Johnston

Johnston
Sweepers Limited



# Operator's Guide

## CN201 & CX201
## Suction Sweeper

Part No
7018550
(GB)

Revision Level F

(VM  Euro 5 & Stage 3a)



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# Foreword

The Johnston CN201, CX201 Compact Sweeper represents the highest grade of craftsmanship and reliability that makes Johnston a 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, 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 auto hopper safety prop.
4. Correct use of seat controls and steering column adjustment.
5. In-cab controls - various switch functions and controls.
6. External controls.
7. Front brush setting, adjustment and changing.
8. Nozzle height setting operation, reverse lift function and Powathrust switch.
9. Daily and weekly maintenance items.
10. Sweeping bulky items, i.e. bottles and cans.
11. The correct way to mount and dismount kerbs.
12. Load discharge.
13. Driving/operational assessment.
14. End of day cleaning, rear mesh and water drainage screens.

Johnston Sweepers 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 may be found in the Parts Manual, which shows and lists hardware, and availability of spares with the orientation and positions of the various components.

Abbreviations Used :

| | | | | | |
|---|---|---|---|---|---|
| LH | = | Left Hand | L | = | Left |
| RH | = | Right Hand | R | = | Right |

## Safety Notice

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

## Warning

**The use of CB radios and other electrical equipment in the sweeper should be properly suppressed (EMC) to prevent the possibility of interference with the sweepers electronic systems**



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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## Page Issue Levels

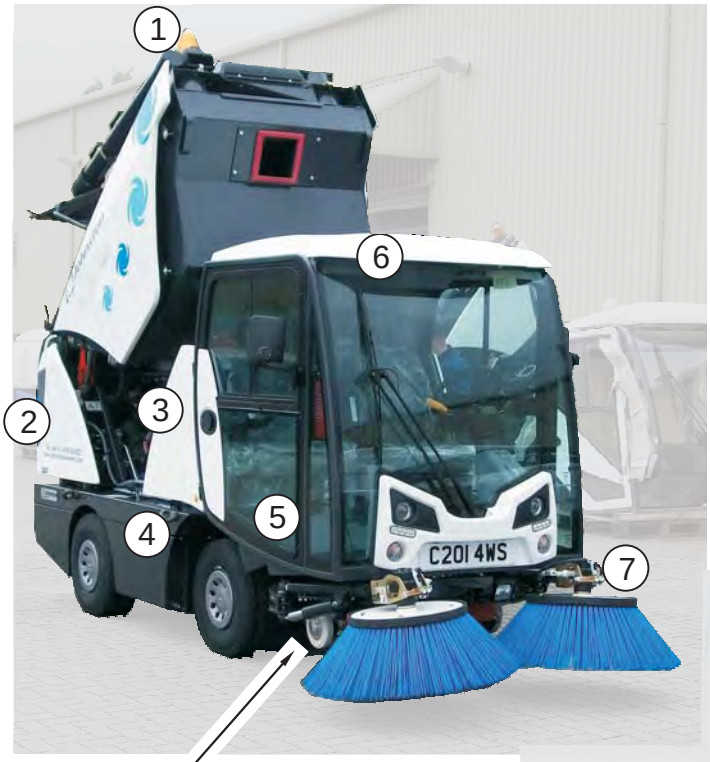
| Page | Issue | Changed | Page | Issue | Changed |
|---|---|---|---|---|---|
| Front Page | F | Y | Foreword 1 | A | |
| Foreword 2 | A | | Foreword 3 | F | Y |
| 1:1 | A | | 1:2 | C | |
| 1:3 | A | | 1:4 | A | |
| 2:1 | A | | 2:2 | C | |
| 2:3 | C | | 2:4 | A | |
| 2:5 | C | | 2:6 | C | |
| 2:7 | C | | 2:8 | C | |
| 2:9 | C | | 2:10 | C | |
| 2:11 | C | | 2:12 | B | |
| 2:13 | C | | 2:14 | A | |
| 3:1 | E | | 3:2 | F | Y |
| 3:3 | C | | 3:4 | A | |
| 3:5 | C | | 3:6 | C | |
| 3:7 | C | | 3:8 | A | |
| 3:9 | C | | 3:10 | C | |
| 3:11 | A | | 3:12 | C | |
| 3:13 | E | | 3:14 | E | |
| 4:1 | C | | 4:2 | A | |
| 4:3 | F | Y | 4:4 | F | Y |
| 5:1 | A | | 5:2 | A | |
| 5:3 | A | | 5:4 | C | |
| 5:5 | C | | 5:6 | C | |
| 5:7 | C | | 5:8 | C | |
| 5:9 | A | | 5:10 | A | |
| 5:11 | C | | 5:12 | A | |
| 5:13 | A | | 5:14 | A | |
| 6:1 | A | | 6:2 | A | |
| 6:3 | D | | 6:4 | F | Y |
| 6:5 | Y | Y | 6:6 | F | Y |
| 6:7 | A | | 6:8 | F | Y |
| 6:9 | A | | 6:10 | E | |
| 6:11 | A | | 6:12 | F | Y |
| 6:13 | C | | 6:14 | A | |
| 6:15 | A | | 6:16 | A | |
| 6:17 | A | | 6:18 | A | |
| 7:1 | C | | 7:2 | C | |
| 7:3 | C | | 7:4 | C | |
| 7:5 | C | | 7:6 | C | |

CHAPTER 1

# General Arrangement

## Table of Contents

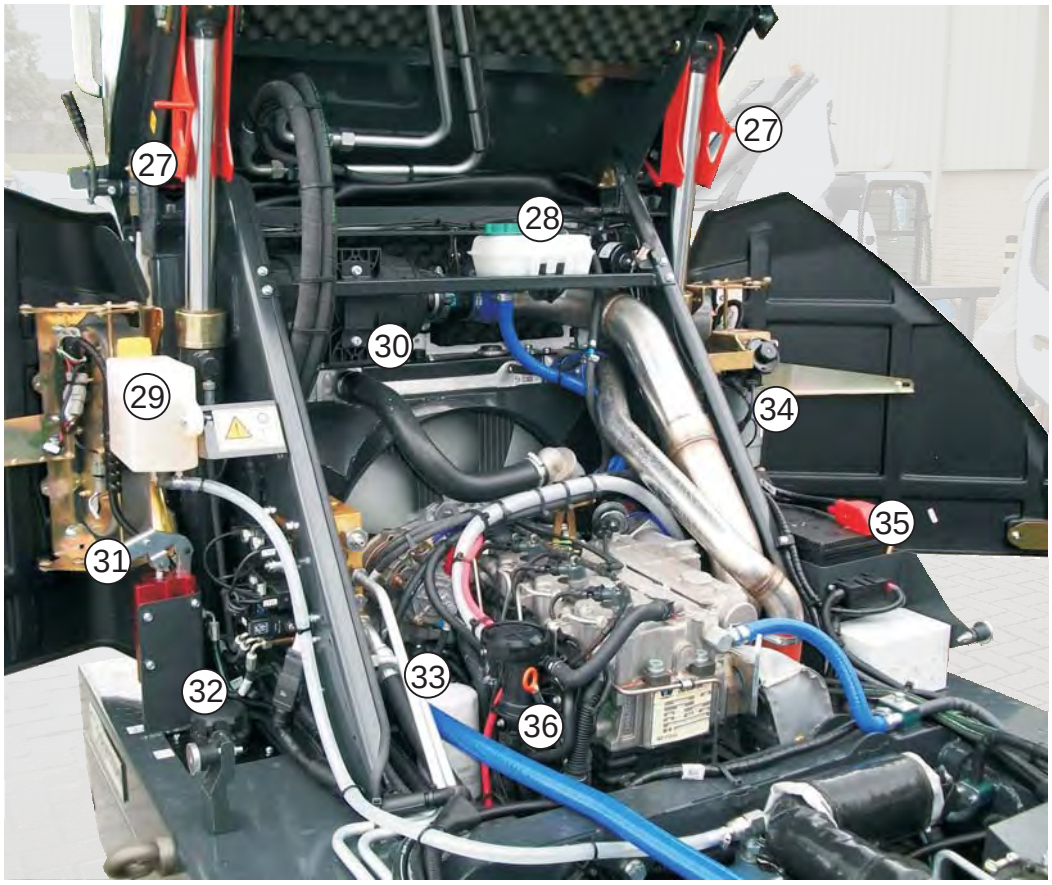
## General Arrangement - Exterior

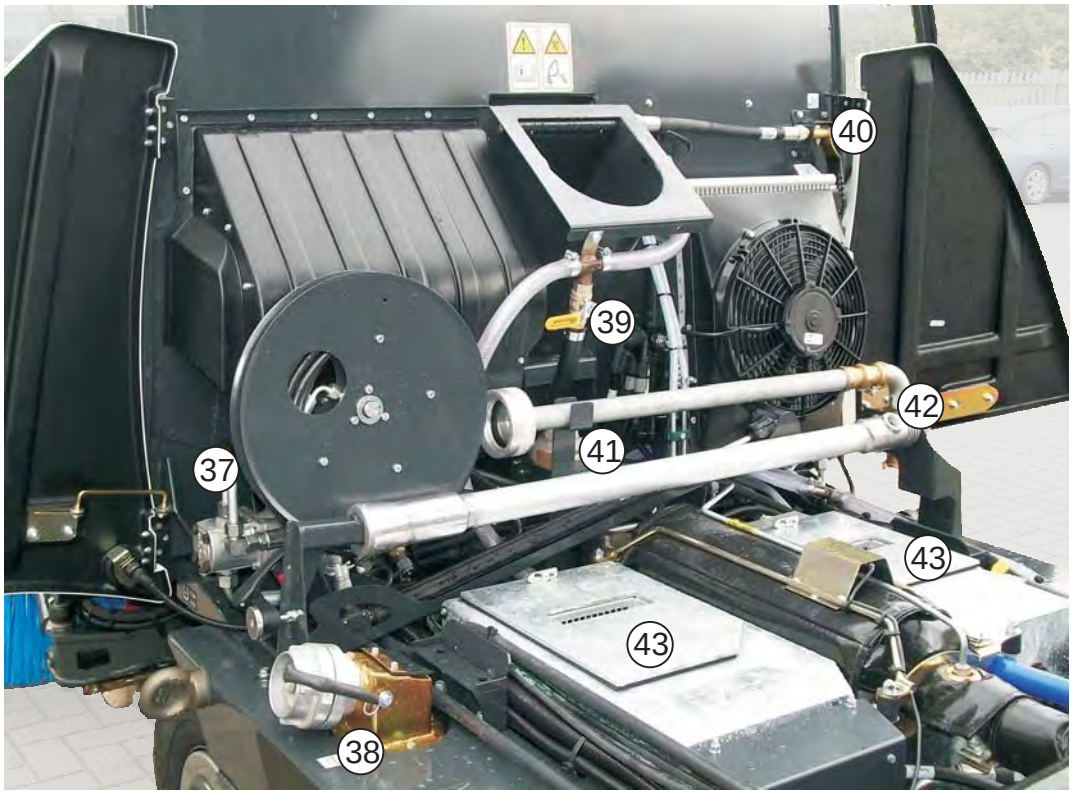





| | |
|---|---|
| Wheels & Tyres: | Front 6.50 R10<br>Rear 225/75 R10 |
| Pressure: | Front 6.2 bar (90 psi)<br>Rear 5.75 bar (83.5 psi) |
| Wheel Nut Torque: | 250 Nm (180 lb.ft) |

## General Arrangement - Hopper and Engine Compartment



## General Arrangement - Component Key

1. Beacon
2. Rear Side Cover (both sides)
3. Front Side Cover (both sides)
4. Securing Eye (x4)
5. Tool Kit

6. High Level Worklamps
7. Water Spray Jets
8. Headlights
9. Daytime Running Lights
10. Indicator Lights

11. Front Towing Eye
12. Low Level Worklights
13. Suction Nozzle
14. Suction Fan Inspection Cover
15. Recirculation Water Tank Filler

16. Suction Fan
17. Wanderhose
18. Hopper Mesh Baskets
19. Recirculating Water Filter Screens
20. Sludge Drainage Channels

21. Hopper Door Lever
22. Rear Strobe Lights
23. Rear Arrowboard
24. Radiator
25. Hydraulic Tank Level Gauge

26. Rear Grille / Working Platform
27. Hopper Safety Props
28. Engine Coolant Reservoir
29. Transmission Oil Reservoir
30. Engine Air Cleaner

31. Hopper Lift Emergency Pump
32. Hydraulic Tank and Filler
33. Transmission Oil Filter
34. Fuel Filter
35. Battery

36. Engine Oil Dipstick
37. Supawash
38. Side Water Tank & Filler
39. Nozzle Duct Water Supply Valve
40. Nozzle Duct Blanking Flap Lever

41. Brake Fluid Reservoir
42. Hydrant Equipment
43. Recirculation Water Tank Access Covers / Filters

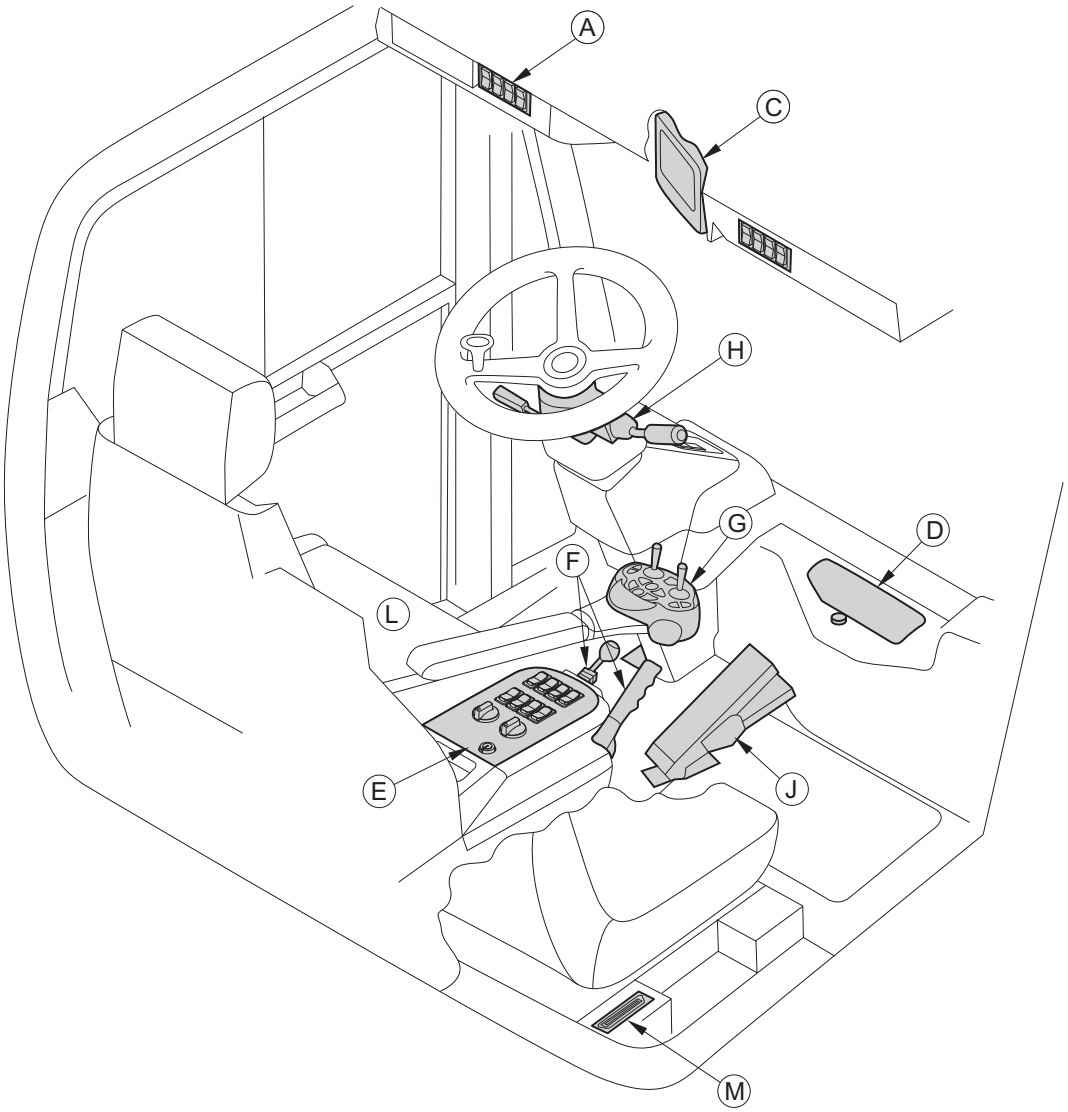
CHAPTER 2

# Controls

## Table of Contents

## In-Cab Operating Controls

### General Layout




**Key**

A - Overhead Console

C - Johnston Visual Module (JVM)

D - Front Centre Console

E - Rear Centre Console

F - Handbrake / Dump Valve Levers

G - Arm Rest Controller

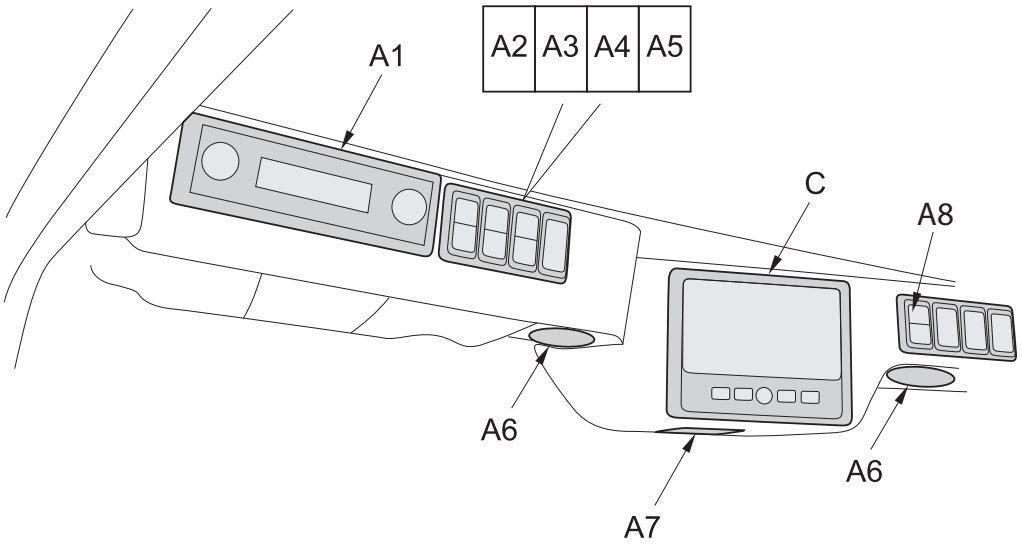
H - Steering Column

J - Foot Controls

L - Driver's Seat Adjustment

M - OBD Port

## Overhead Console - A




| Symbol | Switch | Description |
|---|---|---|
| | A1 | Radio/MP3 Player |
|  | A2 | Head/Side Lights. |
|  | A3 | Rear Fog Lights. |
|  | A4 | Worklights. |
|  | A5 | Heated Windscreen. |
| | A6 | Speakers. |
| | A7 | Interior Light. |
|  | A8 | PTO Function - Gritter / Spreader **<br>First position; off.<br>Second position; activates gritter/spreader when travelling in a forward direction only.<br>Third position; activates gritter/spreader continuously.<br>Note: Functions only with work mode engaged. |
| | C | Johnston Visual Module - JVM (see next page). |
| | | ** Optional Winter Equipment |

## Johnston Visual Module (JVM) - C

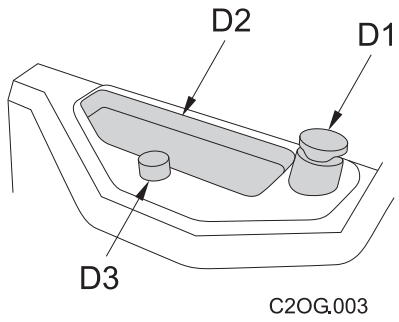

| Symbol | Switch | Description |
|---|---|---|
| | C1 | Brake Failure Warning |
| | C2 | *Not used.* |
| | C3 | Engine Fault |
| | C4 | OBD Emission Fault |
| | C5 | Engine Pre-Heating |
| | C6 | Handbrake Warning Light |
| | C7 | Main Beam |
| | C8 | Side Lights |
| | C9 | Direction Indicators |
| | C10 | Rear Fog Lights |

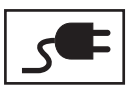
### Johnston Visual Module (JVM) - C

| Symbol | Switch | Description |
|---|---|---|
| | C11 | USB Port. |
| | C12 | Soft key F1. |
| | C13 | Soft key F2. |
| | C14 | Rotary / push-button control. |
| | C15 | Soft key F3. |
| | C16 | Soft key F4. |

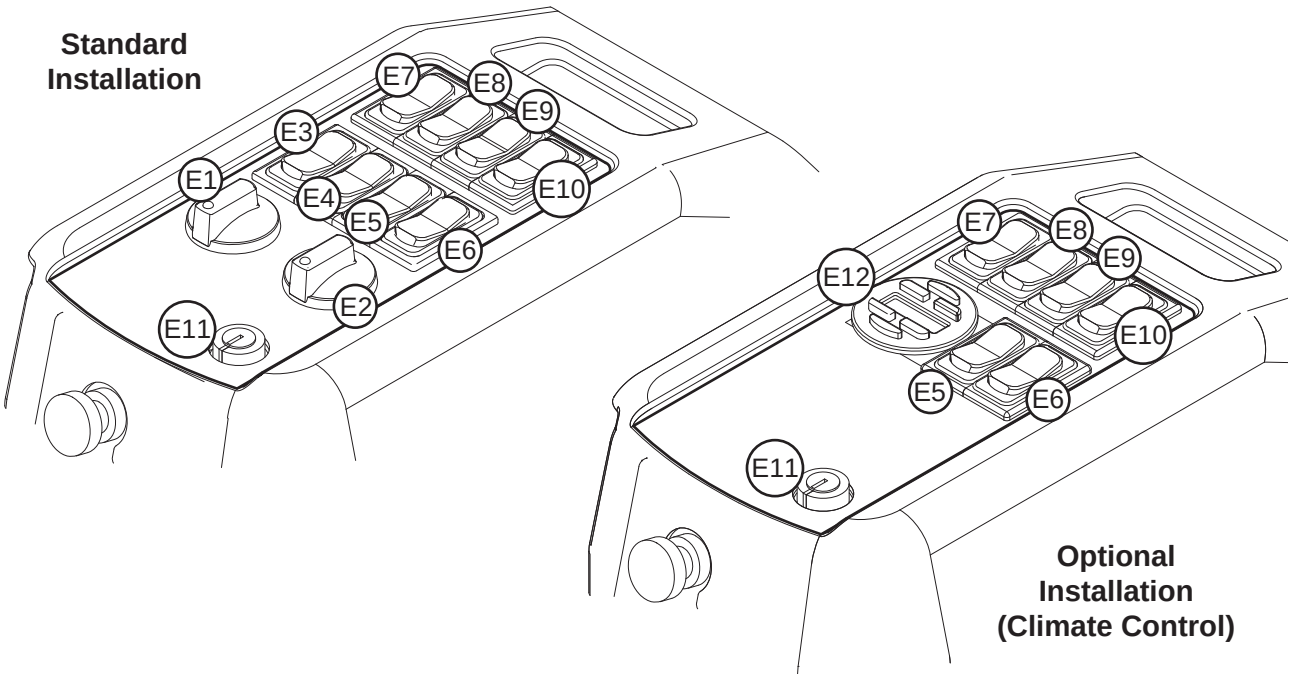
For detailed information on JVM display functions/operation refer to Chapter 5.

### Front Centre Console - D



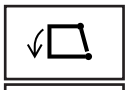
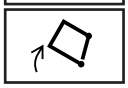
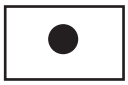

| Symbol | Switch | Description |
|---|---|---|
|  | D1 | Windscreen washer bottle. |
| | D2 | Pen tray. |
|  | D3 | Auxiliary power socket. |

## Rear Centre Console - E



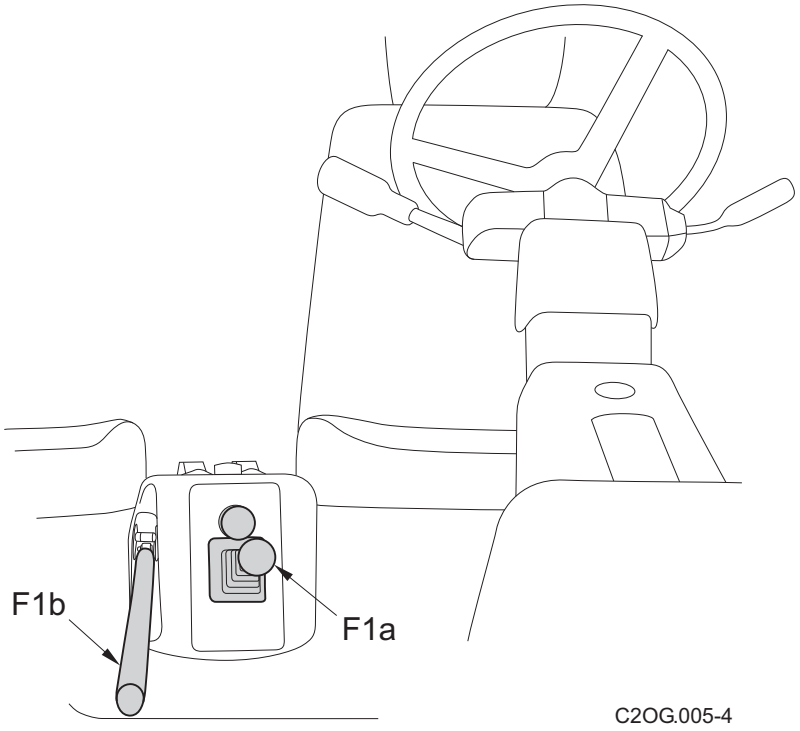

| Symbol | Switch | Description |
|---|---|---|
| | E1 | Heater valve - rotate the valve anticlockwise to achieve warm air and clockwise for colder air. |
| | E2 | Air distribution - recirculate/fresh. |
| | E3 | Heater fan - 2 speed - to optimise heater performance open/close diffusers as required. |
| | E4* | Air conditioning ON / OFF. |
| | E5* | High pressure washer - pressing switch activates water pump to allow use of handlance located behind the rear of the cab. |
| | E6* | 4WS - When switch is selected the vehicle will automatically enable/ disable 4WS when transit/work mode is selected. Therefore 2WS functionality will be enabled as required. (patent pending) |
| | E7 | Water sprays - first position activates sprays with fan and brushes. Second position will immediately activate water sprays. |
| | E8 | Suction fan - may be used with wanderhose when nozzle duct is blanked with flap. May also be used at any time during sweeping operations to run the fan. |

* Optional Equipment

| Symbol | Switch | Description |
|---|---|---|
|  | E9 | Beacon. |
|   | E10 | Hopper raise/lower - pressing switch forwards raises tank backwards lowers hopper. |
| | E11 | Ignition switch - ACC - Accessory position, enables radio to operate whilst engine is switched OFF.<br>ON - Turn ignition ON, use switch H2b to start engine. |
| | E12* | Climate Control; |
|  | | Recirculation - Press for more than one second to display external temperature for six seconds. |
|  | | Airflow - Press to increase / decrease airflow as required. |
|  | | Temperature - Press to increase / decrease temperature as required. |
|   | | Press for five seconds to change compressor state between 'AC' or 'ECON'. |
| | | * Optional Equipment |

## Handbrake / Dump Valve Lever - F

| Item | Description |
|---|---|
| F1a | Handbrake |
| F1b | Dump valve lever |




To release the handbrake in an emergency if the engine is inoperative;

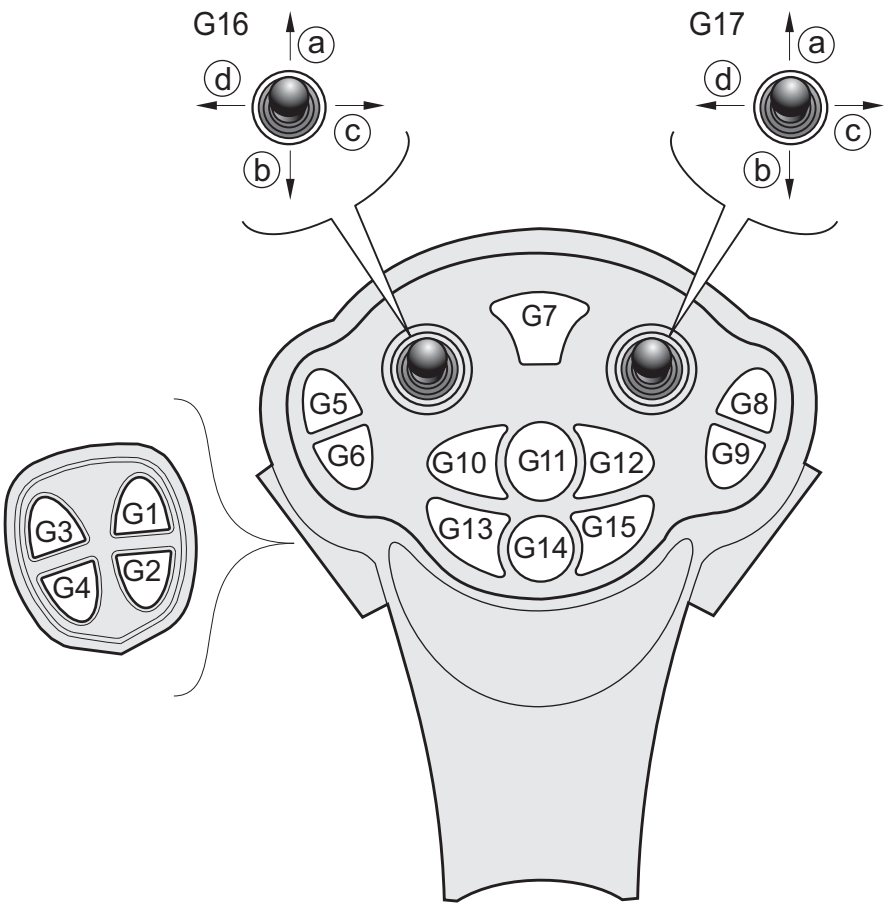
Unscrew silver disc anti-clockwise until plunger releases disc.

Pump plunger disc until solid; i.e. until plunger can no longer be depressed.

Hydraulic handbrake is released at this point, the vehicle is able to be moved after releasing handbrake control.

Before commencing normal vehicle operation, push in silver disc & turn clockwise until fully locked.

## Arm Rest Controller - G




| Symbol | Switch | Description |
|---|---|---|
| | G1 | Nozzle hop down. |
| | G2 | Nozzle hop up (for ingestion of bulky objects). |
| | G3* | Nozzle flap - close } option for ingestion of |
| | G4* | Nozzle flap - open } leaves or bulky items. |
|  | G5 | Brush - speed increase. |
|  | G6 | Brush - speed decrease. |
|  | G7 | Cruise control - pressing switch momentarily will set cruise control active at the current forward speed. Pressing the switch again, or applying the brakes, will cancel the setting.<br>**Note:** Functions only with work mode engaged. |
| | | *Optional Equipment |

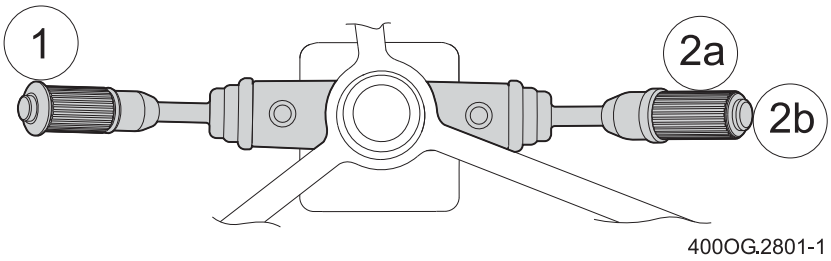
| Symbol | Switch | Description |
|---|---|---|
|  | G8 | Engine speed increase - Increases engine speed to a maximum of 1480 rpm when in work mode. |
|  | G9 | Engine speed decrease - reduces engine speed to a minimum of 1000 rpm. |
|  | G10 | Sweep selector - rotates fan, brushes, water sprays and lowers all sweep gear used for left hand sweeping.<br><br>** Rotates snow broom if fitted.<br><br>In this mode brush pressure will revert to LH last set setting after 6 seconds. |
|  | G11 | Sweep off - cancels fan, brushes, water sprays and returns sweep gear to stowed position. Also if G14 is activated, stops third brush rotation if switch. |
|  | G12 | Right hand sweep selector - rotates fan, brushes, water sprays and lowers all sweep gear to the RH position.<br><br>** Rotates snow broom if fitted.<br><br>In this mode brush pressure will revert to RH last set setting after 6 seconds. |
|  | *G13 | Third brush rotation – clockwise – pressing switch rotates brush for LH sweep. |
| | G14 | Shuffle button (sweeper only, not available with 3rd brush) - In work mode press and hold to automatically move vehicle in a backwards direction with sweepgear engaged. Release button to return to normal mode of travel / sweeping. Note: Reversing camera will auto-engage on selection of the shuffle button. |
|  | *G14 | Third brush functions on/off – enables third brush functions for switches G10, G12, G16 & G17. |

*Optional Equipment

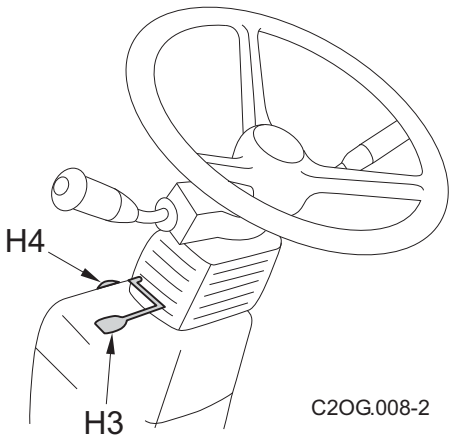
** Optional Winter Equipment

| Symbol | Switch | Description |
|---|---|---|
|  | *G15 | Third brush rotation – clockwise – pressing switch rotates brush for RH sweep. |
| | G16 | a - increases LH brush pressure.<br>a - lowers front-mounted winter equipment.**<br>b - decreases LH brush pressure.<br>b - raises front-mounted winter equipment.**<br>c - moves LH brush in.<br>c - slews front-mounted winter equipment to the left.**<br>d - moves LH brush out.<br>d - slews front-mounted winter equipment to the right.** |
| | G17 | a - increases RH brush pressure.<br>b - decreases RH brush pressure.<br>c - moves RH brush out.<br>d - moves RH brush in. |
| | | * Third brush functions for G16 and G17 are activated when switch G14 is engaged. |
| | *G16 | a – lowers brush.<br>b – raises brush.<br>c – traverses brush arm right.<br>d – traverses brush arm left. |
| | *G17 | a – tilts brush head forward.<br>b – tilts brush head backward.<br>c – swivels brush head right.<br>d – swivels brush head left. |
| | | *Optional Equipment |
| | | ** Optional Winter Equipment |

## Steering Column Switches - H



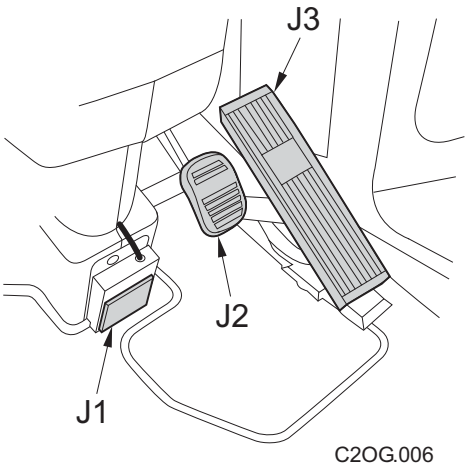

| Symbol | Switch | Description |
|---|---|---|
| | H1 | Lighting<br>Main/dip beam - pushing lever down activates main beam. Lifting lever flashes head lamps.<br>Horn - pushing button in activates horn.<br>Indicators - pushing lever forward, right indicator. Pulling lever backwards, left indicator.<br>Wash/wipe - pressing collar in activates water jets.<br>Turning switch to - Intermittent wipe.<br>- Slow wipe.<br>- Fast wipe. |
| | H2 | Transmission drive selector. |
| | H2a | Forward/reverse - pushing lever forwards selects forward direction.<br>- pulling lever backwards selects reverse direction. |
| | H2b | - With switch E10 set to ON position and foot brake J2 depressed, pressing button will start engine (if not already running).<br>- With engine running pressing button will engage work mode @ 1000 rpm unless the GO pedal is depressed.<br>- Whilst in work/transit mode with reverse selected, pressing button will activate night silent function (mutes reverse bleeper), an icon will illuminate on the JVM.<br>Turn OFF ignition to cancel night silent function. |
| | H3 | Pulling lever towards driver unlocks the column, allowing it's reach (pulling upwards) / rake (pushing downwards) to be adjusted. |
| | H4 | Hazard warning flasher - push to activate, when activated flashes red. |



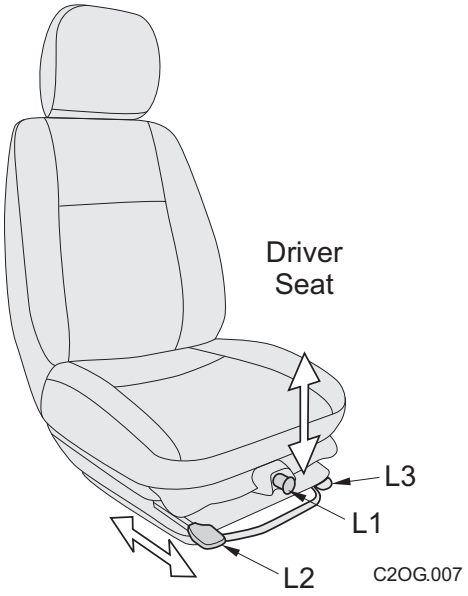

**Note:** This hazard warning signal device should be used in accordance with the road vehicle lighting regulations and should NOT be used whilst sweeping.

## Foot Controls - J

| Item | Description |
|---|---|
| J1 | Powathrust switch - Pressing pedal will activate full brush pressure for 10 seconds. After 10 seconds the brush pressure will return to the previous operating value.<br><br>Pressing J1 when selecting reverse holds the nozzle and brushes in the working position. |
| J2 | Brake pedal - activates 4-wheel brakes. |
| J3 | GO pedal - increases vehicle speed when depressed. Reduces speed when relaxed. |




## Drivers Seat Adjustment - L




| Item | Description |
|---|---|
| L1 | Pull knob to lower seat, push knob to raise it. |
| L2 | Moving lever vertically allows the seat to slide forwards and backwards to the desired position. |
| L3 | Lift lever to adjust the rake of the seat back cushion.<br><br>*Heated seat option - seat will automatically heat up on low ambient temperature and is thermostatically controlled.<br><br>*Optional Equipment |

CHAPTER 3

# Operation

## Table of Contents

## Driving and Safety Precautions

- **The drive foot pedal with its inching feature, propels the vehicle when depressed and enables braking when released. Extra care MUST be exercised with the control on tight turning manoeuvres, during acceleration, when slowing down and during transit mode.**
- **The brakes used on this vehicle can become affected by minor surface oxidisation. If the brakes have not been used for a period of time, the initial use of the brakes can be compromised.**

  **It is recommended that before driving any distance, the brakes are applied in a controlled manner, to ensure the brakes perform correctly.**
- **The steering control provides for extreme manoeuvrability with a non-reactive steering 'feel', therefore care MUST be exercised in transit mode to resist moving the steering wheel with erratic movements.**
- **ALWAYS reduce vehicle speed before making any sharp turns.**
- **Exercise extra care when traversing inclines or ramps.**
- **DO NOT drive the vehicle with the hopper in the raised position.**
- **Ensure transmission column switch is in neutral and the handbrake is on when the machine is left unattended with the engine running.**
- **Ensure that the hopper safety props are used at ALL TIMES whilst the hopper is in the raised position.**

## Essential Daily Check List

Before operating the vehicle for either sweeping or driving, ensure that the following list of checks are carried out.

### Engine and Transmission

Ensure -

1. The engine is filled to the correct level with approved engine oil. Top up if necessary with an SAE 10W/40 multigrade oil to the correct specification.
2. There is sufficient diesel fuel in the fuel tank. The fuel should be to BS 2869 and can contain no more than 5% bio diesel.
3. The cooling system is full and protected by antifreeze to the correct strength, 50% concentration. Top up via the radiator header tank to the maximum level.

4. The transmission oil reservoir is filled to the correct level. Top up if necessary with T46 multigrade hydraulic oil.

5. Drain fuel filter of water if JVM icon is illuminated.

6. Clean / replace air filter elements if icon is displayed on the JVM.

7. There are no visible fuel, water or hydraulic oil leaks.

**The fuel system is self bleeding and any fuel lines should not be loosened in the event of running out of fuel, as high pressure fuel could escape and cause injury.**

**Cab and Chassis**

Ensure -

1. The driver's seat and steering column are adjusted for a comfortable driving position.

2. The lights, indicators, horn, brakes etc. work correctly.

3. The windscreen washer bottle has adequate water in it.

4. The brake fluid reservoir is filled to the correct level. Top up as required.

5. The tyres are in good condition and are inflated to the correct pressures.

**Sweeping System**

Ensure -

1. The hydraulic oil tank is filled to the correct level i.e. middle window of hydraulic tank level gauge. Top up if necessary with T46 multigrade hydraulic oil.

2. The clean water and recirculation water system tanks have adequate water in them.

3. The water spray jets are not blocked and provide an even spray system.

4. All wearing parts (brushes, suction fan, nozzle, trunking, intake duct, meshes etc.), are in good condition.

5. The suction fan is clean and free from debris, as well as being in good mechanical order.

6. The suction fan inspection cover is correctly and securely fitted into position.

7. The sweep system, especially the brush arms, function correctly as they are particularly vulnerable to damage.

8. There are no visible water or hydraulic oil leaks.

## 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 level with the windows closed 71 dB(A).

External noise levels at one metre distance of the side of the machine i.e. wanderhose operation, are 89 dB(A).

Noise levels at 3 metres in front of the machine (manual pavement sweeping into the gutter) are 81 dB(A).

The sound power level $L_{WA}$ is 103 dB(A).

**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 2006/42/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:

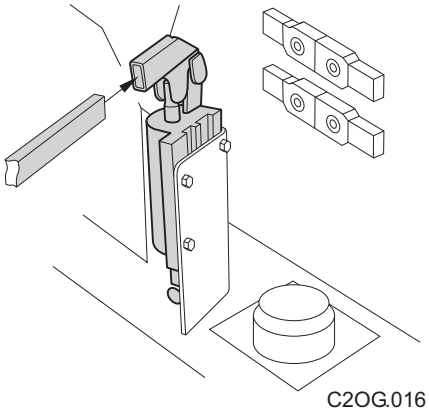
Hand-arm: EAV 2.5$m/s^2$
Whole body: EAV 0.5$m/s^2$

### Towing the Vehicle

The vehicle may be towed at a maximum of 5 mph by attaching a tow rod or cable to the front eye or rear (if fitted).

### Emergency Hand Pump

A hand pump is provided which can be used to raise the hopper to service the engine in the event of a malfunction. To lower the hopper, firstly operate the hand pump to raise the hopper sufficiently to ensure the hopper props can be stowed. The hopper may then be lowered by turning on the ignition switch and operating the hopper lower switch.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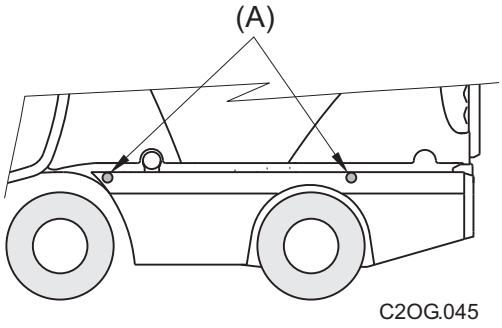
### Securing the Vehicle

When the sweeper is transported on a vehicle, two holes are provided on each side of the chassis for the fitting of the securing eyes (provided in the tool kit) in order that the sweeper can be secured on the transporter.

These securing eyes are not suitable for lifting or craning the machine.



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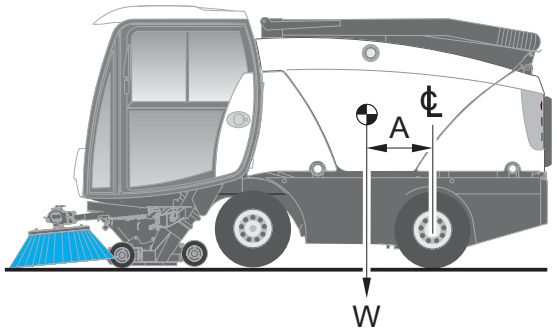
### Craning the Vehicle

The vehicle may be lifted using conventional lifting systems that are slung from the vehicle road wheels.




| Weight – W | Dimension – A | Condition |
|---|---|---|
| 2700 kg. | 0,73 metres | Empty |
| 4000 kg. | 0,63 metres | Loaded |

**◓ = Centre of Gravity**

## Operating Procedures

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

### Engine Starting

400OG,3401-1

1. Carry out essential daily check list.

2. Before starting ensure that the handbrake is on and the transmission column switch is in neutral.

3. To start engine;

3a. In cold weather turn ignition key to ON position until glow plug indicator on JVM disappears. Depress foot brake and press button on transmission steering column switch to start engine.

3b. When engine is warm turn ignition key to ON position, depress foot brake and press button to start engine.

3c. Turning ignition key to ACC position will enable the radio to be operated without the engine running.

On starting the engine the brushes automatically lift and stow for a period of 8 seconds. During this period you cannot activate work mode.

Activating work mode switch with the engine running, will set the engine to a speed of 1000 rpm. The RPM is matched if it is between 1000 and 1480 when selected. Up to a maximum of 1480rpm i.e. if you are driving down the road at 2200rpm, pressing the work mode button will set engine rpm to 1480.

**If there is a system fault an alarm will sound (3 beeps) to indicate a fault condition on the JVM display.**
**Refer to Chapter 5 for further information.**

### Emergency Engine Starting

In the event of a failure of the foot brake switch/circuit (no rear brake lights), the engine will not start. In this event press the Powathrust pedal, red stop button on the armrest controller and the yellow button on gear stalk to start engine. For safety reasons this method should only be used for emergency starting.

**Driving Only (Transit Mode)**

1. Select transmission column switch to either forward or reverse mode.

2. Release handbrake and depress GO pedal until a desired speed is reached. During this mode a maximum engine speed of 2000 rpm on CN201 and 2250 rpm on CX201. The maximum road speed of 40 kph (25 mph) can be attained on a CN201 and 50 kph (32 mph) on a CX201.

   **Note:** The maximum speed in reverse is 13 kph.

**Sweeping (Work Mode)**

1. Ensure nozzle duct blanking flap lever is in the open position.

3. Select 4WS button, if required.

2. Engage work mode switch. The work mode revs will default to 1000 rpm when selected unless the engine speed is increased by depressing the GO pedal before selecting. (**Note**: maximum work mode revs 1480 rpm).

3. Select LH or RH sweeping. Pressing required switch rotates fan, brushes, activates water sprays and lowers all sweepgear to either LH or RH position.

4. Select transmission column switch to forward mode.

5. Release handbrake and depress GO pedal.

6. The brush speed may be adjusted using switch (G5 or G6) and the pressure on each brush can be independently controlled using the respective joystick.

7. Suction performance can be increased by pressing the engine speed increase switch to desired performance of up to 1480 rpm. Depressing engine speed decrease switch will reduce engine speed to a minimum of 1000 rpm.

**Cruise Control**

A switch is provided to set a sweeping speed. Press the GO pedal to reach the required sweeping speed. Press the cruise control switch, this will set the sweeping speed. The foot can be removed from the pedal. Repressing the switch or operation of the foot brake will cancel this function.

During cruise mode pressing the GO pedal will increase road speed for special manoeuvres. Releasing the pedal will revert to preset cruise speed.

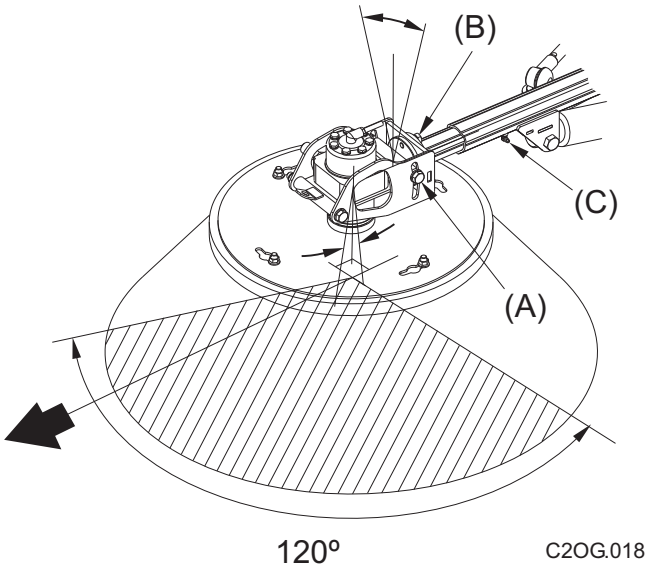
**Shuffle Button**

Use the arm rest controller Shuffle Button if a swept area requires additional sweeping or to reverse out of a blind corner/alleyway and continue sweeping.

## Brush Settings

The brush is supported on a pivoting arm which incorporates a shock absorber mechanism to withstand frontal impacts and allows it to float against the kerb when sweeping.

The brush angle should be correctly set, i.e. not flat on the road but angled so that about 120° of the circumference is towards the front kerb side in contact with the road.




A = Brush tilt adjustment bolts

B = Quick release retaining nuts

C = Grease nipple

**Note:** The brushes and nozzle may be lowered without the engine running by using the service menu on the JVM. For safety reasons, once the brush has been lowered for adjustment (with the engine running), ensure the engine is shut down. The brush will remain lowered for adjustment.

**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.**

## Brush Replacement

The brushes should be replaced when the tines are worn down to 100mm.

Engage work mode and move brushes apart, stop engine and remove ignition key.

Loosen the 4 retaining nuts (B), rotate brush stock to release from top plate. Apply one pump of grease to grease nipple (C). Refit new brush ensuring the brush is rotated to the correct end of the slot to ensure brush security.

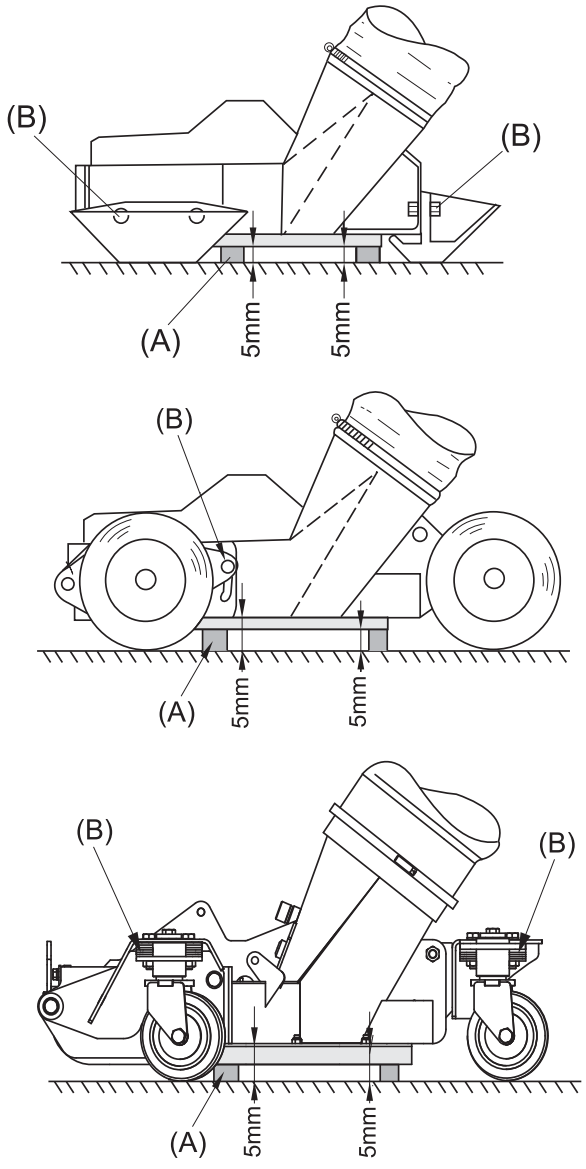
## Suction Nozzle Operation and Settings

Operation of the suction nozzle is in conjunction with the brushes when depressing the sweep selector switch. If the fan and nozzle only is required, then this can be achieved with fan only switch in conjunction with the nozzle lower switch. The nozzle is always lifted automatically when reverse gear is selected or when the sweep selector switch is returned to the central position (pressing Powathrust pedal holds nozzle on ground when reversing).

It is also possible to lift the nozzle using the 'nozzle hop' control during the sweeping operation for ingestion of bulky objects or when leaf sweeping. If leaf flap option is fitted this can also be used to allow bulky objects or leaves to be ingested into the nozzle.

For effective operation and thorough cleansing, the setting of the nozzle gap to the road surface is very important. The setting is the distance between the road surface and the suction head slide. The air gap should be between 5 - 10 mm. Adjustment of this gap should be done with the nozzle standing on a level surface and is made by raising or lowering the three wheels/skids that the nozzle runs on.

### Suction Nozzle Adjustment




The adjustment is carried out by lowering the nozzle onto the 3 height setting anvils provided, then releasing the adjusting bolts and adjusting the nozzle to the desired height.

A = Setting Anvil

B = Height Adjustment

**Note**: The rubber tongue in the suction nozzle must also be in good condition, along with the retaining strap which locates at the rear edge of the tongue. If the tongue is torn in anyway it may affect the suction performance of the machine.

## Sweeping Conditions

### Sweeping in Wet Conditions

1. When operating in wet conditions and the recirculation water tank becomes full drain off excess water using dump valve lever whilst positioned over a drain. The JVM screen will display a recirculation water level high icon.

### Sweeping in Dry Conditions

1. Prior to sweeping, ensure the recirculation water tank is full and the hopper is filled with 100 - 200 mm of water. This can be checked by looking through the hopper door. It will not be necessary to use the dump valve lever (F1b) under these conditions.

2. In dry conditions use the water sprays to prevent dust being generated by rotating brushes.

### Sweeping Bulky Materials/Leaves

1. The nozzle hop control may be used to ingest bulky materials, cans and boxes or during the leaf sweeping season to aid the pick up of leaves.

2. When leaf sweeping, a slower brush speed should be used. Position brushes as desired, some machines may have the adjustable leaf lifter flap option fitted.

3. Once section is cleared, return nozzle to normal position by pressing and sweep over area again. Use leaf flap* if fitted and shuffle button if required.

### To Stop Sweeping

1. Press sweep off switch to cancel fan, brushes, water sprays and to return sweep gear to stowed position.

2. De-select work mode switch with the column switch in neutral.

### To Stop Engine

Allow engine to idle for a brief period, return ignition key to OFF position to stop engine.

*Option

## Blocked Nozzle or Nozzle Duct

1. With the machine stationary and the nozzle and suction operating, open the adjustable leaf flap nozzle (if fitted) to increase the airflow and see if the obstruction clears.

2. If not, again with the nozzle and suction operating raise and lower the nozzle and see if the blockage clears.

3. If still blocked, switch off the engine, open the hopper door and check that the mesh screens are clear of debris and that the hopper is not full.

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

5. If the hopper is full the machine should be emptied at the nearest waste site.

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

7. With the vehicle parked on level ground, carefully raise the hopper and rest it on the hopper prop position. Switch off the vehicle engine.

8. Inspect the nozzle trunking and inlet tube. Using the two piece hoe if available or a suitable size broom handle or rod, clear any debris. When the ducts are clear, restart engine, lower the hopper and return the machine to service.

N.B. Adequate use of water from the brush mounted sprays and the recirculation water system lubricates the hoses and ducts and helps reduce blockages.

## Load Discharge

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

- **Ensure the machine is standing on firm ground and the tipping area is clear of personnel before opening and closing the rear door.**
- **DO NOT raise a loaded body on any grade greater than 5% as stability could be affected.**
- **DO NOT shunt the load in order to aid discharge, or drive with the hopper in the raised position.**

Before load discharge, 'dump' all dirty recirculating water using the recirculating water dump valve whilst positioned over a suitable drainage facility.

1. Reverse vehicle up to skip or tipping area. The load may be dumped into containers of up to 1.5M in height.

   **Note**: Hopper will not tip if the rear cover to the engine compartment is open.

2. Engage handbrake. Open hopper door using hopper door release lever.

3. Raise hopper to full discharge position using the hopper lift/lower switch. Check hopper safety props have activated. Clean out hopper. A hoe is available as an option to assist cleaning.

4. Wash out hopper and recirculation water tank. Refill recirculation water tank.

5. Once load discharge is complete, stow safety props and lower hopper using hopper lift/lower switch.

## Wanderhose Operation (Option)

1. Apply handbrake.

2. Blank off intake duct using nozzle duct blanking flap lever and close of water feed to suction nozzle.

3. Select work mode with engine running.

4. Increase engine speed up to 1480 rpm, depending upon material to be picked up.

5. Select fan only switch.

6. Unclip wanderhose boom from the roof of the hopper ready for cleaning.

7. The wanderhose may be used with a single operator whilst the vehicle is stationary or with a second operator when the wanderhose may be used with the vehicle moving slowly.

## End Of Day Routine

Cleansing may be effected using a steam cleaning unit or the high pressure washer (option).

1. Ensure all doors and windows are shut and the hydraulic oil and fuel filler caps are secure.

2. Clean out hopper mesh screen, recirculating screens and sludge drainage channels.

3. Remove recirculation water tank filter and open dump valve using cab control lever. Clean tank thoroughly.

4. Clean out internal bore of suction hose, suction nozzle and channel brushes.

5. Generally clean down the exterior of the machine.

At the end of the cleaning operation close the tank dump valve and refill the tank ready for the next day or shift. At this stage run the recirculation water pump for a few seconds to flush some clean water through the pump and into the inlet duct to clean the system.

## Sweeping in Cold Temperatures

**Operating temperature 0°C to +5°C**

For sweeping in cold conditions around freezing point e.g. early in the morning in frosty conditions, it is possible to use the two water systems on the machine. It is preferable however to either fill the tanks with warm water or fill them as normal and leave the machine in a heated garage overnight.

The recirculation system will function as normal as the water to a certain extent will be heated by the hydraulic oil cooler located within the tank. The water sprays to the brushes can also be used as normal, provided there is no danger of icing from the water sprayed onto the road.

**Operating temperature -5°C to 0°C**

Do not use or fill the water spray system for the brushes. Dust suppression can still be effected using the recirculation system. This should be filled with warm water or filled and left in a heated garage overnight to warm the water.

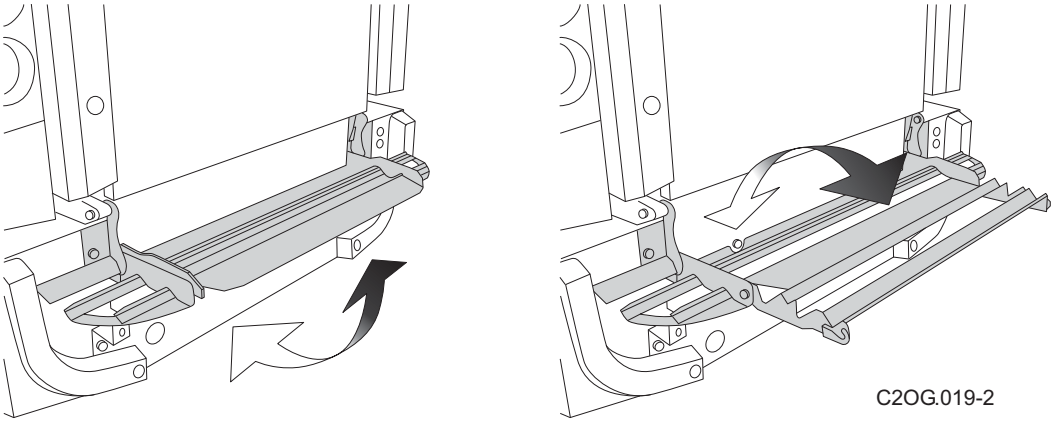
**Operating temperature -15°C to -5°C**

It is possible to use the machine for short periods with both water tanks dry. However, some dust will be exhausted from the machine and premature wear may be experienced on some components.

**Note**: Do not operate the machine dry with an empty recirculation tank for extended periods as this could lead to overheating of the hydraulic oil.

## Rear Grille / Step

The step is situated below the radiator at the rear of the machine.




The step can be accessed by pulling the lower edge away from the machine and hinging it upward. It is secured by lifting it above a horizontal position and pushing it in towards the back of the machine and lowering it into the working position. There are location pins at either end of the grille. Ensure that both pins are engaged correctly. Open out the centre section.

To lower the step, stow the centre section then lift the step above horizontal and pull backwards away from the machine to disengage the latch. Lower the step until it is secured onto the magnetic catches.

### Access to rear mesh baskets

1. With the machine on firm level ground and the hopper in the lowered position, open the hopper door.

2. Deploy the rear grille/step as described above.

3. Carefully remove one basket by releasing the retaining clip at the rear of the basket, unhook the basket and remove.

4. Place the basket on the step.

5. Descend from the step and remove basket from step for cleaning.

6. Repeat process for removing second basket.

7. Clean baskets and ensure mesh screens are in good working condition.

8. Refit baskets one at a time by following the above procedure in reverse.

9. Stow the rear grille/step in accordance with the procedure detailed above.

CHAPTER 4

# Optional Equipment

## Table of Contents

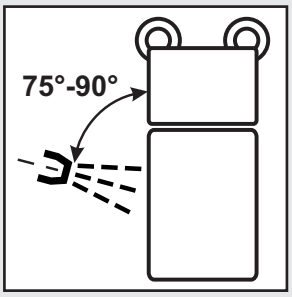
## High Pressure Washer

### Safety Precautions

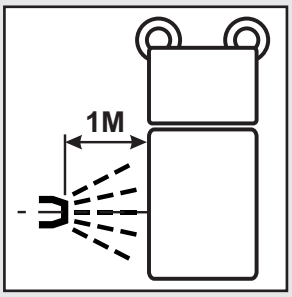
- Care MUST be taken not to damage sign written areas when cleaning. See special notes for cleaning vehicles with vinyl livery below.
- ALWAYS keep pressure equipment in good condition and regularly maintained, particularly at joints and unions.
- The use of safety goggles is recommended in case of deflected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

### Special notes for cleaning vehicles with vinyl livery or reflective markings

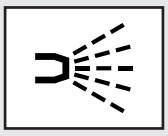
The supawash handlance or similar can be used for cleaning areas of the vehicle with vinyl or reflective markings subject to the following precautions being taken



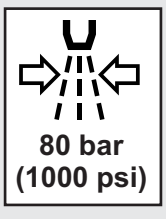

- The spray angle should be maintained between 90 and 75 degrees to the panel ✓




- 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 ✓

The high pressure washer may be used to clean down the vehicle at the end of a shift or day's work. The unit is operated using the dash mounted rocker switch, ensuring the sweep controls are in the neutral position and the machine is in work mode.

The handlance and reel are mounted between the rear of the cab and the hopper. Two jets are provided in the nozzle, a fan spray jet and a pencil jet. To change between the jets, the trigger should be released and the gun rotated through 180°, this will automatically select the alternative jet.

**Frost Precautions**

In cold weather, with the possibility of freezing temperatures, the water system should be drained to prevent freezing up when leaving the machine outside overnight. The recirculation tank can be drained by operating the dump valve by way of the cab controlled lever. This action will drain all water from the system including the pump and hose. The lost water spray system can be drained using each of the drain valves located at the front of each tank.

When empty, the clean water pump and hoses should be drained by operating the pump for a short period of time, If the optional high pressure washer pump is fitted, it is essential to drain the pump hose reel and gun, again by operating the pump for a short period of time until the system is purged of water.

**Note** : DO NOT run the high pressure pump dry for excessive periods.

## Third Brush Option

**Operation**

For details on third brush switch functions refer to Chapter 2.

To operate third brush it is necessary for work mode to be engaged.

Third brush controls on the arm rest controller are activated by pressing the third brush function switch.

Position brush arm as required using arm rest controller joysticks.

To select clockwise rotation of brush; press LH third brush rotation switch. Anticlockwise rotation is selected by pressing RH third brush rotation switch.

Adjust brush head angle using arm rest controller joystick.

The rotation speed of third brush and main brushes is controlled by using brush speed increase / decrease switches.

Dust suppression is achieved by operating water spray switch.

The third brush should be fitted by trained engineers. Fitting instructions may be found in the maintenance manual.

## Winter Equipment

### Gritter / Spreader

Turn on engine and engage work mode.

Press switch to activate Gritter / Spreader mode of operation.

Gritter / Spreader has three modes of operation;

First position; off.

Second position; activates gritter/spreader when travelling in a forward direction only.

Third position; activates gritter/spreader continuously.

**Note:** Gritter / Spreader functions only with work mode engaged.
Standard sweeper equipment is disabled when gritter is active.
Gritter disabled when standard sweeper equipment is active.
Park standard sweeper equipment to activate gritter.

### Gritter Only

Icon will display on JVM screen when second/third PTO switch position has been selected. The icon has three display states;
Off - not operational.
Flashing - standby.
Static - operational.

### Snowplough / Broom Only

For details on snowplough / broom joystick functions refer to page 2:11.

### Broom Only

Press to activate snow broom.


Use switches to control rotational speed of the snow broom.
Last rotational speed setting is activated when switching between activate and deactivate mode.
Speed setting is reset when switching off vehicle ignition.

Press to deactivate snow broom.

Disengage work mode to auto-park front-mounted Winter Equipment.

See maintenance manual for remove and refit instructions of Winter Equipment.

Front-mounted winter equipment will not auto park on initial machine start up for safety reasons. To initially lift front-mounted equipment engage work mode and use joystick functions; refer to page 2:11.

CHAPTER 5

# Johnston Visual Module (JVM)

## Table of Contents

## J-Plex - The Johnston Sweeper Control System

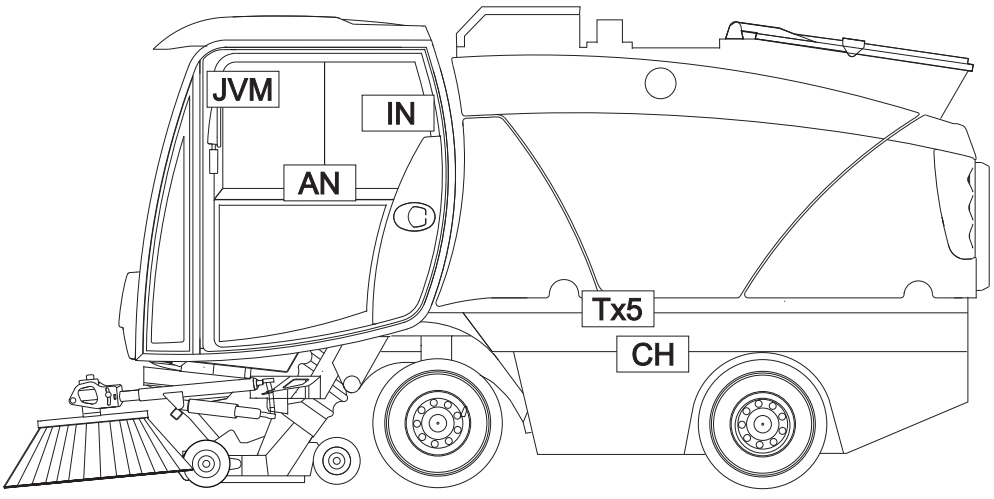
J-Plex II is an electronic road sweeper control system which uses multiplex technology to enable multiple control signals to be combined into one common signal which can then be transmitted and received down a pair of wires (serial communication). This eliminates a substantial number of wires and connections from the vehicle's electrical system, which in turn reduces the size of wiring harnesses and increases reliability. Wiring from Input/Output (I/O) devices such as switches or hydraulic valves is via a local I/O collecting module called a node. On the C201 range of sweepers, the J-Plex control system consists of a Johnston Visual Module (JVM) screen and 4 remote I/O nodes mounted around the sweeper. The JVM acts as the master control unit and communicates between each external node via a CANbus control network.

JVM provides:-

- The operator interface with the powerful diagnostic features provided by J-Plex.
- The ability to check the status of Inputs and Outputs.
- Information about the vehicle - speed, fuel tank contents, etc.
- Data capture - hours sweeping, distance travelled, etc.

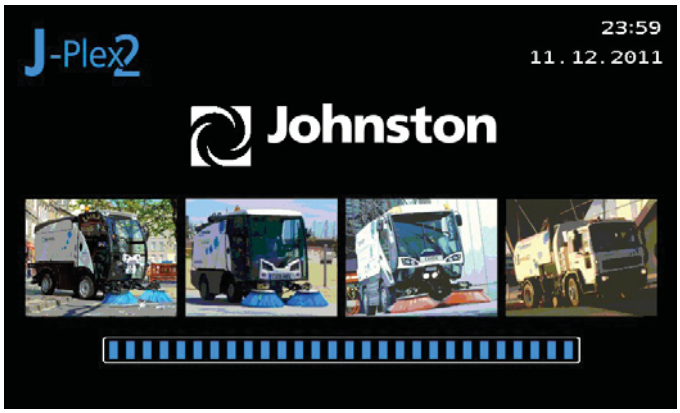
J-Plex is in constant communication with Tx5, the transmission controller. Tx5 receives signals from the accelerator pedal and sensors within the vehicle and adjusts engine/hydrostatic transmission settings accordingly. J-Plex diagnostic capability extends to Tx5.

### Location of J-Plex Components

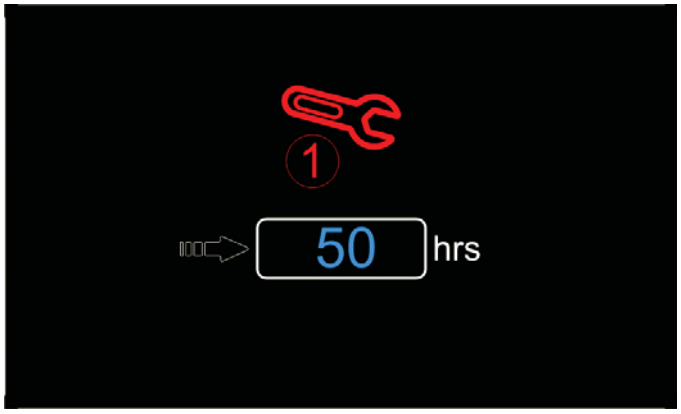



1) Internal Control Node (IN) : On rear internal wall of cab, behind RH seat/soft trim.
2) Chassis Node (CN) : Mounted to exterior of recirculation water tank.
3) Tx5 Node (Tx5) : Mounted to exterior of recirculation water tank.
4) Johnston Visual Module (JVM) : Centrally mounted in the overhead console.
5) Arm Rest Node (AN) : Within the arm rest controller, attached to cab centre tunnel.

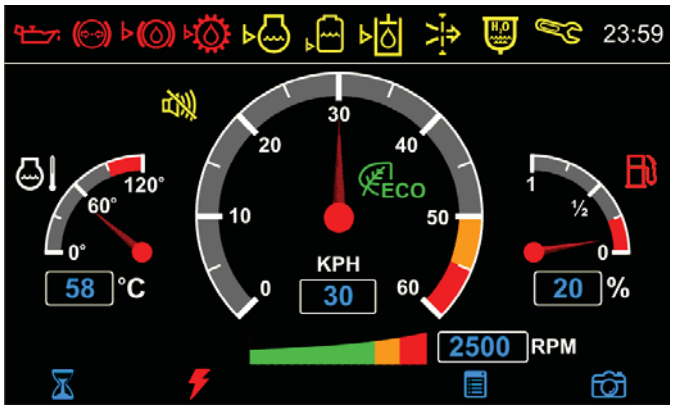
After switching on the vehicle ignition the JVM will display a Splash Screen for 2.5 seconds;



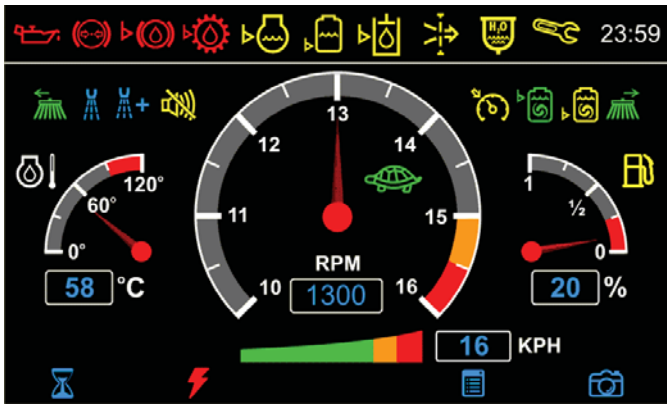

The JVM will then display a Service Notification Screen for five seconds;



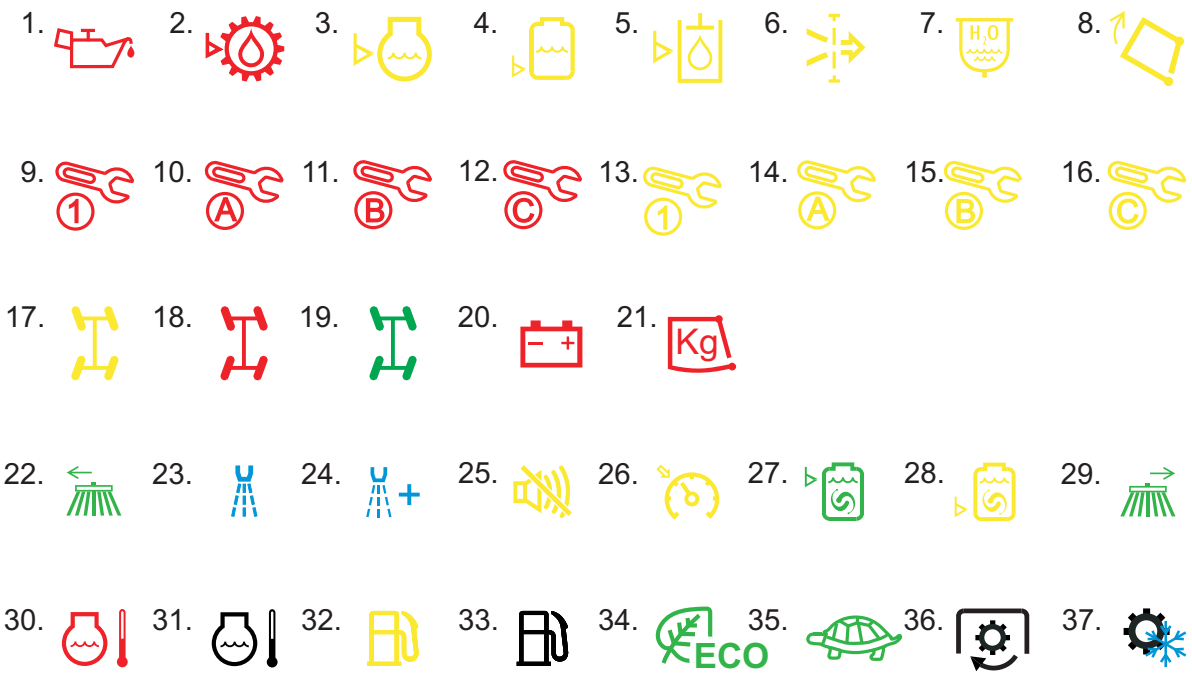

After which the JVM will display the Transit Mode Screen;




When work mode is selected (by selecting steering column switch H2b) the Work Mode Sreen will be displayed;



## Key to Transit and Work Mode Screen Icons




### Information Bar

1. Low Oil Pressure
2. Low Transmission Oil
3. Low Engine Coolant
4. Low Water Level
5. Low Hydraulic Oil Level

6. Air Filter Service Due
7. Water In Fuel
8. Hopper Up
9. Service 1 Overdue
10. Service A Overdue

11. Service B Overdue
12. Service C Overdue
13. Service 1 Due
14. Service A Due
15. Service B Due

16. Service C Due
17. 4WS Warning
18. 4WS Error
19. 4WS Active
20. Alternator not charging

21. Weight Limit Exceeded

### Transit and Work Mode

22. LH Sweep Active
23. Water Pump Sweep Active
24. Water Pump Continuous
25. Night Silent Active
26. Cruise Control Active

27. Recirculation Water Tank Full/100%
28. Recirculation Water Low Level Warning
29. RH Sweep Active

### General

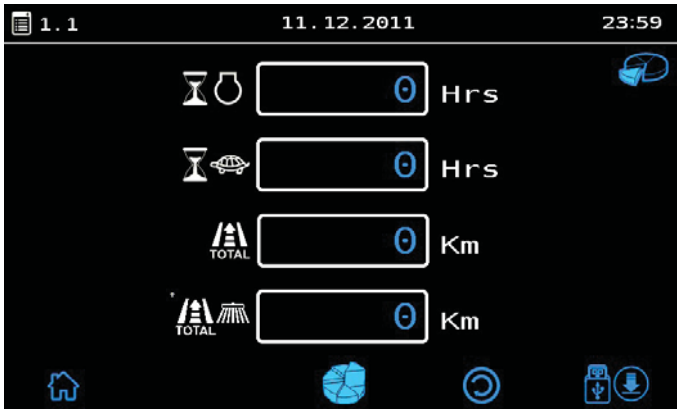
30. High Engine Coolant Temperature
31. Normal Engine Coolant Temperature
32. Low Level Fuel
33. Normal Fuel Level
34. ECO Mode Active
35. Working Mode Active

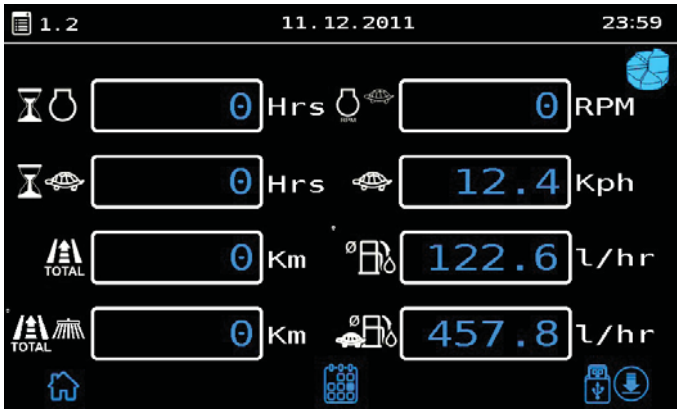
36. PTO Function - Gritter/Spreader
37. Winter Equipment Fitted

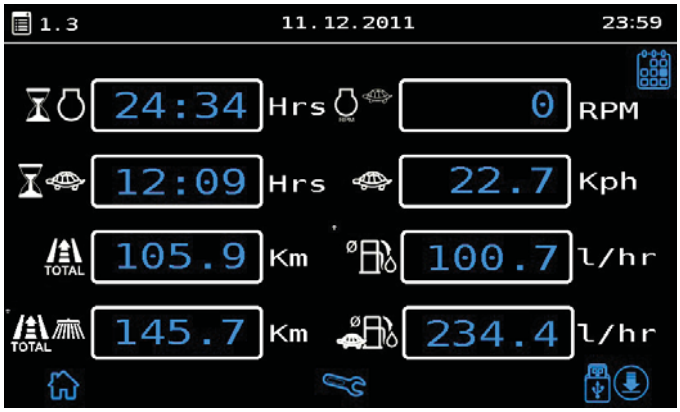
### Menu Navigation

When the JVM is displaying either transit or work modes the following menus may be accessed by pressing the relevant soft keys;

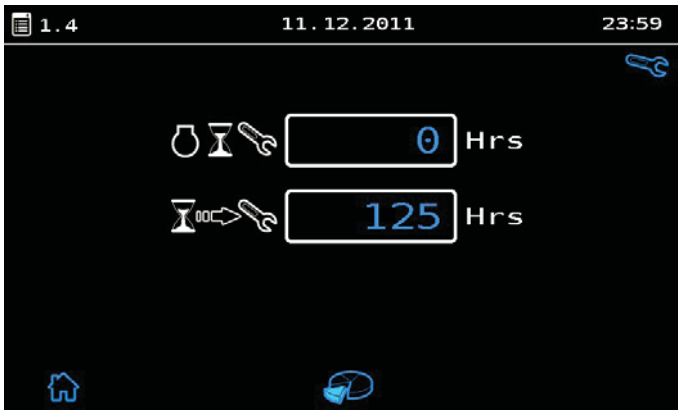
| Soft Key | Description |
|---|---|
|  | **Vehicle Logging** |
|  | 1.1 Part Totals |
|  | Pressing the reset soft key will reset the part totals back to zero. |
|  | 1.2 Grand Totals |
|  | 1.3 Daily Totals |



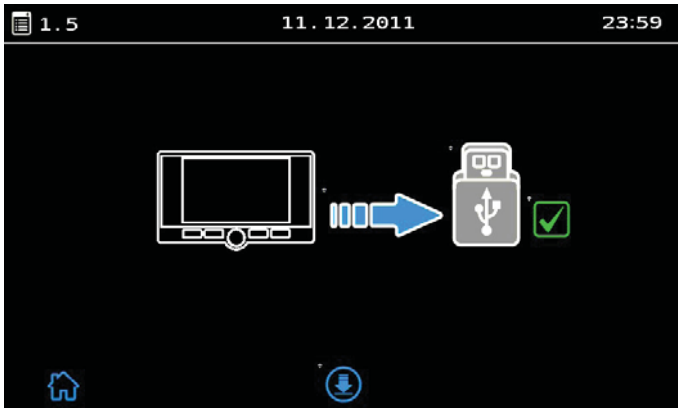
1.4 Service Hours



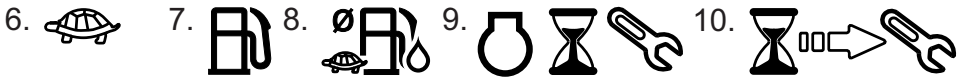

1.4 USB Download
(Data Capture)

Insert an Johnston approved USB stick into the USB port (located on front of the JVM - bottom lefthand side).

Press centre button on JVM to download Part / Grand / Daily totals as required.




**Key to Logging Screen Icons**


1. Engine Hours
2. Engine Hours - Work
3. Total Distance
4a. Total Distance - Swept
4b. Total Distance - Washed
5. Average Work Mode - RPM

6. Average Work Mode - Speed
7. Average Fuel Consumption
8. Average Fuel Consumption - Work Mode
9. Engine Hours - Last Service
10. Engine Hours - Till Next Service

| Soft Key | Description |
|---|---|

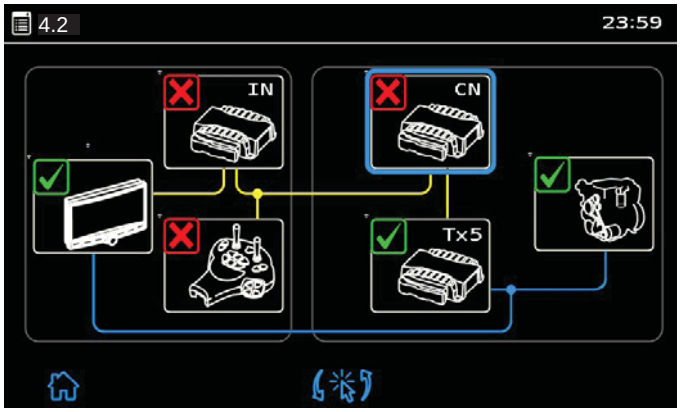
### System Faults

Should a system fault occur in any of the following vehicle systems a fault icon soft key will appear on the transit / work mode screen;
- CANbus Network (Menu 4.2)
- Hydraulic Valve Outputs (Menu 4.3)
- Transmission Controller (Menu 4.9.1)
- 4WS Valve Block (Menu 4.10.2)

Pressing the fault icon soft key will display the relevant fault mode screen.

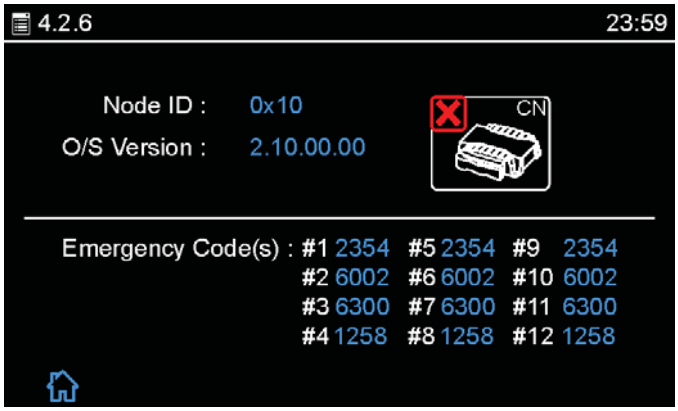
### CANbus Network Faults

Rotate cente button on JVM to move halo; press button to select node on CANbus network that is showing a fault condition.



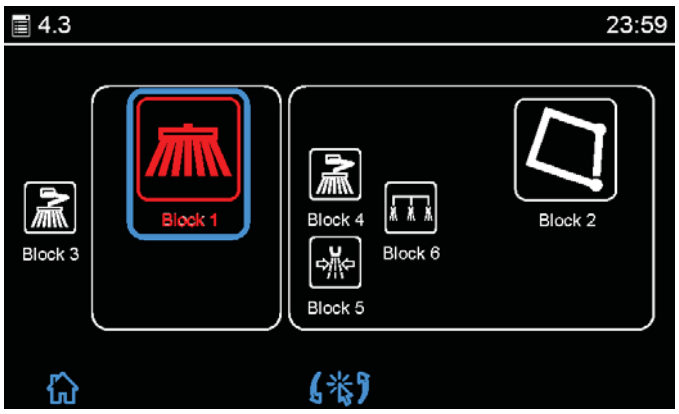

An example fault condition on the CANbus network is displayed opposite.

Should a fault occur within the CANbus network it will be accompanied by one or more emergency codes.

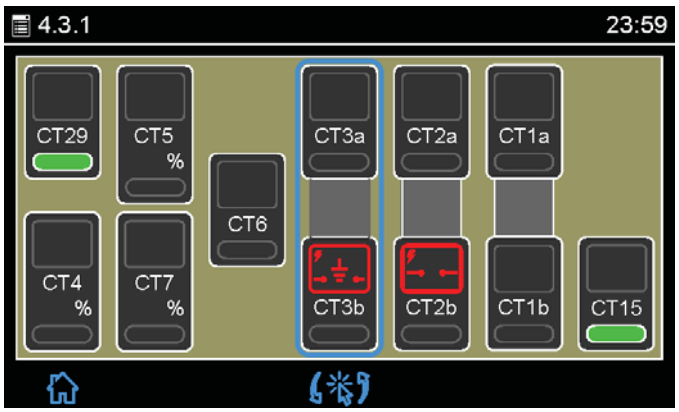


### Hydraulic Valve Output Faults

Rotate centre button on JVM to move halo; press button to select valve block that is showing a fault condition.




An example of a fault condition on a valve block is displayed opposite.

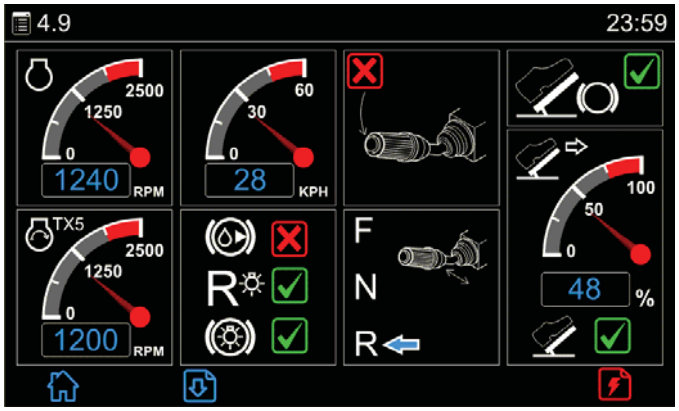


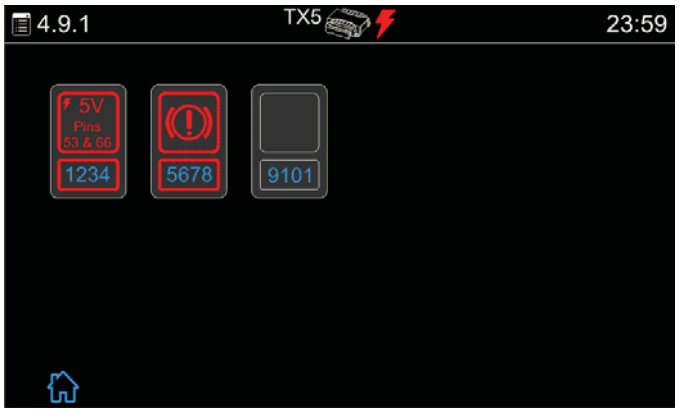

### Transmission Controller (Tx5) Faults

An example transmission controller fault screen is displayed opposite.

Faults are indicated by a red cross or valve icon. Press the red soft key icon (if displayed) to access additional fault condition information.

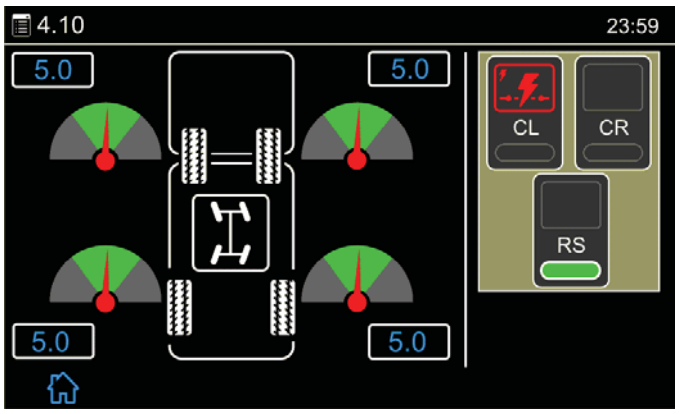
An example of additional faults are displayed opposite. Each fault will include an emergency code.



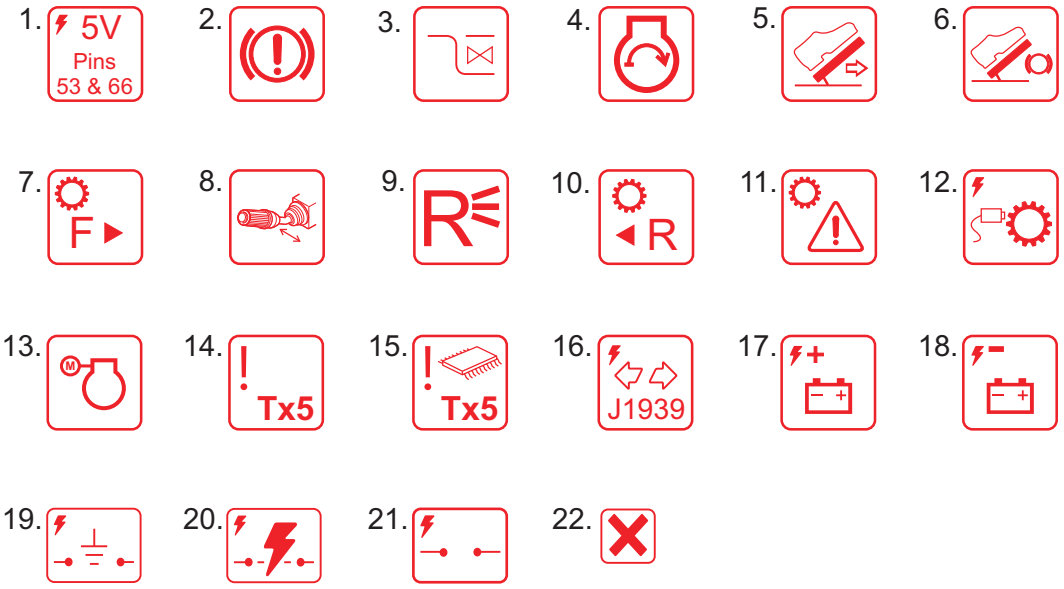



### 4WS Valve Block

An example 4WS Valve Block fault screen is displayed opposite.




### Key to system fault icons




### Transmission Controller (Tx5)

1. 5V External
2. Brake Lights
3. Bypass Valve
4. Cranking Output
5. Drive Pedal

6. Foot Brake Switch
7. Forward Valve
8. Gear Switch
9. Reverse Light
10. Reverse Valve

11. Safety Valve
12. Speed Sensor
13. Tier 3 Actuator
14. General
15. Internal
16. J1939
17. High Battery Supply Voltage
18. Low Battery Supply Voltage

### Hydraulic Valves

19. Short to Ground
20. Short Circuit
21. Open Circuit

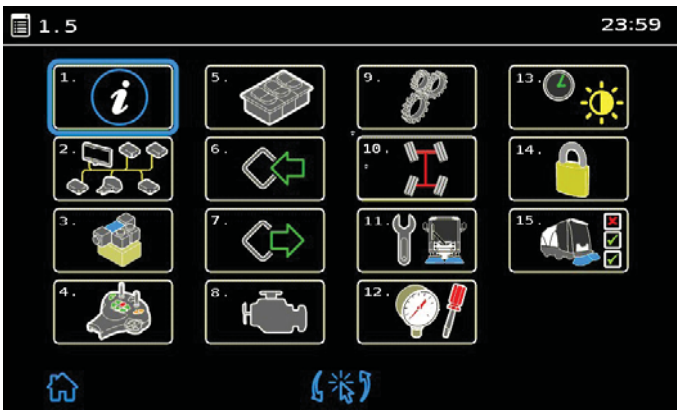
### Miscellaneous

22. No comms

| Soft Key | Description |
|---|---|

**Main Menu**

Rotate central button on JVM to move halo; press button to select menu as required.




Main menus are as follows;

1. System Information
2. CANbus Information
3. Valve Outputs
4. Palm Node
5. Switch Inputs
6. Special Inputs
7. Special Outputs
8. Engine Information
9. Transmission Controller (Tx5)
10. 4WS Control (option)
11. Service Menu
12. Set Pressures
13. Display Settings
14. System Security
15. Vehicle Setup

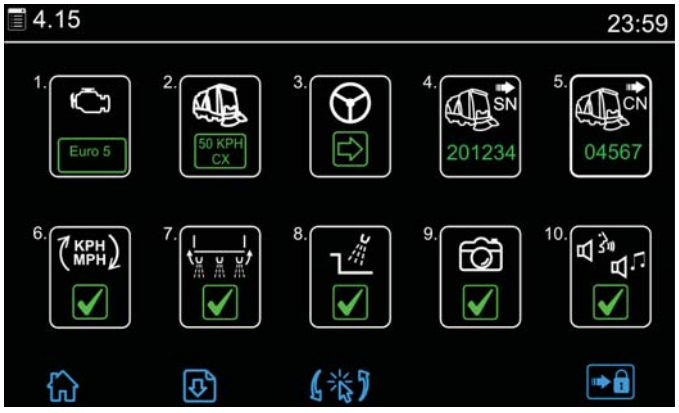
Menu 4.1 details both the Serial Number and Chassis Number of the vehicle.

Both numbers should be quoted when contacting Johnston Sweepers for servicing and maintenace issues.

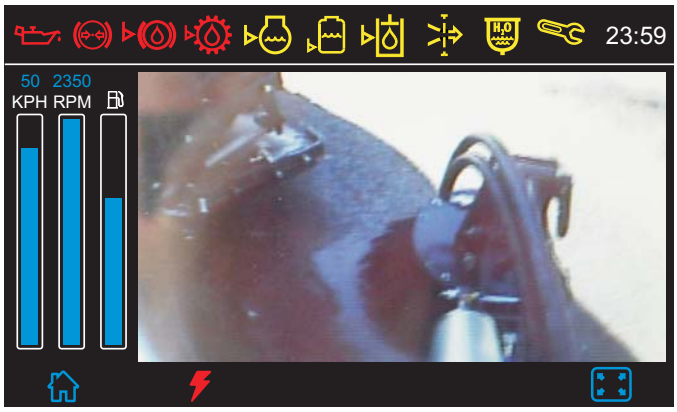

Menu 4.15 shows the configuration of the vehicle for all standard and optional equipment.

**Note:**

For full details of the main menu please refer to the C201 maintenance manual.



| Soft Key | Description |
|---|---|
|  | **Reverse Aid Camera** |
|  | Pressing the Camera Maximise soft key will display the reverse aid camera in full screen display mode. |
|  | Pressing the Camera Minimise soft key will return the reverse aid camera to normal display mode. |

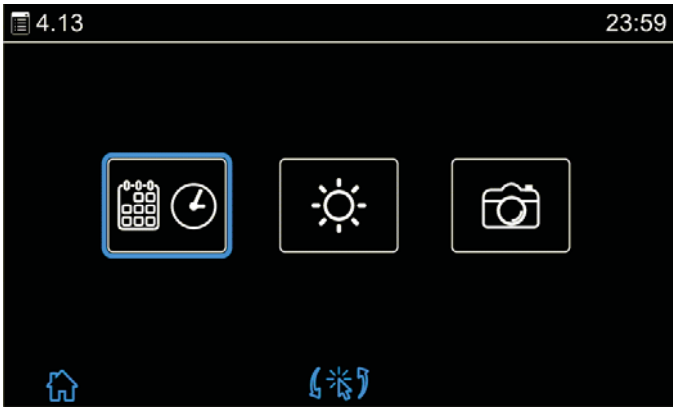



### Display Settings

Menu 4.13 contains three menus which assist the operator in altering the following JVM settings;

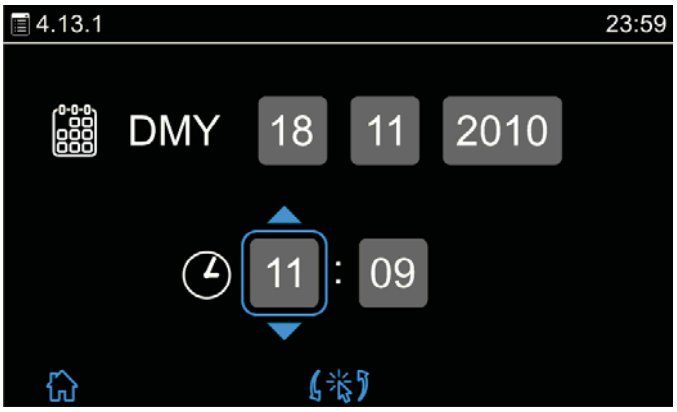
- 4.13.1 Date and Time
- 4.13.2 Brightness and Contrast
- 4.13.3 Camera Brightness, Contrast and Colour Saturation

Rotate the centre button to move the halo and press to select the display setting menu as required.




Menu 4.13.1 Date and Time

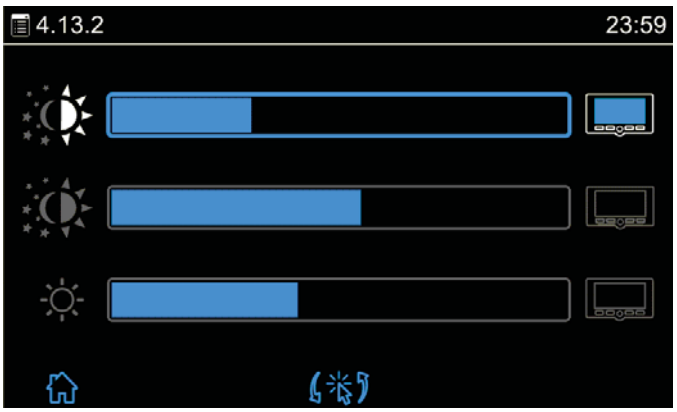
Rotate centre button to move halo. Press to select item, halo colour will change to red. Rotate button to change setting. Press button to enable further changes to date and time settings.




Menu 4.13.2 Brightness and Contrast

JVM display brightness and contrast may be altered for day and nighttime use. The brightness of the soft keys may be altered to suit the operator's requirements.

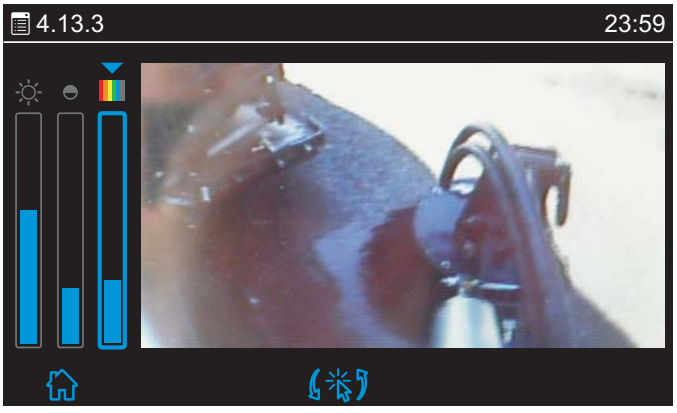
Rotate centre button to move halo. Press to select item, halo colour will change to red. Rotate button to change setting. Press button to enable further changes to brightness and contrast as required.




Menu 4.13.2 Brightness, Contrast and Colour Saturation

Brightness, contrast and colour saturation of the reverse aid camera may be altered to suit the operator's requirements.

Rotate centre button to move halo. Press to select item, halo colour will change to red. Rotate button to change setting. Press button to enable further changes as required.



**CANbus Diagnostics**

Node Status

Each Node connected in the "Sweeper" (CANopen) Network transmits a "Heartbeat" message to indicate its status.

The following Icons are used to display each state:

**Operational**
Node is OK.

**Stopped**
Internal node error.
CANbus network error.

**Pre-operational**
Initial start-up in progress.
OS update in progress.
CANbus network error.

**No Communication**
Node disconnected.
No power (fuse blown).
CANbus network fault.
Node error (software or hardware).

CHAPTER 6

# Routine Maintenance

## Table of Contents

## Safety Precautions

### Safety Notice

**DO NOT**

- Work on or around the engine whilst it is running except to adjust idle settings.
- Remove coolant bottle cap when the engine is hot. Release the cap 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 under a vehicle supported by a jack before lowering the vehicle onto sturdy axle stands or similar.
- Disconnect hydraulic or water pipes whilst the engine is running.
- Approach fan inlet whilst the fan is running.
- Disconnect the battery within 15 seconds of operating the ignition key to the off position.
- Put fingers under the recirculation pump due to rotating blade.

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

## Regular Maintenance

It is impossible to over emphasise the importance of regular maintenance, inspections and running adjustments to maintain efficiency and obtain trouble free service from the machine. Always refer to maintenance guide.

Attention is also drawn to the initial first service and post delivery check over between the first 20-50 hours operation of the machine.

'Next service' will be indicated to the operator via the JVM. For A, B, C and D services a pre-warning will be given at startup.


**20-50 Hour Initial Service**

1a. Drain engine oil and renew oil filter, refill engine with oil to the correct level.
Overfilling the engine oil WILL cause damage to both the engine and CSF (Catalytic Soot Filter).

1b. Reset the Oil Dilution Flag in the engine ECU;
- Turn ignition key to 'ON' position to start the pre-heating phase of the glow plugs.
- Fully depress the GO Pedal five times within a 10 second period.
Carrying out the procedure outlined in 1b ensures that the condition of the CSF (which is a non-serviceable item) is maintained.

2. Renew high pressure hydraulic return line filter.

3. Check engine fan belt(s) for wear (standard and/or air con).

4. Check security of all external nuts, screws, mountings etc.

5. 4WS only torque gimbal bearing pre-load to 140Nm (103lb.ft) using tool 7012202. Check condition of the skid plates for wear, replace if needed.

6. Check battery terminal condition and clean if necessary.

7. Check engine coolant level, top up as required (50 hour & A service intervals only).

8. Renew transmission oil filter - 19/24 Bar pump (50 hour & A service intervals only).

## Maintenance Schedules

Refer to engine user handbook for more detailed instructions on engine servicing.

**Daily Maintenance -** This can be carried out by a trained operative.

**Check the following items and replenish as required;**

1. Engine oil level.

2. Engine coolant level.

3. Hydraulic oil level in main reservoir.

4. Hydraulic oil level in transmission oil header tank.

**Check the following items;**

5. Air cleaner, only if service indicator is illuminated on JVM.

6. Radiator, charge air cooler and oil cooler are free from obstruction/build up.

7. Fan belt is in good condition.

8. Windcreen washer bottle has adequate fluid.

9. For any fluid leaks.

10. Driver's seat and steering coloumn are adjustable.

11. Tyre pressures and condition (Front = 6.2 bar / 90 psi, Rear = 5.75 bar / 83.5 psi).

12. Security of wheel nuts, 250Nm (180 lb.ft).

13. Mechanical damage to sweeping equipment.

14. Suction fan is clean and free of debris.

15. Brush and wear angles. Replace and adjust as required.

16. Water tanks have adequate water.

17. Front water jet sprays and filters, clean/unblock as required.

18. Correct operation of lighting equipment, wiper washers and horn.

19. Suction nozzle ground clearance is 5mm, adjust if necessary.

20. Suction filter screen and de-watering screens are clean and not blocked.

21. Hopper mesh, side screens, ducts and sludge drainage channels are clean and not blocked.

22. Check handbrake and footbrake for correct operation.

23. Water recirculation system and ensure tank top filter is clean. Clean out tank using the dump valve, ensuring that the pump is also cleaned.

**Weekly Maintenance - Daily Maintenance plus the following;**

**Check the following items -**

1. Check & grease all steering equipment. x8 points front axle, x14 on 4 wheel steer option including rear steer ram & pivots.

2. Front suspension strap pivots for freedom of movement and wear.

3. Hopper fan wear and build up of debris on blades.

4. Suction nozzle, flap tie, trunking and hopper inlet duct for wear and replace if necessary.
5. If engine fault lamps C3 or C4 are illuminated the engine requires workshop repair.
6. Routing of electrics, hydraulic services for chafing/leaks.
7. All rubber seals, replace if necessary.
8. Keep engine compartment clean.
9. Check brake master cylinder fluid level, replenish as required.
10. Ensure the air intake ducts on the front of the hopper are clear of debris.
11. Wheel nut torque settings, 250Nm (180 lb.ft).
12. Drain water from the fuel filter if indicated on the JVM.
13. Lubricate the JSL equipment; including suction nozzle castor wheels (if fitted).
14. Carry out full vehicle function road test.


**Service A - Every 300 hours (plus 50 hour service items)**

1. Drain out diesel fuel filter canister and renew fuel filter.
2. Lubricate door locks with special grease.
3. Replace main air filter.
4. Check the air intake circuit is clean and the intercooler pipe is sealed correctly.
5. Check the dust discharge circuit is clean.
6. Check the tightness of vacuum pump and related system.
7. Check the vacuum circuit pipes are sealed correctly.
8. 4WS only check gimbal bearing pre-load torque setting 140Nm (103lb.ft) using tool 7012202. Check condition of the skid plates for wear, replace if needed.
9. Replace EGR and TVA valve filter.


**Service B - Every 600 hours (plus 50 hour & A service items)**

1. Check engine coolant level and concentration gives -39°C frost protection (B Service Only).
2. Check steering system for correct operation; 2WS and/or 4WS.
3. Remove brake drums and inspect front and rear brakes, clean out drums as required. Inspect linings and replace if damaged or worn below 2mm. Refit drums and check brake adjustment.

**Service C - 12 monthly maintenance or every 1500 hours (plus 50 hour, A & B service items)**

1. Renew tranmission filter - 19/24 Bar pump.
2. Renew water tank filter.
3. Replace safety air filter.
4. Check brake fluid level and top up if required.
5. Renew hydraulic suction filter (x2 fitted to Winter/3rd Brush option).
6. Renew hydraulic oil (sweep circuit).
7. Renew engine coolant with a mixture of 50/50 antifreeze/water.
8. Check CSF using diagnostic equipment, perform forced regeneration or renew filter as required.
9. Check front wheel bearings and re-pack with grease.
10. Check all torque settings, see maintenance manual.
11. Carry out a decelerator test.
11. Carry out a 'road test' to check all relevant functions. Check and record pressures, see maintenance manual for procedures.

**Service D - 24 monthly maintenance or every 3000 hours (plus 50 hour, A, B and C service items)**

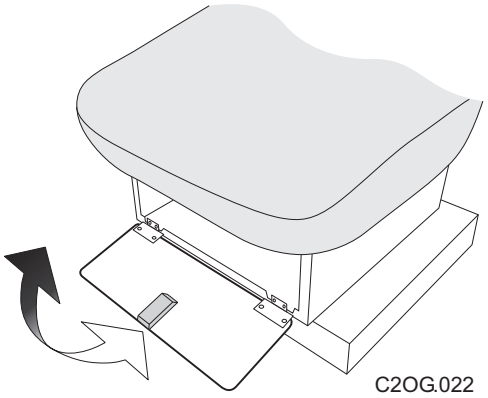
1. Replace brake fluid.
2. Renew clear hose to transmission header bottle, replace cable ties.
3. Renew engine fan belt(s) (standard and/or air con).

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

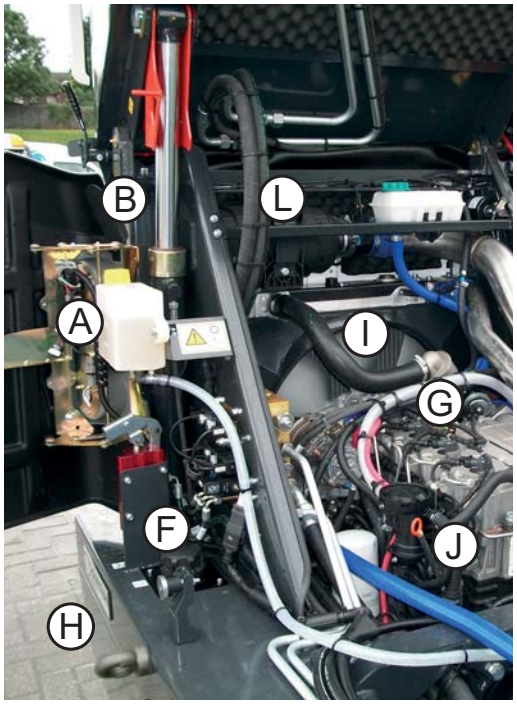
These procedures should be carried out by qualified service personnel.

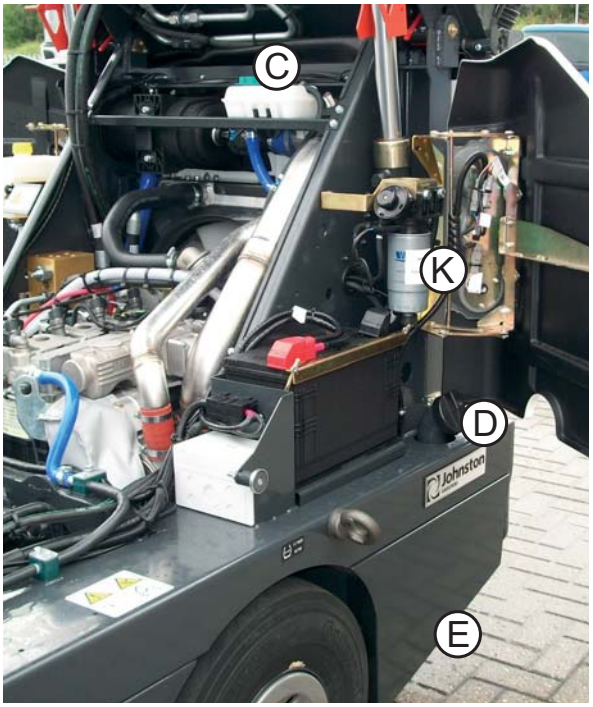
Tool Kit

In order to assist completion of the maintenance schedules, a tool kit is provided. This, along with a hand pump handle are normally located underneath the passenger seat. Access to this equipment is gained by opening the flap at the front of the seat base.




## Service Point Locations




### Key

| | | | |
|---|---|---|---|
| A | Transmission Reservoir | H | Hydraulic Oil Tank |
| B | Air Cleaner Intake Duct | I | Radiator |
| C | Engine Coolant Expansion Tank | J | Engine Oil Dipstick |
| D | Fuel Tank Filler | K | Fuel Filter |
| E | Fuel Tank | L | Air Cleaner |
| F | Hydraulic Oil Tank Filler | | |
| G | Engine Oil Filler | | |

**Hydraulic Reservoir**

Oil level checking - the correct method for checking the oil in the hydraulic reservoir is with the hopper lowered. The oil level should fill the centre window of the tank level gauge and just be visible in the top window.

**Air Cleaner**

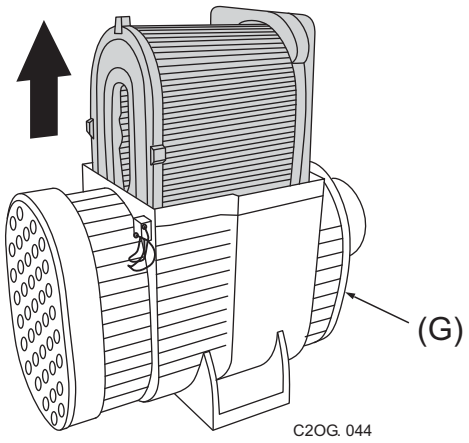
If between scheduled maintenance attendances the JVM display shows the filter requires servicing then the following should be applied:

Open rear door of machine to access air cleaner.

Release for retaining clips and remove cover.

Withdraw the main element from the air cleaner body 'G'.

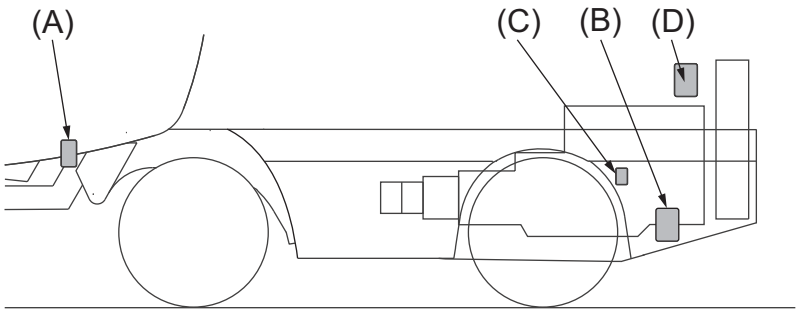
It will be noted that the smaller secondary element (safety element) housed within the body is not usually removed during periodical servicing, it ensures that dust cannot enter the engine in the event of main filter damage.




The safety element should be changed every third time the main element is serviced. Inspect the clean element for damage by placing a bright light inside and looking through the element. Any thin spots, pin holes or other damage will render the element unfit for further use.

Clean the inside of the filter body, 'G' ensuring all dust and debris is removed, do not use petrol. Inspect all joints and hoses for leaks, renew where necessary.
Reassemble the cleaner ensuring all joints are leakproof.

**Oil Filter Locations**

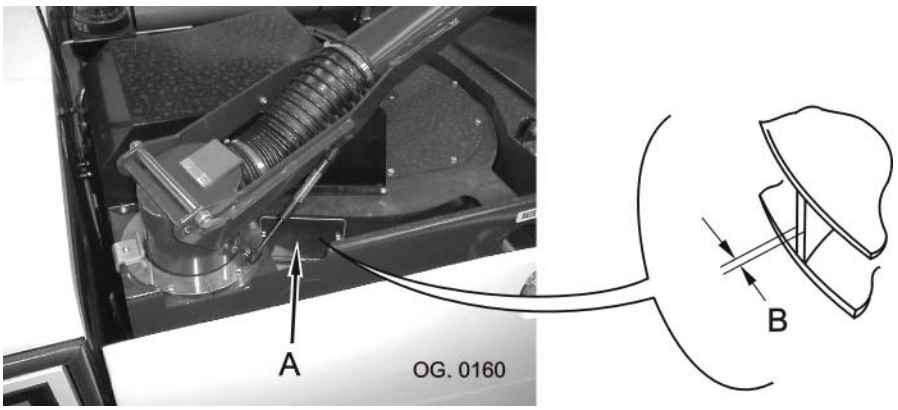



A = Sweep System Oil Filter
B = Transmission Filter
C = Engine Oil Filter (RHS)
D = Fuel Filter (LHS)

**Fan Impeller Wear**

An Inspection hatch is provided in the fan case mounted on top of the body.

**Remove the ignition key to immobilise the engine before starting work.**




Remove plate (A) after releasing the two retaining bolts.

Access can be gained to the side of the fan and the space between the blades can be cleaned with a scraper. Any debris at the eye of the fan should be removed to prevent vibration. This is achieved by removing the blanking plate over the eye of the fan inside of the hopper roof.

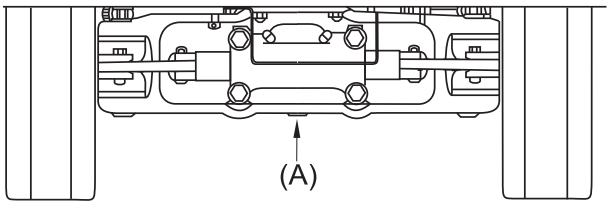
The fan impeller should be replaced when any blade thickness (B) is less than 1.5mm.

### Jacking up the Vehicle

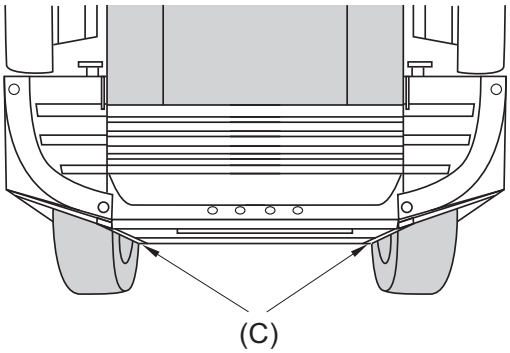
When jacking up the front of the vehicle, it is recommended that a 3000 Kg. trolley jack be applied to the centre of the front axle. For the rear wheels the jack should be applied to the points shown below, in line with the rear wheels.

DO NOT apply the jack to the crossmember directly underneath the engine sump, it is not designed for this purpose.

### Front and Rear Jacking Point Location (Trolley Jack)

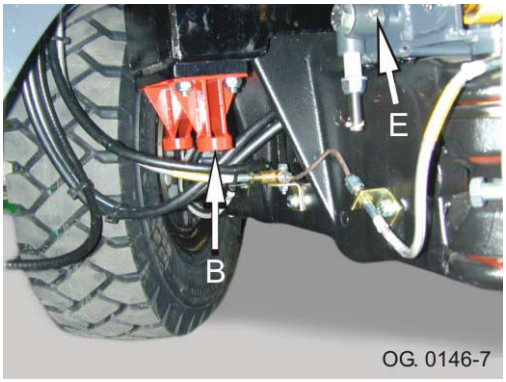



A = Jacking Point - Trolley Jack

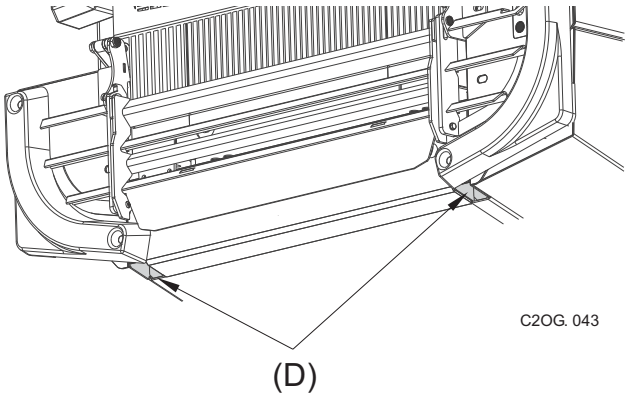



C = Jacking Points - Trolley Jack

### Front and Rear Jacking Points (Bottle Jack)



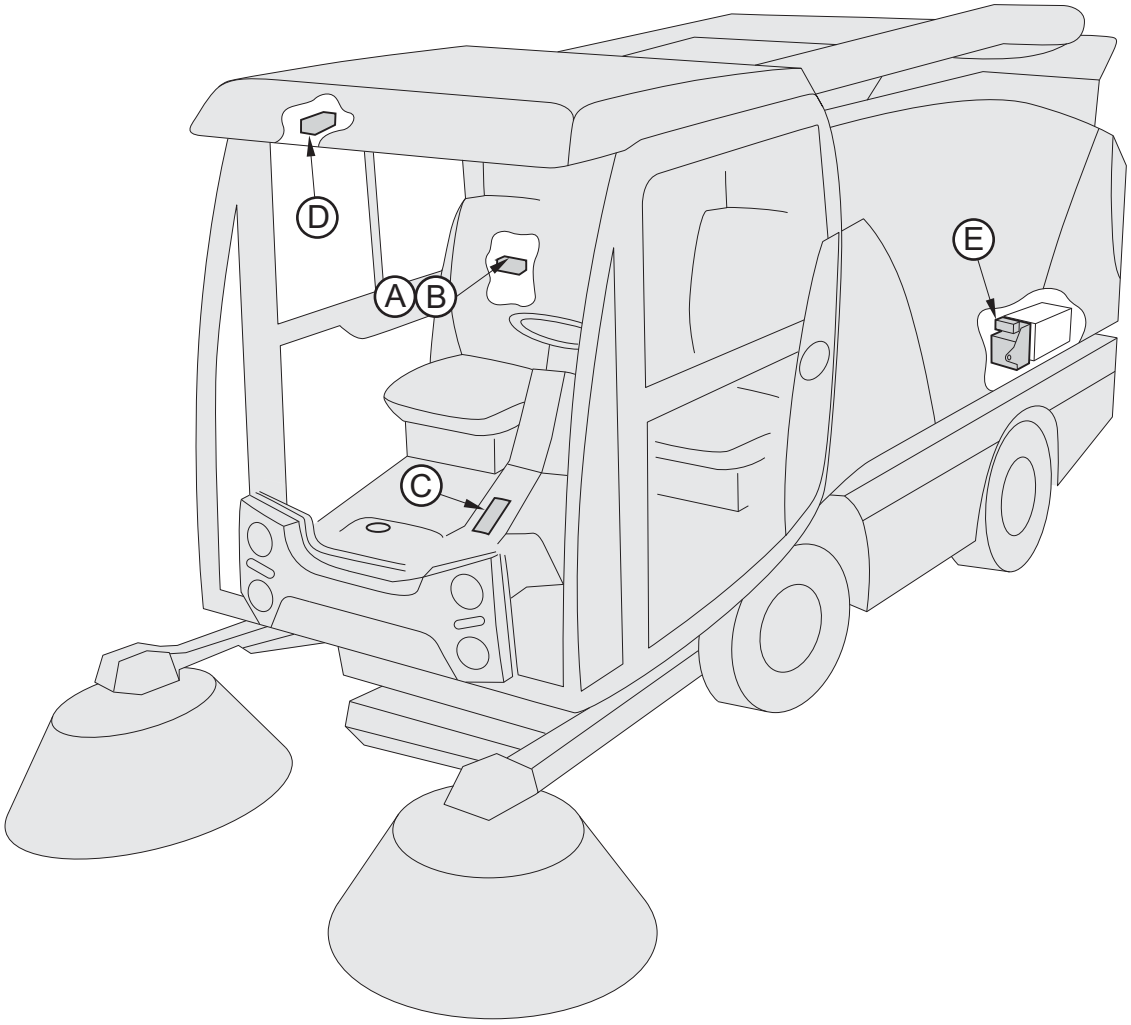

B = Jacking Point - Bottle Jack
E = Check Strap Pivot Grease Point (coil suspension only)




D = Jacking Point - Bottle Jack

## Fuse Applications

### General Layout - Fuses




A - Rear Cab - Fuses

B - Rear Cab - Relays

C - Steering Column Fuses

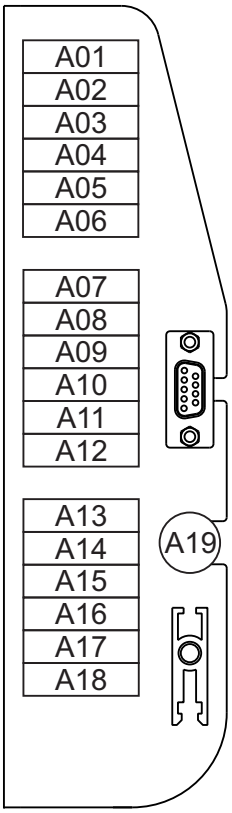
D - Overhead Console Fuses

E - Battery Box Fuses (Euro 5 / Tier 3)

**Before replacing fuses, ensure that all switches and the vehicle ignition are turned OFF to prevent any damage to the vehicle electronics.**

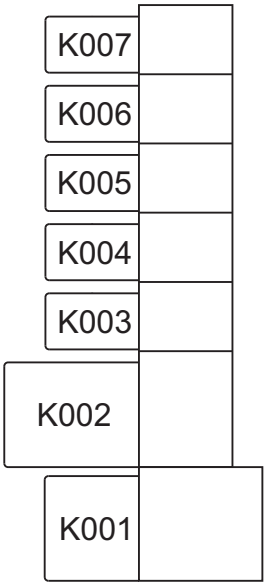
## Rear Cab Fuses - A

| Fuse No. | Description | Type | Rating (Amps) |
|---|---|---|---|
| A01 | Systems/Ignition | Blade | 10 |
| A02 | Ignition Switch, Radio, OBD | Blade | 5 |
| A03 | Safety Feed Internal Node | Blade | 20 |
| A04 | Standard Feed Internal Node | Blade | 20 |
| A05 | Armrest Node | Blade | 5 |
| A06 | Indicator (Ignition Feed) | Blade | 10 |
| A07 | Indicator (Battery Feed) | Blade | 10 |
| A08 | Headlight Master Fuse | Blade | 15 |
| A09 | Wiper, Screen Wash, Horn | Blade | 15 |
| A10 | Worklamps (Low Level) | Blade | 15 |
| A11 | Water Pump (Brushes) | Blade | 10 |
| A12 | Heater Fan | Blade | 15 |
| A13 | Beacon | Blade | 7.5 |
| A14 | Drivers Seat | Blade | 15 |
| A15 | Worklamps (High Level) | Blade | 10 |
| A16 | Autolube | Blade | 1 |
| A17 | Auxiliary Power | Blade | 7.5 |
| A18 | *Reserved* | *Spare* | |
| A19 | Condenser Fan (Air Conditioning) | 1 1/4" x 1/4" | 20 |




## Rear Cab Relays - B

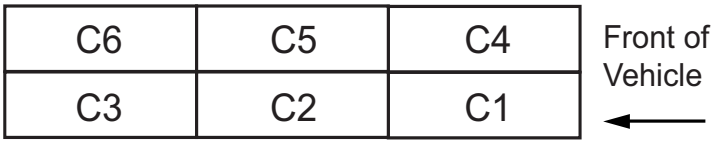
| Relay No. | Description |
|---|---|
| K001 | Ignition Relay |
| K002 | Indicator Timer Module |
| K003 | Headlight Relay |
| K004 | Heater Fan Low-Speed (Air Conditioning) |
| K005 | Condensor Fan (Air Conditioning) |
| K006 | Worklamp (auto-cancel) |
| K007 | Water Pump (Brushes) |




**Note:** Access fuses/relays by sliding LH seat forwards and removing soft trim panel.

## Steering Column Fuses - C

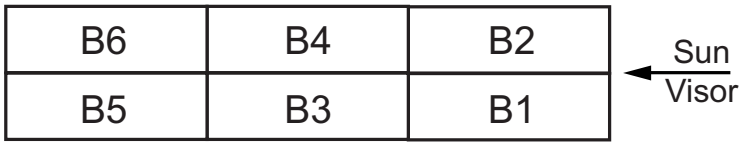
Access fuses by removing plastic cover on top of steering column trim.




| Fuse No. | Description | Type | Rating (Amps) |
|---|---|---|---|
| C1 | LH indicator | Blade | 7.5 |
| C2 | RH indicator | Blade | 7.5 |
| C3 | LH Headlamp | Blade | 10 |
| C4 | RH Headlamp | Blade | 15 |
| C5 | *Spare* | | |
| C6 | *Spare* | | |

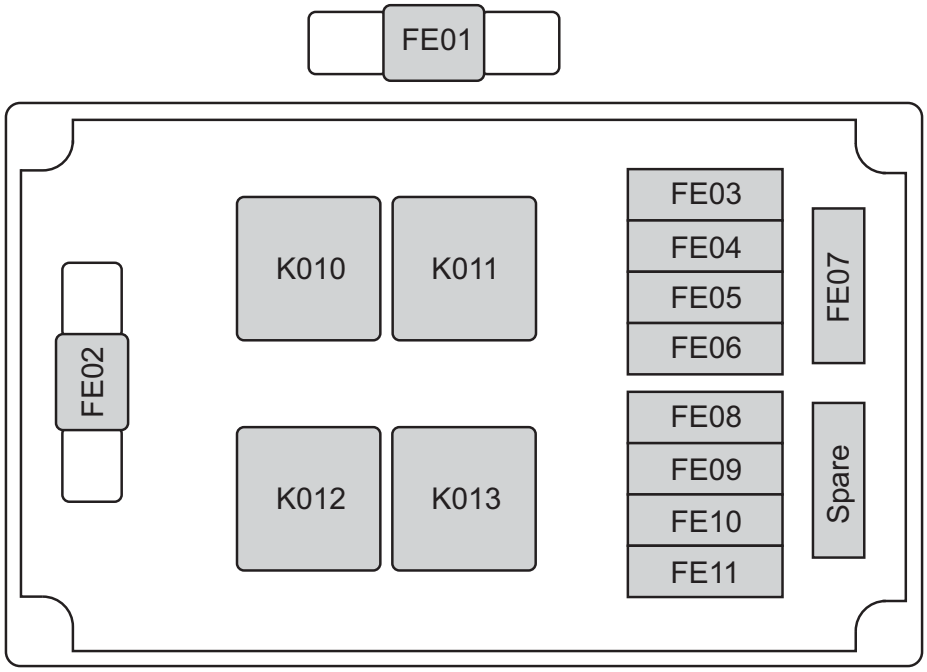
## Overhead Console Fuses - D

Access fuses by pulling down passenger sun visor.




| Fuse No. | Description | Type | Rating (Amps) |
|---|---|---|---|
| B1 | Side lights and instrument illumination | Blade | 5 |
| B2 | Heated windscreen and mirrors | Blade | 25 |
| B3 | Johnston Visual Module (JVM) display | Blade | 10 |
| B4 | *Spare* | | |
| B5 | *Spare* | | |
| B6 | *Spare* | | |

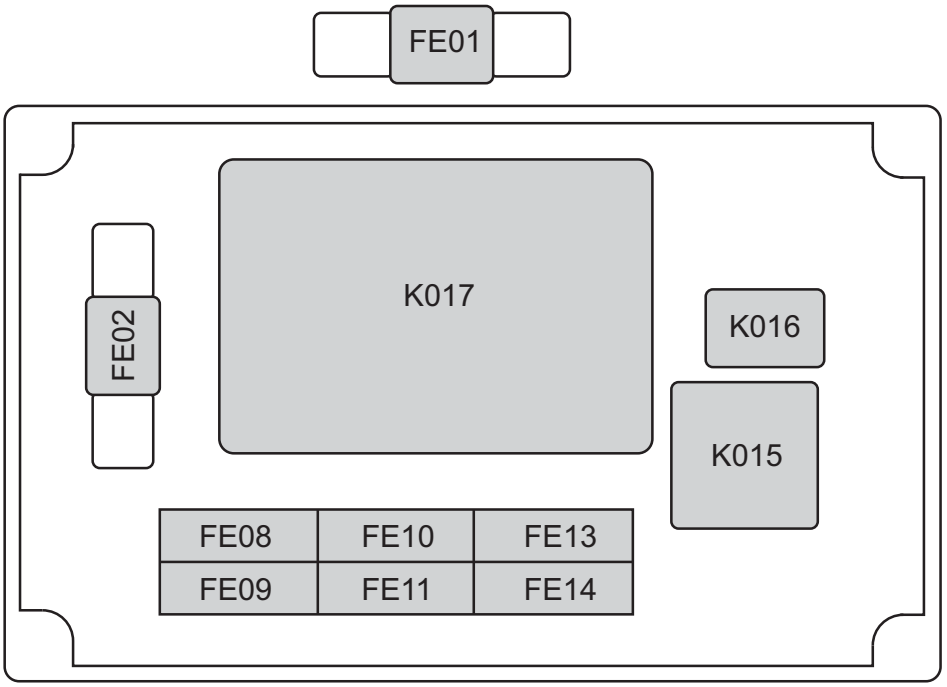
**Euro 5 Engine**
**Battery Box - E**




Access fuse by removing battery box cover.

| Fuse No. | Description | Type | Rating (Amps) |
|---|---|---|---|
| FE01 | Main Fuse | Mega power fuse | 100 |
| FE02 | Glow Plugs | Mega power fuse | 60 |
| FE03 | Engine - Fuse 1 | Blade | 10 |
| FE04 | Engine - Fuse 2 | Blade | 15 |
| FE05 | Engine Systems | Blade | 7.5 |
| FE06 | Cranking Relay | Blade | 30 |
| FE07 | Fuel Heater | Blade | 20 |
| FE08 | Chassis Node - Fuse 1 | Blade | 20 |
| FE09 | Chassis Node - Fuse 2 | Blade | 20 |
| FE10 | Transmission Node - Fuse 1 | Blade | 20 |
| FE11 | Transmission Node - Fuse 2 | Blade | 20 |
| K010 | Engine Main Relay | | |
| K011 | Glow Plug Relay | | |
| K012 | Cranking Relay | | |
| K013 | Fuel Heater Relay | | |

**Stage 3a Engines**
**Battery Box - E**

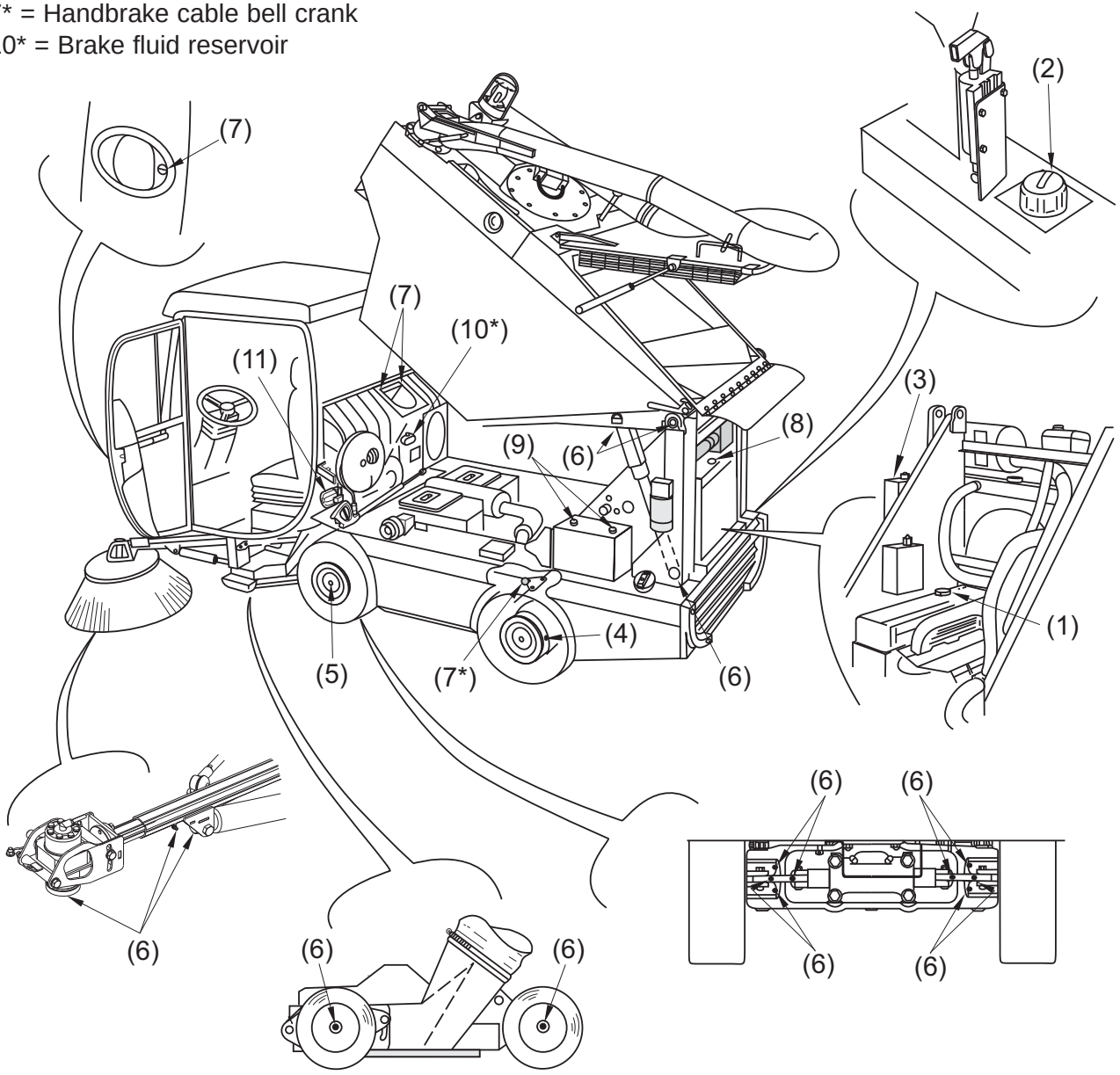


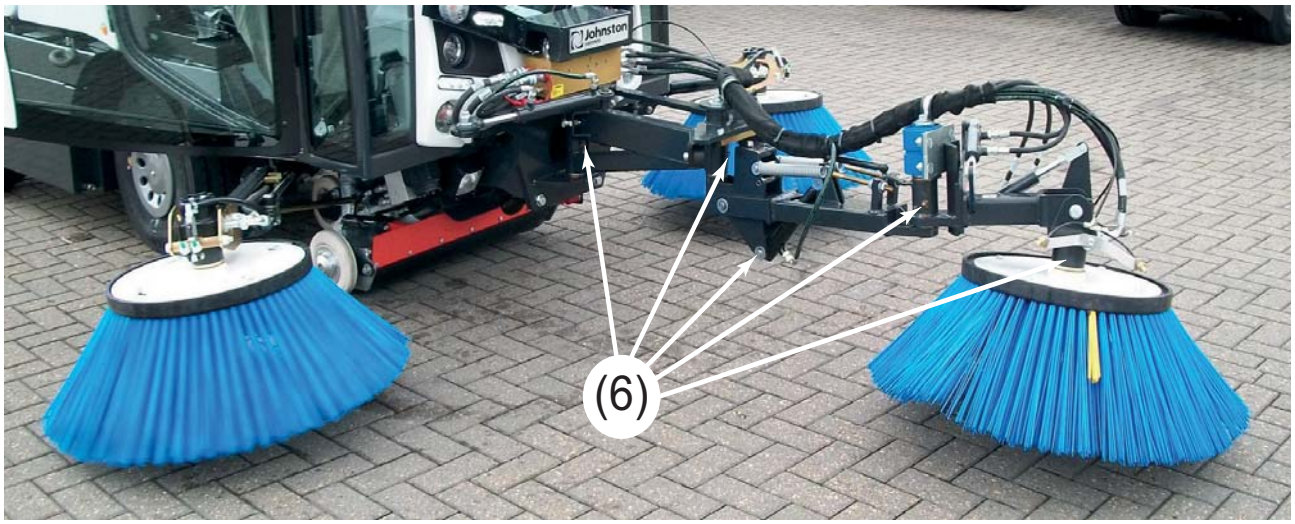

Access fuse by removing battery box cover.

| Fuse No. | Description | Type | Rating (Amps) |
|---|---|---|---|
| FE01 | Main fuse | Mega power fuse | 100 |
| FE02 | Glow plugs | Mega power fuse | 60 |
| FE08 | Chassis Node - Fuse 1 | Blade | 20 |
| FE09 | Chassis Node - Fuse 2 | Blade | 20 |
| FE10 | Transmission Node - Fuse 1 | Blade | 20 |
| FE11 | Transmission Node - Fuse 2 | Blade | 20 |
| FE13 | Cranking | Blade | 30 |
| FE14 | Cold Start | Blade | 3 |
| K015 | Cranking Relay | | |
| K016 | Cold Start Relay | | |
| K017 | Glow Plug Relay | | |

## Lubrication Chart

7* = Handbrake cable bell crank
10* = Brake fluid reservoir



| C200 Approved Lubricants | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Oil Type Grade** | **Capacity** | **Johnston** Part No. | **Shell** | **BP** | **Castrol** | **Mobil** | **Q8** | **Chevron** |
| 1. Engine 10W40, API C1-4, ACEA E6 | 9.2 L (Euro 5) 6.4 L (Tier 3) | 94-79 | Rimula Signia 10W/40 | - | Enduron Low SAPs 10W/40 | Delvac XHP LE 10W-40 | Q8 T905 | - |
| 2. Hydraulic System | 55L | 94-12 | Tellus T46 Multigrade | Bartan HV46 | Hyspin AWH46 | DTE 15M | Handel 46 | Rando HDZ46 |
| 3. Transmission System | 12L | 94-12 | Tellus T46 Multigrade | Bartan HV46 | Hyspin AWH-M46 | DTE 15M | Handel 46 | Rando HDZ46 |
| 4.Transmission Wheel Motors | 0.6L | 39663 | Spirex EP90 | Gear Oil EP90 | Hypoy EP9075W-90 | Mobilube HO90 | T 45 90 | Multigear 80/W90 |
| 5. Front Wheel Bearings | - | - | Retinax LX2 | Energrease L2 | Piroplex Red | Mobilube XHP222 | Rembrandt 3 | Hytex EP2 |
| 6. Grease Nipple |  | - | Retinax A | Energrease L2 | LM Grease | Mobilube Grease MP | Rembrandt EP 2 | Multifak EP2 |
| 7. Spray Lubricant |  | 94-61 | **SPECIAL PTFE LUBRICANT GREASE** | | | | | |
| 8. Antifreeze | 6.5L | 94-21 | **TOTAL COOLANT CAPACITY 13L : 50% CONCENTRATION REQUIRED** | | | | | |
| 9. Battery Terminals | - | - | **PETROLEUM JELLY** | | | | | |
| 10. Brake System | 1L | 6906 | **BRAKE FLUID DOT 4 SPEC** | | | | | |
| 11. HP Water System | 0.3L | 39666 | **AVILUBE 583 SYNTHETIC OR KLUBER SYNTHESCO MT 68 IMPORTANT – ONLY THESE OILS SHOULD BE USED** | | | | | |
| **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

# 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):**
C101
C25, C40, C50
CX200, CN200, CW200
CX201, CN201, CW201
5000, CX400, CN400

**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
Compact Sweeper Division
06/07/11

Compacts Issue : 13

Pt. No. 01500-2(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,<br>Surrey, RH4 1XF, England. |
| **Technical Documentation maintained by:** | Research and Development Department,<br>Johnston Sweepers Limited,<br>Curtis Road, Dorking,<br>Surrey, RH4 1XF, England. |

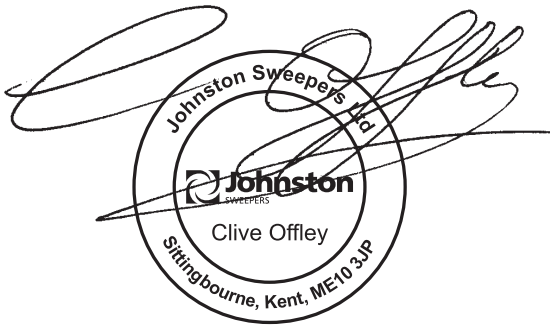
**Johnston Sweepers Ltd. hereby declares that the following equipment conforms to the requirements of EC Directive 2000/14/EC:**

| | |
|---|---|
| **Description of Equipment:** | EC Directive 2000/14/EC, Annex 1, Item 46: Power sweeper |
| **Product Name and Description:** | Johnston Compact C101, CL201, CW201, CN201 & CX201 hydrostatic sweepers with Euro 5 engines. |
| **Maximum Measured Sound Power Level ($L_{WA}$):** | 102dB(A) |
| **Guaranteed Maximum Sound Power Level ($L_{WA}$):** | **103dB(A)** |
| **Conformity Assessment Procedure:** | Internal control of production<br>(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,<br>Curtis Road, Dorking, Surrey, RH4 1XF, England. |

September 2010

**Signed by:**

C.F. Offley
Engineering Director
Johnston Sweepers Ltd




Issue : 06

EUnited Municipal Equipment

PM 10 2010 Certified

We hereby declare this Road Sweeper* has been tested and certified according to the EUnited PM10 Emission Test for Road Sweepers and fulfills the requirements of the test year stated.

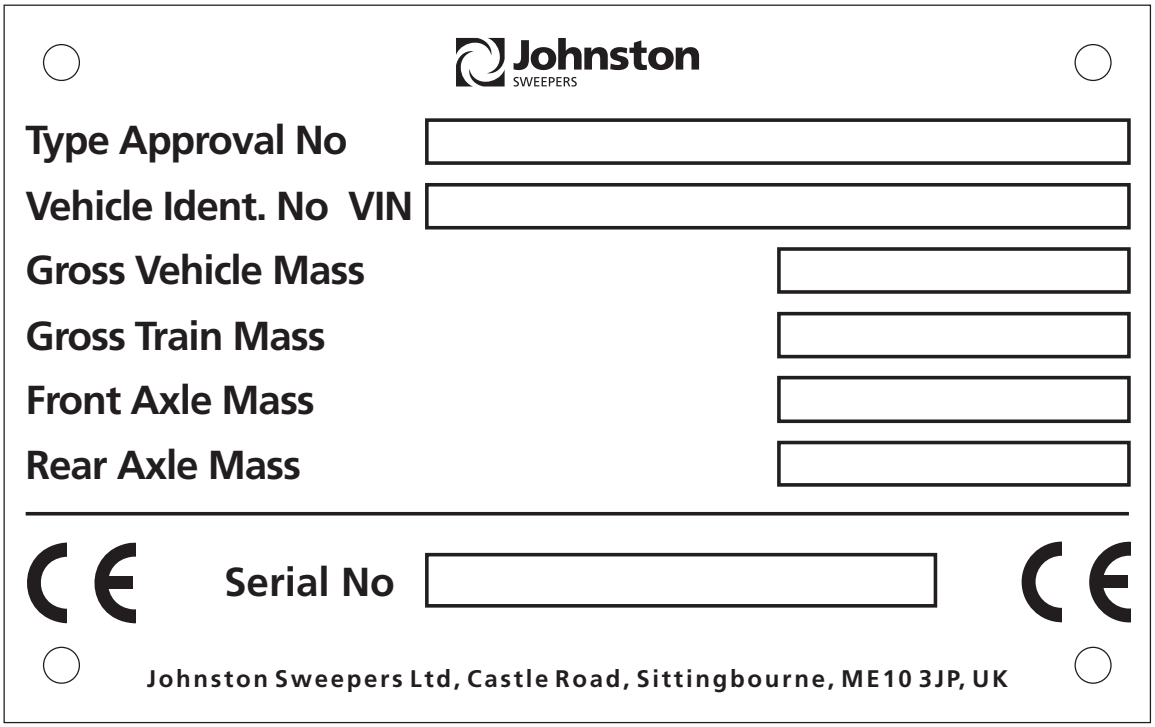
| | |
|---|---|
| **Manufacturer's Name:** | Johnston Sweepers Limited |
| **Manufacturer's Address:** | Curtis Road, Dorking, Surrey, England, RH4 1XF |
| **declares that:** | |
| **Product Name:** | Johnston Road Surface Cleaner |
| **Product Type(s):** | V500, V550, V650, V800<br>C101, C200, C400 |

C. Offley
Engineering Director
Johnston Sweepers Ltd.
01/09/10


*according to;
European Standard EN15429-1:2007 Sweepers - Part 1: Classification and Terminology

Issue 03

**Identification & Permitted Weights**




The vehicle identification plate is located in the cab and contains the following data;

a. Type Approval Number

b. Vehicle Identification Number

c. Gross Vehicle Mass

d. Gross Train Mass

e. Front Axle Mass

f. Rear Axle Mass

g. Serial Number

Note:

Please state the Serial Number / Vehicle Registration Number and/or Vehicle Identification Number whenever you contact a Johnston Sweepers dealer orcustomer service centre.

CHAPTER 6

# Routine Maintenance

## Table of Contents

**Subject** **Page**