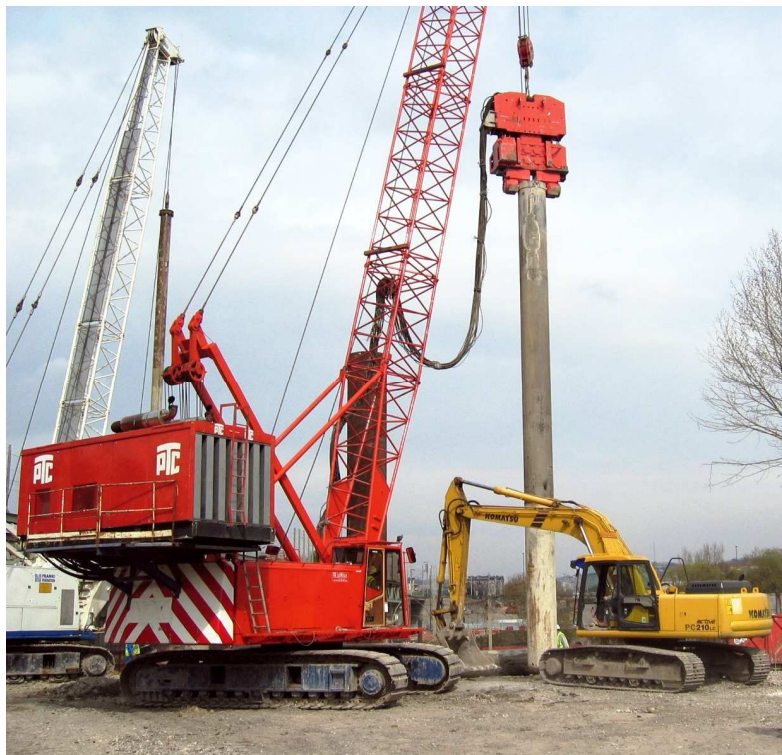
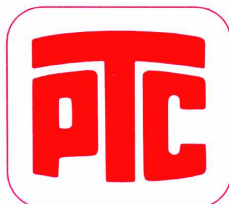


# Vibrofonceur<sup>®</sup>



|               | type           | n°    |
|---------------|----------------|-------|
| Vibrodriver   | 60HD L         | 46721 |
| Power pack    | 600 CAT L      | 28053 |
| Clamping head | Agriplex 240 t | 52154 |
| Clamp         | 120 t          | 55819 |
| Clamp         | 120 t          | 55820 |



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**CAUTION!**

**Failure to carry out all the instructions contained in this manual may affect the safe use of the machine, its performance and its longevity: it may also affect the validity of our warranty.**



# Vibrodriver

Operating Manual USA

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## CHAPTER 1

### SERIAL NUMBERS - SPECIFICATIONS



### CHAPTER 1

### VIBRODRIVER

#### Model:

- Type : **50HS2**
- Serial Number : **46721**
- Year : **2002**

#### Dimensions: (see drawings Chapter 12 page 2/11)

- Weight without clamping head : **15 532 lbs**

#### Hydraulic motor(s):

- Quantity : **2**
- Trade mark : **PARKER**
- Type : **F12-110**

#### Frequency:

- Max : **1 600 rpm**
- Centrifugal force : **208 tons**

#### Suspension yoke:

- Number of elastomer blocks : **8**
- Max. admissible line pull : **66,1 tons**

#### Lubrication: (see Chapter 9)

- Capacity of vibratory gearbox : **11 gal**
- HP filters in the suspension yoke :
  - Quantity : **1**
  - Ref. cartridge P.T.C. : **301.239**



### POWER PACK

#### Model:

- Type : **600 CAT-E**
- Serial Number : **28053**
- Year : **2002**

#### Dimensions : (see drawing Chapter 12 page 2/24)

- Weight (full) : **15 400 lbs**

#### Ambient temperature :

- Min. admissible in operator : **- 4°F**
- Max. admissible in operator : **+ 122°F**

#### Engine :

- Trade mark : **CATERPILLAR**
- Type : **3406 DITA -1**
- Idle speed operation : **1 200 rpm**
- Max. speed under no load : **2 280 rpm**                      - under load : **2 100 rpm**
- Power (ISO 3046 Norm) : **500,2 HP to 2 100 rpm**
- Lubrication (see Chapter 9 and Manufacturer's manual) :
  - Oil pan capacity : **9 gal**
  
- Voltage of electrical equipment : **24 V**
- Original battery :
  - Quantity : **2**
  - Ref. P.T.C.: **301 242**
  - Unit voltage : **12 V**
  - Unit capacity : **160 Ah**



# Vibrofonceur<sup>®</sup>

## Operating manual

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Cooling : (radiator special P.T.C. with incorporated oil radiator)

- Radiator capacity : **17 gal**
- Antifreeze. Original protection until : - **4°F**

Main pump(s) : (variable flow operating in closed loop circuit)

- Quantity : **2**
- Trade mark : **SAUER**                      - Type : **90 R 130**
- Max. working pressure : **5580 psi**
- Delivery at max engine speed under no load (see above) : **156 gal/min**

Auxiliary pump :

- Quantity : **1**
- Ref. P.T.C.: 306786
- Delivery at max. engine speed under load : **9 gal/mn**
- Max. working pressure : **5080 psi**

Hydrostatic transmission oil : (see lubrication table chapter 9/5)

(with environment friendly biodegradable hydraulic oil)

- Tank capacity : **164 gal**
- Capacity of a complete set of **1770 inch** of connecting hoses : **40 gal**
- Filters
  - Intake :
    - Quantity : **3**                      - Ref. cartridge P.T.C.: **301 781**
  - Low-pressure return :
    - Quantity : **2**                      - Ref. cartridge P.T.C.: **301 122**
  - Drain line return :
    - Quantity : **1**                      - Ref. cartridge P.T.C.: **305 957**



# Vibrofonceur<sup>®</sup>

## Operating manual

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Sound proofing : by acoustic gratings, internal soundproofing, special silencer.

- Sound level : **82** dBA

Instrumental panel and pushbutton control box :

Composition. Functions. See drawing pages **Chapter 12 page 5/24 and 6/24**

Hydraulic connecting hoses :

See pages : **Chapter 12 page 23/24**

- Length of original connection : **1770** inch



### CLAMPING HEAD

#### Model :

- Type : **AGRIPLEX 170 t**      - Serial Number : **52154**      - Year : **2002**

#### Dimensions : (see drawing Chapter 12 page 2/4)

- Total weight :      **4740 lbs**

#### Clamping force :

- Per clamp :      **270 tons**  
- Supply pressure : **4 640 psi**

#### Special features :

- Quantity of screws : **14**      - Ref. P.T.C.: **20 027**  
- Tightening Torque : **25 520 in.lbs**





### CLAMPING HEAD

#### Model:

- Type : **2 x 120 t**
- Serial Number : **55819**
- Year : **2002**
- Serial Number : **55820**
- Year : **2002**

#### Dimensions : (see drawing Chapter 12 page 2/4)

- Total Weigth : **3,850 lbs**

#### Clamping force :

- Per clamp : **134 tons**
- Supply pressure : **4,640 psi**

#### Special features :

- Quantity of screw : **14** - Ref P.T.C. : **22 709**
- Tightening Torque : **25,520 lbs.inch**



## CHAPTER 2

### WARRANTY ON PTC VIBRODRIVERS

Our Vibrodriver are covered by a warranty for 12 months running of the power pack, whichever comes first, on manufacturing defects. Warranty is restricted to the free replacement or repair in our works (as chosen by us) of defective parts.

For parts or components which we buy from our subcontractors, the warranty is restricted to the warranty accepted by our own suppliers.

We are not liable for direct or indirect consequences of warranty cases.

All transportation and labour costs are excluded from our warranty.

We are not liable for damages resulting from faulty operation including improper maintenance or overloading.



## CHAPTER 3

### DESCRIPTION

#### I. General description

A Vibrodriver is a generator of unidirectional vibrations consisting of rotating eccentrics producing a centrifugal force with a vertical resultant.

The eccentrics are driven by one (or more) hydraulic motor(s) powered by a power pack supplied with the Vibrodriver or sometimes by the hydraulic take-off from the carrying machine (hydraulic crane or excavator).

A Vibrodriver<sup>®</sup> is used for driving and extracting all sorts of elements (sheet piles, casings, I and H beams, etc...), concrete and wooden piles, etc...

The section is rigidly held under the Vibrodriver by means of a clamping head formed of one, two, or four clamps, itself screwed under the Vibrodriver.

#### II. Vibrodriver

A Vibrodriver consists of 2 main parts. From top to bottom: the suspension yoke, and the vibratory gearbox.

The suspension yoke is designed, in order to avoid vibration transmission to the crane and, on the other hand, to carry on, by its weight an additional downward force. It contains a certain number of elastomer blocks.

The vibratory gearbox contains 2, 4, 8 or more sets, consisting of two eccentrics, one pinion and a shaft.

Those sets, mounted on roller bearings are rotating in a vertical plane. The pinions are transmitting the power and ensure synchronization of all the eccentrics. The bearings are lubricated by an outside pump recycling continuously the gear oil on each bearing.

Some Vibrodriver are equipped with special «Extractor» systems which allow having lubrication when the vibrator is not running.

For the HFV range, one special synchronization system avoids the vibrations during starting up and stopping down.

For the Vibtronic<sup>®</sup> range, one accelerometer and one in-coder are fixed, in order to measure, treat, print, and screen the amplitude and the frequency of the vibrator continuously, and also the soil velocity.

#### III. Clamping head

The clamping head may have one clamp (Agriplex) or two clamps (Multiplex - Duplex) or even 4 clamps (Quadriplex). Each clamp consists of one body, usually made of cast steel, and incorporates on one side a fixed jaw and on the other side a mobile jaw actuated by a hydraulic & double action jack.



## IV. Power pack

The power pack basically consists of a diesel engine. It drives one, two or more main pumps, (which are of variable flow type), powering the Vibrodriver's motor(s). One or 2 auxiliary piston pump(s) is powering the clamping head circuit, the variable circuit (only for HFV range), the extractor and cooling vibrator circuit for the Vibrodriver equipped.

The engine & the pump are fixed on a fuel tank frame, canopy with doors, and is sound proofed in accordance with the standards rules and European and US laws. This sound proof system can be improved for special applications. (S range).

A control panel contains all the diesel engine monitor dials, those for the hydraulic circuit, together with safety indicators and eventually screen and printer (Vibtronic® range).

A button control box with 472 in. cable (standard length) permits remote control of the Vibrodriver (Page 3/A):

- Engine speed control.
- Vibrodriver speed variation.
- Opening/Closing clamping head.

For HFV range:

- Amplitude variation. A+ / A-.

The Vibtronic® range is equipped with a computer which leads all the electrical inputs & outputs. The equipment can also be controlled with a radio system without cable (see page 3/B).

## V. Hydraulic hoses

The connection between the Vibrodriver and the power pack is done by a set of hydraulic hoses.

The hoses (except those for the clamping head) are designed in such a way that it is not possible to make any mistake of connection. The high-pressure and low-pressure hoses of the hydraulic transmission can be interchanged.

The set is formed of 590 in. elements joined together by a swivel coupling for easier of handling (except for the clamping head hoses and the variable circuit for the HFV & Vibtronic® range).

The HFV and Vibtronic® ranges are using an electrical cable between the Vibrodriver and the power pack.



## CHAPTER 4

### PREPARATION BEFORE STARTING

#### I. Receipt and precaution

The greatest caution is recommended during equipment unloading operations.

It is recommended to make a complete inventory and a quick inspection of the equipment as soon as you receive it. Any comments should be made to the carrier. Otherwise claims will not be taken into account.

#### II. Hoisting sling

The supply of the hoisting sling is always the customer's responsibility. Usual safety factor is 5. The sling's normal capacity should in theory be equal to the Vibrodriver's traction capacity.

#### III. Clamping head fixing

Single clamping heads (Agridex and Polygrip) are attached to the Vibrodriver by 8 to 12 screws. For multiple clamping heads (Duplex, Multiplex, Quadriplex), the number of screws depends on the intermediate part. (T-bar, Spreader beam, I-beam).

The length of the screws supplied is such that the threaded part engaged onto the Vibrodriver's shoe plate does not exceed 1 3/8 or 1 3/4 in.

Standard screws can be replaced with tougher screws for especially severe applications.

All screws are used with special washer.

To facilitate hole alignment, two locating pins are supplied with the tool kit.

The tightening torque for the M39 screws indicated 2500 in.lbs ton must be respected.

#### IV. Connection of hydraulic hoses

The first precaution to be taken is to spread out side by side all the hoses, taking care to carefully mark the ends and locate them near to the Vibrodriver and the power pack.

The male and the female plugs must then be removed, taking care to place them in the tool box and clean the nipples and adaptors before connecting.

Before starting up the power pack, and although a "fail-safe" system exists to prevent errors (except on the clamping head hoses), carefully check the connection.

The clamping head is connected to the Vibrodriver by means of hoses supplied with the tool kit. At connection, comply with the indications "OPENING : ←][→" and "CLOSING : →][←".

#### **CAUTION!**

**For the Vibrodriver equipped of the forced lubrication (extractor system).  
Before starting the power pack engine, make sure that the Vibrodriver is in vertical position.  
Otherwise you may damage this system.**



## V. Hoses filling

Check that all the recommendations listed here above are properly complied, then:

- Start up the power pack in accordance with the instructions in chapter 6.
- First, on the charge pump pressure gauge, note the pressure (# 60 psi.) due to the valve located at the power pack's HP output. After a few moments, from 10 to 20 sec., the charge pump pressure at minimum speed of the engine should become stable at above 300 psi. At this point, the hoses are full.

We may specify that there is not mechanical safety device which prevents main pump starting if the charge pump pressure is below 170 psi. Only the alarm of the power pack will be switch on.

## VI. Jack tests

- Check that the adaptors are properly tightened.
- Place a plate between the clamp jaws.
- Press the " Close Jack : →][← ", button on the button box. The button has a locking device, and there is no need to keep the finger on it.
- The clamps should close in 10 to 30 seconds depending on the model. As soon as the desired pressure is reached, the green lamp on the button control box must light up. In the event of failure to close, see chapter 11.
- Press the " Open Jack : ←][→ " push button until the clamp is completely open.
- Perform the Closing/Opening operation again 3 to 4 times to thoroughly purge the circuit.

## VII. Variable system tests (HFV and Vibtronic® range only)

- Make sure that the hoses are properly connected and tightened.
- Check the pressure on manometer which should be above 1305 psi.

## VIII. Reinforced lubrication & cooling system of Vibrodriver

### **CAUTION!**

**For the Vibrodriver equipped of the forced lubrication (Extractor system ).  
Before starting the power pack engine, make sure that the Vibrodriver is in vertical position.  
Otherwise you may damage this system.**

- Check if the gear pump on the extracting system is running.
- Check (if the Vibrodriver is equipped) that the fan of the cooler or into the suspension yoke is running.
- The outside temperature of the Vibrodriver flanges should not exhide 212°F, otherwise the bearing lubrication is not working properly and the Vibrodriver will be damaged.



## CHAPTER 5

### OPERATING – SAFETY

#### I. Prescriptions

##### 1. Prevention

The staff working on the machine should read the manual of use before starting work. It will be too late to do so during work. This applies particularly to the staff dealing only occasionally with the machine, for example for assembling and servicing.

- All operators must read, assimilate and act in strict conformity with the content of the manual for performing their work properly
- The foreman will be held responsible for the good application of the current user regulations
- Any improper use might lead to physical injuries and damages to goods and environment
- The directions for use should be kept by the user during the whole lifetime of the machine, even in case of resale. Should the directions for use come to be damaged, a new copy may be obtained from PTC.

The manual of use gives important instructions enabling you to run the machine safely and in a suitable and economical manner. Please follow these instructions so as to best avoid risks, reduce repairing costs, shorten inactivity time and increase the reliability of the machine as well as its lifetime.

The manual of use should always be available on the job site of the machine

The manual of use has to be read and applied by any person working with the machine.

##### 2. Warning plates and symbols

Following symbols are used in the manual for particularly important indications:

**Important!** Running the machine in an economical way.

**Warning!** Preventing risks.

**Danger!** Preventing physical injuries and considerable damages.

#### II. Principe and suitable use

##### 1. Selection of the equipment

If possible, the equipment used should have more power than required for the work to be performed.

The choice of power depends on the geometric characteristics and the weight of the elements to be driven or extracted, their penetration and the nature of the ground. Moreover, resistance to driving is not always related to ground hardness (usually expressed in SPT).

The selection is basically a matter of experience. If you have not enough experience, do not hesitate to contact PTC agent.

The parameters for a Vibrodriver are as follows:

- Eccentricity Moment: (Mt) in in.Lbs.
- Rotation speed : (n) in thousands of rpm

Which determine:

- Centrifugal force: (Fc) in ton. (or tonnes, approximately)

$$F_c = 97 \times M_t \times n^2$$



- Amplitude: A in in.

$$A = \frac{2Mt}{W}$$
 where W is the total weight in vibration expressed in Lbs.

As a general rule, a high frequency and a low amplitude are preferable for sandy ground and extraction jobs, while a low frequency and a large moment are more suitable for driving in heavy ground.

Do not select a Vibrodriver as a function of the carrying machine, but rather choose the latter as a function of the Vibrodriver model, desirable for the job.

The use of a Vibrodriver is subject to standard NF EN996 (December 2003).

### **CAUTION!**

**The Vibrodriver and the power pack must not be operated when the temperature falls below -4 °F. degrees as major damage can be caused to the hydraulic pumps and motors.**

The set (power pack and Vibrodriver) was manufactured according to the current technical knowledge and the known safety regulations. However, using it might involve risks of physical injuries to the user or third parties and damages to the machine or other goods.

The machine should be used only in perfect technical condition and in conformity with its purpose. Please follow the instructions for use, keep in mind safety rules and remain fully aware of danger! Eliminate any dangerous breakdown. Contact PTC's service department for any problem.

The machine is exclusively intended for driving and extracting sections (casings or sheet piles). Any other use or any use beyond what is allowed shall not be considered as conform to the purpose of the machine. PTC shall not be held responsible for damages incurred through misuse, all responsibility being borne by the user.

## **2. Driving**

When an element is at refusal, leave the Vibrodriver to increase the pressure in order to allow the pulsation. (Only for the HFV range in automatic position). The amplitude decreases and increases automatically, to keep the maximum frequency.

If the element stays at refusal, try to pull it out about 20 in., then resume driving.

It may be a good idea to adapt the frequency as a function of the ground in order to obtain the optimum driving speed, which is not always obtained at maximum frequency.

### **a) Casings**

In general, it is recommended to adopt for casings a wall thickness at least equal to 1/100 th of the diameter. The top of the casings, when they are re-used for each pile, should preferably be reinforced.

Take care to see that the Vibrodriver is correctly centered on the casing by correct clamp positioning.

Whenever possible, execute prior to driving a preliminary hole as deep as the ground and the drilling-machine will permit.

Always drive open casings, except for small diameters and very easy ground (consult us).

If driving is still impossible and if the required depth is not reached, proceed as follows:

Either clean out the casing (below the case, where applicable) by augering when the height of the casing above the ground permits insertion of the auger,

Or, empty the casing by grab in the contrary case.

### **b) Sheet piles**

We recommend driving sheet piles one by one. Experience shows that on most sites, this produces time savings by comparison with driving in pairs.

In view of the narrowness of virtually all PTC Vibrodriver, one sheet pile can be driven between two others. (Piano driving).





The ease of driving greatly depends on correct execution of a sheet pile curtain, reducing the friction between sheet piles.

It is recommended, specially in gravelly ground, to close (e.g. with a rivet) before driving, the lower end of the free lock of a sheet pile so that it may not be obstructed for allowing the next sheet pile to pass through.

### **3. Extracting**

Crane traction on the Vibrodriver should not exceed the capacity marked on the yoke. Should this capacity be exceeded, a loud metallic noise occurs, indicating that the yoke is knocking against the stop.

In this case, vibrations are propagated to the crane boom. Immediately lower the traction force.

Generally speaking, do not exert a traction force until you have checked that the element is vibrating. This occurs when the element begins to be driven into the ground and/or when the hydrostatic pressure rises.

## **III. General instructions**

The manual of use should always be at hand on the working site of the machine.

Besides, one must abide by the general instructions such as legally provided for and follow all other compulsory regulations related to prevention of accidents and protection of the environment. The staff should be instructed accordingly! Such obligations might also be related to the handling of dangerous matters and wearing of protection clothes (helmet, safety shoes).

Make sure, at least from time to time, that the staff works in conformity with the safety instructions and those of the present manual of use and is fully aware of danger.

Use personal protection equipment, if necessary or if so prescribed.

Keep to all instructions relative to safety and danger such as indicated on the warning plates affixed on the machine. Make sure that same plates are complete and easily legible.

In case the behavior of the machine shifts during work, thereby endangering safety, stop the machine immediately and inform the staff (crane driver, surrounding staff) about the incident.

Do not modify the machine in one way or other or add any part (either supplied or not) to it, while safety could be involved, without PTC's prior agreement. This has also to be applied to the assembling and adjusting of the safety devices (pressure stat) and of the safety valves as well as to the welding work on bearing parts.

Replace the hydraulic parts and other elements at due intervals such as indicated in chapter 9 even if no defect liable to endanger safety has been detected.

Periodically carry out controls and inspections as prescribed in chapter 9.

Appropriate and specific working equipment is absolutely necessary for conducting maintenance work. Inform the staff about location of the nearby fire extinguishers and give instructions about their handling.



## IV. Staff selection and qualification

Any work with and on the machine must be performed solely by a trustworthy staff. Legal minimum age must be respected.

Apply only to trained or initiated staff, clearly define staff skills for driving, assembling, maintenance and overhauling.

Make sure that only the staff in charge of these operations works on and with the machine!

The foreman is responsible for the running of the machine and must refuse to follow any instructions against safety rules, which might be given by third parties!

Any staff in the course of training or initiation apprenticed or operating within the frame of a general training is allowed to work on and with the machine only under permanent supervision of an experienced person.

Any work on the electrical equipment of the machine may be performed only by a specialist in electricity or by initiated staff under the direction and supervision of a specialist in electricity and according to the rules of electrical technology.

Only experienced staff having special knowledge in hydraulics is allowed to work on the hydraulic equipments!

## V. Safety instructions concerning particular working phases

Before starting work, get well acquainted with the working conditions on the site, e.g. existing obstacles in the working and moving areas, soil resistance and necessary protection devices between the job site and the public road.

Take the necessary steps to ensure that the machine will work safely and in good working order.\$

### **CAUTION:**

**For Vibrodriver equipped with forced lubrication (extracting system).  
Before starting the power pack make sure the Vibrodriver is in vertical position. Otherwise, you  
might damage the forced lubrication system of the vibrator.**

Do not start the machine unless all protection and safety devices - such as urgency stopping devices, soundproofing, and suction devices - are there and working.

Make sure all the precautions mentioned in chapter 4 have been taken.

Check the machine at least once with respect to the electrical board so as to detect any visible damage and defects. Immediately advise the concerned person or post about any modification noticed (including change in behavior during work) or any fault detected. Eventually, stop the machine immediately and lock it.

During the starting and stopping operations, watch the control indicators located on the front of the power pack (manometers, level indicators, etc...)



## VI. Special operations involved in the running of the machine, servicing and repairing during work

Adjusting, maintenance and inspection operations must be conducted at intervals provided for in chapters 9 and 10. Instructions concerning replacement of the parts (see chapters 9 and 12 for list of references) must be followed. Only qualified staff may perform same work.

If the machine has been completely stopped for maintenance and repairing work, it must be protected against any unintentional restarting:

- lock the main controls and take off the key
- have a warning plate affixed on the main switch

The individual parts and large units to be replaced must be cautiously slinged with appropriate hoisting equipment in perfectly good technical condition and with suspension means for the load having a sufficient loading capacity. Do not stay or work under suspended loads!

Only experienced staff should sling the loads and guide the crane driver! The guide must stand within sight of the driver or be able to communicate orally with him.

Clean the machine, especially the connecting wires and bolts and wipe off the remaining oil, fuel and cleaning product before starting maintenance or repairing work! Do not use aggressive cleaning product! Use wipers which do not plush.

Before cleaning the machine with water or vapor jetting (high pressure cleaner) or with other cleaning product, cover all openings which, for safety and good working's sake, must be protected against water, vapor or cleaning product. This particularly applies to the control board of the power pack.

Once cleaning is over, check all fuel, engine oil and hydraulic oil piping, make sure there is no leak, that the connecting wires have not been loosened or damaged due to rubbing or otherwise deteriorated. Deal immediately with any eventual flaw by calling PTC's technical services, if necessary.

Tighten up any screw connections which might have been loosened during maintenance and overhauling work!

### **CAUTION!**

**Watch out for high-pressure oil leakage. Remain at a distance from the hydraulic hoses and never try to restrict any leakage by placing the hands (or feet) over the leak (this might cause a serious wound).**

## VII. Instructions related to specifics risks

The Vibrodriver are subjected to the same safety rules as those for suspended loads. (EEC 89/392)

For extraction work, never exceed the Vibrodriver's traction capacity (see further on under " extraction ").

During the work, constantly check the clamping jack pressure and check that there is no slipping on the element gripped.

Never leave a Vibrodriver at rest:

- Attached to the hoisting machine with an element suspended from the clamping head,
- On a driven element in the ground, without the crane's support.



## 1. Electrical energy

Read carefully chapter 8 of the present manual before actioning electrically the power pack.

Use only original fuses with the right amperage such as indicated! In case of breakdown in the electrical unit, stop the power pack immediately.

Keep the machine far enough from electrical wires! In case work is to be done near electrical wires, make sure the equipment does not come close to these wires. Death danger! Inquire about the safety distances to keep.

If you have touched high current lines:

- do not leave the machine
- drive the machine out of the dangerous area
- warn the surrounding people not to get near the machine and not to touch it
- have tension cut off
- Do not leave the machine before you know for sure that the touched / damaged line has no more current in it.

Any work on electrical equipment or working means cannot be performed but by a skilled electrician or by initiated persons under the supervision and control of a skilled electrician and according to the electro technical regulations.

For parts of the machine on which inspection, maintenance or repairing work is to be performed, position the battery switch located within the unit on OFF.

The electrical equipment of the power pack must be checked and inspected regularly. Any default such as loosened connections or carbonized cables must be immediately eliminated.

Should any work be done on parts under tension, a second person must be present for eventually actioning the urgency stop button. Delimit the working area with a red security chain and a warning plate. Use only tension isolated tools.

## 2. Gas, dust, vapor, smoke

Welding, oxide cutting or grinding may not be performed on the machine (power pack / Vibrodriver) without express authorization (for example in case of fire or explosion risk).

## 3. Hydraulics, pneumatics

Work on hydraulic equipment may be performed only by people having special knowledge and the required experience in hydraulics. In all cases, chapter 7 of the present document must be referred to. Check the values of the main hydraulic circuit (charging pump, power circuit) as well as the hydraulic circuit of the clamps.

Check regularly all pipes, hoses and screw connections in order to detect visible leaks and damages. Immediately deal with these defects. Oil projections may cause wounds and generate fires.

Before starting any repairs take pressure off the segments of the system and the pipes to be opened (hydraulics) as per the descriptions relating to the units.

Fit and assemble the hydraulic pipes. Do not invert the hoses.

## 4. Noise

The soundproofing devices of the machine must be protected during service, for example the sound damping elements (located on both ends of the power pack).

Wear the prescribed personal protection against acoustic shocks.



## **5. Oil, grease and other chemical matters**

Follow the current safety instructions when handling oil, grease and gasoil.  
Handle hot matters with caution (risk of burning).

## **6. Transport and towing, restarting**

Tow, load and transport as per road regulations.  
Use only appropriate transporting means and hoisting means having sufficient loading capacity.  
For restarting, proceed only according to the present manual of use.

## **VIII. Other safety arrangements**

### **1. Crane hoisting force**

The crane should have a sufficient capacity to exert, with the adequate boom length and at the requisite working span, a hoisting force equal: to the weight of the Vibrodriver plus the weight of the element to be driven or extracted, plus the pulling force deemed necessary to overcome the ground friction.

### **2. Slings**

The sling should have a normal loading capacity equal, in theory, to the maximum admissible pulling force on the Vibrodriver.

### **3. Guiding**

#### **a) Vibrodriver**

In most cases, it is not essential to guide the Vibrodriver by means of leaders. The leaders are, in theory, reserved for very precise jobs (cut-off walls, for example) and frequently for raked piling jobs.

#### **b) Elements to be driven or extracted**

On the other hand, it is frequently recommended to provide guiding for these elements.

### **4. Water jetting**

On sandy ground, it is frequently a good idea to facilitate driving and sometimes extraction by means of a water jetting system at a pressure of 220 to 300 psi. For such applications, please consult us.

### **5. Special applications**

- Working with the Vibrodriver near constructions, can, for some cases, in function of ground conditions, distance with the construction, type of construction, frequency and amplitude, require some precautions. Consult us.
- Underwater jobs: hydraulic Vibrodriver can operate underwater. For such applications, consult us.
- Driving - extraction of more than 20° raked elements. For this application, consult us.
- Special clamping heads: clamping heads for clamping sections of special geometry or large size, concrete piles, wooden piles of circular or parallelepiped cross-section, or for positioning the Vibrodriver in relation to a sheet-pile screen at a specific angle other than 90°, etc... may be supplied or designed. For such cases, please consult us.



## CHAPTER 6

### COMMISSIONING – H, HF, HFV

#### I. Preliminary checks

Check that all the recommendations listed here above are properly complied with:

- Check that the preparation described in chapter 4 "Preparation before starting" has been satisfactory performed.
- Check, especially for equipment not received from the factory, that the maintenance and inspections described in chapter 9 have been properly performed.

#### II. Control panel

Before carrying out the commissioning operation, carefully identify the position and function of all the control elements located on the instrument panel (for this point, see chapter 12).

To prevent any false indication on the pressure gauges, purge by disconnecting the hoses from pressure gauges.

#### III. Diesel engine start-up

Carefully read the engine manufacture's manual. This is specially recommended after a long period of engine idleness.

- Check batteries charge condition of.
- Close battery cutout contact. (Located into the power pack)
- Switch on the contact button with the key.
- The green « Start » indicator must light up (otherwise, see chapter 11).
- Where applicable, turn the start-up selector switch and leave in « pre-heating » position for about 30 seconds to 1 minute.
- Press the « fault cancelling » button a few seconds during and after engine starting.
- Press or turn the starting button.
- Completely release the starting button immediately when the engine starts rotating.
- Release the « fault cancelling » pushbutton a few seconds after engine starting.
- Allow the engine to build up temperature.
- Increase the speed of the engine.

#### NOTE:

*Engine speed is limited by a stop installed in factory. Do not alter in any case the setting of this stop without consulting PTC. The speed should be checked by stroboscope.*

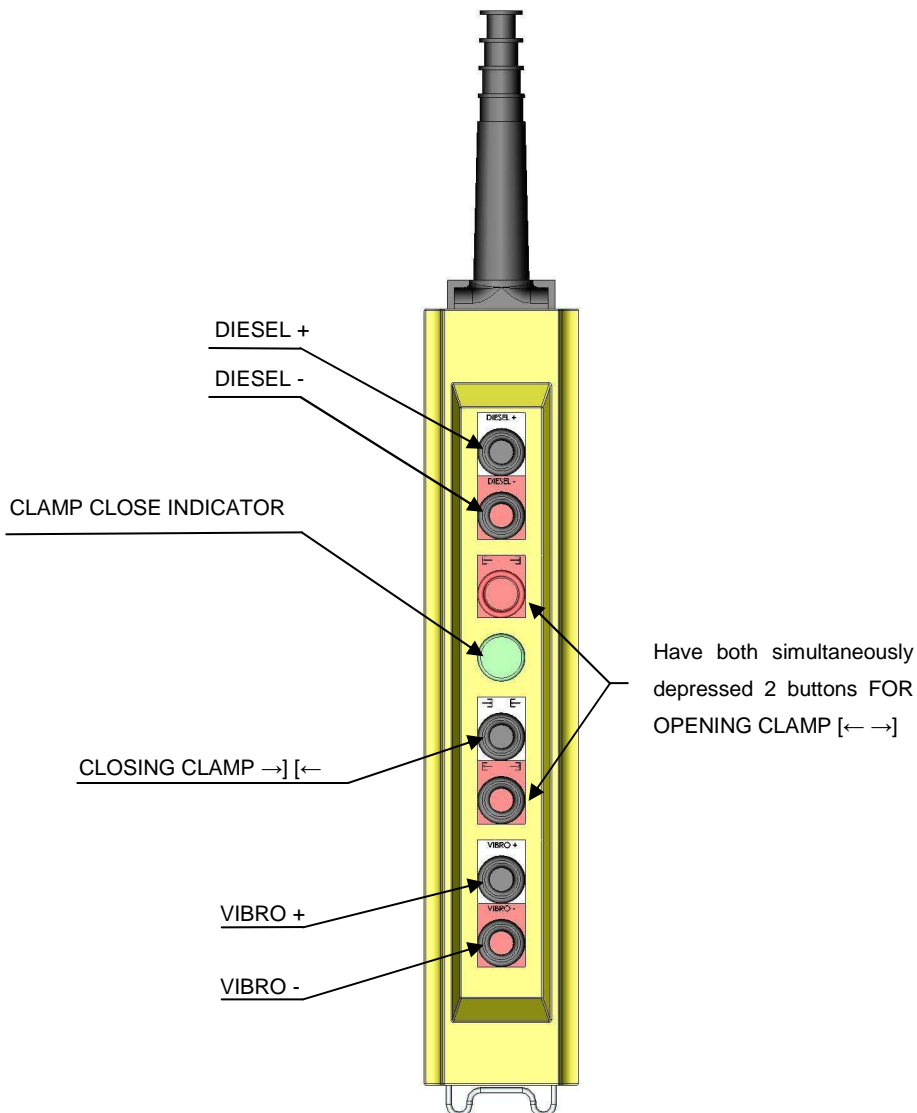
- Check that the charge pump pressure is higher than 140 psi at idle speed and 300 psi at maximum speed. Otherwise, have the circuit checked (see chapter 7).
- If the hydraulic pumps are not in neutral position, a safety forbids the starting of the diesel engine.

#### IV. Vibrator control from the remote control box

Place the Vibrator with the clamping head on the element to be driven or extracted. Our power packs are building in order to authorize the vibration only when the clamping heads are tightened.



## Remote control for standard Vibrofonneur



**Press the « Close Clamp →][←» button. This button remains locked.**

**Wait until the green indicator on the button box lights up**

Start the Vibrator by pressing on the « Vibro + » button. Let it pressed 5 to 10 seconds to obtain maximum vibration.

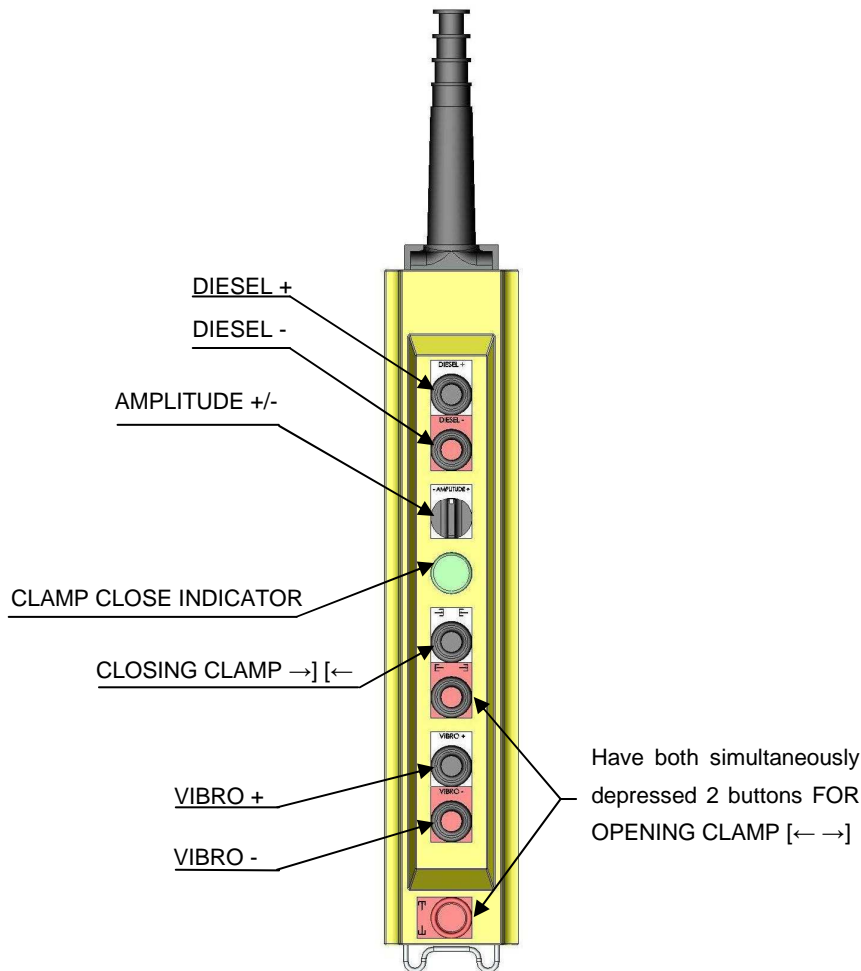
*NOTE: For low frequency, (100 to 300 rpm), the vibratory motion of the vibrator gearbox is not filtered by the suspension yoke and can be transmitted to the crane.*

- To minimize this phenomenon, "Vibro +" must be maintained without interruption until the maximum frequency or at least a sufficient frequency is obtained.
- The frequency of the vibrator can be change by pushing in small steps " Vibro+" or "Vibro-"

### **Stop The Vibrator:**

- To stop vibration, keep the finger on the « Vibro - » button 5 to 10 seconds.
- The green light "Start" on the control panel must light up when the vibration is completely stopped.
- Open the clamps, by pressing during 5 to 10 seconds on the « Open Clamp ←][→» button (A safety device cancels this operation during vibration).

## Remote control for HFV Vibrofonneur



**Press the « Close Clamp →][←» button. This button remains locked.**

**Wait until the green indicator on the button box lights up**

Start (rotation of eccentrics) the Vibrator by pressing on the « Vibro + » button. Let it pressed 5 to 10 seconds to obtain maximum frequency.

There are 2 ranges of frequency:

- Middle frequency: 1650 rpm - 1850 rpm
- High frequency: 1850 rpm - 2300 rpm

You can adjust the frequency as requested by soil conditions between 1650 and 2300 rpm.

You can read the frequency and amplitude on the screen of the control panel.

To obtain the vibration, turn the button « AMPLITUDE + » side. To obtain the maximum amplitude maintain the pressure 5 to 10 seconds.

*NOTE: The best work is not necessary obtained with the maximum amplitude.*

This machine allows you to change **2 parameters** independently (frequency & amplitude), in order to obtain every time the best result.

- To decrease the frequency: press in small steps on the « VIBRO - » pushbutton.
- To reduce the amplitude: Turn the selector « AMPLITUDE - ». One step equals ½ mm of amplitude.

### **Stop The Vibrator:**

- Stop the amplitude vibrator by turning the selector « AMPLITUDE - ». Wait the complete stop of the vibration.
- Stop the rotation of the eccentrics by pushing « VIBRO - » button during 5 to 10 seconds.
- To open the clamps, press during 5 to 10 seconds the « Open Clamp » pushbutton (A safety device cancels this operation during vibration)





## V. Stop the power pack

- FIRST Stop THE VIBRATION. It is essential.
- Slow down the diesel engine and allow it to rotate for several minutes (Turbo pressure)
- Press on the « Stop » button and turn the ignition key.
- Open the battery cut-out contact where applicable.

### **CAUTION!**

**Never stop or slow down the diesel engine suddenly before vibrations have completely stopped. This might harm the equipment.**

#### SAFETY:

The clamping pressure in the clamps is normally maintained by safety devices: automatic pressure holding (except when stopped) and checks valves on each clamp. Nevertheless, hydraulic leakage, though slight, may still produce (jack seals, valves, etc...) and allow opening.

As a consequence:

- Care must be taken during operation.
- When the power pack is stopped:
  - Never leave a load suspended under the Vibrator
  - Never leave the Vibrator resting on the part driven into the ground, unless it is held back by the crane.



## CHAPTER 7

### HYDRAULIC CIRCUIT OPERATION

#### I. Description

The eccentrics are driven by one (or more) hydraulic motor(s) powered by one (or two) variable flow pump(s) operating in a closed loop circuit.

1. The jack for the clamp(s) is powered by an auxiliary constant flow pump operating in open loop circuit.
2. For the HFV and Vibtronic<sup>®</sup> range, there is also an auxiliary constant double flow pump operating in open loop circuit. Each output allows supplying separately the 2 circuits, in order to power the jack for the clamp(s) and the rotating cylinder which controls the amplitude.
3. Some Vibrodriver are equipped with a cooling circuit. In this case, a second double flow pump (working in open loop circuit) is fixed on the diesel engine.

#### II. Operation

##### 1. Main circuit (diagrams 7/A)

The main circuit operates in closed loop circuit. The quantity of oil returned from the hydraulic motor(s) through the (Low Pressure) circuit is directly reinstated into the pump (s).

The variable flow is obtained by inclining the swash plate on which rest the axial-piston shoes (zero delivery with plate perpendicular to the axis). This control is made by an electric jack from the button control box.

For the Vibtronic<sup>®</sup> range, the oil flow variation is driven by an electrical card in relation with the computer.

Part of the oil is taken out at the motor(s) level, for: lubrication of the motor(s) and cooling of the motor(s). The oil is automatically removed by purge valve or taking block located on the LP of the motor(s), on HP (for HFV range only).

The lubrication and cooling of the pump(s) are done by special taking block(s) located into the power pack. The oil removed by this way and the oil due to natural leakage returns the power pack through the drainage circuit. It goes through the cooler, equipped with a by-pass valve calibrated at 30 psi, and returns into the tank.

The difference in quantity of oil between the HP and LP circuits is compensated by the charge pump integrated to the main pump (s). This charge pump(s) takes oil from the tank through a filter of 10 microns nominal size.

The charge pressure should be regarded as the essential feature of the hydrostatic transmission system.

When the delivery of the main pump is zero, the charge pressure is limited by the charge pressure governor located on the pump(s) and fitted with a spring calibrated between 435 and 464 psi when the Diesel engine is at full speed.

A multiple function valve on HP side has been fixed in order to make the oil flow regulation when the High Pressure reaches so 5580 psi. (setting value). This valve is also equipped with a safety device seated at 6100 psi. During normal operation this value should not reach.

For HFV range, there is a pressure controller installed on the HP circuit which allows in automatic position, the pulsation system when the pressure reaches 5365 psi. (Calibrated value).



## **2. Auxiliary clamp circuit (diagram 7/C)**

The auxiliary pump 10 or 16 CC (0.60 or 1.0 Cuin) for the clamp jack circuit takes oil from the hydraulic oil tank. This circuit is protected by a pressure limiter calibrated at 4800 psi. installed under the electro distributor.

The pump supply oil into an electro distributor (3 positions, 4 channels) with an internal configuration in U.

- In the center position “ U ”, the oil returns directly to the tank.
- In pushing position “ Close Jack → ] [← ”, the oil leaves through port A and returns to the tank through port B.

On port A is located a non-return valve, and downstream a pressure switch set at 3915 psi on rising. The pressure controller allows automatic clamping of the jack(s) in operation by an electro distributor refeeding at 4060 psi. The switch also lights up of the green indicator on the button control box to indicate that the clamps are tightened.

The non return valve located at the distributor level is only necessary for the pressure controller pressure intake, while there is another valve located on each jack to prevent clamp opening if one hose breaks accidentally.

- In pulling position “ Open Jack ← ] [→ ”, the oil leaves through port B and returns to the tank through port A.

The circuit is controlled from the pushbutton control box. The “ Close Jack → ] [← ” button has an interlock to enable automatic clamp tightening by the pressure switch during operation. The “ Open Jack ← ] [→ ” button is of the impulse type.

For the Vibronic® range, the clamping pressure can be read on the control display.

## **3. Amplitude's variation circuit (only HFV range)**

For the power pack called “HFV” the pump for the clamp circuit is replaced by a double pump 2 x 7,5cc (0.4 Cuin).

This double pump (clamp & HFV) takes oil from the hydraulic oil tank and works in open loop circuit.

This pump discharges for one side into the clamp circuit and in the other side on the HFV line. The oil flow for the HFV system is going into an electro distributor (3 positions, 4 channels) with an internal configuration in H.

The circuit is protected by a pressure limiter calibrated at 1740 psi. (the pressure can be lower for old models).

- In the center position, the oil is returning directly to the tank.
- In “ Amplitude + ” position, the oil goes through port A to the rephasing side of the cylinder by pushing the non-return valve. The oil on dephasing side returns to the tank by port B.
- In “ Amplitude - ” position, the oil goes through port B to the dephasing side of the cylinder and open the non-return valve to allow the oil to go back to the tank on rephasing side.

So, you can obtain all the position you wish for the cylinder, and therefore all the values of amplitude you need. The protection of the circuit is obtained through 2 filters located on the yoke of vibrator.



## 4. Forced lubrication circuit

A double pump 2 x 7.5cc or (0.4 Cuin) is fixed directly on the Diesel engine.

The suction is done directly by a filter on the main tank.

The pump is working in open loop circuit.

- The first outlet supplies oil into the “ Extractor ” hydraulic motor located on the Vibrodriver.
- The second outlet supplies oil into the cooler hydraulic motor located on the suspension yoke of the Vibrodriver.

The protection of each circuit is done by pressure limiter (settled at 3625 psi) and located into the power pack.

### **CAUTION!**

**For the Vibrodriver equipped of the forced lubrication (extractor system ).  
Before starting the power pack engine, make sure that the Vibrodriver is in vertical position.  
Otherwise you may damage this system.**



## CHAPTER 8

### ELECTRICAL CIRCUIT OPERATION

See electric diagram page 8/A

All the power packs are equipped with a battery cutout contact and an ignition key.

#### I. Diesel engine circuit

The main electrical parts of the diesel engine are:

- Starter
- Alternator
- Safety switches
- Control gauges

##### 1. Starter

The starter is battery-powered by means of a heavy section cable (4,6 x 10<sup>-6</sup> sq.ft).  
The energizing is performed by means of an intermediate relay.

For the Vibtronic<sup>®</sup> range, the starter is powered by 4 batteries of 12 V (2 batteries in serial linked in parallel with 2 batteries in serial).

Starting is performed by the « Start » button when the green « Start » indicator is lit up.  
This indicator is lit up when:

- The ignition key has been turned,
- The pump delivery variation control lever is in zero delivery position.

For the Vibtronic<sup>®</sup> range:

- The pump delivery position control lever has been replaced by a electric servo control and the zero delivery position come back automatically each stop and each commissioning.
- There is not a green start indicator.

It is possible starting engine when:

- The contact - key is on ON
- The Diesel is load idle
- The power pack emergency stop button is not pushed
- The radio control emergency stop button is not pushed
- The level hydraulic oil is sufficient
- The hydraulic oil temperature is inferior at 176°F

#### NOTE:

*Depending on the diesel engine model, the limit switch controlled by the pump lever acts either directly or through an intermediate relay on the green « Start » indicator.*

##### 2. Alternator

The engine manufacturer usually installs the wiring for the alternator and battery load regulator.  
We simply add an ammeter on the instrument panel.



### 3. Safety switches:

Two safeties switches are found on all engines:

- Oil pressure
- Water temperature

An additional safety system is found only on large power packs, namely the radiator level gauge. All these safeties systems are connected in such a way that any single safety system can stop the diesel engine. The thermostat contact is normally closed. It opens when the temperature rises above approx. 203 °F.

The oil pressure contact is opened at idle. It only closes once the oil circuit is made. It only opens in the event of a drop in pressure or engine stoppage.

For the Vibtronic® range, it is the same working that describe on a top with 2 safeties separated in order to display messages on the screen.

#### NOTE:

*Since this contact is opened at idle, it must be cancelled, hence the fault canceling button which must be held pressed down for several seconds at start-up until the oil pressure is established.*

The contact controlling the water level in the radiator acts as soon as the water level is too low and sets on the horn.

The sensor is also equipped by a test circuit just to clarify if it is working right. To check the sensor, push on a black button (near the alarm), which will move on the alarm if the sensor is working.

For the Vibtronic® range, there are two safeties types:

1. Defaults point out to operator by the red indicator, the alarm and a message:

- Aspiration filters clogged default
- Water level default
- Water level sensor default

2. Safeties which stop the engine, lit up the red indicator and display a message:

- Oil engine safety
- Water temperature engine safety
- Hydraulic oil level safety
- Hydraulic oil temperature safety
- Low charge pressure safety

### 4. Control gauges

On the control panel are located:

- A thermometer (water temperature) powered by a transmitter,
- A pressure gauge (oil high pressure, clamps pressure, charge pressure into each clamp) powered by a transmitter,
- A clock powered on 24 V, which starts up as soon as the engine is rotating,
- A tachometer.
- A manometer, which indicates the HFV circuit, pressures (Variation Amplitude).



For the Vibtronic® range, the control panel is composed by:

- A control screen which displays data.
- A closed clamps light
- A printer (Option)

The electric box:

- A computer
- A thermostat fix
- A ventilator
- One or several control electric cards
- A conditional for the accelerometer signal
- Two circuits breakers 16A and 10A.

All components are powered on 24V.

## II. Circuit for main pump(s)

Variation flow of the main pump(s) is controlled by a 24 V electric jack. The control jack is energized through either the « Vibro + » button or the « Vibro - » button located in control box.

For the Vibtronic® range, a Sauer electric servo control takes the place of the electric jack by a electronic card (MCE 126).

The "Freq + " or "Freq - " buttons remote control and "Vibro + " or "Vibro-" buttons of remote control the servo control.

### NOTE:

*The diesel engine start-up is controlled by a stop limit switch which closes as soon as delivery is zero.*

*The pressure regulator switch set at 220 psi. lit up a red indicator light as soon as the pressure is below than or equal to 220 psi, and set on the horn.*

For the Vibtronic® range, if the charge pressure is stolen below than 220 psi during 15s, consequently the engine is stopped.

## III. Clamp auxiliary pump circuit

The distribution of the Hydraulic clamps is supplied by an electro distributor.

The electro distributor is powered on 24 V through the « Close Jack →][←» button with mechanical interlock function on the button control box.

Then the pump supply by outlet A and outlet B of electro distributor is connected to the tank.

If the pressure rises to around 4000 psi. and the pressure switch calibrated at 4000 psi switch off the electro distributor power supply in rising.

If the pressure drops below 4000 psi. the pressure switch contact is restored again and the pressure builds up again to 4000 psi., and so on. To open the clamps, unlock the « Close Jack » button by pressing the « Open Jack ←][→» button on the control box, maintaining pressure with the finger until the jaws are completely open.

For the Vibtronic® range, a pressure sensor replaces the pressure controller and a computer orders the function. The using system is the same.



## IV. Circuit for HFV and Vibtronic<sup>®</sup> system

The power pack works in HFV when you select on the connection box (kit HFV), the "ON" position. The connection box (kit HFV) is opposite to the control panel, into the power pack.

Other selector (the junction box near the control panel) allows to work on manual or automatic mode. The mode chosen can be modified every time when the Vibrodriver is working. In the Vibtronic<sup>®</sup> range, the mode selector is located in the electric box opposite.

When the intermediate switch (mounted on the electric jack of the main pump) is on, then it energizes the coil "Amplitude -» of the electro distributor of kit HFV, so that the vibration is inhibited.

When there is no amplitude, the light on the electro distributor switch off.

Anyway, an auxiliary contact forbids the Vibrodriver vibration, as far as the eccentric's speed is 1600 Rpm. To obtain this frequency, push on the "Vibro +" button on the control box. Then on the electro distributor, a light switches on, and the previous switch off. (This does not concern the Vibtronic<sup>®</sup> range).

### 1. Automatic mode

Once the intermediary switch is on, the "Amplitude +" electro distributor coil is powered. The Vibrodriver is under vibration. The vibration is in maximum value without control box manipulation.

When the high pressure into the main(s) pump(s) circuit is 5365 psi, the controller pressure (situated on the high pressure) turns off the coil "Amplitude +" power and energizes the "Amplitude -" coil in order to reduce the Amplitude and to keep an equivalent.

The "Amplitude +" coil will be energized again, when the pressure detected by the controller pressure comes down lower than 5600 psi as far as the Vibrodriver is stopped.

This phenomenon is called: The Pulsation.

For the Vibtronic<sup>®</sup> range, the operator can choose every time a frequency and amplitude level. It seems that the frequency value or amplitude values that the system will still during the driving. If there is no value order integrated, the system will work with the maximum value).

When the operator pushes on the "Freq +", the Vibrodriver will reach to the order values as far as an impulsion on "Freq -".

(See chapter 6).

### 2. Manual mode

When the auxiliary contact is commuted then maintains the selector on the "Amplitude" of the control box on position "+" in order to obtain the vibration. Then the electro distributor coil is powered.

To reduce the vibration, reproduce the same procedure for position "-".

For the Vibtronic<sup>®</sup> range, the working is like to HFV Vibrodriver in "manual". From 1600 Rpm, the operator can increase or decrease the amplitude.

#### NOTE:

*In manual position, it is impossible to get Pulsation phenomenon. The advantage is to obtain the amplitude which is chosen.*





## CHAPTER 9

### MAINTENANCE SCHEDULE

**ALL THE INFORMATION IN THIS CHAPTER SHOULD BE REGARDED AS OF THE UTMOST IMPORTANCE.**

*The equipment's reliability and long life depend on it, remember: « that preventing is better than curing. »*

Points to be specially watched are :

- Hydrostatic transmission (charge pump pressure, filters cleanliness, oil level and state),
- Diesel engine (oil and water),
- Coolers (cleanliness),
- Electrical box watertight.
- Vibrodriver gearbox (bearings, pignons and gears, oil level and state, lubrication pump(s), filters cleanliness),
- The clamp(s) (jaws, seals)
- Suspension yoke (elastomer blocks, hydraulic hoses),
- Screw tightening,
- Hydraulic hoses,

The hydrostatic transmission requires special cleaning during each intervention (oil filling, connection, disassembly, etc...).

#### I. Constant controls

##### 1. Charge pump pressure

The charge pump pressure should not be less than 200 psi. at any operating conditions, including running at idle speed.

It is wise to have the transmission checked whenever the charge pump pressure falls to 200 psi.

##### 2. Diesel engine oil pressure and water temperature (See manufacturer's notice)

Two safety switches stop the diesel engine in the event of irregular pressure or temperature. Remember, however, that sudden stoppage of the diesel engine under load may seriously damage the hydrostatic transmission.

**These safety switches should in no case be removed, or the warranty will no longer be valid.**

##### 3. Jack circuit pressure

The jack circuit pressure must be constantly above 4000 psi. and the green indicator on the button control box must be switch on.



## 4. Vibtronic® range

The computer is checking permanently the diesel engine, the pump(s), tank level, cooler, filters, and all sensors.

In any case, when you start the diesel engine, you may check the printer position, the display message(s) and the batteries of the radio control.

## II. Maintenance schedule

*NOTE: Performance of all lubrication and maintenance items in the Maintenance schedule is owner's responsibility.*

### 1. Daily inspection

#### a) Before start-up

- Check diesel engine oil level (see manufacturer's manual).
- Check diesel engine cooling water level.
- Check clamping head screw tightening.
- Check vibratory gearbox oil level (middle of indicator).
- On the vibrator equipped with reinforced lubrication check if the gear box oil pump is working properly.

#### b) After start-up

- Check hydraulic oil level (mini ¼).
- Check charge pump pressure (mini 200 psi.).
- Check jack(s) pressure (mini 4000 psi.).
- For the Vibrodriver equipped with forced lubrication system, check if the gear pump is working properly.

### 2. At 10 hours after initial start-up

- Change the suction filter cartridge(s) into the power pack. See page 9/12.
- Check on screw tightening :
- Clamping head attachment screws (and after each clamping head dismounting operation).
- Elastomer blocks attachment screws.
- Screws connecting vibratory gearbox and suspension yoke.
- For the Vibrofonneur® equipped with forced lubrication system, check if the gear pump is working properly.

### 3. At 100 hours (see power pack hour meter)

- Drain and replace vibratory gearbox oil
- Clean filter into each flanges of the Vibrodriver (lubrication circuit).
- Clean lubrication pumps filters.
- Check screw tightening (clamping head and suspension yoke).
- Check the eccentrics bearings radial clearance.



## 4. Every 250 hours or every 6 months (see power pack hour meter)

### a) Hydraulic maintenance

- Change the suction filter cartridge(s) (See page 9/12).
- Change the drain filter cartridge(s).
- Change the LP filter cartridge(s).
- Change the HP filter cartridge(s) (on the Vibrodriver).
- Clean the 2 filters of HFV circuit on the Vibrodriver.
- Check radial bearings clearance of the Vibrodriver gearbox.

### b) Diesel engine maintenance Please see constructor's manual for complete informations

- Drain oil.
- Remove filters (fuel, oil ...).

### c) Vibrodriver

- Drain and replace vibratory gearbox oil
- Clean filter into each flanges of the Vibrodriver (lubrication circuit).
- Clean lubrication pumps filters.
- Check screw tightening (clamping head and suspension yoke).
- Check the eccentrics bearings radial clearance.

## 5. At 500 hours (see power pack hour meter)

### a) Hydraulic maintenance

- Change the suction filter cartridge(s) (See page 9/12).
- Change the drain filter cartridge(s).
- Change the LP filter cartridge(s).
- Change the HP filter cartridge(s) (on the Vibrodriver).
- Clean the 2 filters of HFV circuit on the Vibrodriver.
- Check radial bearings clearance of the Vibrodriver gearbox.

### b) Diesel engine maintenance Please see constructor's manual for complete informations

- Drain oil.
- Remove filters (fuel, oil ...).

### c) Vibrodriver

- Drain and replace vibratory gearbox oil
- Clean filter into each flanges of the Vibrodriver (lubrication circuit).
- Clean lubrication pumps filters.
- Check screw tightening (clamping head and suspension yoke).
- Check the eccentrics bearings radial clearance.



## 6. At 750 hours (see power pack hour meter)

### a) Hydraulic maintenance

- Change the suction filter cartridge(s) (See page 9/12).
- Change the drain filter cartridge(s).
- Change the LP filter cartridge(s).
- Change the HP filter cartridge(s) (on the Vibrodriver).
- Clean the 2 filters of HFV circuit on the Vibrodriver .
- Check radial bearings clearance of the Vibrodriver gearbox.

### b) Diesel engine maintenance Please see constructor's manual for complete informations

- Drain oil.
- Remove filters (fuel, oil ...).

### c) Vibrodriver

- Drain and replace vibratory gearbox oil
- Clean filter into each flanges of the Vibrodriver (lubrication circuit).
- Clean lubrication pumps filters.
- Check screw tightening (clamping head and suspension yoke).
- Check the eccentrics bearings radial clearance.

## 7. At 1000 hours (see power pack hour meter)

- Drain the hydraulic oil tank & clean it before refueling with new oil to filling with new oil.
- Change air filter cartridge(s).
- Open the top of the Vibrofonceur<sup>®</sup> gearbox drain and clean it. Check the mechanic state and the bearings axial and radial clearance.
- For the Vibrodriver equipped of reinforced lubrication circuit, check & test the complete circuit.
- Check the elastomer Blocks state & replace them systematically in case of difficult application.
- Diesel engine (see constructor's manual).

### a) Hydraulic maintenance

- Change the suction filter cartridge(s) (See page 9/12).
- Change the drain filter cartridge(s).
- Change the LP filter cartridge(s).
- Change the HP filter cartridge(s) (on the Vibrodriver).
- Clean the 2 filters of HFV circuit on the Vibrodriver .
- Check radial bearings clearance of the Vibrodriver gearbox.

### b) Diesel engine maintenance Please see constructor's manual for complete informations

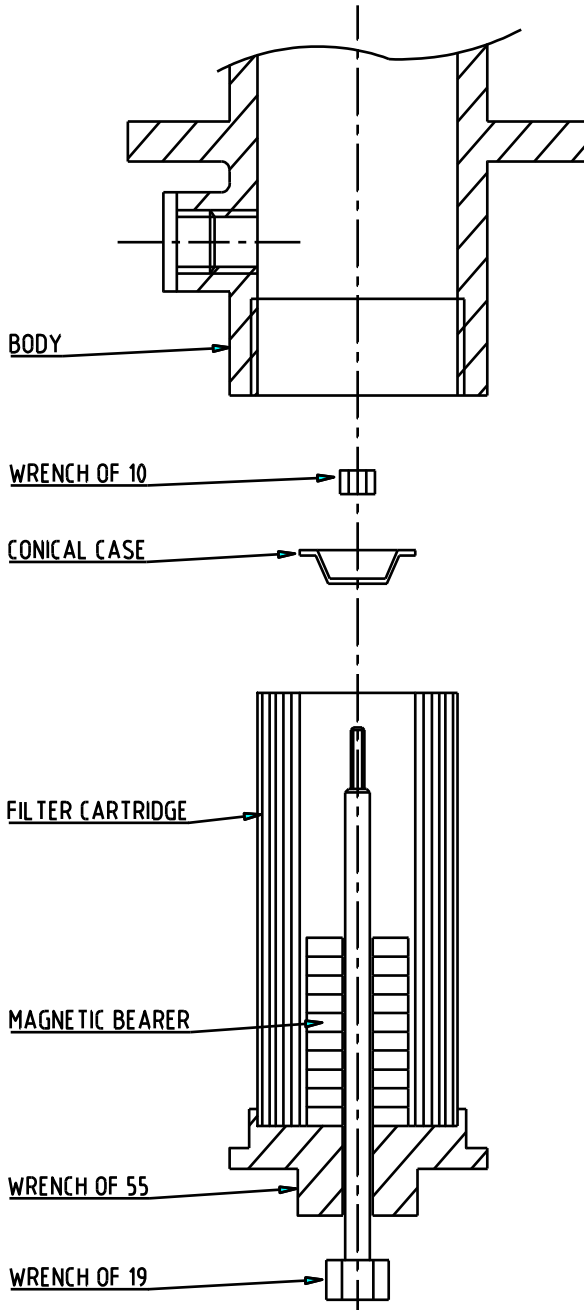
- Drain oil.
- Remove filters (fuel, oil ...).

### c) Vibrofonceur<sup>®</sup>

- Drain and replace vibratory gearbox oil
- Clean filter into each flanges of the Vibrodriver (lubrication circuit).
- Clean lubrication pumps filters.
- Check screw tightening (clamping head and suspension yoke).
- Check the eccentrics bearings radial clearance.
- Check the rotating jack working and oiltight



## MAINTENANCE OF THE « ARLON » FILTER



### Removing the filtering cartridge:

❶ With a 19 lengths unscrew (on a 1.18 in. length) the screw, the head of which is located at the bottom of the filter.

This closes the valve isolating the filter from the tank.

❷ With a 55 spanner unscrew the lower cover completely (place a container underneath to collect the 0.5 gal. of oil still remaining in the filter housing).

❸ To remove the filtering cartridge unscrews the nut located in the conical obturator, with a 10 spanner and a 19 one at the base.

### Reassembly:

❶ Clean the magnetized column with a rag.

❷ Place a clean cartridge on the cover, then the conical obturator and its fixing nut.

❸ Introduce the whole lot into the filter body and lock the cover (Wrench of 55 in.).

### IMPORTANT:

Do not forget to rescrew the screw at the base (Wrench of 19, no need to tighten too strongly); otherwise, the oil would not reach the pump.



## ENGINE FILTERS

| POWER PACK                                   | FILTERS  | Qty              |
|--|--|------------------|
| <b>CATERPILLAR ENGINES</b>                   |  |                  |
| 1900 CAT<br>3512 B<br>307292                 | 308936 FUEL filter cartridge<br>308938 OIL filter cartridge<br>308937 AIR filter cartridge   | 5<br>3<br>2      |
| 1200 CAT<br>3412 DISTA<br>ref. 306548        | 302613 FUEL filter cartridge<br>302614 OIL filter cartridge<br>306695 AIR filter cartridge   | 2<br>2<br>2      |
| 800 CAT<br>3408E ATAAC<br>ref. 307457        | 308548 FUEL filter cartridge<br>308549 FUEL pre-filter cartridge<br>302614 OIL filter cartridge<br>306400 kit of 2 AIR filter cartridge (round)        | 1<br>1<br>2<br>1 |
| 800 CAT<br>3412 DITA<br>ref. 303919          | 302613 FUEL filter cartridge<br>302614 OIL filter cartridge<br>304509 AIR filter cartridge   | 2<br>2<br>2      |
| 800 CAT<br>3412 DITT index D<br>ref. 306725  | 302613 FUEL filter cartridge<br>302614 OIL filter cartridge<br>304509 AIR filter cartridge   | 2<br>2<br>2      |
| 700 CATC 15<br>réf.308545                    | 308374 FUEL filter cartridge<br>308373 FUEL pre-filter cartridge<br>308375 OIL filter cartridge<br>306400 kit of 2 AIR filter cartridge (round)        | 1<br>1<br>1<br>1 |
| 600 CAT<br>3406 DITA1 index D<br>ref. 307620 | 302613 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>302614 OIL filter cartridge<br>302612 AIR filter cartridge                         | 1<br>1<br>1<br>1 |
| 540 CAT<br>3408 DITA<br>ref. 304744          | 302613 FUEL filter cartridge<br>302614 OIL filter cartridge<br>302612 AIR filter cartridge (old model)<br>306400 kit of 2 AIR filter cartridge (round) | 1<br>1<br>2<br>1 |
| 540 CAT<br>3406 DITA2 index D<br>ref. 306731 | 302613 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>302614 OIL filter cartridge<br>302612 AIR filter cartridge                         | 1<br>1<br>1<br>1 |
| 450 CAT<br>3406 DIT index D<br>ref. 304173 D | 302613 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>302614 OIL filter cartridge<br>302612 AIR filter cartridge                         | 1<br>1<br>1<br>1 |
| 450 CAT<br>3406 DITA index D<br>ref. 307849  | 302613 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>302614 OIL filter cartridge<br>302612 AIR filter cartridge                         | 1<br>1<br>1<br>1 |
| 350 CAT<br>3406 DIT index C<br>ref. 304173   | 302613 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>302614 OIL filter cartridge<br>302612 AIR filter cartridge                         | 1<br>1<br>1<br>1 |



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|  |  |                  |
|--|--|------------------|
| 350 CAT<br>3306 DITA2 index D<br>ref. 307659 | 301940 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>303506 OIL filter cartridge<br>308064 AIR filter cartridge | 1<br>1<br>2<br>1 |
| 260 CAT<br>3306 DIT<br>ref. 302148           | 301940 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>303506 OIL filter cartridge<br>302214 AIR filter cartridge | 1<br>1<br>2<br>1 |
| 260 CAT<br>3306 DITA index C<br>ref. 307658  | 301940 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>303506 OIL filter cartridge<br>308064 AIR filter cartridge | 1<br>1<br>2<br>1 |
| 180 CAT<br>3116 DIT<br>ref. 308098           | 308430 FUEL filter cartridge<br>308431 FUEL pre-filter cartridge<br>308432 OIL filter cartridge<br>308433 AIR filter cartridge | 1<br>1<br>1<br>1 |



| POWER PACK                             | FILTERS   | Qty                   |
|--|---|-----------------------|
| <b>VOLVO ENGINES</b>                   |   |                       |
| 540 VOLVO<br>TWD1630PB<br>ref. 306355  | 301641 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>301642 OIL filter cartridge<br>301640 AIR filter cartridge<br>305572 WATER filter cartridge | 2<br>1<br>2<br>2<br>1 |
| 450 VOLVO<br>TWD 1210V<br>ref. 306959  | 301641 FUEL filter cartridge<br>307883 FUEL pre-filter cartridge<br>303506 OIL filter cartridge<br>307884 AIR filter cartridge                                  | 2<br>1<br>2<br>1      |
| 450 VOLVO<br>TWD 1231VE<br>ref. 307652 | 301641 FUEL filter cartridge<br>307883 FUEL pre-filter cartridge<br>301642 OIL filter cartridge<br>307884 AIR filter cartridge                                  | 2<br>1<br>2<br>1      |
| 350 VOLVO<br>TD 121G<br>ref. 304042    | 301641 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>301642 OIL filter cartridge<br>301640 AIR filter cartridge                                  | 2<br>1<br>2<br>2      |
| 350 VOLVO<br>TWD 1031VE<br>ref. 307732 | 301641 FUEL filter cartridge<br>307883 FUEL pre-filter cartridge<br>301642 OIL filter cartridge<br>307884 AIR filter cartridge                                  | 2<br>1<br>2<br>1      |
| 260 VOLVO<br>TD 100HP<br>ref. 304059   | 301641 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>301642 OIL filter cartridge<br>301640 AIR filter cartridge                                  | 2<br>1<br>2<br>2      |
| 260 VOLVO<br>TD 1030VE<br>ref. 308198  | 301641 FUEL filter cartridge<br>307883 FUEL pre-filter cartridge<br>301642 OIL filter cartridge<br>301640 AIR filter cartridge                                  | 2<br>1<br>2<br>2      |

| POWER PACK           | FILTERS  | Qty              |
|----------------------|--|------------------|
| <b>IVECO ENGINES</b> |  |                  |
| 260 IVECO            | 306447 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>306449 OIL filter cartridge<br>306448 AIR filter cartridge | 2<br>1<br>2<br>1 |





| POWER PACK   | FILTERS   | Qty              |
|--|---|------------------|
| <b>JOHN DEERE ENGINES</b>  |   |                  |
| 220 JOHN DEERE E<br>6068<br>ref. 307 630                         | 308 528 FUEL filter cartridge<br>303 508 FUEL pre-filter cartridge<br>308 269 OIL filter cartridge<br>308 011 AIR filter cartridge          | 1<br>1<br>1<br>1 |
| 200 JOHN DEERE E<br>6068<br>ref. 307 630                         | 308 528 FUEL filter cartridge<br>303 508 FUEL pre-filter cartridge<br>308 269 OIL filter cartridge<br>308 011 AIR filter cartridge          | 1<br>1<br>1<br>1 |
| 180 JOHN DEERE<br>6059 T<br>ref. 302 280 (12V) and 305 772 (24V) | 303948 FUEL filter cartridge<br>303508 FUEL pre-filter cartridge<br>303079 OIL filter cartridge<br>303077, 303082, 304686 AIR filter cart.  | 1<br>1<br>1<br>1 |
| 180 JOHN DEERE<br>6068<br>ref. 309 177                           | 309 419 FUEL filter cartridge<br>309 418 FUEL pre-filter cartridge<br>309 421 OIL filter cartridge<br>309 420 AIR filter cartridge          | 1<br>1<br>1<br>1 |
| 180 JOHN DEERE E<br>6068<br>ref. 307 630                         | 308 528 FUEL filter cartridge<br>303 508 FUEL pre-filter cartridge<br>308 269 OIL filter cartridge<br>308 011 AIR filter cartridge          | 1<br>1<br>1<br>1 |
| 85 JOHN DEERE<br>4039<br>ref. 302 943                            | 303 948 FUEL filter cartridge<br>303 508 FUEL pre-filter cartridge<br>303 079 OIL filter cartridge<br>303 082, 305 619 AIR filter cartridge | 1<br>1<br>1<br>1 |
| 85 JOHN DEERE E<br>4045<br>ref. 307 592                          | 308 528 FUEL filter cartridge<br>303 508 FUEL pre-filter cartridge<br>303 079 OIL filter cartridge<br>307 924 AIR filter cartridge          | 1<br>1<br>1<br>1 |
| 70 JOHN DEERE E<br>3029<br>ref. 307 937                          | 309 422 FUEL filter cartridge<br>303 508 FUEL pre-filter cartridge<br>303 079 OIL filter cartridge<br>309 423 AIR filter cartridge          | 1<br>1<br>1<br>1 |



**Vibronceur<sup>®</sup> oil**

« Extreme pressure » oil meeting standard : ISO 6743 category CC.

List of miscible semi-synthetic oils for the Vibronceur<sup>®</sup> gearbox :

| Producer | Brand name             | Pour point (°F) | Flash point (°F) | Viscosity cSt at 100 °F | Viscosity index | Density (lbs/gal) |
|----------|------------------------|-----------------|------------------|-------------------------|-----------------|-------------------|
| BP       | ENERSYN HTX 220        | -31             | 518              | 220                     | 154             | 7.3               |
| CALTEX   | SYNSTAR GL             | - 54.4          | 450              | 220                     | 150             | 7.3               |
| COFRAN   | SINTONEP               | -43.6           | 471              | 202                     | 170             | 7                 |
| ELF *    | REDUCTELF SYNTHESE 220 | -49             | 520              | 227,5                   | 151             | 7.3               |
| MOBIL    | SHC 630                | -49             | 511              | 218                     | 149             | 7.2               |
| TEXACO   | MEROPA SYNTHETIC 220   | -54 4           | 450              | 220                     | 150             | 7.2               |
| TOTAL    | CARTER SH 220          | - 39            | 509              | 220                     | 150             | 7                 |

\* Original PTC. oil.

NOTE : In the event of non-stop operations (cut-off wall jobs, for example), it is recommended to use a cooling system for gearbox oil. Please contact P.T.C.



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## Power Pack oil engine

All those oils answer at the specifications of norms : US military MILL-L-2104 E or MILL-L-2104 F, Caterpillar TO2 and Volvo VDS.

| Producer | Brand name                    | Pour point | Flash point | Viscosity cSt at 100 ƒ | Viscosity index | Density (lbs/gal) |
|----------|-------------------------------|------------|-------------|------------------------|-----------------|-------------------|
| BP       | VANELLUS C3 MULTI 15W40       | - 27 ƒ     | 450 ƒ       | 105                    | 134             | 7.4               |
| CALTEX   | DELO 500 15W40                |            |             |                        |                 | 7.4               |
| COFRAN   | PLURA SUPER 15W40             | -22 ƒ      | 428 ƒ       | 104                    | 145             | 7.4               |
| ELF *    | PERFORMANCE SUPER 15W40       | -22ƒ       | 455 ƒ       | 110                    | 140             | 7.4               |
| ELF      | PERFORMANCE SNOW TRACTOR 5W40 | -49 ƒ      | 446 ƒ       | 67                     | 190             | 7.2               |
| SHELL    | RIMULA X 15W40                | - 38 ƒ     | 457 ƒ       | 106                    | 132             | 7.4               |
| TEXACO   | URSA SUPER LA 15W40           |            |             |                        |                 | 7.4               |

\* Original P.T.C. oil.



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## Hydraulic circuit oil tank

|                                   | Maker                   | Brand name        | Pour Point [°F] | Flash point [°F] | Viscosity at 100 °F [cSt] | Viscosity at 210°F [cSt] | Viscosity index | Density [lbs/gal] |
|-----------------------------------|-------------------------|-------------------|-----------------|------------------|---------------------------|--------------------------|-----------------|-------------------|
| HYDRAULIC OIL<br>(miscibles oils) | ELF                     | HYDRELF 46        | - 44°           |                  | 49,8                      |                          | 152             | 7                 |
|                                   | AGIP                    | ARNICA 46         | - 18.4          |                  | 42                        |                          | 186             | 7                 |
|                                   | BP                      | ENERGOL SHF HV 46 | - 38°           | 432              | 46                        | 8,2                      | 152             | 7                 |
|                                   | BP                      | HYDRAULIQUE TP 46 | - 40°           | 410              | 48                        | 9,7                      | 175             | 7                 |
|                                   | CALTEX                  | RANDO HTZ 46      | - 43.6°         |                  | 48                        | 8,6                      | 154             | 7.2               |
|                                   | ESSO                    | UNIVIS N 46       | - 33°           |                  | 44,5                      |                          | 172             | 7.3               |
|                                   | MOBIL                   | DTE 15 M          | - 55°           |                  | 46                        |                          | 150             | 7.3               |
|                                   | MOBIL                   | MOBILFLUID        | - 61°           |                  | 49                        |                          | 151             | 7.3               |
|                                   | SHELL                   | TELLUS T 46       | - 43°           | 428              | 46,2                      | 8,3                      | 155             | 7.3               |
|                                   | TEXACO                  | RANDO HDZ 46      | - 43°           |                  | 48                        | 8,6                      | 154             | 7.3               |
|                                   | TOTAL<br>Réf:<br>304994 | EQUIVIS ZS 46     | - 33°           |                  | 46                        |                          | 160             | 7.3               |

|                      |                           |                   |        |       |    |      |     |     |
|----------------------|---------------------------|-------------------|--------|-------|----|------|-----|-----|
| BIO OIL<br>BIO > 90% | ELF (2)<br>Réf:<br>306900 | BIOHYDRAB TMP 46  | - 38.2 | 575.6 | 53 | 10,4 | 189 | 7.7 |
|                      | PANOLIN                   | HLP SYNTHETIC 46  |        |       |    |      |     |     |
|                      | TEXACO                    | HYDRA 46          |        |       |    |      |     |     |
|                      | SHELL                     | HF - E 46         |        |       |    |      |     |     |
|                      | MOBIL                     | EAL SYNDRAULIC 46 |        |       |    |      |     |     |
|                      | BP                        | BIOHYD SE S 46    |        |       |    |      |     |     |

|                 |                                 |                      |        |     |      |      |     |     |
|-----------------|---------------------------------|----------------------|--------|-----|------|------|-----|-----|
| VEGETAL BIO OIL | ELF (2)                         | NATURELF HYD 38      | - 27.4 | 554 | 38,1 | 8,57 | 214 | 7.7 |
|                 | ESSO                            | UNIVIS 40            |        |     |      |      |     |     |
|                 | TEXACO<br>(1)<br>Réf:<br>307846 | BIOSTAR HYDRAULIC 46 | - 22   | 437 | 46,2 | 10,1 | 210 | 7.7 |
|                 | MOBIL                           | EAL 224 H46          |        |     |      |      |     |     |
|                 | BP                              | BIOHYD 46            |        |     |      |      |     |     |

Original PTC oil

PTC can provide these oils.



## CHAPTER 10

### TESTS – SETTINGS

#### I. Main hydraulic circuit

##### 1. Charge pressure

The charge pressure shall be from :

- 430. to 460 psi at maximum speed, zero delivery
- 290 to 360 psi. at maximum speed, with delivery.

There is no particular test. Readings are constantly taken on the instrument panel pressure gauge.

##### 2. Power circuit

The main points to be checked are as follows :

- Pressure in the housing of the motor(s) and pump(s) : the pressure shall be equal to or less than 70 psi. if the oil is cold, and approx. 45 psi. if the oil is warm.
- High pressure (power test) : the maximum pressure in the high pressure circuit is 6090 psi.. The pressure multi function prevents going beyond this pressure. If the pressure becomes excessive, the safety devices maintain the pressure at 5580 psi., but reduces flow. In this case, the Vibrodriver's frequency drops noticeably.

When the pressure never reaches 5580 psi., due, for example, to easy ground or a blocked section, the user can check that the hydrostatic transmission is ok condition in way :

- Suspend the Vibrodriver 7,8 in. above the ground or attach it onto a section driven flush with the ground level and pour into the vibratory gearbox an oil identical to the oil already in the gearbox in order to obtain a pressure of 5000 to 6000 psi.
- Operate the Vibrodriver at maximum speed during **3 minutes maximum**.

If the pressure does not reach 5000 psi. to 6000 psi., check :

- First, check the pressure gauge by connecting the capillary tube to the jack pressure gauge.
- Check condition of HP valves, by reversing. Where applicable change the HP valve.
- Check the condition of the hydraulic motor(s).
- Check condition of pump or call on PTC.

For HFV and Vibtronic® range, if you are in automatic position (see chapter 8), the pulsation phenomenon starts :

- First, the moment decreases then the HP decreases and the Vibrator takes on the power.
- When the pressure falls under 4600 psi, the moment increases. The frequency will remain at the same value.



### 3. Oil flow :

To check that the power pack provides normal delivery, one may proceed in two ways:

- Install a flow meter on the HP circuit (carefully calibrate the flow meter pressure and flow).
- Otherwise, one can operate the Vibrodriver at maximum speed, measuring the vibration frequency by means of stroboscope and taking great care to note the corresponding pressure (operation valid with hydraulic motor(s) in sound condition).

**NOTE:**

*First check that the diesel engine rotates at rated speed and that the lever of the pump(s) moves on its full range.*

## II. Clamp hydraulic circuit

### 1. Jack pump test

The only test consists in checking that the pump produces a pressure of approx. 4600 psi. max. For this purpose, simply close the opening and closing pipes at the power pack outlet by means of the plugs delivered with the original equipment, and press on the jack closing button. If the pressure does not rise to 4600 psi. and the green indicator is not switched on, have the pump checked.

### 2. Test of clamping head check valve

Fit a plug on the cylinder piloting circuit (see diagram page 10/B) and compare the pressure thus obtained with that previously observed. In the event of a major difference, replace the check valve.

## III. HFV and Vibtronic<sup>®</sup> circuit

Check that the pressure in the pump is 1300 psi.. There is a manometer on the control panel. For the Vibtronic<sup>®</sup> range, the operator panel displays the pressure every time.

## IV. Power pack testing

If one wishes to operate the power pack without Vibrodriver to test one of its components, merely connect one HP outlet and one LP outlet by means of hoses of the same cross-section as the HP and LP hoses (length 40 or 80 in.) and close all other outlets (drainage and clamps) with the plugs supplied as original equipment. In this way, the power pack can operate at full delivery



## CHAPTER 11

### TROUBLESHOOTING

#### I. General

***In performing troubleshooting, a number of basic principles should be taken into account, namely :***

- ↪ Be acquainted with the machine's mechanical operation,
- ↪ Be acquainted with the electrical circuit,
- ↪ Be acquainted with the hydraulic circuit,
- ↪ Above all, methodically test part by part in the direction of energy circulation (from source to receiver).

***The extent of the malfunction must be assessed rapidly in order to determine the means to be employed :***

- ↪ Intervention of site personnel.
- ↪ Intervention by a specialist (diesel specialist, hydraulics engineer, electrician).
- ↪ At PTC technician or agent.
- ↪ Whether an assembly must be replaced.

**IMPORTANT!** Except for standard maintenance and ordinary troubleshooting, and except with PTC's agreement, do not interfere with the equipment during **the warranty period**. Leave this up to a PTC technician, failing which the warranty might be compromised.

***In the event of recourse to a specialist or PTC. agent, the information required on calling for assistance is as follows :***

- ↪ Description, as accurate as possible, of the phenomenon encountered.
- ↪ Indication of equipment type and its serial number.

**IMPORTANT!** Check always, if there is pressure in the hoses or into the organs which you use.

#### II. Emergency stop

If the control key does not stop the engine and if there is an emergency to stop it (oil hydraulic loss important for example), act the red button "Emergency stop".

On the last solution, act the electro stop or disconnect the power of the diesel hoses.

#### III. Diesel engine

##### 1. The « Start » indicator does not light up :

Check the electrical circuit as follows :

- Battery cut-out device closed and battery charged
- Ignition key closed
- On a main pump(s), stroke-limit electrical jack. Press on the button (-) of the button control box for 5 or 10 seconds and check that the jack stroke-limit safety contact is properly closed.
- Light of « Start » indicator in working condition.
- The emergency stop button closed



## **2. The « Start » indicator is switched on and the starter does not operate**

- Check electric circuit and fuel level.

## **3. The starter operate but the Diesel engine do not start**

- Check the Diesel feeding circuit is in working condition and the cleaning filters.

## **4. The engine cannot be delivered his power**

- Check the electric jack in working condition, situated on the injection pump.
- Check the oil hydraulic level.
- Check the Diesel filters.

## **5. The Diesel engine stops itself**

- Check the engine securities.

## **6. The engine cannot be throttled down by simply pressing on the « DIESEL - » button.**

- It is necessary first to press on the « Vibro - » button for five seconds, and, if this is not sufficient, to press on the end-of-stroke security contact on the pump.

## **IV. Hydrostatic Transmission (main circuit)**

### **1. The charge pressure is lower than 220 psi.**

**IMPORTANT!** Practice the different test only if the charge pressure fall down and place the Power pack alone.

#### **a) At zero delivery**

- Check the limit value concerning the charge pressure with the adjusting screw
- Check oil level in tank (recommended level 2/3 full).
- Change cartridge of intake filter(s).
- Check that no air is taken in between the tank and pump(s) (check couplings, etc...)

#### **b) At maximum delivery**

- If the pressure is higher than 220 psi, check the servo control cylinder.
- If the pressure is lower than 150 psi, check the motor(s) swashplate and after the pump(s) swashplate.
- Change boosting pump. Make sure that the replacement pump is designed to rotate in the same direction as the pump replaced.

### **2. The electric jack does not operate**

- Check if the closing clamp (s) is in working condition. The green indicator must be lit up on the control box. In the other case, check the controller pressure.
- Check that the jack is powered on 24 V when the «Vibro + » button on the control box is pressed.
  - If so : Change electric jack.





- If not: Check good condition of « + » pushbutton on control box and the continuity of electric circuit.

### **3. The electric jack operates, but the Vibrator motors are not turning.**

- Check if the hoses H.P. and L.P. do not inverted.
- Check charge pressure.(≈ 360 psi)
- The charge pressure is satisfactory, high pressure being around 5075 psi.
- Check the motor(s) by operating it under no load after uncoupling it.
- Check that the vibratory gearbox is not blocked.

### **4. The Vibrodriver operates, but not at its normal speed**

- Check the charge pressure (3625 psi is needed when the flow is full).
- First check its frequency.
- Check diesel engine speed.
- Check electric jack (complete stroke?).
- Act manually the servo control pump in order to check).

### **5. The hydraulic pressure does not rise. (≈ 2200 psi)**

- This may be due to the ground and/or the section which is not vibrating.
- Check HP valve on motor(s), and whether the pressure rises above a certain threshold (see below).
- Check with a flow meter , the oil flow sent into the engines.

### **6. If the pumps are old, the flow fall down.**

- HP fluctuations (pressure and delivery, i.e. frequency)
- Check servo-control nozzles.

## **V. Clamping head auxiliary circuit**

*If by pushing the « CLOSE →][←» button, the clamp does not close, check that the hoses are not inverted.*

### **1. The clamping head does not close**

- First, look for the source of the malfunction. Place plugs over the power pack in place of the jack opening.
- Push on the "close clamps →][←" button.
  - If the pressure does not rise, the malfunction is due to the pump or electro distributor , or the control box (cable) and the flow separator if the power pack is equipped.
  - If the pressure rises, the malfunction is due to a leakage in the clamping head.

#### **a) Pump**

- Check that it is properly powered and that it delivers.

#### **b) Electro distributor**

- Check that it is powered on 24 V on both solenoids by pressing on buttons « CLOSE →][←» and « OPEN ←][→».



- In the negative, check that the contact making the circuit is properly closed and that there is continuity in the electric circuit.
- In the affirmative, manually operate the distributor by pushing with a diameter 1/8 in. rod in the axis of the two solenoids one after one.
- If the distributor operates manually, change the solenoid(s) after checking that the circuit is right.
- If the distributor does not operate manually, change the electro-distributor.

### **c) Clamping head**

- If the oil reaches the clamping head and the clamping head does not close, first check the check valve (see chapter 10), then the jack seals and the connection (elastic pins) between the piston and the mobile jaw.

### **d) The clamping head slides over the casing or section**

- Check sound condition of jaws and, if necessary, clean by scraping, and clean jaw serrations with fuel oil.
- Check clamping pressure
  - If the pressure does not rise to approximately 4000 psi., the green indicator lamp being lit up on the pushbutton control box : change pressure switch.
  - If the pressure does not rise to approximately 4000 psi., with the green lamp remaining extinguished : check condition of lamp.

## **2. The clamping head does not open**

- Examine same points as in paragraph 1.
- Check operating condition of check valve located on the bottom of the jack ; this valve is piloted and should open the pushing circuit of the jack, which will then be in communication with the tank.

## **3. Unstable pressure (fluttering of pressure gauge pointer)**

- Look for internal or external leaks.
- Check the check valves.
- Check condition of pump(s), which may be worn out.
- Check if the adjustment between the pressure limiter and the pressostat is sufficient (400 psi.).

## **VI. Vibrodriver**

### **1. Vibratory gearbox**

If the vibratory gearbox overheats, this may be due to intense work. In this case, provide for Vibrodriver stoppages to enable cooling. Otherwise:

- Check oil level. The level should be in the middle of the indicator, neither above nor below. See capacity of vibratory gearbox, chapter 1.
- Check condition of bearings.
- Check oil quality.

### **2. Extraction yoke**

- In the event of yoke rebounds:
- Check condition of elastomer blocks.
- In the event of inadequate traction force (bore stops come in contact) :
- Check condition of elastomer blocks and the crane traction force.



## VII. Variable amplitude circuit (only HFV range)

### 1. The Vibrator is not vibrating above 1650 rpm

#### a) Electricity :

- Check that the switch on the electrical jack of the pump(s) is on the right position and work properly.
- Check the electrical continuity from the button box to the connection box of HFV kit.
- Check the rotary jack in working condition.

#### b) Hydraulic :

- Check that the pump delivers from the oil flow repartitor.
- Check that the electro distributor is powered on 24 V. If so, manually operate the distributor by pushing it with a rod in the axis of the two solenoids one after one.

### 2. The Vibrator is vibrating under 1650 rpm :

- Check that the coil « Amplitude A- » of electro distributor is energized. If so, check that the hoses are not inversed.



## CHAPTER 12

### SPARE PARTS

**WHENEVER ORDERING PARTS, MENTION THE SERIAL NUMBER OF THE MACHINE**