

**Aldridge Piling Equipment (Hire) Co Ltd**  
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**Responsibility for the work equipment and imposed duty of regulation**

Aldridge Piling Equipment's duty under the Health and Safety at Work Act and The Provision of Work Equipment regulations as amended - PUWER 98 Regulation 3 paragraph 3, is only to the extent that we have control over the equipment that we hire. i.e.

- x to provide equipment that is suited to the task,
- x to provide information and instruction on safe methods of work and residual hazards.
- x The equipment being supplied has been inspected and maintained.

APE has no control over how the hirer uses the equipment, or any deterioration of the equipment that may occur during the hire.



**Mini Hammers**  
**No.1**  
**No.2**



**No.300**



**TEP 400**



**500N**  
**600N**  
**700N**



**500**



**Activity : - PILING OPERATIONS**

**Notes:**

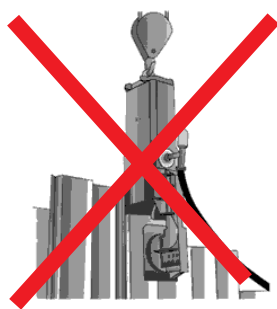
1. The following hazard list applies specifically to the following types of hammer:
  - a) excavator mounted (E MV) type
  - b) suspended (remote powerpack) type
  - c) air hammers
2. The following standards apply specifically to piling operations:
  - a) EN996: 1996 – Piling Equipment – Safety Standards
  - b) BS5228 Part 1 1997 – Noise and vibration control on construction and open sites
3. Many hazards associated with piling equipment can be avoided if a personnel exclusion zone of 15m is maintained around the pile during piling operations.
4. Both the operator and his supervisor should be familiar with the operation of the piling equipment having read the suppliers instruction manual and have received sufficient training prior to commencing work.
5. Personal protective equipment e.g gloves, hard hat, goggles, ear defenders, high visibility jacket etc should be used at all times during piling operations.
6. Pile driving hammers are designed to transfer extremely high loads from the hammer into the pile and the surrounding soil. The forces are so high that without proper maintenance and skilful operation the equipment is considered as self-destructive.

2. AIR Hammers		
Hazard Associated with Activity	precautions to be taken to reduce the risk	comments
Noise	Follow the guidance given in BS 5228 as referenced above. Maintain a 15m exclusion zone as noted above.  Operatives must wear ear defenders at all times  Keep access doors on the compressor shut.	
Fracture and/or failure of components	Regular inspection of the hammer should take place particularly for cracking to the anvil and anvil retaining stops.  Ensure operator has suitable training and experience and is familiar with the suppliers operating instructions.	The hammer should never be run off the pile.  The operator should ensure that the supporting chain remains slack whilst the pile is being driven down
Oil Mist	Correct air line oil lubrication should be maintained  Maintain the personnel exclusion zone when the hammer is operating, do not stand directly in line with the exhaust ports.	
Compressed Air	Ensure all hoses couplings clamps are regularly inspected and in good order Switch off compressor and de compress prior to removing hoses	Ensure that the operators manual for the compressor is adhered to. Use hose retainers to avoid whiplash if hose ruptures during use
Falling components	Maintain 15m exclusion zone when hammer is operating	

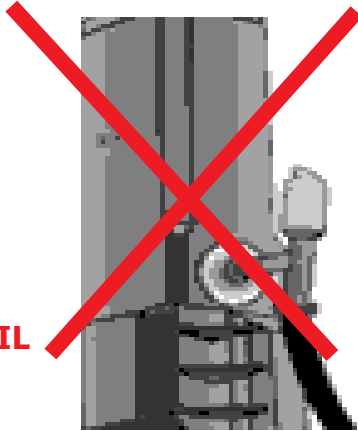


### Common Issues

Location of oil bottle, for all hammers excluding the N Series the oiler goes on the hammer,



**NEVER MOUNT THE OIL BOTTLE ON THE N SERIES HAMMERS**



Serious damage to the hammer may result. Should hose and bottle breakaway then this can be extremely dangerous

### Pollution

This hammer requires constant lubrication (Hydraulic oil - No.1, No.2 and No.300 for all others Engine Oil ) in order to function properly. However, what lubricant enters the hammer also leaves via the exhaust flow. Where this poses a serious problem we can supply oil-fog lubricators which can better regulate the flow into the hammer, ensuring the minimal amount of oil enters the hammer. Where this still produces unsatisfactory results we also offer a range of excavator mounted vibrator hammers which in normal usage does not lead to lubricant loss into the environment.



**Your hammer is leaking oil a seal must have gone!**

**Answer - No, the air hammer is air powered not oil powered.**

**Oil is merely a lubricant what oil goes in comes out!**

### In Operation

NEVER run the hammer off the pile this includes keeping the hammer running whilst moving onto a new pile. This will damage the hammer typically breaking the anvil stops or tie-rods. In the case of hammer that use tie-rods (No.300, Copco 400 and MKT500), such action could lead to the hammer falling apart.



**Your hammer does not bounce on the sheet as much as others I have seen.**

**Answer - It is not meant to. Do not allow the hammer to bounce on the pile. This will damage the hammer and your sheet. If the hammer is bouncing reduce the air supply.**

### Adjustment to suit the pile

The N series hammers feature an adjustable guides arrangement, this should be adjusted using the available drilled holes. Note that the 700N has more positions than the 600N which in turn has more than the 500N.

It is important that these are adjusted such that the hammer sits centrally over the pile (or pair of piles). When supplied by APE we will typically leave a substantial clearance between inserts to make the unit easier to mount. If sheet damage does occur, try tightening this adjustment.

**The leg guides and anvil stops are fabrications the presence of weld therefore does not mean that this component has recently been repaired**

In the event of sheet damage, these inserts must always be opened outwards, to enable easy removal of the hammer. Pulling a hammer off a damaged sheet will only serve to damage the hammer.



## Operating Instructions

There are only two constantly moving parts in the hammer, both of which are controlled by the air flow entering the hammer. When the hammer is given a supply of air, the hammer will start working. However the following precautions will prevent avoidable delays due to breakdown.

Before setting the hammer to work, check that the operating air supply is at the correct pressure and capacity 125 - 150 cfm - No.300 and Copco 400, and a 250 cfm compressor for the MKT500 - working at 90 PSI). Please check that the air supply is:

**CLEAN** - Worn hoses should not be used and always blow the hose out first before connecting it to the hammer - please ensure that safety procedures for hose restraints are employed to prevent injury to personnel. It is important to blow hoses out since debris can be blown into the hammer and **even small particles can reduce the effectiveness of the hammer**

**DRY** - Keep the length of the hose to an absolute minimum to prevent condensate and ensure that suitable drain cocks are fitted to release any condensate from the supply line. **Water in the hammer can lead to the hammer seizing up especially in cold weather.**



Lift the hammer onto the sheet or pile to be driven. If the hammer does not fit correctly or seems to sit on one side of the sheet or pile, please check that the leg guides are correct for the given profile.



Since these hammers are top acting, unsupported piles may lean. This is to be expected as most of the weight is at one end. Should this become to great a problem contact the sheet hire company for details on shoring and support systems.



The hammer should be warmed up slowly, this is achieved by providing a few manual strokes - via the air cock or compressor controls when the hammer is positioned remote to the operator.



Then run the hammer slowly, again by controlling the airflow and then increase the flow until the hammer is working at the desired speed.



There is always the temptation to run the hammer far faster than it is really needed. When the ground is soft you may only need to work the hammer at half capacity, increasing the speed above this level will lead to the hammer 'bouncing' on the sheet or pile - increasing the damage to your sheets/piles.






Do not exceed the maximum speed of the hammer (see table). Pay particular attention to the speed of piling, as in soft ground conditions each blow of the hammer will be more effective and the pile can be driven in, far quicker than the hammer can follow. In such cases excess wear will occur as the hammer will be acting on itself. It is not often easy to rely on a blow count to assess overworking of the hammer, but appropriate selection of the size of compressor will reduce the risk. If the hammer starts jumping on the sheet, reduce the air flow to the hammer.

**If using a biodegradable hydraulic oil, note this is only suitable for the smaller hammers, those that require hydraulic oil lubrication. Be prepared to flush the unit with diesel at the end of each shift, since the degrading oil can clog the hammer.**

**Air hammers are prone to freezing up in cold weather.**

**Be prepared for this and have anti-freeze or Killfrost Oil available.**



-  Likewise, if the ground is hard, the pile may stop moving or its movement be so slow it might as well have stopped. This is called refusal, continuation of piling with this size of hammer is damaging to the hammer and the sheets, since they are absorbing more of the stress. Please contact A.P.E. and order a larger hammer. Please note that you may also need to upgrade your sheets as well.
-  If the pile reaches premature refusal then it will be necessary to loosen up the ground, possibly through drilling. Under no circumstances should the pile be forced further. Alternatively a larger piling device should be used.
-  Finally as with all our pile drivers keep the hammer hoist slack at all times. When this is not adhered to, not only is piling less efficient but the hammer will act upon itself.

### Daily checks and maintenance to be performed by the hirer.

These should be performed whilst the work equipment is not functioning. This is especially true when performing routine maintenance on the clamp. It features a pneumatic clamp which produces a compressive force which can easily bruise fingers, hands or feet. Never place fingers or hands between the hammer body and the anvil block.



Check all bolts and connections visually and tighten where necessary.

Check the eyebolt/ lifting connection at the top of the hammer.

Check that the hammer is well oiled and has received good lubrication

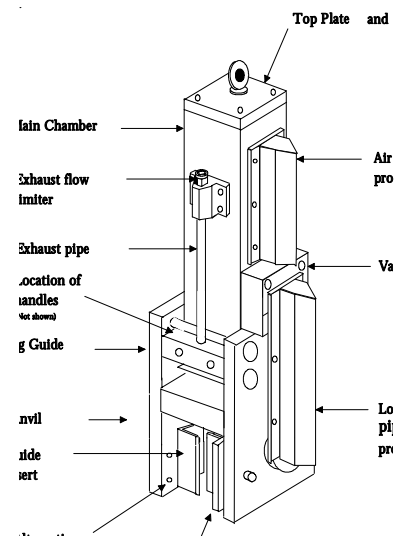
Check for any obvious deterioration particularly the anvil block which receives the most wear.

Piling Equipment in general are highly stressed work equipment being design to exert either vibration and/or impact. Both of which are known to:-

-  reduce the strength or increase the loosening of fittings, which hold the assembly together
-  and accelerate structural deterioration.

Therefore whilst the work equipment has been design and maintained to have superior robustness to suit its application, deterioration can still occur during normal use. This is exaggerated in situations were the equipment is being abused.

Should the hammer appear damaged or its behaviour has become erratic or non functional, you must notify APE immediately for assessment and remedial action.



Hammer	Compressor Size	Blow Count
APE No.1	125 cfm	445
APE No.2	125 cfm	442
BSP N.300	125 - 150 cfm	400
Copco 400	125 - 150 cfm	310
MKT500	250 cfm	300
500N	250 cfm	330
600N	500 cfm	250
700N	600 cfm	225



## Typical forms of abusive damage



**Damage:** Legs splayed and diaphragm plate (normally flat) bent around the diaphragm

**CAUSE:** Hammer used to straighten pile inclination, or hammer pulled off a damaged sheet.

**Solution:** Do not apply side loading to the hammer, not only will this damage the hammer but the heavy anvil may drop out.

Never pull a hammer off a damaged sheet, the leg guides are adjustable - open them up and free the hammer.



**Damage:** Fabricated anvil stops broken away from leg

**CAUSE:** Allowing the hammer to operate off pile, or allowing hammer to bounce.

**Solution:** Control the air supply and never run the hammer off the pile. This damage is always abuse base since in normal operation the anvil is held away from the stops by the pile.

**Damage:** Legs bent

**CAUSE:** Despite being based on a 2" thick fabrication the legs can be bent especially when side loaded for instance used to straighten a pile, or more typically when pulled off a damaged pile

Do not apply side loading to the hammer, never pull a hammer off a damaged sheet, the leg guides are adjustable - open them up and free the hammer.



**Damage:** Legs snapped, although site claimed that the leg fell apart. Note that whilst a fabrication, the member shown broken is a solid piece within the fabrication.

**CAUSE:** Hammer used to straighten pile inclination, or hammer pulled off a damaged sheet.

Do not apply side loading to the hammer, never pull a hammer off a damaged sheet, the leg guides are adjustable - open them up and free the hammer.

