

OPERATORS MANUAL

DYNAMIC PROBING RIGS

LMSR-V / LMSR-H / LMSR-E / LMSR-SPT-V / LMSR-SPT-H

NOTE: Please read this manual before working!



Revisionsstand: 2014 – 09

Nordmeyer GEOTOOL GmbH

Wolfener Straße 32

10681 Berlin

Germany

Tel: +49 (0) 30 934 905 200

E-Mail: info@nordmeyer-geotool.de

Internet: www.nordmeyer-geotool.de

Copyright © by Nordmeyer GEOTOOL GmbH

1	General	1
2	Usage Regulations	1
3	Safety	1
3.1	Responsibility of the Operator	1
3.2	Advises in this manual	2
3.3	General safety information	2
3.4	Protective Gear	2
4	Instruction Manual.....	2
5	Maintenance	4
6	Annex.....	5

1 General

The following manual contains important information on the handling of the dynamic probing rigs LMSR and LMSR-SPT. The LMSR unit serves to carry out dynamic probing procedures with drop weights of 10, 30, 50 kg (LMSR) or 63,5 kg (LMSR-SPT). The drop height of the LMSR is 500 mm for DP-L, DP-M and DP-H or 750 mm for SPT.

Window sampling operations up to 80 mm diameter are also possible.

Standard Versions

With these tools one can carry out Light- (DPL), Middle- (DPM) and heavy- (DPH) dynamic probing procedures:

- ▶ **LMSR-V** with Combustion Engine
- ▶ **LMSR-H** with Hydraulic Engine
- ▶ **LMSR-E** with Electric Engine

SPT Versions

With these tools one can carry out Light- (DPL), Middle- (DPM), heavy- (DPH) as well as Super heavy- (SPT) dynamic probing procedures:

- ▶ **LMSR-SPT-V** with combustion engine
- ▶ **LMSR-SPT-H** with hydraulic engine



IMPORTANT!

This Operators Manual is universally valid for all versions stated above. If there is no explicit information about differences between these versions at the beginning of a chapter, a subchapter or a section, it counts for all of them. Please contact GEOTOOL GmbH for further information.

2 Usage Regulations

The LMSR is designed to carry out dynamic probing tests. Warranty and operating permit will expire if the LMSR is used for any other purpose.

3 Safety

Read the following section carefully. It contains important information for your personal safety and the safety of the LMSR.

3.1 Responsibility of the Operator

The operator of the LMSR is responsible to operate the LMSR for its intended use as stated in section 1.2 only. Instruct co-workers thoroughly and request them to read the operating manual. Do not leave the LMSR unattended to prevent misuse by third parties (e.g. children).

3.2 Advises in this manual

Please notice the “**CAUTION**” advises in this manual. CAUTION informs of impending damage for the machine caused by inappropriate handling of the LMSR as well as not operating the LMSR in conformity to its intended use as described in section 1.2 of this manual.

Please notice the “**WARNING**” advises in this manual. WARNING informs of impending danger for the operator or other persons caused by inappropriate handling of the LMSR as well as not operating the LMSR in conformity to its intended use as described in section 1.2 of this manual.

3.3 General safety information

Carrying out dynamic probing procedures with the LMSR carelessly can lead to the injuries described below:

- ▶ Serious strokes caused by the falling hammer
- ▶ Burning by hot exhaustion parts
- ▶ Injury to the hearing due to disregarding the recommendations to wear hearing protection

3.4 Protective Gear

The operator should wear protective gear as listed below:

- ▶ Protective helmet
- ▶ Hearing protection
- ▶ Protective shoes
- ▶ Protective clothes
- ▶ Protective gloves

4 Instruction Manual



IMPORTANT!

Only trained and capable personnel familiar with this manual is permitted to operate the rig. Before operating the LMSR unit check the following parts and components for correct setting and remediate any possible damage:

- key bolt for drop weight carriage
- screw fastenings, bolt connections, safety pins
- drop weight carriage, allen screws, service status
- hard hat, gloves and ear protection available?

1. Move the rig to the borehole location with mast either fully erect or in the intermediate position. Make sure the central pin keeping the mast in position is fully inserted and secured by an R-clip. In heavy terrain make sure it does not topple over damage the low-slung engine.
2. Set up the rig at the borehole using:

LMSR: wooden ground plates for wheels and mast foot to ensure proper standing by reaching a stable three-point suspension between wheel bases and front end of the mast foot. By means of the lateral spindles in conjunction with the air bubble indicator the mast can be adjusted in an upright vertical position.

LMSR-SPT: the cranks to achieve a stable vertical 3-point suspension in conjunction with the air bubble indicator mounted to the left hand side of the mast. When a Y-shaped three-leg foot is mounted first insert the two longer front legs and secure those with bolts and R-clips. Now set up the rig, push it forward from the rear end and insert the shorter back leg. Apply bolt and R-clip.

3. Now remove safety bolt and erect top part of the mast.

LMSR-H / LMSR-SPT-H: connect hydraulic hoses.



CAREFUL!

Do not clamp chain! Use wing nuts to secure mast top. Afterwards mount chain cover by using the safety bolt and clip.

4. Lift drop weight.
LMSR-H / LMSR-SPT-H: start motor and with the lever move chain and drop weight up. Important: Make sure the key bolt connection the drop weight carriage is fully inserted and the R-clip is in place. Move drop weight up until it falls into the safety latch.
LMSR-V / LMSR-E / LMSR-SPT-V: using the hand winch.
5. Put in safety bolt to prevent weight frame to fall down.
LMSR: Remove front rod guiding roller from mast foot.
LMSR-SPT: Open rod guide at the front bottom of the mast and insert plastic rod guide pieces fitting to the desired rod or sampler diameter.
6. Insert probing rod with point.
LMSR: Apply brass cap and lower drop weight mechanism onto the rod after removing safety bolt. The brass cap is fully taken up by the anvil. Reinstall front rod guiding roller.
LMSR-SPT: close rod guide and apply brass cap on the top of the rod.
7. Remove safety bolt and carefully lower drop weight carriage onto the rod. The brass cap shall fully be taken up by the anvil. When lowering the frame it can occur that the weight body is caught by a chain block. In this case lift the carriage and open the latch by pressing back its top part on top of the basic drop weight.
8. At this moment recheck the vertical position of the mast and readjust if necessary. Reset the blow counter to „0“ by pushing the button.



IMPORTANT!

Before commencing operation make sure that:

- the rig is set up in a stable position and does not tend to topple
- the rod with it's brass piece is fully taken up by the anvil
- the lifting hook is disengaged
- no persons are close to the operating machine
- the rig is under severe supervision at all times

9. Start the procedure:
LMSR-H / LMSR-SPT-H: Start chain motor with hydraulic control valve.
LMSR-V / LMSR-SPT-V: Start engine with idle speed. (For the operation and maintenance of the Honda motor please refer to the relevant Honda instructions delivered with each rig). Increase engine speed by using the throttle lever; the chain is set into motion by an internal centrifugal clutch.
LMSR-E: start electric engine. The procedure starts immediately.
10. The chain blocks mounted on the drive chain take up the weight body until it is released at the top end of the drop weight frame and falls freely onto the anvil. The drop energy is transmitted to the rod and the point. By setting the engine speed through the throttle lever the number of blows per minute can be adjusted.



IMPORTANT!

Do not manipulate any part of the unit whilst in operation!

In case of irregularities immediately put the throttle to idle position and stop the engine. If necessary lower down the drop weight frame to make sure the weight body is not resting on the chain block before you work on the rig.

11. With the rod fully sunk in and the drop weight frame in its bottom position the chain blocks do not catch the weight any more. This is to prevent the weight from hammering onto the mast foot. Please note that the blow counter remains in function disregard of the position of the drop weight. Therefore cut down engine speed until the chain comes to a standstill and stop the motor.
12. Now lift up drop weight frame and secure it with the safety pin. Add next rod, connect the rods tight and carry on as described under 6. above.



IMPORTANT!

- ALWAYS follow these instructions to avoid damage or injuries!
- Do not undertake any manipulations during operation!
- Always disengage hook from the eye bolt of the drop weight frame!
- When terminating the dynamic probing procedure close petrol valve to empty the carburetor pot until the engine comes to a standstill. This avoids petrol leaking from the carburetor during transport.
- Make sure that during transport the mast inclination does not exceed 90 degrees to vertical otherwise engine or gearbox oil could be leaking from the relevant reservoirs.
- Make sure the weight is secured to the mast foot during transport to prevent same from rapid movements, for example when braking.

5 Maintenance

The following section contains important information on the maintenance of the LMSR. Read this section carefully. Insufficient and inappropriate maintenance of the LMSR may cause engine trouble.

Interval	Maintenance work
daily	Clean and lightly spray oil chrome rod of the Drop weight frame / chrome rod.
daily	Oil latch mechanism.
daily	Check chain tension: <ol style="list-style-type: none"> 1. Lower drop weight frame fully down. 2. Attach spring scale to the chain at the front of the mast in the middle between drive sprocket and return sheave. At a pull force of 4-5 kg the distance between chain and mast profile shall be 8 mm.
weekly	Clean and lubricate chain.
weekly	Clean and grease must guiding profile.
weekly	Oil rope pulleys.
weekly	Clean latch mechanism
weekly	Check oil level of the gearbox.

Tensioning of Chain

1. Undo lateral 19 mm securing nuts at the return pulley axle.
2. Undo 19 mm securing nut on top of the mast.
3. Increase chain tension by fastening the 19 mm tensioning nut under the securing nut until correct setting is reached.
4. Fasten securing nuts on top and at the return pulley axle.

6 Annex

The following documents are attached at the end of the operators manual:

- CE Declaration of Conformity
- Operators Manual Motor
- List of spare parts

