SUMO

DTS

DEEP TILLAGE SEEDER

Best Practice

GUIDE

Contents

Introduction

The benefits of Strip Till Drilling in the UK are becoming more and more apparent, as the use of such a machine is yielding many advantages over more conventional methods of establishment.

Large savings in both fuel and time mean that input costs can be cut by up to a third over existing systems, and field operations can be implemented within a short window of time to match weather conditions.

The use of a DTS has many environmental benefits as well: with continued use of this drill, soil structure can be improved which means better drainage, less erosion, and an improved weight-carrying capacity for the field.

As soil health improves, soil fauna and earthworm levels increase helping to release locked-in nutrients and restore the correct balance of pH. This guide will help to explain how to get the best out of your DTS drill when used in conjunction with current and changing farm policy.

It should not be considered as a 'silver bullet' machine for those endeavouring to regain a healthy profit margin and cure all weed problems, but as a tool amongst others that collectively will yield results.

- all figures based on averages taken from across the UK

Sumo DTS

There are many benefits of using the Sumo DTS to establish crops on both agronomic and economic levels. Here are a few figures to highlight possible cost savings that could be achieved by switching to a 'strip-till' system.

COST ↓ TIME ↓

CONVENTIONAL TILLAGE	£ / HA	HA / HR	HR / HA
Plough	60	0.8	1.25
Press	20	1.5	0.6
Power Harrow	37	1.25	0.8
Drill	30	3	0.3
Roll 8m	9	4	0.25
	156		**3.2**

Typical plough based establishment system

MIN TILL	£ / HA	HA / HR	HR / HA
Min Till Cultivator 3m	40	2	0.5
Heavy Press 4.6m	18	4	0.25
Spraying	14	7.5	0.13
Tine Drill 4m	25	3	0.3
Roll 8m	9	4	0.25
	106		**1.43**

Typical min-till based establishment system

STRIP-TILL DRILLING	£ / HA	HA / HR	HR / HA
Straw Rake 6m	7.8	6.0	0.16
Spraying	14	7.5	0.13
DTS 4m Drill	41	3	0.33
Roll 8m	9	4	0.25
	71.8		**0.87**

Typical DTS strip-till drill establishment system

54%
COST SAVING OVER CONVENTIONAL TILLAGE

32%
COST SAVING OVER MIN-TILL

39%
TIME SAVING OVER MIN-TILL

73%
TIME SAVING OVER CONVENTIONAL TILLAGE

SECTION 2

Stubble Management

CROP RESIDUE

Leaving last year's crop residues on the surface before drilling provides cover for the soil at a critical time of the year. The cover prevents soil erosion and helps reduce water evaporation in a warmer period. It also improves the soil tilth and adds organic matter to soil as it decomposes, providing a valuable food source to earthworms and soil microbes, all of which are valuable to soil health and structure. All of these factors are beneficial to your farm, but they do require a certain degree of extra management and planning for the resulting drill passes and crop establishment to be successful. Planning for residue management begins at harvest; it needs to be decided what method of stubble operations are to be undertaken when the crop is taken off, and the following factors should be taken into consideration:

1 Is the straw to be baled or chopped?

2 What is the likely weed or slug burden for the field?

3 What equipment is available?

4 What is the soil type?

5 Timescale between crops

BALED OR CHOPPED STRAW

The DTS is designed to work into either chopped straw stubbles or baled stubbles as a one pass establishment system. For this to happen successfully the key will be attention to detail! If the field is baled, it is important that the combine driver tries to apply these good driving techniques:

1. When opening up a field headland and cutting into a corner, lift the header and reverse for 10m or so to avoid a large heap of swath
2. Avoid running the combine up the centre of a tramline as this will drop straw into the wheel marks of the tramline making it difficult for a baler to pick up
3. If a blockage occurs on the header, reverse for 10m or so, again to avoid a large heap of swath
4. On headland turns, lift the combine header and continue at same speed until straw swath has fully exited the combine before commencing a headland turn
5. Make sure trailers do not run on swaths when tipping - tip on headlands wherever possible
6. Use crop lifters
7. Stubble height of no more than 150mm

FIGURE 1 RUN-ON STRAW SHOULD BE AVOIDED

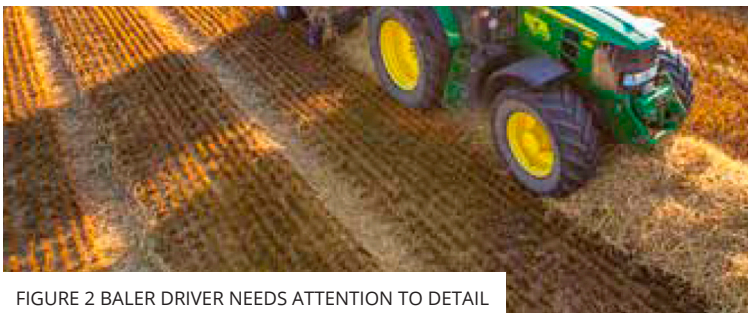


FIGURE 2 BALER DRIVER NEEDS ATTENTION TO DETAIL

This will then make the following baler operation a lot easier and should reduce the amount of straw that gets left in the field that has been run on. This will have a large impact on the efficient following operation of the DTS drill, as it will not have to contend with the passage of large amounts of compressed straw through the coulter system.

Baler drivers must also pay particular attention to try to void running on swaths. The driver should also ensure that the pick-up of the baler is set at the correct height, and the straw swath is not too wide for the mouth of the pick-up.

FIGURE 3 EXTRA ATTENTION SHOULD BE PAID TO THE SERVICE OF YOUR COMBINE CHOPPER

STUBBLE LENGTH

If the field is to be chopped, the following points must be taken into consideration:

1. Ensure straw chopper blades on combine are replaced or turned before season, including stationary blades
2. Ensure chopper vanes are not damaged and will articulate to account for wind direction and give full spread
3. Chopper will spread straw full width of header. Stubble height 150mm
4. If header blockage occurs, reverse for 10m or so to avoid a large heap of chopped straw in one place
5. Use crop lifters

Remember: If stubble or material is longer than the gap it has to go through in the following machine, this will cause blocking issues! 150mm or less is ideal.

FIGURE 4 ENSURE THE SWATH IS NOT TOO WIDE FOR THE BALER PICK-UP

FIGURE 5 EVEN SPREAD OF CHOPPED STRAW

SECTION 3

Cultivations

WHAT EFFECT DO LIGHT CULTIVATIONS HAVE?

Light cultivations after the combine are designed to encourage the germination of stale seed beds in the period between harvest and resowing, and generally they are a good method of controlling blackgrass, sterile brome and volunteer seeds prior to drilling. However, recent research has shown that cultivating as lightly as possible is preferable. Moving soil any more than 20mm in the creation of a stale seed bed may encourage the unwanted germination of grass weeds in the lower soil profile, that may become problematic later on in the season post drilling and emergence. Cultivating only the top 20mm will ensure a very quick strike of weeds, and will also help the root structure of the previous crop to remain intact.

Disc Type Cultivator

BENEFITS

- Good chit of weed seeds
- Incorporation of muck or litter

DRAWBACKS

- Loose finish
- Does not spread trash evenly
- Disrupts existing root structures
- Can work too deep
- Doesn't bury trash in light land
- Can dry out soil profile

Straw Rake

BENEFITS

- Fast operation
- Spreads and levels out residue evenly
- Leaves root structures intact
- High work rates of up to 15ha/hr
- Disrupts slug populations
- Doesn't dry out the soil profile
- Ensures more even breakdown of straw

DRAWBACKS

- May need multiple passes
- Dry weather conditions needed for best results
- Not effective on a damp dewy mornings

FIGURE 6 CREATION OF A SHALLOW STALE SEEDBED

FIGURE 7 USE A STRAKE AT AN ANGLE TO THE COMBINE PASS

SUMO STRAKE

The Sumo Strake is a straw rake designed to do a little bit more than the standard straw rake you may find on the market. As well as levelling out and spreading straw residues, the spring tines on our rake have the ability to be adjusted for aggressiveness; in drier conditions they can therefore be angled more into work to create a 'micro-tilth' of soil with the residue to encourage weed germination and straw breakdown.

Also because of the less aggressive action of the Strake as compared to a disc type machine, the root structure of the previous crop remains intact. This means in heavy rain situations the soil structure is more stable and there will be significantly less run off and erosion.

In high residue burdens, half of the tines can be hydraulically lifted out of work to aid passage though the machine, before a second pass with all the tines in work if required. Aim to use a straw rake at least at a 30 deg angle to the combine pass to get the maximum even spread of residue; if a second pass is to be undertaken then that also needs to be at a different direction to the original pass to maximise the straw raking effect.

A straw rake can also be used as a cultural method of controlling problem slug burdens. The reciprocating action of the tines at speed serves to kill the slugs by simply squashing and crushing adults, and smashing and disrupting slug eggs. Multiple passes may be needed with the straw rake for optimum slug control and to clear up any remaining nests.

Ideally aim to rake directly after the combine (within hours in a hot dry period), as the moisture in the very top layer of the soil will still be present and a good mix will result. Then a second pass just before drilling after the sprayer to further spread material and disruption to slug populations.

FIGURE 8 RAKE AT AN ANGLE FOR OPTIMUM SPREAD

FIGURE 9 SLUGS AND EGGS GET DISRUPTED BY RAKING

CULTIVATIONS SUMMARY

The most important factor of all to consider when choosing which post-harvest cultivation pass to use is how to keep the previous residues root structure intact.

A disc-type cultivator will break up root structure and mix it within the top 30-40mm of topsoil. This is fine if the stale seed bed is to be left to settle and germinate over a period before drilling, but not so if the following drilling operation is to be undertaken immediately, especially in lighter ground. The DTS system requires soil structural integrity to function correctly, and ensure a consistent flow of material through the drill when drilling.

For this reason we would recommend a straw rake prior to pre-DTS drilling for the following two reasons:

1 Best spread of material

2 Leaves stubble root structure intact

FIGURE 10 DTS DRILLING INTO A STRAW RAKED SEEDBED

FIGURE 11 WELL-STRUCTURED, DARK COLOURED SOIL INDICATES HIGH ORGANIC MATTER LEVELS

SECTION 4

Soil Structure

One of the inherent features of the DTS or 'strip-till' system is the ability to allow the soil profile to restructure itself by leaving the land in between the cultivated strips undisturbed. This allows soil microbes and earthworm numbers to multiply and grow and in effect 'repair' the soil. As the soil structure improves, natural drainage, OM levels, weight carrying capacity and fertility will too. However, in the interim period of the first 1-2 years of using the DTS, there may be a need to address some compaction issues in the upper soil profile that may occur thought the year. High trafficked headlands/dung pads or slumped areas of a field may need attention prior to the drill.

SUBSOILER

The use of a low disturbance type subsoiler should be used in this situation. This type of machine will alleviate the compacted soil structure but leave the minimal of soil disturbance, meaning important topsoil is not being incorporated lower into the soil profile. The problem areas should be identified first by the use of a spade! Or even a penetrometer. Setting the subsoiler at the wrong depth not only burns fuel unnecessarily, but may not lift and shatter in the correct area.

It should be noted that the removal of the compacted layer is only the first step towards repairing soil structure. The cracks and fissures created by sub soiling under the compaction layer allow free movement through the rooting zone and help particularly in repairing the soil. However, it is not a sustainable measure: only biological activity is able to build structure back into the soil. The end result of this will be to remove the need to subsoil; as the humus levels increase so will the elasticity of the soil and the ability to support weight.

The main aim of achieving higher levels of worm activity in the soil is to provide a structure for micro-organisms to flourish. They require three things; water, air and food. Food is already available in vast quantities so the formation of pore spaces by subsoiling will fulfil the other two requirements, whilst also aiding drainage.

FIGURE 12 TACKLE TRAFFICKED COMPACTION FIRST IN THE SOIL PROFILE

FIGURE 13 HIGH TRAFFICKED AREAS MAY NEED ATTENTION

GREEN COVER

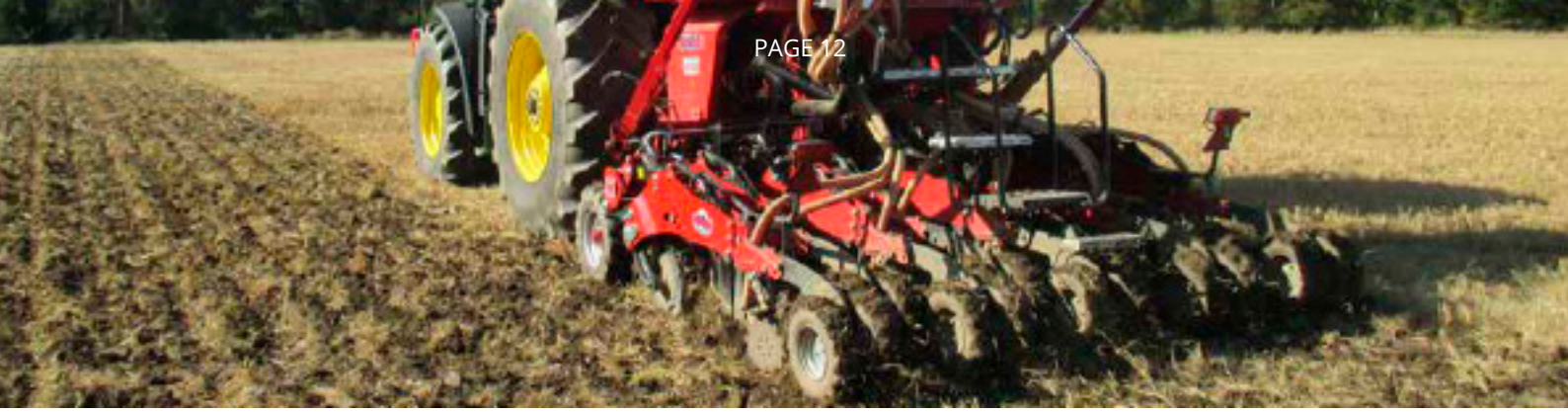
The use of green cover and catch crops is a very good way of improving soil structure. It is also part of the new 'Greening Rules' set out in the current CAP reform for UK farmers, which require a percentage of arable land to be established, either between harvest and Autumn sowing with a catch crop, or over winter as a cover crop.

As the DTS is a one pass drill, cover crops can be established quickly and easily for as little as £30/ha (£12/ac). This will minimise the cost burden incurred whilst also giving the crop the best possible start by placing the seed into moist loosened soil.

The DTS will fit this role well in both the establishment of - and drilling into - green cover, to get the maximum benefits from this system. As with stubble management, green cover needs to be managed in a similar way, with the key factors of keeping the root structure undisrupted and evenly distributed (if possible) to ensure easy drill function.

FIGURE 14 DRILLING DIRECTLY INTO COVER CROP WITH THE DTS

FIGURE 15 BLACK OATS AS A COVER CROP DRILLED INTO BARLEY STUBBLE



SECTION 5

Drill Requirements

To get the best output from the DTS drill, you will require a tractor that is well matched to the machine. Here is a quick guide to what is required...

TRACTOR SPECS

The basic requirements for the tractor unit that is to be pulling the drill included here are HP, Tracks or Tyres, Ballasting, Guidance, Hydraulic Requirements, and Draw bar settings.

FIGURE 16 160HP FOR 3M DTS DRILL

HP

The draught requirement of a standard DTS working in medium to heavy ground will be around 50-60hp/m for a 4WD tractor. This is an average guide figure that we have attained from our own testing and customer feedback which may need to be increased by 10hp+/m if steep terrain is involved, and could be reduced to 40hp/m on flat lighter land.

FIGURE 17 340HP FOR 8M DTS DRILL

GUIDANCE

GPS steering guidance is now fitted to most modern tractors that have been assigned to the duties of drilling. It has obvious benefits for the operator in reducing fatigue, being able to implement field mapping and increasing daily output by up to 10%. All guidance systems need setting up for the particular machine and the performance of the system will depend greatly on the correct input of the parameters of the implement.

Firstly the height of the receiver on the tractor must be measured from ground level, and then the distance from the receiver to the centre of the rear non-steering axle. Secondly measure the distance from the centre of the axle to the attachment/pivot point of the drawbar.

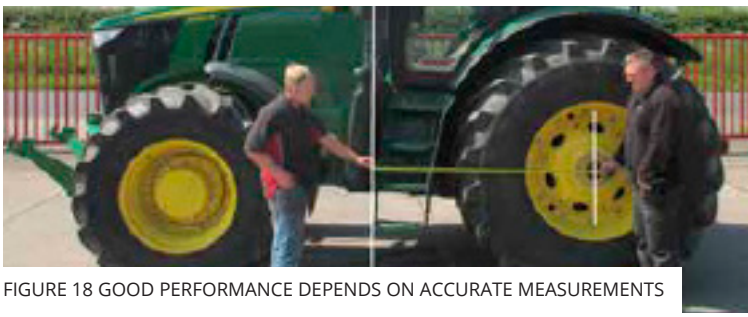


FIGURE 18 GOOD PERFORMANCE DEPENDS ON ACCURATE MEASUREMENTS

TRACKS OR TYRES

The DTS can be used in conjunction with both; we have listed some pros and cons of each format but the choice will generally come down to farm preference.

Tracks

FOR

- Tracks can improve output due to reduced wheel slip in the field and potentially have lower hp requirements/m.
- More common on larger models of the DTS of 6m+
- Good for drawbar work
- Less chance of leaving wheeling marks
- High work rates of up to 15ha/hr

AGAINST

- Can be problematic in wet conditions with traction and scrubbing on headland turns
- Not ideal for road transport and long distances

Tyres

FOR

- Generally used on smaller DTS models from 3-6m
- More universal than tracks utilising farm's main tractor
- Easier for road transport
- Better traction in wetter conditions

AGAINST

- Can be problematic in wet difficult to get optimum grip and performance balance with other duties the tractor has to perform
- More ground pressure than tracks
- More prone to wheeling marks in damper conditions

BALLASTING

As the DTS is a drawbar trailed machine, the amount of weight transfer from the drill to the tractor may vary depending on various factors. Whether or not the drill is in or out of work, or how much seed is in the hopper, will have an effect on the performance of the tractor pulling the drill. Use the tractor or tyre manufacturer's guidelines to control wheel slip correctly by using the right amounts of ballast using either water filled tyres or cast weights.

Aim to get a 40%-60% split front to back weight balance, and ideally have wheel slip of around 8-12% for optimum traction when the drill is in work.

FIGURE 19 CHECK CORRECT TYRE PRESSURES AND BALLAST REQUIREMENTS WITH OPERATORS MANUAL

NUMBER OF SPOOLS / OIL OUTPUT

The tractor will require 4 spool valves for all trailed DTS drills and 3 spool valves for the 3m DTS. All will require a free-flow return, preferably with a return straight to tank and with at least a ¾" quick fit coupling or larger. A pressure gauge is situated on the return circuit from the fan to indicate the amount of back pressure returning to the tractor. The back pressure should be no more than 15 bar (220psi) when both the fan motor and the coulter circuit are engaged to protect from expensive component failure.

1. Lift circuit can be set at maximum 100% flow on the tractor (if electronic timed spool valves are used, the drill lowering time needs to be longer than the lift time due to lift ram displacement volumes)
2. Fold/Markers circuit can be at any flow setting as restrictors and check valves are used for both functions as protection
3. The hydraulic fan will require no-more than 25 ltrs/min for normal running speeds
4. The coulter circuit requires no-more than 10 ltrs/min for normal working operation

NB: A pressure relief valve is provided on the fan circuit which is only for component protection under extreme conditions

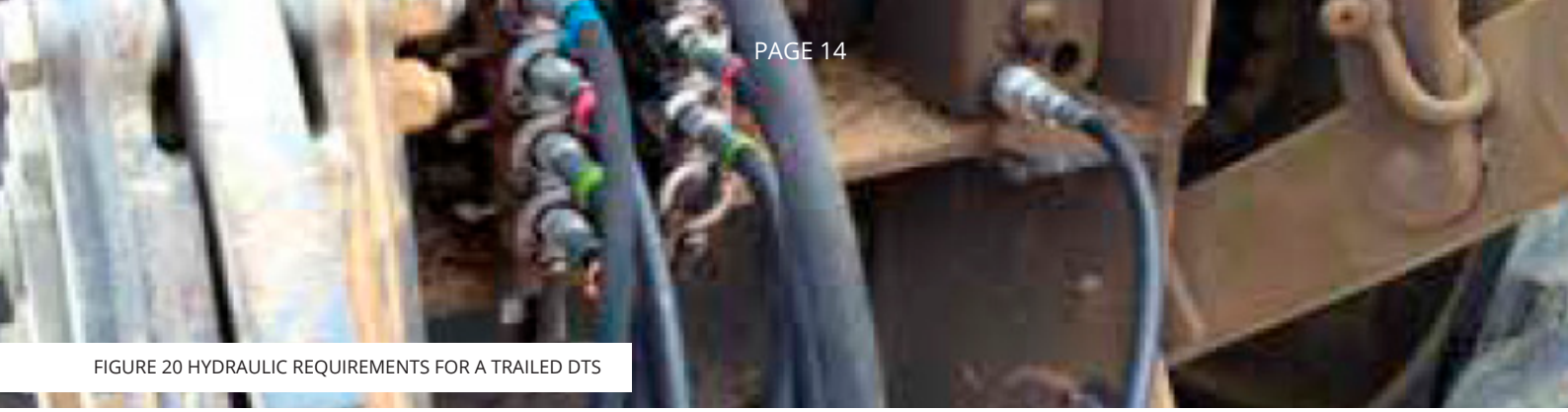


FIGURE 20 HYDRAULIC REQUIREMENTS FOR A TRAILED DTS

DTS DRILL MEASUREMENTS

The correct parameters of each of the trailed DTS drills have been included below.

A Connection point to first ground contact point (measured to mid-point between front and back gangs)

B First ground contact point to seed drop point (measured to mid-point between front and back gangs)

C Working width (number of coulters x row width)

Enter the measurements below into the input pages of the tractor guidance system

MODEL	DTS4	DTS4.8	DTS6	DTS8	DTS9
A (mm)	6615	6615	7578	7995	8365
B (mm)	1840	1840	1840	1840	1840
C (mm)	4000	4800	6000	8000	9000

If incorrect or incomplete figures are entered into the guidance system, the system will still work to a degree but the performance will be compromised. This is especially true when using an adaptive curve features or when drilling on gradients. This means misses or excessive overlaps will become apparent in the emerging crop.

The 3m DTS is generally a simpler machine to set up for guidance due to the smaller dimensions, and generally only requires the working width to be entered.

Note: The 8m and 9m DTS drills do not have bout markers so will require a keen attention to detail on initial set up.

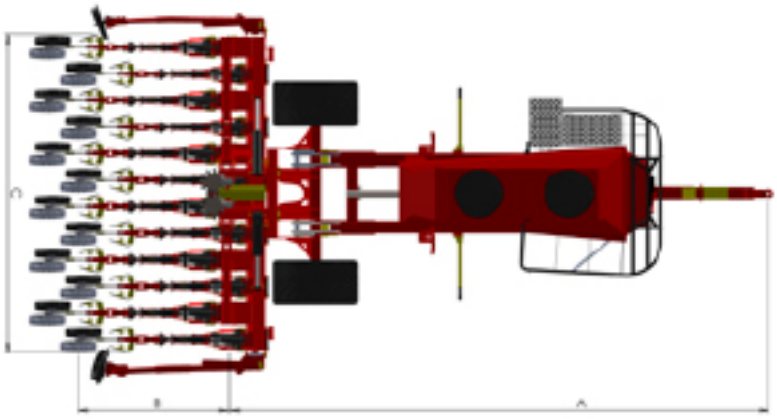


FIGURE 21 DRILL MEASUREMENTS

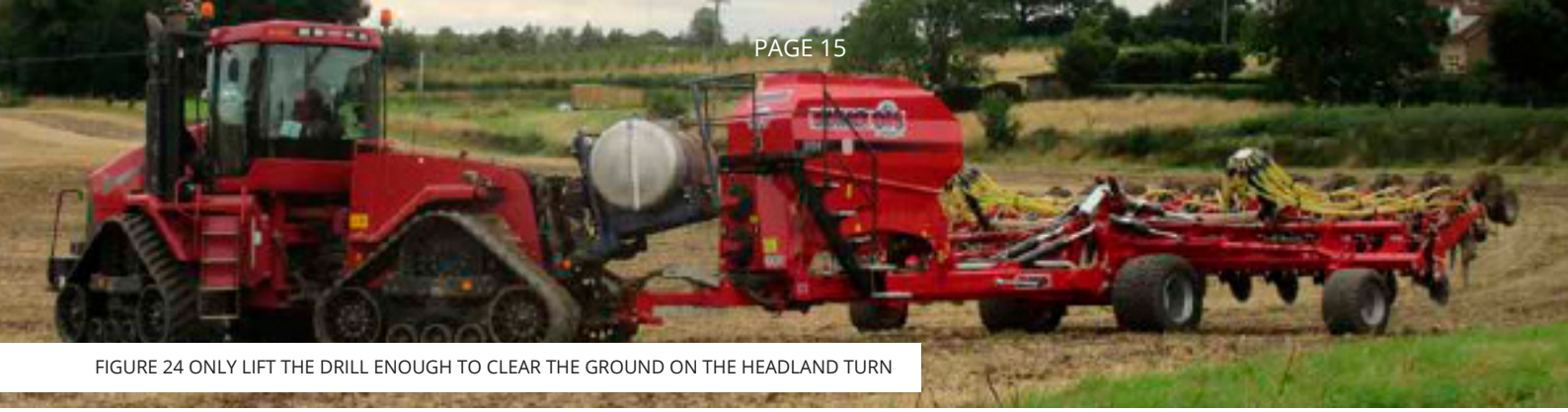


FIGURE 24 ONLY LIFT THE DRILL ENOUGH TO CLEAR THE GROUND ON THE HEADLAND TURN

LIFT AND LOWER (TRAILED DRILLS)

LOWERING

When lowering the drill into work, the oil pressure required for this also actuates the area cut-out ram which starts and stops the seed metering function. Balancing of the oil pressure for these functions is described in the operator's manual section 9.1 by the means of a flow control valve (FCV) which on the drill will be factory set. It must be noted that adjustments carried out must be small and only require ¼ turns or less when setting. Make sure the grub screw on the tap is re-tightened after adjustment.

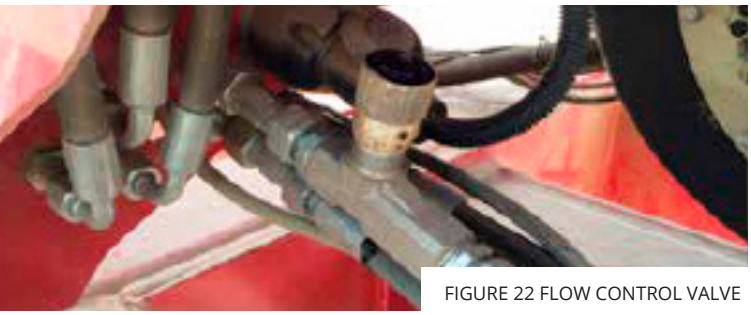


FIGURE 22 FLOW CONTROL VALVE

The FCV will only require adjustment if the metering is not starting quickly enough when the drill is lowered into work, or if the drill lift has become lazy or slow on the headland turn. When lowering the drill into work, the spool valve must continue to be powered for an extra 3 seconds after the main lift rams have reached the end of their stroke. This is to account for other ancillary functions such as the area cut-out ram and tramline functions.

Failure to do this may result in incorrect sowing depth and metering stoppages.

FIGURE 23 ENSURE SEEDER UNIT IS PRESSURISED INTO WORK POSITION

LIFTING

Lift drill manually or set timer to lift just enough for all the drilling components to be clear of the ground on the headland turn. Lifting excessively high may means the drill will be delayed when lowered back into work.

FIGURE 25 DRAWBAR ADJUSTABLE HEIGHT

DRAWBAR

We recommend that a drawbar is used to tow the trailed DTS rather than a pick-up hitch. This will make the whole unit more manoeuvrable in the field and will reduce the risk of fouling the drill drawbar with the tractor wheels or tracks. Tractor drawbar heights will differ between manufacturers, and it is important for the correct function of the drill to have the chassis running as near parallel to the ground when the drill is in work as possible, so the towing eye on the drill has been made adjustable for height to account for this.

By loosening the bolts that hold the towing eye, it can be moved up or down to match the drawbar height of the tractor. An optional hydraulic jack-stand is available for the drill to aid removal and adjustment which is powered from a separate service.

FIGURE 26 TOWING EYE ADJUSTED FOR HEIGHT

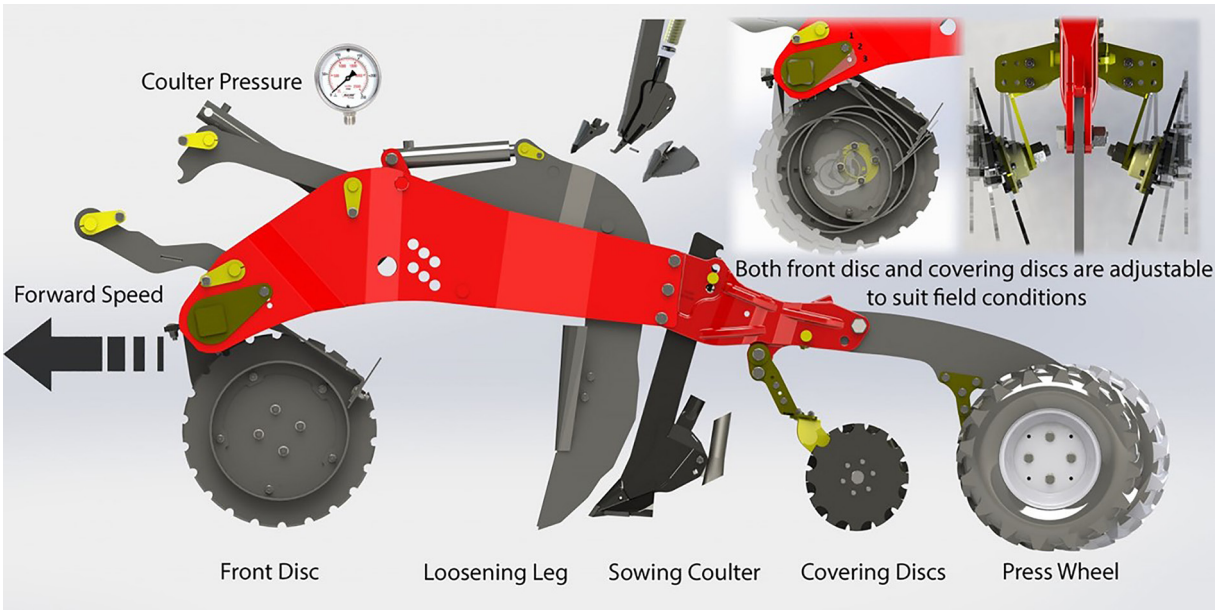
SECTION 6

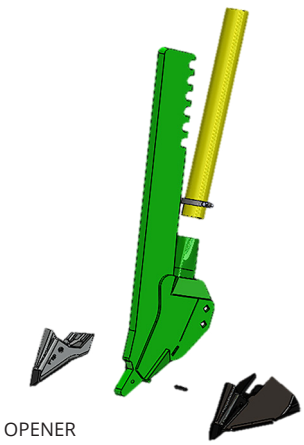
Drill Setup

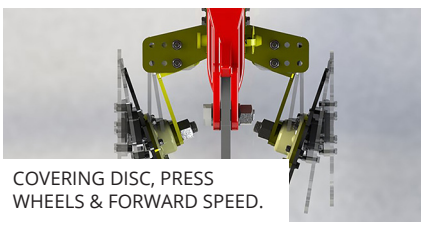
FIELD NOTES FOR DIFFERENT CONDITIONS

All new Sumo DTS drills will have gone through a rigorous Pre-Delivery Inspection (PDI) of checks and testing before delivery to the customer. This is to ensure the machine is in working order and fit for purpose before use. Field notes for different conditions because it is not known what seeds/field conditions a new machine will be working into, a set of standard settings are assigned to the drill at the factory. It is then up to the operator to make the correct adjustments to the drill to account for the seed type and field conditions. The DTS operator's manual will give you the basic field settings for the drill before use on:

1. Hydraulic Coulter pressure and flow
2. Artemis control box function and product calibration
3. Area cut-out ram
4. Fan speeds (dual product option)
5. ORGA metering settings for different seed types and fertiliser
6. Lift/lower setup

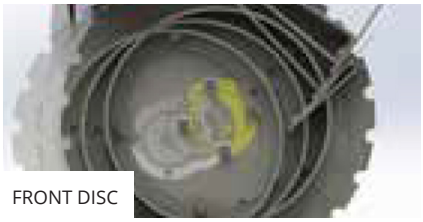



OPENER


COVERING DISC, PRESS WHEELS & FORWARD SPEED.


MARKER DISC

LOOSENING LEG AND STRAW DEFECTOR


FRONT DISC

STUBBLE, MILL-TILL & PLOUGHED SEEDBED

The following section outlines a few extra helpful guidelines for field settings for the DTS.

INFORMATION	STUBBLE	MIN-TILL	PLOUGHED SEEDBED
Front disc	Hole 2-3 (3 in drier conditions)	Hole 1-2	Hole 1
Loosening Leg	• Trash guard fitted • Cereals-100mm below seed • OSR-160mm below seed	• Trash guard removed • Cereals-100mm below seed • OSR-160mm below seed *	• Trash guards removed • Set below sowing depth for coulter protection
Coulter Pressure	40bar ± 5 bar hard ground stoney ground	35bar ± 5 bar	35bar ± 5 bar
Sowing Coulter	set sowing depth after 20m run in the ground, not static	set sowing depth after 20m run in the ground, not static	set sowing depth after 20m run in the ground, not static
Universal 5" tips	for all cereals, peas and OSR	for all cereals, peas and OSR	for all cereals, peas and OSR
Universal 1" tips	for maize and beans	for maize and beans	for maize and beans
Covering discs	less angle as less soil throw	more angle to account for soil throw	max angle will leave the most level finish
Press wheels	ensure stone guards in place	-	-
Forward speed	8-12km/hr	8-12km/hr	8-12km/hr

* If min-till seedbed has already been deep loosened, a shallower DTS loosening leg depth will be acceptable. This will result in a lower power requirement, but you must still ensure the loosening leg is not set shallower than the sowing coulter

STUBBLE

MIN-TILL

PLOUGHED SEEDBED

FIGURE 27 DRILL AT AN ANGLE TO EXISTING STUBBLE

DRILLING DIRECTION

Common field practice for any strip-till drill is to sow the new crop at an angle of at least 25-30 degrees to the existing stubble. This is for the simple reason that material (be it stubble or trash) will flow a lot more effectively through the elements of the drill instead of drilling the 'same way' as the existing stubble has been laid. This will make drilling in difficult conditions easier and more effective, and existing tramlines will still be visible for the following sprayer to follow.

SUMMARY

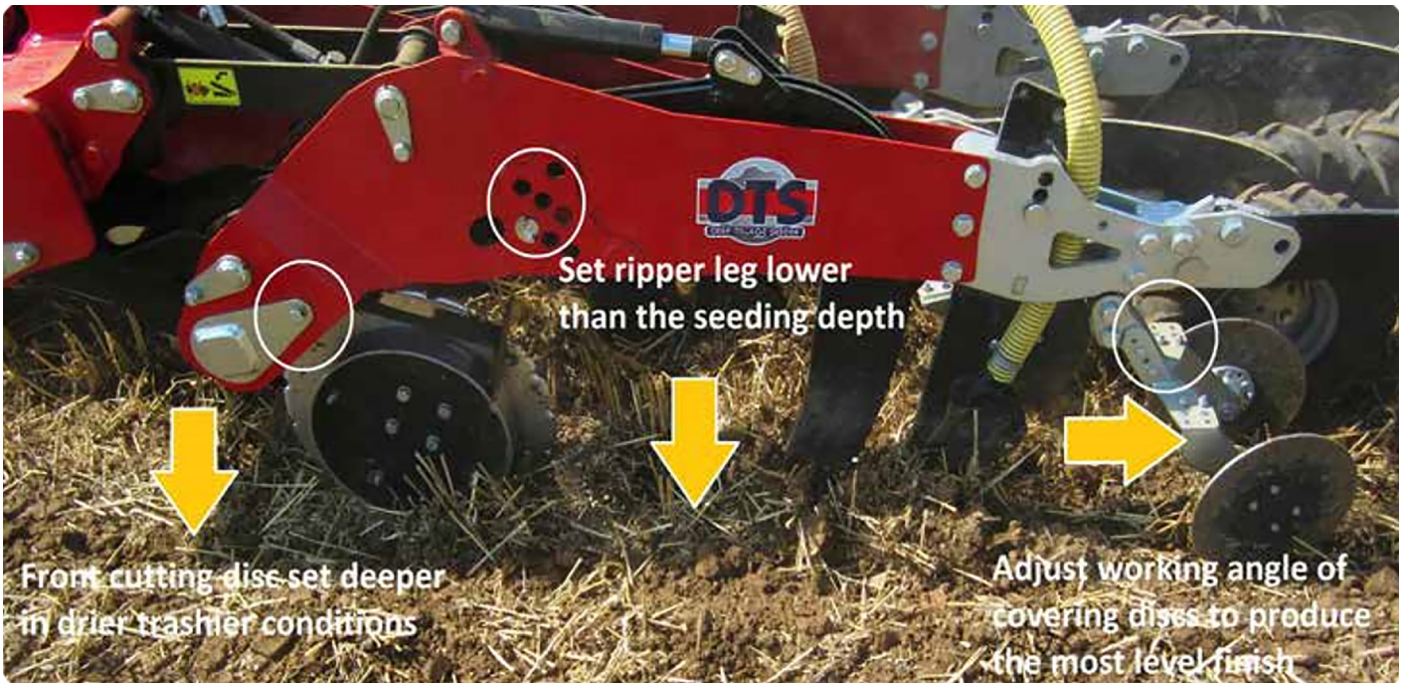


FIGURE 28 MOST EFFECTIVE DTS COULTER SETUP

SECTION 7

Trouble Shooting

METERING

UNDER-SEEDING/OVER-SEEDING

If after the calibration process you find the drill is not putting on the correct application rate, try the following guidelines which should help:

1 **a)** Ensure both tank lids are in place and secure and the lid seals are present when drilling. (The ORGA metering system requires balanced air so it is important that the seed hopper is sealed for correct operation)

b) Check air pipe from metering system to tank for blockages from dust and debris

c) Check for mud and debris on the ground speed radar

2 **a)** Ensure nylon insert is fitted for all seeds and products apart from peas and beans

b) Ensure correct ORGA insert is fitted according to DTS operators manual

c) Ensure choke slide is fully open

d) Prime ORGA fully with product before calibration process

3 **a)** Is the actual weight of the seed bag accurate? (Home saved seed can be wrong!)

b) Are the scales accurate? (Test against another set)

c) Is the Speed Sensor Factor (SSF) correct? Every drill comes with a default setting of 0.0076 which may need correcting to register the true ground speed (Refer to the Sumo DTS operators manual section 4.11 to perform an 'Auto-Cal')

d) Due to atmospheric conditions, you may need to perform a new bag test every morning when using fertiliser products, to bring the calibration back in line

e) When entering bag weight in the calibration process, check decimal placing and units!

f) Perform 'Calibration Nudge' outlined in operators manual section 4.7.2

COULTER SYSTEM

COULTER PRESSURE

Oil flow set too high from tractor is likely to cause overheating of the transmission oil of the tractor and may lead to locking out of the contour following rams. Ensure there is no more than 10-20% oil flow from the tractor on any width DTS drill.

LEG ALIGNMENT

To ensure correct function of the coulter system, all of the elements of each individual coulter unit must be in line. If for some reason the loosening leg becomes out of line with the following sowing coulter, this will invariably cause unwanted build-up of soil or trash in the space between the two and may lead to a blockage.

Follow this procedure for bringing the sowing units back into line as a remedial measure or as part of your out of season maintenance program:

1 Identify problem coulters by eyeing up from the rear with drill lifted, and remove the leg

FIGURE 29 IDENTIFY OUT OF LINE LEG

2 Inspect the alignment of the leg to make sure it is straight. If not, use a hydraulic press to realign if necessary, then reattach the leg

FIGURE 30 CHECK LEG ALIGNMENT

3 If the leg is still out of line with the coulter, loosen the three M16 bolts at the back of the red coulter outer plates that hold the sowing coulter leg sockets. Depending on the age of the machine these will either be cut plated steel profiles or red cast sockets

FIGURE 31 M16 BOLTS NEW STYLE CAST LEG SOCKETS

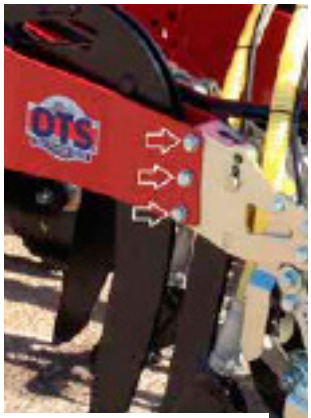


FIGURE 32 M16 BOLTS OLD STYLE CUT PROFILES

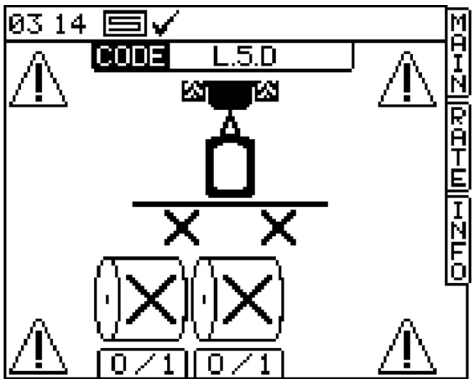
4 You may find that the leg and coulter will fall back in line when the bolts are loosened. If not, ask an assistant to manipulate the back section of the coulter unit by twisting the back press wheels until they are back in line and then re-tighten to each bolt to 215Nm

FIGURE 33 RE-ALIGNED COULTER

COMMON ARTEMIS ERROR CODES

From time to time under normal working situations the drill control box may come up with an error code which will prevent the drill from further function. They are designed to act as a failsafe to prevent unwanted events, or to protect the metering system of the drill from damage. Here is a list of the most common codes and what they mean, and some helpful tips of what to do if they occur.

NB. To reset an error code on the DTS drill, lift and lower the drill in and out of work at least once.

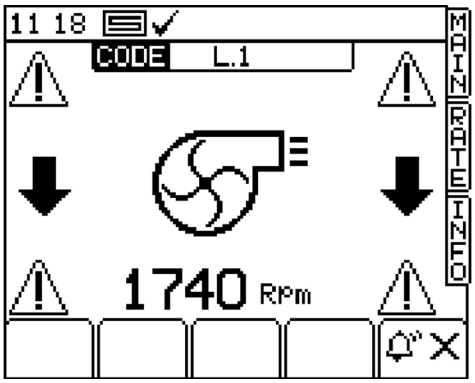


L.5.S METERING IS DISABLED

Due to pressing the on-screen motor inhibit button underneath the seed meter icon.

Re-press to re-enable the motor or ignore to continue with the motor inhibited.

Useful for when setting up the drill in the field without sowing!

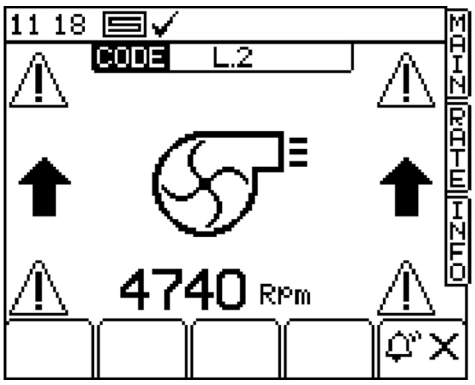


L 1 LOW FAN SPEED

Fan speed below the low alarm value programmed. Adjust fan speed accordingly.

SVS may have been accidentally knocked out of gear.

ORGA metering system will stop immediately if this happens even if forward speed is registered!

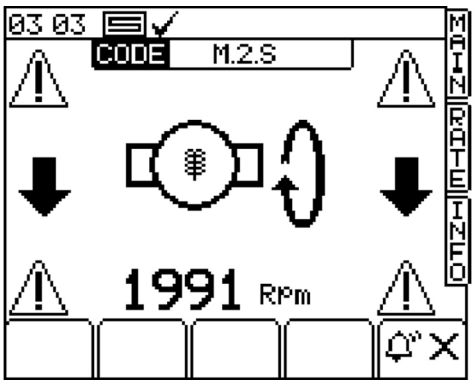


L 2 HIGH FAN SPEED

Fan speed is above the high alarm value programmed.

Adjust fan speed immediately by lowering oil flow.

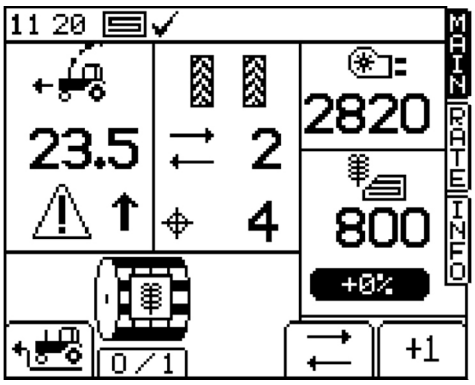
Continued use at high speed may cause fan component damage!



M.2.S SEED MOTOR SPEED LOW

Will appear if tractor forward speed is too slow and ORGA drive motor is unable to attain a speed signal or gearing too high on the ORGA metering.

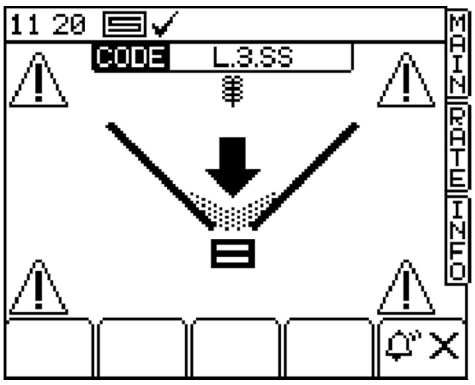
Ensure forward speed of at least 5km/hr before putting drill into work or check ops manual for correct gear selection.



HIGH FORWARD SPEED

Forward speed exceeds the maximum calculated and displayed on the RATE screen.

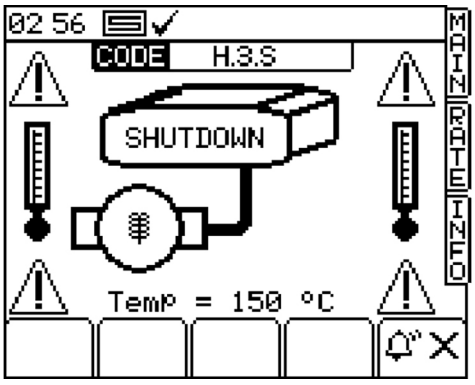
Change gearing on ORGA drive to a higher ratio or remove plastic sleeve and re-calibrate.



L.3.SS SEED/FERT LEVEL IS LOW

Sensor is working correctly.

Sensor height is adjustable to suit seed type or operator preference.

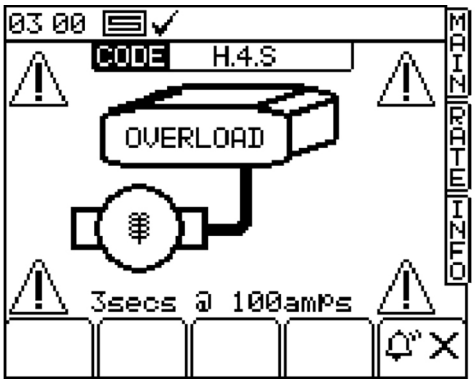


H.3.S SEED MOTOR MODULE TEMPERATURE SHUTDOWN

Module temperature has exceeded the value programmed.

Excessive load applied to motor which for a prolonged time has caused the high module temperature.

Check ORGA for binding or product build up. Remove plastic sleeve or change to lower gearing and re-calibrate.

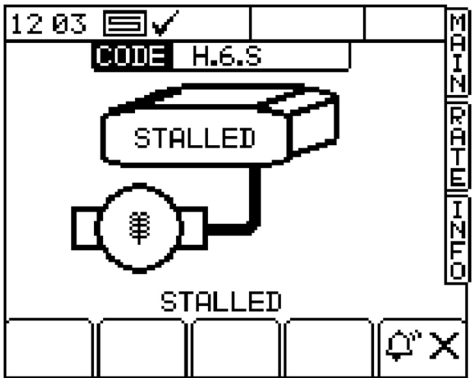


H.4.S SEED MOTOR MODULE OVERLOAD SHUTDOWN

Motor current requirement exceeded so module shutdown and motor operation inhibited.

Excessive load applied to motor which for a prolonged time has caused the high module load.

Check ORGA for binding or rubbing. Remove plastic sleeve or change to lower gearing and re calibrate.



H.6.S MOTOR HAS STALLED

Sudden metering roller jamming due to foreign object.

Switch off control box and un-plug power cable before investigating.

CAUTION when re-starting

A complete list of codes is listed in the RDS Pro-Series 8000i Artemis operation manual supplied with the drill

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