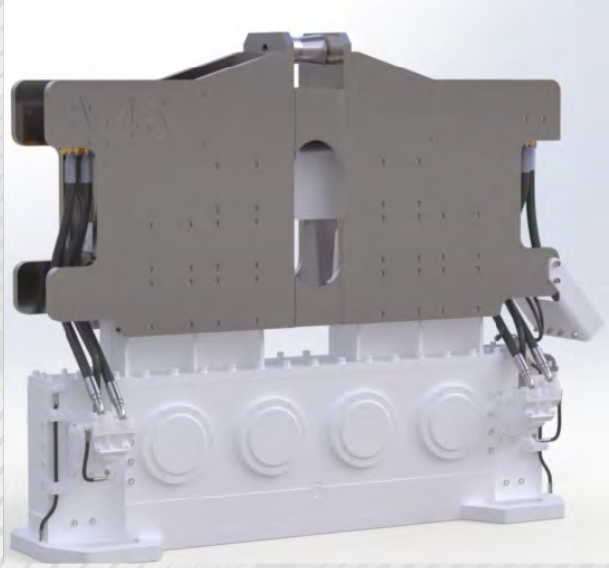
PILECO INC

Operating manual Vibratory Hammer V46-V



Model:	V-46
Serial number:	V-46-HPU-070-0724
Year of manufacture:	2025
Revision:	-
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PILECO INC.

OPERATING MANUAL V46-V

PILECO has the right to change parts of the equipment at any time without prior or direct notice to the client. The contents of this publication are subject to changes without prior notice.
This publication is to be used for the standard version of the equipment only. PILECO cannot be held responsible for any damage resulting from the application of this publication to the version actually delivered to you.

For extra information as to adjustments, maintenance and repair, please contact the technical department of your supplier.

This publication has been written with great care. However, PILECO cannot be held responsible, either for any errors occurring in this publication or for their consequences.

IMPORTANT:
Important safety instructions are marked as shown below:

CAUTION

The meaning of this safety warning is as follows:
Attention! Become alert! Your safety is involved.

If this situation is not avoided, it MAY result in minor or moderate injury.

WARNING

The meaning of this safety warning is as follows:
Attention! Become alert! Your safety is involved.

If this situation is not avoided, it COULD result in injury or even death.

DANGER

The meaning of this safety warning is as follows:
Attention! Become alert! Your safety is involved.

If this situation is not avoided, it WILL result in injury or even death.

PILECO INC.

OPERATING MANUAL V46-V

1. Contents

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OPERATING MANUAL V46-V

1. Preface

This owner's manual has been written for the users of **Pileco** Hydraulic Power Stations. The owner's manual explains which parts are used in the Hydraulic Power Station. If needed parts can be looked up in the parts manual for reordering.
One copy of the owner's manual will be delivered with the Hydraulic Power Station. The document should be stored in a safe place. If needed an extra copy can be ordered at your local dealer.
For ordering of parts model number, equipment serial number and part number are needed.
Please have these numbers when ordering the parts.
If problems arise which are beyond the scope of this manual, please contact your dealer. They are prepared to assist you in order to make the best use of your equipment.
Please have the following at hand:

Model:	V-46
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Year of manufacture:	2025
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2. Safety Instructions

Safety precautions

Regular maintenance and skillful operation will not only lengthen the mechanical life but is essential for the safety of the user and possible bystanders.

WARNING

It is the responsibility of the user or operator to ensure that the local health and safety regulations are observed before and during the use of the equipment.

Operators:

- Only trained personnel shall be permitted to operate the machine.
- Temporary employees and trainees shall only be permitted to work with the equipment under the supervision and instruction of trained personnel.

Owner's manual:

- Everyone who works at or with the equipment should be familiar with the contents of this manual and the manuals of the machines and should follow the instructions accurately.
- One copy of the present manual should at any time be at the location where the unit is in operation.
- The management is under obligation to inform the personnel of the contents of this manual and is obliged to observe all of the regulations and directions.
- Additional manuals are available on request.

Always:

- Lead exhaust fumes outside when operating in a closed area. Continued breathing-in of exhaust fumes may be fatal.
- Pay attention to irregular or unusual noises and analyze where they come from.
- Remove all tools and electrical cords before starting the Hydraulic Power Station.
- Warn colleagues when you feel uncomfortable with the way the Hydraulic Power Station or the driven machine is functioning.

Never:

- Make adjustments or repairs while the system is under pressure.
- Make adjustments or repairs while the engine is running.
- Continue operation when service inspection is due, or when a repair is necessary.
- Continue operation when it is known that any of the safety provisions is out of order or not working properly.
- Leave the remote control unattended.
- Attempt to (dis)connect the quick-disconnect couplers when the engine is running.

Tools:

- Never use defective (maintenance) tools.
- Only use a tool for the purpose it was designed for.

Clothing and footwear:

- When working with the equipment, do NOT wear rings, watches, jewelry or any loose clothing/hair which could be caught in moving or rotating parts.
- Always wear protective goggles, a safety helmet, protective footwear and hearing protection especially suited for the work.
- Keep hands away from moving or rotating parts.
- Take appropriate measures for the ear protection if the sound level of 85 dB(A) is exceeded; always use ear protection when working close to a machine in operation.

Water and Moisture:

- Do not allow water, sand or dirt to enter the hydraulic system.
- NEVER direct a jet of water at electrical parts.
- Make sure all protective devices of the electric installation have been installed to guarantee adequate protection from moisture and water. Failure to do so can cause malfunction of safety circuits and cause harm to personnel and equipment components.
- Avoid internal condensation, in the gear case, by quick temperature changes.

Technical specifications:

- The permissible tolerances as stated in the present manual shall NOT be exceeded.

Safeguards:

- Any safety direction, warning or instruction fitted on the equipment shall NOT be removed, rendered illegible or covered. They shall be present and legible throughout the entire operating life of the equipment.
- Illegible, damaged or covered safety directions, warnings or instructions shall immediately be replaced or repaired.
- The equipment should never be switched ON when the protective covering is incomplete or when the safeguards are not in place.
- All safeguards must be checked at regular intervals and repaired immediately in case of malfunction.

Safety directions and warnings:

- Any safety direction, warning or instruction fitted on the equipment shall NOT be removed, rendered illegible or covered. They shall be present and legible throughout the entire operating life of the equipment.
- Illegible, damaged or covered safety directions, warnings or instructions shall immediately be replaced or repaired.

Service and maintenance:

- The service and maintenance activities shall only be carried out by qualified PILECO personnel or one of PILECO'S appointed and certified dealers in full compliance with all safety instructions and service intervals.
- Use original PILECO Parts and liquids.

Electrical system:

- Work on the electrical system or equipment may only be carried out by skilled electricians or by specially instructed personnel under the supervision of such electricians and in accordance with the applicable electrical engineering rules.

Hydraulic system:

- The hydraulic system is a high pressure, high oil flow system. Work on the hydraulic equipment shall only be carried out by persons having special knowledge and experience in high pressure hydraulic systems.
- When bleeding hoses or looking for leaks, take protective measures. Escaping oil under pressure, even a pin-hole size leak, can penetrate body tissue, causing serious injury.

Use according to purpose:

- To guarantee correct operation, the equipment should only be used in accordance with the purpose as described in this owner's manual.

Fire or explosion prevention:

- Hydraulic oil and diesel fuel are flammable. Therefore:
- Do not weld or flame-cut on pipes or tubes that contain flammable fluids. Clean them thoroughly with non-flammable solvent before welding or flame cutting on them.
- Clean and tighten all electrical connections. Check regularly for loose or frayed electrical wires. Wiring must be kept in good condition, properly routed and firmly attached. Routinely inspect wiring for wear or deterioration. Loose, unattached, or unnecessary wiring must be eliminated.

WARNING

Never smoke when filling the fuel tank or use flames in the vicinity.
Never store flammable liquids near the engine.

Work area:

- Place the Vibratory hammer in a safe place.
- Position the Hydraulic hammer in such a matter that eye contact with the Hydraulic Power Station is assured.
- Keep the work area clean. Keep the equipment accessible and make sure that the area surrounding of the equipment is kept clean.
- Always be extremely careful when using a carbon tetrachloride fire extinguisher in a closed area, as it may produce toxic vapors and/or deplete the area from oxygen.

Safety instructions

	HAZARD DESCRIPTION
	**Safety sign** Read the operation manual
	**Risk for short circuit** Disconnect power source before opening dashboard
	**Make sure the machine is in good condition** Read the maintenance instructions in the owner's manual for proper service procedures
	**High noise level** Use ear protection
	**Surface can be hot** Do not touch, allow the surface to cool down
	**Fire risk** Keep machine clear of oil rests, be careful when handling fuel and hydraulic oil
	**Component is pressurized** Depressurise before maintenance
	**Risk of burns resulting from dangerous liquids or chemicals** Wear protective gloves

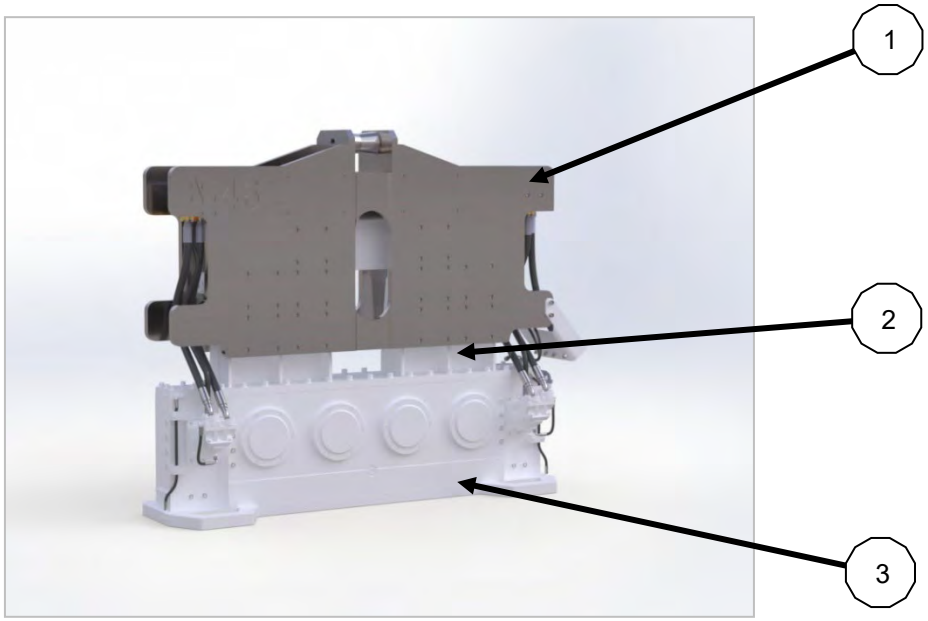
	HAZARD DESCRIPTION
	Risk for imbalance Slippery surface Use adequate climbing device

3. Description

Description of the Vibratory hammer

This part of the manual contains the description of all standard vibratory hammers delivered by Vigor piling.

Main Components



1. Suppressorhouse assembly
2. Suppressor assembly
3. Vibrationcase Assembly

Vibration case

The vibration case contains eccentric weights which rotate in a vertical plane to create vibration. The eccentric weights are driven by one, two or more motors. The motors and the eccentrics are synchronized by gears. The shafts are mounted in heavy roller bearings. Lubrication is provided by a splash lubrication or by a forced lubrication system.

Suppressor housing

The suppressor housing, or extraction head, contains rubber elements (elastomers) to isolate the vibrations from the gear case to the crane or piling rig. The hammer is attached to the crane with a steel wire rope sling.

Suppressor

The suppressor binds the vibration case to the suppressor house by rubber elastomers.
It also contains channels for hydraulic and lubrication oil.

Rigging of the vibratory hammer

A steel wire rope sling must be connected to the lifting pin on the suppressor housing. The required strength of this sling depends on the capacity of the crane and the work to be carried out. A safety factor of five is recommended. Several turns of a smaller diameter cable will usually last longer than one turn of a larger diameter cable. Daily check the steel wire rope sling for damages. Immediately replace damaged steel wire rope slings. Always check for local regulation(s) on steel wire rope slings.

Operation

When the vibratory hammer is connected to a piling rig, excavator or other equipment to control the hammer. Please refer to the operating and maintenance manual of that machine.

CAUTION

Make sure to have clear view over the vibratory hammer and the working area. Ensure that communication between the crane driver and other operators is always possible.

WARNING

Stay clear from the direct surrounding of the vibratory hammer during operation.

Clamping a pile

Position the vibratory hammer first over and then on the sheet pile, make sure the full clamp jaw surface is on the pile. Turn the clamp switch to close. Don't start operations before the hydraulic clamp has reached the maximum pressure. The clamp pressure is achieved when the lights on the power pack will light up and stay on. The lights will normally light up in a few seconds.

Always use a safety chain or sling between the sheet pile or tube and the piling rig.

Starting stopping the vibro

Start
Close the clamp
Increase engine speed/(pump flow) to at least 1200 rpm(50%)
Select start on remote or local control

Stop
Select stop on remote or local control

CAUTION

Always allow the machine to warm-up by running at reduced rpm for 5 minutes before you start working with it.

Changing the vibro speed

In order to provide maximum flexibility in achieving optimum piling penetration and extraction rates, the rpm's from the vibratory hammer is adjustable. The rpm's can be changed by adjusting the engine speed. The engine speed can be changed by the rpm +/- switch.

Releasing the pile

Turn the clamp switch to open hold the button to release the hydraulic clamp so that the vibratory hammer can be removed from the pile. Never try to open the clamp before the vibratory hammer has come to a complete stand still. Make sure, the pile or tube cannot drop from the clamp when the clamp is opened.

CAUTION

Check if lifting line is slightly under tension before the clamp pressure is released. Do not turn the clamp open switch to open until a visual check indicates that the vibratory hammer has stopped.

Emergency stop

For an emergency stop, press the button on the power pack frame, dash board, or remote control.

CAUTION

Before continuing operation reset the emergence stop button by turning it clockwise. Always reset the emergence stop button immediately after the hammer and power pack have been shut down completely.

4. Special operations

Operating at low temperatures

When using the hammer at low ambient temperatures, below 10°C, please make sure you follow the next instructions:

Allow the equipment to warm up, never start the hammer at maximum speed when you start working.
Make sure the bearings get enough oil when the hammer is equipped with forced lubrication. Open a plug furthest from the pump or a hose to see if oil is getting too the bearings.
The lubrication oil may be changed for an oil with lower viscosity. Make sure you have the correct viscosity at operational temperature.

In case of doubt, you can measure hydraulic oil and vibration case lubrication oil temperatures and contact your local dealer.
Check also at higher temperatures because the vibratory hammer warms up very rapidly at full speed and working pressure.

CAUTION

Hydraulic and gearbox oil temperatures should never exceed 90 degrees Celsius

Operating underwater up to 10 mtr. Depth

It is recommended to contact your local dealer before you start under water operations. Pay attention to the following when you start working under water with a vibratory hammer:

- Make sure that the vibration case ventilation is above the water surface level.
- The vibration case ventilation hose diameter must be at least 1.5 x nominal diameter.

CAUTION

Watch carefully that the hammer is not warm when lowered through the water line during driving. This may cause thermo-shock and damage the vibration case.

CAUTION

High pressure in the vibration case can damage the case or cause leakage.
Pressure difference inside/outside Vibrationcase should never exceed 1 bar.

CAUTION

Check lubrication oil regularly during and in case the underwater work is finished. Water may also enter the vibration case as condensate from non-dried compressed air. If the lubrication oil turns white or grey water has entered the case and the lube oil should be replaced.

Operating underwater below 10 mtr. Depth

For vibratory hammers that have to be operated in deep water you need to install an air regulating system.

Connect the air regulating system to an air compressor with an air buffer.
The air pressure, in bar, you need under water is 0,1 of the water depth in meters. For example, 150 meter water depth means you need at least 150 x 0,1=15 bar pressure in the vibration case.

It is recommended to contact your local dealer before you start under water operations. Pay attention to the following when you start working under water with a vibratory hammer:

- Check the seals, gaskets and O-rings on the vibratory hammer.
- Check all bolts and nuts on the vibratory hammer.
- Remove the vibration case breather and replace it by a safety valve from ± 0.5 bar, the pressure in the gear case will then not go over 0.5 bar.
- Check for any possible leakage by increasing the pressure in the vibration case, not more the 0.5 bar.
- Check the oil level in the vibration case.
- Check all hydraulic hoses for leakage.
- Connect the vibration case to a compressor and increase the pressure in the case to 0.5 bar overpressure.
- When the hammer is 5 MTR. below the water line increase the pressure to 1 bar overpressure.
- Check the oil level regularly during under water operation. If the oil becomes white or grey check immediately for leakage and replace the oil.

WARNING

By lowering and retrieving the hammer be aware of the maximum speed. When lowering the hammer, the compressor needs to fill the vibration case with air, fast enough to get an overpressure. By retrieving, the pressure relief valve needs to let the compressed air out of the vibration case.

5. Maintenance

WARNING

Regularly maintenance increases the life span and the output of the vibratory hammer, and is essential for the safety of the user and possible bystanders. Before starting maintenance, make sure the machine has cooled down, the working area is safe and clean, and the system is depressurized. Install a DO NOT OPERATE or similar warning label to the ignition switch. Turn off the main switch.

General

Preventive maintenance includes normal servicing that keeps the vibratory hammer in good operating condition and prevents unnecessary breakdown.

Lubrication is essential for the system, determining to a great extent life of the vibratory hammer. Therefore it is important that the instructions regarding types of oils and exchange intervals are closely adhered to.

- Prevent dirt from entering lubricants and the hydraulic system.
- Thoroughly clean all lubrication fittings, caps, filter plugs and level plugs and their surrounding surfaces before servicing.

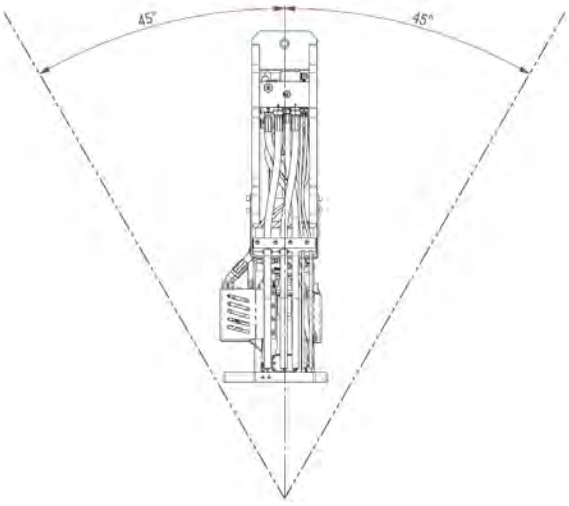
Daily maintenance

The daily instructions apply to routine or daily starting of a vibratory hammer. Each day, or at the beginning of each shift, check the entire vibratory hammer before start up, after start up and during operation.

Before start-up

- Inspect all bolts, nuts and screws. If necessary tighten.
- Check oil level of the vibration case. If necessary fill to proper level. Oil level should be between the middle and top of the sight gauge.
- Check all hoses for signs of damage or cuts that may cause hose failure during operation. Be sure all connections are tight.
- If the first layer of steel from a hose is damaged you should replace it.
- Check all elastomers on cracks, if cracked you should replace it.
- Visually check on cracks in metal parts.

To make sure bearings are lubricated before use we advise to flip the vibro over from left to right.



After start-up

- Check all hydraulic hoses and connections for leaks. Make sure the hoses are free to move when the hammer is lifted up.
- Check the connections on the Vibratory hammer and the manifold inside the Vibratory hammer.

During operation

- Be alert on rattling noises. These may indicate that there is something loose. Bolts, nuts, screws or covers, stop the equipment and check the vibratory hammer.
- Strange noises can also indicate on vibration case failures.
- Watch the hoses that they can move freely during work.

Weekly maintenance

- Tighten all bolts on the hammer and the hydraulic clamp. Always use the right torque for the bolts and the nuts.
- Check the air breather from the vibration case. If necessary, clean the breather with diesel fuel.

Monthly maintenance

- Check the forced lubrication system on a proper functioning by removing a plug or hose on the pressure side of the pump.
- Look in the system from the power pack if the vibratory hammer needs inspection or maintenance.
- Check filters and oil on parts that indicate there is too much wear in the vibration case.

Yearly maintenance

- Have the hydraulic oil analyzed. Replace fluid if required.
- Replace the forced lubrication pump if this is on the vibratory hammer.
- Check all safety valves and settings for the right adjustments.

CAUTION

Any contamination of the hydraulic fluid will drastically shorten the life of the hydraulic system.

Lubrication intervals

INSPECTION INTERVALS BASED ON OPERATING VIBRATORY HAMMER					
	Normal conditions		Heavy conditions		Min.
	First	Interval	First	Interval	
Oil level	Check level		Check level		Daily
Filter gear case	25	100	10	50	Yearly
Lube. Oil pump	monthly		Every 2 weeks		Yearly
Hoses	Check for damaged steel wires				Daily
Clamp	Check for leaks and cracks				Daily
Elastomers	Check for cracks				Daily
Bearings		500		250	Yearly
Actuator		500		250	Yearly

CHANGE INTERVALS BASED ON OPERATING VIBRATORY HAMMER					
	Normal conditions		Heavy conditions		Min.
	First	Interval	First	Interval	
Oil level	50	200	25	200	Yearly
Filter gear case	50	200	25	200	Yearly
Lub. Oil pump		500		500	Yearly
Hoses	Exchange when first layer is damaged				Every 2 years
Elastomers	Exchange when small hair cracks are visible				Every 5 years
Bearings		1000		500	Every 3 years
Actuator		1500		1000	Every 3 years

- When operating in an environmental air with high salt or moisture content, the service intervals need not to be changed. However, unit shall be thoroughly inspected weekly to determine what additional servicing, if any, might be required.
- During stand by or inactive periods, the service intervals may be extended twice from those specified.

Heavy driving conditions

The following conditions are to be considered heavy driving conditions. The temperature from the vibration case can rise under extreme conditions to 90°C or more. Please contact ALLPACKS for recommendations on lubrication oil and special instructions.

- Temperatures above 30°C or below -20°C
- Working days of more than 8 hours per day
- A vibratory hammer that is mounted to a leader
- Soil compaction, installation of drains or diaphragm walls, etc.
- Rebound

Longterm storage

If the vibratory hammer is not been used for a period of 2-3 months, the gear case should be filled with any kind of oil. Take out the lubrication oil and fill the case with any cheap oil. Make sure that all the bearings are below oil level. The best way to store the hammer is vertically with the head a little bit higher than the case. This way you are sure the bearings are not trapped in an air gap. If you are not able to fill up the gear case, make sure you run the hammer every 2-3 weeks.

Hydraulic oil

Up on customer demand we can delivery any type and brand of hydraulic oil. See also inside the power pack for the right specification from the hydraulic oil that is in your equipment. When you replace the hydraulic oil for another brand or type please use a fluid with the following specifications:

If you use the equipment in extreme cold or hot conditions you may use a different viscosity oil which is better adapted to adverse conditions. If you work under very cold conditions it is recommended to use any kind of heater to preheat the oil before you start the equipment.
Contact your nearest oil supplier to help you, or contact your local dealer.

Biodegradable hydraulic oil

You can use biodegradable oil if it is an ester type oil with the same specifications as the mineral oil used by all PILECO equipment.
Please contact your local dealer if you have any doubt or contact your local oil supplier.

Vibro lubrication oil

The level is easily read through the level gauge on the long side of the vibratory case. Under normal conditions and temperatures the level should be in the middle of the level gauge. Due to high operating temperatures the most preferred lubrication oil is a synthetic lubricant. They have good oxidation stability and also provide considerably longer service life than natural lubricants. The vibration case oil installed at the factory is Total SH 460 for splash lubrication. For forced lubrication we install total SH 220. When replacing the oil please us an oil with the following specifications:

Maintenance of hydraulic circuit

CAUTION

Check all connections, fitting and hoses regularly for leaks and damaged parts. Repair immediately because spilled oil may cause injuries, fire and contaminations.

Bolt torque

The following torque specifications apply to the bolts from the vibratory hammer listed in the parts manual. When any of these bolts are replaced the torque given in the tables should be adhered to.

Bolts with coarse pitch							
		Tightening force, kN			Tightening moments, Nm		
Diameter	Pitch	Class	Class	Class	Class	Class	Class
Mm	mm	8.8	10.9	12.9	8.8	10.9	12.9
M6	1.0	8.2	11.6	13.9	10	14	16
M8	1.3	15.0	21.1	25.3	23	33	39
M10	1.5	23.8	33.4	40.1	46	64	77
M12	1.8	34.5	48.5	58.2	78	110	132
M14	2.0	47.3	66.5	79.8	125	176	211
M16	2.0	66.2	93.1	112	198	278	333
M18	2.5	81.3	114	137	275	387	465
M20	2.5	103	145	174	386	542	651
M22	2.5	128	180	216	522	734	881
M24	3.0	149	209	251	667	937	1125
M27	3.0	194	273	327	966	1358	1630
M30	3.5	237	333	400	1318	1854	2225
M33	3.5	293	431	517	1788	2628	3154
M36	4.0	345	507	609	2297	3377	4053
M39	4.0	412	606	727	2950	4338	5205
M42	4.5	473	696	835	3669	5394	6473
M48	5.0	623	915	1098	5504	8091	9709
M56	5.5	857	1261	1513	8842	12999	15599
M64	6.0	1130	1662	1994	13199	19405	23286

6. Ordering parts

Procedure

When ordering parts, be sure to include the model and serial number of the unit or component. Confirm all telephone and/or e-mail orders immediately to avoid duplicating shipment.

Original equipment

Where serial numbers are given, these numbers only apply to equipment and components originally furnished with the unit. Where equipment has been changed or added to, these numbers may not necessarily apply.
Replace broken parts only with Vigor Original replacement parts.

Shipment

State to whom shipment is to be made and method of shipment desired, otherwise our own judgment will be made.

Shortages

Claims for shortages or errors shall be made immediately on receipt of parts. No responsibility will be assumed for delay, damage or loss of material while in transit. Broken, damaged or loss of material shall be refused or a full description made of damage or loss to the carrier agent on the freight or express bill.

Return of parts

If for any reason you desire to return parts to the factory or to any distributor from whom these parts were obtained, first ask permission to return the parts. Shipping instructions will be given along with this permission.

Screws and bolts

Almost all connections on the unit are made with metrical threads. These screws are available at most industrial supply houses.
Some screws or bolts require a specific torque when replacing. For identification of these bolts and a more thorough understanding of torque look in the operating manual of the engine or from the impact hammer.

Abbreviations used			
BHCS	Button Head Cap Screw	HSSS	Hex. Socket Set Screw
FHCS	Flat Head Cap Screw	PHMS	Philips Head Machine Screw
FLCS	Flanged head Cap Screw	RHMS	Round Head Machine Screw
HC	High Collar	SHCS	Socket Head Cap Screw
HHCS	Hex. Head Cap Screw	SHPP	Socket Head Pipe Plug
HHPP	Hex. Head Pipe Plug	SHSS	Socket Head Shaller Screw

Hoses

For the right hoses see the parts manual from the Hydraulic Power Station or call Vigor piling for the right hose.