RS - V5000

Truck Mounted Vacuum

Operator's Manual

Read this manual completely and understand the instructions before operating the machine.

"English Version"

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Prepared by KM, NPM TD Dept.

IMPORTANT NOTE:

Roots Multiclean Ltd. (RMCL) is not liable for any legal claims that may arise as a direct or indirect result of the contents of this manual.

Roots Multiclean Ltd.
R.K.G. Industrial Estate, Ganapathy,
Coimbatore - 641 006, India.

MACHINE DATA

Please fill at the time of installation for future reference:

Model No. - _____

Serial No. - _____

Engine No. - _____

Blower No. - _____

Accessories - _____

Installation Date - _____

OPERATOR'S MANUAL:

ROOTS philosophy is to continually improve all of its products. For this reason we may modify the design, appearance and engineering of our products periodically.

Therefore, some changes, modifications and improvements may not be covered in this manual.

For the latest Operator's Manual, visit:

www.rootsmulticlean.com/user-manual/

PREFACE

Dear Customer,

We are pleased with you having chosen the ***RS-V5000 Truck Mounted Vacuum*** for your cleaning requirements. Backed by our industry expertise that spans across two decades, we assure you that the machine comes with ROOTS promise of quality, efficiency and performance.

We advise you to carefully read through the instructions prior to the operation of the machine. This manual contains detailed instructions for the proper operation of the machine, along with important information regarding its handling, care, maintenance and service needs.

We are sure that you will find the machine and its performance to your utmost satisfaction. Once again, we thank you for choosing us as a trusted partner for your cleaning requirements.

Usage, Handling & Modification

Use of the product beyond the specified scope of functioning is deemed improper and the manufacturer cannot be held liable for any damages which may arise due to this.

This machine may be used only by persons who are trained or are familiar with the machine and are aware of the possible hazards involved. The appropriate Accident Prevention Regulations as well as applicable general regulations pertaining to Safety and Health at the work place must be adhered to by the user.

Modifications made to machine without the manufacturer's consent will relieve the manufacturer of responsibility and any possible liability for consequential damage.

Notes on Warranty

Refer the Warranty manual supplied along with the machine.

Acceptance of the Machine

On arrival of the machine at the shipping address, please check for any damage that may have occurred as a result of transit. In the event of any such damage, the purchaser is bound by responsibility to send a claim letter to the concerned authorized dealer with a copy of the invoice. The letter should be sent within 24 hours of receipt of the machine.

NOTE:
ILLUSTRATIONS SHOWN IN THIS MANUAL ARE FOR REPRESENTATIVE PURPOSE ONLY. ACTUAL PRODUCT MAY VARY.

ROOTS reserves the right to change the product or contents of this manual without prior information.

For Engine, Battery, Motors, Blowers or other OEM components related information kindly refer to their manufacturers manual supplied along with the machine for instructions regarding usage, maintenance and service.

Prior to first operation, read the manual carefully and strictly comply with the instructions contained.

The Operator's Manual is an integral part of the machine and must not be misplaced.

INTENDED USE

This truck mounted vacuum is intended for industrial use, for example in factories, large open spaces, cement industries, etc. It is designed to pick up loose debris up to 20 mm in diameter like cement, loose sand, small stones, etc. Do not use the machine to pick up soil, grass or hazardous substances. Use only recommended suction nozzles.
Do not use this machine in any other way other than described in this Operator's Manual.

WARNING:
When using indoors, ensure proper ventilation is available. Smoke hazard.

TECHNICAL SPECIFICATION

ENGINE

Manufacturer	-	**Ashok Leyland**
Model	-	**4 cylinder diesel, water cooled**
Displacement	-	**3839 cc**
Horsepower	-	**101 Hp/75kW @2200 rpm**
Net torque	-	**390 Nm@1440-1600 rpm**
Air cleaner	-	**Spin on type**
Oil filter	-	**Spin on type**
Radiator fan	-	**Pusher**
Electrical	-	**24V**

VACUUM

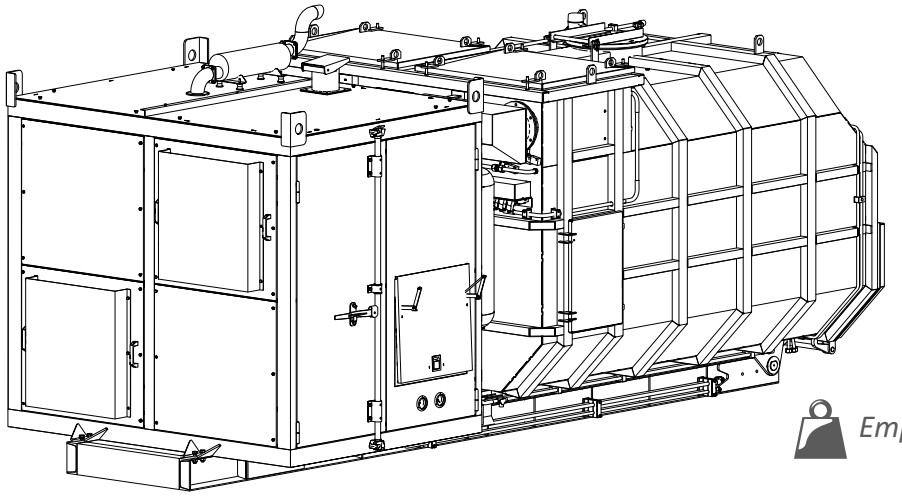
Manufacturer	-	**Robuschi**
Type	-	**3 lobe rotary with atm air injection**
Construction	-	**Cast iron**
Bearings	-	**2 sealed bearings**
Shaft	-	**60 mm diameter**
Drive	-	**5 XPB section banded individual V belt**
Air flow (max.)	-	**2800 m³/h (1647CFM)**
Vacuum pressure (max.)	-	**700 mbar (21" of HG)**
Pressure relief valve	-	**610 mbar (18" of HG)**
Max. pump temp	-	**140 °C**

FUEL

Type of fuel - **Diesel**
Tank capacity - **150 liters**

HYDRAULIC

Drive	-	**PTO gear pump from aux. engine**
Pump type	-	**Fixed displacement**
Reservoir	-	**34 Litres**
Filtration	-	**10 micron spin-on inline mounted**
Function	-	**Hopper tilting & rear door lock open and close**



Empty weight - **4500 kg**

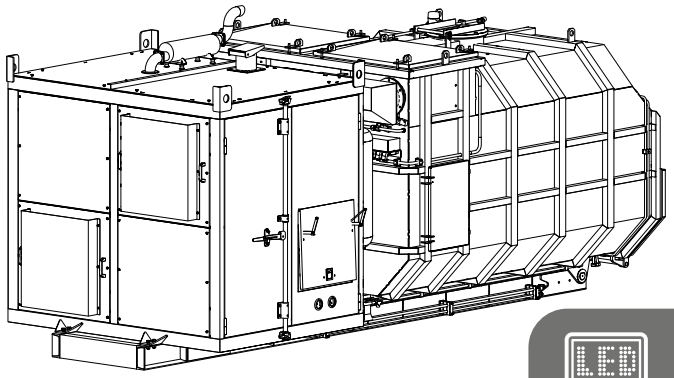
HOPPER

Hopper	-	**Heavy gauge carbon steel**
Steel	-	**5 mm (6 gauge) for walls & floor**
Construction	-	**Welded carbon steel**
Volumetric capacity	-	**8 cubic meters (10.4 cubic yards)**
Useable capacity	-	**5 cubic meters**
Dumping method	-	**Rear door dump**
Dump door	-	**1350 mm self locking hydraulic fingers**
Dump height	-	**1100 mm**

TECHNICAL SPECIFICATION

FILTER

Type	-	**Bag type - Primary**
Cleaning method	-	**Reversible pulse jet**
Blast orifice	-	**High pressure located in top**
Function	-	**Separate blast orifice for each bag**
Filtration area	-	**34 sq.m**
Bag filter - Filtration size	-	**3 microns**
Bag filter material	-	**Felt polyester 550 g/sq.m**
Pump cooling filter	-	**Cartridge type, 1 micron**
Secondary filter	-	**Cartridge type, 1 micron**
No. of secondary filters	-	**3**
Purging tank capacity	-	**11 Litres**
Air tank capacity	-	**60 Litres**
Air compressor	-	**230 cc, engine direct driven**



SAFETY SYSTEM

Shutdown system - **3 point system (LLOP, HWT,Over speed) Emergency Stop Switch**

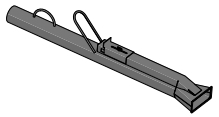
DISPLAY

Display size	-	**5 inch**
Warnings	-	**Indication & buzzer**
Electrical control panel	-	**Body mounted**
Ignition switch	-	**Start/Stop-push button**
Filtration switch	-	**Auto/Manual (adj. time)**

BATTERY

Battery - **24V, 80Ah**

ACCESSORIES



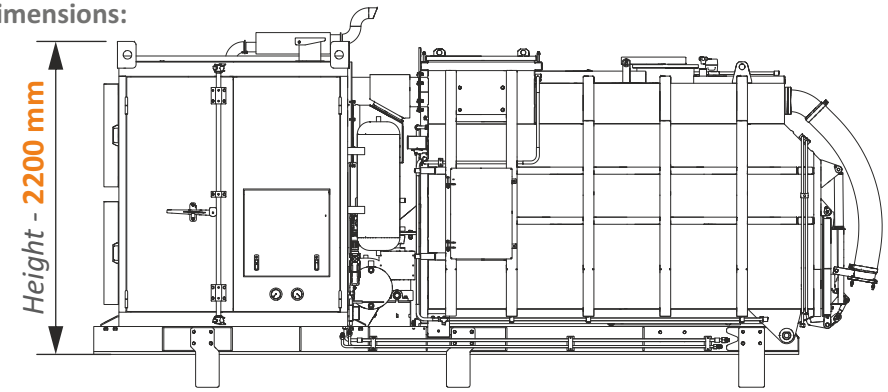
Standard:

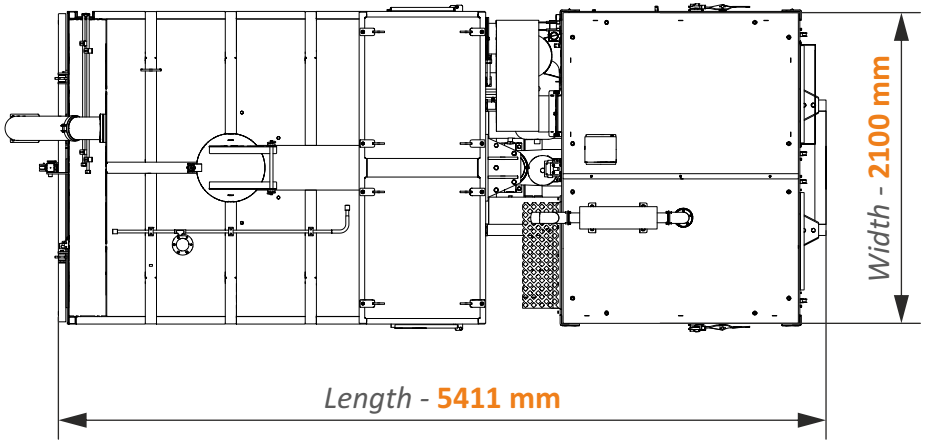
Fluidized bulk nozzle
Bulk nozzle
100 dia hose x 20 meters
Hose connectors

Optional:

Extension hose
Special filters

Kit Dimensions:





GENERAL SAFETY SYMBOLS

Read manual

Prior to first operation, read the manual carefully and strictly comply with the instructions contained.

Caution (the machine)

Important information on handling the machine in order to maintain operability.

Ecological hazard (the environment)

Due to use of substances representing an inherent danger to health of environment.

Safety Provisions (persons & goods)

Safety provisions in dangerous situation caused by misuse inaccurate adherence of instruction or prescribed work routine.

SAFETY INSTRUCTIONS

- Apart from the information contained in this manual generally applicable legal provisions for safety and prevention of accidents must be adhered to.
- Do not put this manual aside without having read it, even if you have already operated similar equipment before.
- The warning and instruction plates attached to the machine give important advice on safe operation.
- Replace lost or illegible safety labels.
- Before starting to work, the operator has to check that the machine and its working implements are in proper and safe operating condition.
- Machines with known defects must not be used.
- It is important for operators and all persons likely to use the product, to familiarize themselves with all accessories and controls, as well as their functions, before starting operations.

General Safety Instructions

- Never operate the machine until you have read and completely understood this manual, the truck operator's manual, the auxiliary engine operator's manual.
- Never allow inexperienced or untrained personnel to operate the truck and machine without supervision.
- Always maintain the safety decals in good readable condition. If the decals are missing, damaged, or unreadable, obtain and install replacement decals immediately. Consult your authorized sales representative for decal replacements.
- All safety shields, guards and other protective safety devices should be used and maintained in good working condition. All safety devices should be inspected carefully for missing or broken components. **NEVER REMOVE PROTECTIVE SHIELDS AND GUARDS! NEVER MODIFY OR CUT PROTECTIVE SHIELDS OR GUARDS!**

- When shields or guards are removed to access areas for maintenance, they must be replaced and be in good condition before operating. Missing, broken, or worn shields, guards, and other protective devices must be replaced at once and prior to operation to reduce the possibility of injury or death from thrown objects, entanglement, or contact.
- The machine must be equipped with a fire extinguisher, rated for all fires, in an accessible and visible area. The fire extinguisher should be inspected routinely by a certified inspector for operational use and replaced as needed. Never obstruct access to the fire extinguisher.
- Operation of this equipment under certain conditions may generate airborne dust particles that could contain crystalline silica. In those conditions, personal protective equipment including an appropriate respirator must be used.

Driver Safety Instructions

- New operators should be trained in an open area clear of obstructions before operating in the workplace. If operation of the entire machine (truck, auxiliary engine, and suction components) are not completely understood, consult your authorized sales representative for a detailed explanation. Never allow an untrained or unqualified driver to operate the machine.
- The machine driver must meet the requirements and possess a Motor Vehicle License as determined by the state/country in which the machine is operated.
- **NEVER use drugs or alcohol** immediately before or while driving or operating the machine. Drugs and alcohol will affect an operator's alertness and coordination and therefore affect the operator's ability to operate the machine safely. **NEVER** allow anyone to operate this machine when their alertness or coordination is impaired. Serious injury or death to the operator or others could result if the operator is under the influence of drugs or alcohol.

- ***Always wear approved Personal Protective Equipment (PPE) while operating, servicing, repairing, and/or cleaning the machine. PPE is designed to provide bodily protection during such activities.***

Personal Protective Equipment includes:

- *Protective Eye Wear*
- *Steel Toed Safety Footwear*
- *Gloves*
- *Hearing Protection*
- *Close Fitted Clothing*
- *Hard Hat* - When working around a raised hopper.
- *Respirator* - Depending on conditions and material being sucked. Specialized protective equipment may be required if dangerous or hazardous material is being vacuumed or cleaned from the machine.

- Prolonged operation of the machine may cause fatigue affecting the safe operation of the machine. It is recommended that the operator takes scheduled work breaks to help prevent these potentially impaired operating conditions. If possible, completely shut down the machine, exit the cab and move around stretching your arms and legs.
- Do not operate, or perform maintenance to, the machine while wearing loose fitting clothing. Entanglement of loose clothing with the rotating elements can result in serious injury or death. Stay clear of all rotating elements at all times.
- *PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS!*. We recommend that you always wear hearing protection if the noise in the operator's position exceeds 80db. Noise over 85db, over an extended period of time will cause severe hearing loss.

Operational Safety Instructions

- Use both hands for support when getting on and off the truck.
- Make sure you have solid footing before stepping down. Be careful of your step and use extra caution when mud, ice, snow, or other matter has accumulated on the steps or handrails. Never rush to exit or jump off the machine.
- Do not attempt to mount the machine while it is moving.
- Never attempt to mount a runaway machine. Serious injury or death may occur from being run over by a moving machine.
- BEFORE leaving the truck's seat, always engage the parking brake and/or set the truck's transmission in parking gear, stop the engine, remove key, and wait for all moving parts to stop.
- Never dismount a truck that is moving or while the truck and auxiliary engines are running.
- Always wear a seat belt while driving the machine during transport. Serious injury or even death could result from falling out of the truck or from being involved in a collision.
- Extract material only in conditions where you have clear visibility of the area being worked on, in daylight or with adequate artificial lighting. Never operate in darkness of foggy conditions where you cannot clearly see at least 50 feet in front and to the sides of the machine. Make sure that you can clearly see and identify passers by, slopes, ditches, overhead obstructions, power lines, and other ground equipments. If you are unable to see these types of items, discontinue operating until visibility improves.
- Transport the machine only at safe speeds. Serious accidents and injuries can result from driving this machine at unsafe speeds. Become familiar with the driving characteristics of the truck and how it handles before operating or transporting on highways *(for transporting only)*.
- Make sure the truck's steering, brakes, and wheels are in good condition and operate properly.

Before transporting the machine determine the safe transport speeds for youself and the machine. Make sure you abide by the following rules:

Test the machine at a slow speed and increase the speed slowly. Apply the brakes smoothly to determine the stopping characteristics of the truck equipped with the vacuum module. When driving down a hill or on wet or rain slick roads, the braking distance increases: use extreme care and reduce your speed. Do not operate the machine with weak, faulty brakes or worn out tires.

- *Obey all traffic laws and regulations. Never exceed the posted speed limit.*
- *The machine has a high center of gravity that may be further increased when carrying a loaded hopper. Use extreme caution when transporting at highway speeds. Slow down for sharp corners to avoid tipping or turning the machine over.*
- When operating in the work site, use the machine's directional indicator or signal lights to indicate your movement. Always use the machine's flashing signal lights and other equipped warning features to alert ground staff of your presence.
- Do not exceed the rated operating speed for the truck and auxiliary engines. Excessive operating speeds can cause engine and vacuum component damage.
- *KEEP AWAY FROM ROTATING ELEMENTS* including the belt and pulleys to prevent entanglement and possible serious injury or death.
- Do not operate the machine if excessive vibration or noise exists. Shut down the vacuum components, truck and auxiliary engines. Inspect the machine to determine the source of the vibration or noise. If components are loose, damaged, or missing, replace them immediately. Do not operate the machine until all necessary repairs have been performed and the machine operates smoothly.

SAFETY INSTRUCTIONS

- To reduce the possibility of property damage, serious injury, or even death, never operate the machine with missing or damaged components.
- Never attempt to extract debris that is too large for the machine to pick up. Such objects may plug the suction components and cause serious mechanical damage to the machine.
- Objects such as wire, cable, rope, and chain can get entangled in the rotating parts of the suction components causing mechanical damage.
- Use extreme caution when dumping the contents. Be aware of bystanders and objects in the area. Select a dump site on level ground and clear of overhead obstructions, that could be hit when raising the hopper.
- When positioning the truck at the dump station, choose an accessible location only on level ground. Raising the hopper on uneven ground increases the possibility of tipping.
- Make sure the area is clear of ground and overhead obstructions.
- Never raise the hopper unless you can clearly see all overhead structures. Make sure you stay clear of all utility lines.
- Do not dump the hopper over a pit area where the ground may cave in or is unstable.
- Wear eye and respiratory protection while dumping.
- Use care when positioning the machine to the dumping site. Your vision, especially to the side and rear of the machine may be reduced by the size. Use side and rear view mirrors to aid vision.
- If you cannot see the dump site clearly, stop the truck and examine the area. If necessary, request assistance to guide you while backing the truck into position.
- If the hopper will be in the raised position for more time than is normally required to dump, or if someone is going to get under the hopper for repair, maintenance, cleaning or any other reason, secure the ***safety prop*** into position.

- Never drive the truck with the hopper in the raised position. Traveling with the hopper in the raised position increases the chances of colliding with overhead obstructions. In addition, the center of gravity of the machine is higher with a raised hopper, making the unit more prone to tipping over.

Do not allow the machine to come in contact with potentially dangerous and/or hazardous material. Such hazards may include, but are not exclusively limited to, the following:

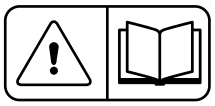
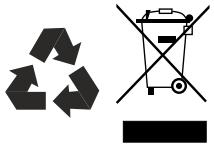
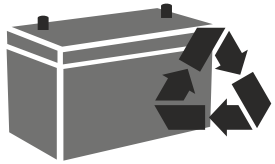
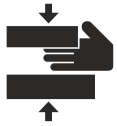
- *Fire Hazards* - Fuel spills, burning material,
- *Chemical Hazards* - Chemical spills, discarded chemical containers, batteries,
- *Biological Hazards* - Decaying carcasses, Biomedical waste,
- *Radioactive Hazards* - Radioactive waste, Radioactive material,
- *Cutting Hazards* - Broken glass, Lumber with protruding nails,
- *Corrosive Materials* - Batteries, Acids and Bases.
- Always wear required Personal Protective Equipment (PPE) when coming in contact with and removing potentially dangerous and hazardous material that has been collected by the machine or which is obstructing one or more suction components.
- Never vacuum hot or burning debris. A burning object, even as small as a lit cigarette, has the potential of igniting the collected waste inside the hopper, possibly destroying the machine and inflicting serious injury or death to the operator or passers by.
- Verbal communication near the machine is difficult and dangerous. Operating instructions and operating directions should be made prior to starting the machine. Unclear and misunderstood communication may lead to operator and bystander's injury or death and equipment damage.
- Never allow anyone to approach the machine while in operation.
- Never allow children to play on, under, or around the machine nor allow children to operate its controls. Children can slip or fall off the machine and be injured or killed.

- Allow passengers only in situations where their presence is involved in the vacuuming operation (operator training, supervision, maintenance inspection). Never carry passengers whose presence distracts from the safe operation or transport of the machine. Passengers must be seated securely and belted in the cab's passenger seat. Never allow any person to ride on any other location of the machine during operation or transport.
- Make sure that no bystander, animal or obstruction such as a vehicle, building, or street sign are behind the machine when backing up. The design of the machine impairs operator rear vision when backing. Use extreme caution to ensure that the machine is not backed into the path of pedestrian or vehicle traffic. Serious injury or death and property damage could result from running into, being crushed by, or run over by the machine.
- Avoid body contact with collected debris in the hopper. Use protective clothing including gloves and eye protection when servicing or working in or around hopper. Collected debris in the hopper can cut or puncture resulting in serious bodily injuries and the transmittal of diseases.
- Use extreme caution when operating the machine, to alert ground staff of the machine's presence, the machine is equipped with warning signals, flashing lights. Optional electrical lights, flashers and a warning bar light, strobe, or beacon may be positioned on top of the cab.
- Before starting the vacuuming operation, make sure all the warning signal lights are connected, visible and working. Routinely inspect the machine's headlights, brake lights, backup lights, and turn signal lights for operational condition. Repair non-functioning lighting immediately.
- Always turn on all safety lights and flashers when you operate the machine. It is recommended that you preset the beacon/strobe light switches to ON, so that the lights go on whenever the auxiliary engine is ON and lights go OFF whenever the auxiliary engine is turned OFF. This presetting action has the additional benefit of alerting the operator if the auxiliary engine is inadvertently left ON.
- DO NOT use mobile phone while driving/operating the machine.

Important Safety Note:

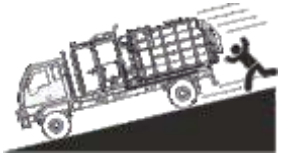
Always follow the jobsite rules while driving or vacuuming at all times.

SYMBOLS & HAZARDS PICTORIAL DEFINITIONS

 Read Manual	 Information	 General Warning	 Caution	 Toxic Hazard
 Recycle/Do Not Throw In Garbage	 Environmental Hazard	 Battery: Recycle	 No Fire/Matches	 No Smoking
 No Passengers	 Do Not Throw In Garbage	 Hand Crush Hazard	 Suffocation Hazard	 Trip Hazard
 Slip Hazard	 Hot Surface	 Entrapment Hazard	 Heavy Object	 Static Electricity Hazard

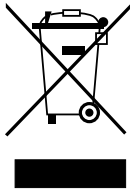
SAFETY INSTRUCTIONS

SYMBOLS & HAZARDS PICTORIAL DEFINITIONS

 Wear Overalls	 Wear Gloves	 Wear Safety Shoes	 Wear Safety Glasses	 Wear Safety Helmet
 Wear Ear Muff	 Wear Respirator	 Do Not Vacuum In Rains	 Electrocution Hazard	 Safe Zone
 Runaway Hazard	 Maintain Safe Distance	 Do Not Start Tag	 Do Not Tip On A Slope	 Rotating Belt Hazard
 High Pressure Fluid				

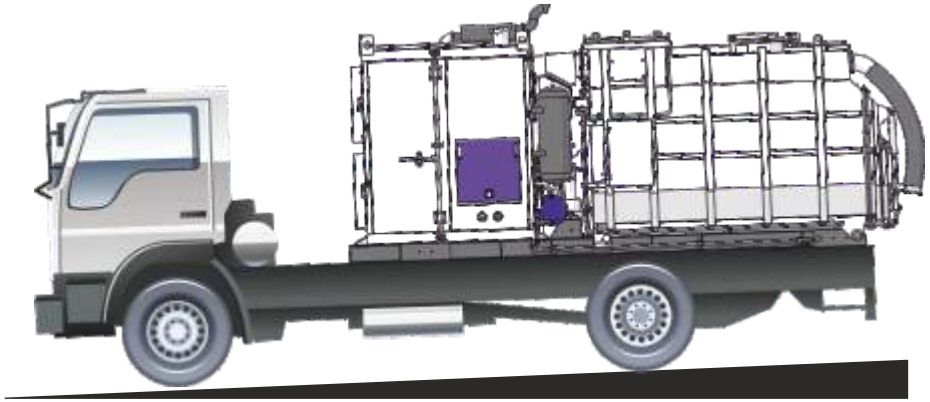
ENVIRONMENTAL RESPONSIBILITY

The packaging material can be recycled. Please do not place the packaging into the ordinary refuse for disposal, but arrange for the proper recycling.

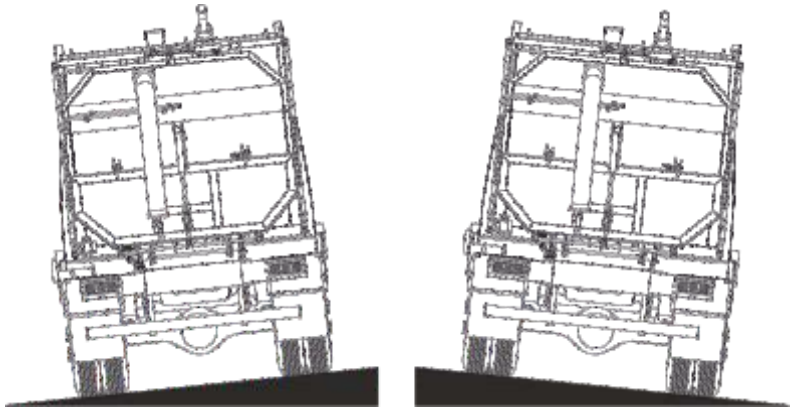


Old machines contain materials that can be recycled. Please arrange for the proper recycling of old machines. Batteries, electrical & electronic components contain substances that must not enter the environment. Please dispose off your old machine, batteries, electrical & electronic components using appropriate collection systems at the end of the product's life cycle.

Max Inclination Permissible for Material Discharge



Maximum Inclination Allowed Is 5°



Maximum Inclination Allowed Is 3°

TYPES OF MATERIAL THAT CAN BE VACUUMED:

CEMENT

FLY ASH

SAND

CLINKERS

M SAND

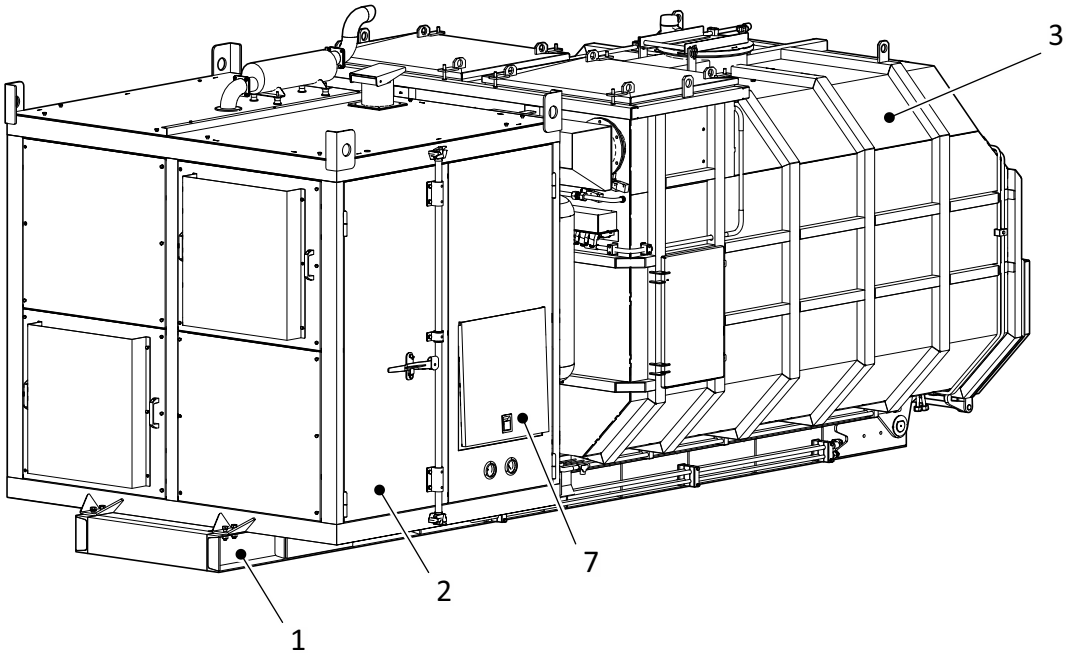
STONES UPTO 20 mm

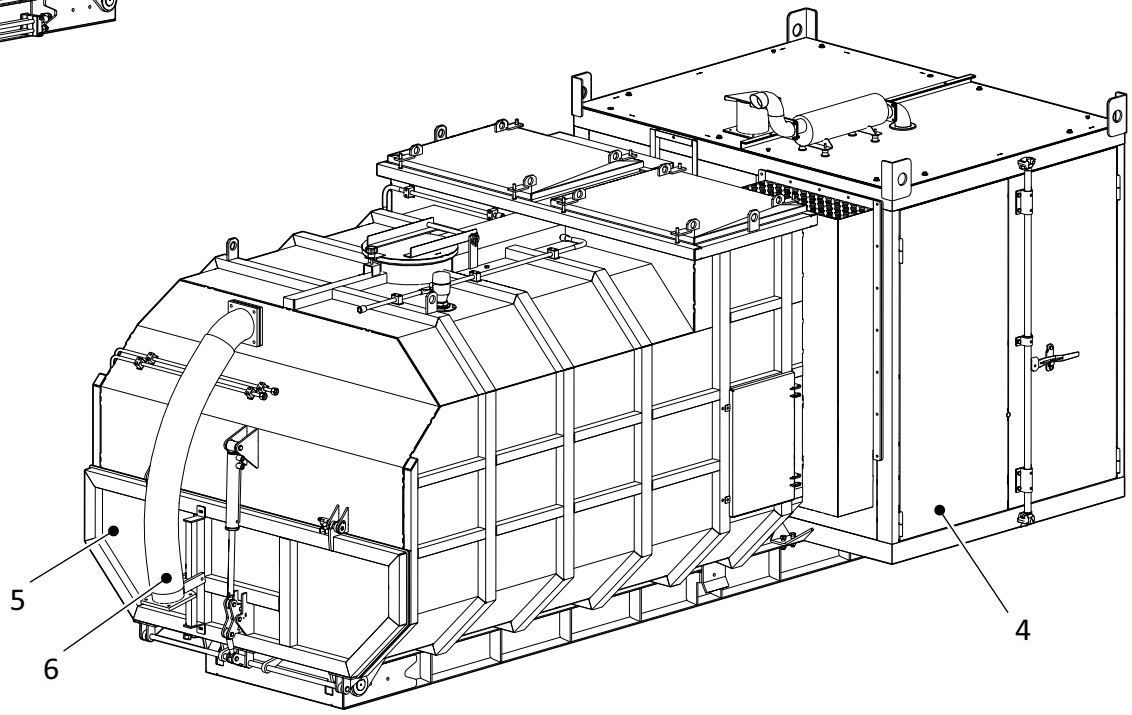
TYPES OF MATERIAL THAT SHOULD NOT BE VACUUMED:

STONES LARGER THAN 20 mm

SHARP OBJECTS LIKE BLADES, NAILS, KNIVES, ETC.

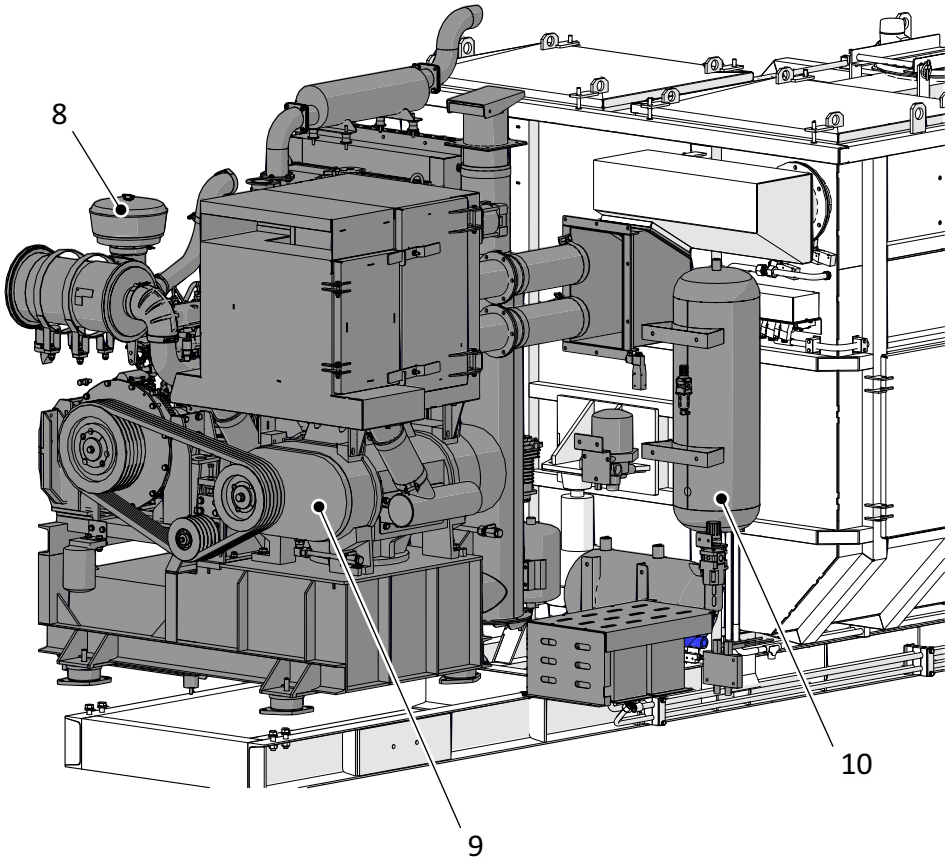
Main Components of the Vacuum Module

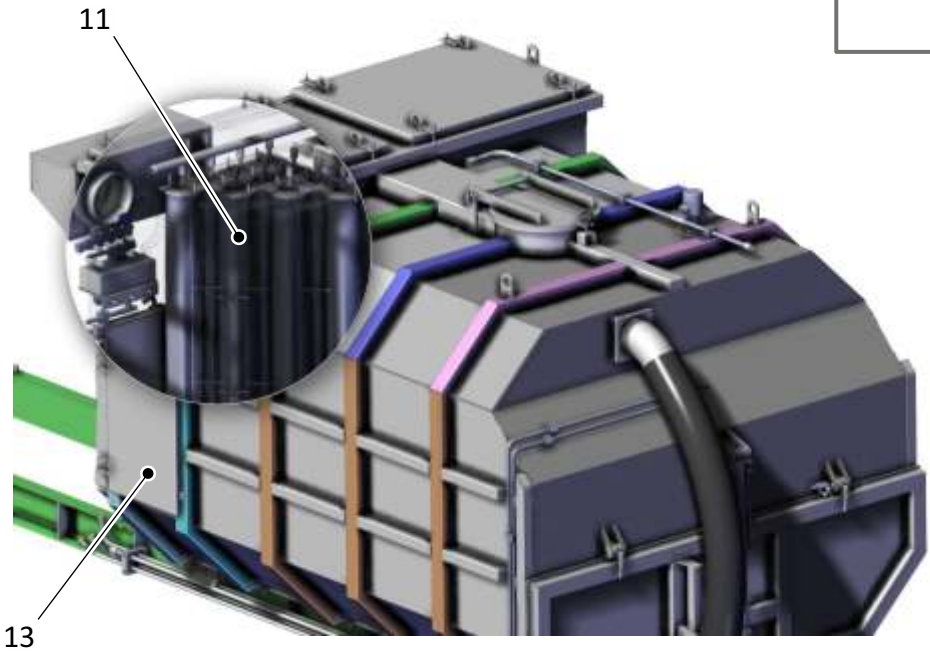


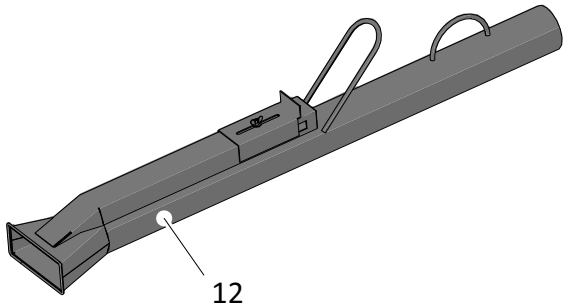


Legend:

1. **Base Frame**
2. **Engine Room**
3. **Debris Hopper**
4. **Engine Room Access Doors**
5. **Hopper Rear Door**
6. **Suction Hose**
7. **Control Panel**







Legend:

8. Engine

9. Blower

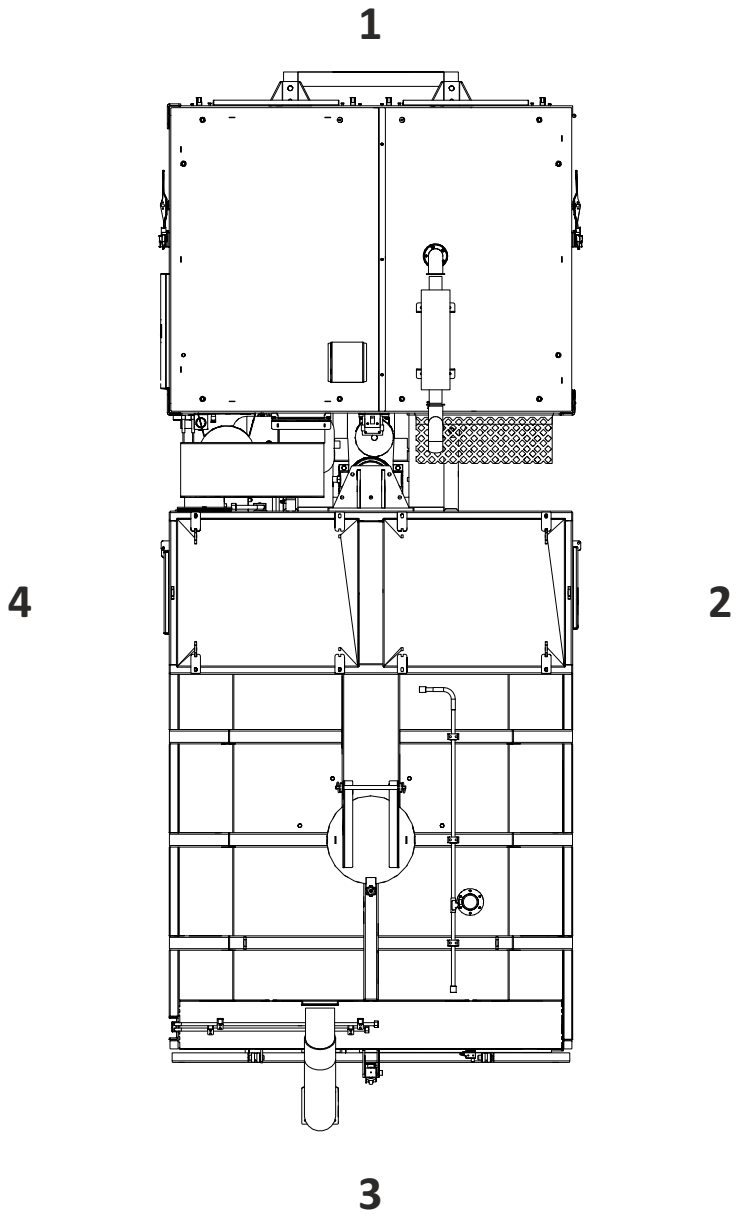
10. Air Tank

11. Filters

12. Suction Nozzle

13. Filter Chamber

Operator Orientation:



1. FRONT
2. RIGHT
3. REAR
4. LEFT

KNOW YOUR MACHINE - DECALS

HOPPER DUMPING OPERATION

1. SWITCH OFF ENGINE
2. DETACH SUCTION HOSE
3. START THE ENGINE AND SET HOPPER TILT SWITCH TO ON
4. LIFT UP THE HOPPER AND REAR DOOR LEVERS SIMULTANEOUSLY TO EMPTY HOPPER
5. PRESS DOWN THE HOPPER LEVER UNTIL THE HOPPER IS FULLY DOWN
6. PRESS DOWN THE REAR DOOR LEVER UNTIL THE REAR DOOR IS FULLY CLOSED.
7. SWITCH OFF THE ENGINE

(1)

GREASE EVERY 50 HOURS OF OPERATION

(2)

HYDRAULIC OIL

RECOMMENDED OIL FOR THIS UNIT IS ISO GRADE 46

(3)

DISCHARGE AIR BEFORE SERVICE

(4)

PERIODICALLY CHECK SAFETY FILTER

(5)

PERIODICALLY CHECK FILTER CHAMBER

(6)

DO NOT WORK UNDER TILTED HOPPER

(7)

BATTERY CUT-OFF SWITCH

(8)

DIESEL
FUEL ONLY

(9)

(10)

HOPPER UP-DOWN

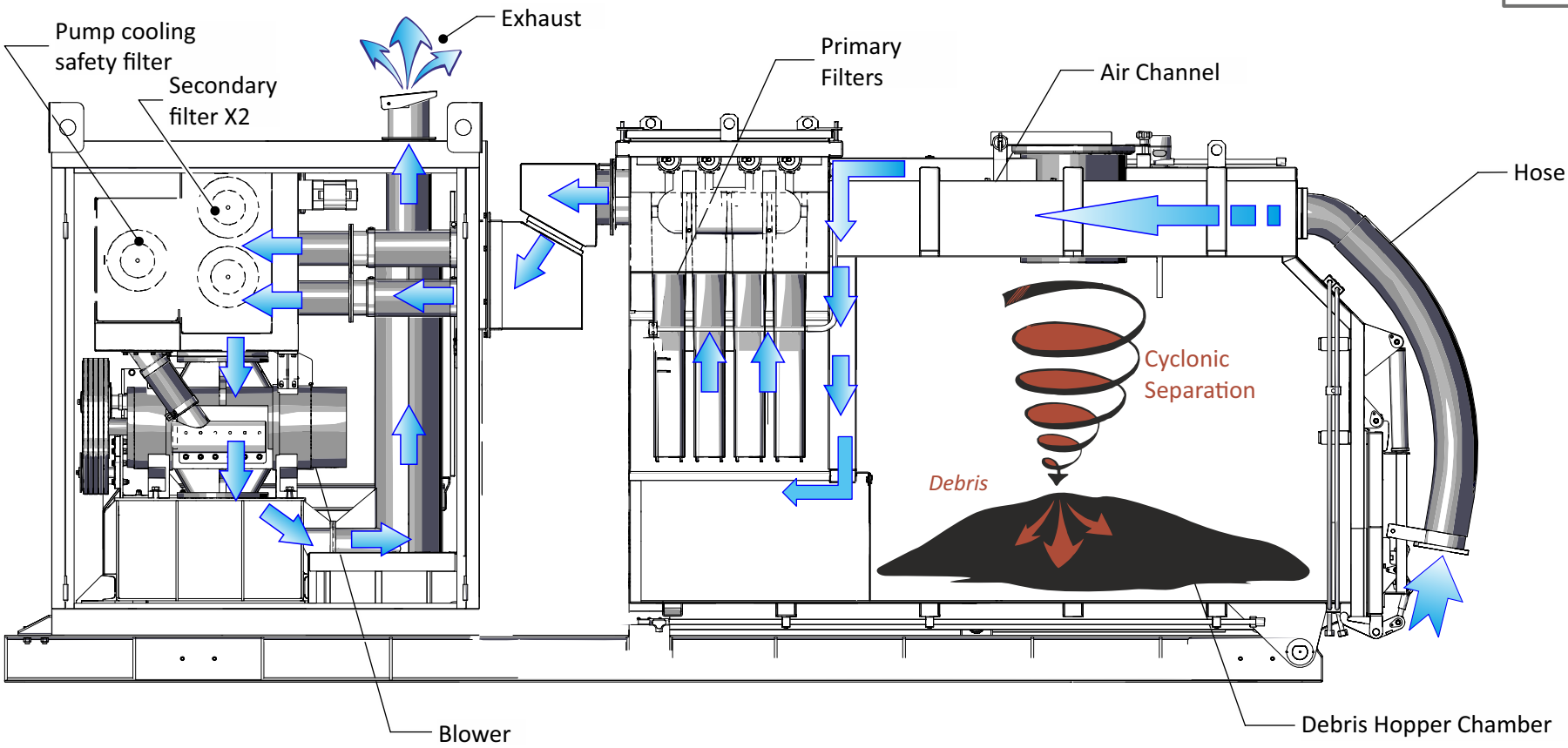
(11)

REAR DOOR OPEN-CLOSE

(12)

1. Hopper dumping operation decal
2. Grease decal
3. Hydraulic oil decal
4. Discharge air decal
5. Check safety filter decal
6. Check filter chamber decal
7. Tilted hopper warning decal
8. Battery decal
9. Fuel warning decal
10. Rotating element warning decal
11. Hopper control decal
12. Rear door control decal

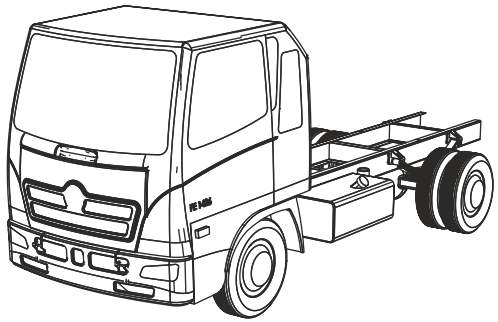
Working Principle



The blower is used for vacuum generation, that creates vacuum inside the hopper and the debris is collected through the suction nozzle connected to the hopper.

Main Components of the Vacuum System

Truck:



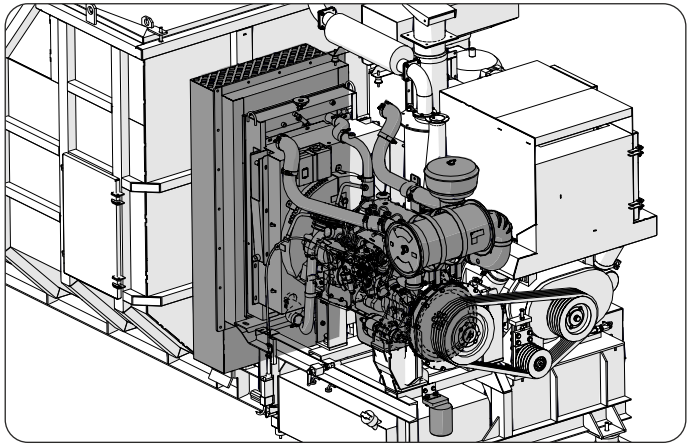
The truck is the base in which the vacuum kit is mounted.

Kindly refer to the truck manufacturer's manual on how to operate the truck, safety, warranty policy and its maintenance.

Before driving the truck/machine ensure the following points:

- Ensure that the operator has checked the worthiness of the truck.
- Ensure that there is enough fuel to operate the truck.
- Ensure that the operator has fastened his seat belt before driving.
- Adjust the mirrors prior to starting the engine of the truck.
- Ensure that the operator is qualified to drive the truck.

Engine with Blower:

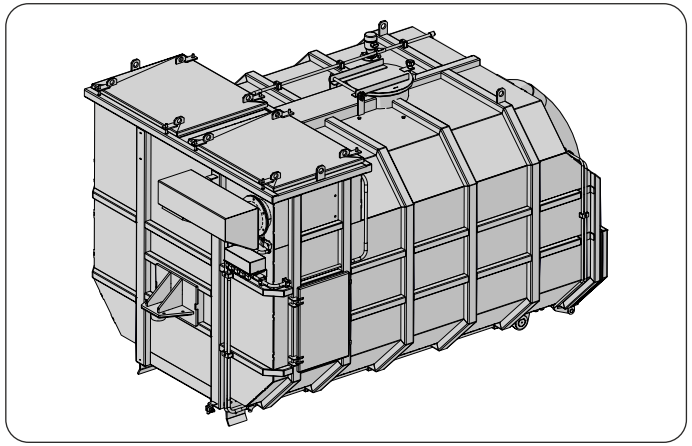


Engine - The auxiliary engine is a turbo diesel unit. The engine is mounted on its own cradle. This engine is used to power the kit i.e: Blower, Hydraulics, Electrical, etc.
The auxiliary engine has its own fuel tank which is located on the right hand side. For safety and ease of operation the engines's control systems are located in the control panel.
Note: *For detailed information on the engine, refer the engine manufacture's manual which is supplied along with the machine.*

Blower - *The blower is a 3 lobe rotary blower used for high performance suction systems. This is the primary component of the vacuum system.*

Note: *For detailed information on the blower, refer the blower Owner's Manual which is supplied along with the machine.*

Hopper:



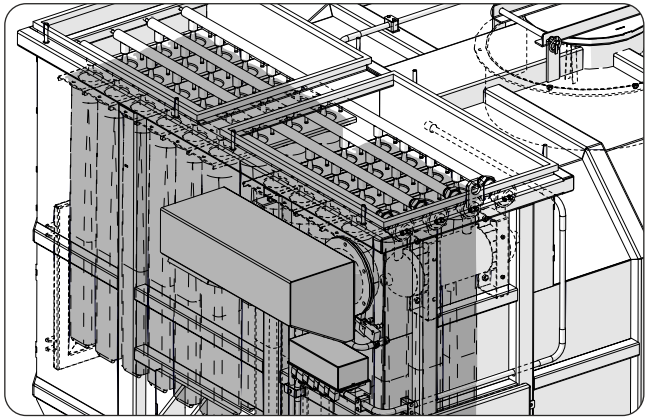
The hopper is rigidly built to store the bulk material collected by vacuum. The hopper is mounted on a heavy duty frame which is fastened to the truck's chassis. This provides a stable base to mount the hydraulic cylinders used to raise and lower the hopper into the dump and normal position.

The filter chamber in the hopper is used for primary filtration of the dust.

The hopper is equipped with a rear door which opens up while dumping the debris. This door is opened and closed with the aid of hydraulic cylinders. The locking of the rear door is also done by hydraulic cylinders.

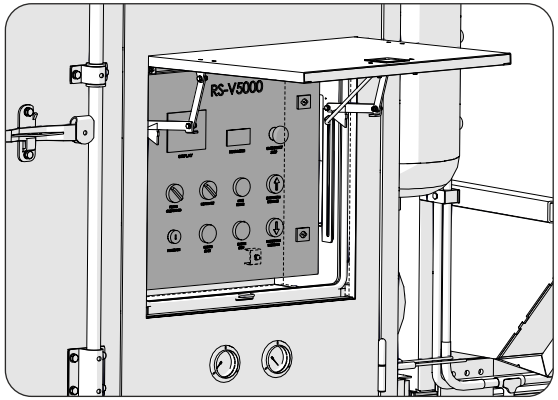
The hopper is equipped with a vibrating level switch which alerts the operator once the hopper is full.

Filters:



The machine uses both primary and secondary filters to ensure that even the smallest of the dust particle is filtered from the air. It has a unique purging system which operates automatically according to the density of the dust and can be set to different levels via the control panel.

Control Panel:



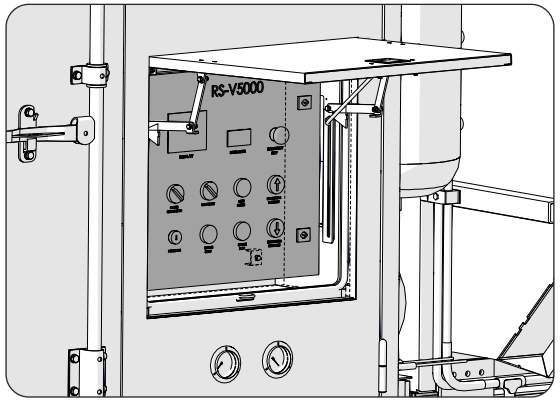
The main control panel is mounted on the left hand side door assembly of the engine room group. The control panel has a door to keep it concealed when not in use. All electrical elements in the system are protected by resettable circuit breakers/fuses.
In addition to the controls, there is an LCD display module which shows various parameters during the operation of the machine. This module shows the various parameters of the auxiliary engine also.

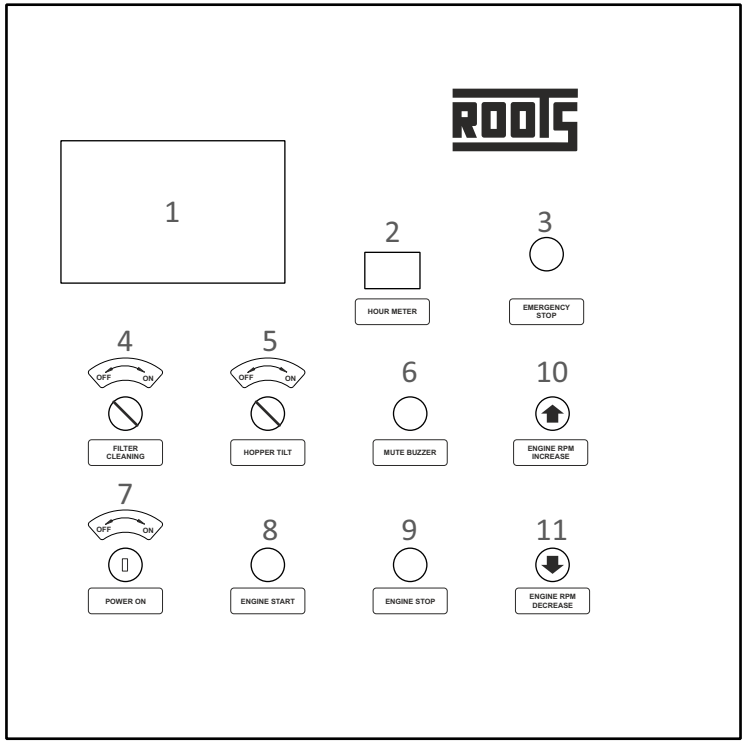
WHITE = Normal Operation
RED = Function Error

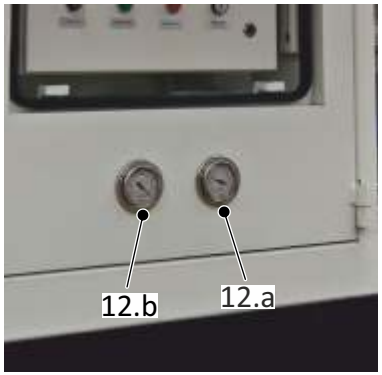
- ***Only trained and authorized operators are allowed to operate the control panel.***
- ***Care should be taken when operating the control panel.***
- ***Do not press all the buttons at the same time.***
- ***Watch out for by-standers or objects in the vicinity of the function to be activated.***

Control Systems:

Control Panel:



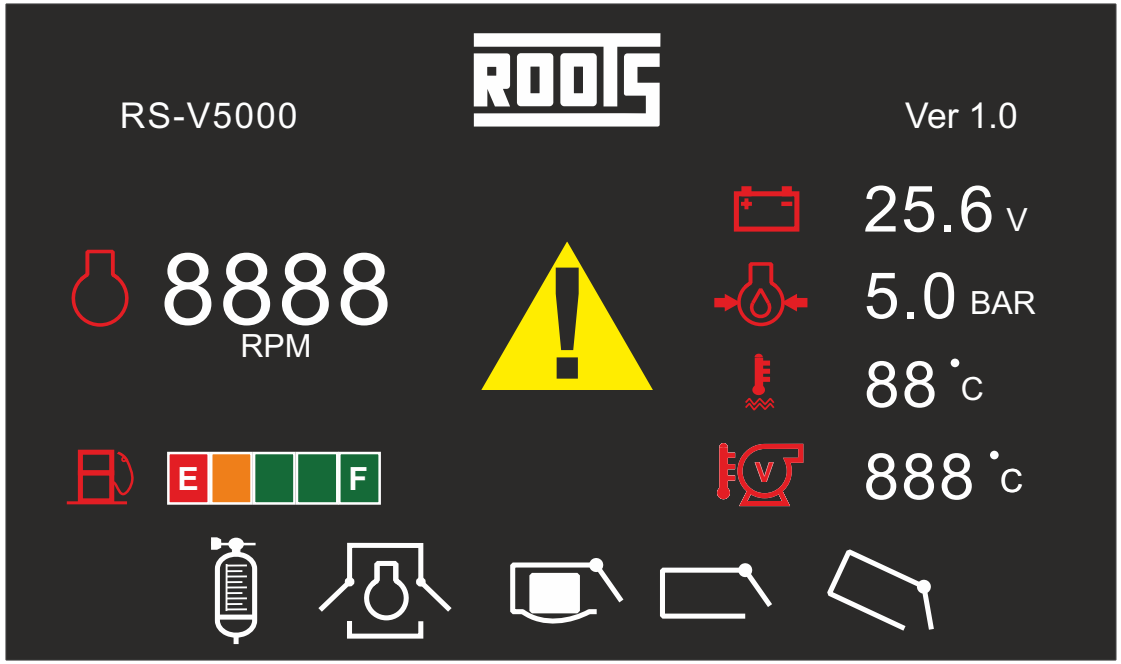




1. LCD Screen
2. Hourmeter
3. Emergency Stop Button
4. Filter Cleaning On/Off Switch
5. Hopper Tilt On/Off Switch
6. Mute Buzzer Switch
7. Power On/Off Key Switch
8. Engine Start Switch
9. Engine Stop Switch
10. Engine Speed Increase
11. Engine Speed Decrease
12.a. Air Pressure Gauge
12.b. Vacuum Pressure Gauge

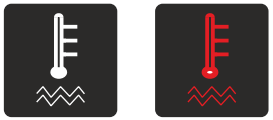
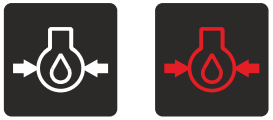
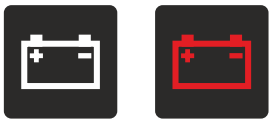
LCD Screen:

The LCD screen displays information on the current status of the machine while it is in operating mode, by indicating which items of equipment are active, plus other relevant information i.e: fluid levels, blower speed and temperatures, it also alerts the operator to any warnings by means of appropriate flashing symbols and, when appropriate, a warning buzzer. For warnings identified by ⚠ , stop the machine and look for the cause before proceeding.



⚠ ***Warning: The LCD screen's UART connector is for uploading/downloading information (ONLY) and must not be used for any other purpose.***

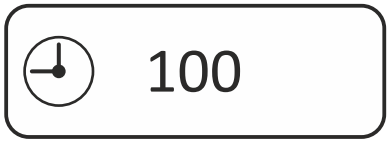
LCD Screen Icons

Item	Description	Function
RS-V5000	Product	Displays the product name.
Ver 1.0	Software	Displays the software version.
	Engine coolant temperature	Displays engine coolant temperature in degree Celsius. The icon turns RED when an engine overheat occurs, the safety warning icon is also displayed.
	Engine oil pressure	Displays engine oil pressure in bar. The icon turns RED when the oil pressure is low, the safety warning icon is also displayed.
	Engine speed	Displays engine speed in rpm. The icon turns RED when the engine speed increases beyond the set limit, the safety warning icon is also displayed.
	Fuel	Displays the fuel available in the tank via color coded bars. The icon turns RED when the fuel level drops to zero, the safety warning icon is also displayed.
	Battery	Displays the battery voltage in volts. The icon turns RED when the battery does not charge, the safety warning icon is also displayed.

LCD Screen Icons

Item	Description	Function
	Vacuum pump temperature	Displays the vacuum pump temperature in degree Celsius. The icon turns RED when the vacuum pump overheats and reaches 140°C, the safety warning icon is also displayed.
	Hopper capacity	This icon is displayed when the hopper is filled to its maximum capacity.
	Engine room door	This icon is displayed if any of the engine room doors are not closed.
	Hopper rear door	This icon is displayed when the rear door of the hopper is open.
	Hopper tipping	This icon is displayed when the hopper is in tipping position or lifted from the frame.
	Purging system	This icon is displayed when the air pressure of the purging system is low (3 bar).
	General Warning	This warning triangle is displayed when any of the RED icons are displayed. Warns the operator of a potential error.

Hour meter:



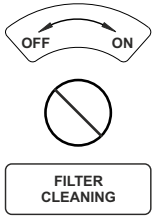
The hourmeter displays the total number of hours the machine has been used. It can be used to track maintenance intervals.

Emergency Stop Button:

The Emergency Stop Button is located in the control panel. Use this switch in case of an emergency ONLY.

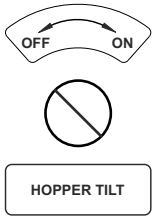
- ➔ PRESS to activate emergency stop function.
- ➔ Turn clockwise to release switch.

Filter Cleaning On/Off Switch:



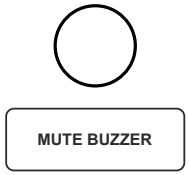
This switch is used to control the filter purging system.
Switch position Off - Purging system is completely Off.
Switch position On - Purging system is activated.

Hopper Tilting On/Off Switch:



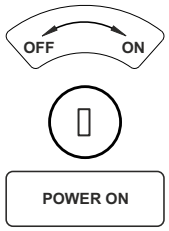
Once the hopper tipping operation has to be performed, the tilt switch should be in ON position to set the rpm of the engine for tilting.

Mute Buzzer Switch:



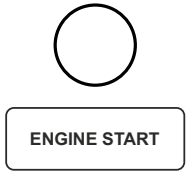
This button is used to mute the alarm sound for any occurrence of errors. Press the button once to mute the alarm. **Ensure to correct the error on top priority.**

Power On/Off Key Switch:



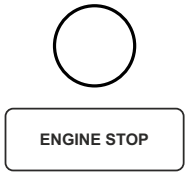
The key switch is used to On/Off the electrical supply to the control panel which is also used to control the engine electricals.
Switch position Off - No power to system.
Switch position On - System is powered.

Engine Start Switch:



This button switch is used to start the engine. Press the button to start.

Engine Stop Switch:

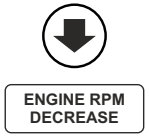


This button switch is used to stop the engine. Press the button once to stop.

Engine Speed Increase Switch:

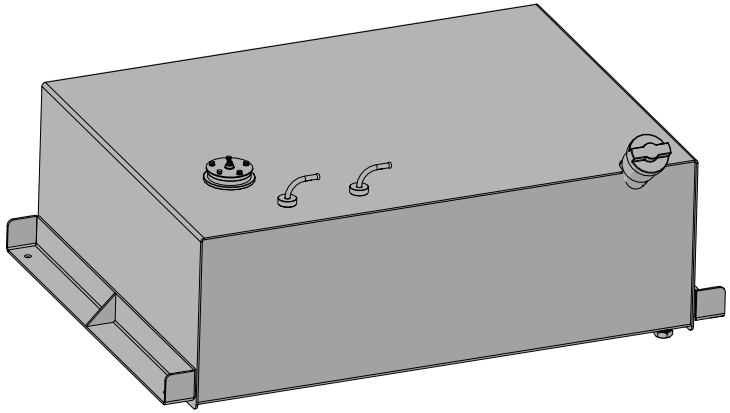
This button switch is used to increase the speed of the engine. Upon pressing the switch once the engine speed increases.

Engine Speed Decrease Switch:



This button switch is used to decrease the speed of the engine. Upon pressing the switch once the engine speed decreases.

Refueling the Diesel Fuel Tank:



The diesel fuel tank is located on the right side of the machine below the engine skid. To refuel the tank follow the steps below:

- Ensure that the engine is shut down.
- Operate the key and open the fuel filler slowly to vent out gases.
- Fill in the required quantity of **DIESEL** fuel.
- Close the fuel filler and lock it to prevent any unauthorized handling.
- The LCD screen in the control panel displays the amount of fuel in the tank.

DIESEL ONLY

Caution: Do not spill fuel into the environment while refueling. There is risk of contaminating the environment.

- DO NOT add additives to the fuel.
- DO NOT mix contaminated fuel.
- **DO NOT SMOKE WHEN REFUELING.**
- DO NOT spill fuel on the floor.
- If any fuel spill is noticed on the floor or the machine, immediately wipe to avoid risk of fire which may damage the machine or cause risk of burns or death.
- DO NOT top up oil or coolant when engine is running.

WARNING

Avoid static electricity when fueling. Avoid death or serious injury from fire or explosion.

WARNING

DO NOT USE MOBILE PHONE WHILE REFUELING THE FUEL TANK. RISK OF EXPLOSION.

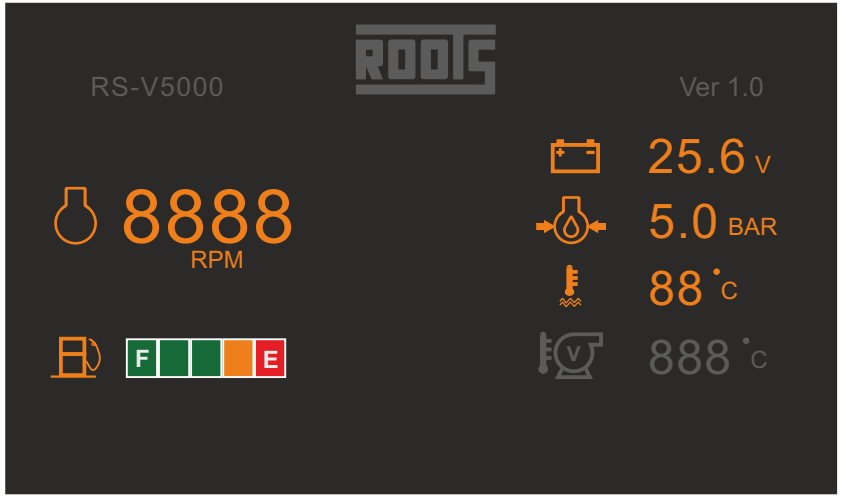
Fuel level indicator

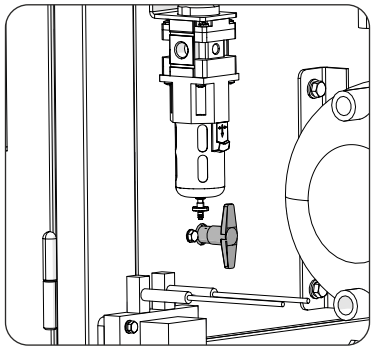
Green zone - Fuel level is full
Orange zone - Fuel level is in reserve
Red zone - Fuel level is dangerously low

Starting Auxiliary Engine:

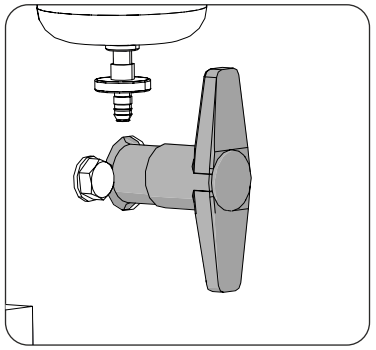
To start the engine follow the steps below:

- Park the machine on a flat level ground.
- Engage the parking brake of the truck.
- Switch ON the battery cut-off switch.
- Open the control panel door upwards.
- Insert the key and turn to ON position.
- The LCD screen lights up displaying all the icons for a few seconds.
- Ensure that the fuel quantity is at required levels.
- Press the Engine Start button till the engine completely cranks. (During startup the blower also rotates).
- The real time engine speed (in rpm), engine oil pressure (in bar) and engine coolant temperature (in degree Celsius) are displayed on the LCD screen.

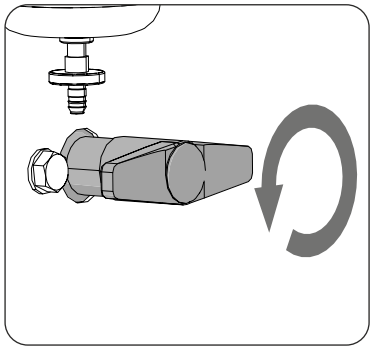




The battery cut-off ON/OFF switch is located at the rear of the engine room near the control panel door.



Position 1 - ON



Position 2 - OFF

WARNING

DO NOT turn OFF the battery cut-off switch in Off position when the engine is running.

NOTE

Engine will not start if the engine room doors aren't properly closed and locked.

Speed Settings:

The engine speed can be varied to higher or lower depending upon the operation. To do so follow the below steps:

- Ensure that there is enough fuel to handle higher speed.
- Ensure that the engine is running normally.
- Press the “Engine RPM Increase” button to speed up the engine. The engine speeds up.
- Press the “Engine RPM Decrease” button to slow the engine. The engine slows down.

Maximum engine speed is 1800 rpm. (Factory set)

WARNING

DO NOT press both the engine speed setting buttons simultaneously, it may cause engine and blower damage.

Stopping Engine:

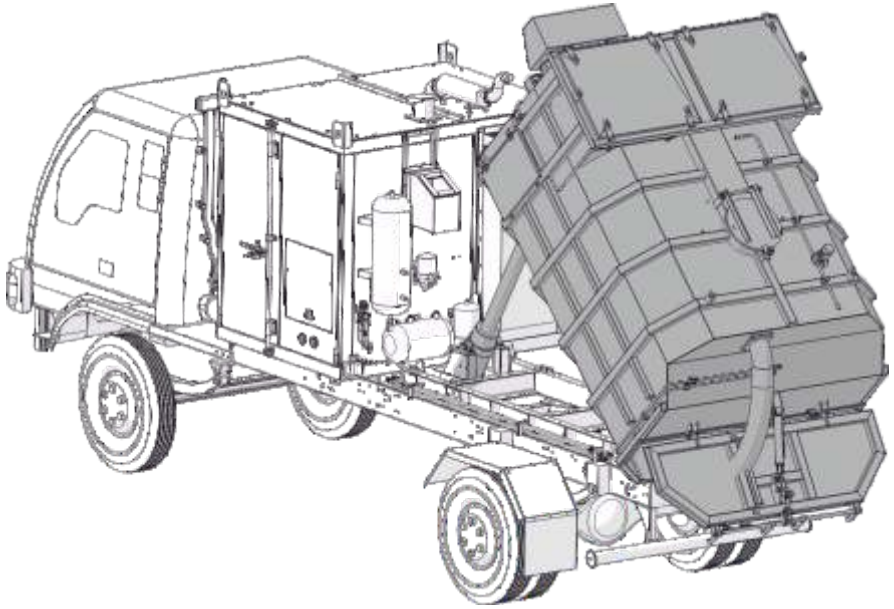
To stop the engine follow the steps below:

- Bring the engine speed to idle rpm.
- Let the engine run in idle speed for a minute.
- Press the Engine Stop button once and wait till the key warning message disappears from the screen.
- Switch Off key switch and remove key.
- Set battery cut-off switch to OFF position.
- Close the control panel cover.

WARNING

If the engine is running at a higher rpm, reduce speed to idle before stopping the engine. Do not shut down the engine at a higher speed other than an emergency situation.

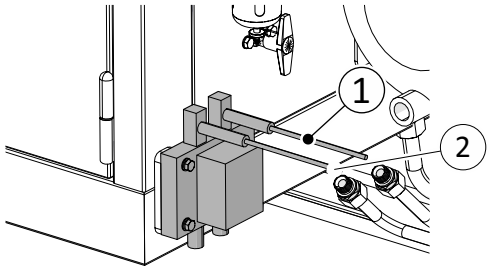
Tipping of Hopper:



The hopper's tipping function is used to dump the debris from the jobsite.

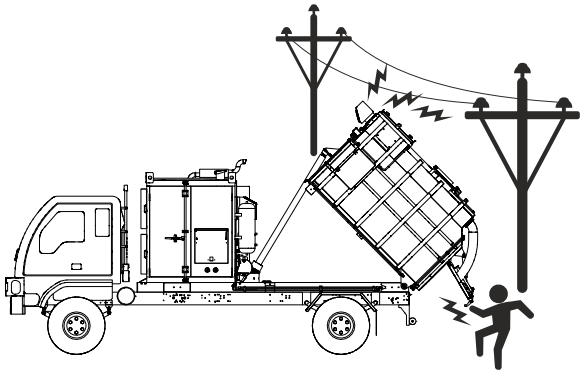
Tipping the hopper:

- Move the truck to the assigned dumping area.
- Turn off truck engine, engage parking brake and remove key.
- Open the control panel door.
- Insert the auxiliary engine ignition key into the key switch.
- Set the battery cut-off switch to ON position.
- Turn key to ON position.
- Press the "Engine Start" button till the engine starts.
- Turn the "Hopper Tilt" switch to ON position.(Engine speed is 1400 rpm)
- Operate Lever 1 to open the rear door.
- Operate Lever 2 to tip the hopper.



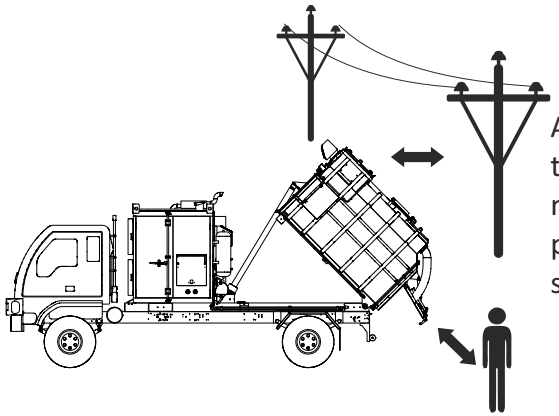
Lever 1 - Rear door Open & Close:
Push the lever up to open the rear door.
Push the lever down to close the rear door.

Lever 2 - Hopper tipping:
Push the lever up to tip the hopper.
Push the lever down to lower the hopper.

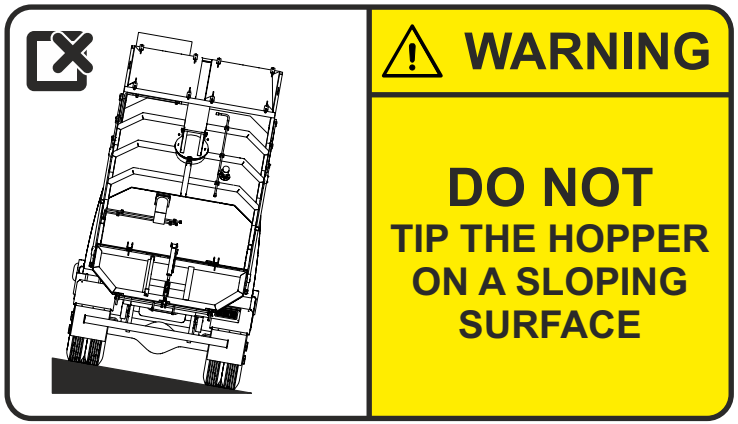


CAUTION

- ➔ **Watch out for overhead obstacles like electric power lines or overhead structures.**
- ➔ **NEVER tip the hopper when the machine is on an uneven ground.**
- ➔ **NEVER tip the hopper where the ground can cave in.**
- ➔ **NEVER tip the hopper before opening the rear door.**



Always maintain a safe distance if the hopper has to be tipped nearby overhead electrical power lines or overhead structures.



Do not tip the hopper on a sloping surface, doing so may cause the telescopic cylinder to get stressed due to the load, causing damage to it.

Lowering the hopper:

- Operate Lever 2 to lower the hopper.
- Operate Lever 1 to close the rear door.
- Turn the “Hopper Tilt Switch” to Off position.
- Press the “Engine Stop” button.
- Turn Off key switch and remove key.

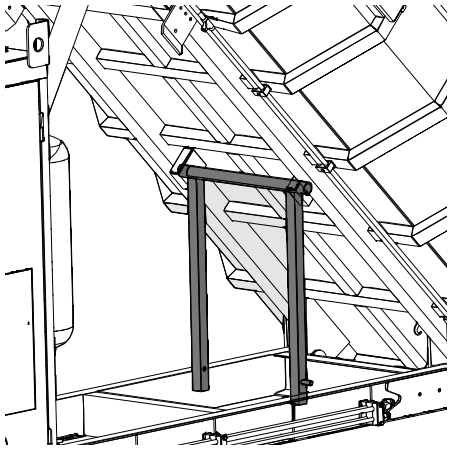
NOTE

Close the rear door only after lowering the hopper completely.

Hopper Safety Prop

Use the hopper safety prop to secure the hopper during maintenance or repair work.

- Raise the hopper upwards completely.
- Remove the safety prop from its locking position.
- Lower the hopper till the safety prop locks completely on the base frame.



WARNING

DO NOT work under the hopper without engaging the safety prop.

Machine Operation:

It is the operator's responsibility to be knowledgeable of all potential operating hazards and to take every reasonable precaution to ensure safety of oneself, others, animals, and property.

This section of the Operator's Manual is designed to familiarize, instruct, and educate safe and proper machine use to the operator. The operator must be familiar with the machine operation and all associated safety practices before operating.
Proper operation of the machine, as detailed in this manual, will help ensure years of safe and satisfactory use of the machine. ***READ, UNDERSTAND, and FOLLOW*** the safety messages. Serious injury or death may occur unless care is taken to follow the warnings and instructions stated in the safety messages. Always use good common sense to avoid hazards.

⚠ WARNING

Do not operate a damaged or malfunctioning machine. Risk of equipment failure or cause of injury or death or damage to property.

Operator Requirements:

Only qualified people are allowed to operate the machine. A qualified operator has to read and understand the owner's manual and should comply with its procedures. If any part of the operation and safe use of this equipment is not completely understood, consult an authorized dealer for a complete explanation.

If the operator cannot read the manuals for himself or does not completely understand the operation of the equipment, it is the responsibility of the supervisor to read and explain the manuals, safety practices, and operating instructions to the operator.

Employer Responsibilities:

a. Train the employee to operate the machine in a safe way.
b. Permit only qualified personnel to operate and service the machine.
c. Instruct all operators to maintain the shields and guards in its proper working condition at all times.
d. Ensure that the operators use approved Personal Protective Equipment at all times or whenever required.
e. Forbid the operators to carry additional people on the truck or the machine.
f. Ensure that nobody including the operator modifies or alters the machine or any of its function, doing so may cause fatal injury or death or it may damage the machine itself.
g. Ensure that the operator follows the state/country traffic rules at all times.
h. Ensure that children do not operate the machine.

Before Starting the Machine:

Before operating the machine, ensure that the equipment is working properly and that you are prepared for vacuuming operations by checking the Pre-operative checklist and testing the machine operations.

Pre-Operative Checklist:

For the machine:

- Visually inspect the machine for general condition.
- Check the engine's oil level.
- Check the engine's radiator coolant level.
- Check the hydraulic tank fluid level and fill as needed.
- Inspect the hydraulic system for leaks and faulty lines.
- Check if all moving parts are well lubricated.
- Check if all the doors and hatches are sealed tightly.
- Check the blower belts for cracks and sag.
- Check the pneumatic system.
- Check if proper greasing is done.
- Check if the filters are clean.
- Check for any oil, fuel or coolant leaks.
- Check the fuel level.

For the truck:

- Inspect the rims and wheel nuts.
- Check the tires for wear, damage, and pressure.
- Inspect/check the braking system.
- Inspect/check the steering system.
- Inspect the suspension system.
- Inspect the exhaust system.
- Check the fuel level.
- Check the truck's engine oil and radiator fluid levels.
- Inspect the engine air filters.
- Check the transmission fluid level.
- Check the battery and terminals.
- Inspect all engine drive belts for wear.
- Check the windshield washer fluid level.
- Check operation of all lights and beacons.
- Adjust the mirrors of the truck.
- Verify that all emergency equipments are present and are working.

Jobsite:

- Visually inspect the jobsite before starting the vacuum operation.
- Ensure that the operator is aware of the type of material to be collected.
- Ensure there is solid ground to stand during vacuum operation.
- Also ensure that the operator is aware of any underground pipelines, cables, etc that might be sucked during vacuuming.
- Ensure that there are no flammable materials in the vicinity of the machine during the vacuuming operation.

Start-Up Test:

By identifying any problems before traveling to the work site, you'll save unnecessary travel time and will be able to make repairs more easily with the proper tools.

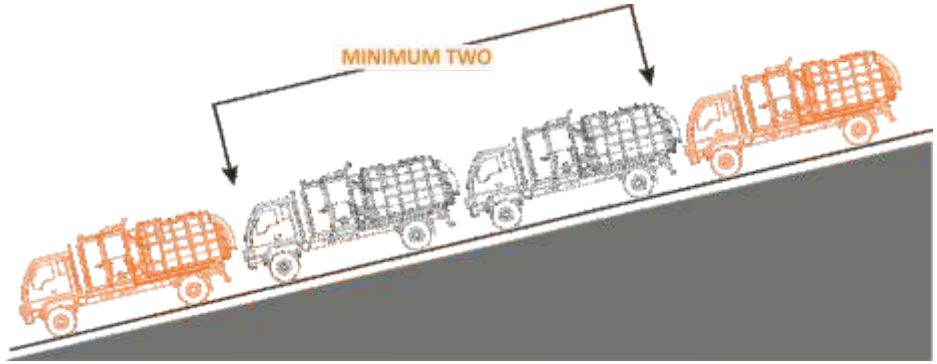
WARNING

Never operate the machine in a closed building or without adequate ventilation. The exhaust fumes can be hazardous to your health.

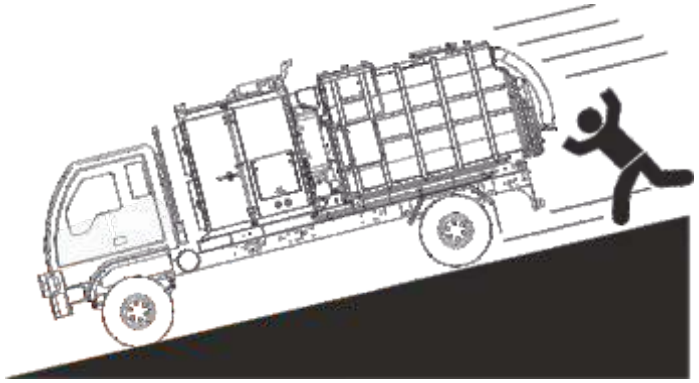
Driving in/around jobsite:

Always follow the rules and regulations of the jobsite while driving the machine.
While traveling the jobsite road, always maintain a safe speed for the haul road conditions and grades. Never allow the machine to move or coast with the transmission in 'NEUTRAL'.
Pay attention to jobsite road conditions to avoid rocks, holes, or other obstacles. Such obstacles not only present hazards to safe operation, but can needlessly damage tyres and suspensions if not avoided.

Always maintain a safe distance behind the machine ahead, particularly on downgrades. A good rule-of-thumb to follow is to allow two (2) truck-lengths between machines for each 15 km/h of travel speed under normal operating conditions. Under adverse conditions, allow more room for safe operation. On jobs in which minimum distance between machines is specified for the jobsite road, be sure to observe the regulations at all times. Such regulations would be established for the safety of everyone on the job.



When approaching downgrades, select the proper transmission range and use the brakes as required to maintain safe descent speed without over-speeding the engine or gaining excess travel speed.



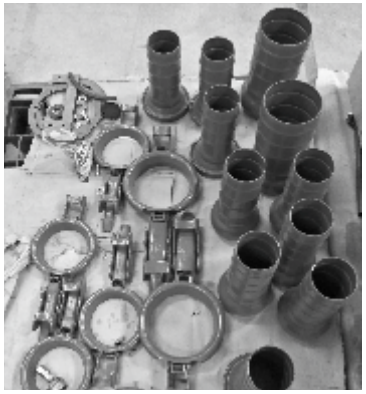
DO NOT leave the truck on a slope or a flat ground without engaging the parking brake.
RISK OF A RUNAWAY MACHINE!

Attaching the Suction Hose

Suction Hose

The machine is equipped with 5m (4 nos) robust suction hose which helps in the collection of material.
The hose has quick fixing couplers which help the operator to easily attach and detach the hose at the jobsite.

The suction nozzle located at one end of the hose is used to collect the material. It has a handle to facilitate easy manoeuverability at the jobsite.



A variety of couplers and nozzles are available to order, to suite your job.

Air Gun

An air gun is provided along with the pneumatic system to support the operator in cleaning the filter after the tipping process is complete or to clean before maintenance/service of the machine.

NOTE

Clean all the filters regularly with pressurized dry air for improved life.
Do not use beyond 7 bar of pressure.

Vacuuming Procedure:

Controls:

Before starting the machine ensure that all switches are in ***OFF*** position.

Engine:

- Always check the engine's oil and coolant level before its first startup of the day.
- Look at the control panel to make certain that all switches are turned off.
- The engine is equipped with a safety shutdown system that will automatically shut off in the event of high coolant temperature or low oil pressure.
- Let the engine run for several minutes (until it warms up) before operating the machine.

⚠ *CAUTION*

During engine start-up, blower also rotates. Ensure that there are no objects placed on top of the blower.

LCD Screen:

- Check the LCD screen for any faults or error messages.

Driving the machine:

- Drive the machine to the jobsite within the set speed limits.
- Do not drive at a high speed when the hopper is full with material.
- Do not drive with the hopper in raised position.

Vacuuming:

Use safety equipment as necessary.

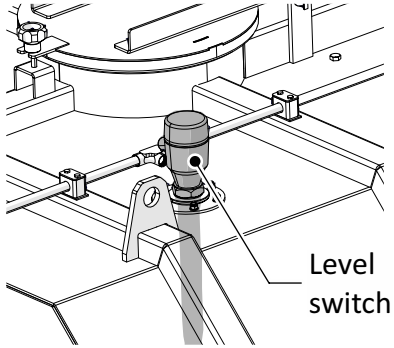
- Park the machine as close as possible to the material to be collected, this is to obtain maximum suction performance by keeping the hose length to its minimum.
- Ensure that the required end accessories are fitted, also check for a tight fit.
- Start the engine of the machine by pressing the "Engine Start" button on the control panel, upon starting the blower also rotates.
- Increase the engine speed by pressing the "Engine RPM Increase" button to increase the suction capacity.
- To lower the suction capacity press the "Engine RPM Decrease"button.
- Use these buttons depending upon the material density and quantity to be collected.

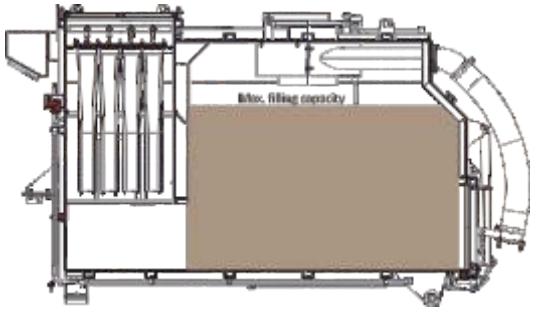
KEEP HANDS AWAY FROM THE SUCTION INLET WHEN THE MACHINE IS RUNNING.

Materials that can be collected:

1. MSand
2. Cement
3. Flyash
4. Sand
5. Clinkers
6. Stones upto 20 mm

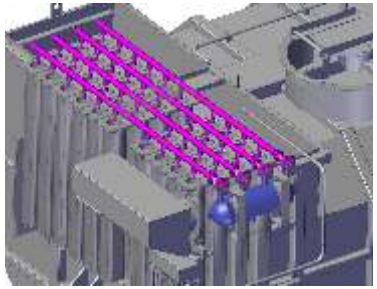
The hopper is equipped with a safety level switch that alerts the operator via a alarm in the control panel when the hopper is filled to its maximum capacity.
Upon activation of the alarm the engine speed drops to the set idle speed to prevent the machine from vacuuming further. Upon this alert the operator must stop all vacuuming operations.





DO NOT VACUUM ANY LIQUIDS OR SLUSHY MATERIAL. DOING SO MAY DAMAGE THE FILTERS.

➔ **DO NOT VACUUM DURING RAINS**
➔ **DO NOT VACUUM WET MATERIAL**



The hopper is equipped with an automatic purging system. A blast of air at a preset time cleans the bag filters to ensure that the vacuumed material does not escape into the atmosphere. The purging system's frequency can be adjusted by the operator depending upon the material being vacuumed.

NOTE

Upon start up, ensure that a vacuum pressure of 4 bar is achieved.
Upon starting the engine wait for 5 minutes before operating the machine. This is to ensure that the air tank is filled and ready to use.

WARNING

The machine will shutdown when the vacuum pressure reaches the set limit to protect the machine from any possible failure and to prevent engine overheating.

End of Vacuuming:

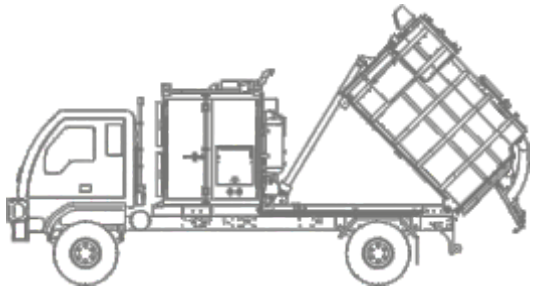
- Decrease the engine speed by pressing the “Engine RPM Decrease” button.
- Let the engine run in idle for a minute.
- Press the “Engine Stop” button to shut down the engine.
- Switch off key switch and remove key.
- Switch off battery cut-off switch.
- Close the control panel cover.
- Drive truck to dumping area.
- Empty the hopper completely.

WARNING

- ***Do not use the Emergency Stop Button to shut down the engine, unless it is an emergency. Doing so may cause damage to the engine.***
- ***Do not store collected material in the hopper for a longer period of time.***

Dumping:

The dumping operation is the normal practice of the operator to empty the contents of the hopper at an appropriate location, which is usually done when the hopper is full.
The system alerts the operator when the hopper has reached its maximum capacity by flashing the “hopper full ” icon on the display screen.



Dumping procedure:

- Park the truck on flat level ground.
- Switch off truck engine, remove key and engage parking brake.
- Open the control panel access door.
- Start the machine engine.
- Switch On the hopper tilt switch.
- Operate hopper rear door lever to open the rear door.
- Operate hopper tilt lever to tip the hopper, hold the lever until the hopper tips upwards completely.
- Hold the hopper in this position until the material is completely emptied.
- Switch Off the hopper tilt switch.
- Lower the hopper completely.
- Close the rear door.
- Switch off machine by pressing Engine Stop Button, remove key and close the control panel door.
- Move truck to proceed to the jobsite.

WARNING

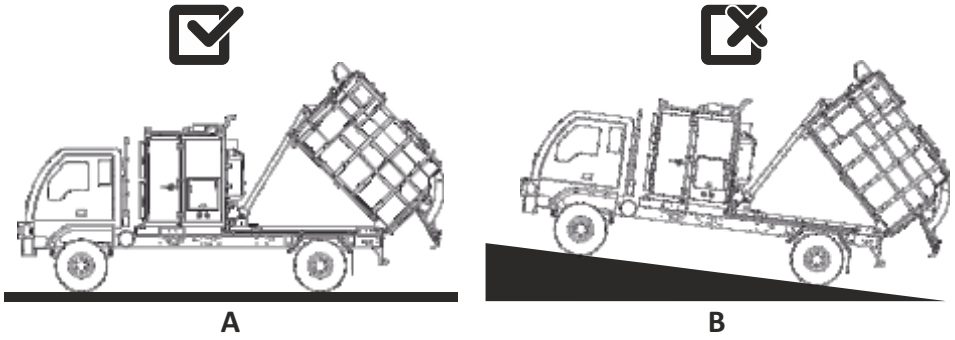
Rearward visibility may be limited due to the large size of the machine, use a ‘SPOTTER’ to help back the machine at the dumping site. While backing to position, the operator must watch the 'SPOTTER' at all times and follow his direction. Under no circumstances should the operator leave his seat to gain better visibility while backing. Always remain seated to maintain maximum machine control.

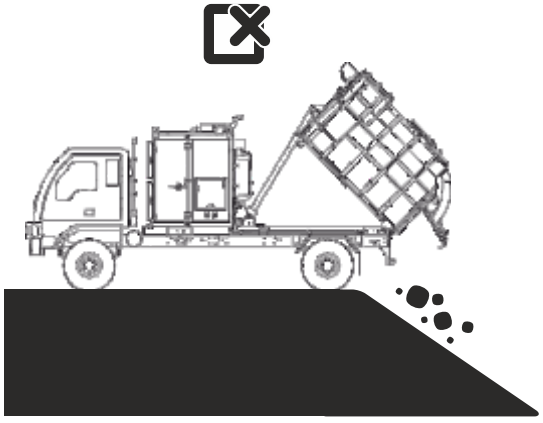
Before raising the hopper, make sure the rear wheels are on firm level ground. If one wheel is higher than the other, a twisting strain is imposed upon the mounting hinge pins, cylinder and chassis.

WARNING

<u>NEVER 'JUMP DUMP'</u> the machine by bouncing the rear tyres against a stop block, or otherwise <u>'JARRING'</u> the body in its raised position to dislodge stuck or frozen material. The tremendous loads that this practice develops on the body pin area, chassis and hydraulic system can cause needless, extensive stresses.

DO NOT drive the machine with the hopper up. Apart from affecting the stability of the truck, there can be severe danger from contacting overhead electric cables, trees, or bridges over the jobsite route.





A: Always tip the hopper on a flat level ground.
B: Do Not tip the hopper on a slope or on an incline.
C: Do Not tip the hopper over a ledge or where the ground can cave in due to the machine's weight.

- **When operating the machine in low lit areas or in dark ensure sufficient lighting is provided.**
- DO NOT park the machine with the material retained within the hopper. This may cause unnecessary wear on the hopper mounting pins and the truck tires.

Emergency Equipment:

When operating the machine, you should carry along the following emergency equipments, as well as hand tools to aid in removal of material. The following is a suggested list which can be adapted to suit your specific needs:


Shovel


Toolkit


Flashlight


Fire Extinguisher


First Aid Kit

Cleaning the Machine

Clean the machine at the end of the day. This will ensure that the machine will have a trouble free performance for years and an extended machine life.

The exteriors of the machine can be pressure washed.

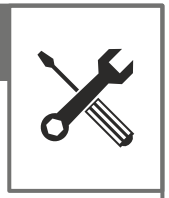
DO NOT CLEAN THE INTERIOR OF THE HOPPER USING WATER OR CHEMICALS.

DO NOT CLEAN THE FILTER OR FILTER CHAMBERS USING WATER OR CHEMICALS.

CAUTION

RISK OF SUFFOCATION: Always ensure that nobody is inside the hopper before closing the door. There is risk of death due to suffocation.

MAINTENANCE



General Maintenance

This section describes the maintenance of the machine under the following sections:

- Engine & blower room access doors
- Hopper inspection panels
- Filter chamber access panels
- Suction port hatch
- Working on top of the hopper
- Cleaning/Replacement of suction cartridge filters
- Replacement of filter bags
- Replacement of seals
- Maintenance of tipping cylinders
- Maintenance of drive belts
- Maintenance of diesel engine
- Maintenance of blower
- Maintenance of truck
- Lubrication
- Hydraulic system
- Pneumatic system
- Electrical system

⚠ *WARNING*

- ➔ ***Maintenance and/or repair operations must be done by skilled and authorized personnel; all operations on the electrical and pneumatic devices are to be performed by specialized personnel only.***
- ➔ ***Read this manual thoroughly before performing any repair or maintenance operations.***
- ➔ ***For repair and/or maintenance of high reach areas of the machine, use a suitable work lift or working platforms.***
- ➔ ***Use genuine Roots spare parts ONLY which are specifically designed for the machine.***
- ➔ ***USE suitable PPE at all times when working or servicing the machine.***

⚠ *IMPORTANT!*

- ➔ ***ALWAYS SWITCH OFF ENGINE AND REMOVE KEY BEFORE PERFORMING ANY MAINTENANCE OR REPAIR WORK.***
- ➔ ***ENSURE THAT THE BATTERY CUT-OFF SWITCH IS IN OFF POSITION.***

SAFETY PRECAUTIONS

Do not allow unauthorized personnel to service or maintain this machine. Study the Operator's Manual and Maintenance Manual before starting, operating or servicing this machine. Always follow procedures and safety precautions detailed in the Maintenance Manual.

Always attach a 'DO NOT START' or similar warning sign to ignition switch or a control before cleaning, lubricating or servicing the machine.

Never allow anyone to work on the machine while it is moving. Make sure no one is on the machine before working on it.

Do not work under or near unblocked or unsupported hopper. Always use the hopper safety prop.

Do not work under or near any unblocked or unsupported linkage, part or truck.

Always relieve pressure before servicing any pressurized system.

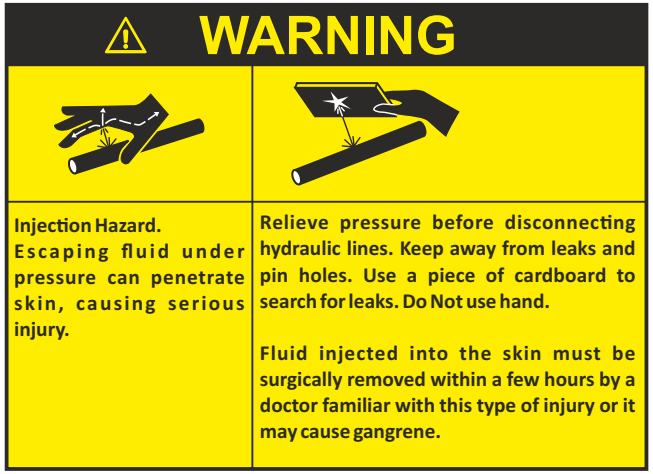
When changing oil in the engine, transmission and hydraulic systems, or removing hydraulic lines, remember that the oil may be hot and can cause burns to unprotected skin.

When working on or around exhaust components, remember that the components may be hot and can cause burns to unprotected skin.

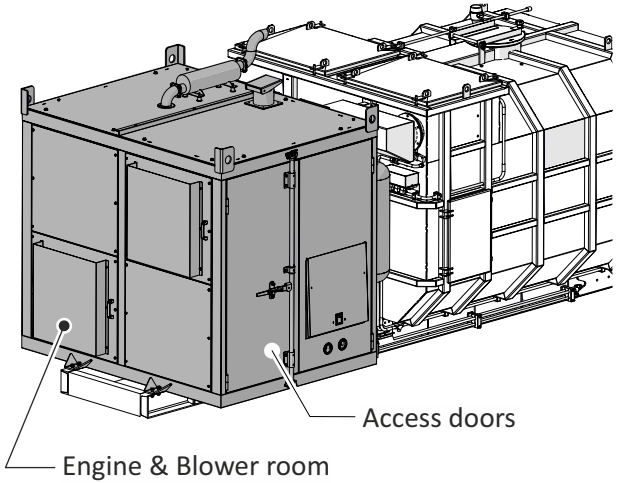
Always deflate tyre before attempting to remove any embedded objects or removing the tyre and rim assembly from the truck.

WARNING

Escaping fluids under pressure can penetrate skin.
When working around battery area, keep all flames and sparks away from batteries.



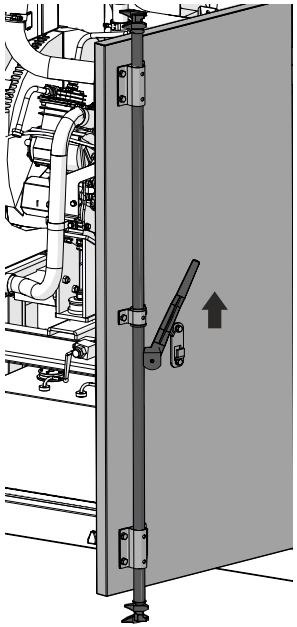
Engine & Blower Room Access Doors:



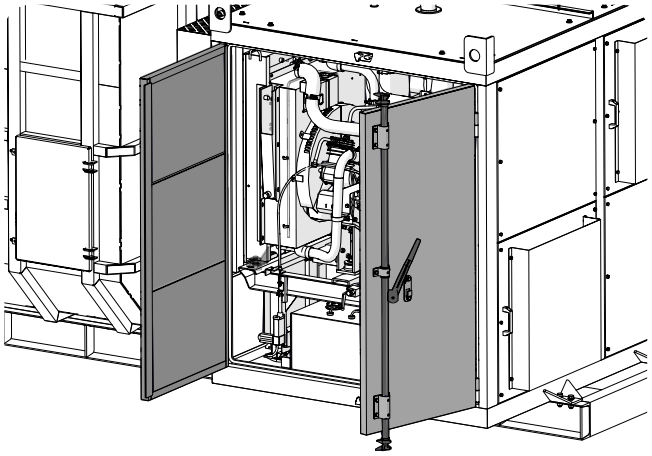
The engine room houses the diesel engine and the blower. It is accessible via doors on either sides which are also sound proof.

To access the engine side doors follow the below steps:

- Park the truck on a flat level ground.
- Engage parking brake of the truck. If required additional wheel blocks can be used.
- Switch off the truck engine and remove key.
- Open the access door on the right side of the machine.



Lift the lock lever upwards and rotate anti-clockwise to release the latch from its locking groove and pull it towards you. Now the access door is open.



Engine side access door open

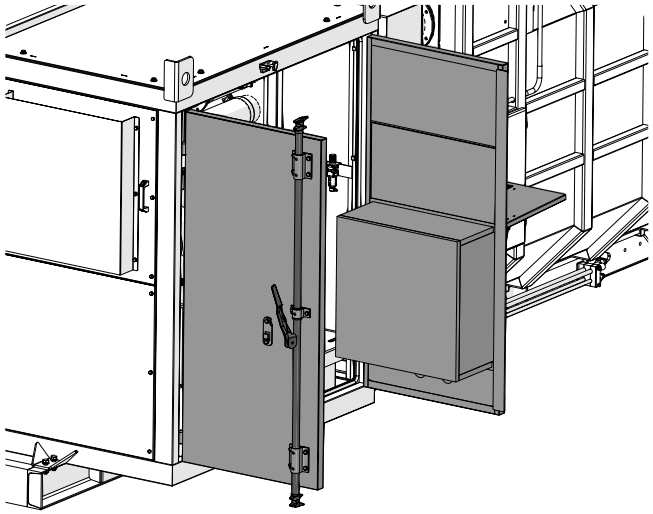
Always be careful while opening the doors.
Risk of fingers getting caught in between the door and cabin.

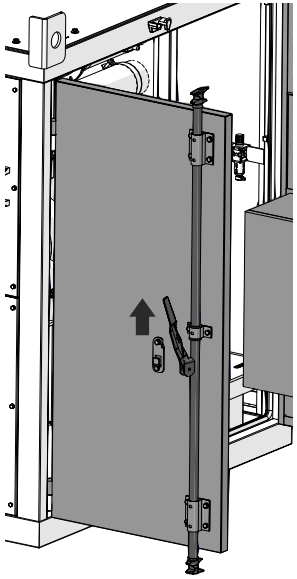
- The following symbol illuminates in the LCD screen to warn the operator that the access door is open.

NOTE:
When any of the doors are opened when the machine is running, the limit switch for safety is activated and the engine stops.

To access the blower side doors follow the below steps:

- Park the truck on a flat level ground.
- Engage parking brake of the truck. If required additional wheel blocks can be used.
- Switch off the truck engine and remove key.
- Open the access door on the left side of the machine.





Lift the lock lever upwards and rotate anti-clockwise to release the latch from its locking groove and pull it towards you. Now the access door is open.

WARNING

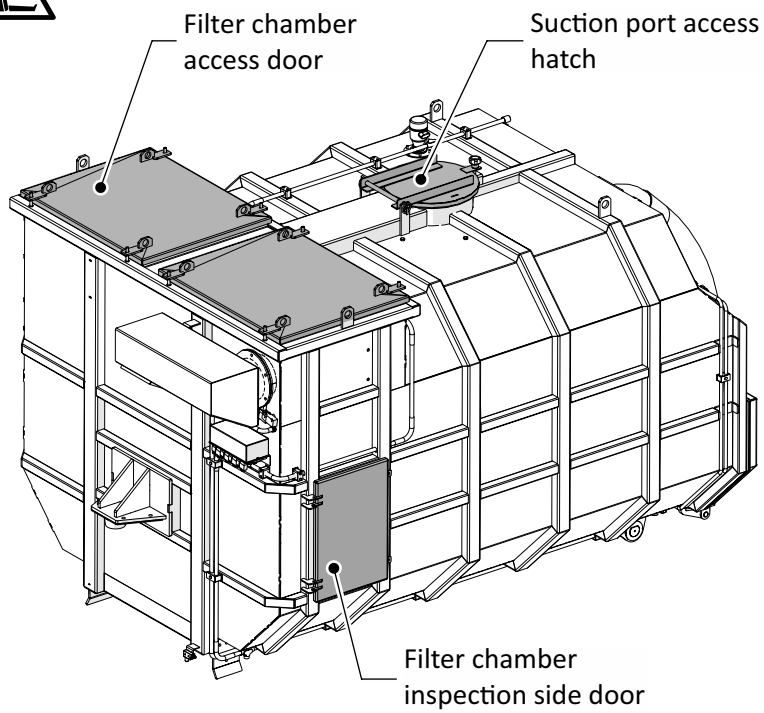
Always be careful while opening the doors.
Risk of fingers getting caught in between the door and cabin.

- The following symbol illuminates in the LCD screen to warn the operator that the access door is open.

CAUTION

RISK OF ENTRAPMENT: Always ensure that nobody is inside the engine room before closing the doors. Risk of death due to suffocation and heat.

Hopper Inspection Doors:



Filter Chamber Inspection Side Door:

The filter chamber inspection side doors are used to check for any block in the filter chamber. These are located on either side of the hopper.

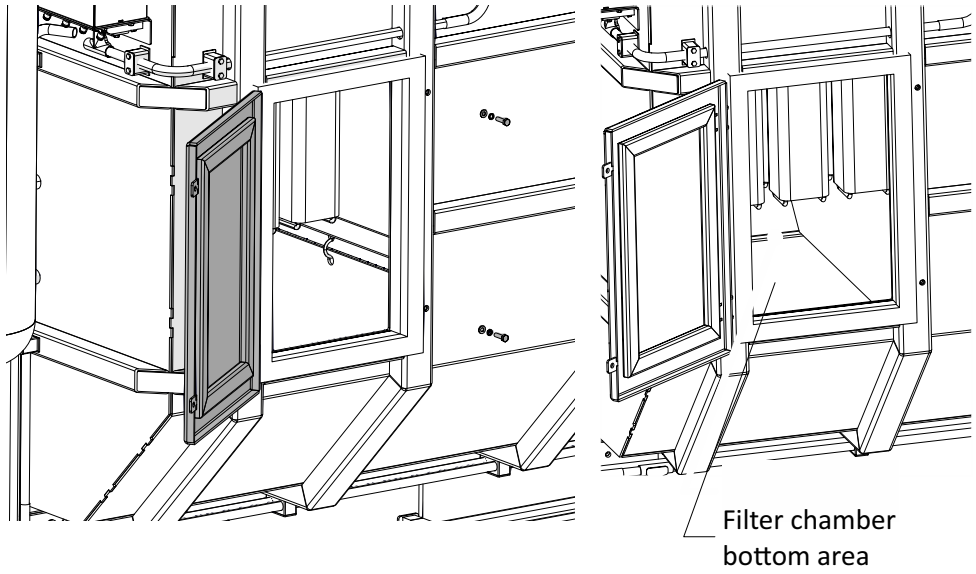
To open these doors follow the steps below:

- Ensure that the auxiliary engine is switched off.
- Remove the screw (2 nos) using spanner.
- Open the door outwards.

To close these doors follow the steps below:

- Close the door.
- Fasten the screw (2 nos) tightly using a spanner.
- **Ensure that there is no vacuum leak after the doors are closed.**

Warning: Ensure that the screws are fastened tightly. Failure to do so may cause equipment damage or cause harm/death to the operator due to flying debris.

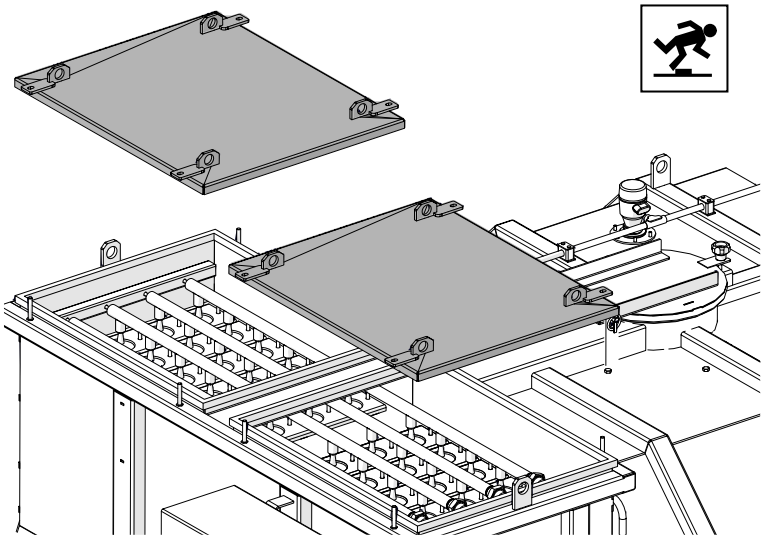


CAUTION

RISK OF ENTRAPMENT: Always ensure that nobody is inside the hopper before closing the access panels. Risk of death due to suffocation and heat.

Filter Chamber Access Doors:

These access doors are used to check for any block in the filter bags, and also to remove the filter bags. These doors are located on top of the hopper.



To open these doors follow the steps below:

- Remove the screw (8 nos) using spanner.
- Lift the doors upwards.

WARNING

Use appropriate lifting equipments to remove the panels, they are built heavy to withstand the vacuum pressure.

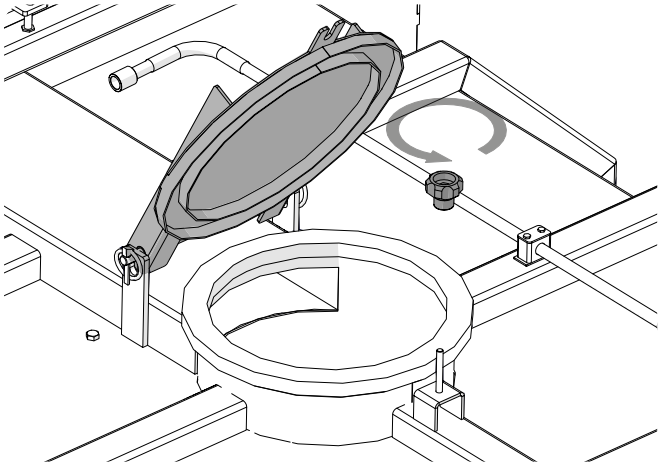
WARNING
Heavy Object.
Can cause muscle strain or back injury.
Use lifting aids and proper lifting techniques when lifting and moving.

To close these doors follow the steps below:

- Close the door.
- Fasten the screw (8 nos) tightly using a spanner.
- **Ensure that there is no vacuum leak after the doors are closed.**

Suction Port Access Hatch:

This circular hatch is used to inspect or clear any debris stuck in the air duct of the hopper which leads to the filter chamber.



To open the hatch follow the steps below:

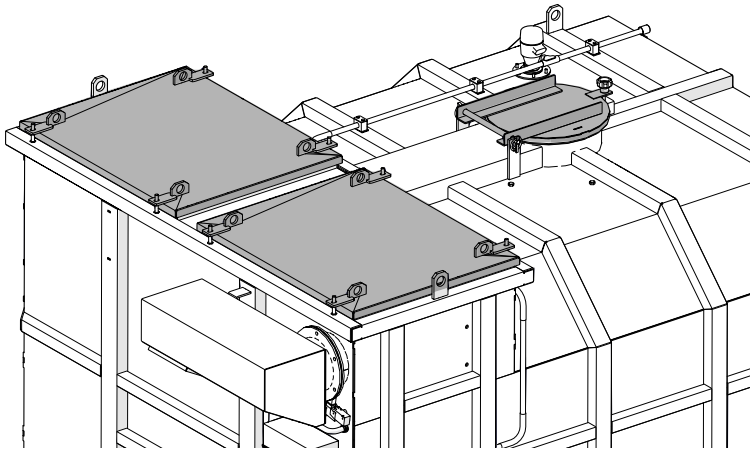
- Unscrew the circular knob by rotating it anti-clockwise.
- Open the hatch.

To close the hatch follow the steps below:

- Lower the hatch.
- Secure the hatch using the knob by rotating it clockwise.
- **Ensure that there is no vacuum leak after the doors are closed.**

Warning: Ensure that the hatch is closed properly. Failure to do so may cause equipment damage or cause harm/death to the operator due to flying debris.

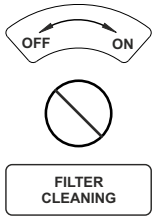
Working on Top of the Hopper:



CAUTION: TRIP HAZARD

Use extreme care while working on top of the hopper, Risk of tripping/slipping, may cause injury.

Filter Bag Cleaning

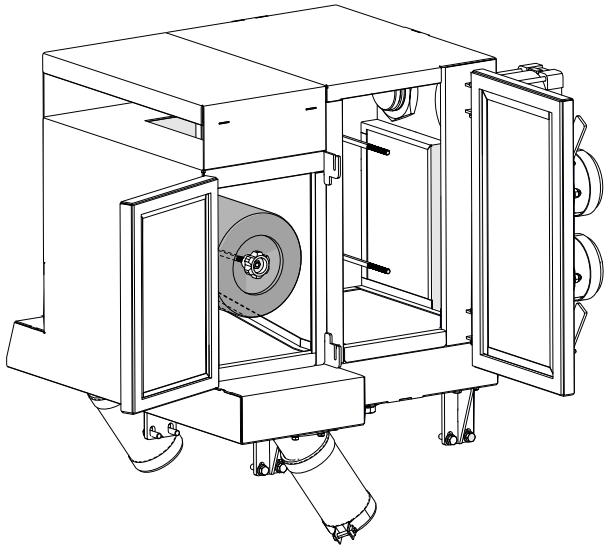


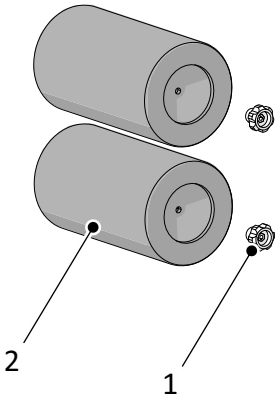
This switch is used to control the filter purging system.
Switch position Off - Purging system is completely Off.
Switch position On - Purging system is activated.

A pneumatic system is used for the filter purging system. It has a timer to vary the frequency of the purging. It requires minimum 3 bar of pressure to operate.

Cleaning/Replacement of Secondary Filters

- Open the filter box door by moving the locking lever upwards.
- Unscrew the knob (1) by turning it anti-clockwise.
- Pull the cartridge filter (2).
- Blow pressurized air to clean it or replace with new one.
- Place the filter back and secure using the knob.
- Ensure the correct seating of the filters.
- **Clean the filters daily.**



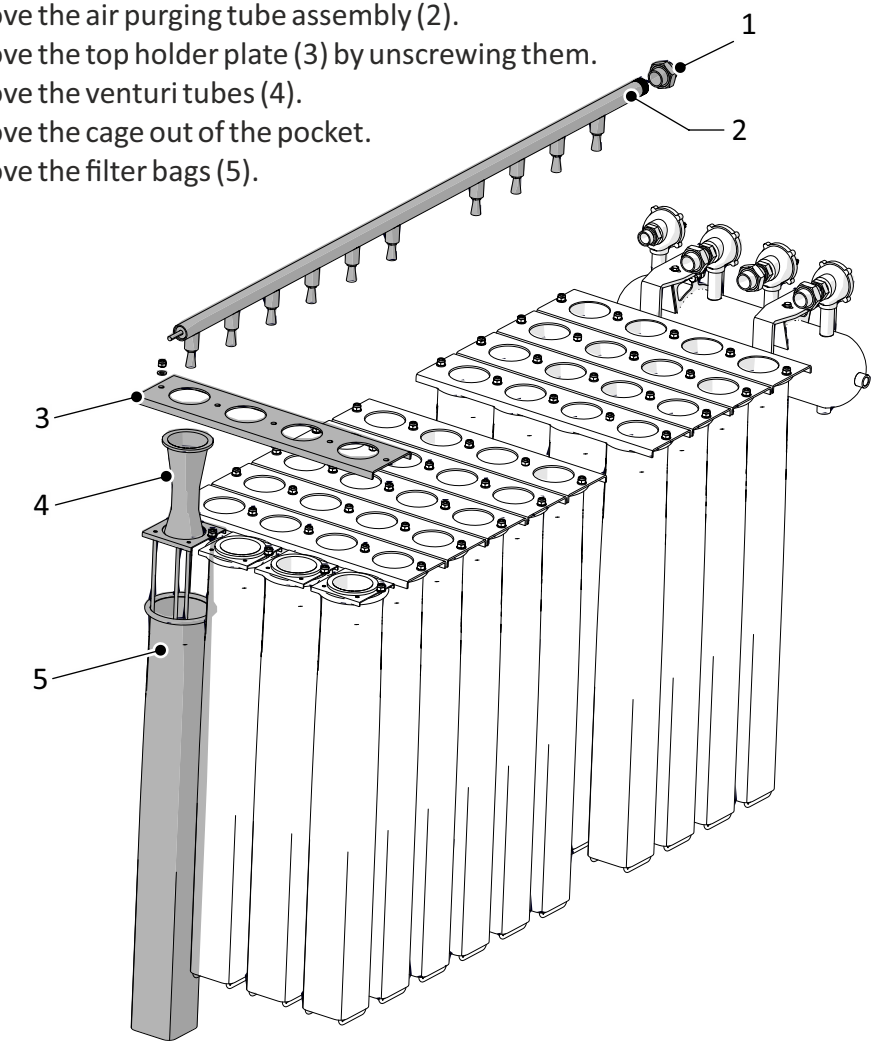


DANGER
Inhalation hazard.
Do not breath in dust particles.

WARNING: Do not throw the used filters in the garbage.

Replacement of Filter Bags

- Remove the filter chamber access doors.
- Remove the union connecting the pipe (1).
- Remove the air purging tube assembly (2).
- Remove the top holder plate (3) by unscrewing them.
- Remove the venturi tubes (4).
- Remove the cage out of the pocket.
- Remove the filter bags (5).



Clean filter bag area chamber.
Check condition of filter bag frame and seals. If found damaged or broken, replace with a new one.
The filter bags can be washed using normal water. Do not overturn the filter bags.
Install the filter bag in the machine only after it is completely dry.
Also check the condition of the seals, if damaged replace with new one.
Check the filter bag to be free from holes.

⚠ DANGER
Inhalation hazard.
Do not breath in dust particles.

Replacement of Seals

Seals are located on the door of the hopper, check them for wear, if damage replace them.

WARNING: Do not throw used seals in the garbage.

Maintenance of Drive Belts

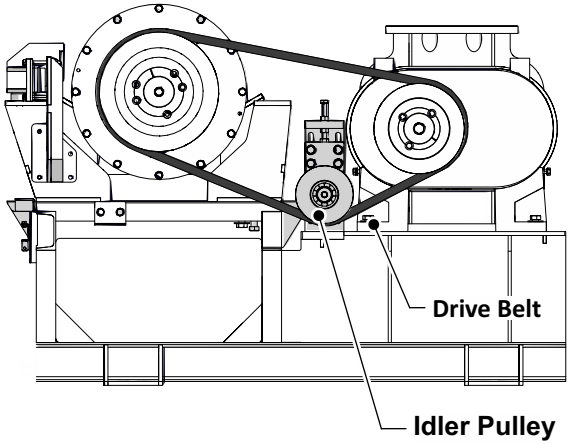
To access the drive belts remove the engine room front panel covers by unscrewing the screws.

To adjust the belt tension:

- To tension the belt, the idler pulley must be adjusted.
- Loosen the lock nut, loosen/tighten the screw till the belt is set to the required tension of **928 N**.
- Tighten the lock nut.

To replace the drive belt:

- Loosen the lock nut.
- Move the idler pulley upwards till the belt is loose.
- Remove the belt from the pulleys.
- Replace a new belt, adjust the idler pulley till the required tension of **928 N** is set.
- Tighten the lock nut.



WARNING: Do not throw used belt in the garbage.

Maintenance of Auxiliary Diesel Engine

For information regarding the maintenance of the auxiliary diesel engine, kindly refer the engine manufacturer's manual supplied with the machine.

Maintenance of Blower

For information regarding the maintenance of the blower, kindly refer the blower manufacturer's manual supplied with the machine.

Maintenance of Truck

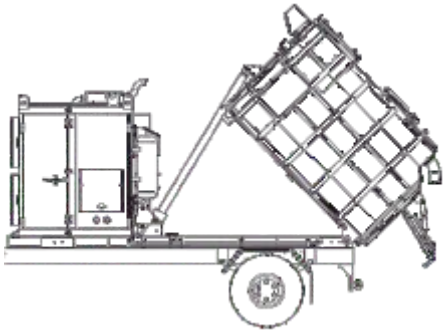
For information regarding the maintenance of the truck, kindly refer the truck manufacturer's manual supplied with the machine.

Lubrication

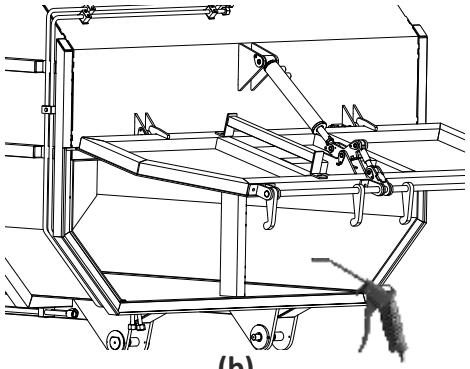
What	Grade	Qty
Engine oil	Gulf 20W40	11 litres
Coolant oil		21 litres (after mixing)
Blower oil	PD AEON	Gear side - 3.50 litres & Drive side - 1.60 litres
Hydraulic oil	Servo 46	40 litres
Grease	AP3 grade	As required

Cleaning the Hopper

Park the machine on a flat ground.
Open the rear door. (a)
Tip the hopper upwards, a little more than half. (a)
Use the air gun (b) provided with the machine to clean the insides of the hopper.
Start from the top surface and move down towards the bottom of the hopper.



(a)



(b)

WARNING: Do not use water or other fluids to clean the inside of the hopper.

WARNING: Do not use a crowbar or other sharp metallic objects to remove stuck materials.

Cleaning the Filter Chamber

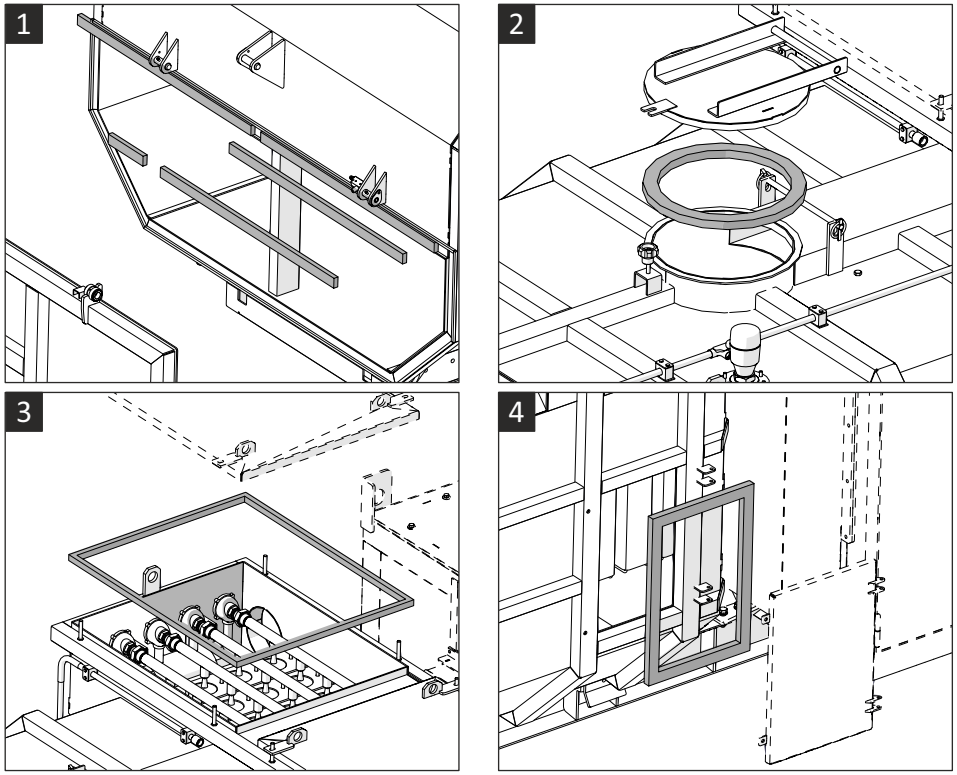
Park the machine on a flat ground.
Open the filter chamber access door.
Use the air gun provided with the machine to clean the insides of the chamber.
Tip the hopper to discard any dust.

WARNING: Do not use water or other fluids to clean the inside of the filter chamber.

WARNING: Do not use a crowbar or other sharp metallic objects to remove stuck materials.

Sealing Foams

The machine uses sealing foams to ensure the vacuum chamber is properly sealed. This in due course of use gets worn out.
Check the foams for wear or damage/cracks. Replace with a new one immediately.



1. Rear door foam
2. Suction port hatch foam
3. Filter chamber access door foam
4. Filter chamber side door foam

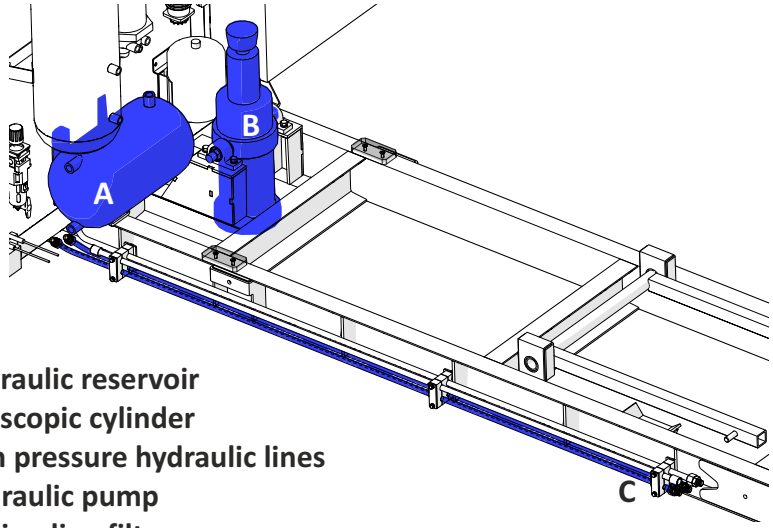
WARNING: Do not throw the used foams in the garbage.

Hydraulic System

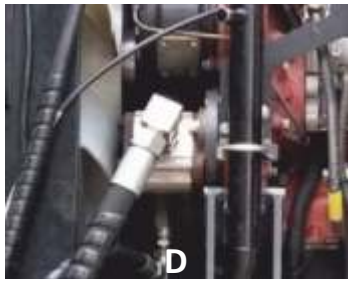
The machine is equipped with a hydraulic system which powers the tipping cylinders and the rear door functions of the machine.
The system comprises of a hydraulic tank located near the engine room and a hydraulic pump powered by the machine's auxiliary engine.
This system has to be checked periodically for optimum performance.

WARNING

DO NOT service the hydraulic system in the open environment, There is risk of contaminating the environment. Always work in an approved maintenance/service bay.

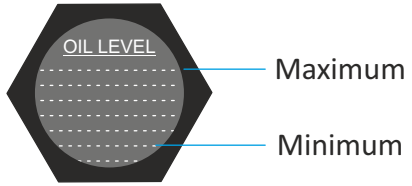


A - Hydraulic reservoir
B - Telescopic cylinder
C - High pressure hydraulic lines
D - Hydraulic pump
E - Suction line filter



Areas to inspect in the system:

1. Hydraulic Oil Level:
The hydraulic oil level in the tank must be checked periodically to ensure that there is sufficient amount of oil in the tank for the machine to perform as intended.



The oil level in the tank should not drop below the Minimum mark, doing so may cause the hydraulic system to fail and may cause severe hydraulic system damage or may damage the machine.

If hydraulic oil level is found low, top up the tank with SERVO 46 grade oil. Capacity of the reservoir is 34 liters. Do not fill beyond the specified limit. It may overflow during operation, causing damage to the environment.

Caution: Do not spill oil into the environment while refilling. There is risk of contaminating the environment.

2. Hydraulic Fittings & Hoses:

The hydraulic system uses various types of end connectors and hoses which have to be checked for tightness and leaks on daily basis.

To check the system, first start the auxiliary engine of the machine and set the speed to idle. Operate the hydraulic functions one by one to inspect for any leaks or damage.

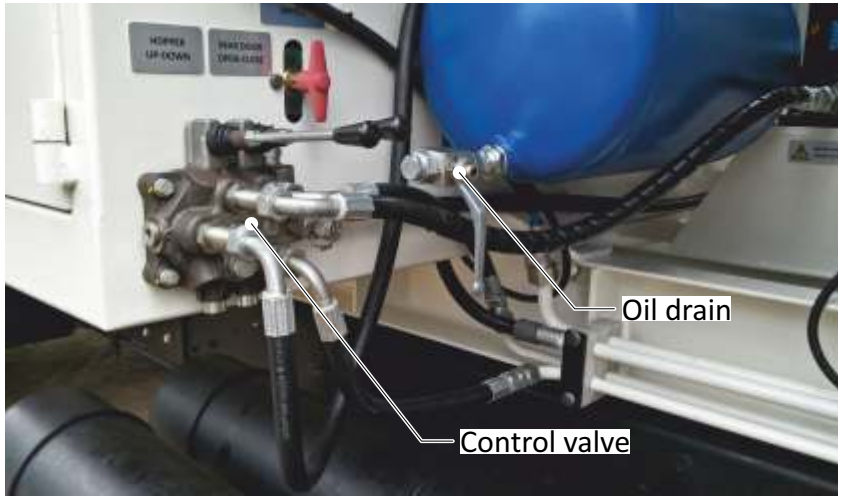
If any component has a leak or is damaged, inspect for the cause, repair or replace.

Do Not overtighten any component to arrest the leak, it may cause unnecessary pressure on the component causing it to crack and fail.

When checking the hydraulic system for leaks do not use hand to identify for pin hole leaks, use a cardboard.

3. Control Valve & Oil Drain:

The hydraulic functions are controlled by a control valve located near the reservoir, the control valve has to be checked for leaks and proper function.



To check the system, first start the auxiliary engine of the machine and set the speed to idle. Operate the control levers upwards and downwards one by one to inspect for any leaks or damage.

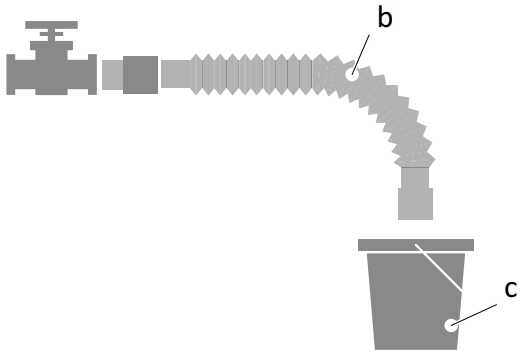
If any component has a leak or is damaged, inspect for the cause, repair or replace.

Do Not overtighten any component to arrest the leak, it may cause unnecessary pressure on the component causing it to crack and fail.

When checking the hydraulic system for leaks do not use hand to identify for pin hole leaks, use a cardboard.

3. Oil Drain:

The hydraulic reservoir has a drain function to empty the old oil during maintenance or repair.



Draining procedure:

1. Remove the dummy (a) from the valve.
2. Attach a hose to the valve (b).
3. Place a oil collecting bucket at the other end of the hose (c).
4. Turn the lever (d) upwards to drain the oil out of the reservoir.
5. After draining the oil completely close the valve by pushing the lever downwards completely.
6. Close the dummy.

Caution: Do not spill oil into the environment while refilling, There is risk of contaminating the environment.

4. Suction Line Filter:

The hydraulic system uses a suction line filter to prevent any contamination entering the system which may cause damage. The filter has to be replaced in its specified service interval.

Before removing or replacing the filter ensure that the auxiliary engine is switched off and the key is removed. Drain the oil before removing the filter.

To remove the filter turn the filter cartridge anti-clockwise with special tool till it is released from its holder. Clean the holder and install a new filter of the same type. Ensure that the filter is tightened completely with hand to prevent any leak.

CAUTION:

Do not overtighten the filter .

Do not install used or damaged filters.

WARNING

DO NOT dispose the used filter into the environment, There is risk of contaminating the environment.

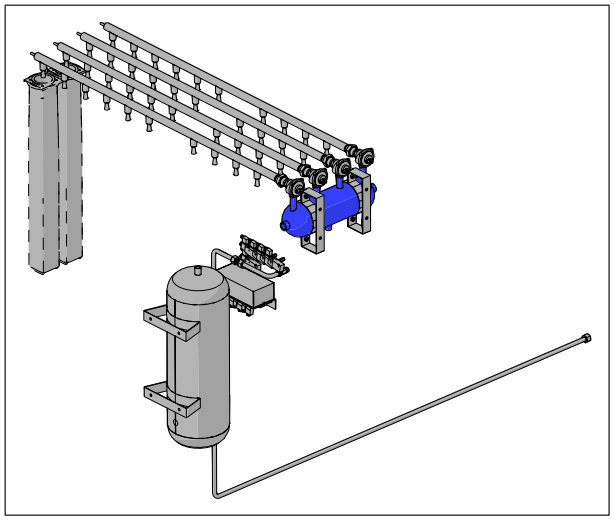
DO NOT dispose the used filter in regular garbage, use appropriate methods.

Maintenance of Tipping Cylinder

Use only quality oils for the hydraulic system, oil density suggested:
- ISO 32 for temperature from 0 °C to +25 °C
- ISO 46 for temperature from 0 °C to +46 °C
- ISO 68 for temperature from -10 °C to +38 °C

Never use oils with additives.
Do not use contaminated oil.
Do not mix different types of oils.
Grease the tipping cylinder mounts every week.

Pneumatic System



The pneumatic system is used for purging the primary bag filters on the machine.

Safety practices to be adhered while servicing the pneumatic system:

- ➔ Flying particles and debris – can result in eye injuries, cuts/scrapes or other significant injuries to almost any body part;
- ➔ High pressure air – can result in air injection into the body leading to potential injuries such as air embolism, ruptured ear drums or organs, and dislodged eye balls;
- ➔ High noise – can result in temporary or permanent hearing loss.
- ➔ Wear appropriate personal protective equipment (PPE) when using pneumatic tools and equipment, such as hearing protection and safety glasses with side shields or goggles. Additional PPE such as a face shield, gloves or steel-toed shoes, may also be required, depending on the hazards encountered.
- ➔ Never point the nozzle of an air hose at anyone and never use compressed air to clean debris from a person's skin or clothing.
- ➔ **Before conducting any repairs to the pressure system of air compressors, receivers or compressed air equipment, ensure all hazardous energy sources are locked and tagged out, and all pressure has been released.**

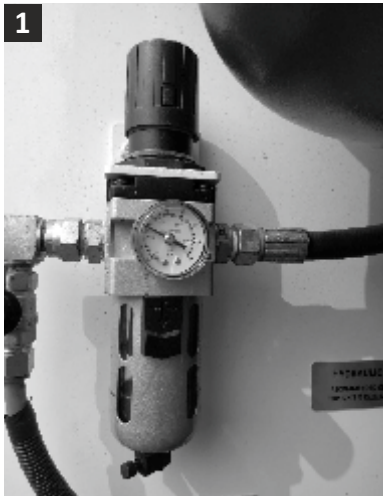
DANGER

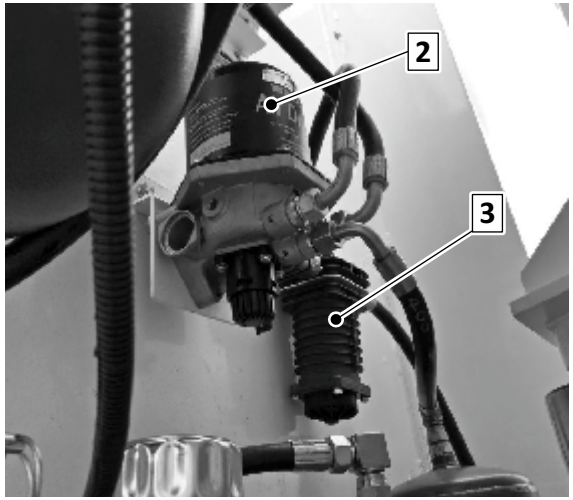
Compressed Air.
Do not use for blowing off clothes or body.

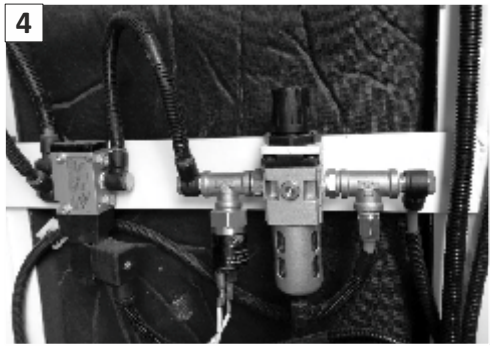
DANGER

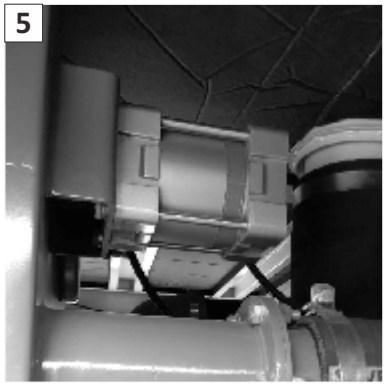
- ☒ **Compressed air accidentally blown into the mouth can rupture the lungs, stomach or intestines.**
- ☒ **Compressed air can enter the navel, even through a layer of clothing, and inflate and rupture the intestines.**
- ☒ **Compressed air can enter the bloodstream, and death is possible if it makes its way to blood vessels in the brain.**
- ☒ **Direct contact with compressed air can lead to serious medical conditions and even death.**
- ☒ **Even safety nozzles which regulate compressed air pressure below 30 psi should not be used to clean the human body.**
- ☒ **As little as 5 kg of compressed air pressure can blow an eye out of its socket. If an air pocket reaches the heart, it causes symptoms similar to a heart attack. Upon reaching the brain, pockets of air may lead to a stroke.**

Areas to check in the pneumatic system:









1. Filter Regulator Combination (FRC)
2. Air dryer
3. Water separator
4. Pneumatic components: Solenoid valve, Hoses, Connectors
5. Pneumatic cylinder used for vacuum bleed flap

1. FRC:

The FRC unit in the machine is used to filter the compressed air from any dust particles before entering into the system and to also lubricate the pneumatic cylinder.

- Check the dust level in the FRC unit, it should not go beyond the maximum mark, doing so may prevent the unit from functioning properly.
- The FRC unit has a manual drain mechanism to release the excess air. Ensure that it works smoothly.
- Clean the FRC unit exterior with a damp cloth everyday to ensure the filter is always visible.
- Clean the pressure gauge glass to ensure visibility always.
- Incase the FRC unit is removed for service, note the direction of flow before installation and connect piping accordingly.
- Flush pipes for dirt, dust, rust and other foreign particles.
- Install in clean atmosphere.
- **Caution:** Polycarbonate bowls of the FRC may get damaged and possibly fail if exposed to synthetic oils, thinner, solvents, trichloroethylene kerosene or other aromatic hydrocarbons.

Pressure setting:

Pull the knob and adjust by turning the knob clockwise to increase the pressure. Push the knob back to its locked position.
(Turning the knob counter clockwise will reduce the pressure)

Pressure to be set is 7.4 bar.

2. Air Dryer:
The air dryer provides outstanding & reliable protection against humidity in the air that is generated by the compressor. It has a filter cartridge which has to be services/replaced during a period of time.
Ensure that the drain for the water is not restricted or blocked.
The air dryer maintains the set pressure constantly by releasing the excess air at periodical intervals, this can be identified by a 'whoosh' sound.
Recommended service life of 2 years, as a result entire air system is kept operating safely and at peak performance.

WARNING

DO NOT dispose the used filter into the environment, There is risk of contaminating the environment.
DO NOT dispose the used filter in regular garbage, use appropriate methods.

3. Water Separator:
The water separator is used to remove the water content from the compressed air. The water separator has an outlet drain hose to drain the water.
Always ensure that the drain hose is not blocked.

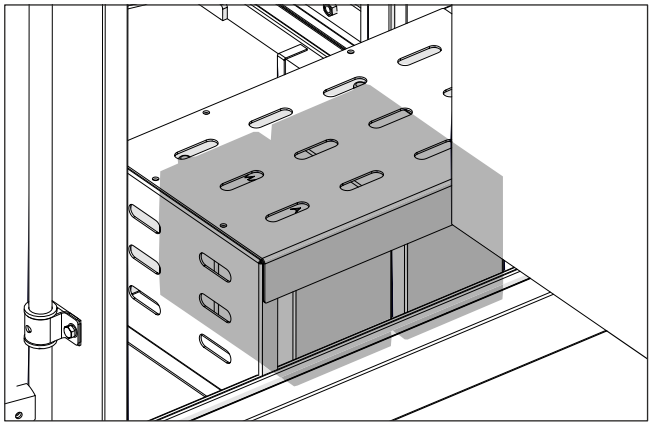
4. Pneumatic Ancillary Components:
The pneumatic system comprises of many components such as hoses, nozzles, connectors, solenoid valves.
Ensure that these components are not blocked by any dust or debris which may curb their function.
Check the hoses and connectors for lose connection.
Check the hoses for pin hole damage or ruptures. This can usually be found by the *'whoosh'* sound made by the air stream at the area of the leak.
Check the solenoid valves for proper function.
Check for any loose electrical connections in the solenoid valves.

5. Pneumatic Cylinder:
The pneumatic cylinder has to be checked for unrestricted movement and for air hose connection leaks.
If the cylinder movement is slow or restricted, lubricate and then resume operations.
If hose connections are loose, insert and tighten the hoses completely until no leaks are found.

6. Pneumatic Tank:
A valve is provided at the bottom to empty the tank during maintenance or service.
Ensure that the valve is closed during normal operation.

Electrical System

Before working on the electrical system, ensure that the battery cut-off switch is in Off position.
Remove the auxiliary engine key before working on the electrical system.



The batteries of the electrical system are located inside the engine cabin assembly on the left hand side of the machine. They are secured in position by a retaining plate assembly.

The main control panel of the machine is located on the left hand side engine room door assembly. It can be opened to gain access to the fuses and circuit boards for maintenance or repair.

NOTE

Only authorised RMCL engineers are allowed to work on the electrical circuit boards. Failure to do so may void warranty and cause machine damage.

Main control panel

Control panel PCB's

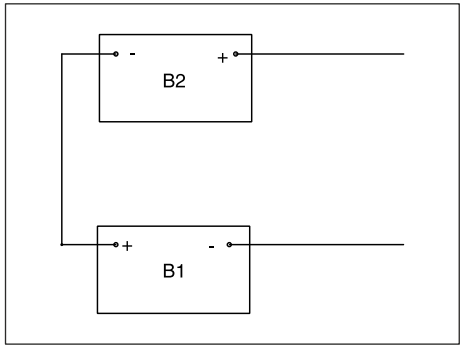
WARNING

DO NOT tamper or modify the circuit boards. Risk of short circuit and damage to machine.

Fuse details:

2A	-	A1 & A2 circuit board fuse
10A	-	Actuator & Stop solenoid fuse
30A	-	Starter motor fuse
5A	-	Mosfet output fuse

Battery connection diagram:



Volts	-	24V
Amps	-	80Ah
Qty.	-	2 nos.

Electrical System

Safety Symbols for Battery System

The below instructions have been established for your safety and have to be strictly observed.

Observe the instruction which must be mounted clearly at the charging point!

No Smoking!
No naked lights, embers or sparks in the vicinity, risk of fire and explosion!

Wear protective goggles and protective clothing when working on the batteries!

Do not tilt the battery!
Only use certified hoisting and transport equipment.

Keep children away from batteries.

Any splashes of acid in the eyes or on the skin must be rinsed thoroughly with plenty of clear pure water.
Then consult a doctor immediately!

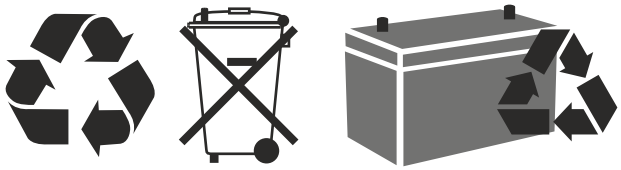
Risk of fire explosion, avoid short circuits!
Caution! Metal components in the battery cells are always under voltage, never place any foreign items or tools on the battery!

Electrolyte is highly corrosive!

Charge in a well-ventilated area

Do not throw in garbage!

Disposal of Batteries



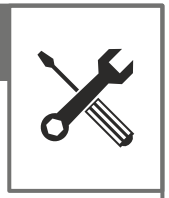
Old batteries with this sign are recyclable economic goods and should be brought back into the recycling process. Old batteries which are not brought back into the recycling process, have to be dealt with as dangerous materials under the observance of all regulations.

Areas to inspect in the electrical system:

Check if the battery has charge in it.
Check for any error display on the LCD screen.
Check for any blown fuses, replace if necessary.
Check the cables for loose connection, wear and damage, replace if necessary.

Truck Lighting

The truck is equipped with headlamps and tail lamps, always ensure that they are working in perfect condition.
Check for loose connections, blown fuses, fused bulbs or broken lamps. Replace them immediately to ensure the safety of the machine and the people around the jobsite.

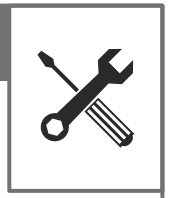


Maintenance Schedule

INTERVAL	MAINTENANCE AREA	THINGS TO CHECK
Daily	***Air intake system***	Check the air filter clog indicator.
	Coolant system	Check coolant level and top up as needed.
	Brake	Check brake oil level and top up as needed.
	Wheels and tires	Visually inspect for deflation, wear and damage. Repair or replace as needed.
		Check the air pressure in the tires.
	Aux. Engine	Refer engine owner's manual, Check water seperator visually.
	Hopper	Inspect the hopper for wear or damage and repair as needed.
		Check the hopper panels and top hatch for proper seating, check gasket, replace if required.
	Hydraulic system	Check hydraulic oil level and top up as needed, check all hydraulic connections and hoses for leak.
	Pneumatic system	Check all hose connections for leak.
	Miscellaneous	Check belts for wear, relpace if required.
	Filters	Clean the cartridge filters daily, replace if required. Check filter chamber for any stuck debris, clean if required.
	Hoses	Inspect the air hose from filter to engine for any damage & proper tightness of the hose clamps.
Weekly	***Greasing***	All purpose grease to be applied in all grease points.
50 Hours	***Hydraulic system***	Check functioning of control levers.
	Filter bag	Check filter bag for visual damage, replace if needed.
	Blower	Check oil level, top up if required.
	Belts	Check belts for tension, adjust if required.
	Wheels and tires	Check and tighten front & rear wheel nuts.
	Hose	Check suction hose for damage.

Maintenance Schedule

INTERVAL	MAINTENANCE AREA	THINGS TO CHECK
100 Hours	***Engine***	Refer engine owner's manual.
	Coolant system	Inspect radiator fins and clean as needed.
	Hydraulic system	Check oil level and top up as needed.
	Pneumatic system	Check oil level in the FRL, top up as needed.
		Check pneumatic cylinders, solenoid valves and purging system valves for function, replace if required.
	Hopper	Inspect hopper interiors and door seals for wear or damage. Adjust or replace as needed.
		Inspect filter chamber seals for damages. Adjust or replace as needed.
	Lubrication points	Telescopic tipping cylinder (2 fittings) Lubrication type - grease
		Door Cylinder (2 fittings) Lubrication type – grease
		Hood Latches & Hinges - Lubrication type - grease
	Cartridge filter	Check cartridge filter for visual damage, replace if needed.
	Filter bag	Check filter bag for visual damage, replace if needed.
	Electrical	Check limit switches, fuses for function, replace if required.
200 Hours	***Engine***	Refer engine owner's manual.
	Air intake system	Clean air filter. NOTE: Clean more often in dusty conditions.
		Replace air filter.
	Battery	Check water level, clean and tighten battery cable connection.
	Lubrication points	Telescopic tipping cylinder (2 fittings) Lubrication type - grease
		Door Cylinder (2 fittings) Lubrication type – grease
		Hood Latches & Hinges - Lubrication type - oil
	Belts	Check belts for tension, adjust if required.
	Blower	Check oil level, top up if required.
	Hydraulic system	Check suction line filter, replace is required.



Maintenance Schedule

INTERVAL	MAINTENANCE AREA	THINGS TO CHECK
400 Hours	***Engine***	Refer engine owner's manual.
	Brake cylinder	Check brake oil line, oil level and top up if needed.
	Electrical	Check functioning of all switches, check battery cables, replace if required.
500 Hours	***Coolant system***	Drain and flush the coolant system and top up as needed.
800 Hours	***Hydraulic system***	Clean hydraulic oil strainer and breather cap.
		Replace hydraulic oil and filter.

Troubleshooting

PROBLEM	CAUSE	REMEDY
Engine	*Refer the engine manual supplied with the machine*	
Blower	*Refer the blower manual supplied with the machine*	
Engine does not start	Master switch is in Off position	Set master switch position to On
	Low fuel in tank	Fill fuel in tank
	Engine room doors are open	Close engine room doors completely
	Ignition key is in Off position	Set ignition key position to On
	Engine overheated	Wait for sometime till the temperature drops
	Battery charge low	Recharge or replace battery
	Loose electrical wiring	Tighten wiring leads
Poor purging function	Purging system does not work	Turn On purging system
	Purging frequency is inconsistent	Set correct time frequency on the panel
	No air in purging tube assembly	Check pneumatic hoses for leak or loose connection
	No air in secondary purging tank	Check for open valves or leaks
	Solenoid malfunction	Repair or replace solenoid valve
Pneumatic system	Pneumatic system does not work	Switch On engine
	No air in pneumatic tank	Switch On engine and wait till the pneumatic tank is filled with air
	Compressor failure	Check and repair compressor
	Air lines blocked	Check hoses and valves for blocks
	FRL not working	Check FRL for leaks or damage
	FRL oil level is low	Top up FRL oil
	Compressed air has moisture	Check air dryer for proper function. Replace dryer cartridge
	Compressed air is contaminated	Check or replace FRL filter
		Check debris in pneumatic hoses due to holes or leaks. Repair or replace

Troubleshooting

PROBLEM	CAUSE	REMEDY
Loss of vacuum	Blower leak	Check seals in blower chamber
	Hose leak	Check vacuum hoses for leaks
	Gaskets & Seals damaged	Check gasket & seals for wear and tear, replace if required
	Hopper leak	Check hopper for any visible holes, repair if required
	Access panels and top hatch are open	Close access panels and top hatch
Hopper does not raise or lower	Hydraulic system problem:	Refer Hydraulic System problems in this section
	Control valve	
	Gear pump	
	Lift cylinder	
	Relief valve	
Hopper telescopic cylinder failure	Line to cylinder leak	Tighten fittings or replace hose
	Piston seals leaking	Replace seals
	Bent piston rod	Replace cylinder rod
Hydraulic control valve failure	Foreign matter in spool bore	Remove spool and clean
	Valve seals leaking	Replace seals
	O-Ring damaged	Replace O-Ring
	Relief valve stuck	Replace relief valve
Hydraulic gear pump failure	Pump leak	Replace seals or pump
	Gears worn out	Rebuild pump
	Relief valve stuck	Clean or replace
	Low oil supply	Top up oil
	Clogged oil filter	Clean filter
	Incorrect oil	Use recommended oil
	Damage due to entry of air into the hydraulic system	Maintain correct level in hydraulic tank. Keep all hose fittings tight.

Troubleshooting

PROBLEM	CAUSE	REMEDY
Hydraulic system noisy	Air in system	Maintain correct level in hydraulic tank. Keep all hose fittings tight.
	Relief valve dirty or damaged	Clean or replace
	Loose suction line	Tighten fittings
	Clogged filter or pump inlet	Clean or replace filter or line
	Internal pump or motor damaged	Check and repair
Truck	*Refer the truck manual supplied with the machine.*	

DO'S & DON'TS

Do's

- ✓ Always park the machine on a flat level ground.
- ✓ Before starting the engine ensure that there is sufficient fuel in the diesel tank.
- ✓ Check the drive belts for wear and tear or damage.
- ✓ Check the batteries for voltage.
- ✓ Ensure that the purging system is switched On before vacuuming.
- ✓ All the doors and hatches should be completely closed before starting the engine.
- ✓ Get to know the material type that is going to be vacuumed.
- ✓ Vacuum dry material only.
- ✓ Check the LCD screen for any warning signs during operation/before operation.
- ✓ Ensure that the rear door is opened completely before tipping the hopper.
- ✓ In case of an emergency stop the machine using the Emergency Stop Switch located on the control panel.
- ✓ Check the hydraulic oil level regularly.
- ✓ Ensure that the truck's condition is dependable in all operating conditions.
- ✓ Clean the cartridge filters daily.
- ✓ Ensure that the hopper is empty and lowered down at the end of the day.
- ✓ Close the rear door only after lowering the hopper.
- ✓ After engine shutdown, wait for the key off message to disappear before removing the key.

Don'ts

- × Do not vacuum toxic or hazardous materials.
- × Do not vacuum flammable materials.
- × Do not vacuum wet , damp or slushy materials.
- × Do not vacuum materials that may corrode the machine.
- × Do not operate the machine without activating the purging system.
- × Do not shut down the machine using the emergency stop button.
- × Do not operate the machine with a low hydraulic oil level.
- × Do not mix different types of hydraulic oils or other additives.
- × Do not mix contaminated hydraulic oil during top up or replacement.
- × Do not clean the inside of the hopper using water or other fluids.
- × Do not raise the hopper without opening the rear door.
- × Do not attempt to jump dump the material.
- × Do not use jarring method to dump.
- × Do not use crowbar or sharp metallic objects to remove or dislodge stuck material.
- × Do not attempt to open any of the access panels or doors when the machine is running.
- × Do not open the engine room door when the engine is running.
- × Do not tamper the control boards.
- × Do not close the rear door before lowering the hopper.
- × Do not remove the key immediately after engine shutdown.

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