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February 2013
Hybrid Drill Warranty Registration

In order to activate your Claydon Warranty this page must be completed and returned to:

Claydon Yield-O-Meter Ltd
Gaines Hall,
Wickhambrook,
Newmarket,
Suffolk,
CB8 8YA
Tel: +44 (0) 1440 820 327
Fax: +44 (0) 1440 820 642

**IF THE REGISTRATION DOCUMENT IS NOT RETURNED THEN THE DRILLS WARRANTY WILL BE VOID**

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME:</td>
<td></td>
</tr>
<tr>
<td>ADDRESS:</td>
<td></td>
</tr>
<tr>
<td>CONTACT NUMBER:</td>
<td></td>
</tr>
<tr>
<td>DELIVERY DATE:</td>
<td></td>
</tr>
<tr>
<td>HYBRID SERIAL NUMBER:</td>
<td></td>
</tr>
</tbody>
</table>

**PLEASE ENSURE:**

- The Machine is washed off upon delivery to remove any road salt,
- The drills hydraulic free flow service is plugged in prior to the drill being operated.

SIGNATURE:
Safety

Safety stickers can be found located on your Claydon Hybrid drill at numerous locations, these stickers must be observed to ensure your safety and that the machine is operated in a safe manner.

Warning Symbols

If any of the stickers become illegible or peel off, new stickers can be ordered and attached in the appropriate position. The stickers must not be removed.

Meaning of warning symbols:

Read the operating manual carefully.
Prior to operating the machine the manual must be read fully and understood. Special attention should be applied to the Warnings and Cautions section.

Do not stand between the tractor and the machine.
Standing between tractor and the drill is especially prohibited during coupling and uncoupling.
Riding on the machine is prohibited. Serious or fatal injury can occur as a result of riding on the machine.

Proceed with care in the event of leaking hydraulic fluid. Defective hydraulic hoses or incorrectly seated hydraulic couplings can trigger unpredictable machine movements and cause injury.

Keep clear of slewing range. There is an extreme risk of injury from slewing or folding machine parts.

Do not pressure wash locality. Electronic components will be seriously damaged if event occurs.

Machine noise levels. Noise level of fan during operation (decibels).

Wear gloves. Gloves must be worn when handling product or preforming maintenance tasks.

Risk of crushing. Gaps between components may become smaller or disappear completely.

Caution, danger of explosion. Disassembly and re-pair work must be completed by a qualified person only. Accumulators contain pressurised gas and oil.

Retighten all nuts. All nuts should be checked and retightened after a few operating hours. Nuts may come loose due to machine vibration.
Introduction

Thank you for your purchase of a new Claydon Hybrid Seed Drill. The Claydon Hybrid Seed Drill is a high performance drill designed to sow seed of a wide variety type and size. Due to its electronically controlled metering system this is achieved accurately and economically.

The purpose of this Operator’s Manual is to comprehensively explain to the operator how to set up, use and maintain the machine.

It is important that the operator reads this manual carefully to correctly set up, use and maintain the machine safely. In particular, it is essential that the Warnings and Cautions section has been read carefully.

For any further assistance or explanation please contact Claydon Yield-O-Meter using the contact details given on the front cover. The serial number stamped on the left hand plate near where the top link attaches will also need to be quoted.

The Claydon Hybrid Seed Drill will give many years of excellent service with little maintenance due to its robust construction and its small number of moving parts. However, for optimum machine life some maintenance will be necessary.

We reserve the right to make future modifications to the machine that could make some diagrams and descriptions in this manual ‘out of date’. While the clarity of the manual should not be affected by this, please bring any concerns to the attention of Claydon Yield-O-Meter Ltd for us to resolve the problem.

Identification of the Machine

The Claydon Range offers drills with the following specification:

<table>
<thead>
<tr>
<th>Machine</th>
<th>Working Width</th>
<th>Transport Width</th>
<th>Weight Approx. Unloaded</th>
<th>Max Hopper Capacity</th>
<th>Number of Working Rows</th>
</tr>
</thead>
<tbody>
<tr>
<td>3m</td>
<td>3m</td>
<td>3m*</td>
<td>1.5 Tons</td>
<td>1700L</td>
<td>9</td>
</tr>
<tr>
<td>4m</td>
<td>4m</td>
<td>2.85m</td>
<td>2.2 Tons</td>
<td>1700L</td>
<td>13</td>
</tr>
<tr>
<td>4.8m</td>
<td>4.8m</td>
<td>2.85m</td>
<td>2.5 Tons</td>
<td>1700L</td>
<td>15</td>
</tr>
<tr>
<td>6m</td>
<td>6m</td>
<td>3m</td>
<td>3.2 Tons</td>
<td>1700L</td>
<td>19</td>
</tr>
</tbody>
</table>

* With level boards removed
In addition to the machine identification plate, the serial number of the machine is stamped into the left hand main mounting beam.

Record your serial number here: ........................................................................................................

You may need to quote the serial number of your machine when you order spare parts in the future.

**Directive Provisions**

The Claydon Hybrid Seed Drill conforms to Machinery Directive 2006/42/EC (see Appendix B – Declaration of Conformity at the rear of the manual).

**Airborne Noise Emissions**

The A-weighted emission sound pressure level of measurements taken directly at the fan is 94dBA.

**Warnings and Cautions**

These warnings and cautions must be observed when operating the Hybrid Seed Drill.

- Ensure total weight of tractor/drill combination does not exceed permitted limits and weight of tractor is sufficient for safe field and road use.
- Do not allow anyone to stand between tractor and drill during coupling/uncoupling procedures.
- For maintenance/adjustment of the drill ensure that it is lowered to the ground on the 3 point linkage.
- Seed dressing is highly poisonous so protective measures-gloves, goggles, facemask must be used while loading the hopper and cleaning the machine after use with compressed air.
- The hydraulic system on the machine operates under high pressure and pressurised hydraulic oil is dangerous. Connecting/disconnecting the drill must only be undertaken with the tractor engine turned off and the pressure in the hoses released.
- Before operating the machine ensure no-one is standing within range of its turning circle-including the marker arms.
IMPORTANT INFORMATION for Drills with Hydraulic Stone Protection System:

- BEFORE pressurising the stone protection circuit, ensure that the drills hydraulic free flow service is plugged in as the overflow pressure is directed into this circuit and dissipated back into the tractor through the free flow return, this will avoid damage to the stone protection circuit or fan motor (which are not covered by warranty).
- Always release the pressure from the stone protection system before working on the hydraulic system.
- Release the pressure from the stone protection system for over winter storage and allow the rams to go to closed centres, therefore allowing the rods some protection against corrosion.
- The Tungsten points on the leading tines should be protected by parking the drill on wooden boards.

Equipment Overview

The terms ‘front’ ‘rear’ ‘left’ and ‘right’ in this manual refer to the machine as follows:

1. ‘Front’ indicated the three point linkage end of the machine
2. ‘Rear’ indicates the machine end on which the steps are mounted
3. ‘Left’ indicated the left of the machine as you look at the machine from the rear
4. ‘Right’ indicates the right of the machine as you look at the machine from the rear.

Preparation

General

On taking delivery check for any possible damage that could have occurred during transit. Remove all loose parts (harrow tines, level boards etc.) that may have been stored in the seed hopper for transit and fit to the machine.
A tool box is supplied and contains the following items:

1 x Quick Release Tool
1 x Spare Front Tine (Part No SBA152)
1 x Pack of Shear Bolts (Shear Bolt version machines only)
2 x M16 U-Bolts for Tine
1 x Control Unit and Cable
1 x Control Unit Mounting Bracket and Bolts
1 x Tractor Power Cable
1 x Claydon Instruction Manual
1 x Claydon Instruction DVD
1 x Parts Catalogue
1 x Calibration Scales
1 x RDS Operation manual
1 x Fan 1” ISO with 18L male thread

Please contact Claydon if any are missing.

**Connecting the Drill to the Tractor**

The Claydon Drill can be mounted onto any CATIII or CATIVN compatible three point linkage with the linkage pins supplied and CATIII balls (not supplied).

Connect the main power cable supplied with the RDS Artemis Control Unit directly to the battery terminals. Run the cable to the tractor cab by a safe route so that it can’t be caught or snagged. All of the hydraulic hoses on your Hybrid Seed Drill have been colour coded and are displayed in Figure 2. **THE HYDRAULIC FREE FLOW SERVICE MUST BE PLUGGED IN PRIOR TO THE DRILL BEING OPERATED.**

![Figure 2 – Tractor connections (model shown 4m/4.8m)](image)

<table>
<thead>
<tr>
<th>Connections</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Light cable</td>
<td>-</td>
</tr>
<tr>
<td>2. Folding wings*</td>
<td>Yellow</td>
</tr>
<tr>
<td>3. Stone Protection**</td>
<td>White</td>
</tr>
<tr>
<td>4. Marker Arms</td>
<td>Green</td>
</tr>
<tr>
<td>5. Hydraulic Fan (Free flow service 18L connector)</td>
<td>Red</td>
</tr>
<tr>
<td>6. Hydraulic fan (Pressure)</td>
<td>2x Red markers</td>
</tr>
</tbody>
</table>

*Only present on 4m, 4.8m and 6m
**Optional extra.
The following labels (Figure 3) can be found located on the front of the drill's seed hopper, these labels specify the corresponding hydraulic connections and their color coded indicators. The amount of hydraulic services on your Hybrid drill will alter depending on the specifications and the drill's width.

![Hydraulic Services Diagram]

**Marker Arms** - Green

**Folding** - Yellow (4.4, 4.8 and 6m drills only)

**Hydraulic Fan** - Red

**Stone Release** – White (Optional extra)

**Figure 3 – Labels for hydraulic services**

Mount the RDS Artemis Control Unit in a position in the cab easily visible and reachable from the driving position.

Mount the drill onto the three point linkage. Run the electric cables into the tractor cab and connect them to the relevant sockets within the cab (they will only fit their correct partners – see Figure 4). To avoid exposure to moisture, keep the connections inside the cab wherever possible.

![Electric Cable Connections Diagram]

**Cables shown connected**

1. Artemis control unit
2. Data cable from RDS box
3. Electric power cable to RDS box
4. Electrical power cables to battery terminals

**Figure 4 – Electric cable connections**
CAUTION: MAKE SURE THE FAN RETURN IS PLUGGED INTO A ‘FREE FLOW RETURN’ ON THE TRACTOR.

Connect the hydraulic hoses to the tractor spools in their relevant pairs. The 1” ISO female coupling with 18L male thread supplied with your drill will have to be connected to the tractor rear axle. If necessary, your tractor dealer will advise. The return pipe cannot just be inserted into the filler cap as the oil cannot return to the pump sufficiently quickly in many tractors. DO NOT CHANGE THE 1” ISO TO A DIFFERENT SIZE AS THIS COULD CAUSE DAMAGE TO THE MOTOR, WHICH ARE NOT COVERED BY WARRANTY. The fan return cannot be connected to the tractor ISO.

Once the drill is attached and at the correct working depth, the top link should be set at an angle in which the convergence point between the upper and lower link arms should fall at the front axle (Figure 5). This can be achieved by altering the top link pin attachment points on the tractor and drill. This ensures stability and the mass of the implement is used correctly.

Figure 5 – Top link convergence position

1. Upper link point
2. Upper hitch point
3. Lower link point
4. Lower hitch point
5. Vertical virtual hitch point
Transportation

Raise the machine off the ground and fold the wings fully upright (applies to 4m, 4.6m and 6m machines). Once folded, turn the hydraulic tap parallel to the cylinder to lock the wings in the upright position (Figure 6). To unfold the wings turn the hydraulic tap in the opposite direction and operate the spool valve. **Never** transport along public highways without isolating the folding wings.

![Hydraulic tap to isolate folding wings](image)

**Figure 6 – Location of wing isolation hydraulic tap**

Marker Arms

On delivery of the drill the marker arms may be in their shortest position for transport. Both marker arms will have to be set up for the working width of the machine. Additionally, should the driving position not be central (either through driver’s choice or position of the seat) it may be necessary to adjust the two markers to avoid gaps or overdrilling.

Figure 7 shows where to measure from in order to set the marker arm distance followed by a brief explanation on how to achieve this. It is advised to carry out this process when the drill is in the ground and at the correct working depth.

![Marker arms](image)

1. Marker arm extended
2. Marker arm folded in
3. Working width of the machine, from the centre of the middle line to the centre of the marker point

**Figure 7 – Marker arms**
Measure horizontally from the centre of the middle (leading) tine on the machine to the centre of the marker point (the spring tine at the marker arm, that runs behind the wheel), with the marker arm swung out completely. This measurement needs to be equal to the width of the machine, e.g. for a 4.8m wide machine the measurement between the two points must be 4.8m. To lengthen the marker arm, slacken the U-Bolt, slide the arm out to the correct length and retighten.

If the marker arm tine is not aggressive enough during operation, then a more prominent mark can be made by adjusting the tine angle. This is achieved by slackening the bolts at the stub axle shaft and allowing the whole unit to pivot round on the slotted holes (Figure 8).

![Stub axle marker arm arrangement](image)

Figure 8 – Stub axle marker arm arrangement

When the drill is in transport, the Hydraulic valve taps (located on the hydraulic cylinders, Figure 9) should be locked off to prevent the marker arms being unfolded.

![Location of marker arm isolation valve taps](image)

Figure 9 – Location of marker arm isolation valve taps

**Radar Recalibration Process**

Once your Hybrid Seed Drill is fully connected to the tractor it is recommended that the drills radar should be recalibrated. Firstly a 100m stretch should be measured out and marked using two indicators. The drill should be in the ground and the tractor should be stationary at the beginning of the 100m run. It is recommended that the marker arm should be extended out so it can be used as a guide when crossing the second indicator.
Figure 10 displays how to navigate the Artemis control box in order to select the radar recalibration process once the tractor and drill are in position.

By selecting the “Auto-Cal” option the radar calibration procedure can now begin, this procedure should start from a standstill and come to a stop at the 100m indicator. The screens displayed on the Artemis box during this procedure can be seen in Figure 11.

On completion of the 100m run a new factor will be displayed, the green return key must be pressed once more to accept and store the new factor. Once the new factor has been stored the control box will return to the Setup menu.
Changing/releasing the Stone Release Pressure

(Hydraulic Stone Protection Machines only)

The optional Stone Protection System is designed to safeguard the drill from damage when operating in stony conditions.

The free flow return on the drill MUST be plugged into the tractor otherwise the pressure released from the stone protection circuit can damage the hydraulic motor. The hydraulic fan motors are not covered by warranty.

Plug the hydraulic pipe running from the valve assembly (mounted under the seed hopper) into the tractor. Turn the tap to the ‘open’ position (parallel to the direction of the pipe Figure 12; this may release the pressure from the circuit back into the tractor depending on the spool valve position.

Figure 12 – Tap in open position

Before carrying out work on the hydraulic stone protection system, the pressure gauge (highlighted in Figure 13) MUST read 0 with the spool valve in float or open position. It is dangerous to work on the hydraulic circuit while it is under pressure.

Figure 13 – Stone Protection pressure gauge
Using the tractor’s hydraulics, the circuit needs to be pressurised to the required pressure (maximum pressure is set to 110 bar (1600 psi) from the factory). In the event that it is higher or lower, please call Claydon for guidance on how to adjust it (see Contact Details on front cover).

When the required pressure is met, turn the tap to the ‘off’ position (at a right angle to the direction of the hose Figure 14).

Figure 14 – Tap in closed position

Wing Balancing Kit – 6m Machines Only

The Wing Balancing Kit spreads the weight of the chassis and the full hopper over the whole width of the drill and not just in the centre section. In this way, it allows the wings to float and follow the contours of the ground.

To ensure the kit is working correctly the operator should operate the tractor spool valve to lower the wings, (spool needs to be set up so pushing the controller forward lowers the wings, the spool must also have a float position.) once the pressure has reached 10 bar (145 psi) the operator needs to push the controller fully forward into float to allow excess pressure to return to the tractor in the event of the drill hitting a large obstacle and the wings raising beyond their pre-set limit. The location of the pressure gauge can be seen in Figure 15.

1. Wing balancing pressure gauge
2. Stone protection pressure gauge

Figure 15 – Pressure gauges for Wing Balancing Kit and Stone Protection Unit
Setting Up and Calibrating the Seed System

Navigating the Control Unit (brief guide)

This is a brief guide to using the RDS Artemis Control Unit while in work. The RDS manual supplied with the machine should be read for full instructions. The Artemis display has 3 main screens which can be selected using the arrow buttons on the right hand side of the display. The screens are ‘Main’, ‘Rate’ and info.

1. Press to select Main screen
2. Press to select Rate setting screen
3. Press to select Info page

Main Screen

An overview of the Artemis Main screen can be seen in Figure 17; this screen will be displayed when the control box is first turned on and whilst in work. Figure 18 displays the navigation buttons located on the Artemis box.

1. Time
2. Area cut out status
   \( \checkmark = \text{In work}, \ X = \text{Out of work} \)
3. Tramline number
4. Fan speed (rpm)
5. Manual Override Seed Metering (On/Off)
6. Forward speed
7. Seed rate

Figure 16 – Screen selection
Figure 17 – Main screen indications
1. Setup Menu
2. Go to INFO Screen
3. Go to RATE Screen
4. Go to MAIN Screen (currently displayed)
5. Number Key Pad
6. Power On/Off Button
7. Pre-Start, starts metering unit prior to moving forward
8. Manual Override Seed Metering (On/Off)
9. Auto Tramline advance (On/Off)
10. Tramline number nudge (tramlines come on when on highest number, 5 of 5 in this case)
11. Backspace key
12. Enter Key

Figure 18 – Main screen controls

Rate Screen

Figure 19 displayed the Rate screen sub menu, the corresponding buttons and their functions can be seen in Figure 20.

1. Time
2. Area cut out status (✓ = In work, X = Out of work)
3. Seed rate set (Target)
4. Seed rate applied (current)
5. Maximum drilling speed

Figure 19 – Rate screen Indications
1. Navigate to INFO Screen
2. Navigate to RATE Screen (currently displayed)
3. Navigate to MAIN Screen
4. Number Key Pad
5. Power On/Off
6. Decrease Seed Rate by 5%
7. Increase Seed Rate by 5%
8. Return Seed Rate to target (target Seed Rate 100Kg/Ha displayed)
9. Setup Menu
10. Backspace Key
11. Enter Key

**Info Screen**

Figure 21 displayed the Info screen sub menu where the amount of hectares (Ha) and quantity of seed (Kg) can be viewed. The corresponding buttons and their functions can also be seen in Figure 22.

1. Time
2. Area cut out status
   (√ = In work, X = Out of work)
3. Area covered (Ha)
4. Quantity dispensed (Kg)
5. Time in operation since date
1. Setup Menu
2. Navigate to INFO Screen (currently displayed)
3. Navigate to RATE Screen
4. Navigate to MAIN Screen
5. Number Key Pad
6. Power On/Off
7. Select Part Total/ Normal Total (Part Total currently in view)
8. Select Grand Total Screen
9. Not in use in this function
10. Reset Total (only applicable to part total and Normal Total)
11. Back Space Key
12. Enter Key

Figure 22 – Info screen controls

Setup Menu

On pressing the Setup Menu key the screen displayed in Figure 23 will be shown, shortcut keys are now present along the bottom of the screen; the corresponding buttons are positioned directly under each option.

1. Calibration check button
2. Shortcut to manual calibration screen
3. Tramline Setup
4. Alarms Setup
5. Data Logging and Variable Rate functions

Figure 23 – Shortcut keys within setup menu

The Calibration check option will be discussed in greater detail after the calibration procedure has been described. The Tramline and Alarms Setup menus will be explained in the following sections, for further information on the remaining Setup screens please consult the RDS manual.
Tramlining

In order to adjust the required tramline width or to turn the system off completely access the tramline Submenu by pressing the tramline shortcut key (Figure 24).

Once the tramline option key has been selected, the tramline setup menu displayed in Figure 25 will be displayed. Within this sub menu the spray width can be adjusted or tuned off by altering the target number of bouts. Furthermore the tramline rhythm can also be altered between Symmetrical, Asymmetrical left and Asymmetrical right using the navigation keys (Figure 25).
Alarms Setup

In order to view the fan speed alarm limits and the status of the hopper level sensors, the alarms setup menu can be accessed by pressing the alarms shortcut key (Figure 26).

Figure 26 – Alarms shortcut key

Figure 27 displays the recommended fan speed threshold settings and whether the seed low level sensor is activated. If the fan speed drops or exceeds the pre-set alarm thresholds then the system will alarm and the metering units will not run.

Figure 27 – Alarms sub menu screen

The seed low level alarm can be turned off by firstly using the navigation buttons located on the left of the Artemis unit to select the level sensor option. Once selected, use the navigation buttons on the right of the Artemis unit to turn the level sensor either on or off.
Setting Up the Seeding System

As previously described, make sure the Artemis Control Unit and all electrical connections are correctly installed. Connect the two black round connectors to power up the Control Unit.

If the Control Unit is beeping with a forward speed alarm this can be turned off by pressing the Metering On/Off button. To enable seeding, press the Metering On/Off button again.

The toggle switch comes attached to its mounting plate. Position the mounting plate to straddle the upright plate of the headstock. The drill should be placed on a solid surface while attached to the tractor. The toggle switch bracket should now be slid up or down the headstock plate until the switch is in the neutral position (in the middle) and just touching the bottom of the top link. Now tighten the pinch bolts up to lock the bracket into place. The purpose of the switch is to turn the seeding system on and off. With the drill in the working position and at drilling depth there should be approximately 5mm clearance between the switch and the underside of the top link.

The seed level sensor can be set in three positions for different seed rates: the upper for high seed rates, the middle setting for medium seed rates and the lower position is ideal for low seed rates i.e. Oilseed rape.

1. Setting for low seed rates (Current position)
2. Setting for medium seed rates
3. Setting for high seed rates

To adjust the hopper level sensor setting:
From inside the hopper pull the end of the bracket nearest the sensor away from the hopper and over the locating bolt head. Move the sensor to the required position and locate on the appropriate bolt head.
Calibrating the Seed Rate

Prior to explaining the calibration process an overview of the metering units highlighting the various components can be seen in Figures 30 – 34.

Overview of the Metering Unit

1. Lid to empty hopper
2. Air pipe
3. Slider position scale
4. Red lever
5. Handle
6. Calibration button

Figure 30 – Metering unit

1. Red cog should always remain in the closed position (high gear)
2. Lid for emptying large seed amounts and cleaning seed wheel
3. Outlet for emptying smaller seed amounts (e.g. OSR)

Figure 31 – Gearing
1. U Bracket
2. 90 degree Bend

Figure 32 – Rear view

1. Speed sensor for metering system
2. Calibration button

Figure 33 – Speed sensor and calibration button

1. Slider position

Figure 34 – Slider position Method
To make sure seed is being metered and sown at the required rate it is necessary to take and weigh a sample from the metering unit. This weight is then entered at the Artemis Control Unit which will calculate and adjust for any error—i.e. the error being the difference in seed weight between what the control unit calculated would pass through the metering system per revolution and what was actually weighed. With the seed hopper empty follow the method below to calibrate your drill:

<table>
<thead>
<tr>
<th>Small Seeds (OSR etc.)</th>
<th>Larger Seeds (Cereals etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) At the metering unit wind in the handle until it is fully closed (the O position).</td>
<td>Turn red lever so that it is not in the drive shaft key way (see Figure 35.2).</td>
</tr>
<tr>
<td>2) Turn red lever to intersect drive shaft key way (see Figure 35.1).</td>
<td>Fan deflector lever needs to be set parallel to pipe direction (Figure 36.2).</td>
</tr>
<tr>
<td>3) Fan deflector lever needs to be set perpendicular to pipe direction (Figure 36.1).</td>
<td>Fan deflector lever needs to be set parallel to pipe direction (Figure 36.2).</td>
</tr>
<tr>
<td>4) If necessary, ensure that the white and red gears are aligned by pushing the white button so that the red gear will insert into the grey/white gear and push into place. This setting should always be used and gives high speed gearing at all times.</td>
<td>If necessary, ensure that the white and red gears are aligned by pushing the white button so that the red gear will insert into the grey/white gear and push into place. This setting should always be used and gives high speed gearing at all times.</td>
</tr>
<tr>
<td>5) Wind out handle to about 15 on slider (20 max), see Figure 34. For more comprehensive details on slider positions consult Appendix C (at the rear of the manual).</td>
<td>Wind out handle to about 80 on slider. The handle may be wound out further to achieve higher speeds (Figure 34). For comprehensive details on slider positions consult Appendix C.</td>
</tr>
<tr>
<td>6) Undo the U bracket and release the 90º bend. Place a bucket under the metering unit, prime the metering unit by pressing the white button and hold for three seconds to start the metering motor, this ensures the unit is full of seed prior to an automatic calibration. Press the white button again and hold for another three seconds to stop seed flow. Empty the bucket.</td>
<td>Undo the U bracket and release the 90º bend. Place a bucket under the metering unit, prime the metering unit by pressing the white button and hold for three seconds to start the metering motor, this ensures the unit is full of seed prior to an automatic calibration. Press the white button again and hold for another three seconds to stop seed flow. Empty the bucket.</td>
</tr>
<tr>
<td>7) To commence the automatic calibration procedure, position a bucket which you have accurately weighed in its place under the metering unit. Press the white button and hold for three seconds, to start the metering motor. When you have obtained a good sized sample, press the white button again and hold for another three seconds to stop seed flow, (the motor may not stop immediately).</td>
<td>To commence the automatic calibration procedure, position a bucket which you have accurately weighed in its place under the metering unit. Press the white button and hold for three seconds, to start the metering motor. When you have obtained a good sized sample, press the white button again and hold for another three seconds to stop seed flow, (the motor may not stop immediately).</td>
</tr>
<tr>
<td>8) Weigh the bucket with the sample in accurately (grams for small seeds kg for large seeds).</td>
<td>Weigh the bucket with the sample in accurately (grams for small seeds kg for large seeds).</td>
</tr>
<tr>
<td>9) Subtract bucket weight.</td>
<td>Subtract bucket weight.</td>
</tr>
<tr>
<td>10) At the Artemis control unit select grams for small seeds or kg for large seeds (Figure 37).</td>
<td>At the Artemis control unit select grams for small seeds or kg for large seeds (Figure 37).</td>
</tr>
<tr>
<td>11) Enter the weight measured (Figure 37).</td>
<td>Enter the weight measured (Figure 37).</td>
</tr>
<tr>
<td>12) Press the Enter key three times to correct the error (Figure 37).</td>
<td>Press the Enter key three times to correct the error (Figure 37).</td>
</tr>
<tr>
<td>13) Select the rate screen (middle arrow button to the right of the screen).</td>
<td>Select the rate screen (middle arrow button to the right of the screen).</td>
</tr>
<tr>
<td>14) Type in the seeding rate you require on the number pad.</td>
<td>Type in the seeding rate you require on the number pad.</td>
</tr>
<tr>
<td>15) The Control Unit will automatically set the seeding rate and display the maximum drilling speed. If you consider this speed too slow you can wind the handle on the metering unit out further to allow more seed through and repeat the calibration process.</td>
<td>The Control Unit will automatically set the seeding rate and display the maximum drilling speed. If you consider this speed too slow you can wind the handle on the metering unit out further to allow more seed through and repeat the calibration process.</td>
</tr>
<tr>
<td>16) To check that the calibration is now correct, repeat the process. The error displayed should now be between 0 and 4%.</td>
<td>To check that the calibration is now correct, repeat the process. The error displayed should now be between 0 and 4%.</td>
</tr>
<tr>
<td>17) MAKE SURE you replace the 90º bend on the bottom of the metering unit.</td>
<td>MAKE SURE you replace the 90º bend on the bottom of the metering unit.</td>
</tr>
<tr>
<td>18) Ensure the fan speed is set between 3200 – 3500 RPM</td>
<td>Ensure the fan speed is set between 4300 – 4500 RPM</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 35 – Red lever positions

Figure 35.1 - Red lever (on shaft) out, small seed setting

Figure 35.2 - Red lever (on shaft) in, large seed setting

Figure 36 – Deflector settings

Figure 36.1 - Deflector set for small seeds (OSR)

Figure 36.2 - Deflector set for large seeds (cereals)
1) Screen displayed on Artemis control box after calibration button has been pressed.

2) Enter actual weight dispensed making sure the correct units are highlighted, press Enter.

3) Once the weight is entered and the cursor has stopped flashing, press Enter again.

Kg’s or Gram’s selected by pressing these button’s

Kg’s highlighted

5) Once the stored values are accepted and saved, the Setup menu will be displayed.

4) This screen will be displayed once the weight has been entered. Press the Enter key once more to accept and store the new values.

Figure 37 – Calibration process on Artemis control box
Calibration Check

To ensure the metering unit has been calibrated correctly, it is possible to perform a calibration check by observing the “Cal. Factor”. This is checked by firstly pressing the Setup menu button, from the Setup menu the calibration check button should then be pressed (Figure 38).

1. Calibration check button

Figure 38 – Calibration check option

Once the calibration check button has been pressed the screen in Figure 39 will be displayed and the “Cal. Fact” can now be seen. This value is the kg of seed dispensed for each revolution of the metering unit.

Figure 39 – Calibration Factor highlighted

This value is generated after every calibration and can now be compared against the calculated “Cal. Factors” in Appendix D (at the rear of the manual). If large discrepancies are present between the “Cal. Factors” in Appendix D and what is displayed on the control box, a recalibration may be required.
Field Use of the Drill

Set Machine Level

It is important that the machine is set level from front to rear to gain accurate and consistent seed depth between the front and rear seeding tines, this is achieved by adjusting the tractors top link. To confirm the seed drill is set up evenly, the depth wheels positioned across the width of the machine should be firstly set so the drills A-Shares scalp the field’s surface when in work (Figure 40).

![Figure 40 – Front and rear tines scalping field’s surface](image)

This can be achieved by setting the depth wheels to one of the measurements displayed in Figure 41. The depth can be accurately set by measuring between the lugs on the depth wheel assembly (Figure 41). By altering the depth wheels to one of these measurements the front and rear A-Shares should scalp the field’s surface evenly, if the tractors top link has been set correctly.

![Figure 41 – Measurement lugs located on depth wheels](image)

1. Front A-Shares
2. Rear A-Shares
3. Seed depth adjustment
4. Depth wheel

For a 4m, 4.8m and a 6m drill measurement should be: **495mm**

For a 3m drill measurement should be: **475mm**
Set the Seeding Depth

Once the machine has been set level front to rear, the seeding depth can be set by re-adjusting the top links on the depth wheels (Figure 42) positioned across the width of the machine. Check that the adjusters are all the same length with a tape measure using the position lugs as previously described (you can measure between the pins if you prefer).

![Figure 42 – Setting the seeding depth](image)

1. Angled flat on lug on which to measure
2. Hook tape measure over square lug

Lower the machine into the ground and drive a short distance, brush away the tilth where the straw is still attached and find the original surface level of the field. Now brush back and find the depth of the seed compared to the original level of the field. Ignore how much soil is directly on top of the seed as this will level out and settle down to the original field level.

![Figure 43 – Seed depth](image)

1. Seed depth
2. Original soil level

To ensure the correct drilling depth has been achieved the depth of the drills A-Shares relative to the grounds surface should be examined. Figure 44 displays the recommended A-Share depth for Oilseed rape (shoulder of A-Share should coincide with ground surface) and Wheat (top of A-Share should coincide with ground surface).

![Figure 44 – Recommended A-Share depth for OSR and Wheat](image)
Once the seed depth is set you can set the depth of the front tine, as a guide the front tine should be set to approximately:

- 120 - 150mm deep for Oilseed rape,
- 100mm for Cereals,
- 125mm for autumn Beans and Maize,
- 75-100mm for Spring Beans.

The front tine is adjusted by simply removing the pin, sliding the tine to the required depth position hole (Figure 45) and reinserting the pin.

1. Remove pin and slide tine up or down to required position
2. Wear hole

Figure 45 – Setting front tine depth

The top hole should not be used on brand new tines; it is only to be used once the tine has begun to wear. Do not operate the front tine deeper than 150mm.

**Set Up the Level Board**

The Level Board (also known as Batter Board or Ski Board) should be set up to drag along the top of the ridges with little down pressure. The down pressure can either be increased or decreased by altering the adjuster at the rear of the drill (Figure 46). The levelling boards are designed to level the ridges created from the leading tine and not to perform any kind of pressing operation. The Boards should not be set at too steep an angle and should have the appearance of skiing along the surface.

The green harrow tines may also be fitted to follow behind the levelling boards (Figure 46) or used as an alternative depending on the machine specification.
The level board angle is adjusted on the pin holes where the tool bar connects to the arms (Figure 47). The green harrow tines should be situated at an acute angle with the tail of the tine positioned firmly and parallel to the ground. This angle can be adjusted by altering the pin holes on the connecting arm (Figure 47). Figure 47 displays our suggested setting.

1. Remove pin to alter angle of ski boards
2. Rear tool bar
3. Remove pin to adjust height of green tines
4. Connecting arm for double tool bar
5. Remove pin to alter angle of green tines

Figure 47 – Ski boards and green tines adjustment settings

The level board height is altered on the adjuster located on the swivel beams (Figure 48). The levelling boards can be lifted completely out of work with this adjuster or have some downward pressure applied to them. Depending on the field conditions the following Ski board settings are recommended and should be achieved using the adjuster:

- **Wet conditions** - Remove pressure from ski boards
- **Dry conditions** - Apply pressure to ski boards
- **Ideal conditions** - Zero pressure (top link becomes loose during adjustment)

Figure 48 – Setting level board
Care and Maintenance

**Lubricating Points**

Lubrication should be performed by using multi-purpose grease. An overview of the greasing points for the 4m to 6m Hybrid drill is given in Figure 49 and Figure 50, an overview for the 3m hybrid is given in Figure 51, with identification numbers corresponding to the detail of lubricating points in Figure 52. Not all lubrications points apply to all machines and some are multiple lubrication points, so some identification numbers may not appear or may be repeated.

N.B. At regular intervals lubrication should also be placed on the drills top link pin to prevent excessive wear from the upper link ball.

![Lubrication points, 4 to 6m Hybrid](image)
Figure 50 – Lubrication points, 4 to 6m Hybrid

Figure 51 – Lubrication points, 3m Hybrid drill overview
### Lubrication Points to be Greased Daily

<table>
<thead>
<tr>
<th>1. Wheel hub</th>
<th>2. Marker arm pivot pin</th>
<th>3. Marker arm ram base</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Marker arm ram rod end</td>
<td>5. Folding ram base end</td>
<td>6. Folding ram rod end</td>
</tr>
<tr>
<td>7. Folding pivot pin</td>
<td>8. Marker arm 3m Hybrid</td>
<td>9. Wings bearings 6m Hybrid</td>
</tr>
</tbody>
</table>

**Figure 52 – Details of lubrication points**

### Changing Wearing Parts

#### Changing Front Tines

To change the front tine, simply remove the lynch clip and remove the 19mm pin, slide the entire tine out and replace the entire tine with a new one. Refit pin and lynch pin.

**IF WORK IS REQUIRED TO BE CARRIED OUT WHILST THE DRILL IS RAISED, ENSURE A SUBSTANTIAL PROP IS POSITIONED SAFELY UNDER THE DRILL PREVENTING IT FALLING UNDER ITS OWN WEIGHT.**

**Figure 53 – Changing front tines**
When new, the steel of the tine protrudes beyond the Tungsten, this is to protect the Tungsten when transporting new drills. After use the drill should be placed on wooden boards to protect the Tungsten. Great care needs to be taken when lowering the drills onto concrete.

**Tyre Pressures**

It is recommended that the wheels on the Hybrid seed drill should be inflated to a pressure of 30 psi (2 bar).

**Changing Shares**

On the seeding leg, hook the removal tool (supplied) over the top of the share and push the pin down, hit the top with a hammer to remove the share. Now simply slide the new share up the speed-Loc adaptor and hit the bottom with a hammer until the locking pin pushes back out. **IF WORK IS REQUIRED TO BE CARRIED OUT WHILST THE DRILL IS RAISED, ENSURE A SUBSTANTIAL PROP IS POSITIONED SAFELY UNDER THE DRILL PREVENTING IT FALLING UNDER ITS OWN WEIGHT.**

1. Speed-Loc tool
2. A-Share
3. Speed-Loc adapter

**Figure 54 – Changing shares**

NEVER HIT THE TUNGSTEN CARBIDE TILES WITH A HAMMER, WEAR GLOVES AND SAFETY GLASSES WHEN WORKING WITH THE TUNGSTEN CARBIDE PARTS. NEVER HIT THE LOCKING PIN WITH A HAMMER AND PUNCH OR ANYTHING SIMILAR AS THIS WILL DAMAGE THE SPRING.

**Changing Seed Boots**

To remove and refit the seed boot undo the nut, remove the bolt and let the boot drop out of the boot holder, place new boot in holder and push bolt back into place, retighten the nut.

**Figure 55 – Changing seeding boots**

NB. Use 9/16” spanners.
## Appendix A - Artemis Fault Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Screen</th>
<th>Reason</th>
<th>Check?</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
<td>High forward speed</td>
<td><strong>Target application rate is as required</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Calibration factor is realistic</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Adjust metering unit and recalibrate which will increase kg/rev factor and therefore increase maximum achievable forward speed</strong></td>
</tr>
<tr>
<td>L.1</td>
<td><img src="image1" alt="Screen" /></td>
<td>Low fan speed</td>
<td><strong>Fan’s actually operating</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Hydraulic flow from tractor</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Sensor &amp; target functioning and correct</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>PPR value programmed correctly</strong></td>
</tr>
<tr>
<td>L.2</td>
<td><img src="image2" alt="Screen" /></td>
<td>High fan speed</td>
<td><strong>Fan is actually operating</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Sensor &amp; target functioning and correct</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>PPR value programmed correctly</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Hydraulic flow from tractor</strong></td>
</tr>
<tr>
<td>L.3.SS</td>
<td><img src="image3" alt="Screen" /></td>
<td>Seed level is low</td>
<td><strong>Seed level is actually low</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Seed only or Seed &amp; Fert drill, 1 metering unit per product)</td>
<td><strong>Sensor is functioning correctly</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Wiring between sensor and connection box is correct</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Wiring between connection box and CAN module is correct</strong></td>
</tr>
<tr>
<td>L.3.FS</td>
<td><img src="image4" alt="Screen" /></td>
<td>Fert level is low</td>
<td><strong>Fert level is actually low</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Seed &amp; Fert drill only, 1 metering unit per product)</td>
<td><strong>Sensor is functioning correctly</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Wiring between sensor and connection box is correct</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Wiring between connection box and CAN module is correct</strong></td>
</tr>
<tr>
<td>L.3.SL</td>
<td><img src="image5" alt="Screen" /></td>
<td>Seed level left is low</td>
<td><strong>Seed level is actually low</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Seed only drill with 2 metering units, independent left &amp; right level sensors)</td>
<td><strong>Sensor is functioning correctly</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Wiring between sensor and connection box is correct</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Wiring between connection box and CAN module is correct</strong></td>
</tr>
</tbody>
</table>
| **L.3.SR** | Seed level right is low (Seed only drill with 2 metering units, independent left & right level sensors) | • Seed level right is actually low  
• Sensor is functioning correctly  
• Wiring between sensor and connection box is correct  
• Wiring between connection box and CAN module is correct |
|---|---|---|
| **L.3.SD** | Both seed levels are low (Seed only drill with 2 metering units, independent left & right level sensors) | • Seed levels are actually low  
• Sensors are functioning correctly  
• Wiring between sensors and connection box is correct  
• Wiring between connection box and CAN module is correct |
| **L.3.FD** | Fert level is low (only Seed & Fert drill, 2 metering units per product) | • Fert level is actually low  
• Sensor is functioning correctly  
• Wiring between sensor and connection box is correct  
• Wiring between connection box and CAN module is correct |
| **L.4.L** | Half Width Enabled – Left Side (only Seed drill, 2 metering units per product) | • Left side motor is disabled due to pressing the on-screen motor inhibit button.  
• Re-press to re-enable the motor or ignore to continue with half width drilling. |
| **L.4.R** | Half Width Enabled – Right Side (only Seed drill, 2 metering units per product) | • Right side motor is disabled due to pressing the on-screen motor inhibit button.  
• Re-press to re-enable the motor or ignore to continue with half width drilling. |
| **L.5.S** | Single Motor Metering Off | • Motor is disabled due to pressing the on-screen motor inhibit button.  
• Re-press to re-enable the motor or ignore to continue with the motor inhibited. |
### L.5.D Dual Motor Metering Off
- Both motors are disabled due to pressing the on-screen motor inhibit buttons.
- Re-press to re-enable the motors or ignore to continue with the motors inhibited.

### L.6 Max Forward Speed
- Based upon the calibration factor, this is the maximum speed that can be achieved.
- If this is too low then open the metering unit slide further and re-calibrate.

### L.7.SU Seed Level Upper is Low (Pre-Level)
- Seed level upper is actually low
- Sensor is functioning correctly
- Wiring between sensor and connection box is correct
- Wiring between connection box and CAN module is correct

### N/A Area cut-out
- Flashes up for 1 second every 3 seconds when system is ‘out of work’
- Is drill still lifted
- Sensor & target/switch functioning and correct
- Spring toggle switch correctly set + operating
- Operating logic not set correctly
- Wiring between sensor and connection box is correct
- Wiring between connection box and CAN module is correct

### M.1.S Seed motor speed high
- Error between actual motor speed and target motor speed is greater than 10%
- Target motor speed too low
- Erratic forward speed signal
- Erratic loading on motor via metering unit
- Check radar
- Reduce Metering Unit Opening/Slide
- Re-calibrate

### M.2.S Seed motor speed low
- Error between actual motor speed and target motor speed is greater than 10%
- Target motor speed to high
- Erratic forward speed signal
- Erratic loading on motor via metering unit
- Check radar
- Increase Metering Unit Opening/Slide
- Re-calibrate
| M.3.S | Seed metering unit is not going around | - Is seed metering unit rotating when motor rotates  
- Sensor & target functioning and correct  
- PPR value programmed correctly  
- Wiring between sensor and connection box and CAN module is correct  
- Check sensor on metering unit |
|-----------------------------|--------------------------------------|--------------------------------------------------------------------------------|
| M.3.L | Left seed metering unit is not going around  (Seed only drill with 2 motors each driving 1 metering unit) | - Is seed left metering unit rotating when motor rotates  
- Sensor & target functioning and correct  
- PPR value programmed correctly  
- Wiring between sensor and connection box is correct  
- Wiring between connection box and CAN module is correct  
- Check sensor on metering unit |
| M.3.R | Right seed metering unit is not going around  (Seed only drill with 2 motors each driving 1 metering unit) | - Is right metering unit rotating when motor rotates  
- Sensor & target functioning and correct  
- PPR value programmed correctly  
- Wiring between sensor and connection box is correct  
- Wiring between connection box and CAN module is correct  
- Check sensor on metering unit |
| M.3.LF | Fert metering unit is not going around  (Seed & fert drill with 2 motors each driving 1 metering unit) | - Is fert metering unit rotating when motor rotates  
- Sensor & target functioning and correct  
- PPR value programmed correctly  
- Wiring between sensor and connection box is correct  
- Wiring between connection box and CAN module is right  
- Check sensor on metering unit |
### Hybrid Seed Drill

**M.3.LFH**
- Left fert metering unit is not going around (Seed & fert drill with 2 motors each driving 2 metering unit)
- Is fert left metering unit rotating when motor rotates
- Sensor & target functioning and correct
- PPR value programmed correctly
- Wiring between sensor and connection box is correct
- Wiring between connection box and CAN module is correct
- Check sensor on metering unit

**M.3.SLH**
- Left seed metering unit is not going around (Drill with 1 motor driving 2 metering units)
- Is seed left metering unit rotating when motor rotates
- Is drill being operated at ½ width?
- Sensor & target functioning and correct
- PPR value programmed correctly
- Wiring between sensor and connection box is correct
- Wiring between connection box and CAN module is correct
- Check sensor on metering unit

**M.3.RSH**
- Right seed metering unit is not going around (Drill with 1 motor driving 2 metering units)
- Is seed right metering unit rotating when motor rotates
- Is drill being operated at ½ width?
- Sensor & target functioning and correct
- PPR value programmed correctly
- Wiring between sensor and connection box is correct
- Wiring between connection box and CAN module is correct
- Check sensor on metering unit

**M.4.S**
- Motor speed signal from seed motor not being received
- Motor being operated and pulses received from shaft confirmation sensors but no motor speed signal
- Signs of mechanical damage to encoder or cabling on motor
- 3way connector between motor and harness is correct
- Wiring between 3way connector and module connector is correct
## Hybrid Seed Drill

| H.1.L | Left motor control module is 'offline' | **Check wiring between 6way connector and module connector on MCM harness**  
**If alarm M.3.L & H.1.L also shown then check between 50way D connector on back of PSI and both 6way & 4way of instrument harness** |
| H.1.R | Right motor control module is 'offline' | **Check wiring between 6way connector and module connector on MCM harness**  
**If alarm L.7.SU & H.1.L also shown then check between 50way D connector on back of PSI and both 6way & 4way of instrument harness** |
| H.1.S | Seed Motor Control Module is 'offline' | **Check wiring between 6way connector and module connector on MCM harness**  
**If alarm H.1.L also shown then check between 50way D connector on back of PSI and both 6way & 4way of instrument harness** |
| H.1.F | Fert motor control module is 'offline' | **Check wiring between 6way connector and module connector on MCM harness**  
**If alarm L.4.R & H.1.L also shown then check between 50way D connector on back of PSI and both 6way & 4way of instrument harness** |
| H.1.T | Tramline module is 'offline' | **Check module has got power from main battery power cable**  
**Check wiring between 4way connector and module connector on HBM harness**  
**If alarm L.4.R also shown then check between 50way D connector on back of PSI and both 6way & 4way of instrument harness** |
| H.2.S | Seed motor module temperature too hot  
Module temperature has exceeded the value programmed | **Motor speed very low**  
**Excessive load applied to motor which for a prolonged time has caused the high module temperature** |
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.3.S</td>
<td>Seed motor module temperature shutdown</td>
<td>- Module temperature has exceeded the value programmed - Motor speed very low - Excessive load applied to motor which for a prolonged time has caused the high module temperature</td>
</tr>
<tr>
<td>H.4.S</td>
<td>Seed motor module overload shutdown</td>
<td>- Motor current requirement exceeded so module shutdown and motor operation inhibited - Motor stalled - Excessive drag on the metering unit requiring high motor current</td>
</tr>
<tr>
<td>H.5.SF</td>
<td>Forward Speed Failure (Seed &amp; Fert)</td>
<td>- Check wiring of forward speed in alarmed connection box - Check for continuity between pin 2A on MCM 1 (white wire) and pin 2A on MCM 2</td>
</tr>
<tr>
<td>H.5.LR</td>
<td>Forward Speed Failure (Left &amp; Right)</td>
<td>- Check wiring of forward speed in alarmed connection box - Check for continuity between pin 2A on MCM 1 (white wire) and pin 2A on MCM 2</td>
</tr>
<tr>
<td>H.6.S</td>
<td>Motor has Stalled</td>
<td>- Check for blockages in the metering unit - Disconnect motor from metering unit and ensure both units rotate separately - Check motor and gearbox - Open and Close Finger Switch/Area Cut Out to Reset Alarm Criteria</td>
</tr>
</tbody>
</table>
EC Declaration of Conformity
In accordance with EN ISO 17050-1:2004

We
Claydon Yieldometer Ltd
of
Gaines Hall

in accordance with the following Directive(s):

2006/42/EC
The Machinery Directive

hereby declare that:

Equipment
Claydon Drills
Model number
Hybrid
Serial Number

is in conformity with the applicable requirements of the following documents

Ref. No. Title Edition/ date
EN ISO 12100-1:2003 Safety of Machinery – Basic Concepts 2003

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(s)

Signed by: .......................................................... ..........................................................

Name: Oliver Claydon
Position: Director of Design and Production

Done at
Gaines Hall
Wickhambrook

On
21/06/2012

The technical documentation for the machinery is available from:

Name: Claydon Yieldometer Ltd
Address: Gaines Hall
Wickhambrook
Newmarket
Suffolk
CB8 8YA
Appendix C – Metering Unit Slider Positions

Table 1 displayed where the slider on the metering unit should be positioned when sowing seed with a 3m Hybrid seed drill. Firstly, select the desired product and then select the closest required application rate (Kg/Ha), the metering unit should then be opened to the slider setting displayed, e.g., if wheat was required to be sown at 246 Kg/Ha, the slider on the metering unit would be set at 50 on a 3m drill, highlighted below.

Table 1 – Metering unit slider positions for a 3m Hybrid Drill

<table>
<thead>
<tr>
<th>Sliding Setting</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
<th>Kg/Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>48</td>
<td>47</td>
<td>45</td>
<td>34</td>
<td>32</td>
<td>30</td>
<td>40</td>
<td>45</td>
<td>11</td>
<td>0</td>
<td>2.3</td>
<td>2.4</td>
<td>9.0</td>
<td>2.6</td>
</tr>
<tr>
<td>15</td>
<td>72</td>
<td>69</td>
<td>68</td>
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<td>23.4</td>
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<td>217</td>
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<td>224</td>
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<td>256</td>
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<td>232</td>
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<td>284</td>
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<td>31.2</td>
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<td>24.4</td>
</tr>
</tbody>
</table>

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Table 2 displayed where the slider on the metering unit should be positioned when sowing seed with a 4m Hybrid seed drill. Firstly, select the desired product and then select the closest required application rate (Kg/Ha), the metering unit should then be opened to the slider setting displayed, e.g. If wheat was required to be sown at 241 Kg/Ha, the slider on the metering unit would be set at 65 on a 4m drill, highlighted below.

### Table 2 – Metering unit slider positions for a 4m Hybrid Drill

<table>
<thead>
<tr>
<th>Normal Seed Setting - Red Locking Tap Points Towards the Metering Unit</th>
<th>Small Seed Setting - Red Locking Tap in Hexagon Shaft Groove</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>English</strong></td>
<td><strong>German</strong></td>
</tr>
<tr>
<td>English</td>
<td>Grain</td>
</tr>
<tr>
<td>Italian</td>
<td>Grano</td>
</tr>
<tr>
<td>Dutch</td>
<td>Tarwe</td>
</tr>
<tr>
<td>Spanish</td>
<td>Arroz</td>
</tr>
<tr>
<td>Danish</td>
<td>Havre</td>
</tr>
<tr>
<td>German</td>
<td>Weizen</td>
</tr>
<tr>
<td>French</td>
<td>Blé</td>
</tr>
<tr>
<td>Polish</td>
<td>Pszenica</td>
</tr>
</tbody>
</table>

| Relative density Kg/l | 0.77 | 0.74 | 0.68 | 0.85 | 0.81 | 0.76 | 0.83 | 0.79 | 0.36 | 0.77 | 0.74 | 0.68 | 0.5 |
| Drill width (m) | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Slider Setting | Kg/l | Kg/l | Kg/l | Kg/l | Kg/l | Kg/l | Kg/l | Kg/l | Kg/l | Kg/l | Kg/l | Kg/l | Kg/l |
| 10 | 36 | 35 | 34 | 33 | 32 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 |
| 15 | 54 | 53 | 52 | 51 | 50 | 49 | 48 | 47 | 46 | 45 | 44 | 43 | 42 |
| 20 | 72 | 70 | 68 | 66 | 64 | 62 | 60 | 58 | 56 | 54 | 52 | 50 | 48 |
| 25 | 84 | 81 | 78 | 76 | 74 | 72 | 70 | 68 | 66 | 64 | 62 | 60 | 58 |
| 30 | 94 | 91 | 88 | 85 | 82 | 80 | 77 | 75 | 73 | 71 | 69 | 67 | 65 |
| 35 | 104 | 101 | 98 | 96 | 94 | 92 | 89 | 87 | 85 | 83 | 81 | 79 | 77 |
| 40 | 114 | 111 | 108 | 106 | 104 | 102 | 99 | 97 | 95 | 93 | 91 | 89 | 87 |
| 45 | 124 | 121 | 118 | 116 | 114 | 112 | 109 | 107 | 105 | 103 | 101 | 99 | 97 |
| 50 | 134 | 131 | 128 | 126 | 124 | 122 | 119 | 117 | 115 | 113 | 111 | 109 | 107 |
| 55 | 144 | 141 | 138 | 136 | 134 | 132 | 129 | 127 | 125 | 123 | 121 | 119 | 117 |
| 60 | 154 | 151 | 148 | 146 | 144 | 142 | 139 | 137 | 135 | 133 | 131 | 129 | 127 |
| 65 | 164 | 161 | 158 | 156 | 154 | 152 | 149 | 147 | 145 | 143 | 141 | 139 | 137 |
| 70 | 174 | 171 | 168 | 166 | 164 | 162 | 159 | 157 | 155 | 153 | 151 | 149 | 147 |
| 75 | 184 | 181 | 178 | 176 | 174 | 172 | 169 | 167 | 165 | 163 | 161 | 159 | 157 |
| 80 | 194 | 191 | 188 | 186 | 184 | 182 | 179 | 177 | 175 | 173 | 171 | 169 | 167 |
| 85 | 204 | 201 | 198 | 196 | 194 | 192 | 189 | 187 | 185 | 183 | 181 | 179 | 177 |
| 90 | 214 | 211 | 208 | 206 | 204 | 202 | 199 | 197 | 195 | 193 | 191 | 189 | 187 |
| 95 | 224 | 221 | 218 | 216 | 214 | 212 | 209 | 207 | 205 | 203 | 201 | 199 | 197 |
| 100 | 234 | 231 | 228 | 226 | 224 | 222 | 219 | 217 | 215 | 213 | 211 | 209 | 207 |
| 105 | 244 | 241 | 238 | 236 | 234 | 232 | 229 | 227 | 225 | 223 | 221 | 219 | 217 |
| 110 | 254 | 251 | 248 | 246 | 244 | 242 | 239 | 237 | 235 | 233 | 231 | 229 | 227 |
Hybrid Seed Drill

Table 3 displayed where the slider on the metering unit should be positioned when sowing seed with a **4.8m** Hybrid seed drill. Firstly, select the desired product and then select the closest required application rate (Kg/Ha), the metering unit should then be opened to the slider setting displayed, e.g. if wheat was required to be sown at 263 Kg/Ha, the slider on the metering unit would be set at 85 on a 4.8m drill, highlighted below.

**Table 3 – Metering unit slider positions for a 4.8m Hybrid Drill**

<table>
<thead>
<tr>
<th>English</th>
<th>Wheat</th>
<th>Rye</th>
<th>Durum</th>
<th>Barley</th>
<th>Oats</th>
<th>Beans</th>
<th>Peas</th>
<th>Lupines</th>
<th>Vetches</th>
<th>Malva</th>
<th>Grass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italian</td>
<td>Grano</td>
<td>Segale</td>
<td>Tarwe</td>
<td>Grano</td>
<td>Segale</td>
<td>Grano</td>
<td>Segale</td>
<td>Grano</td>
<td>Segale</td>
<td>Grano</td>
<td>Segale</td>
</tr>
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<td>Roggen</td>
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<td>Roggen</td>
<td>Roggen</td>
<td>Roggen</td>
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<td>Roggen</td>
<td>Roggen</td>
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<td>Spanish</td>
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<td>Centeno</td>
<td>Cebada</td>
<td>Centeno</td>
<td>Cebada</td>
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<td>Swedish</td>
<td>Votlado</td>
<td>Hägsel</td>
<td>Hägsel</td>
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<td>Žito</td>
<td>Zito</td>
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<td>Czech</td>
<td>Czech</td>
<td>Czech</td>
<td>Czech</td>
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<tr>
<td>Relative density Kg/l</td>
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<td>0.74</td>
<td>0.68</td>
<td>0.5</td>
<td>0.81</td>
<td>0.78</td>
<td>0.83</td>
<td>0.79</td>
<td>0.36</td>
<td>0.77</td>
<td>0.74</td>
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<td>4.8</td>
<td>4.8</td>
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<td>Kg/Ha</td>
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<td>230</td>
<td>230</td>
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</tr>
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</table>

**Normal Seed Setting – Red Locking Tap Points Towards the Metering Unit**

**Small Seed Setting – Red Locking Tap in Hexagon Shaft Groove**
Table 4 displayed where the slider on the metering unit should be positioned when sowing seed with a 6m Hybrid seed drill. Firstly, select the desired product and then select the closest required application rate (Kg/Ha), the metering unit should then be opened to the slider setting displayed, e.g. if wheat was required to be sown at 236 Kg/Ha, the slider on the metering unit would be set at 95 on a 6m drill, highlighted below.

<table>
<thead>
<tr>
<th>Normal seed setting - Red locking tap points towards the metering unit</th>
<th>Small seed setting - Red locking tap in hexagon shaft groove</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product</strong></td>
<td><strong>Small seed setting - Red locking tap in hexagon shaft groove</strong></td>
</tr>
<tr>
<td>English Wheat</td>
<td>0.77</td>
</tr>
<tr>
<td>Italian Grano</td>
<td>0.74</td>
</tr>
<tr>
<td>Dutch Tarwe</td>
<td>0.68</td>
</tr>
<tr>
<td>Spanish Trigo</td>
<td>0.68</td>
</tr>
<tr>
<td>Swedish Vete</td>
<td>0.68</td>
</tr>
<tr>
<td>German Weizen</td>
<td>0.68</td>
</tr>
<tr>
<td>French Blé</td>
<td>0.74</td>
</tr>
<tr>
<td>Polish Pszenica</td>
<td>0.74</td>
</tr>
<tr>
<td>Relative density Kg/l</td>
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</tr>
<tr>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Kg/Ha</td>
<td>Kg/Ha</td>
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<tr>
<td>16</td>
<td>24</td>
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<tr>
<td>15</td>
<td>36</td>
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<td>21</td>
<td>111</td>
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<td>22</td>
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<td>33</td>
<td>271</td>
</tr>
<tr>
<td>34</td>
<td>283</td>
</tr>
</tbody>
</table>

Table 4 – Metering unit slider positions for a 6m Hybrid Drill
Once the “Cal. Factor” value has been obtained from the calibration check procedure, the figure can then be compared with the results below; all the values within this section apply to large seeds only.

Firstly select the correct product (large seeds continue on following page), then locate the nearest application rate (Kg/Ha) followed by the drill width. The corresponding “Cal Factor” (Kg/rev) can then be compared to the value displayed on the Artemis control box. Although the values may not be an exact match, the figures should be within the same region, if not a recalibration may be required, e.g. If a 3m Hybrid drill containing Wheat was calibrated to apply 121Kg/Ha, the Artemis unit would display a Cal Factor of approximately 0.101 Kg/rev, shown below.

<table>
<thead>
<tr>
<th>Drill Width</th>
<th>Cal Factor (Kg/rev)</th>
<th>Application rate (Kg/Ha)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.040</td>
<td>48</td>
</tr>
<tr>
<td>4</td>
<td>0.075</td>
<td>75</td>
</tr>
<tr>
<td>4.8</td>
<td>0.111</td>
<td>97</td>
</tr>
<tr>
<td>6</td>
<td>0.122</td>
<td>147</td>
</tr>
<tr>
<td>102</td>
<td>0.144</td>
<td>172</td>
</tr>
<tr>
<td>108</td>
<td>0.165</td>
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<td>0.205</td>
<td>249</td>
</tr>
<tr>
<td>126</td>
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</tr>
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</tr>
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<tr>
<td>150</td>
<td>0.311</td>
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<tr>
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<td>0.331</td>
<td>397</td>
</tr>
<tr>
<td>162</td>
<td>0.351</td>
<td>421</td>
</tr>
<tr>
<td>168</td>
<td>0.370</td>
<td>447</td>
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<tr>
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<td>0.391</td>
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<td>548</td>
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</table>
## Hybrid Seed Drill

<table>
<thead>
<tr>
<th>Drill Width</th>
<th>Cal Factor (Kg/rev)</th>
<th>Application rate (Kg/ha)</th>
<th>Drill Width</th>
<th>Cal Factor (Kg/rev)</th>
<th>Application rate (Kg/ha)</th>
<th>Drill Width</th>
<th>Cal Factor (Kg/rev)</th>
<th>Application rate (Kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.025</td>
<td>30</td>
<td>4</td>
<td>0.033</td>
<td>40</td>
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<td>0.038</td>
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## Small Seeds

Once the “Cal. Factor” value has been obtained from the calibration check procedure, the figure can then be compared with the results below; all the values on this page apply to small seeds only.

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