

# Manual

## Pumping unit P2000EG650



## **OPERATING MANUAL**

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### **ATTACHMENTS:**

- STARTPROCEDURE
- PERFORMANCE CHART
- PUMP MANUAL
- ENGINE MANUAL
- ELECTRIC PLANS
- MAINTENANCE REGISTRATION

## **1.1 MOBILISATION**

The weight of the P2000EG650 is approx. 21.000kg.

Prior to lifting the pump unit a few checks must be made:

1. check if all stored articles inside the pump unit are securely tied down
2. take the ignition key out of the control panel
3. lock all doors

When all this is done you can hook up the lifting chains to the 4 top twist lock blocks.

Use certified and tested chains only, longer than 5 meters.

### **NEVER:**

1. Stand or walk underneath the load
2. Use chains that are too short, too light, or have uneven lengths
3. Uncertified lifting equipment
4. Less or more than the 4 top twist lock blocks

Use a rope, tied to one of the bottom twist lock blocks to steer and/or turn the pump unit when it is lifted.

When the pump unit is loaded onto the truck, tie it down securely before it leaves your yard, have the driver sign the delivery note and keep the original.

## **1.2 PLACING THE PUMPUNIT ON SITE**

Before you place your pump unit on its site location, there are a few preparations you can do:

1. Place a sheet of 8x4 meters of oil resistant plastic foil on the location of the pump unit
2. Place 2 drag line boards each at least 6 mtr. long with approx. 0.5 mtr. space between another horizontally, well supported by solid soil, on top of the plastic foil.
3. if you decide not to use the plastic foil: always use drag line boards or something similar placed horizontally to give the pump unit its full support
4. Place the pump unit as close to the mud tank as possible: maximum length of the suction hose is 6 meters.
5. Place the unit as horizontal as possible

When all this is done you can unhook up the lifting chains

Put the pump unit on the drag line boards and unlock the doors

Remove all articles out of the pump

### **The following connections have to be made:**

1. mud-in:
  - 6" Victaulic
2. mud discharge:
  - 3" weco #200
3. pop-off:
  - 2" weco #200

### **1.3 OVERALL CHECK OF THE PUMPUNIT**

Before you can start pumping there are a several checks to be made:

1. Check electric power supply, switch-on indoor lights, check on/off of the liner wash pump.
2. Check oil level of the piston pump: a dipstick is located at the drive-end on the side of the pump unit. If the level is to low, add oil at the breather/filler cap on top of the drive-end. Check if there are any oil leaks on the power-end of the pump, if so, they must be fixed prior to starting the pump unit up.
3. Check if there are any oil leaks on the transmission, if so, they must be fixed prior to starting the pump unit.
4. Check oil level, coolant level and fuel level on the Diesel engine, a dipstick for engine oil level is located at the right side of the pump unit. To check coolant level, open the filler cap located at the top of the radiator, slowly with a rag over it as any pressure may still be present in the cooling system.
5. To check fuel level see the sight gauge on the fuel tank located at the side inside the pump unit. Check if ball valve's in the fuel are opened.

### **6. Only use fuel with EN 510 Specification's**

7. If any of these levels is to low, they must be added to the maximum level.
8. Check for any leaks on each of the systems and if so, they must be fixed prior to starting the pump unit up.
9. Check if all electrical cables and wires are still in good condition, repair if necessary.
10. Check fan drive and V-belts, compressor drive and V-belts and alternator drive and V-belts.
11. Check if all airlines and pipes are still in good condition, repair if necessary.
12. Check, overall, for any damaged or loose parts and repair if needed.
13. Check the safety valve and its setting
14. Check all guards
15. Check remote control unit and cable.

### **1.4 CAPACITY PARAMETERS AND PERFORMANCE CHART**

This unit is capable to pump 2000 ltr/min @ 100 bar with fresh water of 7 Ph and 60 sec of viscosity and 1.2 gram/Cc.

**Engine:**

**HP Pump:**

Make: ORUC  
Type: ST6070

**Generator:** Stamford  
Type: HCI544F1

**Engine:** VOLVO  
Type: TWD1683GE  
Serial: 40869790 / 2016157559

## **2.1 CHECK BEFORE STARTING THE PUMPUNIT**

Before starting the pump unit you must do a quick check of all components of the pump unit:

1. Check the pump
2. Check Right liner size
3. Safety valve setting: check pump performance list
4. All fluid levels
5. Liner wash pump, tank, filter, manifold, hoses and water level make sure that there is now water in the last compartment of the liner wash tank this compartment is to collect oil spill and have to by drained every day.
6. Open all valves (suction and discharge)
7. Check for any leaks on the suction hose and inside the pump unit.
8. Connect and check remote
9. Put gearbox in neutral
10. make sure that all emergency switch's are pulled out

### **FILL THE LINERWASH TANK UP WITH CLEAN WATER**

START THE LINERWASH SYSTEM AND RUN IT FOR A FEW MINUTES  
CHECK IF ANY DEBRIS PLUGS THE WASHPIPES if so clean out the system

## **2.2 STARTING THE PUMPUNIT**

- Connect all hose connections
- Connect remote control cable and connections
- Check the "safety valve"
- Fill the compartments of the liner wash tank with clear water
- Check all oil levels (marked red)
- Switch "main on/off" on the main control panel to "on"
- Switch "linerwash on/off" on the main control panel to "on"
- Check the liner wash if it's flushing
- Push "push to start" when turning the key
- Let the engine idle for 10 min.

### **Always switch booster pump to "on" before running the pump**

- Check booster pressure min. 2 bar max 3.5 bar
- Never let the ignition switched on for longer than 1 minute if the engine is not running
- Lock doors at night
- Clear liner wash tank daily

### **Shut down of the unit,**

1. Put pump in off position on panel local or remote
2. Select local on main panel
3. Stop engine on main panel
4. Turn off mass switch

**During operation frequently check:**

- Liner wash liquid level visually
- Pump general inspection
- High pressure hose ad connections
- Suction hose and connections

## **2.3 OPERATING THE PUMPUNIT**

When the pump unit is in service the responsible operator has to keep checking all items discussed in chapter 1.3 and 2.1 on a regular basis.

Extra to that is keeping an eye on the mudflow of the pump: bouncing hoses often mean you have a valve problem, mud in the liner wash system often means a liner and/or piston rubber has to be replaced.

Also while running the unit make sure that the oil pressure of the pump is between 1.5 and 3 bar this is the pressure of the lubrication system inside the pump when there is not enough pressure this means that the filters have to be changed ore lines are blocked

**Do not continue running your pump until all these problems are solved!!**  
**The fluid-end, drive-end and drive line will be seriously damaged by this!!**

**The unit will stop automatically.**

1. Engine temperature high
2. Oil pressure engine low
3. Emergency stop

**Never run the unit with less than a 1/4 of fuel in the tank (300 liter)**

## **2.4 WORKING ON THE PUMP AND EXCHANGING PARTS**

Before you start working on the pump idle the engine for 5 minutes then stop it.

Before you start working on the pump close all valves.

Before you start working on the pump determine what the problem could be.

### **In case of a valve problem you can repair as follows:**

1. screw out all six cap retainer rings
2. remove all six caps and gaskets
3. remove the 3 suction valve spring holders
4. remove all valves and springs
5. wash all parts and the inside of the fluid-end thoroughly
6. determine what parts need to be replaced, do not forget to check the valve seats remaining in the fluid-ends, for any wash-outs
7. replace worn out parts
8. re-assemble the pump with great care!
9. place suction valves in first
10. place valve springs onto the 3 holders and put them one by one into the fluid-end using the heavy bar to hold them down through the valve seat of the valve above
11. put in the cylinder head cap with its special seal using little grease
12. screw in the cap retainer ring using little anti-seize
13. after the suction valves are assembled put in the discharge valves
14. put in the springs
15. put in the valve caps with their special seals using little grease
16. screw in the cap retainer rings using little anti-seize

To start the pump, go back to chapter 2.1 of this manual.

### **In case of a liner problem you can repair as follows:**

1. start working as described above in 'in case of a valve problem'.
2. stop the liner wash system and disassemble the liner wash manifold
3. undo the piston rod clamp of the leaking liner
4. turn the crank of the pump leaving the piston rod in the front of the liner and pull the push rod back using the Allen wrench turning the jack shaft at the back of the pump.
5. undo the 4 bolt's that hold the liner and retainer ring in the fluid-end
6. carefully pull out the liner/piston rod/retainer ring assembly
7. press out the piston/rod assembly
8. replace the piston rubber and grease it
9. press the piston/rod assembly into the new liner that is lightly greased on the inside
10. clean the bore of the liner in the fluid-end using little detergent
11. grease the o-ring chamber of the liner and place a new o-ring in it
12. grease the bore of the liner in the fluid-end lightly after checking for any wash-outs on the o-ring area on the fluid-end
13. carefully put the liner/piston rod assembly into the fluid-end
14. place the retainer ring over the liner
15. screw in the 4 bolt's hand tight only
16. torque up the 4 b crosswise
17. turn the crank of the pump until the push rod hits the piston rod
18. check for misalignment
19. put on the piston rod clamp

20. reassemble the liner wash manifold
21. reassemble the valves as described above in 'if you have a valve problem'
22. drain liner wash water, clean the system and fill up with clean water

### **3.1 12 HOUR SHIFT MAINTENANCE**

The maintenance on the pump unit for a 12 hour shift is running through all the points discussed in chapter 1.3 thru 2.4. Notice only the time intervals for different oil changes that have to be made on time.

### **3.2 24 HOUR SHIFT MAINTENANCE**

The maintenance on the pump unit for a 24 hour shift is running through all the points discussed in chapter 1.3 thru 2.4 at every change of shifts (2x in 24 hours).

Notice only the time intervals for different oil changes that have to be made on time.

### **3.3 WEEKLY MAINTENANCE**

For weekly maintenance on the pump unit the following activities are recommended:

1. check the pump as described in chapter 2.3 thru 3.2.
2. check the pump unit overall as described in chapter 1.3 and 2.1
3. clean the inside of the pump unit
4. carefully wash out the bentonite from the radiator using a steam cleaner
5. empty the cans from the sump vents
6. disassemble the fluid-end and replace worn out parts
7. check if an oil change is needed
8. check filters of the oil lube System and diesel system
9. grease the universal joint with 5 pump strokes
10. drain water out of the air tank

### **for grease use Shell RHODINA EP2**

### **3.4 MONTHLY MAINTENANCE**

For monthly maintenance on the pump unit the following activities are recommended:

1. follow all the points described in weekly maintenance
2. open crank case cover of the pump to:
  - Check if all bolts and nuts are still tightened
  - Check if all oil lines are still in good condition and flushing
  - Check for excessive play on the big con-rod bearings
  - Drain water from pump bottom

### **3.5 3 MONTH MAINTENANCE**

For 3 month maintenance on the pump unit the following activities are recommended:



1. Follow all the points described in monthly maintenance
2. Open remote control box and check for any loose wires and air hoses
3. Grease all door hinges
4. Check if all gauges work properly
5. Check coolant condition

### **3.6 6 MONTH MAINTENANCE**

For 6 month maintenance on the pump unit the following activities are recommended:

### **3.7 OIL CHANGE INTERVALS**

- Diesel Engine :
- engine oil must be changed every 250 running hours
  - oil filters must be changed every 500 running hours
  - fuel filters must be changed every 500 running hours
  - air filter must be changed every 1000 running hours
  - coolant must be changed every 2 years

See VOLVO manual for the kind of oil needed.  
USE SHELL COOLANT PLUS coolant.

- ST250 pump
- oil must be changed every 400 engine running hours
  - or when you have water in the oil (milky substance)
  - oil filter must be changed every 400 engine running hours
  - or when you had water in the oil
  - USE SHELL Spirax 80W90

- Eaton Gear Box: - USE SHELL Spirax 80W90

DRAIN WATER OUT OF DIESEL TANK AT LEAST ONCE A YEAR

### **4.1 DEMOBILISATION**

The weight of the P2000EG650 is approx. 21.000kg.  
Prior to lifting the pump unit a few handlings must be made:

1. check if all stored articles inside the pump unit are securely tied down
2. take the ignition key out of the control panel
3. uncouple all hoses
4. open the fluid-end as described in 'if you have a valve problem' and wash out the inside of the fluid-end
5. wash out the inside of the pump unit
6. lock all doors

When all this is done you can hook up the lifting chains to the 4 top twist lock blocks.  
Use certified and tested chains only, longer than 5 meters.

#### **NEVER:**

1. Stand or walk underneath the load
2. Use chains that are too short, too light or have uneven lengths

3. Use uncertified lifting equipment
4. Use less or more than the 4 top twist lock blocks

Use a rope, tied to one of the bottom twist lock blocks to steer and/or turn the pump unit while it is lifted.

## **4.2 LONG-TERM STORAGE**

Long-term storage is when the pump is out of use (on or off site) for more than 3-4 weeks.

If this is so, there are a few preparations to be made to make sure the pump unit can be in operation as soon as it is needed.

Preparations on power pack:

1. clean out the radiator with a steam cleaner
2. replace fuel filters as described in chapter 3.7
3. drain water from air tank
4. drain water from fuel tank

Preparations on the pump:

1. Undo liners as described in chapter 2.4
2. drain liner wash tank and take out the liner wash pump

## **CLEAN OUT YOUR ENTIRE PUMPUNIT**

Before start-up dress-up the pump as described in chapter 2.4.

Also you must go through all the points described in chapter 2.1 thru 2.3.

## **5.1 PARTS SUPPLY AND RECOMMENDED PARTS STOCKLIST**

To make sure all your wear parts are available you have to stock your parts on-site.

We therefore made a list of the parts and quantities of all wear parts for a normal period. If parts are used it is necessary to refill your stock immediately.

**!!! USE GENIUNE PARTS SUPPLIED BY SITETEC ONLY !!!**