LAVINA by SUPERABRASIVE

ELITE SERIES

LAVINA ELITE L20NEB

User Manual

Tech Support Line: 800-987-8403 | www.superabrasive.com | info@superabrasive.us

Warranty Registration Card

Complete and submit this form within 30 days from the date of purchase. The registration is invalid without the machine serial number.

Section 1: Customer Information

Customer name

Address | City | State and Zip Code

Phone # | Email

Section 2: Machine Information

LAVINA model | Serial #

Purchase Date | Purchased From (distributor, dealer)

Email: warranty@superabrasive.us / Fax: 706-658-0357
Superabrasive Inc., 9411 Jackson Trail Rd, Hoschton, GA 30548

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WARRANTY AND RETURNS

WARRANTY POLICY FOR LAVINA® NEB MACHINES

A warranty card must be submitted to Superabrasive within 30 days of purchase in order for the foregoing warranty to apply.

You can either mail a hard copy of the warranty card or submit it electronically - see page 2.

Superabrasive warrants, from the time of delivery and receipt by the original customer, new and unused products sold by Superabrasive or Superabrasive-appointed distributors or dealers. Goods shall be free from defects in materials and workmanship. Superabrasive or a Superabrasive-appointed repair facility shall either replace or repair any defects in the Goods resulting from faulty design, materials, or workmanship. Products repaired or replaced during the warranty period shall be covered by the foregoing warranty for the remainder of the original warranty period, or ninety (90) days from date of the repair or shipment of the replacement, whichever is longer. Spare parts for repair will be either new or equivalent to new.

Warranty period shall be 2 years from the time of delivery and receipt by the original customer, or 600 operating hours on the machine - whichever occurs first. Superabrasive will cover the shipping charges for the transportation of the machine to Superabrasive (or an approved repair facility) and back to the customer (within the contiguous 48 United States) in the event that the damage occurs and is reported within 200 operating hours. Shipping charges, if covered by Superabrasive, must be agreed upon in advance and approved by Superabrasive. Thereafter, the customer will have to cover the shipping charges to Superabrasive and back. Superabrasive will not warranty Goods after a period of 2 years from the time of delivery and receipt by the original customer, or 600 operating hours on the machine - whichever occurs first.

Superabrasive shall not be liable for any defects that are caused by circumstances that occur after the Goods have been delivered and whilst the Goods are in the possession of the purchaser. Furthermore, the warranty does not include normal wear and tear or deterioration. Wear parts are not warranted. Superabrasive is not liable for defects arising out of use of non-OEM parts.

The Warranty is void if the purchaser has not followed the maintenance plan stipulated by the machine's manual and warranty card. The warranty is void if the purchaser repairs said Goods himself, or if repairs are conducted by a repair facility that is not approved by Superabrasive. Superabrasive's liability does not cover defects which are caused by faulty maintenance, incorrect operation, faulty repair by the purchaser, or by alterations conducted without Superabrasive's prior written consent. The same applies to any alterations of the Goods or services performed by another party other than Superabrasive, a Superabrasive-appointed distributor, or a Superabrasive-approved repair facility. The warranty is not applicable on a defect that arises due to tools or parts that are not original to Superabrasive. Replaced defective parts shall be placed at Superabrasive's disposal and shall become property of Superabrasive. If such defective parts are replaced within the warranty period, the shipping charges will be covered by Superabrasive. In warranty complaint cases, when no defects are found for which Superabrasive is liable, Superabrasive shall be entitled to compensation for the labor, material cost, and shipping charges, incurred by Superabrasive as as a result of the complaint.

The warranty herein is non-transferable, and only applies to the original owner or purchaser of the machine.

RETURN POLICY FOR LAVINA® NEB MACHINES

The Lavina® ELITE machines may be returned, subject to the following terms:

In no case, a machine is to be returned to Superabrasive Inc. for credit or repair without prior authorization. Please contact Superabrasive Inc. or your local distributor for an authorization and issuance of a return authorization number. This number along with the serial number of the machine must be included on all packages and correspondence. Machines returned without prior authorization will remain property of the sender and Superabrasive Inc. will not be responsible for them. No machines will be credited after 90 days from the date of invoice.

All returns must be shipped freight prepaid. Returned machines may be exchanged for other equipment or parts of equal dollar value. If machines are not exchanged, they are subject to a fifteen percent (15%) restocking fee.

1. GENERAL INFORMATION

This owner's manual is intended for the operator of the **LAVINA® NEB** machine, the servicing technician as well as for anyone involved with operating or servicing the machine. We recommend that you read the instructions very carefully and follow them strictly. The manual includes information about assembling, using, handling, adjusting and maintaining your **LAVINA® NEB** floor grinding and polishing machine.

1.1 MANUFACTURER

Superabrasive was founded in 1987, as a manufacturer of high quality diamond tools for the stone and concrete industry. Today, Superabrasive is one of the world's leading companies in the production of diamond tools and floor grinding machinery. At Superabrasive, we strive to deliver the very best solutions to our customers, and enable them to work more efficiently.

1.2 GENERAL DESCRIPTION

The **LAVINA® NEB** machine is intended for grinding, polishing and buffing concrete, marble, granite, limestone and terrazzo surfaces with diamond tools. Additionally, the machine could be used for grinding wood floor surfaces.
The **LAVINA® NEB** machine is a three-disc machine, which can be used wet or dry.
For best results, use only tools manufactured or recommended by Superabrasive and its distributors.

⚠ WARNING

The LAVINA® NEB machine is manufactured and fitted for the above-mentioned applications only! Every other use may possess risks to the persons involved.

1.3 ENVIRONMENTAL CONDITIONS

The temperature range for operating the **LAVINA® NEB** machine outdoors is between 41°F and 86°F or 5°C and 30°C. Never use the **LAVINA® NEB** machine during rain or snow when working outdoors. When working indoors, always operate the machine in well- ventilated areas.

1.4 VACUUM CONNECTION

A connection for a vacuum dust extractor is located on the carriage. The **LAVINA® NEB** machine does not include a vacuum dust extractor. The customer must purchase the vacuum dust extractor separately. The vacuum dust extractor must be adapted for floor grinders and have a minimum air displacement of 310m3/h with a negative vacuum of 21 kPa.

1.5 LAVINA® 20NEB MAIN COMPONENTS

The Lavina® ELITE machine is made of two main component sections:

1.5.1 Carriage which contains:

- **Handle - the handle** on the frame is adjustable in height and allows the operator to work in a correct and safe posture (see point 3. Handling and transportation).
- **LED lights - the LED lights** (Fig.1.1; Fig.1.2) enables the operator to work in darker areas. Existing lighting system does not replace adequate overhead lighting.
- **The control panel** (fig.1.3) is positioned on top of the frame and contains buttons and switches for start/stop the machine also for the , lights, RPMs control switch, hour meter unit, EMG button and the USB port for charging your phone.
- **The water tank** is on the opposite side of the frame, so that the weight of the water does not affect the operation of the machine. The frame weight, on the other hand, is fully absorbed by the driving wheels..
- **Power box**

1.5.2 Machine head which contains:

- **The Electric motor -** its mounted on the base plate and it is driving the three heads with a belt system.
- **The planetary motion -** it derives from the main engine, driven by a simplex roller chain.
- **The self-leveling Guard** is designed to have contact with the surface. Anytime, no matter the height of the tool used.

- **"Quickchange" tool holder** is designed to hold the tools with "Quickchange"connection (All of our new tools use the "Quickchange" connection and there is no more foam holders).

Figure 1.1

Figure 1.2

Figure 1.3

1.6 TECHNICAL DATA

	Lavina® 20NEB	
Voltage/Hz	1 or3 ph x 200-240V 50-60Hz	
Amperage	Max 30 Amps	
Power	5.5 kW	7.5 HP
Tool holder rpm	400-1100 rpm	
Direction off rotation	The heads have clockwise / right rotation	
Working width	510mm	20"
Tool diameter (QC Plate)	3x 225 mm	3x 9"
Weight	265 kg	584 lbs
Grinding pressure Weights upward	85 kg	187 lbs
Grinding pressure Weights downward	130 kg	287 lbs
Application	wet and dry	
Vacuum hose port	Cam lock E250 or hose 2"	
Water tank capacity	20 l	5.2 gal
Water feed	**Peripheral**	
Cable length	17.4 m	57 ft
Machine LxWxH	1709x557x1195 mm	67.3x21.9x47"
Packing LxWxH Crate 1	1390x710x1400 mm	54.7x28.5x55.1"

1.7 VIBRATIONS

The vibrations of the machine are within the limits of directives and harmonized standards from the European Union when the
Lavina® NEB is operated with the recommended tools and in normal conditions.

SONOROUS EMISSIONS

The sonorous emissions are within the limits of directives and harmonized standards from the European Union when the Lavina® NEB is operated with the recommended tools and in normal conditions. However, as previously stated, the operator must wear ear protectors.

LABEL DATA

The data on the label provides the correct Voltage and kW (needed for operational purposes);
Weight (needed for transportation purposes); production year and serial number (needed for maintenance purposes).

CUSTOMER SERVICE

For customer assistance and technical support call your local distributor or call Superabrasive Inc. at
1-800-987-8403 or visit us at: www.superabrasive.com , where you can download a copy of this manual.

2. SAFETY INSTRUCTIONS RECOMMENDED USE

The Lavina® NEB machine is
designed and manufactured to grind and polish concrete, terrazzo, and natural stone floors. It can be used for renovations as well as for polishing. The machine is designed for dry or wet use. When using it dry, use a vacuum of appropriate size. For more information, please refer to the chapter on handling the
vacuum connection.

2.1 PROHIBITED USE ⚠ WARNING

The machine MUST NOT be used:

For applications different from the ones stated in the General
Description chapter.
For not-suitable materials.
In environments which: Possess risks of explosion
Possess high concentration of powders or oil substances in the air
Possess risks of fire
Feature inclement conditions. Possess electromagnetic radiation.

2.2 PREPARATION FOR WORK ⚠ WARNING

Make sure that You have closed
the work area, so that no person unfamiliar with operating the machine can enter the area. The tool plate and tools are adjusted to the machine properly. There are no missing parts of the machine.
The machine is in upright working position. The protection devices are working properly. The electrical cable is free move and follow the machine easily. In order to keep the electrical cable from being
damaged, no vehicle should cross the zone where electrical cables are situated.

2.3 PROTECTION DEVICES ⚠ WARNING

The machine is equipped with several protection devices including the following:
An emergency stop button
A protection skirt and hood for protecting the tool plates.
These devices protect the operator and/or other persons from potential injuries. Do not remove them. On contrary, before using the machine, please ensure that all protection devices are mounted and function properly. The Security plate prevents the QuickChange pads from loosening during use.

2.4 ARREST FUNCTIONS ⚠ WARNING

Functions of arresting the machine are following: Button to stop the motor (category 1)
Emergency button (category 1)

2.5 SAFE USE ⚠ WARNING

The Lavina® NEB is designed to
eliminate all risks correlated with its use. However, it is not possible to eliminate the risks of an eventual accident with the machine. Unskilled or uninstructed operator may cause correlated residual risks. Such risks are:
Position Risks due to operator's incorrect working position Tangling up Risks due to wearing inappropriate working clothes Training Risks due to lack of operational training
NOTE: In order to reduce all consequences of the above- mentioned risks, we advise that machine operators follow the instructions in the manual at all times.

2.6 RESIDUAL RISKS ⚠ WARNING

During the normal operating
and maintenance cycles, the operator is exposed to few residual risks, which cannot be eliminated due to the nature of the operations.

2.7 BEFORE YOU BEGIN ⚠ WARNING

Working area must be clear
from any debris or objects.
A first-time operator must always read the manual and pay attention to all safety instructions.
All electric connections and cables must be inspected for
potential damages.
Ground wire system of the power supply must be also inspected. Perform general daily inspections of the machine and inspect the machine before each use.
Always inspect the safety devices: Mount the Security plate for the Quickchange pads.
The emergency break must be clear and working
The tool protector must be working
The machine must be clean
Never operate the machine in the rain!
Confirm that there are no missing parts especially after
transportation, repair, or maintenance.
Before filling the water tank with water make sure the machine is not working and the main switch is turned off.
Before turning on the machine make sure that the base is placed on the floor, the machine MUST NOT be in an upright position when turned on!

2.8 OPERATING MACHINE ⚠ WARNING

When operating the Lavina® NEB, make certain that there is no one, but you around the machine.
Never leave the machine unattended while working.
The electrical cable must move freely and must be damage-free.
The water hose must move freely and must be damage-free.
Check the floor you will work on to make sure it is not too uneven. If this is the case, it may damage the machine.

2.9 AFTER WORK IS COMPLETED ⚠ WARNING

Clean the machine and its
surroundings properly
Empty and clean the water tank
Unplug the machine and wind up the electrical cable
Store the machine in a safe place

2.10 THE WORK AREA ⚠ WARNING

Make certain that people or
vehicles do not enter the work area.
Avoid cables and hoses being in the way. Always check the floor for debris

2.11 PERSONAL PROTECTION EQUIPMENT (PPE) ⚠ WARNING

Always wear safety shoes when working with the machine. Always wear ear protectors
when working with the machine.
All personnel in the immediate work area must wear safety glasses with side shields.
Always wear safety gloves when changing the tools. Always wear clothes suitable for the work environment.

2.12 OPERATOR

⚠ WARNING

The LAVINA® NEB machine.
The operator must know the machine's work environment. Only one operator at a time can work with the machine. The operator must be properly trained and well instructed prior operating the machine.
The operator must understand all the instructions in this manual.
The operator must understand and interpret all the drawings
and designs in manual.
The operator must know all sanitation and safety regulations pertaining to the operation of the machine.
The operator must have floor grinding experience.
The operator must know what to do in case of emergency.
The operator must have an adequate technical knowledge and preparation.

3. HANDLING AND TRANSPORTATION

3.1 ADJUSTING THE HANDLE

The Handle on the frame is adjustable in height and allows the operator to work in a correct and safe posture (Fig. 3.1, Fig. 3.2, Fig. 3.3, and Fig.3.5). Choose the upright position to move easy the machine.

Figure 3.2

Figure 3.3

Figure 3.4

3.2 TURNING THE MACHINE FROM WORKING TO TOOL MOUNTING POSITION

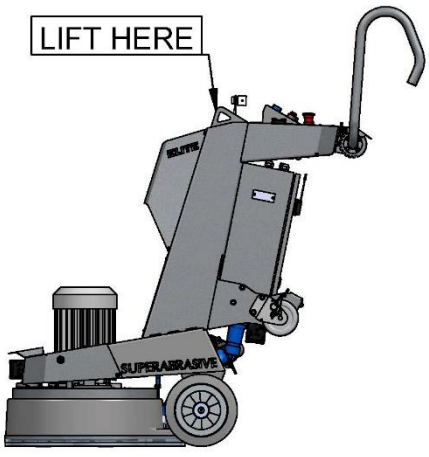


Figure 3.5

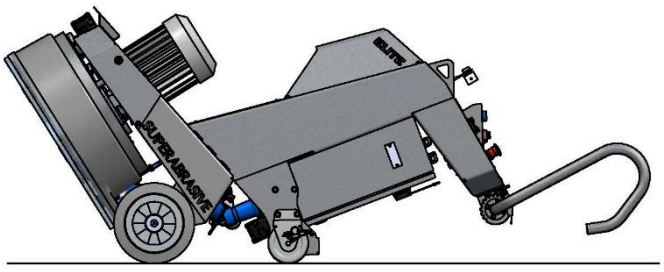


Figure 3.6

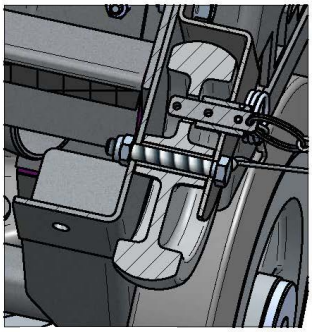


Figure 3.7

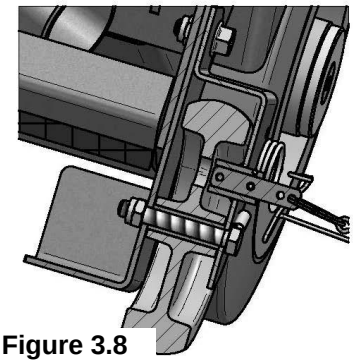


Figure 3.8

Put the handles of the carriage as shown on (Fig. 3.5). **Ensure** that the water tank is empty before flipping the machine. Push the handles and flip in position shown on (Fig. 3.6). If necessary, help by placing your foot on the heel near the control box. **Always keep both rear wheels locked (Fig. 3.7)**. Unlock the wheels (Fig. 3.8) only when you wish to move the machine.

3.3 LIFTING

Lifting the machine by crane is possible by using the handles of the carriage (see fig. 3.5 and fig. 3.6).Do not lift any other loads on the machine. Always use hoisting equipment rated for 300 kg (660 lbs) or greater.

3.4 STORAGE

Always store the Lavina® NEB machine in a dry place. Never transport the Lavina® NEB machine unprotected; it may be damaged if transported unprotected and exposed to rain or snow.

⚠ WARNING

When the machine is in storage and the temperature may fall down to or below 32F (or 0° C). You should empty the water from the system:

- Leave open internal and external valves to drain water

4. OPERATION

4.1 PRELIMINARY CONTROLS

Inspect the working area as explained in the safety instructions. Fill in the water tank for wet use or connect the vacuum extractor and ensure that the vacuum hose is clear and it will follow the machine easily.
Make sure that the electrical motor is connected with the power box and then you can connect the power cable with the electricity and start the machine.

4.2 WATER FLOW CONTROL SYSTEM

The water system is designed to supply water directly on the tools. The water supply is coming either from the tank or from external water source:

- water supply from the tank:

  Put the internal water valve into position „ON" (along the axis of the machine) Figure 4.2 and close the external valve Figure 4.3, so the water could flow from the tank through the internal valve over the tools.

  You can adjust the water flow by putting the internal valve in an intermediate position.

- external water supply:

  Put the internal water valve into position „OFF" Figure 4.1 and open

  The external valve Figure 4.4, so the water could flow through the external valve over the tools.

  You can adjust the water flow by putting the external valve in an intermediate position.

ALWAYS USE CLEAN WATER TO PROTECT THE SYSTEM FROM DIRT.

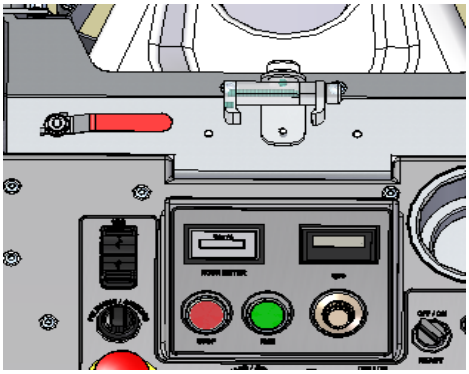


Figure 4.1

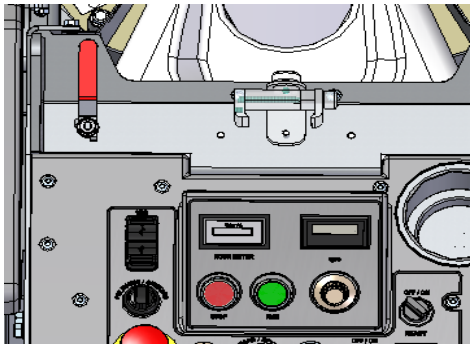


Figure 4.2

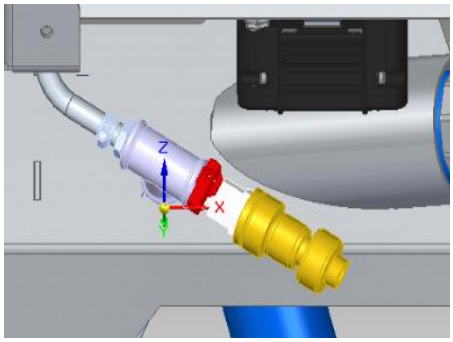


Figure 4.3

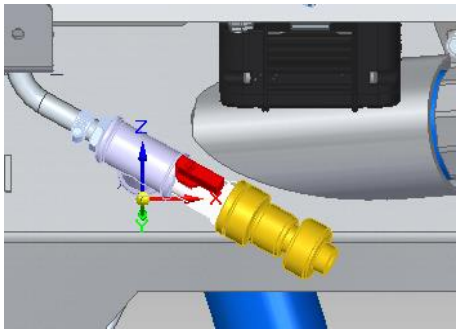


Figure 4.4

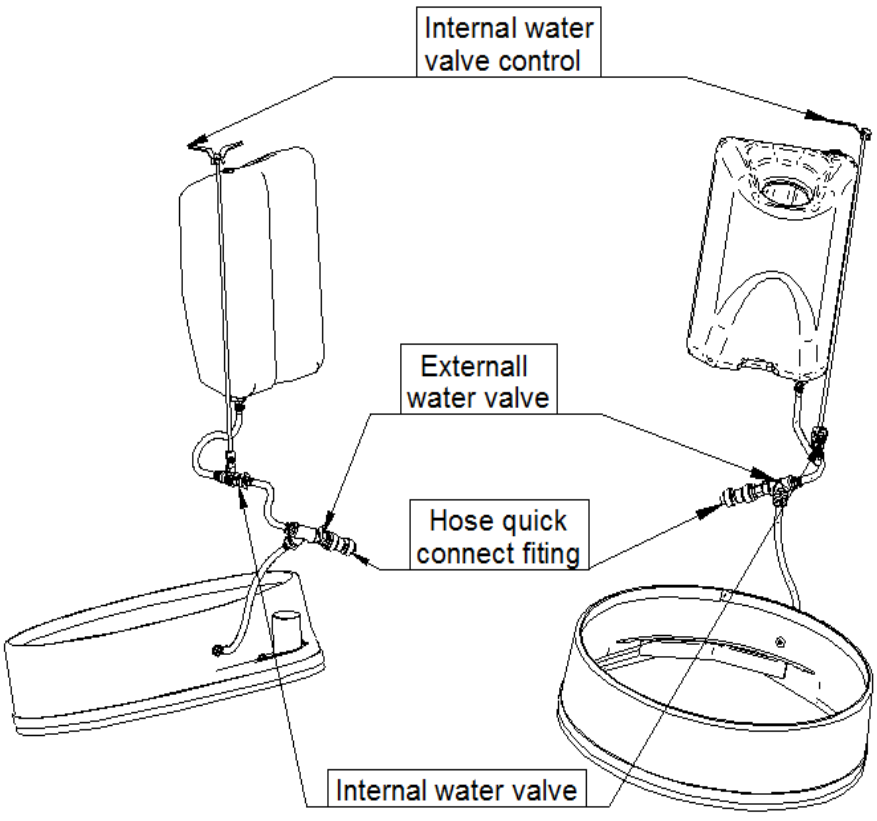


Figure 4.5

4.3 ADJUSTING AND MOUNTING TOOLS

Lavina 20NEB uses tool holder A63. With this new holder every one of our tools uses the "Quickchange" connection. To change the tools you need first to unlock the butterfly (fig 4.6 in blue) by using the key we provide you (you can see it in the pictures fig. 4.7) remove the security plate (fig 4.6 in red) then load the tools you want and insert the security plate again so the tools cannot go backwards, rotate and lock the butterfly (as shown in fig.4.7). As you can see in fig. 4.6, for some of the new tools you need to remove the security plate as they don't need locking system at all but for the others always make sure that the tools are securely locked.

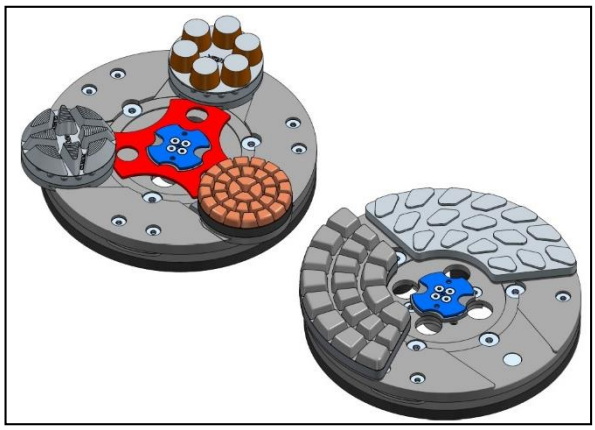


Figure 4.6

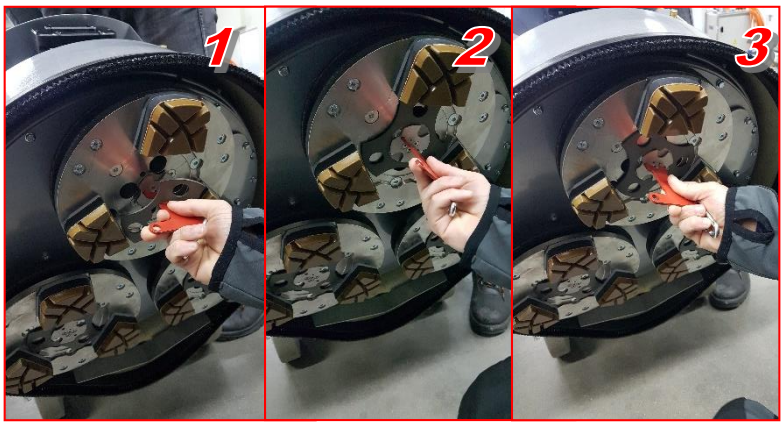


Figure 4.7

In Lavina 20NEB the holder is initially mounted with 3 buffers.

Mount the tools only after ensuring that there is enough diamond bond material left. Be sure that the plates are always clean before mounting.

WARNING: Always secure the Quick Change tools with the butterfly (Fig.4.6 in blue), lock with the tool holder key (Fig.4.7) and make sure that the butterfly is securely locked and it holds the security plate not to fall off.

4.4 VACUUM CONNECTION

To connect a vacuum cleaner, the Lavina 20NEB is supplied with vacuum hose Cam Lock inlet C250 / vacuum hose diam. 2, 5 in (63mm) (Fig.4.8). You can also dismount the Cam Lock adaptor and connect a hose with outside diam. 2in.

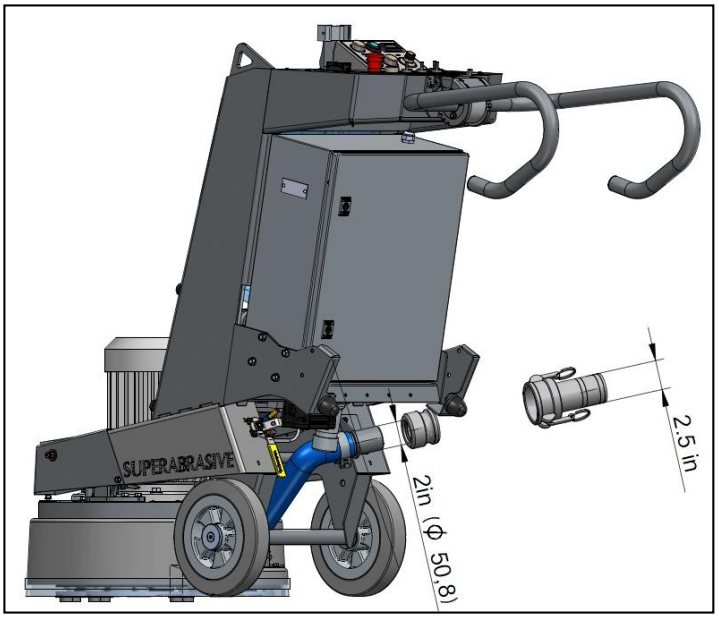


Figure 4.8

4.5 CONTROL BOARD

1. Hour Meter

2. USB charger.

3. EMERGENCY button used to stop the motor in case of emergency.

4. POWER glowing button - it glows when the machine is connected to the electricity.

5. Forward/Reverse switch. Select forward for clockwise rotation of the grinding plates or reverse for counterclockwise rotation of the grinding plates (recommended configuration). The preferred operating direction should be when the switch is in the forward position. The proper direction of rotation of the motor (counterclockwise) is indicated by an arrow on its cover.

6. ALARM/Reset button resets the alarm of the inverter**.** **Button** lights blue when the inverter goes into alarm mode.

7. LED lights switch

8. QR code. When you scan it with your phone for example, it will redirect your browser to Lavina manuals page.

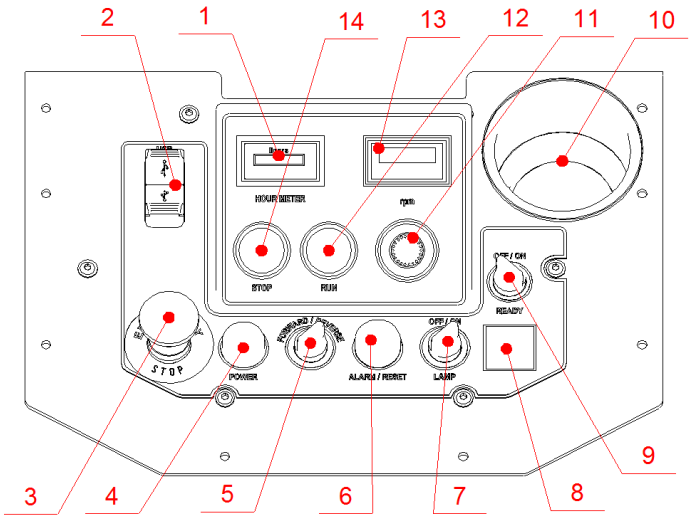


Figure 4.9

9. READY ON / OFF switch. If you want to start the motor it must be ON as it puts the inventor into standby mode (it glows when it's turned ON). If it's off the inventor will be out of standby mode and you cannot start the motor. The switch returns to its starting position after being released.

10. Cup holder.

11. Potentiometer. Controls the RPM of the grinding plates in a range of 300-1100 rpm.

12. RUN button. Start the motor (ready ON/OFF switch must be ON).

13. Digital Tachometer. Indicates the revolution per minute of the grinding plates (not the revolution per minute of the entire unit).

14. STOP button which stops the motor**.**

4.6 STARTING THE MACHINE

First, follow the directions in the chapter on Safety Devices and Safety Instructions. Next, release the **emergency stop (3),** turn the **Ready switch (9)** to the ON position to put the machine in standby mode. Check the **potentiometer (11)**, and ensure that it is set to the working speed. If you are working wet, add water to the floor surface . If you are working dry make sure your machine is connected to the vacuum unit. Finally, hold the machine firmly and push the **RUN button (12)**.

4.7 OPERATING THE MACHINE

Guide the machine in straight lines across the floor, slightly overlapping the previously completed surface with each new line. Work at a constant speed, allowing the tools time to work at a speed appropriate for the tools' grit size. Avoid vibrations. Do not stop the machine while tools are still running as they will mark the surface of the floor. When working wet, select the destination of the water feed with the water tap (fig. 4.2) When working dry, check the floor surface periodically for dust accumulation. Check regularly to see if you're vacuum works properly.

4.8 STOPPING THE MACHINE

The stopping of the machine must be done gradually until the motor stops. Do not stop moving the machine before the motor comes to rest, as the tools could damage the surface.

To stop the machine:

1.Push the STOP button (14) .

2.Turn the **ON/OFF** (9) switch in position OFF, this will cut the voltage to the invertor and the green light will turn off.

5. TOOLS AND ACCESSORIES

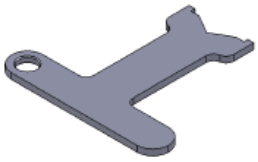


Figure 5.1

Tool holder key

The tool holder key (Fig. 5.1) is used for adjusting, mounting and dismounting of the foam plates. Always use the key for mounting.
Item number is A03.00.00.00

Figure 5.2

Security plate for Quickchange pads

Plate (Fig.5.2) used to ensure the “Quickchange” tools.
Item number is A63.00.01

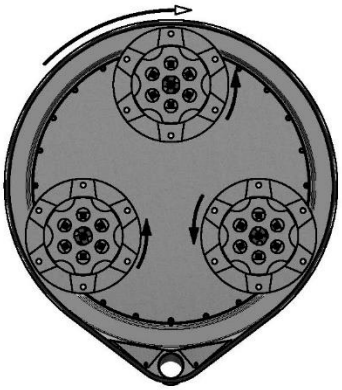
Figure 5.3

Security plate for RING TOOLS

Plate (Fig.5.3) used to ensure the “Ring” tools.
Item number is A85.00.00

6. POPULAR TOOLS

The heads have counter-clockwise / left rotation. Use the blue PCDs and Carbide Scrapers



RECOMMENDED TOOLS

QuickChange System and Tooling feature extremely fast and convenient tool changes, and a long tool life, providing for great long-term cost savings. The QuickChange pads are produced in four different bonds for super hard, hard, medium and soft concrete, in a variety of grit sizes. They are offered with 1 or 2 buttons or rectangular segments, which allows you to customize the aggressiveness of the cut.

CORSA HYBRID DISCS WITH QUICK CHANGE ATTACHMENT (WET OR DRY) : The new Corsa hybrid discs are designed for scratch removal and transitioning from metal to resin tools, and are similar to Calibra but the ceramic bond has been modified for more efficient use on soft and medium concrete.

NATO® WITH QUICK CHANGE ATTACHMENT

Superabrasive's Nato resin pucks are a great tool choice for soft and hard concrete polishing applications. Among the thickest diamond pads on the market - featuring a thick 12mm layer of resin and diamonds for extra long life. Wide channels and a unique patented design allow for work on a cleaner surface, ensuring a quality polish. Offered in wet and dry bond.

V-HARR® Premium Polishing Pads for 9-inch TOOL HOLDERS
NOW AVAILABLE IN A QUICK CHANGE STYLE - NO FOAM PLATES NEEDED

V-Harr felt diamond pads are one of Superabrasive's most versatile and successful diamond tools for concrete polishing. V-Harr pads are also ideal for polishing terrazzo and hard stone floors. V-Harr polishing pads should be used DRY on concrete! However, they will produce remarkable gloss results on black granite when used wet.

Hybrid and resin tool rings

Exceptional flexibility with a thick layer of flexible foam.
Quick and easy magnetic attachment directly to the grinding heads.
Offered in 9" and 13" – compatible with lavina grinders and trowels.

Use Only Superabrasive's Recommended Tools. For More Tooling Options, Visit www.superabrasive.com

7. MAINTENANCE AND INSPECTION

7.1 CLEANING

Keep your machine clean. Cleaning the machine on a regular basis will help detect and solve potential problems before they cause damage to the machine. Most importantly, check and clean the tool plate connections, vacuum hoses, water tank and the Propane installation.

7.2 CHECK HOURLY

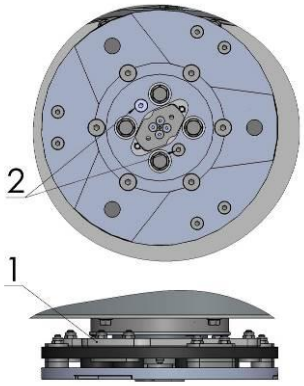


Figure 7.1

7.3 CHECK DAILY

After operating the Lavina® NEB machine, the operator should conduct a visual inspection of the machine. Any defect should be solved immediately. Pay attention to power cords, plugs and vacuum hoses, loose bolt or screws.

Tool holders: Buffers and elastic element are consumables and must be visually checked daily and replaced if needed. See that flanges or discs are mounted and locked well in place. The key lock holders (butterflies) should be also checked.

Check the rubber buffers and fixing of the holders. The flange holding the buffers (Fig.7.1_1) has to be firmly fixed to the unit. A gap seen there means that there are loose screws fixing the holder. The screws have to be tightened immediately for safe operation. Working with loose screws on the holder could also cause bad damages on the machine. Tightening force of the screws has to be 22...25N.m(16...18 ft/lbs).

It is very important to regularly check the screws (Fig.7.1_2) that fix the “Quickchange” holder to the safety part, so that the holder will not fly away if the buffers get damaged. “Quickchange” should be clean.

7.4 CHECK AND REPLACE AFTER THE FIRST 15 WORKING HOURS

Check the belt tension after 15 hours working with the machine.

The bottom cover has a control cover (Fig.7.2) that allows fast and easy control and correction of the belt. It is recommended to check the tension of the belt after the first 15 hours and to tighten if necessary. For the correct tension, see TROUBLESHOOTING “mounting the belt”. Every time you open the control cover, mount back all the screws.

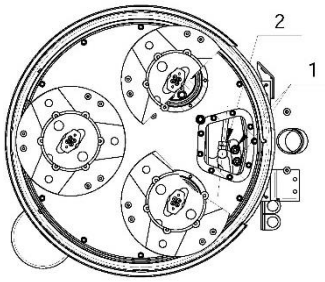


Figure 7.2

7.5 CHECK AND REPLACE EVERY 200 WORKING HOURS

Every 200 working hours the operator should inspect all parts of the machine carefully. Most importantly, inspect and clean the tool plate connections, vacuum hoses and water tank. Also, check the water flow. Check the guard assembly. Make certain the wheels are clean and rotate properly. Inspect the control buttons. If there are defective control parts, they should be replaced immediately. Replace worn vacuum- and water hoses.

Carefully inspect the seal rings and bearings of the grinding units, and replace any showing signs of excessive wear. For more information, refer to chapter troubleshooting below.

Open the service cover on the motor base (Fig 7.2) (Fig 7.3) to check of the planetary chain. Lubricate the chain with special lubricant for chains and correct the sag if needed. For sagging correction (See TROUBLESHOOTING).

Dismount the tool holders (See Troubleshooting) replace all parts (elastic element, buffers, and sealers) with the slightest damage or consume. **Return** machine to **authorized service center** for overall checkup of the Engine. For Propane safety, have the machine serviced by a **Certified Technician**, including emission check.

Figure 7.3

7.6 CHECK AND REPLACE EVERY 400 WORKING HOURS

Besides the checks of 200 working hours, replace sealer and V-rings like described in chapter “TROUBLESHOOTING REPLACING BELT AND PULLEY UNITS. Check if belts and bearings are in good condition, change if needed.

Return machine to authorized service center for overall checkup of the Engine. For Propane safety, have the machine serviced by a Certified Technician, including emission check.

7.7 VACUUM

As stated previously, frequently check hoses and othe r parts for clogging.

7.8 WATER LEAKS

Replace any leaking parts immediately as the water could damage your machine

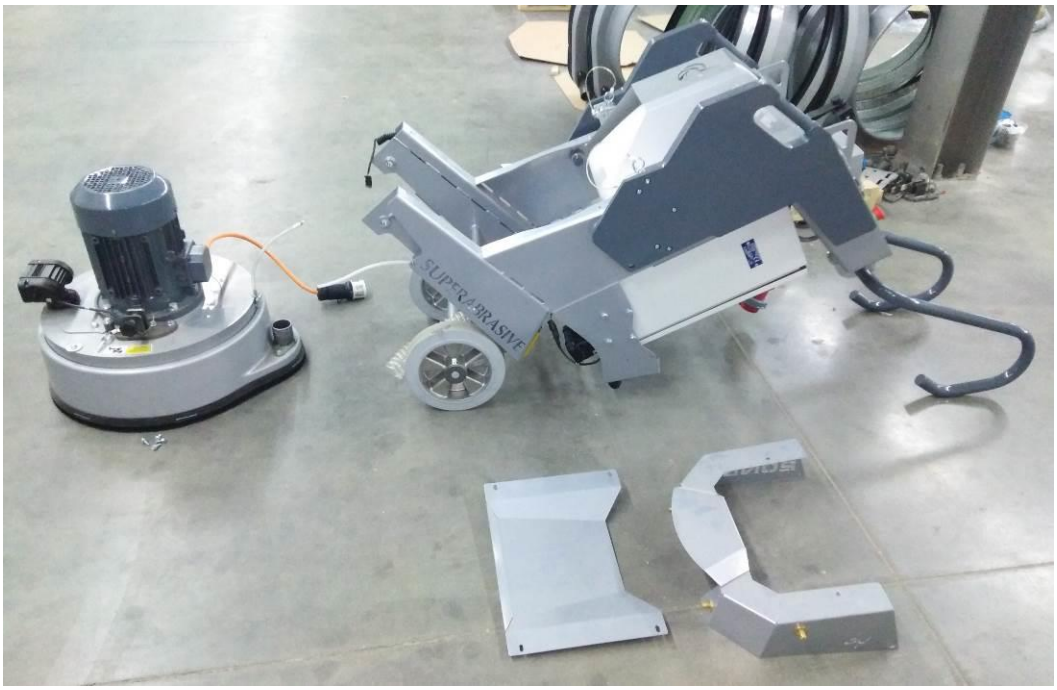
7.9 MECHANICAL PARTS

Parts such as the belts, seal rings, cap rings, spiders and buffers and guard assembly are subject to wear and should be replaced as needed.

OPERATION	INTERVAL		
	Daily	Every 200 Hrs.	Every 400 Hrs.
Inspect power cords, plugs and vacuum hoses, loose bolt or screws.	X		
Check the rubber buffers, elastic element and fixing of the holders	X		
Inspect and clean the tool plate connections		X	
Inspect and clean water tank.		X	X
Inspect the seal rings and bearings of the grinding units		X	
Check the planetary chain and lubricate		X	X
Replace Felt-Ring and V-rings			X
Check belts and bearings			X

8. TROUBLESHOOTING

8.1 SEPARATING THE HEAD FROM THE CARRIAGE



1. Unscrew the four bolts to remove the panel fig. 8.2-1.
2. Disconnect the flexible hose supplying water under the cover of the machine fig. 8.2-2.
3. Disconnect the cable of lamp and remove the lamp fig. 8.2-3.
4. Unscrew the four bolts to remove the cover fig. 8.2-4.
5. Disconnect the engine cable from the power box fig. 8.2-5.
6. Release the clamp and remove the suction hose from the head fig. 8.2-6.
7. Make sure everything is disconnected fig. 8.2-7.

8. **For separating the carriage from the head you need to be two people** – one to hold the carriage while the other removes the pins fig 8.2-8. After the pins are removed the person which is holding the carriage should carefully place it on the ground without harming it fig. 8.1.

Figure 8.2

8.2 DISMOUNTING/MOUNTING THE GUARD

You can dismount and mount the safe guard without separating the carriage from the main head. Put the machine in position to change the tools. Unscrew the four bolts M5 from the metal cover preventing the safe guard to fall. Dismount one of the three holders. Dismount the safe guard.

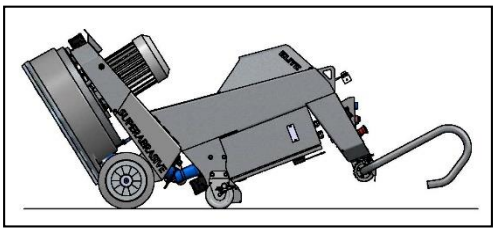


Figure 8.3

Figure 8.4

8.3 REPLACING POWER CORD AND PLUGS

When replacing the power cord or plugs, always use cords and plugs with specifications as the original ones.

Never use lower quality or different type cord and plugs.

In addition, take into consideration the distance of the appliance from the electrical source. The greater the distance, the greater the resistance and the less current that will be available at the other end; there will be a voltage drop and the inverter will sign alarm mode. This can also happen if several machines are working on the same line or when the generator is underrated. In general our standard power cable can be doubled in length; if longer lengths are needed you have to replace all the cables with bigger gage rated cables for the length and amperage.

8.4 DISMOUNTING TOOL HOLDER TO CHANGE V-RINGS AND FELT-RINGS

Figure 8.5.1

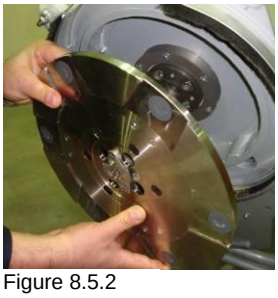


Figure 8.5.2

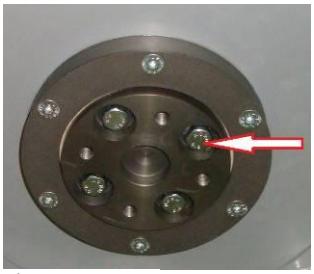


Figure 8.5.3

Figure 8.5.4

Figure 8.5.5

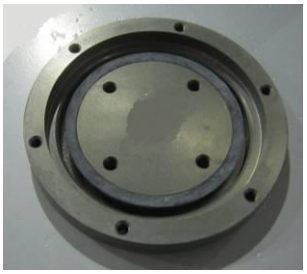


Figure 8.5.6

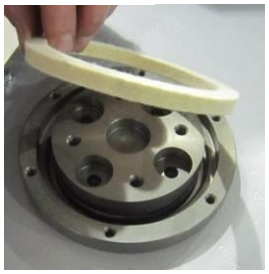


Figure 8.5.7

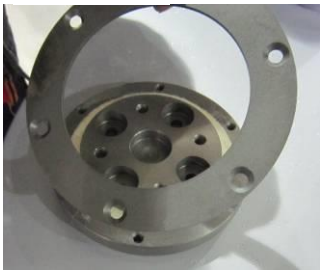


Figure 8.5.8

To check or replace the buffers and the elastic elements, the tool holders have to be dismounted.

You will need a 13mm deep metric socket with an outside diameter of no more than 3/4in to unscrew the four bolts (Fig.8.5.1) and remove the holder (Fig.8.5.2) When the tool holder is dismounted, you can change the sealers (V-Ring and Felt-Ring).

By loosening four Hex cap flange bolts (Fig.8.5.3) the adaptor comes loose. Unscrew the six screws of the cap (Fig.8.5.4) holding the felt-ring. Take out the Felt-Ring, adaptor and V-Ring.

Mount the V-Ring with the smallest lip of the V to the inside (Fig.8.5.5) - simply push the V-Ring so the top is on the same level as the pulley top (Fig.8.5.6). Then take the adaptor and push the V-Ring down with the adaptor (Fig.8.5.7). The lowest lip of the V-Ring should only barely touch its gliding surface. Mount the adaptor and the Felt-Ring on top (Fig.8.5.7). Close the sealers with the cap (Fig.8.5.8) and screw the bolts. Always use the original bolts. Do not push the V-ring down with fingers.

8.5 DISASSEMBLING AND MOUNTING TOOL HOLDER TO CHANGE BUFFERS AND ELASTIC ELEMENT

When the TOOL HOLDER is disassembled you can change defective parts – elastic element, buffers, etc.


Figure 8.6.1


Figure 8.6.2

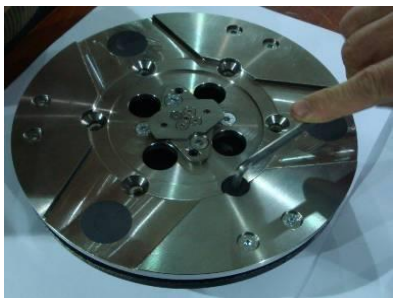


Figure 8.6.3

Lift the locking pin (Fig.8.6.1) to dismount the retaining washer (Fig.8.6.2).

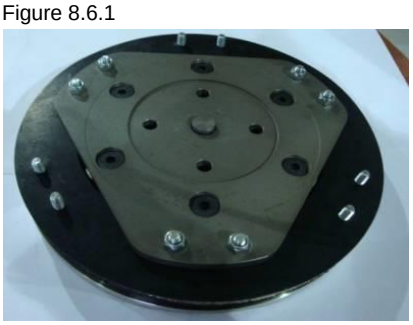


Figure 8.6.4


Figure 8.6.5


Figure 8.6.6

Take out the screws on the buffers and the nuts of the elastic element


Figure 8.6.7


Figure 8.6.8

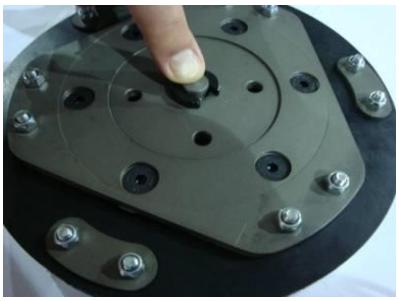


Figure 8.6.9

(Fig.8.6.3;Fig.8.6.4). Remove the elastic element from the QC plate (Fig.8.6.5). While the holder is dismounted (Fig.8.6.6;Fig.8.6.7) clean the parts and replace the defective with new ones. Assemble the holder with new buffers with new screws and new elastic element. Put the retaining washer (Fig.8.6.8) and push the locking pin (Fig.8.6.9). This will prevent the fall of the washer when mounting the holder on the machine.


Figure 8.7.1

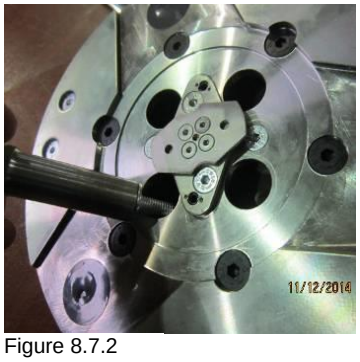


Figure 8.7.2

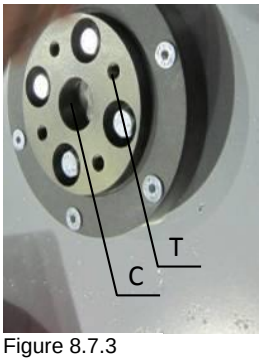


Figure 8.7.3

Make sure the four bolts holding the adaptor (Fig.8.7.3) are reliably tightened. Mount the holder on the machine using the same socket as in 8.4 (Fig.8.7.1;Fig.8.7.2). The retaining washer fits into the central hole C of adaptor and the four bolts into the thread holes T (Fig.8.7.3). The holder is centered on the outside diameter of the adaptor. Ensure the holder is properly connected to the plate of the adaptor and then tight evenly the four bolts. Tightening force on the bolts has to be 22...25N.m(16...18 lbf.ft). Mounting the holder without the retaining washer (Fig.8.6.2) is **INADMISSIBLE** because the security system preventing the separation of part of the holder in case of broken buffers and elastic element will not function!

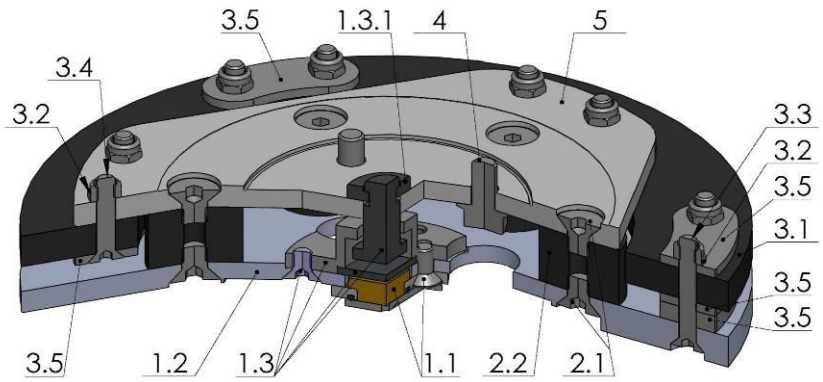


Figure 8.7.4

You can change the butterfly of the holder without dismounting the holder from the machine.

Fig.8.7.4 is 3-D section view of the holder, showing its parts. The numbering is the same as in Spare parts.

8.6 CORRECTING DEFLECTION OF THE USED PLANETARY CHAIN

Figure 8.8.1

Unscrew the two bolts (Fig.8.8.1) and take out the cover. Lift the machine in position to change the tools. Turn manually the holders in order to turn the main head, stop when you see through the window the chain tensioner (Fig.8.8.2).
Loosen a quarter to 1/2 rev the two nuts of the chain tensioner pos.3 (Fig.8.8.2) and pos.6 (Fig.8.8.2) the tensioner should turn with minimum clearence, without inclination, then unscrew the nuts pos.2 (Fig.8.8.2) and pos.7(Fig.8.8.2). To tension the chain pos.4 screw the nut pos.1 (Fig.8.8.2). To tension the chain pos.5 screw the nut pos.8 (Fig.8.8.2). The tensioner of the planetary chain should allow chain sagging 3...5mm/1/8...3/16 in/ controlled in span X on two chain Fig.8.8.2). When ready screw the two nuts pos.3 and pos.6 (Fig.8.8.2) and the nuts pos.2 and pos.7 (Fig.8.8.2).

ATTENTION: NEVER "OVER" TENSION THE CHAIN, THE CHAIN WILL BE DAMAGED

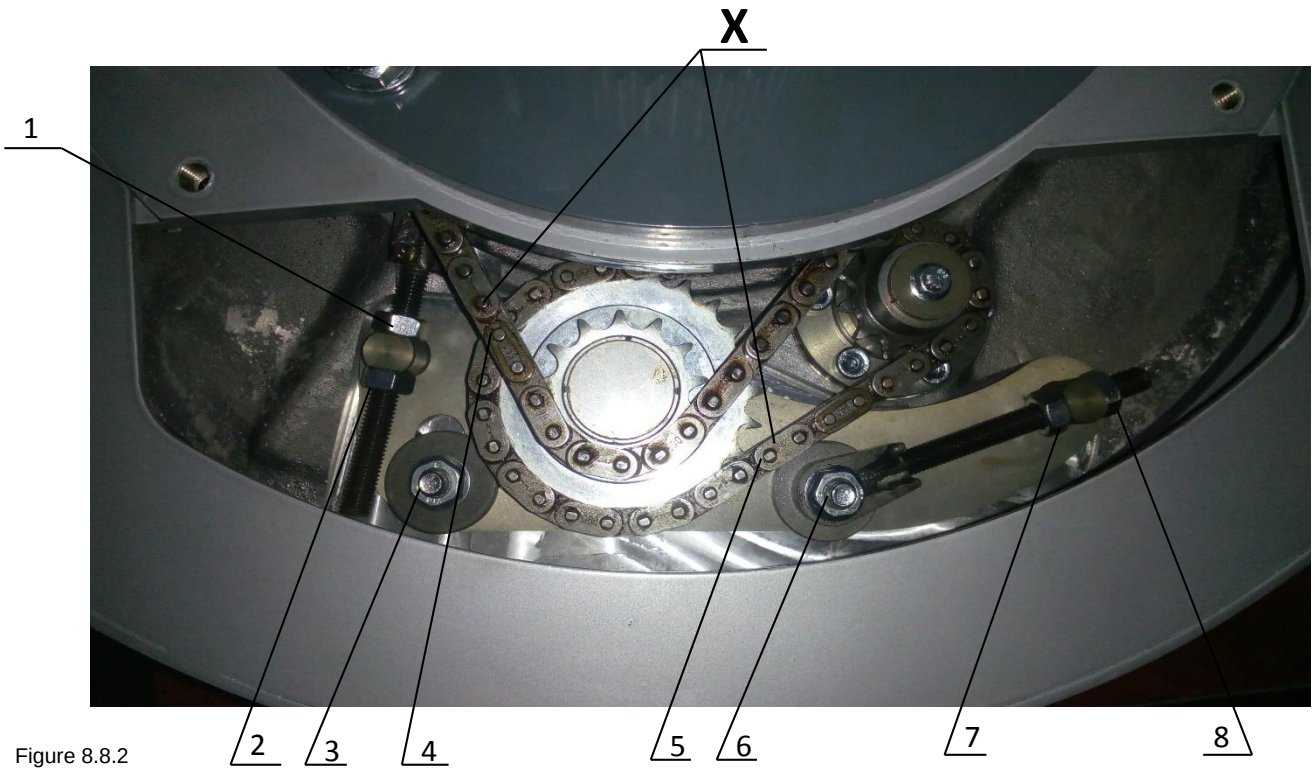


Figure 8.8.2

8.7 MOUNTING NEW PLANETARY CHAIN

The planetary chains are replaced with new ones when the step/drive of the chain tensioner is finished or there is a break in the integrity of the chain. Remove the guard as shown on **8.2 DISMOUNTING/MOUNTING THE GUARD.**

Unscrew the two bolts (Fig.8.8.1) and take out the cover. Lift the machine in position to change the tools. Turn manually the holders in order to turn the main head, stop when you see through the window the chain tensioner (Fig.8.8.2). Then separate the carriage from the main head as shown on **8.1 SEPARATING THE HEAD FROM THE CARRIAGE**. Lift the metal cover as shown on (Fig.8.9.1 and Fig.8.9.2)

Loosen a quarter to 1/2 rev the two nuts of the chain tensioner pos.3 (Fig.8.8.2) and pos.6 (Fig.8.8.2) the tensioner should turn with minimum clearance, without Inclination. Then unscrew the nuts pos.2 (Fig.8.8.2) and pos.7 (Fig.8.8.2), as well as the nuts in pos. 1 and pos.8 to have possibility to dismount the two old chains.

Figure 8.9.1

Figure 8.9.2

Mount the new chains (Fig.8.9.3 - Fig.8.9.6), using the the chain link pin and the split pin. First tighten the longer chain (Fig.8.9.7; Fig.8.9.8) then the second one (Fig.8.9.9; Fig.8.9.10).The tensioner of the planetary chain should allow chain sagging 3...5mm/1/8...3/16 in/ controlled in span X (Fig.8.8.2). Be sure to tighten the locking nuts (Fig.8.9.11; Fig.8.9.12; Fig.8.9.13; Fig.8.9.14).

Figure 8.9.3

Figure 8.9.4

Figure 8.9.5

Figure 8.9.6

Figure 8.9.7

Figure 8.9.8

Figure 8.9.9

Figure 8.9.10

Figure 8.9.11

Figure 8.9.12

Figure 8.9.13

Figure 8.9.14

ATTENTION: NEVER "OVER" TENSION THE CHAIN, THE CHAIN WILL BE DAMAGED

ATTENTION: BE VERY CAREFULL PLACING BACK THE METAL COVER, NOT TO DAMAGE THE RUBBER V RING. IT SERVES TO PROTECT THE PLANETARY CHAINS FROM THE DUST AND MOISTURE. PUT THE METAL COVER WITH DOWNWARD MOVEMENT FOLLOWING THE TWO CONDUCTORS POS.8 (Fig.8.9.1) AND THE EDGES POS. 9 (Fig.8.9.1) OF THE PROPANE MOTOR CARRIER.

8.8 REPLACING THE PLANETARY DRIVING CHAIN WHEEL AND PLANETARY TENSIONER

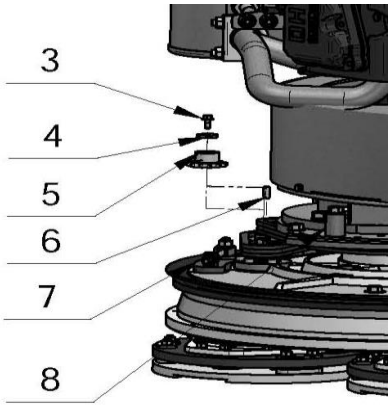


Figure 8.10.1

Check and repeat the instruction in 8.7 MONTING NEW PLANETARY CHAIN.

Unscrew bolt pos.3 take the chain pulley pos.5. Apply lithium grease on the shaft and mount back the wheel and the front washer pos.4 as shown on (Fig.8.10.1). Screw the bolt by using always the "blue" thread locking adhesive. Tightening force of the bolts has to be 22...25N.m (16...18 ft/lbs).

8.9 REPLACING PULLEY UNITS

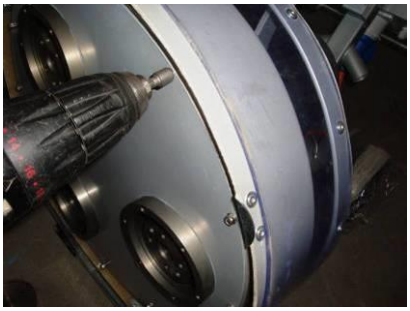


Figure 8.11.1

Figure 8.11.2

Figure 8.11.3

See previous chapters to take of the tool holders and top cover. Unscrew the screws of the bottom cover (Fig. 8.11.1). Set the bottom cover assembly aside (Fig.8.11.2).Remove the O-rings to avoid losing them (Fig.8.11.3).

Figure 8.11.4

Figure 8.11.5

Figure 8.11.6

Only the two loose (non-driving) pulleys can be remove without removing on top the motor base disc and motor. Loose the nu t on top of the pulley (Fig.8.11.4). Carefully pull out the unit with crowbars, but do not use excessive force (Fig.8.11.5) (Fig.8.11.6).

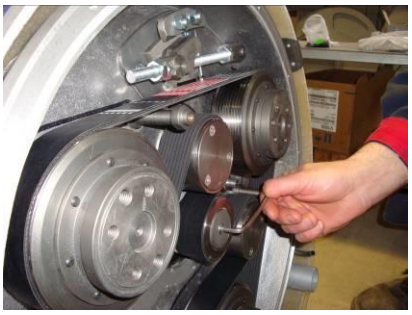


Figure 8.11.7

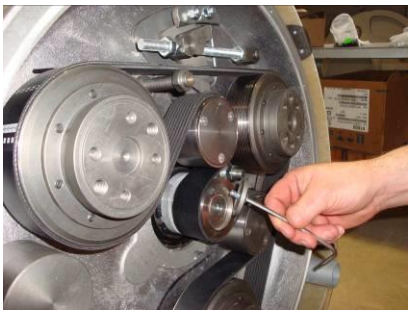


Figure 8.11.8


Figure 8.11.9

If all the pulley units have to be replaced, dismount motor base disc and motor. Before removing the belt unscrew the central pulley (so it does not turn while unlocking) (Fig.8.11.7) (Fig.8.11.8). Pull the central pulley off (Fig.8.11.9).


Figure 8.11.10

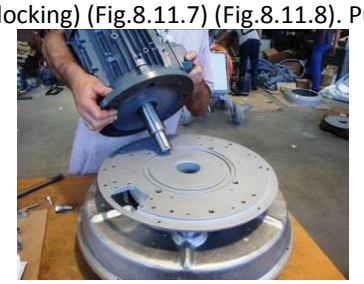


Figure 8.11.11

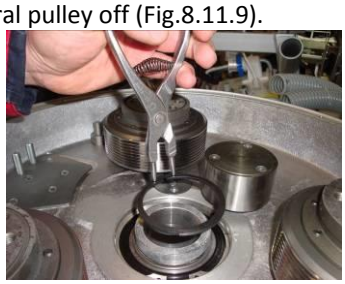


Figure 8.11.12


Figure 8.11.13


Figure 8.11.14


Figure8.11.15


Figure 8.11.16


Figure 8.11.17


Figure 8.11.18


Figure 8.11.19

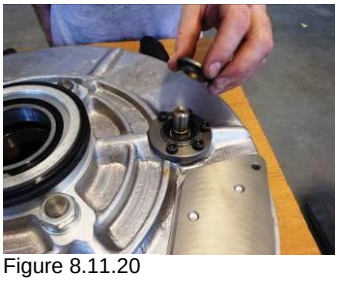


Figure 8.11.20


Figure 8.11.21


Figure 8.11.22


Figure 8.11.23


Figure 8.11.24

Unscrew bolts (Fig.8.11.10) and take more off (Fig.8.11.11). Unlock retaining shaft/bearing (Fig.8.11.12). Take away the filling ring (Fig.8.11.13). Now the motor base disc is unlocked, the only way to dismount it is to press it out on a bearing press (Fig.8.11.14) (Fig.8.11.15). Dismounting the driving pulley: take the top screw out to release the bushing (Fig.8.11.16), push

the bushing together with the washer up (Fig.8.11.17), push washer down of the bushing., take bushing out (Fig.8.11.18), push key out (Fig.8.11.19), now the washer releases (Fig.8.11.20), dismount sealer cap (Fig.8.11.21), the pulley can be released with two crowbars; do not use excessive force (Fig.8.11.22) (Fig.8.11.23), push the sealer cap to dismount (Fig.8.11.24), by mounting back the sealer cap, secure with sealant, center the holes to mount the pulley.

Change the two other pulleys as earlier described in the chapter, best when the motor base disc is dismount to change the roller units too. Unlock the nut on top (Fig.8.11.25). The pulleys can be released with two crowbars; do not use excessive force (Fig.8.11.26) (Fig.8.11.27).


Figure 8.11.25


Figure 8.11.26


Figure 8.11.27

8.10 MOUNTING THE BELT


Figure 8.12.1


Figure 8.12.2


Figure 8.12.3


Figure 8.12.4


Figure 8.12.5

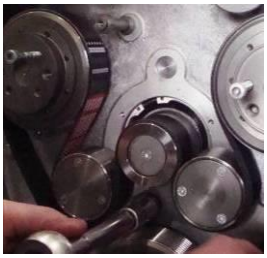


Figure 8.12.6


Figure 8.12.7


Figure 8.12.8


Figure 8.12.9


Figure 8.12.10

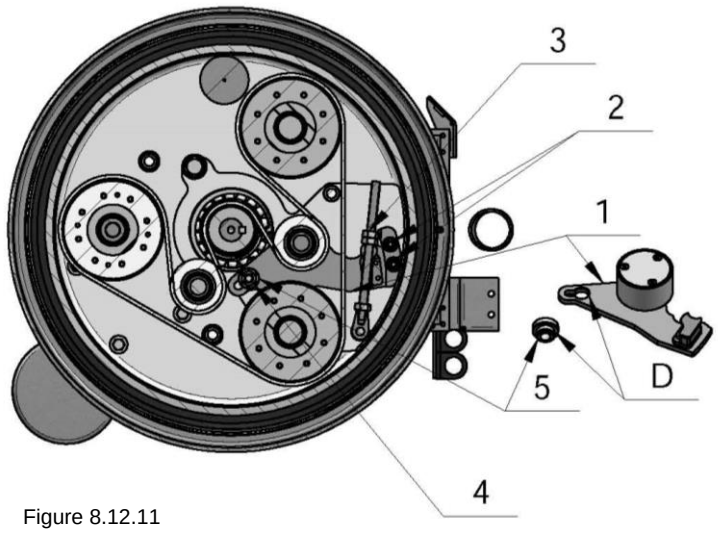


Figure 8.12.11

The mounting of the belt is shown on Fig. 8.12.11. Putting the belt is possible when the tensioner is in starting position:

- loosen the nuts pos.2
- loosen enough the nuts pos.3 (or unscrew them).
- unscrew the nut (pos.4) and pull out the bush (pos.5) from hole D in the tensioner (pos.1), that will allow the tensioner to have the position in Fig. 8.12.11.
- put the belt following steps shown on Fig. 8.12.2; Fig. 8.12.3 and Fig. 8.12.4. (It is possible also to put the belt on the roller unit assembly as a last step.) Check if the belt is on the right place in the grooves of each of the pulley units and on the central pulley.

Put back the tensioner in a position the axle bushing to fit in the tensioner hole (Fig. 8.12.5) (You can push down the bush screwing the nut pos.4)

Tighten the nuts (pos.2, Fig. 8.12.11) and loosen them again a half of turnover. This will allow the tensioner turn in minimum clearance. Rotate the tensioner into the lightening direction so you can mount the belt. After the belt is mounted you need to tension it by using Optikrik II device (Measuring range: 500-1400 N) (Fig . . . 8.13.2).
For a new belt the tensioning force is 650N. The tension of the existing belt must be 520 N.

ATTENTION: NEVER "OVER" TENSION THE BELT, THE BELT WILL BE DAMAGED AND IT WILL NEVER RECOVER ITS ORIGINAL TENSION

Tighten the two nuts on the sectors and contra nut on the tensioner (Fig. 8.12.9). Put the seal ring on the bottom cover and close the machine (Fig. 8.12.11).
Reassemble in the same manner.
Your LAVINA® NEB machine is now ready for use!

8.11 CHECKING THE TENSION OF THE BELT


Figure 8.13.1


Figure 8.13.2


Figure 8.13.3


Figure 8.13.4

Open the checking cover to reach the belt and tension device (Fig.8.13.1). You should rotate the whole system by hand and check the tensioning several times to ensure its equal in all the regions of the belt. It is recommended that the tensioning of the belt be measured with Optikrik II Device (Measuring range: 500 -1400 N) (Fig.8.13.2). The tension of the existing belt must be 520 N.

ATTENTION:
NEVER "OVER" TENSION THE BELT, THE BELT WILL BE DESTROYED AND IT WILL NEVER RECOVER ITS ORIGINAL TENSION
Loose the contra nuts (Fig.8.13.3), loose light the two nuts of the tension device (Fig.8.13.4), and adjust the tension with the nut seen in. When the right tension is reached: close the contra nuts and the two nuts of the support. Reassemble in the same manner.
PLEASE MAKE SURE YOU CHECK THE TENSION OF THE BELT AFTER THE FIRST 15 HOURS OF OPERATION.

8.12 FAULT DIAGNOSIS INVERTER YASKAWA V1000

Pages are referring to
Yaskawa Electric SIEP C710606 18A YASKAWA AC Drive – V1000 Technical Manual

◆ Types of Alarms, Faults, and Errors

Check the LED operator for information about possible faults if the drive or motor fails to operate. *Refer to Using the Digital LED Operator on page 70*.

If problems occur that are not covered in this manual, contact the nearest Yaskawa representative with the following information:

- Drive model
- Software version
- Date of purchase
- Description of the problem

Table 6.4 contains descriptions of the various types of alarms, faults, and errors that may occur while operating the drive.

Contact Yaskawa in the event of drive failure.

Table 6.4 Types of Alarms, Faults, and Errors

Type	Drive Responses to Alarms, Faults, and Errors
Faults	When the drive detects a fault: • The digital operator displays text that indicates the specific fault and the ALM indicator LED remains lit until the fault is reset. • The fault interrupts drive output and the motor coasts to a stop. • Depending on the setting, the drive and motor may stop via different methods than listed. • If a digital output is programmed for fault output (H2-☐☐ = E), it will close if a fault occurs. • When the drive detects a fault, it will remain inoperable until that fault has been reset. *Refer to Fault Reset Methods on page 264*.
Minor Faults and Alarms	When the drive detects an alarm or a minor fault: • The digital operator displays text that indicates the specific alarm or minor fault and the ALM indicator LED flashes. • The motor does not stop. • One of the multi-function contact outputs closes if set to be tripped by a minor fault (H2-☐☐ = 10), but not by an alarm. • The digital operator displays text indicating a specific alarm and ALM indicator LED flashes. • Remove the cause of an alarm or minor fault to automatically reset.
Operation Errors	When parameter settings conflict with one another or do not match hardware settings (such as with an option card), it results in an operation error. When the drive detects an operation error: • The digital operator displays text that indicates the specific error. • Multi-function contact outputs do not operate. • When the drive detects an operation error, it will not operate the motor until the error has been reset. Correct the settings that caused the operation error to reset.
Tuning Errors	Tuning errors occur while performing Auto-Tuning. When the drive detects a tuning error: • The digital operator displays text indicating the specific error. • Multi-function contact outputs do not operate. • Motor coasts to stop. • Remove the cause of the error and repeat the Auto-Tuning process.

◆ Alarm and Error Displays

■ Faults

When the drive detects a fault, the ALM indicator LEDs remain lit without flashing. If the LEDs flash, the drive has detected a minor fault or alarm. *Refer to Minor Faults and Alarms on page 240* for more information. An overvoltage situation trips both faults and minor faults, therefore it is important to note whether the LEDs remain lit or if the LEDs flash.

LED Operator Display	Name		Page
bUS	bUS	Option Communication Error	*242*
CE	CE	MEMOBUS/Modbus Communication Error	*242*
CF	CF	Control Fault	*242*
CoF	CoF	Current Offset Fault	*242*
CPF02	CPF02	A/D Conversion Error	*242*
CPF03	CPF03	PWM Data Fault	*243*
CPF06	CPF06	Drive specification mismatch during Terminal Board or Control Board replacement	*243*
CPF07	CPF07	Terminal Board Communication Fault	*243*

LED Operator Display	Name		Page
CPF08	CPF08	EEPROM Serial Communications Fault	*243*
CPF11	CPF11	RAM Fault	*243*
CPF12	CPF12	FLASH Memory Fault	*243*
CPF13	CPF13	Watchdog Circuit Exception	*243*
CPF14	CPF14	Control Circuit Fault	*243*
CPF16	CPF16	Clock Fault	*243*
CPF17	CPF17	Timing Fault	*243*
CPF18	CPF18	Control Circuit Fault	*243*
CPF19	CPF19	Control Circuit Fault	*244*

LED Operator Display		Name	Page
CPF20 or CPF21	CPF20or CPF21	RAM Fault	244
		FLASH Memory Fault	244
		Watchdog Circuit Exception	244
		Clock Fault	244
oH3	oH3	Motor Overheat 1 (PTC input)	247
oH4	oH4	Motor Overheat 2 (PTC input)	248
oL1	oL1	Motor Overload	248
oL2	oL2	Drive Overload	248
oL3	oL3	Overtorque Detection 1	249
oL4	oL4	Overtorque Detection 2	249
oL5	oL5	Mechanical Weakening Detection 1	249
oL7	oL7	High Slip Braking oL	249
oPr	oPr	Operator Connection Fault	249
CPF22	CPF22	A/D Conversion Error	244
CPF23	CPF23	PWM Feedback Data Fault	244
CPF24	CPF24	Drive Capacity Signal Fault	244
dEv	dEv	Excessive Speed Deviation (for Simple V/f with PG)	244
EF0	EF0	Option Card External Fault	244
EF1 to EF7	EF1 to EF7	External Fault (input terminal S1 to S7)	244
FbH	FbH	Excessive PID Feedback	245
FbL	FbL	PID Feedback Loss	245

LED Operator Display		Name	Page
GF	GF	Ground Fault	245
LF	LF	Output Phase Loss	245
LF2	LF2	Output Open Phase	246
oC	oC	Overcurrent	246
oFA00	oFA00	Option Card Fault (port A)	246
oH	oH	Heatsink Overheat	247
oH1	oH1	Heatsink Overheat	247
PGo	PGo	PG Disconnect (for Simple V/f with PG)	250
rH	rH	Dynamic Braking Resistor	251
rr	rr	Dynamic Braking Transistor	251
SEr	SEr	Too Many Speed Search Restarts	251
STO	STO	Pull-Out Detection	251
UL3	UL3	Undertorque Detection 1	251
UL4	UL4	Undertorque Detection 2	251
UL5	UL5	Mechanical Weakening Detection 2	251
Uv1	Uv1	Undervoltage	252
Uv2	Uv2	Control Power Supply Undervoltage	252
Uv3	Uv3	Soft Charge Circuit Fault	252
oS	oS	Overspeed (for Simple V/f with PG)	249
ov	ov	Overvoltage	249
PF	PF	Input Phase Loss	250

Note: If faults CPF11 through CPF19 occur, the LED operator will display CPF00 or CPF11.

■ Minor Faults and Alarms

When a minor fault or alarm occurs, the ALM LED flashes and the text display shows an alarm code. A fault has occurred if the text remains lit and does not flash. *Refer to Alarm Detection on page 253*. An overvoltage situation, for example, can trigger both faults and minor faults. It is therefore important to note whether the LEDs remain lit or if the LEDs flash.

Table 6.5 Minor Fault and Alarm Displays

LED Operator Display		Name	Minor Fault Output (H2-□□ = 10)	Page
bb	bb	Drive Baseblock	No output	253
bUS	bUS	Option Card Communications Error	YES	253
CALL	CALL	Serial Communication Transmission Error	YES	253
CE	CE	MEMOBUS/Modbus Communication Error	YES	253
CrSt	CrSt	Can Not Reset	YES	253
dEv	dEv	Excessive Speed Deviation (for Simple V/f with PG)	YES	254
dnE	dnE	Drive Disabled	YES	254
EF	EF	Run Command Input Error	YES	254
EF0	EF0	Option Card External Fault	YES	254
EF1 to EF7	EF1 to EF7	External Fault (input terminal S1 to S7)	YES	255
FbH	FbH	Excessive PID Feedback	YES	255
FbL	FbL	PID Feedback Loss	YES	255
Hbb	Hbb	Safe Disable Signal Input	YES	255
HbbF	HbbF	Safe Disable Signal Input	YES	255
SE	SE	MEMOBUS/Modbus Test Mode Fault	YES	—
oL5	oL5	Mechanical Weakening Detection 1	YES	249
UL5	UL5	Mechanical Weakening Detection 2	YES	251
dWAL	dWAL	DriveWorksEZ Alarm	YES	244
HCA	HCA	Current Alarm	YES	256
oH	oH	Heatsink Overheat	YES	256
oH2	oH2	Drive Overheat	YES	256
oH3	oH3	Motor Overheat	YES	256
oL3	oL3	Overtorque 1	YES	256
oL4	oL4	Overtorque 2	YES	257
oS	oS	Overspeed (for Simple V/f with PG)	YES	257

LED Operator Display		Name	Minor Fault Output (H2-□□ = 10)	Page
ov	ov	Overvoltage	YES	257
PASS	PASS	MEMOBUS/Modbus Test Mode Complete	No output	257
PGo	PGo	PG Disconnect (for Simple V/f with PG)	YES	257
rUn	rUn	During Run 2, Motor Switch Command Input	YES	258
rUnC	rUnC	Run Command Reset	YES	258
UL3	UL3	Undertorque 1	YES	258
UL4	UL4	Undertorque 2	YES	258
Uv	Uv	Undervoltage	YES	258

■ Operation Errors

Table 6.6 Operation Error Displays

LED Operator Display		Name	Page
oPE01	oPE01	Drive Unit Setting Error	259
oPE02	oPE02	Parameter Setting Range Error	259
oPE03	oPE03	Multi-Function Input Setting Error	259
oPE04	oPE04	Terminal Board Mismatch Error	260
oPE05	oPE05	Run Command Selection Error	260
oPE07	oPE07	Multi-Function Analog Input Selection Error	260

LED Operator Display		Name	Page
oPE08	oPE08	Parameter Selection Error	260
oPE09	oPE09	PID Control Selection Error	260
oPE10	oPE10	V/f Data Setting Error	261
oPE11	oPE11	Carrier Frequency Setting Error	261
oPE13	oPE13	Pulse Train Monitor Selection Error	261

9. DISPOSAL

If your machine after time is not usable or needs to be replaced, send the machine back to Superabrasive or a local distributor, where a professional disposal complying with the environment laws and directives is guaranteed.

10. MANUFACTURER'S CONTACTS

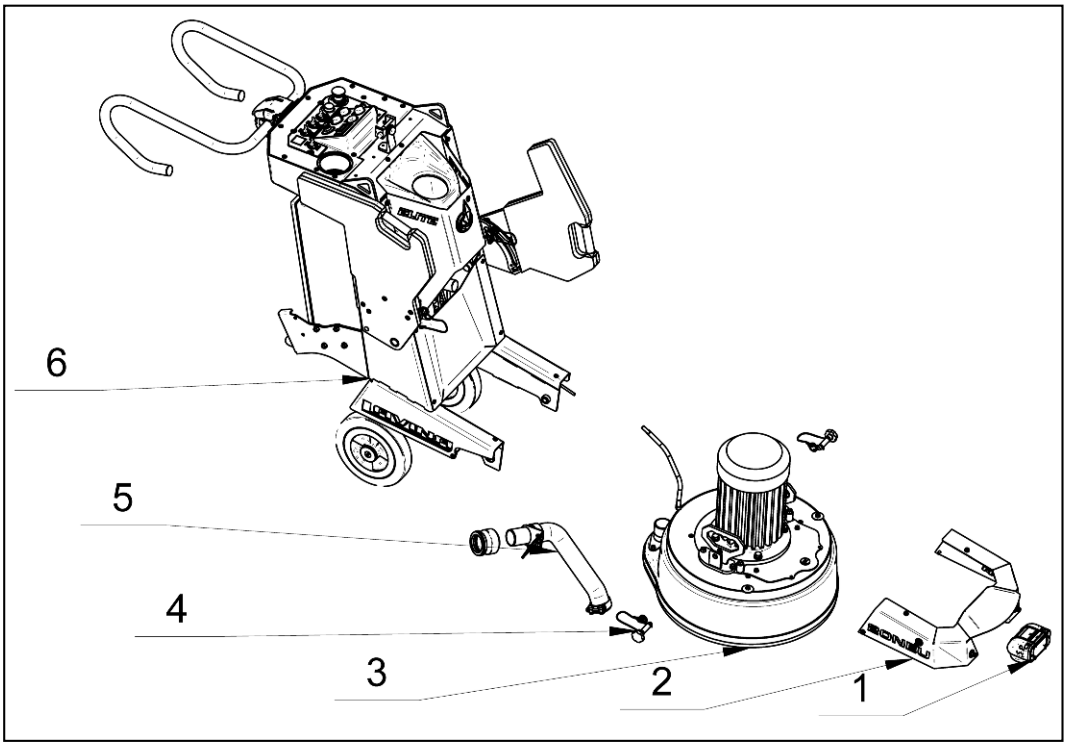
If you need to contact Superabrasive Inc. with technical support questions, below is the contact information.

Address: 9411 Jackson Trail Road, Hoshton GA 30548, USA
Email: info@superabrasive.us
Tel.: 706 658 1122
Fax: 706 658 0357

11. SPARE PARTS

ASSEMBLY AND PARTS SPECIFICATIONS

11.1 GENERAL PARTS



11.1 LAVINA® 20NEB GENERAL PARTS			
No.	**Item No.**	**Description**	**Pcs.**
1	A50.00.00.00	LED light with magnetic base	1
2	L20NEB01.00.00	Bumper	1
3	L20NEB10.00.00	Main Head	1
4	L25SPS-07.03.00.00	Pin Assembly	2
5	L20GE-02.00.00	Vacuum hose	1
6	L20NEB20.00.00	Carriage	1

11.2 BUMPER

11.2 LAVINA® 20NEB BUMPER			
ITEM № L20NEB01.00.00			
No.	**Item No.**	**Description**	**Pcs.**
1	L20NEB01.00.01-K	Bumper right part	1
2	30301240103	Nut M6DIN985	6
3	L20GX-01.00.03	Bumper middle part	1
4	L20NEB01.00.02	Bumper left part	1
5	30301210048	Bolt M6X12DIN6921	6
6	30301210051	Bolt M6X16DIN6921	4

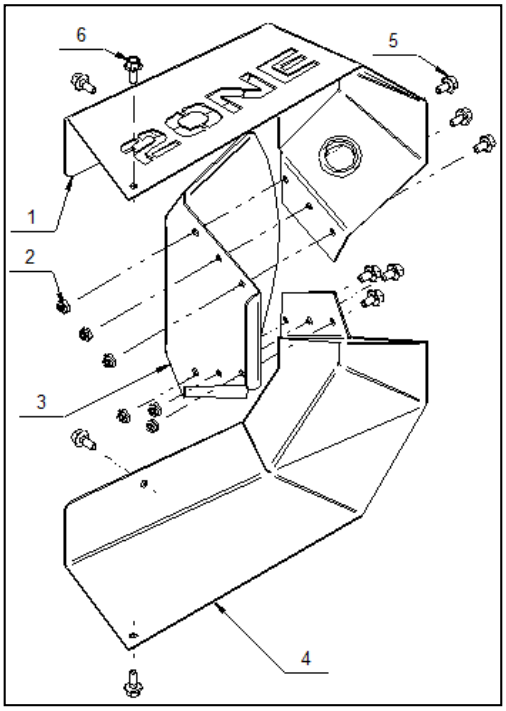


Figure 11.2

11.3 VACUUM HOSE

11.3 LAVINA® 20NEB Vacuum Hose			
Item No. L20GE-02.00.00			
No.	**Item No.**	**Description**	**Pcs.**
1	L20GX-02.10.00	Vacuum Port	1
2	30301210051	Bolt M6x16DIN6921	2
3	30301240098	Flange Nut M6DIN6923	2
4	30308000400	Clamp for Vacuum Hose	1
5	D50L470PU	Soft Vacuum Hose	1

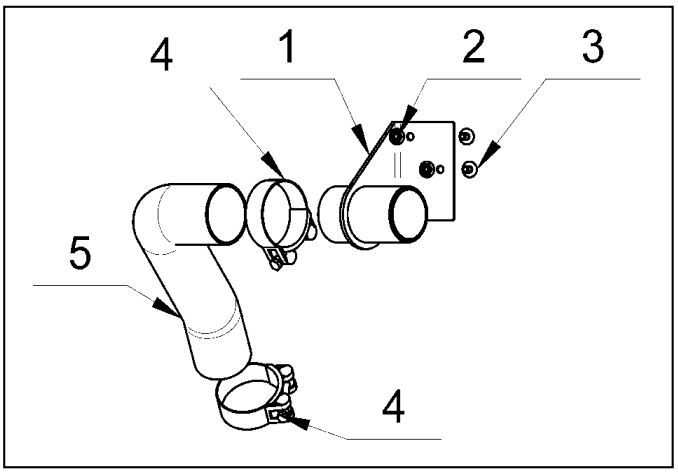


Figure 11.3

11.4 CARRIAGE

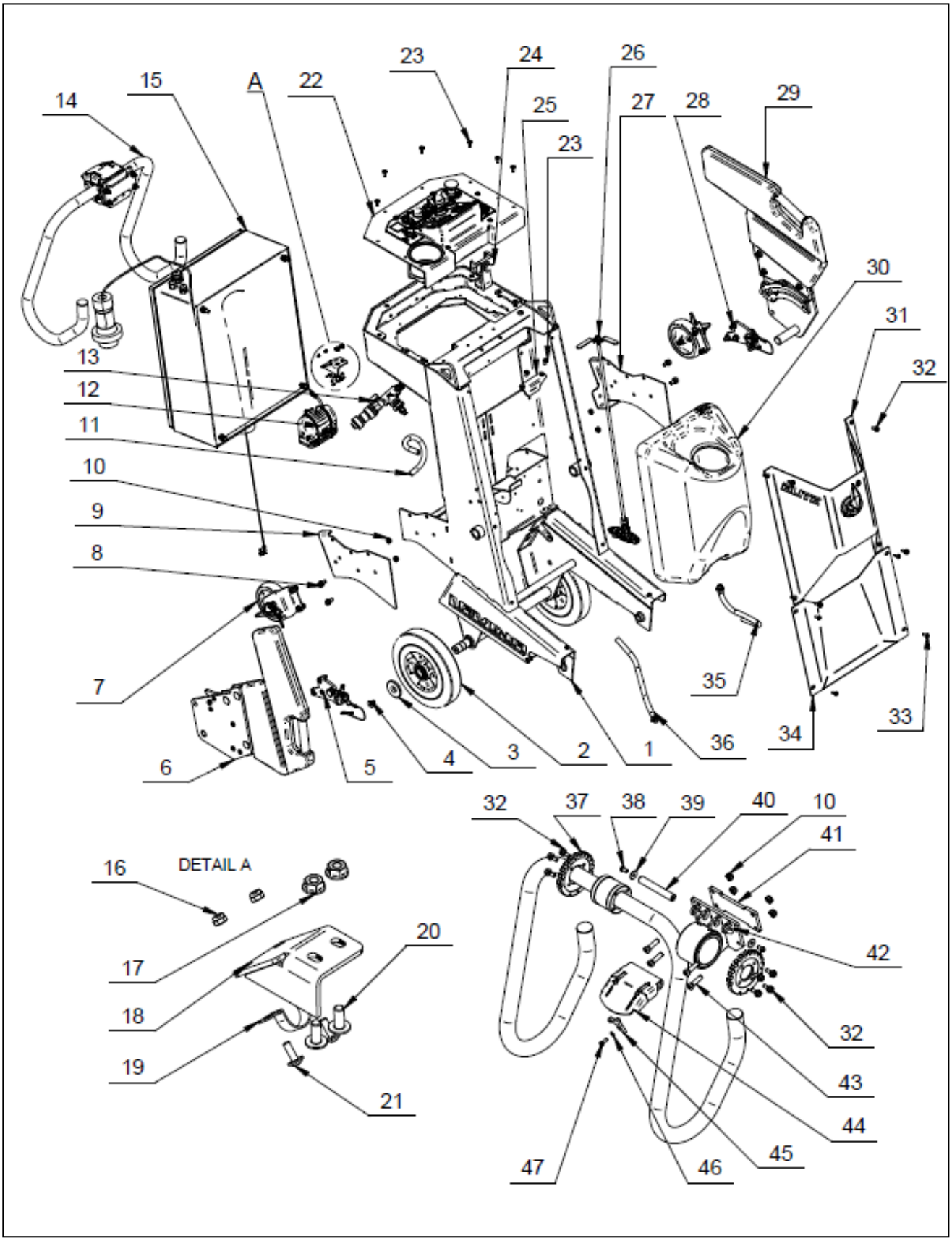


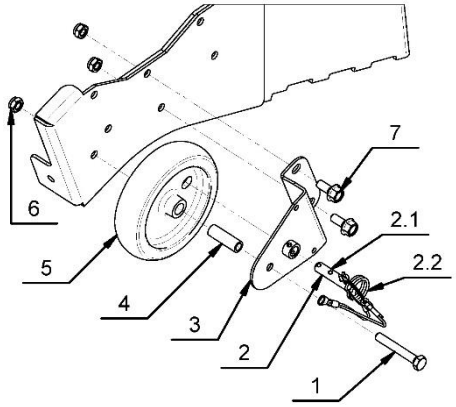
Figure 11.4

11.4 LAVINA® 20NEB Carriage

Item No. L20NEB20.00.00

No.	Item No.	Description	Pcs.	No.	Item No.	Description	Pcs.
1	L20NEB21.00.00	Frame	1	24	HGP270	Phone clip mount	1
2	30312000043	Wheel	2	25	L20E20.10.00	Tank holder plate assembly	1
3	L25X-20.00.03-1	Wheel cap	2	26	A89.00.00	WATER BALL VALVE	1
4	30301230015	Screw 10x16DIN7991/10.9/	2	27	L20GX-20.00.22-2	Support left	1
5	L20GX-20.30.00	Right Weight Support	1	28	L20GX-20.40.00	Left Weight Support	1
6	L25E20.10.00	Right Weight	1	29	L25E20.20.00	Left Weight	1
7	L25E20.60.00	Wheel Assembly	2	30	A78.00.00.00	Tank Assembly	1
8	30301210072	Bolt M8x16DIN6921	4	31	L25E20.50.00	Front panel assembly	1
9	L20GX-20.00.21-2	Support right	1	32	30301210051	Bolt M6x16DIN6921	12
10	30301240106	Nut M8DIN985	8	33	30301230251	Screw 5x16ISO7380F/10.9/	4
11	MAR8.28-K	PE Tube	1	34	L20E20.00.03	Front cover	1
12	UT-BS0201	LED Light	1	35	MAR8.32-K	PE Tube	1
13	A88.00.00	WATER BALL VALVE	1	36	MAR8.32-K	PE Tube	1
14	L20GX-23.10.00	Handle assembly	1	37	L20GX-23.00.01	End cover	2
15	L20NEB25.00.00	Control box	1	38	30301230250	Screw M6 x12ISO7380-/10.9/	2
16	30301240114	Nut M4DIN 985	2	39	30301221012	Washer M6DIN9021	2
17	30301240098	Nut M6DIN6923	2	40	L20GX-23.00.02-1-K	Pin	1
18	L20E20.00.06	Cable holding plate	1	41	L20GX-23.00.03	Handle support plate	1
19	30311000818	Cable clamp	1	42	L20GX-23.30.00	Handle support	1
20	30301230262	Screw 6x14ISO7380/10.9/	2	43	30301230257	ScrewM8x30DIN7984	4
21	30301230066	Screw M4x12DIN 967	2	44	L20GX-23.20.00	Handle locking bit	1
22	L20EB22.00.00	Control board assembly	1	45	L20GX-23.00.11-K	Locking lever	1
23	30301230243	Screw 6x16ISO7380F/10.9/	10	46	30301221002	Washer M5DIN125A	1
				47	30301210109	Bolt M5x14DIN933	1

11.5 Wheel Assembly



11.5. LAVINA® 20NEB WHEEL ASSEMBLY				
ITEM № L25E20.60.00				
No.		Item No.	Description	Pcs.
1		30301210005	Bolt M8X55DIN933	1
2		L25E20.62.00	Pin Assembly	1
	2.1	L25E20.62.02	Pin	1
	2.2	L25E20.62.00-K	Accessories	1
3		L25E20.61.00	Housings	1
4		L25E20.60.03	Bushing	1
5		L25E20.60.01	Wheel	1

11.6 EXTERNAL WATER VALVE

11.6 LAVINA® 20NEB EXTERNAL WATER VALVE			
Item №. A88.00.00			
No.	Item No.	Description	Pcs.
1	A88.00.00-K	Water ball valve kit	1
2	30316000013	Quick-change nozzle	1

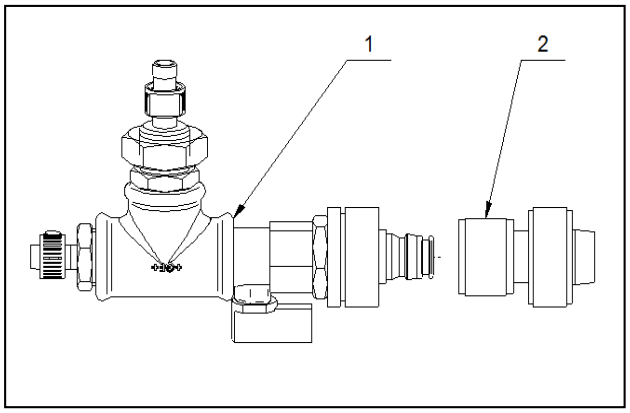


Figure 11.6

11.7 WATER TANK

11.7 LAVINA® 20NEB WATER TANK				
Item No. A78.00.00.00				
No.		Item No.	Description	Pcs.
1		A33-00.02-K	Water Tank-K	1
2		30316000001	Filter	1
3		30316000015	Nipple	1

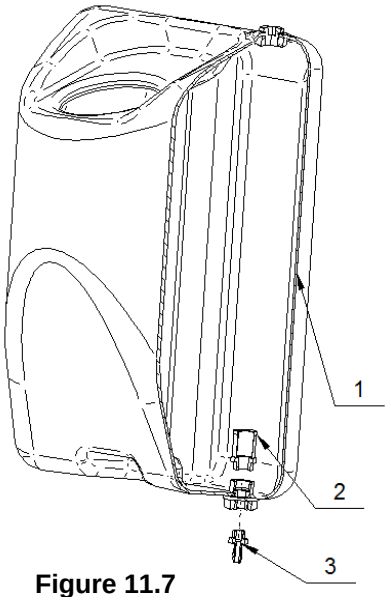


Figure 11.7

11.8 CONTROL BOARD ASSEMBLY

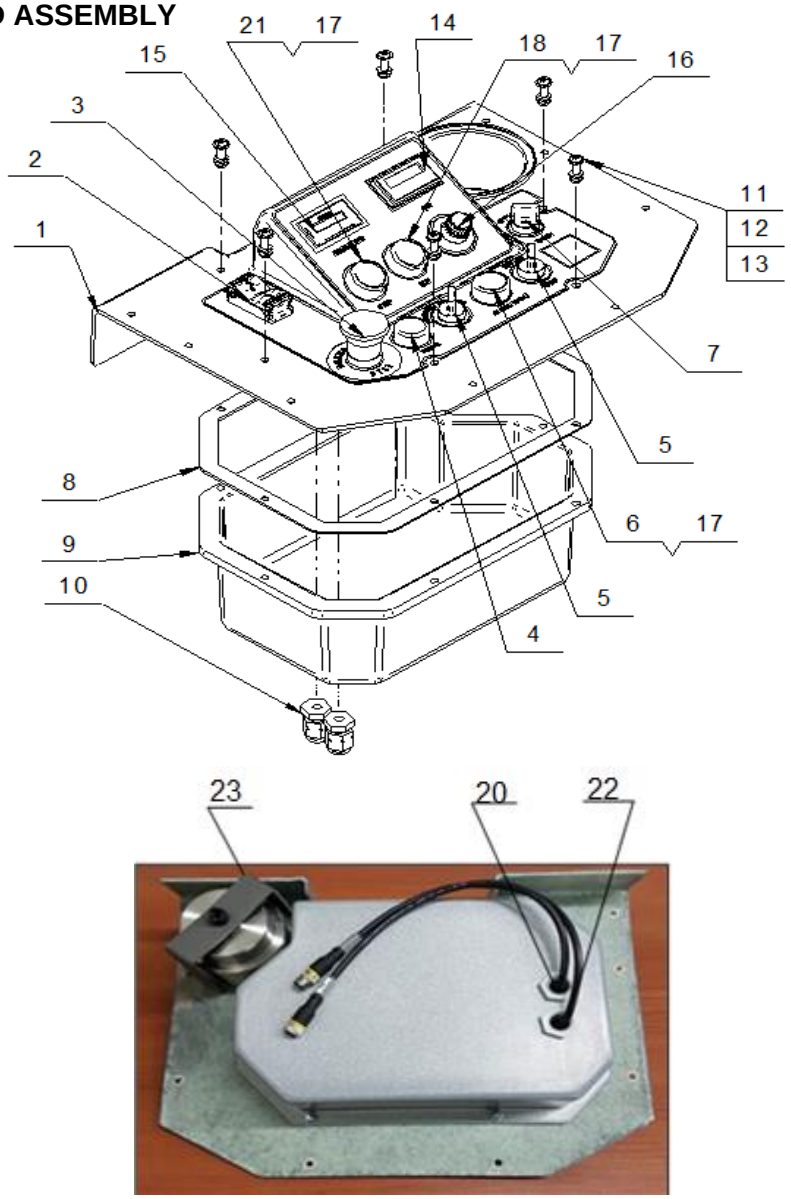


Figure 11.8

11.8 LAVINA L20NEB CONTROL BOARD ASSEMBLY							
Item No. L20EB22.00.00							
No.	**Item No.**	**Description**	**Pcs.**	**No.**	**Item No.**	**Description**	**Pcs.**
1	L20E22.10.00	Control board assembly kit	1	13	30301240103	Nut M6DIN985	6
2	30313000173	USB charger	1	14	30313000150	Tachometer	1
3	30311000717	EMG Button	1	15	30313000153	Hour meter	1
4	30311000740	Power glowing Green	1	16	30311000690	Potentiometer	1
5	30311000721	Switch	2	17	30311000750	Cap	3
6	30311000730	Бутон	1	18	30311000701	Button	1
7	30311000732-K	Switch	1	19	30350000045	Cup holder	1
8	30302000145	Seal	1	20	L20E22.22.00	L20E Cable X2 control board	1
9	L25E22.00.02	Box	1	21	30311000700	Button	1
10	30311000401	Cable Gland 16x1,5	2	22	L20EB22.21.00	L20EB Cable X1 control board	1
11	30301230264	Screw	6	23	L20GX-40.20.03	Clamp	1
12	30301221003	Washer M6DIN125	6				

11.9 TOP COVER PARTS 1

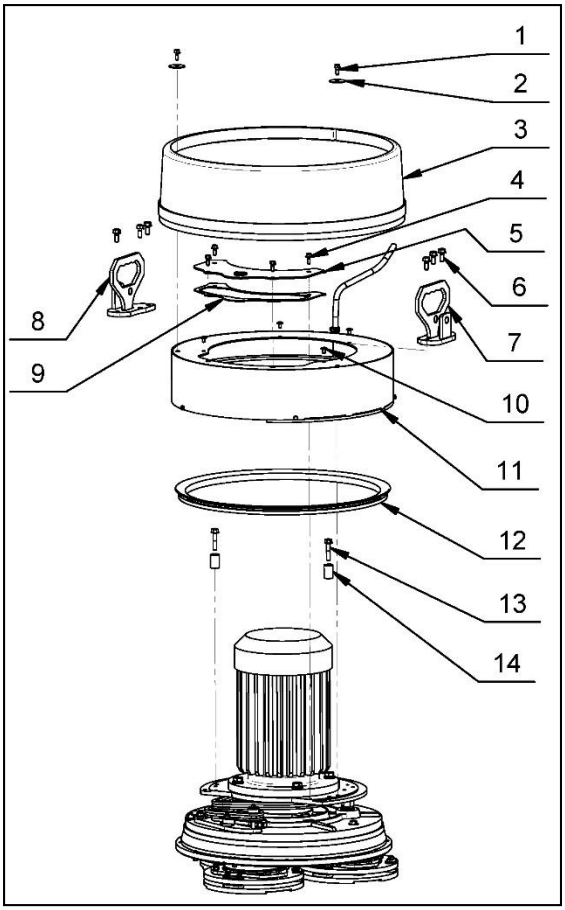


Figure 11.9

11.9 LAVINA® 20NEB Top Cover 1 parts			
No.	**Item No.**	**Description**	**Pcs.**
1	30301210051	Bolt M6x16DIN6921	2
2	30301221022	Washer D35x1.4	2
3	L20NEB10.70.00	Guard Assembly	1
4	30301210051	Bolt M6X16DIN6921	4
5	L20E19.20.00-1	Inspection cover	1
6	30301210031	Bolt M8X20DIN6921	6
7	L20E18.10.00-1	Left fork	1
8	L20E18.20.00-1	Right fork	8
9	L20E10.00.62	Sealer Inspection Cover	1
10	30301230021	Screw M6X10ISO7380F/10.9/	4
11	L20NEB19.00.00	Top cover assembly	1
12	30302000044	V-ring TWVA04500	1
13	30301210092	Bolt M8X40DIN6921	2
14	L20GX-15.00.29	Bushing	2

11.10 GUARD ASSEMBLY

11.10 LAVINA®20NEB Guard Assembly			
Item No. L20NEB10.70.00			
No.	**Item No.**	**Description**	**Pcs.**
1	**30301210117**	Bolt M6x**20**DIN6921	2
2	L20E10.72.00	Vacuum Port	1
3	30301240111	Nut M12DIN985	1
4	30301221006	Washer M12DIN125	1
5	L25GEB10.70.02	Nozzle L25GEB	1
6	L20GX-05.00.01	Guard	1
7	L20E10.71.00	Bottom Vacuum Port	1
8	FBL1350-1795	Brush	1

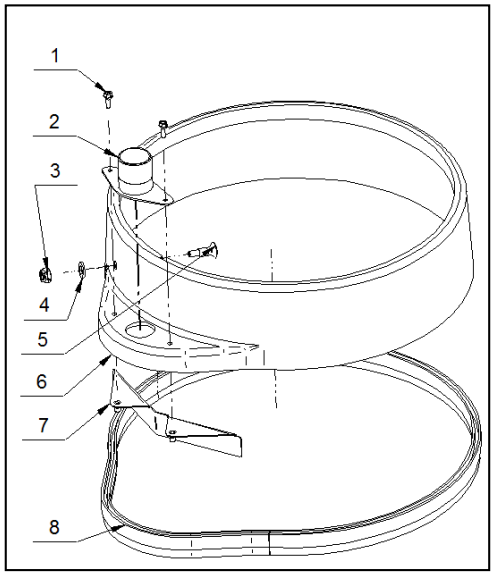


Figure 11.10

11.11 TOP COVER ASSEMBLY

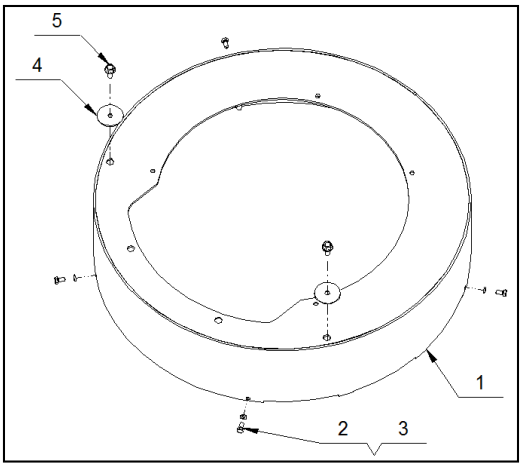


Figure 11.11

11.11 LAVINA®20NEB TOP COVER Assembly			
Item No. L20NEB19.00.00			
No.	**Item No.**	**Description**	**Pcs.**
1	L20NEB19.10.00-K	Top Cover	1
2	30301220001	Spring Washer M5DIN127	4
3	30301210007	Bolt M5X10DIN933	4
4	30301221022	Washer D35x1.4	2
5	30301210051	Bolt M6X16DIN6921	2

11.12 BOTTOM COVER 1 PARTS

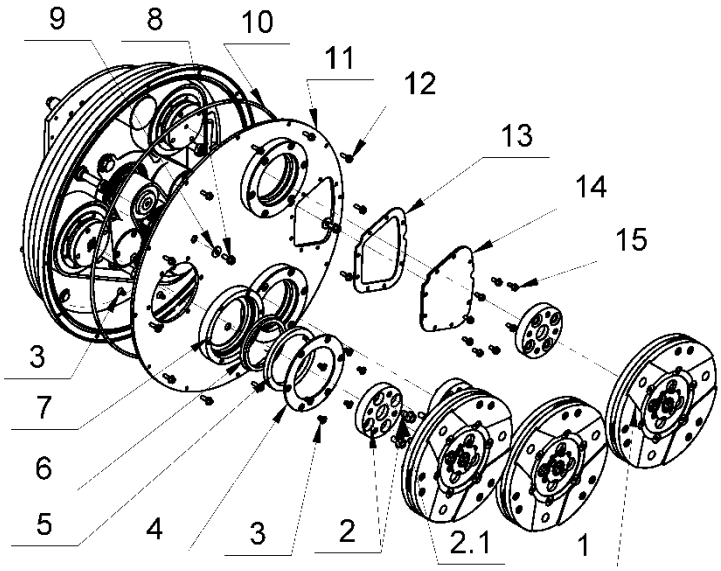


Figure 11.12

11.12 LAVINA® 20NEB BOTTOM COVER 1 PARTS				
No.		**Item No.**	**Description**	**Pcs.**
1		A63.00.00	Tool Holder A63	3
2		A42.03.00	Adaptor	3
	2.1	30301210072	Bolt M8x16DIN6921	24
3		30301230017	Screw M6X10DIN7991/10,9/	36
4		L25LS-14.00.03	Outer Cover	3
5		30309000000	Felt Ring	3
6		30302000005	V-Ring Type A	3
7		L25LS-14.00.02	Flange	3
8		30301210051	Bolt M6X16DIN6921	3
9		30301221012	Washer M6DIN9021A	3
10		D4X2X1450	Seal	1
11		L20NS-14.00.00	Bottom Cover Assembly	1
12		30301210110	Bolt M5X16DIN6921	12
13		L20NS-14.00.05	Sealer Inspection Cover	1
14		L20NS-14.00.04	Inspection Cover	1
15		30301210030	Bolt M5X12DIN6921	8

11.13 PLANETARY DRIVE PARTS

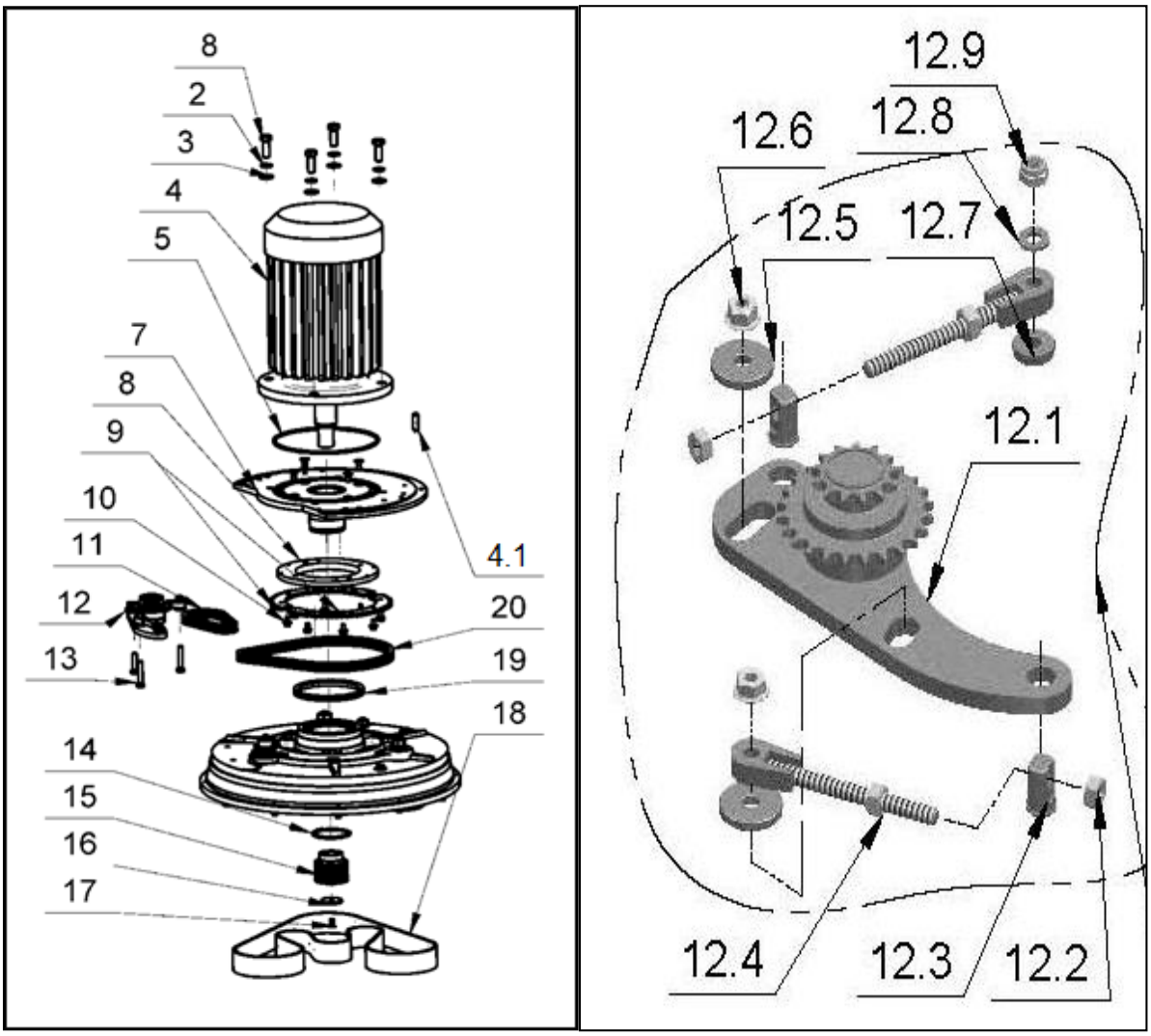


Figure 11.13

11.13 LAVINA® 20NEB PLANETARY DRIVE PARTS							
No.	Item No.	Description	Pcs.	No.	Item No.	Description	Pcs.
1	30301210017	Bolt M12x35DIN933	4	12.4	L21X-17.30.00	Support	2
2	30301220005	Spring washer M12 DIN	4	12.5	L32D.10.00.24	Washer	2
3	30301221006	Washer M12DIN125A	4	12.6	30301240095	Nut M8DIN6923	2
4	S203	Electrical motor	1	12.7	L20GX-17.10.04	Washer	1
4.1	30301260057	Key 8X7X36DIN6885A	1	12.8	30301221004	Washer M8DIN125A	1
5	D4X2X650	Seal	1	12.9	30301240106	Nut M8DIN985	1
7	L20E15.20.00-1	Base plate	1	13	30301210078	Bolt M8x45DIN 933	3
8	L20GX-15.00.01-K	Flange	1	14	30301250002	Circlip B65DIN471	1
9	L20GX-15.00.02	Chain Pulley	2	15	L20E10.00.08	Central pulley	1
10	30301210048	Bolt M6X12DIN6921	8	16	L25SPS-00.00.00.15	Washer	1
11	06BH-35	Chain	1	17	30301230002	Screw	1
12	L20GX-17.00.00	Tensioner assembly	1	18	30308000103	Belt	1
12.1	L20GX-17.10.00	Chain Tensioner	1	19	30302000008	V-Ring Type A	1
12.2	30301240023	Nut M8DIN934	4	20	06BH-79	Chain	1
12.3	L21X-17.00.01	Pin	2				

11.14 PULLEY UNITS

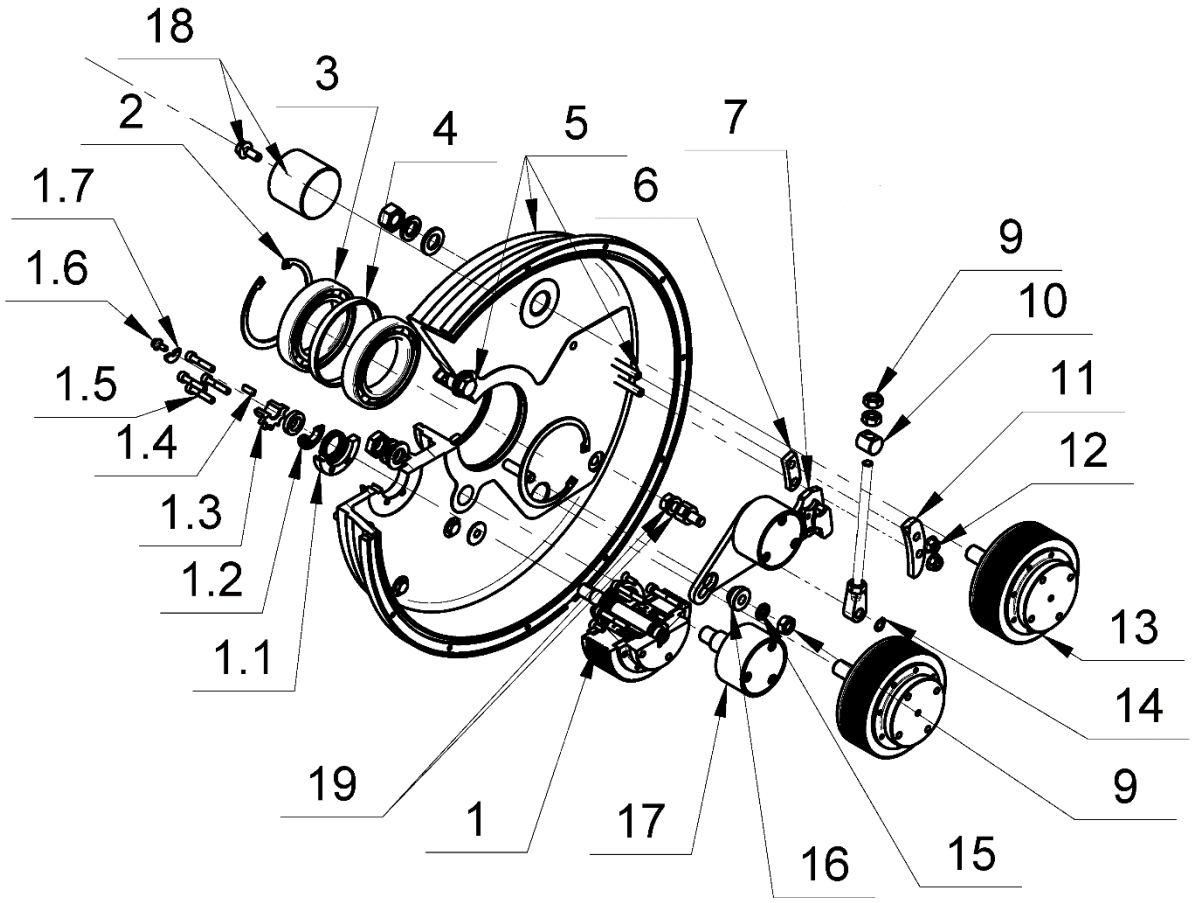


Figure 11.14

11.14 LAVINA® 20NEB PULLEY UNITS									
No.		**Item No.**	**Description**	**Pcs.**	**No.**		**Item No.**	**Description**	**Pcs.**
1		L20GX-16.00.00	Driving Pulley Unit	1	6		L20NS-10.00.12	Sector	1
	1.1	L20S-16.00.11-K	Flange with seal	1	7		L20NS-12.00.00	Tensioning Support	1
	1.2	L20S-16.00.14	Washer reflective	1	9		30301240099	Nut M10DIN934	3
	1.3	L20GX-16.00.02	Drive chain pulley	1	10		L32C-14.20.04	Nut	1
	1.4	30301260060	Key 5x5x16DIN6885A	1	11		L20NS-10.00.11	Sector	1
	1.5	30301230042	Screw	5	12		30301240095	Nut M8DIN6923	2
	1.6	30301210030	Bolt M5X12DIN6921	1	13		L20X-11.00.00	Pulley Unit Assembly	2
	1.7	L25X-10.00.46	Washer	1	14		30301250003	Retaining Ring	1
2		30301250009	Retaining Ring	2	15		30301220004	Spring Washer	1
3		30303000012	Roller Assembly	2	16		L20NS-10.00.14	Axle Bushing	1
4		L25SPS-00.00.00.34	Distance Ring	1	17		20GX-13.00.00	Roller Unit Assembly	1
5		L20GX-10.00.10-K	Disc	1	18		L20NS-10.00.58-K	Balancing weight	1
					19		L20N-S-10.00.13-K	Axis	1

11.15 DRIVING PULLEY UNIT PARTS

11.15 LAVINA® 20NEB DRIVING PULLEY UNIT PARTS			
No.	**Item No.**	**Description**	**Pcs.**
1	30301260055	Key 5x5x25DIN6885A	1
2	L20GX-16.00.13-K	Shaft	1
3	30301260060	Key 5x5x16DIN6885A	1
4	L20S-16.00.11-K	Flange	1
5	30301230042	Screw M6x30 DIN 912/10.9/	5
6	L20S-16.00.14	Washer	1
7	L20GX-16.00.03	Distancing sleeve	1
8	L20GX-16.00.02	Drive chain pulley	1
9	L25X-10.00.46	Washer	1
10	30301210030	Bolt M5x12DIN6921	1

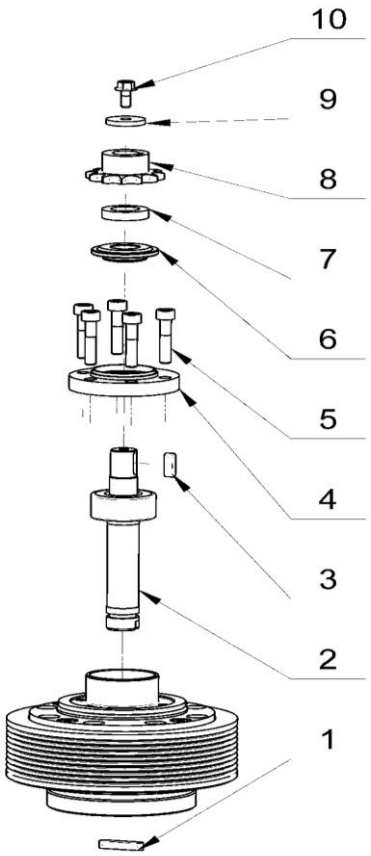


Figure 11.15

11.16 TOOL HOLDER PARTS

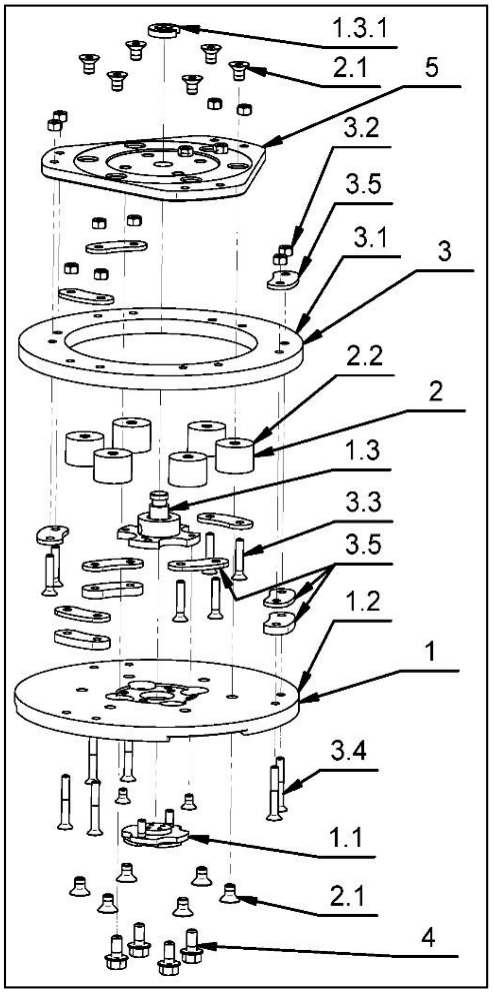


Figure 11.16

11.16 LAVINA®20NEB Tool Holder Parts/see also fig.8.7.13/ (pos.1 include pos.1.1;1.2;1.3/pos.1.3 include pos.1.3.1 and etc.)					
No.			**Item No.**	**Description**	**Pcs.**
1			A63.10.00	Quick Change Assembly	1
	1.1		A63.12.00	Keylock Set	1
	1.2		A41.11.00	Quick Change plate	1
	1.3	.	A41.12.00	Security set	1
		1.3.1	A41.00.05	Washer A41	1
2			A25.00.10-K	Buffer with two screw	6
	2.1		30301230161	Screw M8X12DIN7991/10.9/	12
	2.2		A25.00.10	Buffer	6
3			A41.20.03-K	Driving Set A41	1
	3.1		A41.20.03	Elastic Element	1
	3.2		30301240124	Self Locking Nut M6DIN980V	12
	3.3		30301230123	Screw M6X30DIN7991-10.9	6
	3.4		30301230131	Screw M6X40DIN7991-10.9	6
	3.5		A41.21.00	Set of plates	1
4			30301210072	Bolt M8x16DIN6921	4
5			A41.20.01	Flange	1

11.17 LAVINA 20NEB CONTROL BOX PARTS 200-240V

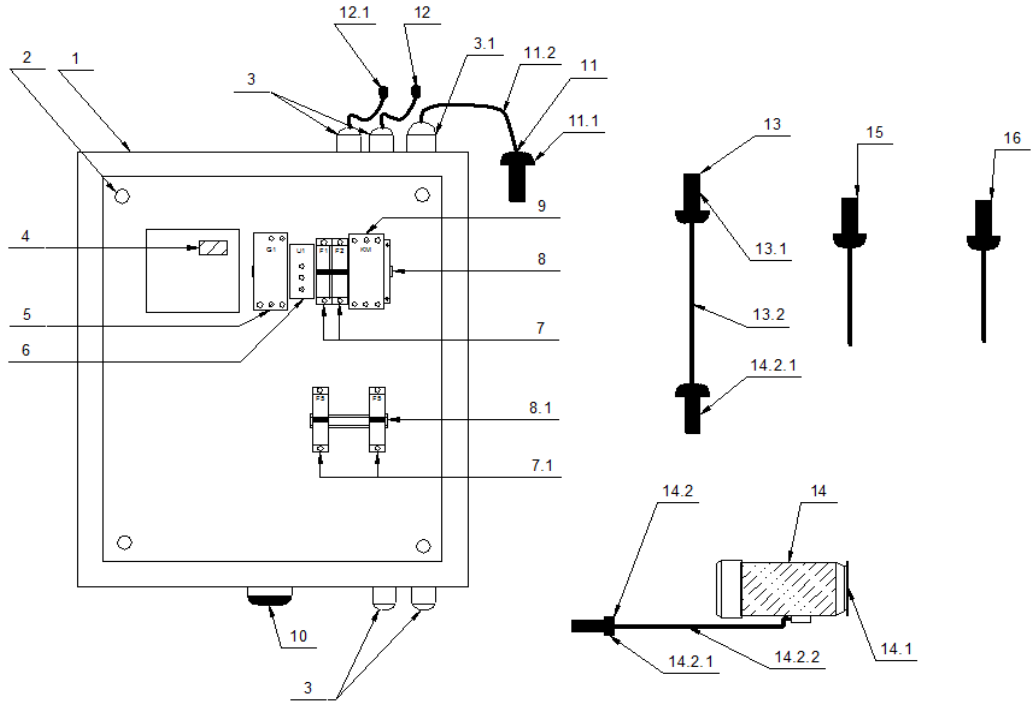
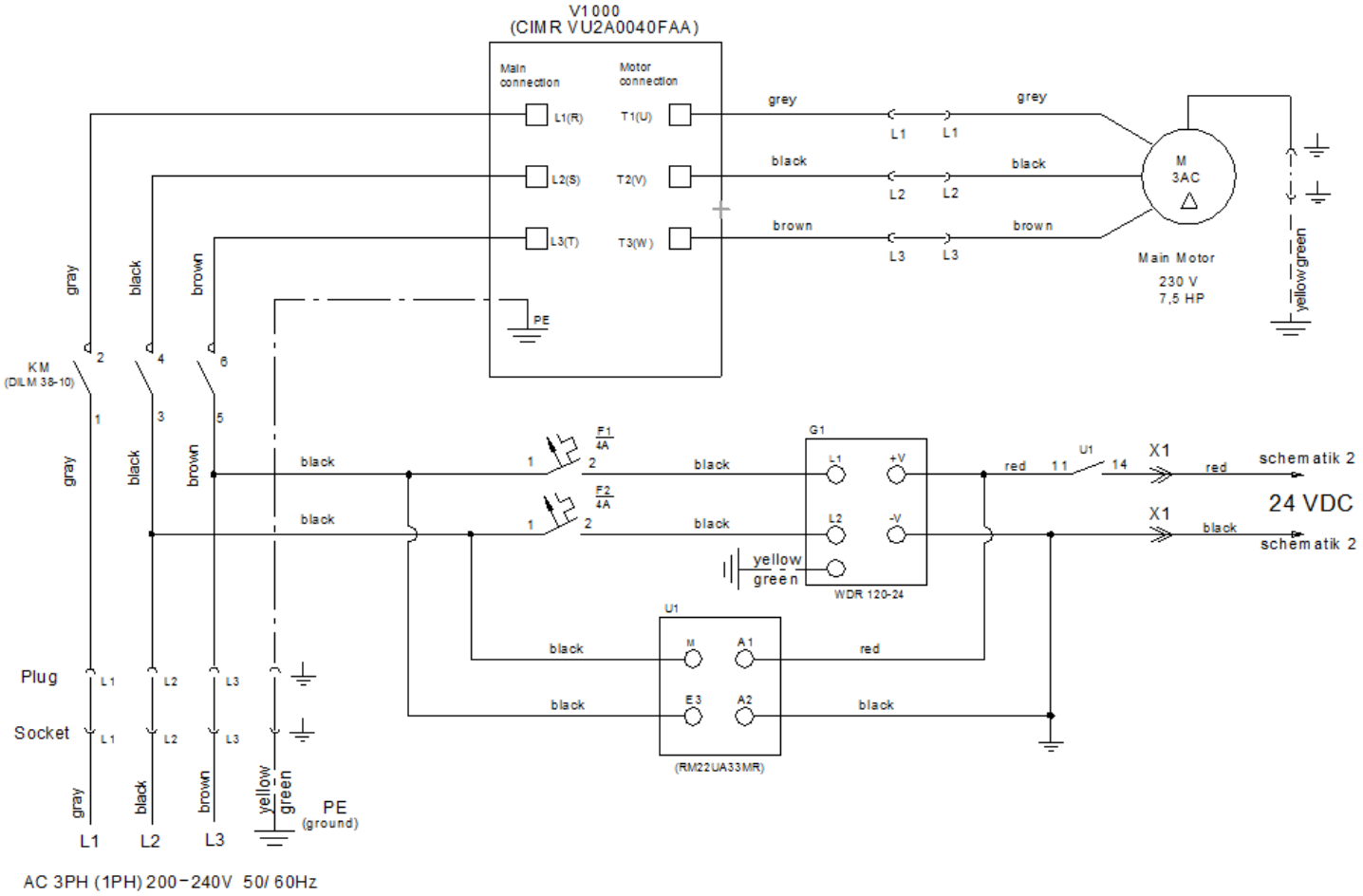


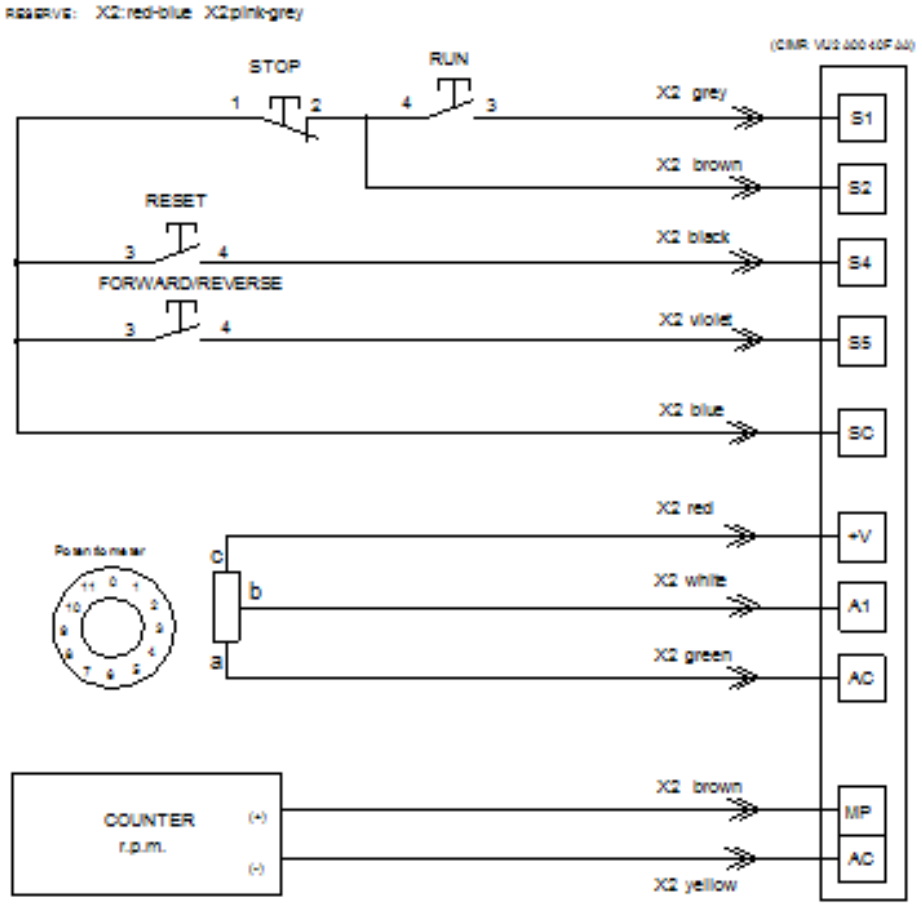
Figure 11.17

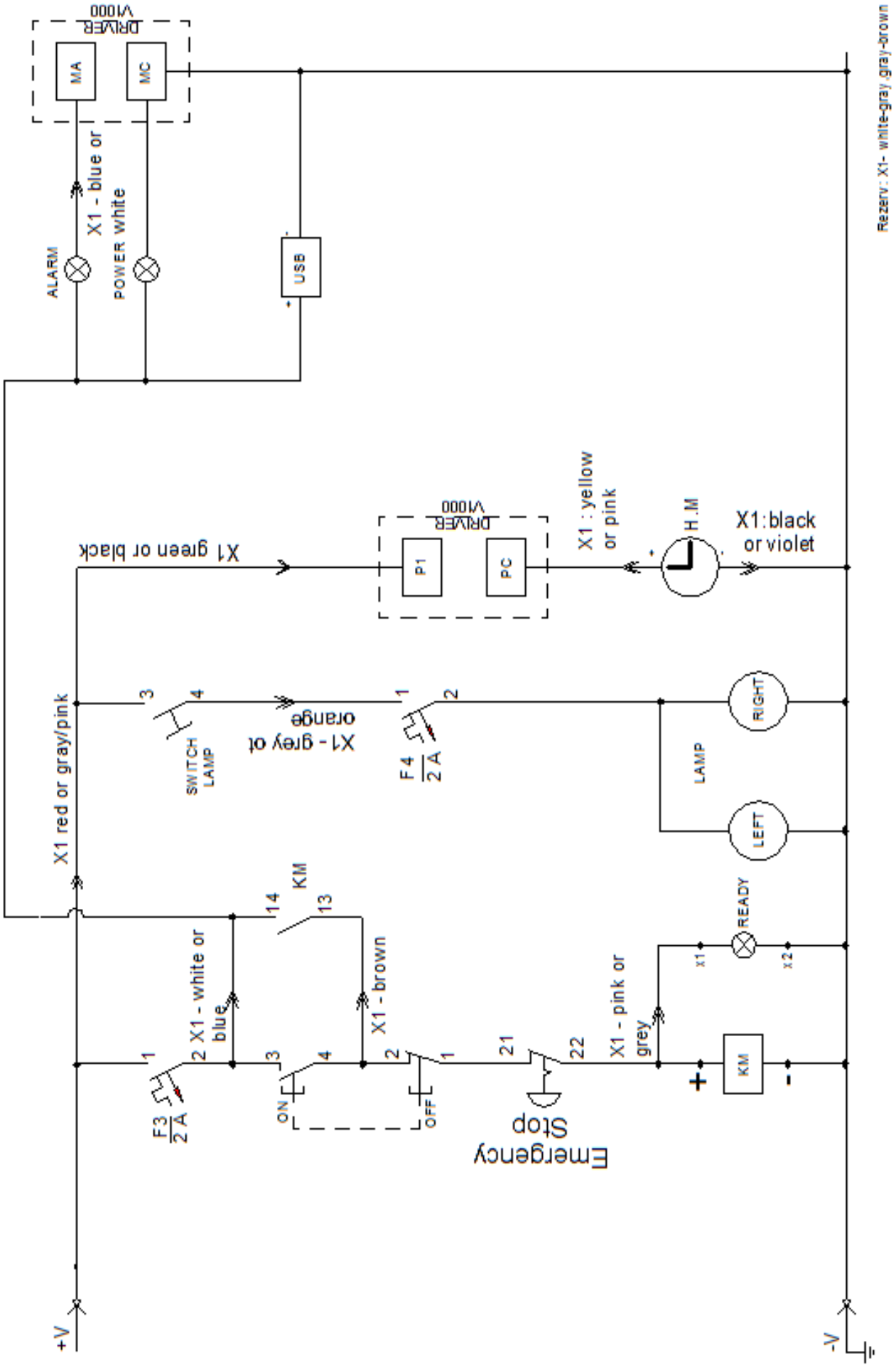
11.17 Lavina 20 NEB CONTROL BOX PARTS 200-240 V							
No.	**Item No.**	**Description**	**Pcs.**	**No.**	**Item No.**	**Description**	**Pcs.**
1*	L20NEB25.10.01	Metal Box/only/	1	11.1	30311000063	Plug on Control Board	1
2	L20NE25.20.01	Metal Box Plate/only/	1	11.2	L20NE25.31.00	Cable	1
3	30311000401	Cable Gland 16x1,5	4	12	L20EB25.51.00	Cable X1 Control Box	
3.1	30311000405	Cable Gland 25x1,5	1	12.1	L20E25.54.00	Cable X2 Control Box	1
4	30313000101	Inverter Yaskawa (V 1000)	1	13	L20NS-30.02.00	Cable with Conector and Plug	1
5	30313000190	Power supply	1	13.1	30311000043	Conector	1
6	30311000191	Voltage Relay	1	13.2	L20NS-30.02.02	Cable	1
7	30311000600	Circuit Breaker - 4 A	2	14	L20NS30.20.00	Electro Motor Assembly	1
7.1	30311000612	Circuit Breaker - 2 A	2	14.1	S203	Electro Motor	1
8	L20NE25.20.02	Rail	1	14.2	L20NS30.20.10	Cable for Electro Motor	1
8.1	L32EHV25.20.03	Rail	1	14.2.1	30311000045	Plug	2
9	30311000189	Contactor	1	14.2.2	L20NS30.20.12	Cable	1
10	30311000044	Socket	1	15	L20NS-30.03.00	Pigtail 3 Phase	1
11	L20NE25.30.00	Cable on Control Board	1	16	L20NS-30.01.00	Pigtail 1 Phase	1

11.18 ELECTRICAL SYSTEM

Dust should not enter the control box, as it will destroy the contacts. Remove (blow out) any dust present






DRIVER V1000
MA
MC
X1 - blue or
POWER white
ALARM
USB
Rezerv: X1- white-gray ,gray-brown
X1 green or black
P1
PC
X1 : yellow
or pink
H .M
X1:black
or violet
X1 red or gray/pink
SWITCH LAMP
X1 - grey ot
orange
F 4
2 A
RIGHT
LAMP
LEFT
KM
READY
X1 - white or
blue
X1 - brown
X1 - pink or
grey
F3
2A
ON
OFF
Emergency
Stop
+V
-V