Operator's Guide

V Range Suction Sweepers
Incorporating
VT501 • 651 • 801
Twin engine machines
&
VS501 • 651 • 801
Single engine, Hydrostatic machines

Part No 01282-1-GB (A5 size)

Revision Level 02

VT - Twin Engine	Specific to Twin engine sweepers.
VS - Single Engine	Specific to Single engine sweepers.

E.C.M. Issue - 711837

Print date - 03.02.2014

FOREWORD

The Johnston V501, 651 and 801 range of Suction Sweeper represents the highest grade of craftsmanship and reliability that makes Johnston probably the world leader in sweeping technology.

This machine is designed for the removal of spoil on traffic or pedestrian areas, and litter collection using the Wanderhose [Ref. EN 13019], and should only be driven by trained operatives.

This machine should not be used for sweeping hot or burning substances. In the unlikely event of a fire, normal powder or foam fire fighting equipment can be used on this product.

An operator should receive training in the follow elements:

1 Safety Observations/Notices
2 Transit driving
3 Correct use of body prop
4 In cab controls
5 External controls
6 Sweeping techniques
7 Load discharge
8 Channel brush setting and changing
9 WSB setting and changing
10 Nozzle setting and Maxigap operation
11 Daily and weekly maintenance items
12 Driving/operation assessment
13 End of day cleaning of body and machine

Johnston Sweepers Limited can provide operator training upon request.

We would point out that it is the employers responsibility to carry out his own Risk Assessment on the equipment in his particular working environment and work application.

This handbook should be carefully studied. In it you will find instructions for the operation and maintenance of your JOHNSTON SWEEPER.

It is vitally important that the operator and maintenance staff have a copy of this book. The life of the machine will depend upon following these instructions in respect of regular maintenance and correct operating methods.

It is important that only GENUINE JOHNSTON SPARE PARTS are used when servicing and maintaining the sweeper. This is especially important for consumables, filters etc, as the use of non-genuine parts may cause premature failure and invalidation of warranty.

When carrying out maintenance or part replacement, additional explanatory illustrations can be found in the Parts Manual, which shows and lists hardware, and availability of spares with the orientation and positions of the various components.

Safety Notice

The universal safety symbol is used throughout this manual to indicate information which is essential for health and safety for all operating personnel.

Every endeavour has been made to ensure that the information contained in this Operator's Guide is correct, but due to continuous product development, the Company reserve the right to alter its contents without notice. This document should not be interpreted as being part of a formal contract.

For further information and enquiries please contact:

Johnston Sweepers Limited
Curtis Road, Dorking, Surrey RH4 1XF, UK

Tel: +44 (0)1306 884722
Fax: +44 (0)1306 884151
E-mail: enquiries@johnstonsweepers.com
Web: www.johnstonsweepers.com

PAGE ISSUE LEVELS

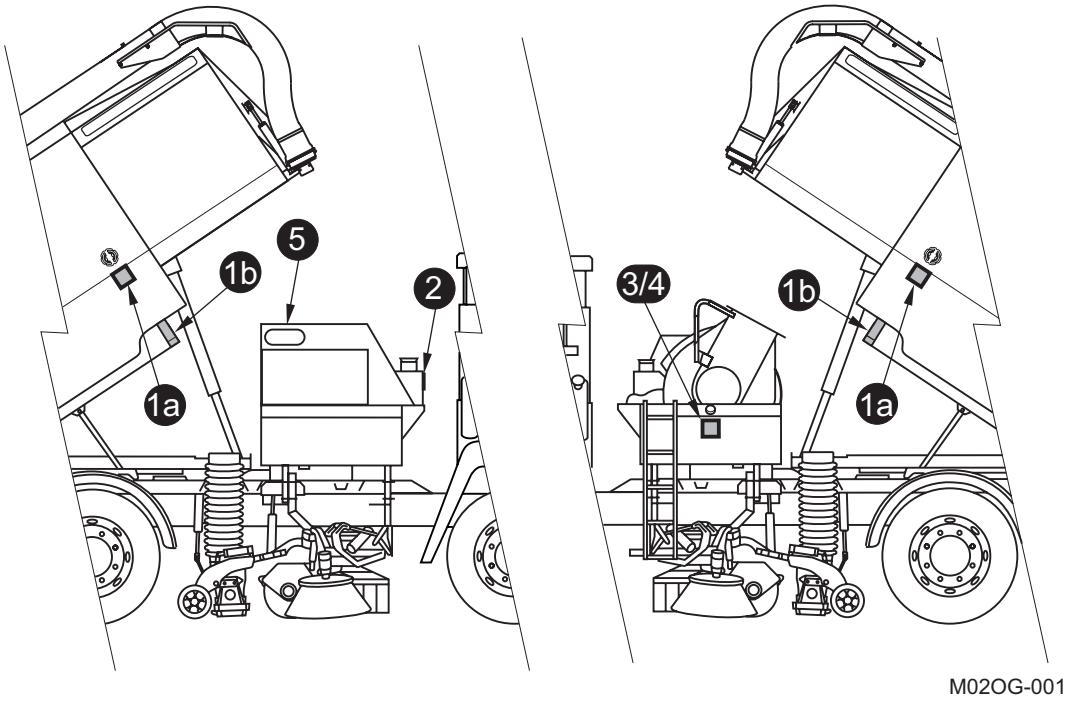
Page	Issue	Changed	Page	Issue	Changed
Front Page	02	✓	Foreword 1	01	
Foreword 2	01		Foreword 3	02	✓
Foreword 4	01		Foreword 5	01	
Foreword 6	02	✓	Foreword 7	01	
OG1:1	01		OG1:2	01	
OG1:3	01		OG1:4	01	
OG2:1	01		OG2:2	01	
OG2:3	01		OG2:4	01	
OG2:5	01		OG2:6	01	
OG2:7	01		OG2:8	01	
OG2:9	01		OG2:10	01	
OG2:11	01		OG2:12	01	
OG2:13	01		OG2:14	01	
OG3:1	01		OG3:2	01	
OG3:3	01		OG3:4	01	
OG3:5	01		OG3:6	01	
OG3:7	01		OG3:8	01	
OG4:1	01		OG4:2	02	✓
OG4:3	01		OG4:4	01	
OG4:5	01		OG4:6	01	
OG4:7	01		OG4:8	01	
OG4:9	01		OG4:10	01	
OG5:1	02	✓	OG5:2	02	✓
OG5:3	01		OG5:4	01	
OG5:5	01		OG5:6	01	
OG5:7	01		OG5:8	01	
OG5:9	01		OG5:10	01	
OG5:11	01		OG5:12	01	
OG5:13	01		OG5:14	01	
OG5:15	01		OG5:16	01	
OG5:17	01		OG5:18	02	✓
OG5:19	02	✓	OG5:20	01	
OG6:1	01		OG6:2	01	
OG6:3	02	✓	OG6:4	02	✓
OG6:5	02	✓	OG6:6	01	
OG6:7	01		OG6:8	01	
OG6:9	01		OG6:10	01	
OG6:11	01		OG6:12	01	
OG6:13	01		OG6:14	01	
OG6:15	01		OG6:16	01	
OG6:17	01		OG6:18	01	
OG6:19	02	✓	OG6:20	01	
OG7:1	01		OG7:2	01	
OG7:3	01		OG7:4	01	
OG7:5	01		OG7:6	01	

INTERNATIONAL SYMBOLS

Conforming to ISO 3767

Graphical symbols are used to indicate the water, fuel and hydraulic oil tank filler ports and air cleaner servicing instructions.

Their location and descriptions are shown below.



M02OG-001

1. Water tank filler ports — 1a = Hose Pipe; 1b = Hydrant

2. Hydraulic oil tank filler

3. Fuel tank (diesel) filler

4. Fuel tank - Engine requires Ultra Low Sulfur fuel

5. Engine air cleaner instructions, i.e. use only genuine Johnston replacement air cleaner elements and refer to Chapter 6 of this guide for servicing instructions

VEHICLE SAFETY LABELS

General safety alert symbol.

Read Operator's Guide.

Crushing of whole body - force applied from above.

Body prop correctly engaged in rack.

General safety alert symbol.

Keep clear of brushes.

Severing of fingers or hand - Impeller blade.

Never reach in or drop tools into the fan case.

General safety alert symbol.

Release radiator cap carefully when hot to avoid scalding.

General safety alert symbol.

Stay at least 1 metre distance from the machine.

General safety alert symbol.

Wear ear defenders when working in this area.

Safety Notice

DO NOT

- **Work on or around the engine whilst it is running except to adjust idle settings.**
- **Remove engine radiator cap when the engine is hot, without first covering the cap with a cloth. Release it slowly, otherwise there is a risk of being scalded by escaping coolant.**
- **Touch any part of the engine exhaust system without first allowing it to cool sufficiently.**
- **Drain engine oil until it has cooled, to avoid scalding.**
- **Disconnect hydraulic or water pipes whilst the engine is running.**
- **Approach fan inlet or outlet whilst the fan is running.**

ALWAYS

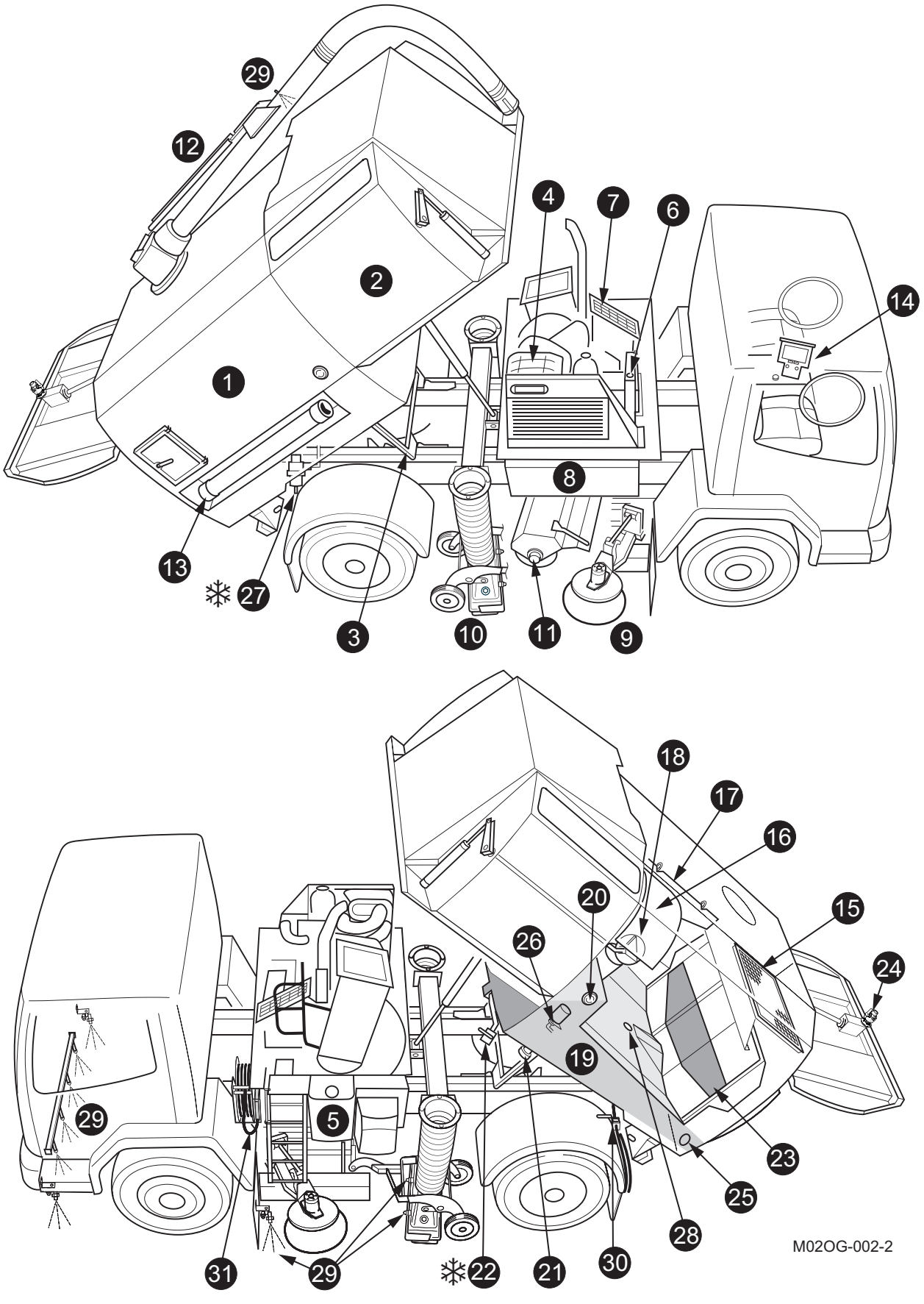
- **Ensure necessary precaution are taken when re-fuelling to avoid any risk from spillage, due to the height of the fuel filler.**
- **Ensure the machine is standing on firm, level ground and there are no obstructions above or to the rear before raising the hopper.**
- **Ensure that the body is resting on the body prop, before working underneath the raised hopper - See Maintenance Section of the Technical Manual.**
- **Keep hands, loose clothing, hair etc, well clear of moving parts.**
- **Use approved safety platforms/gantries when working above ground level. Get a second person to check periodically when only one person is working on access equipment or inside the body.**
- **Ensure the operators and service personnel are fully conversant with the controls and their operation.**
- **Disconnect the vehicle battery when working on the electrical system. Remove the plugs from the Nodes and the Display when carrying out any welding on the vehicle.**
- **Remove ignition key when working on the vehicle. Ensure all personnel are clear of the vehicle before restarting engine.**
- **Ensure all guards and covers are refitted after servicing.**
- **Disconnect or isolate the air system in the systems locker before working on any pneumatic items.**
- **Always follow the chassis manufactures recommendations when using a battery booster or starter pack to avoid damaging electronic components.**

CHAPTER 1

General Arrangements

Table of Contents

GENERAL ARRANGEMENT



Item	Component	See Chapter
1	Hopper/load compartment	-
2	Cowling	-
3	Body (hopper and cowl) prop	3
4	Auxiliary engine (VT Only)	6
5	Fuel tank	-
6	Hydraulic oil reservoir	6
7	Suction fan case	6
8	Systems locker	-
9	Channel brush	6
10	Suction nozzle	6
11	Wide sweep brush	6
12	Wanderhose - optional	4
13	Wanderhose extension tubes	-
14	Cab Mounted Controls	2
15	Filter screens	6
16	Wearing plate(s)	-
17	Hopper centre baffle - duals only	-
18	Intake flaps	-
19	Water tank	-
20	Water tank filler	6
21	Water tank hydrant filler and filter - nearside	6
22	Water tank drain/flushing valve	6
23	Rear door screen	-
24	Rear door drainage tap	3
25	Water tank flushing ports	6
26	Water pump primary suction filter	6
27	Water pump secondary suction filter	6
28	Extended water tank plug	4
29	Water spray jets	-
30	Washdown hose and control valve	2
	Top Mounted Wanderhose Water control valve - optional	2
	Littasnatch Water control valve - optional	2
31	Supawash hose reel and hand lance - optional	4

❄ Cold Weather Drains

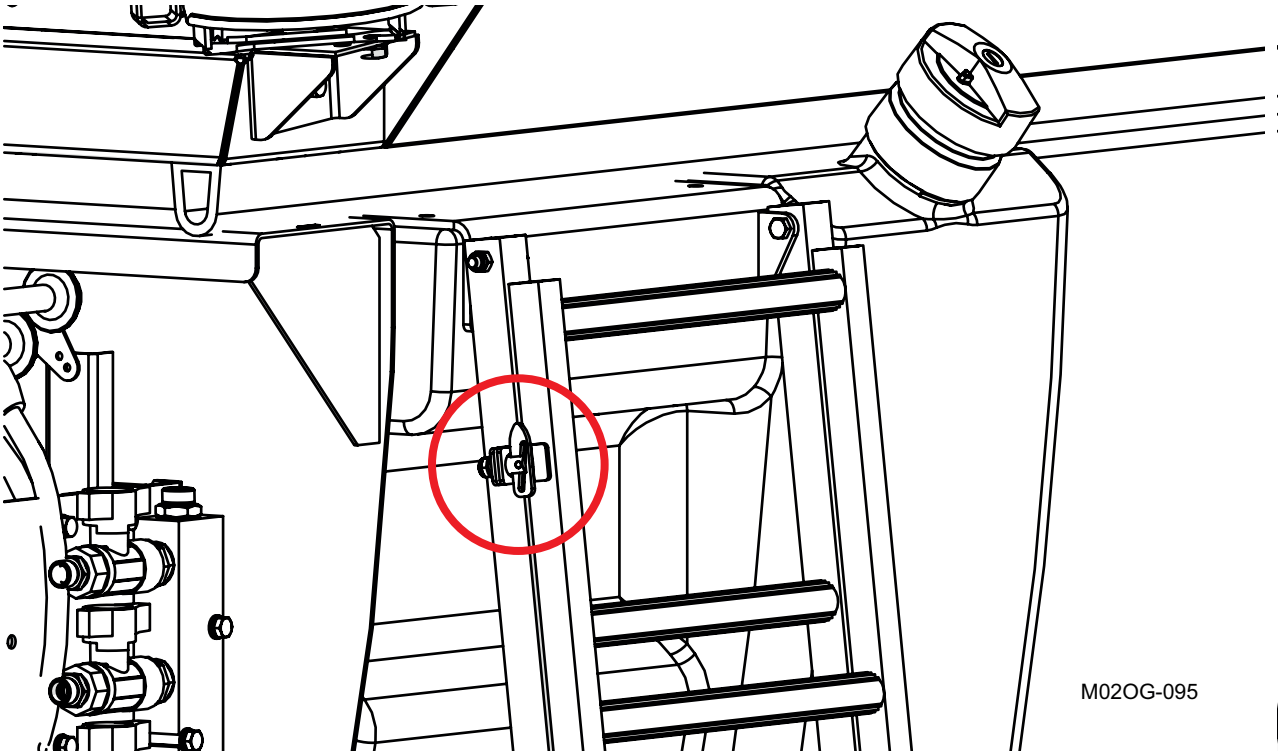
EQUIPMENT ACCESS

Safety Notice

- **Always ensure that the Body prop is located in the rack before accessing the equipment.**
- **Always ensure the ladder is securely stowed prior to operating the equipment or driving the vehicle.**

To gain access to any equipment mounted above ground level a folding ladder is provided together with appropriate grab handles.

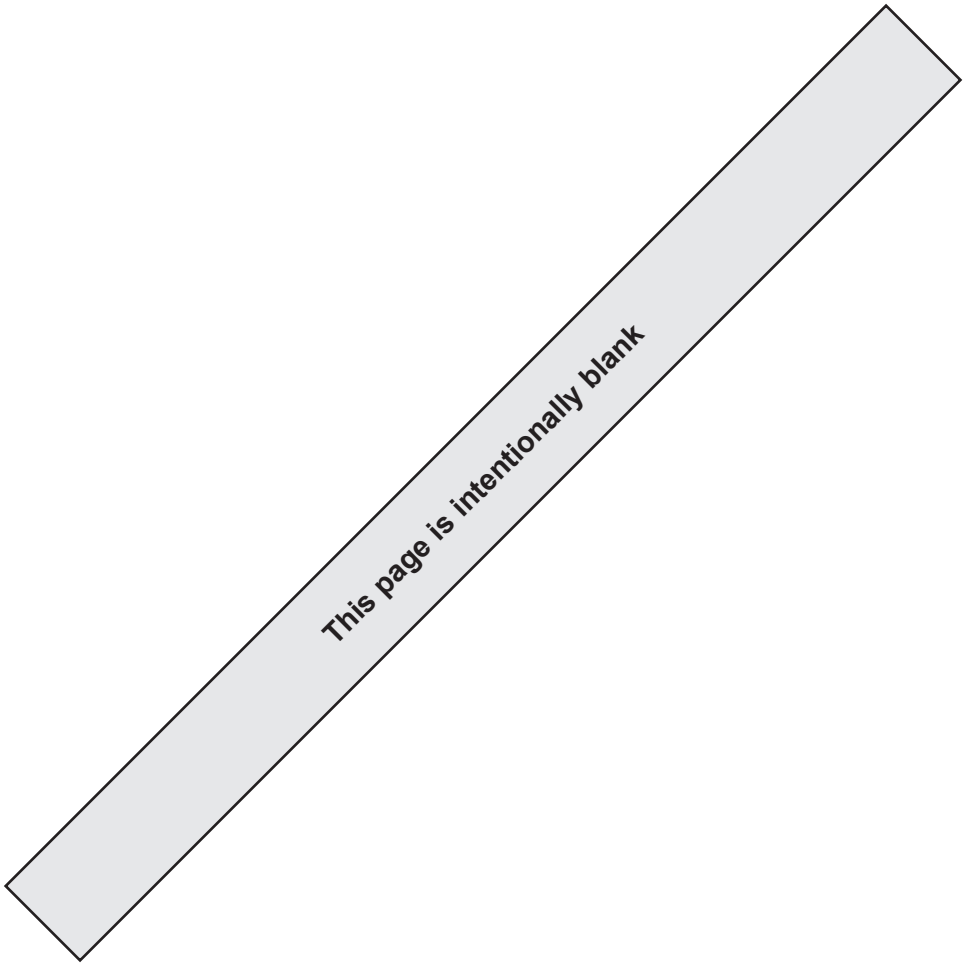
The ladder is unfolded into its extended position by de-latching the quick release securing pin.



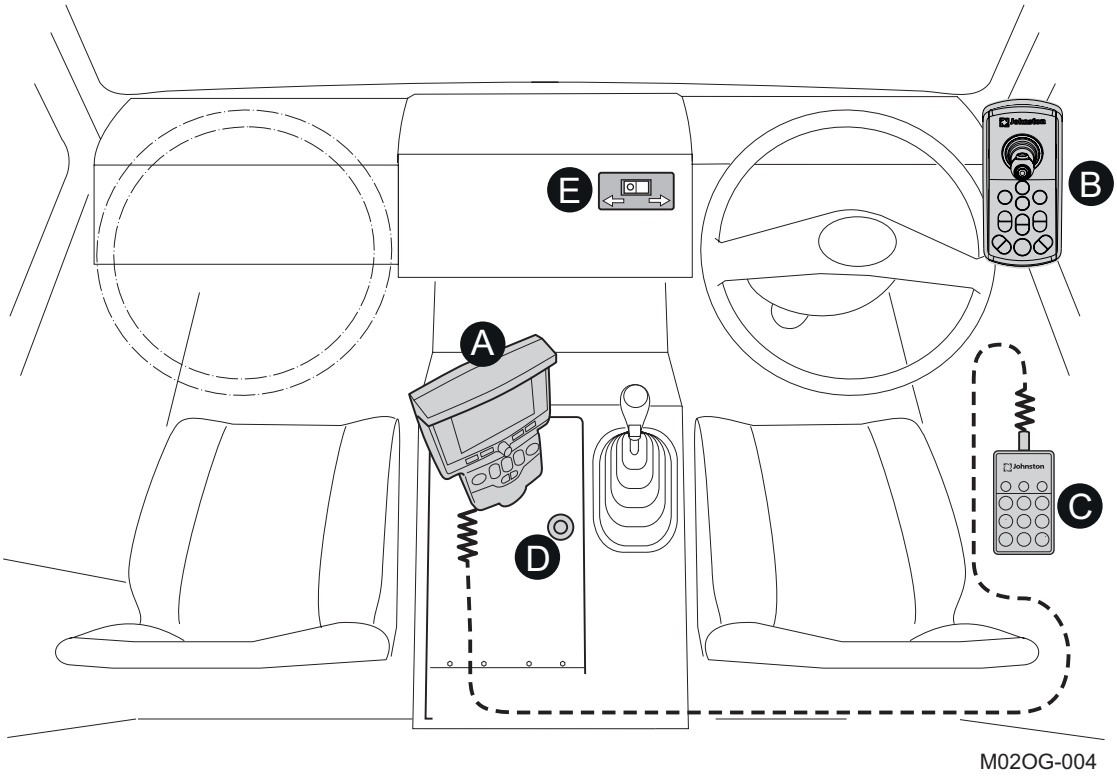
CHAPTER 2

Controls

Table of Contents



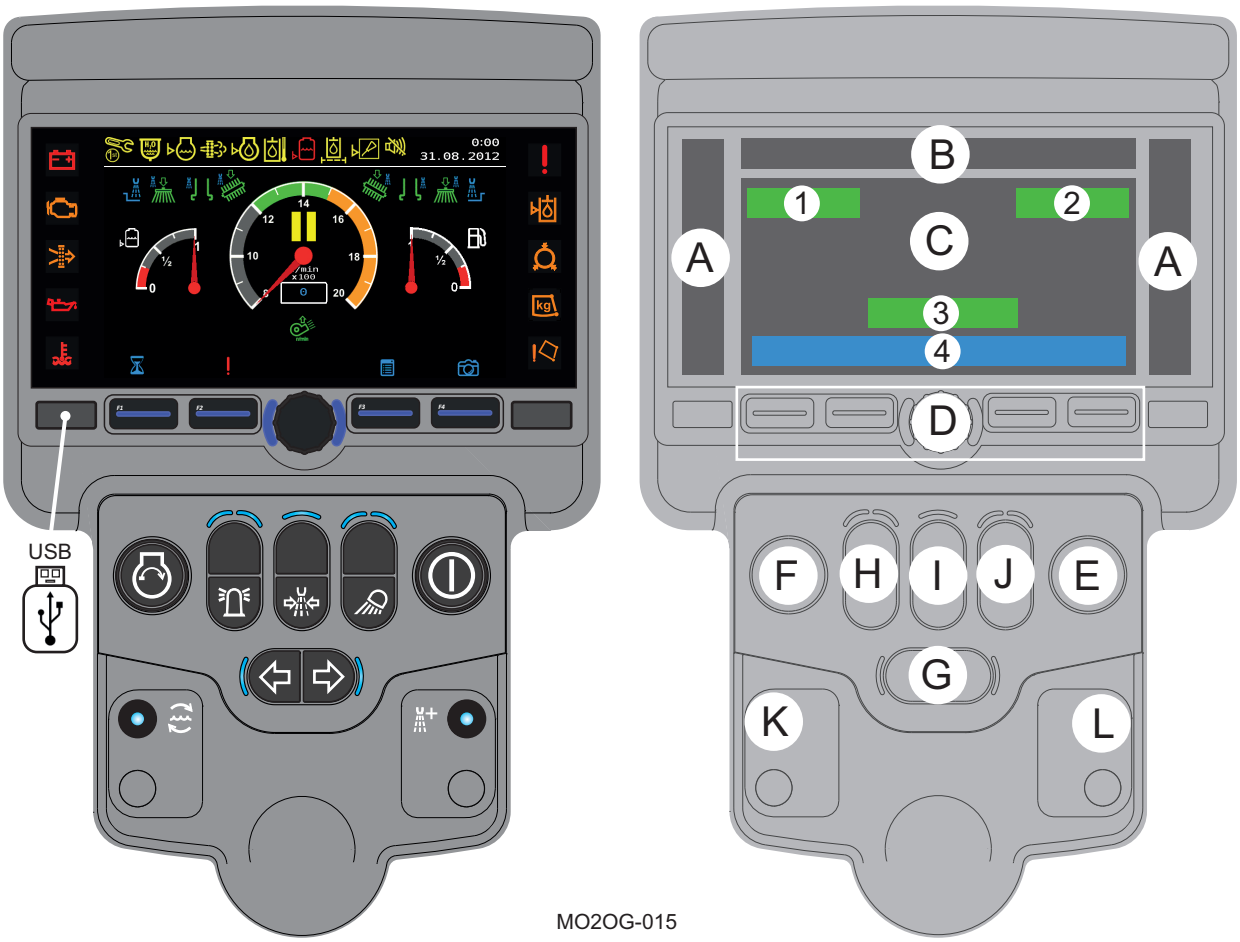
CAB MOUNTED CONTROLS



Control	Description
A	Centre Console
B	Door Controller
C	Multifunctional Remote Pendant unit mounted by driver's seat (For application see Chapter 3 - Operation)
D	Powasave Regulator
E	Dual Steer change over - (Optional - Chassis Dependant)

VT - Twin Engine

CENTRE CONSOLE



MO2OG-015

A Warning LED's

B Information Bar

C Display Screen
1 Left hand sweep status
2 Right hand sweep status
3 Option status
4 Soft key function

D Soft Keys and Rotary Encoder

E Sweeper Ignition

F Engine Start

G Sweep Select

H Beacons

I * Supawash

J Work Lamps

K * Water Recirculation

L * Additional Water Sprays

* Denotes Optional Equipment

VT - Twin Engine

WARNING LED's

ENGINE

Symbol	Description
	Alternator Charge
	Engine Management
	Air Filter State Indicator
	Engine no oil pressure
	Engine coolant overheat

SYSTEMS

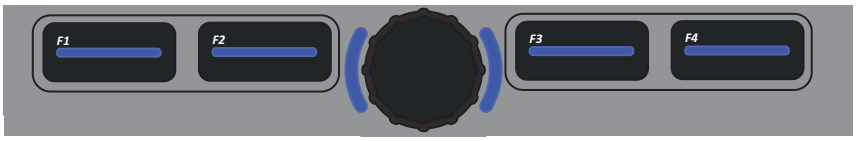
Symbol	Description
	Electrical Faults
	Hydraulic oil low level
	Low air pressure and audible warning
kg	Vehicle overload
	Body raise indicator/rear door locks open

INFORMATION BAR

Symbol	Description
1st	**1st** 50 Hour Service **A** 500 Hour Service **B** 1000 Hour Service **A** 1500 Hour Service **C** 2000 Hour Service or 12 Monthly **D** 4000 Hour Service or 24 Monthly
H_2O	Water in Fuel System
	Engine Coolant low level

Symbol	Description
	Engine Oil low level
	Hydraulic Filter State Indicator
	Hydraulic Oil Temperature
	Water Tank low level
	Low Autolube
	Mute internal buzzer

MULTIFUNCTONAL SOFT KEYS AND ROTARY ENCODER



Soft Keys

Depending on screen selection the functions change. The function is displayed above the key with a blue icon.

Rotary Encoder

Enables you to navigate the menus. Pressing it selects the highlighted icon.

VS - Single Engine

CENTRE CONSOLE

MO2OG-055

A Warning LED's

B Information Bar

C Display Screen
1 Left hand sweep status
2 Right hand sweep status
3 Option status
4 Soft key function

D Soft Keys and Rotary Encoder

E Sweeper Ignition and Initiates engine rpm

F Gearbox Engage/Dis-engage

G Sweep Select

H Beacons

I * Supawash

J Work Lamps

K * Water Recirculation

L * Additional Water Sprays

M Directional drive selector

* Denotes Optional Equipment

VS - Single Engine

WARNING LED's

ENGINE

Symbol	Description
	Cruise Control Active
	Transit Drive - Work Mode Disengaged
	Hydrodrive Drive - Work Mode Enaged
	Not used
	Suction Fan Active

SYSTEMS

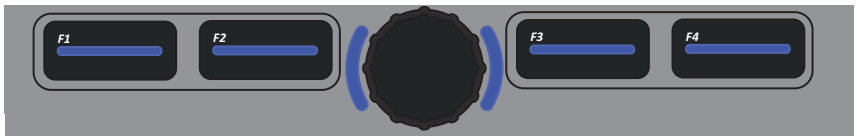
Symbol	Description
	Electrical Faults
	Hydraulic oil low level
	Low air pressure and audible warning
	Vehicle overload
	Body raise indicator/rear door locks open

INFORMATION BAR

Symbol	Description
	1st 50 Hour Service **A** 500 Hour Service **B** 1000 Hour Service **A** 1500 Hour Service **C** 2000 Hour Service or 12 Monthly

Symbol	Description
	Hydraulic Filter State Indicator
	Hydraulic Oil Temperature
	Water Tank low level
	Low Autolube
	Mute internal buzzer

MULTIFUNCTONAL SOFT KEYS AND ROTARY ENCODER



Soft Keys

Depending on screen selection the functions change. The function is displayed above the key with a blue icon

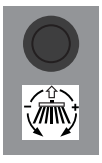
Rotary Encoder

Enables navigation of the menus. Pressing it selects the highlighted icon.
When Forward drive is selected, the encoder controls the cruise function. Pressing the encoder enables it, and rotating the encoder CW increases and CCW decreases the road speed.

DOOR CONTROLLER

MO2OG-025

IN-CAB REGULATOR



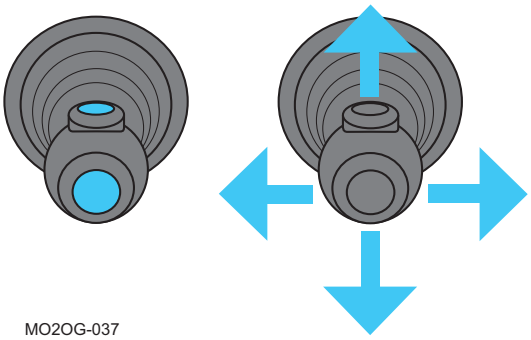
* **Powasave**; - In cab regulator sets a Light Sweep to maximise brush life. With the brush working, turn the regulator Anti-clockwise to set the ground pressure to its maximum, now turn Clockwise to reduce the pressure to the required setting.

SWEEPING CONTROLS

Symbol	ID	Description
	A	**Water sprays**; - ON/OFF Illuminated when selected **Nozzle**; - ACTIVE/STOWED - intake flaps open automatically
	B	**Water sprays**; - ON/OFF Illuminated when selected **Channel brush**; - ACTIVE/STOWED
	C	**Water sprays**; - ON/OFF Illuminated when selected **Wide Sweep Brush**; - ACTIVE/STOWED
	D	**Gutter spray bars**; - ON/OFF
	E	* **Powathrust**; - ON/OFF. Increases Channel Brush ground pressure to preset level when on. Without the need to re-adjust the in cab regulator.
	F	* **Powascrub**; - ON/OFF. Increases Wide Sweep Brush ground pressure to preset level when on.
VT - Twin Engine		
	G	**ECO Mode Override**; - ON/OFF. Allows the engine speed to be increased from 1500 to 2000 rev/min.
VS - Single Engine		
	G	**ECO Mode Override**; - ON/OFF. Increases the fan to boost when sweeping. ON/OFF. Activates the fan when using Wanderhose.
	H	**Channel brush speed** - PULSE/HOLD switch to Increase rpm **Channel brush speed** - PULSE/HOLD switch to Decrease rpm
	I	**Engine speed**; - PULSE/HOLD switch to Increase rpm **Engine speed**; - PULSE/HOLD switch to Decrease rpm
	J	**Pause**; - ON/OFF suspends all sweeping and parks brushes. Pressing again reactivates previous settings.

* Denotes Optional Equipment

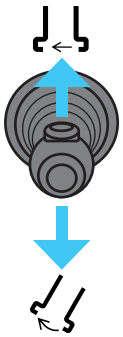
DOOR CONTROLLER - MULTIFUNCTION JOYSTICK



MO2OG-037

JOYSTICK OPERATED SWEEPING CONTROLS

Function A - Maxigap/Varagap



Moving the Joystick up - Closes the Nozzle

Moving the Joystick down - Opens the Nozzle

Function B - Variabrush

Standard feature: Operating the Joystick left/right positions Prime-side Channel Brush fully In or fully Out
Optional Variabrush feature: Operating the Joystick left/right positions Prime-side Channel Brush as required

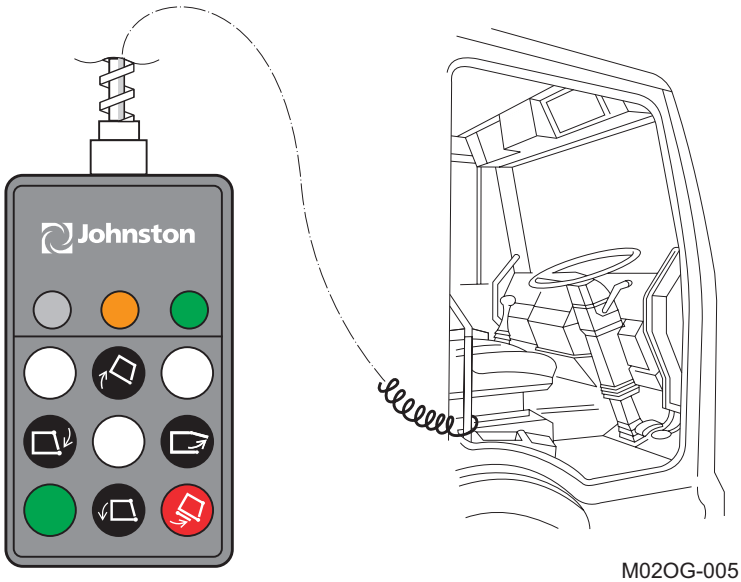
Standard feature: Operating the Joystick left/right together with the push button positions the non Prime-side Channel Brush fully In or fully Out
Optional Variabrush feature: Operating the Joystick left/right together with the push button positions the non Prime-side Channel Brush as required

Function C - Rotatilt

Moving the Joystick left/right together with the button on the top Moves the Prime-side Rotatilt

Moving the Joystick left/right together with both the button on the top and the end moves the Secondary-side Rotatilt

MULTIFUNCTION REMOTE PENDANT UNIT
FUNCTION A LOAD DISCHARGE
FUNCTION B WSB BALANCE (SEE MAINTENANCE MANUAL)

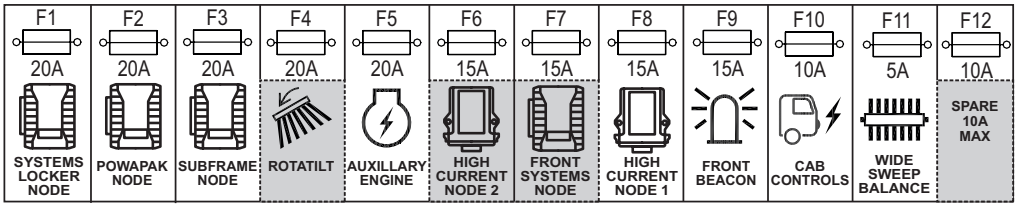


M02OG-005

LED	Function
	Hand brake off - Pendant not ready for operation
	Hand brake on - Pendant ready for operation

Switch	Function
	Raises body
	Closes rear door
	Opens rear door
	Lowers body
	Stows body prop when body is raised and not resting on it
	Green safety switch must be pressed to enable discharge functions

SYSTEMS WAFER FUSES

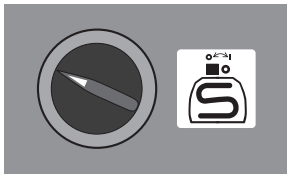


MO2OG-013

Fuse No.	Function	VT	VS	Colour
F1	Systems Locker Node	20	20	Yellow
F2	Powapak Node	20	20	Yellow
F3	Subfame Node	20	20	Yellow
F4	Rotatilt Option	20	20	Yellow
F5	Auxiliary Engine	20	N/A	Yellow
F6	High Current Node 2	15	15	Blue
F7	Front Systems Node	15	15	Blue
F8	High Current Node 1	15	15	Blue
F9	Front Beacon	15	15	Blue
F10	Cab Control	10	10	Red
F11	Wide Sweep Brush	5	5	Orange
F12	Spare	10	10	Red

EXTERNAL CONTROLS - BODY REAR

Littasnatch
Rotary Switch - Opens/Closes Littasnatch Gate



MO2OG-039

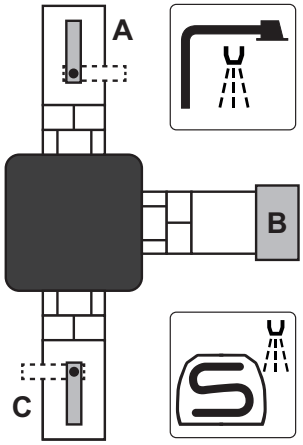
Rear Mesh Shaker
Push Button - Press to activate mesh shakers

MO2OG-038

A - Top Mounted Wanderhose Water
Manual tap

B - Wash Down Hose
Bayonet fitting

C - Littasnatch Water
Manual tap

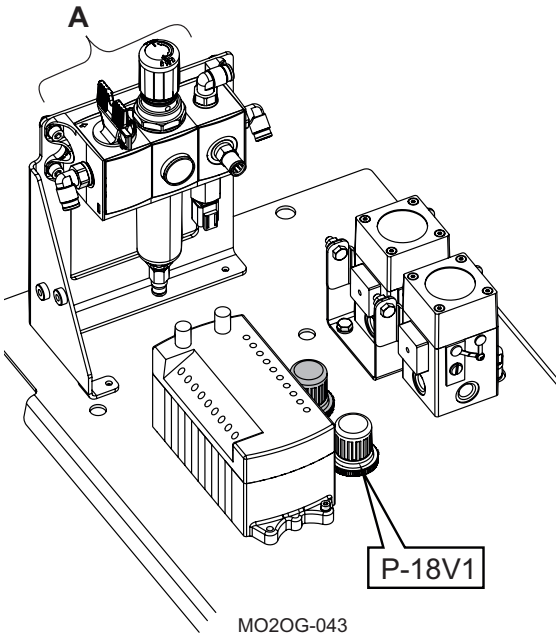


MO2OG-040

EXTERNAL CONTROLS - SYSTEMS LOCKER

A - Pneumatic Filter Regulator
Including:
- Isolation tap
- Air Pressure switch
- Air Pressure gauge

Wide Sweep Brush Lift
P-18V1
Wide Sweep Brush lift regulator



MO2OG-043

CHAPTER 3

Operation

Table of Contents

VT - Twin Engine

ENGINE STARTING AND OPERATING PROCEDURES

With the chassis ignition turned on the JVM will become active, the screen will display the following features:

Auxilliary ignition off - Water Tank Level - Clock: - Fuel Tank Level
Auxilliary ignition on -Water Tank Level - Engine RPM: - Fuel Tank Level

Starting the Engine:

Press crank button until engine fires, and release.
If the oil pressure light fails to extinguish on starting, the engine will shut down to show a fault.

VS - Single Engine

HYDRODRIVE GEARBOX CONTROL

*The hydrostatic transmission system and hydraulic power for the sweeping functions, are provided by means of hydraulic pumps mounted to a gearbox termed '**HYDRODRIVE**' which is located within the main drive-line from the vehicle's gearbox to the rear axle.*

***HYDRODRIVE** provides two modes of operation.*

***Work** - when the machine is ready for sweeping duties.*
***Transit** - when the machine can be driven in its normal transport mode.*

*To enable the sweeping functions the 'work' mode, '**HYDRODRIVE**' must be engaged.*

To Engage or Disengage Hydrodrive

Ensure the chassis air system is adequately charged so the low pressure warning is off.
The following functions must be satisfied in order to engage or disengage the gearbox.
The Hydrodrive directional control joystick must be in the neutral position.
Hand brake is applied.
Chassis Gearbox is in neutral.
*With these functions satisfied, the **HYDRODRIVE** select switch can be activated, this will cause the **HYDRODRIVE** to shuttle into or out of engagement.*

Transit Drive - Work Mode Disenaged

Hydrodrive Drive - Work Mode Engaged

System Warning Alarms

Audible warning system. A warning buzzer will sound with the appropriate warning light if the following exists.

Low air pressure.

Body not completely lowered or rear door locks not fully engaged.

Low hydraulic oil level - could indicate a leak on the hydraulic system.

TO COMMENCE SWEEPING

1 Start Chassis engine. Ensure the low air pressure warning lamp is extinguished.

VT - Twin Engine

2 Start Auxiliary engine - Increase engine speed up to 1200 rev/min.

VS - Single Engine

2. Engage the Hydrodrive - 'H' lamp illuminates.
Select the 1:1 gear of the chassis gearbox.
Switch on the sweeper ignition to Increase engine speed up to 1100 rev/min.
Note: *The engine speed will only increase if the correct gear has been selected.*

3. **Selecting The Hand Of Sweep:**
Within the JVM the equipment specification has been factory set.

Dual Sweep Machines Without Simultaneous Sweep Option:
The equipment can only be set to operate on either the Left or Right Hand side. The selected side of sweep is indicated by the illumination of the appropriate switch located on the centre console. To change the hand of sweep select the side that is not illuminated

Dual Sweep Machines Featuring Simultaneous Sweeping Option:
For Single Sweep Operation:
The equipment can be set to operate on either side IE: L/Hand or R/Hand. To change the hand of sweep first select the side that is not illuminated before de-selecting the other side.

For Simultaneous Sweep Operation:
Select the side that is not illuminated, both sides will now be illuminated indicating the Simultaneous sweep mode.

4. **Activating the Sweeping Equipment - Door Controller:**
Pressing the corresponding symbol activates the equipment to its sweeping position, the symbol is displayed on the screen.

VT - Twin Engine

Note: Activating the Nozzle automatically opens/closes the respective intake Flap.The top segment of the switches activates the water and illuminates the LED above the switch.

VS - Single Engine

Note: *In addition to the above.*
Activating the Nozzle automatically engages the Suction Fan.

5. **Gutter Sprays:**
Pressing the switch located on the door control activates the corresponding gutter spray.

6. **Commence Sweeping:**
Select the lowest gear to give a road speed between 2-8 mph (2 to 12 km/h).
Always use the slowest brush and engine speeds consistent with satisfactory cleaning.
Normal engine operating speeds between 1200 - 1500 rev/min.

VT - Twin Engine

7. **Eco Mode Override**
Enables the engine speed to be increase to maximum 2000 rev/min for when arduous sweeping conditions are encountered.

VS - Single Engine

*7. **Eco Mode Override***
Enables the Fan speed to be increase to maximum rev/min for when arduous sweeping conditions are encountered.

TO TERMINATE SWEEPING

1. Turn off the active switches.
2. Return the engine speed to idle,
3. Turn off ignition switch to stop engine.

Note:

To interrupt the sweeping, press the pause button. The switch will illuminate and suspend the sweeping modes. - The engine speed will default to 1200 rev/min, deselecting the pause button re-activates the sweeping equipment as previously selected and the engine speed returns to the previous setting

Water Drainage

If the sweepings are waterlogged, excess water can be drained off using the drain valve attached to the rear door.

Load De-Watering Option

Open the drain de-watering valve mounted on the rear door - See water recirculation option, Chapter 4.

Blocked Nozzle Or Nozzle Duct

If it is apparent that the suction nozzle is not picking up debris it may be that it is blocked or that the body is full.

1. With the machine stationary and the suction still operative on the nozzle, open the Maxigap/ Varagap nozzle to increase the airflow and see if the obstruction clears.

2. If not, raise and lower the nozzle and see if the blockage clears.

3. If still blocked, switch off the engine(s), open the body access door and check that the mesh screens are clear and that the body is not full.

4. If the screens are blocked, clean them and providing the body is not full return the machine to service and check the nozzle performance.

5. If the body is over half full the machine should be emptied at the nearest waste site.

6. If the screens are clear, the body less than half and debris is still not being picked up,it may be that the nozzle trunking or inlet tube is blocked.

7. With the vehicle on level ground carefully raise the body and rest it on the lowest body prop position, raising the body any higher may affect the vehicle's stability due to the load moving within the body. Switch off the engine(s).

8. Clear any obstruction in the nozzle or inlet duct.

LOAD DISCHARGE AND AUTO BODY PROP

Safety Notice

Before carrying out the load discharge operations ensure the following safety aspects are observed

- **Ensure the machine is standing on firm, level ground and there are no obstructions above or to the rear before raising the body.**
- **The rear door must be fully open before raising a loaded body.**
- **Ensure no-one is near the load discharge area when opening or closing the rear door.**
- **Ensure the body rests on the auto prop when the body is left in the raised position, or when working under the body or cowl.**
- **Do not shunt the load in order to aid discharge or drive with the body raised.**
- **Do not raise a loaded body on any gradient greater than 5% as stability could be affected.**
- **Do not tip the body when fully loaded to clear blocked inlet ducts or service the auxiliary engine. Tipping the loaded body without opening the rear door could cause load movement and the vehicle to become unstable.**
- **A safety interlock prevents the body from being tipped without the handbrake being applied.**

The disposal of sweepings should be in accordance with the local waste disposal regulations.

Tipping the Load

Start the chassis to ensure the air pressure is at maximum. - To disengage the Auto prop air pressure is required. Do not lean under the body to release the prop.

The pendant control has a green safety switch which must be pressed to enable each of the discharge functions.

1. Open the rear door by pressing the green safety switch together with the door open switch.

2. Raise the body by pressing the green safety switch together with the body raise switch. - The body prop is automatically deployed to index into the locking rack ensuring a number of possible safety locking elevations for the body.

Lowering the Body

1 Raise the body by pressing the green safety switch together with the body raise switch.

2 Press the green safety switch together with the auto prop, keeping these held press the body lower switch.

3 Press the green safety switch together with the rear door close.

4 Leave rear door partially open to allow moisture to escape and prolong the life of the rear door seal.

5. After the door has closed continue holding the buttons for 5 seconds to ensure the locks are fully engaged.

END OF DAY CLEANING

Safety Notice

- **After the load has been discharged, lower the body to rest on the prop**
- **A warning light on the JVM illuminates and a audible warning will sound when the body is not fully lowered or the rear door is not closed correctly**
- **Do not direct high pressure washdown equipment, directly onto the engine, or ancillary electronic or electrical control systems, care should also be taken when washing the paintwork.**
- **The use of Needle stick gloves is recommended when working with this equipment**

COLD WEATHER PRECAUTIONS

Safety Notice

The machine is designed for operating between -15°C and 46°C.

To avoid the possibility of frost damage to the water system when the machine is left during cold weather, it is essential to drain the system adequately. In order to assist this process the machine is equipped with an automated Pressadrain feature. This feature is accessed via the JVM menu following the on screen instructions the system will automatically purge the water system with air, displacing any surplus water.

1. Drain the water tank.
2. Start both the chassis and auxiliary engines.
3. Operate the low pressure water and Supawash (if fitted) open the manual taps for the Supawash spraybars.
4. Raise the body and engage the body prop.
   The Supawash pump will stop when the low level water LED illuminates.
5. Close the manual taps for the Supawash.

Using JVM

Select Main Menu (4)
Select Service Menu (11)
Select Pressadrain Menu (6)

6. Follow the on screen instructions.
7. Open the washdown hose and purge the water from the hose and close (machines without Supawash only).
8. Open the Wanderhose/Littasnatch water injection valves, if fitted, and close when the water has been purged.
9. Operate the Supawash hand lance until air is emitted from the jet.
10. Operate each Supawash spraybar in turn. When air has emitted from each bar turn off. Turn off the Pressadrain, Supawash and stop the auxiliary engine.
11. Remove the red drain plug from the secondary water filter.

Note: Refit the red drain plug and turn off all the Supawash taps before using the machine.

SWEEPING IN COLD TEMPERATURES

Operating Temperature 0°C To +5°C

For sweeping in cold conditions above freezing, it is possible to use the water system providing the machine has been left in a warm garage overnight.

Care must be taken to ensure water sprayed onto the road does not freeze.

Do not use full suction capacity above 1500 rev/min. as the air speed up the nozzle could cause the water to freeze.

Operating Temperature 0°C To -15°C

It is possible to use the machine for short periods without water in the tanks.

Sweeping can be carried out using low to medium suction 1200 - 1500 rev/min.

Note:

When operating the equipment without water dust will be emitted from the fan outlet, and premature wear will be experienced on some components.

TOWING THE VEHICLE

Safety Notice

- **The air system needs to be charged to ensure sweep gear is raised.**

CRANING THE VEHICLE

- **The vehicle may be lifted using conventional lifting systems that are slung from the vehicle road wheels. However, it is necessary to ascertain the centre of gravity as it can be up to 20% from the mid point of the wheelbase. The exact position is dependent upon chassis type and vehicle build. Refer to the chassis handbook.**

CHAPTER 4

Optional Equipment

Table of Contents

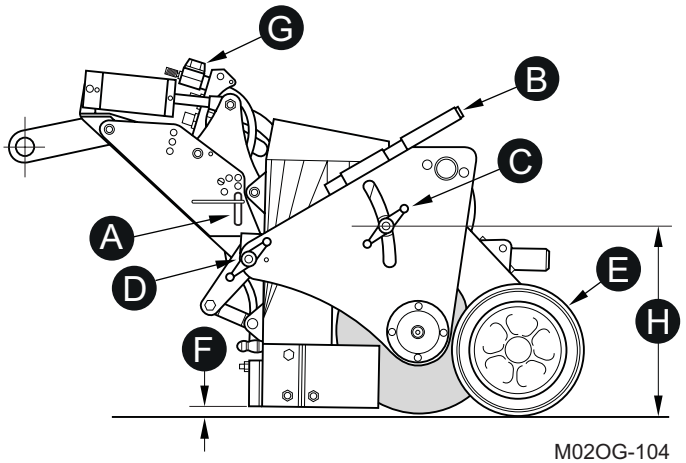
COMBIVAC NOZZLE OPTION

The Combivac nozzle contains a rotating brush and may allow higher sweeping speeds in certain working conditions.

Water sprays; - ON/OFF Illuminated when selected

A **Nozzle**; - ACTIVE/STOWED - Nozzle lowers and brush rotates intake flaps open automatically

The Combivac Nozzle features four water jets as standard, two of which can be isolated by turning off the manual tap **(G)** at the front of the nozzle drawbar. The pressure of the brush on the road is achieved by loosening hand nuts **(C)** and **(D)** and raising or lowering by use of the handle **(B)**. The normal nozzle opening **(F)** is controlled by moving pin **(A)** up or down the adjustment holes to achieve the desired opening (nominal 30mm).



M02OG-104

To Operate Nozzle With Brush

Lower nozzle, release hand nuts **(C)** and **(D)** and lower brush to obtain the desired pressure on the road. Retighten nuts **(C)** and **(D)**.

To operate without brush

Lower nozzle, release hand nuts **(C)** and **(D)** and raise the brush assembly using the handle (B). Retighten nuts **(C)** and **(D)**. Brush should be above the road surface.

Nozzle Wheel Adjustment

The nozzle wheel **(E)** is adjustable to compensate for wear. Ensure the dimension **(H)** is 365mm when a new brush is fitted.

To Adjust Operating Height

Lower nozzle and operate maxigap. This will remove tension from pin (A). The pin can be moved to the desired hole to set the minimum nozzle opening required.

To Change Brush Segments

i) Lower nozzle to ground. Remove the outer brush carrier plate by removing the two M10 setscrews from the cross tube and the two hand nuts.

ii) Raise the nozzle and withdraw the brush stock.

iii) Undo the end plate of the stock and replace brush segments. On re-assembling, remember to fit a spacer at each end of the stock.

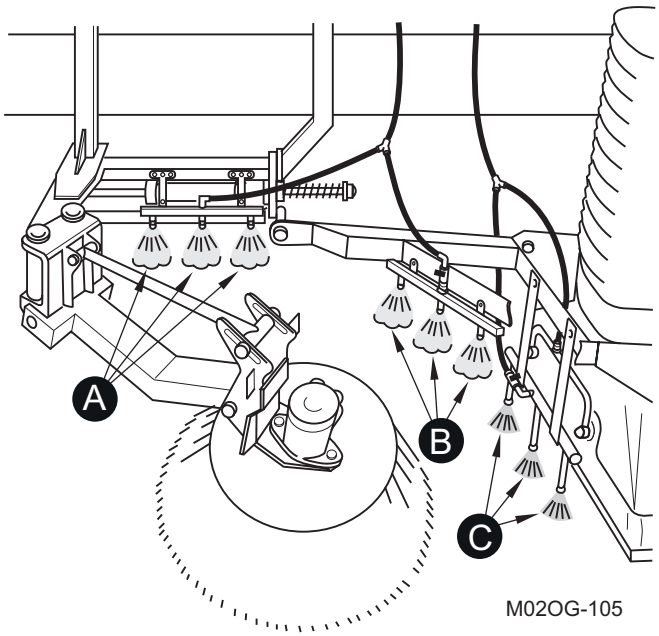
iv) Refitting is the reverse of the above procedure.

MICROTRAP OPTION

Safety Notice

- **Do not use this option at temperatures below 5°C**

A combination of micron particle water spray jets are installed around the sweeping system to reduce dust particle emission. When this option is fitted it is activated by operating the nozzle switch and channel brush switch located on the door controller.



M02OG-105

Operation

The standard channel brush water switch activates the PM10 jets **(A & B)**.

The standard channel brush jets are activated in conjunction with the gutter spray switch.

Check daily that all additional micro water jets are functioning not blocked.

Taps are provided on spraybars **(B & C)** so that the operator has some adjustment if required.

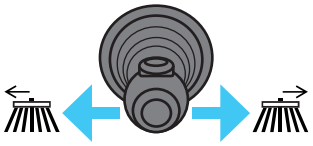
VARAGAP NOZZLE OPTION

The Maxigap cylinder is replaced by a version offering a variable aperture for the nozzle. Moving the lever up closes the nozzle, moving the lever down opens the nozzle. The length of time the lever is held dictates the nozzle gap.

VARIABRUSH OPTION

Allows the lateral position of the channel brush to be altered whilst sweeping. Operating the Multifuctional joystick moves the channel brush in/out from its nominal working position.

Standard feature: Operating the Joystick left/right positions Prime-side Channel Brush fully In or fully Out
Optional Variabrush feature: Operating the Joystick left/right positions Prime-side Channel Brush as required

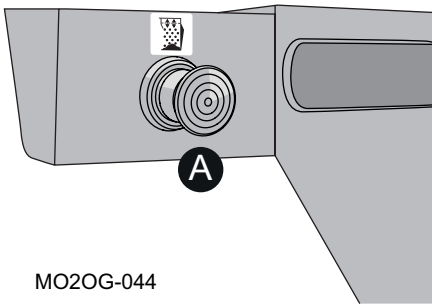


Standard feature: Operating the Joystick left/right together with the push button positions the non Prime-side Channel Brush fully In or fully Out
Optional Variabrush feature: Operating the Joystick left/right together with the push button positions the non Prime-side Channel Brush as required

REAR MESH SHAKER OPTION

A push button **(A)** is fitted on the nearside at the rear of the body. The auxiliary engine should be set at tickover, or stopped, and with the main engine running press the button for 10 seconds.

Repeat this process two times.



MO2OG-044

ROTATILT OPTION

The angle of the channel brush can be adjusted from the cab when sweeping.

Operation

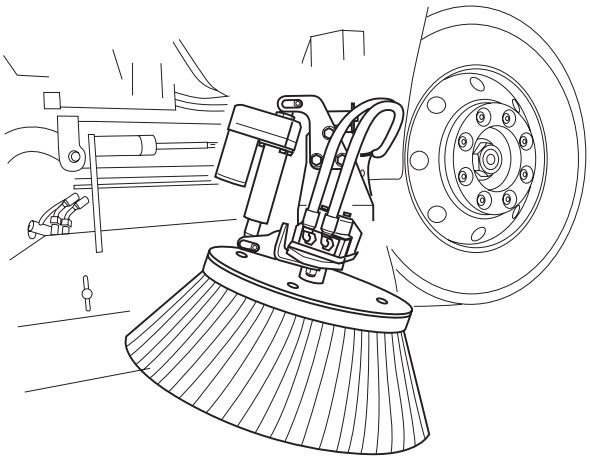
Operating the Joystick left/right together with the button on the top positions the Prime-side Rotatilt.

Operating the Joystick left/right together with the button on the top and the end positions the non Prime-side Rotatilt.

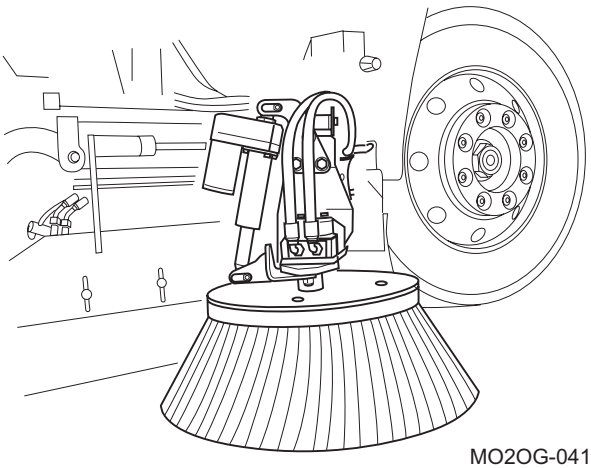
Note:

The Rotatilt will only function when channel brush is operating.

When stowing the channel brush, ensure the brush angle is reduced so that the brush stock does not protrude beyond the vehicle width.



MAXIMUM ANGLE



MO2OG-041

MINIMUM ANGLE

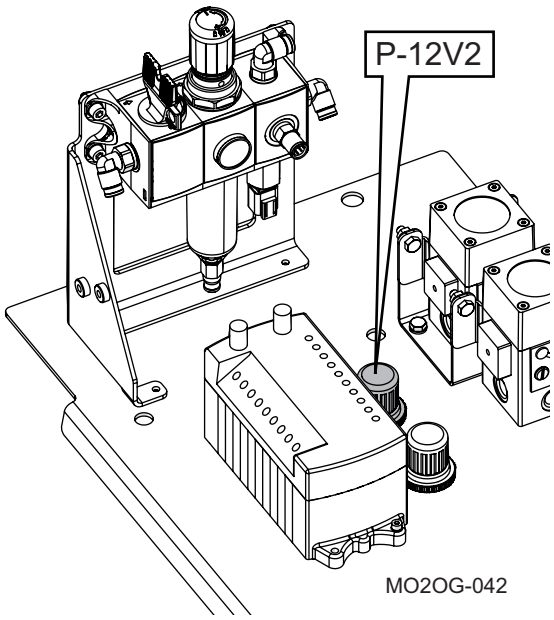
POWATHRUST OPTION

Operation

P-12V2

The channel brush Powathrust regulator located in the systems locker, is pre-set at 3.5 bar, and provides a means to increase the ground pressure of the brush on the road. The regulator sets the maximum pressure.

The switch located on the door control turns the Powathrust ON/ OFF.



With Powathrust active the ground pressure is adjusted using the in cab Powasave regulator.

SUPAWASH OPTION

Safety Notice

- **Care must be taken when cleaning signwritten areas not to lift the paint off with the spray.**
- **Always keep pressure equipment in good condition and regularly maintained, particularly at joints, unions and hose.**
- **The use of safety goggles is recommended in case of deflected spray/debris.**
- **Never direct a high pressure nozzle at the skin as fluid may penetrate the underlying tissue etc. and cause serious injury.**

Description

The equipment comprises a hydraulically driven high pressure water pump, a hand lance together with a 15 metre hose wound onto a recoiling reel, and a front spraybar. Optional nozzle mounted spraybars. The spraybars can be used independently or in conjunction with sweeping.

Operation

The auxiliary engine must be running and the engine speed adjusted as required.
Press switch on the Centre Console to activate the water pump.

Hand Lance

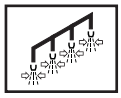
Remove the lance from its holster. Two jets are provided at the nozzle; a fan spray and a pencil jet. To change between jets the trigger should be released and the gun rotated through 180°, this will automatically select the alternative jet.

Spraybars

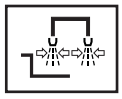
The spraybars are activated by the isolating valves located on the manifold adjacent to the hose reel. The valves should be closed when the hand lance is to be used.

Note:.

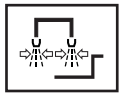
The Supawash pump will not operate if the water tank is nearly empty.



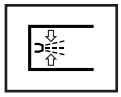
(A) Front Spraybar



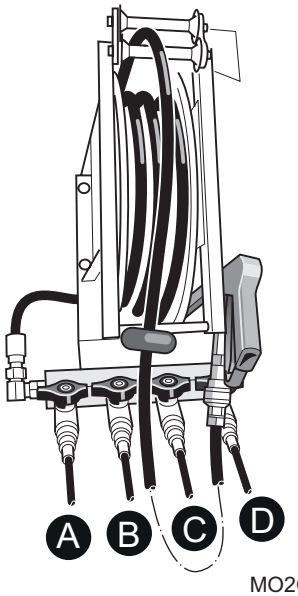
(B) LH Nozzle Spraybar



(C) RH Nozzle Spraybar



(D) Recirculating Duct Cleaning



MO2OG-009

Supawash Operation - Continued

If the vehicle is being used exclusively for street washing (no sweeping), the water tank capacity can be extended after firstly thoroughly washing out the body and removing the plug in the body of the floor and installing the optional filter assembly.

The body can be filled with water using the offside hydrant filler (when the machine is equipped with the optional re-circulating water) or via the side access doors to the level of the water tank overflow, thereby extending your on station time.

Note:

The plug must be replaced before sweeping or dirt will enter the water tanks and cause damage/blockages to the water pumps.

HAND LANCE DETERGENT INJECTION

Hand Lance Detergent Injection

Note:

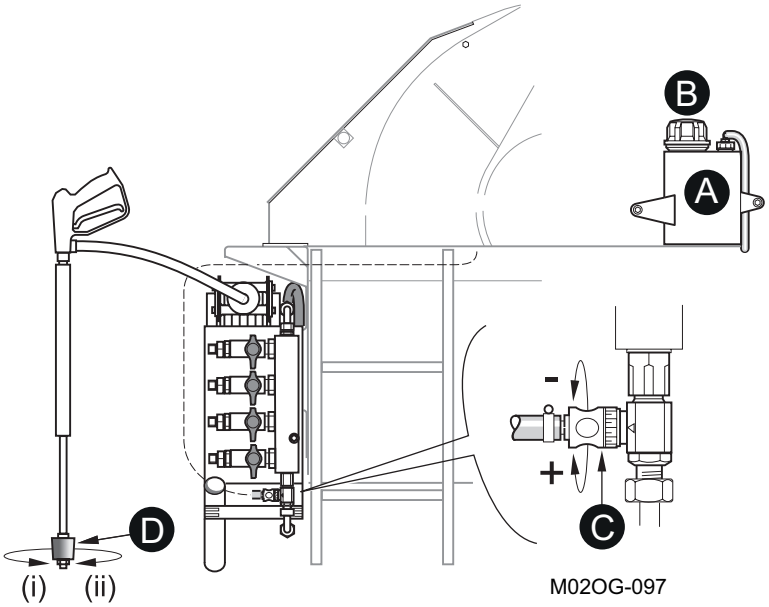
This option is only available with Supawash.

(**A**) 6 litre detergent can

(**B**) Filler port

(**C**) Detergent mix control

(**D**) Hand lance control



Operation

Fill the detergent can **(A)** with detergent.

Operate the detergent injection control knob **(D)** at the end of the hand lance by turning it clockwise to position **(ii)**.

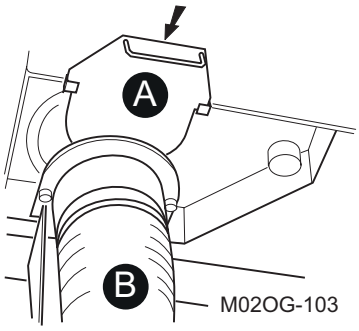
Pressing the hand lance trigger will allow water to spray from the jet and outer cone of **(D)**. This allows the detergent to be mixed with the water.
The rate of the detergent mix is controlled by valve **(C)**. The detergent will take a few seconds to appear at the lance due to the length of hand lance hose. To stop the detergent turn the knob **(D)** counterclockwise to position **(i)** which returns the hand lance to the normal fan jet.

WANDERHOSE AND LITTASNATCH OPTIONS

Safety Notice

- **The use of Needle stick gloves is recommended when working with this equipment**
- **The use of ear defenders is recommended when working with this equipment**

Preparation



Before using either the Wanderhose or the Littasnatch it is necessary to blank off the nozzle ducting to prevent air passing into the body via the nozzle(s). On a machine fitted with intake flap(s) this is easily effected by not operating either nozzle, but on a single sweep machine without a flap, the duct has to be manually blanked using the blanking plate. This plate **(A)** is stowed on the underside of the body adjacent to the intake duct and must be positioned on the seat at the top of the flexible nozzle duct **(B)**. The body must be raised slightly to position the plate, and lowered afterwards.

Operation

Once the intake duct(s) have been blanked:

1. Unclip the Wanderhose from the bracket at front of body.
   Note : If the boom is released from the stowage hook before the extension hose is fitted and rises out of reach, it can be retrieved with the grab provided.

2. Clip on extension hose as required.

VT - Twin Engine

3. Start auxiliary engine and set throttle as required.

VS - Single Engine

3. Engage Hydrodrive and set engine speed as required.

4. Lower boom and release from stowage hook.

5. Turn on Wanderhose water injection using tap at the rear of the body.

The hose and boom are spring loaded and can be used to the rear, left or right hand side of a stationary vehicle with a single operator. With a second operator, the hose can be used whilst the vehicle is moving slowly. The hose operator should position themselves at the rear of the vehicle, moving onto the footpath to clean around obstructions as they are encountered. Additional extensions can be added to the equipment for cleaning deep drains, gullies and catchpits. The Wanderhose can also be employed effectively on surface flood water.

Note :

The correct operation of the Wanderhose is achieved by holding the pipe just above the water or debris being picked up.

WANDERHOSE - POWABOOM OPTION

The Wanderhose is assembled as 1-3 on previous page for Wanderhose.

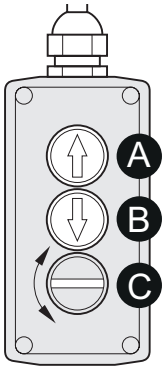
4. Apply the vehicle handbrake.

5. Press switch **(A)** to raise the unit from its stowage position and rotate to the working position.

   Press switch **(B)** to lower as required.

   Switch **(C)** controls the suction as follows;

   Turn clockwise to turn fan on, counter clockwise to turn fan off.



M02OG-102

LITTASNATCH - OPTION

The equipment is intended for picking up light objects such as leaves, drink cans, water, etc. and is operated in the same way as the Wanderhose.

Preparation

VT - Twin Engine

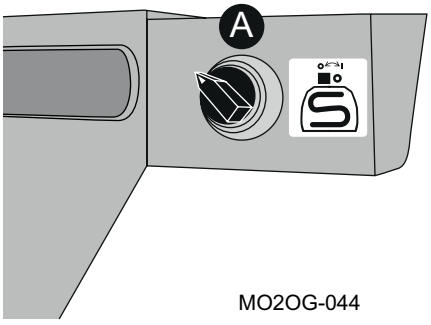
With the auxiliary engine running in low speed, blank off the nozzle ducting in the same way as described for Wanderhose preparation.

VS - Single Engine

Engage Hydrodrive, set engine to low speed and blank off the nozzle ducting in the same way as described for Wanderhose preparation.

Operation

Operating the rotary switch **(A)** located on the rear of the body opens the Littasnatch gate.



MO2OG-044

Note:

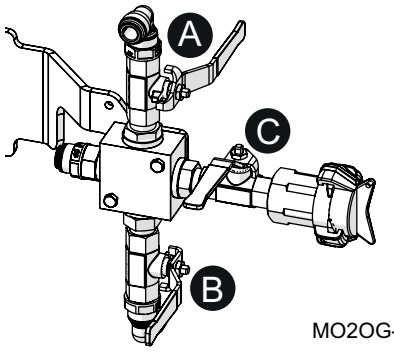
Ensure the hose is not twisted before operating the valve. This will prevent it snaking around as air passes through it.

Water Injection

Water injection is controlled from the rear of the machine.

Valve **(A)** Wanderhose
Valve **(B)** Littasnatch
Valve **(C)** Washdown

On completion of work, close the valves and re-stow the hose.



MO2OG-045

WATER RECIRCULATION OPTION

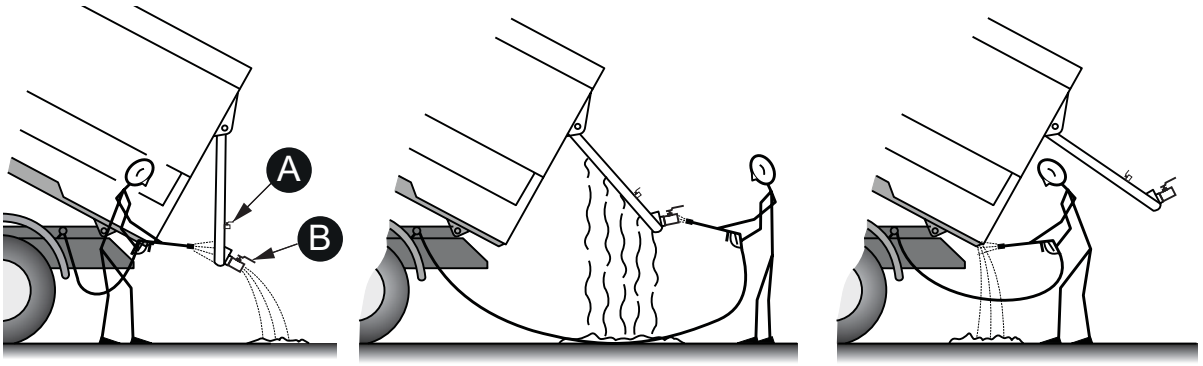
Safety Notice

- **Do not use at temperatures below 5°C as the water could freeze in the inlet duct.**

This feature allows a first fill of an additional 750 litres of water to be carried within the body, which can be re-circulated back to the body allowing longer on station working. In dry conditions the body should be filled with water via the offside hydrant filler to the level of the tap **(A)** on the rear door.

Operating the switch will allow this water to be re-circulated via the nozzle whilst sweeping.

After Load Discharge

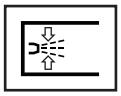


M02OG-049

1. Open the de-watering valve **(B)** on the bottom of the rear door.
2. Lower the nozzles and activate the re-circulating water switch.
3. Thoroughly clean the door meshes and the ducting through the body.

Failure to carry out this procedure could lead to blockages in the water ducts.

Recirculation Flushing During Operation



An optional tap located on the Supawash manifold enables the body transfer duct to be flushed through at high pressure.

With the re-circulation switch off and the Supawash activate, the high pressure water will back flush the transfer duct into the body and expel the dirt through the large ball valve on the rear door if opened, or into the body.

With the re-circulation switch on, the pipework from the transfer duct to the nozzle can be flushed out at the same time.

CHAPTER 5

Johnston Visual Module (JVM)

Table of Contents

Safety Notice

DO NOT

- **Disconnect the battery within 15 seconds of operating the ignition key to the off position.**

ALWAYS

- **Disconnect the vehicle battery and all the CANbus nodes when working on the electrical system or when carrying out any welding on the vehicle. Failure to observe this can cause damage to the nodes.**
- **Remove ignition key when working on the vehicle. Ensure all personnel are clear of the vehicle before restarting engine.**

J-Plex - The Johnston Sweeper Control System

J-Plex II is an electronic road sweeper control system which uses multiplex technology to enable multiple control signals to be combined into one common signal which can then be transmitted and received down a pair of wires (serial communication). This eliminates a substantial number of wires and connections from the vehicle's electrical system, which in turn reduces the size of wiring harnesses and increases reliability. Wiring from Input/Output (I/O) devices such as switches or hydraulic valves is via a local I/O collecting module called a node. On the V501, 651, 801 range of sweepers, the J-Plex control system consists of a Johnston Visual Module (JVM) screen, 2 Key Pad nodes, 3 remote I/O nodes and 2 HC nodes mounted around the sweeper. The JVM acts as the master control unit and communicates between each external node via a CANbus control network.

JVM Provides:

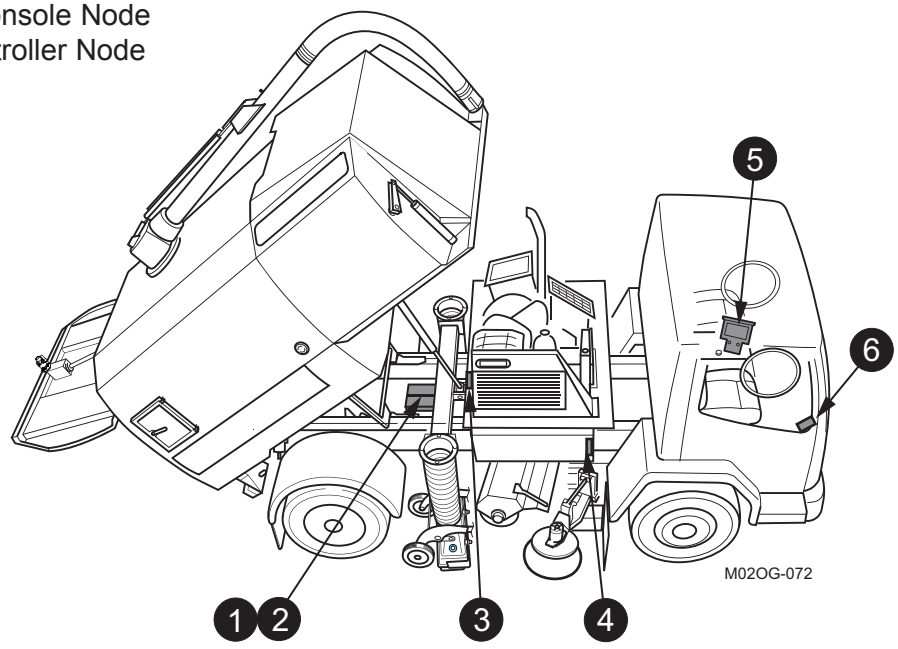
The operator interface with the powerful diagnostic features provided by J-Plex.
The ability to check the status of Inputs and Outputs.
Information regarding the machine operating status, fuel tank contents, etc.
Data capture - hours sweeping, distance travelled, etc.
Fully customisable modern sweeping experience.
Clear display showing current operation status.
Direct communication with the Chassis.

Operating Instructions:

Throughout the J-Plex, pictorial icons are used to both confirm the current status and when required communicate instructions.

Location of J-Plex Components

1. Subframe Node
2. High Power Nodes
3. Powerpack Node
4. Systems Locker Node
5. Centre Console Node
6. Door Controller Node



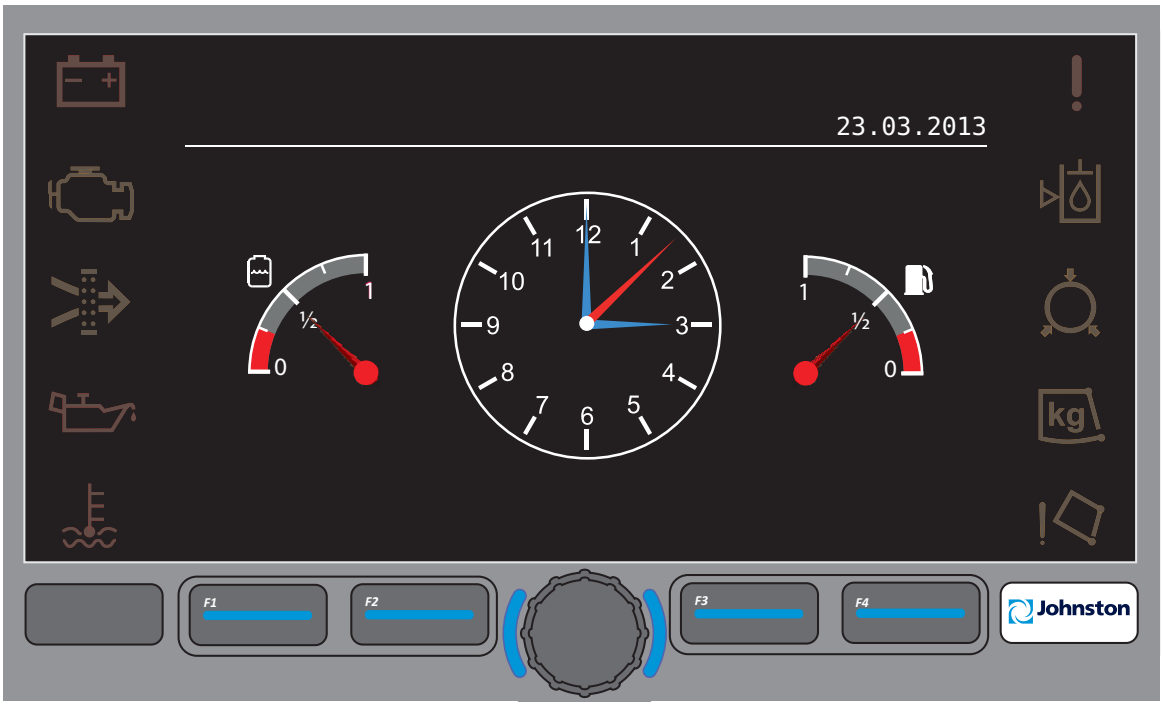
JVM Display Screens.

Switching on the vehicle ignition:

The JVM will display a Splash Screen for 2.5 seconds;

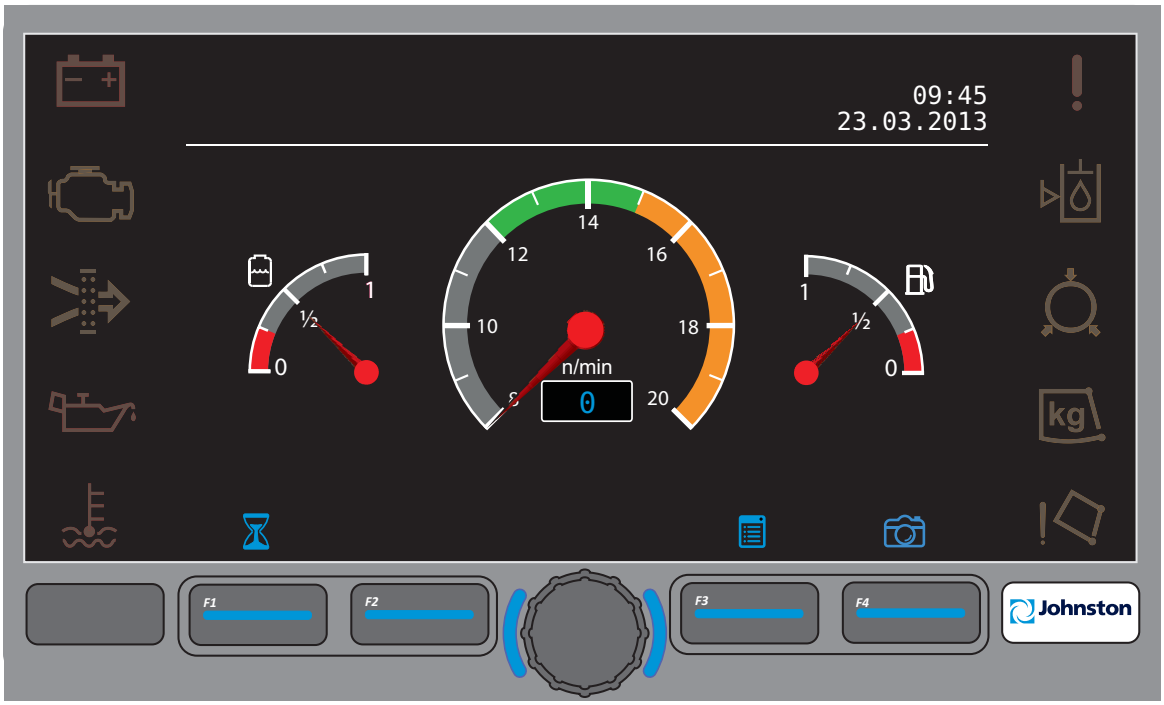
After which the Standby Screen is displayed showing:

Water tank level, Clock and Fuel tank level.



Activating the ignition switch:

Prepares the system for starting the engine and displays the RPM counter. Relevant soft key functions will be displayed.



Activating Soft Key F3:

Opens the Main Menu 4.00.

Main Menu

Menu 4.00

Rotating the central encoder enables navigation of the various menus, with required menu highlighted; press encoder to select.

Main Menu descriptions:

1. Vehicle Serial Number
2. CAN Bus Information
3. Valve Outputs
4. Door Controller Switches

5. Switch Inputs
6. Special Inputs
7. Special Outputs
8. Engine Information

9. Hydrostatic Gearbox Set up
10. Wide Sweep Brush Balance
11. Service Menu
12. Set Pressures

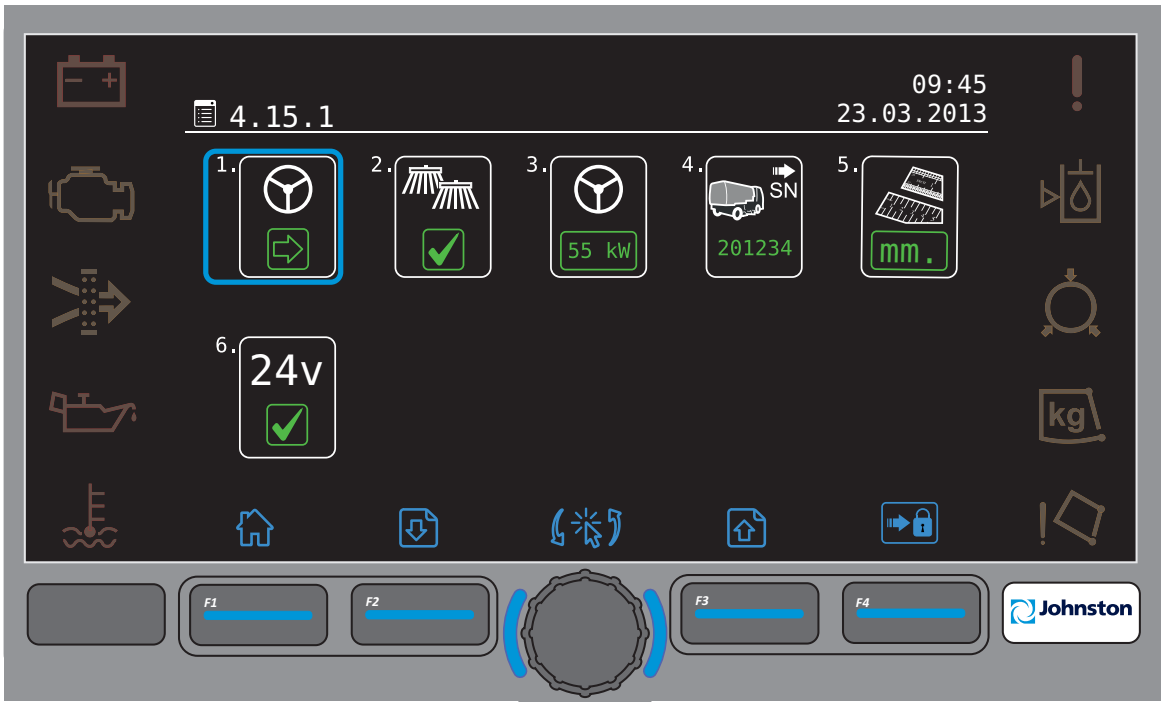
13. Display Settings
14. Set Security Level
15. Machine Setup
16. User Settings

Menu 4.1 - Vehicle Serial Number

This number should be quoted when contacting Johnston Sweepers for servicing and maintenance issues.

Menu 4.15.1 - Machine Setup

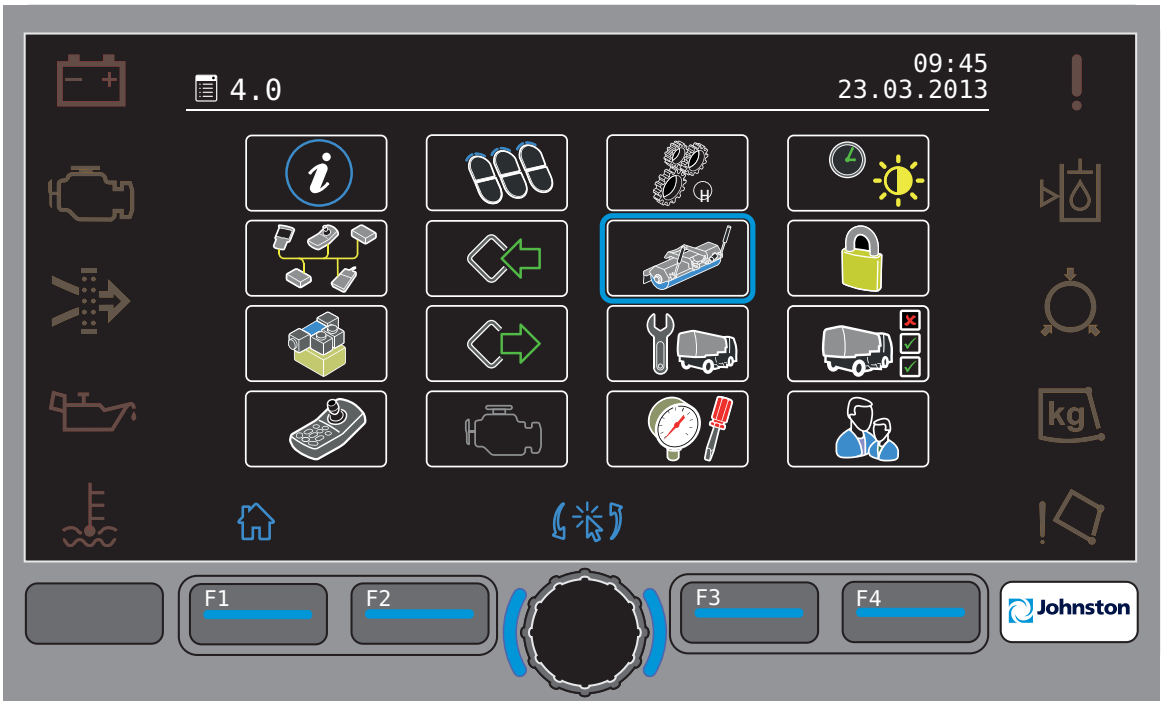
Shows the configuration of the vehicle for all standard (Page 1) and optional equipment (Pages 2-4).



Menu Navigation - An example of the JVM functionality to set the Wide Sweep Brush Balance.

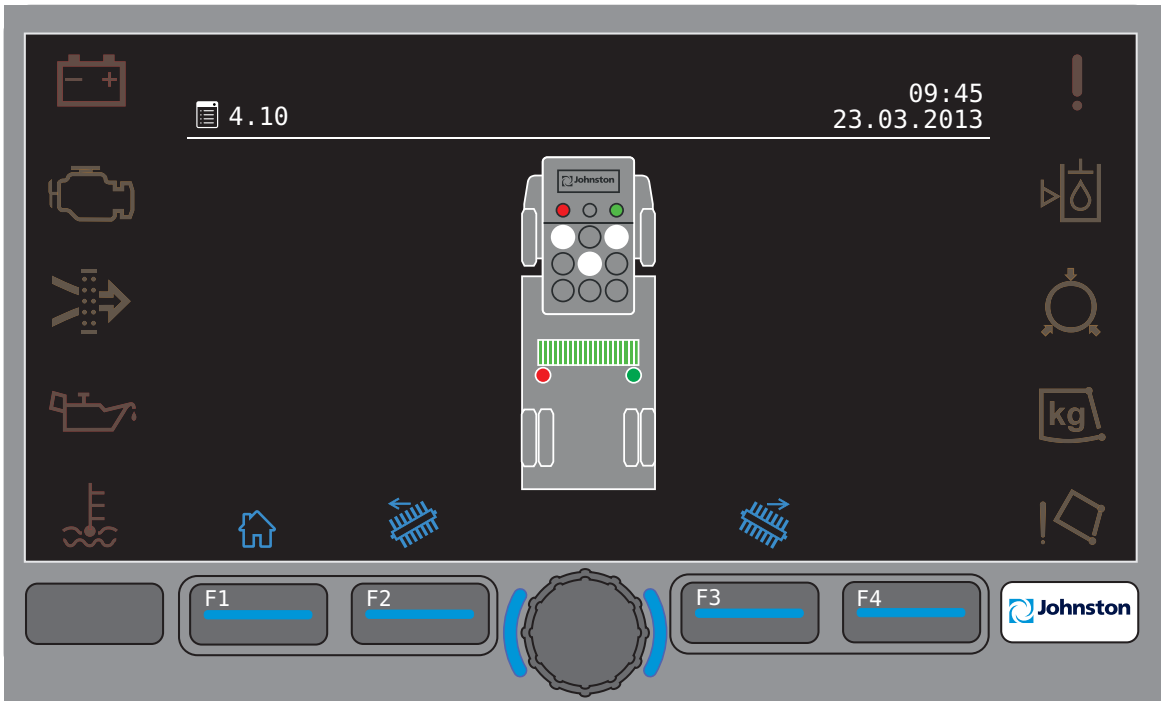
Activating Soft Key F3: Opens Main Menu 4.00

- Rotate the central encoder to highlight menu 10, Wide Sweep Brush Balance.
- Press the encoder to select.

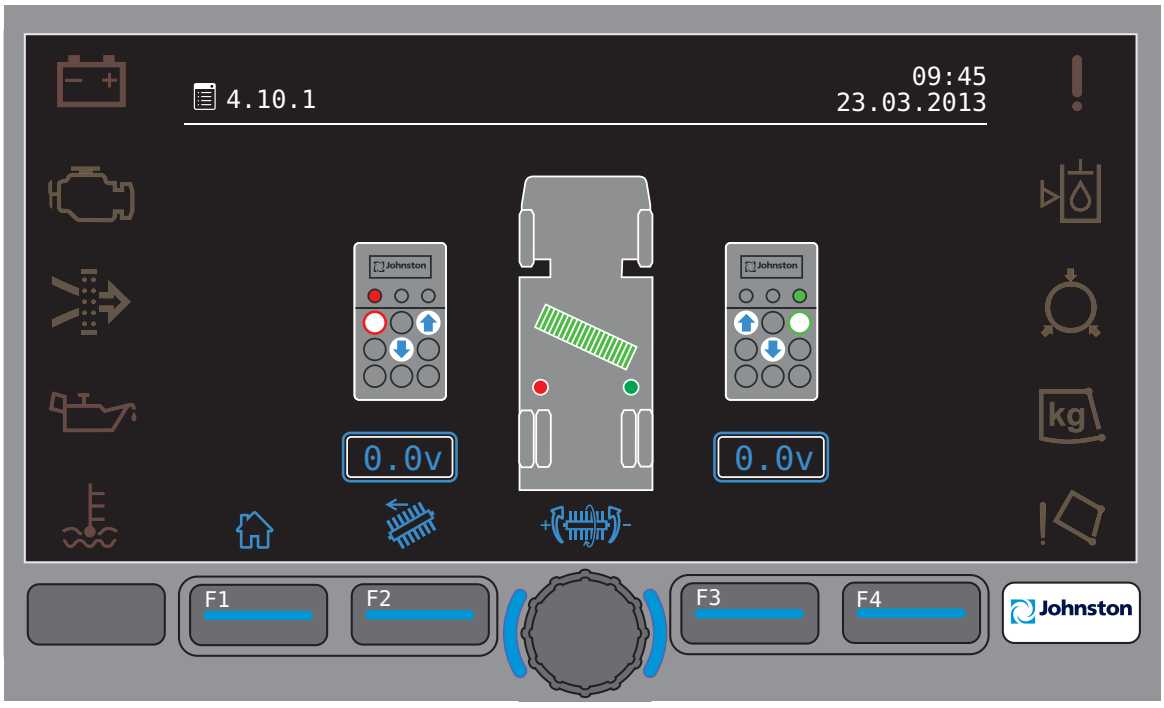


Menu 4.10.0
If not running, the Auxiliary engine needs to be turned on before the next screen is shown.

Menu 4.10 - Pendant LED light up as shown.
Select Slew direction using F2 (LH Slew) or F3 (RH Slew). On selection of slew WSB begins to rotate in direction selected. All other sweepgear controls are locked for this process.

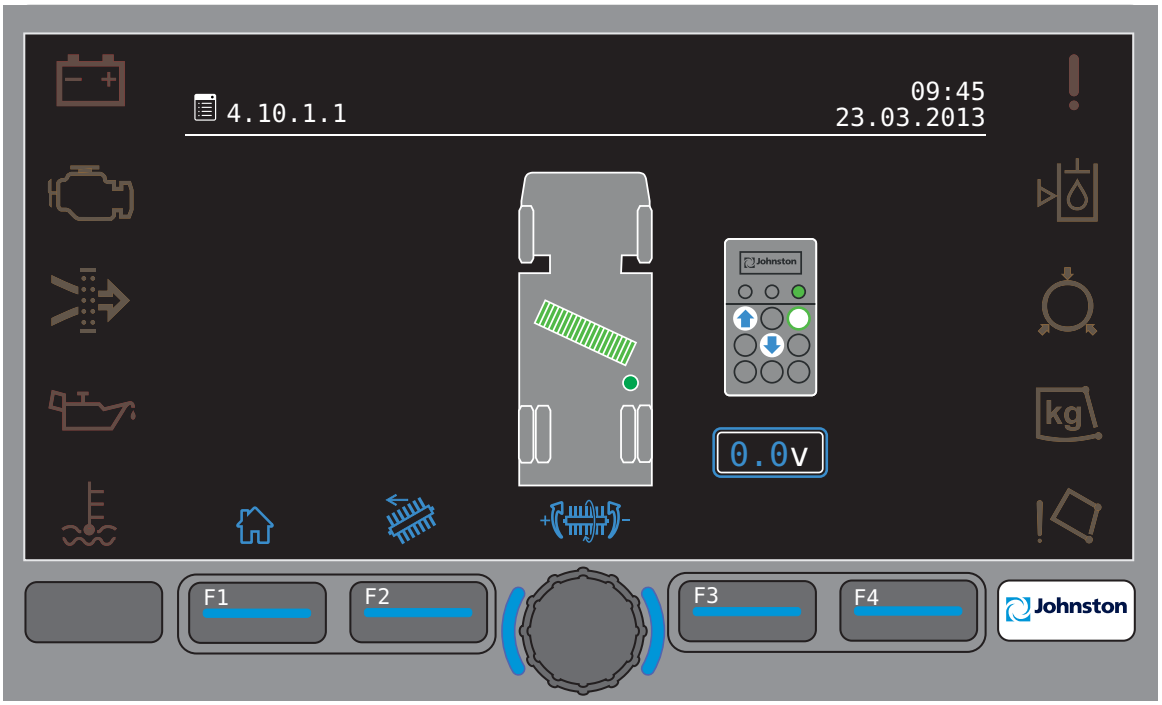


Main Menu 4.10.1 - RH Slew selected, F3 icon disappears, WSB slews right hand and rotates. Pendant remains as before. WSB Speed control option becomes adjustable with potentiometer if option fitted (4.10.2 for LH Slew).

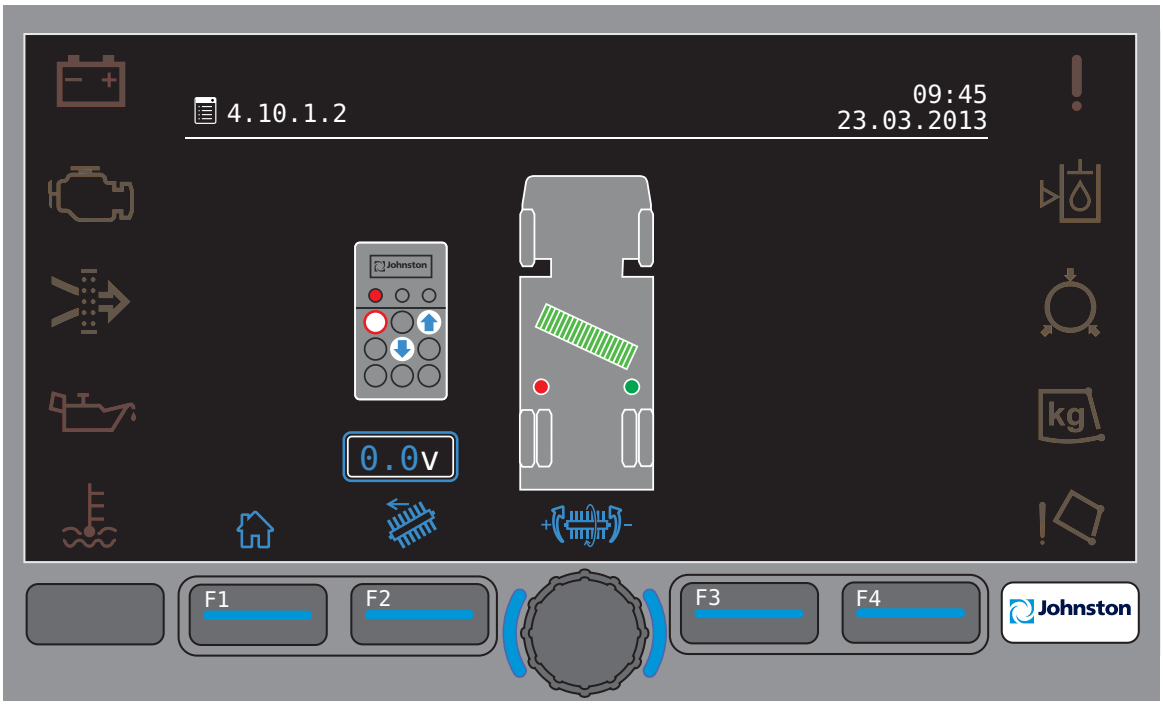


Wide Sweep Brush Balance (continued)

Menu 4.10.1.1 - RH Cylinder selected by holding down top RH button on pendant. Red LED goes out. Adjust using upper and lower buttons. When adjusted, RH button is released and screen returns to 4.10.1.



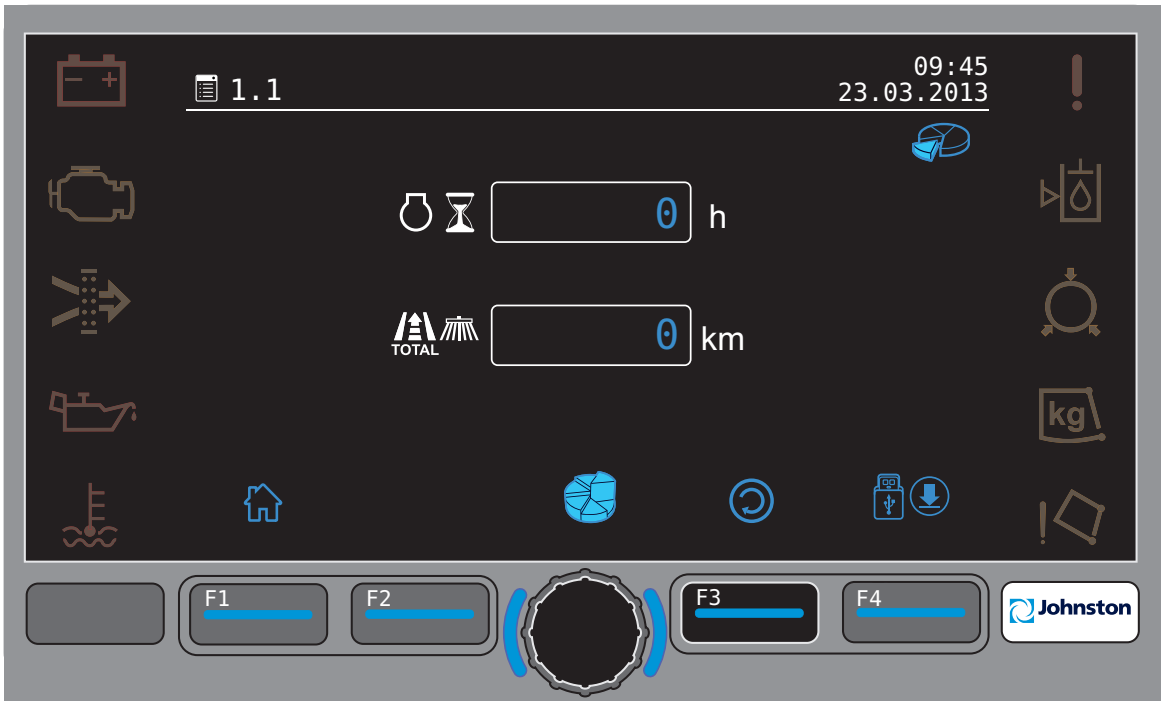
Menu 4.10.1.2 - LH Cylinder selected by holding down top LH button on pendant. Green LED goes out. Adjust using upper and lower buttons. When adjusted, LH button is released and screen returns to 4.10.1. Press F2 to select LH Slew and repeat process. Pressing F1 exits the menu, and the Wide Sweep Brush goes to raised position.



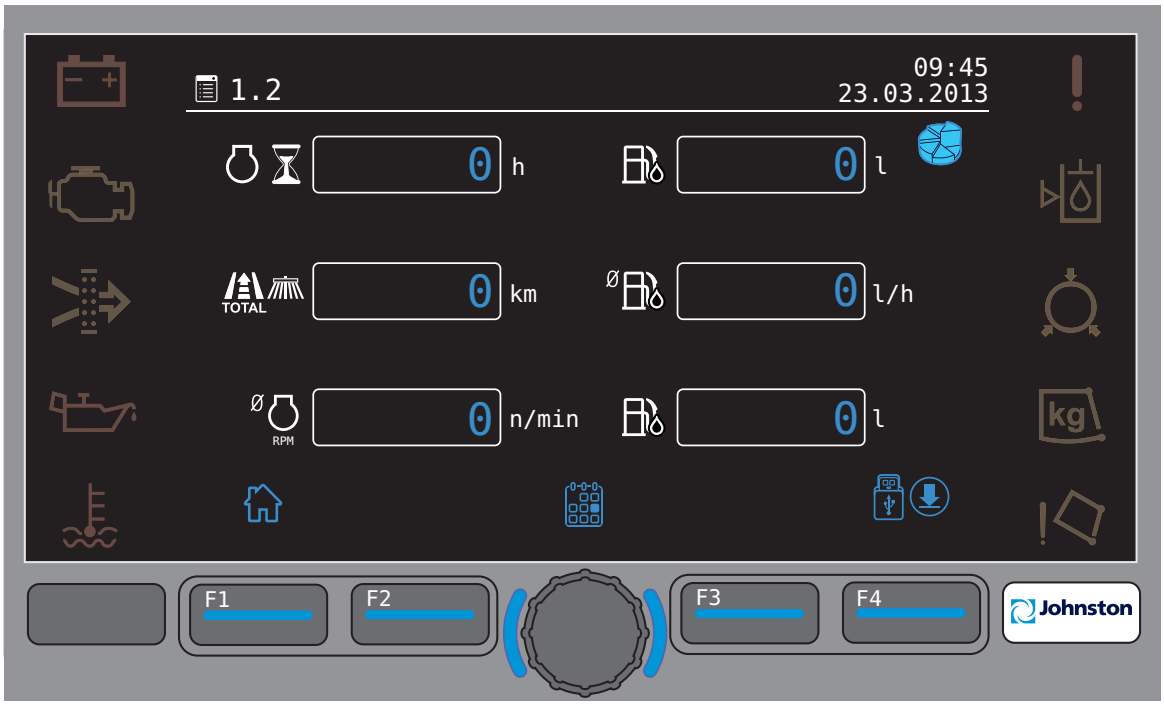
Vehicle Logging (F1 on Base Screen)

Menu 1.1 - Part Totals

Pressing the reset soft key (F3) will reset the part totals back to zero.
Press encoder to progress through menus.

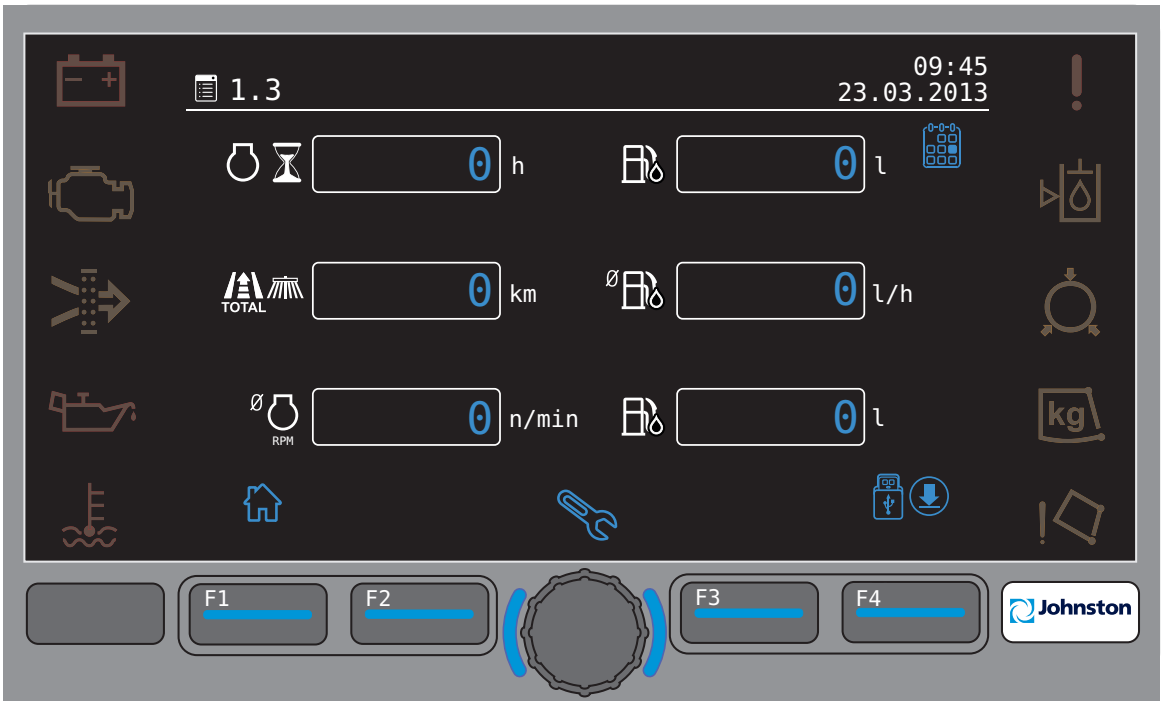


Menu 1.1 - Grand Totals

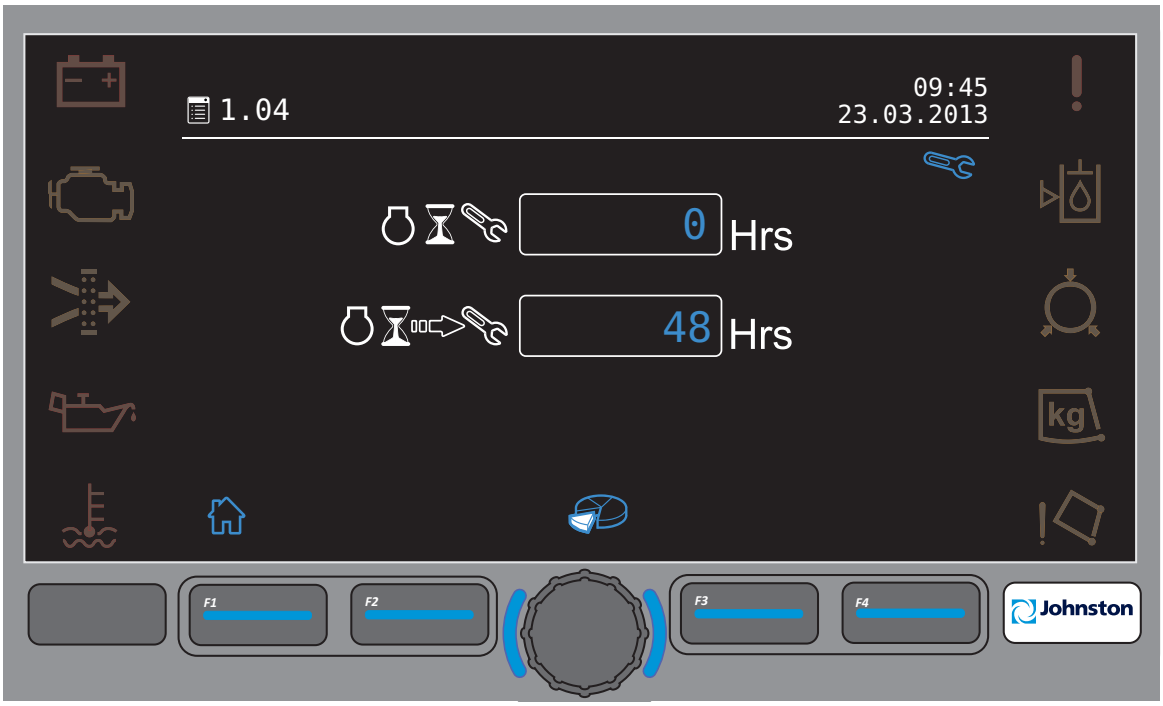


Menu 1.3 - Daily Totals

Vehicle Logging (continued)



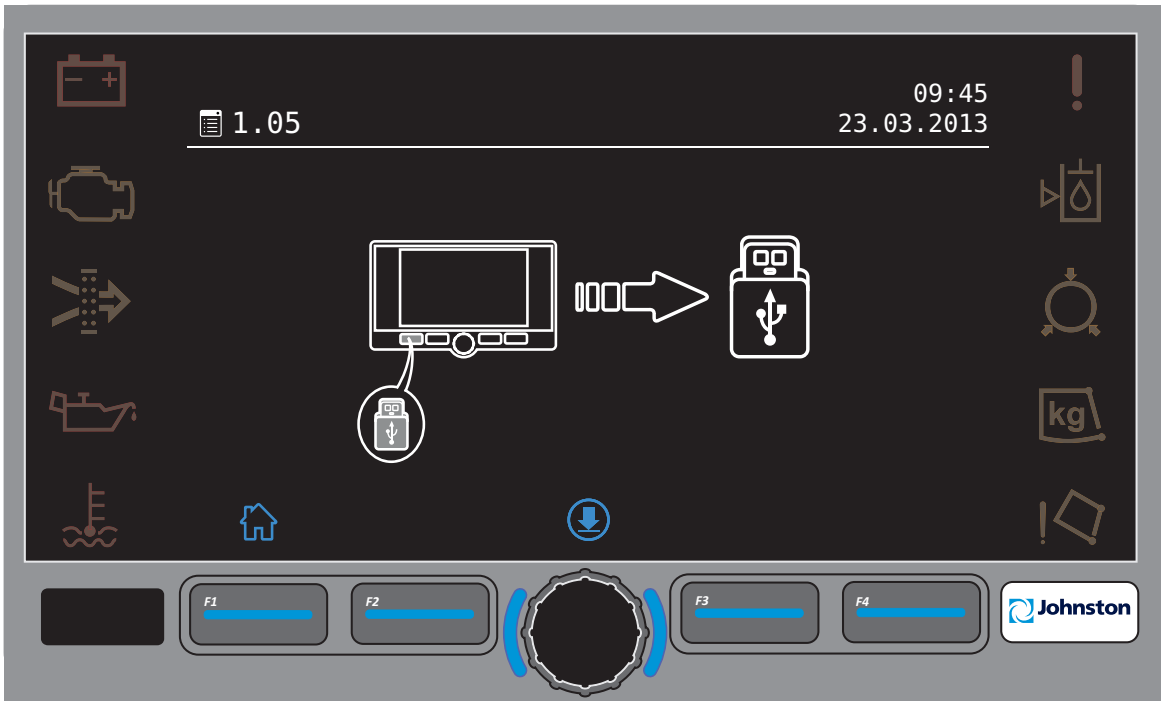
Menu 1.4 - Service Hours



USB Download (Press F4)

Menu 1.5 - Data Capture

Insert an approved Johnston USB stick into the USB port (located on front of the JVM - bottom left hand side). Press centre encoder on JVM to download Data Capture file.



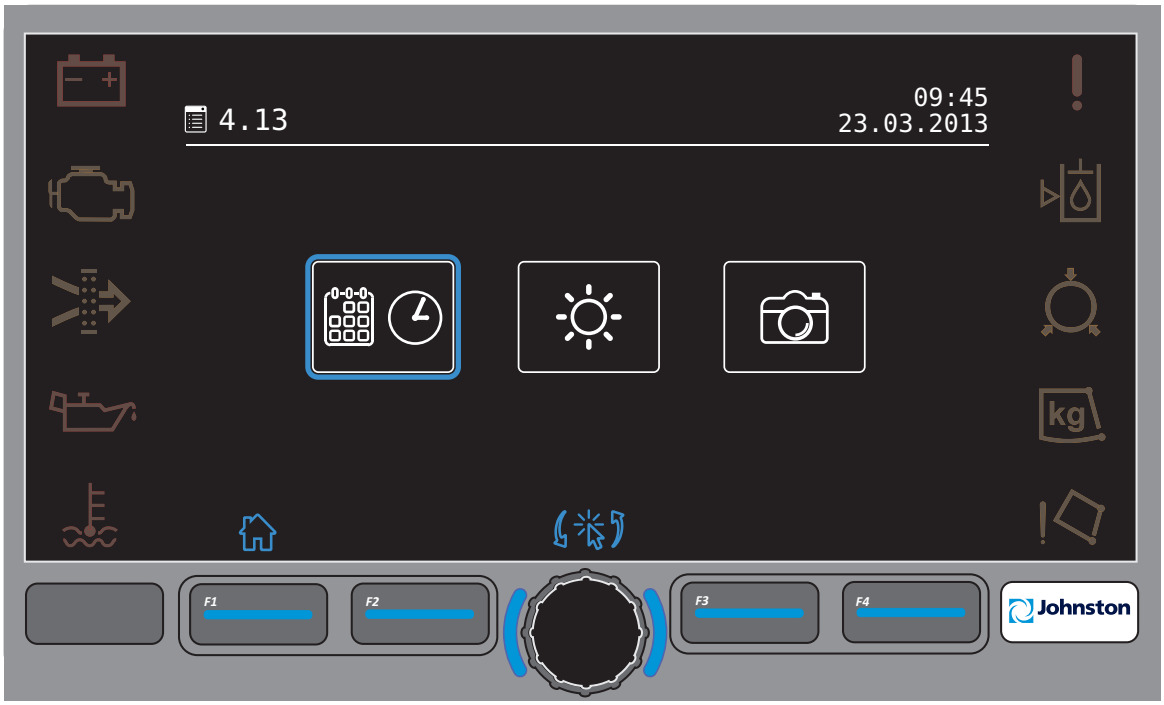
5.0 Camera (Press F4 on Base Screen)

Pressing the Camera Maximise soft key (F4) will display the camera in full screen display mode.

Pressing the Camera Minimise soft key will return the camera to normal display mode.

Display Settings

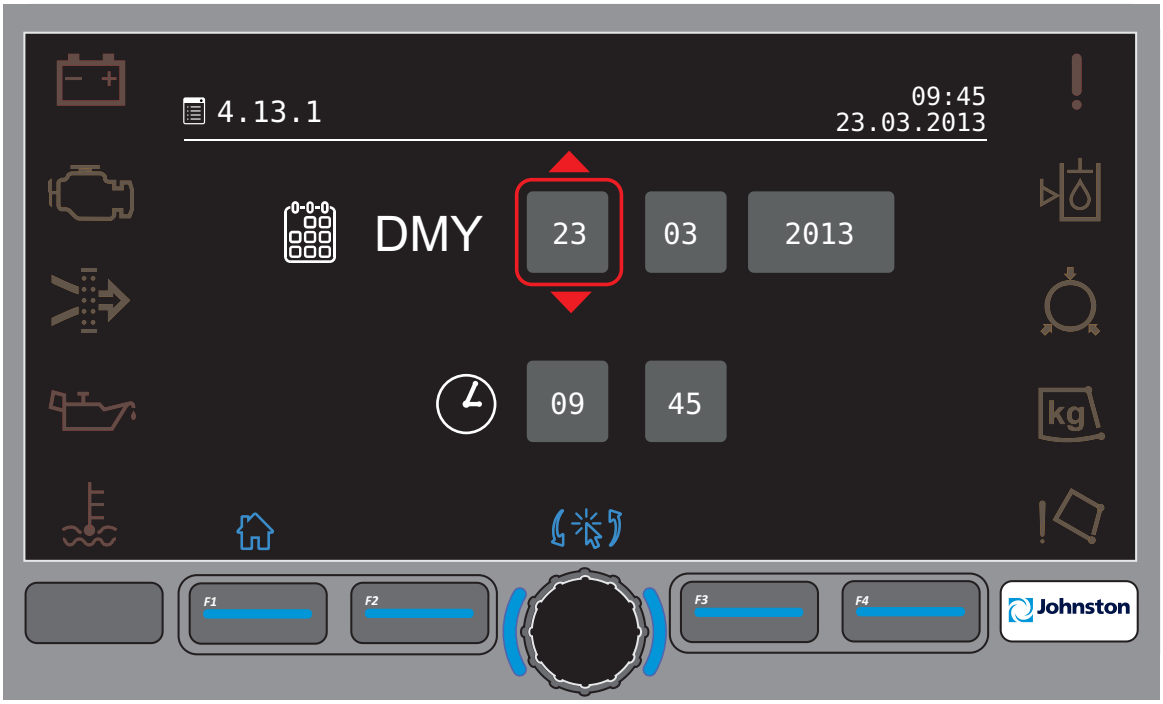
Menu 4.13 Allows the operator to set prefered settings for the following:
4.13.1 Date and Time. 4.13.2 Screen and Buttons Brightness and Contrast.
4.13.3 Camera Brightness, Contrast and Colour Saturation.
Rotate centre encoder to move the halo and press to select display setting menu as required.



Display Settings (continued)

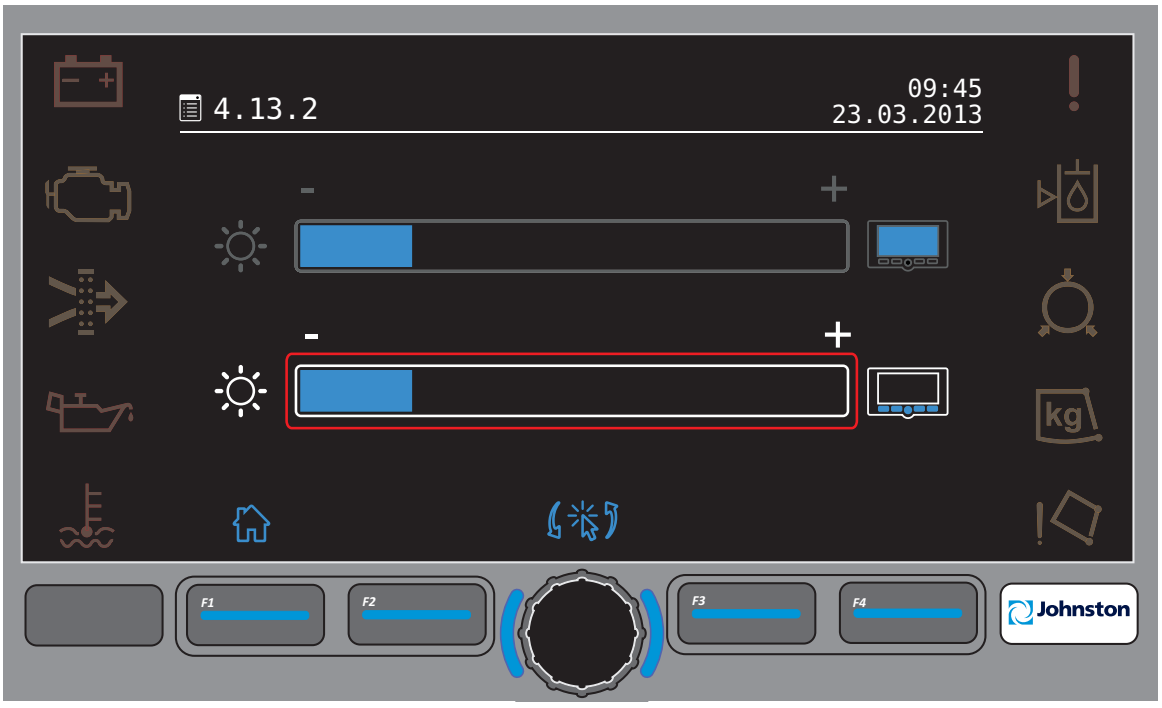
Menu 4.13.1 - Date and Time

Rotate centre encoder to move halo. Press encoder to select item, halo colour will change to red. Rotate encoder to adjust. Press encoder to store value.



Menu 4.13.2 - Display, Soft Key Brightness

The brightness of both the JVM display and soft keys may be altered as required Rotate the Encoder to move halo. Press to select item, halo colour will change to red. Rotate Encoder to change setting. Press Encoder to store.



Menu 4.13.3 - Camera Brightness, Contrast and Colour Saturation

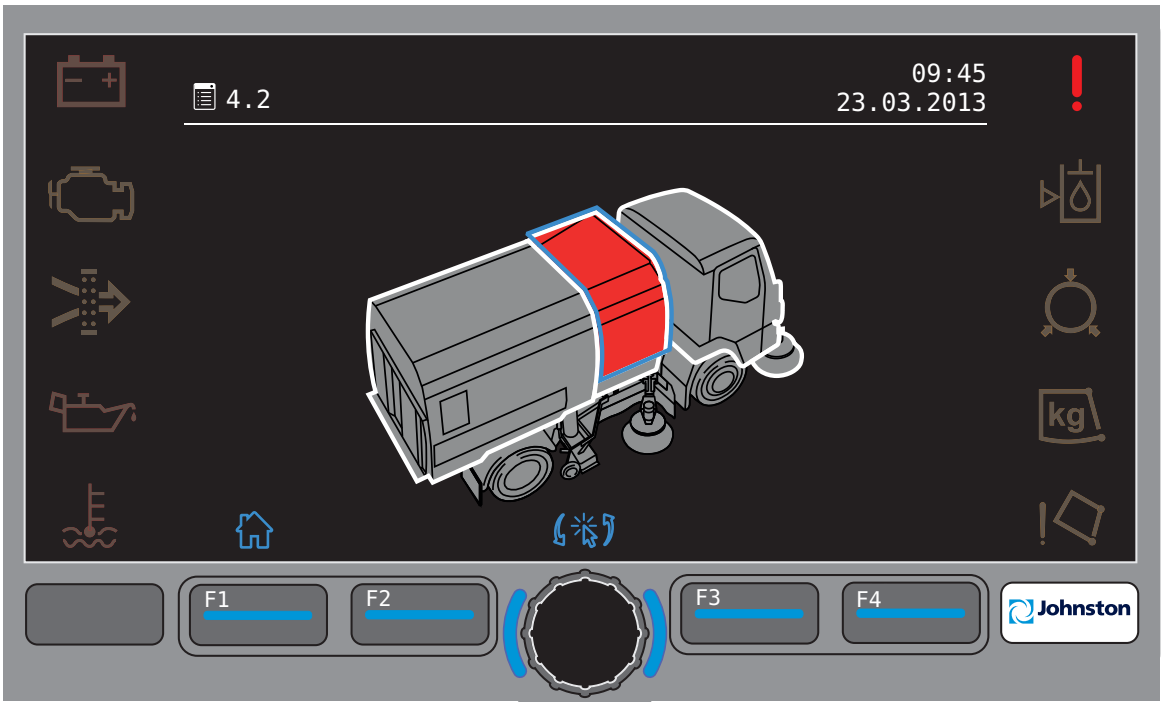
Brightness, contrast and colour saturation of the camera may be altered to suit the operator's requirements. Rotate centre encoder to move halo. Press to select item, halo colour will change to red. Rotate encoder to change setting. Press encoder to store.

System Faults

Should a fault occur in any of the equipment operating systems the fault icon **(!)** is displayed over soft key **F2.**
Selecting **F2** automatically opens Menu 4.2 (CANbus Network) which highlights the location of the affected Node.

Menu 4.2 - CANbus Network Faults

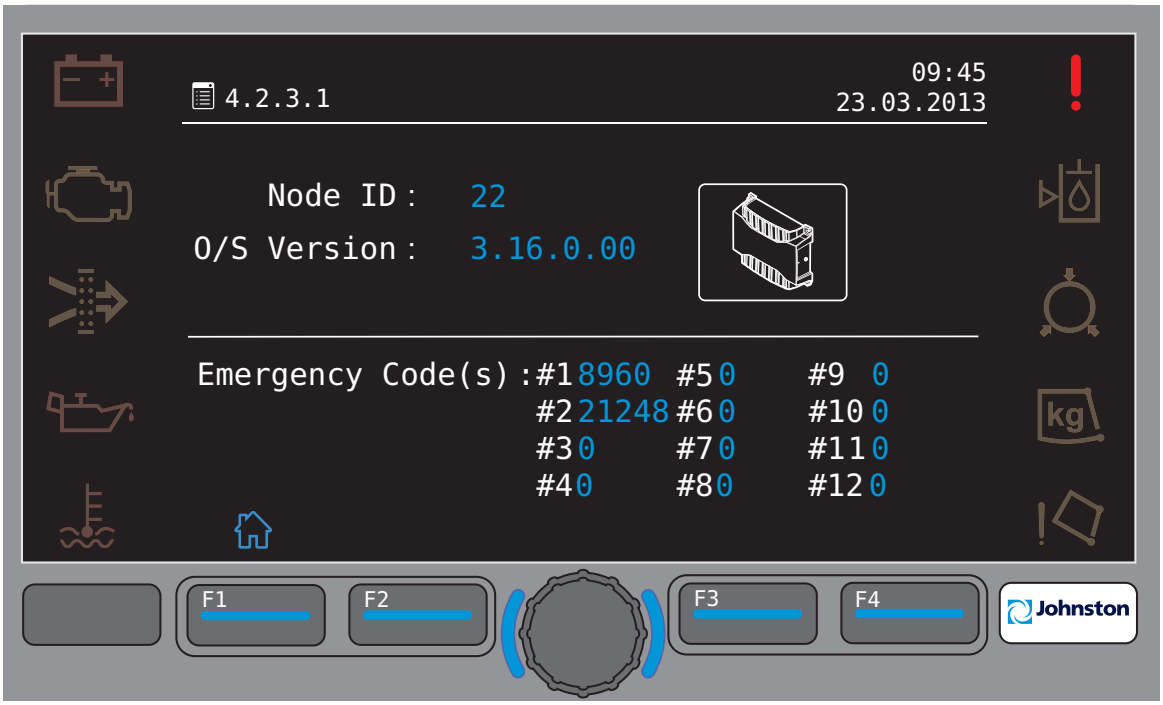
Rotate the encoder to highlight the indicated area (Powapak).
Press the encoder to display the fault.



Menu 4.2.3.1 - Powapak IO Node

Example:-

Should a fault occur it will be accompanied by one or more emergency codes (EMCY), which will be logged in the system. Shutting down the system will clear the error.



CHAPTER 6

Routine Maintenance

Table of Contents

VT - Twin Engine

MAINTENANCE SCHEDULE

Safety Notice

- **Attention is drawn to the recommendations in the Auxiliary Engine Handbook.**
- **These procedures should be carried out by qualified service personnel.**

Daily Maintenance - This can be carried out by a suitably trained operator.

Check the following items:-

1 Oil level in hydraulic reservoir - top up if required.
2 Auxiliary engine oil level - top up if required.
3 Auxiliary engine radiator level - top up if required.
4 Auxiliary engine radiator is not obstructed.
5 Filter state indicator - service air filter if red.
6 Mesh screens in body are clean and fitted correctly.
7 Centre baffle is in position - duals only.
8 Mechanical damage to brush gear and report damage to supervisor.
9 Brushes for adjustment and wear - adjust or replace as required.
10 Spray jets for correct operation - clean if necessary.
11 Oil/water/fuel leakages.
12 Chassis items as recommended in chassis manufacturer's handbook.

Weekly Maintenance - This can be carried out by a suitably trained operator.

Attend to/check the following:-

1 Oil level in 'Z' drive gearbox - top up if required.
2 Fan/engine bay is clean of oil etc.
3 Auxiliary engine drive belt tensions.
4 Suction fan impeller, wear plates and intake flap for wear, renew if necessary.
5 Routing of electric and hydraulic services for chafing.
6 Lubricate all grease points - see page OG6:16.
7 Water pump suction filters.
8 Oil level and condition in Supawash pump if fitted.

50 Hour Service - To be carried out by workshop personnel.

Attend to/check the following:-

1 Drain and refill 'Z' drive gearbox.
2 Drain and refill Supawash pump (if fitted).

VT - Twin Engine

MAINTENANCE SCHEDULE (Continued)

Service A - Every 500 Hours - To be carried out by workshop personnel.

1. Change auxiliary engine oil and renew filter.
2. Clean fuel pre-filter bowl (John Deere).
3. Renew the fuel filter element.
4. Renew auxiliary engine air cleaner elements.
5. Check auxiliary engine throttle control and engine idle for correct operation.
6. Clean duct in body roof.
7. Check the fluid flywheel oil level.
8. Check auxiliary engine coolant concentration gives -39°C frost protection.
9. Check Supawash pump (if fitted) for the correct operation of jets and any plunger seal leaks. Service as necessary.

Service B - Every 1000 Hours - To be carried out by workshop personnel.

1. Carry out 500 hour service; plus:-
2. Renew hydraulic return filter element.
3. Renew water pump suction filters.
4. Check valve clearances on the auxiliary engine if applicable.
5. Replace fuel pre-filter.
6. Carry out a visual inspection for the security of body mounts, pivot pins and equipment. - Ensure torque identification marks are aligned - re-torque as required (See torque chart in maintenance manual)

Service C - Every 2000 Hours - To be carried out by workshop personnel.

1. Carry out 1000 hour service; plus.:-
2. Drain and refill hydraulic reservoir.
3. Clean/replace suction filters and refill hydraulic reservoir.
4. Drain and refill 'Z' drive gearbox.
5. Replace Auxiliary engine drive belts.
6. Drain and refill Supawash pump (if fitted).

Service D - Every 2 years - or Every 4000 Hours

1. Carry out 2000 hour service; plus.:-
2. Drain and refill fluid flywheel.

Used oils and filters should be disposed of in accordance with local waste disposal regulations.

VS - Single Engine

MAINTENANCE SCHEDULE

Safety Notice

- **Attention is drawn to the recommendations in the Chassis Engine Handbook.**
- **These procedures should be carried out by qualified service personnel.**

Daily Maintenance - This can be carried out by a suitably trained operator.

Check the following items:

1 Oil level in hydraulic reservoir - top up if required.
2 Oil cooler radiator is not obstructed.
3 Chassis engine air cleaner - service when shown by restriction indicator.
4 Mesh screens in body are clean and fitted correctly.
5 Centre baffle is in position - duals only.
6 Mechanical damage to brush gear and report damage to supervisor.
7 Brushes for adjustment and wear - adjust or replace as required.
8 Spray jets for correct operation - clean if necessary.
9 Oil/water/leakages.
10 Chassis items as recommended in chassis manufacturer's handbook.

Weekly Maintenance - This can be carried out by a suitably trained operator.

Attend to/check the following:

1 Oil level in 'HYDRODRIVE' gearbox - top up if required.
2 Powapak bay is clean of oil etc.
3 Suction fan impeller, wear plates and intake flap for wear, renew if necessary.
4 Routing of electrics and hydraulic services for chafing.
5 Lubricate all grease points - see page OG6:18.
6 Water pump suction filters - see page 1:2.
7 Oil level and condition in Supawash pump if fitted.

50 Hour Service - To be carried out by workshop personnel.

Attend to/check the following:

1 Change hydrodrive gearbox oil.
2 Renew transmission pump filter.
3 Drain and refill Supawash pump (if fitted).

VS - Single Engine

MAINTENANCE SCHEDULE (Continued)

Service A - Every 500 Hours - To be carried out by workshop. personnel

1. Renew transmission pump filter.
2. Clean duct in body roof.
3. Check Supawash pump (if fitted) for correct operation of jets and any plunger seal leaks. Service as necessary.

Service B - Every 1000 Hours - To be carried out by workshop. personnel

1. Carry out 500 hour service; plus
2. Renew hydraulic return filter element.
3. Renew water pump suction filters.
4. Change oil in 'HYDRODRIVE' gearbox.
5. Carry out a visual inspection for the security of body mounts, pivot pins and equipment. - Ensure torque identification marks are aligned - re-torque as required (See torque chart in maintenance manual)

Service C - Every 2000 Hours - To be carried out by workshop. personnel

1. Carry out 1000 hour service; plus
2. Drain and refill hydraulic reservoir.
3. Clean suction filter and refill hydraulic reservoir.
4. Drain and refill Supawash pump (if fitted).

Used oils and filters should be disposed of in accordance with local waste disposal regulations.

These procedures should be carried out by qualified service personnel.

Attention is drawn to the recommendations for servicing in the Chassis Manufactures Handbook.

EQUIPMENT ADJUSTMENT / MAINTENANCE

Safety Notice

- **The use of Needle stick gloves is recommended when working with this equipment**
- **Ensure the auxiliary engine is not running and isolated before brush adjustment or replacement is attempted.**

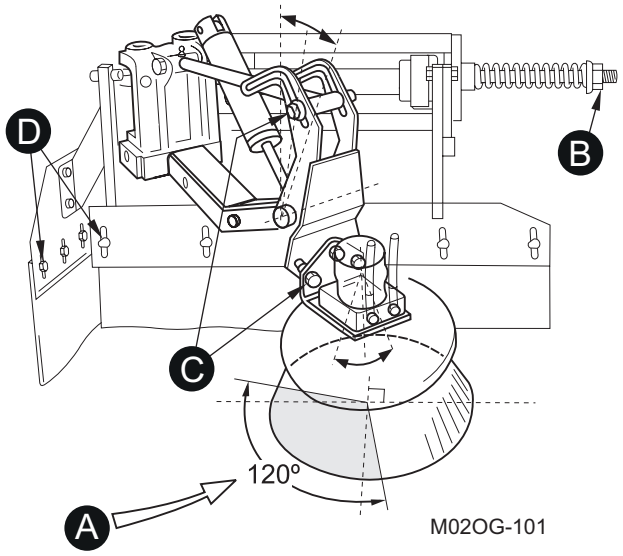
Introduction

This chapter highlights some of the basic adjustment and maintenance procedures required to keep the machine performing efficiently. For more detailed information refer to the Technical Manual.

Channel Brush Adjustment

The brush is supported on a pivoting arm which allows it to float against the kerb and fold back on impact.

The 'kick back' resistance (A) is adjusted by the compression spring nut (**B**) at the rear of the brush assembly.



The brush angle adjustment.

Is set, using adjusters (**C**), so that about 120° of circumference towards front and kerbside is in contact with the road.

Rubber curtain adjustment.

These should be set just clear of the ground using adjusters (**D**). Adjustment should be effected with brush in working position. A cab control is provided to vary the speed of the brush, also the ground pressure by means of the Powasave control.

Channel Brush Replacement

Removal

It is preferable to have the brush arm in the working position with chassis engine inert and air supply isolated. Loosen the four flange nuts securing brush stock assembly to the drive plate. turn slightly to align nuts with holes in plate and remove brush.

Refitting

Reverse of removal procedure. Any loops of steel tines which project above the head of the stock should be hammered flush before offering up the brush stock assembly to the driving plate. Loosen flange nuts on brush stock, align brush with holes in drive plate, rotate in the opposite direction of brush rotation and tighten nuts.

Safety Notice

- **The use of Needle stick gloves is recommended when working with this equipment**

Wide Sweep Brush Adjustment

The Wide Sweep Brush balance control system has been designed so as not to require any regular adjustment. by the operator.

The system uses electronic proportional regulators which are factory set to optimise the sweeping performance and life of the brush.

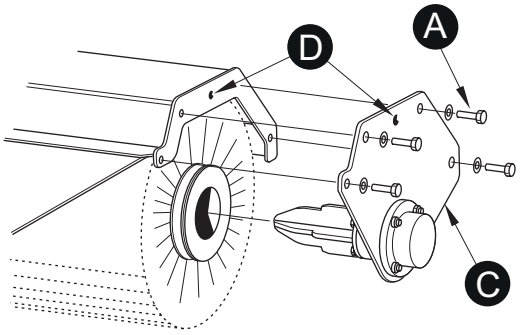
In the event of the brush requiring any adjustment it is recommended that this work is carried out by trained personnel. A detailed procedure is provided in the maintenance manual.

Wide Sweep Brush Stock Replacement

Removal

With the brush in the lowered position remove the 4 bolts **(A)** from the end plate **(C)** opposite the hydraulic motor. Withdraw the plate assembly.

Remove the metal core with segment stock.



M02OG-105

Refitting

Slide core with segments under the wide sweep brush carriage. Engage the core on the motor drive dog. Refit the end plate assembly turning it if necessary to engage the bearing drive dog. *Line the end plate up with the carriage and refit the 4 securing bolts **(A)**.

*A location hole **(D)** is provided for a tapered bar to locate and hold the end plate assembly in place, while bolts **(A)** are being located.

Nozzle Adjustment

Safety Notice

- **The use of Needle stick gloves is recommended when working with this equipment**

In order to maximise the performance of the machine It is important that a working clearance is maintained between the nozzle rubbers and the road surface. The following settings are recommended as a guide although some conditions may require a tighter front nozzle setting. Adjustment is carried out with the Maxigap/Varagap in the closed position.

Rear Nozzle Rubber.

Recommended ground clearance 8-10mm.

Adjustment.

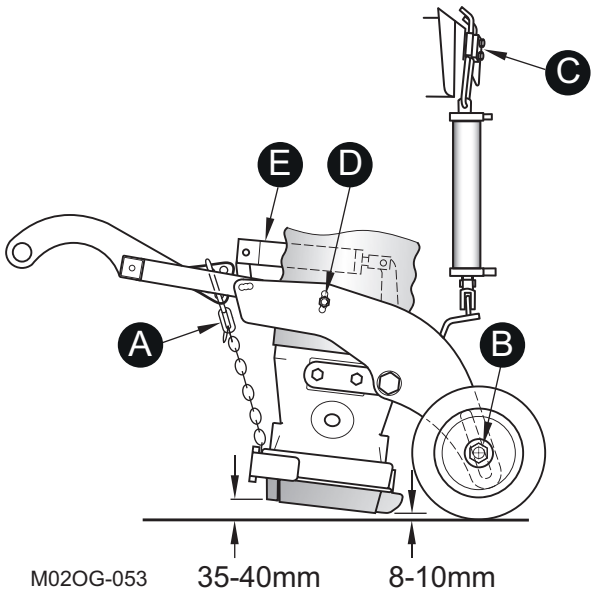
Raise or lower the carriage wheels **(B)** as required.

Front Nozzle Rubber.

Recommended ground clearance 35-40mm.

Adjustment.

Raise or lower the chain link **(A)** as required.



The rear nozzle rubber should always be approximately 8-10mm from the ground to allow for the road camber. An average gap setting between the front nozzle rubber and the ground has been found to be 35-40mm for most sweeping conditions. These adjustments may become necessary as nozzle rubbers and tyres wear.

There must always be sufficient extension (75-100mm) capability in the nozzle trunking and the nozzle lift cylinder to ensure that the nozzle does not become suspended when passing over road surface depressions. The attachment of the nozzle lift cylinder to the trunking bracket may be adjusted downwards by the clamped 'U' bolt **(C)**.

Additional adjustment is provided to alter the draw bar height/position. Normally the centre hole is utilised. Repositioning setscrew **(D)** into a lower hole raises the front of the nozzle, or into a higher hole lowers the front of the nozzle.

The Maxigap feature **(E)** opens the nozzle aperture to allow for the ingestion of bulky objects.

Suction Fan Impeller and Casing

VT - Twin Engine

Safety Notice

- **Ensure the auxiliary engine is not running and isolated before fan maintenance or replacement is attempted.**
- **The fan impeller is finely balanced as an assembly in manufacture. NEVER remove or replace the hub.**

VS - Single Engine

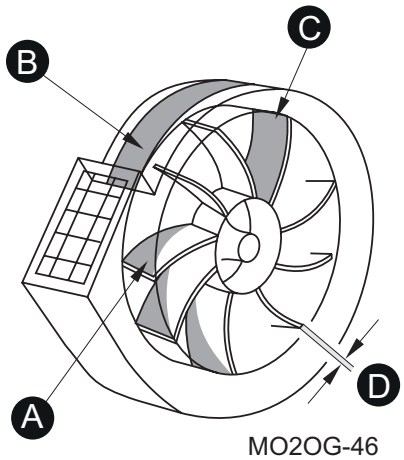
Safety Notice

- **Ensure the chassis engine is not running and isolated before fan maintenance or replacement is attempted.**
- **The fan impeller is finely balanced as an assembly in manufacture. NEVER remove or replace the hub.**

In operation the impeller and casing can be subjected to wear in the form of erosion resulting from dust or small abrasive particles passing through the fan system and must be inspected in accordance with the Weekly Maintenance Schedule.

In cases where excessive dust could pass through the system, these inspections should be made more frequently, the blades should be clean of any debris (**C**) to prevent dirt build up and premature failure due to vibration.

If the impeller is subjected to excessive wear, disintegration could occur whereby the front shroud plate detaches itself from the driving plate as a result of the high rotational forces. Any wear occurring to the impeller is usually shown up as a thinning of the blades generally in a broad wear pattern **(A)**. Once apparent thinning of the impeller blades is observed, the impeller must be replaced when any blade thickness **(D)** is less than 2mm. If perforation of the fan case is observed **(B)** due to wear erosion, this should also be replaced.



MO2OG-46

Filter Screens and Roof Duct

Safety Notice

- **Ensure the screen is lowered slowly. If the mesh is allowed to 'free fall' and bounce off of the baffle, there is a possibility of it being dislodged from the hinge point.**

The body filter screens and roof duct must be kept clean, otherwise suction performance can be affected. The screens should be removed when cleaning, To remove, push the handle to release the screen and allow it to swing down, disconnect the air pipe to the mesh shaker unit if fitted. The screen can then be lifted out of the hooks on the rear sloping panel for thorough cleaning. With the screens removed and the body raised and resting on its prop, clean out all debris from the roof duct which runs along the top of the body, using a hose and broom. Care should be taken not to get excessive water in the fan case.

When refitting a screen, ensure it is a close fit against the mating faces. Adjustment is provided so that debris is prevented from entering the fan.

Wanderhose Adjustment

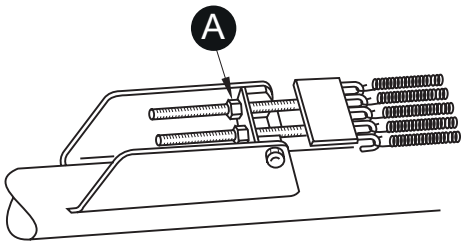
Safety Notice

- **Safety platform/gantry to be used for this procedure**

Adjustment

The balance of the Wanderhose can be adjusted. This is done by tightening or slackening the nuts **(A)** on the two spring jack studs and should only be done with the extension hose assembly attached.

Adjustment is correct when the Wanderhose boom tends to rise when released and only a small effort is required to lower it. When the Wanderhose without the extension assembly is stowed, this adjustment should give effective capacity in the stowage hook.



M02OG-100

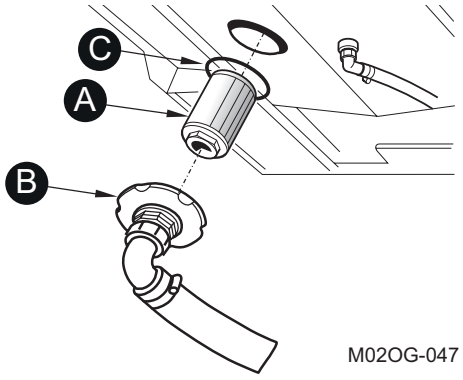
WATER SYSTEM

The Water System Is Protected By Both A Primary And Secondary Water Filter.

Primary Filter

The primary filter is located within the water tank attached to the underside of the body. Its purpose is to prevent foreign particles entering the water system which could cause malfunction of the water system. Access to filter **(A)** is gained by first draining the tank using the flushing valve located on the side of the body, raise the body and engage the safety prop. Unscrew the cap **(B)** to reveal the filter attached.

The filter can be cleaned in situ or, preferably, removed from the cover and washed under a tap from inside to out. The cover is sealed with a sealing washer **(C)** and it is wise when refitting the cover to clean both cover and the washer thoroughly and then smear with grease. The grease will help retain the sealing washer.



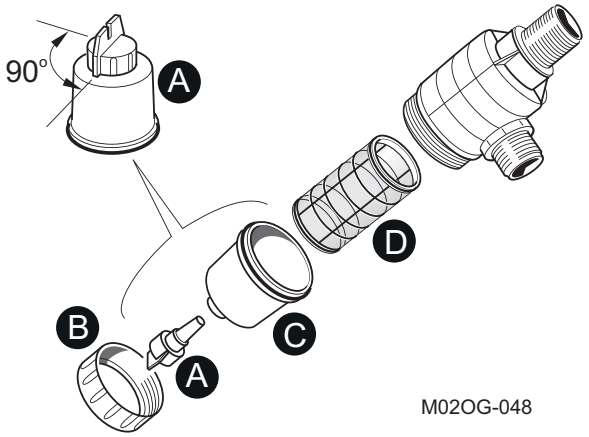
M02OG-047

Periodically, whilst cleaning the filter, it is advisable to flush out the tank. This is done by leaving off the cap, lowering the body and using a high pressure hose through the two port holes in the rear panel adjacent to the rear door. When replacing the port hole caps, again smear with grease and ensure the sealing washer is present. Refit the filter, cap, and close flushing valve(s).

Secondary Water Filter

1 Before dismantling the filter, activate the shut off valve actuator **(A)** located in the filter housing. It has a bayonet type mechanism. Press in and turn anticlockwise to activate the shut off valve.

2 To access filter element, unscrew the securing ring **(B)** around the outside of the filter housing **(C)** and remove. The filter element **(D)** can now be withdrawn.



M02OG-048

3 Clean the element by flushing with clean water or an air line from the inside out. Visually inspect the element for damage and replace if necessary.

4 When reassembling the filter, ensure that the filter element is correctly located in the filter housing before tightening the securing ring.

5 Refit the shut off valve actuator. Pushing in and turn clockwise to open the valve ready for use.

Filling

The water tank can be filled with a hose pipe via fillers located on either side of the body or, alternatively, hydrant connection is provided adjacent to the nozzle trunking. This facility is provided with a filter cartridge to prevent particles entering the tank. The filter is mounted vertically allowing particles to be back washed and fall out once the hydrant hose is released.

VT - Twin Engine only

POWAPACK

Fluid Levels

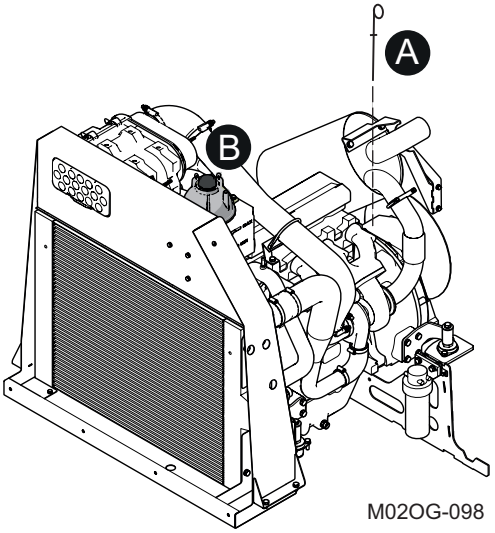
Safety Notice

- **Ensure the body prop is located and care is taken when using the walkways**

Engine Oil

Checking Oil Level - Check Daily

The engine oil level is electronically monitored, if low it is displayed via the icon on the Information Bar of the JVM. The oil level can be manually checked using the dipstick **(A)**. The recommended oil is shown in the lubrication chart at the end of this chapter.



M02OG-098

Checking Coolant Level - Check Daily

The coolant level **(B)** is electronically monitored, if low it is displayed via the icon on the Information Bar of the JVM. Ensure the engine is cool before topping up the level.

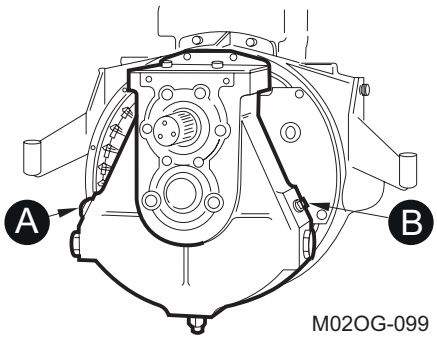
Cold Weather Precautions

The cooling system must be filled with equal quantities of antifreeze and water to maintain a minimum concentration of 50%, i.e. -39°C. Any top ups must therefore be done with a 50% mixture of antifreeze and water. The concentration level should be checked at the 500 hour service interval as failure to observe this can cause corrosion of the engine block.

'Z' Drive Gearbox

Checking Oil Level

The level plug **(B)** should be removed and filled to the bottom of the thread. The window **(A)** allows a quick reference and, if the oil level is not visible on the window, the level requires topping up.

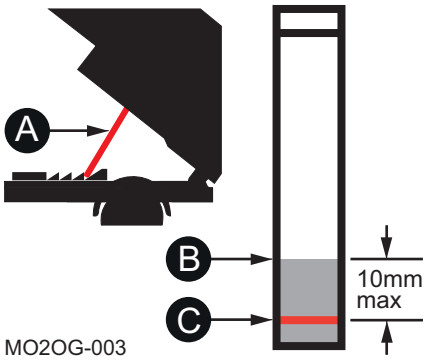


M02OG-099

Hydraulic Reservoir

Checking Oil Level

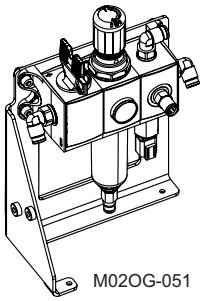
Raise the body and engage the body prop **(A)** in its highest position. The level **(B)** should be 10mm above the lower red line **(C)** on the gauge. It is important that the correct level is maintained as under filling can adversely affect the heat dissipation rate of the oil, whilst over filling can cause oil to overflow when the body is lowered. The recommended oil is shown in the lubrication chart at the end of this chapter.



MO2OG-003

Pneumatic Filter Regulator Unit

The filter regulator unit comprises a combined air filter and pressure regulator.
The air is isolated and drained by turning the red gate valve on the unit.
The air filter features an automatic drain.


M02OG-051

VT - Twin Engine only

Air Cleaner Restriction Indicator

A filter condition is electronically monitored and when restricted the icon is displayed on the JVM, giving a positive indication of when the air cleaner element needs replacing and so eliminates haphazard servicing. It should be attended to immediately.

Note:

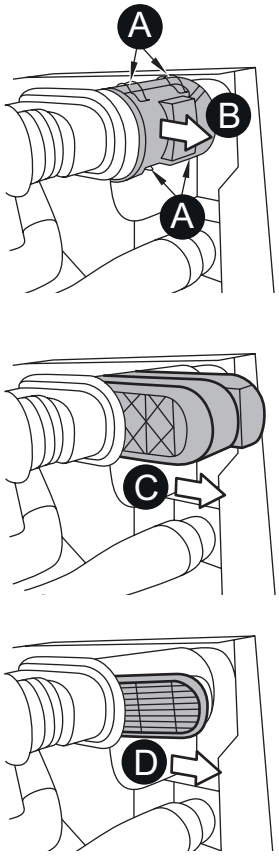
The indicator does not show the amount of dust present in the dust cap. When the air cleaner requires servicing the warning icon will be illuminated. After servicing the indicator will automatically reset.

Air Cleaner

The air cleaner elements must be replaced at the intervals given in the Maintenance Schedule or if the filter restriction indicator is showing red between these scheduled services.

To access the air cleaner elements, lift the retaining clips **(A)** and remove the lid **(B)**.
Remove the main filter element **(C)** by first pushing the filter down and tilting it towards the radiator and then lift it out. There is a small safety element **(D)** within the main filter body, this should be replaced every third time the main element is changed. Re-assemble the air cleaner ensuring all parts are correctly positioned and fitted.

Ensure that the elements, lid and clips are correctly fitted and that the air intake pipe and clips to the engine are in good condition and fully sealed.



M02OG-010

Cylinder Maintenance

Periodically inspect the cylinder rods for damage, blemishes or build up of material such as tar, cement, paint etc. Particular attention should be given to the wide sweep brush slew cylinder on dual sweep machines and the channel brush lift cylinder. The rods can be cleaned with fine wire wool and/or spirit to ensure long seal life. When cleaning the machine avoid playing the washdown hose over the body tip cylinder when in the fully raised condition.

Supawash Pump

The oil level in the Supawash pump should be checked weekly. There is a sight level glass and dipstick at the front end of the pump.

It is recommended that the oil is changed after the first 50 hours of operation and then changed at every C Service.

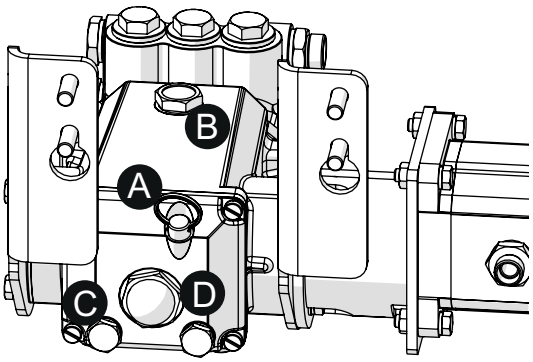
Checking Oil Level

The water pump is mounted adjacent to the central cross-member.

The pump oil level should be checked weekly using dipstick **(A)**.

A visual check may also be made through window **(D)**.

The oil is filled via port **(B)**. The oil colour should be clear, if it is frothy/milky then water has entered the oil and it should be changed immediately and the cause investigated. The recommended oil is shown in the lubrication chart at the end of this chapter.



MO2OG-011

Note:

(C) is the pump oil drain plug.

VS - Single Engine only

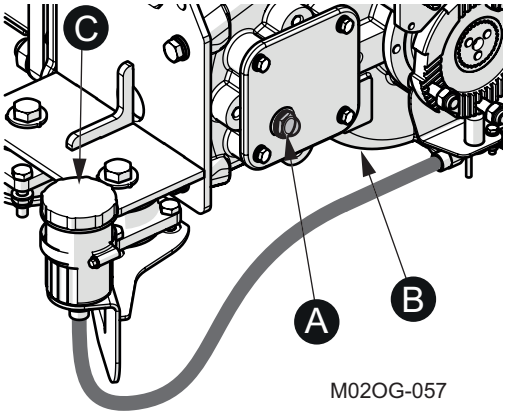
Hydrodrive Gearbox - Fluid Levels

Safety Notice

Ensure the chassis engine is turned off and isolated before carrying out this check

Checking Oil Level

Check weekly. The level can be checked with the body down. It can be viewed through the sight glass window **(A)** or the external reservoir **(C)**.
The external reservoir **(C)** is provided to enable ease of filling. the correct level is to the middle of the either the sight glass or the reservoir.



M02OG-057

Changing Oil

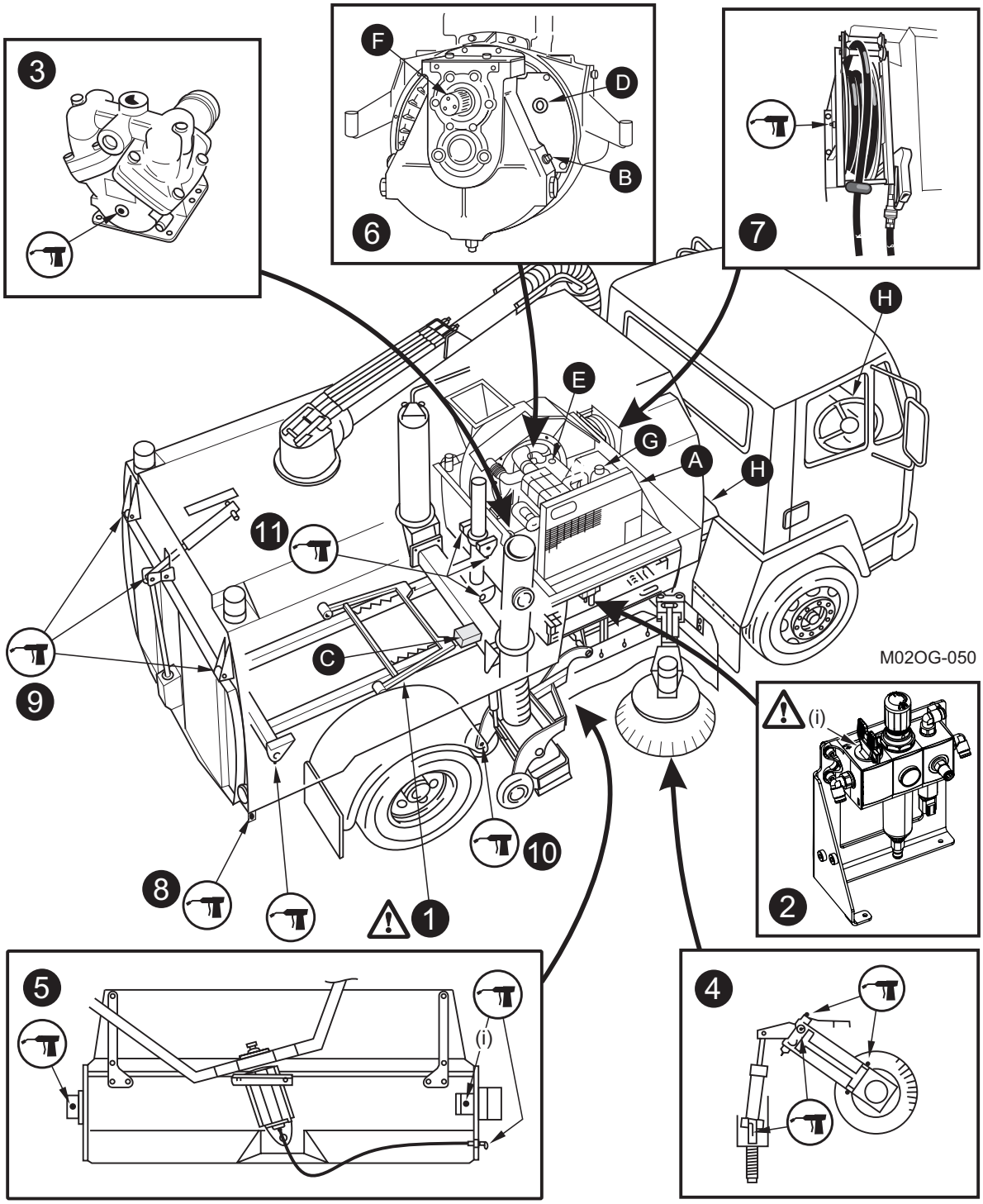
Change the oil after the first 50 hours operation, thereafter as indicated in the Maintenance Schedule. The recommended oil is shown in the lubrication chart at the end of this chapter.

The oil is best drained whilst warm via the drain plug **(B)**, located on the underside of the gearbox.

VT - Twin Engine

LUBRICATION DIAGRAM

Refer to Maintenance Schedules for lubrication intervals



1	Body Prop - **Ensure autoprop has engaged when body is raised.**	6	'Z' drive gearbox.
2	Vitaliser unit - (i) Isolation valve.	7	Supawash hose reel.
3	Water pump.	8	Wanderhose
4	Channel brush.	9	Rear door
5	Wide sweep brush - (i) Grease when renewing brush stock.	10	Nozzle wheel
		11	Body raise cylinder

RECOMMENDED LUBRICANTS

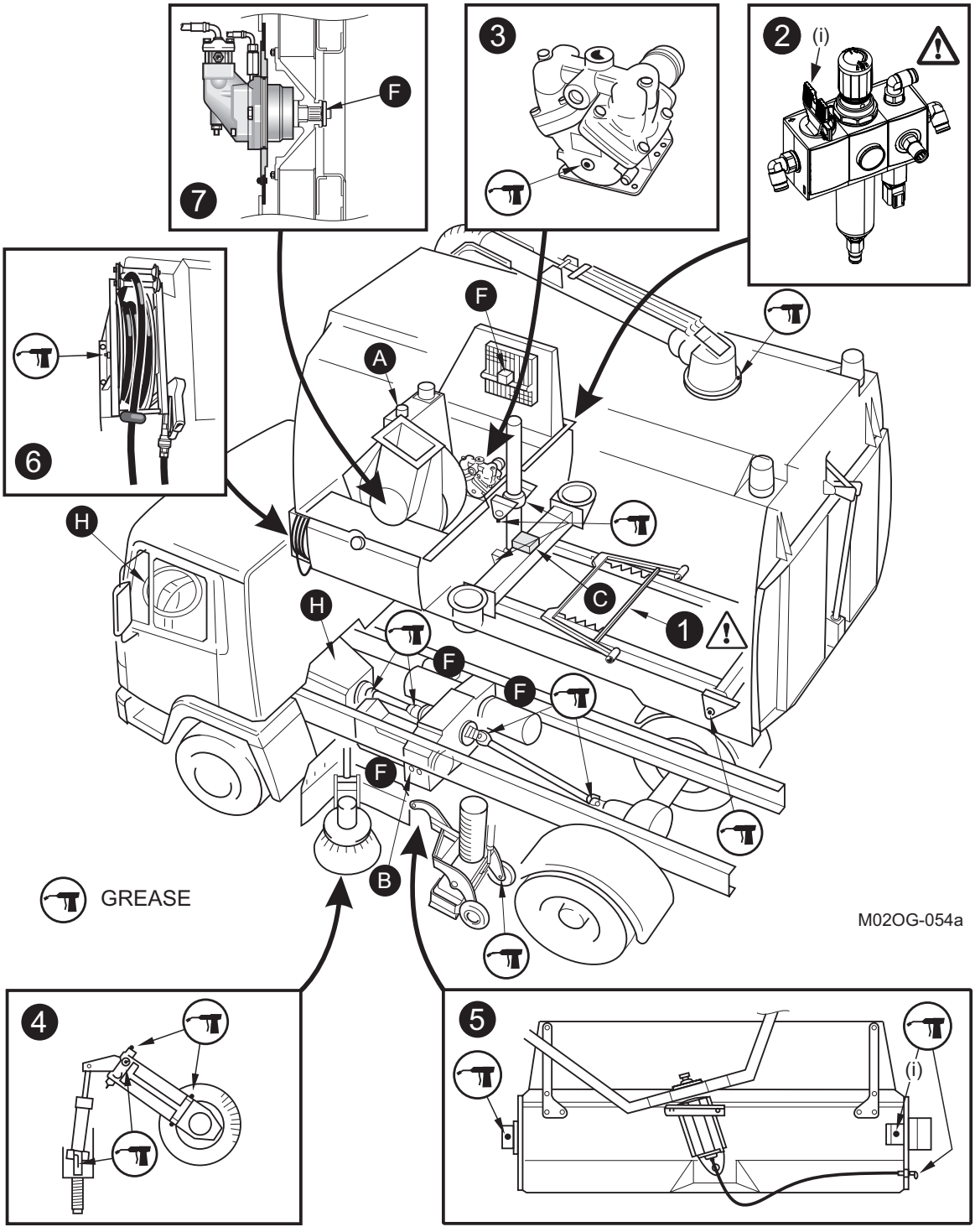
	Capacity	ISO Oil Grade	Johnston Part No.	Shell	BP	Castrol	Mobil	CHEVRON TEXACO
A Hydraulic System	75L	-	94-12	*Tellus S2V-46	Bartan HV46	Hyspin AWH-M46	DTE 15M	Rando HDZ 46
B Gearbox	1.75L	API GLA	94-67	Spirex S4 AT 75W-90	Energear SHX-M	Syntrans 75W/85	Mobilube 1 SCH 75W-90	Multigear S 75W-90
C Supawash Pump	0.37L	API GLA	94-67	Spirex S4 AT 75W-90	Energear SHX-M	Syntrans 75W/85	Mobilube 1 SCH 75W-90	Multigear S 75W-90
D Fluid Flywheel	4.85L	-	94-12	*Tellus S2V-46	Bartan HV46	Hyspin AWH-M46	DTE 15M	Rando HDZ 46
E Engine	14L	ACEA E3 - E5	94-23	Rimular Super 15W/40	Vanellus E6 15W/40	Tection 15W/40	Delvac Super 1400 15W/40	URSA Super TD 15W-90
F Drive Splines		-	94-24	**Kluberpaste (46 MR 401)**				
G Antifreeze	15L	-	39664	Shell Safe Premium	BP Isocool	Castrol AF	-	Havoline Anti-freeze
H Chassis PAS - Auto Gearbox	See Chassis Handbook	-	39661	Spirex S4 ATF HDX	Autran DXIII	Castrol Dexron II	AFT 220	Havoline Multi-Vehicle ATF
Grease Points		-	94-69	Gadus S2-V 200	Energrease L2	LM Grease	Mobilube MP	Multifak EP
Battery Terminals	-	-	94-69	**Petroleum Jelly**				

* In cold climates use Tellus S2V-32

VS - Single Engine

LUBRICATION DIAGRAM

Refer to Maintenance Schedules for lubrication intervals



1 Body Prop - **Ensure autoprop has engaged when body is raised.**
2 Vitaliser unit - (i) Isolation valve.
3 Water pump.
4 Channel brush.
5 Wide sweep brush - (i) Grease when renewing brush stock.
6 Supawash hose reel.

RECOMMENDED LUBRICANTS

	Capacity	ISO Oil Grade	Johnston Part No.	Shell	BP	Castrol	Mobil	CHEVRON TEXACO
A Hydraulic System	75L	-	94-12	*Tellus S2V-46	Bartan HV46	Hyspin AWH-M46	DTE 15M	Rando HDZ 46
B Gearbox	5L	API GLA	94-67	Spirex S4 AT 75W-90	Energear SHX-M	Syntrans 75W/85	Mobilube 1 SCH 75W-90	Multigear S 75W-90
C Supawash Pump	0.37L	API GLA	94-67	Spirex S4 AT 75W-90	Energear SHX-M	Syntrans 75W/85	Mobilube 1 SCH 75W-90	Multigear S 75W-90
D Not Applicable		-						
E Not Applicable								
F Drive Splines		-	94-24	**Kluberpaste (46 MR 401)**				
G Not Applicable		-					-	
H Chassis PAS - Auto Gearbox	See Chassis Handbook	-	39661	Spirex S4 ATF HDX	Autran DXIII	Castrol Dexron II	AFT 220	Havoline Multi-Vehicle ATF
Grease Points		-	94-69	Gadus S2-V 200	Energrease L2	LM Grease	Mobilube MP	Multifak EP
Battery Terminals	-	-	94-69	**Petroleum Jelly**				

* In cold climates use Tellus S2V-32

CHAPTER 7

Conformity Certificates

Table of Contents

EC DECLARATION OF CONFORMITY (CE)

Manufacturer's Name: Johnston Sweepers Limited

Manufacturer's Address: Curtis Road, Dorking, Surrey, England, RH4 1XF

declares that:

Product Name: Johnston Road Surface Cleaner

Product Type(s): VT501, VT651, VT801
VS501, VS651, VS801
VT551, RT655

Product Options: All

Product Serial Number:

conforms to the following standards:

E.C. Council Directive 2006/42/EC and amendments

BS EN 13019 : 2008. Machines for Road Surface Cleaning Safety Requirements

C.F. Offley
Engineering Director
Johnston Sweepers Ltd.
11/10/2012

Truck Mounted Issue : 16

EC DECLARATION OF CONFORMITY (NOISE EMISSION IN THE ENVIRONMENT BY EQUIPMENT FOR USE OUTDOORS: DIRECTIVE 2000/14/EC)

Manufacturer's Name:	Johnston Sweepers Limited
Manufacturer's Address:	Curtis Road, Dorking, Surrey, RH4 1XF, England.
Technical Documentation maintained by:	Research and Development Department, Johnston Sweepers Limited, Curtis Road, Dorking, Surrey, RH4 1XF, England.

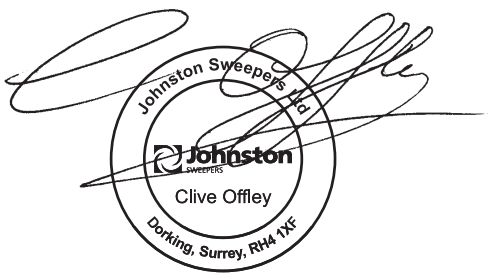
Johnston Sweepers Ltd. hereby declares that the following equipment conforms to the requirements of EC Directive 2000/14/EC:

Description of Equipment:	EC Directive 2000/14/EC, Annex 1, Item 46: Power sweeper
Product Name and Description:	Johnston VT501, VT651 and VT801 chassis-mounted powered sweeper, with JCB 55KW - Stage 4/Tier 4 Final
Maximum Measured Sound Power Level (L_{WA}):	109dB(A)
Guaranteed Maximum Sound Power Level (L_{WA}):	**110dB(A)**
Conformity Assessment Procedure:	Internal control of production (Ref: Annex V - 2000/14/EC)
Other EC Directives applied to this equipment:	98/37/EC and amendments
Place and Date of this Declaration:	Johnston Sweepers Limited, Curtis Road, Dorking, Surrey, RH4 1XF, England.

October 2012

Signed by:

C.F. Offley
Engineering Director
Johnston Sweepers Ltd



Issue 02 : 11/10/2012

EC DECLARATION OF CONFORMITY (NOISE EMISSION IN THE ENVIRONMENT BY EQUIPMENT FOR USE OUTDOORS: DIRECTIVE 2000/14/EC)

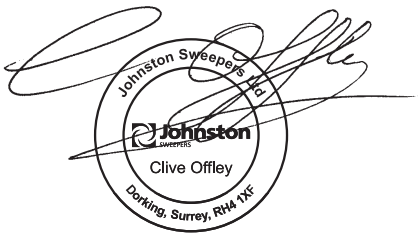
Manufacturer's Name:	Johnston Sweepers Limited
Manufacturer's Address:	Curtis Road, Dorking, Surrey, RH4 1XF, England.
Technical Documentation maintained by:	Research and Development Department, Johnston Sweepers Limited, Curtis Road, Dorking, Surrey, RH4 1XF, England.

Johnston Sweepers Ltd. hereby declares that the following equipment conforms to the requirements of EC Directive 2000/14/EC:

Description of Equipment:	EC Directive 2000/14/EC, Annex 1, Item 46: Power sweeper
Product Name and Description:	Johnston VT501, VT651 and VT801 chassis-mounted powered sweeper, with JD 86KW - Stage 3a/Tier 3 JCB 85KW - Stage 3a/Tier 3 JCB 93KW - Stage 3b/Tier 4 Interim
Maximum Measured Sound Power Level (L_{WA}):	111dB(A)
Guaranteed Maximum Sound Power Level (L_{WA}):	**112dB(A)**
Conformity Assessment Procedure:	Internal control of production (Ref: Annex V - 2000/14/EC)
Other EC Directives applied to this equipment:	98/37/EC and amendments
Place and Date of this Declaration:	Johnston Sweepers Limited, Curtis Road, Dorking, Surrey, RH4 1XF, England.

October 2012

Signed by:
C.F. Offley
Engineering Director
Johnston Sweepers Ltd



Issue 02 : 11/10/2012

NOISE AND VIBRATION

Safety Notice

- **Ear defenders are recommended when working around the machine**

Noise Levels

All noise levels are given at maximum engine operating speeds, but in normal operation are likely to be lower than the figures quoted.

In-cab noise levels with the windows closed 68 dB(A) nominal, dependent upon chassis.

External noise levels at one metre distance of the side of the machine, i.e. Wanderhose operation, are 93 dB(A).

Noise levels at 3 metres in front of the machine (manual pavement sweeping into the gutter) are 83 dB(A).

For maximum sound power level see Noise Declaration Certificate.

Vibration

Vibration levels in accordance with 2002/42/EC as amended.

Hand-Arm

The vector sum weighted root mean square acceleration values ($a_{h.w}$) during recommended sweeping/ washing activities do not exceed 2.5 m/s^2.

Whole Body

The dominant axis weighted root mean square acceleration values (a_w) during recommended sweeping/ washing activities do not exceed 0.5 m/s^2.
Conditions of test - body empty and water tanks full on public thoroughfare.

The Control of Vibration at Work Regulations 2005 Directive 2002/44/EEC.
In accordance with the above Regulation the operators of the machine over a typical duty cycle will be subjected to an 8 hour energy equivalent acceleration A(8) below the Exposure Action Level (EAV) for both Hand-arm and Whole Body Vibration.

These Limits are:

Hand-arm: EAV 2.5m/s^2
Whole body: EAV 0.5m/s^2