



# Z50 Citadel™

(Diesel)

Outdoor Sweeper  
Operator Manual



**North America / International**



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**4019030  
Rev. 01 (9-2026)**



## INTRODUCTION

This manual is furnished with each new model. It provides necessary operation and maintenance instructions.

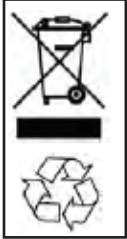


**Read this manual completely and understand the machine before operating or servicing it.**

This machine will provide excellent service. However, the best results will be obtained at minimum costs if:

- The machine is operated with reasonable care.
- The machine is maintained regularly - per the machine maintenance instructions provided.
- The machine is maintained with manufacturer supplied or equivalent parts.

## PROTECT THE ENVIRONMENT



Please dispose of packaging materials, used components such as batteries and fluids in an environmentally safe way according to local waste disposal regulations.  
Always remember to recycle.

Environmental protection precautions

Improper disposal of waste can cause environmental and ecological damage.

Potentially polluting waste installed on the machine (fuel, oil, filters and batteries) must be separated and disposed of in different ways, according to the different composition of the products, in compliance with the laws in force.

Correctly dispose of waste from electrical and electronic equipment because it may contain substances that are potentially harmful to the environment and to people's health. The illegal disposal of electrical and electronic equipment (WEEE) shall be sanctioned by the laws in force in the territory in which the infringement is ascertained. The coolant used in the air-conditioning system must not be released into the atmosphere: although not dangerous to the ozone layer, it is recognised as a potential cause of global warming.

**NOTICE:** Do not dump oil; dispose of it correctly as oil is a pollutant.

## MACHINE DATA

Please fill out at time of installation for future reference.

Model No. - \_\_\_\_\_

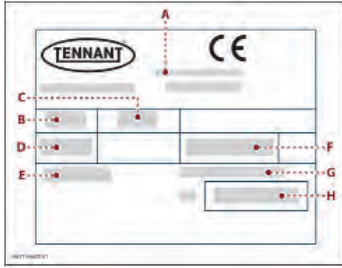
Serial No. - \_\_\_\_\_

Installation Date - \_\_\_\_\_

## MACHINE AND MANUFACTURER IDENTIFICATION DETAILS

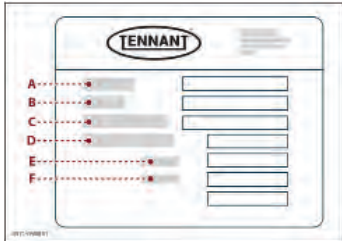
The plates shown, which are attached directly to the machine, contain all the information required to identify the machine and the manufacturer.

### Manufacturer data plate



- A. Manufacturer's details
- B. Year of construction
- C. Rated power
- D. Maximum operating slope
- E. Trade name of the machine
- F. Gross machine weight
- G. Machine code number
- H. Machine serial number

### Engine manufacturer data plate



- A. Vehicle type
- B. VIN
- C. Type approval number
- D. Overall weight (kg)
- E. Total mass on 1st axle (kg)
- F. Total mass on 2nd axle (kg)

## ENGINE IDENTIFICATION DETAILS

The internal combustion engine identification details are stated on the label affixed directly to the engine. For the meaning of the data contained on the plate see the engine manufacturer's use and maintenance manual. The engine data plate is also located in the cab.

## INTENDED USE

The manual, which is part and parcel of the machine, was created by the manufacturer to provide the operator with the necessary information and the criteria to apply concerning machine use and maintenance.

This information is provided by the manufacturer in the original language (Italian) and can be delivered in other languages to meet legislative and/or commercial requirements.

Certain illustrations in the manual show the machine with the safety devices and/or guards removed only in order to make it easier to understand the operations to be performed. The machine must never be used without the safety devices or guards fitted.

Some illustrations may differ from the actual machine, but this does not affect the content of the instructions.

The manufacturer reserves the right to make changes to the manual without advance notice, provided that these changes do not affect levels of safety.

The manual must be kept, for future reference, until the machine is scrapped.

If the machine is sold, the seller is required to pass on this manual to the new owner.

The machine is designed and built to sweep large areas.

The machine is equipped with a diesel engine.

The machine may only be driven on public roads if it is properly registered and insured.

The machine is designed and built to sweep large areas.

### **Tennant Company**

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Specifications and parts are subject to change without notice.

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## IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS

Symbols, as outlined below, have been adopted to highlight the operations involving a certain level of risk in safety terms or information deemed important.

The following precautions are used throughout this manual as indicated in their descriptions:



**WARNING: To warn of hazards or unsafe practices that could result in severe personal injury or death.**

**FOR SAFETY: To identify actions that must be followed for safe operation of equipment.**

The following information signals potentially dangerous conditions to the operator. Know when these conditions can exist. Locate all safety devices on the machine. Report machine damage or faulty operation immediately.



**WARNING: Do not aim the water at people or animals.**



**WARNING: All maintenance operations provided for in this chapter must be carried out by authorized and qualified maintenance personnel.**



**WARNING: Before using the machine, ensure the locking and protection devices are properly fitted, in good condition, and in proper working order.**



**WARNING: Do not stand or move within the working range of the front brush.**



**WARNING: Always close the valves on the jacks and lock the jacks with the locking devices before carrying out any work underneath the hopper.**



**WARNING: When loading and unloading the machine, before leaving the truck, clean the ramps and the deck.**



**WARNING: When loading and unloading the machine, before boarding the vehicle, thoroughly clean the ramps and platform.**



**WARNING: Engine emits toxic gases. Severe respiratory damage or asphyxiation can result. Provide adequate ventilation. Consult with your regulatory agency for exposure limits. Keep engine properly tuned.**



**WARNING: High dump vertical clearance. Stay clear of overhead obstacles and power lines**



**WARNING: Raised hopper may fall. Engage hopper support bar.**



**WARNING: Lift arm pinch point. Stay clear of hopper lift arms.**



**WARNING: Hopper door pinch point. Stay clear of hopper door.**



**WARNING: Brush linkage pinch point. Stay clear when linkage is moving.**



**WARNING: Side brush can move. Do not step on side brush.**



**WARNING: Conveyor throws debris. Conveyor pinch point. Stay clear when in operation.**



**WARNING: Machine noisy when using can wand. Hearing loss can result. Wear hearing protection.**



**WARNING: Flammable material can cause explosion or fire. Do not use flammable materials in tank. Only use water.**



**WARNING: Do not spray people or animals. Severe personal injury can result. Wear eye protection. Hold sprayer with two hands.**



**WARNING: Raised cab may fall. Engage cab support bar.**

**FOR SAFETY:**

1. Do not operate machine:
  - Unless trained and authorized.
2. Do not operate machine:
  - Unless trained and authorized.
  - Unless operator manual is read and understood.
  - Unless mentally and physically capable of following machine instructions.
  - Under the influence of alcohol or drugs.
  - While using a cell phone or other types of electronic devices.
  - If not in proper operating condition.
  - With pads or accessories not supplied or approved by Tennant. The use of other pads may impair safety.
  - Without filters in place or with clogged filters.
  - In dusty environments without the vacuum fan on.
  - In areas where flammable vapors/liquids or combustible dusts are present.
  - In areas that are too dark to safely see the controls or operate the machine unless operating / headlights are turned on.
  - In flammable or explosive areas unless designed for use in those areas.
3. Before starting machine:
  - Check for fuel leaks.
  - Keep sparks and open flame away from refueling area.
  - Make sure all safety devices are in place and operate properly.
  - Check brakes and steering for proper operation.
  - Check parking brake for proper operation.
  - Adjust seat and fasten seat belt.
4. Before starting machine:
  - Keep foot on brake and directional pedal in neutral
5. When using machine:
  - Use only as described in this manual.
  - Use brakes to stop machine.
  - Reduce speed when turning.
  - Go slow on inclines and slippery surfaces.
  - Do not pick up burning or smoking debris, such as cigarettes, matches or hot ashes.
  - Keep all parts of body inside operator station while machine is moving.
  - Always be aware of surroundings while operating machine.
  - Use care when reversing machine.
  - Move machine with care when hopper is raised.
- Make sure adequate clearance is available before raising hopper.
- Do not raise hopper when machine is on an incline.
- Keep children and unauthorized persons away from machine.
- Do not allow machine to be used as a toy.
- Do not carry riders on machine.
- Always follow safety and traffic rules.
- Follow site safety guidelines when using machine.
- Report machine damage or faulty operation immediately.
6. Before leaving or servicing machine:
  - Do not park near combustible materials, dust, gases, or liquids.
  - Stop on a level surface.
  - Set parking brake.
  - Turn off machine and remove key.
7. When servicing machine:
  - All work must be done with sufficient lighting and visibility.
  - Keep work area well ventilated.
  - Avoid moving parts. Do not wear loose clothing, jewelry and secure long hair.
  - Block machine tires before jacking machine up.
  - Jack machine up at designated locations only. Support machine with jack stands.
  - Use hoist or jack that will support the weight of the machine.
  - Do not push or tow the machine without an operator in the seat controlling the machine.
  - Do not power spray or hose off machine near electrical components.
  - Wear eye and ear protection when using pressurized air or water.
  - Disconnect battery connections before working on machine.
  - Keep all metal objects off batteries.
  - Avoid contact with battery acid.
  - Avoid contact with hot engine coolant.
  - Do not remove cap from radiator when engine is hot.
  - Allow engine to cool.
  - Keep flames and sparks away from fuel system service area. Keep area well ventilated.
  - Use cardboard to locate leaking hydraulic fluid under pressure.
  - All repairs must be performed by trained personnel.
  - Do not modify the machine from its original design.
  - Use Tennant supplied or approved replacement parts.

- Wear personal protective equipment as needed and where recommended in this manual.



**For Safety: wear hearing protection.**



**For Safety: wear protective gloves.**



**For Safety: wear eye protection.**



**For Safety: wear protective dust mask.**

**8. When loading/unloading machine onto/off truck or trailer:**

- Empty debris hopper before loading machine.
- Drain tanks before loading machine
- Use ramp, truck or trailer that will support the weight of the machine and operator.
- Do not drive on a slippery ramp.
- Use caution when operating on a ramp.
- Do not load/unload on ramp inclines that exceed 11% grade.
- Use winch. Do not drive the machine onto/off the truck or trailer unless the load height is 380 mm (15 in) or less from the ground.
- Turn off machine and remove key.
- Set parking brake after machine is loaded.
- Turn off machine and remove key.
- Block machine tires.
- Tie machine down to truck or trailer.

**FOR SAFETY: Have the fire extinguisher checked and serviced regularly in accordance with the information on the fire extinguisher's data plate and in compliance with legislation in force, to ensure it is in good working order if needed.**

**FOR SAFETY: To prevent explosions or personal injury do not use products such as ether to start the engine.**

**FOR SAFETY: Make sure that there are no people or animals in the area where the hopper is emptied.**

**FOR SAFETY: Raise the hopper and lower onto solid, flat ground.**

**FOR SAFETY: All maintenance operations provided for in this chapter must be carried out by authorized and qualified maintenance personnel.**

**FOR SAFETY: Do not get into the hopper to clean the bag filters.**

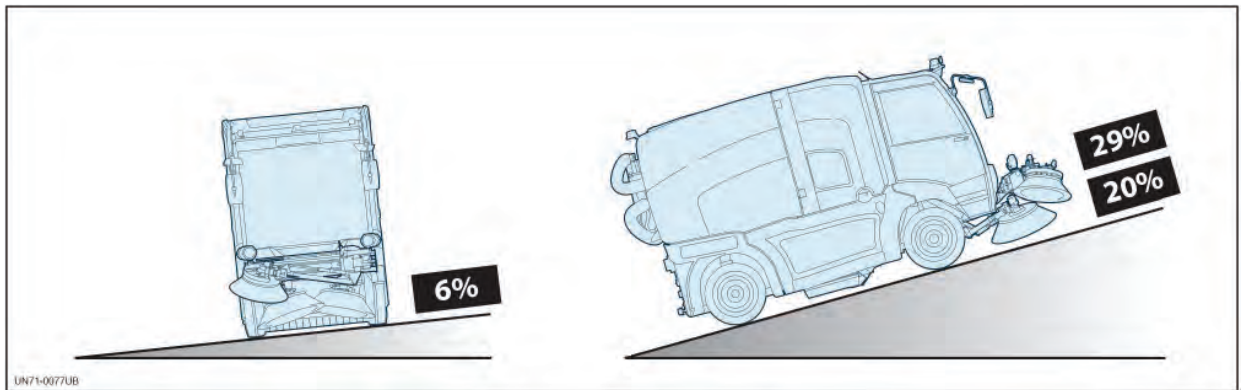
**FOR SAFETY: Do not disconnect the battery cables when the machine is running.**

**FOR SAFETY: Do not refill the fuel tank completely as fuel may overflow and ignite. Leave a gap of at least 4 from the fuel tank filler neck. Do not smoke or use an open flame during fuelling. Clean up fuel leakage immediately.**

**FOR SAFETY: The machine can be jacked up at the designated locations. Use a hoist or jack that will support the weight of the machine; a 7-ton jack for empty hopper, and a 10-ton jack with full hopper. It is best to empty the hopper and water tank before jacking up the machine.**

### Maximum admitted slope

The illustration shows the machine's maximum permitted gradients during work and travel.



Maximum longitudinal gradient with no load (29%).

Maximum longitudinal gradient with full load (20%).

**FOR SAFETY: Never tamper with or bypass the locking and protection devices.**

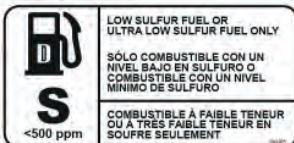
## INFORMATION AND SAFETY SIGNS

Indicates the connection point for the lubrication pump



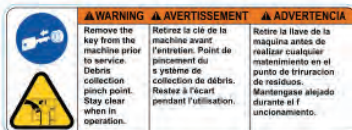
Located on the driver-side door panel

Low sulfur fuel or ultra low sulfur fuel only



Located on the driver-side door panel

WARNING LABEL - Remove the key from the machine prior to service.



Both sides

Located on the driver-side cover and on the passenger-side cover

Indicates the DEF tank filler neck

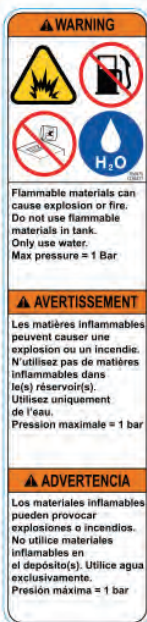


Located on the right side cover

Indicates the type of fuel to be used



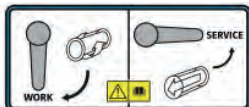
Located on the driver-side door panel



WARNING LABEL - Flammable materials can cause explosion or fire. Do not use flammable materials in tank. Only use water. Max pressure = 1 Bar

Located on the driver side of the auxiliary water tank

Indicates the position of the lever for selecting work mode or service mode



Located on the machine frame, driver side

WARNING LABEL - Raise the cab only on level ground. Use the prop rod to prevent the cab from falling.

Both sides

Located on the cab, driver side and passenger side



WARNING LABEL - Keep clear of machine during operation.

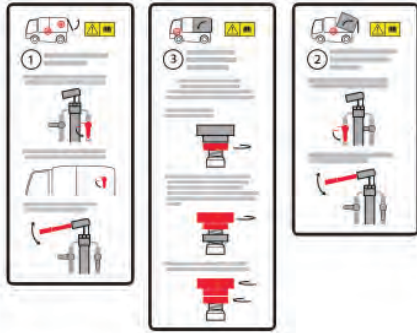


Both sides

Located on the cab, driver side and passenger side

UN71-0578UD

This briefly outlines the manual procedure for opening the hopper hatch and lifting and lowering the hopper.

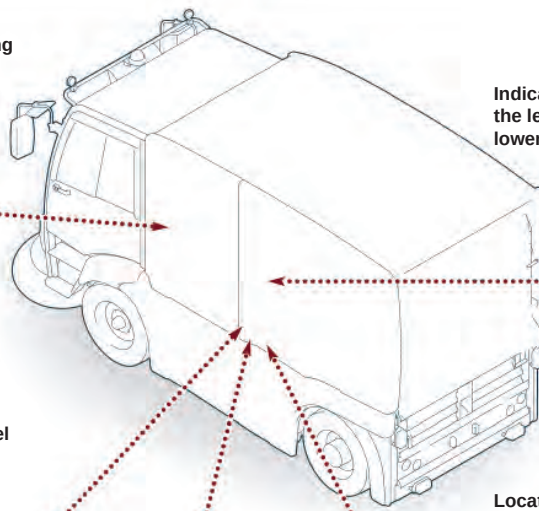


Located on the passenger side, on the electrical panel door

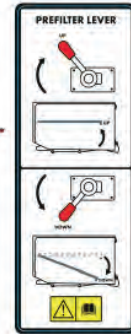
**WARNING LABEL - Burn hazard. Hot surface. Do NOT touch.**



Located on the passenger side, on the oil tank



Indicates the position of the lever used to raise and lower the hopper pre-filter



Located on the passenger side of the hopper

**WARNING LABEL - Engine Compartment pinch point. Stay clear when linkage is moving.**



Located on the passenger side, on the oil tank

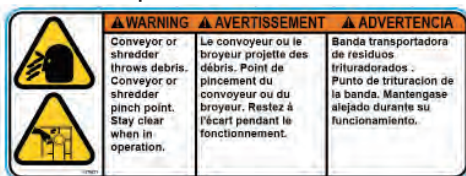
This shows where the hydraulic oil tank is located.



Located on the passenger side, on the oil tank

UN71-0577UD

**WARNING LABEL - Conveyor or shredder throws debris. Conveyor or shredder pinch point. Stay clear when in operation.**



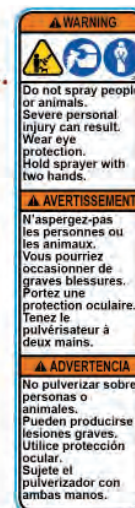
Located at the rear of the machine, on the hopper discharge door

**WARNING LABEL - Hopper door pinch point. Stay clear of hopper door.**



Located at the rear of the machine, on the hopper discharge door

**WARNING LABEL - Do not spray people or animals. Severe personal injury can result. Wear eye protection. Hold sprayer with two hand.**



Located at the rear of the machine

**WARNING LABEL - Burn hazard. Hot surface. Do NOT touch.**



Located at the rear of the machine

Indicates the position of the lever to activate or deactivate the pressure washer



Located at the rear of the machine

This shows the location of the lever to select the spray mode or high-pressure washer use.



Located at the rear of the machine



Located at the rear of the machine

This shows the location of the battery isolator lever to switch the batteries on and off.

**WARNING LABEL - Hopper pinch point. Stay clear when hopper is raised.**



Both sides

**WARNING LABEL - Burn hazard. Hot surface. Do NOT touch.**



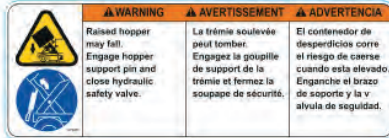
Both sides

**WARNING LABEL - Engine Compartment pinch point. Stay clear when linkage is moving.**



Both sides

**WARNING LABEL - Raised hopper may fall. Engage hopper support pin and close hydraulic safety valve.**



Both sides

**WARNING LABEL - Hopper pinch point. Stay clear when hopper is raised.**



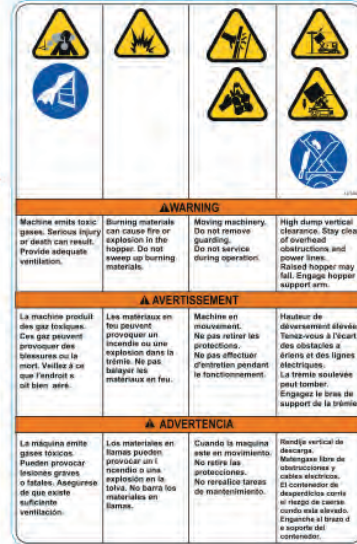
Both sides

**WARNING LABEL - Machine emits toxic gases. Serious injury or death can result. Provide adequate ventilation.**

**WARNING LABEL - Burning materials can cause fire or explosion in the hopper. Do not sweep up burning materials.**

**WARNING LABEL - Moving machinery. Do not service during operation.**

**WARNING LABEL - High dump vertical clearance. Stay clear of overhead obstructions and power lines. Raised hopper may fall. Engage hopper support arm.**



Located on the console

**FOR SAFETY - Read manual before operating machine.**



Located on the console

Indicates that the machine is certified to remove and retain fine particulate matter



Located on the windshield

**WARNING LABEL - Side brush can move. Do not step on side brush.**



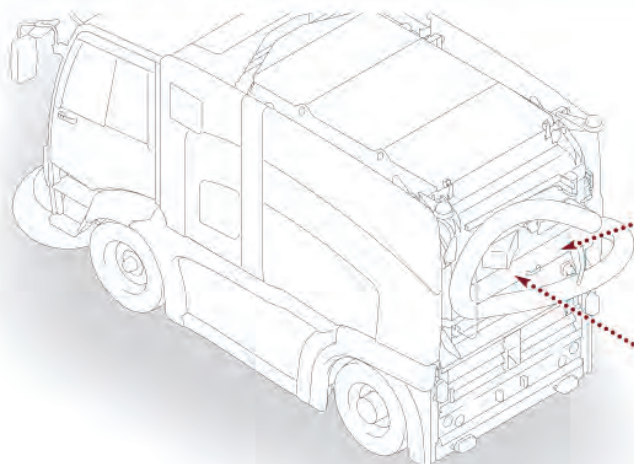
Located on the windshield

**WARNING LABEL - Side brush can move. Do not step on side brush.**

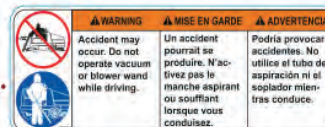


Located on the windshield

UN71-0570UD

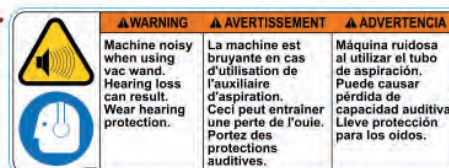


**WARNING LABEL - Accident may occur. Do not operate vacuum or blower wand while driving.**



Located on the suction hose

**WARNING LABEL - Machine noisy when using vac wand. Hearing loss can result. Wear hearing protection.**



Located on the suction hose

**WARNING LABEL - Side brush can move. Do not step on side brush.**



Located on the main brush

**WARNING LABEL - Engine Compartment pinch point. Stay clear when linkage is moving.**



Located on the main brush

**WARNING LABEL - Side brush can move. Do not step on side brush.**



Located on the main brush

**WARNING LABEL - Engine Compartment pinch point. Stay clear when linkage is moving.**



Located on the main brush

UN71-0580UD

### Permitted use

The machine must be used in conformity with its technical characteristics; it is forbidden to make modifications or use the machine for improper uses.

The machine must be operated by a single operator seated in the driving seat inside the cabin.

Unless prior authorization is given by the manufacturer, any use other than that specified must be considered misuse and therefore not permitted.

### Improper and unauthorized uses

It is prohibited to use of the machine in potentially explosive atmospheres.

It is prohibited to run or use the machine in poorly ventilated areas.

If necessary, take appropriate precautions to prevent the machine's exhaust gas building up.

It is forbidden to use the machine if guards or locking and safety devices are either missing or not working.

It is forbidden to use the machine as a vehicle.

It is prohibited to use the machine as towing vehicle.

It is forbidden to use the machine to collect hazardous and toxic dust.

It is forbidden to use the machine with any accessories other than those approved by the manufacturer.

It is forbidden to operate the machine with the cab access doors open.

It is forbidden to operate the machine on rough, unpaved, and yielding grounds.

It is prohibited to use the machine beyond the performance limits envisaged by the manufacturer.

## RESIDUAL RISKS

While the manufacturer has focused particular attention on safety aspects in the design and construction of this machine, the residual risks described remain.

### - Risk of being run over.

Due to the insufficient visibility when the machine is reversed in tight spaces with poor lighting there is the risk that objects, animals and people may be run over.

Do not stand in the vicinity of the machine during driving and steering.

### - Risk of impacts.

Do not stand in the vicinity of the front brush and side brushes.

### - Risk of burns due to contact with hot parts of the engine and the exhaust silencer.

Wait for the silencer and the engine to cool to prevent burns.

### - Risk of burns/scalding when checking and resetting the oil level in the engine.

Contact with hot parts can cause burns.

Wear appropriate personal protective equipment.

### - Risk of burns/scalding when resetting the coolant level of the engine.

Allow the engine to cool to avoid getting burned.

### - Risk of burns from contact with hot parts of the machine including transmission parts.

The operator must allow the machine to cool down to prevent possible burns.

### - Danger of fire and explosion due to the presence of gas and flammable substances.

The fuel, oil, battery fluid and gases that these liquids release are flammable and explosive.

Do not smoke or use naked flames in the vicinity of flammable substances and gases.

### - Danger of intoxication by exhaust gases of the engine.

Direct the exhaust gases away from humans.

### - Risk of crushing and laceration of the upper limbs.

Keep hands clear of the machine's joints.

The hopper could crush the upper limbs during upward and downward movements.

### - Risk of slipping and falling.

Oil, grease, snow, and ice on the cab access steps could cause the operator to slip and fall.

To minimise the risk of injury, clean the cab access steps and handles to remove all traces of mud, snow, ice, oil, and grease, then check that there are no foreign objects on them.

### - Risk of overturning

Do not operate the machine on uneven, unpaved, or yielding ground.

Only ever use the machine on sloping ground within the limits set by the manufacturer (see "Maximum admitted slope").

Keep away from the digging area and do not drive near the edges unless they have been tested for stability.

Empty the hopper with the machine standing on flat, solid ground.

Given the various working conditions, the list of situations with a risk of overturning is not comprehensive.

Exercising caution and care is the best way of avoiding accidents.

Electric shock risk: do not use the machine in particularly bad weather conditions (thunderstorms with lightning)

### - Risk of pressurised liquid spurts: rupture of a tube or a leakage of pressurised liquid can lead to the risk of skin wounds and infections.

**Operator training**

The operator has the task of carrying out all the operations related to the use of the machine and ordinary maintenance operations in total safety.

The personnel authorized by the owner must be suitably trained in order to provide the operator with the knowledge required to carry out the activity safely.

**General safety warnings**

Failure to comply with some simple safety and prudence rules is the cause of most accidents and injuries at work.

In most cases, accidents can be avoided by foreseeing the possible causes: consequently act with the necessary care and caution.

Exercising caution and care is the best way of avoiding accidents.

Before using the machine, the operator and other workers must carefully read and understand the instructions contained in the manual supplied and those directly applied to the machine.

The operator and the employees shall comply with the instructions for the safe operation of the machine at all times.

It is important to pay attention to the meaning of the symbols on the labels applied; their shape and color are very important for safety purposes.

All labels must be legible and the information they contain must be respected.

Never leave the machine with the engine running.

On no account must you tamper with, eliminate or by-pass the safety devices as this could seriously put at risk the health of people.

The specific safety warnings for the engine must always be complied with, in particular those highlighted by the special symbols (see the engine instruction manual provided with this manual).

**Handling and transport safety precautions**

Handle in accordance with the information on the machine and in the manufacturer's operating manual.

Unloading, loading, and handling activities must be carried out by qualified, authorized personnel who have received specific training.

Before transferring the machine, check that the machine is anchored to the means of transport to avoid uncontrolled movements and check that the

profile is within the foreseen overall dimensions.

If necessary apply the necessary markings.

To load or unload the machine from the means of transport, choose a flat area that offers good support for the vehicle's wheels.

**Use and operation safety precautions**

The machine must only be put to the uses intended by the manufacturer.

Misuse of the machine can cause health and safety risks and may lead to financial losses.

Do not use the machine while under the influence of either alcohol or drugs such as tranquilizers, sleeping pills, stimulants, or other drugs which may slow down and/or affect reflexes or sight.

Do not start or use the machine in poorly ventilated areas.

Adopt all necessary precautions to prevent build-ups of exhaust gas.

To minimise risk of injury, the machine must only be used by properly trained and qualified personnel who are able to coordinate the work of all those involved in the operations.

Watch out for passers-by and parked vehicles when using the machine.

Check that the routes are suitable and that the working areas are suitable for machine transit and stability.

Ask for the expert operators' assistance for operations in tight spaces and with poor visibility.

The operator must be familiar with the performance and weight of the machine in relation to the type of ground (flat, compact, rough, sloping) in order to always work safely.

Adjust and lock the seat and steering wheel in the most comfortable position.

**Safety instructions for adjustment and maintenance**

Maintenance is of primary importance for the efficiency and reliability of the machine and is one of the most important safety elements.

Scheduled maintenance must be carried out in compliance with the deadlines and according to the procedures established by the manufacturer.

Maintenance work must be carried out on flat, compact ground, with the engine turned off and the ignition switch key removed.

If electrical welding is performed on the machine's

frame, the connectors must be disconnected from the electrical panels and the battery cables must be disconnected, to prevent damage to electrical and electronic equipment.

Do not carry out any electric welding if the machine is positioned on a metal bed.

It is forbidden to remove or modify machine parts and components or to install accessories and devices not intended by the manufacturer.

Before any adjustment operation activate all safety devices foreseen and assess whether personnel working nearby must be informed of the operation.

At the end of the operations, before starting the machine, check that there are no tools, cloths or other material near the moving parts or in risk areas.

Work on the cabin air conditioning and pressurization system must be carried out solely by specialized personnel.

## Fire prevention safety precautions

In the event of an accident, follow the procedures envisaged by legislation or standards in force in the country where the machine is in use.

Keep the engine, battery, fuel tank and hydraulic oil tank areas clean to avoid the risk of fire caused by the build-up of residues.

Do not smoke or use open flames during refuelling and clean up any fuel and hydraulic fluid leaks on the machine or surroundings immediately.

Tighten or replace the clamps, piping, loose or damaged bolts.

Only install pipes and hoses that are not damaged and that are in good condition.

Replace damaged batteries.

Clean traces of fuel, oil, dirt, grease, debris and other materials that may catch fire.

Clean and tighten all electrical connections.

In the presence of worn or hardened cables or wires, with damaged or missing terminals do not start the machine.

In the event of a fire, use the powder extinguisher supplied with the machine if possible.

The illustration shows the location of the fire extinguisher supplied with the machine.

## Personal protection devices

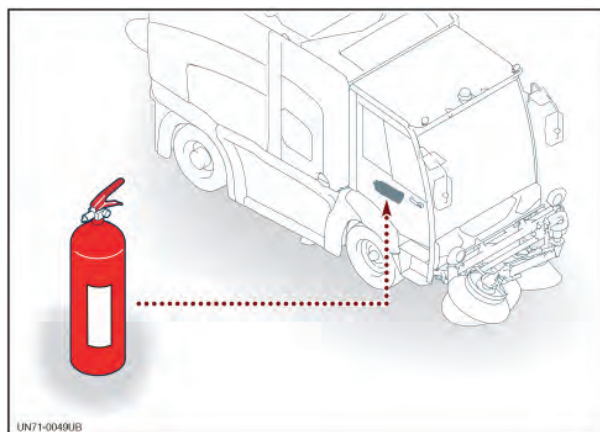
Always wear work clothes which are appropriate for the job in hand (close-fitting clothes, safety

shoes, leather gloves, etc. as required by law).

Do not wear clothes with grease on them as this makes them highly flammable.

Wear personal protective equipment in accordance with occupational health and safety legislation in force.

It is the operator or safety manager's responsibility to choose the personal protective equipment (PPE) depending on the activity to be carried out. For their correct use and maintenance, refer to the equipment manuals themselves.



**FOR SAFETY: Have the fire extinguisher checked and serviced regularly in accordance with the information on the fire extinguisher's data plate and in compliance with legislation in force, to ensure it is in good working order if needed.**

## How to leave the machine in the event of danger

In the event of danger, leave the machine as described here.

- Turn the ignition switch to turn off the engine.
- To leave the cab, open the doors or - if the doors are locked - the sliding windows.

### Safety advice for handling and transportation

Before starting operations, organize the work area so that movements can be carried out safely.

During handling operations, anyone not involved in the operations must keep a safe distance away.

To load or unload the machine from the means of transport, choose a flat area that offers good support for the vehicle's wheels.

If necessary, when loading and unloading from the truck use ramps which are in good condition and offer the appropriate load-bearing capacity.

Transportation by rail, sea or air must be carried out in compliance with the regulations and laws in force.

Lock all the moving parts of the machine before transit

Before transportation, check the road conditions and the size and weight limits, as well as the highway code.

### Machine delivery

The machine, depending also on the destination, can be delivered using different transport means (road, rail, sea and air).

The manufacturer has provided anchor points to ensure the stability of the machine on the means of transport.

Upon receipt of the machine, check that no damage has occurred.

Check that you have received all the equipment stated on the accompanying documents.

In the event of damaged or missing material, contact the manufacturer to agree on the action to take.

### Safety advice concerning use

Do not allow unauthorized personnel to use the equipment.

The operator must be properly trained and documented on the use of the machine and informed of any special risks present in the workplace.

The operator must assess the presence of specific hazards in the proposed conditions of use which require special care, for example, special soil conditions (soft or slippery ground etc.) and it is the operator's responsibility to take the necessary measures to remove or reduce these hazards.

Only ever use the machine on sloping ground

within the limits set by the manufacturer (see "Maximum admitted slope").

Use the machine only if you are in good physical and mental condition.

During first use of the machine, the operator must simulate several test maneuvers to detect the main controls and functions.

Check brake and steering wheel operation.

Before use, check that the controls are in good working order.

Empty the hopper with the machine standing on flat, solid ground.

Keep away from the digging area and do not drive near the edges unless they have been tested for stability.

The specific safety warnings for the engine must always be complied with, in particular those highlighted by the special symbols (see the engine instruction manual provided with this manual).

**FOR SAFETY: To minimise the risk of injury, clean the cab access steps and handles to remove all traces of mud, snow, ice, oil, and grease, then check that there are no foreign objects on them.**



**WARNING: Do not stand or move within the working range of the front brush.**

**Empty hopper with the machine on flat, solid ground.**

**FOR SAFETY: Wear appropriate personal protective equipment.**

**Do not aim the water at people or animals.**

**Safety advice for maintenance**

Before carrying out any maintenance, turn on all the locking and safety devices featured.

Lock moving parts which, if activated, could cause injuries.

Assess the need to inform people operating nearby of the activities in progress.

In particular, mark off the surrounding areas and prevent access to all devices that, if turned on, could cause unexpected hazards and pose a risk to health and safety.

Perform maintenance operations with the machine disconnected from all power supplies and as per the instructions given by the manufacturer.

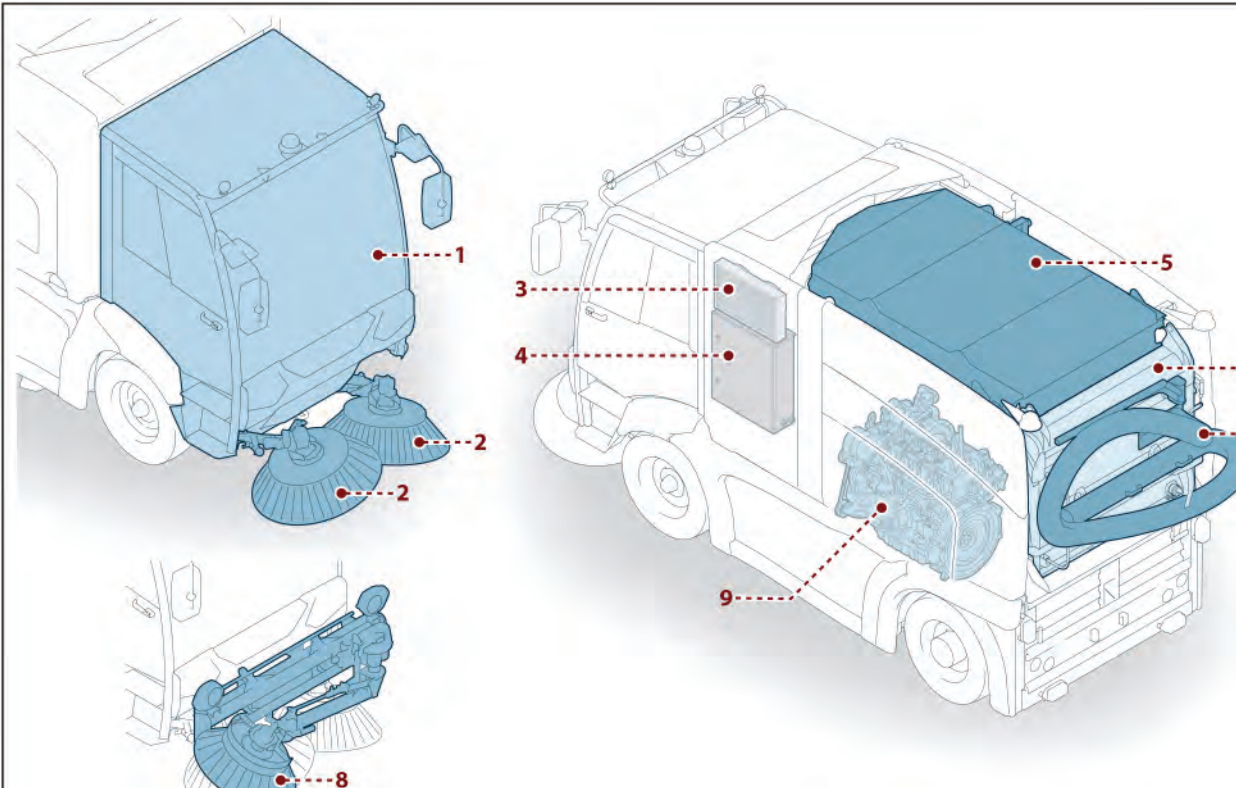
Carry out the maintenance operations envisaged by the machine's manufacturer to ensure the machine remains safe and in good working order.

At the end of the operations, before starting the machine, check that there are no tools, cloths or other material near the moving parts or in risk areas.

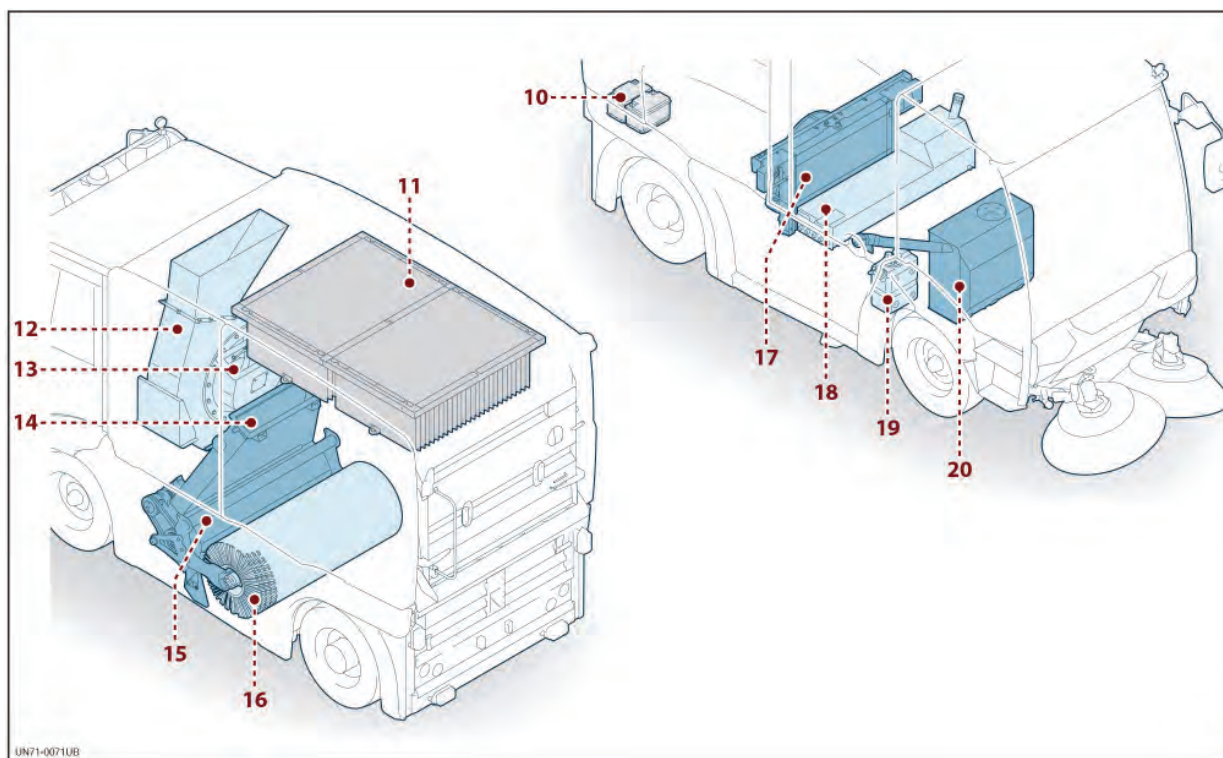
**FOR SAFETY: All maintenance operations not provided for in this chapter must be carried out by authorized and qualified maintenance personnel.**



## MACHINE COMPONENTS



1. Cab
2. Side brush
3. Air conditioning condenser (optional)
4. Electronic component box
5. Hopper
6. Hopper unloading hatch
7. Vacuum Hose Assembly (optional)
8. Front brush
9. Engine



1. Cab
2. Side brush
3. Air conditioning condenser (optional)
4. Electronic component box
5. Hopper
6. Hopper unloading hatch
7. Vacuum Hose Assembly (optional)
8. Front brush
9. Engine
10. Batteries
11. Bag filters
12. Vacuum unit

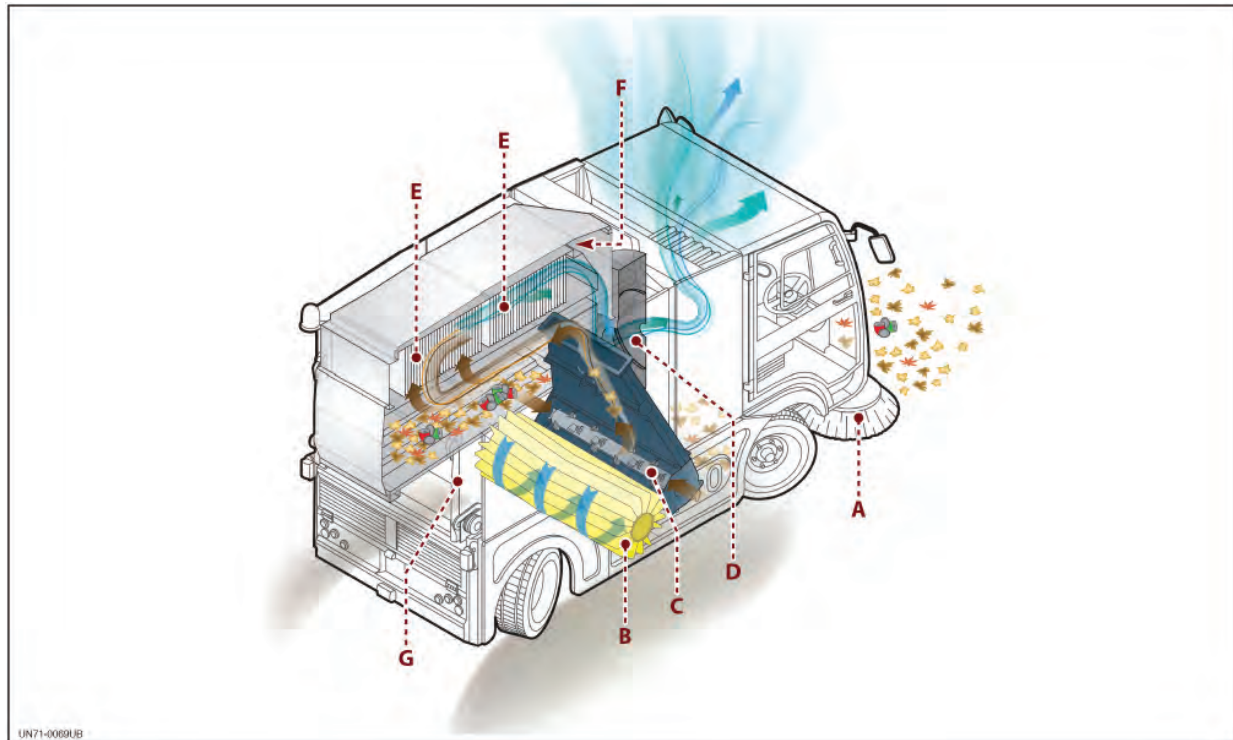
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**OPTIONS**

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- Suspension/steering/ steered wheel brake 2 - 4 assembly
- Pipeline assembly with scraper Z50 Citadel
- Shredder/suction speed control unit
- Tilting side brush assembly Z50 Citadel
- Brush pressure control block
- Brush tracking unit
- Shifting brush unit
- Shifting brush unit with adjustable force
- Hybrid shifting headlight unit
- Full LED shifting headlight unit
- Stainless steel container
- Container filling unit
- Container lifting unit
- Manual suction hose pipe unit with 150 diameter.
- Air conditioning unit
- Premium seat unit
- Heated rear-view mirrors
- Heated powered rear-view mirrors
- Automatic battery cut-off
- Low/high dust suppression - with high-pressure washer wand
- High-pressure washer wand
- Standard water tank
- Additional water tank
- Spraying unit for side brushes and shifting brush
- Rear mushroom-head emergency button unit
- Heated rear-view camera
- Debris management system (DMS) camera
- Radio/stereo
- Cruise control
- In-cab cabled remote control
- In-cab system pressure reading
- Brush pressure booster
- Adaptive buzzer

## HOW THE MACHINE WORKS



1. The side brushes (A) convey the debris to the center of the machine.
2. The main brush (B) pushes the debris towards the shredder (C).
3. The debris is conveyed to the hopper.  
This occurs due to the vacuum generated by the vacuum fan (D).
4. The heavy debris falls downwards while the dirty air passes through the bag filters (E) and is released into the atmosphere clean at 99,9%.  
If the air is very damp, it must be released outside via the by-pass (F) without passing through the bag filters.  
This allows the filter surfaces to be protected and kept cleaner.
5. Open the rear hatch (G) and tip the hopper to unload the debris collected.

## WHILE OPERATING THE MACHINE

Perform the Pre-Operation Procedures before each use (see MACHINE MAINTENANCE section of this manual).

Avoid bulky debris such as crates, boxes, tree branches, and heavy material. Avoid straps, twine, rope, etc., that could become entangled in the brushes.

Plan the sweeping in advance. Try to arrange long runs with minimum stopping and starting. Sweep as straight a path as possible. Overlap the brush paths. Use dust suppression in dusty conditions.

Avoid turning the steering wheel too sharply when the machine is in motion. The machine is very responsive to the movement of the steering wheel. Avoid sudden turns, except in emergencies.

If poor sweeping performance is observed, stop cleaning and refer to MACHINE TROUBLESHOOTING in this manual.

Drive the machine slowly on inclines. Use the brake pedal to control machine speed on descending inclines. Sweep with the machine up inclines rather than down inclines.

**FOR SAFETY: When using machine, go slowly on inclines and slippery surfaces.**

Do not operate machine in areas where the ambient temperature is above 40° C (104° F). Do not operate sweeping functions in areas where the ambient temperature is below -5° C (23° F).

**FOR SAFETY: When using machine, do not sweep on ramp inclines that exceed 20% grade or transport (GVWR) on ramp inclines that Exceed 20% grade.**

This machine is equipped with a DPF (Diesel Particulate Filter) to meet the latest emissions requirements. This filter automatically burns all soot collecting in the DPF when the machine is operating at full power / capacity.

When the machine has not been operated at full power to eliminate the soot from the DPF, the machine will need to run through a Regeneration process. The EDM (engine display module) alerts the operator when a regeneration process is required. For instructions how to initiate a DPF regeneration, see DPF REGENERATION in the MAINTENANCE section of this manual.

*NOTE: Operate the machine at full power / capacity to avoid having to initiate a regeneration. See DPF REGENERATION in the MAINTENANCE section of this manual.*

**PRE-OPERATION CHECKLIST**

Perform the following steps before operating the machine:

- ☐ Check engine air filter indicator status.
- ☐ Check engine oil level.
- ☐ Check the windshield washer fluid level.
- ☐ Check the hydraulic fluid level.
- ☐ Check the condition of the right skid and skirt.
- ☐ Check the main brush for debris and wear.
- ☐ Check the main brush pattern.
- ☐ Lubricate the right side conveyor / shredder and main brush linkage.
- ☐ Check for debris wrapped around the right side brush motor shaft and check the brush for wear.
- ☐ Check the tires for damage and proper inflation.
- ☐ Tilt the hopper back and check the condition of the hopper-to-conveyor / shredder seal.
- ☐ Check the condition of the hopper dust filter and filter seals.
- ☐ Check the condition of the conveyor / shredder paddle and chain.
- ☐ Clean and lubricate the conveyor / shredder chain o-rings.
- ☐ Check the condition of the left skid and skirt.
- ☐ Lubricate the left side conveyor / shredder and main brush linkage.
- ☐ Check for debris wrapped around the left side brush motor shaft and check the brush for wear (if equipped).
- ☐ Confirm engine coolant is visible in the level site gauge located at the top of the radiator.
- ☐ Confirm both the hydraulic cooler and the radiator fins are clean.
- ☐ Check the wet dust control systems and nozzles (if equipped).
- ☐ Confirm the water tank is full.
- ☐ Inspect vacuum wand hose (if equipped).
- ☐ Inspect the pressure washer hose (if

equipped).

- ☐ Check the pressure washer wand (if equipped).
- ☐ Check brakes and steering for proper operation.
- ☐ Confirm the horn, headlights, taillights, safety lights, and backup alarm (if equipped) are operational.
- ☐ Empty debris from hopper.
- ☐ Check the service records to determine maintenance requirements.
- ☐ Check that the locking and protection devices are all fitted and in good working order.
- ☐ Check the battery charge levels.
- ☐ Check the fuel level and if necessary fill the tank (see "Refueling").
- ☐ Check the level of hydraulic oil in the tank (see "Topping up the hydraulic oil level").
- ☐ Check the coolant level and, if necessary, top up with a suitable coolant for the ambient temperature in which the machine will be used (see "Coolant level top up").
- ☐ Check the level of "DEF" in the tank.
- ☐ Check the tire pressure.
- ☐ If there is a spray system installed on the machine, check the water level in the tank.
- ☐ If necessary, fill the tank (see "Filling the dust suppression system tank").

**MACHINE TROUBLESHOOTING**

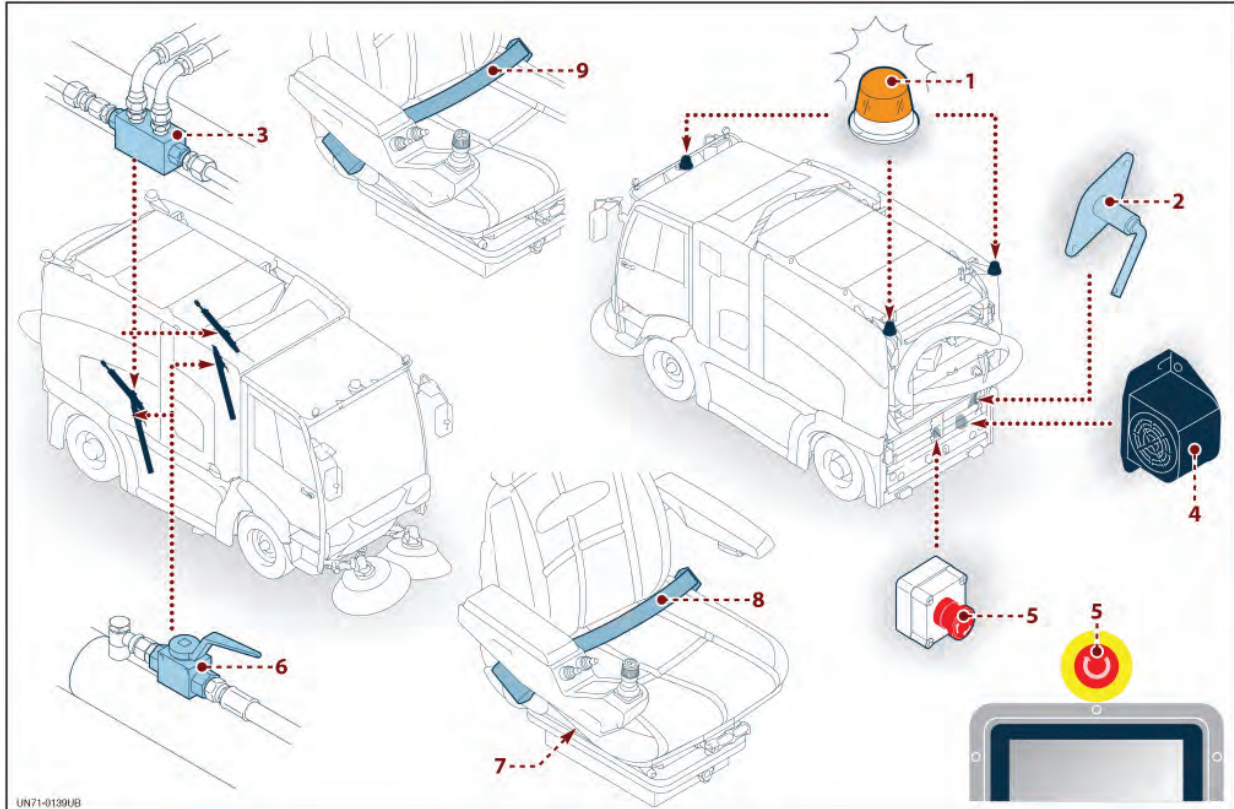
For requests for technical assistance (machine malfunctions, failures, etc.) Contact TENNANT service personnel.

For each service request, please state the data provided on the machine's identification plates and the type of fault detected.

## LOCKING AND PROTECTION DEVICES

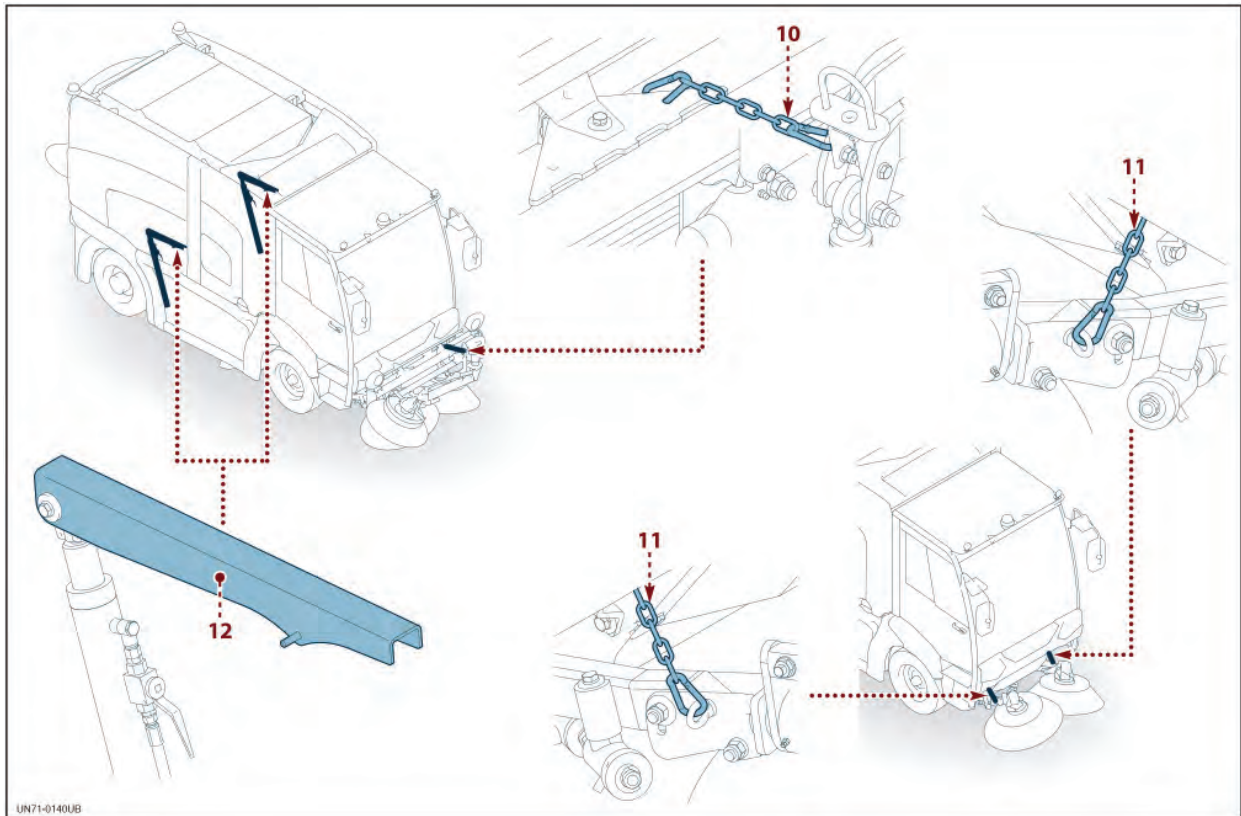
**FOR SAFETY:** Never tamper with or bypass the locking and protection devices.

Before using the machine, ensure the locking and protection devices are properly fitted, in good condition, and in proper working order.



1. Orange status beacon
2. Battery isolation switch
3. Lock valve: this stops the movement of the hopper lifting cylinder in the position in which it is in the event of a breakage of a hydraulic pipe or if there is a drop in pressure.
4. Warning Beeper
5. Emergency stop button: in situations of impending risk, stops the engine running and the machine movement immediately.
6. Valve: when closed, this stops a moving hydraulic lifting cylinder in its current position in the event of a hydraulic hose rupture or pressure drop.
7. Microswitch (operator not in seat): this detects if the operator gets up from the driver's seat.
  - Machine movement stops and the parking brake engages.
  - After a short while, all active brush movements stop.
8. Safety belt: it prevents the operator driving the machine from being thrown out of the driving seat in the event of sudden jolts or overturning
9. Safety belt with microswitch: this prevents machine travel if the belt is not properly fastened.

This is featured when the overhead lift option for the hopper is installed on the machine.



10. Locking device: this locks the front brush.

11. Locking device: this locks the side brushes.

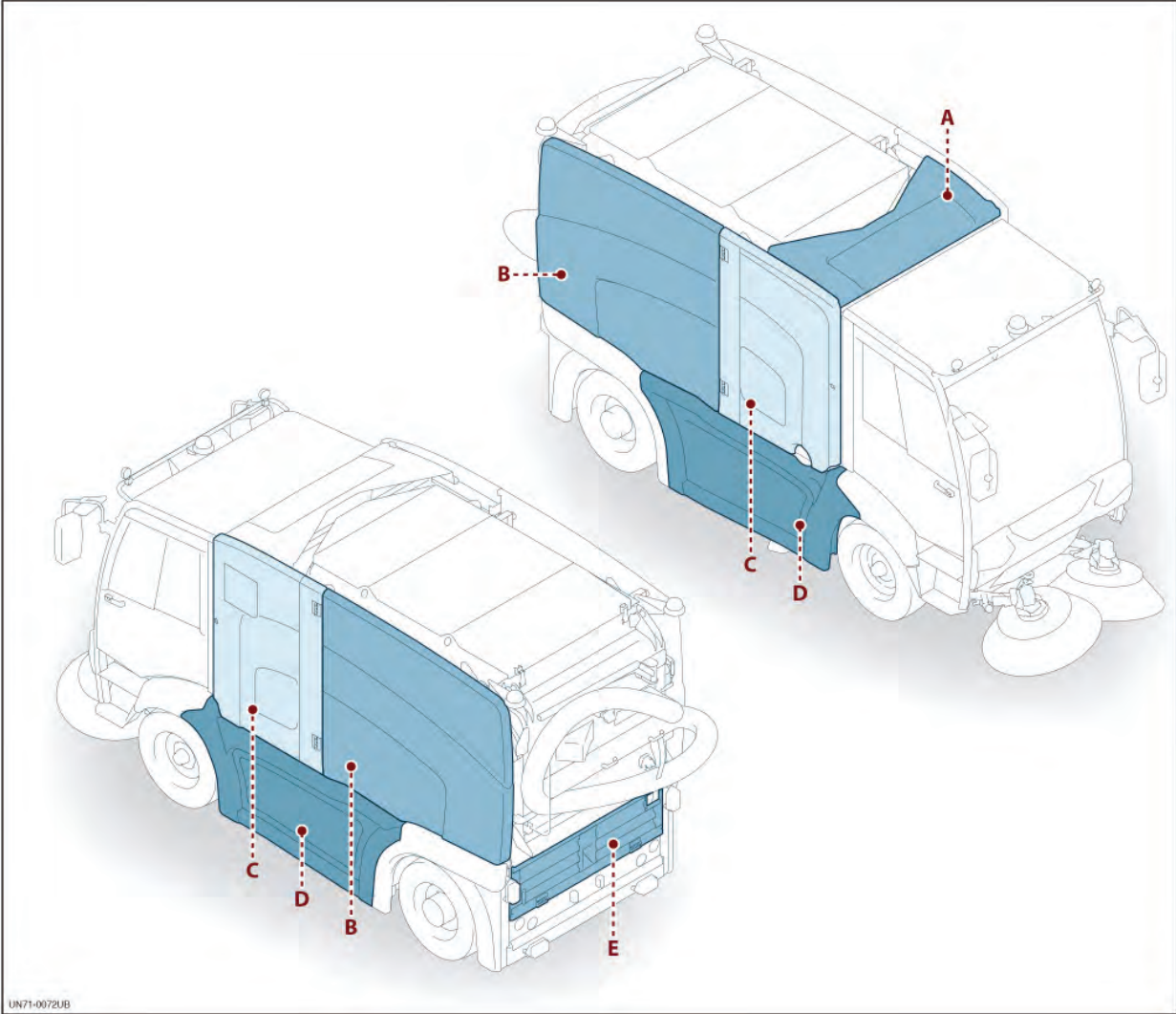
12. Locking device: this stops jack movement in the event of a hydraulic hose rupture or pressure drop.

This is featured when the overhead lift option for the hopper is installed on the machine.

## GUARDS

**FOR SAFETY:** Before attempting to use the machine, make sure that all the safety devices are in good conditions and installed properly.

During the work, the movable guards must be closed.



- A. Fixed guard: this protects the upper part of the vacuum unit.
- B. Fixed guard: this protects people from unexpected contact with the moving parts of the hopper.
- C. Mobile guard: this prevents unauthorized access to the internal parts of the machine.
- D. Fixed guard: this protects people from unexpected contact with the dangerous parts of the main brush and the shredder.
- E. Mobile guard: this prevents unauthorized access to the rear internal parts of the machine.

### GAS EMISSION

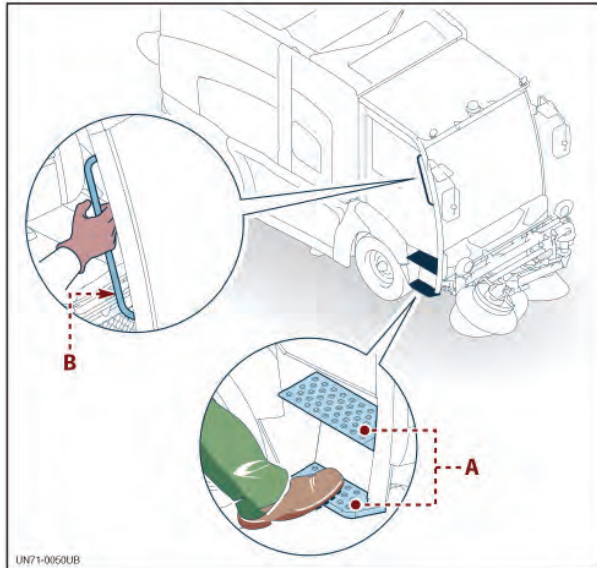
The machine emits the toxic gases listed below.

- Carbon monoxide developed by the combustion of the engine and released into the environment by the exhaust silencer.
- Hydrogen generated by the engine ignition battery.
- Inflammable and explosive fumes produced by the engine fuel.

### GETTING IN AND OUT OF THE MACHINE

**FOR SAFETY:** To minimize the risk of injury, clean the cab access steps and handles to remove all traces of mud, snow, ice, oil, and grease, then check that there are no foreign objects on them.

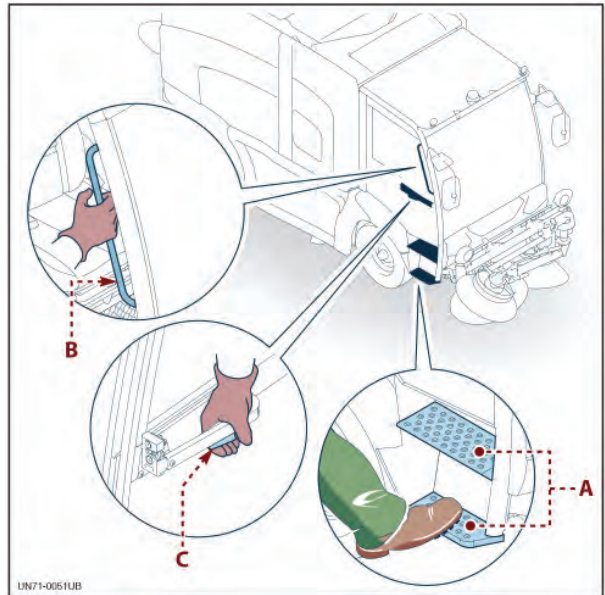
#### GETTING INTO THE MACHINE



Complete the operations described.

1. Open the door.
2. Use the steps (A) and the handle (B) to get into the machine.

#### GETTING OUT OF THE MACHINE

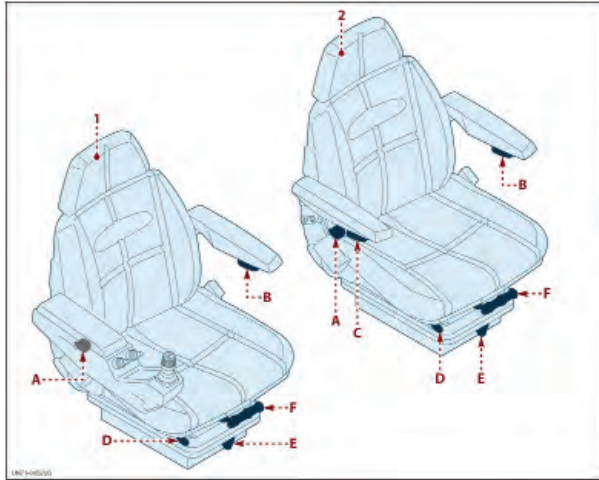


Complete the operations described.

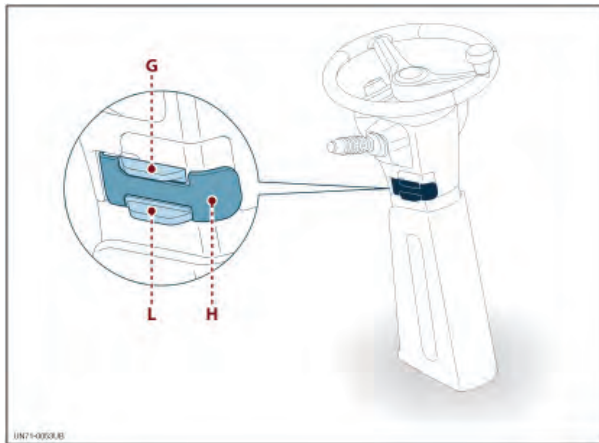
1. Use the lever (C) to open the door.
2. Use the handle (B) and steps (A) to get out of the machine.
3. Close the door.

## ADJUSTING THE SEAT AND STEERING WHEEL

Before starting work, adjust and lock the seat and steering wheel in the most comfortable position.



1. Driver's seat.
2. Passenger's seat.
- A. Lever: used to tilt the backrest.
- B. Wheel: used to adjust the left armrest position.
- C. Wheel: used to adjust the right armrest position.
- D. Lever: used to position the seat lengthways.
- E. Knob: used to raise and lower the seat.
- F. Lever: used to adjust the seat spring rate according to the weight of the operator.



- G. Lever: adjusts the angle of the steering wheel.
- H. Lever: raises and lowers the steering wheel.

- I. Lever: adjusts the steering column angle.

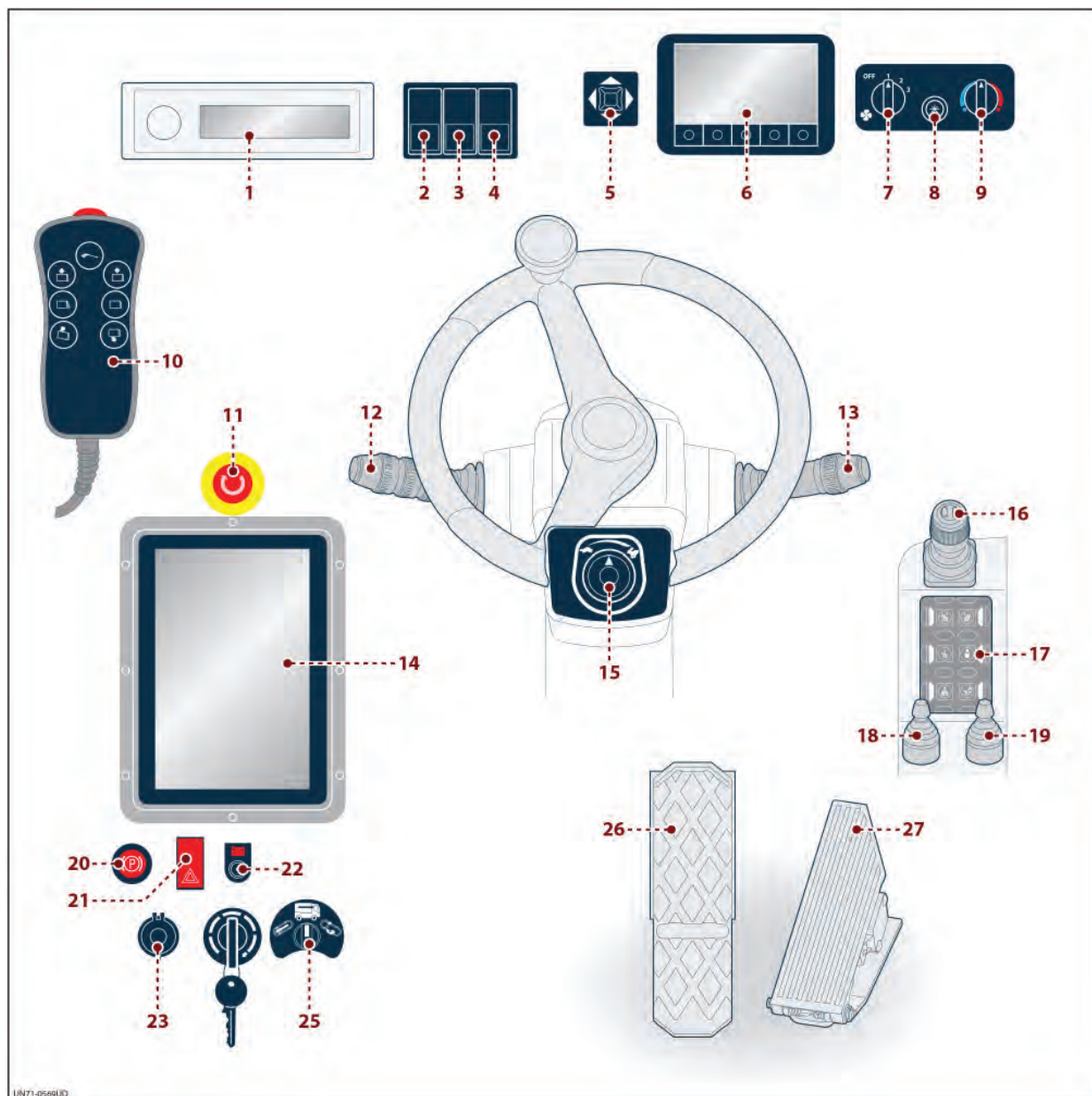
## PNEUMATIC SEAT ADJUSTMENT

Before starting work, adjust and lock the seat and steering wheel in the most comfortable position

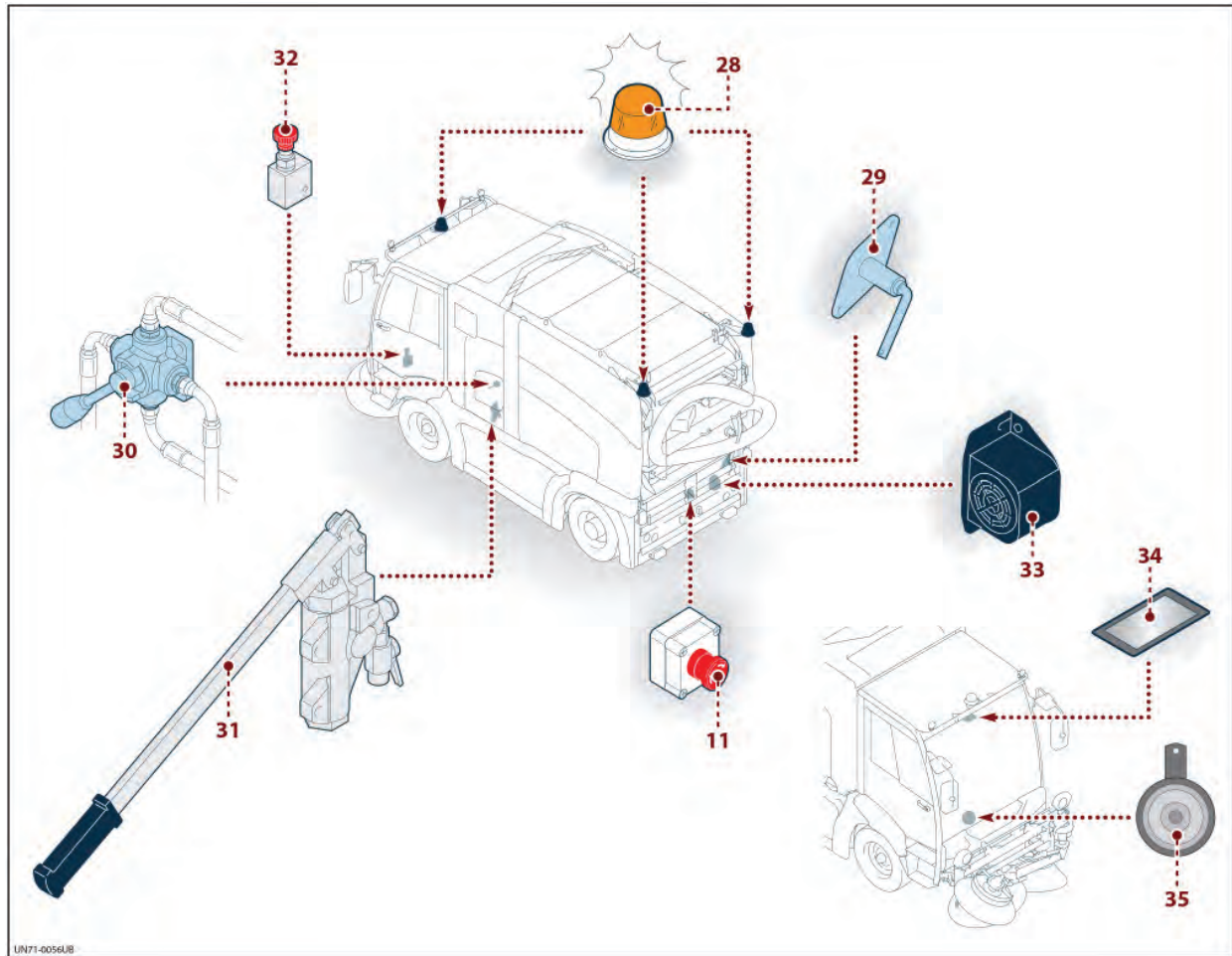


- A. Wheel: used to adjust the left armrest position.
- B. Lever: used to position the seat lengthways.
- C. Lever: used to tilt the backrest.
- D. Knob: used to raise and lower the seat and adjust the seat spring rate according to the operator's weight.

## DESCRIPTION OF THE CONTROLS AND SIGNAL LIGHTS

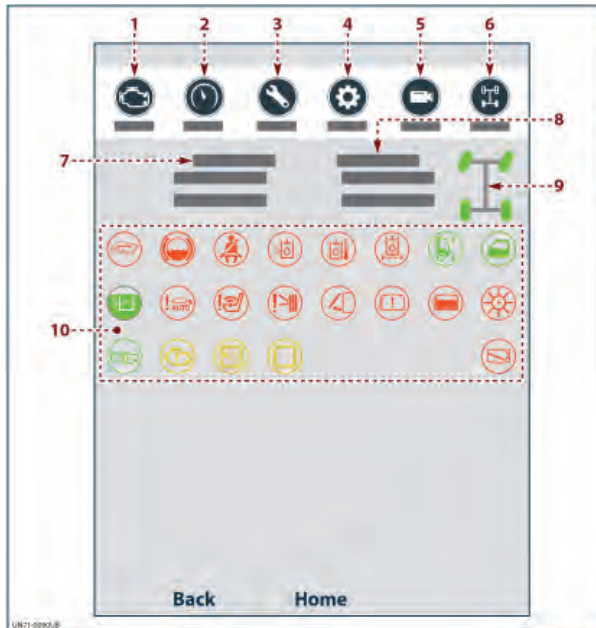


1. Radio/stereo
2. Rearview mirror heating on/off switch
3. Rotary lamp on/off switch
4. Working light on/off switch
5. Rear-view mirror joystick
6. Engine control terminal.
7. Cab ventilation knob
8. Air conditioning on/off button
9. Cab temperature knob
10. Cabled remote control (optional)
11. Emergency stop button: in situations of impending risk, stops the engine running and the machine movement immediately.
12. Multifunction lever.
  - Direction indicators.
  - Machine's beeper
  - Machine's headlights.
  - Windshield wipers.
13. Multifunction lever.
  - This is used to select the machine travel direction.
  - This is used to select power-saving mode.
  - This is used to turn on cruise control.
14. Operating terminal (touchscreen display): set, edit, and display machine operating parameters.
15. Accelerator dial: this is used to alter the engine speed.
16. Front brush joystick
17. Brush control panel
18. For a description of the control panel, see "Description of the brush control panel".
19. Left side brush joystick
20. Right side brush joystick
21. Parking brake button
  - When the button is not lit, it means the machine brakes are not engaged.
  - When the button is lit, it means the machine brakes are engaged.
22. Hazard light button
23. Battery power supply button
24. 12 V socket
25. Suspension height switch
26. Brake pedal.
27. Propel pedal



- 28. Orange status beacon
- 29. Battery isolation switch
- 30. Filter Screen Adjustment Lever
- 31. Hopper manual pump lever
- 32. Hopper manual release valve
- 33. Warning Beeper
- 34. Lamp
- 35. Audio warning signaller (horn): this warns people nearby that machine is about to start working, as well as signalling a hazardous situation.

## DESCRIPTION OPERATING TERMINAL (TOUCH-SCREEN DISPLAY) IN TRAVEL MODE



When the machine is turned on, the page shown in the illustration appears on the operating terminal display.

Set the travel mode (see “Drive mode”).

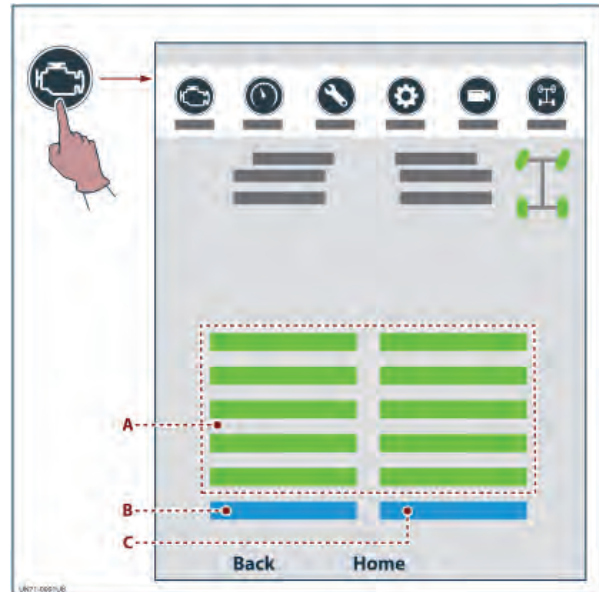
1. Button: this is used to display the page showing the engine parameters, hydraulic oil temperature, and vacuum unit speed
2. Hydraulic: this is used to display the pages showing the hydraulic pump pressures.
3. Service: this is used to display the service pages.
4. Settings: this is used to display the setting pages.
5. Button: this is used to turn on the rear-view camera and, if present, the loading area-view camera.
6. Steering Mode: this is used to change the machine's steering mode.
7. Distance-travelled display field.
8. Partial distance and total distance can be displayed in this field.
9. Hour meter.
10. The partial utilization time and the total utilization time can be displayed in this field.
11. Steering type display field.

## 12. Signal light display field.

Some signal lights only appear in the event of a fault.

For a description of the signal lights, see “Description of the signal lights”.

## ENGINE PARAMETERS SCREEN



1. Tap the key shown in the illustration. The engine parameters page appears

- A. Engine parameters display field.
- B. Hydraulic fluid temperature display field.
- C. Vacuum unit speed display field.

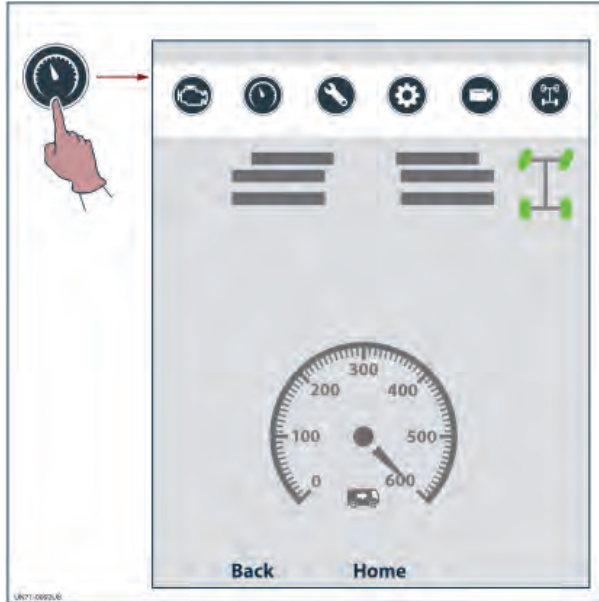
This field can only be displayed if the “Variable vacuum unit” option is featured

## HYDRAULIC PUMP PRESSURE SCREEN

Depending on the customer's request, two pages can be displayed, one with an inactive option and one with an active option

### PAGE WITH INACTIVE OPTION

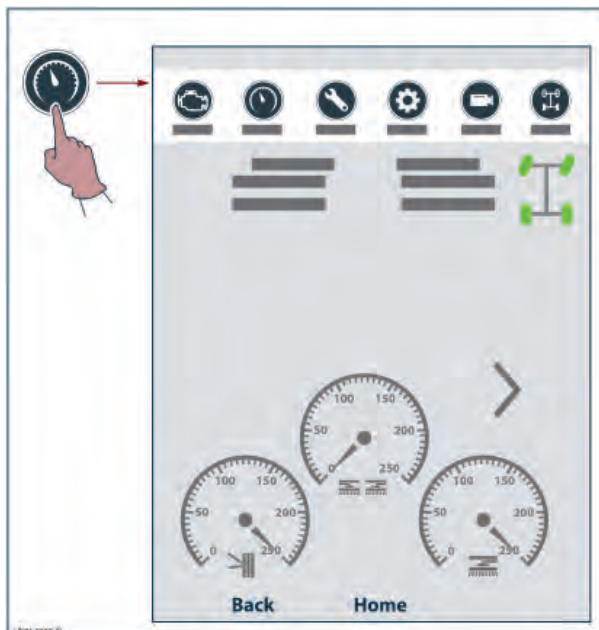
When the option is not active, only the travel pump pressure is visible



1. Tap the button shown in the illustration to display the page.

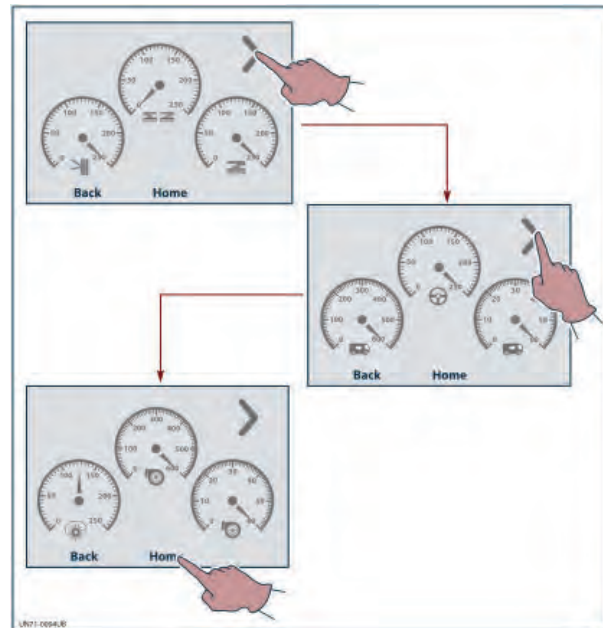
### PAGE WITH ACTIVE OPTION

When the option is active, the hydraulic pressure of all pumps mounted on the machine is visible



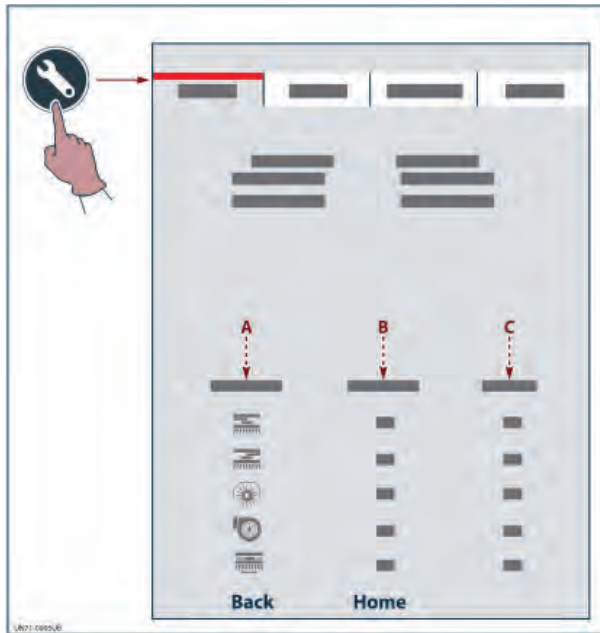
Complete the operations described.

1. Tap the button shown in the illustration to display the page.

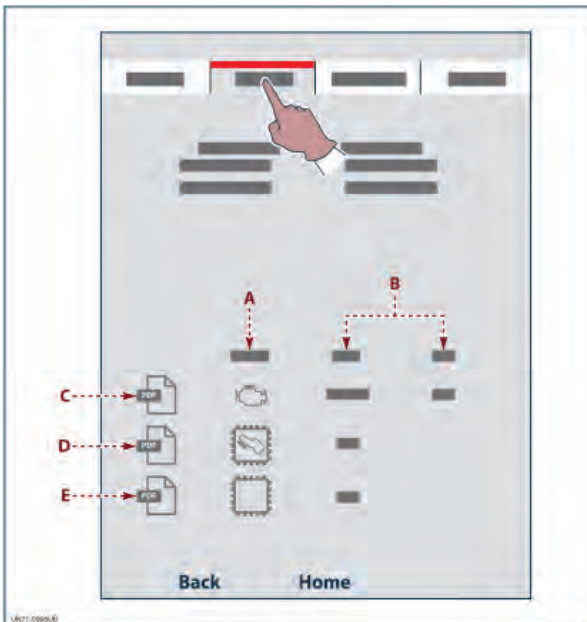


2. Tap the buttons shown in the illustration to switch to the other pages.
3. Tap the "Home" button to return to the home page.

## SERVICE SCREEN



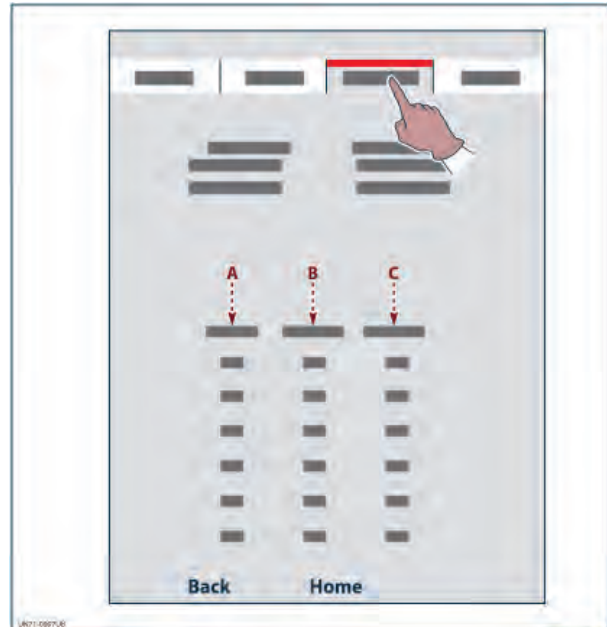
1. Tap the button shown in the illustration to display the "Total hours" page.
- A. Equipment display field.
- B. Partial equipment working hours display field.
- C. Total equipment working hours display field.



1. Tap the button shown in the illustration to display the "Errors" page.
- A. Device type display field.
  - Engine
  - Travel system.

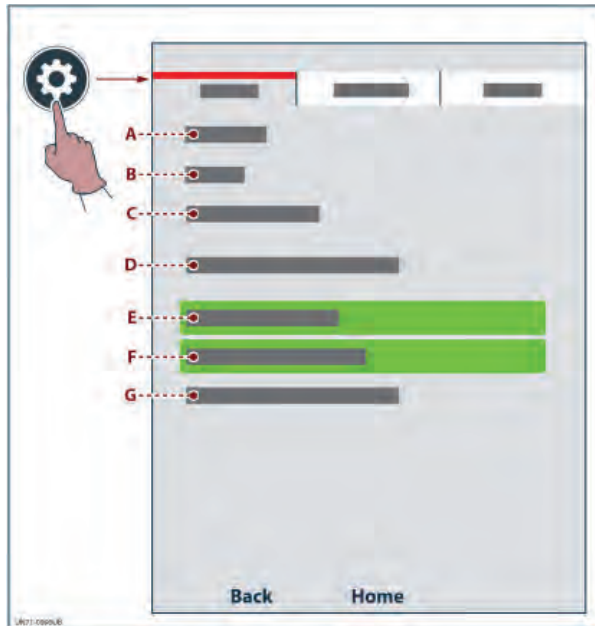
- Machine management system.

- B. Error code display field.
- C. Engine Error Code: this is used to display the document with the list of engine error codes.
- D. Travel system Error Codes: this is used to display the document with the list of travel system error codes.
- E. Machine Error Codes: this is used to display the document containing the list of machine management system error codes.



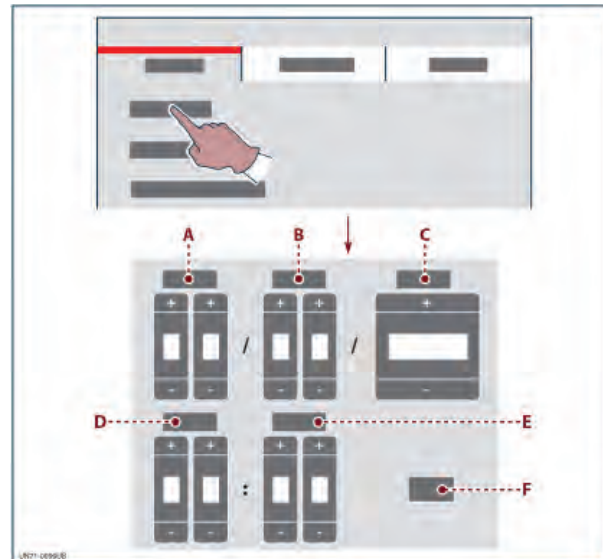
1. Tap the button shown in the illustration to display the "Maintenance" page.
- A. Display field for maintenance intervals (hours) set by the machine manufacturer.
- B. Display field showing the next scheduled maintenance intervals (hours) following a reset.
- C. Display field showing the next scheduled maintenance (hours left)

## SETTINGS SCREEN



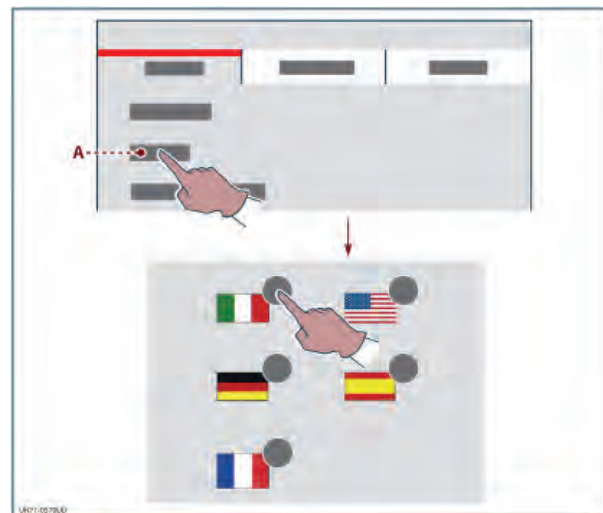
1. Tap the button shown in the illustration to display the “Level 0” page.
- A. Date Setting: this is used to display the time and date setting page.
- B. Language Setting: this is used to display the language setting page.
- C. Unit of Measurement Setting: this is used to display the unit of measurement setting page.
- D. Resetting Partial Equipment Working Hours: this is used to display the page for resetting the partial equipment working hours.
- E. Reset Partial Distance to Zero: this is used to set the partial distance (kilometers) to zero.
- F. Button: this is used to display the maintenance reset page.  
  
Reset operations are password-protected.  
  
The operator cannot perform maintenance reset operations.
- G. Suspension Calibration: this is used to display the suspension calibration page.

## SETTING THE DATE AND TIME



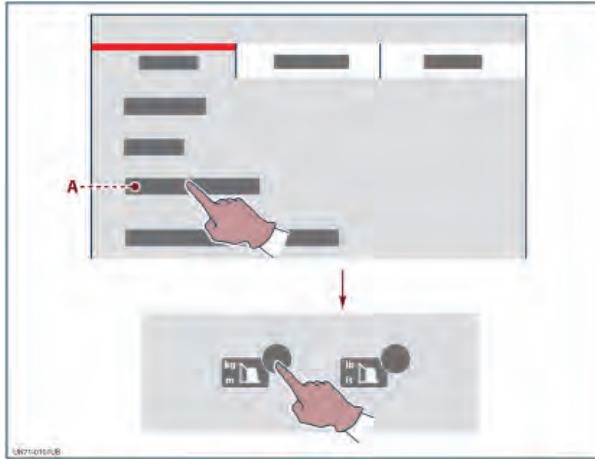
- A. Day setting field.
- B. Month setting field.
- C. Year setting field.
- D. Hour setting field.
- E. Minute setting field.
1. Tap the button (F) to save the settings.

## SETTING THE LANGUAGE



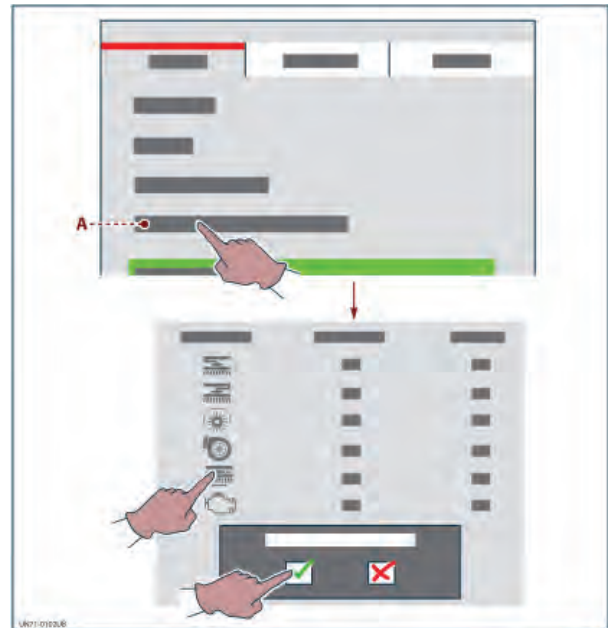
1. Tap the button (A) to display the language setting page.
2. Tap the button next to the flag to select the desired language.

## SETTING THE UNIT OF MEASURE



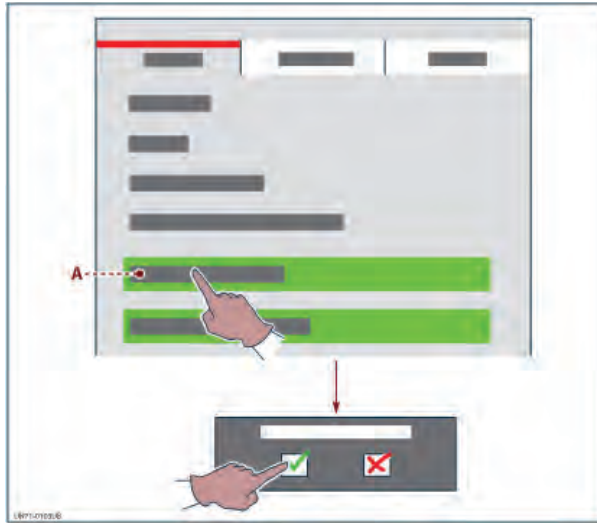
1. Tap the button (A) to display the unit of measurement setting page.
2. Tap the button with the desired unit of measurement to set it.

## RESETTING PARTIAL EQUIPMENT WORK TIME (HOURS)



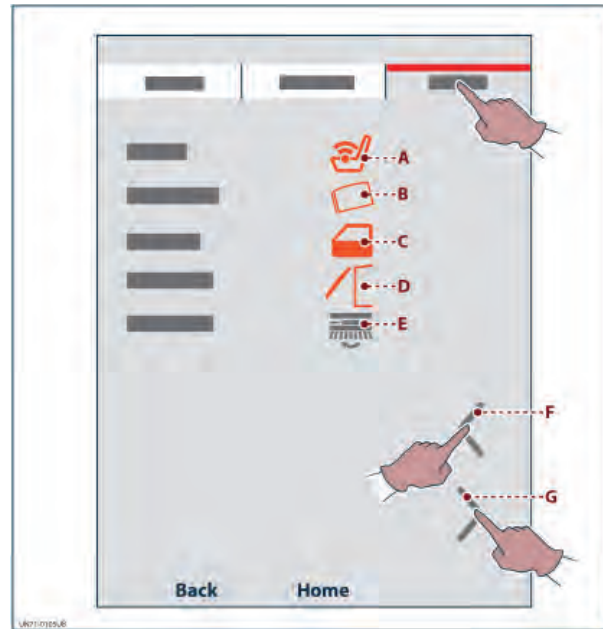
3. Tap the button (A) to display the page for resetting the partial equipment work time (hours).
4. Tap the button for the desired equipment.
5. The window to confirm or cancel the reset appears.
6. Tap the respective button to either confirm or cancel the reset.

## RESETTING THE PARTIAL DISTANCE (KILOMETERS)



1. Tap the button (A) to display the reset page for the partial distance (kilometers).
2. Tap the respective button to either confirm or cancel the reset.

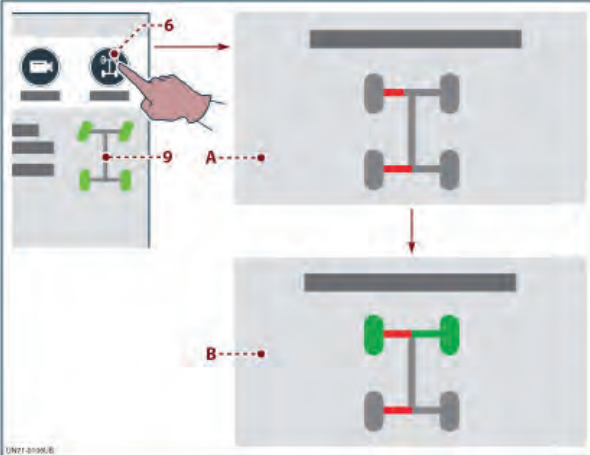
## DIAGNOSTICS SCREEN



1. Tap the button shown in the illustration to display the "Diagnostics" page.

- A. Seat microswitch operation.
- B. Off-site container sensor operation.
- C. Machine door closed/open sensor reading.
- D. Hopper door opening and closing sensor.
- E. Front brush rotation sensor operation.
- F. Back Navigation Button
- G. Forward Navigation Button

## CHANGING THE STEERING MODE



The steering mode set is shown in the diagram (9).

Complete the operations described.

8. Press and hold the button (6) for approximately 2 seconds.

The diagram (A) instructing the operator to “Align wheels” appears.

9. Align the wheels.

The diagram showing (B) “Wheels aligned” appears.

10. Keep the wheels aligned for a few seconds to change the steering mode.

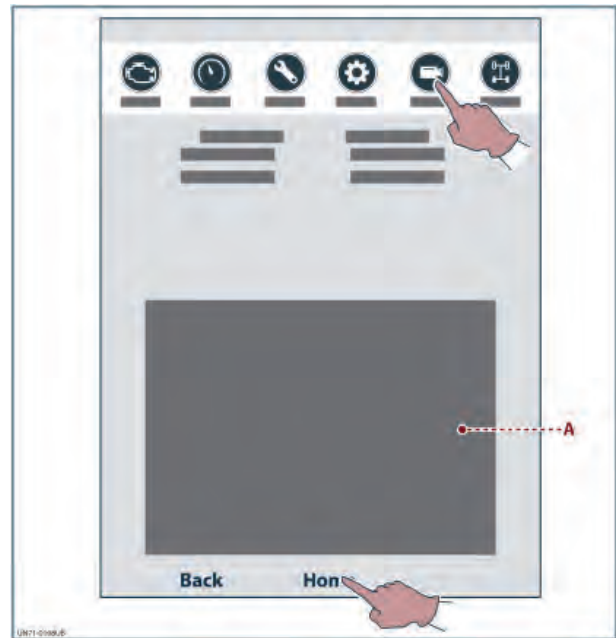
## USING THE CAMERA IN TRAVEL MODE

The machine features a rear-view camera as standard and an optional camera in the loading area.

In drive mode, only the rear-view camera is active.

To set the camera to turn on and off automatically, proceed as described here.

11. Engage the machine’s reverse gear to switch the camera on.
12. Disengage the machine’s reverse gear to switch the camera off.



To turn the camera on and off in manual mode, proceed as described here.

13. Tap the button shown in the illustration to switch the camera on.

The image transmitted by the camera is shown in the field (A).

14. Tap the button shown in the illustration once again to switch the camera off.

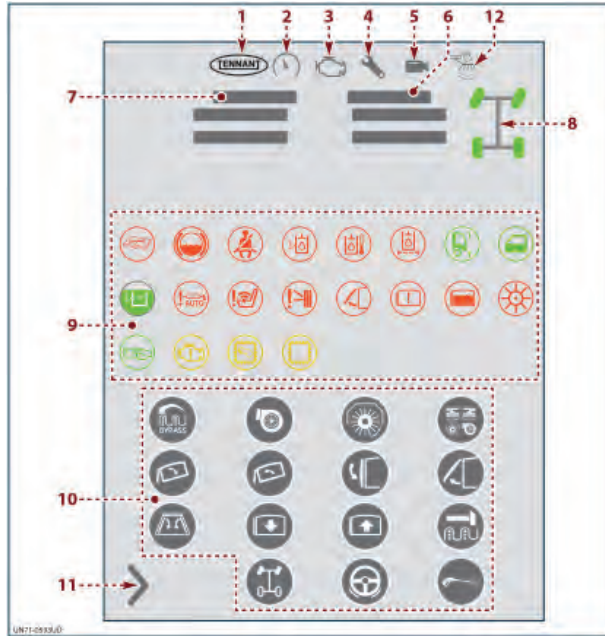
The camera is also turned off by tapping the “Home” button.

**FOR SAFETY: When using machine, always be aware of your surroundings.**

## DESCRIPTION OF THE OPERATING TERMINAL (TOUCH-SCREEN DISPLAY) IN WORK MODE

Set the work mode (see “Work mode”).

The page shown in the illustration appears on the operating terminal display.



The illustration shows the “full optional” page.

1. Key (HOME): this is used to go back to the home page.
2. Hydraulic: this is used to display the pages showing the hydraulic pump pressures.
3. Button: this is used to display the page showing the engine parameters, hydraulic oil temperature, and vacuum unit speed.
4. Key: this is used to display the diagnostics page.
5. Button: this is used to turn on the rear-view camera and, if present, the loading-area-view camera.
6. Hour meter.

The partial utilization time and the total utilization time can be displayed in this field.

7. Distance-travelled display field.

Partial distance and total distance can be displayed in this field.

8. Steering type display field.
9. Signal light display field.

Some signal lights only appear in the event of a fault.

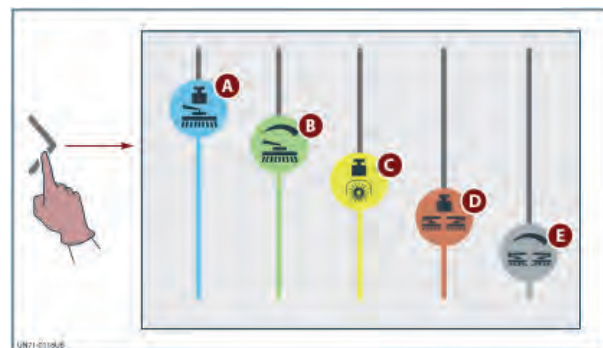
For a description of the signal lights, see “Description of the signal lights”.

10. Display field for work device activation buttons  
The illustration shows the button for a full optional machine.

For a description of the buttons, (see “Description of the buttons for switching on the work devices”).

11. Button: this is used to display the brush speed setting page or the brush ground pressure setting page.  
The button appears when the brush ground pressure and brush rotation speed options are active in the machine.
12. Button (optional): this is used to enable manual control of front brush rotation reversal.

## BRUSH SPEED AND BRUSH PRESSURE SETTING PAGE (OPTIONAL)



- A. Scroll button: increase or decrease front brush pressure.
- B. Scroll button: increase or decrease front brush rotation speed.
- C. Scroll button: increase or decrease main brush pressure.
- D. Scroll button: increase or decrease side brush pressure.
- E. Scroll button: increase or decrease side brush rotation speed.

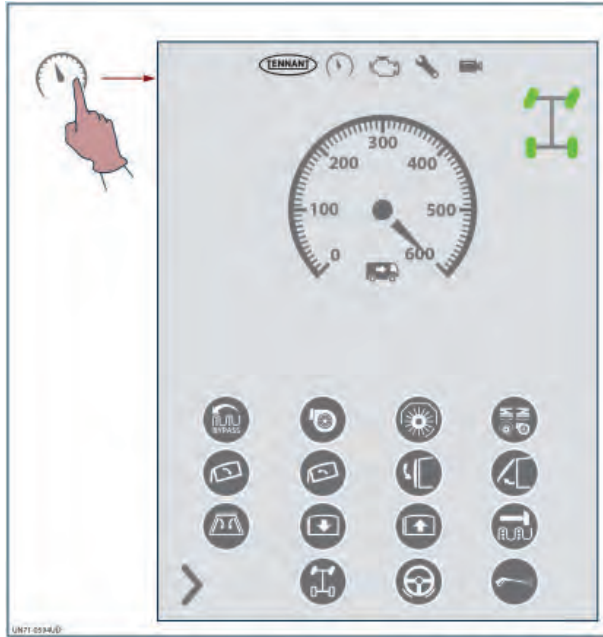
## HYDRAULIC PUMP PRESSURE SCREEN

Set the work mode (see “Work mode”).

The page shown in the illustration appears on the operating terminal display.

## PAGE WITH INACTIVE OPTION

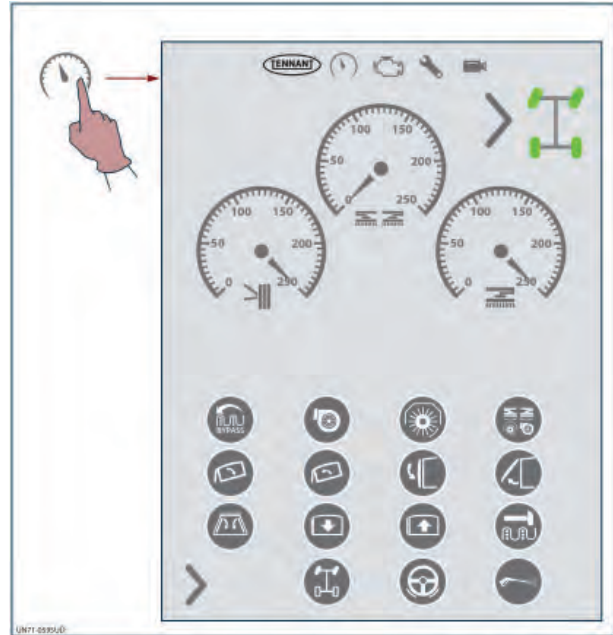
When the option is not active, only the travel pump pressure is visible.



1. Tap the button shown in the illustration to display the page

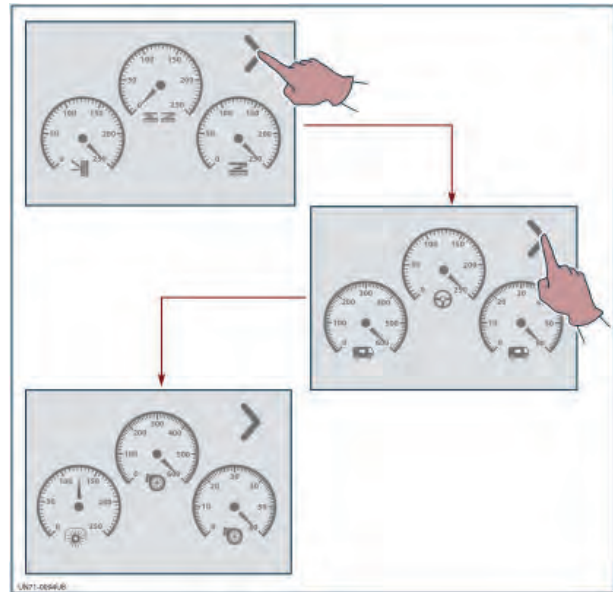
## PAGE WITH ACTIVE OPTION

When the option is active, the hydraulic pressure of all pumps mounted on the machine is visible



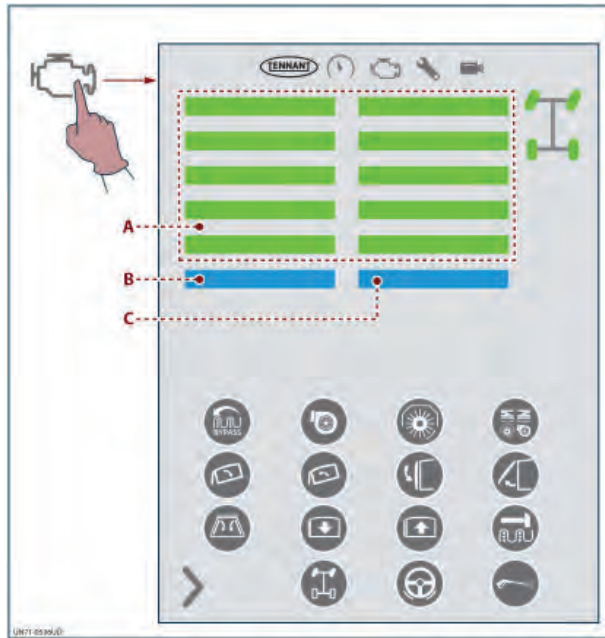
Complete the operations described.

1. Tap the button shown in the illustration to display the page.



2. Tap the buttons shown in the illustration to switch to the other pages

## ENGINE PARAMETERS SCREEN

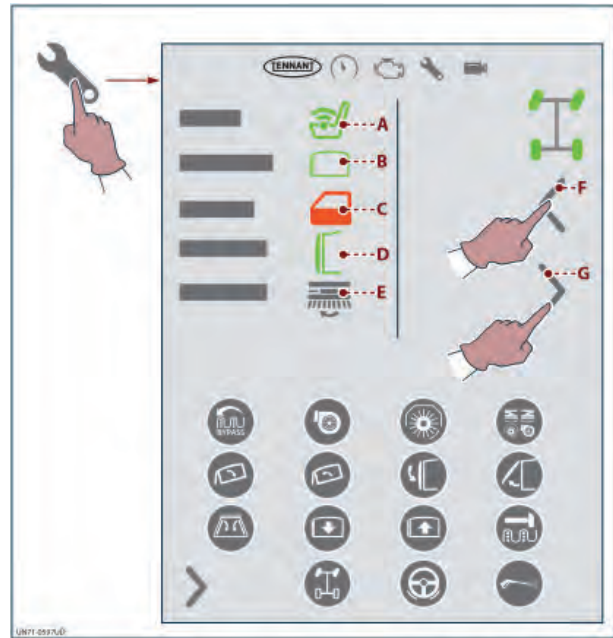


1. Tap the key shown in the illustration. The engine parameters page appears.

- A. Engine parameters display field.
- B. Hydraulic fluid temperature display field.
- C. Vacuum unit speed display field.

This field can only be displayed if the "Variable vacuum unit" option is featured.

## DIAGNOSTICS SCREEN



1. Tap the button shown in the illustration to display the "Diagnostics" page.

- A. Seat microswitch operation.
- B. Off-site container sensor operation.
- C. Machine door closed/open sensor reading.
- D. Hopper door opening and closing sensor.
- E. Front brush rotation sensor operation.
- F. Back Navigation Button
- G. Forward Navigation Button

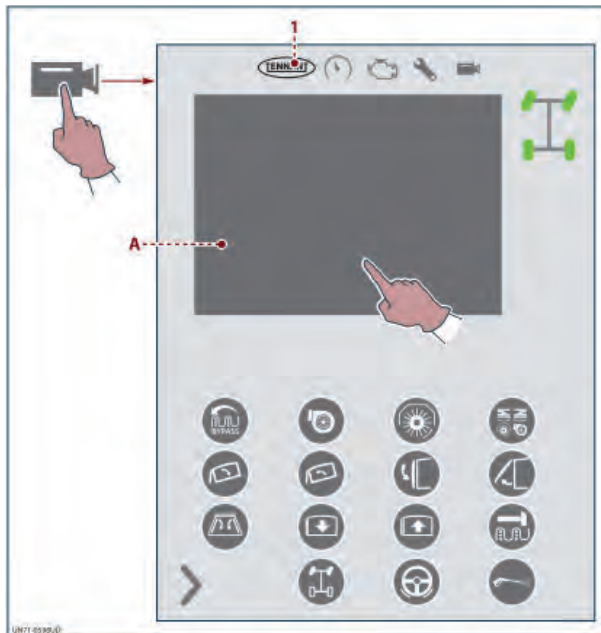
## OPERATE THE CAMERA IN WORK MODE

The machine features a rear-view camera as standard and an optional camera in the loading area.

To set the camera to turn on and off automatically, proceed as described here.

1. Engage the machine's reverse gear to switch the camera on.
2. Disengage the machine's reverse gear to switch the camera off.

To turn the camera on and off in manual mode, proceed as described here.



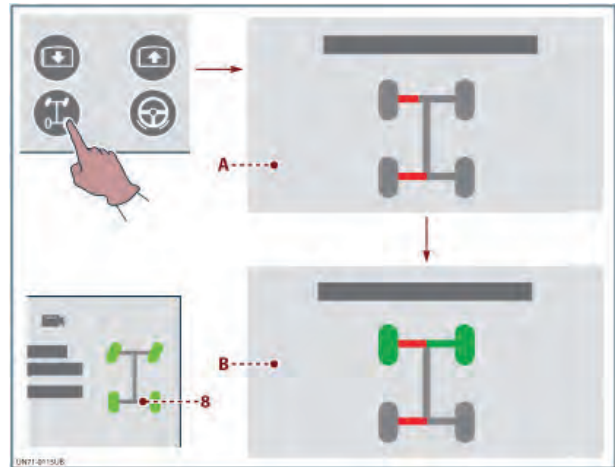
1. Tap the button shown in the illustration to switch the camera on.

The image transmitted by the camera is shown in the field (A).

If a camera is also fitted on the machine in the loading area, the camera images can be displayed alternately.

2. Tap the field (A) to toggle between views.
3. Tap the button (1) to switch the camera off.

## CHANGE THE STEERING MODE



The steering mode set is shown in the diagram (8).

Complete the operations described.

1. Tap the key shown in the illustration.

The diagram (A) instructing the operator to "Align wheels" appears.

2. Align the wheels.

The diagram showing (B) "Wheels aligned" appears.

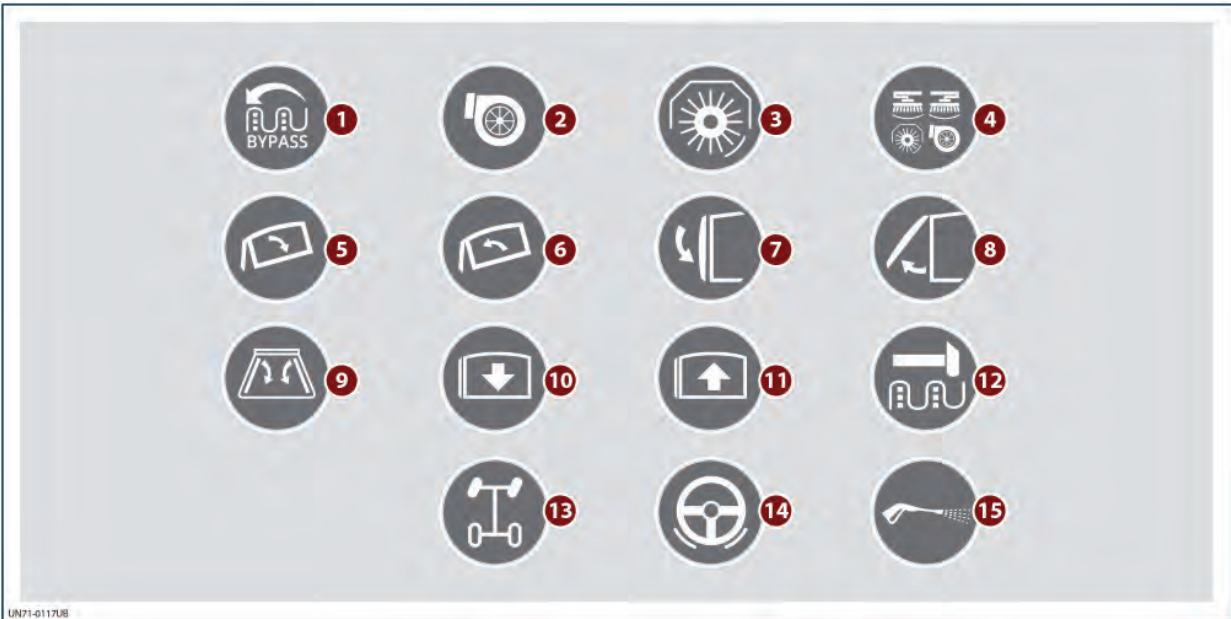
3. Keep the wheels aligned for a few seconds to change the steering mode.

## DESCRIPTION OF THE SIGNAL LIGHTS



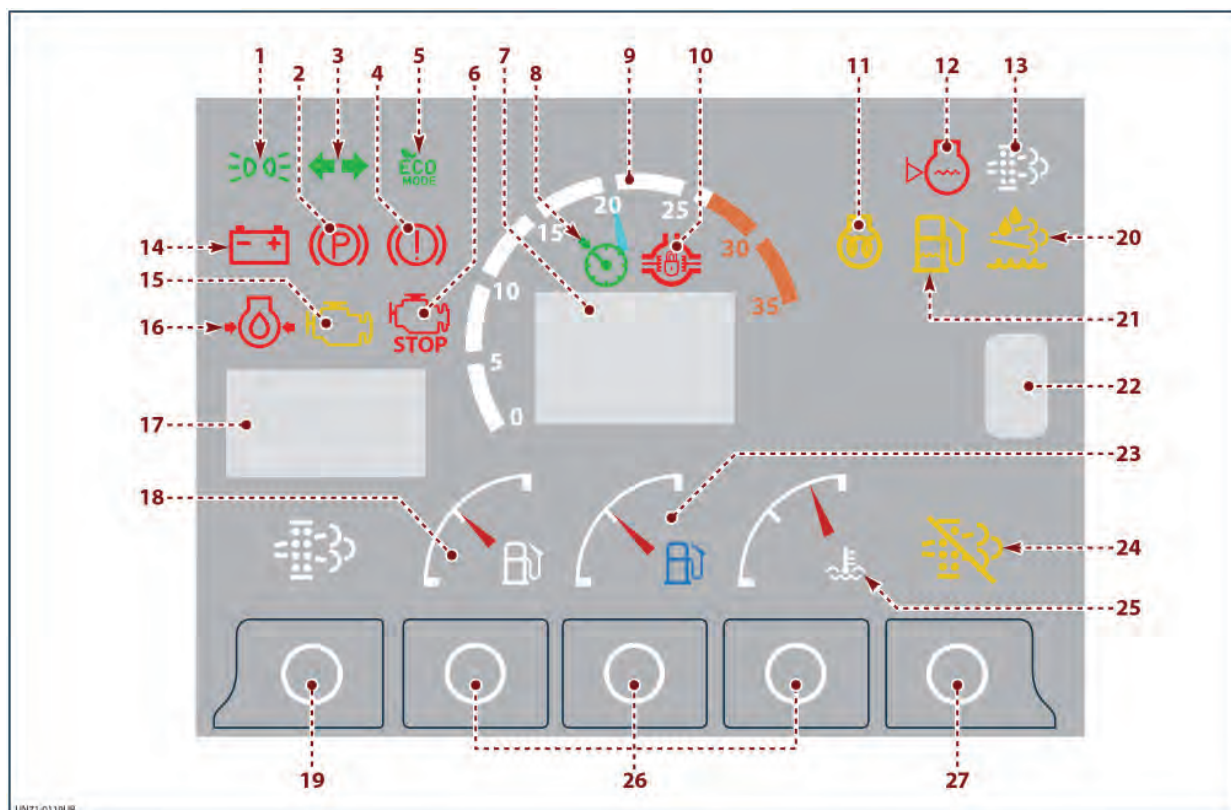
1. Light: Front Wheel Only Steering Mode
2. Light: four-wheel steering mode.
3. Light: fault in the front axle sensor.
4. Light: fault in the rear axle sensor.
5. Light: maintenance intervals.
6. Light: alarms.
  - A steady light shows low brake oil level.
  - A flashing light shows a brake system pressure alarm.
7. Light: seat belt
8. Light: hydraulic fluid level is low.  
A sound signal switches on.
9. Light: high hydraulic fluid temperature.
10. Light: hydraulic fluid filter is clogged.
  - A sound signal switches on.
11. Light: suspension position.
  - Low.
  - Intermediate.
  - High.
12. Light: door status.
  - A red light shows that the doors are open.
  - A green light shows that the doors are closed.
13. Tank Water Level Light
  - A red light shows a low tank water level.
14. Greasing System Fault Light
15. Seat Sensor Fault light
16. Suspension sensor fault light
17. Light: this shows that the hopper unloading hatch is open.
18. Light: this shows that the hopper is not in place.
19. Light: this shows that the hopper is full.
20. Light: this shows the shredder locking alarm is active.
21. Light: this shows badge use.
22. Light: this shows a fault in the engine.
23. Light: this shows a fault in the drive system.
24. Light: this shows an error in the machine management system.
25. Light: this shows that the grate inside the hopper is down.

## DESCRIPTION OF THE BUTTONS FOR SWITCHING ON THE WORK DEVICES



1. Button: this is used to turn on the by-pass.
2. Button: this is used to turn on the vacuum unit.
3. In the optional "Variable vacuum unit speed" version, the vacuum speed can be varied.
4. Button: this is used to turn on the main brush.
5. Button: this is used to turn on the side brushes, main brush, and vacuum unit at the same time.
6. Button: this is used to tip the hopper downwards.
7. Button: this is used to tilt the hopper upwards.
8. Button: this is used to close the hopper unloading hatch.
9. Button: this is used to open the hopper unloading hatch.
10. Button (optional): this is used to turn on the scraper blades.
11. Button (optional): this is used to lower the hopper.
12. Button (optional): this is used to lift the hopper.
13. Button: this is used to turn on the filter shaker manually.
14. Button (optional): this is used to activate a steering mode change.
15. Button (optional): this is used to turn on the brush-tracking mode.
16. Button (optional): this is used to enable pressure washer use.

## DESCRIPTION OF THE ENGINE CONTROL TERMINAL



1. Signal light: this shows that the machine's lights are on.
  - Parking lights.
  - Low-beam headlights.
  - High-beam headlights.
2. Signal light: this means the parking brake is applied.
3. Direction indicator.
4. Signal light: this shows a brake fault.

When the signal light comes on, an audio signal sounds at the same time.
5. Signal light: this shows that the power-saving travel mode is turned on.
6. Signal light: this shows that the engine has stopped due to a serious operating failure.

When the signal light comes on, an audio signal sounds at the same time.
7. Speed display field.
8. Signal light: this shows that the cruise control is turned on.
9. Engine speed display field.
10. Signal light: this shows that the differential lock is engaged.
11. Signal light: this shows the glow plugs are activated for preheating.
12. Signal light: this shows a low engine coolant level.

When the signal light comes on, an audio signal sounds at the same time.
13. Signal light: this shows that the particulate filter is clogged.

When the signal light comes on, an audio signal sounds at the same time.
14. Signal light: this shows a fault in the engine alternator.

When the signal light comes on, an audio signal sounds at the same time.
15. Signal light: this signals an engine operating failure.

When the signal light comes on, an audio signal sounds at the same time.
16. Signal light: this shows a low engine oil pressure.

When the signal light comes on, an audio signal sounds at the same time.
17. Engine fault display field.
18. Signal light: this shows the fuel level in the tank.

The signal light flashes when the fuel level is below 15%.
19. Button: this is used to turn on the particulate filter regenerator.
20. Signal light: this signals low "DEF" fluid level in the tank.

When the signal light comes on, an audio signal sounds at the same time.
21. Signal light: this shows the presence of water in the fuel tank.

When the signal light comes on, an audio signal sounds at the same time.
22. Signal light: this shows the machine travel direction.
23. Signal light: this shows the "DEF" level liquid in the tank.

The signal light flashes when the "DEF" liquid is below 15% percent.
24. Signal light: when the light is white, the particulate filter regeneration cycle can be turned on.

Press the button (27) to disable particulate filter regeneration.

The signal light turns yellow.
25. Signal light: this shows the engine coolant temperature.

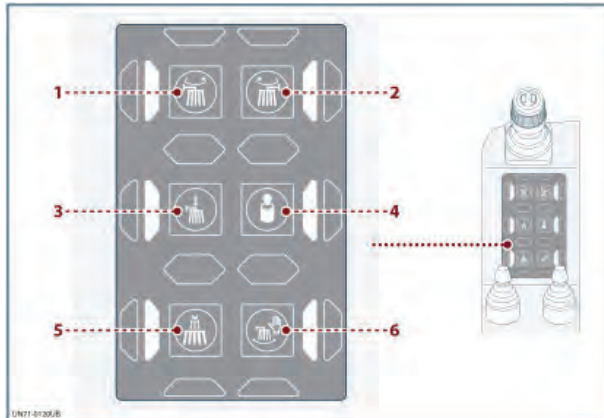
The signal light is red if the reading is above 105.

The signal light is white when the temperature is below 102.
26. Buttons: not active.
27. Button: this is used to disable particulate filter regeneration activation.

### DESCRIPTION OF THE BRUSH CONTROL PANEL

There are always optional buttons featured on the control panel.

If the options associated with the buttons are not featured on the machine, the buttons do not light up.



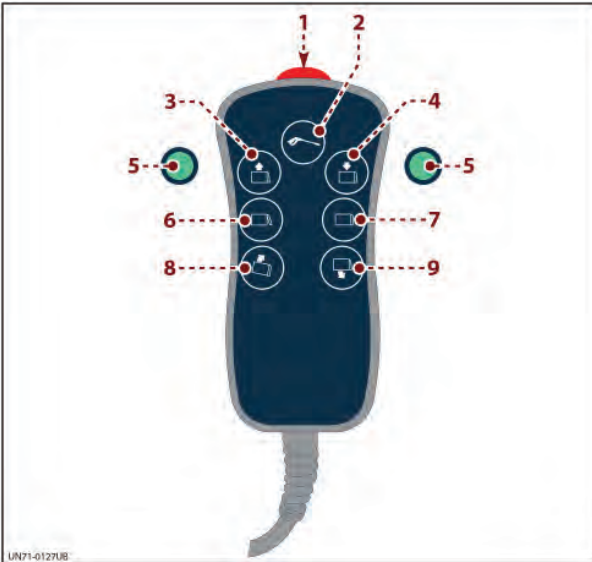
1. Button: LH side brush on and off.
2. Button: RH side brush on and off.
3. Button (optional): front brush on and off.
4. Button (optional): main brush pressure.
5. Button (optional): brush spraying.

Spraying switches on when the corresponding brush is turned on.

6. Button (optional): reverse the front brush rotation direction.

### CABLED REMOTE CONTROL (OPTIONAL)

The buttons on the cabled remote control work in parallel with the buttons on the operating terminal (touch-screen display).



Connect the remote control cable to the machine.

1. Emergency stop button: this is used to stop the engine in situations of impending danger.
2. Button (optional): enable the high-pressure washer.  
  
If there is no high-pressure washer featured, the button is not active.
3. Button (optional): this is used to lift the hopper.  
  
If this option is not featured, the button is not active.
4. Button (optional): this is used to lower the hopper.  
  
If this option is not featured, the button is not active.
5. Buttons: not active.
6. Button: this is used to open the hopper unloading hatch.
7. Button: this is used to close the hopper unloading hatch.
8. Button: this is used to tip the hopper upwards.
9. Button: this is used to tip the hopper downwards.

## ENGINE STARTER

**FOR SAFETY: To prevent explosions or personal injury do not use products such as ether to start the engine.**

**Exhaust gases are harmful to health.**

**Do not start the engine in closed or poorly ventilated areas.**

**Adopt all necessary precautions to prevent build-ups of exhaust gas.**

*NOTE: In the ignition phase do not adjust the engine speed.*

To start the engine, always follow the procedure described in this instruction manual.

The electric starting motor must not be used continuously for more than 15 seconds.

Wait about thirty seconds between one ignition attempt and the next to allow the electric motor to cool down.

Knowing the correct start-up procedure will prevent damage to engine parts and potential accidents.



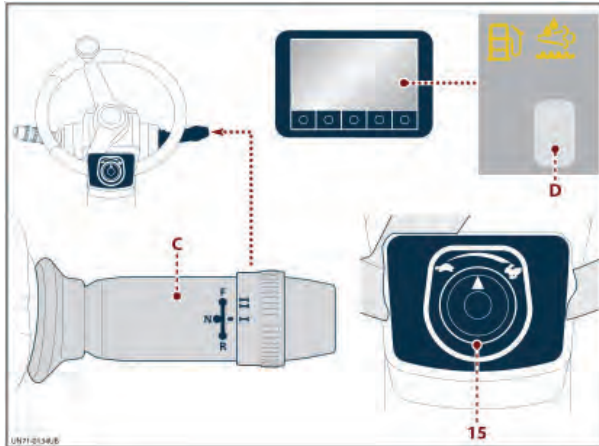
Complete the operations described.

1. Turn the battery isolation switch (29) to activate the electrical system.  
  
If there is an electronic battery isolator, press the button (22) to turn on the batteries.
2. Turn the accelerator dial (15) to set the engine to idling speed.
3. Turn the ignition key (24) by one click.  
  
The engine control terminal (6) switches on.  
  
The operating terminal (touch-screen display) (14) is turned on.
4. Turn the ignition key by another click to start the engine.
5. Press the button (20) to disengage the parking brake.  
  
The button comes back up and remains lit.
6. Press the pedal (26) to unlock the machine.  
  
The button (20) goes off.  
  
Travel is enabled.

If the parking brake does not disengage, seek assistance from authorized technical personnel to resolve the fault.

## ENGINE STOPPING

Complete the operations described.



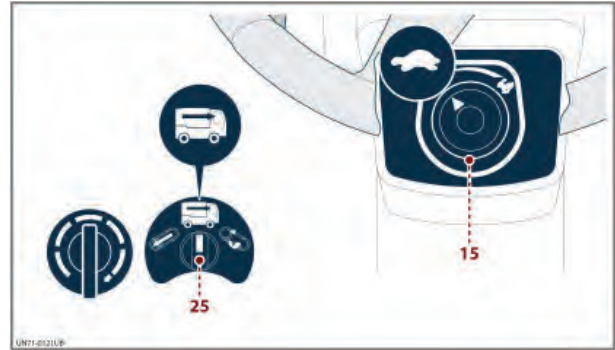
1. Turn the accelerator dial (15) to set the engine to idling speed.
2. Leave the engine to idle for the time needed to ensure it cools gradually.
3. Set the lever (C) in the central position to put the machine into neutral.
4. - The neutral symbol appears in the field (D).



5. Press the button (20) to engage the parking brake.  
The indicator lamp (A) lights up.
6. Turn ignition switch key (24) to the "0" position.  
The engine switches off.

## DRIVE MODE

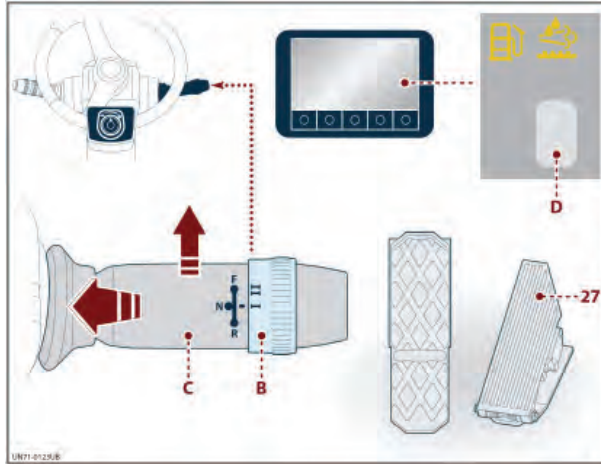
Complete the operations described



1. Get into the cab (see "Getting in and out the machine").
2. Fasten safety belt.
3. Start the engine (see "Engine starter").
4. Turn the accelerator dial (15) all the way to the left to set the engine to idling speed.  
At idling speed, sweeping functions are disabled.
5. Set the suspension height switch (25) to the central position.



6. Press the button (20) to disengage the parking brake.  
The button comes back up and remains lit.  
The signal light (A) will turn off.
7. Press the brake pedal to unlock the machine.  
The button (20) goes off.  
Travel is enabled.



8. Turn the selector switch (B) to the desired position.
  - (I) normal travel.
  - (II) power-saving travel mode.
9. Move the lever (C) upwards and forwards at the same time.
  - Forward travel is enabled.
  - The forwards symbol appears in the (D) field.

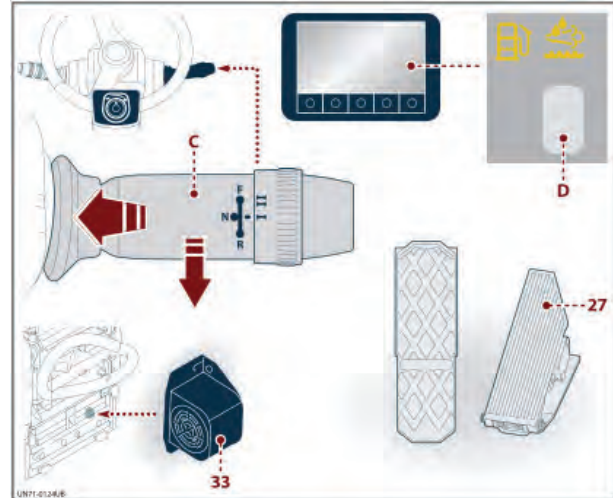
**FOR SAFETY: go slow on inclines and slippery surfaces.**

10. Press the propel pedal (27) gradually.
  - The machine moves forwards.

**FOR SAFETY: Reduce speed when turning.**

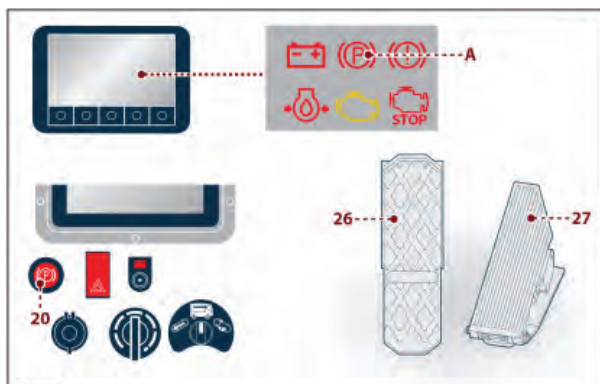
11. Use the steering wheel to steer the machine.

To use the reverse gear, carry out the steps described here.



12. Move the lever (C) upwards and backwards at the same time.
  - Reverse gear is enabled.
  - The reverse symbol appears in the field (D).
  - The camera comes on.
13. Press the propel pedal (27) gradually.
  - The machine moves backwards.
  - The buzzer (33) will sound.

## STOPPING THE MACHINE IN DRIVE MODE

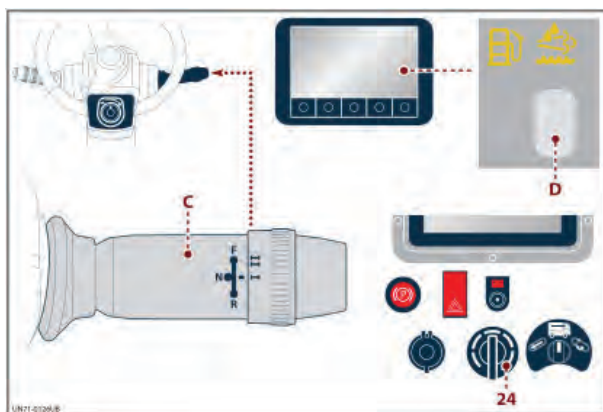


Complete the operations described.

1. Release the pedal (27).  
The machine slows down.
2. Press the pedal (26) to stop the machine.
3. Press the button (20) to engage the parking brake.

The button (20) will light up.

The indicator lamp (A) lights up.



4. Set the lever (C) in the central position to put the machine into neutral.  
The neutral symbol appears in the field (D).
5. Turn ignition switch key (24) to the "0" position.  
The engine switches off.

## WORK MODE

In the work mode, the equipment is enabled for operation.

**NOTICE: Stop brush rotation when the machine is stationary.**

Complete the operations described.

1. Get into the cab (see "Getting in and out the machine").
2. Fasten safety belt.
3. Start the engine (see "Engine starter").



4. Turn the suspension height switch (25) to the right.
5. At idling speed sweeping functions are disabled. Turn the accelerator dial (15) to increase the engine speed.



6. Press the button (20) to disengage the parking brake.

The button comes back up and remains lit.

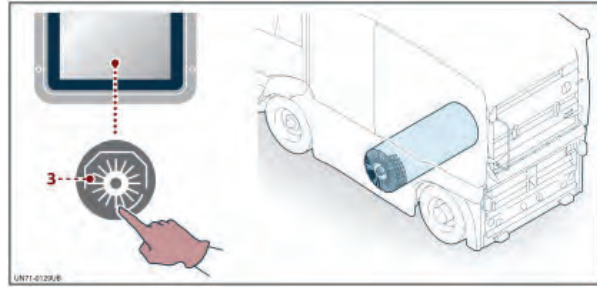
The signal light (A) will turn off.

7. Press the brake pedal to unlock the machine.

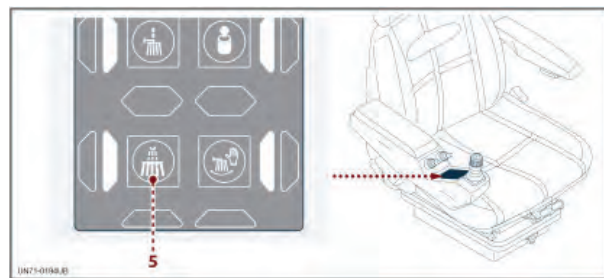
The button (20) goes off.

Travel is enabled.

8. Turn on the vacuum unit (see "Turn the vacuum unit on and off").



9. Tap the button (3) to turn on the main brush.
10. Turn on the side brushes (see "Using the side brushes").



11. Turn on the dust suppression if dust suppression is necessary.

Press the backlit button (5) to turn on spraying.

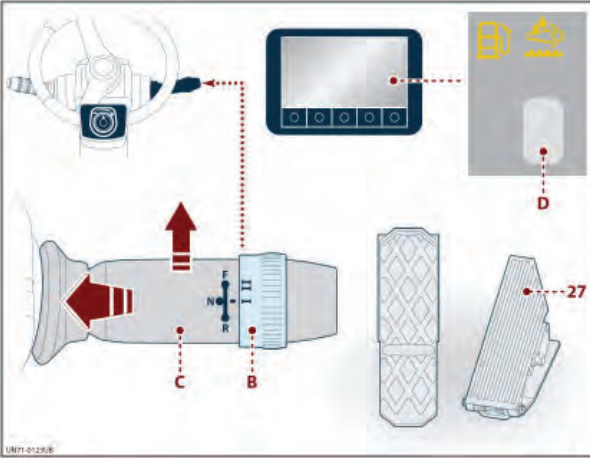
12. Turn on the front brush if necessary (see "Using the front brush (optional)").
13. Turn on the scraper blades if fitted (see "Using the scraper blades (optional)").

The main brush, side brushes, and vacuum unit can be turned on and off simultaneously



Tap the button (4) to turn on the equipment.

To turn off the equipment, touch the button (4) again.



14. Turn the selector switch (B) to the desired position.

(1) normal travel.

(11) power-saving travel mode.

15. Move the lever (C) upwards and forwards at the same time.

Forward travel is enabled.

The forwards symbol appears in the (D) field.

16. Press the propel pedal (27) gradually.

The machine moves forwards.

**NOTICE: If sweeping wet ground, turn on the by-pass to stop the bag filters getting wet.**

To turn on the by-pass (see "Sweeping wet ground").

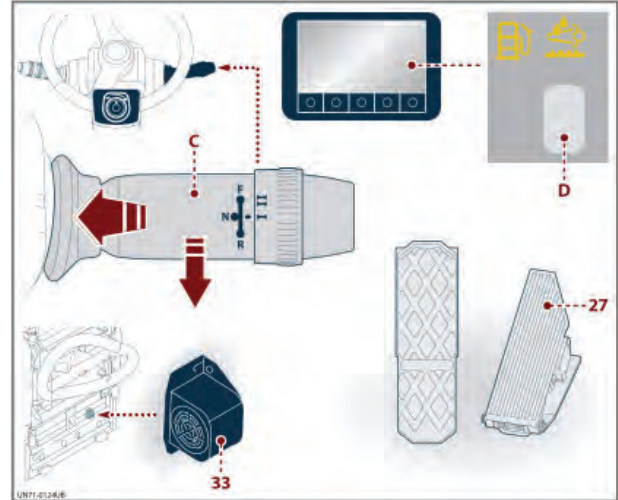
When collecting piles of wet leaves and bulky debris, proceed as described here.

17. Set the machine to drive mode.

18. Turn on the vacuum unit (see "Turn the vacuum unit on and off").

If the "Variable vacuum unit" option is featured, turn on the vacuum unit at top speed.

To use the reverse gear, carry out the steps described here.



1. Move the lever (C) upwards and backwards at the same time.

Reverse gear is enabled.

The reverse symbol appears in the field (D).

The camera comes on.

2. Press the propel pedal (27) gradually.

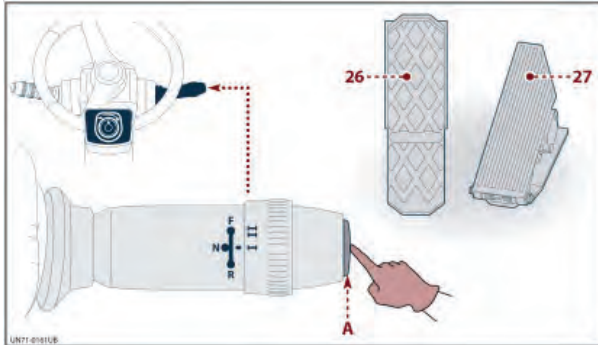
The machine moves backwards.

The buzzer (33) will sound.

### CRUISE CONTROL (OPTIONAL)

Cruise control can be used in both drive mode and work mode.

Complete the operations described.

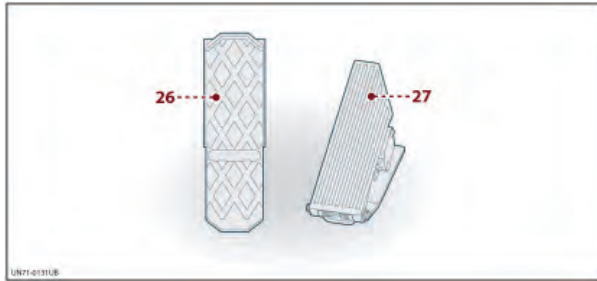


1. Press button (A) to turn on cruise control.

The machine maintains a constant travel speed without pressing the propel pedal (27).

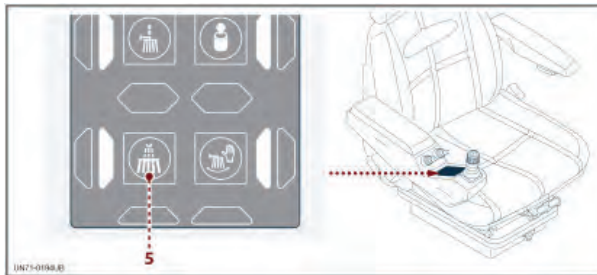
2. To turn off cruise control, either press the button (A) or press the accelerator pedal (27) gently or the brake pedal (26) gently.

## STOPPING THE MACHINE IN WORK MODE

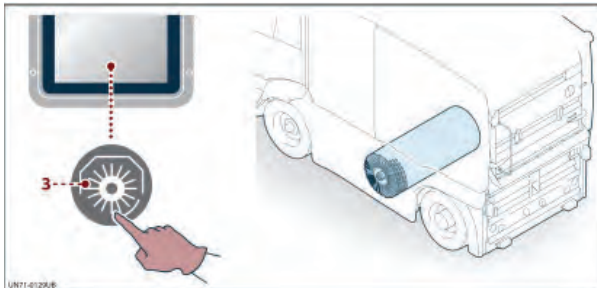


Complete the operations described.

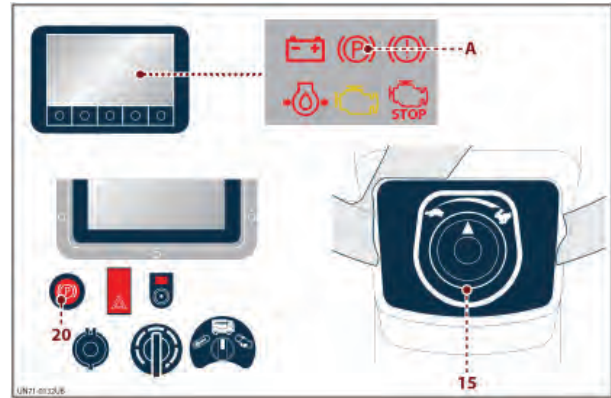
1. Release the pedal (27).  
The machine slows down.
2. Press the pedal (26) to stop the machine.



3. Press the backlit button (5) to stop spraying.
4. Turn off the front brush (see "Using the front brush (optional)").
5. Turn off the side brushes (see "Using the side brushes").

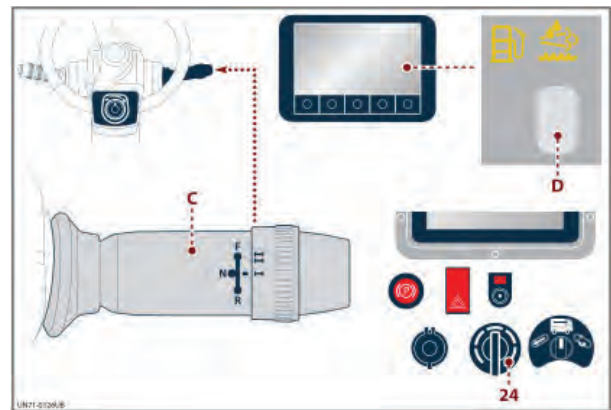


6. Touch the button (3) to turn off the main brush.
7. Turn off the vacuum fan (see "Switching the vacuum fan on and off").



8. Turn the accelerator dial (15) to set the engine to idling speed.
9. Press the button (20) to engage the parking brake.

The indicator lamp (A) lights up

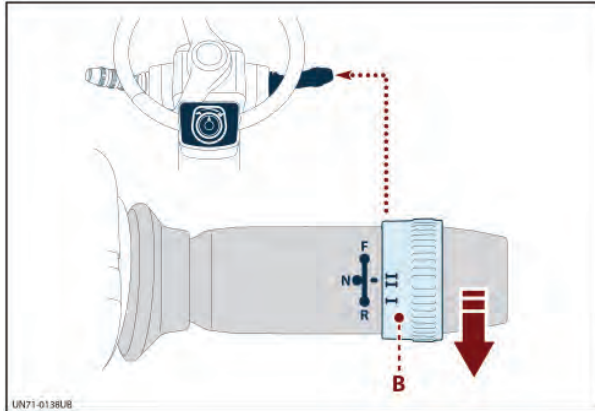


10. Set the lever (C) in the central position to put the machine into neutral.  
The neutral symbol appears in the field (D).
11. Turn ignition switch key (24) to the "0" position.  
The engine switches off.

## POWER-SAVING TRAVEL MODE

The power-saving mode involves lower fuel consumption.

The power-saving mode can be selected in both drive mode and work mode.



Complete the operations described.

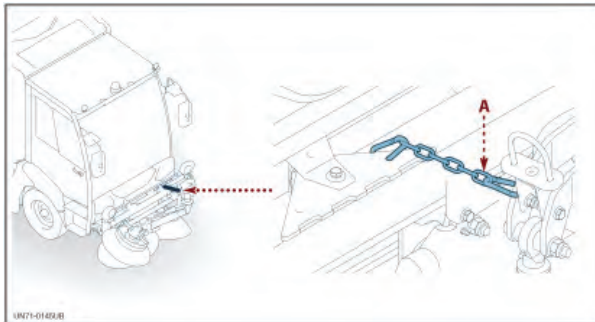
1. Turn the selector switch (B) to the "II" position.

## USING THE FRONT BRUSH OPTION

The front brush facilitates cleaning in areas further away from the machine.

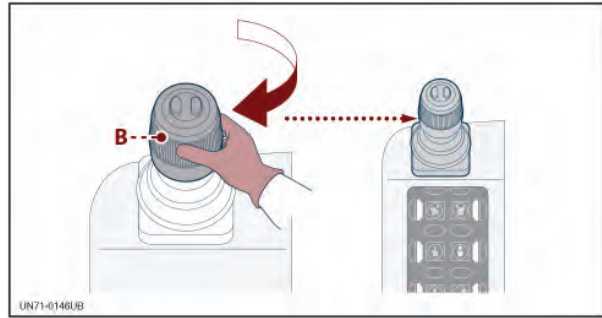


**WARNING: Do not stand or move within the working range of the front brush.**

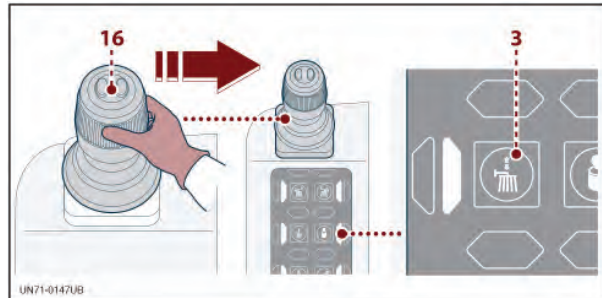


Complete the operations described.

1. Release the safety device (A) to unlock the front brush.
2. Start the engine (see "Engine starter").
3. Set the work mode (see "Work mode").



4. Turn the hand grip (B) to open the front brush arm.

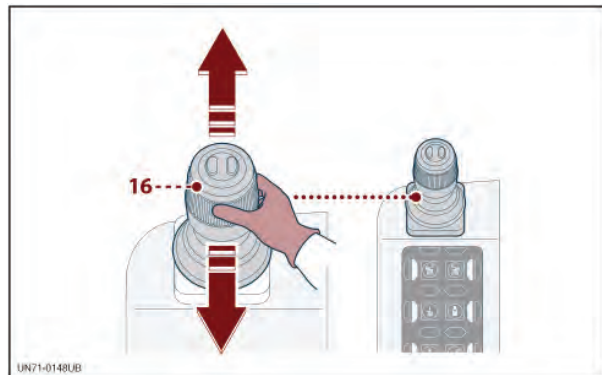


5. Move the joystick (16) to move the front brush into the work position.

When the position is reached, brush rotation switches on automatically.

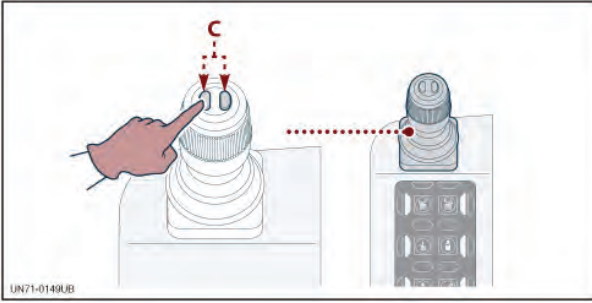
6. Press the button (3) to lower the arm and position the brush so that it is touching the ground.

The button backlight will come on.



7. Move the joystick (16) forwards to increase the brush pressure and backwards to decrease the force of the brush pressure.

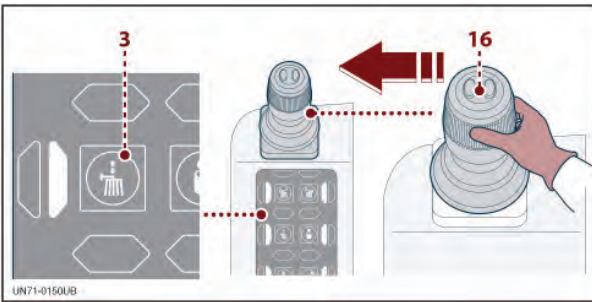
This control is optional.



8. Press the buttons (C) to tilt the brush.

This control is optional.

To sweep the LH side, proceed as described here.



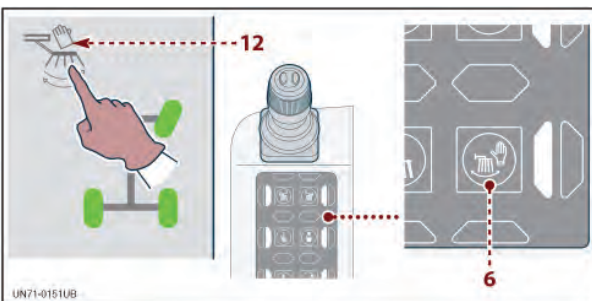
1. Press the button (3) to lift the arm and the brush off the ground.
2. Move the joystick (16) to move the front brush to the left.

The brush rotation direction reverses automatically.

3. Press the button (3) to lower the arm and position the brush so that it is touching the ground.

Brush rotation can be reversed manually if the operator feels it is necessary.

Complete the operations described.

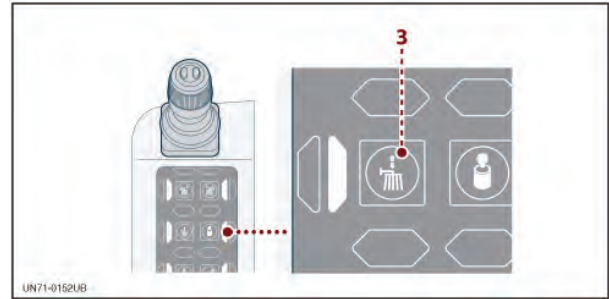


1. Tap the button (12) on the operating terminal.

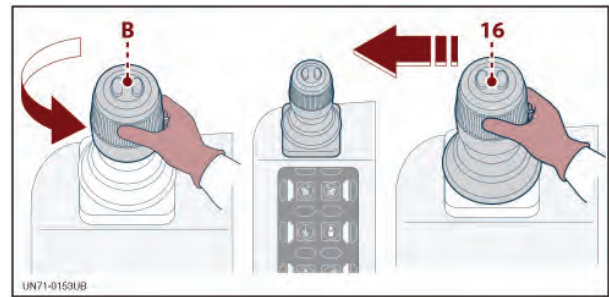
The button (6) is enabled.

2. Press the button (6) to reverse the brush rotation direction.

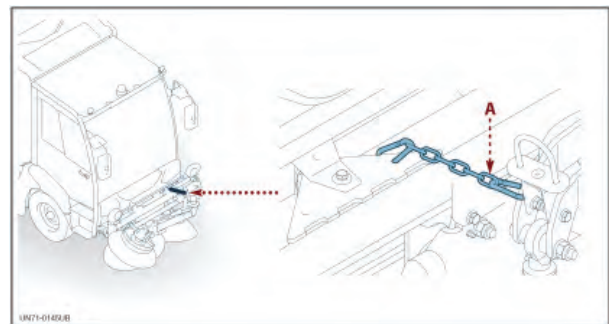
To return the brush to its resting position, carry out the steps described here.



1. Press the button (3) to lift the arm and the brush off the ground.



2. Turn the hand grip (B) to close the front brush arm.
3. Move the joystick (16) to move the front brush to the left.

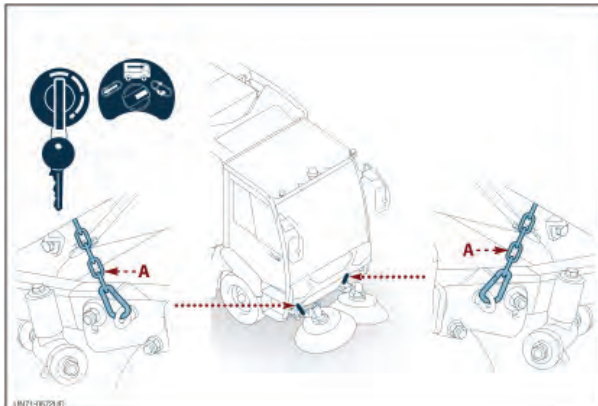


4. Engage the safety device (A) to lock the front brush.

## USING THE SIDE BRUSHES

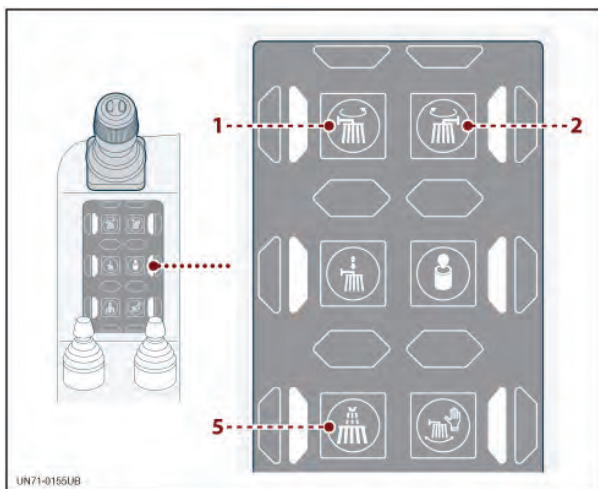


**WARNING:** Do not stand or move within the working range of the front brush.



Complete the operations described.

1. Release the safety devices (A) to unlock the side brushes.
2. Start the engine (see "Engine starter").
3. Set the work mode (see "Work mode").



4. Press the backlit button (2) to turn on the RH brush.

The button backlight will come on.

The brush moves into its work position and starts rotating

5. Press the backlit button (1) to turn on the LH brush.

The button backlight will come on.

The brush moves into its work position and starts rotating

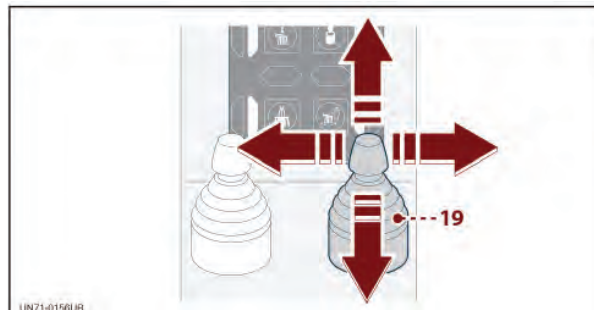
6. Decide whether spraying needs to be turned

on.

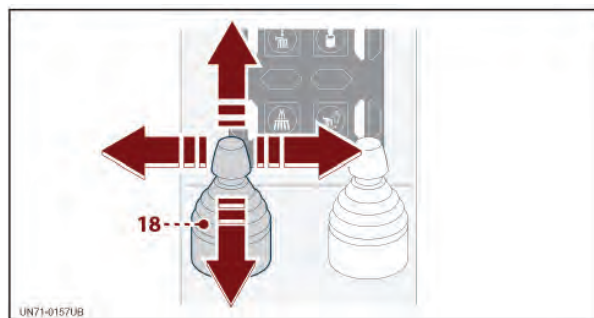
7. Press the backlit button (5) to turn on spraying.

The button backlight will come on.

The brushes can be moved and adjusted manually.

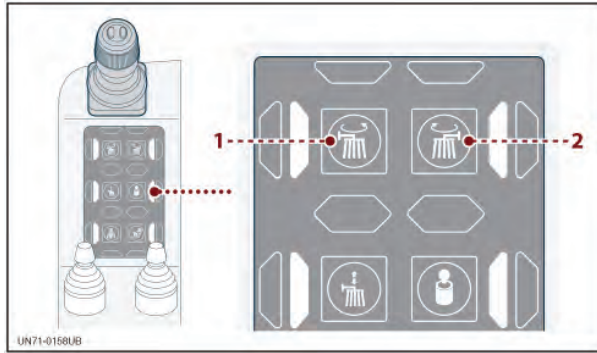


8. Move the joystick (19) to the right to open the RH brush or to the left to close the RH brush.
9. Move the joystick (19) forwards or backwards to adjust the angle of the RH brush (optional control).



10. Move the joystick (18) to the left to open the LH brush or to the right to close the LH brush.
11. Move the joystick (18) forwards or backwards to adjust the angle of the LH brush (optional control).

To turn off the side brushes, carry out the steps described here.



1. Press the backlit button (2) to turn off the RH side brush.

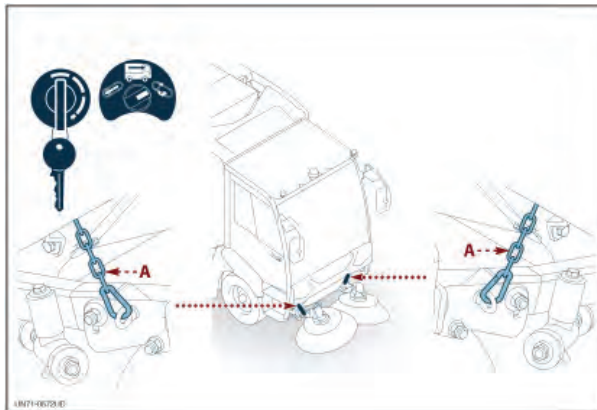
The button will no longer be illuminated.

The brush moves to the home position.

2. Press the backlit button (1) to turn off the LH side brush.

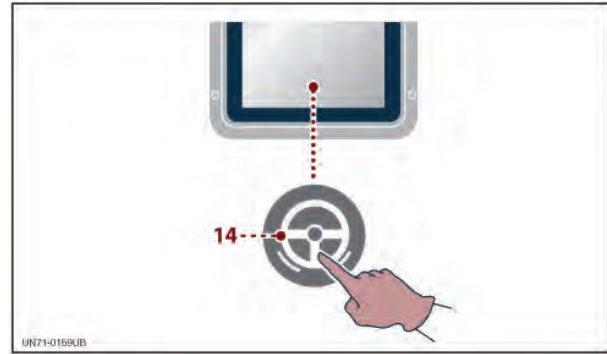
The button will no longer be illuminated.

The brush moves to the home position.



3. Fasten the safety devices (A) to lock the side brushes.

## USING THE TRACKING MODE



Complete the operations described.

4. Touch the button (14) to turn on the side brush tracking mode.

The brushes move in the same way as the machine is steered.

5. Tap the button (14) again to turn off the side brush tracking mode.

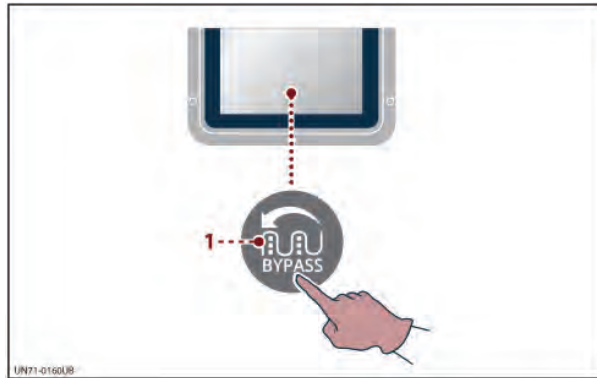
The side brushes will return to standard mode.

### SWEEPING WET GROUND

**NOTICE:** When sweeping wet ground, turn on the by-pass system to stop getting the bag filters wet and dirty, as this would render them unusable.

The by-pass system allows damp air to be blown directly to the outside without being filtered by the bag filters.

To turn on the by-pass system, carry out the steps described here.



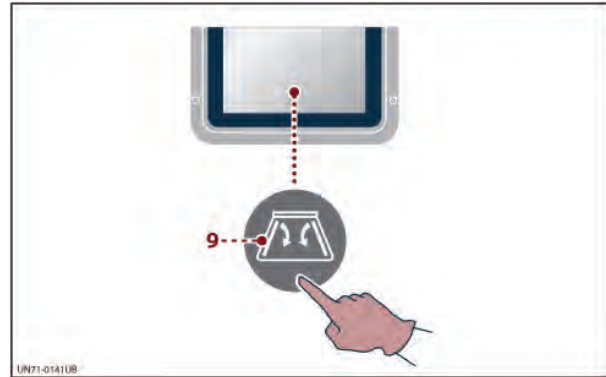
1. Touch the button (1) to turn on the by-pass system.

If the ground dries out, turn off the by-pass system.

2. Touch the button (1) again to turn off the by-pass system.

### USING THE SCRAPER BLADES (OPTIONAL)

The scraper blades clean the inside of the loading bin.



Complete the operations described.

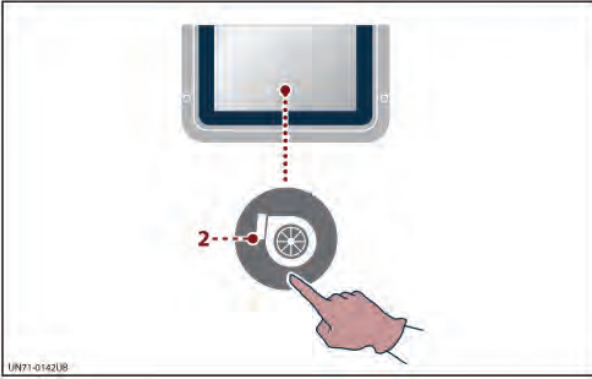
1. Touch the button (9) to enable the scraper blades.

The scraper blades work automatically.

The scraper blades only work if the vacuum fan and brush rotation are active.

2. Touch the button (9) again to disable the scraper blades.

## SWITCHING THE VACUUM FAN ON AND OFF



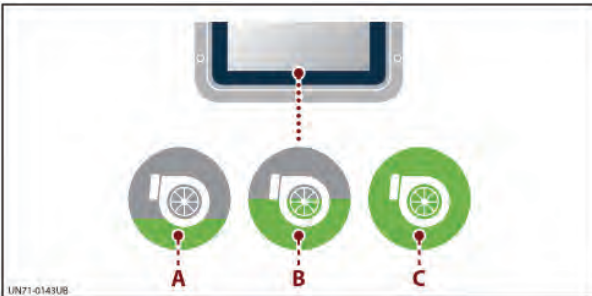
Complete the operations described.

1. Touch the button (2) to switch the vacuum fan on.
2. Touch the button (2) again to switch the vacuum fan off.

The vacuum fan switches off automatically in these conditions.

- Hopper out of place.
  - Hopper unloading hatch open.
  - High engine coolant temperature alarm.
  - Grate down.
3. When the vacuum fan is turned off, the filter shaker switches on automatically for 5 seconds.

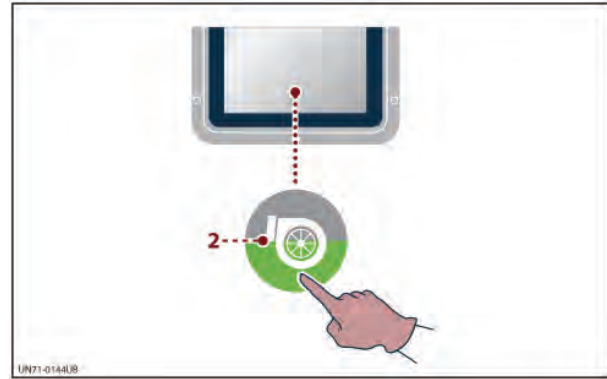
If the "Variable vacuum fan" option is configured, proceed as described here



The color of the button shows the suction speed set.

- A. Low vacuum speed.
- B. Medium vacuum speed.
- C. High vacuum speed

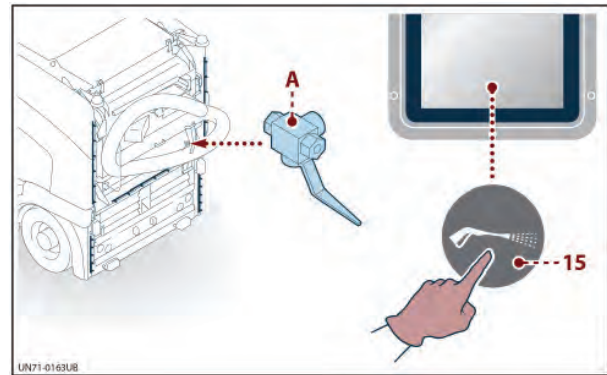
**NOTICE:** The variable vacuum fan must be turned on at medium suction speed.



1. Tap the button (2) twice to set the medium suction speed.
2. Tap the button (2) once or several times to change the suction speed.
3. Press and hold the button (3) for approximately 3 seconds to turn off the vacuum fan.

## REAR SPRAYING (OPTIONAL)

Rear spraying reduces dust when unloading debris



Complete the operations described.

1. Turn the valve lever (A) as shown in the picture.
2. Tap the button (15) to switch spraying on.
3. Tap the button (15) again to switch spraying off.

## EMPTYING THE HOPPER

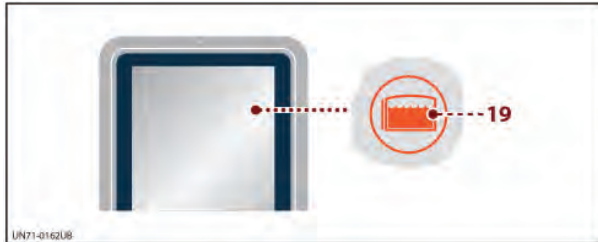
**NOTICE:** Empty the hopper when it is full and at the end of each working day.

**FOR SAFETY:** Make sure that there are no people or animals in the area where the hopper is emptied.

Empty the hopper with the machine standing on flat, solid ground.

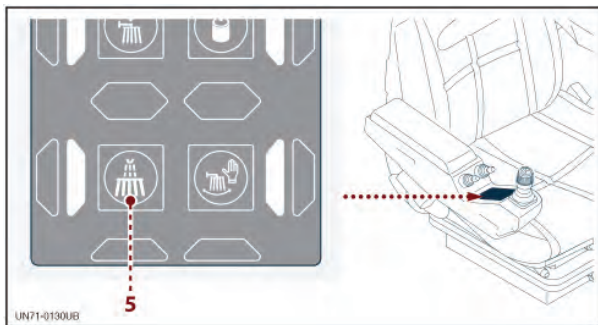


**WARNING:** Lift arm pinch point. Stay clear of hopper lift arms.



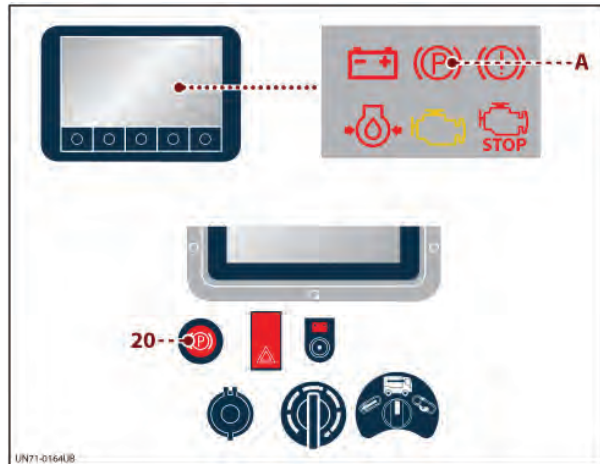
If the machine is equipped with the 'hopper full' alarm option, the operating terminal display shows the signal light (19) and a pop-up appears.

If the machine does not feature a full hopper alarm, the operator must decide, depending on the material sucked in, whether to go and empty the container or continue with the job.



Complete the operations described.

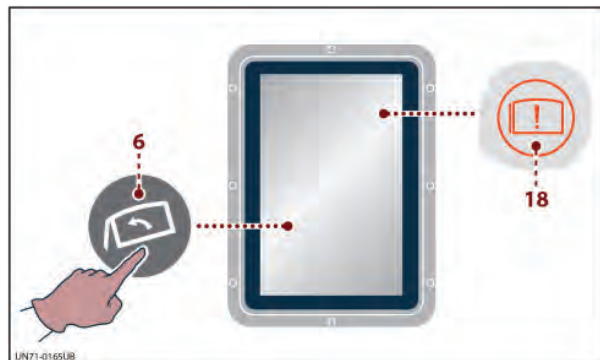
1. If dust suppression is turned on, switch it off.  
Press the backlit button (5) to stop spraying.
2. Turn off all the equipment.
3. Turn off the vacuum fan (see "Switching the vacuum fan on and off").
4. Move the machine to the unloading area.



5. At idling speed hopper raise/lower functions are disabled. Press the button (20) to engage the parking brake.

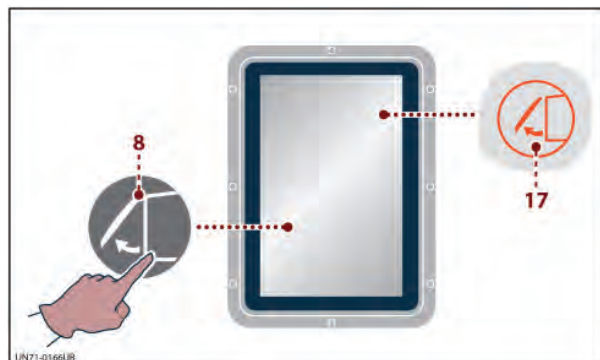
The indicator lamp (A) lights up.

6. If the optional rear spraying device is featured, switch it on (see "Rear spraying (optional)").



7. Press and hold the button (6) to tilt the hopper upwards.

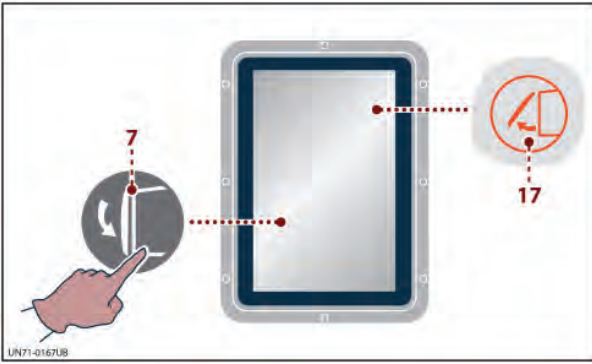
The signal light (18) appears.



8. Press and hold the button (8) to unlock and open the hopper door.

The signal light (17) appears.

9. Empty the hopper completely.

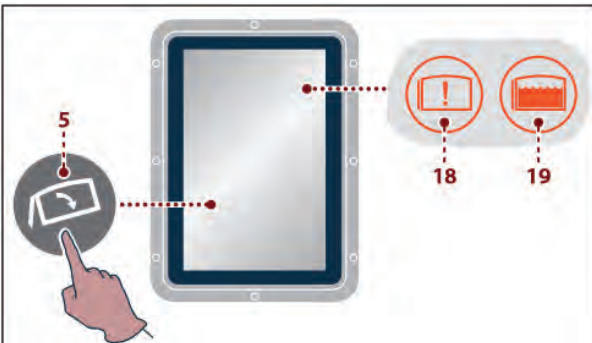


10. Press and hold the button (7) to close and lock the unloading hatch.

The signal light (17) disappears



**WARNING: Hopper door pinch point. Stay clear of hopper door.**



11. Press and hold the button (5) to lower the hopper.

The signal light (18) disappears.

12. Turn off rear spraying (see "Rear spraying (optional)").
13. If this option is featured, check that the signal light (19) is no longer showing on the operating terminal display.

## EMPTYING THE HOPPER (UNLOADING AT HEIGHT)



**WARNING: Lift arm pinch point. Stay clear of hopper lift arms.**



**WARNING: High dump vertical clearance. Stay clear of overhead obstructions and power lines.**



**WARNING: Make sure that there are no people or animals in the area where the hopper is emptied.**

Empty the hopper with the machine standing on flat, solid ground.

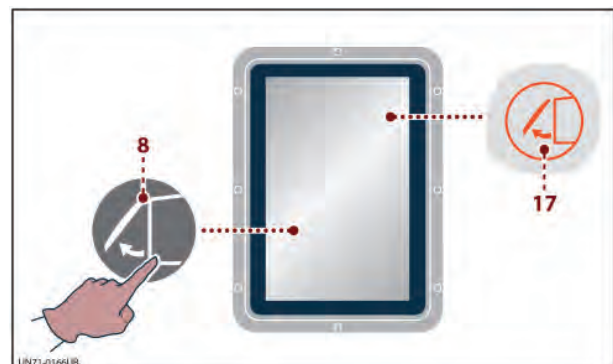


Complete the operations described.

1. Move the machine to the unloading area.
2. Press the button (20) to engage the parking brake.

The indicator lamp (A) lights up.

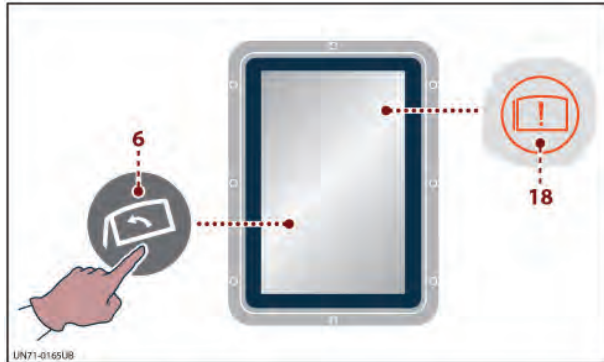
3. Raise the hopper (see "Raising and lowering the hopper").



## OPERATION

- Press and hold the button (8) to unlock and open the hopper door.

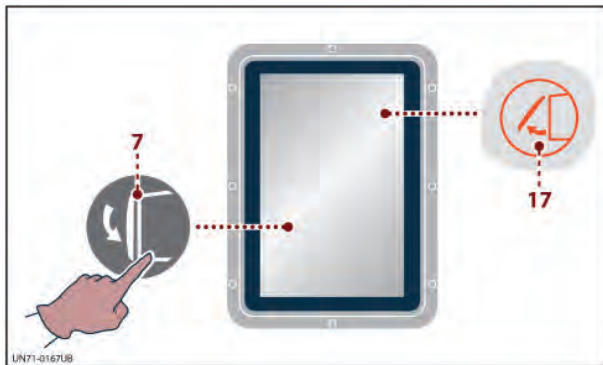
The signal light (17) appears



- Press and hold the button (6) to tilt the hopper upwards.

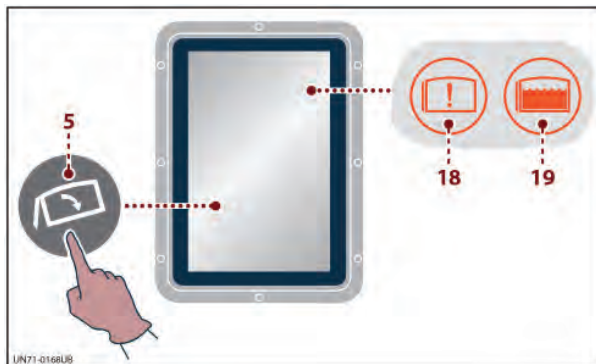
The signal light (18) appears.

- Empty the hopper completely.



- Press and hold the button (7) to close and lock the unloading hatch.

The signal light (17) disappears



- Press and hold the button (5) to lower the hopper.

The signal light (18) disappears.

- If this option is featured, check that the signal light (19) is no longer showing on the operating terminal display.

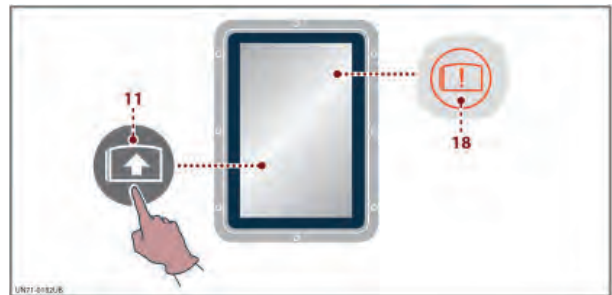
- Lower the hopper (see "Raising and lowering the hopper").

## RAISING AND LOWERING THE HOPPER (OPTIONAL)

**FOR SAFETY:** Raise the hopper and lower onto solid, flat ground.



**WARNING:** High dump vertical clearance. Stay clear of overhead obstructions and power lines.



Complete the operations described.

- Press and hold the button (11) until the hopper is fully raised.

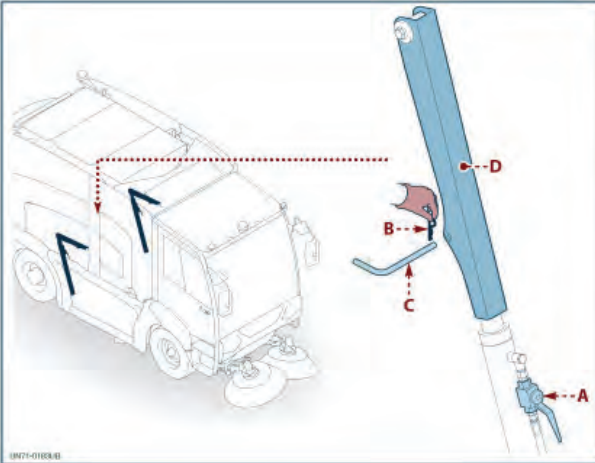
The signal light (18) appears.

## SECURING THE HOPPER FOR MAINTENANCE



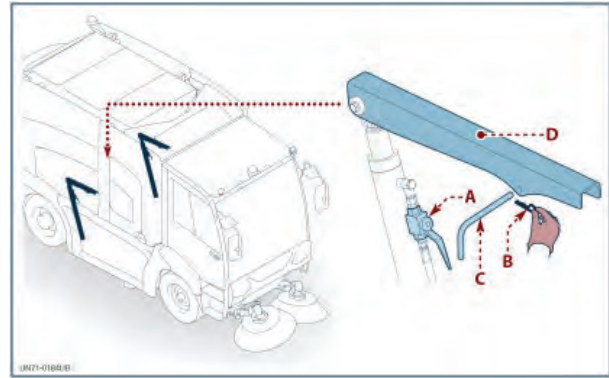
**WARNING:** Always close the valves on the jacks and lock the jacks with the locking devices before carrying out any work underneath the hopper.

To lock the jacks, proceed as described here.



1. Close the valve (A).
2. Remove the pin (B).
3. Remove the pin (C).
4. Fit the locking device (D).
5. Place the pin (C) in position.
6. Insert the plug (B).
7. Proceed as described for the other jack.

To unlock the jacks, proceed as described here.



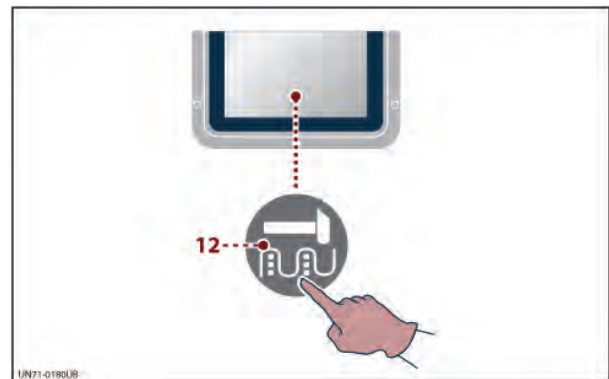
1. Remove the pin (B).
2. Remove the pin (C).
3. Fit the locking device (D).
4. Place the pin (C) in position.
5. Insert the plug (B).
6. Open the valve (A).
7. Proceed as described for the other jack.

## SWITCHING THE FILTER SHAKER ON AND OFF

The filter shaker switches on automatically for a few seconds every time the vacuum fan is turned off.

If necessary, the filter shaker can be manually turned on and off.

Complete the operations described.



8. Press and hold the button (12).  
The filter shaker is turned on.
9. Release the button to turn off the filter shaker.

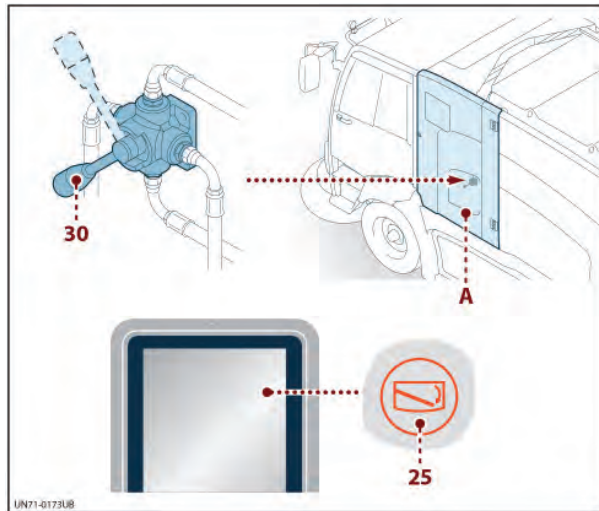
## CLEANING THE HOPPER

Use a high-pressure washer to clean the hopper.

**NOTICE:** Do not get the bag filters wet during cleaning.

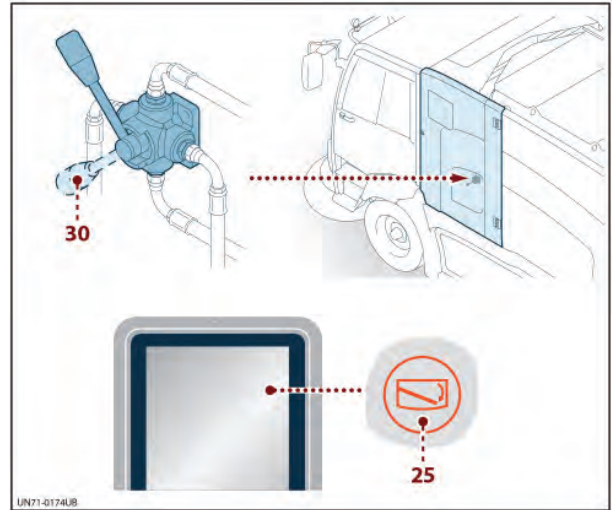
If the bag filters do get wet, let them dry before resuming work.

Clean the hopper in an area specifically designated for cleaning and washing.



Complete the operations described.

1. Open the movable guard (A).
2. Turn the lever (30).  
The bag filter protection mesh tilts.  
The signal light (25) appears.
3. Tip the hopper upwards (see "Emptying the hopper").
4. Turn on the high-pressure washer (see "Using the high-pressure washer wand").



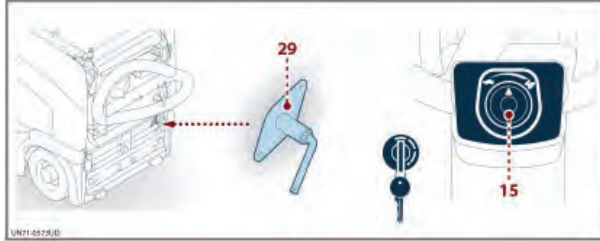
Once cleaning is complete, proceed as described here.

1. Turn off the high-pressure washer (see "Using the high-pressure washer wand").
2. Tip the hopper downwards (see "Emptying the hopper").
3. Turn the lever (30).

The bag filter protection mesh is in the horizontal position.

The signal light (25) disappears.

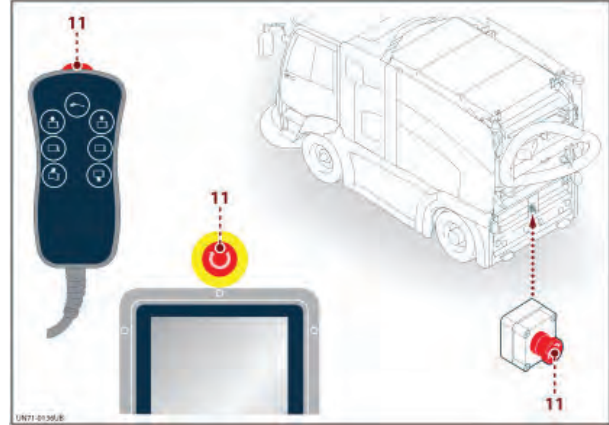
## END OF WORK STOP



Complete the operations described.

1. Turn off all the equipment.
2. Park the machine on an area of flat, solid ground where there are no risks.
3. Turn the accelerator dial (15) to set the engine to idling speed.
4. Leave the engine to idle for the time needed to ensure it cools gradually.
5. Stop the engine (see "Engine stopping").
6. Remove the engine ignition key and store in a safe place.
7. Turn the battery isolation switch (29) to disconnect the battery electrical circuit.
8. Provide proper signage if the machine is parked in areas open to traffic.

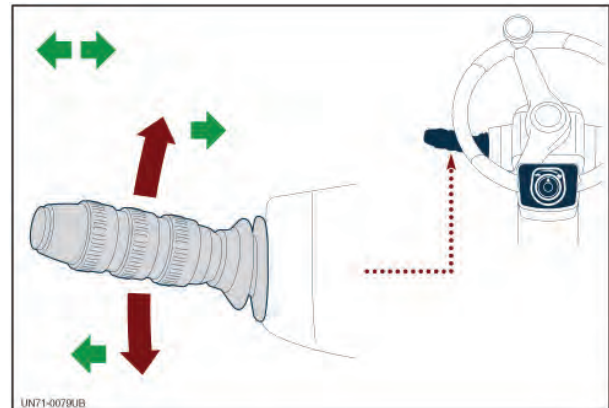
## STOPPING IN EMERGENCY CONDITIONS



Only perform an emergency stop in the event of imminent risk to persons and to prevent damage to the machine or other equipment.

1. Press one of the emergency buttons (11) immediately stop the machine.  
The parking brake is engaged on.
2. Eliminate the cause of the emergency stop before re-starting the machine.
3. Release the locked emergency button.
4. Start the engine (see "Engine starter").
5. Restore normal operating conditions.

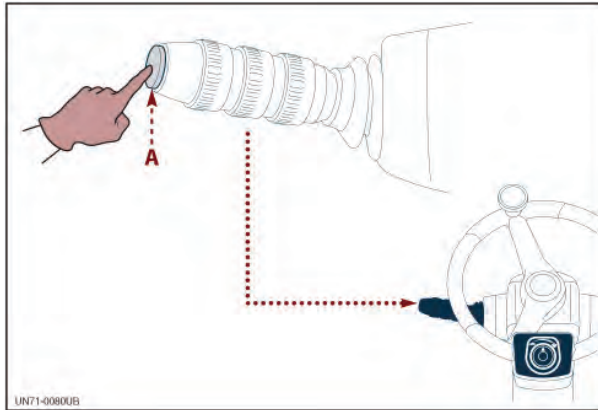
## ACTIVATING THE DIRECTION INDICATORS



Move the lever forwards to turn on the RH indicator.

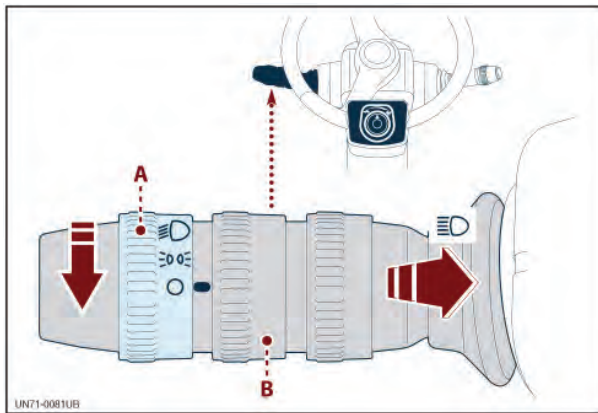
Move the lever backwards to turn on the LH indicator.

## TURN ON THE BEEPER



Press the button (A) to turn on the beeper.

## TURNING ON THE LIGHT



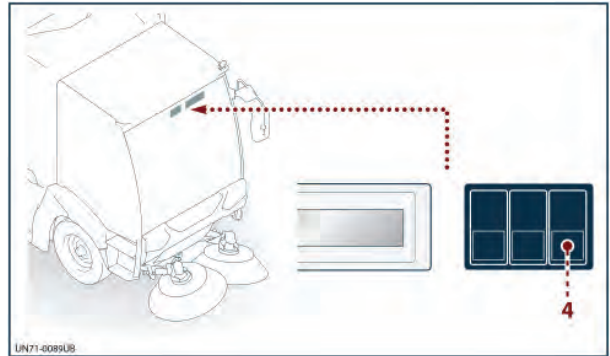
Turn the switch (A) by one position to turn on the parking lights.

Turn the switch (A) by two positions to turn on the low-beam headlights.

With the low-beam headlights turned on, move the lever (B) upwards to turn on the high-beam headlights.

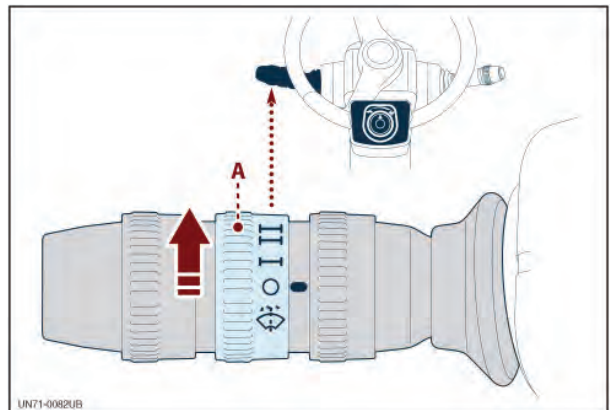
## TURNING OF THE WORK LIGHTS

When working in poor visibility conditions, turn on the work lights



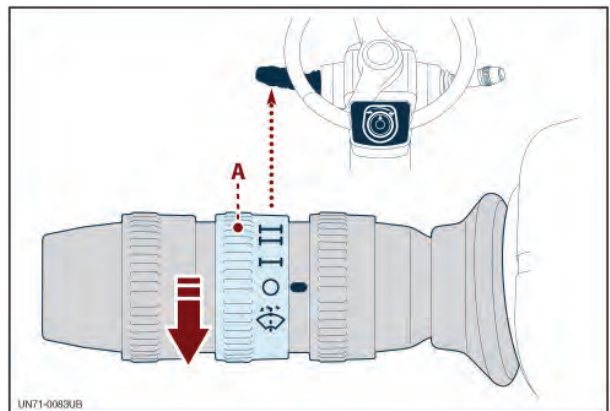
1. Use the switch (4) to turn on the work lights.

## USING THE WINDSHIELD WIPERS



1. Turn and hold the switch (A).

The windscreen wiper fluid pump switches on.



Turn the switch (A) by one position to turn on the windshield wipers at low speed.

Turn the switch (A) by two positions to turn on the windshield wipers at high speed.

Turn the switch (A) to zero to turn off the windshield wipers.

## USING THE HIGH-PRESSURE WASHER WAND

**FOR SAFETY: Wear appropriate personal protective equipment.**

**Do not aim the water at people or animals.**

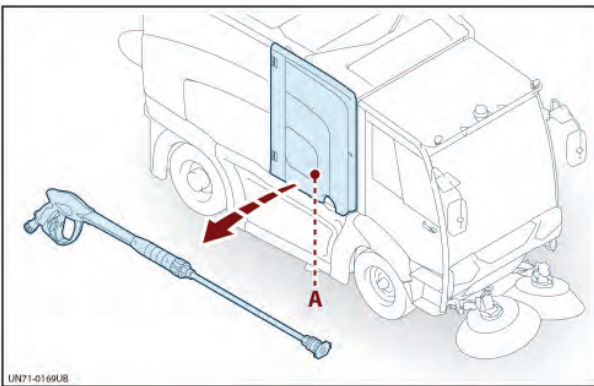
*NOTICE: Do not spray the water on the electrical parts, as this could damage them.*

Only turn on the high-pressure washer pump when the water tank is full.

Do not leave the pump running for long periods without switching on the water supply.

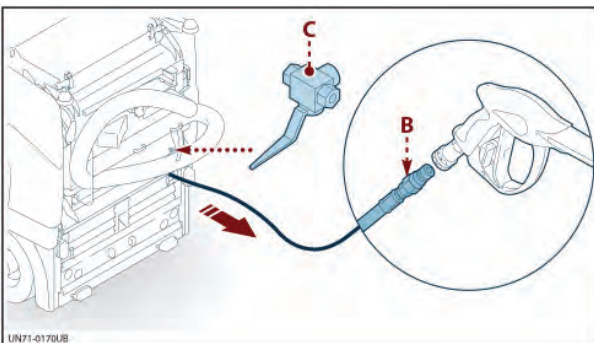


**WARNING: Flammable materials can cause explosion or fire. Do not use flammable materials in tank. Only use water.**



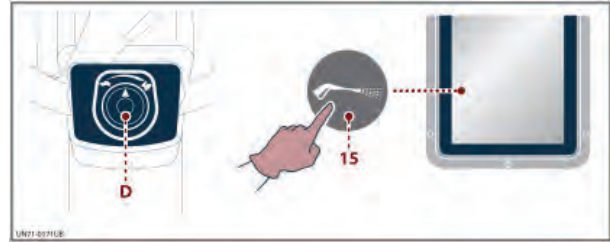
Complete the operations described.

1. Open the movable guard (A).
2. Remove the wand.



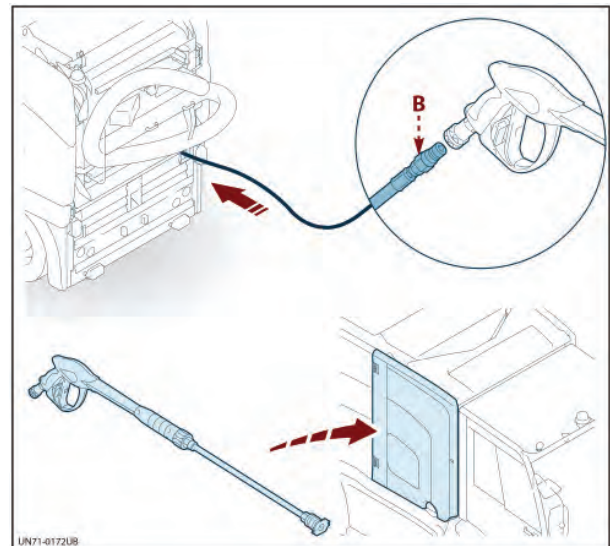
3. Unwind the hose (B).
4. Connect the hose to the wand.

5. Turn the valve lever (C) as shown in the picture.
6. Start the engine (see "Engine starter").



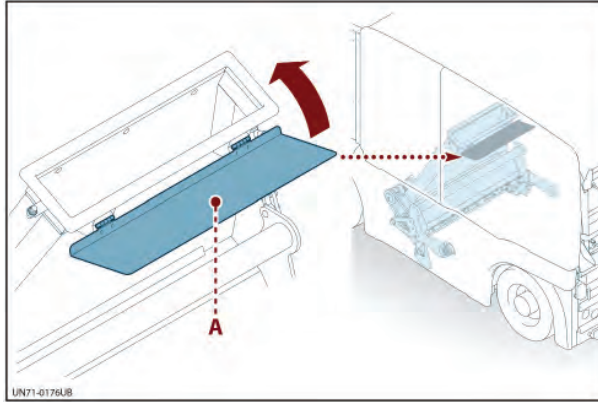
7. Turn the accelerator dial (D) to adjust the engine speed.
8. Tap the button (15) to turn on the high-pressure washer pump.
9. Using the gun lever, turn on the water.

When you have finished using the wand, proceed as described here.



1. Press the gun lever to depressurize the system.
2. Disconnect the hose (B) from the gun.
3. Wind up the hose.
4. Place the wand in its seat.

## USING THE REAR VACUUM HOSE (OPTIONAL)



Complete the operations described.

**FOR SAFETY: Before leaving or servicing machine, stop on level surface, set parking brake.**

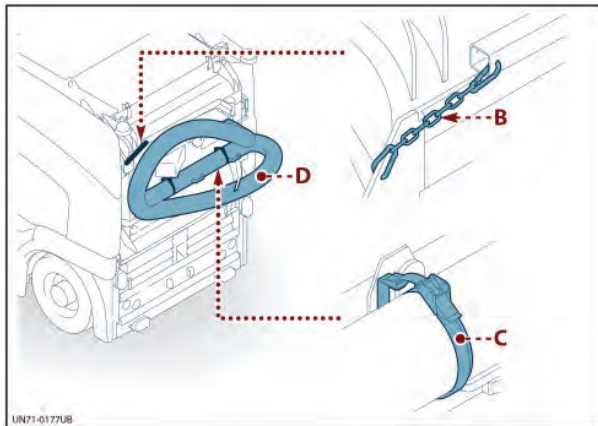
1. Tip the hopper upwards (see “Emptying the hopper”).

The vacuum fan switches off.

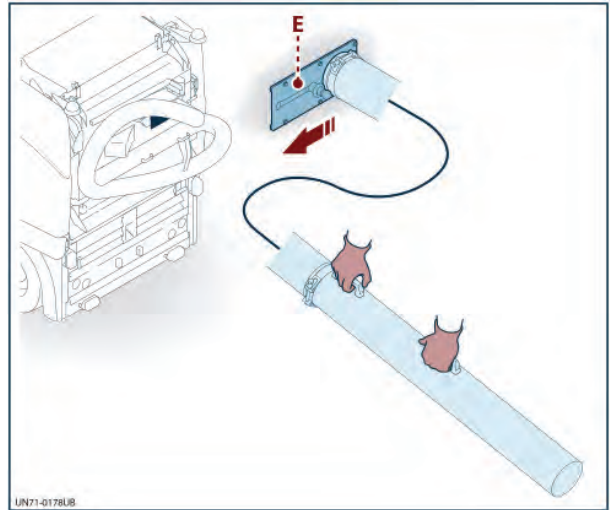
2. Close the suction port with the panel (A).
3. Tip the hopper downwards (see “Emptying the hopper”).

The vacuum fan switches on automatically.

If the vacuum fan is not active, switch it on (see “Switching suction on and off”).



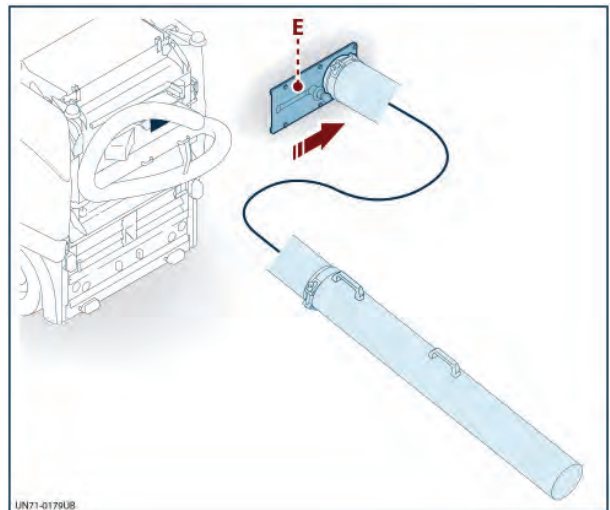
4. Release the fastener (B) securing the vacuum hose pipe support arm.
5. Open the clamps (C).
6. Unwind the suction hose pipe (D).



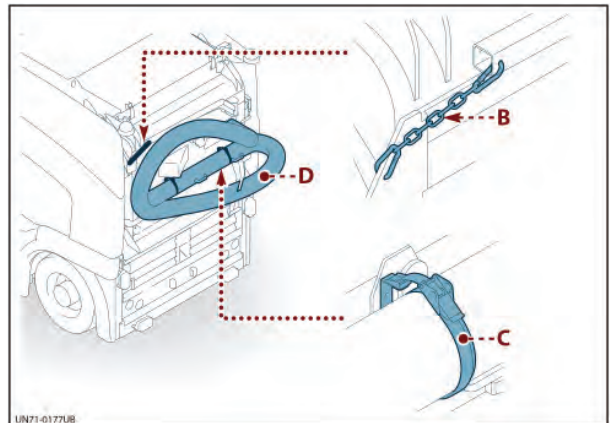
7. Opening the shutter (E).

8. Grasp the vacuum hose pipe by the handles and start vacuuming.

Once vacuuming is finished.

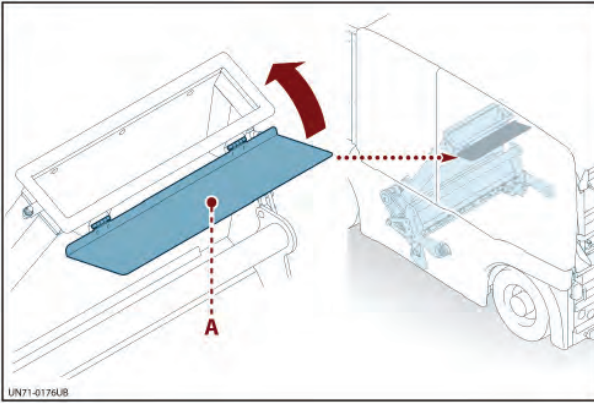


1. Close the shutter (E).



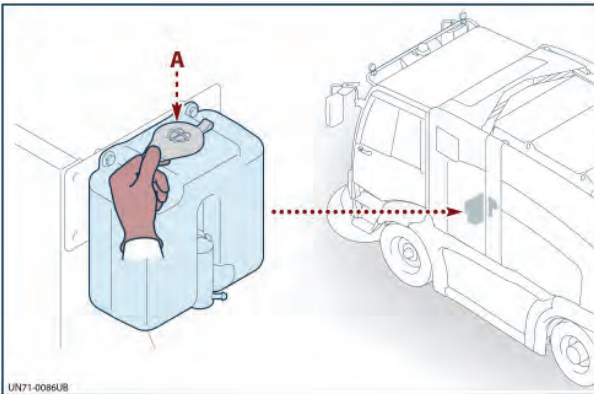
2. Roll up the vacuum hose (D).

3. Close the clamps (C).
4. Close the vacuum hose support arm fastener (B).
5. Tip the hopper upwards (see "Emptying the hopper").



6. Open the suction port by moving the panel (A).
7. Tip the hopper downwards (see "Emptying the hopper").

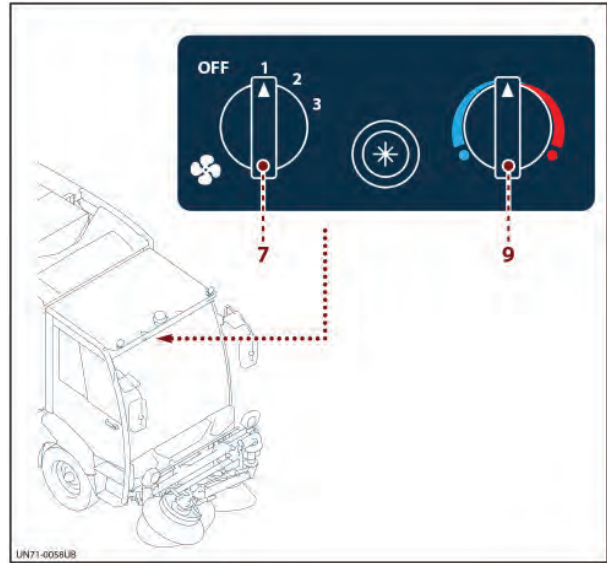
#### FILLING THE WINDSHIELD WIPER FLUID TANK



Complete the operations described.

1. Tip the hopper upwards (see "Emptying the hopper").
2. Open the cap (A).
3. Add the windscreen wiper fluid.
4. Close the cap (A).
5. Tip the hopper downwards (see "Emptying the hopper").

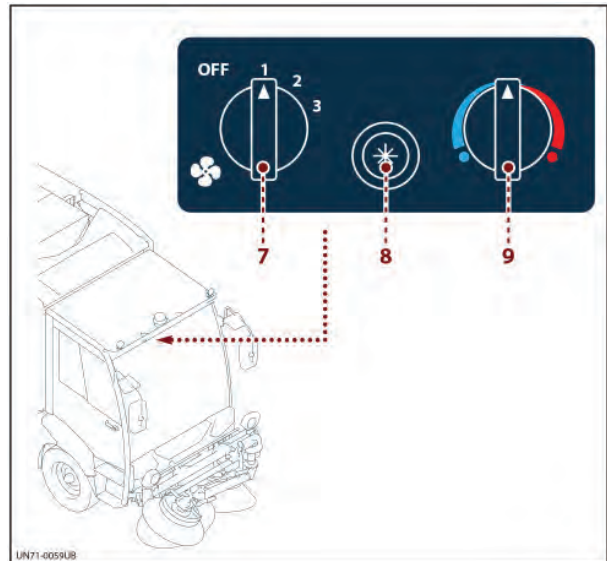
#### CAB HEATING



Complete the operations described.

6. Turn the knob (9) clockwise to turn on the heater.
7. Turn dial (7) to turn on ventilation.

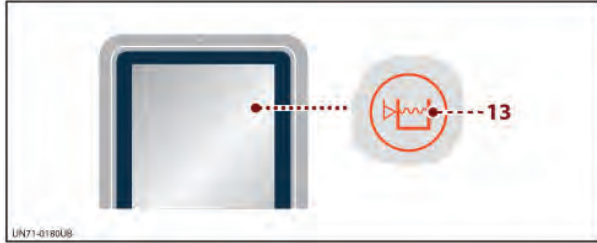
#### CAB AIR CONDITIONING



Complete the operations described.

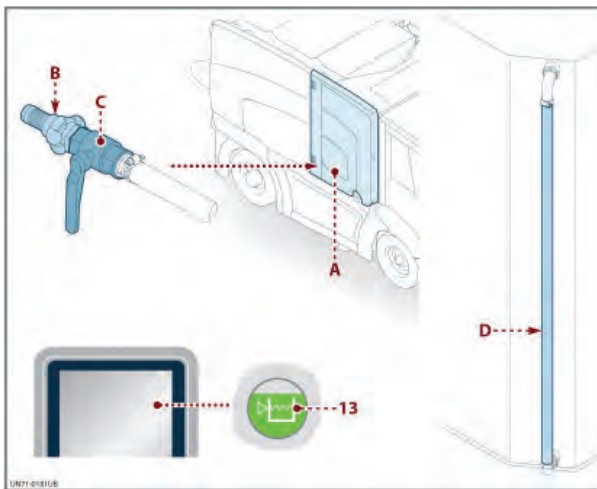
1. Press the button (8) to turn on the air conditioning.
2. Turn dial (9) to adjust air temperature.
3. Turn dial (7) to turn on ventilation.

### FILLING THE DUST SUPPRESSION SYSTEM TANK



A low water level in the tank is shown on the operating display. The red signal light (13) comes on.

Complete the operations described.



1. Open the movable guard (A).
2. Connect the water supply hose to the fitting (B).
3. Open the valve (C).

The signal light (13) lights up green and shows the tank is filling.

4. When the filling is complete, close the valve (C).
5. Disconnect the water supply hose from the fitting (B).
6. Close the movable guard (A).

If the machine is equipped with an additional tank, the tank fills automatically after the main tank has been filled.

The filling level of the additional tank is shown on the level gauge (D).

## REFUELING

**FOR SAFETY:** Do not refill the fuel tank completely as fuel may overflow and ignite.

Leave a gap of at least 4 from the fuel tank filler neck.

**Do not smoke or use an open flame during fuelling.**

**Clean up fuel leakage immediately**

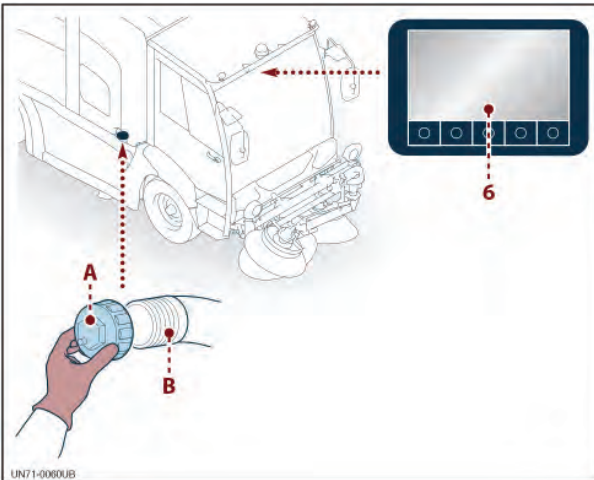
*NOTICE:* The fuel must comply with the specifications provided by the engine manufacturer (see the user manual issued by the engine manufacturer)

For the good working order of the engine, the fuel must be free from suspended impurities; therefore it must settle for a suitable amount of time.

The fuel tank should be refilled before it is completely empty to prevent air entering into the injection pump.

If the pump has taken in air, refill the fuel tank when the engine is cool.

Bleed the fuel circuit (see "Engine manufacturer's manual").

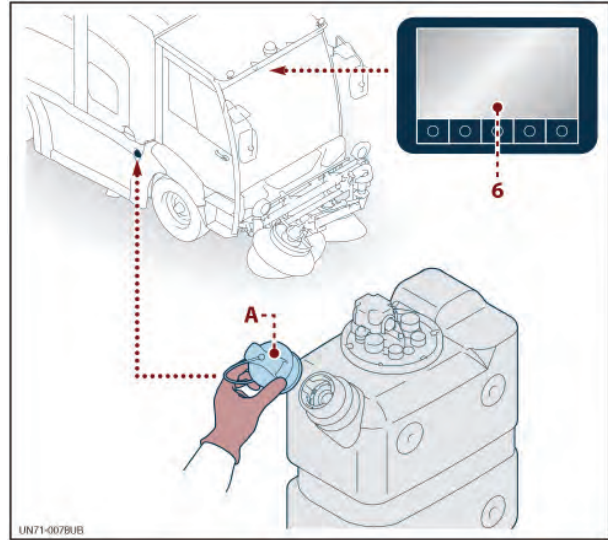


Complete the operations described.

1. Remove cap (A).
2. Fill the fuel tank via the filler cap (B).

The fuel level in the tank is shown on the respective page on the engine control terminal (6).

## REFUELING OF DEF



Use fluid that is compliant with the engine manufacturer's specifications (see the engine user manual).

When the fluid level is low, the letters "DEF" are shown on the display of the engine control terminal (6).

Complete the operations described.

1. Remove cap (A).
2. Refill the "DEF" tank.
3. Reinstall on the cap (A).

## TOWING THE MACHINE

**NOTICE:** In the event of failure of the combustion engine or the hydraulic system, the machine must be towed.



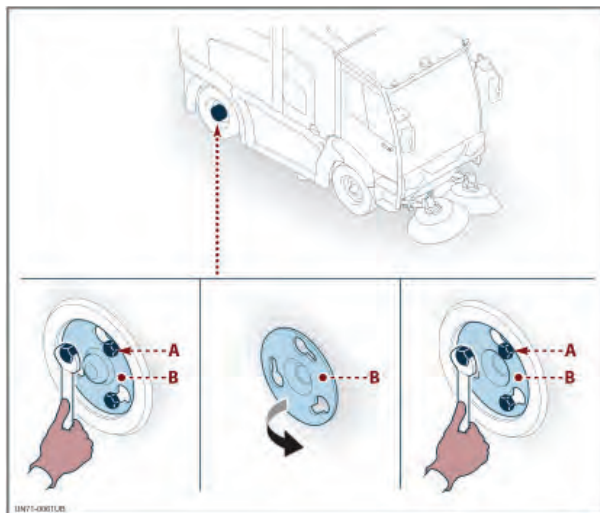
**WARNING:** Flammable materials can cause explosion or fire. Do not use flammable materials in tank. Only use water.

Using a suitable vehicle to tow the machine.

When the parking brakes are released, there is no braking force applied to the machine.

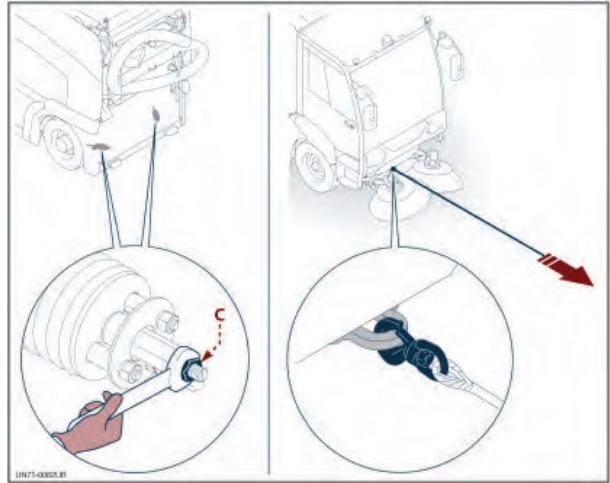
Take the necessary steps to prevent the machine moving.

To tow the machine, the gear units must be disengaged and the parking brakes on the wheels released.



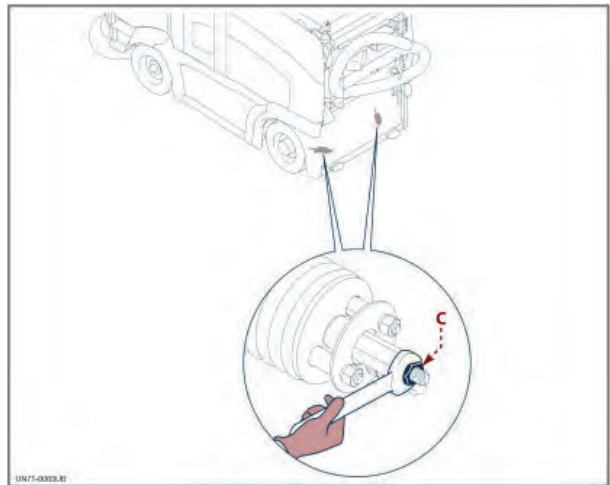
Complete the operations described.

1. Undo the screws (A).
2. Remove the cover (B).
3. Turn the cover by 180.
4. Position the cover (B).
5. Tighten the screws (A).

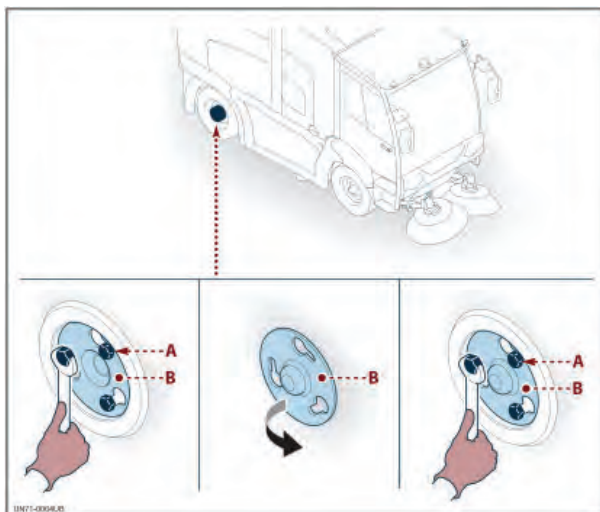


6. Unscrew the nut (C).
7. Proceed in the same way to disengage the other gear unit and release the other brake.
8. Tow the machine.

To resume normal operation, the parking brakes must be locked and the wheel gear units engaged.



1. Tighten the nut (C).



2. Undo the screws (A).
3. Remove the cover (B).
4. Turn the cover by 180.
5. Position the cover (B).
6. Tighten the screws (A).

### USING MACHINE AFTER STORAGE

Before starting up the machine after a long period out-of-use proceed as follows.

- Remove the antioxidant from the unpainted parts.
- Replace all the filter parts.
- Check and, if necessary, top up all the fluid levels.
- Eliminate any fluid leakages.
- Check the battery charge levels.
- Fit the batteries.
- Check that the locking and protection devices are all fitted and in good working order.
- Check that the safety and information signs are in place and in good condition.
- Check the tire pressure.
-

## MAINTENANCE

**NOTICE:** In the event of failure of the combustion engine or the hydraulic system, the machine must be towed

### Scheduled maintenance table (Customer)

| Interval  | Component                           | Type of work |
|-----------|-------------------------------------|--------------|
| Every day | Engine oil                          | Check        |
|           | Coolant                             |              |
|           | Brake fluid                         |              |
|           | Parking brake functions             |              |
|           | Brushes                             |              |
|           | Flaps                               |              |
|           | Hydraulic oil                       |              |
|           | Engine air filter primary cartridge | Cleaning     |
|           | Water and oil radiator              |              |
|           | Cleaning the hopper                 |              |
|           | Cleaning the suction ports          |              |
|           | Brushes                             |              |
|           | Flaps                               |              |

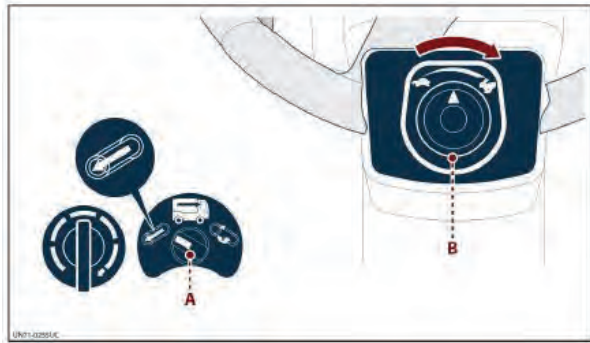
### Scheduled maintenance table (Authorized service center)

| Interval                | Component                                | Type of work |
|-------------------------|------------------------------------------|--------------|
| Every 100 hours of work | Alternator belt                          | Check        |
|                         | Air conditioning belt                    |              |
|                         | Cooling circuit leak test                |              |
|                         | Horn and reverse alarm test              |              |
|                         | Parking brake                            |              |
|                         | Hydraulic seals                          |              |
|                         | Dust suppression sprayers                |              |
|                         | Vibration shaker                         |              |
|                         | Brushes                                  |              |
|                         | Starter batteries                        |              |
|                         | Seals between container and suction port |              |
|                         | Tires/alignment                          |              |

| Interval                 | Component                                                                                                                                                                                  | Type of work |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Every 300 hours of work  | Engine air filter safety cartridge<br>Inter-cooler air intake circuit<br>Oil separation circuit<br>Fuel system screws and pipes - tightness check<br>TVA suction valve<br>Bearing greasing | Check        |
|                          | Engine air filter primary cartridge<br>Engine oil filter<br>Engine oil<br>Water tank filter<br>Brushes                                                                                     | Replacement  |
| Every 600 hours of work  | Coolant                                                                                                                                                                                    | Check        |
|                          | Fuel filter<br>Shredder belt<br>Hydraulic oil filter<br>Gear unit oil<br>Hammers                                                                                                           | Replacement  |
| Every 900 hours of work  | Alternator belt<br>Air conditioning belt<br>Air filter clogging sensor<br>Fuel tank                                                                                                        | Replacement  |
| Every 1200 hours of work | Hydraulic oil<br>Cab filter<br>Flaps<br>Lateral dust flaps                                                                                                                                 | Replacement  |
| Every 1500 hours of work | Diesel engine glow plugs<br>Starter motor carbon brushes<br>Diesel engine valve clearance check<br>Tightening the diesel engine head S (6)                                                 | Check        |
|                          | Engine air filter safety cartridge<br>DEF filter<br>DEF suction filter                                                                                                                     | Replacement  |
| Every 2000 hours of work | Diesel S (6) engine injectors<br>Diesel engine turbocharger S (6)<br>Braking system                                                                                                        | Check        |
|                          | Seals between container and suction port                                                                                                                                                   | Replacement  |
| Every 3900 hours of work | Particle filter (regeneration/cleaning)<br>Coolant                                                                                                                                         | Replacement  |
| Every 5000 hours of work | Rear brake shoes<br>Tires/alignment                                                                                                                                                        | Replacement  |

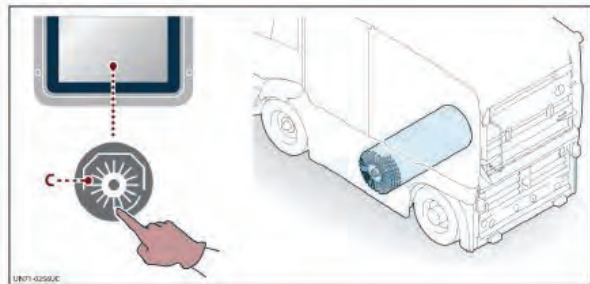
## REPLACING THE MAIN BRUSH

**FOR SAFETY:** Before leaving or servicing machine, stop on level surface, turn off machine, set parking brake, and remove key.

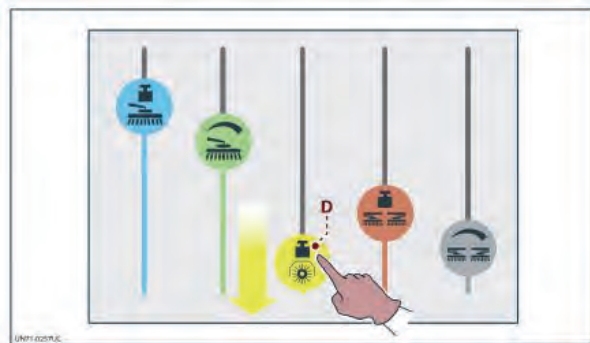


**FOR SAFETY:** Wear suitable gloves to protect your hands during this work.

1. Start the engine.
2. Turn the selector switch (A) to the counterclockwise.  
The machine moves to the brush change-over position.
3. Engage the parking brake.
4. Turn the knob (B) to activate the work mode.



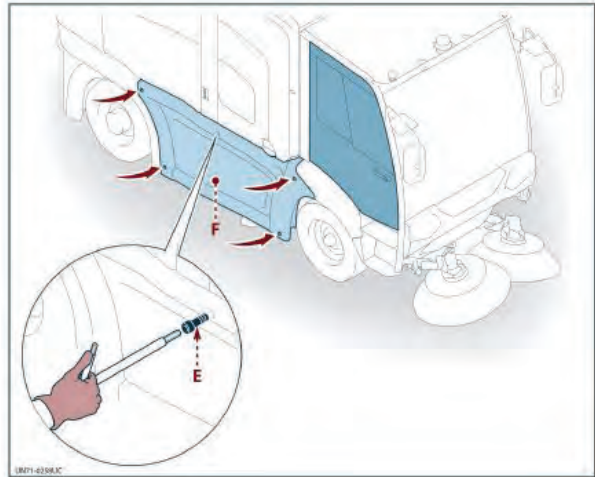
5. Touch the button (C) to turn on the main brush.



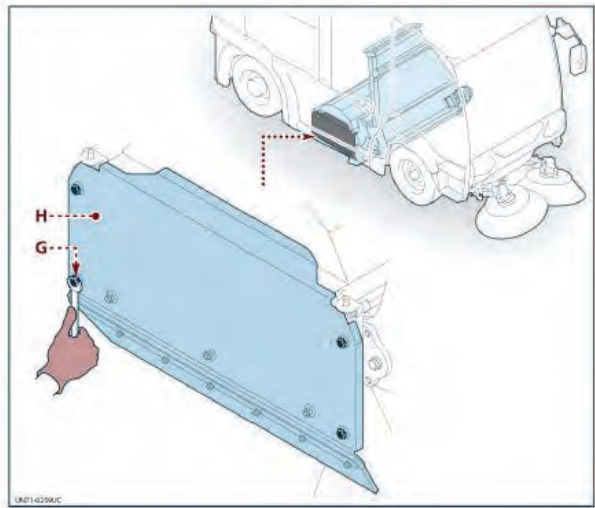
6. If the machine has the optional feature that allows the user to set the brush pressure applied to the ground setting, slide button (D) all the way down.

**FOR SAFETY:** The machine is not equipped with a safety dust suppression that locks the doors open. Make sure that the right door is always open during work to replace the main brush.

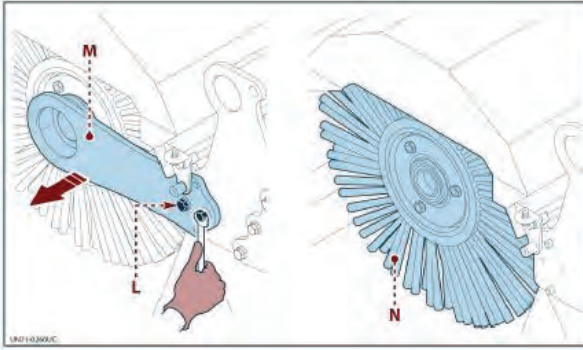
7. Open the right door to deactivate main brush rotation.



8. Remove the screws (E).
9. Remove the fixed guard (F).



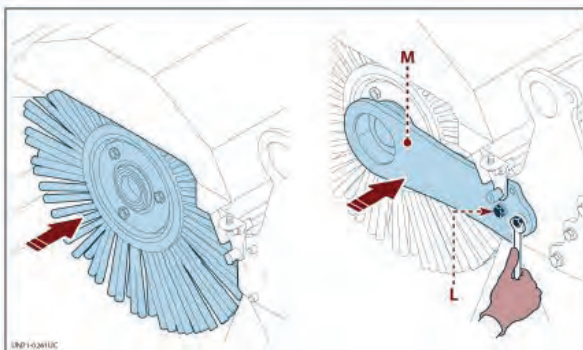
10. Remove the screws (G).
11. Remove bulkhead (H).



12. Remove the screws (L).

13. Remove the support (M).

14. Remove the brush (N).

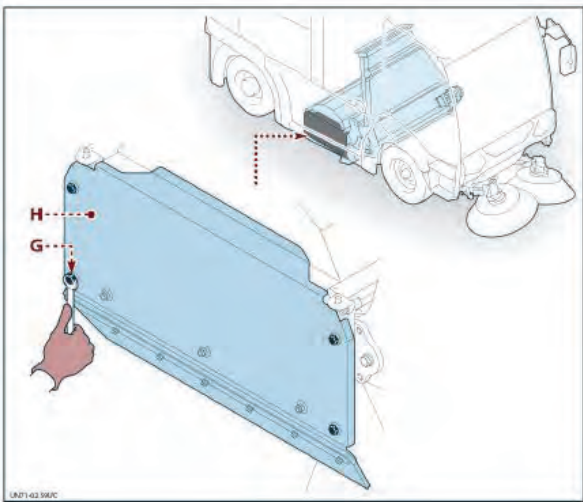


15. Position the new brush.

16. Make sure the brush is fully inserted into the motor hub.

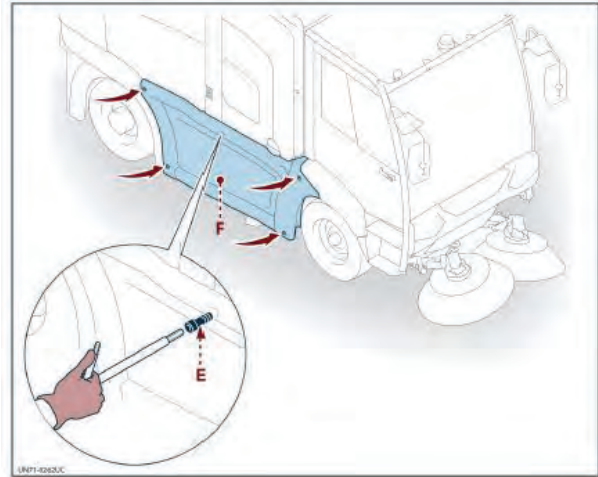
17. Position the support (M).

18. Tighten the screws (L).



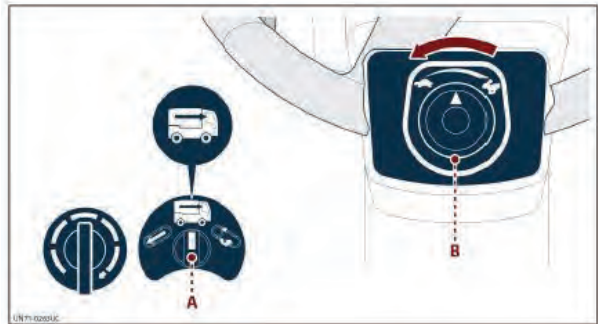
19. Position bulkhead (H).

20. Tighten the screws (G).



21. Position the fixed guard (F).

22. Tighten the screws (E).



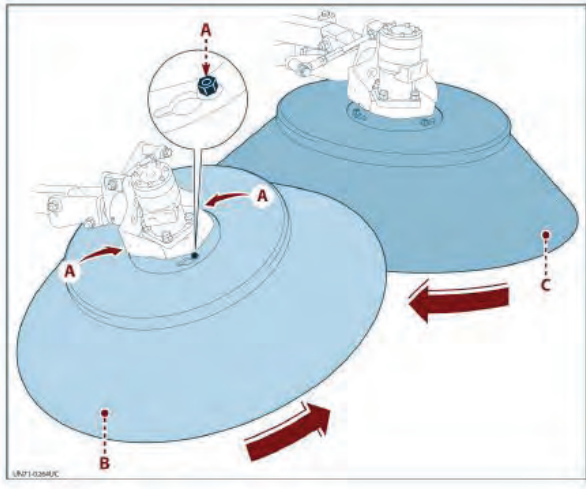
23. Turn the knob (B) all the way to the counterclockwise.

24. Turn the selector switch (A) to the central position.

The machine will move into the drive position.

## REPLACING THE SIDE BRUSHES

**FOR SAFETY:** Before leaving or servicing machine, stop on level surface, turn off machine, set parking brake, and remove key.

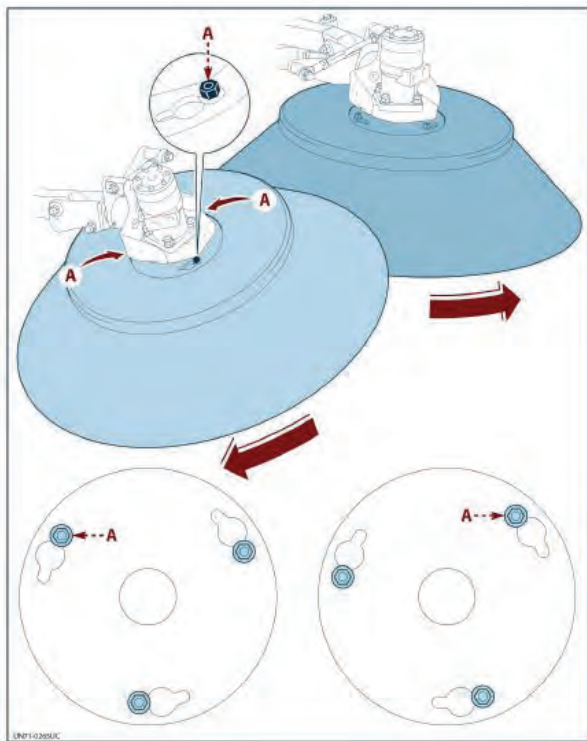


**FOR SAFETY:** Wear suitable gloves to protect your hands during this work.

1. Turn off the machine.
2. Loosen the nuts (A).
3. Rotate and remove brush (B).

Proceed in the same way to remove brush (C).

The arrows in the illustration show the rotation direction to release the brushes.



4. Position the new brush.
5. Rotate the brush to secure it.
6. Tighten the nuts (A).

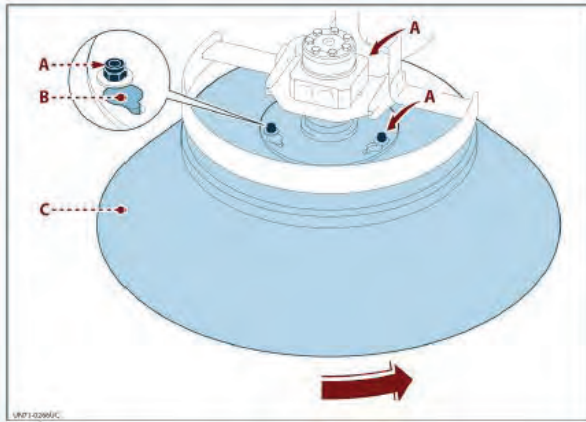
Proceed in the same way to position the other brush.

Make sure that the nuts (A) are positioned as shown in the illustration.

The arrows in the illustration show the rotation direction to secure the brushes.

## REPLACING THE FRONT BRUSH

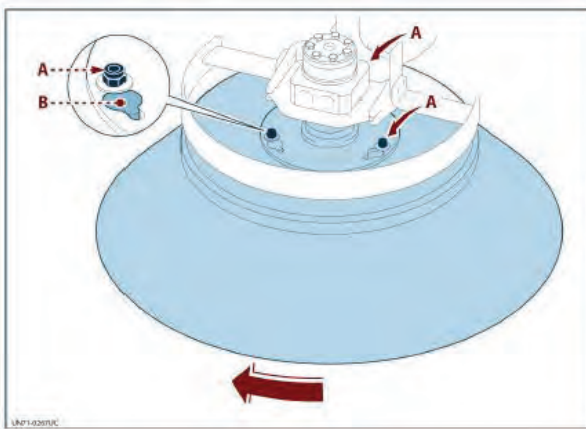
**FOR SAFETY:** Before leaving or servicing machine, stop on level surface, turn off machine, set parking brake, and remove key.



**FOR SAFETY:** Wear suitable gloves to protect your hands during this work.

1. Loosen the nuts (A).
2. Remove the clamp (B).
3. Rotate and remove brush (C).

The arrow in the illustration shows the rotation direction to release the brush.



4. Position the new brush.
5. Rotate the brush to secure it.

The arrow in the illustration shows the rotation direction to secure the brush.

6. Position the clamp (B).
7. Tighten the nuts (A).

### JACKING UP THE MACHINE

**FOR SAFETY: Before leaving or servicing machine, stop on level surface, turn off machine, set parking brake, and remove key.**

If possible, empty the hopper and water tank prior to lifting the machine.

Chock the tire prior to jacking.

Lower the hopper prior to lifting the machine.

Jack the machine only when necessary, e.g. to change tires.

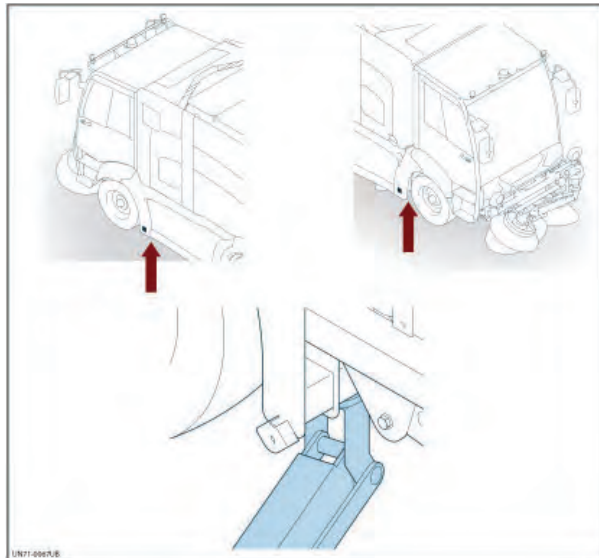
**FOR SAFETY: Use a hoist or jack that will support the weight of the machine.**

A 7-ton jack for empty hopper, and a 10-ton jack with full hopper.

### FRONT WHEELS

**FOR SAFETY: Before leaving or servicing machine, stop on level surface, turn off machine, set parking brake, and remove key.**

The illustration shows the jacking points.



Complete the operations described.

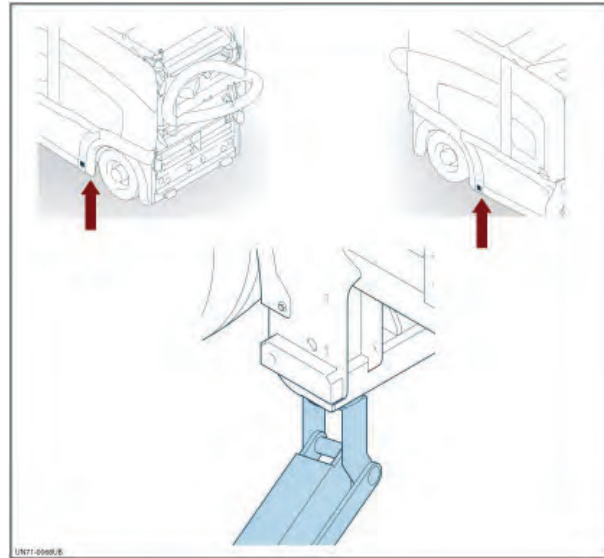
1. Set the machine in drive mode to facilitate jack positioning (see "Drive mode").
2. Position the jack.
3. Make sure that the lift plate is touching the machine's chassis.
4. Slowly jack up the machine as much as necessary to carry out the work.

5. Jack stands must be used to support the machine after it has been lifted for service. After placing jack stands, the hopper can be raised safely.

### REAR WHEELS

**FOR SAFETY: Before leaving or servicing machine, stop on level surface, turn off machine, set parking brake, and remove key.**

The illustration shows the jacking points.



Complete the operations described.

1. Set the machine in drive mode to facilitate jack positioning (see "Drive mode").
2. Position the jack.
3. Make sure that the lift plate is touching the machine's chassis.
4. Slowly jack up the machine as much as necessary to carry out the work.
5. Jack stands must be used to support the machine after it has been lifted for service. After placing jack stands, the hopper can be raised safely.

## MACHINE CLEANING

Wash the machine with a high-pressure water jet using legally approved non-toxic and non flammable detergents.

Do not spray the water on the electrical parts, as this could damage them.

## FRAME INSPECTION

Wash the machine thoroughly before the inspection (see "Machine cleaning").

Carry out a visual inspection to establish the structure's overall condition, focusing in particular on the welding, to find damage due to ageing, wear, vibrations, corrosion or weathering.

If you notice any weakening and/or slight cracks, contact one of the manufacturer's authorized service centers immediately.

## CHECKING THE HOSE/FITTINGS

**FOR SAFETY: Before leaving or servicing machine, stop on level surface, turn off machine, set parking brake, and remove key.**

Complete the operations described.

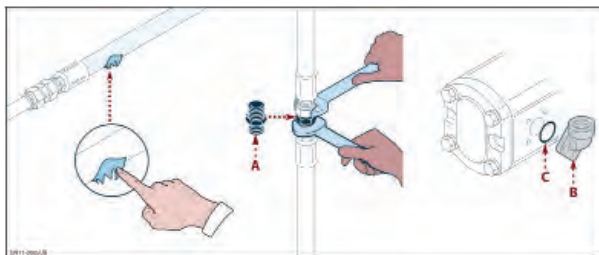
1. Check the seam fastening the fittings to the hose and the condition of the hoses.

If the pipes show signs of ageing, breakages, swellings, abrasions, etc., they must be replaced.

2. Check the fittings (A) for oil leaks.

Normally, oil leaks from fittings can be eliminated by tightening the fittings; if this is not the case, they must be replaced.

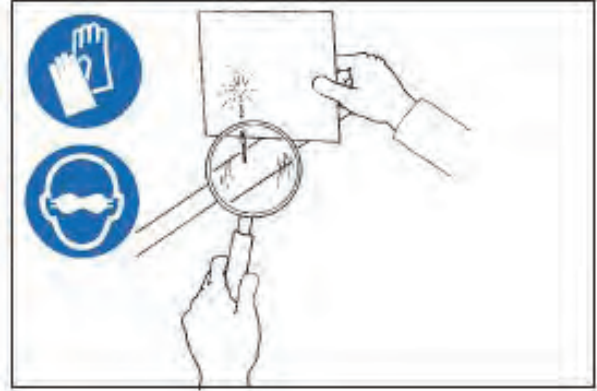
Oil leaks from the flanges (B) can only be eliminated by replacing the sealing gasket (C).



**FOR SAFETY: When servicing machine, use cardboard to locate leaking hydraulic fluid under pressure.**

High pressure fluid escaping from a very small

hole can almost be invisible, and can cause serious injuries



Immediately consult a physician if injury results from escaping hydraulic fluid. Serious infection or reaction can occur if proper medical treatment is not given immediately.

Contact a mechanic or supervisor if a leak is discovered.

### HYDRAULIC FLUID LEVEL

The amount of oil in the tank is signalled by the level indicators (A).

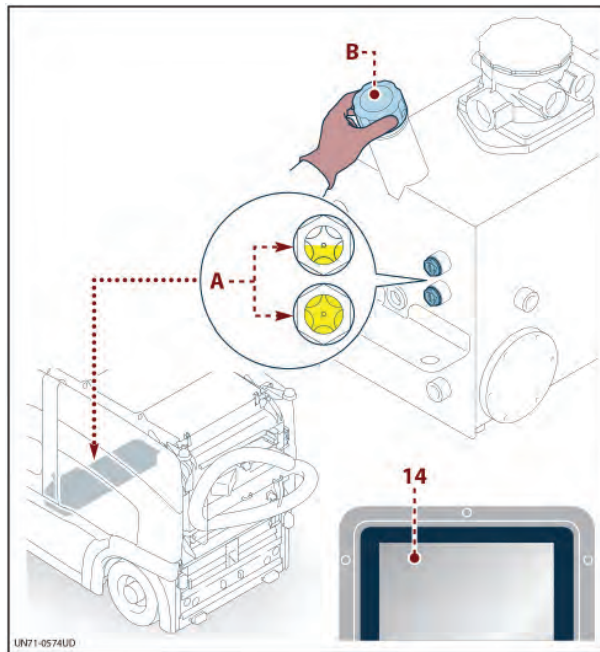
If the hydraulic oil is running low, this is shown by a signal light lighting up on the operating terminal (14) and an audio signal sounding.

The hydraulic oil level must be checked with the machine cold.

As work continues, when the minimum oil level is reached, the engine shuts down.

**ATTENTION! Do not overfill the hydraulic fluid reservoir or operate the machine with a low level of hydraulic fluid in the reservoir.**

**Damage to the machine hydraulic system may result.**



Complete the operations described.

1. Stop the machine on solid and even ground.
2. Tip the hopper upwards (see “Emptying the hopper”).
3. Close the safety valves on the hopper lifting jacks.
4. Remove cap (B).
5. Top up the oil in the tank to the correct level.

6. The illustration shows the correct hydraulic oil level.
7. Reinstall on the cap (B).
8. Open the safety valves on the hopper lifting jacks.
9. Tip the hopper downwards (see “Emptying the hopper”).

For oil characteristics see the “Lubricant comparison table”.

**ATTENTION! Hydraulic components depend on system hydraulic fluid for internal lubrication.**

**Malfunctions, accelerated wear, and damage will result if dirt or other contaminants enter the hydraulic system.**

## TRANSPORTING THE MACHINE

**FOR SAFETY:**When loading/unloading machine onto/off truck or trailer: Do not load/unload on ramp inclines that exceed 11% grade.

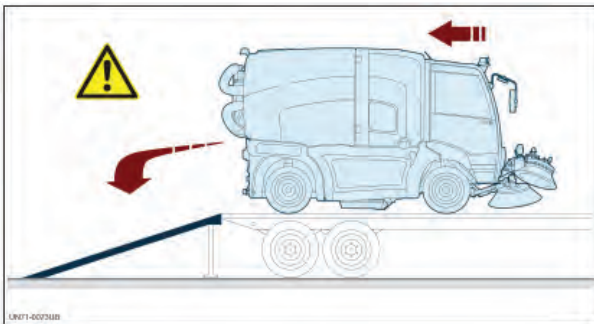
## UNLOADING THE MACHINE

Two operators are recommended for unloading and handling operations.

Operators must be equipped with appropriate personal protective equipment (protective helmet, safety shoes, and gloves).



**WARNING:** When loading and unloading the machine, before leaving the truck, clean the ramps and the deck.



Complete the operations described.

1. Remove the ropes or chains used for anchorage to the vehicle.
2. Remove the chocks from the wheels.
3. Turn Suspension Height Switch to the left Maintenance/Brush Change position to raise the machine to its highest level before driving onto the ramps.
4. Remove the planks from underneath the machine.
5. Position the ramps on the transport means and fix them in a stable way to the truck bed using the fastening devices (pins, screws, chain etc.).
6. Start the engine (see "Engine starter").
7. Position the machine centrally to the ramps and if necessary adjust the width of the ramps so that the machine weight is evenly distributed.
8. Move off the transport means at minimum forward speed.

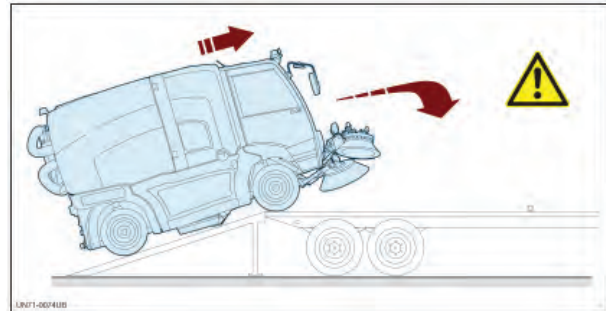
## LOADING THE MACHINE

Two operators are recommended for handling and loading operations.

Operators must be equipped with appropriate personal protective equipment (protective helmet, safety shoes, and gloves)



**WARNING:** When loading and unloading the machine, before boarding the vehicle, thoroughly clean the ramps and platform.

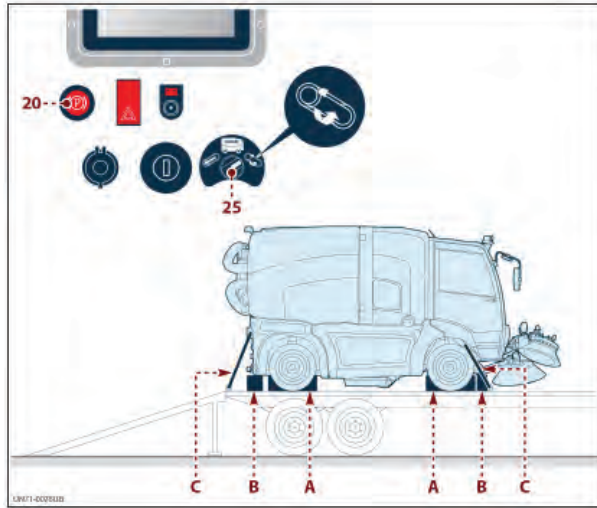


Complete the operations described.

1. Position the ramps on the transport means and fix them in a stable way to the truck bed using the fastening devices (pins, screws, chain etc.).

Position the machine centrally to the ramps and if necessary adjust the width of the ramps so that the machine weight is evenly distributed.

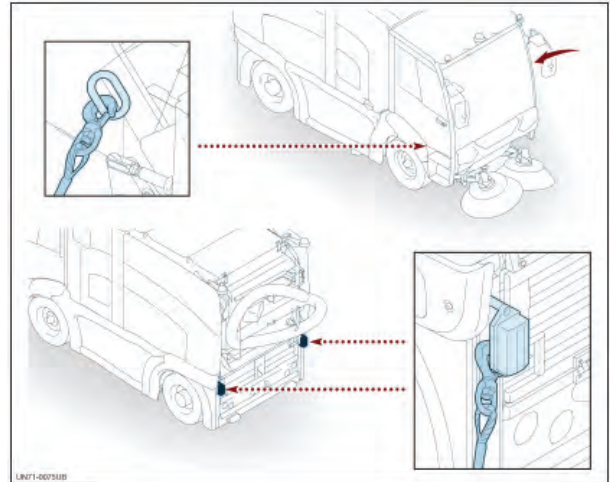
2. Start the engine (see "Engine starter").
3. Turn Suspension Height Switch to the left Maintenance/Brush Change position to raise the machine to its highest level before driving onto the ramps.
4. Move up onto the transport means with minimum forward speed.



5. Turn the suspension height switch (25) as shown to lower the machine.
6. Press the button (20) to engage the parking brake.
7. Turn off the engine and remove the ignition key.
8. Place the chocks (A) next to the wheels.
9. Place the planks (B) under the machine.
10. Anchor the machine to the vehicle with ropes or chains (C).

For anchorage points, see “Anchorage Points”.

## TIE DOWNS



The manufacturer has provided anchor points to ensure the stability of the machine on the means of transport.

The picture shows the anchorage points.

## STORING PROCEDURES

Arrange an appropriate area in which to park the machine.

To prevent machine wear, preferably park it in a sheltered area where there are no risks of fire or explosion.

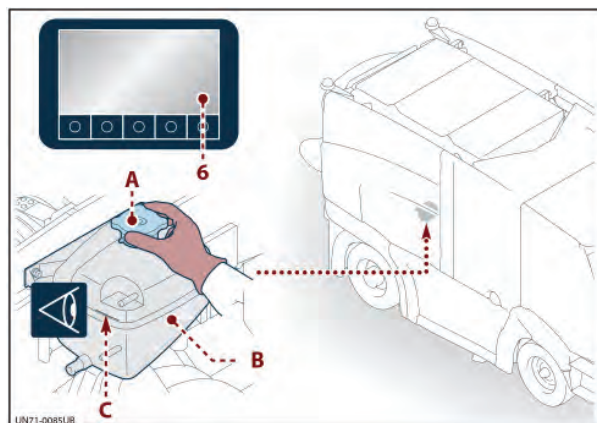
In the event of long-term storage, check that the machine is not at risk of damaged from changing environmental conditions within the storage area.

## ENGINE COOLANT

**FOR SAFETY:** Before leaving or servicing machine, stop on level surface, turn off machine, set parking brake, and remove key.

**FOR SAFETY:** allow the engine to cool. Never remove the cap from the expansion tank when the engine is still hot as this could result in scalding by spurts of the (still hot) liquid.

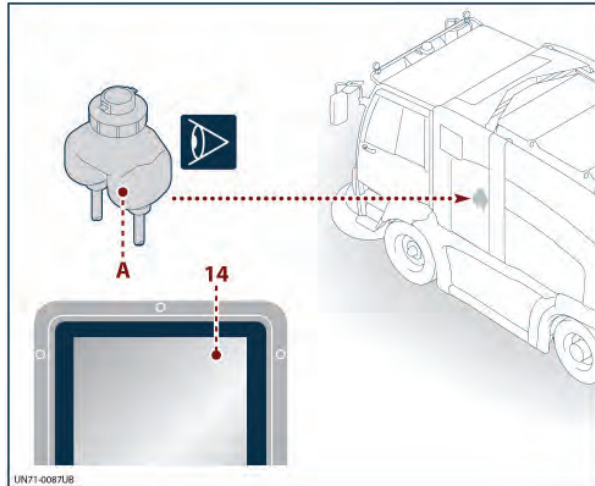
A low engine coolant level is shown on the control terminal display (6) with a signal light and a audible alarm.



Complete the operations described.

1. Tip the hopper upwards (see "Emptying the hopper").
2. Close the safety valves on the hopper lifting jacks.
3. Remove the filler cap (A) on the expansion tank (B).
4. Add coolant.
5. The correct liquid level is shown by the level gauge (C).
6. Please refer to the engine manufacturer's manual for coolant characteristics, taking ambient conditions into consideration.
7. Reinstall on the cap (A).
8. Open the safety valves on the hopper lifting jacks.
9. Tip the hopper downwards (see "Emptying the hopper").

## CHECKING THE BRAKE LEVEL



Complete the operations described.

1. Tip the hopper upwards (see "Emptying the hopper").
2. Check the oil level in the tank (A).

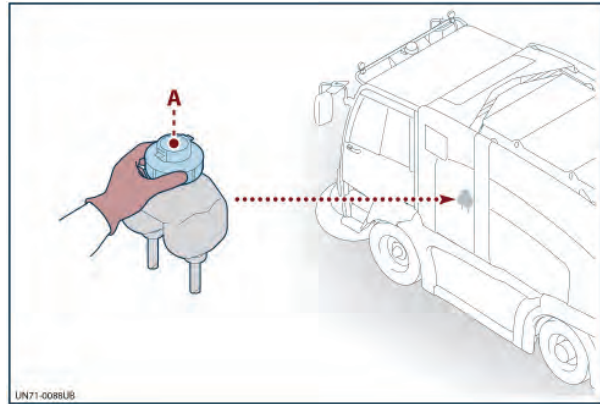
The oil level must reach the "MAX" mark on the tank.

If necessary, top up the fluid (see "Topping up the brake fluid").

Insufficient brake fluid in the tank is also shown by a flashing signal light on the operating terminal (14).

3. Tip the hopper downwards (see "Emptying the hopper").

## TOPPING OFF THE BRAKE FLUID



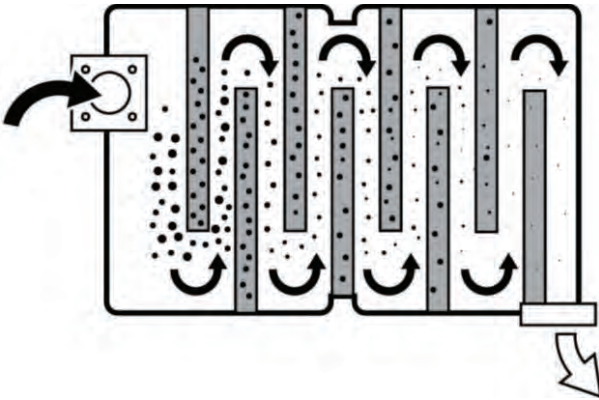
Complete the operations described.

1. Tip the hopper upwards (see "Emptying the hopper").
2. Remove cap (A).
3. Top up the oil in the tank to the correct level.
4. Reinstall on the cap (A).
5. Tip the hopper downwards (see "Emptying the hopper").

## DPF (DIESEL PARTICULATE FILTER) REGENERATION

The machine is equipped with a DPF trap that collects the soot from the exhaust system preventing it from being released into the atmosphere. The DPF filter is needed to meet the latest emission requirements.

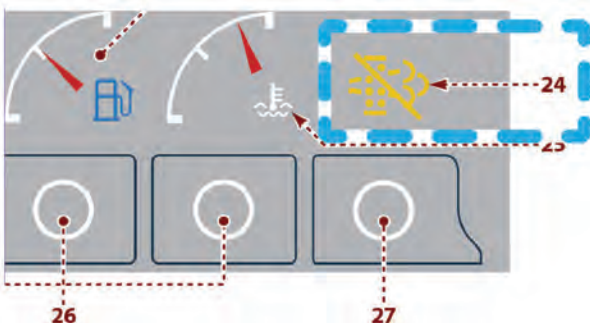
As the machine is being operated, the trapped soot creates back pressure in the DPF. When this back pressure builds up, it will eventually affect engine performance and / or damage the engine if the soot is not eliminated through the regeneration process. The soot trapped inside the DPF is burned during the regeneration process eliminating the back pressure.



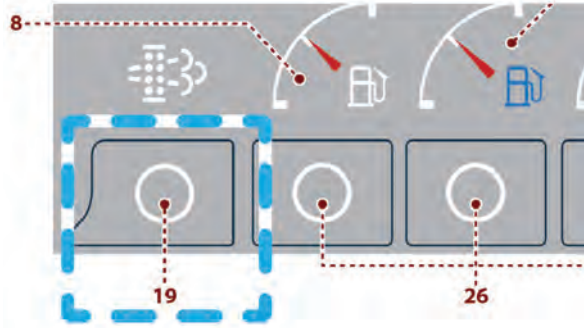
The machine automatically burns the soot collecting in the DPF when the machine is operating at the optimal power level (full power / capacity). The DPF will get clogged much more quickly when the machine is not run at the optimal power level. To avoid having to initiate active regenerations, always try to operate the machine at the optimum level.

A DPF regeneration is necessary when the DPF is significantly clogged. An signal light appears (24) on the EDM (engine display module) when a regeneration is necessary.

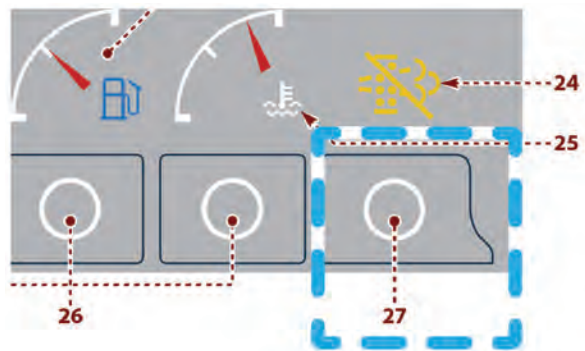
When the signal light (24) is white, the particulate regenerator cycle can be switched on.



Press the DPF regeneration button (19) to turn on the particulate filter regenerator.

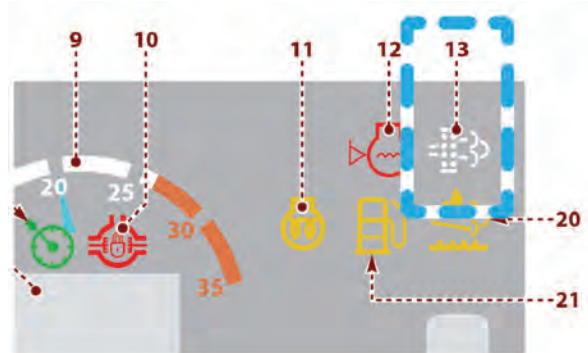


Press the DPF regeneration off button (27) to turn off the automatic particulate filter regenerator. The signal light (24) will turn yellow.



**NOTE:** It is not recommended that automatic regeneration be disabled unless there is a safety issue (nearby combustible materials) requiring automatic regeneration be disabled.

If the DPF does become clogged, a white signal light (13) displays along with an audio alarm.



A regeneration may take between 20–40 minutes to complete depending on engine and ambient temperatures. Once a regeneration is started it should be allowed to complete. It is strongly recommended that the regeneration be done when the first yellow alert appears.

*NOTE: The regeneration can be run at a later time, but each time the request is declined, soot will continue building up further diminishing engine performance and requiring a longer time to perform the next regeneration process.*

Be sure the machine is not near any combustible materials when stopping the machine and forcing an engine regeneration since the exhaust system can get very hot while the regeneration is in progress and could possibly cause a fire if near combustible materials.

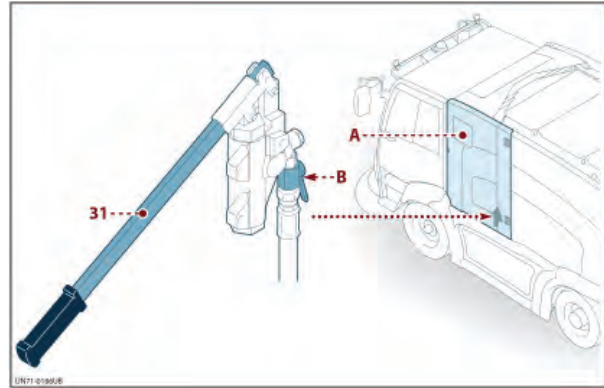
The high exhaust system temperature indicator may illuminate during the forced regeneration. See **HIGH EXHAUST SYSTEM TEMPERATURE INDICATOR (TIER 4F EMISSIONS ENGINE)**.

### TILTING AND LOWERING THE HOPPER MANUALLY

**NOTICE:** Raise and lower the hopper manually only in the event of engine failure.

**FOR SAFETY:** Raise the hopper and lower onto solid, flat ground.

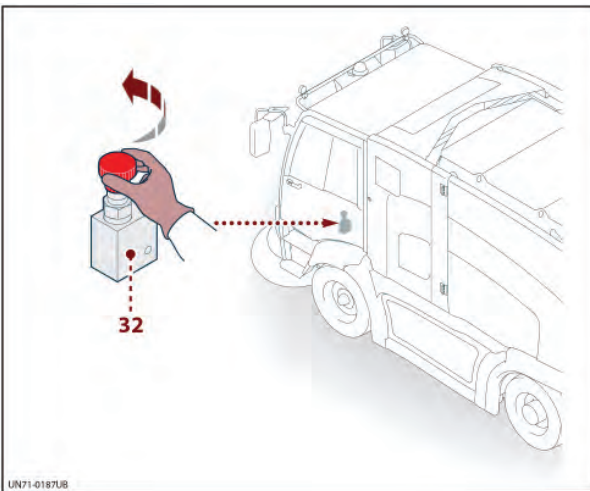
A low engine coolant level is shown on the control terminal display (6) with a signal light and a audible alarm.



Complete the operations described.

1. Remove the lever (31) from its housing.
  2. The lever is housed in the cab, behind the passenger seat.
  3. Open the movable guard (A).
  4. Insert the lever (31) into the hand pump.
  5. Turn the lever (B) to enable hand pump use.
  6. Use the lever (31) to raise the hopper.
  7. Close the safety valves on the hopper lifting jacks.
  8. Lock the lifting jacks with the locking devices.
  9. Remove the lever (A) and place it back in its seat.
  10. Turn the lever (B) to disable hand pump use.
- To lower the hopper, proceed as described here.
11. Remove the locking devices from the hopper lifting jacks.

12. Open the safety valves on the hopper lifting jacks.
13. Open the passenger side door.
14. Turn the valve knob (32) to lower the hopper.



### CLEANING THE FILTER BAGS

Turn on the filter shaker to clean the bag filters (see “Switching the filter shaker on and off”).

Complete the operations described.

**FOR SAFETY: Wear personal protective equipment (protective goggles, gloves, and dust mask).**

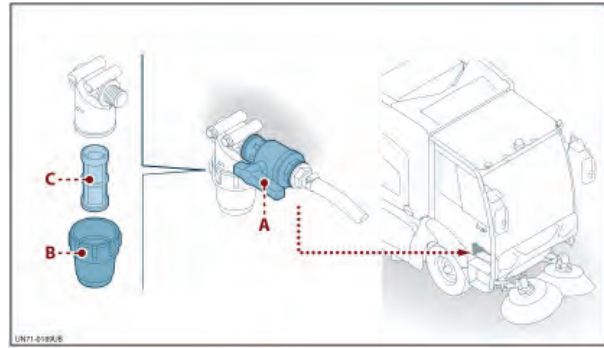
15. Make sure the hopper is empty.

1. If necessary, empty the hopper (see “Emptying the hopper”).
2. Open the rear hopper door.
3. Turn off the engine and remove the ignition key.

**FOR SAFETY: Do not get into the hopper to clean the bag filters.**

4. Clean the filters using compressed air.
5. Close the rear hopper door.

### EMPTYING THE DUST SUPPRESSION SYSTEM TANK

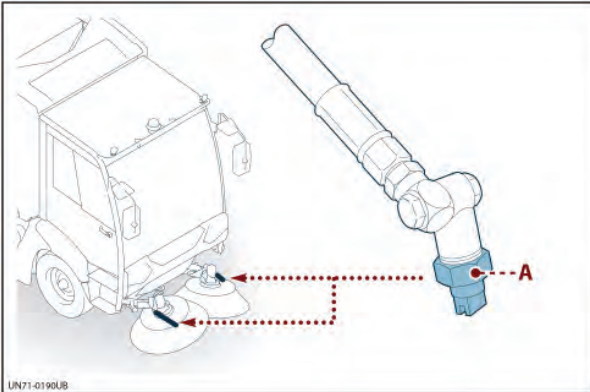


Complete the operations described.

1. Turn off the engine and remove the ignition key.
2. Close the valve (A).
3. Unscrew the filter unit (B).
4. Remove the filter cartridge (C).
5. Open the valve (A).
6. Allow water to completely drain.
7. Position the filter cartridge (C).
8. Tighten the filter unit (B).

## CLEANING THE SIDE BRUSH DUST SUPPRESSION SYSTEM NOZZLES (OPTION)

**FOR SAFETY:** Wear appropriate personal protective equipment.



Complete the operations described.

1. Turn off the engine and remove the ignition key.
2. Remove the nozzles to be replaced.
3. Clean the nozzle (A) with a jet of pressurised air.
4. Remove any lime scale deposits.
5. If necessary, replace the nozzle with a new one.
6. Reinstall the nozzle (A).
7. Repeat the same procedure to clean the other nozzles fitted.

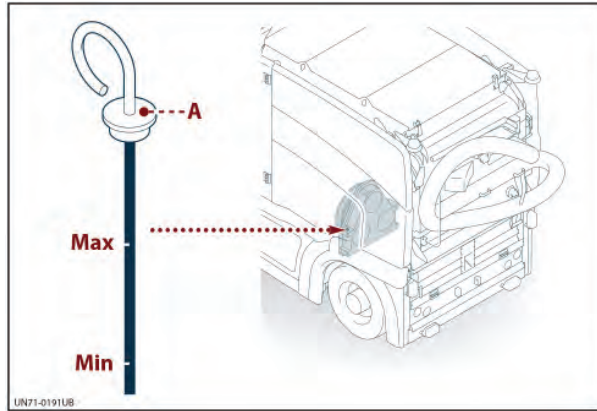
Complete the operations described.

1. Turn off the engine and remove the ignition key.
2. Remove the nozzles to be replaced.
3. Clean the nozzle (A) with a jet of pressurised air.
4. Remove any lime scale deposits.
5. If necessary, replace the nozzle with a new one.
6. Reinstall the nozzle (A).
7. Repeat the same procedure to clean the other nozzles fitted.

### CHECKING THE COUPLER OIL LEVEL

**NOTICE:** Do not dump oil; dispose of it correctly as oil is a pollutant.

**FOR SAFETY:** Wear appropriate personal protective equipment

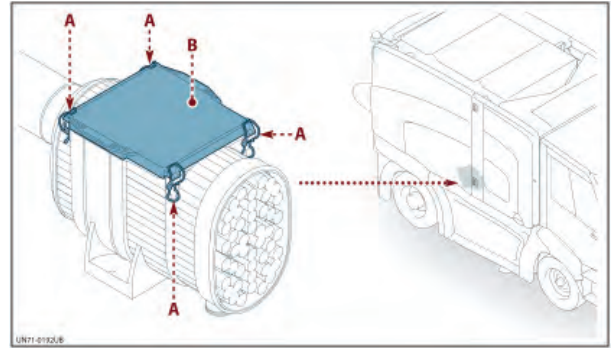


Complete the operations described.

1. Tip the hopper upwards (see “Emptying the hopper”).
2. Turn off the engine and remove the ignition key.
3. Pull out the dipstick (A).
4. Check the oil level.
5. The oil must be between the “Min” and “Max” notches on the dipstick.
6. If necessary, top up the oil to the correct level. Insert the dipstick (A).
7. Tip the hopper downwards (see “Emptying the hopper”).

### CLEANING THE ENGINE AIR FILTER

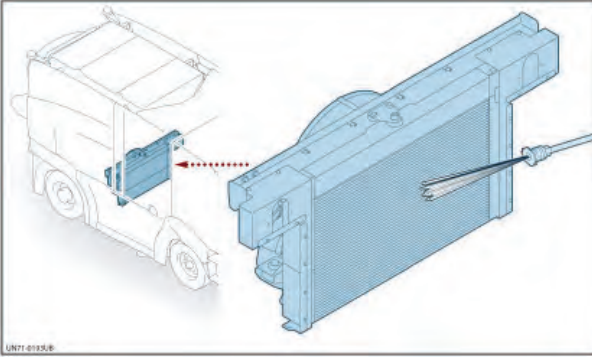
**FOR SAFETY:** Wear appropriate personal protective equipment.



Complete the operations described.

1. Tip the hopper upwards (see “Emptying the hopper”).
2. Release the fasteners (A).
3. Remove the cover (B).
4. Remove the filter cartridge.
5. Clean the filter cartridge with a pressurised air jet.
6. Position the cover (B).
7. Fit the fasteners (A).
8. Tip the hopper downwards (see “Emptying the hopper”).

## CLEANING THE ENGINE/HYDRAULIC OIL HEAT EXCHANGER FINS



Complete the operations described.

1. Tip the hopper upwards (see “Emptying the hopper”).

**NOTICE: Aim the water jet at the heat exchanger fins as shown in the illustration.**

2. Turn on the high-pressure washer (see “Using the high-pressure washer wand”).
3. Clean the heat exchanger fins.
4. Turn off the high-pressure washer (see “Using the high-pressure washer wand”).
5. Tip the hopper downwards (see “Emptying the hopper”).

## LONG OUT-OF-USE PERIODS

When the machine is not going to be used for long periods of time proceed as follows.

Wash the machine completely.

Check for and stop any fluid leaks.

Repair the damaged or worn mechanical parts.

Protect the unpainted parts with antioxidant products.

Empty the dust suppression system tank.

Park the machine in a sheltered place, where it can only be accessed by authorized personnel.

Use the battery disconnect switch to isolate the batteries.

Remove the batteries and store them somewhere where they will not be exposed to frost.

Remove the engine ignition key and store in a safe place.

If the engine is to be left unused for a long period of time, see the engine manufacturer’s manual.

## BATTERY CHARGING

Do not charge the batteries while they are fitted in the machine as there is a risk of the engine compartment being flooded with the gases released during the charging phase, which could result in a fire and explosion risk.

Keep flames away and never create sparks near the battery (explosive gas).

The battery contains diluted sulfuric acid which is highly corrosive.

In the event of accidental contact with skin rinse immediately with plenty of water.

If the battery fluid is frozen, recharge the battery once thawed.

Recharge the battery in a ventilated place and away from open flames or possible spark sources.

If the batteries of the machine are fully discharged, we recommend you replace them (see “Replacing the battery”).

### SAFETY ADVICE IN CASE OF REPLACEMENTS

All the component replacement operations not described in this manual must be performed by Tennant service authorized personnel.

Before replacing any parts, turn on all the safety devices provided and assess the need to inform personnel working nearby.

In particular, provide suitable signs in the surrounding areas and prevent access to all devices that could, if activated, result in unexpected danger and put people's health and safety at risk.

Replace worn or damaged parts with original spare parts.

The manufacturer cannot be held liable for any damage to property or persons caused by the use of non-original parts and repairs which have not been authorized by the manufacturer.

Proceed with the replacement and repair operations with the machine disconnected from all power supplies and in compliance with manufacturer's instructions, or contact your service representative if these activities are not described in the manual.

If hydraulic components (filters, hoses, etc.) need to be replaced, have a suitably sized container ready to collect any oil that may spill.

Components and waste material must be disposed of in compliance with the law in force concerning waste collection, sorting and disposal.

Before starting the machine, ensure there are no tools, cloths or other material near the moving parts or in risk areas.

**NOTICE: To replace engine parts, follow the instructions in the use and maintenance manuals provided by the engine manufacturer.**

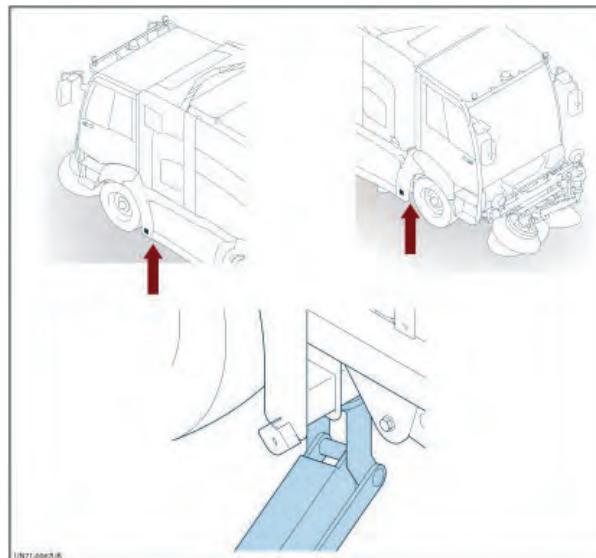
### REPLACING THE TIRES

Carry out the procedure with the engine switched off and the key removed from the ignition.

Make sure the hopper is empty.

For the tire characteristics, see "Specifications".

### REMOVING AND FITTING THE FRONT WHEELS



Complete the operations described.

1. Set the machine in drive mode to facilitate lift positioning.

**FOR SAFETY: Use hoist or jack that will support the weight of the machine.**

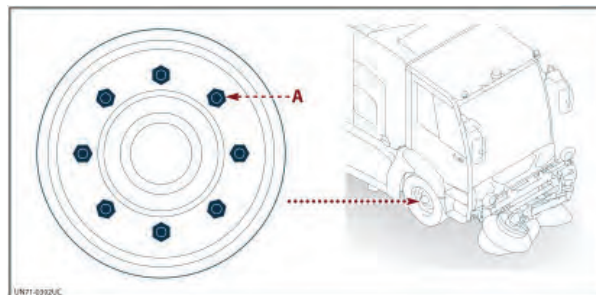
**FOR SAFETY: When servicing machine: Block machine tires before jacking machine up.**

A 7-ton jack for empty hopper, and a 10-ton jack with full hopper.

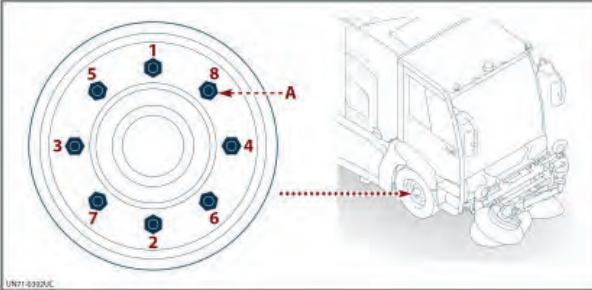
2. Position the jack.

The illustration shows the jacking points.

3. Make sure that the lift plate is touching the machine's chassis.

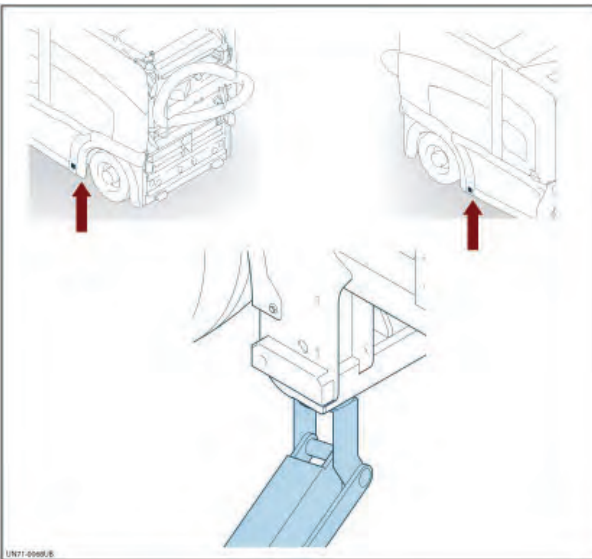


4. Loosen the nuts (A).
5. Lift the machine slowly, just as much as is needed for the wheel to be replaced to come off the ground.
6. Unscrew the nuts (A).
7. Remove the wheel.



8. Fit the new wheel.
9. Tighten the nuts (A) following the sequence shown in the figure.  
Tightening torque (300 Nm, 221.27 lb·ft).
10. Lower the machine.
11. Remove the lift.
12. Proceed in the same way to replace the other wheel.

#### REMOVING AND FITTING THE REAR WHEELS



Complete the operations described.

1. Set the machine in drive mode to facilitate lift positioning.

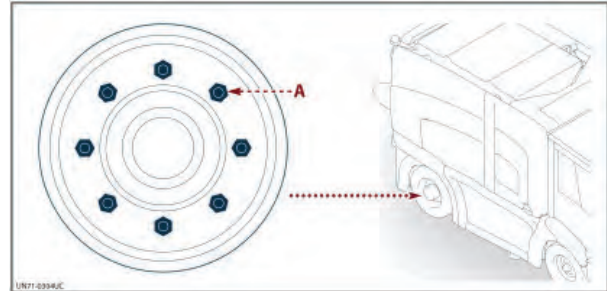
**FOR SAFETY: Use hoist or jack that will support the weight of the machine.**

A 7-ton jack for empty hopper, and a 10-ton jack with full hopper.

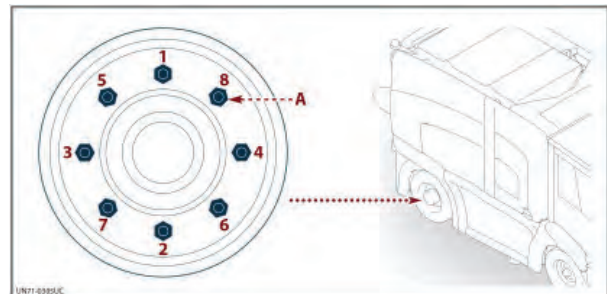
2. Position the jack.

The illustration shows the jacking points.

3. Make sure that the lift plate is touching the machine's chassis.



4. Loosen the nuts (A).
5. Lift the machine slowly, just as much as is needed for the wheel to be replaced to come off the ground.
6. Unscrew the nuts (A).
7. Remove the wheel.



8. Fit the new wheel.
9. Tighten the nuts (A) following the sequence shown in the figure.  
Tightening torque (300 Nm, 221.27 lb·ft).
10. Lower the machine.
11. Remove the lift.
12. Proceed in the same way to replace the other wheel.

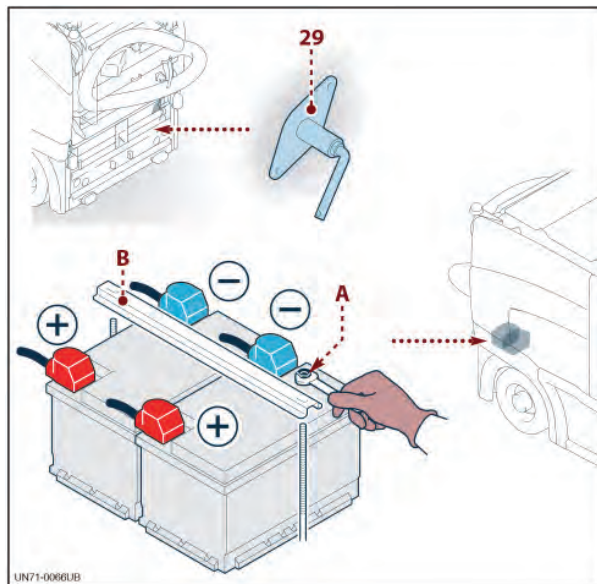
## REPLACING THE BATTERY

**FOR SAFETY: Do not disconnect the battery cables when the machine is running.**

**Do not smoke, not use naked flames and do not cause sparks that could make the battery explode.**

Replace the faulty battery with one of the same type and with the same technical characteristics.

Take care when working with metal tools or conductive materials to prevent short circuits and sparks.

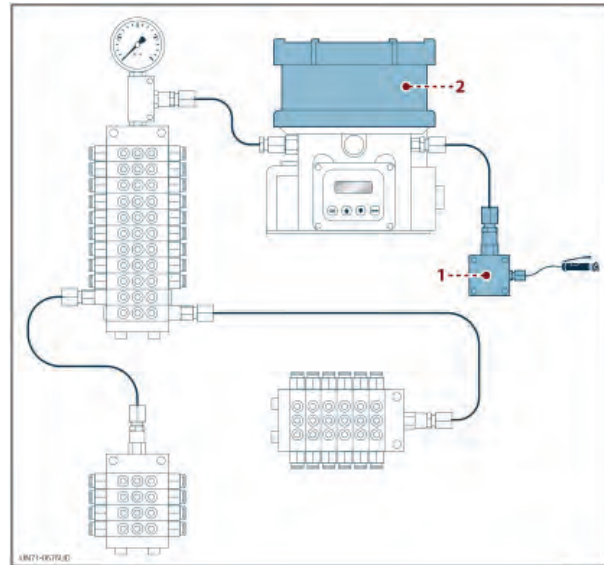


Complete the operations described.

1. Isolate the batteries using the battery isolator switch (29).
2. Unscrew the nuts (A).
3. Remove the part (B).
4. Disconnect the negative terminal (-).
5. Disconnect the positive terminal (+).
6. Remove the faulty battery.
7. Place the new battery in the machine.
8. Position the element (B).
9. Tighten the nuts (A).

10. Protect the battery terminals with adequate antioxidant products.
11. Connect the positive cable (+).
12. Connect the negative cable (-).
13. Check that the terminals are securely connected to the battery terminals.

## LUBRICATION PUMP FILLING



Complete the operations described.

1. Connect a grease pump to the valve (1).
2. Pump until the reservoir (2) of the lubrication pump is full.

For the characteristics of the lubricating grease, see "Oil and Lubricant Specifications."

## STORAGE

When taking the machine out of service, a series of operations must be carried out to make sure that the machine and all the devices do not represent an obstacle and are not easily accessible.

To prevent the machine posing a risk to people, all the machine's connections to power supplies (electric, pneumatic, hydraulic, etc.) must be made unusable.

Drain out all the liquids that may be present (lubricants, coolants etc.) to prevent damage to the environment.

Store the machine in a suitable area, which cannot be accessed by unauthorized personnel.

## FREEZE PROTECTION FOR WET DUST CONTROL SYSTEM AND HIGH PRESSURE WASHER OPTION

1. Drain the water tank and lines from the inline filter located behind the front right tire.
2. Pour 7.6 L (2 gal) of Propylene Glycol Based/ Recreational Vehicle (RV) Antifreeze into the water tank.
3. Machines equipped with the high pressure washer option: Prepare the high pressure washer for use.
4. Machines equipped with the high pressure washer: Point the high pressure washer wand in a safe direction and squeeze the trigger until RV Antifreeze solution is spraying out the nozzle.
5. Machines equipped with the high pressure washer option: Turn off the high pressure washer system, point the pressure washer wand in a safe direction, and squeeze the trigger to relieve pressure from the system.
6. Machines equipped with the high pressure washer option: Return the high pressure washer components to the storage area on the machine.
7. Machines equipped with the front dust control option: Press the front brush spraying button until RV antifreeze solution spray out both side nozzles.
8. Machines equipped with rear hopper dust control: Press the Hopper dust control button in the cab or on the cabled remote until RV antifreeze solutions spray out the nozzles.

## PREPARING THE MACHINE FOR OPERATION AFTER STORAGE

All antifreeze must be completely cleaned from the cleaning system before the machine can be used for cleaning.

**FOR SAFETY: Before leaving or servicing machine, stop on level surface, turn off machine, and set the parking brake.**

1. Completely drain the antifreeze from the the water tank and lines from the inline filter located behind the front right tire.
2. Pour cool clean water into the water tank, enough to clear all water lines and pumps of antifreeze.
3. Machines equipped with the high pressure washer option: Prepare the high pressure washer for use.
4. Machines equipped with the high pressure washer: Point the high pressure washer wand in a safe direction and squeeze the trigger until all of the RV antifreeze solution is sprayed out and only clean water is coming out the the nozzle.
5. Machines equipped with the high pressure washer option: Turn off the high pressure washer system, point the pressure washer wand in a safe direction, and squeeze the trigger to relieve pressure from the system.
6. Machines equipped with the high pressure washer option: Return the high pressure washer components to the storage area on the machine.
7. Machines equipped with the front dust control option: Press the front brush spraying button until all of the RV antifreeze solution is sprayed out and only clean water is coming out of the nozzle.
8. Machines equipped with rear hopper dust control: Press the Hopper dust control button in the cab or on the cabled remote until all of the RV antifreeze solution is sprayed out and only clean water is coming out of the nozzle.



## SPECIFICATIONS

| GENERAL MACHINE DIMENSIONS/CAPABILITIES                                              |       |                                        |
|--------------------------------------------------------------------------------------|-------|----------------------------------------|
| Cleaning track                                                                       |       |                                        |
| Main brush working width                                                             | mm    | 1400 / 55,12 in                        |
| Working width with two side brushes                                                  | mm    | 2400 / 94,49 in                        |
| Working width with side brushes + third brush                                        | mm    | 3100 / 22,05 in                        |
| Main cylindrical brush diameter                                                      | mm    | 580 / 22,83 in                         |
| Diameter of side disc brushes                                                        | mm    | 900 / 35,43 in                         |
| <b>Hopper</b>                                                                        |       |                                        |
| Volume                                                                               | l     | 4100 / 1083,11 US gal                  |
| Max. container lifting height                                                        | mm    | 1820 / 71,65 in                        |
| <b>Suction</b>                                                                       |       |                                        |
| Air flow rate                                                                        | m³/h  | 14000 / 61.640,18 US gpm               |
| Filtering surface area (m²)                                                          | m²    | 50 / 538,20 ft²                        |
| Suction motor power rating                                                           | KW    | 30 / 40,23 HP                          |
| <b>Performance</b>                                                                   |       |                                        |
| Maximum speed                                                                        | Km/h  | 40 / 24,85 mph                         |
| Maximum driveable gradient with no load                                              | %     | 29                                     |
| Working speed                                                                        | Km/h  | 0-20/ 12,43 mph                        |
| <b>Engine type</b>                                                                   |       |                                        |
| Engine                                                                               | -     | VM R754 EU VI phase E                  |
| Power supply                                                                         | -     | Diesel                                 |
| Engine power                                                                         | HP/KW | 126 / 100 / 134,10 HP                  |
| Engine speed                                                                         | rpm   | 2000 Work - 2600                       |
| <b>Dimensions and weights</b>                                                        |       |                                        |
| Machine length with side brushes + third brush                                       | mm    | 5013                                   |
| Machine length with side brushes                                                     | mm    |                                        |
| Machine width                                                                        | mm    | 1861 / 73,27 in                        |
| Machine height in work mode                                                          | mm    | 2769 / 109,02 in                       |
| Machine height in drive mode                                                         | mm    | 2800 / 110,24 in                       |
| Machine height with waste container tilted                                           | mm    | 4166 / 164,02 in                       |
| Machine height with waste hopper raised                                              | mm    | 3302 / 130,04 in                       |
| Machine height with waste container raised and tilted                                | mm    | 4699 / 185,00 in                       |
| Machine length with side brushes + third brush and waste container tilted            | mm    | 5831 / 229,57 in                       |
| Machine length with side brushes + third brush and waste container raised and tilted | mm    | 6248 / 246,02 in                       |
| Curb weight: TARE - GVW (Gross vehicle weight)                                       | Kg    | 5800 - 9000 / 12.786,8 lb- 19.841,6 lb |
| <b>General vehicle characteristics</b>                                               |       |                                        |

## SPECIFICATIONS

| GENERAL MACHINE DIMENSIONS/CAPABILITIES |     |                              |
|-----------------------------------------|-----|------------------------------|
| Turning radius                          | mm  | 4500 / 177,17 in             |
| Service brake                           | -   | Hydraulic                    |
| Parking and emergency brake             | -   | Hydraulic - negative         |
| Rear-wheel drive                        | -   | Hydraulics - Automotive      |
| Wheels                                  | -   | 245/70 R17.5                 |
| Suspension                              | -   | type MC Person - hydraulic   |
| Machine height check                    | -   | On 4 wheels                  |
| Diesel tank capacity                    | l   | 150 / 39,63 US gal           |
| Water tank capacity                     | l   | 200 + 200 opt / 52,83 US gal |
| Tire pressure levels                    | PSI | 116                          |

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### SOUND EMISSIONS

Test operating conditions according to Annex III point 46 of Directive 2000/14/EC

Measuring instrument used: G078333, CR:161C

The measurement uncertainty rating K, with reference to the basic standard(s) and the test conditions, is estimated to be 1,5.

The measured sound power level is 115 dB.

The sound pressure level measured at the operator's cab is 70,9 dB.

The level was measured with the windows closed and the machine running.

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### VIBRATIONS

The measured whole-body vibration level is 0,4 m/s<sup>2</sup> / 1,31 ft/s<sup>2</sup>

Level measured with daily exposure A (8).

The vibration status is considered a low risk.

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### ENVIRONMENTAL CONDITIONS FOR OPERATION

The machine works regularly with the indicated environmental conditions.

- Ambient temperature of reference: -5°C / 23°F

- Relative humidity: 30%

## OIL AND LUBRICANT SPECIFICATIONS

| Type of liquid              | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Quantity                       |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| <b>Engine oil</b>           | <p>The engine oil must have the following characteristics:</p> <ul style="list-style-type: none"> <li>- Fully synthetic or semi-synthetic.</li> <li>- Viscosity grade SAE 10W-40</li> <li>- Oil quality specifications ACEA E6 + E9<br/>o E8 + E11, API CJ4 / CK4.</li> <li>- TBN (Total Base Number) <math>\geq 10\text{mgKOH/g}</math>.</li> <li>- In the event of extremely low operating temperatures (up to <math>-30^{\circ}\text{C}</math> / <math>-22^{\circ}\text{F}</math>) an engine oil with the specifications stated above and the following grade may be used:<br/>SAE 5W-40 o SAE 5W-30.</li> </ul> <p>Do not mix oils with different characteristics</p> | 8,4 L / 2,22 US gallons        |
| <b>Hydraulic oil</b>        | <p>ISO-L-HV 46<br/>ISO - VG 46 (biodegradable oil)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 90 L / 23,78 US gallons        |
| <b>Coolant</b>              | <p>The coolant must comply with standards ASTM D 3306 Type 3.<br/>NOTE: only ready-to-use coolants may be used.<br/>Concentrates that require mixing with water may not be used.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | n.a.                           |
| <b>Brake fluid</b>          | DOT 04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1 L / 0,264 gal                |
| <b>Lubricating grease</b>   | <p>AUTOMATIC SYSTEM<br/>Max. grease consistency<br/>NLGI 2</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3 KG / 6,61386 lb<br>AUTOMATIC |
|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | n.a.                           |
| <b>Gearbox oil</b>          | ISO-VG 220                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2,5 l / 84,54 fl oz            |
| <b>Travel drive oil</b>     | ISO-VG 220                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 950 g / 2 lb (per wheel)       |
| <b>Fuel type</b>            | <p>The engine is designed to be powered by standard fuels according to UNI EN 590 specifications (maximum 7% bio-diesel content) IMPORTANT<br/>Fuels with specifications other than those stated must not be used.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 120 L / 4.057,68 fl oz         |
| <b>Def fluid</b>            | <p>IMPORTANT: Solutions with specifications other than those stated must not be used.<br/>Liquid management in compliance with the specifications of ISO 22241 - 1 - 2 - 3 - 4</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 14<br>(including reserve)      |
| <b>Air conditioning gas</b> | R134                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 750 gr / 1 lb e 10,5 oz        |

## MACHINE DIMENSIONS

