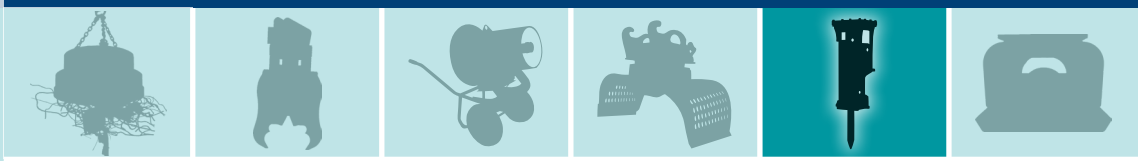
DEHACO

# Operation and maintenance manual



# IBEX

Hydraulic breakers - G-type

**English**
IBEX • Versie 17-08-2018

# PREFACE

## General

Congratulations with the your purchase of the IBEX hydraulic breaker. By opting for the IBEX breaker you have chosen for years of experience in development, sales, aftersales and servicing of hydraulic breakers.

The IBEX breakers are suitable for breaking large boulders in quarries, tunnels, creating trenches for pipe construction, demolition of concrete structures, removing slag from blast furnaces and breaking asphalt.

As standard the IBEX breakers are available with an open or silenced housing. In addition they are prepared for a central greasing system and an air connection for underwater demolition.

## Markings on the machine

The main specifications are listed on the identification plate on the side of the housing. This plate also includes the address of the manufacturer. Removal of this plate or switching it to another machine is strictly forbidden. If the identification plate is damaged or removed the user should inform Dehaco or an approved Dehaco dealer so a new plate can be produced. An additional identification plate is located on the backhead of the breaker, on which the serial number and year of manufacture is indicated.

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Dealer

# EG DECLARATION OF CONFORMITY

## IBEX 130, 135, 170, 200, 320, 600, 900, 1200, 2200, 2800, 3200 (EC Machinery Directive 2006/42/EC)

We, Dehaco B.V., herewith declare that the following products comply to the essential requirements of the above mentioned European Directive and the following harmonized standards:

**Product:** Hydraulic breakers

**Type designation:** IBEX 130GS, IBEX 170GS, IBEX 200GS, IBEX 320GS, IBEX 600GS, IBEX 900GS, IBEX 1200GS, IBEX 2200GS, IBEX 2800GS, IBEX 3200GS

**Manufacturer:** Dehaco B.V.
Kruisbaak 25, 2165 AJ Lisserbroek (The Netherlands)

**General manager:** Jeroen Korporaal

**Standard(s):** EN ISO 12100-2:2003
EN 982:1996+A1:2008

**Place and date:** Lisserbroek, 04-07-2013

## EG Declaration of Conformity IBEX 400GS, 1800GS, 4000GS (EC Machinery Directive 2006/42/EC)

We, Dehaco B.V., herewith declare that the following products comply to the essential requirements of the above mentioned European Directive and the following harmonized standards:

**Product:** Hydraulic breakers

**Type designation:** IBEX 400GS, IBEX 1800GS, IBEX 4000GS

**Manufacturer:** Dehaco B.V.
Kruisbaak 25, 2165 AJ Lisserbroek (The Netherlands)

**General manager:** Jeroen Korporaal

**Standard(s):** ISO 12100:2010
ISO 4413:2010

**Place and date:** Lisserbroek, 04-07-2013

# INDEX

# 1. SAFETY INSTRUCTIONS

Read these Safety and operating instructions and specifically all safety instructions before using the IBEX breaker. This will:
- ◊ prevent the risk of injuries and fatal accidents for yourself and others,
- ◊ protect the IBEX breaker and other property against material damage,protect the environment against environmental damage.

Follow all instructions in this operation and maintenance manual. Store this manual in de document compartment of the carrier cab.

Anyone responsible for transporting, installing or removing, operating, maintaining, repairing, storing or disposing of the IBEX breaker must have read and understood these Safety and operating instructions.

This operation and maintenance manual belongs to the IBEX breaker. Keep it for the life of the product. Ensure, if applicable, that any received amendment is incorporated in the instructions. Hand over the Safety and operating instructions if ever you lend, rent out or sell the IBEX breaker.

All safety regulations listed in this manual comply with the laws and regulations of the European Union. Also observe the additional national/regional regulations.

IBEX breaker operations outside the European Union are subject to the laws and regulations valid in the country of use. Please observe any other, more stringent regional regulations and legislation.

Read the carrier manufacturer's Safety and operating Instructions before attaching the IBEX breaker to the carrier and operating it. Observe all instructions.

## 1.1 Signal words

The signal words danger, warning, caution, and notice are used as follows in this operation and maintenance manual:

**⚠ DANGER!**
**indicates a hazardous situation which, if not avoided, will result in death or serious injury.**

**⚠ WARNING!**
**Indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

**⚠ CAUTION!**
**Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**

*NOTE*
**The signal word NOTICE is used to address practices related to possible property damage but not related to personal injury.**

## 1.2 Qualification

**Transporting** the IBEX breaker is only permitted if carried out by people who:
- ◊ are authorised to operate a forklift truck according to the applicable national provisions,
- ◊ know all the relevant national/regional safety provisions and accident prevention rules,
- ◊ have read and understood the safety and transport chapter of this operation and maintenance manual.

**Installing**, **maintaining**, **storing** and **disposing** of the IBEX breaker is only permitted if carried out by people who:
- ◊ know all the relevant national/regional safety provisions and accident prevention rules,
- ◊ have read and understood these Safety and operating instructions.
- ◊ Operating the IBEX breaker is only permitted if carried out by qualified operators. Operators are qualified if they:
- ◊ have been trained to operate a carrier according to the national regulations,
- ◊ know all the relevant national/regional safety provisions and accident prevention rules,
- ◊ have read and understood these Safety and operating instructions.

**Testing** the hydraulic installation is only permitted if carried out by professionals.

**Repairing** the IBEX breaker is only permitted if carried out by professionals trained by Dehaco.

## 1.3 Intended use

Only attach the IBEX breaker to a hydraulic carrier of a suitable load–bearing capacity. Read the carrier manufacturer's instructions before attaching the IBEX breaker to the carrier and operating it. Observe all instructions.

## 1.4 Protective equipment

Personal protective equipment must comply with the applicable health and safety regulations.

Always wear the following personal protective equipment:
- ◊ Protective helmet
- ◊ Safety glasses with side protectors
- ◊ Protective gloves
- ◊ Protective shoes
- ◊ Warning vest

## 1.5 Operation, precautions

**⚠ WARNING!**
**If the load-bearing capacity of the carrier used is insufficient, the carrier will not be stable. It can topple over and cause injuries and damage.**

**Using a carrier whose load-bearing capacity is too high will greatly burden the IBEX breaker causing it to wear faster.**
- ➢ Only attach the IBEX breaker to a hydraulic carrier of a suitable load-bearing capacity.
- ➢ The carrier must remain stable at all times.
- ➢ Read the carrier manufacturer's Instructions before attaching the IBEX breaker to the carrier and operating it. Observe all instructions.

## 1.6 Hydraulic installation, precautions

**⚠ WARNING!**
**If the hydraulic pressure is too high, the parts of the IBEX breaker will be exposed to excessively high loads. Parts can break loose or burst causing serious injuries.**
- ➢ Connect the drain line of the pressure relief valve directly in the tank to ensure the safe functioning of the pressure relief valve!
- ➢ The pressure relief valve must be set at the maximum static pressure.
- ➢ The pressure relief valve setting must be checked to ensure that the maximum static pressure (see chapter Technical specifications) of the hydraulic installation is not exceeded at any time. Attach a lead seal to the pressure relief valve.
- ➢ Prior to their first use, the safety facilities on the hydraulic installation must be checked by a professional/authorised monitoring body for their quality (CE mark etc.), suitability and proper functioning.
- ➢ If any significant changes are made to the hydraulic installation, a new acceptance inspection is to be carried out in accordance with the relevant national safety provisions.

**⚠ WARNING!**
**The hydraulic system is under high pressure. Hydraulic lines may spring a leak or burst. Hydraulic oil under pressure can lead to serious injury.**
- ➢ When attaching the IBEX breaker do not lay any hydraulic lines through the carrier's cab.
- ➢ Only use hydraulic lines which comply with the highest quality requirements.

## 1.7 Media/consumables, precautions

**⚠ WARNING!**
**Hydraulic oil will spray out under high pressure if there is a leakage. The jet of oil might penetrate people's skin and cause permanent damage. Hot hydraulic oil can cause burns.**
- ➢ Never use your hands to find leaks.
- ➢ Always keep your face away from a possible leak.
- ➢ If hydraulic oil has penetrated your skin consult a doctor immediately.

**⚠ WARNING!**
**Spilt hydraulic oil can make a floor slippery. If people slip they can be injured. Hydraulic oil is environmentally harmful and must not penetrate the ground or enter the water table or water supplies.**
- ➢ Make sure not to spill any hydraulic oil.
- ➢ Immediately clean the floor if you have spilt hydraulic oil.
- ➢ Observe all safety and environmental protection provisions when handling hydraulic oil.

**⚠WARNING!**
**Hydraulic oil and grease can cause rashes (or even eczema) if they come into contact with the skin.**
- ➢ Avoid all skin contact with hydraulic oil and grease.
- ➢ Use a suitable skin protection product.
- ➢ Always wear safety gloves when working with hydraulic oil or grease.
- ➢ Immediately clean any skin that has been contaminated by oil or grease with water and soap.

## 1.8 Explosion and fire, precautions

**⚠ DANGER!**
**Explosions cause serious injury or death. Explosives being cut by the IBEX breaker may lead to an explosion.**
- ➢ Never operate the IBEX breaker in the direct vicinity of explosives.
- ➢ Make sure that no explosives are hidden in the concrete.
- ➢ Check gas line position plans of the complete construction area.

**⚠ DANGER!**
**Operating the IBEX breaker may create sparks which ignite highly flammable gases. This may lead to fire or an explosion.**
- ➢ Never work in an environment with highly flammable substances.
- ➢ Make sure that there are no hidden sources of gas in the work area.
- ➢ Check gas line position plans of the complete construction area.

**⚠ DANGER!**
**Dust-rich air can form an explosive atmosphere which may ignite when operating the IBEX breaker. his may lead to fire or an explosion.**
- ➢ Never operate the IBEX breaker in an explosion-hazard atmosphere.
- ➢ Always provide sufficient ventilation when working in buildings or in a confined area.

## 1.9 Elektric shock, precautions

**⚠ DANGER!**
**Any contact of the IBEX breaker with electric circuits or other sources of electricity will lead to an electric shock, resulting in serious injury or death. The IBEX breaker is not electrically insulated.**
- ➢ Never work in the vicinity of electric circuits or other sources of electricity.
- ➢ Make sure that there are no hidden circuits in the work area.
- ➢ Check wiring diagrams.

## 1.10 Falling stones, precautions

**⚠ WARNING!**
**Fragments of material which come loose while operating the IBEX breaker may become airborne and can cause serious injury if people are hit by them. Small objects falling from a great height or at a high velocity can also cause serious damage.**

**During IBEX breaker operation the danger zone is considerably greater than during the excavation operation due to fragments of stone and pieces of steel flying around, and for this reason the danger zone must, depending on the type of material to be worked on, be enlarged correspondingly, or secured in a suitable manner through corresponding measures.**
- ➢ Secure the danger zone.
- ➢ Stop the IBEX breaker immediately if anyone enters the danger zone.
- ➢ Close the windscreen and the side windows of the driver's cab.

## 1.11 Emissions, precautions

**⚠ WARNING!**
**Dust may be generated when operating the IBEX breaker. If dust from rocks or silica dust, produced when operating the IBEX breaker on rocks, concrete, asphalt or other such materials, is inhaled this may lead to silicosis (dust lungs, a severe lung disease). Silicosis is a chronic disease which may lead cancer and death.**
- ➢ Wear a suitable breathing mask.

## 1.12 Handling machines, precautions

**⚠ WARNING!**
**Narcotics, alcohol and medicinal drugs make their users less alert and affect their ability to concentrate. Negligence and incorrectly assessing a situation can result in serious injury or death.**
- ➢ Never work on or with the IBEX breaker when under the influence of narcotics, alcohol or drugs which affect your alertness.
- ➢ Never allow other people who are under the influence of narcotics, alcohol or drugs which affect their alertness to work on or with the IBEX breaker.

## 1.13 Modifications to the IBEX breaker, precautions

**⚠ WARNING!**
**Changes to the IBEX breaker or the adapter plate may lead to serious injury.**
- ➢ Never carry out any changes to the hydraulic
- ➢ attachment or the adapter plate.
- ➢ Only use original parts or accessories approved by Dehaco.
- ➢ Modifications that entail new hazards may require a new procedure for assessing conformity.
- ➢ Changes to the hydraulic attachment.

## 1.14 Environmental pollution, precautions

*NOTE*
**Hydraulic oil is permanently environmentally harmful. Escaped hydraulic oil will lead to groundwater and soil contamination. Organisms may die.**
- ➢ Collect any hydraulic oil which escapes to avoid environmental pollution. For minor volumes use an absorbing medium (in case of an emergency use soil). In case of major leakages contain the hydraulic oil. It must not drain off and penetrate the ground or enter the water table or water supplies.
- ➢ Collect contaminated absorbing medium or soil in a watertight box/container and close it tight.
- ➢ Contact an authorized waste management company.
- ➢ Dispose of all contaminated material in accordance with the applicable environmental regulations.

## 1.15 Guarantee terms and conditions

New IBEX breakers supplied by Dehaco B.V. have a guarantee period of 12 calendar months.

The IBEX breakers are guaranteed against material or production faults for the duration of the guarantee period (Manufacturers Guarantee), subject to the following terms and conditions.

The IBEX breaker must be installed and commissioned by Dehaco BV or an approved dealer. The guarantee period will commence from the date that the IBEX breaker was dispatched.

The faulty components that fall under the guarantee become the property of Dehaco B.V. These must be kept available for Dehaco BV and should be returned immediately, complete and unmodified.

A guarantee claim will only be considered when a written claim has been registered with Dehaco BV or an approved dealer. The damage or malfunction should be registered within 24 hours of the first occurrence.

All claims must contain the following information:
- ◊ The serial number.
- ◊ The type of carrier that the machine has been mounted on.
- ◊ A description of the damage or malfunction.
- ◊ Photos of the damage (where applicable), carrier and situation.
- ◊ A copy of the delivery receipt and invoice of the IBEX breaker.

After the fault has been determined Dehaco BV, or the approved dealer can give the owner permission to perform certain repairs. If these repairs fall under the conditions of the guarantee the required components will be delivered free of charge. If permission is not given to perform the repair yourself then the IBEX breaker should be returned to Dehaco BV or an approved dealer for repair or modifications. The repairs that will be undertaken will be performed free of charge. Whereas the transport and/or call-out costs to and from Dehaco BV or an approved dealer are not covered.

Dehaco B.V. is not liable for the consequential damage or losses caused by a defective IBEX breaker. This includes consequential excavator/carrier damage, consequential damage or losses due to stoppage of the excavator/ carrier or work).

**Excluded from the guarantee**
- ◊ Damage caused by improper installation or commissioning of the IBEX breaker, excavator/ carrier or the hydraulic system.
- ◊ Damage caused by improper or neglected maintenance and transport damage.
- ◊ Damage or failures that can be traced to faulty repairs/maintenance and/or performed by unauthorized third parties.
- ◊ Damage that can be traced to the incorrect execution of preventative maintenance such as regular lubrication.
- ◊ Damage or failure to components that are subject to wear such as chisels and bushes.
- ◊ Consequential damage caused by the failure to replace these wearing parts when required.

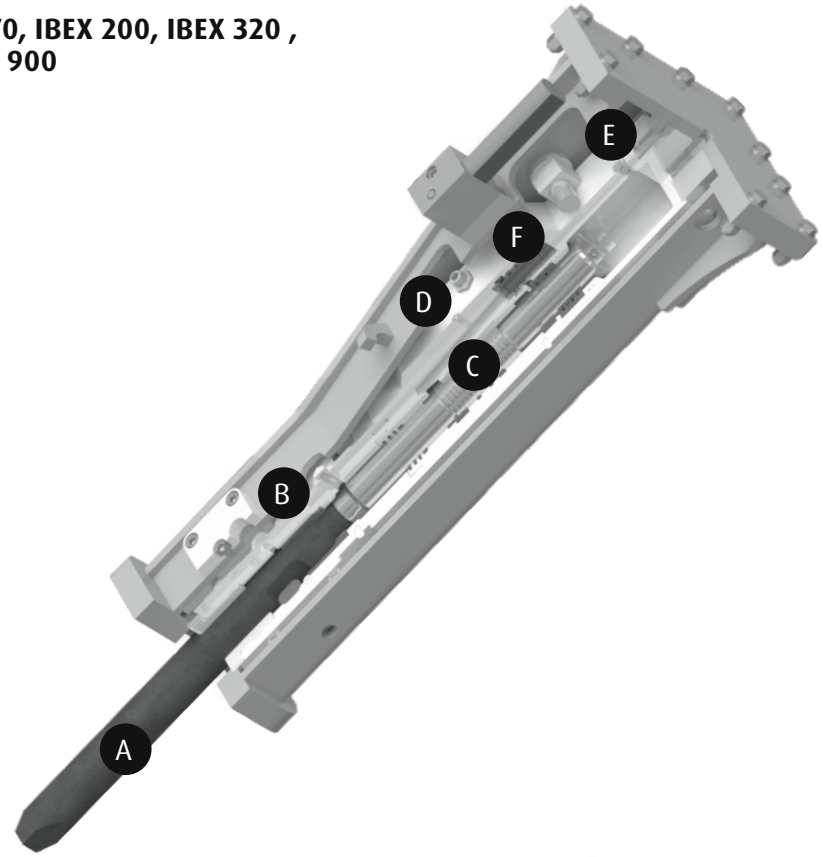
If damaged or failed components are replaced with non-original parts the entire guarantee expires.

# 2. OVERVIEW

## 2.1 Description of the IBEX breaker

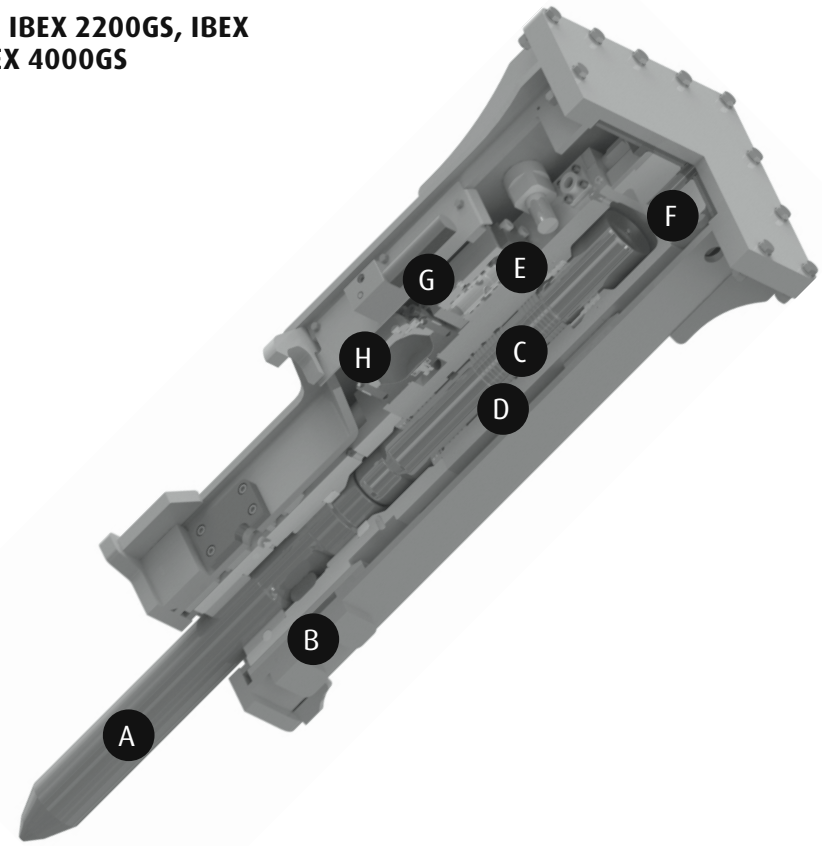
**IBEX 130, IBEX 135, IBEX 170, IBEX 200, IBEX 320 , IBEX 400, IBEX 600 en IBEX 900**

A) Tool
B) Front head
C) Piston
D) Cylinder
E) Back head
F) Valve




**IBEX 1200GS, IBEX 1800GS, IBEX 2200GS, IBEX 2800GS, IBEX 3200GS & IBEX 4000GS**

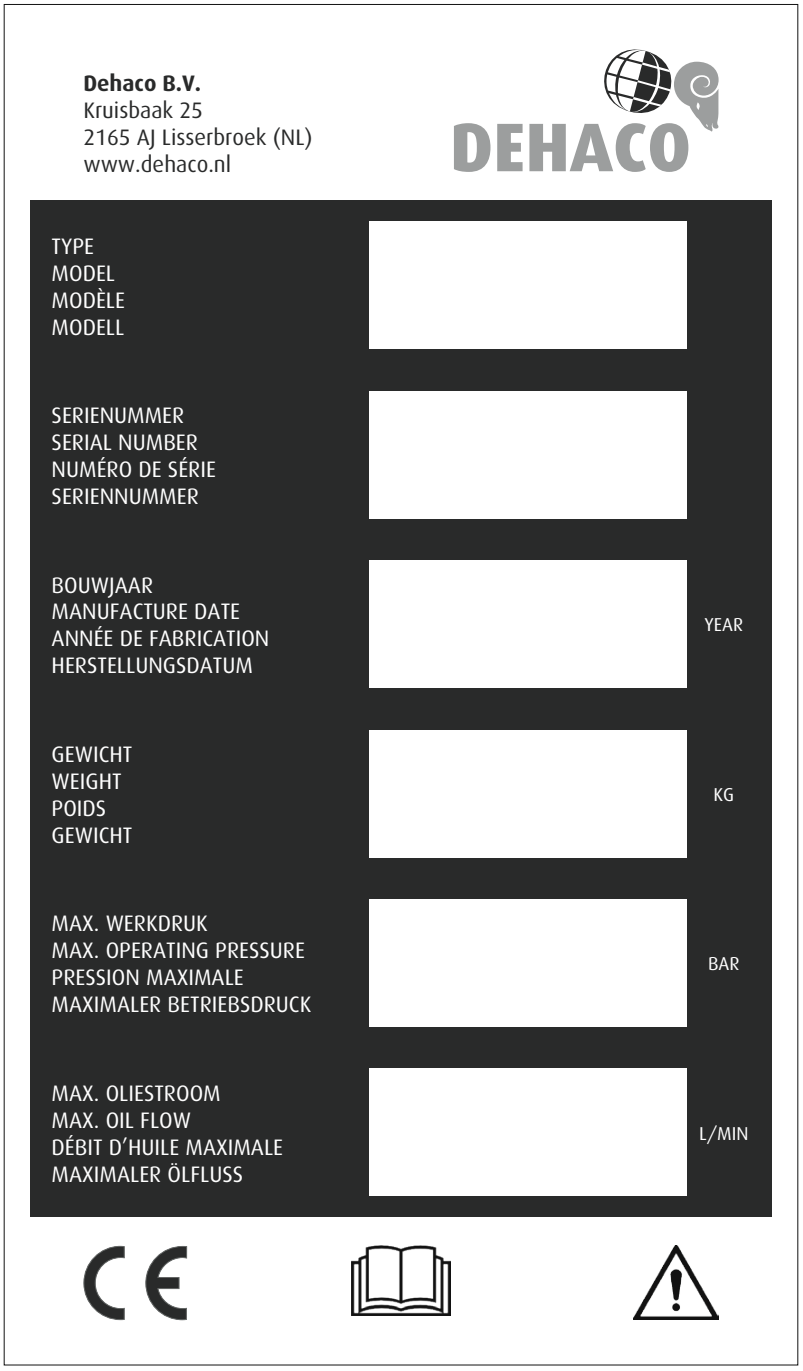
A) Tool
B) Front head
C) Piston
D) Cylinder
E) Valve
F) Back head
G) Valve block
H) Accumulator



## 2.2 Name plate

**⚠ WARNING!**
**The name plate contains important information about the IBEX breaker. A missing name plate can lead to misinterpretation of possible risks and cause personal hazards. The name plate must always be clearly legible.**

- ➢ Immediately replace a defective name plate.
- ➢ Use the spare parts list to order a new name plate.



## 2.3 Applications

The hydraulic breaker can be used for:
◊ demolition applications
◊ breaking applications
◊ trenching
◊ foundation work

## 2.4 Removing the packaging

1) Remove all the packaging material.
2) Dispose of it in accordance with the applicable provisions.
3) Check that the delivery is complete.
4) Check the delivery for visual damage.
5) If any defects are found, contact Dehaco or an authorized dealer as soon as possible.

## 2.5 Scope of delivery

The IBEX breaker is delivered complete with:
◊ IBEX breaker
◊ Operation and maintenance manual
◊ Spare parts list
◊ EC Declaration of Conformity
◊ Accessories (§2.6)

## 2.6 Accessories - standard and as ordered

Every IBEX breaker has a standard set of accessories. These are supplied alongside the breaker at delivery. These accessories ensure that the breaker can be prepared for use directly after delivery.

The standard accessories consist of:
◊ Hydraulic hoses – specific to model type
◊ Tool box – contents specific to model type (listed below)
◊ Gas charging kit
◊ Nut and bolt set for mounting adaptor plate
◊ 1 Grease cartridge
◊ Dust cap

Dependant on the delivery type it is possible that certain accessories are mounted on the breaker and are not delivered separately.

The contents of the tool box are specific to the model of IBEX breaker, these are listed in the table below:

# 3. TRANSPORT

**⚠ WARNING!**
**The IBEX breaker is heavy. A falling or tipping forklift and/or breaker can cause injury or damage to people or the surrounding area.**

- ➢ Transport the IBEX breaker using only machinery and accessories with the correct loading capacity.
- ➢ Ensure that nobody is within the working area or route when transporting the IBEX breaker.

## 3.1 Transport using an excavator or crane

The lifting eye that is integral to the IBEX breakers housing should be used for lifting or relocating. This should be performed using a chain or cable that is suitable for the particular breaker. The breaker should never be lifted using the tool or adapter plate.

## 3.2 Transport using a forklift

- ◊ Choose a forklift that is capable of making the lift.
- ◊ Ensure that the forks are adjusted to a suitable width before attempting to lift the breaker.
- ◊ Place the forks under the housing of the breaker so that the weight is evenly distributed.
- ◊ Carefully lift the breaker and once stable transport the breaker. It is possible that the breaker is much wider than the forklift. Take care to assess the surrounding area for obstacles before attempting to transport the breaker.
- ◊ Extra attention should be given when driving with a breaker. The material of the breaker is naturally slippery when on the fork, and there is a greater chance of it shifting whilst in motion.
- ◊ For extra information and tips read the operation manual of the forklift and pay attention to the lifting table included.

## 3.3 Transport using a van or truck

- ◊ It is advised, and in some regions mandatory to place the IBEX breaker on an antislip mat whilst on transport.
- ◊ The breaker should be securely fastened during transport. The use of lashing straps to fix the breaker in place so that it cannot shift is strongly advised.
- ◊ It is advised to fasten the breaker so that is cannot shift in any direction transport.
- ◊ The tool should always face the backside of the vehicle.

# 4. INSTALLATION

## 4.1 Tool

### 4.1.1 Selection of tools

Dehaco can offer a selection of tools to suit each application. The correct tool must be selected to ensure the best possible results and the longest lifetime.

Dehaco offers the next following tools:
- ◊ Blunt
- ◊ Chisel
- ◊ Cone
- ◊ Moil
- ◊ Asphalt

**⚠ ATTENTION!**
- ➢ **Use only official tools from Dehaco. If you do use other types of chisels the warranty expires.**
- ➢ **The chisel can be very hot, make sure that the tool is cooled with regularity.**
- ➢ **Use of imitation tools will expire the warranty period.**

### 4.1.2 Installation and removal of the tool

**Installation**

1) For IBEX types 130GS to 400GS remove the spring pin and tool pin using the tool included.
2) For IBEX types 600GS to 4000GS loosen cover plate bolts and remove the cover plate, tool pin buffers and tool pins.
3) Ensure that the new tool and the inside of the front head is clean.
4) Apply chisel grease to the contact surfaces of the tool, tool pins and bushes.
5) Insert the tool into the front head.
6) Insert the tool pin/s.
7) For IBEX types 130GS to 400GS use a hammer to replace the spring pin, ensuring that it completely supports the tool pin.
8) For IBEX types 600GS to 4000GS replace tool pin buffer and cover and fasten bolts.

**Removal**

1) If the breaker is still mounted onto the excavator place the breaker horizontally on level ground. Ensure that the excavator is turned off and pressure from the hydraulic system released.
2) For IBEX types 130GS to 400GS remove the spring pin and tool pin using the tool included.
3) For IBEX types 600GS to 4000GS loosen cover plate bolts and remove the cover plate, tool pin buffers and tool pins.
4) The tool should now be loose in the front head and can be removed. Great care should be take whilst doing this as a well lubricated chisel can slide out by itself.
5) If the chisel is no longer suitable for operation is should be cleaned and recycled in the proper manner.
6) If no new tool is to be installed the tool pin assembly should be reassembled.

## 4.2 Mounting the breaker on the excavator

*PLEASE NOTE*
- ➢ Make sure the breaker is mounted on an excavator with sufficient capacity.
- ➢ During installation, the excavator should only be operated from the cabin.
- ➢ Avoid contact with holes and mounting surfaces when mounting the breaker.
- ➢ Ensure that when the excavator is in motion, nobody is in the swing radius.
- ➢ Wear adequate personal protective equipment.

**Procedure for pin and bush system**

7) Place the breaker in a horizontal position on beams on a flat surface.
8) Remove any mounted excavator attachments.
9) Insert pin and mount stop ring.
10) Adjust the speed of the engine to low idle.
11) Move the bucket cylinder, align the front linkage holes with the mounting holes. Insert pin and mount the stop ring.
12) Remove the cover of the valve and plugs from the hoses. Connect hoses and valves.
13) Make sure the valves are in 'on' position.

For quick coupler or other systems, adhere to the operation guidelines of the manufacturer.

## 4.3 Setting the breaker

### 4.3.1 Set operating pressure

1) Stop the carrier engine.
2) Assemble the high pressure gauge to the high pressure measuring port. Start the engine.
3) Set the tool of the breaker e.g. on a thick steel plate or concrete.
4) Calibrate the excavator computer to produce the correct flow and pressure.
5) Read the average pressure from the high pressure gauge operating pressure.
6) Operating pressure is preadjusted at the factory and there should be no reason to adjust it.
7) Stop the carrier and remove the gauge.
8) Tighten the plug of the pressure measuring point.

**Relief valve**

1) The relief valve is a safety device which is used to protect the breaker when the pressure rises in the hydraulic circuit.
2) The operating pressure of the breaker determines the setting of the relief valve in the pressure line.
3) The relief valve setting should be acceptable as per the specifications of each model.

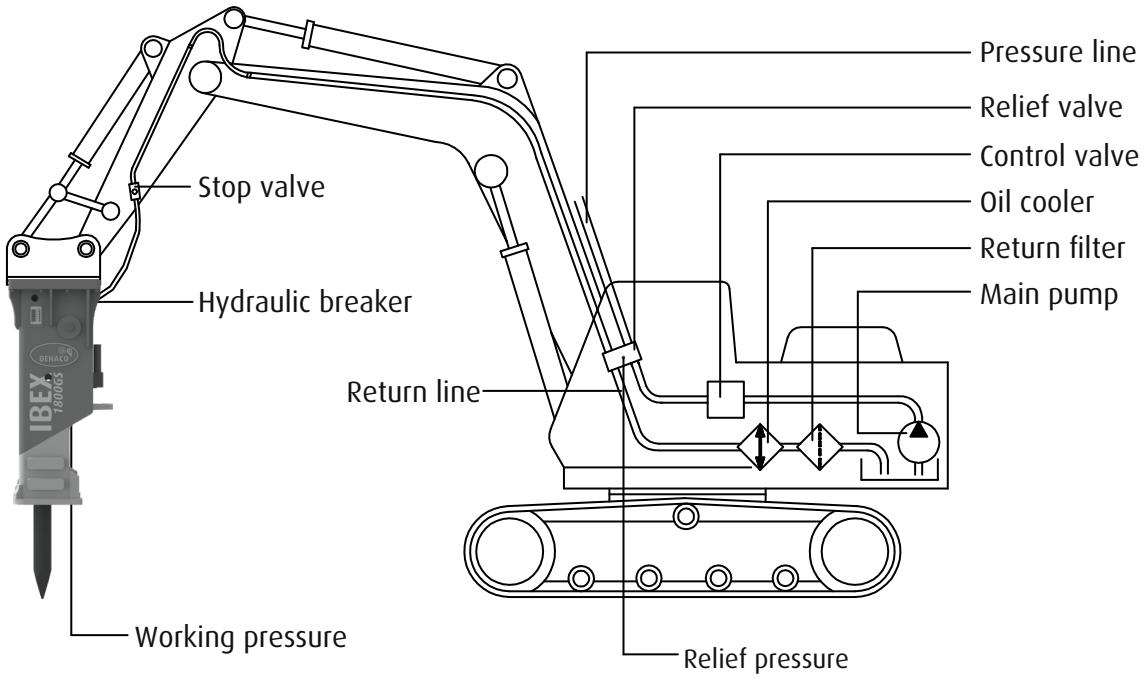
**We advise that this work is to be undertaken by a qualified technician from a Dehaco approved dealership.**

### 4.3.2 Setting of impact frequency (from IBEX 1200GS)

To set the frequency (bpm), there is a standard controller (set screw) installed in the IBEX hydraulic breakers. As a result, the most efficient way of breaking can be adjusted, depending on the working conditions.

- ◊ This control is located on the right side of the cylinder.
- ◊ Use a wrench and tighten the set screw to the end for a minimum number of beats per minute.
- ◊ By loosening the screw, frequency will increase.

After setting, tighten the nut properly.

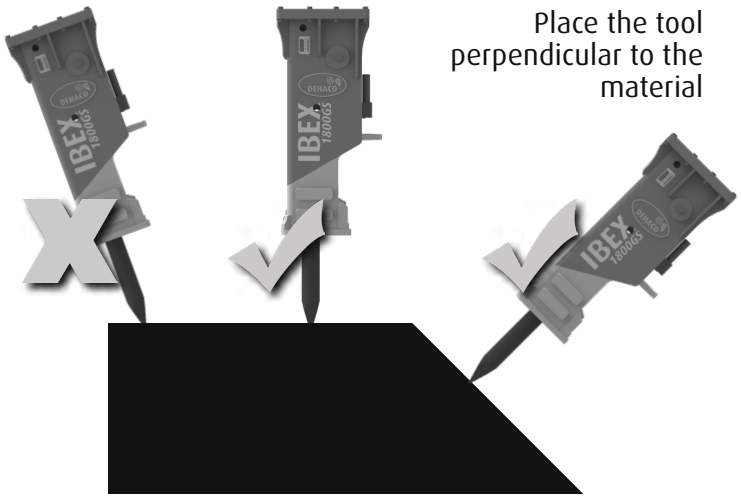


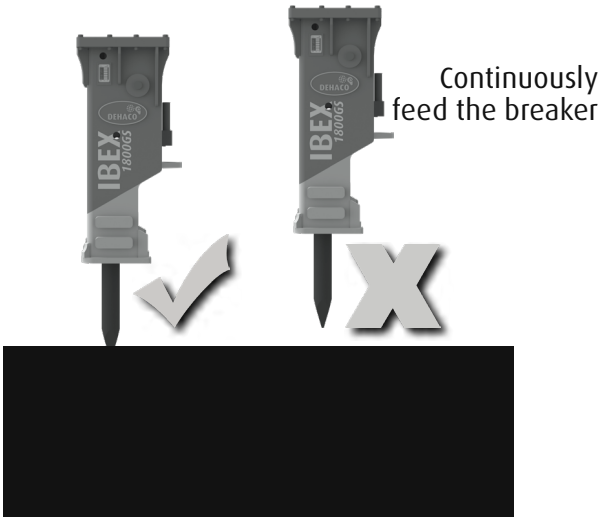
# 5. WORKING METHODS

**⚠ WARNING!**
- **Ensure the breaker is used only for suitable applications.**
- **Inspect the area of the project prior to operating the breaker.**
- **Pay particular attention to the safety of yourself and others.**

## 5.1 Correct working Methods

1) Prepare the excavator as for normal excavation work. It is strongly advised that the front screen, guard and door are closed to protect the operator.
   - Move the excavator to the required position.
   - Engage the parking brake if fitted.
   - Set drive to neutral .
   - Disengage the boom lock if fitted.
   - It is also strongly advised to wear hearing protection at this point. Anyone in the surrounding area should also wear protection to prevent hearing damage.
2) Adjust the excavator manually or using the on-board computer to produce the correct flow and pressure for the breaker.
3) Place the tool perpendicular to the material.
   - Avoid small irregularities in the material that will break easily causing idle strokes or an incorrect working angle.
4) Use the excavators boom to press the breaker firmly against the object. Ensuring that the tool remains perpendicular to the material
   - Never start the breaker until the correct force has been applied to the tool.
5) Start the breaker.
   - Stop the breaker immediately if someone enters the working area. Whilst working, this zone is much larger due to possible stone fragments in the air. A reasonable perimeter should be created during breaking.
6) Continuously feed the breaker.
   - As the tool penetrates the material the breaker must also be fed into the material. Failing to do so will cause idle strokes and increased wear upon the breaker.
   - A continuous feed at the correct force will increase the efficiency of the breaker.
7) Ensure the breaker remains perpendicular in relation to the material.
   - If the material moves or its surfaces breaks, the breaker should be repositioned immediately. Failing to do so will cause increased wear upon the breaker.
8) The breaker should not be worked continuously for more than 15 seconds.



### 5.1.1 Extra information for increasing efficiency

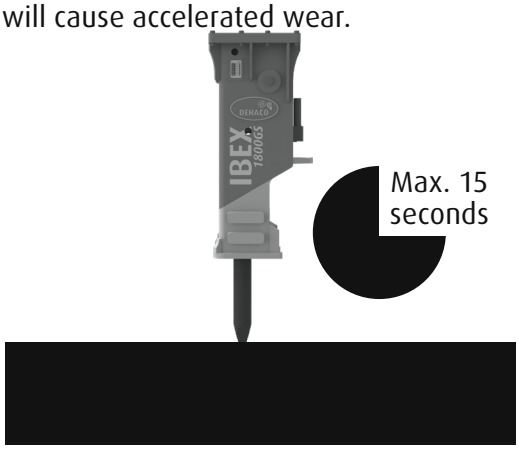
The breaker should not be worked continuously for more than 15 seconds. If more time is required for a single break, attempt to break smaller sections or change the angle of attack. It is generally more effective to break smaller pieces than larger ones.

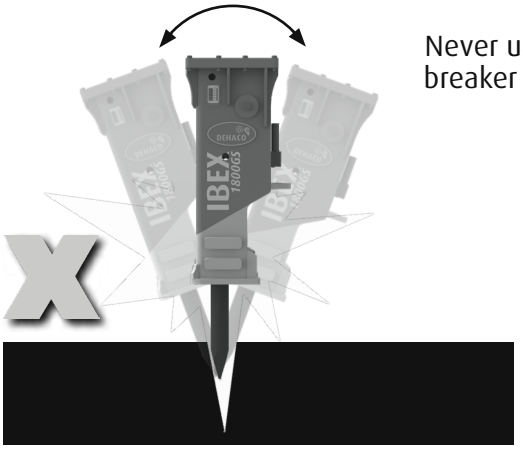
The breaker and its tool should never be used to pry partially broken material apart. This will undoubtedly cause the tool to break and cause accelerated wear upon its bushes. This should never be attempted.

Although prying with the breaker is strongly forbidden gently rocking the breaker during operation can increase productivity. Whilst rocking the breaker, air and dust that accumulates under the tool can be released. This dust can inhibit the full impact energy of the breaker.

This movement should be kept to a bare minimum. Excessive movement can cause huge stresses on the breaker and its tool. Just a few degrees of rotation (5°) should create enough space to release this dust.

If an attempt is made to break a large section it is possible the tool will be driven into the material without any breaking effect. This can cause huge spikes in the temperature of the chisel. Such high temperatures can reduce the hardness of the tool which will cause accelerated wear.




Never use the breaker to pry

## 5.2 Operating Temperature

The operating temperature range of the IBEX breaker is -20°C - 80°. When working outside of these conditions special measures must be taken to ensure the good working of the breaker.

### 5.2.1 Working in high ambient temperatures

The temperature of the hydraulic oil must be continuously monitored. If the excavator cannot maintain the temperature of the oil below 80 °C then an oil cooler should be installed, or the excavator should be inspected for the cause of the higher temperatures. Using the correct oil is also essential. Dependant on the climate and season the correct oil and viscosity should be selected.

### 5.2.2 Working in low ambient temperatures

At low ambient temperatures the excavator and attachment must be pre-heated prior to use.

In extreme conditions hot oil can cause catastrophic damage to a cold breaker. This could cause damage to the internal seals and cause the diaphragm to fail.

The hydraulic breaker will not perform optimally until it and the oil has reached an optimal temperature. Once a suitable temperature has been reached it will be maintained during operation. Ensure that if the breaker has stood still for a long period of time that the temperature is checked before use.

## 5.3 Other important points

- Pay careful attention to the noise that the breaker makes.
  - If the sound becomes thinner and the impact less efficient, the tool could be misaligned and/or that there is not enough downward force on the tool.
  - The tool should be realigned and placed firmly against the material.

- As a standard assembly the breaker must not be used underwater. For underwater applications an underwater kit must first be installed to breaker and excavator.
  - Working underwater without this set can cause catastrophic damage to the breaker.
  - Contact Dehaco or an approved Dehaco dealer for more information.

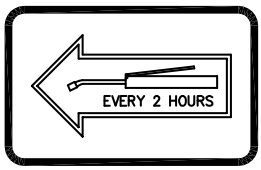
- The tool will remain very hot even after operation. Ensure that great care is taken to avoid contact with the tool whilst hot.

# 6. MAINTENANCE

## 6.1 Manual lubrication

**Grease interval**

1) Tool shank must be well lubricated before installation.
2) 5~10 strokes from grease gun to tool bushing and tool at regular intervals.
3) Adapt interval and amount of grease to decrease wearing of tool and good working conditions.
   - This should be done every 2 hours.




**Greasing point**
The greasing point on the hammer has been marked with this sticker.

*Insufficient greasing or improper grease may cause:*

- ◊ Abnormal wear of tool bushing and tool.
- ◊ Tool breakage.

**Technical data:**

- ◊ NLGI grade 2
- ◊ Synthetic oil base with aluminium complex soap
- ◊ Approximately 15% graphite copper solids to reduce metal to metal contact damage.
- ◊ Dropping point 260°C (500°F)
- ◊ Viscosity: 15 cSt
- ◊ Temperature range: -30°C ~ 230°C (-20°F ~ 450°F)

## 6.2 Inspection and maintenance schedule

- ➢ During underwater operations, inspection and maintenance should be performed more regularly.
- ➢ It is strongly advised to use only original IBEX parts when maintaining the IBEX breaker.
- ➢ Contact Dehaco or an approved Dehaco dealer for more inspection and maintenance information.

| During Operation | Daily | Weekly | Monthly | Yearly |
|---|---|---|---|---|
| Lubricate tool using correct grease every 2 working hours | Check hydraulic connections for leakages | Check that the tool and retainer pins are securely fastened | Inspect tool and bushes for wear | Make a complete inspection of the breaker and replace parts where necessary |
| 5-10 strokes of lubricant for IBEX 130 - IBEX 900 | Inspect through bolts | Inspect tool for abnormal wear or damage | Inspect tool shank and tool pins for damage or burrs | Inspect the seals and accumulator diaphragm (IBEX 1200 – IBEX 4000) for leakages |
| 10-15 strokes of lubricant for IBEX 1200 - IBEX 4000 | Inspect maximum temperature of hydraulic oil after continuous operation | | Measure back head and accumulator pressure | Check the tension of the through bolts |
| If automatic lubricating pump is fitted cartridge should be checked and replaced where necessary | Check for damage on the hoses, either from rubbing or contact with another object | | Inspect adapter plate and bolts for wear and damage | Check for clearance in the wear plates, guide bushes (IBEX 1200 – IBEX 4000) and top buffer |
| Lubricating pump should use approximately 1 cartridge per day for IBEX 320 - IBEX 900 2 - 3 cartridges per day for IBEX 1200 - IBEX 4000 | | | | Inspect the housing for damage, cracks and fatigue |

## 6.3 Hydraulic oil

**⚠ ATTENTION!**
- **When the breaker is used continuously, the temperature of the hydraulic oil will normalize at a certain level. At this temperature, the viscosity of the hydraulic oil should be 20~40 cst (2.90~5.35°E)**
- **The breaker may not be started if the viscosity of the hydraulic oil is above 1000 cst (131°E) or operated when the viscosity of the hydraulic oil is below 15 cst (2.35°E).**

**Problems when the hydraulic oil is too thick:**
- ◊ Difficult start up.
- ◊ Stiff operation.
- ◊ Breaker strikes irregularly and slowly.
- ◊ Danger of cavitation in the pumps and hydraulic breaker.
- ◊ Sticky valves.
- ◊ Filter bypass, impurities in the oil will not be removed.

**Problems when the hydraulic oil is too thin:**
- ◊ Efficiency losses (internal leaks).
- ◊ Damage to seals.
- ◊ Accelerated wearing of parts, because of decreased lubrication efficiency.

**Special oils**
- ◊ Is some cases special oils (e.g. biological oils and non-inflammable oil) can be used, please observe following specifications when considering the use of special oil:
  - The viscosity range in the special oil must be in the given range of 15~1,000cSt (2.35~131°E).

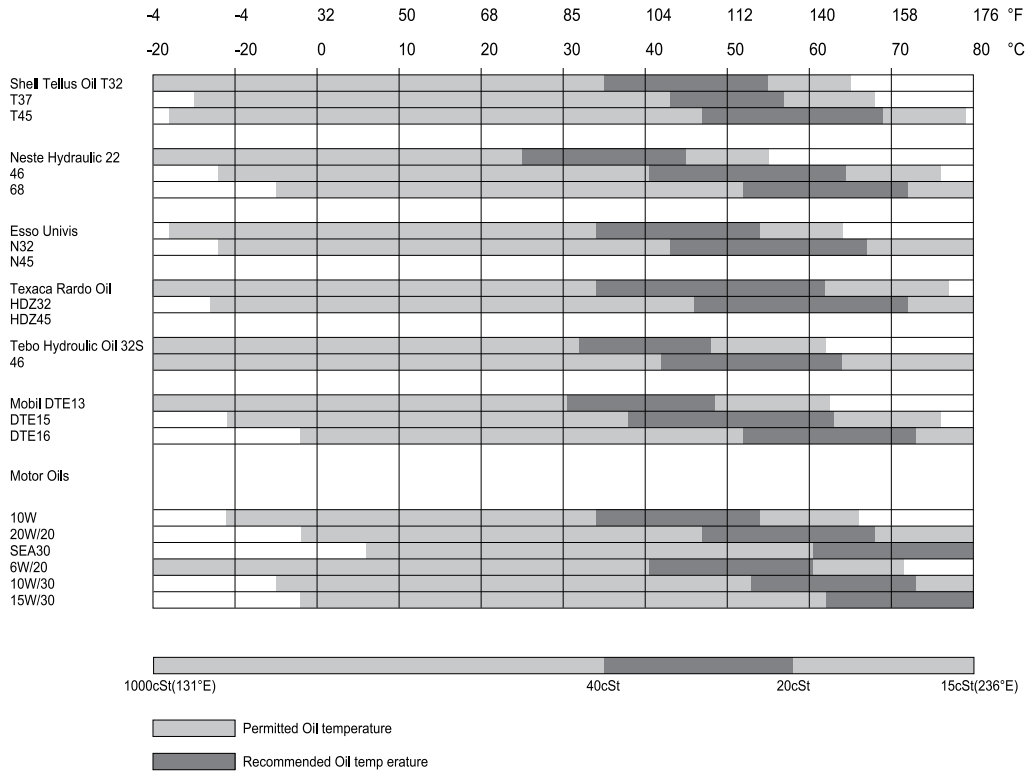
**Cleanliness of hydraulic oil**
1) The hydraulic oil filter of the excavator will clean the oil flowing through the breaker.
2) The purpose of the oil filter is to remove impurities from the hydraulic oil (air and water are also impurities in oil).
3) Impurities also cause the oil to overheat and deteriorate.

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

**The auxiliary hydraulic cooler can be installed:**
- ◊ In front of the radiator, in which case an additional fan is not required, ie. maximum rise of the cooling air is 5°C (40°F).
- ◊ Any other suitable place, using a fan either hydraulically or electrically driven.

**Damage caused by hydraulic oil contamination**
1) The working life of the pumps is significantly shortened.
   - Premature wear of parts.
   - Cavitation.
2) Valves do not function properly.
   - Spools bind.
   - Premature wear of parts.
   - Blocking of small holes.
3) Wear of cylinders and gaskets
4) Reduced breaker efficieny.
   - Premature wear of moving parts and seals.
   - Danger of the piston seizing.
   - Oil overheats.
5) Shorten working life and reduced efficiency of hydraulic oil.
   - Oil overheats.
   - Oil quality deterioration.
   - Electrochemical changes in hydraulic oil.

## Recommended oil, temperature, viscosity



## 6.4 Nitrogen gas in the backhead

Dehaco or an approved Dehaco dealer will ensure that the hydraulic breaker will be ready to use at delivery. The backhead therefore will be charged with nitrogen. For inspection or maintenance purposes it is required to monitor and refill the nitrogen.

The breaker will be supplied with a gas charging kit as standard. This includes a charging block, extension, 25 bar pressure gauge (IBEX 70GS – IBEX 4000GS) and 100 bar pressure gauge (IBEX 1200GS – IBEX 4000GS). By following the steps below it is possible to safely and accurately inspect and fill the backhead with nitrogen.

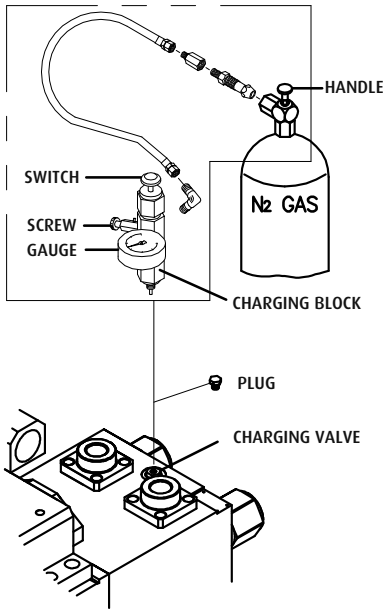
Procedure for filling backhead

1) Unscrew the gas plug on the backhead using a 5 mm Allen key.
2) Attach the charging kit to the charging valve on the backhead (it is possible that an extension is required to mount the kit).
3) Ensure that the pusher is in the up position.
4) Close the screw valve.
5) Attach the gas cylinder.
6) Charge the backhead to the pressure indicated in column A. This is 4 bar higher than the required pressure.
7) Open the cylinder and wait for the pressure to equalise between the regulator and the backhead, once equalised close the cylinder.
8) Open the screw valve whilst the pusher is in the up position to release the pressure within the charging kit and hose, then remove the hose from the charging kit.
9) Screw the stop back onto the charging kit.
10) Press the pusher in to measure the nitrogen in the backhead.
11) Whilst holding the pusher in the down position adjust the pressure to the value indicated in column B using the screw valve.
12) Release the pusher and the backhead should be charged to the desired pressure.
13) If the pressure is lower than desired then repeat procedure from step 6.
14) Open the screw valve whilst the pusher is in the up position to release the pressure within the gauge and dismount the charging kit.
15) Tighten the gas plug.

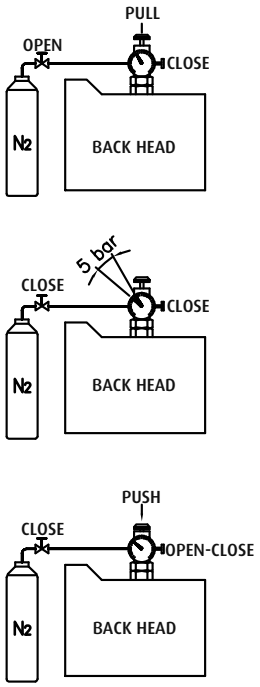
### 6.4.2 Technical data nitrogen gas backhead

| Model | A | B |
|---|---|---|
| **IBEX 130** | 16 bar (232 psi) | 12 bar (174 psi) |
| **IBEX 135** | 12 bar (174 psi) | 8 bar (116 psi) |
| **IBEX 170** | 20 bar (290 psi) | 16 bar (232 psi) |
| **IBEX 200** | 12 bar (174 psi) | 8 bar (116 psi) |
| **IBEX 320** | 20 bar (290 psi) | 16 bar (232 psi) |
| **IBEX 400** | 20 bar (290 psi) | 16 bar (232 psi) |
| **IBEX 600** | 20 bar (290 psi) | 16 bar (232 psi) |
| **IBEX 900** | 20 bar (290 psi) | 16 bar (232 psi) |
| **IBEX 1200** | 10 bar (145 psi) | 6 bar (87 psi) |
| **IBEX 1800** | 10 bar (145 psi) | 6 bar (87 psi) |
| **IBEX 2200** | 10 bar (145 psi) | 6 bar (87 psi) |
| **IBEX 2800** | 13 bar (188 psi) | 9 bar (130 psi) |
| **IBEX 3200** | 20 bar (290 psi) | 16 bar (232 psi) |
| **IBEX 4000** | 20 bar (290 psi) | 16 bar (232 psi) |

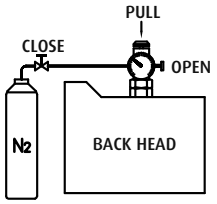
GAS CHARGING ASSEMBLY:




INSTRUCTIONS FILLING BACKHEAD:




REMOVE CHARGING KIT:



## 6.5 Nitrogen gas in the accumulator

*Note: The information listed below only applies to the IBEX 1200GS - IBEX 4000GS.*

**⚠ ATTENTION!**
- The accumulator housing and lid must be securely fastened before filling.

**⚠ WARNING!**
- Never use other than $N_2$ gas for charging the accumulator.

**⚠ ATTENTION!**
- Always use the correct valve for charging the accumulator.

### 6.5.1 Inspection of the nitrogen pressure in accumulator

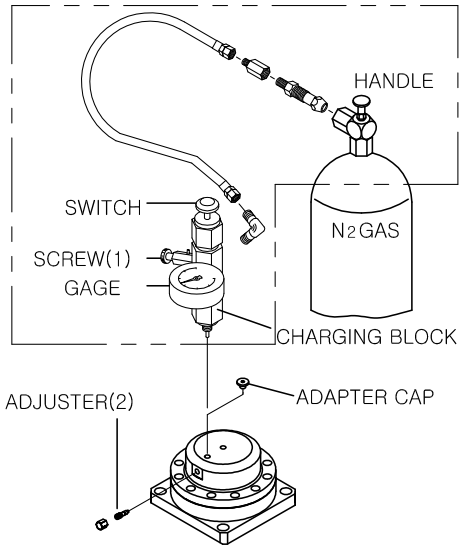
1) Remove both the gas plug and adjuster cap from the accumulator.
2) Attach the charging kit to the accumulator and ensure that the screw valve and stop are tight.
3) Using an Allen key turn the adjuster anticlockwise slowly until the pressure gauge has equalised.
4) Tighten the adjuster again by turning it clockwise and release the pressure with the gauge by opening the screw valve.
5) Remove the charging kit and replace the plug and cap. Take care to ensure that the o-rings are still in position.

### 6.5.2 Filling the accumulator with nitrogen

1. Remove both the gas plug and adjuster cap from the accumulator.
2. Attach the charging kit to the accumulator and ensure that the screw valve is tight.
3. Attach the gas cylinder to the charging kit.
4. Turn the adjuster anticlockwise and slowly open the gas cylinder and charge the accumulator to the desired pressure.
5. When the accumulator is at the correct pressure tighten the adjuster and close the gas cylinder.
6. Release the remaining pressure within the charging set using the screw valve and remove the charging kit.
7. Replace the plug and cap. Take care to ensure that the O-rings are still in position.

### 6.5.3 Technical data accumulator pressure

| Model | Accumulator pressure |
|---|---|
| **IBEX 1200GS** | 60 bar (870 psi) |
| **IBEX 1800GS** | 60 bar (870 psi) |
| **IBEX 2200GS** | 60 bar (870 psi) |
| **IBEX 2800GS** | 60 bar (870 psi) |
| **IBEX 3200GS** | 60 bar (870 psi) |
| **IBEX 4000GS** | 60 bar (870 psi) |



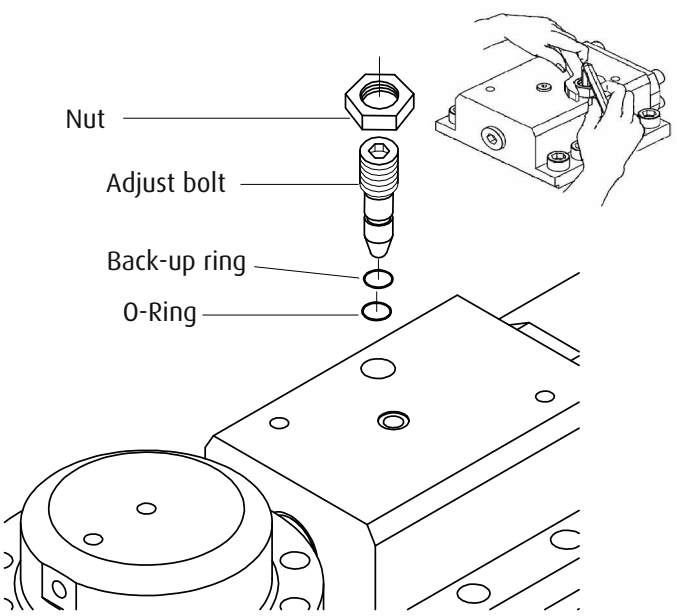
## 6.6 Regulating oil flow rates of valve adjuster

Setting initial status of adjust bolts:

1) Loosen de adjust nut to enable the valve adjuster to be turned.
2) Turn the adjust bolt clockwise, and tighten it securely.
3) Turn the adjust bolt 2.5 turns counter clockwise.
4) After finishing the adjustment, tighten the adjust nut securely.

*Notes:*

◊ The adjustment of this valve adjuster is needed only when the oil flow and the operating pressure are less than the required specification value. Otherwise, do not adjust.
◊ The valve adjuster is set at the position of 2.5 turns counter clockwise turning when first released to the customer from factory.
◊ Do not turn the valve adjuster more than 4 times counter clockwise.




## 6.7 Wear parts

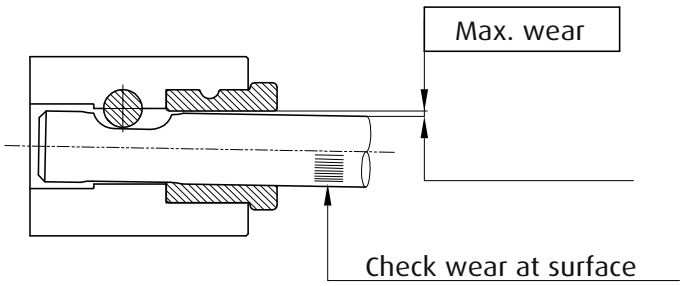
1) When damaged or worn it is highly recommended to replace the following items. These should be inspected regularly and replaced as soon as possible.
   - Tool
   - Tool bushing
   - Tool pins
   - Retainer pin, bushing pin
   - Accumulator and steering valve bolts
   - Hydraulic seals
   - Through bolts
   - Hydraulic hoses
   - Grease nipples/pump

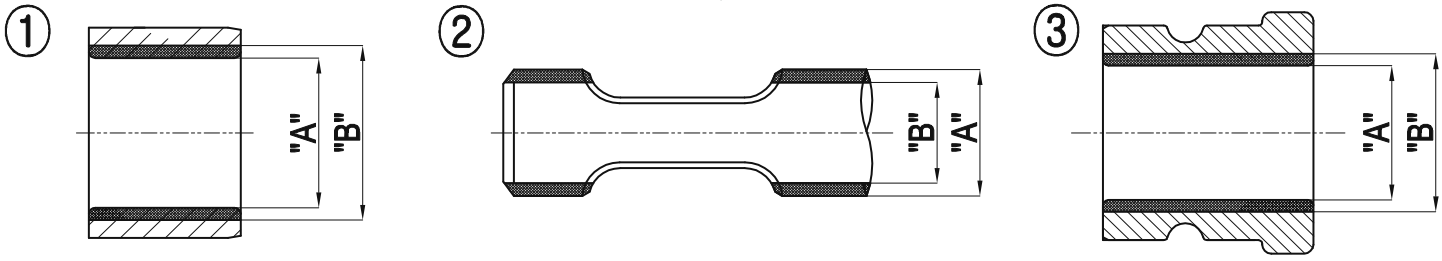
2) We recommend that the user stocks these wearing parts to minimise downtime.
3) Replace hydraulic seals every 600 hours of actual operation.
4) Tool pin
   - When each tool pin is excessively deformed, it is difficult to remove the tool. Therefore it is advised to rotate the tool pin (IBEX 600 – IBEX 4000) every 100 to 150 hours of operation to ensure an even wear. Only genuine tool pins should be used.
   - When replacing wearing parts check each for wear, breakage and so on. This can cause increased wear to other parts within the breaker.

## 6.8 Wear limits for parts

### 6.8.1 Wear limit for tool and tool bushing

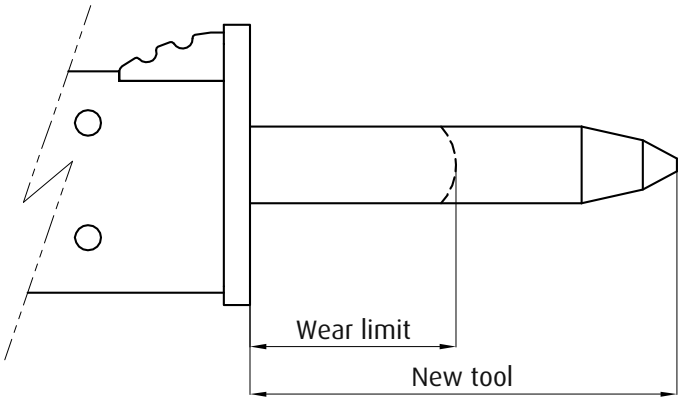
1) The normal clearance between the tool and its bushing varies per model. Using the table below the exact figures can be seen for every model.
2) Regular inspections are advised of both tool and tool bushes. If the tool or either of these bushes have reached the wear limit they should be immediately replaced to prevent unnecessary damage occurring to other parts of the breaker.




| | Wear limit | Upper bushing (1) | | Tool (2) | | Tool bushing (3) | |
|---|---|---|---|---|---|---|---|
| | | New | Reject | New | Reject | New | Reject |
| **IBEX 130GS** | 4 mm | - | - | 44,5 mm | 42,5 mm | 44,5 mm | 46,5 mm |
| **IBEX 135GS** | 4 mm | - | - | 40 mm | 38 mm | 40 mm | 42 mm |
| **IBEX 170GS** | 4 mm | - | - | 53 mm | 51 mm | 53 mm | 55 mm |
| **IBEX 200GS** | 4 mm | - | - | 59,5 mm | 57,5 mm | 59,5 mm | 61,5 mm |
| **IBEX 320GS** | 4 mm | 68 mm | 70 mm | 68 mm | 66 mm | 70 mm | 68 mm |
| **IBEX 400GS** | 4 mm | 75 mm | 77 mm | 74,5 mm | 72,5 mm | 74,5 mm | 76,5 mm |
| **IBEX 600GS** | 4 mm | 85 mm | 88 mm | 85 mm | 82 mm | 85 mm | 88 mm |
| **IBEX 900GS** | 5 mm | 100 mm | 102,5 mm | 100 mm | 96,5 mm | 100 mm | 102,5 mm |
| **IBEX 1200GS** | 6 mm | 120 mm | 123 mm | 120 mm | 117 mm | 120 mm | 123 mm |
| **IBEX 1800GS** | 6 mm | 135 mm | 140 mm | 135 mm | 133 mm | 135 mm | 140 mm |
| **IBEX 2200GS** | 6 mm | 150 mm | 153 mm | 150 mm | 147 mm | 150 mm | 156 mm |
| **IBEX 2800GS** | 6 mm | 153 mm | 156 mm | 153 mm | 150 mm | 153 mm | 156 mm |
| **IBEX 3200GS** | 6 mm | 160 mm | 166 mm | 160 mm | 157 mm | 160 mm | 166 mm |
| **IBEX 4000GS** | 6 mm | 180 mm | 183 mm | 180 mm | 177 mm | 180 mm | 183 mm |

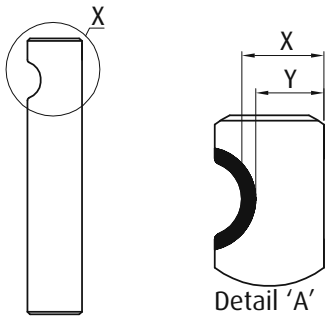
## 6.8.2 Wear limit tool




| | New tool | Wear limit |
|---|---|---|
| **IBEX 70GS** | 222 mm | 172 mm |
| **IBEX 130GS** | 188 mm | 150 mm |
| **IBEX 135GS** | 343 mm | 230 mm |
| **IBEX 170GS** | 275 mm | 210 mm |
| **IBEX 200GS** | 310 mm | 210 mm |
| **IBEX 320GS** | 310 mm | 210 mm |
| **IBEX 400GS** | 416 mm | 250 mm |
| **IBEX 600GS** | 542 mm | 350 mm |
| **IBEX 900GS** | 557 mm | 350 mm |
| **IBEX 1200GS** | 707 mm | 400 mm |
| **IBEX 1800GS** | 750 mm | 400 mm |
| **IBEX 2200GS** | 800 mm | 450 mm |
| **IBEX 2800GS** | 735 mm | 450 mm |
| **IBEX 3200GS** | 785 mm | 500 mm |

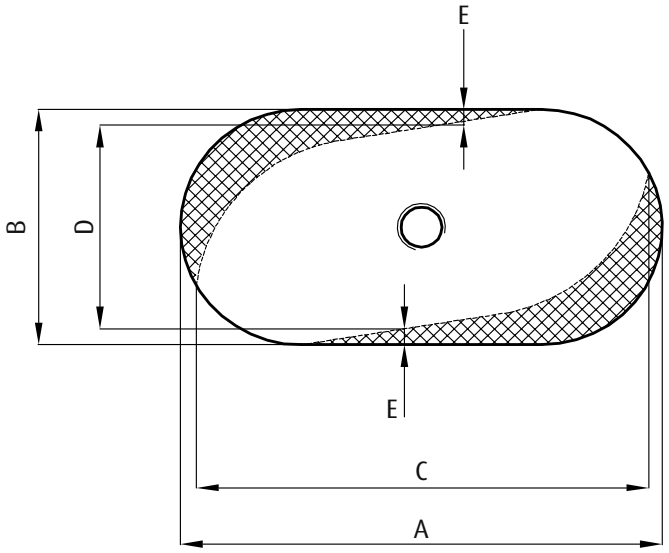
## 6.8.3 Wear limit tool pin

### IBEX 130GS t/m IBEX 400GS



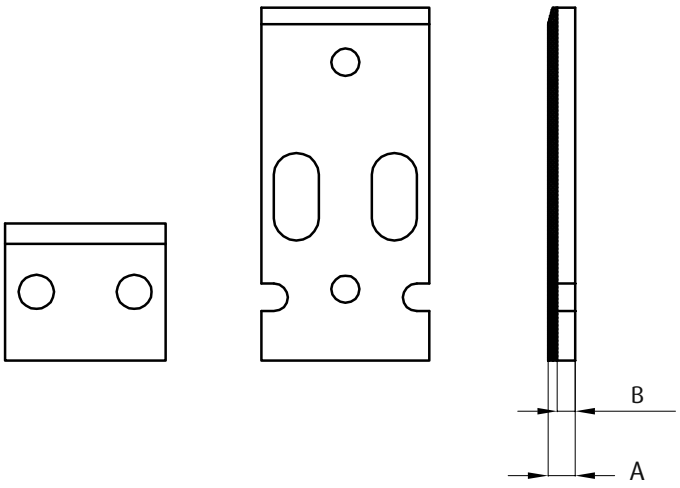

| | X | Y |
|---|---|---|
| **IBEX 70** | 22,5 mm | 18,5 mm |
| **IBEX 130** | 25,5 mm | 21,5 mm |
| **IBEX 135** | 21,5 mm | 19,5 mm |
| **IBEX 170** | 17 mm | 13 mm |
| **IBEX 200** | 30 mm | 26 mm |
| **IBEX 320** | 20 mm | 16 mm |
| **IBEX 400** | 22,5 mm | 18,5 mm |

### IBEX 600GS t/m IBEX 4000GS




| | A | B | C | D | E |
|---|---|---|---|---|---|
| **IBEX 600GS** | 54 | 30 | 51 | 37 | 1.5 |
| **IBEX 900GS** | 60 | 32 | 57 | 29 | 1.5 |
| **IBEX 1200GS** | 72 | 40 | 69 | 37 | 1.5 |
| **IBEX 1800GS** | 80 | 40 | 77 | 37 | 1.5 |
| **IBEX 2200GS** | 90 | 45 | 87 | 42 | 1.5 |
| **IBEX 2800GS** | 100 | 50 | 97 | 47 | 1.5 |
| **IBEX 3200GS** | 100 | 50 | 97 | 47 | 1.5 |
| **IBEX 4000GS** | 105 | 50 | 102 | 47 | 1.5 |

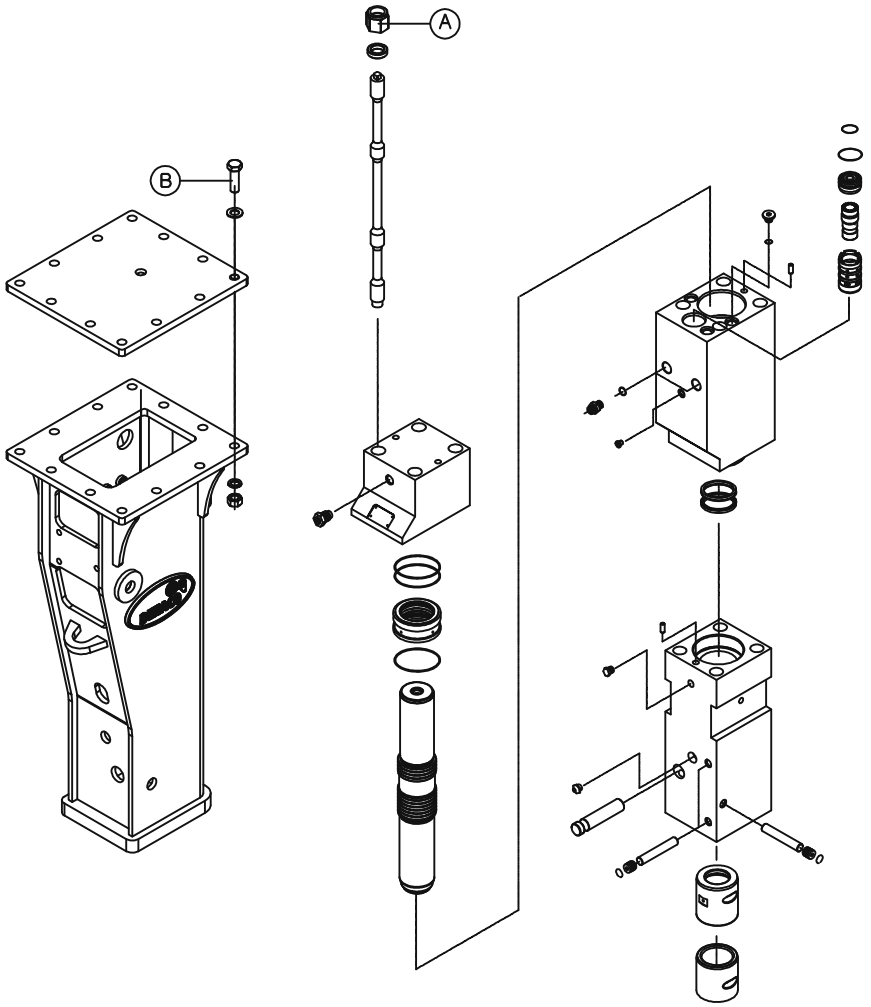
### 6.8.4 Wear limit wearing plate




| | New wearing plate (A) | Wear limit (B) |
|---|---|---|
| **IBEX 70GS** | 10 | 8 |
| **IBEX 130GS** | 10 | 8 |
| **IBEX 135GS** | 10 | 8 |
| **IBEX 170GS** | 10 | 8 |
| **IBEX 200GS** | 10 | 8 |
| **IBEX 320GS** | 12 | 10 |
| **IBEX 400GS** | 12 | 10 |
| **IBEX 600GS** | 16 | 14 |
| **IBEX 900GS** | 16 | 14 |
| **IBEX 1200GS** | 20 | 18 |
| **IBEX 1800GS** | 20 | 18 |
| **IBEX 2200GS** | 20 | 18 |
| **IBEX 2800GS** | 20 | 18 |
| **IBEX 3200GS** | 20 | 18 |
| **IBEX 4000GS** | 20 | 18 |

## 6.9 Torques IBEX 130GS t/m 900GS

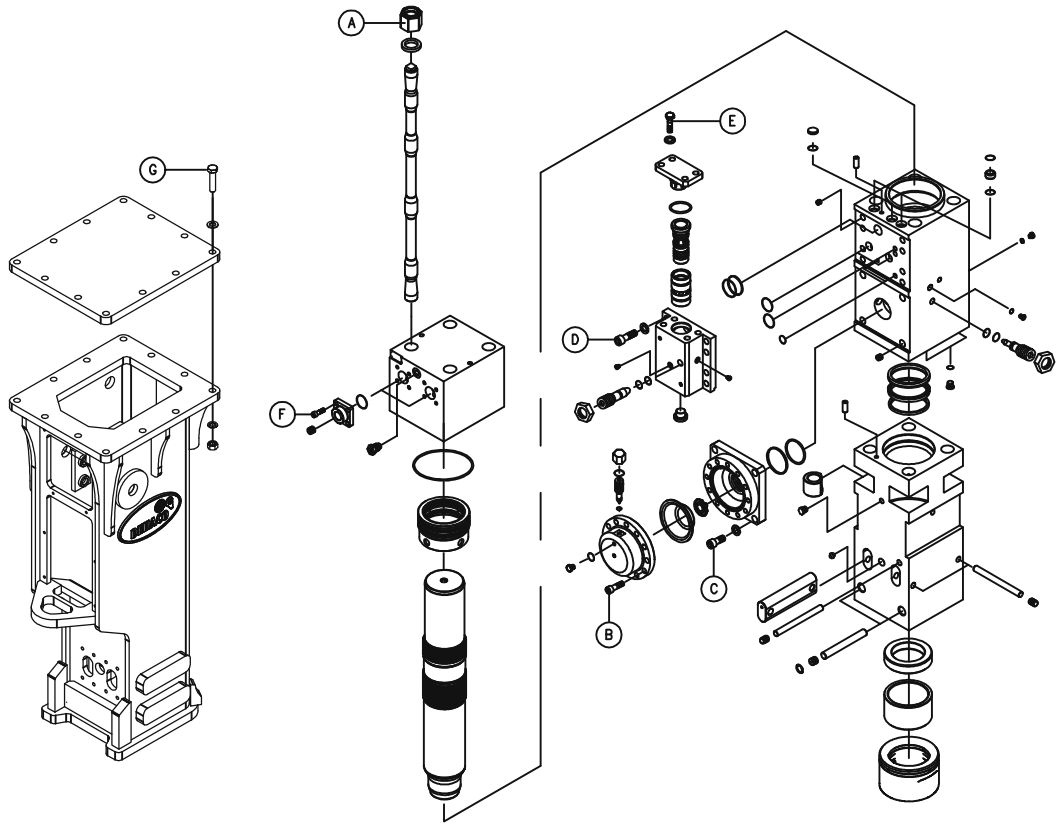
*Note: The bolts used to mount the adapter plate must be rated to a quality of 8.8 or higher.*




| | A) Through bolt nut<br>N.m / lb. f-ft | B) Top cover bolt<br>N.m / lb. f-ft |
|---|---|---|
| **IBEX 70** | 90 / 67 | 90 / 67 |
| **IBEX 130** | 350 / 258 | 350 / 258 |
| **IBEX 135** | 300 / 258 | 300 / 221 |
| **IBEX 170** | 350 / 258 | 350 / 258 |
| **IBEX 200** | 350 / 258 | 350 / 258 |
| **IBEX 320** | 600 / 443 | 600 / 443 |
| **IBEX 400** | 900 / 664 | 900 / 664 |
| **IBEX 600** | 1500 / 1106 | 1500 / 1106 |
| **IBEX 900** | 1700 / 1254 | 1700 / 1254 |

## 6.10 Torques IBEX 1200GS t/m 4000GS

*Note: The bolts used to mount the adapter plate must be rated to a quality of 8.8 or higher.*




| | A) Through bolt nut N.m / lb. f-ft | B) Accumulator cover bolt N.m / lb. f-ft | C) Accumulator bottom bolt N.m / kg. f-m / lb. f-ft | D) Valve block bolt N.m / kg. f-m / lb. f-ft | E) Valve block cover bolt N.m / kg. f-m / lb. f-ft | F) Flange adapter bolt N.m / kg. f-m / lb. f-ft | G) Top cover bolt N.m / kg. f-m / lb. f-ft |
|---|---|---|---|---|---|---|---|
| **IBEX 1200GS** | 1700 / 1254 | 1700 / 1254 | 950 / 96 / 700 # 4 | 500 / 50 / 368 # 6 | 200 / 20 / 147 # 4 | 200 / 20 / 147 # 8 | 650 / 66 / 479 # 12 |
| **IBEX 1800GS** | 3000 / 2213 | 3000 / 2213 | 950 / 96 / 700 # 4 | 500 / 50 / 368 # 8 | 200 / 20 / 147 # 4 | 200 / 20 / 147 # 8 | 650 / 66 / 479 # 12 |
| **IBEX 2200GS** | 3500 / 2481 | 3500 / 2581 | 950 / 96 / 700 # 4 | 500 / 50 / 368 # 8 | 500 / 50 / 368 # 8 | 200 / 20 / 147 # 8 | 2300 / 235 / 1696 # 12 |
| **IBEX 2800GS** | 4250 / 3135 | 4250 / 3135 | 950 / 66 / 479 # 4 | 500 / 50 / 368 # 8 | 500 / 50 / 368 # 8 | 200 / 20 / 147 # 8 | 2300 / 234 / 1696 # 14 |
| **IBEX 3200GS** | 4250 / 3135 | 4250 / 3135 | 950 / 66 / 479 # 4 | 500 / 50 / 368 # 8 | 500 / 50 / 368 # 8 | 200 / 20 / 147 # 8 | 2300 / 234 / 1696 # 12 |
| **IBEX 4000GS** | 5000 / 3688 | 5000 / 3688 | 2000 / 203 / 1475 # 4 | 800 / 81 / 590 # 8 | 800 / 81 / 590 # 8 | 200 / 20 / 147 # 8 | 2300 / 234 / 1696 # 14 |

# 7. STORAGE

It may happen that the breaker for a shorter or a longer period is not in use. In that case, follow these guidelines.

## 7.1 Dismounting the breaker

Unless otherwise specified, the breaker must be disassembled in the reverse order of assembly.

**⚠ ATTENTION!**

➢ Make sure the pressure is off the hydraulic system before disassembly.

**⚠ WARNING!**

➢ Turn off the excavator completely before you do the following steps.

1) Position the breaker horizontally on the floor and remove the tool.
2) Close breaker inlet and outlet lines. If quick couples are used, disconnection automatically closes hammer lines.
3) Disconnect hoses, plug the hoses and the breaker inlet and outlet ports.
4) Remove bucket pins and other parts, or release quick hitch if fitted.
5) The carrier can be moved aside.

For quick coupler or other systems, adhere to the operataion guidelines of the manufacturer.

### 7.1.2 Short term storage

Lay the breaker flat on the floor and follow the instructions above (7.1).

### 7.1.3 Long term storage

Observe the following points to store the breaker in a way so that the vital parts of the attachment are protected against rust and the machine is ready to use whenever necessary.

1) Make sure the storage area is dry.
2) Remove the tool.
3) The lower end of the piston, tool and bushing must be well protected with grease.
4) Connections must be sealed with clean plugs to prevent oil leakage and dirt getting into couplings.
5) Make sure the breaker can not fall.

# 8. TROUBLE SHOOTING GUIDE

## 8.1 Oil leakage

| Cause | Required action |
|---|---|
| Oil leakage between the tool and tool bushing. | Replace damaged seals. |
| Oil leaking at the surface of the breaker. | Retighten hydraulic connections. |
| Oil leaks between the cylinder and the backhead. | Tighten specified torque. |

## 8.2 No impact energy

| Cause | Required action |
|---|---|
| Oil temperature is too low. | Oil temperature must reach to min. 30°C. |
| Valve does not operate properly. | Check breaker operating button in the cabin of the excavator. |
| Pressure in backhead and setting pressure of relief valve is low. | Check pressure of nitrogen gas and relief valve. |
| Poor performance of hydraulic pump. | Contact excavator manufacturer. |

## 8.3 Irregular blows after normal start

| Cause | Required action |
|---|---|
| Oil temperature increased due to lack of hydraulic oil. | Replace hydraulic oil. |
| Pressure in back head too high. | Check gas pressure. |
| Relief valve is set too low. | Check pressure of relief valve. |
| Not enough down pressure on tool. | Apply enough down pressure with arm or boom of excavator. |
| The clearance between the tool and tool bushing is too large. | Check the clearance between tool and tool bushing. |
| Wear on top of tool. | Disassemble tool to check. |
| Poor performance of hydraulic pump and back pressure is too high. | Contact excavator manufacturer. |
| Foreign material in side valve. | Disassemble and clean. |
| Seizure of piston and cylinder. | Overhaul and check. |

# 9. OPTIONS LIST

| | IBEX 130GS | IBEX 135GS | IBEX 170GS | IBEX 200GS | IBEX 320GS | IBEX 400GS | IBEX 600GS |
|---|---|---|---|---|---|---|---|
| Silenced housing | ● | ● | ● | ● | ● | ● | ● |
| Automatic lubrication | | | | | ◇ | ◇ | ◇ |
| Elevated underwater connection | | | | | | | |
| Low underwater connection | | | ● | ● | ● | ● | ● |
| $N_2$ accumulator | | | | | | | |
| Anti-blank firing system | | | | | | | |
| Double speed system | | | | | | | |
| Single tool bush | ● | ● | ● | ● | | | |

| | IBEX 900GS | IBEX 1200GS | IBEX 1800GS | IBEX 2200GS | IBEX 2800GS | IBEX 3200GS | IBEX 4000GS |
|---|---|---|---|---|---|---|---|
| Silenced housing | ● | ● | ● | ● | ● | ● | ● |
| Automatic lubrication | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ |
| Elevated underwater connection | | ● | ● | ● | ● | ● | ● |
| Low underwater connection | ● | | | | | | |
| $N_2$ accumulator | | ● | ● | ● | ● | ● | ● |
| Anti-blank firing system | | | ● | | | | |
| Double speed system | ● | ● | ● | ● | ● | ● | ● |
| Single tool bush | | | | | | | |

● = standard equipment

◇ = optional equipment

# 10. TOOLBOX CONTENT

| ITEM: | Spec. (mm) | IBEX 130 | IBEX 135 | IBEX 170 | IBEX 200 | IBEX 320 | IBEX 400 | IBEX 600 | IBEX 900 | IBEX 1200 | IBEX 1800 | IBEX 2200 | IBEX 2800 | IBEX 3200 | IBEX 4000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spanner** | 13 | | | | 2 | | 2 | | | | | | | | |
| **Spanner** | 19 | | | | | | | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| **Spanner** | 22 | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 |
| **Spanner** | 24 | 2 | 2 | 2 | 2 | | | | 1 | | | | | | |
| **Spanner** | 27 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | |
| **Spanner** | 30 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | | | | | | |
| **Spanner** | 32 | | | | | 2 | | | | | 1 | 1 | 1 | 1 | 1 |
| **Spanner** | 36 | | | | | | | | | 1 | 2 | 2 | | | |
| **Spanner** | 41 | | | | | | | 1 | 1 | | | | | | |
| **Spanner** | 46 | | | | | | | 1 | 1 | 1 | 1 | 1 | | | |
| **Spanner** | 50 | | | | | | | | | 1 | 1 | 1 | | | |
| **Spanner** | 55 | | | | | | | | | | | | 2 | 2 | 2 |
| **Spanner** | 60 | | | | | | | | | | | | 1 | 1 | 1 |
| **Double open ended spanner** | 17*19 | | | | | | | | | | | 1 | | | |
| **Double open ended spanner** | 24*27 | | | | | | | | | 1 | | | | | |
| **Double open ended spanner** | 27*30 | | | | | | 1 | 1 | | | | | | | |
| **Double open ended spanner** | 32*36 | | | | | | | | | 1 | | | | | |
| **Allen key** | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Allen key** | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Allen key** | 10 | 1 | 1 | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Allen key** | 12 | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Allen key** | 14 | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **T-Spanner (handle) 150mm** | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **T-Spanner (handle) 150mm** | 14 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Pin bar** | D8 | 1 | 1 | | | | | | | | | | | | |
| **Pin bar** | D10 | | | 1 | | | | | | | | | | | |
| **Pin bar** | D15 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Snap ring plier** | 12~65 | | | | | | 1 | | | | | | | | |
| **Grease gun** | 500cc | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Gas charging kit incl. 25/100 bar gauge** | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 |

# 11. TECHNICAL SPECIFICATIONS

| | | IBEX 130 | IBEX 135 | IBEX 170 | IBEX 200 | IBEX 320 | IBEX 400 | IBEX 600 | IBEX 900 |
|---|---|---|---|---|---|---|---|---|---|
| **Excavator weight** | ton | 0,8 - 2 | 1 - 2 | 1,2 - 3 | 2 - 4 | 3,5 - 7 | 5 - 8 | 6 - 10 | 10 - 16 |
| **Weight incl. tool** | kg | 105 | 125 | 155 | 180 | 305 | 380 | 555 | 855 |
| **Impact frequency** | bpm | 700 ~ 1000 | 700 ~ 1500 | 600 ~ 950 | 550 ~ 800 | 500 ~ 750 | 460 ~ 750 | 400 ~ 800 | 400 ~ 800 |
| **Impact energy** | Joule | 205 | | 352 | 480 | 742 | 975 | 1490 | 2165 |
| **Working pressure** | bar | 80 ~ 110 | 90 ~ 120 | 90 ~ 120 | 90 ~ 120 | 95 ~ 130 | 95 ~ 130 | 130 ~ 150 | 140 ~ 160 |
| **Relief pressure** | bar | 140 ~ 160 | 160 ~ 180 | 140 ~ 160 | 140 ~ 160 | 150 ~ 170 | 170 ~ 180 | 180 ~ 190 | 190 ~ 200 |
| **Oilflow** | l/min. | 15 ~ 30 | 15 ~ 35 | 25 ~ 40 | 30 ~ 45 | 35 ~ 50 | 45 ~ 85 | 45 ~ 90 | 80 ~ 110 |
| **Max. Back pressure** | bar | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Tool diameter** | mm | 44,5 | 40 | 53 | 59,5 | 68 | 74,5 | 85 | 98 |
| **Oil temperature** | °C<br>°F | -20 - +80°C<br>(-4 - +176°F) | -20 - +80°C<br>(-4 - +176°F) | -20 - +80°C<br>(-4 - +176°F) | -20 - +80°C<br>(-4 - +176°F) | -20 - +80°C<br>(-4 - +176°F) | -20 - +80°C<br>(-4 - +176°F) | -20 - +80°C<br>(-4 - +176°F) | -20 - +80°C<br>(-4 - +176°F) |
| **Hydraulic oil viscosity** | cSt | 1000 ~ 15 | 1000 ~ 15 | 1000 ~ 15 | 1000 ~ 15 | 1000 ~ 15 | 1000 ~ 15 | 1000 ~ 15 | 1000 ~ 15 |
| **Pressure line size** | mm<br>inch | 12 mm<br>(1/2 in) | 12 mm<br>(1/2 in) | 12 mm<br>(1/2 in) | 12 mm<br>(1/2 in) | 12 mm<br>(1/2 in) | 19 mm<br>(3/4 in) | 19 mm<br>(3/4 in) | 19 mm<br>(3/4 in) |
| **Return line size** | mm<br>inch | 12 mm<br>(1/2 in) | 12 mm<br>(1/2 in) | 12 mm<br>(1/2 in) | 12 mm<br>(1/2 in) | 12 mm<br>(1/2 in) | 19 mm<br>(3/4 in) | 19 mm<br>(3/4 in) | 19 mm<br>(3/4 in) |
| **Backhead pressure** | bar<br>psi | 12 bar<br>(174 psi) | 15 bar<br>(217 psi) | 16 bar<br>(232 psi) | 8 bar<br>(116 psi) | 16 bar<br>(232 psi) | 16 bar<br>(232 psi) | 16 bar<br>(232 psi) | 16 bar<br>(232 psi) |

| | | IBEX 1200 | IBEX 1800 | IBEX 2200 | IBEX 2800 | IBEX 3200 | IBEX 4000 |
|---|---|---|---|---|---|---|---|
| **Excavator weight** | ton | 13 - 18 | 18 - 25 | 25 - 32 | 32 - 40 | 36 - 45 | 40 - 55 |
| **Weight incl. tool** | kg | 1150 | 1650 | 2100 | 2660 | 3100 | 3780 |
| **Impact frequency** | bpm | 450 ~ 800 | 400 ~ 800 | 350 ~ 700 | 250 ~ 550 | 200 ~ 450 | 200 ~ 400 |
| **Impact energy** | Joule | 3460 | 4825 | 6815 | 8050 | 9150 | 12150 |
| **Working pressure** | bar | 150 ~ 170 | 160 ~ 180 | 160 ~ 180 | 160 ~ 180 | 180 ~ 220 | 160 ~ 180 |
| **Relief pressure** | bar | 200 ~ 210 | 200 ~ 210 | 200 ~ 210 | 200 ~ 210 | 200 ~ 210 | 200 ~ 210 |
| **Oilflow** | l/min. | 90 ~ 120 | 125 ~ 150 | 160 ~ 190 | 180 ~ 220 | 190 ~ 260 | 250 ~ 300 |
| **Max. Back pressure** | bar | 10 | 10 | 10 | 10 | 10 | 10 |
| **Tool diameter** | mm | 120 | 135 | 150 | 153 | 160 | 180 |
| **Oil temperature** | °C<br>°F | -20 - +80°C<br>(-4 - +176°F) | -20 - +80°C<br>(-4 - +176°F) | -20 - +80°C<br>(-4 - +176°F) | -20 - +80°C<br>(-4 - +176°F) | -20 - +80°C<br>(-4 - +176°F) | -20 - +80°C<br>(-4 - +176°F) |
| **Hydraulic oil viscosity** | cSt | 1000 ~ 15 | 1000 ~ 15 | 1000 ~ 15 | 1000 ~ 15 | 1000 ~ 15 | 1000 ~ 15 |
| **Pressure line size** | mm<br>inch | 25 mm<br>(1 inch) | 25 mm<br>(1 inch) | 25 mm<br>(1 inch) | 32 mm<br>(1 1/4 inch) | 32 mm<br>(1 1/4 inch) | 32 mm<br>(1 1/4 inch) |
| **Return line size** | mm<br>inch | 25 mm<br>(1 inch) | 25 mm<br>(1 inch) | 25 mm<br>(1 inch) | 32 mm<br>(1 1/4 inch) | 32 mm<br>(1 1/4 inch) | 32 mm<br>(1 1/4 inch) |
| **Underwater connection** | | PF 1/2″ | PF 1/2″ | PF 1/2″ | PF 1/2″ | PF 1/2″ | PF 1/4″ |
| **Accumulator pressure** | bar<br>psi | 60 bar<br>(870 psi) | 60 bar<br>(870 psi) | 60 bar<br>(870 psi) | 60 bar<br>(870 psi) | 60 bar<br>(870 psi) | 60 bar<br>(870 psi) |
| **Backhead pressure** | bar<br>psi | 6 bar<br>(87 psi) | 6 bar<br>(87 psi) | 6 bar<br>(87 psi) | 9 bar<br>(130 psi) | 16 bar<br>(232 psi) | 16 bar<br>(232 psi) |

# APPENDIX-1 UNDERWATER OPERATION

All of the IBEX breakers are suitable for underwater operations. An underwater kit must first be mounted to the breaker to ensure safe and continuous breaking. This kit is not included as standard with the breaker but is readily available and easily mounted to the breaker and excavator.

Whilst breaking underwater the impact area between the piston and tool will fill with water. The volume of the water is equal to the stroke length of the piston plus the stroke length of the tool. During impact enormous forces are applied to the water that can only be relieved via the clearance between the tool and bush. This water is discharged at an extremely high pressure and velocity that can be injected into the breaker itself.

Although the breaker is completely sealed without this underwater kit it is possible that water could enter the breaker and therefore the excavator causing catastrophic damage. Due to the extreme conditions that are applied to the breaker whilst operating underwater this kit is essential.

IBEX models 170GS to 900GS have an air connection mounted directly on the front head. Whilst models 1200GS to 4000GS have an elevated and safer mounting point on the backhead. This prevents possible damage to air hoses and connections. In turn reducing the possibility of damage to the breaker and therefore down time.

## A-1.1 Compressor Capacity

Whilst breaking underwater compressed air must be applied to ensure safe operation. The volume of air required varies dependent on the type of breaker. This information is available per model from Dehaco or an approved Dehaco dealer. The standard pressure required for all models is between 3 - 5 bar (32-72 psi).

Setting the supplied air pressure is also dependent on the working depth of the breaker.

- ◊ 2 Bar should be added per 10 meter depth
  - I.e. 10 meter, 3-5 bar + 2 bar = 5-7 bar
- ◊ Flow is dependant on model

**Procedure for supplied air pressure setting:**

1) After installation of the underwater kit, operate the compressor to supply the air to the breaker before it is submerged in the water. Maintain the air pressure with the regulator during this period.
2) Submerge the breaker to the maximum working depth for that particular work. Before operating the breaker ensure that bubbles are visible from the tool of the breaker.
3) Whilst maintaining the aforementioned condition, reduce the air pressure gradually with the regulator and set the supplied air pressure to the required level.
4) Warning – Do not supply the compressed air at full power directly to the breaker. Otherwise air may be injected into the sealed area of the breaker. Ensure that the compressed air always passes through the regulator.

## A-1.2 Operation

Operate the breaker with great care underwater because it is exposed to the severe conditions of the water.

1) When using a breaker that has been stored for a long term, ensure that the lubricating oil is removed from the clearance between the tool and bushes prior to operation.
2) Supply the compressed air to the underwater kit.
3) Only operate the breaker once the air pressure has reached the required pressure.
4) Submerge the breaker in the water.
5) Stop breaking immediately if the air supply has been broken during operation. Determine the cause and reinstate the air supply before continuing.
6) Do not break in the same position for a long time.
7) In the case that the excavator is mounted on a barge, the tool is liable to break because of the instability of the barge.
8) The tool must be greased more often than during normal operation due to the severe conditions of the water and air combined.

## A-1.3 Storage

**⚠ WARNING!**
➢ Perform routine checks and required maintenance before storage. This will ensure a longer life span of the breaker.

**⚠ WARNING!**
➢ The wearing parts of the breaker deteriorate much faster underwater. Ensure that these are regularly inspected.

### A-1.3.1 Short term storage
◊ In order to drain the water completely from the breaker, operate it on dry land for several minutes whilst supplying compressed air.
◊ It is difficult to operate the breaker under the aforementioned conditions. Run the excavator at low RPM's and idle the breaker 5 to 6 times whilst maintaining the air supply.

### A-1.3.2 Long term storage
1) Clean the breaker and carry out the short term storage maintenance.
2) Cover the breaker with a waterproof cover to ensure that it remains dry for the storage period.
3) It is strongly advised to store the breaker in the vertical position. The use of a stand to place the breaker in is for safety strongly advised.

## A-1.4 Safety Device

In order to minimise the risk of water entering the breaker, the underwater kit is supplied with a choice of safety devices. The purpose of this is to either alert the operator of a loss of pressure using an alarm. Or to immediately stop the breaker using a pressure switch mounted within the excavator. These solutions safeguard the breaker from the injection of water, and can be installed by Dehaco or one of its approved dealers.

## A-1.5 Maintenance Intervals

◊ The IBEX breakers are designed for underwater operations of only a short duration.
◊ The wear resistance of breaker parts is considerably lower in underwater conditions than in normal use. This is due to the corrosive nature of the underwater conditions.
◊ During underwater breaking, routine inspections must be performed more often. For example every half hour of operation.
◊ Adapt these inspections dependant on the working conditions.

### A-1.5.1 Procedure

**Every half hour of operation**
1) Grease the tool shank and the tool bushing using the grease nipples. (If auto grease pump is installed, ensure it is working correctly. It may need to be re-adjusted to supply a larger quantity of grease).
2) Inspect the movement of the body within the housing to ensure that the buffers have not worn.
3) Inspect all hoses and connections. Re-fasten if they are loose.
4) Check the operation of the air pressure switch and other safeguards.

**⚠ WARNING!**
➢ Automatic lubrication pump should be suitable for underwater application. Contact Dehaco or an approved dealer for information.

**Daily**
1) Remove the retainer pin and tool for inspection. Grind away any burrs if necessary and inspect for abnormal wear.
2) Inspect the tool and bushed for sufficient greasing
3) Breaker maintenance after underwater work
4) The breaker must be totally dismantled and serviced after working underwater for a long period of time.
5) Inspect and clean all of the components and either replace or repair damaged parts.
6) Re-assemble the breaker using new seals
7) Neglecting the breaker after underwater work can cause severe damage.
8) Without correct maintenance and servicing the rust can form on the piston in a matter of days depending on the environment.

# APPENDIX-2 ANTI-BLANK FIRING

Anti-Blank Firing (ABF) is an internal hydraulic system that protects, and therefore increases the service life of the breaker and excavator. When little or no downward pressure is applied to the tool the breaker will automatically prevent the downward stroke from the piston.

By eliminating this blank firing the major components of the breaker will not receive any unnecessary stress. These stresses can cause catastrophic failures within the breaker itself leading to unwanted and avoidable repairs and downtime.

ABF can be used as an aid during training. By eliminating the faults that can be made by inexperienced operators, (and experienced operators under heavy conditions) the breaker will have a much longer lifespan.

As standard at delivery ABF is switched on. It is recommended that even experienced operators make use of this function. It is simple to adjust or switch off. Using just the tools that are included at purchase the ABF can be adjusted on location at the worksite, by either a mechanic or operator.

## A-2.1 Method for adjusting ABF

**⚠ CAUTION!**

➢ In order to correctly and safely operate and adjust the breaker and its systems, ensure that you familiar with the content of this manual.

**⚠ WARNING!**

➢ The breaker operates under high pressure which can cause serious injury and death.

◊ The remaining pressure within the hydraulic system must be removed before attempting to adjust the ABF
◊ Do not attempt to operate this function if you do not fully understand its operation.
◊ Factory standard ABF is on
◊ When switched on the ABF adjuster should protrude 5mm from the hex nut.

### A-2.1.1 To turn ABF on

1) Place the breaker of a flat surface and turn of the excavator.
2) Relieve the remaining pressure within the system and disconnect the hydraulic hoses form the excavator.
3) Using a 32mm spanner or socket, loosen the hex nut by turning it anti-clockwise.
4) Using a 10mm Allen key rotate the adjuster clockwise to the fully closed position and mark its position in relation to the cylinder
5) Rotate the adjuster now anti-clockwise 4-5 turns
6) Whilst ensuring the adjuster remains in this position, fasten the hex nut by rotating it clockwise.
7) The ABF is now on. Re-connect the hydraulic hoses and test the breaker under working conditions

### A-2.1.1 To turn ABF off

1) Place the breaker of a flat surface and turn of the excavator.
2) Relieve the remaining pressure within the system and disconnect the hydraulic hoses form the excavator.
3) Using a 32mm spanner or socket loosen the hex nut by turning it anti-clockwise.
4) Using a 10mm Allen key rotate the adjuster clockwise to the fully closed position.
5) Rotate the hex nut clockwise until tight.
6) The ABF is now off. Re-connect the hydraulic hoses and test the breaker under working conditions

**ABF is currently only available on the IBEX 1800GS.**

# NOTITIES / NOTES

# NOTITIES / NOTES

# NOTITIES / NOTES



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