



SERVICE MANUAL

CB 140, CB 160, CB 200, CB 20, CB 210, CB 230, CB 260, CB 300, CB 380, CB 400, CB 40, CB 550, CB 60, CB 61, CB 62, CB 70, CB 800, CB 80

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Tools	89
[89.700] Hammer	89.1
[89.165] Water kit	89.2



INTRODUCTION

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Foreword



This warning symbol means risk of fatalities or personal injury if the instructions are not followed.

- This service manual is intended as a guide and/or instruction for correct use and maintenance of the breaker, shall be read through very carefully before installation, inspection, maintenance, repair or any other service of the breaker.
- Keep this manual at the workshop and mobile service vehicle so that it is always at hand. Repurchase it if it is lost.
- The breaker operator's manual is written to apply for various markets.
- Therefore, we ask you to disregard the sections which are not applicable to your breakers and/or carriers.
- Many hours are spent on design and production to make breakers serviceable as efficiently and safely as possible.
- The accidents which occur in spite of this, are mostly caused by the human factor. A safety conscious person and well serviced/maintained breaker make a safe, efficient and profitable combination. Therefore, read the safety instructions and follow them.
- We continually strive to improve our products and to make them more efficient through changes to their design.
- We retain the right to make these changes without committing ourselves to introducing these improvements on products which have already been delivered.
- We also retain the right to change data and equipment, as well as instructions for service and maintenance measures without prior notice.
- Be sure you are thoroughly familiar with the positions and functions of all instruments and controls of the carrier, along with the instructions in the service manual before service or maintenance is carried out or before running the breaker.
- The breaker manufacturer will not accept any responsibility if any tools or work methods other than those described in this service manual are used.

Specifications and applicable carrier

- Each and every breaker was produced for its own specifications and its dedicated applicable carrier, see **Hammer - General specification (89.700)**.
- Make sure that all breakers used within the range of specifications and applicable carrier.

NOTE: *Warranty is void if any breaker has been used and/or serviced beyond the range of specifications and/or applicable carrier.*

Warranty registration Card

- Breaker installation on the carrier must be carried out according to the instruction of this service manual.
- Particularly when brand new breaker is installed on the carrier for the first time, delivery, and inspection information must be provided to the breaker manufacturer in the form of Warranty Registration Card.

NOTE: *Warranty is void if no Warranty Registration Card is submitted.*

- For warranty registration card, see **Statement - Warranty registration card ()** .

Failure and/or warranty claim report

- The breaker manufacturer must be immediately informed of any defect and the defective product shall not be operated until the defect has been rectified.
- The breaker manufacturer has to have a written statement form of this concerning any defect during the warranty time.

NOTE: *The breaker manufacturer has to be informed within five days from the date of defect. Otherwise the breaker manufacturer is discharged from the warranty responsibility as far as the defect in question is concerned.*

- For failure and/or warranty claim report, see **Statement - Failure and/or warranty claim report ()** .

Statement - Warranty registration card

Customer and Dates Related

Distributor Name		Date of Delivery to dealer	
Customer Name		Date of Install	
Customer Address			

Breaker

Model		Gas Pressure (B/H)	___ Kg/cm2
Serial Number		Gas Pressure (Acc')	___ Kg/cm2

Accessories delivered with breaker to the customer

No.	Accessories		No.	Accessories	
1	Breaker tool	Yes <input type="checkbox"/> No <input type="checkbox"/>	6	Tool box	Yes <input type="checkbox"/> No <input type="checkbox"/>
2	Gas charging kit	Yes <input type="checkbox"/> No <input type="checkbox"/>	7	Operation manual	Yes <input type="checkbox"/> No <input type="checkbox"/>
3	Gas cylinder	Yes <input type="checkbox"/> No <input type="checkbox"/>	8	Breaker bracket	Yes <input type="checkbox"/> No <input type="checkbox"/>
4	Spring guard hose	Yes <input type="checkbox"/> No <input type="checkbox"/>	9	9 Part catalog	Yes <input type="checkbox"/> No <input type="checkbox"/>
5	Maintenance tools	Yes <input type="checkbox"/> No <input type="checkbox"/>	10	ALS (option)	Yes <input type="checkbox"/> No <input type="checkbox"/>

Brand		Manufactured Year	
Model		Total Weight	

Operating Pressure	___ Kg/cm2	Main Relief Set Pressure	___ Kg/cm2
Oil Flow	___ L/min	2nd Relief Set Pressure	___ Kg/cm2
Hours (when installed)		Max. Output of Pumps Supplying	___ L/min

Warranty

Date of Start		Date of Expiry	
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Acknowledgement & Comment

Inspector's Comment / Distributor	SIGNATURE
	Date :
Inspector's Comment / Customer	SIGNATURE
	Date :

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Required photos for failure analysis

<p style="text-align: center;">PHOTO</p> <p style="text-align: center;">PHOTO 1</p>	<p style="text-align: center;">PHOTO</p> <p style="text-align: center;">PHOTO 2</p>
<p>Whole carrier body</p>	<p>Carrier hour meter</p>
<p style="text-align: center;">PHOTO</p> <p style="text-align: center;">PHOTO 3</p>	<p style="text-align: center;">PHOTO</p> <p style="text-align: center;">PHOTO 4</p>
<p>Whole breaker body</p>	<p>Breaker name plate</p>
<p style="text-align: center;">PHOTO</p> <p style="text-align: center;">PHOTO 5</p>	<p style="text-align: center;">PHOTO</p> <p style="text-align: center;">PHOTO 6</p>
<p>Breaker failure part</p>	<p>Breaker failure part</p>
<p style="text-align: center;">PHOTO</p> <p style="text-align: center;">PHOTO 7</p>	<p style="text-align: center;">PHOTO</p> <p style="text-align: center;">PHOTO 8</p>
<p>Breaker failure part</p>	<p>Breaker failure part</p>

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<p style="text-align: center;">PHOTO</p> <p style="text-align: center;">PHOTO 9</p>	<p style="text-align: center;">PHOTO</p> <p style="text-align: center;">PHOTO 10</p>
<p>Breaker failure part</p>	<p>Breaker failure part</p>
<p style="text-align: center;">PHOTO</p> <p style="text-align: center;">PHOTO 11</p>	<p style="text-align: center;">PHOTO</p> <p style="text-align: center;">PHOTO 12</p>
<p>Breaker failure part</p>	<p>Breaker failure part</p>

Note to the Owner

Spare parts order

When you need parts or some information concerning maintenance of your breaker, contact your local authorized dealer.

Required information:

1. Name of customer and contact person
2. Order number (when available)
3. Delivery address
4. Mode of delivery (air mail, etc.)
5. Required delivery date
6. Invoicing address
7. Model and serial number of breaker
8. Name, number and required amount of spare parts

NOTE: *Use of non-genuine parts may damage the breaker, will void the breaker warranty.*







Modification and welding

Non approved modification and/or welding can cause injury and/or damage. Consult with the breaker manufacturer.

NOTE: *Non approved modification and/or void the breaker warranty.*

Safety signs

- Warning decals are on various places of the breaker.
- The operator should pay attention to the warning decals and ensure use, maintenance and service of the breaker to be carried out accordingly, see reference information below.
- The warning decals should be cleaned and legible.
- Any missing, illegible or damaged decals should be replaced by the operator.
- When any part where the decal is positioned is replaced the decal must also be replaced by the operator.

Sign	Image Content	Reference
	Head wearing ear protection	Must wear ear protection
	Operator's Manual Service Manual	Consult manual for proper use, maintenance and service procedures.
	Working breaker with diagonal slash	Keep away from breaking area while the breaker is working.
	Grease gun	Inject grease into grease nipple with grease gun periodically.
	Accumulator Back head	"HIGH PRESSURE" Discharge prior to disassembly
	High temperature	Keep away as the breaker is so "HOT"

Personal safety

General information

All mechanical equipment can be hazardous if operated without due care or correct maintenance. Most accidents involving breaker commissioning, maintenance and repair are caused by failing in observing basic safety rules or precautions.

The accident can often be avoided by recognizing potentially hazardous situations before it occurs. Since it is impossible to anticipate every possible circumstance that might involve a potential hazard, the warnings in this Service Manual and on the breaker are not all inclusive.

If any procedure, tool, working method or operating technique not specifically recommended by the manufacturer is used, you must make sure that it is safe for yourself and others, also ensure that the breaker will not be damaged or handled unsafe by your selected method of servicing or operating procedures.

Safety is not just a matter of responding to the warnings. When working with the breaker, always pay attention to what hazards there might be and how to avoid them.

Do not work with the breaker until you are sure that you can control it. Do not start any job until you are sure that you and those around you will be safe.

WARNING

Read the following warning messages carefully which explain various hazards and how to avoid them.

Service manual

- Read and understand the service manual.
- The operator must be thoroughly familiar with how to operate and maintain the breaker and should undergo required training on the breaker.
- The operator must follow the rules and recommendations given in this Operator's Manual and the Carrier Operator's Manual, also pay attention to any statutory and national regulations or specific requirements or risks that apply to the work site.
- If anything is unclear or not understandable on the Operator's Manual or requires additional explanation, contact your authorized dealer.

Care and alertness

- When working with the breaker, always be careful and stay alert for hazard. The risks of serious or even fatal accident increase when you are intoxicated or under the influence of alcohol or drugs.

Clothing and protective items

- Suitable clothing for safe handling should be worn.
- Use a hard hat, safety glasses, protective shoes and gloves and an approved respirator (dust mask), also other protective items when required.

Training

- You and others can be injured or even killed if you perform unfamiliar operations without practicing them first. Practice away from the work site, in a clear area.
- Keep other persons away. Do not perform any new operations until you are sure you can do them safely.

Oil at high pressure

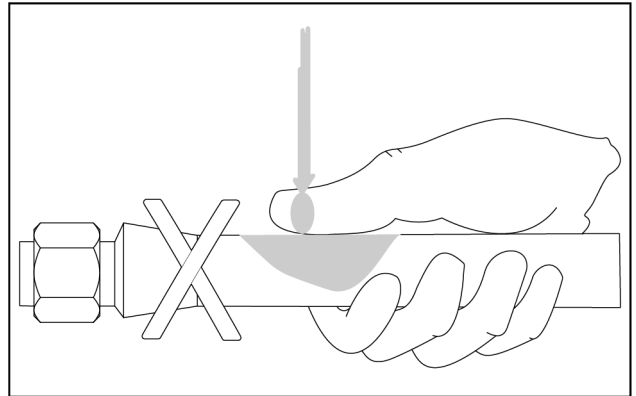
⚠ CAUTION

Escaping fluid!

Hydraulic fluid or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injury. To prevent personal injury: Relieve all pressure before disconnecting fluid lines or performing work on the hydraulic system. Before applying pressure, make sure all connections are tight and all components are in good condition. Never use your hand to check for suspected leaks under pressure. Use a piece of cardboard or wood for this purpose. If injured by leaking fluid, see your doctor immediately.

Failure to comply could result in minor or moderate injury.

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- Hydraulic oil at system pressure can be dangerous. Before disconnecting or connecting hydraulic hoses, turn off the engine, operate the controls to release pressure trapped in the hoses and wait **10 min**. While operating, keep persons away from the hydraulic hoses.
- Fine jets of hydraulic oil at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic oil leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of hydraulic oil. If hydraulic oil has penetrated your skin, seek medical treatment immediately.

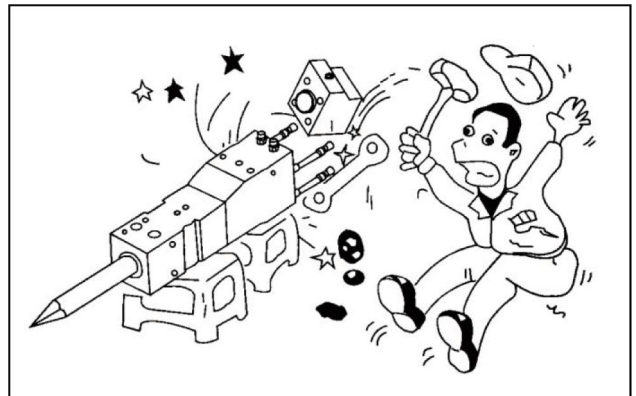
Pressure accumulator

- The breaker incorporates pressure accumulator. The accumulator is pressurized even after hydraulic pressure has been released from the breaker. Attempting to remove or dismantle the accumulator without first releasing the pressure can cause severe injury or death. Do not try to dismantle pressure accumulator, contact your authorized dealer.

Back head, gas charging valve and accumulator cover

NOTICE: *Disassembly with gas or hydraulic pressure kept inside the breaker is very dangerous and may cause injury to the mechanics.*

When disassembling back head, gas charging valve or accumulator cover, all of sudden it may spring out due to gas or hydraulic pressure that remains inside the breaker. Before disassembling any of those parts, you must ensure that gas and hydraulic pressures are fully discharged.



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Charging Nitrogen gas

⚠ WARNING

Explosion hazard!

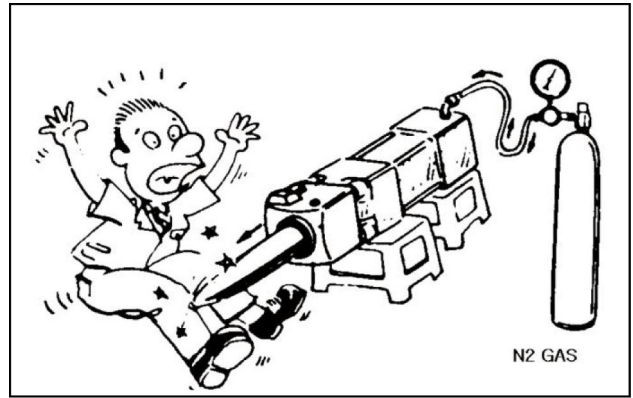
Use only **DRY** nitrogen when charging the accumulator. Do not use air or oxygen that will cause an explosion.

Failure to comply could result in death or serious injury.

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NOTICE: Tool may spring out of the power cell when charging Nitrogen gas into back head, may cause injury to the mechanics. Do not stand in front of the tool.



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Basic instructions - Maintenance plan

All hydraulic components of breaker require your handling of great care and cleanliness. Dirt is the worst enemy to all hydraulic parts of the breaker. Ensure that all hydraulic parts are clean and covered by clean lint-free cloth.

Do not use any materials other than designed for cleaning hydraulic part purpose. Never use water or carbon tetrachloride.

NOTE: Read through following instruction and carry out maintenance of the breaker accordingly. Warranty is void if any breaker has not been maintained according to the maintenance instruction of this service manual.

Maintenance interval

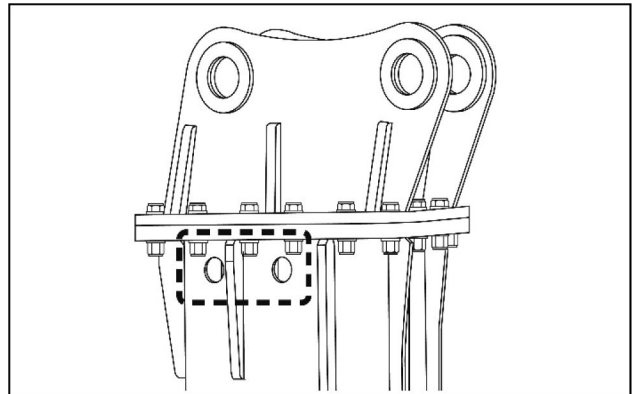
NOTE: Hours are carrier hours while the breaker is mounted/used on/by the carrier, including installation, breaking operation, repositioning on the rocks, etc. whether breaker piston is striking or not.

Every 2 hours

1. Apply grease on tool, tool pins and bushes till grease is visible on the tool underneath housing.
2. Check breaker paste or grease residual volume in the cartridge if ALS is mounted.
3. Tighten loose fittings and connections if necessary.
4. Check if breaker impact is efficient enough and if breaker is striking at constant speed.

Every 10 hours or once a week, whichever comes first

1. Remove tool and tool pins, then check their wearing shape and amount.
2. Replace or repair tool and tool pins upon wear limit and repair instruction, if necessary. See **Hammer - Repair (89.700)**.
3. Check if tool and lower bush are sufficiently greased. If not, apply grease more frequently.
4. Check through bolt & nut condition by hitting them with steel bar via Service Window 2 holes on each side on the housing.



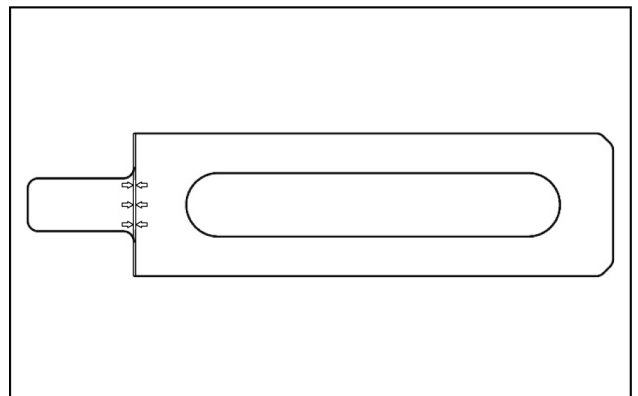
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Every 50 hours or once a month, whichever comes first

1. Check wearing amount of tool pin, tool shank and bushes. Replace them if they have reached wear limit. See **General specification - Wear limits ()**.

NOTE: Upper bush must be replaced when it has reached wear limit or at every second replacement of lower bush, whichever comes first. Upper bush wearing can be measured with the jig, illustrated below. The jig is supplied with breaker as standard accessory.

2. Check back head gas pressure and, if necessary, adjust the pressure to suit the specification.
3. Check hydraulic and grease hoses and replace them if necessary.



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Every 500/600 hours

Replace consumable and wear parts upon the maintenance interval.

Maintenance interval of consumable and wear parts

Consumable parts should be replaced upon below maintenance interval.

CB20 ~ CB160

Part	600 h or 6 months	1200 h or 12 months	1800 h or 18 months	2400 h or 24 months
Seals	X	X	X	X
Hydraulic hose*		X		X
Diaphragm	X	X	X	X
Accumulator body bolt			X	
O-ring of gas valve set			X	
Through bolt set			X	
Tool pin	Replace upon wear limit guide. See General specification - Wear limits () .			
Bottom damper				
Lower bush				
Stopper pin				
Shell pad				
Upper damper				
Upper bush				

NOTE: Hours or months on above table should be applicable, whichever comes first.

NOTE: * Check hose condition and replace if necessary.

NOTE: Hours are carrier hours while the breaker is mounted/used on/by the carrier, including installation, breaking operation, repositioning on the rocks, etc. whether breaker piston is striking or not.

CB210 ~ CB800

Part	500 h or 6 months	1000 h or 12 months	1500 h or 18 months	2000 h or 24 months
Seals	X	X	X	X
Hydraulic hose*		X		X
Diaphragm	X	X	X	X
Accumulator body bolt			X	
O-ring of gas valve set			X	
Through bolt set			X	
Tool pin	Replace upon wear limit guide. See General specification - Wear limits () .			
Bottom damper				
Lower bush				
Stopper pin				
Shell pad				
Upper damper				
Upper bush				

NOTE: Hours or months on above table should be applicable, whichever comes first.

NOTE: * Check hose condition and replace if necessary.

NOTE: Hours are carrier hours while the breaker is mounted/used on/by the carrier, including installation, breaking operation, repositioning on the rocks, etc. whether breaker piston is striking or not.

The end users are highly recommended to keep fast moving spare parts in stock close to the breaker such as tool, tool pin, stopper pin, rubber plug/cover, through bolt and hoses.

The above maintenance interval should be respected by the end users and/or the operators. Lack of respect can void the warranty of breaker.

NOTE: Consumption of spare and wear parts varies upon the condition of breaker and/or carrier, operator's skill, work material, job site condition, etc.

Therefore, if necessary, the parts should be replaced more frequently than the interval stated on above table.

Maintenance interval of special application breaker

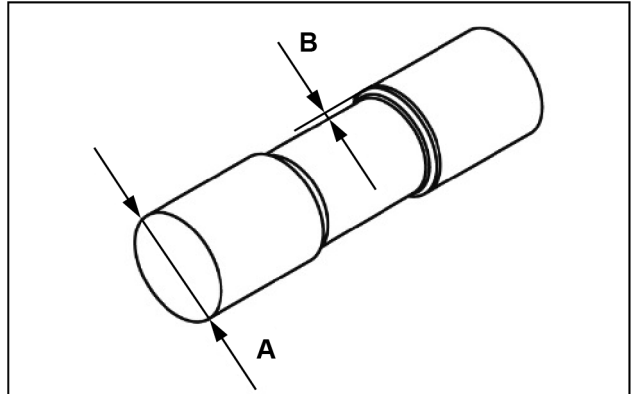
Breaker maintenance requirements to the special application are much higher than the conventional applications.

Therefore breaker maintenance interval at the special applications including but not limited to underground, tunneling, foundry cleaning, underwater, extremely low or high temperature, etc. is much shorter than the conventional. Consult with your authorized dealer.

General specification - Wear limits

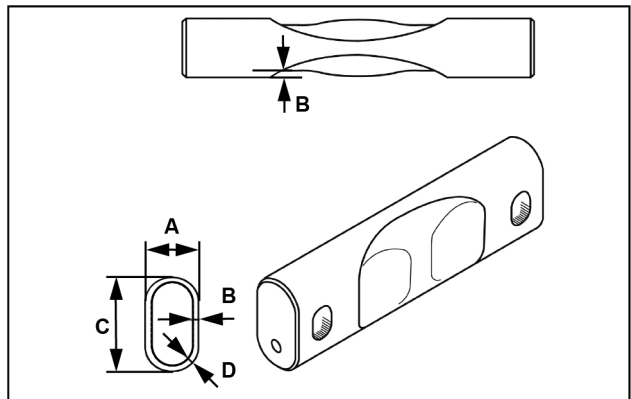
Tool pin

CB20 ~ CB61, CB80



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CB62, CB70, CB140 ~ CB800



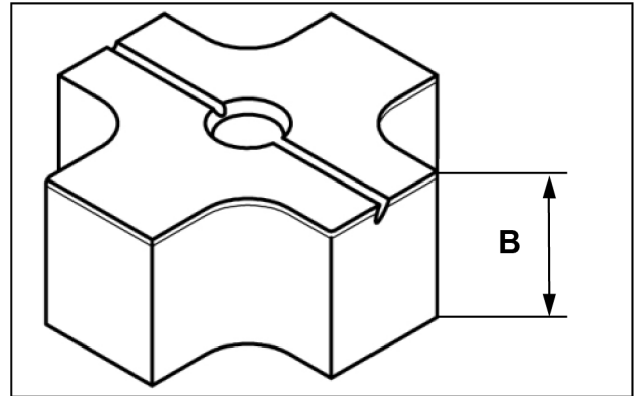
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Model	Standard valve (A)	Wear limit (B)	Standard valve (C)	Wear limit (D)
CB20	25.00 mm (0.98 in)	2.00 mm (0.08 in)	-	-
CB40	30.00 mm (1.18 in)	2.00 mm (0.08 in)	-	-
CB60, CB61	36.00 mm (1.42 in)	2.00 mm (0.08 in)	-	-
CB62, CB70	25.00 mm (0.98 in)	2.00 mm (0.08 in)	42.00 mm (1.65 in)	2.00 mm (0.08 in)
CB80	37.50 mm (1.48 in)	2.00 mm (0.08 in)	-	-
CB140	35.00 mm (1.38 in)	3.00 mm (0.12 in)	70.00 mm (2.76 in)	3.00 mm (0.12 in)
CB160	40.00 mm (1.57 in)	3.00 mm (0.12 in)	70.00 mm (2.76 in)	3.00 mm (0.12 in)
CB200	40.00 mm (1.57 in)	3.00 mm (0.12 in)	70.00 mm (2.76 in)	3.00 mm (0.12 in)
CB210	40.00 mm (1.57 in)	3.00 mm (0.12 in)	90.00 mm (3.54 in)	3.00 mm (0.12 in)
CB230	45.00 mm (1.77 in)	3.00 mm (0.12 in)	100.00 mm (3.94 in)	4.00 mm (0.16 in)
CB260	50.00 mm (1.97 in)	3.00 mm (0.12 in)	95.00 mm (3.74 in)	3.00 mm (0.12 in)
CB300	50.00 mm (1.97 in)	3.00 mm (0.12 in)	112.00 mm (4.41 in)	4.00 mm (0.16 in)
CB380	52.00 mm (2.05 in)	3.00 mm (0.12 in)	115.00 mm (4.53 in)	4.00 mm (0.16 in)
CB400	50.00 mm (1.97 in)	3.00 mm (0.12 in)	125.00 mm (4.92 in)	4.00 mm (0.16 in)
CB550	50.00 mm (1.97 in)	3.00 mm (0.12 in)	134.00 mm (5.28 in)	4.00 mm (0.16 in)
CB800	65.00 mm (2.56 in)	5.00 mm (0.20 in)	160.00 mm (6.30 in)	5.00 mm (0.20 in)

NOTE: Tool pin wearing beyond the limit may cause failure of tool as well as tool pin.

Upper damper

Model	Standard valve	Wear limit (B)
CB20 - CB61	54.00 mm (2.13 in)	52.00 mm (2.05 in)
CB62 - CB80	78.00 mm (3.07 in)	75.00 mm (2.95 in)
CB140	100.00 mm (3.94 in)	96.00 mm (3.78 in)
CB160 - CB210	110.00 mm (4.33 in)	106.00 mm (4.17 in)
CB230 - CB550	125.00 mm (4.92 in)	121.00 mm (4.76 in)
CB800	147.00 mm (5.79 in)	142.00 mm (5.59 in)

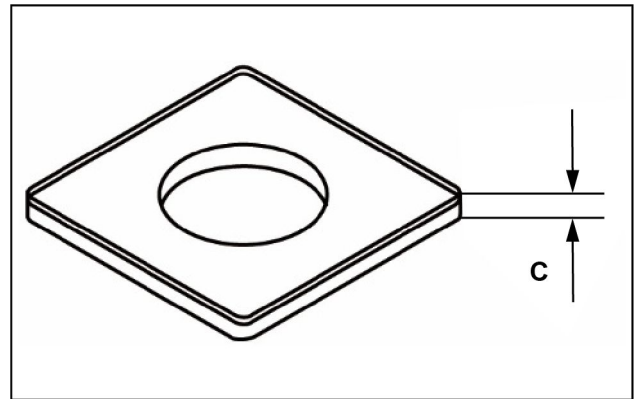


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NOTE: Upper damper wearing beyond the limit may cause shaking of power cell and various parts failure of power cell and housing.

Bottom damper

Model	Standard valve	Wear limit (C)
CB20 - CB210	20.00 mm (0.79 in)	18.00 mm (0.71 in)
CB230 - CB550	25.00 mm (0.98 in)	22.00 mm (0.87 in)
CB800	35.00 mm (1.38 in)	31.00 mm (1.22 in)



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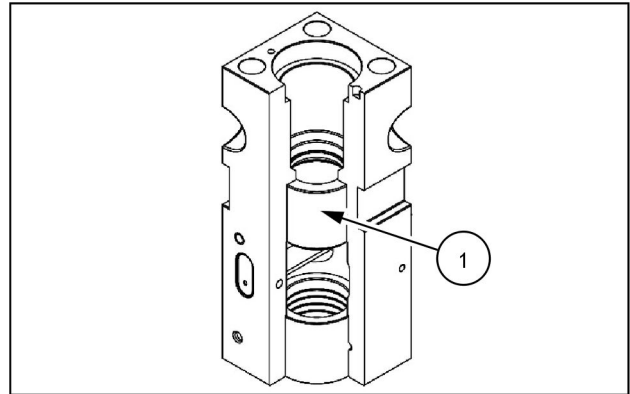
NOTE: Upper damper wearing beyond the limit may cause shaking of power cell and various parts failure of power cell and housing.

Upper bush

NOTE: The upper bush is assembled inside front head block (CB62, CB70 & above).

NOTE: The upper bush is built in front head as part of front head block (CB20, CB40, CB60, CB61).

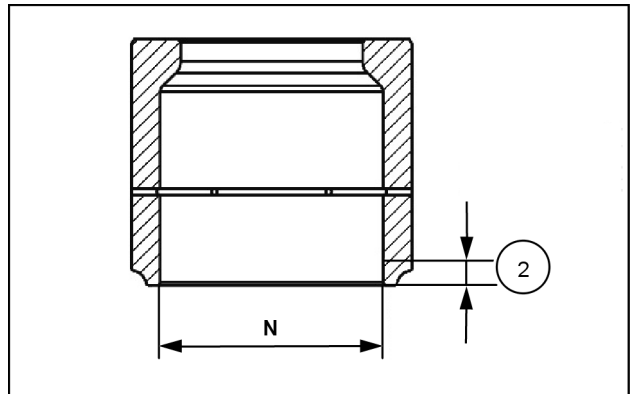
NOTE: Upper bush (1) wearing may affect breaker performance decrease and cause piston and tool failure. Therefore the operator should check upper bush wearing amount by periodical monitoring and replace upper bush or front head in case wearing amount has reached the limit. See wear limit table below.



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Measure at **10 mm** from the end of upper bush (2).

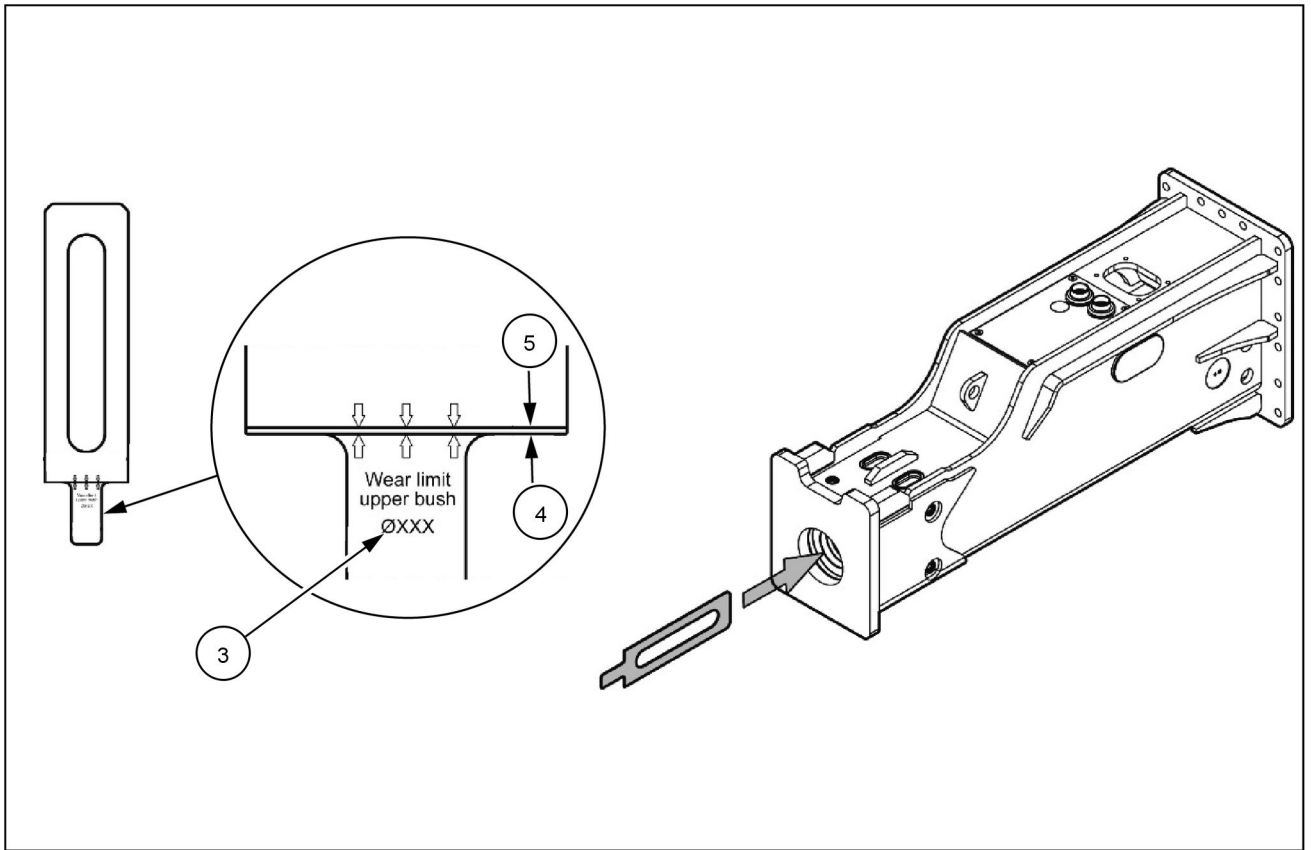
Model	Standard valve (N)	Wear limit
CB20	45.00 mm (1.77 in)	50.00 mm (1.97 in)
CB40	57.00 mm (2.24 in)	62.00 mm (2.44 in)
CB60, CB61	70.00 mm (2.76 in)	75.00 mm (2.95 in)
CB62, CB70	75.00 mm (2.95 in)	80.00 mm (3.15 in)
CB80	80.00 mm (3.15 in)	86.00 mm (3.39 in)
CB140	105.00 mm (4.13 in)	111.00 mm (4.37 in)
CB160	115.00 mm (4.53 in)	121.00 mm (4.76 in)
CB200	125.00 mm (4.92 in)	131.00 mm (5.16 in)
CB210, CB230	135.00 mm (5.31 in)	142.00 mm (5.59 in)
CB260	145.00 mm (5.71 in)	153.00 mm (6.02 in)
CB300	150.00 mm (5.91 in)	158.00 mm (6.22 in)
CB380	155.00 mm (6.10 in)	164.00 mm (6.46 in)
CB400	165.00 mm (6.50 in)	174.00 mm (6.85 in)
CB550	175.00 mm (6.89 in)	184.00 mm (7.24 in)
CB800	200.00 mm (7.87 in)	209.00 mm (8.23 in)



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NOTE: For CB62 & above, the jig to measure upper bush wearing is supplied with breaker as standard accessories. See the image 7 below, put the jig into the hole of breaker housing, then replace upper bush if bottom of lower bush touches the Limit Line of jig.

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PTIL19GEN0108FA 7

3. Jig reference	5. Limit line
4. End line	

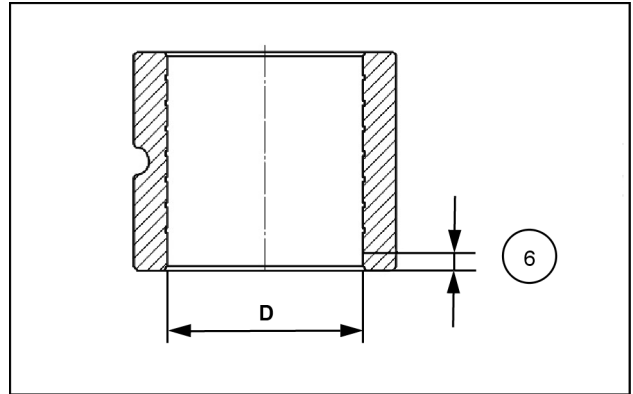
Jig reference	Model
Ø75	CB20
Ø75	CB70
Ø80	CB80
Ø105	CB140
Ø115	CB160
Ø125	CB200
Ø135	CB210, CB230
Ø145	CB260
Ø150	CB300
Ø155	CB380
Ø165	CB400
Ø175	CB550
Ø200	CB800

NOTE: In case the jig has been lost, ensure that you purchase new one from an authorized dealer, upon below upper bush jig reference table.

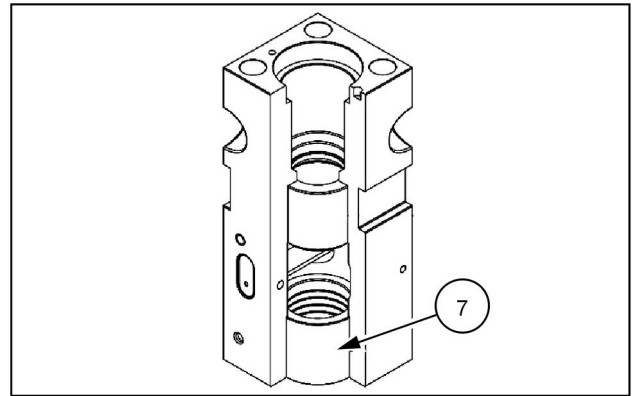
Lower bush

- Measure at **10 mm** from the end of lower bush (6).
- Lower bush (7).

Model	Standard valve (D)	Wear limit
CB20	45.00 mm (1.77 in)	48.00 mm (1.89 in)
CB40	57.00 mm (2.24 in)	60.00 mm (2.36 in)
CB60, CB61	70.00 mm (2.76 in)	73.00 mm (2.87 in)
CB62, CB70	75.00 mm (2.95 in)	78.00 mm (3.07 in)
CB80	80.00 mm (3.15 in)	84.00 mm (3.31 in)
CB140	105.00 mm (4.13 in)	109.00 mm (4.29 in)
CB160	115.00 mm (4.53 in)	119.00 mm (4.69 in)
CB200	125.00 mm (4.92 in)	129.0 mm (5.1 in)
CB210, CB230	135.00 mm (5.31 in)	140.00 mm (5.51 in)
CB260	145.00 mm (5.71 in)	151.00 mm (5.94 in)
CB300	150.00 mm (5.91 in)	156.00 mm (6.14 in)
CB380	155.00 mm (6.10 in)	162.00 mm (6.38 in)
CB400	165.00 mm (6.50 in)	172.00 mm (6.77 in)
CB550	175.00 mm (6.89 in)	182.00 mm (7.17 in)
CB800	200.00 mm (7.87 in)	207.00 mm (8.15 in)



PTIL19GEN0109FA 8



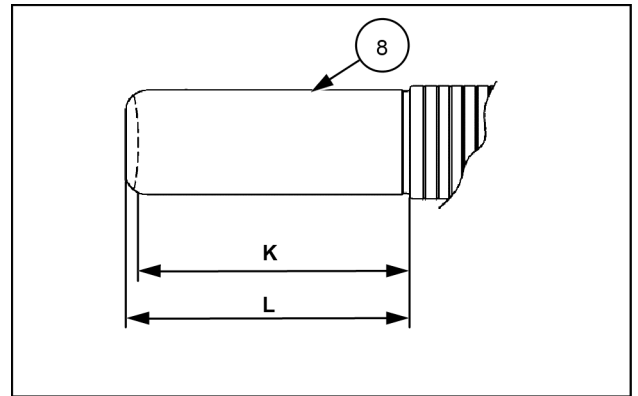
PTIL19GEN0106AA 9

NOTE: Upper damper wearing beyond the limit may cause shaking of power cell and various parts failure of power cell and housing.

Piston

Piston bottom (8).

Model	Standard valve (L)	Wear limit (K)
CB20	150.00 mm (5.91 in)	149.00 mm (5.87 in)
CB40	168.00 mm (6.61 in)	167.00 mm (6.57 in)
CB60, CB61	177.00 mm (6.97 in)	176.00 mm (6.93 in)
CB62, CB70	210.00 mm (8.27 in)	209.00 mm (8.23 in)
CB80	218.00 mm (8.58 in)	217.00 mm (8.54 in)
CB140	273.00 mm (10.75 in)	272.00 mm (10.71 in)
CB160	290.00 mm (11.42 in)	288.00 mm (11.34 in)
CB200	291.00 mm (11.46 in)	289.00 mm (11.38 in)
CB210	305.00 mm (12.01 in)	303.00 mm (11.93 in)
CB230	311.00 mm (12.24 in)	309.00 mm (12.17 in)
CB260	336.00 mm (13.23 in)	334.00 mm (13.15 in)
CB300	353.00 mm (13.90 in)	351.00 mm (13.82 in)
CB380	363.00 mm (14.29 in)	361.00 mm (14.21 in)
CB400	412.00 mm (16.22 in)	410.00 mm (16.14 in)
CB550	455.00 mm (17.91 in)	453.00 mm (17.83 in)
CB800	462.00 mm (18.19 in)	460.00 mm (18.11 in)

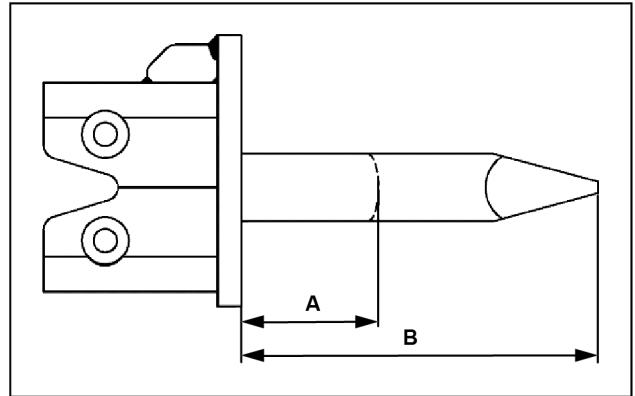


PTIL19GEN0110AA 10

NOTE: Piston wearing is highly sensitive to breaker performance. Any piston that has reached wear limit may cause malfunction of breaker, shall be replaced with brand new piston.

Tool

Model	Standard valve (B)	Wear limit (A)
CB20	258.00 mm (10.16 in)	200.00 mm (7.87 in)
CB40	331.00 mm (13.03 in)	
CB60, CB61	359.00 mm (14.13 in)	250.00 mm (9.84 in)
CB62, CB70	368.00 mm (14.49 in)	
CB80	454.00 mm (17.87 in)	
CB140	532.00 mm (20.94 in)	
CB160	561.00 mm (22.09 in)	
CB200	630.00 mm (24.80 in)	350.00 mm (13.78 in)
CB210	645.00 mm (25.39 in)	
CB230	674.00 mm (26.54 in)	400.00 mm (15.75 in)
CB260	657.00 mm (25.87 in)	450.00 mm (17.72 in)
CB300	643.00 mm (25.31 in)	
CB380	675.00 mm (26.57 in)	500.00 mm (19.69 in)
CB400	744.00 mm (29.29 in)	
CB550	781.00 mm (30.75 in)	550.00 mm (21.65 in)
CB800	835.00 mm (32.87 in)	

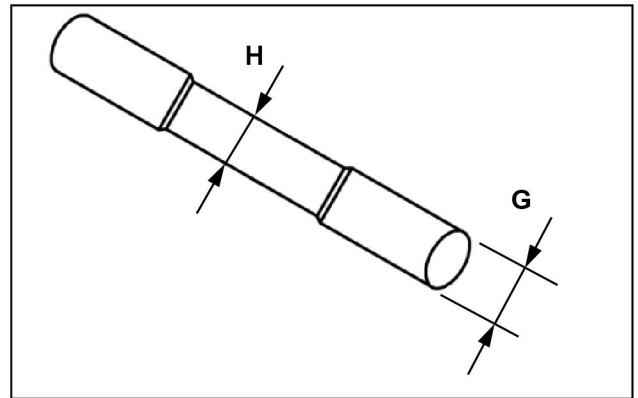


PTIL19GEN0111AA 11

NOTE: Use of tool beyond wear limit will led to shortening life time of housing and also dust/debris entering into breaker percussion chamber ultimately causing contamination failure.

Stopper pin

Model	Standard valve (G)	Wear limit (H)
CB20 - CB61	10.00 mm (0.39 in)	8.00 mm (0.31 in)
CB62, CB70	15.00 mm (0.59 in)	13.00 mm (0.51 in)
CB80	10.00 mm (0.39 in)	8.00 mm (0.31 in)
CB140 - CB260	17.50 mm (0.69 in)	15.50 mm (0.61 in)
CB300, CB380	21.50 mm (0.85 in)	19.50 mm (0.77 in)
CB400 - CB800	27.50 mm (1.08 in)	25.50 mm (1.00 in)



PTIL19GEN0112AA 12

NOTE: Stopper pin wearing over the limit may cause tool pin, tool and/or bush failures as well as stopper pin failure.

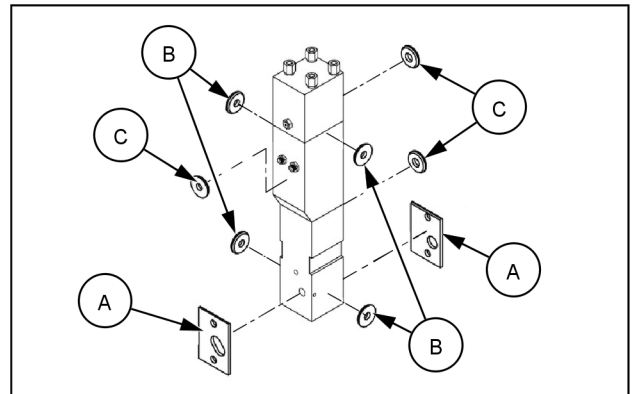
NOTE: When breaker striking force has been delivered to stopper pin over and over, it can be bent or deformed. Heavily bent or deformed stopper pin may not be removed from tool pin and bush, which will cause a significant amount of repair time and resource spending. Check stopper pin condition periodically and replace it with brand new before too late.

Shell pad

CB20 - CB80

Model	Standard valve (A)	Wear limits	Standard valve (B)	Wear limits	Standard valve (C)	Wear limits
CB20, CB40	12.00 mm (0.47 in)	10.50 mm (0.41 in)	22.00 mm (0.87 in)	20.5 mm (0.81 in)	12.00 mm (0.47 in)	10.50 mm (0.41 in)
CB60 - CB80	15.00 mm (0.59 in)	13.50 mm (0.53 in)	15.00 mm (0.59 in)	13.50 mm (0.53 in)	15.00 mm (0.59 in)	13.50 mm (0.53 in)

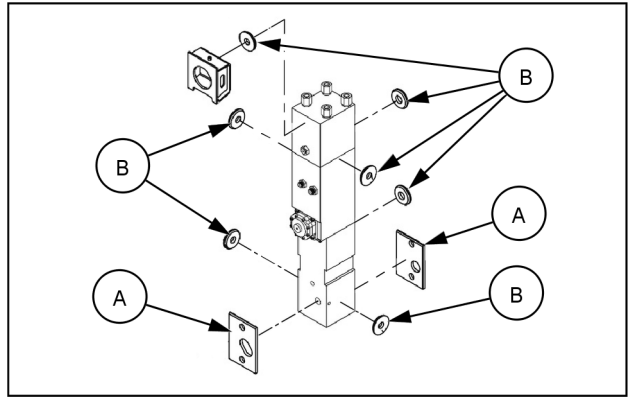
CB20, CB40



PTIL19GEN0113AA 13

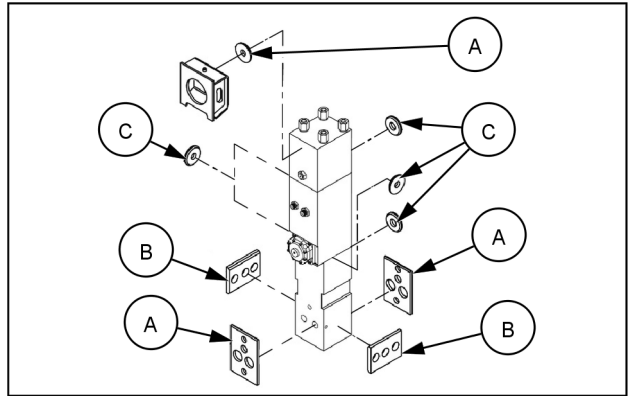
INTRODUCTION

CB60, CB61



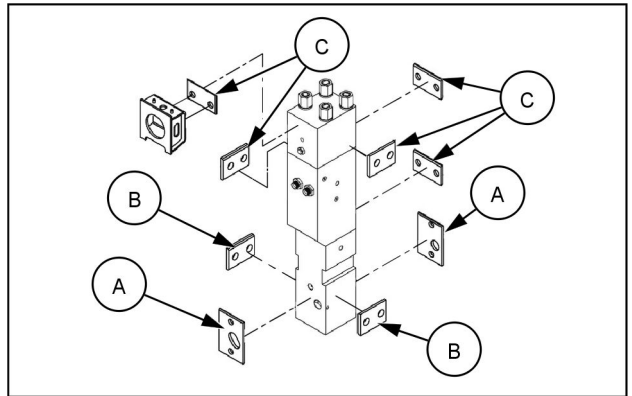
PTIL19GEN0114AA 14

CB62, CB70



PTIL19GEN0115AA 15

CB80

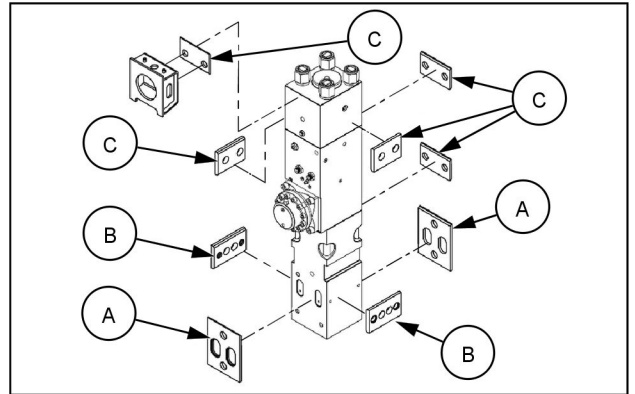


PTIL19GEN0116AA 16

CB140 - CB800

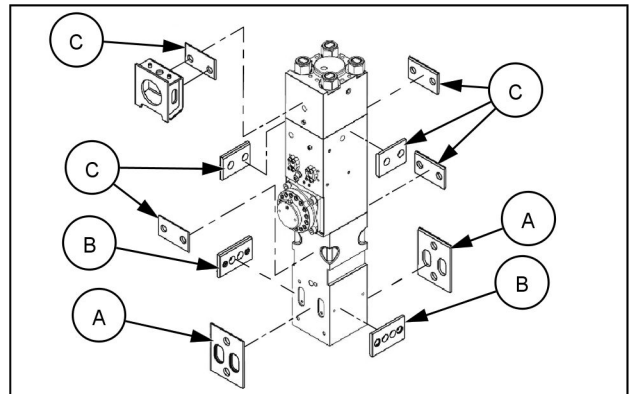
Model	Standard valve (A)	Wear limits	Standard valve (B)	Wear limits	Standard valve (C)	Wear limits
CB140 - CB800	15.00 mm (0.59 in)	13.50 mm (0.53 in)	15.00 mm (0.59 in)	13.50 mm (0.53 in)	15.00 mm (0.59 in)	13.50 mm (0.53 in)

CB140 - CB400



PTIL19GEN0117AA 17

CB550, CB800



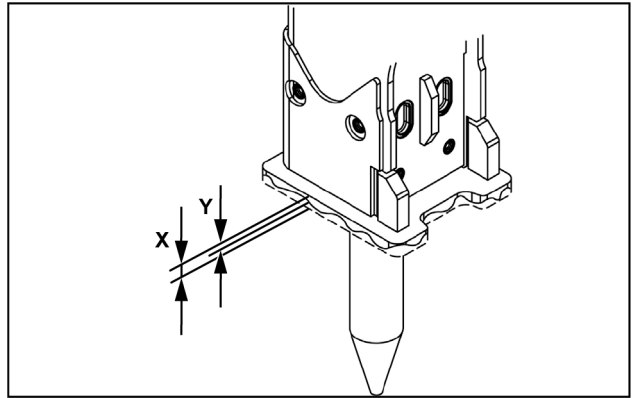
PTIL19GEN0118AA 18

NOTE: Shell pad wearing beyond the limit may cause shaking of power cell and various parts failure of power cell and housing.

NOTE: Also operating breaker with any missing shell pad may cause shaking of power cell and various parts failure of power cell and housing.

Housing bottom plate

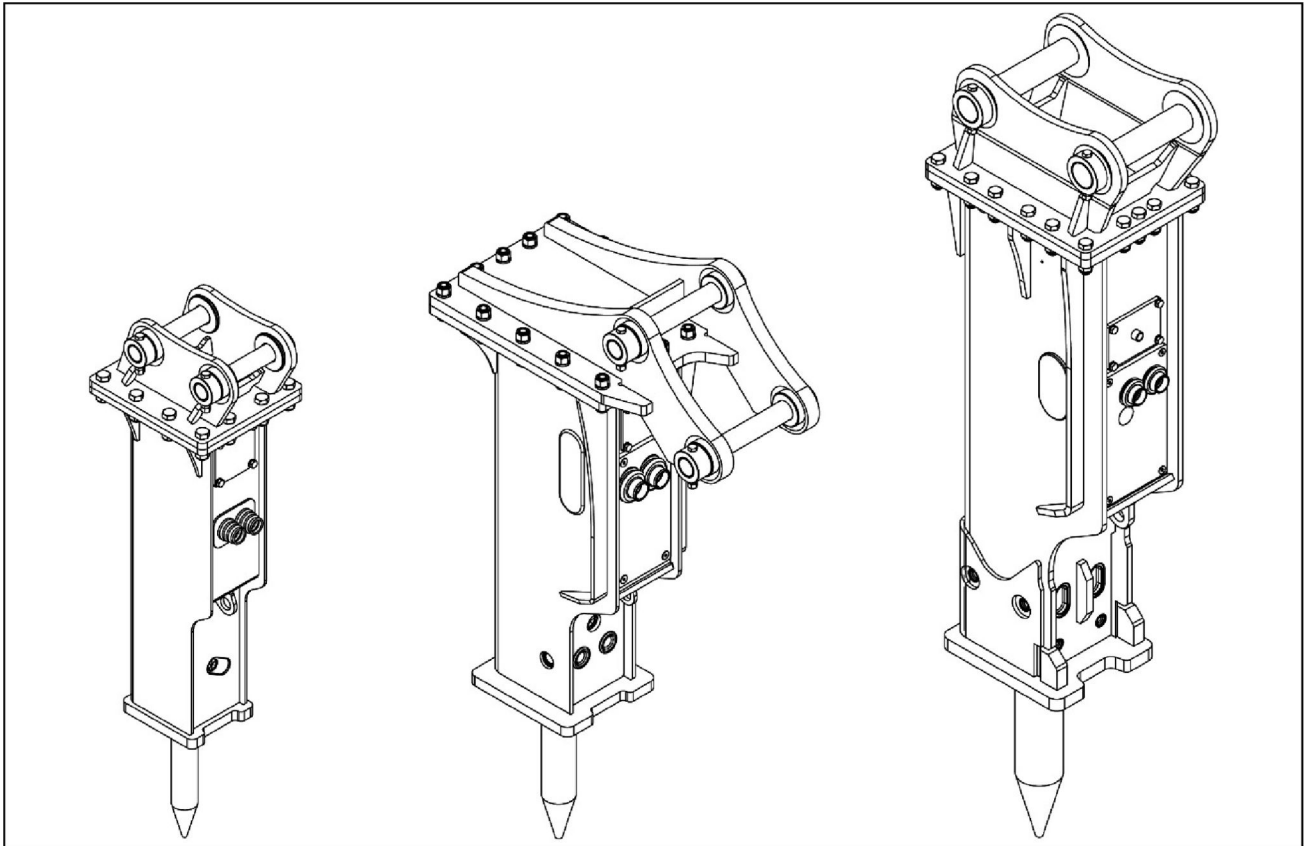
Model	Standard valve (X)	Wear limit (Y)
CB20 - CB140	25.00 mm (0.98 in)	15.00 mm (0.59 in)
CB160 - CB260	40.00 mm (1.57 in)	20.00 mm (0.79 in)
CB300, CB380	50.00 mm (1.97 in)	25.00 mm (0.98 in)
CB400	60.00 mm (2.36 in)	30.00 mm (1.18 in)
CB550, CB800	80.00 mm (3.15 in)	40.00 mm (1.57 in)



PTIL19GEN0119AA 19

NOTE: Bottom plate wearing over the limit may incur failure or shorter service life of housing, bottom damper and/or lower bush, shall be reinforced before too late.

Product overview



PTIL19GEN0001FA 1

- The breaker is a hydraulically powered breaker. It can be used on any carrier with correct carrier weight, hydraulic flow and necessary mechanical installation requirements.
- Breaker works by repeatedly raising a steel piston and driving it down onto the head of a removable breaking tool.
- No additional pressure accumulators are necessary for the carrier since the integrated pressure accumulator absorbs hydraulic pressure peaks. The breaker impact energy is almost constant and independent of the carrier's hydraulic system.

Removal from packaging

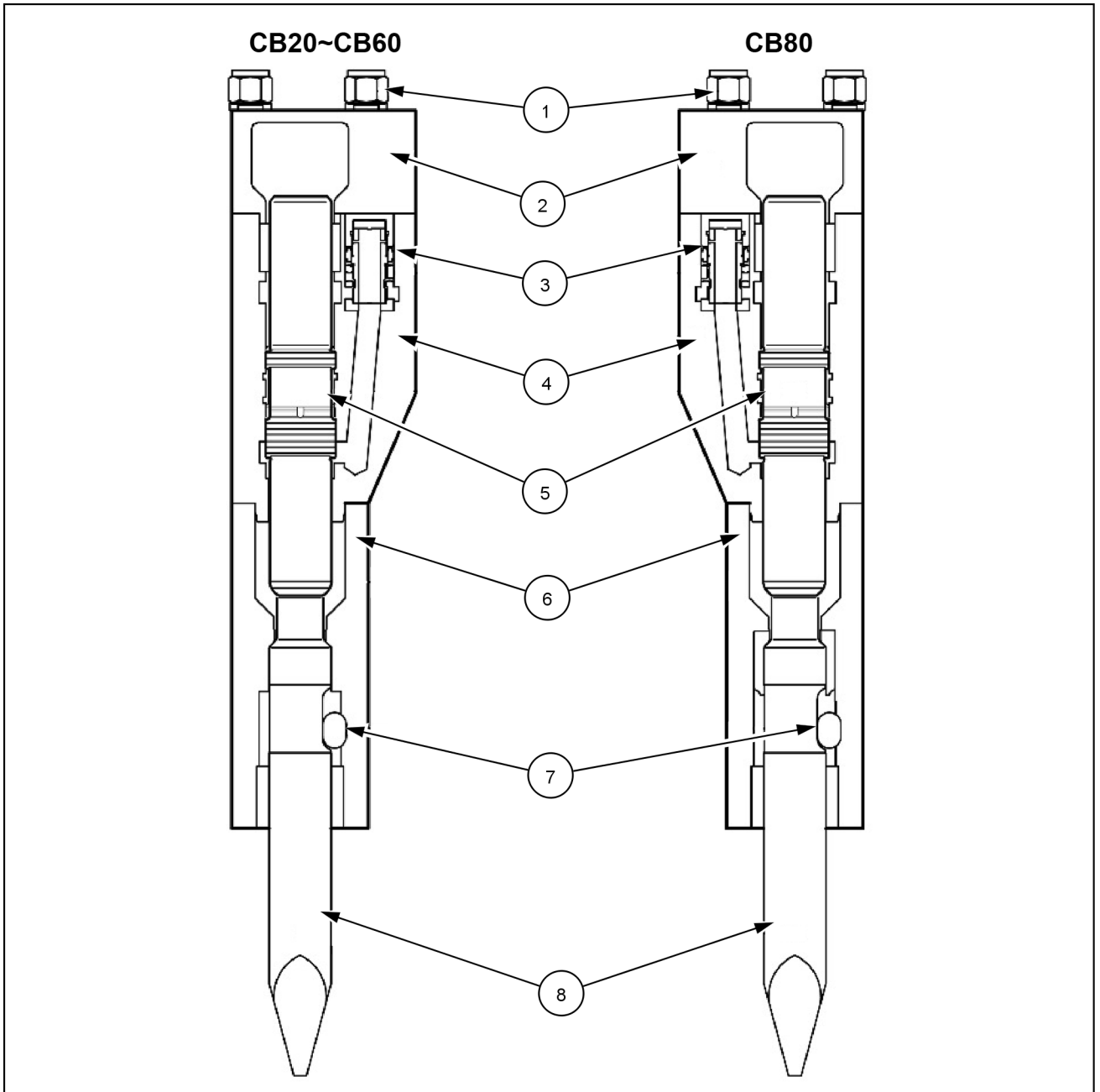
- Remove all steel belts from the packaging. Open the packaging and remove all plastics covering the product. Scrap steel belts and plastics.
- Wooden frames and boxes as well as steel bolts and plastics can be recycled.
- Check if the breaker is in good condition and there is no visible damage.
- Check if all ordered parts and accessories have been enclosed with the breaker. Some options may be provided by your local dealer such as installation kits, hoses, breaker bracket, etc.

Main structure of hydraulic breaker

Breaker consists of five main sections such as Cylinder, Piston, Control valve, Front head and Back head.

- Four through bolts are holding cylinder, back head and front head together.
- Cylinder contains piston, control valve and accumulator where Nitrogen gas is charged.
- Piston strikes the working tool by oil & gas pressures.
- Control valve located inside cylinder determines direction of piston movement.
- Tool pins are located inside front head, limiting tool stroke distance.
- Back head has a chamber where Nitrogen gas is charged.

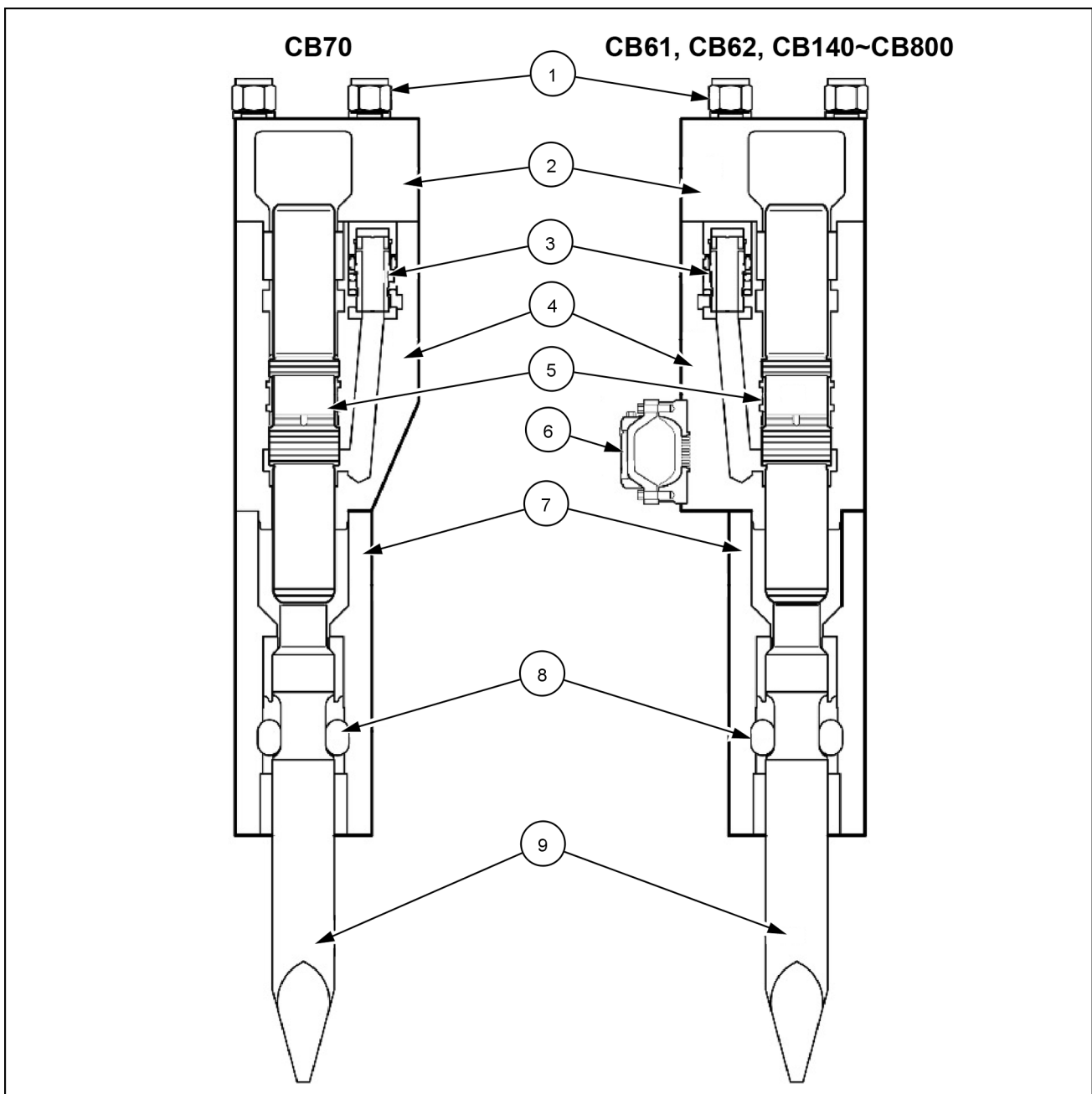
INTRODUCTION



PTIL19GEN0003GA 2

1.	Through bolt	5.	Piston
2.	Back head	6.	Front head
3.	Control valve	7.	Tool pin
4.	Cylinder	8.	Tool

INTRODUCTION



PTIL19GEN0004GA 3



1.	Through bolt	6.	Accumulator
2.	Back head	7.	Front head
3.	Control valve	8.	Tool pin
4.	Cylinder	9.	Tool
5.	Piston		

Product identification

Name plate

The breaker information including serial number and key technical data is available on the name plate, shown below, for your use to identify the product as well as its key specifications.

Make note of the serial number and quote it when ordering spare parts or consulting technical enquires to the authorized dealer.

 	
TYPE/MODEL	WEIGHT kg
SERIAL NUMBER	OIL FLOW (min-max) l/min
PART No	WORKING PRESSURE BAR/MPa
YEAR OF MANUFACTURE	Case New Holland Construction Equipment (India) Private Limited B1-207, 2nd Floor, BOOMERANG, Chandivli Farm Road, Near Chandivli Studio, Andheri (East), MUMBAI - 400072 (Maharashtra), INDIA

PTIL19GEN0005AA 1



SERVICE MANUAL

Tools

CB 140, CB 160, CB 200, CB 20, CB 210, CB 230, CB 260, CB 300, CB 380, CB 400, CB 40, CB 550, CB 60, CB 61, CB 62, CB 70, CB 800, CB 80

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[89.165] Water kit	89.2



Tools - 89

Hammer - 700

CB 140, CB 160, CB 200, CB 20, CB 210, CB 230, CB 260, CB 300, CB 380, CB 400, CB 40, CB 550, CB 60, CB 61, CB 62, CB 70, CB 800, CB 80

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DIAGNOSTIC

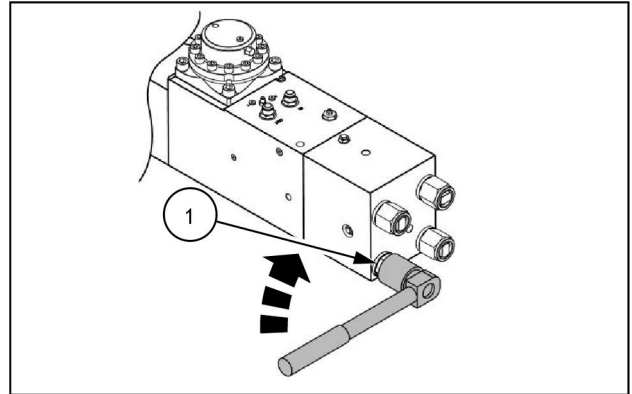
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(*) See content for specific models

Hammer - Torque

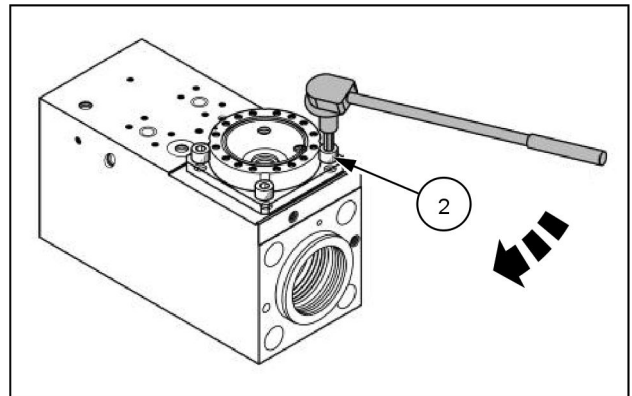
Before starting work, check all the bolts tightness and also be sure to retighten the loosen bolts to the specified torque referring to the manual. The tightening torque of each bolt is as follows:

Through bolt set (1)



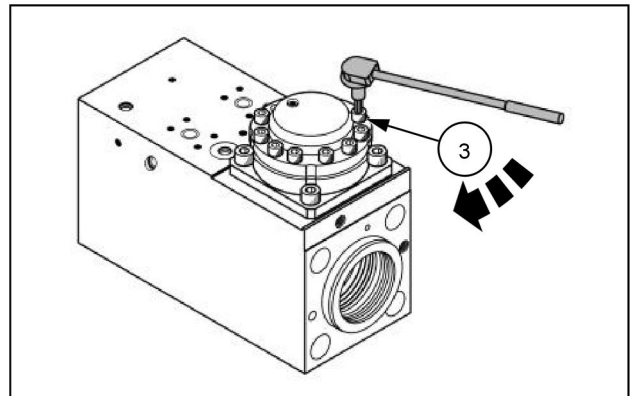
PTIL19GEN0183AA 1

Accumulator body bolt (2)



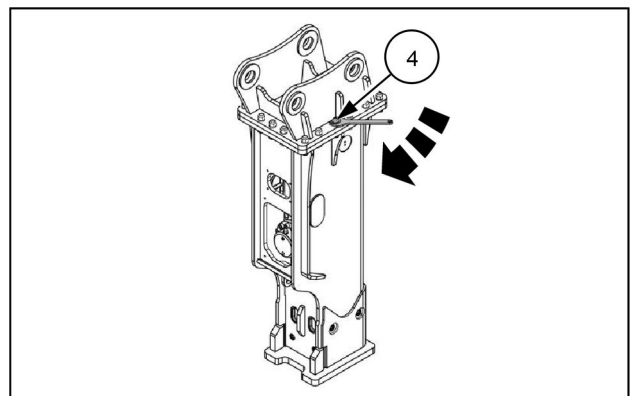
PTIL19GEN0184AA 2

Accumulator cover bolt (3)



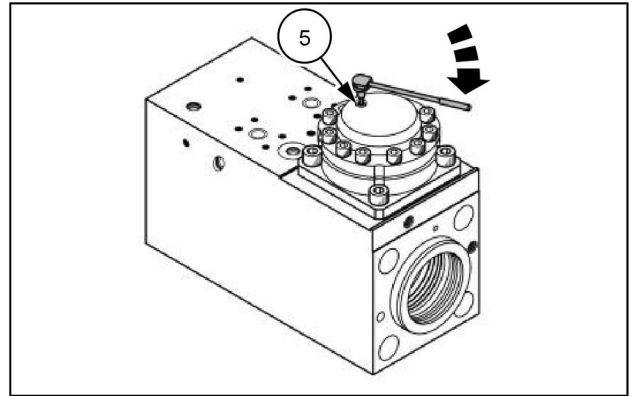
PTIL19GEN0186AA 3

Breaker bracket bolt (4)

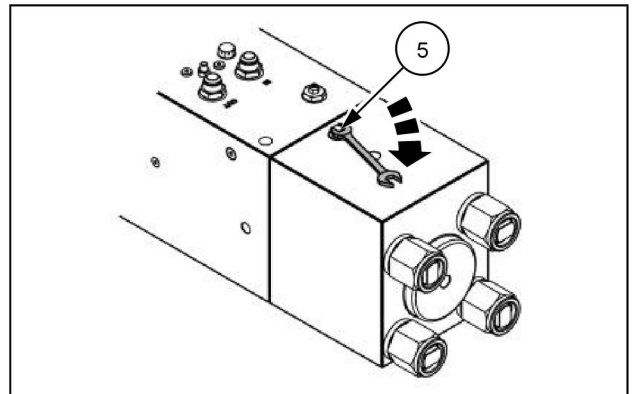


PTIL19GEN0185AA 4

Gas charging valve cap (5)

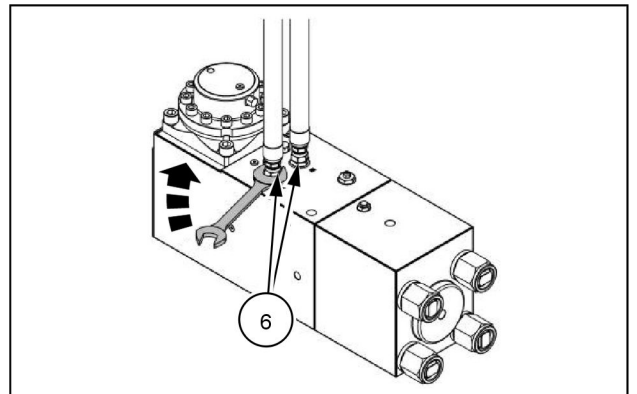


PTIL19GEN0187AA 5



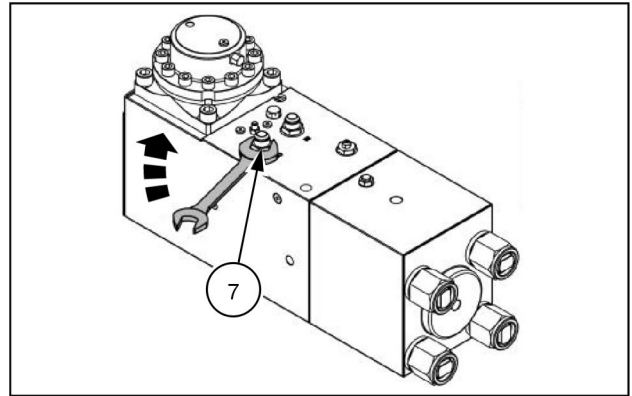
PTIL19GEN0188AA 6

Hose (6)

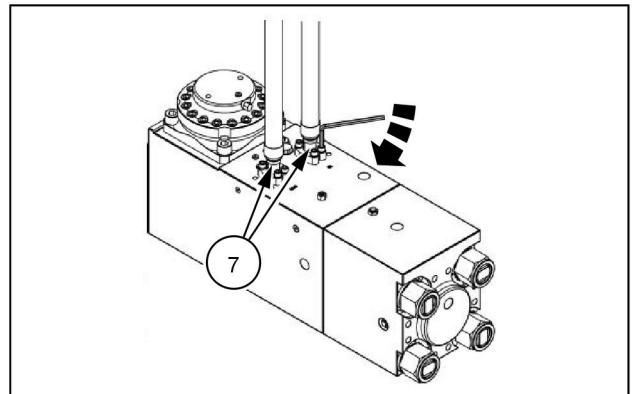


PTIL19GEN0189AA 7

Hose adapter (7)



PTIL19GEN0190AA 8



PTIL19GEN0191AA 9

Torque value

Model	Through bolt set	Breaker bracket bolt	Accumulator body bolt	Accumulator cover bolt	Gas charging valve cap	Hose adapter	Hose
CB20	30 kgm (294 N·m)	45 kgm (440 N·m)	-	-	-	18 kgm (176 N·m)	12 kgm (118 N·m)
CB40	45 kgm (440 N·m)	45 kgm (440 N·m)	-	-	-	18 kgm (176 N·m)	12 kgm (118 N·m)
CB60	50 kgm (490 N·m)	45 kgm (440 N·m)	-	-	-	18 kgm (176 N·m)	12 kgm (118 N·m)
CB61	50 kgm (490 N·m)	45 kgm (440 N·m)	45 kgm (440 N·m)	14 kgm (137 N·m)	5 kgm (49 N·m)	18 kgm (176 N·m)	12 kgm (118 N·m)
CB62	50 kgm (490 N·m)	45 kgm (440 N·m)	45 kgm (440 N·m)	14 kgm (137 N·m)	5 kgm (49 N·m)	26 kgm (255 N·m)	18 kgm (176 N·m)
CB70	50 kgm (490 N·m)	45 kgm (440 N·m)	-	-	-	26 kgm (255 N·m)	18 kgm (176 N·m)
CB80	95 kgm (931 N·m)	45 kgm (440 N·m)	-	-	-	26 kgm (255 N·m)	18 kgm (176 N·m)
CB140	160 kgm (1568 N·m)	100 kgm (980 N·m)	60 kgm (588 N·m)	35 kgm (343 N·m)	5 kgm (49 N·m)	26 kgm (255 N·m)	18 kgm (176 N·m)
CB160	240 kgm (2352 N·m)	100 kgm (980 N·m)	85 kgm (833 N·m)	35 kgm (343 N·m)	5 kgm (49 N·m)	35 kgm (343 N·m)	24 kgm (235 N·m)
CB200	270 kgm (2646 N·m)	100 kgm (980 N·m)	110 kgm (1078 N·m)	50 kgm (490 N·m)	5 kgm (49 N·m)	35 kgm (343 N·m)	24 kgm (235 N·m)
CB210	270 kgm (2646 N·m)	100 kgm (980 N·m)	110 kgm (1078 N·m)	50 kgm (490 N·m)	5 kgm (49 N·m)	35 kgm (343 N·m)	24 kgm (235 N·m)
CB230	330 kgm (3234 N·m)	100 kgm (980 N·m)	110 kgm (1078 N·m)	50 kgm (490 N·m)	5 kgm (49 N·m)	35 kgm (343 N·m)	24 kgm (235 N·m)
CB260	330 kgm (3234 N·m)	100 kgm (980 N·m)	110 kgm (1078 N·m)	65 kgm (637 N·m)	5 kgm (49 N·m)	40 kgm (392 N·m)	30 kgm (294 N·m)
CB300	380 kgm (3724 N·m)	250 kgm (2450 N·m)	180 kgm (1764 N·m)	65 kgm (637 N·m)	5 kgm (49 N·m)	20 kgm (196 N·m)	-
CB380	390 kgm (3822 N·m)	250 kgm (2450 N·m)	180 kgm (1764 N·m)	65 kgm (637 N·m)	5 kgm (49 N·m)	20 kgm (196 N·m)	-
CB400	550 kgm (5390 N·m)	250 kgm (2450 N·m)	180 kgm (1764 N·m)	65 kgm (637 N·m)	5 kgm (49 N·m)	20 kgm (196 N·m)	-
CB550	620 kgm (6076 N·m)	250 kgm (2450 N·m)	180 kgm (1764 N·m)	65 kgm (637 N·m)	5 kgm (49 N·m)	20 kgm (196 N·m)	-
CB800	720 kgm (7061 N·m)	250 kgm (2450 N·m)	180 kgm (1764 N·m)	65 kgm (637 N·m)	5 kgm (49 N·m)	35 kgm (343 N·m)	-

Hammer - Special tools - Eye bolt**Suitable eye bolt for handling power cell**

Model	Weight		Eye bolt size				Allowed weight	
			Front head	Cylinder	Piston	Back head		
CB20	60 kg	132 lb	M10	M10	M10	M10	150 kg	331 lb
CB40	75 kg	165 lb	M10	M10	M10	M10	150 kg	331 lb
CB60	130 kg	287 lb	M12	M12	M12	M12	220 kg	485 lb
CB61	130 kg	287 lb	M12	M12	M12	M12	220 kg	485 lb
CB62	190 kg	419 lb	M12	M12	M12	M12	220 kg	485 lb
CB70	190 kg	419 lb	M12	M12	M12	M12	220 kg	485 lb
CB80	250 kg	551 lb	M16	M16	M12	M16	450 kg	992 lb
CB140	517 kg	1140 lb	M20	M20	M12	M20	630 kg	1389 lb
CB160	602 kg	1327 lb	M20	M20	M16	M20	630 kg	1389 lb
CB200	725 kg	1598 lb	M20	M20	M16	M20	630 kg	1389 lb

Tools - Hammer

Model	Weight		Eye bolt size				Allowed weight	
			Front head	Cylinder	Piston	Back head		
CB210	800 kg	1764 lb	M20	M20	M16	M20	630 kg	1389 lb
CB230	950 kg	2094 lb	M20	M20	M16	M24	950 kg	2094 lb
CB260	1100 kg	2425 lb	M30	M30	M16	M30	1500 kg	3307 lb
CB300	1280 kg	2822 lb	M30	M30	M24	M30	1500 kg	3307 lb
CB380	1500 kg	3307 lb	M30	M30	M24	M30	1500 kg	3307 lb
CB400	1720 kg	3792 lb	M36	M36	M24	M36	2300 kg	5071 lb
CB550	1960 kg	4321 lb	M36	M36	M24	M36	2300 kg	5071 lb
CB800	2567 kg	5659 lb	M42	M42	M24	M42	3400 kg	7496 lb

Hammer - General specification

Excavator

Description		CB20	CB40	CB60	CB80	CB140
Operating weight*		138 kg	192 kg	303 kg	499 kg	1018 kg
		304 lb	423 lb	668 lb	1100 lb	2244 lb
Overall length		1196 mm	1410 mm	1593 mm	1897 mm	2295 mm
		47.09 in	55.51 in	62.72 in	74.69 in	90.35 in
Tool diameter		45 mm	57 mm	70 mm	80 mm	105 mm
		1.57 in	2.24 in	2.76 in	3.15 in	4.13 in
2nd relief setting pressure**		175 Kg/cm ²	175 Kg/cm ²	175 Kg/cm ²	175 Kg/cm ²	210 Kg/cm ²
		2500 psi	2500 psi	2500 psi	2500 psi	3000 psi
Operating pressure		90 – 120 Kg/cm ²	90 – 120 Kg/cm ²	110 – 165 Kg/cm ²	140 – 170 Kg/cm ²	140 – 190 Kg/cm ²
		1280 – 1700 psi	1280 – 1700 psi	1565 – 2350 psi	1990 – 2420 psi	1990 – 2700 psi
Oil flow		13 – 30 L/min	20 – 60 L/min	29 – 60 L/min	38 – 85 L/min	68 – 119 L/min
		3.43 – 7.92 US gpm	5.28 – 15.85 US gpm	7.66 – 15.85 US gpm	10.03 – 22.45 US gpm	17.96 – 31.43 US gpm
Blow rate	Power mode	550 ~ 1,000 Bpm	600 ~ 1,500 Bpm	380 ~ 1,000 Bpm	400 ~ 800 Bpm	350 ~ 550 Bpm
	Speed mode				600 ~ 1,100 Bpm	600 ~ 900 Bpm
Back head gas pressure		10 – 14 Kg/cm ²	14 – 16 Kg/cm ²	10 – 14 Kg/cm ²	10 – 14 Kg/cm ²	10 – 14 Kg/cm ²
		142 – 199 psi	199 – 228 psi	142 – 199 psi	142 – 199 psi	142 – 199 psi
Accumulator gas pressure		-	-	-	-	55 – 60 Kg/cm ²
		-	-	-	-	782 – 853 psi
Suitable carrier		0.8 – 2.5 t	1.5 – 4.0 t	3 – 6.5 t	4.5 – 8.0 t	10 – 15 t
		1760 – 5500 lb	330 – 8800 lb	6600 – 14300 lb	9900 – 17600 lb	22000 – 33000 lb

NOTE: Above specifications are subject to change without prior notice.

NOTE: * Operating weight includes power cell, housing, tool, breaker bracket, pins and hydraulic hoses only. Operating weight can vary by breaker bracket type.

NOTE: ** Guide for carrier port relief valve pressure setting.

Description		CB160	CB200	CB210	CB230	CB260
Operating weight*		1253 kg	1468 kg	1613 kg	1873 kg	2087 kg
		2762 lb	3236 lb	3556 lb	4129 lb	4601 lb
Overall length		2453 mm	2600 mm	2723 mm	2793 mm	2964 mm
		96.57 in	102.36 in	107.20 in	109.93 in	116.69 in
Tool diameter		115 mm	125 mm	135 mm	135 mm	145 mm
		4.53 in	4.92 in	5.31 in	5.31 in	5.71 in
2nd relief setting pressure**		210 Kg/cm ²	210 Kg/cm ²	210 Kg/cm ²	210 Kg/cm ²	210 Kg/cm ²
		3000 psi	3000 psi	3000 psi	3000 psi	3000 psi
Operating pressure		140 – 190 Kg/cm ²	150 – 190 Kg/cm ²	160 – 190 Kg/cm ²	160 – 190 Kg/cm ²	160 – 190 Kg/cm ²
		1990 – 2700 psi	2130 – 2700 psi	2275 – 2700 psi	2275 – 2700 psi	2275 – 2700 psi
Oil flow		85 – 127 L/min	85 – 131 L/min	102 – 132 L/min	119 – 161 L/min	127 – 178 L/min
		22.45 – 33.54 US gpm	22.45 – 34.60 US gpm	27 – 34.87 US gpm	31.43 – 42.53 US gpm	33.54 – 47.02 US gpm
Blow rate	Power mode	320 ~ 550 Bpm	320 ~ 500 Bpm	320 ~ 480 Bpm	340 ~ 450 Bpm	270 ~ 400 Bpm
	Speed mode	400 ~ 700 Bpm	400 ~ 650 Bpm	400 ~ 600 Bpm	420 ~ 550 Bpm	330 ~ 500 Bpm
Back head gas pressure		14 – 16 Kg/cm ²	14 – 16 Kg/cm ²	14 – 16 Kg/cm ²	14 – 16 Kg/cm ²	14 – 16 Kg/cm ²
		199 – 228 psi	199 – 228 psi	199 – 228 psi	199 – 228 psi	199 – 228 psi

Description	CB160	CB200	CB210	CB230	CB260
Accumulator gas pressure	55 – 60 Kg/cm ²	55 – 60 Kg/cm ²	55 – 60 Kg/cm ²	55 – 60 Kg/cm ²	55 – 60 Kg/cm ²
	782 – 853 psi	782 – 853 psi	782 – 853 psi	782 – 853 psi	782 – 853 psi
Suitable carrier	12 – 18 t	16 – 22 t	18 – 24 t	20 – 26 t	24 – 30 t
	26500 – 39700 lb	35200 – 48500 lb	39700 – 52900 lb	44100 – 57300 lb	52900 – 66100 lb

NOTE: Above specifications are subject to change without prior notice.

NOTE: * Operating weight includes power cell, housing, tool, breaker bracket, pins and hydraulic hoses only. Operating weight can vary by breaker bracket type.

NOTE: ** Guide for carrier port relief valve pressure setting.

Description	CB300	CB380	CB400	CB550	CB800	
Operating weight*	2564 kg	2828 kg	3330 kg	4174 kg	5936 kg	
	5653 lb	6235 lb	7341 lb	9202 lb	13087 lb	
Overall length	3044 mm	3174 mm	3322 mm	3610 mm	3981 mm	
	119.84 in	124.96 in	132.36 in	142.13 in	156.73 in	
Tool diameter	150 mm	155 mm	165 mm	175 mm	200 mm	
	5.91 in	6.10 in	6.50 in	6.89 in	7.87 in	
2nd relief setting pressure**	210 Kg/cm ²	230 Kg/cm ²	230 Kg/cm ²	210 Kg/cm ²	250 Kg/cm ²	
	3000 psi	3300 psi	3300 psi	3000 psi	3570 psi	
Operating pressure	160 – 190 Kg/cm ²	160 – 190 Kg/cm ²	150 – 190 Kg/cm ²	150 – 190 Kg/cm ²	170 – 210 Kg/cm ²	
	2275 – 2700 psi	2275 – 2700 psi	2130 – 2700 psi	2130 – 2700 psi	2420 – 3000 psi	
Oil flow	153 – 204 L/min	170 – 221 L/min	187 – 238 L/min	204 – 272 L/min	238 – 323 L/min	
	40.41 – 53.89 US gpm	44.90 – 58.38 US gpm	49.40 – 62.88 US gpm	53.89 – 71.85 US gpm	62.87 – 85.32 US gpm	
Blow rate	Power mode	250 ~ 380 Bpm	230 ~ 400 Bpm	230 ~ 345 Bpm	230 ~ 330 Bpm	220 ~ 300 Bpm
	Speed mode	300 ~ 450 Bpm	270 ~ 470 Bpm	270 ~ 410 Bpm	270 ~ 500 Bpm	290 ~ 400 Bpm
Back head gas pressure	14 – 16 Kg/cm ²	14 – 16 Kg/cm ²	10 – 14 Kg/cm ²	14 – 16 Kg/cm ²	14 – 16 Kg/cm ²	
	199 – 228 psi	199 – 228 psi	142 – 199 psi	199 – 228 psi	199 – 228 psi	
Accumulator gas pressure	55 – 60 Kg/cm ²	55 – 60 Kg/cm ²	55 – 60 Kg/cm ²	55 – 60 Kg/cm ²	55 – 60 Kg/cm ²	
	782 – 853 psi	782 – 853 psi	782 – 853 psi	782 – 853 psi	782 – 853 psi	
Suitable carrier	25 – 36 t	28 – 42 t	40 – 60 t	40 – 60 t	58 – 100 t	
	55100 – 79400 lb	61700 – 92600 lb	88200 – 132300 lb	88200 – 132300 lb	127867 – 220462 lb	

NOTE: Above specifications are subject to change without prior notice.

NOTE: * Operating weight includes power cell, housing, tool, breaker bracket, pins and hydraulic hoses only. Operating weight can vary by breaker bracket type.

NOTE: ** Guide for carrier port relief valve pressure setting.

Skid steer loader

Description	CB40	CB60	CB70	CB80
Operating weight*	270 kg	357 kg	430 kg	542 kg
	595 lb	787 lb	948 lb	1195 lb
Overall length	1483 mm	1604 mm	1671 mm	1875 mm
	58.39 in	63.15 in	65.79 in	73.82 in
Tool diameter	57 mm	70 mm	75 mm	80 mm
	2.24 in	2.76 in	2.95 in	3.15 in
2nd relief setting pressure**	230 Kg/cm ²	230 Kg/cm ²	230 Kg/cm ²	230 Kg/cm ²
	3300 psi	3300 psi	3300 psi	3300 psi

Tools - Hammer

Description		CB40	CB60	CB70	CB80
Operating pressure		100 – 190 Kg/cm ²	110 – 190 Kg/cm ²	120 – 190 Kg/cm ²	140 – 190 Kg/cm ²
		1420 – 2700 psi	1560 – 2700 psi	1700 – 2700 psi	1990 – 2700 psi
Oil flow		23 – 70 L/min	35 – 70 L/min	40 – 80 L/min	45 – 90 L/min
		6.07 – 18.49 US gpm	9.24 – 18.49 US gpm	10.56 – 21.13 US gpm	11.88 – 23.77 US gpm
Blow rate	Power mode	600 ~ 1,500 Bpm	380 ~ 1,000 Bpm	380 ~ 900 Bpm	400 ~ 800 Bpm
	Speed mode				600 ~ 1,100 Bpm
Back head gas pressure		10 – 12 Kg/cm ²	10 – 12 Kg/cm ²	10 – 12 Kg/cm ²	10 – 14 Kg/cm ²
		142 – 170 psi	142 – 170 psi	142 – 170 psi	142 – 199 psi
Accumulator gas pressure		-	-	-	-
		-	-	-	-
Suitable carrier		1.5 – 4 t	3 – 6.5 t	4.5 – 8 t	4.5 – 8 t
		3300 – 8800 lb	6600 – 14300 lb	9900 – 17600 lb	9900 – 17600 lb

NOTE: Above specifications are subject to change without prior notice.

NOTE: * Operating weight includes power cell, housing, tool, breaker bracket, pins and hydraulic hoses only. Operating weight can vary by breaker bracket type.

NOTE: ** Guide for carrier port relief valve pressure setting.

TLB

Description		CB61	CB62
Operating weight*		366 kg	441 kg
		807 lb	972 lb
Overall length		1552 mm	1648 mm
		61.10 in	64.88 in
Tool diameter		70 mm	75 mm
		2.76 in	2.95 in
2nd relief setting pressure**		175 Kg/cm ²	175 Kg/cm ²
		2500 psi	2500 psi
Operating pressure		110 – 165 Kg/cm ²	120 – 165 Kg/cm ²
		1565 – 2350 psi	1700 – 2350 psi
Oil flow		29 – 60 L/min	34 – 68 L/min
		7.66 – 15.8 US gpm	8.98 – 17.96 US gpm
Blow rate	Power mode	380 ~ 1,000 Bpm	380 ~ 900 Bpm
	Speed mode		
Back head gas pressure		10 – 14 Kg/cm ²	16 – 182 Kg/cm ²
		142 – 199 psi	228 – 256 psi
Accumulator gas pressure		40 – 50 Kg/cm ²	40 – 50 Kg/cm ²
		569 – 711 psi	569 – 711 psi
Suitable carrier		3 – 6.5 t	4.5 – 8 t
		6600 – 8800 lb	9900 – 17600 lb

NOTE: Above specifications are subject to change without prior notice.

NOTE: * Operating weight includes power cell, housing, tool, breaker bracket, pins and hydraulic hoses only. Operating weight can vary by breaker bracket type.

NOTE: ** Guide for carrier port relief valve pressure setting.

Hammer - General specification - Table of Applications

A. Excavator

	CB20	CB40	CB60	CB80	CB140	CB160	CB200 CB210 CB230	CB260	CB300	CB380 CB400	CB550	CB800
CX17C	X											
CX18C	X											
CX26C		X										
CX30C		X										
CX33C		X										
CX37C		X										
CX57C			X									
CX60C			X									
CX75, CX80				X								
CX130, CX145C					X							
CX160, CX180						X						
CX210, CX220, CX235C							X					
CX240, CX250, CX260								X				
CX300,									X			
CX350, CX370, CX380										X		
CX470, CX490											X	
CX470ME, CX500											X	
CX700												X
CX800												X

B. Skid steer loader

1. Tier 3

	CB40	CB60	CB70	CB80
SR130	X			
SR150	X	X		
SR175	X	X		
SV185	X	X		
SR200		X	X	
SR220		X	X	
SV250		X	X	
SR250		X	X	
SV300		X	X	
TR270		X	X	
TR320		X	X	
TV380		X	X	

2. Tier 4

	CB40	CB60	CB70	CB80
SR130	X			
SR160	X	X		
SR175	X	X		
SV185	X	X		
SR210		X	X	X
SR240		X	X	X
SV280		X	X	X
SR250		X	X	X
SR270		X	X	X
SV300		X	X	X
SV340		X	X	X
TR270		X	X	X
TR310		X	X	X
TR340		X	X	X
TV380		X	X	X
TV450		X	X	X

C. TLB

1. Pithampur

	CB61	CB62
570T	X	X
570ST	X	X
B80B	X	X
770	X	X
770EX	X	X
770EX MAG.	X	X
851EX	X	X

2. Lecce

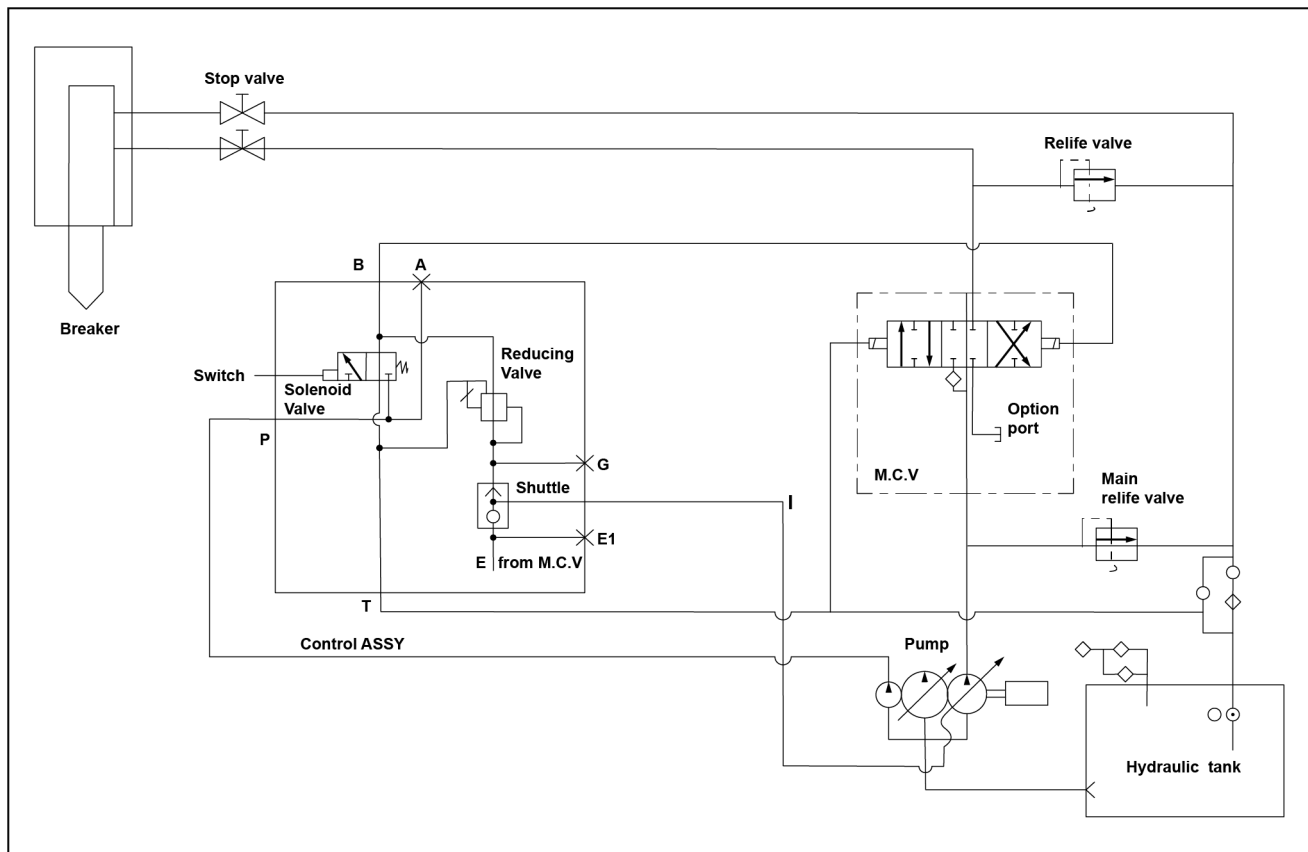
	CB61	CB62
580T S'TYLED	X	X
B90B S'TYLED	X	X
580ST S'TYLED	X	X
B100B S'TYLED	X	X
590ST S'TYLED	X	X
B110B S'TYLED	X	X
695ST S'TYLED	X	X
B115B S'TYLED	X	X
580T CASE DNA	X	X
580ST CASE DNA	X	X
590ST CASE DNA	X	X
695ST CASE DNA	X	X

3. Burlington

	CB61	CB62
580N	X	X
580SN	X	X
590SN	X	X

Hammer - Hydraulic schema

Breakers were produced to be working with hydraulic system of various carrier types. Below hydraulic circuit is an example of how breaker interacts with carrier hydraulic system.



PTIL19GEN0262FA 1

NOTE: Be sure you are thoroughly familiar with hydraulic system of the carrier, along with the instructions in this Service Manual before installation, service, maintenance or running the breaker.

NOTE: Hydraulic circuit as shown in image 1 is an example, can be different by carrier brand, carrier type and carrier model.

Hammer - Exploded view - Hydraulic Auto-lubrication system

CB 140	
CB 160	
CB 210	
CB 230	
CB 300	
CB 380	
CB 800	

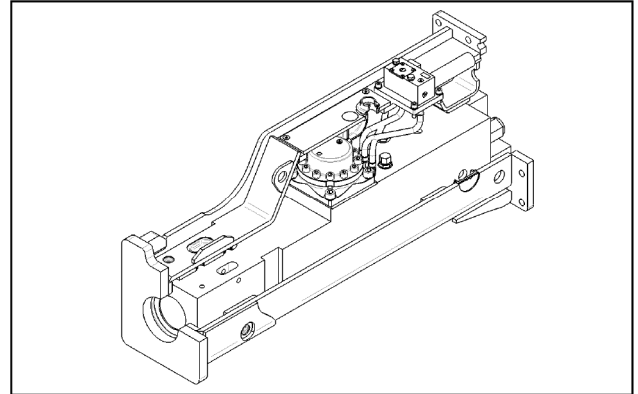
Overview

CB140 ~ CB800

For Adjustment, See **Hammer - Adjust - Hydraulic Auto-lubrication system (89.700)**.

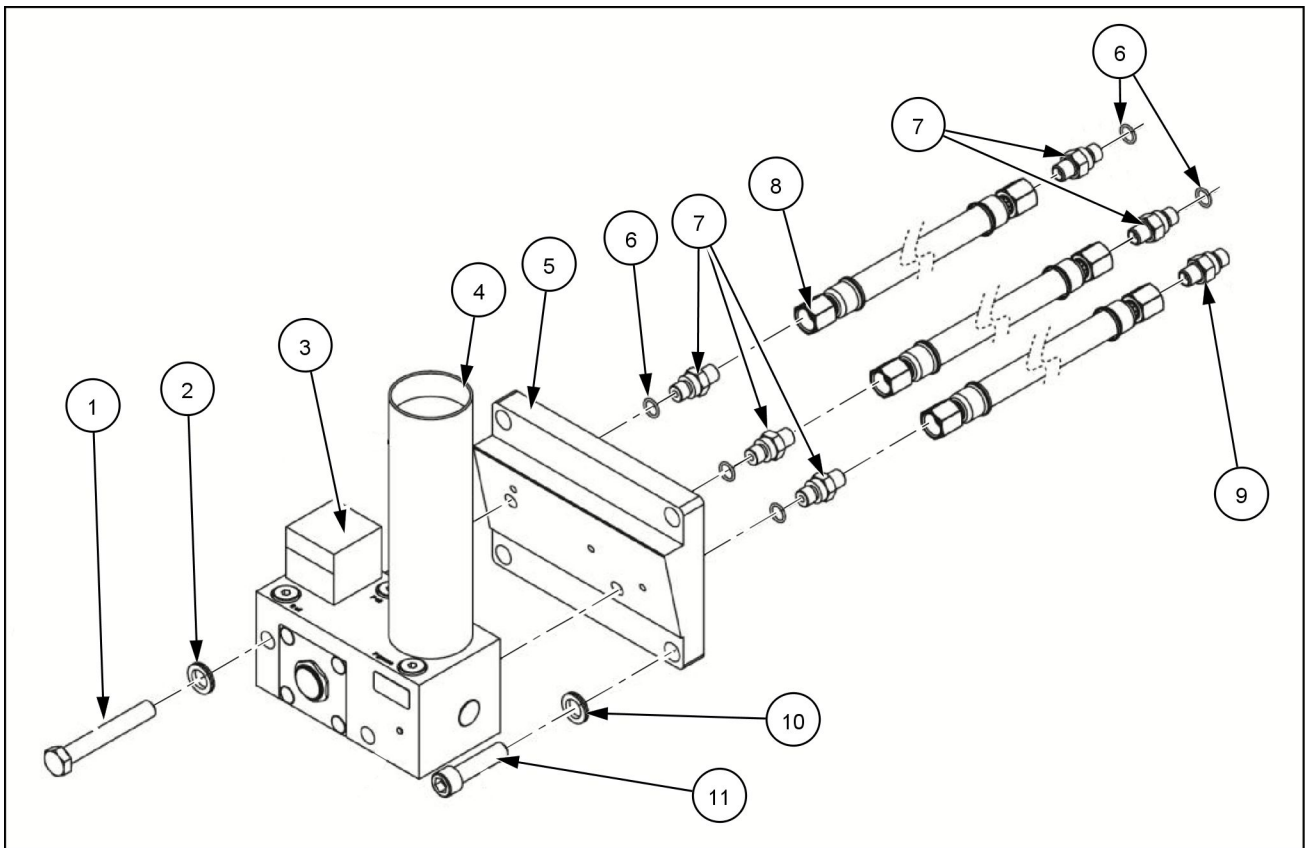
For greasing, See **Hammer - Grease - Hydraulic Auto-lubrication system (89.700)**.

NOTE: For installation, See **Hammer - Install - Hydraulic Auto-lubrication system (89.700)**.



PTIL19GEN0235AA 1

Auto-lube kit part list (CB140, CB160, CB200)

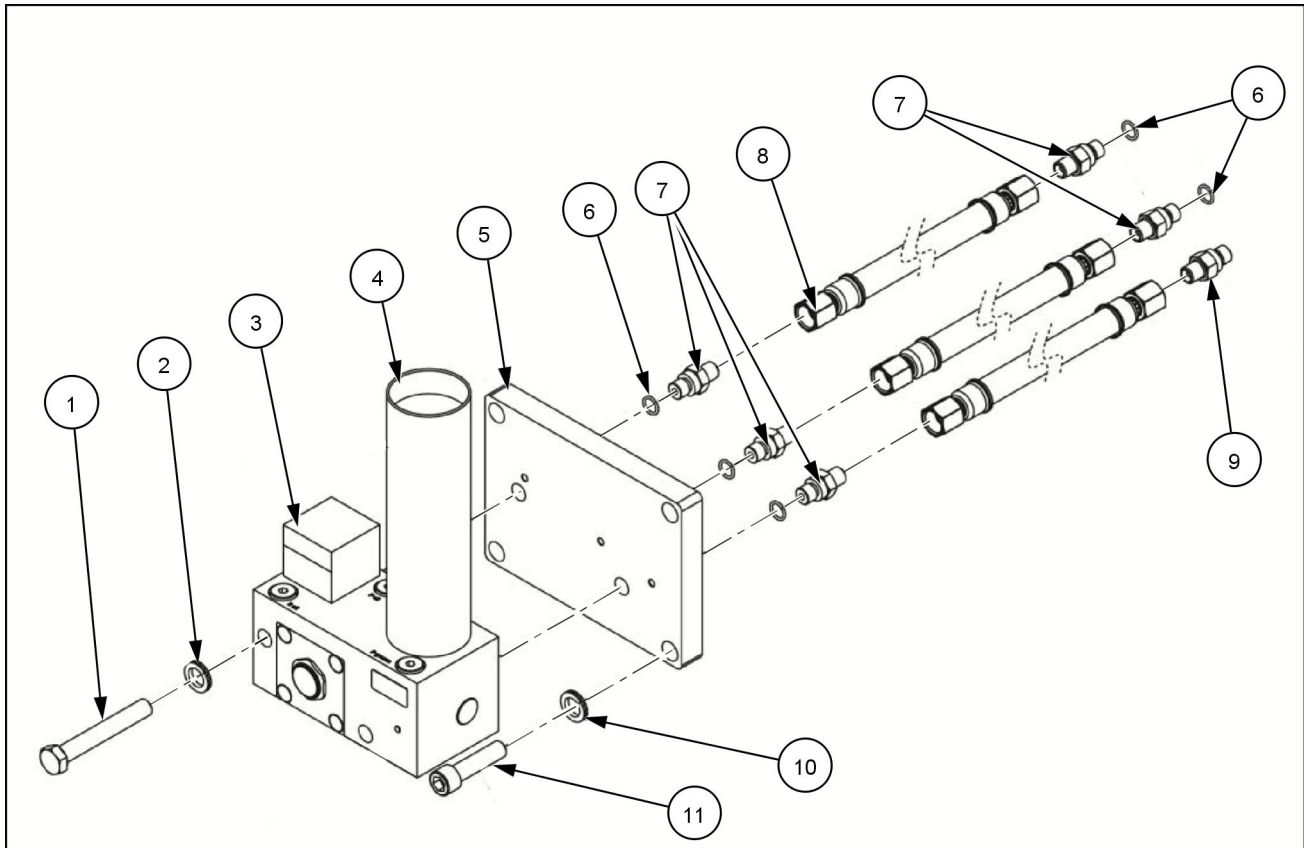


PTIL19GEN0241FA 2

No.	Auto grease kit	Quantity
1.	Hex bolt	2
2.	Nordlock washer	2
3.	Auto grease body	1

No.	Auto grease kit	Quantity
4.	Cartridge	1
5.	Auto grease base plate	1
6.	O-Ring	5
7.	Adapter	5
8.	Grease hose	3
9.	Adapter	1
10.	Nordlock washer	4
11.	Socket bolt	4

Auto-lube kit part list (CB210 ~ CB800)



PTIL19GEN0242FA 3

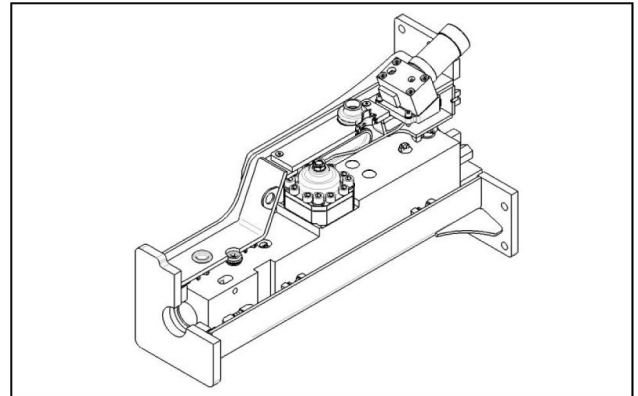
No.	Auto grease kit	Quantity
1.	Hex bolt	2
2.	Nordlock washer	2
3.	Auto grease body	1
4.	Cartridge	1
5.	Auto grease base plate	1
6.	O-Ring	5
7.	Adapter	5
8.	Grease hose	3
9.	Adapter	1
10.	Nordlock washer	4
11.	Socket bolt	4

Hammer - Exploded view - Vibrating Auto-lubrication system

CB 140	
CB 160	
CB 200	
CB 210	
CB 230	
CB 260	
CB 300	
CB 380	
CB 400	
CB 550	
CB 62	
CB 800	

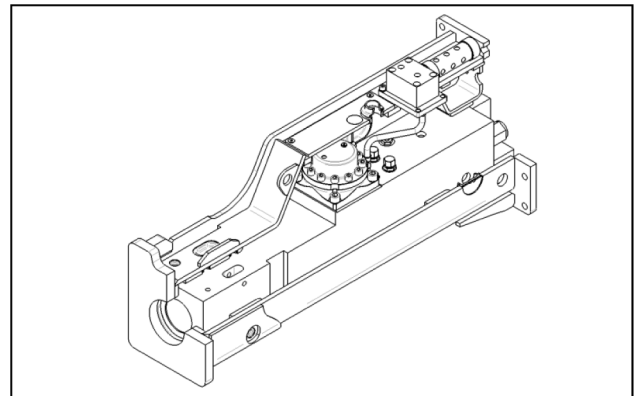
Overview

CB62



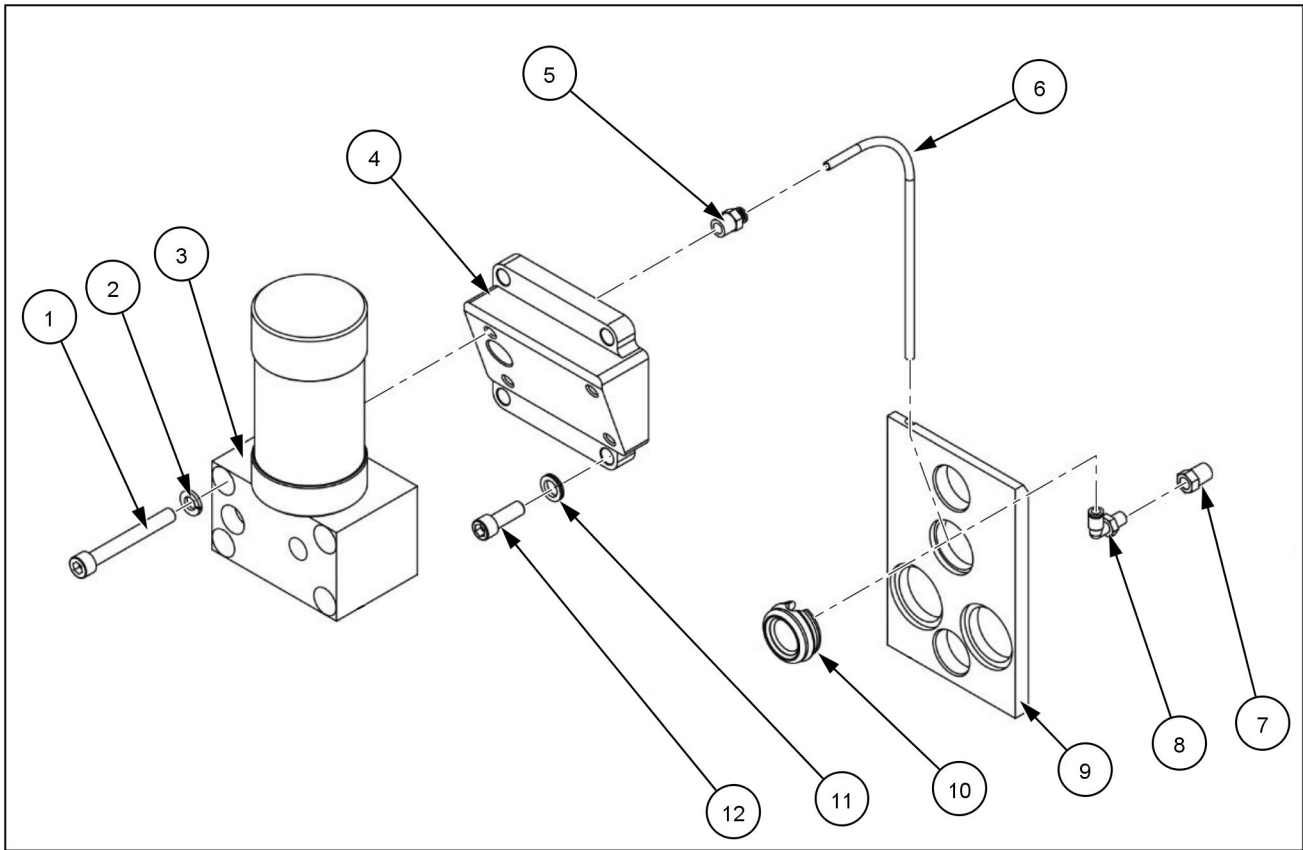
PTIL19GEN0243AA 1

CB140 ~ CB800



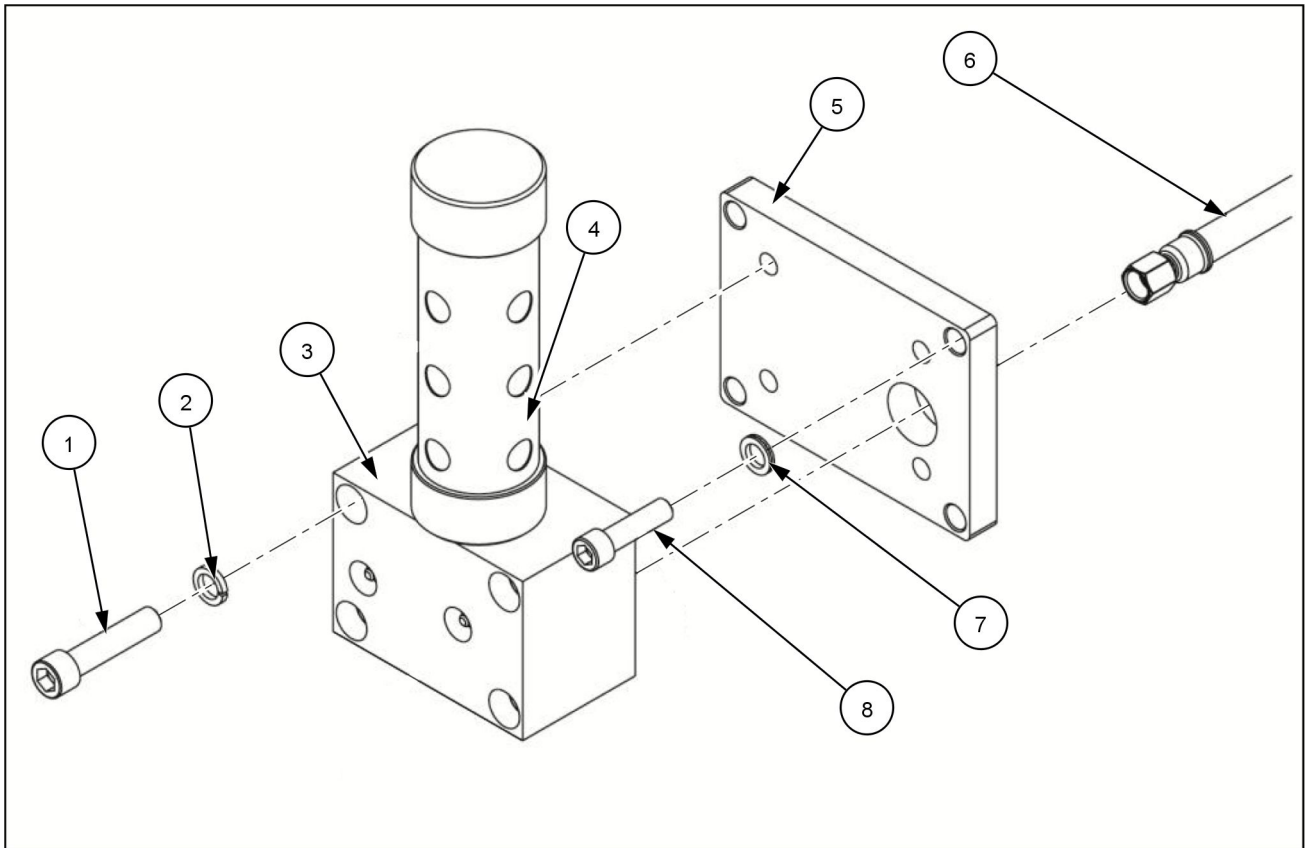
PTIL19GEN0244AA 2

Auto-lube kit part list (CB62)



PTIL19GEN0250FA 3

No.	Auto grease base plate	Quantity
1.	Socket bolt	4
2.	Spring washer	4
3.	Auto grease body	1
4.	Auto grease base plate	1
5.	One touch fitting	1
6.	Grease hose	1
7.	Hex bush	1
8.	One touch elbow	1
9.	Shell pad	1
10.	Rubber cover	1
11.	Nordlock washer	4
12.	Socket bolt	4

Auto-lube kit part list (CB140 ~ CB800)

PTIL19GEN0251FA 4

No.	Auto grease kit	Quantity
1.	Socket bolt	4
2.	Spring washer	4
3.	Auto grease body	1
4.	Cartridge	1
5.	Auto grease base plate	1
6.	Grease hose	1
7.	Nordlock washer	4
8.	Socket bolt	4

For adjustment, see **Hammer - Adjust - Vibrating Auto-lubrication system (89.700)**.

For greasing, see **Hammer - Grease - Vibrating Auto-lubrication system (89.700)**.

NOTE: For installation, see **Hammer - Install - Vibrating Auto-lubrication system (89.700)**.



Hammer - Operating

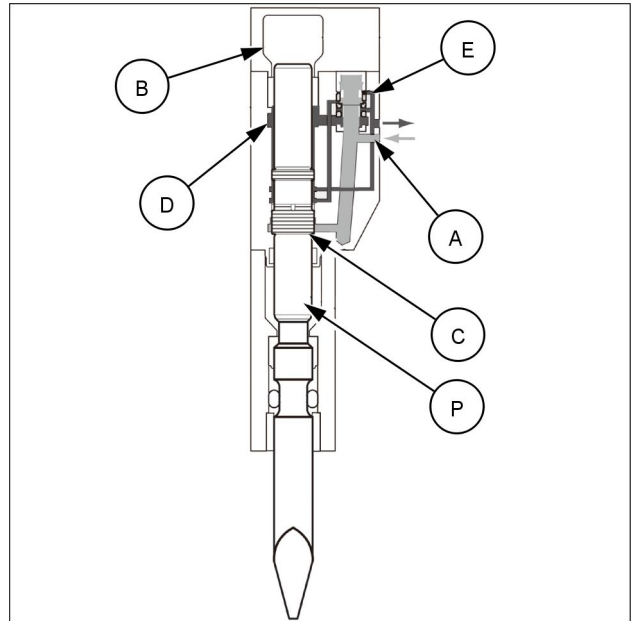
CB20, CB40, CB60, CB70, CB80

Start up

When operator put breaker on the breaking target material and activates carrier breaker switch, high pressure oil comes to piston lower part (C), inside valve & outside valve upper part. At this stage, valve is pushed down by high pressure oil outside valve upper part (E) and low pressure oil at piston upper part (D) is connected to return line.

Check for pressure flow levels in the image

	Low pressure
	High pressure




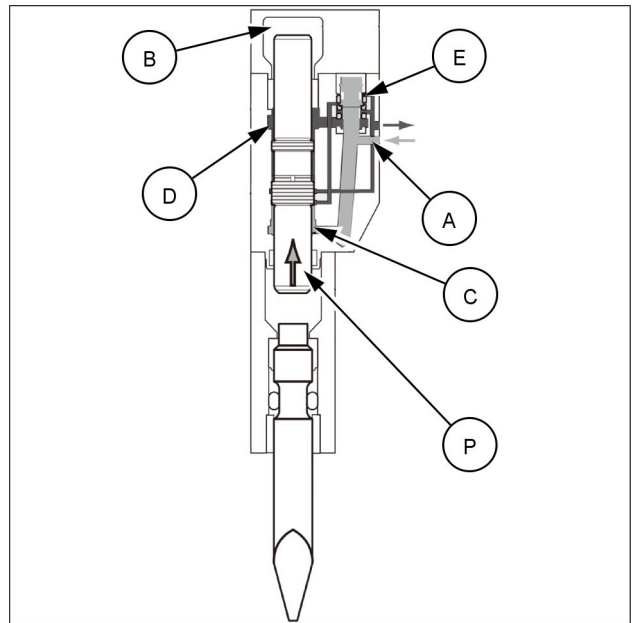
PTIL19GEN0254GB 1

Piston raising

High pressure oil at the piston lower part (C) raises piston up inside back head gas chamber (B). At this stage, nitrogen gas inside the chamber (B) is compressed and low pressure oil at the piston upper part (D) returns to the carrier oil tank.

Check for pressure flow levels in the image

	Low pressure
	High pressure





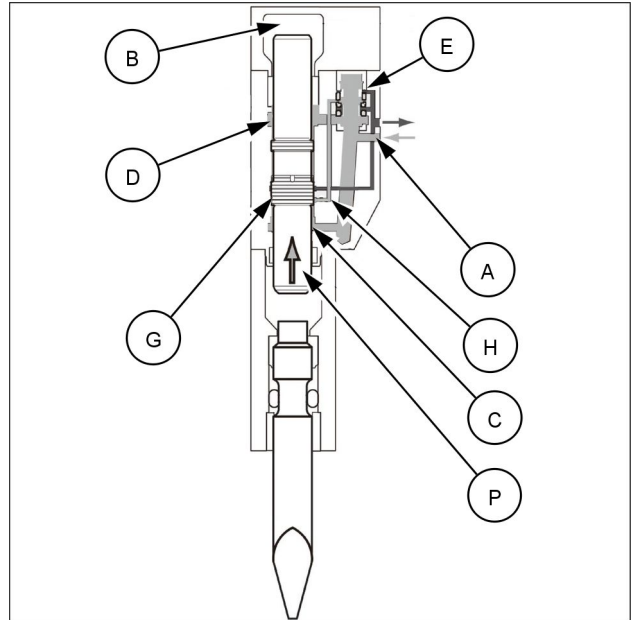
PTIL19GEN0255GB 2

Valve position change

While piston is moving up, high pressure oil at the piston lower part (C) comes into channel (H) and reaches the outside of valve middle part. At this stage, valve moves up and opens the channel for high pressure flow to come into piston upper part (D).

Check for pressure flow levels in the image

	Low pressure
	High pressure



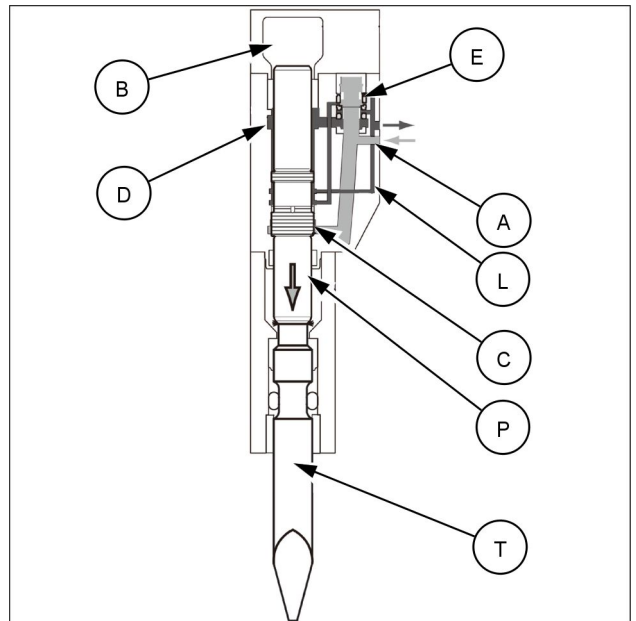
PTIL19GEN0256GB 3

Impact

Compressed nitrogen gas at the chamber (B) with high pressure at the piston upper part (D) pushes piston and piston strikes tool (T), delivering impact energy to the breaking target material. At this stage, pilot channel (L) is connected to return line, then valve moves down and cuts high pressure flow into piston upper part (D), then piston upper part area (D) is changed to low pressure and piston lower part area (C) is changed to high pressure which puts breaker into start up position again.

Check for pressure flow levels in the image

	Low pressure
	High pressure





PTIL19GEN0257GB 4

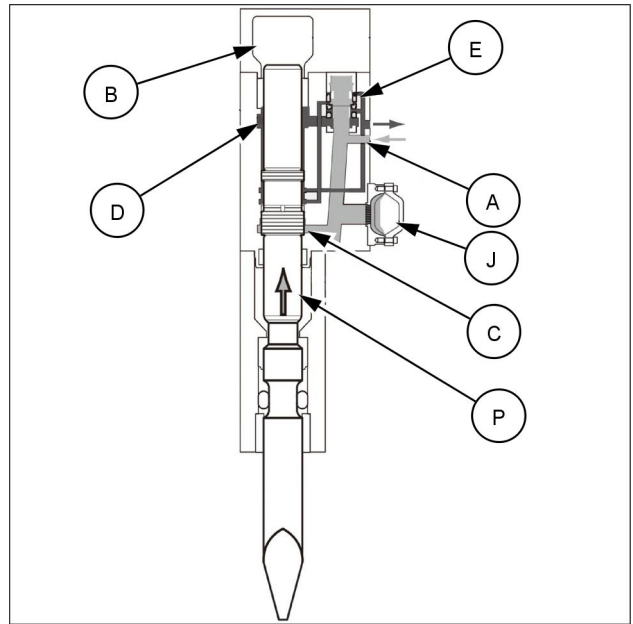
CB61, CB62, CB140 ~ CB800

Start up

When operator put breaker on the breaking target material and activates carrier breaker switch, high pressure oil comes to piston lower part (C), inside valve & outside valve upper part and entrance of accumulator (J). At this stage, valve is pushed down by high pressure oil outside valve upper part (E) and low pressure oil at piston upper part (D) is connected to return line.

Check for pressure flow levels in the image

	Low pressure
	High pressure





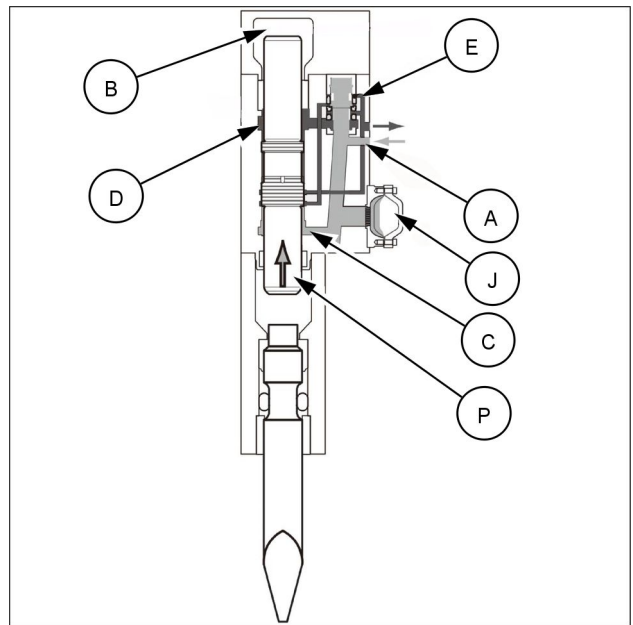
PTIL19GEN0258GB 5

Piston raising

High pressure oil at the piston lower part (C) raises piston up inside back head gas chamber (B). At this stage, nitrogen gas inside the chamber (B) is compressed and low pressure oil at the piston upper part (D) returns to the carrier oil tank.

Check for pressure flow levels in the image

	Low pressure
	High pressure





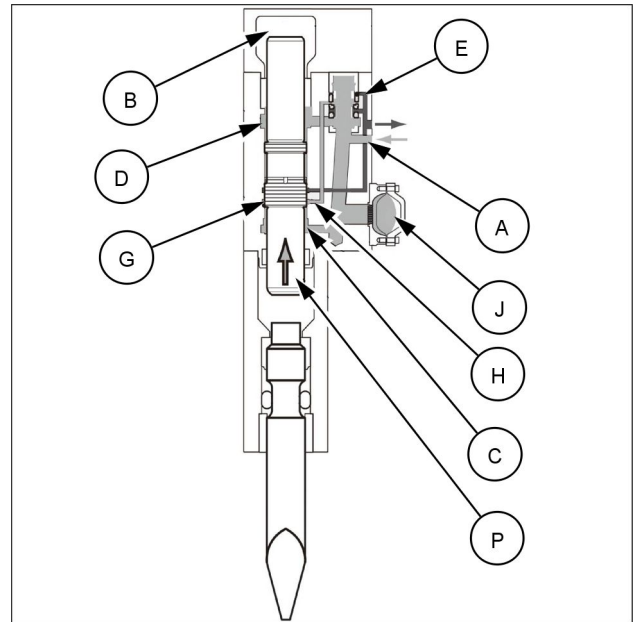
PTIL19GEN0259GB 6

Valve position change

While piston is moving up, high pressure oil at the piston lower part (C) comes into channel (H) and reaches the outside of valve middle part. At the same time high pressure also comes inside accumulator (J), compressing gas inside accumulator gas chamber. At this stage, valve moves up and opens the channel for high pressure flow to come into piston upper part (D).

Check for pressure flow levels in the image

	Low pressure
	High pressure




PTIL19GEN0260GB 7

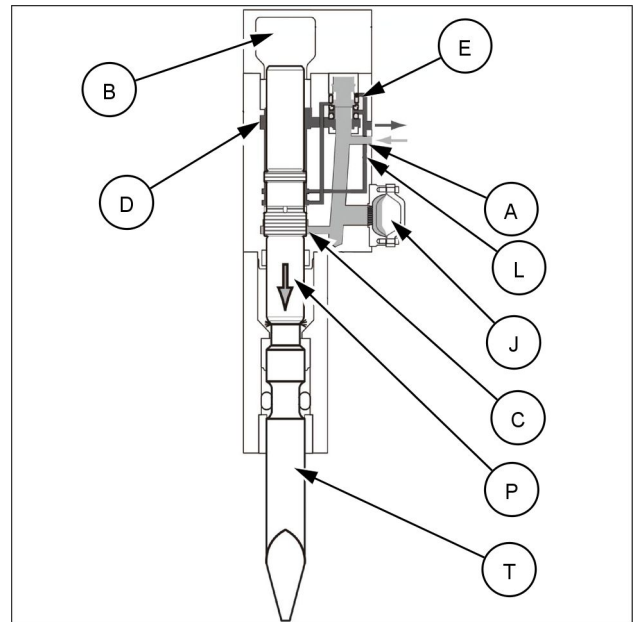
Impact striking

Compressed nitrogen gas at the chamber (B) with high pressure at the piston upper part (D) pushes piston and piston strikes tool (T), delivering impact energy to the breaking target material. At that time the compressed gas inside accumulator pumps "accumulated" high pressure oil into piston upper part, increasing piston striking speed and power.

At this stage, pilot channel (L) is connected to return line, then valve moves down and cuts high pressure flow into piston upper part (D), then piston upper part area (D) is changed to low pressure and piston lower part area (C) is changed to high pressure which puts breaker into start up position again.

Check for pressure flow levels in the image

	Low pressure
	High pressure



PTIL19GEN0261GB 8

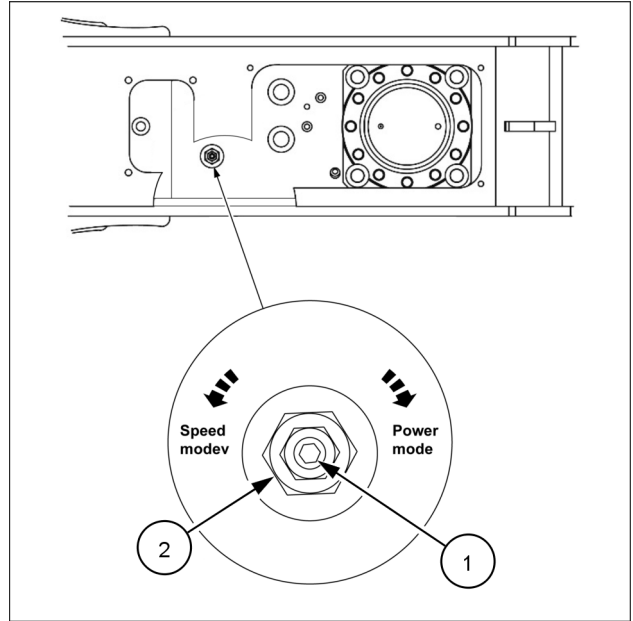
Hydraulic system

Breakers were produced to be working with hydraulic system of various carrier types. See **Hammer - Hydraulic schema (89.700)**.

Work mode selection

NOTE: Breaker work mode is selectable at the models of CB80 and above.

1. Remove MC Cover.
 2. Loosen adjuster valve nut until you can start to turn adjuster valve.
 3. Turn adjuster valve with **5 mm L-wrench (1)** (available in tool box).
 - Power mode: turn to the right (to maximum till fully tightened).
 - Speed mode: turn to the left by 2 turns.
 4. After setting, tighten adjuster valve nut **(2)** completely.
- Speed mode: applications that require productivity from high speed.
 - Soft material breaking such as light/medium duty limestone, soft duty granite, concrete structure, asphalt, etc.
 - Power mode: applications that require productivity from power breaking.
 - Hard material breaking such as heavy duty limestones and stone, granite, basalt, andesite, iron ore, etc.



PTIL19GEN0012GB 9

Oil temperature

The oil temperature varies by working condition but it is usually **40 – 80 °C**. If it is over **80 °C**, life time of seals and accumulator diaphragm becomes shorter.

Ensure that the breakers are used under following condition to avoid unnecessary rising of oil temperature.

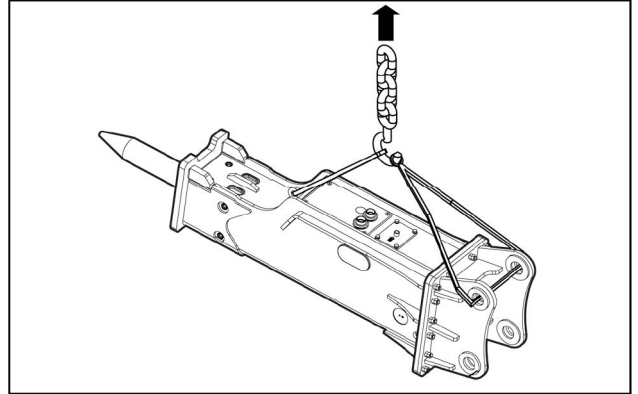
1. Do not break the same material point continuously over **30 s**.
2. Do not blow continuous over **15 s**.
3. Do not increase carrier engine rpm or oil flow beyond the range of breaker oil flow.
4. Keep clean carrier cooler all the time.

Hammer - Handle

Lifting instructions

NOTICE: Ensure that no persons are near the breaker when it is lifted. If the breaker falls down there is a risk of personal injuries.

- Use a hoist when lifting breaker or component parts, to avoid back injury.
- Make sure all chains, hooks, slings, etc., are in good condition and of correct capacity. Be sure that hooks are positioned correctly.
- Lifting devices must safely carry working weight of the breaker, see **Hammer - General specification (89.700)**. Place the chains or slings, as shown in the illustration, prior to lifting breaker.
- Always check balance of the breaker by lifting it gradually. If the breaker is well balanced, it may be lifted higher.



PTIL19GEN0002AA 1

Lifting eyes and lifting eye bolts

NOTICE: Ensure that lifting eye bolts are fully tightened to the housing before using them for lifting. If any lifting eye bolt is not properly tightened it may break. If the breaker falls down there is a risk of personal injuries.

- Lifting eyes on the breaker housing are only intended for handling the breaker.
- The breaker or its parts must not be used for lifting other products.

NOTE: Always remove lifting eye bolts and replace them with blanking screws before operating the breaker.

- Follow the safety instructions for lifting the breaker, see **Personal safety ()**.

Hammer - Commission

Prerequisites for breaker performance and its long life time are:

1. Proper commissioning by experienced/skillful dealer technicians.
2. Respect P (pressure) and Q (flow) rate requirements upon specifications.
3. Use fresh and contamination free hydraulic oil.
4. Proper operation as per Operator's Manual.
5. Respect maintenance interval as per Operator's Manual.
6. Proactive inspection by dealer technicians as we as operator.
7. Timely repair by experienced/skillful dealer technicians as per Service Manual.

It is therefore extremely important that dealer technicians/mechanics read through Service section of this Service Manual very carefully, build their capability to provide the customer with a professional breaker service according to the instructions and guides stated in the manual.

Commissioning

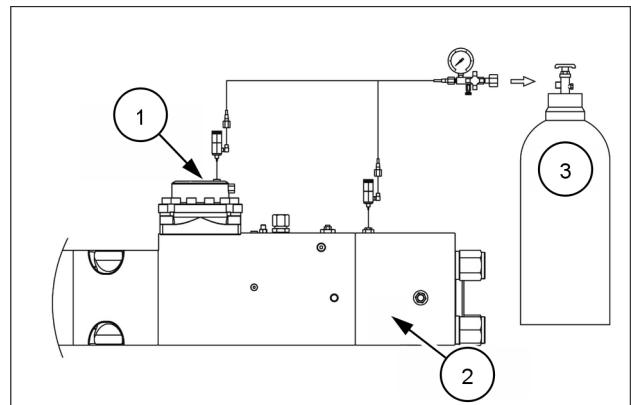
Gas pressure

Hydraulic breaker is working with gas pressure as well as hydraulic oil pressure. If gas pressure is higher than optimum level, the breaker gets overload.

If gas pressure is lower than optimum level, the breaker delivers low performance. Therefore it is crucial to keep gas pressure at the optimum level all the time. See below gas pressure guide.

1.	Accumulator	2.	Back head
3.	Nitrogen gas		

Model	Back head	Accumulator
CB20	10 – 14 Kg/cm ²	–
CB40	14 – 16 Kg/cm ²	–
CB60	10 – 14 Kg/cm ²	–
CB61	10 – 14 Kg/cm ²	40 – 50 Kg/cm ²
CB62	16 – 18 Kg/cm ²	40 – 50 Kg/cm ²
CB70	10 – 12 Kg/cm ²	–
CB80	10 – 14 Kg/cm ²	–
CB140	10 – 14 Kg/cm ²	55 – 60 Kg/cm ²
CB160	14 – 16 Kg/cm ²	55 – 60 Kg/cm ²
CB200		
CB210		
CB230		
CB260		
CB300		
CB380	10 – 14 Kg/cm ²	55 – 60 Kg/cm ²
CB400		
CB550		
CB800	14 – 16 Kg/cm ²	55 – 60 Kg/cm ²



PTIL19GEN0086FA 1

NOTE: Some skid steer loader carrier may incur return line back pressure issue and decrease breaker power, which can be easily sorted out by simple alternation of gas pressure. Please consult with your breaker supplier.

NOTE: Gas must be charged only after the breaker has been sufficiently cooled down.

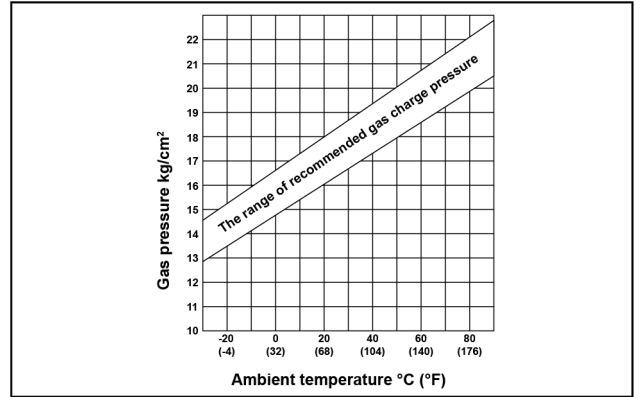
NOTE: Ensure that working tool shall not be pushed up into power cell.

NOTE: Ensure gas cylinder is not stored under sunshine, also its valve is always closed.

NOTE: The optimum gas pressure varies upon ambient temperature of the job site. See below chart.

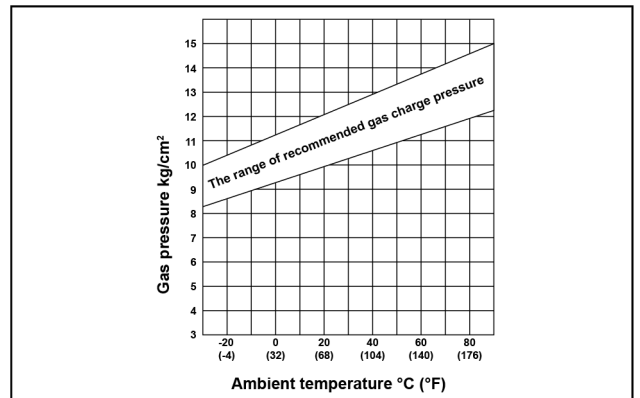
Back head gas pressure

CB62



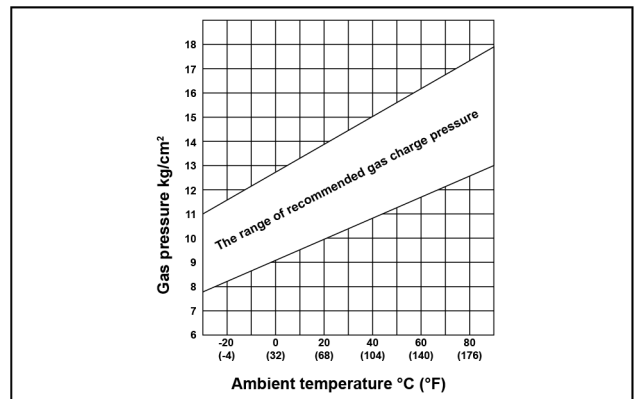
PTIL19GEN0080AB 2

CB61, CB70



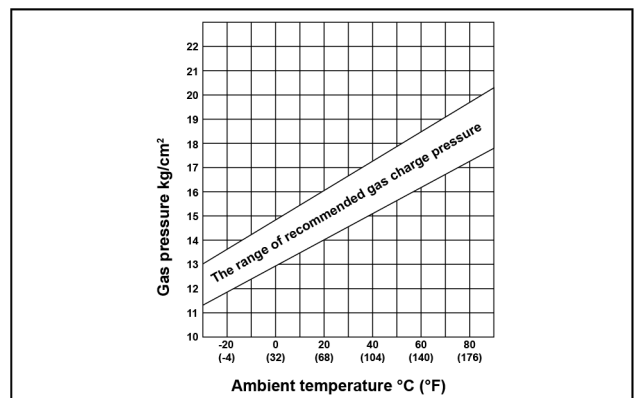
PTIL19GEN0081AB 3

CB20, CB60, CB80, CB140



PTIL19GEN0082AB 4

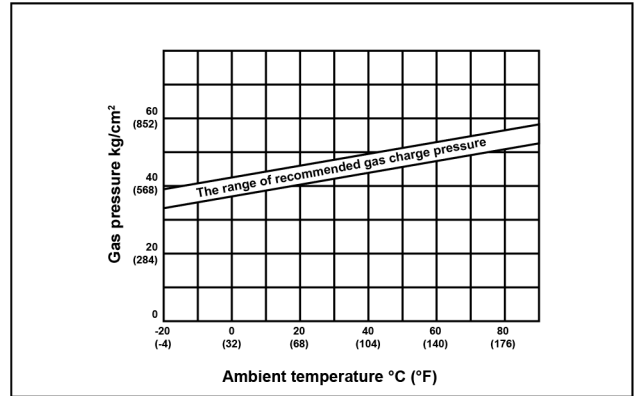
CB40, CB160~CB800



PTIL19GEN0083AB 5

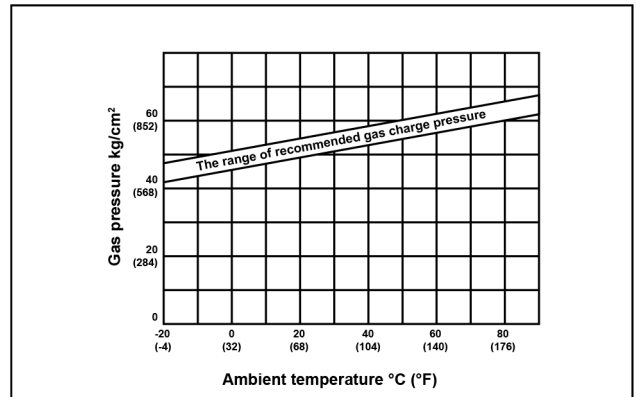
Accumulator gas pressure

CB61, CB62



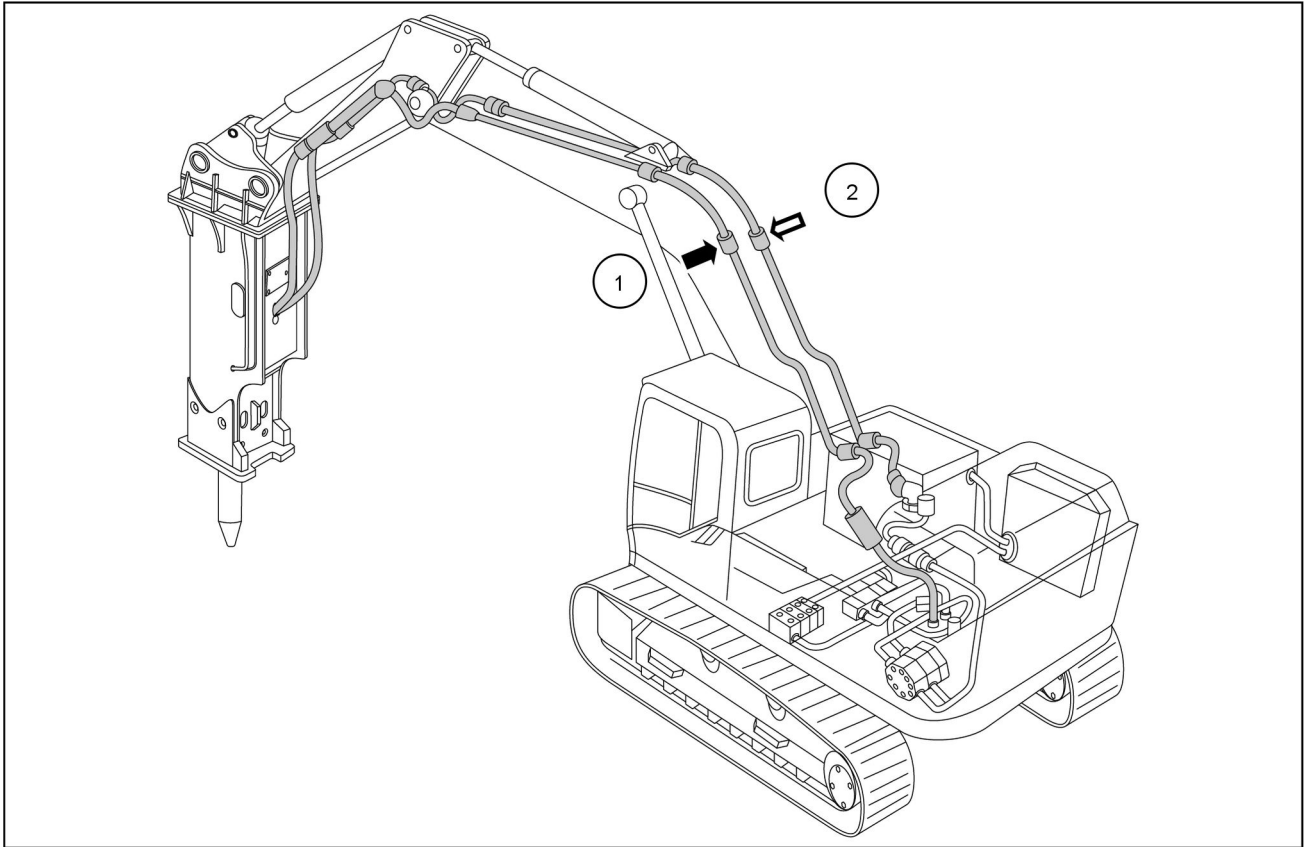
PTIL19GEN0084AB 6

CB140~CB800



PTIL19GEN0085AB 7

Carrier hydraulic pipe lines and controls



PTIL19GEN0132FB 8

The breaker requires following devices from the carrier. Contact carrier supplier if any missing.

- Auxiliary control valve.
- Pedal switch or joy stick button switch.
- High pressure pipe lines **(1)** to feed high pressure oil to breaker.
- Low pressure pipe lines **(2)** for low pressure oil to return to carrier oil tank.
- Stop valve to shut off oil lines when installing or disassembling breaker on/off the carrier.
- See **Hammer - Hydraulic schema (89.700)** for further information.
- Once those devices are available on the carrier, check the connection to breaker. Fitting threads must be free of damage and contamination.
- Ensure that hydraulic line width and fitting are the ones to match with breaker hose size.

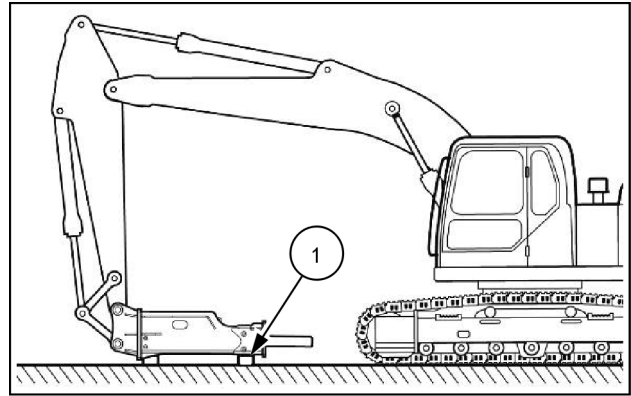
Model	CB20 - CB61	CB62 - CB140	CB160 - CB230	CB260 - CB800
Hose size	12.7 mm (0.5 in)	19.10 mm (0.75 in)	25.4 mm (1.0 in)	31.75 mm (1.25 in)

Oil contamination

Oil contamination causes failures of control valve, piston and cylinder as well as breaker performance decrease. Ensure that breaker working oil is kept in clean condition all the time. Replace carrier oil filter every **100 h** and working oil every **600 h**.

When installing breaker on an aged carrier, check working oil condition and replace it if necessary. While the breaker is installed on the carrier, hydraulic circuit parts can be easily exposed to the risks of contamination or damage.

Therefore breaker installation shall be carried out with utmost care. Keep the breaker on the wooden blocks **(1)**.



PTIL19GEN0133AA 9

Port (2nd) relief valve pressure

The breaker is not self-powered. It uses hydraulic power system of the carrier where it is mounted.

To enable the carrier to operate the breaker, carrier hydraulic power system must be converted accordingly to requirement of each breaker working pressure range. Set port relief valve pressure as per below guide.

Excavator and Tracked loader backhoe

Description	CB20 ~ CB80	CB140 ~ CB300	CB380, CB400	CB550	CB800
Port relief valve setting pressure	175 Kg/cm ² (2500 psi)	210 Kg/cm ² (3000 psi)	230 Kg/cm ² (3300 psi)	210 Kg/cm ² (3000 psi)	250 Kg/cm ² (3570 psi)

Skid Steer Loader

Description	CB40, CB60, CB70, CB80
Port relief valve setting pressure	230 Kg/cm ² (3300 psi)

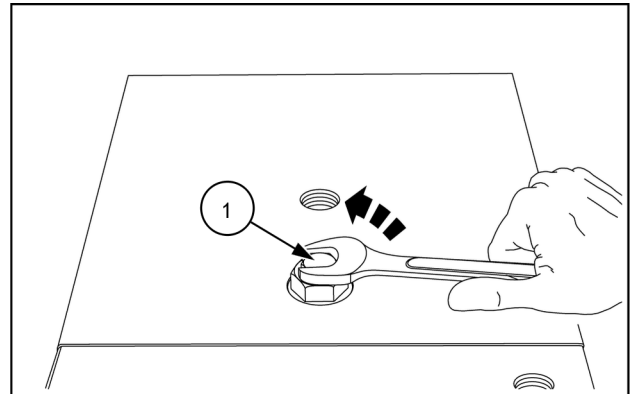
NOTE: If port relief valve is set higher than the guide of this Service Manual, breaker working pressure becomes higher than specified range of breaker and will cause failures on various breaker parts and shorten breaker service life. This case will void the warranty of breaker.

NOTE: For flow setting procedure, see **Hammer - Pressure setting (89.700)**.

Hammer - Charging - Back head (CB20 - CB80)

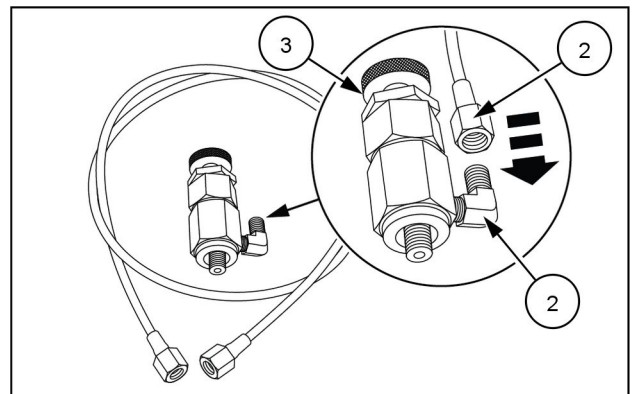
CB 20	
CB 40	
CB 60	
CB 61	
CB 62	
CB 70	
CB 80	

1. Open the valve cap (1).



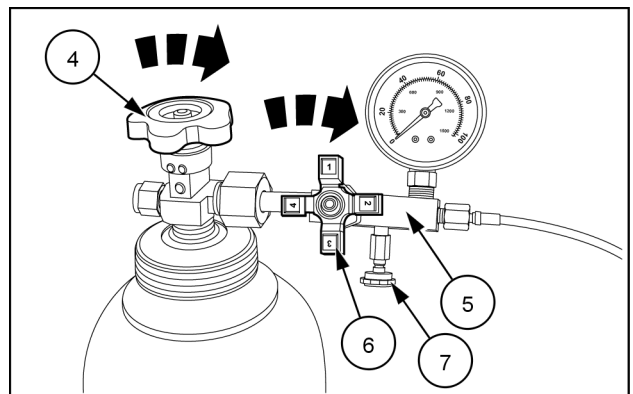
PTIL19GEN0049AA 1

2. Connect the hose (2) to the adapter (3).



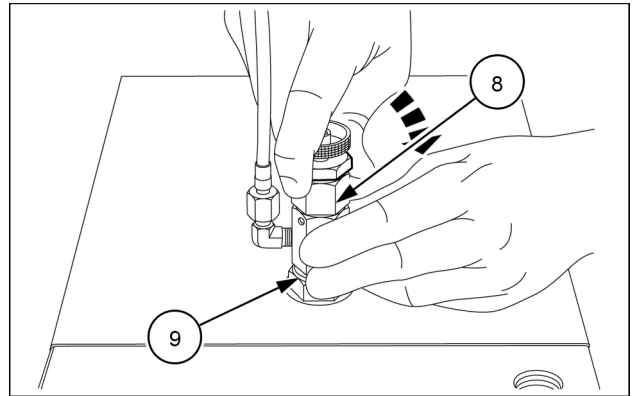
PTIL19GEN0129AA 2

3. Close the gas cylinder valve (4) and connect the gas charging kit (5).
4. Close the three way valve (6) and the drain cock (7).



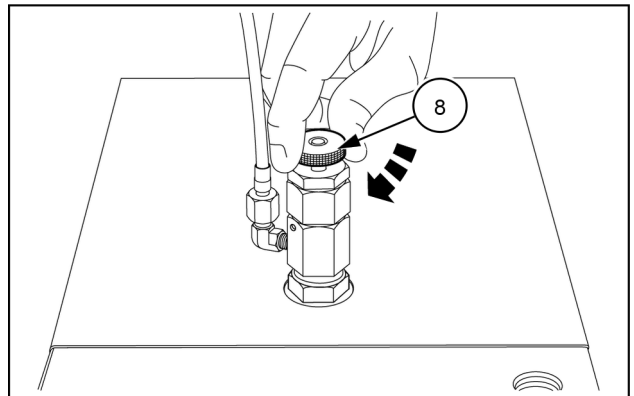
PTIL19GEN0050AA 3

5. Fit the adapter (8) on the inlet port (9) by tightening the middle section of the adapter.



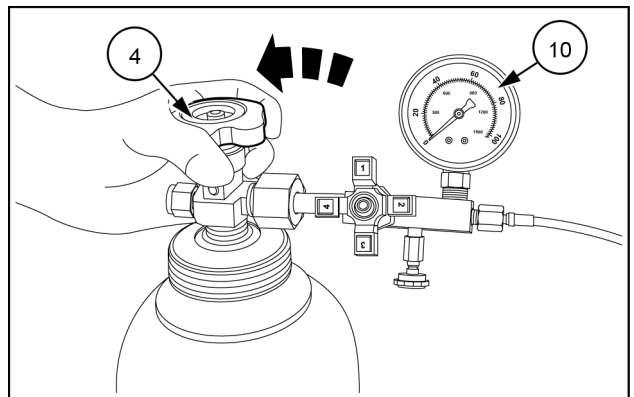
PTIL19GEN0051AA 4

6. Tighten the top section of the adapter (8).



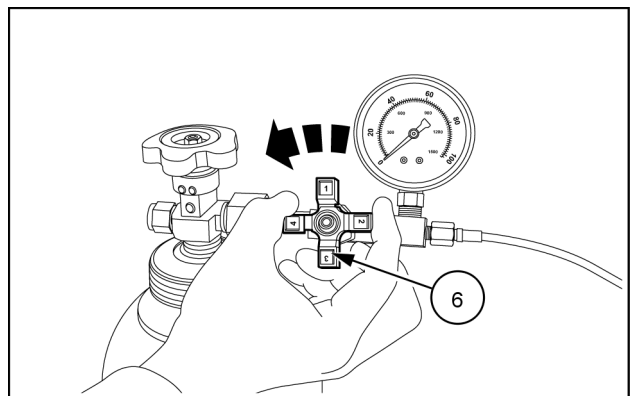
PTIL19GEN0052AA 5

7. Open the gas cylinder valve (4) slowly.
8. Quick gas cylinder valve (4) opening may cause damage to the gauge (10).



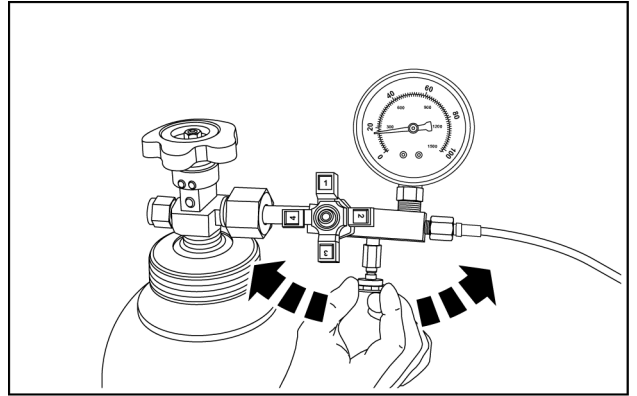
PTIL19GEN0053AA 6

9. Open the three-way valve slowly (6) and charge N2 gas up to 20 Kg/cm².
10. close the three-way valve (6).



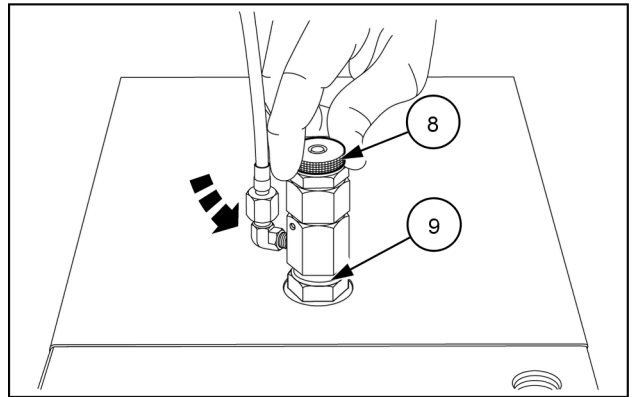
PTIL19GEN0054AA 7

11. Drain the gas to **16 – 18 Kg/cm²** upon ambient temperature of job site.



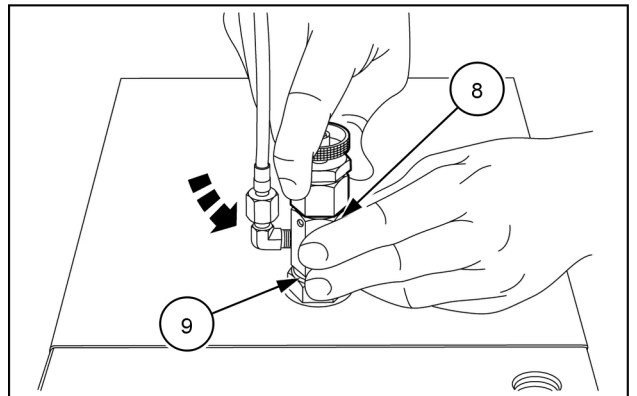
PTIL19GEN0055AA 8

12. Close the inlet port **(9)** by loosening top section of the adapter **(8)**.



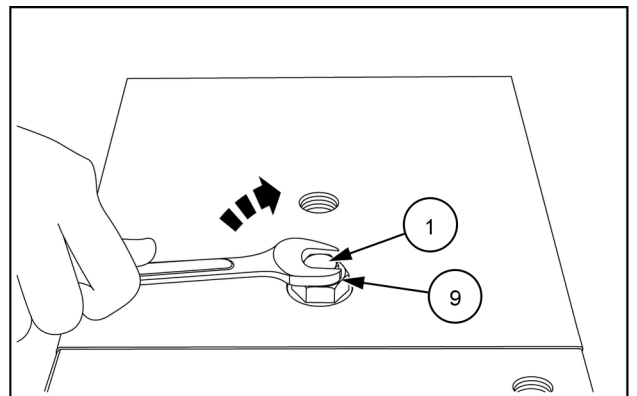
PTIL19GEN0056AA 9

13. Disassemble the adapter **(8)** from the inlet port **(9)** by loosening middle section of the adapter.



PTIL19GEN0057AA 10

14. Assemble the valve cap **(1)** to the inlet port **(9)**.

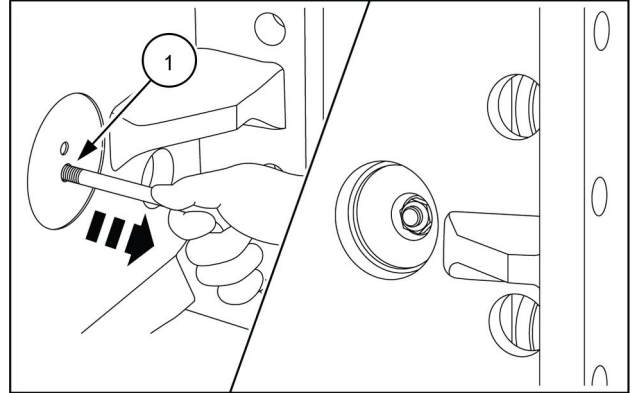


PTIL19GEN0058AA 11

Hammer - Charging - Back head (CB140 - CB800)

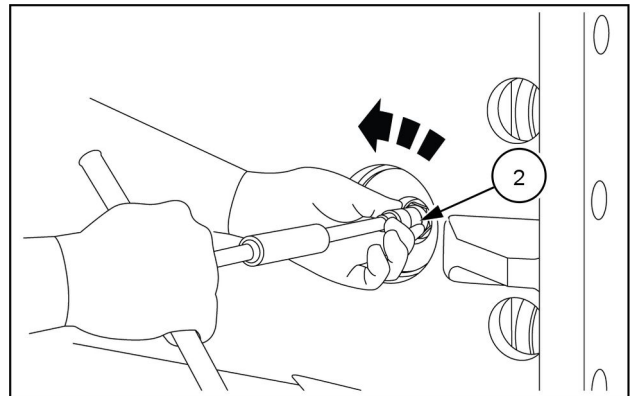
CB 140	
CB 160	
CB 210	
CB 230	
CB 300	
CB 380	
CB 800	

1. Remove the rubber plug (1).



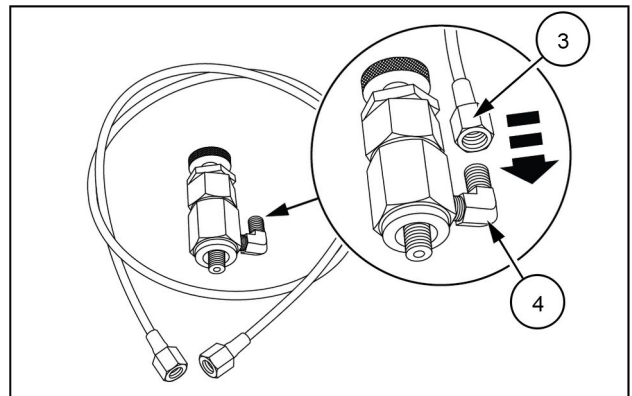
PTIL19GEN0059AA 1

2. Open the valve cap (2).



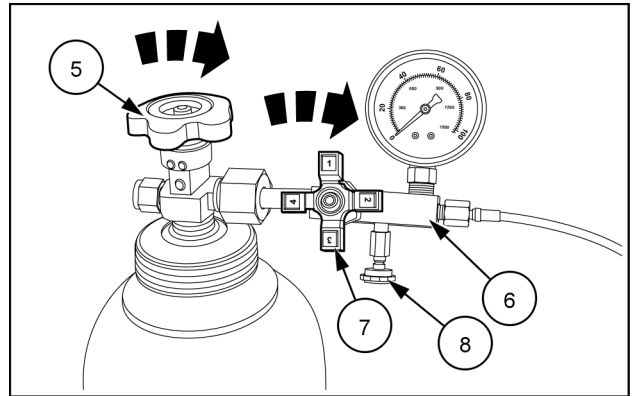
PTIL19GEN0060AA 2

3. Connect the hose (3) to the adapter (4).



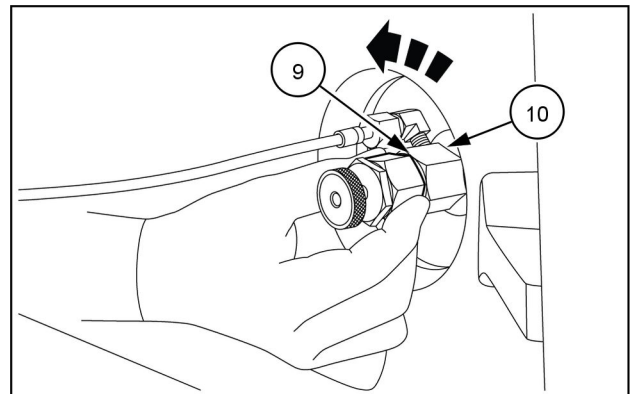
PTIL19GEN0129AA 3

4. Close the gas cylinder valve **(5)** and connect the gas charging kit **(6)**.
5. Close the three-way valve **(7)** and the drain cock **(8)**.



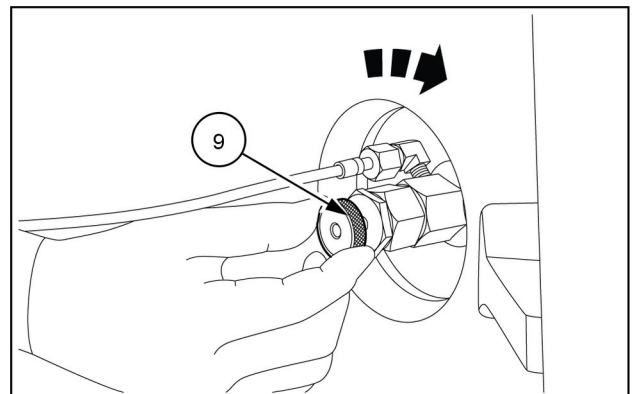
PTIL19GEN0050AA 4

6. Fit the adapter **(9)** on the inlet port **(10)** by tightening middle section of the adapter.



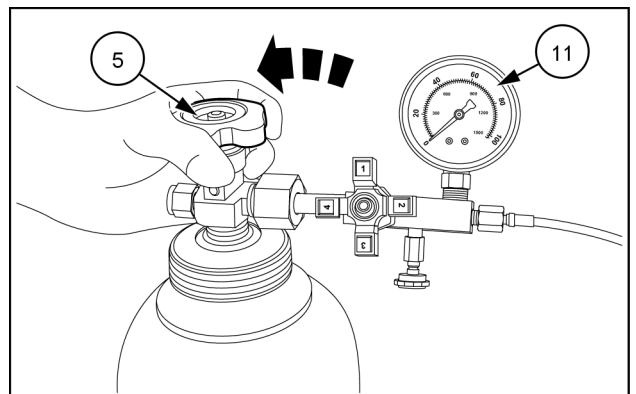
PTIL19GEN0064AA 5

7. Tighten the top section of the adapter **(9)**.



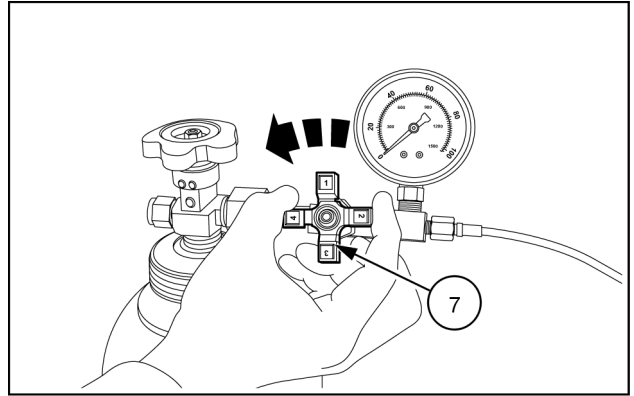
PTIL19GEN0062AA 6

8. Open the gas cylinder valve **(5)** slowly.
9. Quick gas cylinder valve **(5)** opening may cause damage on the gauge **(11)**.



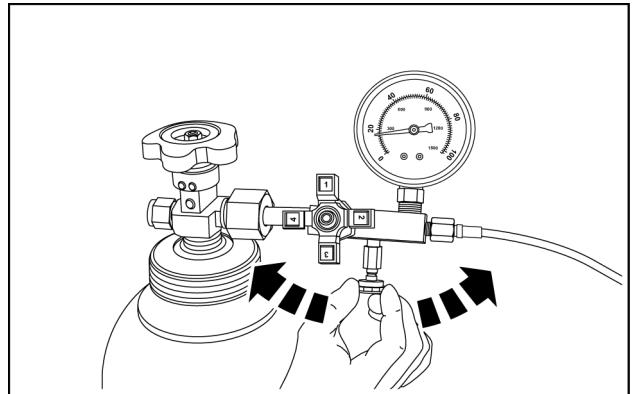
PTIL19GEN0053AA 7

10. Open the three-way valve (7) slowly and charge N2 gas upto **20 Kg/cm²**.
11. Close the three way valve (7).



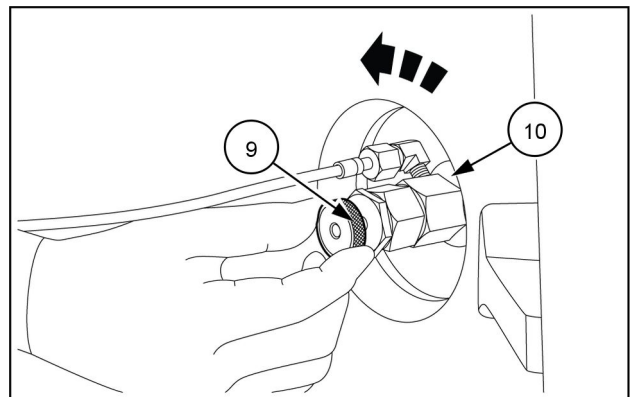
PTIL19GEN0054AA 8

12. Drain the gas properly for each model upon ambient temperature of job site.



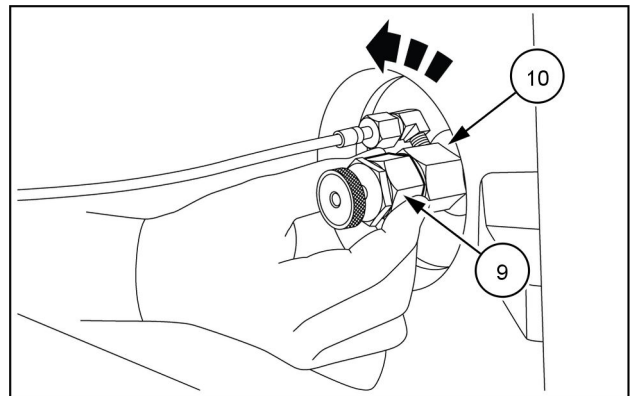
PTIL19GEN0055AA 9

13. Close the inlet port (10) by loosening top section of the adapter (9).



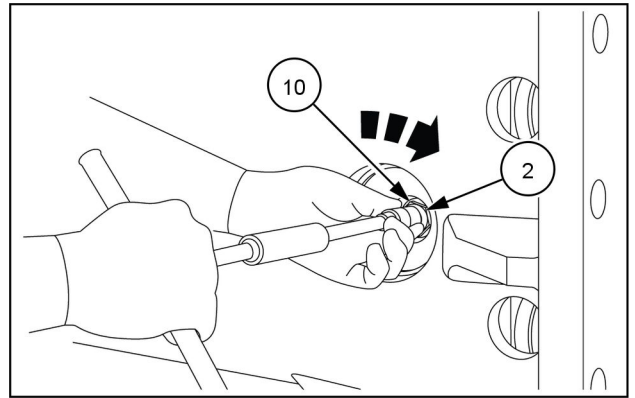
PTIL19GEN0063AA 10

14. Disassemble the adapter (9) from the inlet port (10) by loosening middle section of the adapter.



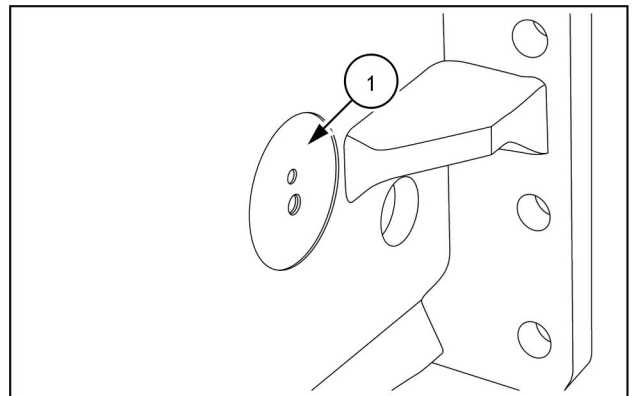
PTIL19GEN0064AA 11

15. Assemble the valve cap (2) to the inlet port (10).



PTIL19GEN0065AA 12

16. Assemble the rubber plug (1).



PTIL19GEN0067AA 13

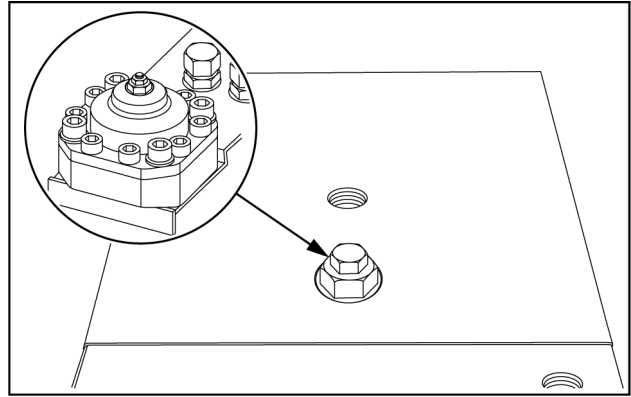
Hammer - Charging - Accumulator (CB61, CB62)

CB 61	
CB 62	

NOTE: Carry out gas charging only after the breaker has been sufficiently cooled down. Ensure that the breaker is lying on the floor and work tool shall not be pushed into power cell.

NOTE: When storing gas bottle, ensure the bottle is not exposed to the sun and its valve is always closed.

1. Accumulator gas charging valve is same as back head gas charging valve, see **Hammer - Charging - Back head (CB20 - CB80) (89.700)**.
2. Charging accumulator gas can be done in the same way as illustrated earlier for back head.

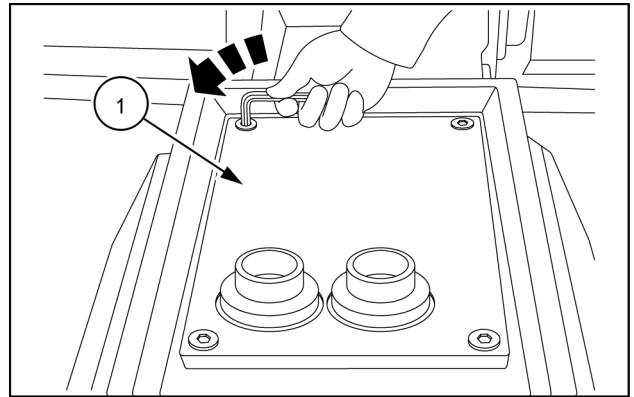


PTIL19GEN0069AA 1

Hammer - Charging - Accumulator (CB140 - CB800)

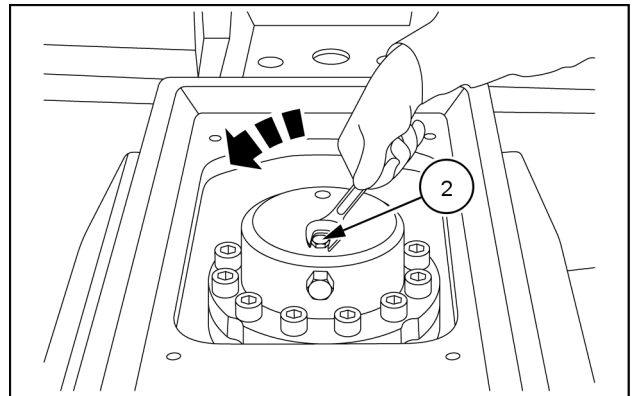
CB 140	
CB 160	
CB 210	
CB 230	
CB 300	
CB 380	
CB 800	

1. Remove the MC cover (1).



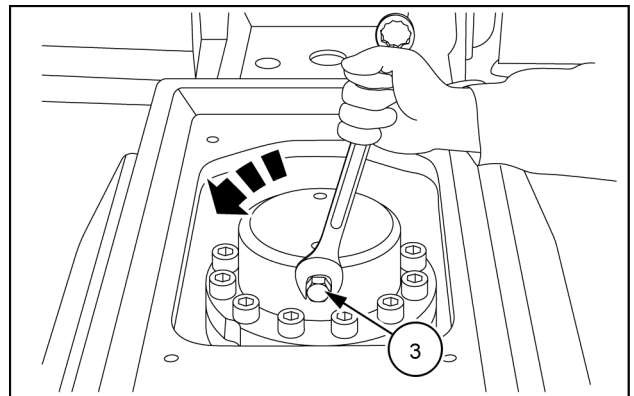
PTIL19GEN0070AA 1

2. Remove the valve cap (2).



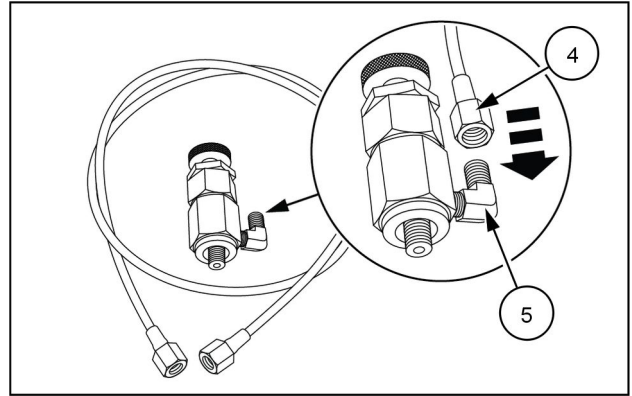
PTIL19GEN0071AA 2

3. Remove the needle valve cap (3).



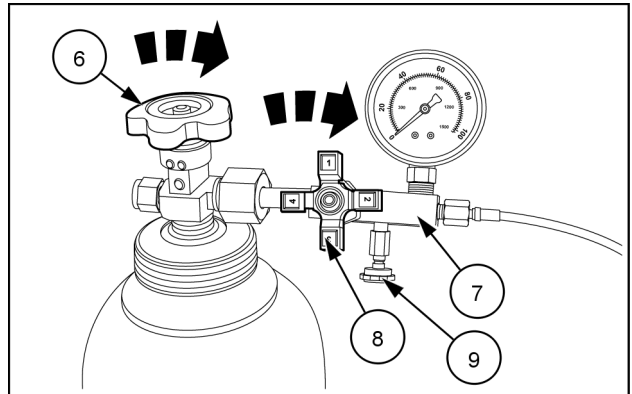
PTIL19GEN0072AA 3

4. Connect the hose (4) to the adapter (5).



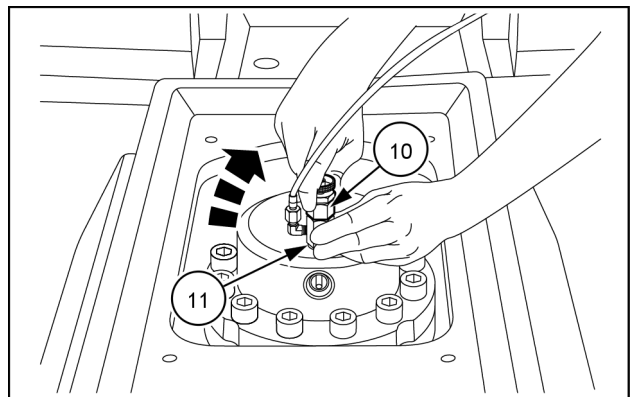
PTIL19GEN0129AA 4

5. Close the gas cylinder valve (6) and connect the gas charging kit (7).
6. Close the three-way valve (8) and the drain cock (9).



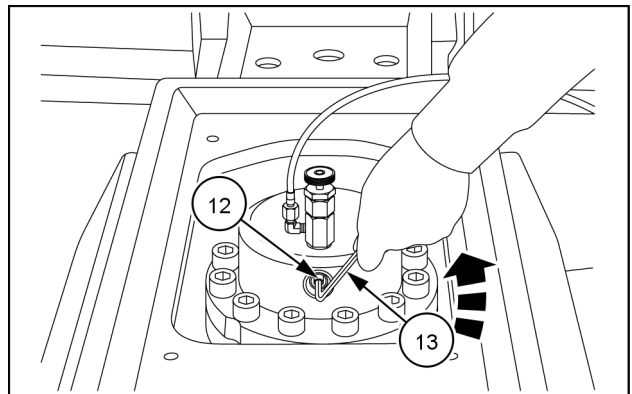
PTIL19GEN0050AA 5

7. Connect the adapter (10) to the inlet port (11).



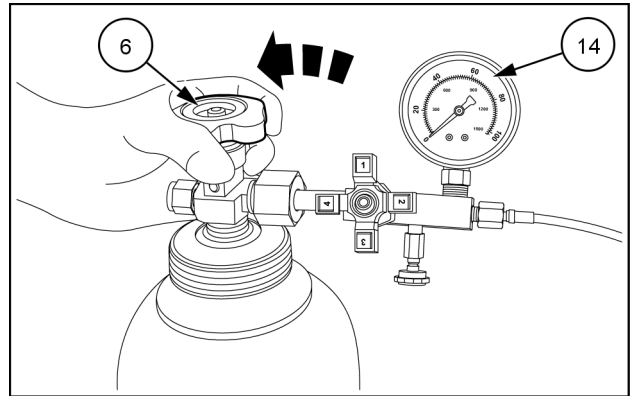
PTIL19GEN0073AA 6

8. Open the needle valve (12) with 5 mm L-wrench (13).



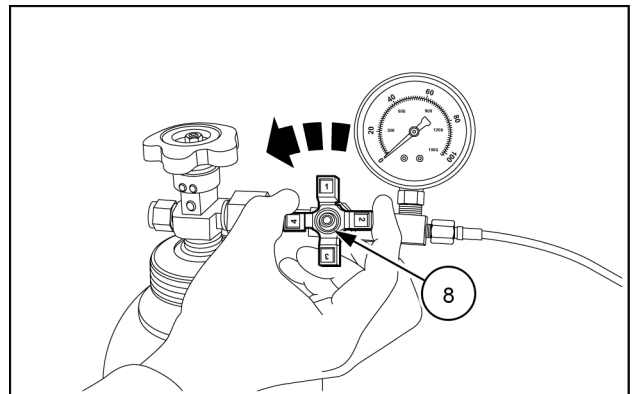
PTIL19GEN0074AA 7

9. Open the gas cylinder valve (6) slowly.
10. Quick gas cylinder valve (6) opening may cause damage on the gauge (14).



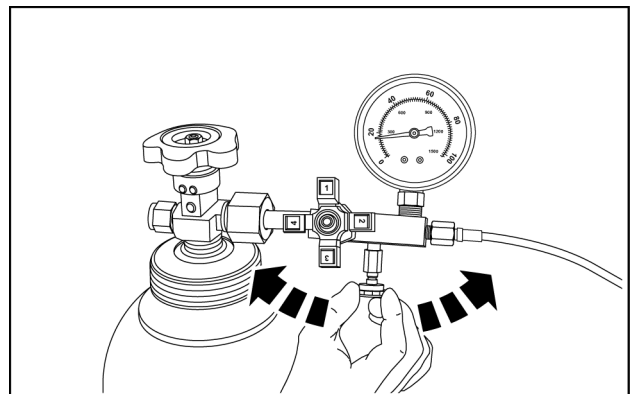
PTIL19GEN0053AA 8

11. Open the three-way valve (8) slowly and charge N2 gas up to 65 Kg/cm².
12. Close the three way valve (8).



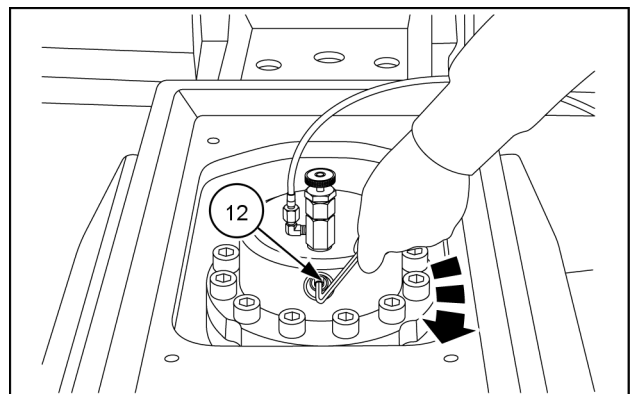
PTIL19GEN0054AA 9

13. Drain the gas to 55 – 60 Kg/cm² upon ambient temperature of job site.



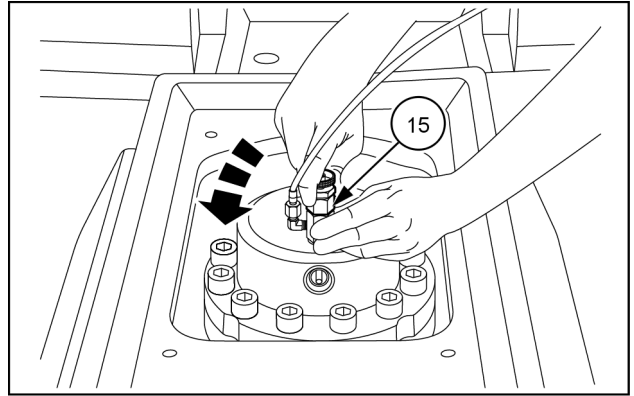
PTIL19GEN0055AA 10

14. Close the needle valve (12).



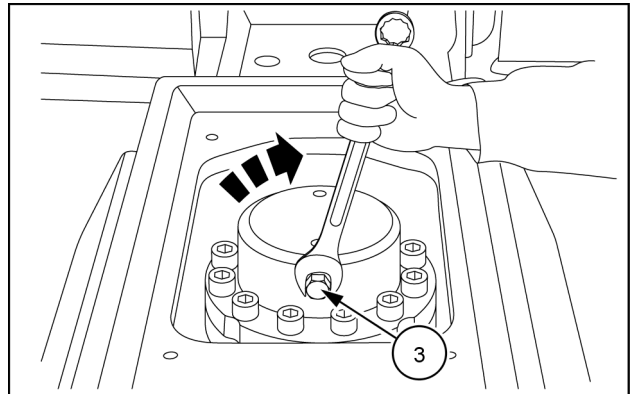
PTIL19GEN0075AA 11

15. Remove the gas charging adapter (15).



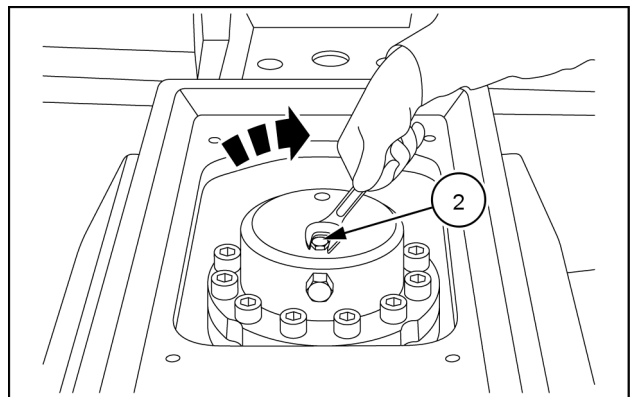
PTIL19GEN0076AA 12

16. Assemble the needle valve cap (3).



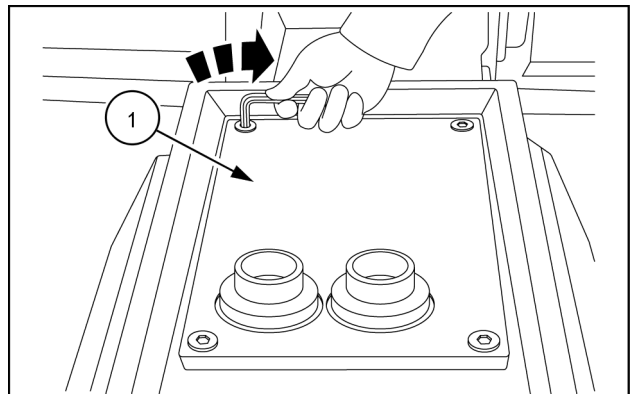
PTIL19GEN0077AA 13

17. Assemble the valve cap (2).



PTIL19GEN0078AA 14

18. Assemble the MC cover (1).



PTIL19GEN0079AA 15

Hammer - Pressure setting

The breaker is to work with its specific flow range. Set carrier flow feeding to the breaker as follows.

1. Connect breaker hoses to the flow meter.
2. Open flow meter restrictor fully.
3. Connect the other end of breaker hoses to the end of carrier pressure and return lines.
4. Check flow requirements of the breaker (see **Hammer - General specification (89.700)** for pressure values).
5. Open stop valve of carrier hydraulic lines.
6. Adjust flow to the range of breaker specifications by tuning carrier engine rpm or if available flow control valve.

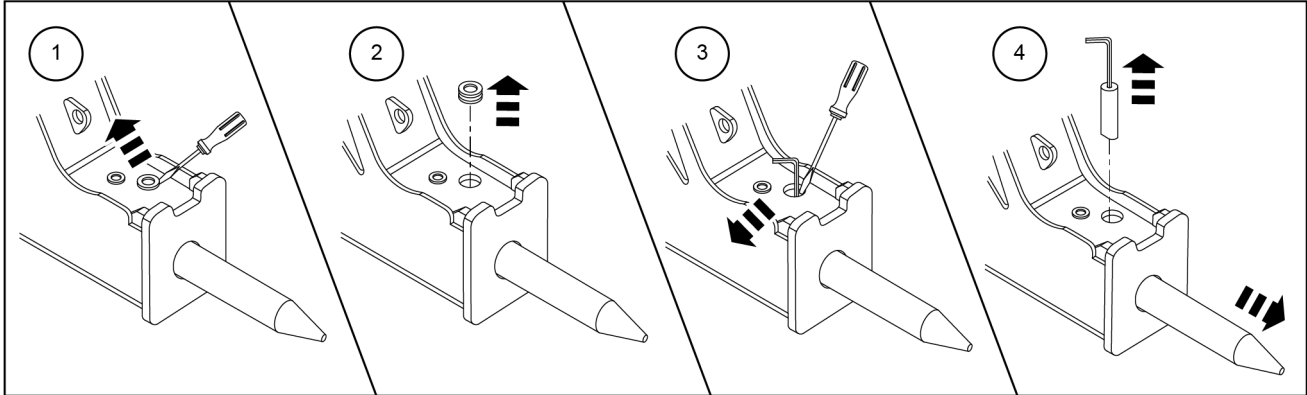
NOTE: *Over flow will cause oil heating, early seal failures and piston & cylinder scratches. Use of breaker over the specification will not be supported by the breaker supplier's warranty.*

Hammer - Disassemble - Tool

NOTICE: For safety reason, the carrier must be switched off before performing the following work. Never use your fingers to check whether the recesses on the working tool shaft are aligned to the slots for the tool pin.

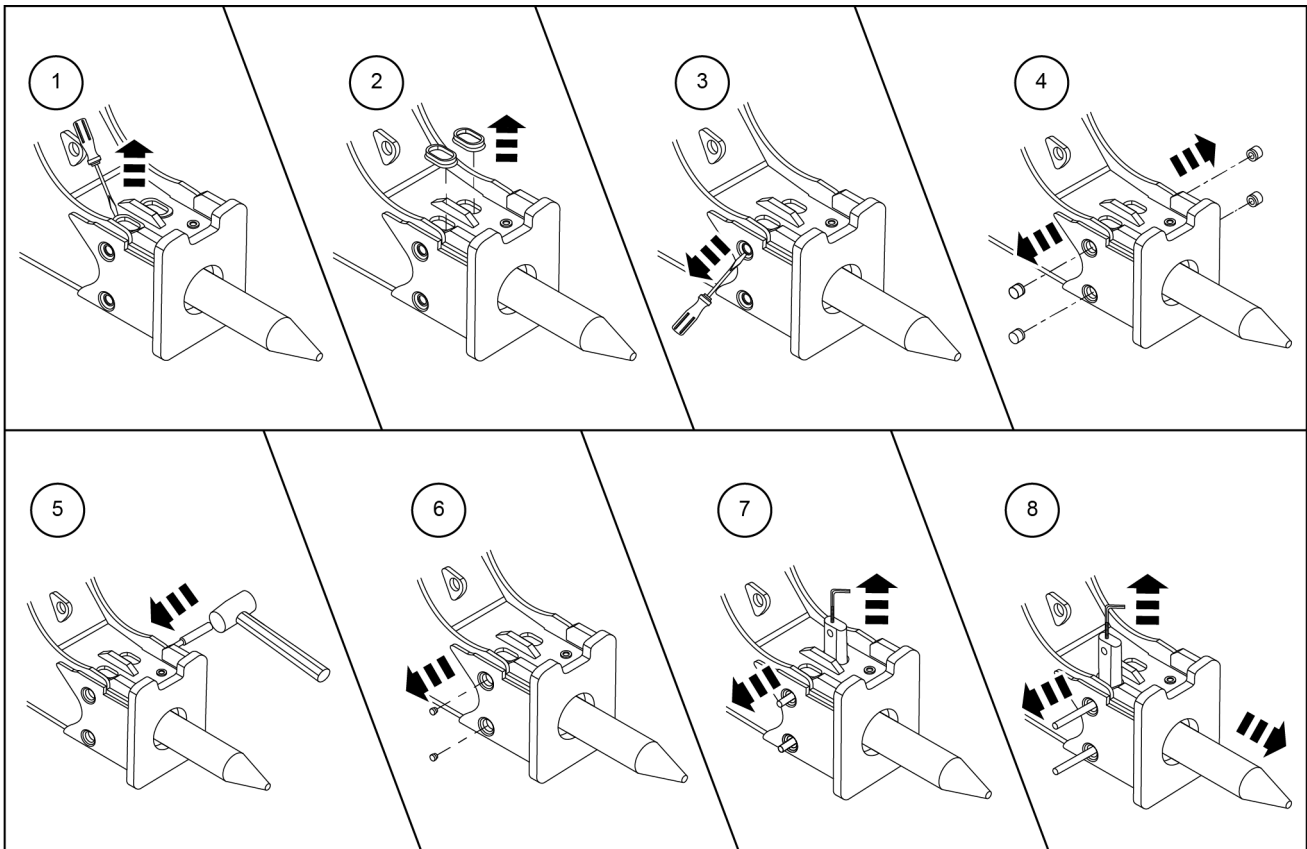
NOTICE: Always wear protective glasses when fitting or removing the tool, since metal splinters may fly off when breaking out the stopper pins.

CB20, CB40, CB60, CB61, CB70, CB80



PTIL19GEN0087EA 1

CB62, CB140~CB800



PTIL19GEN0091FA 2

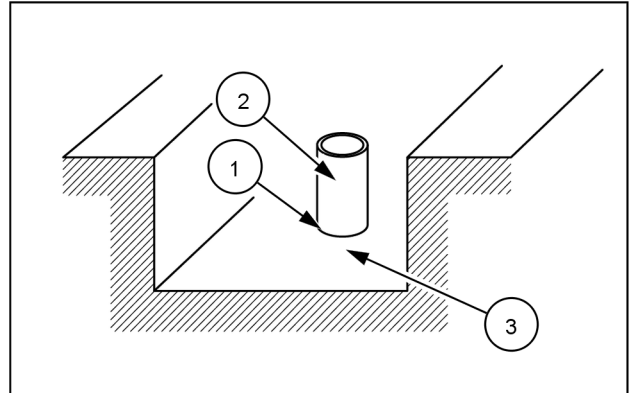
Hammer - Disassemble - Housing

Prior operation:

Disassemble the breaker tool, see **Hammer - Disassemble - Tool (89.700)** .

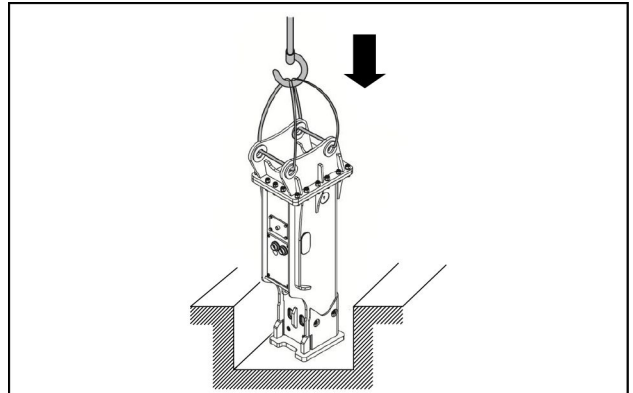
NOTICE: Use right capacity lifting devices. Also ensure holding pipe as shown below is available to avoid breaker falling down. Disassembling work without proper lifting devices and holding pipe is very dangerous and may cause injury or fatal accident.

- A. Prepare a hole and holding pipe **(2)**.
Place a steel plate **(3)** below the holding pipe **(2)**.
Weld the pipe **(2)** together with plate **(3)** at base **(1)**.



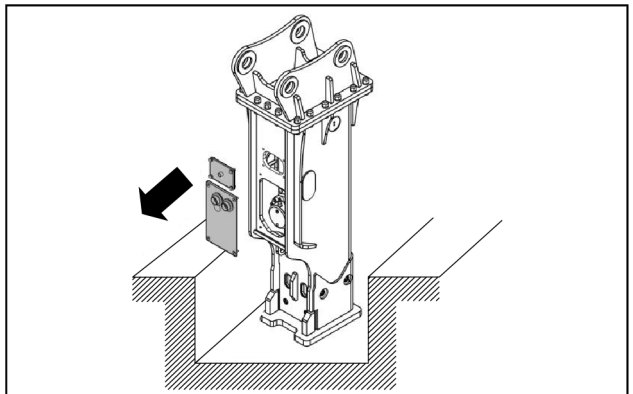
PTIL19GEN0134AA 1

- B. Place the breaker on the pipe.



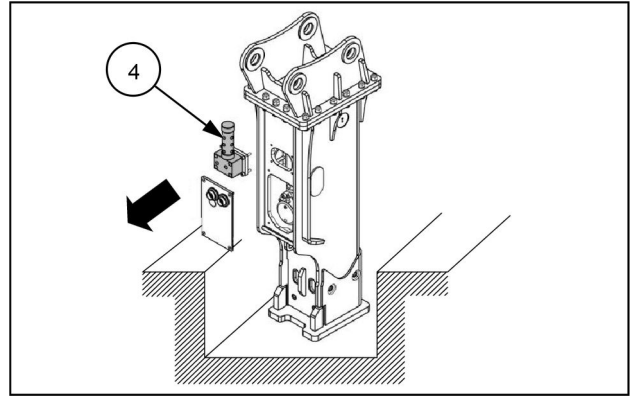
PTIL19GEN0135AA 2

- C. Remove MC cover and gas cover.



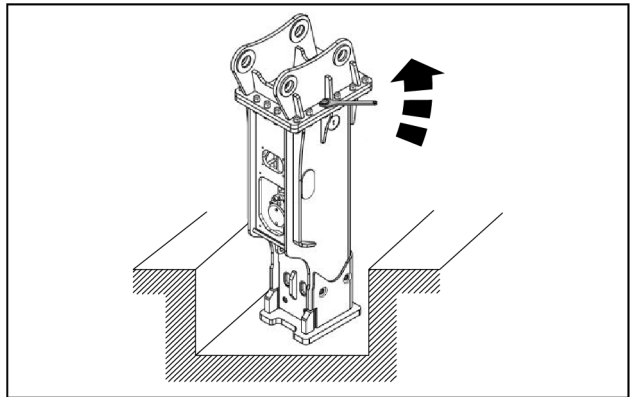
PTIL19GEN0136AA 3

D. Remove Optional Auto-lubrication system (ALS) (4) and its bracket, if equipped.

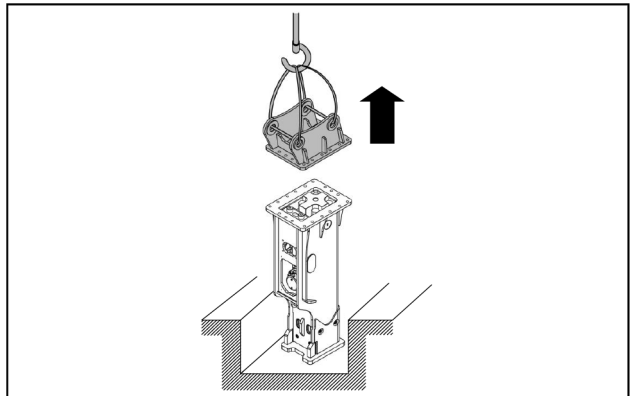


PTIL19GEN0137AA 4

E. Disassemble the bracket from the breaker housing.

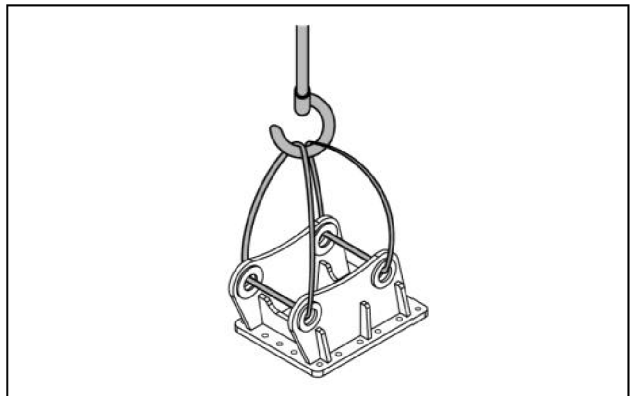


PTIL19GEN0138AA 5



PTIL19GEN0139AA 6

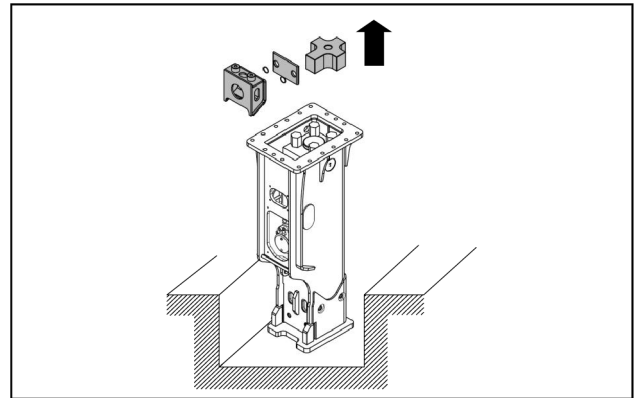
F. Put the breaker bracket on the floor safely.



PTIL19GEN0140AA 7

- G. Take upper damper, head plate, shall pad from the breaker housing.

NOTE: Be careful not to lose rubber plug(s) on the head plate and two O-rings between head plate and shall pad. Reassembly of breaker with any missing will cause failure of breaker parts.

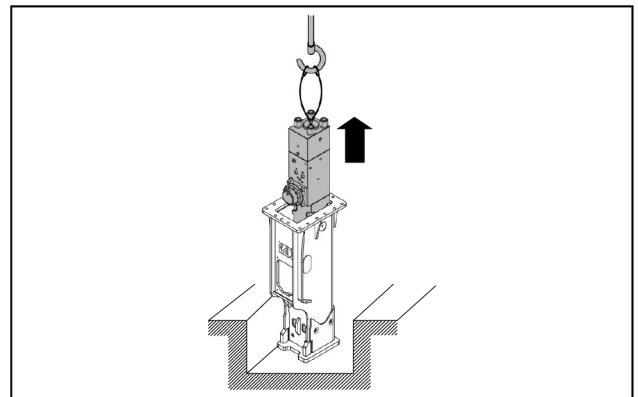


PTIL19GEN0141AA 8

- H. Remove the power cell from the breaker housing.

NOTE: Ensure that eye bolt is fitted tightly and lifting devices and facilities are up to the right capacity to handle power cell weight.

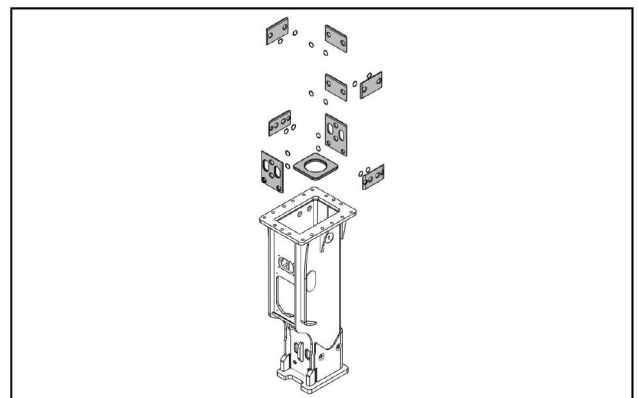
NOTE: Select the eye bolt as per the breaker model to handle power cell, see **Hammer - Special tools - Eye bolt (89.700)**.



PTIL19GEN0142AA 9

- E. Remove all remaining shell pads and bottom damper from the housing.

NOTE: Be careful not to lose two O-rings between head plate and shall pad. Reassembly of breaker with any missing will cause failure of breaker parts as well as shall pad.



PTIL19GEN0143AA 10

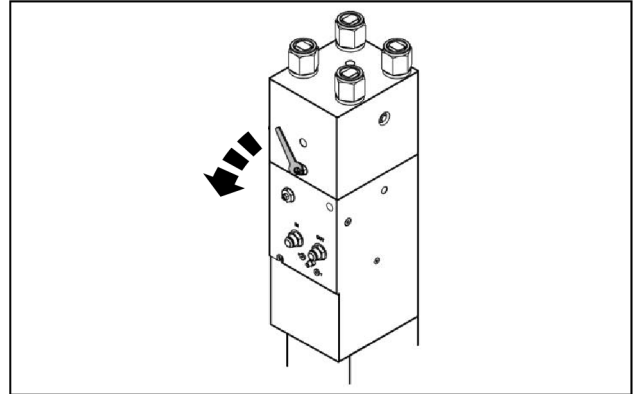
Hammer - Discharging - Nitrogen gas

NOTICE: Ensure back head gas is completely discharge before disassembly of power cell. Any residual gas pressure inside back head may cause injury or fatal accident.

Prior operation:

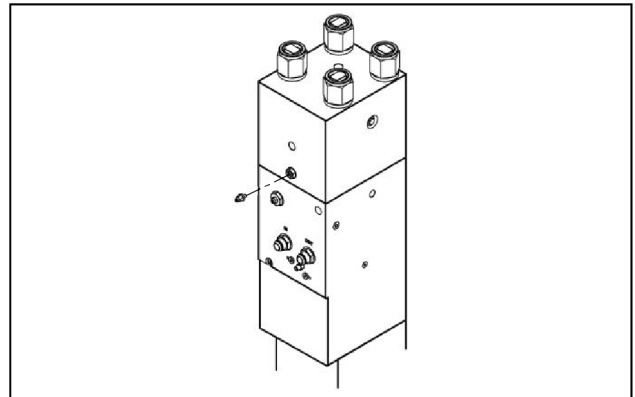
Disassemble the housing, See **Hammer - Disassemble - Housing (89.700)**.

1. Open gas charging valve cap.



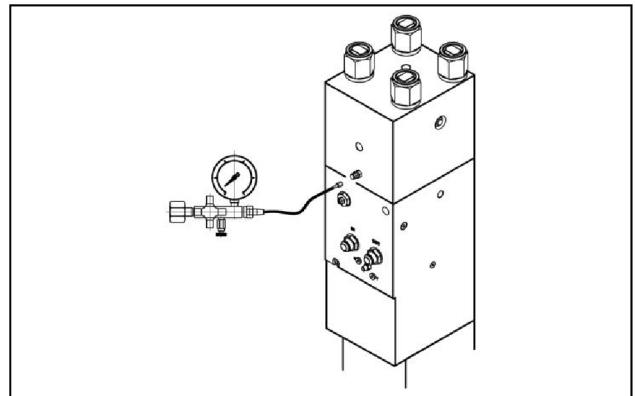
PTIL19GEN0144AA 1

2. Assemble gas charge adapter on the gas charging port.



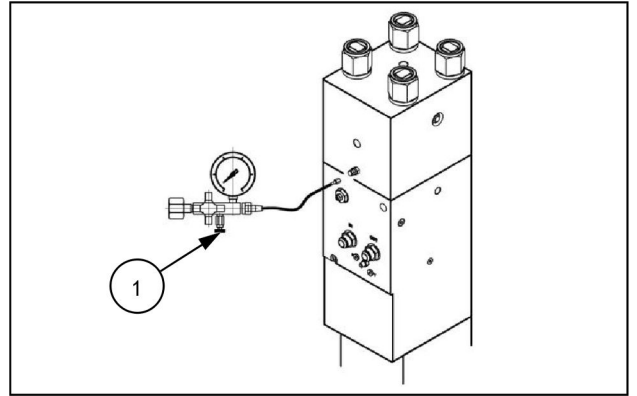
PTIL19GEN0145AA 2

3. Connect gas charging kit to the adapter.



PTIL19GEN0146AA 3

4. Discharge gas completely by opening drain cock (1).



PTIL19GEN0146AA 4

Hammer - Disassemble - Power cell

Prior operation:

Remove the power cell from the breaker housing, see **Hammer - Disassemble - Housing (89.700)**.

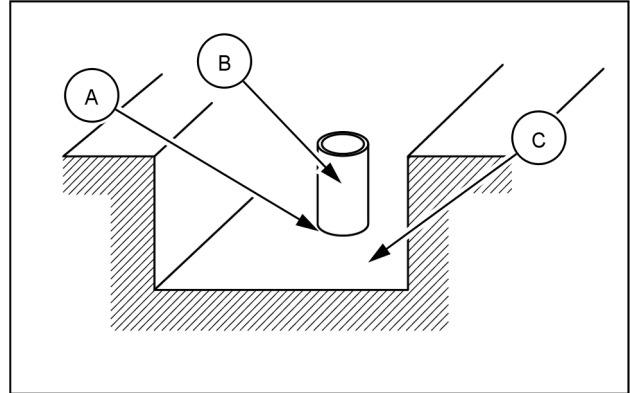
Prior operation:

Discharge the nitrogen gas, See **Hammer - Discharging - Nitrogen gas (89.700)**.

NOTICE: Ensure holding pipe is available to avoid power cell falling down. Disassembling without proper lifting devices and holding pipe is very dangerous and may cause injury or fatal accident.

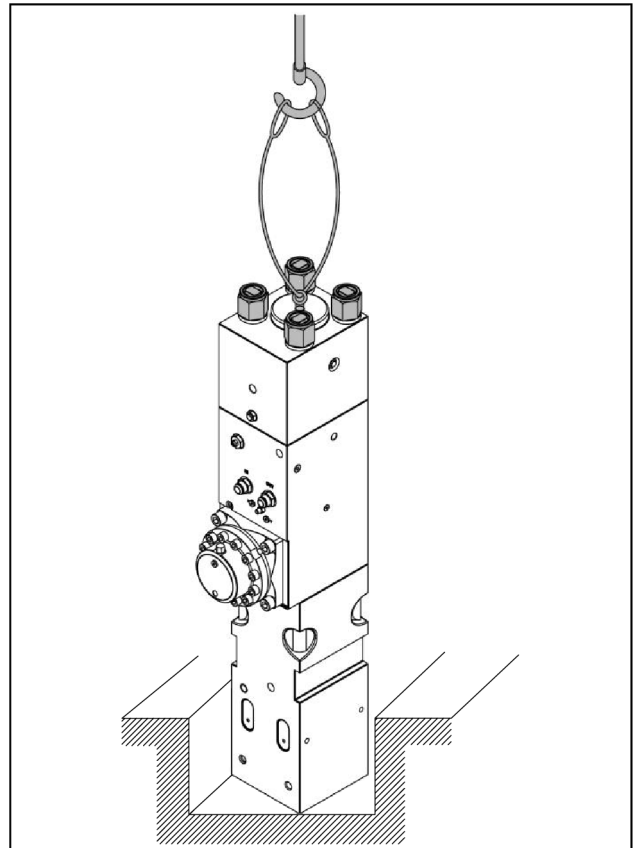
1. Place a steel plate **(C)** below the holding pipe **(B)**.
Weld the pipe **(B)** together with plate **(C)** at base **(A)**

NOTE: Select suitable eye bolt as per the breaker model to handle power cell, see **Hammer - Special tools - Eye bolt (89.700)**.



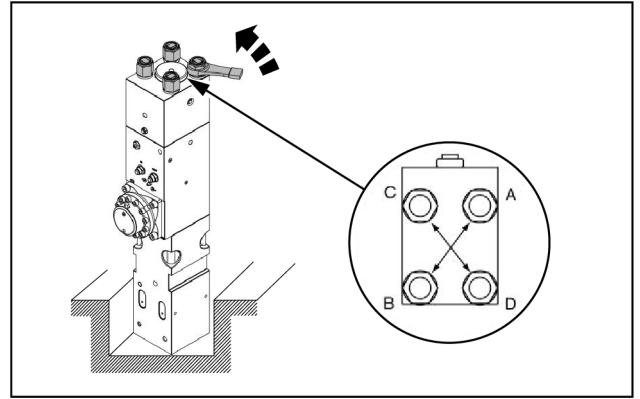
PTIL19GEN0134AA 1

Place power cell on the pipe.



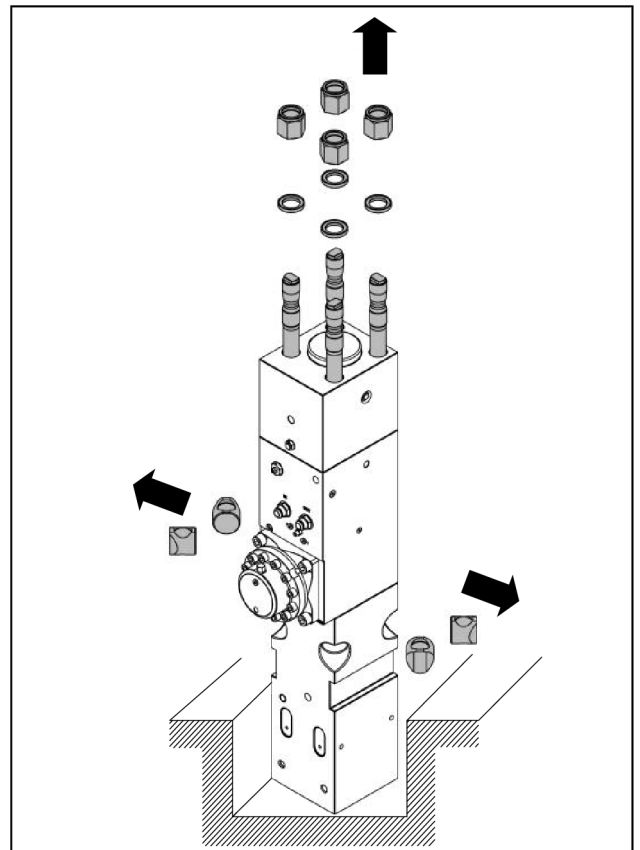
PTIL19GEN0147BA 2

2. Loosen through bolt nuts.
To loosen the bolts, follow the pattern as shown in **3**



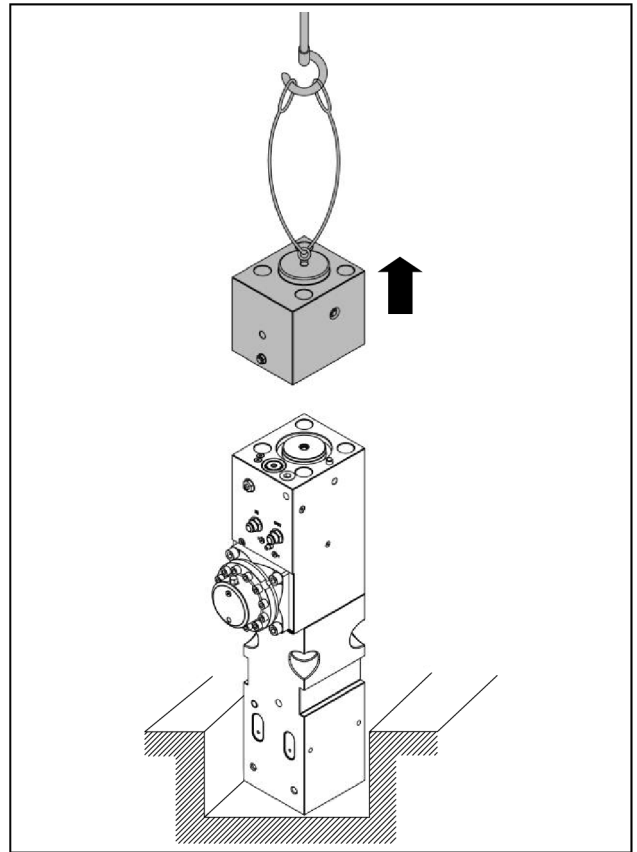
PTIL19GEN0148AA 3

3. Remove through bolts, top and bottom nuts and washers.



PTIL19GEN0149BA 4

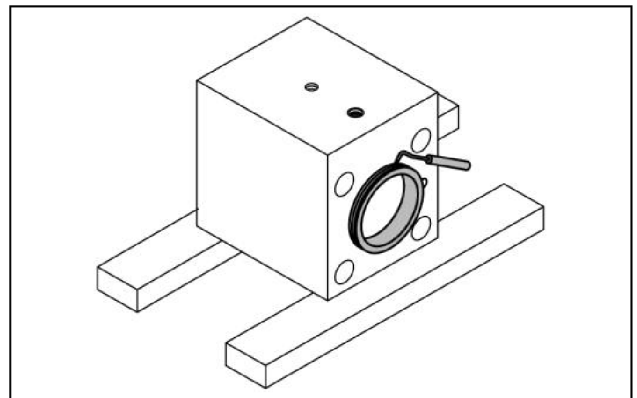
4. Remove back head.



PTIL19GEN0150BA 5

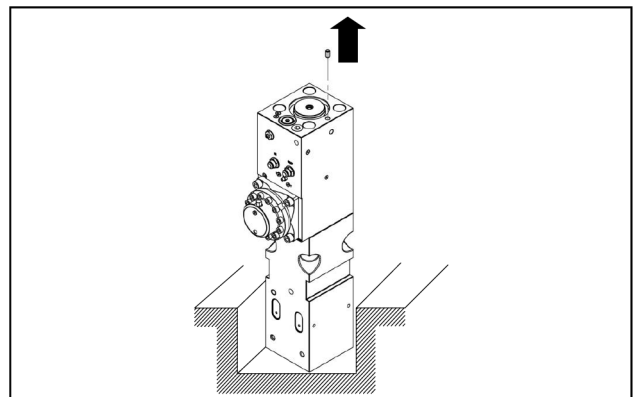
5. Put the back head down on wood blocks.

6. Remove O-ring from the back head.



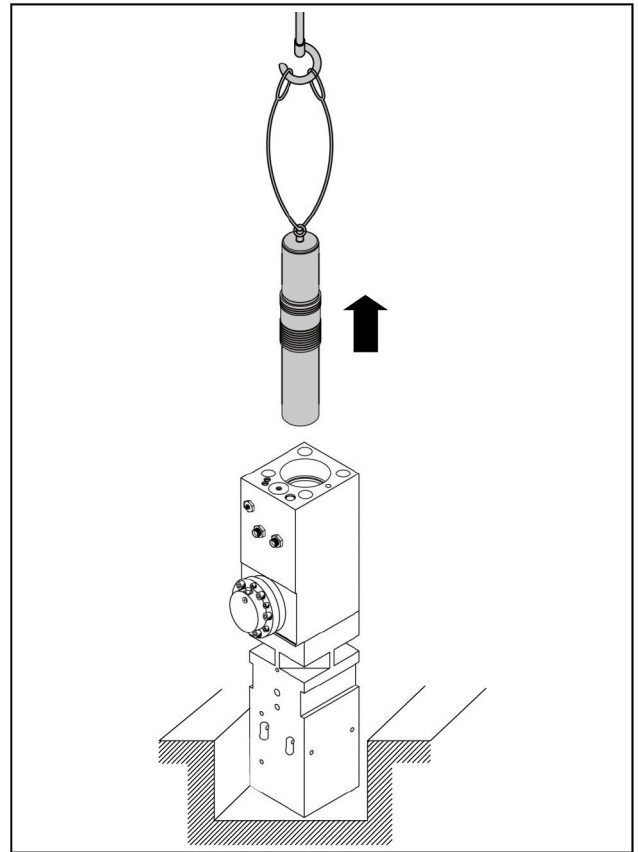
PTIL19GEN0151AA 6

7. Take rock pin (holding pin) out of the cylinder.



PTIL19GEN0152AA 7

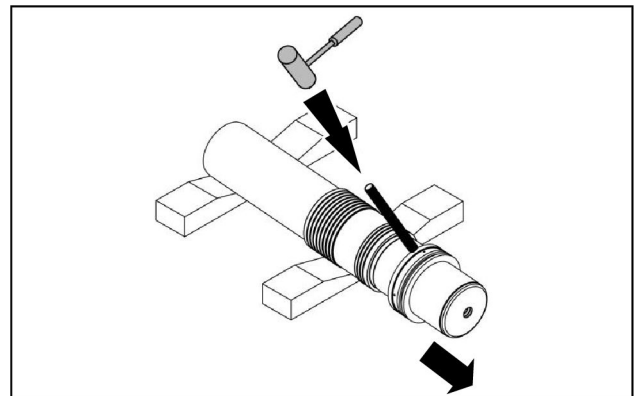
8. Take piston out of the cylinder.



PTIL19GEN0153BA 8

9. Disassemble cylinder bush from the piston.

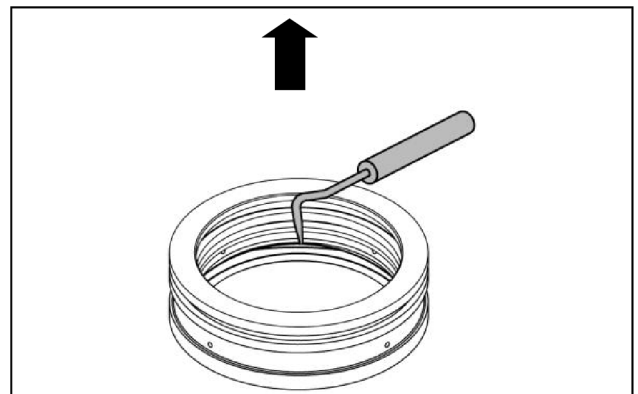
NOTICE: Use wood or plastic hammer only when removing cylinder bush.



PTIL19GEN0154AA 9

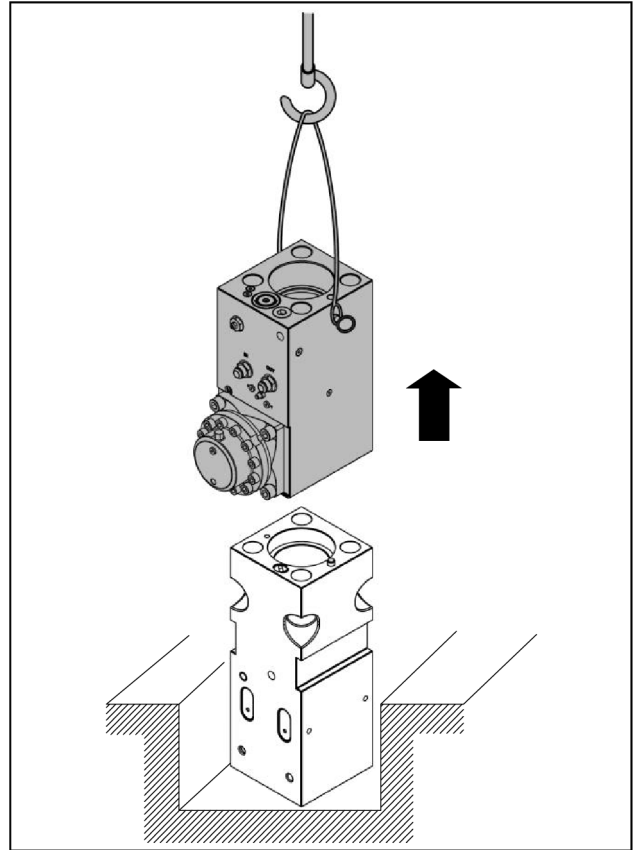
10. Remove seals on the cylinder bush.

NOTICE: Removed seals shall never be recycled.



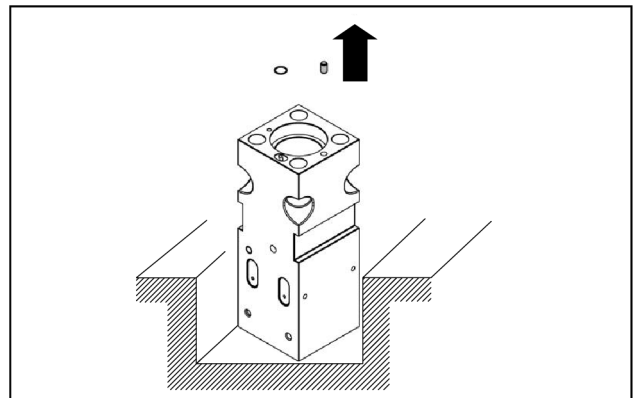
PTIL19GEN0155AA 10

11. Remove cylinder block.

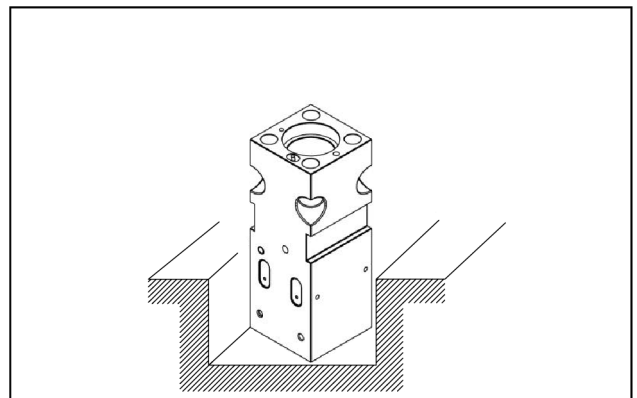


PTIL19GEN0156BA 11

12. Remove rock pin (holding pin) and O-ring from the front head block.



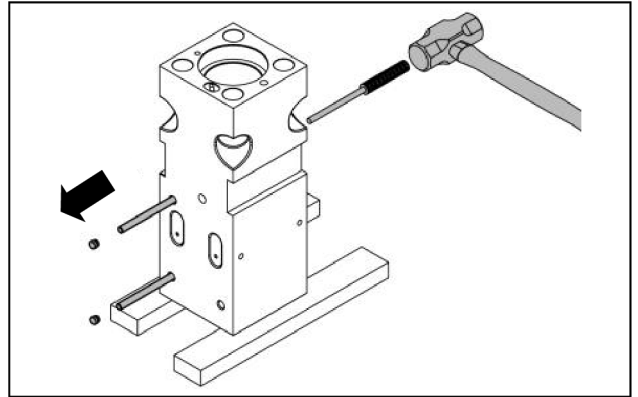
PTIL19GEN0157AA 12



PTIL19GEN0158AA 13

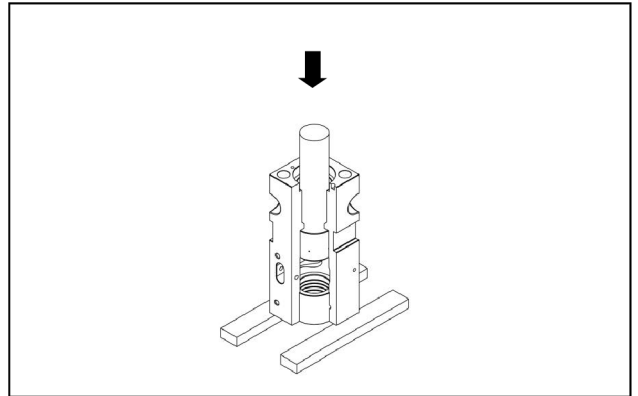
Disassembly of lower bush and upper bush

13. Put front head block upside down on wood block.
14. Remove stopper pins and rubber plug.



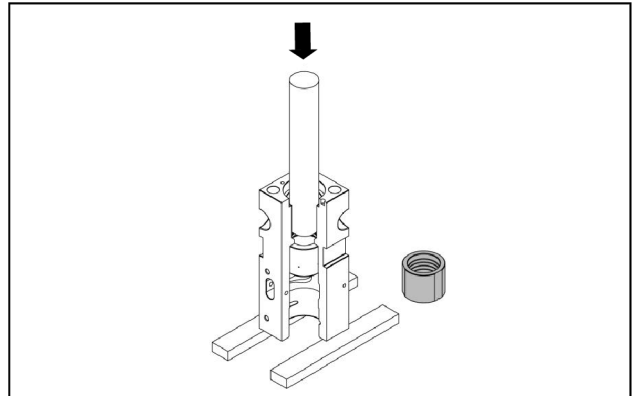
PTIL19GEN0159AA 14

15. Insert a round steel bar into front head hole.
16. Remove lower bush from the front head block by pushing the bar down with hydraulic press.



PTIL19GEN0160AA 15

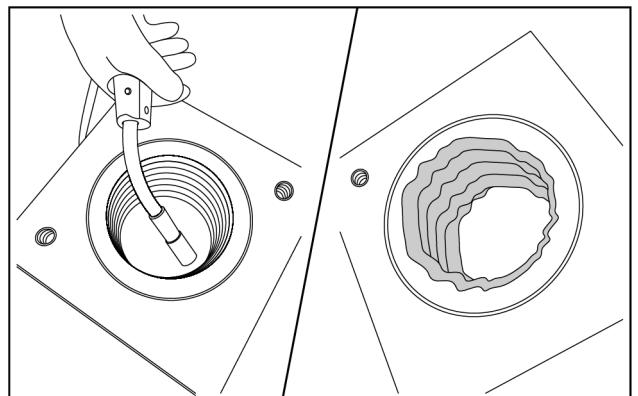
17. Take upper bush out of front head block by the same way.



PTIL19GEN0161AA 16

NOTE: In case hydraulic press is unavailable, bushes can be removed by welding torch.

Model	Bead layer	Bead size
		mm(inch)
CB20 ~ CB40	4	5 mm (0.20 in) x 5 mm (0.20 in)
CB60 ~ CB140		7 mm (0.28 in) x 7 mm (0.28 in)
CB160 ~ CB260	5	9 mm (0.35 in) x 9 mm (0.35 in)
CB300 ~ CB550		12 mm (0.47 in) x 12 mm (0.47 in)
CB800	7	12 mm (0.47 in) x 12 mm (0.47 in)

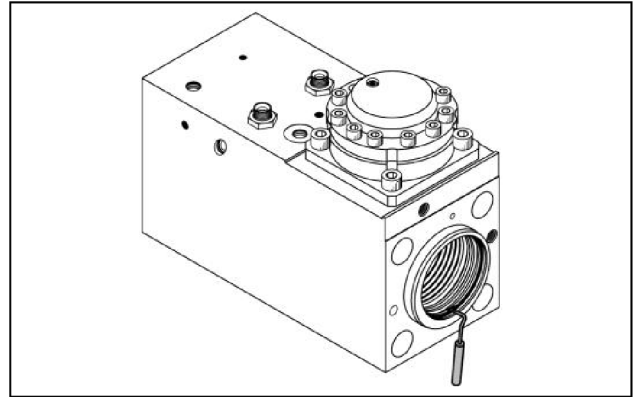


PTIL19GEN0162AA 17

Disassembly of cylinder block

18. Remove seals.

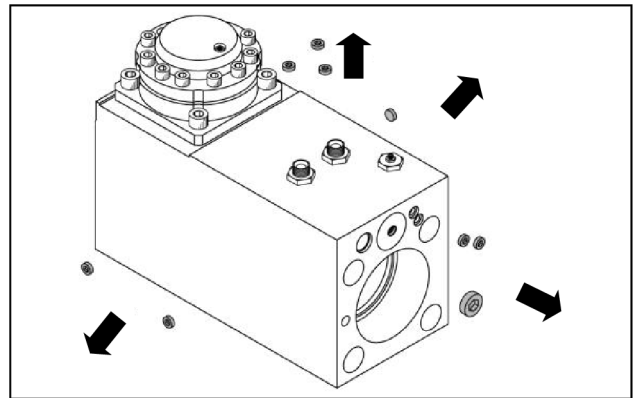
NOTE: Cylinder is a very sensitive part to contamination. Ensure cylinder block disassembly is carried out on a completely clean pad.



PTIL19GEN0163AA 18

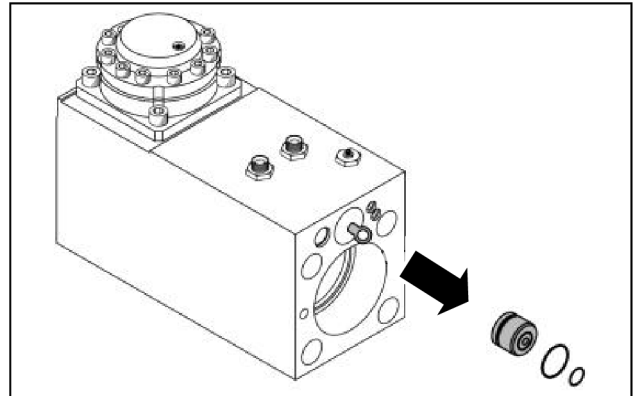
19. Removing Ro plugs is not required for breaker overhauling.

20. Do not remove any Ro plugs at all if not agreed with the breaker supplier for a specific purpose.



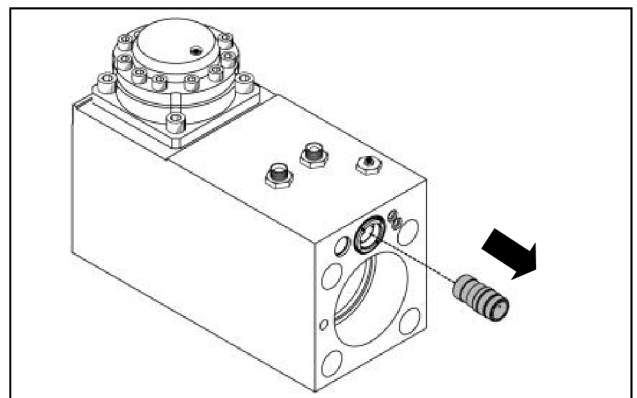
PTIL19GEN0164AA 19

21. Remove valve cap with eye bolt.



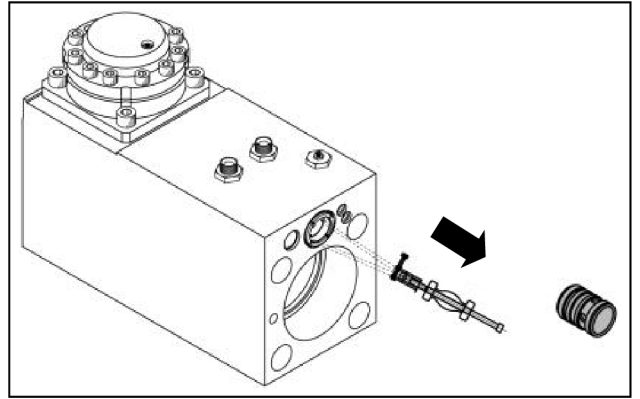
PTIL19GEN0165AA 20

22. Remove valve by hand.



PTIL19GEN0166AA 21

23. Remove valve bush with valve puller.



PTIL19GEN0167AA 22

Hammer - Discharging - Accumulator

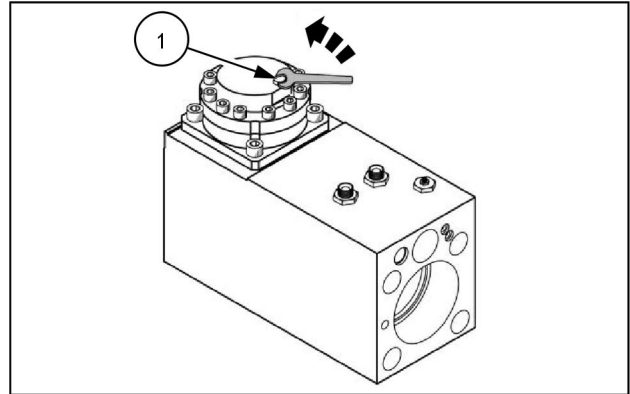
⚠ WARNING

Pressurized system!

DO NOT attempt to disassemble any accumulator until the nitrogen charge is properly discharged.
Failure to comply could result in death or serious injury.

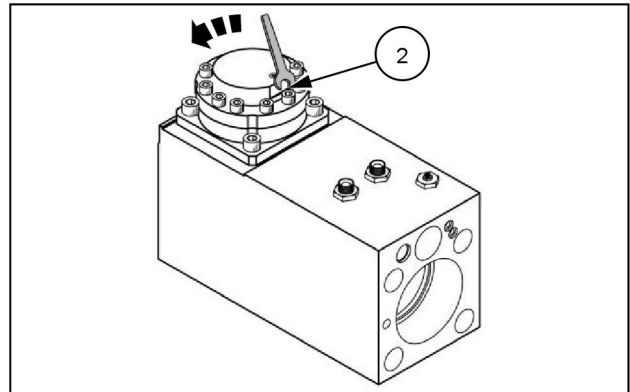
W0974A

1. Open the charging valve cap (1).



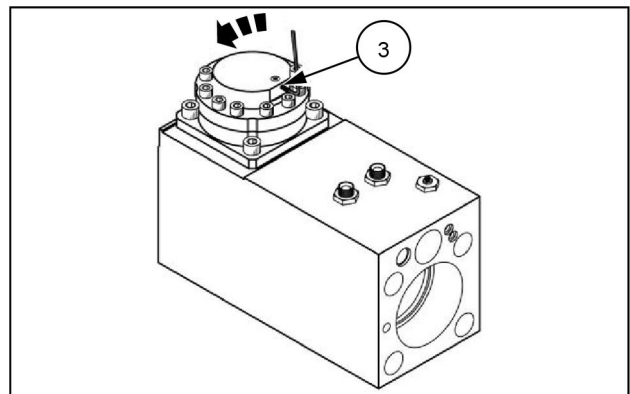
PTIL19GEN0168AA 1

2. Open the needle valve cap (2).



PTIL19GEN0169AA 2

3. Open the needle valve (3) & release gas, you will hear noise of gas releasing.
4. Check if gas releasing is done completely by opening the needle valve a bit more.

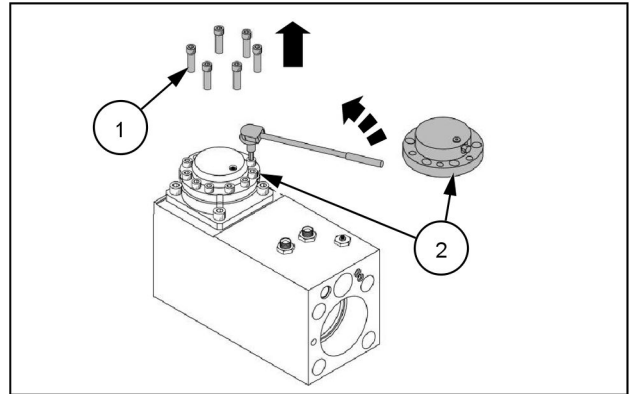


PTIL19GEN0170AA 3

NOTE: To disassemble Accumulator see, **Hammer - Disassemble - Accumulator (89.700)**.

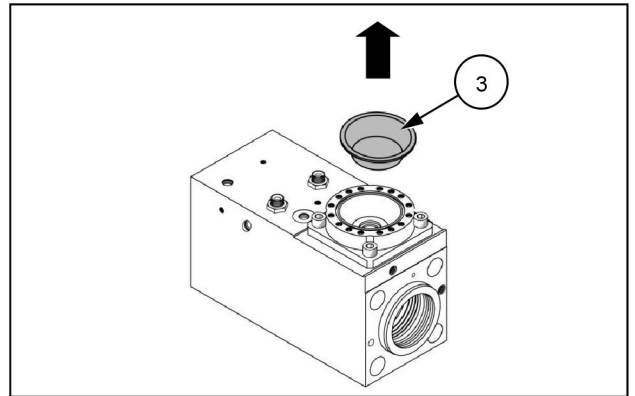
Hammer - Disassemble - Accumulator

1. Discharge gas from the accumulator, see **Hammer - Discharging - Accumulator (89.700)**.
2. Loosen the accumulator cover bolts (1) and disassemble the accumulator cover (2).



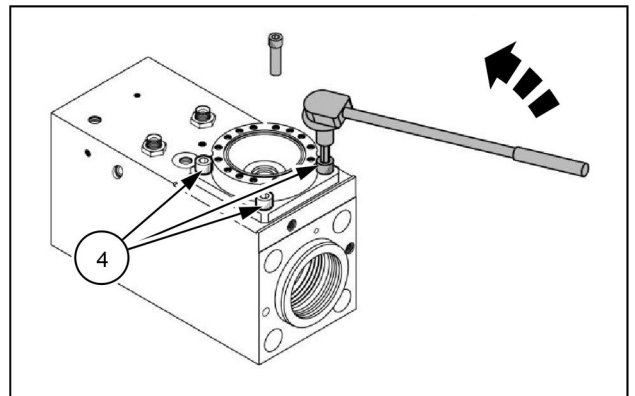
PTIL19GEN0171AA 1

3. Remove the diaphragm (3).



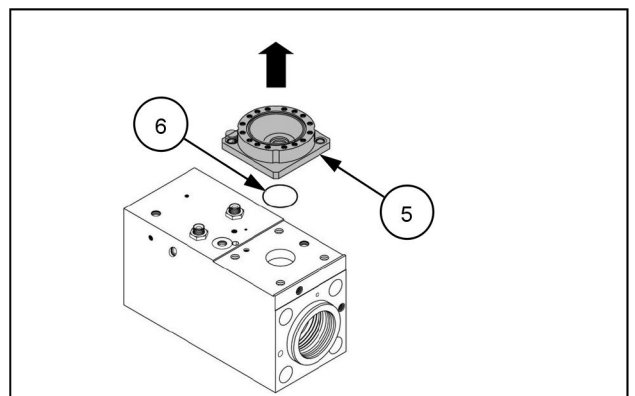
PTIL19GEN0172AA 2

4. Loosen the accumulator body bolt (4).



PTIL19GEN0173AA 3

5. Remove the accumulator body (5) and face-seal (6).



PTIL19GEN0174AA 4

Hammer - Inspect

Fasteners

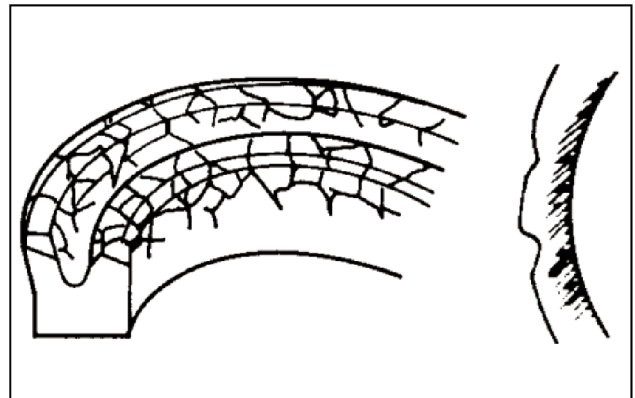
When the breaker gets aged, breaker fasteners can be loosened. Check the condition of all breaker fasteners and retighten them. When you retighten one fastener of fastener set, retighten the rest fasteners as well so that each fastener of the set can play the same role. In case any frequent loosening of fastener, replace it (or a complete set) with brand new.

Gas leakage

In case back head and/or accumulator gas is losing pressure despite of recharging gas, check O-ring condition of gas charging valve and replace it.

External oil leakage

Check if any oil leaks where parts are connected. Leakage of a little amount oil between tool and lower bush can be disregarded as it helps lubrication in between. Check if any seal is scratched, heavily pressed/deformed, severely decolored, or taken out of the seal position (groove).



PTIL19GEN0175AA 1

NOTE: When checking seal condition, do NOT remove seals from the seal grooves. Check their condition with the seals kept where they are. Your trial of removing may end up with seal scratches. Even a light scratch may cause oil leakage.

NOTE: Never recycle any seal once taken out of the seal groove, whether partially or entirely and whether in good or bad condition.

NOTE: Seal failure is often the outcome of some other root causes. When you check seal condition, ensure that you also check followings as well.

1. Oil contamination
2. Piston scratch
3. Cylinder scratch
4. Back head gas pressure
5. Carrier setting oil flow
6. Carrier port relief valve setting pressure

Internal oil leakage

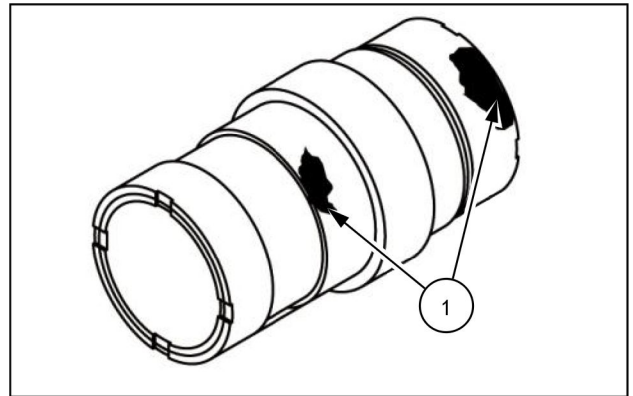
In case of internal oil leakage (from cylinder to back head), replace gas seal and O-ring that are fitted on cylinder bush. If piston has got any scratches, remove the scratches or if necessary replace it with brand new. See Trouble shoot guide **Hammer - Troubleshooting - Carrier Malfunction (89.700)**.

Control valve

Seizure mark (1)

Check if valve has any sign of seizing or scuffing. In case of small size seizing, you can use the valve after polishing such seizing mark area with fine oilstone or sand paper, #1000~1200.

NOTE: Ensure that you also inspect valve and valve cap of the concerned valve.



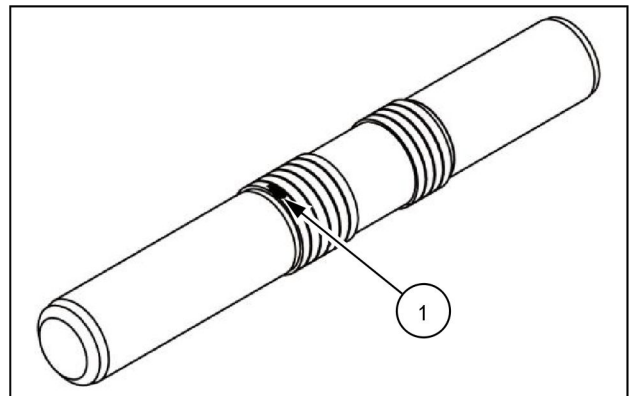
PTIL19GEN0176AA 2

Piston

Lower part of piston large diameter area must be inspected periodically.

- Seizure mark (1).
- Check if valve has any sign of seizing or scuffing. In case of small size seizing, you can use the valve after polishing such seizing mark area with fine oilstone or sand paper, #1000~1200.

NOTE: Ensure that you also inspect cylinder area that has infected such piston seizing or scuffing area.



PTIL19GEN0177AA 3

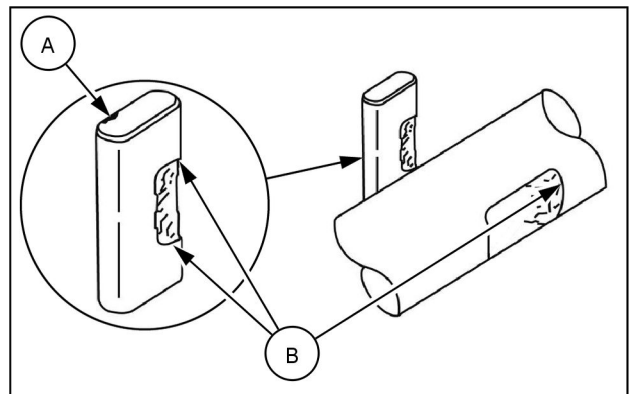
Tool, tool pins

Every **50 h** and whenever replacing tool, tool pin condition shall be checked along with tool. Remove, if any, burrs and swelling of tool pins and tool grooves.

- When changing tool pin direction, place pin with this surface (A) on tool side
- Remove burrs and swelling with grinder or the like (B).

If only one of tool pin faces is worn over the limit, turn both tool pins around so that they can contact the tool with unused faces. When one of the tool pins is replaced, the rest pin should be turned around so that its reverse face contacts the tool.

NOTE: When tool pin is excessively deformed, it is difficult to replace tool. Therefore change tool pin face every **100–150 h** operating hours whether tool pin has reached wear limit or not.



PTIL19GEN0253AA 4

Hammer - Repair

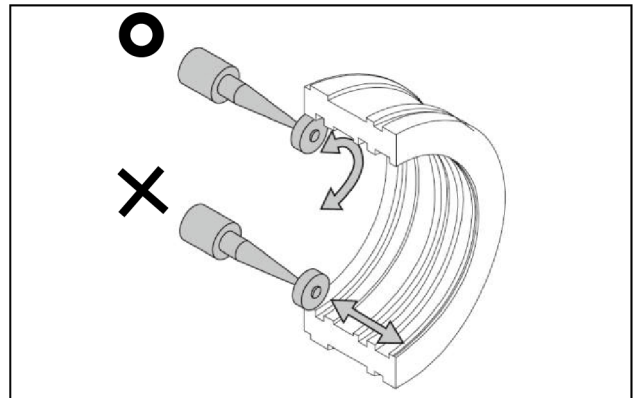
Repair

Removing seizing marks and/or scratches on cylinder or piston should be done as smooth as possible. Ensure you use an oilstone, emery paper, flex hone and/or pneumatic grinder stone according to below guide, keeping in mind that overworking may cause oil leakage and/or malfunctioning of breaker.

Tool type	Roughing	Finish
Oilstone	Rough and medium grain	Finish grain
Emery paper	#100, #160, #240	#400, #600
Pneumatic grinder stone	#220	#1000

(A) Cylinder bush and cylinder

When using the buffering grindstone, apply the grinder correctly to the circumference. If the grinder is led straight ahead, circularity will be spoiled. Wash the parts after finishing them.

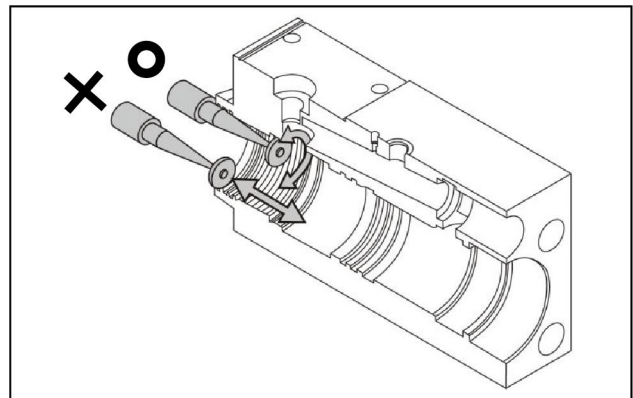


PTIL19GEN0178AA 1

NOTE: Using breaker with unrepaired condition will eventually destroy cylinder. Repair at early failure stage before too late.

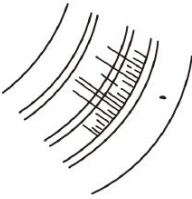
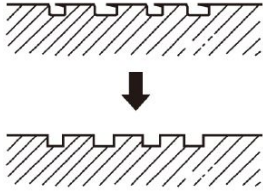
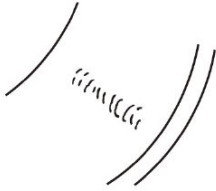
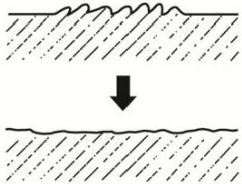
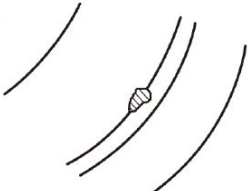
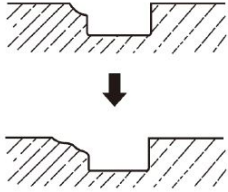
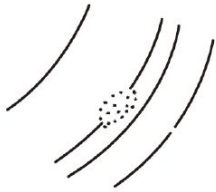
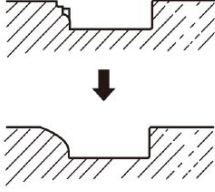
NOTE: Polish to perpendicular direction only. If not, circularity will be spoiled.

NOTE: Clean repaired cylinder before reassemble.



PTIL19GEN0179AA 2

Caution on using pneumatic grinder stone, oilstone and/or emery paper

Fault type	Condition	Remedy
Vertical scratch	 <p>Stripped marks running to the direction of piston striking</p>	 <p>If burrs stick out of grooves, remove burrs and repair vertical scratches with oilstone, emery paper.</p>
Galling	 <p>Localized fault wider than vertical scratch</p>	 <p>Finish galling with oilstone till no step exists on the surface, then finish with fine emery paper.</p>
Chipping	 <p>Chipped corner of sliding section</p>	 <p>Finish the chipped edge smoothly with oilstone.</p>
Vermin	 <p>"Vermin" shape fault at the corner of sliding part</p>	 <p>Vermin causes galling if not repaired. Remove it with pneumatic grinder stone, finish edge with oilstone.</p>

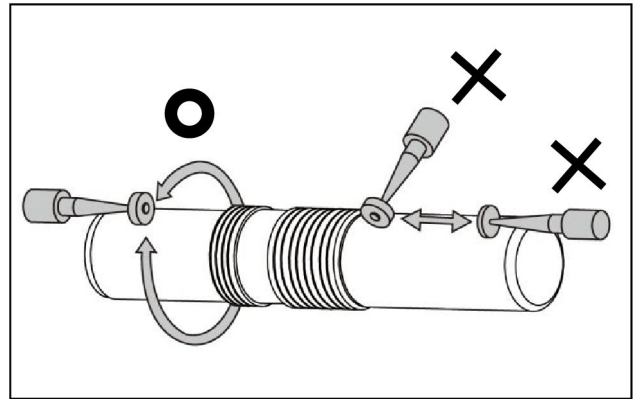
(B) Piston sliding surface

Repair seizing mark and/or scratch area with pneumatic grinder stone, oilstone and/or emery paper.

NOTE: Using breaker with unrepaired condition will eventually destroy cylinder. Repair at early failure stage before too late.

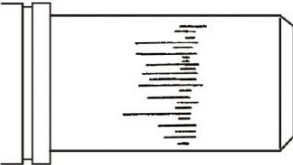
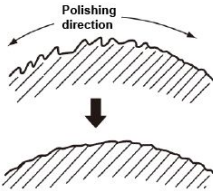
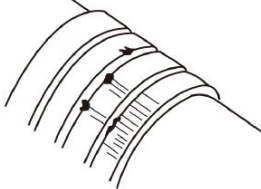
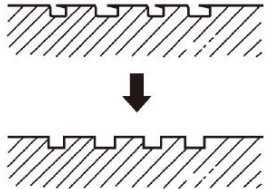
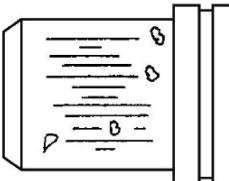
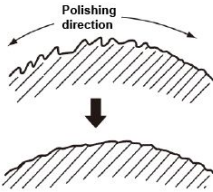
NOTE: Polish to perpendicular direction only. If not, circularity will be spoiled.

NOTE: Wash repaired piston before reassemble.



PTIL19GEN0252AA 3

Caution on using pneumatic grinder stone, oilstone and/or emery paper

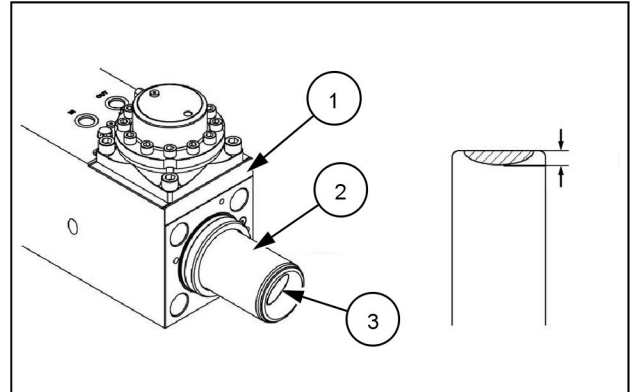
Fault type	Condition	Remedy
Vertical scratch	 <p>Striped scratches to the direction of piston striking.</p>	 <p>Remove burrs by polishing to the circumferential direction.</p>
Scratch in the grooves	 <p>Repair at early stage as scratches may develop to a fatal failure.</p>	 <p>Remove burrs sticking out of grooves and finish edges.</p>
Vertical scratch or rust pit on lower part of piston	 <p>Chipped corner of sliding section</p>	 <p>Remove burrs by polishing machine to the circumferential direction. NO polishing more than 0.05 mm in depth from normal diameter. Replace the piston if scratches and rust pits are not removed by that much polishing.</p>

(C) Piston impact surface

Damaged piston impact surface causes an adverse effect to the breaker tool. Repair it at early failure stage before too late or replace the piston

Collapse

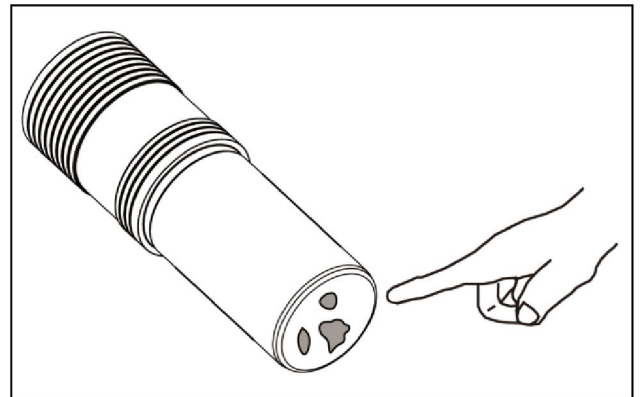
1. If impact surface has collapsed by more than **2 mm** in depth, replace the piston.
 - Cylinder (1)
 - Piston (2)
 - Collapse (3).
- If impact surface deformation is less than **2 mm** in depth, smooth the deformed area as flat as possible.



PTIL19GEN0180AA 4

Chipping a peeling-off

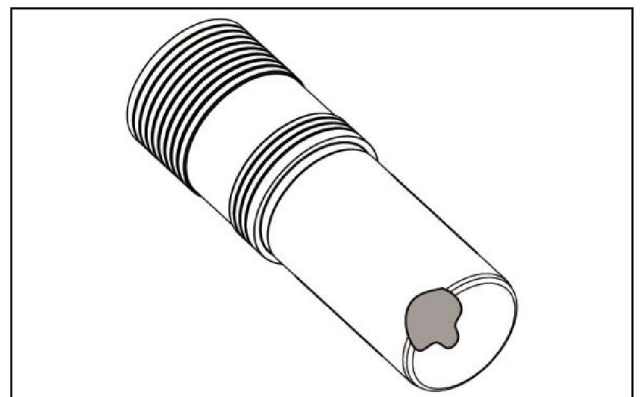
If impact surface has got chipping or peeling-off on some limited areas, smooth the areas to stop progress of peeling-off.



PTIL19GEN0181AA 5

Chipping-off at the piston bottom edge

Replace the piston immediately.



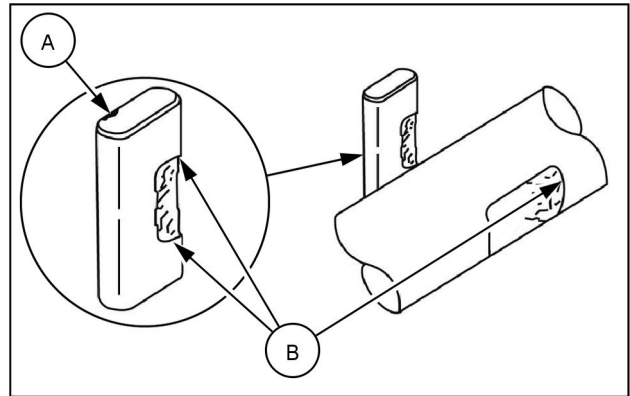
PTIL19GEN0182AA 6

(D) Tool, tool pins

Every **50 h** and whenever replacing tool, tool pin condition shall be checked along with tool. Remove, if any, burrs and swelling of tool pins and tool grooves.

- When changing tool pin direction, place pin with this surface **(A)** on tool side
- Remove burrs and swelling with grinder or the like **(B)**.

If only one of tool pin faces is worn over the limit, turn both tool pins around so that they can contact the tool with unused faces. When one of the tool pins is replaced, the rest pin should be turned around so that its reverse face contacts the tool.



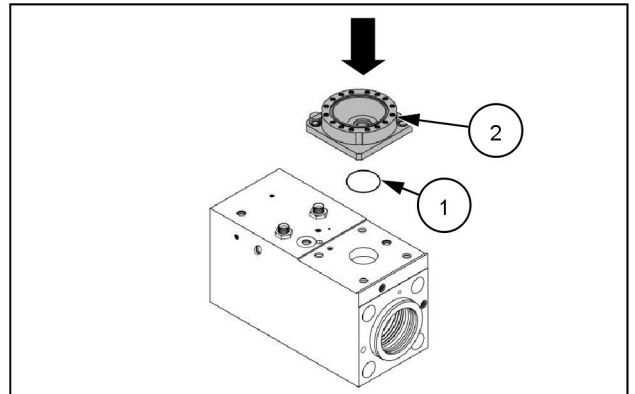
PTIL19GEN0253AA 7

NOTE: When tool pin is excessively deformed, it is difficult to replace tool. Therefore change tool pin face every **100 – 150 h** operating hours whether tool pin has reached wear limit or not.

Hammer - Assemble - Accumulator

NOTICE: Before starting reassembly of breaker, ensure all the parts of accumulator and cylinder are cleaned with cleaning liquid and air gun.

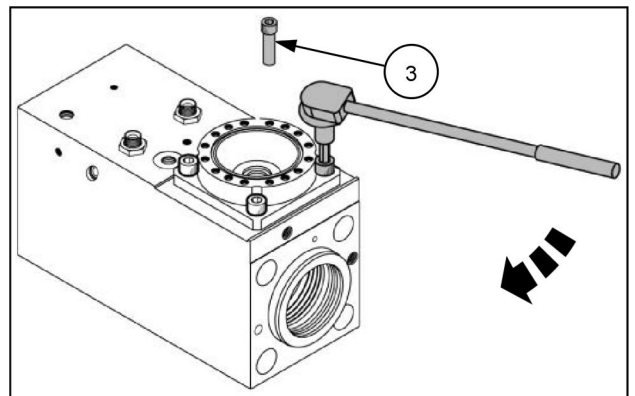
1. Position the face seal (1) and the accumulator body (2).



PTIL19GEN0192AA 1

2. Install and tighten the accumulator body bolt (3).

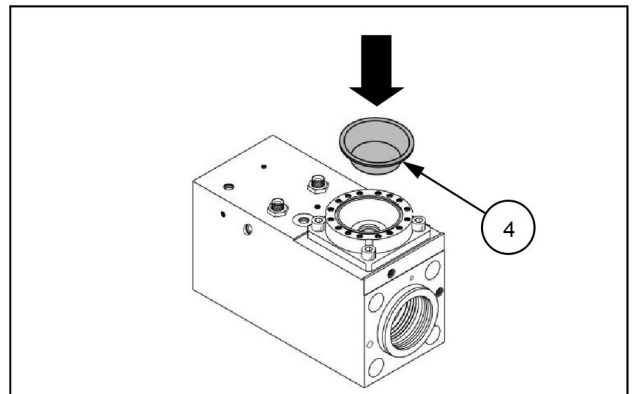
NOTE: Torque must be applied to accumulator body bolt.,see torque specification on **Hammer - Torque (89.700)**.



PTIL19GEN0193AA 2

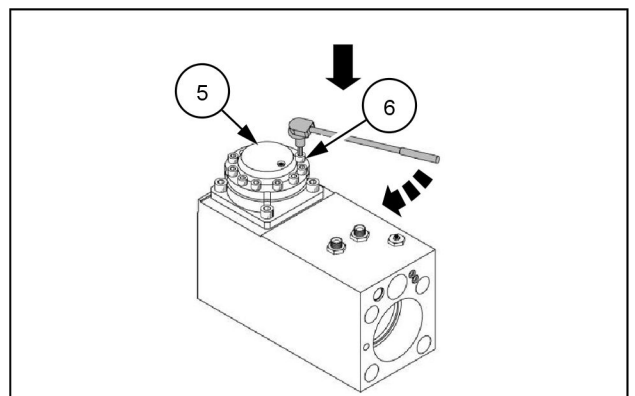
3. Assemble the diaphragm (4).

NOTE: Apply grease around diaphragm lip.



PTIL19GEN0194AA 3

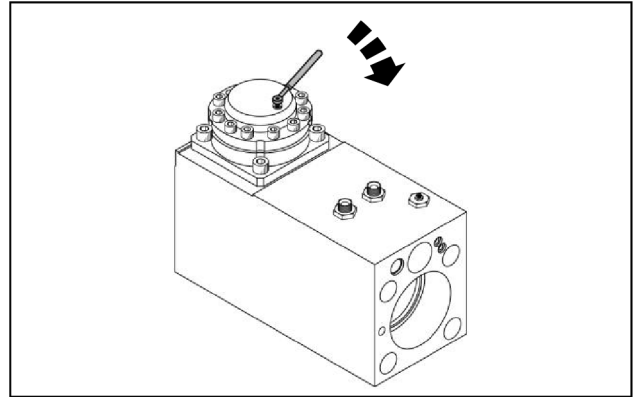
4. Install the accumulator cover (5) to the accumulator body.
5. Install and tighten the bolts (6) to the accumulator cover.



PTIL19GEN0195AA 4

NOTE: Torque must be applied to accumulator body bolt ,. see torque specification on **Hammer - Torque (89.700)**

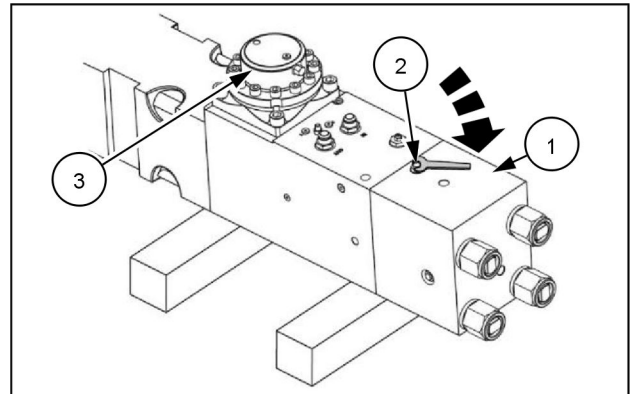
6. Charge the gas into accumulator, see **Hammer - Charging - Accumulator (CB61, CB62) (89.700)** or **Hammer - Charging - Accumulator (CB140 - CB800) (89.700)**, as per the breaker model.



PTIL19GEN0196AA 5

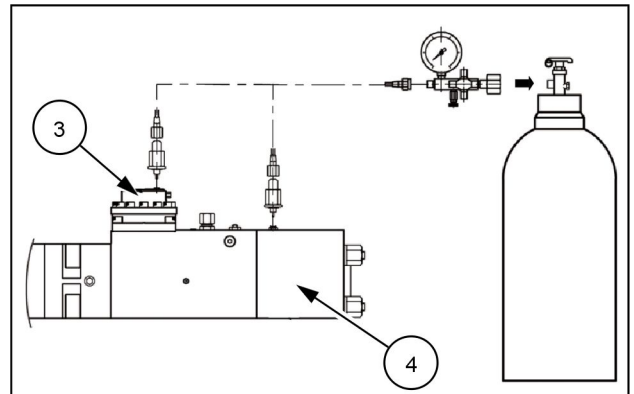
Hammer - Charging - Gas

1. Assemble the gas charge valve (1) and the valve cap (2) to the accumulator (3).



PTIL19GEN0216AA 1

2. Charge the gas into the back head (4) and assemble the gas valve cap to the accumulator (3).
3. See the gas pressure and the gas charging in **Hammer - Discharging - Back head (CB20 - CB80) (89.700)** and **Hammer - Charging - Back head (CB140 - CB800) (89.700)**.



PTIL19GEN0217AA 2

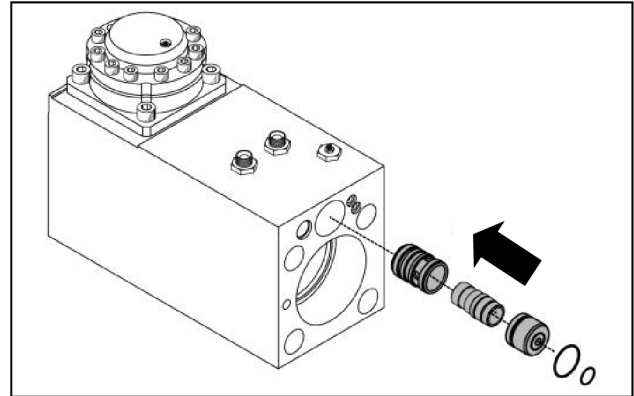
Hammer - Assemble - Power cell

1. Installation of Accumulator and cylinder assembly, See **Hammer - Assemble - Accumulator (89.700)**.

Cylinder block - Assemble

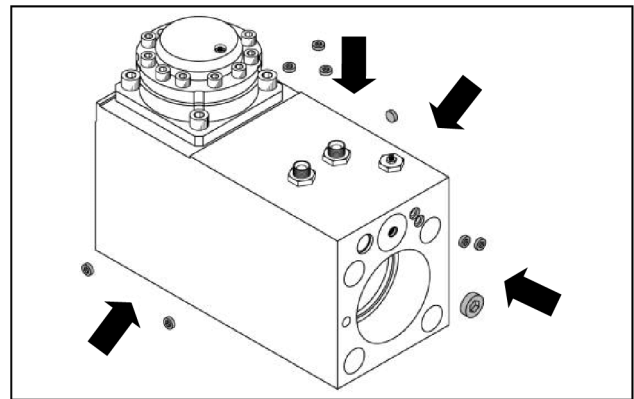
2. Assemble control valve set, then R-plug and O-rings.

NOTE: Not required unless disassembled as per agreement with the breaker.



PTIL19GEN0197AA 1

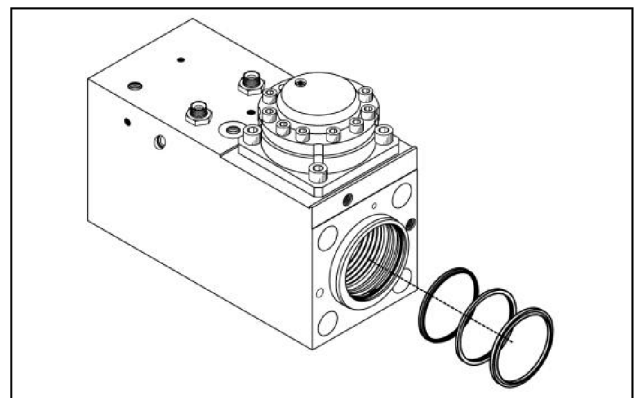
NOTE: Put valve, valve bush and valve cap into oil basin so that oil can be applied on them entirely. Sub-assemble valve set, fit 2 O-rings on valve cap and then assemble valve set into cylinder. Any O-ring missing will be led to leakage and/or valve cap crack.



PTIL19GEN0198AA 2

3. Fit seals inside the cylinder.

NOTE: Apply oil on seals and seal grooves before fit the seals.

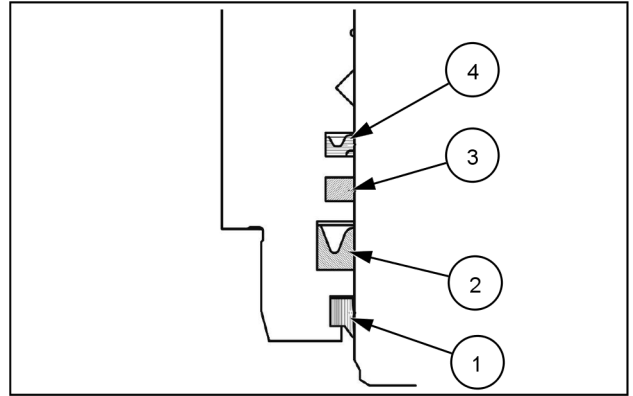


PTIL19GEN0199AA 3

4.

NOTE: Seal fitting direction is extremely important. Dust seal lip must face outside the cylinder. U-packing and buffering lips must face inside. Flat surface of step seal must face outside.

NOTE: Fitting with wrong direction causes contamination and/or external leakage as well as seal crack.



PTIL19GEN0200AA 4

1. Dust Seal	3. Buffer ring set
2. U-Packing	4. Buffer ring set

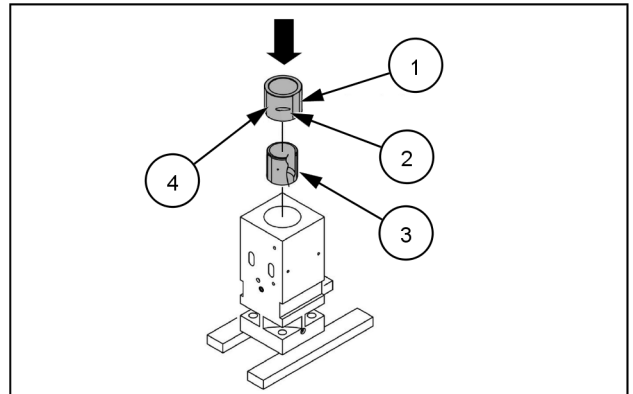
NOTE: Seal type and number of seals are different breaker model by model. See the concerned breaker part catalog.

Model	Seal (see image 4)
CB20 ~ CB70	(1), (2)
CB80 ~ CB550	(1), (2), (4)
CB800	(1), (3), (4)

Front head assembly

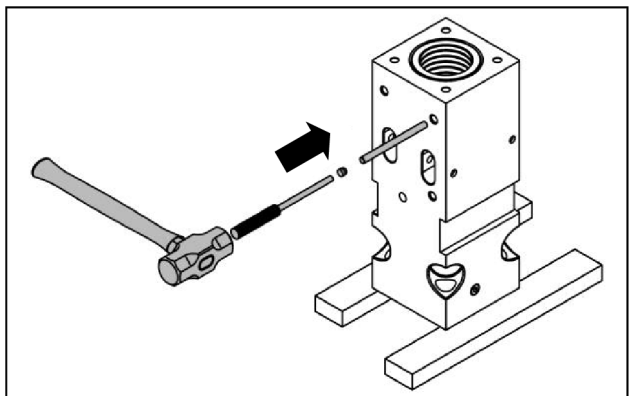
5. Assemble upper bush and lower bush in the front head.

1. Lower bush	3. Upper bush
2. Groove for stopper pin	4. Groove



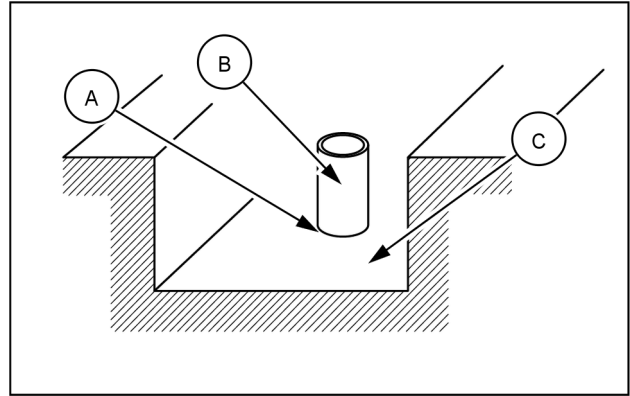
PTIL19GEN0201AA 5

NOTE: Align bush groove direction and bush stopper pin hole direction precisely before inserting bushes into the front head block. Otherwise bush stopper pin will not be assembled.



PTIL19GEN0202AA 6

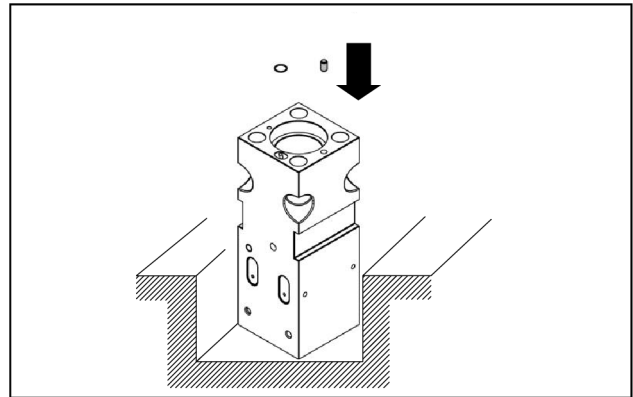
- 6. A. Welding
- B. Breaker holding pipe
- C. Steel plate



PTIL19GEN0134AA 7

- 7. Put front head on the holding pipe.
- 8. Fit O-ring at the entrance of grease channel and then apply grease.
- 9. Insert lock pin (holding pin) on the lock pin hole.

NOTICE: Without holding pipe, power cell or its parts may fall down, causing fatal accident.

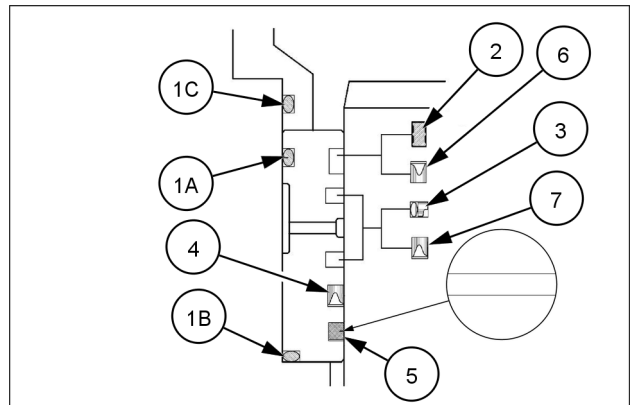


PTIL19GEN0203AA 8

Piston and cylinder bush assembly

1A.	Cylinder O-ring	4.	U-packing
1B.	Piston O-ring	5.	Slide seal
1C.	Back head O-ring	6.	Gas seal
2.	Gas seal	7.	Buffer ring
3.	Step seal		

Model	Seal
CB20	(1), (2), (3)
CB40	(1), (2), (4)
CB60, CB61	(1), (2), (4), (5)
CB62 ~ CB260	(1), (2), (3)
CB300 ~ CB550	(1), (2), (3), (5)
CB800	(1), (3), (5), (6)



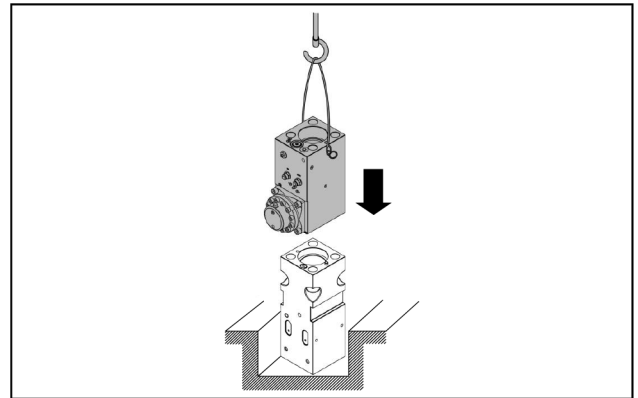
PTIL19GEN0267FB 9

NOTE: Apply oil on seal grooves and seals (except gas seal) before fitting.

NOTE: Apply grease on gas seal before fitting.

NOTE: The grooves of slide seal (5) must be assembled downwards.

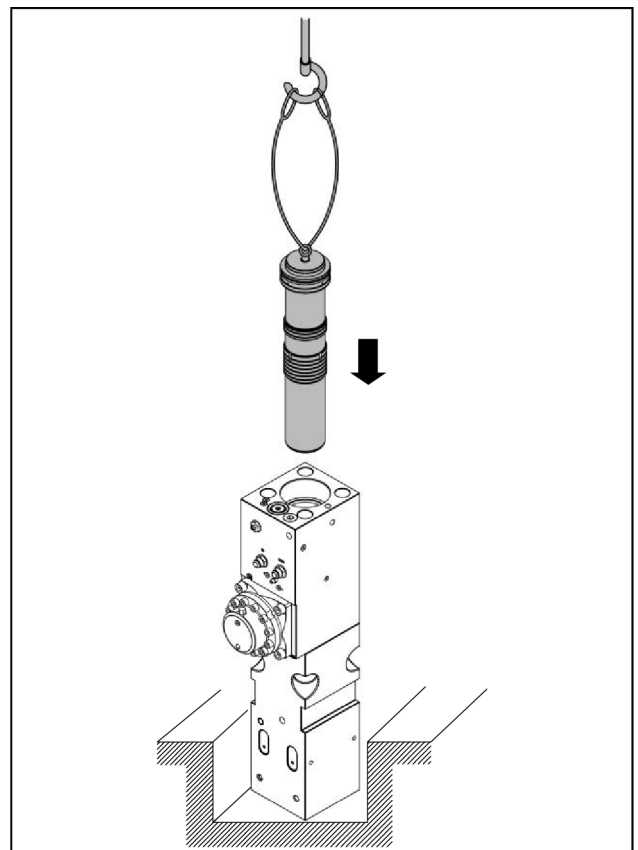
10. Put the cylinder block on top of front head.



PTIL19GEN0204AA 10

11. Insert the piston into cylinder hole slowly.

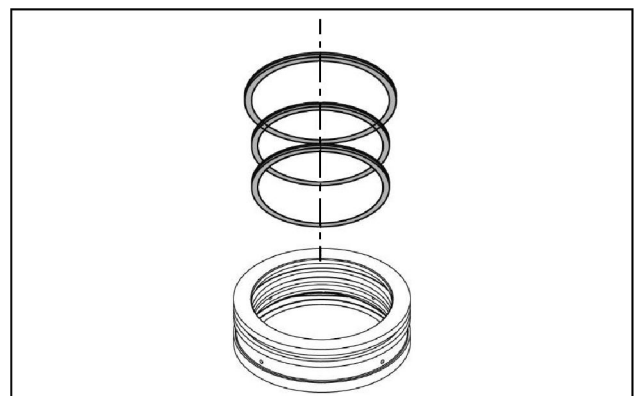
NOTE: Ensure that lock pin and O-ring are assembled at the right places before loading cylinder on the front head.



PTIL19GEN0205BA 11

12. Fit seals to the grooves of cylinder bush.

NOTE: For details about the seal and o-ring for different models , see image 9.

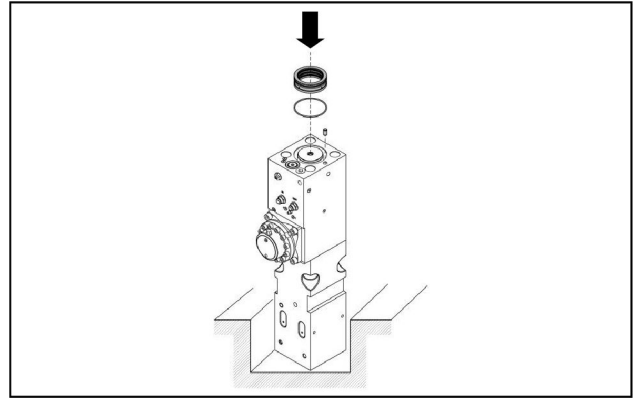


PTIL19GEN0266AB 12

13. Fit O-ring (1B) around piston and then push it down to the bottom.

NOTE: For details about the seal and o-ring for different models , see image 9.

14. Insert cylinder bush around piston. Push it to the bottom by hammering with a plastic bar.

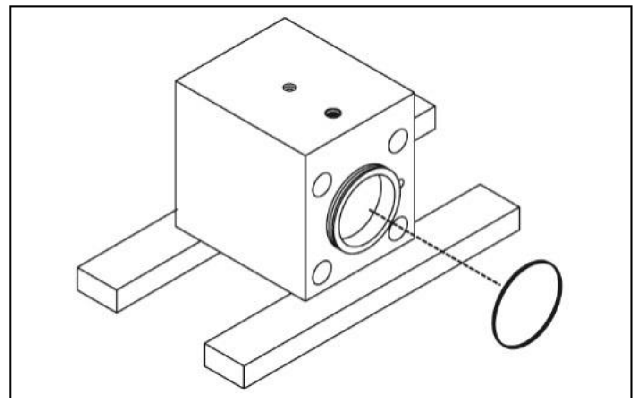


PTIL19GEN0207AA 13

Back head assembly

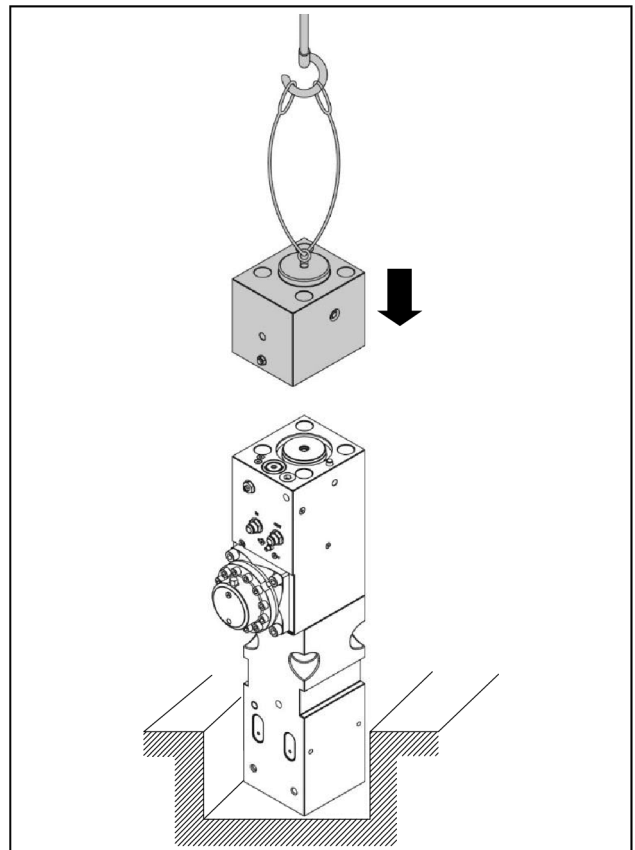
15. Fit O-ring (1C) underneath back head.

NOTE: For details about the seal and o-ring for different models, see image 9.



PTIL19GEN0209AA 14

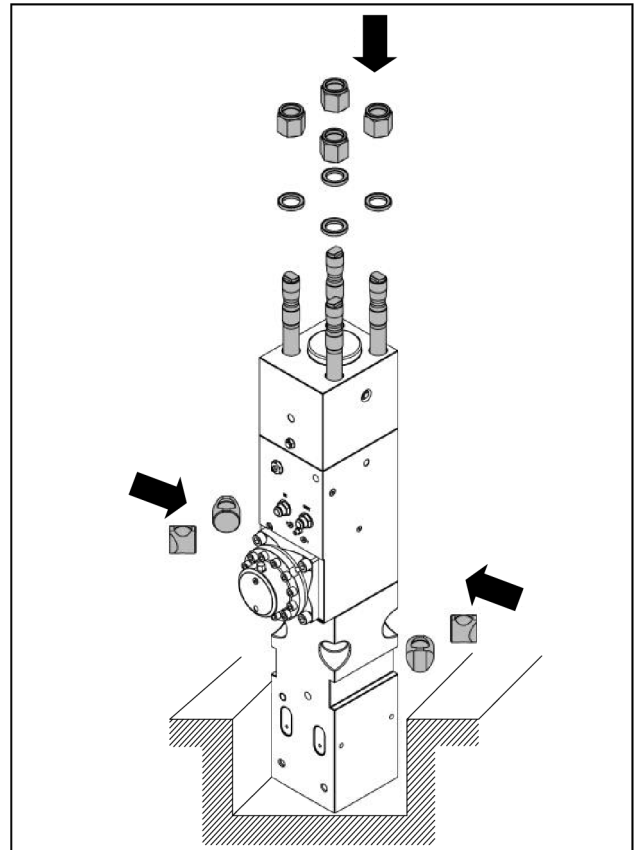
16. Then put the back head on top of cylinder.



PTIL19GEN0210BA 15

Through bolt set assembly

17. Put bottom nuts into the holes on the front head. Put washers on the holes on the back head.
18. Insert through bolts into the holes of back head. Put top nuts on the through bolts.



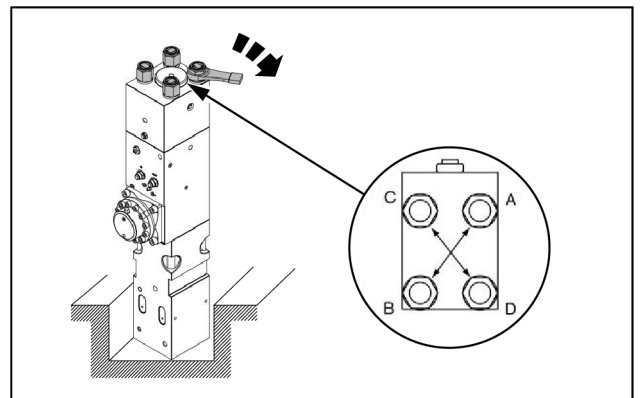
PTIL19GEN0211BA 16

19. Then tighten the nuts with specified torque by power torque wrench. See **Hammer - Torque (89.700)**.

NOTE: Apply torque step by step. Initial torque, intermediate torque, then final torque according to the instruction of Torque Value, See **Hammer - Torque (89.700)**.

NOTE: Initial setting shall be made by **15 – 20 kgm** for CB20 ~ CB70 and **50 kgm** for CB80 and above.

NOTE: Apply each step torque in "A → B → C → D" order as shown above.



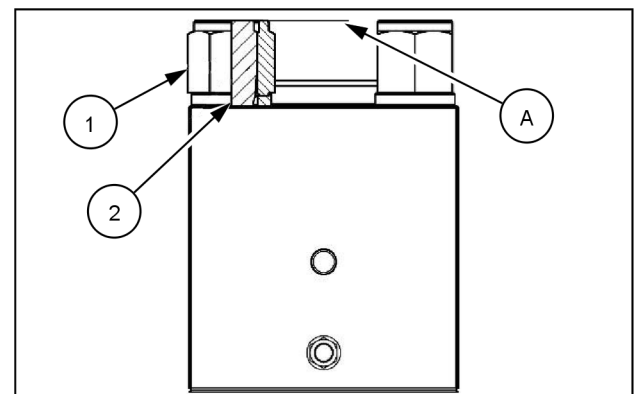
PTIL19GEN0212AA 17

CB20 to CB400

1. Top nut	2. Through bolt
------------	-----------------

NOTE: When setting through bolt (2) and top nut (1) before you apply initial torque, ensure through bolt (2) top surface and top nut (1) surface are aligned as show below.

NOTE: For the models CB 20 to CB400, the through bolt (2) and top nut (1) are in same level (A).

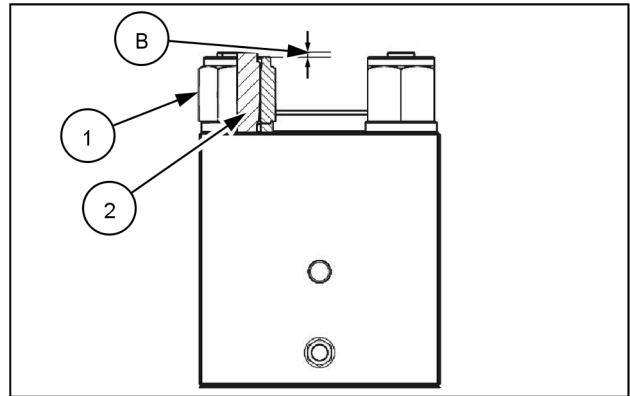


PTIL19GEN0213AB 18

CB550, CB800

1. Top nut	2. Through bolt
------------	-----------------

NOTE: For the models CB550, CB800, the through bolt (2) and top nut (1) surface differ by 3 mm (B).



PTIL19GEN0214AA 19

Apply manual torque on through bolt set

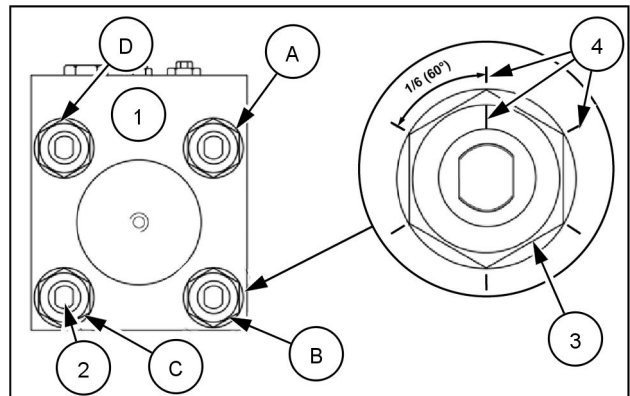
20. For CB80 and above, manual torque can also be applied if power torque wrench out of order.

1st step

Make Initial Setting of top nuts with 50 kgm (490 N·m) torque wrench and impact socket. Mark an apex of top nut and also mark back head surface where each apex of top nut indicates.

1. Back head	3. Top nut
2. Through bolt	4. Marking point

Model	Hammer size
CB80	4.54 kg (10 lb)
CB140, CB160	5.44 kg (12 lb)
CB200 ~ CB230	7.26 kg (16 lb)
CB260 ~ CB800	9.07 kg (20 lb)



PTIL19GEN0215AB 20

NOTE: Apply each step torque in "A → B → C → D" sequence.

21. 2nd, 3rd, 4th step

Turn top nut with hammer and impact socket until the marked apex turns by number of turns specified on the 2nd, 3rd, 4th step respectively. See the table below for manual torque applying.

Manual torque applying

Model	Torque value		Manual torque					
			1st step			2nd step		
	Kg.m (ft.lb)	N.m (ft.lb)	Torque value		Turn	Torque value		Turn (from previous step)
			Kg.m (ft.lb)	N.m (ft.lb)		Kg.m (ft.lb)	N.m (ft.lb)	
CB20	30 kgm (217 ftlbs.)	294 N·m (217 lb ft)	15 kgm (108 ftlbs.)	147 N·m (108 lb ft)	–	30 kgm (217 ftlbs.)	294 N·m (217 lb ft)	–
CB40	45 kgm (326 ftlbs.)	441 N·m (326 lb ft)	20 kgm (145 ftlbs.)	196 N·m (145 lb ft)	–	45 kgm (326 ftlbs.)	441 N·m (326 lb ft)	–
CB60 ~ CB70	50 kgm (362 ftlbs.)	490 N·m (362 lb ft)	20 kgm (145 ftlbs.)	196 N·m (145 lb ft)	–	50 kgm (362 ftlbs.)	490 N·m (362 lb ft)	–
CB80	50 kgm (362 ftlbs.)	490 N·m (362 lb ft)	50 kgm (362 ftlbs.)	490 N·m (362 lb ft)	–	95 kgm (687 ftlbs.)	931 N·m (687 lb ft)	2.5/6
CB140	160 kgm (1258 ftlbs.)	1568 N·m (1258 lb ft)	50 kgm (362 ftlbs.)	490 N·m (362 lb ft)	–	90 kgm (651 ftlbs.)	882 N·m (651 lb ft)	1/6
CB160	240 kgm (1738 ftlbs.) (270 kgm (1953 ftlbs.))	2352 N·m (1738 lb ft) (2646 N·m (1953 lb ft))	50 kgm (362 ftlbs.)	490 N·m (362 lb ft)	–	90 kgm (651 ftlbs.)	882 N·m (651 lb ft)	0.5/6
CB200, CB210	270 kgm (1953 ftlbs.) (310 kgm (2242 ftlbs.))	2646 N·m (1953 lb ft) (3038 N·m (2242 lb ft))	50 kgm (362 ftlbs.)	490 N·m (362 lb ft)	–	90 kgm (651 ftlbs.)	882 N·m (651 lb ft)	0.5/6
CB230, CB260	330 kgm (2387 ftlbs.) (380 kgm (2749 ftlbs.))	3234 N·m (2387 lb ft) (3724 N·m (2749 lb ft))	50 kgm (362 ftlbs.)	490 N·m (362 lb ft)	–	150 kgm (1085 ftlbs.)	1470 N·m (1085 lb ft)	1.5/6
CB300	380 kgm (2749 ftlbs.) (440 kgm (3183 ftlbs.))	3724 N·m (2749 lb ft) (4312 N·m (3183 lb ft))	50 kgm (362 ftlbs.)	490 N·m (362 lb ft)	–	150 kgm (1085 ftlbs.)	1470 N·m (1085 lb ft)	1/6
CB380	390 kgm (2821 ftlbs.) (450 kgm (3255 ftlbs.))	3822 N·m (2821 lb ft) (4410 N·m (3255 lb ft))	50 kgm (362 ftlbs.)	490 N·m (362 lb ft)	–	150 kgm (1085 ftlbs.)	1470 N·m (1085 lb ft)	1/6
CB400	550 kgm (3978 ftlbs.) (600 kgm (4340 ftlbs.))	5390 N·m (3978 lb ft) (5880 N·m (4340 lb ft))	50 kgm (362 ftlbs.)	490 N·m (362 lb ft)	–	200 kgm (1447 ftlbs.)	1960 N·m (1447 lb ft)	1/6
CB550	620 kgm (4489 ftlbs.) (710 kgm (5140 ftlbs.))	6076 N·m (4489 lb ft) (6958 N·m (5140 lb ft))	50 kgm (362 ftlbs.)	490 N·m (362 lb ft)	–	200 kgm (1447 ftlbs.)	1960 N·m (1447 lb ft)	1/6
CB800	720 kgm (5,208 ftlbs.)	7061 N·m (5208 lb ft)	Only power torque wrench is applicable.					

Tools - Hammer

Model	Manual torque					
	3rd step		Turn (from previous step)	4th step		Turn (from previous step)
	Torque value			Torque value		
		–		–		
CB20	–	–	–	–	–	–
CB40	–	–	–	–	–	–
CB60 ~ CB70	–	–	–	–	–	–
CB80	–	–	–	–	–	–
CB140	160 kgm (1258 ftlbs.)	1568 N·m (1258 lb ft)	2.2/6	–	–	
CB160	150 kgm (10854 ftlbs.)	1470 N·m (1085 lb ft)	1.5/6	240 kgm (1738 ftlbs.)	352 N·m (1738 lb ft)	1/6 (1.4/6)
CB200, CB210	150 kgm (10854 ftlbs.)	1470 N·m (1085 lb ft)	1.5/6	270 kgm (1953 ftlbs.)	646 N·m (1953 lb ft)	1/6 (1.7/6)
CB230, CB260	250 kgm (1808 ftlbs.)	2450 N·m (1808 lb ft)	1.5/6	330 kgm (2387 ftlbs.)	234 N·m (2387 lb ft)	0.5/6 (1/6)
CB300	250 kgm (1808 ftlbs.)	2450 N·m (1808 lb ft)	1/6	380 kgm (2749 ftlbs.)	724 N·m (2749 lb ft)	1.3/6 (1.9/6)
CB380	250 kgm (1808 ftlbs.)	2450 N·m (1808 lb ft)	1.5/6	390 kgm (2821 ftlbs.)	822 N·m (2821 lb ft)	1.2/6 (1.8/6)
CB400	400 kgm (2893 ftlbs.)	920 N·m (2893 lb ft)	2/6	550 kgm (3978 ftlbs.)	390 N·m (3978 lb ft)	1/6 (1.3/6)
CB550	400 kgm (2893 ftlbs.)	920 N·m (2893 lb ft)	2/6	620 kgm (4489 ftlbs.)	076 N·m (4489 lb ft)	1/6 (1.3/6)
CB800	Only power torque wrench is applicable.					

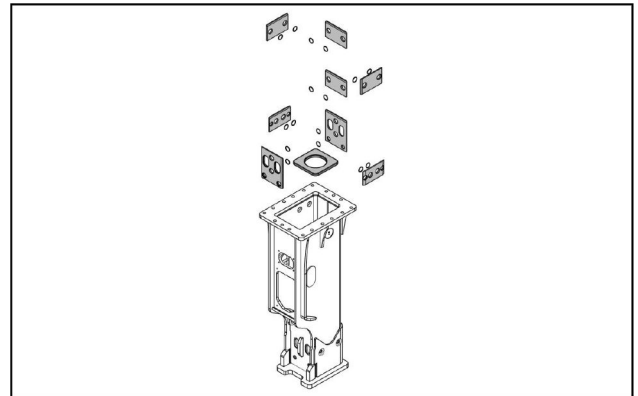
NOTE: Torque unit: kg.m/N.m/ft.lb

NOTE: Value in () shall be applied to the breakers in India, Middle East and Mexico.

22. For information on gas charging, see **Hammer - Charging - Gas (89.700)**.

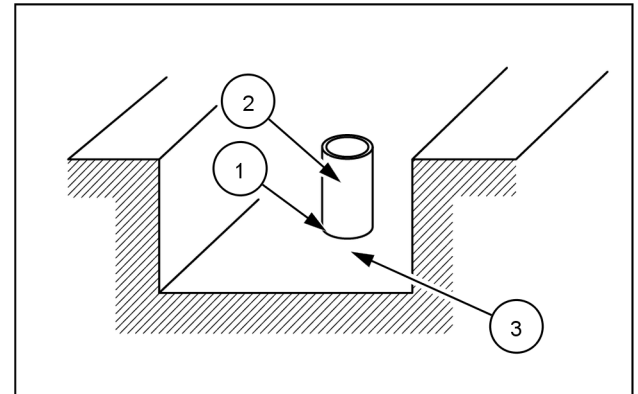
Hammer - Assemble - Housing

1. Assemble the bottom damper, O-rings and shall pads on the breaker housing.



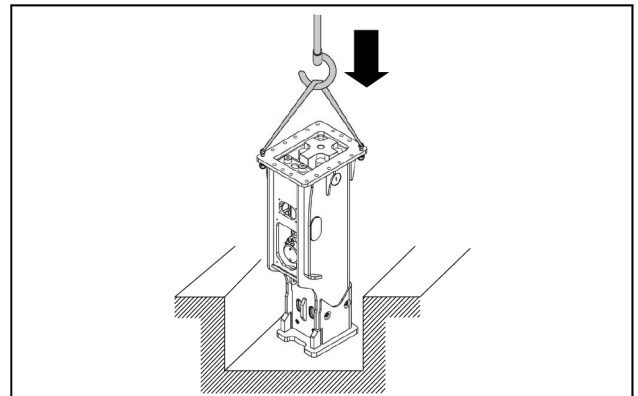
PTIL19GEN0143AA 1

- Welding **(1)**
 Breaker holding pipe **(2)**
 Steel plate **(3)**.



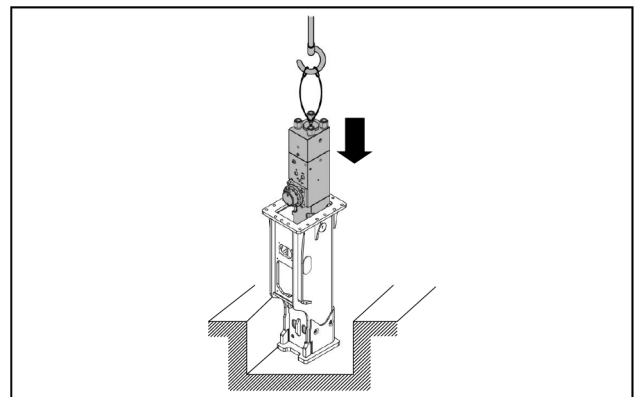
PTIL19GEN0134AA 2

2. Place the breaker housing on the holding pipe.



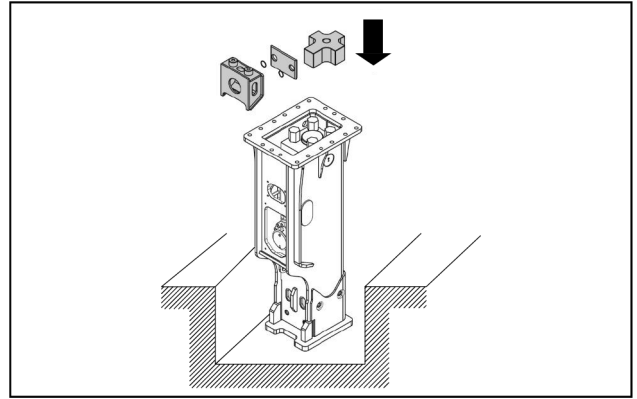
PTIL19GEN0218AA 3

3. Assemble the power cell, see **Hammer - Assemble - Power cell (89.700)**.



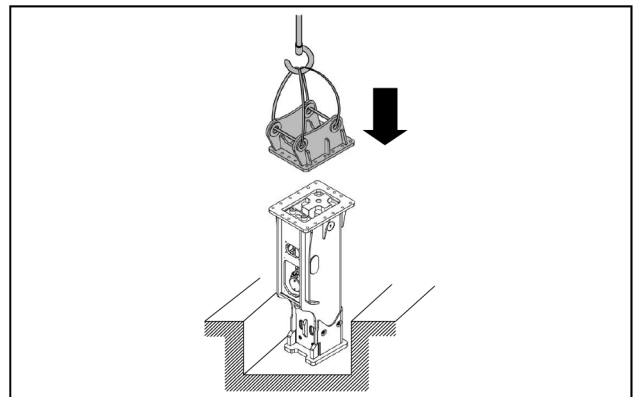
PTIL19GEN0219AA 4

4. Assemble the power cell holder, shell pad, O-ring, and upper damper.

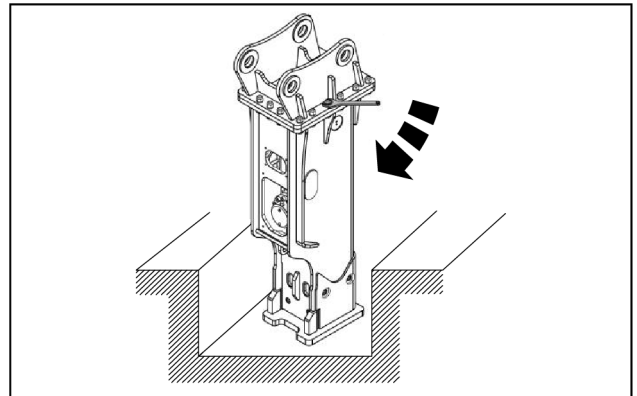


PTIL19GEN0220AA 5

5. Assemble the breaker bracket according to torque value, see **Hammer - Torque (89.700)**.

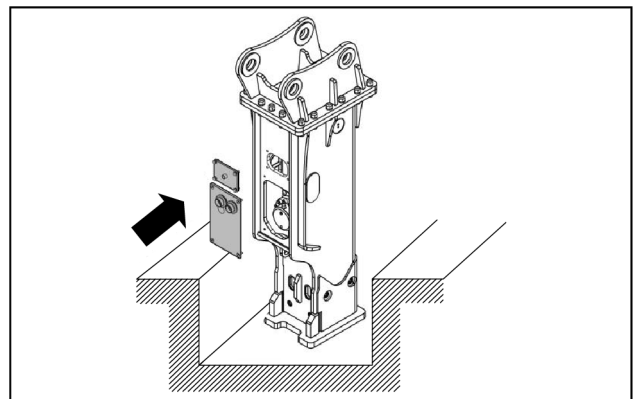


PTIL19GEN0221AA 6



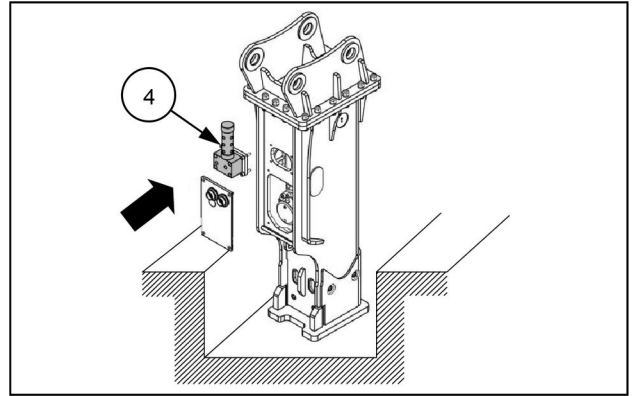
PTIL19GEN0222AA 7

6. Assemble the hose and the gas covers.

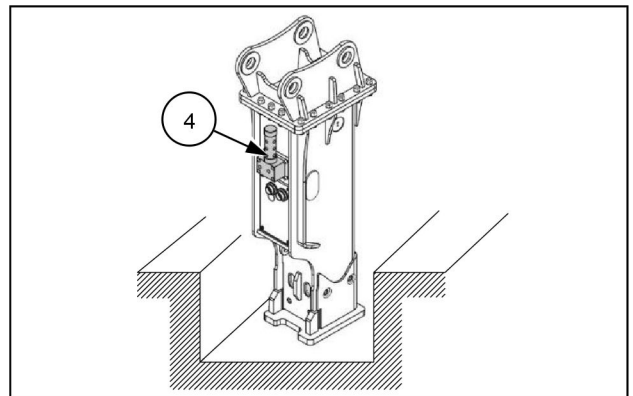


PTIL19GEN0223AA 8

7. Assemble the optional Auto-lubrication system (ALS) (4), if equipped.



PTIL19GEN0224AA 9



PTIL19GEN0225AA 10

Next operation:

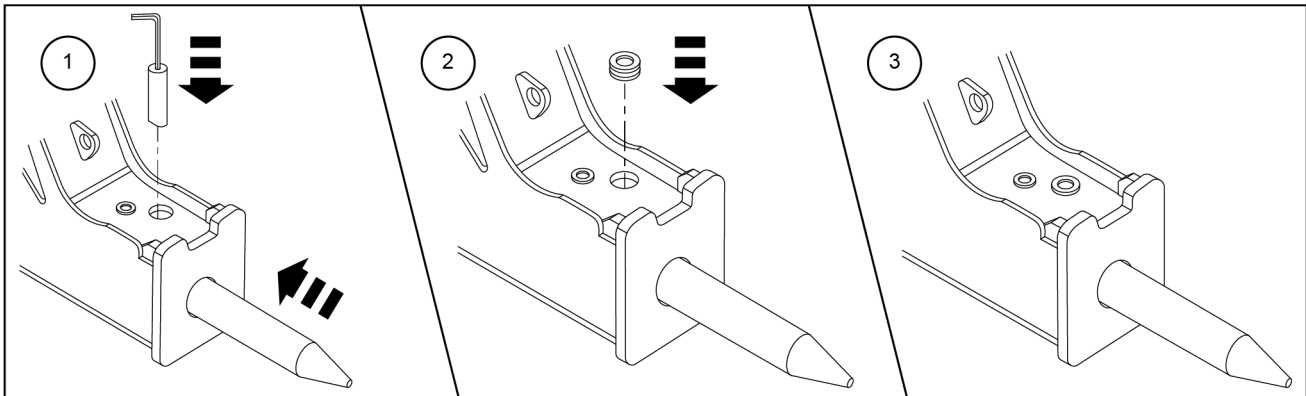
Assemble the breaker tool, see **Hammer - Assemble - Tool (89.700)**.

Hammer - Assemble - Tool

NOTE: For safety reason, the carrier must be switched off before performing the following work.

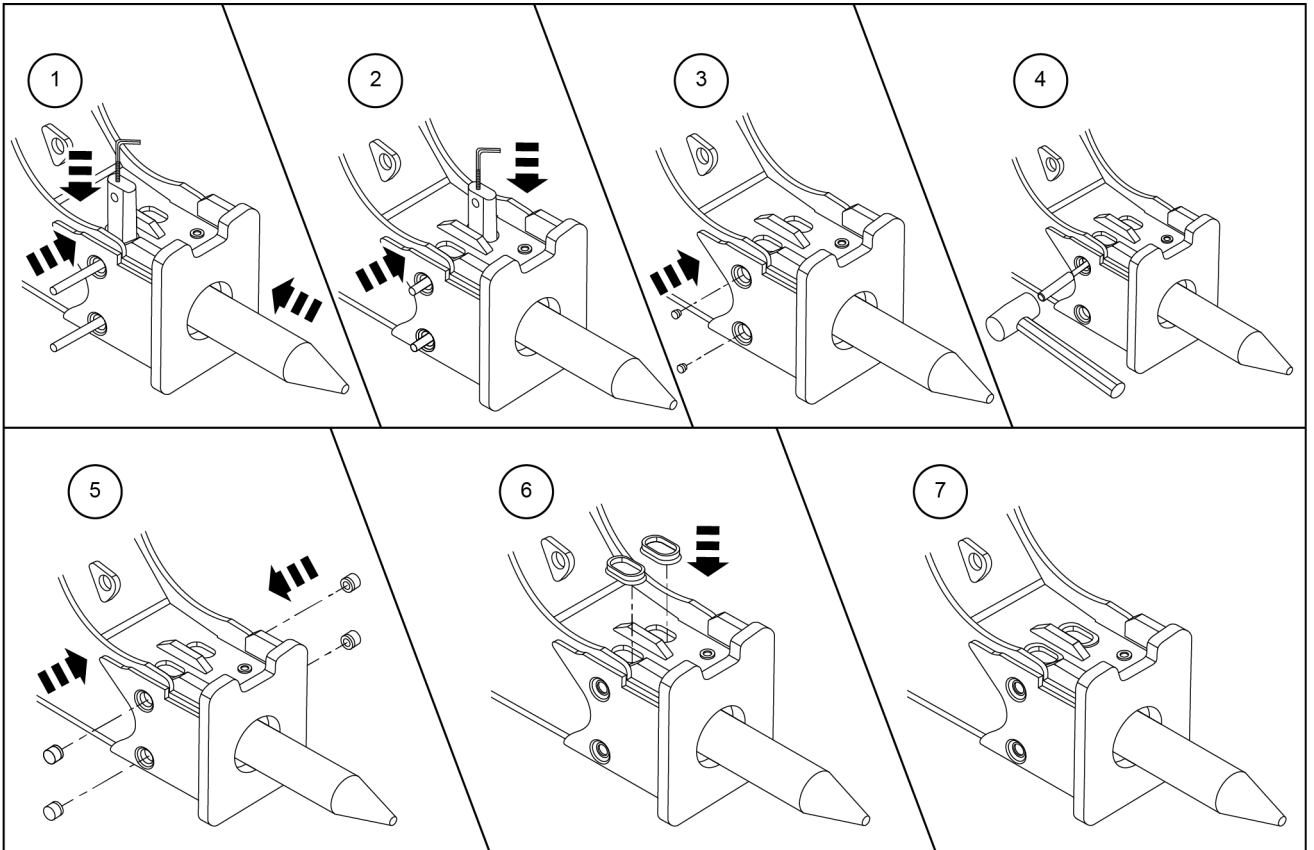
- Never use your fingers to check whether the recesses on the working tool shaft are aligned to the slots for the tool pin.
- Always wear protective glasses when fitting or removing the tool, since metal splinters may fly off when breaking out the stopper pins.
- Clean away any dirt adhering to the working tool in the insert zone.
- Lubricate to the contact faces in the lower breaker part between the working tool and the wear bushes.
- The tool should only be fitted correctly.

CB20, CB40, CB60, CB61, CB70, CB80



PTIL19GEN0226EA 1

CB62, CB140~CB800



PTIL19GEN0227FA 2

Hammer - Install - Hydraulic Auto-lubrication system

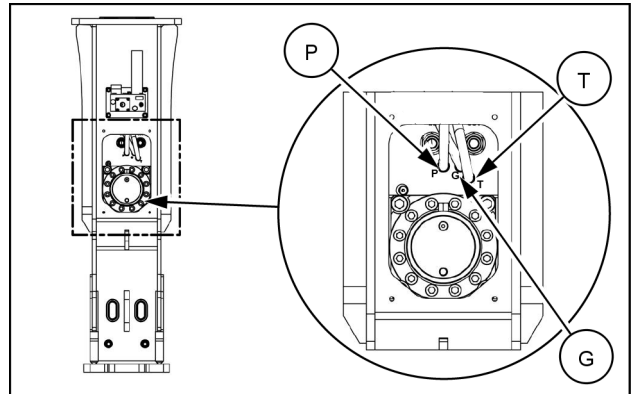
CB 140	
CB 160	
CB 200	
CB 210	
CB 230	
CB 260	
CB 300	
CB 380	
CB 400	
CB 550	
CB 800	

NOTE: For Overview and Parts list, see **Hammer - Exploded view - Hydraulic Auto-lubrication system (89.700)**.

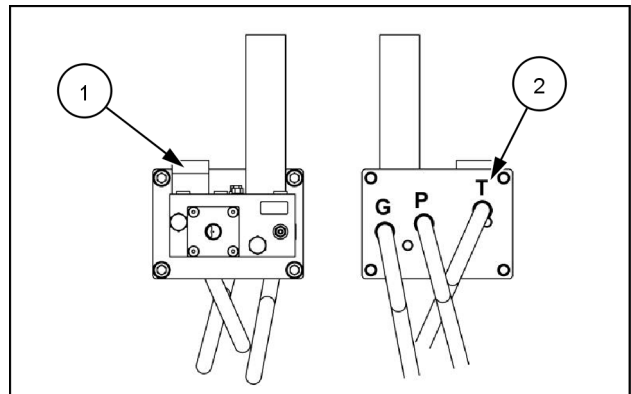
NOTE: For Adjustment, see **IU Hammer - Adjust - Hydraulic Auto-lubrication system (89.700)**.

NOTE: For grease refilling, See **Hammer - Grease - Hydraulic Auto-lubrication system (89.700)**.

1. Connect the grease hose to the port **(G)** of ALS block.
2. Connect the first hydraulic hose to the port **(P)** of ALS block.
3. Connect the second hydraulic hose to the port **(T)** of ALS block.
4. Connect the other end of grease hose to the port **(G)** on the cylinder.
5. Connect the other end of first hydraulic hose to the port **(P)** on the cylinder.
6. Connect the other end of second hydraulic hose to the port **(T)** on the cylinder.
7.
 - Front view **(1)**
 - Rear view **(2)**.



PTIL19GEN0236AA 1



PTIL19GEN0237AA 2

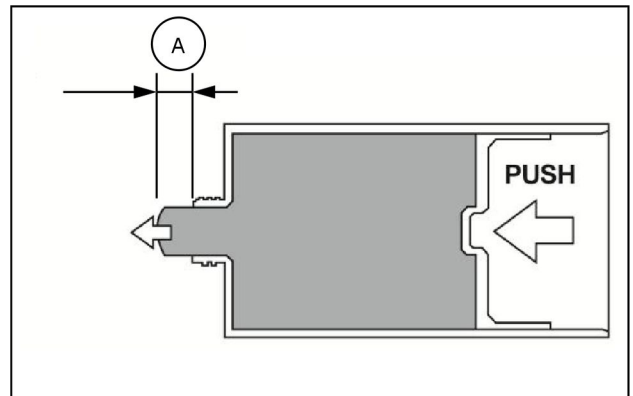
Hammer - Grease - Hydraulic Auto-lubrication system

CB 140	
CB 160	
CB 200	
CB 210	
CB 230	
CB 260	
CB 300	
CB 380	
CB 400	
CB 550	
CB 800	

NOTE: For Overview and Parts list, see **Hammer - Exploded view - Hydraulic Auto-lubrication system (89.700)**.

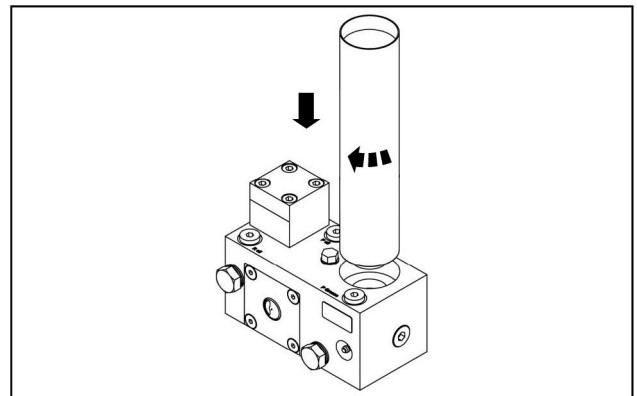
NOTICE: When replacing the cartridge, make sure that no contamination enters the intake area of the cartridge.

1. First remove the cap from the cartridge opening, then, using the cartridge follower piston.
2. Press out grease of **(A) = 5 – 10 mm**.



PTIL19GEN0238AB 1

3. Subsequently, insert the cartridge in the cartridge holder by pressing it slightly, and fasten it by hand.



PTIL19GEN0239AA 2

NOTE: For Adjustment, see **Hammer - Adjust - Hydraulic Auto-lubrication system (89.700)**.

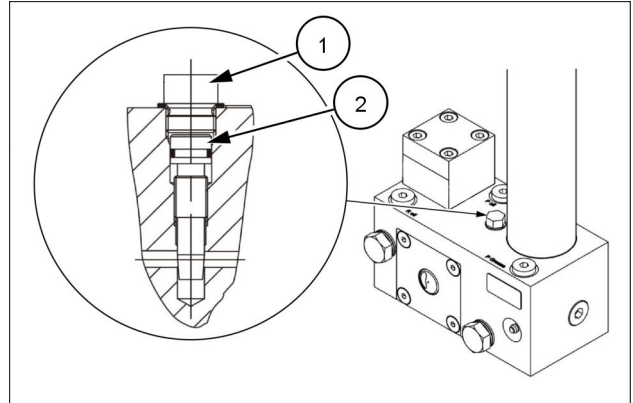
NOTE: For Installation, see **Hammer - Install - Hydraulic Auto-lubrication system (89.700)**

Hammer - Adjust - Hydraulic Auto-lubrication system

CB 140	
CB 160	
CB 200	
CB 210	
CB 230	
CB 260	
CB 300	
CB 380	
CB 400	
CB 550	
CB 800	

NOTE: For Overview and Parts list, See **Hammer - Exploded view - Hydraulic Auto-lubrication system (89.700)**

1. Before adjustment, you must remove the plug screw **(1)**.
2. Afterwards, you can release the throttle **(2)** using a slotted screwdriver.
3. By unscrewing the throttle **(2)**, you increase the flow rate, thus enhancing the delivery rate.



PTIL19GEN0240FA 1

NOTE: For grease refilling, see **Hammer - Grease - Hydraulic Auto-lubrication system (89.700)**.

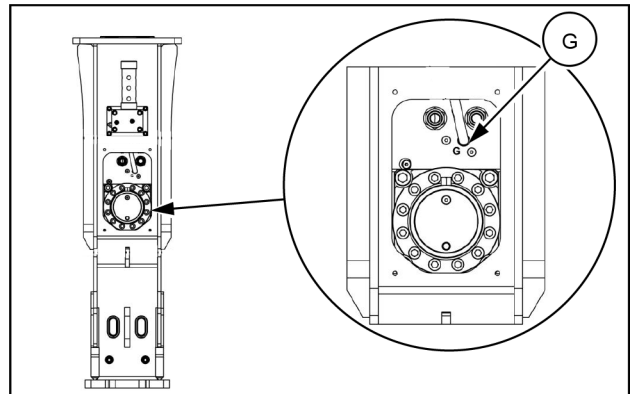
NOTE: For Installation, see **Hammer - Install - Hydraulic Auto-lubrication system (89.700)**.

Hammer - Install - Vibrating Auto-lubrication system

CB 140	
CB 160	
CB 200	
CB 210	
CB 230	
CB 260	
CB 300	
CB 380	
CB 400	
CB 550	
CB 62	
CB 800	

NOTE: For Overview and parts list, see **Hammer - Exploded view - Vibrating Auto-lubrication system (89.700)**.

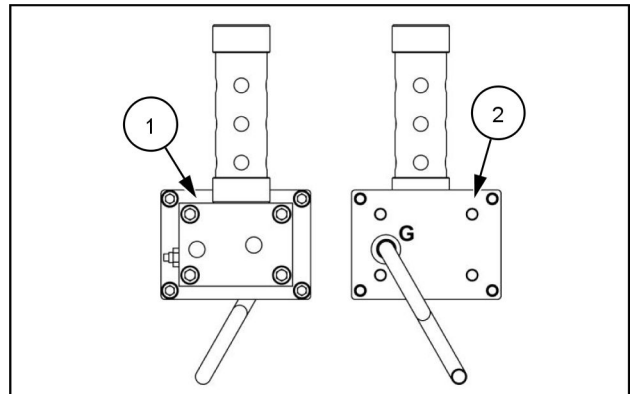
1. Connect the grease hose to the port **(G)** of ALS block.
2. Connect the other end of grease hose to the port **(G)** on the cylinder.



PTIL19GEN0245AA 1

3. • Front view **(1)**
• Rear view **(2)**.

NOTE: For Grease refilling, see **Hammer - Grease - Vibrating Auto-lubrication system (89.700)**



PTIL19GEN0246AA 2

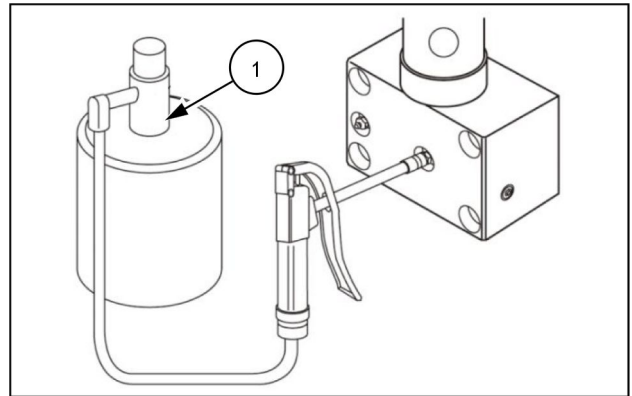
Hammer - Grease - Vibrating Auto-lubrication system

CB 140	
CB 160	
CB 200	
CB 210	
CB 230	
CB 260	
CB 300	
CB 380	
CB 400	
CB 550	
CB 62	
CB 800	

NOTE: For Overview, see *Hammer - Exploded view - Vibrating Auto-lubrication system (89.700)*.

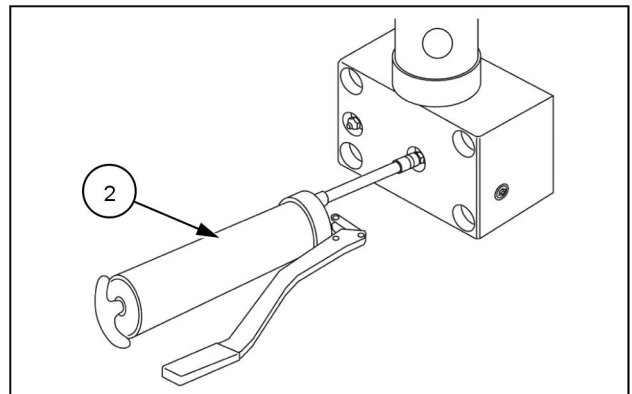
NOTE: For Installation, see *Hammer - Install - Vibrating Auto-lubrication system (89.700)*.

Grease refill by power grease gun (1). It can without reassemble cartridge.



PTIL19GEN0247AA 1

Grease refill by manual grease gun (2). It can without reassemble cartridge.
Relief valve is opened when the grease is refilled completely through this port, then over grease is by passed to the breaker side.



PTIL19GEN0248AA 2

NOTE: For Adjustment, see *Hammer - Adjust - Vibrating Auto-lubrication system (89.700)*.

Hammer - Adjust - Vibrating Auto-lubrication system

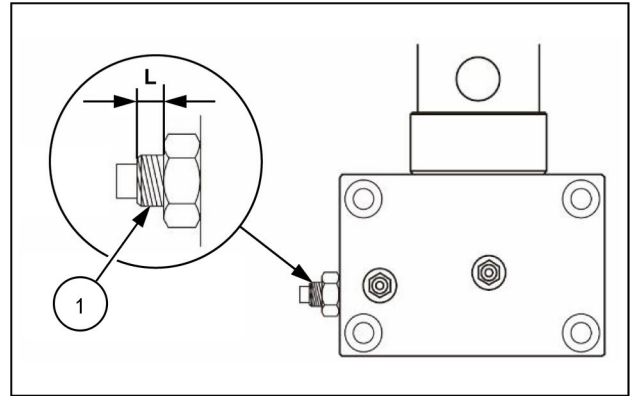
CB 140	
CB 160	
CB 200	
CB 210	
CB 230	
CB 260	
CB 300	
CB 380	
CB 400	
CB 550	
CB 62	
CB 800	

The amount of grease delivery per stroke can be set using the metering screw (1).

Allowing the unit to be adapted to differing requirements.

Maximum Output L= **6 mm**

Minimum Output L= **0 mm**



PTIL19GEN0249AA 1

NOTE: For Overview, see *Hammer - Exploded view - Vibrating Auto-lubrication system (89.700)*.

Hammer - Troubleshooting - Carrier Malfunction

OPERATION

Prerequisites for breaker performance and its long life time are;

1. Proper commissioning by experienced/skillful dealer technicians.
2. Respect P (pressure) and Q (flow) rate requirements upon specifications.
3. Use fresh and contamination free hydraulic oil.
4. Proper operation as per Operator's Manual.
5. Respect maintenance interval as per Operator's Manual.
6. Proactive inspection by dealer technicians as we as operator.
7. Timely repair by experienced/skillful dealer technicians as per Service Manual.

Repairing breaker troubles by dealer technicians/mechanics protects value of customers, builds a huge trust of customers and significantly contributes to retaining the customers.

Particularly well repairing by dealer efforts is often paid back by following breaker orders during the business cycle of Sales to Order, Order to Delivery and Delivery to Repurchase.

Therefore breaker dealer should response promptly to any types of breaker failure, dealer technicians/mechanics should be repeatedly trained to build up breaker service understanding, knowledge and skills to correctly grasp trouble symptoms and take adequate counter measures to root causes with no time delay.

Breaker problems may be caused by carrier hydraulic system if it is not working to specifications.

Therefore thoroughly check carrier condition like hydraulic pump output, port relief valve setting pressure and valve itself, breaker piping line, return pressure, oil filter, pedal or joy stick switch, cooling system, etc. prior to any repair inspection/action on the breaker in trouble.

Breaker problems may also be caused by operator's insufficient respect to instruction and guide for operation and/or maintenance on the Operator's Manual.

Do not forget to inspect operator's way of using and maintain the breaker before commencing any repair inspection/action on the breaker in trouble.

Following instructions are about breaker symptoms, causes and countermeasures, will help dealer technicians/mechanics properly response to the troubles that the customers may encounter.

Read them through carefully and ensure all instructions are fully captured in your way of handling the troubles of your customer.

Problem	Possible Cause	Correction
Breaker does not work	Too low port relief valve setting pressure	Check/adjust setting pressure
	Clogged piping	Check, flush or and/or repair hydraulic line from the stop valve to pump/oil tank
	Main control valve does not operate properly.	Check conditions of MCV and pilot pressure. Consult with carrier dealer or supplier.
	Insufficient input power (P x Q)	Check power (P x Q)
Irregular blows at the beginning of breaker operation	Too low port relief valve setting pressure	Check/adjust setting pressure
Breaker easily damaged due to too strong impact power	Too high port relief valve setting pressure	Check/adjust setting pressure
Rapid increase of oil temperature	Poor carrier cooling system	Consult with carrier dealer or supplier
	Wear of pump internal parts	Consult with carrier dealer or supplier
	Clogged hydraulic line	Check, flush or and/or repair hydraulic line from the stop valve to pump/oil tank

Hammer - Troubleshooting - Breaker Malfunctions

Problem	Possible Cause	Correction
Breaker does not work	Seizure of breaker (piston or valve)	Oil entering into back head gas chamber Remove
	Oil entering into back head gas chamber	Remove oil. Check/replace gas seal and step seals. Ensure that you check if piston or cylinder has got any scratch.
Stop breaking or erratic striking after 30 – 90 min of operation	Oil entering into back head gas chamber	Remove oil. Check/replace gas seal and step seal. Also ensure that you check if piston or cylinder has got any scratch.
Tool crack	See section Breaker Tool Failure.	See section Breaker Tool Failure.
Tool point melting	See section Breaker Tool Failure.	See section Breaker Tool Failure.
Tool tip edge crack	See section Breaker Tool Failure.	See section Breaker Tool Failure.
Pulsation of pressure line hose	Diaphragm crack	Replace diaphragm. Check if the breaker has made frequent blank fires.
Irregular blows at the beginning of breaker operation	Seizure of piston and cylinder	Inspect cylinder, piston seal condition. Check if contaminated or not. Remove seizing marks. Replace cylinder and piston if necessary.
Low blow speed	Insufficient power (P x Q)	Check power (P x Q)
Weak striking force	Insufficient power (P x Q)	Check power (P x Q)

Hammer - Troubleshooting - Oil leakage

Oil leakage do not always require any part replacing. Check below before calling the breaker supplier.

Problem	Possible Cause	Correction
Leakage between tool and lower bush	Light oil leakage	Leave it as it is. Keep using breaker as it helps lubrication.
	Heavy oil leakage	Seals at the cylinder bottom might have been damaged. Inspect/replace the complete seal set.
Leakage between cylinder & back head	Leakage from control valve or Ro-plug	Damaged or missing O-ring during breaker overhauling. Check/replace O-ring.
	Oil entering into back head gas chamber	Remove oil. Check/replace gas seal and step seal. Also ensure that you check if piston or cylinder has got any scratch.
	Oil leakage	Loosed through bolts & nuts : Retighten.

Hammer - Troubleshooting - Poor operation of breaker

The symptoms with below causes should be followed by dealer training to the operator for proper use and maintenance of breaker as per the breaker Operator's Manual.

Problem	Possible Cause	Correction
Breaker does not work	Too high back head gas pressure or too low port relief valve setting pressure	Check/adjust gas pressure or port relief valve setting pressure
	Insufficient pushing down the tool	Train operator for proper breaker operation
Irregular blows at the beginning of breaker operation	High oil temperature.	Refill hydraulic oil.
	Too high back head gas pressure	Check/adjust gas pressure.
	Insufficient pushing down of tool	Push tool down with a bit higher force.
	Too large clearance between tool and lower bush	Measure lower bush wearing. Replace lower bush.
	Excessive wearing of tool head	Check tool head wearing. Check piston impact surface condition as well.
	Control valve contamination	Inspect control valve condition. Clean control valve set. Also inspect cylinder and piston condition, flush or replace them.
Stop breaking or erratic striking after 30 to 90 minutes of operation.	Too high back head gas pressure	Check/adjust gas pressure
Hard to install/remove tool	Deformation of tool pin	Replace deformed tool pin.
Excessive plays between housing and power cell	Damper and/or shell pad wearing beyond the limit	Check wearing amount and replace upper damper, bottom damper and/or shell pads.
Weak striking force	Too low back head gas pressure	Check/adjust gas pressure
Low blow speed	Insufficient pushing down of tool	Train operator for proper breaker operation
	Too high back head gas pressure	Check/adjust gas pressure
Low blow speed	Too low back head gas pressure	Check/adjust gas pressure.
	Insufficient pushing down of tool	Push tool down with a bit higher force.
Breaker easily damaged due to too strong impact power	Too high back head gas pressure	Check/adjust gas pressure

Hammer - Troubleshooting - Accumulator

CB 140	
CB 160	
CB 200	
CB 210	
CB 230	
CB 260	
CB 300	
CB 380	
CB 400	
CB 550	
CB 61	
CB 62	
CB 800	

OPERATION

- Check accumulator gas pressure in case of a big tremor on the hose of high pressure line. If the gas pressure is low, recharge accumulator gas chamber
- After refilling the gas, if there is still a big tremor and gas is lost after a short time breaker running, check O-ring of accumulator charging valve and check whether oil is leaking around accumulator.
- After replacement and inspection, the socket bolts that fix the accumulator should be tightened by the torque wrench.

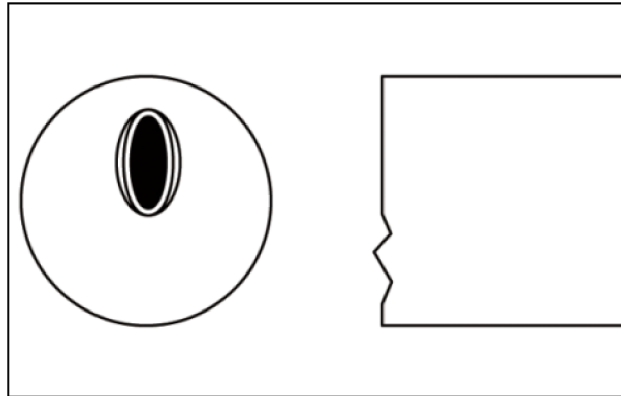
Hammer - Troubleshooting - Tool failure

OPERATION

Followings are typical tool failure cases that the customers encounter. Read them through carefully and response to them correctly.

Material defect

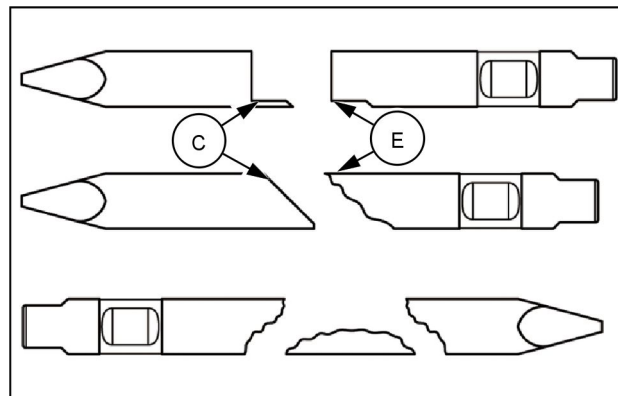
Tool crack on the area between **(C)** and **(E)**, caused by material defect, shows stress concentration point on the broken surface but inside outer circle.



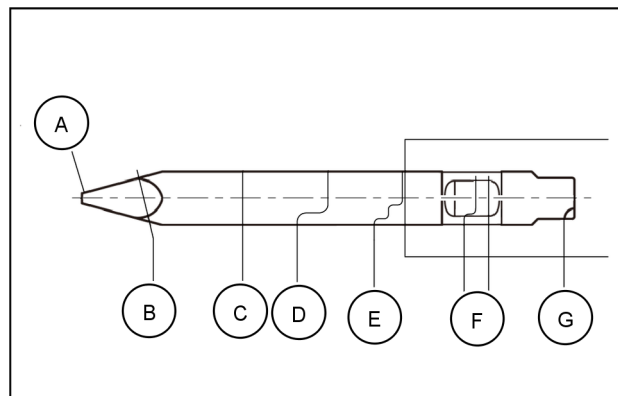
PTIL19GEN0228AA 1

Excessive bending force

Tool crack on the area between **(C)** and **(E)**, caused by excessive bending force, show below tool fracture shapes.



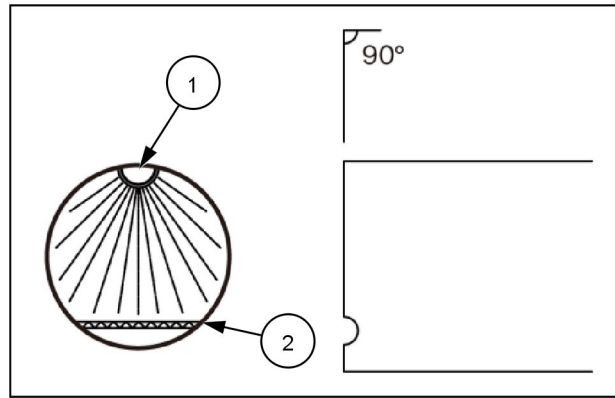
PTIL19GEN0230AA 2



PTIL19GEN0229AA 3

Typical high stress fracture when breaker “pulls” material.

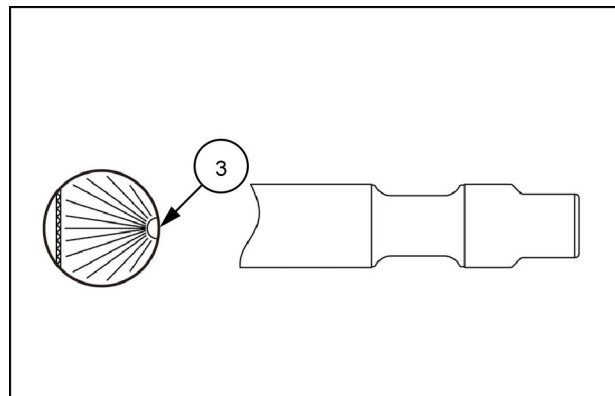
- Stress Concentration point **(1)**
- Hollow **(2)**



PTIL19GEN0231AA 4

Typical fracture when levering tool while buried in the burden

- Stress concentration Point at **90°** to the retainer pin flats (**3**).

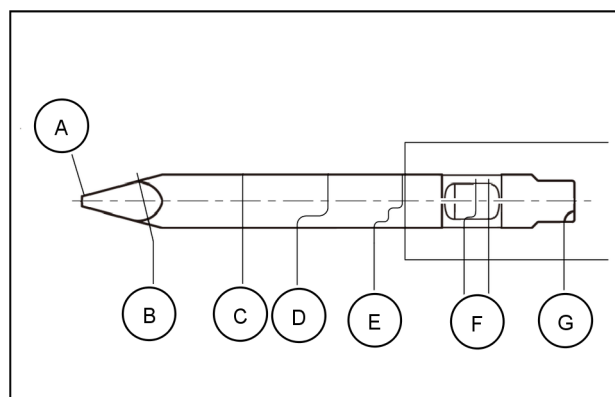


PTIL19GEN0232AA 5

Lubrication, burrs, maintenance or blank firing

Tool crack on the area (**F**) is another typical failure case from miss-use of breaker:

1. Insufficient lubrication on tool and tool pin.
2. Breaker use with no removal of burrs on tool pin and tool.
3. Tool pin use with no periodical change of tool pin face.
4. Tool pin use over wear limit.
5. Blank firing by less experienced or skilled operator.
6. **NOTE:** This is a frequent failure type at the secondary rock breaking application.



PTIL19GEN0229AA 6

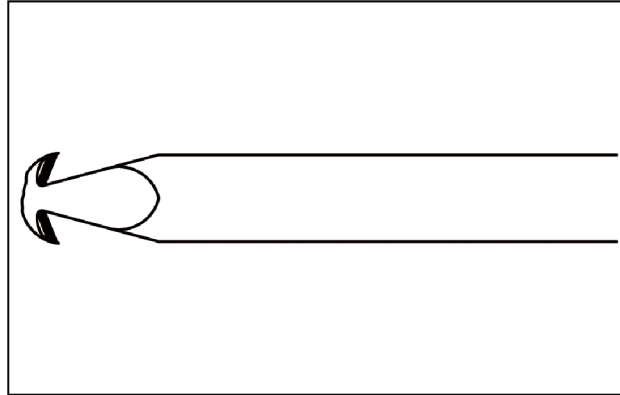
Mushrooming

Deformation on tool point, so called “mushrooming”, is caused by:

1. Striking the same material spot for a too long time.

NOTE: Do not break the same spot for more than **30 s**.

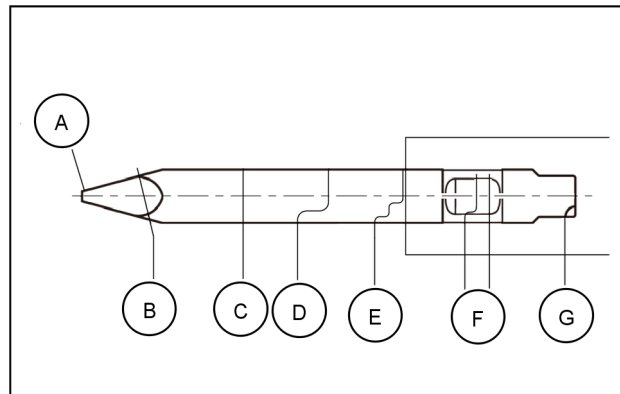
2. Use of moil point tool at hard rock breaking application, volcanic rock for example.
3. Disappearing of heat treat surface by local reshaping tool point.



PTIL19GEN0233AA 7

Chipping of tool point

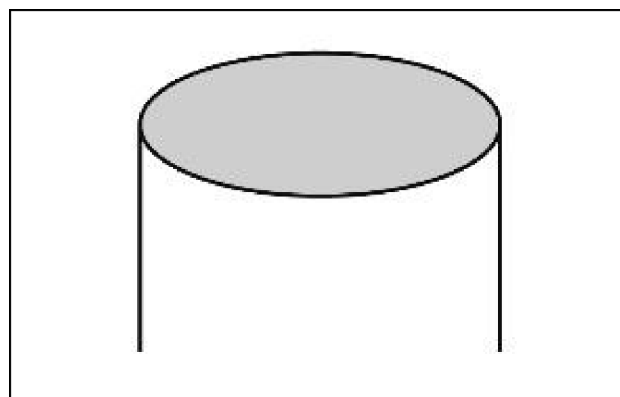
Chipping of tool point area **(F)** occurs when the tool strikes unstable material, particularly at the secondary rock breaking application or small rock boulder demolishing application.



PTIL19GEN0229AA 8

Cold fracture

Use of tool under cold ambient temperature below **0 °C** celsius may end up with a sudden tool fracture with no prior indicative sign. Preheat the tool before commence breaker tool striking.



PTIL19GEN0234AA 9

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(*) See content for specific models



Tools - 89

Water kit - 165

CB 140, CB 160, CB 200, CB 20, CB 210, CB 230, CB 260, CB 300, CB 380, CB 400, CB 40, CB 550, CB 60, CB 61, CB 62, CB 70, CB 800, CB 80

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Water kit - Overview

Introduction

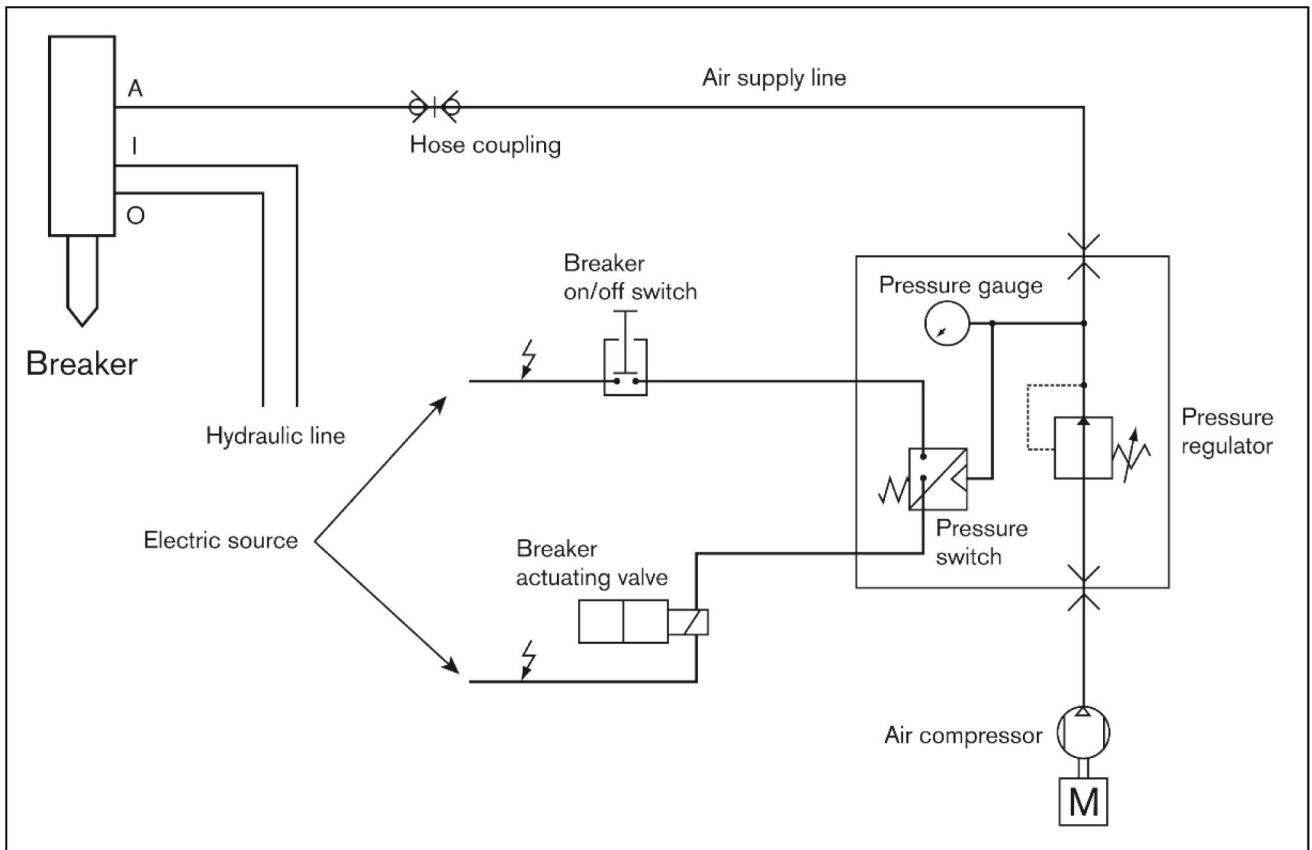
- This is about requirements of the underwater application breaker.
- It is very important for you to read and understand the instruction before the breaker is put into underwater application.
- Keep the instructions provided herewith with you all the time.
- When the breaker is operated at underwater application without any proper underwater kit, water comes into percussion chamber and cylinder, cause serious damage to seals, cylinder, piston and control valve such as corrosion, scratch and crack as well as a significantly shortened life time of tool, tool pins, upper bush, lower bush, etc.
- Therefore a proper underwater kit should be installed on the breaker and working whenever the breaker works at under water application.

NOTE: The breaker manufacturer do NOT supply any underwater kit. All information related with underwater kit technical information, installation, capacity, setting pressure, operation, maintenance, part list, etc. of this Service Manual is only to help the operator understand risks and requirements of underwater application breaker, shall NOT be interpreted as breaker manufacturer's responsibility to warrant underwater kit as well as underwater breaker.

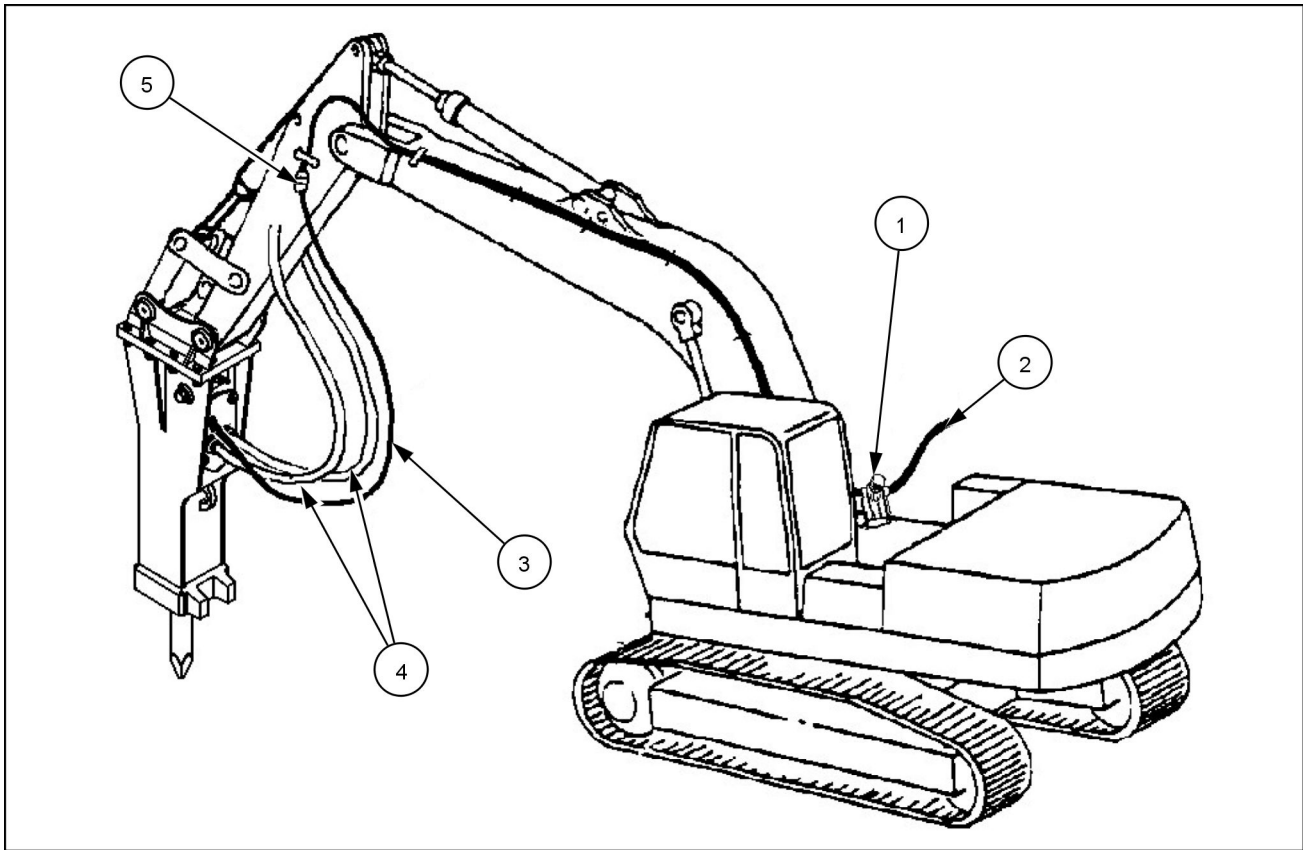
NOTE: Underwater application breaker is not supported by breaker manufacturer's warranty. Breaker operation at underwater application shall be carried out at full responsibility of the Operator.

Structure of underwater kit

Normally underwater kit consists of air compressor, air supply line, pressure regulator, pressure switch, electric cable, coupling, adaptor, fasteners, etc.



PTIL19GEN0123FA 1

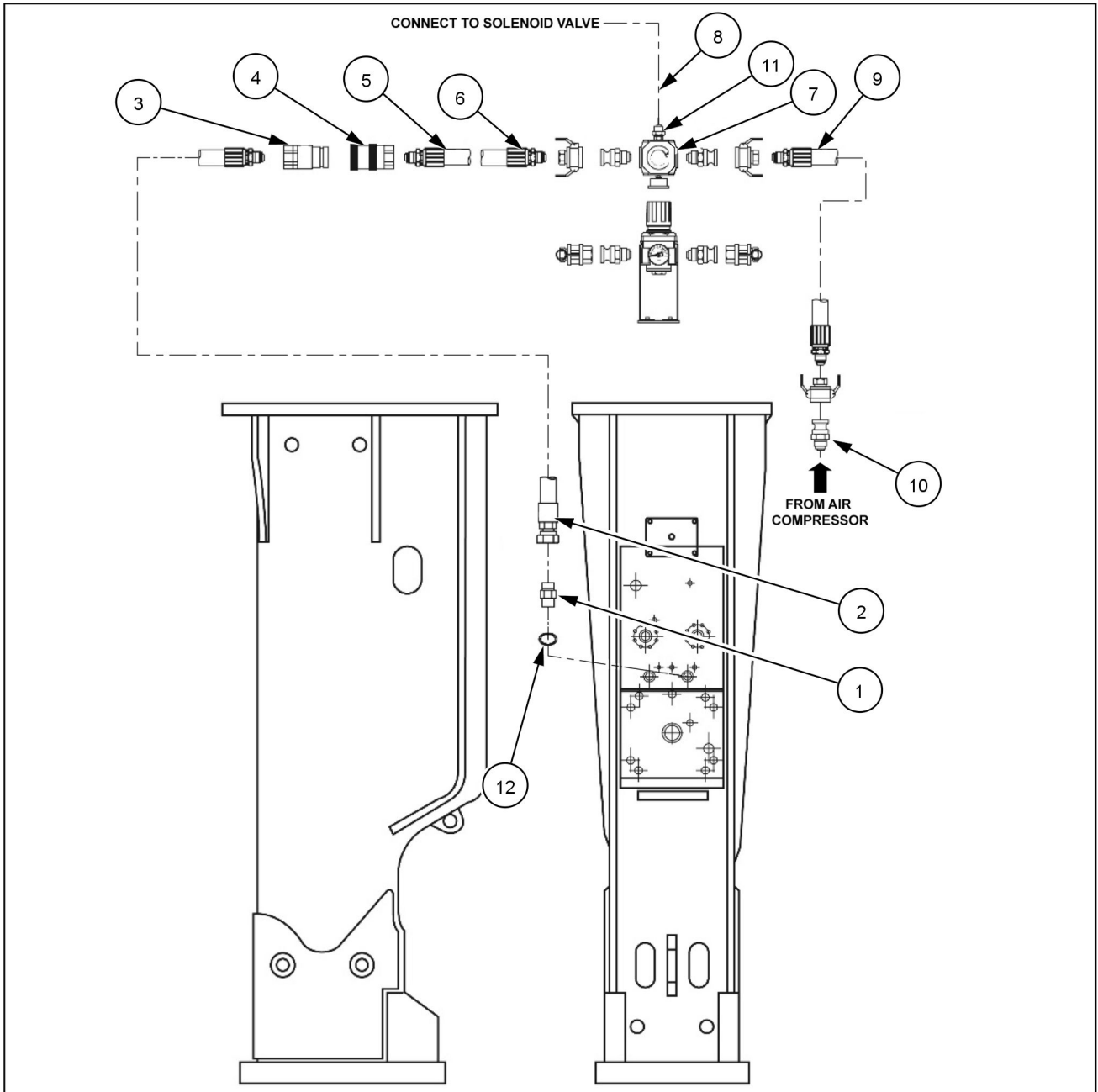


PTIL19GEN0124FB 2

1.	Pressure regulator	4.	hydraulic line
2.	Connect to air compressor	5.	Hose coupler
3.	Air supply line		

Water kit - Exploded view

A) Typical underwater kit parts of CB210 class



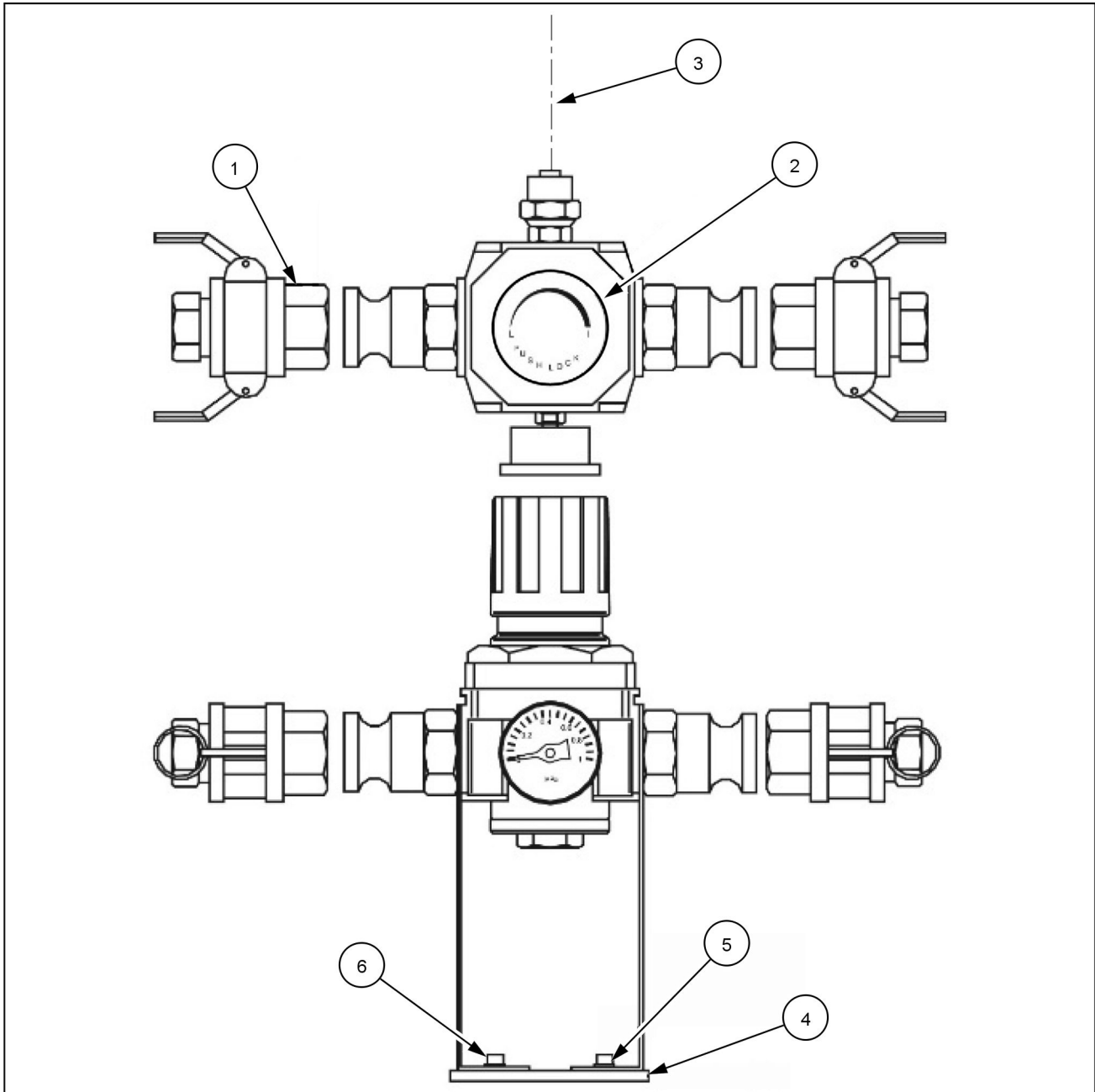
PTIL19GEN0125GB 1

CB210

Item	Part name	Quantity	Remarks
1	Adaptor	1	PF1/2" O-RING×PF1/2"5#
2	Hose	1	PT1/2"(MALE)×PF1/2"5#(FEMALE)× 25000L×2S
3	Quick Coupler Plug	1	1/2", 6605-12
4	Quick Coupler Socket	1	1/2", 6603-12
5	Hose	1	PT1/2"(BOTH MALE)×2S×12m
6	Female Thread Coupler	3	1/2" CAM-LOCK
7	Regulator Assembly	1	1/2" AC4004GS(Air filter + Regulator + Lubricator + P/Switch)
8	Electric Cable	1	1.5mm ² -10m
9	Hose	1	PT1/2"(BOTH MALE)×2S×20m
10	Male Thread Coupler	3	1/2" CAM-LOCK

Item	Part name	Quantity	Remarks
11	Pressure Switch	1	9000401
12	O-ring	1	1B P18

B) Pressure regulator



PTIL19GEN0126GB 2

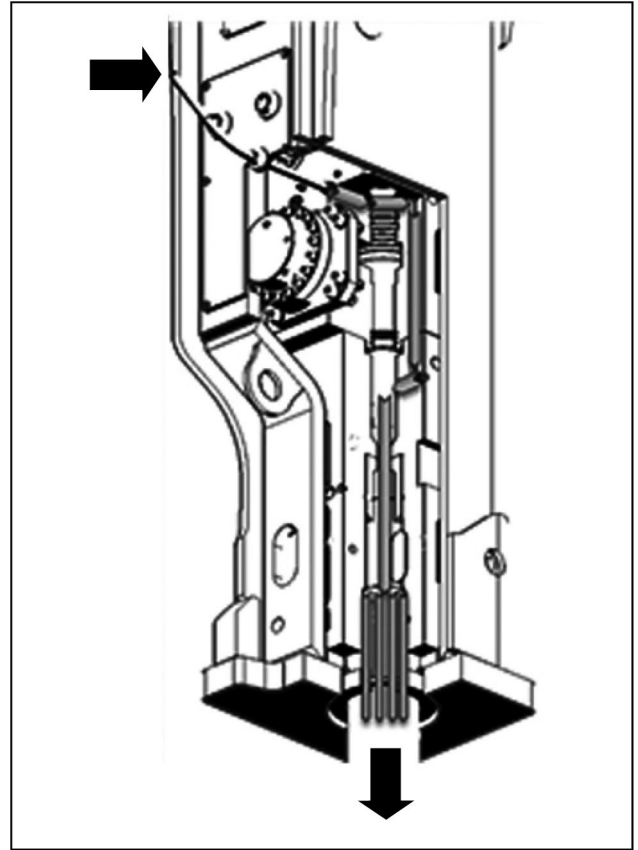
Item	Part Name	Quantity	Remarks
1.	Coupler socket	3	
2.	Pressure regulator assembly	1	
3.	Electric cable	1	1.5 mm - 10 m
4.	Plate	1	
5.	Socket bolt	2	M10×1.5×14L
6.	Washer	2	M10

Water kit - Component identification

Technical requirements

- Air supply channel is built in the breaker cylinder and front head blocks as standard for the range CB140 & above range.
- Air supply hose can be fitted to the air inlet port of cylinder. Insert air supply hose through rubber cover and fit it on the air inlet port.
- Air inlet port size
 - CB140 - CB300 : PF1/2 inch
 - CB380 - CB800 : PF3/4 inch

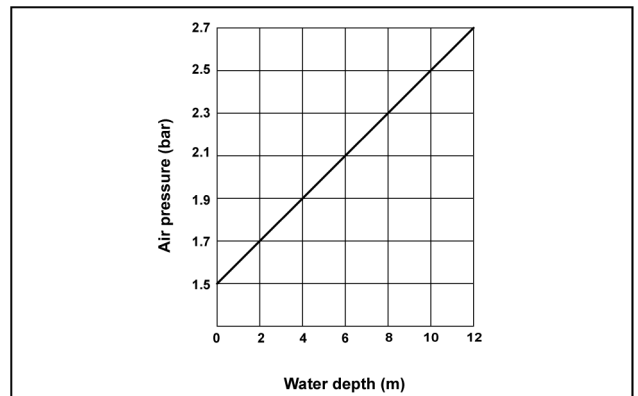
NOTE: The hoses twisted or folded will not Allow a proper air supply to the breaker.



PTIL19GEN0127BA 1

	CB140	CB160 - CB260	CB300	CB380	CB400 - CB800	
Air hose size (inner diameter)	12.7 mm (0.5 in)			19.05 mm (0.75 in)		
Regulated air pressure	0 – 5.5 bar (max 9 bar)					
Switching pressure	1.5 bar (Activating pressure switch)					
Air compressor capacity	Minimum air pressure	5 bar				
	Air delivery	90 m ³ /hr	162 m ³ /hr	180 m ³ /hr	180 m ³ /hr	198 m ³ /hr
	Rated output	12.5 kW (17 Hp)	22 kW (30 Hp)	25 kW (34 Hp)	25 kW (34 Hp)	27 kW (37 Hp)

- Air pressure = (Water depth / 10 m) + 1.5 bar.
- Water pressure gets **1 bar** at every **10 m** water depth. You may calculate air pressure from the formulated value on the above.
- You may also get an idea of proper air pressure level from the chart on the right.



PTIL19GEN0128AA 2

Water kit - Service instruction

Following is what you may refer for maintain underwater application breaker.

Every 30 min.	<ul style="list-style-type: none"> • Grease tool, tool pins, bushes • Check if tool moves up and down with no difficulty. • Check function range of air pressure switch. • Check air hoses and their fitting condition.
Daily (8 h)	<ul style="list-style-type: none"> • Remove tool pin and tool condition, remove burrs if any. • Check if tool was greased sufficiently, grease more frequently if needed. • Check if the breaker is rust or abnormally worn out, particularly piston face and percussion chamber.
When the job is over	<ul style="list-style-type: none"> • Completely disassemble breaker and carry out overhauling including but not limited to seals. • Check if any breaker parts were damaged or rust, replace if any. • Check if all underwater kit parts are in good condition and work properly.

As soon as underwater breaker operating is finished, remove water that remains in percussion chamber

1. Operate the breaker at the ground over 10 times with air supply from the compressor.
2. Keep supplying compressed air to the breaker for minimum **10 min.**
3. Apply hydraulic oil or anti-rust oil inside percussion chamber with air supply line.
4. Apply grease inside percussion chamber, repaint the breaker if necessary.

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