

# Operator's Guide



## CN200 & CX200 Suction Sweeper

Guide (GB)

01276-1

Revision Level 02

(VM Euro 5)

**General Arrangement** **1**

**Controls** **2**

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## Foreword

The Johnston CX200, CN200 Compact 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, 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  
RH = Right Hand

L = Left  
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

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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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CHAPTER

**1**

**General Arrangements  
and CE Certificate**

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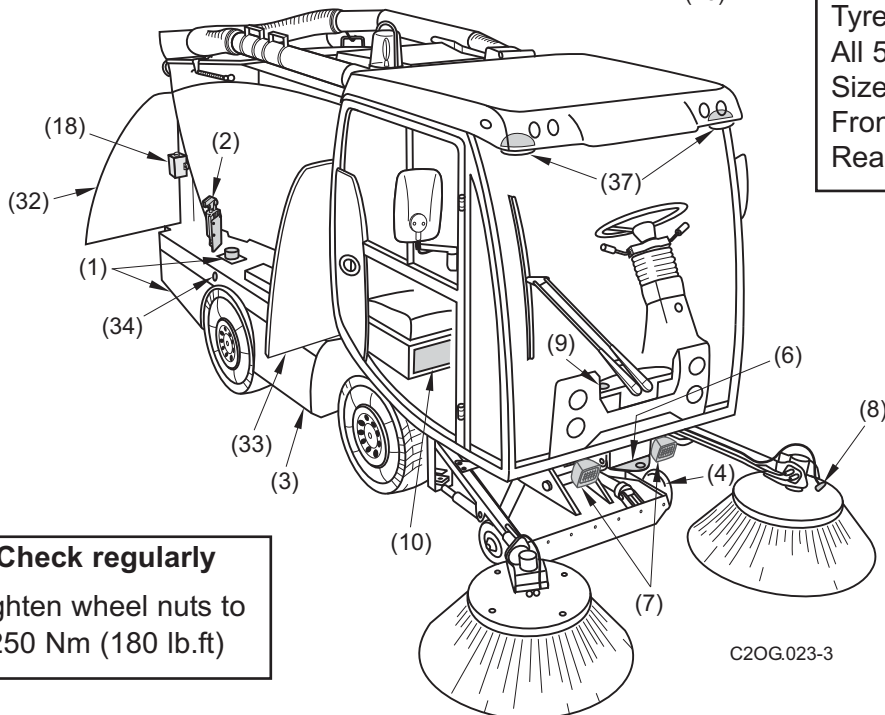
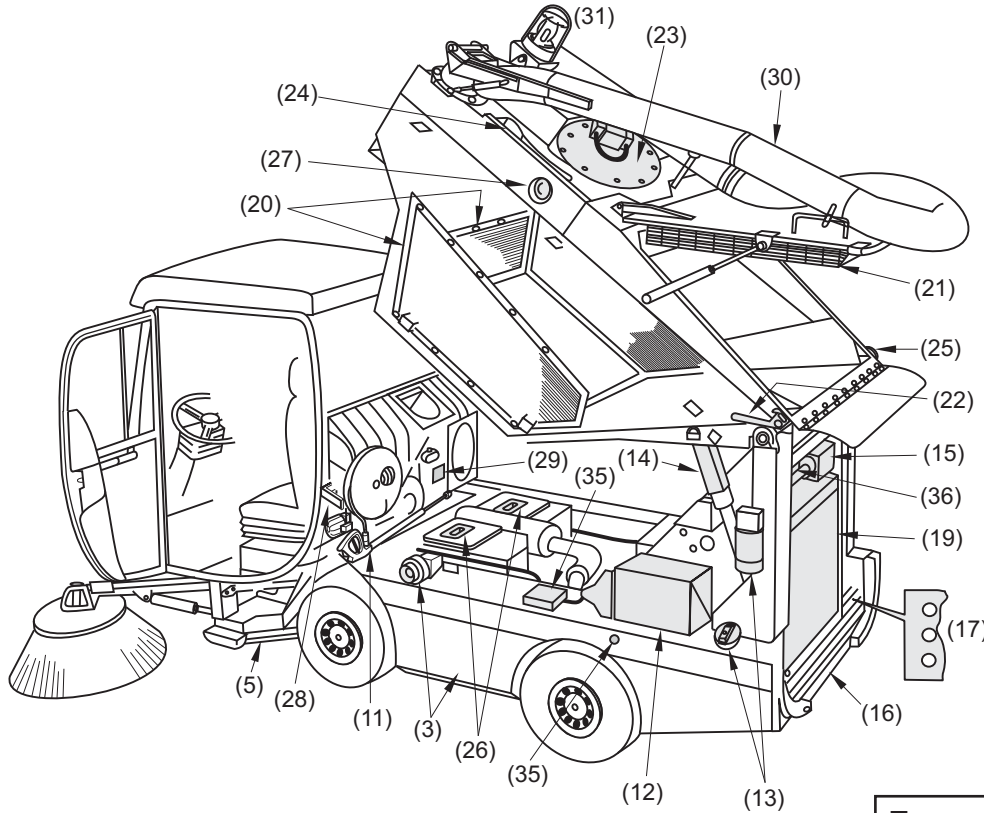


**Safety Notice**



**ALWAYS** be aware of the safety requirements associated with this machine

**General Arrangement**



Tyre pressures:  
 All 5.7 bar (83 psi)  
 Size:  
 Front = 6.5 R10  
 Rear = 225/75 R10

**Check regularly**  
 Tighten wheel nuts to  
 250 Nm (180 lb.ft)

C2OG.023-3

**Component Key**

- 1 Hydraulic oil tank and filler
- 2 Hopper lift emergency hand pump
- 3 Clean water tanks and filler
- 4 Suction nozzle - wheeled
- \*5 Suction nozzle - skids (option)
- 6 Tow point
- 7 Worklights - Low level
- 8 Water spray jets
- 9 Windscreen washer bottle
- 10 Tool Kit
- \*11 High pressure washer unit (option)
- 12 Battery
- 13 Fuel tank, filler and filter
- 14 Hopper safety prop
- 15 Engine air cleaner
- 16 Rear grille / working platform
- 17 Hydraulic tank level gauge
- 18 Transmission oil reservoir
- 19 Radiator/engine cooling system
- 20 Recirculation water filter screens
- 21 Hopper mesh baskets
- 22 Hopper door lever
- 23 Suction fan
- 24 Suction fan inspection cover
- 25 Sludge drainage channels
- 26 Recirculation water tank access covers/filters (x2)
- 27 Recirculation water tank filler
- 28 Nozzle duct blanking flap lever
- 29 Brake fluid reservoir
- 30 Wanderhose
- 31 Beacon
- 32 Rear access door - both sides
- 33 Front access door - both sides
- 34 Hole for fitting of securing eye - for tie down
- 35 MegaJET node
- 36 Radiator header tank/filler
- \*37 Work lamps - High level

\*Option

## 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):** C25, C40, C50, 5000, CX200.  
C101, CN200, CW200,  
CX400 & CN400

**Product Options:** All

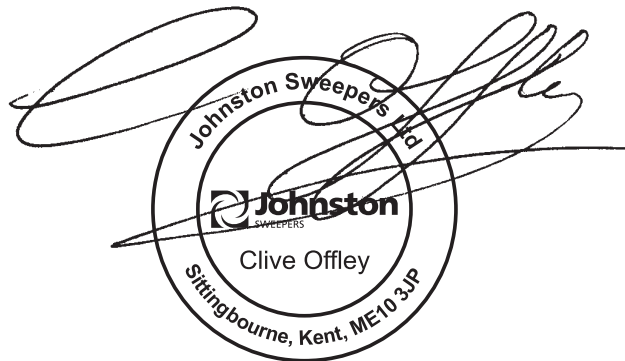
**Product Serial Number:**

**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  
01/09/10





**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 Compact C101, CL200, CW200,  
CN200 & CX200 hydrostatic sweepers with  
Euro 5 engines.

**Maximum Measured Sound Power Level (L<sub>WA</sub>):** 102dB(A)

**Guaranteed Maximum Sound Power Level (L<sub>WA</sub>):** **103dB(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.  
September 2010

**Signed by:**

C.F. Offley  
Engineering Director  
Johnston Sweepers Ltd





We hereby declare this Road Sweeper\* has been tested and certified according to the EUUnited 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  
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

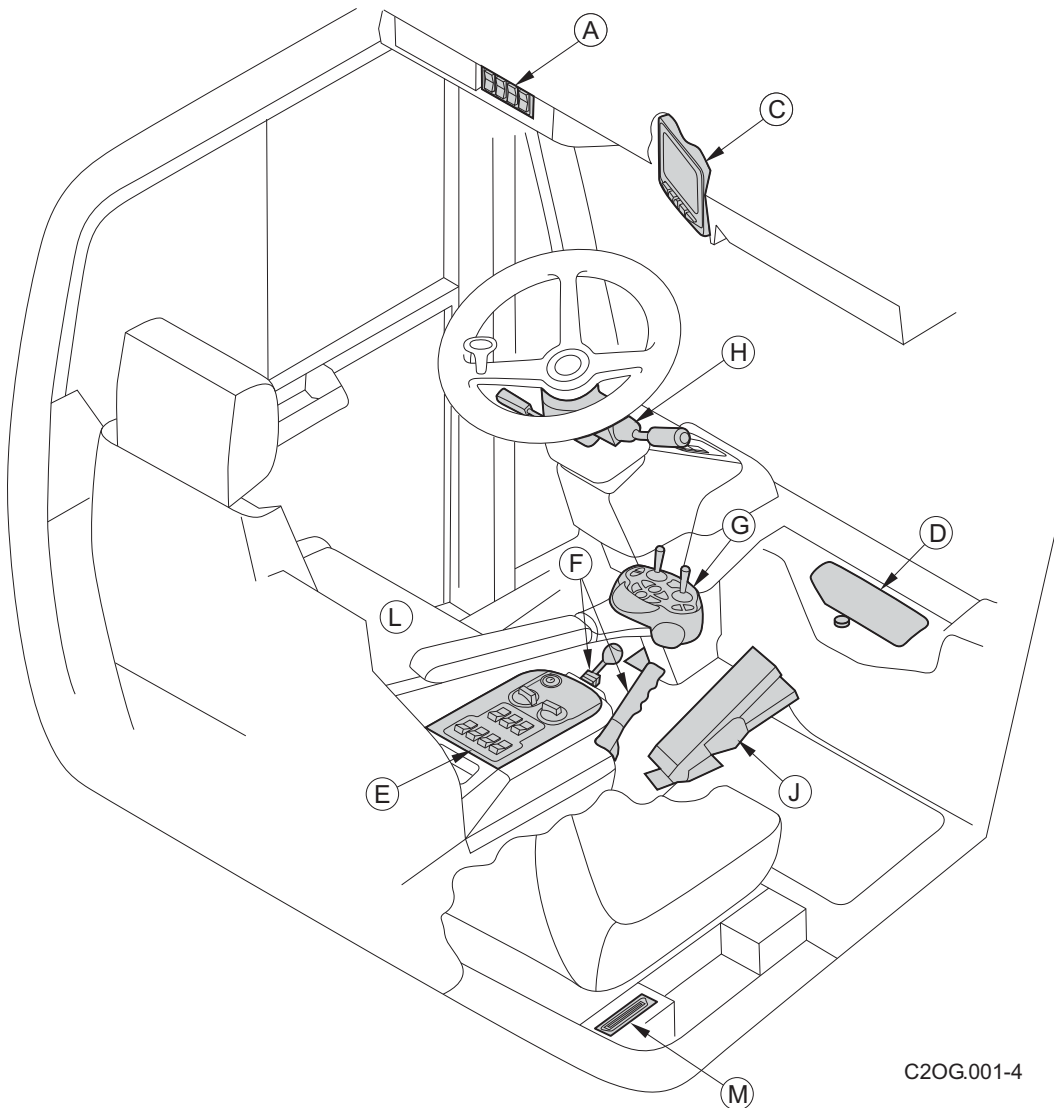
## CHAPTER

## 2

## Controls

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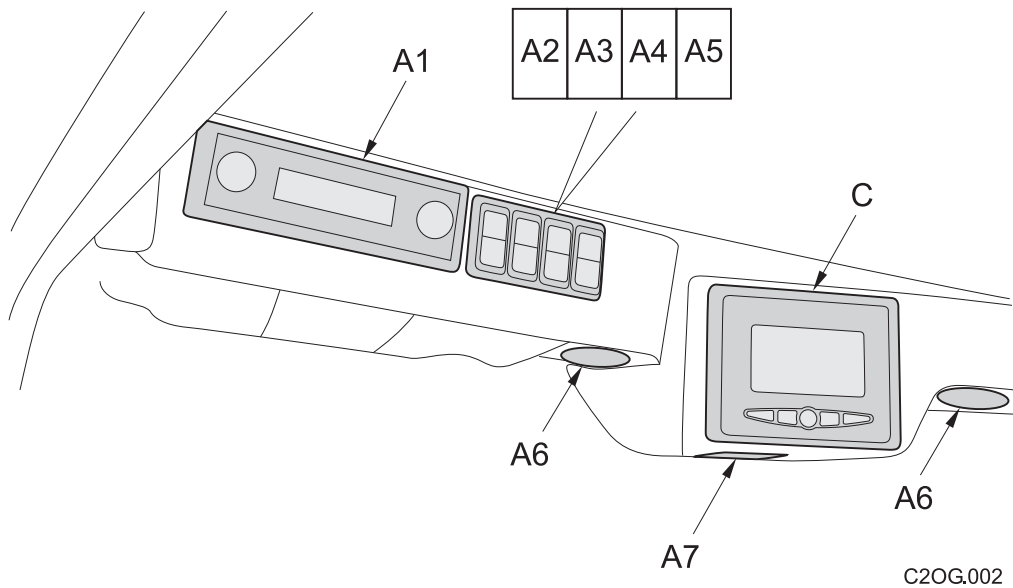
**In-Cab Operating Controls****General Layout**

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**Key**

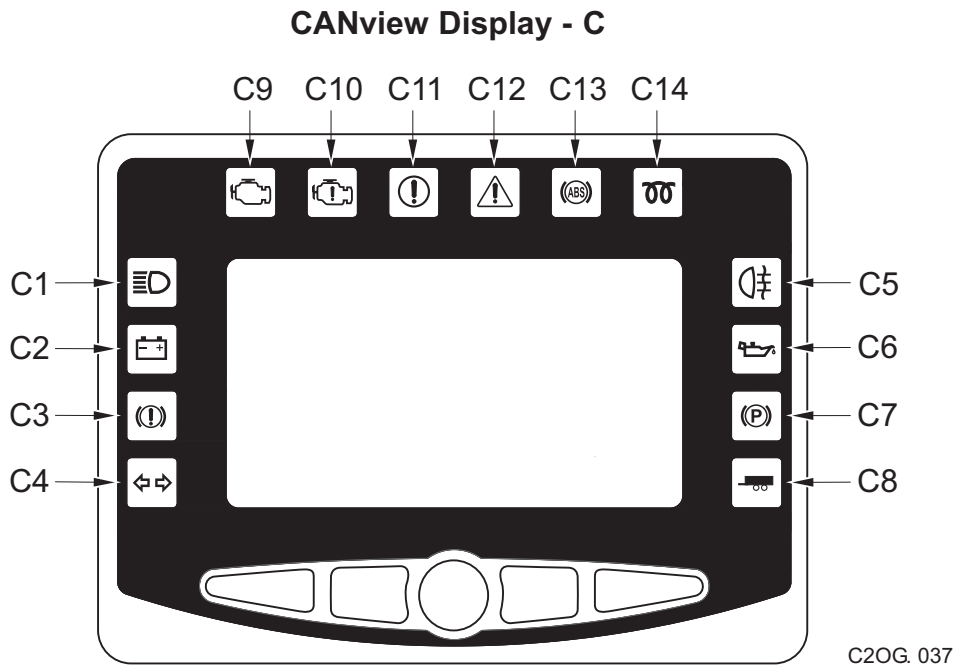
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- |                                    |                               |
|------------------------------------|-------------------------------|
| A - Overhead console.              | G - Arm rest controller.      |
| C - CANview display.               | H - Steering column.          |
| D - Front centre console.          | J - Foot controls.            |
| E - Rear centre console.           | L - Driver's seat adjustment. |
| F - Handbrake / dump valve levers. | M - OBD port.                 |










Overhead Console - A



C2OG.002






Symbol	Switch	Description
	A1	CD/MP3 Player.
	A2	Head/Side lights.
	A3	Rear fog lights.
	A4	Worklights.
	A5	Heated windscreen.
	A6	Speakers.
	A7	Interior light.
	C	CANview display - see next page.



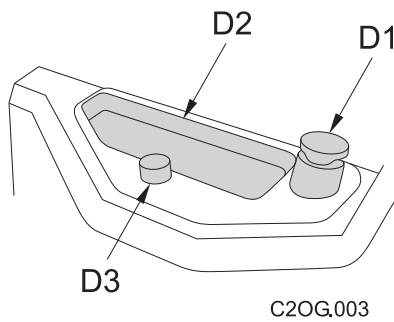
Symbol	Switch	Description
	C1	Main beam.
	C2	Alternator not charging warning light.
	C3	Brake system warning light - indicates low level brake fluid/low brake pressure.
	C4	Direction indicator warning light.
	C5	Rear fog warning light.
	C6	Engine low oil pressure warning light.
	C7	Handbrake warning light - illuminates when handbrake (F) is applied.
	C8	Trailer indicator advisor.
	C9	OBD emission fault warning - engine requires maintenance as problem with engine emission control or particulate filter.



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

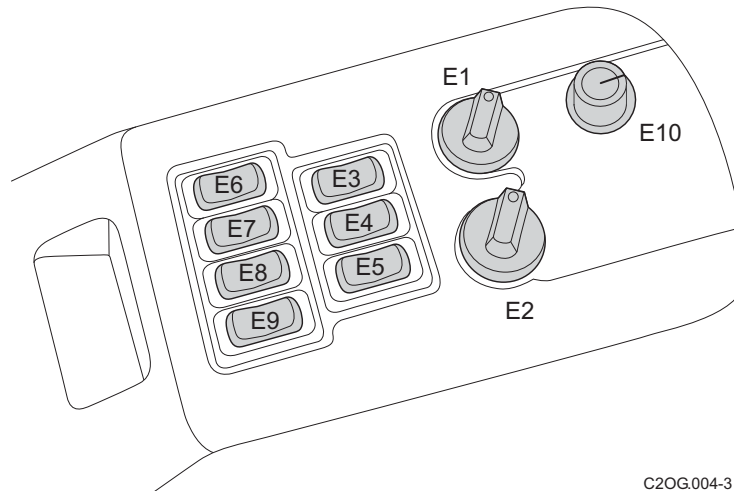
CANview Display - C

Symbol	Switch	Description
	C10	Engine fault warning and error codes if available.
	C11	Not used.
	C12	Not used.
	C13	ABS option - (C400 Only).
	C14	Engine pre-heating.










Front Centre Console - D



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

**Rear Centre Console - E**


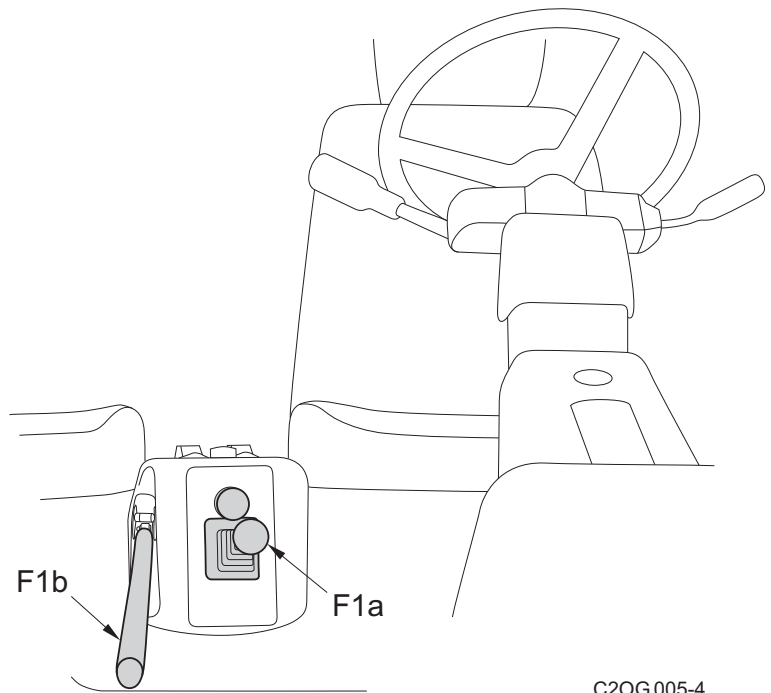
C2OG.004-3

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	High pressure washer - pressing switch activates water pump to allow use of handlance located behind the rear of the cab.
	E4	Air conditioning ON / OFF.
	E5	Heater fan - 2 speed - to optimise heater performance open/close diffusers as required.
	E6	Hopper raise/lower - pressing switch forwards raises hopper, backwards lowers hopper.
	E7	Beacon.
	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.
	E9	Water sprays - first position activates sprays with fan and brushes. Second position will immediately activate water sprays.
	E10	Ignition switch - ACC - Accessory position, enables radio to operate whilst engine is switched OFF. ON - Turn ignition ON, use switch H2b to start engine.
	*Option	



**Handbrake/Dump Valve Lever - F**

<b>Item</b>	<b>Description</b>
F1a	Handbrake
F1b	Dump valve lever



C2OG.005-4

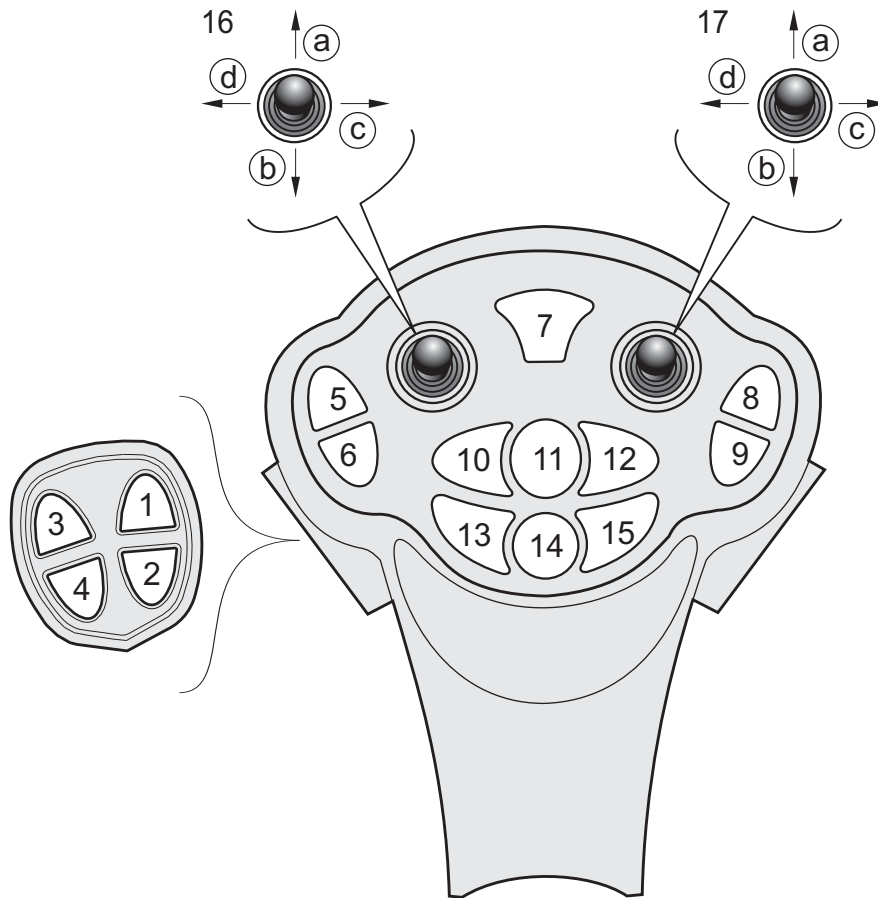
To release the handbrake in an emergency if the engine is inoperative;

Unscrew silver disc anti-clockwise until plunger releases disc.




Pump plunger disc until solid, can't push plunger in.

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.

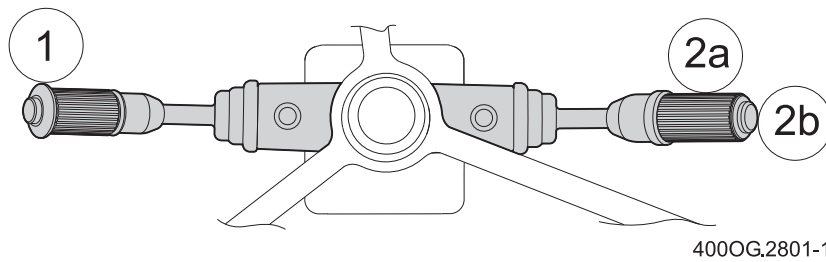
**Arm Rest Controller - G**



C2OG. 029-2

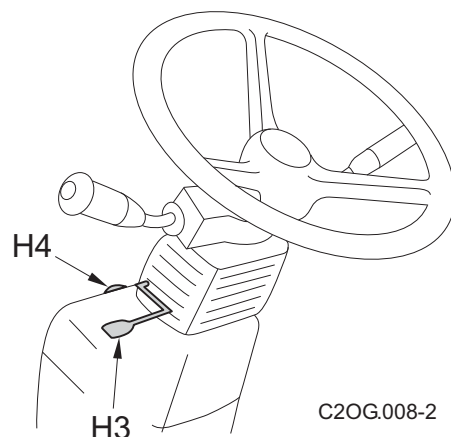
Symbol	Switch	Description	
	G1	Nozzle hop down.	
	G2	Nozzle hop up (for ingestion of bulky objects).	
	G3*	Nozzle flap - close	} option for ingestion of } leaves or bulky items.
	G4*	Nozzle flap - open	
	G5	Brush - speed increase.	
	G6	Brush - speed decrease.	
	G7	Cruise control - pressing switch momentarily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

Arm Rest Controller - G

Symbol	Switch	Description
	G8	Engine speed increase - Increases engine speed to a maximum of 1500 rpm when in work mode.
	G9	Engine speed decrease - reduces engine speed to a minimum of 1100 rpm.
	G10	Sweep selector - rotates fan, brushes, water sprays and lowers all sweep gear used for left hand sweeping.  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.  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	Third brush functions on/off – enables third brush functions for switches G10, G12, G16 & G17.
	*G15	Third brush rotation – clockwise – pressing switch rotates brush for RH sweep.
	G16	a - increases LH brush pressure. b - decreases LH brush pressure. c - moves LH brush in. d - moves LH brush out.
	G17	a - increases RH brush pressure. b - decreases RH brush pressure. c - moves RH brush out. d - moves RH brush in.
		* Third brush functions for G16 and G17 are activated when switch G14 is engaged.
	*G16	a – lowers brush. b – raises brush. c – traverses brush arm right. d – traverses brush arm left.
	*G17	a – tilts brush head forward. b – tilts brush head backward. c – swivels brush head right. d – swivels brush head left.

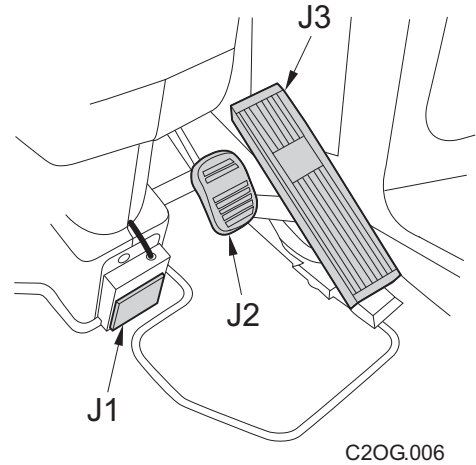
**Steering Column Switches - H**


Symbol	Switch	Description
	H1	<p>Lighting</p> <p>Main/dip beam - pushing lever down activates main beam. Lifting lever flashes head lamps.</p> <p>Horn - pushing button in activates horn.</p> <p>Indicators - pushing lever forward, right indicator. Pulling lever backwards, left indicator.</p> <p>Wash/wipe - pressing collar in activates water jets.</p> <p>Turning switch to</p> <ul style="list-style-type: none"> <li>- Intermittent wipe.</li> <li>- Slow wipe.</li> <li>- Fast wipe.</li> </ul>
	H2	Transmission drive selector.
	H2a	<p>Forward/reverse</p> <ul style="list-style-type: none"> <li>- pushing lever forwards selects forward direction.</li> <li>- pulling lever backwards selects reverse direction.</li> </ul>
	H2b	<ul style="list-style-type: none"> <li>- With switch E10 set to ON position and foot brake J2 depressed, pressing button will start engine (if not already running).</li> <li>- With engine running pressing button will engage work mode @ 1100 rpm unless the GO pedal is depressed.</li> <li>- Whilst in work/transit mode with reverse selected, pressing button will activate night silent function (mutes reverse bleeper).</li> </ul> <p>Turn OFF ignition to cancel night silent function.</p>
	H3	Pulling lever towards driver unlocks the column, allowing it's reach/rake to be adjusted.
	H4	<p>Hazard warning flashers - push to activate, when activated flashes red.</p> <p><b>Note:</b> This hazard warning signal device should be used in accordance with the road vehicle lighting regulations and should NOT be used whilst sweeping.</p>

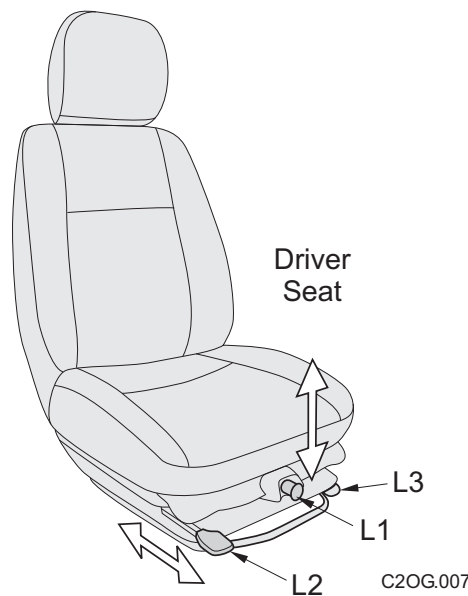


**Foot Controls - J**

Item	Description
J1	<p>Powathrust switch - pressing pedal lowers brush arms fully and then restores the normal working pressure after going over 'sleeping policemen' or kerb climbing. Holding switch also gives full brush pressure for scrubbing of particular areas.</p> <p>Pressing J1 when selecting reverse holds the nozzle and brushes in the working position.</p>
J2	<p>Brake pedal - activates 4-wheel brakes.</p>
J3	<p>GO pedal - increases vehicle speed when depressed. Reduces speed when relaxed.</p>



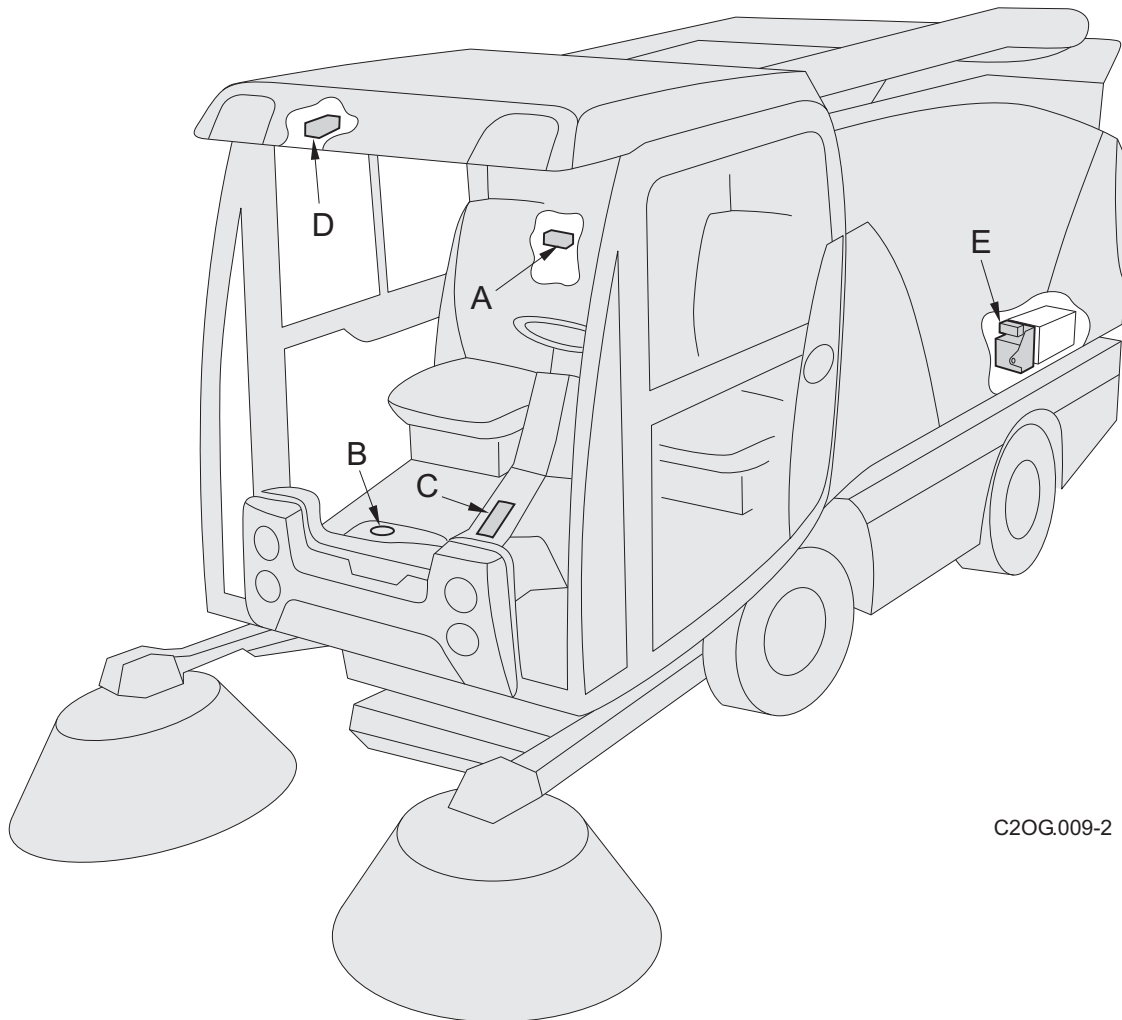
**Drivers Seat Adjustment - L**



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

## Fuse Applications

### General Layout - Fuses



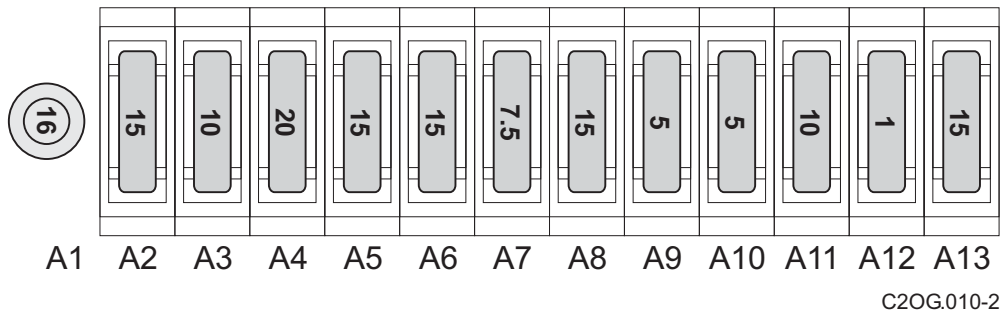
C2OG.009-2

- A - Rear cab.
- B - Front cab fuses.
- C - Steering column.
- D - Overhead console.
- E - Battery box.



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

Rear Cab Fuses - A

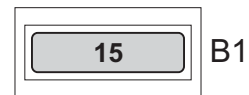


Access fuses by sliding LH seat forwards and removing soft trim panel.

Fuse No.	Description	Type	Rating (Amps)
A1	Condenser fan	1 1/4" x 1/4" glass	16
A2	J-Plex internal control node	Blade	15
A3	J-Plex chassis node & J-Plex arm rest node	Blade	10
A4	MegaJET system	Blade	20
A5	MegaJET failsafe	Blade	15
A6	Air conditioning / heater blower	Blade	15
A7	Beacons - rear hopper = 7.5A, roof bar beacon = 15A	Blade	7.5
A8	Drivers seat	Blade	15
A9	VM engine ECU	Blade	5
A10	OBD connector	Blade	5
A11	LP water pump	Blade	10
A12	Autolube (option)	Blade	1
A13	Worklights	Blade	15

Front Cab Fuses - B

Access fuses by removing front centre console.

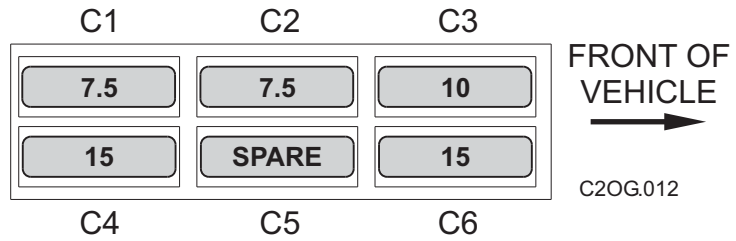


C2OG.011

Fuse No.	Description	Type	Rating (Amps)
B1	Auxiliary power socket (in-line fuse)	Blade	15

**Steering Column Fuses - C**

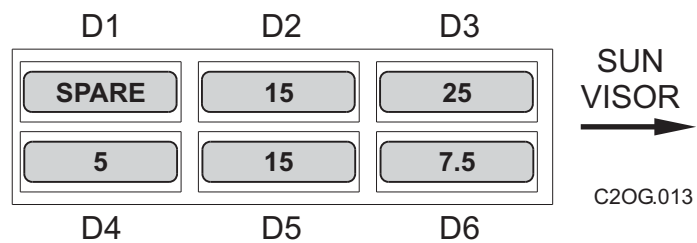
Access fuses by removing plastic cover on top of steering column trim.



Fuse No.	Description	Type	Rating (Amps)
C1	LH indicator	Blade	7.5
C2	RH indicator	Blade	7.5
C3	Hazard switch	Blade	10
C4	Main beam headlights	Blade	15
C5	<i>Spare</i>		
C6	Wipers/intermittent wiper relay/screen washers/horn	Blade	15

**Overhead Console Fuses - D**

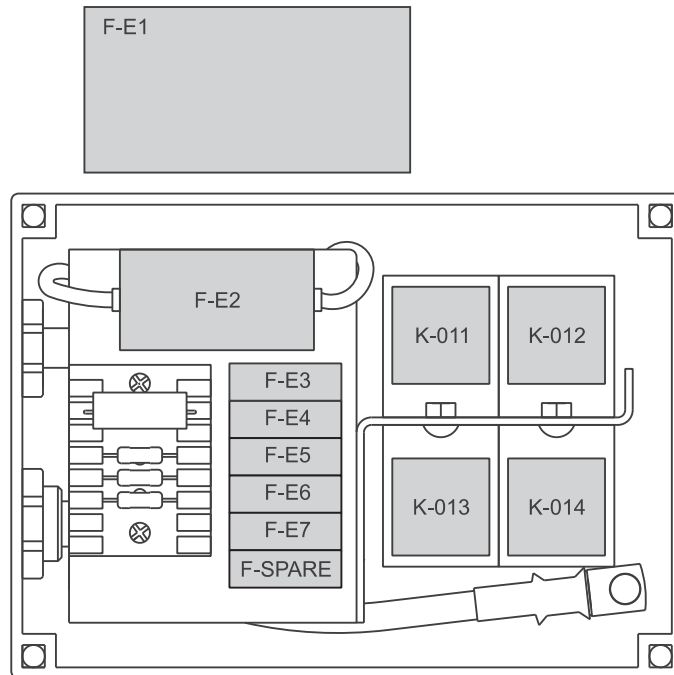
Access fuses by pulling down passenger sun visor.



Fuse No.	Description	Type	Rating (Amps)
D1	<i>Spare</i>		
D2	Worklights	Blade	15
D3	Heated windscreen and mirrors	Blade	25
D4	J-Plex CANview display	Blade	5
D5	Dip beam headlights	Blade	15
D6	Side lights and instrument illumination	Blade	7.5



Battery Box - E

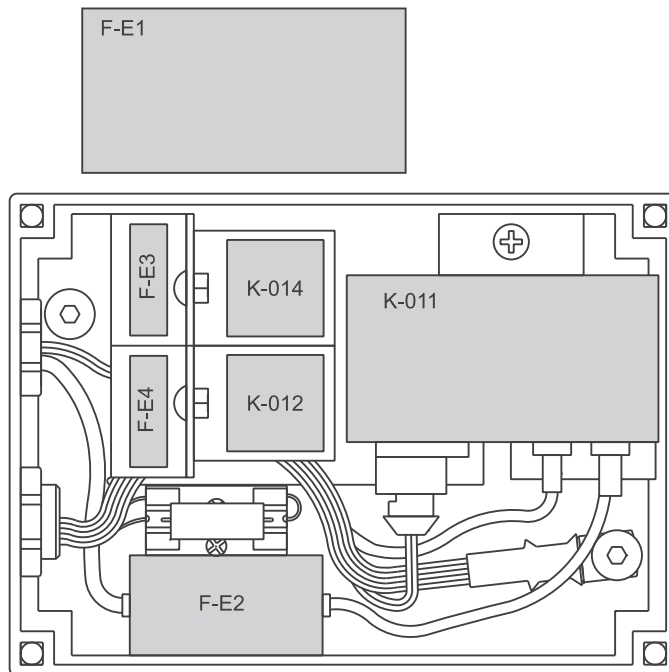


C2OG.014-4

Access fuse by removing battery box cover.

Fuse No.	Description	Type	Rating (Amps)
F-E1	Main fuse	Mega power fuse	100
F-E2	Glow plug	Mega power fuse	60
F-E3	Start relay	Blade	30
F-E4	ECU battery supply	Blade	15
F-E5	ECU battery main 2	Blade	10
F-E6	Engine valve acutators	Blade	15
F-E7	Fuel heater	Blade	20
F-E8	<i>Spare</i>		
K-011	Glow Plug Relay		
K-012	Cranking Relay		
K-013	EDC Main Control Relay		
K-014	Fuel Heater Relay		

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



C2OG.014-5

Access fuse by removing battery box cover.

<b>Fuse No.</b>	<b>Description</b>	<b>Type</b>	<b>Rating (Amps)</b>
F-E1	Main fuse	Mega power fuse	100
F-E2	Glow plug	Mega power fuse	60
F-E3	Cold Start	Blade	30
F-E4	Cranking	Blade	3
K-011	Glow plug Relay		
K-012	Cranking Relay		
K-014	Cold Start Relay		

## CHAPTER

## 3

## Operation

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### **Driving and Safety Precautions**



- The drive foot pedal (J3) with its inching feature, propels the vehicle when depressed and enables braking when released. Extra care **MUST** be exercised with this control on tight turning manoeuvres, during acceleration, when slowing down and during transit mode.
- 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 (H2a) is in neutral and the handbrake (F1a) 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. These checks may be carried out by opening the rear door of the machine.

#### **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.
2. There is sufficient diesel fuel in the fuel tank. The fuel should be to BS 2869 and can contain up to 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 CANview icon is illuminated.
6. Clean / replace air filter elements if CANview icon is illuminated.
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 - 5.7 bar (83 psi).

### **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<sup>2</sup>.

#### 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<sup>2</sup>.

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<sup>2</sup>

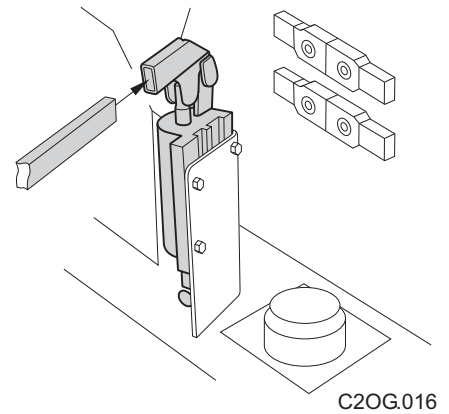
Whole body: EAV 0.5m/s<sup>2</sup>

**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).

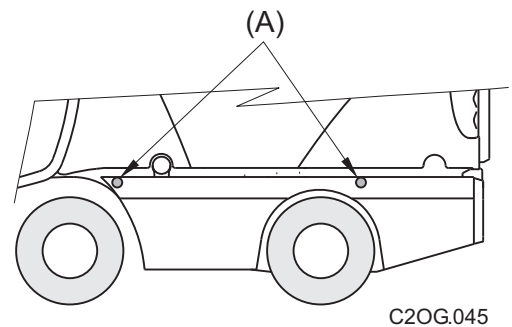
**Emergency Hand Pump**

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 (E10) and operating the hopper lower switch (E6).



**Securing the Vehicle**

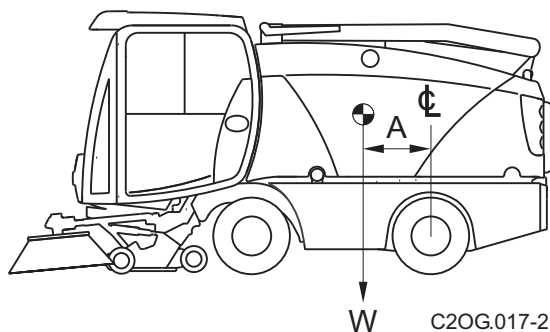
When the sweeper is transported on a vehicle, two holes are provided on each side of the chassis for the fitting of the securing eyes (provided in the tool kit) in order that the sweeper can be secured on the transporter.



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

**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

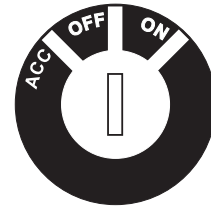
## Operating Procedures



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

1. Carry out essential daily check list.
2. Before starting ensure that the handbrake (F1a) is on and the transmission column switch (H2) is in neutral.
3. To start engine;
  - 3a. In cold weather turn ignition key (E10) to ON position until glow plug indicator  on CANview screen (C) disappears. Depress foot brake (J2) and press button (H2b) on transmission steering column switch to start engine.
  - 3b. When engine is warm turn ignition key (E10) to ON position, depress foot brake (J2) and press button (H2b) to start engine.
  - 3c. Turning ignition key (E10) to ACC position will enable the radio to be operated without the engine running.



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On starting the engine the brushes automatically lift and stow for a period of 6 seconds. During this period you cannot tip the hopper or activate work mode.

Activating work mode switch (H2b) with the engine running, will set the engine to a speed of 1100 rpm.



**If there is a system fault an alarm will sound (3 beeps) to indicate a fault condition on the CANview.**

**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 the Powathrust pedal J1 can be used instead of the foot brake as an emergency interlock override. For safety reasons this method should only be used for emergency starting.



## Driving Only (Transit Mode)

1. Select transmission column switch (H2a) to either forward or reverse mode.
2. Release handbrake (F1a) and depress GO pedal (J3) until a desired speed is reached. During this mode a maximum engine speed of 1750 rpm on CN200 and 2300 rpm on CX200. The maximum road speed of 40 kph (25 mph) can be attained on a CN200 and 50 kph (32 mph) on a CX200.

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

## Sweeping (Work Mode)

1. Ensure nozzle duct blanking flap lever is in the open position.
2. Engage work mode switch (H2b). The work mode revs will default to 1100 rpm when selected unless the engine speed is increased by depressing the GO pedal before selecting. (**Note:** maximum work mode revs 1500 rpm).
3. Select LH or RH sweeping by pressing either switch G10 or G12 on the arm rest controller (G). Pressing required switch rotates fan, brushes, activates water sprays and lowers all sweepgear to either LH or RH position.
4. Select transmission column switch (H2a) to forward mode.
5. Release handbrake (F1a) and depress GO pedal (J3).
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 (G16 or G17).
7. Suction performance can be increased by pressing the engine speed increase switch (G8) to desired performance of up to 1500 rpm. Depressing engine speed decrease switch (G9) will reduce engine speed to a minimum of 1100 rpm.

## Cruise Control

A switch is provided (G7) to set a sweeping speed. Press the GO pedal (J3) to reach the required sweeping speed. Press the cruise control switch (G7), 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.

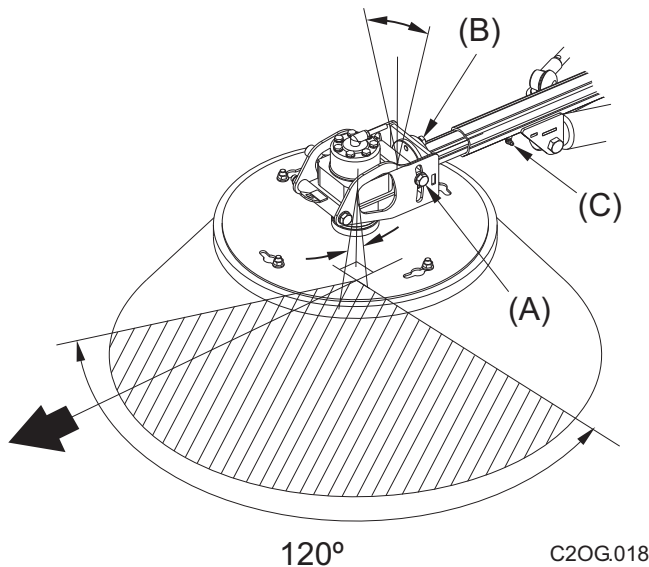
During cruise mode pressing the GO pedal will increase road speed for special manoeuvres. Releasing the pedal will revert to preset cruise speed.

## 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 brush cannot be raised or lowered without the engine running. For safety reasons, once the brush has been lowered for adjustment, 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.

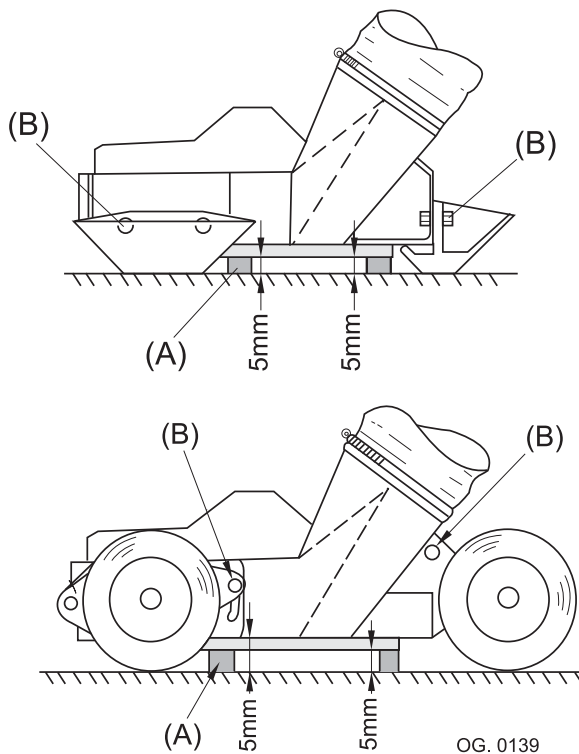
### Suction Nozzle Operation and Settings

Operation of the suction nozzle is in conjunction with the brushes when depressing G10 or G12. If the fan and nozzle only is required, then this can be achieved with fan only switch in conjunction with G1 to lower the nozzle. 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 (J1) 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 (F1b) whilst positioned over a drain. The CANview 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 (E9) to prevent dust being generated by rotating brushes.

#### Sweeping Bulky Materials/Leaves

1. The nozzle hop control (G2) 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 (G1) and sweep over area again. Use leaf flap\* if fitted.

#### To Stop Sweeping

1. Press sweep off switch (G11) to cancel fan, brushes, water sprays and to return sweep gear to stowed position.
2. De-select work mode switch (H2b) 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 (F1b) 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 (F1a). Open hopper door using hopper door release lever.
3. Raise hopper to full discharge position using the hopper lift/lower switch (E6). 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 (E6).

## Wanderhose Operation (Option)

1. Apply handbrake (F1a).
2. Blank off intake duct using nozzle duct blanking flap lever.
3. Select work mode (H2b) with engine running.
4. Increase engine speed up to 1500 rpm, depending upon material to be picked up.
5. Select fan only switch (E8).
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

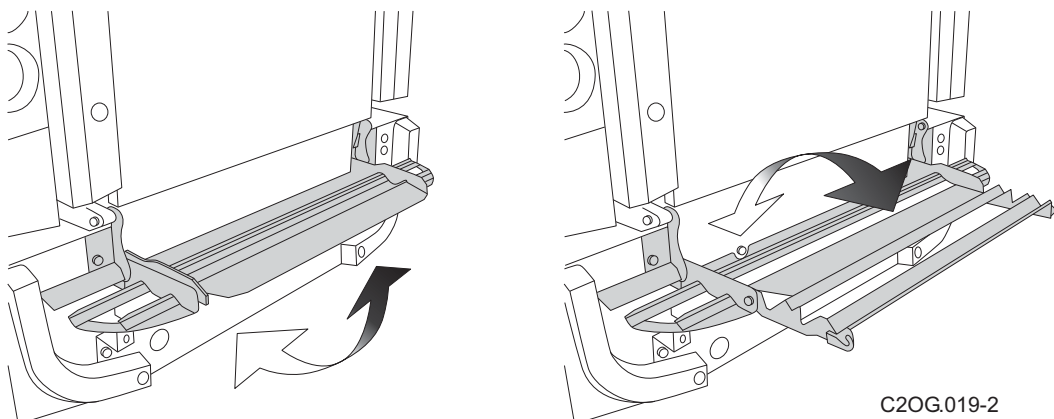
Cleansing may be effected using a steam cleaning unit or the high pressure washer (option).

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 (F1b). 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.

### Rear Grille / Working Platform

The rear grille / working platform below the radiator hinges up and is secured by pushing in towards the cab at a 45 degree angle. Lowering the grille will lock it into the working position. Please note! Ensure that both pins are engaged correctly before accessing the platform. A working platform is created by opening out the centre section of the grille to allow viewing of the interior of the hopper. The platform may also aid removal of the rear mesh baskets, cleaning and inspection tasks. To lower grille, stow the centre section then lift the grille at a 45 degree angle and pull backwards to disengage the latch. Lower the grill until it is secured onto the magnetic catches.



## **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 0°C to -5°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 -5°C to -15°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.



CHAPTER

**4**

**Optional Equipment**

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## High Pressure Washer



### Safety Precautions



- Care **MUST** be taken not to damage sign written areas when cleaning.
- **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.

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 hand lance 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 (H2b).

Third brush controls on the arm rest controller (G) are activated by pressing the third brush function switch (G14).

Position brush arm to the required position using joysticks (G16 & G17).

To select clockwise rotation of brush, press switch (G13), anticlockwise rotation is selected by pressing switch (G15).

Adjust brush head angle using switches (G17a, b, c & d).

The rotation speed of third brush and main brushes is controlled by using switches (G5 & G6).

Dust suppression is achieved by operating switch (E9).



## CHAPTER

## 5

## CANview

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## J-Plex - The Johnston Sweeper Control System

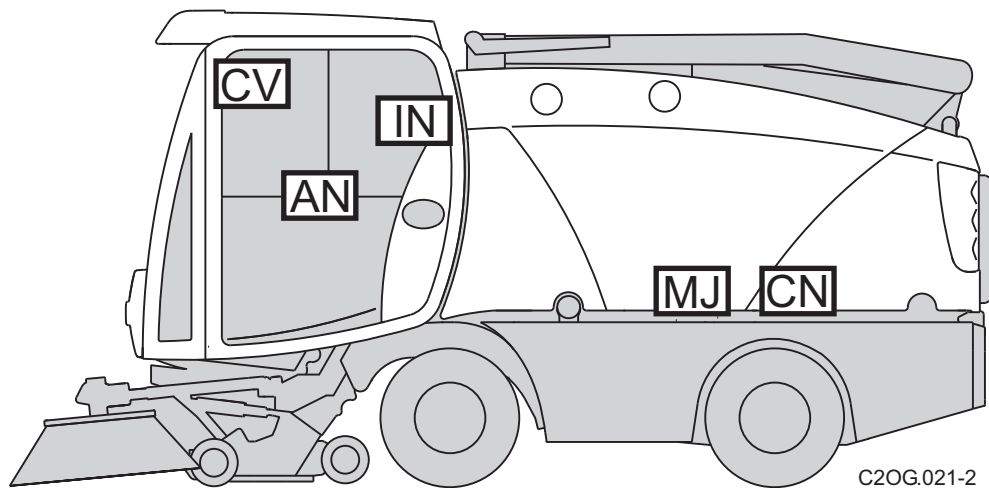
J-Plex is an electronic road sweeper control system which uses multiplex technology to enable multiple control signals to be combined into one common signal which can then be transmitted and received down a pair of wires (serial communication). This eliminates a substantial number of wires and connections 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 C200 range of sweepers, the J-Plex control system consists of a CANview screen and 4 remote I/O nodes mounted around the sweeper. The CANview acts as the master control unit and communicates between each external node via the two-wire control network. Each external node requires only a power supply to achieve the required functionality.

CANview 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.
- Sweeper performance data - hours sweeping, distance travelled, etc.

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

### 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) : On the RH chassis sidemember.
- 3) MegaJET Node (MJ) : On the LH chassis sidemember.
- 4) CANview (CV) : Centrally mounted in the overhead console.
- 5) Arm Rest Node (AN) : Within the arm rest controller, attached to cab centre tunnel.

**The CANview Display**

The CANview is an information centre which shows the status of numerous features of the vehicle. It provides a visual and audible warning of any malfunction or potential malfunction. Information frequently found in or around an instrument cluster is available via CANview.

CANview is also the interface between the operator and the powerful diagnostic tools which are a key feature of J-Plex.



C2OG. 037-1

**Switching On**

When the ignition is switched on, the following display will be seen briefly.

At the same time all the warning lights will illuminate to ensure the integrity of the bulbs. CANview will then revert to the default transit mode display.

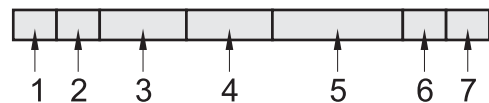


C2OG. 37-3

**Information Bar**

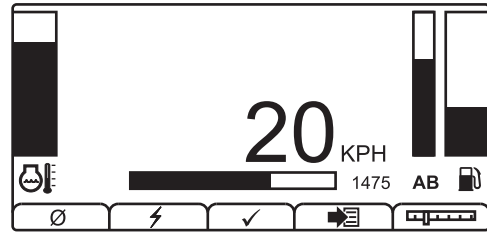
Shown at the top of the CANview screen, provides the following information.

- 1 - Engine water temperature °C
- 2 - Water tank % CX400 and CW200 only
- 3 - Clock time
- 4 - Menu number
- 5 - Operating icon
- 6 - AdBlue tank % (C400 Only)
- 7 - Fuel tank level %



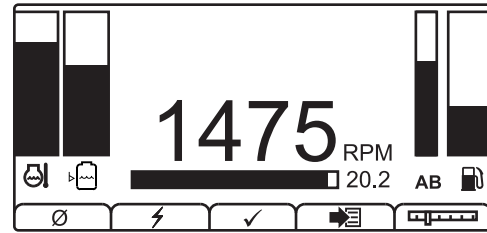
C2OG. 37-30

Transit mode display shows vehicle road speed, engine revs, engine temperature and fuel level.



C2OG. 037-31




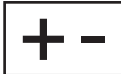




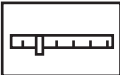


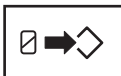




Engaging work mode will alter the display to show engine speed (suction power) and water levels (optional) in addition to engine temperature and fuel levels.



C2OG. 037-32








CANview Button Icons

Icon	Description	Icon	Description
	Vehicle log - menu 1.		Read maintenance manual.
	Electrical/system fault - menu 2.		Increase / decrease.
	Enter.		Shift left / right.
	Main menu - menu 4.		Vehicle log - grand total hours.
	Display set up - menu 5.		Vehicle log - part total hours since log was reset.
	Exit menu.		Reset part total hours/digital valve status.
	Scroll up.		Configure nodes (service use only).
	Scroll down.		
	Service menu.		

General Operating Icons

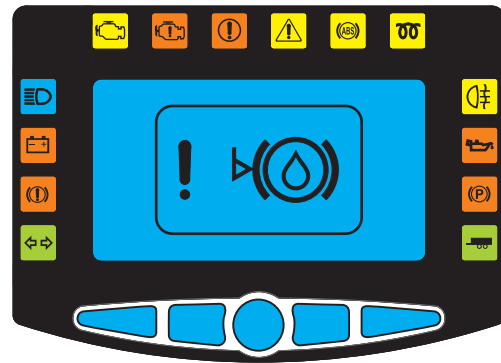
The following list of icons will appear on the CANview display to indicate mode of operation.

Icon	Description	Icon	Description
	Work mode.		Clock.
	Left hand sweep.		Service required.
	Right hand sweep.		


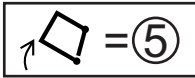


















## Warning Icons

The following list of tools may appear on the CANview display to alert the driver to an item, which may prevent effective operation of the vehicle.

3 beeps will sound in addition to a warning window and flashing icon appear on the CANview display. Pressing ✓ will remove the warning window from the display for 15 minutes.



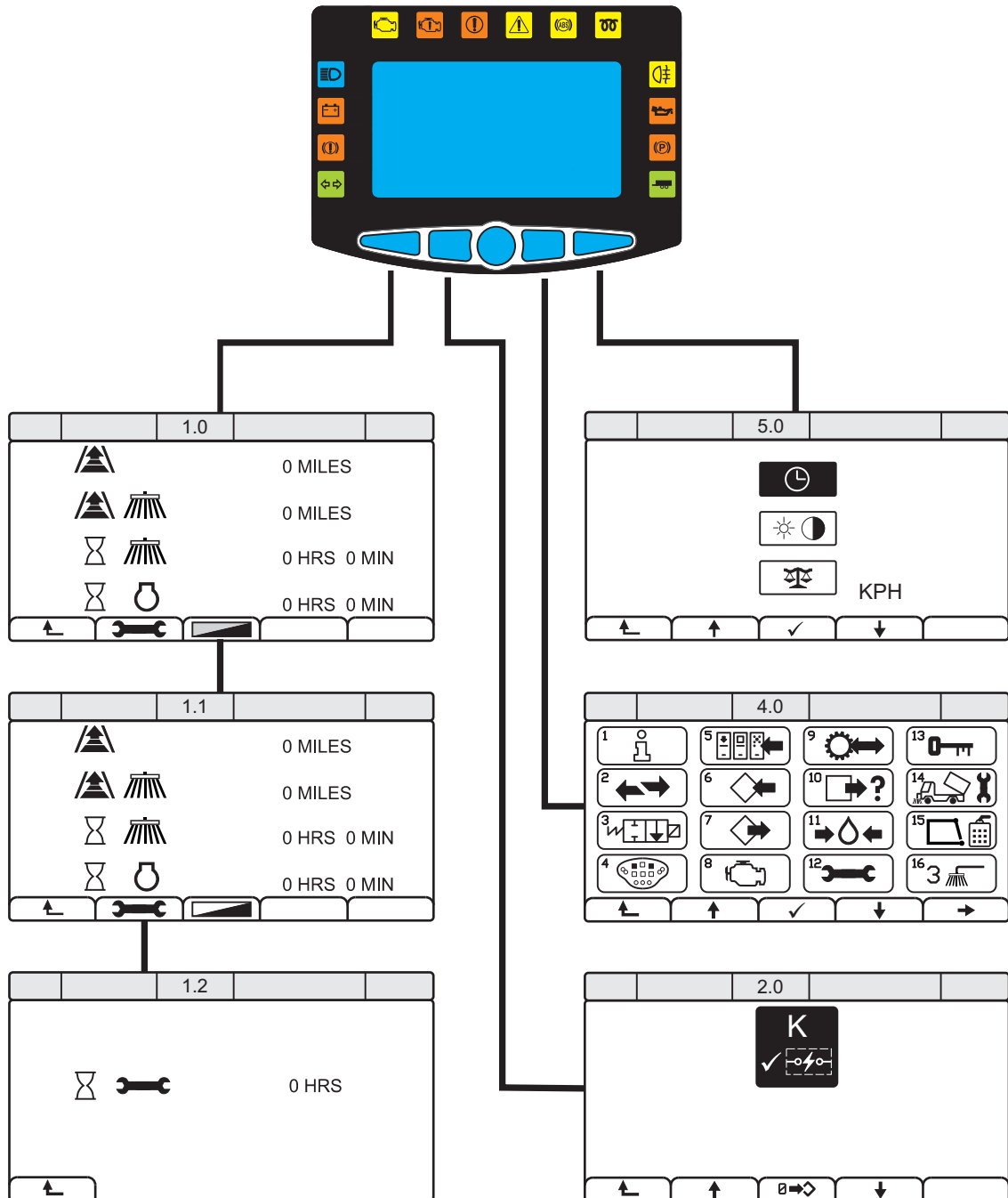
C2OG. 037-2

Icon	Description	Icon	Description
	Electrical fault.		Hopper up - vehicle speed restriction.
	Engine oil pressure.		*Low water level. C400 Standard, C200 Option
	Apply handbrake.		Engine water temperature.
	Select neutral.		*High recirculating water. C200 Option Only
	Engine rear door open. C200 Standard Only		*Low recirculating water. C200 Option Only
	*Low brake pressure. C400 Standard, C200 Option		Low hydraulic oil level.
	Low brake fluid.		Low fuel level.
	*Low transmission oil. C200 Option Only		*Hydraulic oil high temperature. C400 Option Only
	*AdBlue level low. C400 Standard Only		Air filter requires servicing.
	*Engine coolant low. C400 & C200 Option		*Water in fuel - service fuel filter. Euro engines only, not Tier 3

\*Option dependent on machine specification.

Menu Tree

Display functions described previously appear automatically. The four main branches of the menu tree may be accessed by pressing the relevant buttons.





C2OG.026-3






### Menu 1 - Vehicle Log

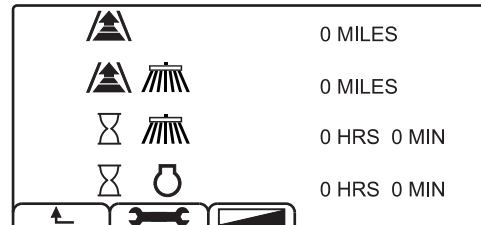


This menu is split into part total and grand total.

Icon	Description
	Part total (total since last reset).
	Grand total since delivery.

The menu can provide the following information.

Icon	Description
	*Total distance travelled.
	*Total distance cleaned.
	*Cleaning hours.
	Engine running hours.
	*Hours until next service point.



C2OG. 037-7

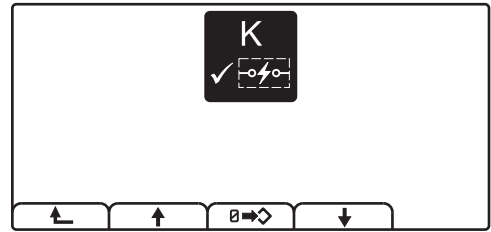
\*Option dependent on machine specification.

Menu 2 - System Faults



Should a fault occur with the J-Plex control system this menu will display the fault.

The screen will display a picture highlighting the item with the detected fault. The following symbols are used to denote electrical problems.



C2OG. 037-9

Icon	Description
	Open circuit.
	Short circuit.
	Intermittent connection - open circuit.
	Intermittent connection - short circuit.
	Valve energised.
	Valve NOT energised.

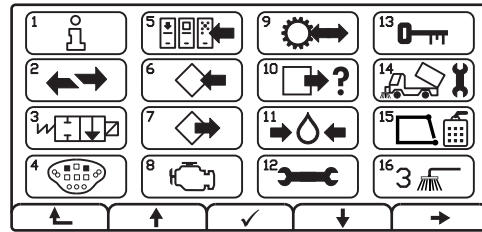
**Menu 4 - Main Menu**



Pressing the MENU button on the CANview unit will access the main menu display.

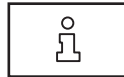
Press **↑**, **↓** or **→** to scroll through the menu list and the **✓** button to access the required menu.

Pressing **⬅** will return display to either the work or transit mode screen.



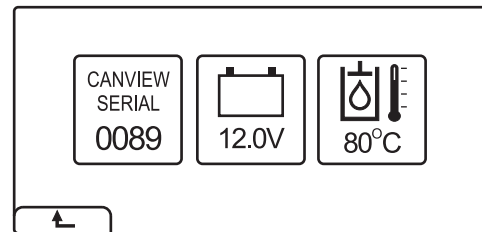
C2OG. 037-10

**Menu 4.1 - System Information**



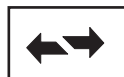
The system information menu displays vehicle information.

Press **⬅** to return to the main menu screen.

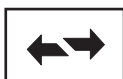


C2OG. 037-11

**Menu 4.2 - CANbus Information**



This displays the status for all connected to the CANview. By holding down the **✓** button the software version of the nodes will be displayed.



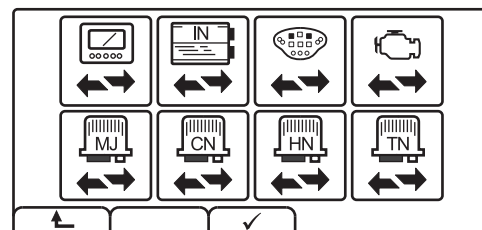
Node communication ok.



Node communication fault.



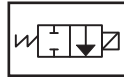
Node not recognised - configuration required.



C2OG. 037-12

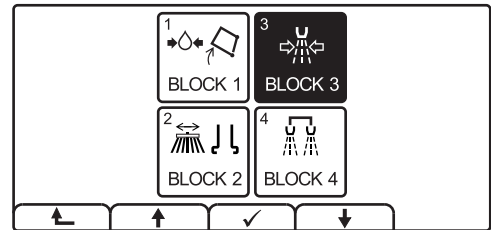
Press **⬅** to return to the main menu screen.

**Menu 4.3 - Valve Outputs**



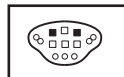
The status of each valve within the selected valve block is shown ✓, ✗ or % if valve is proportional. The valve block and appropriate valve reference can be selected as required.

Press ⬆ to return to the main menu screen.



C2OG. 037-13

**Menu 4.4 - Arm Rest Node**

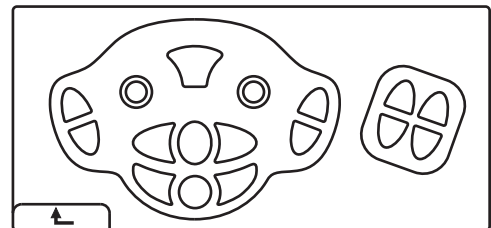


The display will show a pictograph of the sweeper controls. Pressing the switch to ON will cause the switch on the pictogram to light up.

When the joysticks are moved the display will show an arrow in the direction of movement.

This menu can be used to check all switch inputs by operating switches and checking the J-Plex has received the signal.

Press ⬆ to return to main menu.



C2OG. 037-14

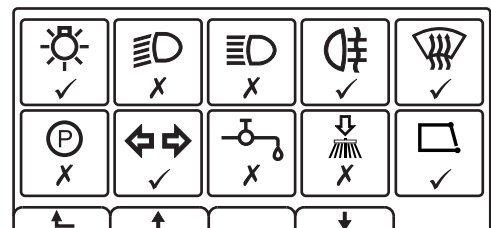
**Menu 4.5 - Switches Inputs**



The switches menu displays the state of each switch input.

This menu can be used to check all switch input wiring by operating switches and checking the J-Plex has received the signal i.e. OFF = ✗ or ON = ✓.

Press ↓ or ↑ to scroll through the displays and ⬆ to return to the main menu screen.

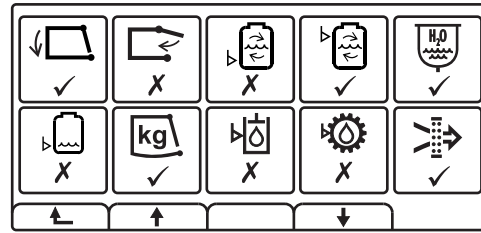


C2OG. 037-15

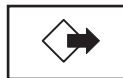
**Menu 4.6 - Special Inputs**


The special inputs menu displays the state of each special input.

Press **⬆** to return to the main menu screen.



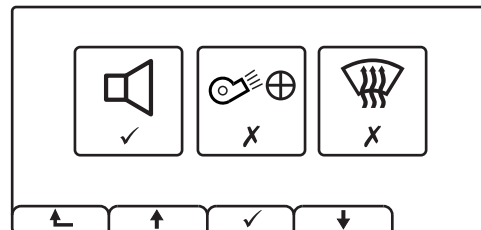
C2OG. 037-16

**Menu 4.7 - Special Outputs**


This menu displays the status of special outputs. Special outputs are all outputs which are not hydraulic valves i.e. bleeper, heated windscreen, fan only switch lamp. Turn outputs ON or OFF by pressing **✓**.

Press **↑** or **↓** to scroll through each block as required.

Press **⬆** to return to the main menu screen.

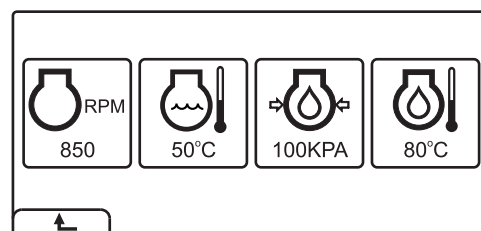


C2OG. 037-17

**Menu 4.8 - Engine Information**


This menu displays the engine information -

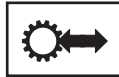
- i.e. Engine rpm
- Water temperature
- Oil pressure
- Oil temperature



C2OG. 037-18



**Menu 4.9 - Transmission Control**



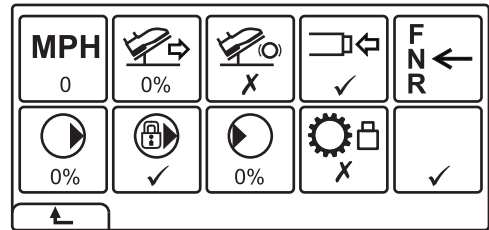
The menu displays input and output information for the transmission controller. For each input or output its current state is displayed.

As the go pedal and transmission pump valves are proportional, their state is shown as a percentage; 100% = fully ON, 0% = OFF.

Press **↑** to return to the main menu screen.

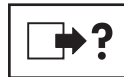
**Note:** To view the transmission pump status the transmission forward/reverse lever must be engaged accordingly.

The foot brake will always display OFF when ignition is first turned ON until foot brake is activated.



C2OG. 037-19

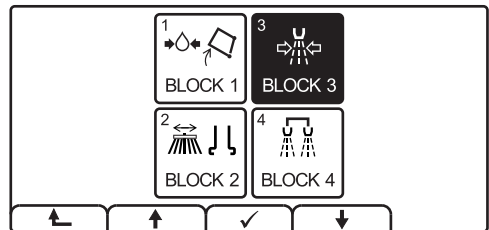
**Menu 4.10 - Test Outputs**



The test output menu enables individual outputs to be switched ON and OFF to assist in fault diagnosis.

Press **↑** or **↓** to scroll through each block as required. Each block has a value sub screen. Turn outputs ON or OFF by pressing **✓** as required and **↑** to return to the main menu screen.

**NB** - When in this menu all other functions are disabled.



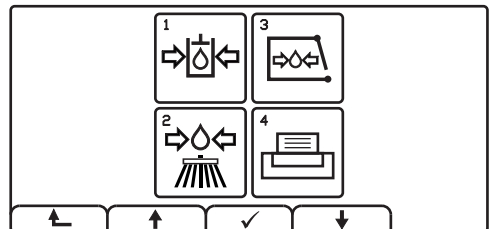
C2OG. 037-13

**Menu 4.11 - Set Pressures**



The pressure menu enables specific valve combinations to be energised so that hydraulic pressures can be adjusted.

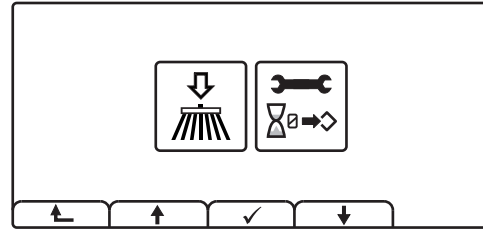
Press **↑** or **↓** to scroll through each pressure set up display. To activate a pressure setting press **✓** (a beep will be sounded when pressing the **✓** button) and **↑** to return to the main menu screen.



C2OG. 037-21

**Menu 4.12 - Service Menu**


This menu allows you to lower the sweepgear for service / repair, without starting the engine and reset the service indicator.



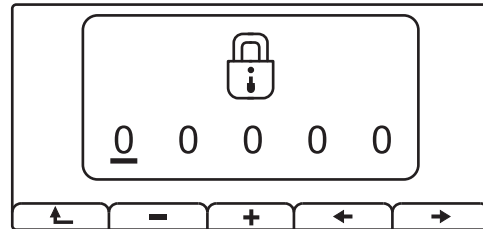
C2OG. 037-22

**Menu 4.13 - System Security**


A password is required to enter the vehicle set up mode and can only be accessed by Johnston Sweepers Limited.

Press + or - to scroll the number up or down.

Press → to move to next number and press + or - to scroll the next number. When the security number is entered press ↵ to return to the main menu screen.

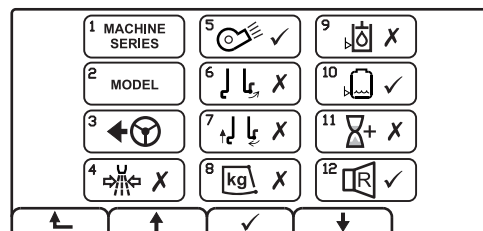


C2OG. 037-23

**Menu 4.14 - Vehicle Setup**


Some functions can be selected by the operator but the main vehicle setup can only be carried out by Johnston Sweepers Limited.

The screen will show the current options fitted on the machine with a ✓ or a ✗.



C2OG. 037-24

Menu 4.15 - Pendant Control



Not used.

Menu 4.16 - Third Brush\*



This menu shows the status of the various valves for this option when fitted.

Press **↑** , **↓** or **→** to scroll through the display.  
The valve status will be shown by a **✓** or **✗**.

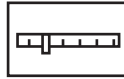
Press reset to reset errors/faults.


Press **⬅** to return to the main menu screen.

31 ✓	34a ✗	35a ✗	38a ✗	39a ✗
33 ✓	34b ✗	35b ✗	38b ✗	39b ✗
⬅	↑	↔	↓	

C2OG. 037-34

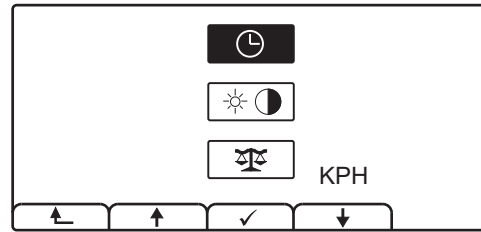
\*Option

**Menu 5 - Display Setup**

Pressing the  button on the CANview unit will access the display setup menu.

Press **↑** or **↓** to scroll up or down the menu list.

Press **✓** to access the required menu. Pressing **⬅** will return display to work or transit mode screen.



C2OG. 037-33

**Menu 5.1 - Set Clock**

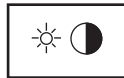
Time settings may be adjusted as required via the set clock menu (24 hour clock only).

Press **+** to increase the time and **-** to reduce it.

Press **⬅** to return to the main menu screen.

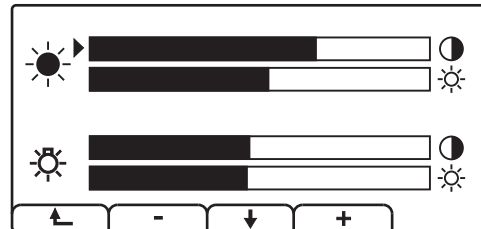


C2OG. 037-28

**Menu 5.2 - Brightness Control**

Contrast and back lighting of the CANview screen may be adjusted via the brightness control menu.

The night time display may only be adjusted when the side lights are activated. Press **↓** to select either day or night time and **⬅** to return to the main menu screen.



C2OG. 037-29

CHAPTER

**6**

**Routine Maintenance**

**Table of Contents**

<b>Subject</b>	<b>Page</b>
Safety Precautions	OG6 : 2
Maintenance Schedules	OG6 : 3
Service Point Locations	OG6 : 6
Jacking up the Vehicle	OG6 : 9
Lubrication Chart and Approved Lubricants	OG6 : 10

**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 without first covering the cap with a cloth. 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.

**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.

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

### 20-50 Hour Initial Service

1. Check engine coolant level, replenish as required.
- 2a. Drain engine oil and renew oil filter canister, refill engine with oil to the correct level.  
Overfilling the engine oil WILL cause damage to both the engine and CSF (Catalytic Soot Filter).
- 2b. Reset the Oil Dilution Flag in the engine ECU;
  - Turn ignition key (E10) to 'ON' position to start the pre-heating phase of the glow plugs.
  - Fully depress the GO Pedal (J3) five times within a 10 second period.Carrying out the procedure outlined in 2b ensures that the condition of the CSF (which is a non-serviceable item) is maintained.
3. Renew hydraulic return line filter.
4. Renew transmission oil filter.
5. Check and adjust front and rear brake shoes.
6. Check security of all external nuts, screws, mountings etc.

## 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 -

1. Engine oil level in engine, replenish as required.
2. Engine coolant level, replenish as required.
3. Hydraulic oil level in main reservoir, replenish as required.
4. Hydraulic oil level in transmission oil header tank, replenish as required.
5. Air cleaner, only if service indicator is illuminated on CANview.
6. Ensure engine water radiator, charge air cooler and oil coolers matrix are clean and free from debris. Take care when cleaning the radiator matrix, flush from the outside in.
7. For any oil, fuel or water leaks.
8. For any mechanical damage to sweeping equipment.

9. Wear of channel brushes, brush angles. Replace and adjust as required.
10. Front water jet sprays and filters, clean if blocked.
11. Lighting equipment, wiper washers and horn for correct operation.
12. Suction nozzle for ground clearance of 5mm, adjust if necessary.
13. Water recirculation system and ensure tank top filter is clean. Clean out tank using dump valve, ensuring that pump is also cleaned.
14. Hopper mesh, side screens, ducts and sludge drainage channels are clean and not blocked.
15. Tyre pressures and condition.

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

**Check the following items -**

1. Lubricate sweeping equipment and the 8 grease points on the front axle. Check strap pivots (coil suspension units only).
2. Check fan impeller for wear and build up of debris on the blades. Failure to keep the blades clean or excessive blade wear can cause vibration and result in failure owing to 'out of balance' forces.
3. Check suction nozzle flap and tie, nozzle trunking and hopper inlet duct for wear and replace if necessary.
4. Drain water from fuel filter if service indicator is illuminated on CANview.
5. If engine fault lamps C9 or C10 are illuminated the engine requires workshop repair.
6. Check routing of all electrical and hydraulic services for chafing damage.
7. Keep engine compartment clean.
8. Check brake master cylinder fluid level.
9. Check condition of all hopper seals, replace if required.
10. Check wheel nut torque settings.

♠ **Service A – Every 300 hours**

**Weekly maintenance plus the following;**

- 1a Drain engine oil and renew oil filter canister, 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 (E10) to 'ON' position to start the pre-heating phase of the glow plugs.
  - Fully depress the GO Pedal (J3) five times within a 10 second period.Carrying out the procedure outlined in 2b ensures that the condition of the CSF (which is a non-serviceable item) is maintained. The procedure also extinguishes the MIL warning light (C9) on the CANview display.
2. Drain out diesel fuel filter canister and replace diesel fuel filter.
3. Check and adjust front and rear brake shoes.
4. Lubricate door locks with special grease through key aperture and other items as shown on lubrication chart.
5. Renew hydraulic return filter and top up if required.
6. Renew main air filter element on the engine.
7. Check security of all external nuts, screws, mountings etc.



## ♠ Service B - Every 600 hours

### 300 hours maintenance plus the following;

1. Check concentration of coolant gives -39°C frost protection.
2. Check steering system for correct operation.
3. Check hand brake and foot brake for correct operation.
4. Check battery terminal condition and clean if necessary.
5. Replace the EGR valve filter.

## ♠ Service C - 12 monthly maintenance or every 1500 hours

### 600 hours maintenance plus the following;

1. Replace clear hose (and securing cable ties) to transmission header bottle, to enable air bubbles to be seen whilst re-bleeding the transmission system.
2. Renew transmission pump oil and oil filter.
3. Check front and rear brake linings, replace if worn.
4. Drain hydraulic oil reservoir.
5. Remove hydraulic suction filter and clean. It is important that the element is cleaned from centre to outside only. Dry before refitting. Access to the suction filter is via the filler cap fixing plate.
6. Refill hydraulic reservoir.
7. Replace engine coolant with a mixture of 50/50 antifreeze/water.
8. Renew engine poly vee belt to alternators etc.
9. Replace engine air cleaner elements - main and safety.
10. Check water tank filter - renew if required.

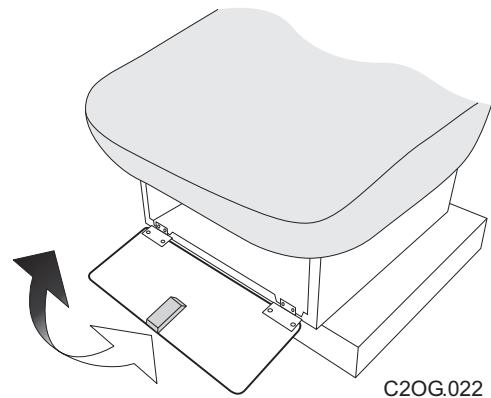


**Used oils and filters should be disposed of in accordance with local waste disposal regulations.**

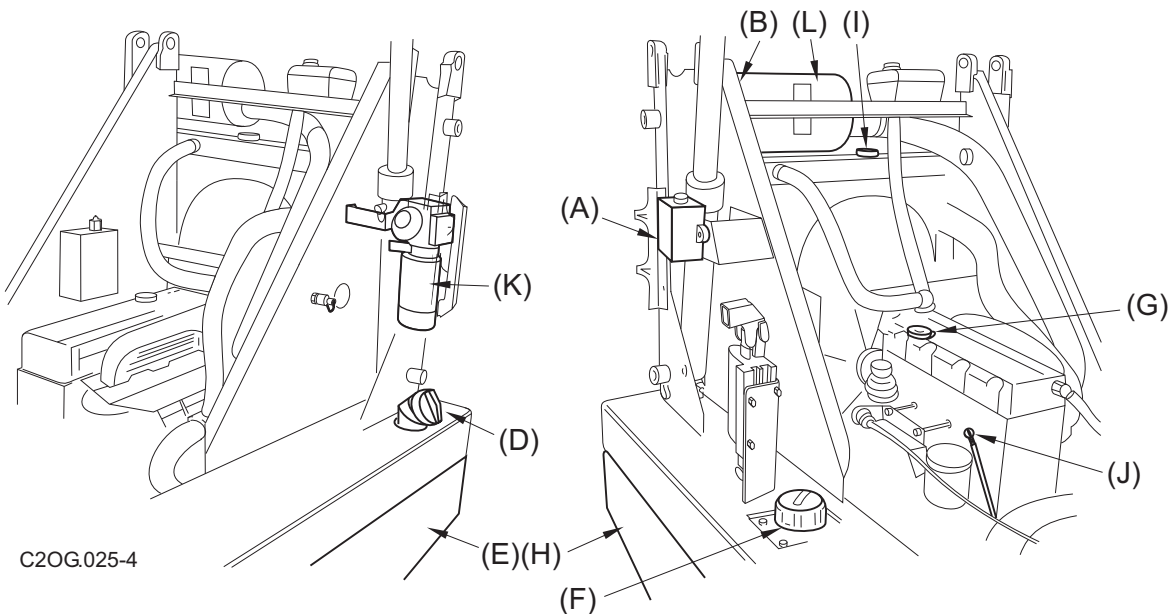
- ♠ These procedures should be carried out by qualified service personnel.

**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.



C2OG.022

**Service Point Locations**


C2OG.025-4

**Key**

A	Transmission Reservoir	H	Hydraulic Oil Tank
B	Air Cleaner Intake Duct	I	Radiator
C	<i>Not used</i>	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**

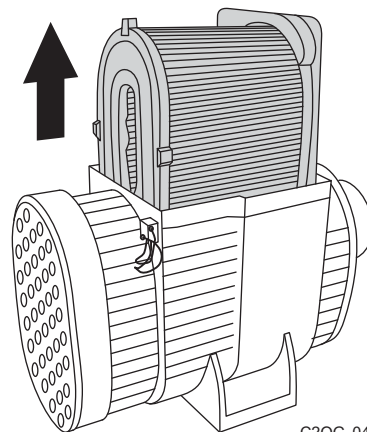
The air cleaner should only be serviced between maintenance schedules if the CANview display shows the filter requires servicing, if this occurs dust must be cleaned out of the body (G).

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.

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.

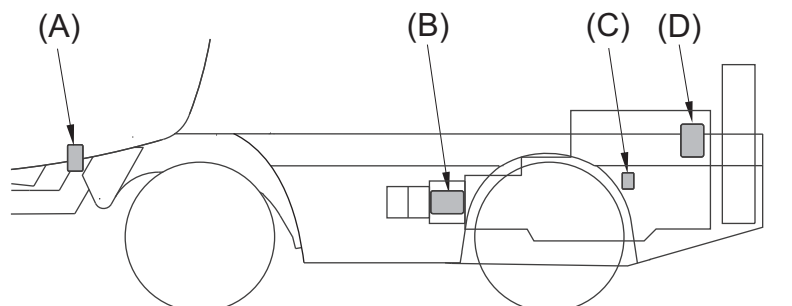


C2OG. 044

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, 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)

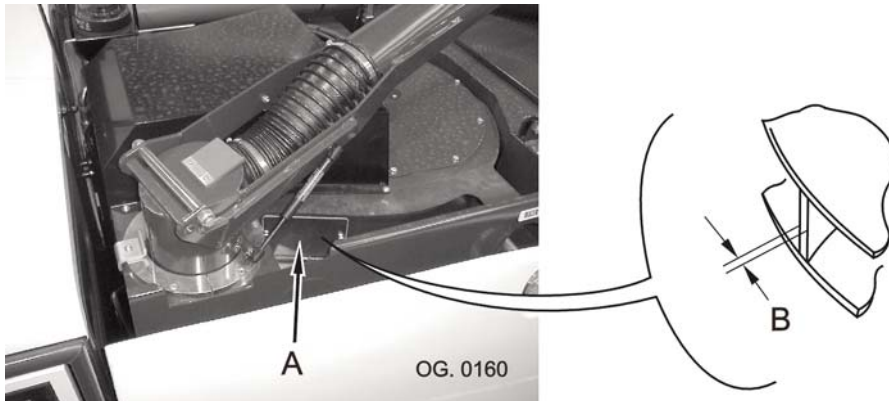
C2OG. 038-2

### 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.

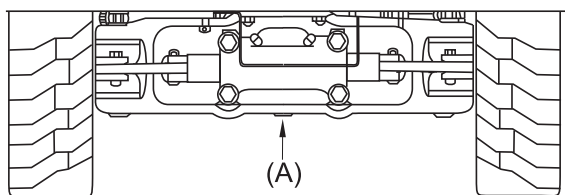
The fan impeller should be replaced when any blade thickness (B) is less than 2mm.

**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.

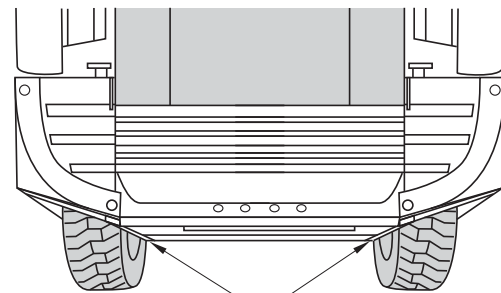
DO NOT apply the jack to the crossmember directly underneath the engine sump, it is not designed for this purpose.

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



OG. 0146-3

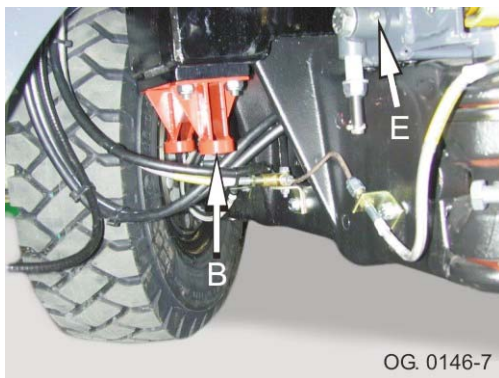
A = Jacking Point - Trolley Jack



OG. 0146-10

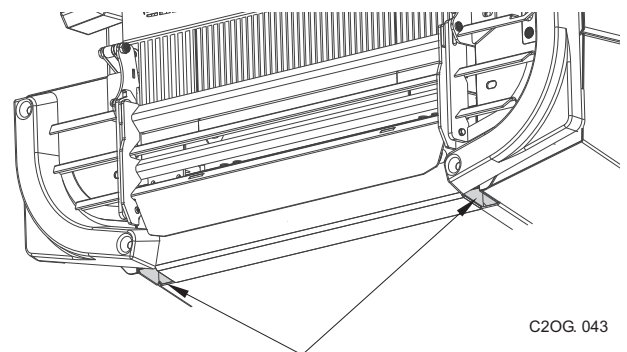
C = Jacking Points - Trolley Jack

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



OG. 0146-7

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



C2OG. 043

D = Jacking Point - Bottle Jack

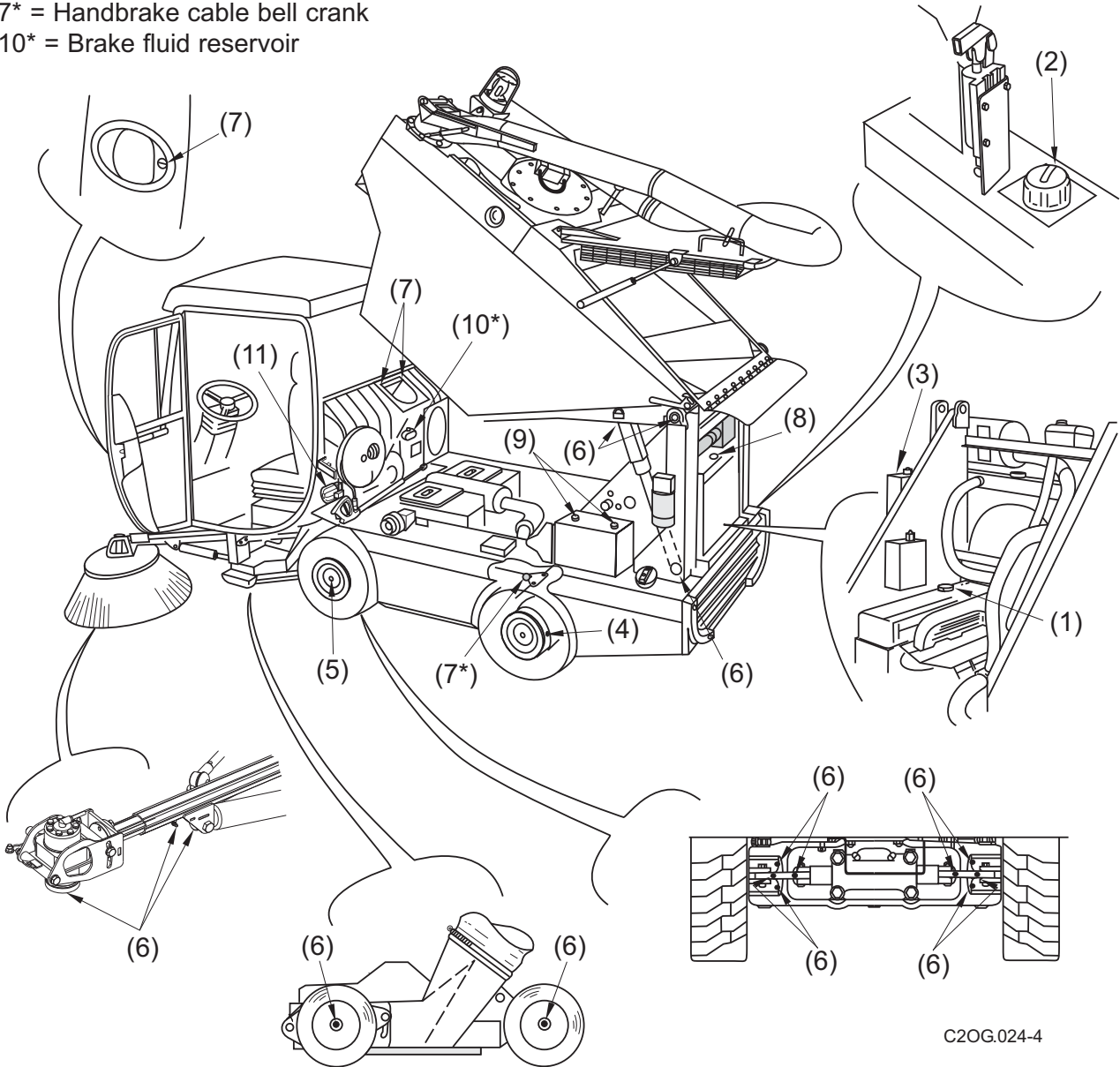
**Wheel Removal**

After the wheels have been refitted it is necessary to re-torque the wheel nuts to 250 Nm (180 lb.ft.) daily for the first week and thereafter in line with the maintenance schedule.

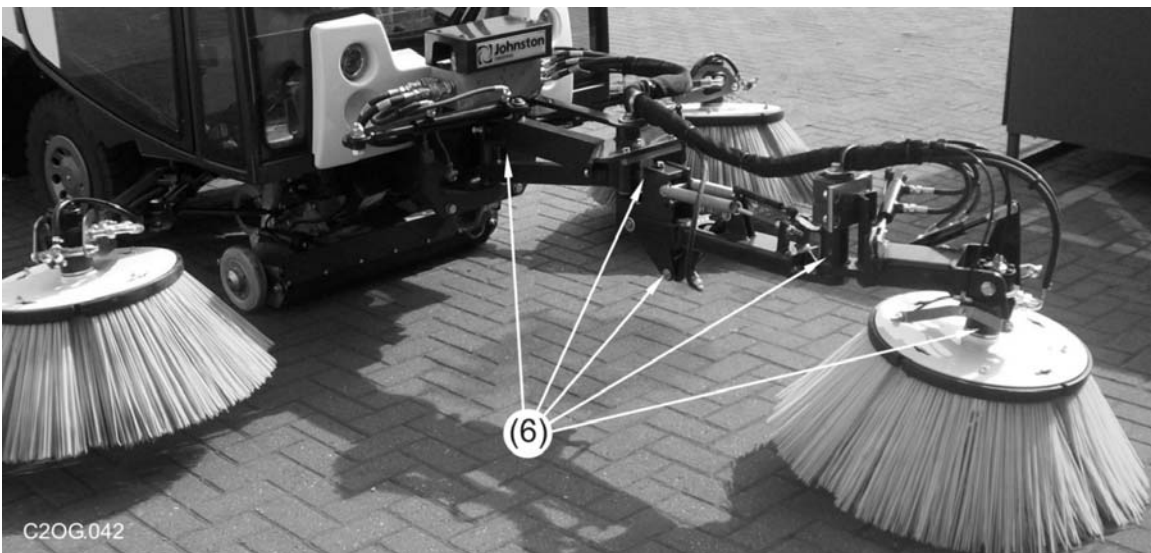
**Lubrication Chart**

7\* = Handbrake cable bell crank



10\* = Brake fluid reservoir



C2OG.024-4



C2OG.042

<b>C200 Approved Lubricants</b>									
<b>Oil Type Grade</b>	<b>Capacity</b>	<b>Johnston Part No.</b>	<b>Shell</b>	<b>BP</b>	<b>Castrol</b>	<b>Mobil</b>	<b>Q8</b>	<b>Chevron</b>	
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			<b>SPECIAL PTFE LUBRICANT GREASE</b>				
8. Antifreeze	6.5L	94-21			<b>TOTAL COOLANT CAPACITY 13L : 50% CONCENTRATION REQUIRED</b>				
9. Battery Terminals	-	-			<b>PETROLEUM JELLY</b>				
10. Brake System	1L	6906			<b>BRAKE FLUID DOT 4 SPEC</b>				
11. HP Water System	0.3L	39666			<b>AVILUBE 583 SYNTHETIC OR KLUBER SYNTHESCO MT 68 IMPORTANT – ONLY THESE OILS SHOULD BE USED</b>				
<b>The above oils are those approved by Johnston Sweepers. Other manufacturer's oils must be of equivalent grade.</b>									

