

TOPFLOOR

SIMPLE, STRONG, SAFE

TF850R-SRS

Operator's manual -



English

www.crescentindustrial.co.uk

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Apply to the Technical Service Department (mechaid@c-ind.co.uk) as for the machine schematics (electrical, hydraulic, water supply, etc...)

CHAPTER 1

INTRODUCTION - WARNINGS

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1.1 - INTRODUCTION

This manual has been prepared by Crescent and is an integral part of the machine; it must therefore be kept with care and in storage compartment in the machine's cab where it is easily accessible to all users (operators and service personnel) for the machine's entire life time up to its demolition.

If the machine is sold, make sure you give this manual, as well as all the enclosed technical documents, to the new owner.

Copies of this manual and of the documents accompanying the machine may be obtained from Crescent by specifying the type of machine and its serial number.

1.1.a - PURPOSE OF THE MANUAL

The purpose of this manual is to provide the instructions necessary for optimum operation, use and maintenance of your machine.

By carefully reading these instructions and by strictly observing the safety rules contained herein, it is possible to obtain the best possible results in terms of performance, safety, efficiency, operational management and service life of the machine.

Failure to follow these instructions could cause damage or harm to the operators or bystanders, the machine, and to the environment.

The indications and instructions in this manual do not substitute, integrate or modify any regulation, directive, decree or law of a general or a specific nature, including but not limited to any OSHA standards, in force in the location where the vehicle is used.

1.1.c - LEGEND OF THE SYMBOLS

To emphasize information and procedures regarding safety, use, maintenance, etc... the following symbols are used throughout the manual:

 **DANGER:**

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING:**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION:**

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION:

Used without the safety alert symbol indicates potentially hazardous situation, which, if not avoided, may result in property damage.

NOTICE:

Indicates important information relevant to the sweeper, the sweeper's use or to sections of this manual to which particular attention must be paid.

REMEMBER:

Descriptions preceded by this symbol contain information, or procedures recommended by Crescent for optimum use of the sweeper.

1.1.d - TERMINOLOGY USED IN THE MANUAL

The following terminology has been used in this manual:

The term **Machine** and **Sweeper** are used instead of the commercial name of the sweeper to which this manual refers.

The terms front, back, right, left, lower, upper refer to the machine as seen by the operator sitting on the driver's seat.

The term **OPT (optional)** indicates the accessories that may be obtained on request as options and which are therefore not always present on the machine.

1.2 - GENERAL WARNINGS

1.2.a -GENERAL WARNINGS AND INSTRUCTIONS

 **WARNING:**

Failure to follow the warnings and instructions provided in this manual could result in failure of the sweeper, an accident, personal injury or death.

- 1) Carefully read, understand and follow the warnings and instructions given in this manual. It is an essential part of the product. Keep it in a safe place for future reference.
- 2) If you sell this sweeper, please delivery this manual to the new owner.
- 3) If the use and maintenance procedures provided in this manual are not properly performed, or the other instructions in this manual are not followed, an accident could occur.
- 4) Throughout this manual, reference is made that “an accident” could occur. Any accident could cause you or a bystander to sustain severe personal injury or death, or result in property damage.
- 5) The service and repair tasks specified in this manual require specialized knowledge, tools and experience. General mechanical aptitude may not be sufficient to properly service or repair your sweeper. If you have any doubt whatsoever regarding your ability to properly service or repair your sweeper, please see your retailer.
- 6) Always maintain the safety decals in good, readable condition. If the decals are missing, damaged, or unreadable, obtain and install replacement decals immediately.
- 7) All safety shields, guards, signal lights, buzzers and other protective safety devices must remain in place, in good condition and in proper working order.
- 8) All safety devices should be inspected carefully before using the sweeper. Missing, broken, or worn shields, guards, and other protective devices must be replaced prior to operation.
- 9) The lifespan of Crescent products depends on many factors. Improper use, abuse or harsh use in general may compromise the integrity of the sweeper and significantly reduce its lifespan. The sweeper is also subject o wear over time. Please have your sweeper regularly inspected by a qualified mechanic. If the inspection reveals any damage or excessive wear, no matter how slight, immediately replace or repair the component.

1.2.b - OPERATOR'S POSITION

The operator should always remain seated in the driver's seat while working with the sweeper, except when using the manual leaf sucking hose (OPT) or the high pressure hose (OPT). When using these optional hoses, the operator should properly activate all safety mechanisms and utilize extreme caution when moving around or interacting with the sweeper.

1.2.c - MANUFACTURER'S RESPONSIBILITY

The manufacturer, Crescent, declines any responsibility arising from failures, accidents, etc... due to the lack of knowledge (or to the lack of application) of the warnings and instructions contained in this manual, or arising from any misuse, abuse or for any change in the machine and/or installation of accessories that have not been previously authorized in writing by Crescent. Please see Crescent Industrial's warranty on Topfloor Sweepers.

DANGER:

No warranty or representation is made as to this sweeper's ability to protect the user from all foreseeable accidents or from any injury or death. The user of this sweeper recognizes and agrees that there are risks inherent in operating this machinery which could result in personal injury or death. By his/her use of this sweeper, the user expressly, voluntarily and knowingly accepts and assumes these risks, including but not limited to the risk of passive or active negligence of Crescent, breach of warranty, or hidden, latent, or obvious defects in the sweeper, and agrees to hold Crescent its distributors and retailers harmless to the fullest extent permitted by law against any resulting damages. By and in consideration for his/her purchase and use of the Crescent sweeper, the user expressly recognizes and agrees that in the event of any claim arising out of the use of this sweeper, whether such claim is based in contract, warranty, tort (personal injury or wrongful deaths) or otherwise, the laws of the Republic of Italy shall apply and jurisdiction and venue for any such action shall be in the Courts of Bologna, Italy.

Any and all claims or disputes of whatever nature arising out of or otherwise relating to this machine shall be governed and construed in accordance with the laws of the Republic of Italy only.

The parties expressly acknowledge and irrevocably agree that an Arbitrator in Bologna, Italy shall have exclusive jurisdiction over any such claim or dispute, and that such claim or dispute shall be resolved by binding arbitration in Bologna, Italy, to the exclusion of the jurisdiction of the courts, arbitrators or other decision-making body of any other place

1.2.d - SERVICING

If you have any questions concerning the proper use or maintenance of your sweeper, please contact your nearest Crescent retailer directly.

You can contact Crescent at Tel. 0845 33 77 695, Fax 0845 33 78 695, or info@c-ind.co.uk

In case of a written request, please specify the sweeper specifications listed in the front of this manual, as well as:

- *Machine model*
- *Serial number*
- *Detail of the problems encountered*
- *Inspections that have been performed*
- *Adjustments made and their outcome*
- *Any other useful information*

Address your requests to:

Crescent Industrial, Berrington House, Berrington Road, Leamington Spa, CV31 1NB

Tel. 0845 33 77 695

Fax 0845 33 78 695

info@c-ind.co.uk

or to the **"AUTHORIZED SERVICING NETWORK"**

1.2.e - SPARE PARTS

Use only **ORIGINAL SPARE PARTS** supplied by Crescent.

The use of unoriginal spare parts voids the warranty and makes the user responsible for any incident caused by the unoriginal components.

1.3 - CONSTRUCTIONAL

REGULATIONS AND EC MARKING

Design and development of this machine complies with the fundamental safety and health requirements set forth by the European directives listed in the EC conformity certificate enclosed to the technical documentation.

NOTICE:

The EC marking of conformity to European Union directives is located on the machine's ID tag (see "chapter 3").

Furthermore, it complies with the US S.A.E. standards for sweepers.

1.4 - MACHINE DELIVERY

- The machine is inspected and tested by the manufacturer before it leaves the factory.
The sales network should run further inspections before delivery.
- In order to insure that all inspections were completed, when the machine is delivered, check that it is complete with all the requested accessories and the tool kit, and that it is accompanied by the following documents:
 - Machine use and maintenance manual;
 - Spare parts manual;
 - EC Conformity declaration;
 - Warranty; please sign the certificate attached to the warranty booklet and send it to Crescent or register the warranty on line at www.crescentindustrial.co.uk
 - Other documents related to engine, batteries, fittings, schematics (electrical, hydraulic or water), etc...

1.5 -INTENSED USE OF THE MACHINE

The machine can be used only to carry out road and/or industrial cleaning operations, to collect dust, debris, paper, leaves, etc...

Any other use is improper, can result in an accident and will void the warranty.

WARNING:

If the machine is designed to collect debris and sand soaked with oil and fuel, in airports for example, it must be appropriately equipped by the Manufacturer. If these components are not installed, do not use the machine for this application.

WARNING:

If the machine is to be used to collect particularly heavy and/or bulky materials (dirt, gravel, sand, blacktop debris, etc...) do not exceed the machine's maximum load capacity and the waste container's full load capacity.

1.5 -INTENSED USE OF THE MACHINE

WARNING:

Never sweep, collect and/or suck any type of material, which is burning/smoldering incandescent or having a temperature higher than 120°F/50°C.

WARNING:

Never sweep, collect and/or suck any type of flammable, explosive, toxic, carcinogenic material/ waste (gasoline, fuel oil, acids, solvents, thinners for varnishes, acetone, even if diluted) and/or other substances that are harmful for people's health, unless specific equipment for this application, is installed on the machine by Crescent. If you are not sure if the sweeper is so equipped, do not use it for these applications.

1.6.a - AREAS WITH EXPLOSION HAZARD

Never use the machine in places where there is a risk of explosion due to gases, vapors, fluids, and flammable and explosive powders.

1.6.b - TRANSPORTATION - TOWING

Never use the machine to transport or tow people and/or things.

1.7 - USE RESTRICTIONS

- In order to be able to reach all the control devices with comfort properly operate the machine, the operator's height must be between 1,50 m (5 Feet) and 2,05 m (7 Feet) (shoes included).
- When using the machine in environments with corrosive debris or extreme climates, heavy magnetic fields, saline air and brackish water, etc... please consult the sales network for additional use/maintenance requirements.
- The cab air filter: is not a substitute for providing the operator with specific filtering or respiratory equipment in compliance with any applicable regulations. Always use respiratory protection/devices in accordance with local standards and regulations, including but not limited to OSHA regulations.
- Heavy rain: debris collection is difficult to accomplish.
- Never lift or tilt the hopper unless you are in the process of: - unloading the waste hopper (see chapter 5);
- maintenance operations (see chapter 6).
- Do not use under climatic conditions different than those indicated in "chapter 3".

NOTICE:

Crescent shall not be held responsible for mechanical issues, failures, breaks or accidents, due to the use of the machine under conditions different than those specified in "chapter 3" or elsewhere in this manual.

1.7.a - GAS EMISSION OF INTERNAL COMBUSTION ENGINES

When using machines with internal combustion engines (gasoline, diesel, LPG, methane, etc...), please comply with local standards and regulations, including but not limited to OSHA regulations.

WARNING:

Risk of Carbon Monoxide Poisoning.

NEVER use the machine with internal combustion engines in areas which are not properly ventilated.

California Proposition 65

 **WARNING:**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

- ***Always start and operate the engine in a wellventilated area;***
- ***If in an enclosed area, vent the exhaust to the outside;***
- ***Do not modify or tamper with the exhaust system.***

The employer is responsible for complying with all applicable regulations, including but not limited to OSHA.

 **WARNING:**

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.

Wash hands after handling.

See California Health and Safety Code section 25249.5, Title 22 of the California Code of Regulations at Section 1200, et seq., and Title 8 of the California Code of Regulations.

1.8 - PRE-USE CHECKS

Before beginning work, check that all safety and emergency devices are in place, in good condition and working properly.

Do not start the machine if any safety shields, guard, control, instrument, signal light or signal buzzer, or other protective device, is not in place and working properly.

These checks must be carried out:

- Before starting the machine;
- At regular time intervals (see chapter 6);
- After any modification or repair;
- Also see "Preliminary checks, chapter 5".

Safety devices check

The machine's safety devices (see chapter 2.2) must be checked by properly trained technicians once every six months.

The technician must prepare a check report at the end of the inspection.

General overhaul

Every 9000 hours of operation (see operation counter onboard) or at least once every 5 years, the machine must be overhauled by a workshop authorized by Crescent.

1.9 - SAFETY RULES

1.9.a - RULES FOR USING THE MACHINE

Please comply with the following instructions:

1.9.a.1 - Authorized people:

- *Do not allow unauthorized people or bystanders to get close to the machine.*
- *Only properly trained personnel are allowed to use, maintain and repair the machine. The operators will be authorized to operate the machine (users) or maintain it (maintenance men) only after having been properly trained.*
- *This personnel must be physically and mentally fit. Furthermore, they must not be under the effects of alcohol, medications and/or drugs.*

Never use drugs or alcohol immediately before or while driving or operating the sweeper. If you are taking prescription or over the counter medication, you must consult a medical professional regarding any side effects of the medication that could hinder your ability to operate the sweeper safely.

Take frequent breaks in order to remain fully alert during operation of the sweeper. Never operate the sweeper if you are bored or distracted.

- **Personal Protective Equipment (PPE):**
 - Specialized protective equipment may be required if dangerous or hazardous material is being swept by or cleaned from the sweeper.*
- *Always use OSHA approved PPE while using or maintaining your sweeper.*
- *Remove jewelry, loose clothing and restrain long hair before using sweeper.*
- *Wear steel-toed shoes with slip-resistant soles.*
- *Wear approved eye and face protection.*
- *Wear gloves.*
- *Wear hearing protection.*
- *Wear additional PPE as needed or when required by your employer, local codes, or the nature of the work.*
- *Check with your supervisor for further information.*
- *Never modify any component of the sweeper, or the settings or calibrations set by the manufacturer.*

1.9.a.2 - General warnings and fuel:

- **Fuel handling: -**
 - refuel the machine only when the engine is turned off. Never smoke or use open flames while refueling.*
- *When the engine is hot do not remove the cap from the radiator: boiling liquid can erupt from the radiator resulting in burn/scalding injuries.*
- *Never remove or modify fixed or mobile shields or guards. If, for any reason, the shields or guards are removed, modified or if the guards are disabled or in poor condition, they must be restored to their original condition before restarting the machine.*
- *Never disable or bypass any warning lights or buzzers.*
 - They must be restored to their original condition before restarting the sweeper.*
- *Always use handholds and steps when entering and exiting the sweeper. Always maintain three points of contact (i.e. two hands and one foot or two feet and one hand) with the sweeper.*
- *Never attempt to mount the sweeper when it is moving.*
- *Before leaving the sweeper's seat, always engage the parking brake and/or set the transmission to "park", stop the engine, remove the key, and wait for all moving parts to stop.*

1.9.a.3 - Before starting the machine:

- *Walk around the sweeper to insure that all components are in good condition and operational, and that there are no foreign objects or debris in or about the sweeper which could affect its operation.*
- *Only operate the sweeper if all guards, covers, and shields are in place and in perfect condition.*
 - Remedy any deficiency before you begin work.*
- *Make sure that no foreign object is on the machine (rags, tools, etc...).*
- *Clean the driver's cab windows and rearview mirrors.*
- *Make sure all warning lights, signals and alarms are working.*
- *Adjust the seat and steering wheel. Never perform any adjustments when the machine is operating.*
- *Make sure all the battery caps are properly fastened.*
- *The machine may only be started after the prestart test is successfully completed.*
- *Start the sweeper only when seated and belted in the operator seat.*

1.9.a.4 - During use:

- *Before starting out, check that all systems of the sweeper, including the brakes, steering system, warning devices, and brushes are operating properly.*
- *Operate the sweeper controls from the sweeper seat only.*
- *In the event you hear any strange noise or feel unusual vibration, if a component or system is not operating properly, or if any warning lights illuminate or buzzers sound, stop the sweeper immediately.*

Identify the cause and take any necessary remedial action.

Contact your supervisor if necessary.

- *During any operation, make sure you can operate the emergency devices quickly.*
- *Never overload the machine (see technical data, machine capacity).*
- *Operate the sweeper only when you have a clear and unobstructed view of the area being swept.*
- *While working and especially while backing up, keep a constant lookout for people, particularly children, who might be present in the work area, as well as for other obstructions such as steep slopes, drop offs, oversized debris or overhead wires.*
- *When the machine is fully loaded, drive at a slow speed, especially when turning.*
- *When using the machine on inclined surfaces, be careful to avoid situations, such as abrupt turns or maneuvers, which could prejudice the machine's stability and cause the machine to roll over.*
- *Sharp turns and/or turns with the steering wheel completely rotated must be carried out only at a low speed on level ground.*
- *The machine must be level and horizontal before the container may be lifted and/or tilted. Avoid any quick maneuvers. The machine could over turn or the container could come off its hinges.*
- *Note that the center of gravity of the sweeper moves as the hopper becomes loaded with debris, making the sweeper more unstable. Remain aware of the increased propensity for rollover of the sweeper during use.*
- *Never attempt to sweep oversized objects or items which can become entangled in the rotating parts of the sweeper, such as wire, rope or chains. These objects can be thrown or slung by the sweeper, resulting in personal injury.*
- *Make sure that the brooms have come to a complete stop before raising them from the ground. Lifting a rotating broom creates a significant risk of injury from thrown objects or direct broom contact.*
- *This sweeper should only be used for small road debris.*
Never use it to collect potentially hazardous material, such as:
 - *hot, burning, smoldering or smoking debris;*
 - *road kill;*
 - *medical waste;*
 - *asbestos; - chemicals.*
- *Be sure that all warning lights, signals and alarms are turned on and working while using the sweeper.*
- *Unless necessary for sweeping operations, never allow any passengers on the sweeper.*
Passengers must always remain properly seated and belted in the cab.
No one should ever lean out of the cab of the sweeper during operation.
- *Never allow any bystander to be within 30 feet of the sweeper during operation.*
They could be hit by thrown debris, contacted by the brooms or be run over.

- *Use extreme caution when backing up.
Rearward visibility in the sweeper is extremely limited.*
- *At the end of your workday*
 - *Relieve all hydraulic pressure*
 - *Place brooms on the ground*
 - *Fully lower hopper bin onto chassis*
- *Immediately notify your supervisor of any oil and/ or battery fluid leaks.*

1.9.a.5 - Dumping the hopper:

- *Do not come into contact with debris in the hopper. You cannot know everything present, and many different things could injure you in many ways. If you must service the hopper or otherwise contact or be in proximity to the debris, wear appropriate personal protective equipment such as eye protection, face shield respiratory protection, gloves and cover-alls.
Consult with your supervisor for all applicable local regulations, including but not limited to OSHA.*
- *Be sure the sweeper is on level ground.*
- *Do not allow any bystanders to be present during dumping operations.*
- *Be sure that there are no overhead obstructions, such as utility lines, which could be hit by the hopper.*
- *Be sure your mirrors are properly adjusted to provide a clear view of the sides and rear of the hopper.*
- *Remain in the cab with the windows rolled up during dumping operations.*
- *If the hopper will remain in a raised position after dumping is complete (for repairs, cleaning, etc.), secure the safety pin or safety support (depending on the version of the sweeper).*
- *Never travel with the hopper in a raised position.*

1.9.a.6 - Machine stop:

- *Upon each prolonged stop of the machine, and in case of temperatures close to or lower than 35°F/ 0°C, completely empty the water tank of the sprinkler system (OPT).*
- *The machine must be secured against unintended movements when it is not in operation.
Activate the parking brake and remove the starting key.
Enable all safety devices.*

- *Do not start the machine if it is stopped for servicing (tune up, maintenance, lubrication, etc...).*
- *Never leave the machine on sloping surfaces. If no option but to stop on inclined surfaces, place chocks under the wheels.*

1.9.b - SAFETY INSTRUCTIONS FOR SUPPLIES

1.9.b.1- Hydraulic fuel and engine oil:

- Avoid contact with the skin.
 - Do not inhale oil vapors.
 - Never dispose of oils in the environment because they cause water pollution.
Collect them and take them in legally approved containers to a collection center.
 - Always wear personal protective equipment when performing maintenance operations on the machine (gloves, glasses, etc...), in order to avoid oil coming into contact with the skin.
- Consult with your supervisor for all applicable local regulations, including but not limited to OSHA.

 **WARNING:**

If hydraulic fluid should leak from the hydraulic system while under pressure, it could penetrate into the skin. This is poisonous. Immediately consult a doctor if this should happen. Use a piece of cardboard to locate any leaks.

1.9.b.2- Battery acid:

- Do not inhale the vapor because it is toxic.
- Use appropriate personal protection equipment to avoid contact with the skin.
- Battery acid is corrosive: rinse with plenty of water in case of contact with battery acid and consult your physician.
- Explosive gas mixtures may form while charging the battery.
Charging operations must take place only in a well ventilated area.
- Do not smoke or use open flames within a six (6) foot radius of the battery while it is being charged or while it is cooling after having been charged.
- Do not cause short circuits.
- Do not invert polarity of battery pole connections.
- Do not rest tools or metal objects on the batteries; danger of short-circuits.
- Use a battery charger appropriate to the battery's capacity and features.
- Do not move the sweeper manually and do not start it while the battery is charging.

1.9.c -INSTRUCTIONS FOR HIGH-PRESSURE WATER SYSTEMS (OPT)

 **WARNING:**

Improper use of pumps and high-pressure systems, as well as non-compliance with the installation and maintenance instructions, can cause serious damage to people and/or property. Only properly trained personnel may use the high pressure system.

Before starting the system, the operator must make sure that:

- The high pressure pipes do not show any sign of abrasion or damage.
- Fittings are in perfect conditions.
- No bystanders, debris or animals are in the work area.
- There is no object that could be thrown by the high pressure jet.

 **WARNING:**

In case of any malfunction, anomaly or possible defects, the operator must immediately stop the pump, bring the pressure to zero and inform his supervisor.

1.10- MAINTENANCE INSTRUCTIONS

 **WARNING:**

- *Before carrying out cleaning or maintenance operations on the machine, or when replacing machine parts, turn off the engine, remove the ignition key and disconnect the battery.*
- *Should any maintenance task require the disabling, removal or disassembling of any safety device, that device must be immediately restored or replaced when the maintenance is complete.*
- *If the waste container is raised at any time, insert the safety pin or the safety support, (depending on the version of sweeper).*
- *Use caution when draining the oil and eliminate any oil trace present on the machine and in the environment.*
- *Wear personal protective equipment and clothes, in compliance with local rules and regulations, including but not limited to OSHA. See your supervisor for instructions.*

The components of Crescent products are designed as a single integrated system.

To avoid compromises in terms of safety, performance, durability and function, and to prevent voiding of the warranty, do not substitute Crescent components with components manufactured by other companies. Use only original Crescent spare parts.

CAUTION:

To clean and wash the machine, do not use aggressive or acid cleansers. Use caution around the electric parts and to the engine.

Comply with the instructions provided by the cleanser's manufacturer.

 **WARNING:**

Any maintenance, overhaul and repair operation, must be performed by properly trained technicians. Only use original Crescent spare parts.

Follow the instructions outlined in "chapter 6". Comply with the laws in force for oil disposal.

- Never modify or alter the sweeper or any of its components, especially all guards, covers, buzzers, lights or shields.
- Use proper stairs, ladders or platforms to access areas that cannot be reached from ground level.
- Always use handholds and steps when climbing onto the sweeper, and always maintain three points of contact (i.e. two hands and one foot or two feet and one hand) with the sweeper.

- Never leave the sweeper unattended with the hopper in a raised position.
- Always use the hopper safety pin or the safety support, (depending on the version of the sweeper) while working on the sweeper with the hopper in a raised position.
- Use appropriate personal protection equipment, such as eye protection, face shield, respiratory protection, gloves and coveralls, when performing maintenance, repairs or adjustments in compliance with local regulations or OSHA.

Check with your supervisor.

- Never crawl under or be in close proximity to any raised component (including but not limited to the cab, hopper, brooms or covers) unless the component is securely supported, and the hydraulic pressure is relieved.
- Never attempt any repairs or adjustments to any hydraulic component or auxiliary unit, including pumps, hoses, fittings, if the system is pressurized or operational or if the sweeper is in motion. Always shut down the sweeper and all engines and motors, relieve all pressure and wait for all motion to come to a complete stop before performing any repairs or adjustments.
- Check with your supervisor before entering the hopper for any reason and use extreme caution when entering the hopper.

This area may be a "confined space" which presents significant hazards to workers from fumes, gases, or other vapors, or other hazards due to the contents of the hopper.

You may be required to use specialized personal protection equipment such as a respirator and protective body suit, or follow other work procedures in accordance with OSHA or other local regulations. Check with your supervisor.

- If you must run the engine in an enclosed area without adequate ventilation, remove the exhaust fumes to the outdoors with an exhaust pipe extension.

Cleaning:

For cleaning operations, comply with the instructions outlined in "chapter 6".

1.10.a - REPAIRS OR MAINTENANCE ON SYSTEMS

Any intervention on the electric, hydraulic and water systems may only be executed by QUALIFIED PERSONNEL which has been instructed on the machine's features and on accident prevention standards.

CAUTION:

After having removed the ignition key, wait at least 2 minutes before disconnecting the battery so that the control boxes may go off completely.

1.11- FIRE STANDARDS

WARNING:

An appropriate fire extinguisher must be available on or close to the machine.

In case of fire:

- If possible, and without risk for the operator or for people, move the machine to the outside until reaching an isolated area.
- Stop the engine.
- Keep strangers away.
- Call the personnel in charge of fire prevention and, if necessary, the Fire Department.

1.12- MACHINE DEMOLITION AND DISPOSAL OF NOXIOUS SUBSTANCES

Machine disassembly must be carried out by specialized technicians (mechanics, electricians, etc...).

If the machine has a roadworthiness certificate, it is necessary to fulfill all obligations set forth by local legislation before it is disassembled.

For the disposal of noxious substances such as lubricants, hydraulic fluid, batteries, etc..., please comply with all applicable rules and regulations.

NOTICE:

Any infraction of any rule or regulation committed before, during or after scrapping and disposal of the machine components, or in the interpretation and application of current regulations, is the exclusive responsibility of the machine operator or owner.

CHAPTER 2

SAFETY DEVICES - HANDLING

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2.1- WARNING STICKERS

This section identifies some of the warnings stickers affixed to the sweeper itself. However, warning stickers do not replace good judgment, common sense and safe work practices.

1) General warnings

Sticker located inside the driver's cab; the use of this machine by unauthorized or untrained personnel is forbidden.

Crescent accepts no liability for personal injury or damage to the equipment or property caused by improper use of the sweeper.

2) Stay away from the machine's range of operation

Sticker located on the back of the machine and close to the doors; it directs bystanders to stay away from the machine during operation.

3) Do not get close when the machine is turning

Sticker located on the sides of the machine; they inform that no one should get close to the machine while it is turning since there is a risk of getting crushed.

4) Backing

Sticker located on the back of the machine; it indicates that no one should stand or cross behind the machine while it is backing-up.

5) Stand clear when the waste container is moving

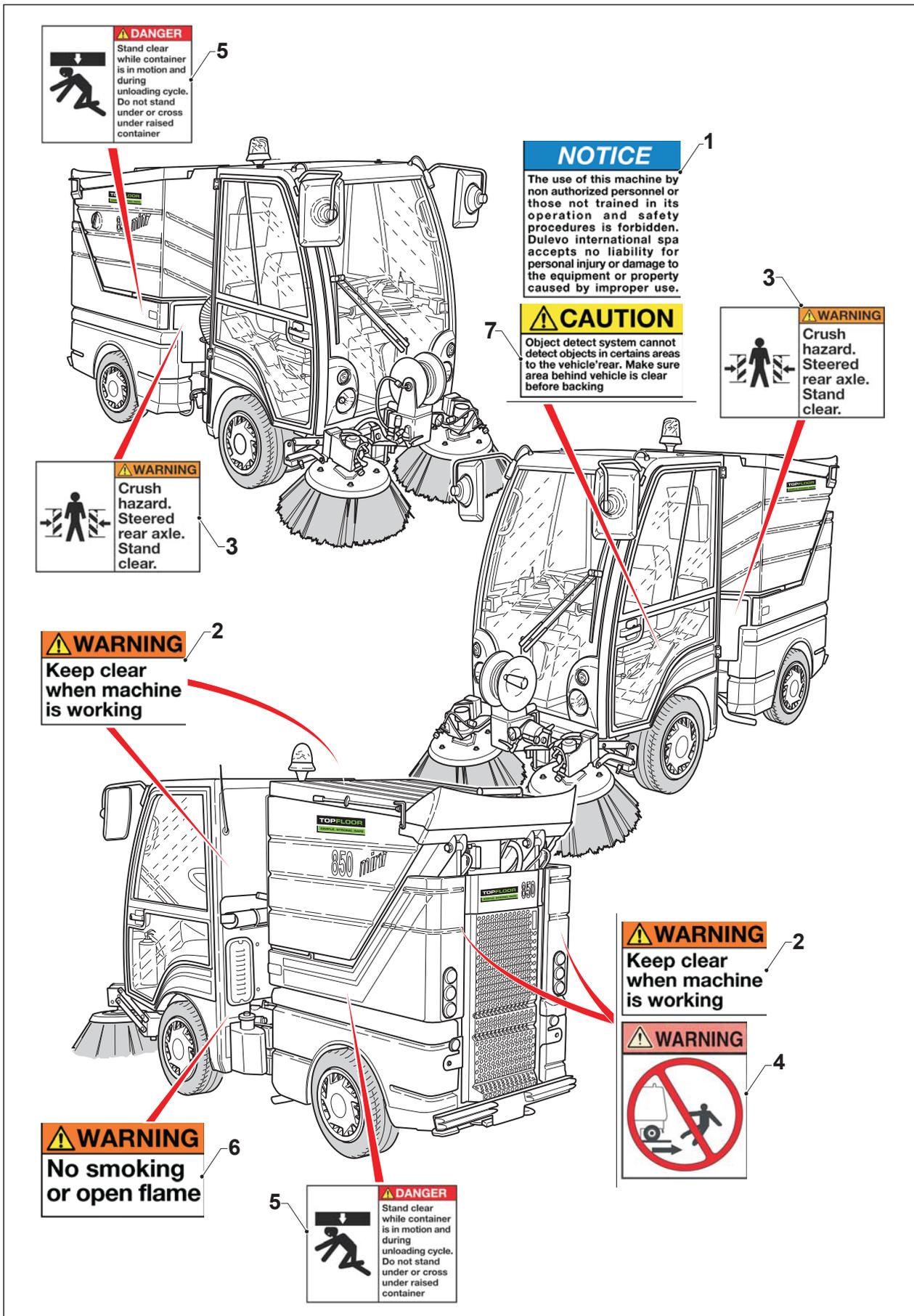
Sticker located on the sides of the machine; it informs that no one should get close to the machine while the waste container is moving (especially when lowering).

6) It is forbidden to smoke or use open flames

Sticker located near the fuel tank; it indicates that it is forbidden to smoke or use open flames near the machine because of the risk of explosions or fires.

7) Backing (OPT)

Sticker located inside the driver's cab; it indicates that it is necessary to pay close attention when the machine is backing up, even if there is a rear object detection system.



8) Towing

Sticker located in the lower part of the machine; it indicates that the machine must not proceed at more than 3 km/h while being towed.

9) Locking the side brushes

Sticker located near the side brushes; it indicates that the safety locking devices must be connected to the brushes whenever the machine is transit.

10) Climbing on the brushes is forbidden

Sticker located near the side brushes; it indicates that it is forbidden to contact the brush plate.

11) Hot surfaces

Sticker visible when the waste container is lifted; it indicates that it is forbidden to touch the mechanical parts since there is a risk of getting burned because of the high temperatures.

12) Turn off the engine and remove the ignition key before climbing on the machine

Sticker visible when the waste container is lifted; it warns that before climbing on the vehicle frame or body (such as during maintenance), it is necessary to turn off the engine and remove the ignition key.

13) Insert security pins when waste container is lifted

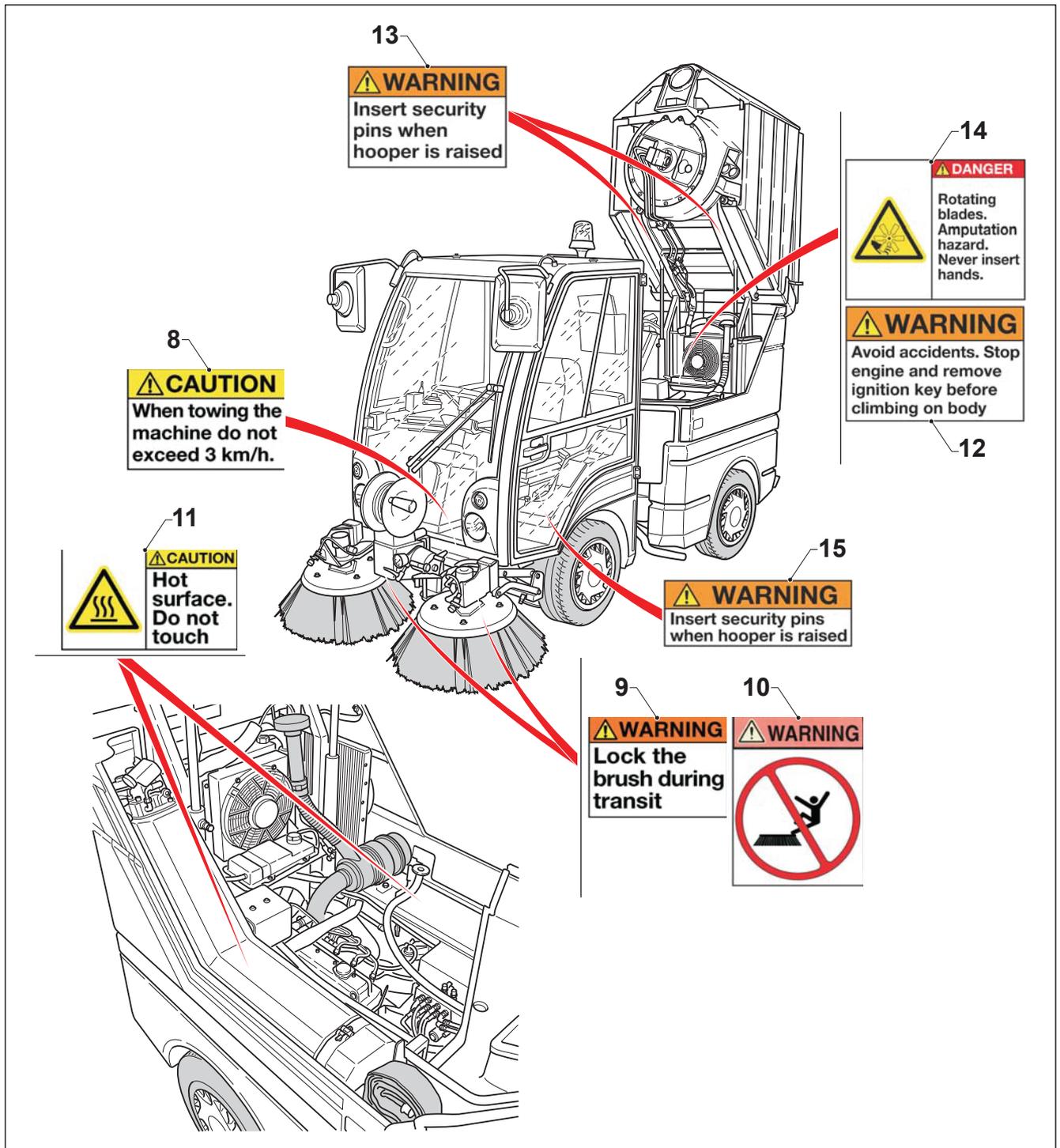
Stickers visible when the container is lifted; it indicates that it is mandatory to insert the safety bars whenever operating with raised hopper.

14) Hand amputation due to rotating suction fan

Sticker visible when the waste container is lifted; it warns that there is a risk of hands amputation and crushing due to the suction fan.

15) Insert security pins when waste container is lifted

Stickers located on the safety bars; it indicates that it is mandatory to insert the safety bars whenever operating with raised hopper.



2.2- SAFETY DEVICES

This section identifies some of the safety devices provided with the sweeper. However, safety devices can fail or be rendered inoperative by someone unknown to you. Before operating the sweeper, you must confirm that each of these devices are in good working order.

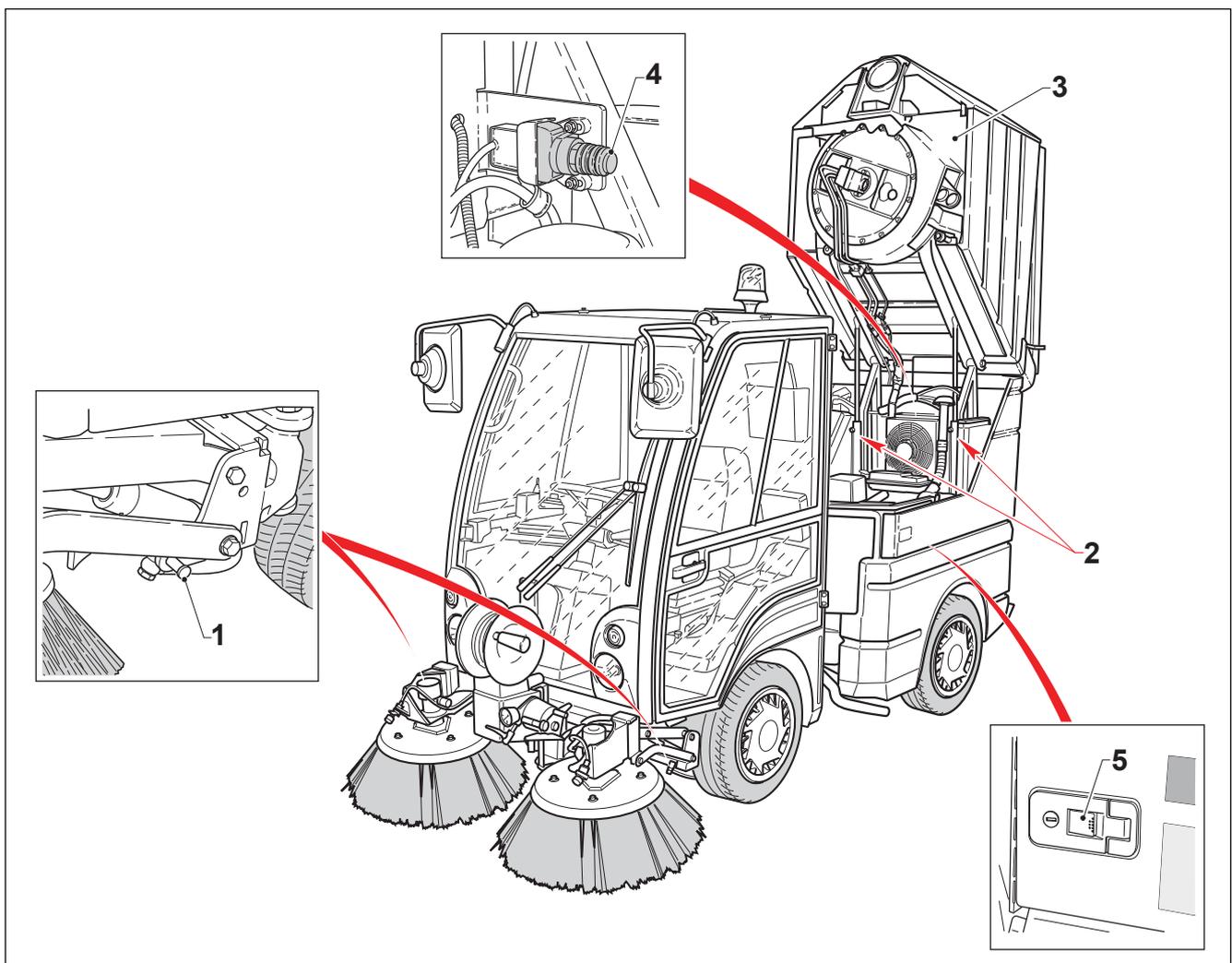
NOTICE:

No safety device replaces proper training, careful operation, good judgment and safe work practices.

NOTICE:

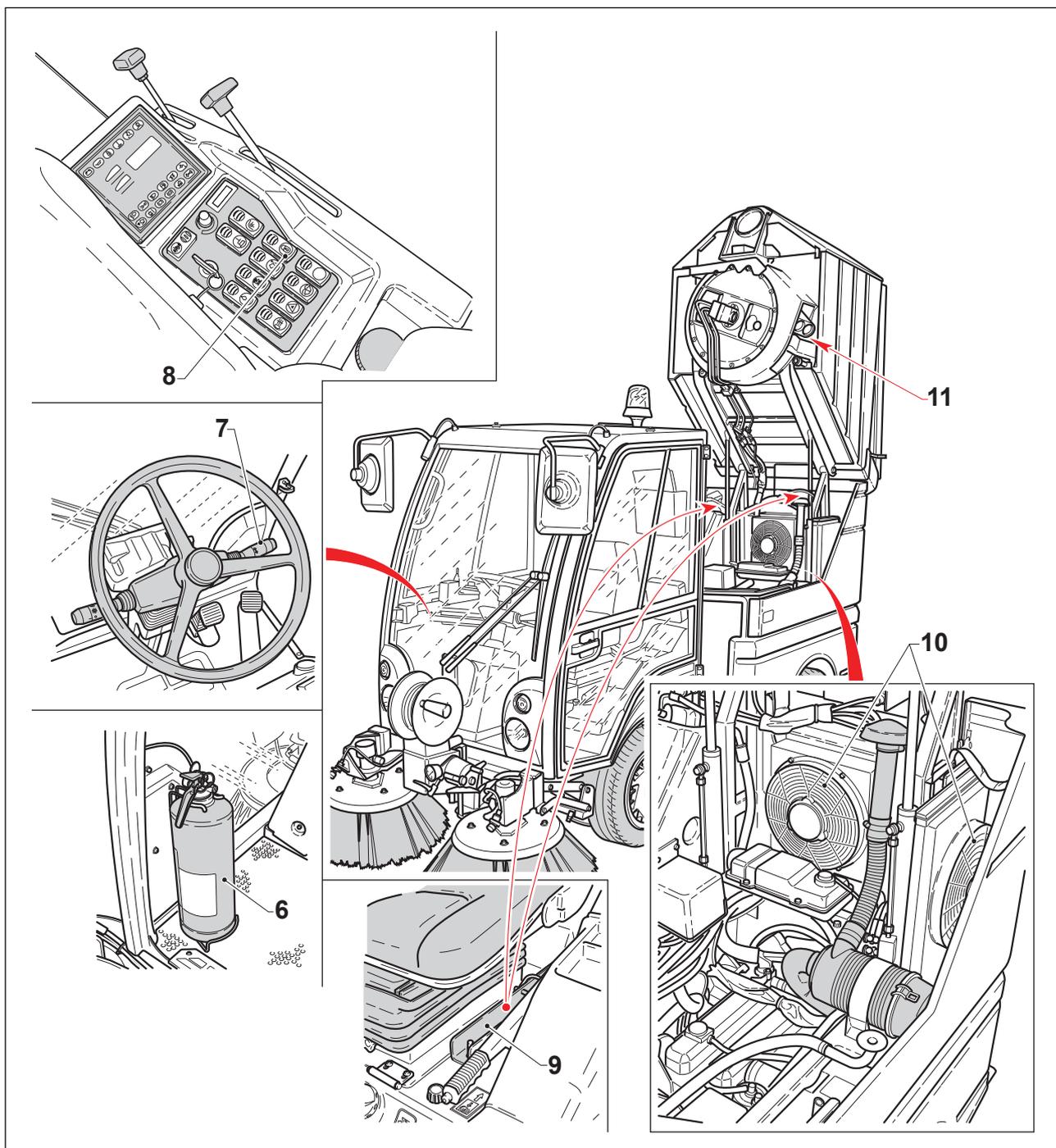
Some of the devices and systems installed and mentioned below are optional.

- Pin (1) locking the brushes to the lifted position during transfer.
- Block valves placed on the lifting cylinders (2) of the hopper (3) blocking the hopper descent in case of a pipe breakage.
- Micro-switch (4) signalling, through a signal bulb on



the dashboard, that the hopper is lifted.

- Key closing the doors (5) for access to engine compartment.
- Buzzer warning that the machine is going in reverse.
- Fire extinguisher (6) in the driver's cab.
- Starting of the machine only with starting lever (7) in idling position.
- Operator's presence at the driving seat sensor: stops the running onward functions in case the operator is not present.
- Operating switch (8): blocks the accidental use of work buttons operation.
- Safety bars (9) for lifted hopper located in cab; to be used for maintenance operations.



- Radiator fans protection grating (10).
- Waste suction fan protection grating (11).

2.3- HAZARDOUS AREAS

! WARNING:

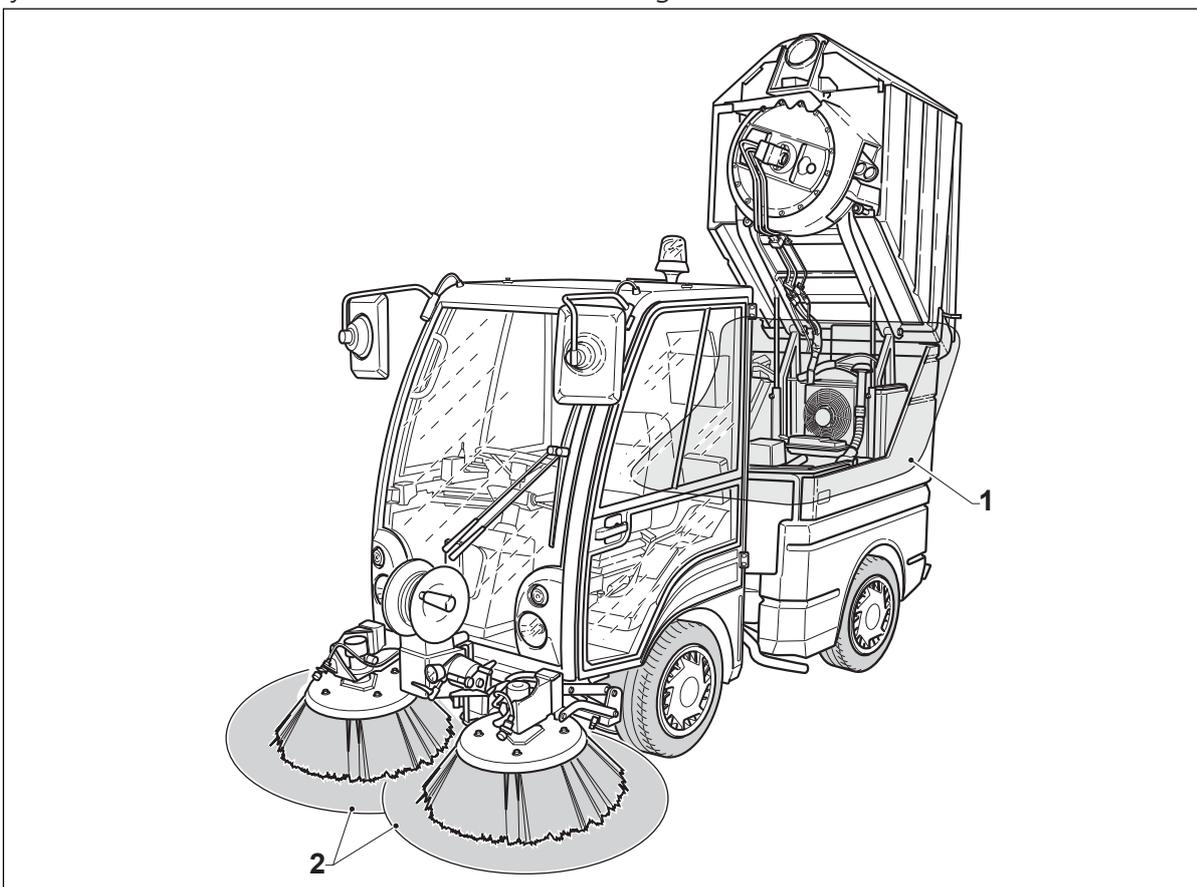
This section identifies some areas near or portions of the sweeper which present a risk of personal injury.

These danger zones cannot be designed out of the sweeper or guarded against it.

It is essential that the operator demonstrates good judgment, common sense and safe work practices to avoid personal injury or death.

The machine's primary hazardous areas are as follows:

- 1) The area under the container:
 - risk of burns;
 - risk of amputation by moving parts;
 - risk of crushing when the hopper is moving.
- 2) The areas in proximity of the side brushes when they are rotating:
 - risk of crushing;
 - risk of severe abrasion or skin removal.
- 3) Anywhere close to the machine when it is running.



2.4- HANDLING AND TRANSPORT

⚠ WARNING:

Avoid personal injury.

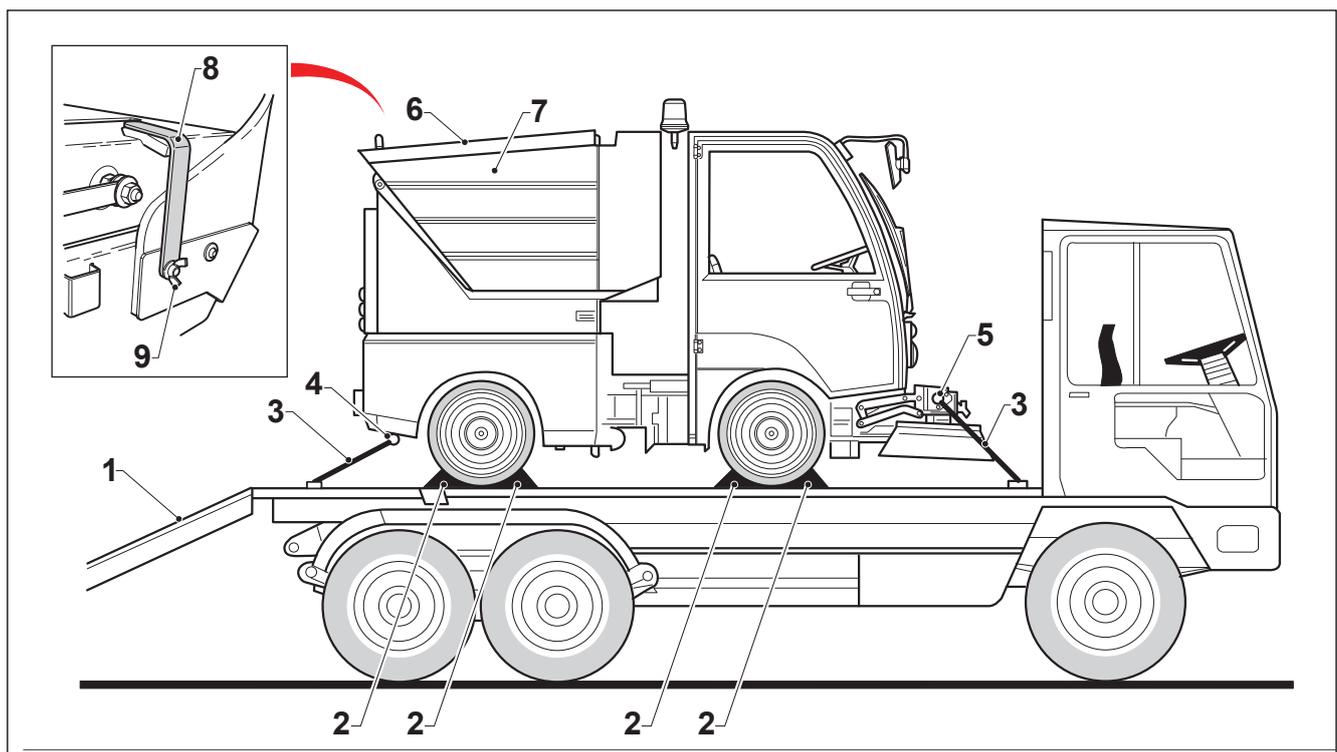
All loading and unloading operations must be performed only by SPECIALIZED PERSONNEL. For the machine's mass see "chapter 3". See "chapters 4 and 5" for the description of the controls and the use of the machine.

2.4.a - TRANSPORT ON TRUCK

- Using the loading ramp (1), position the machine on the truck platform.

CAUTION: *To prevent the side brushes from striking the ramp, position them externally with respect to the foot board, through the suitable controls, then with the machine lifted retract the brushes.*

- Enable the parking brake.
- Lock the machine wheels through the suitable chocks (2).
- During transport the machine must be tied with belts or cables (3) by using as connections points the slots (4) positioned in the back and the towing hook (5) located in the front of the machine's frame.
- Retract the brushes.



CAUTION: *The eyebolts (4) are to be used only to fasten the machine during transport. Never use the eyebolts to hoist the machine.*

CAUTION: *During transport on a truck be sure the cover (6) of the hopper is locked by the appropriate clamp (8). After transport and before starting the machine, remove the clamp (8) by unscrewing the butterfly nut (9).*

The clamp (8) has to accompany the machine and has to be mounted every time the machine is transported on a truck.

2.4.b - TOWING

Before towing the machine, disable all functions and bypass the traction pump (1).

- Enable the parking brake and switch off the engine.
- Lift the waste container (2) as indicated in "chapter 4".
- Unscrew by three rounds the hexagonal nuts (3) located on the pump.

WARNING:

After having carried out this operation, the machine is in the neutral gear and can roll freely, and can bump against or crush something or someone. Always insure the parking brake is operational and use wheel chocks.

- Hook the hauling bar to the hook (4).
- Start the engine (if possible) to activate the power steering and power braking.
- Lower the waste container.
- Only now release the parking brake and remove the wheel chocks.

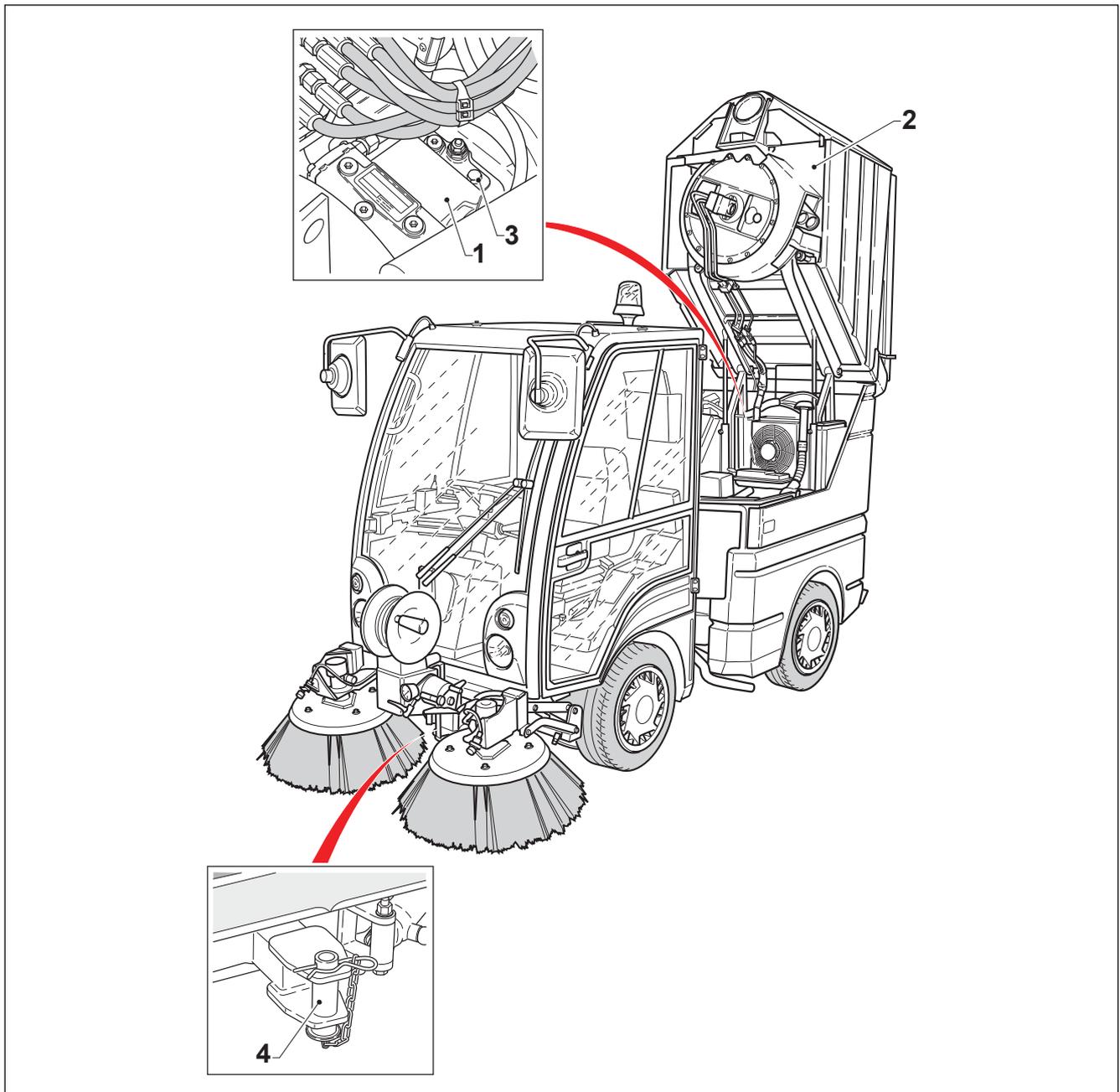
 **CAUTION:** *During towing, the power steering and power braking systems do not work. You will need to exert significant effort to effect any steering or braking maneuvers.*

 **WARNING:** *You must comply with all local regulations during towing, such as the use of flags, lights or accompanying machines.*

⚠ CAUTION:

During towing proceed at a very slow speed (max 3 km/h).

- When the towing is finished, pull the parking brake and remove the hauling bar.
- Lift the waste container (2).
- Restore the traction pump (1) circuit by turning the nut (3).



CHAPTER 3

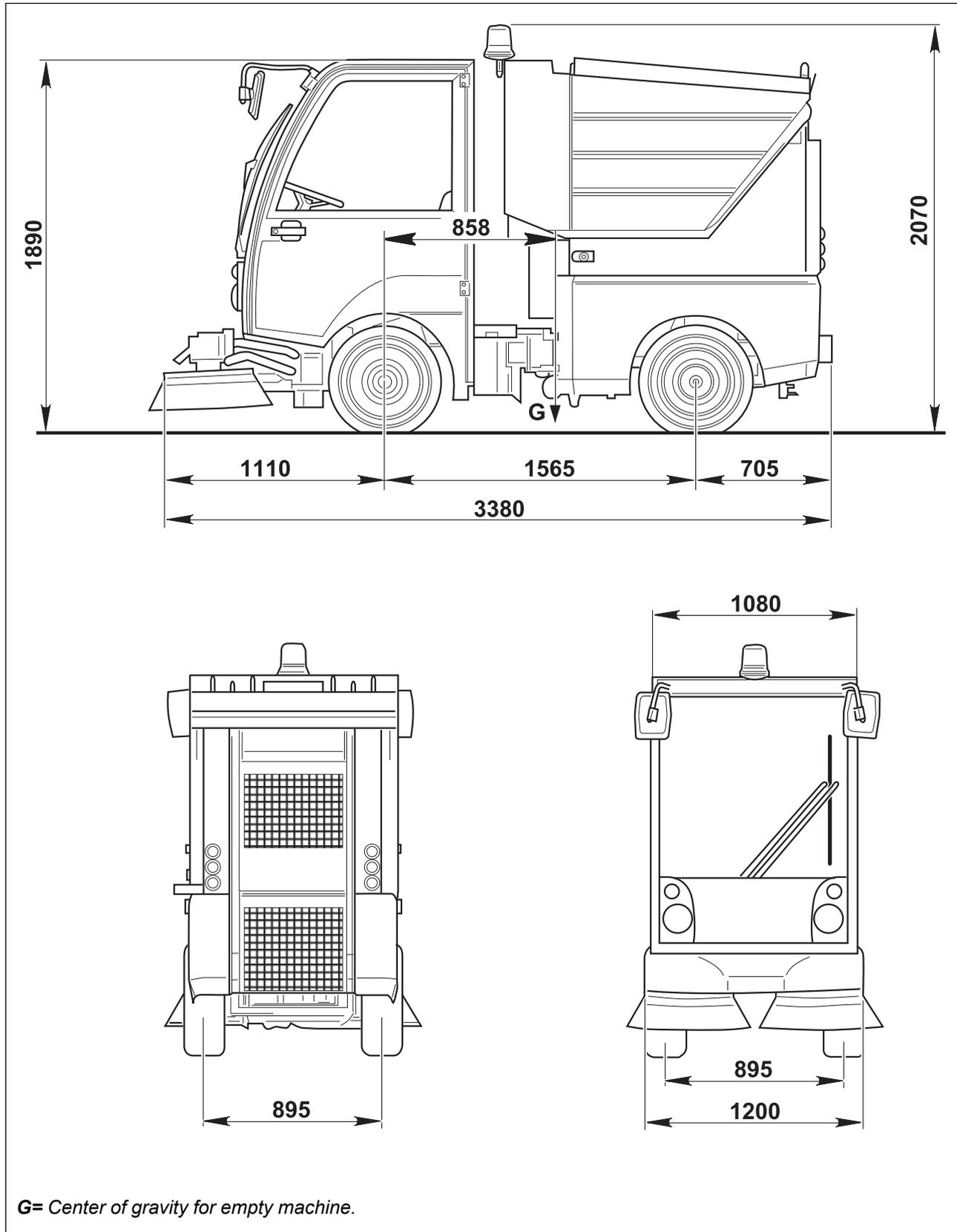
TECHNICAL DATA - IDENTIFICATION

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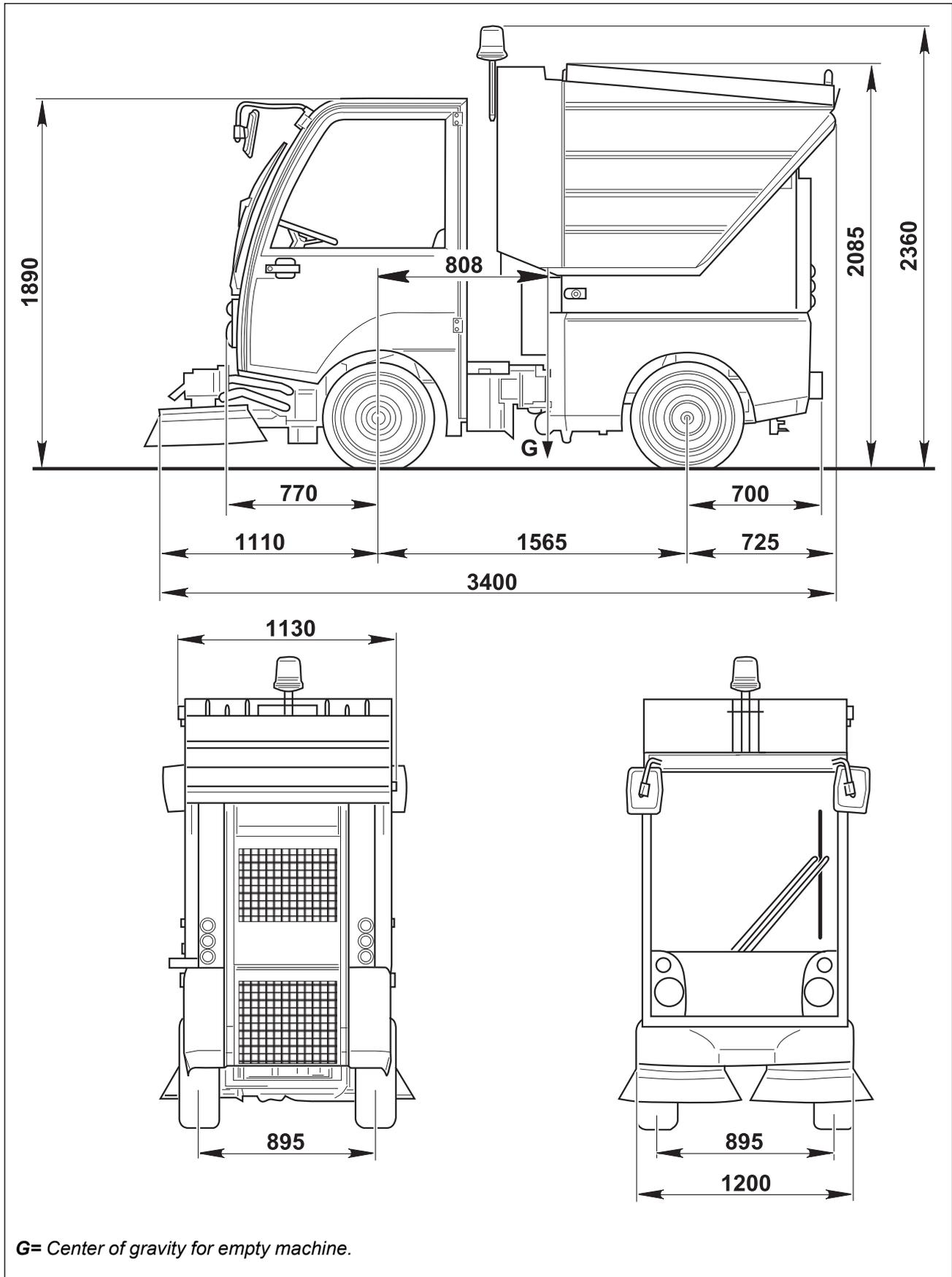
3.1 -OVERALL DIMENSIONS

3.1.a -STANDARD VERSION



G= Center of gravity for empty machine.

3.1.b - 1m³ VERSION



G= Center of gravity for empty machine.

3.2 - TECHNICAL DATA

Container geometrical cubature

<i>Standard version</i>	0.85 m³
<i>1m³ version</i>	1 m³

Mass in running conditions (driver: 70 kg)

<i>Unloaded (Standard version)</i>	1850 kg
<i>Unloaded (1m³ version)</i>	1860 kg
<i>Loaded (Standard version)</i>	2200 kg
<i>Loaded (1m³ version)</i>	2440 kg
<i>Loaded (Standard version)</i>	2200 kg
<i>Loaded (1m³ version)</i>	2440 kg

Engine

<i>type</i>	KUBOTA V1505-EU1
<i>water cooling</i>	
<i>cubic capacity</i>	1498 cc
<i>maximum engine power</i>	25 kW
<i>working rating</i>	2000 g/min
<i>fuel</i>	Gasoil

<i>4 tyres type (Standard version)</i>	185/60 R14
<i>4 tyres type (1m³ version)</i>	175/65 R14C
<i>Water tanks capacity</i>	175 litres
<i>Maximum cleaning width with side brooms ø 730</i>	up to 2080 mm
<i>Unloading height</i>	1400 mm
<i>Transfer speed</i>	0 ÷ 26 km/h

Electrical system

<i>Nominal tension</i>	12 V
<i>Alternator</i>	60 A
<i>Batteries</i>	12 V - 80 Ah

3.2.a - LIMIT WEATHER CONDITIONS FOR THE USE

The limit weather conditions for the use of the machine are the following:

- Maximum ambient temperature:
+40°C
- Minimum ambient temperature:
+1°C (use of sprinkling system)
-5°C (engine starting)
-15°C (during operation)
- Altitude:
up to 2800 m
- Relative humidity: f
from 30% to 95% (without condensate)

3.3- MACHINE NOISE EMISSION

The test conditions under which the phonometric survey and the calculation of the sonic power were carried out comply with European regulations and directives and are described in detail in the various technical reports kept by Crescent.

In case of accidental and/or instrumental errors, the uncertainty relative to the values indicated below is $K = 2$ dB.

L_{pA} : A-WEIGHED AVERAGE EMISSION SOUND PRESSURE LEVEL - AT DRIVER'S SEAT

This is an indicator of what is perceived by the human ear and consequently constitutes the value used to assess the operators' exposure to noise.

$$L_{pA} = 76 \text{ dB (A)}$$

L_{wA} : WEIGHED SOUND POWER LEVEL ISSUED BY THE MACHINE IN THE ENVIRONMENT

$$L_{wA} = 101 \text{ dB (A)}$$

(See paragraph "SOUND POWER PLATE POSITIONING").

3.4- INFORMATION ABOUT VIBRATIONS

The vibrations have been measured in a typical condition of machine use, i.e. during work and with operating working tools.

The tests have been done on a level asphalt road with a roadbed in good conditions.

The vibrations have been measured and rated according to the requests of directive 2002/44/CE; they are described in detail in the relative technical report kept by Crescent.

The equivalent vibration level produced by the machine in working conditions is: - for the hand-arm system: lower than 2,5m/s²; - for the whole body: lower than 0,5m/s².

These values relate to the time of actual use of the machine. They may be used only as comparison values and are not suitable to determine the operator's real exposure levels, which depend on the conditions and environment of use.

3.5 - IDENTIFICATION OF THE MACHINE

NOTICE:

The machine plates are the only legal identification reference, therefore you must keep them in good condition. The warranty will be void for any machine having modified or removed identification plates.

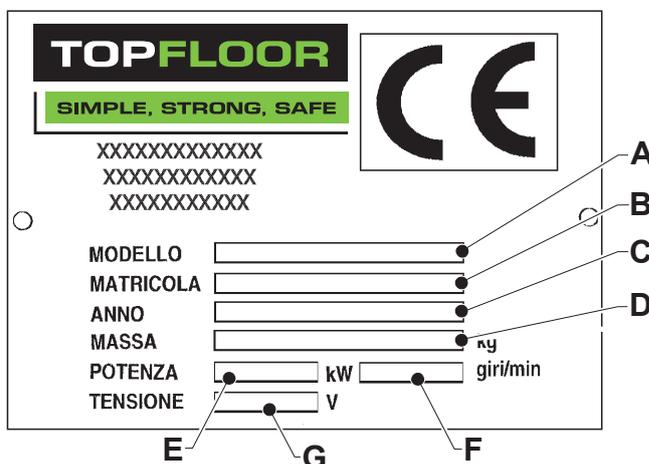
NOTICE:

The vehicle's serial number and type approval number are indicated on the special plates. They are also permanently printed on the right side member of the chassis.

3.5.a - IDENTIFICATION PLATE

Plate located inside the driver's cab; the data present on this sticker are the following:

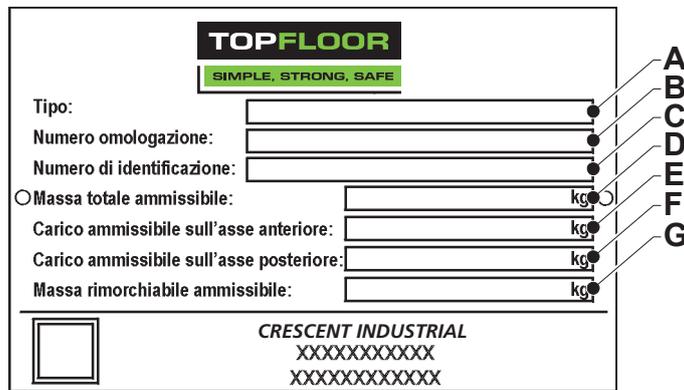
- A** = Model
- B** = Serial Number
- C** = Year of Construction
- D** = Total mass expressed in kg
- E** = Engine power
- F** = Engine rpm
- G** = Supply voltage



3.5.b -ROAD TYPE APPROVAL DATA PLATE

Plate located inside the driver’s cab; the data present on this sticker are the following:

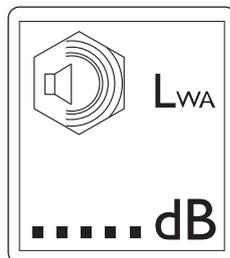
- A** = Machine Type
- B** = Type approval number
- C** = Identification number
- D** = Total admissible mass
- E** = Maximum admissible load on the front axle
- F** = Maximum admissible load on the rear axle
- G** = Admissible trailerable mass



3.5.c - SOUND POWER PLATE

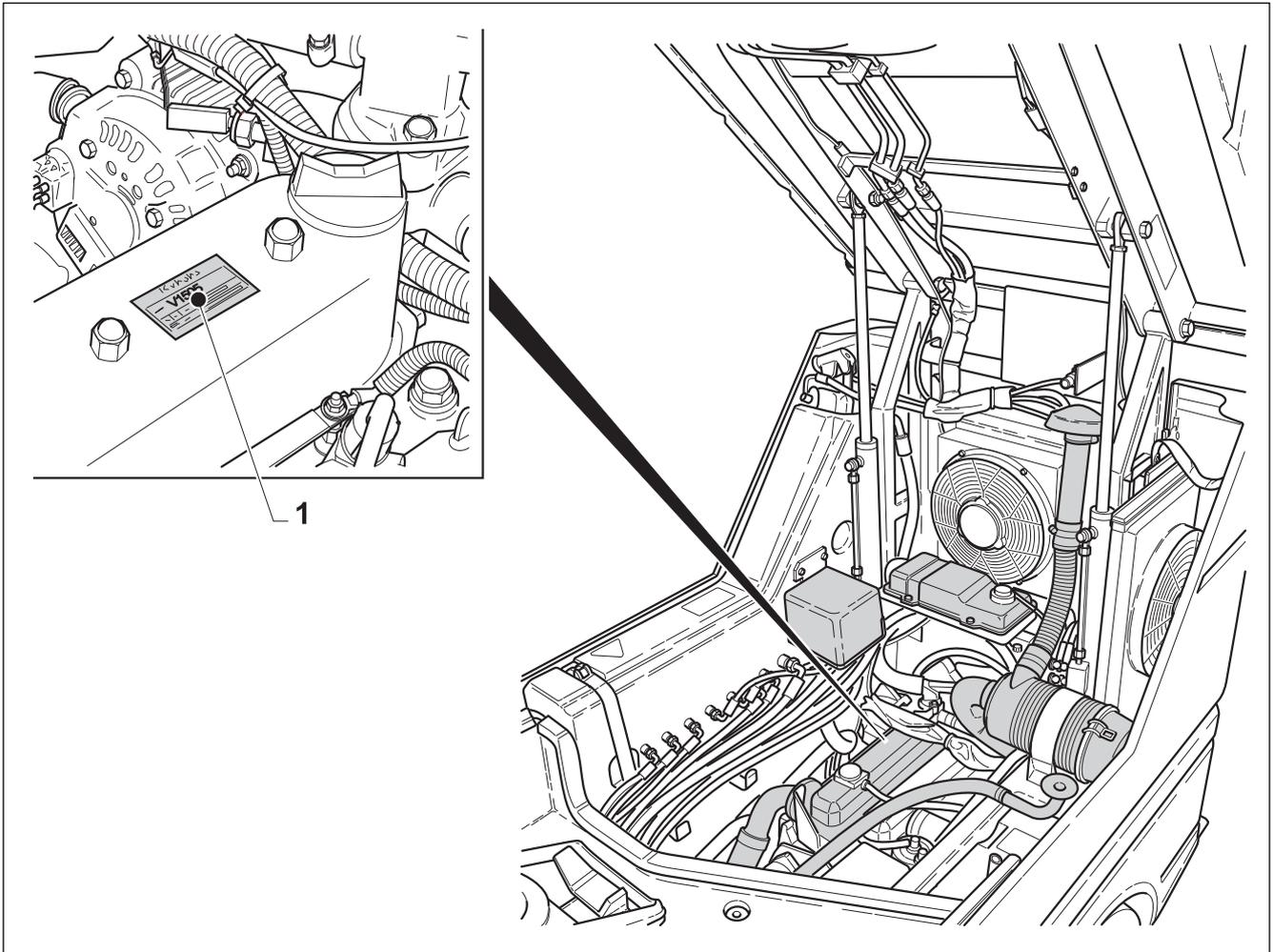
(See paragraph 3.3)

Plate located inside the driver’s cab. It indicates the guaranteed sound power level.



3.5.d -ENGINE SERIAL NUMBER PLATE

The engine serial number plate (1) is positioned on the engine block and it can be reached by lifting the waste container.



CHAPTER 4

KNOWLEDGE

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4.1 - WORKING PRINCIPLE

The machine collects the waste through a waste intake duct system.

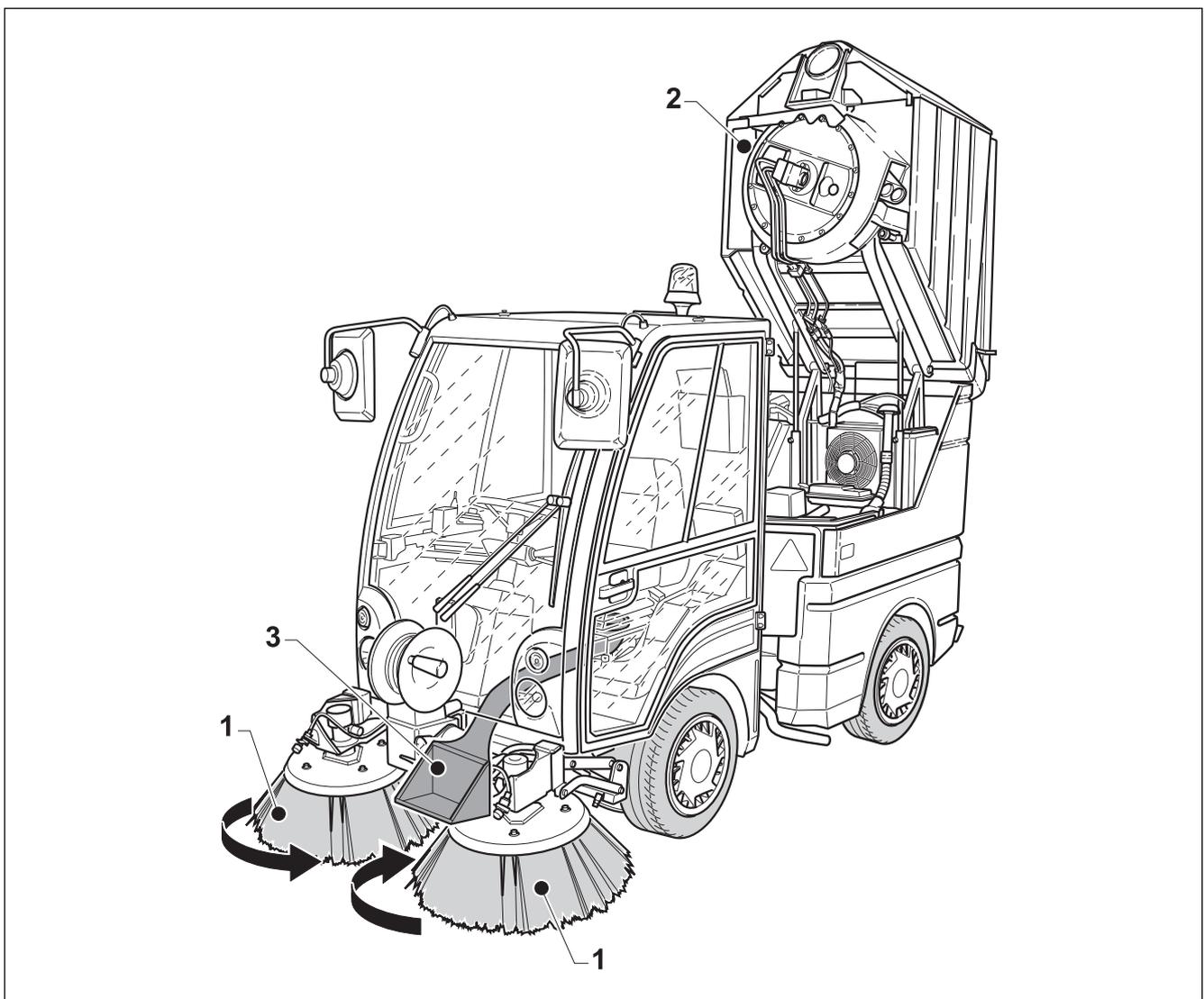
Two rotating side brushes (1) bring the waste towards the middle of the machine where a powerful vacuum sucks them through a waste intake duct positioned on the front of the machine.

The waste intake duct system was designed to suck the waste and put it into the hopper, hence it is equipped with:

- a vacuum (2) actuated by an hydraulic motor;
- a waste intake duct (3) located under the driver's cab.

NOTICE:

All the openings of the waste collecting area are equipped with rubber gaskets to prevent the dust from coming out.



4.2 - ACCESS TO INTERNAL PARTS

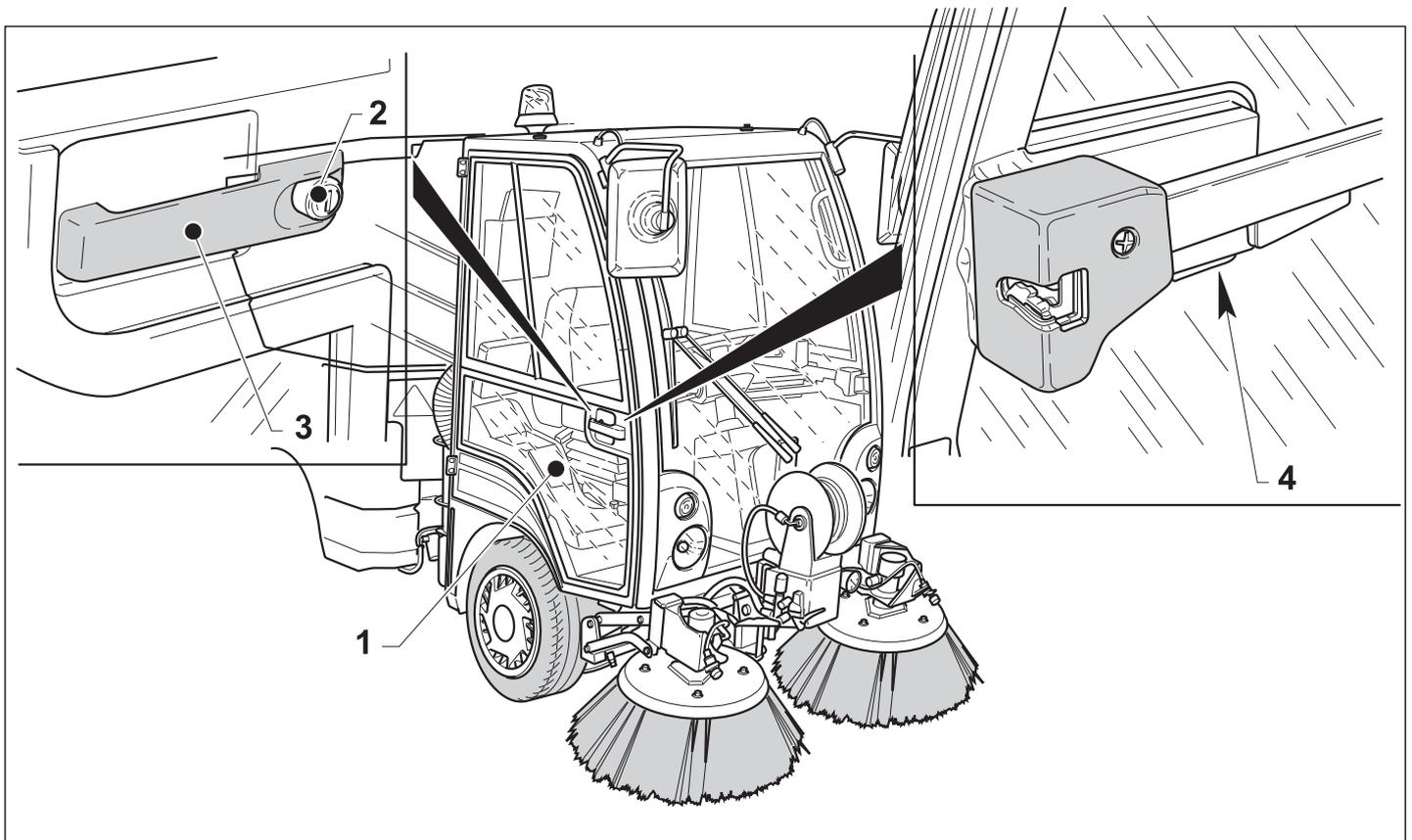
4.2.a - TO OPEN THE CAB DOORS

- In order to open the door (1) from outside insert the key into the lock (2) and turn it counterclockwise.

Open the door by pressing the button (2) and by pulling the handle (3) to the outside.

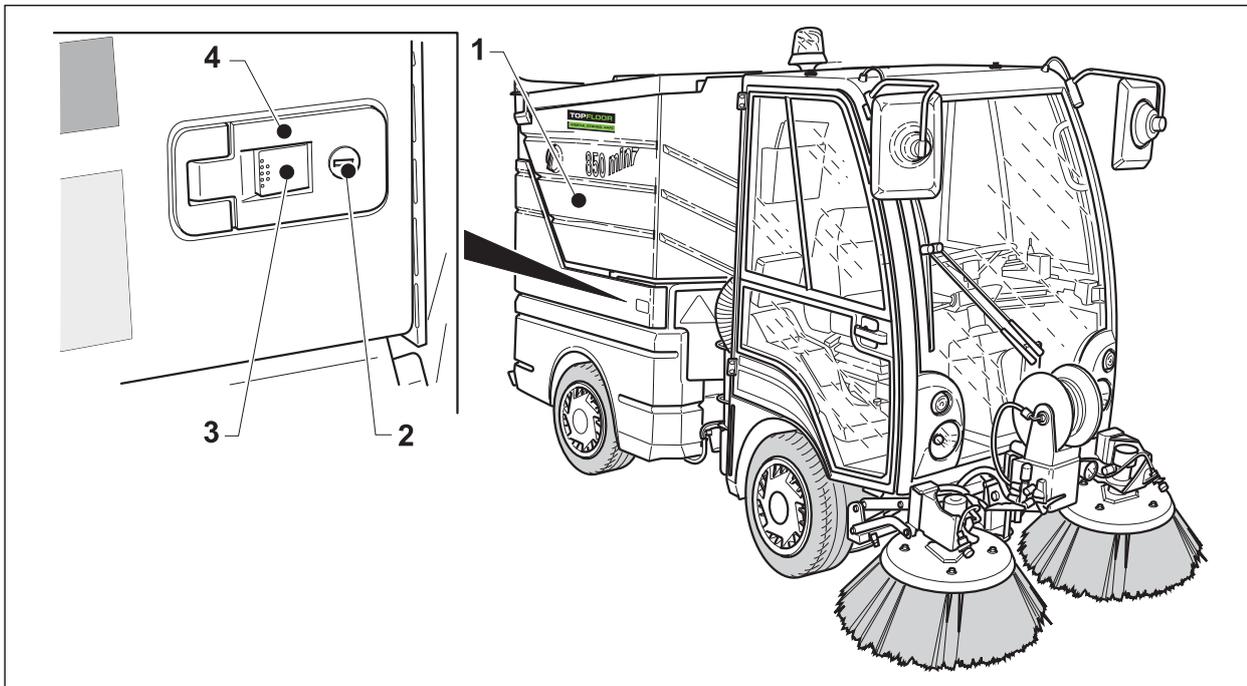
In order to lock the door turn the key to the opposite direction.

- In order to open the door from inside press the lever (4) until the door is unlocked and then push to the outside.



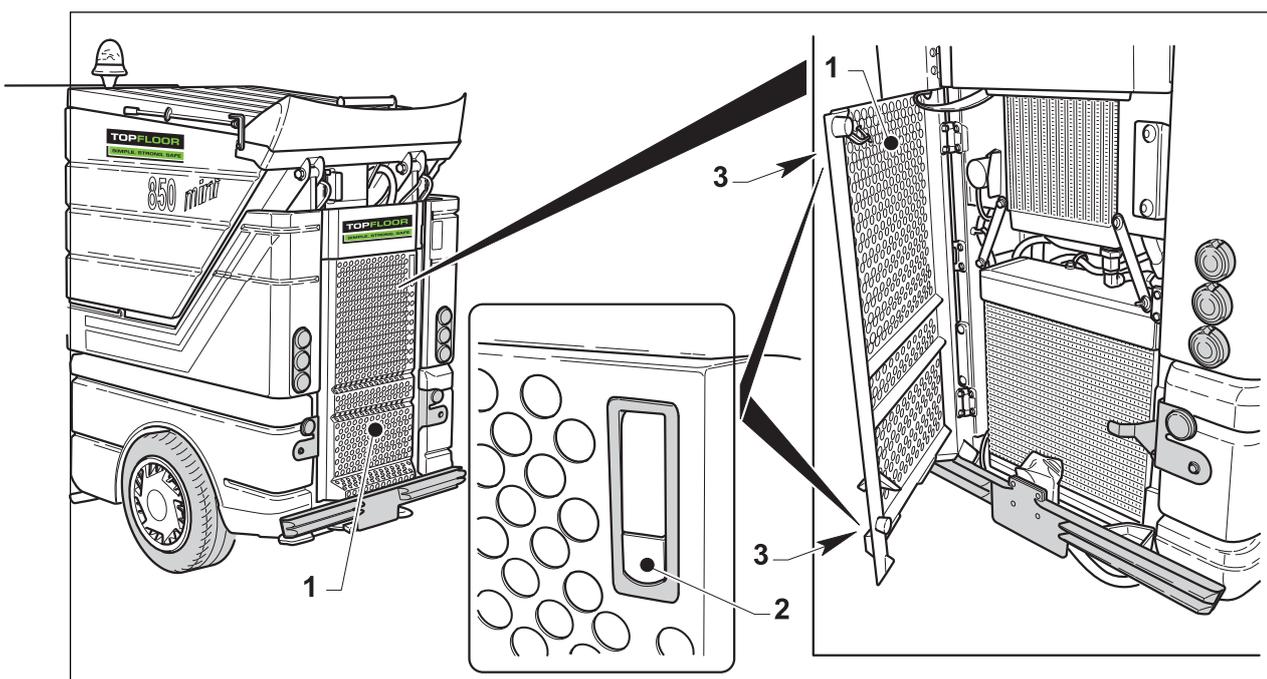
4.2.b - TO OPEN THE SIDE HATCHES

- In order to open the lateral hatches (1) insert the key in the lock (2) and turn it counterclockwise.
- Press the button (3) to release the handle (4).
- Open the hatch by pulling the lever (4) to the outside.
- In order to lock the hatch intervene in the opposite direction.



4.2.c - OPENING THE REAR DOOR

- To open the rear door (1) press the button (2) of the two locks (3).
- To close the door, repeat the sequence in reverse order.



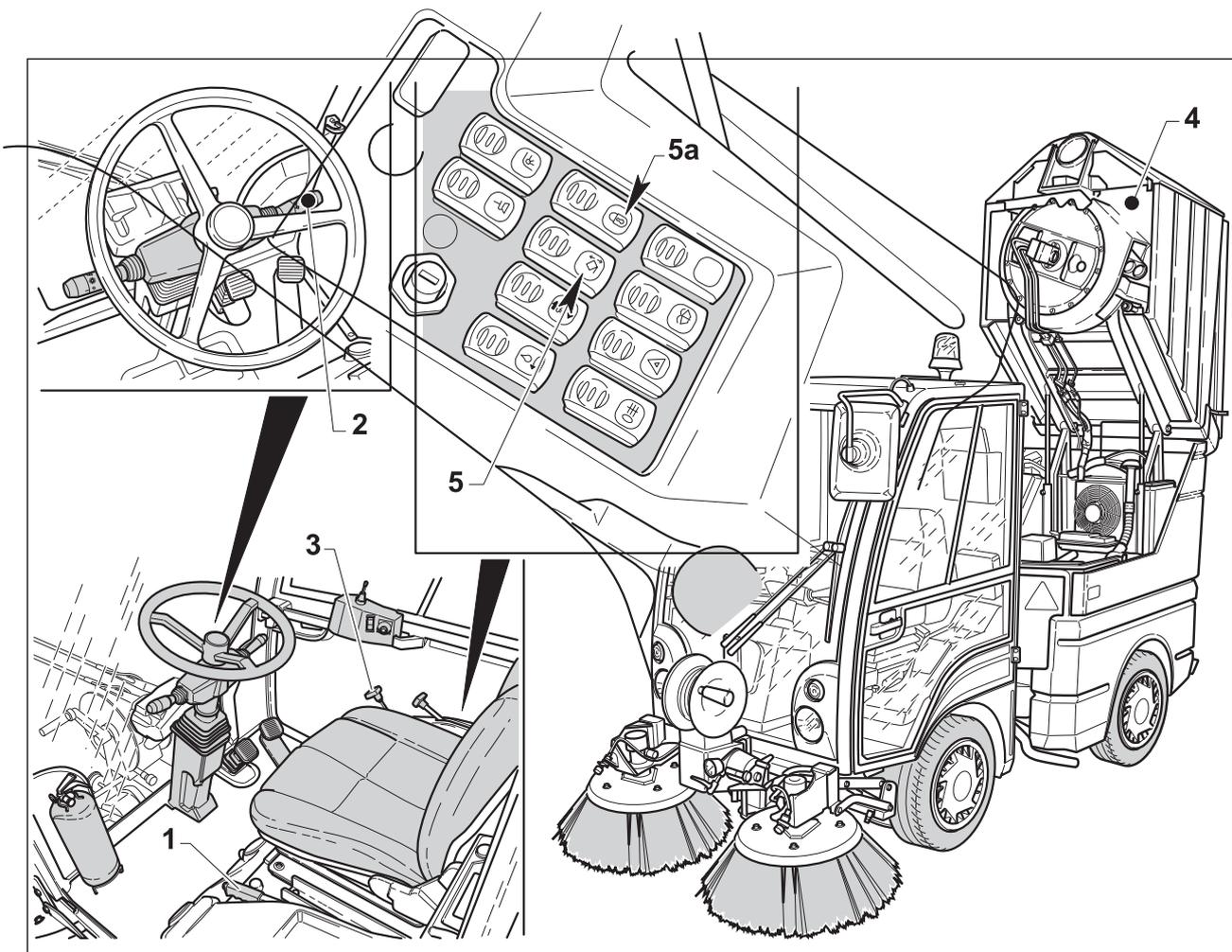
4.2.d - WASTE CONTAINER OVERTURNING

The various controls for the waste container are described in the next paragraphs. The instructions regarding waste dumping are described in chapter 5.

⚠ DANGER: Never work beneath or near the hopper unless it is completely tilted and locked in place with the safety bar.

In order to tilt the hopper (4) carry out the following procedure:

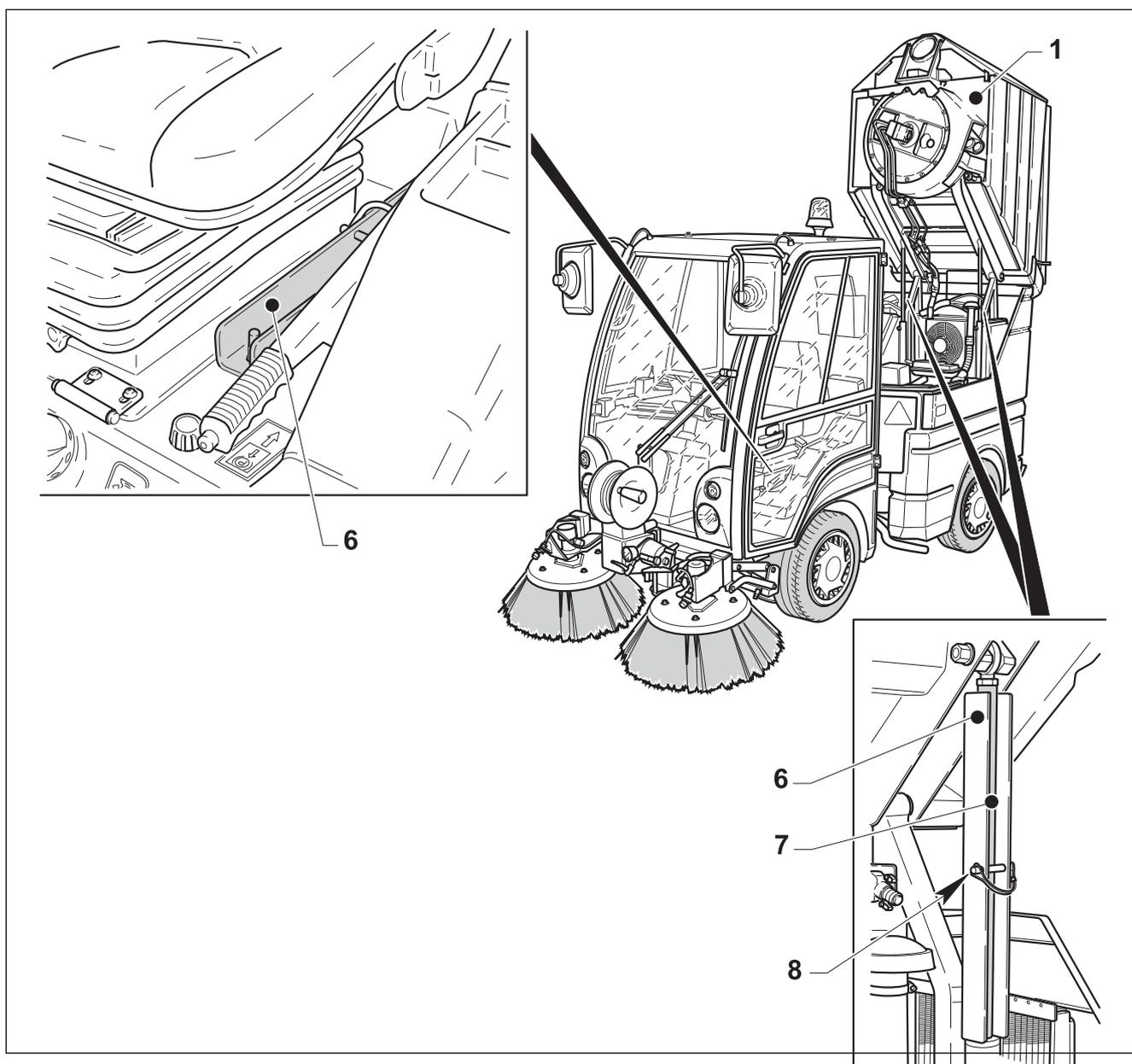
- Make sure the vacuum is stopped.
- Set the parking brake (1).
- Make sure the speed selection lever (2) is in the central (neutral) position.
- Start the engine.
- Set the engine to 1800 RPM through the lever (3).
- Press the button (5a) to enable the hydraulic system . .
- Lift the hopper (4) by pressing the button (5)  and hold it down until the hopper reaches its end of travel.
- To lower the hopper, press the button (5) onto the other side.
- Turn off the engine.



⚠ WARNING: When performing maintenance or repair operations on the hopper or any component beneath the hopper, you must install the safety bars (6) on the cylinder rods (7) as follows:

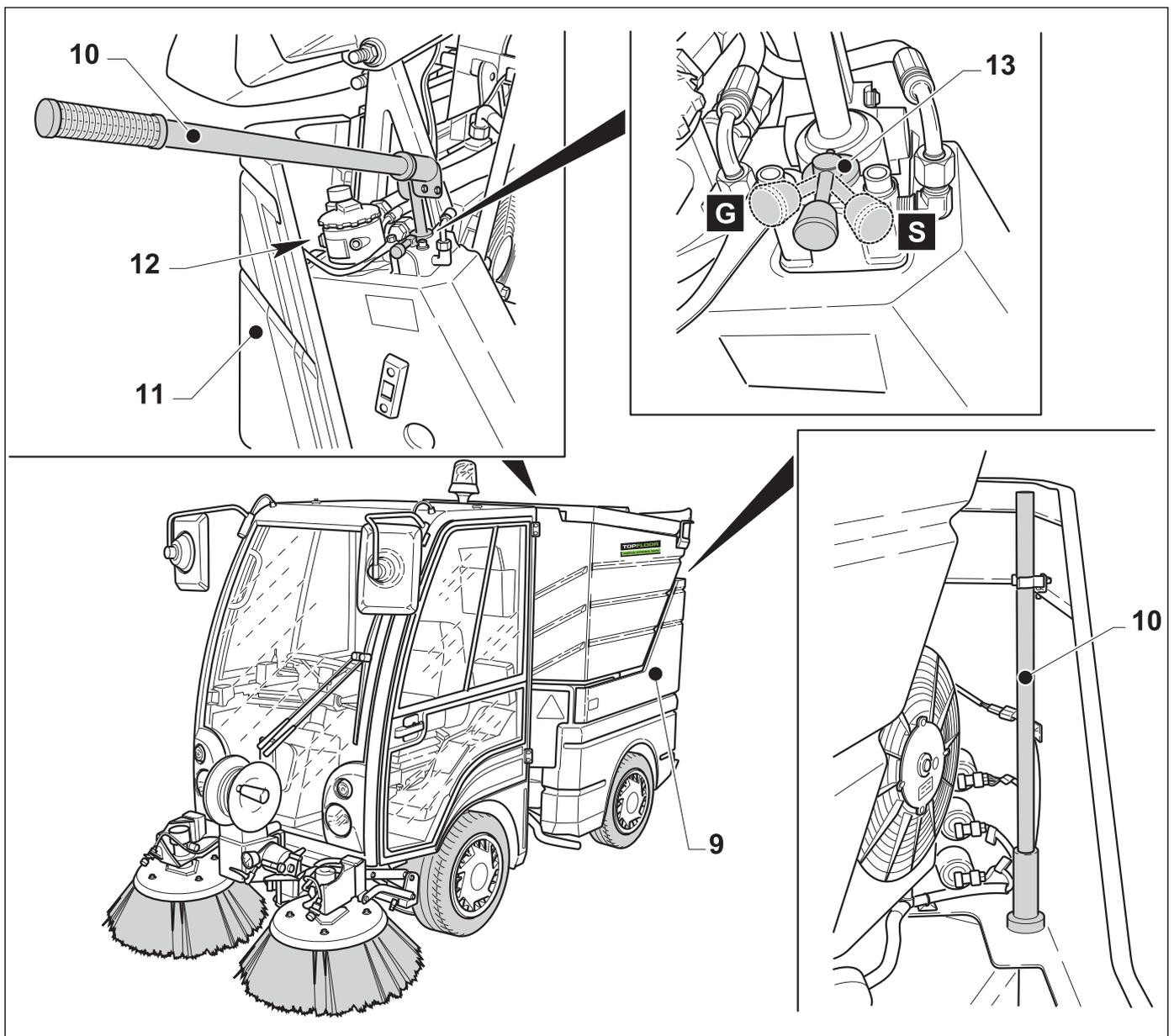
- Remove the two safety bars (6) from their housing inside the driver's cab
- Position the safety bars (6) onto the cylinder rods (7) and lock them in place with the pin and clamps (8).

NOTICE: In the event the hopper cannot be lifted due to a malfunction, use the manual pump according to the following procedure:



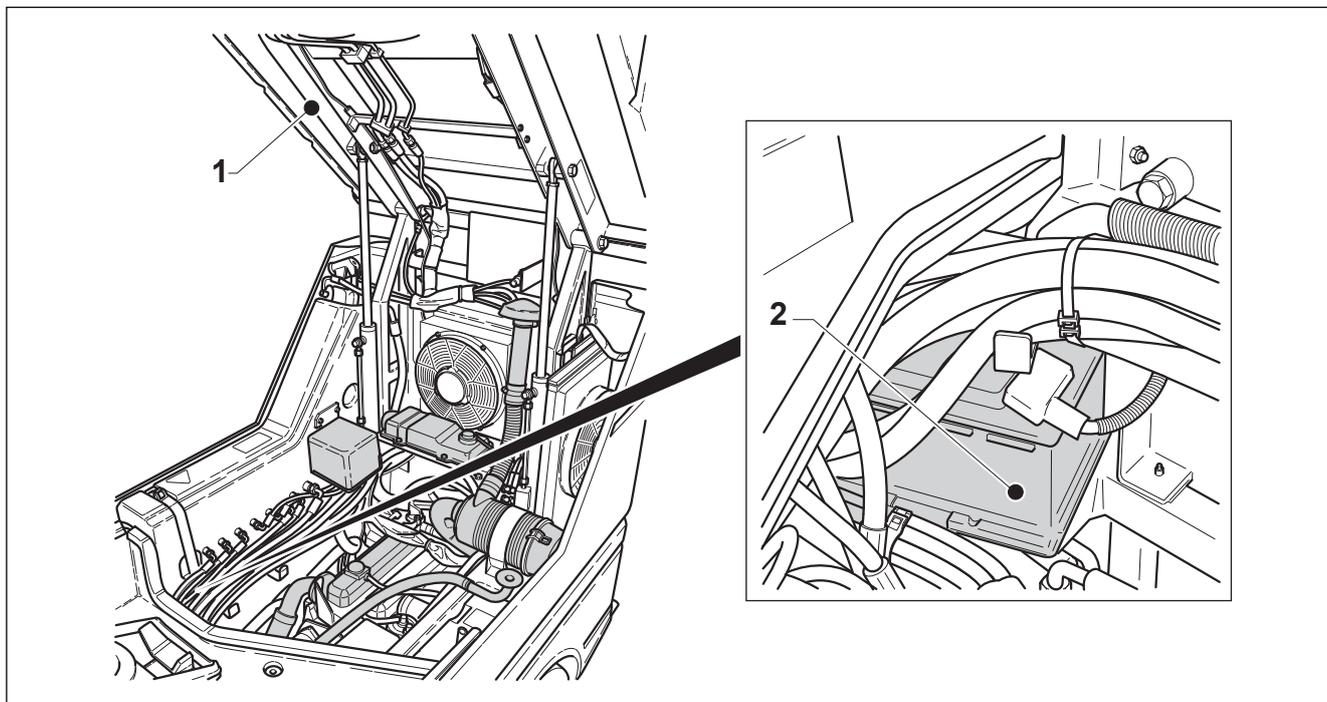
- Open the LH side casing (9) and extract the lever (10).
- Open the RH side casing (11) and insert the lever (10) into the manual pump (12).
- Shift the lever (13) to position "S" and alternatively shift the lever (10) upwards and downwards until the hopper is completely lifted.
- To lower the hopper, shift the lever (13) to G and alternatively shift the lever (10) upwards and downwards until the hopper is completely lowered.

NOTICE: After performing the manual lifting operations of the hopper, to restore the use of controls from the cab, bring back the lever (13) to the central position, otherwise it will be impossible to lift the hopper.



4.2.e - BATTERY

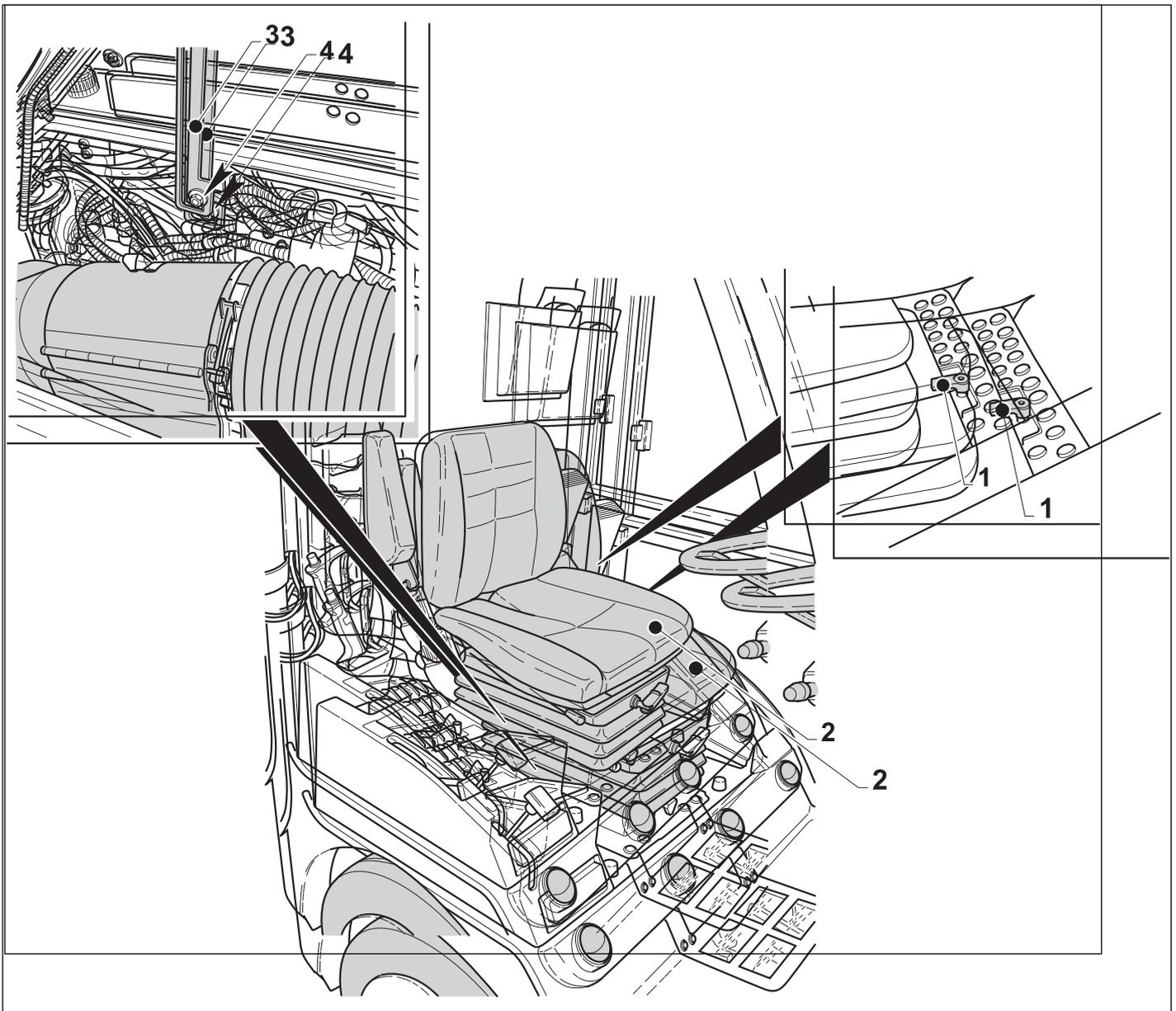
- Lift the waste hopper (1) and lock in position with the safety bars.
- The battery (2) is housed in the compartment shown in the drawings below.
- When finished working on the battery, lower the hopper.



4.2.f - RAISING THE SEAT -

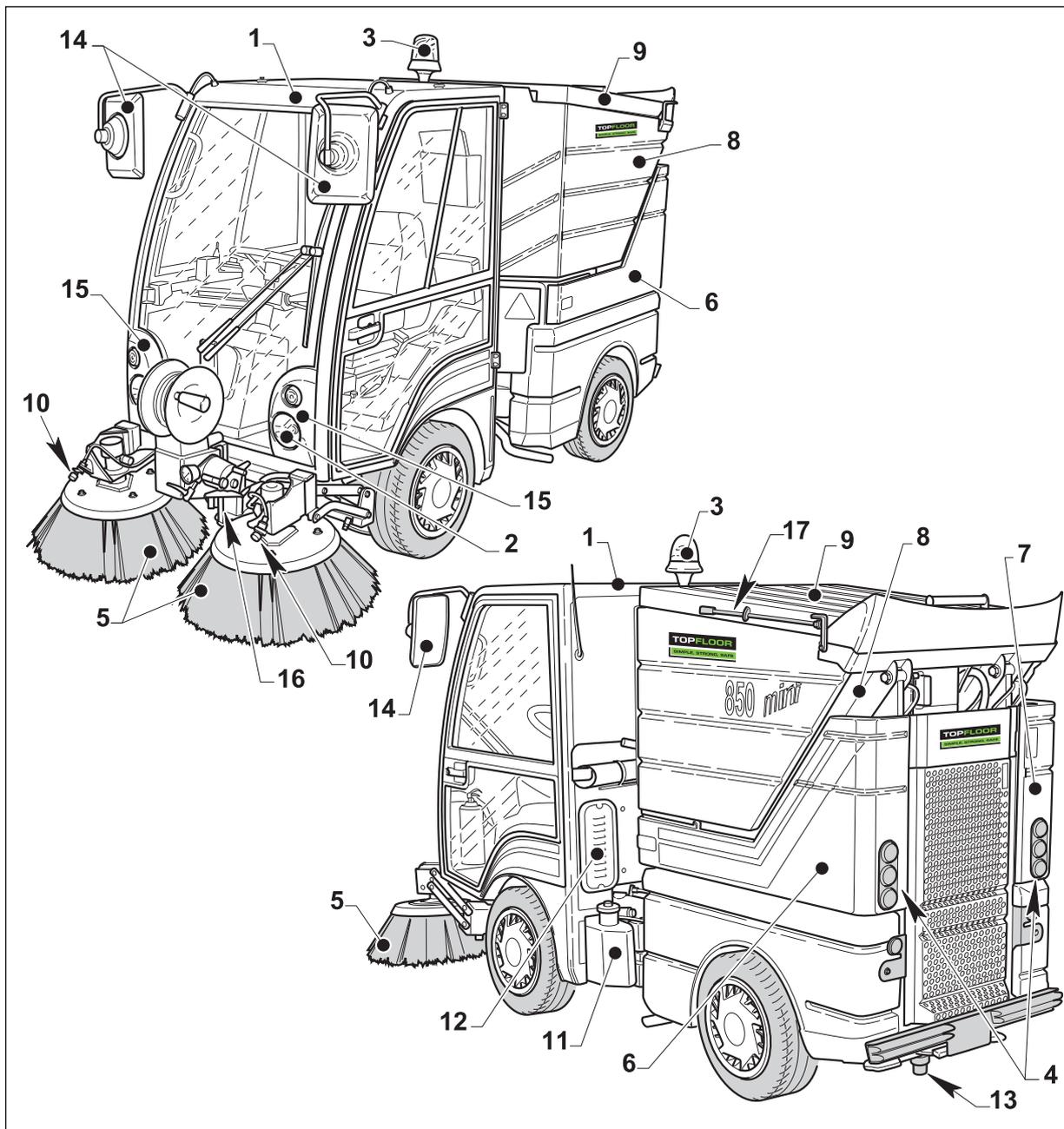
Move the stop lever (1) to free the seat plate.

- Raise the seat (2) up to the end stop and check that the lever (3) locks onto the safety pin (4) holding the seat in position.
- To lower the seat, lift it slightly and release the lever (3) from the safety pin (4).
- Lock the seat into place by turning the stop lever (1).



4.3 - GENERAL VIEWS

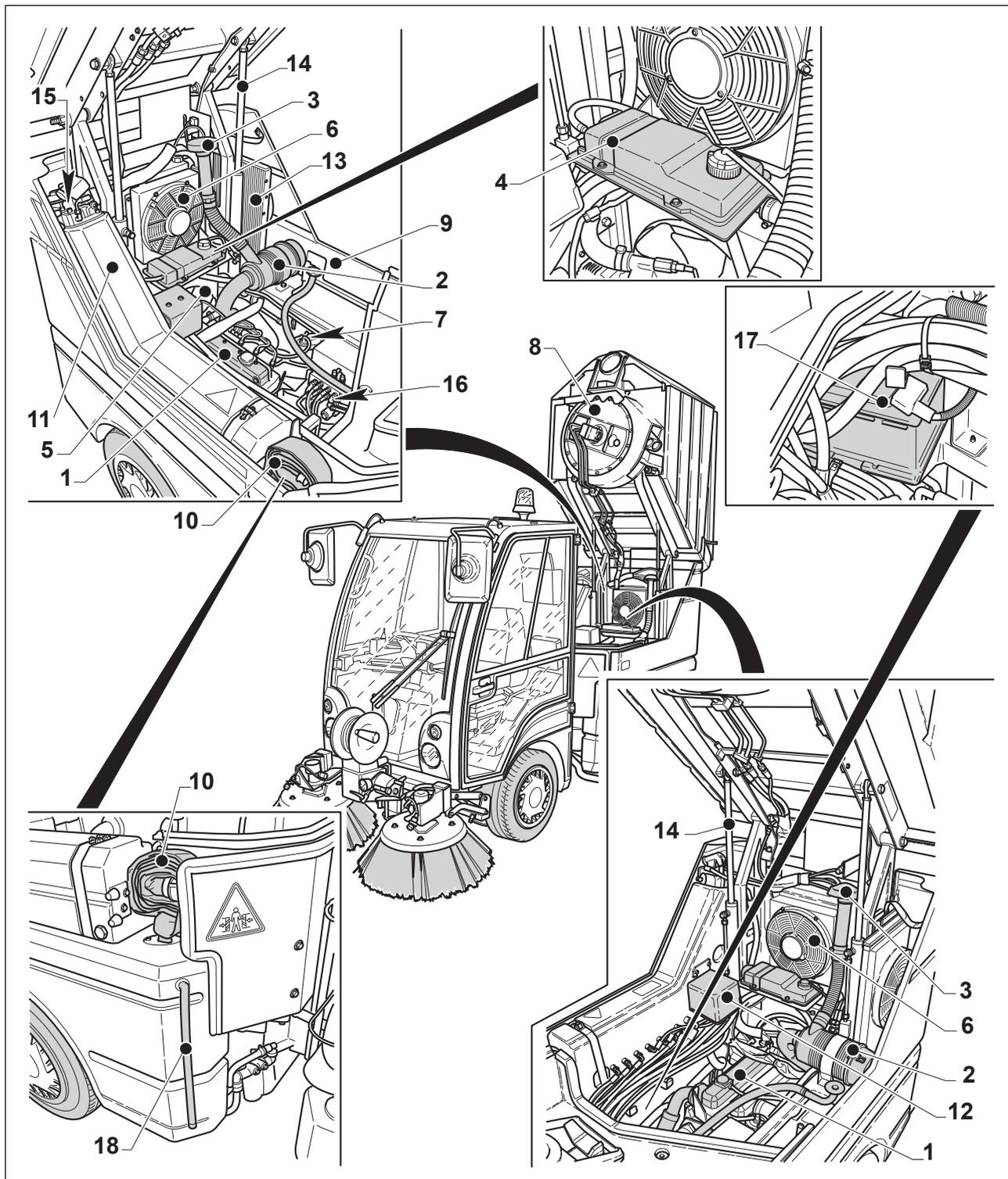
4.3.a - FRONT AND REAR VIEW



- 1) Driver's cab
- 2) Vacuum intake mouth
- 3) Rotating beacon
- 4) Back lights assembly
- 5) Side brushes
- 6) Opening LH lateral casing
- 7) Opening RH lateral casing
- 8) Waste hopper
- 9) Hopper cover
- 10) Water spraying nozzles

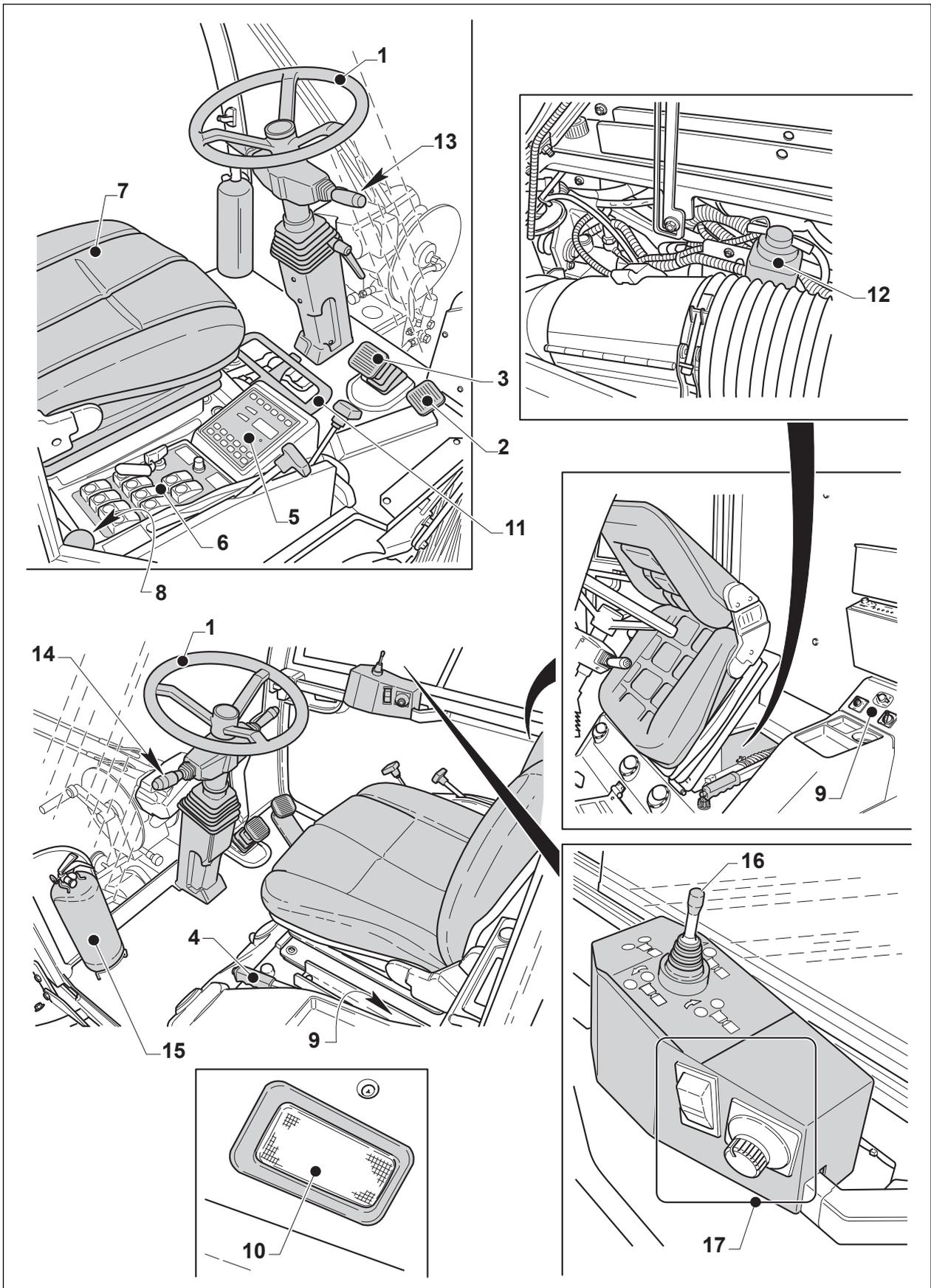
- 11) Fuel tank
- 12) Cab air filter
- 13) Water filter
- 14) Rearview mirror
- 15) Front lights assembly
- 16) Towing hook
- 17) Hopper cover safety lever

4.3.b - INNER VIEW OF ENGINE COMPARTMENT



- 1) Diesel engine
- 2) Engine air filter
- 3) Engine induction rain protection cap
- 4) Coolant expansion tank
- 5) Engine radiator
- 6) Oil radiator
- 7) Diesel oil filter
- 8) Vacuum intake
- 9) Water tanks
- 10) Water charge pipe
- 11) Oil tank
- 12) Fuses and relays assembly
- 13) A/C unit radiator
- 14) Hopper lifting cylinders
- 15) Hopper lifting manual pump
- 16) Solenoid valves assembly
- 17) Battery
- 18) Tank water level pipe

4.3.c - DRIVER'S CAB INNER VIEW



- 1) *Steering wheel*
- 2) *Accelerator pedal*
- 3) *Brake pedal*
- 4) *Parking brake*
- 5) *Signal bulbs and indicator lights dashboard*
- 6) *Control board*
- 7) *Operator's seat*
- 8) *Window washing fluid tank*
- 9) *A/C unit controls*
- 10) *Courtesy lamp (on the cab's roof)*
- 11) *Waste intake duct shutter*
- 12) *Brake fluid tank*
- 13) *Speed selecting lever (forward/backward)*
- 14) *Lights, windscreen wiper, horn, direction indicators control levers*
- 15) *Fire-extinguisher*
- 16) *Joystick for side brushes movement*
- 17) *Electrically heated and adjustable external wing mirror controls (OPT)*

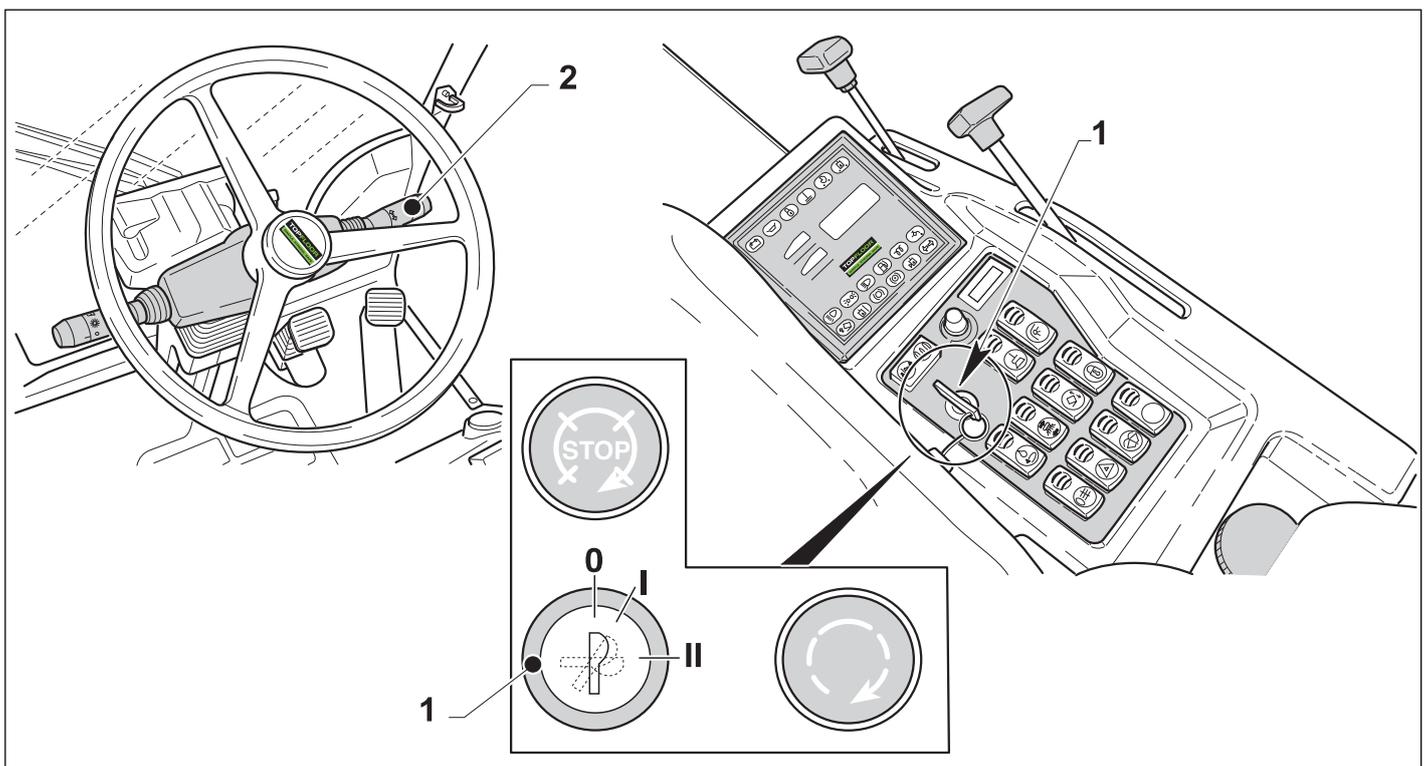
4.4 - DRIVER CAB'S INSTRUMENTS AND CONTROLS

4.4.a - STARTING KEY

The ignition key (1), has 3 positions:

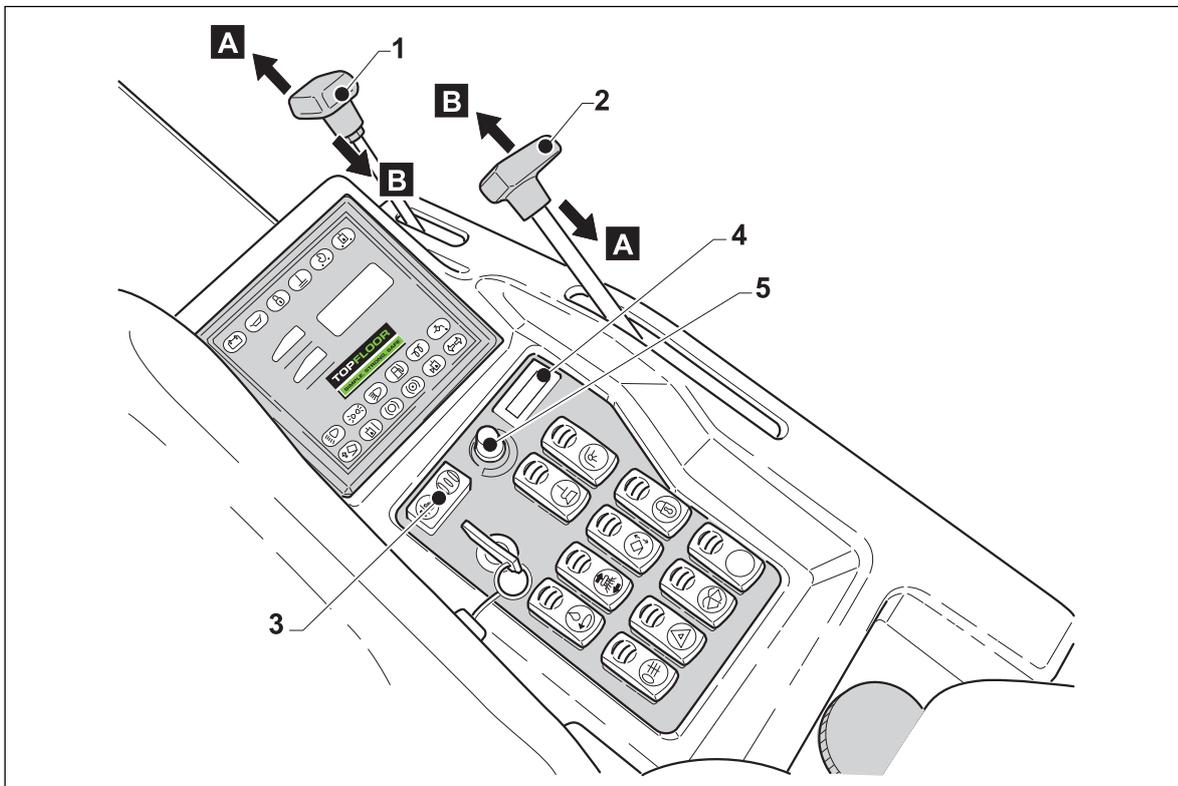
- **Position "0":**
Key insert and extraction position (no circuit under voltage).
- **Position "I":**
All the circuits are under voltage.
- **Position "II":**
Engine start position.

NOTICE: The machine starts only if the gear lever (2) is in the central position (neutral).



4.4.b - DRIVING CONTROLS DASHBOARD

4.4.b.a - Indicators and push buttons



1) Hand-operated engine accelerator

By moving the lever (1) with engine started the engine speed (rpm) is either increased or decreased.

- By shifting the lever to "A" the engine speed (rpm) is increased
- By shifting the lever to "B" the engine speed (rpm) is decreased

2) Flap opening/closing control lever

By acting on the lever (2) the opening of the "Flap" waste intake duct is either increased or decreased.

- By shifting the lever to "A" the opening is increased.
- By shifting the lever to "B" the opening is decreased.

3) Brush rotation direction button (OPT)

This button allows changing the direction of rotation of the brushes. Instead of conveying the material into the machine to be collected, it is conveyed to the outside. Refer to the relative paragraph for the operating procedures.

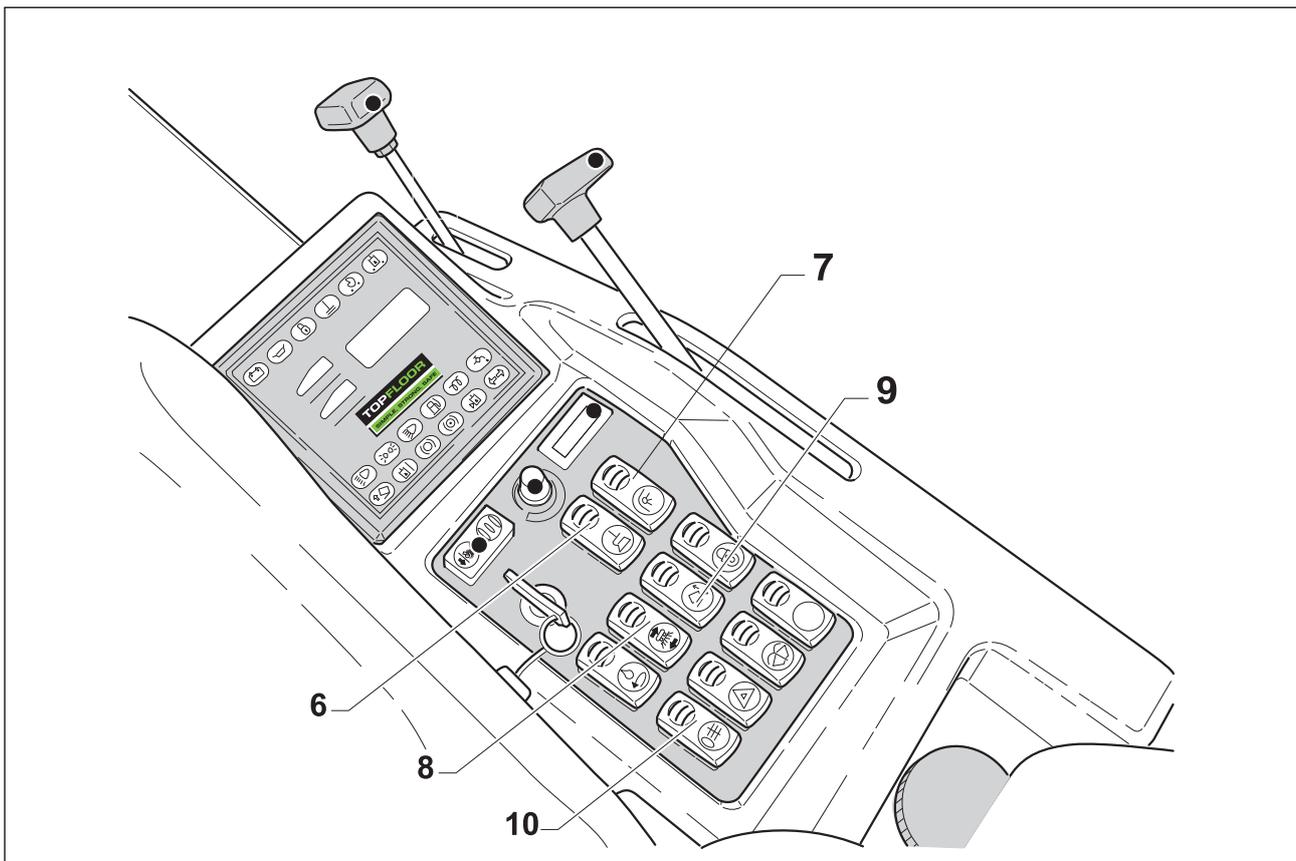
4) Not enabled

5) Brushes speed adjusting knob -

By turning the knob clockwise the brushes speed is increased, while by turning the knob counter-clockwise, the brushes speed is decreased.

6) Brushes rotation switch

Pushed to one side the side brushes start rotating and are lowered to the ground; pushed to the opposite side, the side brushes stop rotating and holding it pushed they are raised.



7) Aspirator start switch

Pushed to one side the aspirator is started and pushed to the opposite side it is stopped.

8) Water pump on-off button

- By pressing the button onto  the water pump is started and the yellow signal bulb on the button itself goes on.
- By pressing it onto the other side, the pump is stopped and the signal bulb goes off.

9) Hopper lifting button

Push button with return to centre.

Pushed to one side and holding it, the container is raised; pushed to the opposite side and holding it the container is lowered.

By releasing the button, the hopper is stopped in the reached position. 1

0) Fog-guard luminous button

- By pressing the button onto  the fog-guard is enabled and the yellow signal bulb on the button itself goes on.
- Pushing it again, the light is turned off and the LED goes off.

NOTE: It only illuminates with running lights enabled.

11) Emergency lights luminous button

- By pressing the button  all of the direction indicators are simultaneously enabled and the green signal bulb  and the red signal bulb  on the button itself start blinking.

12) Windscreen wiper and windows washer on-off switch

- Pushing the switch  , the windscreen wipers are activated; pushing it again, the windscreen washer pump is started.
- Pushing it to the opposite side, the windscreen wipers are stopped.

13) Operating switch enabling button

- By pressing the button the signal bulb of the button enabling operating switch illuminates. Press it once again to disable the operating switch in their current status. If the machine is turned off, the button is to be enabled again.

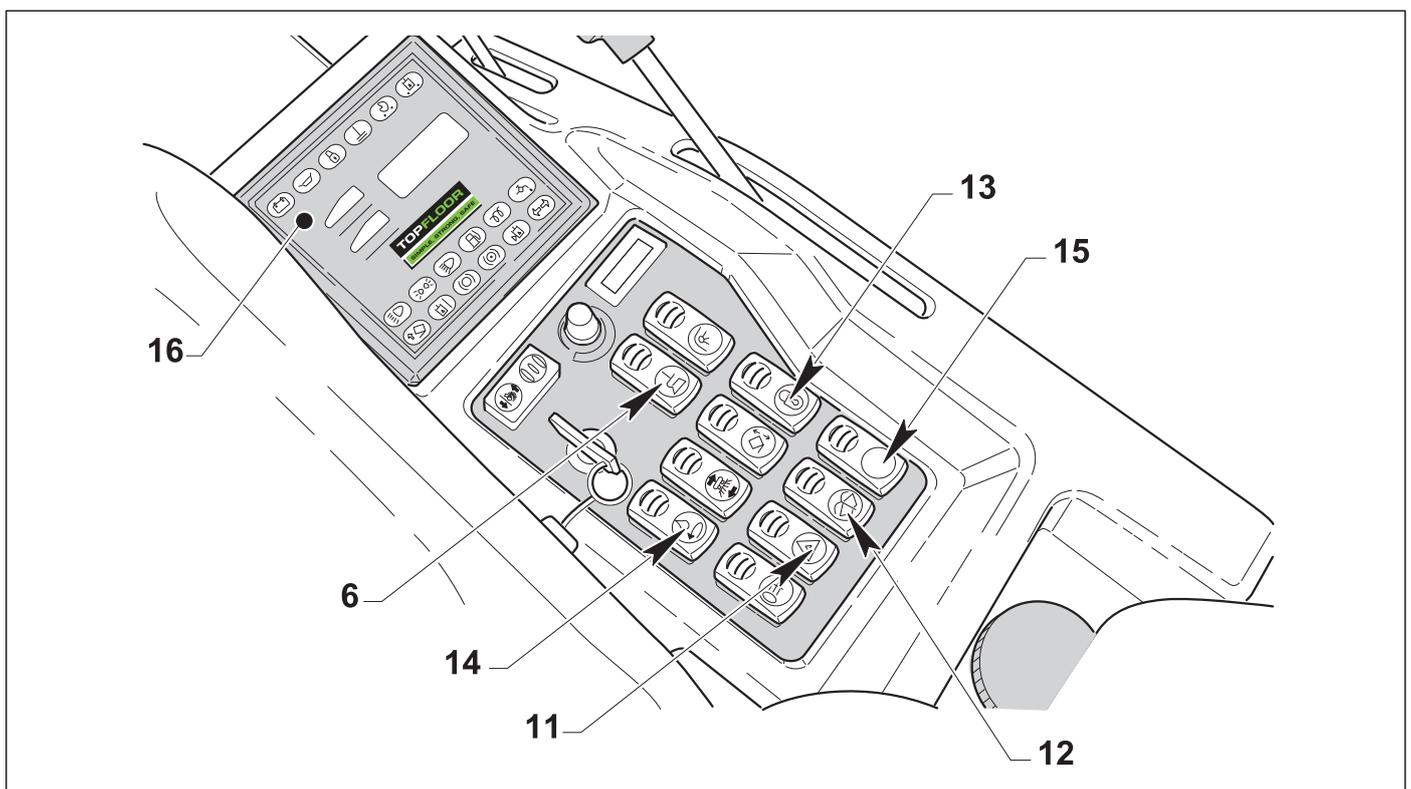
14) Recycling button (OPT)

- Pushing the switch to  , the recycling function of the water contained in the collection container is enabled (the LED on the switch comes on). The water is sprayed directly into the intake to further remove the dust. Pushing it to the opposite side, the water recycling function is stopped and the LED on the switch goes off.

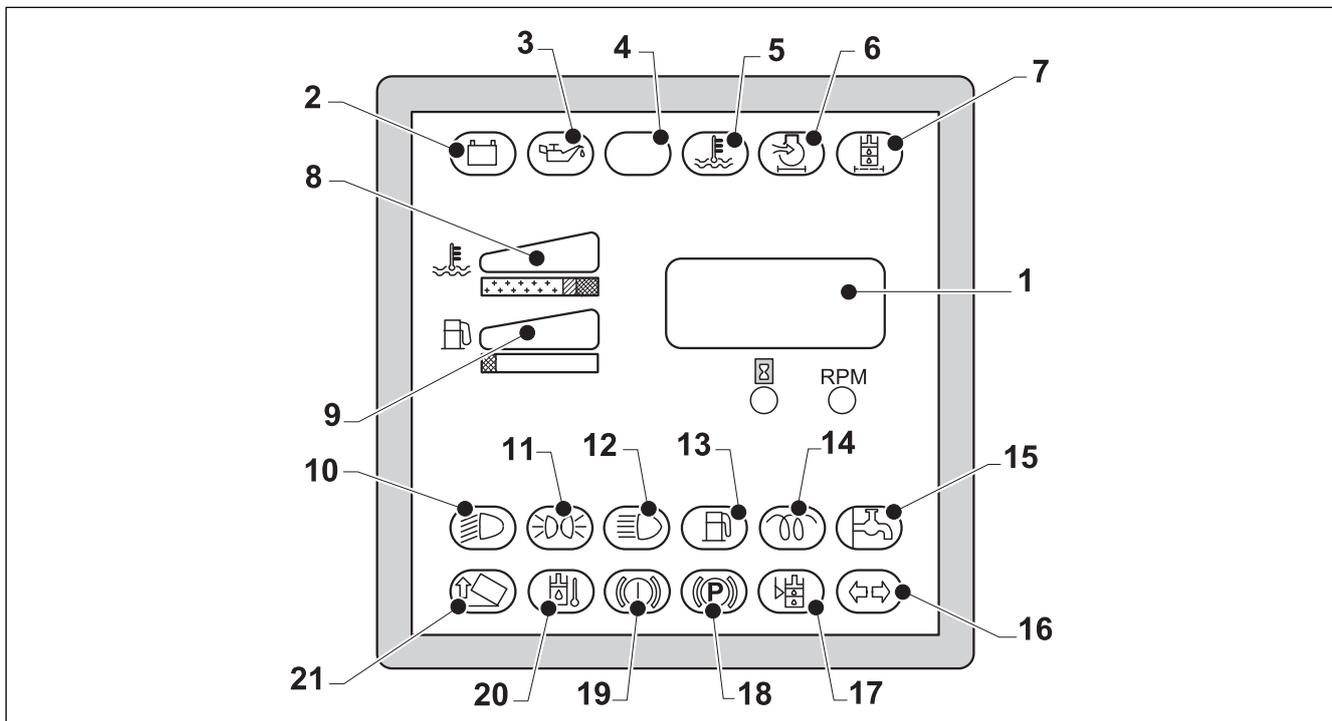
15) Display selection switch

- When pressed it shows the RPM on the display (RPM LED on), when pressed again it shows the total hours of running on the display ( LED on), and when pressed once more the actual hours of sweeping are shown (RPM LED and  LED off).

16) Signal bulbs and indicator lights dashboard



4.4.b.b - Signal bulbs and indicator lights dashboard



1) DISPLAY

With the engine off, the display shows the engine working hours.

With the engine on, the display shows the engine speed (RPM) number.

Pressing the "Display selection switch" (see button 15 - previous paragraph) the display also shows the actual hours of sweeping.

(2)  Battery recharged failed signal light (red):

At the first click of the starting key, the signal light must turn on. When the engine is started the signal light must turn off; if this signal light illuminates in any other way, immediately stop the engine and call the Service Department.

(3)  Engine oil pressure insufficient (red):

At the first click of the starting key the signal light must turn on. When the engine is started the signal light must turn off; if this signal light illuminates in any other way, immediately stop the engine and check the oil level.

(4)  Not enabled

(5)  Coolant excessive temperature signal light (red)

If it illuminates it signals that the engine is overheated. If it illuminates, stop the engine and have the sweeper inspected and repaired by a qualified technician.

(6)  Engine air filter signal bulb (red) (OPT)

It illuminates when the engine air filter is clogged.

(7)  Hydraulic fluid filter signal light (red) (OPT)

It illuminates when the fluid filter is clogged. The signal light can also illuminate if the machine is started and fluid is cold.

Have the sweeper inspected and repaired by a qualified technician.

(8) Engine cooling water temperature digital indicator**(9) Fuel level digital indicator**

- It indicates the amount of fuel contained in the tank.

When only 10 litres fuel are left in the tank, the yellow signal bulb  on the dashboard illuminates.

(10)  Lower beams signal light (green)

It illuminates when the lower lights are enabled.

(11)  Running lights signal lights (green)

It illuminates when the running lights are enabled.

(12)  Upper beams signal lights (blue)

It illuminates when the upper lights are enabled.

(13)  Fuel reserve Signal bulb (yellow)

When this bulb illuminates, it warns that about 10 litres fuel are left in the tank.

(14)  Glow-plugs warming up signal bulb (orange)

It illuminates before the machine is started.

(15)  Water level signal bulb (orange)

It illuminates when the water in the tank reached the minimum level and the pump stops.

(16)  Direction indicators signal bulb (green)

It illuminates intermittently when the direction indicators lever is actuated or when the emergency lights switch is turned on.

(17)  Hydraulic fluid level signal bulb (red) (OPT)

It illuminates when the hydraulic fluid in the tank reached the minimum level.

If it illuminates, stop the engine and have the sweeper inspected and repaired by a qualified technician.

(18)  Parking brake signal bulb (red)

It illuminates when the parking brake is enabled.

(19)  Braking system anomaly signal bulb (red)

When it illuminates it indicates a failure in the braking system (low fluid level).

If it illuminates, stop the engine and have the sweeper inspected and repaired by a qualified technician.

(20)  Hydraulic fluid temperature too high signal bulb (red) (OPT)

When it illuminates, it warns that the hydraulic fluid has overheated.

If it illuminates, stop the engine and have the sweeper inspected and repaired by a qualified technician.

(21)  Hopper tilted signal bulb (orange)

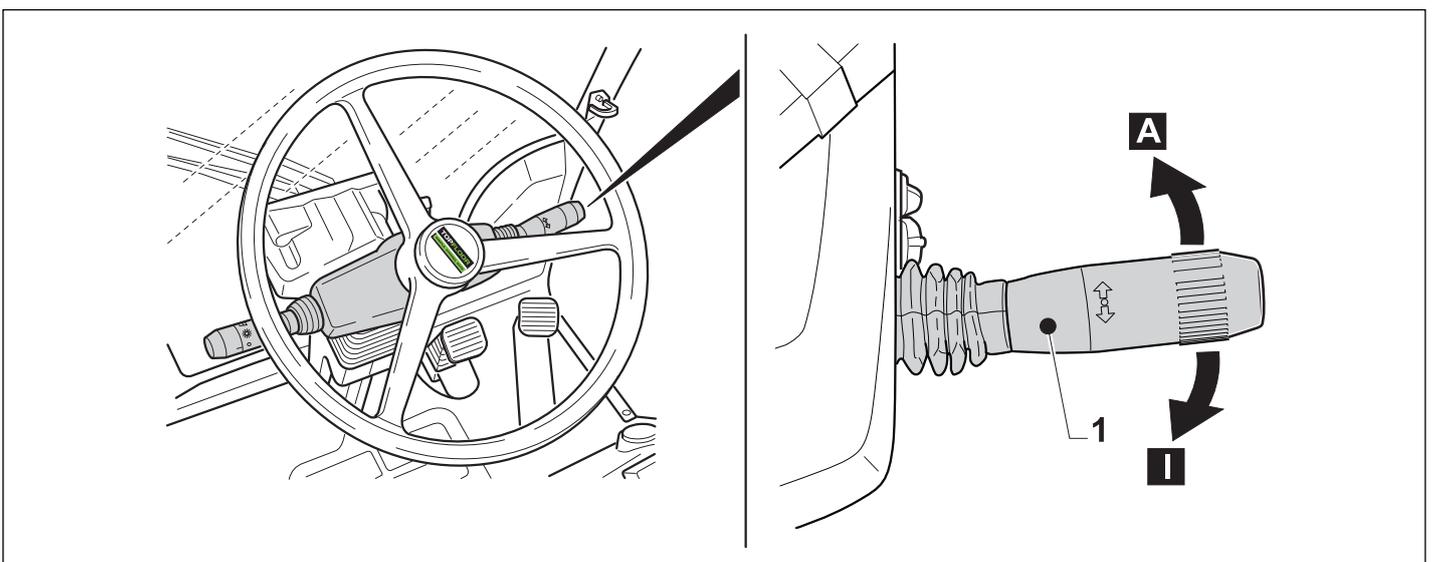
It illuminates when the waste hopper is tilted.

4.4.c - GEAR LEVER

Three-position lever (1):

- By shifting the lever to position "A" the "FORWARD" running is enabled.
- By shifting the lever to position "I" the "BACKWARD" running is enabled; the machine then sends out an audible warning alarm.
- By moving the lever to the central position the gear is set to "NEUTRAL".

CAUTION: When the machine is moving, do not reverse.



4.4.d - LIGHTS, HORN, AND DIRECTION INDICATOR LEVER

The lights, the horn, the direction indicators are controlled by the lever (1).
The functions are enabled when the starting key is turned to the position "I".

Lights

- To turn on the lights turn the knob (2) at the end of the lever.
- By turning it to the position  the front and back position lights and the plate and dashboard lights are turned on.
- By turning it to the position  the lower beams and the above mentioned lights are turned on.
- The turning on of the lights is indicated by the turning on of the green bulb  . .
- When the lower beams are on, by pushing the lever to the "A" direction the upper beams are turned on. By bringing the lever back to the original position the upper beams are turned off.
- The enabling of the upper beam is signalled by the turning on of the blue signal bulb  . .
- In order to blink with the upper beams, repeatedly pull the lever to the "B" direction, even when the lights are off. When releasing it, it goes back to its original position and the upper beams are turned off.

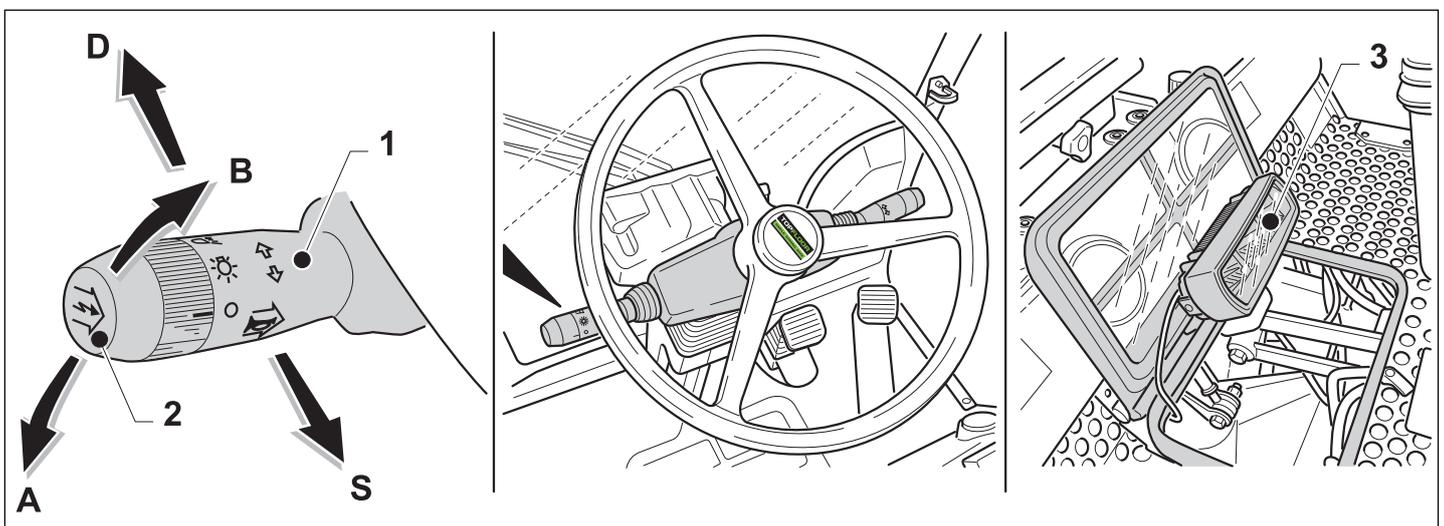
NOTICE: When turning on the lights, the light (3) on the waste intake duct door (OPT) illuminates.

Horn

- By pressing the knob (2) to the direction  the horn is sounded.

Direction indicators

- By shifting the lever (1) to the "S" position the left direction indicators start blinking.
- By shifting the lever to the "D" position the right hand direction indicators start blinking.
- In both cases the green bulb starts blinking 



4.4.e - PARKING BRAKE

The parking brake must be engaged any time the operator leaves the cab to prevent unintended movement of the machine.

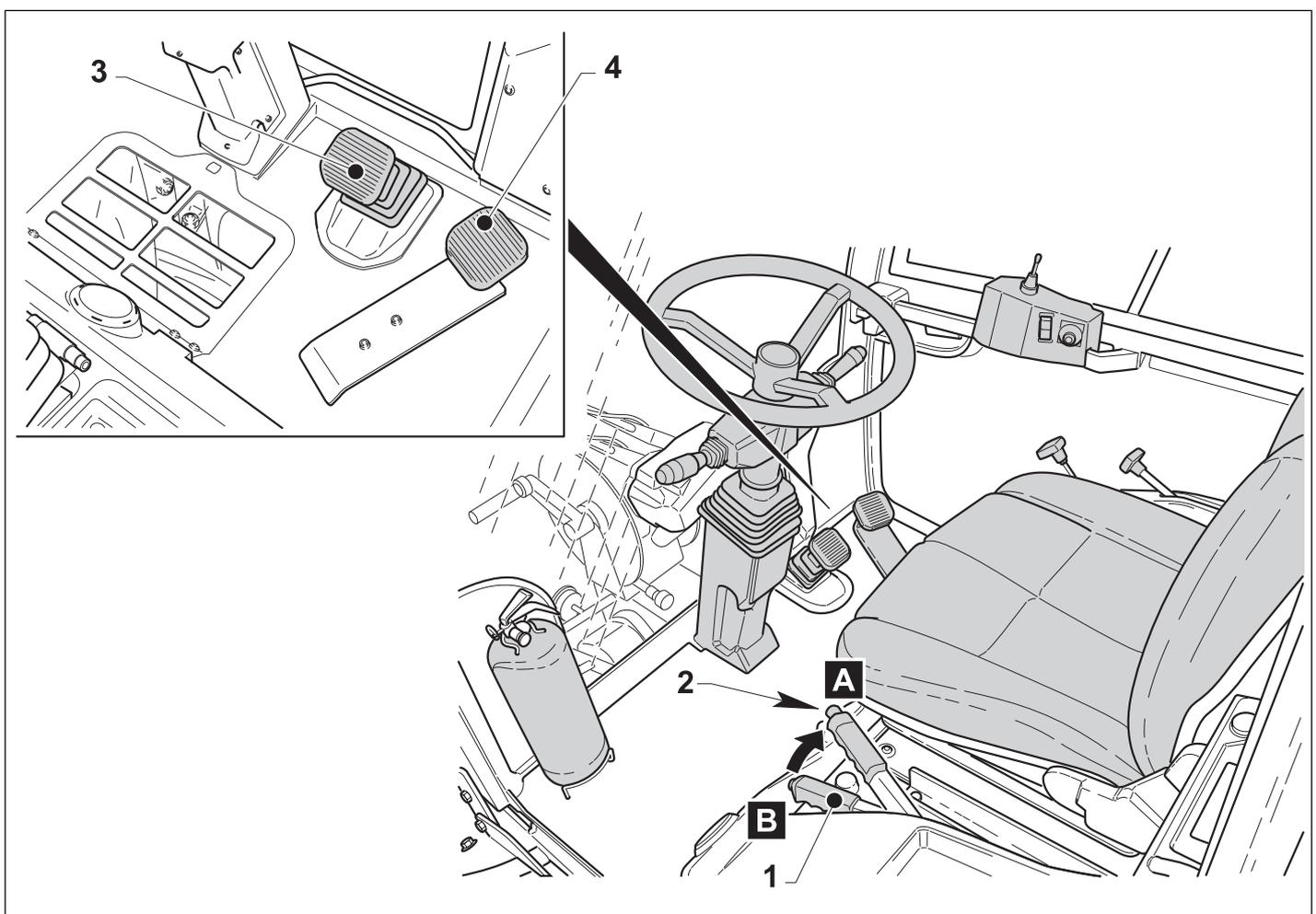
- In order to engage it pull the lever (1) to the "A" position.
- In order to disengage it further pull the lever to the "A" position, press the button (2) and while holding it down bring back the lever to the "B" position.

4.4.f - BRAKE PEDAL

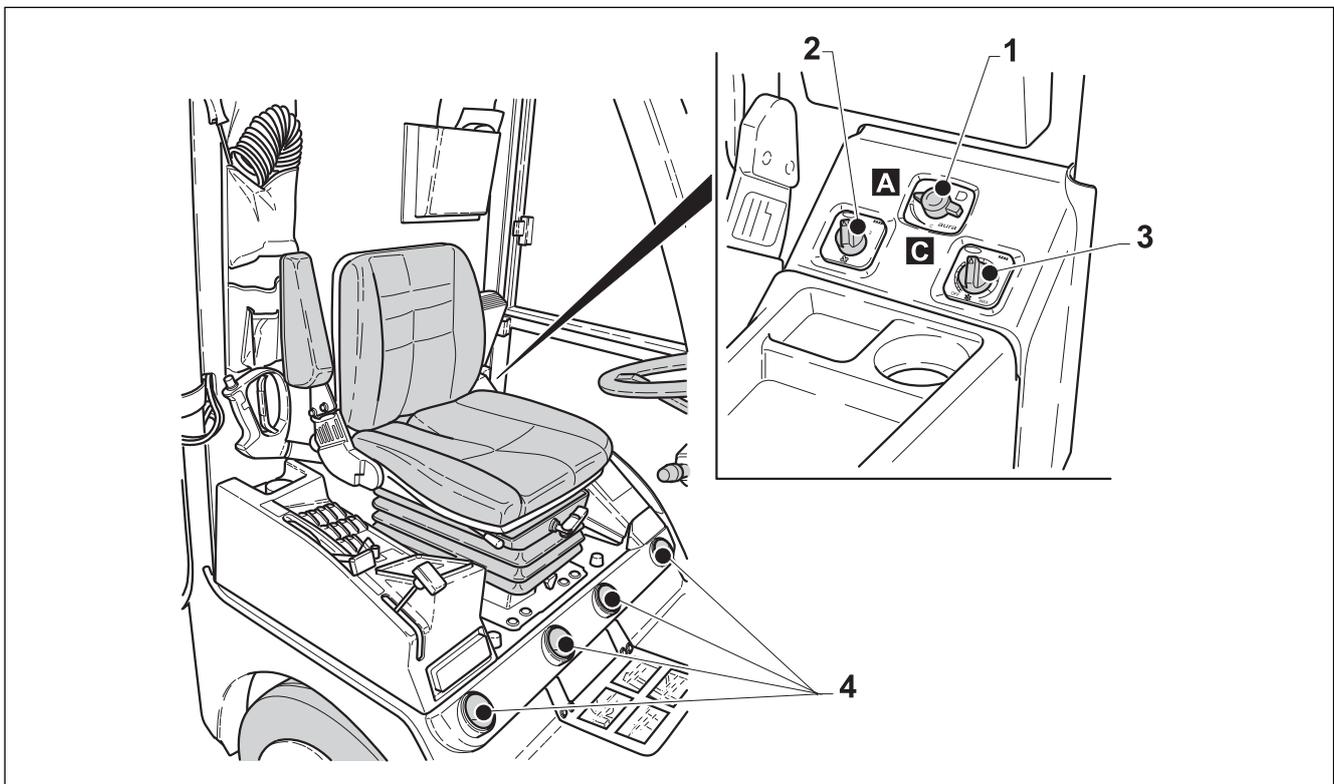
The brake pedal (3) is positioned beside the running pedal (4).
By pressing this pedal the machine slows down until it stops.

4.4.g - ACCELERATOR PEDAL

By pressing the pedal (4) the machine goes forward or backward according to the position of the gear lever. The machine runs with a speed being proportional to pedal travel.



4.4.h - A/C SYSTEM CONTROLS



To obtain HOT AIR

- Open the valve (1) by turning it to the "A" position.
 - Adjust the ventilation knob (2) and set it to one of the three available positions.
- The more the knob is turned clockwise the more the ventilation and the temperature increase.

For obtain COLD AIR

- Close the valve (1) by turning it to the "C" position.
- Adjust the ventilation knob (2) and set it to one of the three available positions.
- The more the knob is turned clockwise the more the ventilation increase.
- In order to enable the A/C system (OPT), turn the knob (3) clockwise over the click.
- Adjust the temperature knob (3). In order to decrease the inner temperature turn it clockwise.
- In order to disable the A/C system, turn the knob (3) counterclockwise over the click.

NOTICE:

Air flaps (4) must be open and they may be adjusted in the desired direction.

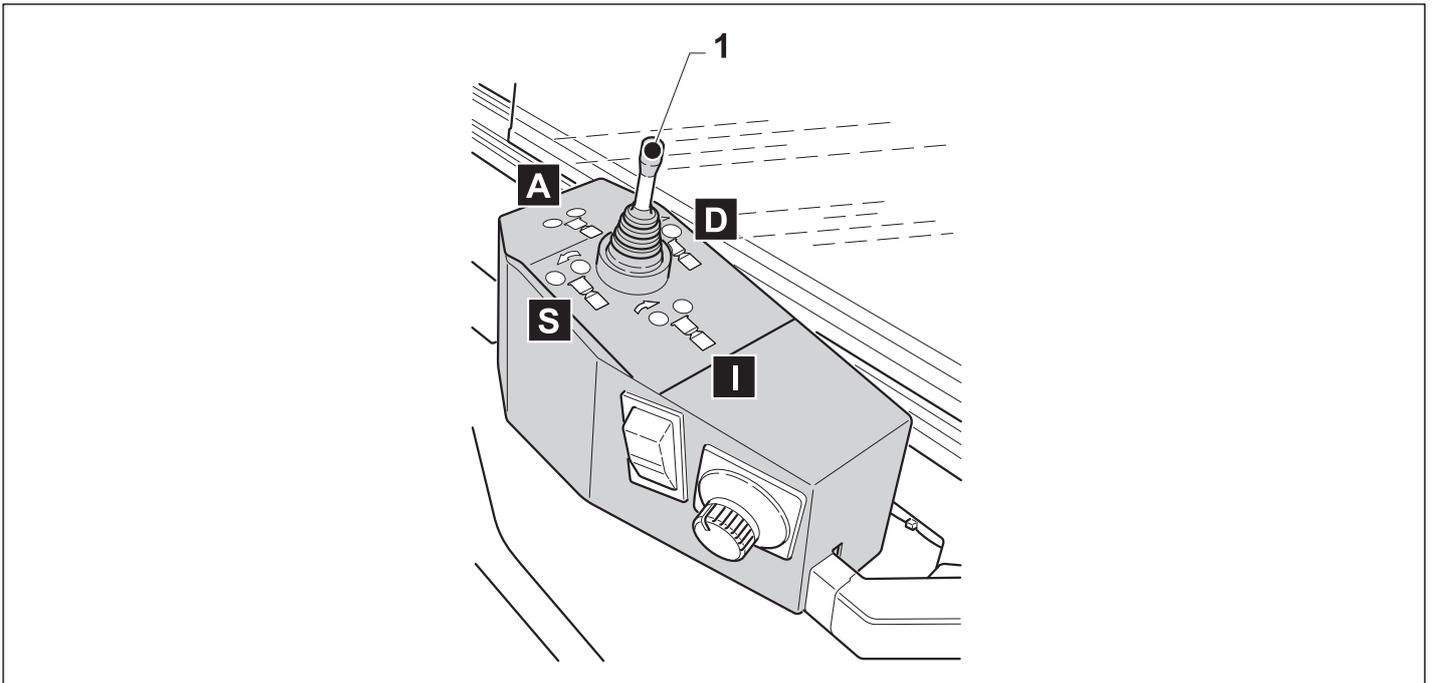
NOTICE:

It is advisable to have the system work at least once per month, even in the cold periods, in order to ensure a long life and a good lubrication to the system.

4.4.i - JOYSTICK

The Joystick allows the movement of the right and left (OPT) front brushes.

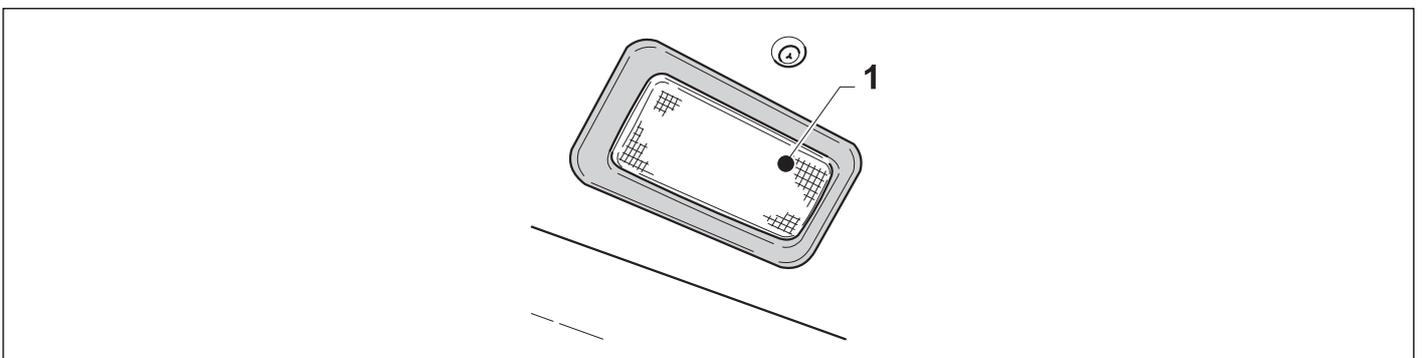
- Moving the joystick (1) to **"A"**, the left front brush is extended;
moving the joystick (1) to **"I"** the left front brush is retracted.
- Moving the joystick (1) to **"D"**, the right front brush is extended;
moving the joystick (1) to **"S"**, the right front brush is retracted.



4.4.I - COURTESY LIGHT

Lamp (1) with three positions:

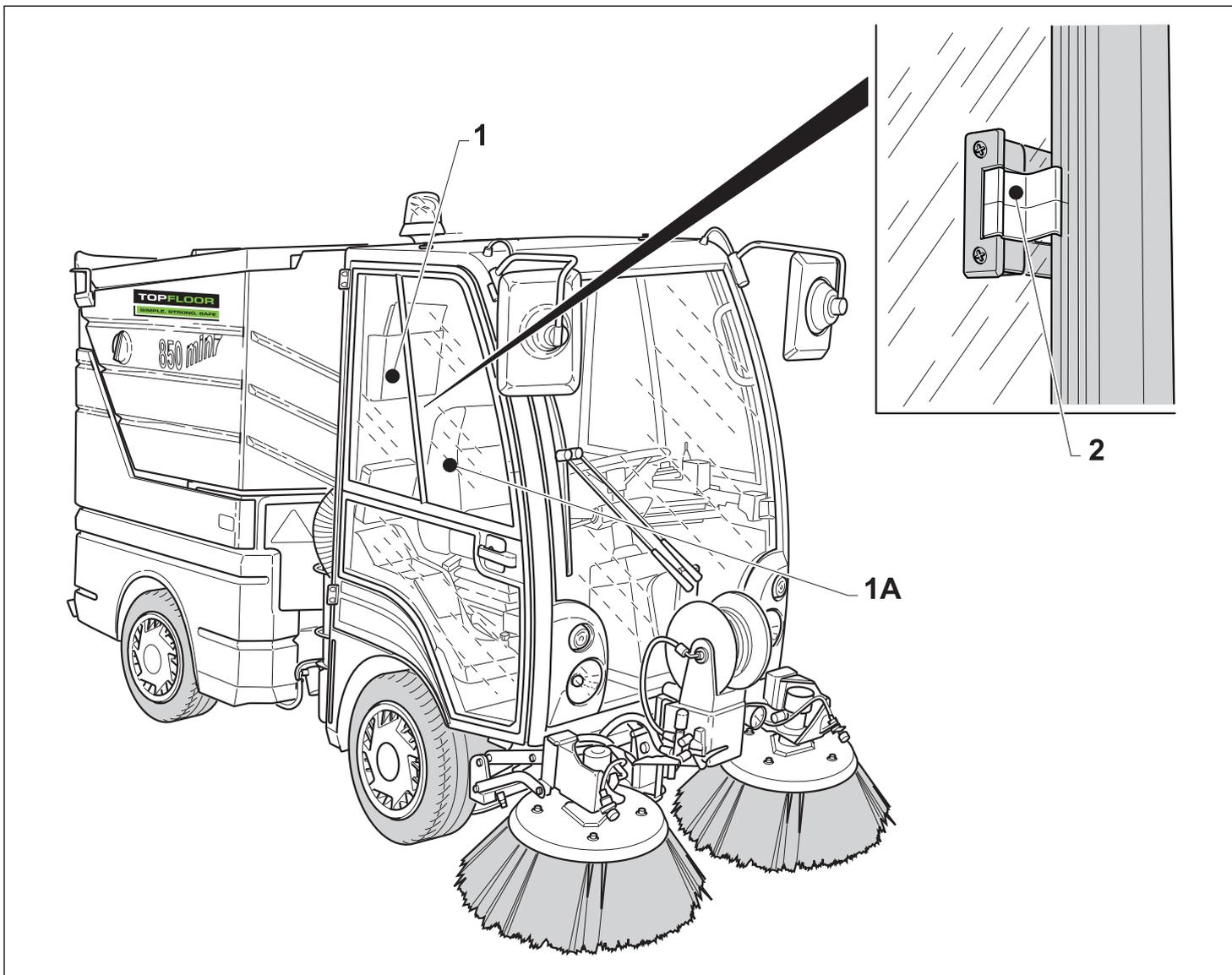
- When pressed to one side, the lamp is always on.
- When pressed to the other side, the lamp is always off.
- When positioned in the middle, the lamp goes on when the driver's cab doors are opened.



4.4.m - WINDOWS OPENING/CLOSING

- To open the side windows (1) or (1A), push the lever (2) until unhooking the windows, then slide them sideways.

In order to close them completely have them sliding onward until the lever is blocked (2)



4.4.n - EXTERNAL ELECTRIC WING MIRRORS (OPT)

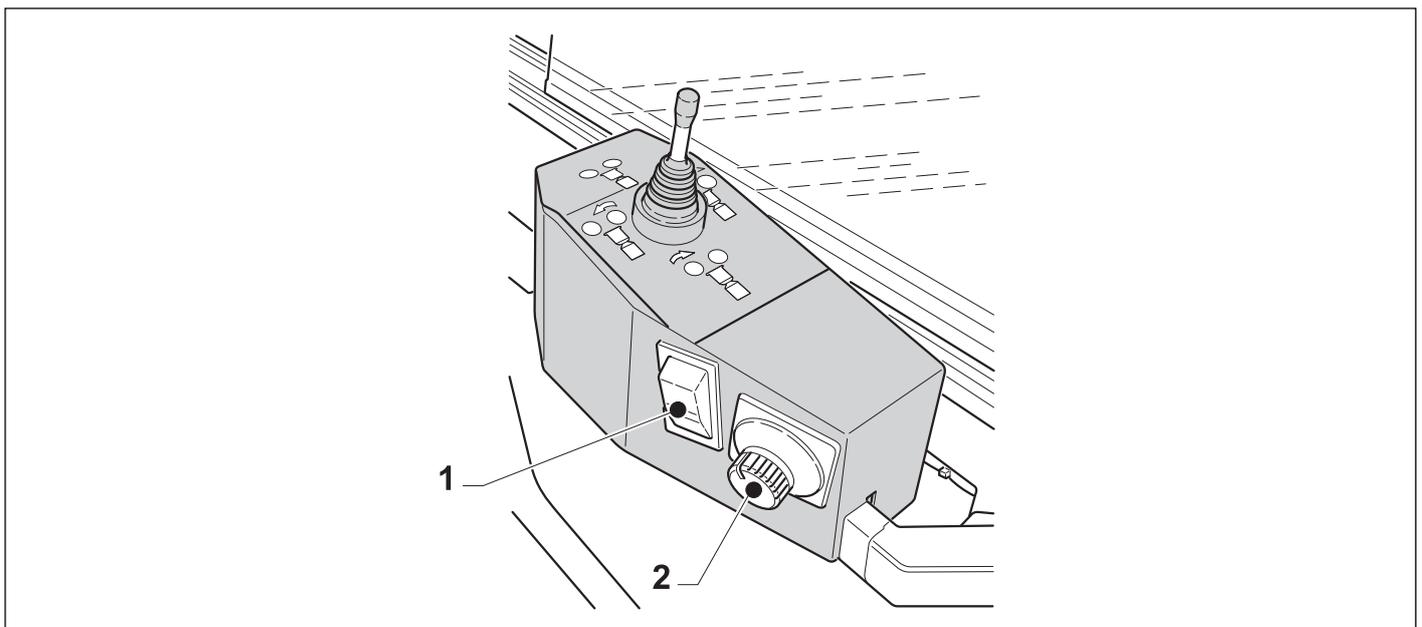
Heating / defrosting

- Press the luminous switch (1) to heat the wing mirrors.
- To stop heating the mirrors, press the switch (1) again. The lamp on the switch turns off.

Adjustment

- To adjust the position of the mirrors, turn the knob (2):

- central position: no adjustment;
- turn left to adjust the position of the left-hand wing mirror;
- turn right to adjust the position of the right-hand wing mirror.



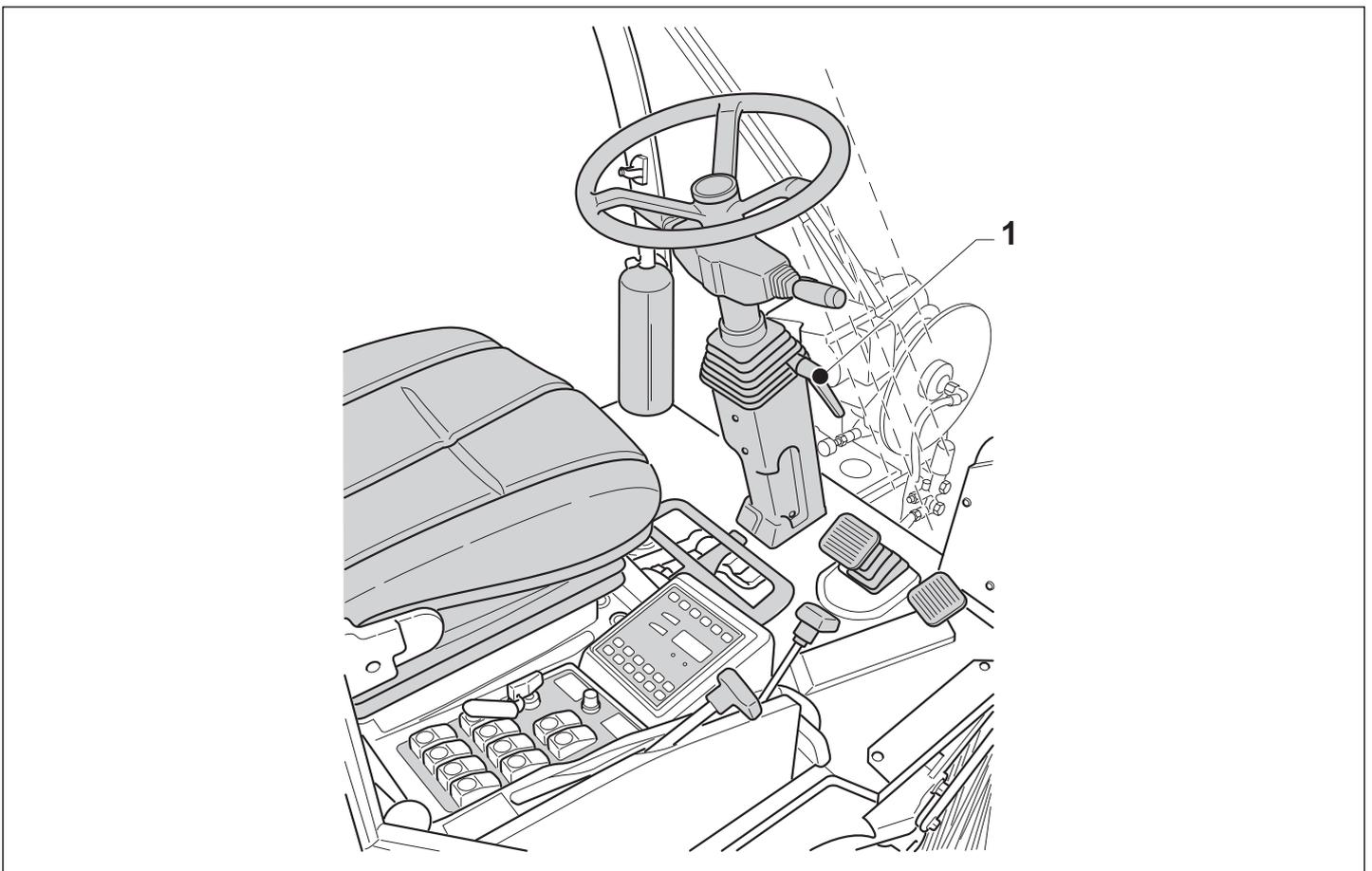
4.5 - ADJUSTMENTS

4.5.a - STEERING COLUMN ADJUSTMENT

⚠ WARNING: Always adjust the steering column when the machine is not running. Adjustments while the machine is moving could result in sudden and unexpected loss of control, an accident, personal injury or death.

It is possible to adjust the steering column inclination either forward or backward in order to adapt it to the driver's needs.

- Unlock the column movement by turning the lever counterclockwise (1).
- Sit down in the driver's seat and grip the steering wheel with both hands by either pushing or pulling it until the wished position is reached.
- Lock the steering column movement by turning the lever clockwise (1).

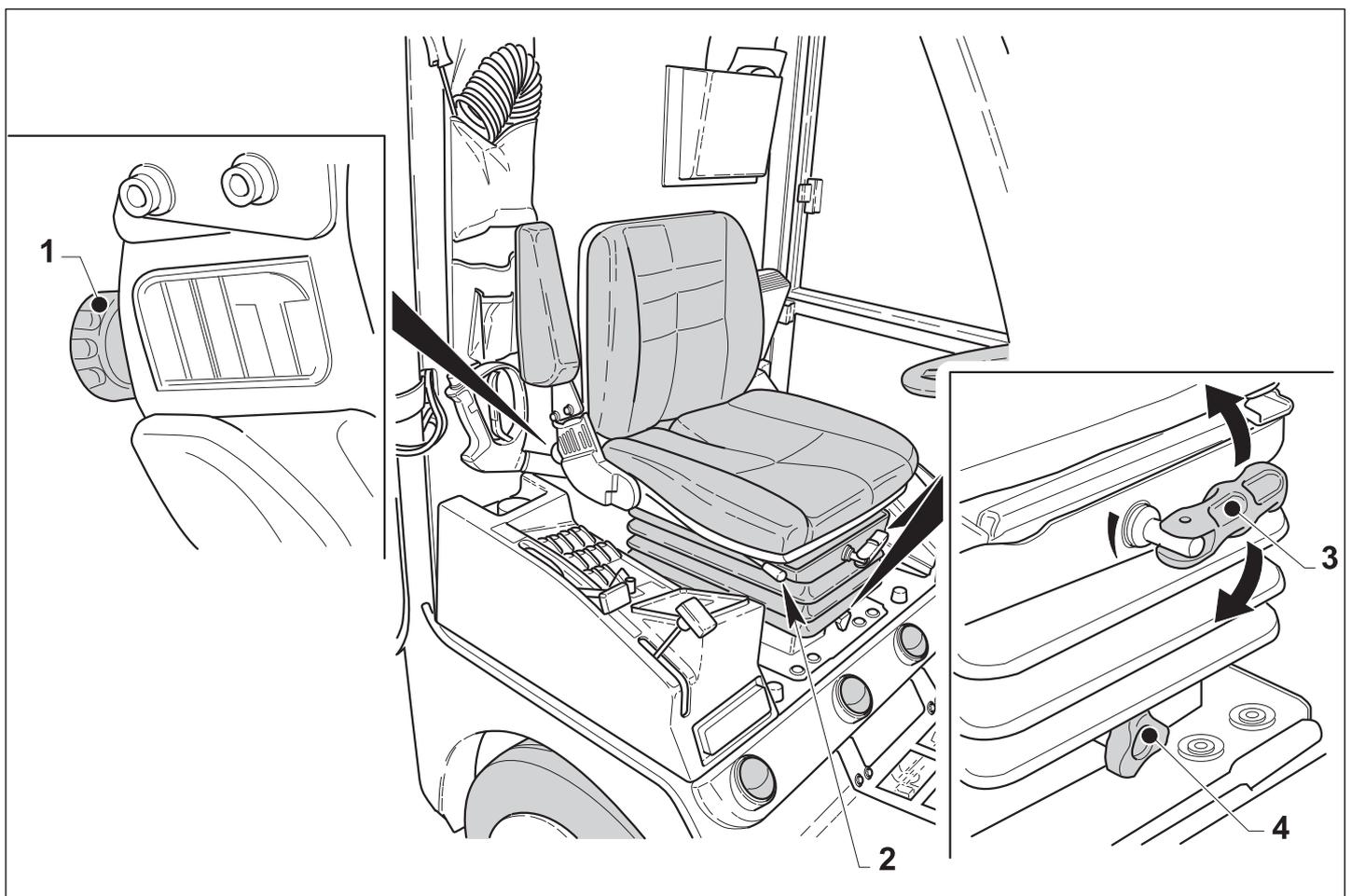


4.5.b - SEAT ADJUSTMENT

! WARNING: Adjust the seat only when the machine is parked. Adjustments while the machine is moving could result in sudden and unexpected loss of control, an accident, personal injury or death.

To adjust the seat, it is necessary to operate the respective knobs and/or levers described below:

- Knob (1)
adjustment of backrest angle;
- Lever (2)
front-back adjustment of seat;
- Lever (3)
adjustment of elasticity (according to operator's weight);
- Knob (4)
seat height adjustment.



CHAPTER 5

USE

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5.1 - PRELIMINARY CHECKS

NOTICE:

Perform the checks listed below on a daily basis to keep your machine in good working order.

These checks do not replace scheduled maintenance.

- Visually check all fluid systems and make sure there are no leaks.
- Check fluid levels.
- Visually check the wear of the tires.

- Measure tire pressure.
- Make sure that all doors and hatches are properly closed, that the container is completely lowered and that the various machine parts are fastened correctly.
- Check the lights and horn and make sure they work correctly.
- Check the brakes and their travel; make sure they work correctly.

 WARNING: If you have any doubt whatsoever about the condition of the machine, DO NOT use it. Have it inspected and repaired by a qualified technician.

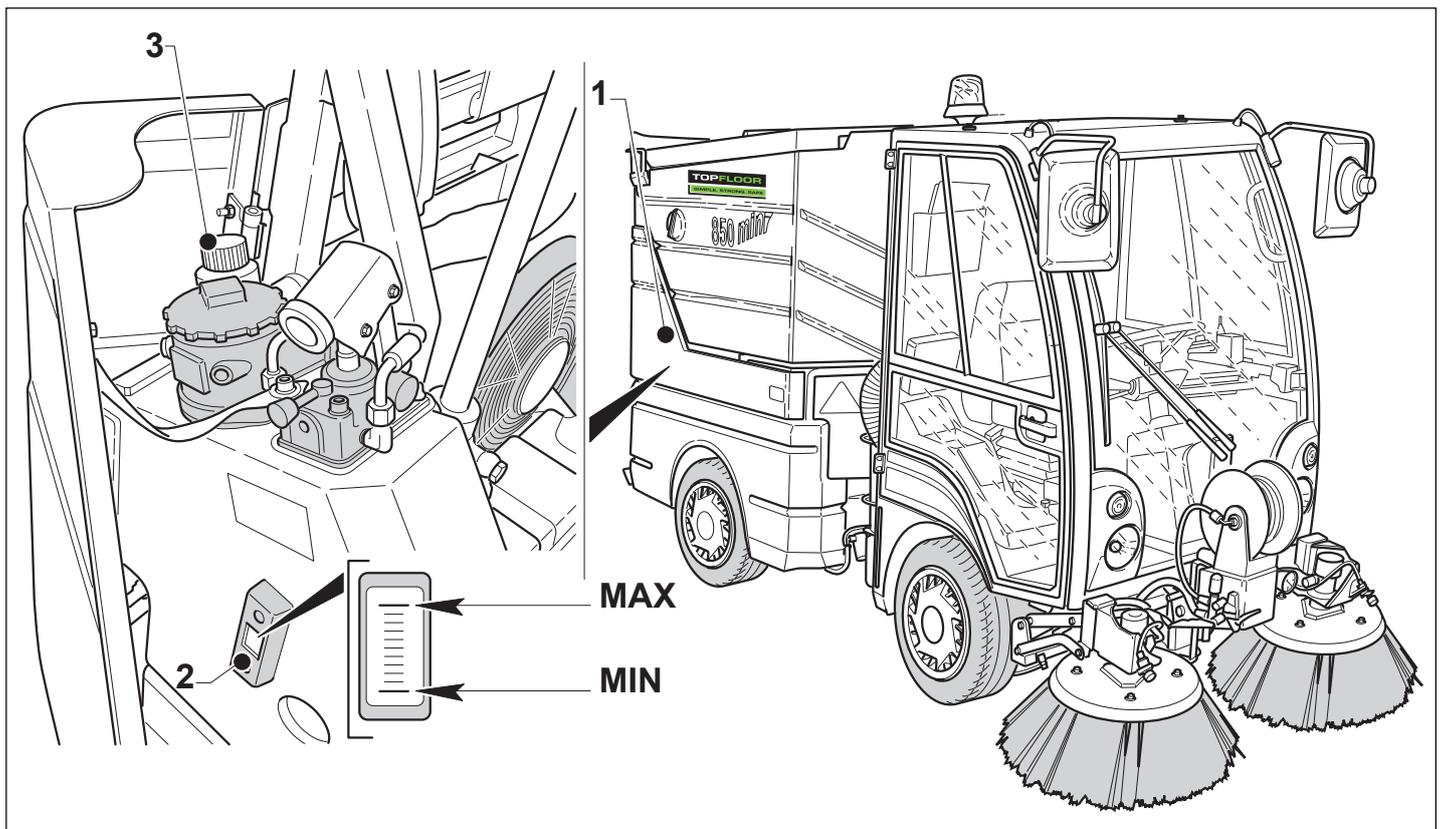
Besides these general checks, perform the checks described in the following paragraphs before each machine starting.

See also Section 1.9.a.3.

 WARNING: The checks described hereafter must be done when the engine is cold and turned off (danger of burns) and the machine is level. Furthermore, never smoke or use open flames during these operations.

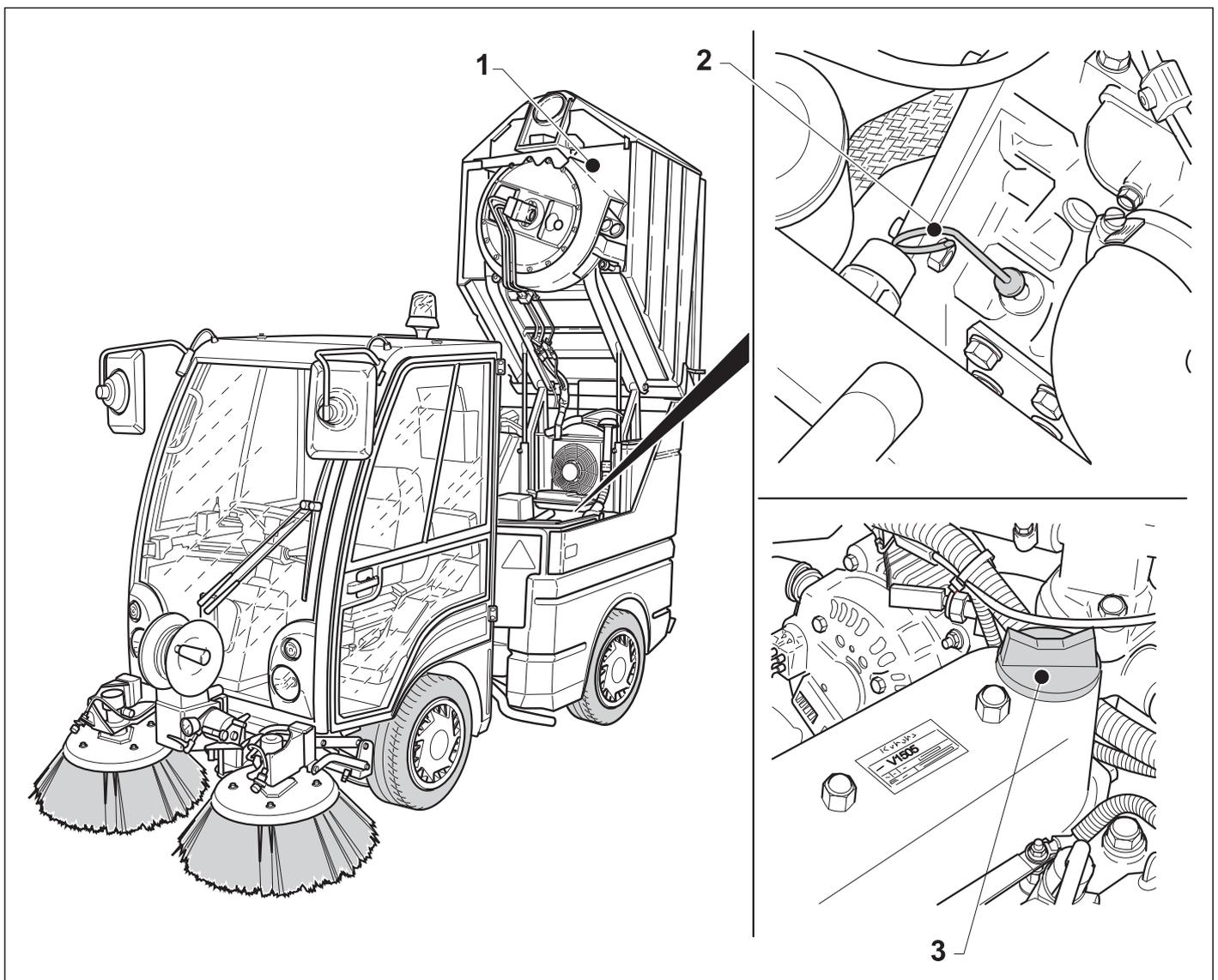
5.1.a - HYDRAULIC FLUID LEVEL

- Open the hatch (1).
- Check the level with the indicator (2); make sure the level ranges between the minimum (MIN) and the maximum level (MAX).
- When topping up remove the cap (2) and fill with oil according to the type indicated in refueling table, chapter 6.
- Check the correct oil level.



5.1.b - ENGINE OIL LEVEL

- Lift the hopper (1) and secure it in place with the safety bar.
- Remove the oil dipstick (3) and make sure the level falls in between the minimum (MIN) and the maximum (MAX) level.
- When topping up, remove the cap (4) and fill with oil according to the type indicated in refueling table, chapter 6.
- Screw the tank cap back on (4).
- Check the correct oil level.



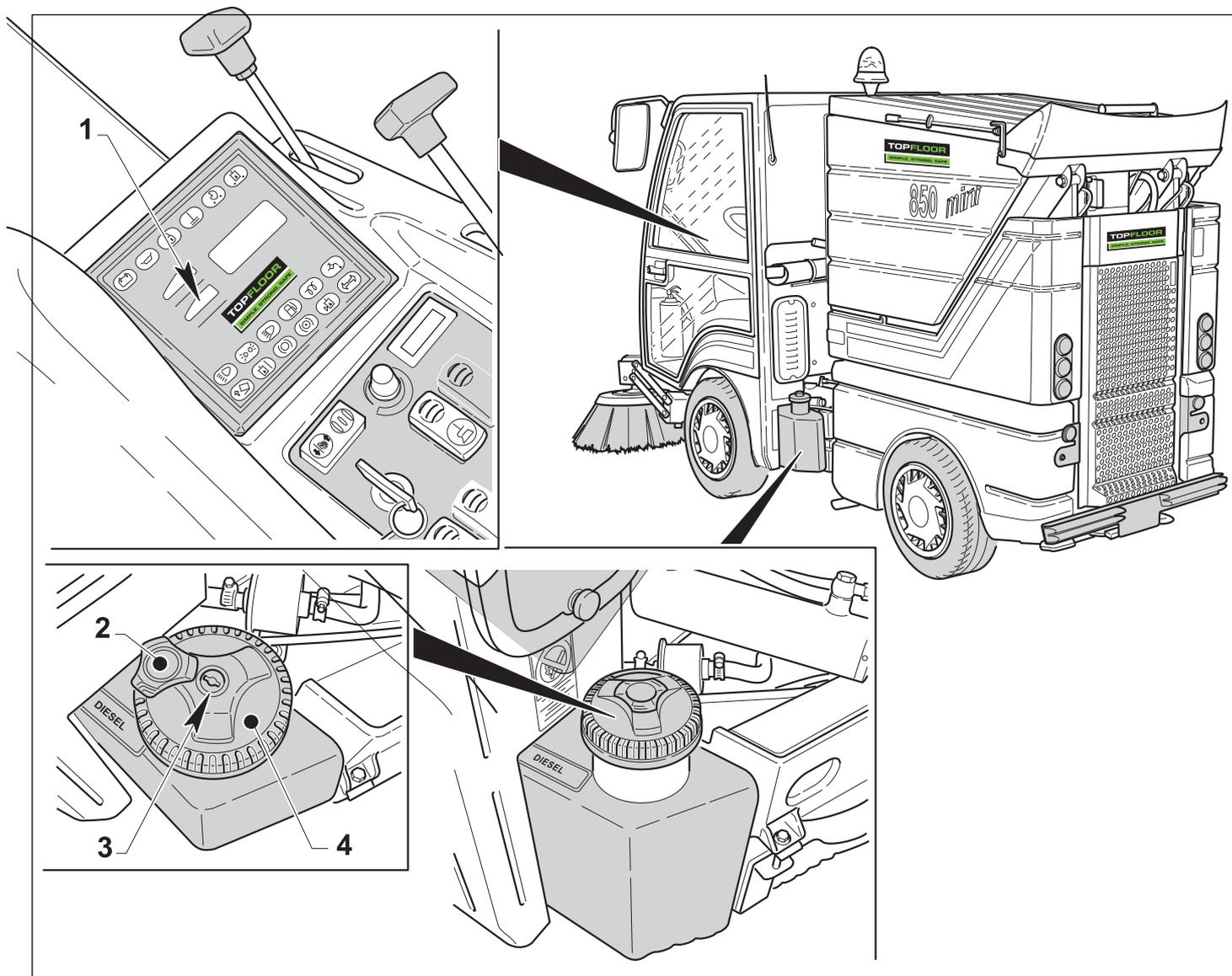
5.1.c - FUEL FILLING

⚠ DANGER:

Turn off the engine before refueling. Do not smoke or use open flames when refueling.

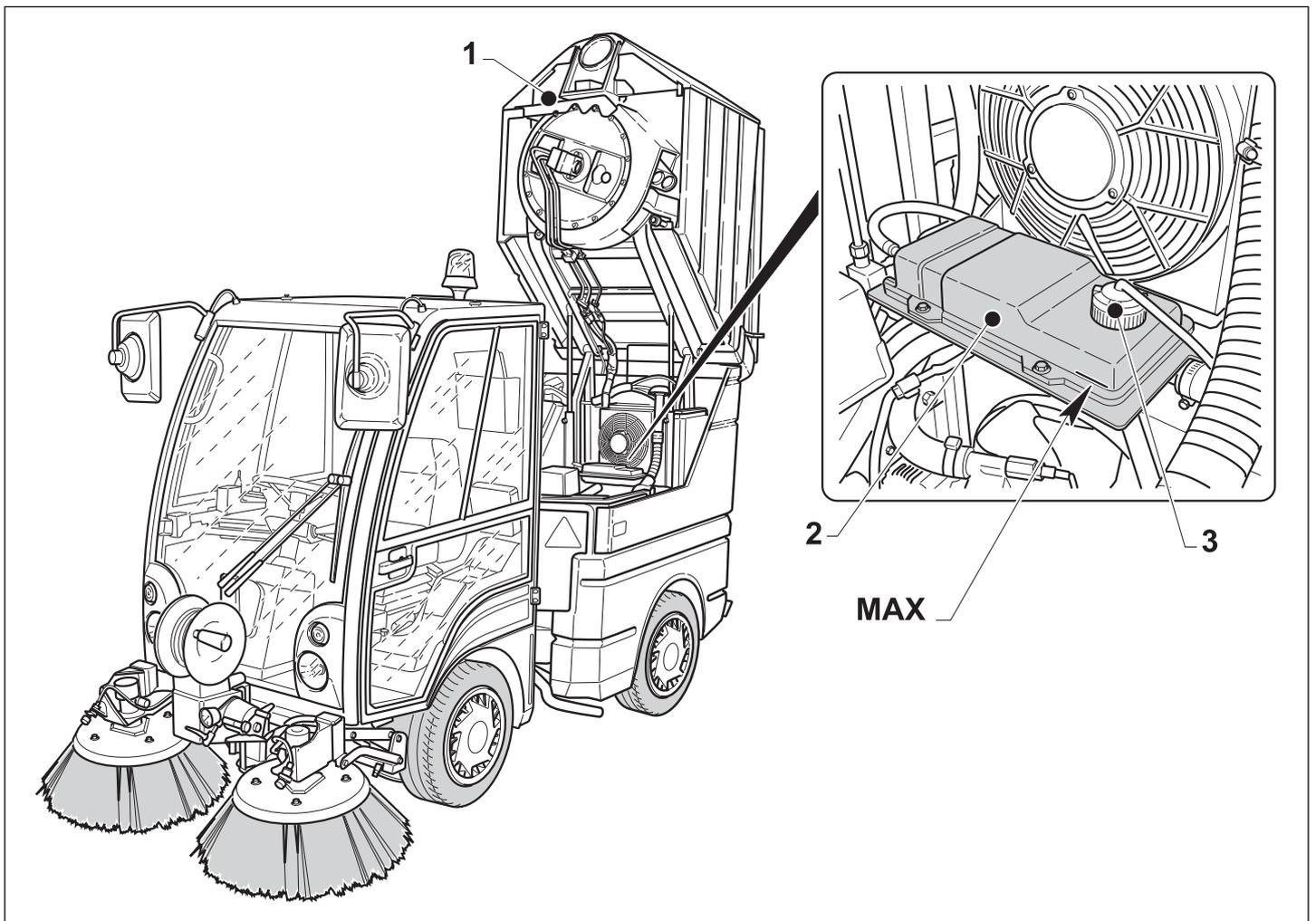
- Energize the controls by turning the key on and check sure, through the indicator (1) the fuel level.
- To refuel, turn the cover (2), fit the key into the lock (3) and turn it, and then remove the cap (4).
- Afterwards, put back the cap (4) by proceeding in reverse order.

NOTICE: *If the fuel should overflow, carefully wash the area with water.*



5.1.d - COOLANT LEVEL CHECK

- Lift the hopper (1) and secure it in place with the safety bar.
- Make sure, with cold engine, that the fluid is present in the expansion vessel (2) and that the level does not exceed the (MAX) notch.
- When topping up, remove the cap (3) and fill with a liquid according to the type indicated in refueling table, chapter 6.
- Screw the tank cap back on (3).
- Check the correct coolant level.



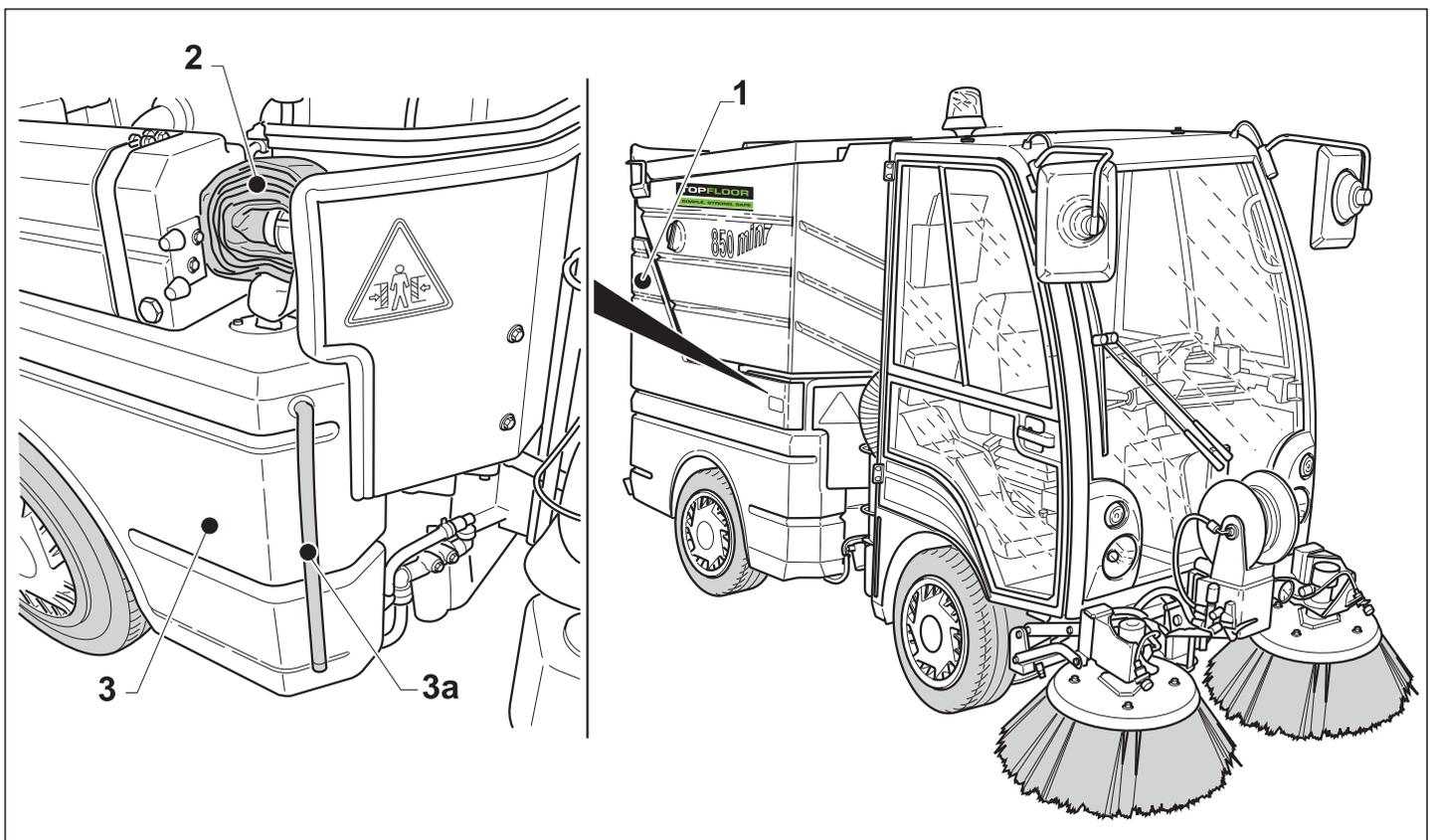
5.1.e - SPRINKLER WATER TANK LEVEL/FILLING

- Open the hatch (1).
- Visually check the tank (3) water level by the level pipe (3a) and if necessary refill it as follows:
- Before the filling make sure that the pump switch (see chapter 4) is disabled, to avoid the automatic start of the pump itself.
- Attach the hose (2) which is connected to the tank (3) to a water outlet of a mains supply.

! WARNING:

Use water mains in order to avoid introducing in the hydraulic system possible impurities (sand, mud,) that may damage the system.

- During the filling visually check the tank water level through the level pipe (3a).
- The capacity of the tank is 220 litres.
- At the end of this operation detach the pipe (2) from water main and re-place in its housing



5.1.f - RECYCLING CIRCUIT WATER FILLING (OPT)

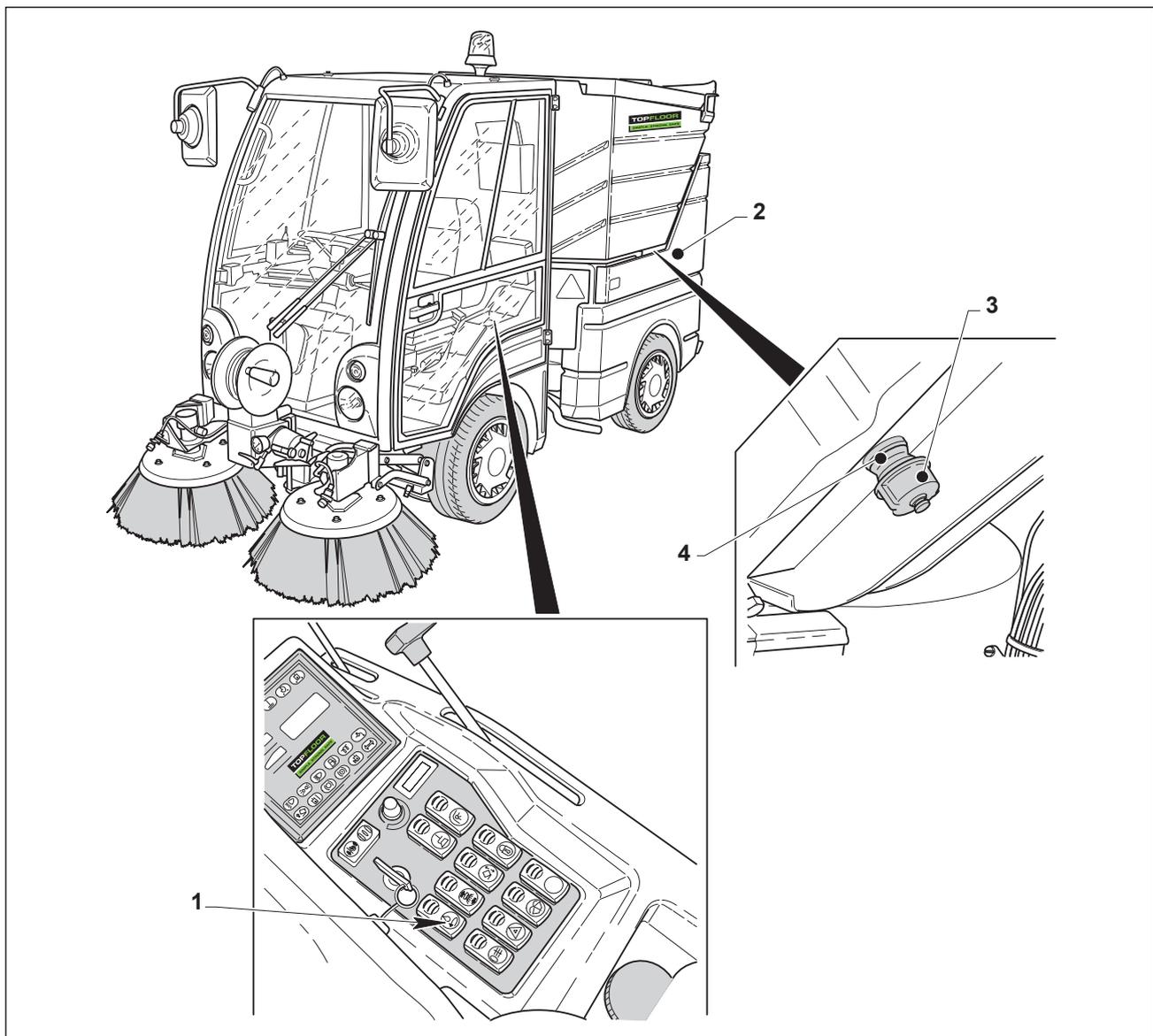
It is possible to fill water into the hopper and to use it with a closed loop recycling system; to fill the hopper comply with the following procedure:

- Position the machine on an even surface and lower the hopper completely.
- Make sure the recycling switch (1) is disabled.
- Open the left hatch (2).
- Unscrew the plug (3) and inject water from the water supply through the filler (4).

When water starts coming out of the filler (4) stop the flow of the supply water.

! WARNING: Do not thread a hose onto the filler (4). Instead, loosely fit a hose to allow excess water to drain out.

- Replace the plug



5.2 - MACHINE START

- Carry out the preliminary checks (see paragraph 1.9.a.3 and 5.1).
- Get into the machine and sit on the driver's seat.
- If necessary, adjust the position of the driver's seat, steering wheel and rearview and work mirrors.
- Make sure that the parking brake is enabled.
- Make sure that the gear lever (1) is in the central position (neutral).

NOTICE: *If the lever (1) is not in the neutral position the machine cannot be turned on.*

Engine start

- Insert the key (2) and turn it up to the first click "I" by keeping it to its position until the signal bulb  on the dashboard goes off.
- Turn the key to the end-of-stroke "II", releasing it when the engine starts.

CAUTION:

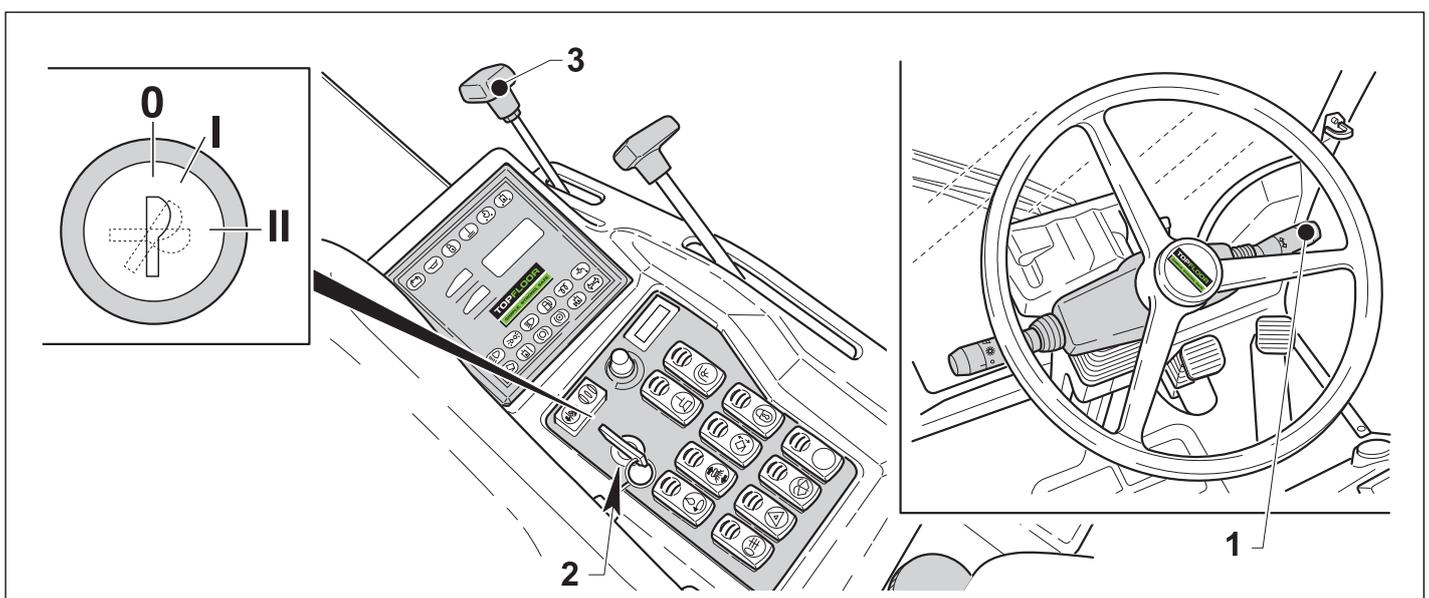
Cold starting To facilitate starting, slightly accelerate by acting on the lever (3). Let the motor run for a few minutes with the machine stopped.

DANGER:

Do not use the machine with the engine running in non-aerated premises.

CAUTION:

If the engine does not start, in order not to drain and/or damage the battery, wait at least 1 minute between one trial and the next one.



If after 3 trials the engine still does not start DO NOT continue trying. Contact a qualified technician.

- After the engine starts, confirm that the following signal bulbs are not illuminated:
- no battery recharge 
- engine oil pressure insufficient  .

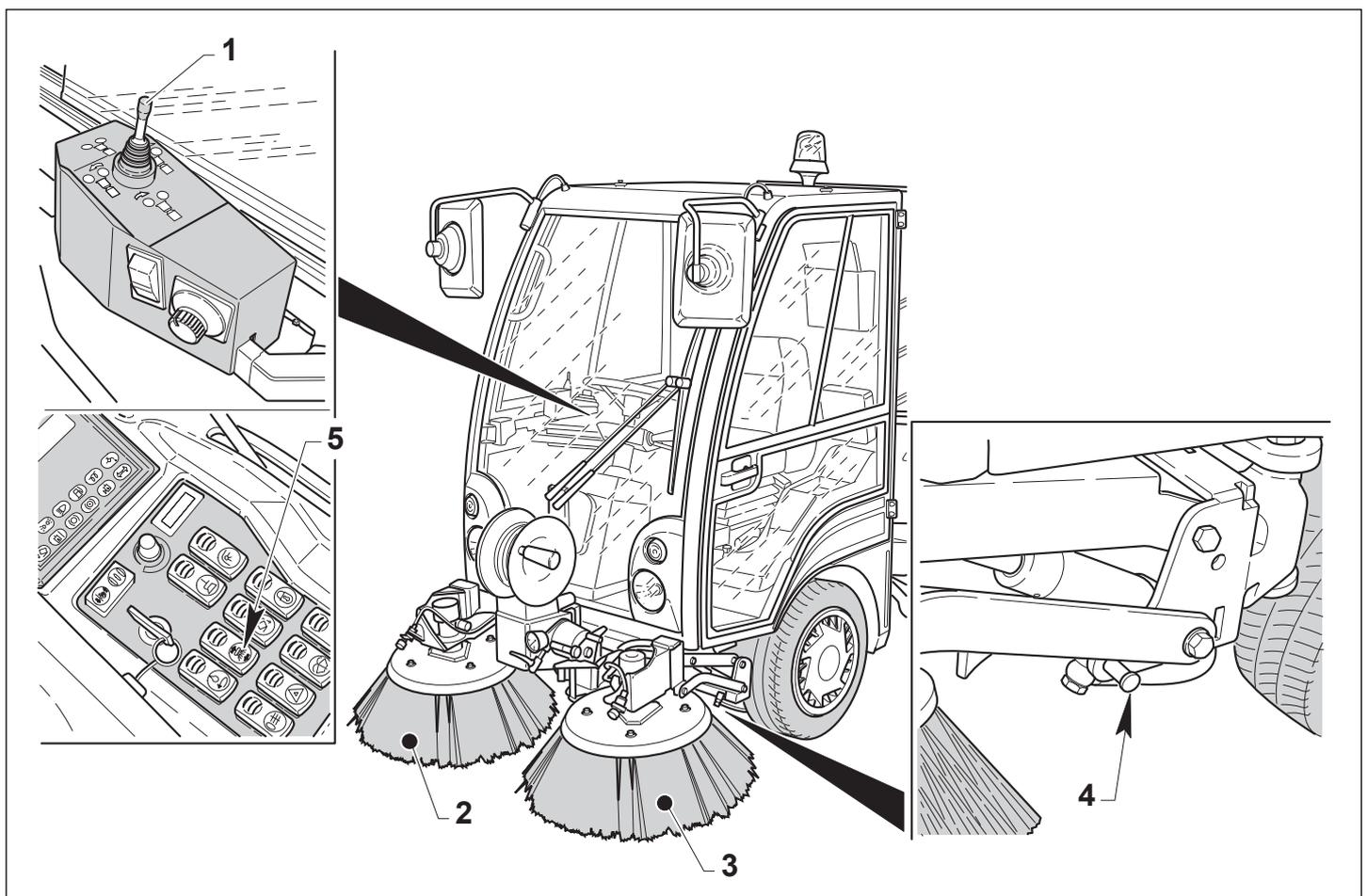
5.3 - TRANSFERRAL

5.3.a - LOCKING OF SIDE BRUSHES

Use the Joystick (1) to retract the side brushes (2) and (3) completely and lock them with the pins (4) after lifting them by pressing the switch (5).

CAUTION:

During the machine transfer, the side brooms always need to be locked to this position.



5.3.b - MACHINE TRANSFER

- Make sure that brushes are lifted, retracted, and locked to the transfer position (see par. 5.3.a).
- Enable the running control lever (1) in the desired direction, forward  or backward .
- Release the parking brake (2)
- Operate the machine by adjusting the speed with the accelerator pedal (3) (the machine goes on with a speed which is proportional to the pedal travel).

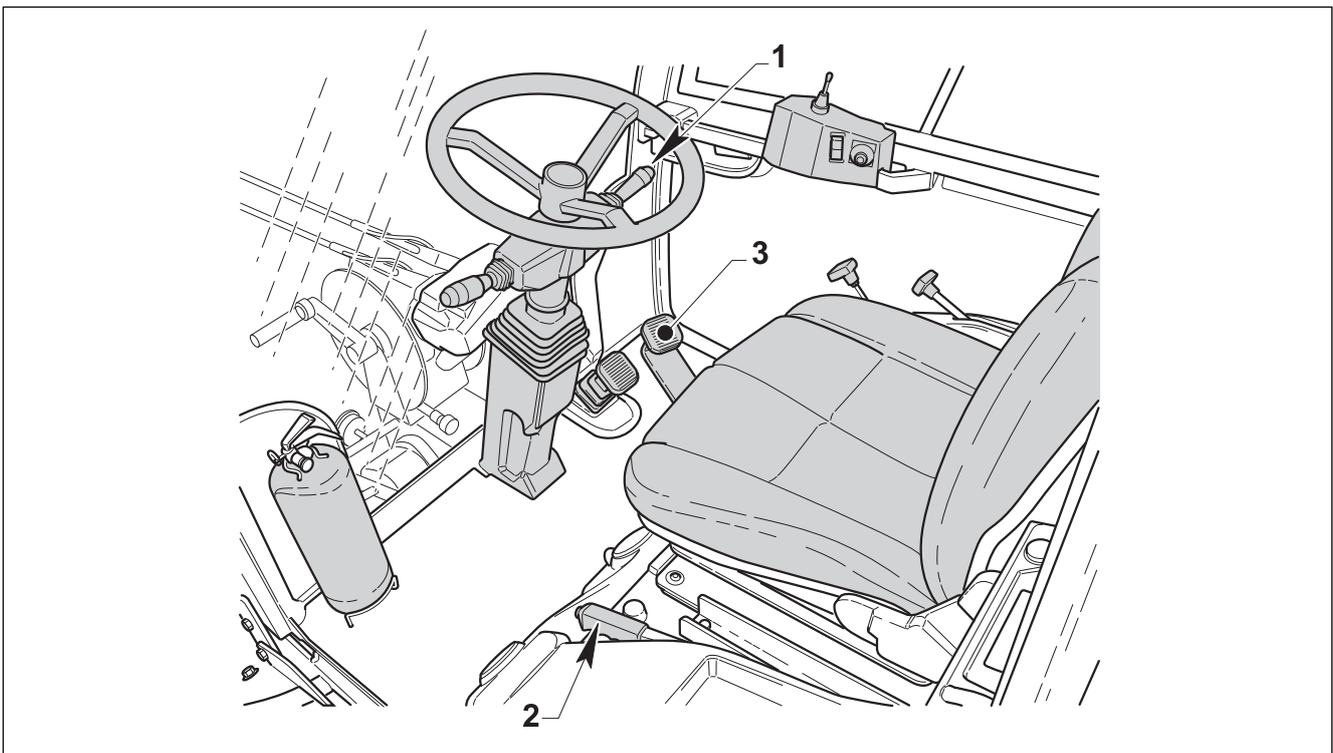
 **WARNING:**

Avoid Roll Over. While driving on uneven roads, in turns and on slopes, decrease the speed of the vehicle.

 **WARNING:**

When using the machine, monitor the “engine oil pressure insufficient  signal bulb” and the “engine coolant excessive temperature  signal bulb”. If the signal bulbs illuminate, immediately turn off the engine.

Have the sweeper inspected and repaired by a qualified technician.



5.3.c - WORKING FUNCTIONS DISABLING

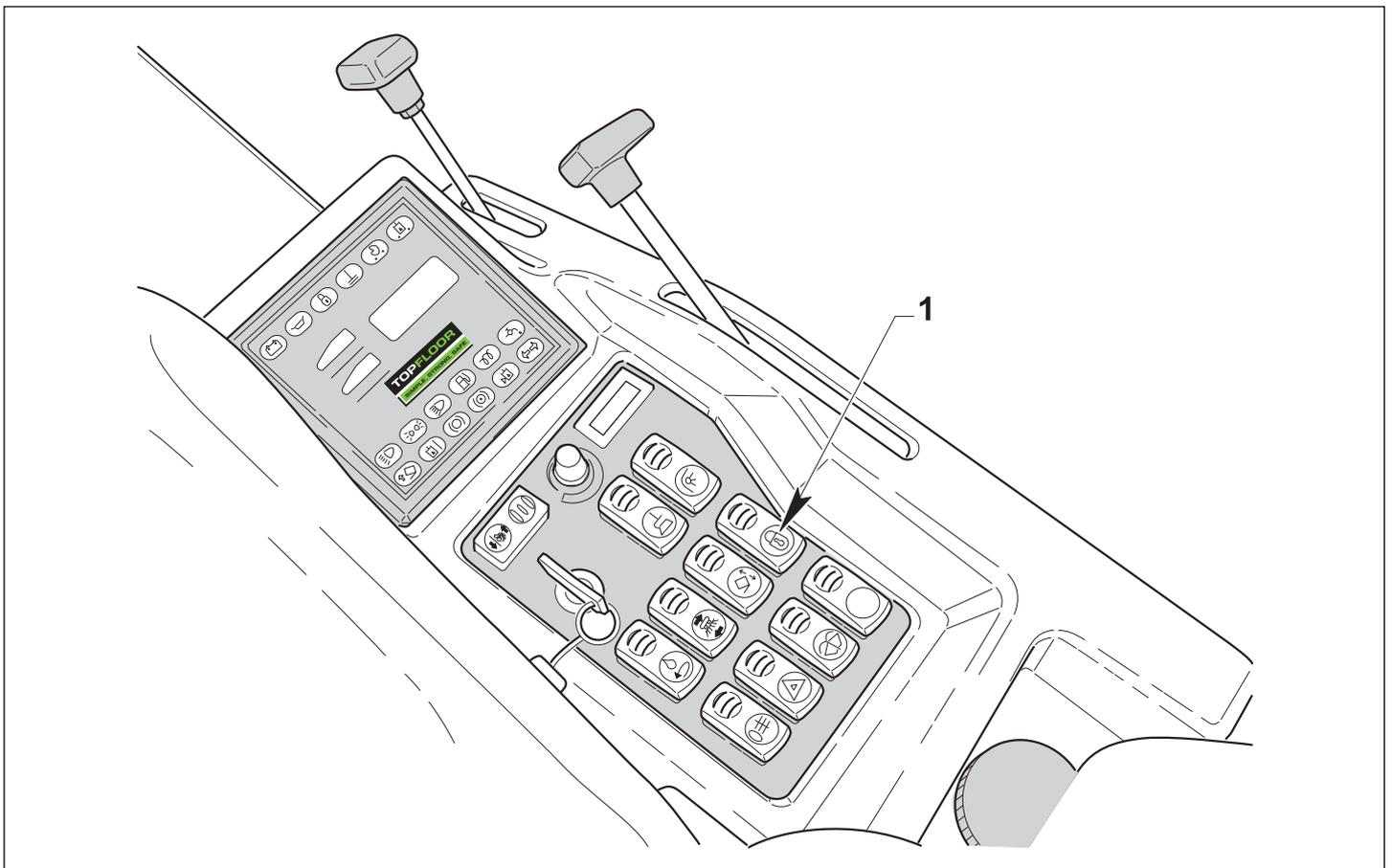
NOTICE:

Before disabling the hydraulic system be sure the vacuum intake and brushes are lifted.

- The hydraulic system can be disabled by pressing button (1); the button light switches off thus indicating that the hydraulic system is blocked and all components and functions are locked in place.

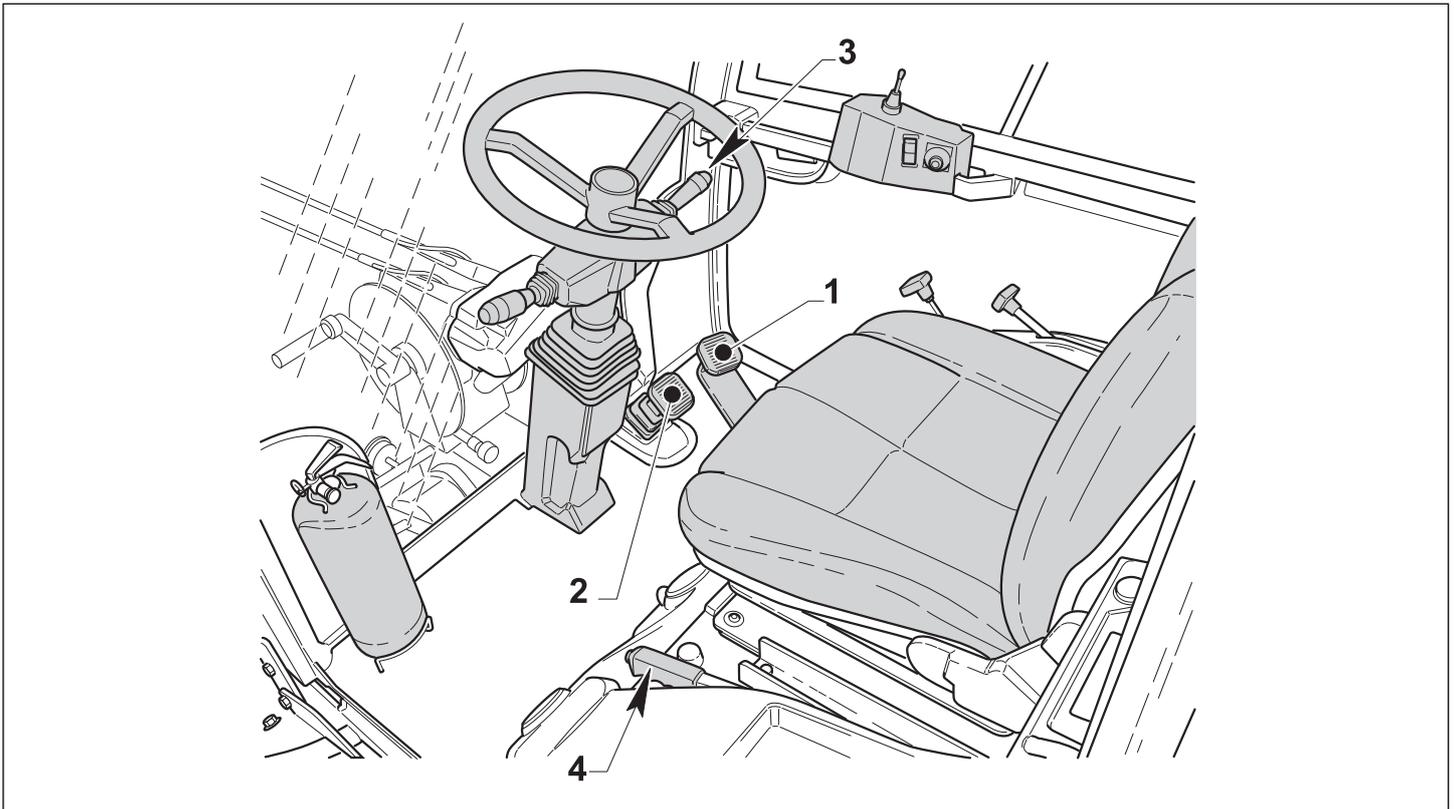
! WARNING:

When the button (1) is reset all hydraulic components and functions restart automatically.



5.3.d - MACHINE STOP

- Release the accelerator pedal (1) and press the brake pedal (2) until the machine comes to a standstill.
- Place the lever (3) in central position to stop the machine's movement.
- Set the parking brake (4).
- Remove the starting key.



5.4 - SWEEPING OPERATIONS

5.4.a - SWEEPING START

- Release the side brooms by performing in the reverse order the same steps as those needed to lock them in the reverse order (see paragraph 5.3.a).
- Enable the running control lever (1) in the wished direction, onward  or backward 

NOTE: When the reverse motion is enabled, the side brushes and the waste intake duct are lifted. The brushes and intake are lowered when the lever is positioned either in neutral or in forward motion position.

- Disengage the parking brake (2).
- Run the machine by adjusting the speed through the accelerator pedal (3).
- Push the lever forward (4) until an engine speed of 1300/1400 rpm are obtained.
- Press the luminous button (A) to enable the hydraulic system.
- Start the vacuum by activating the switch (5).
- After starting the vacuum, adjust the engine speed

through the lever (4) according to the type of work to be done (2000/2200 RPM).

- Lower and adjust the position of the side brooms by the button (6) and the Joystick (7) and adjust speed through the knob (8).

NOTICE:

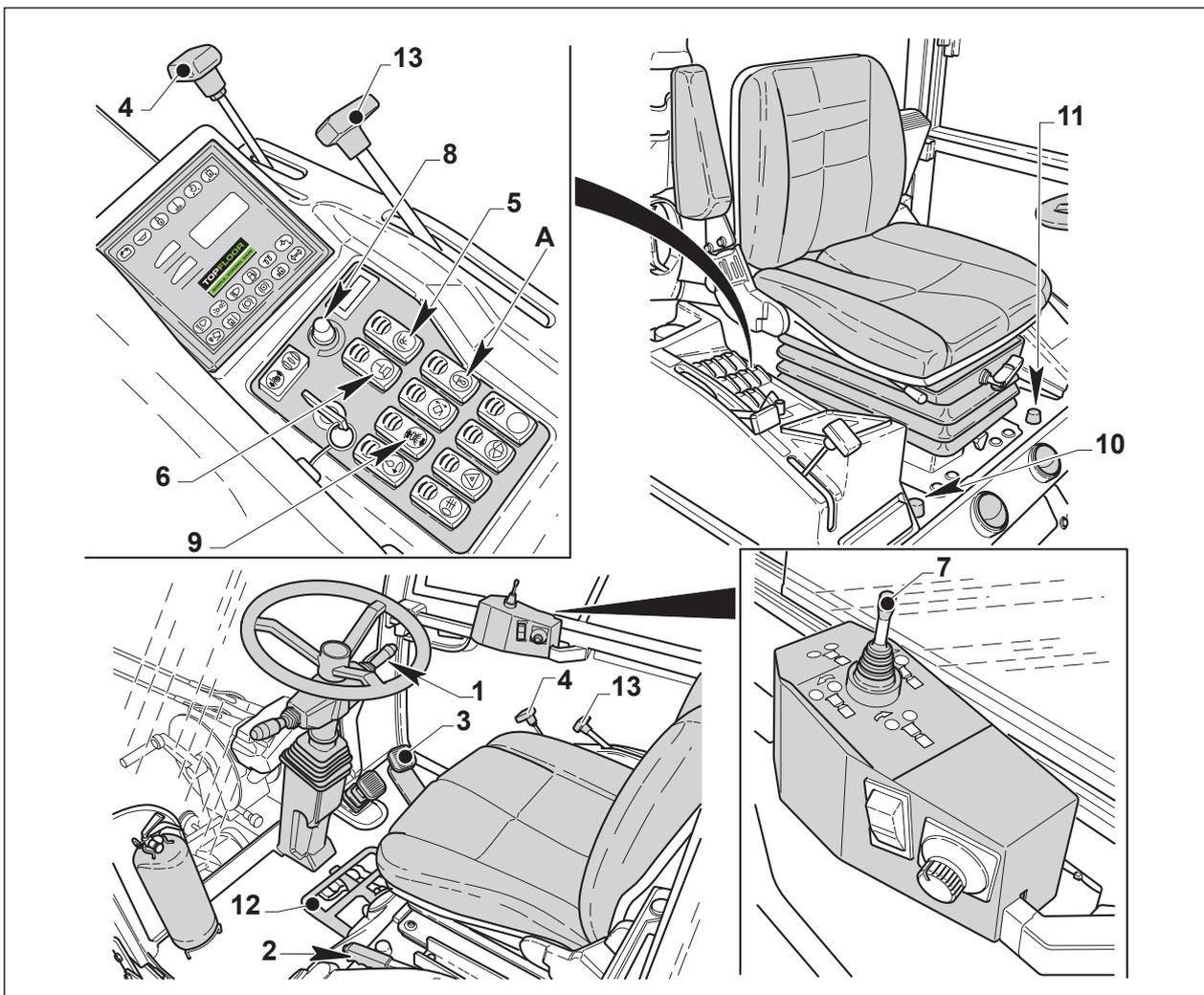
The functioning of the brushes is enabled only when the operator sits on the driver's seat.

- If needed, start the pump through the switch (9) and adjust the valve switches (10) and (11) to deliver water to the brooms and the waste intake duct respectively by adjusting the water flow rate.

- Select the most appropriate machine speed through the accelerator pedal (3). With low working speeds the sweeping is more effective.

NOTICE:

The machine collects both light material such as dust, leaves, twigs etc., and heavy material, such as stones, bottles, etc..; through the sight glass (12) it is possible to check the waste intake duct and through the lever (13) open or close the flap as a function of the size of the waste to be sucked.



NOTICE:

When working on wet roads and when raining it is advisable to stop the water pump and close the valve switches controlling water delivery to brushes.

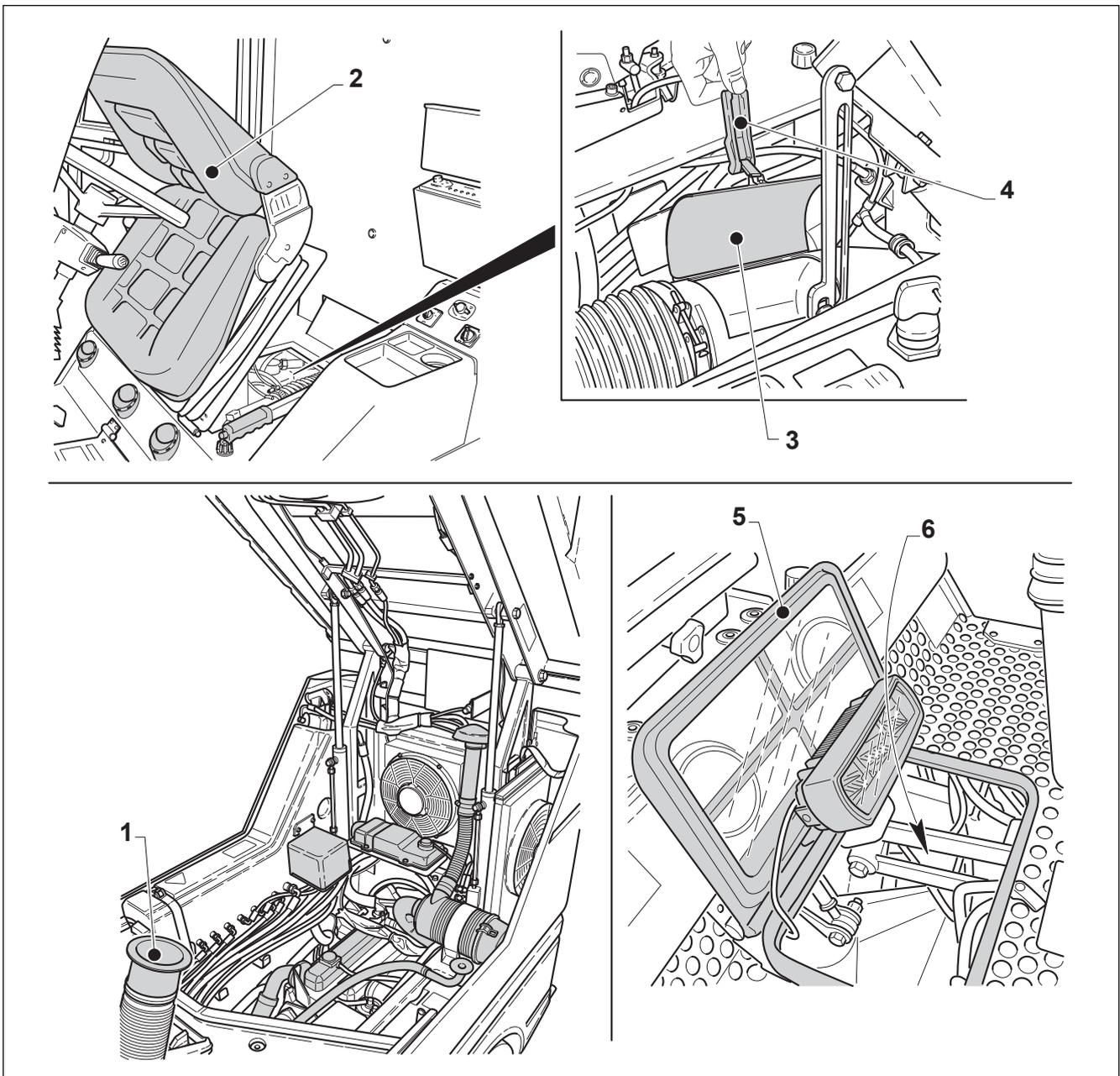
NOTICE:

When working on steep slopes the accelerator pedal (3) has to be pressed gradually and slowly. If the pedal (3) is pressed deeply and rapidly the diesel motor could stop. It is advisable to increase the engine speed to about 2500 rev/min (only when climbing).

5.4.b - OPERATIONS DURING WORK

Waste intake duct clearing

In case intake difficulties are detected and hence some



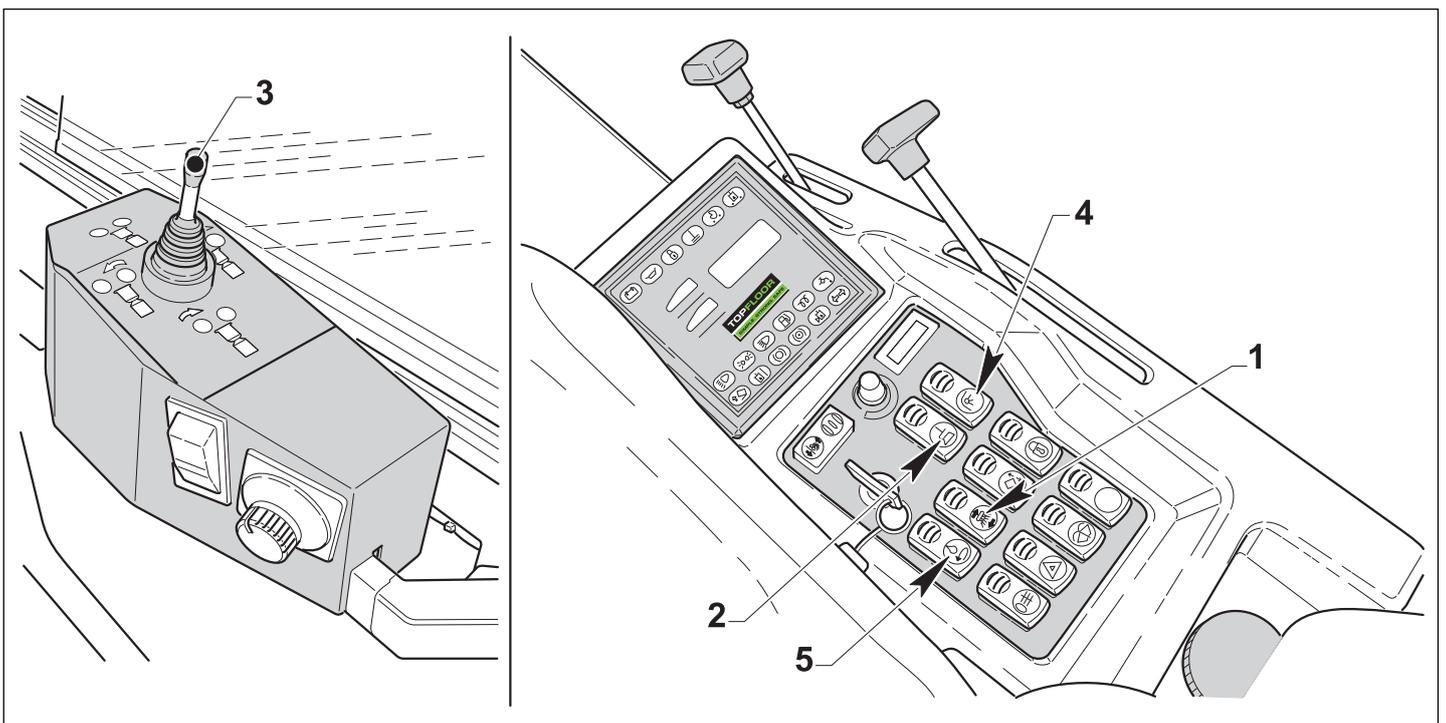
waste residues remain on the road surface, it is necessary to check that there are no objects obstructing the waste intake duct. If so, take the following steps.

- Stop waste collection.
- Discharge the hopper as indicated in the relevant paragraph; let the hopper lifted and secure it in place with the safety bar.
- Stop the machine and turn off the engine.
- Check that on the intake pipe mouth (1) there is no waste hindering intake.
- Lift the seat (2) as indicated in the relevant paragraph and open the inspection door by acting on the handle (4), to check that there are no objects clogging the intake pipe.
- Lift the door (5) and check that the waste intake duct (6) is not clogged.

5.4.c - END OF SWEEPING OPERATION

At the end of a sweeping operation comply with the following procedure:

- Stop the water pump with switch (1) and close the recycling through the button (5).
- Stop the side brushes rotation and lift them through the button (2).
- Retract side brushes by using the Joystick (3).
- Keep moving forward a few metres with the only intake unit functioning by collecting the waste heaped in front of the waste intake duct.
- Stop the vacuum through the button (4).
- If appropriate, stop the machine as indicated in paragraph 5.3.d.



5.4.d - HOPPER UNLOADING

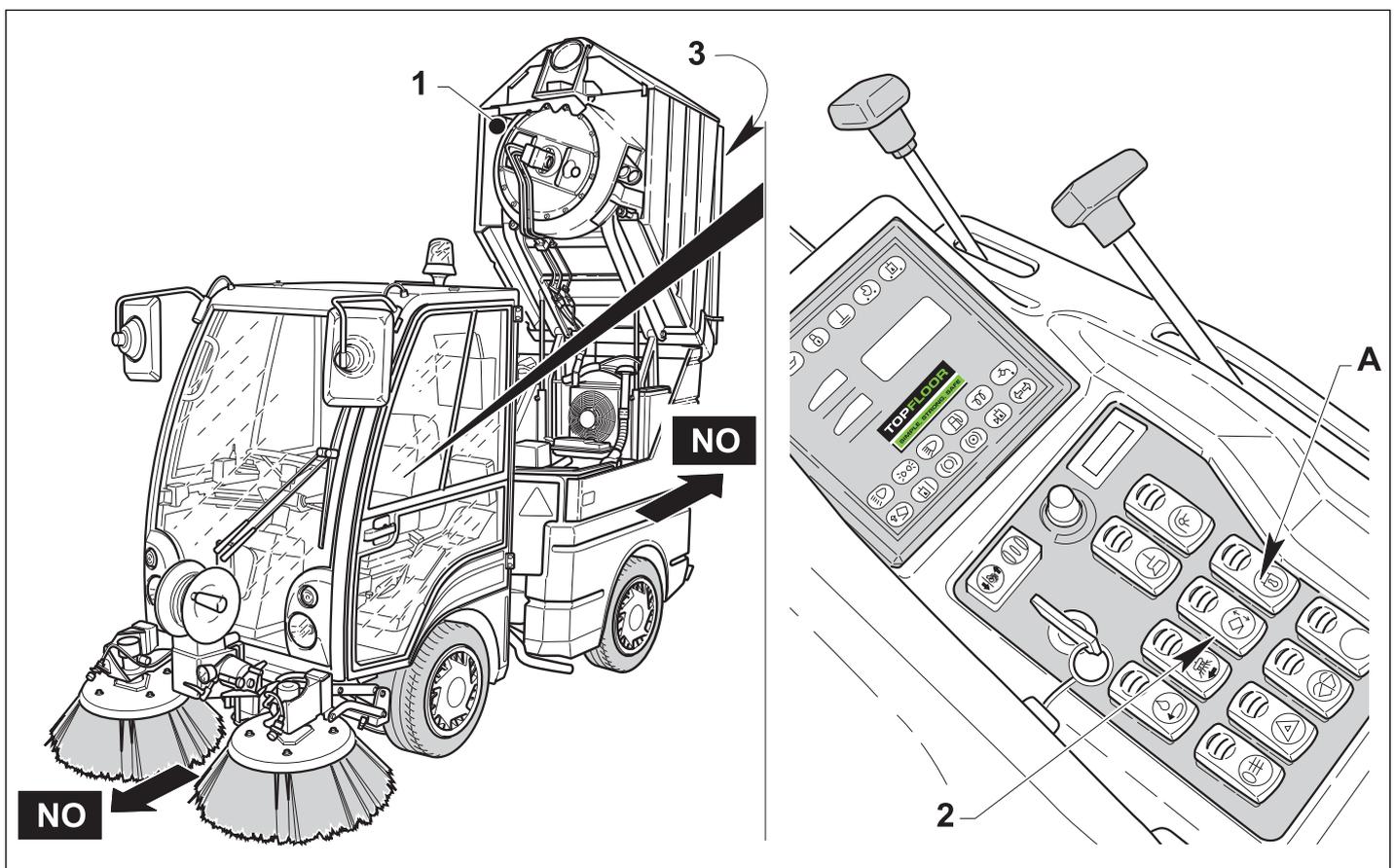
! DANGER:

While unloading waste from the container, the machine must only move at a slow walking pace both forward and in reverse. This operation must be carried out with great caution and with the machine on a level surface.

While the container is being unloaded, always make sure that there is no one close to the machine. If a bystander appears, immediately stop the operation.

In order to unload the hopper, comply with the following procedure:

- Perform the end of work operations as indicated in paragraph 5.4.c.
- Position the machine in the unloading area.
- Pull the parking brake and put the gear lever in neutral position.
- Press the button (A) to enable the work functions.
- Tilt the container (1) by pushing the switch (2) to one side and holding it until the container is fully tilted; the door (3) opens automatically.
- Once unloaded, lower the container (1) by pushing the switch (2) to the opposite side.



5.5 - OPTIONAL ACCESSORIES

5.5.a - LEAVES SUCTION HOSE

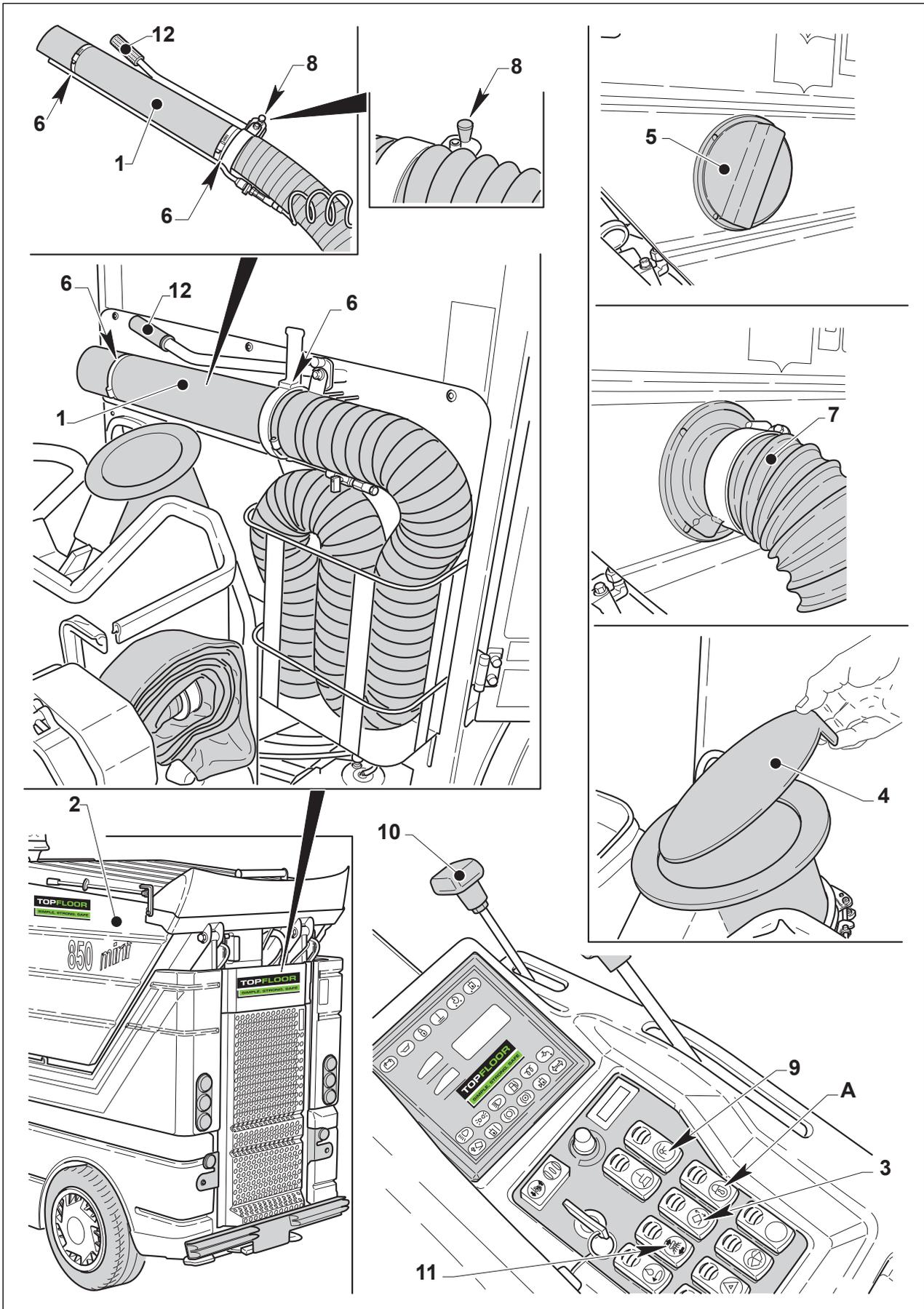
Leaves are collected through the leaves suction hose (1) by complying with the following:

- Press the button (A) to enable the work functions.
 - Through the button (3) lift the hopper (2) and secure it in place with the safety bar.
 - Position the cover (4) on the opening of the intake pipe.
 - Lower the hopper (2) through the button (3).
 - Remove the cover (5) by turning it counter-clockwise. - Release the hose (1) from its supports by moving the elastic clamp (6).
 - Mount the hose (1) by inserting the flange (7) in the relative bayonet couplings and turning it clockwise as far as it will go.
 - Remove the knob (8) and adjust the position of the grip (12).
 - Start the suction unit through the switch (9).
 - Increase the engine rpm by bringing it to the maximum level through the manual accelerator (10).
 - Keep the hose mouth (1) at a slight distance from the leaves so as to let the air in.
 - Shake the hose in order to ease the passage of leaves.
-
- At work end, stop the suction.
 - Lift the hopper (2) and secure it in place with the safety bar.
 - Remove the cover (4).
 - Lower the container (2).
 - Re-place the hose (1) and fix it by the elastic straps.
 - Mount the cover (5) by inserting it into the relative bayonet couplings and turning clockwise by forcing it.

NOTICE:

The leaves suction hose (1) is equipped with an additional water supply hose for gully-holes to clear off mud.

The water is taken from the tank of the sprinkling system and sent to the mouth of the leaves suction hose through a back tap. To make it work, enable the water pump (OPT) with the switch (11).

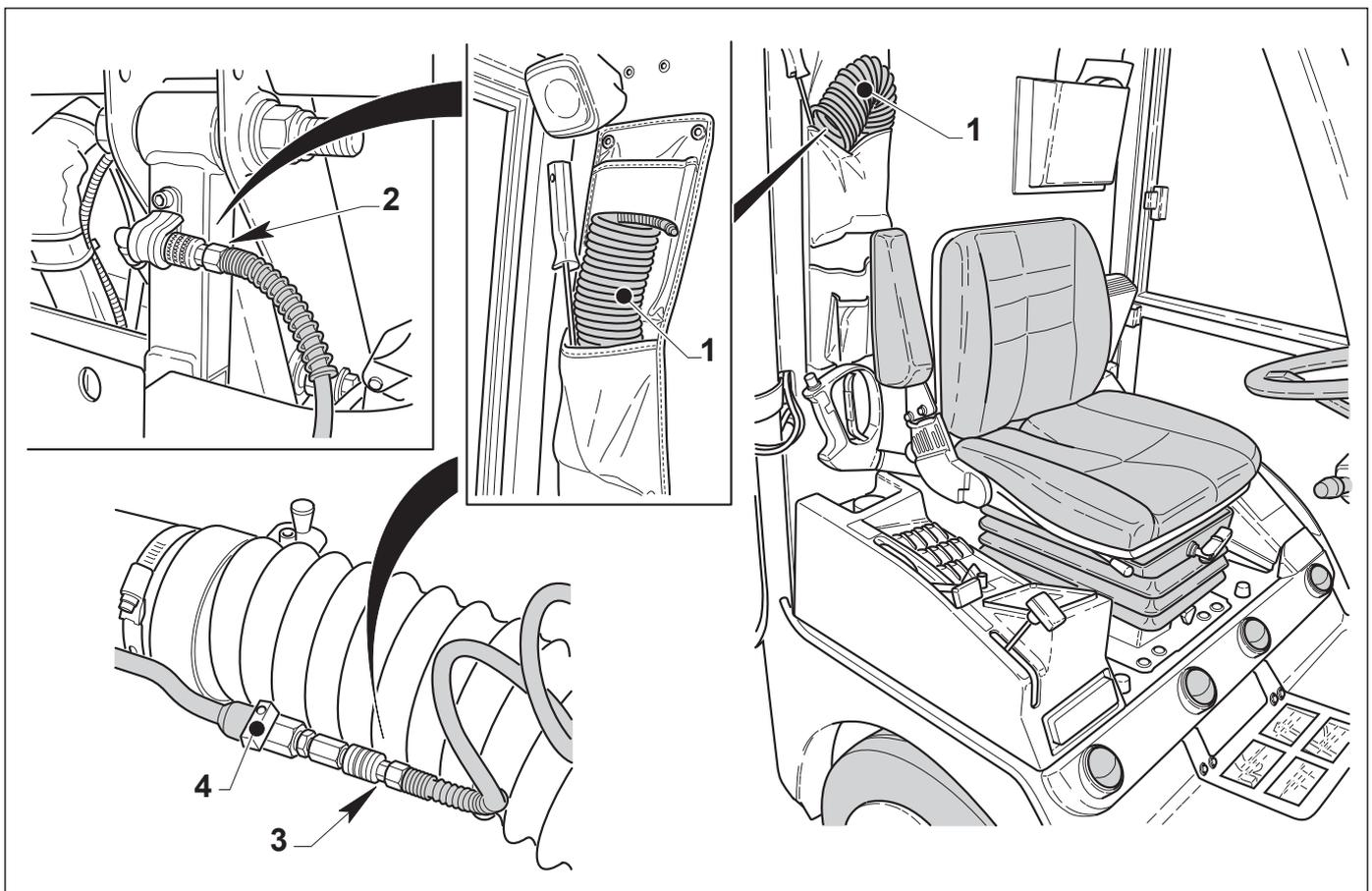


5.5.b - LOW PRESSURE WATER NOZZLE IN LEAF COLLECTOR HOSE (OPT)

A low pressure water nozzle can be connected to the leaf collector hose.

The nozzle delivers water which is collected by the hose in order to clean it and prevent it from clogging.

- Take the hose from the cab (1).
- Connect the hose (1) to the snap-on connector (2) located at the rear of the machine and connect the other end to the nozzle (3).
- Start the water pump as indicated in the paragraph 4.4.b.a.
- Adjust the quantity of water by turning the tap (4) on the nozzle.
- After work, disconnect the hose by performing the connection operations in reverse order and put it back.



5.5.c - HIGH PRESSURE WATER NOZZLE

! WARNING:

High pressure water nozzle discharges water at extremely high pressure.

Never point the water jet in the direction of people. The water jet or dislodged objects can cause serious personal injury or death.

Wear gloves, eye protection and other appropriate personal protection equipment.

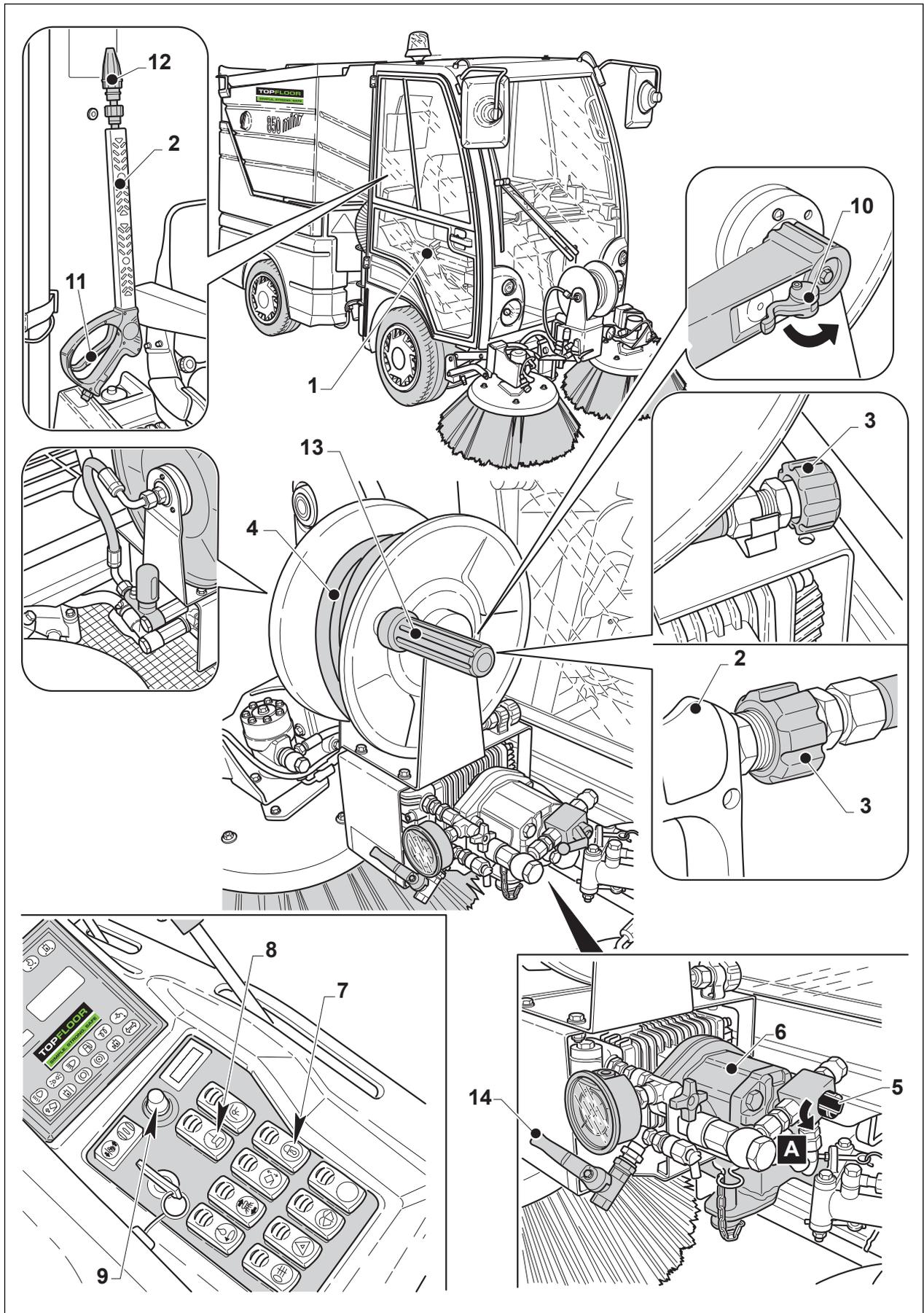
Check with your supervisor.

In order to use the high pressure nozzle comply with the following:

- a) Make sure that the water tank is full.
- b) Check that valve (16) is closed.
- c) Open the right door (1) and take the nozzle (2) placed inside the cab.
- d) Release the threaded connector (3) placed on the winder (4) hose from its seat and screw it on the nozzle (2) tightening it completely.
- e) Rotate the hydraulic valve (5) to the position "A" in order to deviate the hydraulic oil towards the motor (6) of the water pump group.
- f) Start the engine, push the button (7) to enable the work functions, then press the switch (8) to run the pump. Rotate the knob (9) clockwise to the end of stroke (brooms maximum speed).
- g) Release the clamp (10) in order to take out the hose from the winder (4).
- h) Take the nozzle and aim it to the part to be washed and press the trigger (11); the kind of jet can be changed through the nozzle (12).
- i) Stop the pump by pushing again switch (8).
- l) At the end of the work close the valve (5), press the trigger (11) of the nozzle (2) and keep it pressed to vent the pressure from the hose.
- m) Unscrew the threaded connector (3) from the nozzle (2), rotate the lever (13) to rewind the hose then place again the nozzles (2) and the threaded connector (3) in their seats; Lock the winder (4) by hooking the clamp (10) again.

NOTICE:

When the temperature is low, drain water from the pump and from the system by opening the tap (14) and proceed with system drainage as indicated in "chapter 6".



5.5.d - BRUSHES ROTATION DIRECTION CHANGE

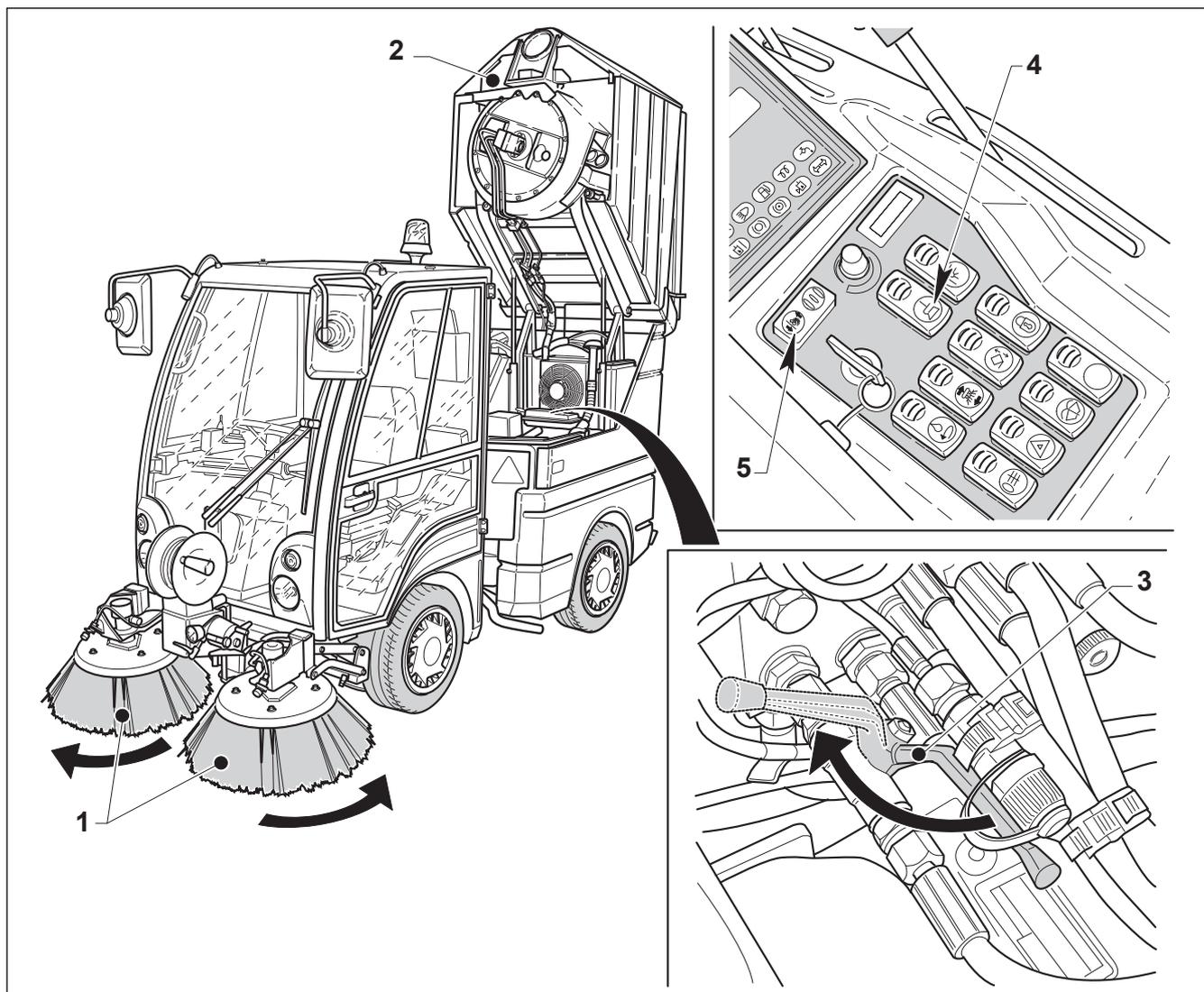
This type of optional accessory allows you to change the rotation direction of brushes. Debris will not be conveyed beneath the machine to the waste intake duck but will instead be pushed to the outside.

NOTICE: This function is to be used with suction unit disabled.

To change the brushes rotation direction: -

- Be sure brushes (1) are lifted.
- Lift the hopper (2) and secure it in place with the safety bar.
- Close the valve (3) to prevent the lowering of the waste intake duct.
- Lower the hopper (2).
- Start brushes rotation pressing (4), then change rotation by pressing (5), the button light switches on.

To restore normal functions carry out the same operations in the opposite sequence.



5.6 - PUTTING THE MACHINE OUT OF SERVICE

5.6.a - BRIEF STOP

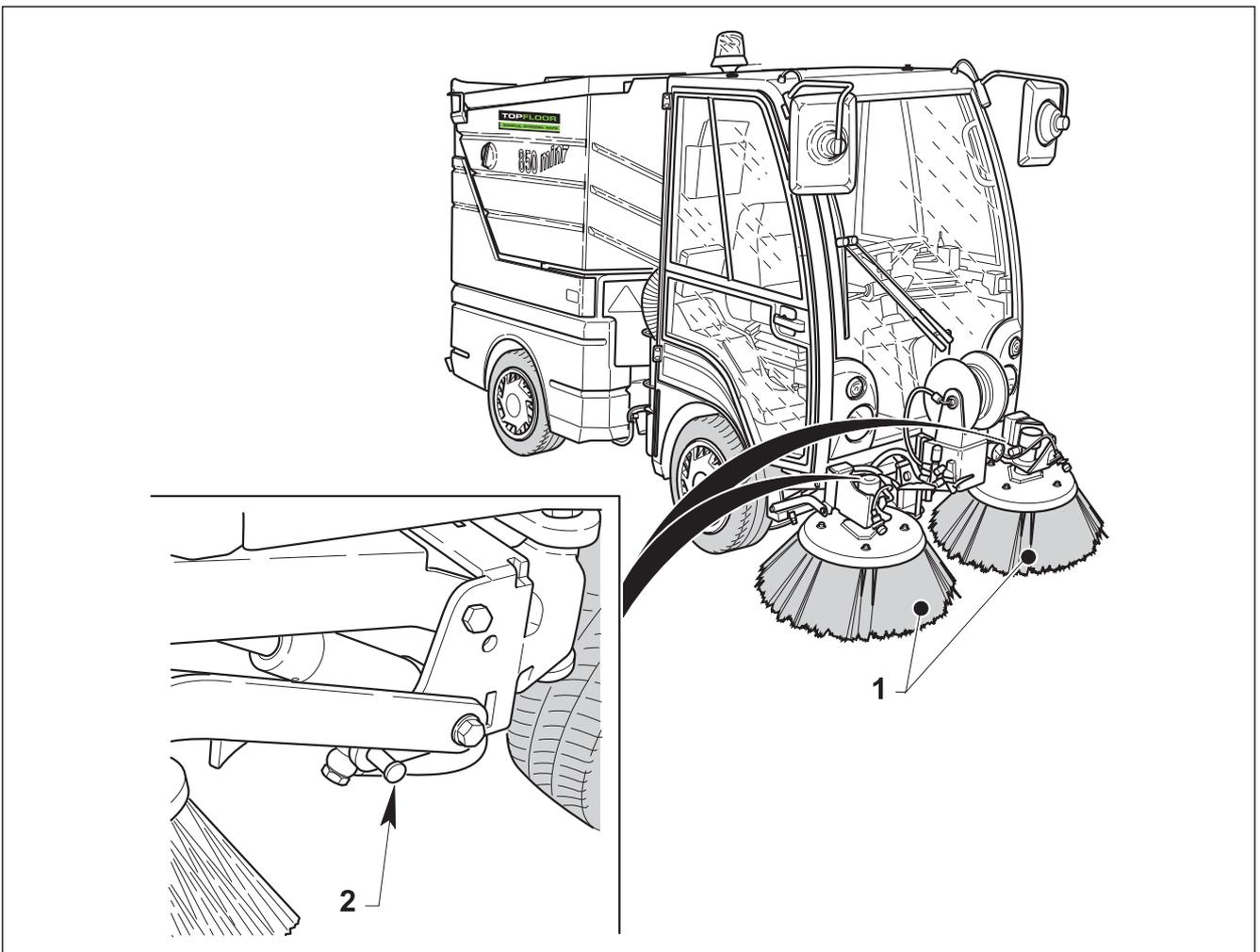
“Brief stop” means not using the machine for a period of time of more than 3 days but less than a week.

In this case, proceed as follows:

- Fasten the side brushes (1) with the pin (2) to prevent them from deforming and remaining on the floor.

NOTICE:

If the environmental temperature is close to or less than 0°C, empty the sprinkling system, the water filter, and the water pump as indicated in chapter 6. See also paragraph 1.9.a.6.



5.6.b - TEMPORARY STOP

“Temporary stop” means not using the machine for a period of time of more than a week and less than 2 months.

In this case proceed as follows:

- Do as indicated in the previous paragraph “Brief stop”.

-
- Empty the sprinkling system, the water filter and the water pump as indicated in "Chapter 6".
 - Clean the entire machine (see Chapter 6).

5.6.c - PROLONGED STOP

"Prolonged stop" means not using the machine for a period of time of more than 2 months. In this case proceed as follows:

- Proceed as indicated in the previous paragraphs "Brief stop" and "Temporary stop".
- General lubrication (see chapter 6).
- Lubricate all the unpainted metal parts with oil or grease.
- Shelter the machine in a dry and dustless place.
- Disconnect/remove the battery/batteries and load it/ them once every month. - Lift the machine to avoid contact of the wheels with the ground. Adjust the tire pressure at 1 bar (see chapter 6).

5.6.d -CHECKS AND INSPECTIONS AFTER A LONG PERIOD OF INACTIVITY

Before using the machine after a long period of inactivity it is necessary to carry out the following:

- Thoroughly clean the machine.
- Check battery/batteries charge, put it/them back in the machine and connect the terminals after having smeared vaseline on them.
- Check tire pressure and lower the machine to the ground.
- Lubricate all parts.
- Run the preliminary checks indicated in paragraph 5.1.
- Start the engine and keep it at a minimum engine speed for a few minutes. - Confirm that the brakes are working properly.
- Check all systems, to make sure that there is no oil leak or strange noises. - Confirm that all safety shields, guards, signal lights, buzzers and other protective safety devices remain in place and in good condition and are working properly.

 **WARNING: Comply with the contents of "Chapter 6" when carrying out the above operations.**

CHAPTER 6

MAINTENANCE

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6.1 - MAINTENANCE OPERATIONS

To maintain the machine in optimum working order, strictly adhere to the maintenance schedule provided in this chapter.

In addition, due to the particular conditions of use of your machine, your machine may require additional scheduled maintenance and repairs.

Crescent suggests that you consult with your dealer and trained technicians to agree on a maintenance schedule most appropriate for your machine.

Maintenance operations are of two types:

EXTRAORDINARY MAINTENANCE. ROUTINE MAINTENANCE.

WARNING:

Maintenance operations must be carried out only by properly trained technicians or by authorized repair facilities.

Always comply with applicable laws and regulations (such as OSHA), as well as the warnings and instructions provided in chapter 1.

6.1.a - MAINTENANCE PRELIMINARY OPERATIONS

Before carrying out the maintenance operations comply with the following procedure: Position the machine on a flat, level surface and make sure that it cannot move accidentally.

- 1) Set the parking brake.
- 2) Turn off the machine and remove the keys.
- 3) Set wheel chocks.
- 4) Visually signal that you are carrying out maintenance operations.

WARNING:

Before performing any operation on the electric system, disconnect the battery.

6.1.b - HYDRAULIC AND WATER SYSTEMS MAINTENANCE RULES

WARNING:

Before performing any maintenance or repairs, stop the pumps and relieve all pressure in the system (i.e. pressure valves as zero).

Never perform any maintenance adjustments or repairs while the systems are operating (except for pressure adjustment).

6.1.c - HYDRAULIC SYSTEMS GENERAL RULES

- After the first few hours of work carefully check the oil level and look for any possible leaks; if necessary, to tighten any pipe unions or hose fittings that may be loose.
- Fluid levels must be checked and changed at regular intervals during machine operation. The intervals suggested in Section 6.6 are for normal use conditions. Your particular condition of use may change these intervals. See your Crescent dealer to discuss a schedule that is best for you.

6.1.d - WATER SYSTEM GENERAL RULES

- Note that water may contain some impurities (sand, dirt, rust, etc.) that easily produces scale which tends to jam the solenoid valves, the water pump, and nozzles.
- If the solenoid valves and the spraying nozzles are encrusted with scale or otherwise obstructed, they have not to be replaced but they have to be fully dismantled and accurately cleaned.
- When the machine is not going to be used, empty the water system: tank, pumps, filter, and manifolds.
- To prevent breaks due to freezing always discharge the system in case the ambient temperature is close to 0°C.
- To fully empty the water from the pump, make the pump run for a few seconds after water stops flowing: there is no risk of damaging it.

6.2 - EXTRAORDINARY MAINTENANCE

“Extraordinary maintenance” refers to those maintenance and repair procedures that are not performed according to any schedule, but on an “as needed” basis such as puncture of a tire, replacement of a lamp, etc...

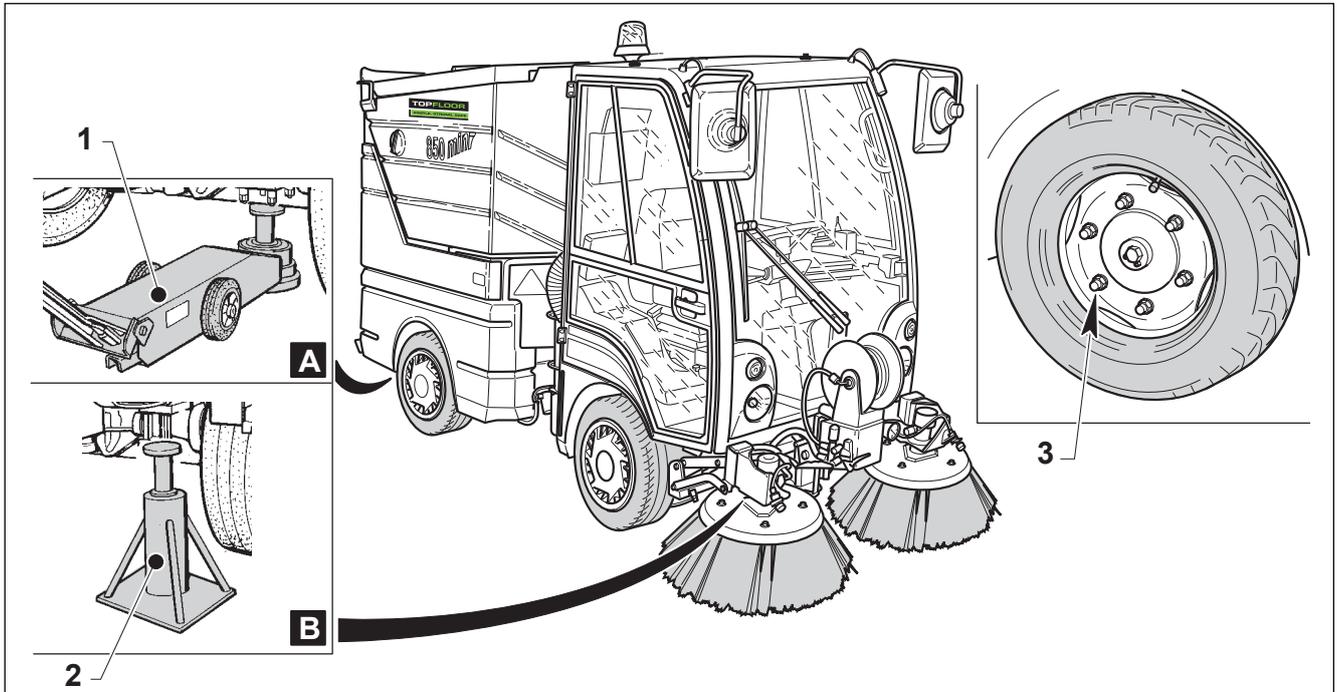
6.2.a - WHEELS REPLACEMENT

- Park the machine on a flat, level surface.
- Set the parking brake.
- Apply the lifting jack (1) under the chassis in the suitable area on the side of the wheel to be replaced and lift the machine.
- Raise the machine and insert a jack (2) stand.

 **WARNING: The jack used must have sufficient capacity for the machine's weight. Caution the machine can fall or several of its parts may be damaged if the jack is not positioned correctly.**

NOTICE: The machine lifting operation must be carried out while the waste container is empty.

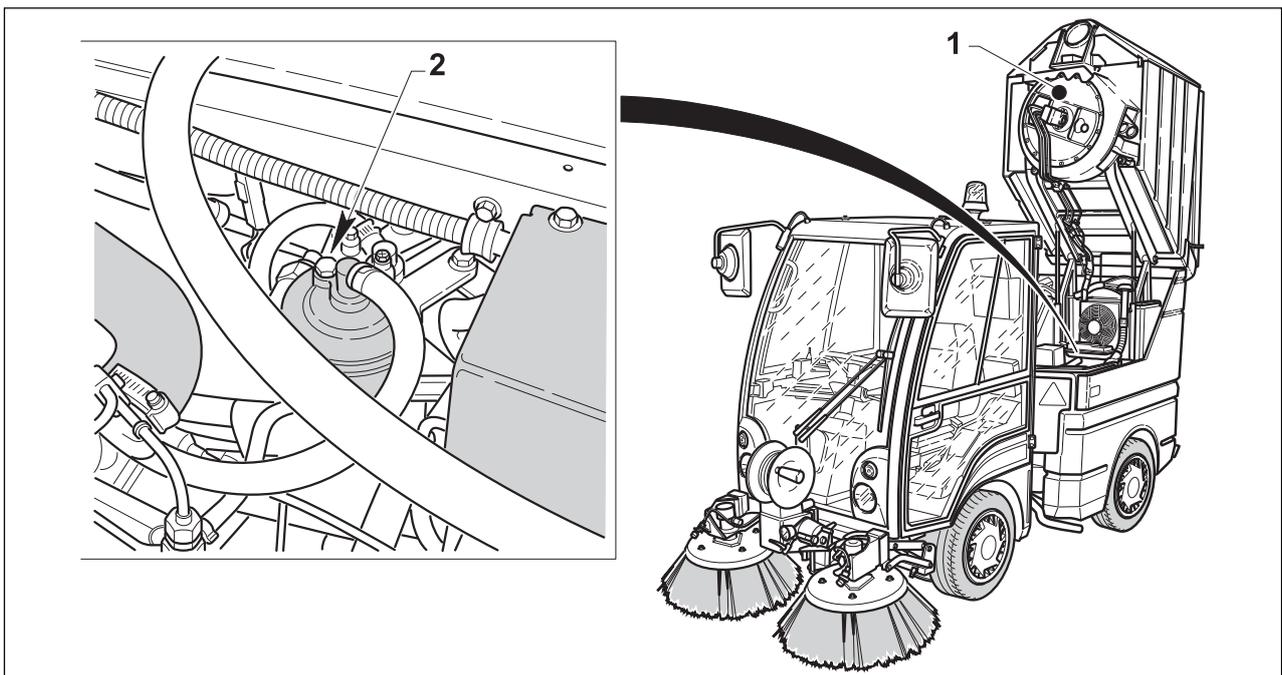
- Remove the bolts (3) of the wheel.
- Change the wheel.
- Tighten the bolts with the tightening torque indicated in the paragraph "Wheel tightening check".



6.2.b - AIR BLEEDING FROM THE GAS OIL SUPPLY CIRCUIT

In case there is no fuel left in the tank, proceed as follows before starting the engine:

- Lift the hopper (1) and secure it in place with the safety bar.
- Loosen the bleeding screw (2) on the filter.
- Activate the starter and wait until diesel oil with no air



bubbles is ejected from bleeding valve.

- Tighten the screw (2).
- Start the diesel engine.

6.2.c - LAMP REPLACEMENT

Before replacing a lamp, check that the relevant fuse is in good condition (see paragraph "Fuses Replacement").

NOTICE:

Always replace the lamp with one having the same size and power.

Front Lights:

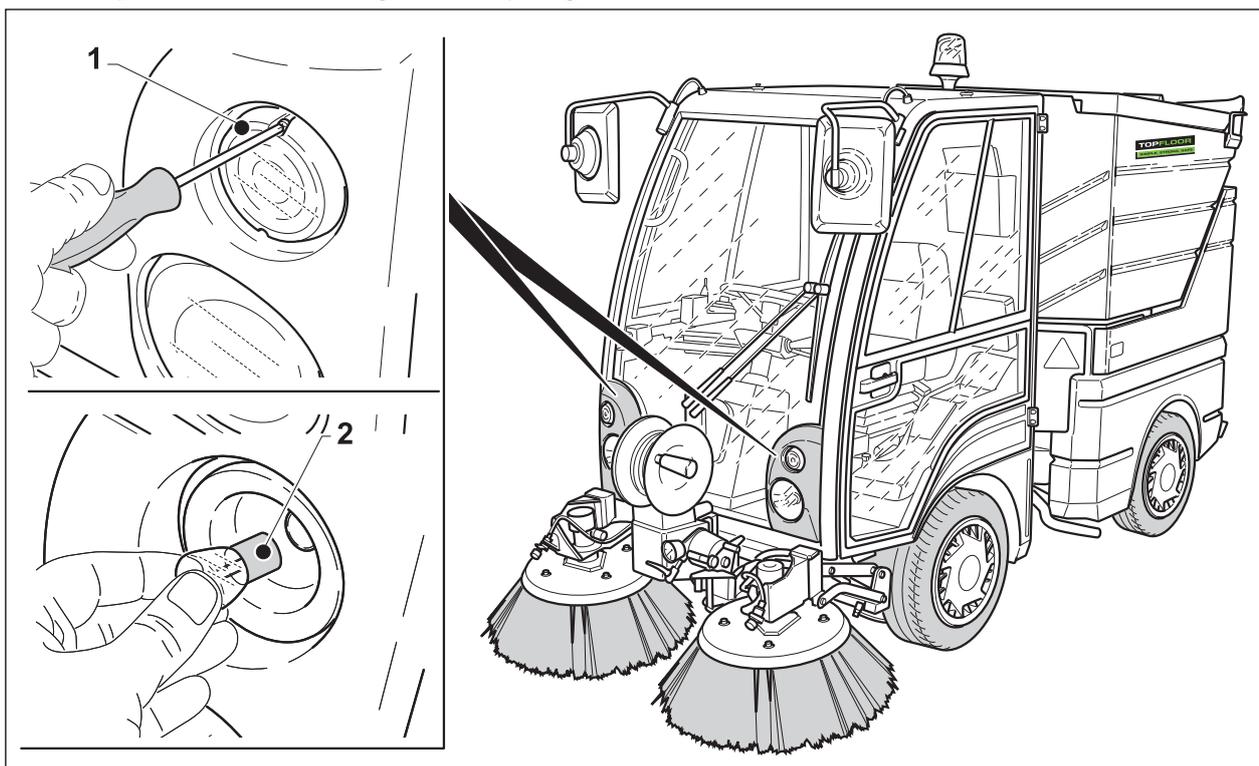
- Running lights N^o+2 lamps 12V 5W coupling IEC BA 9 s
- Lower beams/ Upper beams N^o+2 lamps 12V 45/ 40W coupling IEC P45t
- Direction indicators N^o2 lamps 12V 21W coupling IEC BA 15 s

Back Lights:

- Running lights/stop lights N^o2 lamps 12V 5/21W coupling IEC BAY 15 d
- Direction indicators N^o2 lamps 12V 21W coupling IEC BA 15 s
- Backing light N^o1 lamp 12V 21W coupling IEC BA 15 s
- Fog guard N^o1 lamp 12V 21W coupling IEC BA 15 s
- Plate light N^o+1 lamp 12V/5W

Rotating beacon:

- N^o+1 lamp 12V 55W (halogen) coupling IEC H1



Roof lamp (in the cab):

- N.º+1 lamp 12V 5W coupling IEC SV 8,5 - 8

Lateral Direction Indicators

- Unscrew the two plugs of the transparent cover (1) and remove it.
- Slightly push and turn the burnt out lamp (2) to remove from its bayonet, then replace it.

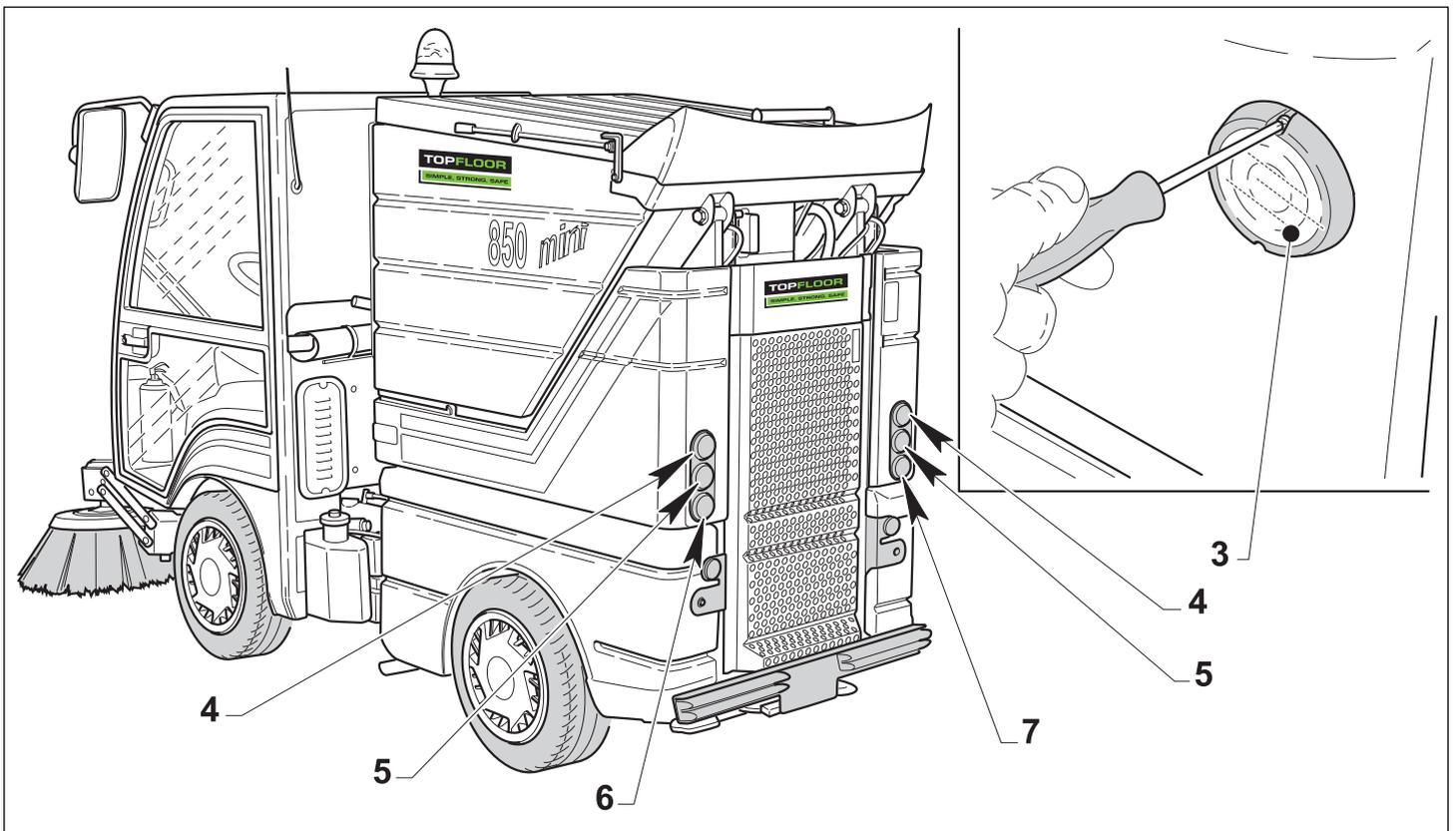
Back-up lights lamps group

- To replace one lamp in the back lights group it is necessary to remove the transparent cover (3) by unscrewing the relevant screws.
- Slightly push and turn the burnt out lamp to remove it from the bayonet coupling, then replace it.

The position of the lamps is the following:

- Lamp (4): running lights - stop lights.
- Lamp (5): direction indicator lights.
- Lamp (6): fog-guard light.
- Lamp (7): back-up light.

- Reassemble the transparent cover (3) by screwing back the relevant screws.



Front lights Lamps group

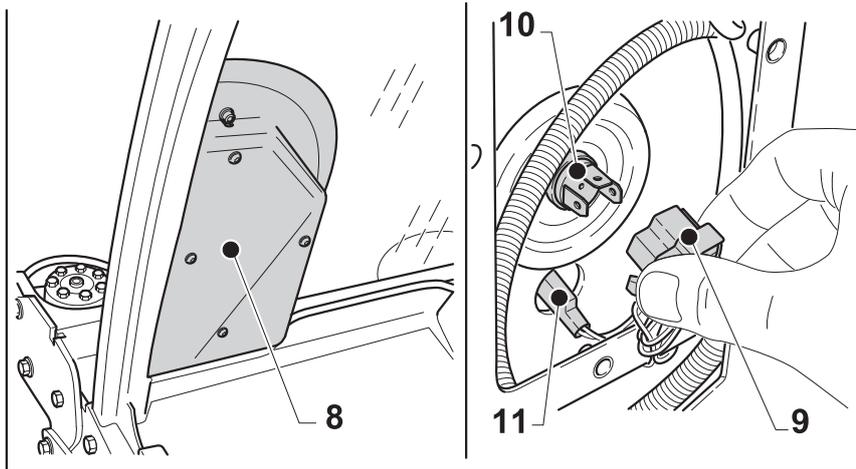
- Remove the cover (8) by unscrewing the relevant screws.

Low beams lamp

- Remove the coupling (9) and remove the lamp (10)

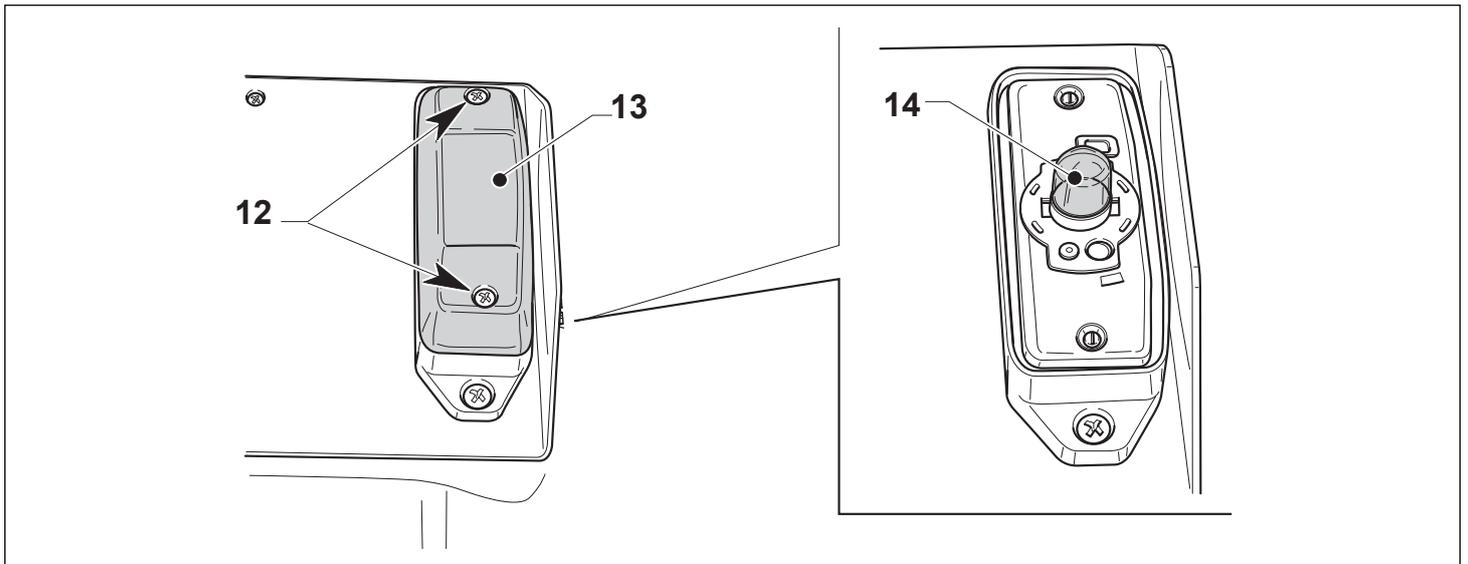
Running lights lamp

- Detach the faston (11) and remove the lamp.



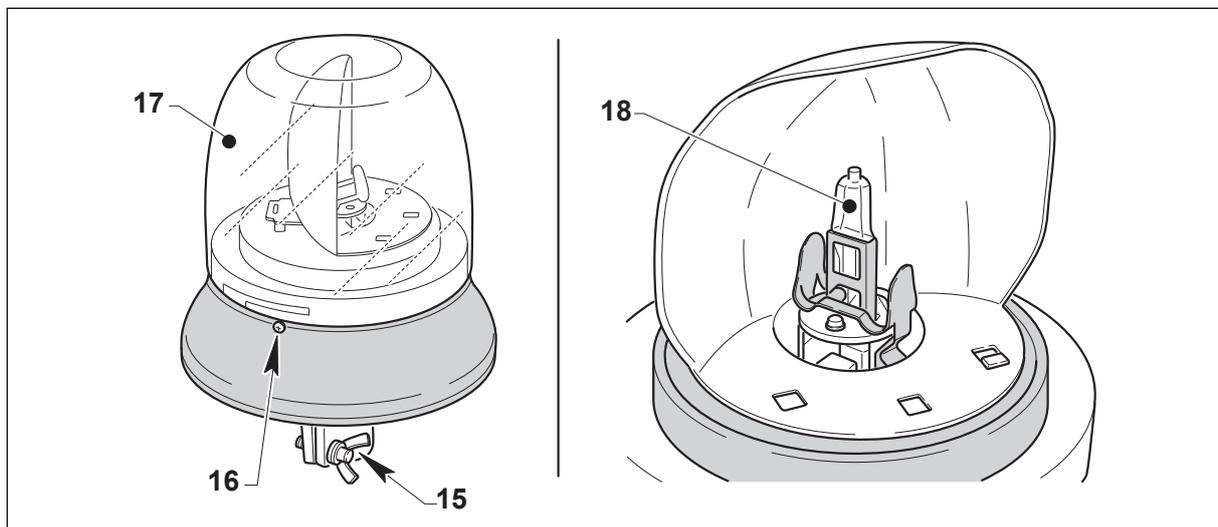
License plate holder lamp

- Unscrew the screws (12) and remove the cover (13).
- Slightly push and rotate the burnt-out lamp (14) to remove it from the bayonet socket and replace it with a new one.
- Reassemble the cover (13) by paying attention to correctly position the gasket.
- Screw again the screws (12).



Rotating beacon lamp

- Remove the rotating beacon from the machine by loosening the wing nut (15).
- Unscrew the screw (16), slightly turn and remove the transparent cover (17).
- Do not touch the lamp bare hands, wear gloves.
- Remove the burnt out lamp (18), then replace it with a new one.
- Reassemble the transparent cover (17), by paying attention to properly fit back the relevant gasket.
- Screw again the screws (16).
- Reassemble the rotating beacon onto the machine.



6.2.d - REPLACEMENT OF FUSES AND RELAYS IN CAB

⚠ WARNING:

Fire Hazard. Never replace a burnt-out fuse with wire or other metal. Always use only an intact fuse with the same amperage.

Never replace a burnt-out fuse with another one having a higher amperage.

Before replacing a fuse, stop all the machine's functions and remove the ignition key.

Should a replaced fuse burn-out over again, that is an indicator of a problem with your electrical system, call an authorized assistance center.

Never tamper with the machine's electric system.

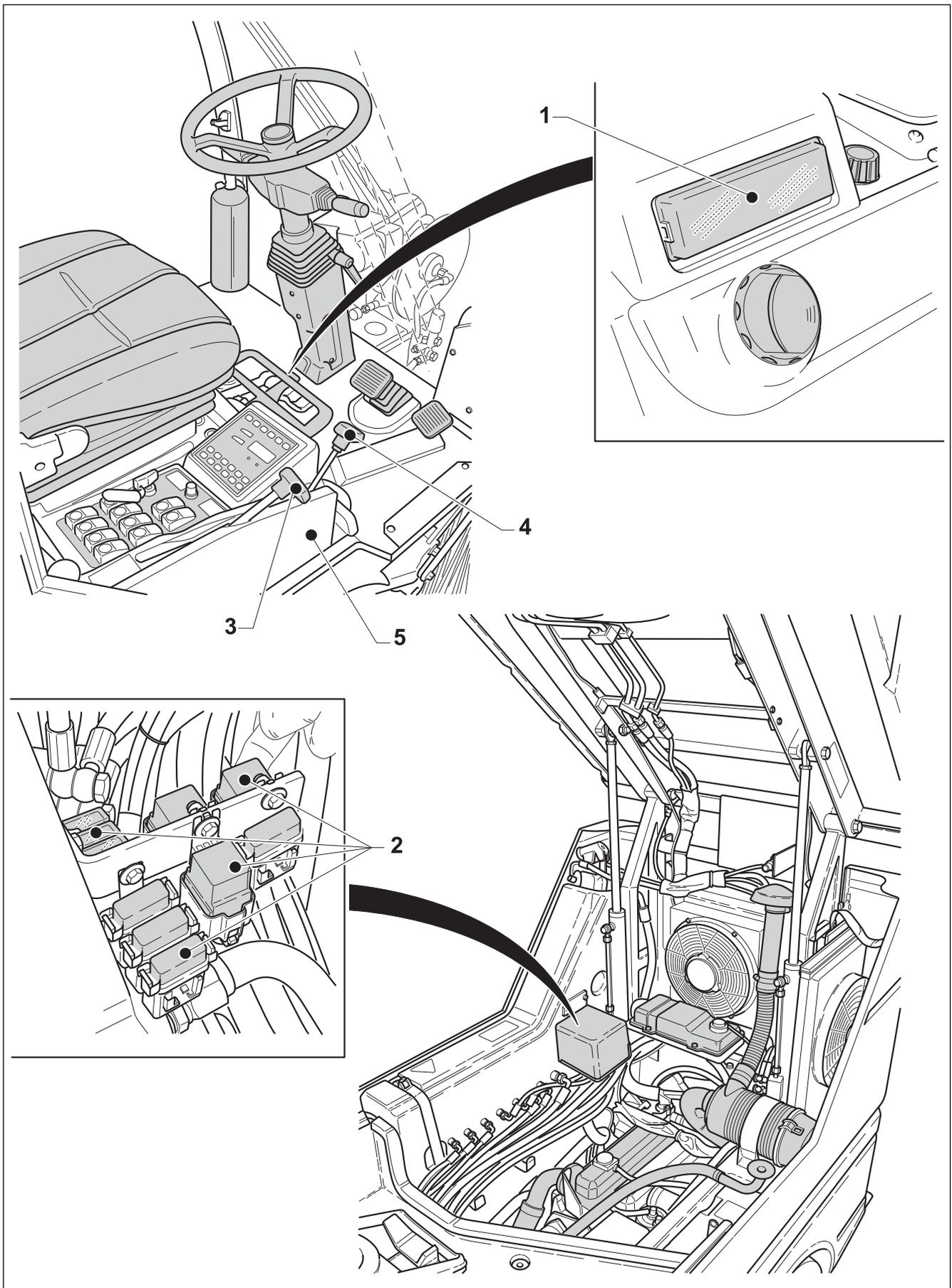
Turn off the machine and carry out maintenance preliminary operations.

The fuses are positioned inside the driver's cab under the cover (1) and under the waste hopper on the back of the machine on the right hand side (Fuses and relays 2).

Other relays are positioned under the casing (5) of the control dashboard.

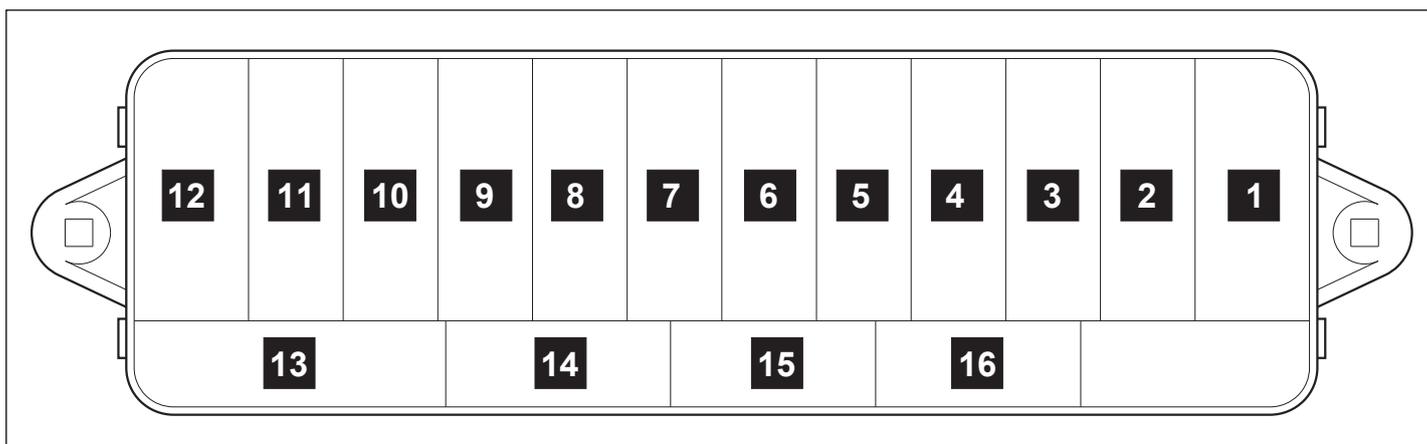
In order to access them:

- 1) Unscrew the knobs (3) and (4)
- 2) Unscrew the screws clamping the casing (5) and remove it.



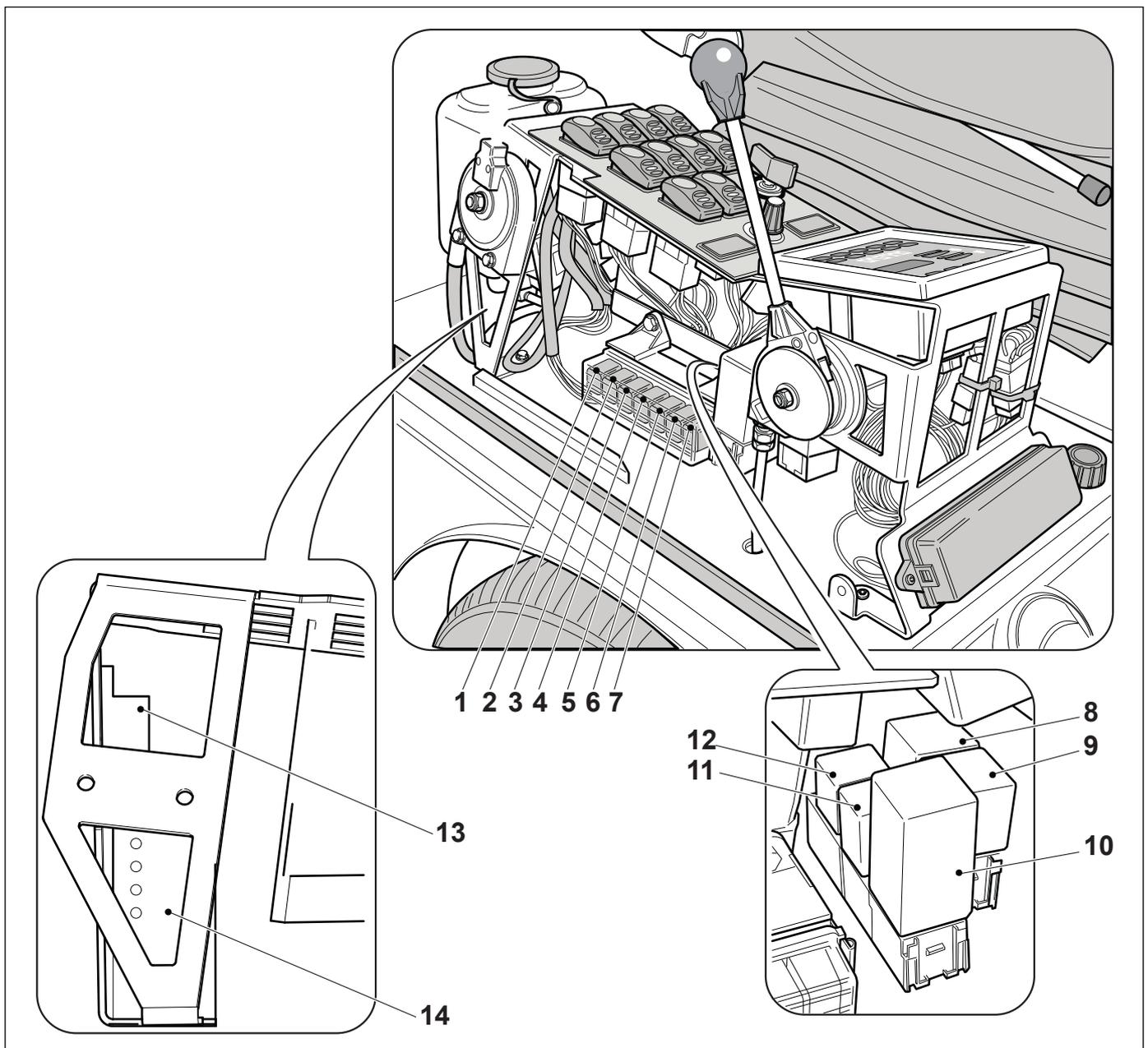
Fuses position and function
Protection

1=	Running lights	5A
	Front running lamp	
	Plate lamp	
	Back running lamp	
2=	Running lights	5A
	Front position lamp	
	Back position lamp	
3=	Brooms descent-rise-rotation	
	Solenoid valve	10A
4=	Vacuum motor	10A
	Brushes range	
	Hopper tilting-descent	
5=	Forward running	10A
	Gear switch	
	Digital multi-function panel	
6=	Emergency lights	10A
	Emergency lights control	
7=	Stop	10A
	Stop lamp	
	Horn	
8=	High beams lamp	15A
9=	Dipped headlight lamp	15A
10=	Alternator	10A
	Motor electric stop	
	Oil solenoid valve relay	
11=	Water recovery	10A
12=	Direction indicators	7,5A
13=	Water pump	10A
14=	Electric fan	20A
15=	Windscreen wiper	15A
16=	Blinker	15A
	Driver's cab roof lamp	



Relays in cabin

1. Brushes lifting relay
2. Low-beam headlight relay
3. High beams relay
4. Rotating beacon relay
5. Stoplight relay
6. Brushes lowering relay
7. Water pup relay
8. Safety general bistable relay
9. Intermittence relay
10. Timer relay
11. Rear fog light bistable relay
12. Start safety relay
13. Glow plugs control unit
14. Electronic regulator for electrovalve

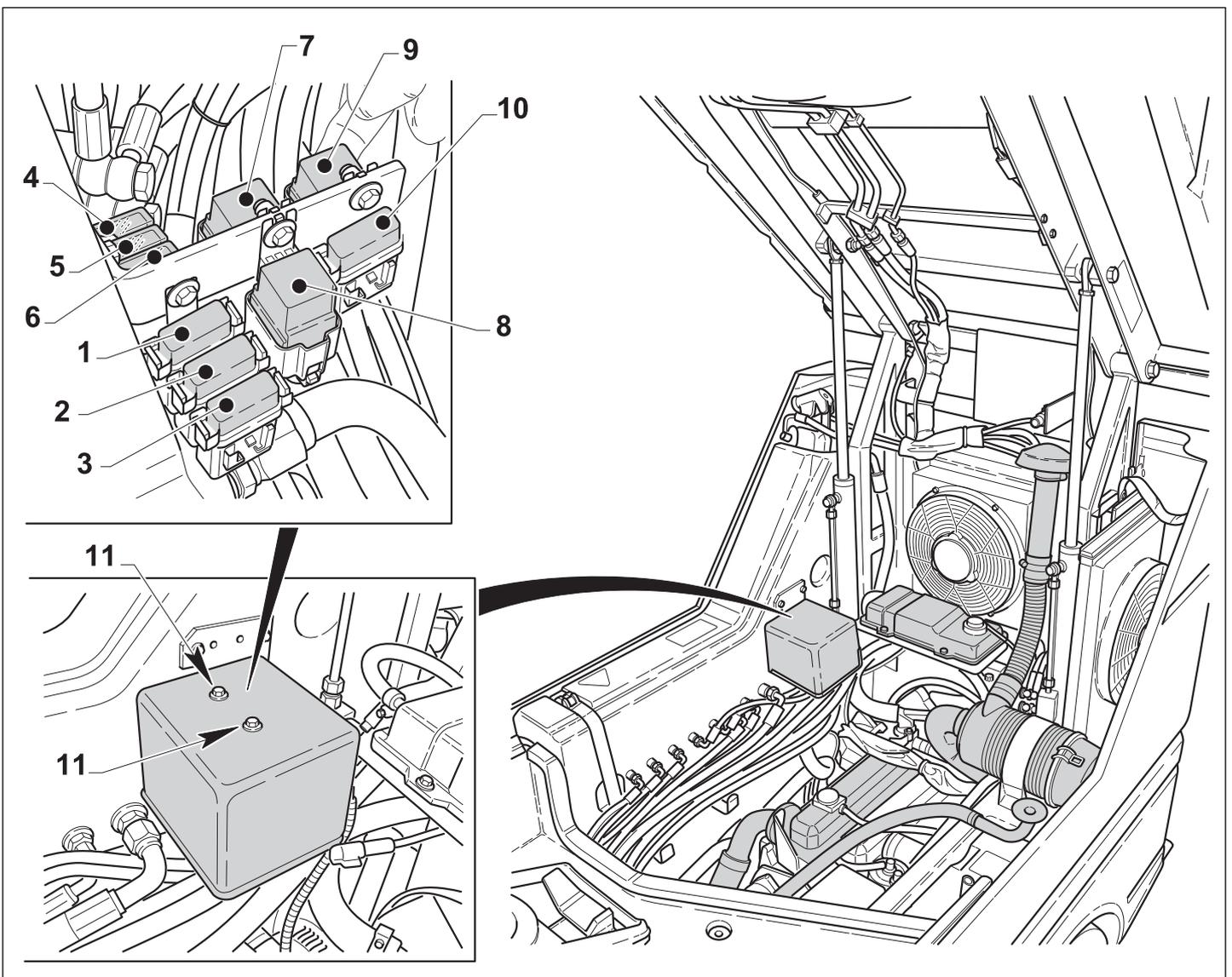


Engine fuses and relay replacement

- Lift the hopper to have access to the fuses (1), (2), (3), (4), (5) and (6) and to the relays 87), (8) and (9); secure the hopper in place with the safety bar.
- Remove the safety guard by undoing the two screws (11).

Position and values of fuses and relays

- | | | |
|------|---------------------------------------|-----|
| 1 = | Glow plug fuse | 40A |
| 2 = | Lights general fuse | 40A |
| 3 = | Fuse + battery | 40A |
| 4 = | Electrostop fuse | 30A |
| 5 = | A/C electrofan fuse | 20A |
| 6 = | Hydraulic oil electrofan fuse | 20A |
| 7 = | A/C fan relay | |
| 8 = | Hydraulic oil fan relay | |
| 9 = | Glow plug relay | |
| 10 = | Cold starting electrovalve fuse | 5A |



6.2.e - SERVICE FOR HYDRUALIC BLOCK

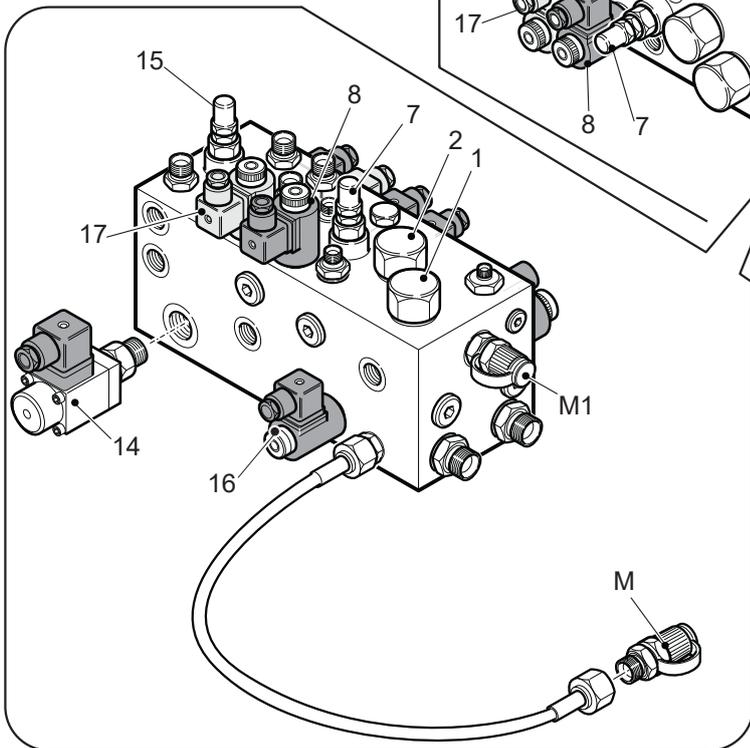
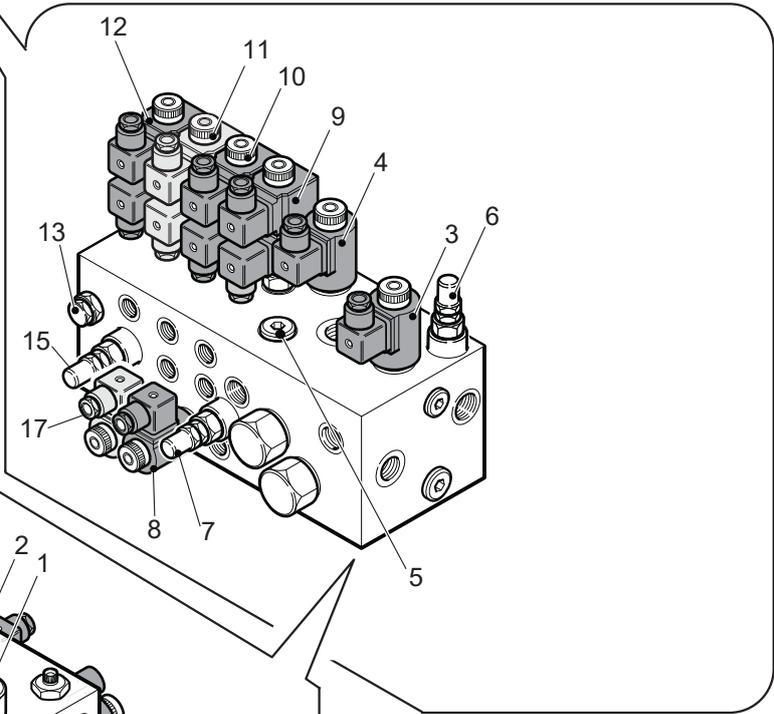
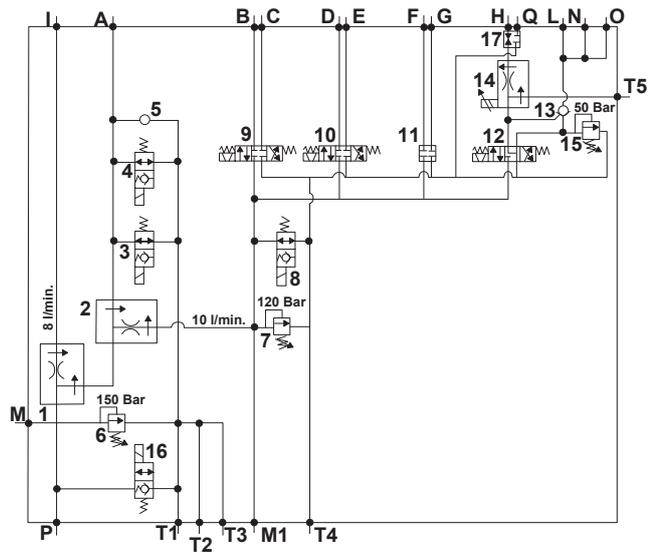
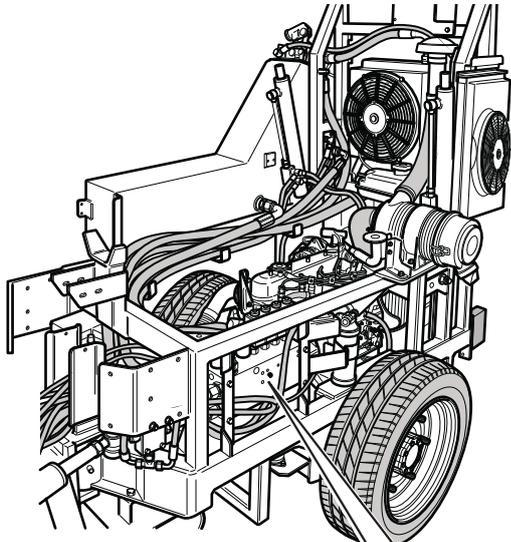
Hydraulic block in the picture with 12Volt coils:

- 1) priority valve with 2,8 mm diaphragm, adjusted at 8 l/1': flow oil to power steering;
- 2) priority valve with 3 mm diaphragm, adjusted at 10 l/1': flow oil to brushes;
- 3-4) 2 ways N.O. electrovalves, the number (4) is temporized with 3 seconds late closing for turbine circuit;
- 5) non return valve;
- 6) safety valve, adjusted at 160bar. See below;
- 7) safety valve, adjusted at 120 bar. See below;
- 8) 2 ways N.O. common electrovalve, for cylinders and brushes circuit. This valve must be energized together with one of 9,10,11,12 electrovalve. If this electrovalve is not energized, the services do not work;
- 9) electrovalve for container lifting cylinder;
- 10) electrovalve for right brush cylinder;
- 11) electrovalve for left brush cylinder (OPT);
- 12) electrovalve for side brushes rotation, waste intake duct lifting cylinder and right&left brushes lifting cylinders;
- 13) piloted non return valve for waste intake duct and side brushes lowering;
- 14) oil flow adjusting valve for brushes with electric adjusting;
- 15) safety valve adjusted at 50 bar for pressure check of side brushes and waste intake duct lifting cylinders;
- 16) valve to favour cold start: it opens only upon the diesel engine start, then it closes again;
- 17) electric valve for brushes rotation direction change (OPT).

Pressure check of safety valves:

Valve 6: safety valve, inlet pressure: max pressure 160 bar; through a manometer fitted on the hydraulic hose position M. Remove the cap and unscrew the locknut; screw to increase the pressure and viceversa.

Valve 7: safety valve, services pressure: max pressure 120 bar; through a manometer fitted on the connection M1. See above for regulation.



6.3 - SCHEDULED MAINTENANCE

Some of the routine maintenance operations may be carried out by the technical engineer of your company but some others need instead to be carried out by the specialized after-sales service centre. For these operations, please refer to the operation tables given below.

NOTICE:

In case of use in dusty environments, at very low temperatures and for particularly heavy duties, it is necessary to reduce the interval between the various interventions of routine maintenance. Consult your dealer to set a schedule that is best for you.

Scheduled maintenance operations are divided into three main groups:

- 1) Daily maintenance **EVERY 8 HOURS**
- 2) Weekly maintenance **EVERY 40 HOURS**
- 3) Periodic maintenance **EVERY 250 HOURS**

Maintenance interventions tables indicate the maintenance intervals expressed in hours of operation indicated on the hour counter.

NOTICE:

This paragraph outlines some maintenance operations that shall be carried out on the engine. For further information, please follow the instructions provided in the engine manual, a copy of which is supplied with each machine.

6.4 - DAILY MAINTENANCE

Table of maintenance interventions to be carried out every 8 hours

Operation	hours	authorized pers.		Paragraph ref.
	Every 8	TA	CA	
Drain the water system in case of frost	●	●		6.4.a
Engine air filter cleaning	●	●		6.4.d
Engine radiator cleaning	●	●		6.4.b
Hydraulic oil radiator cleaning	●	●		6.4.c
Hopper and filter cleaning	●	●		6.4.e
Suction hose and waste intake duct cleaning	●	●		6.4.f
Check for possible material wrapped around and hence hindering the side brushes	●	●		6.4.g
Tray filter cleaning (OPT)	●	●		6.4.h

TA = Company technician

CA = Authorized service center.

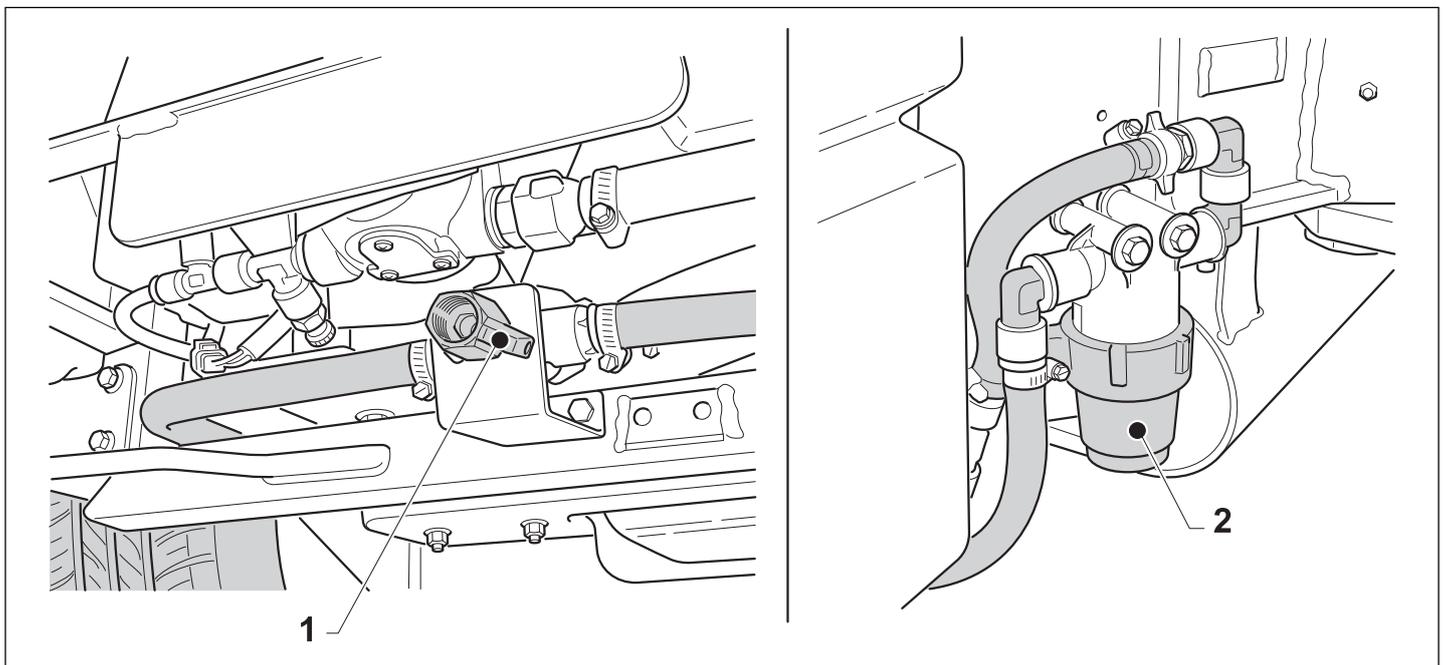
6.4.a - DRAIN THE WATER SYSTEM IN CASE OF FROST

In order to drain water from the system:

- Open the water draining valve (1).
- Remove the cover (2) of the filter.
- Start the electric pump for a few seconds.

! WARNING:

If the machine is equipped with high pressure pump, follow the instruction in chapter 5 to drain the water from the pump.



6.4.b - ENGINE RADIATOR CLEANING

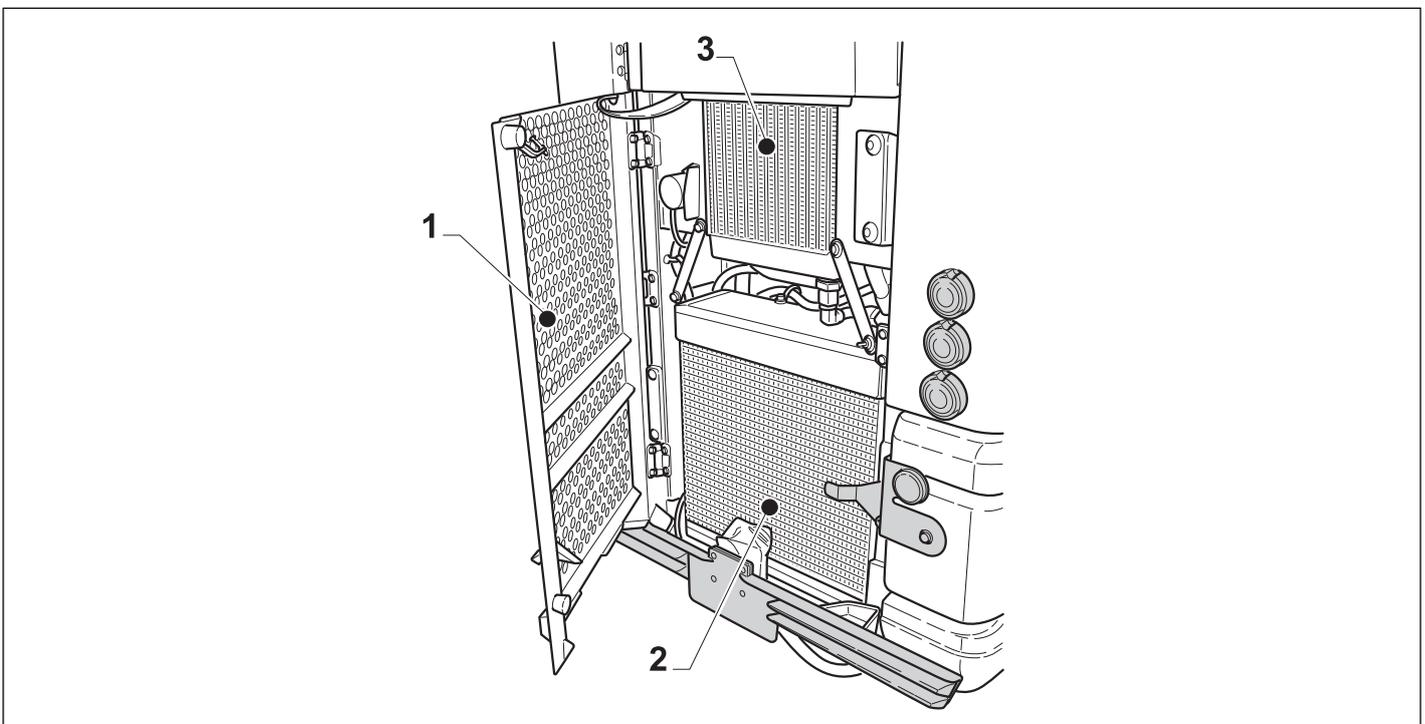
As to general cleaning rules, please refer to CHAPTER 1. Machine cleaning depends upon employment and working environment.

- Open the rear door (1) and clean the engine radiator (2) using medium pressure compressed air.

6.4.c - HYDRAULIC OIL RADIATOR CLEANING

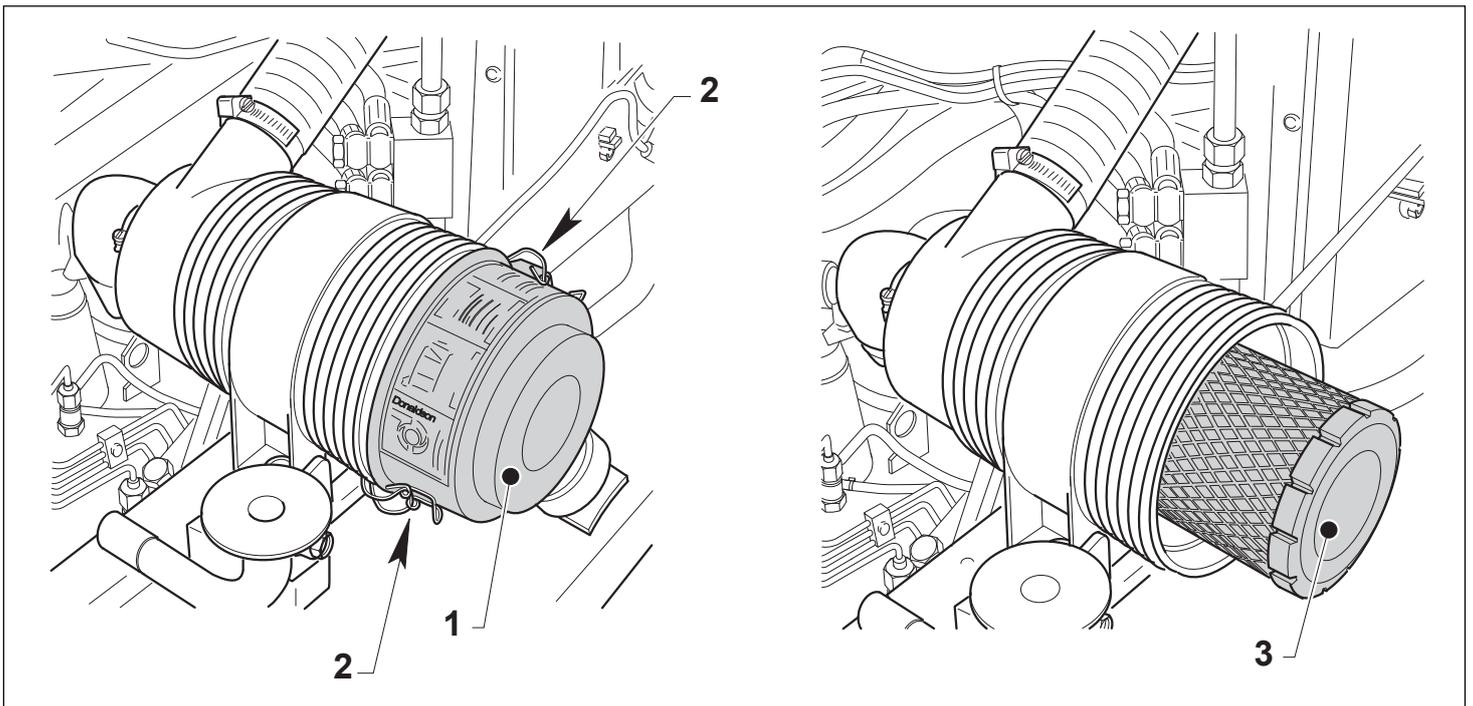
As to general cleaning rules, please refer to CHAPTER 1. Machine cleaning depends upon employment and working environment.

- Open the door (1) as indicated in the relative chapter.
- Clean the hydraulic oil radiator (3) using medium pressure compressed air.



6.4.d - ENGINE AIR FILTER CLEANING

- Lift the hopper and secure it in place with the safety bar.
- Remove the filter cover (1) releasing the hooks (2).
- Remove the filter cartridge (3).
- Clean or replace the filter cartridge and reassemble everything following the opposite procedure, make sure that the cartridge rubber gasket is in good condition.
- To clean use light pressure air, blowing from the inside to the outside.



6.4.e - HOPPER AND FILTER CLEANING

Lift the hopper (1) and secure it in place with the safety bar; lift the cover (2) and lock it by the rod (3).

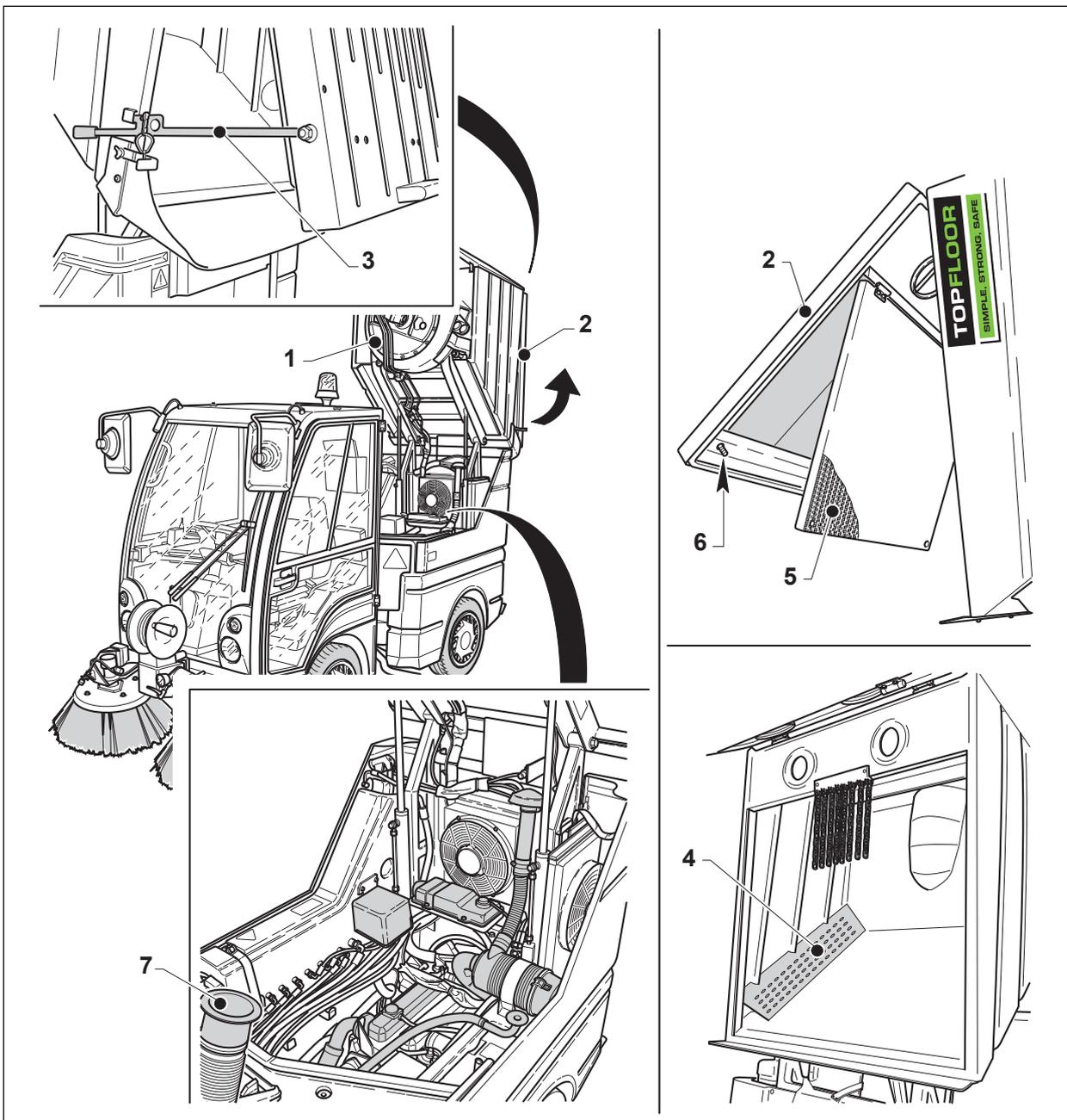
Use a hose to clean inside the hopper, and in particular the perforated plate filter (4). Release the intake filter (5) from the pins (6) and wash it carefully.

Allow the intake filter (5) to drip dry completely, reassemble the parts and lower the hopper.

6.4.f - SUCTION HOSE AND WASTE INTAKE DUCT CLEANING

Lift the hopper (1) and secure it in place with the safety bar.

Clean the waste intake duct (7) with a hose and the suction hose through the waste intake duct (7).



Drain and lower the hopper.

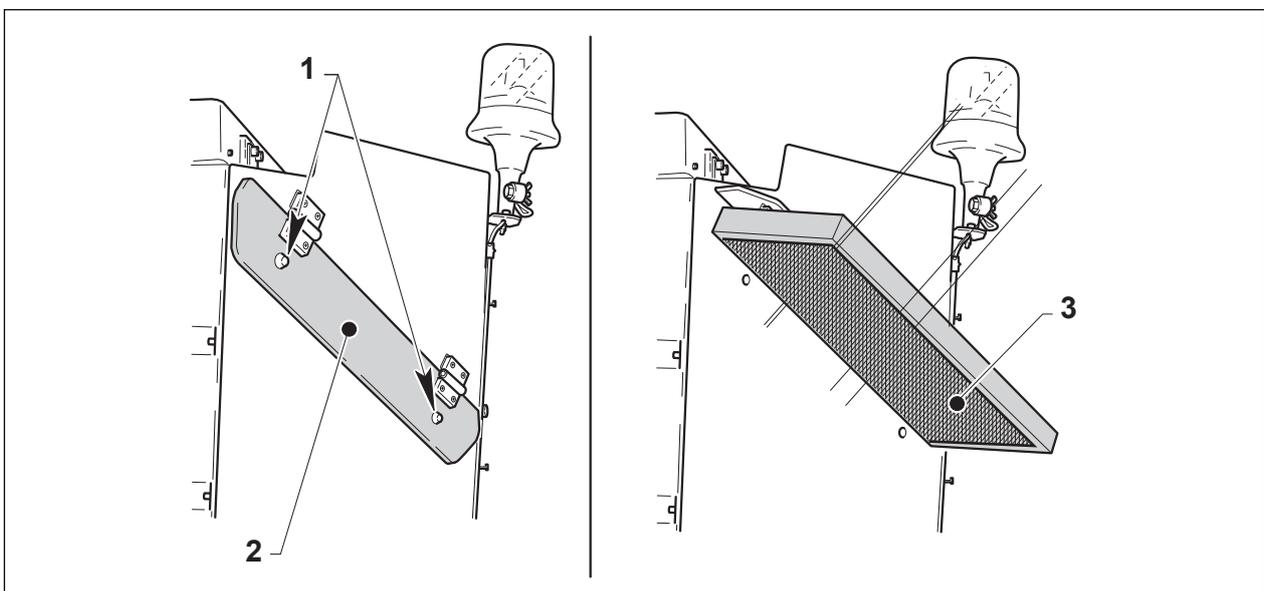
6.4.g - CHECK FOR POSSIBLE MATERIAL WRAPPED AROUND AND HENCE HINDERING THE SIDE BRUSHES

Visually check that no material is wrapped on the side brushes (1), which will interfere with their operation.



6.4.h - TRAY FILTER CLEANING (OPT)

- Use the key to unlock locks (1), lift the cover (2) and remove the filter (3).
- Clean the filter (3) with compressed air and reassemble it following a sequence opposite to that of the disassembly.



**6.5 - WEEKLY
MAINTENANCE**

EVERY 40 HOURS

Table of maintenance interventions to be carried out every 40 hours

Operation	hours	authorized per		Paragraph ref.
	every 40	TA	CA	
Hydraulic oil level check	●	●		Chapter 5
Engine oil level check	●	●		Chapter 5
Coolant level check	●	●		Chapter 5
Tire pressure check	●	●		6.5.a
Wheel tightening check	●	●		6.5.b
Battery electrolyte level check	●	●		6.5.c
Brooms efficiency check (inclination and length of bristles)	●	●		6.5.d
Water filter cleaning	●	●		6.5.f
Sprinkling nozzles cleaning	●	●		6.5.g
Brake fluid level check	●	●		6.5.h
General greasing	●	●		6.5.i
Check of oil leaks from fittings	●	●		6.5.l

TA = Company technician

CA = Authorized service center.

6.5.a - TIRE PRESSURE CHECK

- Check the integrity and the pressure of the tyres.

! **WARNING:**

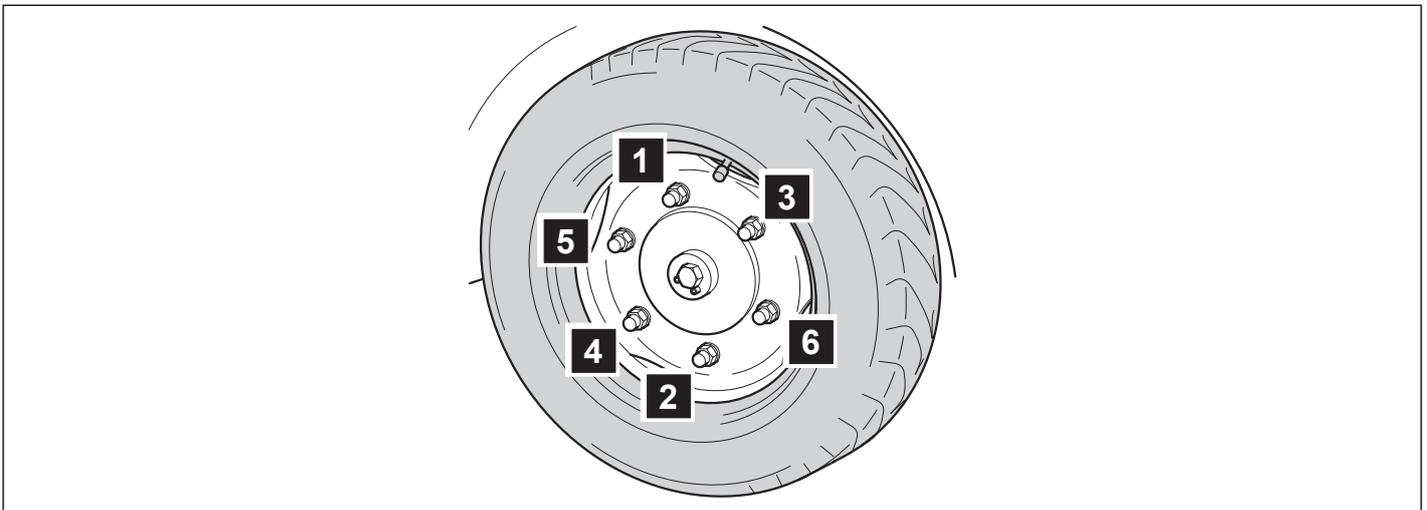
**Never exceed the indicated tire pressures. Risk of tire explosion.
Stand to the side of the tire while adding air.**

Check tire pressure according to the 'Supplies' table at the end of this chapter.

6.5.b - WHEEL TIGHTENING CHECK

- The tightening of wheel nuts has to be checked according to the time intervals indicated in the previous maintenance table and when you replace a wheel.
- For wheel replacement modes see chapter (6.2.a).
- Figures shows the tightening order of the wheel nuts.
- Nuts have to be tightened with a torque wrench setting of 300 Nm.

NOTICE: The indicated torque wrench settings are meant for clean screws, degreased and without lubricants.



6.5.c - BATTERY ELECTROLYTE LEVEL CHECK

Check that the level of the starting battery electrolyte is correct.
If necessary, top up as indicated in the battery instructions.

6.5.d - BRUSHES EFFICIENCY CHECK (INCLINATION AND LENGTH OF BRISTLES)

The side brushes collect waste and sweep it to the middle where it is vacuumed by the waste intake duct. The brushes tilting may be mechanically adjusted. The brushes may yield in order to avoid breakings in case of impact against a fixed obstacle.

WARNING:

The brushes must touch the ground (“ground contact zone”) as indicated in the picture only with the front side and never with its rear side.

6.5.d.a - Brushes adjustment

Brushes tend to wear after continuous use, therefore you periodically need to adjust them to maintain a correct ground contact zone.

For every broom, you can adjust:

- the front tilt;
- the side tilt.

Lateral tilting

- loosen the screw (1).
- turn the support (2) of the brushes (3) so that the external edge of the brushes is lower than the inner one.
- tighten the screw (1).

Frontal tilting

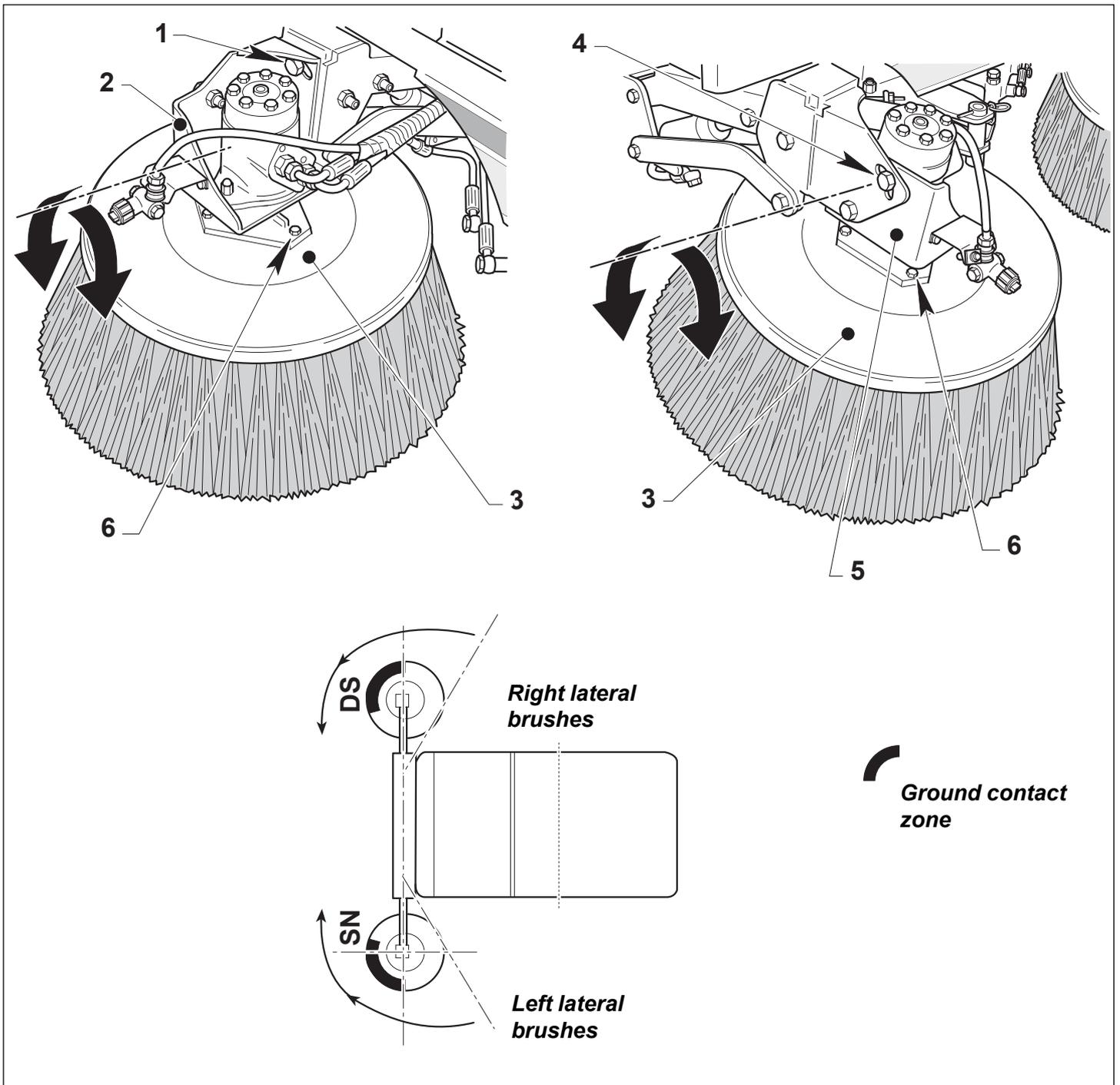
- loosen the screw (4).
- Rotate the support (5) so that the front edge is lower than the back one.
- tighten the screw (4).

6.5.e - LATERAL BRUSHES REPLACEMENT

The brushes must be replaced when the bristle are 6 cm long.

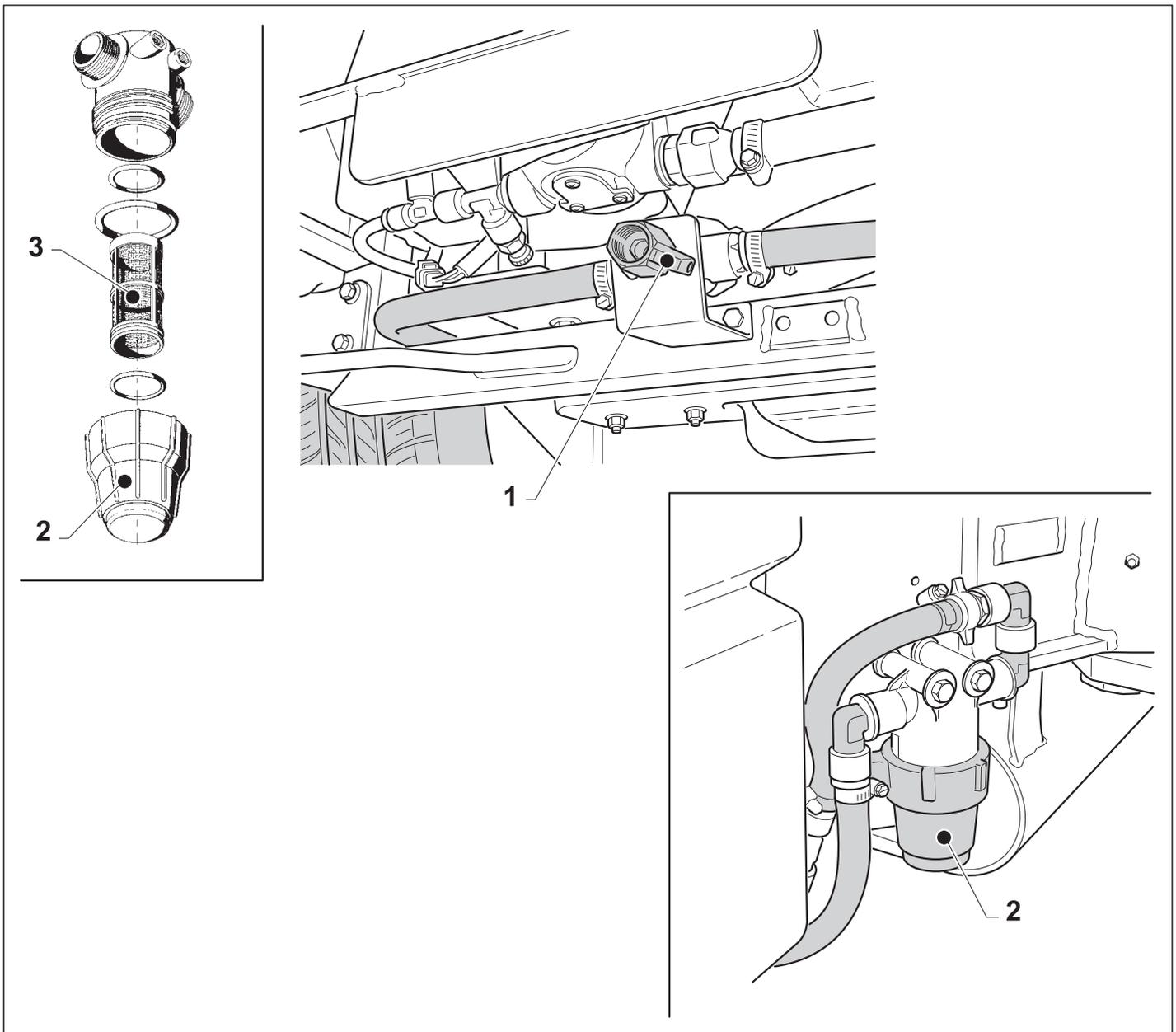
Standard brushes

- Remove the three screws (6) and remove the brushes (3).
- Mount the new brushes by reassembling the screws (6).



6.5.f - WATER FILTER CLEANING

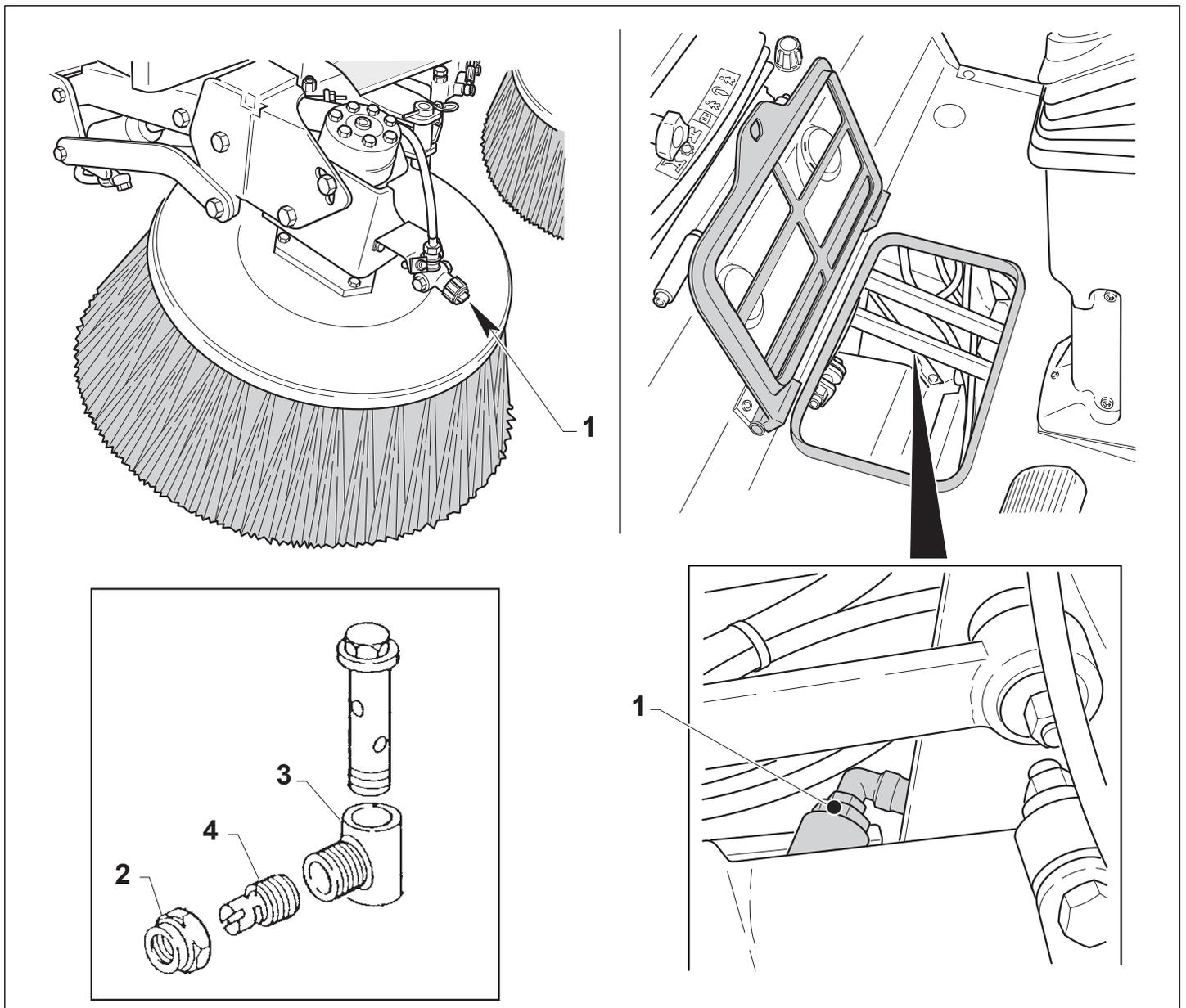
- Open the valve (1) to completely drain water from the tank.
- Unscrew the cover (2) and remove the cartridge (3).
- Clean the cartridge (3) with a compressed air jet.
- Reassemble all the parts in the reverse order.
- The cleaning of the filter is to be carried out at the intervals indicated in the table and when a sprinkling water pressure reduction is detected.
- It is necessary to use water from the waterworks to fill the tank.



6.5.g - CLEANING OF THE WATERING NOZZLES

The sprinkling nozzles need to be cleaned when the flow of water is inadequate.

- Disassemble the nozzles (1) from the side brushes and from waste intake duct by unscrewing the ring nut (2) from the nozzle holder (3) then remove the nozzle (4).
- If it is necessary, clean them with compressed air or with a anti-scale liquid or also mechanically, through an iron wire (1 mm diam.).
- Then reassemble them by replacing, if needed, the teflon gasket.
- Replace the nozzles when they are excessively worn out and their jet is irregular.

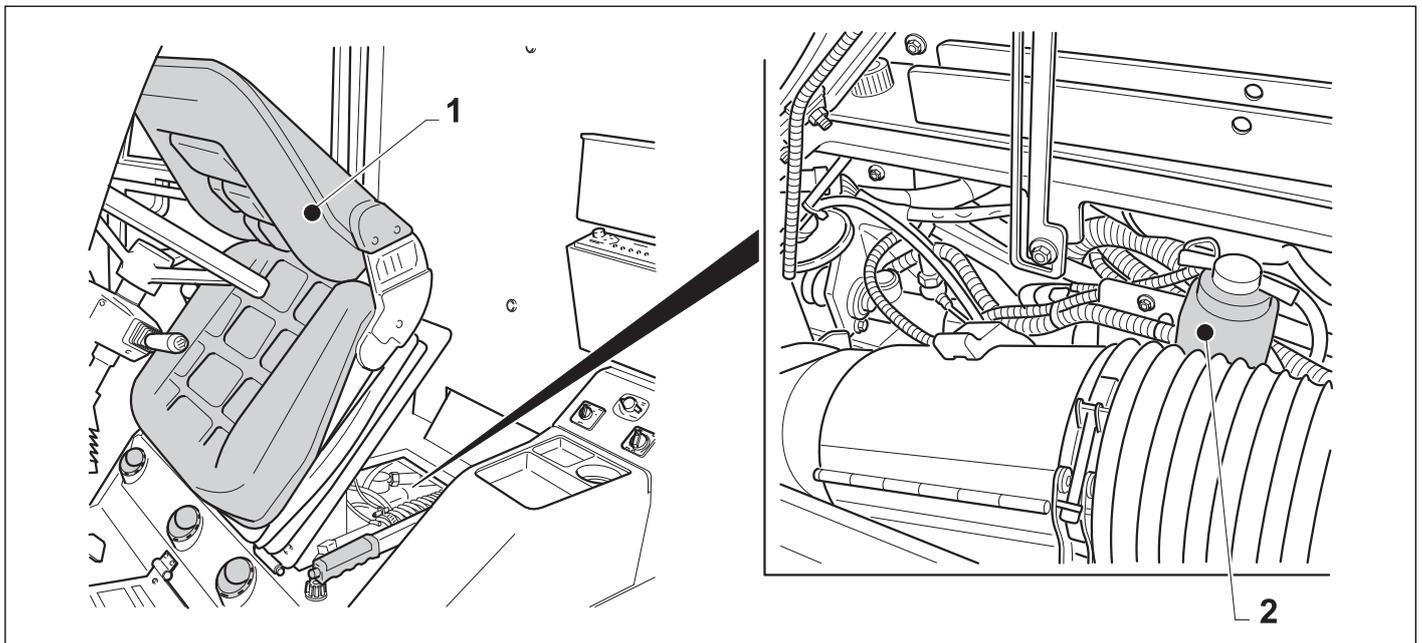


6.5.h - BRAKE FLUID LEVEL CHECK

- Lift the seat (1).
- Make sure the brake fluid level in the tank (2) ranges within the two "MIN" and "MAX" notches.
- In case of replenishment, use the brake fluid indicated in the refuelling table.

! WARNING:

Another type of fluid may damage the braking system, causing loss of control of the vehicle, an accident, personal injury or death.

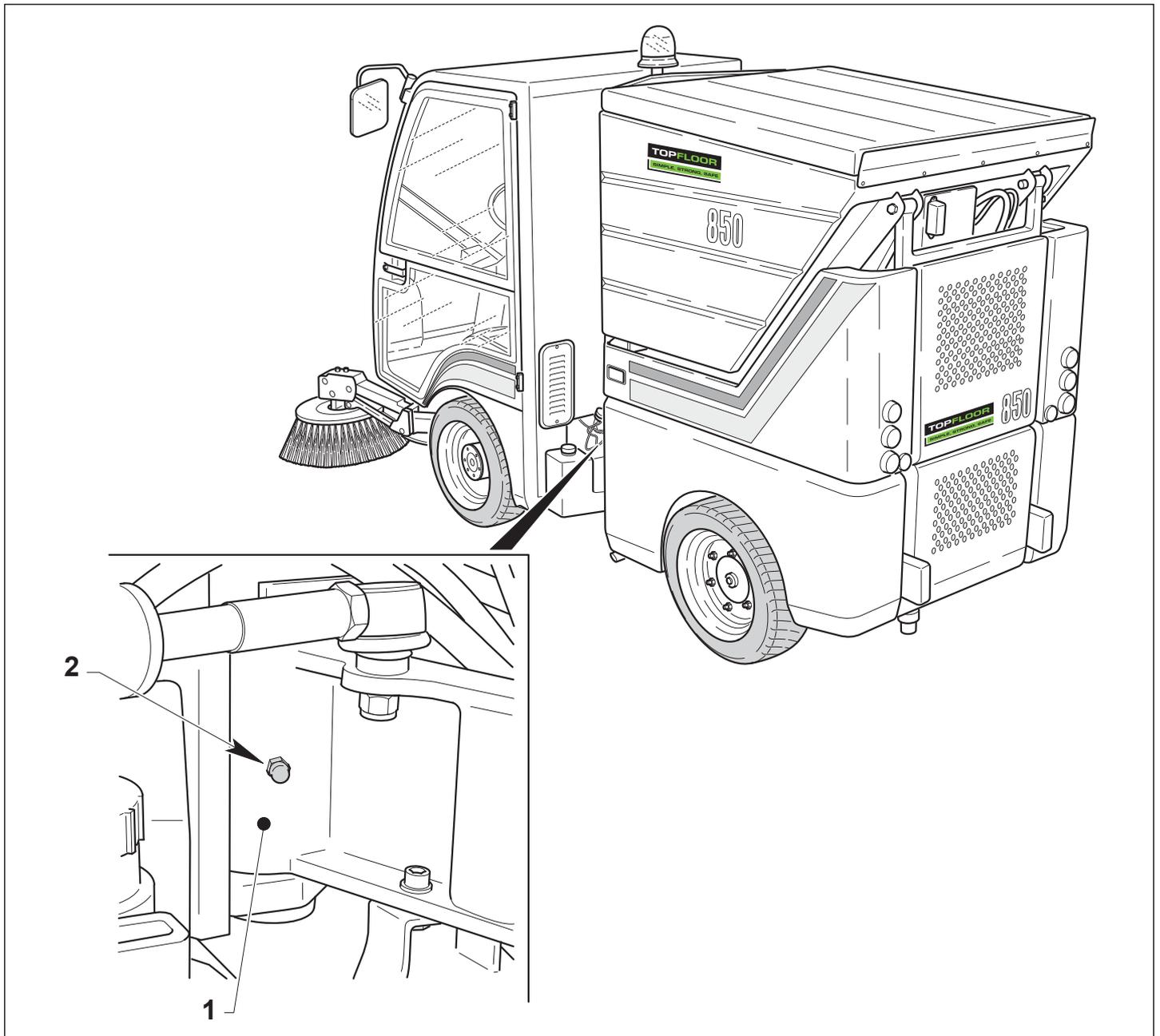


6.5.i - GENERAL GREASING

Accurately clean the head of the lubricator before pumping grease.

The point to be lubricated with a grease gun (2) is the central articulation (1).

For the type of grease to be used please refer to the refuelling table.



6.5.I - CHECK OF OIL LEAKS FROM FITTINGS

Visually confirm that no leak from the hydraulic circuit fittings is present.

In case oil leaks are detected, tighten the fittings, if the problem continues, contact the Technical service.

**6.6 - PERIODIC
MAINTENANCE**

EVERY 250 HOURS

Table of maintenance interventions to be carried out every 250 hours

Operation	hours				authorized per		Paragraph ref.
	Every 250	Every 500	Every 1000	Every 1500	TA	CA	
Engine oil replacement (<u>first replacement after 50 hours</u>)	●					●	6.6.a
Engine oil filter replacement (<u>first replacement after 50 hours</u>)	●					●	6.6.b
Replacing the prefilter and diesel oil filter	●					●	6.6.c
Engine air filter replacement		●				●	6.4.d
Hydraulic oil filter replacement		●				●	6.6.d
Cab filter cleaning and/or replacement		●				●	6.6.e
Parking brake check and adjustment		●				●	
Alternator belt tension check		●				●	6.6.f
High-pressure pump oil replacement (OPT)		●				●	
Valves and valve rockers backlash check			●			●	
Alternator belt replacement			●			●	
Injectors check and cleaning			●			●	
Hydraulic oil change				●		●	

TA = Company technician

CA = Authorized service center.

NOTICE:

For specific maintenance operations to be carried out on the motor, see the Use and Maintenance manual of the motor coming with the machine.

NOTICE:

As to periodical maintenance operations apply to an authorised service center.

6.6.a - ENGINE OIL REPLACEMENT

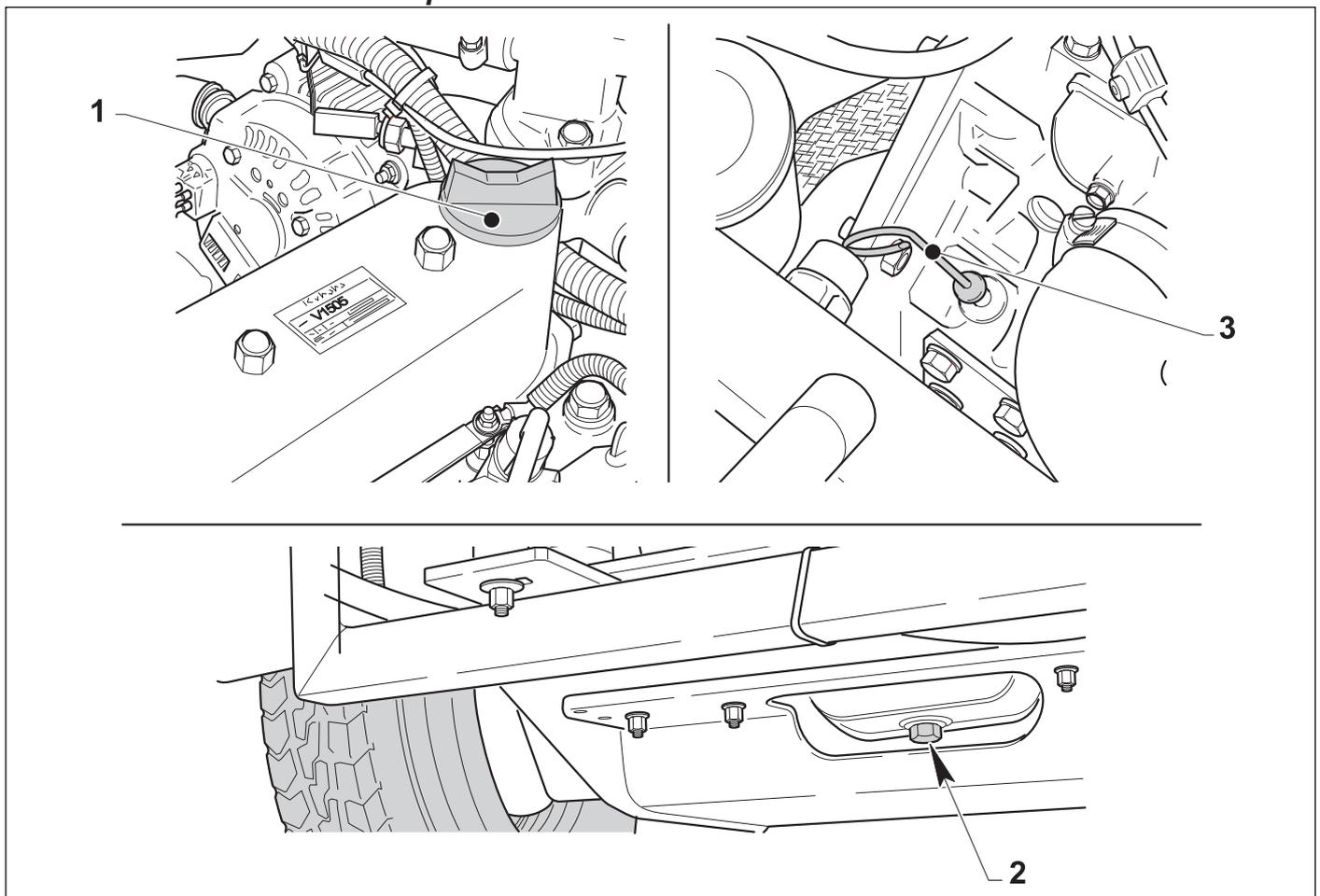
⚠ WARNING:

This operation must be performed with hot engine. Wear appropriate personal protective equipment and follow safe work practices.

- Lift the hopper and secure it in place with the safety bar.
- Position a receptacle of adequate capacity under the motor to collect the oil.
- Remove the oil inlet cap (1) and the cap (2) located under the engine.
- Wait that the oil is completely drained, then close the drain cap (2) and add the oil through the upper cap (1).
- Wait a few minutes so that the oil can flow to the pan, then check its level with the dip stick (3).
- Reassemble everything in the opposite way.

NOTICE:

For the oil type to be used and the quantity to add, please refer to the "refuelling table" at the end of this chapter.

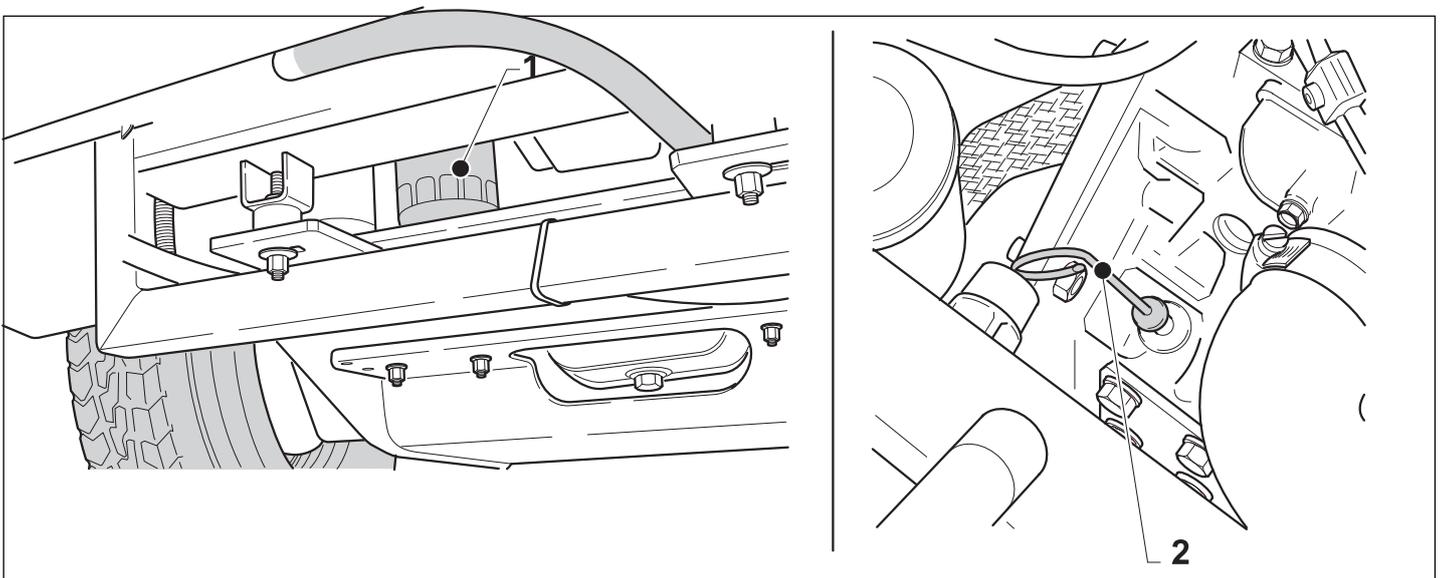


6.6.b - ENGINE OIL FILTER REPLACEMENT

⚠ WARNING:

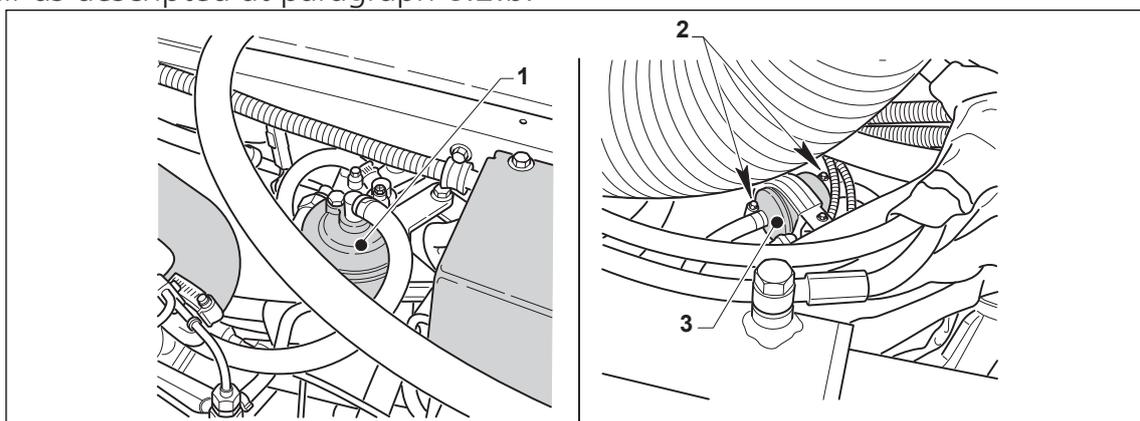
This operation must be performed with hot engine. Wear appropriate personal protective equipment and follow safe work practices.

- Lift the hopper and secure it in place with the safety bar.
- Place a container under the oil filter (1).
- Unscrew the oil filter (1) and remove it.
- Lubricate the gasket placed on the upper edge of the new filter and tight it manually.
- Check fluid level with dipstick (2).



6.6.c - REPLACING THE PREFILTER AND DIESEL OIL FILTER

- Lift the hopper and secure it in place with the safety bar.
- Unscrew the filter (1) and remove it.
- Lubricate the gasket placed on the upper edge of the new filter and tight it manually.
- Bleed the air as described at paragraph 6.2.b.



- *Unscrew the two clamps (2) and replace the prefilter (3).*

6.6.d - HYDRAULIC OIL FILTER REPLACEMENT

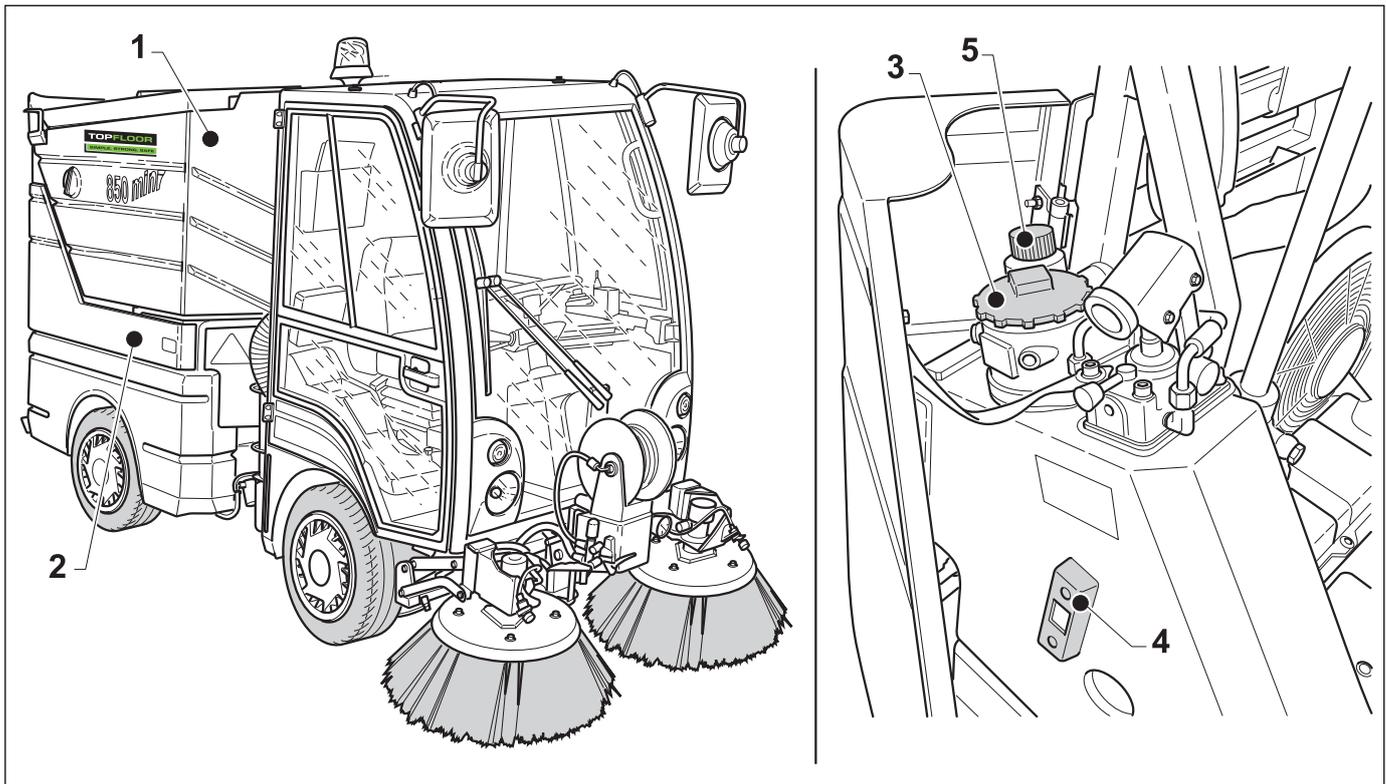
- Lift the hopper (1) and secure it in place with the safety bar.
- Open the side casing (2).
- Unscrew the filter cap (3).
- Replace the filter and tighten the cover (2).

NOTICE:

Once the cartridge has been replaced, always pour oil through the plug (3) until the filter's container is full.

NOTICE:

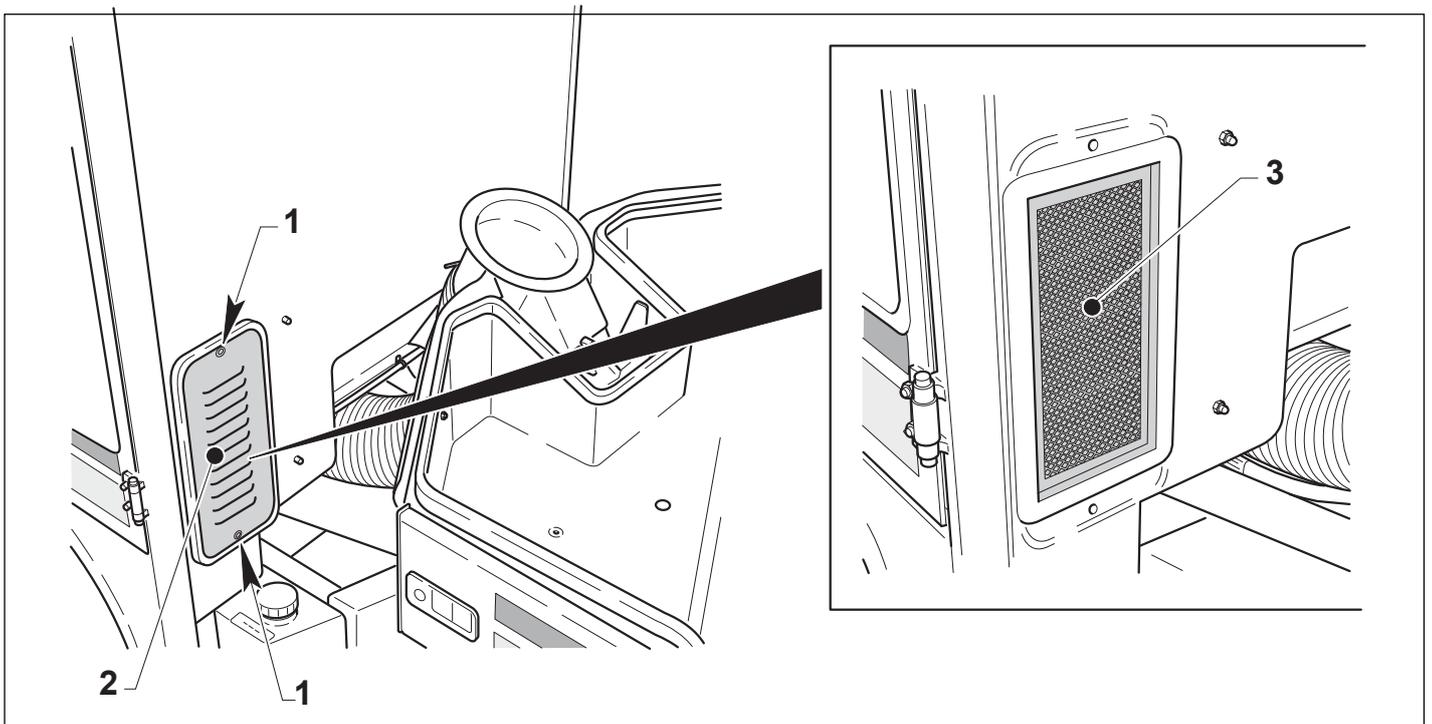
For the lubricant type to be used and the quantity to add, please refer to the "refueling table" at the end of this chapter.



6.6.e - CAB FILTER CLEANING AND/OR REPLACEMENT

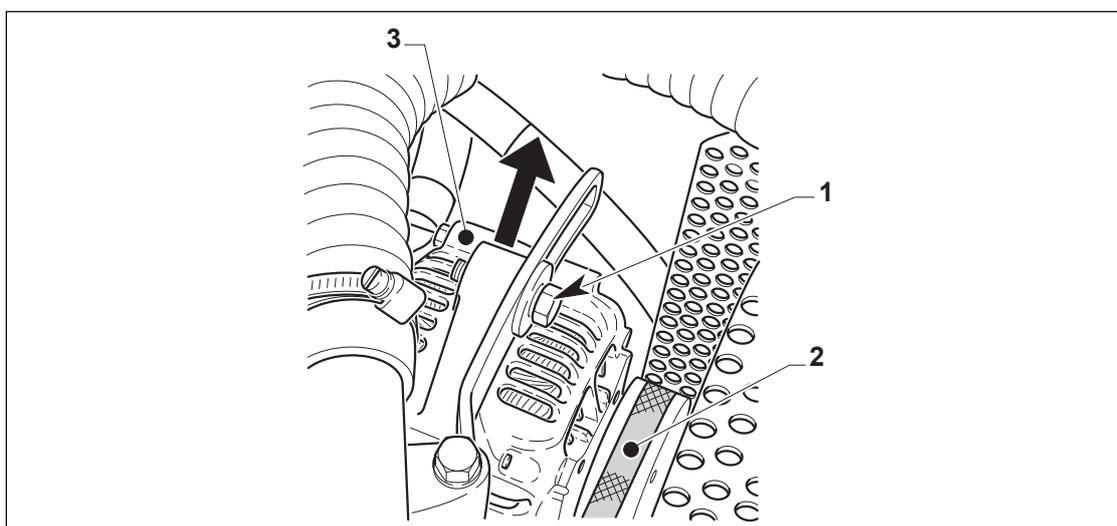
The filter is positioned on the rear of the driver's cab and is used to filter the air inlet in the cab. In order to clean it, comply with the following procedure:

- Unscrew the two screws (1) and remove the cover (2).
- Remove the filter (3) and clean by using a low pressure compressed air jet.
- Reassemble the parts in the reverse order.



6.6.f - ALTERNATOR BELT TENSION CHECK

- Lift the hopper and secure it in place with the safety bar.
- Loosen the screw (1) and stretch the belt (2) by moving the alternator (3) in the arrow direction.
- When the tension is reached tighten the screw (1).



REFUELLING

COMPONENT	SPECIFICATION	TF850R-SRS
ENGINE SUMP	Agip FORMULA PLUS ONE 10W-40	6 L
ENGINE COOLING CIRCUIT	50% PARAFLU 11 - 50% WATER	14 L
FUEL TANK	DIESEL	38 L
HYDRAULIC TANK	Agip ARNICA 68 (t > 40°C)	50 L
GREASE FITTINGS	Agip GR LP 2	With centralized greasing system (OPT)
TYRE PRESSURE	-	4,9 BAR
BRAKES OIL TANK	DOT 4	0,16 L
AIR CONDITIONING SYSTEM (OPT)	GAS R134 MIN = 0,5 - 1 BAR MAX = 13 - 17 BAR	0,75 Kg
HIGH PRESS. WATER PUMP (OPT)	Agip SIGMA TRUCK PLUS 15W-40	0,4 L

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