

**Instruction**  
**Manual**  
**145 Series**  
**MA**

## **Introduction to the manual**

The provision of this manual is a requirement of the *Supply of Machinery (Safety) Regulations 1992*.

This manual has been written and provided to enable operators of Dowdeswell products to:

- 1) Understand how the machine operates.
- 2) Be able to operate the machine safely and without hazard to either the operator or those in the vicinity.
- 3) Be able to use the machine to its full potential.

The operator or any persons employed to service or maintain the machine must read and fully understand this manual before using or servicing the machine.

The contents of this manual are intended as a guide to the operation and servicing of the machine described herein and as such is not a training manual.

Whilst ever care and attention has been taken in the design and production of all Dowdeswell products as with all machinery there remains a certain amount of risk to personnel whilst the machine is in use.

In accordance with the *Supply of Machinery (Safety) Regulations 1992*,

Note: The equivalent continuous A-weighted sound pressure level at the drivers seat does not exceed 70dB(A).

## **Important Information**

### **Serial Number**

It is important to make a note of the serial number and year of manufacture of your machine in the spaces provided below. This information should always be quoted in any correspondence with Dowdeswell Engineering.

When ordering spares for your machine, you should always quote the serial number and year of manufacture either to Dowdeswell's or to your dealer.

Machine Serial Number: \_\_\_\_\_

Year of manufacture: \_\_\_\_\_

### **Warranty**

Should defective material or workmanship used in the manufacture give rise to failure, the products, components or sub-assemblies affected, will be replaced free of charge during the period of warranty offered with the machine at the time of purchase. The fitting of non Dowdeswell parts, or repairs, or modifications carried out by unauthorised persons will invalidate the warranty. No work will be carried out without prior consultation with Dowdeswell Engineering Co. Ltd.

Save to the extent covered by the warranty, the company shall not be liable in any circumstances for any loss, injury or expense, whether direct or indirect, which may arise for any reason whatsoever from any defect in or otherwise in connection with any goods supplied or work done by the company.

### **Replacement Parts**

Use only genuine Dowdeswell spares as these replacement parts are designed for your machine to give the best possible performance and also have the full backing of the warranty cover. See the Parts Manual for the part number and description, when ordering spares always quote the machine serial number.

### **Definitions**

Throughout this manual the terms "Front", "Rear", "Left-hand (LH)" and "Right-hand (RH)" will be used and are derived from the tractor drivers normal position facing forward with the plough in its transport position.

The left-hand components are those which move the soil to the left, and the right-hand components are those which move the soil to the right.

## Contents

This manual covers the 145 Series Shearbolt range of fully mounted reversible plough. This plough is designed to be fitted to the tractor's 3 point linkage and the reversing of the plough is achieved by hydraulic power being provided by the tractor. The plough is solely to be used for the cultivation of soil and **must not** be used for any other purpose.

A wheel is provided on the plough, and is used for both depth control whilst working and used as a transport wheel when travelling between areas or work.

It is essential that the machine is operated in line with the procedures and practices as outlined in this manual.

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All the information given throughout this manual is correct at the time of publication. However, in the course of constant development of Dowdeswell machines, changes in specification are inevitable. Should you find the information given in this book to be of variance with the machine in your possession, please advise the Dowdeswell Service Department where up to date information can be supplied.

The manual can obtain standard and optional features and is not be used as a machine specification.

# **145 Series MA Technical Specification**

## **Weight Matrix**

Model	DD	DDS	UCN	SCN	YCN	MSlatt
5F Basic	2110	2090	1980	1995	2020	2060
6F (5+1)	2386	2362	2230	2248	2278	2326
6F Basic	2361	2337	2205	2223	2253	2301
7F (6+1)	2637	2609	2455	2476	2511	2567

## **Dimensions**

Furrow widths: 12" – 18" (30.5 – 45.7cm)  
Interbody: 36" (91cm)  
Underbeam: Standard – 28.5" (72.4cm)  
Option – 30" (76.2cm)

## **Tractor Requirements**

Tractor HP: Up to 300hp (221kW)  
Linkage categories: Category 3 and Category 3 Narrow.

## **Hydraulic Specifications**

Turnover ram: Bore dia 4" (10cm) Rod dia 1 1/2" (3.8cm)  
Offset ram: Bore dia 4" (10cm) Rod dia 5cm  
Alignment ram: Bore dia 5" (12.7cm) Rod dia 5cm  
Maximum system working pressure 3000psi. (207Bar)

## **Basic Construction**

Beam construction: 5mm high tensile steel  
Leg Material: 32mm high tensile steel  
Shearbolt protection of bodies as standard

## **Build Options**

Body options: DD, DDS, UCN, SCN, YCN, Slatted  
Square shanked skims fitted as standard.  
Tyre specification: 10.00/75 x 15.3 – 10 Ply  
11.5/80 x 15.3 – 10 Ply  
12.5/80 x 15.3 – 14 Ply  
Recommended pressure 40psi (2.75 Bar)

## **Safety Precautions (1)**

Dowdeswell products have been designed, constructed and tested in accordance with the current safety regulations. However, as with all machinery there are inherent dangers whilst operating and carrying out maintenance on the machine. The following is a list that must be brought to the attention of the persons operating or working on the machine and should be complied with at all times.

### **Before use**

- 1) Read and familiarise yourself with the operator's instruction manual for both the tractor which is being used and this machine.
- 2) Consult the tractor manufacturers manual for instructions on mounting implements and safe working practices.
- 3) Ensure that the work area is clear of bystanders.
- 4) Ensure that all guards, covers, warning decals and safety devices are in position and in working order. Any guard that is damaged must be replaced immediately.
- 5) Inspect the work area for obstructions that may constitute a hazard.
- 6) Ensure the tractor is of a suitable size to lift the machine safely. The addition of ballast in the tyres and/or the fitting of front weights may be required to ensure that the combination is stable and safe for use.

### **During use**

- 1) Observe all safe working procedures, for example, reducing speed on slopes and turning sharply as the rear of the machine will travel quickly over a wide arc during turning.
- 2) Avoid working on ground where there is a risk of overturning.
- 3) Do not cut across the face of slopes.
- 4) Avoid inhalation of dust and fumes generated by the machine.
- 5) Be alert for hidden obstructions. Should the machine hit an obstacle, stop immediately and check for damage before proceeding.
- 6) Observe all relevant regulations during the transport of the machine while on private and public highways.

## **Safety Precautions (2)**

### After use

- 1) Inspect the machine for damage and replace parts as necessary.
- 2) Carry out lubrication and maintenance as detailed in this manual to maintain the machine in a safe working condition.
- 3) Check all bolts, nuts and screws are tight.

### Always

- 1) Wear safety footwear.
- 2) Avoid loose clothing that may become entangled in moving parts.
- 3) Take care when working on the machine as there are many sharp and protruding components that could cause serious injury.
- 4) Lower the machine gently to the ground.

### Never

- 1) Carry out any adjustments on the machine unless the tractor engine is stopped, handbrake applied and the machine is either lowered to the ground or it is safely supported.
- 2) Leave the tractor unattended unless the machine is lowered, the engine is stopped and the parking brake is applied.
- 3) Allow children or untrained persons on or near the machine.
- 4) Touch any moving parts or parts that may become hot in the operation of the machine.
- 5) Stand on the machine to carry out adjustments or maintenance.
- 6) Stand or sit on the machine while the machine is moving.
- 7) Stand under the machine unless it is safely supported.

### Remember

- 1) Safety is the responsibility of the operator or persons working on the machine.
- 2) Think safety at all times.

## Safety decal description (1)



### Caution

Stop the tractor's engine and remove the key before starting any servicing or maintenance on the machine.

### Caution

Check that all nuts and bolts are tight before commencement of daily work. It is also advisable to check the nuts and bolts on new machines, or on re-worked areas, after the first two hours of work.

### Caution

Any operator is advised to fully read the operators manual prior to using the machine. If there are any areas of doubt, it is important to contact Dowdeswells before proceeding. It is advisable to keep the instruction manual in the cab of the tractor to ensure that any new operators can familiarise themselves with the machine before use.



## Safety decal description (2)



### Caution

Do not stand underneath the machine when it is raised. If you need to get access to the underside, you must ensure that the machine is safely supported.



### Caution

Do not stand between tractor and machine when the machine is being fitted to the tractor.



### Caution

Do not stand on the machine at any time.



### Safety decal description (3)



#### Caution

Some of the components on the machine have sharp edges or corners. Caution must be used when servicing or maintaining the machine and appropriate protection for the hands should be worn. It is advisable for people who are unfamiliar with the machine to wear a hard hat to protect themselves from injury.



#### Caution

There are areas on the machine that could crush a part on the body. You should never enter these areas when the machine is being used. You should only enter these areas when the machine is lowered to the ground and the tractor's engine has been stopped and the key removed.



#### Caution

To ensure that the machine will function correctly, it is important to grease the machine. The greasing intervals are outlined in the instruction manual.

## **Safety decal description (4)**



### Caution

To ensure that damage does not occur to any component, it is vital that only Dowdeswell genuine shearbolts are used. Failure to do so will invalidate any warranty on the machine.

### Caution

Some of the components on the machine will become hot during the use. Caution must be used when servicing or maintaining the machine and appropriate protection for the hands should be worn.

# **Tractor Preparation**

## **Tractor ballast**

The tractor must have the appropriate amount of ballast for the length and weight of the plough to ensure maximum safety during transport and turnover, and optimum traction and balance in work. Weight should be added, as required to the front of the tractor and, if required, to the rear wheels and/or tyres in the case of wheeled tractors. The most cost effective method of increasing the weight at the rear is to add water ballast. This is best done by a competent tyre fitter and should not exceed the amount as specified by the tyre manufacturer, if in doubt, seek advice from your dealer.

It is important that the maximum axle loads are not exceeded, as this could cause failure of the axles. This can be checked by placing the front and rear axles on a weighbridge and matching the results to the maximum axle loadings that should be stated in the tractor instruction manual.

It is also important to check that the tractor and implement combination does not exceed the maximum permissible vehicle weight. This weight includes the tractor, implement, ballast and the operator and any tools carried. This weight can be checked by placing the tractor and implement combination on a weighbridge and matching the result to the tractor instruction manual

## **Tyre pressures**

The tyre pressures should be set equal on both front and rear axles in accordance with the tractor instruction manual or tyre manufacturers recommendations.

## **General tractor condition**

To get the best from your equipment, the tractor must be maintained in accordance with the tractor manufacturers recommendations.

## **Safe road transport**

The tractor and implement should be driven on the public highway in accordance with current regulations for such a combination. Also it is advisable that a flashing beacon be fitted to the tractor to ensure that the tractor is visible to other road users.

## **Connecting To Tractor**

### **Wheel track measurements**

The 145 series plough (when used in the furrow) will work where the inside wheel measurements are set between 48” and 60” (122cm and 152cm). Ideally the settings for front and rear wheels should be set equally, however, where some wheel designs do not permit fine adjustment, the front wheel can be allowed to be set up to 2” (5cm) wider than the rear. When used on the land the 145 series plough will accommodate tractors with an outside of track measurement of up to 3M.

### **Lower lift arms**

Both lift arms should be set at the same height from the ground. Check this by measuring the length of the drop arms on both sides and adjusting as necessary.



### **Top link location**

The 145 Series of ploughs are designed for use with tractors in the mid to high horsepower range. The majority of tractors in this range use the lower links to sense the draught forces during ploughing. In these cases, the tractor's top link does not carry any load during work and is used solely when the plough is raised from the ground.



Where the tractor has lower link sensing, the top link pin should be located in the slot. When ploughing on level ground, the top link pin should be set to run in the centre of the slot, whereby allowing the pin to move forwards and backwards when ploughing over the undulations in the ground.

If the tractor has top link sensing, the top link pin should be located in one of the three round holes. To give the plough maximum lift when raised, locate the top link pin in the top hole.

## Connection Procedure

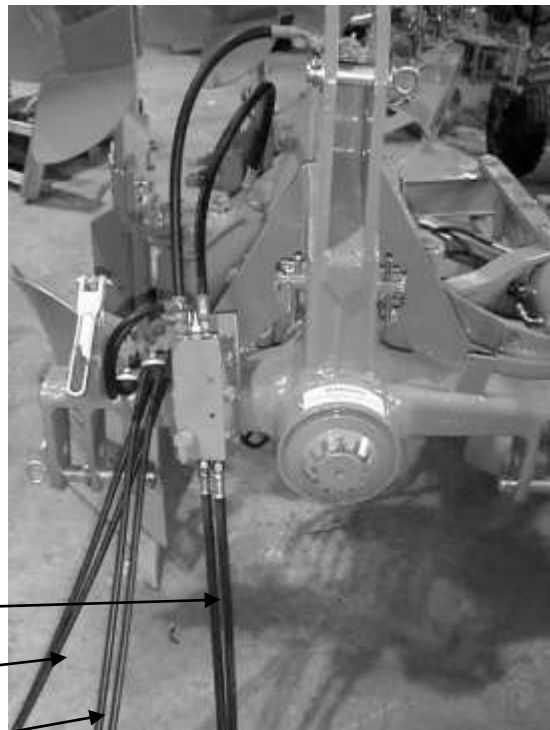
To ensure safe and efficient connection of the plough to the tractor, it is important that the following procedure is followed;

- 1) Ensure that the tractor and plough are on a firm and level surface.
- 2) Check that the lift arm ball ends are of equal height from the ground. If they are not, please refer to the Lower link arm section for guidance.
- 3) Fit the left lower link and linch pin, then fit the right. There are two positions on the lower links, the inner position for Category 3 narrow and the outer position is for Category 3 tractors.



- 4) Connect the top link pin using the pin and linch pin provided. Please refer to the Top link location for information on the correct pin position.
- 5) Lengthen the top link by two turns.
- 6) Connect the hydraulic hoses as outlined below. It is important that the connectors are free from any dirt.

- a) Turnover hoses (Items 1) to any double acting service. Labelled Red
- b) Offset hoses (Items 2) to any double acting service. Labelled Blue
- c) Alignment hoses (Items 3) to any double acting service. Labelled Yellow



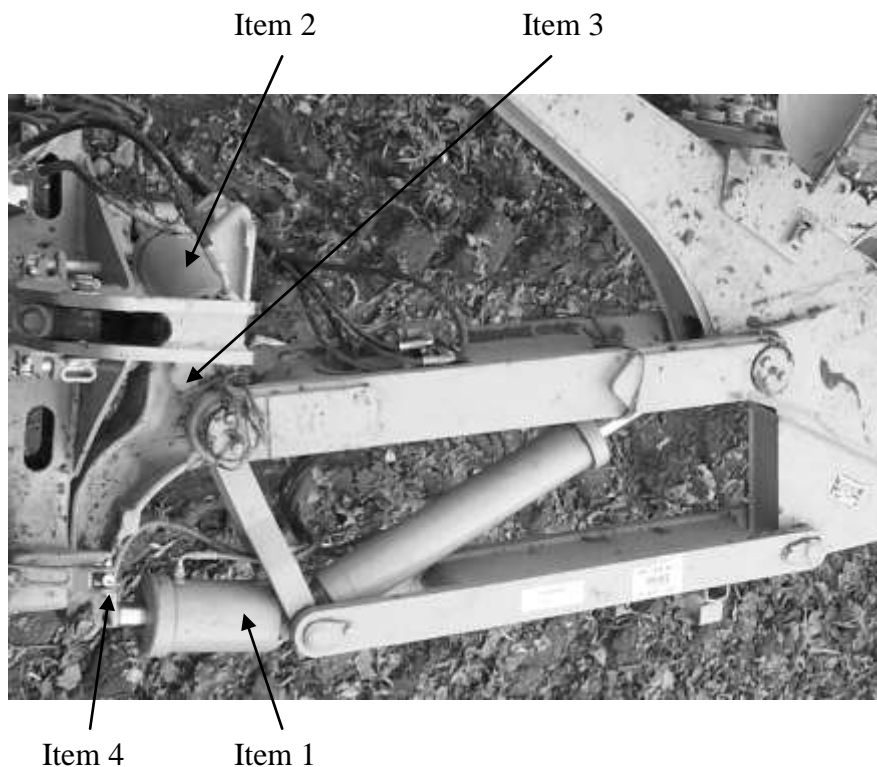
- 7) Ensure that the tractor check chains have enough slack to allow the plough to swing a little and that the plough misses the drawbar.

## Turnover

When operating the turnover, always move the spool lever in the same direction and hold it there until the sequence is complete. This procedure is the same irrespective if you are turning left to right or right to left. The changeover of the hydraulic oil flow takes place within the turnover valve block which is triggered automatically. Once a turnover has completed you must allow at least 5 seconds before repeating the sequence, this is important especially when the oil is cold.

During the turnover sequence, the following actions will occur automatically;

- 1) The alignment cylinder (Item 1) will extend fully.
- 2) The turnover cylinder (Item 2) will close up until it is fully closed and automatically extend when the plough has gone through its “top dead centre” position. The cylinder will stop when the turnover arm (Item 3) has come into contact with the verticality screw (Item 4).
- 3) The alignment cylinder (Item 1) will close up to the length it was set to before the turnover was started.



### Safety Notes

- 1) It is important that any spectators are kept at a safe distance from the plough as the speed of turnover can be rapid.
- 2) Take care that the plough does not strike the tractor cab, PTO guard or drawbar and that the hydraulic hoses and any electrical cables cannot become damaged or trapped.

## **Verticality Adjustment**

When the plough is in work, the ploughs legs should be 90 degrees to the land when viewed from the rear. Individual stops are provided for both left and right hand work. Extending the stops will allow for deeper ploughing and/or narrower between tyre measurements.

The procedure for altering the stops is as follows;

- 1) Raise the plough a small amount.
- 2) The turnover arm needs to be moved away from the stop to allow the adjustment. This is achieved by operating the spool valve for a very short period of time until a gap appears under the stop.
- 3) Adjust the stop by using the handle and reposition the handle over its locating peg.
- 4) Operate the spool valve in the reverse direction until the turnover arm comes into contact with the stop.
- 5) The same procedure should be carried on both stops and they should be adjusted the same amount.
- 6) Repeat this procedure should further adjustments be required.



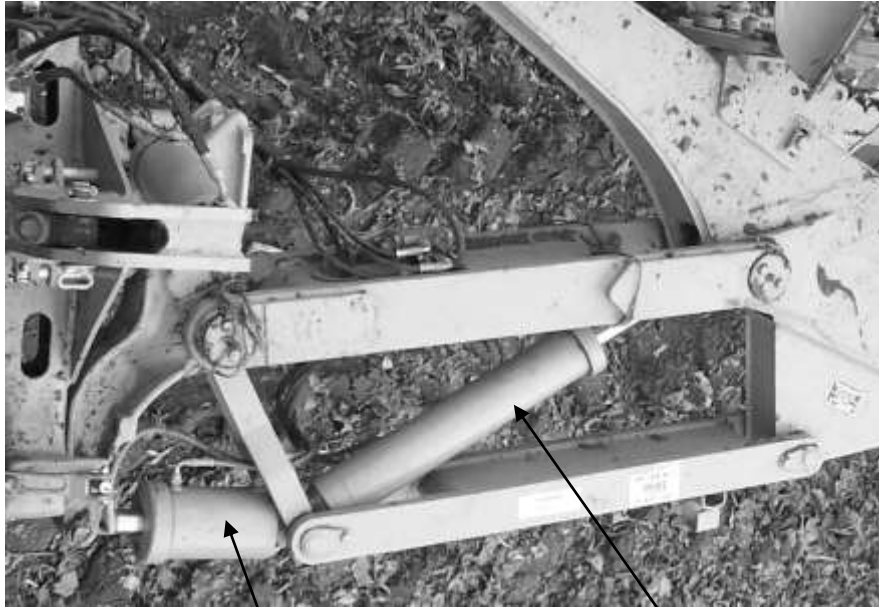
### **Safety notes**

- 1) It is important that any untrained people do not attempt this adjustment.
- 2) It is important that you do not put your hands between the stop and turnover arm and your feet should not be under any part of the plough.



## **Offset Mechanism**

The correct front furrow width is achieved when the width of the front furrow matches the width of the rear furrow from the previous pass. To adjust the front furrow width, open or close the offset ram until the correct width is achieved.



Beam alignment cylinder

Offset cylinder

## **Beam Alignment**

When in work, the top link of the tractor should be pointing directly ahead, aligned with the centre line of the tractor. If the top link is not running central, the beam alignment cylinder should be adjusted until the correct position is reached. If the furrow width is altered, the beam alignment cylinder will need to be altered to ensure the top link is running in its correct position.

### **Safety notes**

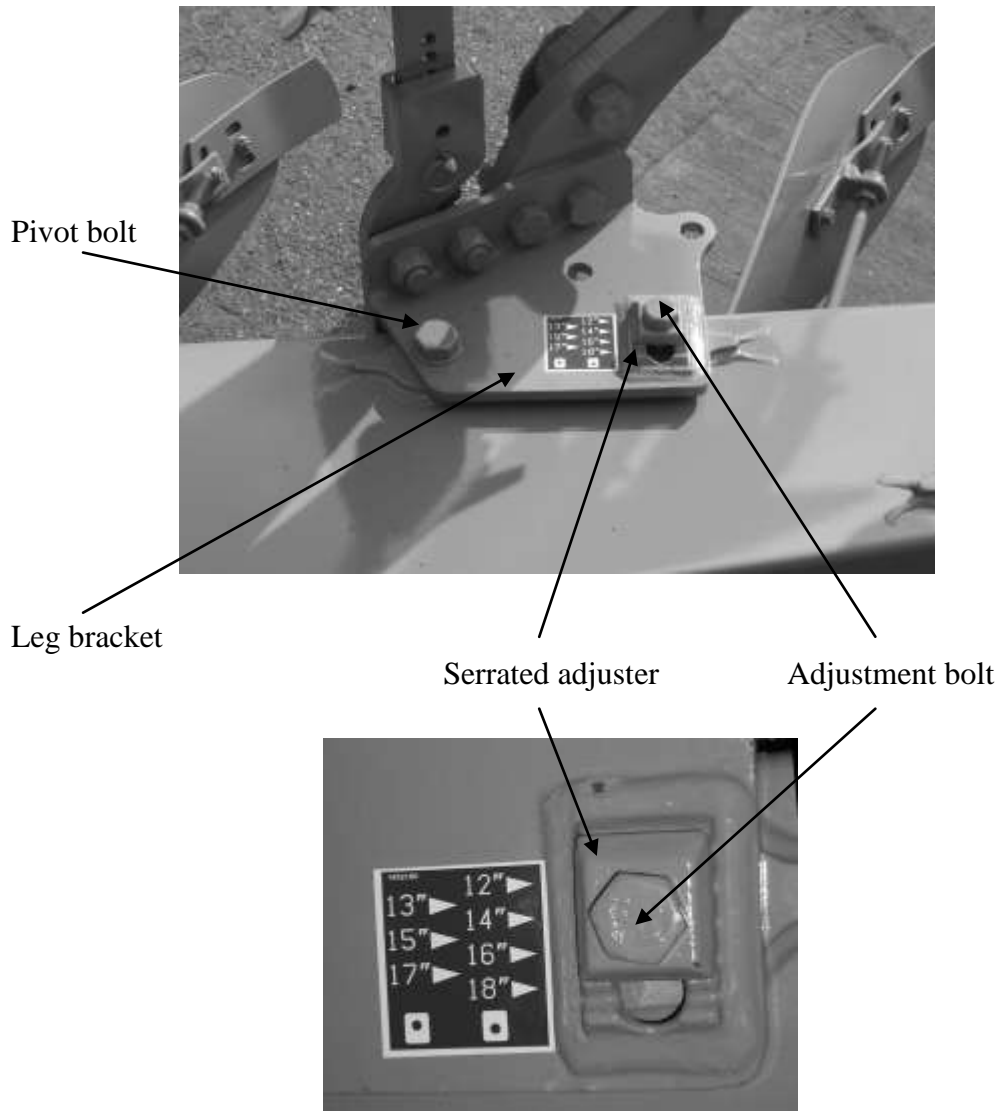
- 1) It is important that any spectators are kept at a safe distance from the plough during adjustment of either the offset ram or beam alignment ram.
- 2) Do not place any part of the body in the alignment or offset mechanism.

## Furrow Width Adjustment

The 145 Series plough has adjustable furrow widths from 12" to 18" (30.5 to 45.7cm), with increments of 1" (2.5cm).

The furrow width is adjusted as follows;

- 1) Slacken the pivot bolt.
- 2) Slacken the adjustment bolt until the serrated adjuster is free to rotate.
- 3) Rotate the leg bracket until the desired furrow width is reached. Please see below for a description of how to establish the furrow width.
- 4) Re-tighten all bolts.



By not rotating the serrated washer, the furrow width increments are 2" (5cm), if you rotate the serrated washer 180 degrees the furrow width increment is 1" (2.5cm). The furrow width is determined when the centre of the adjustment bolt is in line with the appropriate arrow on the decal. The photograph above shows the furrow width set to 14" (35.5cm).

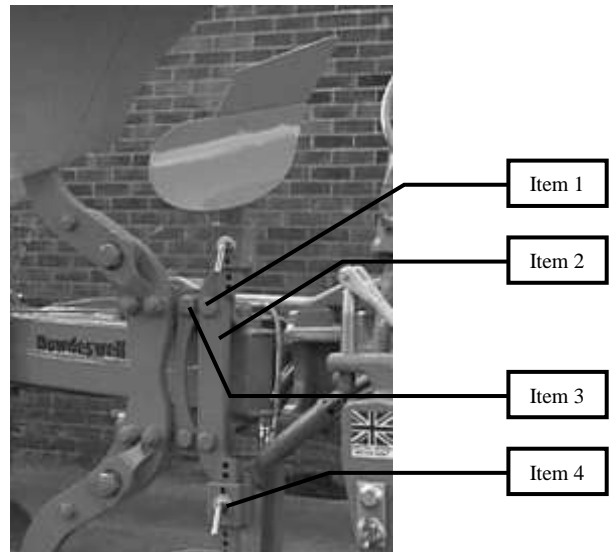
Note: the skims and discs move with the leg bracket and should not require any further adjustments.

## Skim Adjustment

Three mounting positions are provided for the skim when ploughing.

To change the mounting position, remove the skim mounting bolts (item 1) and remove the skim assembly (item 2). Remove the bolts (item 3) and reposition them where the skim assembly was previously. The skim assembly can then be repositioned in the rear mounting position.

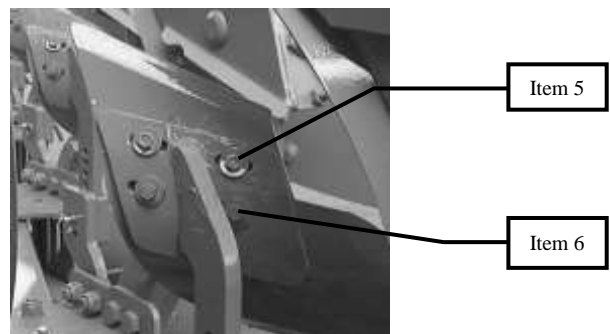
Alternatively, remove the skim retaining peg (item 4) and remove the skims. Then remove the skim mounting bolts (item 1) and invert the skim bracket so as it angles rearward instead of forward. Now replace the skim mounting bolts (item 1) and replace the skims to the required depth.



Depth adjustment of the skim is made by removing the skim retaining peg (item 4), sliding the skim shank in it's holder to the required position & replacing the skim peg. The two holes in the skim mounting allow for a depth adjustment of 1/2".

Width setting is made by slackening the nuts, holding the skim point (item 5) and the skim wing (item 6) . Then moving them along the slots to increase or decrease the cutting width of the skim.

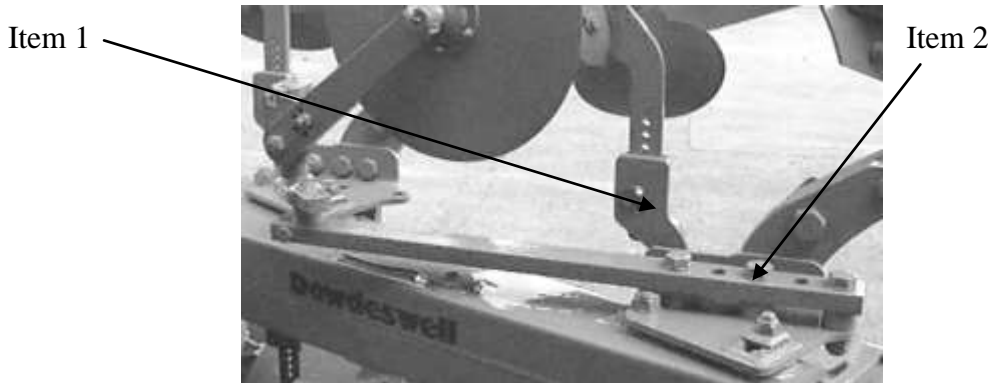
The skim working depth should be set to the minimum possible to bury all the trash and a maximum depth, equal to one third ploughing depth.



## Disc Adjustment

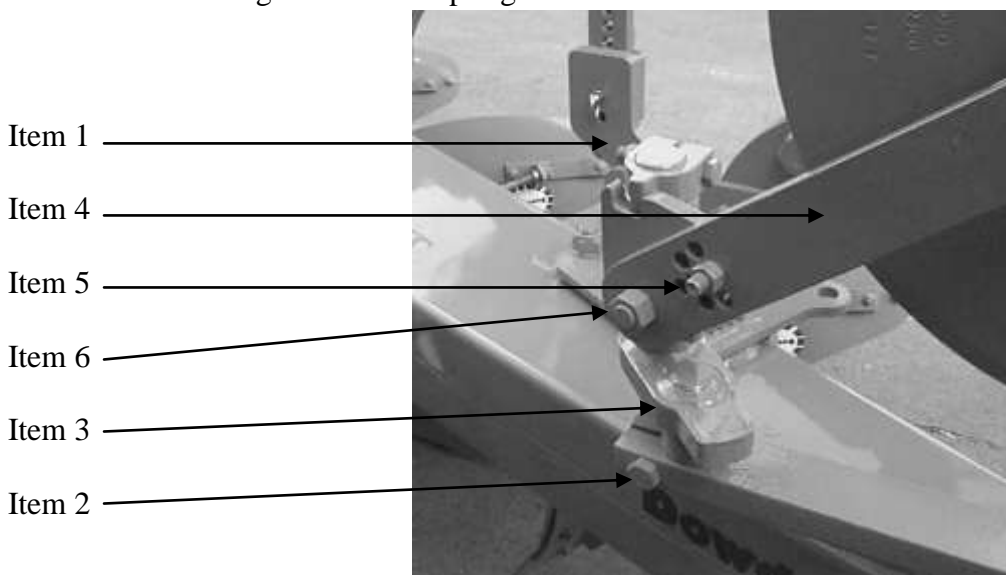
The discs should be set so that they do not contact the skim when in work. The disc should be set no more than half of the ploughing depth.

As with the skim, the disc can be adjusted forwards and rearwards. To alter the position of the disc, remove the bolts (item 1) and reposition the disc in its new position then replace the bolts. If the disc is moved to its rear most position it will be necessary to remove the disc support nut (item 2).



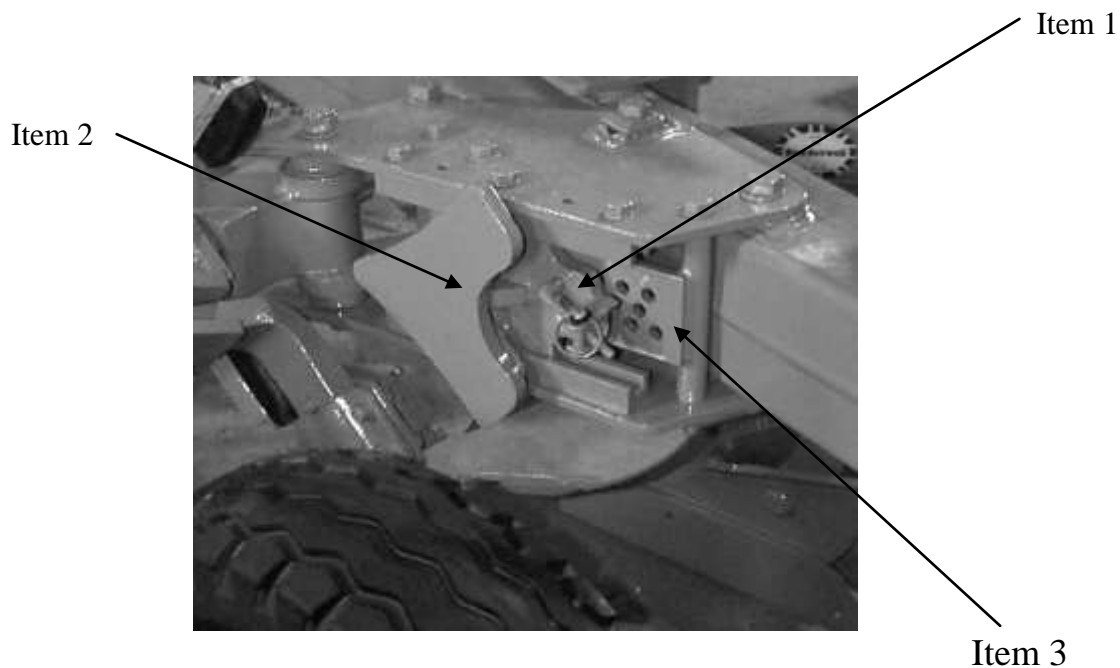
To alter the width of the disc assembly, slacken the clamping bolt (item 1) and the setting bolt (items 2). The disc knuckle (item 3) and disc arm (item 4) can now be moved to its required position so that the disc, when in line with the landside, is just clear of the skim point. The clamping bolt (item 1) and the setting bolt (item 2) can now be re-tightened.

The depth is adjusted by removing the shearbolt (item 5) and replacing it in an appropriate adjustment hole in the disc arm (item 4). It may be necessary to slacken the pivot nut (item 6) to enable movement of the disc arm. The pivot nut (item 6) should then be re-tightened and kept tight.



## Depth Adjustment

The furrow depth at the front of the plough is controlled by the tractor linkage height. The furrow depth at the rear of the plough, is controlled by the pneumatic depth/transport wheel. The ploughing depth can be trimmed individually to match both left-hand and right-hand ploughing by fitting a shim under the depth striker.



To adjust the ploughing depth;-

- a) Remove the depth locating pin (item 1)
- b) Slide the depth adjuster (item 2) forwards to reduce furrow depth or backwards to increase furrow depth.
- c) Replace the depth locating pin (item 1).

NOTE; The adjustments along the depth locator (item 3) will give 1/2" increments to the furrow depth.

NOTE;- It is recommended that a tyre pressure of 40 p.s.i is used. Please also see note on transport.

## Transport 1 of 2

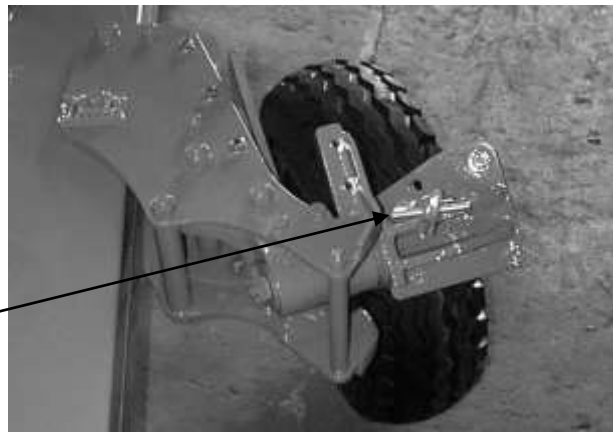
Before turning the plough into the transport or butterfly position, arrange the plough in the right hand ploughing position with the bodies on the ground.

NOTE;- It is advisable to use the slotted top link hole on the plough for transport and to keep some weight of the plough on the top link.

To move the plough into its transportation position the following procedure should be applied;-

- 1) Remove the wheel transport location pin (item 1) from the work position.
- 2) Swing the wheel from its working position into its transport position

Item 1



- 3) Replace the wheel transport location pin (item 1) into the transport position.

Item 1



Continued...

## Transport 2 of 2

- 4) Extend the headstock transport pin (item 1) on the left-hand side of the headstock.
- 5) Raise the plough off the floor and slowly allow the turnover to function until the plough is in its central position.
- 6) Extend the headstock transport pin on the right – hand side of the headstock.
- 7) Lower the plough onto the ground to allow the transport wheel to take some of the plough weight.



Item 1

**The plough is now ready for transport.**

To return the plough to its working position the procedure above should be followed in reverse.

It may be found helpful when moving the plough out of its central position too lower the beam when the tractor is driven forwards before operating the turn over.

Note; - The plough should be raised on the tractor links when entering gateways or travelling over rutted tracks to avoid serious damage to the plough.

Note;- The tyre pressure for long road journeys should be set at 55 P.S.I and towing speeds for any distance must not exceed 20 mph

## Pitch Adjustment

The pitch of the bodies can be adjusted to assist penetration in hard conditions. Increase the pitch by lowering the point, decrease the pitch by raising the point. It is preferable to run the plough with minimal pitch. Ensure that the pitch is equal on all bodies to avoid uneven wear, this can be done by measuring vertically from the point to the beam.

Note: This can only be done accurately with new points fitted.

Note: The recommended pitch setting with new points should give an underbeam measurement to match that ordered on the plough.

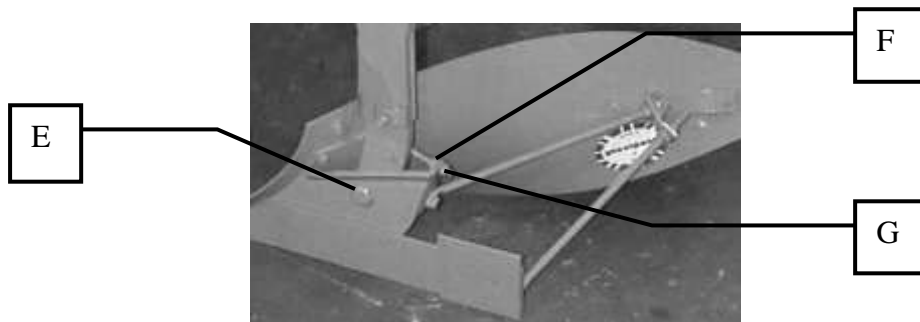
### UCN/SCN

To adjust the pitch slacken mushroom headed bolt 'A' and unscrew 'D'. Turn setscrews 'B' & 'C' in the required direction. Then re-tighten bolt 'A' and setscrew 'D'.



### DD/YCN

To adjust the pitch, slacken the mushroom headed bolt 'E'. To increase the pitch, loosen lock nut 'F' and tighten lock nut 'G'. To decrease pitch, loosen lock nut 'G' and tighten lock nut 'F'. Re-tighten mushroom headed bolt 'E'.





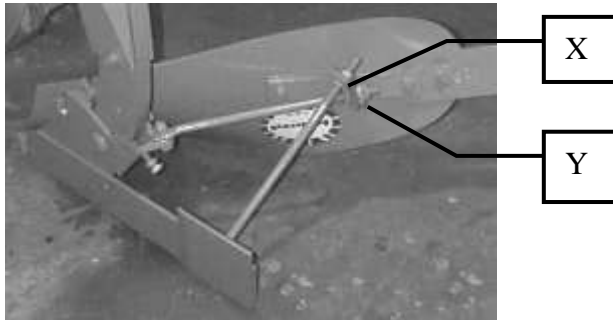
## Mouldboard Adjustment

To adjust the mouldboards, set one pair of mouldboards by measuring from a consistent position on the mouldboard to a fixed non-wearing point on the plough. Repeat this for all bodies. This dimension should be the same.

Next, measure from one mouldboard to the mouldboard behind it. This dimension should be equal to the interbody clearance. If any of these dimensions are incorrect, adjustment can be carried out as follows: -

- 1) For the rear bodies loosen lock nuts 'X', and move the mouldboard to the required position by turning lock nuts 'Y' in the required direction.
- 2) Re-Tighten lock nuts 'X' to apply load to the landside.
- 3) For all other bodies turn lock nuts 'Y' in the required direction.

UCN



DD

