Operator's Guide

RT655 Mk III Regenerative Air

Twin Engine Suction Sweeper

From Manufacture Sequence No. 7458

Part No 01288-1(GB)

Revision Level A

Foreword

The Johnston RT655 Air Regen 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 [EN 13019 refers], 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 (gutter broom) setting changing
9 Nozzle (pick-up head) setting
10 Daily and weekly maintenance items
11 Driving/operation assessment
12 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.

Ear defenders are recommended when working around the machine

Eye protection is recommended when working around the machine

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.

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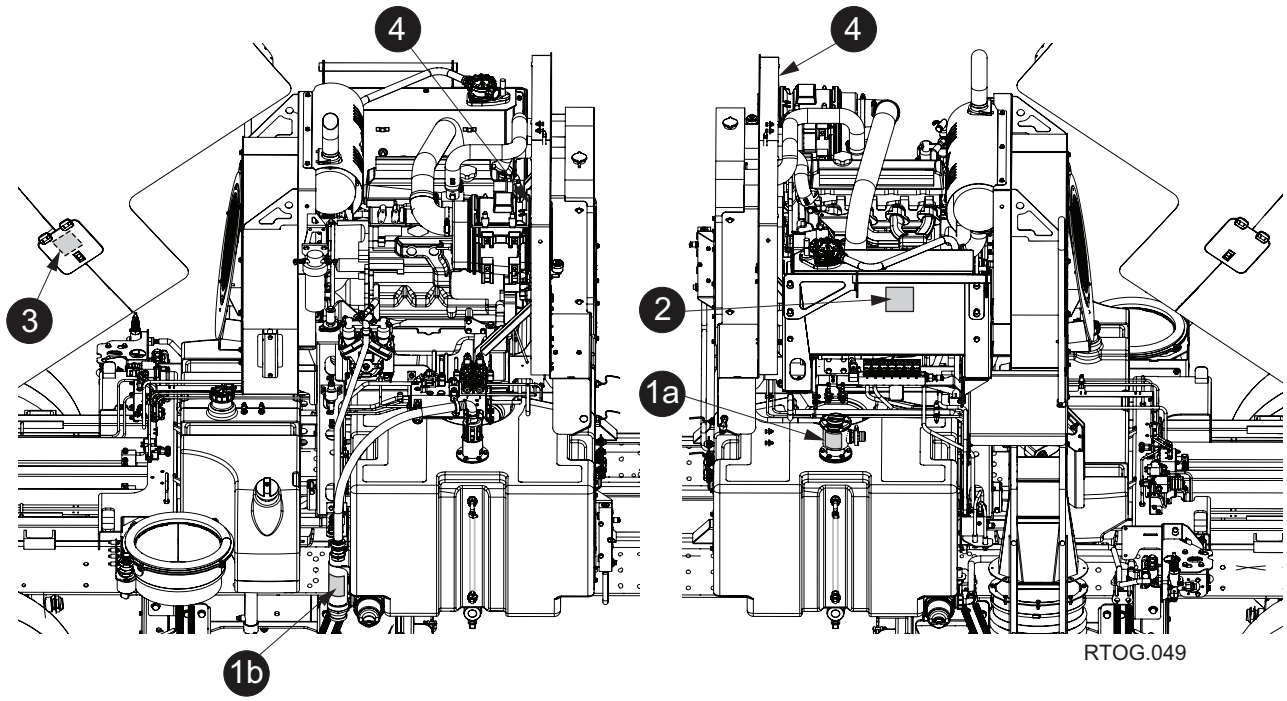
OG7:3	A		OG7:4	A	

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

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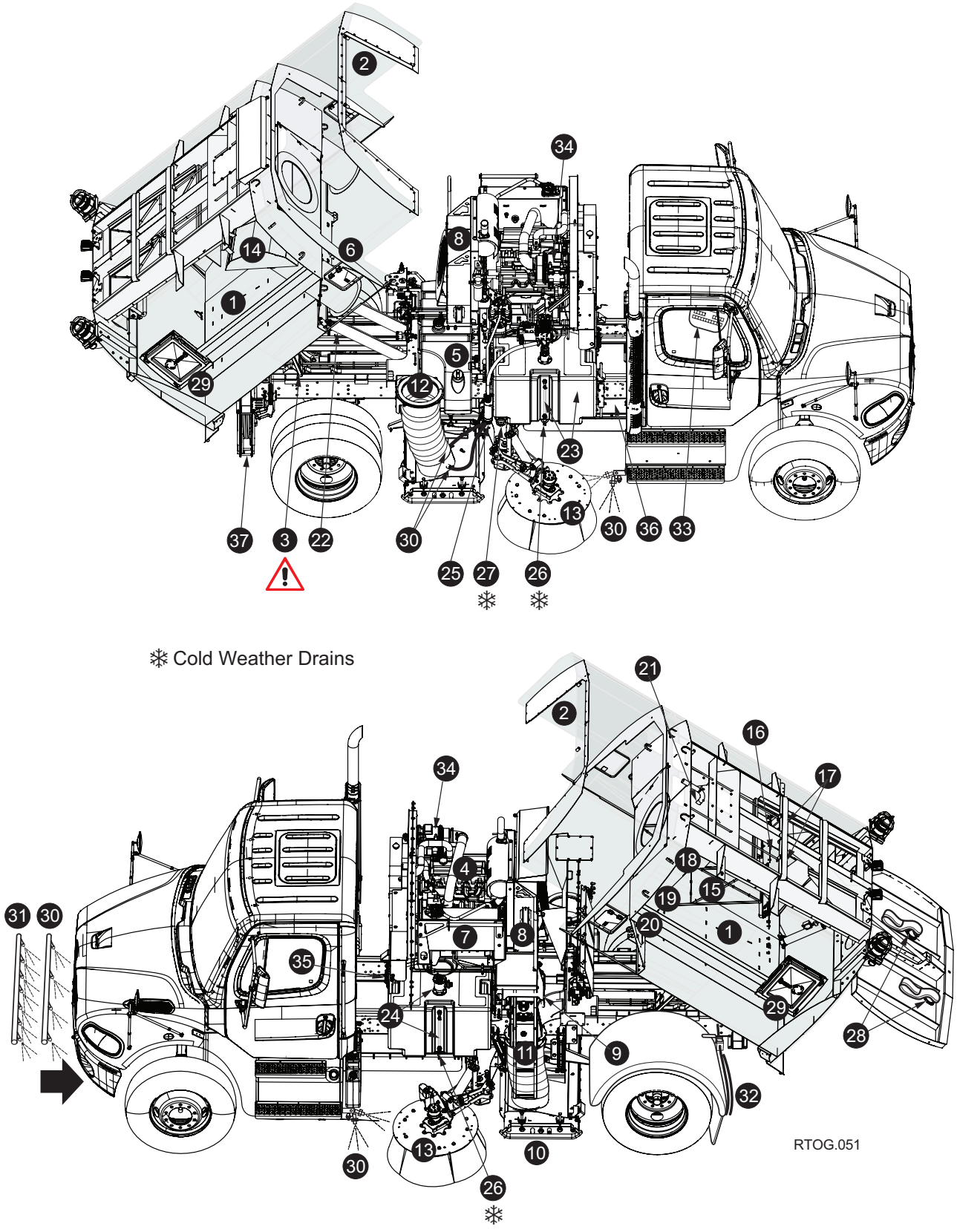
GENERAL ARRANGEMENT

Figure 1



❄ Cold Weather Drains

RH Sweep machine shown

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	-
6	Fuel tank filler access flap	-
7	Hydraulic oil reservoir	6
8	Suction fan case	6
9	Variable exhaust gate (VEG)	-
10	Pick-up head (hood)	6
11	Blaster duct	-
12	Suction duct	-
13	Channel brush / gutter broom	6
14	Wear plate	-
15	Filter screen	6
16	Filter screen curtain	6
17	Filter screen water sprays	6
18	'SepaVac' separator box	3
19	'SepaVac' access panel	-
20	'SepaVac' discharge door	3
21	'SepaVac' water flush	3
22	'SepaVac' water flush hydrant connection	3
23	* R.H. Water tank and contents gauge	6
24	* L.H. Water tank, contents gauge and hose filler	6
25	Water tank(s) hydrant filler	6
26	Water tank drain tap - under both tanks	6
27	Water pump suction filter	6
28	Rear door drainage hoses	3
29	Rear door access door	3
30	Low pressure water spray jets	-
31	High pressure Water spray jets	-
32	Washdown hose	-
33	Master control panel	2
34	Air cleaner	6
35	Air cleaner filter state indicator	6
36	Hydrant hose stowage - optional	-
37	Supawash hose reel & handlance	4

* Total water capacity 950 litres

CHAPTER 2

Controls

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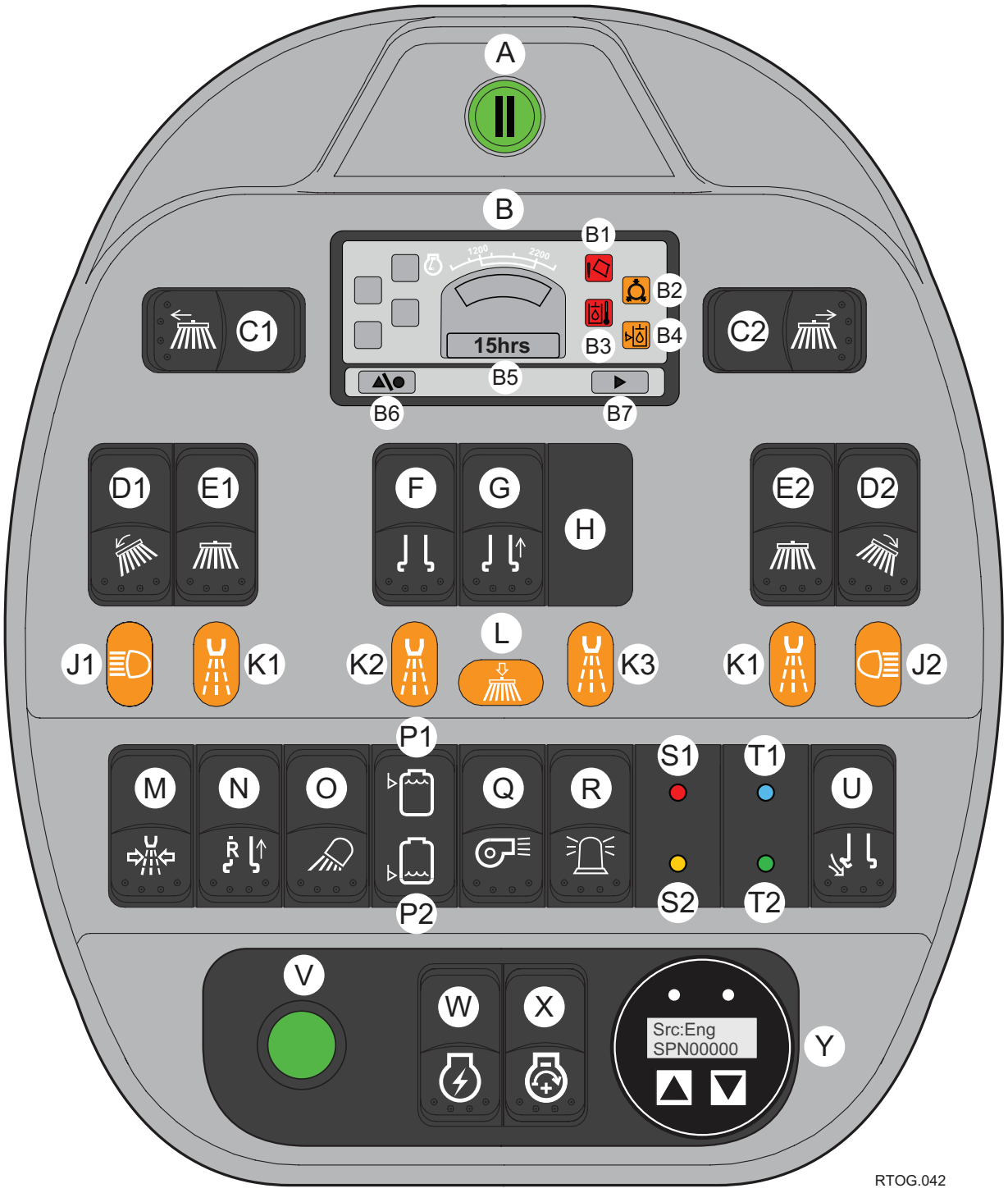
Sweeping Controls - Switch Panel

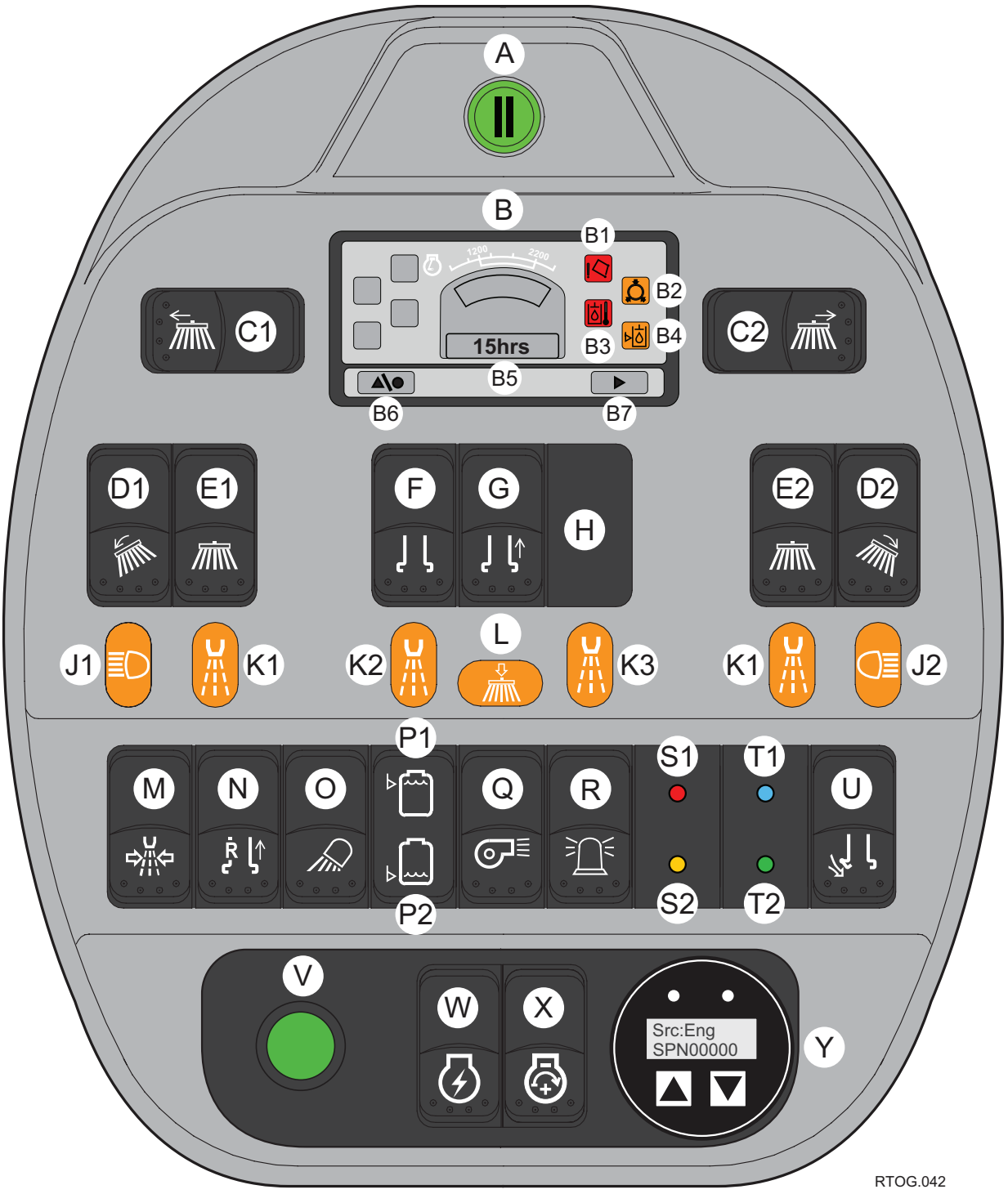


*Denotes Optional Equipment

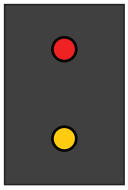
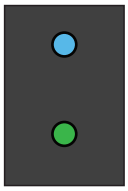
Sweeping Controls

Symbol	ID	Description
	**A**	Programme Button; ON/OFF switch illuminates when pressed and suspends all sweeping and parks brushes. Pressing again reactivates previous settings.
	**B1**	'Hopper Raise' - red warning lamp and buzzer.
	**B2**	'Low Air Pressure' - amber warning lamp and buzzer.
	**B3**	Hydraulic Oil 'Temperature' - red warning lamp.
	**B4**	Hydraulic Oil 'Low Level' - amber warning lamp and buzzer.
	**B5**	Rear Broom hours worked/clock.
	**B6**	Push button to select hourmeter reading/clock - cancels after 10 seconds.
	**B7**	Advance button - advances clock time when in clock setting mode.
	**C1**	*LH Variabrush - spring centred switch moves brush out or in.
	**C2**	*RH Variabrush - spring centred switch moves brush out or in.
	**D1**	*LH Rotatilt - spring centred switch; alters angle of Gutter broom to suit road camber.
	**D2**	*RH Rotatilt - spring centred switch; alters angle of Gutter broom to suit road camber.
	**E1/E2**	LH/RH Gutter Broom 2 position switch - stowed/active illuminated when selected.
	**F**	Pick-up head and water sprays; 3 position switch - stowed/active/water sprays. Illuminated when selected.
	**G**	Pick-up head hop; 2 position - push to make stowed / CLOSED / OPEN.
	H	*Blank.*
	**J1/J2**	LH/RH worklamp; 2 position switch OFF/ON. Illuminated when selected.
	**K1**	Front Spray Bar. 2 position switch OFF/ON illuminated when selected.
	**K3**	Gutter Spray. 2 position switch OFF/ON illuminated when selected.
	**K3**	Hopper Spray. 2 position switch OFF/ON illuminated when selected.
	**L**	* Powathrust; - ON/OFF. Increases Channel Brush ground pressure to preset level when on. Without the need to re-adjust the in cab regulator.

Sweeping Controls - Switch Panel

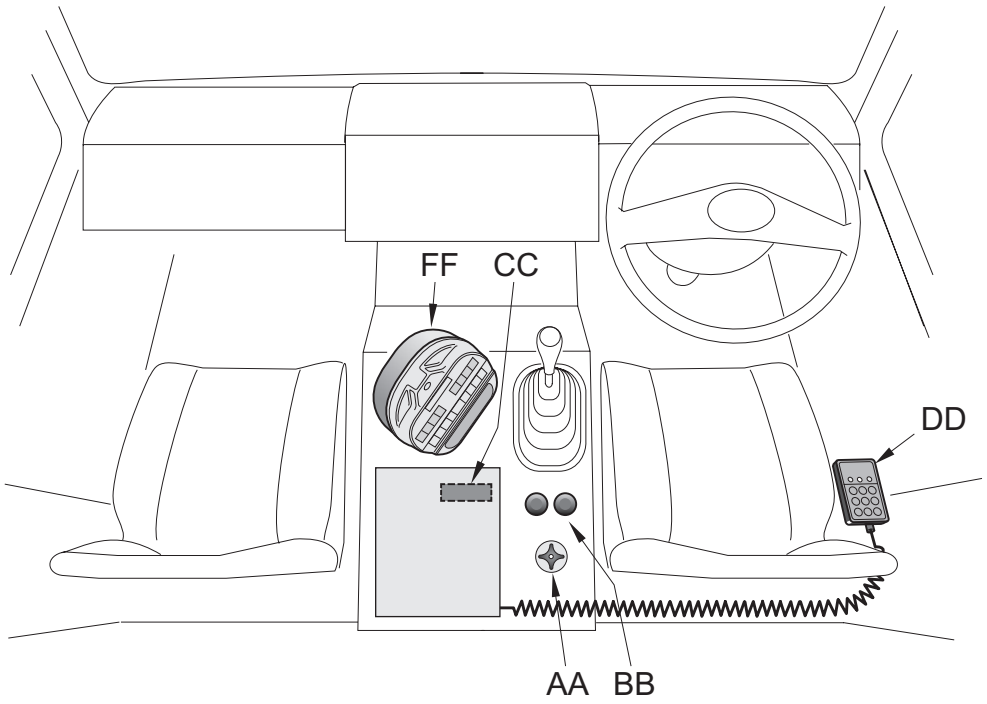


Sweeping Controls

Symbol	ID	Description
	**M**	Supawash option; 2 position switch - OFF/ON illuminated when selected.
	**N**	Hood reverse pick-up select switch; 2 position switch - OFF/ON.
	**O**	Rear Worklamp; 2 position switch OFF/ON illuminated when selected.
	**P1**	Water tank low level indicator - illuminated when tank empty.
	**P2**	Water tank high level indicator - illuminated when tank is full.
	**Q**	Powasave – 2 position switch – operates with gutterbroom. Overrides pre-set pressure level to allow maximum down pressure on brush.
	**R**	Beacons; 2 position switch - OFF / ON. illuminated when selected.
	**S1**	VEG - position 1. Regen Mode - Colour Red
	S2	VEG - position 2. 60% Regen - Colour Yellow
	**T1**	VEG - position 3. 30% Regen - Colour Blue
	T2	VEG - position 4. Vacuum Mode - Colour Green
	**U**	VEG opening switch; 3 position sprung centred switch controls an electrical actuator CLOSED / OFF / OPEN.
	**V**	Engine crank button - push to crank. Flashes to indicate engine fault requests.
	**W**	Ignition switch - 2 position - OFF/ON. **NB :** Only beacons will operate when switch is off.
	**X**	Engine throttle control; 3 position spring centred switch REDUCE/OFF/ INCREASE.
	**Y**	CAN FED - John Deere, Diagnostics, Engine hours, Engine RPM, Coolant Temperature, John Deere Fault codes.

*Denotes Optional Equipment

Cab Mounted Controls



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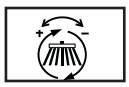
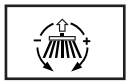
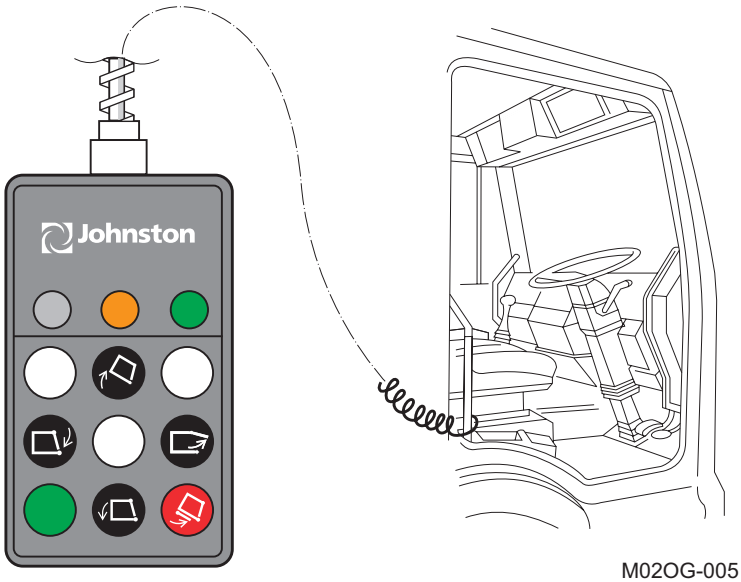
Symbol	Switch	Description
	AA	Channel brush speed control; clockwise rotation increases brush speed.
	BB	Pressure control for each gutter broom Powasave; clockwise rotation reduces brush pressure.
	CC	Fuse box is mounted inside relay box. Fuse functions - see page OG2:8.
	DD	Load discharge pendant unit mounted by driver's seat.
	FF	Switch panel - see previous pages of this chapter.

Load Discharge Control Pendant
(Located beside the driver's seat)



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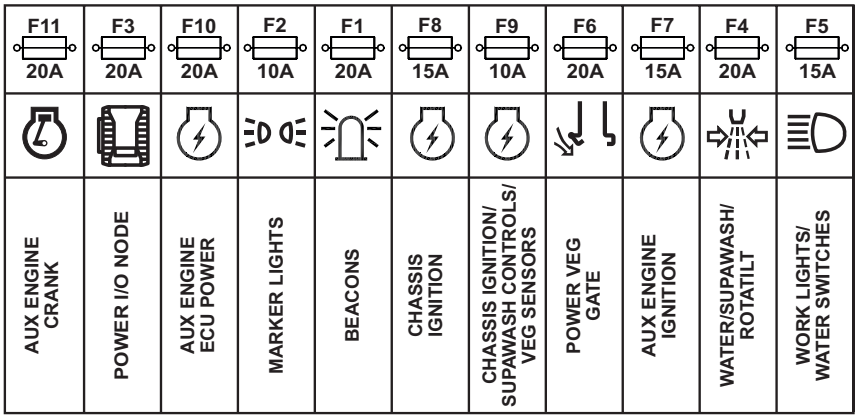
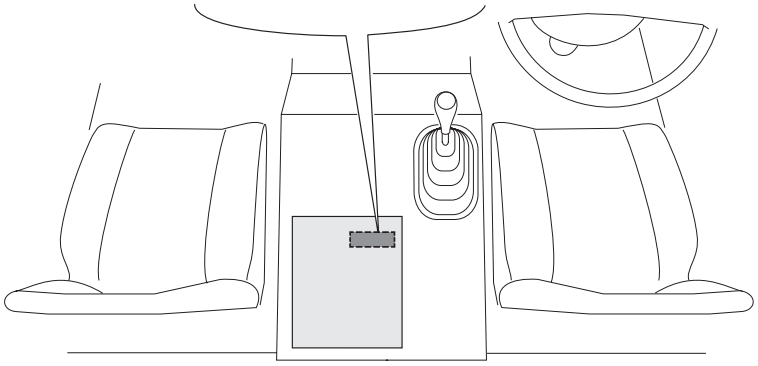
LED	Function
	Hand brake off - Pendant not ready for operation
	Hand brake on - Pendant ready for operation

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

Fuse Functions





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Fuse No.	Function	Amps
F1	Beacons	20
F2	Marker Lights	10
F3	Power I/O Node	20
F4	Water/Supawash/Rotatilt	20
F5	Work Lights/Water Switches	15
F6	Power VEG Gate	20
F7	Aux Engine Ignition	15
F8	Chassis Ignition	15
F9	Chassis Ignition/Supawash Controls/VEG Sensors	10
F10	Aux Engine ECU Power	20
F11	Aux Engine Crank	20

Fuse colour key

5 Orange 10 Red 15 Blue 20 Yellow

CHAPTER 3

Operation

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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.

Towing the Vehicle

Refer to the chassis handbook.

Safety Notice

Please note the air system needs to be charged to ensure the channel brush / gutter broom is raised.

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 sweepgear 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.

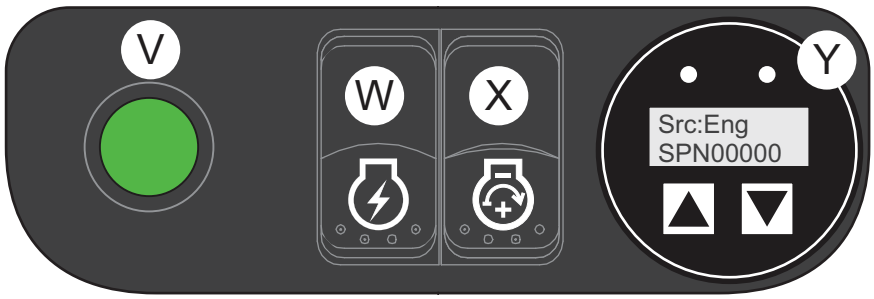
John Deere Electronic Engine

Starting Hot or Cold

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

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

(X) is the throttle and will increase engine RPM to 1500 before needing ECO mode override button (Q) to 2000 RPM.



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ENGINE STARTING AND OPERATION PROCEDURES.

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.

Engine Speed Regulation

The throttle speed switch is a spring centred switch operating an electric variable speed engine control. The engine speed is between 1200 and 2000 rev/min to suit sweeping conditions. The Eco Override button (Q), need pushing to increase engine RPM higher than 1500.

NB: If the truck and auxiliary engine use a single fuel tank. When the fuel gauges reaches ¼ full, stop the auxiliary engine as there is a chance it could run out of fuel, meaning the fuel system would need to be bled again.

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.

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 will 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. Ensure the intake blanking plate is not blanking the tube and is stowed on the body underside.
3. Start auxiliary engine.
4. Ensure warning beacons are operating - switch (R).
5. Ensure programme button (L3) is not illuminated.
6. Increase engine speed up to 1500 rev./min.
7. Lower pick-up head (G2) and lower channel brushes (gutter brooms) as required (E1/E2). **NB:** The brushes move out to their full working position whilst turning. Third position activates Hood Water Sprays.
8. Set additional water jets to suit the debris being swept (J2, K2). Always operate (K3) body interior sprays.
9. Commence sweeping at a forward speed between 2-12 kph depending upon the debris being swept. Always use the slowest channel brush between 10 and 100 rpm to give satisfactory suction performance.
10. The position of the channel brush can be altered (moved towards the chassis) by operating switches C1 and C2 for the LH and RH channel brushes.
11. The channel brush ground pressure can be reduced by operating the Powasave regulations BB.

It is necessary to select the correct position of the VEG gate for the type of material being swept. A simple guide is as follows:-

Material	Decals illuminated	Colour	VEG Position
Heavy sweep	S1	Red	1 - Regen
General litter	S2	Yellow	2 - 60% Regen
General sweep	T1	Blue	3 - 30% Regen
Light sweep (leaves)	T2	Green	4 - Vacuum Mode

Hood Hop

The Hood Hop feature is a versatile way to overcome bulky debris when sweeping. The pick-up head hop switch is instant. It reacts to lift the hood for as long as the button is pressed.

When bulky items or a mass of leafs are in front of the hood. A quick press of the button, allows the hood just to lift to bring in the excess material and sweep it away.

The best way to use the hood hop: -

Sweep at 3 Kph ahead of the bulky items.

As the hood meets the material engage button (G) for 1-1.5 second just to break the seal between floor and hood. Release button and continue, the hood will return to original position

Safety Notice

- **Switch off the auxiliary engine without first rasing the sweepgear will cause the channel brush to remain in its working position.**
- **Driving the sweepgear with the brush(es) or Hood down in this position could lead to irreparable damage.**
- **When stopping the auxiliary engine, the throttle automatically returns to tick over. Should the auxiliary engine be off, and the hood down use the electronic discharge pump to raise the hood.**

To Interrupt Sweeping

Pressing the programme button (A) will raise all sweepgear gear, shut off water, and drop engine to 1200 RPM. After 20 seconds the engine will drop the RPM to low idle.

To Terminate Sweeping

1. Turn off the channel brush switches (E1/E2).
2. Raise the pick-up head (F).
3. Turn off the hopper sprays (K3).
4. Return the engine speed to tick over.
5. Press the engine ignition switch (V) off.

Water Drainage

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

Reverse Hood Pick-up Switch

The Reverse Hood Pick-up (N) allows the hood to remain in the working position, when reverse is selected. The gutterbrooms lift and stow.

Blocked Pick-up Head or Suction Duct

If it is apparent that the pick-up head is not lifting 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 pick-up head, raise and lower the pick-up head and see if the blockage clears.

2. If still blocked, switch off the engine(s), open the body rear access door and check that the filter screen is clear and that the body is not full.

3. If the screen is blocked, clean it and providing the body is not full return the machine to service and check the pick-up head performance.

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

5. If the screen is clear, the body less than half not full and debris is still not being picked up, it may be that the pick-up head trunking or inlet tube is blocked.

6. With the vehicle on level ground carefully raise the body and rest it on the body prop, ensure the prop has located against the locking step on the subframe. Raising the body higher than necessary for the prop to engage 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.)

Safety Notice

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.

7. Inspect the pick-up head trunking and inlet tube. Using a suitable size broom handle or rod clear any debris. When the ducts are clear, restart engines, lower the body and return the machine to service.

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

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.

LOAD DISCHARGE AND AUTO BODY PROP

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

1. Apply vehicle handbrake.

2. Ensure the auxiliary engine is running at tick over and the pendant unit is connected and the programme button has been depressed if the sweeping controls are activied.

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. Using the pendant control, press the green safety switch in order to run the functions shown over the page.

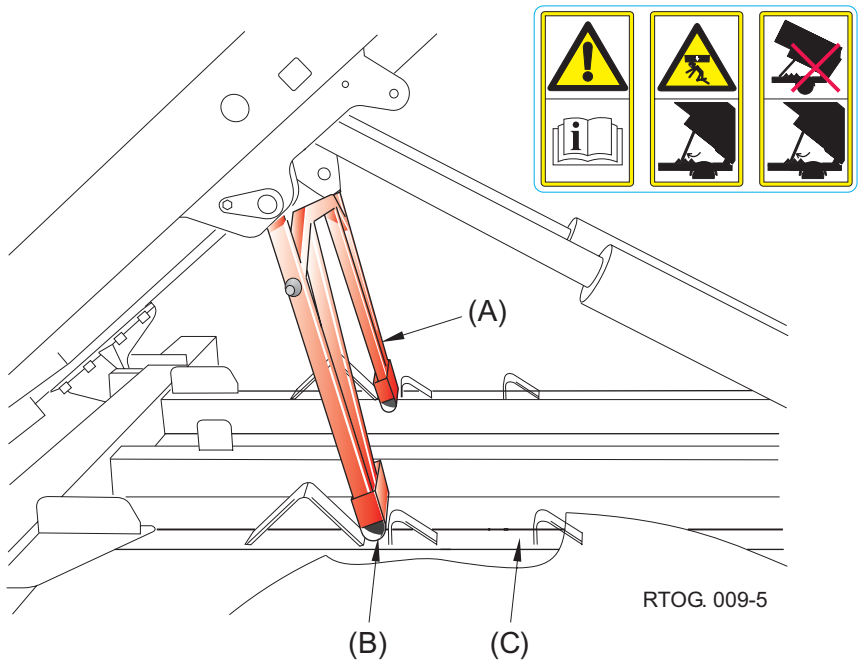
* See Load Discharge Control Pendant - Chapter 2.

For emergency discharge option, see Section 4.

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 step 'B' on the subframe. Ensure the prop has located against the step.



After the load discharge and whilst the body is raised, wash out the intake tube, filter screen (Item 15, Fig.1), SepaVac unit (Item 18, Fig.1) and the rear door with the washdown hose or Supawash hand lance (whichever is fitted) to remove any 'caked' material.

A bang should be heard when the rear door locking pin locates in the latch plate.

To Lower the Body

Ensure that the chassis air system is fully charged so the body prop delatch system will operate correctly and prevent any possible damage to the release mechanism.

Press DD-C and F to raise the body so that the body prop can clear the locking steps.

Press buttons DD-D, E and F to lower the body.

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

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

Emergency Discharge Pump

In the event of an auxiliary or electrical system malfunction , the body can be raised by:-

- Turning on the chassis engine
- Turn on the sweepger ignition
- Check the green light on the discharge pendant
- Push buttons DD-C and F to raise the body so that the body prop can clear the locking steps

NB: This system can also be used to open the rear door. So is applicable for discharging loads when in dusty environments.

End of Day Cleaning Routine

Safety Notice

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.

The body flush out hydrant hose connection (item 22, Fig. 1) is provided and when connected will flush out the various ducts and hoses.

1. With the nozzle hood (pick-up hood) in the stowed position, start the auxiliary engine and increase the speed to approximately 1500 rpm.

2. Slowly turn on the hydrant water. This procedure will automatically wash out the internal body, ductwork and SepaVac (dust separator), the blower housing, the blower fan and the nozzle pressure hose, along with the underside of the nozzle hood and the nozzle suction hose.

3. After about 5 minutes, lower the hood to the ground and continue the flushing cycle. This will collect all the water into the body flushing the dirty water from the surrounding areas.

4. Turn the hydrant water off. Raise the nozzle hood (pick-up head) to the stowed position and open the rear door to drain off the waste water.

5. Whilst the body is in the raised position, stow on the auto prop. Turn the hydrant water back on to wash out the internal SepaVac cover that will have hinged clear of the fan inlet to allow the fan side of the SepaVac to be cleaned.

6. The waste water will run through the SepaVac discharge covers to thoroughly clean the total body fan system.

7. Leave the 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.

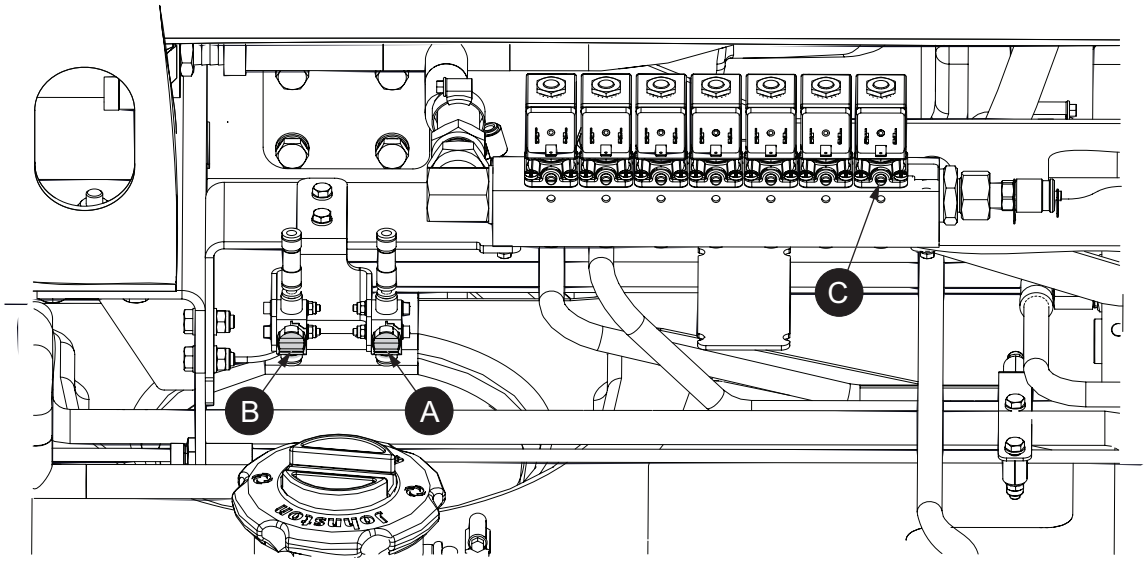
Please note that some dust may be emitted from the fan outlet, and premature wear may be experienced on some components.

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 ❄ Items 26 & 27, Fig. 1. When the water draining from the taps stops:

1. Start truck engine and auxiliary engine and raise the body.

2. Operate the low pressure and Supawash water pump (if fitted) with the manual overrides (B) open and the Supawash spraybar (if fitted) on. Manual override indicator (C).
   The Supawash pump will stop when the water low level light illuminates.



RTMA.056

3. Open the Pressadrain tap (A) for 1 minute to provide air to purge the water from each jet.

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

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

6. Operate the Supawash spraybar in turn. Turn off the Pressadrain, Supawash and stop the auxiliary engine.

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

CHAPTER 4

Optional Equipment

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SUPAWASH OPTION

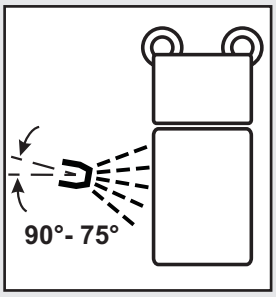
Safety Precautions

- Care MUST be taken not to damage sign written areas when cleaning. See special notes for cleaning vehicles with vinyl livery below.
- ALWAYS keep pressure equipment in good condition and regularly maintained, particularly at joints and unions.
- The use of safety goggles is recommended in case of deflected spray/debris.
- NEVER direct a high pressure nozzle at the skin as the fluid may penetrate the underlying tissue etc. and cause serious injury.

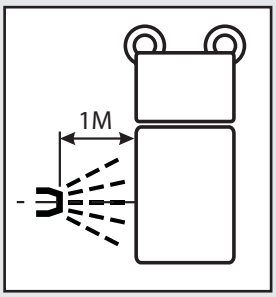
Eye protection and ear defenders are recommended when working around the machine

Special notes for cleaning vehicles with vinyl livery or reflective markings

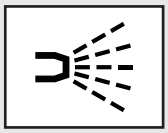
The supawash handlance or similar can be used for cleaning areas of the vehicle with vinyl or reflective markings subject to the following precautions being taken



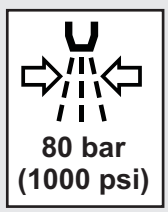
- The spray angle should be maintained between 90 and 75 degrees to the panel ✓



- The nozzle distance should be greater than 1 metre minimum from the panel ✓



- The spray pattern should be a wide fan pattern ✓

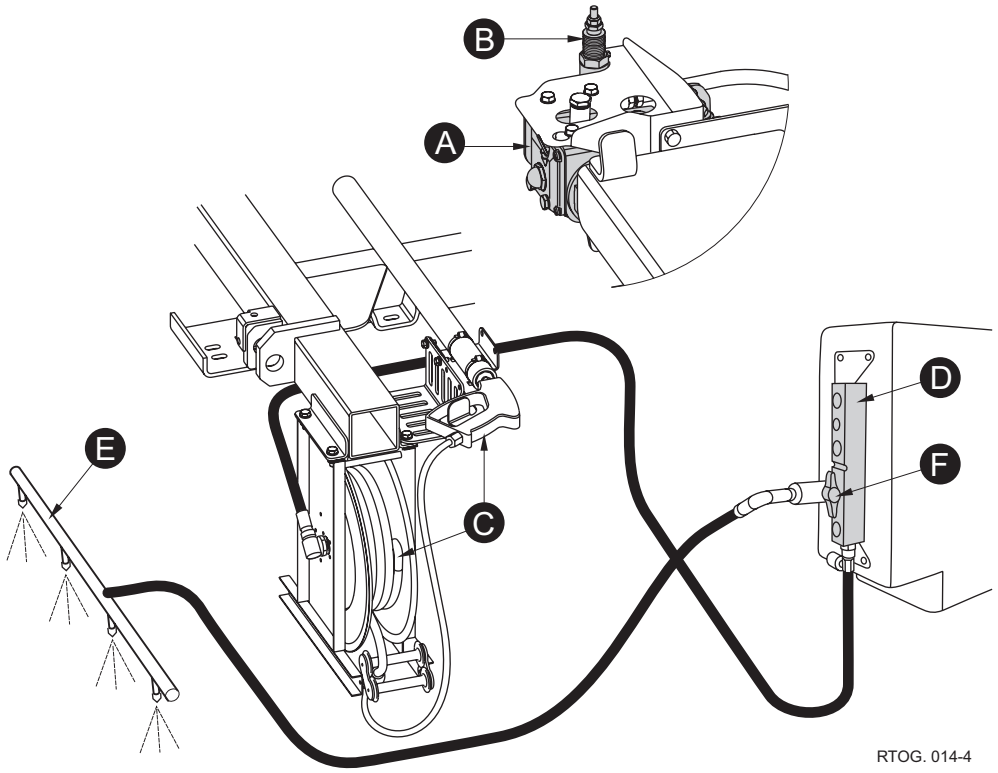


- The nozzle pressure should be 80 bar (1000PSI) max ✓
- The water temperature should not exceed 60 ºC ✓
- Do not use acid or solvent cleaning solutions ×

Alternative Methods

- Do clean with a sponge or soft cloth using cold or warm water with a soap or detergent, followed by a cold water rinse ✓

DESCRIPTION

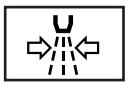


The equipment comprises a hydraulically driven high pressure water pump (A) and unloader valve (B) fitted to the subframe centre crossmember. A hand lance with 15 metres of hose on a recoiling reel (C) mounted to the subframe rear crossmember and a manifold (D) attached to the nearside water tank. An optional front spraybar (E) is available with isolating valve (F). The spraybar 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 to 2000 rpm.



Press switch (M1) on the switch panel to activate the water pump.

HAND LANCE - Remove the lance (Item 37, 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 bar is activated by an isolating valve located on the near side water tank (D). 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. Low level water switch illuminates in the cab when this occurs.#

Safety Notice

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.

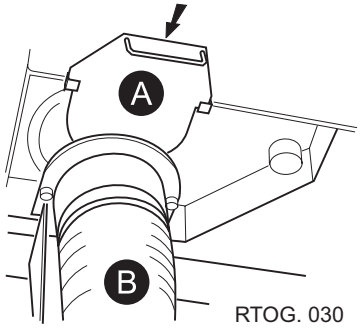
Ear defenders are recommended when working around the machine

Eye protection is recommended when working around the machine

WANDERHOSE OPTION

PREPARATION

Before using the Wanderhose it is necessary to blank off the intake hood ducting to prevent air passing into the body via the hood. 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.



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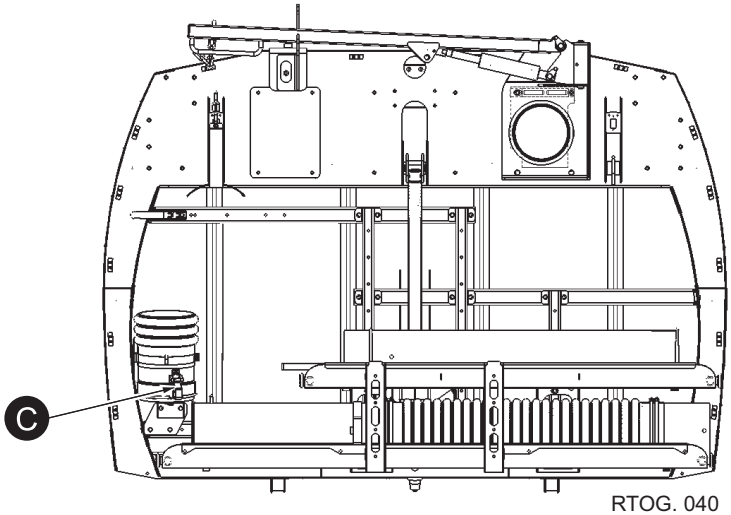


RTOG. 040

OPERATION - Once the intake duct(s) have been blanked:

1. Before using the Wanderhose, always fully open the VEG gate.
2. Raise the body and blank off suction duct
3. Switch the ECO override button, so full throttle RPM is available
4. Unclip the Wanderhose end from the option frame stowage
5. Clip on extension hose
6. Set engine RPM as required
7. Use powaboom controls to release Boom from Stowage and manoeuvre

The hose and boom are hydraulically lifted and can be used to the 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 along. The hose operator should position them self 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 - CONTROL

The Wanderhose is assembled on the previous page.

When using the controls for a single user:

1. Apply the vehicle handbrake.

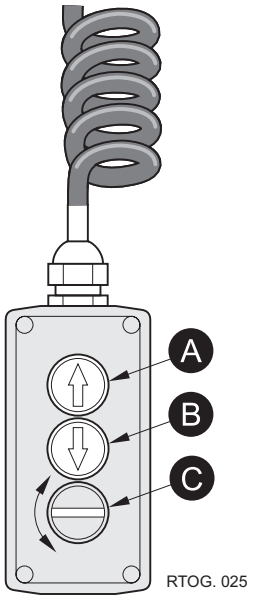
2. Press button A to raise the unit from its stowage position and rotate to the working position.

   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. Turning 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.



EMERGENCY DISCHARGE

In the event of an auxiliary engine malfunction, or discharging a load, tipping can be achieved as follows.

1. Apply vehicle brake and leave the chassis engine running.
2. Push sweeper ignition
3. Use discharge pendant to raise body or open rear door

EMERGENCY HOOD LIFT

To raise the hood without the auxiliary engine running, or if the engine malfunctions when the hood is in the working position, the following routine should be adopted to raise it.

1. Apply vehicle handbrake
2. Switch sweeper ignition off and then turn on
3. Check hood switch is in its off position
4. Push in the third position the Hood Hop button, until the hood is fully raised

CHAPTER 6

Routine Maintenance

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Safety Precautions

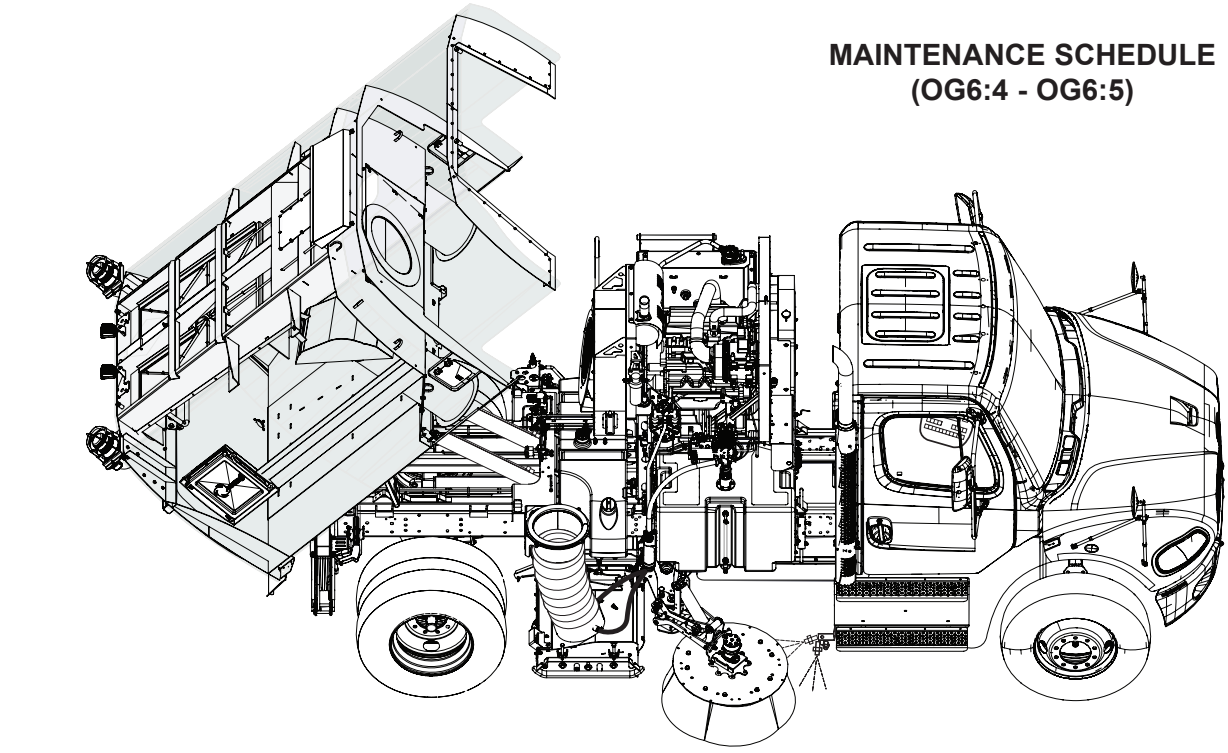
DO NOT

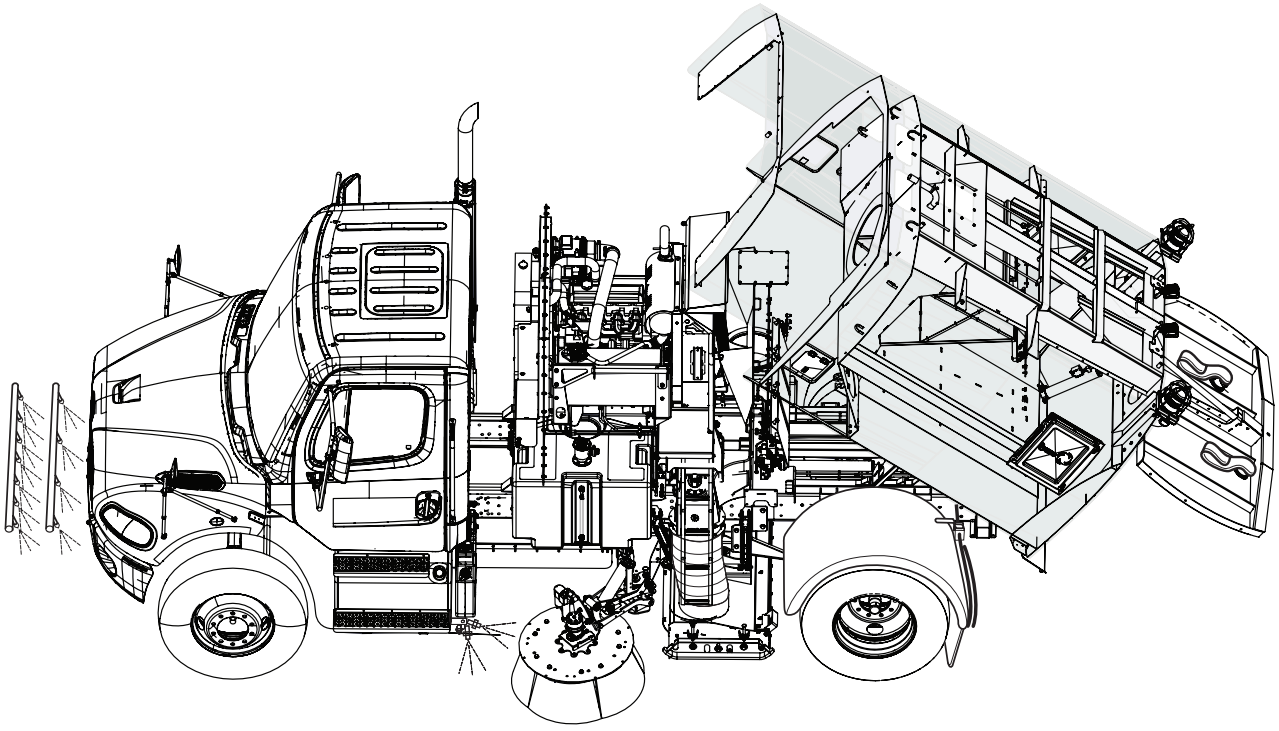
- **Work on or around the engine whilst it is running except to adjust idle settings.**
- **Remove engine radiator cap when the engine is hot, without first covering the cap with a cloth. Release it slowly, otherwise there is a risk of being scalded by escaping coolant.**
- **Touch any part of the engine 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 before working underneath the raised hopper.**
- **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 before working on any pneumatic items.**

MAINTENANCE SCHEDULE
(OG6:4 - OG6:5)





Key

D = Daily W = Weekly A = 500 Hours B = 1000 Hours C = 12 Monthly

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

RH Sweep machine shown

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 screen in body is clean and fitted correctly.
7 Mechanical damage to brush gear and report damage to Supervisor.
8 Brushes for adjustment and wear - adjust or replace as required.
9 Spray jets for correct operation - clean if necessary.
10 With the nozzle (pick-up head) lowered, check nozzle (pick-up hood) suspension springs for proper tension. The springs should be tensioned just enough to allow the skids to lightly contact the road surface. If the spring tension is inadequate, the hood will drag heavily on the road surface, resulting in premature skid wear.
11 Check channel brush(es) (gutter brooms) for proper adjustment. The brush angle should be set using the adjuster bolts so that only about 120^{o} of the circumference towards front and kerbside is in contact with the road.
12 Oil/water/fuel leakages.
13 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 Suction fan impeller, wear plate hood and optional intake flap for wear, renew if necessary.
5 Routing of electrics and hydraulic services for chafing.
6 Lubricate all grease points - see lubrication chart later in this chapter.
7 Water pump suction filters.
8 Oil level and condition in Supawash pump if fitted.

MAINTENANCE SCHEDULE (Continued)

♠ Service A - every 500 hours

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 correct operation of jets and any plunger seal leakes. 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 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.

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

EQUIPMENT ADJUSTMENT / MAINTENANCE

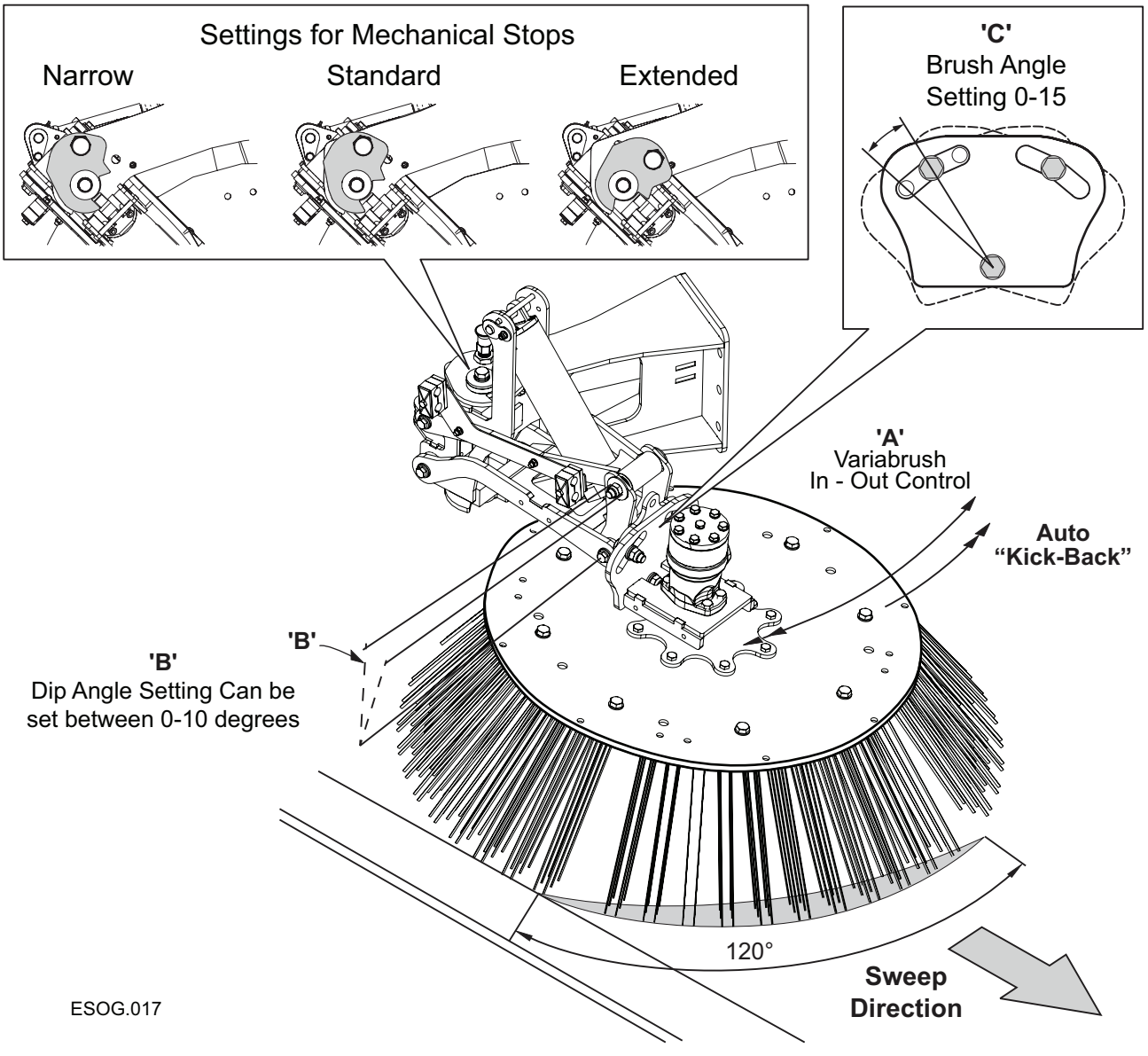
Introduction

This chapter highlights some of the basic adjustment and maintenance procedures required to keep the machine performing efficiently.

Gutter Broom Adjustment

This section highlights the Gutter Broom adjustment. The machine can sweep with single brush, kerb (nearside) or offside (road side) or simultaneously brushes working. When the offside is deployed its important to set the brush close into the chassis by using either the mechanical stop or the Variabrush control. Maintain a visual eye on its position when sweeping so as to avoid other road traffic.

The Gutter Broom(s) are supported on a forward facing arm that is controlled by its lifting cylinder, which allows for 'float' and 'light sweep' (Powasave) ground pressure control. The Gutter Broom head drives itself out to the stopped position (variable) by the action of the rotating brush on the ground.



The brush angle should be set using adjustment (C) and (D) so that only about 120° of the circumference towards the front kerb is in contact with the road.

If a 'light sweep' brush pressure is set, then the brush may not position itself outwards. In this case reset the 'light sweep' regulator for a lower pressure. The brush pressure can be adjusted by the Variabrush feature (A) allowing the brush to be brought forward, (recommended for the off side brush when deployed) or outwards to position the brush for its best sweeping position. This is a very useful feature when sweeping between trees, driveways and other items, as you can move the brush quickly in and out to any position, maintaining the chassis in a straight line.

The brushes have automatic 'kick-back' should they come into contact with an object during the sweeping mode. The head does have a 'dip angle' to maintain optimum brush angle. This can be adjusted as shown below.

Channel Brush Replacement

Safety Notice

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.

Isolate the chassis engine. Turn off the air at the filter regulation unit (item 2 on lubrication diagram). Pull the channel brush arm out to the working position.

The brush segmented heads are held to the top plate by 2 off 5/8" bolts per segment (8 in total), or 4 off 3/8" bolts (16 in total). Loosen these bolts and remove each segment at a time, replacing with new filled segments as you go.

In this way the brush top drive plate will remain level during the removal and refitting. Whilst refitting the brush segments check to see that no wire or tine material has been caught up under the brush top plate. Remove as required.

Good quality brush segments are recommended.

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

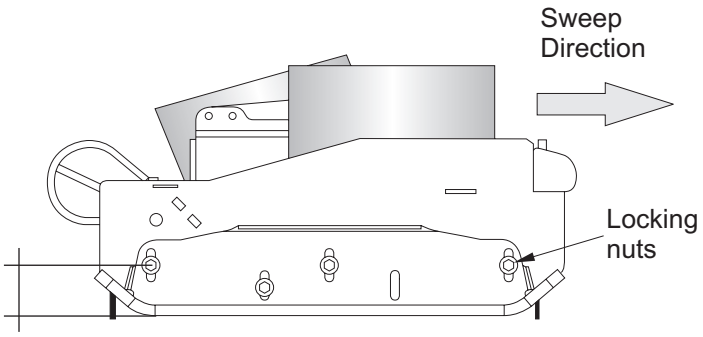
Pick-up Hood

The pick-up hood is towed by 4 chains positioned at the front and rear. This allows the machine to sweep forwards and backwards, as the pick-up hood will be guided during the travel mode. The pick-up hood is lifted by two hydraulic cylinders, one either side that connect directly to the head. The positive hydraulic check valve system will support the nozzle in the stowed position during transit. Additional chains are located at the lift point and anchored to the chains support to prevent excess sideways movement during sweeping.

Pick-up Hood Skate System

The pick-up hood runs on adjustable side skates that are carbide faced to improve wear. The water system provides for front under skate lubrication on dry days for the carbide faces. These skates are non handed and are mounted to the hood side plates by three locking nuts and one bolt that locates into the rear side assembly skate.

The initial setting of the skate is on the centre line of the skate side slots and the skate can be lowered as it wears by moving the skate down into the slots. Re-tighten firmly the three locating nuts and the locating bolt. The skate adjustment is mainly for wear, but you can set the front of the pick-up hood higher to allow for a larger opening when sweeping bulky items such as leaves. The rear of the side skate should retain the rear setting of the internal rubber so as to maintain a close contact to the road surface.



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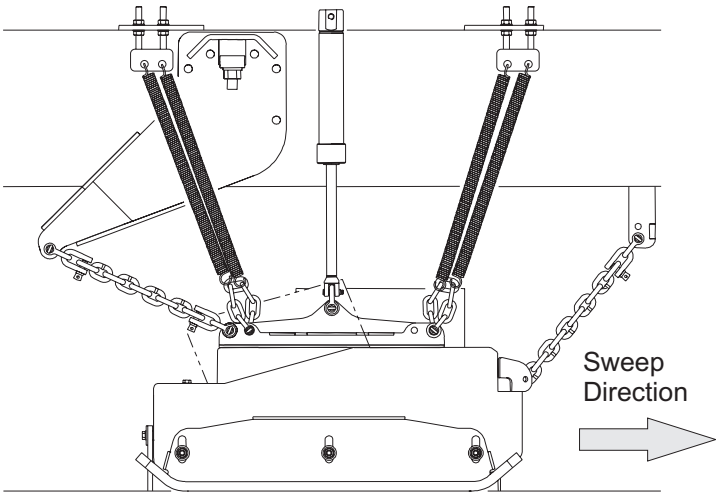
Pick-up Hood Suspension

The pick-up hood is suspended on eight springs, four each side, two at the front and two at the rear. These are set to reduce the weight of the pick-up hood on the ground and will reduce marking of the ground surface. The initial setting ex-factory should suit most conditions and provides for a light (downward) force to seal the hood via its internal flaps whilst working under the suction pressure.



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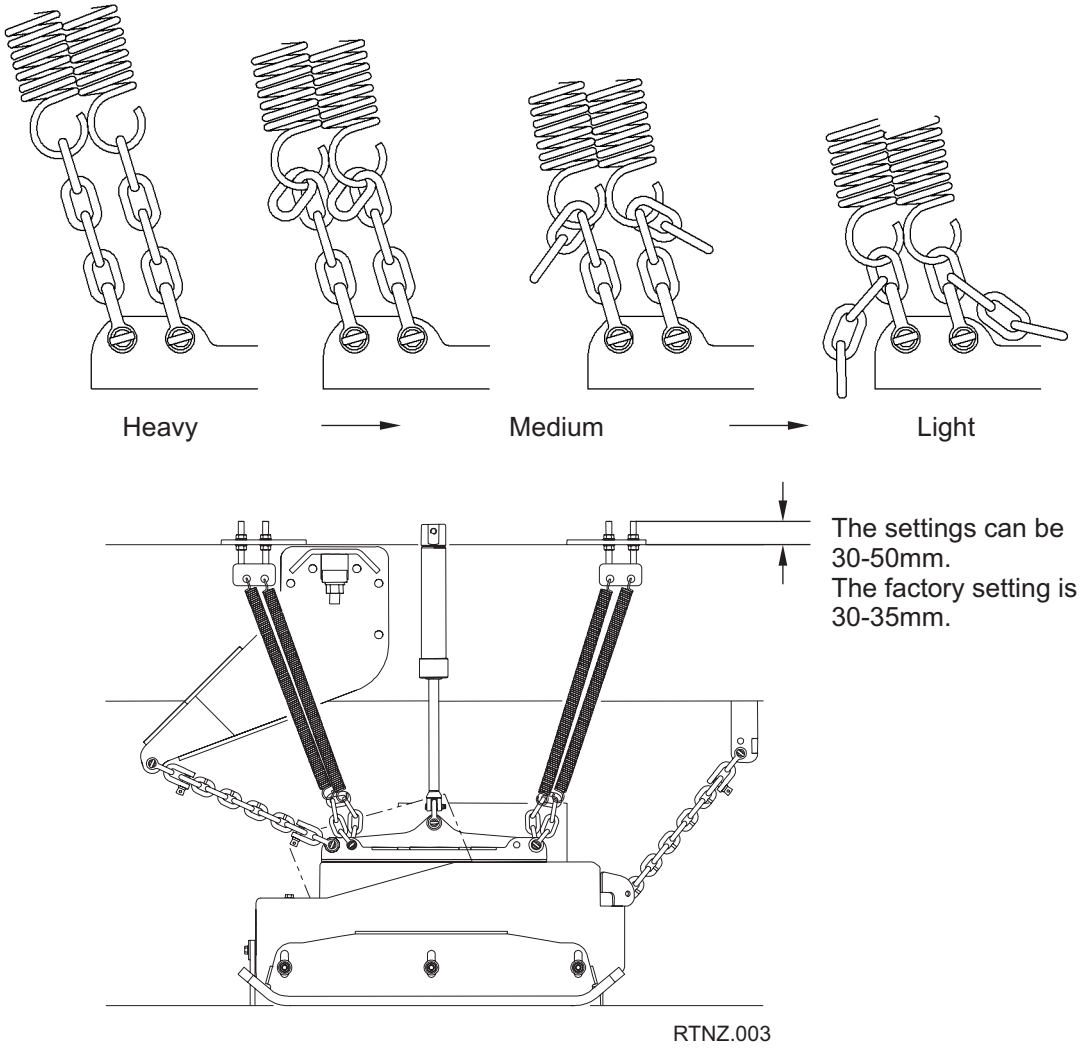
Spring Adjustments

The springs locate to the hood via chains which allow for adjustment by resetting the chain length. The chains length can be set longer by locating the spring into a longer chain loop to create a heavier force to the ground where needed.

The machine ex-factory is set for light sweeping with one chain link spring connection. Once set this does not normally need to be adjusted.



By moving the spring support upwards to 50mm you can tension the springs to fine adjustment. The initial factory setting is 30 - 35mm. Both sides on the pick-up hood should be adjusted in the same way, although subject to road camber you might want to alter these settings to suit conditions.

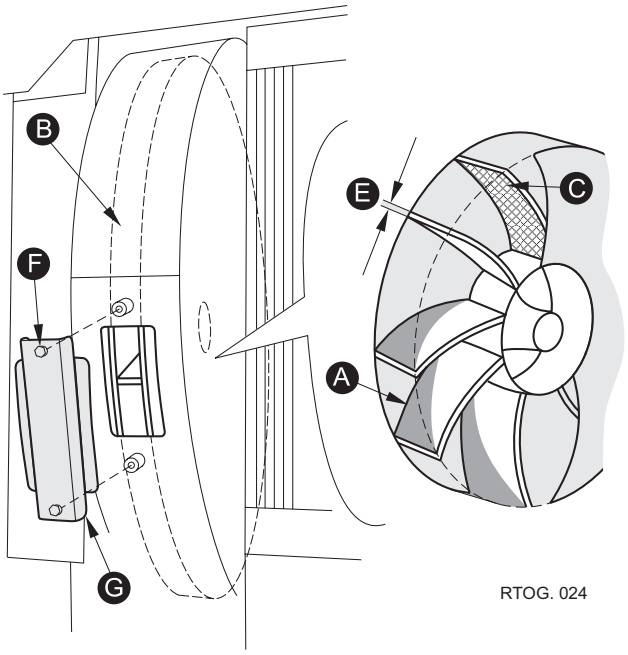
Always try to set the pick-up hood to the lightest ground pressure.

Suction Fan Impeller and Casing

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

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.

Remove the 2 setscrews (F) and remove the inspection plate (G). The impeller blades can be seen through the inspection port and the blades cleaned with a scraper (part no. 283665-1) if required.



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. Refit the inspection plate securely after inspection / cleaning.

Filter Screens and Roof Duct

The body filter screen (Item 15, Fig.1) and roof duct must be kept clean, otherwise suction performance can be affected. The screen can be cleaned in situ, but it is preferable to remove it.

The fan impeller is finely balanced as an assembly in manufacture.
NEVER remove or replace the hub, or carry out repairs to it.

To remove, release the linch pin, 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. Also hose out the roof ducts to ensure they are clean while the filter screen has been lowered.

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 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 the 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 linch pin.

Water Filter - Cleaning

The water filter (Item 27, Fig. 1) for the low pressure pump is on the near side of the machine. The filter is equipped with an integral shut off valve to prevent the water tank from draining should the filter need dismantling for cleaning whilst there is still water in the tank.

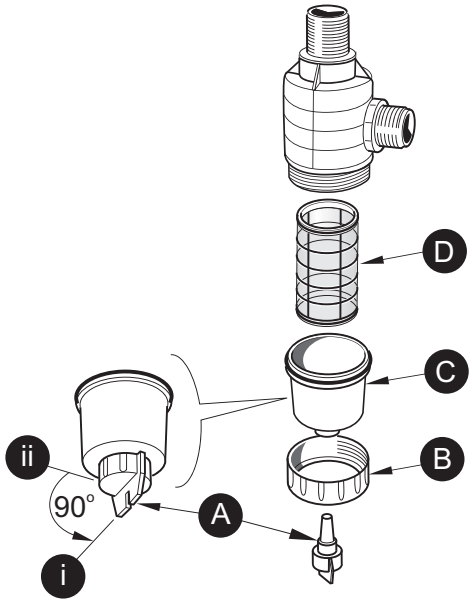
1 Before dismantling the filter, activate the shut off valve actuator (A) located on the bottom of the filter. It has a bayonet type mechanism. Press up and turn anti-clockwise to position (i) to shut the valve.

2 To access the filter element, unscrew securing ring (B) and remove body section (C), complete with 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 up and turn clockwise to position (ii) to open the valve ready for use.



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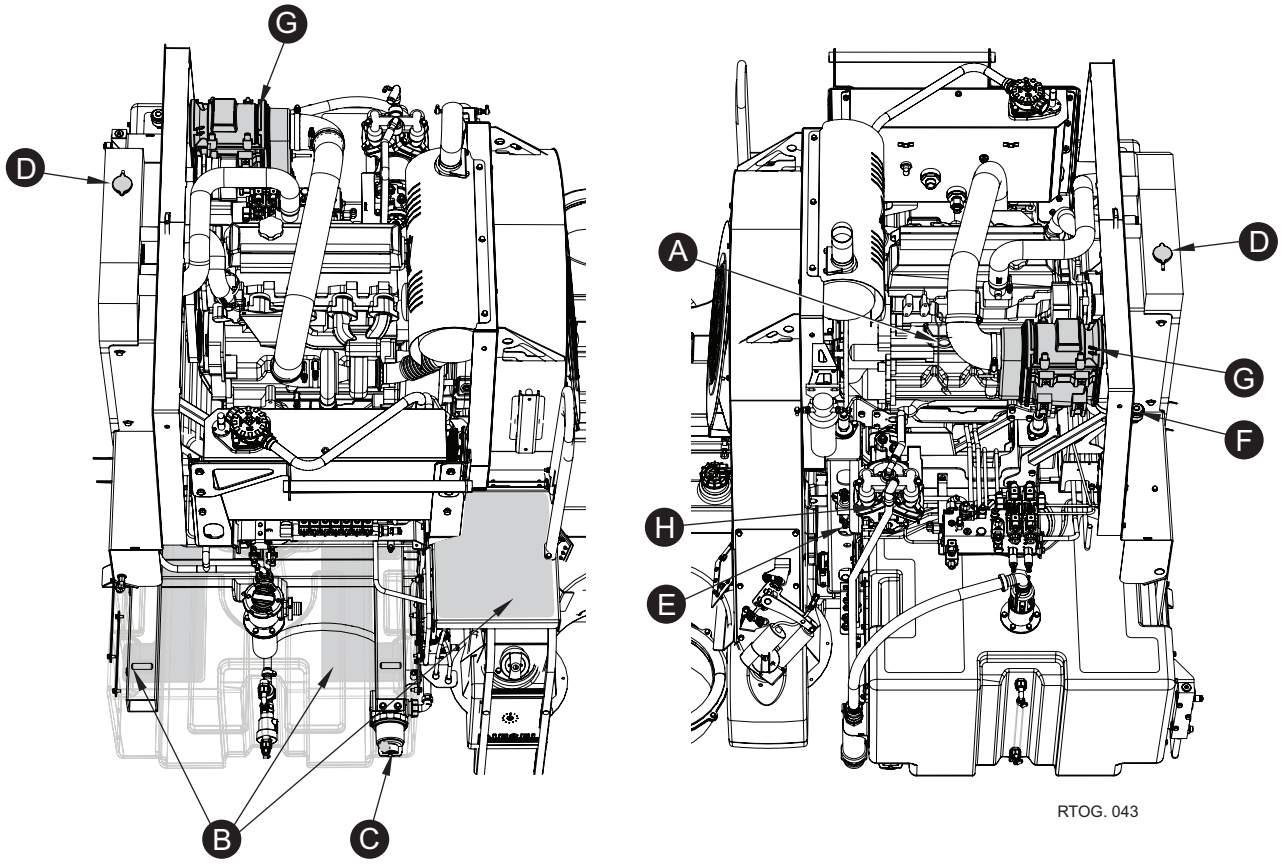
If Supawash is fitted there will be additional filter that feeds the Supawash pump.

AUXILIARY ENGINE

Safety Notice

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 right hand side of the engine 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 specified in the Maintenance Schedule. Oil specifications are shown in the lubrication diagram - see later in this chapter. The oil is best drained whilst warm via the remote drain plug **(C)**.

Cold Weather Precautions

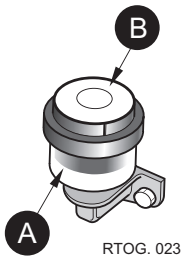
The cooling system **(D)** must be filled with equal quantities of antifreeze and water to maintain a minimum concentration of 50%, i.e. -39°C. Any top ups must therefore be done with a 50% mixture of antifreeze and water. The concentration level should be checked at the 500 hour service interval as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

Filter Regulator Unit (E)

The filter regulator unit 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 (F)

A filter restriction indicator 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.



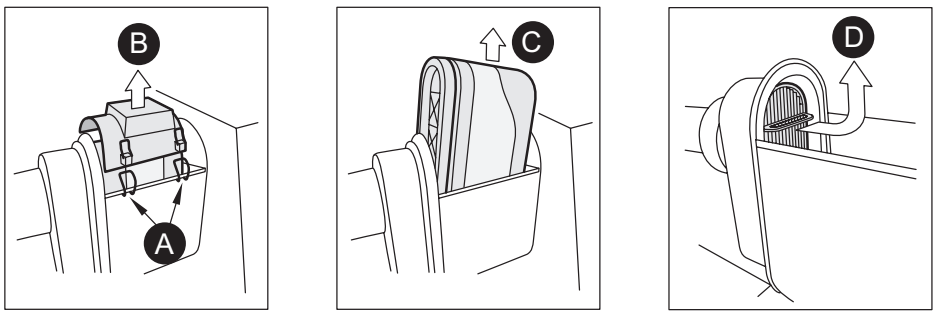
RTOG. 023

Safety Notice

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.

Air Cleaner (G)

The air cleaner should only be serviced when the restriction indicator is showing red, the air cleaner elements must be cleaned and replaced at the intervals given in the Maintenance Schedule.



RTOG. 019-1

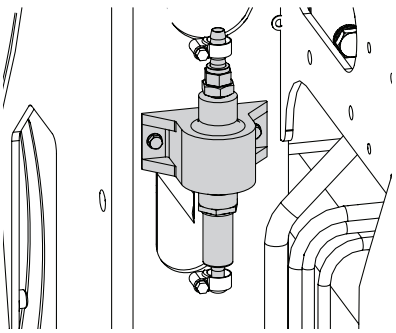
Lift the retaining clips (A) to remove the lid (B). Remove the main filter element (C) by first pushing the filter down and tilting it towards the radiator and then lift it out. There is a small safety element (D) within the main filter body, this should be replaced every third time the main element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

Fuel Lift Pump (H)

The John Deer engine requires an additional electrical lift pump for the fuel.

The lift pump is constantly self-priming, and has a non-return valve fitted to stop dry priming. The pumps are voltage related, 12V (7031889) 24V (7044661). 12V shown.

When the chassis ignition is on, the pump will tick as it is constantly pumping. If it is not ticking, turn the ignition off, wait 1 minute, and retry. If it is still silent, and the engine is not working, the pump has failed. Replace the pump.

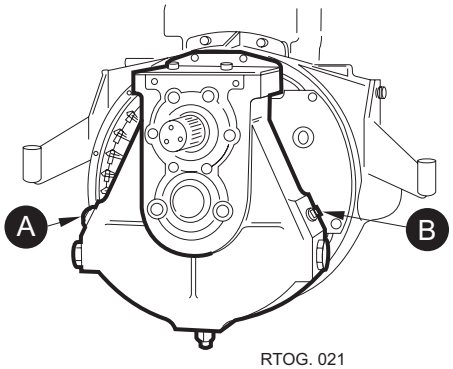


Alternator and Water Pump Belt Tensioning

The John Deere engines have an automatic belt tensioner so should not require adjustment unless the belt is replaced - see engine manufacturers handbook for setting information.

'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.



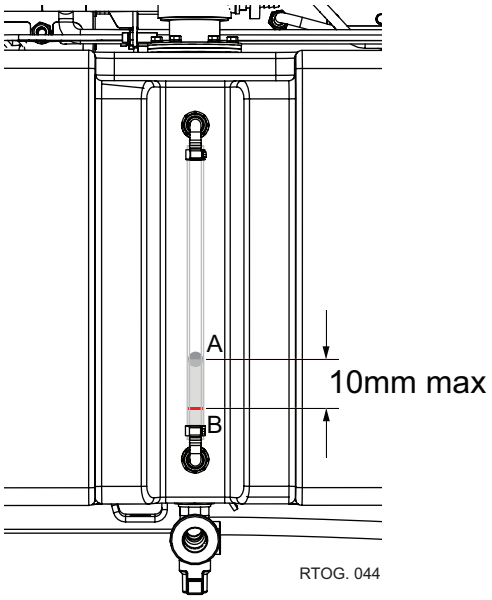
RTOG. 021

OIL CHANGING
Change the oil after the first 50 hours operation, thereafter at 1600 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

Checking Oil Level

Raise the body and engage the body prop in its highest position. The level **(A)** should be 10mm 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. The recommended oil is shown in the lubrication chart at the end of this chapter.



RTOG. 044

CYLINDER MAINTENANCE

Periodically inspect the cylinder rods for damage, blemishes or build up of material such as tar, cement, paint etc. 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

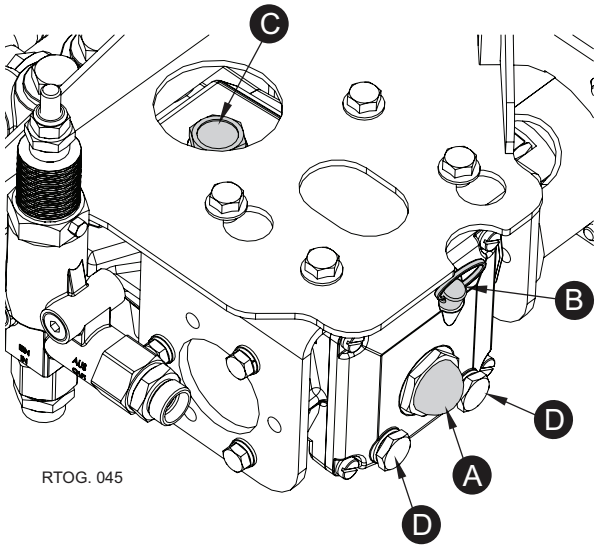
The oil level in the Supawash pump should be checked weekly. There is a sight level glass and dipstick at the front end of the pump.

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

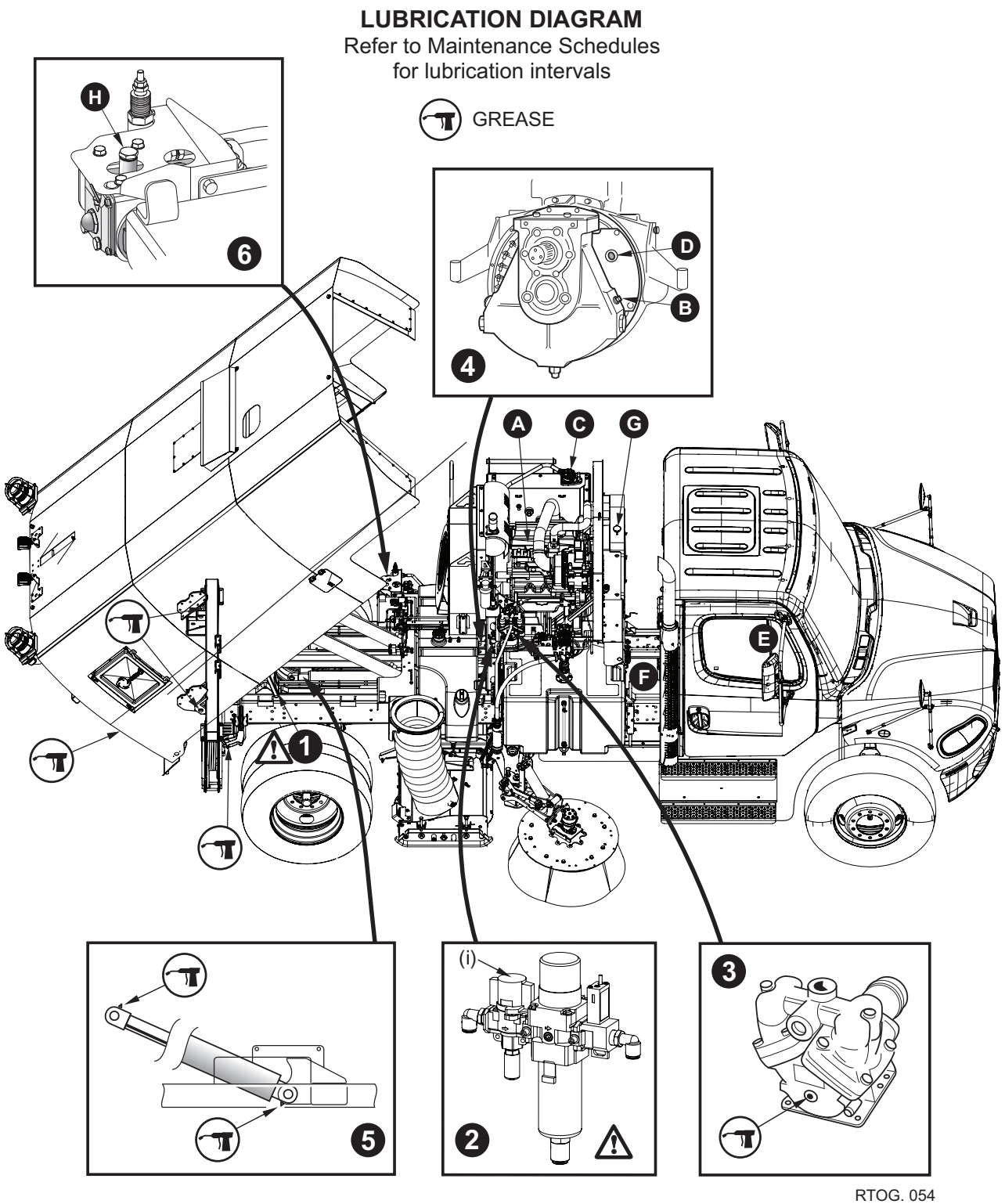
Oil Level / Changing

The water pump is mounted on the offside end of the central crossmember near to the tip rams.

The pump oil level should be checked weekly and is visible through window 'A' and a dipstick 'B' is provided with high and low level marks. The oil is introduced via filler port 'C'. The pump oil is drained via either of plugs 'D'. The oil colour should be clear, if it is frothy/milky when seen through window 'A', 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 - RH SWEEP MACHINE SHOWN



RTOG. 054

1 Body prop - **Ensure autoprop has engaged when body is raised.**
2 Filter regulator unit (FR) - (i) Isolation valve.
3 Water pump.
4 'Z' drive gearbox.
5 Body tip cylinders.
6 Supawash pump - option.

RT655 Approved Lubricants			
	Capacity/ ISO Oil Grade	**Johnston Part No.**	**Fuchs**
A Engine	8.0L/ ACEA E3 - E5	94-23-5	Titan Cytrac HSY 75W -90
B Gearbox **H** Supawash Pump	2.50L 0.37L - GL 4	63684-5	-
C Hydraulic System/ **D** Fluid Flywheel	80L 4.85L	39677-5	-
E Chassis PAS **F** Auto Gearbox	-	94-67-1	-
G Antifreeze 	15L	39664	-
Grease Nipple	-	94-69	-
Battery Terminals	-	**PETROLEUM JELLY**	
The above oils are those approved by Johnston Sweepers. Other manufacturer's oils must be of equivalent grade.			

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
ES351, 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

Clive Offley
Engineering Director
Johnston Sweepers Ltd.
20/07/2015

TMS Issue : 17 - GB

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

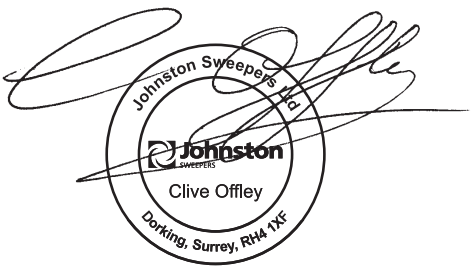
Manufacturer's Name:	Johnston Sweepers Limited
Manufacturer's Address:	Curtis Road, Dorking, Surrey, RH4 1XF, England.
Technical Documentation maintained by:	Research and Development Department, Johnston Sweepers Limited, Curtis Road, Dorking, Surrey, RH4 1XF, England.

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 RT655 chassis-mounted powered air regenerative sweeper, with HP turbo-charged auxiliary engine pack.
Maximum Measured Sound Power Level (L_{WA}):	**107dB(A)**
Guaranteed Maximum Sound Power Level (L_{WA}):	**108dB(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 2006

Signed by:
Clive Offley
Engineering Director
Johnston Sweepers Ltd



RT655 Issue: 01 - GB

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