This document contains important Health & Safety advice and must remain with the vehicle at all times.
MAIN FEATURES (Single Sweep, Left hand Drive shown)
SCARAB MINOR

OPERATING INSTRUCTIONS FOR VEHICLES EQUIPPED WITH CANbus
Incorporating Basic Operator’s Maintenance Information

When re-ordering this document, please quote the following Part Number:

Manual Z039203

Original Issue ............................ November 2011

This manual is published by the Technical Publications Department of Scarab Sweepers Ltd. and every effort is made to ensure that the information it contains is correct at the time of publication. Due to a policy of continuous development, however, the Company reserves the right to alter the specification and to supply when so altered without reference to illustrations and descriptions in this manual.
GENERAL INFORMATION

WARNING - VOLTAGE SENSITIVE COMPONENTS
DO NOT USE A BOOST STARTER / SUPER START. A BOOSTED START WILL BURN OUT THE VEHICLES ELECTRONIC CONTROL NODES.
IF BATTERIES ARE NOT CHARGED ALWAYS USE A FRESH SET.

WEIGHTS, DIMENSIONS AND CAPACITIES

Gross Vehicle Weight (GVW) .................................................. Refer to VIN plate
Unladen Weight (Standard)* .................................................. 2.49 tonnes
Unladen Weight (Hi-tip)* ..................................................... 2.61 tonnes
Overall Length ................................................................. 4230 mm
Front Overhang ............................................................... 1148 mm
Rear Overhang ............................................................... 1053 mm
Wheelbase ................................................................. 2020 mm
Overall Width ............................................................... 1650 mm
Overall Height (hopper lowered) ........................................ 2360 mm
Overall Height (hopper raised) ........................................... 3213 mm
Turning Circle (curb to curb) ................................................ 8.50 metres

Hopper ............................................................. 2.0 m\(^3\) - Hi-tip 1.6 m\(^3\)
Fuel Tanks ............................................................ 60 litres
Engine Oil ............................................................ 5.90 litres
Coolant ............................................................. 18 litres
Hydraulic Tank ........................................................... 15 litres
Water Tank ............................................................. 450 litres - Street Wash Conversion = 1000 litres
Brake System ............................................................ 0.70 litres
High-pressure Water Pump ............................................. 0.55 litres
Tyre Size ............................................................. 195R x 14C
Tyre Pressure ............................................................ .50PSI (3.44Bar)
Wheel Nut Torque .......................................................... 250 Nm

NOISE LEVELS

In cab, ................................................ Between 70 - 84 dB(A) dependent on operating speed
External ................................................ Maximum LWA of 104 dB(A) in accordance
with directive 2000/14/EC

VIBRATION

Description ................................................ All dynamic prime moving components are
resiliently mounted to minimise vibrations.
Whole body .................................................. EVA 0.5 m/s\(^2\)

* Dependent upon specification

IDENTIFICATION PLATES

The SERIAL NUMBER PLATE is located on the outside rear face of the cab, at floor
level to the right hand side. All Scarab Minors have a four-digit number.
The VIN PLATE is located above the serial number plate.
The CHASSIS NUMBER is stamped on the top face of the right hand chassis rail
beneath the cab/tank.
The LOAD APPORTIONING VALVE (LAV) PLATE is located on the outer face of
the left or right hand chassis rail (according to driving position).
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HEALTH & SAFETY ADVICE

IN THE INTERESTS OF YOUR HEALTH AND SAFETY, IT IS IMPORTANT THAT THE FOLLOWING POINTS ARE OBSERVED AT ALL TIMES:

• ONLY TRAINED OPERATIVES SHOULD BE ALLOWED TO DRIVE OR WORK ON THIS MACHINE.
• BEFORE DRIVING THE VEHICLE ENSURE THAT ALL RELEVANT VEHICLE CHECKS HAVE BEEN CARRIED OUT, THAT ALL EQUIPMENT IS STOWED.
• DO NOT OVERLOAD THE HOPPER.
• DO NOT DRIVE THE VEHICLE WITH THE HOPPER IN THE RAISED POSITION, EVEN IF THE HOPPER IS EMPTY.
• ALWAYS USE THE SAFETY PROP TO SUPPORT A RAISED HOPPER (OTHER THAN DURING DISCHARGING). NEVER WORK UNDER A RAISED CAB OR HOPPER UNLESS THE APPROPRIATE PROP IS IN POSITION.
• BEFORE OPERATING EITHER THE HOPPER-TIP OR REAR DOOR CONTROLS, ENSURE THERE IS SUFFICIENT CLEARANCE AND IT IS SAFE TO DO SO. ENSURE THAT ALL PERSONNEL ARE CLEAR OF THE REAR DOOR.
• BEFORE WORKING ON THE MACHINE: POSITION THE VEHICLE ON FIRM, LEVEL GROUND, APPLY THE HANDBRAKE, STOP THE ENGINE, REMOVE THE IGNITION KEY.
• ALWAYS WEAR THE APPROPRIATE PERSONAL PROTECTION EQUIPMENT WHEN OPERATING OR WORKING ON THE VEHICLE.
• BEFORE STARTING THE ENGINE ENSURE ALL CONTROLS ARE OFF, AND THE VEHICLE IS IN NEUTRAL.
• KEEP LONG HAIR, LOOSE CLOTHING AND HANDS AWAY FROM MOVING PARTS.
• WHEN USING THE HIGH PRESSURE WATER SYSTEM, ALWAYS WEAR SUITABLE FACE PROTECTION. WHEN USING THE LANCE DO NOT DIRECT THE WATER JET AT OTHER PERSONS, ALSO BEWARE OF ELECTRICAL INSTALLATIONS ON PUBLIC BUILDINGS & LAMP POSTS etc. AND ALWAYS EXERCISE EXTREME CAUTION IN PUBLIC PLACES.
• THE DRIVER’S SEAT SHOULD BE CORRECTLY ADJUSTED AS TO GIVE A GOOD POSTURE WHEN DRIVING.
• THE MIRRORS SHOULD BE ADJUSTED SO THE DRIVER HAS A GOOD ALL-ROUND VIEW OF THE VEHICLE SIDES AND SWEEPING EQUIPMENT.
• WHILE OPERATING THIS MACHINE THE SAFETY AND WELL BEING OF OTHER PEOPLE ARE THE SOLE RESPONSIBILITY OF THE OPERATOR.

THE HAZARD SYMBOL ⚠ IDENTIFIES GENERAL SAFETY RELATED TEXT THROUGHOUT THIS DOCUMENT, WHERE APPROPRIATE. CORROSIVE ⚠ IDENTIFIES CORROSIVE FLUIDS. THE FOLLOWING ADDITIONAL SAFETY SYMBOLS ARE ALSO USED: 🕶 EYE PROTECTION, 🧡 PROTECTIVE FOOTWARE AND 🧲 GLOVES.

The Caution Symbol ⚠ identifies where the observation of a specific procedure is required to avoid equipment damage or under-performance.
The Information Symbol 📧 identifies text offering helpful advice additional to the main instructions.
The Check Symbol 🌐 identifies text calling for a visual examination to confirm the condition or status of a specific item.

REMEMBER, FAILURE TO COMPLY CAN RESULT IN SERIOUS INJURY.
IF IN DOUBT, ASK!
HAZARD AWARENESS

All operators and workshop personnel should be aware of the physical and biological risks that are inherent in the operation of a road sweeper. The risk falls into two main categories as follows:

- Risks represented by the sweeper and its various systems.
- Risks represented by the sweeper's operating environment.

Both have the potential for exposure to a variety of hazards, ranging from hot surfaces to infectious diseases, that can occur during day-to-day operation, while carrying out adjustments or when involved with the general maintenance and servicing activities on the vehicle.

Typical vehicle-related hazards are:

- Exposure to hot surfaces and sharp edges.
- Exposure to moving parts.
- Exposure to various fluids (including some hot and/or pressurised).
- Exposure to surface contamination resulting from general operating conditions.

Typical environmental hazards are:

- Exposure to sharp objects (e.g. broken glass, discarded hypodermic syringes) while operating or working on the vehicle.
- Exposure to various infectious diseases (e.g. Legionnaire's, Weil's, Hepatitis, Tetanus) while operating or working on the vehicle.

SAFETY PRECAUTIONS

When using external equipment such as the high-pressure water lance, or when dealing with potentially hazardous situations while sweeping (e.g. unblocking a suction nozzle), always wear the appropriate Personal Protection Equipment (PPE) and exercise extreme caution if required to handle any of the material being swept.

Before working on the vehicle, subject it to a thorough steam cleaning or high-pressure hot water wash using appropriate detergents etc.

Even after taking all reasonable steps to reduce the risk from the hazards described, always wear the appropriate Personal Protection Equipment (PPE) when carrying out sweeping duties or when working on the vehicle. This includes:

- Safety Gloves (including where necessary cut-resistant knitted Kevlar).
- Safety boots or shoes with protective soles and toecaps.
- Eye/Face protection (including where necessary full-face mask with under-chin lip).
- Earplugs or Ear defenders as appropriate.
OPERATING ADVICE

Please remember, the information provided in this handbook is designed to ensure that the Scarab sweeper operates both safely and efficiently.

The design of this machine is for the removal of spoil on traffic or pedestrian areas also litter collection using the wander hose.

A poorly maintained machine will become unreliable, inefficient and potentially dangerous. Always observe the recommended maintenance and safety related advice provided.

Unless it is wet or raining, ALWAYS use the low-pressure water spray system when sweeping. This will not only reduce the amount of dust generated, it will also ensure more efficient collection of material. This is because wet material is heavier and will drop more readily from the air stream inside the hopper. If swept dry more of the finer material will pass through the screen, wearing out the fan blades on its way back to the environment behind you.

Operators should be trained in the following elements:

- Health & safety observations/notices
- Transit driving
- In-cab & external controls
- Cab & hopper safety prop use
- Brush setting
- Nozzle flap adjustment
- Correct sweeping operations
- Low & high pressure water systems
- Mounting, dismounting kerb procedure
- Load discharge (tipping)
- Daily, weekly maintenance schedules
- End of day cleaning, ie: suction fan, fan screen & vehicle body

Operator training can be provided by Scarab Sweepers upon request.

It is the responsibility of employers to carry out they own risk assessment for operators or other persons using or affected by the machine and equipment.
## ADDITIONAL SAFETY ADVICE SYMBOLS

<table>
<thead>
<tr>
<th>CHECK VEHICLE BEFORE DRIVING</th>
<th>IN NEUTRAL SWITCHES OFF BEFORE STARTING</th>
<th>CHECK ALL CLEAR TO RAISE BODY</th>
<th>FIRM LEVEL GROUND ONLY</th>
<th>USE CAB OR HOPPER SAFETY PROP</th>
<th>DO NOT DRIVE WITH BODY UP</th>
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## SWITCH SYMBOLS

### MAIN CONTROL PANEL SWITCHES

<table>
<thead>
<tr>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>OPTIONS ☀️</th>
<th>RIGHT SIDE BRUSH - ON / OFF</th>
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<tr>
<td>SWEEP MODE - ON/OFF</td>
<td>LEFT WORK LIGHTS - ON / OFF</td>
<td>LEFT SIDE WATER SPRAYS - ON / OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRONT BRUSH WATER - ON/OFF</td>
<td>LEFT SIDE WATER SPRAYS - ON / OFF</td>
<td>WIDESWEEP WATER SPRAY - ON / OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>![Front Brush Symbol]</td>
<td>![Side Brush Symbol]</td>
<td>RIGHT SIDE WATER SPRAYS - ON / OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEFT FRONT BRUSH</td>
<td>![Side Brush Symbol]</td>
<td>RIGHT WORK LIGHTS - ON / OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>![Side Brush Symbol]</td>
<td>![Water Spray Symbol]</td>
<td>ENGINE SPEED - DECREASE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEFT SIDE BRUSH - ON / OFF</td>
<td>![Water Spray Symbol]</td>
<td>ENGINE SPEED - INCREASE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>![Side Brush Symbol]</td>
<td>![Sweep Symbol]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEFT SUCTION NOZZLE - RAISE / LOWER</td>
<td>![Suction Symbol]</td>
<td>RIGHT WORK LIGHTS - ON / OFF</td>
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<td></td>
</tr>
<tr>
<td>WIDESWEEP BRUSH - ON / OFF</td>
<td>![Suction Symbol]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIGHT SUCTION NOZZLE - RAISE / LOWER</td>
<td>![Suction Symbol]</td>
<td>ENGINE SPEED - DECREASE</td>
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<td></td>
</tr>
<tr>
<td>![Suction Symbol]</td>
<td>![Sweep Symbol]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIGHT FRONT BRUSH</td>
<td>![Sweep Symbol]</td>
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</table>
## SWITCH SYMBOLS

### AUXILIARY CONTROL PANEL SWITCHES

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<th>Description</th>
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<th>Description</th>
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<tr>
<td><img src="Image" alt="Symbol" /></td>
<td>HIGH PRESSURE WATER PUMP - ON/OFF  🌋</td>
<td><img src="Image" alt="Symbol" /></td>
<td>SUCTION FAN - ON / OFF</td>
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<tr>
<td><img src="Image" alt="Symbol" /></td>
<td>SUCTION NOZZLE TILT</td>
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<td>NOT APPLICABLE</td>
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### REMOTE-CONTROL SWITCH BOX

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<th>Description</th>
<th>Symbol</th>
<th>Description</th>
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<td><img src="Image" alt="Symbol" /></td>
<td>HOPPER BODY - RAISE</td>
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<td>HOPPER BODY - LOWER</td>
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<td><img src="Image" alt="Symbol" /></td>
<td>REAR DOOR - OPEN  🌋</td>
<td><img src="Image" alt="Symbol" /></td>
<td>REAR DOOR - CLOSE  🌋</td>
</tr>
<tr>
<td><img src="Image" alt="Symbol" /></td>
<td>NA</td>
<td><img src="Image" alt="Symbol" /></td>
<td>SAFETY INTERLOCK</td>
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★ THIS SYMBOL INDICATES OPTIONAL EQUIPMENT.
OPENING THE DOOR (EXTERNAL)
If the door is locked insert the key into the key slot (1) and turn in a clockwise direction. Grip handle (2) and pull in the direction shown, swinging the door outwards.

OPENING/CLOSING THE WINDOWS (INTERNAL)
Press button (3) and slide window(s) in the open direction. With both windows in the closed position press button (4) to lock.

OPENING THE DOOR (INTERNAL)
Check the doors swing path is free from any obstructions before opening.
Grip lever (5) and squeeze in direction shown, swing door outwards.
ENTERING/LEAVING THE VEHICLE
To get in and out of the cab, use the grab handle on the door pillar and not the steering wheel. Also use the step and always face the vehicle when entering and leaving.

MIRRORS
The mirror brackets can be folded back against the cab and return to their original position once the bracket is swung out again.

INTERIOR LIGHT
The interior light operates independently of the ignition switch. Always remember to turn it OFF when leaving the vehicle.

SEAT ADJUSTMENTS
1. Forward/backwards lever
2. Backrest angle lever
3. Lumber control

The driver’s seat must only be adjusted when the vehicle is stationary. All adjustments should be carried out when the seat is occupied.

SEAT BELTS
The seats are equipped with seat belts; use them. (Mandatory in some countries). They only work properly when correctly tensioned. For this reason never use a clip or other device to reduce the seat belt tension.

If the seat belt has been subjected to high loading, the complete assembly must be renewed. Repairs must be carried out by qualified personnel only.

Wearing seat belts
• The belt must be inserted correctly, tight against the body and not distorted.
• Do not put any hard, sharp or fragile objects such as pens, glasses or phones between your body and the seat belt.
CONTROLS & INSTRUMENTS

The Scarab Minor’s control system can be divided into three distinct areas as follows:

- Dash-mounted switches for the conventional electrical system.
- The standard automotive steering column-mounted controls.
- The Scarab CANbus electronic sweeper controls.

Fig. 1 Dashboard Layout (Left hand drive)

1. Auxiliary control panel
2. Instrument panel
3. Beacons
4. Rear fog lamps
5. Side & head lamps
6. Hazard warning indicators
7. LCD monitor
8. Main control panel
9. 12v Power supply
10. Multi function switch
11. Change between MPH & KPH
12. Cab heater controls
13. Drive lever
14. Horn
Fig. 2 Instrument Panel

- LCD SCREEN
- DIRECTION/HAZARD INDICATORS
- ENGINE COOLANT TEMPERATURE GAUGE
- REVERSE SELECT SYMBOL
- AIR CONDITIONING
- ENGINE TEMPERATURE WARNING
- SWEEP MODE ACTIVE
- MAIN BEAM
- REAR FOG LAMPS
- PARKING BRAKE/LOW BRAKE FLUID WARNING
- LOW ENGINE OIL WARNING
- SYSTEM FAULT WARNING
- WATER IN FUEL WARNING
- MIL WARNING
- MPH/KPH SPEED
- TOTAL HOURS
- TOTAL DISTANCE
STEERING LOCK/CONTACT/STARTER SWITCH

Never Turn The Ignition Key To The Rest Position (0) Or Remove It While The Vehicle Is In Motion. This May Cause The Steering Wheel Lock To Engage.

0 - Rest position - When the key is removed in this position, the steering wheel lock is activated.

I - Accessories position - Steering wheel unlocked. The key can not be removed. Accessories, such as the radio, are activated.

II - Ignition switch ON - Activates all switches and glow plugs. The ignition indicator on the instrument panel illuminates.

III - Starting - Turn to start engine. When released returns to position II.

GLOW PLUGS - When the ignition is ON the engine management system measures the pre-glow & after-glow required. Allow the glow plug indicator on the instrument panel to extinguish before starting the engine.

DASHBOARD MOUNTED SWITCHES

Warning Beacons - Works independent of ignition. Centre LED illuminates when ON. Symbol illuminates when headlights are ON.

Rear Fog Lights - Works only when headlights or ON. Centre LED illuminates when ON. Symbol illuminates when headlights are ON.

3 Position Headlight Switch - Sidelights work independent of ignition. Headlights work when ignition is on. Centre LED illuminates when ON. Symbol illuminates when headlights are ON.

Hazard Warning Indicators - Works independent of ignition. When ON all directional indicator lights flash simultaneously. Symbol illuminates when headlights are On, and flashes when active.
**CAB HEATER CONTROLS**

1. Fan speed control. Has 4 positions, OFF and three speed levels, only active when ignition is ON.
2. Temperature control. The supply of heat can smoothly be set from 0% (blue) to 100% (red).
3. Air conditioning switch **(OPTIONAL)**. Only functions when the engine is running and the fan speed control is ON. LED illuminates when active.
4. Air flow vent. Can be rotated through 180°. Opened through 90° or shut

⚠️ **The air conditioning system contains refrigerant under high pressure. Removal of any parts of the system is not permitted. Work on the system may only be carried out by qualified personnel.**

**STREET-WASH CONTROLS** **(OPTIONAL)**

The street-wash spray bar can be moved through both vertically and horizontally, controlled by a dash-mounted joy-stick which is pushed in the appropriate direction until the spraybar is positioned as required. The spraybar can be raised and lowered parallel to the ground and also slewed to the left or the right to direct the spray jets as required.
STEERING COLUMN-MOUNTED CONTROLS

When pushed in the desired direction the lever locks in place.
To briefly operate the direction indicators, the lever can be pushed slightly against the spring pressure. It springs back when released.

DIRECTION INDICATORS

POSITIONS

1. Intermittent.
2. Off.
3. Low Speed.
4. High Speed.
5. Push in and hold to activate the screen wash, release to de-activate.

WINDSCREEN WIPERS

POSITIONS

1. Main beam activated when lights are on. The main beam indicator in the instrument panel illuminates.
2. Off
3. Activates main beam when lights are on or off. It springs back when released.

MAIN BEAM

DRIVE LEVER
FUSE & RELAY PANEL

Fuse Function
A1- Main
A2- Cab interior light & accessory socket
A3- Side lights
A4- Hazard lights & horn
A5- Directional indicators
A6- Headlights
A7- Brake lights
A8- F/R Lever, Node 1 VBBs and 5v reg
A9- Wipers
A10- Beacons

B1- Left front side & tail light
B2- Right front side & tail light
B3- Left main beam
B4- Right main beam
B5- Left dipped beam
B6- Right dipped beam
B7- Rear fog light
B8- Reverse light
B9- Node 1 & 1.1
B10- Node 0

C1- Bosch ECU ignition feed
C2- Cluster ignition & road speed sensor
C3- Control panel ignition feed
C4- Heater relay
C5- Node 3 VBBs
C6- Node 4 VBBs
C7- Key switch supply
C8- EOBD, cluster & Node 2
C9- Heater
C10- Water pump

D1- Permanent feed
D2- Camera feed
D3- Ignition feed
D4- Ignition feed
D5- Fuel sensor, throttle valve actuator & EGR valve actuator power
D6- ECU power
D7- ECU Power
D8- Starter coil
D9- Fuel heater
D10- Node 4 VBBs

E1- E fuses
E2- Node 7 VBBs
E3- Node 4 VBBs
E4- Fan & hopper sensor
E5- Node 3 VBBs
E6- Node 7 & 8 VBBs
E7- Hopper controller
E8- Reverse valve
E9- Motor valve
E10- Node 8 VBBs

Relays
1- Beacons
2- Dipped beam
3- Main beam
4- Directional indicators
5- Air con (option)
6- Heater
7- Neutral start
8- Water pump
9- Main
10- Glow plugs
11- Fuel heater
12- Starter

LEFT HAND DRIVE VEHICLE SHOWN
THE CANbus SYSTEM

The CANbus system comprises two control panels (main and auxiliary) an LCD monitor and a number of control nodes. The system controls and monitors all sweeper functions and maintains a log of various operating parameters such as operating hours and any fault conditions that might occur.

Switches: The various types of switch function are colour coded as follows:

- **AMBER** = Electrical functions such as lighting.
- **RED** = Critical functions (e.g. Suction Fan).
- **GREEN** = Sweeping functions.
- **BLUE** = Water Spray functions.

Each switch illuminates a function-related symbol on the LCD monitor (installed equipment only) and visible in Sweep Mode. Each symbol is greyed-out until its switch is activated. When a switch is activated the appropriate symbol will illuminate according to system status as illustrated.

1. Equipment not selected
2. Equipment pre-selected
3. Water pre-selected
4. Equipment and Water pre-selected
5. Equipment operating
MAIN CONTROL PANEL SWITCH FUNCTIONS
Switch functions are described from Left to Right and Top to Bottom.

- **FRONT BRUSH WATER** - Press to activate.
- **SYSTEM-START** - Press to start/stop sweep mode.
- **F1 / F2 /F3** - Press to activate special options.
- **LEFT/RIGHT FRONT BRUSH** - Press to activate.
- **LEFT/RIGHT SIDE BRUSH** - Press to start the side-brush. Brush drops and swings out.
- **LEFT/RIGHT SUCTION NOZZLE RAISE/LOWER** - Press to lower the suction nozzle.
- **WIDESWEEP BRUSH** - Press to start the widesweep brush.
- **LEFT/RIGHT WORK-LIGHT** - Press to turn ON.
- **LEFT/RIGHT SIDE BRUSH/NOZZLE WATER** - Press to start the side-brush and suction nozzle dust-suppression.
- **WIDESWEEP WATER** - Press to start the dust-suppression spray for the widesweep brush.
- **DECREASE/INCREASE ENGINE SPEED** - Press and hold down to reduce the speed of the truck engine. A single press of the switch will cut engine speed by 50 RPM. Current engine speed is displayed along the top of the LCD monitor.
AUXILIARY CONTROL PANEL SWITCH FUNCTIONS

- **HIGH-PRESSURE WATER PUMP (Option)** - Press to start.
- **SUCTION FAN** - Press to start the Suction Fan (approximately 2000 rpm).
- **CRUISE CONTROL** - Press to activate cruise control.
- **NOZZLE TILT (LOCKING MODE)** - Press to tilt the suction nozzle for larger items.
- **SUCTION FAN ‘BOOST’** - NA
- **FAVOURITE SETTING** - Press to memorise your preferred sweeping set-up. Hold the switch down until a ‘beep’ sounds. Thereafter, whenever the switch is pressed at system start-up, the memorised configuration will be automatically pre-selected/restarted. Repeat to over-ride with a new configuration.

**FOUR-POSITION MULTI-FUNCTION LEVER** - ON (deploy all selected sweeping equipment). To stop and raise all sweeping equipment, return the lever to the OFF position.

In the ON position the lever can be used to control the front brush(es) and suction nozzle(s). These additional positions ie. Left, Right and Back, return to the central position when released.

The brush and nozzle functions are controlled as follows:

**ON LEFT HAND DRIVE VEHICLES**
Move the lever to the left to swing OUT and to the left to swing IN the front brush(es).

**ON RIGHT HAND DRIVE VEHICLES**
Move the lever to the right to swing OUT and to the right to swing IN the front brush(es).

**NOZZLE-TILT FUNCTION**
Move the lever back to momentarily tilt the suction nozzle.
REMOTE-CONTROL SWITCH BOX

The hopper Raise/Lower and rear door Open/Close switches are located in the remote control box. This is stowed in the cab, between the driver’s seat and door and is connected to a socket by means of a coiled lead.

In The Interest Of Health And Safety And To Avoid Possible Damage To The Sweeper Or Adjacent Structures, It Is Essential That These Controls Are Activated From Outside The Vehicle, From A Vantage Point That Affords A Good View Of The Sweeper And Its Immediate Surroundings.

HOPPER RAISE SWITCH - Press and hold in to raise the hopper. As soon as the hopper starts to rise, the on-screen Hopper Raised symbol illuminates RED.

The Hopper Prop Must Always Be Used When The Hopper Is In The Raised Position. Failure To Do Could Result In Serious Injury.

HOPPER LOWER SWITCH - Press and hold in to lower the hopper. The RED Hopper Raised on-screen symbol will remain illuminated until the hopper is completely down.

REAR DOOR OPEN SWITCH (Option) - Press and hold in until the door is Fully open (at approximately 90° to the rear face of the hopper).

Ensure that the suction fan is OFF. The door cannot be opened while the fan is running due to the low pressure created within the hopper.

REAR DOOR CLOSE SWITCH (Option) - Press and hold in until the door is fully closed and the latching cycle has finished.

Hi-TIP SWITCH (Option) - NA

SAFETY INTERLOCK

This switch must be pressed and held in before any of the control switches can be operated.
THE LCD MONITOR (refer also to Page 17)
The sweeping monitor displays information on the current status of the sweeper while it is in sweep mode, by indicating which items of equipment are active, plus other relevant information ie: fluid levels, fan speed and temperatures, it also alerts the user to any warnings by means of appropriate flashing symbols and, when appropriate, a warning buzzer. For warnings identified by !, stop and investigate the cause. The accompanying illustration shows the range of information/alert symbols that can be displayed, however it should be noted that warning symbols (** ) only illuminate when a specific condition occurs.
DRIVING MODES

NORMAL DRIVE MODE

Before driving, the following conditions must be observed:

- All sweeping equipment must be raised and retracted. Wander hose in the storage position.
- The sweep mode switch must be OFF (sweep mode symbol on instrument panel unlit).
- The vehicle must be stationary, handbrake ON, yellow control lever at neutral and engine OFF.

1. Turn the ignition key to the start engine.
2. Select ECO if required. (press the ‘C’ button on the LCD screen to turn ON/OFF).
3. Select forward or reverse (Yellow control lever), direction select symbol illuminated on instrument panel.
4. Release the handbrake. Press accelerator to move the vehicle.

CRUISE CONTROL - With vehicle at the desired speed, select Cruise Control. Can be over-ridden by the accelerator pedal, and is cancelled by using the foot brake or by pressing the switch.

SWEEP MODE

Before selecting sweep mode, the following conditions must be observed:

- The engine must be running.
- The sweep mode switch must be OFF (sweep mode symbol on instrument panel unlit).
- The vehicle must be stationary, Handbrake ON, Yellow control lever at Neutral.

1. Turn ON the warning beacons.
2. Switch ON sweep mode. Sweep mode symbol illuminates on instrument panel (engine RPM increases to default).

If engine RPM remains at idle (950RPM) the engine Increase switch can be used to adjust the RPM (1250 RPM is considered the most efficient setting for normal sweeping, however it may be necessary to increase engine RPM in certain circumstances, ie: Full-load, Up-hill).

Continued...
Although 1250RPM is considered best for normal sweeping, engine RPM may be reduced when sweeping light or sparsely distributed materials. Experience will enable the operator to judge the best RPM for the sweeping conditions.

3. Switch ON the suction fan.
4. Select the desired sweeping equipment.
5. Switch ON the dust suppression water if required, (it is advisable to use dust suppression water if the areas to be swept are in a dry condition).
6. Place the multi function lever in the ON position.
7. Select forward (yellow control lever). Release the handbrake. Slowly depress the accelerator to move the vehicle.

**HYDROSTATIC BRAKING - SWEEP MODE ONLY.** This allows the vehicle to slow-down rapidly when the accelerator pedal is released, eliminating the need to use the footbrake in certain conditions. Even though this feature is available it is still advisable to always use the footbrake when stopping.

**The footbrake must always be used for emergency braking.**

When reverse is selected in sweep mode, all active sweeping equipment will stop, lift and retract automatically. These will return to their sweeping position when either Neutral or Forward are re-selected.

**REVERTING TO NORMAL DRIVE**

1. With the vehicle stopped, hand brake ON and neutral selected (yellow control lever).
2. Turn OFF all active sweeping equipment.
3. Place the multi function lever in the OFF position.
4. Switch OFF suction fan and sweep mode.
5. Vehicle is now in normal drive and warning beacons can now be switched OFF.
DISCHARGING THE HOPPER (TIPPING)

STANDARD REAR DOOR

BEFORE RAISING THE HOPPER, ENSURE THAT THE VEHICLE IS ON FIRM, LEVEL GROUND AND THAT THERE ARE NO OVERHEAD OBSTRUCTIONS.

DO NOT DRIVE THE VEHICLE WHILE THE HOPPER IS RAISED.

1. Position the vehicle ready to reverse to the discharge point, apply the handbrake, select neutral (yellow control lever).
2. With the engine running, select Sweep Mode.
3. Suction fan switch ON.
4. Remove the locking pin (1). Release the Door clamp (2) (suction fan vacuum will hold door closed).
5. Reverse vehicle to discharge point.
6. Suction fan OFF. Neutral selected. Handbrake ON.
7. Raise hopper fully.

It is essential that the Hopper controls are operated from outside the vehicle and not within the cab and the operator has a clear view of the Hopper and Rear Door area.

Never Work Under A Raised Hopper Without The Hopper Prop In The Safety Position.

8. With the load fully discharge, lower the hopper.
9. Move the vehicle clear of the discharge point.
10. Ensure the door prop (3) is in the safety position.
11. Remove any debris from the door seal and seal faces on the Hopper.
12. Release door safety prop. close door and secure clamp (2) with locking pin (1).
OPERATING INSTRUCTIONS - Minor Road Sweeper

HYDRAULIC OPERATED REAR DOOR

BEFORE RAISING THE HOPPER, ENSURE THAT THE VEHICLE IS ON FIRM, LEVEL GROUND AND THAT THERE ARE NO OVERHEAD OBSTRUCTIONS.

DO NOT DRIVE THE VEHICLE WHILE THE HOPPER IS RAISED.
1. Reverse to the discharge point, apply the handbrake, select neutral (yellow control lever).
2. With the engine running, select Sweep Mode.
3. Raise hopper fully and open rear door fully.

It is essential that the hopper controls are operated from outside the vehicle and not within the cab and with a clear view of the hopper and rear door area.

Never Work Under A Raise Hopper Without The Hopper Prop In The Safety Position.
4. With the load fully discharged, lower the hopper.
5. Move the vehicle clear of the discharge point.
6. Remove any debris from the Door seal and seal faces on the Hopper.
7. Close Rear Door completely, checking the locking mechanism has fully engaged.

HI-TIP VEHICLES (1.6 models only)

1. Using either the Manual or Hydraulic rear door procedures, place the vehicle at the discharge point.
2. Remove locking pin (1) and support pin (2).
3. Allow the stabiliser (3) to lower to ground level.
4. Refit support pin (2) and locking pin (1). If holes do not line-up raise the stabiliser (3) until the next available one’s do.
5. Repeat the above steps for the opposite stabiliser.
6. With the load fully discharged, lower the hopper, re-stow the stabilisers.
7. Move vehicle clear of discharge point and using either Manual or Hydraulic rear door closing procedures.
**THE WANDER HOSE**

**USING THE WANDER HOSE**

With the vehicle in Neutral. Sweep Mode Off. Handbrake ON.

1. Remove the blanking plate (1) from either the rear door or appropriate side loading flap aperture and stow on the spare fasteners below the aperture (2).
2. Attach the wander hose over the aperture, using the captive fasteners.
3. Sweep mode ON, suction fan ON.

**VEHICLES WITH MANUAL BLANKING**

*Never Work Under A Raise Hopper Without The Hopper Prop In The Safety Position.*

1. Raise hopper fully and apply the hopper prop.

*It is essential that the Hopper controls are operated from outside the vehicle and not within the cab and with a clear view of the Hopper and Rear Door area.*

2. Release the securing pins and remove the blanking plate (1) from its stowage position on the nearside rear mudguard.
3. Fit the blanking plate over the upper aperture of the suction tube (2) i.e. on top of the water tank.
4. Return the Hopper prop to its stowage position. Lower Hopper.
5. Remove the blanking plate when finished.

*Use the blanking plate when transporting full loads to the tipping location.*
OPERAting Instructions - minor Road Sweeper

using the dust suppression system

Filling the Water Tank

1. Remove the water tank filler cap (1) (on drivers side).
2. Place an appropriate water hose in the aperture and fill to the top of the water level sight tube (2), (use clean water).
3. Replace filler cap when finished.

Using the Low Pressure Water System

The low pressure water is used on the front brush(es), suction tube(s), side brush(es) and widesweep brush. To operate any of these functions the relevant button(s) on the main panel must be selected when in sweep mode.

The front and side brush(es) are fitted with shut-off valves.

It is vital that the water system is drained totally if the air temperature is expected to fall to 0° or below.

Draining the Water System - Remove the strainer (3). Open the all brush shut-off valves. Switch on all water spray function until system is dry.

Using the High Pressure Water System (Option)

High Pressure Water Can Be Hazardous, Always Wear Goggles Or Suitable Eye Protection When In Use.

Never allow the Pump to run dry.

The high pressure water is used on the front spray bar, hand lance and fan assist wash. To operate any of these functions the relevant button on the main panel must be selected when in sweep mode.

A shut-off valve (4) is situated between the pump and front spray bar. This valve should be OFF when using either the hand lance or fan assist.

Continued...
ATTACHING THE HAND LANCE

The hand lance (5) is located in the cab below the seating. It is attached to the retractable hose reel (6) by a quick release coupling (7).

The system must be depressurized prior to attaching the lance.

With the sweep mode OFF, open the front spray bar shut-off valve, release the coupling from its stowed position and attach the lance. Close the spray bar shut-off valve, before using the lance.

Never Direct The Jet At Other People Or At Any Exposed Electrical Connections.

USING THE DETERGENT (OPTION)

With the hand lance in use, check that the detergent container (8) has sufficient fluid. Turn on the control valve (9). Adjust the spray pattern valve (10) to achieve desired affect.

It is vital that the water system is drained totally if the air temperature is expected to fall to 0°C or below.

Draining the Water System - Follow the instructions for draining the low pressure system, additionally open Valve (11) and (12) on the high-pressure pump.
Before tilting the cab, ensure that there is sufficient space to do so and all loose items are safely stowed.

1. Place the cab lever (1) in the unlock position.
2. With all doors closed hold the safety latch (2) open (always on the nearside).
3. Raise cab in an upwards direction. Deploy the safety prop.


Before lowering the cab, ensure the area below is clear of any obstructions.

4. Stow the safety prop. Lower the cab. Engage the locking lever (1).

HYDRAULIC CAB-TILT (Option)

Before tilting the cab, ensure that there is sufficient space to do so and all loose items are safely stowed.

1. Follow instructions 1 and 2 of the above.
2. Place the control valve (3) in the closed position.
3. Insert the handle into the hand pump (4), operate the pump in an up and down motion.
4. When the cab is clear of its locking latch, release the safety lever and continue pumping until the cab is completely raised. Deploy the safety prop.


Before lowering the cab, ensure the area below is clear of any obstructions.

5. Stow the safety prop. Slowly operate the control valve (3) in the open direction, until fully down.
6. Engage the locking lever (1).
**OPERATING INSTRUCTIONS - Minor Road Sweeper**

**RECOMMENDED OPERATOR’S ROUTINE MAINTENANCE**

It is important that the following routine maintenance procedures are carried out as directed. This will help to ensure that your Scarab sweeper performs at the optimum level of safety and efficiency. Refer to the paragraphs immediately following this schedule and to the Table of Contents (Page 3) for more detailed information.

<table>
<thead>
<tr>
<th>MAINTENANCE PROCEDURE</th>
<th>DAILY ACTIONS BEFORE USE / AFTER USE</th>
<th>WEEKLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check Vehicle/body for safety. All lighting equipment, tyres, fuel, oil, coolant, brake fluid, windscreen wash and water tank level</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>2. Check hydraulic oil level and inspect system for signs of leaks. Check oil cooler is clean.</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>3. If vehicle not previously used by YOU, check suction fan is clean.</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>4. Check brushes/skirts for wear. Remove any entangled items, e.g. lengths of string or strapping etc.</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>5. Check suction nozzle/flaps for damage/correct ground clearance. Faults will degrade suction performance.</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>6. Check water spray jets for blockages.</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>7. Check that all equipment is securely stowed and that brushes are retracted.</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>8. Wash vehicle, particularly hopper screen, surrounding ledges and area above. Leave hopper door partially open, to allow air to circulate.</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>9. Wash oil cooler, ensuring that the fins are clean.</td>
<td>✗</td>
<td>✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MAINTENANCE PROCEDURE</th>
<th>DAILY ACTIONS BEFORE USE / AFTER USE</th>
<th>WEEKLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Lubricate as appropriate, all brush links, pivots and nozzle wheels.</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>11. Remove / clean the L-P and H-P water filter elements as appropriate.</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>12. Clean the suction fan thoroughly, using scraper provided and, if necessary, high-pressure water (See Page 33).</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>13. Conduct a thorough inspection of the fan assembly to verify its condition. Report any defects (See Page 33).</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>14. Grease prop. shafts and check for wear at the Universal Joints (U/Js).</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>15. Grease Hopper Ram (Top &amp; Bottom)</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>16. Visually check entire machine for wear/damage.</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>18. Check wiring and hoses for security of attachment and for signs of chafing. Rectify or report defects as necessary.</td>
<td>✗</td>
<td>✗</td>
</tr>
</tbody>
</table>
The foregoing are general recommendations only. Requirements vary from territory to territory and depend on vehicle usage/operating conditions. IF IN DOUBT, CONSULT YOUR NEAREST DEALER.

The fitting of genuine Scarab parts is highly recommended. The use of alternatives might compromise the performance and reliability of your sweeper and could invalidate your warranty.

**OPERATING INSTRUCTIONS - Minor Road Sweeper**

<table>
<thead>
<tr>
<th>19. Raise &amp; prop hopper, Run fan/brushes [normal speed]. Check the oil tank return filter gauge and report if in the RED zone. Fresh filter element must be fitted.</th>
<th>x</th>
<th>x</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. Check seals on hopper-door, side-hatches, suction-tubes. Report any defects. Faults will degrade suction performance and/or cause leakage.</td>
<td>x</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>22. Check oil level in high-pressure pump, report or top-up as necessary.</td>
<td>x</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>23. Grease nearside, offside and rear door hinges</td>
<td>x</td>
<td>x</td>
<td>✓</td>
</tr>
</tbody>
</table>

**LUBRICATION POINTS**

**SIDE BRUSH**

**FRONT BRUSH**

**IN FROSTY WEATHER**

⚠️ **CAUTION: Do not, under any circumstances, operate the high pressure pump without water.**

Drain the water tank. Switch on the water sprays and run the low pressure pump until dry. Remove the water-strainer elements. Leave the hopper slightly raised with rear & side doors slightly open. This allows air to circulate and prevents damage caused by seals freezing to their mating faces.
OPERATING INSTRUCTIONS - Minor Road Sweeper

AUTO-BLANKING (OPTION)

PROPSHAFT

SWIVEL BRACKET

UPPER LINK

SWIVEL RAMS OMMITTED TO AID CLARITY

TILT RAM

LOWER LINK

MOUNTING PLATE

STREET WASH LINKAGE

CAB DOOR

REAR DOOR

WIDESWEEP BRUSH

KING PIN
BASIC MAINTENANCE

CLEANING THE SUCTION FAN AND SCREEN

FAILURE TO COMPLY WITH THE FOLLOWING COULD RESULT IN SERIOUS INJURY.

1. Raise the hopper and deploying the safety prop. Open rear door. Turn engine OFF. Remove ignition key. Lower hopper screen.
   The Hopper Prop Must Always Be Used When The Hopper Is In The Raised Position. Failure To Do So Could Result In Serious Injury.

2. With the fan stationary, remove the outer and inner inspection covers from the hopper to expose the fan.

3. Using the special scraper, thoroughly clean all parts of the fan. A steam-cleaner or high-pressure water from a remote source will greatly assist in cleaning severely contaminated fans.

4. Wash the screen using steam or high-pressure water. Refit the screen, inspection covers and lower the hopper.


5. Start the engine and switch the suction fan ON.

6. With the rear door shut, direct additional water on to the screen below the fan inlet cone, from an open side-access flap, until only clean water is expelled from the fan casing.
SUCTION NOZZLE FLAP ADJUSTMENT

The suction nozzle flaps should be in good condition, and adjusted to the correct clearance from the road surface (15 mm). These flaps have slotted holes to enable up or down adjustment.

For some operating conditions, it might be found that, alternative clearances are preferred.

BRUSH ADJUSTMENTS

Brush contact with the road surface can be altered as follows:

1. With vehicle stopped, handbrake ON and in sweep mode, activate the desired brush(es) in they working potions).
2. Switch OFF ignition and remove the key.
3. Adjust the top link (1) and/or the motor plate (2) until the brush is at the correct contact with the road surface. Re-tighten any items slackened during adjustment.
4. Re-start vehicle, stow all sweeping equipment activated for adjustment.
FLUID LEVELS

ENGINE COOLANT

It is advisable to top-up the coolant level when the engine is cool.

If topping-up is required when the coolant is hot, adequate precautions must be taken, as an overpressure will have built up in the system.

Ensure the vehicle is on a flat and level surface with the engine stopped. Hand brake ON.

Topping-up

1. Remove side cover (1).
2. Remove expansion tank filler cap (2). (If engine is warm, place a cloth over the filler cap and unscrew carefully one turn to relieve the overpressure).
3. Run engine for several minutes.
4. Stop engine and check coolant level.
5. Top-up to the appropriate level, using the correct coolant mixture.
6. Replace filler cap (2).

Coolant is a toxic fluid. Avoid contact with the skin and environment.
HYDRAULIC OIL TANK

It is important to top-up the hydraulic oil level only when the system is cold.

The hydraulic oil tank level gauge is fitted with a low level sensor. If the oil level drops too low the engine will cut-out preventing damage to the hydraulic pump.

Ensure the vehicle is on a flat and level surface with the engine stopped. Hand brake ON.

Topping-up

1. Remove side cover (1).
2. Using the appropriate size spanner, remove the filler cap (2).
3. Top-up with HPL32 or an equivalent hydraulic oil to the appropriate level on the level label (3).
4. Replace filler cap (1)
ENGINE OIL

Ensure the vehicle is on a flat and level surface with the engine stopped. Ignition key removed. Hand brake ON.

It is important to check/top-up only when the engine is cold.

Raise the cab in accordance with the instructions on Page 29.


Topping-up

1. Remove the dipstick (1) from its holder.
2. Wipe clean with a lint-free cloth.
3. Replace in holder. Remove again and check the oil level.
4. The oil should never fall below the minimum level or exceed the maximum level shown on the dipstick.
5. Remove filler cap (2) and pour oil through the opening until the correct level is maintained.
6. Replace filler cap.

Allow time for the added oil to drain through to the sump before re-checking the level.
**BRAKE FLUID**

Ensure the vehicle is on a flat and level surface with the engine stopped. Ignition key removed. Hand brake ON.

The brake fluid reservoir is fitted with a low level sensor. If the level falls below the minimum the warning light illuminates on the instrument panel.

**Topping-up**

1. Remove the outer cover (1).
2. Unscrew the filler cap (2).
3. Carefully pour brake fluid through the opening until the correct level is maintained.
4. Replace cap (2) and cover (1).

Brake fluid is highly corrosive. Take appropriate measures to protect yourself and remove any spilt fluid immediately with plenty of water.

**SCREEN WASH**

**Topping-up**

1. Unscrew the filler cap (1).
2. Check the fluid level in the reservoir (2)
3. Top up via the filler opening.
4. Replace cap (1).

When topping up, it is recommended to add a windscreen cleaner to the water in the screen wash reservoir.

During the winter periods, add screenwash antifreeze.
**LCD MONITOR - OPTIONS SCREEN**

TO ACCESS THE OPTION SCREEN MODE FROM THE START-UP SCREEN PRESS THE OPTIONS BUTTON (7)

**Button function**

1. **Controller:** Turn to highlight required option, press to enter. Used in all screen modes.
2. **Return:** Press to return to previous screen.
3. **Timer:** Press to use display function. When in start-up screen will display Scarab hours, Engine hour etc.
4. **Right cursor:** Press to position cursor at desired point.
5. **Left cursor:** Press to position cursor at desired point.
6. **ECO Mode:** Press to turn On/Off. (only available when activated in the Control menu).
7. **Options:** Press to access protected options screen. Requires code number.

**Screen menu description**

- Driver’s fault codes
- EDC
- Screen settings
- Information
- Button check
- CAN menu
Driver fault codes
Highlight either the CAN or desired Node, and press enter.

CAN screen identifies location of system errors (in this example Node 4).

Entering a Node screen allows Pin-Contact view. Pin numbers with an active fault are highlighted in RED.
- = Open Circuit
- = Short

EDC
Displays the following current conditions:
- Engine Speed
- Battery Voltage
- Pedal Position
- Parking Brake Position
- Clutch Position
- Road Speed

Screen Settings

Brightness adjustment. Rotate the controller to adjust screen brightness or:
Press the timer button to go to maximum brightness.
Clock adjustment.
With the desired field selected, use the ‘A’ and ‘B’ buttons to move the cursor to the left of the value to be adjusted. Press the controller to exit.

When all the desired fields are adjusted, press the timer button to set.

Information
Displays current system information ie: firmware, etc.

Button checks

Main control panel.
Press appropriate button on the main control panel. As each button is pressed the corresponding graphic will illuminate and a beep will sound. (See examples shown)

Auxiliary control panel
Use the main control instructions to test buttons and joystick.