

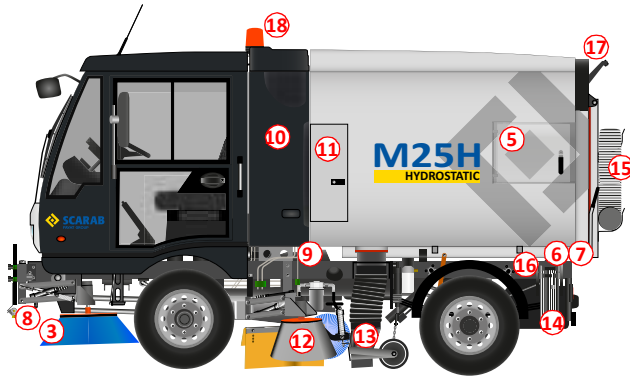


Operating and Basic Maintenance Instructions

 This document contains important Health and Safety Advice and must remain with the vehicle at all times.

Main features (Single Sweep, Left Hand Drive Shown)

1. Air filter and low pressure water pump cover
2. Low pressure water filter
3. Front brush assembly
4. Wide sweep assembly
5. Side loading hatch
6. High pressure water pump, under hopper
7. High pressure water filter
8. Front spray bar(s)
9. Auxiliary hand pump



10. Hydraulic tank, hydraulic valves and coolant tank
11. Tool lockers, drivers side will contain water tank filler
12. Side brush assembly
13. Suction nozzle assembly
14. High pressure retractable hose (option)
15. Wander hose (standard)
16. Fuel filler
17. Rear view camera
18. Warning beacon

M25H

Operating Instructions

**Incorporating Operator's Basic Maintenance Information
Includes information for Stage V engines**

Manual No. SCAZ043075

Version: 1.7.01 16th November 2020

To get latest Operator Manual visit our website.

This manual is published by the Technical Publications Department of Scarab Sweepers Ltd. and every effort is made to ensure that the information it contains is correct at the time of publication. Due to a policy of continuous development, however, the Company reserves the right to alter the specification and to supply when so altered without reference to illustrations and descriptions in this manual.

Scarab Sweepers Limited.
Pattenden Lane, Marden, Tonbridge, Kent TN12 9QD, United Kingdom
T: +44 (0) 1622 831 006
E: scarab@scarab-sales.com - W: www.scarab-sweepers.com
Registered in England No. 1823459 - VAT No. GB 374 5002 68
Registered Office: Pattenden Lane, Marden, Tonbridge, Kent TN12 9QD, United Kingdom

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General information

Weights, dimensions and capacities

Gross Vehicle Weight (GVW)	Refer to VIN plate
Unladen Weight *	2.75 tonnes
Overall Length *	4125mm
Front Overhang (no options)	1177mm
Rear Overhang (no options)	938mm
Wheelbase	2010mm
Overall Width (brushes stowed) *	1650mm
Overall Height (hopper lowered) *	2195mm
Overall Height (hopper raised) *	3965mm
Turning Circle (curb to curb)	6.2m
Hopper Volume Nett/Gross α	2.2m ³ /2.5m ³
Fuel Tank	68 litres
Engine Oil	10.5 litres
Coolant	17 litres
Hydraulic Tank	42 litres
Water Tank	450 litres
Brake System	0.7 litres
Air conditioning gas - Type = R134a	800grams
High Pressure Water Pump	0.55 litres
Tyre Size	225/65R 16C
Front Tyre Pressure	62PSI (4.27bar)
Rear Tyre Pressure	79PSI (5.44bar)
Wheel Nut Torque	170 Nm

Noise levels

In cab	Between 70 - 84 dB(A) dependent on operating speed.
External	Maximum LWA of 104 dB(A) in accordance with directive 2000/14/EC.

Vibration

Description	All dynamic prime moving components are resiliently mounted to minimise vibrations, in accordance with directive 2006/42/EC as amended.
Whole body	Equipment does not exceed 0.5 m/s ² (RMS, weighed).
Hand and Arm	Equipment does not exceed 2.5 m/s ² (VTV).

* Dependent upon specification.

α Measured in accordance with European Standard EN15429.

DEUTZ Auxiliary Engine

The sweeper will either utilise a DEUTZ TCD 2.9 EU Stage IIIB engine or a DEUTZ TCD 2.9 Stage V engine, which drives pumps to operate all hydraulic sweeper functions including the hydrostatic drive.

This manual does not cover the DEUTZ engine that is used in this sweeper.




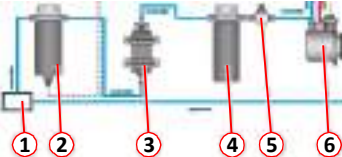
Please consult the DEUTZ engine manual supplied with the machine for more detail and in the case of issues not covered in the manual then contact DEUTZ.

Warnings

⚠ WARNING - Voltage sensitive components
Do not use a boost starter/super starter. A boosted start will burn out the vehicle electronic control nodes.
If the batteries on the vehicle are not charged then always use a fresh set of batteries.

⚠ WARNING - Electrical Interference
CB Radios and other electrical equipment used within the sweeper should be properly suppressed (EMC) to prevent the possibility of interference to the sweeper electronic systems.

⚠ WARNING - DEUTZ TCD 2.9L4 engine fuel outage or fuel filters changed.
Serious damage will result to the high pressure fuel pump if the following procedure is not followed after running out of fuel or changing the fuel filters.

<p>1. Switch ignition ON. Do not crank engine.</p>	<p>2. Wait 20 seconds.</p>	<p>3. Turn ignition OFF.</p>	<p>4. Repeat 4 times.</p>
			<p>X 4</p>
			<p>1 Fuel tank 2 Primary filter 3 Fuel pump 4 Secondary filter 5 Low pressure sensor 6 High pressure pump</p>

Transporting

 **WARNING - Towing - Serious damage will result if vehicle is towed.**

When transporting the vehicle, it shall be secured to the transporter by means of suitable straps as follows:

Front Wheels - One strap per wheel, using wheel loops, to a forward and rearward lashing point.

Rear Wheels - One strap per wheel, using wheel loops, to a forward and rearward lashing point.

Front - One strap each end of front bumper to a forward lashing point




Identification plates

The VIN plate and SERIAL NUMBER plate are located in the cab on the panel just beneath the front of the seats. The Scarab M25H has a four digit serial number. The CHASSIS NUMBER is stamped on the top face of the right hand chassis rail beneath the cab.




Showing new style VIN plate and Serial Number plate.

 Not all components and options shown in this manual may be available on your vehicle.


Health and Safety advice


In the interests of your health and safety, it is important that the following points are observed at all times.

- Only trained operatives should be allowed to drive or work on this machine.
- Before driving the machine ensure that all relevant machine checks have been carried out, that all equipment is stowed.
- Do not overload the hopper.
- Do not drive the machine with the hopper in the raised position, even if the hopper is empty.
- Always use the safety prop to support a raised hopper, other than during discharging.
- Never work under a raised cab or hopper unless the appropriate safety prop is in position.
- Before operating either the hopper tip controls, ensure that there is sufficient clearance and that it is safe to do so. Ensure that all personnel are clear of the rear door.
- Before working on the machine, ensure that it is on firm, level ground. Apply the handbrake, stop the engine and remove the ignition key.
- Always wear the appropriate personal protection equipment when operating or working on the machine.
- Before starting the engine ensure that all controls are switched off and that the machine is in neutral.
- Keep long hair, loose clothing and body parts away from moving parts on the machine.
- High pressure water can be hazardous. Always wear suitable face protection when operating the high pressure water pump and when using the lance.
- Do not direct the water jet at other persons. Beware of electrical installations on public buildings and lamp posts etc. Always exercise extreme caution in public places.
- The driver's seat should always be correctly adjusted as to give a good posture when driving. Do not adjust seat whilst driving.
- The mirrors should be adjusted so the driver has good all round view of the machine sides and sweeping equipment.
- When operating the machine in any mode always be aware of objects and people in the immediate vicinity, especially at the rear of the machine when reversing.
- Whatever the situation, remember that the rules of the traffic and road safety must be observed.
- Whilst operating this machine the safety and well being of other people in the immediate vicinity are the sole responsibility of the operator.
- Never ride on any part of the machine other than in the seats in the driver's cab.

 The universal safety symbol as well as red text is used throughout this handbook and when encountered the related information must be adhered to.

 Refers to important information.

 Identifies cautionary information and specific procedures when required.

 Refers to visual examination to confirm the condition or status of a specific item.

Other symbols not shown here may be used throughout this handbook. When encountered, they must be observed.

Remember, failure to comply can result in serious injury.

Hazard awareness

All operators and workshop personnel should be aware of the physical and biological risks that are inherent in the operation of a road sweeper. The risk falls into two main categories as follows:-

- Risks represented by the sweeper and its various systems.
- Risks represented by the sweeper's operating environment.

Both have the potential for exposure to a variety of hazards, ranging from hot surfaces to infectious diseases, that can occur during day-to-day operation, while carrying out adjustments or when involved with the general maintenance and servicing activities on the vehicle.

Typical vehicle related hazards are:-

- Exposure to hot surfaces and sharp edges.
- Exposure to moving parts.
- Exposure to various fluids, including some hot and/or pressurised.
- Exposure to surface contamination resulting from general operating conditions.

Typical environmental hazards are:-





- Exposure to sharp objects (e.g. broken glass, discarded hypodermic syringes) while operating or working on the vehicle.
- Exposure to various infectious diseases (e.g. Legionnaire's, Weil's, Hepatitis, Tetanus) while operating or working on the vehicle.

Safety precautions

When using external equipment such as the high pressure water lance, or when dealing with potentially hazardous situations while sweeping (e.g. unblocking a suction nozzle), always wear the appropriate Personal Protection Equipment (PPE) and exercise extreme caution if required to handle any of the material being swept.

Before working on the vehicle, subject it to a thorough steam cleaning or high pressure hot water wash using appropriate detergents etc.

Even after taking all reasonable steps to reduce the risk from the hazards described, always wear the appropriate Personal Protection Equipment (PPE) when carrying out sweeping duties or when working on the vehicle. This includes:-

-  Safety Gloves, including necessary cut resistant knitted Kevlar.
-  Safety Boots or shoes with protective soles and toecaps.
-  Eye/Face protection, including where necessary full face mask with under chin lip.
-  Earplugs or Ear Defenders as appropriate.

Operating advice

Please remember, the information provided in this handbook is designed to ensure that the Scarab sweeper operates both safely and efficiently.

The design of this machine is for the removal of spoil on traffic or pedestrian areas also litter collection using the wander hose.

A poorly maintained machine will become unreliable, inefficient and potentially dangerous. Always observe the recommended maintenance and safety related advice provided.

i *Unless it is wet or raining, ALWAYS use the low pressure water spray system when sweeping. This will not only reduce the amount of dust generated, it will also ensure more efficient collection of material. This is because wet material is heavier and will drop more readily from the air stream inside the hopper. If swept dry more of the finer material will pass through the screen, wearing out the fan blades on its way back to the environment behind you.*

Operator training

Operators should be trained in the following elements.

- Health and safety observations/notices.
- Transit driving.
- In-cab and external controls.
- Hopper and cab safety prop use.
- Brush setting.
- Nozzle flap adjustment.
- Correct sweeping operations.
- Low and high pressure water systems.
- Load discharge (tipping).
- Daily, weekly maintenance schedules.
- End of day cleaning, i.e. suction fan, fan screen and machine body.

Operator training can be provided by Scarab Sweepers upon request.

i *It is the responsibility of employers to carry out their own risk assessment for the machine, operators or other persons using or affected by the machine and equipment.*

i *Only personnel qualified in the relevant disciplines should be allowed to work on any part of the machines hydraulic system.*

i *Various safety, hazard and user information labels are fixed to the machine. These must be observed.*

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Cab area

Opening the door (external)

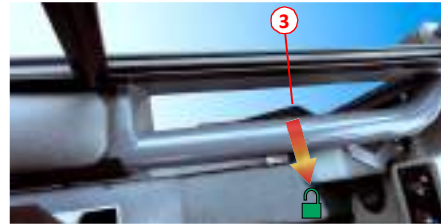
If the door is locked then insert the key into the key slot ① and turn in a clockwise direction. Grip the handle ② and pull in the direction shown, swinging the door outwards.



Opening the door (internal)

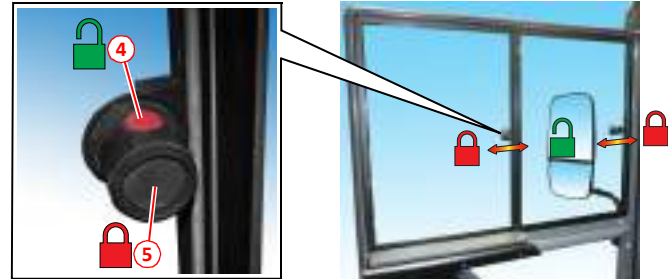
i Check the doors swing path is free from any obstructions before opening.

Grip lever ③ and squeeze in direction shown, swing door outwards.



Opening closing the windows

Press button ④ to unlock and slide window(s) in the open or close directions. With both windows in the closed position press button ⑤ to lock.



Entering/leaving the vehicle

To get in and out of the cab, use the grab handle on the door pillar and not the steering wheel. Also use the step and face the vehicle when entering and leaving.



Mirrors

The mirror brackets can be folded back against the cab and return back to their original position once the bracket is swung out again. The whole mirror can be rotated partially and each individual mirror glass can be manoeuvred in four directions.



Interior light

The interior light is located in the centre of the roof of the cab. It operates independently of the ignition switch. The light turns on when the doors are opened.

The interior light can also be switched on by pressing either end of the light lens. Always remember to turn off the light when leaving the vehicle.



Seat adjustment

1. Forward/backwards lever, lift use.
2. Backrest angle lever, lift to use.
3. Lumber control, rotate anticlockwise.
4. Headrest raises and angles.

⚠ The driver's seat must only be adjusted when the vehicle is stationary. All adjustments should be made when the seat is occupied and before seat belt is fastened.



Seat belts

The seats are equipped with seat belts; use them. They are mandatory in some countries.

They only work properly when correctly tensioned. For this reason never use a clip or other device to reduce the seat belt tension.

If the seat belt has been subjected to high loading, the complete assembly must be renewed. Repairs must be carried out by qualified personnel only.

Wearing seat belts

- The seat belt buckle should be inserted correctly, the seat belt must be tight against the body and not distorted.
- Do not put hard, sharp or fragile objects such as pens, spectacles, mobile phones etc. between your body and the seat belt.
- Press either red button to release.



Controls and instruments

Dashboard layout

The M25H's control system can be divided into three distinct areas as follows:-

- Dash mounted switches and controls for the vehicles conventional electrical system.
- The standard automotive steering column mounted controls.
- The Scarab CAN bus electronic sweeper controls.



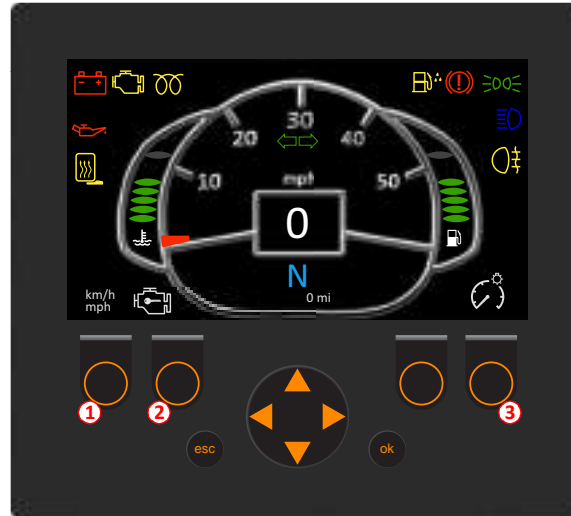
1. Auxiliary control panel, page 29
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4. Side and headlights, hazard warning indicators, rear fog lights, beacons and reverse bleeper silence switches, page 21
5. Main control panel, page 28
6. 12v power supply
7. Multi-function switch, page 29
8. Cab heater controls, page 22
9. Drive lever, page 32
10. Horn
11. Radio, Bluetooth, iPod/iPhone, MP3
12. Turn signal, windscreen wiper and washers and main beam light control lever, page 23
13. LCD operators monitor, rear view monitor





Instrument panel

i Instrument panel shown with all icons visible.


1. km/h and mph toggle switch
2. Engine run lock
3. Instrument illumination toggle switch, dim or standard





 Ignition on/possible charging/battery fault.


 Engine fault warning


 Glow plugs


 Water in fuel

 Parking brake/Low brake fluid level warning


 Side lights


 Engine oil low pressure warning

 Turn signals

 Dipped beam/Main beam

 Heated mirror

 Rear fog lights

 Water temperature Normal/Overheated

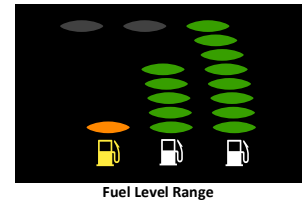
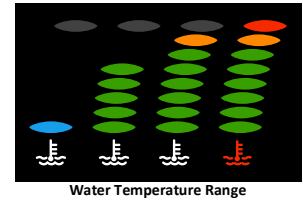
The segments will show the temperature range. Starting with 1 blue segment when cold then the segments will go green for normal operating temperature. If the temperature increases above 100°C the orange segment will display and then if the temperature increases to over 110°C the red will display and the water temperature symbol at the base of the segments will change to red.

 Fuel level Normal/Low

Fuel level will be indicated with up to 8 green segments when full 63 litres and when below 7 litres the bottom segment will turn orange and the fuel light will change to yellow.

D N R Drive - Neutral - Reverse

The speed will be indicated via the red pointer around the dial and via the digital read out in the centre of the instrument panel. It will display in km/h or mph as selected and indicated above the digital read out. The odometer will display total distance travelled in kilometres or miles as selected.




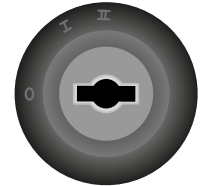
Ignition and starter switch


0 - Rest position - Allows the key to be removed in this position.

I - Ignition on - Enables the vehicle electrical system and glow plugs. The ignition and glow plug indicators on the instrument panel illuminate. The key cannot be removed.




II - Starting - Turn to start engine. When released key will return to position **I**.


Glow plugs - When the ignition is on the engine management system measures the pre-glow and after-glow required. Allow the glow plug indicator  on the instrument panel to extinguish before starting the engine.






 Note: Ignition switch bezel is not actually marked. Shown for reference only.


Lights, hazard, beacon and reverse warning switches

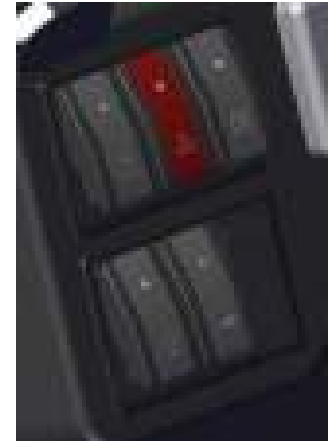
 **3 position headlight switch** - Sidelights and headlight work independent of ignition. Centre LED illuminates when on. Symbol on switch illuminates when on. The relevant symbols illuminate on the instrument panel when side and/or headlights are on.  

 **Hazard warning switch** - Works independent of ignition. When on, all directional indicator lights flash simultaneously. Symbol illuminates when lights are on and flashes when active.

 **Rear fog lights** - Works only when headlights are on. Centre LED illuminates when on. Symbol illuminates when lights are on. Fog light indicator on the instrument panel illuminates. 

 **Warning beacons** - Works independent of ignition. Centre LED illuminates when on. Symbol illuminates when lights are on.

 **Reverse warning sounder silence** - Press to silence the reverse warning sounder. Symbol illuminates when lights are on.



Dash mounted light switch panel

Cab heater controls

Fan speed control - It has 4 positions, OFF and 3 speed levels. It is only active when ignition is on.

Temperature control - The supply of heat can be smoothly be set by rotating the control from 0% (blue) to 100% (red)

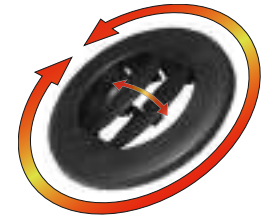
Air conditioning switch - Only functions when the engine is running and the fan speed control is on. LED illuminates when active.

Air flow vents - Are located in various positions on the dash area and can be rotated through 360°. Opened through 90° or shut.

⚠ The air conditioning system contains refrigerant under high pressure. Removal of any parts of the system is not permitted. Work on the system may only be carried out by qualified personnel.



Cab heater controls with air conditioning




Air flow vent

Heated seats and mirror switches

Located between the seats on the central console are the switches for the heated seats and heated mirrors.

👉 Heated seats - Only work while the engine is running. The heated seats have sensors in them which will allow the seat to heat if seat temperatures is below 10°C and turns off when the seat temperature reaches 20°C. Centre LED illuminates when on. Symbol illuminates when sidelights are on.

👉 Heated mirrors - Only work while the engine is running. Turn on the heated mirrors when you need to demist the mirrors. Turn them off when they have demisted. Centre LED illuminates when on. Symbol illuminates when sidelights are on.  will appear on instrument panel when on.



Heated seats and mirror switches

Steering column mounted controls

Turn signal control

Push lever towards ① to indicate a right turn, pull lever towards ② to indicate a left turn. The lever will lock in place and will self-cancel if the steering wheel has been turned enough in the relevant direction.

To briefly operate the turn signals, the lever can be pushed lightly against the spring pressure. It will spring back when released.



Windscreen wiper control

- ① Intermittent.
- ② Off.
- ③ Low Speed.
- ④ High Speed.
- ⑤ Push in button on end of lever and hold to activate the screen wash. Release to deactivate.



Main beam control

- ① Main beam activated when lights are on. The main beam indicator of the instrument panel illuminates. To turn off main beam move control to position ②.
- ③ Off.
- ③ Activates main beam when held in position, regardless of the lights being on or off. It springs back to position ② when released and turns off the main beam.

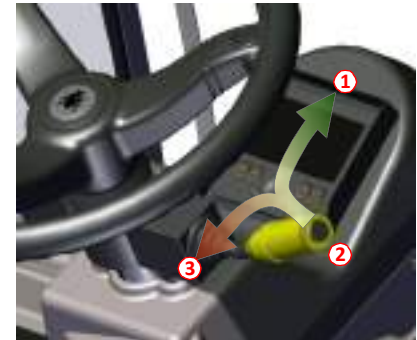


Drive control

Positions

- ① Forward.
- ② Neutral.
- ③ Reverse.

Lift lever slightly and move to the forward or reverse positions.



Horn

Press button at end of the drive control to sound the horn.

Standard rear camera viewing screen

The LCD screen used to display the CAN bus information to the operator is also used as the camera viewing screen. The screen is connected to a camera situated above the hopper rear door. It can also be connected to another camera situated around the vehicle. When reverse drive is selected the screen will display a view of the area around the rear of the vehicle, even if the other camera view is showing. The camera view can also be selected via button ①, if it has been enabled in the options, for use when travelling forward. When on the camera view screen, pressing the encoder ② will toggle the view between the two cameras, if fitted. The display will show the camera view to the left hand side of the screen and on the right hand side it will show the essential operating information.

Multiple cameras can be connected to the machine but will be displayed on a separate monitor and is not a standard option.



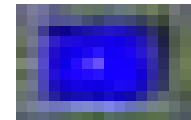
LCD monitor with normal operation mode displayed



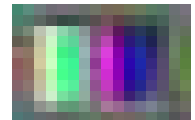
LCD monitor Showing view from rear camera and operating info



Rear camera



LCD monitor camera screen showing information icons



LCD monitor camera screen with no camera attached

Cab fuse and relay panel LHD

Fuse/Relay - Function - Amp

- F1 - NODE 0 IGNITION (2A)
- F2 - NODE 1 IGNITION (2A)
- F3 - NODE 2 IGNITION (2A)
- F4 - NODE 2.1 IGNITION (2A)
- F5 - NODE 3 IGNITION (2A)
- F6 - BB PLUG IGNITION 1 (2A)
- F7 - BB PLUG IGNITION 2 (5A)
- F8 - FUEL GAUGE PSU (5A)
- F9 - HEATER (15A)
- F10 - VACANT
- F11 - NODE 2 BATT+ (2A)
- F12 - NODE 3 VBB0 (15A)
- F13 - NODE 3 VBB0 (15A)
- F14 - NODE 3 VBB0 (2A)
- F15 - BB PLUG BATT+ (5A)
- F16 - BB PLUG BATT+ (5A)
- F17 - HOPPER CONT (2A)
- F18 - IGNITION SWITCH (5A)
- F19 - CLIMATE PACK (15A)
- F20 - VACANT
- F21 - RH CAM SIGNAL (2A)
- F22 - ENGINE RUNNING SIGNAL (2A)
- F23 - MOTOR COIL (3A)
- F24 - REVERSE COIL (2A)
- F25 - VACANT
- F26 - VACUUM PUMP (15A)

- K0 - IGNITION RELAY
- K1 - VACUUM PUMP RELAY
- K2 - ENGINE RUNNING RELAY
- K3 - NEUTRAL START RELAY
- K4 - AIR CON CUT OUT RELAY

- K101 - DIPPED BEAM
- K102 - MAIN BEAM
- K103 - SIDE LIGHT
- K104 - FRONT BEACON
- K105 - REAR BEACON
- K106 - REVERSE LIGHT
- K107 - FOG LIGHT
- K108 - BRAKE LIGHT
- K109 - FLASHER RELAY
- K110 - WIPER RELAY

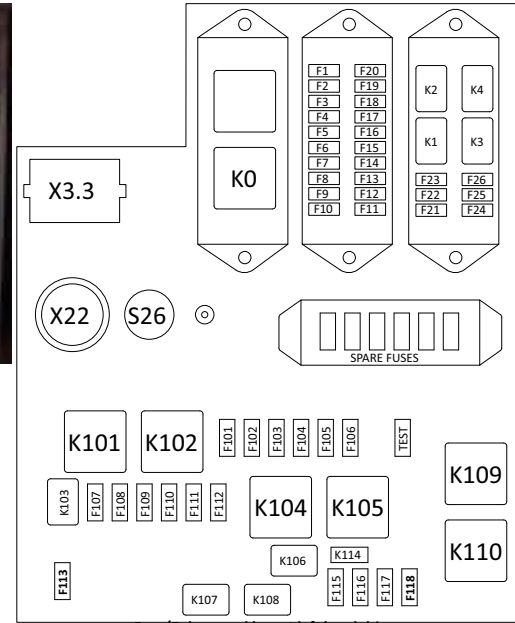
- S26 - ENGINE DIAG SWITCH
- X3.3 - BODY BUILDER PLUG
- X22 - ENGINE DIAG PLUG
- TEST - FUSE TESTER

X3.3 Body builder plug

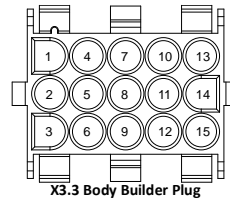
PIN	Description	Fuse	Max Amp
1	BATT POSITIVE	F15	5A
2	IGNITION	F6	2A
3	BATT NEGATIVE		5A
4	FRONT BEACON POSITIVE	F104	15A
5	FRONT BEACON EARTH		15A
6	BATT NEGATIVE		5A
7	WORK MODE		1A
8	TRACKER		1A
9	BATT NEGATIVE		5A
10	IGNITION	F7	2A
11	RH NOZZLE CAMERA	F21	2A
12	ENGINE RUNNING SIGNAL	F22	2A
13	REVERSE OUT		1A
14	BATT POSITIVE	F16	5A
15	SPARE		



The fuse panel area has a light just above the panel. It will illuminate when the doors are open or the interior light is switched on.



Fuse/Relay panel layout left hand drive



X3.3 Body Builder Plug



The fuse panel is located behind the lower dash panel on the passenger side of the cab.

Cab fuse and relay panel RHD

Fuse/Relay - Function

- F1 - NODE 0 IGNITION (2A)
- F2 - NODE 1 IGNITION (2A)
- F3 - NODE 2 IGNITION (2A)
- F4 - NODE 2.1 IGNITION (2A)
- F5 - NODE 3 IGNITION (2A)
- F6 - BB PLUG IGNITION 1 (2A)
- F7 - BB PLUG IGNITION 2 (5A)
- F8 - FUEL GAUGE PSU (5A)
- F9 - HEATER (15A)
- F10 - VACANT
- F11 - NODE 2 BATT+ (2A)
- F12 - NODE 3 VBBo (15A)
- F13 - NODE 3 VBBo (15A)
- F14 - NODE 3 VBBo (2A)
- F15 - BB PLUG BATT+ (5A)
- F16 - BB PLUG BATT+ (5A)
- F17 - HOPPER CONT (2A)
- F18 - IGNITION SWITCH (5A)
- F19 - CLIMATE PACK (15A)
- F20 - VACANT
- F21 - RH CAM SIGNAL (2A)
- F22 - ENGINE RUNNING SIGNAL (2A)
- F23 - MOTOR COIL (3A)
- F24 - REVERSE COIL (2A)
- F25 - VACANT
- F26 - VACUUM PUMP (15A)

- K0 - IGNITION RELAY
- K1 - VACUUM PUMP RELAY
- K2 - ENGINE RUNNING RELAY
- K3 - NEUTRAL START RELAY
- K4 - AIR CON CUT OUT RELAY

- K101 - DIPPED BEAM
- K102 - MAIN BEAM
- K103 - SIDE LIGHT
- K104 - FRONT BEACON
- K105 - REAR BEACON
- K106 - REVERSE LIGHT
- K107 - FOG LIGHT
- K108 - BRAKE LIGHT
- K109 - FLASHER RELAY
- K110 - WIPER RELAY

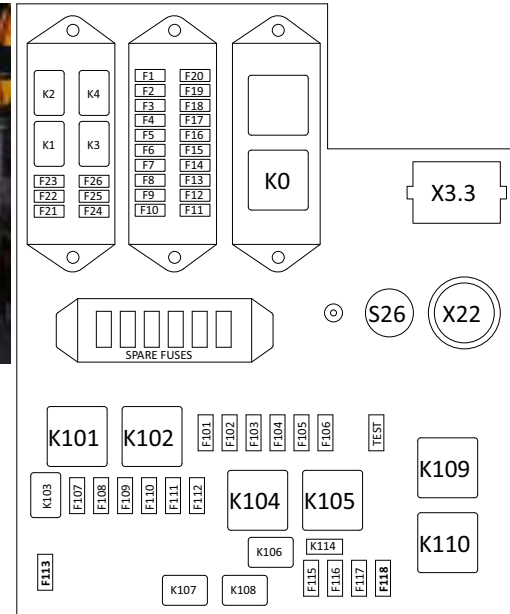
- S26 - ENGINE DIAG SWITCH
- X3.3 - BODY BUILDER PLUG
- X22 - ENGINE DIAG PLUG
- TEST - FUSE TESTER

X3.3 Body builder plug

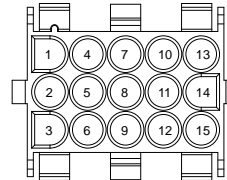
PIN	Description	Fuse	Max Amp
1	BATT POSITIVE	F15	5A
2	IGNITION	F6	2A
3	BATT NEGATIVE		5A
4	FRONT BEACON POSITIVE	F104	15A
5	FRONT BEACON EARTH		15A
6	BATT NEGATIVE		5A
7	WORK MODE		1A
8	TRACKER		1A
9	BATT NEGATIVE		5A
10	IGNITION	F7	2A
11	RH NOZZLE CAMERA	F21	2A
12	ENGINE RUNNING SIGNAL	F22	2A
13	REVERSE OUT		1A
14	BATT POSITIVE	F16	5A
15	SPARE		



The fuse panel area has a light just above the panel. It will illuminate when the doors are open or the interior light is switched on.



Fuse/Relay panel layout right hand drive



X3.3 Body Builder Plug



The fuse panel is located behind the lower dash panel on the passenger side of the cab.

The CAN bus system

Overview

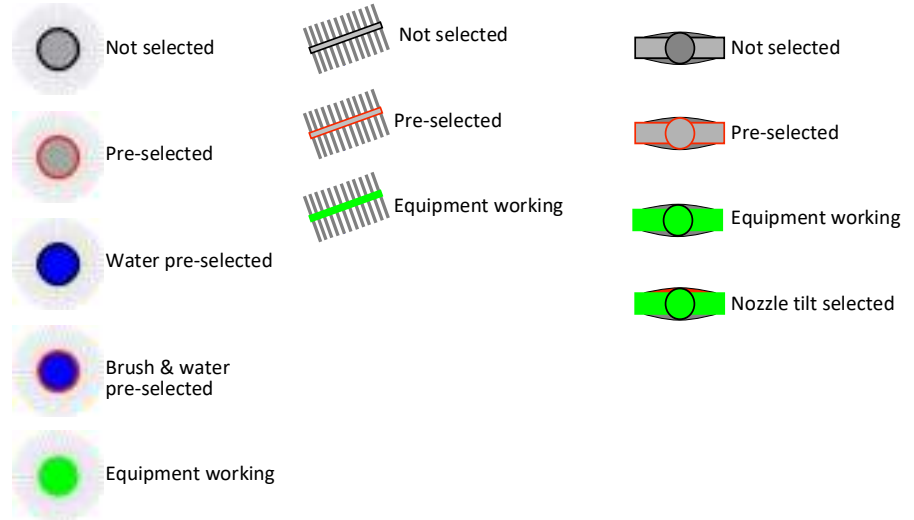
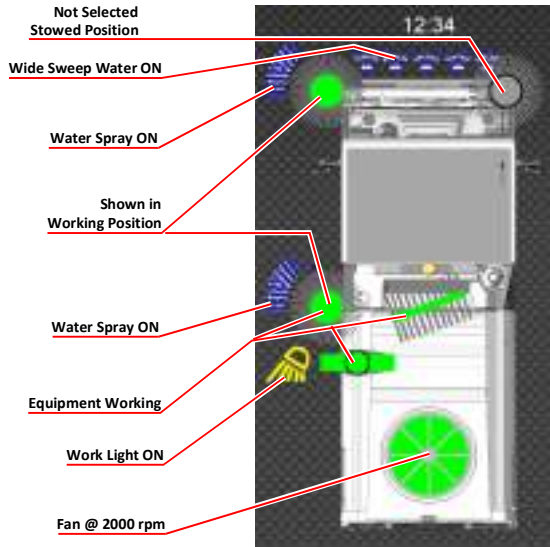
The CAN bus system comprises two control panels, main and auxiliary, an LCD monitor and a number of control nodes. The system controls and monitors all sweeper functions and maintains a log of various operating parameters, such as operating hours and fault conditions that might occur.

Switches













The various types of switch function are colour coded as follows:-

- Amber** = Electrical functions such as lighting.
- Red** = Critical functions such as start/stop sweep mode.
- Green** = Sweeping functions.
- Blue** = Water spray functions.

Each switch illuminates a function-related symbol on the LCD monitor (installed equipment only) and visible in Sweep Mode. Each symbol is greyed out until its switch is activated. When a switch is activated the appropriate symbol will be illuminated according to system status as illustrated.









Main control panel switch functions

-  *Switch functions are described from left to right and top to bottom.*
-  **Front brush water** - Press to activate/deactivate.
-  **System start** - Press to start/stop Sweep Mode.
-  **F1 / F2 / F3** - Press to activate/deactivate special options.
-  **Left/right front brush** - Press to activate/deactivate.
-  **Left/right side brush** - Press to activate/deactivate.
-  **Left/right suction nozzle** - Press to raise/lower.
-  **Wide sweep brush** - Press to activate/deactivate.
-  **Left/right work light** - Press to switch on/off.
-  **Left/right side brush/nozzle water** - Press to activate/deactivate.
-  **Wide sweep water** - Press to activate/deactivate.
-  **Reduce/increase engine speed** - Press and hold down to change the speed of the truck engine. A single press will change the engine speed by 50 RPM. Current engine speed is displayed along the top of the LCD monitor.



Auxiliary control panel switch functions

-  **High pressure water pump** (option) - Press to turn on/off.
-  **Suction fan** - Press to start/stop.
-  **Cruise control** - Press to activate/deactivate.
-  **Nozzle tilt lock** - Press to activate/deactivate.
-  **Suction fan 'boost'** - N/A
-  **Favourite setting** - N/A

Four position multi-function lever

OFF - Stop and raise all sweeping equipment.


ON - Deploys all selected sweeping equipment.

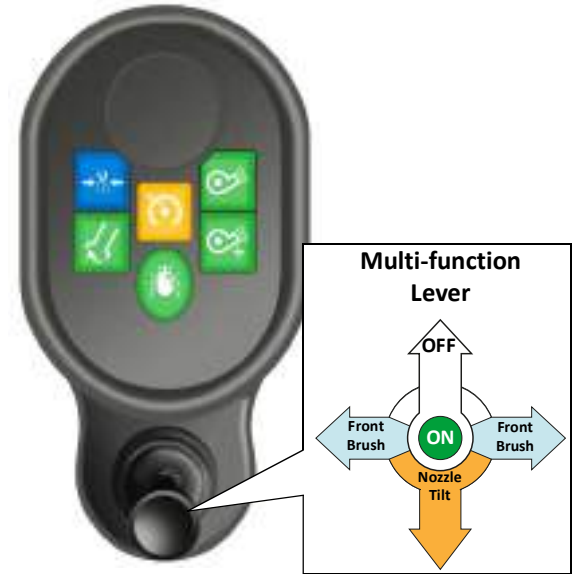
In the ON position the lever can be used to control the front brushes and suction nozzle(s). These additional positions, left, right and back will return to the central ON position when released.

Left - Move the lever to the left to swing out or retract left front brush(es).

Right - Move the lever to right to swing out or retract right front brush(es).


Back - Move the lever back to momentarily tilt the suction nozzle.


 *Only dual sweep machines will have both front brushes that can swing out. Single sweep machines will have a front brush on the driver's side that can swing out and the other brush is fixed in position.*




Remote control switch box

The hopper raise/lower and rear door open/close switches are located on the remote control switch box. This is stowed in the cab, between the drivers seat and the cab door, it is connected to a socket via a coiled lead.

⚠ In the interests of health and safety and to avoid possible damage to the sweeper and/or adjacent structures, it is essential that the remote controls are not activated within the cab. Always use outside of the machine from a vantage point that affords a good view of the machine and its immediate surroundings. Wear a high visibility jacket/waistcoat 

 **Hopper Raise** - Press and hold to raise the hopper.

⚠ The hopper safety prop should always be in the deployed position when the hopper is in the raised position. Failure to do so could result in serious injury. See page 36.


 **Hopper Lower** - Press and hold to lower the hopper.

⚠ Ensure that the hopper safety prop is returned to its stowage position before attempting to lower the hopper and no obstructions are present under the hopper. Failure to do so could result in damage to the machine and/or serious injury. See page 36.

 **Rear Door Open** - N/A - Future option.

i *Ensure that the suction fan has been switched off before attempting to open the rear door because the fan creates a vacuum within the hopper space preventing the door from being opened.*

⚠ The rear door safety prop must be in the deployed position whenever working under the rear door. See page 34.

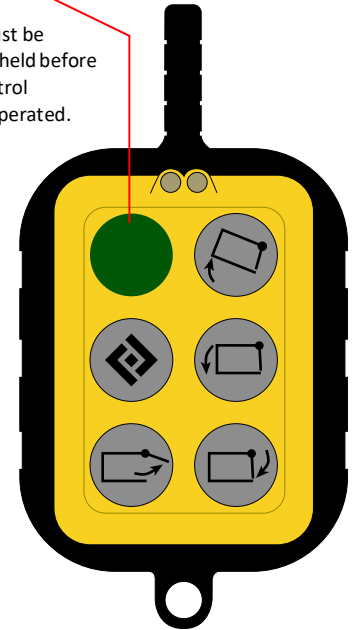
 **Rear Door Close** - N/A - Future option.

⚠ The rear door safety prop must be removed and no obstructions are present before lowering the rear door. See page 34.

 **Option.**

SAFETY INTERLOCK

This switch must be pressed in and held before any of the control switches are operated.

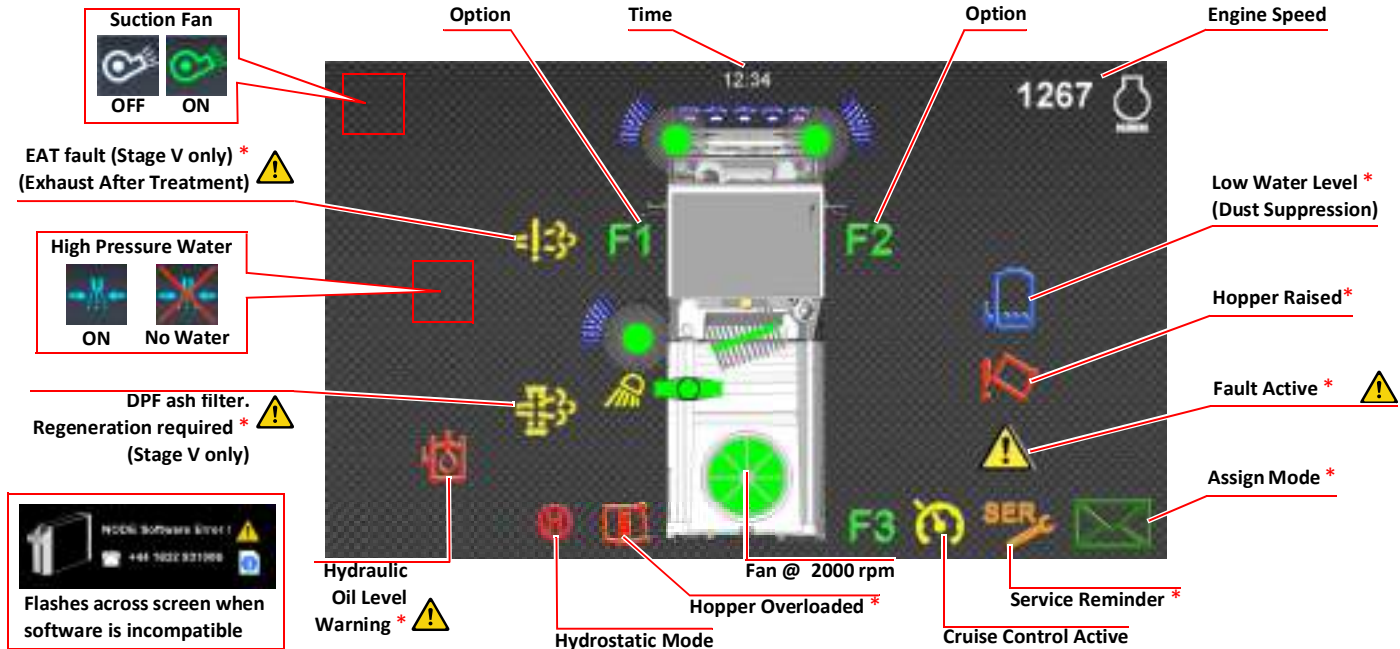


LCD monitor

The sweeping monitor displays information on the current status of the sweeper while it is in sweep mode, by indicating which items of equipment are active, plus other relevant information i.e. fluid levels, fan speed etc. It alerts the user to any warnings by means of appropriate flashing symbols and, when appropriate, a warning buzzer. For warnings identified by ⚠, stop and investigate the cause. The accompanying illustration shows the range of information/alert symbols that can be displayed, however it should be noted that warning symbols (*) only illuminate when a specific condition occurs.

If any of the following DEUTZ engine faults occur the ⚠ will flash and the warning buzzer will pulse, stop and investigate the cause.

Low engine coolant, air filter blocked, water in fuel, engine protection lamp (amber), engine stop lamp (red), oil pressure and high coolant temperature.



Driving modes

Normal drive mode

⚠ Before driving, the following conditions must be observed:

All sweeping equipment must be raised and retracted. Wander hose in the storage position.

The sweep mode switch must be off.

The vehicle must be stationary, handbrake on, yellow drive control lever at neutral ② and engine off.

1. Turn the ignition key and start the engine. See page 21.
2. Select forward ① or reverse ③ using the yellow drive control lever, direction symbol will illuminate on the instrument panel.
3. Release the handbrake. Press accelerator to move vehicle in selected direction.






Sweep mode

⚠ Before selecting sweep mode, the following conditions must be observed:

The engine must be running.

The sweep mode switch must be off.

The vehicle must be stationary, handbrake on, yellow drive control lever at neutral and engine off.

1. Turn on the warning beacons . See page 21.
2. Switch on sweep mode . Sweep mode illuminates on instrument panel (engine RPM increases to default).
- i** *If engine RPM remains at idle (950 RPM) the engine increase switch  can be used to adjust the RPM, 1250 RPM is considered the most efficient setting for normal sweeping, however it may be necessary to increase RPM in certain circumstances, i.e. full load, uphill.*
- i** *Although 1250 RPM is considered best for normal sweeping, engine RPM may be reduced when sweeping light or sparsely distributed materials. Experience will enable the operator to judge the best RPM for the sweeping conditions.*
3. Switch on the suction fan .
4. Select the desired sweeping equipment. See page 28.
5. Switch on the dust suppression water if required, it is advisable to use dust suppression water if the areas to be swept are in a dry condition.
6. Place the multi function leaver in the on position. See page 29.
7. Select forward on the yellow control lever. Release the handbrake. Slowly depress accelerator to move the vehicle.
- i** **Cruise control** - With vehicle at the desired speed, select cruise control . Can be overridden by the accelerator pedal, and is cancelled by using the foot brake or by pressing the switch. Only works in sweep mode.



i Hydrostatic braking - Sweep mode only - This allows the vehicle to slow down when the accelerator pedal is released, eliminating the need to use the foot brake in certain conditions. Even though this feature is available it is still advisable to always use the footbrake when stopping.

⚠ The foot brake must always be used for emergency braking.

i When reverse is selected in sweep mode, all active sweeping equipment will stop, lift and retract automatically. These will return to their sweeping position when either neutral or forward are selected again.

Reverting to normal drive




1. With the vehicle stopped, hand brake on and neutral ② selected using the yellow control lever.
See page 23 or 32.
2. Turn off all active sweeping equipment. See page 28.
3. Place the multifunction lever in the off position. See page 29.
4. Switch off suction fan and sweep mode. See page 28.
5. Vehicle is now in normal drive mode and warning beacons can now be switched off.



Discharging the hopper (tipping)




Standard rear door

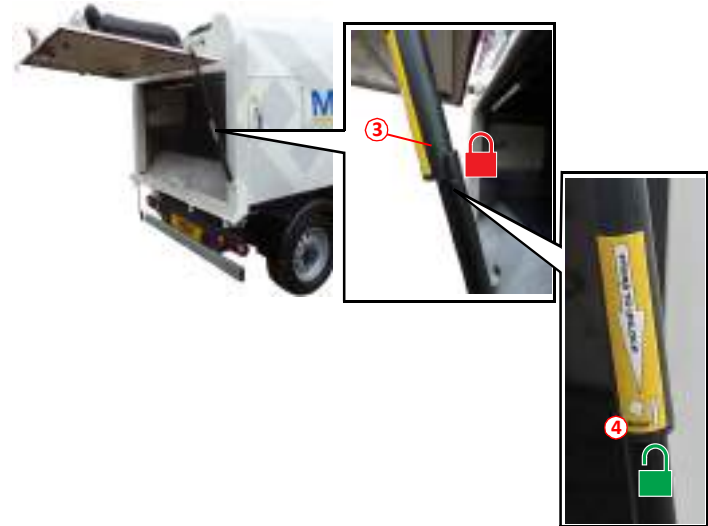
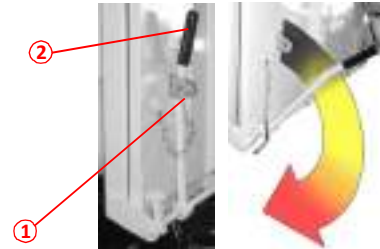
⚠ Before draining the hopper, ensure that the vehicle is on firm, level ground and that there are no overhead obstructions. Do not drive the vehicle while the hopper is raised.

1. Position the vehicle ready to reverse to the discharge point, apply the hand brake, select neutral with yellow control lever. See page 23 or 32.
2. With the engine running, select sweep mode **①**, see page 32.
3. Switch suction fan on .
4. Remove the locking pin **①**. Release the door clamp **②**. The suction fan vacuum will hold door closed.
5. Reverse vehicle to discharge point.
6. Switch suction fan off .
7. Raise hopper fully .

⚠ It is essential that the hopper controls are operated from outside the vehicle and not within the cab and the operator has a clear view of the hopper and rear door area.

⚠ Never work under a raised hopper without the hopper prop in the safety position.

8. With the load fully discharged, lower the hopper .
9. Move the vehicle clear of the discharge point.
10. Raise rear door fully up and ensure that the gas strut safety catch **③** locks into place as shown.
11. Remove any debris from the door seal and seal faces of the hopper.  
12. Holding rear door up release the gas strut safety catch **④** by pressing it in at **④** and lowering rear door.
13. Close the door and secure clamp **②** with locking pin **①**.



Using the auxiliary hand pump




In the event of hydraulic system failure, an auxiliary manually operated hydraulic pump is fitted, to enable the hopper to be operated. This is located on the left hand side of the vehicle, adjacent to the hydraulic and water valves. The pump handle is stowed in the cab in a locker under seat.

i It should be noted that it will require a substantial number of pumping cycles to complete the following operations. The assistance of a second person is preferable.

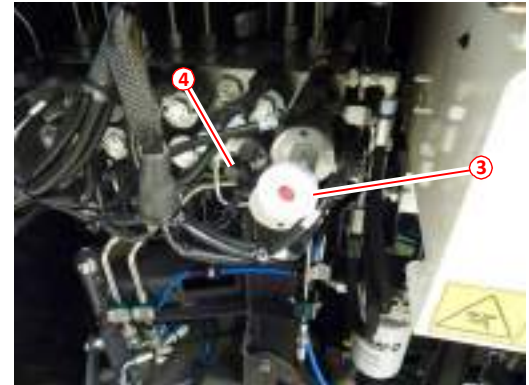
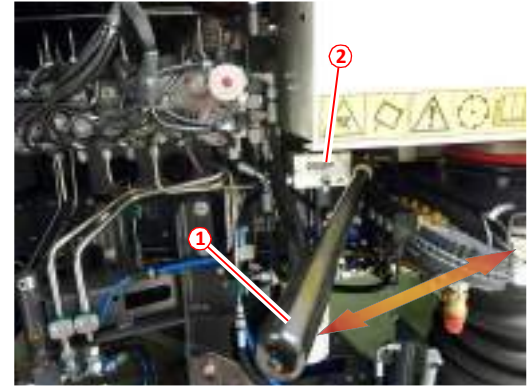
Follow the procedure below:

1. Switch the engine and ignition off. Apply the handbrake.
2. Open left hand gantry door to access the main valve block.
3. Insert the pump handle ①, into the pump ②.
4. To raise hopper, press in and turn to latch the control on top of raise and lower solenoid ③.
To lower hopper, pull out and turn to latch the control on top of raise and lower solenoid ③.
5. Push in and hold unloader valve ④.
6. Operate the pump handle to raise or lower the hopper manually.
7. When hopper is in position required, release unloader valve ④ and unlatch control ③.
8. Stow handle when finished with.

Alternate procedure, this will require two people to perform:

1. Apply the handbrake. Switch the ignition on but do not start engine.
2. Insert the pump handle ①, into the pump ②.
3. One person is required to press and hold the raise or lower buttons  or  and the safety interlock button  on the remote control.
4. Second person then operates the pump handle to raise or lower the hopper manually.
5. When hopper is in position required, release the buttons on the remote control.
6. Stow pump handle when finished with.

⚠ Never work under a raised hopper unless an appropriate prop is used.



Hopper safety prop

⚠ Never work under a raised hopper without the hopper safety prop in the safety position.

If the hopper has been raised it is essential that the hopper safety prop be deployed if any work under the hopper is going to be carried out. The hopper safety prop is located underneath the hopper and is usually located kerbside.

Deploying hopper safety prop

Grab the handle and swing the hopper safety prop down and place into the safety cup.

Retracting the hopper safety prop

Raise hopper fully and then swing up the hopper safety prop back into its stowage position under the hopper. The hopper can now be lowered back down.



Dust suppression system

Low pressure water system

The low pressure water is used on the front brushes, suction tube(s), side brush(es) and wide sweep brush. To operate any of these functions the relevant button(s) on the main panel must be selected when in sweep mode. The front and side brush(es) are fitted with shut off valves.

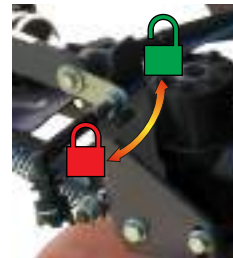
Filling the water tank

1. Open the driver's side hopper locker.
2. Attach water hose with hydrant adaptor if available to the connector ① or insert a water hosepipe.
3. Fill with clean water to the top of the level indicated by the side of the sight tube ②.
4. When full remove hose and close locker door.

Draining the water system

⚠ It is vital that the water system is drained totally if the air temperature is expected to fall to 0°C or below.

1. Remove the strainer from the inside of the low pressure water filter ③, which is located under the rear right of hopper. They can be opened without raising the hopper. Repeat for the high pressure water filter ④, if fitted, it is located under the rear left of the hopper.
2. Open all the brush shut off valves.
3. With engine running, sweep mode on ①.
4. Switch on all water spray functions, on the main control panel, until the system is dry. See page 28.



Front Brush Shut-Off Valve



Side Brush Shut-Off Valve

High pressure water system

- ⚠ High pressure water can be hazardous, always wear goggles or suitable eye/face protection when in use.
Exercise extreme care when using the lance, do not direct the jet at other people or electrical connections.
Failure to comply can result in serious injury.**




Using the high pressure water system

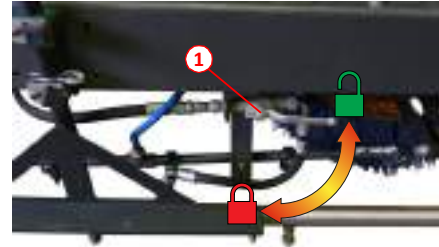
The high pressure water system is a set of optional components.

High pressure water is used on the follow options:-

- Front high pressure spray bar.
- Hand lance.

To operate any of the above functions

1. Sweep mode must be on **①**.
2. Press the high pressure water switch  on the auxiliary control panel.
3. If using the front high pressure spray bar then open shut-off valve **①** located between the pump and front spray bar.
4. If using the lance then the shut-off valve **①** should be closed.



Hand lance

The hand lance ① is stored in the left side hopper locker.

Retractable hose

The hand lance ① attaches to a 13 metre long rubber hose fitted to the hose reel ③ via a quick release system. When extending the hose a ratchet mechanism allows the reel to lock in place. Further extending past the ratchet allows the hose to retract back onto the reel.

Attaching the hand lance

⚠ The system must be de-pressurised prior to attaching the lance.

1. Sweep mode off ①.
2. Open the front high pressure spray bar shut off valve.
3. Release the coupler ② from its stowed position.
4. Attach the lance ① to the coupler ②.
5. Close the front high pressure spray bar shut off valve ④.
6. The high pressure lance is now ready to use.

Hand lance detergent

Detergent to be used with the high pressure hand lance is an option.

1. With the hand lance connected and in use.
2. Check detergent container has sufficient fluid.
3. Turn the control valve ⑤ on.
4. Adjust nozzle ⑥ at end of hand lance to achieve desired spray pattern.

⚠ It is vital that the water system is drained totally if the air temperature is expected to fall to 0°C or below.

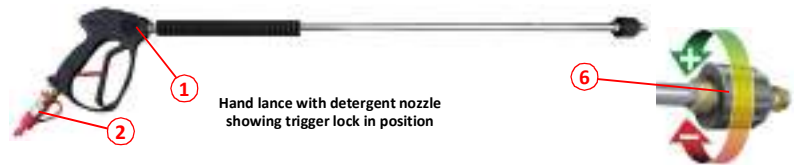
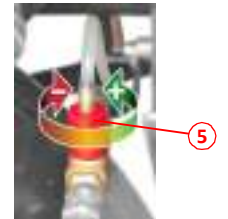
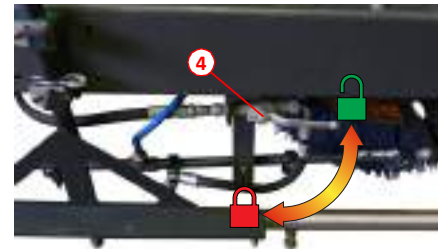
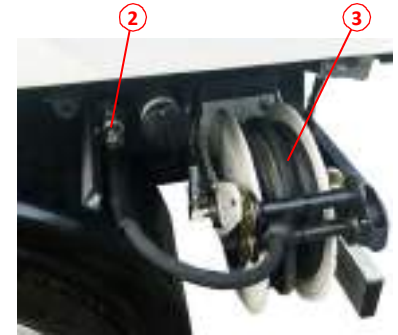
Draining high pressure water system

Follow instructions to drain the water system on page 37.

⚠ Never allow the high pressure pump to run dry.



Locker showing scraper, hand lance, water tank filler and optional stand pipe






Hand lance with detergent nozzle showing trigger lock in position

Wander hose




Manual blanking

When the wander hose needs to be used the suction path needs to be blocked off and if the sweeper does not have auto blanking then this needs to be done manually with a blanking plate also when transporting full loads to the tipping point the blanking plate should also be used.

Placing blanking plate

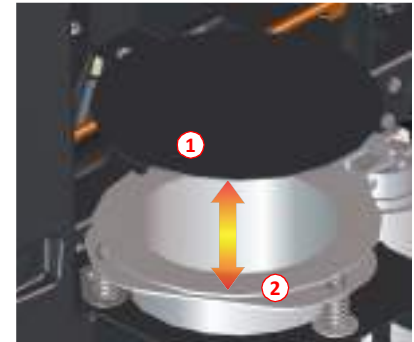
1. Select neutral with yellow control lever, see page 23 or 32.
2. Turn sweep mode off  and apply handbrake.
3. Take the blanking plate out of the locker.
4. Raise the hopper fully and apply the hopper safety prop, see page 36.
5. Place the blanking plate  on top of the suction spigot .
6. Retract hopper safety prop and lower hopper.
7. The wander hose can now be deployed and used if required, see page 41.

Removing blanking plate










1. Select neutral with yellow control lever. See page 23 or 32.
2. Turn sweep mode off  and apply handbrake.
3. Raise the hopper fully and apply the hopper safety prop.
4. Lift and remove the blanking plate  from the top of the suction spigot , see page 36.
5. Retract hopper safety prop and lower hopper.
6. Place the blanking plate back in the locker.



Blanking plate stowed in locker



Deploying the wander hose

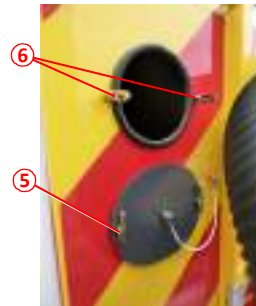
1. Select neutral with yellow control lever. See page 23 or 32.
2. Turn sweep mode off  and apply handbrake.
3. If the sweeper is fitted with rear traffic control sign then remove this first by removing R-clip  and then undoing the captive fasteners , lift then rotate/pull forward to open.
4. Lift the wander hose from the stowage brackets and remove it from its central stowage position by undoing the captive fasteners .
5. Remove the blanking plate  by undoing the fasteners from either side of the rear door. Stow the blanking plate on the fasteners below the aperture .
6. Attach the wander hose over the aperture, using the fasteners .
7. Turn sweep mode on  and suction fan on .
8. The wander hose can now be used.



Traffic Sign Attached To Wander Hose Stowage Brackets



Wander Hose in Stowage Position




Wander Hose Aperture and Blanking Plate Stowage



Wander Hose in Attached Position

Stowing the wander hose

1. Turn sweep mode off .
2. Undo the fasteners and remove the wander hose.
3. Undo the fasteners holding the stowed blanking plate, remove blanking plate and place over the aperture and close the fasteners.
4. Attach wander hose back on its stowage fasteners and place wander hose back in its stowage brackets.

Cab tilt

Standard cab tilt

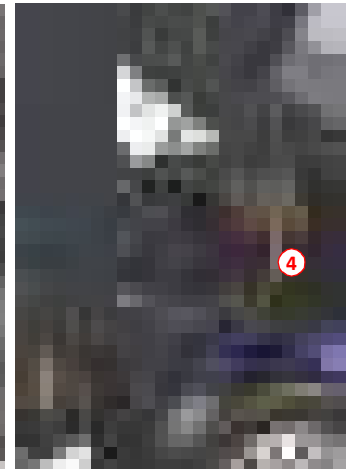
⚠ Before tilting the cab, ensure that there is sufficient space to do so and all loose items are safely stowed.

1. Open the cab lock cover ①, located between the seats.
2. Place the cab lever ② in the unlock position.
3. With all doors closed hold safety lever ③ open. Always on right side.
4. Lift cab in an upward direction.
5. Deploy the safety prop ④ and ensure it is sitting in its pocket.

⚠ Never work under a raised cab without the cab prop in the safety position.

⚠ Before lowering the cab, ensure the area below is clear of any obstructions.

6. Stow the safety prop ④.
7. Lower the cab.
8. Engage the cab locking lever ②.
9. Close the cab lock cover ①.



Clearing a blockage in the suction path



A blockage in the suction path will be indicated by a trail of material behind the vehicle.

Follow the procedure below for removal as soon as possible:-

1. With all sweep gear retracted and stowed.

⚠ Never raise the hopper where the load it contains or the ground you are on could cause the vehicle to become unstable.


2. Raise hopper fully , deploy the safety prop, stop engine, remove ignition key.

⚠ Never work under a raised hopper without the hopper prop in the safety position. See page 36.

3. Visually check the suction path to determine the nature and location of the blockage. If no blockage is present then further investigation of the suction system will need to be carried out.

4. If the blockage is still present, use a suitable implement, a stout length of wood is ideal, to remove the obstacle by pushing it downwards.

⚠ Always be aware of the risk from sharp objects and never place your hands into the blockage, even when wearing gloves. Exercise extreme caution when handling any items removed from the suction system, keeping such activities to the absolute minimum.

5. Stow the hopper prop and lower the hopper . Do not start the suction fan at this stage.

6. Move the vehicle sufficiently to expose the cause of the blockage. Stop the vehicle, apply the parking brake and remove ignition key. Carefully isolate the blockage and if appropriate, place it in the hopper via the side loading hatch.

7. Resume sweep mode. Lower the suction nozzle and switch on the fan. Ensure the suction is functioning correctly.

8. Return to the start of the trail created by the blockage and resume sweeping.






Recommended operator's routine maintenance

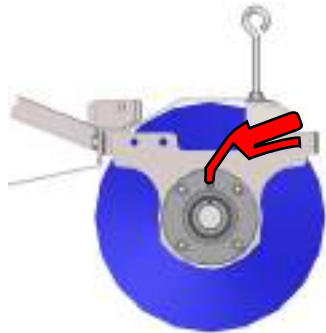


It is important that the following routine maintenance procedures are carried out as directed. This will help to ensure that your Scarab sweeper performs at the optimum level of safety and efficiency. Refer to the paragraphs immediately following this schedule.

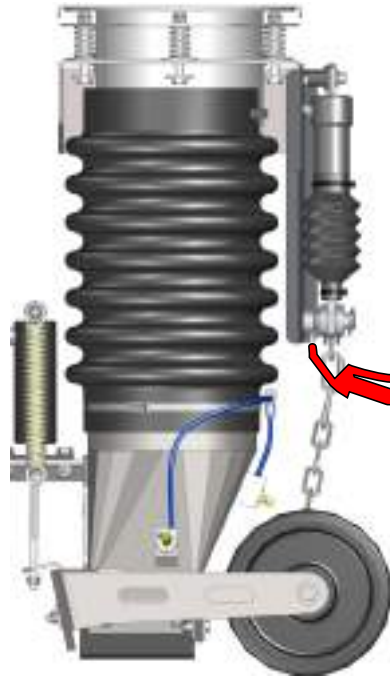
	Maintenance Procedure	Daily Actions		Weekly		Maintenance Procedure	Daily Actions		Weekly
		Before Use/	After Use				Before Use/	After Use	
1	Check vehicle/body for safety. All lighting equipment, tyres, fuel, oil, coolant, brake fluid, windscreen wash and water tank level.	✓	✗	✗	10	Lubricate as appropriate, all brush links and pivots. See page 45.	✗	✓	✗
2	Check hydraulic oil level and inspect system for signs of leaks. Check oil cooler is clean.	✓	✗	✗	11	Remove and clean the low pressure and high pressure water filter elements. See page 37.	✗	✓	✗
3	If vehicle not previously used by YOU, check suction fan is clean.	✓	✗	✗	12	Clean the suction fan thoroughly, using the scraper provided and high pressure water. See page 47.	✗	✗	✓
4	Check brushes/skirts for wear or damage. Remove entangled items, e.g. string, wire, strapping etc.	✓	✗	✗	13	Grease hopper ram at pivot points. Use a liquid spray grease. See page 45	✗	✗	✓
5	Check suction nozzle flaps for damage/correct ground clearance. See page 49.	✓	✗	✗	14	Visually check entire machine for wear/damage.	✗	✗	✓
6	Check water spray jets for blockages.	✓	✗	✗	15	Check wiring and hoses for security of attachment and signs of wear or damage.	✗	✗	✓
7	Check that all equipment is securely stowed and brushes are retracted.	✓	✗	✗	16	Check wear in suction tubes and deflectors in hopper.	✗	✗	✓
8	Wash vehicle, particularly hopper screen, surrounding ledges and area above. Leave hopper door partially open, to allow air to circulate. See page 48.	✗	✓	✗	17	Check seals on hopper door, side hatches and suction tubes.	✗	✗	✓
9	Wash oil cooler, ensuring that the fins are clean.	✗	✓	✗	18	Check oil level in high pressure water pump, top up if needed.	✗	✗	✓
					19	Lubricate all points. See page 45.	✗	✗	✓

-  It is vital that the water system is drained totally if the air temperature is expected to fall to 0°C or below.
-  In frosty weather leave the hopper slightly raised with the rear door and side doors slightly open.
-  The foregoing are general recommendations only. Actual requirements vary from territory to territory and depends on vehicle usage/operating conditions. If in doubt, consult your nearest dealer.

Lubrication points



Wide Sweep

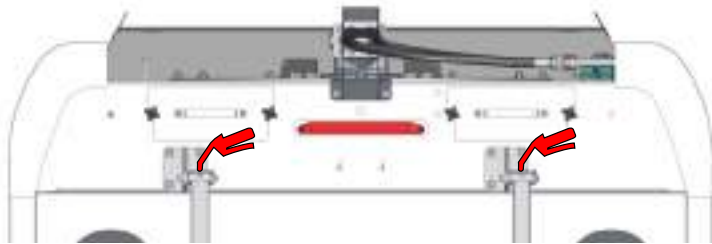


Nozzle Lift



Hopper Lift Ram Lubrication

Continued...



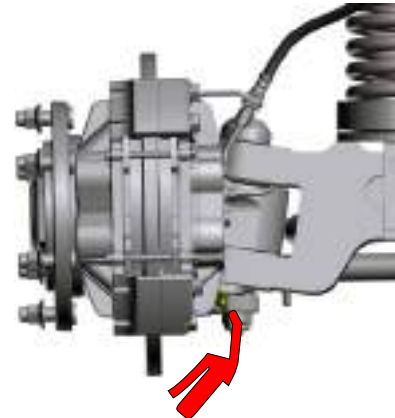
Rear Door



Cab Door



Auto-blanking (Dual Sweep)



Steering Hub King Pin

Basic maintenance





Cleaning the suction fan

⚠ Failure to comply with the following could result in serious injury.

⚠ Before working on the machine position it on firm, level ground and apply the handbrake.

The fan is an extremely heavy rotating mass. Never attempt to slow or stop its rotation by using the hands or by inserting any item into the fan chamber, even at low speeds.

Follow the procedure below:-

1. Unlock rear door. Raise the hopper fully , and deploy the hopper safety prop. Turn engine off. Remove ignition keys.
- ⚠ The hopper safety prop must always be deployed when the hopper is in the raised position. Failure to do so could result in serious injury.**
2. With the fan stationary, remove the outer and inner inspection covers from the hopper to expose the fan.
3. Using the special scraper, thoroughly clean all parts of the fan. A steam cleaner or high pressure water from a remote source will greatly assist in cleaning contaminated fans.
4. Refit the inspection covers, unlatch and stow hopper safety prop.
5. Start engine and lower hopper . Turn off engine.
6. Proceed to page 48 to clean hopper filter screen.



Please pay particular attention to the inner curve of each impeller blade, as indicated by the green/yellow arrow, and around the centre of the unit as dirt accumulates around the hub area.



Hopper filter screen cleaning

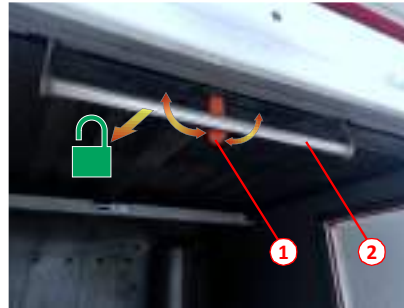


⚠ Before working on the machine position it on firm, level ground and apply the handbrake. Turn off engine.

1. Unlock and open rear door fully until door safety catch locks in place, see page 34.
2. Move safety catch ① to left or right to allow handle to move past it and then unlatch by moving handle ② forward then lowering the hopper filter screen.
3. Using a steam cleaner or high pressure water from a remote source, thoroughly clean the screen pleats ③ and the suction fan inlet cone ④.
4. Raise hopper filter screen and close latch.
5. Holding rear door up release the gas strut safety catch by pressing it in, lower door and lock it, see page 34.

⚠ Loose particles from the cleaning procedure can be ejected via the hopper cover when the fan is restarted, ensure that all personnel are clear of the area before re-starting the fan. Safety eye protection must be worn.

6. Start engine, turn sweep mode on ① and suction fan on ②.
7. Open a side access hatch and direct additional water on to the screen below the inlet cone ⑤, until only clean water is expelled from the fan casing via the hopper cover.
8. Close side access hatch.
9. Turn suction fan off ③, turn sweep mode off ① and stop engine.



Screen safety catch and lowering handle



Screen in lowered position ready for cleaning



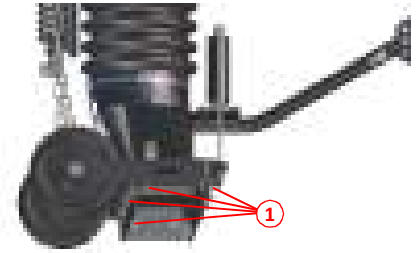
Area to direct water onto screen through side access hatch

Suction nozzle flap adjustment

The suction nozzle flaps should be in good condition, and adjusted to the correct clearance from the road surface (15 mm).

These flaps have slotted holes to allow up and down adjustment after loosening the appropriate nuts, bolts ①. After you have adjusted tighten anything loosened.

i For some operating conditions, it might be found that, alternative clearances are preferred.



Brush adjustments

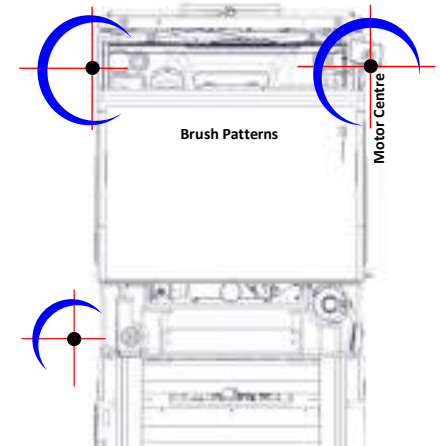
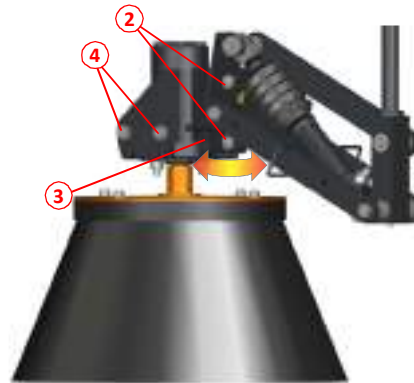
Brush contact with the road surface can be altered as follows:

⚠ Before proceeding ensure people and objects are clear of the brush area.

1. With the vehicle stopped, handbrake on, and in sweep mode, activate the desired brush(es) in the working positions.
2. Switch off ignition and remove the key.

⚠ Do not attempt to alter the brush settings while the brush is rotating.

3. Slacken nuts ② at back of motor plate ③ this will allow the brush unit to rotate slightly to the left or the right.
4. Slacken bolts ④, on both sides, which will allow the brush unit to tilt forward and back.
5. Adjust until the brush is at the correct contact with the road surface.
6. Tighten any items slackened during adjustment.
7. Start the vehicle, stow all sweeping equipment activated for adjustment.




Fluid levels

Engine coolant


 It is advisable to top-up the coolant level when the engine is cold.

 **Coolant is a toxic fluid. Avoid contact with the skin environment.**



 **If topping up is required when the coolant is hot adequate protection must be taken, as an overpressure will have built up in the system.**


 Ensure that the vehicle is on a flat and level surface with the engine stopped and handbrake on.

Topping up

The coolant expansion tank is fitted with a low level sensor that will display the 'Fault Active' symbol  on the LCD monitor. The operator should then further investigate via the diagnostics screen on the LCD monitor.

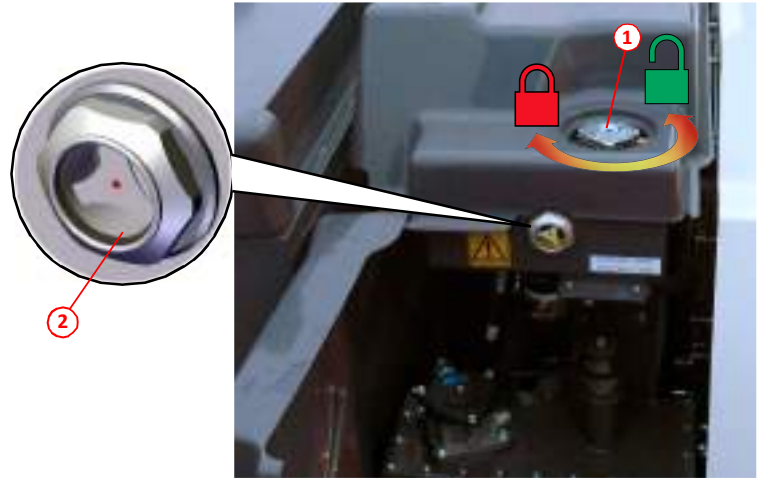
To check and top up the coolant fluid use the following procedure:-

1. Open left hand side gantry locker.
2. Remove the filler cap  from the expansion tank.
3. Run the engine for several minutes.
4. Stop the engine.
5. Check the coolant level using the sight glass  on the side of the expansion tank.
The coolant level should be within the sight glass and ideally level with the dot in the centre of the sight glass.
6. If required top up coolant to the required level using the correct coolant mixture.
7. Replace the filler cap.
8. Close the locker door.

 **Coolant:- Must be O.A.T. specification.**

DEUTZ DQC CB-14

Scarab use FUCHS MAINTAIN FRICONFIN LL with a 50/50 mix to ASTM D4985.



Hydraulic oil tank

⚠ It is important to top-top the hydraulic oil level only when the system is cold.

i The hydraulic oil tank level gauge is fitted with a low level sensor. If the oil level drops too low the certain operations will be switched off.

i Ensure that the vehicle is on a flat and level surface with the engine stopped and handbrake on.

Topping up

1. Open left hand side gantry locker.
2. Using the appropriate size spanner, remove the filler cap ①.
3. Top-up with the correct hydraulic oil, see below, to the appropriate level on the level label ②.
4. Replace the filler cap ①.
5. Close the locker door.

i Hydraulic oil:- Fuchs Renolin B10 VG 32 or HLP 32 equivalent.

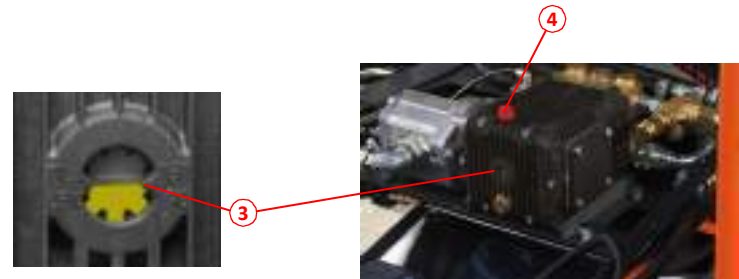
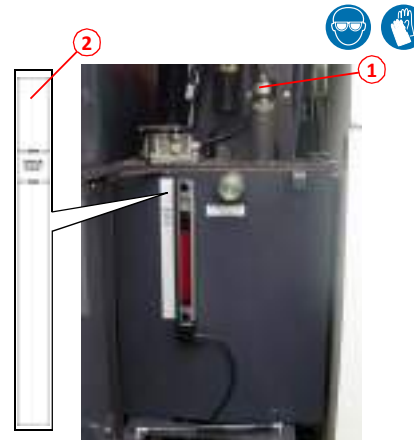
High pressure water pump

The high pressure water pump is located under the hopper at the back of the chassis. Located at the front on the casing is an oil level sight and the oil level should be within this window and ideally at the centre as indicated by the opposing arrows at the edge of the sight window.

Topping up

1. Check the oil level in the sight window ③.
2. If the oil level requires topping up then undo filler cap ④ and fill to the correct level with the appropriate oil.
3. Replace the filler cap ④.

i Oil:- SAE 30W



Filling the Fuel Tank

⚠ Ensure that the machine is on a flat and level surface when filling the fuel tank.

The DEUTZ TCD 2.9L engine uses ultra low sulphur diesel fuel to EN590.

To check the level of the fuel in the tank, switch on ignition and use the fuel gauge on the instrument panel. See page 20.

To fill the fuel tank use the following procedure:

1. The fuel filler ① is located at the rear left of the machine below the hopper and to the rear of the rear mudguard.
2. If a lockable filler cap is being used then insert key and unlock.
3. Turn filler cap ant-clockwise and remove.
4. Fill with correct fuel as required.
5. Replace filler cap and lock if lockable cap fitted.

⚠ If the engine has run out of fuel or the fuel filters and/or the fuel pumps have been removed or replaced then please follow the priming procedure on page 5.



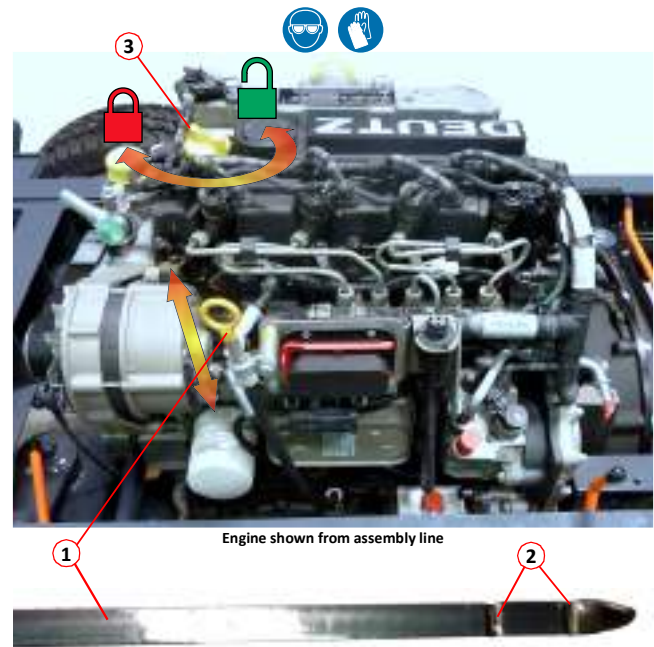
Engine oil

- ⚠** It is important to check/top-top the engine oil level when the engine is cold.
- i** Ensure that the vehicle is on a flat and level surface with the engine stopped and handbrake on.
- i** Raise the cab in accordance with the instructions on page 42.
- ⚠** **Never work under a raised cab without the cab safety prop being in the safety position.**
- ⚠** **Allow the engine and its surrounding area to cool before checking.**

Topping up

1. Remove dipstick ① by pulling upwards from its holder.
2. Wipe the bottom of the dipstick clean with a lint free cloth.
3. Replace in holder.
4. Remove dipstick again and check the level at the bottom of the dipstick.
5. The level should be within the area between the two lines ②. It should never be above or below this area.
6. Remove the filler cap ③.
7. Pour the correct grade oil, see below, through the opening, allowing time for the oil to drain through to the sump, check the level and repeat this process until the correct level is achieved.
8. Replace the filler cap ③.

i Engine oil:- 10w-40.



Brake fluid

⚠ Brake fluid is highly corrosive. Take appropriate measures to protect yourself and the surrounding area. Remove any spilt fluid immediately with plenty of water.

⚠ It is important to check/top-top the engine oil level when the engine is cold.

i Ensure that the vehicle is on a flat and level surface with the engine stopped and handbrake on.

i The brake fluid reservoir is fitted with a low level sensor, if the level falls below the minimum a warning light will illuminate on the dashboard.

The brake fluid reservoir is located on dash just above the heater controls.

Topping up

1. Remove the cover ① by removing the two thumbscrews ②.
2. Unscrew filler cap ③.
3. Carefully pour brake fluid through the opening until the correct level is achieved.
4. Replace the filler cap ③.
5. Replace the cover ① and the two thumbscrews ②.

i Brake fluid:- DOT 4.

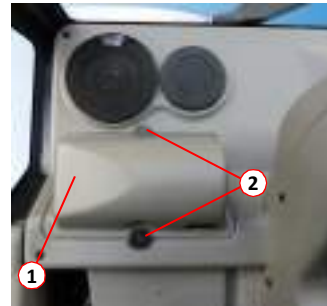
Screen wash

The screen wash bottle is located in the cab on the driver's side below the heater controls.

Topping up

1. Check the fluid level in the reservoir ④.
2. Flip up the filler cap ⑤.
3. Top up via the filler opening.
4. Replace the filler cap ⑤.

i When topping up it is advisable to use a screen wash fluid that has a cleaner in it. For winter periods use one that contains an antifreeze.



DPF regeneration (Stage V engines only)

During use of the sweeper the DPF ash/soot warning symbol may appear on the Main screen. This indicates that a standstill DPF regeneration is required. DPF regeneration is the process of burning off (oxidizing) the accumulated soot from the diesel particle filter (DPF).

i The regeneration process cannot be forced via the main screen. It can only be released if the Deutz ECU is requesting regeneration due to ash/soot load or 550 engine hours have passed since the last regeneration.

i The Serdia (Deutz) tool can be used to force a regeneration if desired.

⚠ Ensure that the vehicle is parked somewhere safe, away from the public, with plenty of ventilation.

DPF regeneration prerequisites

- Engine coolant temperature must be above 75°C
- Engine must be at idle
- The ECU must be requesting a standstill regeneration or is being forced by the service tool
- Enough fuel for at least 30 minutes run time.

DPF regeneration process

The operator must authorise the regeneration process by pressing the release button on the Scarab control system display. Not the truck dashboard which may have its own button for the truck engine with a similar symbol.

This can be done via any of the screens shown to the right.

Press button **9** from the Main screen or press button **3** from either the After-treatment screen or the EOL Test/Regen screen.

The regeneration process takes about 20 minutes but could be shorter or longer depending on condition of the DPF. Button **2** from the After-treatment screen or EOL/Test Regen screen will cancel the Regen process.

i For more information on how to access these screens see the section "LCD Monitor Screen" starting on page 56.

Whilst the regeneration is active the sweeper functions are disabled, this is to allow the system to control the engine speed at a known load to carry out the regeneration efficiently.

Regeneration process completion

When the regeneration process has completed the following will happen depending on what screen you are viewing.

- The warning symbol will disappear from Main screen.
- On the After-treatment screen the Regen Status will show "Not Active".
- On the EOL Test screen the Regen Flag will show "Regen finished successfully".

Normal use of the sweeper is now available.



Main screen



After-treatment screen



EOL Test/Regen screen

LCD monitor screen


Boot up screen

Screen boot up takes 12 seconds from ignition on. A sleep function is active for the first 30 minutes after ignition has been turned off, if the ignition is switched back on the screen is ready within 2 seconds.

If you need to power down the screen fully after ignition has been turned off then press buttons ①, ⑤, ⑥ and ⑨ simultaneously.

Button function

- ① **Camera** - Press to enable rear view while in forward drive.
- ② Not used.
- ③ **Buzzer silence** - Press to silence hopper and rear door activity buzzer.
- ④ **DPF regeneration**.
- ⑤ Not used.
- ⑥ **Contrast screen** - Press to change background colours (black/white).
- ⑦ **Menu** - Press to access the menu screen (Bottom right illustration).
- ⑧ **Hours** - Press to view hours logged.
- ⑨ **Return** - Press to return to previous screen.
- ⑩ **Encoder** - Turn to highlight required option, press to enter. Used in all screen modes. Press to display side tabs from the sweeping mode screen.

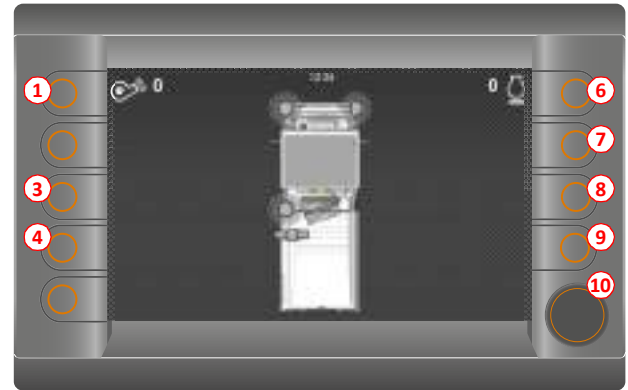
 *Button function may change depending on the screen that is being displayed.*



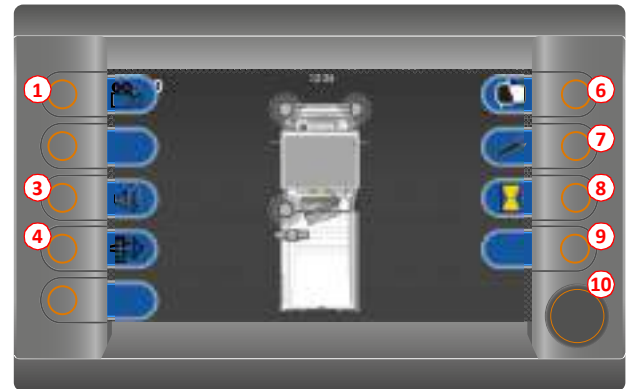
Operators screen

Button function

- ① **Camera** - Press to enable rear view while in forward drive, if enabled. Page 59.
- ③ **Buzzer silence** - Press to silence hopper and rear door activity buzzer.
- ④ **DPF regeneration** - Press to start the DPF regeneration procedure if conditions are met (*see page 55*).
(*Deutz Stage V engine only*).
- ⑥ **Contrast screen** - Press to change background colours (dark/light).
- ⑦ **Menu** - Press to access the menu screen. Page 58.
- ⑧ **Hours** - Press to view hours logged. Page 59.
- ⑨ **Return** - Press to return to previous screen.
- ⑩ **Encoder** - Turn to highlight required option, press to enter. Used in all screen modes. Press to display side tabs from the operators screen.



Operators screen in Sweeping Mode



Operators screen with button tabs displayed

Operators menu screen

To access this menu screen from the operators screen press button ⑦.

Button function

- ⑨ **Return** - Press to return to previous screen.
- ⑩ **Encoder** - Turn to highlight required option, press to enter.

Rotate the encoder ⑩ to the required option, the option highlighted will have a red border and a grey background, press the encoder ⑩ to select the option.



Operators fault selection. Page 60.



Engine fault screen. Page 62.



Screen settings. Page 64.



Information. Page 66.



Button check. Page 67.



Supervisors menu (Password protected).



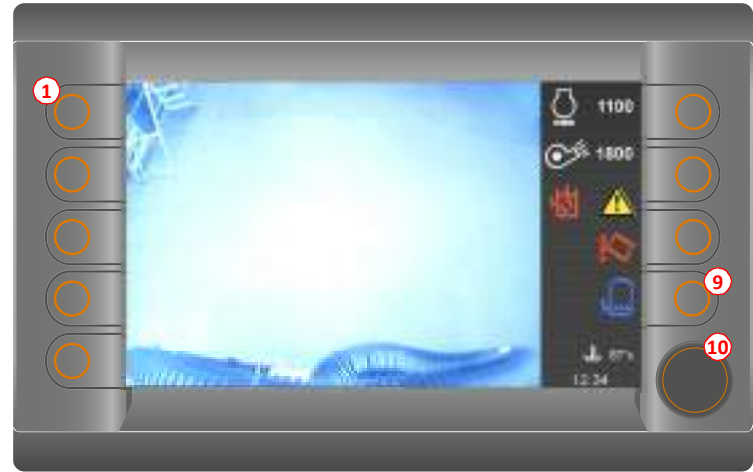


Hours screen

To access this screen from the operators screen press button ⑧.
Displays the working time of various functions.

Sweeping hours	Sweeping distance	Average fuel used per hour
Engine hours	Distance	Fuel used per hour in transit
Overloaded hours	Service hours	Fuel used per hour sweeping
Total fuel used		Fuel used per hour average total life

i Service hours only displays when the option has been activated from the service reminder screen within the supervisor menu.
Pressing button ⑨ will exit from this screen.



Camera screen

To access this screen from the operators screen press button ① if it has been enabled. See page 65.

Displays the view from the rear camera on screen along with essential functions on the right side of the screen. Enables the operator to see behind whilst driving forward.

Pressing the encoder ⑩ will display the tab of the Return button ⑨.

i Putting the vehicle into reverse drive will override whatever is displayed here with the view from the rear camera.
Pressing button ⑨ will exit from this screen.



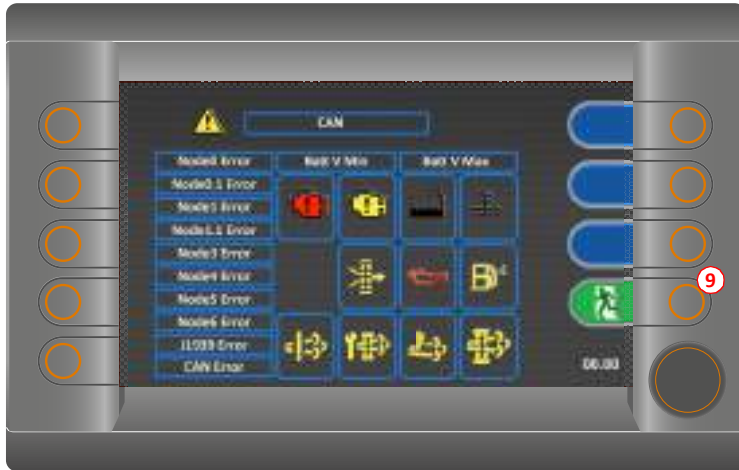
Operator faults selection screen

Allows the operator to select the CAN or Nodes to display any errors on them.

Rotate the encoder ⑩ to the required option, the option highlighted will have a red border and a grey background.












Press the encoder ⑩ to select the highlighted option.

Pressing button ⑨ will exit from this screen.



CAN faults screen (Deutz Stage V)

Show where CAN error is. Errors are displayed with a red background.

 Red engine fault.	 Yellow engine fault.
 Engine water level.	 Engine water temperature.
 Air filter blocked.	 Low oil pressure.
 Water in fuel.	 SCR system.
 DPF Ash Maintenance.	 DPF Temperature.
 Standstill regeneration.	








Pressing button ⑨ will exit from this screen.



CAN faults screen (NOT Deutz Stage V)

Show where an error on the CAN is.

Errors are displayed with a red background.

 Red engine fault.
 Yellow engine fault.
 Engine water level.
 Engine water temperature.
 Air filter blocked.
 Low oil pressure.
 Water in fuel.

Pressing button ⑨ will exit from this screen.



Node error screen

Entering a Node screen allows Pin-Contact view. Pin numbers with an active fault are highlighted with a red background. The symbols below show what type of error is checked on each pin.

-/- = Open Circuit

□ □ = Short

Pressing button 9 will exit from this screen.

i Node 3 shown, other Nodes are similar.



Engine faults screen

Shows information on various sensors of the engine.

Turbo air temperature		Turbo boost pressure
Engine speed	Fuel litres used per hour	Barometric pressure
Battery voltage	Fuel rail pressure	Oil pressure
Coolant temperature	Fuel priming pressure	Engine load
Accelerator pressed %		Road speed

Pressing button 9 will exit from this screen.



After treatment (Deutz Stage V only)

Displays the following current conditions:-
(Left to right, top to bottom)

Soot build up percentage	Exhaust temp at DOC outlet	Regeneration Status
Ash build up percentage	Exhaust temp at DOC inlet	Filter Status
Ambient temperature at air filter intake	Differential pressure sensor	Time since last regeneration
Warning lights - Indicator lights glow orange if active		

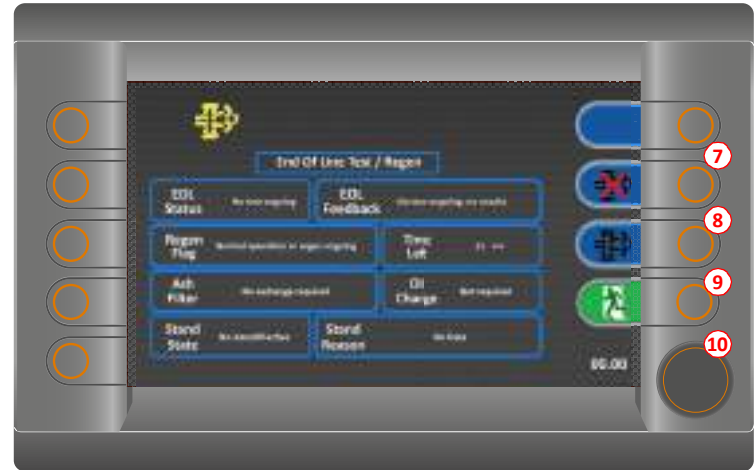
Button ⑦ will cancel a running regen.

Button ⑧ will start a regen if conditions met (see page 55).

Button ⑨ will exit screen.

Rotate the encoder ⑩ clockwise to go to the EOL Test/Regen.

Rotate the encoder ⑩ counter-clockwise to go to the Vehicle values



EOL Test/Regen (Deutz Stage V only)

Displays the status of the End Of Line Test / Regen
(Left to right, top to bottom)

EOL Status	EOL Feedback
Regen Flag	Time Left
Ash Filter	Oil Change
Stand State	Stand Reason

Button ⑦ will cancel a EOL Test/Regen if active.

Button ⑧ will start EOL Test/Regen.

Button ⑨ will exit screen.


Rotate the encoder ⑩ counter-clockwise to go to the After-treatment screen.





Screen settings

Rotate the encoder ⑩ to the required option, the option highlighted will have a red border and a grey background.

Press the encoder ⑩ to select the highlighted option.

 Screen brightness settings.

 Date and time settings.

 Camera activation.

Pressing button ⑨ will exit from this screen.



Screen brightness setting

Rotate the encoder ⑩ to increase or decrease by 2% increments or decrements the brightness level of the screen. The green bar will show the level of brightness and the % value will be shown below in white.

Pressing button ⑦ will increase brightness to 100%.

Pressing button ⑧ will decrease brightness to 10%.

Pressing button ⑨ will exit from this screen.



Date and time settings

Highlighted box is shown with a red border and grey background.

If the highlighted box is flashing then it enables you to adjust the current value by turning the encoder ⑩.

If the highlighted box is static then it enables you to navigate to another box by turning the encoder ⑩.

Toggle navigating to other boxes or adjusting the value by pressing the encoder ⑩.

Once you have adjusted the date and time as necessary, ensure that the highlighted box is not flashing and then press the set button ⑥.

Pressing button ⑨ will exit from this screen.

i If button ⑥ has not been pressed then any changes will be lost upon exit.



Camera activation

Enables the camera view from the operator screen.

The highlighted box is shown with a red border and grey background.

To toggle the camera view on/off rotate the encoder ⑩ to move the highlighted box to the ON/OFF box and then press the encoder ⑩.

If the camera view is on then a green tick will appear in the graphic display of the screen as shown above.

Pressing button ⑨ will exit from this screen.



Information screen

This screen will display the works number of the machine, and the firmware and software levels of the control nodes.

Press button 6 to access the PDF screen.

Rotate the encoder 10 to access the options active screen.

Pressing button 9 will exit from this screen.



PDF viewer warning screen

The PDF viewer warning screen gives you a warning that you must follow before accessing it.

Press button 8 to access the view and then follow the instructions there to access and view stored PDF files.

Pressing button 9 will exit from this screen.

⚠️ Only use the PDF viewer when vehicle is stationary and the engine is off. Turn ignition off and after you have exited from the PDF viewer.



Options active screen

This screen displays all the active options and is used to help diagnose possible issues and you may be asked by Scarab Technical Support to access this screen and confirm option numbers.

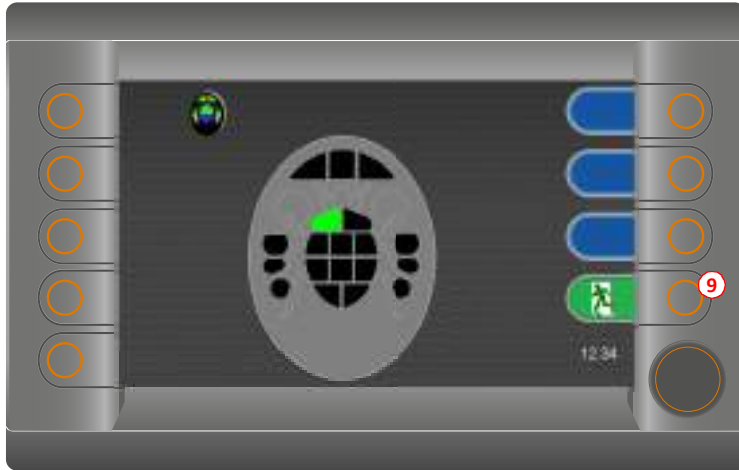
Pressing button ⑨ will exit from this screen.



Button check menu

Rotate the encoder ⑩ to move the red/grey highlight box to the option you require and then press the encoder ⑩ to select.

Pressing button ⑨ will exit from this screen.

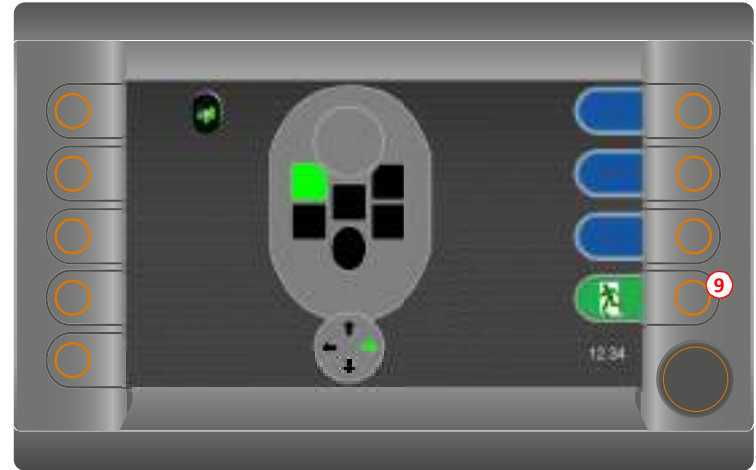


Main control panel button check

Press buttons on the main control panel and the corresponding button should light up green as shown above.

A beep will sound if the function is fitted to the sweeper.

Pressing button 9 will exit from this screen.



Auxiliary control panel button check

Press buttons on the main control panel and the corresponding button should light up green, as shown above.

Move the multi-function lever and an arrow should light up according to direction the lever was moved in, as shown above.

A beep will sound if the function is fitted to the sweeper.

Pressing button 9 will exit from this screen.



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M25H Road Sweeper



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Scarab Sweepers Limited

Pattenden Lane, Marden, Kent TN12 9QD

Telephone: 01622 831 006
International: +44 (0) 1622 831 006
e-mail: scarab@scarab-sweepers.com

Manual No. SCAZ043075 1.7.01

Fax: 01622 832 417
International +44 (0) 1622 832 417
Web site: www.scarab-sweepers.com

E&OE