SCARAB

Scarab Minor VM *Hydrostatic*

OPERATOR'S MANUAL

M/c Serial No:

OPERATOR'S MANUAL

SCARAB MINOR Euro 3

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This manual is published by the Technical Publications Department of Scarab Sweepers Limited 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.

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GENERAL INFORMATION

WEIGHTS, DIMENSIONS AND CAPACITIES

Gross Vehicle Weight (GVW)	Refer to VIN plate
Unladen Weight (Standard)*	2.49 tonnes
Unladen Weight (Hi-Tip)*	2.61 tonnes
Overall Length	4230 mm
Front Overhang	1148 mm
Rear Overhang	1053 mm
Wheelbase	2020 mm
Overall Width	1650 mm
Overall Height (hopper lowered)	2360 mm
Overall Height (hopper raised)	3213 mm
Turning Circle (curb to curb)	8.50 metres

Hopper	2.0 m^3 - Hi-tip 1.6 m^3
Fuel Tanks	60 litres
Engine Oil	5.90 litres
Coolant	18 litres
Hydraulic Tank	15 litres
Water Tank	450 litres - Street Wash Conversion = 1000 litres
Brake System	0.70 litres
High-pressure Water Pump	0.55 litres

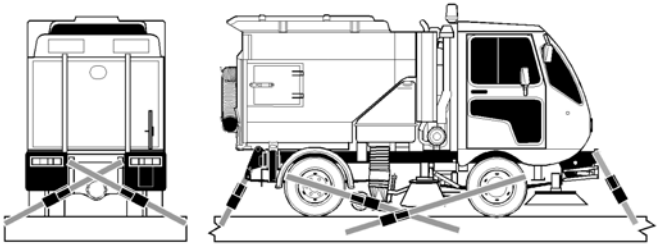
**** Dependent upon specification***

TOWING & TRANSPORTATION

SERIOUS DAMAGE TO TRANSMISSION WILL RESULT IF VEHICLE IS TOWED WITH PROP-SHAFT CONNECTED.
If towing is considered necessary, it is imperative that the prop shaft is removed before any attempt to tow the vehicle.

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

Front Wheels	One Strap per Wheel to a REARWARD lashing point.
Rear Wheels	One Strap per Wheel to a FORWARD lashing point.
Front of Body	One Strap each end of Front Bumper to a FORWARD lashing point.
Rear of Body	One Strap over each Rear Spring Hanger to an OPPOSITE REARWARD lashing point.



IDENTIFICATION PLATES

The SERIAL NUMBER PLATE is located on the outside rear face of the cab, at floor level to the right hand side. All Scarab Minors have a four-digit number with the prefix H.
The VIN PLATE is located above the serial number plate.
The CHASSIS NUMBER is stamped on the top face of the right hand chassis rail beneath the cab/tank.
The LOAD APPORTIONING VALVE (LAV) PLATE is located on the outer face of the left or right hand chassis rail (according to driving position).

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HEALTH & SAFETY ADVICE

THIS OPERATORS MANUAL CONTAINS ESSENTIAL INFORMATION AND MUST REMAIN WITH THE VEHICLE AT ALL TIMES.

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

- **BEFORE DRIVING THE MACHINE CHECK THAT THE CAB SAFETY LOCK IS PROPERLY ENGAGED IN THE LOCKED POSITION.**
- **DO NOT DRIVE THE VEHICLE WITH THE HOPPER IN THE RAISED POSITION, EVEN IF THE HOPPER IS EMPTY.**
- **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.**
- **ALWAYS USE THE SAFETY PROPS PROVIDED TO SUPPORT A RAISED CAB OR HOPPER. NEVER WORK UNDER A RAISED CAB OR HOPPER UNLESS THE APROPRIATE PROP IS IN POSITION.**
- **BEFORE WORKING ON THE MACHINE:**
  POSITION THE VEHICLE ON FIRM, LEVEL GROUND,
  APPLY THE HANDBRAKE,
  STOP THE ENGINE,
  REMOVE THE IGNITION KEY.
- **BEFORE OPERATING EITHER THE HOPPER-TIP CONTROLS OR REAR DOOR, ENSURE THAT THERE IS SUFFICIENT CLEARANCE AND THAT IT IS SAFE TO DO SO.**
- **EXERCISE EXTREME CARE WHEN DISCHARGING THE HOPPER. FOLLOW THE INSTRUCTIONS DETAILED IN THIS MANUAL.**
- **BEFORE STARTING THE ENGINE ENSURE THAT ALL CONTROLS ARE SWITCHED OFF AND THAT THE VEHICLE IS IN NEUTRAL.**
- **DO NOT OVERLOAD THE HOPPER.**
- **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.**

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

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

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 Minor performs at the optimum level of safety and efficiency. Refer to the paragraphs following this schedule for more detailed information.

MAINTENANCE PROCEDURE	DAILY ACTION BEFORE	DAILY ACTION AFTER	WEEKLY ACTION	MONTHLY ACTION
Check vehicle / body for safety. All lighting equipment, tyres, fuel, oil, coolant, brake fluid, windscreen wash and water-tank levels	✔	✘	✘	✔
Check hydraulic oil level and inspect vehicle for signs of hydraulic leaks. Check oil cooler and radiator are clean	✔	✘	✘	✔
If vehicle not previously used by YOU, check suction fan is clean. Rectify as required	✔	✘	✘	✔
Check brushes/skirts for wear. Remove any entangled items, e.g. lengths of string	✔	✘	✘	✔
Check suction nozzle/flaps for damage/correct ground clearance. Wrong setting will impair suction performance	✔	✘	✘	✔
Check all equipment is stowed and brushes have been raised	✔	✘	✘	✔
Check water spray jets for blockages	✔	✘	✘	✔
Wash vehicle, particularly hopper screens and area above. Leave hopper door partially open, allowing air to circulate. Avoid directing high-pressure water at electrical connections.	✘	✔	✘	✔
Wash suction fan thoroughly, using scraper provided and high-pressure jetting lance	✘	✔	✔	✔
Carry out a thorough inspection of the fan assembly to verify that it is in good condition	✘	✘	✘	✔
Wash oil cooler, ensuring that the fins are clean	✘	✔	✘	✔
Wash the radiator, ensuring that the fins are clean	✘	✔	✘	✔
Lubricate as appropriate, brush links, pivots, nozzle wheels and the wide sweep bearing	✘	✔	✘	✔
Remove and clean the water strainer elements	✘	✔	✘	✔
Grease prop. shaft and check for wear on U/Js	✘	✘	✔	✔
Check entire machine for wear/damage. Rectify as required	✘	✘	✘	✔
Raise/prop hopper. Run fan/brushes (normal speed). Check oil tank return filter gauge, if in RED zone, replace element	✘	✘	✘	✔
Check for wear in suction tubes and deflectors	✘	✘	✘	✔
Check seals on hopper-door, side-hatches, suction-tubes	✘	✘	✘	✔

Continued...

MAINTENANCE PROCEDURE	DAILY ACTION BEFORE	DAILY ACTION AFTER	WEEKLY ACTION	MONTHLY ACTION
Check hopper and subframe-to-chassis mounting points	✘	✘	✘	✔
Check wiring and hoses for security of attachment and for signs of chafing. Rectify as necessary	✘	✘	✘	✔
Check oil level in high-pressure pump, top up as necessary	✘	✘	✘	✔
Clean air cleaner (more often if working in dusty conditions)	✘	✘	✘	✔

IN FROSTY WEATHER

CAUTION

Do not, under any circumstances, operate the high pressure pump without water.

Drain the water tank (by removing the water strainers).
Open the drain taps on each water pump.
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.

SCARAB PARTS & SERVICE PROVIDERS

AUSTRALIA
Rosmech
2 Newfield Road
Para Hills West SA 5096
Tel: 08 8260 5855

BELGIQUE
MOL Cy nv
VDK Waste Systems
Dikstmuidesteenweg
B-8830
Hooglede
Tel: 32 51 701681

DEUTCHLAND
Terra-Trade Import/Export GmbH
Terra-Vertlieb & Kundendienst West
Kruger & Co KG
Gewerbegebiet Nord
Lauchaer Höhe
D-99880 Waltershausen
Tel: 49 3622 6410

ESPAGNE
Piquer Maquinaria, SA
Apartado de Correos, 3071
04080
Almeria
Tel: 34 950 62 50 60

FRANCE
Dominique Declercq Distribution
Avenue d'Immercourt ZI Est
62000
Arras
Tel: 33 3 212 27590

GREECE
D F Sarantopoulos
210 Lenorman Street
104 43 Athens
Tel: 30 1 51 46 411

IRELAND
Motor Distributors Ltd.
Nass Road
Dublin 12
Tel: 3531 4503333

ITALIA
Enterprise CDS srl
Via Biancospini, 19
20146
Milano
Tel: 39 02 93568801

NORTHERN IRELAND
McCreath Taylor (NI) Ltd.
Flush Park, Knockmore Ind. Est.
Lisburn
Co. Antrim BT28 2DX
Tel: 01846 662756

NEDDERLANDS
DHM
Houtstraat 2A
8471 ZX Wolvega
Tel: 31 561 611 611

PORTUGAL
Silvia Ltd.
Avenida Infante Santo, 53, r/c Esq
1300 Lisboa
Tel: 351 1 397 40 18

SCANDINAVIA
REN VÄG AB
Gronbogartan 2
503 68 Boras
Tel: 46 33 106460

SCOTLAND
Applied Sweepers Ltd.
Bankside, Falkirk
FK2 7XE
Tel: 01324 611666

UK (Northern England)
Londonderry Garage Ltd.
Londonderry, Northallerton
North Yorkshire DL7 9NB
Tel: 01677 424627 / 422185

UK (England & Wales)
Scarab Sweepers Ltd.
Pattenden Lane
Marden
Kent TN12 9QD
Tel: 01622 831006

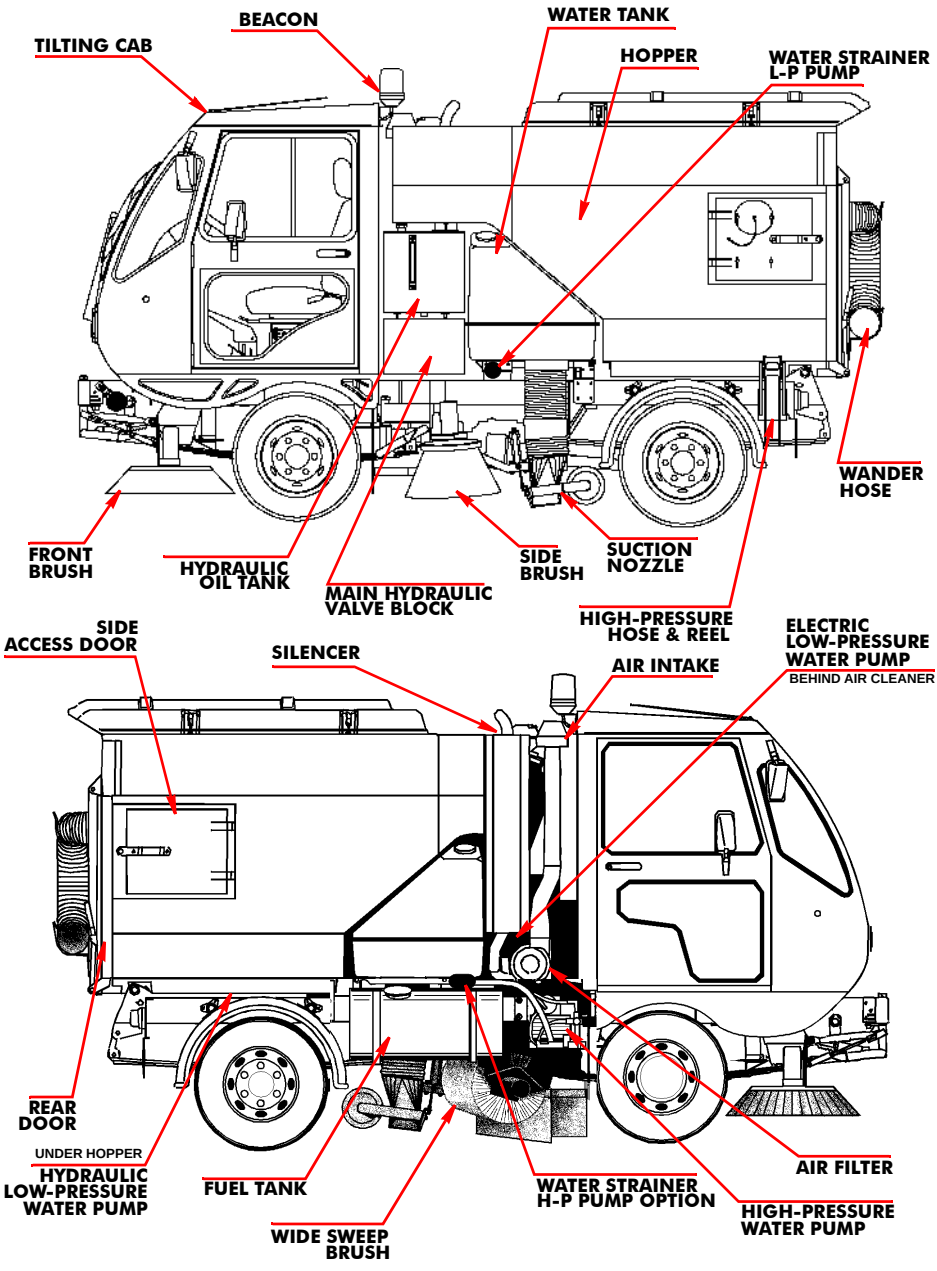


Fig. 1 Main Features of the Scarab Minor Euro 3

TILTING THE CAB

CAUTION

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

1. Operate the cab-locking lever (located between the seats) by moving it through approximately180°(see Fig. 2).
2. Close the cab door and raise the cab safety latch, simultaneously lifting the rear of the cab until it reaches its maximum tilt position.
3. Deploy the cab prop, locating it in its retaining pocket on the chassis rail.

CAUTION

Before lowering the cab, ensure that area below it is clear of any items or equipment used while the cab was in the raised position.

4. Lower the cab and engage the locking lever.

WARNING

BEFORE DRIVING THE VEHICLE, ENSURE THAT THE CAB LOCKING LEVER IS FULLY ENGAGED IN THE LOCKED POSITION.

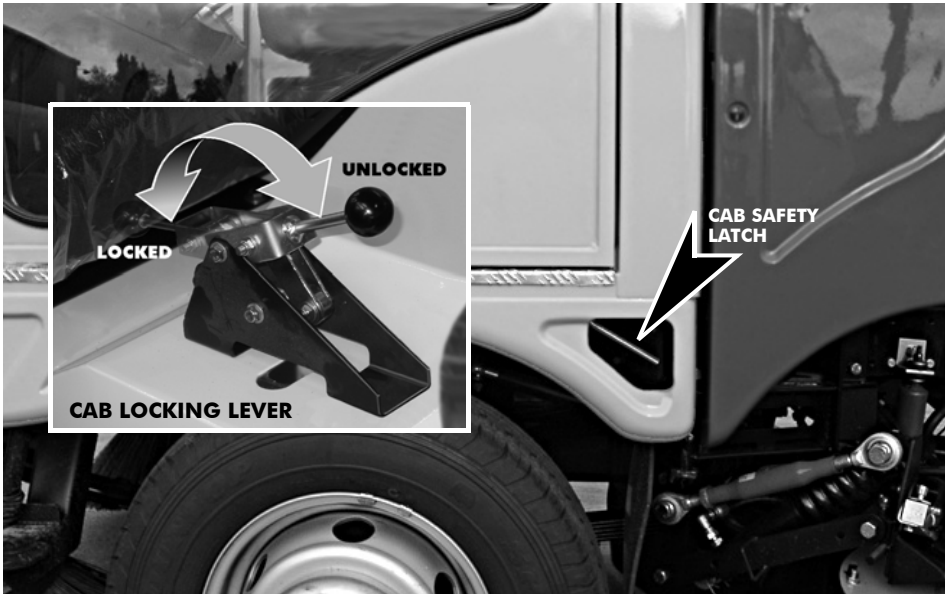


Fig. 2 Cab-tilt Locking Mechanism

KEY MAINTENANCE PROCEDURES
CLEANING THE SUCTION FAN

WARNINGS: FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY.

1. BEFORE WORKING ON THE MACHINE POSITION IT ON FIRM, LEVEL GROUND, APPLY HANDBRAKE, STOP ENGINE & REMOVE IGNITION KEY.

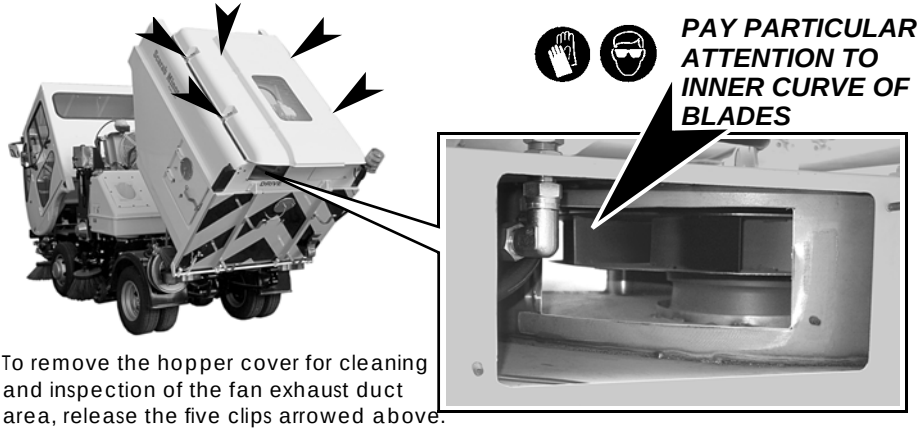
2. ALWAYS USE THE HOPPER PROP TO SUPPORT A RAISED HOPPER.

3. 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.

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

5. ALWAYS WEAR SUITABLE EYE PROTECTION WHEN USING THE HAND LANCE.

1. Raise the hopper and deploy the hopper prop.
2. Switch off the engine and remove the ignition keys.
3. Remove the outer inspection cover from the hopper and the inner cover from the fan housing to expose the fan (Refer to Fig. 3).
4. Using high-pressure water from the jetting lance and the special scraper, as necessary, thoroughly clean the fan. Pay particular attention to the inside curve of each impellor blade and to the area around the fan hub.
5. Refit the inspection covers and lower the hopper.



To remove the hopper cover for cleaning and inspection of the fan exhaust duct area, release the five clips arrowed above.

Fig. 3 Inspecting & Cleaning the Suction Fan

WARNING:

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.

SUCTION NOZZLE CLEARANCES

inspect the suction nozzle flaps to verify that they are in good condition and do not exhibit excessive wear. Adjust as necessary to achieve the correct flap to ground clearances (Refer to Fig. 4).

NOTE:

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

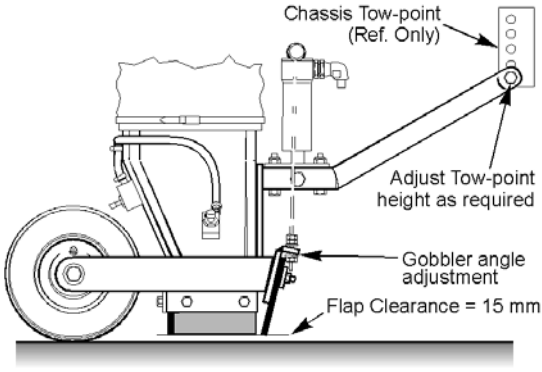


Fig. 4 Suction Nozzle Clearance - Factory Set-up

SETTING UP THE BRUSHES & SKIRTS

Maintaining an effective brush set-up is essential to good sweeping performance, it also determine. The following instructions are based on the factory settings, which produce excellent results in virtually all conditions. It should be remembered, however, that there is no substitute for experience and if it is found that, for a specific sweeping job, an alternative set-up is more effective, this may be adopted when necessary.

SIDE BRUSH

1. The side brush should be angled so that, when deployed, about **33% (120°)** of the outer/leading edge of its circumference is in contact with the road surface.
2. The rubber skirt adjacent to the side brush collects / positions material in the path of the suction nozzle. Condition and adjustment are very important. Position the skirt so that it is just clear of the ground.

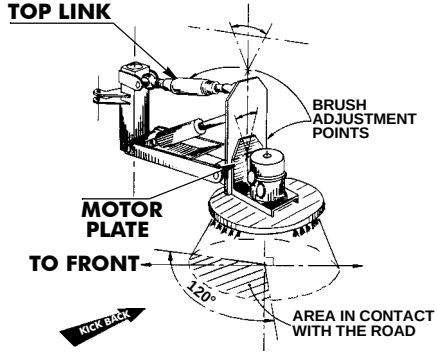


Fig. 5 Brush Tilt Adjustment

FRONT BRUSHES

1. There are two sweeping configurations with the Front Brushes.
   (a) When both brushes are lowered straight down onto the road.
   (b) When the curb-side brush is extended outwards to the gully.
   On dual sweep machines, both brushes can be extended.
2. On single sweep machines, front brush tilt-angle differs from side to side. For general sweeping duties, a greater proportion of the outward-extending brush is in contact with the road surface.
3. To set the correct tilt angles, adjust the Top Link and/or swivel the Motor Plate, to obtain a satisfactory setting as follows:
4. **Extending Brush.** Set the brush so that about **40% (150°)** of its circumference, at the outer/leading edge, is in contact with the road surface, ***when the brush is in the extended position***.
5. **Non-extending Brush.** Adjust so that about **33% (120°)** of its circumference, at the outer/leading edge, is in contact with the road surface.

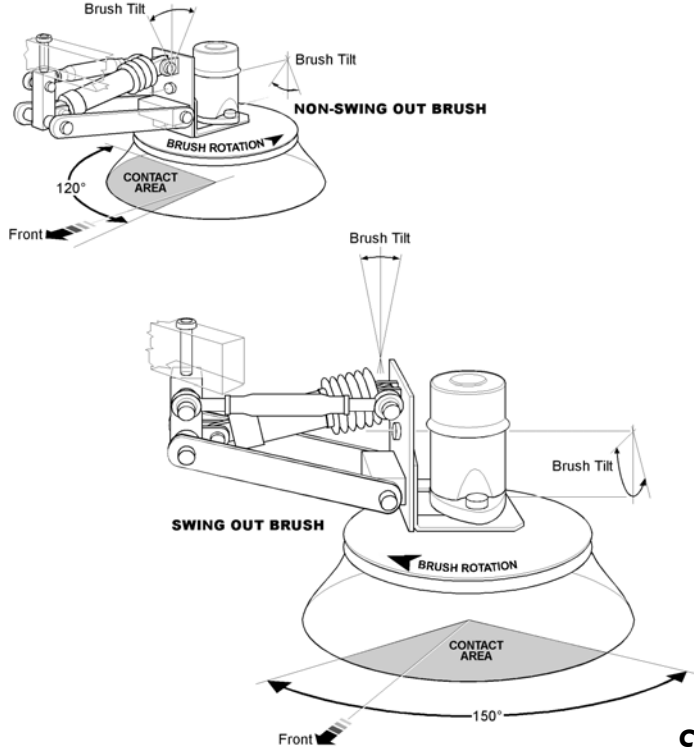


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Fig. 6 Front Brush Adjustment

FRONT BRUSHES (*Continued*)

Dual Sweep Machines

1. Adjust the Top Link and/or Motor Bracket of each brush, until about **40**% or **150**° of its circumference, at the outer/leading edge, is in contact with the road surface.

CAUTION:

An incorrect front brush set-up affects not only sweeping efficiency, but can also greatly influence the rate of brush wear.

REMOVING / REFITTING THE BRUSH HEADS

The Scarab Minor Euro 3 is fitted with quick-release brush hubs. These hubs incorporate slotted holes. Brush removal is accomplished by loosening the four flange nuts and rotating the brush, until the nuts align with the holes. The brush can then be taken off and/or refitted without removing the nuts from the brush bolts. All Scarab supplied replacement brushes now have captive bolts and are supplied with new flange nuts.

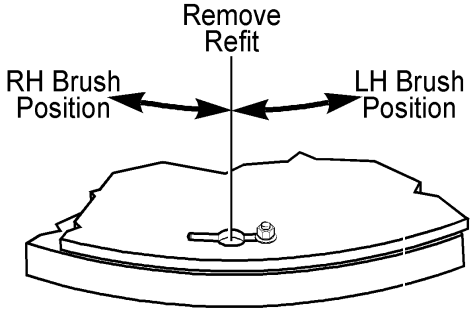


Fig. 7 Quick-release Brush Hub Alignment

CAUTION:

Care should be taken to ensure that when fitting/refitting brushes they are correctly positioned on the hubs, in accordance with the illustrated alignments (see Fig. 7).

SWEEPING FAULTS - DIAGNOSIS & RECTIFICATION

FAULT	SOLUTION
LIGHT MATERIAL IS CARRIED ROUND SIDE BRUSH & DEPOSITED BACK IN CHANNEL	THE SIDE BRUSH IS SET TOO FLAT ON THE ROAD SURFACE. CHECK/RESET BRUSH ANGLE
A TRAIL OF SMALL STONES IS LEFT BEHIND THE SUCTION NOZZLE	1. SUCTION NOZZLE FLAPS ARE SET TOO HIGH 2. SUCTION NOZZLE TOW-POINT SET TOO HIGH 3. FAN SPEED IS TOO LOW

FLUID LEVELS

For coolant and hydraulic filler points refer to Fig. 8.
The brake and screen-wash reservoirs are in the cab. Access to the brake fluid reservoir is gained via a flap on top of the dash panel.

For engine oil filler and dipstick refer to Fig. 9.

Fig. 8 Cab Interior Arrangement

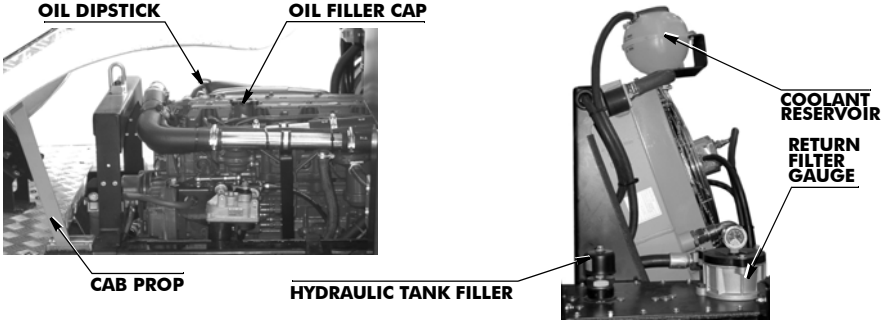


Fig. 9 Engine & Hydraulic Tank Fluids

RECOMMENDED LUBRICANTS AND CONSUMABLE PARTS

DESCRIPTION	SPECIFICATION	SCARAB PART
HYDRAULIC OIL	DERWENT 32	005005
MULTI-PURPOSE GREASE (GREASE POINTS)	SUPER LITHIUM 2	005007
MOTOR OIL (HIGH-PRESS WATER PUMP)	15W/50	005001
REPLACEMENT BRUSH DISCS (WIDE SWEEP)	-	023471
REPLACEMENT SPACERS (WIDE SWEEP)	-	023472
REPLACEMENT SIDE BRUSH	-	023470
REPLACEMENT FRONT BRUSH	-	023469
RUBBER SKIRT (2 SLOT), SIDE BRUSH	-	012216
RUBBER SKIRT (3 SLOT), SIDE BRUSH	-	010247
FRONT SKIRT, WIDE SWEEP	-	022516
SUCTION TUBE	-	023154
FLAP KIT, SUCTION NOZZLE	-	011593

Continued...

DESCRIPTION	SPECIFICATION	SCARAB PART
CLAMP (LONG), SUCTION NOZZLE	-	011592
CLAMP (SHORT), SUCTION NOZZLE	-	013615
GOBBLER ROD, SUCTION NOZZLE	-	011811
SPRING, SUCTION NOZZLE BOX	-	010521
SEAL, SUCTION NOZZLE - HOPPER	-	013601
SEAL, REAR DOOR	-	010544
SEAL, SIDE LOADING HATCH	-	013599
SEAL, FRONT APERTURE	-	013594
WANDER HOSE	-	010119
ELEMENT, HYDRAULIC RETURN FILTER	-	011972
ELEMENT, WATER FILTER	-	010121
DISC PAD SET	-	020138

MANUAL GREASING

Carry out manual greasing in accordance with the appropriate schedule (OPERATOR'S ROUTINE MAINTENANCE on page 5) and by referring to Fig. 10

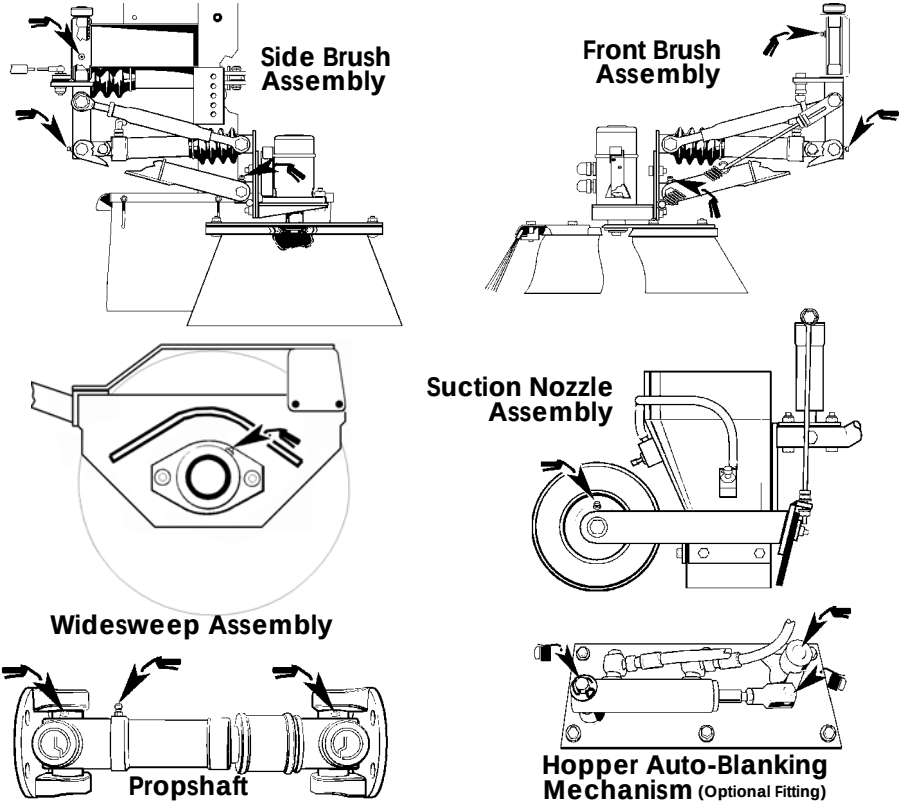
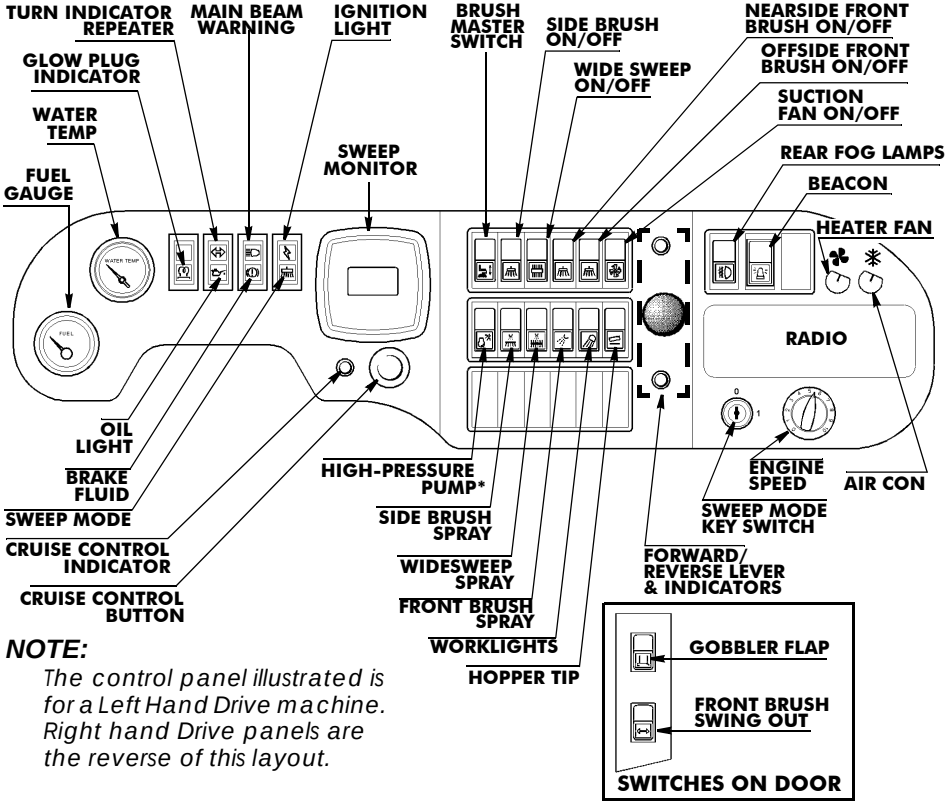


Fig. 10 Grease-point Locations

DESCRIPTION OF SWEEPING CONTROLS



NOTE:

The control panel illustrated is for a Left Hand Drive machine. Right hand Drive panels are the reverse of this layout.

Fig. 11 LHD Control Panel Layout (right-hand-drive panel is mirror image of this)

SWEEP MODE SWITCH. Two-position key switch.

CAUTION:

Before selecting Sweep Mode, turn the suction fan OFF. The engine will stall if Sweep is selected with fan ON with engine-speed controller at 0.

Position 1 (Sweep) - gives a sweep-speed range of 0 - 10 mph (0 - 16 kph). The green Sweep Mode indicator will illuminate.

Position 0 (Drive) - gives a driving-speed range of 0 - 40 mph/0 - 65 kph). When Drive Mode is selected the Sweep Mode indicator will extinguish.

CAUTION:

Always turn the Sweep Mode Switch to 0 after sweeping operations.

ENGINE-SPEED ADJUST. Rotary potentiometer used to preset engine-speed for sweeping, it has a bezel marked 1 to 10. Turning clock-wise increases engine speed. Used with the Sweep Monitor (page 20).

Continue...

SUCTION FAN SWITCH. Two-position (ON/OFF) switch. Switch insert illuminates when ON.

FRONT BRUSH SWITCHES - NEARSIDE & OFFSIDE. Two-position (ON/OFF) switch. Switch inserts illuminates when ON.

FRONT BRUSH SWING OUT SWITCH. Two position (ON/OFF) switch. Switch insert illuminates when ON.

SIDE BRUSH SWITCH. Two-position (ON/OFF) switch. Switch insert illuminates when ON.

WIDESWEEP SWITCH. two-position (ON/OFF) switch. Switch insert illuminates when ON.

WATER SPRAY SWITCH (Side Brush/Suction Box). Two-position (ON/OFF) switch. Switch insert illuminates when ON.

WATER SPRAY SWITCH (Front Brush). Two position (ON/OFF) switch. Switch insert illuminates when ON.

WATER SPRAY SWITCH (Wide Sweep Brush). Two-position (ON/OFF) switch. Switch insert illuminates when ON.

HIGH-PRESSURE PUMP SWITCH. Two-position (ON/OFF) switch. Switch insert illuminates when ON.

BEACON SWITCH. Two-position (ON/OFF) switch. Switch insert illuminates when ON.

HOPPER RAISE/LOWER SWITCH. Three-position (ON/OFF) switch detented to the central position.
Press the ***Top*** of the switch to RAISE the Hopper.
Press the ***Bottom*** to LOWER the Hopper. Switch insert illuminates when ON.

BRUSH MASTER SWITCH. Three-position (ON/OFF) switch detented to the central position.
Press the ***Top*** of the switch to STOP & RAISE all sweeping equipment.
Press the ***Bottom*** to LOWER & START the sweeping equipment configuration pre-selected on the control panel. Switch insert illuminates when ON.

GOBBLER FLAP SWITCH. Three-position (ON/OFF) switch.
Use the **Centre** position for normal sweeping conditions.
Press the ***Top*** of the switch to momentarily raise the Gobbler, this is spring loaded and will return to normal position when released.
Press the ***Bottom*** of the switch to raise the Gobbler permanently. Switch insert illuminates when ON.

CRUISE CONTROL BUTTON. Press the Cruise Control Button (Red indicator lamp illuminates). The Drive system will maintain the current sweeping speed until disengaged. To **DISENGAGE** - Press the Cruise Control Button again or apply the brakes.

LIMITATIONS OF USE

The Scarab Minor is classed as an Urban/Precinct Road Sweeper and, as such, is intended only for operation in the sweeping and associated roles for which it has been expressly designed.

OPERATING PROCEDURE - DRIVE MODE

1. Ensure that the Forward/Reverse lever is in the NEUTRAL position and that the hand brake is applied.
2. Start the engine and select Drive Mode (**0**) on the Key Switch.
3. Select FORWARD or REVERSE on the Forward/Reverse lever.
4. Release the handbrake and slowly depress the throttle pedal to move the vehicle in the appropriate direction of travel.

NOTE:

In Drive Mode, the vehicle is controlled, by means of the throttle and brake pedals, in a similar manner to a vehicle fitted with automatic transmission. Releasing the throttle pedal at normal road speeds produces a conventional automotive-style deceleration/over-run.

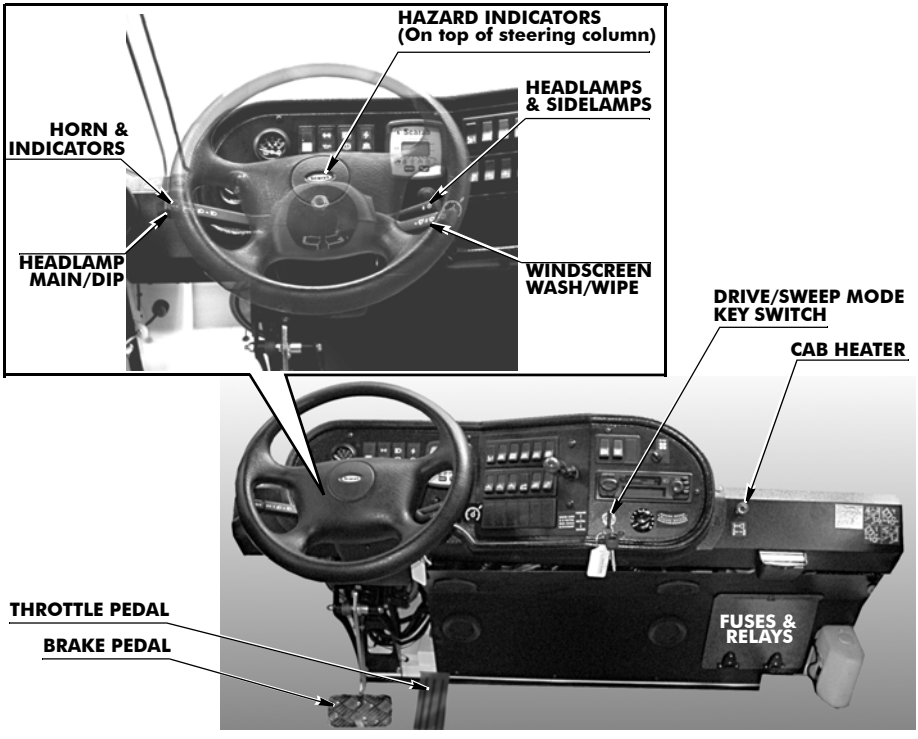
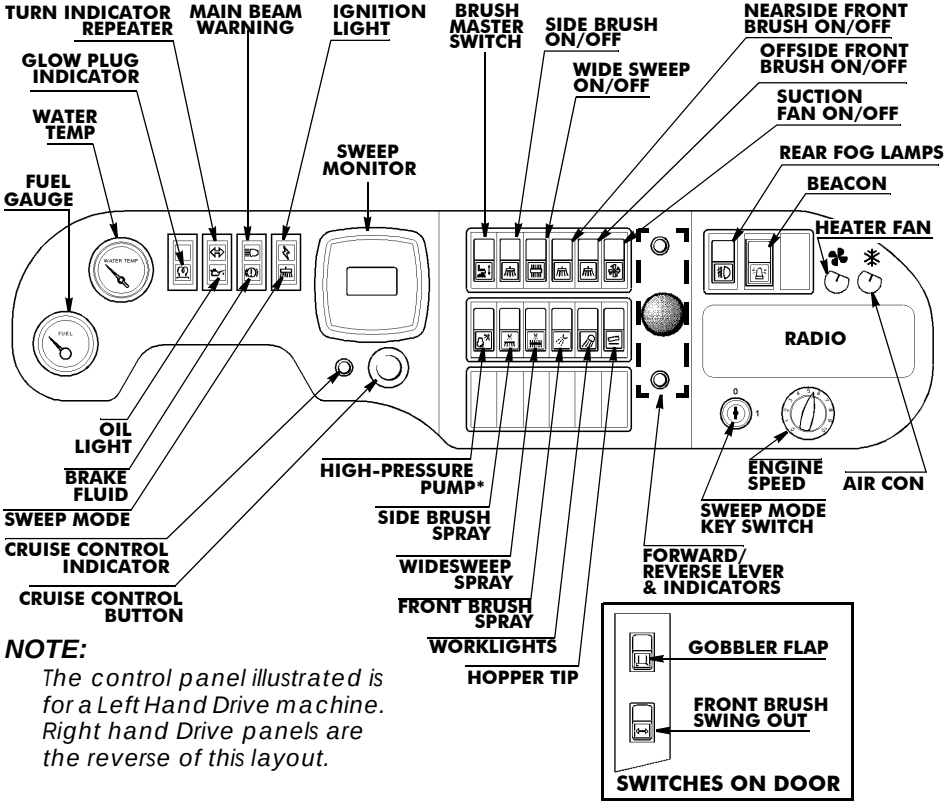


Fig. 12 Driving Controls

OPERATING PROCEDURE - SWEEP MODE



NOTE:

The control panel illustrated is for a Left Hand Drive machine. Right hand Drive panels are the reverse of this layout.

Fig. 13 LHD Control Panel layout (right-hand-drive panel is mirror image of this)

CAUTIONS:

The vehicle MUST be brought to a complete standstill, the handbrake applied and Neutral selected BEFORE Sweep Mode is selected.

1. Stop the vehicle, release the foot throttle and apply handbrake.
2. Engage NEUTRAL on the Forward/Reverse Lever.
3. Ensure that the suction fan is OFF and turn the Key Switch to **Position 1**. The Sweep Mode indicator will illuminate (GREEN), confirming Sweep Mode (the sweep controls are now active).
4. Press the ⌄ symbol on the RDS Sweep Monitor, until engine RPM is displayed (page 20) and rotate the Engine Speed Control clockwise until the required engine speed is achieved (1380 rpm is the most efficient setting for normal sweeping duties.)

NOTE:
*The maximum engine speed for '**full-load, up-hill**' sweeping should not exceed 1800 rpm. Operating the engine beyond this level consumes more fuel without giving further performance advantage.*

5. Select the desired sweeping equipment combination (including Beacon) by operating the appropriate switches on the control panel.
6. Select Suction Fan ON and then deploy the sweeping equipment by operating the Brush Master Switch.

NOTE:
The suction fan speed is preset to reach maximum RPM at normal engine operating speed (1380 rpm), therefore, suction performance cannot be improved by increasing engine speed beyond the values stated in paragraph 4.

7. Select **FORWARD** on the FORWARD/REVERSE lever and release the handbrake.

NOTE:
In Sweep Mode, the vehicle is controlled, principally, by means of the throttle. The brakes are only necessary when manœuvring in very confined areas. Releasing the throttle pedal at sweeping speeds produces marked deceleration with very little over-run, affording precise control while sweeping.

8. When Reverse is selected in Sweep Mode, all sweeping equipment in use will stop and lift automatically. This will revert to the selected sweeping configuration when **NEUTRAL** or **FORWARD** is re-selected.
9. Upon completion of the sweeping run, operate the Brush Master Switch to stop and raise the sweeping equipment permanently to the stowed position (the selected sweeping configuration will remain active and may be redeployed by returning this switch to the **ON** position).
10. Turn the suction fan **OFF**.

REDUCING NOISE LEVELS & FUEL CONSUMPTION

Although the most efficient engine operating speed is 1380 rpm, there are times when it is possible to reduce engine speed, thereby reducing noise levels. This is most beneficial when sweeping at night, or in areas sensitive to noise pollution.

Sweeping with reduced engine speeds can be achieved most satisfactorily when sweeping light or sparsely distributed materials. Experience will enable the operator to vary the selected engine speed according to sweeping conditions.

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.

RDS SWEEPER MONITORS

Current machines are fitted with the latest version of this instrument which is known as the Scarab Wizard. For details of the original version please refer to page 21.

SCARAB WIZARD MODEL

DESCRIPTION

The monitor will illuminate as soon as the vehicle's ignition is switched on. Initially, the display will show the software type, issue and revision details before defaulting to either Position 1 - Forward Speed (if in Transit mode) or Position 6 - Engine Speed (if in Sweep Mode i.e. Master Key Switch ON).

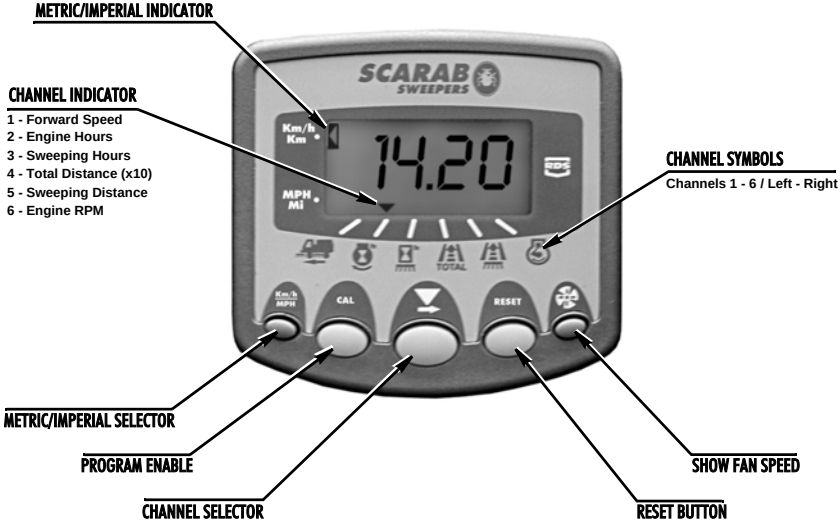


Fig. 14 The Scarab 'Wizard' Sweeper Monitor

CONTROLS

1. **CHANNEL SELECTOR**. This enables the selection and display of the various operating channels, when used in normal operating mode. When the monitor is in programming mode, this control enables the setting of the required digits for each channel's numerical default value.
2. **METRIC/IMPERIAL SELECTOR**. This enables the selection and display of either metric (Km) or imperial (Miles) units of measurement for appropriate operating modes e.g. Forward Speed. Operating the switch toggles between the metric and imperial settings.

3. **PROGRAM ENABLE**. This enables access to the calibration factors (CAL Mode 1). This mode is only accessible when the security link in in position and is used to set the calibration factors for each channel.
4. **FAN SPEED SELECTION**. This enables the current speed of the Suction Fan to be displayed. When pressed, fan speed will be displayed, remaining on-screen for a brief period (approximately 5 sec) before reverting to the default channel display
5. **RESET** - This resets either the Work Hours or Work Distance display to ZERO, dependent upon the channel selected. The security link must be in position for this procedure.

ORIGINAL MODEL

DESCRIPTION

1. **CHEVRON BUTTON** - Used to select and display the monitor's various channels/functions. This is achieved by pressing, and holding down, the Chevron Button until the Chevron Pointer moves to the required channel position.
2. The **Engine Speed** display is accessed by pressing, and holding down, the Chevron Button until the Chevron Pointer moves to the channel six position, this becomes the active channel.
3. When engine speed adjustment is completed, reselect Channel One (Forward Speed).
   Alternatively, the instrument will default to **Forward Speed** mode automatically as soon as a speed of approximately 9 mph / 15 kph is achieved in Drive Mode.

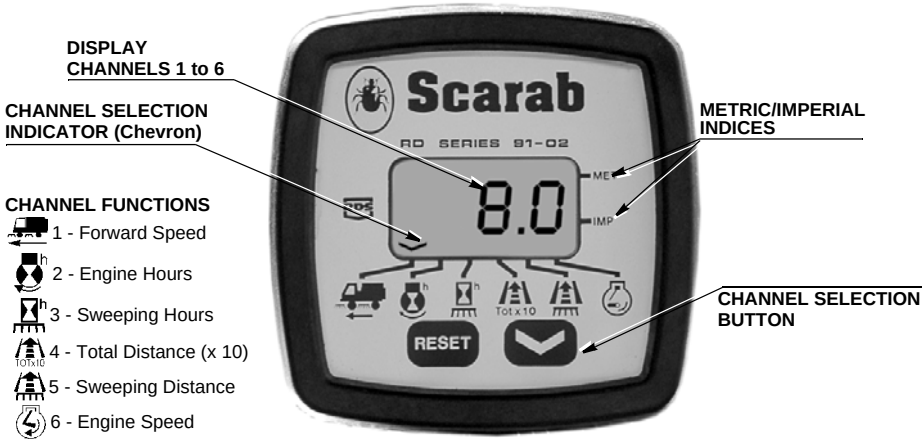


Fig. 15 The RDS Sweeper Monitor

WANDER HOSE

WARNING

BEFORE CONNECTING THE WANDER HOSE, ENSURE THAT THE SUCTION FAN IS TURNED OFF.

1. Remove the blanking plate from one of the wander hose apertures in either the hopper rear door, or the appropriate side loading flap and stow it on the spare fasteners located below the aperture.
2. Attach the wander hose over the exposed aperture.

NOTE:

*The wander hose can be used at the same time as the other sweeping equipment. For **maximum** suction, however, set engine speed to at least 1700 rpm and blank off the suction nozzle(s). On machines with auto-blanking, this is done by raising the sweeping equipment. On all other machines it is necessary to fit the special blanking-plate between the Hopper and Water Tank.*

BLANKING PLATE

3. Refer to RAISING THE HOPPER on page 22.
4. Release the securing pins and remove the blanking plate from its stowage position on the nearside rear mudguard.
5. Fit the blanking plate over the upper aperture of the suction tube i.e. on top of the water tank (Refer to Fig. 16).
6. Refer to (LOWERING THE HOPPER on page 23).
7. Turn on the suction fan.

Fig. 16 Use of the Blanking-plate

HOPPER OPERATING PROCEDURE

WARNING

ALWAYS USE THE HOPPER PROP WHEN THE HOPPER IS RAISED. 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.

DO NOT DRIVE THE VEHICLE WHILE THE HOPPER IS RAISED.

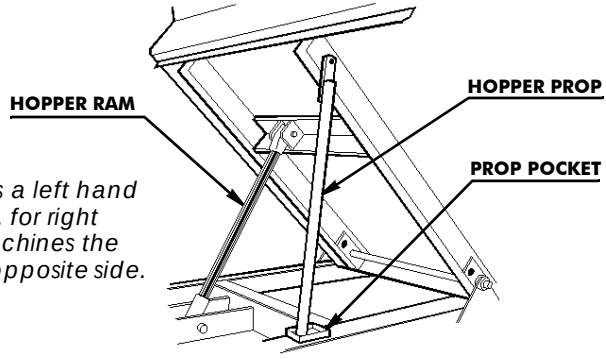
RAISING THE HOPPER

NOTE:

When discharging the hopper, the recommended technique is to release the door clamp while the suction fan is running, position the vehicle, raise the hopper and then turn the suction fan OFF, thereby allowing the door to open and the hopper to discharge.

1. From inside the cab, operate the Hopper switch by pressing and holding down the TOP of the switch.

2. When the hopper is fully raised, release the switch and deploy the hopper prop, locating the free-end in its pocket (Refer to Fig. 17)



NOTE:
This view shows a left hand drive machine, for right hand drive machines the prop is on the opposite side.

Fig. 17 - Correct Use of the Hopper Prop

LOWERING THE HOPPER

3. Stow the prop.

4. From inside the cab, press and hold down the BOTTOM of the Hopper Switch until the hopper is completely lowered.

REAR DOOR

1. The door is manually operated, assisted by two gas struts. A safety prop deploys automatically when the door is opened (page 22).

USING THE LOW-PRESSURE WATER PUMP

There are two types of low-pressure water pump fitted to the Minor.

The hydraulically driven single-cylinder Hardi pump as fitted until late 2001 and an electrically driven pump fitted to current units *i.e.* machines with the revised hydraulic system (steel pipes).

1. For dust suppression purposes, there are three control switches on the sweeper panel, enabling selection of any or all of the following: Side Brush spray, Wide Sweep spray and Front Brush spray.

2. Ensure that there is sufficient water in the water tank.

3. Select the water spray configuration you require, according to the intended sweep pattern. This will start when the Brush Master Switch is operated (in Sweep Mode) to deploy the selected configuration.

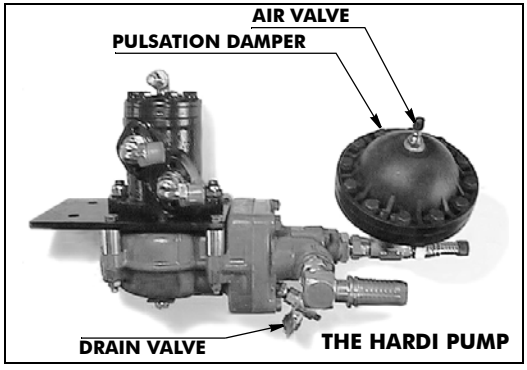
LUBRICATION

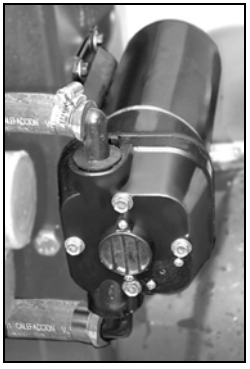
4. The pump bearings are 'sealed-for-life' and require no lubrication.

Continued...

DRAINING

5. It is vital that pumps are totally drained when air temperature is expected to fall to 0°C or below. If a pump is allowed to freeze it is likely that damage will be incurred resulting in seizure.
6. Drain the water tank and open the drain valve (Fig. 18). Switch on all sprays and run the Hardi water pump until dry.
7. The electric pump is self-draining.





THE ELECTRIC PUMP

Fig. 18 Low-pressure Water Pump Arrangements

USING THE OPTIONAL HIGH-PRESSURE WATER PUMP

WARNING

HIGH PRESSURE WATER CAN BE HAZARDOUS, ALWAYS WEAR GOGGLES OR SUITABLE EYE PROTECTION WHEN OPERATING WITH HIGH PRESSURE WATER. 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.

CAUTIONS:

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.

1. Ensure that there is sufficient water in the water tank (and the street wash bag-tank if fitted).
2. Switch on the high pressure pump.
3. Set engine speed to 1700 rpm.
4. If the machine is fitted with a front-mounted high-pressure spray bar,

adjust the ball valves (Refer to Fig. 19) to supply the spray bar or the hand-lance as required.

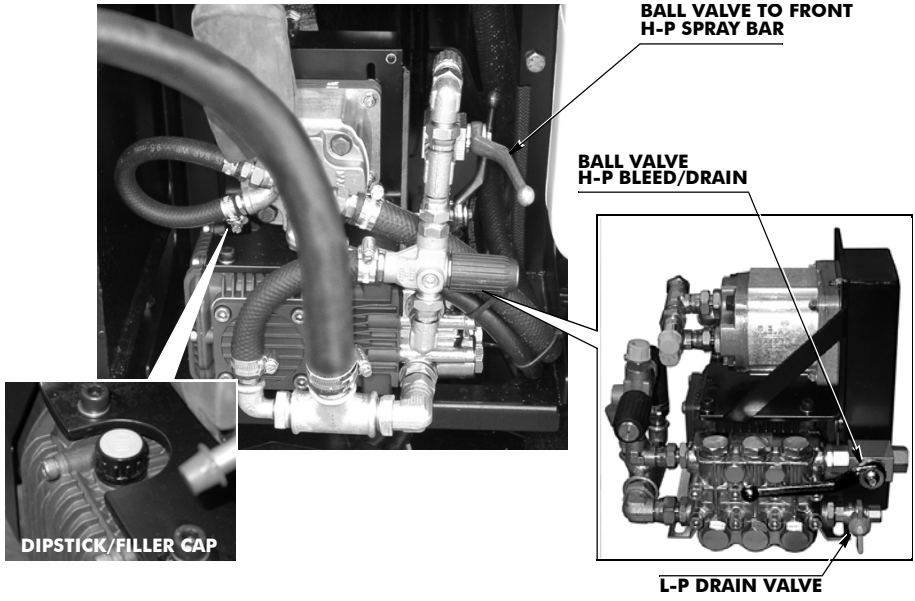


Fig. 19 High-pressure Water Pump Arrangement

OIL LEVEL

5. The level of the oil in the pump's crankcase should be checked on a regular basis (See "OPERATOR'S ROUTINE MAINTENANCE" on page 5.) and topped up as necessary. There is a combined filler cap/dipstick on the top of the pump body (Refer to Fig. 19).

DRAINING

CAUTION:

This pump should NEVER be permitted to run dry, as this will quickly destroy the piston seals and cause the pump to fail.

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.

6. Drain the water tank (refer to OPERATOR'S ROUTINE MAINTENANCE on page 5),

7. To drain the high-pressure side of the pump, open the ball valve (plated lever).

8. To drain the low-pressure side of the pump, open the lower valve (Red Tap).

Continued...

OPERATING SYMBOLS

WARNING LIGHTS	
	ENGINE GLOW-PLUGS WARNING
	ENGINE OIL LEVEL WARNING
	TURN INDICATORS REPEATER
	BRAKE FLUID LEVEL WARNING
	HEADLAMP MAIN BEAM WARNING
	POWER **ON** INDICATOR
	SWEEP-MODE INDICATOR
MAIN SWEEPING PANEL SWITCHES (FROM LEFT TO RIGHT & TOP TO BOTTOM)	
	MASTER SWITCH - LOWERS / ACTIVATES / RAISES PRE-SELECTED SWEEP GEAR
	SIDE BRUSH (SECOND SWITCH ADDED TO SPARE PANEL FOR DUAL SWEEP)
	WIDE SWEEP BRUSH
	NEARSIDE FRONT BRUSH
	OFFSIDE FRONT BRUSH
	SUCTION FAN
	SIDE BRUSH WATER-SPRAY (SECOND SWITCH ADDED FOR DUAL SWEEP)

OPERATING SYMBOLS

	WIDE SWEEP WATER SPRAY
	FRONT BRUSHES WATER SPRAY
	HOPPER TIPPED
	WORK LIGHTS
	HIGH-PRESSURE WATER PUMP
DOOR PANEL SWITCHES	
	SUCTION NOZZLE - GOBBLER FLAP
	FRONT BRUSH SWING IN / OUT (SECOND SWITCH ADDED FOR DUAL SWEEP)
	BOTH SIDE BRUSHES SIMULTANEOUSLY (DUAL SWEEP OPTION ONLY)
	LEFT OR RIGHT-HAND SIDE (CHANNEL) BRUSH (DUAL SWEEP OPTION ONLY)
AUXILIARY LIGHTING PANEL SWITCHES	
	HIGH-INTENSITY REAR LIGHTS
	WARNING BEACONS / LIGHT BAR

SUPPLEMENTARY INFORMATION

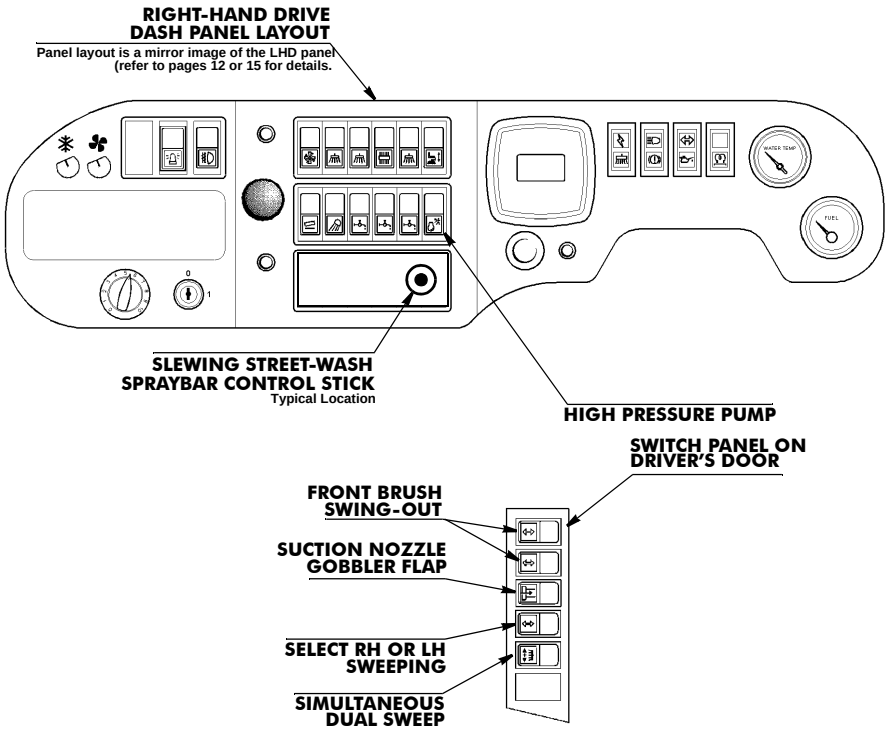


Fig. 20 Dual Sweep & Street Wash Controls

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