

## **LUBRICURVE ELECTRO 5 Installation & Maintenance Manual**

### **TRACKSIDE ELECTRIC RAIL / WHEEL LUBRICATOR SYSTEM**

- **Running Rail**
  - 2 blades
  - 4 blades
- **Top of Rail**
  - 2 blades
  - 4 blades
- **35kg Capacity**



## Warning!

This lubricator uses a 12V-100Ah battery which contains an acid based fluid, the electrolyte. Care must be taken to avoid the electrolyte coming in contact with the skin or clothing as the electrolyte may cause severe burns.

If the electrolyte contacts the skin wash with large quantities of clean water and seek medical advice.

### **DO NOT expose the battery to naked flames or cigarettes**

During the charging process hydrogen gasses are vented from the battery and these gasses when mixed with the air may explode if ignited.

Do not short circuit the battery terminals, as this may cause a spark or explosion.

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## 1 General

- Health & Safety legislation requires that rail lubricators are fitted by trained personnel only; warranty will also be affected if un-trained teams work on the LubriCurve products. Whitmore Rail provides suitable training courses.

This Manual should be used in support of training courses.

- This Instruction Manual is intended to be generic and concentrates on the full range of LubriCurve Electro 5 systems to suit flat bottom running rails, both top of rail and gauge corner / face applications; system install differences are highlighted as necessary.
- Only lubricator greases or friction modifiers approved for use by Whitmore Rail and the rail user can be used in these LubriCurve Electro systems. Use of other greases or friction modifiers will invalidate warranty and could affect operation.

## 2 Product Transport / Storage

- Goods are packed and delivered to the requested address in a form that is suitable for the product, given good practice in the off-loading by the receiving company.
- LubriCurve systems are delivered on the basis that they will be installed within one month of receipt.
- Delivered systems are not intended for outside storage, equipment should be off loaded and stored inside a secure watertight building until required for installation.
- All items are carefully checked prior to despatch and any damage or missing parts should be advised to Whitmore Rail within five days of despatch from WHITMORE RAIL premises for consideration.

### **Note:**

**Keep cabinet upright at all times from transport to install**

### 3 Main Component Definitions

<b>Pump Cabinet</b>	<p>Each trackside Cabinet contains: Reservoir, gear pump, gear pump hose, control panel, battery charger, and cabinet mounting brackets.</p> <p>The grease is delivered from the reservoir via the gear pump to hose at the base of the Cabinet. Feed hoses then transfer grease to the Blade system.</p>
<b>Pump Reservoir</b>	This reservoir holds the rail grease or friction modifier. The LubriCurve Electro 5 reservoir is capable of holding 35 Kg of grease or friction modifier.
<b>Pump</b>	The pump unit consists of a single or twin chamber gear pump driven by a close-coupled 12V DC motor. The unit fits directly to the reservoir underside.
<b>Pump Control</b>	Triggered from the Wheel Sensor the unit allows control of the pump and recording of key data. A number of operational settings are user adjustable to suit the site and application.
<b>Wheel Sensor</b>	The Wheel Sensor clamps to the running rail and provides non-contact sensing of passing wheels. Indicating lamps provide local indication of correct operation during test. Sensor is connected to control box through armoured cable.
<b>Solar Panel</b>	Depending on model, a solar panel is supplied. The unit fits onto the rear of the cabinet and is used to provide power to the battery by utilising sun and ambient light to generate electric power.
<b>Delivery Hose</b>	<p>The delivery hose transfers the grease from the pump outlet to the Blade inlet.</p> <p>Lengths of hose are supplied with each lubricator, which have to be cut into suitable lengths to fit between the trackside Cabinet and Blade assemblies.</p> <p>The hose is secured using a hose clip at each end of the hose.</p>
<b>Blade (Grease Dispensing Unit - GDU)</b>	Blades are provided that allows the grease or friction modifier to be delivered to the gauge corner/gauge face or top of the rail, for the train wheels to pick up and spread along the curve. The quantity supplied is dependent on the application specified.

## 4 Preparation of Main Components for Installation

<b>Application</b>	Ensure the correct pump type and system options have been selected for the application.
<b>Training</b>	Ensure installation team has been fully trained on the product, sighting and the application.
<b>Packing</b>	<p>The Cabinet is delivered pallet mounted and wrapped, together with the majority of loose items required for the install, and larger items are secured to a separate pallet and wrapped.</p> <p>Ensure package has not been damaged during storage or transport to rail site, damage must be reported to the equipment supplier on initial receipt. Dispose of all waste packaging materials responsibly.</p>
<b>Cabinet</b>	<p>Visually inspect for any defects that will affect its operation.</p> <p>Ensure that all loose items are available with reference to items ordered.</p> <p>Ensure that battery is fully charged with reference to green indicator lamp on the charge controller or the voltmeter display.</p>
<b>Blade</b>	<p>Ensure they are not bent or damaged and all ports are free from blockages.</p> <p>Ensure that all bolts are present and are fitted securely.</p> <p>Ensure that the hose inlet tails, which the delivery hoses attach to, are in place and are not damaged.</p>
<b>Clamps</b>	<p>Ensure that both Sensor and Blade clamps are not damaged.</p> <p>Ensure that the threads on the clamp studs are not damaged.</p> <p>Ensure that the threads on the hook bolts are not damaged.</p>
<b>Hoses (feed and delivery)</b>	Ensure that the hoses are intact and free of holes and splits.
<b>Wheel Sensor and cable</b>	Ensure that the cable and sensor are intact and free of sharp kinks and any damage.
<b>Serial Numbers</b>	Lubricators are supplied with unique serial numbers; these should be recorded prior to installation and recorded on installation record sheets as required. Serial numbers are on both external and internal faces of the cabinet.

## 5 Equipment Handling

Generally Electro 5 items required for each site are delivered on a pallet. The lubrication system is heavy and care should be taken in general safe mechanical handling of the units from delivery truck off-load to site install (cabinet weight excluding grease is approximately 90kg). The following methods of handling the unit are appropriate:

Fork Lift Truck.      Lift with forks fully engaged under the cabinet.

Personnel              Two people are required to lift the cabinet – Take care not to trap fingers or feet when lowering to the ground.

The cabinet should be kept vertical at all times, take care to avoid damage to the paint finish as this forms a part of the corrosion resistance and general integrity of the unit.

## 6 Typical Install Process

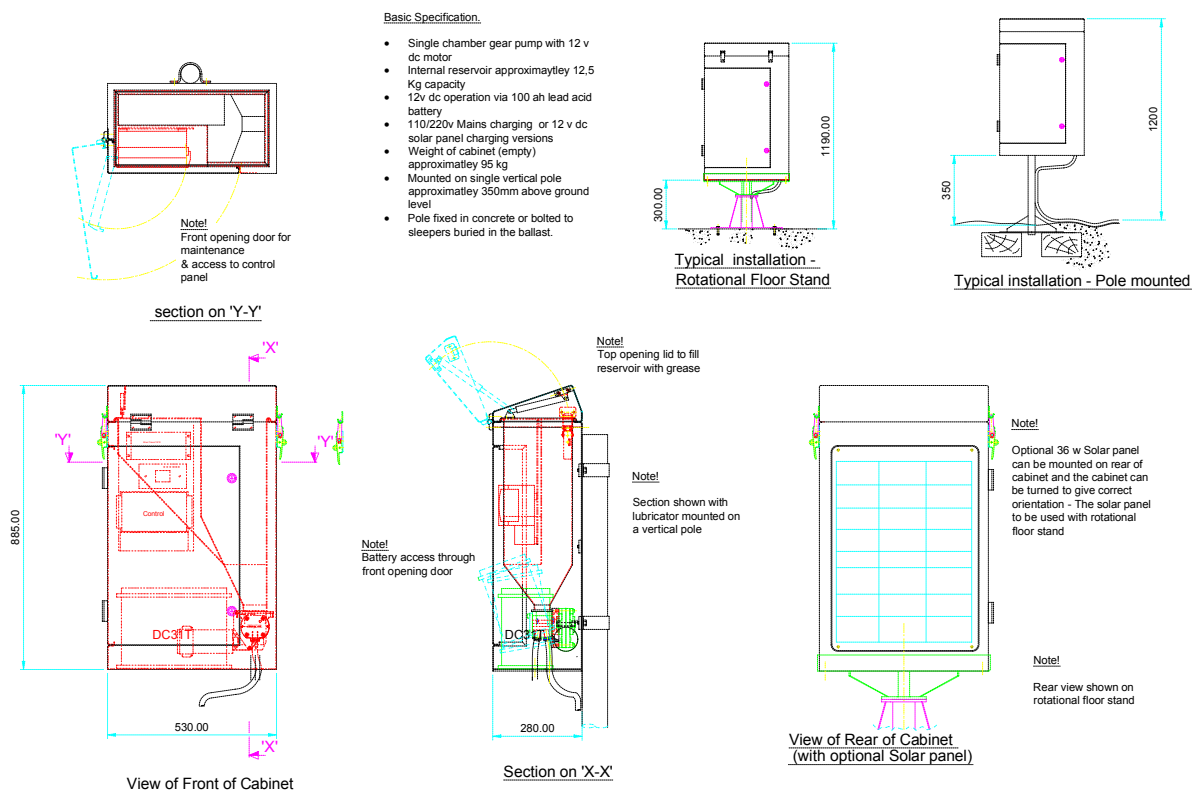
There are several possible sequences that can be followed to efficiently install the lubricator, this will largely depend on personnel available, track access and general conditions – the following is recommended as a guide.

Activity	Manual Section
1. Equipment Handling	5
2. Prepare Base for Cabinet Install	8.1, 8.2
3. Electrical Connection	8.5, 9
4. Install Blades	10.3
5. Install Track Mounted Wheel Sensor	10.1
6. Hose connection and routing from Blades to Cabinet	10.7
7. System Priming	10.8
8. System Settings	11

## 7 Site Preparation

To install a LubriCurve Electro 5 lubricator, a simple base is required to support the vertical pole or the rotational frame on which the Cabinet is mounted. The form and stability of the base is important as it resists the wind loads on the cabinet. For a pole mount the base would typically be formed from concrete with a 60mm diameter tube cast vertically. The tube is approximately 1000mm above the concrete surface. For a rotational frame, the base could be either concrete or two full length sleepers. Either construction the surface of the base must be flat.

Outline and requirements are indicated in the diagram below. Drawings are applicable to Electro 5 pole & rotational frame mounting systems. Suitable poles and frames are available from Whitmore Rail.



- Base and cabinet must be positioned to maintain mandatory track and OLE clearances.
- Vegetation should be cleared around the unit where necessary to ensure a safe working environment.
- The base should be securely bedded into the ground / ballast to ensure stability and tube to be vertical
- The equipment needed for the installation work includes.



- All relevant P.P.E. needed to carry out the works safely.
- Shovel or ballast fork whichever one is the most suitable.
- Orange pipe to protect delivery hose and sensor cable across 4' and 6'.
- Spirit level
- Compass
- Lubricator installation tool kit (see Section 14).
- Wiring termination tools.
- Cordless or portable drill and bits

Note. Other site specific mounting options may be used.

## 8 Installation Trackside Items

### 8.1 Fitting the Trackside Cabinet to mounting tube

- 8.1.1 The vertical tube is to be installed and the concrete is to be fully cured prior to the installation of the cabinet
- 8.1.2 The Cabinet includes three clamps to hold the cabinet secure to the vertical tube. All clamps are to be tightened at final fix.
- 8.1.3 The cabinet is positioned adjacent to the vertical tube and the three clamps are assembled loose around the tube. The cabinet is then lifted approximately 300mm and the clamps are tightened. Note if a solar panel is to be fixed to the rear of the cabinet, ensure the rear of the cabinet is facing south for northern hemisphere and north for southern hemisphere locations.

### 8.2 Fitting the Trackside Cabinet to Support Frame

- 8.2.1 The support frame is to be installed on a level firm base, either concrete or two full length sleepers
- 8.2.2 The support frame is to be bolted to the concrete with M8 x 80 anchor bolts or M8 x 100 coach bolts, if timber sleepers are used.
- 8.2.3 The Electro 5P cabinet is bolted to the support frame with 4 No. M8 bolts fitted through the base of the cabinet.

### 8.3 Earth Bond

- 8.3.1 Subject to local regulation it may be required to bond the unit to the track. A 16.5 mm diameter hole is to be drilled in the rear of the cabinet for a 16mm diameter earth stud (Whitmore part No. LCS105-11). Alternatively, Whitmore part No. LCS105-11-M20 can be inserted in one of the two diameter 20 holes in cabinet base behind battery.
- 8.3.2 The bond itself must be supplied and fitted directly by Rail owner authorised personnel and not by the lubricator installer.

### 8.4 Fitting the Solar Panel

- 8.4.1 The solar panel is fixed directly to the rear of the cabinet. There are four spacers that hold the solar panel away from the cabinet. Using the M8 security bolts attach the spacers to the rear of the cabinet. The solar panel are fixed to the spacers with M8 security bolts.
- 8.4.2 The cable from the solar panel is routed through a 20mm gland to the inside of the cabinet and the ends of the cable are connected to the solar panel controller.

### 8.5 Battery Charger Electrical Connection

The majority of the electrical termination is completed in the Whitmore Rail factory prior to despatch, a maximum of three site connections (including one for the Wheel Sensor, Section 10.1.7) are required, for battery charging:

- 8.5.1 Solar Panel Cabinet Mounted – (see section 8.6)
- 8.5.2 Mains Power – two pole MCB for incoming 110 or 220vac fused and earthed mains power (see section 8.7)

### Warning!

This lubricator uses a 12v-115ah battery which contains an acid based fluid, the electrolyte. Care must be taken to avoid the electrolyte coming in contact with the skin or clothing as the electrolyte may cause severe burns.

If the electrolyte contacts the skin wash with large quantities of clean water and seek medical advice.

### **DO NOT expose the battery to naked flames or cigarettes**

During the charging process hydrogen gasses are vented from the battery and these gasses when mixed with the air may explode if ignited.

## 8.6 Solar Systems

Solar panel charged lubricator model uses the charger shown in the picture. Cable connection is directly into the left hand side screw terminals indicated on the charger.

The battery feed cable will have been factory connected, the free end with ring terminals should be connected to the battery terminals; blue core to negative and brown core to positive.

The round solar panel cable connects to terminals indicated with the solar panel legend; Brown '+', Blue '-'



**Damage will result if incorrectly connected.**

The controller contains two indicator lamps:

- A Green LED and this will be illuminated as soon as there is power from the module. When the controller starts to limit the charge current the LED will flash.
- The second LED can change colour from Red via Yellow to Green. Battery voltage is shown by the colour and legend on the controller - Green full charge, Red low battery charge.
- When the battery voltage falls below approximately 11v the multi-colour LED will start to flash FAST. While the battery remains at a low charge the LED will continue to flash slowly.

## 8.7 Mains Powered Systems

If solar charging is not possible an alternative system that utilises local mains power to maintain battery charge may be used. Cable routing and connection should be undertaken by trained and authorised personnel only. Using the following procedure:

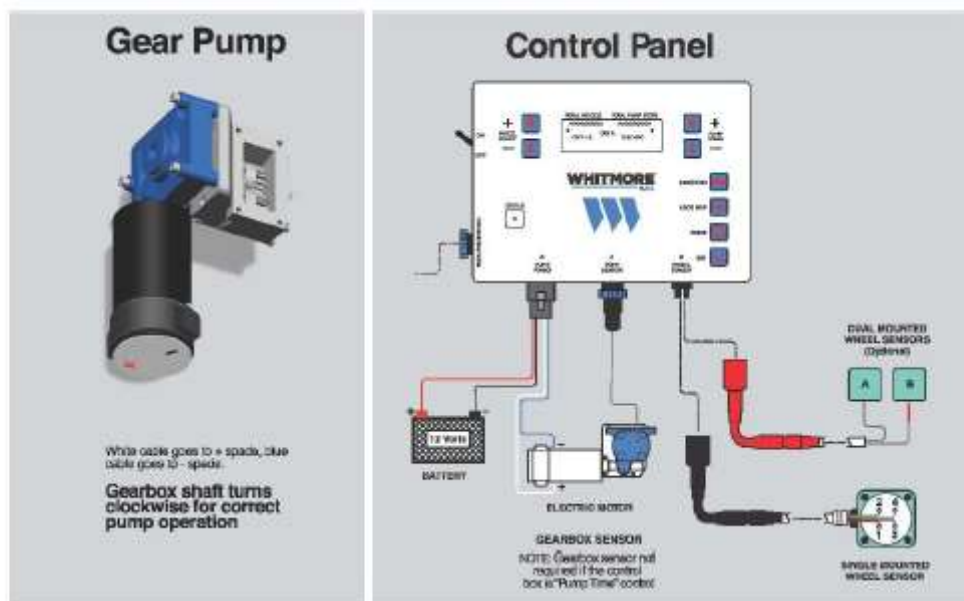
- 8.7.1 A suitable cable should be routed from the local trackside power source to the cabinet via suitable armoured cable and routed into the cabinet through a suitable waterproof gland. The cabinet can be drilled towards the base to suit the gland; care should be taken to avoid damage to any internal cabinet components.
- 8.7.2 The cable incoming cable should be armoured and suitably routed and protected to avoid a hazard.
- 8.7.3 Cable rating should be 220/110 volt at 5 amps.
- 8.7.4 Connection should be made on the two pole MCBs to the left of the main Control Box. All other power wiring will have been completed during product assembly.
- 8.7.5 Connection should only be undertaken with the lubricator installer present.

The mains charger is suitable for input voltage between 95 and 240 volts ac or dc.

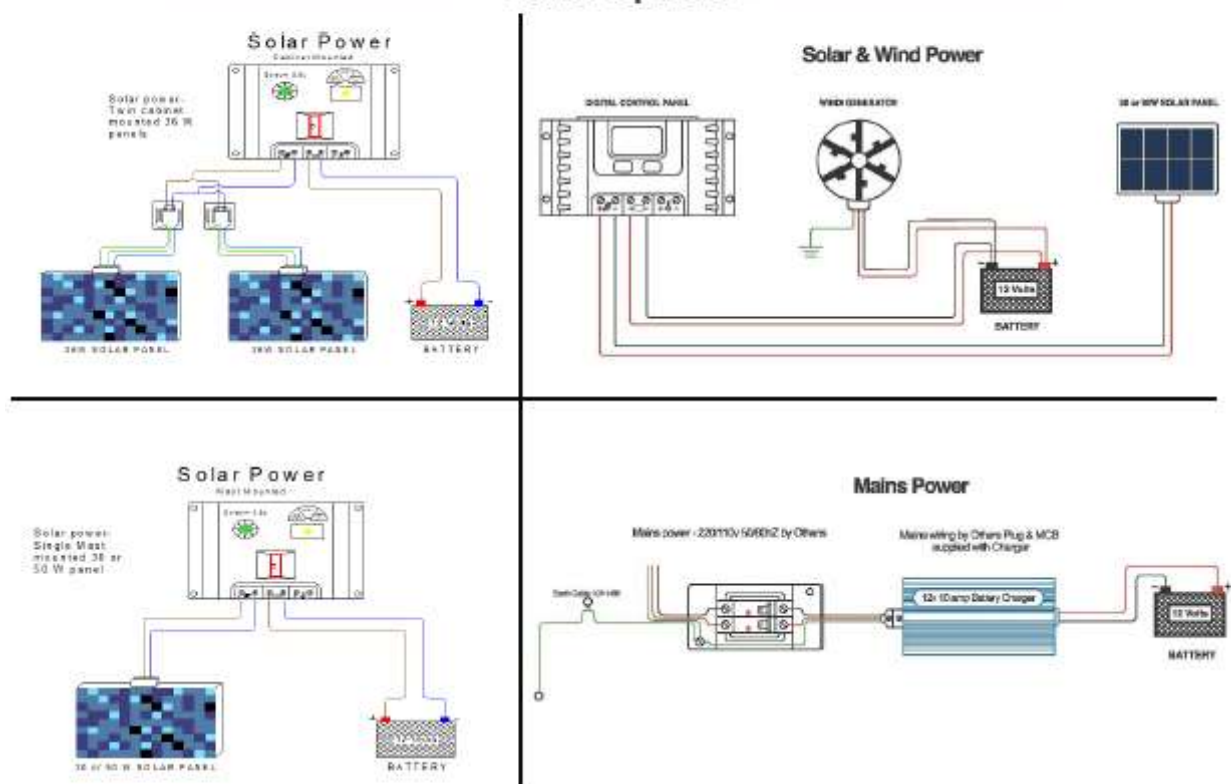
The battery connections from the mains charger are:-

- Cable with RED sleeve is connected to the positive battery terminal [Note: the cable insulation is smooth]
- Cable with no sleeve is connected to the negative battery terminal [Note: the cable insulation has three longitudinal ribs]

## 9 System Wiring Diagram



### Power Options



### WARNING!

This applicator uses a 12V-100Ah battery which contains an acid based fluid, the electrolyte. Care must be taken to avoid the electrolyte coming in contact with the skin or clothing as the electrolyte may cause severe burns.

If the electrolyte contacts the skin, wash with large quantities of clean water and seek medical advice.

**DO NOT** expose the battery to naked flames or cigarettes.

During the charging process, hydrogen gases are vented from the battery and these gases, when mixed with the air, may explode if ignited. Do not short circuit the battery terminals, as this may cause a spark or explosion.

## 10 Installation of Track Items

This aspect of the installation involves fixing of the Wheel Sensor to the running rail, fixing of the Blade system and running of the feed delivery hose system

### 10.1 Wheel Sensor – Bidirectional Operation Option

10.1.1 The Wheel Sensor is a non-contact proximity device that will detect a passing wheel when correctly set. The unit is pre-assembled on an aluminium mounting plate and needs to be clamped to the rail 3 to 6 metres upstream from the furthest rail mounted Blade. The sensor will be in the 4' and can be on either rail as best suited to the site.

10.1.2 Sensor rail fixing clamps are similar to the EasiBlade arrangement and fitting is generally covered in Section 10.3, key differences are:

10.1.3 Clamp the sensor to the M16 rail clamp studs with the sensor uppermost.

10.1.4 Adjust the height of the sensor to 42 / 45mm below the rail head crown and securely tighten the M16 fixings.



*Note if required by site conditions the sensor can be reversed on the sensor mounting plate such that the cable exits in the opposite direction.*

10.1.5 Connect the extension cable by plugging the SureSeal connector into the sensor pigtail. Run the cable from the sensor along the foot of the rail on the cess or field side, fix to each rail clip using cable ties and into the trackside Cabinet.

10.1.6 The cable must route through protective pipe when running across the 4' or 6', in third rail applications the cable should pass through robust insulated pipe work below the conductor rail.

**10.1.7** Route the cable within the Cabinet to the Control box and connect.

**Note!** On very small rails a simple plate with shims are used to mount the Wheel Sensor – see site specific layout/ install drawings

This aspect of the installation involves fixing of the Directional Wheel Sensor System to the running rail and the control box element to the lubricator cabinet (if not factory fitted)

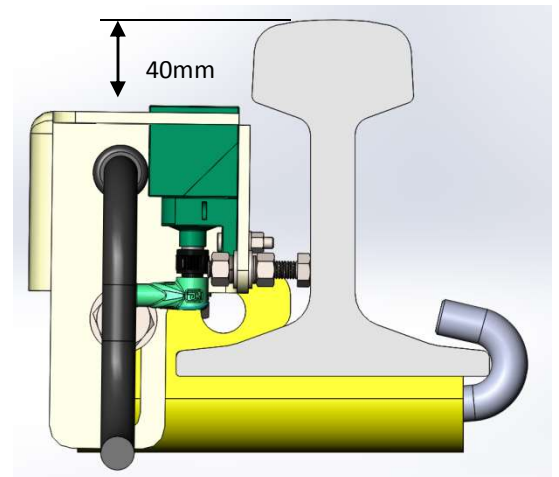
### 10.2 Wheel Sensors – Single Direction Operation Option

- 10.2.1 The Wheel Sensors are non-contact proximity devices that will detect a passing wheel when correctly set. The unit is pre-assembled on an aluminium mounting plate and needs to be clamped to the rail 3 to 6 metres upstream from the furthest rail mounted Blade. The sensors will be mounted in the 4' and can be on either rail as best suited to the site.

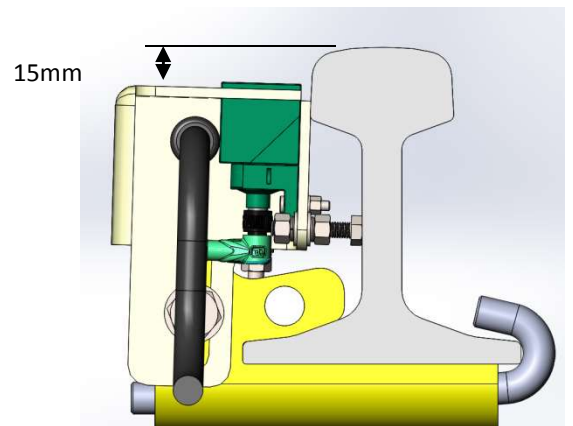


- 10.2.2 Sensor rail fixing clamps are similar to the EasiBlade arrangement and fitting is generally covered in the main electric lubricator manuals.
- 10.2.3 The sensors will be factory fitted & wired onto an aluminium bracket (painted yellow). The bracket is secured to the rail mounted bracket via two M16 bolts. The whole assembly is clamped to the rail by one single 'J' bolt and M16 nyloc nut or for slab track installations via the two clamping nuts.
- 10.2.4 Adjust the height of the sensor bracket so that the sensors are set to 40mm below the rail head crown for gauge side mounting or to 15mm below the rail head crown for field side mounting and securely tighten the M16 fixings. Adjustable stops are mounted to the bracket to aid the setup process. One stop is set onto the web of the rail and one stop onto the foot of the rail. These adjustable stops allow the sensor bracket to be repositioned easily if the bracket is pivoted away from the rail e.g. for rail grinding. Ensure that the sensor heads do not touch or detect the rail head when connected to the control system.

Gauge Side Sensor Position –  
Set 40mm below Rail Head



Field Side Sensor Position –  
Set 15mm below Rail Head



Sensor height positions may need to be adjusted for each specific site depending upon gauge width or site specific track conditions.

- 10.2.5 The sensor unit includes a prewired short free cable with Sureseal connector. An extension cable housed with flexible PVC conduit and typically 15 metre (50') long should be routed from the sensor along the foot of the rail on the cess or field side, fix to each rail clip using cable ties and position the cable into the trackside Cabinet through a cable gland or open aperture.
- 10.2.6 The cable must route through protective pipe when running across the 4' or 6', in third rail applications the cable should pass through robust insulated pipe work below the conductor rail.
- 10.2.7 Route the cable within the Cabinet to the Control Box. Plug the connector to the control box using the intermediate 'red' link cable.



### 10.3 Blade System

The system allows use of a range of grease distribution units:

- Running Rail Blades
  - 2 blades on high rail
  - 4 blades on the high rail and 4 blades on the low rail

### 10.4 EasiBlade Installation, Standard 'W' Rail Clamp Bracket

10.4.1 EasiBlades are supplied as complete single units. From the 4' / Gage and midway between Sleepers / Ties slide the base (W bracket) over the rail foot as shown. Locate the hook bolt around the opposite side of the foot and tighten the single Nyloc nut. Fully bed the base onto the rail using a hammer on the vertical faces of the 'W' bracket. Retighten the Nyloc nut.

10.4.2 Where 4 blades per rail systems are installed it is important that the two inner blades are in adjacent beds an empty bed and then the outer blades. This arrangement allows wheel circumference pick-up and also benefits hose layouts

10.4.3 The blades are provided in left and right hand forms; the difference being the direction the hose tail points, the correct layout is shown in the adjacent picture, outer pairs with hose tails pointing towards each other.

10.4.4 Tilt the blade up so that the blade tip is towards the rail head and as high as possible, lightly tighten the two pivot bolts.



10.4.5 Decide the required blade height and tap the two steel lugs on the blade evenly down using a hammer to achieve the required height. The setting gauge should be used to verify heights.

10.4.6 There may be a slight gap between the tip of the blade and the rail. To close this gap tap the corner of the lug as necessary, **do not hammer the blade itself.**

Strike here to angle in blade

10.4.7 Repeat process for each EasiBlade.

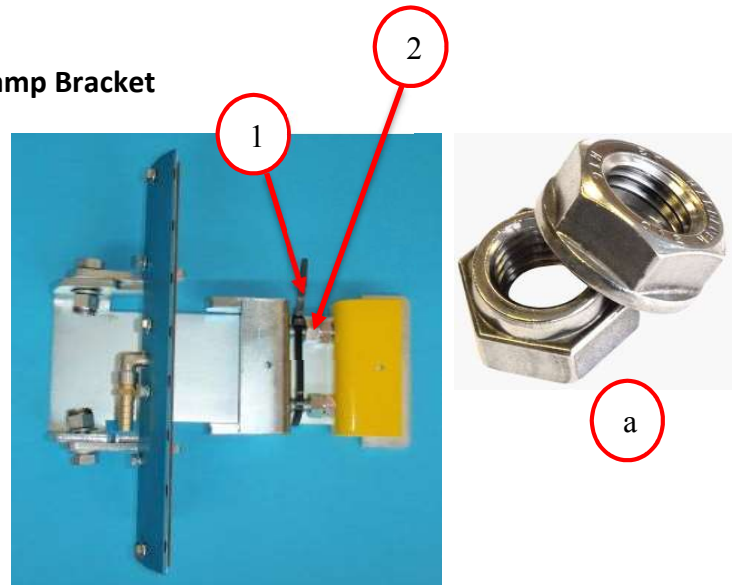


Note!

Blade height should be set at approximately 6mm below the indicated wear line on the gauge face of the rail. If no wear line is apparent a good starting point is 22mm below the top of the rail

## 10.5 EasiBlade Installation, Low-Clearance Rail Clamp Bracket

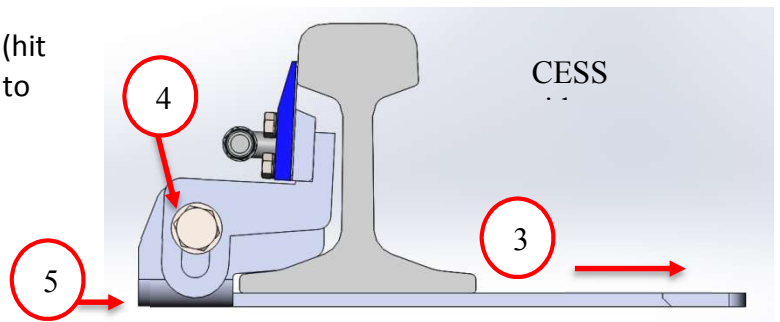
- 10.5.1 Remove the cable tie with a wire cutter.
- 10.5.2 Loosen the M16 nuts and separate the slab track bolt anchor (yellow component) from the base clamp.
- 10.5.3 Slide the base clamp under the rail.



- 10.5.4 Tighten the M16 bolts and the two piece hardlock M16 nuts (a) [see following page for instructions on how to assemble hardlock nuts] in order to **be able to pre-adjust the blade against the rail as shown.**

- 10.5.5 If necessary use a rubber mallet (hit where the red arrow is pointed) to secure the base clamp in place.

- 10.5.6 Adjust the M16 nuts in order to be able to bring the foot clamp and bolt anchor together.

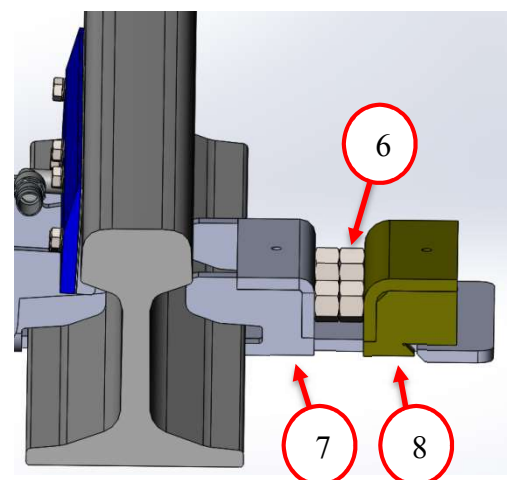


- 10.5.7 Slide the foot clamp underneath the rail (use a rubber mallet if necessary).
- 10.5.8 Slide the bolt anchor so it matches the chamfer of the base clamp.

- 10.5.9 Push the bolt anchor against the chamfer of the base clamp.
- 10.5.10 Tighten the M16 nuts to ~195Nm (closest to the bolt anchor).
- 10.5.11 Tighten the M16 nuts to ~195Nm (furthest from the bolt anchor) to lock the base clamp onto the rail.

- 10.5.12 Adjust the height of the blade in relation to the top of the rail (20-22mm typically).

- 10.5.13 Tighten the two piece hardlock nuts (see following page).



10.5.14 Important: Confirm that the blade is against the rail, at the desired height and the whole assembly is tightly secured to the rail.

### Hardlock installation procedure

1. Use a spanner to tighten the convex nut with rotated torque (for a M16 – torque is 97Nm to 257Nm).
2. Thread down the concave nut onto the convex nut manually.
3. Tighten the concave nut with the spanner, about one turn. (For a M16 – torque is 70Nm to 100Nm).



### 10.6 Routing of delivery hoses, Cabinet to blade

- 10.6.1 As outlined previously there are a number of options to allow connection to the relevant Blade option. Picture shows EasiBlade layout with empty bay between end sleepers.
- 10.6.2 Hoses are 16mm bore for systems with pump distances up to 8 metres. The correct type and length of hose will have been despatched with the system.
- 10.6.3 Irrespective of hose type the principals of running the hose are similar and shown below for a typical installation with blades on both rails.
- 10.6.4 Hoses should be protected within suitable piping when passing under rails across the 4'
- 10.6.5 Running Rail Systems
  - Two blades have single hose from cabinet to a T piece centrally between the two blades.
  - Four blades have single hose from cabinet to a Y piece near each rail linked in turn to T piece centrally between each blade pair.
- 10.6.6 Top of Rail Systems
  - Two blades have single hose from cabinet to a T piece centrally between the two blades.
  - Four blades have single hose from cabinet to a Y piece near each rail linked in turn to T piece centrally between each blade pair.
- 10.6.7 Specific hose routing will depend on each site, note, to assist balanced flow:
  - Main delivery hose runs should be of the same length.
  - Individual hose lengths between each interconnection should be the same length.



## 10.7 Fitting the Main Delivery Hoses

- 10.7.1 Having first filled the reservoir operate the pump by pressing the 'run' button until grease is present at hose tail fitting.
- 10.7.2 Fit one end of a delivery hose to the hose tail inlet on the Blade with a hose clip and after routing and filling the delivery hose connect to the hose tails on the outside of the pump.
- 10.7.3 Repeat the procedure for the other hose (If using a twin chamber pump with two hose outlets).

## 10.8 Fill the Hoses and Blade's

- The main lubricator pump can be used to pump grease from the reservoir to the Blades.
- On the Control Panel periodically press the Pump Run button.
- Continue cycle until grease is evident at all Blade ports.

## 10.9 Top of Rail (TOR) EasiBlade Installation

### Process Applicable for Single Port TOR EasiBlade and 8 Port TOR EasiBlade

- 10.9.1 TOR EasiBlades are supplied as complete single units. From the Field side and midway between Sleepers / Ties slide the base (W bracket) over the rail foot. Locate the hook bolt around the opposite side of the foot and tighten the single Nyloc nut. Fully bed the base onto the rail using a hammer on the vertical faces of the 'W' bracket. Retighten the Nyloc nut.



[Single Port EasiBlade, above]

- 10.9.2 Tilt the blade up so that the blade tip is towards the rail head and as high as possible, lightly tighten the two pivot bolts.
- 10.9.3 Decide the required blade height and tap the two steel lugs on the blade evenly down using a hammer to achieve the required height.
- 10.9.4 There may be a slight gap between the tip of the blade and the rail. To close this gap tap the corner of the lug as necessary, **do not hammer the blade itself**.
- 10.9.5 Tighten the two M16 bolts. Adjust the nuts on the two lock bars to restrain the blade from vibration.
- 10.9.6 Repeat process for each EasiBlade.



[Eight Port EasiBlade, above]



## 11 Commissioning / Setting

### 11.1 Filling the Reservoir

The Electro 5 lubricators have been designed with a direct fill reservoir via a secure opening lid. This direct fill method is the quickest and most user friendly filling method.

Access the Grease Reservoir

- Open the lid on top of the cabinet. There are two latches (padlocks may be used to secure the lid) that need to be released and the lid can then be hinged upwards. There is a stay in the lid that prevents the lid from closing accidentally. When the lid is open you will be able to see the grease reservoir.

**Note** – ensure only approved grease or friction modifier enters the reservoir. Any non-approved materials could severely damage the electric pump.

Filling the Grease Reservoir

- Grease can be poured directly from the drum or storage bag, into the reservoir. Electro 5 reservoir will hold 35kg.
- Do not over fill the reservoir.
- Once filled close the lid by closing the lid slightly then opening to release the lock and then the lid can be closed fully. Press firmly shut and secure using the latches. It is important that the lid is locked correctly; if the lid is left open the grease / modifier may biodegrade rapidly.



### 11.2 Wheel Sensor Heights and Operation

Procedure for height adjustment and testing operation are covered in Section 12.10.

### 11.3 Pump Setting

The Electro 5 Lubricators are controlled and set by a control panel located inside the cabinet. The control panel allows the user to set the grease output from the Blade blades with respect to the rail traffic using the line.

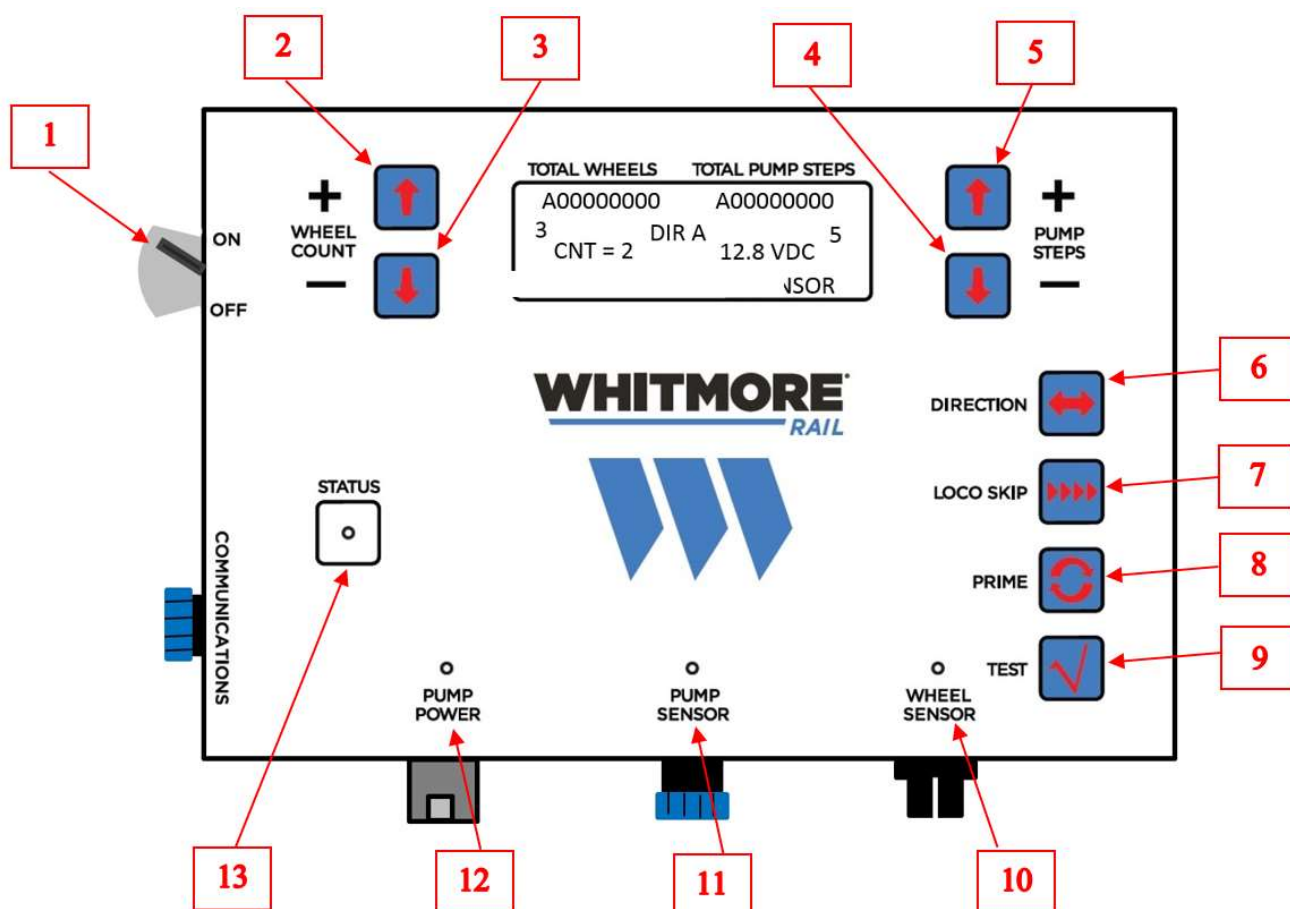
The following steps explain how to set and adjust the Lubricator once installed.

The buttons and indicator lamps have been numbered to help explain these instructions.

The first wheel of the train initiates the pump. The control panel



counts the set number of wheels and then operates the pump, grease / friction modifier is then dispensed every time the set number of wheels has been detected.



- 1) **Power Switch** – This toggles the power to the controller ON when in the up position and OFF when in the down position. There is a clear protective rubber cover to keep the switch liquid tight. DO NOT try and remove this cover.
- 2) **Wheel Increment Button** – This *increases* the wheel setting for enabling pump activation, and the setting for Loco Skip when enabled (see 7) by an increment of one each time the button is pressed. Hold down the button and it will increment at a steady rate.
- 3) **Wheel Decrement Button** – This *decreases* the wheel setting for enabling pump activation, and the setting for Loco Skip when enabled (see 7) by a decrement of one each time the button is pressed. Hold down the button and it will decrement at a steady rate.
- 4) **Pump Decrement Button** – This *decreases* the pump output setting by a decrement of one each time the button is pressed. Hold down the button and it will decrement at a steady rate.
- 5) **Pump Increment Button** – This *increases* the pump output setting by an increment of one each time the button is pressed. Hold down the button and it will increment at a steady rate
- 6) **Direction Button** – This toggles the directional setting of the controller for Direction A and Direction B as shown on the display. Upon powering up the controller Direction A is displayed as a default. Press Direction Button once to go to Direction B settings, if using a dual direction sensor. Press Direction Button a second time to go to the Total Wheel Counts and Total Pump Steps screen. Press Direction Button a third time to return to Direction A. When Loco Skip is selected (see 7) the direction button (6) is used to alternate between Direction A and B.

- 7) Loco Skip Button – Press this button once to enter the Loco Skip feature. This allows a delay in the pump activation by “skipping” a set amount of wheels before beginning the standard pump activation process. Once in the Loco Skip feature, use the Wheel Count Increment (2) and Wheel Count Decrement (3) buttons to adjust the amount of wheels to skip. Use the Direction Button (6) to switch between A and B directions for Loco Skip to be enabled. Press Loco Skip Button to exit the feature.
- 8) Prime Button – Press button once to begin pump prime process. The pump will run continuously for up to 4 minutes, or until the Prime Button is pressed again. Line 4 of the display will show “PRIME IN PROCESS”.
- 9) Test Button – Press button once to activate the pump for the set amount of steps according to the display and direction selected.
- 10) Wheel Sensor Light – When the track sensor detects a wheel is passing this red LED will illuminate. This corresponds with the change of wheel sensor counts on the display. This light will remain illuminated when there is a wheel present above the track sensor.
- 11) Pump Sensor Light – When the pump sensor detects a gear tooth this red LED will illuminate. This corresponds with the change of pump step counts on the display. The LED could potentially remain illuminated depending on the position of the gear pump relative to the pump sensor.
- 12) Pump Power Light – When the pump is activated this red LED illuminates
- 13) Status Light – This is a multicolour LED light that is always on when the controller is powered up, even when the display is in sleep mode. When the LED light is green there are no errors and the controller is functioning as it should. When the LED light is red there is some type of error occurring that relates to the battery being low, or there is a wheel sensor cable error. When the LED light is blinking orange there is a pump sensor error 1 or 2. On the third pump sensor error the status light turns to solid red. These changes in colour helps indicate trouble shooting when an error occurs in conjunction with the display. A message will appear on the display in conjunction with a red or orange Status Light error.

## **TURNING POWER ON/OFF**

- In order to access the control panel, open the main door of the cabinet by rotating the door handle clockwise.
- To turn the controller ON locate the toggle switch (1) on the left side of the control box and flip upwards. The display and status light (13) will become illuminated.
- Upon the controller powering up, there is a splash screen that displays for approximately four seconds. This splash screen displays which configured version of the software the controller is currently set to use. The two types are “WHITMORE RGD” and “WHITMORE TOR”. (See DISPLAY INFORMATION section below for details)
- To turn the controller OFF locate the toggle switch (1) on the left side of the control box and flip downwards. The display and status light (13) will become inactive.

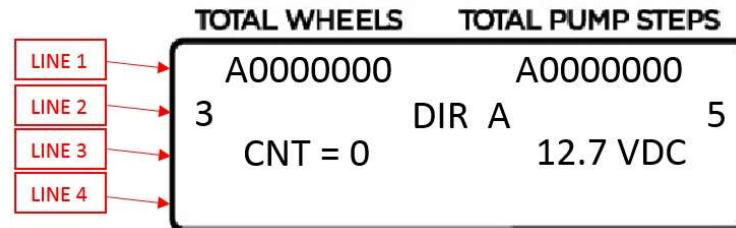
## **11.4 Display information**

**Splash Screen** – upon powering on the controller, the display initially shows a message that pertains to the controller configuration. The two possible configurations are “RGD” and “TOR”. The RGD

configuration resets the current wheel count back to zero after a train has passed for approximately 45 seconds. The TOR configuration does not reset the wheel count back to zero and simulates one continuous train.

**Screen Time-Out** – If there is no input from any button on the controller within approximately 90 seconds the display will turn off. Press any button on the controller once to turn the display back on. (Note: the button pressed to turn the display back on will not function other than to just turn on the display)

**Default Screen Direction A** – this is the default screen that appears upon powering on the controller. The default setting for the controller upon initial installation will be 3 wheels and 5 steps. The wheel and pump settings on Line 2 can vary depending on what they were upon powering down the box previously.



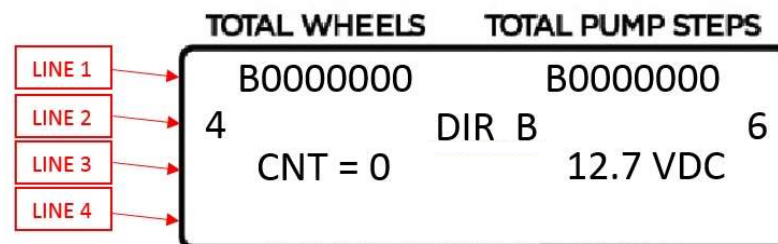
Line 1 – Total Wheel and Pump Steps for direction A

Line 2 – Wheel count setting, direction, and pump step setting

Line 3 – Current wheel count and voltage of battery

Line 4 – Will display various status and error messages. (See troubleshooting section for clearing errors)

**Direction B Screen** – press the Direction Button once from default screen to access the direction B information screen.



Line 1 – Total Wheel and Pump Steps for direction B (NOTE: there will be no counts on this screen with single direction cable)

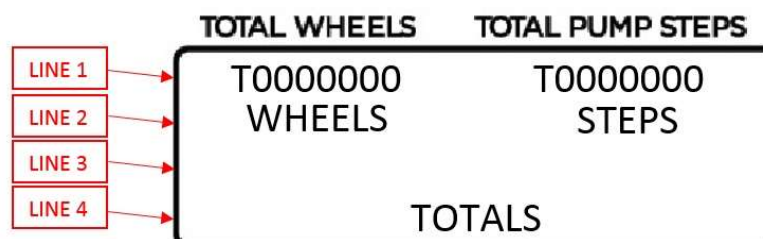
Line 2 – Wheel count setting, direction, and pump step setting

Line 3 – Current wheel count and voltage of battery

Line 4 – Will display various status and error messages (See troubleshooting section for clearing errors)

Note: Message “Single Sensor Cable” will appear on Direction B Screen if using a single sensor system that does not allow dual direction capability.

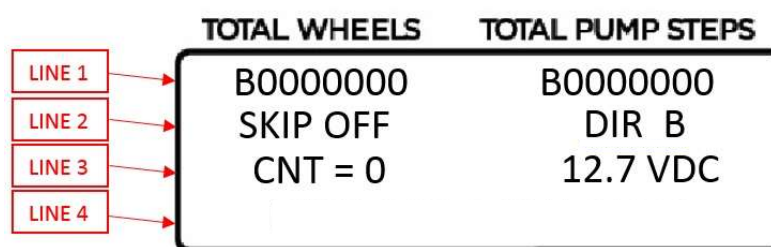
**Totals Screen** – press the direction button (6) until the Totals Screen appears to access the totals for wheel counts and pump steps





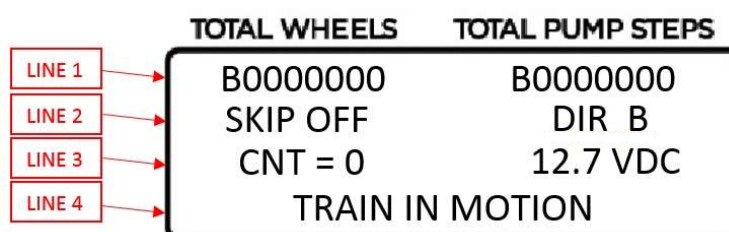
Line 1 – Total Wheel Counts for A & B and Pump Steps for direction A or B combined  
Line 2 – States “WHEELS” for count number above, and “STEPS” for count number above  
Line 3 – BLANK  
Line 4 – will display “TOTALS” only

**Loco Skip Screen** – access this screen by pressing the Loco Skip Button (7). Change the direction setting of the skip feature by pressing the Direction Button (6).



Line 1 – Total Wheel and Pump Steps for direction A or B  
Line 2 – Loco Skip count setting and direction  
Line 3 – Current wheel count and voltage of battery  
Line 4 – Will display various status and error messages. (See troubleshooting section for clearing errors)

### **TRAIN IN MOTION**



Line 4 – Upon the wheel sensor responding to a passing wheel the message “TRAIN IN MOTION” will appear on Line 4 of the display, and the screen will default to the current sensor direction screen either A or B depending on type of wheel sensor and train direction. This will lockout any buttons from being active until there has been no wheel sensor response for approximately 60 seconds.

**NOTE:** For installation convenience only you may exit the TRAIN IN MOTION lockout screen by holding down the Wheel Count Increment button (2) and Pump Count increment button (5) simultaneously for approximately 5 seconds. This should NOT be done as a train is passing by, but only during sample testing conditions.

### **PUMP TIME-OUT**

In certain circumstances where high train speeds and controller settings are not ideal, the pump steps will accumulate faster than the pump can carry out the operation. To prevent the pump from running continuously after a train has passed, the pump will stop after approximately five seconds if no wheel has been seen by the controller. If a consecutive wheel is seen after the five second time-out, but before the 60 second train reset period, then the pump steps will return to the normal operation.

### **RESETTING WHEEL COUNTS TO ZERO**

Using two hands, at the same time press and hold down the WHEEL INCREMENT BUTTON (2) and the WHEEL DECREMENT BUTTON (3) for approximately five seconds until counts return to zero. This will only zero out the current direction selected.

NOTE: From the TOTALS screen you will not be able to zero out any counts for wheels or pump steps.

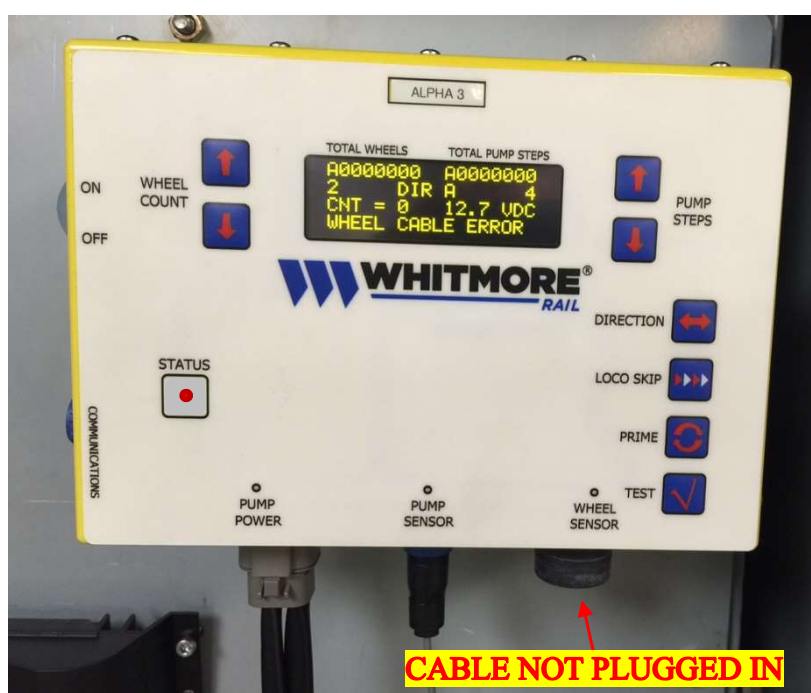
### **RESETTING PUMP STEPS TO ZERO**

At the same time press and hold down the PUMP STEP INCREMENT BUTTON (5) and the PUMP STEP DECREMENT BUTTON (4) for approximately five seconds until counts return to zero. This will only zero out the current direction selected.

NOTE: From the TOTALS screen you will not be able to zero out any counts for wheels or pump steps.

### **ERROR MESSAGES & TROUBLESHOOTING**

- **WHEEL SENSOR CABLE ERROR**



This error will only occur upon powering on the controller with the wheel sensor cable being unplugged or not having a good connection. The STATUS LIGHT (13) will illuminate red and the message WHEEL CABLE ERROR will display on line 4. To fix this power down the controller and ensure the wheel sensor cable is properly connected. You must power cycle the controller in order to clear the error. (NOTE: cables should never be connected/disconnected with the controller powered on)

- **DUAL WHEEL SENSOR ERROR**

This error will only occur when a dual direction wheel sensor misses the leading axle in the A or B direction. For example, if a train's lead axle passes over the wheel sensor B, but the controller does not get a reading from wheel sensor A and gets a consecutive wheel sensor B reading, then the error "TRAIN WHL

A ERROR” displays on line 4. The STATUS LIGHT (13) will illuminate orange when this occurs. After 60 seconds of no train motion the display on line 4 will display “WHEEL A SENSE ERROR” or “WHEEL B SENSE ERROR” depending on the sensor that missed the leading wheel of the train. The controller will check to see if the error is cleared on the passing of the following train, and if cleared the message on line 4 of the display will return to “TRAIN IN MOTION” and STATUS LIGHT (13) will return to green. To troubleshoot, turn off the controller and ensure the connection and height setting of the track sensors are correct.

(NOTE: cables should never be connected/disconnected with the controller powered on)

## 11.5 Pump Settings / Operation

- 11.5.1 For maintenance log purposes the display screen also records the total wheel count and also the total pump steps. It is possible to zero the display following direct discussion with Whitmore Rail.
- 11.5.2 The set of Test Buttons, Test Run (6) and Test Stop (7) can be used to run the pump settings without the wheel sensor being activated. These buttons are useful during initial Lubricator set-up or maintenance periods.
- 11.5.3 The Run Pump Button (8) can be pressed and held for continuous pump operation. This button is useful during the initial priming of the pipes and Blade blades.

**Note: The gearbox output shaft is clearly visible and should rotate in a clockwise direction when pumping.**

The required pump settings will vary for each site and depend on such items and train type and speed. For guidance the table below should be followed and then adjustments made to suit local conditions during subsequent visits.

**Initial Electro 10 / 20 Settings**

Speed		Carriages 2		Carriages 3		Carriages 4	
Speed mph	Speed kph	Wheel Count	Pump Steps	Wheel Count	Pump Steps	Wheel Count	Pump Steps
<15	<25	3	4	3	4	4	5
<50	<80	3	4	3	4	4	5
<90	<120	3	4	4	4	6	5
<100	<160	3	4	4	4	6	5

<125      <200                      -                      -                      -                      -                      -                      -

Speed		Carriages 8+		Carriages 20+	
Speed mph	Speed kph	Wheel Count	Pump Steps	Wheel Count	Pump Steps
<15	<25	4	4	3	4
<50	<80	6	4	8	5
<90	<120	6	5	30	10
<100	<160	40	8	-	-
<125	<200	40	8	-	-

## **12 Routine Maintenance**

**Prior to any maintenance it is necessary to have the following data.**

- The date that the lubricator was last maintained.
- The final depth of the reservoir when the lubricator was last maintained.
- Blade and Wheel Sensor heights when the lubricator was last maintained.
- Any works that were carried out when the lubricator was last maintained that could change the grease output.
- Any work that was identified but not carried out on the previous visit.

### **12.1 Control Panel**

- 12.1.1 The control panel incorporates all operational functions for pump setting and also historic data logging of activities.
- 12.1.2 Record the Total Wheel Count and Current Wheel Count Setting from the Panel LCD readout.
- 12.1.3 Record the Total Pump Steps or Seconds and Current Pump Steps or Time Setting from the Panel LCD readout.
- 12.1.4 Note these 'total' settings can be zeroed by depressing the buttons adjacent to the readout but this should be recorded as a specific maintenance activity.

### **12.2 Pump Setting**

- 12.2.1 Record the settings shown on the display as per Section 12.1.
- 12.2.2 Establish by visual inspection that grease / modifier output is correct or requires adjustment (plus or minus):
  - If **additional** grease/modifier output is required then:
    - Increase Pump Steps or Seconds setting by press and hold of the 'more' button.
    - Or
    - Reduce the Wheel Count Inhibit such that the pump will operate for a second cycle after fewer wheels have passed. It may also be necessary to reduce Pump Steps/Time as part of this adjustment to prevent over output.
    - Assess Blade output and make further adjustments as necessary.
  - If **reduced** grease output is required then:
    - Reduce Pump Steps or Seconds setting by press and hold of the 'less' button.
    - Or
    - Increase the Wheel Count Inhibit time such that the pump will operate for a second cycle after a greater number of wheels has passed.
    - Assess Blade output and make further adjustments as necessary.

### 12.3 Measuring the Reservoir

- This measurement is the only true guide to how much grease the lubricator has used since it was last visited. It is necessary to have the previous recordings of the last inspection, this will enable you to make judgements and carry out corrective action if needed without any guesswork.
- Using a flexible steel tape, insert it through the top of the reservoir, holding the tape vertical extend until the end is touching the top of the grease.
- Check exactly the measurement (in millimetres) against the face of the top reservoir cover.
- Record this measurement and compare it to the data that you have brought to site.
- By subtracting the final measurement recorded from the last time the lubricator was maintained from the measurement you have recorded this time would give you the grease used in millimetres.

### 12.4 Cabinet Maintenance

- 12.4.1 The Cabinet should be cleaned at each site visit and any damage to the paintwork attended to help prevent corrosion, damage could result from stone chips and general trackside activity in the vicinity.
- 12.4.2 It is important that both door locks are lubricated at each visit to ensure effective long-term operation.
- 12.4.3 Any water from rain or condensation should be removed so the inside of the cabinet is dry. In extreme environments where condensation forms then a suitable desiccant or dryer should be installed.

### 12.5 Battery Maintenance

#### **Warning!**

This lubricator uses a 12v-100ah battery which contains an acid based fluid, the electrolyte. Care must be taken to avoid the electrolyte coming in contact with the skin or clothing as the electrolyte may cause severe burns.

If the electrolyte contacts the skin wash with large quantities of clean water and seek medical advice.

#### **DO NOT expose the battery to naked flames or cigarettes**

During the charging process hydrogen gasses are vented from the battery and these gasses when mixed with the air may explode if ignited.

- 12.5.1 The battery is not maintenance free and standard practices should be employed to correctly maintain by trained operatives. This test will include:
- 12.5.2 Check battery fluid levels regularly, and top up with distilled water as necessary. Typically checks should be at two to three months intervals and this should tie in with normal lubricator maintenance schedules.
- 12.5.3 Integrity of battery connections should be checked; in particular the positive and negative post terminals should be cleaned and suitable anti-corrosion material applied. **WARNING:** Do not short circuit the battery as this may cause an explosion
- 12.5.4 Battery should be checked for signs of physical damage and replaced should anything be found

- 12.5.5 Maintenance records should include details of battery with indelible marking of 'replace by date'
- 12.5.6 Batteries should be changed with new units at 2 (max 3) year intervals.

## **12.6 Solar Panel Maintenance**

- 12.6.1 The panel will become dirty over time. At regular intervals to suit general environment conditions the panel should be cleaned with water and a mild detergent using a sponge or soft cloth, scrub brush or abrasive materials should not be used.
- 12.6.2 If the panel surface is physically damaged it must be replaced.
- 12.6.3 Check the mechanical integrity of the unit and its alignment.
- 12.6.4 Check electrical connections are tight and free from corrosion

## **12.7 Replacing the Pump Sensor**

- 12.7.1 Disconnect battery
- 12.7.2 Remove control box terminal cover and disconnect the three core grey cable from the terminals and draw clear of the control box through the cable gland (see wiring diagram in Section 9), remove any cable ties and pull cable to base of cabinet at rear.
- 12.7.3 The sensor is secured to the pump body with two M8 nuts (13mm open spanner needed). Loosen the outer nut, loosen the inner nut and then unscrew the sensor fully from the pump body.
- 12.7.4 The new sensor is supplied with two loose nuts and one lock washer. Discard the lock washer and spin both nuts along the sensor and over the grey cable.
- 12.7.5 Wind the sensor into the pump body by hand until it cannot be turned further; turn the sensor back one revolution. Holding the sensor in that position fit the first nut tight to the pump body and then tighten the locknut.
- 12.7.6 Route the cable behind the drum plate and to the control box. Reconnect the three cores.
- 12.7.7 Reconnect the battery.
- 12.7.8 Press pump run and ensure the 'motor sense' LED next to the sensor cable (just connected) flashes.
  - If lamp flashes all is correct
  - If lamp does not flash then loosen the sensor and reset by turning it clockwise or anti-clockwise.

## **12.8 Cleaning the Lubricator and Surrounding Site**

- 12.8.1 The lubricator and site must be cleaned so that when maintenance checks are made, you will be able note measurements and assess the operations of the lubricator accurately and carry out the works in a cleaner and safer environment.
- 12.8.2 The whole of the lubricator must be cleaned thoroughly.
- 12.8.3 The site must be cleared of excess grease.

- 12.8.4 If oil absorbent granules are being used, the existing, soiled granules should be removed and replaced with fresh granules. This must be done with extreme caution, if the granules are allowed to get into the lubricator system via the blades, the system may become blocked.
- 12.8.5 The surrounding rail chairs and clips, all rails in the immediate vicinity and the insulator pots need to be cleaned. 3rd and 4th rail are needed to be cleaned to ensure they are free of grease and dirt, this is to avoid causing a fire risk and hazardous under footing.

**Do not attempt to clean live traction current rails with the current switched on.**

## 12.9 Checking for Leaks

- 12.9.1 The lubricator should be checked for leaks. With some leaks it will be necessary to take the leak into consideration in regards to the grease output that you have noted.
- 12.9.2 Leaks on the primary side (i.e. within the cabinet) of the lubricator will cause an increase in grease output that is not due to the settings of the lubricator.
- 12.9.3 Tighten any hose clips or nuts / bolts / screws that maybe the cause of the leak and / or replace the faulty part that is causing the leak.

## 12.10 Measuring / Testing the Wheel Sensor

- 12.10.1 The sensor height to be measured is the vertical distance between the top of the green sensor body, and the top of the crown of the rail.
- 12.10.2 The sensor height should be set at 42 to 45mm. below the top of the rail
- 12.10.3 If the lubricator has not used the amount of grease that is required for this lubricator since the last time that it was maintained.
- Check that the sensor heights are the same as when the lubricator was last maintained.
  - You may find that the sensor height has changed due to loose bolts on the mounting bracket causing the assembly unit to move, check the bolts and tighten if necessary. If necessary reset the heights once all other checks have been carried out.
  - If the sensor height has been reset on this visit record the new heights.
- 12.10.4 Check the sensor is operating:
- With the Control Panel powered a 'green' LED will be visible at one end of the Wheel Sensor (opposite end to cable entry). If the lamp is not illuminated there is no power to the sensor and the cause should be investigated.
  - With the Control Panel powered move a solid metallic ferrous object (i.e. 2lb Ball Pein hammer) over the sensor. The second indicating LED should illuminate 'yellow' to show the sensor has 'seen' the object.
  - Repeat the test with a person viewing the red sensor-indicating lamp on the Control Panel. The lamp should illuminate when the sensor is activated.

## 12.11 Checking for Airlocks

The following shows steps taken to check for airlocks.



- Remove the delivery hoses from the Cabinet hose outlet. Operate the Run button on the control panel and check grease flows freely from each outlet.
- Remove delivery hoses from the Blade's. Operate the Run button on the control panel and check grease flows freely from each outlet.

Note:

- If the test was not satisfactory,
  - Check the reservoir is full of grease.
  - Clear the block within the grease path.
  - Operate the Pump by activating the 'Run' button.

**Do not run for more than 5 seconds with a 20 second interval between operations.**

Air locks that are present on arrival at the lubricator will give you certain information into why the lubricator has not had a sufficient grease output.

If the lubricator has not used any grease, but no air locks are present other corrective actions should be undertaken.

## **12.12 Inspection of the Blade's**

12.12.1 Visually check the Blade's for damage and / or wear. Record and report findings.

12.12.2 Check that each port is clear and that there is a vertical stand of grease from each running rail Blade.

12.12.3 Check Blade height with reference to initial installation height settings

12.12.4 Check that the fastenings are secure.

12.12.5 Operate the pump from the Test button and ensure all of the ports on the top face of the spreader bar are dispersing grease. This will show if there is hardened grease, inside the Blade and/or if the Blade slots are blocked.

12.12.6 If Blade is partially blocked:

- For each delivery hose run close flow valves on all Blades other than the Blade to be worked on (note on two blade systems there are no flow valves).
- Cover each working port while operating pump, this should clear minor blocks.
- If blockage persists then strip and clean Blade

12.12.7 If Blades are fully blocked then remove, strip and clean.

12.12.8 Record your findings and any works carried out.

## **12.13 Filling the Reservoir**

12.13.1 Refer to Section 11.1

## **12.14 Periodic Replacement of Components**

12.14.1 It is recommended that various system items are replaced periodically; exchange will be dependent on traffic frequency and should be monitored during maintenance visits but as a minimum should include the following.

Item	Exchange Frequency
Battery	2 years
Control Box	5 years
Fasteners	5 years
Hose	2 years
Wheel Sensor	3 years

Whitmore Rail Electro Lubricator Maintenance Log Sheet									
Maintained By	Maintainers Name	Maintain Date	Lubricator No.						
			Mileage						
Lub' Manufacturer	W' Rail		ELR						
Pump Model		Serial	Road						
			Rail Type						
GDU / Blade Config	2 - 4 - 8	Power Source	Solar	Wind	Mains	Battery			
Special Product Notes									
1. Reservoir Capacity		Initial 0 - ¼ - ½ - ¾ - full		Final 0 - ¼ - ½ - ¾ - full					
2. Grease Integrity / Leakage		Comments on leakage							
2.1 Pump		Yes / No							
2.2 Reservoir		Yes / No							
2.3 Hoses		Yes / No							
2.4 Blades		Yes / No							
3. Wheel sensor:		Initial Height		mm		Final Height		mm	
3.1 Sensor LED test				PASS / FAIL					
3.2 Control panel sensor indicating lamp				PASS / FAIL					
4. Battery charger unit panel									
4.1 Battery volts		Volts		n/a		Comment			
4.2 Wind turbine volts		Volts		n/a		Comment			
4.3 Solar panel volts		Volts		n/a		Comment			
5. Solar panel condition	PASS / FAIL n/a	Panel Cleaned Yes / No	6. Wind turbine operation	PASS / FAIL n/a	7. Mains charger	PASS / FAIL n/a			
If failed, action taken									
8. Pump settings		Initial			Final				
8.1 Wheel Inhibit									
8.2 Pump Steps									
8.3 Total wheel count reading									
8.4 Total pump steps reading									
9. Pump:									
9.1 Operation Test		PASS / FAIL							
If above test failed, action taken									
9.2 Airlocks		PASS / FAIL							
If above test failed, action taken									
10. Blade height.	1	2	3	4	5	6	7	8	
Initial									
Final									
			LH Rail / Running-on			RH Rail / Running-off			
9.1 Visual check		PASS / FAIL			PASS / FAIL				
9.2 Pumped through GDUs		PASS / FAIL			PASS / FAIL				
9.3 Removed & cleaned plates		YES / NO			YES / NO				
9.4 Fitted new plates		YES / NO			YES / NO				
11. Grease distribution through curve									
11.1 Over rail head		YES / NO							
11.2 If yes, number of sleepers									
11.3 Grease distribution		¼ - ½ - ¾ - Full Curve			PASS / FAIL				
11.4 Total Miles Covered		Miles							
If any part of section 10 has failed what action, if necessary, was taken									
12. Lubricator fastenings check		YES / NO							
WORK / GENERAL		Environmental/Waste					Spares Required		
		Any waste including packing and empty grease tubs handed over to Client for appropriate disposal							
Post Install site accepted by:									
Customer		Name				Date			

## 12.15 Maintenance Log Sheet Example

Whitmore Europe Limited, Unit 9, Foster Avenue, Woodside Park Industrial Estate, Dunstable, Bedfordshire, LU5 5TA United Kingdom  
01707 379 870 - [info-UK@whitmores.com](mailto:info-UK@whitmores.com) - [www.whitmores.com](http://www.whitmores.com)  
Company Registration Number: 08038592 - VAT Number: 327534891

## **13 Parts List**

Contact Whitmore Rail for advice / availability

## **14 Basic Installation Tool Kit**

A selection of hand tools are suggested to correctly fit and maintain the pumps, specific recommended Whitmore Rail products are referenced above.

- Ratchet Handle 1/2" Drive
- Combination Spanner 24mm
- Combination Spanner 19mm
- Combination Spanner 17mm
- Combination Spanner 13mm
- Combination Spanner 10mm
- Nut Spinner 7mm
- Socket 13mm 1/2" drive
- Socket 17mm 1/2" drive
- Socket 19mm 1/2" drive
- Socket 24mm 1/2" drive
- 1lb Ball Pein Hammer
- Sharp Knife
- Side Cutter
- Junior Hacksaw and Blades
- Screwdriver 6" x 1/4" flat blade, flared tip
- Screwdriver Pozidrive No. 0, 1 & 2
- Terminal Screwdriver
- Cordless Drill
- 8mm Drill Bit



## EC Declaration of Conformity

In accordance with EN ISO 17050-1:2004

We Whitmore Europe Limited

of City Park  
Watchmead  
Welwyn Garden City  
Hertfordshire AL7 1LT

*in accordance with the following Directive(s):*

2006/42/EC The Machinery Directive

2004/108/EC The Electromagnetic Compatibility Directive

*Hereby declare that:*

Equipment Electro 5, 6, 10, 15, 20 & 30, Track Mounted, Electrical, Rail & Wheel Flange Lubricator System

Model number LCS103, 105, 108, 110, 113, 115, 120, 121, 205, 206, 210, 211, 212, 213 Series Lubricators and accessories.

*is in conformity with the applicable requirements of the following documents*

Ref. No.	Title	Edition/date
ISO 9001	Quality Management System Requirements	2008
ISO 14001	Environmental Management System	2004

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications and is in accordance with the requirements of the Directive providing the Lubricator has been installed in accordance with Whitmore Europe's Installation & Maintenance Manual

Signed by: 

Name: Craig Foster

Position: Managing Director

Whitmore Europe Ltd., Welwyn Garden City AL7 1LT

On 5<sup>th</sup> February 2017

The technical documentation for the machinery is available from:

Name: Operations Director

Address: Whitmore Europe Ltd., Welwyn Garden City AL7 1LT

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An ISO 9001 and ISO 14001 registered company registration no. 7678917