

LAVINA®



LAVINA® 32G -X 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 48 contiguous 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.

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1. GENERAL INFORMATION

This owner's manual is intended for the operator of the Lavina® 32G-X machine, the servicing technician as well as anyone else 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® 32G-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® 32G-X machine is intended for grinding, polishing and buffing concrete, marble, granite, limestone and terrazzo surfaces with diamond tools.

The Lavina® 32G-X is a six-disc machine and can be used dry as well as wet.

For best results, use only tools manufactured or recommended by Superabrasive and its distributors.

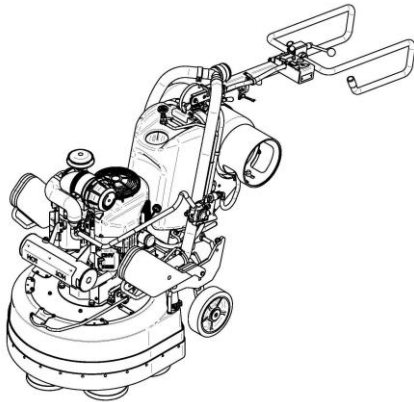


Figure 1.1

WARNING!

The Lavina® 32G-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® 32G-X is made of two main component sections:

LAVINA® 32G-X MAIN DESIGN

The two main component sections are the carriage and main head.

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



Figure 1.2

A halogen spotlight (Fig.1.2) lights the grinded floor behind the machine. The lamp holder can be adjusted to different positions.

- **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 sprayer or internal
- **The Engine Kawasaki FX921V** with electric clutch is mounted on the base plate and drives the six heads with a belt system.
- **The planetary motion** is derived from the main engine, driven by a duplex roller chain,
- **The self-leveling Guard** is designed to have contact with the surface. Anytime, no matter the height of the tool used. fast
- **“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 six grinding heads with a key lock (butterfly). The Velcro mounting system allows for quick, easy changing of tools.



Figure 1.3

ENVIRONMENTAL CONDITIONS

The temperature range for operating the Lavina® 32G-X outdoors is between 41°F and 86°F or 5°C and 30°C. Never use the Lavina® 32G-X 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® 32G-X 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 76 mm/ 3 inch and can be glided over the three-way pipe. The vacuum dust extractor must be adapted for floor grinders and have a minimum air displacement of 500 m³/h with a negative vacuum of 21 kPa.

TECHNICAL DATA

	LAVINA® 32G-X	
Engine	Kawasaki FX921V	
Capacity of engine	999cc	61.0cu.in
Power	23.1 kW	31 HP
Tool holder rpm	600-1020 rpm	
Engine rpm	2000-3400 rpm	
Working width	814 mm	32"
Tool holder diameter	6 x 225 mm	6 x 9"
Weight	574 kg	1270 lbs
Grinding pressure	300; 380 kg	660; 850 lbs
Application	*3 operating heads wet and dry	
Vacuum hose port	76 mm	3"
Water attachment	Quick change for 3/4" hose	
Water tank capacity	46 l	12 gal
Propane tank capacity	15.2 kg	33.5 lbs
Water feed	Peripheral and front stream with pump	
Third wheel	Option	
Machine LxWxH	2520x850x1350 mm	99.2"x34"x48.4"
Packing crate LxWxH	1460x1000x1520 mm	58"x37"x60"

* The machine can work with 3 OPERATING HEADS only when each working head alternates with a non working head

VIBRATIONS

The vibrations of the machine are within the limits of directives and harmonized standards from the European Union when the Lavina® 32G-X is operated with the recommended tools and in normal conditions.

NOISE EMISSIONS

The noise emissions are within the limits of directives and harmonized standards from the European Union when the Lavina® 32G-X is operated with the recommended tools and in normal conditions. However, as previously stated, the operator must wear ear protectors.

LABEL DATA

The data on the label provides the correct voltage, kW and RPM (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® 32G-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 different from the ones stated in the General Description chapter.
 For not-suitable materials.
 In environments which:
 Possess risks of explosion
 Possess high concentration of powders or oil substances in the air
 Possess risks of fire
 Feature inclement conditions.
 Possess electromagnetic radiation.
 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:
 You have closed the work area, so that no person unfamiliar with operating the machine can enter the area
 The tool plate and tools are adjusted to the machine properly
 There are no missing parts of the machine
 The machine is in upright working position
 The protection devices are working properly.

PROTECTION DEVICES

The machine is equipped with several protection devices including the following:
 An emergency stop button
 A protection skirt and a hood for protecting the tool plates.
 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

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

SAFE USE

The Lavina® 32G-X is designed to eliminate all risks correlated with its use. However, it is not possible to eliminate the risks of an eventual accident with the machine. Unskilled or uninstructed operator may cause correlated residual risks. Such risks are:

Position Risks due to operator's incorrect working position

WARNING

Tangling up Risks due to wearing inappropriate working clothes

Training Risks due to lack of operational training

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

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 overflow. 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 shall 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 much less 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 NPFA 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**

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

**WARNING**

OPERATING MACHINE

Never work with the machine without visual contact with it.

Never run the machine when you are situated between the handles of the wheel

When operating the Lavina® 32G-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.

Check if the floor, you work on, is not too uneven. If this is the case, it may damage the machine.

AFTER WORK IS COMPLETED  **WARNING**

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 its storage

THE WORK AREA  **WARNING**

Make certain that people or vehicles do not enter the work area.

Avoid cables and hoses being in the way.

Always check the floor for debris

PERSONAL PROTECTIVE EQUIPMENT (PPE)  **WARNING**

Always wear safety shoes 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 is 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 Lavina® 32G-X machine must have an adequate technical knowledge and preparation.

The operator must know the machine's work environment.

Only one operator at a time can work with the machine.

The operator must be properly trained and well instructed prior operating the machine.

The operator must understand all the instructions in this manual.

The operator must understand and interpret all the drawings and designs in manual.

The operator must know all sanitation and safety regulations pertaining to the operation of

The operator must have floor grinding experience.

The operator must know what to do in case of emergency

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 33.5 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 33.5 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 33.5-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 33.5 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 no more than 80% of their rated capacity. The other 20% 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, is -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), also 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 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 POSITIONING THE HANDLE

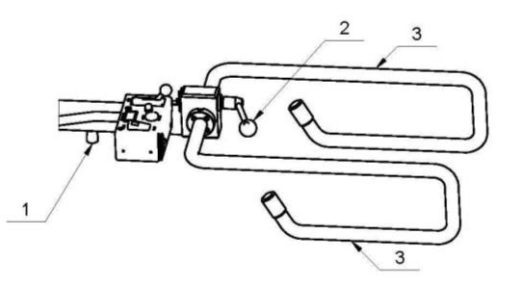


Figure 3.1



Figure 3.2



Figure 3.3

USING THE STEERING BRACKET

By loosening the swivel bolt (Fig. 3.1-2), one can turn the steering bracket (Fig. 3.1-3) to a new position. To turn the steering bracket down (Fig. 3.3) you have to loosen the swivel bolt (Fig. 3.1-2) and push it in, for security reasons.



Figure 3.4

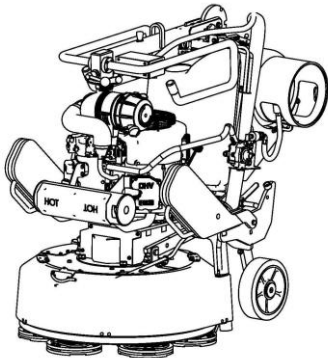


Figure 3.5

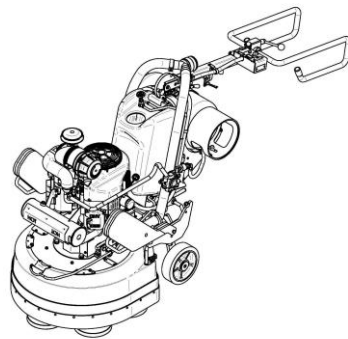


Figure 3.6

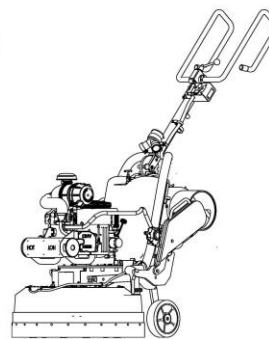


Figure 3.7

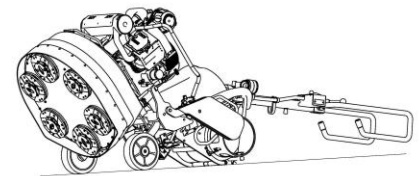


Figure 3.8

The handle can be positioned in three positions:

Transport position to store or to transport or to hoist the machine (fig. 3.5)

Working position (fig. 3.6) and Flipping position (fig. 3.7)

To change the handle positions pull the knob (Fig. 3.1-1, Fig. 3.4), and move the handle up or down.



Figure 3.9



Figure 3.10

To choose the transport-position pull the additional the security pin (Fig. 3.9, Fig. 3.10) out and replace it when the handle is in position. Never lift the machine by the handle without mounting this pin.

FLIPPING THE MACHINE UP

To change the tools, put the handle in the flipping (upright) position (Fig. 3.7), grab the steering bracket and pull the machine down using all bodyweight (one foot on the control box can help). Put the bracket down on the floor (Fig. 3.8) and change tools. One foot on the control box can help again while putting the machine down.

LIFTING

Lifting the machine by crane is possible by using the hoisting ring mounted on the carriage (see Fig.3.12). Do not lift any other loads on the machine. Always use hoisting equipment rated for 600 kg (1300 lbs). Make sure the security pin (Fig. 3.10, Fig. 3.11) is mounted before lifting.

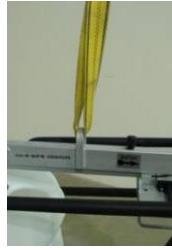


Figure 3.11



Figure 3.25



Figure 3.26



Figure 3.27



Figure 3.28

STORAGE

Always store and transport the Lavina® 32G-X in a dry place. Never transport the Lavina® 32G-X unprotected; it may be damaged if transported unprotected during rain or snow.

⚠ WARNING

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

- Pull out the hose of the tank (Fig.3.25)
- Using compressed air, blow out excess water from the system at each position of the lever (Fig. 3.26, Fig. 3.27)

4. OPERATION

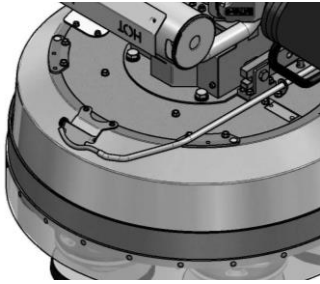


Figure 4.1

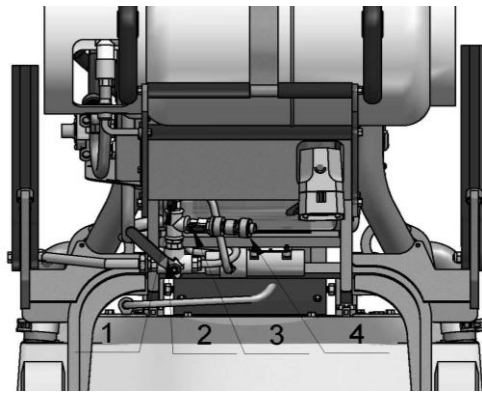


Figure 4.2

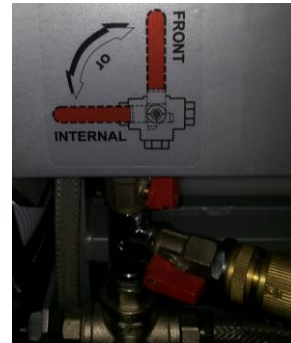


Figure 4.3



Figure 4.4

PRELIMINARY CONTROLS

Inspect the working area as explained in the safety instructions. For wet use, fill in the water tank. Connect the vacuum extractor and ensure that the vacuum hose is clear and it will follow the machine easily.

CONTROL OF THE WATERFLOW

Using the valve (Fig.4.2-2) the operator can choose from where the water will spray:

- when the handle of the tap is in vertical position the water will spray in front of the machine (fig.4.1),
- when the handle is in the horizontal position the water will spray under the cover of the machine.

The flow regulating valve located on the tank (Fig.4.3) is increasing or reducing the waterflow to the working area – in front of the machine or under the main head cover of the machine.

The valves (Fig. 4.2-1 and Fig. 4.2-3) are controlling the flow of an external water supply. A $\frac{3}{4}$ " water tube can be attached to the quick connection (Fig. 4.2-4).

ADJUSTING AND MOUNTING TOOLS

The Holder A41 in the 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 32G-X, the holder is initially mounted with 6 buffers.

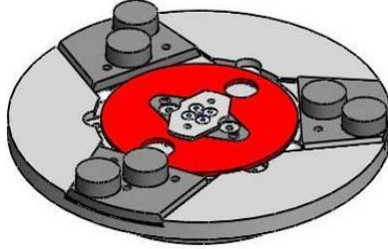


Figure 4.5



Figure 4.6

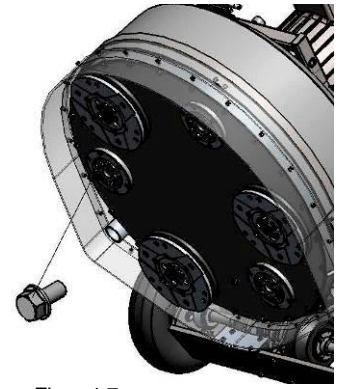


Figure 4.7

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

WARNING: Always secure the “Quickchange” pads with the security plate (Fig.4.5) and lock with the tool holder key (Fig.5.3). Diamond tools with Velcro are attached on six 9-inch foam plates (Fig.4.6).

The foam plates are mounted on the key lock (butterfly).

Always use the tool holder key (Fig.5.3).

The machine can work with 3 operating heads by operating every other head as shown in Fig.4.7. For the inactive heads, remove the holders only (not adaptors), and screw the bolts mounting the holders into the free thread holes of the adaptors in order to protect them.(Fig.4.7)

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.

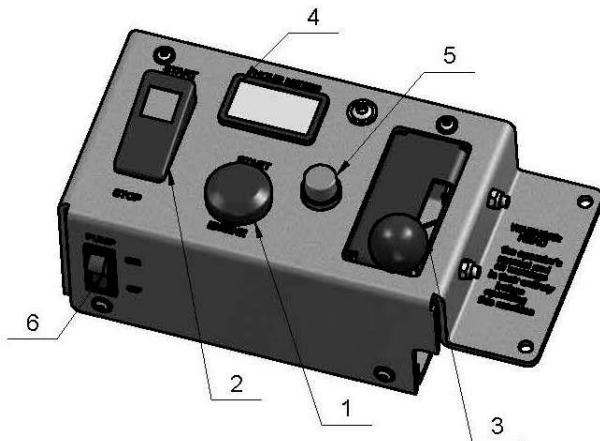
CONTROL BOARD

Figure 4.5

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.

rpm engine	rpm tools
2000	600
2100	630
2200	660
2300	690
2400	720
2500	750
2600	780
2700	810
2800	840
2900	870
3000	900
3100	830
3200	960
3300	990
3400	1020
3500	1050
3600	1080

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.

5. TOOLS AND ACCESSORIES

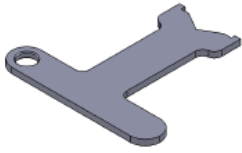


Figure 5.1

TOOL HOLDER KEY

The tool holder key (Fig. 5.1) is used for adjusting, mounting and dismounting of the tools. Always use the key for mounting.

Item number is A03.00.00.00

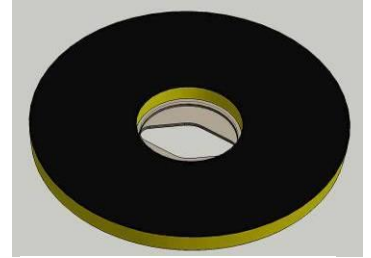


Figure 5.2

FOAM PLATE

Diamond tools with Velcro are mounted on the foam plate 9" (Fig. 5.2).

The foam plate is mounted on the flexible backer plate.

Item number is LV-9-FP-S

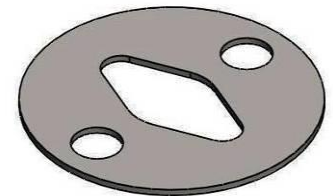


Figure 5.3

SECURITY PLATE FOR QUICKCHANGE PADS

Plate (Fig. 5.3) used to secure the "Quickchange" pads.

Item number is A38.00.01

THIRD WHEEL

With the Lavina® 32GX, it is possible to install a third wheel to allow better handling. It is purchased as a full assembly - item number L32S-04.00.00 (shown on fig. 5.4)

Mounting/dismounting with pin assembly (see fig. 5.4-1).

While working the operator can turn the wheel support 90° (fig. 5.4-7). Pull out the handle, turn it 90° and fix it again.

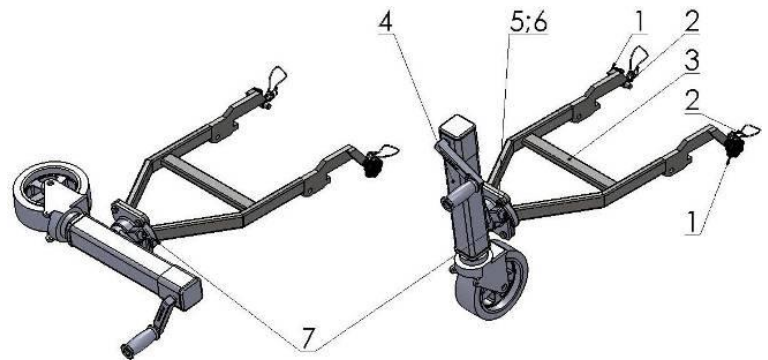


Figure 5.4

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 included 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, and are great for daily use. When used wet, they require only water (no wax or chemicals needed), making them an 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 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

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, power cord and plugs, vacuum hoses and water tank.

CHECK DAILY

After operating the Lavina® 32-X/32-X-HV, 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 bolts or screws.

Tool holders: Buffers and elastic element are consumables and must be visually checked daily and replaced if needed. The key lock holders (butterflies) on the tool holders should be also checked.

Check the rubber buffers and make sure the holders are secure. The flange holding the buffers (Fig.7.1-1) has to be firmly secured to the unit. A gap seen here indicates loose screws securing the holder. The screws have to be tightened immediately to safely operate the machine. Working with loose screws could cause serious damage to the machine. The tightening force on the screws should be 22-25N.m (16-18lbf.ft).

It is very important to regularly check the screws that secure the "QuickChange" holder to the safety part (Fig.7.1- 2), so that the holder will not fly away if the buffers get damaged. The "QuickChange" should also be cleaned.

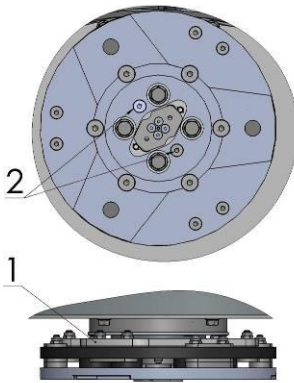


Figure 7.1

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 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, plugs, vacuum hoses and water tank and filter. Also, check the water flow of the pump. Check the guard assembly. Make certain the wheels are clean and rotate properly. Inspect the control buttons. If there are defective control parts, they should be replaced immediately. Replace worn vacuum- and water hoses.

Carefully inspect the seal rings and bearings of the grinding units, and replace any showing signs of excessive wear. For more information, refer to chapter troubleshooting below. Open the service cover on the motor base Figure 9.7.2 to check of the planetary chain. Lubricate the chain with chain lubricant and correct the sag 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.

CHECK EVERY 400 WORKING HOURS

In addition to checks made every 200 working hours, replace sealer and V-rings as described in chapter **"DISMOUNTING TOOL HOLDERS TO CHANGE V-RINGS AND FELT-RINGS"**.

Remove the protective covers under the generator. Check the belt that runs the generator. If necessary, tighten it, making sure not to "over tension." Replace it if necessary.

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

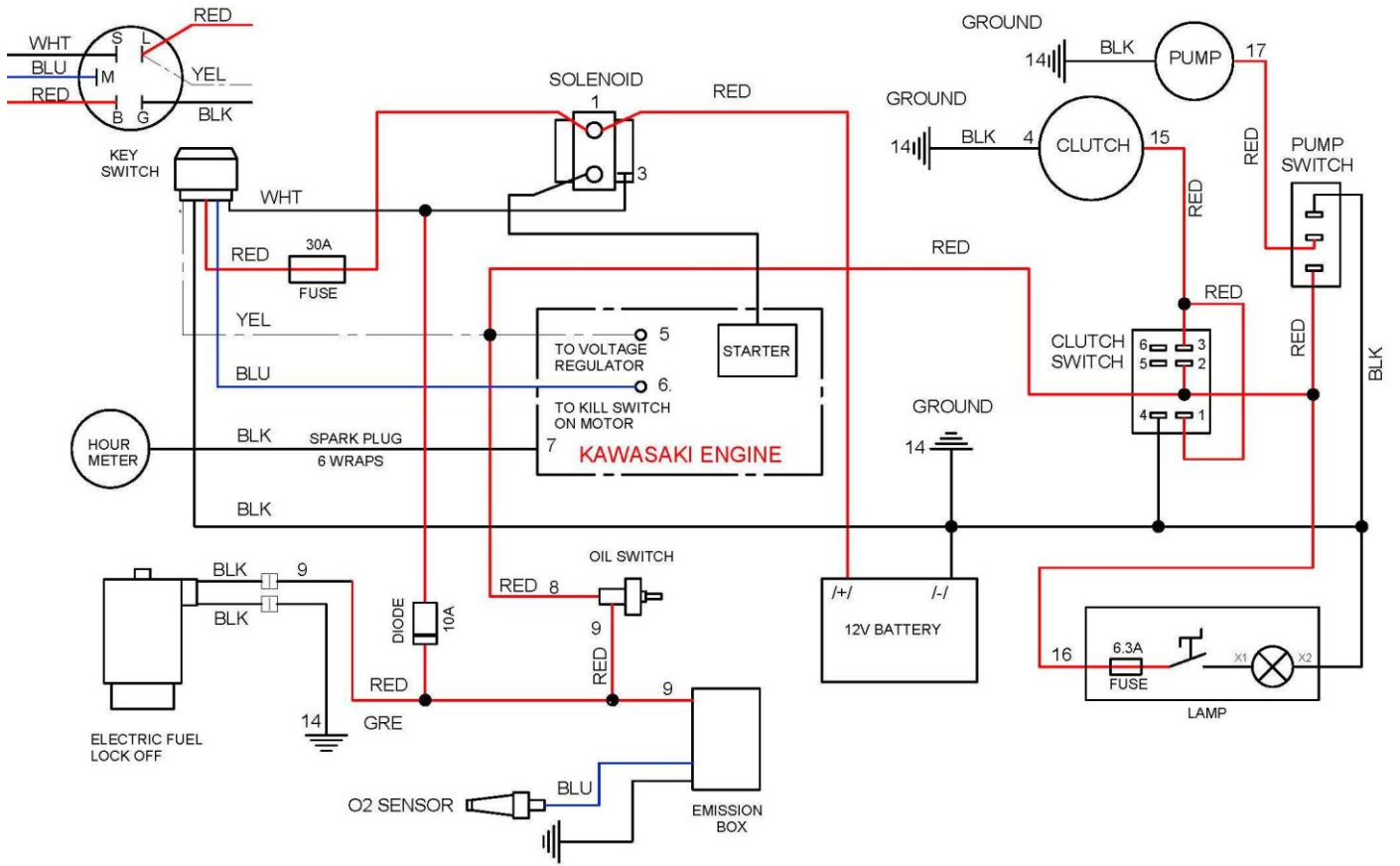
Replace any leaking parts immediately as the water could damage your machine

ELECTRICAL SYSTEM

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

MECHANICAL PARTS

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



8. TROUBLESHOOTING

INDEX OF PROBLEMS AND SOLUTIONS

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 under the control box. 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

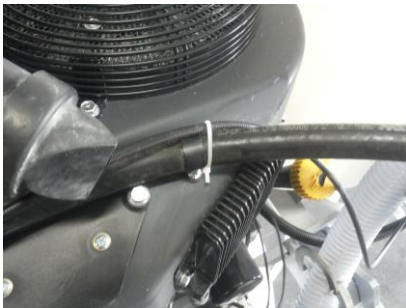


Figure 8.2.1



Figure 8.2.2

Check the engine oil level; do not 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 CARRAGE

Please note that the propane cylinder has to be removed (Fig. 8.3.1) and stored outside before any maintenance or reparation is done.



Figure 8.3.1



Figure 8.3.2



Figure 8.3.3



Figure 8.3.4



Figure 8.3.5



Figure 8.3.6



Figure 8.3.7

Pull the connector of the battery (Fig. 8.3.2), pull out the propane hose (Fig. 8.3.3), pull out the connectors of the LP Fuel Lockoff valve (Fig. 8.3.4). Disconnect the water hose from the main head (Fig.8.3.5) (Fig. 8.3.6). Release the vacuum hose from the carriage (Fig. 8.3.7) (Fig. 8.3.8).



Figure 8.3.8

Dismount the control board (Fig. 8.3.9; Fig. 8.3.10) and release the cable (Fig. 8.3.11; Fig. 8.3.12; Fig. 8.3.13).



Figure 8.3.9



Figure 8.3.10



Figure 8.3.11

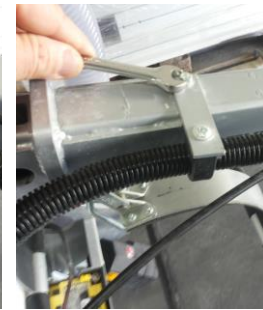


Figure 8.3.12



Figure 8.3.13



Figure 8.3.14



Figure 8.3.15

Unscrew the nuts (Fig. 8.3.14 and Fig. 8.3.15) Unscrew the bolts holding the head to the carriage and separate the carriage from the main head.

8.4 DISMOUNTING/MOUNTING THE ENGINE AND CHANGE BELT

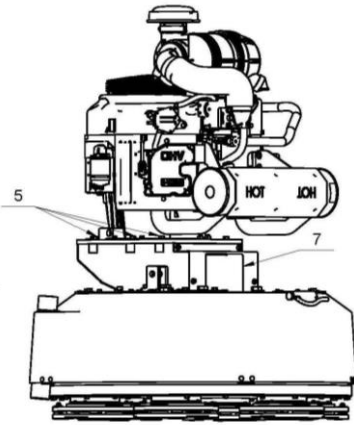


Figure 8.4.1

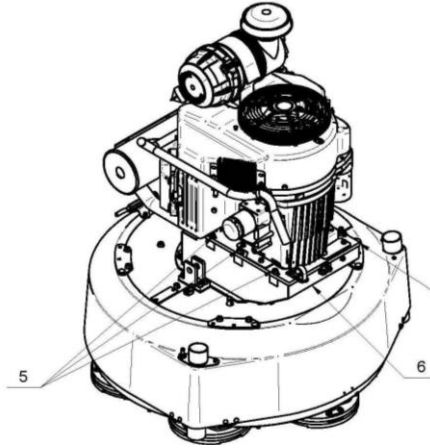


Figure 8.4.2

Separate the head from the carriage (see previous chapter). Remove the front and back belt protectors (Fig. 8.4.1-7) (Fig. 8.4.1-6). Loosen the motor base plate (Fig. 8.4.2_5) and release the tensioner assembly (Fig. 8.4.3_4). Take off the engine with the motor base plate.

Reassemble in the same manner. (Fig. 8.4.5), Tension the belt with bolt (4) on (fig. 8.4.4). The belt tension can be tested with a Frequency tension Tester Optibelt 3 TT. The readings should be 195...205 Hz. If you do not have a Frequency tension Tester, use the already set limit of the movement of the motor base plate

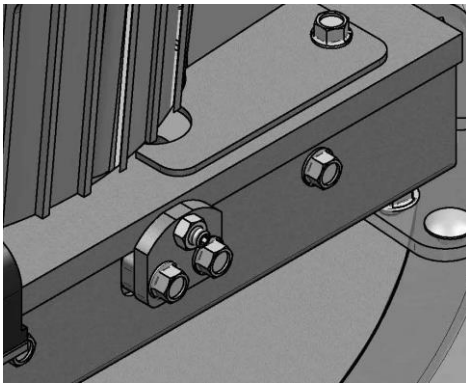


Figure 8.4.3

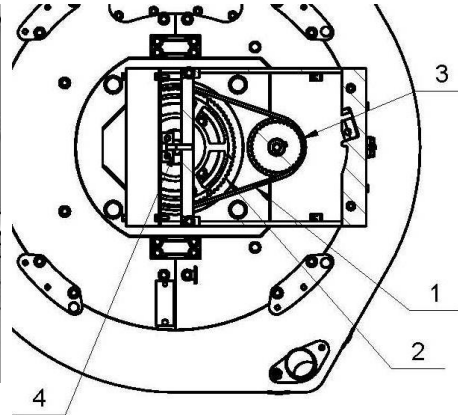


Figure 8.4.4

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

8.5 REPLACING THE CLUTCH

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 lbf.ft (Fig. 8.5.2 and Fig. 8.5.3).

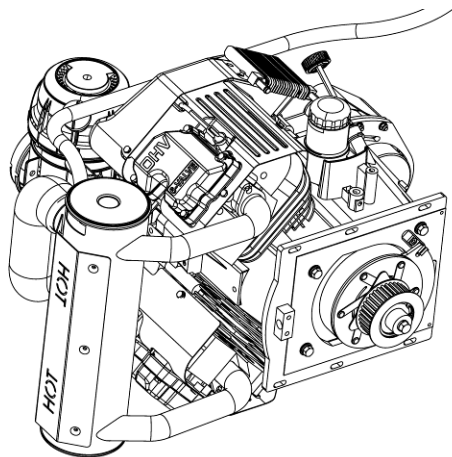


Figure 8.5.1

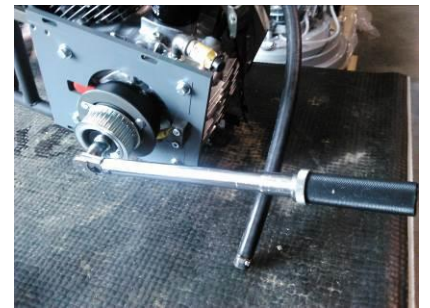


Figure 8.5.3



Figure 8.5.2



Figure 8.5.4



Figure 8.6.1



Figure 8.6.2

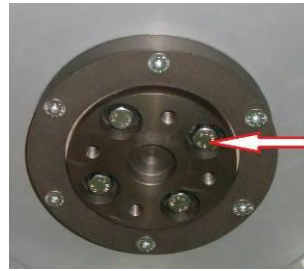


Figure 8.6.3



Figure 8.6.4



Figure 8.6.5



Figure 8.6.6

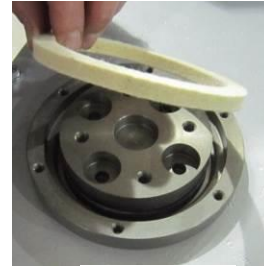


Figure 8.6.7

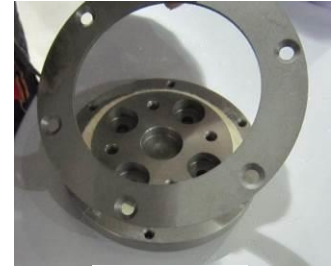


Figure 8.6.8

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.

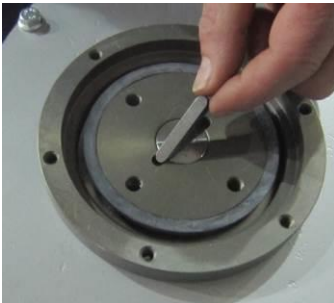


Figure 8.6.9



Figure 8.6.10

When the tool holder and adapter are dismantled, you can change the top key transmitting the movement to the planetary chain.

8.7 DISASSEMBLING AND MOUNTING TOOL HOLDERS TO CHANGING 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

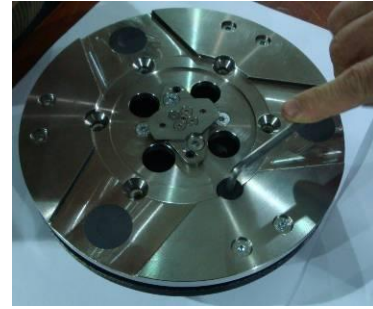


Figure 8.7.3

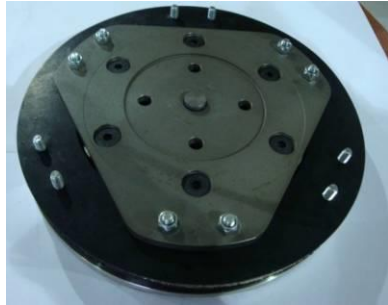


Figure 8.7.4



Figure 8.7.5



Figure 8.7.6



Figure 8.7.7



Figure 8.7.8

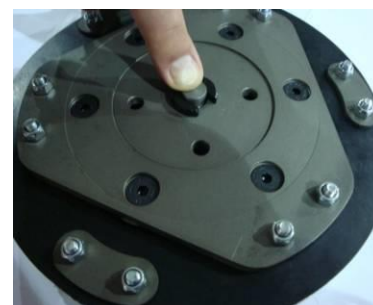


Figure 8.7.9

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 dismounting the holder of the machine.



Figure 8.7.10

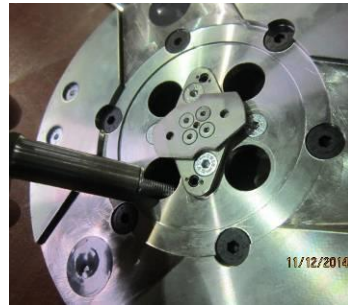


Figure 8.7.11

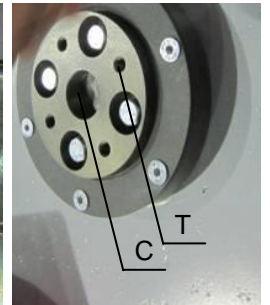


Figure 8.7.12

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

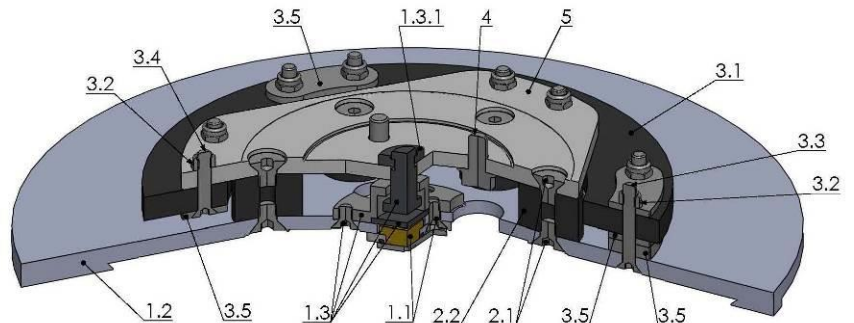


Figure 8.7.13

8.8 CORRECTING SAG OF USED PLANETARY CHAIN

Unscrew the bolts of the maintenance window (see Fig.8.8.1) from the right side of the main head (Fig.8.8.2) (Fig.8.8.3) and lift the machine into tool-changing position. Manually turn the holders in order to turn the main head, stop when the chain link and the chain tensioner can be seen through the window.

Loosen 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, and then unscrew the inner nut (Fig.8.8.6). To tension the chain screw, tighten the outer nut (Fig.8.8.7). 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 the tension is set, screw the two nuts (Fig.8.8.6) (Fig.8.8.7) and the two bolts (Fig.8.8.4) (Fig.8.8.5).



Figure 8.8.1

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



Figure 8.8.2



Figure 8.8.3



Figure 8.8.4



Figure 8.8.5



Figure 8.8.6



Figure 8.8.7

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 loss of integrity of the chain. Take off the maintenance window (see Fig.8.8.1) from the right side of the main head (Fig.8.8.2) (Fig.8.8.3) and lift the machine into tool-changing position. Manually turn the holders in order to turn the main head, stop when the chain link and the chain tensioner can be seen through the window.

Separate the main head from the carriage as described in the paragraph “Splitting the carriage from the main head”, Dismount the top cover. Unscrew the eight bolts (Fig.8.9.1) and take off the top cover (Fig.8.9.2) (Fig.8.9.3).



Figure 8.9.1



Figure 8.9.2



Figure 8.9.3

Pull out the split pin (Fig.8.9.6) and the chain link pin (Fig.8.9.7) Remove the chain, and install the new chain in the same manner, then insert the chain link pin and the split pin (Fig.8.9.8) (Fig.8.9.7)



Figure 8.9.4

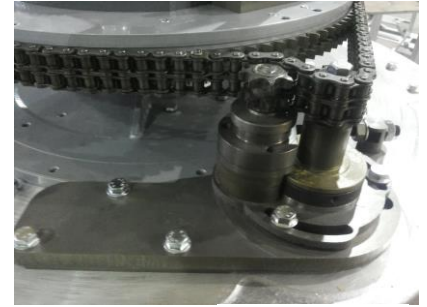


Figure 8.9.5

To tension the chain, screw the outer nut (Fig.8.8.8). The tensioner of the planetary chain should allow chain sag of 3...5mm (1/8...3/16 in) measured in span X (Fig.8.8.8). With tension set, screw the two nuts (Fig.8.8.7) (Fig.8.8.8) and the two bolts (Fig.8.8.5) (Fig.8.8.6).

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



Figure 8.9.6



Figure 8.9.7



Figure 8.9.8

8.10 TENSIONING AND REPLACING THE BELTS

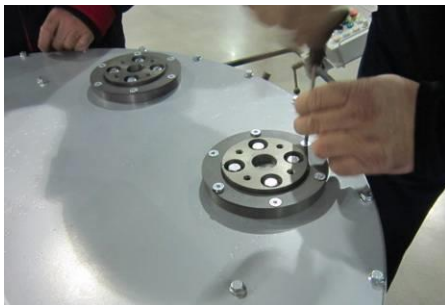


Figure 8.10.1



Figure 8.10.2



Figure 8.10.3

The transmission of the machine has two timing belts. To change the belts, you have to remove all holders and dismount their adaptors. Dismount the sealing. Carefully check the friction surface (flanges of the lower cover and the outside diameter of the adaptors) for wear and replace if necessary. To remove the bottom cover, unscrew the bolts around the edge and the three bolts of the spacer (Fig. 8.6.1). Under the cover, a sealer lines the edge, and the spacers have O-Rings. When changing belts, it is recommended that all of these are replaced.

Fig. 8.10.4 shows the scheme of belts location. To mount the new belts, first unscrew nuts (7), (8), and (9) such that it is possible to rotate the tensioners (4) and (5) around 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 a way that the timing belt may be fitted without any applied 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.

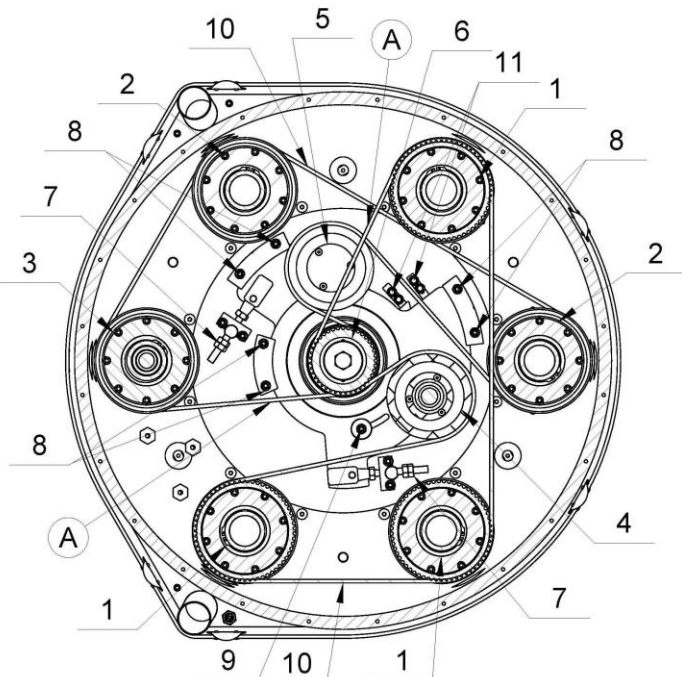


Figure 8.10.4

Arrange the belts in pos.10 as per the scheme, paying attention for their correct orientation at every pulley. Loosen the nuts (7) to the end of the bolt, and loosen the nuts on the half moon (8), allowing the rotation of the tensioners with minimal force.

Using nuts (7) tighten the belt, verifying again the correct position of the two belts, and the correct gearing in every pulley. Rotate the gear while tensioning to allow for regular tension distribution along the belt. Control the tension using Frequency tension Tester (Optibelt 3 TT) (Fig. 8.10.3). Tension in the span A of the belt should be 115-120Hz.

It is possible to use the pre-installed supports (11) as a reference to stop the tensioner at the desired belt tension, provided that the supports have not been moved from their factory position.

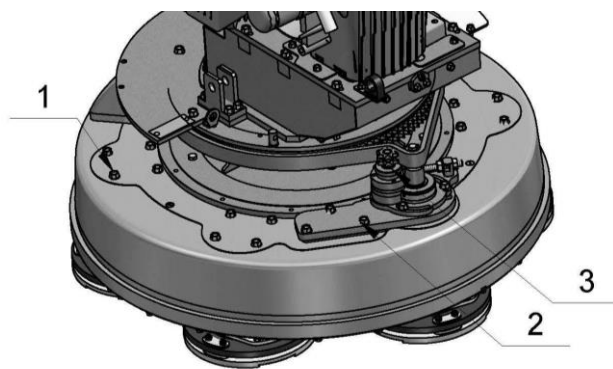


Figure 8.11.1

8.11 REPLACING THE PULLEYS

Fully loosen the belt and remove (see the previous section). After removing the belts, unscrew the four bolts of the pulleys on top of the disc (Fig. 8.11.1) and replace.

8.12 REPLACING THE FRONT KEY JOINT OF THE PLANETARY PULLEY

Find the driving pulley unit of the planetary movement. Dismount the holder (Fig.8.10-11) and the adaptor underneath (Fig.8.10-11), this will clear the access to the front key joint.Fig. 8.11.1)



Figure 8.12.1



Figure 8.12.2



Figure 8.12.3



Figure 8.12.4

8.13 REPLACING THE PLANETARY DRIVING CHAIN WHEEL AND CENTRAL CHAIN WHEEL AND PLANETARY TENSIONER

Unscrew the bolt and remove the old gear. Put grease in the safety cap (Fig.8.13.1-3) of the new gear and mount to the shaft. Fold the safety washer as shown on Fig.8.13.1, and screw the bolt, using the “blue” thread locking adhesive.

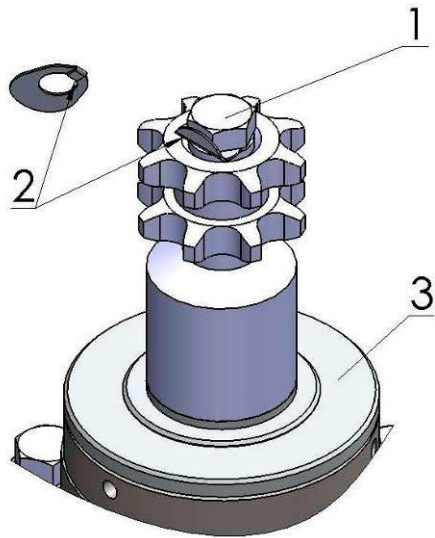


Figure 8.13.1

the shaft. Fold the safety washer as shown on Fig.8.13.1, and screw the bolt, using the “blue” thread locking adhesive. Tightening force on the bolts should be 22...25N.m (16...18 lbf.ft). Screw the safety washer as shown on (Fig.8.13.1). The central gear consists of two halves, which are replaceable by unscrewing the bolts on fig.8.13.2



Figure 8.13.2

When dismantling the chain, unscrew the nuts (1) on the pin. Unscrew the bolts (2) and lift the tensioning assembly. Unscrew the bolts (3) and replace the tensioner with a new one. Mount the new tensioner, replace the chain and tension the chain.

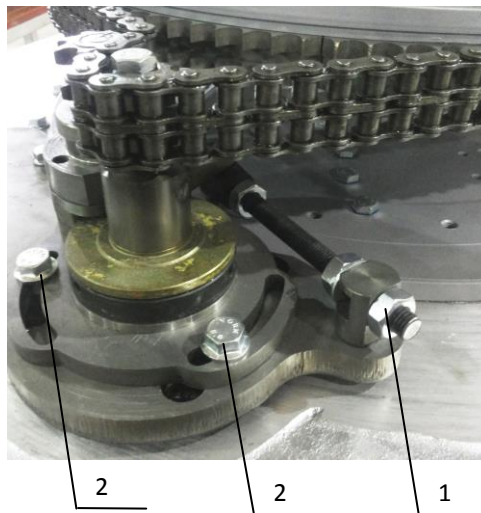


Figure 8.13.3

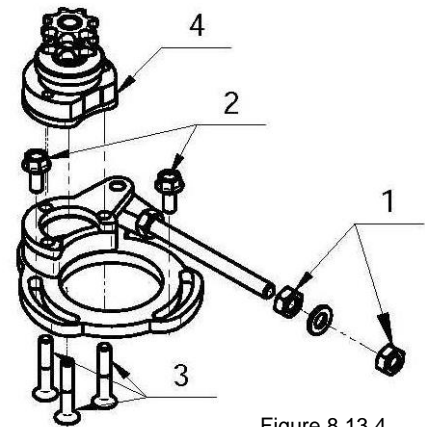


Figure 8.13.4

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

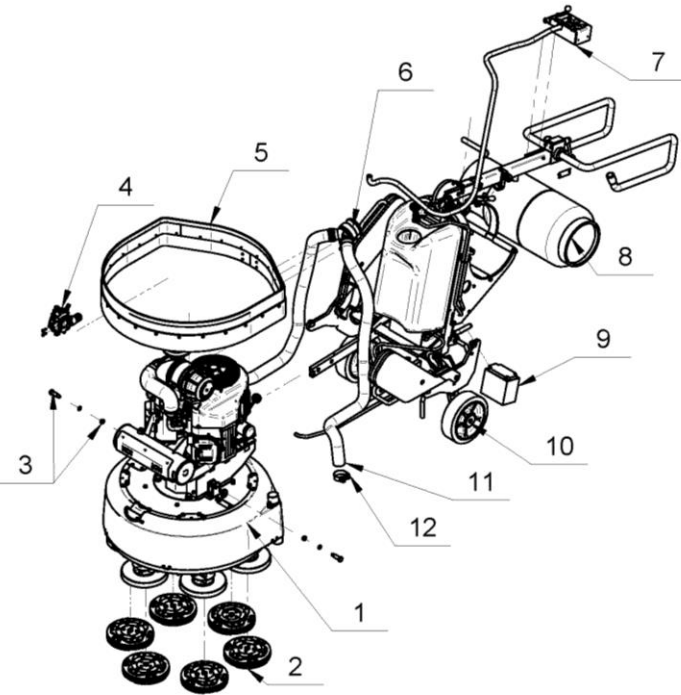
Fax: 706 658 0357

Website: www.superabrasive.com

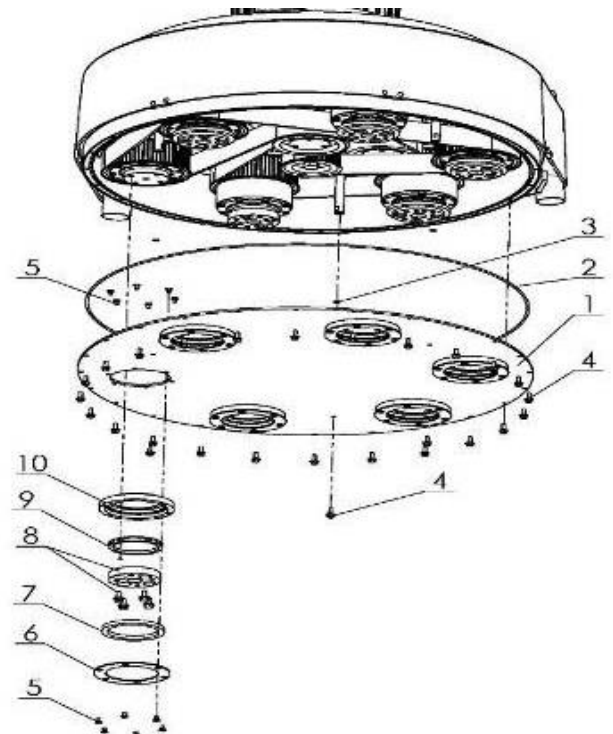
11. SPARE PARTS

ASSEMBLY AND PARTS SPECIFICATIONS

11.1 LAVINA®32G-X GENERAL PARTS				
No.	Item No.	Description	Pc s.	
1	L32GX-10.00.00	Main Head	1	
2	A41.00.00	Tool Holder A41	6	
3	L32-00.00.00.00.02-K	Bolt with Nut Assembly	2	
	3.1	L32-00.00.00.00.02	Bolt	2
	3.2	M12DIN127B	Spring Washer	2
	3.3	M12DIN934	Nut	2
4	L32GX-42.00.00	Regulator set	1	
5	L32X-02.00.00	Guard Assembly	1	
6	L32GX-06.00.00	Air Duct Three-Way L32GX	1	
7	L32GX-41.00.00	Control board Assembly	1	
8	W2505	Horizontal Aluminium Propane Tank	1	
9	CC01-25968	12V Battery & Wire Connector	1	
	9.1	W4359	12V Battery	1
	9.2	TAG-SA-12VBA-32B-32R TAG-SA-12VBA-16R-10B	Wire Connectors	1
10	L32GX-20.00.00	Carriage	1	
11	D50L1300	Vacuum Hose	2	
12	SGBW156-59	Clamp	4	

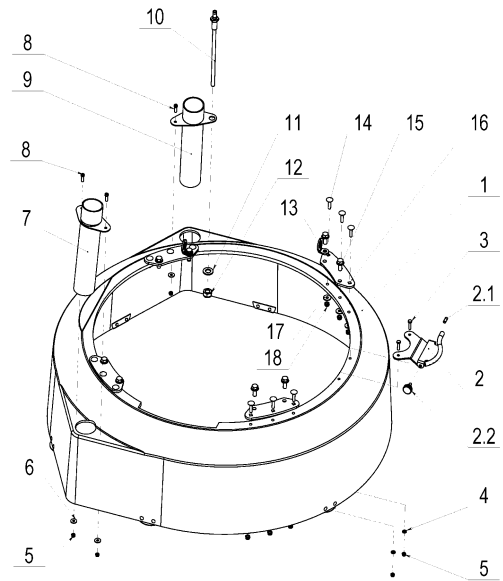


11.2 LAVINA®32G-X BOTTOM COVER ASSEMBLY PARTS				
No.	Item No.	Description	Pcs.	
1	L32X-18.00.00	Bottom Cover Assembly	1	
2	D4x2-2500	Seal	1	
3	D6X2	O-Ring	3	
4	M6X16DIN6921	Bolt	27	
5	M6x10DIN7991	Screw	72	
6	L25LS-14.00.03	Outer Cover	6	
7	110x90x8.5	Felt Ring	6	
8	A42.03.00	Adaptor	6	
9	TWVA00800	V-Ring Type A	6	
10	L32S-10.02.02	Flange	6	



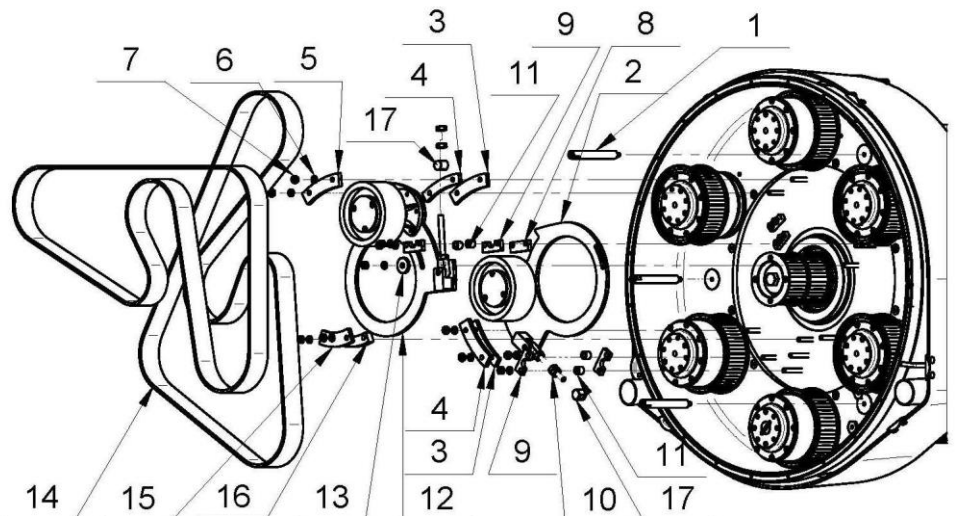
11.3 LAVINA 32 G-X TOP COVER PARTS

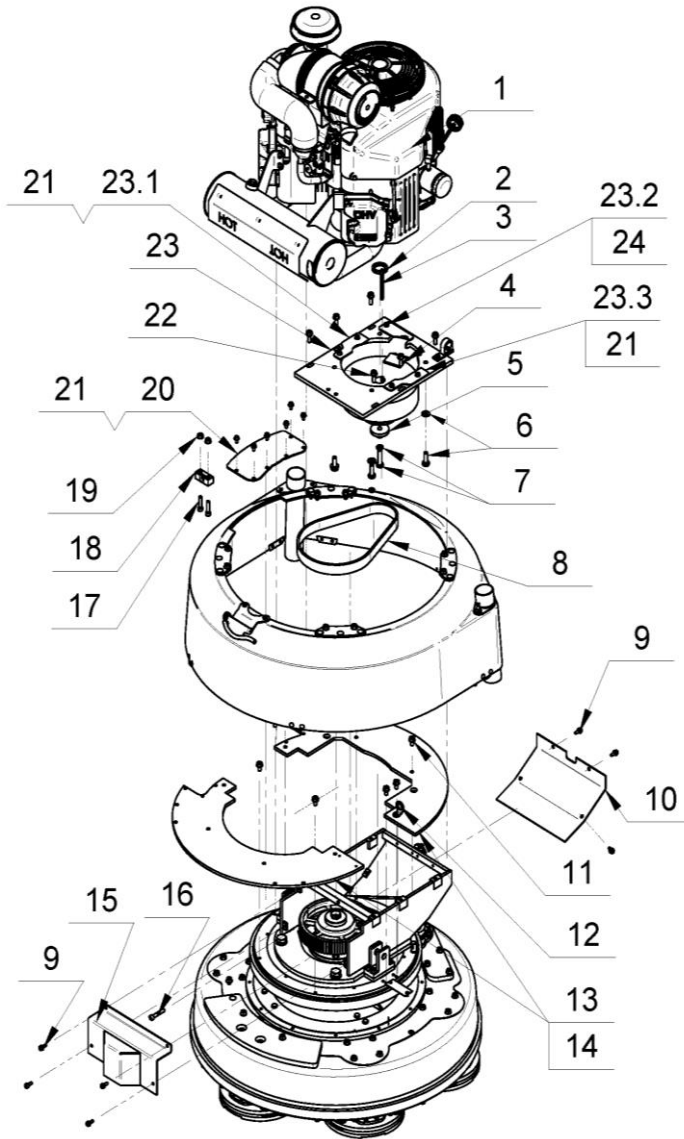
No.	Item No.	Description	Pcs.
1	L32GX-19.00.00	Top Cover Assembly	1
1.1	L32GX-19.10.00	Top Cover	1
2	A29.30.00	Spray Unit	1
2.1	M6X16DIN913	Screw	1
2.2	H766-21	Knob Bolt	1
3	M5x20DIN933	Bolt	2
4	M5DIN125A	Washer	2
5	M5DIN985	Nut	5
6	M5DIN9021A	Washer	3
7	L32D.01.01.00	Vacuum Port	1
8	M5X16DIN84A	Screw	3
9	L32S-01.01.00	Vacuum Port	1
10	L32X-19.20.00	Water Fitting	1
11	M12DIN125A	Washer	1
12	M12DIN985	Nut	1
13	L25X-15.00.02	Ring	2
14	M6X25DIN603	Screw	12
15	M8x20DIN6921	Bolt	8
16	L38GRX-10.10.02	Carrier	4
17	M6DIN9021	Washer	12
18	M6DIN985	Nut	12



11.4 LAVINA®32G-X TRANSMISSION BELT PARTS

No.	Item No.	Description	Pcs.	No.	Item No.	Description	Pcs.
1	L32X-10.00.17	Distance Bolt	3	10	M10DIN934	Nut	4
2	L32GX-15.00.00	Tension Roller Bottom	1	11	L25L-10.00.08	Washer	4
3	L32X-10.00.13	Sector 3	1	12	L32GX-16.00.00	Tension Roller Top	1
4	L32X-10.00.11	Sector 1	2	13	L32D.10.00.24	Washer	1
5	L32X-10.00.12	Sector 2	2	14	HL24008MHL50	Timing Belt	2
6	M8DIN127B	Spring washer	11	15	L32X-10.00.14	Sector 4	1
7	M8DIN934	Nut	11	16	L32X-10.00.15	Sector 5	1
8	L32X-10.00.18	Support Plate 2	1	17	L32C.14.20.04	Nut	1
9	L25L-10.00.07	Support Plate	4				



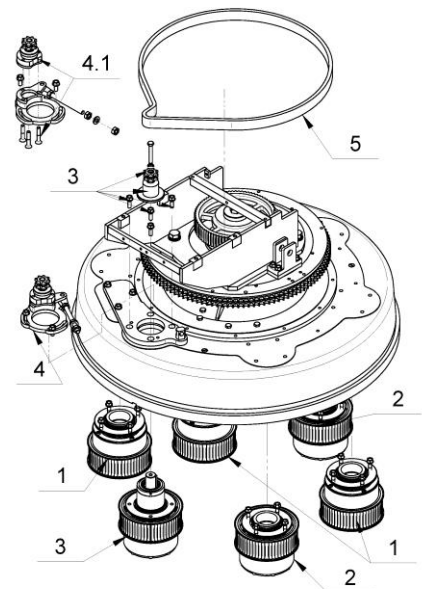


11.5 LAVINA®32G-X TOP COVER AND MOTOR SUPPORT PARTS

No.	Item No.	Description	Pcs.
1	FX921V-BS00-S	Kawasaki Engine	1
2	L32GX-10.00.45	Clutch Washer	1
3	L32GX-10.00.67	Key	1
4	IXR-14537D	Electric Clutch	1
5	L32GX-10.00.44	Bearing retainer	1
6	SAB-3/8-16X1-1/4	Bolt	4
7	F13107-F33622	Bolt with Spring Washer	1
8	HL8248MHL30	Timing Belt	1
9	M6X16DIN6921	Bolt	6
10	L32GX-10.00.50	Rear Guard	1
11	M8X16DIN6921	Bolt	8
12	L25X-15.00.02	Plate Ring	1
13	L32GX-19.30.02	Rear Top Cover Base	1
14	L32GX-19.30.01	Front Top Cover Base	1
15	L32GX-10.06.00	Front Guard	1
16	M8X45DIN912	Bolt	1
17	M8X35DIN912	Bolt	2
18	L32GX-10.00.43	Tensioning Device Support	1
19	M8DIN6923	Nut	1
20	L32GX-19.30.03	Inspection Cover	1
21	M6X12DIN6921	Bolt	6
22	M8X25DIN6921	Bolt	6
23	L32GX-10.00.42	Base plate assembly	1
23.1	L32GX-10.00.48	Cover 1	1
23.2	L32GX-10.00.51	Cover 2	1
23.3	L32GX-10.00.49	Cover 3	1
24	M6X25DIN6921	Bolt	5

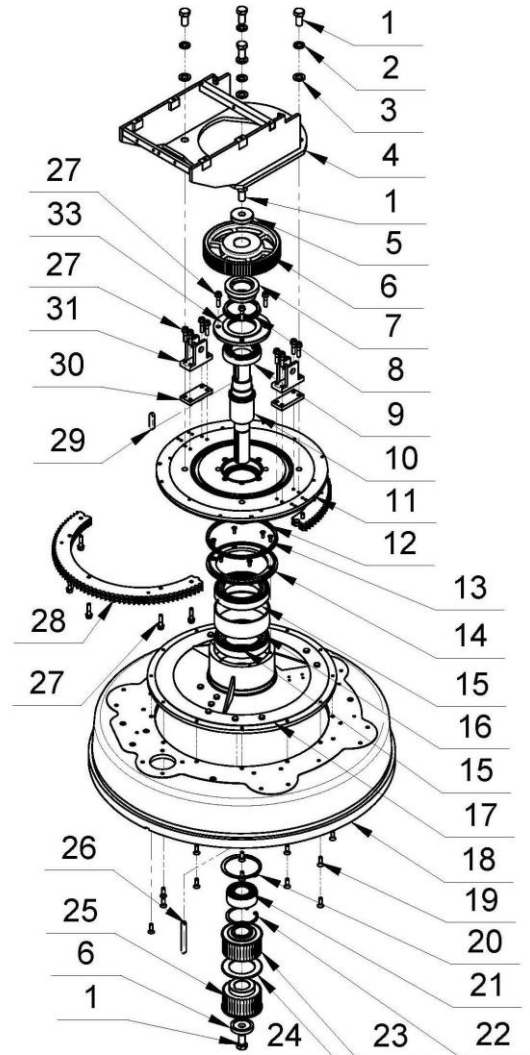
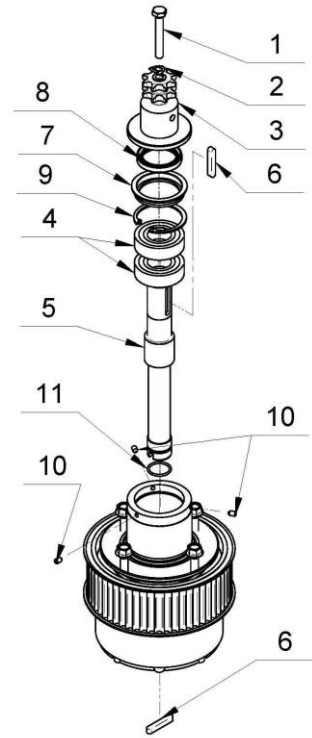
11.6 LAVINA®32G-X PULLEY UNITS PARTS

No.	Item No.	Description	Pcs.
1	L32X-14.00.00	Pulley Top Belt	3
2	L32X-12.00.00	Pulley Bottom Belt	2
3	L32GX-13.00.00	Driving Pulley Unit	1
4	L32GX-17.00.00	Planetary Tensioning Unit	1
4.1	L32GX-17.21.00-K	Planetary chain ring assembly	1
5	08B-2-120	Chain	1

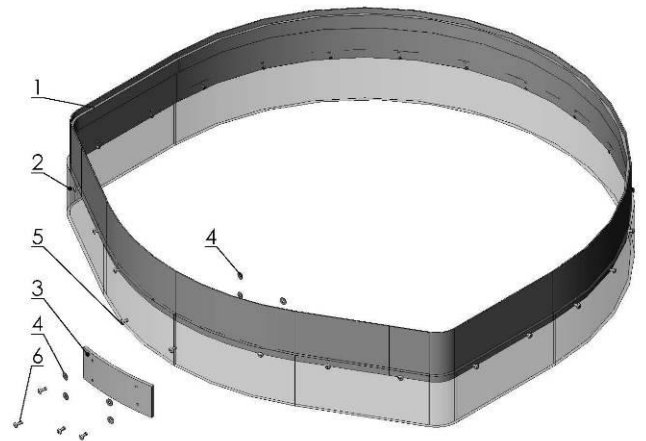


11.7 LAVINA®32G-X DRIVING PULLEY UNIT PARTS			
No.	Item No.	Description	Pcs.
1	M8X55DIN933	Bolt M8x55	1
2	L32X-13.00.25	Security washer	1
3	L32GX-13.30.00	Drive chain pulley	1
4	6205	Bearing 6205	2
5	L32GX-13.00.09	Shaft	1
6	6X6X36DIN6885A	Key	2
7	L32GX-13.00.12	Cap	1
8	TRAA00350	Seal ring	1
9	A52DIN472	Circlip A52	1
10	M5X8DIN914	Screw M5x8	3
11	D21x2	O-Ring	1

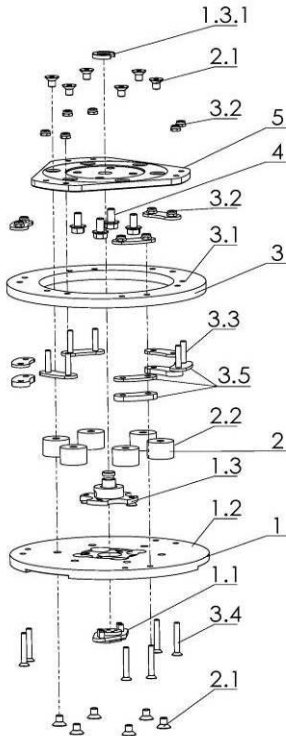
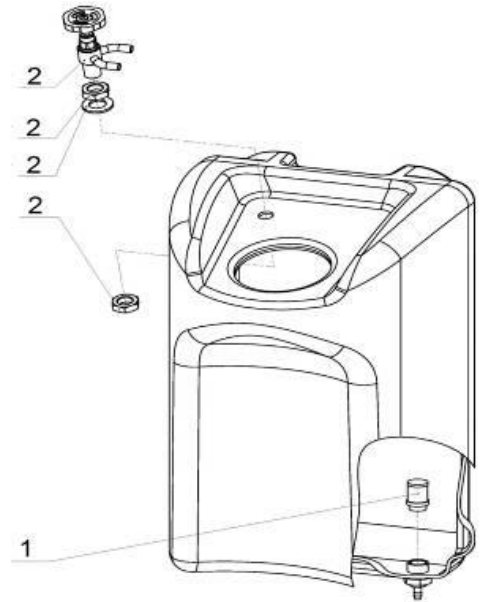
11.8 LAVINA®32G-X CENTRAL SHAFT BEARING PARTS			
No.	Item No.	Description	Pcs.
1	M16X35DIN933	Bolt M16x35	6
2	M16DIN127B	Spring Washer	4
3	M16DIN125A	Washer	4
4	L32GX-11.40.00	Motor support assembly	1
5	L32X-11.00.10	Washer End	2
6	L32GX-11.00.35	Pulley unit	1
7	L32GX-11.00.33	V-Ring Support	1
8	TWVA00800	V-Ring Type A	1
9	6211	Roller Assembly	1
10	L32GX-11.00.05	Shaft	1
11	L32GX-11.20.00	Disc Assembly	1
12	TWVL01700	V-Seal	1
13	M6x16DIN7991	Screw	6
14	L32D.11.00.03	Cap	1
15	6019	Roller Assembly	2
16	L32X-11.00.04	Spacer	1
17	L32GX-11.10.00-K	Housing	1
18	L32GX-11.00.06-K	Disc	1
19	M6x16DIN7991	Screw	12
20	B95DIN471	Retaining Ring	1
21	3208	Roller Assembly	1
22	A80DIN472	Retaining Ring	1
23	L32X-11.01.00	Gear Pulley 1	1
24	L32X-11.00.08	Spacer	1
25	L32X-11.02.00	Gear Pulley 2	1
26	DIN6885A12x8x100	Key	1
27	M8X35DIN6921	Bolt	22
28	L32X-11.30.00	Planetary Chain ring Set	2
29	DIN6885A12x8x50	Key	1
30	L32X-11.00.34	Fork plate	2
31	L32GX-11.00.01	Fork	2
32	M8X35DIN6921	Bolt	22
33	L32GX-11.00.32	Cap flange VLC L32GX	1



11.9 LAVINA®32G-X GUARD ASSEMBLY PARTS			
No.	Item No.	Description	Pcs.
1	L32X-02.01.00	Ring	1
2	L32X-02.00.02	Guard	1
3	L32X-02.00.05	PVC Sheet	1
4	M4DIN9021A	Washer	8
5	D4X10DIN7337LF12	Rivet	24
6	D4X16DIN7337	Rivet	4



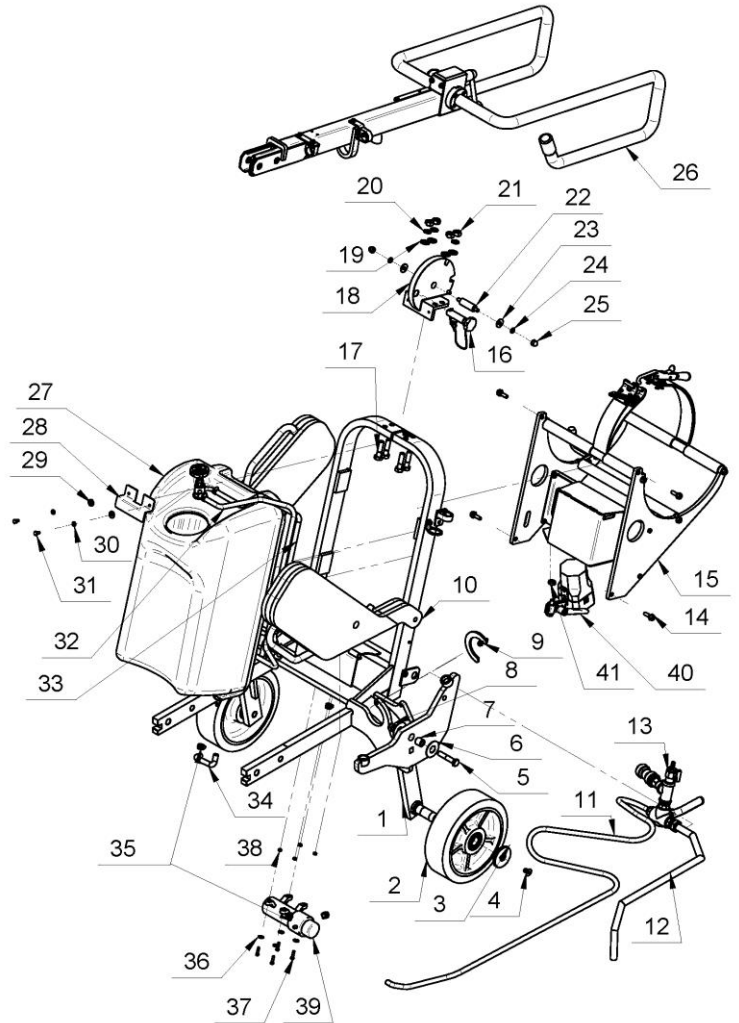
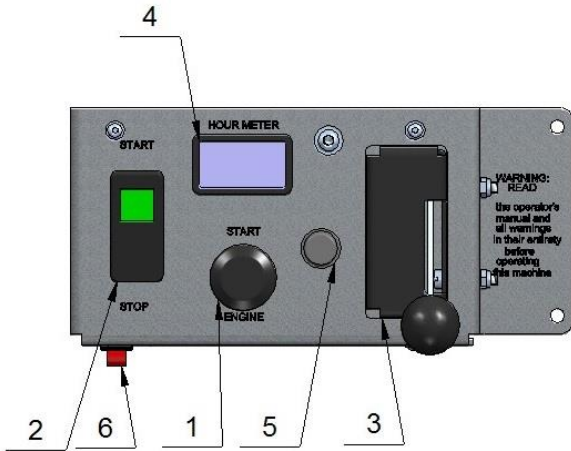
11.10 LAVINA®32G-X WATER TANK ASSEMBLY PARTS			
No.	Item No.	Description	Pcs.
1	1/2"	Filter	1
2	A29.50.00	Regulator	1



11.11 LAVINA®32G-X TOOL HOLDER PARTS				
/see also fig.8.7.13/ (pos.1 include pos.1.1;1.2;1.3/pos.1.3 include pos.1.3.1 AND ETC.)				
No.	Item No.	Description	Pcs.	
1	A41.10.00	Quick Change Assembly	1	
	1.1	A31.12.00	Key lock Set	1
	1.2	A41.11.00	Quick Change plate	1
	1.3	A41.12.00	Security set	1
	1.3.1	A41.00.05	Washer A41	1
2	A25.00.10-K	Buffer with two screw	6	
	2.1	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	

11.12 LAVINA® 32G-X CONTROL BOARD PARTS

No.	Item No.	Description	Pcs.
1	W1301	Start/Stop Switch	1
2	W1330	Clutch Switch	1
3	109894	Throttle cable 96 in	1
4	W4313	Hour Meter	1
5	6x30_30A	Fuse	1
6	W9999	Pump switch	1

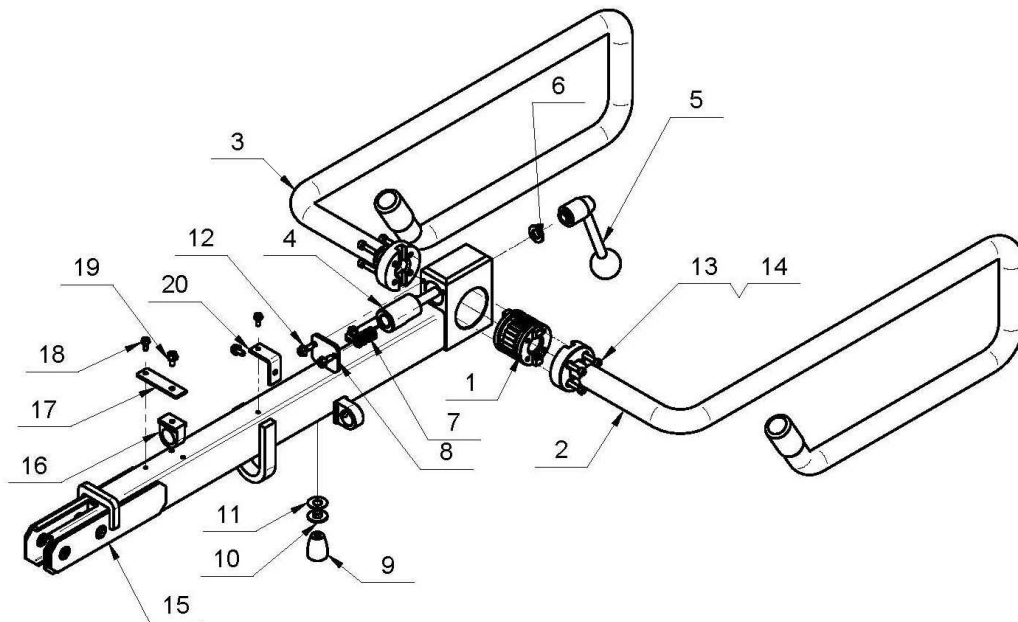


11.13 LAVINA®32G-X CARRIAGE PARTS

No.	Item No.	Description	Pcs.	No.	Item No.	Description	Pcs.
1	L32GX-21.00.00	Frame	1	22	L32-02.00.00.00.02	Pin	1
2	L32-02.01.00.00-01	Wheel	2	23	M8DIN9021A	Washer	2
3	L32D.20.00.03	Wheel Cap	2	24	M8DIN127B	Spring Washer	2
4	M10X16DIN7991	Screw	2	25	M8DIN1587	Nut	2
5	M12x60DIN931	Bolt	2	26	L32GX-23.00.00	Handle Assembly	1
6	L32GX-20.00.39	Washer	4	27	A36.10.00	Tank assembly	1
7	L32GX-20.00.38	Bushing	2	28	L32S-20.00.11	Upper Bracket	1
8	M12DIN985	Nut	2	29	M6DIN125A	Washer	1
9	L32GX-20.00.34-K	Bracket with bolt	2	30	M6DIN7980	Spring Washer	2
10	L32GX-20.40.00	Weight	2	31	M6x12DIN933	Bolt	2
11	MAR8.140	Tube	1	32	MAR8.130	Tube	1
12	MAR8.70	Tube	1	33	MAR8.80	Tube	1
13	L32MX-20.01.00	Water Connection	1	34	MAR8.40	Tube	1
14	M8X25DIN6921	Bolt	4	35	10-16DIN3017	Clamp	5
15	L32GX-24.00.00	Propane tank holder	1	36	M5DIN9021A	Washer	4
16	L32GX-02.05.00	Pin assembly	1	37	M5X20DIN933	Bolt	1
17	M12X45DIN931	Bolt	4	38	M5DIN985	Nut	4
18	L32X-22.00.00	Handle Positioner	1	39	1040	Water Pump	1
19	M12DIN125A	Washer	4	40	L25SPS-01.00.00.00-G	Lamp Unit Incl. Cable	4
20	M12DIN127B	Spring Washer	4	41	M10DIN985	Nut	4
21	M12DIN934	Nut	4				

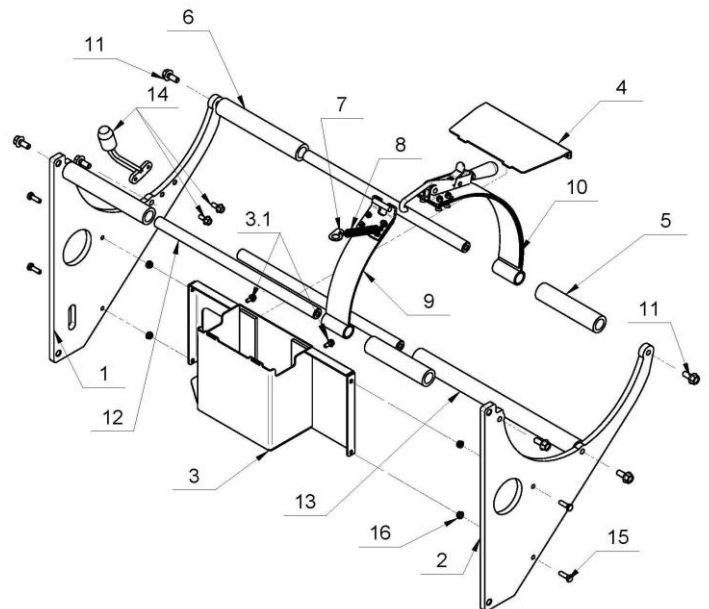
11.14 LAVINA®32G-X STEERING BRACKET PARTS

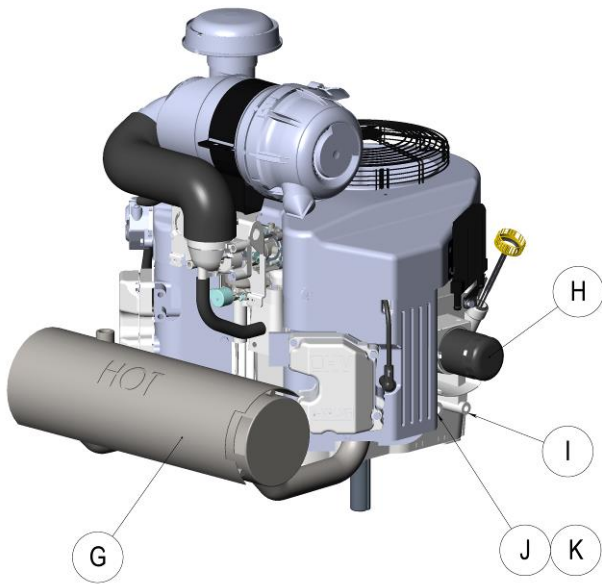
No.	Item No.	Description	Pcs.	No.	Item No.	Description	Pcs.
1	L32B-02.03.00.01-01	Sprocket	1	11	L32-02.03.00.00.02	Teflon Washer	1
2	L32C.02.03.02.00.00	Left Bracket	1	12	M6X16DIN6921	Bolt	2
3	L32C.02.03.03.00.00	Right Bracket	1	13	M6X25DIN912	Screw	8
4	L32C.23.00.06	Screw	1	14	M6DIN7980	Spring Washer	10
5	GN212.3-28-M12-E	Swivel Bolt	1	15	L32GX-23.10.00-K	Lever base L32GX	1
6	M12DIN125A	Washer	1	16	FLEXICON21	Clamp	2
7	L32B-02.03.00.00.02	Spring	1	17	L32GX-23.00.22	Clamp support 1	1
8	L32C.23.00.21	Housing	1	18	M5X12DIN6921	Bolt	2
9	BO751-107-25M08	Knob	1	19	M6X12DIN6921	Bolt	2
10	L32-02.03.00.00.01	Washer	1	20	L32GX-23.00.23	Clamp support 2	1



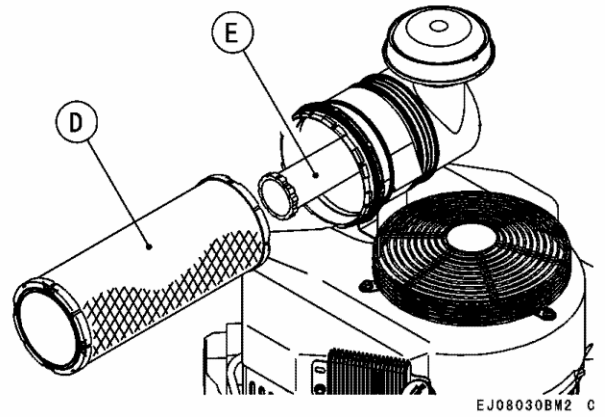
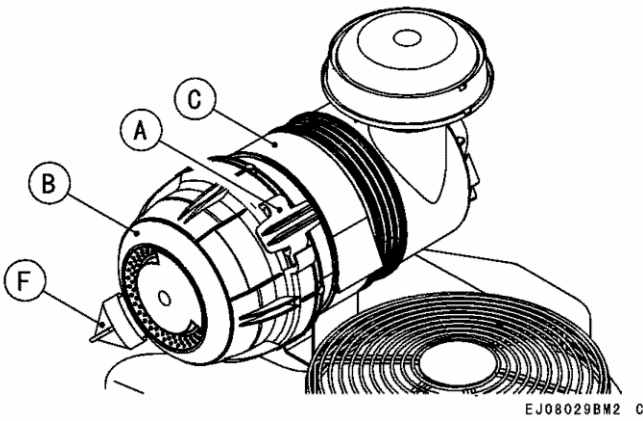
11.15 LAVINA® 32G-X PROPANE TANK HOLDER

No.	Item No.	Description	Pcs.
1	L32GX-24.00.01	Right base plate	1
2	L32GX-24.00.02	Left base plate	1
3	L32GX-24.11.00	Battery box	1
4	L32GX-24.50.00	Battery cover	1
5	L32GX-24.00.06	Rubber support 1	2
6	L32GX-24.00.05	Rubber support 2	2
7	L32GX-24.00.04	Spring hook	1
8	L32GX-24.00.03	Spring	1
9	L32GX-24.30.00	Propane tank back lock	1
10	L38GRX-26.20.00	Strap	1
11	M8X20DIN6921	Bolt M8x20	6
12	L38GRX-26.00.03	Link	3
13	L32GX-24.00.07	Rubber support 3	1
14	L32GX-24.20.00-K	Propane tank stopper	1
15	M6DIN985	Nut M6	4
16	M6X20DIN933	Bolt M6x20	4





11.16 LAVINA® 32G-X ENGINE PARTS			
No.	Item No.	Description	Pcs.
		Kawasaki FX921V-BS00-S	1
A		Retaining clamps	2
B	11011-7050	Cap - AIR FILTER	1
C	11011-7047	Case-AIR FILTER	6
D	11013-7044	Primary Element -AIR FILTER	1
E	11013-7045	Secondary Element -AIR FILTER	1
F	11065-7008	Cap	1
G	FX 921V-11.00.00	Cat Muffler Assy.	1
H	49065-7010	Oil Filter	1
I	W1325	Oil Pressure Switch	1
J	K59071-7004	Joint	1
K	FE17409029909	Oil Drain Valve	1



12.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, vapor 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