

Instruction Manual for LUBRICO 15 oiler



This manual and other manuals as well, especially documents relating to safety, must be kept in such place where the staff in charge of operating and maintenance can consult them.

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1. Introduction

Spindle oiler Lubrico 15 (further referred as Lubrico) is oiling device for maintenance of all types of Novibra spindles.

Particular lubrication nozzle has to be selected and used for each spindle type to ensure proper lubrication and correct oil level in the spindle bolster.

Lubrico can be used for initial oil filling and periodical oil change as well.

Fresh oil is supplied into the bolster during lubrication procedure and used oil is drained away at the same time therefore only one lubrication gun is needed. Lubricating gun is designed to keep the correct oil level in the bolster automatically.

Lubrico is powered either by accumulator or by an AC/DC adapter from electrical network. Two maintenance-free leads, a charging set and a set of basic tools are supplied with the oiler as well.

2. Main technical data

Power supply: Lead accumulator, 12 V, 24Ah
Optionally: AC/DC adapter 12V/7A (not included, see Ch. 9.2)
Fuse: F 6,3A

Dimensions: Height: 72.5 cm
Length: 72.5 cm
Width: 40.0 cm
Weight: 53 kg

3. Safety instructions

Read these operating instructions carefully Before the first start-up of Lubrico. It contains important information for start-up (Ch. 10), usage and maintenance (Ch.12). In particular, pay attention to the safety instructions in the text.

Protective glasses and gloves are recommended to reduce risk of skin or eye irritation by oil. Both steering rollers can be secured by brakes to avoid unintended motion of Lubrico.



4. Proper use

Lubrico must only be used to fill spindles with an oil or to change the oil inside spindles in accordance with this manual. Allowed kinematic viscosity of oil is ISO VG 10 to 46.

Novibra will not take over any responsibility for any damage resulted from incorrect usage.

5. Transport

To avoid damage and extra expenses, transport the Lubrico only in original packing material. Dispose the packing material in conformity with the national regulations.

6. Disposal

Laws and regulations in force in the particular country must be obeyed for Lubrico machine at the end of its lifetime concerning reutilization, recycling, and waste disposal.

Any oil, grease, plastic parts etc. must be disposed of in accordance with the regulations in force.

Store new and dispose used oil in accordance to country regulations and its producer recommendations.

Attention!

Improper storage or disposal of oil creates risk of fire or damage to the environment.



7. Design

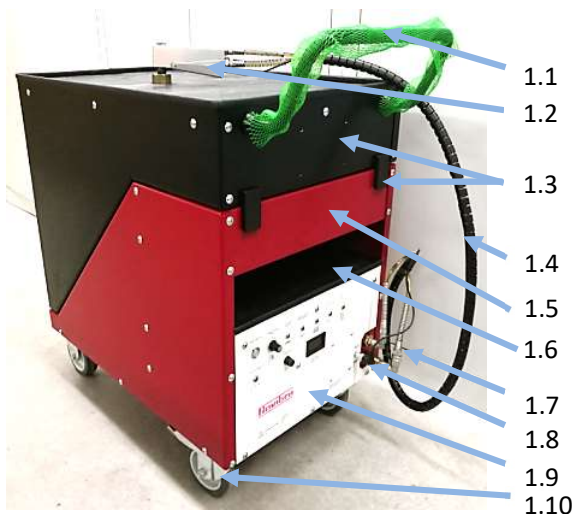


Fig. 7.1 Lubrico 15

7.1. Main parts (Fig. 7.1)

- Handrail (1.1)
- Lubricating gun (1.2)
- Closure cover with security locks (1.3)
- Protective packing of pipes of oil (1.4) and wire for trigger sensor of lubricating gun
- Main machine cabinet (1.5)
- Storage place (1.6)
- Coupling set for pipes of oil (1.7) and gun sensor (1.8)
- Front operating panel (1.9)
- Steering rollers with security brakes (1.10)

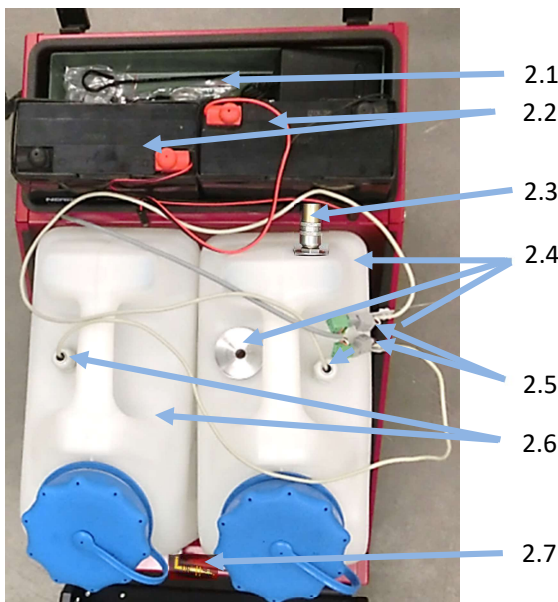


Fig. 7.2 Opened main machine cabinet

7.2. Main machine cabinet (Fig. 7.2)

- Box with accessories (2.1), see Appendix 1
- 12V main & spare battery (2.2)
- Hose coupling for container of used oil (2.3)
- Container for used oil with float switch coupling and gun deposit hole (2.4)
- Connectors of float switches of containers (2.5)
- Container for fresh (new) oil with float switch coupling (2.6)
- Hose coupling for container of fresh oil (2.7)

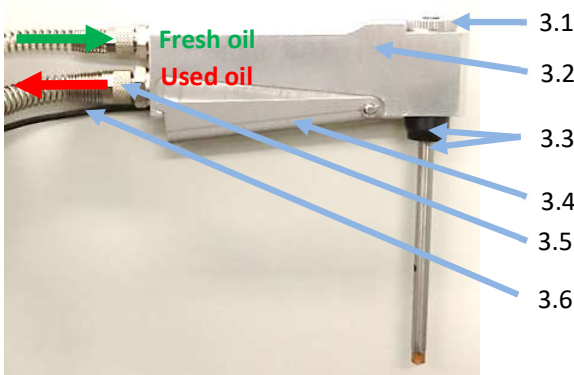


Fig. 7.3 Lubrication gun

7.3. Lubricating gun (Fig. 7.3)

- Security nut of lubrication nozzle (3.1)
- Gun body (3.2)
- Lubrication nozzle with rubber spacers (3.3) (for correct selection of spacers see Ch. 10.3)
- Gun trigger (3.4)
- Gun oil pipe couplings (3.5)
- Trigger sensor and its cabling (3.6)

Lubrico is supplied with lubrication nozzles specified by customer according to spindle type. For correct selection see Appendix 2.

For list of spare parts see Appendix 3.

8. Front operating panel



Fig. 8.1 Front panel

Front panel (Fig. 8.1) consists of indication LEDs, battery indicator, switches, fuse holder, timer setting knob and connector for gun trigger. Fuse specification can be found in Ch. 8.4.

8.1. Indication LEDs

Indication LEDs are luminous parts of panel that show actual functionality state of Lubrico 15 device. **LED indicators are divided into warning indications (red colour) and operation indicators (green and blue colour).**

8.1.1. MAIN SWITCH indicator

MAIN SWITCH is an illuminated switch (Fig. 8.2). which glows when Lubrico is turned ON i.m. in depressed position. If MAIN SWITCH is not glowing in ON state, see troubleshooting (Ch. 13.2).



Fig. 8.2 MAIN SWITCH turned ON and lighting

8.1.2. TRIGGER ON/OFF

A green LED labelled TRIGGER ON/OFF (Fig. 8.1, Fig 8.3) indicates whether the trigger of lubricating gun is pressed or not. In case the green LED doesn't follow gun triggering, see troubleshooting Ch.13.5

8.1.3. LUBRICATION IN PROGRESS

Blue LED indicator LUBRICATION IN PROGRESS glows when the oil pump is activated (Fig. 8.3).

Lubrico is lubricating only if gun trigger is pressed and no warning arises on the panel (no red light is glowing).

Duration of lubrication is determined by timeout set with the knob Lubrication time (Fig 8.3) or by release of the gun trigger (Fig. 7.3). For further details see Ch.8.2.

If LUBRICATION IN PROGRESS and TRIGER ON/OFF leds don't glow when gun is triggered see troubleshooting (Ch.13.5)



Fig. 8.3 Lubrication in progress

8.1.4. BATTERY FLAT alarm and BATTERY INDICATOR

Red LED indication BATTERY FLAT (Fig. 8.4) informs operator that voltage level of power source dropped below safe level. This feature protects:

- batteries from low voltage (damage)
- oil pumps from malfunctioning due to low power feeding



Fig. 8.4 Battery FLAT LEDs

Once it happens the lubrication is blocked as well as functionality of the other LED indicators (TRIGGER, FRESH/USED oil etc.). The warning disappears when power source voltage increases above secure level (a fresh battery or AC/DC adapter is connected).

Check quality of power source when the alarm BATTERY FLAT appears.

BATTERY INDICATOR (Fig. 8.5) is showing actual condition of the accumulator when the Lubrico is ON. It allows early prediction of necessity to change the accumulator in use for a fresh one. It is better to replace the accumulator immediately when the status bar turns to red fields.



Fig. 8.5 Battery indicator

When alarm BATTERY FLAT appears and Lubrico is supplied from accumulator, it indicates that accumulator is discharged and should be replaced by a fresh one, see Chapters 9.1 and 12.1.

If the device is plugged from external DC adapter it indicates that adapter is insufficient to supply Lubrico as too low current (power) is feeding the oil pump. Check the parameters of adapter Ch.9.2.

8.1.5. OIL warnings (barrel empty/full)

Red LEDs of barrels indicate that fresh oil container is empty or used oil container is full.

Lubrication (oil pump) of the device is blocked when at least one of these to warnings is active (Fig.8.6).

FRESH OIL BARREL EMPTY indicates that level of fresh oil is too low to lubricate spindles. Fresh oil must be added to the barrel. Warning will disappear automatically when level of oil is sufficient for further oiling.



Fig. 8.6 Fresh oil warning

USED OIL BARREL FULL - indicates that used oil barrel must be emptied in order to continue with lubrication.

For detailed procedure of containers handling - see chapter 10.4.

8.2.Lubrication time

Duration of lubrication is determined by the shortest action of following two:

- a timeout set with the knob Lubrication time (Fig.8.3, page 5)
- a release of the gun trigger (Fig 3.4, page 4)

LUBRICATION TIME knob allows smooth setting of lubrication time from 0.5 s to 25 s. Set time is indicated by glowing LED “lubrication in progress”, see Ch. 8.1.3., Page 5.

The spindle bolster is usually rinsed in about 2 seconds which is recommended initial setting for first trials of searching for optimal cleaning time.

For proper bolster cleaning adjust the time in such a way that colour of oil in the used oil pipe behind the lubricating gun is not dark anymore. It must have clear appearance like the fresh oil if bolster is properly cleaned.

Attention!

Too short cleaning time may result in failure of the spindle bearing.



8.3. Trigger plug in

Oiling gun (Fig 7.3, page 4) has an electronic trigger which must be plugged into connector on the front panel Fig. 8.7 .



Fig. 8.7 Connection of oiling gun trigger

8.4. Fuse 6.3A

Fuse holder on panel with fast blow fuse 6.3A (Fig.8.8) protects main electronics against power shock and in case of wrong battery polarization or another hazardous manipulation.

Fuse specification : F 6.3A 5x20mm



Fig. 8.8 Panel mount fuse

9. Power

Lubrico device is delivered with two pieces of 12V lead accumulators and suitable charger. It is necessary to take a proper care of battery maintenance for optimal working performance of the device – see Ch. 9.1.

Lubrico can be optionally supplied by an external 12 Vdc adapter as well. DC adapter is not supplied because of variety of voltage and various designs of sockets around the world.

However it can be bought on local market in accordance to the bellow specification in Ch.9.2.

9.1. Accumulator

For optimal lifetime of the two delivered batteries it is necessary to keep them always charged. One lead accumulator can be connected at a time to the Lubrico. The second one shall be charged during the time when the other is in use.



Fig. 9.1 Lead acid accumulator with attached cable

Accumulator has to be unplugged from Lubrico when charging. Original battery charger, which is delivered with Lubrico, should be used for recharging of flat batteries. For correct procedure of charging see Ch. 12.1

The accumulators are delivered with attached cables so that it is user friendly for plugging into Lubrico device and or to charger.

Battery connector of Lubrico device is located on the left side of metal chassis behind the accumulator – see Fig. 9.2.



Fig. 9.2 Powering of Lubrico by accumulator

9.2. External DC adapter

Plug for the DC adapter is located on the front panel (Fig. 9.3) DC adapter with following parameters can be used as optional powering of Lubrico device:

- Output voltage: **12Vdc**
- Output current: **min 5A**
- Connector type: **DC plug 2.1/5.5**
- Polarity: **Inner electrode positive**
- DC adapter protection: **Double insulation**



Fig. 9.3 External DC power connector

Note that active lead battery is disconnected by insertion of plug into DC input socket. I.m. that Lubrico is not powered if DC adapter with no electricity is plugged into panel even if the battery is connected.

Attention!

- Never use DC adapter which has insufficient protection class or power.
- Never use Lubrico with DC adapter outdoors.
- Never use adapter which shows any sign of damage!



Consequences:

- **Injury of the staff.**
- **Damage of the device**

9.3. Battery charger

Battery charger is included with Lubrico package. The charger has special connector mating with accumulator cable. The charger can be operated with mains voltage between 90 to 250 Vac.



Fig. 9.4 Accumulator charger with adapted connector for accumulator plug (right) and socket for mains cable (left)

Charging of accumulators is described in Ch.12.1

10. Inspection before first start-up

10.1. Check after delivery

Before first start-up, check the Lubrico for any apparent damage. **A defective device must not be put into operation.**

Secure the Lubrico steering rollers by their security brakes to avoid unintended move.

Attention!

Never use Lubrico which shows any sign of a damage!



Consequence: Injury of the staff or Lubrico damage.

10.2. Opening the closure cover

1. Switch the MAIN SWITCH to the "OFF" state.
2. Release both cover locks and open the cover (Fig. 10.1)

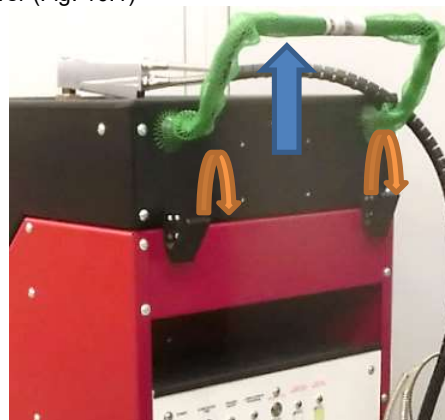


Fig. 10.1 Closure cover

10.3. General inspection before first start-up

Make sure that:

- hoses for the used and clean oil are connected to both of containers and to the lubrication gun (Page 4, Fig. 7.2, positions 2.3&2.7).
- both of couplings are inserted well otherwise the oil stream is blocked, see proper connection on Fig. 10.2.



Fig. 10.2 Properly inserted hose couplings

- gun trigger sensor is connected to its coupling (see Page 7, Fig. 8.7)

- float switches inside the containers for used and clean oil (Page 4, Fig. 7.2) are properly connected as shown on Fig. 10.3



Fig. 10.3 Properly connected float switches

- there is enough oil in the fresh oil container (see Page 4, Fig. 7.2 pos.2.6)
- the container for used oil is empty (see Page 4, Fig. 7.2 pos.2.4)
- here is a filter inside the container for fresh oil (Fig 10.4)



Fig. 10.4 Filter of fresh oil

- lubricating gun is equipped with the suitable lubrication nozzle (see Appendix 2) and suitable rubber sealing spacer.

Notice: Shorter rubber spacer is used for bolsters with internal lock, see Fig. 10.5. Higher rubber spacer is used for bolsters with hook see Fig. 10.6.

Check the obtained oil level inside the Spindle bolster by suitable Novibra dip stick after oiling to ensure that spacers were selected well.

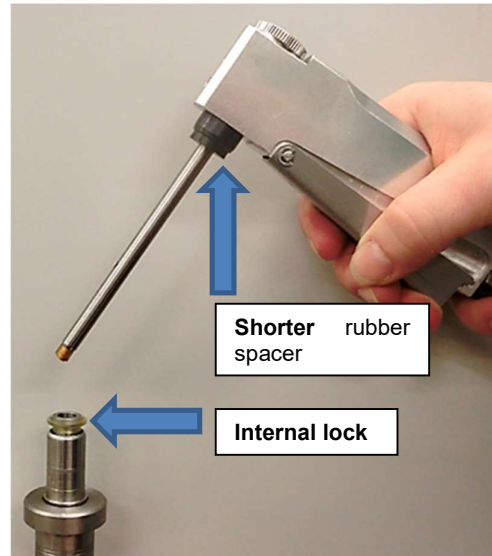


Fig. 10.5 Short rubber spacer for Spindles with internal lock

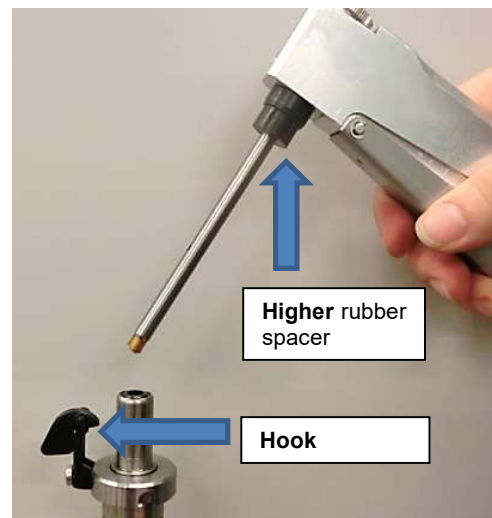


Fig. 10.6 Higher rubber spacer for spindles with hook

Fig. 10.7 Rubber spacer height

| SPINDLE | Rubber Higher/ Hook | Rubber Shorter/ Internal lock |
|---------|------------------------|----------------------------------|
| HP-S68 | 10,6mm | 4,8mm |
| LENA | 9,7mm | 4,8mm |

- the fuse 6,3A (Page 7, Fig.8.8) is installed at the front plate

- a charged accumulator or AC/DC adapter is connected

10.4. Filling the fresh oil container and emptying the used oil container

Both containers are equipped with float sensors. If the used oil exceeds permissible limit or the clean oil drops below the permissible limit corresponding LED indication glows on the panel (Ch.8.1.5) and lubrication is blocked until warning disappears. Another **start-up is not possible unless the container for fresh oil is filled and the container for used oil is empty.**

To remove a container from the Lubrico:

1. Turn the main switch to the "OFF" position (Page 5, Fig. 8.2).
2. Open the Lubrico closure cover (Page 8, Fig. 10.1).
3. Disconnect the float switch (Page 9, Fig. 10.3).
4. Open the hose coupling (Page 9, Fig. 10.2)
5. Remove the oil container (Page 4, Fig. 7.2)

Avoid contamination of fresh oil by pollution during filling of fresh container. If needed, use a sifter to separate rough dust from fresh oil (Fig.10.8; not included).

Always check if the fresh oil filter (Page 9, Fig 10.4) is mounted inside the fresh oil container oil and it is not blocked by a pollution. If it is blocked, clean it or replace it. See Ch. 12.2



Fig. 10.8 Fresh oil container

Attention!

- **Use the same oil type and quality when filling in the oil.** Mixing different oil types may change the oil quality and cause the oiler and Spindle damage.
- Dispose of the used oil in conformity with your national regulations.



11. Filling the spindle bolster with oil

1. Make the basic check as described in Ch.10
2. Turn the main switch ON see Ch.8.1.1, Page 5).
3. Check the main panel indication LEDs for indication of any malfunction (for detail see Ch.8, Page 5).
4. Set required oiling time by LUBRICATION TIME knob (Ch.8.2, Page 6). Correct **Lubrication time must be found by trials and errors**, see point 6 below.
5. Insert the lubrication gun and lubrication nozzle into the spindle bolster. Correct position: the sealing spacer is slightly pre-tensioned to avoid oil losses.



Fig. 11.1 Pre-tensioned lubrication gun

6. Pull the trigger and **observe the oil colour for its cleanliness** in used oil hose behind the lubrication gun. **If the oil is still dark after machine stops, prolong the oiling time by time relay knob.** You have to achieve colour similar to the colour of fresh oil which indicates that bolster was properly cleaned.
7. After machine stops, release trigger gun but keep the gun inside the bolster for further about 0.5 second to make sure that the oil in the spindle drops to the correct level.
8. Remove the lubrication gun carefully.
9. **Use Novibra oil measuring rod (dip stick, see list in Appendix 1) to check achieved oil level.** Repeat oiling if necessary.

12. Maintenance

12.1. Charging the accumulator

If the accumulator is flat corresponding LED indicator glows and operation of Lubrico is blocked. **The accumulator must be always fully charged to keep its optimal lifetime, even during its storage.** Novibra delivers two batteries i.m. one can be charged while the other is in use.

Charging procedure:

1. Turn the main switch OFF.
2. Open the Lubrico cover.
3. **Disconnect the flat accumulator from power connector** (Fig 9.2, Page 7)
4. Remove the flat accumulator from the Lubrico
5. Plug accumulator to the charger (Fig.12.1)
6. The charger is equipped with one LED indicator. It glows red when accumulator is plugged and is being charged. It glows green when no accumulator is connected or accumulator is fully charged.
7. If the indication on the charger turns green and the charging is finished, accumulator can be either unplugged or stayed on charger. There will not be any damage of accumulator due to and overcharging.

Attention!

- In the case of incorrect connection of the poles, the accumulator might be destroyed.

- **Accumulator has to be unplugged from Lubrico when charging.**

- Original battery charger which is delivered with Lubrico should be used for recharging of flat batteries.

- **Never use chargers with charging current higher than 5A. Never use chargers that cannot operate with AGM or GEL accumulators.**

Consequences:

- Machine damage
- Injury of the staff



Fig. 12.1 Battery charging

12.2. Oil filter maintenance

Filter for clean oil (Page 9, Fig 10.4) has to be cleaned or changed when dirty.

Cleaning procedure:

1. Take out the filter from the container then loose the sleeve on filter and remove the filter from the container (Fig.12.2).



Fig. 12.2 Remove filter

2. Use the wrench 13 mm and disassemble the filter into parts (Fig.12.3).



Fig. 12.3 Filter disassembling

3. Clean all parts (Fig.12.4) in a cleaner e.g. technical petrol.

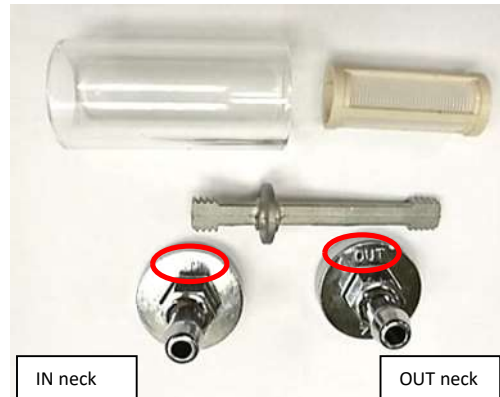


Fig. 12.4 Disassembled filter

4. When assembling, **first assemble the OUT neck**, sifter and mandrel. Tighten them by hand (Fig.12.5).



Fig. 12.5 Filter assembling

5. Add glass housing and IN neck.
6. For final tightening use wrench 13mm Fig.12.3

13. Troubleshooting

For correct handling of the machine, study previous chapters before first start up.

13.1. Visual damage of Lubrico?

If any damage is found, do not use the device before the damage is fixed. For list of spare parts see Appendix 1.

13.2. MAIN SWITCH doesn't light green when switched ON

If MAIN SWITCH doesn't glow when turned ON follow below steps:

- A. If Lubrico is supplied from accumulator then:
 - If an AC/DC adapter is plugged if front panel DC plug (Fig. 9.3) - unplug it.
 - Check the fuse 6,3A (Page 7, Ch. 8.4). If the fuse is burned, replace it.
 - Open the closure cover and check if accumulator is connected properly to the machine (Fig. 9.2).
 - Check with a multimeter if accumulator is in a good condition (voltage above 12V).
 - Check if there is no loosen wire from the accumulator. It can be checked by a multimeter or by plugging the battery to the charger and observing of charger LED indication. It should turn to red immediately after accumulator is plugged in (see Ch12.1, page 11).
 - If none of the above is applicable front panel must be replaced. Contact Novibra for further instructions pls.
- B. If Lubrico is supplied from external DC adapter:
 - Check the fuse 6,3A (Page 7, Ch. 8.4) and replace it if it is burned.
 - Check the adapter output voltage and power rating. DC adapter must be able to supply currents of at least 5 Amps.
 - Unplug the adapter from main panel and check the functionality with a charged accumulator. If Lubrico is fully functional with accumulator but malfunctioned with adapter, replace the adapter.
 - If none of the above is applicable, front panel must be replaced. Contact Novibra for further instructions pls.

13.3. Battery flat illuminates

If a red alarm "battery flat" arises (Fig.13.1), then the power source is insufficient. Follow Ch. 8.1.4, page 6 in this case.



Fig. 13.1 Battery flat blowing



Fig. 13.2. Battery indicator

Battery indicator (Fig 13.2) allows to operator prediction of remaining battery life. It is better to replace battery when the status bar turns to red fields.

13.4. Container LEDs illuminate

Red LEDs indicate that fresh or used oil container is empty or full – see Ch. 8.1.5. If a container LED illuminates, follow chapters 10.4, Page 10.

Fig. 13.3 LED container blowing



13.5. Trigger ON/OFF don't glow wen gun is triggered

Blue LED indicator LUBRICATION IN PROGRESS glows when the oil pump is activated (Fig.13.4). Lubrico is lubricating only if gun trigger is pressed and no warning arises on the panel (no red light is glowing).



Fig. 13.4 LED container blowing

If trigger ON/OFF don't glow then:

- follow Ch. 13.1-13.4
- check if the gun is properly connected to the main panel (Fig 8.8, page 7)
- remove the sheet metal trigger from the gun body and check by a steel object (e.g. screwdriver, see Fig 13.5) if the sensor reacts properly. There must be ON signal reached if a steel object is touching the sensor. If not, sensor must be replaced. Contact Novibra in this case for further instructions.

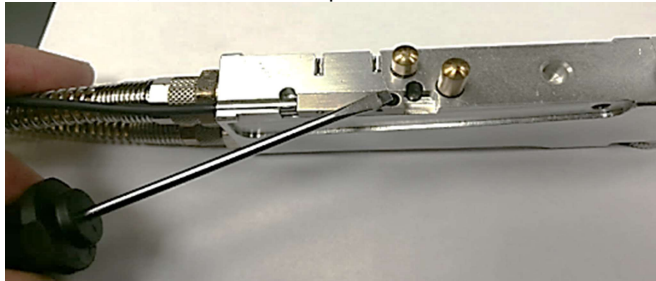


Fig. 13.5 Check of trigger sensor by a steel object

13.6. LUBRICATION IN PROGRESS LEDs don't glow wen gun is triggered

If LUBRICATION LEDs don't glow when gun is triggered then:

- Follow Ch. 13.1 - 13.5
- Check if you can hear a "click" sound of relay or a noise of running pump. If no sound is heard, contact Novibra for further steps.
- **Removal of main panel and unauthorised access to internal machine parts can lead into forfeiture of the warranty!**

13.7. Oil is not flowing freely

If oil is not running freely through hoses, then there might be a blockage present somewhere in the oil circuit. In this case:

- Check the filter of fresh oil (Fig 10.4, page 9). If needed, clean it (Ch.12.2) or replace it.
- Check if hose couplings are properly connected to barrels (Fig 10.2, page 9) or if they are not damaged.
- Check all hoses and clean them if needed.
- Remove lubrication insert from the lubrication gun. If oil is running freely without lubrication insert, then lubrication insert must be replaced.
- Check the lubrication gun itself. Dismantle it and clean it e.g. by a pressure air. If it doesn't help, lubrication gun must be replaced.

13.8. Correct oil level is not obtained

- Check the power source, see chap. 9. Accumulator must be properly charged.
- Check filter in fresh oil container, see chap. 12.2
- Check if you have correct oiling nozzle and rubber sealing, Ch.10.3 Page 10, Ch.10.3 and Appendix 01
- Check if you have correct Novibra Lubrication dip stick - see Appendix 01.
- **Initial oil level before the oil change must be always lower than the maximal oil level given by the Novibra oil dip stick otherwise an excessive oil level might be obtained after oiling. Reduce the initial oil level before oiling if needed.**

13.9. Oil leakage observed

All sealing O rings are subject to wear. If an oil leakage is observed at the gun trigger position, then O rings of gun internal pistons must be replaced, see Fig 13.6. The same is valid if an oil leakage is observed around oiling insert. In this case O rings of oiling insert must be replaced. All mentioned rings can be found as spare parts in the box of accessories.

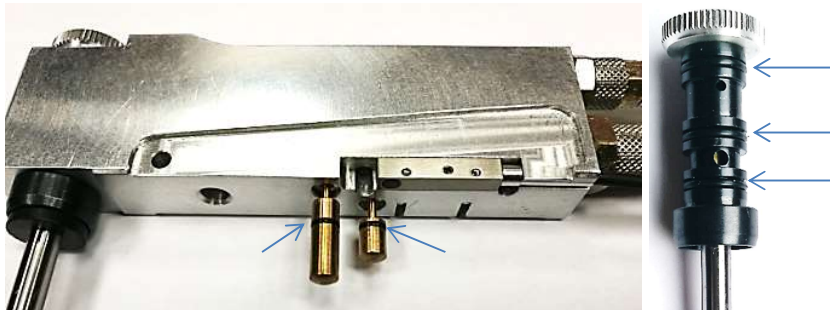


Fig. 13.6 Replaceable O rings of oiling gun and lubricating nozzle

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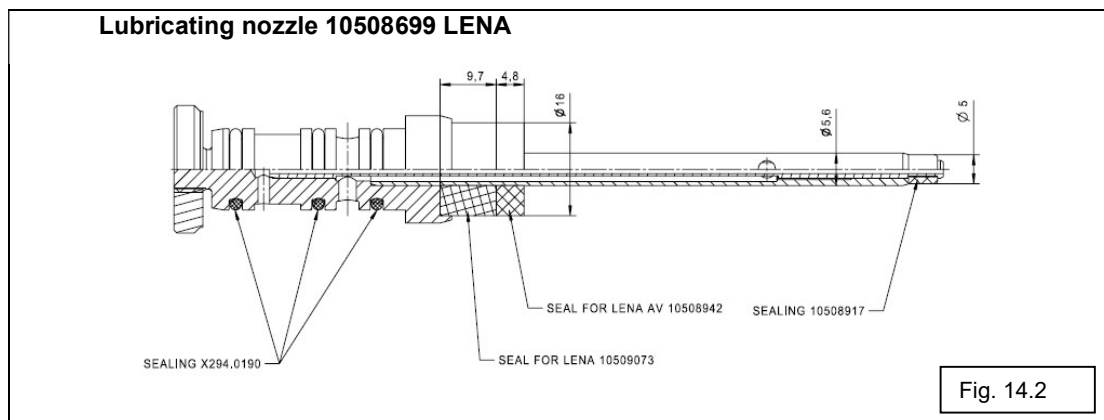
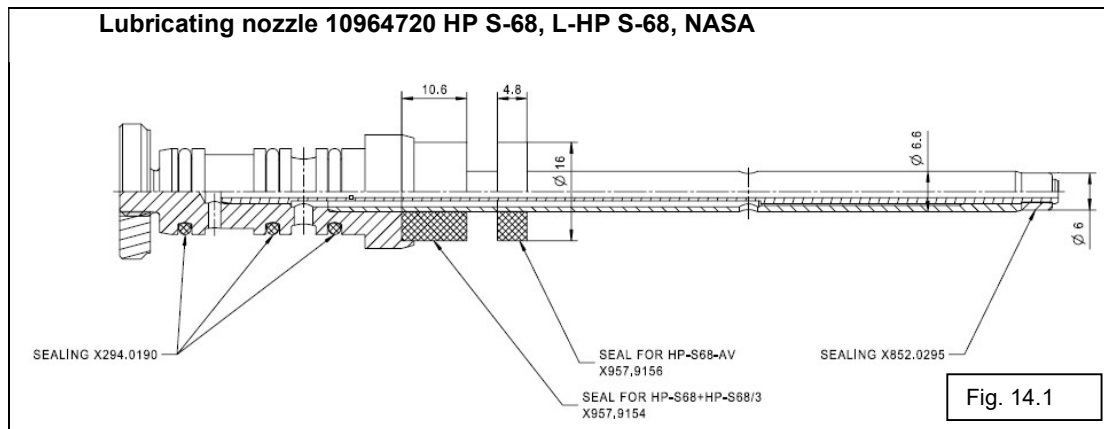
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Appendix 1: Spare parts delivered with Lubrico 15

| Accessory | No. : |
|--|--|
| Lubrication dip stick for Novibra spindles of HPS68 family | X850.3877 |
| Lubrication dip stick for Novibra LENA spindle | 10756365 |
| Spare set of rubber sealing spacers for Novibra lubricating nozzles HPS 68 - see, Fig.10.7, page 9 or Fig. 14.1 bellow | X957.9154 hook; 10,6mm X957.9156 internal lock; 4,8mm |
| Spare set of rubber sealing spacers for Novibra lubricating nozzles LENA - see, Fig. 10.7, page 9 or Fig. 14.2 bellow | 10509073 hook; 9,7mm 10508942 internal lock; 4,8mm |
| Spare set of rubber sealing of the tip of Novibra lubricating nozzle HPS 68 – see Fig.14.1 | X852.0295 |
| Spare set of rubber sealing of the tip of Novibra lubricating nozzle LENA – see Fig.14.2 | 10508917 |
| Spare set of rubber sealings for Lubricating gun (O-ring 4x1) – see Fig. 13.6, page 15 | 11107854 |
| Spare set of rubber for Novibra lubricating nozzles HPS 68 and LENA (O-ring 10x2mm) – see Fig. 13.6, page 15 | X294.0190 |
| Spare Fresh oil filter – see Fig. 10.4, page 9 | 11028851 |

Appendix 2: Suitable lubrication nozzles

| Spindle type | Lubricating nozzle No.: |
|--|-------------------------|
| Novibra L HPS 68 HPS 68 NASA HPS 68 ; Fig 14.1 | 10964720 |
| Novibra LENA ; Fig 14.2 | 10508699 |



Appendix 3: Spare parts upon order

| Part | Part Picture (Page / Fig. No.) : | Part No. : |
|--|--------------------------------------|-----------------------------------|
| Handrail | Page 4 / Fig. 1.1 | 11017346 |
| Battery charger | Page 8 / Fig. 9.4 | 11141986 |
| Power cable for battery charger EU-CEE 7/16-(C) | - | 11141074 |
| Power cable for battery charger USA-NEMA 5-15-(B) | - | 11146638 |
| Container hose coupling: - coupling new oil - coupling used oil | Page 4 / Fig. 2.3, Fig. 2.7 | 11284647 11284673 |
| Front operating panel incl. electronics | Page 5 / Fig. 8.1 | 11017738 |
| Steering rollers: - with security locks: - without security locks: | Page 4 / Fig. 1.10 | 11017858 11017535 |
| Plastic box for spare parts | Page 4 / Fig. 2.1, see Appendix 1 | 11146777 |
| 12V main battery | Page 4 / Fig. 2.2 | 11141073 |
| Container for used oil with float switch coupling | Page 4 / Fig. 2.4 | 11018021 |
| Container for clean oil with float switch coupling | Page 4 / Fig. 2.5 | 11018025 |
| Security nut of lubricating nozzle | Page 4 / Fig. 3.1 | X957.8713 |
| Lubricating nozzle with spacers | Page 4 / Fig. 3.3, see Appendix 2 | 10964720 10508699 |
| Lubricating gun (incl. trigger sensor) | Page 4 / Fig. 1.2 | 11065702 |
| Trigger sensor and its cabling for lubri.gun | Page 4 / Fig. 3.6 | 11019466 |
| Oil pipe couplings for lubri.gun | Page 4 / Fig. 3.5 | 11108848 –1/4” 11108889 – 1/8” |
| Oil Pump 12V | - | 11018231 |