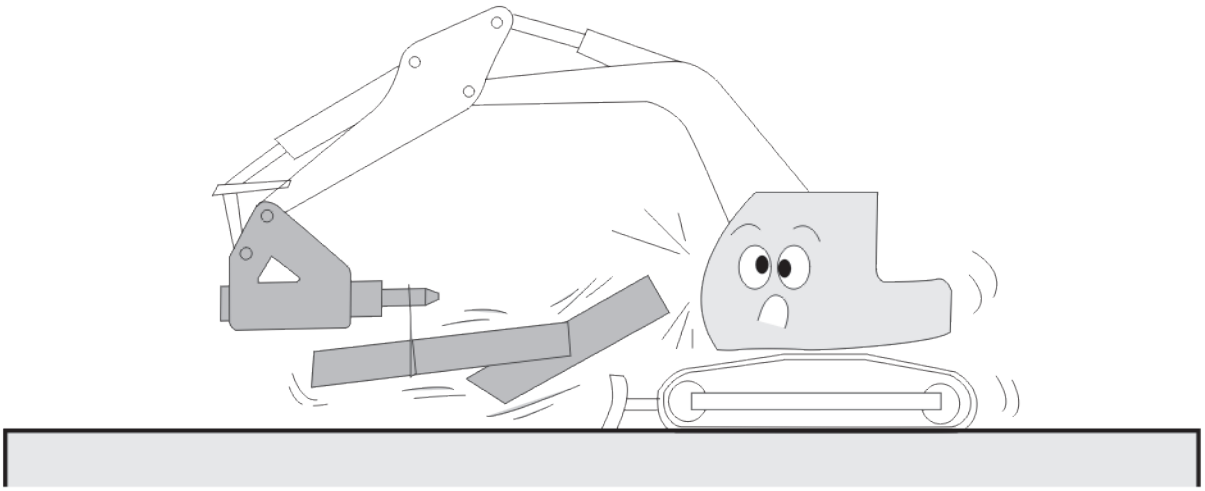
• Do not hammer with base machine cylinders moved to stroke end.

Hammering with each base machine cylinder moved to stroke end (a condition that the cylinder is fully extended or retracted will do considerable damage to the cylinder and each part of the base machine.



• Do not lift things with the breaker.

Lifting materials by hanging wire in the bracket or tool not only causes damage to the breaker but also is very dangerous when operating



• Warm up base machine engine prior to operation.

Especially in winter, the base machine engine should be warmed up for five to ten minutes 30°C~40°C (86°F~105°F) before breaker operation. Follow the Instruction Book for Base Machine for warming-up of the engine.

• Do not touch tool for breaker working

During breaker working, high temperature at tool.

• When operating the breaker you must use ear protection,

Eye protection and breathing protection.

• Accumulator type danger

Attention pressurized container! Do not open while reading the manual or consulting the authorized service personel!

• Greasing

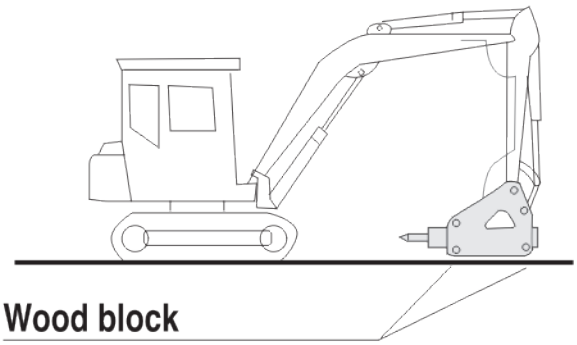
With breaker mounted on carrier, apply down pressure on tool, and fill cavity with recommended grease through the grease nipple.

• Always where eye protection when removing the stop pin.

Stop pin removed by during it in and out with a punch and hammer.

7. Removal of the Hydraulic Breaker

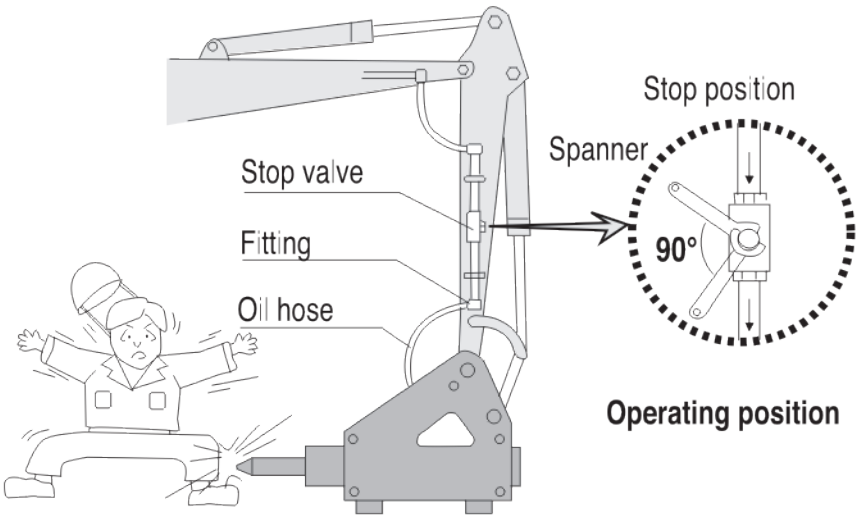
When the bucket and breaker operation are performed alternately, the bucket and breaker can be easily exchanged by the hydraulic hoses and two pins. There is however, a risk of the hydraulic circuit contamination. Accordingly, install and remove as follows.



Position of the base machine for installation and removal of the hydraulic breaker

- **Move the base machine to stable ground free from mud, dust and dirt. Stop the engine, turn off the main switch and deflate air from oil tank if it is pressurized.**

- **Turn 90° the stop valve installed to the end of arm to prevent hydraulic form**



Warning : As tool may fly out due to N_2 gas pressure, do not approach tool.

- **Loosen hose plug on the breaker arm. Collect small amount of oil flowing out at this time and put into a container.**

- **Be careful to prevent mud or dust from entering oil hoses and pipe lines.**
  Plug oil hoses with hose plug and pipe lines with union caps. Bind high-and low-pressure hoses with a wire to prevent them from getting mud.

• **To remove the breaker, pull out pins in the bucket link and arm.**
When leaving the breaker outdoor, set the breaker on wood blocks and cover with sheets.

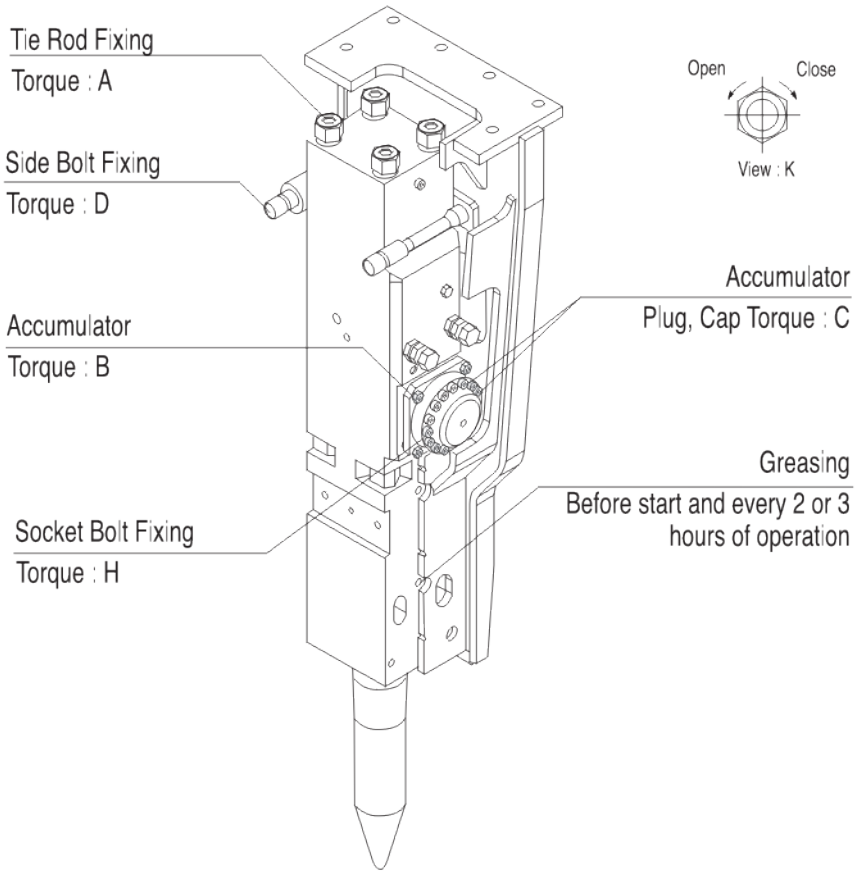
• **When leaving the breaker removed for a long period of time**
- Clean exterior of the breaker.
- Remove tool from the front head and spray with rust preventive oil.
  Bleed N_2-gas from the back head before pushing piston into cylinder.
- Apply grease to each part of the breaker and then install tool again.

• **To install the hydraulic breaker, reverse the aforementioned removal procedures.**
The bucket operation easily contaminates the end part of hoses and pipe lines. The contaminated part must be cleaned with no delay. Hydraulic oil or light oil is highly recommendable.

8. *Repair and Inspection*

1. INSPECTION POINTS

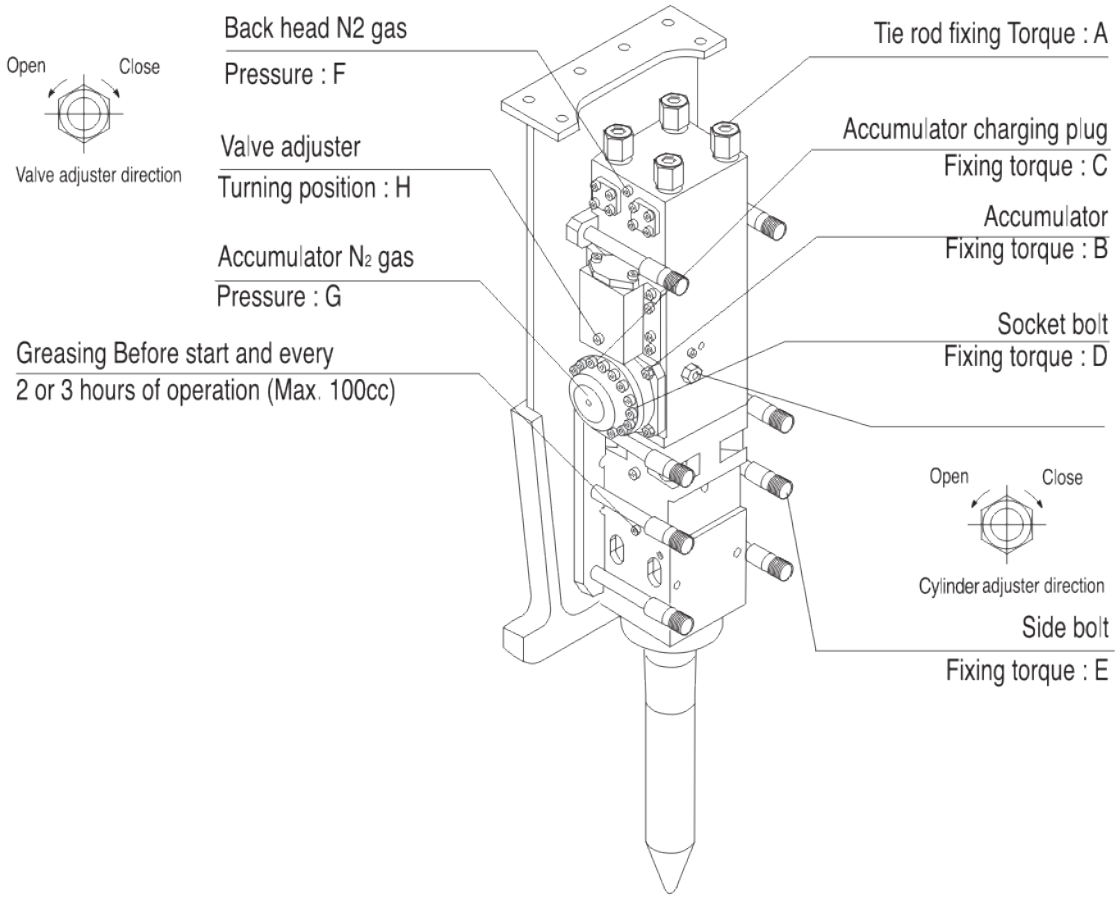
• **RB50SSG, RB100G, RB125G, RB250G, RB500GG**



RB50SSG, RB100G, RB125G, RB250G, RB500GG

	Part	Unit	RB50SSG	RB100G	RB125G	RB250G	RB500GG
Tie rod fixing torque	A	kg.m	40	40	100	100	150
		ib.ft	289	289	723	723	1084
Accumulator fixing torque	B	kg.m	-	-	-	-	-
		ib.ft	-	-	-	-	-
Accumulator plug fixing torque	C	kg.m	-	-	-	-	-
		ib.ft	-	-	-	-	-
Side bolt fixing torque	D	kg.m	80	100	145	145	145
		ib.ft	578	723	1048	1048	1048
Socket bolt fixing torque	H	kg.m	-	-	-	-	-
		ib.ft	-	-	-	-	-
Back head N_2 gas pressure (at 20℃)	-	kg.m	14	16.5	14	16.5	16.5
		ib.ft	199	235	199	231	231
Accumulator N_2 gas pressure (at 20℃)	-	kg/cm^2	-	-	-	-	-
		psi	-	-	-	-	-
Adjuster turning position (0 turning when fully closed)	-	-	-	-	-	-	-
		-	-	-	-	-	-

• RB750GG, RB1000GG, RB1300GG, RB1640GG, RB2250GG



RB750GG, RB1000GG, RB1300GG, RB1640GG, RB2250GG,

	Part	Unit	RB750GG	RB1000GG	RB1300GG	RB1640GG	RB2250GG	Inspection Interval
Tie rod fixing torque	A	kg.m	150~170	240~250	270~300	270~300	520~550	Every Week
		ib.ft	1085~1230	1735~1808	1953~2170	1953~2170	3761~3978	
Accumulator Fixing Bolt	B	kg.m	60~65	60~65	60~65	60~65	60~65	Every Week
		ib.ft	434~470	434~470	434~470	434~470	434~470	
Accumulator charging plug Fixing Torque	C	kg.m	8~12	8~12	8~12	8~12	12~15	Every Week
		ib.ft	58~87	58~87	58~87	58~87	87~108	
Socket bolt fixing torque	D	kg.m	20~25	30~40	30~40	40~45	55~60	Every Week
		ib.ft	145~180	217~180	217~180	289~325	398~434	
Side bolt fixing torque	E	kg.m	200~220	250~270	250~270	320~350	410~440	Every Week
		ib.ft	1447~1591	1808~1953	1808~1953	2315~2532	2966~3183	
Back head N_2 gas pressure (at 20℃?F)	F	kg/cm^2	6~7	6~7	6~7	8~9	8~9	Every Week
		ib.ft	85~100	85~100	85~100	114~128	114~128	
Accumulator N_2 gas pressure (at 20℃?F)	G	kg/cm^2	54~55	54~55	54~55	58~63	58~63	Every Week
		psi	768~782	768~782	768~782	825~895	825~895	
Valve adjuster turning position (0 turning when fully closed)	H	-	2.5~3.0	2.5~3.0	2.5~3.0	2.5~3.0	3.75~4.25	Every Week

• Cylinder Adjuster control methods

An adjuster which adjusts the number of blows is standard device in our breakers.
For the most effective breaking, change the number of blows depending on the working condition.

Basic function is that by changing piston stroke, number of blows can be adjusted, meanwhile keeping working pressure and flow rate of oils fixed.

The adjuster is installed on the right side of cylinder of breaker body.

To control the adjuster, rotate the adjusting screw by wrench after off nut from the head of this screw.
Rotating the screw deep down to the end makes the longest stroke and minimum number of blows, while rotating the screw upwards by “o” position makes the shortest stroke and gives the maximum blows.

After adjusting as required, please make sure the nut is in place and tighten up.
Cylinder adjuster of all breakers supplied by us has been set with “o” position (tightened completely), as recommended at all times.

• Valve adjuster control method

How to work:

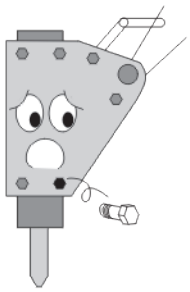
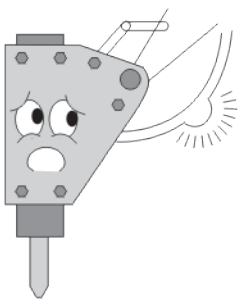
When the base machine supplies insufficient hyd. Oil to breaker, this valve adjuster can obtain the rated working pressure by reducing number of blows, and in the reverse, when excessive oil flow from base machine, the increasing number of blows by this valve adjuster can keep the rated working pressure. all breakers are being supplied with adjuster preset at 1.0 turn anti-clockwise for standard specifications.

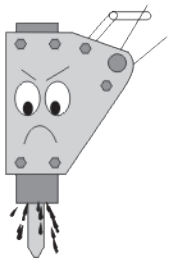
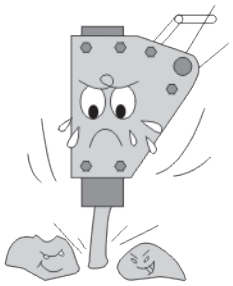
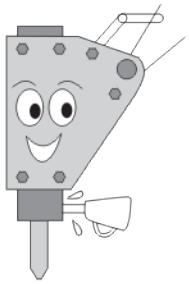
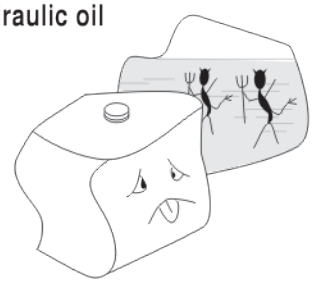
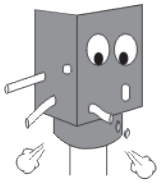
How to adjust valve adjuster :

When adjuster is tightly closed to completely block off the flow of oil, the notch of valve adjuster shall be set to face the mark “1”.
Now take this position as “0” flow-rate and start adjusting flow-rate upwards by unscrewing this valve adjuster.

2. DAILY BREAKER INSPECTION

Before starting operation, be sure to inspect the breaker refering to the following table.

Inspection Item	Inspection Point	Remedy
Loose, missing and damaged bolts and nuts 	• Tie rod • Bracket mounting bolts	• check looseness • Retighten securely.
Loose of hose fittings, visible damage to hoses and oil leakage 	• Hydraulic pipes for breaker - oil hoses	• Retighten securely. • Replace seriously damaged parts.

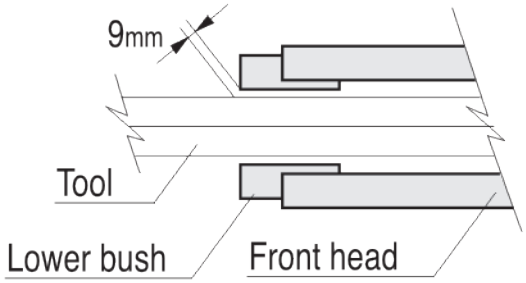
Inspection Item	Inspection Point	Remedy
Abnormal oil leakage 	• Connections of back head and cylinder • Clearance between front head & tool (*But small leakage is normal from front-head)	• Consult with ROCKBLASTER service station for further inspection.
Abnormal wear and cracks on tool 	• Tool	• Deformed, burred and wom out tool should be repaired. • Excessively worn tool needs to be replaced.
Greasing 	• Grease at start and every 2 or 3 hours using head grease pump. • Pumping;5~10 times (Greasing position and method shown at left.) • When greasing, press the tool against on the ground. (See right fig)	• Grease front head.
Level and contamination of hydraulic oil 	• Conditions of hydraulic oil	• Contamination of hydraulic oil varies with operating conditions, but oil color tells the level of contamination. • Criteria for judging contamination is specifically set by ROCKBLASTER. • When contamination is excessive, drain and flush the hydraulic oil tank and fill it with new oil.
Missing rubber plugs and snap rings 	• Rubber plugs. • Snap rings	• A seriously damaged one must be replaced.
(silince type breaker) Clearance of wear plate, guide plate, cushion etc...	Check every 3 month, if the wear-plate, guide-plate, cushions are good or not.	When worn too much or demaged, replace the parts.

3. REGUALR BREAKER INSPECTION AND MAINTENANCE

Regular inspection is essential for keeping hydraulic breaker operating in the best condition. Consult with ROCKBLASTER service station for regular inspection and maintenance. Customers are recommended to contact the service station for inspection within six months after delivery.

4. REPLACEMENT OF TOOL

Tool is deformed of burrs produced in a long-term use. When a tool tip is worn out, tool is liable to slip. Then, sharpen the tool tip. Grinding the tool tip many times to shapen the edge, will make a heat-treated hardened surface layer dissappear and tool wear out rapidly. In this case, replace with a new tool. If a gap between tool and thrust ring becomes large, piston fails to fit in tool, resulting in damage. When the gap is found to be over 9mm, replace thrust ring together with tool.

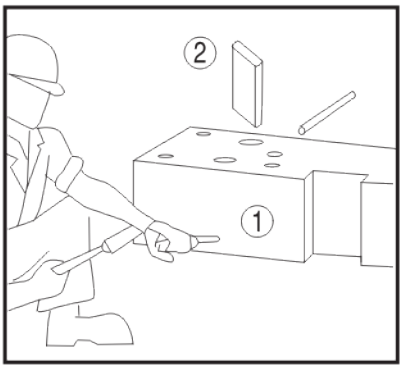


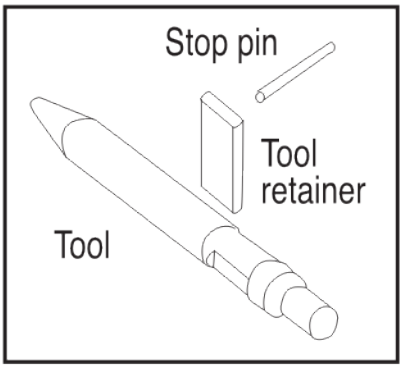
• Replacement Order

• Remove steel plug (or snap-ring) and tool pin in order with a 330mm-long steel bar. When reassembling, align groove in tool to tool pin hole and insert tool pin.

• Reverse disassembly procedures to install a replacement tool. Before installing a new tool, check each part for wear, breakage, scores, etc... Remove burrs and swellings on each tool pin, apply a coat of grease to the movable areas of the tool pin and tool and finally install tool. Excessively deformed tool pins will make difficult replacement of tool. Therefore, tool retainers are required to be checked every 100 to 150 hours of operation.

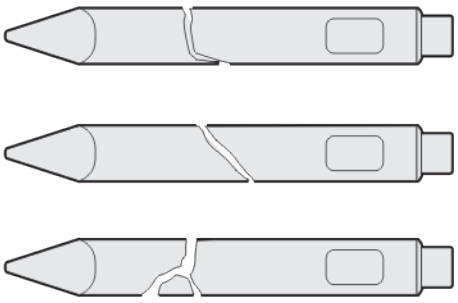
* If replacement tool is not a genuine part, we do NOT WARRANTY the performance of other parts of the breaker.



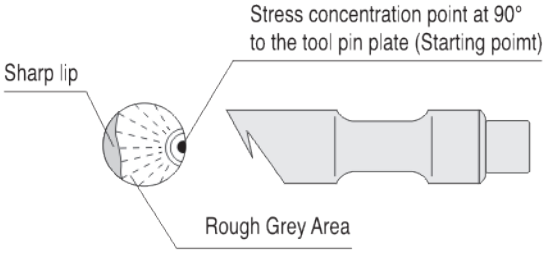


5. BREAKAGE OF TOOL

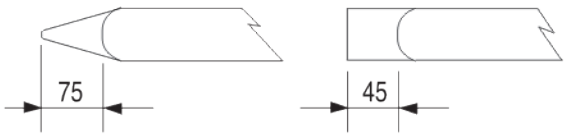
The service life of various tool depends on the manner of handling them. The tool can sufficiently withstand the vertically acting load, but is weak to the perpendicularly acting load, Especially, the tool is affected by the negative conditions such as force by craning operation, tilted blowing, wrenching, idle strokes, etc. its service life becomes shorter. There are several ways of breaking a tool. Each cause of breakage can be infered by observing the broken sections. Further, the breakage case which is not caused by low-quality materials or insufficient heat-treatment but by wrong way of handling, the manufacturer is not responsible for the breakage. (See below figure) The breakage section has the origin on the outer surface, a narrow area of fatigue breakage and a wide area of rough grey area, and final breakage part has the share-lip form. Such an undualation on the breakage section and its inclination to the right and left witness that the breakage is caused by excessive force which exceeds the toughness of the tool. Such a breakage is supposed to occur owing to careless handling of the tool. To avoid such a breakage, more care and attention are required in handling the breaker.



Typical fractures caused by excessive bending of the tool. Warranty claims rejected.



Typical fractures caused by levering tool while buried in the burden. Warranty claims rejected.



Flat type tool worn more than 45mm or moil type and wedge, universal type tools worn back more than 75mm of working end classed as reasonable life. Warranty claims rejected.

6. DISASSEMBLEY AND ASSEMBLY OF BREAKER

Since breaker body is manufactured by state-of the art processing techniques and consists of high-quality hydraulic parts, it is dangerous to disassemble breaker at a workshop. Contact our service station when disassembly is called for, otherwise quality and performance of the breaker cannot be guaranteed.

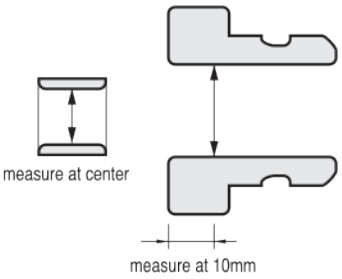
9. Wear Tolerances

1. RB50SSG, RB100G, RB125G, RB250G, RB500GG

• Lower Bush

Unit : mm(inch)

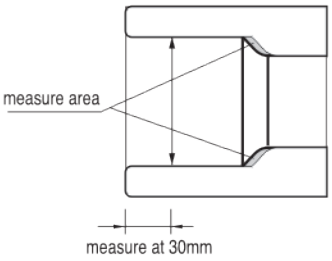
Model	Inside diameter A as new part	Inside diameter at reject limit
RB50SSG	53 (2.09)	55 (2.17)
RB100G	70 (2.76)	72 (2.83)
RB125G	80 (3.15)	84 (3.31)
RB250G	85 (3.35)	89 (3.50)
RB500GG	100 (3.94)	105 (4.13)



• Upper Bush

Unit : mm(inch)

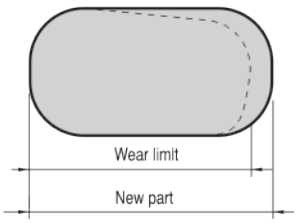
Model	Inside diameter A as new part	Inside diameter at reject limit
RB50SSG	53 (2.09)	55 (2.17)
RB100G	70 (2.76)	72 (2.83)
RB125G	80 (3.15)	84 (3.31)
RB250G	85 (3.35)	89 (3.50)
RB500GG	100 (3.94)	105 (4.13)



• Tool Retainer

Unit : mm(inch)

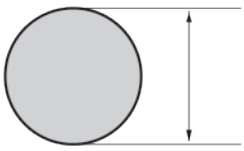
Model	Outside diameter or length as new part	Outside diameter or length at reject limit
RB50SSG	24 (0.95)	22 (0.87)
RB100G	30 (1.18)	28 (1.10)
RB125G	35 (1.38)	33 (1.30)
RB250G	54 (2.13)	51 (2.01)
RB500GG	60 (2.36)	57 (2.24)



• Stop Pin

Unit : mm(inch)

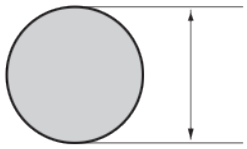
Model	Outside diameter or length as new part	Outside diameter or length at reject limit
RB50SSG	10 (0.39)	8 (0.31)
RB100G	16 (0.63)	14 (0.55)
RB125G	16 (0.63)	14 (0.55)
RB250G	17.5 (0.69)	15.5 (0.61)
RB500GG	17.5 (0.69)	15.5 (0.61)



• Lower Bush Pin

Unit : mm(inch)

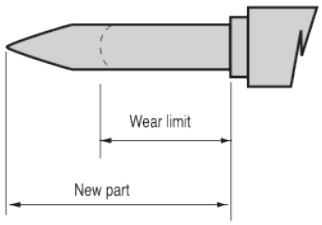
Model	Outside diameter or length as new part	Outside diameter or length at reject limit
RB50SSG	13 (0.51)	11 (0.43)
RB100G	16 (0.63)	14 (0.55)
RB125G	16 (0.63)	14 (0.55)
RB250G	20 (0.79)	18 (0.71)
RB500GG	26 (1.02)	24 (0.95)



• Tool

Unit : mm(inch)

Model	Depth as new part	Depth at reject limit
RB50SSG	365 (14.37)	250 (9.84)
RB100G	422 (16.61)	282 (11.10)
RB125G	474 (18.66)	324 (12.76)
RB250G	474 (18.66)	324 (12.76)
RB500GG	616 (24.25)	361 (14.21)

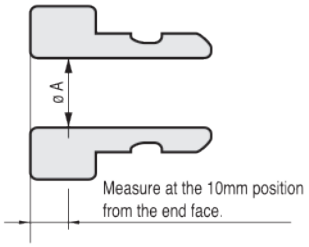


2. RB750GG, RB1000GG, RB1300GG, RB1640GG, RB2250GG

• Lower Bush

Unit : mm(inch)

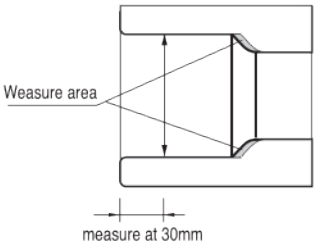
Model	Inside diam. A as a new part	Inside diam. at reject limit
RB750GG	120 (4.72)	126 (4.96)
RB1000GG	135 (5.31)	141 (5.55)
RB1300GG	150 (5.91)	158 (6.22)
RB1640GG	160 (6.30)	168 (6.61)
RB2250GG	180 (7.09)	188 (7.40)



• Upper Bush

Unit : mm(inch)

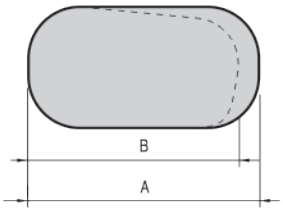
Model	Inside diam. A as a new part	Inside diam. at reject limit
RB750GG	120 (4.72)	126 (4.96)
RB1000GG	135 (5.31)	141 (5.55)
RB1300GG	150 (5.91)	158 (6.22)
RB1640GG	160 (6.30)	170 (6.69)
RB2250GG	180 (7.09)	190 (7.48)



• Tool Retainer

Unit : mm(inch)

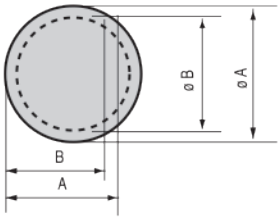
Model	Size A as a new part	Size B at reject limit
RB750GG	70 (2.76)	67 (2.64)
RB1000GG	80 (3.15)	77 (3.03)
RB1300GG	90 (3.54)	86 (3.39)
RB1640GG	100 (3.94)	96 (3.78)
RB2250GG	120 (4.72)	116 (4.57)



• Stop Pin

Unit : mm(inch)

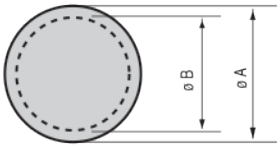
Model	Outside diam. A as a new part	Outside diam. B at reject limit
RB750GG	17.5 (0.69)	15.5 (0.61)
RB1000GG	20 (0.79)	18 (0.71)
RB1300GG	20 (0.79)	18 (0.71)
RB1500G	20 (0.79)	18 (0.71)
RB1640GG	25 (0.98)	23 (0.91)
RB2250GG	26 (1.02)	24 (0.94)



• Lower Bush Pin

Unit : mm(inch)

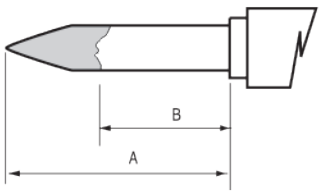
Model	Outside diam. A as a new part	Outside diam. B at reject limit
RB750GG	26 (1.02)	24 (0.94)
RB1000GG	30 (1.18)	28 (1.10)
RB1300GG	30 (1.18)	28 (1.10)
RB1500G	30 (1.18)	28 (1.10)
RB1640GG	36 (1.42)	34 (1.34)
RB2250GG	36 (1.42)	34 (1.34)



• Tool

Unit : mm(inch)

Model	Effective length A as a new part	Usable length B at reject limit
RB750GG	700 (27.56)	380 (14.96)
RB1000GG	765 (30.12)	450 (17.72)
RB1300GG	780 (30.71)	460 (18.11)
RB1640GG	825 (32.48)	480 (18.90)
RB2250GG	914 (35.98)	485 (19.09)



10. Trouble shooting guide

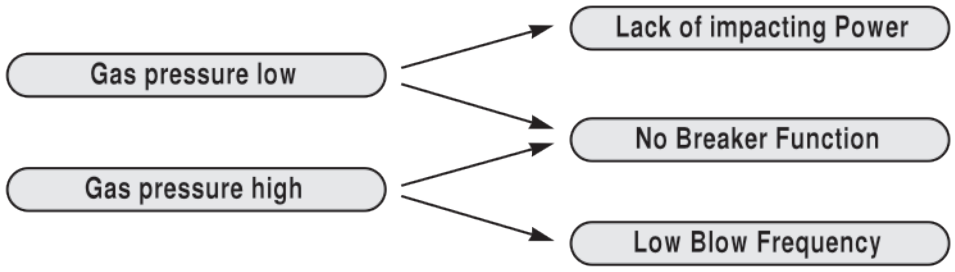
1. PROBLEMS IN OPERATION

If the breaker does not work or blow frequency and blow power get worse, check following trouble shooting. And then inspect according to the following order.

Symptom	Cause	Required action
No blow out	1. Excessive back head gas pressure 2. Stop valve(s) closed 3. Lack of hydraulic oil 4. Wrong adjustment of pressure reducing valve 5. Faulty hydraulic hose connection 6. Oil back head infection	1. Re-adjust nitrogen gas pressure 2. Open stop valve 3. Fill hydraulic oil 4. Re-adjustment valve 5. Tighten or replace 6. Replace back head o-ring, or cylinder bush step seal
Low impact power	1. Line leakage or blockage 2. Clogged tank return line filter 3. Lack of hydraulic oil 4. Hydraulic oil contamination, or heat deterioration 5. Poor main pump performance 6. Back head nitrogen gas low 7. Low flow rate by mis-adjustment of flow control pressure reduction valve 8. Chisel out of range for blowing position	1. Check lines 2. Wash filter, or replace 3. Fill hydraulic oil 4. Replace hydraulic oil, rinse tank and replace hydraulic oil inside lines 5. Call an authorized service man 6. Refill nitrogen gas 7. Re-adjust reduction valve 8. Rush down chisel by excavator operation
Irregular impact	1. Low accumulator gas pressure, of bad accumulator 2. Bad piston or valve sliding surface 3. Piston moves down/up to blank blow hammer chamber	1. Refill nitrogen gas 2. Call an authorized service man. 3. Rush down tool by excavator operation
Bad tool movement	1. Tool diameter incorrect 2. Tool and pin jammed from tool retainer pin wear 3. Jammed lower bush and tool 4. Deformed tool and piston contact area	1. Replace tool with genuine replacement parts 2. Smoothen rough surface of tool 3. Smoothen rough surface of lower bush interior 4. Replace tool
Sudden reduction 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 leakage between front head and tool	1. Cylinder seal worn	1. Replace seal
Gas leakage	1. O-ring damage in related parts	1. Replace relevant o-ring

RELATION OF GAS PRESSURE, IMPACT ENERGY AND FREQUENCY

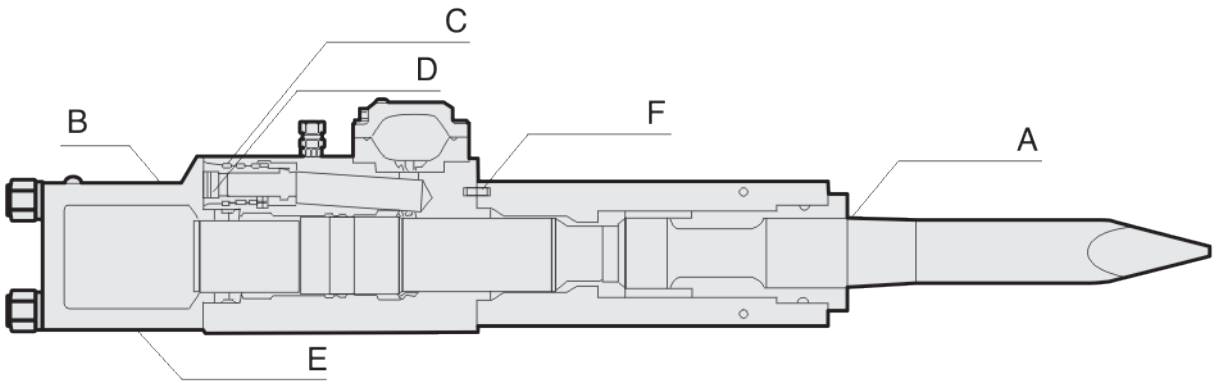


2. GAS LEAKAGE

Trouble	Cause	Remedy
Gas leakage from the top of charging valve	• Defective o-ring in charging valve • Defective or damage in charging valve	• Replace • Repair or replace charging valve
Gas leakage between charging valve and back head	• Defective o-ring in charging valve • Charging valve loose in back head	• Replace • Re-tighten
Gas leakage between cylinder and back head	• Defective o-ring in back head	• Replace
Gas leakage from drain plug hole	• Defective gas seal in seal retainer • Defective step seal in seal retainer • Seizing of piston and seal retainer	• Replace • Replace • Repair or replace seal retainer and piston.(When repaired replace packing)

3. OIL LEAKAGE

Even if oil is leaking, there is no use to replacing parts at all times. Check the following points listed in the chart below. 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 valve after overhaul	NORMAL : During assembly from lubrication oil & anti-rust oil applied
D	Between main valve & surface of cylinder	• Oil leakage from reassembly of breaker 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

11. Warranty Policy

1. Warranty

ROCKBLASTER provides Distrbutor who purchases hydraulic Breaker or parts "**PRODUCTS**" from ROCKBLASTER with the following warranty.

The Terms of Warranty

The Warranty provided by ROCKBLASTER hereunder shall extend either for a period of a **12 months** from the date of shipment to Distributors, as determined by the date of Bill of Lading or for a period of **6 months** from the date of sale by Distributor to the Buyer, as determined by the date of Distributor's invoice for the products to the Buyer, whichever comes first. Distributor shall advise ROCKBLASTER of the date of sale of the products to the Buyer either by facsimile or mail not later than 15 days after the date of sale.

Warranty will be applied to the Original purchaser only.

The Contents of Warranty

All delivered products will be cheched for defects, damages or missing parts to assure performance upon arrival. The distributor has in form ROCKBLASTER with a written claim on any missing or damaged part within two weeks, 14 days, after receipt of products.
Damage occurred by transportation shall be claimed by the receiver directly to the transportation company. The damages shall be recorded on the shipping documents and the claim has to be made immediately. ROCKBLASTER will not warrant any damage that is occurred by incorrect of careless handling, excessive stress, normal wear and tear or similar cases not due to faults of ROCKBLASTER. The distributor or Buyer must submit Service Report presented separately or attached in manual to ROCKBLASTER within 15 days when any failure shall occur. If not, ROCKBLASTER will not take the responsibility on claim. Any defects found in workmanship and faulty material will be repaired by Distributor and ROCKBLASTER will reimburse to Distributor as follows:
- Spares on ROCKBLASTER account.
-Airfreight up to 20kgs on ROCKBLASTER
-Customs clearance fee, labor charge, trucking charge to end-user and other all chages on Distributor account.
The distributor will keep the damaged products for inspection and analysis by a ROCKBLASTER engineer Reimbursement will be carried out within 30 days after ROCKBLASTER's decision if any written claim report with photos is applied to warranty or not. ROCKBLASTER will make its best efforts to settle any claim made by Distributor in a shortest time.

The exception of warranty

This warranty shall not apply in the following circumstances, even if within the above warranty period.

1. If a report detailing the specific alleged defect and/or damage, as well as the actual conditions under which the products were used and satisfactory proof thereof, including photographs, were not sent to ROCKBLASTER within 2 months from the date of such alleged or damage is discovered.

2. If the distributor does not, promptly after ROCKBLASTER so requests, furnish to any reasonable information available to the distributor and necessary for ROCKBLASTER to analysis the warranty claim.

3. If the allegedly damaged and/or defective product is lost or not provided to ROCKBLASTER at distributor's site for inspection within one year of reported damage.

4. If the product involved was used in conjunction with parts other than genuine ROCKBLASTER brand parts.

5. If the subject product was altered or modified by the distributor, the buyer or any user of the products without the express written consent of installation.

6. If the defect complained of in such products is caused solely or partly by improper use, repair, improvement, maintenance, storage or installation.

7. If the defect is caused by an act of god, or in full/part by the negligence or intentional act of the distributor, the buyer or any user of the products or any other person.

8. This warranty does not apply to any tools served with the products, reserve parts and following wearing parts.:
   Chisel, chisel pin set, seal kit, accumulator bladder, front head, bushing, etc.., and normal wear recognized generally.

2. Delivery Report

This report is for checking that breaker is correctly delivered and equipped on machine. Distributor should correctly draw up this because this will be a major data when warranty claim arise in the future.
This report must be drawn up in typewritten and informed within 7 days after the date when delivered breaker to customer, and also ROCKBLASTER by registered air mail within 30days after the date, otherwise warranty claims shall not be carried out accordingly.

1) Machine
- ? Maker/Model : Manufacturer and model name of the carrier
- ? Operating Weight
- ? Operating Hours : Actual operating hours at time or Date delivered out breaker
- ? Oil filter - If there is it mark “Y”, if not mark “N”
  If there is not it or it’s condition is bad, breaker should be troubled easily.
  Therefore lease recommend customer to install it in or change new one.
- ? Others : Performance or Condition of Engine and Hydraulic pump

2) Breaker
- ? Model&Serial No. : Model name and Serial No. of the breaker
- ? Operating Pressure : Actural operating pressure
- ? Relief set Pressure : Actual relief valve setting pressure for breaker
- ? Operating Oil Flow : Actual required operating flow
- ? Gas Pressure : Actual pressure in accumulator or gas chamber

3) Warranty Period
- ? Warranty Start : Date delivered the breaker
- ? Expired date : Date to be six months from the date delivered to customer

DELIVERY REPORT

REF. NO: _____

DISTRIBUTOR: _____
NAME

_____ _____
CITY PROVINCE/STATE

CUSTOMER: _____
NAME

_____ _____
CITY PROVINCE/STATE

MACHINE:

Maker/Model: _____

Operating Weight: _____ Ton

BREAKER:

Model: _____ S/No: _____

Oil Pressure: _____ Bar or PSI

OIL Flow: _____ L/Min or G/min

WARRANTY START _____ EXPIRY DATE _____

I hereby acknowledge that the subject was delivered in satisfactory condition and operates properly, and that I receive operation manual and instruction as to it's proper operation, preventive maintenance, and that all aspect of the standard warranty have been fully explained to me.

SIGNATURE _____ _____
CUSTOMER TITLE

DELIVERED BY _____ _____
DISTRIBUTOR'S SERVICE MANAGER DATE

ROCKBLASTER

3. Service Report

This report can be used as Warranty Claim Report.
1) Ref. No.: Your work order No.

2) Date of Service : Date service done or failure date of the breaker.

3) Base Carrier
- ? Marker : Manufacture of the base machine.
- ? Model : Model No. of the base machine.
- ? Operating House : Actual or Estimated operating hours at time of failure.
- ? When writing actual operating hours : A xxx Hrs
- ? When writing estimated operating hours : E xxx Hrs
- ? Remarks : Conditions of engine and hydraulic pump of the base carrier.

4) Base Carrier
- ? Model & Serial No. : Name of model and Serial No. of the breaker.
- ? Gas Pressure : Actual gas pressure in accumultor or Gas chamber.
- ? Bracket Type : Top(Vertical) or side (Horizontal)
- ? Operating Hours : Actual or Estimated operating hour.
- ? Delivered Date : Date the breaker was delivered.
- ? The date must correspond to that on delivery report.

5) Condition of Breaker
- ? Cil Flow : Actual operating oil flow.
- ? Relief Set pressure : Actual relief valve setting pressure for breaker.
- ? Blow per Minute : Hammering speed per minute.

6) Warranty claim parts, troubled parts requested by you or customer for warranty service.
- ? No.: Sequence No. for the parts.
- ? Part Name:
- ? Part No.; Particular No. of each part.
- ? Q'TY : Quantity of parts requested.

7) Evidence
- ? Detail Report : If it is attached, mark '0'
- ? Distributor or dealer has to describe further cause of trouble, condition of job site, condition of breaker like status of each bolt, grease injection, etc., if customer use breaker correctly in accordance to the operating manual, as well as customer complaints etc.
- ? Photo : Photos showing trouble portion of the units or parts. If it is attached, mark '0'

8) Parts Returned : If you returned troubled parts, mark '0'

9)Treatment : If you complete out service, mark'0'
- ? Replace part : Inform ROCKBLASTER list of parts replaced, by fax or mail with this report.

10) Inspector's Comment : Inspector's comment on the trouble of breaker or service you have done.

11) Customer's Comment : Customer's comment on cause of the trouble or service done by inspector

SERVICE REPORT

REF. NO.: _____

DATE OF SERVICE: _____

BASE MACHINE	MAKER:	MODEL:
	OPERATING HOURS:	REMARKS:

BREAKER	MAKER:	SERIAL NO.:
	OPERATING HOURS: Hrs	DELIVERY DATE:

CONDITION OF BREAKER	OIL PRESSURE	Hrs	N2 GAS PRESSURE	ACCUMULATOR	BAR
	OIL FLOW	Hrs		BACK HEAD	BAR

NO.	PART NAME	PART NO.	Q'TY	
				□ EVIDENCE ? DETAILED REPORT ( ) ? PHOTOS ( ) □ PARTS RETURNED □ TREATMENT ? REPLACE PARTS

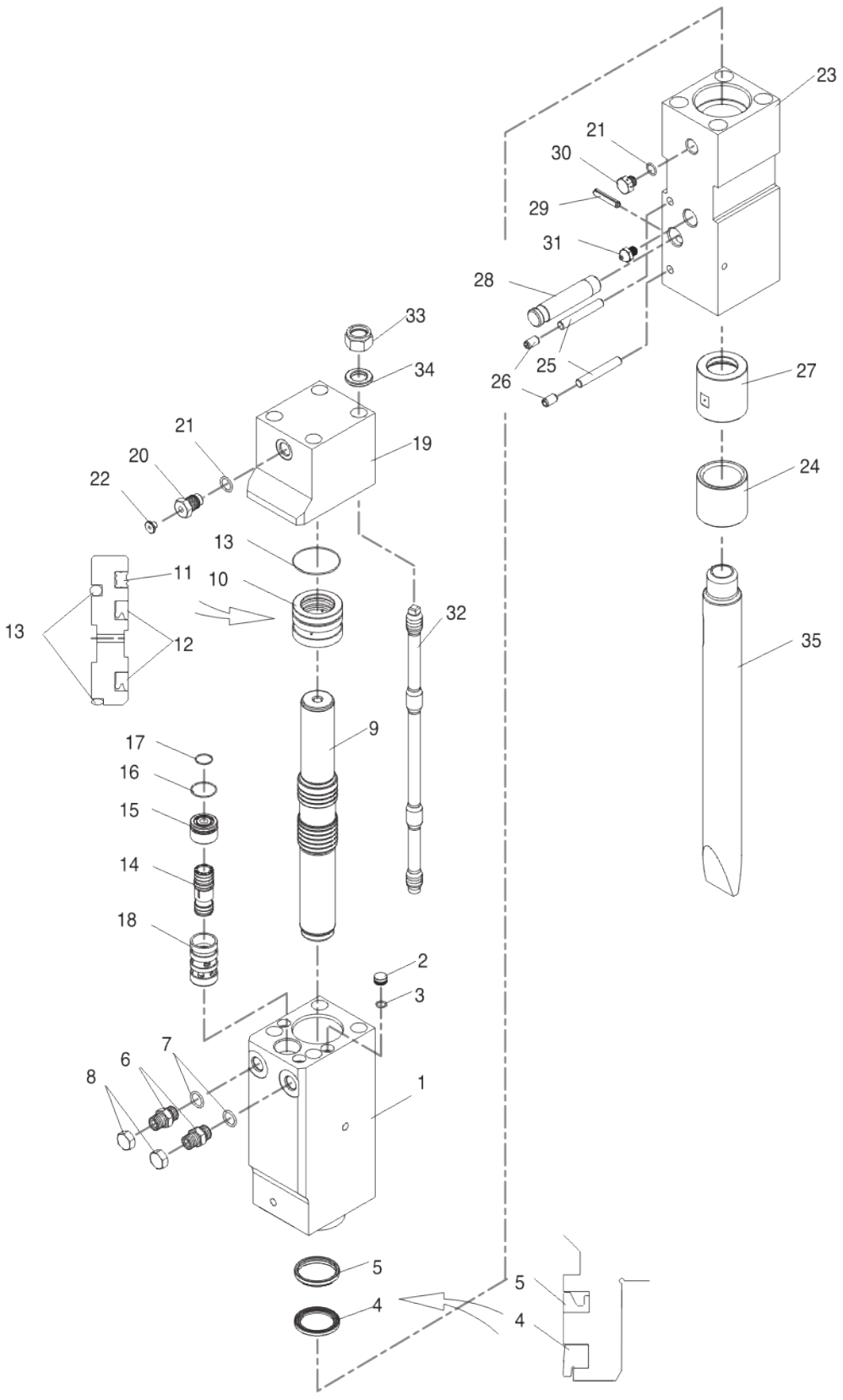
INSPECTOR'S COMMENT	CUSTOMER'S COMMENT
CUSTOMER: LOCATION OF EQUIPMENT _____ signature of customer	DISTRIBUTOR CODE: _____ signature of distributor;s inspector

ROCKBLASTER

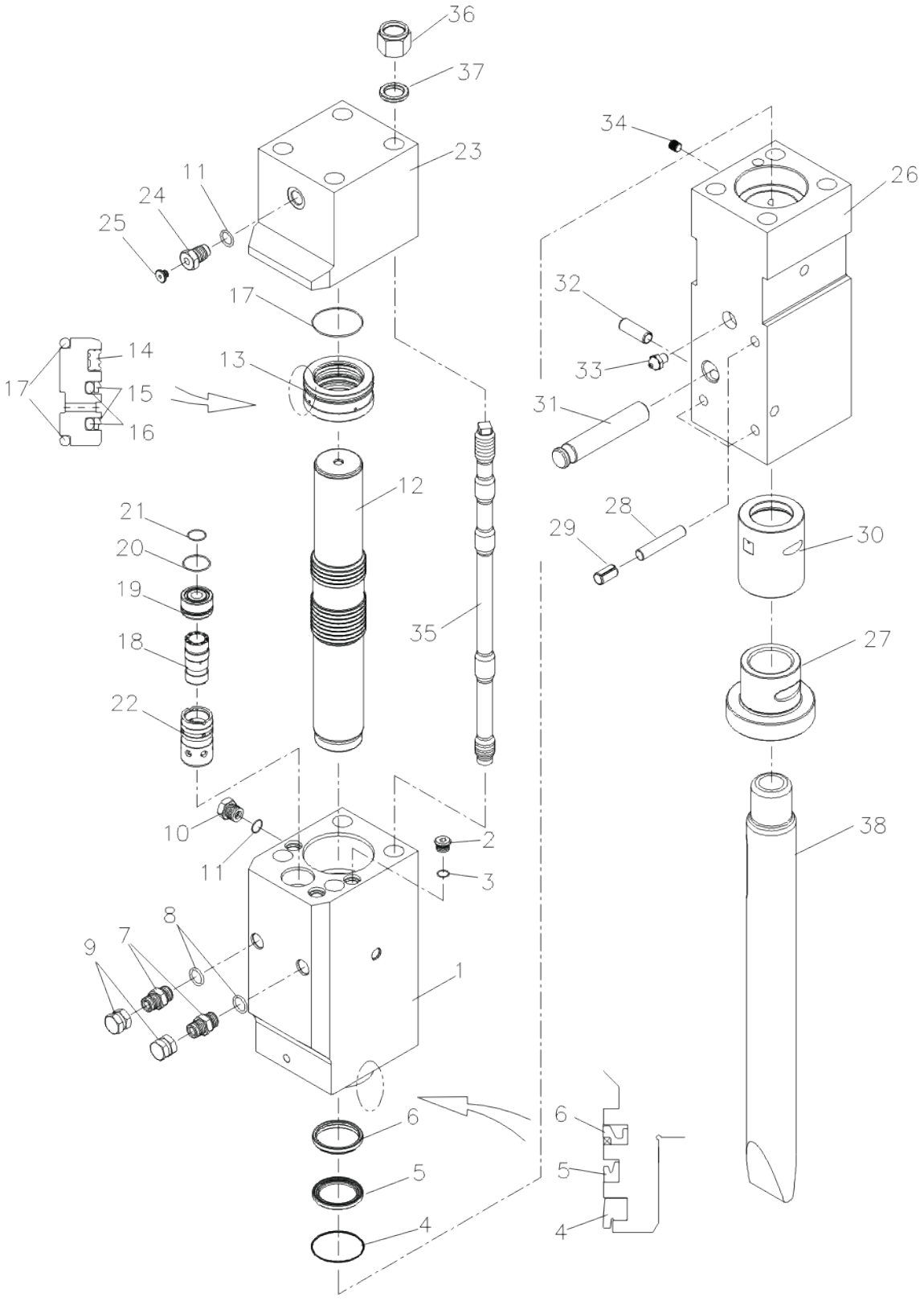
Part List

ROCKBLASTER BREAKER

RB 50SSG POWER CELL



RB 100G POWER CELL



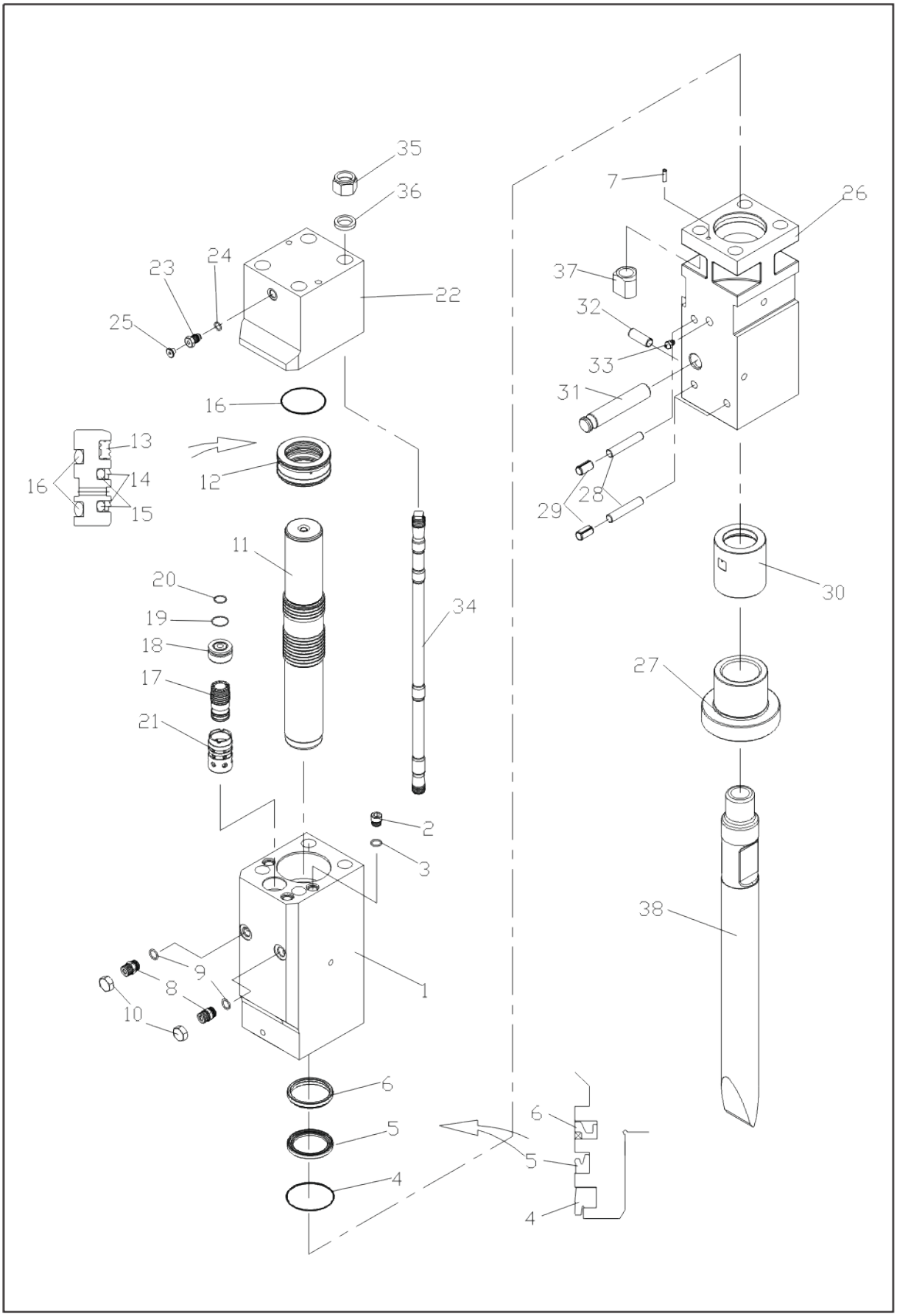
RB 50SSG PART LIST

NO	PART NO.	PART NAME	Q'TY
	35M1100	CYLINDER ASS'Y	
1	35M1101	CYLINDER	1
2	35M1102	TEFLON PLUG	3
3	25F1102-1	O-RING	3
4	35M1104	DUST SEAL	1
5	35M1105	U-PACKING	1
6	35M1108	MALE ADAPTER	2
7	50M1108-1	O-RING	2
8	35M1109	UNION CAP	2
9	35M1201	PISTON	1
	35M1300	SEAL RETAINER ASS'Y	
10	35M1301	SEAL RETAINER	1
11	35M1302	GAS SEAL	1
12	35M1303	U-PAKING	2
13	30M1503-1	O-RING	3
14	35M1502	VALVE	1
15	35M1503	VALVE PLUG	1
16	35M1503-1	O-RING	1
17	18F1501-3	O-RING	1
18	35M1504	VALVE SLEEVE	1
	35M1600	BACK HEAD ASS'Y	
19	35M1601	BACK HEAD	1
20	25F1602	BACK HEAD CHARGING VALVE	1
21	25F1602-1	O-RING	2
22	25F1602-2	CHARGING VALVE PLUG	1
	35M1700	FRONT HEAD ASS'Y	
23	35M1701	FRONT HEAD	1
24	35M1702	LOWER BUSH	1
25	35M1703	BUSH PIN	2
26	35M1705	SPRING PIN(S)	2
27	35M1706	UPPER BUSH	1
28	35M1707	TOOL RETAINER	1
29	35M1708	SPRING PIN(L)	1
30	35M1110	AIR CHECK VALVE	1
31	25F1710	GREASE NIPPLE	1
	35M1800	TIE ROD ASS'Y	
32	35M1801	TIE ROD	4
33	35M1802	HEX NUT	4
34	35M1803	WASHER	4
35	35M1901	TOOL	1

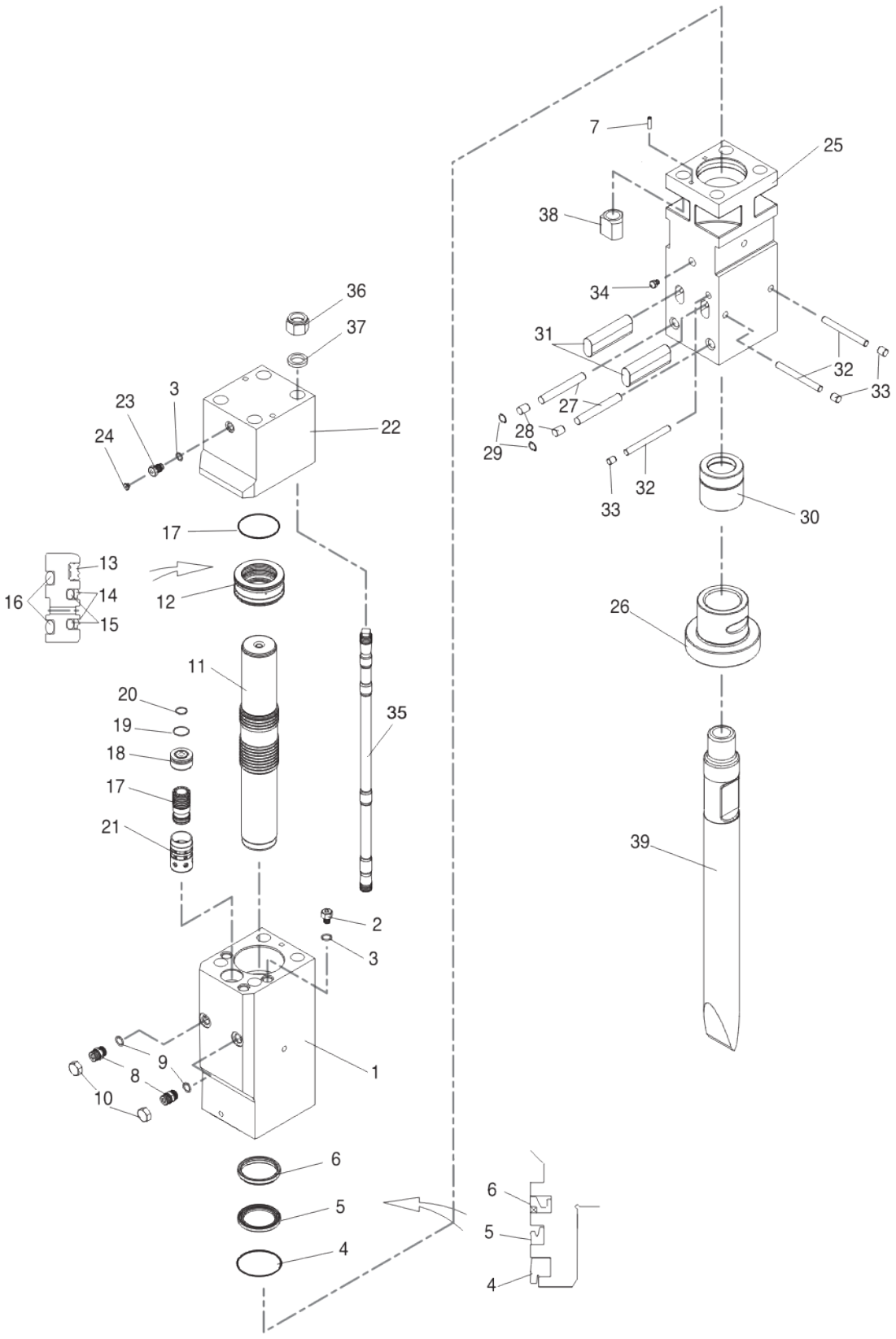
RB 100G PART LIST

NO	PART NO.	PART NAME	Q'TY
	50M1100	CYLINDER ASS''Y	
1	50M1101-01	CYLINDER	1
2	50M1102	SOCKET PLUG	3
3	50M1102-1	O-RING	3
4	50M1104	DUST SEAL	1
5	50M1105	U-PACKING	1
6	50M1106	BUFFER SEAL	1
7	50M1108	MALE ADAPTER	
8	50M1108-1	O-RING	2
9	50M1109	UNION CAP	2
10	25M1110	AIR CHECK VALVE	1
11	25F1602-1	O-RING	2
12	50M1201	PISTON	1
	50M1300	SEAL RETAINER ASS''Y	
13	50M1301	SEAL RETAINER	1
14	50M1302	GAS SEAL	1
15	50M1303	STEP SEAL	2
16	50M1303-1	O-RING	2
17	50M1304	O-RING	3
18	50M1502	VALVE	1
19	50M1503	VALVE PLUG	1
20	25F1501-4	O-RING	1
21	25F1501-3	O-RING	1
22	50M1504	VALVE SLEEVE	1
	50M1600	BACK HEAD ASS''Y	
23	50M1601	BACK HEAD	1
24	25F1602	BACK HEAD CHARGING VALVE	1
25	25F1602-2	CHARGING VALVE PLUG	1
	50M1700	FRONT HEAD ASS''Y	
26	50M1701-01	FRONT HEAD	1
27	50M1702	LOWER BUSH	1
28	50M1703	BUSH PIN	3
29	50M1705	SPRING PIN(S)	3
30	50N1706-01	UPPER BUSH	1
31	50M1707	TOOL RETAINER	1
32	50M1708	SPRING PIN(L)	1
33	25F1710	GREASE NIPPLE	1
34	25F1507	HOLLOW PLUG	1
	50M1800	TIE ROD ASS''Y	
35	50M1801	TIE ROD	4
36	50M1802	HEX NUT	4
37	50M1803	WASHER	4
38	50M1901	TOOL	1

RB 125G POWER CELL



RB 250G POWER CELL



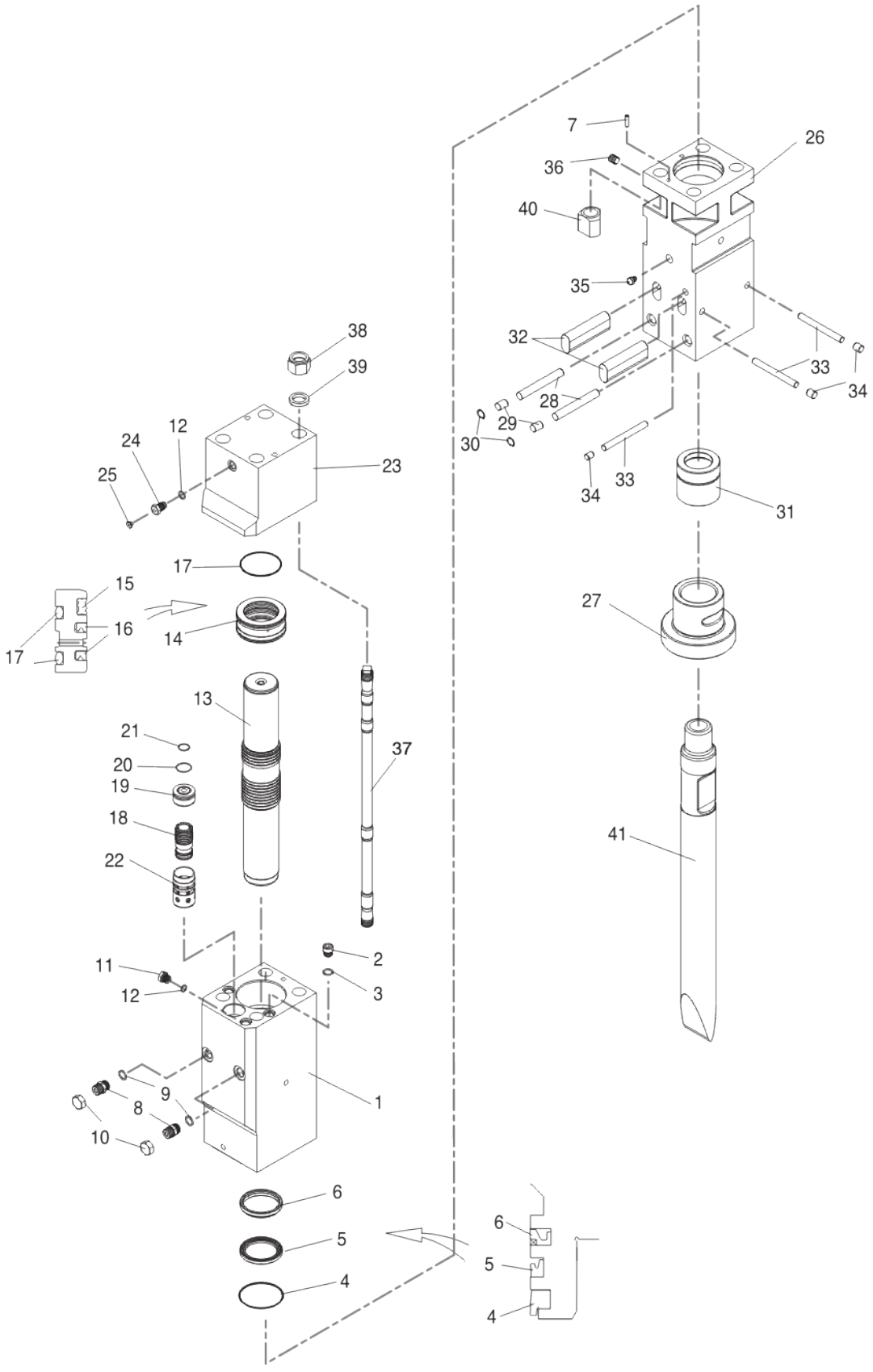
RB 125G PART LIST

NO	PART NO.	PART NAME	Q'TY
	80M1100	CYLINDER ASS'Y	
1	80M1101	CYLINDER	1
2	80M1102	SOCKET PLUG	3
3	80M1102-1	O-RING	4
4	80M1104	DUST SEAL	1
5	80M1105	U-PACKING	1
6	80M1106	DUFFER SEAL	1
7	25F1107	DOWEL PIN	1
8	80M1108	MALE ADAPTER	2
9	30M1108-2	O-RING	2
10	80M1109	UNION CAP	2
11	80M1201	PISTON	1
	80M1300	SEAL RETAINER ASS'Y	
12	80M1301	SEAL RETAINER	1
13	80M1302	GAS SEAL	1
14	80M1303	STEP SEAL	2
15	80M1303-1	O-RING	2
16	80M1304	O-RING	3
17	80M1502	VALVE	1
18	80M1503	VALVE PLUG	1
19	25M1503-2	O-RING	1
20	25F1501-3	O-RING	1
21	80M1504	VALVE SLEEVE	1
	80M1600	BACK HEAD ASS'Y	
22	80M1601	BACK HEAD	1
23	25F1602	BACK HEAD CHARGING VALVE	1
24	25F1601-2	O-RING	1
25	25F1602-2	CHARGING VALVE PLUG	1
	80M1700	FRONT HEAD ASS'Y	
26	80M1701-01	FRONT HEAD	1
27	80M1702-01	LOWER BUSH	1
28	80M1703	BUSH PIN	3
29	80M1705	SPRING PIN(S)	3
30	80M1706-01	UPPER BUSH	1
31	80M1707	TOOL RETAINER	1
32	50M1708	SPRING PIN(L)	1
33	25F1710	GREASE NIPPLE	1
	80M1800	TIE ROD ASS'Y	
34	80M1801	TIE ROD	4
35	80M1802	HEX NUT	4
36	80M1803	WASHER	4
37	80M1804	ROUND NUT	4
38	80M1901	TOOL	1

RB 250G PART LIST

NO	PART NO.	PART NAME	Q'TY
	10M1100	CYLINDER ASS'Y	
1	10M1101	CYLINDER	1
2	10M1102	SOCKET PLUG	3
3	25F1602-1	O-RING	5
4	10M1104	DUST SEAL	1
5	10M1105	U-PACKING	1
6	10M1106	BUFFER SEAL	1
7	25F1107	DOWEL PIN	1
8	10M1108	MALE ADAPTER	2
9	30M1108-2	O-RING	2
10	10M1109	UNION CAP	2
11	10M1201	PISTON	1
	10M1300	SEAL RETAINER ASS'Y	
12	10M1301	SEAL RETAINER	1
13	10M1302	GAS SEAL	1
14	10M1303	STEP SEAL	2
15	10M1303-1	O-RING	2
16	10M1304	O-RING	3
17	10M1502	VALVE	1
18	10M1503	VALVE PLUG	1
19	25F1501-1	O-RING	1
20	25F1501-3	O-RING	1
21	10M1504	VALVE SLEEVE	1
	10M1600	BACK HEAD ASS'Y	
22	10M1601	BACK HEAD	1
23	25F1602	BACK HEAD CHARGING VALVE	1
24	25F1602-2	CHARGING VALVE PLUG	1
	10M1700	FRONT HEAD ASS'Y	
25	10M1701	FRONT HEAD	1
26	10M1702	LOWER BUSH	1
27	10M1703	LOWER BUSH PIN	2
28	25F1709	RUBBER PLUG (L)	2
29	10M1705	SNAP RING	2
30	10M1706	UPPER BUSH	1
31	10M1707	TOOL RETAINER	2
32	10M1708	STOP PIN	3
33	10M1709	RUBBER PLUG (S)	3
34	25F1710	GREASE NIPPLE	1
	10M1800	TIE ROD ASS'Y	
35	10M1801	TIE ROD	4
36	10M1802	HEX NUT	4
37	10M1803	WASHER	4
38	10M1804	ROUND NUT	4
39	10M1901	TOOL	1

RB 500GG POWER CELL



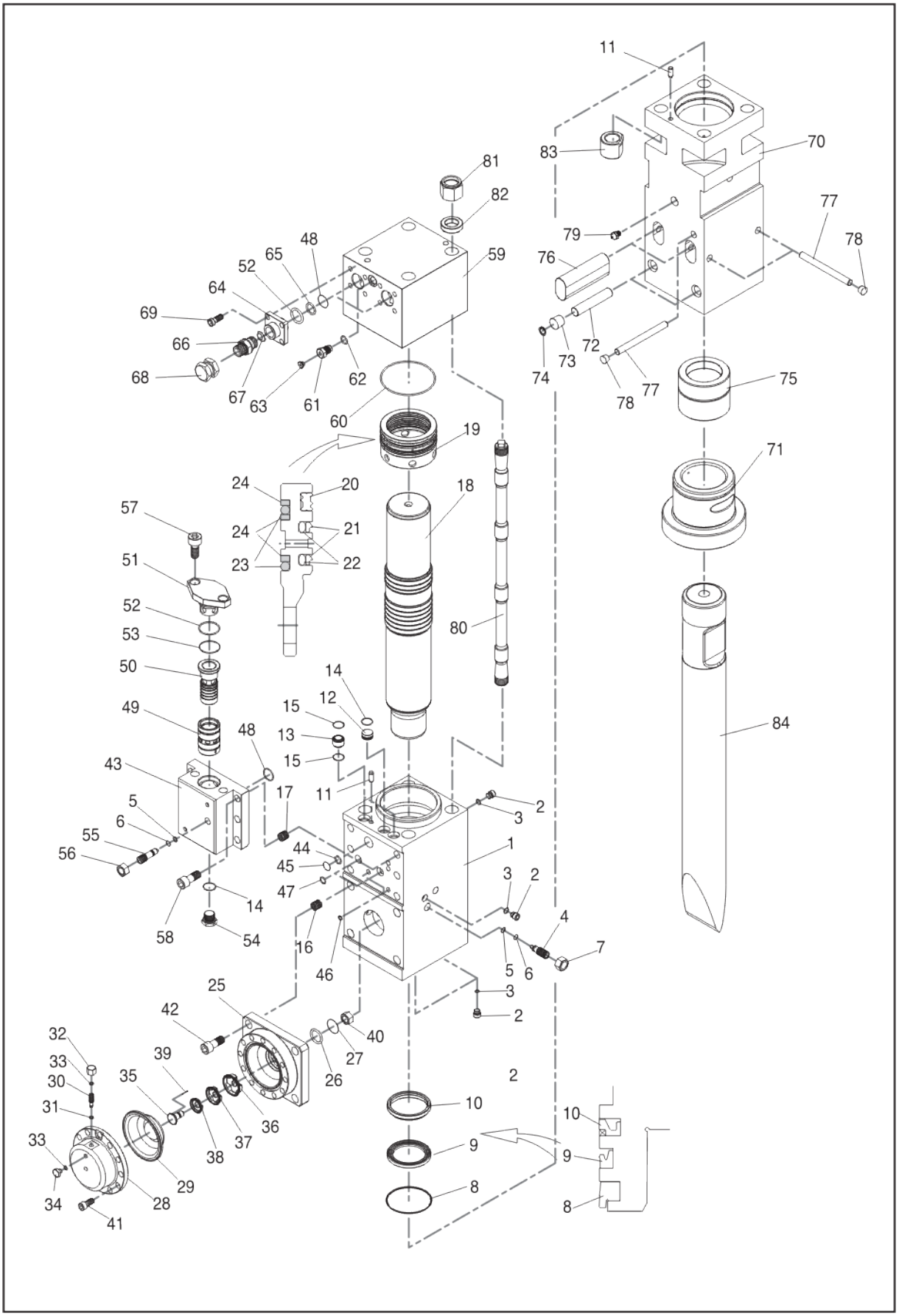
RB 500GG PART LIST

NO	PART NO.	PART NAME	Q'TY
	13M1100	CYLINDER ASS'Y	
1	13M1101	CYLINDER	1
2	13M1102	SOCKET PLUG	3
3	13M1102-1	O-RING	3
4	13M1104	DUST SEAL	1
5	13M1105	U-PACKING	1
6	13M1106	BUFFER SEAL	1
7	25F1107	DOWEL PIN	1
8	13M1108	MALE ADAPTER	2
9	30M1108-2	O-RING	2
10	13M1109	UNION CAP	2
11	30M1110	AIR CHECK VALVE	1
12	25F1602-1	O-RING	2
13	13M1201	PISTON	1
	13M1300	SEAL RETAINER ASS'Y	
14	13M1301	SEAL RETAINER	1
15	13M1302	GAS SEAL	1
16	13M1303	U-PACKING	2
17	13M1304	O-RING	3
18	13M1502	VALVE	1
19	13M1503	VALVE PLUG	1
20	13M1401-1	O-RING	1
21	18F1501-4	O-RING	1

NO	PART NO.	PART NAME	Q'TY
22	13M1504	VALVE SLEEVE	1
	13M1600	BACK HEAD ASS'Y	
23	13M1601	BACK HEAD	1
24	25F1602	BACK HEAD CHARGING VALVE	1
25	25F1602-2	CHARGING VALVE PLUG	1
	13M1700	FRONT HEAD ASS'Y	
26	13M1701	FRONT HEAD	1
27	13M1702	LOWER BUSH	1
28	13M1703	LOWR BUSH PIN	2
29	13M1704	RUBBER PLUG (L)	2
30	13M1705	SNAP RING	2
31	13M1706	UPPER BUSH	1
32	13M1707	TOOL RETAINER	2
33	13M1708	STOP PIN	3
34	13M1709	RUBBER PLUG (S)	3
35	25F1710	GREASE NIPPLE	1
36	25F1507	HOLLOW PLUG	1
	13M1800	TIE ROD ASS'Y	
37	13M1801	TIE ROD	4
38	13M1802	HEX NUT	4
39	13M1803	WASHER	4
40	13M1804	ROUND NUT	4
41	13M1901	TOOL	1

MEMO

RB 750GG POWER CELL

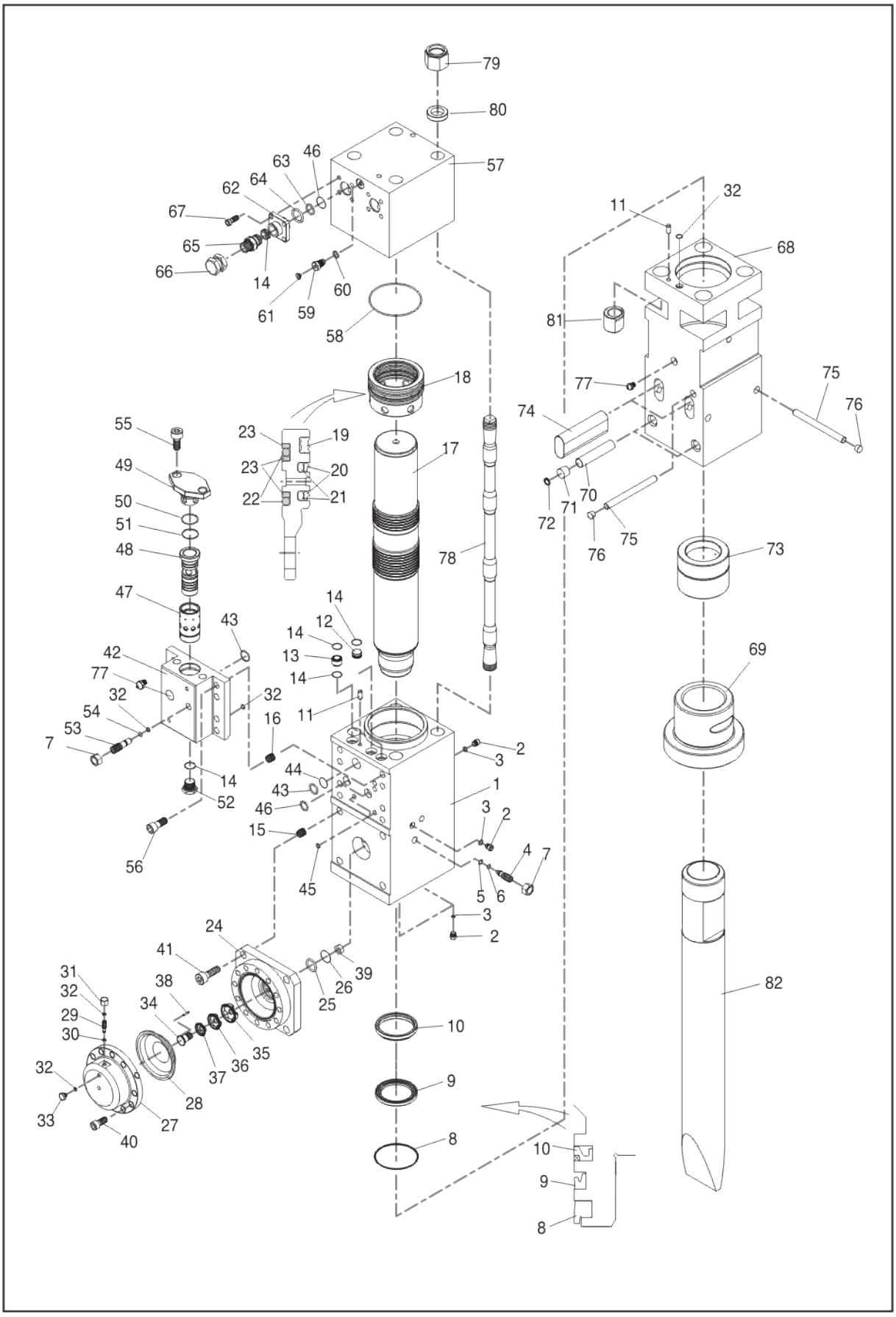


RB 750GG PART LIST

NO	PART NO.	PART NAME	Q'TY
	18F1100	CYLINDER ASS'Y	
1	18F1101	CYLINDER	1
2	25F1102	SOCKET PLUG	4
3	25F1102-1	O-RING	4
4	25F1103	CYLINDER ADJUSTER	1
5	25F1103-1	O-RING	2
6	25F1103-2	BACK-UP RING	2
7	25F1103-3	HEX-NUT	1
8	18F1104	DUST SEAL	1
9	18F1105	U-PACKING	1
10	18F1106	BUFFER SEAL	1
11	25F1107	DOWEL PIN	2
12	18F1109	TEFLON PLUG	1
13	18F1110	TEFLON BUSH	2
14	30M1108-2	O-RING	2
15	18F1111	O-RING	4
16	25F1112	HELI-SERT COIL	4
17	25F1113	HELI-SERT COIL	6
18	18F1201	PISTON	1
	18F1300	SEAL RETAINER ASS'Y	
19	18F1301	SEAL RETAINER	1
20	18F1302	GAS SEAL	1
21	18F1303	STEP SEAL	2
22	18F1303-1	O-RING	2
23	18F1304	O-RING	2
24	18F1304-1	BACK-UP RING	3
	18F1400	ACCUMULATOR ASS'Y	
25	18F1401	ACCUMULATOR BODY	1
26	25F1401-1	O-RING	1
27	25F1401-2	BACK-UP RING	1
28	18F1402	ACCUMULATOR COVER	1
29	18F1403	DIAPHRAGM	1
30	18F1404	ACCUMULATOR CHARCING VALVE	1
31	25F1404-1	O-RING	1
32	25F1404-2	ACCUMULATOR CHARGING VALVE CAP	1
33	25F1404-3	O-RING	2
34	25F1405	CHARGING PLUG	1
35	25F1406	HOLDER PIN	1
36	25F1406-1	HOLDER (A)	1
37	25F1406-2	HOLDER (B)	1
38	25F1406-3	HOLDER (C)	1
39	25F1406-4	CENTER PIN	1
40	25F1406-5	HOLDER NUT	1
41	18F1407	SOCKET BOLT	12
42	18F1408	SOCKET BOLT	4
	18F1501	VALVE HOUSING ASS'Y	

NO	PART NO.	PART NAME	Q'TY
43	18F1501	VALVE HOUSING	1
44	25F1501-1	O-RING	1
45	25F1501-2	BACK-UP RING	1
46	18F1501-3	O-RING	2
47	18F1501-4	O-RING	2
48	25F1501-4	O-RING	3
49	18F1502	VALVE	1
50	18F1503	VALVE PLUG	1
51	18F1504	VALVE COVER	1
52	35F1501-1	O-RING	3
53	18F1504-2	BACK-UP RING	1
54	18F1505	VALVE HOUSING PLUG	1
55	18F1506	VALVE ADJUSTER	1
56	18F1103-3	HEX NUT	1
57	18F1508	SOCKET BOLT	2
58	18F1509	SOCKET BOLT	6
	18F1600	BACK HEAD ASS'Y	
59	18F1601	BACK HEAD	1
60	30M1304	O-RING	1
61	25F1602	BACK HEAD CHARGING VALVE	1
62	25F1602-1	O-RING	1
63	25F1602-2	CHARGING VALVE PLUG	1
64	25F1603	FLANGE ADAPTER	2
65	25F1603-1	BACK-UP RING	2
66	25F1604	ADAPTER	2
67	25F1111	O-RING	2
68	25F1606	UNION CAP	2
69	25F1605	SOCKET BOLT	8
	18F1700	FRONT HEAD ASS'Y	
70	18F1701	FRONT HEAD	1
71	18F1702-1	LOWER BUSH	1
72	18F1703	LOWER BUSH PIN	2
73	18F1704	RUBBER PLUG (L)	2
74	18F1705	SNAP RING	2
75	18F1706	UPPER BUSH	1
76	18F1707	TOOL RETAINER	2
77	18F1708	STOP PIN	3
78	18F1709	RUBBER PLUG (S)	3
79	25F1710	GREASE NIPPLE	1
	18F1800	TIE ROD ASS'Y	
80	18F1801	TIE ROD	4
81	18F1802	HEX NUT	4
82	18F1803	WASHER	4
83	18F1804	ROUND NUT	4
84	18F1901	TOOL	1

RB 1000GG POWER CELL

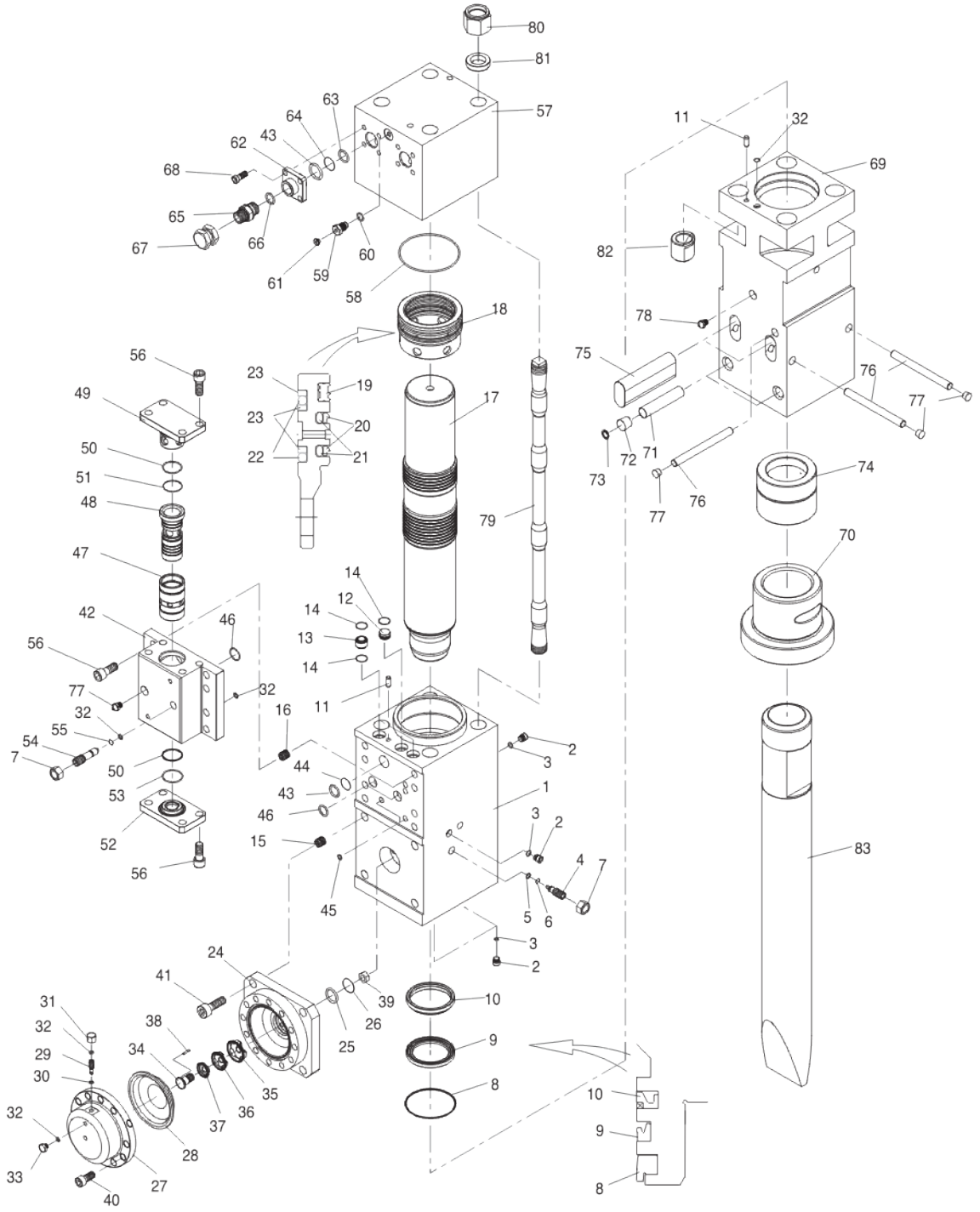


RB 1000GG PART LIST

NO	PART NO.	PART NAME	Q'TY
	25F1100G	CYLINDER ASS'Y	
1	25F1101G	CYLINDER	1
2	25F1102	SOCKET PLUG	4
3	25F1102-1	O-RING	4
4	25F1103	CYLINDER ADJUSTER	1
5	25F1103-1	O-RING	1
6	25F1103-2	BACK-UP RING	1
7	25F1103-3	HEX-NUT	2
8	25F1104	DUST SEAL	1
9	25F1105	U-PACKING	1
10	25F1106	BUFFER SEAL	1
11	25F1107	DOWEL PIN	2
12	25F1109	TEFLON PLUG	1
13	25F1110	TEFLON BUSH	2
14	25F1111	O-RING	8
15	25F1112	HELI-SERT COIL	4
16	25F1113	HELI-SERT COIL	8
17	25F1201	PISTON	1
	25F1300	SEAL RETAINER ASS'Y	
18	25F1301	SEAL RETAINER	1
19	25F1302	GAS SEAL	1
20	25F1303	STEP SEAL	2
21	25F1303-1	O-RING	2
22	25F1304	O-RING	2
23	25F1304-1	BACK-UP RING	3
	25F1400	ACCUMULATOR ASS'Y	
24	25F1401	ACCUMULATOR BODY	1
25	25F1401-1	O-RING	1
26	25F1401-2	BACK-UP RING	1
27	25F1402	ACCUMULATOR COVER	1
28	25F1403	DIAPHRAGM	1
29	25F1404	ACCUMULATOR CHARCING VALVE	1
30	25F1404-1	O-RING	1
31	25F1404-2	ACCUMULATOR CHARGING VALVE CAP	1
32	25F1404-3	O-RING	5
33	25F1405	CHARGING PLUG	1
34	25F1406	HOLDER PIN	1
35	25F1406-1	HOLDER (A)	1
36	25F1406-2	HOLDER (B)	1
37	25F1406-3	HOLDER (C)	1
38	25F1406-4	CENTER PIN	1
39	25F1406-5	HOLDER NUT	1
40	25F1407	SOCKET BOLT	12
41	25F1408	SOCKET BOLT	4
	25F1500G	VALVE HOUSING ASS'Y	

NO	PART NO.	PART NAME	Q'TY
42	25F1501G	VALVE HOUSING	1
43	25F1501-1	O-RING	2
44	25F1501-2	BACK-UP RING	1
45	25F1501-3	O-RING	2
46	25F1501-4	O-RING	4
47	25F1502	VALVE	1
48	25F1503	VALVE PLUG	1
49	25F1504	VALVE COVER	1
50	25F1504-1	O-RING	1
51	25F1504-2	BACK-UP RING	1
52	25F1505	VALVE HOUSING PLUG	1
53	25F1506	VALVE ADJUSTER	1
54	25F1506-1	BACK-UP RING	1
55	25F1508	SOCKET BOLT	2
56	25F1509	SOCKET BOLT	8
	25F1600	BACK HEAD ASS'Y	
57	25F1601	BACK HEAD	1
58	25F1601-1	O-RING	1
59	25F1602	BACK HEAD CHARGING VALVE	1
60	25F1602-1	O-RING	1
61	25F1602-2	CHARGING VALVE PLUG	1
62	25F1603	FLANGE ADAPTER	2
63	25F1603-1	BACK-UP RING	2
64	35F1501-1	O-RING	2
65	25F1604	ADAPTER	2
66	25F1606	UNION CAP	2
67	25F1605	SOCKET BOLT	8
	25F1700G	FRONT HEAD ASS'Y	
68	25F1701G	FRONT HEAD	1
69	25F1702	LOWER BUSH	1
70	25F1703	LOWER BUSH PIN	2
71	25F1704	RUBBER PLUG (L)	2
72	25F1705	SNAP RING	2
73	25F1706	UPPER BUSH	1
74	25F1707	TOOL RETAINER	2
75	25F1708	STOP PIN	3
76	25F1709	RUBBER PLUG (S)	3
77	25F1710	GREASE NIPPLE	2
	25F1800	TIE ROD ASS'Y	
78	25F1801	TIE ROD	4
79	25F1802	HEX NUT	4
80	25F1803	WASHER	4
81	25F1804	ROUND NUT	4
82	25F1901	TOOL	1

RB 1300GG POWER CELL

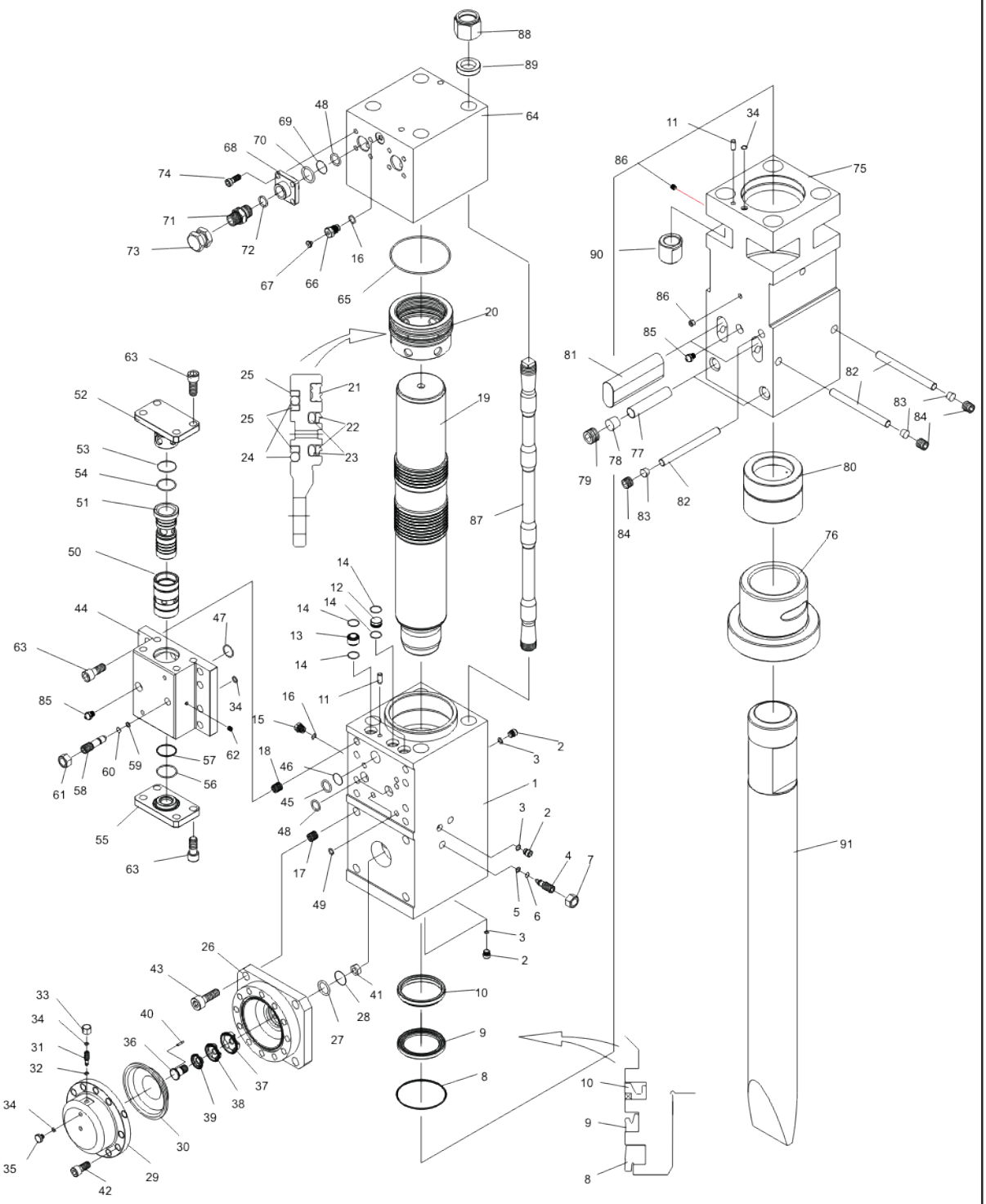


RB 1300GG PART LIST

NO	PART NO.	PART NAME	Q'TY
	35F1100G	CYLINDER ASS'Y	
1	35F1101G	CYLINDER	1
2	25F1102	SOCKET PLUG	4
3	25F1102-1	O-RING	4
4	25F1103	CYLINDER ADJUSTER	1
5	25F1103-1	O-RING	1
6	25F1103-2	BACK-UP RING	1
7	25F1103-3	HEX-NUT	2
8	35F1104	DUST SEAL	1
9	35F1105	U-PACKING	1
10	35F1106	BUFFER SEAL	1
11	25F1107	DOWEL PIN	2
12	35F1109	TEFLON PLUG	1
13	35F1110	TEFLON BUSH	2
14	35F1111	O-RING	5
15	35F1112	HELI-SERT COIL	4
16	25F1113	HELI-SERT COIL	8
17	35F1201	PISTON	1
	35F1300	SEAL RETAINER ASS'Y	
18	35F1301	SEAL RETAINER	1
19	35F1302	GAS SEAL	1
20	35F1303	STEP SEAL	2
21	35F1303-1	O-RING	2
22	35F1304	O-RING	2
23	35F1304-1	BACK-UP RING	3
	35F1400	ACCUMULATOR ASS'Y	
24	35F1401	ACCUMULATOR BODY	1
25	35F1401-1	O-RING	1
26	35F1401-2	BACK-UP RING	1
27	35F1402	ACCUMULATOR COVER	1
28	35F1403	DIAPHRAGM	1
29	25F1404	ACCUMULATOR CHARCING VALVE	1
30	25F1404-1	O-RING	1
31	25F1404-2	ACCUMULATOR CHARGING VALVE CAP	1
32	25F1404-3	O-RING	5
33	25F1405	CHARGING PLUG	1
34	25F1406	HOLDER PIN	1
35	25F1406-1	HOLDER (A)	1
36	25F1406-2	HOLDER (B)	1
37	25F1406-3	HOLDER (C)	1
38	25F1406-4	CENTER PIN	1
39	25F1406-5	HOLDER NUT	1
40	35F1407	SOCKET BOLT	14
41	35F1408	SOCKET BOLT	4
	35F1500G	VALVE HOUSING ASS'Y	

NO	PART NO.	PART NAME	Q'TY
42	35F1501G	VALVE HOUSING	1
43	35F1501-1	O-RING	3
44	35F1501-2	BACK-UP RING	1
45	25F1501-3	O-RING	2
46	25F1501-1	O-RING	3
47	35F1502	VALVE	1
48	35F1503	VALVE PLUG	1
49	35F1504	VALVE COVER (A)	1
50	35F1504-1	O-RING	2
51	35F1504-2	BACK-UP RING	1
52	35F1505	VALVE COVER (B)	1
53	35F1505-2	BACK-UP RING	1
54	35F1506	VALVE ADJUSTER	1
55	25F1506-1	BACK-UP RING	1
56	25F1509	SOCKET BOLT	16
	35F1600	BACK HEAD ASS'Y	
57	35F1601	BACK HEAD	1
58	35F1601-1	O-RING	1
59	25F1602	BACK HEAD CHARGING VALVE	1
60	25F1602-1	O-RING	1
61	25F1602-2	CHARGING VALVE PLUG	1
62	25F1603	FLANGE ADAPTER	2
63	25F1501-4	O-RING	2
64	25F1603-1	BACK-UP RING	2
65	25F1604	ADAPTER	2
66	25F1111	O-RING	2
67	25F1606	UNION CAP	2
68	25F1605	SOCKET BOLT	8
	35F1700G	FRONT HEAD ASS'Y	
69	35F1701G	FRONT HEAD	1
70	35F1702	LOWER BUSH	1
71	25F1703	LOWER BUSH PIN	2
72	25F1704	RUBBER PLUG (L)	2
73	25F1705	SNAP RING	2
74	35F1706	UPPER BUSH	1
75	35F1707	TOOL RETAINER	2
76	35F1708	STOP PIN	3
77	25F1709	RUBBER PLUG (S)	3
78	25F1710	GREASE NIPPLE	2
	35F1800	TIE ROD ASS'Y	
79	35F1801	TIE ROD	4
80	35F1802	HEX NUT	4
81	35F1803	WASHER	4
82	35F1804	ROUND NUT	4
83	35F1901	TOOL	1

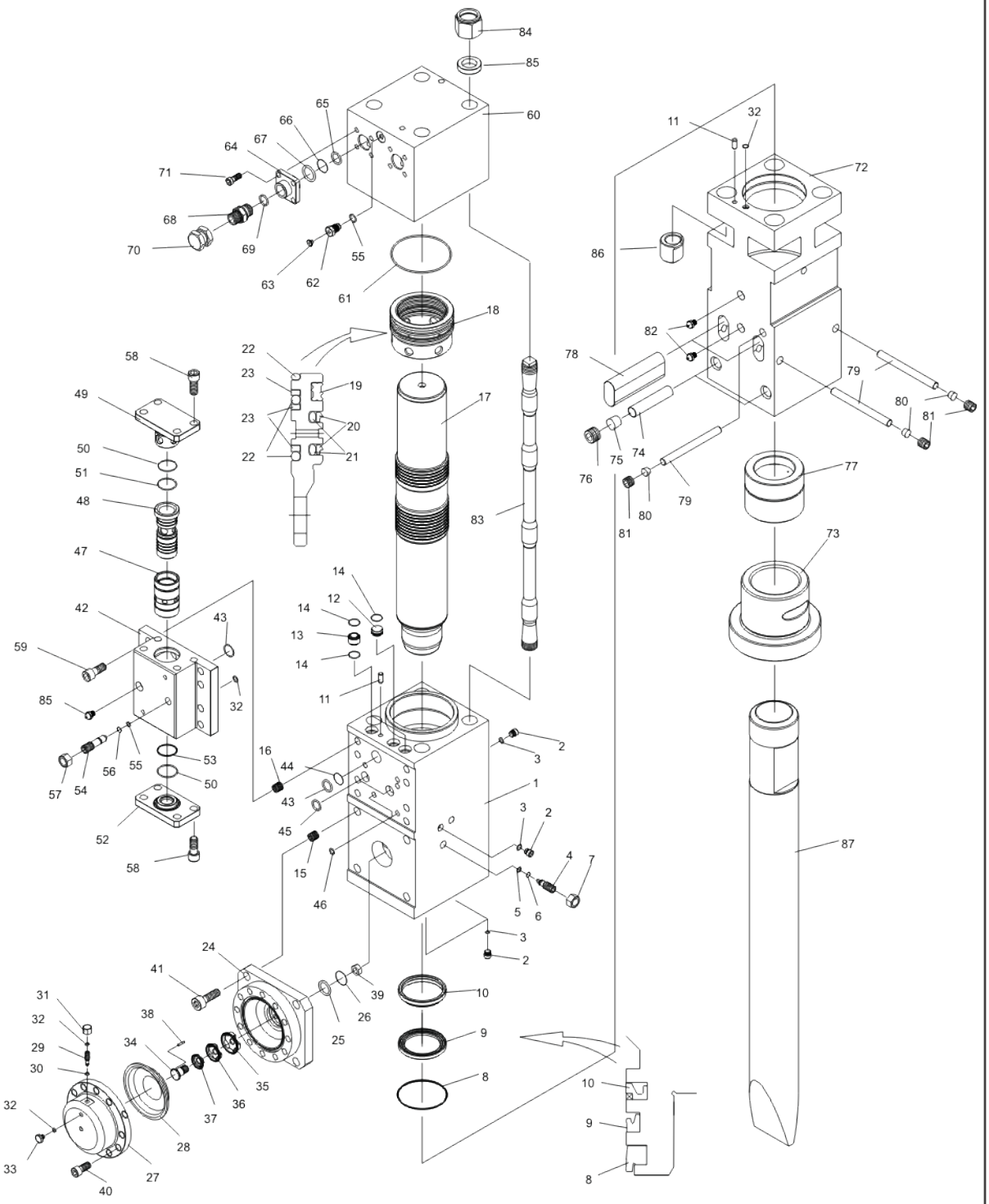
RB 1640GG POWER CELL



RB 1640GG PART LIST

NO	PART NO	PART NAME	Q'TY
	45F1100	CYLINDER ASS'Y	
1	45F1101	CYLINDER	1
2	25F1102	SOCKET PLUG	4
3	25F1102-1	O-RING	4
4	25F1103	CYLINDER ADJUSTER	1
5	25F1103-1	O-RING	1
6	25F1103-2	BACK-UP RING	1
7	25F1103-3	HEX-NUT	1
8	45F1104	DUST SEAL	1
9	45F1105	U-PACKING	1
10	45F1106	BUFFER SEAL	1
11	25F1107	DOWEL PIN	2
12	45F1109	TEFLON PLUG	1
13	45F1110	TEFLON BUSH	2
14	45F1111	O-RING	6
15	35M1110	AIR CHECK VALVE	1
16	25F1602-1	O-RING	2
17	25F1112	HELI-SERT COIL	4
18	25F1113	HELI-SERT COIL	8
19	40F1201	PISTON	1
	45F1300	SEAL RETAINER ASS'Y	
20	45F1301	SEAL RETAINER	1
21	45F1302	GAS SEAL	1
22	45F1303	STEP SEAL	2
23	45F1303-1	O-RING	2
24	45F1304	O-RING	2
25	45F1304-1	BACK-UP RING	3
	45F1400	ACCUMULATOR ASS'Y	
26	45F1401	ACCUMULATOR BODY	1
27	35F1401-1	O-RING	1
28	45F1401-2	BACK-UP RING	1
29	45F1402	ACCUMULATOR COVER	1
30	45F1403	DIAPHRAM	1
31	25F1404	ACCUMULATOR CHARGING VALVE	1
32	25F1404-1	O-RING	1
33	25F1404-2	ACCUMULATOR CHARGING VALVE CAP	1
34	25F1404-3	O-RING	4
35	25F1405	CHARGING PLUG	1
36	45F1406	HOLDER PIN	1
37	45F1406-1	HOLDER(A)	1
38	45F1406-2	HOLDER(B)	1
39	45F1406-3	HOLDER(C)	1
40	45F1406-4	CENTER PIN	1
41	45F1406-5	HOLDER NUT	1
42	45F1407	SOCKET BOLT	14
43	25F1408	SOCKET BOLT	4
	45F1500	VALVE HOUSING ASS'Y	
44	45F1501	VALVE HOUSING	1
45	35F1501-1	O-RING	1
46	35F1501-2	BACK-UP RING	1
47	25M1503-2	O-RING	1
48	25F1501-1	O-RING	4
49	18F1501-3	O-RING	2
50	45F1502	VALVE	1
51	45F1503	VALVE PLUG	1
52	45F1504	VALVE COVER(A)	1
53	30M1503-1	O-RING	1
54	45F1504-2	BACK-UP RING	1
55	45F1505	VALVE COVER(B)	1
56	45F1505-1	O-RING	1
57	45F1505-2	BACK-UP RING	1
58	45F1506	VALVE ADJUSTER	1
59	50M1102-1	O-RING	1
60	45F1506-2	BACK-UP RING	1
61	45F1506-3	HEX-NUT	1
62	45F1507	HOLLOW PLUG	1
63	25F1509	SOCKET BOLT	16
	45F1600	BACK HEAD ASS'Y	
64	45F1601	BACK HEAD	1
65	45F1601-1	O-RING	1
66	25F1602	BACK HEAD CHARGING VALVE	1
67	25F1602-2	CHARGING VALVE PLUG	1
68	45F1603	FLANGE ADAPTER	2
69	45F1603-2	BACK-UP RING	2
70	25F1503-1	O-RING	2
71	45F1604	ADAPTER	2
72	45F1604-1	O-RING	2
73	45F1606	UNION CAP	2
74	25F1605	SOCKET BOLT	8
	40F1700	FRONT HEAD ASS'Y	
75	40F1701	FRONT HEAD	1
76	40F1702	LOWER BUSH	1
77	45F1703	LOWER BUSH PIN	2
78	45F1704	RUBBER PLUG(L)	2
79	45F1704-1	HEX PLUG	2
80	40F1706	UPPER BUSH	1
81	45F1707	TOOL RETAINER	2
82	45F1708	STOP PIN	3
83	45F1709	RUBBER PLUG(S)	3
84	45F1709-1	HEX PLUG	3
85	25F1710	GREASE NIPPLE	2
85	25F1507	HOLLOW PLUG	2
	45F1800	TIE ROD ASS'Y	
87	45F1801	TIE ROD	4
88	45F1802	HEX NUT	4
89	45F1803	WASHER	4
90	45F1804	ROUND NUT	4
91	40F1901	TOOL	1

RB 2250GG POWER CELL

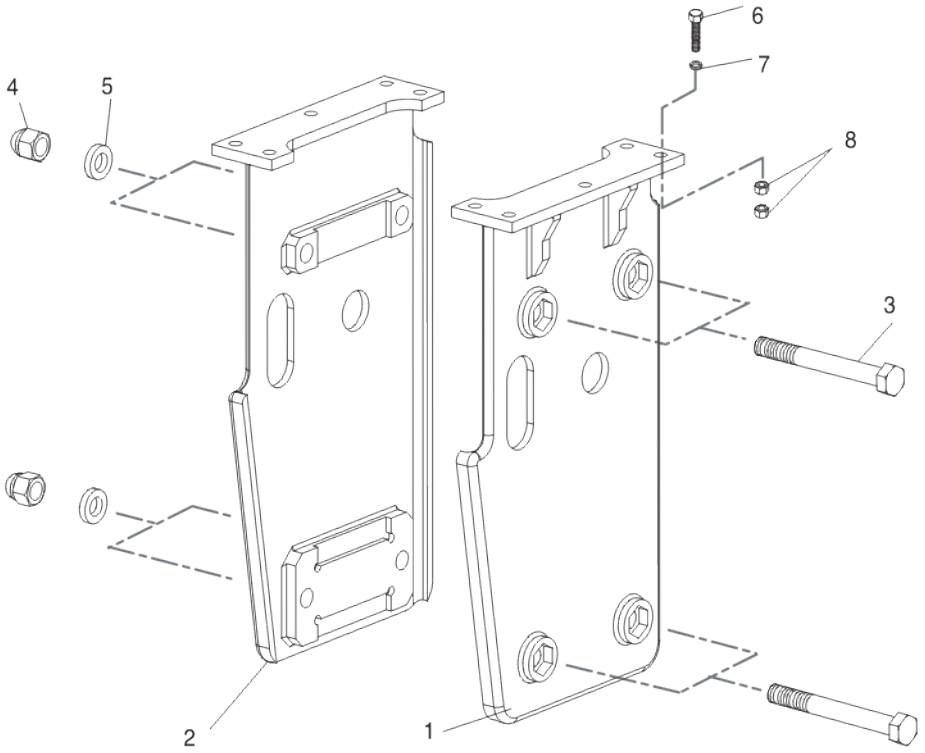


RB 2250GG PART LIST

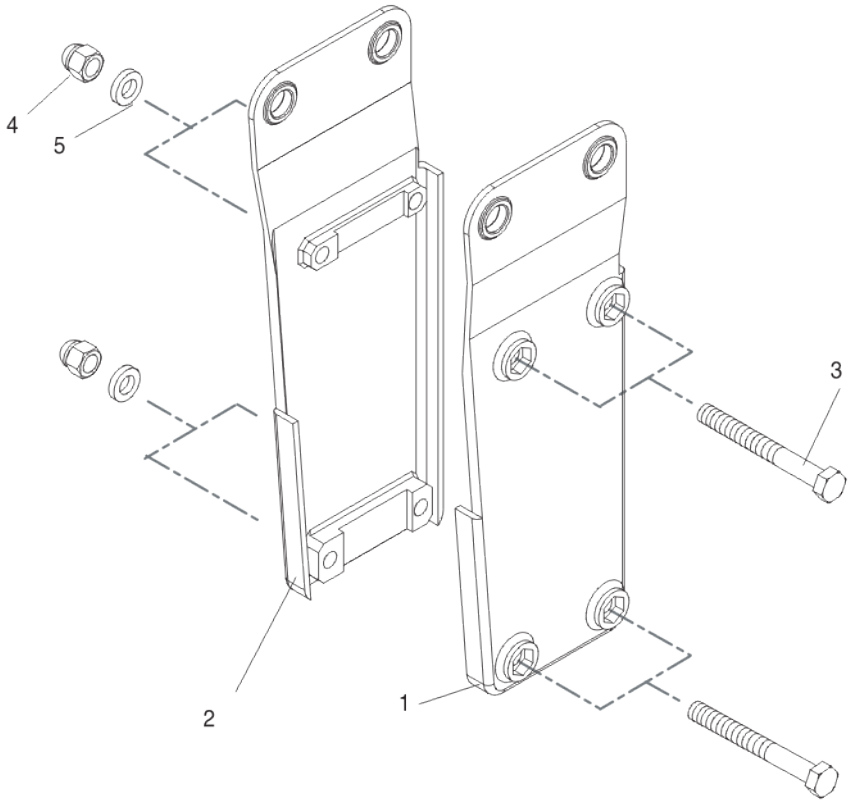
NO	PART NO.	PART NAME	Q'TY
	55F1100	CYLINDER ASS'Y	
1	55F1101	CYLINDER	1
2	25F1102	SOCKET PLUG	4
3	25F1102-1	O-RING	4
4	25F1103	CYLINDER ADJUSTER	1
5	25F1103-1	O-RING	1
6	25F1103-2	BACK-UP RING	1
7	25F1103-3	HEX-NUT	1
8	55F1104	DUST SEAL	1
9	55F1105	U-PACKING	1
10	55F1106	BUFFER SEAL	1
11	45F1107	DOWEL PIN	2
12	55F1109	TEFLON PLUG	1
13	55F1110	TEFLON BUSH	2
14	55F1111	O-RING	5
15	35F1112	HELI-SERT COIL	4
16	25F1112	HELI-SERT COIL	8
17	60F1201	PISTON	1
	55F1300	SEAL RETAINER ASS'Y	
18	55F1301	SEAL RETAINER	1
19	55F1302	GAS SEAL	1
20	55F1303	STEP SEAL	2
21	55F1303-1	O-RING	2
22	55F1304	O-RING	3
23	55F1304-1	BACK-UP RING	3
	55F1400	ACCUMULATOR ASS'Y	
24	55F1401	ACCUMULATOR BODY	1
25	55F1401-1	O-RING	1
26	55F1401-2	BACK-UP RING	1
27	55F1402	ACCUMULATOR COVER	1
28	55F1403	DIAPHRAM	1
29	25F1404	ACCUMULATOR CHARGING VALVE	1
30	25F1404-1	O-RING	1
31	25F1404-2	ACCUMULATOR CHARGING VALVE CAP	1
32	25F1404-3	O-RING	4
33	25F1405	CHARGING PLUG	1
34	25F1406	HOLDER PIN	1
35	25F1406-1	HOLDER(A)	1
36	25F1406-2	HOLDER(B)	1
37	25F1406-3	HOLDER(C)	1
38	25F1406-4	CENTER PIN	1
39	25F1406-5	HOLDER NUT	1
40	55F1407	SOCKET BOLT	16
41	35F1408	SOCKET BOLT	4
	55F1500	VALVE HOUSING ASS'Y	
42	55F1501	VALVE HOUSING	1
43	25F1504-1	O-RING	2
44	55F1501-2	BACK-UP RING	1
45	25M1503-2	O-RING	2

NO	PART NO.	PART NAME	Q'TY
46	25F1501-4	O-RING	2
47	55F1502	VALVE	1
48	55F1503	VALVE PLUG	1
49	55F1504	VALVE COVER(A)	1
50	55F1504-1	O-RING	2
51	55F1504-2	BACK-UP RING	1
52	55F1505	VALVE COVER(B)	1
53	55F1505-2	BACK-UP RING	1
54	55F1506	VALVE ADJUSTER	1
55	25F1602-1	O-RING	2
56	55F1506-2	BACK-UP RING	1
57	55F1506-3	HEX-NUT	1
58	55F1508	SOCKET BOLT	8
59	55F1509	SOCKET BOLT	8
	55F1600	BACK HEAD ASS'Y	
60	55F1601	BACK HEAD	1
61	55F1601-1	O-RING	1
62	25F1602	BACK HEAD CHARGING VALVE	1
63	25F1602-2	CHARGING VALVE PLUG	1
64	45F1603	FLANGE ADAPTER	2
65	25F1501-1	O-RING	2
66	45F1603-2	BACK-UP RING	2
67	25F1503-1	O-RING	2
68	45F1604	ADAPTER	2
69	45F1604-1	O-RING	2
70	45F1606	UNION CAP	2
71	25F1605	SOCKET BOLT	8
	60F1700	FRONT HEAD ASS'Y	
72	60F1701	FRONT HEAD	1
73	60F1702	LOWER BUSH	1
74	55F1703	LOWER BUSH PIN	2
75	45F1704	RUBBER PLUG(L)	2
76	45F1704-1	HEX PLUG	2
77	60F1706	UPPER BUSH	1
78	55F1707	TOOL RETAINER	2
79	55F1708	STOP PIN	3
80	45F1709	RUBBER PLUG(S)	3
81	45F1709-1	HEX PLUG	3
82	25F1710	GREASE NIPPLE	3
	55F1800	TIE ROD ASS'Y	
83	55F1801	TIE ROD	4
84	55F1802	HEX NUT	4
85	55F1803	WASHER	4
86	55F1804	ROUND NUT	4
87	60F1901	TOOL	1
		SEAL KIT	

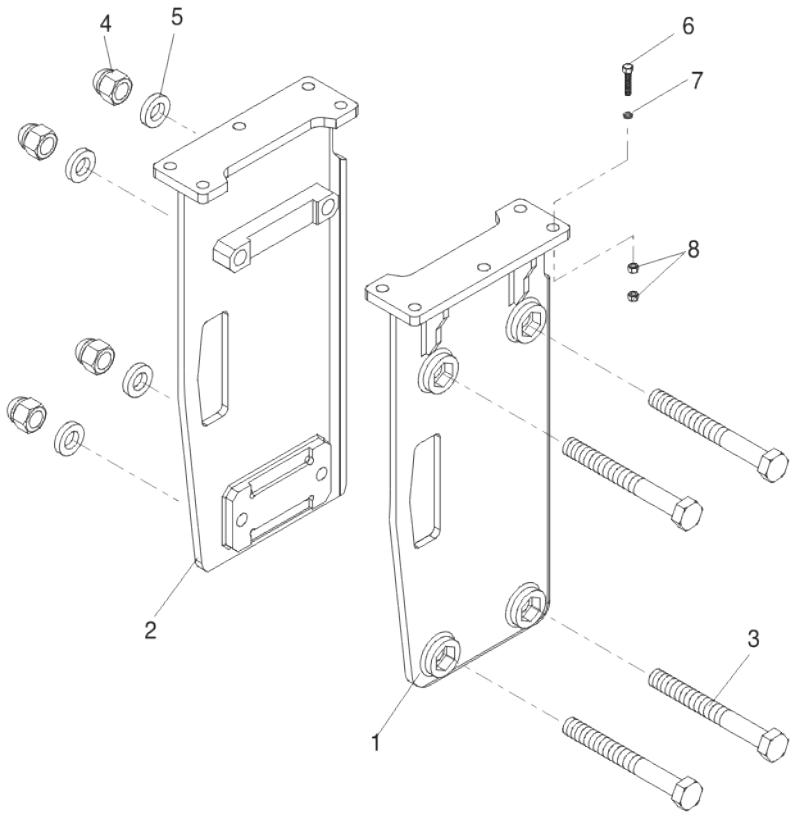
RB 50SSG TOP SEPARATION BRACKET



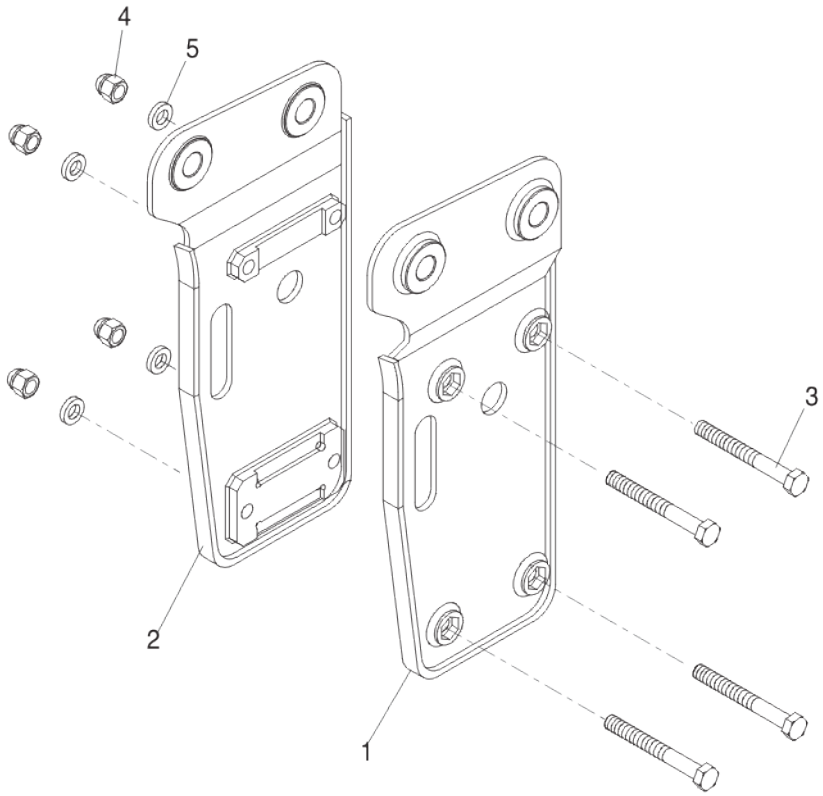
RB 50SSG UNI RAM BRACKET



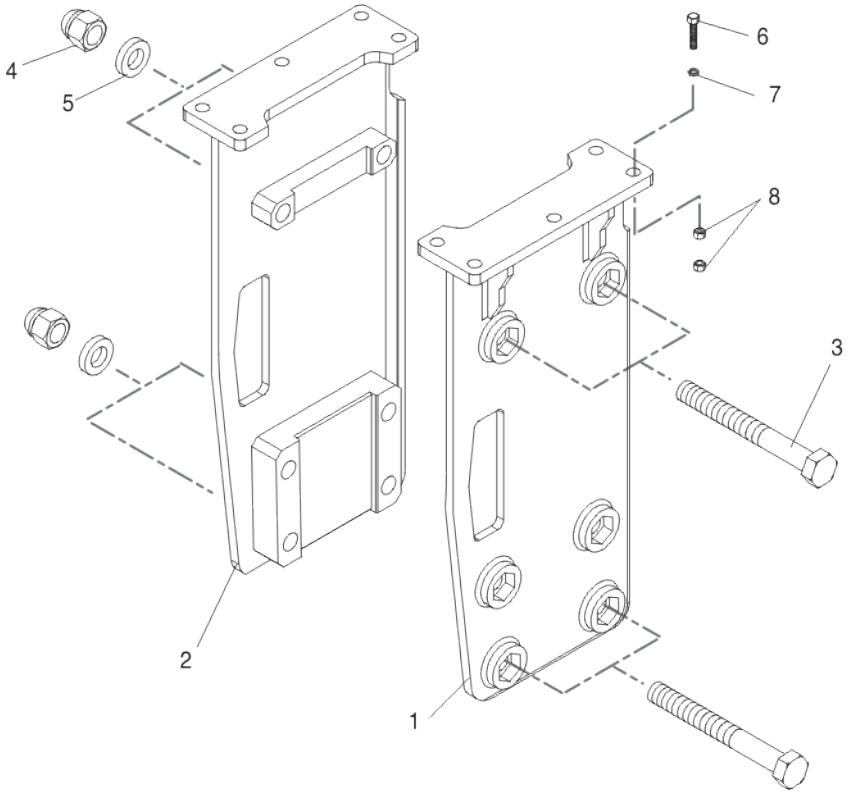
RB 100G TOP SEPARATION BRACKET



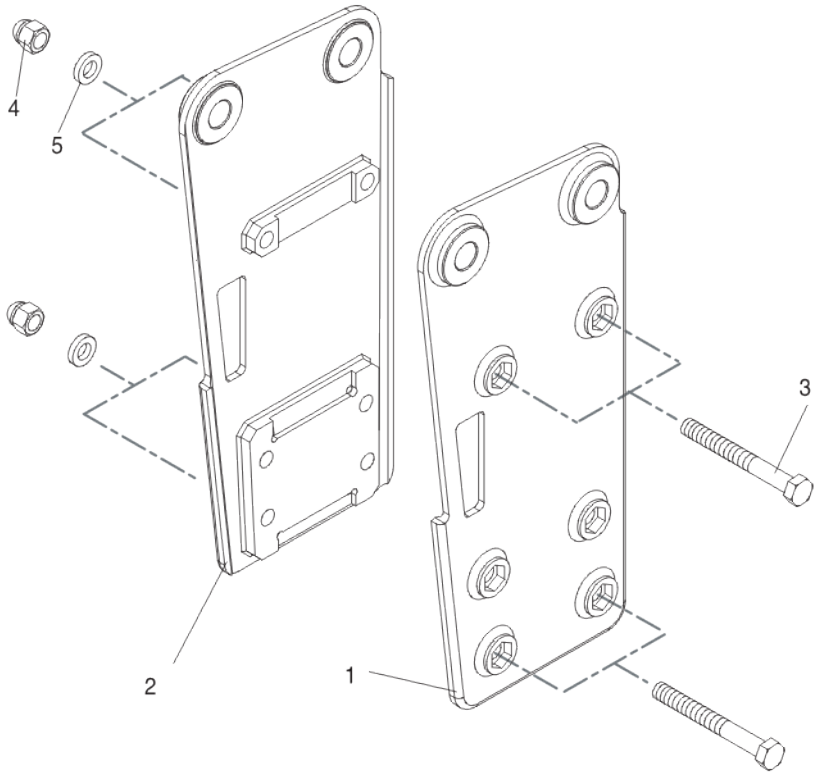
RB 100G UNI RAM BRACKET



RB 125G TOP SEPARATION BRACKET



RB 125G UNI RAM BRACKET



RB 50SSG TOP BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	35M2101	FRAME (LH)	1
2	35M2102	FRAME (RH)	1
	35M2103-0	SIDE BOLT ASS'Y	
3	35M2103	SIDE BOLT	4
4	35M2103-1	CAP NUT	4
5	35M2103-2	SPRING WASHER	4
6	35M2109	M/F LOCKING BOLT	10
7	35M2109-1	SPRING WASHER	10
8	35M2109-2	HEX NUT	20
	35M3101	OIL HIGH PRESSURE HOSE	2
	35M3102	OIL HOSE PLUG	2

RB 50SSG UNI RAM BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	35M2501	FRAME (LH)	1
2	35M2502	FRAME (RH)	1
	35M2103-0	SIDE BOLT ASS'Y	
3	35M2103	SIDE BOLT	4
4	35M2103-1	CAP NUT	4
5	35M2103-2	SPRING WASHER	4
	35M3101	OIL HIGH PRESSURE HOSE	2
	35M3102	OIL HOSE PLUG	2

RB 100G TOP BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	52M2101	FRAME (LH)	1
2	50M2102	FRAME (RH)	1
	50M2103-0	SIDE BOLT ASS'Y	
3	50M2103	SIDE BOLT	4
4	50M2103-1	CAP NUT	4
5	50M2103-2	SPRING WASHER	4
6	50M2109	M/F LOCKING BOLT	10
7	50M2109-1	SPRING WASHER	10
8	50M2109-2	HEX NUT	20
	50M3101	OIL HIGH PRESSURE HOSE	2
	50M3102	OIL HOSE PLUG	2

RB 100G UNI RAM BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	50M2501	FRAME (LH)	1
2	50M2502	FRAME (RH)	1
	50M2103-0	SIDE BOLT ASS'Y	
3	50M2103	SIDE BOLT	4
4	50M2103-1	CAP NUT	4
5	50M2103-2	SPRING WASHER	4
	50M3101	OIL HIGH PRESSURE HOSE	2
	50M3102	OIL HOSE PLUG	2

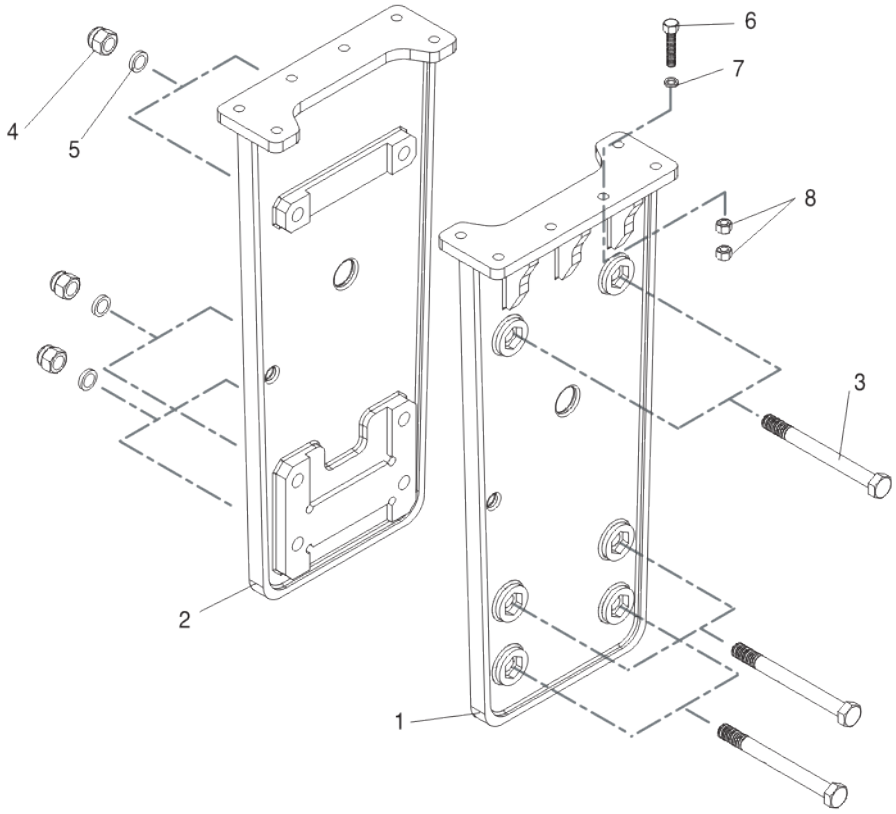
RB 125G TOP BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	80M2101	FRAME (LH)	1
2	80M2102	FRAME (RH)	1
	80M2103-0	SIDE BOLT ASS'Y	
3	10M2103	SIDE BOLT	4
4	10M2103-1	CAP NUT	4
5	10M2103-2	SPRING WASHER	4
6	10M2109	M/F LOCKING BOLT	10
7	10M2109-1	SPRING WASHER	10
8	10M2109-2	HEX NUT	20
	80M3101	OIL HIGH PRESSURE HOSE	2
	80M3102	OIL HOSE PLUG	2

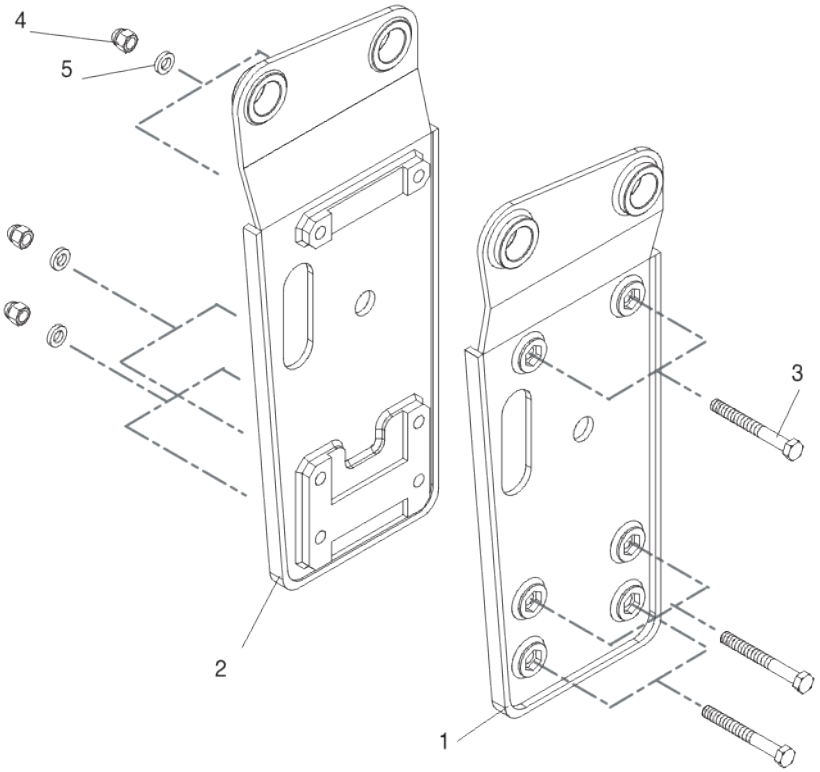
RB 125G UNI RAM BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	80M2501	FRAME (LH)	1
2	80M2502	FRAME (RH)	1
	10M2103-0	SIDE BOLT ASS'Y	4
3	10M2103	SIDE BOLT	4
4	10M2103-1	CAP NUT	4
5	10M2103-2	SPRING WASHER	2
	80M3101	OIL HIGH PRESSURE HOSE	2
	80M3102	OIL HOSE PLUG	

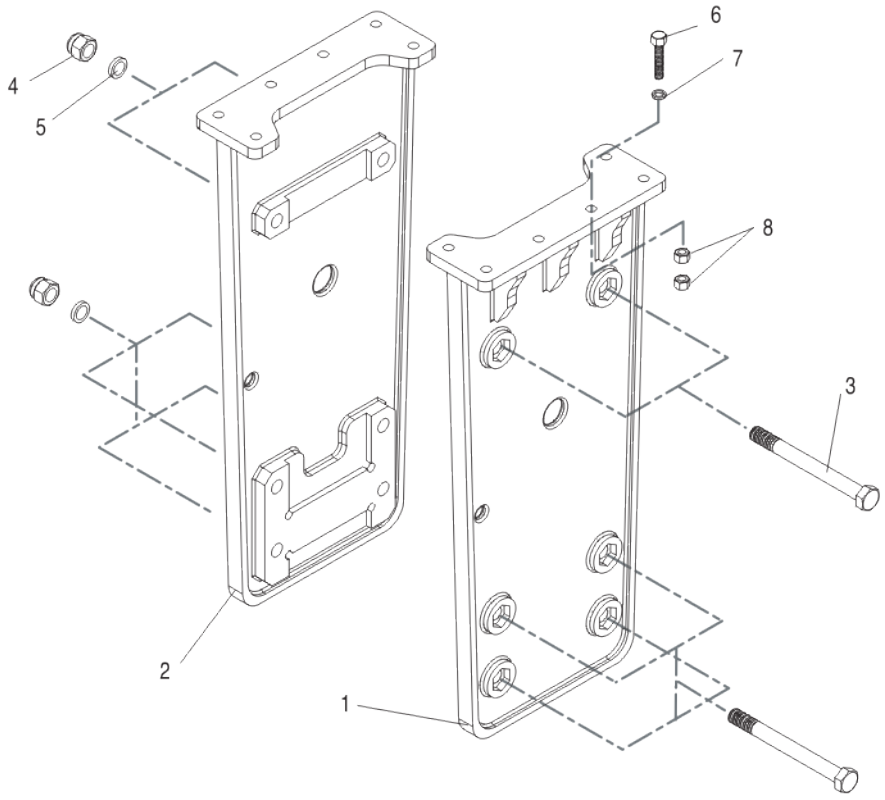
RB 250G TOP SEPARATION BRACKET



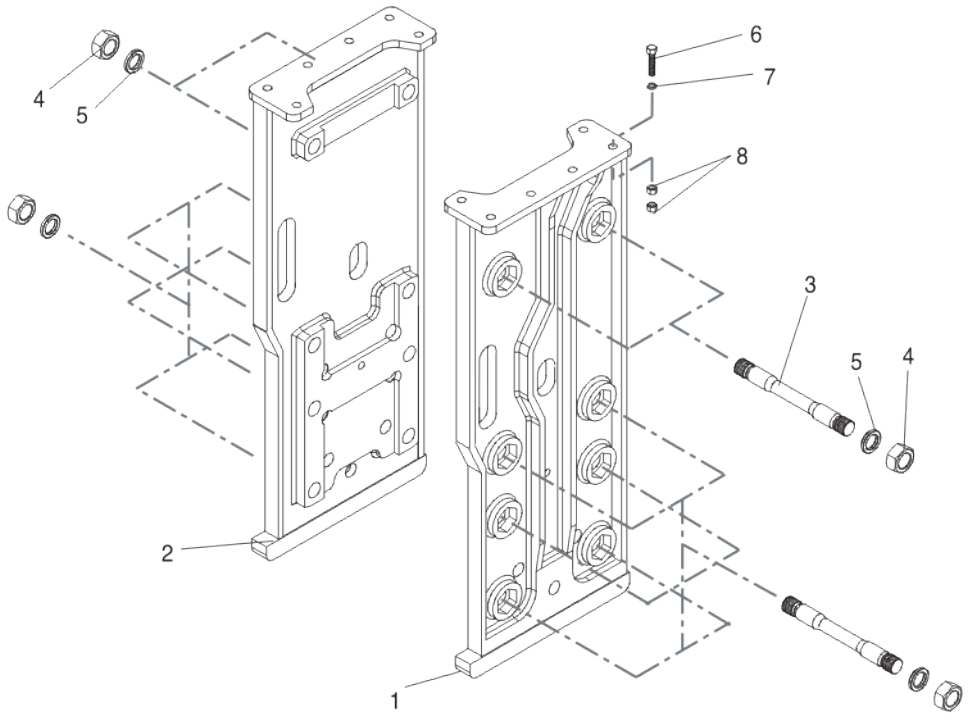
RB 250G UNI RAM BRACKET



RB 500GG TOP SEPARATION BRACKET



RB 750GG TOP SEPARATION BRACKET



RB 250G TOP SEPARATION BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	10M2101	FRAME (LH)	1
2	10M2102	FRAME (RH)	1
	10M2103-0	SIDE BOLT ASS'Y	
3	10M2103	SIDE BOLT	6
4	10M2103-1	CAP NUT	6
5	10M2103-2	SPRING WASHER	6
6	10M2109	M/F LOCKING BOLT	12
7	10M2109-1	SPRING WASHER	12
8	10M2109-2	HEX NUT	24
	10M3101	OIL HIGH PRESSURE HOSE	2
	10M3102	OIL HOSE PLUG	2

RB 250G UNI RAM BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	10M2501	FRAME (LH)	1
2	10M2502	FRAME (RH)	1
	10M2103-0	SIDE BOLT ASS'Y	
3	10M2103	SIDE BOLT	6
4	10M2103-1	CAP NUT	6
5	10M2103-2	SPRING WASHER	6
	10M3101	OIL HIGH PRESSURE HOSE	2
	10M3102	OIL HOSE PLUG	2

RB 500GG TOP SEPARATION BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	13M2101	FRAME (LH)	1
2	13M2102	FRAME (RH)	1
	13M2103-0	SIDE BOLT ASS'Y	
3	13M2103	SIDE BOLT	6
4	13M2103-1	CAP NUT	6
5	13M2103-2	SPRING WASHER	6
6	13M2109	M/F LOCKING BOLT	12
7	13M2109-1	SPRING WASHER	12
8	13M2109-2	HEX NUT	24
	13M3101	OIL HIGH PRESSURE HOSE	2
	13M3102	OIL HOSE PLUG	2

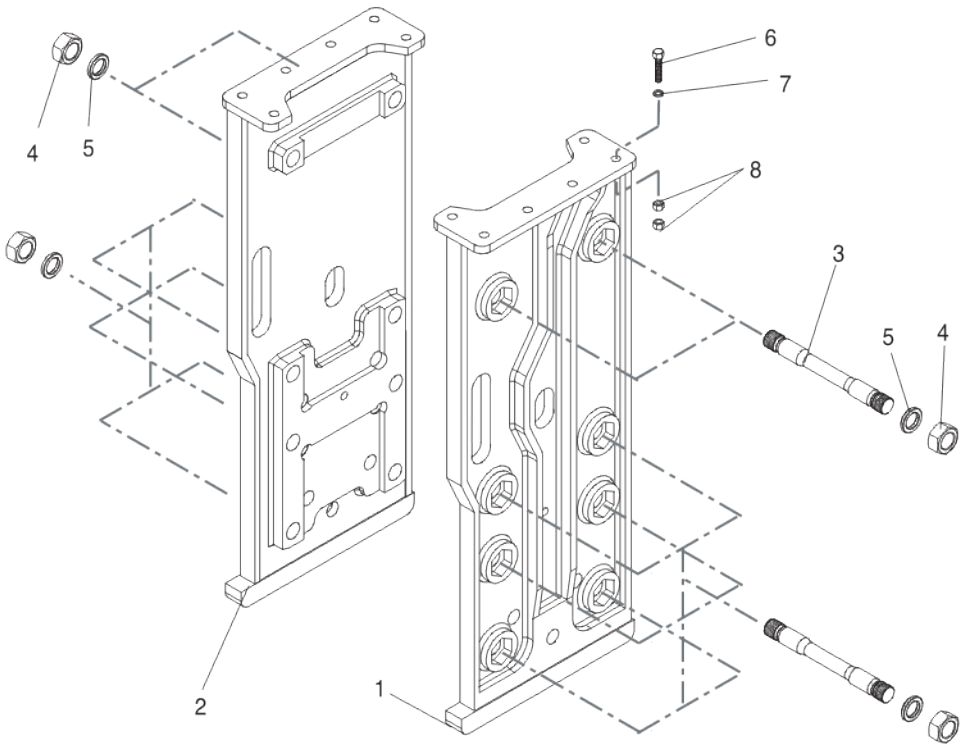
RB 750G TOP SEPARATION BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	18F2101	FRAME (LH)	1
2	18F2102	FRAME (RH)	1
	18F2103-0	SIDE BOLT ASS'Y	
3	18F2103	SIDE BOLT	8
4	18F2103-1	HEX NUT	16
5	18F2103-2	WASHER	16
6	18F2109	M/F LOCKING BOLT	12
7	18F2109-1	SPRING WASHER	12
8	18F2109-2	HEX NUT	24
	18F3101	OIL HIGH PRESSURE HOSE	2
	18F3102	OIL HOSE PLUG	2

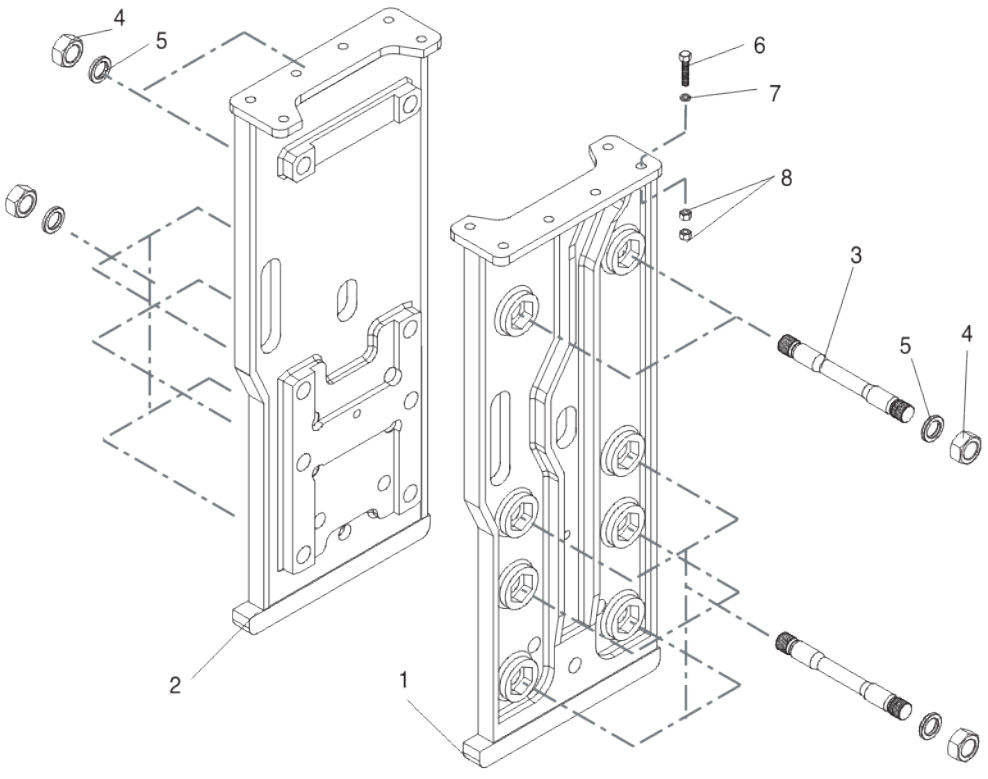
RB 750GG TOP SEPARATION BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	18F2101	FRAME (LH)	1
2	18F2102	FRAME (RH)	1
	18F2104-0	SIDE BOLT ASS'Y	
3	18F2104	SIDE BOLT	8
4	18F2104-1	HEX NUT	16
5	18F2104-2	WASHER	8
6	18F2109	M/F LOCKING BOLT	12
7	18F2109-1	SPRING WASHER	12
8	18F2109-2	HEX NUT	24
	18F3101	OIL HIGH PRESSURE HOSE	2
	18F3102	OIL HOSE PLUG	2

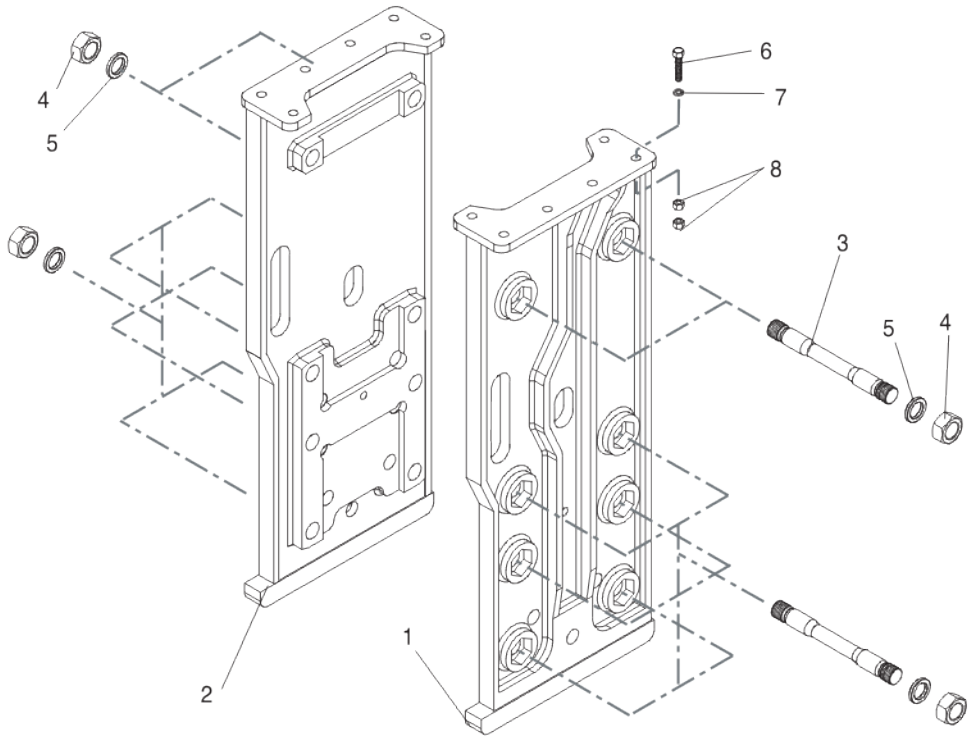
RB 1000GG TOP SEPARATION BRACKET



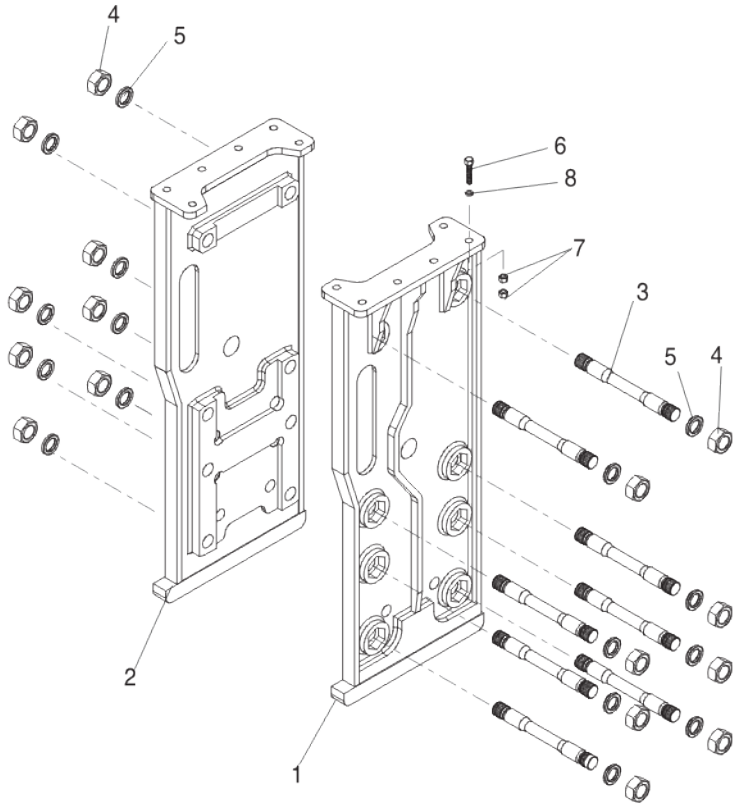
RB 1300GG TOP SEPARATION BRACKET



RB 1640GG TOP SEPARATION BRACKET



RB 2250GG TOP SEPARATION BRACKET



RB 1000GG TOP BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	25F2101	FRAME (LH)	1
2	25F2102	FRAME (RH)	1
	25F2103-0	SIDE BOLT ASS'Y	
3	25F2103	SIDE BOLT	8
4	25F2103-1	HEX NUT	16
5	25F2103-2	WASHER	16
6	25F2109	M/F LOCKING BOLT	12
7	25F2109-1	SPRING WASHER	12
8	25F2109-2	HEX NUT	24
	25F3101	OIL HIGH PRESSURE HOSE	2
	25F3102	OIL HOSE PLUG	2

RB 1300GG TOP BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	35F2101	FRAME (LH)	1
2	35F2102	FRAME (RH)	1
	35F2103-0	SIDE BOLT ASS'Y	
3	35F2103	SIDE BOLT	8
4	35F2103-1	HEX NUT	16
5	35F2103-2	WASHER	16
6	35F2109	M/F LOCKING BOLT	12
7	35F2109-1	SPRING WASHER	12
8	35F2109-2	HEX NUT	24
	35F3101	OIL HIGH PRESSURE HOSE	2
	35F3102	OIL HOSE PLUG	2

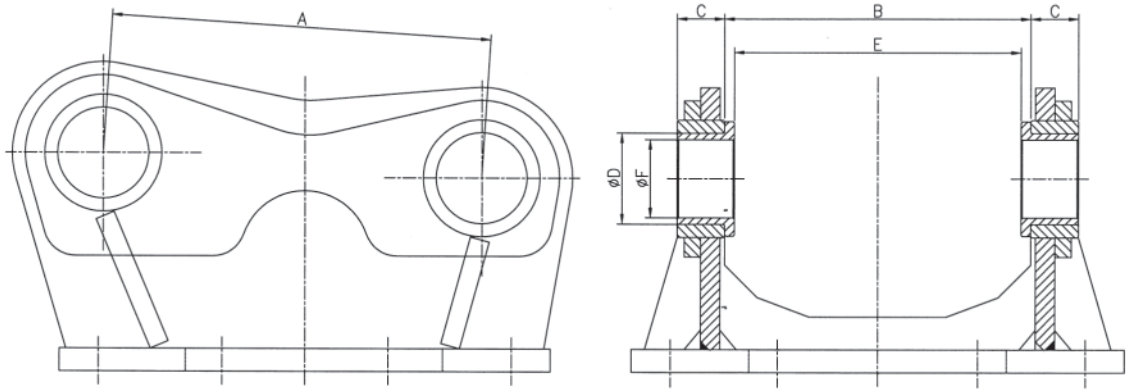
RB 1640GG TOP BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	45F2101	FRAME (LH)	1
2	45F2102	FRAME (RH)	1
	45F2103-0	SIDE BOLT ASS'Y	
3	45F2103	SIDE BOLT	8
4	45F2103-1	HEX NUT	16
5	45F2103-2	WASHER	16
6	45F2109	M/F LOCKING BOLT	12
7	45F2109-1	SPRING WASHER	12
8	45F2109-2	HEX NUT	24
	45F3101	OIL HIGH PRESSURE HOSE	2
	45F3102	OIL HOSE PLUG	2

RB 2250GGG TOP BRACKET PART LIST

NO	PART NO.	PART NAME	Q'TY
1	45F2101	FRAME (LH)	1
2	45F2102	FRAME (RH)	1
	45F2103-0	SIDE BOLT ASS'Y	
3	45F2103	SIDE BOLT	8
4	45F2103-1	HEX NUT	16
5	45F2103-2	WASHER	16
6	45F2109	M/F LOCKING BOLT	12
7	45F2109-1	SPRING WASHER	12
8	45F2109-2	HEX NUT	24
	45F3101	OIL HIGH PRESSURE HOSE	2
	45F3102	OIL HOSE PLUG	2

TOP BRACKET, PIN DIMENSIONS

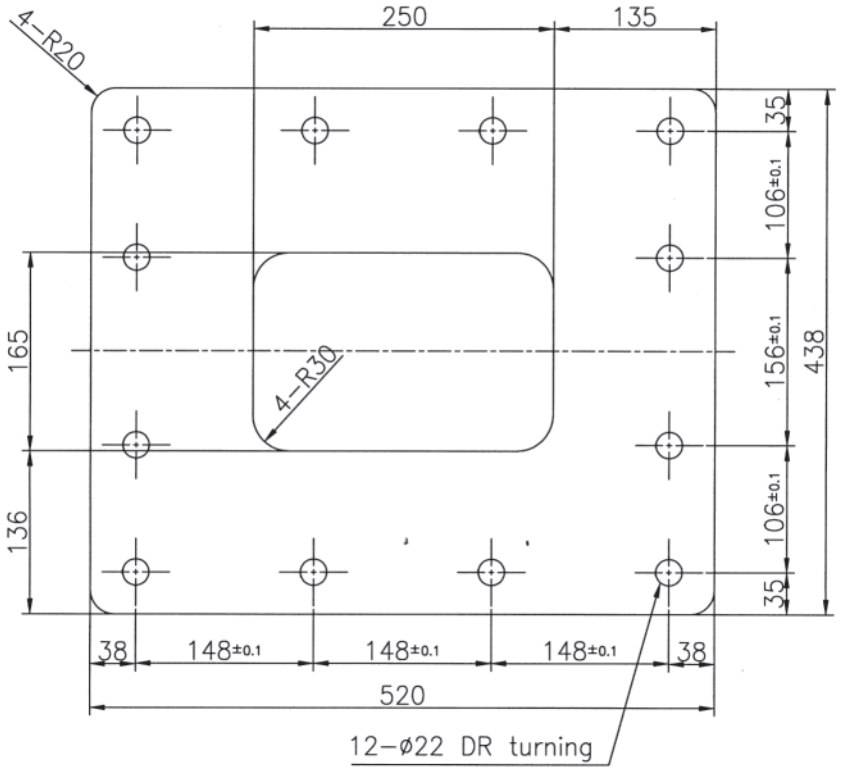


TOP BRACKET & PIN DIMENSIONS

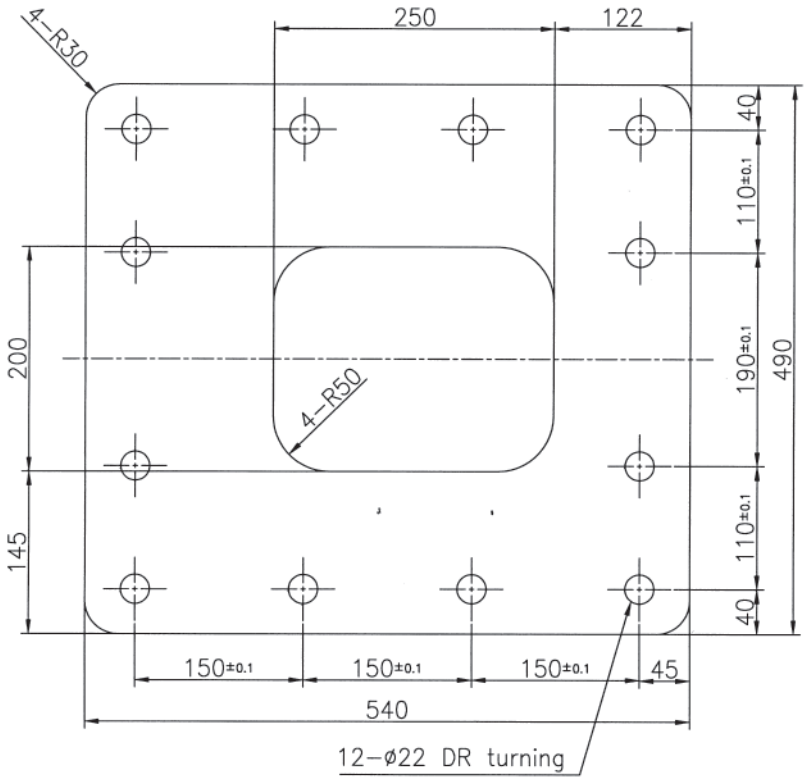
NO	PROJECT	A	B	C	D	E	F
1	RB 50SSG	230	170	-	65	136	45
2	RB 100G	355	260	40	56	136	45
3	RB 125G	355	260	40	56	-	50
4	RB 250G	380	305	45	70	245	50
5	RB 500GG	406	314	50	80	250	65

NO	PROJECT	A	B	C	D	E	F
1	RB 750GG	450	350	63	100	315	80
2	RB 1000GG	450	350	63	100	315	80
3	RB 1300GG	520	440	78	120	415	90
4	RB 1640GG	520	440	78	120	415	90
5	RB 2250GG	582	500	73	140	-	100

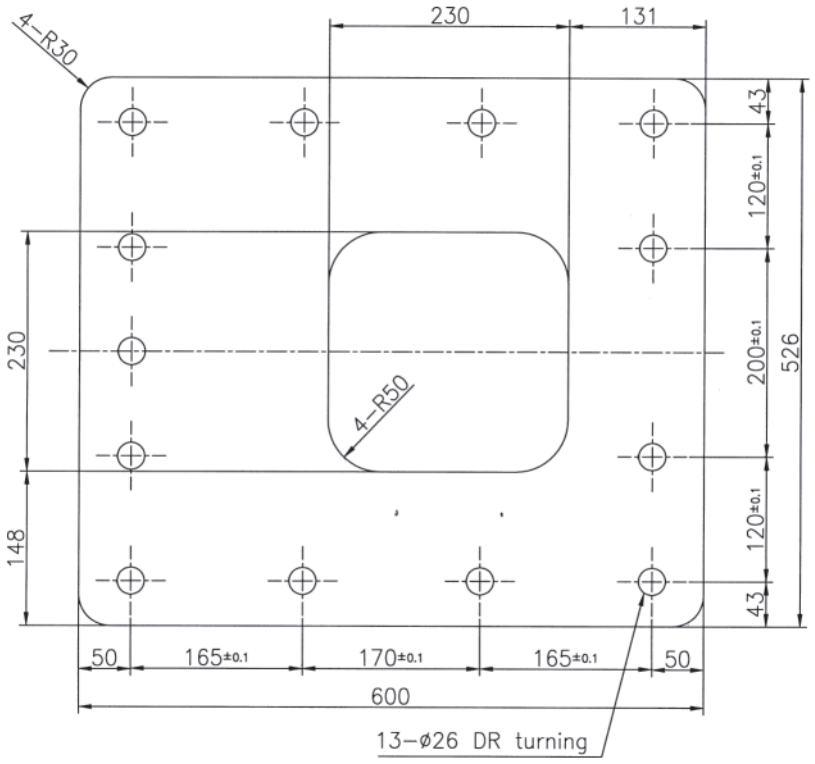
RB 500GG TOP BRACKET BOLT PATTERN



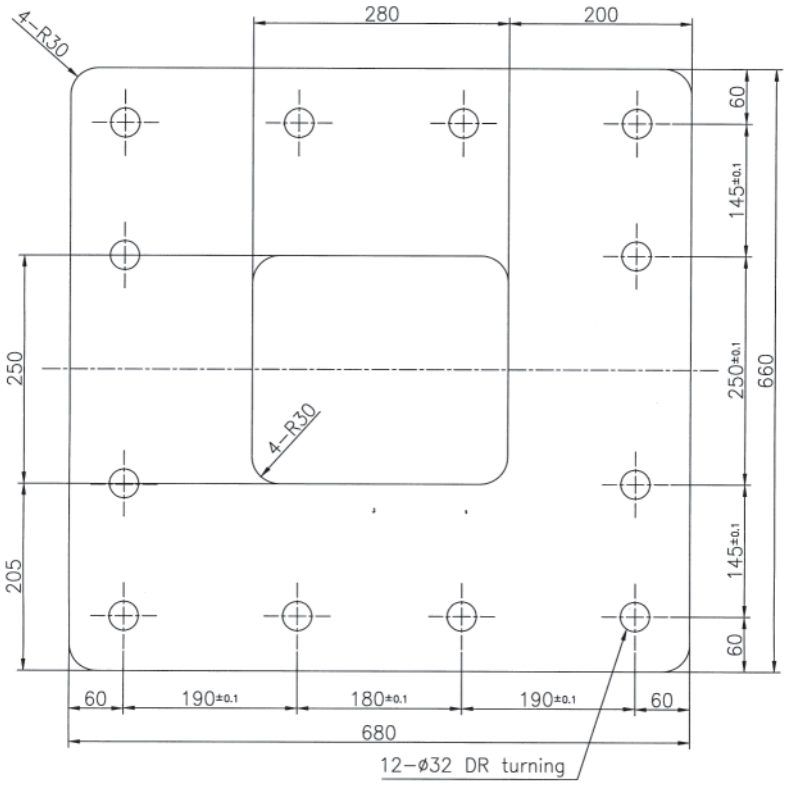
RB 750GG TOP BRACKET BOLT PATTERN



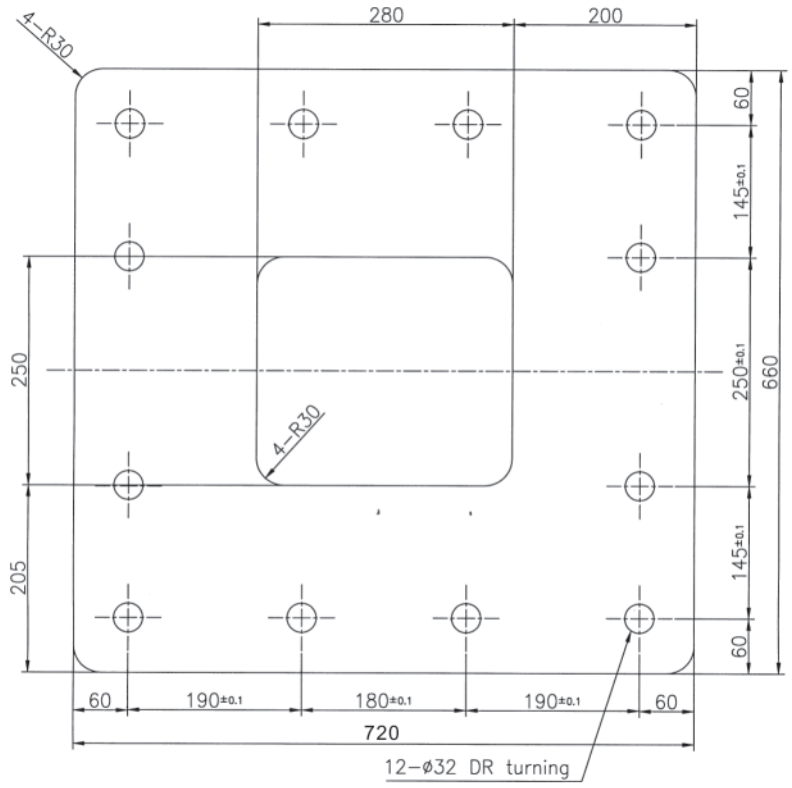
RB 1000GG TOP BRACKET BOLT PATTERN



RB 1300GG TOP BRACKET BOLT PATTERN



RB 1640GG TOP BRACKET BOLT PATTERN



RB 2250GG TOP BRACKET BOLT PATTERN