



**SCARAB** *Hydrostatic*

**Truck-Mounted Sweepers**



**OPERATING INSTRUCTIONS** CANbus3

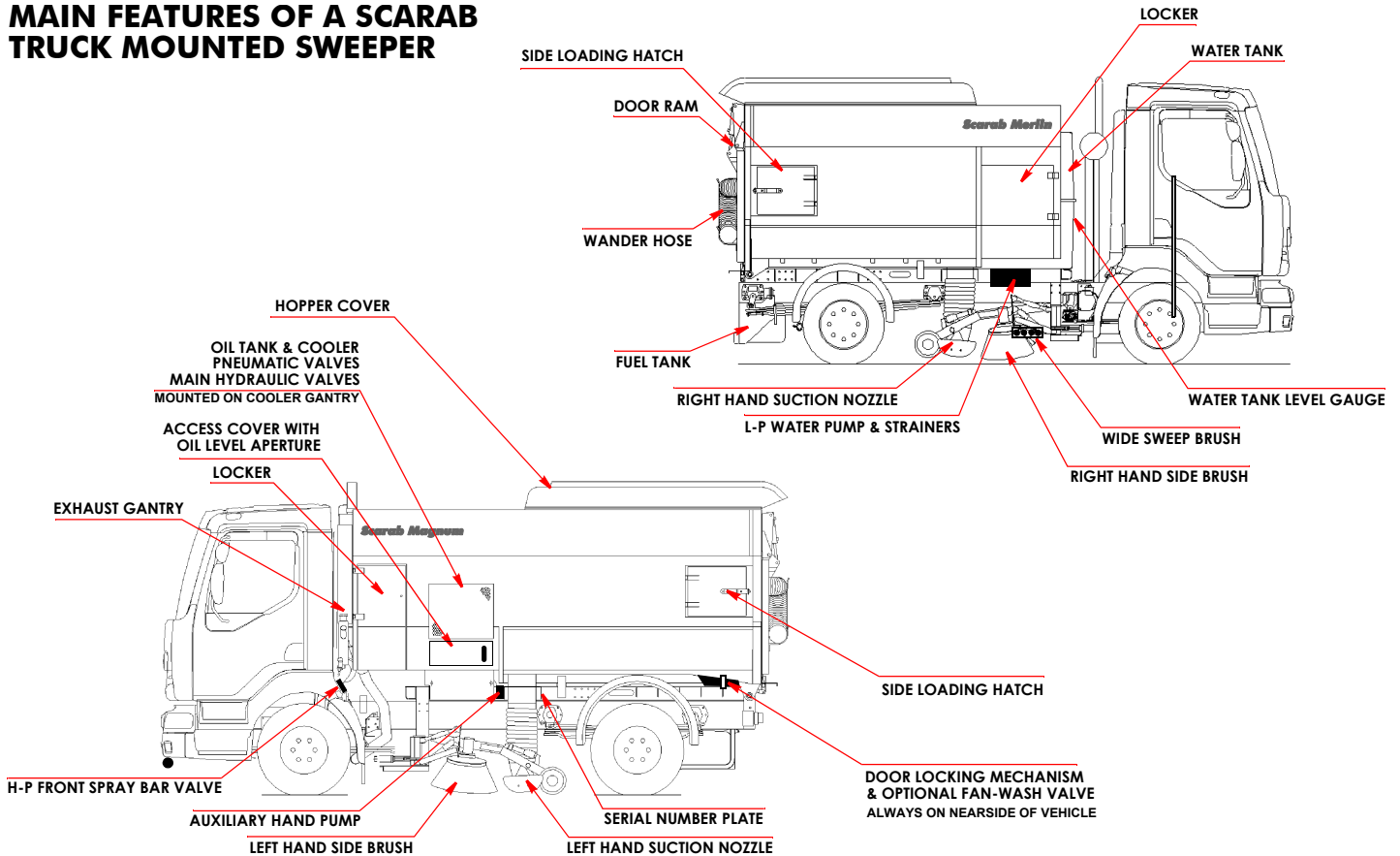
*Incorporating Basic Operator's Maintenance Information*

 This document contains important Health & Safety advice and must remain with the vehicle at all times



# OPERATING INSTRUCTIONS - *Hydrostatic Truck-mounted Sweepers*

## MAIN FEATURES OF A SCARAB TRUCK MOUNTED SWEEPER





# SCARAB MERLIN XP - MERLIN - MAGNUM

## OPERATING INSTRUCTIONS FOR HYDROSTATIC VEHICLES EQUIPPED WITH CANbus 3 Incorporating Basic Operator's Maintenance Information

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## GENERAL INFORMATION



### WARNING - VOLTAGE SENSITIVE COMPONENTS

**DO NOT USE A BOOST STARTER / SUPER START. A BOOSTED START WILL BURN OUT THE VEHICLES ELECTRONIC CONTROL NODES. IF BATTERIES ARE NOT CHARGED ALWAYS USE A FRESH SET.**

#### WEIGHTS, DIMENSIONS AND CAPACITIES

##### GROSS VEHICLE WEIGHT (GVW)

MERLIN .....	7.5 tonne to 12.0 tonne
MAGNUM .....	13.0 tonne to 15.0 tonne
<b>PAYLOAD*</b>	
MERLIN .....	Typically 2300 kg to 6300 kg
MAGNUM .....	Typically 6340 kg to 8540 kg
Overall Length* .....	Typically 5500 mm
Front Overhang* .....	Typically 1240 mm
Rear Overhang* .....	Typically 1350 mm
Wheelbase* .....	Typically 3000 mm
Overall Width* .....	Typically 2220 mm
Overall Height (hopper lowered)* .....	Typically 2980 mm
Overall Height (hopper raised)* .....	Typically 4180 mm

##### HOPPER CAPACITY

MERLIN .....	5.5 m <sup>3</sup>
MAGNUM .....	7.5 m <sup>3</sup>

##### TANK CAPACITY\*

MERLIN Fuel Tank .....	Typically 100 litres
MAGNUM Fuel Tank .....	Typically 150 litres
Hydraulic Tank .....	15 litres
Water Tank* .....	900 litres to 1800 litres

#### TOWING

**SERIOUS DAMAGE TO THE TRANSMISSION WILL RESULT IF THE VEHICLE IS TOWED WHILE THE HYDROSTATIC DRIVE IS ENGAGED.**

If towing is necessary, it is imperative that the hydrostatic drive is disengaged before making any attempt to tow the vehicle.

#### IDENTIFICATION PLATES

The SERIAL NUMBER PLATE is located on the rear face of the left hand suction nozzle spigot.

The Serial Number will comprise four numerical digits only (for example 5843). For the location of the vehicle's VIN PLATE and CHASSIS NUMBER, refer to the chassis manufacturers' documentation.

#### LIMITATIONS OF USE

The Scarab Merlin and Magnum are classified as truck-mounted heavy-duty suction road sweepers and, as such, are intended only for operation in the sweeping and associated roles for which they have been expressly designed.

#### APPLICABILITY

This manual covers the operating requirements of the Scarab **Merlin XP**, **Merlin** and **Magnum Hydrostatic** sweepers with the CANbus 3 system.

*\* Dependent upon chassis and specification*



*In view of the fact that many of the foregoing values are subject to variables such as chassis type and machine specification, it is not possible to quote precise details. If this type of information is required, please contact our Technical Sales staff giving your sweeper's Serial Number.*



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## HEALTH & SAFETY ADVICE

**IN THE INTERESTS OF YOUR HEALTH AND SAFETY, IT IS IMPORTANT THAT THE FOLLOWING POINTS ARE OBSERVED AT ALL TIMES:**

- AT NO TIME SHOULD UNQUALIFIED PERSONNEL BE PERMITTED TO OPERATE OR WORK ON THE SCARAB SWEEPER.
- BEFORE DRIVING THE VEHICLE ENSURE THAT ALL RELEVANT VEHICLE CHECKS HAVE BEEN CARRIED OUT, THAT ALL EQUIPMENT IS STOWED AND THAT THE BRUSHES HAVE BEEN RAISED.
- DO NOT OVERLOAD THE HOPPER.
- DO NOT DRIVE THE VEHICLE 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 PROP IS IN POSITION.
- BEFORE OPERATING EITHER THE HOPPER-TIP CONTROLS OR REAR DOOR, 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:  
POSITION THE VEHICLE ON FIRM, LEVEL GROUND, APPLY THE HANDBRAKE, STOP THE ENGINE, REMOVE THE IGNITION KEY.
- ALWAYS WEAR THE APPROPRIATE PERSONAL PROTECTION EQUIPMENT WHEN OPERATING OR WORKING ON THE VEHICLE.
- BEFORE STARTING THE ENGINE ENSURE THAT ALL CONTROLS ARE SWITCHED OFF AND THAT THE VEHICLE IS IN NEUTRAL.
- KEEP LONG HAIR, LOOSE CLOTHING AND HANDS AWAY FROM MOVING PARTS.
- HIGH PRESSURE WATER CAN BE HAZARDOUS, ALWAYS WEAR SUITABLE EYE 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 & LAMP POSTS etc. AND ALWAYS EXERCISE EXTREME CAUTION IN PUBLIC PLACES.
- THE DRIVER'S SEAT AND MIRRORS SHOULD BE SO ADJUSTED AS TO MAKE IT POSSIBLE TO HAVE THE WINDOWS CLOSED WHILE SWEEPING. THIS NOT ONLY REDUCES IN-CAB NOISE, IT ALSO ENSURES THAT THE CORRECT POSTURE IS ADOPTED WHILE CONTROLLING THE VEHICLE. WHEN USING EXTERNAL EQUIPMENT, OR IF IT IS NECESSARY TO OPERATE WITH THE WINDOWS TEMPORARILY OPEN, DUE CONSIDERATION SHOULD BE GIVEN TO THE NEED FOR EAR DEFENDERS AND SAFETY GLASSES.

THE HAZARD SYMBOL  IDENTIFIES GENERAL SAFETY RELATED TEXT THROUGHOUT THIS DOCUMENT. WHERE APPROPRIATE, THE FOLLOWING ADDITIONAL SAFETY SYMBOLS ARE ALSO USED:  EYE PROTECTION,  PROTECTIVE FOOTWEAR AND  GLOVES.

The **Caution Symbol**  identifies where the observation of a specific procedure is required to avoid equipment damage or under-performance.

The **Information Symbol**  identifies text offering helpful advice additional to the main instructions.

The **Check Symbol**  identifies text calling for a visual examination to confirm the condition or status of a specific item.

**REMEMBER, FAILURE TO COMPLY CAN RESULT IN SERIOUS INJURY.  
IF IN DOUBT, ASK!**



### **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 where 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.



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## ADDITIONAL SAFETY ADVICE SYMBOLS

CHECK VEHICLE BEFORE DRIVING	IN NEUTRAL SWITCHES OFF BEFORE STARTING	CHECK ALL CLEAR TO RAISE BODY	FIRM LEVEL GROUND ONLY	USE CAB OR HOPPER SAFETY PROP	DO NOT DRIVE WITH BODY UP

## SWITCH FUNCTION ICONS

MAIN SWEEPING PANEL SWITCHES (FROM-TOP LEFT TO BOTTOM -RIGHT)			
	OPTIONS  (Additional information is appended at back of manual when applicable.)		LEFT HAND WORK LIGHTS - ON / OFF
	SWEEP MODE / HYDROSTATIC DRIVE		LEFT HAND SIDE WATER SPRAYS - ON / OFF
	BRUSH SPEED ADJUSTMENT STAGE 1 (+) & 2 (++)		WIDESWEEP WATER SPRAY - ON / OFF
	LEFT HAND SIDE BRUSH - ON / OFF		RIGHT HAND SIDE WATER SPRAYS - ON / OFF
	LEFT HAND SUCTION NOZZLE - RAISE / LOWER		RIGHT HAND WORK LIGHTS - ON / OFF
	WIDESWEEP BRUSH - ON / OFF		ENGINE SPEED - DECREASE
	RIGHT HAND SUCTION NOZZLE - RAISE / LOWER		LEFT / RIGHT HAND ADDITIONAL WATER SPRAYS - ON / OFF
	RIGHT HAND SIDE BRUSH - ON / OFF		ENGINE SPEED - INCREASE















# OPERATING INSTRUCTIONS - *Hydrostatic Truck-mounted Sweepers*

## SWITCH FUNCTION ICONS

### AUXILIARY (DOOR) PANEL SWITCHES

	HIGH PRESSURE WATER PUMP ☼		SUCTION FAN - ON / OFF
	SUCTION NOZZLE TILT		SUCTION FAN - ON / BOOST
	CRUISE CONTROL (PEDAL POSITION ONLY)		FAVOURITE SETTING

### REMOTE CONTROL SWITCH BOX

	HOPPER BODY - RAISE		HOPPER BODY - LOWER
	REAR DOOR - OPEN		REAR DOOR - CLOSE

☼ THIS SYMBOL INDICATES OPTIONAL EQUIPMENT FITS.

## OPERATING ADVICE

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

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

Many supposed operating problems can be traced to a lack of simple daily maintenance. Going out to sweep in a machine that has a blocked screen, a dirt encrusted suction fan, poorly adjusted suction nozzles or brushes is not only a waste of time; it is also a waste of fuel.

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.



## THE CANbus SYSTEM

The CANbus 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 any fault conditions that might occur.

**Switches:** The various types of switch function are grouped in two ways. Firstly they are colour coded as follows:

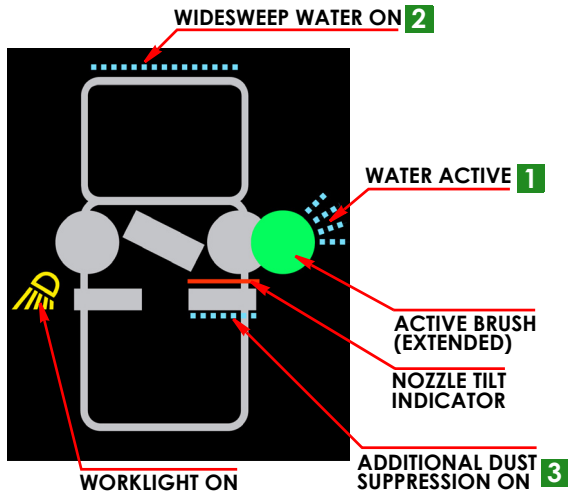
**AMBER** = Electrical functions such as lighting.

**RED** = Critical functions (e.g. Engage Hydrostatic Drive).

**GREEN** = Sweeping functions.

**BLUE** = Water Spray functions.

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



- 1. Function not selected
- 2. Side Brush/Nozzle pre-selected & activated
- 3. Side Brush/Nozzle Water pre-selected
- 4. Side Brush/Nozzle AND Water pre-selected
- 5. Side Brush/Nozzle AND water activated
- 6. Widesweep pre-selected & activated
- 7. Widesweep Water pre-selected
- 8. Widesweep + Water pre-selected & activated
- 9. Additional Nozzle Water pre-selected
- 10. Additional Nozzle Water activated





**LEFT HAND SUCTION NOZZLE RAISE/LOWER SWITCH** - Press to lower the suction nozzle. The on-screen symbol outline illuminates RED when the feature is pre-selected, changing to a GREEN in-fill when the Sweep Master switch is activated and the nozzle drops to its working position.

**WIDESWEEP BRUSH SWITCH** - Press to start the widesweep brush. The on-screen symbol outline illuminates RED when the feature is pre-selected, changing to a GREEN in-fill when the Sweep Master switch is activated. When active, the brush will lower to the sweeping position and, on dual sweep machines, will swivel to the primary sweeping side unless over-ridden. The on-screen brush symbol will change to indicate widesweep orientation.

**RIGHT HAND SUCTION NOZZLE RAISE/LOWER SWITCH** - Press to lower the suction nozzle. The on-screen symbol outline illuminates RED when the feature is pre-selected, changing to a GREEN in-fill when the Sweep Master switch is activated and the nozzle drops to its working position.

**RIGHT HAND SIDE BRUSH SWITCH** - Press to start the side-brush. The symbol outline illuminates RED when the feature is pre-selected, changing to a GREEN in-fill when the Sweep Master switch is activated.

**LEFT HAND WORK-LIGHT** - Press to turn ON. The left hand work light on-screen symbol will illuminate YELLOW.

**LEFT HAND SIDE BRUSH/NOZZLE WATER SWITCH** - Press to start the side-brush and suction nozzle dust-suppression. When brush and suction nozzle are pre-selected, the brush symbol illuminates as a BLUE in-fill when dust suppression is also pre-selected. Both symbols change to a GREEN in-fill with a BLUE spray symbol when the Sweep Master switch is activated.

**WIDESWEEP WATER SWITCH** - Press to start the dust-suppression spray for the widesweep brush. The widesweep symbol turns BLUE when water is pre-selected and the BLUE spray bar symbol illuminates when the Sweep Master switch is activated.

**RIGHT HAND SIDE BRUSH/NOZZLE WATER SWITCH** - Press to start the side-brush and suction nozzle dust-suppression. When brush and suction nozzle are pre-selected, the brush symbol illuminates as a BLUE in-fill when dust suppression is also pre-selected. Both symbols change to a GREEN in-fill with a BLUE spray symbol when the Sweep Master switch is activated.

**RIGHT HAND WORK-LIGHTS** - Press to turn ON. The right hand work light symbol will illuminate YELLOW.

**REDUCE ENGINE SPEED** - Press and hold down to reduce the speed of the truck engine. A single press of the switch will cut engine speed by 50 RPM. Current engine speed is displayed along the top of the LCD monitor.



## OPERATING INSTRUCTIONS - *Hydrostatic Truck-mounted Sweepers*

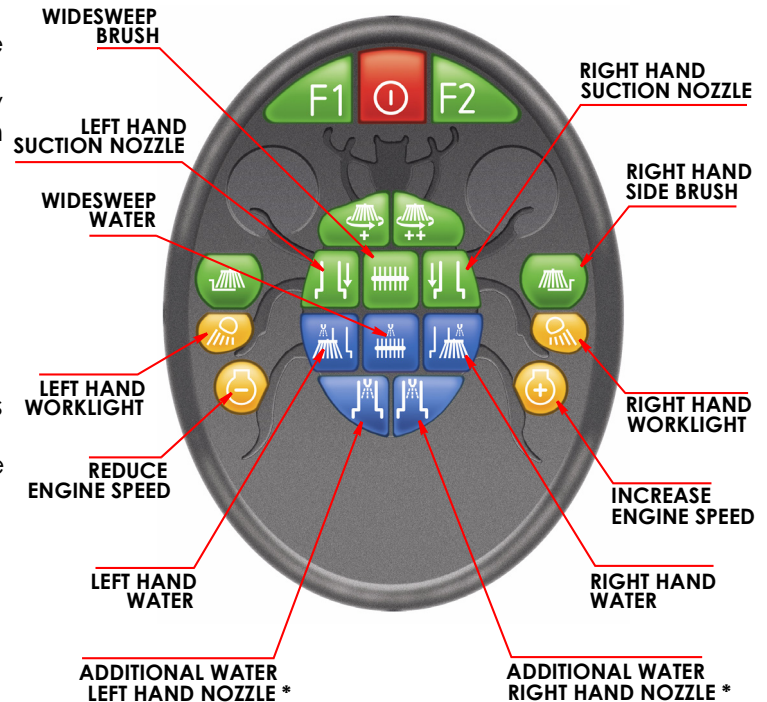
### LEFT HAND SUCTION NOZZLE - ADDITIONAL WATER

**SWITCH \*** Press to start the additional water jets for the suction nozzle. The left hand nozzle symbol turns BLUE when water is pre-selected and the BLUE nozzle spray bar symbol illuminates when the Sweep Master switch is activated.

### RIGHT HAND SUCTION NOZZLE - ADDITIONAL WATER

**SWITCH \*** Press to start the additional water jets for the suction nozzle. The right hand nozzle symbol turns BLUE when water is pre-selected and the BLUE nozzle spray bar symbol illuminates when the Sweep Master switch is activated.

**INCREASE ENGINE SPEED** - Press and hold down to increase the speed of the truck engine. A single press of the switch will increase engine speed by 50 RPM. Current engine speed is displayed along the top of the LCD monitor.





## AUXILIARY CONTROL PANEL

**FORWARD/REVERSE LEVER** - Lift collar to release from Neutral and move the lever in the desired direction to activate the hydrostatic transmission. All active functions will stop and/or retract when reverse is selected, redeploying when reverse is disengaged.

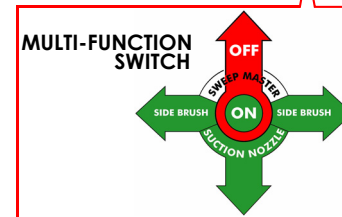
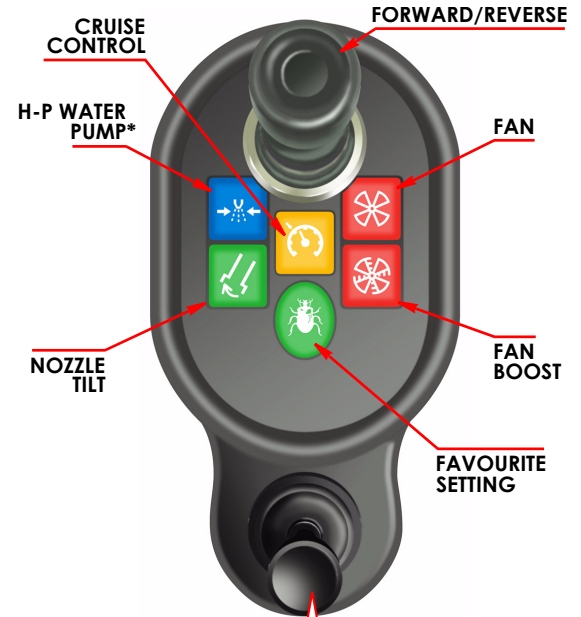
**HIGH-PRESSURE WATER PUMP SWITCH \*** - Press to start the H-P water pump. The high-pressure water pump symbol will illuminate BLUE when the feature is selected. *If the water level in the tank is insufficient, the pump will not operate and the symbol will display a RED strike-through.*

**SUCTION FAN SWITCH** - Press to start the fan. The Suction Fan symbol on the LCD monitor will illuminate RED when the fan is ON. Fan speed (approximately 2000 rpm) is displayed on the LCD monitor. This switch remains active when the fan-boost switch is pressed. (See also Fan Boost switch)

**CRUISE CONTROL** - Press to activate cruise control. The Cruise Control symbol on the LCD monitor illuminates AMBER when the feature is selected.

**NOZZLE TILT SWITCH (LOCKING MODE)** - Press to tilt the suction nozzle for larger items, such as bottles. The Nozzle Tilted indicator will illuminate RED when the switch is activated. Press the switch again to revert to normal setting.

**SUCTION FAN 'BOOST' SWITCH** - Press to activate the fan boost mode. This increases fan speed to approx. 2200 rpm. The Red Suction Fan symbol on the LCD monitor changes to the Fan Boost symbol while the feature is selected and the fan speed indicated on the monitor will change to show approximately 2200 rpm. Press again to revert to normal fan speed.



\* Indicates optional equipment



## **OPERATING INSTRUCTIONS - Hydrostatic Truck-mounted Sweepers**

**FAVOURITE SETTING SWITCH** - Press to memorise your preferred sweeping set-up. Hold the switch down until a 'beep' sounds. Thereafter, whenever the switch is pressed at system start-up, the memorised configuration will be automatically pre-selected/restarted. Repeat to over-ride with a new configuration.

**FOUR-POSITION MULTI-FUNCTION SWITCH** - Move the switch back (centre position) to turn the Master Switch function ON (deploys all selected sweeping equipment). To stop and raise all sweeping equipment, return the switch to the OFF position.

In the ON position the switch can be used to control the side brushes and suction nozzles. These additional positions i.e. Left, Right and Back, are detented to the central (SWEEP MASTER ON) position.

The brush and nozzle functions are controlled as follows:

### **ON LEFT HAND DRIVE VEHICLES**

Move the switch to the left to swing the side brush(es) OUT.

Move the switch to the right to swing the side brush(es) IN.

### **ON RIGHT HAND DRIVE VEHICLES**

Move the switch to the right to swing the side brush(es) OUT.

Move the switch to the left to swing the side brush(es) IN.

### **NOZZLE-TILT FUNCTION**

On machines with hydraulic nozzle-tilt, move the switch back to 'nudge' the suction nozzle DOWN from the LOCKED OPEN position.

On machines with pneumatic nozzle-tilt, move the switch back to momentarily tilt the suction nozzle or close it from LOCKED OPEN.





## REMOTE-CONTROL SWITCH BOX

The hopper Raise/Lower and rear door Open/Close switches are located in the remote control box. This is stowed in the cab, between the driver's seat and door and is connected to a socket via a coiled lead.

**⚠ IN THE INTEREST OF HEALTH AND SAFETY AND TO AVOID POSSIBLE DAMAGE TO THE SWEEPER OR ADJACENT STRUCTURES, IT IS ESSENTIAL THAT THE REMOTE HOPPER/DOOR CONTROLS ARE NOT ACTIVATED FROM WITHIN THE CAB. ALWAYS USE THESE CONTROLS OUTSIDE OF THE VEHICLE FROM A VANTAGE POINT THAT AFFORDS A GOOD VIEW OF THE SWEEPER AND ITS IMMEDIATE SURROUNDINGS.**

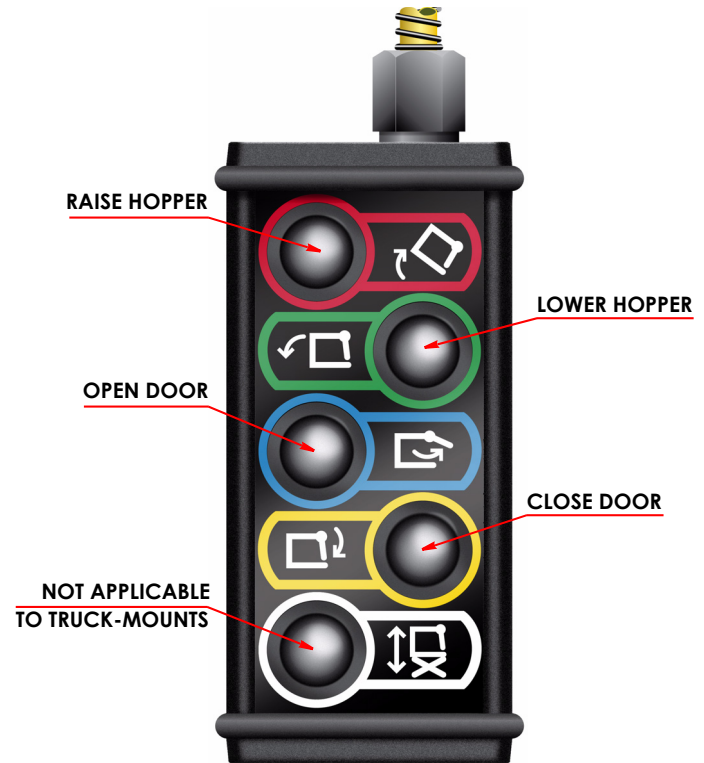
**HOPPER RAISE SWITCH** - Press and hold down to raise the hopper. As soon as the hopper starts to rise, the hopper raised symbol illuminates RED on the LCD monitor.

**HOPPER LOWER SWITCH** - Press and hold down to lower the hopper. The RED Hopper Raised symbol will remain illuminated until the hopper is fully in the lowered position.

**REAR DOOR OPEN SWITCH** - Press and hold down until the door is Fully open (at approximately 90° to the rear face of the hopper).

**i** Ensure that the suction fan is OFF. The door cannot open while the fan is running due to the low pressure created within the hopper.

**REAR DOOR CLOSE SWITCH** - Press and hold down until the door is fully closed and the latching cycle has finished.



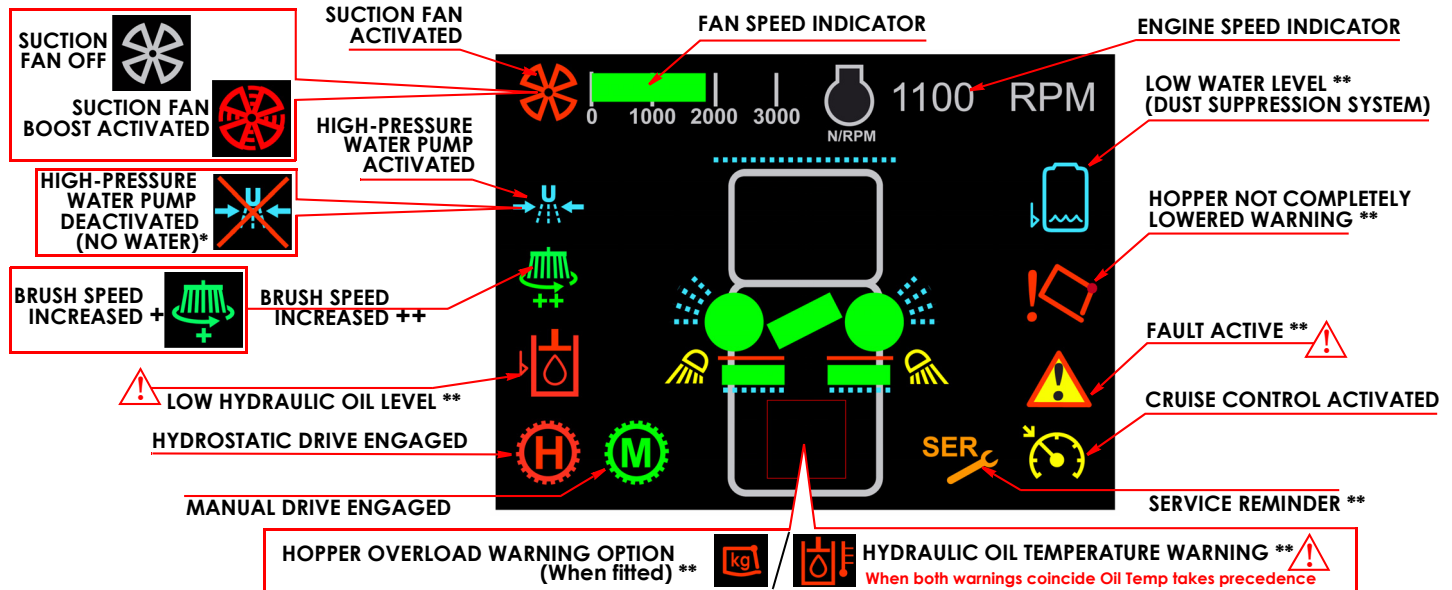




# OPERATING INSTRUCTIONS - Hydrostatic Truck-mounted Sweepers

## THE LCD MONITOR (refer also to Page 8)


The LCD monitor is the user interface with the control panels and with the various operating and information feedback systems incorporated in your Scarab sweeper. The display not only provides information on the current status of the sweeper while it is in sweep mode, by indicating which items of equipment are active, fluid levels and temperatures, it also alerts the user to deficiencies and/or malfunctions 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 only those related to system status under normal operating conditions remain permanently illuminated - warning symbols (\*\*) only illuminate when a specific condition occurs.







## ADDITIONAL CONTROLS & INSTRUMENTS (The \* symbol indicates optional equipment)

 **Do not exceed a pressure of 2.5 bar when adjusting brush pressure settings. Failure to comply will result in drastically reduced brush life.**

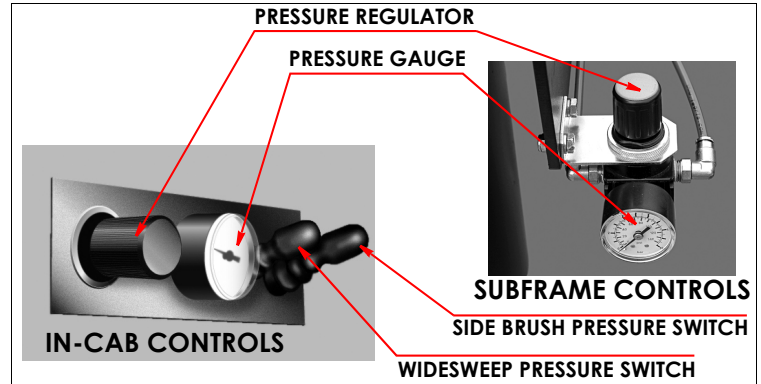
**AIR-PRESSURE REGULATOR \*** - Used to adjust the amount of up/down-thrust applied to the brush(es) .

**AIR-PRESSURE GAUGE \*** - Indicates the amount of pressure being applied to the brush(es) .

 Side-brush regulators/gauges are mounted inside the cab.

Widesweep regulators/gauges are located externally to the rear of the near-side suction spigot mount on the sweeper subframe.

This function is only effective while the relevant brushes are fully deployed.



**CONTROLS FOR OVERHEAD WANDER BOOM OPTION \*** - These are mounted just above the wander boom handle and consist of two buttons for selecting fan extra-boost speed (3rd Speed) of approx. 2500 rpm and/or the low-pressure dust suppression water supply. Auxiliary engine speed will automatically increase to 1800 rpm when fan 3rd Speed is selected.



*The action of these buttons dictates that a firm application of pressure is required before they can be activated. When activated they will lock in the down (ON) position until released by rotating them in the direction indicated by the arrows.*



## OPERATING INSTRUCTIONS - *Hydrostatic Truck-mounted Sweepers*

### OPERATING MODES

There are two driving modes, Normal & Hydrostatic (Sweep), these are selected using the SWEEP MODE switch on the control panel. The selected drive mode is indicated on the LCD monitor as follows:



Normal drive mode



Hydrostatic drive

### ENGAGING HYDROSTATIC DRIVE

REFER TO THE HEALTH & SAFETY INFORMATION ON Page 4



**The engine must be running and the air tanks/pneumatic system must be fully pressurised before attempting to engage hydrostatic drive mode. The hydrostatic gearbox will not engage unless the vehicle is stationary.**



1. Switch on the hazard warning beacons.
2. Stop the vehicle, apply the parking brake and select Neutral.
3. With the engine running, depress the clutch pedal and press the Sweep Mode switch. When hydrostatic drive engages, a number of symbols representing the installed sweeping equipment will appear superimposed on the truck graphic displayed on the LCD monitor.
4. Depress the clutch and press the F1 switch. The RED Hydrodrive symbol 'H' will illuminate.






*If the Hydrostatic Gearbox fails to engage properly, the RED 'H' drive symbol displayed on the LCD monitor will flash ON/OFF and a buzzer will sound intermittently. If the clutch is engaged at this point while the parking brake is applied, the engine will probably stall. Refer to Step 6.*


5. Select the highest forward gear available and release the clutch pedal. The vehicle is now in hydrostatic drive and may be driven without use of the clutch.
6. If Hydrostatic drive fails to engage, press Sweep Mode again to restore Normal Drive. Engage first gear, release the hand brake and move the vehicle forward slightly. Repeat Steps 2. to 5.
7. Set the required engine speed by means of the engine speed +/- controls on the main panel (normal operation can be conducted at between the default engine speed (refer to Options Screen page) and 1800 rpm according to prevailing conditions). The switches adjust engine speed up or down in 50 rpm increments or can be held down for greater adjustment.






## OPERATING INSTRUCTIONS - Hydrostatic Truck-mounted Sweepers

8. Switch on the suction fan, selecting Normal (approx. 2000 rpm) or Boost (approx. 2200 rpm) as required. If Boost is selected (Page 19) remember that increased engine speed might be necessary. Fan speed can be confirmed by referring to the LCD on the main panel. 
9. Select the desired configuration of brushes/suction boxes and water sprays (any combination of brushes and water can be selected) either manually or by pressing the Favourite Settings switch to recall your preferred arrangement. Switch on work-lights as required. 
10. Move the Multi-Function Switch (located on the auxiliary control panel) to the 'Sweep Master Switch ON' position to start and deploy the pre-selected sweeping equipment. To stop and stow the sweep gear, return the switch to OFF. The sweeping equipment will raise to the stowed position and all water spray jets will stop (this will also occur automatically as soon as REVERSE is engaged, reverting to the original configuration as soon as REVERSE is disengaged). 

 *If the master switch is left in the ON position when the system is switched to Drive Mode it will NOT be active when the system is returned to Sweep Mode. To reactivate the Sweep Master ON condition, momentarily move the switch to OFF and then return it to the ON position*

11. Operate the multi-function switch to swing the side brushes OUT and the Nozzle Tilt switches (auxiliary control panel) as required to suit the sweeping conditions. The multi-function switch can also be used to control nozzle-tilt (refer to Page 13 for operating details).

 *While in the 'Sweep Master Switch ON' position, the multi-function switch will automatically return to the central position from the side brush and nozzle control positions.*

12. Select Forward drive using the hydrostatic control lever and slowly depress the throttle pedal to start sweeping.





### SUCTION FAN BOOST SETTING

When required, a boost setting is available for the suction fan. This increases fan speed by approximately 10% and is used when sweeping densely distributed or heavy debris such as rubble. To operate the fan at the Boost setting, carry out the following procedure:

1. Press the suction fan BOOST switch and refer to the LCD monitor to confirm fan speed.
2. Adjust engine speed as necessary, by means of the controls on the main panel, until the fan speed is approximately 2200 rpm using the lowest engine speed to achieve this.



### CLIMBING GRADIENTS

1. When sweeping up hill it might be necessary to increase engine speed to maintain sweeping performance. It is advisable to do this before you start to climb the hill. The amount of increase will depend on a range of variable factors:
  - (a) The individual characteristics of the engine.
  - (b) The current hopper load.
  - (c) The current sweeping load (e.g. light or heavy material)
  - (d) The angle of the gradient.

To increase engine speed, do one of the following:

- **Use the engine speed-setting controls** (this method is most useful when a prolonged increase in engine speed is required).
- **Use the throttle pedal** to temporarily over-ride the pre-set engine speed (this method is more convenient for brief increases in engine speed as engine speed will automatically revert to the pre-set value when the throttle pedal is returned to its previous position).





### REVERTING TO NORMAL DRIVE MODE

1. Move the Multi-Function Switch (located on the auxiliary control panel) to the Sweep Master Switch OFF position. This will stop and raise all sweeping equipment to the stowed position. The sweeping equipment symbols displayed on the LCD monitor will change back to grey, indicating that they are no longer active.



**i** For safety reasons and to comply with current legislation, if the Multi-Function Switch is not returned to the OFF position at this point, the sweeping equipment will not function upon any subsequent resumption of Sweep Mode until the Multi-Function Switch has been moved to the OFF position and then returned to the ON position.

2. Bring the vehicle to a complete stop and apply the hand brake.
3. Depress the clutch (engine speed will drop to IDLE) and engage Neutral on the truck gearbox.
4. With the clutch depressed, Press the Sweep Mode switch, holding it down until the drive symbols change. When hydrostatic drive disengages, the RED hydrostatic drive symbol 'H' will extinguish and the GREEN manual drive symbol 'M' will illuminate. The symbols displayed on the LCD monitor representing the installed sweeping equipment will also extinguish.



**i** If the Hydrostatic Gearbox fails to disengage properly, the GREEN 'M' drive symbol will flash ON/OFF and a buzzer will sound intermittently. If this occurs, restore hydrostatic drive, edge the vehicle forward and repeat Step 4.

5. As soon as you no longer represent a hazard turn OFF the beacons.

### REDUCING NOISE LEVELS & FUEL CONSUMPTION

Although it is important to always operate within the engine's optimum speed range, there are times when it is possible to reduce engine speed to the lower end of this, thereby reducing noise levels. This is most beneficial when sweeping at night, or in areas sensitive to noise pollution. Sweeping at reduced engine speeds can be achieved most satisfactorily when sweeping light or sparsely distributed materials. Experience will enable the operator to vary engine speed, according to sweeping conditions, without affecting sweeping performance.

It should be noted that the operator also benefits from reduced noise levels within the cab and that any reduction in engine speed, also results in a corresponding reduction in fuel consumption.



### DISCHARGING THE HOPPER (TIPPING)

#### OPERATING THE REAR DOOR



**NEVER OPERATE THE REAR DOOR OR HOPPER CONTROLS FROM WITHIN THE CAB. IT IS ESSENTIAL THAT THESE ACTIONS ARE ONLY CARRIED OUT WHEN THE OPERATOR IS OUTSIDE THE VEHICLE AND HAS A CLEAR VIEW OF THE HOPPER AND REAR DOOR AREA. ENSURE THAT ALL PERSONNEL ARE CLEAR OF THE DOOR.**



**Ensure that the suction fan is turned OFF and that there is room for the door to open fully.**

**Always ensure that door is OPEN before raising the hopper. This will avoid the possibility of causing damage to the door in the event of a heavy load sliding back as the hopper tilts**

The Rear Door controls are located on the remote-control box which is stowed in the cab and connected to an internal socket via a heavy-duty coiled lead.

#### DOOR-OPEN CONTROL

With the engine running at idle and the vehicle in Sweep Mode, press and hold down the Door Open button until the door is fully open (i.e. at approximately 90° to the rear of the hopper).



#### DOOR-CLOSE CONTROL



**Before closing the door, ensure that the seal, and mating faces on the hopper, are free from any foreign matter that might damage the seal or adversely affect the sealing function.**

With the engine running at IDLE and the vehicle in Sweep Mode, press and hold the Door Close button until the door is fully closed and the door-locking ram has completed its locking cycle.





## OPERATING THE HOPPER



**THE HOPPER PROP MUST ALWAYS BE USED WHEN THE HOPPER IS IN THE RAISED POSITION. FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY.**

**BEFORE RAISING THE HOPPER, ENSURE THAT THE VEHICLE IS ON FIRM, LEVEL GROUND AND THAT THERE ARE NO OVERHEAD OBSTRUCTIONS.**

**OTHER THAN TO MANOEUVRE FOR TIPPING, DO NOT DRIVE THE VEHICLE WHILE THE HOPPER IS RAISED.**

The hopper controls are located on the remote-control box which is stowed in the cab and connected to an internal socket via an armoured heavy-duty coiled lead.

### HOPPER-RAISE CONTROL



1. With the engine running and the vehicle in Sweep Mode, press and hold down the Hopper Raise button until the hopper is in the fully raised position. When the hopper is raised a RED warning symbol illuminates on the LCD monitor and remains lit until the hopper is back in the fully-lowered position.

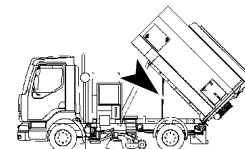


If working under the hopper, deploy the hopper safety prop, ensuring that its foot is securely located in the subframe pocket.



### HOPPER-LOWER CONTROL

1. To lower the hopper, fold (if deployed) the hopper safety prop into its stowage position flush with the hopper base frame.
2. Press and hold down the Hopper Lower button until the hopper is fully lowered. When the hopper reaches the fully-down position the RED warning symbol on the LCD monitor will extinguish.

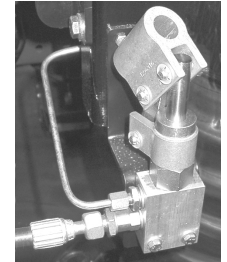






### USING THE AUXILIARY HYDRAULIC PUMP

In the event of hydraulic system failure, an auxiliary (manually operated) hydraulic pump is fitted, to enable the rear door and hopper to be operated. This is located on the left hand side of the vehicle, adjacent to the hopper suction spigot. The pump handle is stowed in the cab.



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

#### REAR DOOR

- i** *Electrical power is required to use the auxiliary pump for these procedures. The vehicle ignition should be **ON** and the machine should be in **Sweep Mode**.*

#### TO OPEN THE REAR DOOR

Operate the auxiliary pump, simultaneously pressing and holding the Door Open button on the remote control box until the door is in the required position.



#### TO CLOSE THE REAR DOOR

- 👁** *Before closing the door, ensure that the door seal, and mating faces on the hopper, are free from any foreign matter that might damage the seal or adversely affect the sealing function.*


Operate the auxiliary pump, simultaneously pressing and holding the Door Close button on the remote control box until the door is fully in the closed position and the locking ram has completed its latching cycle.





For the hopper emergency raise/lower procedures, please refer to Page 24.



## HOPPER

-  *Electrical power is required to use the auxiliary pump for these procedures. The vehicle ignition should be **ON** and the machine should be in **Sweep Mode**.*

### TO RAISE THE HOPPER

-  1. Operate the auxiliary pump, simultaneously pressing and holding the Hopper Raise button on the remote control box until the hopper is in the required position.
-  2. Deploy the hopper prop before attempting to carry out any work beneath the raised hopper



### TO LOWER THE HOPPER

-  **Before closing the door, ensure that the door seal, and mating faces on the hopper, are free from any foreign matter that might damage the seal or adversely affect the sealing function.**

1. Stow the hopper prop by folding it flush with the base of the hopper.
2. Operate the auxiliary pump, simultaneously pressing and holding the Hopper Lower button on the remote control box until the hopper is fully down and the Hopper Up warning on the LCD monitor has extinguished.



-  *Any electrical failure involving the remote control box should be reported to your supervisor.*




## WANDER HOSE & WANDER BOOMS

Scarab truck-mounted sweepers can be equipped with the standard wander hose, or either the optional Rear-mounted Wander Boom or the Overhead Wander Boom.

### USING THE WANDER HOSE


1. Move the Multi-Function Switch (located on the auxiliary control panel) to the Sweep Master Switch OFF position to stop any active equipment. The suction nozzle blanking flaps will remain open.
2. If the fan is running, deselect it and allow it to run down. The suction fan symbol will change from RED to GREY.
3. When the fan has stopped, remove the blanking plate from one of the apertures in the rear door, stowing it on the captive fasteners.
4. Attach the wander hose over the aperture, using the captive fasteners.



 For situations requiring maximum suction power, such as when clearing gully pots, select fan boost-speed and blank off the suction nozzles as follows:

5. Deselect any active suction nozzle(s). This will close the nozzle blanking flap(s) and the suction nozzle symbols on the LCD monitor will turn GREY.
6. Press the suction fan switch to restart the fan, followed by the fan boost switch. The suction fan symbol will change from Grey to RED and then to the RED fan-boost symbol. The wander hose is now ready for use. If desired, a second operator can now use the wander hose during normal sweeping operations.



 If desired, a second operator can also use the wander hose during normal sweeping operations.



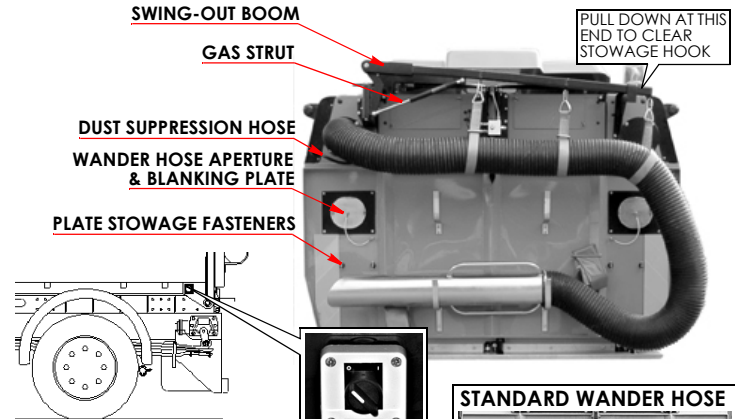
## USING THE REAR-MOUNTED/OVERHEAD WANDER BOOMS



On machines fitted with either optional wander boom arrangement, the wander hose is permanently fitted. On the rear-mounted boom the weight of the hose/nozzle is partially supported by a gas strut, on the overhead boom the hose/nozzle and main tube are supported by a coil spring arrangement. The wander booms are equipped with their own dust suppression system and blanking flap. As with the standard wander hose, both versions of the wander boom can be used while sweeping.

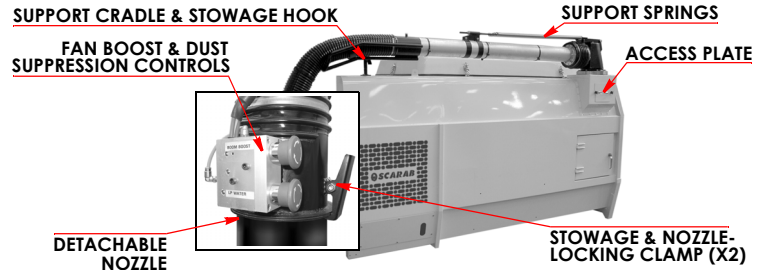
**i** For situations requiring maximum suction power, such as when clearing gully pots, select fan boost-speed and blank off the suction nozzles as follows:

1. Deselect any active suction nozzle. This will close the corresponding blanking flap. The nozzle symbol on the LCD monitor will turn GREY.
2. Demount the hose assembly from its stowage as detailed and swing-out the entire assembly to the required position.
3. Operate the wander boom controls. The appropriate blanking flap will open and the dust suppression spray jets will start. The wander boom is now ready for use.




**i** Left Hand Drive vehicle shown. The assembly is fitted to the opposite side on Right Hand Drive machines

Rotate switch clockwise to Position 1 ON





### USING THE LOW-PRESSURE WATER PUMP

 **Unless the ground is wet, always use the dust suppression sprays. Before using the dust suppression system, ensure you have sufficient water in the tank.**

In Sweep Mode, press the appropriate switches on the sweeper panel to start the required water spray for each item of sweeping equipment as follows:

 *Individual spray jets can be isolated by using the valve on each supply hose.*

**Side-brush & Suction Box** - To start either or both the left hand or right hand spray nozzles, press the appropriate side-brush/suction nozzle water switches. The appropriate side brush symbol on the LCD monitor will change to BLUE unless the Sweep Master is already ON, in which case the BLUE spray symbol will illuminate.



**Widesweep Brush** - To start the widesweep spray nozzles press the widesweep water switch. The widesweep brush symbol on the LCD monitor will change to BLUE unless the Sweep Master is already ON, in which case the BLUE spray bar symbol will illuminate.



**Suction Box - Additional Dust Suppression (Optional)** - Press the suction box Additional Water Spray switch. The suction nozzle symbol on the LCD monitor will change to BLUE unless the Sweep Master is already ON, in which case the BLUE nozzle spray bar symbol will illuminate.



Move the Multi-Function switch to the 'Sweep Master ON' position to start the selected configuration. The symbols for the pre-selected dust suppression sprays will change from BLUE to GREEN and the appropriate spray symbols will illuminate BLUE to indicate that the sprays are active.



### LUBRICATION

The main bearings are 'sealed-for-life' and require no lubrication, however, on some pumps the crankcase void is provided with a grease nipple (the schedule on Page 32 gives frequency of applications).

### DRAINING

1. It is vital that the strainer and pump are totally drained whenever the air temperature is expected to fall to 0° C or below. If allowed to freeze it is likely that damage will be incurred.
2. Drain the water tank and open the drain valve. Switch on all sprays and run the water pump until the system runs dry.



## USING THE OPTIONAL HIGH-PRESSURE WATER PUMP



**HIGH PRESSURE WATER CAN BE HAZARDOUS, ALWAYS WEAR GOGGLES OR SUITABLE EYE/FACE PROTECTION. EXERCISE EXTREME CARE WHEN USING THE LANCE, DO NOT DIRECT THE JET AT OTHER PEOPLE. WHEN CLEANING PUBLIC BUILDINGS OR STREET FURNITURE, ENSURE THAT NO ELECTRICAL CONNECTIONS ARE EXPOSED. FAILURE TO COMPLY CAN RESULT IN SERIOUS INJURY.**



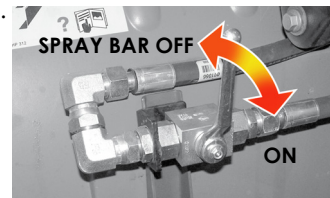
**Do not direct the high pressure jet directly at paint work or at electrical connections, this could result in damage to the vehicle. This pump should NEVER be permitted to run dry, as this will quickly destroy the piston seals and cause the pump to fail. If the pump shuts off in-use the most likely cause will be low water activating the auto shut-off float switch in the tank.**



1. Ensuring that there is sufficient water in the water tank, select Sweep Mode and set engine speed to the high end of its optimum range.
2. Switch on the high-pressure pump. A BLUE high-pressure pump symbol will illuminate on the LCD monitor. If the pump is activated when there is insufficient water in the tank or if the level drops below a pre-determined level, the pump will cut out and the symbol on the LCD monitor will change as illustrated, to indicate that the pump has cut out.



*If the vehicle is fitted with a high-pressure spray bar, adjust the ball valve to supply the spray bar or the hand-lance as required (located on the near side front mudguard).*



### OIL LEVEL



1. The level of the oil in the pump's crankcase should be checked on a regular basis (refer to operator's maintenance chart) and topped up as necessary. The pump has a combined filler cap/dipstick.

### DRAINING



**This pump should NEVER be permitted to run dry. Failure to comply will quickly destroy the piston seals causing the pump to fail.**

1. It is vital that the pump is drained of all water whenever the ambient temperature is expected to fall to 0°C or below. If the pump is allowed to freeze it is likely that damage will be incurred resulting in seizure.
2. Drain the water tank (refer to Page 32),
3. To drain the the pump, open the drain valves for both the high and low pressure sides of the pump.



## OPERATING INSTRUCTIONS - Hydrostatic Truck-mounted Sweepers

### OPTIONAL SUCTION FAN WASH-ASSIST SYSTEM



**DUE TO THE POSSIBILITY OF EXCESS WATER AND LOOSE MATERIAL BEING EJECTED VIA THE HOPPER HOOD WHEN THE SUCTION FAN IS RESTARTED, THIS PROCEDURE SHOULD ONLY BE CARRIED OUT AT AN APPROPRIATE LOCATION.**

The system comprises a supply hose from the H-P pump, terminating at a spray nozzle in the suction fan case. A ball valve mounted adjacent to the door locking ram assembly controls water supply to the spray nozzle.

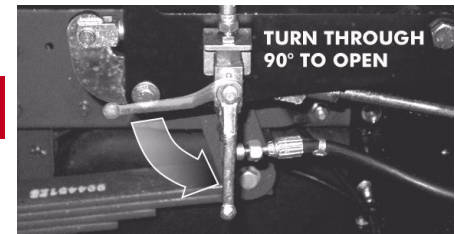
This system is not intended as an alternative to the normal fan cleaning procedures (see Page 34), but as an aid to this process. Regular use of the system will, however, greatly enhance fan performance by reducing the rate at which dirt is allowed to build up on the impellor blades and fan case. As such, it is suggested that this system is used immediately following a days sweeping (**or more often if sweeping in more arduous conditions**).

Routine fan inspection and cleaning procedures should always take place at the recommended intervals .

#### 1. OPERATION



2. Ensure that there is sufficient water in the water tank.
3. Select Sweep Mode and set engine speed to the high end of its optimum range.
4. If the machine is fitted with a front-mounted high-pressure spray bar, adjust the control valve to OFF (hand-lance position).
5. Set the wash-assist valve to the ON position and switch on the high-pressure pump. The fan-wash jet will start.



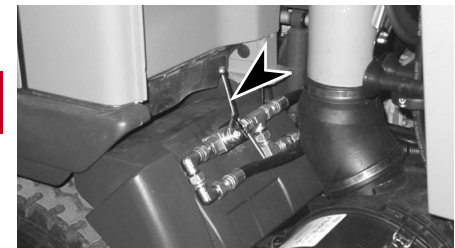
SUCTION FAN WASH-ASSIST VALVE 'ON'



**LOOSE PARTICLES FROM THE CLEANING PROCESS CAN BE EJECTED FROM THE FAN CASING VIA THE HOPPER COVER WHEN THE FAN IS RESTARTED. ENSURE THAT THE AREA AROUND THE MACHINE IS CLEAR BEFORE RESTARTING.**



6. With fan-wash still running, turn the Suction Fan ON and wait until clear water is being ejected. Return the control valve to the OFF position, stop the High-pressure Pump and then stop the Fan.
7. Return the Suction Fan switch to the OFF position.
8. Set engine to IDLE and turn OFF (if hot allow to IDLE for 2 minutes before turning off). If appropriate, remove the ignition key.



H-P SPRAY BAR CONTROL VALVE 'OFF'



### CLEARING A BLOCKAGE IN THE SUCTION PATH



A blockage in the suction path will be indicated by a trail of material behind the vehicle. The most likely cause is an obstacle either in the suction nozzle, or the trunking immediately above it, around which other material collects as sweeping progresses. It is important that such problems are rectified as soon as possible.

Before this can be achieved, however, the following health and safety concerns must be addressed. These are important and are intended to maintain safe working conditions at all times, therefore:



**NEVER RAISE THE HOPPER WHERE THE LOAD IT CONTAINS OR THE GROUND YOU ARE ON COULD CAUSE THE VEHICLE TO BECOME UNSTABLE.**

**NEVER ATTEMPT TO WORK BENEATH A PARTIALLY RAISED HOPPER, i.e. WHERE THE SAFETY PROP CANNOT BE DEPLOYED.**

**NEVER ATTEMPT TO CLEAR A BLOCKAGE WHILE THE BRUSHES ARE OPERATING. ALWAYS STOP AND RETRACT ALL BRUSHES, STOP THE ENGINE AND REMOVE THE IGNITION KEYS BEFORE STARTING THE PROCEDURE.**

**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.**

Only when all of the foregoing points have been complied with, should the clearance procedure commence. If it is not possible to comply with these conditions you are advised to consult your supervisor before acting.

The procedure for clearing the suction path is as follows:



1. Raise the hopper, deploying the safety prop, to gain access to the top of the suction tube.
2. Visually check conditions inside the suction tube and nozzle box to determine the nature and location of the blockage and whether, without suction, the blockage has dropped back to the road surface.
3. 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.
4. Once the offending item has been successfully removed, restart the vehicle and use the high-pressure hand lance (if fitted) to thoroughly wash out the trunking and nozzle box.
5. Stow the hopper prop and lower the hopper but do not start the suction fan at this stage.

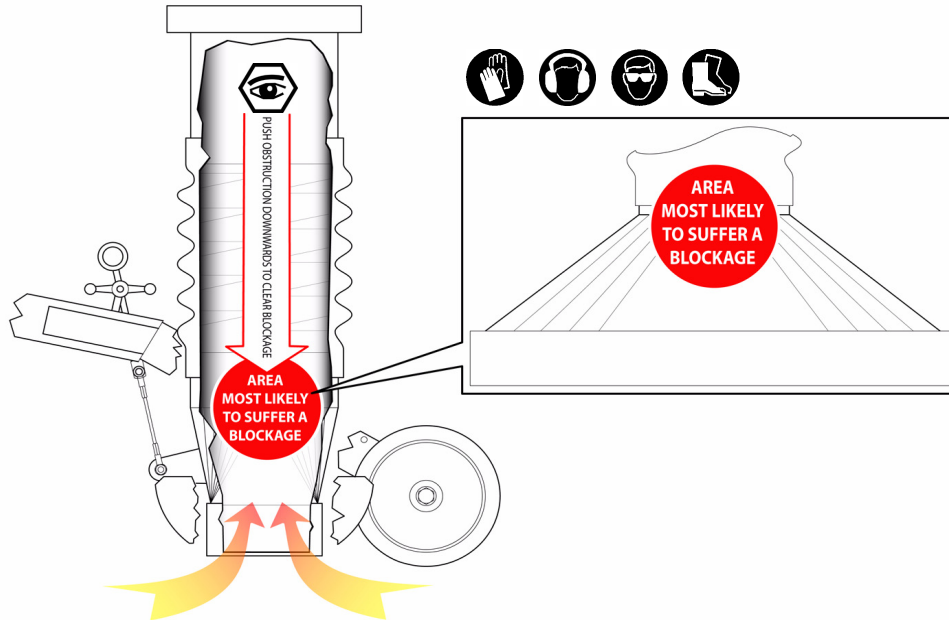




## OPERATING INSTRUCTIONS - *Hydrostatic Truck-mounted Sweepers*



- Reverse the vehicle sufficiently to expose the removed material and to check the main cause of the blockage. Carefully isolate this and, if appropriate place it in the hopper via the side loading hatch.
- Resume sweep mode, start the suction fan and slowly move forward allowing the side brush to thoroughly separate the remaining material so that it enters the suction nozzle progressively.
- Depending on the length of trail created by the blockage either reverse carefully to the start point (if you can legally do so) or return to the start point of the trail by 'driving around the block'.
- Resume sweep mode and continue 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 and to the Table of Contents (Page 3) for more detailed information.

MAINTENANCE PROCEDURE	DAILY ACTIONS BEFORE USE/AFTER USE		WEEKLY	MAINTENANCE PROCEDURE	DAILY ACTIONS BEFORE USE / AFTER USE		WEEKLY
1. Using the truck manufacturer's handbook, check vehicle chassis for safety. All lights, tyres, fuel, oil, coolant, brake fluid, screen wash levels. Rectify or report as necessary.	✓	✗	✗	10. Lubricate as appropriate, all brush links, pivots and nozzle wheels.	✗	✓	✗
2. Check hydraulic oil level and for signs of leaks. Check oil cooler is clean. Rectify/report as necessary.	✓	✗	✗	11. Remove / clean the L-P and H-P water filter elements as appropriate.	✗	✓	✗
3. If vehicle not previously used by YOU, check suction fan is clean. Rectify or report as required (see also Items 12 /13).	✓	✗	✗	12. Clean the suction fan thoroughly, using scraper provided and, if necessary, high-pressure water (See Page 34).	✗	✗	✓
4. Check brushes/skirts for wear. Remove or report any entangled items, e.g. lengths of string or strapping etc.	✓	✗	✗	13. Conduct a thorough inspection of the fan assembly to verify its condition. Report any defects (See Page 34).	✗	✗	✓
5. Check suction nozzle/flaps for damage/correct ground clearance. Faults will degrade suction performance.	✓	✗	✗	14. Grease prop. shafts and check for wear at the Universal Joints (U/Js).	✗	✗	✓
6. Check water spray jets for blockages.	✓	✗	✗	15. Grease Hopper Ram (Top & Bottom)	✗	✗	✓
7. Check that all equipment is securely stowed and that brushes are retracted.	✓	✗	✗	16. Visually check entire machine for wear/damage. Rectify or report as required	✗	✗	✓
8. Wash vehicle, particularly hopper screen, surrounding ledges and area above. Leave hopper door partially open, to allow air to circulate.	✗	✓	✗	17. Check hopper and subframe-to-chassis mounting points. Report any defects.	✗	✗	✓
9. Wash oil cooler, ensuring that the fins are clean.	✗	✓	✗	18. Check wiring and hoses for security of attachment and for signs of chafing. Rectify or report defects as necessary.	✗	✗	✓




## OPERATING INSTRUCTIONS - *Hydrostatic Truck-mounted Sweepers*


19. Raise & prop hopper. Run fan/brushes (normal speed). Check the oil tank return filter gauge and report if in the RED zone. <b>Fresh filter element must be fitted.</b>	X	X	✓	22. Check oil level in high-pressure pump, report or top-up as necessary.	X	X	✓
20. Check for wear in suction tubes & deflectors in hopper. Report any defects.	X	X	✓	23. Grease rear door hinges / locking bar.	X	X	✓
21. Check seals on hopper-door, side-hatches, suction-tubes. Report any defects. Faults will degrade suction performance and/or cause leakage.	X	X	✓	24. Check the air cleaner element (more often than stated if working in dusty conditions). Clean/replace or report as appropriate.	X	X	✓

### LOW-PRESSURE WATER PUMP WHEN FITTED WITH A CRANKCASE GREASE NIPPLE

Using a hand operated grease gun apply two or three pumps after every 300 operating hours. Do not inject more grease than this because over-filling the crankcase can result in damage to the diaphragms.

### IN FROSTY WEATHER

 **CAUTION: Do not, under any circumstances, operate the high pressure pump without water.**  
Drain the water tank (via the drain cock if fitted or by removing the water strainers). Switch on the water sprays and run the low pressure pump until dry. Remove the water-strainer elements. Leave the hopper slightly raised with rear & side doors slightly open. This allows air to circulate and prevents damage caused by seals freezing to their mating faces.

 *The foregoing are general recommendations only. Requirements vary from territory to territory and depend on vehicle usage/operating conditions. IF IN DOUBT, CONSULT YOUR NEAREST DEALER.*  
*The fitting of genuine Scarab parts is highly recommended. The use of alternatives might compromise the performance and reliability of your sweeper and could invalidate your warranty.*  
*For chassis servicing/maintenance, refer to the chassis manufacturer's information or consult the manufacturer's agent or dealer.*



## KEY MAINTENANCE PROCEDURES

### CLEANING THE SUCTION FAN AND SCREEN

 FAILURE TO COMPLY WITH THE FOLLOWING COULD RESULT IN SERIOUS INJURY.

**BEFORE WORKING ON THE MACHINE POSITION IT ON FIRM, LEVEL GROUND, APPLY HANDBRAKE AND, IF REQUIRED, RAISE THE HOPPER, STOP ENGINE & REMOVE IGNITION KEY.**

**ALWAYS USE THE HOPPER PROP TO SUPPORT A RAISED HOPPER.**

**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.**

**BEFORE REMOVING THE SUCTION FAN ACCESS PANELS, ENSURE THAT THE ENGINE IS OFF AND THAT THE IGNITION KEY HAS BEEN REMOVED.**

**ALWAYS WEAR SUITABLE EYE & HAND PROTECTION.**

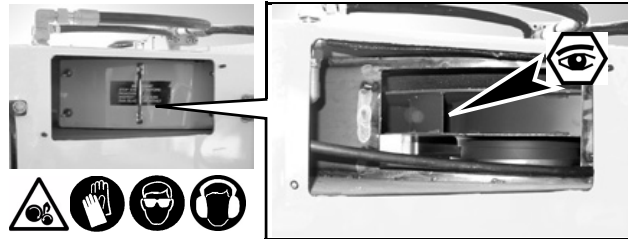


1. Remove the outer inspection cover from the hopper and the inner cover from the fan housing to expose the fan.



Lower the hopper screen to allow displaced material, from the fan cleaning process, to drop into the hopper.

*It will be necessary to prevent the fan from rotating during the cleaning process.*



**PLEASE PAY PARTICULAR ATTENTION TO INNER CURVE OF BLADES AND ALSO THE CENTRE OF THE UNIT WHERE DIRT ACCUMULATES AROUND THE HUB AREA**

2. 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 severely contaminated fans.



3. Wash the screen using steam or high-pressure water. Refit the screen, inspection covers and lower the hopper.



**LOOSE PARTICLES FROM THE CLEANING PROCESS CAN BE EJECTED VIA THE HOPPER COVER WHEN THE FAN IS RESTARTED, ENSURE THAT ALL PERSONNEL ARE CLEAR BEFORE RESTARTING.**

4. Start the engine and switch the suction fan ON.

5. With the rear door shut, direct additional water on to the screen below the fan inlet cone, from an open side-access flap, until only clean water is expelled from the fan casing.





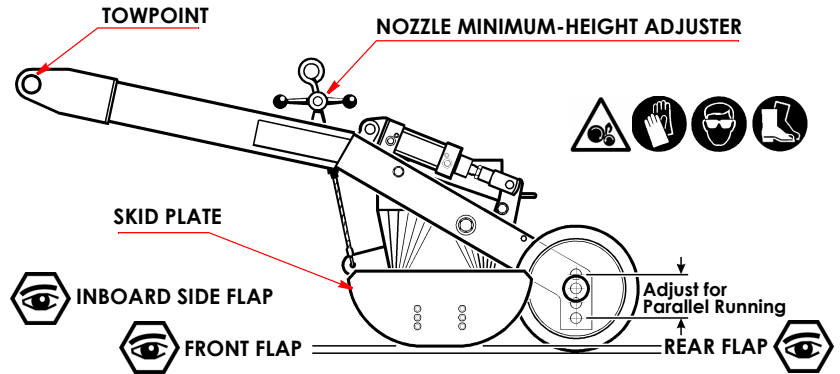
## OPERATING INSTRUCTIONS - Hydrostatic Truck-mounted Sweepers

### SUCTION NOZZLE CLEARANCES

Inspect the suction nozzle flaps to verify that they are in good condition and do not show excessive wear. Adjust as necessary to achieve the correct flap to ground clearances. The factory settings are:

- Inboard Side Flap = 20 mm
- Front Flap = 20 mm
- Rear Flap = 30 mm

**i** These clearances are based on the factory set-up. For some operating conditions, it might be found that, alternative clearances are preferred

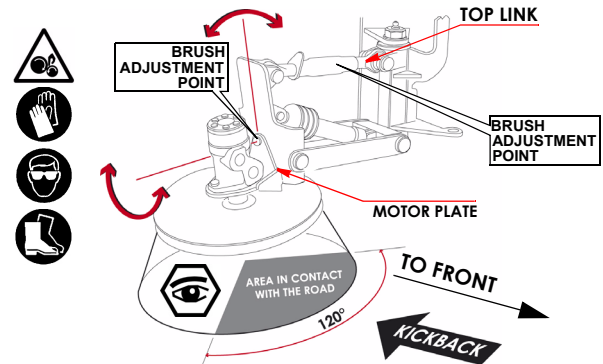


### SIDE BRUSHES & SKIRTS

**!** DO NOT ATTEMPT TO ALTER THE BRUSH SETTINGS WHILE THE BRUSH IS ROTATING.

An effective brush set-up ensures good sweeping performance. The following settings produce excellent results in most conditions. Experience will determine if other settings are better suited to specific conditions.

1. The brush should be angled so that it sweeps with its outer leading edge. About 33% (120°) of its circumference should be in contact with the road surface.
2. The skirt adjacent to the brush, which positions material for the suction nozzle, should also be in good condition and set so that it just clears the ground.





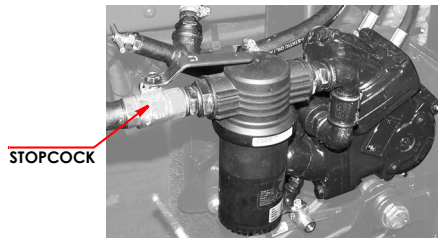
## DRAINING & CLEANING THE WATER PUMP STRAINERS

Both the low-pressure and, if fitted, the high-pressure water pump are fitted with strainers to ensure that foreign matter does not enter the pump. The following steps detail the recommended cleaning procedure.

**i** If removing the strainer for cleaning while there is water in the water tank, ensure that the isolating stopcock is turned off. If this step is not taken it is possible to lose the filter bowl O-seal as water will drain from the tank with some force via the filter unit as soon as the bowl is released.

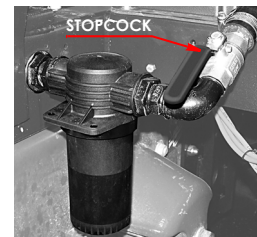
1. Remove the strainer from the filter body by removing the filter bowl at the same time taking care to ensure that the O-seal in the filter housing is retained for future re-assembly.
2. Remove the strainer and thoroughly wash clean.
3. Before re-assembling the strainer, apply some grease to the O-seal to ensure a water-tight fit for the filter bowl.
4. Refit the strainer element noting that it must be installed with the white plastic foot at the base (i.e. furthest from the filter housing).
5. Refit the filter bowl, ensuring that the O-seal nests properly in its groove, before hand-tightening the filter bowl.
6. Return the stopcock to the ON position.

### LOW-PRESSURE WATER STRAINER



The strainer for the low-pressure water pump is located adjacent to the pump assembly on the right hand side of the machine, below the water tank.

### HIGH-PRESSURE WATER STRAINER



The strainer for the high-pressure water pump is located on the subframe to the rear of the suction nozzle spigot on the right hand side of the machine.



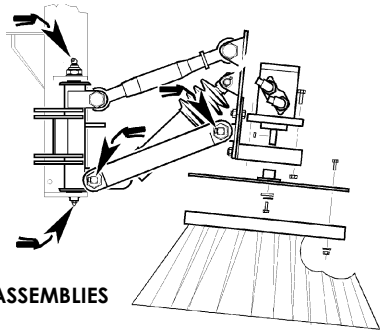
Strainer element must be installed so that the white plastic foot is at the base.

**i** STOPCOCKS ARE SHOWN IN THE 'ON' POSITION

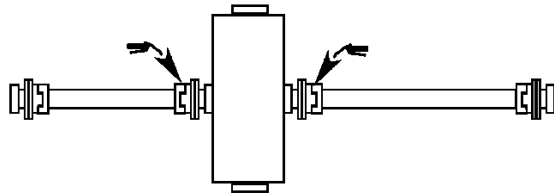


## MANUAL GREASING & LUBRICATION

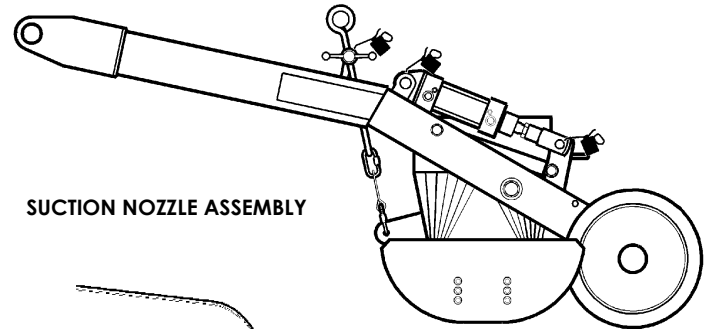
Carry out manual greasing in accordance with the appropriate schedule (Page 32) and by referring to the accompanying diagrams shown here.



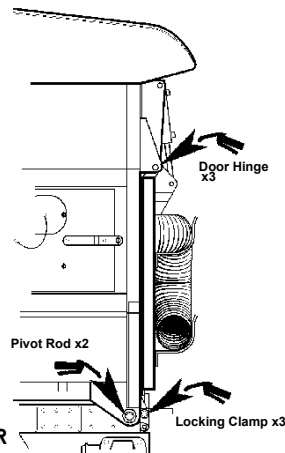
**SIDE BRUSH ASSEMBLIES**



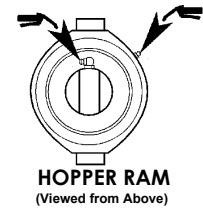
**HYDROSTATIC GEARBOX PROPSHAFTS**



**SUCTION NOZZLE ASSEMBLY**



**HOPPER BODY & REAR DOOR**



**HOPPER RAM  
(Viewed from Above)**



## RECOMMENDED LUBRICANTS AND CONSUMABLE PARTS

DESCRIPTION	SPECIFICATION	QUANT	SCARAB PART
Hydraulic Oil	Derwent 32	5 litres	005005
Hypoid Gear Oil (Scarab Transfer Box)	85W/90	5 litres	005003
Multi-purpose grease (Grease Points)	Super Lithium 2	400 g	005007
Motor Oil (for High-pressure Water Pump)	15W/50	5 litres	005001
Pneumatic Lubricant	Scarab approved	50 ml	005046
Replacement Widesweep Brush Discs (400 mm Dia)	Normal Brush	33	023474
	Extended Brush	45	
Replacement Widesweep Brush Discs (300 mm Dia)	Standard Brush	33	023471
	Extended Brush	45	
Replacement Spacers (Widesweep)	-	32/44	023472
Replacement Side Brush	315 mm Dia	1/2	023470
Replacement Side Brush	400 mm Dia	1/2	014066
Rubber Skirt, Side Brush	2 slot	1	012216
Rubber Skirt, Side Brush	3 slot	1	010247
Rubber Skirt, Side Brush	5 slot		014069
Front Skirt, Wide Sweep	Standard Brush	1	022516
Front Skirt, Wide Sweep	Extended Brush	1	014069
Suction Tube	-	1	023154
Flap Kit, Suction Nozzle	-	Set of 3	024550
Clamp (Long), Suction Nozzle	-	2	013025
Clamp (Short), Suction Nozzle	-	1	013024
Seal, Suction Nozzle - Hopper	-	1	013601
Seal, Rear Door	-	1	010544
Seal, Side Loading Hatch	-	2	013599
Wander Hose (trunking only)	-	1	025214
Element, Hydraulic Return Filter	-	1	013125
Element, Water Filter	Banjo Type	1	010121
Element, Water Filter	UCC Type	1	023863

**MAINTAINING CORRECT FLUID LEVELS**

To check/top up the chassis engine's fluid reservoirs, please refer to the manufacturer's documentation.

The hydraulic oil level sight glass and filler are located on the oil tank, mounted on the left hand side of the machine.

**Access requires the hopper to be in the raised position.**

**BREATHER/FILLER**

**RETURN FILTER**

**SIGHTGLASS**

**SUCTION FILTER**

**HYDRAULIC RESERVOIR**

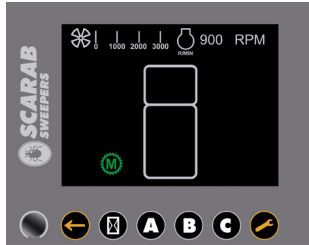
When the hopper is raised the hydraulic oil level should be as indicated by the arrow i.e. approx. half way up.



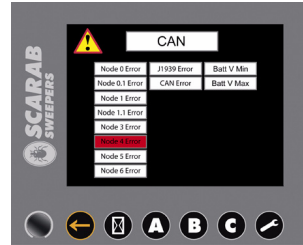


# OPERATING INSTRUCTIONS - Hydrostatic Truck-mounted Sweepers

## LCD MONITOR - OPTIONS MENU



To access the Options Menu:  
From the start-up screen, press the illuminated button (Spanner Symbol).



CAN screen identifies location of system errors (in this example Node 4).

Press controller to exit to previous screen

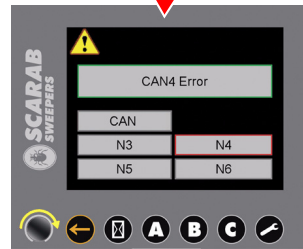


### DRIVER'S FAULT CODES

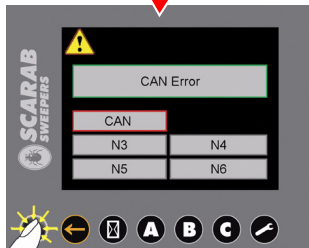
The Options Menu screen opens at its default position (Driver's Fault Codes).

To enter this option, press the controller.

To enter a different option, rotate the controller (refer to following pages).

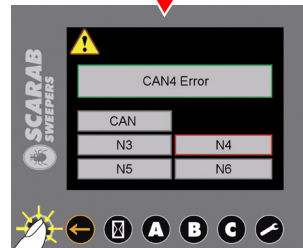


Rotate controller to highlight the error location (in this example Node 4).



To view active CAN errors press the controller while the CAN option is highlighted.

To view the condition of a specific node, rotate the controller to highlight N3 - N6 and press the controller to enter that option.



Press the controller to enter the Node 4 screen.

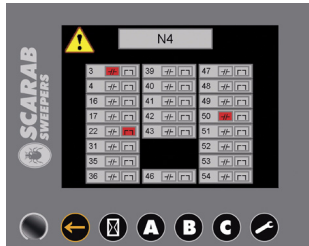
Repeat these steps to enter the other node screens as required.

Continued...



# OPERATING INSTRUCTIONS - Hydrostatic Truck-mounted Sweepers

Continued from previous page

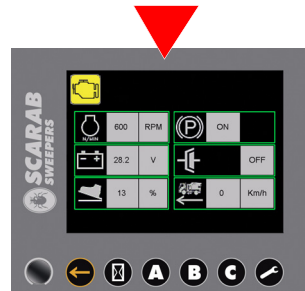


View Node Pin-Contacts:  
Pin numbers with an active fault are highlighted in RED.

↔ = Open Cct

⌂ = Short

Press the Arrow button x 2 to exit to Main Options menu.



EDC screen displays the following current conditions:

- Engine Speed
- Battery Voltage
- Pedal Position
- Parking Brake Position
- Clutch Position
- Road Speed

Press Arrow Button to exit to main Options Menu.



## EDC MENU

Rotate controller to highlight the EDC option.

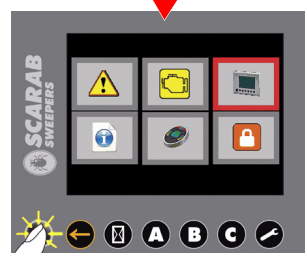


## SCREEN SETTINGS MENU

Rotate controller to highlight the Screen Settings option.



Press the controller to enter the EDC screen



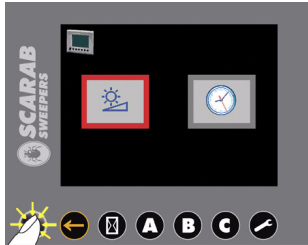
Press the controller to enter the Screen Settings menu.

Continued...



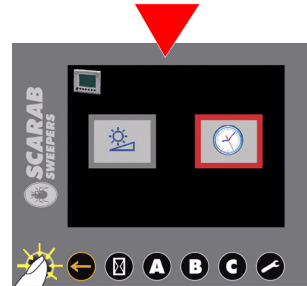
# OPERATING INSTRUCTIONS - Hydrostatic Truck-mounted Sweepers

Continued from previous page

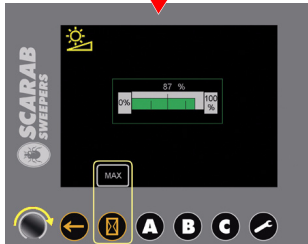


The Settings menu opens at its default position (Brightness). To enter this option, press the controller.

To enter the Clock Settings option, refer below.

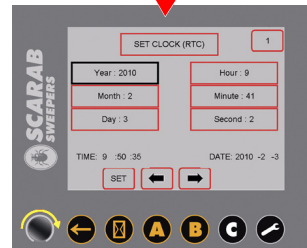


Press the controller to enter the Clock Settings screen.

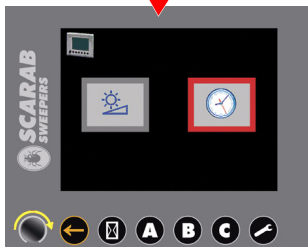


Rotate the controller to adjust screen brightness to the desired level or: Press the timer button to go to maximum brightness as indicated by 'MAX' icon.

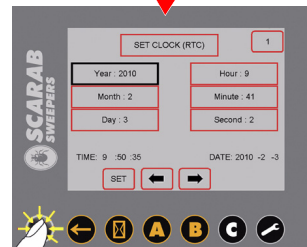
Press Arrow button to exit to Settings menu.



Rotate the controller to position the BLACK highlighter as required



Rotate controller to highlight the Clock Settings option.



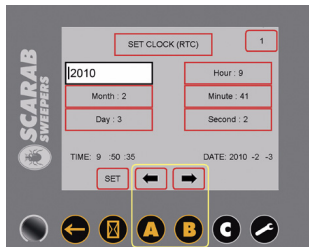
Press the controller to enter the selected option.

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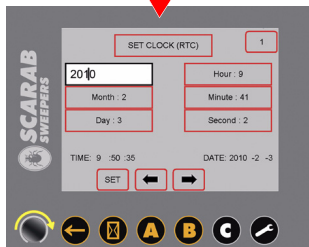


## OPERATING INSTRUCTIONS - *Hydrostatic Truck-mounted Sweepers*

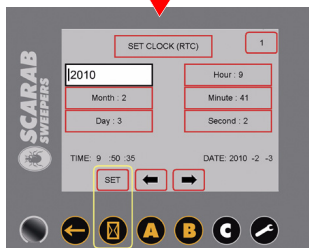
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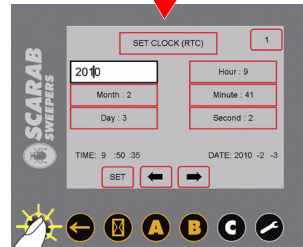
Use the 'A' and 'B' buttons (indicated by arrow icons) to move the cursor to the desired position (i.e. to the left of the character you wish to change).



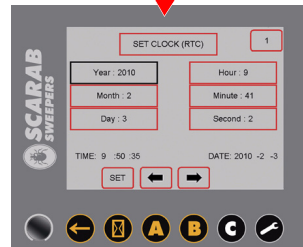
Rotate the controller to change the value of the character at the cursor position.



When adjustment is completed, press the Timer button (indicated by the 'SET' icon) to save your changes.



Press the controller to return to the clock settings screen and repeat the foregoing steps to adjust the other fields as necessary.



When all fields to be changed have been adjusted, press the Arrow button x2 to exit to the main Options Menu screen.



# OPERATING INSTRUCTIONS - Hydrostatic Truck-mounted Sweepers

## INFORMATION MENU

Rotate the controller to highlight the Info option.



## BUTTON CHECKS MENU

Rotate the controller to highlight the Button Checks option.



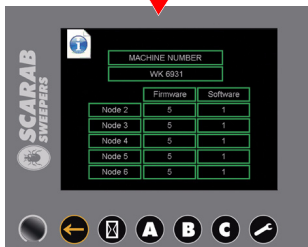
Press the controller to enter the Info screen.



Press the controller to enter the Button Checks screen.



View displayed information. When finished, press the Arrow button to exit to main Options Menu



The Button Checks screen opens at its default position (Main Panel). To enter this option, press the controller.

*To enter the Auxiliary Panel option, refer to the following pages.*

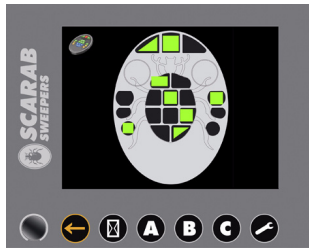


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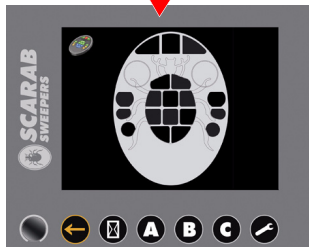


## OPERATING INSTRUCTIONS - Hydrostatic Truck-mounted Sweepers

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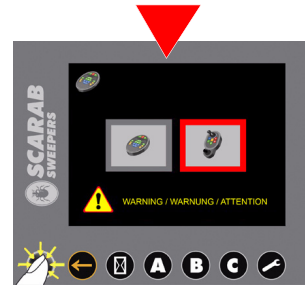
Press all switches to check their functionality. As each switch is pressed a corresponding graphic on the panel display will illuminate (see examples shown). A 'beep' sounds for all switches that activate installed equipment.



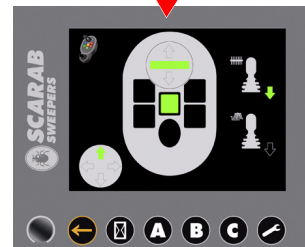
When the checks are completed, press the Arrow button to exit to the Button Checks screen.



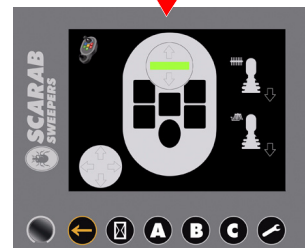
Rotate the controller to highlight the Auxiliary Panel option.



Press the controller to enter the Auxiliary Panel screen



Operate all controls to check functionality. As each function is checked a corresponding graphic on the panel display will illuminate (see examples shown). A 'beep' sounds for all switches that activate installed equipment.



When the checks are completed, press the Arrow button to exit to the Button Checks screen.



**OPERATING INSTRUCTIONS - *Hydrostatic Truck-mounted Sweepers***

**OPERATOR'S NOTES**

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