

LAVINA®



LAVINA® 30G-X/FX/GTX 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*

WARRANTY AND RETURNS

WARRANTY POLICY FOR LAVINA® X 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 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 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® X MACHINES

The Lavina® X 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.

SAFETY INFORMATION 17**WARRANTY AND RETURNS 3****1. GENERAL INFORMATION 5**

MANUFACTURER 5

GENERAL DESCRIPTION 5

MACHINE CHARACTERISTICS 5

LAVINA® 30G-X MAIN DESIGN 5

ENVIRONMENTAL CONDITIONS 6

VACUUM CONNECTION 6

TECHNICAL DATA 6

TECHNICAL DATA 6**2. SAFETY INSTRUCTIONS 7**

SAFE USE 7

PREPARATION FOR WORK 7

PROTECTION DEVICES 7

ARREST FUNCTIONS 7

PROPANE SAFETY 7

FIRE SAFETY 7

EMISSIONS 7

HAZARD COMMUNICATION 8

LOCAL AGENCIES AND REGULATIONS 8

RESIDUAL RISKS 8

BEFORE YOU BEGIN 8

OPERATING MACHINE 9

AFTER WORK IS COMPLETED 9

THE WORK AREA 9

PERSONAL PROTECTIVE EQUIPMENT (PPE) 9

TESTING 9

OPERATOR 9

PROPANE CYLINDERS 9

REFUELLING CYLINDERS 10

STORAGE CYLINDERS 10

TRANSPORTING CYLINDERS 10

3. HANDLING AND TRANSPORTATION 11

ADJUSTING THE HANDLE 11

LIFTING THE MACHINE FROM WORKING TO TOOL

MOUNTING POSITION 11

LIFTING 11

STORAGE 12

MOUNTING OF GUARD ASSEMBLY 12

WATER FLOW CONTROL UNIT 13

ADJUSTING AND MOUNTING TOOLS 13

ALARM 13

CONTROL BOARD 14

THE CONTROL BOARD 14

CONTROL BOARD WITH GTX SYSTEM 14

STARTING THE MACHINE 14

OPERATING THE MACHINE 14

STOPPING THE MACHINE 15

FUEL-MINDER USER MANUAL 15

SYSTEM COMPONENTS 15**OVERVIEW OF FEATURES 15****MAIN MENU NAVIGATION AND USE 16****MAIN MENU 16****OPTIONS MENU NAVIGATION AND USE 16****OPTIONS MENU 16****5. TOOLS AND ACCESSORIES 18**

WEIGHTS 18

TOOL HOLDER KEY 18

FOAM PLATE 18

SECURITY PLATE FOR QUICKCHANGE PADS 18

6. POPULAR TOOLS 19**7. MAINTENANCE AND INSPECTION 20**

REMARK 20

MECHANICAL PARTS 20

CLEANING 20

CHECK HOURLY 20

CHECK DAILY 20

CHECK AND REPLACE AFTER THE FIRST 8 WORKING HOURS 20

CHECK AND REPLACE EVERY 50 WORKING HOURS 20

CHECK AND REPLACE EVERY 200 WORKING HOURS 21

CHECK AND REPLACE EVERY 400 WORKING HOURS 21

VACUUM 21

WATER LEAKS 21

MECHANICAL PARTS 21

ELECTRICAL SYSTEM 21

ELECTRICAL SYSTEM GTX 22

8. TROUBLESHOOTING 23

8.1 ENGINE 23

8.2 CHECKING AND CHANGING OIL 23

8.3 SEPARATING THE HEAD FROM THE CARRIAGE 23

8.4 DISMOUNTING/MOUNTING THE ENGINE 24

8.5 REPLACING THE CLUTCH 25

8.6 DISMOUNTING TOOL HOLDER TO CHANGE V-RINGS AND

FELT-RINGS 25

8.7 DISASSEMBLING AND MOUNTING TOOL HOLDER TO

CHANGE BUFFERS AND ELASTIC ELEMENT 26

8.8 CORRECTING SAG OF THE USED PLANETARY CHAIN 27

8.9 MOUNTING NEW PLANETARY CHAIN 27

8.10 REPLACING THE PLANETARY DRIVING GEAR AND

PLANETARY TENSIONER 28

8.11 TENSIONING AND REPLACING THE BELTS 29

8.12 REPLACING THE PLANETARY DRIVEN GEAR 31

8.13 REPLACING THE PULLEY UNITS 31

8.14 REPLACING THE PLANETARY UNIT 32

WHEN MOUNTING BACK SECURE WITH SEALANT (Fig.8.14.3). 32

9. DISPOSAL 32**10. MANUFACTURER'S CONTACTS 32**

1. LAVINA® 30G-X GENERAL PARTS 33

11. SPARE PARTS 33

ASSEMBLY AND PARTS SPECIFICATIONS 33

2. LAVINA® 30G-X TOP COVER 1 PARTS 33

3. LAVINA® 30G-X ENGINE BASE PARTS 34

4. LAVINA® 30G-X TOP COVER 2 PARTS 35

4.1. LAVINA® 30G-X GUARD PARTS 35

5. LAVINA® 30G-X PLANETARY DRIVE PARTS 36

5.1. LAVINA® 30G-X PULLEY UNIT ASSEMBLY 37

6. LAVINA® 30G-X WATER TANK PARTS 37

7. LAVINA® 30G-X BOTTOM COVER 1 PARTS.....	37	13. LAVINA® 30G-X KAWASAKI FS481V ENGINE PARTS.....	41
8. LAVINA® 30G-X TOOL HOLDER PARTS	38	LAVINA® 30G-X KAWASAKI FX600V ENGINE PARTS	41
9. LAVINA® 25G-X BOTTOM COVER 2 PARTS.....	38	14. EMISSION CONTROL WARRANTY STATEMENT	42
10. LAVINA® 30G-X CONTROL BOARD PARTS	39		
10. LAVINA® 30G-GTX CONTROL BOARD PARTS.....	39		
12. LAVINA® 30G-X CARRIAGE PARTS.....	40		

1. GENERAL INFORMATION

This owner's manual is intended for the operator of the Lavina® X 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® X floor grinding and polishing machine.

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.

GENERAL DESCRIPTION

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

MACHINE CHARACTERISTICS

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

LAVINA® 30G-X MAIN DESIGN

- **The two main components** are the carriage and main head.

The handle on the frame is adjustable in height and allows the operator to work in a correct and safe posture.

- **The halogen spotlight** (Fig.1.2) enables the operator to work in darker areas.

⚠ WARNING Built-in lighting system does not replace adequate overhead lighting.

- **The propane tank** is placed on a tank holder on the backside of the frame.
- **The control panel** (fig.1.3) is positioned on top of the frame and contains switches that allow the operator to start/stop the engine, apply the electromagnetic clutch, and navigate the machine.
- **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. An electric pump sprays the water through a front- or internal sprayer
- **The engine (Kawasaki FS481V)** with electric clutch is mounted on the base plate and drives the three heads with a belt system.
- **The planetary motion** is derived from the main engine, driven by a simplex roller chain.
- **The self-leveling Guard** is designed to maintain contact with the surface at all times, regardless of the height of the tool used.
- **The "Quickchange" tool holder** is designed to hold the tools with "Quickchange" connection.
- **The "Foam" tool holder** is designed to hold tools with Velcro connection. It is mounted on each of the three grinding heads with a key lock (butterfly). The Velcro mounting system allows for quick, easy changing of tools.



Figure 1.1



Figure 1.2



Figure 1.3

ENVIRONMENTAL CONDITIONS

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

VACUUM CONNECTION

A connection for a vacuum dust extractor is located on the carriage. The Lavina® X machine does not include a vacuum dust extractor. The customer must purchase the vacuum dust extractor separately. The hose of the vacuum extractor must be Ø 50.8 mm and can be glided over the pipe. The vacuum dust extractor must be adapted for floor grinders and have a minimum air displacement of 320m³/h with a negative vacuum of 21 kPa.

TECHNICAL DATA

TECHNICAL DATA	Lavina® 30G- X		Lavina® 30G- X	
Engine	Kawasaki FS481V		Kawasaki KFX600-BS	
Capacity of engine	603cc	36.8cu.in	603cc	36.8cu.in
Power	13kW /3600 min	18 hp/3600 min	14.2kW /3600 min	19 hp /3600 min
Tool holder rpm	570-1030 rpm		570-1030 rpm	
Engine rpm	2000-3600 rpm		2000-3600 rpm	
Working width	765 mm	30.1"	765 mm	30.1"
Tool holder diameter	3 x 335 mm	3 x 13.2"	3 x 335 mm	3 x 13.2"
Weight	276	610 lbs	275	628 lbs
Grinding pressure	170 kg	375 lbs	178kg	393 lbs
Additional weight	max 2x29 kg	2x 64 lbs	max 2x29 kg	2x 64 lbs
Application	wet and dry		wet and dry	
Vacuum hose port	Ø 50,8 mm	2"	Ø 50,8 mm	2"
Water tank capacity	20 l	5.2 gal	20 l	5.2 gal
Water feed	Peripheral and front stream with pump		Peripheral and front stream with pump	
Capacity Propane tank	9kg	20lbs	9kg	20lbs
Machine LxWxH	1930x805x1110 mm	76"x32"x47"	1930x805x1110 mm	76"x32"x47"
Packing crate LxWxH	1480x820x1560 mm	58.3"x32.3"x61.5"	1480x820x1560 mm	58.3"x32.3"x61.5"

VIBRATIONS

The vibrations of the machine are within the limits of directives and harmonized standards from the European Union when the Lavina® X 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® X is operated with the recommended tools and in normal conditions. However, the operator must wear ear protectors.

LABEL DATA

The data on the label provides the correct Voltage and Power (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® 30G-X 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.

PROHIBITED USE

The machine **MUST NOT** be used:

- For applications apart from the ones stated in the General Description chapter.
- 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.
- In nursing homes, hospitals, day-care centers, etc
- In areas where loose tiles or other objects are preventing proper use of the machine.
- In rooms without proper ventilation
- In nursing homes, hospitals, day-care centers, etc
- In areas where loose tiles or other objects are preventing proper use of the machine.
- In rooms without proper ventilation

PREPARATION FOR WORK

Make sure that:

- The work area is closed so that no person unfamiliar with operating the machine can enter the area
- The tool plate and tools are mounted on the machine properly
- There are no missing parts of the machine
- The machine is in upright working position
- The protection devices are working properly.

PROTECTION DEVICES

- The machine is equipped with several protection devices including the following:
- A protection skirt and a hood for protecting the tool plates.
- The EnviroGard Emissions Monitoring System
- These devices protect the operator and/or others 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.

ARREST FUNCTIONS

- Methods of arresting of the machine are following:
 - Switch to stop the engine
 - Button to stop the grinding movement
 - Close the propane tank



WARNING

SAFE USE



WARNING

The LAVINA® 30GX is designed to reduce all risks correlated with its use. However, it is not possible to fully eliminate the risks of an 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
- Entanglement Risks due to wearing inappropriate working clothes
- Training Risks due to lack of operational training

PROPANE SAFETY



WARNING

- Propane is a flammable gas whose vapors are heavier than air. As is the case with gasoline, propane can explode if the proper cautions are not heeded. Propane is odorized with an agent having a distinct odor that is recognizable at very low concentrations. This helps in identifying leaks, even when they are small.
- Awareness and basic safety precautions are required when working with propane. As long as these precautions are followed, risk is negligible. Ignorance, however, could pose needless risk.
- The two greatest hazards with propane powered floor care machines are:
 - **Carbon Monoxide Poisoning:** This is the most frequently reported incident associated with propane powered floor care machines and is caused by excessive exhaust emissions. The symptoms are headache, dizziness and nausea. A major cause involves engines with poor preventive maintenance practices, usually those with dirty air filters and machines operated in confined areas without adequate ventilation. Another cause may be substandard, inexpensive machines with no emissions control technology and improperly set carburetion.
 - **Overfilled Fuel Cylinders:** Nearly all fire-related incidents reported result from bringing a cylinder into a building without first checking for overfill. This action is dangerous, unwise, and unnecessary.

FIRE SAFETY



WARNING

- Be aware of the potential dangers of fire or explosion when using propane, and take normal fire-safety precautions.
 - Fire:** There is a possibility of fire from LPG vapor leaking or venting from fuel cylinders or carburetion equipment.
 - Explosion:** LPG vapor concentrated or confined to a small, restricted space may explode or ignite.
 - Propane** may experience a **BLEVE**, a boiling liquid expanding vapor explosion.

EMISSIONS



WARNING

- All propane-powered floor care machines produce emissions. Most are harmless, but some are dangerous and can be fatal. Carbon monoxide (CO) poses the greatest risk, since CO can be lethal within as little as 30 minutes exposure at 3,000 parts per million (ppm) concentration.

- Carbon monoxide is an invisible, odorless, colorless gas created when fossil fuels (such as gasoline, wood, coal, propane, oil and methane) burn incompletely.

HAZARD COMMUNICATION**WARNING**

- A **Material Safety Data Sheet** for propane is to be posted in all buildings where propane will be used. Because propane is odorized, it is easily detected at levels of just a few parts per million, which is far below than the exposure limit of 1000 parts per million.

If you smell propane while operating a propane floor care machine, do the following:

Stop the engine:

1. Pull the throttle to the stop position (if present) or turn the key switch to the off position.
2. Shut off the service valve on the propane cylinder.
3. Move the floor machine to a well-ventilated area.
4. Remove the cylinder from the machine and take it outside the building.
5. If the cylinder is leaking, contact a DOT approved repair shop to determine the cause of the leak and have the shop, not you, repair it.

If a fire occurs while the machine is being operated, do the following:

1. Stop the engine: pull the throttle to the stop position (if present) or turn the key switch to the off position.
2. Shut off the service valve on the propane cylinder if possible. Be careful not to be burned.
3. Move the machine outside if possible. If not possible, move it to a well-ventilated area away from flammable materials.
4. Do not attempt to extinguish the flame from a gas leak. If you do, the gas will build up in the area and could re-ignite. Starve the fire by shutting off the supply of gas.
5. HAVE THE MACHINE AND CYLINDER INSPECTED BEFORE USING THEM AGAIN

LOCAL AGENCIES AND REGULATIONS

- NFPA**

Operating a propane powered floor care machine requires compliance with certain safety regulations. The National Fire Protection Agency (NFPA) Standard for Storage and Handling of LP Gas is the appropriate authority for safe propane use. A copy of this publication is available through the NFPA in Quincy, MA (1-800-334-3555). Among its regulations, NFPA #58 requires that all personnel employed in the handling of propane gas be trained in its proper handling and operating procedures. It also requires them to carry a written certification from their employer or training supervisor to attest to such training. Although this is directed mainly to those who fill and transport liquid propane gas, Onyx Environmental Solutions recommends that operators of propane powered floor care machines in public places be trained and certified as well.

With regard to operation of propane powered floor care equipment, even though NFPA 58 8-4.5 says "these machines shall be permitted to be used in buildings frequented by the public, including the times when such buildings are occupied by

the public," Onyx Environmental Solutions suggests usage when occupancy of a given work area is minimal.

- CARB / EPA**

The California Air Resource Board (CARB) and Environmental Protection Agency (EPA) also set limits for propane-powered engines used outdoors, but CARB/EPA approval does not signify that the engine is safe to use indoors.

- CGA**

The Canadian Gas Association (CGA) has set a limit of 1500 ppm CO in exhaust flow.

- OSHA**

For propane powered machines used indoors, the Occupational Health and Safety Administration (OSHA) has established a limit of 50 ppm CO for 8-hour time weighted average (TWA) in ambient air and is considering a limit of 800 ppm CO in exhaust flow.

- DOT**

The Department of Transportation (DOT) has established regulations regarding the safety of fuel cylinders including the ones used on propane powered floor care machines.

- Local Agencies**

Local law enforcement agencies such as the local Fire Marshall also rely on independent testing labs such as UL and CGA before giving their approval of the use of some equipment. These labs thoroughly test equipment and submit their stamp of approval only after rigorous testing. While not being required by all law enforcement agencies, the stamp of approval by these agencies further assures the operator that he or she is working with and around safe equipment.

NOTE: In order to reduce all consequences of the above- mentioned risks, we advise that machine operators will follow the instructions in the manual at all times.

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.

BEFORE YOU BEGIN**WARNING**

- Clear working area of any debris or objects.
- A first-time operator must always read the manual and pay attention to all safety instructions.
- All propane connections and cables must be inspected for potential damages.
- Perform general daily inspections of the machine and inspect the machine before each use.
- Always inspect the safety devices:
- The tool protector must be working
- Mount the security disc when working with Quickchange Pads.
- 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 running 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 a tilted position when starting

OPERATING MACHINE**WARNING**

- When operating the Lavina® 30G-X, make certain that there is no one, but you around the machine.
- Never leave the machine unattended while working.
- The water hose must move freely and must be damage-free.
- Make sure the working surface is not too uneven. If it is, it may damage the machine.

AFTER WORK IS COMPLETED

Clean the machine and its surroundings properly

- Empty and clean the water tank
- Store the machine in a safe place
- Place the Propane bottle outside in designated storage

THE WORK AREA**WARNING**

- Prevent people or vehicles from entering the work area.
- Clear all hoses and cables from the work area.
- Always check the floor for debris

PERSONAL PROTECTIVE 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.
- Always wear Carbon Monoxide Indicator badges as an extra precaution.
- The plastic indicator contains a colored indicator button that darkens in the presence of Carbon Monoxide. The relative darkness of the indicator button indicates the level of CO in the ambient atmosphere. Most indicator badges have a useful life of 30 days, depending on the concentration of contaminants, humidity, and temperature.

TESTING**WARNING**

- There are a great number of instruments offered on the market to test for toxic gases. Only those designed to read carbon monoxide resulting from combustion engines are considered acceptable for testing exhaust emissions from propane powered floor machines.
- Some instruments are used to read "ambient air" and may be damaged if used to take readings in the muffler or tail pipe. Selecting the proper instrument is an important part of meeting the testing requirements.
- Generally speaking, units capable of reading in ppm, (parts per million), at ranges from 0 to 1000 are adequate for checking ambient air (air in the breathing zone of the operator). Instruments capable of testing carbon monoxide in the exhaust should be able to read from 0 to at least 2000 ppm and should be certified by the manufacturer for that purpose.
- Some instruments and systems used for these purposes are:

1) AMBIENT AIR MONITORING

DRAGER Model 190: Manufactured by National

Drager.

SENSIDYNE gas sampling system with YB-11038

Sensidyne detector tubes

DRAGER gas sampling system with YB-4620 Drager detective tubes

GAS-TECH Model CO-95

ENERAC POCKET 60: Manufactured by Energy Efficiency System

2) ENGINE EXHUAUST ANALYZERS HORIBA

GAS ANALYZER

ENERAC 2000 COMBUSTION ANALYZER

ENERAC POCKET 60

3) DATA LOGGERS

INDUSTRIAL SCIENTIFIC CORP. MODEL STX-70

CO MONITOR, Data-Logger

BIOSYSTEMS INC. "TEXILOG" Data-Logger

- All instruments used for testing must be calibrated at intervals recommended by the manufacturer. The monitor, model number and date of calibration will be recorded with all test results.

OPERATOR**WARNING**

- The operator must know the machine's work environment.
- Only one operator can work with the machine at a time.
- 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 be able to interpret all the drawings and designs in manual.
- The operator must know all sanitation and safety regulations pertaining to the operation of
- The operator must have floor grinding experience.
- The operator must know what to do in case of emergency.
- The operator must have adequate technical knowledge and preparation.
- The operator is expected to operate their equipment safely and responsibly. They are responsible for the proper handling and storage of propane cylinders, identifying potential hazards associated with his job and avoiding these hazards at all times.

PROPANE CYLINDERS**WARNING**

- The Propane cylinders are constructed of either aluminum or steel. We recommend aluminum because it is lighter and guards against rusting. The cylinder used on propane powered floor machines is classified as a 4E240 cylinder. Its rated capacity is 20 lbs. and this designation refers to the model of the cylinder. Actual propane capacity achieved during filling can be less than, equal to, or slightly more than 20 lbs. Use only UL, CTC/DOT listed cylinders.
- The propane cylinder used on the floor machine is a motor fuel cylinder as listed by the Department of Transportation. Unlike

the common 20-lb propane outdoor grill cylinders (which are not legal for use on propane floor machines), the motor fuel cylinder has a number of safety systems designed into it to ensure your safety at all times.

- There are two types of 20 lb. motor fuel cylinders.
 - Liquid draw
 - Vapor draw
- The liquid draw cylinder is used on larger vehicles like forklifts. These machines have special vaporizing carburetors to allow the propane to change from a liquid to a gas before being burned in the combustion chamber.
- The vapor draw cylinder is used on small machines like the propane powered floor care machines. The vacuum generated by the engine draws up the Propane gas vapor through the fuel system. The propane powered floor care machine does not have an evaporating system and will freeze up if liquid propane is introduced to it. It is necessary that special attention be paid to ensure that neither the liquid nor the vapor draw cylinders be overfilled.

REFUELLING CYLINDERS



WARNING

- The proper filling of propane cylinders is a subject so important that it warrants special attention. Propane cylinders should only be filled by qualified propane dealers.
- Most important, propane cylinders should be filled to no more than 80% of their rated capacity. The other 20%, which is about 4" (10 cm) from the top of the cylinder, is called the vapor space or headspace. This vapor can be compressed without causing the pressure relief valve to open and vent gas to the area around the cylinder. If there is no headspace to allow for fuel expansion, the pressure relief valve will open, releasing propane gas into the atmosphere. This is a very dangerous and volatile situation as there is always the possibility that enough of the vented gas could find its way down to the floor and come in contact with a pilot light from a furnace, hot water heater, or other source of ignition. Propane changes into a gas at -44°F (-42° C). Exposing unprotected skin to propane gas or liquid could result in frostbite injury.
- All new cylinders should be vented and purged of air per manufacturer's instructions before use. Never bleed propane cylinders indoors.

STORAGE CYLINDERS



WARNING

- When not in use, propane cylinders always should be stored outside in an upright position in a secure, tamperproof, steel mesh storage cabinet. This cabinet may be located next to the building but with at least five feet (1.5 m) of space between the cabinet and the nearest building opening (door or window), and away from heat and direct sunlight.
- Do not install the cabinet near a stairway or street elevator as vented propane gas will seek a lower level since it is heavier than air and could find its way into the basement of the building. Do not store cylinders full or empty inside a building or inside a vehicle. Although it is unlikely that propane will vent from a stored cylinder, if it should, the vapor could come in contact with an ignition source such as a spark from a power tool or other appliance and create a flash fire.
- Do not smoke or use a device with an open flame when handling or transporting propane cylinders.

TRANSPORTING CYLINDERS



WARNING

- When transporting cylinders to a propane dealer or to a job, make sure the cylinders are securely fastened and standing in an upright position with the service valve closed.
- A cylinder rattling around in the back of a vehicle and banging into other objects constitutes a hazard. Avoid dropping or banging cylinders against sharp objects. The propane cylinders are sturdily constructed but a series of hard jolts could cause damage.
- Please note that any cylinder that has been filled is always considered full, no matter how little propane gas remains in it. This is because even when all liquid has evaporated into vapor there is still some propane gas vapor left in the cylinder. Because this remaining fuel is flammable, an empty cylinder should be treated with the same careful procedures as one that is filled to the 80% level with liquid propane. The only time that a cylinder is considered empty is when it is new, before it has ever been filled with propane.
- When transporting a propane powered floor machine, the propane cylinder may be strapped onto the machine as long as the machine itself is firmly secured in the vehicle.
- Of course, spare cylinders should always be secured in an upright position.

3. HANDLING AND TRANSPORTATION

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). Choose the vertical position to move easy the machine (Fig.3.2).

To adjust, simply pull the locking pin (Fig.3.1) and move the frame. A loaded spring will return the pin and lock the handle in any of several positions (Fig.3.1.1).

To avoid turning the head during transport unscrew the butterfly, wing-headed screw and move the lever from pos.3.3a to pos.3.3.b

The lever must be in the position shown in Fig.3.3a when the machine is running, as well as to rotate the head when changing the tool.



Figure 3.1

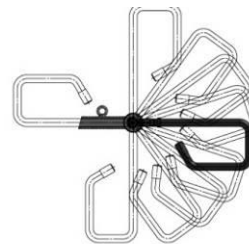


Figure 3.1.1



Figure 3.2

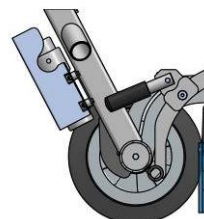


Figure 3.3a

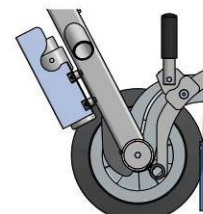


Figure 3.3b

LIFTING THE MACHINE FROM WORKING TO TOOL MOUNTING POSITION



Figure 3.4



Figure 3.5



Figure 3.5.1

Push the pin on the front handle down and swivel it to the front (Fig. 3.4). Pull the handle up and ensure the head is in a stable position for mounting/dismounting the tool. Ensure that the water tank is empty before flipping the machine. Pull the head into mounting position (Fig. 3.5.1).

LIFTING

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



Figure 3.6

STORAGE

Always store and transport the LAVINA® X machine in a dry place. Never transport the LAVINA® X machine unprotected; it may be damaged if transported unprotected during rain or snow.

⚠ WARNING When, during storage of the machine, the temperature may fall to 32F (or 0° C) or less, water should be emptied from the system using the following steps:

- Pull the hose out of the tank (Fig.3.7)
- Using compressed air, blow out excess water from the system for each position of the lever (Fig. 3.8, Fig. 3.9).



Figure 3.7



Figure 3.8



Figure 3.9

MOUNTING OF GUARD ASSEMBLY

To mount the guard assembly without separating the carriage from the main head, put the machine in the position shown in Fig 3.10, and rotate the Guard Assembly (Fig 3.11). Pull back the Guard Assembly so that the Tool holders have pass through it (Fig 3.12). Put the Guard Assembly in position (Fig 3.13), and secure.

Dismounting must be done in reverse sequence.



Figure 3.10



Figure 3.11



Figure 3.12



Figure 3.13

4. OPERATION

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 the bonnet air filter on top of the engine is clean. It should be cleaned hourly.

Check the engine oil level, screw the dipstick in to get reading. Make sure the tank is full (see also "Storage Propane tanks").

TANK and FUEL LINES - Check the tank and fuel lines for any sign of wear and tear, such as cracks or any corrosion. Screw the brass fuel line fitting onto the tank service-valve (hand tight only). This connection **MUST** be secure because the service valve has a safety valve inside it, which will only open if the brass fuel-line fitting is **COMPLETELY** seated into the service valve.



Figure 4.1



Figure 4.2



Figure 4.2.1

WATER FLOW CONTROL UNIT

The operator can direct water to be sprayed in the front (Fig.4.1) by positioning the lever in the horizontal position; the water will spray under the cover of the machine when the lever is in the vertical position (Fig.4.2). The flow regulating valve located on the tank (Fig.4.3) controls the water flow to the working area – in front of the machine or under the main head cover of the machine.

ADJUSTING AND MOUNTING TOOLS

The Holder A43 in LAVINA® X can work with either 3 or 6 rubber buffers, which will alter its elasticity (3 will be more flexible than 6). You can make the change after dismantling the holder as per the instructions in TROUBLESHOOTING.

In the Lavina 30-G-X, 6 buffers are initially mounted.

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

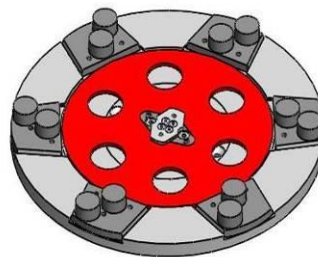


Figure 4.3

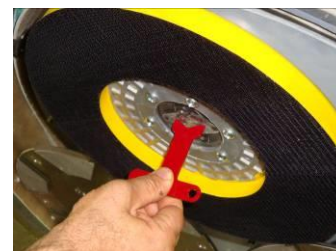


Figure 4.4

WARNING: Always Secure the Quick Change tools with the security plate (Fig.4.3 in red), lock with the tool holder key (Fig.4.4) and make sure that the butterfly is securely locked at 90 degrees. Diamond tools with Velcro are attached on three foam plates (13,2 inch). The foam plates are mounted on the key lock (butterfly). Always use the tool holder key (Fig.5.3).

ALARM

EnviroGard employs a sensor (Fig. 4.6) in the exhaust path between the engine and the catalytic muffler to detect the oxygen content of the exhaust before it is passed through the catalyst. The oxygen sensor does not react to nor does it measure the CO content of the exhaust. It responds only to oxygen content.

- The Control Module is set to ignore the readings from the oxygen sensor during the first three minutes the engine is running. This period allows: The sensor to reach a stable operating temperature.
- The catalyst in the muffler to reach the temperature necessary to reduce the levels of CO, nitrogen oxides (NOx) and hydrocarbons (HC) in the exhaust.



Figure 4.6

The most common event in which the Control Module shuts down an engine is when the air filter becomes dirty enough to restrict the air intake flow, which changes the air-fuel ratio such that the oxygen sensor signal is outside the control limits. Once the air filter is properly cleaned, operation of the machine can be resumed.

CONTROL BOARD

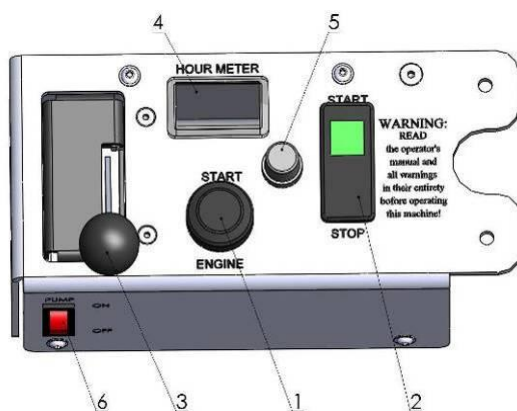


Figure 4.5

THE CONTROL BOARD

1 Start/Stop Engine switch Turn key fully to the right (make contact) to ignite the engine. Fully to the left will arrest the engine.

2 Start/Stop clutch Start will electronically activate the grinding plates to spin; stop will disconnect engine from grinding heads

3 Throttle Push forward to accelerate.

4 Digital Tachometer/workings hours indicator

When running, it indicates the revolutions per minute of the motor (see the conversion table to know the rpm of the tools). When not running, it indicates the worked hours.

The hour meter will blink between 48-52 hours as a reminder for oil change.

5 Fuse 30 Amp fuse for the electrical system.

6 Water pump switch Lights orange when the water pump is running.

pm engine	rpm tools
2000	570
2100	600
2200	630
2300	660
2400	690
2500	715
2600	745
2700	775
2800	800
2900	830
3000	860
3100	890
3200	915
3300	945
3400	975
3500	1005
3600	1030

CONTROL BOARD WITH GTX SYSTEM

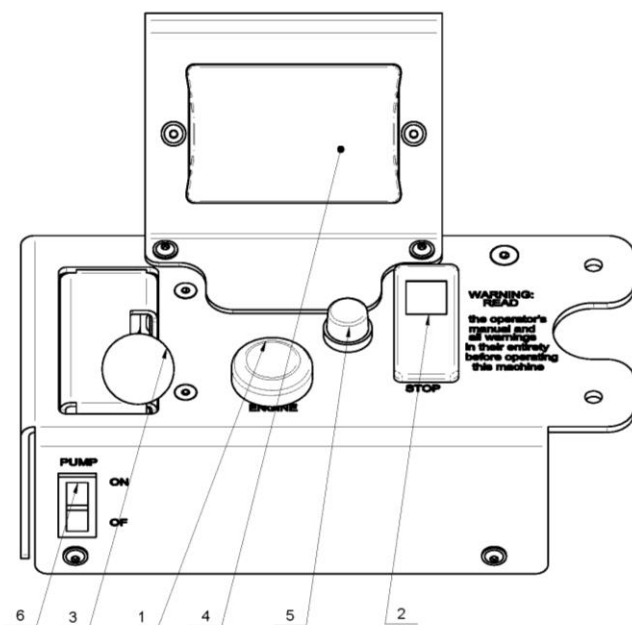


Figure 4.6

1 Start/Stop Engine switch Turn key fully to the right (make contact) to ignite the engine. Fully to the left will arrest the engine.

2 Start/Stop clutch Start will electronically activate the grinding plates to spin; stop will disconnect engine from grinding heads

3 Throttle Push forward to accelerate.

4. Complete Monitor Assembly (Fuel-Minder) is a high-performance digital fuel control system (fig. 4.6).

5 Fuse 30 Amp fuse for the electrical system.

6 Water pump switch Lights orange when the water pump is running.

STARTING THE MACHINE

First, follow the directions in the chapter on Safety Devices and Safety Instructions. Check oil level. Open the service valve on the propane tank about one and a half (counterclockwise) turns. Next, make sure the Start/Stop Clutch rocker (2) is in stop position and check that the throttle (3) in the **IDLE** position. This creates the necessary vacuum to open the lock-off valve inside the regulator. Actuation of the throttle lever will keep the lock-off valve from opening and the engine from getting fuel so the engine will not start. Proper maintenance will insure easy starting. Engage starter

(1) for a **MAXIMUM** of 5 to 6 seconds or until the engine fires. Serious starter damage will result if this is exceeded and the warranty may not apply. Operate the engine at half throttle for approximately two minutes to properly warm engine. Then advance to full throttle for best results. If working wet, add water to the floor surface. If working dry, instead switch on the vacuum unit. Finally, hold the machine firmly and push the start of the Start/Stop clutch button (2).

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. 4.2-1) AND PERIODICALLY RUN THE PUMP (FIG. 4.10-11) TO RELEASE WATER ONTO THE FLOOR SURFACE. STARTING THE PUMP IS POSSIBLE ONLY IF THE MACHINE MOTOR IS ON. WHEN WORKING DRY, CHECK THE FLOOR SURFACE PERIODICALLY FOR DUST ACCUMULATION. CHECK REGULARLY TO SEE IF YOUR VACUUM WORKS PROPERLY

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, push the Stop clutch rocker (2), then close (clockwise) the service valve on the propane tank. ALWAYS allow the engine to run until it stops from lack of fuel.

- In case of emergency ONLY press the "stop" position on the Start/Stop Engine switch (1) and disconnect the fuel line from the tank.

When finished with the machine, store the propane tank outside the building, in a **SECURE** place away from heat or direct sunlight.

FUEL-MINDER USER MANUAL

The SM40 Fuel-Minder is a high-performance, digital fuel control system featuring closed loop feedback, fuel lock-off capability, emissions safety warnings with shutdown, and an LCD screen for user interface. The system is highly responsive to changes in engine load, providing optimum the air-to-fuel ratio regardless of operating conditions.

SYSTEM COMPONENTS

The following parts are included with the system

- Electronics Module
- Integrated Wire Harness
- Fuel Control Valve
- Fuel Control Housing
- O2 Sensor
- LPG Regulator with lock-off

Individual items are available as replacement parts if necessary

OVERVIEW OF FEATURES**Closed Loop Fuel Management System**

The Fuel-Minder uses closed-loop feedback from the O2 sensor to control the amount of fuel introduced to the engine via the Fuel Control Valve. This technology continuously monitors engine emissions and is capable of making fuel corrections to compensate for varying engine loads and conditions.

Faulty O2 Sensor Detection

If a faulty O2 sensor is detected, the Fuel-Minder will alert the user within 3-5 minutes from a cold-start. A message will be displayed on the LCD screen to let the user know that the O2 sensor needs to be replaced.

Built-in Fuel Lockoff Controller

The Fuel-Minder also controls the fuel lockoff and only allows fuel to pass through if it detects the engine is cranking. Once the Fuel-Minder is powered off from the equipment key switch, the Fuel-Minder closes the fuel lockoff and shuts the engine down immediately.

Emissions Warnings and Shutdown

If the Fuel-Minder detects engine emissions that are too lean or rich for a period of 5 minutes, it will shut the engine down via the fuel lockoff. The Red LED will blink and the LCD will display a message alerting the user of the issue and will prompt some common fix suggestions.

Dual Hour Meters

The Fuel-Minder has two hour meters, one for the engine and the other for equipment. The Engine Hours are resettable, which should only be done if the engine is replaced. The Equipment Hours (located in Options Menu) is non-resettable and shows the total hours on the equipment, similar to the odometer of a vehicle.

Battery Voltmeter

This feature allows for real-time display of the battery's voltage, which also helps for troubleshooting any battery or charging system issues that may arise.

Engine Tachometer

Displays the current engine speed (in RPM). This should be used to assess proper idle, WOT and engine speed for the appropriate tooling.

Job Timer

The job timer feature works when it is activated and while the engine is running, and will not continue to run if the engine is stopped. The allows for easy timing of jobs or work areas to help determine speed.

Password Protection

Located in the options menu, the password feature allows a maintenance manager or owner to enable a password that prevents the user from resetting the Service Due alerts without the appropriate pin.

Service Alerts

The Fuel-Minder also provides equipment-specific service alerts for the following items:

- Air Filter
- Oil Change + Filter
- Spark Plugs
- Seal Replacements
- Chain Inspections
- Belt Inspections
- Tooling Inspections

Each item has individual alerts at different hour intervals, and the Fuel-Minder will start alerting the user of upcoming maintenance within 3 hours of when it is due. To reset a particular service alert, simply scroll to it, using the + or - buttons, then hold the reset button for 2 seconds. The meter will then prompt you to reset that interval.

Sleep Mode

To conserve equipment battery life, the Fuel-Minder will enter sleep mode if there are no key inputs or engine activity. The backlight will dim after 30 seconds of inactivity, then turn off after 1 minute. The display will turn off after 2 minutes. To wake from sleep mode, simply press any key or start your engine.

MAIN MENU NAVIGATION AND USE

This section outlines how to navigate the menu and interact with certain features.

MAIN MENU

The Main Menu contains the following screens, which can be viewed by simply using the + and - buttons to scroll. Please note: Upon startup or waking from sleep mode, the first screen shown is always Engine Hours.

- Engine Hours (Default screen)
- Clean Filters
- Oil Change + Filter
- Spark Plugs
- Chain Inspections
- Seal Replacements
- Belt Inspections
- Tooling Inspections
- Battery Voltage
- Tachometer
- Options Menu

LED Alerts & Resetting Service Intervals

The Fuel-Minder will alert you when service is due by blinking a red LED within 3 hours of the specified interval and displaying "Service Due" on the LCD screen. When you see this light, simply scroll through your menu to see which service item is due. To reset a specific interval, just scroll to that particular screen (for example, Oil Change), then hold the **SELECT** button for 2 seconds until you see the reset prompt, then press the + button to reset that interval.

OPTIONS MENU NAVIGATION AND USE

OPTIONS MENU

To enter the options menu, simply scroll until **Options Menu** is displayed on the screen, then press **SELECT**. The first option displayed by default is **Add Password**. Use the + or - buttons to scroll and view other options. To exit the options menu, scroll until you see **EXIT OPTIONS**, then press **SELECT**.

Add Password- This option allows you to add a password that prevents unauthorized users from resetting service intervals or performing a factory reset. This is a 4-digit pin that you set.

Change Password- Allows you to change your password, if one is saved. Note: This option is hidden unless a password has been created.

Remove Password- Used to disable the password feature, if a password is saved. Note: This option is hidden unless a password has been created.

Factory Reset- CAUTION, this option will erase all memory and restore your device to factory condition. This also allows for resetting the total engine hours. Password required if set.

Factory Unlock- This option is only used by SuperAbrasive and requires a factory assigned pin number to activate.

Tach Settings- This allows you to adjust the tachometer for a carbureted or fuel injected engine. It should come pre-set to the correct option and will not require changes.

Equipment Hours- This displays the total number of hours on your equipment and is non-resettable.

Date of Purchase- This can be used by the user or dealer to record the equipment purchase date. To enter the date, hold **SELECT** for 2 seconds; a cursor should appear under the MM. Use the + and – buttons to change the month field, then press **SELECT** to move to the Day field. Again, use the + and – buttons to select the desired day. Once you have the desired date, hold **SELECT** for 2 seconds and a prompt to save the information will appear.

Engine Info- To view the engine model/serial information, scroll to **Engine Info** in the Options Menu, and press **SELECT**. To edit this information, hold **SELECT** for 2 seconds. Then use the + and – buttons to select the appropriate letters and numbers. Press **SELECT** quickly to move the cursor, or hold **SELECT** for 7 seconds to save/exit.

Equipment Info- To view the equipment model/serial information, scroll to **Equipment Info** in the Options Menu, and press **SELECT**. To edit this information, hold **SELECT** for 2 seconds. Then use the + and – buttons to select the appropriate letters and numbers. Press **SELECT** quickly to move the cursor, or hold **SELECT** for 7 seconds to save/exit.

Job Timer- The job timer acts as a stopwatch, but only starts and stops when the engine is turned on/off. This allows you to accurately time how long your engine runs for a particular job.

Exit Options- Returns to the main menu, and default screen (Engine Hours).

SAFETY INFORMATION

Safety Information- Read all safety information before using this device to ensure safe and proper use.

Do not interact with the device while operating your equipment. Doing so may distract your attention and cause an accident, or may be illegal depending on your region.

Avoid any direct contact with pressure washers, water sprayers or cleaning chemicals of any kind.

Do not drop or cause an impact to the device.

Do not bend or twist the device and/or the wire harness excessively.

Do not disassemble, modify or repair your device. This product contains no user serviceable parts.

FCC Part 15.21

Any changes or modifications to this device that are not expressly approved by the manufacturer may void the user's authority to operate the device.

5. TOOLS AND ACCESSORIES

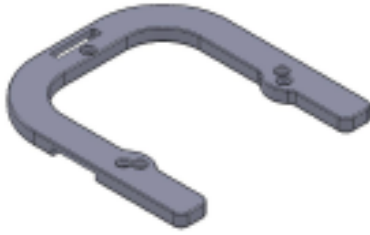


Figure 5.1

WEIGHTS

Superabrasive offers additional weights used to increase the productivity of the machine (Fig.5.1). Each additional weight weighs about 64 lbs or 29kg. Each individual application, type and condition of surface, power capacity of the outlet, etc. will determine the number of weights you can use without tripping a breaker. The weights stack onto three posts fixed around the outer bowl (Fig.5.2). Additional weights will largely depend on the tools; it is not always possible to add weights. Some tools work too aggressively and will cause the machine to stop. The weight can be ordered with item number A08.00.00.00



Figure 5.2

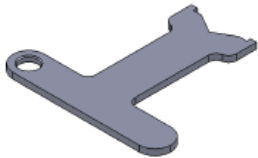


Figure 5.3

TOOL HOLDER KEY

The tool holder key (Fig. 5.3) is used for adjusting, mounting and dismounting of the foam plates. Always use the key to properly secure foam plates
Item number is A03.00.00.00

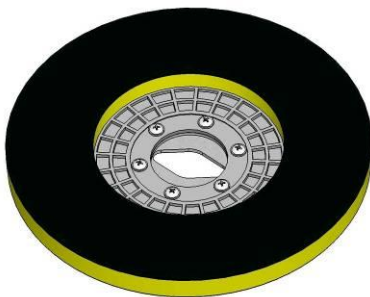


Figure 5.4

FOAM PLATE

Diamond tools with Velcro are mounted on the foam plate 13.5" (Fig.5.4). The foam plate is mounted on the "QuickChange" System.
Item number is LV-FP-13.5-S

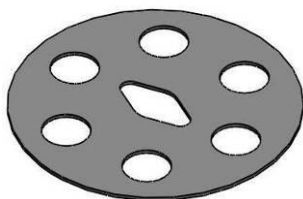


Figure 5.5

SECURITY PLATE FOR QUICKCHANGE PADS

Plate (Fig.5.5) used to secure the "Quickchange" pads.
Item number is A38.00.02

6. POPULAR TOOLS

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.



Calibra grinding discs: our popular ceramic bond discs are designed for the removal of difficult scratches and they save you valuable time by eliminating the need for multiple passes with metal tools. They can be used wet or dry, and are best for hard concrete applications. They are 3-inch, with included Velcro back attachment.



NATO® polishing discs feature a special resin formula designed for both wet and dry applications and a unique design with wide channels allowing for work on a cleaner surface

and ensuring a quality polish. Available in 3 and 4 in sizes. They are with Velcro attachment.



V-HARR® Premium Polishing Pads are designed for mechanically polishing and restoring concrete; also ideal for terrazzo and hard stone floors. V-HARR® pads are offered in a wide variety of diameters and grit sizes to accommodate many applications. Dry use is strongly recommended.



Shine Pro® are high quality diamond-integrated pads for floor maintenance. Available in a variety of sizes, they are great for daily use. When used wet, they require only water (no wax or chemicals needed), making them a very environmentally-friendly solution for maintaining floors.

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

7.MAINTENANCE AND INSPECTION

REMARK

Tampering w/Emission Control System is Prohibited

Federal law and California State law prohibits the following acts or the causing thereof: (1) the removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement, of any device or element at design incorporated into any new engine for the purpose of emission control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the engine after such device or element of design has been removed or rendered inoperative by any person. Among those acts presumed to constitute tampering, involve the parts/systems listed below:

- Carburetor and internal parts
- Spark plugs
- Magneto or electronic ignition system
- Fuel filter element
- Air cleaner elements
- Crankcase
- Cylinder heads
- Breather chamber and internal parts
- Intake pipe and tube

MECHANICAL PARTS

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

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.

CHECK HOURLY

BONNET FILTER - Make sure the bonnet air filter atop the engine is clean. It should be removed hourly and thoroughly cleaned before reuse. The same for the recoil dust filter. If neglected, the engine will overheat and carbon monoxide emissions will elevate.

CHECK DAILY

After operating the Lavina® X 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 as 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 here 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 badly damage the machine. Tightening force on the screws should be 22...25N.m(16...18 lbf.ft).

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 also be cleaned.

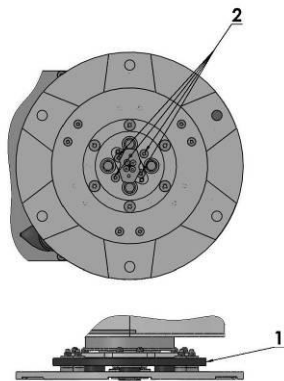


Figure 7.1

CHECK AND REPLACE AFTER THE FIRST 8 WORKING HOURS

Replace the oil in the engine after the first 8 hours work, according to the instructions of the engine manufacturer.

Always use 30HD or 10W30 engine oil with all of the following ratings: SF, SG, and CC

CHECK AND REPLACE EVERY 50 WORKING HOURS

Change engine oil, while changing check for leakage of engine oil at the various seals. The hour meter will blink between 48-52 hours as a reminder. /"Engine Oil Capacity" is 1.5L(1.6US.qt) when oil filter is not removed 1.7L(1.8US.qt) when oil filter is removed/.

Recommended Oil Change Intervals

Do not exceed the 50-hour oil change interval. Oil changes more frequent than 25 hours will give even longer engine life. In any case, always use 30HD or 10W30 engine oil with all of the following ratings: SF, SG, and CC. make sure the oil level is maintained at the "FULL" level.

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 of the pump. Check the guard assembly. Ensure 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 the planetary chain. Lubricate the chain with chain lubricant and correct the sag if needed. For sagging correction (See TROUBLESHOOTING).

Dismount the tool holders (See Troubleshooting) replace all parts (elastic element, buffers, sealers) showing any damage.

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

CHECK AND REPLACE EVERY 400 WORKING HOURS

In addition to the checks made every 200 working hours, replace sealer and V-rings as described in the 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.

VACUUM

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

WATER LEAKS

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

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.

ELECTRICAL SYSTEM

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

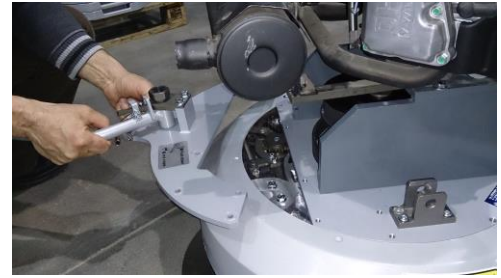
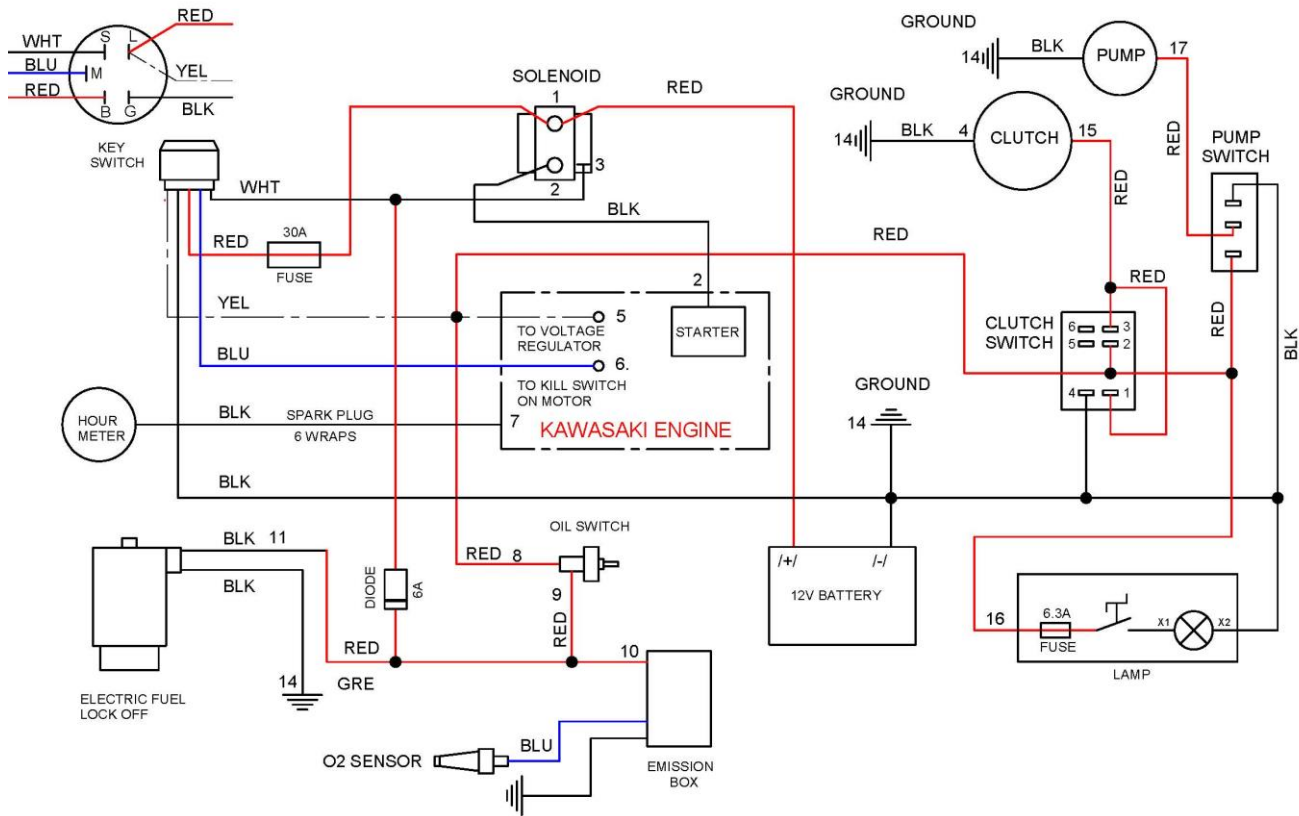


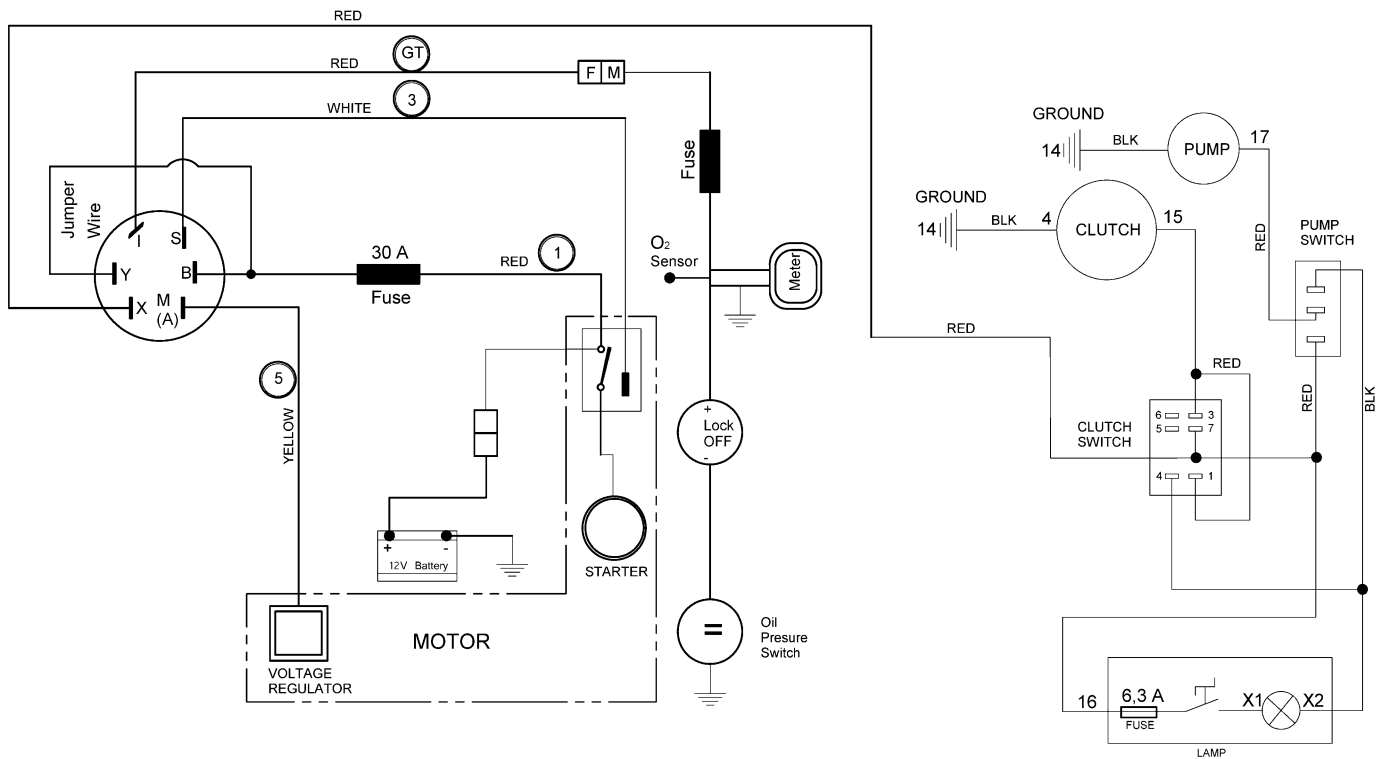
Figure 7.2



Figure 7.3



ELECTRICAL SYSTEM GTX



8. TROUBLESHOOTING

8.1 ENGINE

When troubles occur, be sure to check the simple causes which may at first seem too obvious to be considered. For example, a starting problem could be caused by fuel starvation due to an empty propane cylinder or an unopened service valve. If you do not check for this, starter burnout could result.

Some Troubles and solutions:

Surging idle

To smooth out the engines' idle characteristics, adjustment is provided by an idle screw on the lower left side of the carburetor as viewed from the operator's position. The screw is bright steel and 1/4" in diameter with a Phillips head on it. Rotating the screw clockwise will increase the idle speed and this should cure the "surging idle". If it does not, call our customer service.

Engine starts and idles, but will quit as the throttle is advanced

It is possible that the propane tank's service valve is faulty. To check for this, close the valve completely and then reopen very slowly while you listen for a "click" when the gas begins to travel through the valve. If you hear this very slight noise, the valve is only partially opening. This allows enough gas through to start and idle the engine, but not enough for full throttle operation. As the throttle is increased, allowing more air to enter the intake, the engine will quit from fuel starvation. Call your dealer or the factory for instructions on where to have the service valve replaced. Meanwhile, to get by, you can continue to open the service valve until you do not hear a "click" and then the engine will run normally. If it does not, call your customer service.

Starter barely turns the engine over or the solenoid just clicks

The battery is likely low in charge. This can be remedied by recharging the battery using a 12 Volt battery charger at 4.12 amperes. The battery is located on the left side of the propane tank holder under the battery cover. The positive post is the one with the RED cable attached to it. Follow the instructions that came with the battery charger. REMINDER: this will continue to happen unless your engine is run for sufficient time between starts to recharge the battery

8.2 CHECKING AND CHANGING OIL



Figure 8.2.1



Figure 8.2.2

Check the engine oil level, screw the dipstick in to get reading. While changing engine oil, check for leakage of engine oil at the various seals. The hour meter will blink between 48-52 hours as a reminder.

Recommended Oil Change Intervals

Do not exceed the 50-hour oil change interval. Oil changes more frequent than 25 hours will give even longer engine life. In any case, always use 30HD or 10W30 engine oil with all of the following ratings: SF, SG, and CC. make sure the oil level is maintained at the "FULL" level.

8.3 SEPARATING THE HEAD FROM THE CARRIAGE

Please note that the propane cylinder must be removed and stored outside before any maintenance or reparation is done.



Figure 8.3.1



Figure 8.3.2



Figure 8.3.3

Disconnect the connector of the battery (Fig. 8.3.1), the Propane hose (Fig. 8.3.2), and the connectors of the lamp (Fig. 8.3.3). Remove the control panel (Fig. 8.3.4), and take off all water and vacuum hoses (Fig. 8.3.5). Remove the tank (Fig. 8.3.6). Now it

is possible to separate the head by removing the pins. This will require two people: one person holds the carriage while the other pulls the pins (Fig. 8.3.7).



Figure 8.3.4



Figure 8.3.5



Figure 8.3.6



Figure 8.3.7

8.4 DISMOUNTING/MOUNTING THE ENGINE



Figure 8.4.1



Figure 8.4.2



Figure 8.4.3

Separate head from carriage (see previous chapter). Remove front (Fig. 8.4.1) and back belt protection (Fig. 8.4.2). Loosen the motor base plate (Fig. 8.4.3), release the tension device (Fig. 8.4.4), and take out the belt (Fig. 8.4.5). Take off the engine (Fig. 8.4.6).



Figure 8.4.4



Figure 8.4.5



Figure 8.4.6

Reassemble in the same manner. (Fig. 8.4.7), Tension the belt with bolt (4) on (fig. 8.4.7) or (fig. 8.4.4) The belt tension can be tested with a Frequency tension Tester Optibelt 3 TT- (190-200Hz) or manual by pushing with a force of 6 kg or 13 lbs in point A, the deflection of the belt must be 3,1 mm or $\pm 1/8$ Inch

ATTENTION:

NEVER "OVER" TENSION THE BELT, THE BELT WILL BE DESTROYED AND IT WILL NEVER RECOVER ITS ORIGINAL TENSION

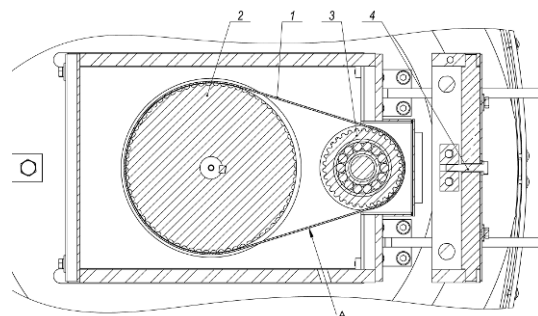


Figure 8.4.7

8.5 REPLACING THE CLUTCH



Figure 8.5.1



Figure 8.5.2

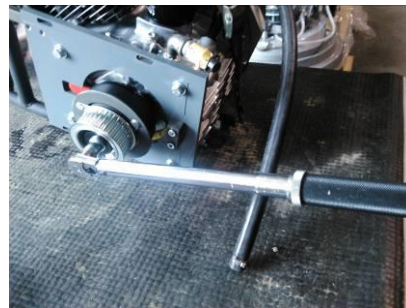


Figure 8.5.3



Figure 8.5.4

To replace the electric clutch, remove the engine (see previous chapter) and lay it on its side with the oil drainage up (Fig. 8.5.1) and loosen the front nut to dismount the clutch (Fig. 8.5.2 and Fig. 8.5.3). Reassemble in the same manner. Do not forget to mount the washer back on the shaft (Fig. 8.5.4). The torque on the front nut (Fig. 8.5.3) to mount the pulley and clutch should be 70 Nm or 52 ft lbs (Fig. 8.5.2 and Fig. 8.5.3).

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



Figure 8.6.1



Figure 8.6.2

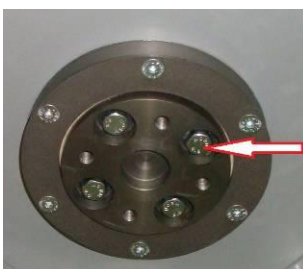


Figure 8.6.3



Figure 8.6.4



Figure 8.6.5



Figure 8.6.6

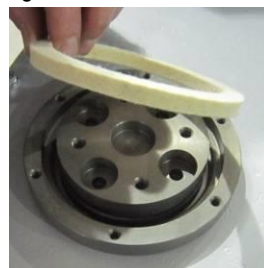


Figure 8.6.7



Figure 8.6.8

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

You will need a 13mm deep metric socket with an outside diameter of no more than 3/4in to unscrew the four bolts (Fig.8.6.1) and remove the holder (Fig.8.6.2). When the tool holder is dismantled, you can change the sealers (V-Ring and Felt-Ring).

By loosening four Hex cap flange bolts (Fig.8.6.3) the adaptor comes loose. Unscrew the six screws of the cap (Fig.8.6.4) 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.8.6.5) - simply push the V-Ring so the top is on the same level as the pulley top (Fig.8.6.6). Then take the adaptor and push the V-Ring down with the adaptor (Fig.8.6.7). The lowest lip of the V-Ring should only barely touch its gliding surface. Mount the adaptor and the Felt-Ring on top (Fig.8.6.7). Close the sealers with the cap (Fig.8.6.8) and screw the bolts. Always use the original bolts. Do not push the V-ring down with fingers.

8.7 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.

Lift the locking pin (Fig.8.7.1) to dismount the retaining washer (Fig.8.7.2). Take out the screws on the buffers and the nuts of the elastic element (Fig.8.7.3; Fig.8.7.4). Remove the elastic element from the QC plate (Fig.8.7.5). While the holder is dismantled (Fig.8.7.6; Fig.8.7.7), clean the parts and replace any defective ones with new ones. Assemble the holder with new buffers, new screws, and new elastic element. Replace the retaining washer (Fig.8.7.8) and push the locking pin (Fig.8.7.9). This will prevent the washer from falling while mounting the holder on the machine.



Figure 8.7.1



Figure 8.7.2

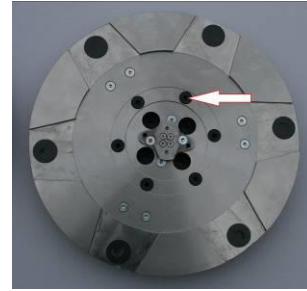


Figure 8.7.3

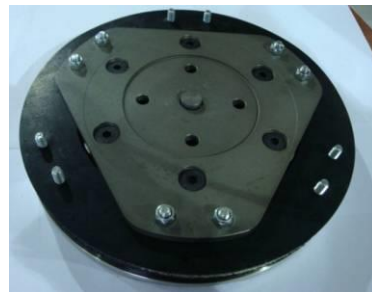


Figure 8.7.4



Figure 8.7.5



Figure 8.7.6



Figure 8.7.7



Figure 8.7.8

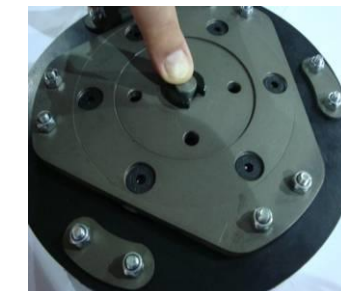


Figure 8.7.9

Make sure the four bolts holding the adaptor (Fig.8.7.12) are reliably tightened. Mount the holder on the machine using the same socket as in 8.6 (Fig.8.7.10; Fig.8.7.11). The retaining washer fits into the central hole C of adaptor and the four bolts into the thread holes T (Fig.8.7.12). 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 retaining washer (Fig.8.7.2) 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! You can change the butterfly of the holder without dismantling the holder of the machine.

Fig.8.7.13 is a 3-d section view of the holder, showing its parts. The numbering is the same as in Spare parts.



Figure 8.7.10



Figure 8.7.11

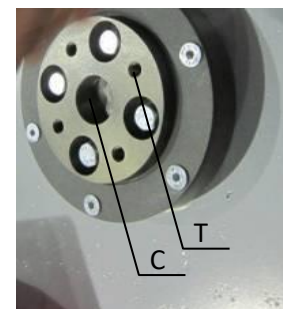


Figure 8.7.12

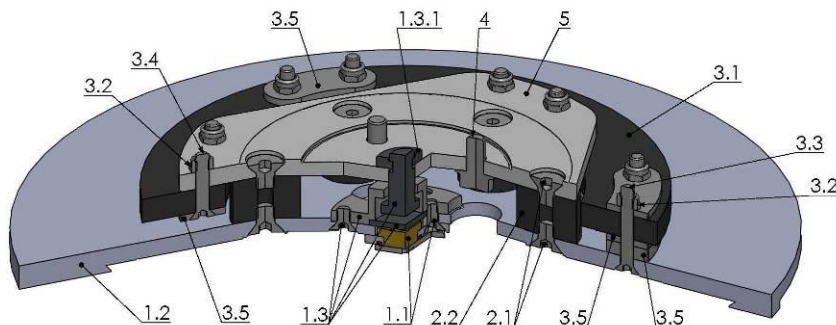


Figure 8.7.13

8.8 CORRECTING SAG OF THE USED PLANETARY CHAIN

Unscrew the eight bolts (Fig.8.8.1) and remove the cover (Fig.8.8.2). Pull the hose out of the water sprayer(Fig.8.8.3). Put the machine in position to change the tools. Manually turn the holders in order to turn the main head, stop when the chain tensioner can be seen through the window(Fig.8.8.4).



Figure 8.8.1

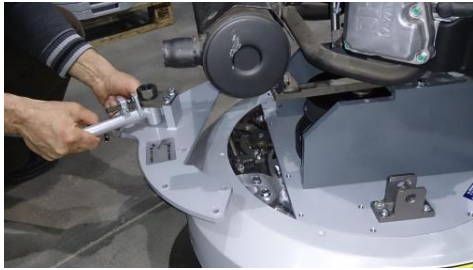


Figure 8.8.2



Figure 8.8.3



Figure 8.8.4

Loosen the two bolts of the chain tensioner a quarter to a half revolution(Fig.8.8.5). The tensioner should turn with minimum clearance, without inclination, then unscrew the inner nut. To tension the chain screw, tighten the outer nut (Fig.8.8.6). The tensioner of the planetary chain should allow chain sagging of 3...5mm/1/8...3/16 in/ measured in span X (Fig.8.8.7). When set, screw the two nuts (Fig.8.8.6) and the screw(Fig.8.8.5).



Figure 8.8.5



Figure 8.8.6



ATTENTION: NEVER “OVER” TENSION THE CHAIN, THE CHAIN WILL BE DAMAGED

8.9 MOUNTING NEW PLANETARY CHAIN

The planetary chain is replaced with new one when the step/drive of the chain tensioner is finished or there is a break in the integrity of the chain. Unscrew the eight bolts (Fig.8.8.1), take off the cover (Fig.8.8.2), and pull the hose out of the water sprayer (Fig.8.8.3). Put the machine in position to change the tools. Manually turn the holders in order to rotate the main head, stopping when the chain tensioner can be seen through the window (Fig.8.8.4). Separate the carriage from main head, and pull out the motor plug, water tubes, and vacuum tubes. Take off the handle (without water tubes) (Fig. 8.8.3). Release the pin sets which attach the head to the carriage. Take off the weight holders(Fig. 8.9.1), machine support(Fig. 8.9.2), and the service window (Fig. 8.8.2) so the top cover can be removed(Fig. 8.9.3).



Figure 8.9.1



Figure 8.9.2



Figure 8.9.3

Loosen the two nuts (Fig.8.8.6) and unscrew the two screws of the tensioner (Fig.8.8.5)(Fig.8.9.4)(Fig.8.9.5). Remove the chain tensioner (Fig.8.9.6). Pull out the split pin (Fig.8.9.7) and the chain link pin (Fig.8.9.8) (Fig.8.9.9). Remove the chain, and install the new chain in the same manner, then insert the chain link pin and the split pin (Fig.8.9.9) (Fig.8.9.8) (Fig.8.9.7).



Figure 8.9.4



Figure 8.9.5



Figure 8.9.6

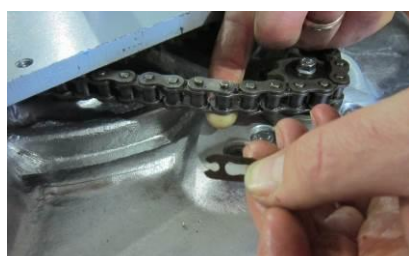


Figure 8.9.7



Figure 8.9.8



Figure 8.9.9

Mount the chain tensioner (Fig.8.8.6). Tighten the two screws (Fig.8.9.4)(Fig.8.8.5). Loosen the bolt of the chain tensioner a quarter to a half revolution (Fig.8.8.5). The tensioner should turn with minimum clearance, without inclination. Then unscrew the inner nut. To tension the chain, rotate the outer nut (Fig.8.8.6). The tension of the planetary chain should allow chain sagging of 3...5mm (1/8...3/16 in) measured in span X (Fig.8.8.7).

When properly tensioned, retighten the two nuts (Fig.8.8.6) and the screw (Fig.8.8.5).

ATTENTION: NEVER “OVER” TENSION THE CHAIN, THE CHAIN WILL BE DAMAGED

8.10 REPLACING THE PLANETARY DRIVING GEAR AND PLANETARY TENSIONER

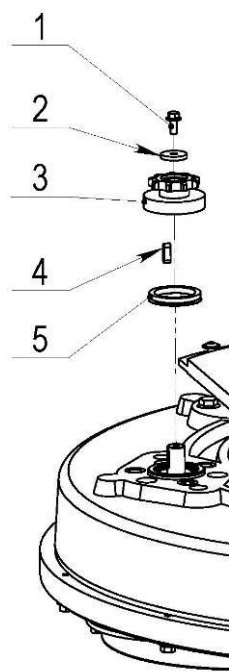


Figure 8.10.1

Check and repeat the instructions in 8.9 MOUNTING NEW PLANETARY CHAIN.

Unscrew bolt (1) and remove the chain pulley (3) with the sealer (5). Change the sealer, and mount it to the chain pulley (3). Apply lithium grease on the shaft and mount back the wheel and the front washer (2) as shown on (Fig.8.10.1). Screw the bolt by using always the “blue” thread locking adhesive. Tightening force on the bolts should be 22...25N.m(16...18 lbs.ft).



Figure 8.11.1

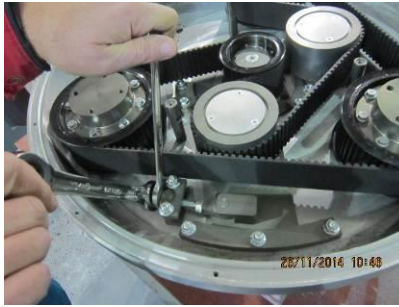


Figure 8.11.2



Figure 8.11.3

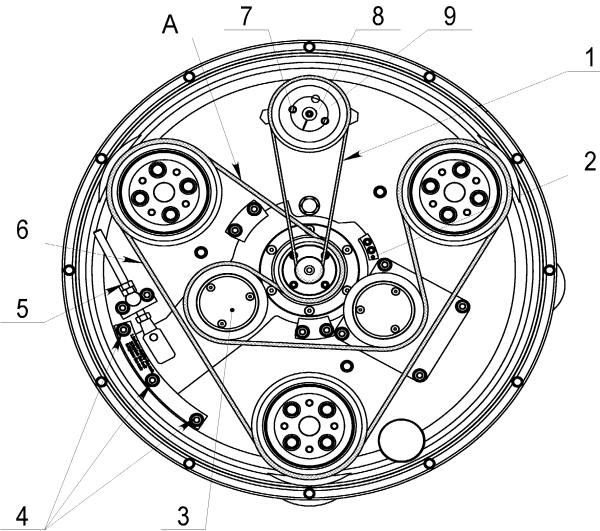


Figure 8.11.5

The transmission of the machine runs two timing belts (a main belt that rotates the plates (and tools) and an auxiliary planetary belt which propels the rotation of the head as a whole). To change the main belt, remove all plate mounts (...Holders) and adapters. There will be a seal to remove as well. Check any friction surfaces for wear, and replace if necessary. To remove the bottom cover, unscrew the bolts at the circumference of the cover, as well as those in the spacers. We recommend that all seals (O-Rings in the pacers and seal around the cover) be replaced when changing belts.

Figure 8.11.5 shows the scheme of the belts. To remove the old belts first remove the planetary belt (1) and then the main belt (6).

To remove the main belt (6), loosen nuts (4) and (5) enough to be able to turn the tensioners (3) around the central axle. Clean the washers and surrounding area, and check all bearings of pulley units/tensioners for too much clearance or rolling noise. Rotating the tensioner will allow the centre distance to be reduced in such that the timing belt may be fitted without force. Installation with the use of force is NOT permissible at any time as this can damage the high quality, low stretch tension cord and other components. This damage

is often not visible. Arrange the belts in pos.6 as per the scheme, paying attention to their orientation at every pulley. Loosen the nuts (5) to the end of the bolt, and fully loosen the nuts on the half moon (4), allowing the rotation of the tensioners with minimal force.

Using nuts (5), tighten the belt, double checking the position/orientation of the belt and the gearing in each pulley.

Rotate the gear while tensioning to allow regular distribution of tension along the belt.

Measure the tension using a Frequency Tension Tester (Optibelt 3 TT) (Fig. 8.11.3). Tension in span "A" of the belt should be 120-130Hz. It is possible to use the pre-installed support (Fig. 8.11.5-2)(Fig. 8.11.6) as a reference to stop the tensioner at the desired belt tension, provided that the supports have not been moved from their factory position.



Figure 8.11.6

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

To remove the planetary belt (Fig.8.11.5-1), unscrew the screw of the front washer (Fig.8.11.7) and the two screws of the conical sleeve (Fig.8.11.8). Screw one of the removed screws into the free thread (Fig.8.11.9) to push the washer down (Fig.8.11.10); take off the conical sleeve and the belt (Fig.8.11.11). A flat head screw driver may help with this. (Fig.8.11.12).



Figure 8.11.7



Figure 8.11.8



Figure 8.11.9



Figure 8.11.10



Figure 8.11.11



Figure 8.11.12

The reassembly is the same process in reverse. It is important to match the threads of the conical sleeve and the belt washer(Fig.8.11.13). Put the front washer (Fig.8.11.14), on the screw - using "blue" thread locking adhesive. Tightening force of the bolts has to be 4,5...6N.m(3,3...4,4 lbf.ft). Carefully replace the two binder screws while leaving the central thread open. (Fig.8.11.14)(Fig.8.11.15). Insert the screws by alternating at 1.5 revolutions each until the conical sleeve pulls up the belt pulley. The conical sleeve must be aligned in height with the belt washer(Fig.8.11.16).



Figure 8.11.13



Figure 8.11.14

Dismounting the planetary belt is possible without removing of the Bottom cover assembly by unscrewing the eight bolts and removing the service window cover and sealing (Fig.8.11.17)(Fig.8.11.18) to access the planetary belt (see 8.11.)



Figure 8.11.15



Figure 8.11.16



Figure 8.11.17



Figure 8.11.18



Figure 8.11.19

8.12 REPLACING THE PLANETARY DRIVEN GEAR

Remove the planetary chain and tensioner and see Fig.8.9(MOUNTING NEW PLANETARY CHAIN).

Dismount the tool holders, sealers, and bottom cover (see Fig.8.11 - TENSIONING AND REPLACING THE BELTS). Unscrew the cap to access the fastening bolts of the driven chain gear (Fig.8.12.1)(Fig.8.12.2). Rotate the main head such that you see a fastening bolt of the gear (Fig.8.12.3) through the hole.

You will need a 10mm magnetic deep metric socket with an outside diameter of no more than 11/16 in to unscrew the six bolts (Fig.8.12.3)(Fig.8.12.4) (Fig.8.12.5). Once these are removed, remove the two halves of the gear.

The gear is composed of two symmetrical halves(Fig.8.12.6). Mount them in reverse order.

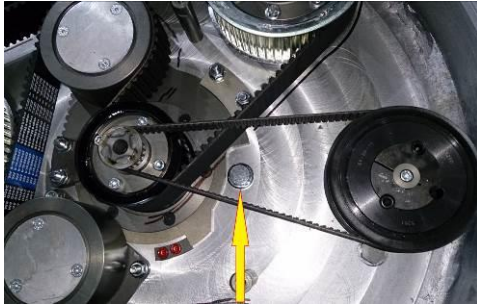


Figure 8.12.1



Figure 8.12.2

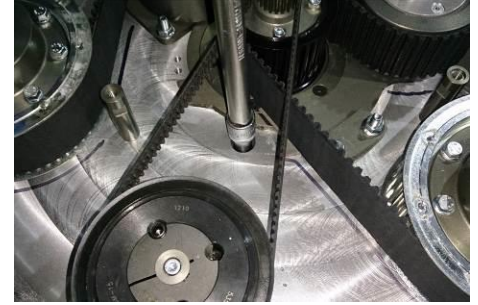


Figure 8.12.3



Figure 8.12.4

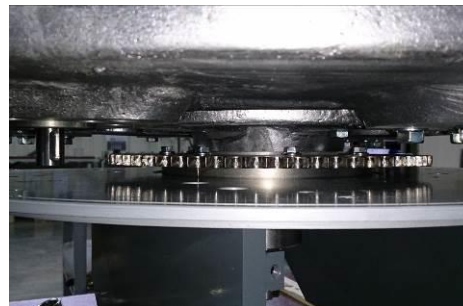


Figure 8.12.5



Figure 8.12.6

8.13 REPLACING THE PULLEY UNITS

Remove guard, top cover, maintenance window, chain tensioner, driven gear, bottom cover and belts as previous described.



Figure 8.13.1



Figure 8.13.2



Figure 8.13.3

Unscrew the four bolts of each pulley between the base plate and the motor base disc (Fig.8.13.1)(Fig.8.13.2) and dismount the pulley (Fig.8.13.3).

A seal (Fig.8.13.4) should be placed on top of the pulley before mounting.



Figure 8.13.4



Figure 8.14.1



Figure 8.14.2



Figure 8.14.3

Unscrew the six bolts (Fig.8.14.1)(Fig.8.14.2) and press down the planetary unit.
When mounting back secure with sealant (Fig.8.14.3).

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.

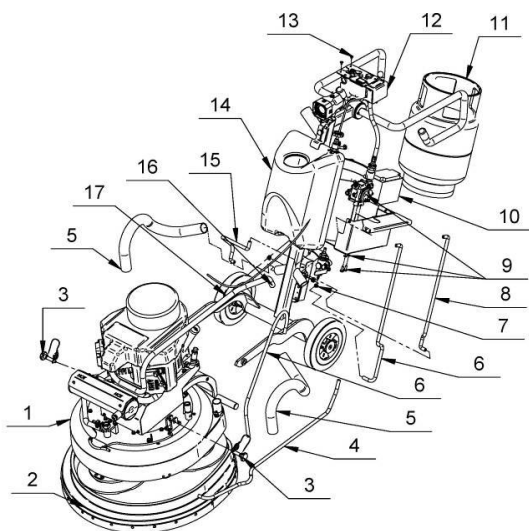
10. MANUFACTURER'S CONTACTS

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
Website: www.superabrasive.com

11. SPARE PARTS

ASSEMBLY AND PARTS SPECIFICATIONS

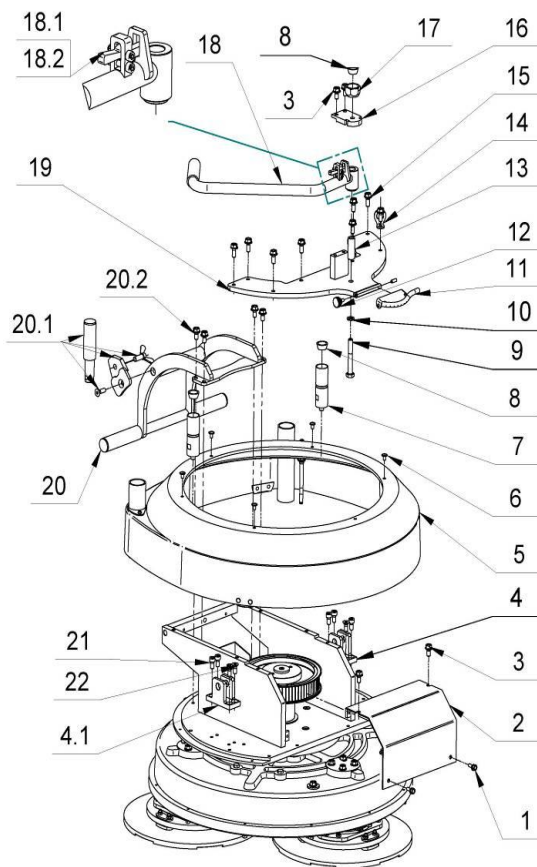


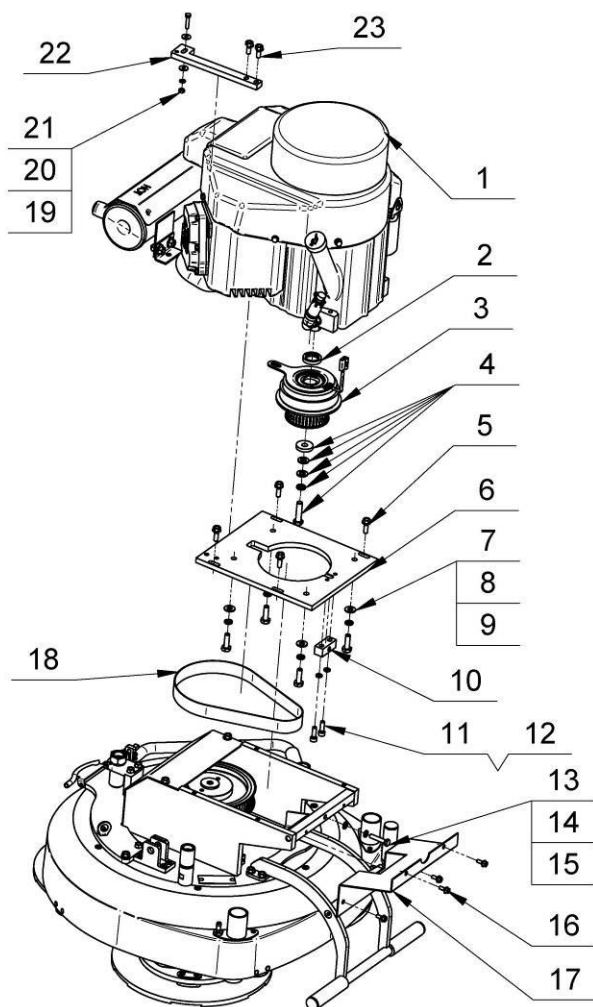
1. LAVINA® 30G-X GENERAL PARTS

No.	Item No.	Description	Pcs.
1	L30GX-10.00.00	Main Head	1
2	L30GX-05.00.00-1	Guard Assembly	1
3	L25SPS-07.03.00.00	Pin Assembly	2
4	MAR8.120	Tube	1
5	D40L700-K	VACUUM HOSE PU ANT WITH TWO CLAMPS	2
5.1	D40L700	Vacuum Hose	2
5.2	SB44-47	Clamp for Vacuum Hose	4
6	MAR8.90	Tube	2
7	10-16DIN3017	Clamp	3
8	MAR8.71	Tube	1
9	L25G-26.00.00	Regulator set	1
10	CC01-25968	12V Battery & Wire Connector	1
11	W2504	Propane Tank	1
12	L25GS-40.00.00	Control Board Ass.	1
13	M6X10ISO7380F	Screw	2
14	L25GX-20.00.00	Carriage With Control Box	1
15	MAR8.50	Tube	1
16	F0708750	Clamp	1
17	W2660	Tube	1

2. LAVINA® 30G-X TOP COVER 1 PARTS

No.	Item No.	Description	Pcs.
1	M6X16DIN6921	Bolt	2
2	L25GX-10.00.69	Front Guard	1
3	M8X16DIN6921	Bolt	8
4	L25SPS-07.00.00.02-L	Left Fork	1
4.1	L25SPS-07.00.00.02-R	Right Fork	1
5	L25X-19.00.00	Top Cover Assembly	1
6	M6X10ISO7380F	Screw	5
7	L25NSPS-07.00.00.05	Back Weight Holder	2
8	L25SPS-07.00.00.29	Rubber Buffer	3
9	M10X75DIN931	Bolt	1
10	M10DIN127B	Spring Washer	1
11	A29.12.00	Spray Unit	1
12	H766-21	Handle	1
13	L25SPS-07.00.00.26	Stud	1
14	L25X-15.00.02	Washer	1
15	M8X20DIN6921	Bolt	8
16	L25S-15.00.04	Support Top L25-S	1
17	L25X-15.10.01	Nut	1
18	L25S-15.10.00	Bar Assembly L25-S	1
18.1	L25S-15.10.02	Lever	1
18.2	L25S-15.10.03	Spring L25-S	1
19	L25GX-15.11.00	Inspection Cover	1
20	L25GX-18.00.00	Machine Support	1
20.1	L25GS-18.30.00	Clamp head	1
20.2	M8X16DIN6921	Bolt	4
21	M8X16DIN912	Screw	6
22	M8X20DIN7991	Screw	2



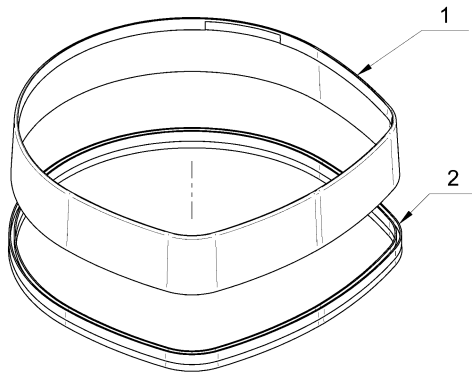
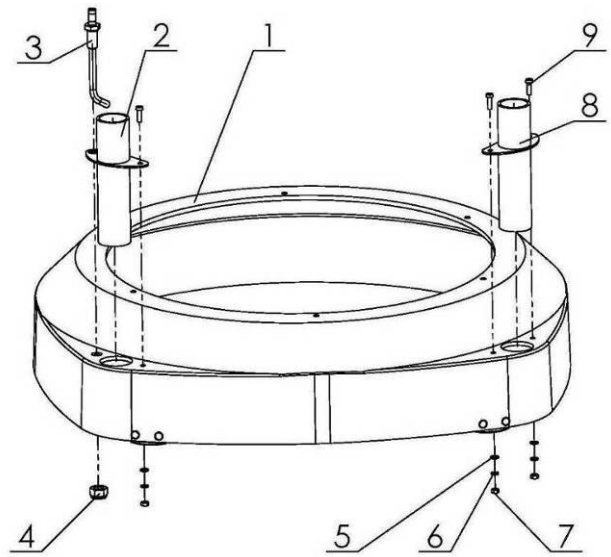
**3. LAVINA® 30G-X ENGINE BASE PARTS**

No.	Item No.	Description	Pcs.
1	KFS481	Complete Engine Assembly	1
*1	KFX600-BS	Complete Engine Assembly	1
*2	L25GS-10.02.06	Clutch Washer	1
3	K47621932	Electric Clutch	1
4	L25G-10.02.02.S	Bolt Set	1
5	M8X25DIN6921	Bolt	4
6	L25G-10.00.65	Engine Base Plate	1
7	F33008	Washer	4
8	F33622	Washer	4
9	F13107	Bolt	4
10	L25G-10.00.66	Tensioning Device Support	1
11	M8X25DIN912	Screw	2
12	M8DIN7980	Spring Washer	2
13	M8X40DIN933	Bolt	1
14	M8DIN125A	Washer	6
15	M8DIN127B	Spring Washer	9
16	M6X16DIN6921	Bolt	4
17	L25G-10.05.00	Back Guard	1
18	OMEGAHP7608MHP30	Endless Transmission Belt	1
19	M6X30DIN933	Bolt	1
20	M6DIN127B	Spring Washer	1
21	M6DIN9021A	Washer	2
22	L25G-10.00.67-02	Support	1
23	M8X20DIN6921	Bolt	2

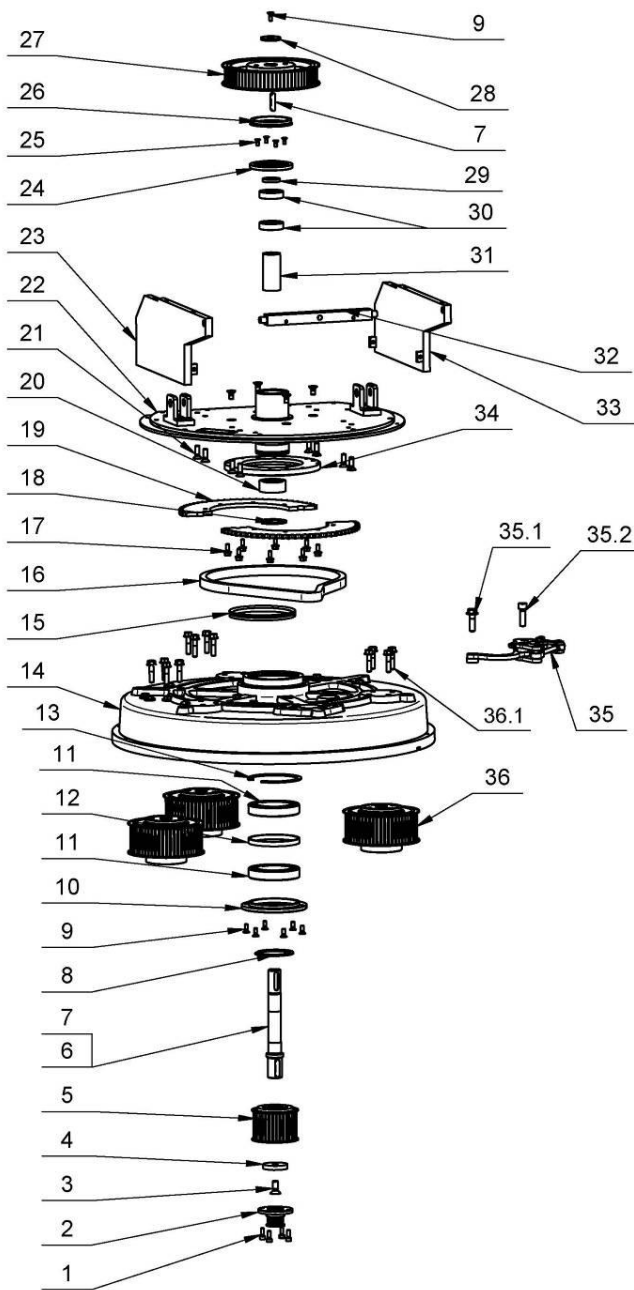
* While dismounting the clutch use one Clutch Washer with item No L25G-S-10.02.06, instead of previously mounted two Washers with item No W1220.

4. LAVINA® 30G-X TOP COVER 2 PARTS

No.	Item No.	Description	Pcs.
1	L25X-19.00.01	Top Cover	1
2	L25GS-19.10.00	Vacuum Port	1
3	L25X-19.20.00	Water Fitting	1
4	M12DIN985	Nut	1
5	M5DIN125A	Washer	4
6	M5DIN127B	Spring Washer	4
7	M5DIN934	Nut	4
8	L25SPS-04.01.00.00	Vacuum Port	1
9	M5X16DIN84A	Screw	3

**4.1. LAVINA®30G-X GUARD PARTS**

No.	Item No.	Description	Pcs.
1	L30GX-05.00.01-1	Guard	1
2	FBL1350-2515	Brush	1



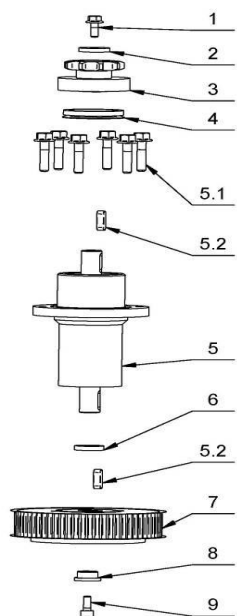
5. LAVINA® 30G-X PLANETARY DRIVE PARTS

No.		Item No.	Description	Pcs.
1		M6X16DIN912	Screw	4
2		L25X-03.00.00	Pulley	1
2*		L25X-03.00.00-R2	Pulley	1
3		M10X25DIN7991	Screw	1
4		L25X-10.00.55	Front Washer	1
5		L25GX-10.10.00	Central Pulley	1
6		L25GX-10.00.57-1-K	Shaft Kit	1
*6		L25GX-10.00.57-1	Shaft	1
7		DIN6885A8x7x36	Key	2
8		B65DIN471	Retaining Ring	1
9		M6x16DIN7991	Screw	*7
*9		M10X25DIN6921	Bolt	1
10		L25X-10.00.17	Cap	1
11		6013	Roller Assembly	2
12		L25SPS-00.00.00.34	Distance Ring	1
13		A10013943	Retaining Ring	1
14		L25X-10.00.01-K	Disc	1
15		TWVA01200	V-Ring Type A	1
16		08B-1-78	Chain	1
17		M6X16DIN6921	Bolt	8
18		A52DIN472	Retaining Ring	1
19		L25X-15.00.12	Chain Pulley	2
20		3205	Roller Assembly	1
21		M8X25DIN7991	Screw	8
22		L25GX-15.20.00	Base plate	1
23		L25GX-15.03.00	Left Plate Assembly	1
24		L25G-10.00.60	Cap for Rotary Seal	1
25		M5X12DIN7991	Screw	4
26		TWVA00700	V-Ring Type A	1
27		L25GX-10.30.00	Pulley Unit	1
28		L25SPS-00.00.00.15	Front Washer	1
*28		L25GX-10.00.55	Front Washer	1
29		L25G-10.00.59	Insert	1
30		6005	Roller Assembly	2
31		L25GX-10.00.58	Bushing	1
32		L25G-10.00.64	Support Plate	1
33		L25GX-15.04.00	Right Plate Assembly	1
34		L25X-15.00.03	Flange	1
35		L25X-17.00.00	Chain Tensioner	1
	35.1	M10X35DIN6921	Bolt	1
	35.2	M10x35DIN912	Screw	1
36		L25X-11.00.00	Pulley Unit Assembly	3
	36.1	M8X35DIN6921	Bolt	4

-*The changes are for machines with Serial No 1602L30GX1925 and bigger.

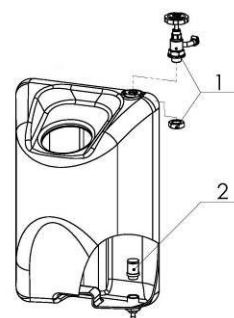
Item No L25GX-10.00.57-1-K includes pos.*6; pos.*9 and pos.*28.

-pos.2* For machines with Serial No 17.01.... and bigger.

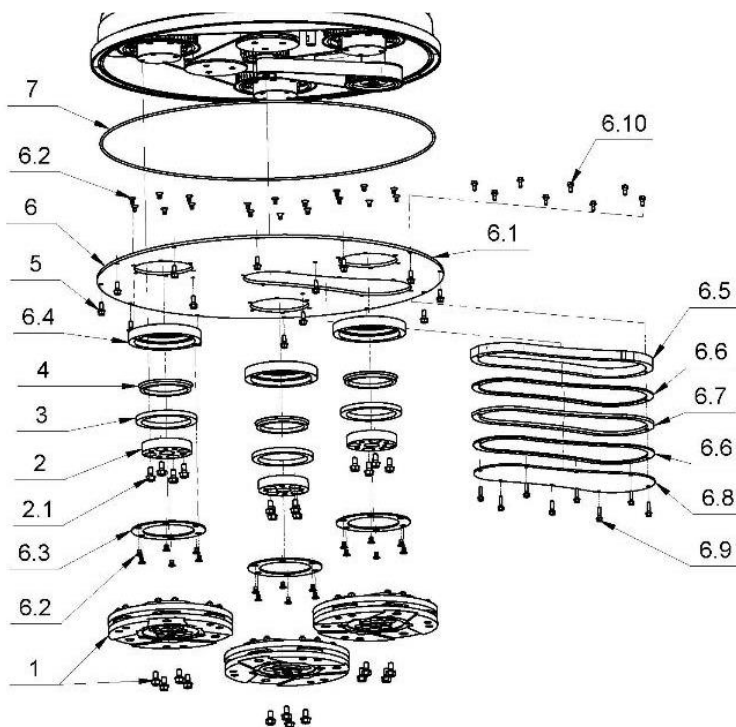
**5.1. LAVINA® 30G-X PULLEY UNIT ASSEMBLY**

Model	No.	Item No.	Description	Pcs.
1	1	M5X12DIN6921	Bolt	1
2	2	L25X-10.00.46	Front Washer	1
3	3	L25X-16.20.00	Chain Pulley Assembly	1
4	4	TWVA00320	V-Ring Type A	1
5		L25X-16.00.00	Bearing Body	1
	5.1	M6X25DIN6921	Bolt	6
	5.2	DIN6885A5X5X16	Key	2
6	6	L25X-16.00.03	Distance Ring	1
7	7	TB64_5M-15-1210-14	Pulley Unit Assembly	1
7*		L25X-04.00.00	Pulley Unit Assembly	1
8	8	L25X-10.00.44	Front Washer	1
9	9	M5X12DIN912	Screw	1

pos.7* For machines with Serial No 17.01.... and bigger.

**6. LAVINA®30G-X WATER TANK PARTS**

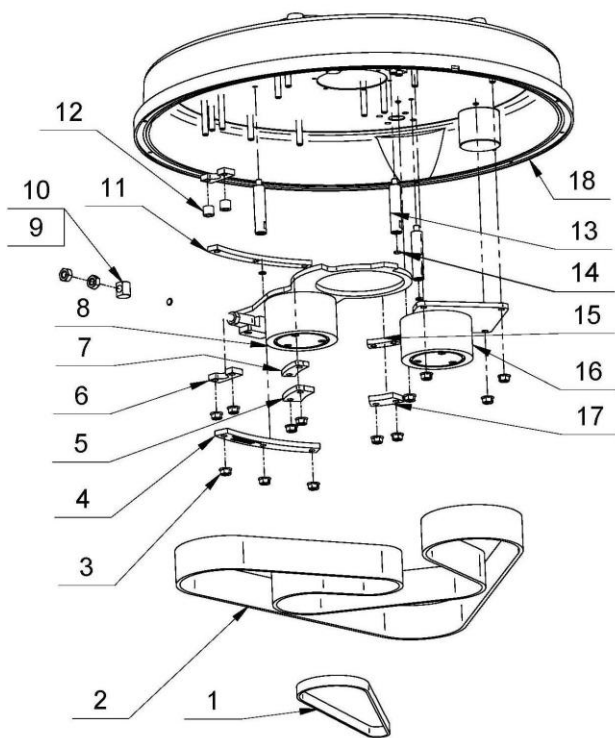
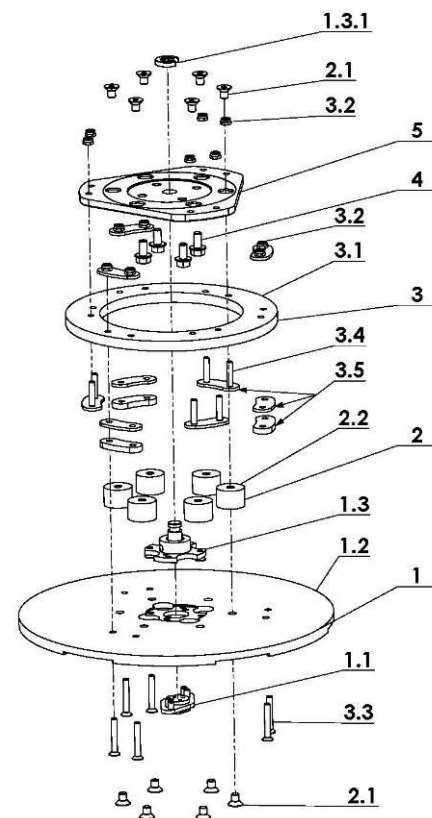
No.	Item No.	Description	Pcs.
1	A29.50.00	Regulator	1
2	1/2"	Filter	1

**7. LAVINA® 30G-X BOTTOM COVER 1 PARTS**

No.		Item No.	Description	Pcs.
1		A43.00.00	Tool Holder A43	3
2		A42.03.00	Adaptor	3
	2.1	30301210072	Bolt M8x16DIN6921	4
3		30309000000	Felt Ring	3
4		30302000005	V-Ring Type A	3
5		30301210051	Bolt M6x16DIN6921	15
6		L25X-14.00.00-R2	Bottom Cover Assembly	1
	6.1	L25X-14.00.01	Bottom Cover	1
	6.2	30301230017	Screw M6X10DIN7991/10.9/	36
	6.3	L25LS-14.00.03	Outer Cover	3
	6.4	L25LS-14.00.02	Flange	3
	6.5	L25X-14.00.05	Flange	1
	6.6	L25X-14.00.04	Sealer Inspection Cover	2
	6.7	L25X-14.00.06	Pad 2	1
	6.8	L25X-14.10.01-R2	Inspection Cover	1
	6.9	30301210105	Bolt M5X20DIN6921	8
	6.10	30301210030	Bolt M5X12DIN6921	8
7		D4X2X1900	Seal	1

8. LAVINA®30G-X TOOL HOLDER PARTS

No.	Item No.	Description	Pcs.
1	A43.10.00	Quick Change Assembly	1
1.1	A31.12.00	Keylock Set	1
1.2	A43.11.00	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	M8X12DIN7991	Screw	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	M6DIN985	Self Locking Nut	12
3.3	M6X40DIN7991	Screw	6
3.4	M6X30DIN7991	Screw	6
3.5	A41.21.00	Set of plates	1
4	M8x16DIN6921	Bolt	4
5	A41.20.01	Flange	1

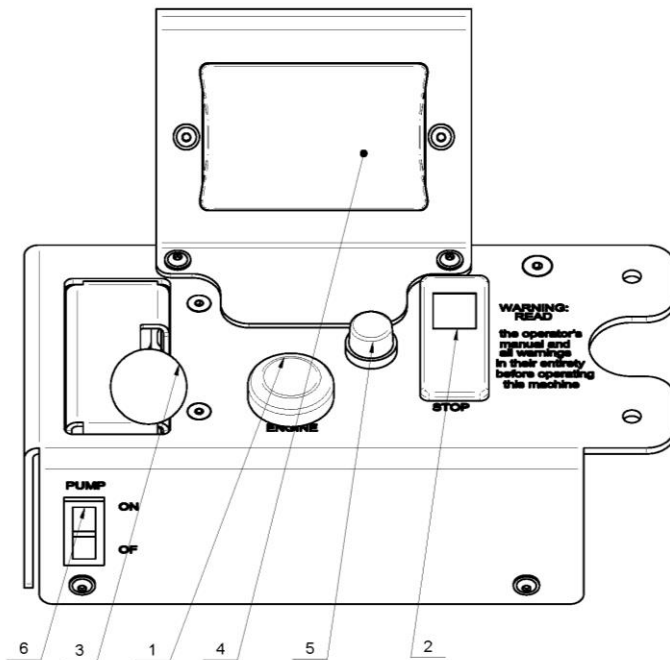
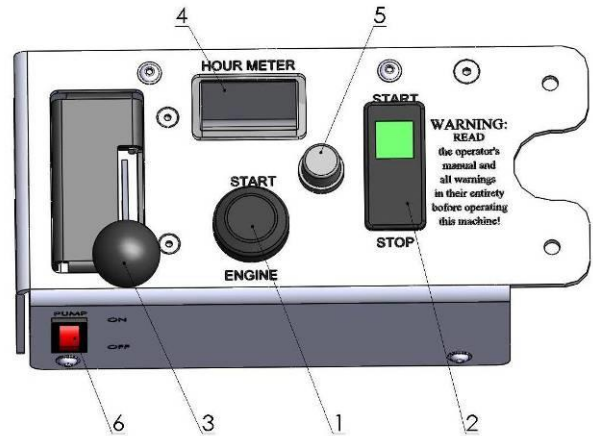
**9. LAVINA® 30G-X BOTTOM COVER 2 PARTS**

No.	Item No.	Description	Pcs.
1	HP6455MHP15	Timing Belts	1
1*	HP6455MHP25	Timing Belts	1
2	HL24008MHL50	Timing Belts	1
3	M8DIN6923	Nut	13
4	L25L-10.00.14	Sector	1
5	L25L-10.00.12	Sector	1
6	L25L-10.00.07	Support	2
7	L25L-10.00.11	Sector	1
8	L25X-12.00.00	Tensioning Support	1
9	L32C-14.20.04	Nut	1
10	M10DIN934	Nut	2
11	L25L-10.00.13	Sector	1
12	L25L-10.00.08	Washer	2
13	L25X-10.00.13	Distance Bolt	3
14	D6X2	O-Ring	3
15	L25X-10.00.34	Sector	1
16	L25X-13.00.00	Deflection Pulley	1
17	L25X-10.00.35	Sector	1
18	L25X-10.00.01-K	Disc	1

Pos.1* is For machines with Serial No 17.01.... and bigger.

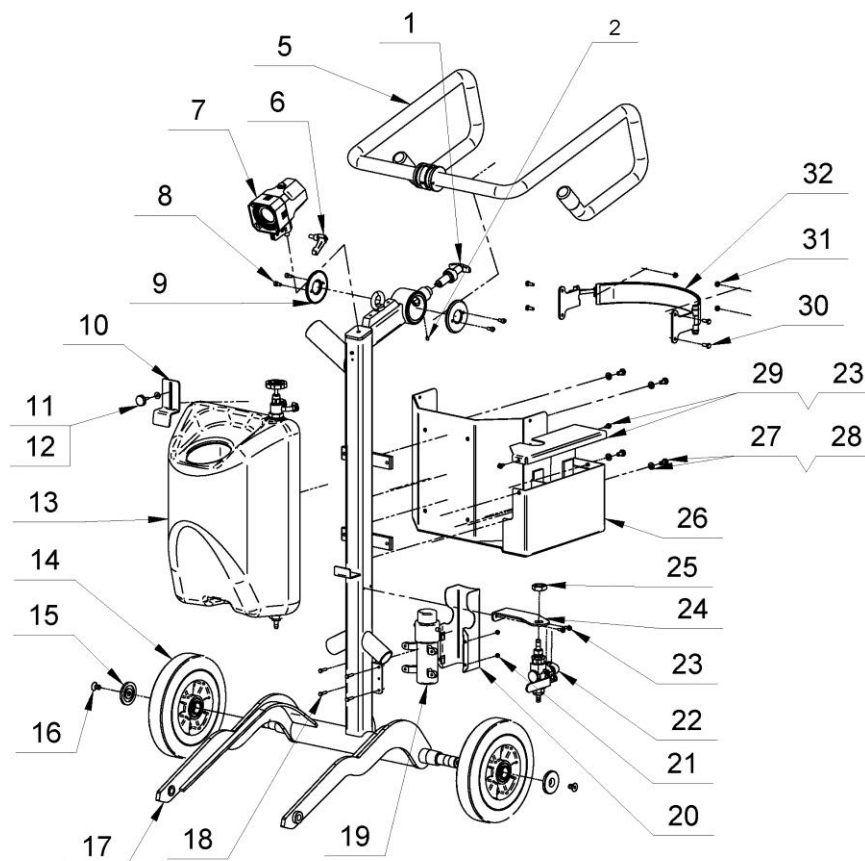
10. LAVINA® 30G-X CONTROL BOARD PARTS

No.	Item No.	Description	Pcs.
1	W1301	Start/Stop Switch	1
2	W1330	Clutch Switch	1
3	W4110	Throttle	1
4	W4313	Hour Meter	1
5	6x30/30A	Fuse	1
6	W9999	Pump switch	1

**10. LAVINA® 30G-GTX CONTROL BOARD PARTS**

No.	Item No.	Description	Pcs.
1	GT-440	Start/Stop Switch	1
2	W1330	Clutch Switch	1
3	W4110	Throttle	1
4	GT-EM40	Complete Monitor Assembly	1
5	6x30/30A	Fuse	1
6	W9999	Pump switch	1

12. LAVINA® 30G-X CARRIAGE PARTS



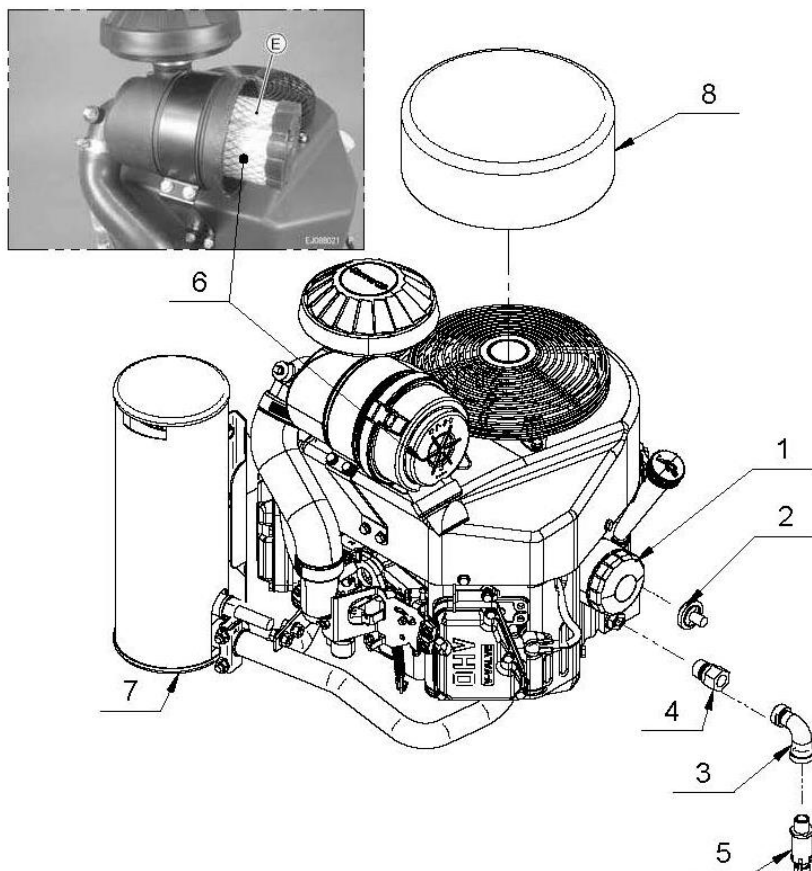
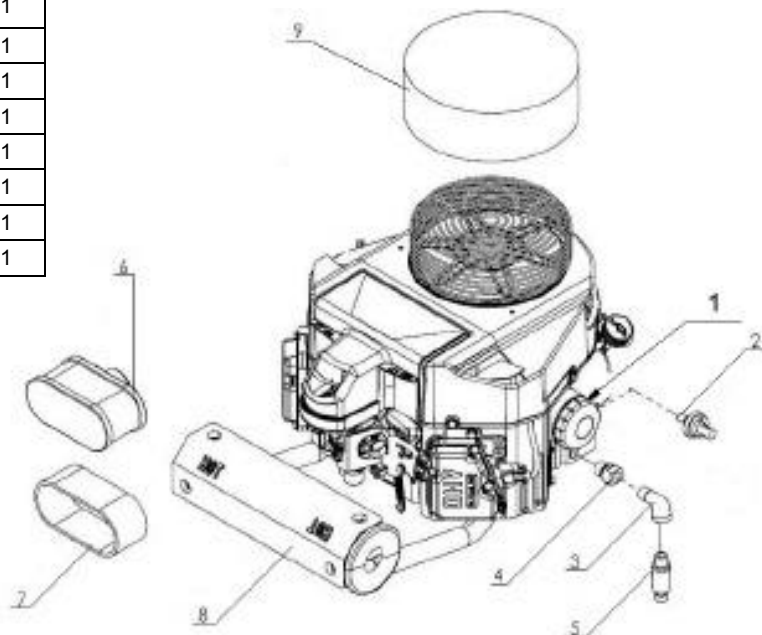
12. LAVINA® 30G-X Carriage parts

No.	Item No.	Description	Pcs.	No.	Item No.	Description	Pcs.
1	L25S-23.00.06-K	Locking bit	1	17	L25GX-21.00.00	Frame	1
2	M6X8DIN915	Screw	1	17**	L25GX-21.00.00-1	Frame	1
3	L25GS-25.00.00	Strap	1	18	M5X20DIN933	Bolt	4
4	M6DIN985	Nut	4	19	1040	Water Pump	1
5	L25S -23.10.00	Handle Assembly	1	20	L25S-20.00.26	Guard	1
6	A58165	Swivel Bolt	1	21	M5DIN985	Nut	4
7	L25SPS-01.00.00.00-G	Lamp Unit Incl. Cable	1	22	A29.40.00	Water Flow Control Unit	1
8	M6X12DIN912	Screw	4	23	M5X12DIN6921	Bolt	4
9	L25S-23.00.02	End Cover	2	24	A29.20.01-01	Flow Unit Base	1
10	L25P-02.00.00.01	Top Bracket	1	25	M20X1.5DIN439B	Nut	1
11	T34391	Knob Bolt	1	26	L25G-22.00.00	Propane Tank Holder	1
12	M5UN732	Washer	1	27	M8X16DIN933	Bolt	4
13	A33.10.00	Tank Assembly	1	28	M8DIN125A	Washer	4
14	L25G-20.00.04	Wheel	2	29	L25G-20.00.05	Battery Cover	1
14**	IFP250x50-25x60	Wheel	2	30	M6X16DIN933	Bolt	4
15	L32D-20.00.03	Wheel Cap	2	31	M6DIN985	Nut	4
15**	L25X-20.00.03	Wheel Cap	2	32	L25GS-25.00.00	Strap	1
16	M10X16DIN7991	Screw	2				

** for machines with Item No 1709L30GX20196 and bigger

13.LAVINA® 30G-X KAWASAKI FS481V ENGINE PARTS

No.	Item No.	Description	Pcs.
1	KFS481	Complete Engine Assembly	1
	K49065-7007	Oil Filter	1
2	W1325	Oil Pressure Switch	1
3	120	Elbow	1
4	123	Joint	1
5	109	Oil Drain Valve	1
6	K11013-7049	Element Air Filter	1
7	K11013-7046	Foam pre-Filter	1
8	W3240A	Cat Muffler Assy.	1
9	117	Kawasaki Bonnet Filter	1

**LAVINA® 30G-X
KAWASAKI KFX600-BS ENGINE PARTS**

No.	Item No.	Description	Pcs.
	KFX600-BS	Complete Engine Assembly	
1	K49065-7007	Oil Filter	1
2	106	Oil Pressure Switch	1
3	120	Elbow	1
4	123	Joint	1
5	109	Oil Drain Valve	1
6	125	Element Air Filter	1
7	K201	Vertical Cat Muffler Assy.	1
8	117	Bonnet Filter	1

14.EMISSION CONTROL WARRANTY STATEMENT**CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT YOUR WARRANTY RIGHTS AND OBLIGATIONS**

The California Air Resources Board and Superabrasive Inc. are pleased to explain the emissions control system warranty on your 2016 small off-road engine (SORE). In California, new SORE must be designed, built and equipped to meet the State's stringent anti-smog standards. Superabrasive Inc. must warrant the emission control system on your SORE for the period of time listed below provided there has been no abuse, neglect or improper maintenance of your SORE.

Your emission control system may include parts such as the carburetor, fuel-injection system, the ignition system, catalytic converter, fuel tanks, fuel lines, fuel caps, valves, canisters, filters, vapour hoses, clamps, connectors, and other associated emission-related components.

Where a warrantable condition exists, Superabrasive Inc. will repair your SORE at no cost to you including diagnosis, parts and labor.

MANUFACTURER'S WARRANTY COVERAGE

The emission control system is warranted for 2 years. If any emission-related part on your equipment is defective, the part will be repaired or replaced by Superabrasive Inc.

OWNER'S WARRANTY RESPONSIBILITIES

As the small off-road engine (SORE) owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Superabrasive Inc. recommends that you retain all receipts covering maintenance of your SORE engine, but Superabrasive Inc. cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the SORE owner you should however be aware that Superabrasive Inc. may deny your warranty if your SORE or its part has failed due to abuse, neglect, improper maintenance or unapproved modification.

You are responsible for presenting your utility equipment engine to a Superabrasive Inc. distribution center as soon as the problem exists. The warranty repairs should be completed within a reasonable amount of time, not to exceed 30 days. If you have any questions regarding your warranty rights and responsibilities, you should contact Superabrasive Inc. at 1-(800)-987-8403 or by e-mail at info@superabrasive.us

Superabrasive Inc
9411 Jackson trail Rd
Hoschton, GA
USA, 30548

GENERAL EMISSIONS WARRANTY COVERAGE

Superabrasive Inc. warrants to the ultimate purchaser and each subsequent purchaser that the equipment is:

Designed, built and equipped so as to conform with all applicable regulations; and

Free from defects in materials and workmanship that cause the failure of a warranted part to be identical in all material respects to that part as described in Superabrasive Inc. application for certification.

The warranty period begins on the date the equipment is delivered to an ultimate purchaser or first placed into service. The warranty period is two years.

Subject to certain conditions and exclusions as stated below, the warranty on emission-related parts is as follows:

- (1) Any warranted part that is not scheduled for replacement as required maintenance in the written instructions supplied, is warranted for the warranty period stated above. If the part fails during the period of warranty coverage, the part will be repaired or replaced by Superabrasive Inc. according to subsection (4) below. Any such part repaired or replaced under warranty will be warranted for the remainder of the period.
- (2) Any warranted part that is scheduled only for regular inspection in the written instructions supplied is warranted for the warranty period stated above. Any such part repaired or replaced under warranty will be warranted for the remaining warranty period.
- (3) Any warranted part that is scheduled for replacement as required maintenance in the written instructions supplied is warranted for the period of time before the first scheduled replacement date for that part. If the part fails before the first scheduled replacement, the part will be repaired or replaced by Superabrasive Inc. according to subsection (4) below. Any such part repaired or replaced under warranty will be warranted for the remainder of the period prior to the first scheduled replacement point for the part.
- (4) Repair or replacement of any warranted part under the warranty provisions herein must be performed at a warranty station at no charge to the owner.
- (5) Notwithstanding the provisions herein, warranty services or repairs will be provided at all of our distribution centers that are franchised to service the subject engines or equipment.
- (6) The SORE owner will not be charged for diagnostic labor that is directly associated with diagnosis of a defective, emission-related warranted part, provided that such diagnostic work is performed at a warranty station.
- (7) Superabrasive Inc. is liable for damages to other engine or equipment components proximately caused by a failure under warranty of any warranted part.
- (8) Throughout the SORE warranty period stated above, Superabrasive Inc. will maintain a supply of warranted parts sufficient to meet the expected demand for such parts.
- (9) Any replacement part may be used in the performance of any warranty maintenance or repairs and must be provided without charge to the owner. Such use will not reduce the warranty obligations of Superabrasive Inc.
- (10) Add-on or modified parts that are not exempted by the Air Resources Board may not be used. The use of any non-exempted add-on or modified parts by the ultimate purchaser will be grounds for disallowing a warranty claim. Superabrasive Inc. will not be liable to warrant failures of warranted parts caused by the use of a non-exempted add-on or modified part.

WARRANTED PARTS

The repair or replacement of any warranted part otherwise eligible for warranty coverage may be excluded from such warranty coverage if Superabrasive Inc. demonstrates that the SORE has been abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for repair or replacement of the part. That notwithstanding, any adjustment of a component that has a factory installed, and properly operating, adjustment limiting device is still eligible for warranty coverage. The following emission warranty parts are covered:

- (1) Catalytic converter
- (2) Fuel system: Carburetor, pressure regulator and fuel lock off
- (3) Ignition system
- (4) Intake system including pre-filter
- (5) Exhaust manifold