

Operating Instructions

PD1 Post and Pile Drivers

These operating instructions include substantial health and safety information and as such are useful when compiling method statements and risk assessments.

Scope

This document pertains to our range PD1 Post and Pile Drivers, this operating instructions has been amended for use of the PD1 with the Atlas Copco PAC9-20 powerpack. This type of equipment is designed to be handheld in operation as it has the trigger handle design.

Different pile caps are available for different sheet piles & post sizes, where possible the standard 4" tube guide will be fitted and then this is used in conjunction with a plastic dolly and pile cap as shown below. All fabricated pile caps can break during use as they are subject to the repeated impact shock of the pile and post driver.



Key responsibilities for the hirer

- To provide a trained and competent person to operate the equipment safely and within its limits.
- Ensuring that the equipment is not abused and used safely, in accordance with the operating instructions.
- Daily, weekly and pre-use checks on the equipment as detailed in the operating instructions, and outlined here. Thereby, monitoring the condition of the equipment, to ensure that it is, and remains in, a condition fit and safe to use.
- Ensuring all nuts, bolts, hoses and connections are tight. The vibrations produced by the pile driver, will always serve to loosen couplings. You must therefore ensure that the operator is equipped to tighten nuts, cap screws etc. Where the owners' representative have to return to site to tighten fittings on hoses or the unit – this should be chargeable.
- Keeping all accessory items in good condition, if the weld breaks - please re-weld

This post and pile driving equipment is in essence very simplistic, but does have several inbuilt safety features ; for example the unit will not function off pile so mount onto the post, tube or cap else the unit will not start (piston needs to be pushed up to the start position) squeeze the trigger handle and the units starts working; likewise releasing the trigger stops the unit. The powerpacks are equally simplistic, but care must still be taken. 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. 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.

For professional use only. This equipment must be used by experience and competent operators and never by young trainees.

The PD1 post driver operates at between 20-30lpm and so when used with any power source capable of more, please ensure you do not have the flow too high else you will break the unit and leaks will result. Any damage resulting from too high a flow will be charged for.

Generic Warnings & Operation, precautions

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.

WARNING Whipping hydraulic hose

Hydraulic hoses under pressure can whip uncontrollably if screws loosen or are loosened. A whipping hydraulic hose can cause severe injuries. Depressurise the hydraulic system before loosening the connection of a hydraulic hose. Tighten the nuts on the connections of the hydraulic hoses to the required torque. Check that the hydraulic hose and the connections are not damaged.

DANGER Compressed gas, explosion hazard

The accumulator is pressurized even when the hydraulic system is shut off. To dismount the accumulator without first releasing the nitrogen gas can cause serious personal injury or death. Fill the high-pressure accumulator with nitrogen (N₂) only. Only authorised personnel are qualified to work with the accumulator.

WARNING Hydraulic oil at high pressure

Thin jets of hydraulic oil under high pressure can penetrate the skin and cause permanent injury. Immediately consult a doctor if hydraulic oil has penetrated the skin. Never use your fingers to check for hydraulic fluid leaks. Keep your face away from any possible leaks.

WARNING Hot surfaces

Hydraulic oil temperatures higher than 60°C (140°F) is transmitted to the post driver body. The hot surfaces can burn if you are unprotected. Always use proper gloves and protective clothes, to avoid skin contact, when operating the machine.

CAUTION Skin eczema

Hydraulic oil can cause eczema if it comes in contact with the skin. Avoid getting hydraulic oil on your hands. Always use protective gloves when working with hydraulic oil. Wash hands after contact with hydraulic oil.

DANGER Explosion hazard

If an working tool comes into contact with explosives or explosive gases, an explosion could occur. When working on certain materials and when using certain materials in machine parts, sparks and ignition can occur. Explosions will lead to severe injuries or death. Never operate the machine in any explosive environment. Never use the machine near flammable materials, fumes or dust. Make sure that there are no undetected sources of gas or explosives.

WARNING Unexpected movements

The post is exposed to heavy strains when the machine is used. If the post breaks or gets stuck, there may be sudden and unexpected movement that can cause injuries. Furthermore, losing your balance or slipping may cause injury. When driving, make sure you are able to keep safely balanced. Keep arms and legs clear of the post. If a post breaks during operating, the post driver with a projecting broken shank will suddenly drop.

WARNING Projectiles

Failure of the work piece, of accessories, or even of the machine itself may generate high velocity projectiles. During operating, splinters or other particles from the working material may become projectiles and cause personal injury by striking the operator or other persons. To reduce these risk:

- Use approved personal protective equipment and safety helmet, including impact resistant eye protection with side protection.
- Make sure that no unauthorised persons trespass into the working zone.
- Keep the workplace free from foreign objects.
- Ensure that the work piece is securely fixed.

WARNING Dust and fume hazard

On the whole the PD1 will be used to drive plastic piling, timber posts and steel tubes, therefore dust exposure is unlikely. However in dry soil condition dust from the soil is a possibility. If driving treated timber posts in hard driving conditions it is feasible that dust can come off the posts during installation. The powerpack is powered by petrol and so care should always be taken when working in confined spaces. Attention should be made to appropriate ventilation. The following information forms part of the user manual and is quite extensive, and generic to Atlas Copco hand tools. Dusts and/or fumes generated or dispersed when using the machine may cause serious and permanent respiratory disease, illness, or other bodily injury (for example, silicosis or other irreversible lung disease that can be fatal, cancer, birth defects, and/or skin inflammation).

Some dusts and fumes created by drilling, breaking, hammering, sawing, grinding and other construction activities contain substances known to cause respiratory disease, cancer, birth defects, or other reproductive harm. Some examples of such substances are:

- Crystalline silica, cement, and other masonry products.
- Arsenic and chromium from chemically-treated rubber.
- Lead from lead-based paints.

Dust and fumes in the air can be invisible to the naked eye, so do not rely on eye sight to determine if there is dust or fumes in the air. To reduce the risk of exposure to dust and fumes, do all of the following:

- Perform site-specific risk assessment. The risk assessment should include dust and fumes created by the use of the machine and the potential for disturbing existing dust.
- Use proper engineering controls to minimize the amount of dust and fumes in the air and to minimize build-up on equipment, surfaces, clothing, and body parts. Examples of controls include: exhaust ventilation and dust collection systems, water sprays, and wet drilling. Control dusts and fumes at the source where possible. Make sure that controls are properly installed, maintained and correctly used.
- Wear, maintain and correctly use respiratory protection as instructed by your employer and as required by occupational health and safety regulations. The respiratory protection must be effective for the type of substance at issue (and if applicable, approved by relevant governmental authority).
- Work in a well ventilated area.
- The PD1 does not have an exhaust but its powerpack will do so direct the exhaust so as to reduce disturbance of dust in a dust filled environment.
- Select, maintain and replace consumables/working tools/ other accessories as recommended in the operating and safety instructions. Incorrect selection or lack of maintenance of consumables/ inserted tools/ other accessories may cause an unnecessary increase in dust or fumes.
- Wear washable or disposable protective clothes at the worksite, and shower and change into clean clothes before leaving the worksite to reduce exposure of dust and fumes to yourself, other persons, cars, homes, and other areas.
- Avoid eating, drinking, and using tobacco products in areas where there is dust or fumes.
- Wash your hands and face thoroughly as soon as possible upon leaving the exposure area, and always before eating, drinking, using tobacco products, or making contact with other persons.
- Participate in air monitoring, medical examination programs, and health and safety training programs provided by your employer or trade organisations and in accordance with occupational health and safety regulations and recommendations. Consult with physicians experienced with relevant occupational medicine.
- Work with your employer and trade organisation to reduce dust and fume exposure at the worksite and to reduce the risks. Effective health and safety programs, policies and procedures for protecting workers and others against harmful exposure to dust and fumes should be established and implemented based on advice from health and safety experts. Consult with experts.
- Residues of hazardous substances on the machine can be a risk. Before undertaking any maintenance on the machine, clean it thoroughly.

WARNING Vibration hazards

This is perhaps the one of the main hazard as this is handheld and hand operated equipment. Vibration data is available for the unit measured at 20 lpm - Vibration level 3 axes 20 lpm is 12.8 m/s^2 - increasing to 17.3 m/s^2 at 30 lpm, which has a faster blow rate. Do not modify the equipment, for instance putting foam on the handles, as this can lead to a situation where the operator grips harder. Where equipment has been modified ensure that vibration testing and data is still applicable. Better for the operator to use gloves, as cold is a key factor for HAV, and if required by your assessment of vibration dosage; vibration dampening gloves can be used. 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.
- When the percussion mechanism 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.
- 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.
- In easy driving conditions turn flow down to 20lpm as this will reduce vibration levels.

Working near buildings - Piling Vibrations

You must evaluate if you have a potential vibration problem and address the appropriate standards. All piling equipment which performs its function by production of impact or vibration, will introduce vibrations into the environment.

Equipment must be selected that suits the location of piling. It is the hirers responsibility to ensure that the equipment hired suits the location, since the owner will often be remotely situated from site and unless notified of site conditions and the nature of neighbouring buildings cannot provide advice on this matter.

BS5228 part 4 relates to vibration caused by piling processes, and details threshold levels for distinct building types below known levels for cosmetic damage.

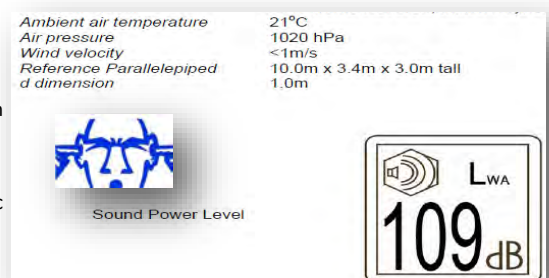
BS6472 relates to the human response to vibration, and possibilities of adverse comment - quite stringent since based at the level of complaint, rather than threshold for illness or property damage.

BS7385 provides threshold values in excess of the previous two standards, relating to levels likely to cause structural damage in building structures.

Vibration produced by pile drivers should not only be considered in terms of the physical shaking of a structure, but also in terms of possible settlement. Settlement of soils, can create voids beneath structures such as foundations or utility lines. If working near live gas pipes you should always seek advice from those responsible for the pipes. Whenever possible, have the supply disconnected.

WARNING Noise hazard - High noise levels can cause permanent and disabling hearing loss and other problems such as tinnitus (ringing, buzzing, whistling, or humming in the ears). There are several noise levels stated in this document and these vary according to testing, measure., distance exposure etc, max noise level stated on plant as 109 Lwa dB(A), although Atlas do state a guaranteed level of 115 db(A). To reduce risks and prevent an unnecessary increase in noise levels:

- Risk assessment of these hazards and implementation of appropriate controls is essential.
- Operate and maintain the machine as recommended in these instructions.
- Always use hearing protection.
- Use damping material to prevent work pieces from 'ringing' - a plastic pile dolly is often provided please ensure this is used and it will avoid the metal to metal contact.
- Other factors can influence noise such as working in enclosed spaces, driving steel or plastic piling etc.



DANGER Electrical hazard and Concealed object hazard

The machine is not electrically insulated. If the machine comes into contact with electricity, serious injuries or death may result. Please bear this in mind when driving steel tubes or trench sheeting as these can come into contact with concealed buried services. Timber posts and plastic piling are non-conductive, further a nylon dolly is utilised between the impacting piston and pile cap, that stated:

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

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.

WARNING Slipping, tripping and falling hazards

There is a risk of slipping or tripping or falling, for example tripping on the hoses or on other objects. Slipping or 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 shoulders width and keeping a balanced body weight.

WARNING Motion hazards

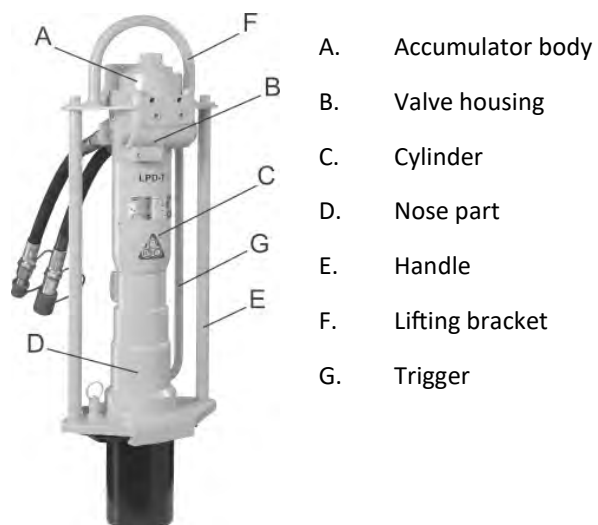
When using the machine to perform work-related activities, you may experience discomfort in the hands, arms, shoulders, neck, or other parts of the body.

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.

CAUTION Hot machine

The insertion tool and the machine can become hot during use. Touching it can lead to burns. Never touch a hot insertion tool or machine. Wait until the insertion tool and the machine has cooled down before carrying out maintenance work.

Main Parts





Specifications

Blows per minute	1320 (at 20 lpm) 1680 (at 30lpm)
Service Weight inc hoses and adaptor	34 kgs
Flow required	20-30 lpm
Pressure	105 - 140 Bar
Energy per blow (based upon LH280 handheld breaker)	85 - 105 Joules/blow
Vibration level 3 axes 20 lpm - 30 plm	12.8 m/s ² - 17.3 m/s ²
Vibration level spreads	3.3 m/s ²
Sound power level guaranteed Lw db(A) (2000/14/EC)	115
Sound Pressure Level Lp r=1m dB(A) rel 20µPa EN ISO 11203	102
EHTMA Class	C/D

Powerpack Specifications

^ Technical details	
Fuel	Petrol
Brand	Honda
Power (kW)	6.7 kW
Input power	0 kW
Weight incl. oil	80 kg
Dimensions (LxWxH)	630x530x640 mm
Oil flow	20 l/min
Maximum pressure	150 bar
Fuel capacity	6 l
Hose included	yes
Power On Demand (POD)	yes
Oil control: engine oil	yes
Electric start	no
Filtration	25µ filter in return line. Filter by-pass valve in valve block.
Cooling system	Thermostatically controlled air blast oil cooler.
EHTMA class	C
Part number	1807 0080 50
Part number (not sold within EU)	1807 0080 51
Sound power level guaranteed (2000/14/EC)	101 dB(A)
Sound pressure level (ISO 11203)	87 Lp. dB(A)



Starting the Powerpack

Pre-Checks

- Check engine oil and hydraulic oil levels
- Check the condition of hoses and connectors
- Check the cooler matrix is clear
- Check the tightness of fasteners
- Check powerpack for signs of damage, including signs of oil or fuel leaks.

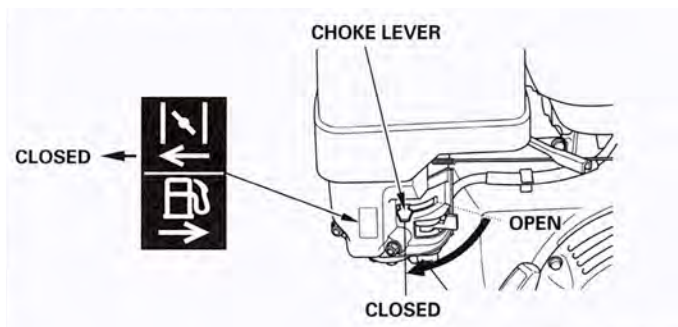
Ensure that the powerpack is in level ground as operating the machine at an angle greater than 20 ° may cause the engine lubrication system to fail and in turn damage the engine.

Ensure that the powerpack is far enough away from combustible materials and there is adequate ventilation for the removal of exhaust gases

Make sure that the flat face coupling (if disconnected) are clean. Ensure that the ON/Off lever is in the flow off position. Ensure that the hoses are connected from the pack to the pile driver.

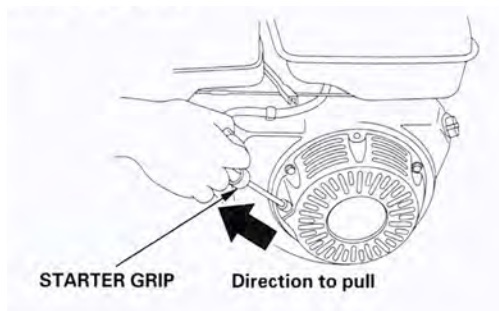
To start the engine of the powerpack:

- Move the fuel valve lever to the ON position
- To start a cold engine, move the choke lever to the closed position. To restart a warm engine leave the choke lever in the open position.
- Move the throttle lever away from the MIN position, about 1/3 rd of the way towards the MAX position.



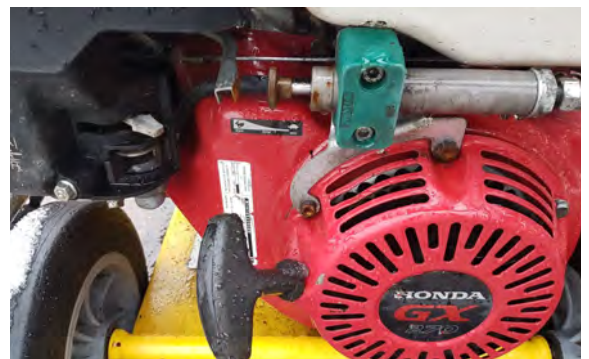
Turn on the engine switch to the ON position and operate the recoil starter, by pulling the starter grip lightly until you feel resistance, then pull briskly in the direction of the arrow shown across.

To power the PD1 open the flow valve on the front of the powerpack to the Flow on position. Then operate the manual direction valve as previously stated.



To stop the engine in an emergency, simply turn the engine switch to the OFF position. Under normal conditions follow the following procedure:

- Move the throttle lever to the min position
- Turn the engine switch to off
- Turn the fuel valve lever to the OFF position.
- Turn the flow valve to the off position.



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