

Instruction Safety Manual

Quantum Pile Driver

800 /1000/1200



Pre - Caution:

- To work with this machine, operators must read and fully understand this instruction manual. They must be well trained in the use of this machine.
- All safety controls must be in place before startup.
- Operators and owners must read this manual and other supporting material provided by the Manufacturer.

This manual provides best practices for operating and maintaining your Quantum Pile Driver

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INTRODUCTION

1- GENERAL INFORMATION

The Quantum pile driver is a new machine for the driving of guardrail/solar posts. It is precisely designed as a self-propelled machine able to use a remote control or GPS location system. The machine is very stable because it is supplied with a safe and reliable rubber crawler track. The use of high quality components guarantees high performances on any type of ground or road surface, and therefore the machine gets the advantage of satisfactory quality and quantity work in construction sites. Speed and precision movements of the machine is example of this.

The company **innosis** (hereafter mentioned as 'Manufacturer') designed and realized the machine respecting appropriate safety rules with the precise intention to safe-guard the operation personnel while operating the machine. At all times, the Manufacturer has the right to modify the pile drivers in production, with the purpose to improve the product without any obligation to inform the Customer and neither to readjust the machines constructed previously.

Every pile driver is supplied with a copy of this instruction manual, which must be read very carefully before using the machine. Lack of knowledge about its operating system and its function, and therefore improper and/or incorrect use of the machine may cause accidents with damages and consequences to the operator and to the pile driver itself. Every pile driver is supplied with all the manuals and handbooks of use and maintenance concerning some of the components applied on it. All manuals are integrating part of this manual and should be kept together with this one in one single case. Therefore, even if the Manufacturer provides all the information concerning the pile driver when the machine is supplied (function, use and maintenance) the customer must read all the manuals and observe the contained instructions.

2- WARRANTY

The company Innosis guarantees that the Pile Driver is exempt from defects. It has been submitted to testing before its delivery to the Customer. The warranty has a one-year validity starting from the indicated date on the fiscal document of delivery. The accessories and tools of the machine are not covered by the warranty. When the Customer receives the machine, they must check every part of its integrity and completeness. All complaints should be notified to the Manufacture in writing within 8 (eight) days from the receipt of the pile driver.

Within the warranty period, the Manufacturer undertakes to manufacture, without any charges and at its location, spare parts in case of damages due to fabrication or material defects. Should it not be possible to substitute the spare parts in its own location, the Manufacturer will send personnel to the Customer's office or directly to the construction site. The investigation of the defect can only be carried out by the Manufacturer or by authorized Manufacturer personnel. It is necessary to remember that defective parts will remain the Manufacturer's property.

INNOSIS WARRANTY

Innosis or any of its subsidiaries warrants the following new products sold by them to be free from defects in material and quality and workmanship.

For the warranty to be valid, all equipment must be checked daily. These daily checks must be recorded on the daily check sheet or on a suitable software. These records must be kept safe as it becomes the machines track history.

This warranty does not apply to:

- Ground Engaging tools, wear plates, cutting edges, crushing and pulverize knives, any impact tool.
- Steel or Rubber tracks and tires and their components.
- Damage to hydraulic hoses caused by wear and tear.
- Hydraulic fittings

- Filters, and all fluids
- Any item that has not been operated in accordance with this Operators Manual.

Warranty Period

- For all equipment sold, the warranty period for the engine is 12 months or 1000 hours, whichever comes first. Starting from the date of delivery to the first user.
- For new parts and assembled components, the warranty period is 12-months or 1000 hours, starting from the date of delivery to the first user.
- For the attachments installed on the machines before or after the delivery, the warranty period is 12-months or 1000 hours, starting from the date of delivery to the first user.

Note:

- For hydraulic line's quick connect/disconnect components sold on Solar/Guardrail Pounders, the warranty period is three months or 50 hours (whichever comes first) starting from the date of delivery to the first user.

Innosis Responsibilities

If a defect in material or quality is found during the warranty period, Innosis will, during regular working hours and at a place of business of Innosis personnel or other source approved by Innosis:

- Replace (at Innosis's choice) new, remanufactured, or Innosis approved repaired parts or assembled components needed to correct the defect.

Note 1: New, remanufactured, or Innosis approved replacement parts provided under the terms of this warranty are warranted for the remainder of the warranty period applicable to the product installed, as if such parts were original components of that product. Items replaced under this warranty become the property of Innosis will:

- Replace lubricating oil, filters, antifreeze, and other service items made unusable by the defect.
- Provide reasonable and customary labor needed to correct the defect, including work for removal and installation when necessary to repair.

User Responsibilities

The user is responsible for:

- Provide daily precheck start-up sheets.
- Transportation costs to an approved repair contractor.
- Parts shipping charges above those that are considered usual and customary.
- Local taxes, if applicable.
- Costs to investigate complaints unless the problem is caused by a defect in Innosis material or quality.
- Give timely notice of a part(s) failure and promptly making the product available for repair.
- Performance of the required maintenance (including proper fuel, oil, lubricants, and coolant) and items replaced due to normal wear and tear.
- Allowing Innosis access to all electronically stored data and reports.

Limitations

Innosis is not responsible for repairs if:

- Failures resulting from any use or installation that Innosis considers improper.
- Failures resulting from attachments, accessory items, and parts not sold or approved by Innosis.
- Failures resulting from abuse, neglect, and improper storage (including installation of parts and assembled components in contaminated systems) or repair (including breakage of components because of being hard-faced or improperly welded).
- Failures resulting from the normal wear of manufactured products.
- Failures resulting from users' delay in making the product available after being notified of a potential product problem.
- Failures resulting from unauthorized repair or adjustments and unauthorized fuel setting changes.
- Repair of components sold by Innosis that is warrantied directly to the user by their respective Manufacturer. Depending on the type of application, specific exclusions may apply. Consult your INNOSIS dealer for more information.
- Any hammering or steel on steel engagements.
- Failure to supply daily inspection sheets

This warranty covers every significant component of the products. Claims under this warranty should be submitted to a place of business of a Innosis dealer or other source approved by Innosis. For further information concerning either the claims or Innosis as the issuer of this warranty, write to Innosis.

Innosis's obligations under this Limited Warranty are subject to, and shall not apply in contravention of, the laws, rules, regulations, directives, ordinances, orders, or statutes of the Türkiye, or of any other applicable jurisdiction, without recourse or liability concerning Innosis.

In the case that the replacement is carried out at the Customer's location or in the construction site, the defect parts have to be sent back to the Manufacture, intact, without any breaking and without any transport charge to the Manufacture;

In the case that the defect parts won't be returned to the Manufacture within 30 (thirty) days (from the date of receipt of the new ones), the company Quantum keeps the right to invoice the new parts shipped.

The warranty is not recognized:

If other manufacturers approved or recognized commercial components not produced by the Manufacture, and therefore the Customer has to refer to the warranties released by the respective Manufacturers;

During the transport, as the pile driver travels under the responsibility of the Customer;

If the failures are caused by an improper or incorrect use of the pile driver, by the carelessness or lack of experience of the operator;

If the failures are caused by normal wear-out even if the machine is out of service;

In the case of a belated notify a defect part due to construction;

In the case of accidents or in case of circumstances beyond one's control.

The warranty declines if:

The instructions and norms contained in this manual as well as in all the other manuals enclosed are not respected or carried out;

The expected maintenance is not carried out;

3- ABOUT THIS INSTRUCTION MANUAL OF QUANTUM PILE DRIVER

This manual should be kept safe, clean and complete in every part of it and kept in an appropriate package, placed on the machine chassis, ready for any consultation. While reading, some instructions may occur incomprehensible, it is appropriate to contact the manufacturer who provides all the desired information. The Manufacturer keeps the right to modify the manual in case there are new law rules (machine directive), concerning technical contents or simply to improve the comprehension.

The contained signals in the manual:

- ❖ The word **ATTENTION** stands for an actual possibility of risk. This means that the operator must be careful and use common sense. The information written in this document must be absolutely known by the operator;
- ❖ The word **IMPORTANT** means that the subject needs to be absolutely understood by the operators;
- ❖ The word **NOTE** indicates that the treated matter can make it easier for the operators to carry out their work.

In the case that part of the contents give rise to controversies, the valid text to refer to remains the one written in the English language.

ATTENTION

It is the purchasing company(s) responsibility to prepare their own Standard Operation Procedures (SOPs), based on this instruction Manual and their working conditions to comply with the local regulations and laws at work.

RISK ASSESSMENT

It is the user's responsibility to do their workplace risk assessment based on their countries health and safety work act/law/regulations. It is highly recommended users contact local authorities in this matter.

4- Quantum PILE DRIVER

The Pile driver has a metallic plate, placed well in sight on which the identification data of the machine are punched. It contains:

- Name of the Manufacturer
- Model of the machine
- Serial number
- Construction year
- Power of the engine in kW
- Weight in Kg

IMPORTANT:

It is absolutely forbidden to alter and/or erase the information punched on the identification plate or those punched on the machine's components. Such data is indispensable when spare parts from the Construction Company are requested.

5- STANDARD EQUIPMENT AND ACCESSORIES ON REQUEST

Standard Equipment

- Supporting foot on column base
- Extractible and reversible pile guide bearing
- Hydraulic Tracks with automatic brakes
- Pile height guide measured in millimeters

- Flashing Safety indicator light
- Working Light
- Accessory Power Plug
- Maintenance Toolbox
- Standard pile hammer and pile head
- Standard pile hammer template
- Proportional hydraulic valve
- Longitudinal inclination of the column
- Engine Cooling Liquid

Accessories

- Hydraulic Rock Drill
- Hydraulic Concrete Core Barrel
- Full functional remote control
- Templates for any type of pile section
- Post Extractor (Balanced/Hydraulic)

6- MANUFACTURING ELEMENTS

The main elements of the pile driver can be grouped as:

Chassis group: This is a complex structure of which take part: the basis level, the fuel and hydraulic oil tanks, the slide with its components, the column with its components and the hammer group. All the components of the chassis group are built with high quality components and therefore highly reliable and functional.

Undercarriage: The whole chassis group of the pile driver is set up on a crawler undercarriage, which makes it possible to move the machine. Other complete equipment are installed on the undercarriage and all these elements make the pile driver a 'complex machine'. It is able to move itself also on difficult grounds that often are not adapted to vehicles on wheels. Besides the chassis structure, the crawler wheels (two) are also parts of the undercarriage. They are necessary for the transmission of the motion. Every single one is composed with a dynamic oil engine, a reducer with a negative brake (this means that the brake is automatically in function, so the machine can't move when it's operating), a gear wheel, two little crawler tightening

wheels and two rubber crawler tracks, which receiving the motion and being the only components that adhere to the ground, are the ones which definitely move the pile driver.

Engine: This is mounted on the base level of the chassis group and an engine bonnet, which protects it and can be locked but can be opened manually. All the technical information about the engine is mentioned in the maintenance section of this manual.

For further details on the engine refer to the engine manual.

7- MAIN COMPONENTS AND TECHNICAL DATA

The main components of the pile driver are as follows (refer to figure 2):

1. Identification plate
2. Slide
3. Column Orientation
4. Pile Hammer
5. Hammer
6. Column Movement
7. Telescopic Mast
8. Traffic Indicator
9. Engine Room
10. Crawler Tracks
11. Control Levers
12. Accelerator Lever
13. Starter Frame
14. Protection Bar
15. Column Translation

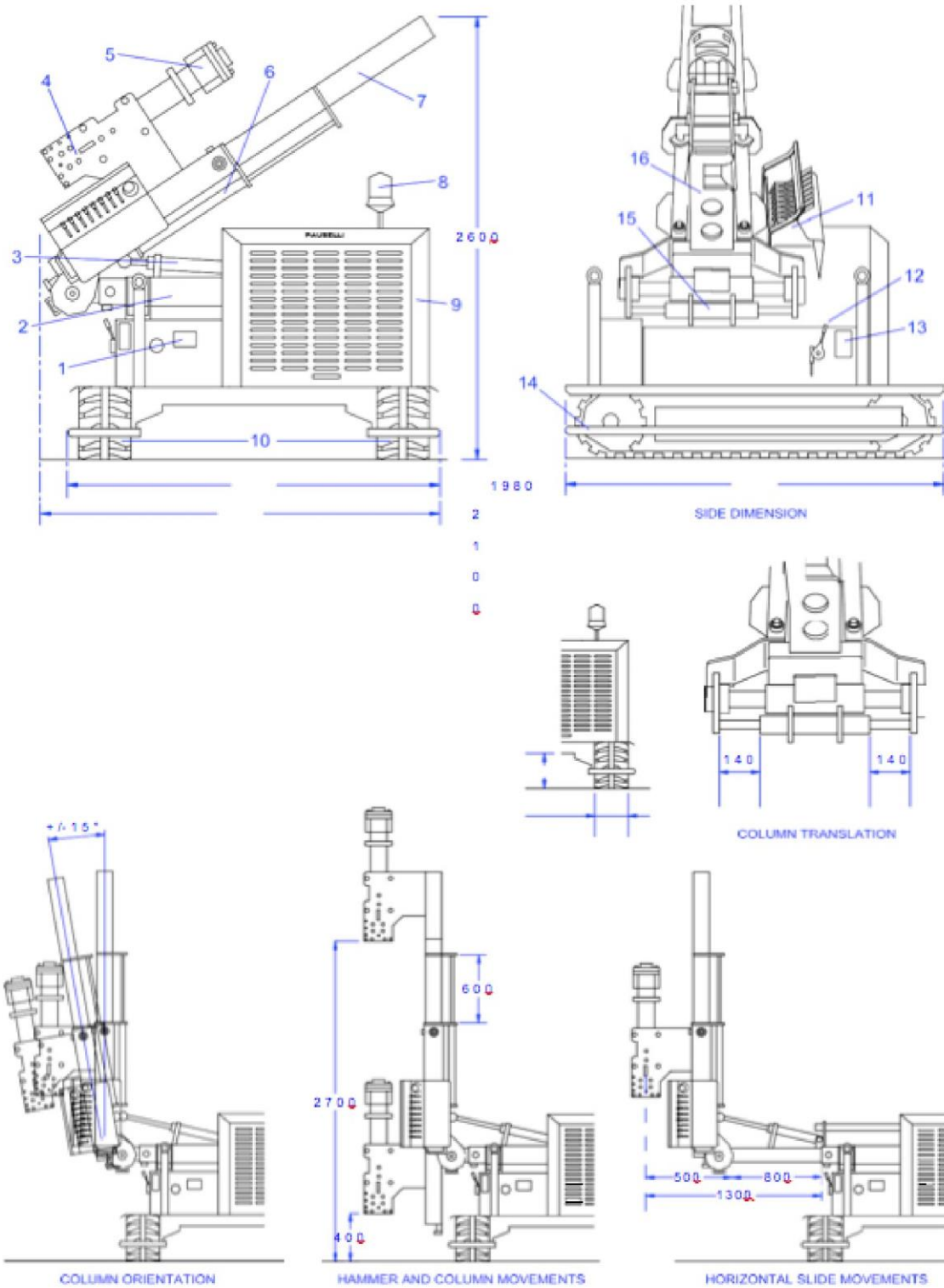


Fig.2 Pile driver main components

SAFETY INSTRUCTIONS

1- FUNDAMENTAL RULES

It is mandatory to read these instructions carefully and completely and ensure they are understood.

Accidents are unlikely to happen when the general safety rules are known, implemented and practiced. Before operating the machine, it is mandatory that ALL safety tests be undertaken thoroughly.

The Pile Driver must be **entrusted to a competent, qualified, and trained personnel. The Manufacturer is not responsible for accidents caused by carelessness of the personnel, improper or incorrect use of the Quantum Pile Driver, or the failure of the safety rules. Furthermore, the warranty of the machine would immediately be void.**

2- SAFETY PRECAUTIONS FOR THE PILE DRIVER

2-1 Transport

Quantum Pile Driver is exceptionally practical and useful self-propelled crawler machine. However, strict safety precautions are required. It is highly recommended to use a remote control unit to load/unload if supplied. The movement of the pile driver on the road is totally forbidden unless on a construction site or control area by signal ribbons. This means that outside the construction site, the pile driver has to be transported on a vehicle.

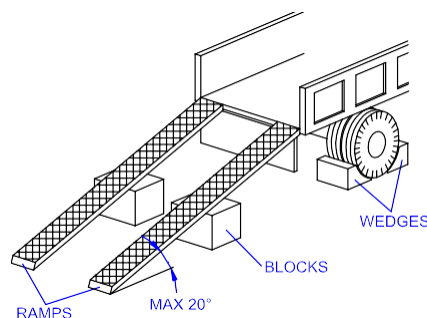


Fig.3 Pile driver anchoring point

Without the remote control the operator must position themselves in a safe location to allow them to control the machine.

The loading and unloading of the machine on the vehicle happens with the help of ramps (shown in the figure 3) anchored on the vehicle.

Using a Crane is not recommended for loading or unloading the machine

This process can be done via two different functions, manually or with the remote control unit.

We highly recommend using remote control, as it is deemed to be the safest practice.

It is the user's responsibility to do their workplace risk assessment based on their country's health and safety work act/law/regulations. It is highly recommended users contact local authorities in this matter. (Please see example on page 74)

Both operations (loading and unloading) always involve high-risk situations so it is necessary to use a lot of caution during the transporting and to observe, always, the following **precautions:**

- Prior to any transporting make sure that it all activity is happening on flat ground and in a safe distance from the edge the edge of ditches and steep slopes.

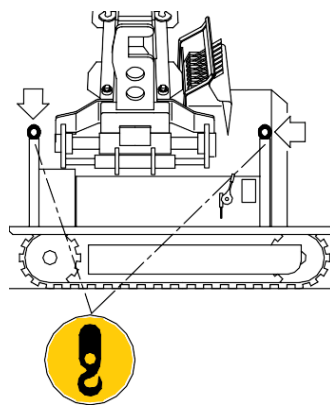


Fig.4 Pile driver anchoring point

Using ramps for loading/unloading

- It is crucial to assure that ramps have sufficient hanging load strength equivalent to the total weight of the pile driver, quoted on the identification plate

- Before starting any loading and movement, it is essential to assure cleanliness of the ramp surfaces from trace of oil, grease, ice or soil
- Make sure that ramps are firmly anchored to the vehicle, placed parallel to each other and positioned with an angle of maximal 30°
- After loading, make sure that the vehicle's engine is off and the machine must be immobilized by means of tie rods or chains attached in the rings or points of anchorage or lifting
- Make sure of using appropriate signals like relative pictograms (representing a hook), like those showed in the figure 4
- Make sure the transporting vehicle is blocked with wedges placed in front and behind every wheel (figure 4)

Both loading and unloading operations require to be carried out by qualified/competent personnel, trained for the job and with full regard to the safety rules. The manufacturer's responsibility such as warranty will void immediately, in case an accident happens because of lack of safety precautions.

It is important to assure a precise configuration of transport and movements in order to keep weight balance on the movement and lifting operation. This can be achieved at best practice

- a) If extended, return the slide completely retracting the relative ram at the end stop point
- b) Return the column completely by retracting the relative ram at the end stop point
- c) At the end, set down carefully the entire column in its rest position, retracting the relative the operator should lower the **protection screen (optional)** to have access to the starter frame, placed on the basis level as shown in the figure. Such screen is designed and applied on the machine essentially for the protection of the operator when he stands by the control post and the machine is in movement, against feet injuries that could be caused by the rubber crawler tracks. At the same time, when the machine is still and the engine off, this screen protects the starter frame and all the controls placed in its closeness end stop point

2-2 On-Site Movements

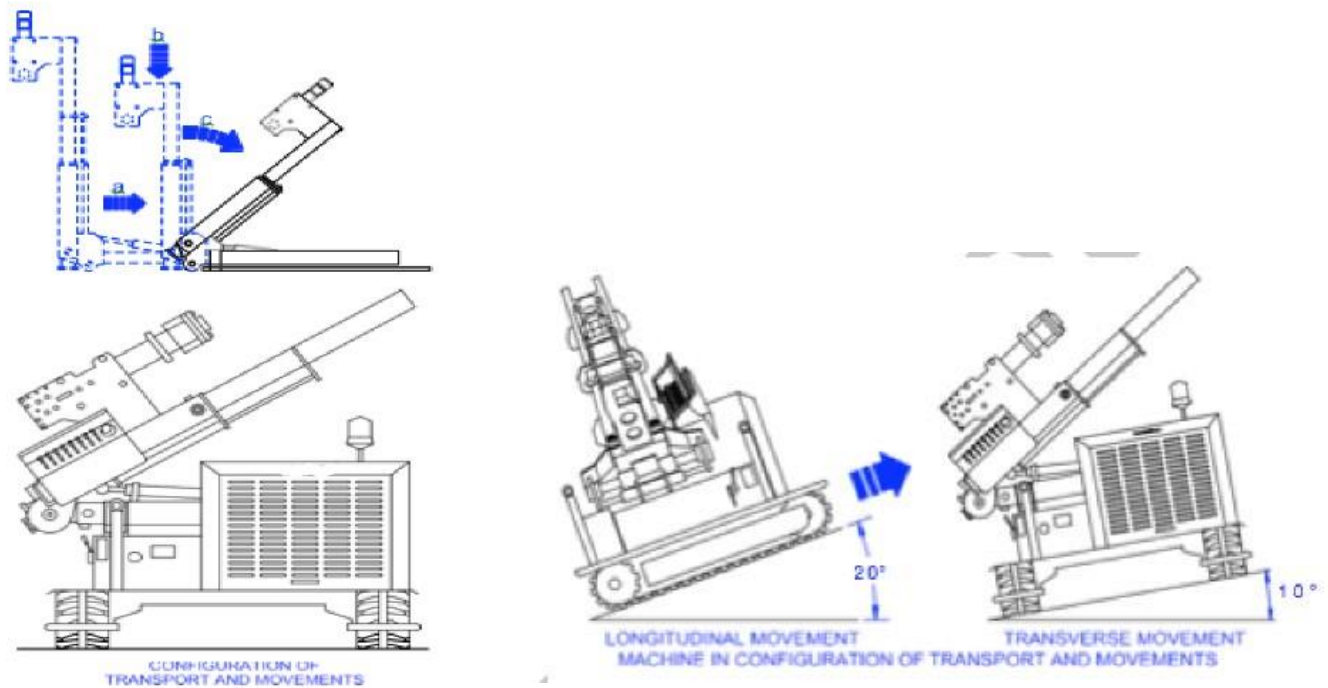


Fig.5 Configuration of transport and movements

For any transporting, on a flat surface as well as on inclined surface, the pile driver has always to assume the transport configuration or movement configuration, as showed in the Page 18 figure 5.

The following **precautions** are necessary for the displacement of the pile driver on inclined surfaces:

- In longitudinal direction, the maximal road grade consented of the soil on which the machine can move itself with safety and balance should be 20° with hard and compact soil. If the soil is gravelled and not compact the consented maximal road grade should be 10°
- In transversal direction, the maximal road grade consented of the soil on which the machine can move itself with safety and balance, should be 10° with hard and compact soil. If the soil is gravelled and not compact the maximal consented road grade should be 5°

The manufacturer does not take responsibility if the customer operating the machine other than firm surfaces.

2-3 Starting and Controls

Before start-up the following checks must be carrying done by the assigned operator:

- Check if all the control levers are in the neutral position
- Make sure that the emergency button is operational. To reactivate rotate a little clockwise
- Check the hydraulic oil level in the relative tank and in the reducers, is as described in the maintenance chapter of this manual;
- Check if the hydraulic tubes are connected in a safe way and that they don't have bottlenecks
- Clean the tracks of any soil and stones.

Note: If the machine is starting after one or more days of not being used (inactivation) it is necessary to consult the maintenance programs and follow up on all the instructions, before starting up the machine. This should be done if the machine has not been operating for a long time.

We strongly recommend preparing a **pre-start-up checklist** See **Appendix E** which forms part of this document.

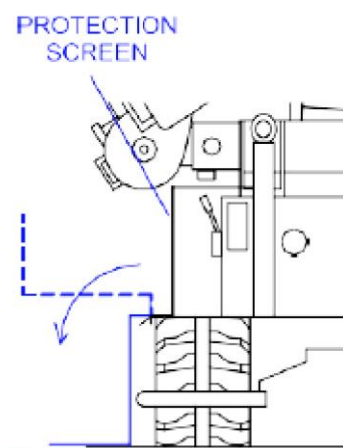


Fig.6 Protection screen

The operator should lower the **protection screen (optional)**, to have access to the starter frame, placed on the basis level as shown in the figure 6. The main purpose of the protection screen is to protect the operator on standing position by the control panel when machine is moving.

There is a risk of injuries to operator's feet by the rubber crawler tracks in the standing position. When the machine engine is off, the protection screen protects the starter frame and the control panel placed in its vicinity.

After preliminary controls and lowering the protection screen, the operator needs to place the accelerator to about $\frac{1}{4}$ of its range and then effect the starting. The operator should follow the instructions in the manual of use and maintenance of the engine. When the machine is on, it is advisable to wait some minutes, so the engine oil and the hydraulic oil will reach on the optimal temperature.

It is advisable to check on all the functions of the machine by manoeuvring one function at a time, before starting the daily task to make sure that everything is functioning well. The operator should have a good realisation of a precise function, as for example the column orientation should be retracted.

IMPORTANT:

It is essential for the operator to observe all the safety rules as described earlier. In case he is working alone in an area, safety policy and procedures for lone worker must be applied. Missing observance of the safety precautions and rules may cause serious harm or even death.

2-4 Operational

The pile driver should be used only for the driving of guardrail and solar posts, or to carry out some other specific functions, being described in the next chapter, upon installation of equipment manufactured by Quantum only. **Therefore, different functions such as application of inadequate or not-tested equipment and not of Quantum manufacturer are considered as improper and are consequently forbidden.**

The machine works with safety devices and technical characteristics, which have been elaborated during the development phase respecting all the appropriate safety rules. Customers cannot alter the technical characteristics of the pile driver for the modification of its performance. **If this should happen anyway, the warranty of the machine as well as the responsibility of the manufacturer will immediately void.**

Before placing the machine in the construction site and starting to use it, it is essential to establish where the pile driving or the drilling should be done. Make sure there are no underground service lines, as for example, water conduction pipelines, gas or combustible oil lines, electrical lines, optical waveguide nets, phone lines or other kind of service nets. Therefore, it is necessary to contact the owner of the ground or the responsible government society, in order to supply precise information or detailed maps of the working area. However, in presence of underground lines, it is obligatory to have presence of an authorised technician of the responsible government society during the operation.

For **electrical high tension lines**, in the working area, it is necessary to observe that between the cable lines and the highest part of the pile driver exists a minimum safety distance (which can be different in every country, because of diversity of climate and moisture in the air. It is advisable to follow the indications mentioned in the table 1). If the distance should be smaller, the responsible owner of the ground must be contacted, in order to raise the line or to install the appropriate protection.

Note: We strictly advise to consult with a local authority regarding the local rules and regulation whenever it applies.

Table 1. Advisable indications on distance based on the cable voltage

Voltage of the cables	Minimum distance to be kept
1,0 kV (distribution line)	5 mt
6,6 kV (2÷3 insulators)	5,2 mt
33 kV (min. 3 insulators)	5,5 mt
66 kV (min. 6 insulators)	6 mt
154 kV (min. 10 insulators)	8 mt
275 kV (min. 19 insulators)	10 mt

The Pile Driver can operate in a vast range of temperatures, (see use in cold climate) but should be used during daytime only. It is NOT supplied with a proper lighting system, but this can be fitted. If for different reasons the Pile Driver should be used during the night, it is mandatory

that the machine, as well as the working area, be sufficiently illuminated, to work respecting all the necessary safety rules.

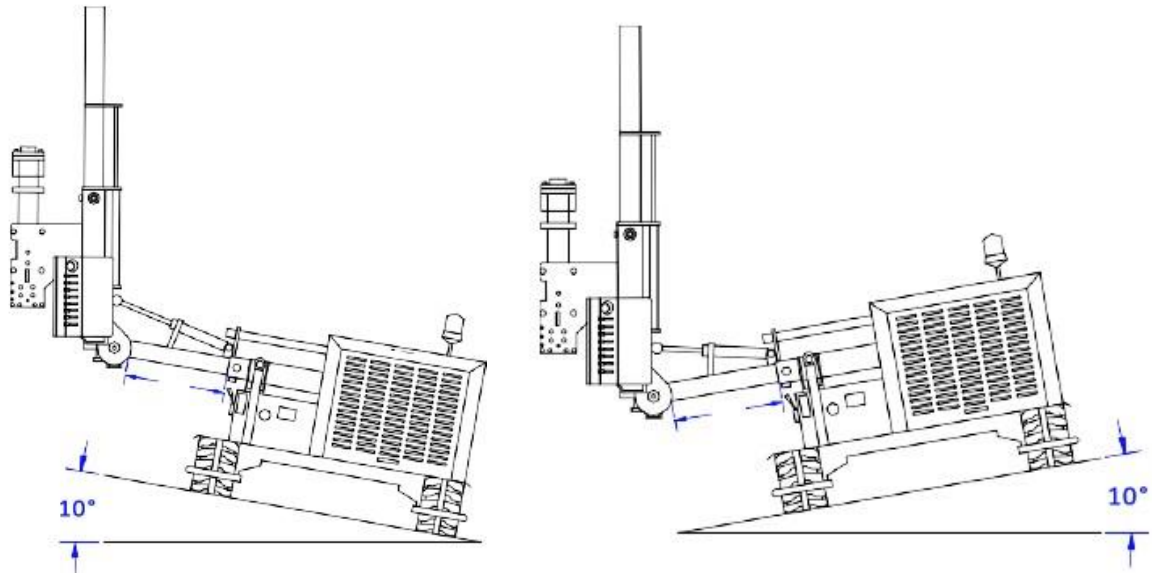


Fig.7 Maximum inclination for safe and stable functioning of the Pile Driver

The pile driver can operate on any kind of ground or road surface. For its safe and stable functionality on inclined surface the maximum inclination grade is 10° (figure 7).

Concerning the movements of the rubber crawler tracks, the operator must observe the following indications:

- Normally the Quantum Pile Driver moves with its rubber tracks. The correct position is to have the back sprocket teeth positioned at the back, as the driving direction should be in the forward direction.
- Take care when you are passing over an obstacle, an empty space is created between the carrying rollers and the crawler track with the risk that the crawler track gets out of its position and could drop off, (figure 8.1)
- Avoid traveling along the border of slopes or on uneven grounds with one crawler track

on the horizontal level and the other one on the inclined level figure 8 (2). Always travel with the sliding blocks on the same horizontal level, in order not to damage the rubber crawlers.

- When the machine proceeds in reverse (figure 8. 3), an empty space is created between the carrying roller, the front wheel, and the rubber crawler track, with the risk that this last one comes out of its seat.
- Do not affect changes of the direction while the machine moves on curbs, rocks, or big level differences. In such cases always proceed perpendicularly regarding to obstacles. While moving reversal uphill (figure 8.4), do not steer in movement. However, if this should be necessary, try to maneuver gradually.
- When you change direction in a situation in which the crawler track moves slowly because it needs to pass an obstacle (figure 8 .5), the crawler tracks can be damaged and get out of its seat.

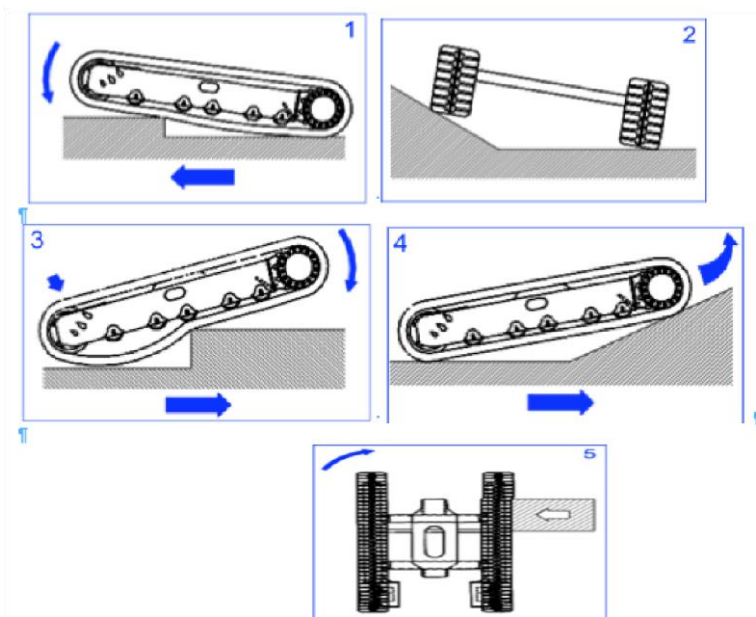


Fig.8 Faulty movements of the crawler

- When the machine travels in reverse showed in figure 9(A), the crawler track may become out of its seat
- When you steer in the conditions shown in figure 9(B), the crawler track may come out of its seat

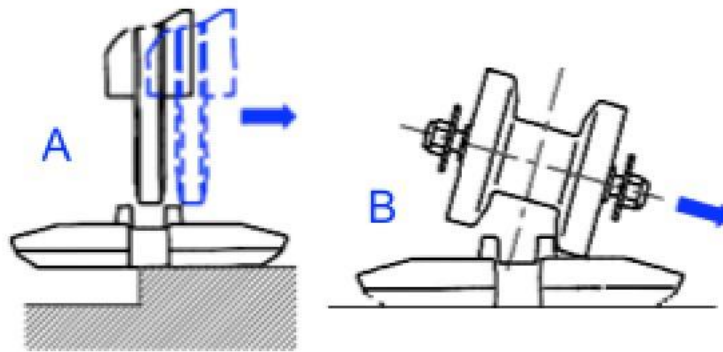


Fig.9 Possible seat movement in reverse movement of the crawler

Every movement of the Pile Driver, although it is affected inside the operative zone or construction site, must always be carried out with the fitted **Flashing Light** on. This light is placed on the rear of the machine and will auto start when the machine is running see figure 10.



Fig 10 Traffic Indicator

The preparation for **driving** of the piles is very easy: the body of the pile is positioned in an appropriate support, named *pile guide bearing*, which is part of the pile hammer. It makes the vertical movement easier. The headstock needs to be inserted in the pile hammer template. The role of headstock is driving the pile in a precise and fast way, in addition to protect it from getting loosened from the pile hammer during the piling phase. When the headstock is inserted in right place, it will be possible to activate the hammer and start driving the pile.

The pile driver is supplied with a stabiliser foot, placed at the bottom of the column. Its main purpose is to supply more stability to the machine when using for pile extraction. It is advisable to place a solid support between the ground and the stabiliser foot (this can be a piece of wood or metal). The use of the stabiliser foot is obligatory for the **extraction** of piles, while it is not absolutely necessary for the driving of piles, figure 11.

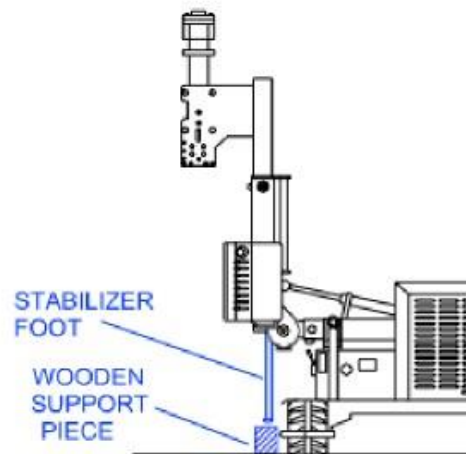


Fig.11 Stabiliser foot

3- PEOPLE SAFETY PRECAUTIONS

3-1 General

The Quantum pile driver is designed to operate extremely safe, however it must be operated by qualified, trained, adult personnel who is very well aware of the instructions in this manual.

Safety is of primary importance for the personnel who use the machine or who carry out reparations or maintenance tasks on the machine. Should this instruction manual not include all the possible working situations, the personnel must be cautious, and use their common sense. We strictly advise that the purchaser of the machine should develop their own

standard operational procedures in compliance with the rules and regulations of the country of use.

All of the functions of the pile driver are subject to activation of the corresponding levers that are placed on a hydraulic control device. The only exception is starting of the engine. Before starting the engine, the operator shall complete a daily check sheet or follow your company guidelines. Start-up Checklist see Appendix B

IMPORTANT:

- It is essential to observe all the safety rules when doing the any checks.
- Insure there are no people and objects around the machine to avoid any possible risk to them.

3-2 Safety Labels

In addition to the contained indications in this manual, there are some adhesive safety labels on different parts of the machine. These labels represent a simple adequate safety message. They are prepared in shape and color, based on the norms they are related to. For instance, the circular labels stand for obligation (in blue and white colors), and prohibition (in red, white, and black colors). The triangular labels stand for danger (yellow and black colors). Triangular labels are warning for danger and supply more information about the safety rules that need to be respected. All the used labels on the machine can be found in figure 12.

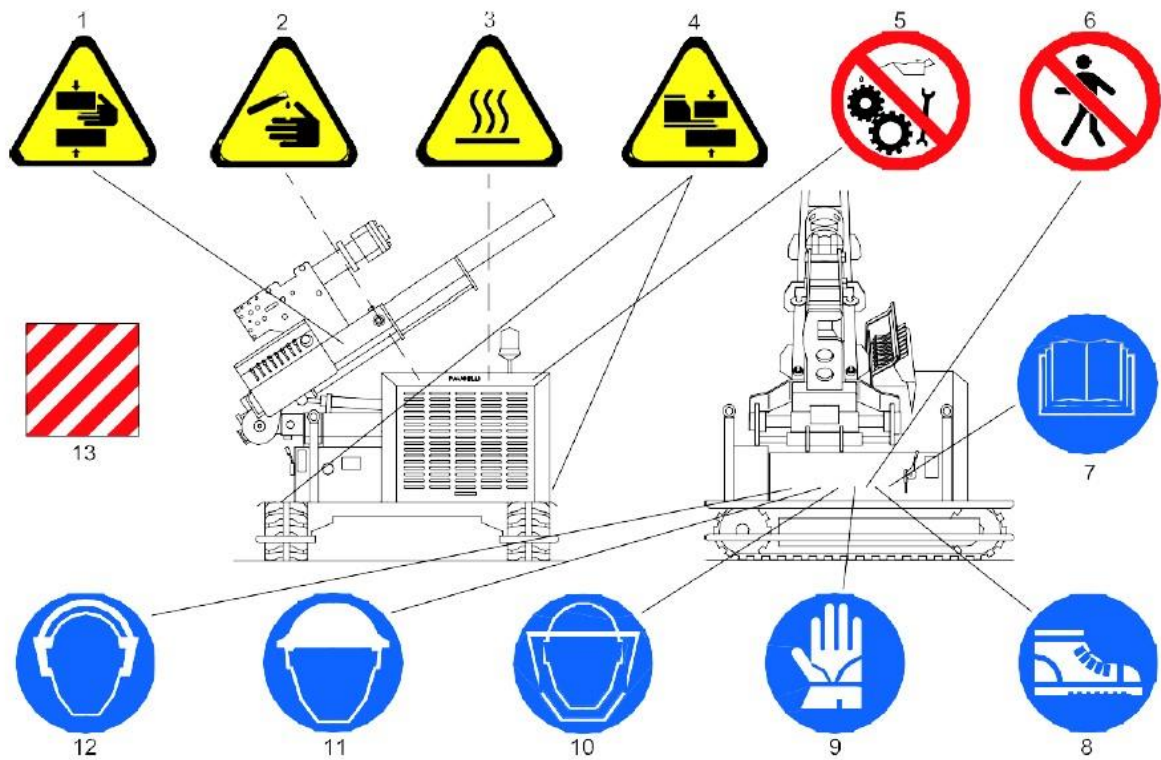


Fig 12 Adhesive Labels

The safety labels are as follows:

- 1) Crushing danger and/or shearing danger to upper limbs. Pay maximum attention during the movements. Use protective gloves.
- 2) Corrosion danger. The battery contains a corrosive substance that irritates the skin. Use protective gloves.
- 3) Burning, Parts of the engine achieves high temperatures and that is why the engine itself has a lockable.
- 4) Crushing danger and/or shearing danger to inferior limbs. Pay maximum attention during movements. Use protective footwear.
- 5) Prohibition to affect reparations or maintenance transporting with moving parts. Do it only if it is necessary, and with high level of caution.
- 6) Prohibition for people to be in the working area of the machine when it is functioning. Take the necessary safety distance and when it is necessary to move, do this with a lot of caution.
- 7) Obligation to read the manual of use and maintenance.

- 8) Obligation to wear protective shoes. Use only approved ones.
- 9) Obligation to wear protective gloves. Use only approved ones that fit well.
- 10) Obligation to wear a safety visor. Use only the approved ones.
- 11) Obligation to wear a protective helmet. Use only the approved ones.
- 12) All operators are obligated to use approved ear protection.
- 13) Signalling ribbon. The operator has to use this to limit the working area (closed construction site) in which the pile driver can move without limits.

3-3 Hydraulic Controls

- 1) A **control distributor** on the machine assures absolute controls of the levers. A lever cannot accidentally be operated while the other lever is still activated. Each lever has an automatic return to its normal position after release. For safety reasons, the lever related to activation of the hammer has a mechanical block at the end point, to assure that the operator will have enough time to take an opportune distance from the machine before hammering start operating.
- 2) When a lever is released (voluntary or involuntary), corresponding jack will block the function by means of a **locking valve**. This blocking will also be activated if there is a problem in the hydraulic system with lack of pressure inside the circuit.
- 3) The locking valve is an integrated system with versatile blocking functionality. For instance, an emergency brake which controls and blocks movement of the rubber crawler.
- 4) To eliminate the risk of a foot injury, the pile driver is supplied with a **protection screen (optional)**. When the protection screen is closed it protects the starter frame and all the controls placed nearby the screen. When it is open, it protects the operator against the crushing danger of his foot. Therefore, to have access to the starter frame (to start the machine), it is necessary to lower the protection screen. For this purpose, it is advisable to remember that this screen must be kept lowered during the whole operation.

5) In case of emergency, the engine must be stopped by pushing the emergency stop button next to the control levers or by activating the emergency stop button on the remote Control. Following stopping the engine, the hydraulic oil pump and all controls will be deactivated. To re-start normal operation, the emergency button needs to be unlocked. For unlocking the emergency button, turn the button slowly clockwise before restarting the engine.

3-4 Noise

The sound level of the pile driver (measured on the control position of the operator) with the engine on and the machine stopped is between 88,2 dB and 108 dB. When the engine is on and the machine drives a pile, the sound level of the pile driver is between 110 dB and 134 dB. Operators must wear appropriate **noise protection equipment**. Find equipment to comply with the local work safety regulation.

Note:

- For noise definition and standard at work in Türkiye refer to:
<https://bit.ly/2LhW5KO>
- For Australia refer to: <https://www.safeworkaustralia.gov.au/noise>
- For the UK refer to: <http://www.hse.gov.uk/noise/>
- For the USA refer to: <https://bit.ly/2JkRydz>

For other countries of end-users of the machine please refer to the related standards and regulations. If the links above will not connect, please copy and paste into your browser.

3-5 Residual Risks

The machine design has considered all possible control measures in order to eliminate or mitigate the risk, however there are some limitations to preserve the functionality of the machine. Therefore, there is a potential residual risk to the operator or to the people nearby which, is not described in the previous mentioned safety norms. The residual risk may contain:

- Risk of striking with lightning in the presence of electrical underground and power lines
- Fire and explosion danger in the presence of underground gas and combustible oil lines
- Shearing risk and/or crushing of the upper and inferior limbs (label #1 and #4)
- Corrosion risk for contacts with the battery liquid (label #2)

- Burning risk for contacts with the endothermic parts of the engine (label #3)
- Face and eye injuries for projection of solid parts (label #10)
- Abrasion further to collision with metallic parts (label #8, #9 and #11)
- Injuries to the auditory apparatus for not having used the proper and proper protection (label #12)

(For labels refer to figure 12 at page 27)

IMPORTANT:

To avoid risk, proper and attentive behaviour of the operator(s) is fully required.

USE AND INFORMATION

1- USE

As it is already emphasised in fundamental safety rules and also in Safety Instructions (1. Fundamental Rules) only an operator must be trained and qualified for the purpose of the use and maintenance of the pile driver may operate the machine. The operator must fully understand all the instructions written in this manual and review all the labels (safety rules and lever movements). For correct use and operation of the machine, it is compulsory that the pile driver is being used only for the purpose it is designed for and that all the maintenance tasks foreseen by the manufacturer are respected.

It is further advisable to point out that the safety controls and the technical characteristics of the pile driver have been elaborated in accordance to the appropriate safety rules, during the development phase. It is strictly forbidden for the customer to alter the technical characteristics or to erase the safety devices/labels placed on the pile driver with the purpose to modify its performance. **Whenever this happens or when the pile driver is used in an improper or incorrect way, the warranty, as well as the responsibility of the manufacturer will immediately be void.**

2- USE IN COLD CLIMATE

The pile driver is designed for the use in a temperature range between –20° and +40°C. If the machine is used in other types of climates, the manufacturer would not be responsible for accidents due to function of the machine. However, if the machine is used

in very cold climate, with temperatures between -20° and $+5^{\circ}\text{C}$ the following requirements are necessary

- Use oils suitable to those temperatures (engine and hydraulic), it is advisable to consult a lubrication list for the choice of suitable oils.
- The machine is fitted with standard anti-freeze at the factory and the operator should check that the antifreeze is suitable for the environment.
- Wait five minutes before starting any movements in order to bring the engine up to the right temperature. Activate the controls for some minutes in occupied to get the hydraulic installation on the right temperature.

3- FUNCTION

3-1 Starting

After the preliminary checks, described in the Start Up Check List on page 86, and before starting the engine, the operator has to position the accelerator lever at about $\frac{1}{4}$ of its range. The starting process can be obtained by inserting the ignition key. Rotate the key clockwise first in position I and then in position II. The indication lights of the oil pressure and the battery will illuminate. As soon as the engine has started, release the key that will automatically return in position I (figure 13). As soon as the engine works, the two indication lights (oil pressure and battery) will switch off and the operator reduces the revolutions with the accelerating lever. If one of the indicators should still be illuminated, the engine must be switched off immediately. This can be done by returning the key to position 0 or by pushing the emergency button.

In this case, always remember to unlock it before you reactivate the engine (by rotating the button slowly clockwise). Regarding the starter frame, consult the use and maintenance manual of the engine (supplied with this manual). Such consultation is also advisable before starting the engine (see cold start).

After the machine has warmed up appropriately, the operator can increase the number of revolutions of the engine by moving the acceleration lever adequately.

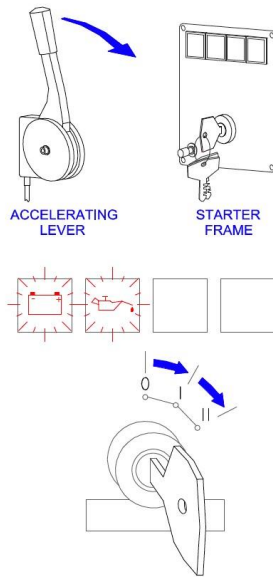


Fig.13 Starting frame

3.2 Hydraulic Safety

All controls on the Quantum Pile Driver are fitted with a pressure relief valve. All the levers, apart from the first one (the one indicated in the figure 14 items 1.), can be activated in two positions. The levers will automatically return to their starting or neutral position. The first lever, the one for the hammer activation, can block itself due to a mechanic block at the endpoint. The movement of a lever in a position, in any case, consents to the realization of a precise function, for example the column orientation.

The controls and functions are as follows:

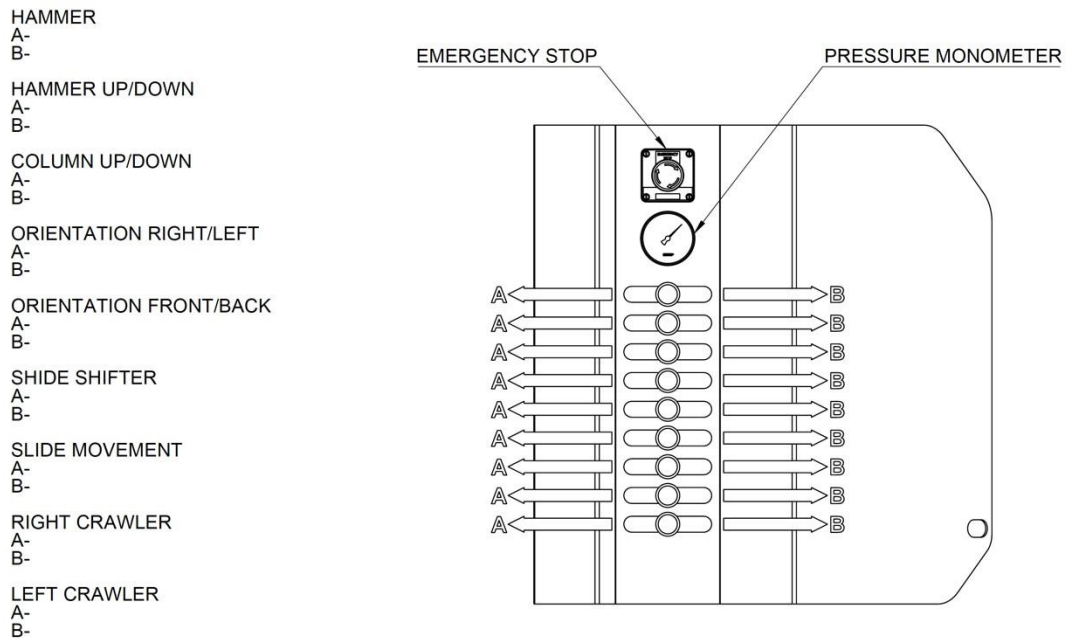


Fig.14 Controls and Checking Components

Emergency button: If the operator notices a dangerous situation or simply needs to stop immediately, he can push the button and the pile driver will block totally. With the engine being off and the pump being deactivated, all the functions in action will fully stop at that moment. In that situation, all the controls are inhibited. **The operator has to unblock the emergency button, rotate it slowly clockwise,** and start the engine again to regain the normal working conditions.

Lighting button: This button is placed on the starter frame and must be pushed for the activation of the traffic indicator before any movement of the machine. The activation of the indicator is compulsory for the safety in operative areas construction sites.

Pressure relief valve: The pressure relief valve is placed on the distributor and is set at the standard working pressure. It intervenes in case of increase of pressure in the hydraulic circuit, stopping the oil flow and unloads the oil in the tank. The manufacturer designs the tank gauging levels. The valve is sealed (with red paint or metallic cable) to avoid adjustment.

Heat exchanger: (It is not a standard accessory - installed only on request). The heat exchanger or more commonly called oil cooler is a device used for cooling hydraulic oil, in the unloading phase, before it reaches the tank. The exchanger, supplied electrically, is activated by a thermic sensor that constantly points out oil temperature when it reaches 80°C. Under this temperature the exchanger doesn't work. Watching the appropriate thermometer, placed outside the tank, can easily carry out the temperature check.

3.3 Remote Control

Operating procedure for Quantum Remote Control Unit

- All controls are clearly marked with the function.
- To turn it on, push the Green and hold until the light shows
- Lights are left and right of the switch
- Once lights are on, push the black button once, then following by the green button again – you are now connected
- Operate the remote in the normal fashion
- At the end of the day push the green button to turn off
- The battery should be recharge at the end of each day
- The RED button is the Estop



3-4 Pile Driving

Before starting work, the operator has to limit the area of the construction site in which the pile driver will be moving and in which piles will be installed (**standard work**). Same goes to supplementary functions with different accessories.

Afterwards, the operator will bring the pile driver to the place where he wants to carry out the work and will position it accordingly. The pile driver has to be set in a precise working location in order to drive the piles. The operator manoeuvres the machine by adjusting the levers of the distributor.

A level, placed on the column (see figure 15).



Fig.15 Level

Fasten Pins

Pile Guide bearing



Fig.16 Pile Guide Bearing

Once the machine is set on the location, the pile driver should be prepared for the driving with the help of the pile guide bearing, showed in figure 16. The operator unthreads the two pins, placed in the side part of the column as showed in the figure 17. He will insert the guide bearing and secure it by reinserting the two pins previously taken off, in the respective holes. Once this is completed the pile driver is ready for the driving of guardrail posts.

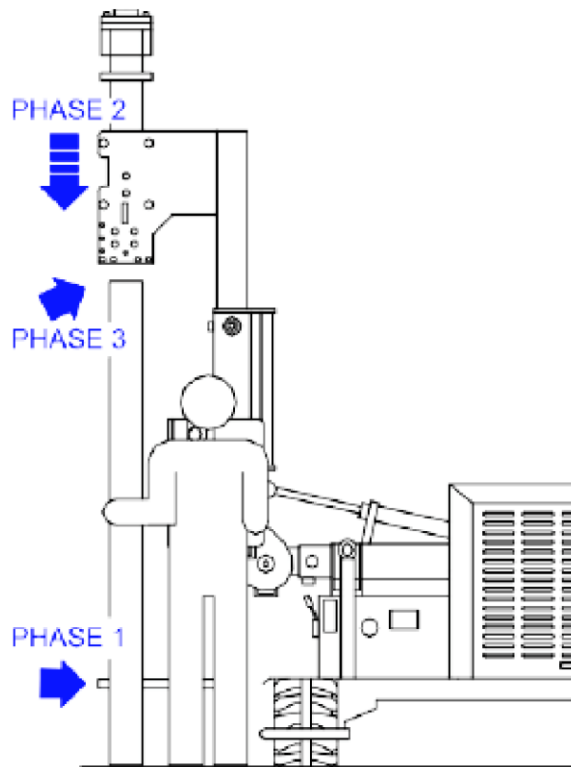


Fig.17 Phases of driving

Pile Driving

The operator places the pile into the guide bearing, as showed in the figure (**phase 1**). Then he will lower the hammer (**phase 2**) until the pile hammer template covers the headstock of the pile, which prevents the pile against coming out (**phase 3**). After that, still activating the same lever for another few seconds, he lowers the hammer group so the hammer group will unhook.

In this way, the hammer is not tied up anymore by the movement of the chain during the hammering phase and will go down under its own weight. The operator then activates the hammering by bringing the respective lever to its end point and by blocking it there. In that way, the driving process will start. (**phase 4**).

3-5 Pile Extraction

Repeat the operation as described in paragraph 3.3, with the addition though of the placement of the supporting foot, as shown in the figure. Normally this foot is only used for the extraction of piles. It is mounted in the side part of the column. It gives stability to the machine during the extraction phase. It is also compulsory to use it during the extraction. The operator has to take the fixing pin out and has to lower the supporting foot that will come out to ground level. It is not always possible to determine the consistency of the soil and because of this reason it is always advisable to place a solid support between the ground and the supporting foot like a wooden piece or a metallic plate. Next, the operator has to secure the supporting foot by reinserting the fixing pin, previously extracted, in the appropriate hole. At the end, he has to lower the column until it is placed well on the supporting piece. In that way, the extraction work could start.

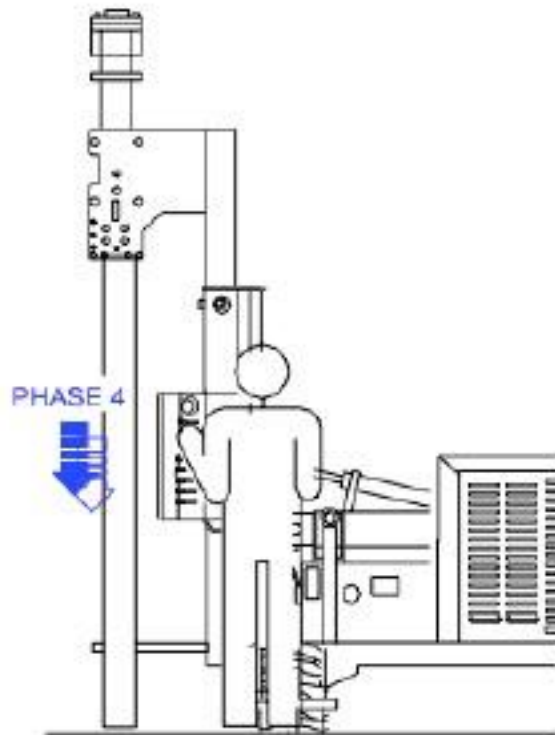


Fig.18 Phase 4 of driving

Pile Extraction

A metallic bar will be inserted in the lateral holes of the pile, as shown in the figure. The bar will be the connection pin for the extraction. Attached to this and to the lateral hooks of the hammer group will be the pile extraction chain, as shown in figure 19, operating as a tie rod. Activating the concerning lever the column will be hoisted. The column will lift the hammer group as well as the pile. The extraction process finishes with the exiling of the pile.

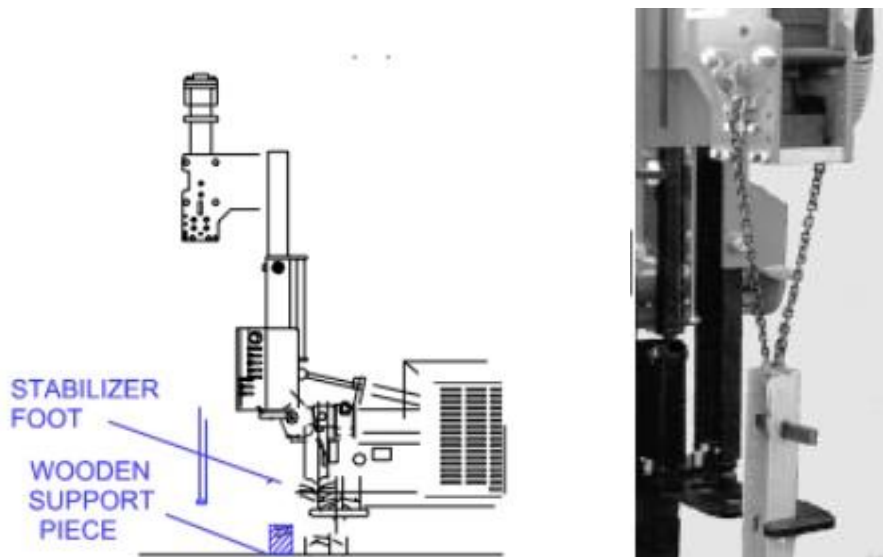


Fig.19 Pile Extraction

IMPORTANT: For extracting the operator has to use the approved the pile extractor and must maintain regular inspections for wear and tear. If wear exists please replace.

3-5 End of Day Operations

At the end of a working day, the operator must close all the hydraulic rams, and lock up all lockable components.

4- COMPONENTS SUBSTITUTION AND VARIOUS REGULATIONS

4-1 Changing of the pile hammer temple and the pile hammer

Depending on their use, piles may have different sections and therefore the pile hammer temple and the pile hammer have to be adapted to each pile section. If it is necessary to drive piles with a different section from the standard ones, it would be necessary to change both pile hammer and pile hammer temple on the hammer group. Both accessories are produced by the company Quantum and are delivered to the Customer only on request. The instructions for the substitution of the pile hammer temple and the pile hammer are described as follows:

- To make the transporting phase easier, it is necessary that the machine assumes the transport configuration, as showed in figure 20, and then the engine has to be switched off

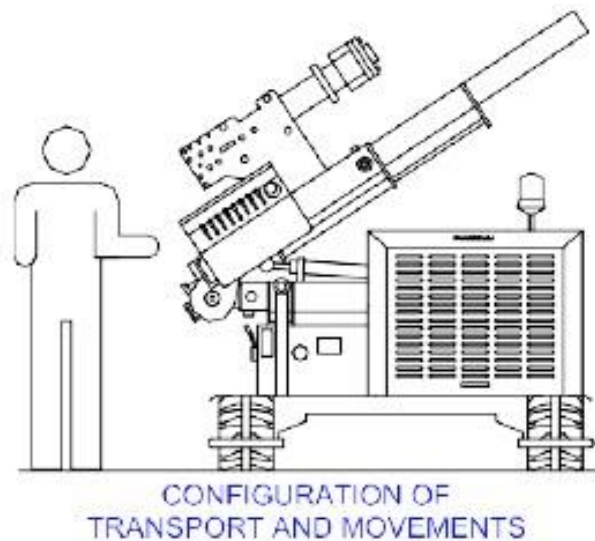


Fig.20 Configuration of transport and movement

- Insert one hand in the pile hammer template (1) so the pile hammer will be pushed up with the purpose of inserting a bearing pin (2) in the appropriate hole, as shown in the fig.21, in order to block the descent of the pile hammer;
- Next, the operator removes only two of the screw nuts, shown in the figure (3), that fix the pile hammer template to the structure of the hammer group without extracting the pins
- The operator then inserts the dilator bolt with screw nut into the structure of the hammer group, as shown in the figure (4). Then the operator will activate the screw nut placed on the same bolt, (5) with a key. Such action opens the sides of the hammer group structure and makes it easy to remove the pile hammer template;

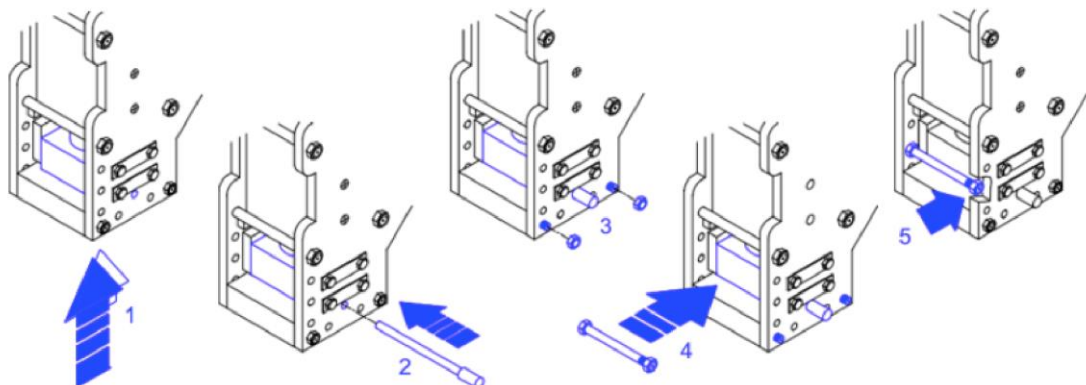


Fig.21. Hammer group structure 1-5

- Holding the pile hammer template still with one hand, extract the two pins that fix it to the hammer group structure (6). After that, remove the template out of its seat (7), as showed in figure 22.
- Holding the pile hammer still with one hand, extract the bearing pin out of its seat (8) and put it on a mobile table. After that, remove the pile hammer (9) carefully with the other hand and make sure the pile head does not fall down (10)
- Hold the pile head still and insert the bearing pin again in the appropriate hole (11) in order to block the descent of the bit. Next , mount the new pile hammer and the new pile hammer template. This can be done inverting the above described operation.

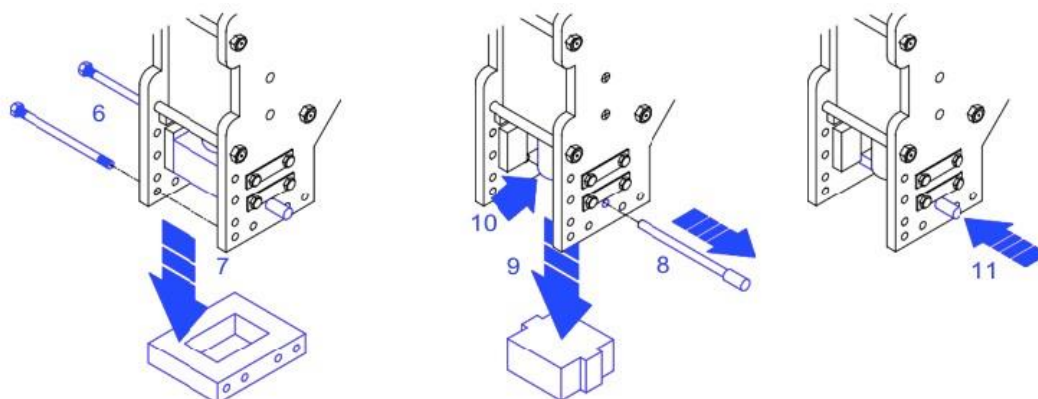


Fig.22. Hammer group structure 6-11

4-2 Replacement and tightening of the Tracks

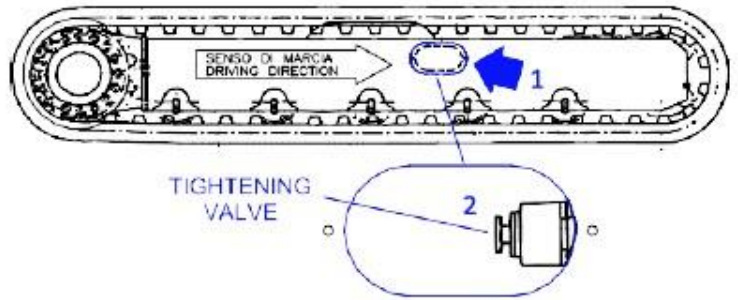
Replacement

The crawler track must be replaced when there are 10 mm of tread left, but also previously to the presence of cuts. For such replacement it is necessary to lift the pile driver up from the ground for at least 40 cm. The lifting of the machine shall be done by hydraulic jacks.

Proceed with the substitution of the crawler track in following way:

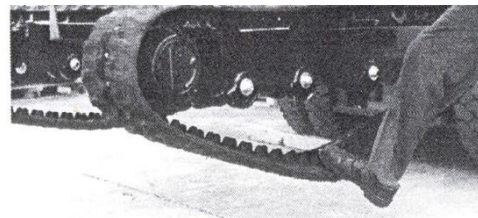
- Carefully clean the parts of the undercarriage

- Remove the closing tally (1) on the backstay, shown in fig.23



- Loosen the tightening valve (2) inside the space as shown in fig 23. Next when it is certain there isn't any grease Fig.23 Sketch of the crawler pressure left, remove the valve

- Move the front wheel by pressuring rubber crawler track with a foot (see fig.24)



the

- Remove the track using protective gloves

Fig.24 Crawler Track

IMPORTANT: Pay attention when the track falls on the ground.

- For the installation of the new crawler track proceed as indicated before but in the opposite order

Tightening

Normally such movement is carried out in the operative area (construction sites) and is operational by introducing grease in the tightening valve with the help of a hand pump. Therefore, not having a manometer, the tightening is operational in an appropriate measure at sight. If instead, the tightening takes place in an authorised workshop, the grease can be injected, under pressure. The standard pressure read out on the manometer of the valve has to be 200 bar.

IMPORTANT: In both ways, in the moment when the pump will be extracted from the valve, the transporting of a shut-off valve will prevent the out coming of grease, especially for that under pressure, is very dangerous.

4-3 Adjustment of the slippage plugs

Adjustment

All the moving parts slide on Teflon plugs. They are constructed in Teflon and therefore self-lubricated.

There are two types: rectangular ones (nonadjustable), and round ones (adjustable). The round unit, plugs adjust for the wear on the structure.

These Teflon plugs are pushed towards the running part by a plug with a hexagonal head, by (fig 25)

To Tighten

1. Loosen the screw (1) Figure 26 and placed on every external ferrule. You do not need to remove the screw (1)
2. Tighten the plug part (3) Figure 26 as much as needed. Tighten part (3) This will push the plug (2) Figure 26 against the running part. Tighten part (3) until it touches the structure, then back off part 3 by a $\frac{1}{4}$ turn.
3. The reset of the Teflon plug is completed, remember to re-tighten part (1)



Fig.25 The ledger with a hexagonal head

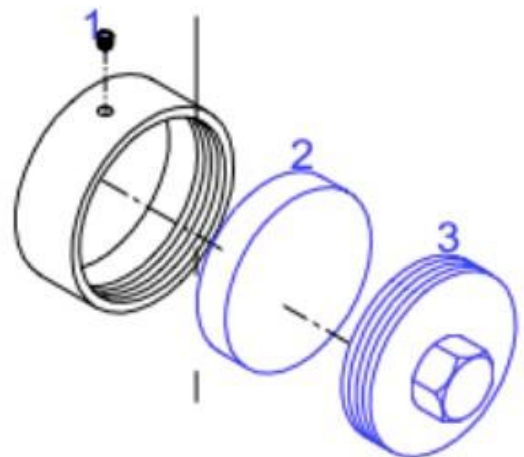


Fig.26. Teflon Wear Plugs

Replacement Wear Plug

1. Loosen the screw (1) and placed it on every external ferrule. You do not need to remove the screw (1)

2. Remove the plug part (3) and part (2)
3. Clean the thread and insert the new Teflon plug. Apply a light covering of grease to the tread and insert part (3)
4. Follow the steps to tighten on page 43

4.3 Trailer Tow Bar

The Quantum Pile Driver is supplied with a towing coupler. It is placed on the rear of the machine with the purpose to permit the towing of a suitable trailer.

Unlock and extract the safety pin (2), Figure 27;

Draw out the pivot (1);

Insert the lunette of the trailer in the seat of the hook (3); Insert again, pivot and block it with the safety pin.

The maximum mass to tow is 3000 kg,

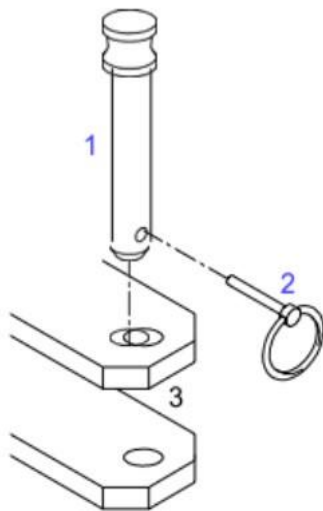


Fig 27 The coupler

Maintenance

1- INSTRUCTIONS

1.1 Overview

The Manufacturer has foreseen a maintenance schedule, which if carried out with care by the customer will maintain the efficiency of the machine. This will preserve the equipment of any possible damage for many hours.

The operator must be a qualified and trained person in the care of the machine. In any case, he must not rely on his memory alone, but he must always read the instructions of this manual and carry them out in an accurate way, respecting the safety rules.

Before any kind of repair task, the operator must place a sign on the Pile Driver with the written words 'Machine Under Repair, do not start' for his own safety and prevent damage to the machine.



Only use the correct tool to loosen or remove bolts and other parts. Only use the correct replacement parts from the Manufacturer.

At the end of the maintenance service, clean the area from water, oil, grease, rags, equipment, or other material.

IMPORTANT

Be careful concerning the loss of fluids under pressure and the excess vibration of the pipes. This means that the nitrogen in the hammerhead is not sufficient. Proceed immediately with the loading process as described in the appropriate manual of the hammer.

1.2- Programmed maintenance

Daily check, (please use the Start Up Check List supplied on Page 86 or your company document)

Daily check (Example)

Do the following checks every day or after 8 (eight) operating hours:

- Check if there are any hydraulic oil leaks or drafts present
- Check the automatic return of the control levers and the carrying out of all the functions
- Check the level of the engine oil
- Check the hydraulic oil level in the tank
- Make sure that the motor reducers work well
- Check the tightening of the crawler tracks
- Apply grease to all the present grease cups on the pile driver with the special hand pump.
- Check to ensure the tracks are clean of stone or rocks.
- Check the placement arm for wear.
- Check the electric magnetics are clean and undamaged.
- Consult the manual of the engine and the hammer for the appropriate maintenance.

Weekly check (Example)

Do the following checks every week or after 40 - 50 operating hours:

- Check if there are any hydraulic oil leaks or drafts present. If yes, check and tighten.
- Check the automatic return of all control levers and ensure all are functional.
- Check the level of the engine oil by using the dipstick.
- Check the hydraulic oil level in the tank by using the sight glass, should be ½ fill or greater.
- Check the tightening of the crawler tracks if required, **Do Not Over Tighten**
- Apply grease to all the present grease cups on the Pile Driver with the handheld grease pump.
- Clean the lift chain, and apply oil as required.
- Check the anchorage pins at each end of the lift chain for wear and replace them if damaged.

Replace every 12-month period.

- Check all the nuts and bolts for tightness.
- Check all rollers on the track frame for oil leaks and wear. • Check the state and the integrity of the pile extractor
- Consult the engine and hammer manual for relative tasks

Maintenance to carry out after 50 operating hours:

All Engine and Hydraulic Oil Filters must be changed.

1.3- Maintenance to carry out after 250 operating hours.

After about 250 operating hours (running), it will be necessary to substitute the engine oil, the engine oil filter and the hydraulic oil filter. For such task follow the instructions described in the appropriate paragraph of the present manual.

Checks and maintenance to carry out every 250 operating hours

Do the following checks after 250 operating hours and every 250 working hours:

- Change the engine oil.
- Change all oil filters.
- Check and restore the nitrogen level of the hammer (25-30 bar)
- Check the condition of all the adhesive labels, and replace as needed.
- Check the condition of all the hoses for damage or leaks .
- Check the automatic return of the control levers and the carrying out of all the functions.
- Check the hydraulic oil level in the tank by using the sight glass, should be ½ fill.
- Check the oil level in the Track final drive units.
- Check the tightening of the crawler tracks.
- Check the wear-out and the state of the crawler tracks. For the check and the substitution of these tracks, consult the instructions described in the relative paragraph.
- Apply grease to all the present grease nipples on the Pile Driver with the hand pump.
- Clean the chain and oil as required.
- Check the anchorage pins at each end of the lift chain for wear and replace them if damaged. Replace each 12 months period.
- Check all the nuts and bolts to ensure these are tight.
- Check the liquid level in the battery.
- Check the state and the integrity of the pile extraction chain;
- Consult the engine and hammer manual for the concerning transporting.

Checks and maintenance to carry out every 500 operating hours

Do the following maintenance after 500 operating hours and every 500 working hours:

- Change the diaphragm in the hammer head and restore the nitrogen level

The checks and maintenance to be carried out every 250/500 hours have to be done regularly, consulting the present manual of use and maintenance as well as the one concerning the hammer.

Yearly check or after 1000 operating hours

Do the following checks after one year or after 1000 operating hours:

- Check the integrity of all the adhesive labels;
- Check the integrity of all the tubes (closing links, integrity of the protective braided wires, and the lack of hydraulic oil leaks or drafts);
- Substitute the engine oil;
- Substitute the engine oil filter;
- Substitute the hydraulic oil in the tank and the concerning filter completely. For such transporting consult the instructions described in the concerning paragraph;

Check the automatic return of the control levers and the carrying out of all the functions;

- Check the tightening of the crawler tracks;
- Check the wear-out and state of the crawler tracks, of the pinions, and of the inferior rollers. For the check and the substitution of the crawler tracks follow the instructions described in the concerning paragraph. For the substitution of the pinions and the side rollers it is advisable to consult the manufacturer;
- Apply grease to all the present grease cups on the pile driver with the special pump. For such maintenance, follow the described instructions in the appropriate paragraph;
- Clean the chain and grease its links;
- Check the presence and the integrity of the hold-downs and the security devices;
- Check the locking of all the nuts and bolts;
- Check the state of the whole carpentry;
- Check the liquid level in the battery;
- Consult the manual of the engine and the hammer for relative task;

Yearly check or after 2000 operating hours

Note: At 2000 hours please drain and replace all the oils on the final drives and the hydraulic system along with filters.

2 Rubber Track Equipment Maintenance Tips

So when you've decided to use rubber tracks on your machinery, what can you do to not only make the job easier and faster but also keep your **rubber tracks in good operating condition** for a much longer time? The following is a guide to rubber track maintenance.

The three-point turn: Whenever possible, make a three-point turn in your machine rather than swinging in a 180-degree arc, especially if you're working in a compact track loader. Why? It reduces side wear on the tracks, which is a real issue when you're working on pavement or some other form of hard surface.

Maintain the machine's undercarriage: if you notice undercarriage parts are wearing out, replace them as quickly as you can. Bad sprocket teeth pull chunks from tracks, and overused rollers cut its rolling area.

Keep tracks clean: This advice goes hand-in-hand with the above tip. Pressure-wash your tracks at the conclusion of every workday. It's also a good time to take out any embedded foreign objects from the tracks, and gives you an opportunity to look for tracks that are missing components or becoming worn, cracked or loose.

Maintain correct tension: Some operators seem to think if you keep track tension tighter than the recommended level, the tracks will last longer, but this is a mistake. Too much tension will cause premature wear and results in greater use of fuel. It's a good idea to check the tension every 50 to 100 hours you use the machine, but base the frequency of your checks on the conditions of your tracks. If you notice they're wearing out, you need to check more frequently. It's essential to maintain correct tension on rubber tracks.

Avoid too little tension: While too much tension is not ideal, so is too little tension. Under-tensioning can allow your machine to walk out of the rubber track, endangering your operator and causing significant damage to the machine. It's always a better idea to keep the tracks a little bit looser rather than a little bit tighter, but if you keep them too loose, you're asking for trouble.

Make sure you have the right fit: Your machine needs the right length and pitch of rubber track to match the machine's sprockets. Poorly fitting rubber tracks result in premature wear, not only to the rubber tracks but also to the sprockets. Tracks should match the machine's horsepower to avoid premature wear, as well.

Don't look back: Always keep your machine moving in a forward direction. If you start to travel in reverse, especially at a higher speed, this will stress your tracks. Remember, rubber tracks are primarily designed for forward use.

Rotate your tracks: In the same way it's a good idea to rotate tires on your car, it's also smart to rotate rubber tracks on your machine periodically. It will give you more even tread wear. And just like your tires on your regular car, if you need to replace one, you also need to replace the corresponding track on the other side. If you only replace one rubber track, you'll experience uneven track wear. It may cost a little more than just replacing one rubber track in the short run, but you'll save money and deal with fewer problems in the long run.

Avoid sunlight: We mentioned this tip above, but just to reiterate, don't park your machine in direct sunlight for a long time. Find some shade or cover the rubber tracks with a tarp. This maintenance tip can double the lives of your rubber tracks.

Easy there, big fella: All rubber tracks wear out under heavy use, so try not to move them around when you're not using them on a job. It's also a good idea to avoid slopes and making sharp turns — remember, three-point turns are the answer.

Rubber track solutions: When you're not using rubber tracks on your machine, store them in a cool, dry area, and place them on their sides in a relaxed position to prevent crimps and folds. If you leave them on your machine, operate it once every couple of weeks for about five minutes to keep the tracks flexible and help them maintain their shape.

Nothing is perfect, of course, and even rubber tracks have a few flaws.

Rubber tracks hate the sun. If you leave your machine with rubber tire tracks out in the sun, your tracks will wear out much faster. No form of rubber reacts well to direct sunlight.

Rubber tracks don't work as well on rough surfaces like gravel. It's not that rubber tracks can't operate on a service like gravel or rocks, but they will not operate as well as on a smoother surface, and it significantly reduces their lifespan.

Your tracks are filthy, and you don't clean them regularly. As we noted above, the cleaner your tracks are, the longer they last. Tracks that are dirty and full of rocks and debris will wear out much faster than tracks you clean every day after the job.

You clean your tracks but pay no attention to your undercarriage. You can't have one without the other. What's the sense in keeping your tracks very clean, but not bothering to clean up the dirt and debris caught in your undercarriage? That could result in your tracks wearing out from the inside out, rather than from the outside in. Also, a dirty undercarriage will mean more damaged parts and components, which means you'll have to spend more money, frustration, and time on repairs.

3-LUBRICATION

3-1 Grease supply points

For the lubrication of the Pile Driver, use grease and oil adapted for such purpose. Before inserting the grease in the grease nipples, remove the respective protection plugs (only where present) and then clean them from eventual dust traces, and then inject the grease with a special pump. When this is done, clean the grease nipples from excess grease and then mount the protection plugs. All the supplying points are indicated on the machine with adhesive labels, as shown in figure 28.

IMPORTANT: To avoid pollution, it's absolutely forbidden to disperse oils, lubricants, filter cartridges or other noxious materials in the environment. Comply strictly with local instructions in force for the disposal of liquids or solid substances.



Fig 28 Lubrication point

3-2 Check of the hydraulic oil in the tank level

Level check:

Place the machine on flat ground and check the level and temperature indicator on the side of the Hydraulic Tanks.

When the oil arrives at half sight (between the blue and red traces, as in figure 29), the quantity inside the tank is sufficient. But if the oil is nearby the red trace, it will be necessary to restore it by adding other oil, following the instructions described later.

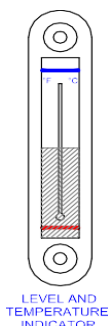


Fig 29 Level indicator

Replacement

Equip yourself with a container with sufficient capacity (200 liters) and place it under the tank where the unloading plug is situated. Unscrew the loading plug and then the unloading one while you let the hydraulic oil flow down completely. Following that, screw the loading plug down after having substituted the relative gasket. Fill the tank with oil approved by the Manufacturer. Do this through the loading plug with the help of a funnel. Assuring that the oil has reached the right point (see figure 29), stop the filling, and screw the plug down.

You should see if the oil reached the right level by looking through the level and temperature indicator. The oil should be between the red and blue traces, on half sight. It is better to use the recommended oil: **BP ENERGOL HLP HM 46** or equivalent

Note:

It is advisable to unload the oil when it is hot, so it will come out easier. Therefore, it would be better to carry out this operation at the end of a job.

When you restore the oil level, do not mix different types of oil, but always use the same type as the one contained. It is possible to use a different brand, but it must have the same characteristics as the one recommended by the Manufacturer.

3.3 Change and check of the hydraulic oil filter in the tank

The hydraulic oil tank is equipped with an averaging device for the purification of the contained fluid. Such device is provided with a cartridge (filter) with a high filtering power. It purifies the oil on its return to the tank (unloading phase). To check the filter, it is necessary to remove the lid, unscrew the three screws and extract it from its seat, as showed in figure 30. Use only a new filter of the same type.

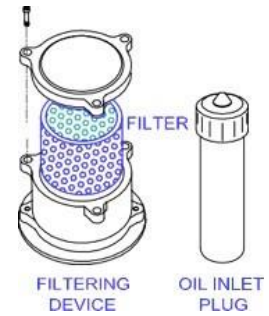


Fig 30 Oil filter check out

IMPORTANT: To avoid pollution, it's absolutely forbidden to disperse oils, lubricants, filter cartridges or other noxious materials in the environment. Comply strictly with the instructions in force for the disposal of liquids or solid substances.

2-4 Changing and check of the oil in the motor reducers

Note: every type of motor drive has got plugs placed in different angles between each other. The types placed on the Pile Driver can have an angle of 90° or of 180°, as those showed in figure 31. **Level check**

Let the motor drives turn until you bring the plugs in one of the numbers of configuration 1 shown in figure 31(1). In both configurations, plug-in position A represents the unloading one and must be on about 15° under the white line in the middle of the drive. The plugin position B represents the loading one. Unscrew both plugs; put oil in the reducer through plug B, and when the oil comes out of the plug it means that the oil has reached the right level.



Note: the oil contained in the motor drives is the same one that lubricates the brakes (represented by the whole gear system inside every drive motor driver). Therefore, when you check or replace the oil in the drives, you automatically check or replace the oil of the brakes.

Replacement

Let the motor drives turn until you bring the plugs in one of the configurations shown in figure 31(2). In both configurations, the plug-in position 'A' represents the unloading one and must be set on the maximal side point. The plug-in position 'B' represents the loading one. Equip yourself with a container of sufficient capacity and place it under the plug-in position 'A'. After that, unscrew both plugs, let the oil come out completely, and then remount the plug-in position 'A'.

Wash the motor drives inside with detergent liquid suitable to the purpose and recommended by the producer of the lubricant in the following way: put liquid in the motor reducer, then remount the plug-in position 'B', let the motor drive turn for a couple of minutes on a sustained speed. Then empty the motor reducer from the detergent liquid again.

Lastly, do the filling up: let the motor drives turn until the plugs reach one of the configurations shown in figure 1 (check level). In both configurations, the plug-in position 'A' represents the unloading one and must be set at about 15° under the white line in the middle of the drives while the plug-in position 'B' represents the loading one. Start with the filling of the drives through plug 'B'. And when the oil comes out of plug 'A', terminate the filling and screw both plugs. After that, let the drives carry out some turns to eliminate eventual air locks. Re-check levels. It is better to use the recommended type of oil: **BP ENERGOL GR-XP 320 or equivalent.**

Note: In case of level re-establishing, do not mix different types of oil, but always use the same type contained in the tank. It is advisable to do the unloading of the oil when it is hot. Therefore, it comes out easier. Therefore, it would be better to carry out this operation at the end of a job. For the substitution of the hydraulic oil, it is possible to use a different brand, however it should have, the same characteristics as the one recommended by the Manufacturer.

IMPORTANT: To avoid pollution, it's absolutely forbidden to disperse oils, lubricants, filter cartridges or other noxious materials in the environment. Comply strictly with the instructions in force for the disposal of liquids or solid substances.

4- ENGINE AND HAMMER CHECK

Engine

For the oil level check of the engine and/or its substitution, for the check and/or the substitution of the concerning filter and for all the other checks concerning the engine, we recommend following all the instructions contained in the proper use and maintenance manual.

Hammer

For the check and/or re-establishment of the charge of nitrogen in the accumulator and for all the other checks concerning the hammer, we recommend following the instructions in the proper use and maintenance manual of the hammer.

5- BATTERY AND ELECTRICAL SYSTEM CHECK

Battery

Carry out the check of the electrolyte level of the battery with the engine off and with the pile driver parked on flat ground. The level of every element should be about 6 mm above the border of the plates. When it's necessary to re-establish the level, add distilled water, wearing waterproof gloves. It's better to add the water before starting the work. Check if the connecting chucks aren't oxidised. If they are, clean and grease them with antioxidant grease or substitute them.

Electrical system

The electrical system does not require special maintenance. Therefore, the good operation of the machine is a constant check of the machine itself. There are some components that, even if they have an independent circuit of operating regarding the machine, must be tested periodically. These components are the emergency button, the traffic indicator, and the outlet.

6- TROUBLESHOOTING

FAILURES	CAUSES	REMEDIES
Crawler tracks: Loosening of the crawler track	Lack of grease	Apply Grease to tighten
	Tightening valve defect The seal on the slack adjuster is damaged	Replace the valve Replace the seals in the slack adjuster Replace the worn-out components
The superior part of the crawler track doesn't maintain the original position anymore	Guide slide crawler track worn-out Rollers are worn-out	Replace the guide slide Replace rollers
The crawler track locks in the steering phase	Spoil like stones, gravel may be between rollers, crawler wheel, and the rubber crawler track	Clean the material out. Rotate the crawler track in both directions, slacken the tightening a little, and if it is possible lift the machine up.
Motor drives: See the concerning use and maintenance manuals supplied enclosed to this one.		

Engine: The Diesel engine doesn't start (battery and oil indicators off)	Battery unloaded Fuse, placed inside the starter frame, interrupted If, after having checked the battery and/or the fuse, the engine still doesn't start, it will be necessary to check the whole wiring of battery/starter board/engine. If this turns out negative, please have a look at the use and maintenance manual of the engine	Load or replace the battery Replace the fuse (20 amp) Replace the wiring
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The diesel engine doesn't start (battery and oil indicators on)	<p>Electric stop device broken</p> <p>If the electric stop device has been removed, the connections are wrong</p> <p>After having checked the emergency button and/or the electric stop device it will be necessary to check the whole wiring of the emergency button/electric stop device/engine. If that results negative, please have a look at the use and maintenance manual of the engine</p>	<p>Replace electric stop device</p> <p>Carry out the connections following the electrical schedule enclosed</p> <p>Replace the wiring</p>
The diesel engine starts.	Emergency button activated	<p>Deactivate the emergency button (rotate slowly clockwise)</p> <p>Release the lever from position A (it returns automatically in the neutral position)</p>

FAILURES	CAUSES	REMEDIES
<p>Control Panel:</p> <p>The distributor control levers do not work</p>	<p>Lack of oil</p> <p>Damaged or not connected tubes in the hydraulic system</p> <p>Hydraulic pump damaged</p> <p>Filter clogged</p>	<p>Add oil</p> <p>Substitute or connect the tubes</p> <p>Substitute the pump</p> <p>Substitute the filter</p>

The Arm move in jerks	Air in the hydraulic circuit	Make the machine work unoccupied for a while, using each function until the air exit the hydraulic circuit.
The Arm moves without activating the lever	Blocking valve jammed Jack gasket wear-out Distributor gasket wear-out	Change the lever and maybe the gaskets
Oil overheating	Filter clogged Tubes squashed Lack of oil	Substitute the filter Check and substitute the tubes Add oil
Oil leak from a connection	Slow connection Gasket wearout	Tighten the tube Substitute the gasket

FAILURES	CAUSES	REMEDIES
<p>Pile driver: The Diesel engine doesn't start (battery and oil indicators off)</p>	<p>Battery unloaded</p> <p>Fuse, placed inside the starter frame, interrupted</p> <p>If, after having checked the battery and/or the fuse, the engine still doesn't start, it will be necessary to check the whole wiring of battery/starter board/engine. If this turns out negative, please have a look at the use and maintenance manual of the engine</p>	<p>Load or replace the battery</p> <p>Replace the fuse (20 amp)</p> <p>Replace the wiring</p>
<p>The diesel engine doesn't start (battery and oil indicators on)</p>	<p>Electric stop device broken</p> <p>If the electric stop device has been removed, the connections are wrong</p> <p>After having checked the emergency button and/or the electric stop device it will be necessary to check the whole wiring of the emergency button/electric stop device/engine. If that results negative, please have a look at the use and maintenance manual of the engine</p>	<p>Replace electric stop device</p> <p>Carry out the connections following the electrical schedule enclosed</p> <p>Replace the wiring</p>

<p>The diesel engine starts, but after a few seconds it turns off</p>	<p>Emergency button activated</p> <p>The lever for hammer activation lever has been left in position A or B (see figure 14 page 33) and blocked at the end point</p> <p>If after having checked the emergency button and the lever for hammer activation and after having started the engine again the result is still negative, please have a look at the use and maintenance manual of the engine</p>	<p>Deactivate the emergency button (rotate slowly clockwise)</p> <p>Release the lever from position A or B (it returns automatically in the neutral position)</p>
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FAILURES	CAUSES	REMEDIES
<p>Pile driver(continued)</p> <p>The distributor control levers do not work</p>	<p>Lack of oil</p> <p>Damaged or not connected tubes in the hydraulic system</p> <p>Hydraulic pump damaged</p> <p>Filter clogged</p>	<p>Add oil</p> <p>Substitute or connect the tubes</p> <p>Substitute the pump</p> <p>Substitute the filter</p>
<p>The jacks move in jerks</p>	<p>Air in the hydraulic circuit</p>	<p>Make the machine working unoccupied for a while, using one by one all the jacks to exit the air left in the hydraulic circuit</p>
<p>A jack moves without activating the lever</p>	<p>Blocking valve jammed</p> <p>Jack gasket wear-out</p> <p>Distributor gasket wear-out</p>	<p>Substitute the valve</p> <p>Substitute the gaskets</p> <p>Substitute the gaskets</p>
<p>Oil overheating</p>	<p>Filter clogged Tubes squashed</p> <p>Lack of oil</p>	<p>Substitute the filter</p> <p>Check and substitute the tubes</p> <p>Add oil</p>

Oil leak from a connection	Slow connection Gasket wear-out	Tighten the tube Substitute the gasket
Hammer: The tubes of the hammer vibrate excessively.	The nitrogen accumulator is empty or lost pressure <i>Note:</i> <i>For all the other inconveniences concerning the hammer, please check the use and maintenance manual of the hammer</i>	Check the nitrogen cartridge in the accumulator or re-establish it. IMPORTANT: It is advisable to react immediately in order not to perforate the diaphragm or damage the tubes.
Note: For all other failures or inconveniences not mentioned in the schedule above, always contact The manufacturer.		

6- REQUEST OF SPARE PARTS

For requesting the spare parts always mention:

- The identification model, serial number, and construction year from the nameplate
- The description of the part against the parts manual or supply a photo of the part
- The quantity of the requested parts.

The reparations, maintenance and substitutions of parts not described in this manual, are not covered by the warranty and the Manufacturer is not responsible for the poor operating of the machine and the eventual consequences due to the use of these parts.

7- DIFFERENTIATED MATERIAL SPLITTING AND DISPOSAL IN CASE OF DEMOLITION

When the pile driver is out of function, the parts, which could be hazardous for people, animals or the environment if dispersed, must be made harmless. The material of the machine which must be subdivided is:

- steel
- hydraulic oil
- rubber
- plastic

The loss of such material must be carried out respecting the orders of law of every single Country.

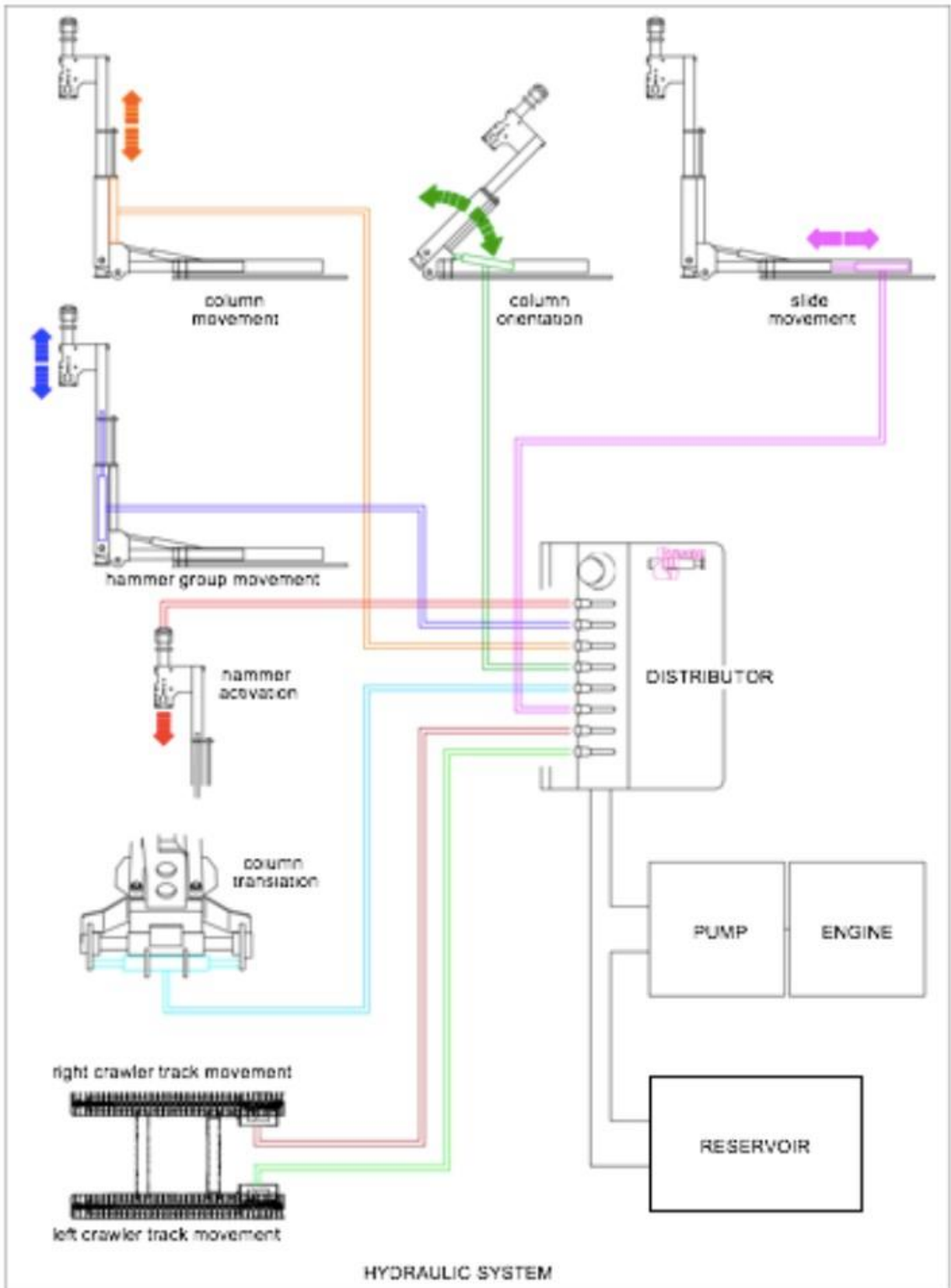


Fig 33

APPENDIX A

OPERATING PROCEDURE FOR DOWN THE HOLE HAMMER ROCK DRILL

The down the hole hammer rock drill was designed to drill through ground that is too hard for the hammer to drive a post i.e. soft to hard rock

Before operating your rock drill please follow this procedure;

1. Remove the drill from storage
2. Remove the cap from the top i.e. the threaded end
3. Using some approved Air Tool lubricating oil, place approximately 30 ml into the top of the hammer and allow it to drain through.
4. Apply normal grease to the thread. Fig 1
5. Place the drill through the bottom bearing.
6. Screw by hand the hammer into the drill connection. (Note the drill will self tighten as the drawer rotates the opposite way to the way the drill screws in) Fig 2
7. For connecting the air hose to your drill rig ensure that there is no direct contact within the hose by blowing a small quantity of air through it. Fig 3
8. Connect the hose to the drawing by inserting a clip to ensure the two connections do not break loose.
9. The drill can be operated by the valve in fig 4
10. Operate the drill by using the hydraulic control at the top of the control panel
11. Apply downward pressure to ensure the drill does not bounce
12. Ensure that the bottom bearing is placed 2 inches off the ground while drilling
13. As the drill is operating there will be a quantity of dust and drilling fines exiting the hole by the means of compressed air been exhausted
14. Either apply water mist to compress the dust or place suitable cover to contain the dust and drilling fines from going airborne
15. Operators should maintain good ear protection, suitable mask if required
16. Final setup. Fig 5



Fig1



Fig2
Fig 3 -



Fig3 Air Connection



Fig4 Hydraulic Control



Fig 5

APPENDIX B

OPERATING PROCEDURE FOR SCREW PILES

Your model pile driver is with a hydraulic motor. figure 1

1. To use the Quantum to screw in piles you need to connect a factory screw pile plate to the bottom of the drill. figure 1
2. The screws in and is tightened by hand
3. Piles are connected by the number of manufactured pins on the plate and held by downward pressure.
4. Piles are set into the base plate figure 2
5. The base plate must be placed on the ground at all times fig 3
6. The screw pile attachment is operated by the controller figure 3
7. At all times hands and personnel must stand back from the rotating pile 8. Normal PP safety gear must be used at all times



Fig 1



Fig2



Fig3

APPENDIX C

QUANTUM QUICK HITCH - INSTRUCTIONS

If a quick hitch is fitted to your machine please follow these instruction to change from the hammer to the second attachment (Rotary drill)

Disconnect all hydraulic hoses. Keep them clean.

Remove all 8 bolts down both sides of the main frame – store for later use

Look under the drill, you will see one bolt in the centre of the frame – remove and store for later use.

Your drill is fitted with (red) lifting eyes, - use these with associated certificated lift gear to remove and store the attachment in a clean and dry location.



Once the drill or the attachment is removed you will have a main frame that looks like this. It is now ready to receive the hammer.

Lift the hammer to position using suitable and certified lifting equipment. The hammer is placed on to the location pins on the top and bottom

Once it is in place – insert the bottom bolt, which is located between the location points, this bolt will pull the hammer down so the bolt holes are aligned.

Insert all 8 bolts and tighten.

Re-connect the two hydraulic hoses to the hammer, these are fitted with quick couplers.

You will have a spare hose, place a cap on the end as this hose is not used on the hammer.



Appendix D - RISK ASSESSMENT WORKSHEET (EXAMPLE ONLY)

PLANT HAZARD RISK ASSESSMENT WORKSHEET (PHA)		
Assessment Number:		Assessment Date:
Plant Type:	Plant Make:	Assessment Facilitated by: (Name & Title)
Plant Model:		
Asset/Fleet/Rego No:	Plant Serial No.	Assessment Participants: (Name & Title)
Plant Owner Name:		Initial Assessment <input type="checkbox"/> Follow up Assessment (See below) <input type="checkbox"/>
Follow up based on change to:		
Use of plant <input type="checkbox"/> System of work <input type="checkbox"/> Plant Environment <input type="checkbox"/> New or additional information <input type="checkbox"/> Plant through modification <input type="checkbox"/>		

Is the plant designed to perform the task? Yes No

Has the plant been modified from the original condition? Yes No _____

Is the plant in good working condition and free of weeds & mud? Yes No _____

All identified action items closed out/addressed (plant checks)? Yes No _____

Is the plant safe to operate? (On completion of PHA and action closure) Yes No _____

Date: _____ **Signature:** _____

Risk / Opportunity Rating Table

Likelihood	Almost Certain	D	C	B	A	A
	Likely	D	D	C	B	A
	Possible	E	D	C	C	B
	Unlikely	E	E	D	C	B
	Rare	E	E	D	D	C
		1	2	3	4	5
Consequence Rating						

Action Table

Residual risk / opp level	Suggested action	Timing of status and report management plans	Authority for continued toleration or improvement of residual rating.
A	Take action to eliminate or implement additional controls to reduce it to acceptable level (ALARP/SFAIRP). “Onsite activities” – Intolerable and activity must not commence	Report as soon as practicable. Normally within hours.	Senior Edit and add Executive Manager Plus Project Manager / Project Leadership Team
B	Implement additional controls reduce it to ALARP/SFAIRP. “Onsite activities” – must not commence without Corporate Management review	Manage and re-evaluate risk / opportunity to allow reporting days.. Manage and re-evaluate risk / opportunity to allow reporting every two weeks	Edit and add General Manager and / or Project Manager / Project Leadership Team
C	Implement additional controls reduce it to ALARP/SFAIRP. “Onsite activities” – must not commence without Site Management review	Manage and re-evaluate risk / opportunity to allow reporting monthly	Edit and add “Specialist” Manager, eg Construction or Design Manager
D	Will still require attention within existing operations to reduce to ALARP/SFAIRP. “Onsite Activities” – Site Management must determine appropriate level of management and supervision prior to commencement of activity	Manage and re-evaluate risk / opportunity to allow reporting every quarter	Edit and add Team Leader
E	Lower priority. May be tolerable. .	Monitor, manage and carryout activity in accordance with identified controls	Edit and add Supervisor

(see [JH-APP-RCC-003-02](#) for a full description of Risk Consequence, Opportunity Consequence and Likelihood Ratings)

Action and Approval Scheme

These suggested timings and tolerance levels in the Action Table will be overridden by specific policies of the company that either dictate shorter timeframes for corrective action or zero tolerance. For example, the company has a zero tolerance policy for Safety and Environmental risks.

The decision to tolerate a risk or capture an opportunity should be based on a consideration of: Whether the risk / opportunity is being controlled to a level that is reasonably achievable;

Whether it would be cost-effective to further control risk or capture the opportunity;

Whether **Edit and add** wishes to tolerate risks / opportunities of that type

Potential Hazards	Hazard			Describe Hazard	Controls Currently In Place on Plant	Current Risk Level	New or Additional Controls Required on Plant	Final Risk Level	New or Additional Controls Action By: (Name and Date)	Action Verified as Complete: (Name and Date)
	Y	N	N/A							

<p>1. Are there any specific warnings or conditions (Manufacturers or other) relating to potential hazards from the operation of the item of plant?</p> <ul style="list-style-type: none"> ■ Refer to technical or operating manuals, SOPs, safe use instructions ■ List any relevant safety warning hazards & controls 										
<p>2. Are there any COMMUNICATION requirements in relation to the safe operation of the plant?</p> <ul style="list-style-type: none"> ■ Active signaling processes. ■ Point to point communications. ■ Whistle ■ Spotter (with/without whistles) ■ Flag signaling ■ Labels and signage 										
<p>3. Can anyone be ENTANGLED in the plant?</p> <ul style="list-style-type: none"> ■ Hair or other body parts caught in moving parts ■ PPE caught in moving parts ■ Isolation devices ■ Warning decals ■ Guarding ■ Rotating parts ■ Emergency stops 										

Potential Hazards	Hazard			Describe Hazard	Controls Currently In Place on Plant	Current Risk Level	New or Additional Controls Required on Plant	Final Risk Level	New or Additional Controls Action By: (Name and Date)	Action Verified as Complete: (Name and Date)
	Y	N	N/A							

<p>4. Can anyone be CRUSHED or TRAPPED? (e.g. through unexpected movement, lack of capability for plant or equipment to be slowed, stopped or immobilized, plant tipping or rolling, being thrown from plant)</p> <ul style="list-style-type: none"> ■ Emergency stop (E Stop) ■ Service or parking brake ■ Battery isolator ■ ROPs/FOPs ■ Being crushed between moving parts ■ Unexpected movement ■ Neutral Start ■ Reversing/travel alarm ■ Warning horn ■ Amber flashing beacon ■ Appropriate controls ■ Crush zone decals ■ Guarding devices 									

Potential Hazards	Hazard			Describe Hazard	Controls Currently Place In on Plant	Current Risk Level	New or Additional Controls Required on Plant	Final Risk Level	New or Additional Controls Action By: (Name and Date)	Action Verified as Complete: (Name and Date)
	Y	N	N/A							

<p>5. Can anyone be CUT, STABBED or PUNCTURED?</p> <ul style="list-style-type: none"> ■ Flying objects ■ Moving parts ■ Pinch points ■ Sharp edges ■ Isolation devices ■ Warning decals ■ Guarding 										
<p>6. Can SHEARING occur?</p> <ul style="list-style-type: none"> ■ Between two moving and rotating parts ■ Between fixed and moving parts ■ Warning decals ■ Guarding 										
<p>7. Can ABRASION, TEARING or STRETCHING occur?</p> <ul style="list-style-type: none"> ■ Continuous contact with moving parts ■ Warning decals ■ Guarding ■ Pulling/pushing 										
<p>8. Can anyone be STRUCK whilst operating the plant?</p> <ul style="list-style-type: none"> ■ Plant disintegrating ■ Mobility of plant travelling ■ Reversing/travel alarm ■ Amber flashing beacon ■ Work pieces thrown out ■ Moving parts ■ Warning decals ■ Guarding 										

Potential Hazards	Hazard			Describe Hazard	Controls Currently In Place on Plant	Current Risk Level	New or Additional Controls Required on Plant	Final Risk Level	New or Additional Controls Action By: (Name and Date)	Action Verified as Complete: (Name and Date)
	Y	N	N/A							
9. Can a hazardous PRESSURE be produced? <ul style="list-style-type: none"> ■ Hydraulic hoses ■ Radiator ■ Come into contact with fluids under high pressure 										
10. Can an ELECTRICAL hazard be created? <ul style="list-style-type: none"> ■ Lack of insulation ■ Contact with electrical conductors ■ Poor earthing ■ Water near equipment ■ Lack of isolation ■ Warning decals 										
11. Can an EXPLOSION or LOSS OF CONTENTS occur? <ul style="list-style-type: none"> ■ Gas emission, ■ Dusts ■ Vapours, lubricants ■ Fuel tank ■ Storage of haz chemicals/ DG's near plant ■ Warning decals ■ Ejection of workpiece ■ Collapse or fragmentation 										
12. Can anyone using or near the plant SLIP, TRIP or FALL? <ul style="list-style-type: none"> ■ Uneven surface ■ Fall from a height ■ Weather conditions 										

■ Slippery surfaces										
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Potential Hazards	Hazard			Describe Hazard	Controls Currently In Place on Plant	Current Risk Level	New or Additional Controls Required on Plant	Final Risk Level	New or Additional Controls Action By: (Name and Date)	Action Verified as Complete: (Name and Date)
	Y	N	N/A							
13. Are there ERGONOMIC - MANUAL HANDLING hazards associated with the plant? <ul style="list-style-type: none"> ■ Poor posture ■ Repetitive or sustained movements ■ Awkward positions ■ Strained movements ■ Poorly designed seating ■ Access and egress ■ Access for maintenance ■ Routine inspections and adjustments 										
14. Are there ERGONOMIC - OPERATING CONTROL hazards associated with the plant? <ul style="list-style-type: none"> ■ Difficult to understand ■ Inappropriate colouring ■ Function not identified ■ Inappropriate controls & switches ■ Access and egress ■ Labelling of controls and indicators ■ Variation in operators 										

<ul style="list-style-type: none"> ■ Operation by two or more persons 									
--	--	--	--	--	--	--	--	--	--

Potential Hazards	Hazard			Describe Hazard	Controls Currently In Place on Plant	Current Risk Level	New or Additional Controls Required on Plant	Final Risk Level	New or Additional Controls Action By: (Name and Date)	Action Verified as Complete: (Name and Date)
	Y	N	N/A							
<p>15. Are there specific requirements for ISOLATION of energy sources?</p> <ul style="list-style-type: none"> ■ Hydraulic pressure ■ Compressed gases ■ Electrical feeds/capacitors ■ Motive power systems ■ Suspended loads ■ Operation by two or more persons 										
<p>16. Can unplanned LOSS of POWER create a hazard?</p> <ul style="list-style-type: none"> ■ Engine shutdown ■ Loss of electrical supply ■ Loss of steering systems ■ Ability to apply brakes and stop 										

<ul style="list-style-type: none"> ■ Ability to lower suspended loads 										
<p>17. Can anyone be SUFFOCATED?</p> <ul style="list-style-type: none"> ■ Lack of oxygen ■ Contaminated atmosphere ■ Confined spaces ■ Spaces where air flow is inadequate 										
Potential Hazards	Hazard			Describe Hazard	Controls Currently Place In on Plant	Current Risk Level	New or Additional Controls Required on Plant	Final Risk Level	New or Additional Controls Action By: (Name and Date)	Action Verified as Complete: (Name and Date)
	Y	N	N/A							
<p>18. Does operation of the plant cause extreme TEMPERATURE changes?</p> <ul style="list-style-type: none"> ■ Fire ■ Burns through conduction ■ Convection ■ Cryogenic burns ■ Operation in extreme heat or cold 										
<p>19. Can a FIRE occur?</p> <ul style="list-style-type: none"> ■ Friction ■ Ingress of materials/fluids ■ Build-up of materials/lubricants ■ Fuels ■ Fire extinguisher 										

<p>20. Can certain WEATHER conditions create a hazard?</p> <ul style="list-style-type: none"> ■ Hypothermia / extreme cold ■ Heat stroke / extreme hot ■ Wet conditions ■ Electrical storms ■ Dirt & mud on roads at egress points 										
<p>21. Does VIBRATION of the plant create a hazard?</p> <ul style="list-style-type: none"> ■ Plant becomes unstable ■ Causes physical problems for the operator whilst operating ■ Vibration of equipment ■ Operation could cause unacceptable vibration levels in nearby structures 										

Potential Hazards	Hazard			Describe Hazard	Controls Currently In Place on Plant	Current Risk Level	New or Additional Controls Required on Plant	Final Risk Level	New or Additional Controls Action By: (Name and Date)	Action Verified as Complete: (Name and Date)
	Y	N	N/A							
<p>22. Can the plant emit toxic FUMES or VAPOURS?</p> <ul style="list-style-type: none"> ■ Exhaust fumes ■ Chemicals ■ Haz chemicals/DG's 										

<p>23. Carry out NOISE survey on page 14. Is the plant noisy?</p> <ul style="list-style-type: none"> ■ Emit >85 dBA at the operator ■ Effects operator communication ■ Noise impacts on community during out-of-hours work (including reversing beepers) 										
<p>24. Carry out the LIGHT survey on page 14. Is there poor visibility</p> <ul style="list-style-type: none"> ■ At the controls ■ At the task ■ Darkens surrounding areas ■ Light impacts on community or sensitive natural environment during out-of-hours work 										
<p>25. Does the plant emit RADIATION?</p> <ul style="list-style-type: none"> ■ Eg X-rays ■ EMR ■ Laser 										

Potential Hazards	Hazard			Describe Hazard	Controls Currently In Place on Plant	Current Risk Level	New or Additional Controls Required on Plant	Final Risk Level	New or Additional Controls Action By: (Name and Date)	Action Verified as Complete: (Name and Date)
	Y	N	N/A							

<p>26. Can operation of the plant create DUST?</p> <ul style="list-style-type: none"> ■ Explosive atmosphere ■ Breathing hazard ■ Reduced visibility ■ Nuisance dust at nearby community ■ Impact on local flora and fauna ■ Loss of topsoil and spread of weeds and pathogens 										
<p>27. Can the plant become UNSTABLE during operation?</p> <ul style="list-style-type: none"> ■ Working on uneven / unstable ground ■ Shifting load ■ Lack of plant support ■ Outriggers 										
<p>28. Could LOSS of LOAD occur?</p> <ul style="list-style-type: none"> ■ Failure of ropes/slings ■ Overloading ■ Entanglement in surrounding structures ■ Maintenance requirements 										

Potential Hazards	Hazard			Describe Hazard	Controls Currently In Place on Plant	Current Risk Level	New or Additional Controls Required on Plant	Final Risk Level	New or Additional Controls Action By: (Name and Date)	Action Verified as Complete: (Name and Date)
	Y	N	N/A							

<p>29. Is there anything in the SURROUNDING ENVIRONMENT that may produce a hazard?</p> <ul style="list-style-type: none"> ■ Power lines ■ Low ceiling ■ Other plant ■ Storage areas ■ Co-located equipment ■ Isolation requirements ■ Potential for flash flooding if operating adjacent to waterways ■ Operating in known areas of weeds, pathogens or contamination ■ Operating in sensitive environments requiring protection from offsite weeds/pathogens or spills 										
<p>30. Can CHEMICALS create a hazard?</p> <ul style="list-style-type: none"> ■ Leaking from plant ■ Splashing ■ Explosion ■ PPE considerations ■ Spill kit considerations 										
<p>31. Operator TRAINING / QUALIFICATIONS?</p> <ul style="list-style-type: none"> ■ Training requirements ■ Qualification requirements ■ Competency assessments ■ Documentation ■ Operator's manual ■ Equipment experience ■ Product knowledge 										
	Hazard				Controls		New or Additional		New or Additional	

Potential Hazards	Y	N	N/A	Describe Hazard	Currently Place Plant	In on	Current Risk Level	Controls Required on Plant	Final Risk Level	Controls Action By: (Name and Date)	Action Verified as Complete: (Name and Date)
32. Are there <u>ANY OTHER</u> potential hazards generated by or during the use of this item of plant and/or any attachments?											

ALL OPERATORS OF THE PLANT OR EQUIPMENT MUST BE BRIEFED ON THE PLANT HAZARD ASSESSMENT (PHA) PRIOR TO FIRST TIME USE.
 ANY RELEVANT CONDITIONS WHICH MAY IMPACT ON THE OPERATION OF THIS ITEM OF PLANT OR EQUIPMENT MUST BE TRANSFERRED TO THE AMS/TRA.

Noise Report /Lighting Report

NOISE REPORT			
Equipment Type:		Serial/Asset No.	
Make:		Model:	
Test by (print):		Date:	
Signature:			
Sound Level Meter Unit Used:			
Manufacturers specified noise level:			dBA
Background level:			dBA
Results – Operator’s Station (Equipment Operating)		dBA	High Idle
		dBA	Low Idle
Comments:			
Results – Bystander Position: At 7 metres from side of equipment – Equipment Operating (High Idle)			
Front			dBA
Rear			dBA

LIGHTING REPORT			
Test by (print):		Date:	
Signature:			
Lux Meter used:			
Results – Operator’s station			
At controls			Lux
At emergency control			Lux
In front/over task			Lux
Left side task			Lux
Right side task			Lux
Comments:			
Results – Surroundings:			
Clearly seen by others?		Yes	No
Decrease lighting in walkways?		Yes	No

Left	dBA
Right	dBA
Comments:	

Decrease lighting to other workstations?	Yes	No
Comments:		



SAMPLE ONLY

Appendix E - QUANTUM PILE DRIVER PRE START UP CHECK LIST

Unit _____ No: _____
Date: _____
Department: _____

Housekeeping in Vehicle Machine:
[] Clean
[] Dirty
© Innosis Makine

Hours: _____
Operator/Shift: _____
Repair Order #: _____

Check defects and explain under "remarks" what is needed or what is defective.
Note: Only those items applicable to your vehicle/machine needs to be checked.

Are you trained to operate this piece of equipment?
Yes []
No []
Explain: _____

Employee's
Signature: _____
Date: _____

Remarks: _____

Check the following	Okay	Needs Repair	Completed	
			Repaired	Initials
Check all Oils, Engine, Hydraulic, and Water levels				
Check for Body Damage				
Check for Wiring damage				
Check that all Guards, Covers are in place				
Latches and Handles are all working				
Clean Tracks of rocks, stones and spoils				
Controls for fully functional and Operation correctly				
Fire Extinguisher and First Aid Kit				
Check Lights if fitted are working				
Check all gauges and meters are working				
Hammer Greased with the last 4 hours				
GPS System fitted correctly (if applies)				
All Bolts checked for loose bolts				
Pile Head undamaged				
Mast can slide Left / Right and In / Out				
Fuel Checked levels				



If the vehicle is unsafe and needs to be dead lined/red tagged:

1. Remove keys
2. Fill out repair order
3. Submit repair order to office

Appendix F - [Warranty Claim Form](#)

Company	
Address	
Contact Person	
Contact Email	
Contact Phone	
Fault Date	
Machine Model	
Machine Serial	
Engine Model	
Engine Serial	
Faulty Parts	
Faulty Part Serials	
Contact Person Signature	

I declare that all information on this document is correct. I am responsible for any problems arising from incorrect or incomplete information.

Please give a full description of the fault with supporting photos:

