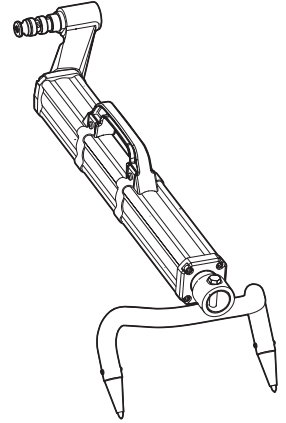


## Safety and operating instructions

### Pusher legs





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## Introduction

Epiroc is a leading productivity partner for the mining, infrastructure and natural resources industries. With cutting-edge technology, Epiroc develops and produces innovative drill rigs, rock excavation and construction equipment, and provides world-class service and consumables. The company was founded in Stockholm, Sweden, and has passionate people supporting and collaborating with customers in more than 150 countries.

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## About the Safety and operating instructions

The aim of the instructions is to provide you with knowledge of how to use the pusher leg in an efficient, safe way. The instructions also give you advice and tell you how to perform regular maintenance on the pusher leg.

Before using the pusher leg for the first time you must read these instructions carefully and understand all of them.

## Safety instructions

To reduce the risk of serious injury or death to yourself or others, read and understand the Safety and operating instruction before installing, operating, repairing, maintaining, or changing accessories on the machine.

Post this Safety and operating instruction at work locations, provide copies to employees, and make sure that everyone reads the Safety and operating instruction before operating or servicing the machine. For professional use only.

In addition, the operator or the operator's employer must assess the specific risks that may be present as a result of each use of the machine.

The pusher leg is used together with a rock drill and a power pack. Carefully study the safety instructions for the rock drill and power pack to ensure safe operation.

## Safety signal words

The safety signal words Danger, Warning and Caution have the following meanings:

### 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.

## Personal precautions and qualifications

Only qualified and trained persons may operate or maintain the machine. They must be physically able to handle the bulk, weight, and power of the tool. Always use your common sense and good judgement.

### Personal protective equipment

Always use approved protective equipment. Operators and all other persons in the working area must wear protective equipment, including at a minimum:

- Protective helmet
- Hearing protection
- Impact resistant eye protection with side protection
- Respiratory protection when appropriate
- Protective gloves
- Proper protective boots
- Appropriate work overall or similar clothing (not loose-fitting) that covers your arms and legs.

### Drugs, alcohol or medication

#### **WARNING Drugs, alcohol or medication**

Drugs, alcohol or medication may impair your judgment and powers of concentration. Poor reactions and incorrect assessments can lead to severe accidents or death.

- ▶ Never use the machine when you are tired or under the influence of drugs, alcohol or medication.
- ▶ No person who is under the influence of drugs, alcohol or medication may operate the machine.

## Installation, precautions

**⚠ WARNING Whipping hose**

Hoses under pressure can whip uncontrollably if screws loosen or are loosened. A whipping hose can cause severe injuries. To reduce this risk:

- ▶ Depressurise the system before loosening the connection of a hose.
- ▶ Tighten the nuts on the connections of the hoses to required torque.
- ▶ Check that the hose and the connections are not damaged.
- ▶ Never carry the machine by the hoses.

**⚠ WARNING Injured hands**

There is a risk of injured fingers when mounting the pusher leg on the rock drill. To reduce this risk:

- ▶ Never inspect, clean, install, or remove the pusher leg while the power source is connected.
- ▶ Never put the fingers between the rock drill and pusher leg attachment.

## Operation, precautions

**⚠ DANGER Electrical hazard**

The machine is not electrically insulated. If the machine comes into contact with electricity, serious injuries or death may result.

- ▶ Never operate the machine near any electric wire or other source of electricity.
- ▶ Make sure that there are no concealed wires or other sources of electricity in the working area.

**⚠ WARNING Unexpected movements**

The equipment is exposed to heavy strains when the machine is used. The inserted tool may break due to fatigue after a certain amount of use. If the inserted tool breaks or gets stuck, there may be sudden and unexpected movement that can cause injuries. Furthermore, losing your balance or slipping may cause injury.

- ▶ Make sure that you always keep a stable position with your feet as far apart as your shoulder width, and keeping a balanced body weight.
- ▶ Always inspect the equipment prior to use. Never use the equipment if you suspect that it is damaged.
- ▶ Make sure that the handles are clean and free of grease and oil.
- ▶ Stand firmly and always hold on to the rock drill with both hands.
- ▶ Never operate the machine when it is lying on the ground.
- ▶ Never strike or abuse the equipment.
- ▶ Check regularly for wear on the equipment, and check whether there are any signs of damage or visible cracks.
- ▶ Pay attention and look at what you are doing.
- ▶ Never rest on the pusher leg.
- ▶ To ensure a stable position, press the foot on the pusher leg.

**⚠ WARNING Abuse hazard**

Never abuse or strike the pusher leg. This may cause machine breakdown.

- ▶ Press the pusher leg foot. Do not press the pusher leg body.
- ▶ Store the pusher leg compressed.

**⚠ WARNING Stalling hazard**

If the insertion tool gets caught during operation, the whole machine might start to rotate if you lose your grip on it. This unexpected rotation of the entire machine may cause serious injury or death.

- ▶ Stand firmly and always hold onto the rock drill with both hands.
- ▶ Make sure that the handle or handles are clean and free from grease and oil.
- ▶ Never drill in an old hole.

**⚠ WARNING Slipping, tripping and falling hazards**

There is a risk of slipping, tripping or falling, for example tripping on hoses or on other objects. Slipping, tripping or falling can cause injury. To reduce this risk:

- ▶ Always make sure that no hose or other object is in your way or in any other person's way.
- ▶ Always make sure you are in a stable position with your feet as far apart as your shoulder width and keeping a balanced body weight.

**⚠ WARNING Motion hazards**

When using the machine to perform work-related activities, you may experience discomfort in the hands, arms, shoulders, neck, or other parts of the body.

- ▶ Adopt a comfortable posture while maintaining secure footing and avoiding awkward off-balanced postures.
- ▶ Changing posture during extended tasks may help avoid discomfort and fatigue.
- ▶ In case of persistent or recurring symptoms, consult a qualified health professional.

**⚠ WARNING Vibration hazards**

Normal and proper use of the machine exposes the operator to vibration. Regular and frequent exposure to vibration may cause, contribute to, or aggravate injury or disorders to the operator's fingers, hands, wrists, arms, shoulders and/or nerves and blood supply or other body parts, including debilitating and/or permanent injuries or disorders that may develop gradually over periods of weeks, months, or years. Such injuries or disorders may include damage to the blood circulatory system, damage to the nervous system, damage to joints, and possibly damage to other body structures.

If numbness, persistent recurring discomfort, burning sensation, stiffness, throbbing, tingling, pain, clumsiness, weakened grip, whitening of the skin, or other symptoms occur at any time, when operating the machine or when not operating the machine, stop operating the machine, tell your employer and seek medical attention. Continued use of the machine after the occurrence of any such symptom may increase the risk of symptoms becoming more severe and/or permanent.

Operate and maintain the machine as recommended in these instructions, to prevent an unnecessary increase in vibration.

The following may help to reduce exposure to vibration for the operator:

- ▶ Let the tool do the job. Use a minimum hand grip consistent with proper control and safe operation.
- ▶ If the machine has vibration absorbing handles, keep them in a central position, avoid pressing the handles into the end stops.
- ▶ When the rock drill is activated, the only body contact with the machine you should have are your hands on the handle or handles. Avoid any other contact, for example supporting any part of the body against the machine or leaning onto the machine trying to increase the feed force. It is also important not to keep the start and stop device engaged while extracting the tool from the broken work surface.
- ▶ Immediately stop working if the machine suddenly starts to vibrate strongly. Before resuming the work, find and remove the cause of the increased vibrations.
- ▶ Participate in health surveillance or monitoring, medical exams and training programs offered by your employer and when required by law.
- ▶ When working in cold conditions wear warm clothing and keep hands warm and dry.
- ◆ Comply with the recommended water-pressure when operating the machine. Either higher or

lower water-pressure has the potential of resulting in higher levels of vibration.

**⚠ WARNING Machine modification**

Any machine modification may result in bodily injuries to yourself or others.

- ▶ Never modify the machine. Modified machines are not covered by warranty or product liability.
- ▶ Always use original parts, working tools and accessories.
- ▶ Change damaged parts immediately.
- ▶ Replace worn components in good time.

**⚠ WARNING Hot water hazard**

The flushing water can become hot and cause burns. To reduce the risk of burns:

- ▶ Keep your body away from the hot water.
- ▶ Stop the machine and the power source immediately.
- ▶ Wait until the machine and power source has cooled down before carrying out maintenance work.

**⚠ WARNING Choosing power pack**

The pusher leg and the handheld hydraulic rock drills are designed for working together with Epiroc power packs. Use of other power sources can lead to personal injury and machine breakdown.

- ▶ Ensure that the power source you plan to use is compatible with the rock drill and the pusher leg, see section "Technical data".

**⚠ WARNING Concealed object hazard**

During operating, concealed wires and pipes constitute a danger that can result in serious injury.

- ▶ Check the composition of the material before operating.
- ▶ Watch out for concealed cables and pipes for example electricity, telephone, water, gas and sewage lines etc.
- ▶ If the pusher leg foot seems to have hit a concealed object, switch off the machine immediately.
- ▶ Make sure that there is no danger before continuing.



## Overview

To reduce the risk of serious injury or death to yourself or others, read the **Safety instructions** section found on the previous pages of this manual before operating the machine.

## Design and function

PL 70, 100, 120 and 150 are designed to be used together with power pack of type PP 100, and hydraulic rock drill of type RD 100.

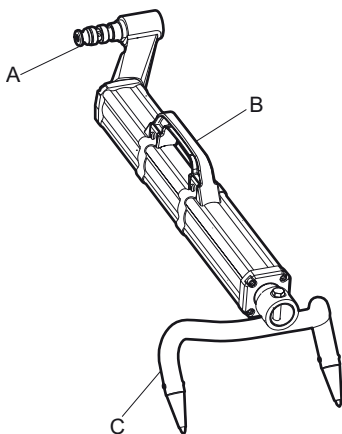
The pusher leg is connected to the rock drill by a special attachment device and is operated via the rock drill.

The feed movement of the pusher leg is powered by water pressure from the power pack via the rock drill. Recommended water pressure to the power pack is between 5 bar (73 psi) and 13 bar (189 psi) at 12 l.p.m (0.42 ft<sup>3</sup>/min) flowrate. The pressure regulator in the power pack is reducing the pressure to a maximum of 10 bar (145 psi).

The pusher leg support is for helping the operator to lift and feed the rock drill during drilling operations. Retract the pusher leg by turning the twist handle forward on the rock drill. Extract the pusher leg by turning the twist handle backward on the rock drill.

No other use is permitted.

## Main parts

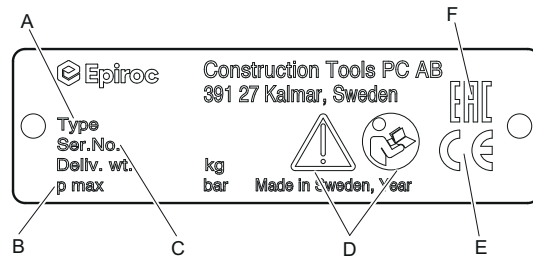


- A. Attachment device
- B. Handle
- C. Foot

## Labels

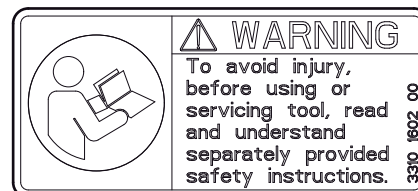
The machine is fitted with labels containing important information about personal safety and machine maintenance. The labels must be in such condition that they are easy to read. New labels can be ordered from the spare parts list.

### Data plate



- A. Machine type
- B. Maximum hydraulic pressure
- C. Serial number
- D. The warning symbol together with the book symbol means that the user must read the safety and operating instructions before the machine is used for the first time.
- E. The CE symbol means that the machine is EC-approved. See the EC Declaration of Conformity which is delivered with the machine for more information.
- F. The EAC symbol means that the machine is EAC approved.

### Safety label



To avoid injury, before using or servicing tool, read and understand separately provided safety instructions.

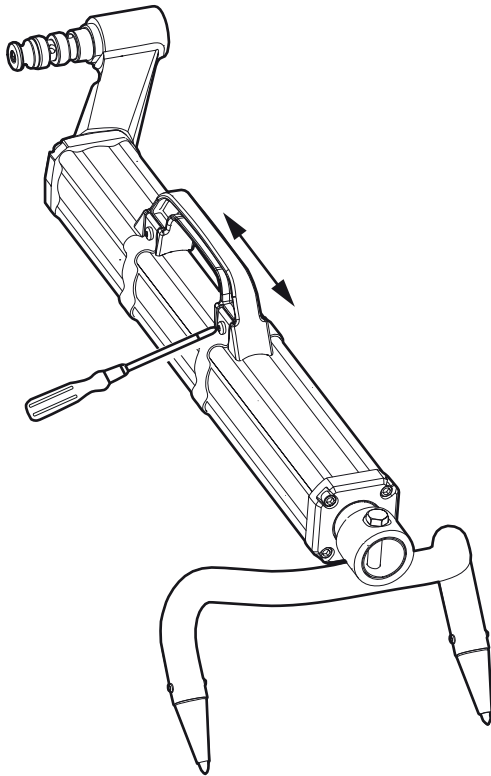
## Installation

### ⚠ WARNING Injured hands

There is a risk of injured fingers when mounting the pusher leg on the rock drill. To reduce this risk:

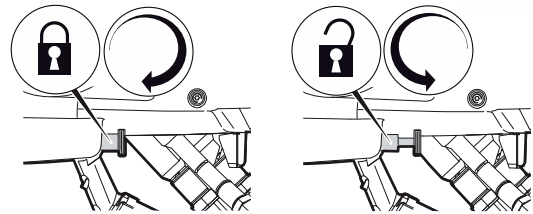
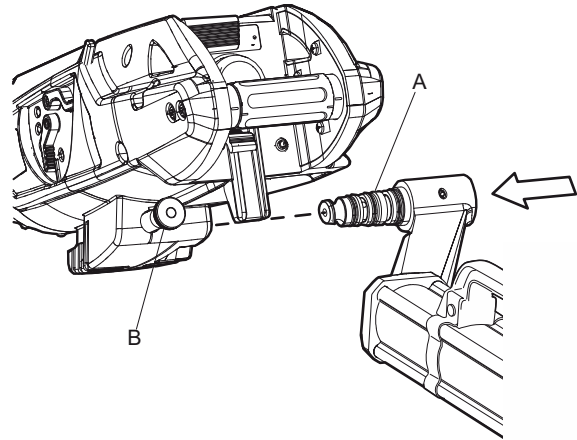
- ▶ Never inspect, clean, install, or remove the pusher leg while the power source is connected.
- ▶ Never put the fingers between the rock drill and pusher leg attachment.

## Adjustment of handle



1. Loosen the screws, no need to fully unscrew them.
2. Move the handle to the position wanted.
3. Tighten the screws.

## Attaching pusher leg to rock drill



1. Make sure that the pin (A) and the machine attachment are clean.
2. Pull out the locking lever (B) and turn counterclockwise to lock it in the open position.
3. Mount the pusher leg to the rock drill.
4. Turn the locking lever (B) clockwise to secure the pusher leg. Make sure that the lever gets pushed all the way in.
5. Fill the pusher leg with water by extracting and retracting it a few times.

## Pressure adjustment

### Water pressure

Ensure that the water supply to the power pack meets the requirements of incoming pressure between 5-13 bar (73-189 psi).

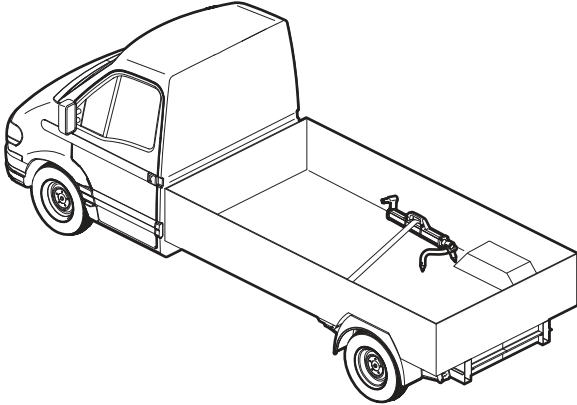
- Too high pressure causes rough operation and excessive wear.
- Too low pressure results in irregular and slow drilling speed and might damage the RD 100.

## Transport

**⚠ WARNING Falling pusher leg**

If the pusher leg tips over and fall, it may cause serious injury.

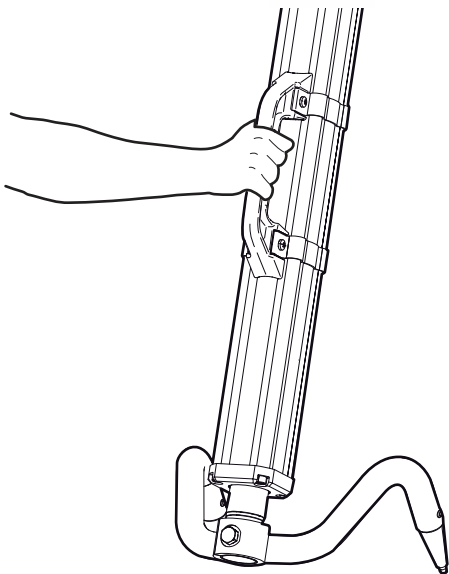
- Place the pusher leg in a safe position where it cannot fall and cause damage.



Ensure that the pusher leg is compressed and secured during transportation.  
Drain the water system if there is risk of freezing.

## Lifting the pusher leg

Grab the handle on the pusher leg, see illustration below. Lift the pusher leg and move it to its intended destination.



## Operation

**⚠ WARNING Involuntary start**

Involuntary start of the machine may cause injury.

- Keep your hands away from the start and stop device until you are ready to start the machine.
- Learn how the machine is switched off in the event of an emergency.
- Stop the machine immediately in all cases of power supply interruption.

## Preparations before starting

**⚠ WARNING Whipping hose**

Hoses under pressure can whip uncontrollably if screws loosen or are loosened. A whipping hose can cause severe injuries. To reduce this risk:

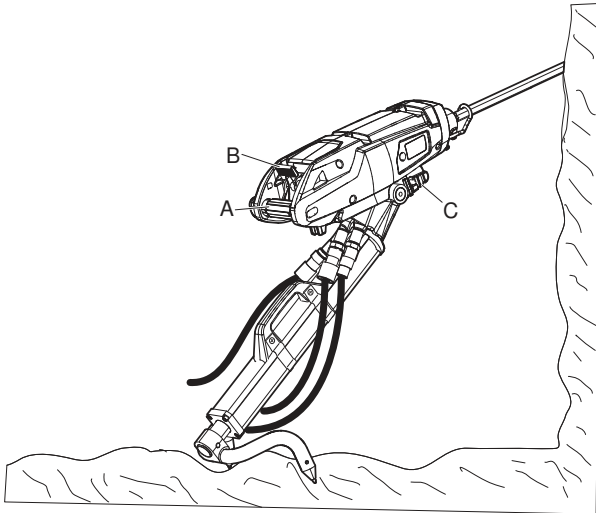
- Depressurise the system before loosening the connection of a hose.
- Tighten the nuts on the connections of the hoses to required torque.
- Check that the hose and the connections are not damaged.
- Never carry the machine by the hoses.

### Check the drilling equipment

- ◆ Check that all of the drilling equipment is in good condition.
- ◆ Check that the impact surface of the drill steel shank is flat, with no signs of wear.
- ◆ Check that the flushing holes in the drill steel and drill bit are not blocked, and that the water flows through without obstruction.
- ◆ Ensure that the fittings are tight and leak-proof.
- ◆ Ensure that the twist handle is in the neutral position to avoid involuntary extract or retract of the pusher leg during start.
- ◆ Ensure that the throttle lever is in the stop position.

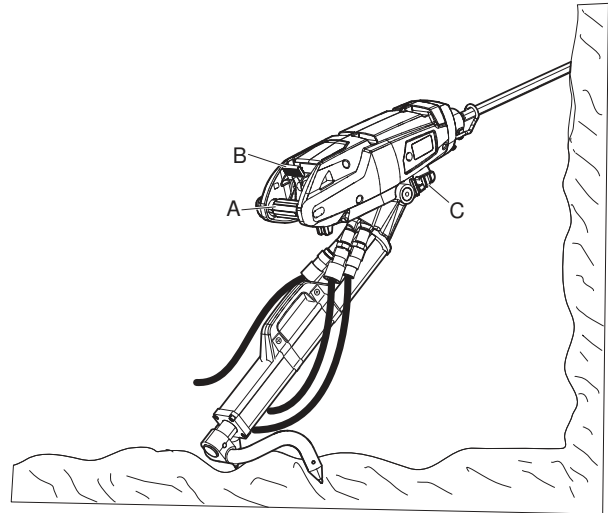
## Start and stop

## Starting the rock drill



1. Check that the drill steel and drill bit are in good condition and properly attached to the rock drill.
2. Check that the tool retainer is locked, so that the drill steel does not fall out.
3. Start the power source.
4. Adjust the twist handle (A) to give a suitable feed force for collaring the hole.
5. Align the rock drill so that the drill steel touches the required collaring point. Avoid small irregularities on the surface, since they break easily and cause either a wrong working angle or blank firing.
6. Move the throttle lever (B) forward a little, which starts the water flushing, the percussion and rotation.
7. Press the rock drill firmly against the material to be drilled. Turn the twist handle to push the rock drill forward by means of the pusher leg. Increase to full throttle when collaring is under control.
8. Adjust the feed force to ensure that the rock drill runs regularly.

## Stopping the rock drill



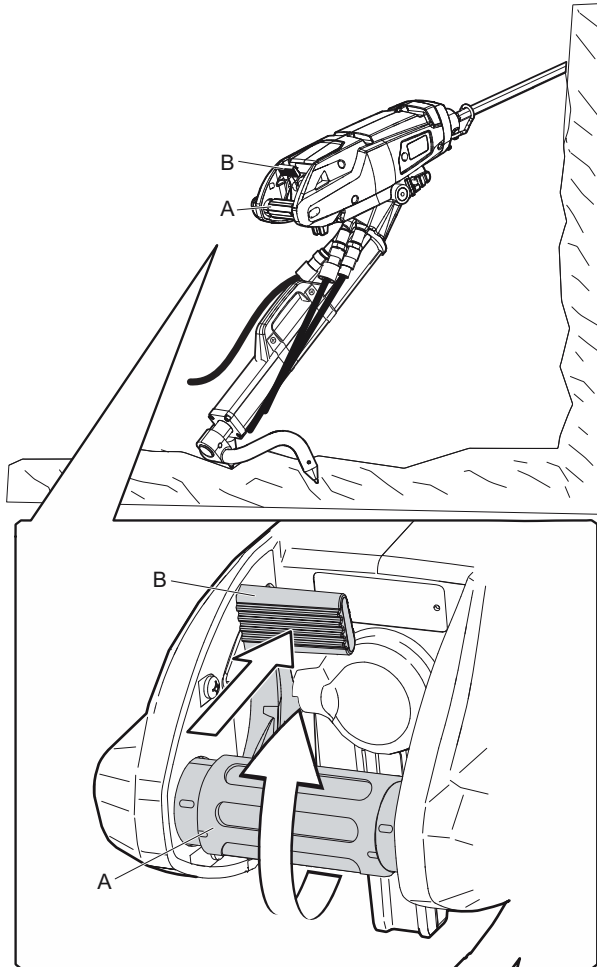
- ◆ Pull the throttle lever (B) backwards. This stops the percussion, rotation, and flushing water.

## Operating

### Drilling

- ◆ Use protective shoes, gloves, helmet, ear protectors and impact resistant eye protection with side protection.
- ◆ Stand firmly and always hold the machine with both hands.
- ◆ Hold the inserted tool firmly against the work surface before starting the machine.
- ◆ Keep hands away from chuck, drill steel and drill bit.

## Re-position of the pusher leg

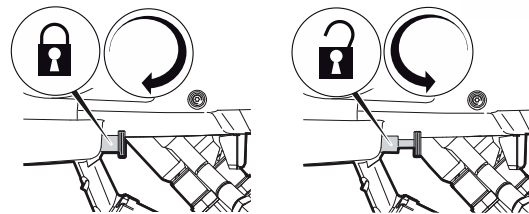
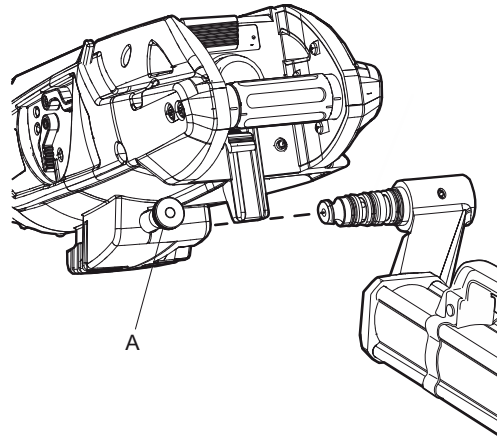


1. Switch off the rock drill percussion, rotation and flushing by means of the throttle lever (B).
2. Retract the pusher leg, by turning the twist handle (A).
3. Re-position the pusher leg. Ensure that the pusher leg stands securely on the ground.
4. Follow the start procedures, see section "Starting the rock drill".

## When taking a break

- ◆ Place the machine in such a way that there is no risk for it to be unintentionally started. Make sure to place the machine on the ground, so that it can not fall.
- ◆ In the event of a longer break or when leaving the workplace: Switch off the power source and shut off the incoming water supply.

## Detaching pusher leg from rock drill



1. Pull out the locking lever (A) and dismount the pusher leg from the rock drill.
2. Drain the water by turning the pusher leg upside down and extract and retract it a few times.

## Maintenance

Regular maintenance is a basic requirement for the continued safe and efficient use of the machine. Follow the maintenance instructions carefully.

- ◆ Before starting maintenance on the machine, clean it in order to avoid exposure to hazardous substances.
- ◆ Use only authorised parts. Any damage or malfunction caused by the use of unauthorised parts is not covered by warranty or product liability.
- ◆ When cleaning mechanical parts with solvent, comply with appropriate health and safety regulations and ensure there is satisfactory ventilation.
- ◆ For major service of the machine, contact the nearest authorised workshop.

## Every day

- ◆ Check the rock drill's connection to the pusher leg.
- ◆ Check the hoses, couplings and controls for leakage and damage.
- ◆ Check the O-rings on the attachment device between the pusher leg and the rock drill.
- ◆ Clean and inspect the drilling equipment and its functions each day before start working.

## Checking for wear

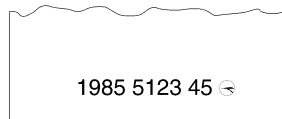
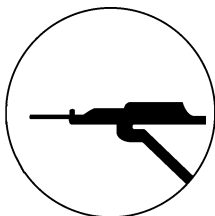
- ◆ Check the spikes on the pusher leg foot. Replace the spikes if they show signs of wear.

## 3 times per year

- ◆ The machine must be inspected and serviced three times per year by authorised staff, trained for this task.

## Differences between original parts and pattern parts

When buying a part, the first thing to do is to verify that the part is an Epiroc part. Most parts can be identified.



Rock drill parts are normally marked with a part number and the Epiroc identity mark which is a circle with a rock drill. In a few cases the part is marked either with the circle only or the part number only.

Rubber and plastic parts are not normally marked.

## Storage

- ◆ Always store the pusher leg in a clean and dry place. Avoid exposure to direct sunlight.
- ◆ Store the pusher leg compressed.
- ◆ Make sure that no foreign matter enters the pusher leg.

- ◆ Drain the water from the pusher leg if there is risk of freezing. Drain by orienting the pusher leg upside down and extract and retract the leg manually a couple of times. The water will escape through the attachment device.

## Disposal

A used machine must be treated and disposed of in such a way that the greatest possible portion of the material can be recycled and any negative influence on the environment is kept as low as possible, and in respect to local restrictions.

## Technical data

## Troubleshooting

Problem	Cause	Solution
Insufficient feed force	Low water pressure.	Increase water pressure to between 5 bar (73 psi) and 13 bar (189 psi).
	Piston rod gasket and/or O-ring are worn or deformed.	Replace the gasket and O-ring.
	Leakage.	Replace worn sealings.
Impossible to extend or retract the pusher leg	The pusher leg has been damaged or bent.	Contact an authorised workshop for assistance.
	The pusher leg is obstructed by dirt or impurities.	Perform cleaning according to section "Maintenance".

## Machine data

Type	Part number	Suitable for rock drill	Length retracted mm (in.)	Stroke mm (in.)	Weight kg (lb)
PL 70	8321 0303 05	RD 100	760 (29.9)	468 (18.4)	8.8 (19.4)
PL 100	8321 0303 08	RD 100	1060 (41.7)	768 (30.2)	10.5 (23.1)
PL 120	8321 0303 10	RD 100	1260 (49.6)	968 (38.1)	11.6 (25.6)
PL 150	8321 0303 15	RD 100	1560 (61.4)	1268 (49.9)	13.4 (29.5)

# EC Declaration of Conformity

## EC Declaration of Conformity (EC Directive 2006/42/EC)

We, Construction Tools PC AB, hereby declare that the machines listed below conform to the provisions of EC Directive 2006/42/EC (Machinery Directive), and the harmonised standards mentioned below.

Pusher leg	Part number	Pmax (bar)	Weight (kg)
PL 70	8321 0303 05	10	8.8
PL 100	8321 0303 08	10	10.5
PL 120	8321 0303 10	10	11.6
PL 150	8321 0303 15	10	13.4

Following harmonised standard was applied:

◆ EN ISO 11148-5

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**Place and date:**

Kalmar, 2015-01-20









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