Operator's Guide

VT500 • VT605
VT650 • VT800

Twin Engined
Suction Sweepers
From Manufacture
Sequence No. 07/2057

Stage 3a / Tier 3 Engines
Part No 01260-4 (GB)

Revision Level 09

E.C.M. Issue - 709037
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Foreword

The Johnston VT500, VT605, VT650 and VT800 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.

Explanation of terms: Tickover = Low engine idle

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:

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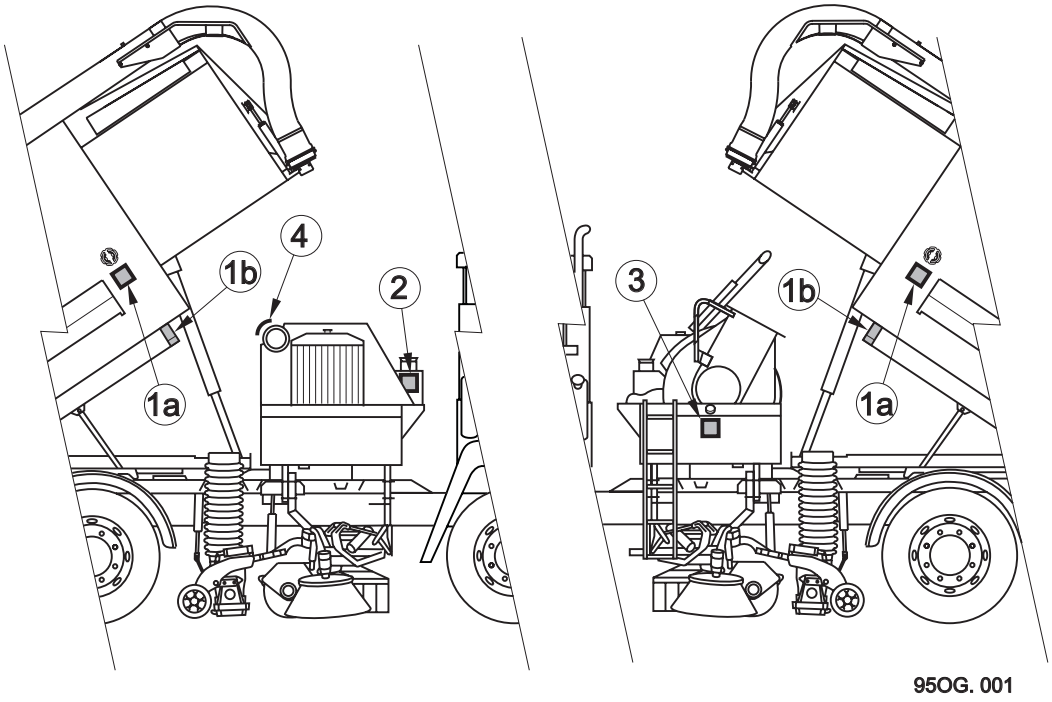
OG6:3	01		OG6:4	09	C
OG6:5	09	C	OG6:6	01	
OG6:7	01		OG6:8	01	
OG6:9	06		OG6:10	01	
OG6:11	01		OG6:12	01	
OG6:13	01		OG6:14	01	
OG6:15	03		OG6:16	06	
OG6:17	02		OG6:18	01	
OG6:19	09	C	OG6:20	01	

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.



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

2. Hydraulic oil tank filler

3. Fuel tank (diesel) filler

4. 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

Safety Symbol Descriptions

Safety alert symbol

Read Operator's Guide

Ensure body prop is engaged in rack before working under raised body

Body prop NOT engaged in rack

Body prop correctly engaged in rack

Keep clear of brushes

Do not open suction fan safety flap while fan is running

Never reach in or drop tools into the fan case

Release radiator cap carefully when hot to avoid scalding

Stay at least 1 metre distance from the machine

Wear ear defenders when working in this area

Sharp objects warning - there can be a risk of injury from sharp objects such as discarded hypodermic needles becoming lodged in the sweeping system. The use of 'needle stick gloves' is recommended when changing brushes, using the wanderhose/Littasnatch and when cleaning out the machine

CHAPTER 1

General Arrangements and CE Certificate

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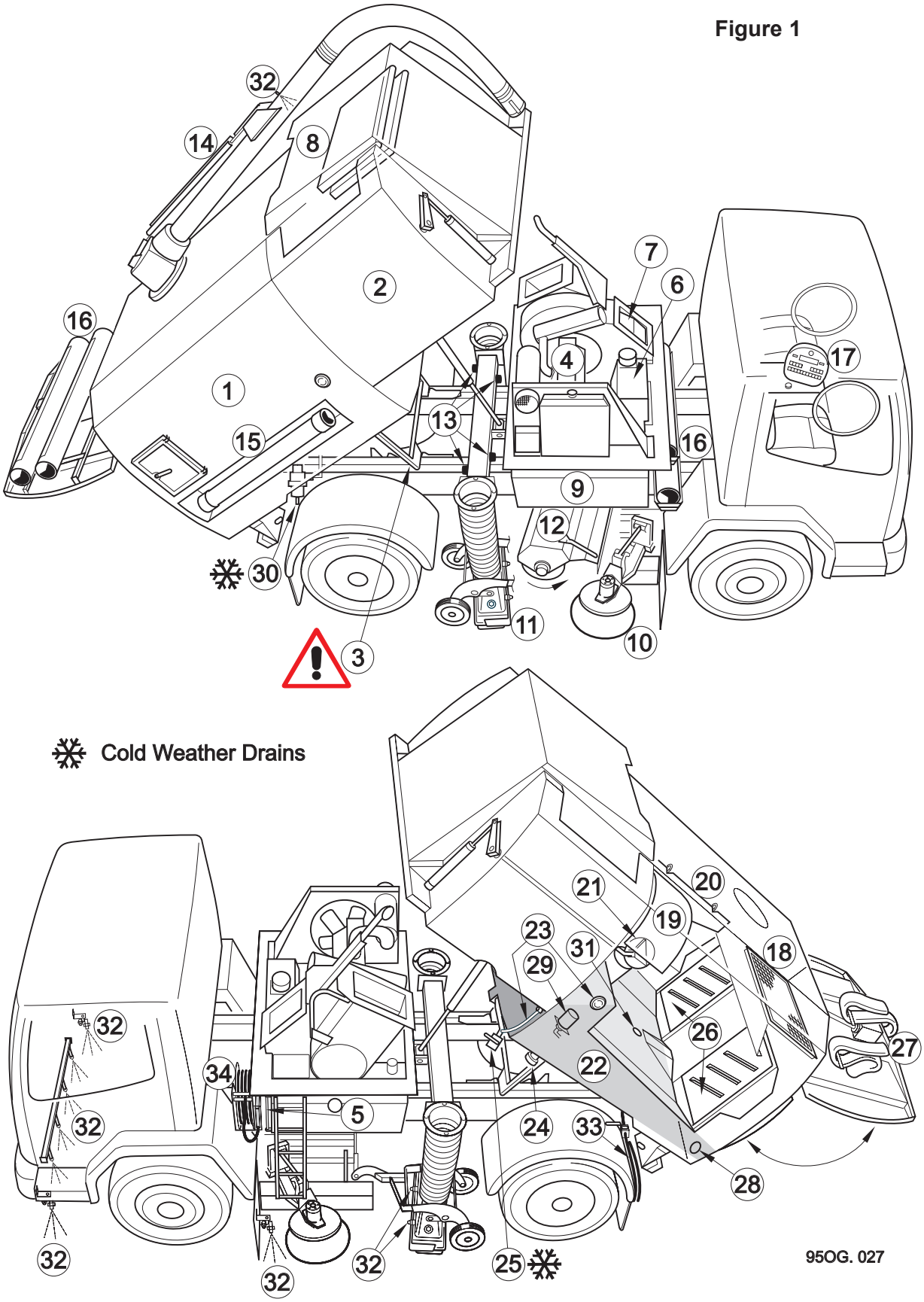
GENERAL ARRANGEMENT

Figure 1



Item	Component	See Chapter
1	Hopper/load compartment	-
2	Auxiliary engine cowl	-
3	Body (hopper and cowl) prop	3
4	Auxiliary engine	6
5	Fuel tank and contents gauge	-
6	Hydraulic oil reservoir	6
7	Suction fan case safety flap	6
8	Suction fan silencer wafers	-
9	Systems locker for hydraulic, pneumatic and water control valves	-
10	Channel brush	6
11	Suction nozzle	6
12	Wide sweep brush	6
13	Wide sweep brush balance regulators	6
14	Wanderhose - optional	4
15	Wanderhose extension tubes VT605 and VT650	-
16	Wanderhose extension tubes VT500 and VT800	-
17	Master switch panel	2
18	Filter screens	6
19	Wearing plate(s)	-
20	Hopper centre baffle - duals only	-
21	Intake flaps - duals only	-
22	Water tank - 1000 litres VT500	-
	1300 litres VT605 and VT650	-
	1850 litres VT800	-
23	Water tank filler and contents gauge	6
24	Water tank hydrant filler and filter - nearside	6
25	Water tank drain/flushing valve	6
26	Rear door screens	-
27	Rear door drainage hoses	3
28	Water tank drain ports	6
29	Water pump primary suction filter	6
30	Water pump secondary suction filter	6
31	Extended water tank plug	4
32	Water spray jets	-
33	Washdown hose and control valve	2
34	Supawash hose reel and hand lance - optional	4

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): VT500, VT550, VT605, VT650, VT800
VS500, VS550, VS605, VS650, VS800
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. Offley
Engineering Director
Johnston Sweepers Ltd.
11/12/09

Truck Mounted Issue : 15

Pt. No. 01500-1(GB)

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 VT500, VT605, VT650 and VT800 chassis-mounted powered sweeper, with Iveco 66kW and John Deere 63kW Stage 3a/ Tier 3 engines.
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.

January 2010

Signed by:

C.F. Offley
Engineering Director
Johnston Sweepers Ltd

Issue 02 : 01/2010

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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 VT500, VT605, VT650 and VT800 chassis-mounted powered sweeper, with Iveco 104kW and John Deere 86kW Stage 3a/Tier 3 engines.
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.

January 2010

Signed by:

C.F. Offley
Engineering Director
Johnston Sweepers Ltd

Issue 02 : 01/2010

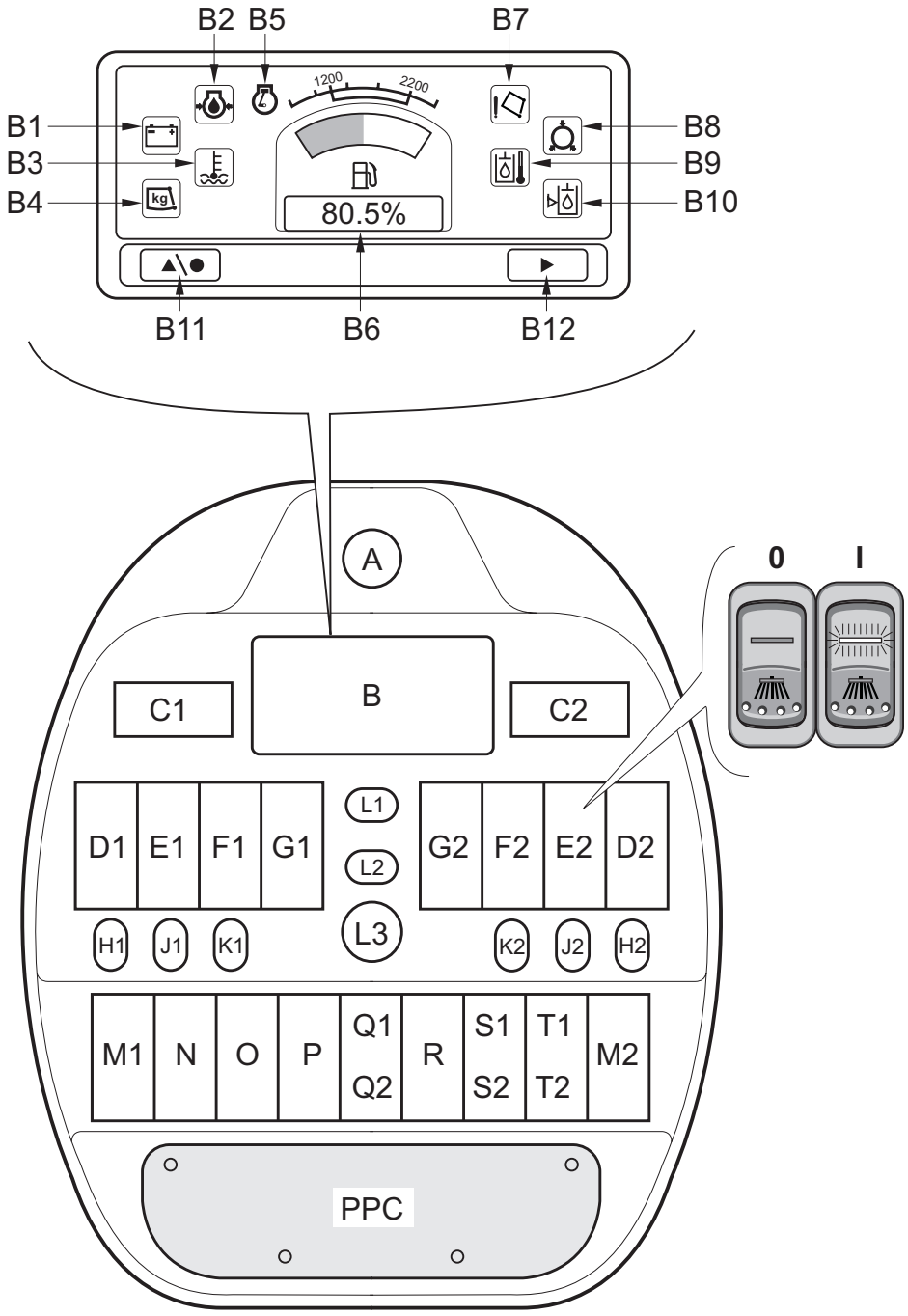
CHAPTER 2

Controls

Table of Contents

Sweeping Controls

Switch Panel



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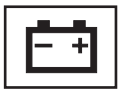
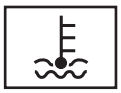
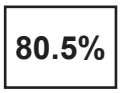
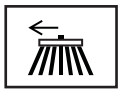
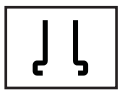
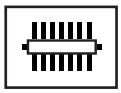
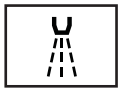
Sweeping Controls

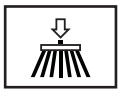
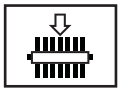
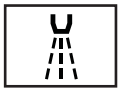
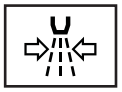
Symbol	Switch	Description
	A	Maxigap - 3 position lever switch; up - not used, centre - normal position, down - open nozzle.
	B1	'Low battery voltage' amber warning lamp.
	B2	Engine 'no oil pressure' red warning lamp (not John Deere electronic).
	B3	Engine coolant 'overheat' red warning lamp (not John Deere electronic).
	B4	Vehicle 'overload' amber warning lamp.
	B5	Engine rpm.
	B6	Fuel gauge % full, engine hour counter, clock. **NB** - On John Deere electronic engine hour counter is on gauge Z.
	B7	Body raise indicator/rear door locks open - red + buzzer.
	B8	'Low air pressure' - amber warning lamp and buzzer.
	B9*	Hydraulic oil 'overheat' - red warning lamp.
	B10	Hydraulic oil 'low level' - amber warning lamp with buzzer.
	B11	Push button to select hourmeter reading/clock - cancels after 10 seconds.
	B12	Advance button - advances clock time when in clock setting mode.

Sweeping Controls

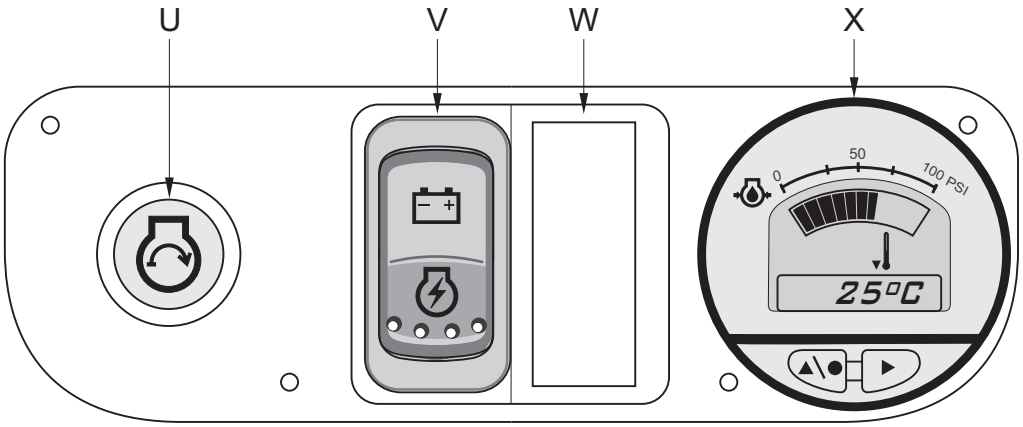
Symbol	Switch	Description
	C1 *	LH Variabrush - spring centred switch moves brush out or in.
	C2 *	RH Variabrush - spring centred switch moves brush out or in.
	D1 *	LH Rototilt - spring centred switch; alters angle of channel brush to suit road camber.
	D2 *	RH Rototilt - spring centred switch; alters angle of channel brush to suit road camber.
	E1/E2	LH/RH channel brush and water sprays; 3 position switch - stowed/active/ water sprays. Illuminated when selected.
	F1/F2	LH/RH nozzle and water sprays; 3 position switch - stowed/active/water sprays. Illuminated when selected.
	G1/G2	LH/RH wide sweep brush and water sprays; 3 position switch - stowed/ active/water sprays.
	H1/H2	LH/RH work lamp; 2 position switch OFF/ON. Illuminated when selected.
	J1/J2	LH/RH gutter spray bars; 2 position switch OFF/ON. Illuminated when selected.
	K1/K2 *	LH/RH inlet flaps; 2 position switch. Opens inlet duct into body when selected.

***** Option

Sweeping Controls

Symbol	Switch	Description
	L1 *	Powasave/Powathrust; 2 position switch - operates only with channel brush. Reduces brush pressure to preset level when off. Increases brush pressure to preset level when illuminated.
	L2 *	Powascrub; 2 position - operates only with wide sweep brush. Reduces brush pressure to preset level when off. Increases brush pressure to preset level when illuminated.
	L3	Programme button; 2 position switch. Illuminates green when pressed and suspends all sweeping and parks brushes. Pressing again will reactivate sweeping functions.
	M1/M2 *	LH/RH water recirculation; 2 position switch - OFF/ON. Illuminated when selected.
	N *	Additional work lamp option. Illuminated when selected.
	O *	Additional WSB water; 2 position - OFF/ON. Illuminated when selected.
	P	*Blank*
	PPC	Powapak controls - see next page.
	Q1	Water tank low level warning - illuminated when tank empty.
	Q2	Engine throttle control; 3 position spring centred switch - REDUCE/OFF/ INCREASE. - **NB** On John Deere electronic engines this switch is an engine resume switch. TICKOVER/OFF/RESUME.
	R	Beacons; 2 position switch - OFF/ON. Illuminated when selected.
	S *	Supawash; 2 position switch - OFF/ON. Illuminated when selected.
	T *	Additional warning lights; 2 position switch - OFF/ON. Illuminated when selected.

PPC - John Deere Engine - Standard Power



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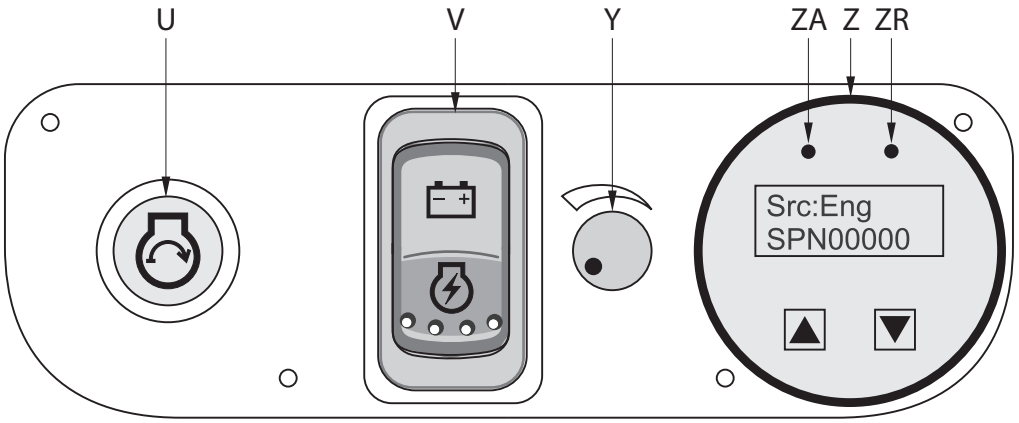
Symbol	Switch	Description
	U	Engine crank button - push to crank.
	U	Illuminates when engine preheater is active.
	V	Alternator charge lamp.
	V	Ignition switch + heat start; 3 position - OFF/ON/PUSH FOR HEATER. **NB :** Only beacons will operate when switch is off.
	W	Not used.
	X *	Temperature and oil pressure gauge for auxiliary engine.

***** Option

PPC - John Deere Engine - High Power Electronic



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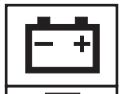
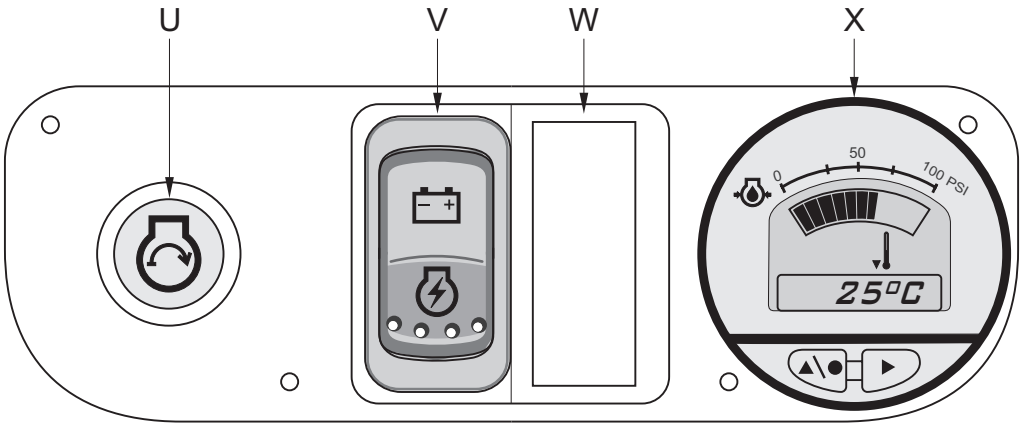
Symbol	Switch	Description
	U	Engine crank button - push to crank.
	U	Illuminates when preheating is active.
	V	Alternator charge lamp.
	V	Ignition switch + 2 position - OFF/ON. **NB :** Only beacons will operate when switch is off.
	Y	Rotary Speed Control - Turn clockwise to increase speed and anti-clockwise to decrease it.
	Z	Engine Diagnostics - Up down arrows cycle through engine data.
	ZA	Amber warning light indicates a minor fault - fault displayed in window.
	ZR	Red warning light indicates a serious fault that may shut down the engine - fault displayed in window.

NB : The water temperature and oil pressure warning lights B2 and B3 do not operate with this engine.

PPC - Iveco Standard Power Engine

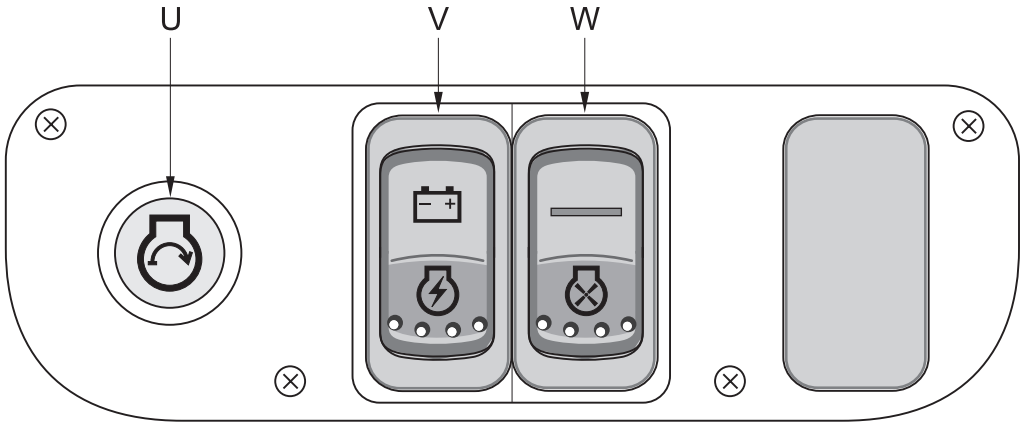


95OG. 005-14a

Symbol	Switch	Description
	U	Engine crank button - push to crank
	V	Alternator charge lamp.
	V	Ignition switch:3 position - OFF/ON/OVERRIDE FOR STARTING. **NB:** Only beacons will operate when switch is off.
	W	Not used.
	X*	Temperature and oil pressure gauge for axuiliary engine.

* Option

PPC - Iveco High Power (104 kW) Stage 3a Turbocharged Engine



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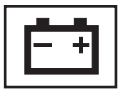
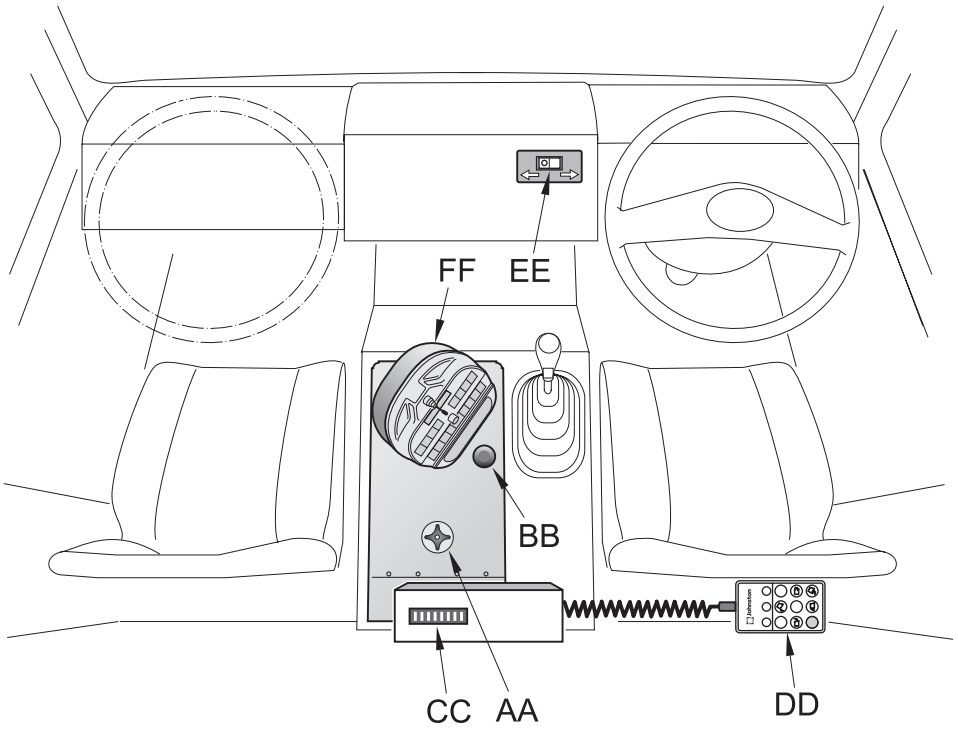
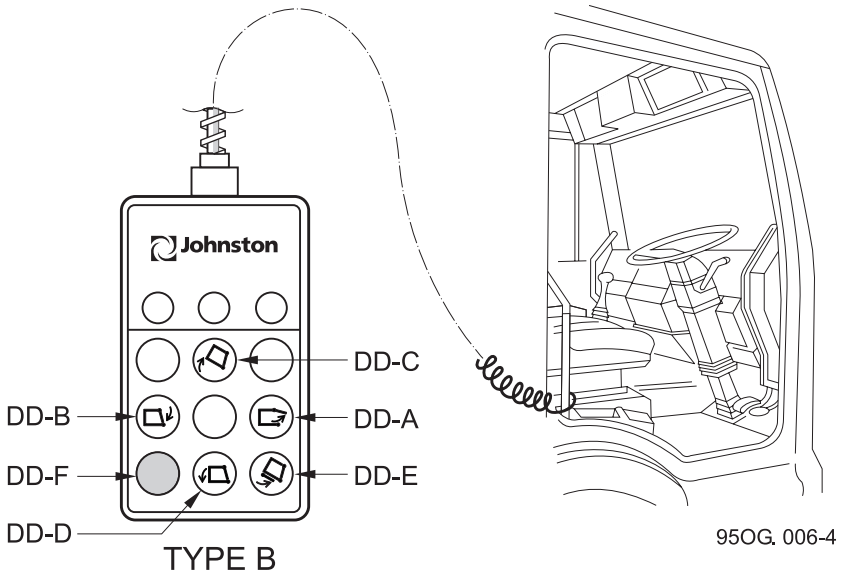
Symbol	Switch	Description
	U	Engine crank button - push to crank. Flashes to indicate engine fault requests.
	V	Alternator charge lamp.
	V	Ignition switch - 2 position - OFF/ON. **NB :** Only beacons will operate when switch is off.
	W	Engine resume - takes engine to minimum operating speed 1200 rpm; 3 position spring centred - TICKOVER/OFF/RESUME. Illuminated when selected.

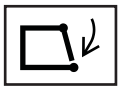
Cab Mounted Controls



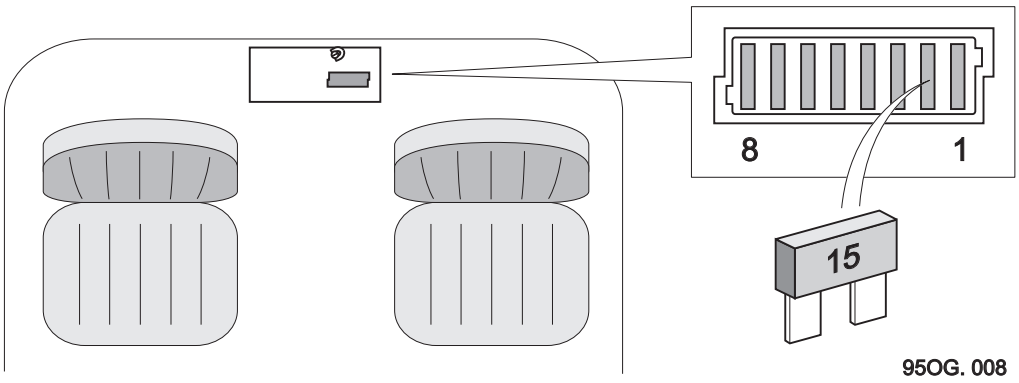
Symbol	Switch	Description
	AA	Channel brush speed control; clockwise rotation increases brush speed.
	BB	Pressure control for Powasave; clockwise rotation reduces brush pressure.
	CC	Fuse box mounted on relay box. Fuse functions - see page OG2:12.
	DD	Load discharge pendant unit mounted by driver's seat.
	EE	Power steering changeover control. (Dual steer vehicles only).
	FF	Switch panel - see front of this Chapter.

Load Discharge Controls
(Located behind the driver's seat)



Emblem	Position	Function
	DD-A	Opens rear door
	DD-B	Closes rear door
	DD-C	Raises body
	DD-D	Lowers body
	DD-E	Stows body prop when body is raised and not resting on it. Button operates with auto body prop release option.
	DD-F	Green safety switch must be pressed to enable the use of any other pendant functions.

Fuse Functions



Fuse No.	Function	Amps	Colour
1	Beacons Rear	15	Blue
2	Beacons Front	15	Blue
3	Work Lamps	15	Blue
4	Channel Brush Nozzle Flaps	15	Blue
	*Rototilt Option	20*	Yellow
5	Wide Sweep Brush Programme Button Front Brush	15	Blue
6	Powapak Work Lamp	15	Blue
7	Body Discharge + Warning Lights	15	Blue
8	Powapak	15	Blue

External Controls

Description

* Washdown hose water control valve - OFF/ON. Turn through 90° - See Chapter 1 Fig. 1, Item 33

* Option Equipment

CHAPTER 3

Operation

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NOISE AND VIBRATION

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.

Ear defenders are recommended when working around the machine

Vibration

All dynamic prime mover components are resiliently mounted to minimise vibrations. 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

Towing the Vehicle

Refer to the chassis handbook.

Please note 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.

ENGINE STARTING AND OPERATION PROCEDURES - JOHN DEERE

Before driving the sweeper, it is advisable to have the chassis engine running as it is necessary to ensure there is adequate air pressure to raise the sweep gear from the ground.

Ensure sweepgear switches are turned off.

NB : The chassis ignition switch must be turned on to energise the switch panel. Never engage engine cranking for longer than 60 seconds as this can damage the starter motor.

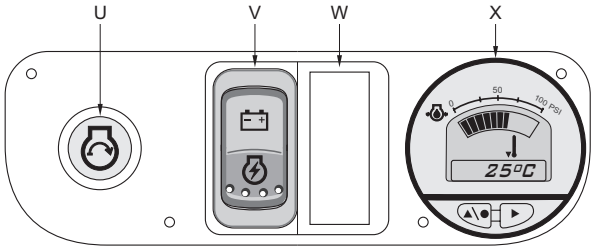
John Deere Engine - Standard Power

Starting the engine in warm conditions

Press the ignition switch (V) to its mid position. It will illuminate

Press crank button (U) until engine fires, then release switch (U).

If the oil pressure light fails to extinguish on starting, the engine will shut down to show a fault.



95OG. 005-14a

Starting the engine in cold conditions below +5°C

Press the ignition switch (V) to its mid position. It will illuminate.

Press and hold switch (V) in position 3 for 10 seconds and the light on (U) button will illuminate to show engine preheater is active.

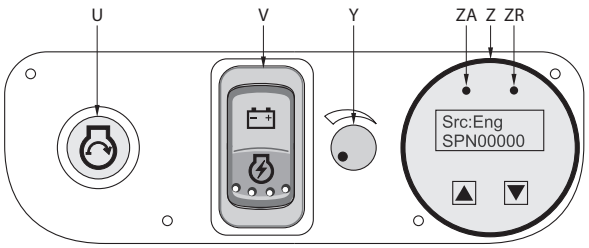
Whilst holding switch (V), press crank button (U) until engine fires, then release switch (U), then (V).

John Deere Engine - High Power Electronic

Starting Hot or Cold

Press the ignition switch (V) to its on position, it will illuminate.

(U) will illuminate to show engine preheating is active. When light goes out press crank button (U) release when engine fires.



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ENGINE STARTING AND OPERATION PROCEDURES - IVECO

Before driving the sweeper, it is advisable to have the chassis engine running as it is necessary to ensure there is adequate air pressure to raise the sweep gear from the ground.

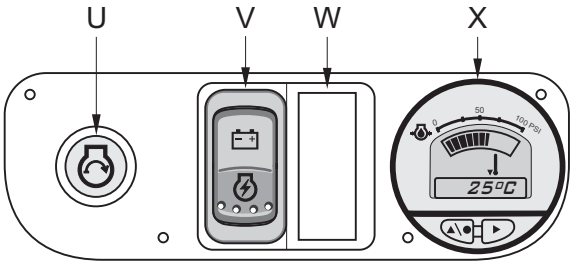
Ensure sweepgear switches are turned off.

NB : The chassis ignition switch must be turned on to energise the switch panel. Never engage engine cranking for longer than 60 seconds as this can damage the starter motor.

Iveco Standard Power Engine

Starting the engine hot or cold

Press the ignition switch (V) to its mid position. It will illuminate. Press crank button (U) until engine fires and then release. If the engine stops turn off the ignition switch (V) and repeat. If the engine stops again there is a fault on the fuel or shut down system.



95OG. 005-14b

NB: The engine must be started within 5 seconds of energising the ignition switch (V) or you will have to turn off ignition as the interlock prevents the engine from cranking.

If the oil pressure or light fails to extinguish on starting, the engine will shut down to show a fault.

Engine Operation Warning System

The engine will automatically be shut down in the event of loss of lubrication oil pressure or coolant overheat. Illumination of the relative warning lamps occurs if these conditions prevail. Testing the oil lamp occurs automatically when the ignition switch is initially turned ON. The water temperature warning light will only illuminate when cooling water reaches 110°C.

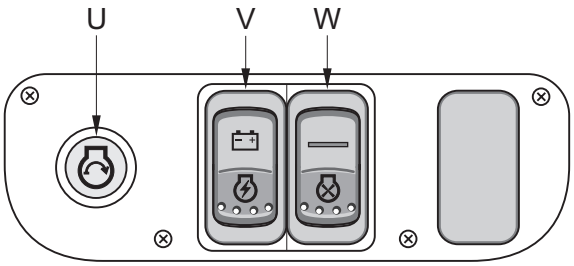
Iveco High Power (104 kW) Stage 3a Engine

Starting the engine hot or cold

Press the ignition switch (V) to its on position. It will illuminate.

Press engine crank button (U), the engine will crank - release button when engine fires.

If a fault is detected, the light on the crank button will illuminate or flash, the engine may or may not start. Contact your service representative for fault diagnostics.



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NB: The engine must be started within 5 seconds of energising the ignition switch (V) or you will have to turn off ignition as the interlock prevents the engine from cranking.

Engine Operation Warning System

The engine will shut down in the event of loss of oil pressure. The engine will derate to 70% of maximum power should the coolant temperature exceed 103°C, at 110°C the engine will shut down.

Engine Speed Regulation

The throttle speed switch (Q2) is spring centred operating an electronic variable speed engine control. The engine speed can be adjusted between 1200 and 2000 rev/min to suit the sweeping conditions.

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.

Setting Clock

The clock (12 hour) can be set with the ignition OFF - clock time should be displayed. Press B11 and hold. Clock time will flash. Release B11 and hour mode will flash. Adjust hours by pressing B12.

Press B11 again and minutes wil flash; set by pressing B12.

When time is correct, press B11 to revert to clock display.

NB: Clock setting display cancels after 30 seconds.

To Commence Sweeping

1. Start vehicle engine.

2. Start auxiliary engine.

3. Ensure programme button (L3) is not illuminated.

4. Increase engine speed (Q2) up to 1500 rev/min. On Iveco High Power (104 kW) Stage 3a press the engine resume switch (W), on John Deere electronic pressing (Q2) resumes engine speed to that set on rotary speed control (Y).

5. Open the required intake flap (K1 or K2) dual (option).

6. Lower channel brush, wide sweep and nozzle by operating switches E1, F1, G1 or E2, F2, G2, as required; ensure the water sprays are selected when it is not raining.

7. Commence sweeping truck in first or second gear to give a road speed between 2-8 mph (2 to 12 km/h) depending upon the amount of material being swept. Always use the slowest brush speed consistent with satisfactory cleaning, and engine speed to give satisfactory suction. Normal engine operating speeds between 1200 - 2000 rev/min.

8. By moving the Maxigap switch down, the nozzle tilts to allow larger debris to enter. Moving the control up returns the nozzle to its preset position.

The machine is designed for operating between -15°C and 46°C.
When operating below 5°C, refer to information later in this chapter.

To Terminate Sweeping

1. Turn off the wide sweep brush, channel brush and nozzle sweep switches.

2. Return the engine throttle switch (Q2) to idle, or on Iveco Euro 3 disengage the engine resume switch (W); illumination goes out. Let the engine idle for two minutes to allow the engine to cool down.

3. Close inlet flap (dual machines + option).

4. Turn off ignition switch to stop engine.

NB : If you are interrupting the sweeping (tea break), press the programme button. The switch will illuminate and suspend the sweeping modes selected.

Switching off the auxiliary engine without first raising the sweep gear will cause the channel brush to remain in its working position. Driving the sweeper with the brush(es) in this position could lead to irreparable damage. When stopping the auxiliary engine, the throttle automatically returns to tickover.

Water Drainage

If the sweepings are waterlogged, excess water can be drained off using the drainage hoses (Item 27, Fig. 1) 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). (Note: Do not tip the body when full with the rear door closed as the vehicle stability could be effected.)

8.  Inspect the nozzle trunking and inlet tube. Using a suitable size broom handle or rod clear any debris. When the ducts are clear, restart engine(s), lower the body and return the machine to service.

N.B. Adequate use of the water jets, especially on the nozzle, lubricates the hoses and ducts and helps reduce blockages.

LOAD DISCHARGE AND AUTO BODY PROP

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

- **A safety interlock prevents the body from being tipped without the handbrake being applied.**
- **Before carrying out the following load discharge operations, 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 dump area when opening or closing the rear door.**
- **Always 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 grade greater than 5% as stability could be affected.**

Before the rear door can be opened, or the body raised:

1. Apply vehicle handbrake.

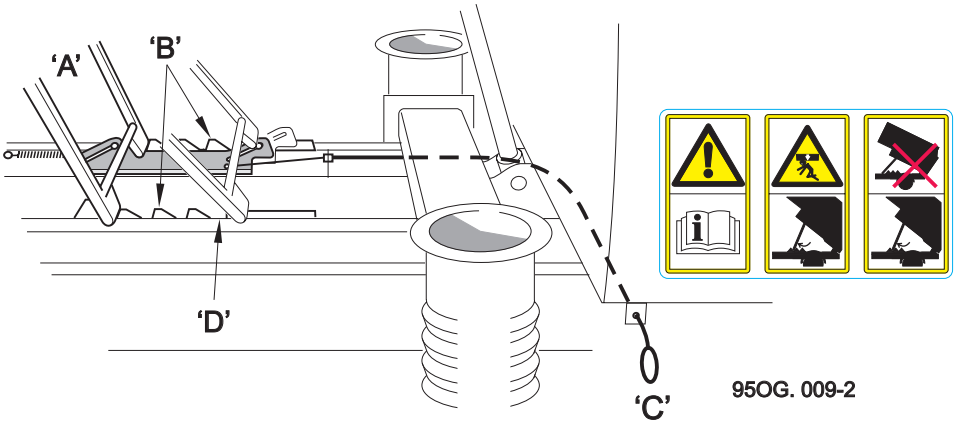
2. Ensure the auxiliary engine is running and the pendant unit is connected.

3. Ensure freedom of hazards and no-one is adjacent to the rear of the sweeper before using any of the discharge controls. The pendant has sufficient wandering cable to allow sight to rear of the sweeper whilst standing to one side.

4. Operate switch (P) if fitted and pick up the pendant control. This has a green safety switch which must be pressed with the following function in order to run.

To Tip the Load

Open the rear door by pressing DD-A and F.
Raise the body by pressing switch DD-C and F, this will cause the body prop (A) (painted red) to index into the locking rack (B) ensuring a number of possible safety locking elevations for the body.



After the load discharge, and whilst the body is raised, wash out the intake flaps (Item 21, Fig.1), the filter screens (Item 18, Fig.1) and the rear door screens (Item 26, Fig.1) with the washdown hose or Supawash hand lance (whichever is fitted) to remove any 'caked' material.

A warning light (B7) on the switch panel illuminates and a bleeper will sound when the body is raised, not fully lowered or the rear door is not closed correctly.

To Lower the Body

First press DD-C and F to raise the body so that the body prop can clear the locking rack (B).

- On machines without 'autoprop release', pull the cable (C) to raise the manual release which should hold up, press buttons DD-D and F to lower the body. When the prop has passed the last locking rack tooth (D), the release cam will delatch and drop before the body is fully lowered.

- On machines with autoprop release press button DD-D, E and F simultaneously to lower the body.

Press button DD-B and F to close the rear door.

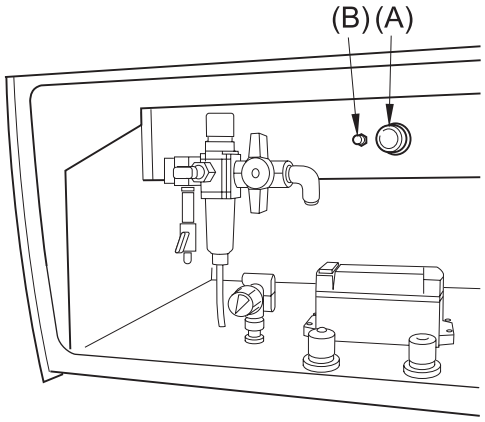
After the door has closed continue holding the buttons for 5 seconds to ensure the locks are fully engaged.

DO NOT attempt to tip the body when 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.

Emergency Discharge

In the event of an auxiliary engine malfunction, emergency tipping can be achieved as follows.

With the chassis ignition on, engage switch (V) and switch (P) if fitted, open the systems locker (Item 9, Figure 1) and press the green button (A) to run the emergency pump. At the same time operate the pendant unit for tipping function.
NB : This unit is only designed for intermittent operation, with the chassis batteries well charged, or the chassis engine running.



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A = Emergency Pump
B = Thermal Trip (see Chapter 9)

End of Day Cleaning

Sharp objects

After load discharge, wash out the interior of the body with the washdown hose (Item 33, Fig. 1) or Supawash hand lance (Item 34, Fig.1), whichever is fitted, especially around the intake flaps (Item 21, Fig.1) and filter screens, (Item 18, Fig.1) and (Item 26, Fig.1). Remove 'caked' material - also see Recirculation Option.

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

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 1600 engine rpm 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 engine rpm.

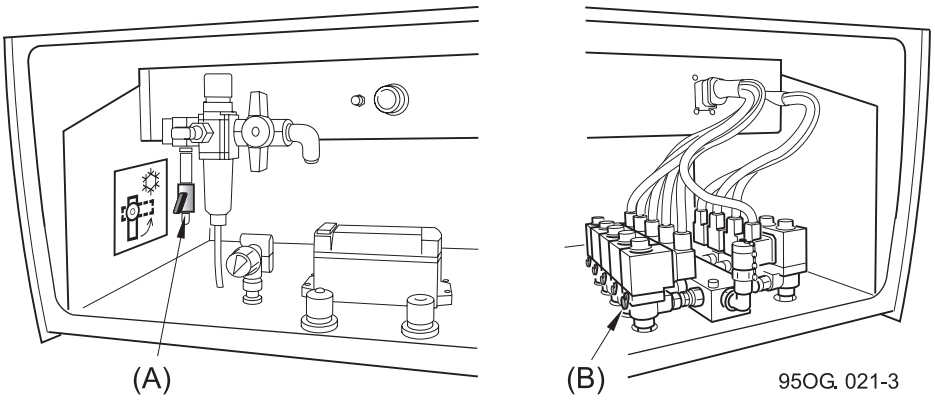
Please note that some dust may be emitted from the fan outlet, and premature wear may be experienced on some components.

COLD WEATHER PRECAUTIONS

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. Open the drain taps ❄ Item 25, Fig. 1. When the water draining from the taps stops:

1. Start truck engine and auxiliary engine. Operate the low pressure and Supawash water pump (if fitted) with the manual overrides (B) open and the Supawash spraybars on.

   DO NOT RAISE THE BODY. The Supawash pump will stop when the water low level light illuminates.



2. Open the Pressadrain tap (A) to provide air to purge the water from each jet.

3. Open the washdown hose and purge the water from the hose and close (machines without Supawash only).

4. Open the wanderhose/Littasnatch water injection valves, if fitted, and close when the water has been purged.

5. Operate the Supawash hand lance until air is emitted from the jet.

6. 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.

7. Remove the red drain plug from the filter ❄ Item 30 Fig. 1.

NB: Remember to refit the red drain plug in the filter and turn off all the manual overrides and Supawash taps on the next shift.

CHAPTER 4

Optional Equipment

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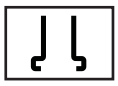
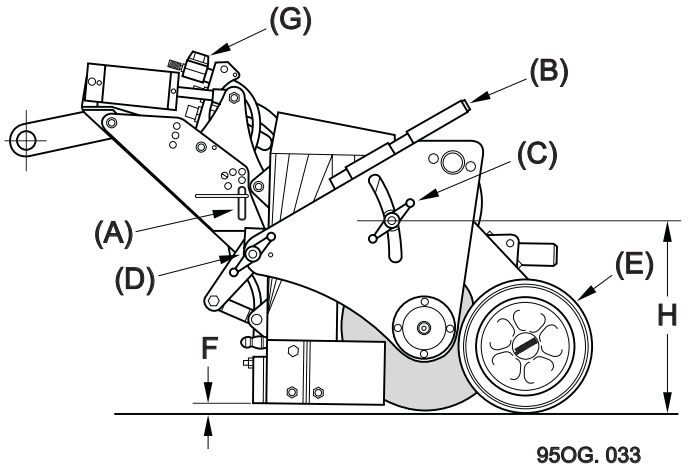
COMBIVAC NOZZLE OPTION

The nozzle contains a rotating brush and may allow higher sweeping speeds in certain working conditions. The maxigap nozzle adjustment is still provided by means of the Maxigap control (A).



Combivac nozzle control and water spray - 3 position switch. Stow/lowers nozzle and rotates brush/rotates brush injects water; lamp indicates when active.

The water to the nozzle 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).



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 alter 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

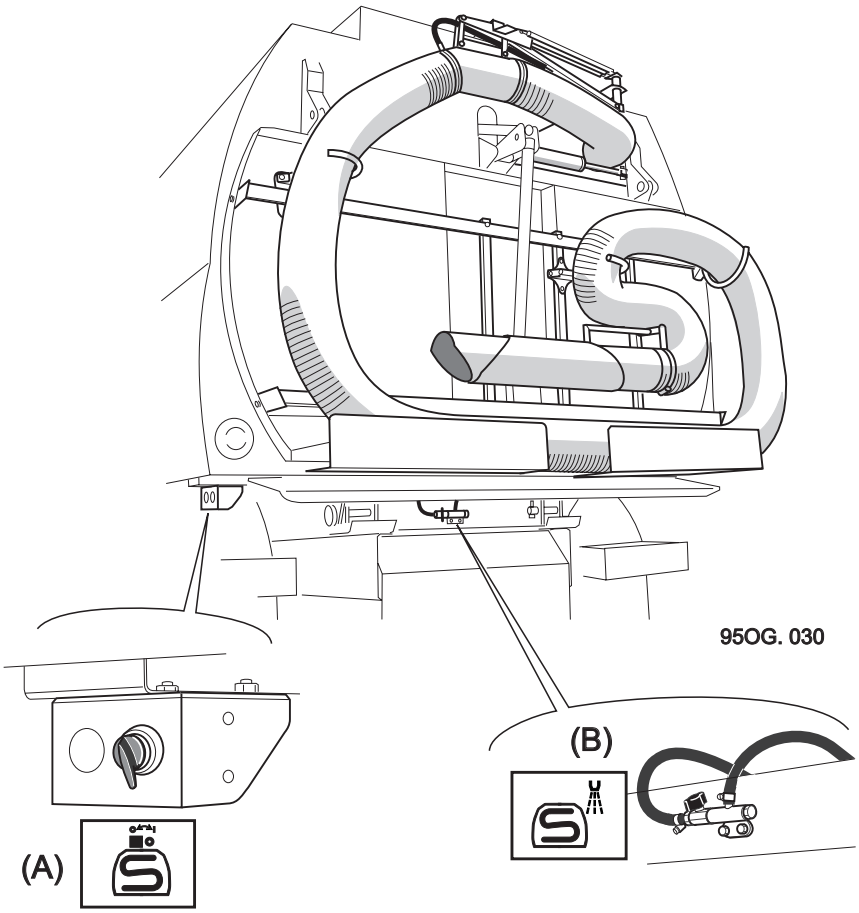
i) Lower nozzle to ground. Remove the outer brush carrier plate by removing the two M10 setscrews from the cross tube and the two hand nuts.

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.

LITTASNATCH - OPTION



PREPARATION

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

OPERATION

Remove the hose from the storage on the rear door and open the valve (A) located on the rear of the body.

Note : Keep hold of the Littasnatch hose when opening the valve to prevent it snaking around as air passes through it.

Water injection is controlled by a valve (B) mounted under the rear door.

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.

On completion of work, close the valves (A) and (B) and re-stow the hose.

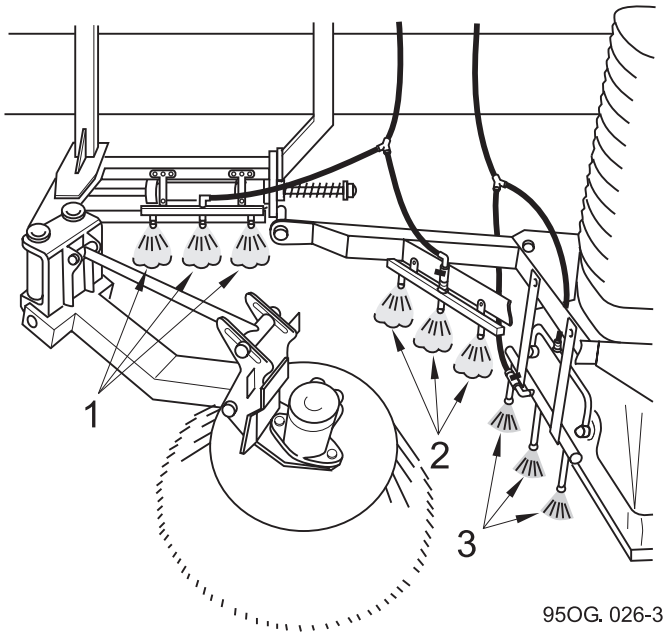
Sharp objects

MICROTRAP OPTION

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 (F1/F2 third position) on the control box and the channel brush switch (E1/E2).

The standard channel brush water sprays are wired into the gutter spray switch (J1/J2).

Do not use this option at temperatures below 5°C



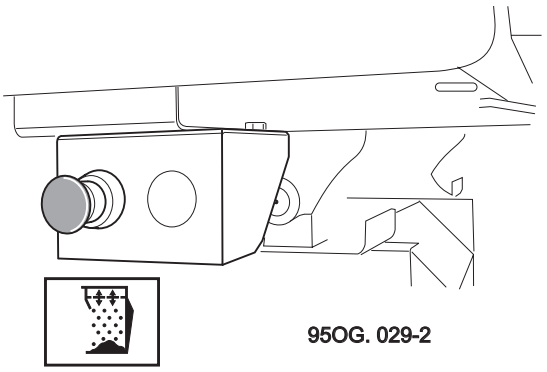
Check daily that all additional micro water jets are functioning/not blocked.

Taps are provided on spraybars 2 and 3 so that the operator has some adjustment if required.

REAR MESH SHAKER OPTION

A push button 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.



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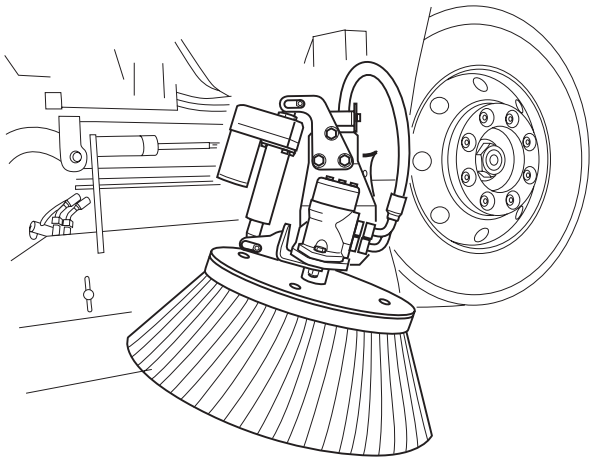
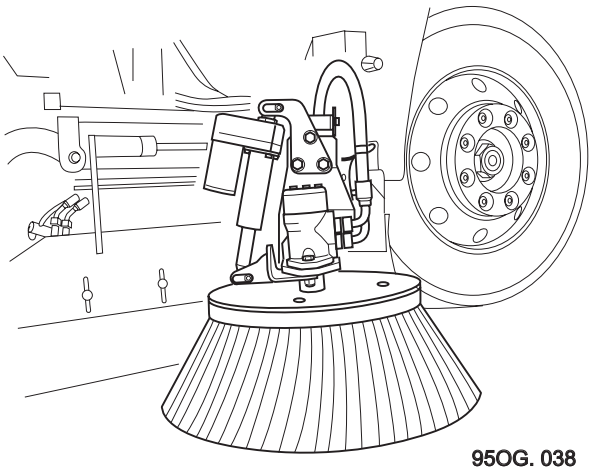
ROTOTILT OPTION

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

Symbol	Description
	Spring Centred Switch D1 or D2. Whilst the channel brush is operating, pressing the switch one way will increase the angle of the brush with the road; pressing the switch the other way will reduce the angle of the brush with the road. **NB** : Will only function when channel brush is operating.



MAXIMUM ANGLE



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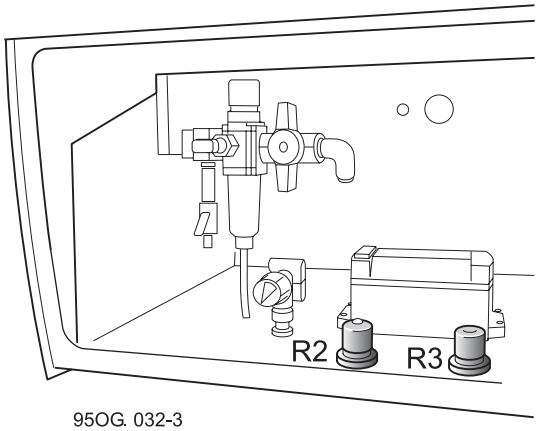
MINIMUM ANGLE

NB: When stowing the channel brush, ensure the brush is not left in an attitude where the brush stock sticks out beyond the vehicle width.

POWASAVE / POWATHRUST OPTION



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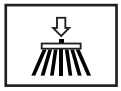
R2 = Powascrub (Fixed)

R3 = Powathrust (Fixed)

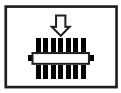


The channel brush Powasave feature (switch L1 in OFF position) provides a means to reduce the dead weight of the brush assembly on the road. With the pressure regulator control (Item BB) rotated fully anticlockwise, the brush exerts its full dead weight pressure; turning it clockwise decreases the ground pressure.

The Powathrust feature allows the operator to increase the scouring action of the channel brush beyond its dead weight by activating switch (L1).

These two regulators will allow one to change between light and heavy sweeping at the flick of a switch. Powathrust will increase brush wear, so use thoughtfully.

POWASCRUB OPTION



When the switch (L2) is off, the required brush pressure and balance can be set by the regulators (Item 13, Fig. 1, also see Chapter 4). When switch (L2) is operated (illuminated for Powascrub) the scouring action of the wide sweep brush is increased on the road for removing heavy deposits. At the flick of a switch one is able to change between light and heavy sweeping. Use of Powascrub will increase brush wear, so use thoughtfully.

SUPAWASH - OPTION

The operator should be familiar with the following safety precautions before using the equipment.

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 mounted on a chassis with a 15 metre hose wound onto a recoiling reel, and a front spraybar. Optional nozzle mounted spraybars. The spraybars can be used during sweeping operations to jet wash the road prior to, or after, sweeping.

The hand lance can be used to clean down the vehicle at the end of a shift or day's work.

OPERATION

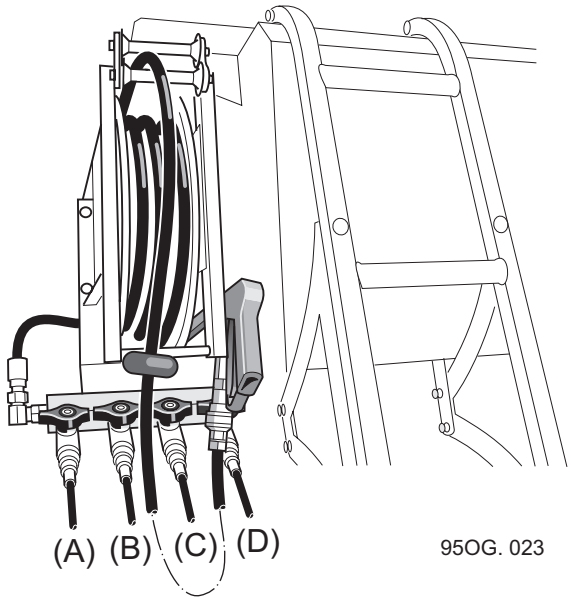
The auxiliary engine must be running and the throttle adjusted by switch (Q).

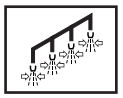
Press switch (S) on the switch panel to activate the water pump.

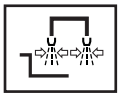
HAND LANCE - Remove the lance (Item 34, Fig. 1) from its holster adjacent to the hose reel. Two jets are provided at the nozzle; a fan spray and a pencil jet. To change between jets the trigger should be released and the gun rotated through 180°, this will automatically select the alternative jet.

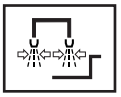
SPRAYBARS - The front and nozzle bars are activated by an isolating valve located on the near side behind the cab. The valves should be closed when the hand lance is to be used.

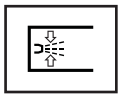
NB : The Supawash pump will not operate if the water tank is nearly empty.




(A) = Front Spraybar


(B) = LH Nozzle Spraybar


(C) = RH Nozzle Spraybar


(D) = Recirculating Duct Cleaning

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 (Item 31, Fig.1) in the body of the floor.

The body can be filled with water using the offside hydrant filler, to the level of the water tank overflow, giving a total water capacity of 3000 litres (1200 in tank, plus 1750 in body).

Note : The plug must be replaced before sweeping or dirt will enter the water tanks and cause damage/blockages to the water pumps. A screw on filter to fit in the access port is available as an option.

HAND LANCE DETERGENT INJECTION

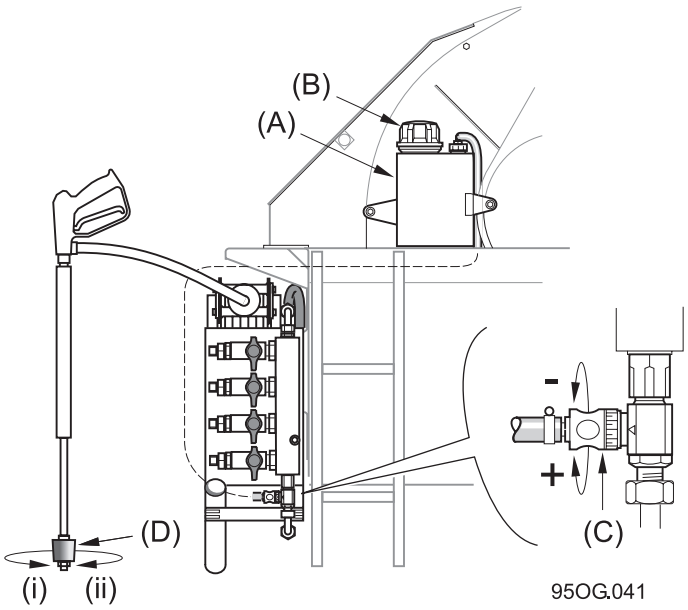
This option is only available with Supawash.

(A) = 6 litre detergent can

(B) = Filler port

(C) = Detergent mix control

(D) = Hand lance control



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.

VARAGAP NOZZLE OPTION

Switch	Description
A	The control is replaced by a 3 position spring centred lever. 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.

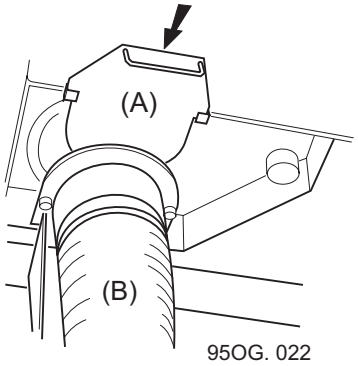
VARIABRUSH OPTION

Symbol	Description
	This allows the lateral position of the channel brush to be altered whilst sweeping. Operating the spring centred switch C1 or C2 moves the channel brush towards the sweeper from its outward position, or to move the brush back out.

WANDERHOSE OPTION

PREPARATION

Before using the wanderhose it is necessary to blank off the nozzle ducting to prevent air passing into the body via the nozzle(s). On a dual sweep machine this is easily effected by operating the intake flaps (K1 and K2), 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:

Sharp objects

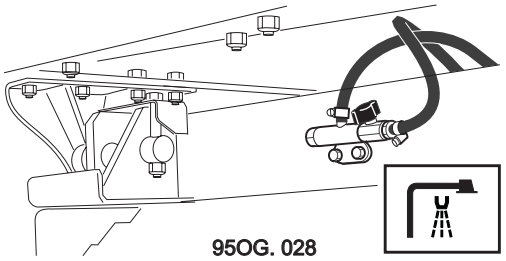
1. Unclip the wanderhose end from bracket at front of body.
   Note : If the boom is released from the stowage hook before the extension hose is fitted and rises out of reach, it can be retrieved with the grab provided.

2. Clip on extension hose (Item 15 or 16, Fig. 1).

3. Start auxiliary engine and set throttle to the desired suction.

4. Lower boom and release from stowage hook.

5. Turn on wanderhose water injection (using tap under rear door).



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. (On VT605 the wanderhose can only be used on the nearside of the machine). With a second operator, the hose can be used whilst the vehicle is moving slowly along. The hose operator should position himself 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.

It is recommended that ear defenders are used when working alongside the machine with the wanderhose.

WANDERHOSE - POWABOOM OPTION

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

4. Apply the vehicle handbrake and engage the load discharge switch P if fitted.

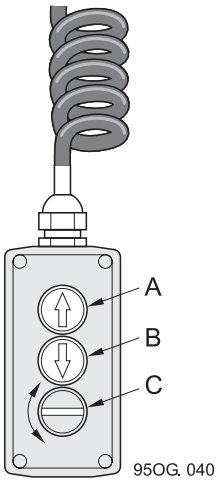
5. Press button A to raise the unit from its stowage position and rotate to the working position.

   Press button B to lower as required.

   Switch C controls the suction as follows;

   Turn clockwise to increase engine speed, counter clockwise reduces speed.

   John Deere electronic. Turn clockwise will increase engine speed from preset value on the engine speed control in the cab to maximum speed, releasing it will return speed to the preset value.

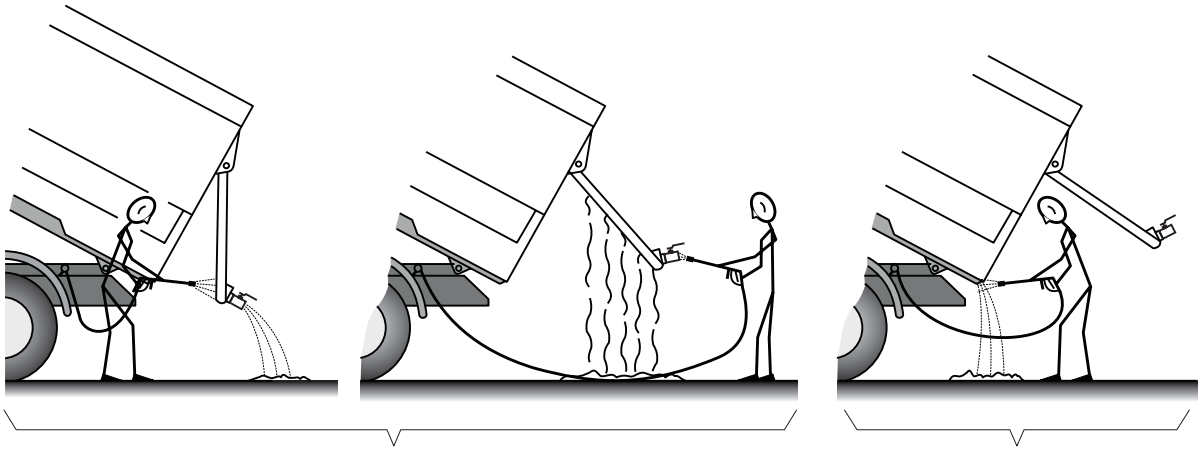


WATER RECIRCULATION OPTION

By operating switch M1 or M2 this will allow water in the body to be recirculated back to the nozzle whilst sweeping and allow for longer on station working. In dry conditions the body should be filled with water via the offside hydrant filler with about 750 litres, i.e. up to the level of the the tap on the rear door.

Do not use this option at temperatures below 5°C

Note : After load discharge, and with the de-watering valve on the bottom of the rear door open, thoroughly clean the door meshes and drain duct under the body floor whilst having the nozzles down and switches M1 and M2 activated. This will allow the ductwork to be flushed out.
Failure to carry out this procedure could lead to blockages in the water ducts.



95OG. 031

ON STATION RECIRCULATION FLUSHING

A tap is provided on the near side of the machine (see Supawash Option) to allow water from the Supawash pump (providing the other taps are off) to:

a) Backflush the transfer duct if the recirculation switches M1 and M2 are off and the Supawash is activated (switch S1). 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.

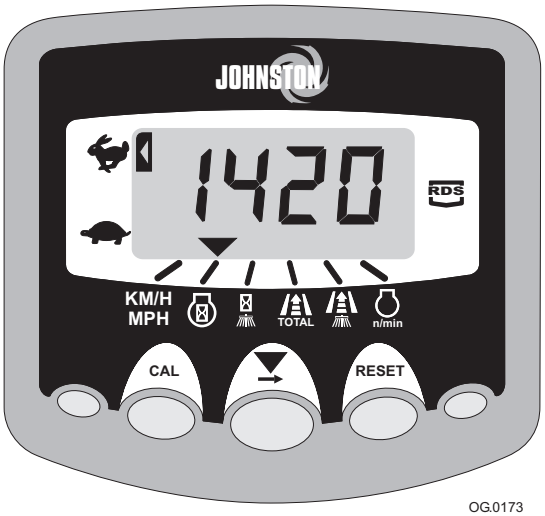
b) If switches M1 or M2 are on, the pipework from the transfer duct to the nozzle can be flushed out one at a time.

Do not use the recirculation system (if fitted) at temperatures below 5°C as the water could freeze in the inlet duct.

WIZARD SWEEP MONITOR

The Wizard provides the vehicle operator and service personnel with the following information

Channel		Output	Factory Set Metric Units	Imperial
KM/H MPH	1.	Road Speed	Kmh/h	Mph
	2.	Total Engine Hours	Hours	Hours
	3.	Hours Run in Work mode	Hours	Hours
TOTAL	4.	Total Distance Travelled	Km	Miles
	5.	Total Distance Travelled in Work mode	Km	Miles
n/min	6.	Engine Rotational Speed	r/m	rpm



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Scroll Button; press button to alter the display output. The unit will automatically reset.

FUNCTION DISPLAYED

Will be shown above the relevant symbol being displayed. When in Transit Mode the Wizard displays the vehicle speed.

When in Work mode, the Wizard displays engine rpm.

At any point the engine hours, distance travelled can be read. If the vehicle is stationary the ignition must be on to recall the information.

Indicates Transit Mode Indicates Work Mode

CHAPTER 6

Routine Maintenance

Table of Contents

Safety Precautions

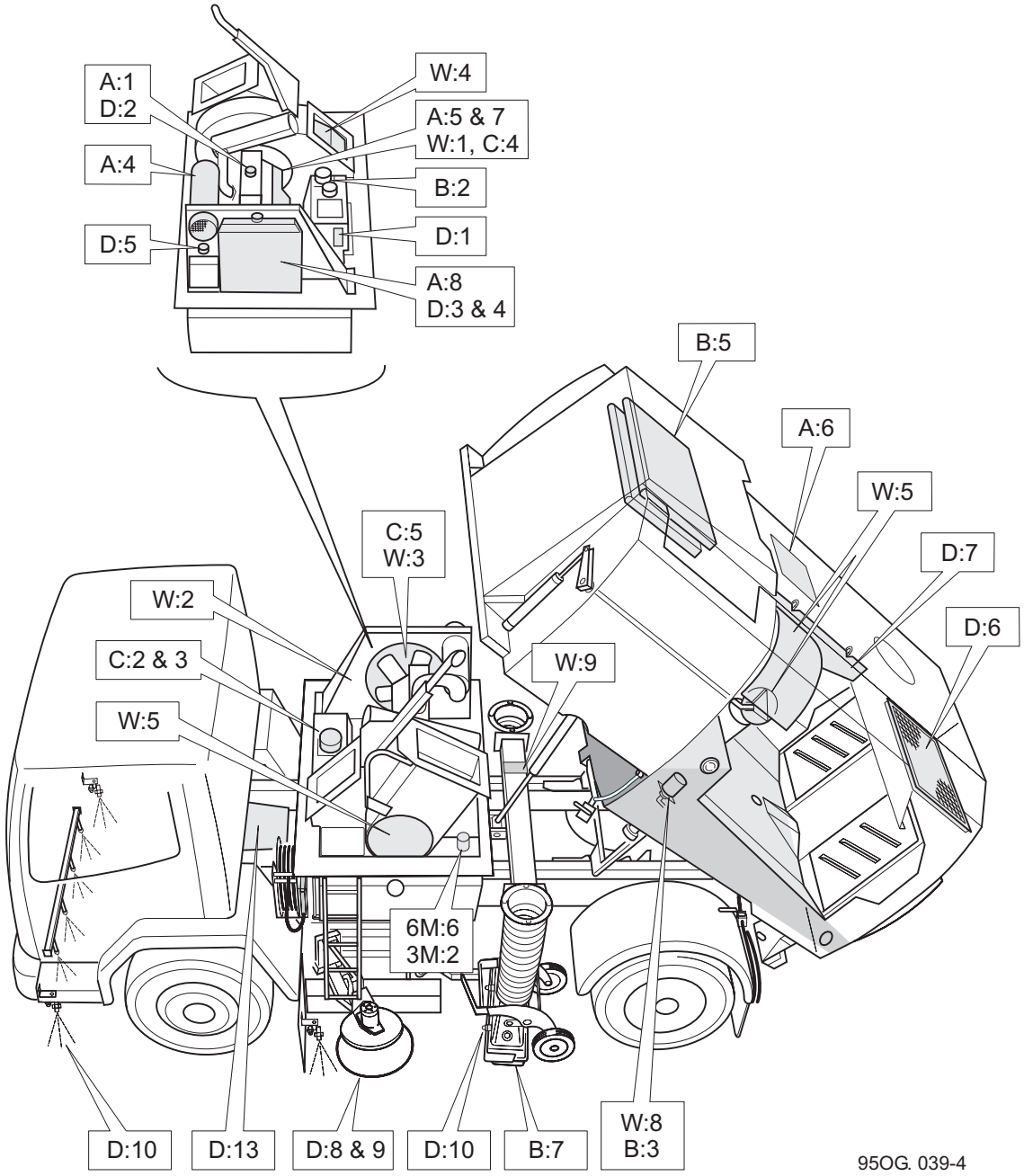
DO NOT

- **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.**
- **Work on the braking system without first discharging the accumulators by 60 full applications of the foot brake.**
- **Disconnect hydraulic or water pipes whilst the engine is running.**
- **Approach fan inlet or outlet whilst the fan is running.**

ALWAYS

- **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, or extended maintenance 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 or 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.**

MAINTENANCE SCHEDULE
(OG6:4 - OG6:5)



Key

D = Daily W = Weekly

A Service = 500 Hours B Service = 1000 Hours C Service = 12 Monthly

Attention is drawn to the recommendations for servicing in the Auxiliary Engine Handbook.

MAINTENANCE SCHEDULE

DAILY MAINTENANCE - These can be carried out by a 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

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 vee belt tensions.
4 Fan safety flap for correct operation.
5 Suction fan impeller, wear plates and intake flap for wear, renew if necessary.
6 Routing of electrics and hydraulic services for chafing.
7 Lubricate all grease points - see page OG6:18.
8 Water pump suction filters.
9 Oil level and condition in Supawash pump if fitted.
10 Check/clean fuel prefilter glass bowl on top of the fuel tank (John Deere and Iveco SP engines).

MAINTENANCE SCHEDULE (Continued)

♠ Service A - every 500 hours

1 Change auxiliary engine oil and renew filter.
2 Clean fuel pre-filter bowl (John Deere and Iveco Standard Power).
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 Replace 'blow by filter'. (Iveco High Power Stage 3a engine only).
10 Check Supawash pump (if fitted) for the correct operation of jets and any plunger seal leaks. Service as necessary.

♠ Service B - every 1000 hours

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 Check the silencer wafers in the cowl roof, clean if required.
6 Replace fuel pre-filter (Iveco engines only).
7 Check security of sweeping equipment to chassis.

♠ Service C - 12 monthly maintenance - or every 2000 hours

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

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

♠ Service D - every 4000 hours

1 Drain fluid flywheel and refill (see chapter 7 in Maintenance Section).

♠ These procedures should be carried out by qualified service personnel.

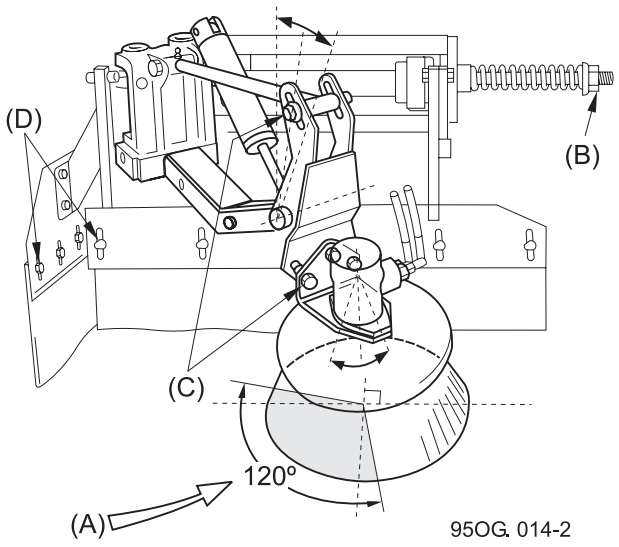
EQUIPMENT ADJUSTMENT / MAINTENANCE

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) can be varied by adjustment of the compression spring nut (B) at the rear of the brush assembly. The brush angle should be set, using adjusters (C), so that only about 120° of circumference towards front and kerbside is in contact with the road. Rubber curtains are arranged to collect and position the material in the path of the suction nozzle. 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

Sharp objects

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.

Ensure the auxiliary engine is not running and isolated before brush adjustment or replacement is attempted.

WIDE SWEEP BRUSH ADJUSTMENT

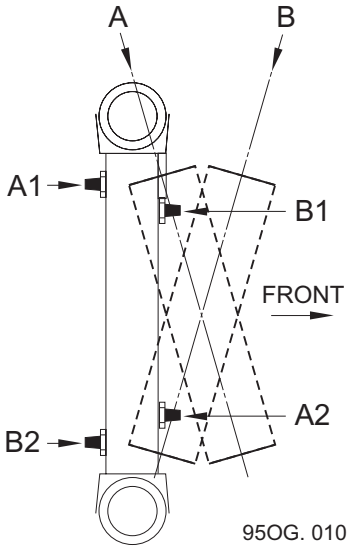
Regulators (Item 13, Fig.1) adjacent to the intake trunking are provided to adjust the brush pressure on the road surface. The adjustment is also used to counteract uneven (conical) brush wear. To reduce brush pressure on the ground, turn regulator knob clockwise, to increase it turn anticlockwise. When correctly adjusted the brush should have a width 75mm wide over its length when operated on a flat surface with the vehicle stationary. Brush adjustment/wear should be checked on a regular basis.
Note : These regulators do not have a locking ring.

SINGLE MACHINE

Single machines have regulators mounted in position A1 and A2 for left hand drive, or B1 and B2 for right hand drive machines.

DUAL MACHINES - DUAL WIDE SWEEP BRUSH REGULATION

The four regulators on the crossmember control the regulation of the brush, two for each hand of sweep.

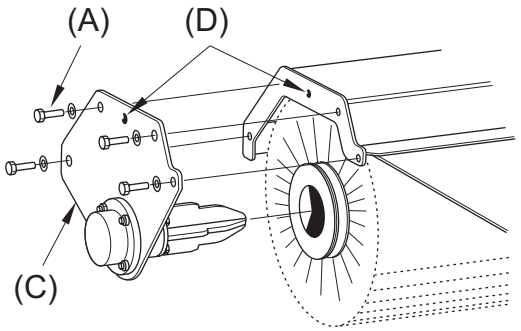


A - Brush in LH slew position
A1 - L HS cylinder 'red' pressure regulator
A2 - RHS cylinder 'red' pressure regulator

B - Brush in RH slew position
B1 - L HS cylinder 'green' pressure regulator
B2 - RHS cylinder 'green' pressure regulator

Note : Ensure the vehicle braking system is fully pressurised before carrying out adjustments.

WIDE SWEEP BRUSH STOCK REPLACEMENT



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Sharp objects

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.

REFITTING

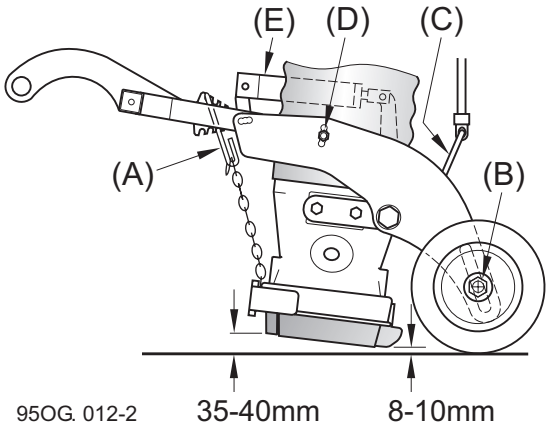
Slide core with segments under the wide sweep brush carriage. Engage the core on the motor drive dog. Refit the end plate assembly turning it if necessary to engage the bearing drive dog. *Line the end plate up with the carriage and refit the 4 securing bolts (A).

*A location bolt (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

It is important that the distance between the nozzle front rubber and the road surface is correctly set to achieve thorough cleaning. Heavy materials require a close setting, light material, leaves, etc. need an open setting.

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. Adjustment is made by raising or lowering the nozzle carriage wheels (B) to set the rear nozzle gap whilst the front setting is effected by raising or lowering the chain links (A) fitted to the front of the nozzle. 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) causes the nozzle aperture to be further enlarged for the ingestion of bulky iobjects.

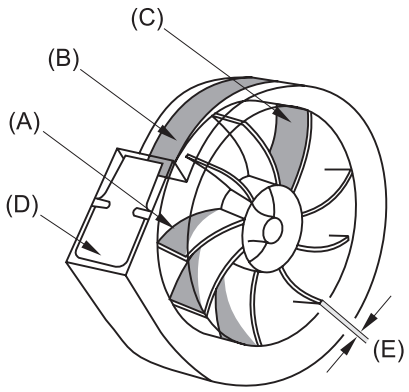
SUCTION FAN IMPELLER AND CASING

Ensure the auxiliary engine is not running and isolated before fan maintenance or replacement is attempted.

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 as instructed in 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 within the component. 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 component must be replaced when any blade thickness (E) is less than 2mm. If perforation of the fan case is observed (B) due to wear erosion, this component should also be replaced to prevent pollution of the fan compartment with dust.



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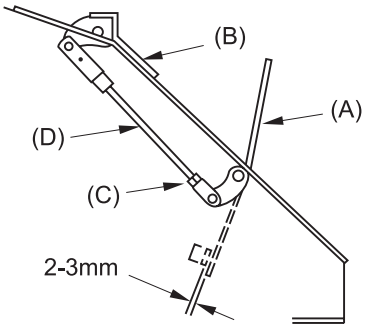
Always ensure safety flap (D) is in the closed position when the body is raised. The flap should move freely and will require lubricating with oil from time to time.

The fan impeller is finely balanced as an assembly in manufacture.
NEVER remove or replace the hub.

FAN CASE - SAFETY FLAP ADJUSTMENT

Check that the safety flap (A) on the fan case outlet is correctly set. There should be 2-3mm of free play between the fan flap and angle stop inside the fan outlet when the flap actuator (B) is fully depressed against the fan case seal face, as shown. Adjustment is made by releasing the yoke end lock nut (C) and rotating the actuation rod (D) to move the yoke end up or down the rod as required. Having achieved the correct setting, retighten the lock nut.



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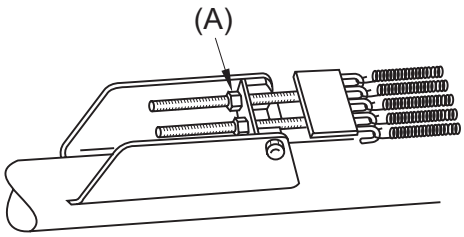
WANDERHOSE ADJUSTMENT

Safety platform/gantry to be used for this procedure

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.



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FILTER SCREENS AND ROOF DUCT

The body filter screen(s) (Item 18, Fig. 1) and roof duct must be kept clean, otherwise suction performance can be affected. The screens can be cleaned in situ, but it is preferable to be removed. To remove, release the linchpin, which will allow the screen 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.

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.

With the screen(s) 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 water in the fan case.

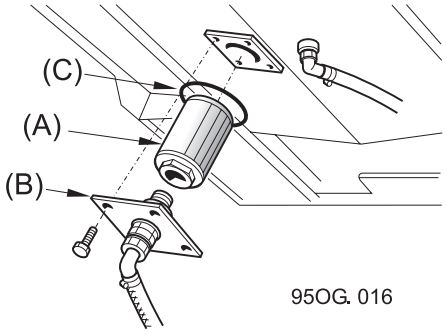
When refitting a screen, ensure it is a close fit against the mating faces. Adjustment is provided so that debris is prevented from entering the fan. Replace the linchpin.

WATER TANK

FILLING - The water tank can be filled with a hose pipe via fillers located on either side of the body (Item 23, Fig. 1) or, alternatively, from a water hydrant. A Stortz type hydrant connection (Item 24, Fig. 1) being 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.

WATER TANK SUCTION FILTER AND TANK FLUSHING

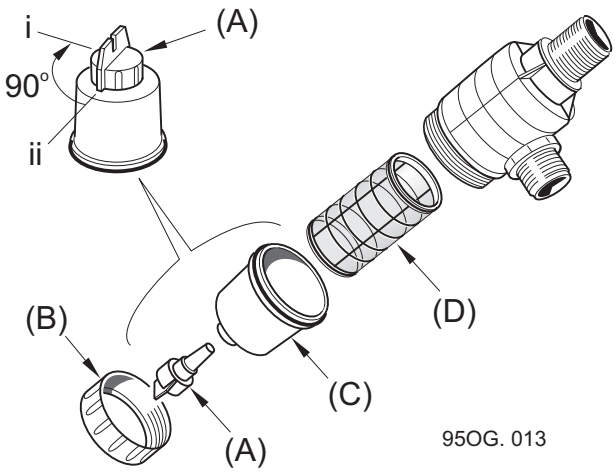
The filter is located within the water tank attached to the rectangular cover secured to the underside of the body. Its purpose is to prevent foreign particles entering the water system which could cause mal-operation of the water pump valves. Access to filter (A) is gained by first draining the tank using the flushing valve(s) (Item 25, Fig.1), then raising the body and, supporting on the prop, releasing the four cover plate securing screws and withdrawing the cover (B) with 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 an 'O' ring (C) housed in a groove in the body flange and it is wise when refitting the cover to clean both cover and flange thoroughly and then smear with grease. The grease will help retain the 'O' ring.

Periodically, whilst cleaning the filter, it is advisable to flush out the tank. This is done by leaving off the cover, lowering the body and playing a high pressure hose through the two port holes (Item 28, Fig. 1) 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 cover plate and filter and close flushing valve(s).

Water Filter - Cleaning



The water filter (Item 8, Fig. 1) is at the rear of the machine. The filter is equipped with an integral shut off valve to prevent the water tank from siphoning into the locker should the filter need dismantling for cleaning whilst there is still water in the system.

1 Before dismantling the filter, activate the shut off valve actuator (A) located on the top of the filter. It has a bayonet type mechanism. Press down and turn anticlockwise to position (i) to shut the valve.

2 To access filter element, unscrew the securing ring (B) around the outside of the filter body and lift the upper part of the body (C) away, complete with the shut off valve. The filter element (D) can now be withdrawn.

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, special care should be taken to ensure that the filter element is correctly (squarely) located in the filter body before tightening the securing ring.

5 Refit the shut off valve actuator. Press down and turn clockwise to position (ii) to open the valve ready for use.

NB : Finer water meshes are obtainable for areas when fine water borne particles are present.

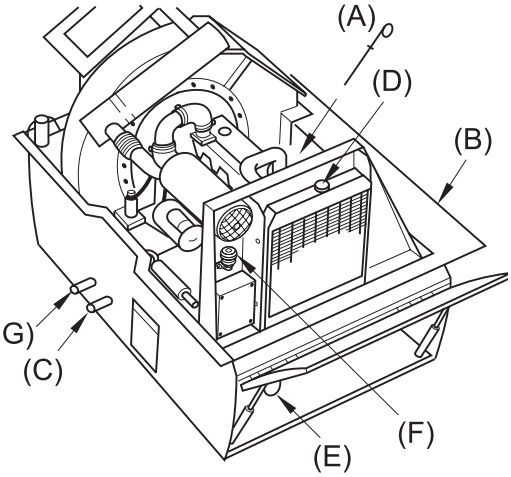
AUXILIARY ENGINE

Ensure the auxiliary engine is not running and isolated before fan maintenance or replacement is attempted.

ENGINE OIL

OIL LEVEL CHECKING
Check daily. The level can be checked with the body raised. **Ensure the body prop is in place.**
The dip stick (A) is located on the side of the engine nearest the can and is reached by standing on the walkway (B). **Extreme care must be taken when working from the walkway, particularly in wet conditions.**

OIL CHANGING
At the frequency dictated by the engine fitted. Oil specifications are shown in the lubrication diagram - see page OG6:14/15. The oil is best drained whilst warm via the remote drain plug (C).



95OG. 020

COLD WEATHER PRECAUTIONS

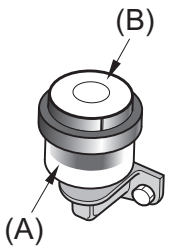
The cooling system (D) must be filled with equal quantities of antifreeze and water to maintain a minimum concentration of 50%, i.e. -39°C. Any top ups must therefore be done with a 50% mixture of antifreeze and water. The concentration level should be checked at the 500 hour service interval as failure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

FILTER REGULATOR UNIT

The filter regulator unit (E) comprises a combined air filter/pressure regulator. The air filter can be manually drained by pushing up the bowl drain tube. The air is isolated and drained by pressing the red gate valve on the unit.

AIR CLEANER RESTRICTION INDICATOR

A filter restriction indicator (F) gives a positive indication of when the air cleaner element needs attention and so eliminates haphazard servicing. It should be remembered that the indicator does not show the amount of dust present in the dust cap. When the air cleaner requires servicing the red warning indicator (A) will lock up. After servicing the indicator should be reset by pressing button (B). It will now show black.



95OG. 017

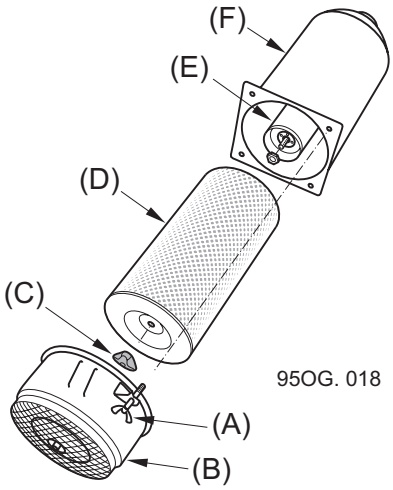
AIR CLEANER

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.

TYPE A

TURBO PRECLEANER
Remove by releasing the two wing nuts (A) and then pull off (B). Clean out dust. When refitting ensure that the precleaner (B) is seated correctly and the wing nuts are securely tightened.

MAIN AND SAFETY ELEMENTS
Remove the precleaner. Release wing nut (C) and withdraw the main element (D) from the air cleaner body. It will be noted that there is a small diameter safety element (E) within the body which is not usually removed during periodical servicing, it ensures dust cannot enter the engine in the event of main element damage. Check that the nut securing this element is kept tight at all times.

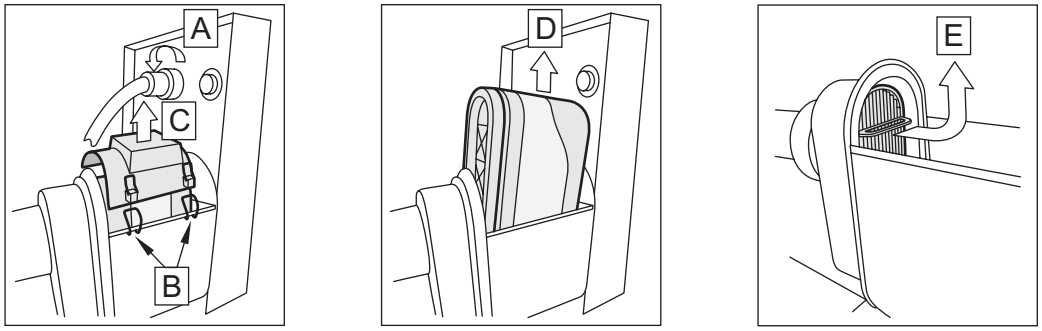


95OG. 018

If the main element is contaminated with dust, it should not be cleaned by banging or by the use of compressed air, but replaced with a new one. The safety element should be changed every third time the main element is serviced. Clean the inside of the filter body (F); do not use petrol. Inspect all joints and hoses, renew where necessary. Reassemble the cleaner, ensuring all joints are leak proof.

TYPE B

If the air filter is located below the engine management box, remove electrical plug (A) by turning CCW. Lift the retaining clips (B) to remove the lid (C).



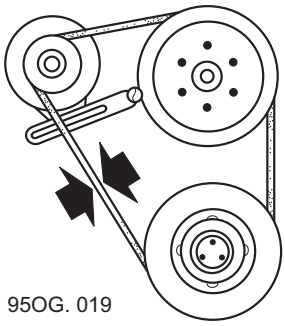
95OG. 045

Remove the main filter element (D) by first pushing the filter down and tilting it towards the radiator and then lift it out. There is a small safety element (E) 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. Refit plug (A) ensuring a good seal against water ingress.

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.

ALTERNATOR AND WATER PUMP BELT TENSIONING - Perkins Auxiliary Engine Only

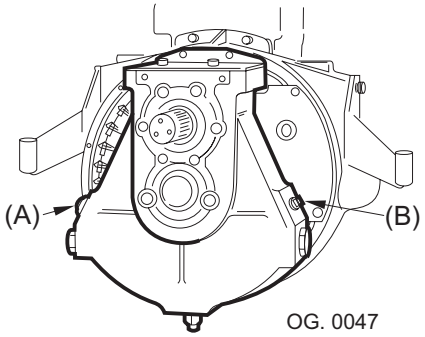
It is important to keep these belts correctly tensioned. If they are too loose slipping will occur resulting in rapid belt wear, and reduced cooling and efficiency of drive to pump(s) and alternator. Conversely, if they are too tight the pump and alternator bearings, and the belts themselves, can be damaged. The correct method of tensioning the belts is to apply pressure in the centre of the longest run and adjust the tension until the belt deflects, about 10mm (3/8"). The illustration shows a typical arrangement.


95OG. 019

NB : The Iveco engine has a self adjusting belt tensioner

'Z' DRIVE GEARBOX

OIL LEVEL CHECKING
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.

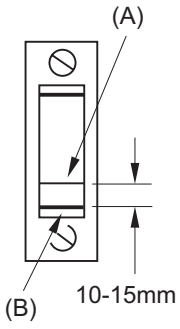


OG. 0047

OIL CHANGING
Change the oil after the first 50 hours operation, thereafter at 2000 hour intervals or 12 monthly whichever is the sooner. Oil specifications are shown in the lubrication diagram - see this chapter. The oil is best drained whilst warm via the remote drain plug (G) located on the engine pack rear valance. See the illustration in the preceding auxiliary engine oil chapter.

HYDRAULIC RESERVOIR

OIL LEVEL CHECKING
The correct method for checking the oil level in the hydraulic reservoir is to raise the body and rest on the body prop. The level (A) should be 10-15mm above the lower red line (B) 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. Oil specifications are shown in the lubrication diagram - see this chapter.



OG. 0026

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.

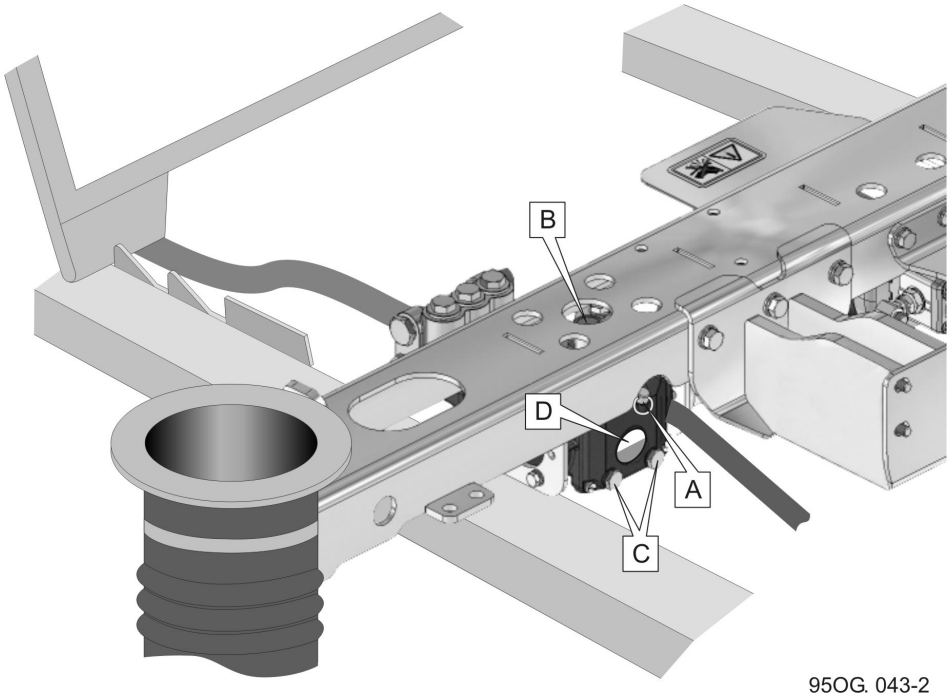
CLEANING THE VEHICLE

With the advent of high pressure steam and washdown equipment, damage can be caused by playing this equipment onto the engine, electrical control systems, paintwork, etc., and great care should be exercised when it is carried out.

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.



95OG. 043-2

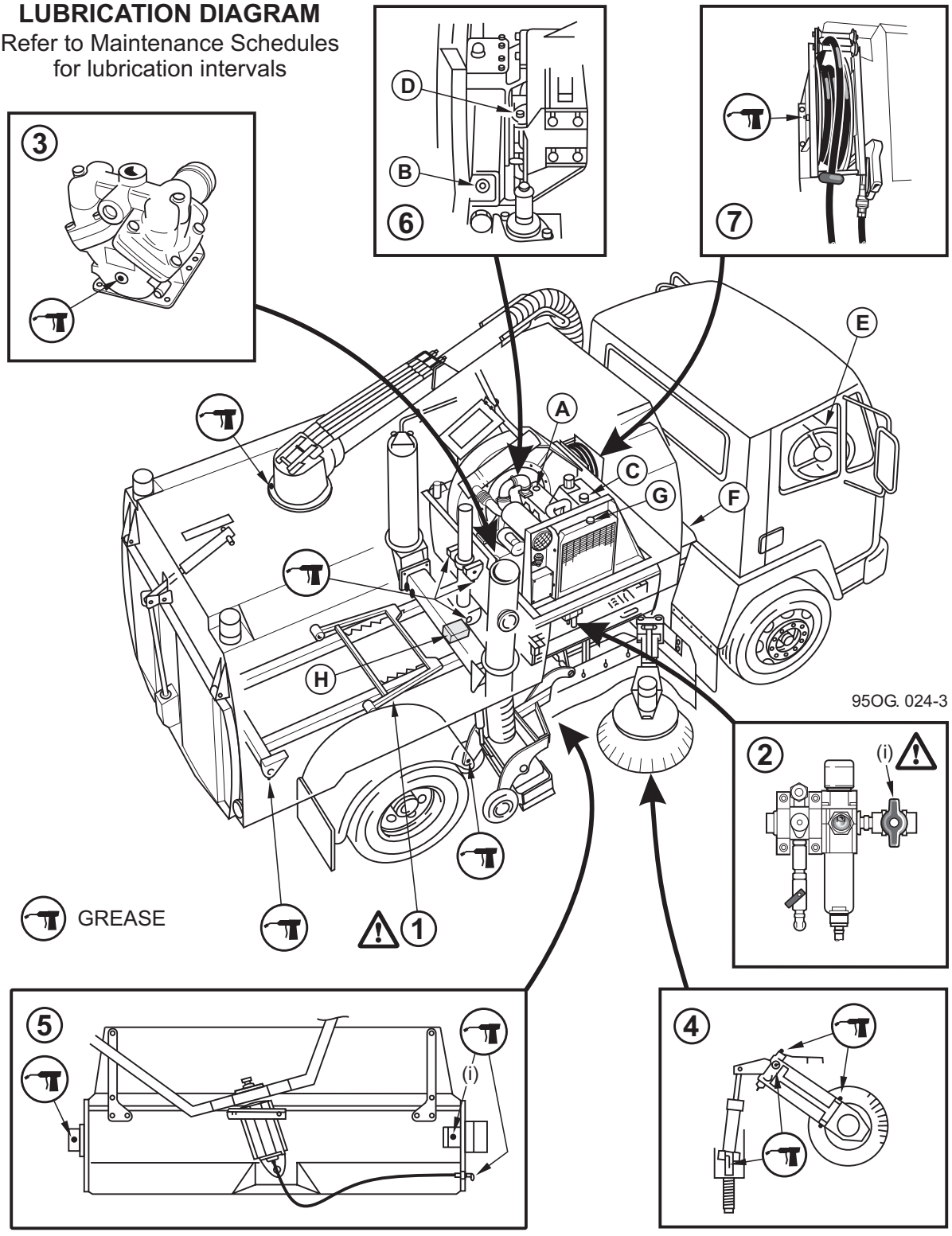
OIL LEVEL / CHANGING

The water pump is mounted under the central crossmember next to the tip ram.

The pump oil level should be checked weekly and is visible through a window and a dipstick 'A' is provided with high and low level marks. The oil is introduced via filler port 'B'. The pump oil drain plug is 'C'. The oil colour should be clear, if it is frothy/milky when seen through window 'D', 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.

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 'Z' drive gearbox.
7 Supawash hose reel.

Recommended Lubricants

	Capacity	ISO Oil Grade	Johnston Part No.	Shell	BP	Castrol	Mobil	CHEVRON TEXACO
A Engine	8.0L	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
B Gearbox **H** Supawash Pump	2.5L 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
C Hydraulic System/ **D** Fluid Flywheel	80L 4.85L	-	94-12	*Tellus S2V-46	Bartan HV46	Hyspin AWH-M46	DTE 15M	Rando HDZ 46
E Chassis PAS **F** Auto Gearbox	-	-	39661	Spirex S4 ATF HDX	Autran DXIII	Castrol Dexron II	AFT 220	Havoline Multi-Vehicle ATF
G Antifreeze	15L	-	39664	Shell Safe Premium	BP Isocool	Castrol AF	-	Havoline Anti-freeze
Grease Points		-	94-69	Gadus S2-V 200	Energrease L2	LM Grease	Mobilube MP	Multifak EP
Battery Terminals	-	**PETROLEUM JELLY**						

* In cold climates use Tellus S2V-32