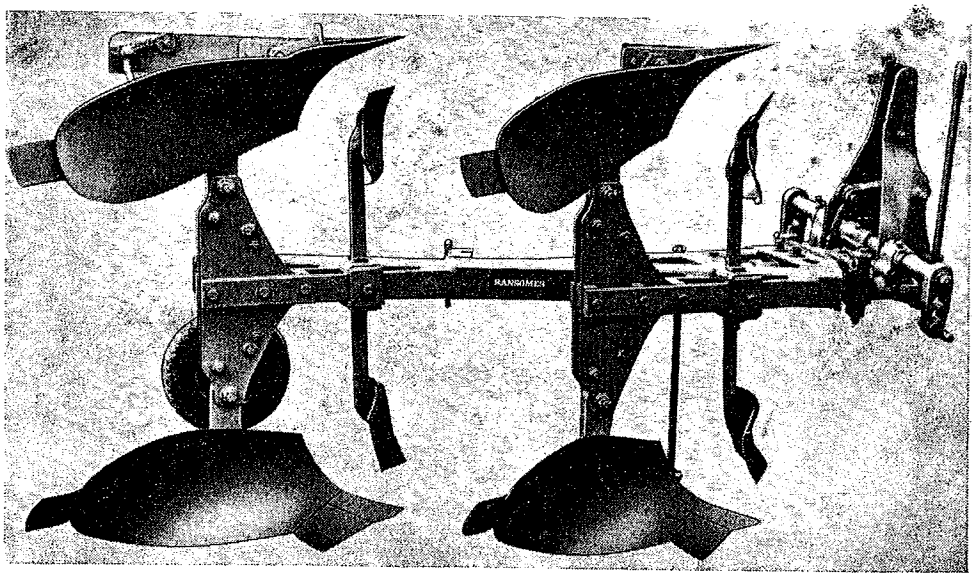
Publication No. 22340 G

TSR 107

REVERSIBLE PLOUGH

OPERATORS INSTRUCTIONS AND ILLUSTRATED LIST OF PARTS



Manufactured by

RANSOMES SIMS & JEFFERIES LTD.

IPSWICH ENGLAND

CP 500 7712
Printed in England

IMPORTANT

Before Operating, Adjusting or Servicing the machine it is important that these instructions are carefully read by those directly concerned. All references to left or right in this manual are taken viewing the machine from the rear, in its normal operational direction of travel. Front is the leading or drawbar end of the machine during normal work.

OWNERS AND OPERATORS

are advised to make full use of the appropriate Ransomes' appointed

DISTRIBUTOR OR DEALER

regarding any field or service problems. Distributor/dealer personnel have access to special training and can give advice on problems arising from local conditions. They are also able to call on the

MANUFACTURING COMPANY

Technical and Service Departments.

Whilst every precaution has been taken to ensure accuracy in this manual, for all adjustments, methods of handling and Service Instructions the information should be considered as a recommended safe system of working.

OPERATION AND SAFETY

Guards and safety devices must always be kept in position during operation.

Once the plough has been raised, do not work underneath it unless the plough is supported on trestles. Servicing, lubrication, etc., should be carried out with it lowered to the ground, tractor engine stopped and brakes on.

Never strike a cast or hardened part with a hammer or other metal instrument as this could cause damage. Use a hide or lead mallet or a block of wood.

When adjusting disc coulters, skims, etc., stand with the feet well clear of the plough.

Before driving off ensure that all persons are well clear of the plough and tractor.

Remember that the rear of the plough will move at great speed when turning sharply.

Road travel. Before leaving the field, the steering brake pedals should be interlocked and the hydraulics set according to the tractor operators handbook, or if the tractor is equipped with a mechanical lock this should be engaged.

Take great care when restarting and increasing speed not to produce a sudden jerk which will cause the front of the tractor to lift.

Use a wide headland which will allow the plough to be lifted clear of the ground before the tractor turns. Before turning, make sure that the differential lock is not engaged.

Never lift the plough out of the ground when the tractor is stationary.

CONTENTS

1. TRACTOR SUITABILITY

It is recommended that this machine is used behind a two wheel drive tractor of not more than 95 engine horsepower. If a larger capacity tractor is used then extra care must be exercised in the operation of this machine.

For ploughs with hydraulic reversing head, it is necessary that the tractor is fitted with a double acting spool valve with a minimum circuit pressure of 172 bar (2500 lbf/in²).

2. PREPARATION OF TRACTOR

Before attaching the plough to the tractor ensure that the tractor front and rear wheels are set equally and as near as possible to the following centres.

Tyre Size Cross Ply Tyres	Width of Cut	
	356 mm (14 in)	406 mm (16 in)
11 x 36	1.524 m (60 in)	1.626 m (64 in)*
12 x 36	1.524 m (60 in)	1.626 m (64 in)*
12 x 38	1.524 m (60 in)	1.626 m (64 in)*
14 x 30	1.626 m (64 in)*	1.727 m (68 in)*
14 x 34	1.626 m (64 in)*	1.727 m (68 in)*

*When the headstock is in the offset position (see paragraph 11) these settings are obtainable with the tractor wheels at 1.524 m (60 in) centres.

The above wheel settings **should be regarded as recommendations only.** It may be found that the settings have to be increased or decreased slightly.

Ransomes ploughs are designed to be used with the front and rear wheel centres in line, and this should be followed at all times if possible.

Failure to do this will cause the plough to crab, resulting in an incorrectly sized front furrow.

When ploughing less than 152 mm (6 in) deep it may be found advantageous to have the inside of the front and rear wheels in line.

For heavy conditions it may be necessary to add water ballast and wheel weights to the rear wheels. If this is done it is important that each wheel is equally ballasted.

It is essential that front end weights up to 136 kg (300 lb) should be fitted to the tractor for heavy land and hilly terrain.

See that the tyres are inflated to the same pressure on each side.

3. PREPARATION OF PLOUGH

In order to prevent rusting in storage and during transit, the wearing parts have been covered with a plastic protective paint. Before using the plough all traces of this paint must be removed otherwise the mouldboards, etc., will not scour satisfactorily. The paint must be peeled off or removed by means of paint remover. Do not use any heat.

4. LUBRICATION

Before commencing lubrication ensure that the tractor is isolated and the plough is lowered and firm on the ground.

Grease nipples are located in the following points and should be greased as indicated:

(1) (Fig. 1). Plunger socket - head casting - every 8 working hours.

(2) (Fig. 1). Cross shaft bearing - head casting - every 8 working hours. Mechanical only.

(3) (Fig. 1). Fulcrum arm - every 8 working hours. Mechanical only.

(4) (Fig. 3). Disc coulters - every 4 working hours.

(5) (Fig. 10). Swivel bracket - depth wheel (if fitted) - every 8 working hours.

(6) (Fig. 10). Depth wheel (if fitted) - every 4 working hours.

(7) (Fig. 12). Trip leg (if fitted) - every 40 working hours.

Note: The barrel of the head casting containing the main spindle is packed with grease and needs no further lubrication unless dismantled for any purpose.

Clean the grease nipples and the nozzle of the grease gun before greasing. Moving parts on the headstock and frame not fitted with grease nipples should be lubricated to ensure easy movement.

5. COUPLING PLOUGH TO TRACTOR (Fig. 1)

Place tractor hydraulics in 'Position Control' so that when the plough is first raised it can be easily controlled to ensure that it does not foul any part of the tractor, including the cab when fully raised.

Remove the drawbar if it is likely to foul the plough. It will be necessary to shorten the lift rods to give 381 mm (15 in) minimum clearance between the point of the front body and the ground when the plough is lifted.

Where "floating" and "rigid" positions on the lift rods are provided the "rigid" position must be used.

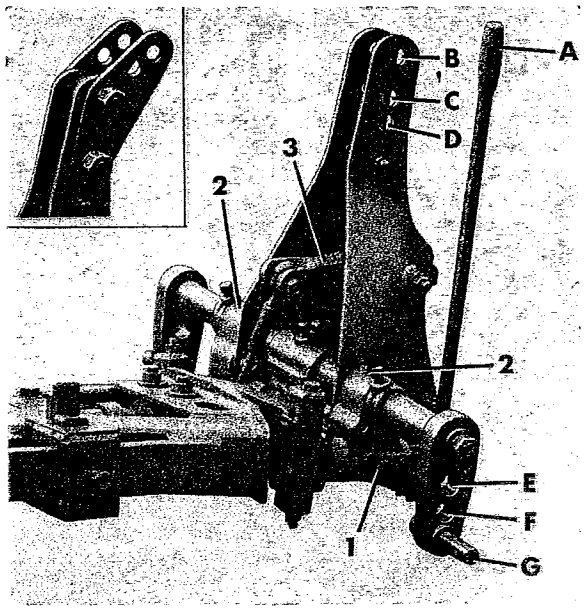


Fig. 1

With the plough on fairly level ground, back the tractor squarely up to it and place the upper link between the headstock plates.

Apply the tractor handbrake and dismount.

Fit the left hand lower link.

Next fit the right hand lower link adjusting the length of the levelling lift rod if necessary.

Finally secure the upper link to the headstock plates in the holes required (see below) by means of the pin. Re-set the length of the levelling lift rod if necessary, so that both lift rods are exactly the same length.

If the plough is fitted with hydraulic reversing head connect the two hoses 'A' (Fig. 2) to the tractor valve.

Three sets of holes are provided in the headstock for attaching the upper link and three holes in the cranks for the lower links to suit varying conditions of work.

Position 'C' is normally used for medium conditions, with position 'B' as an alternative position, and position 'D' for heavy conditions. In conjunction with the above the lower hitch pins should be in position 'E' for light conditions, position 'F' for medium conditions and position 'G' for heavy conditions.

If the plough is to be mounted on a David Brown 990 tractor extension plates will have to be fitted to the headstock. These plates should also be fitted if difficulty is experienced in obtaining the 381 mm (15 in) required between the point of the front body and the ground. The upper link should normally be fitted to the lower of the two holes, with the top position as an alternative.

Note : If the plough is fitted with a depth wheel, position 'B' for the upper link and position 'G' for the lower links should be used.

For the location of the tractor end of the upper link see "Tractor Operators Manual". Raise the plough using the tractor hydraulics, remove the stand and place in the working position.

Do not attempt to operate the reversing mechanism (mechanical or hydraulic) whilst standing beside the plough. Ensure there is no one standing near the plough before operating the reversing mechanism.

6. HYDRAULIC REVERSING HEAD (Fig. 2)

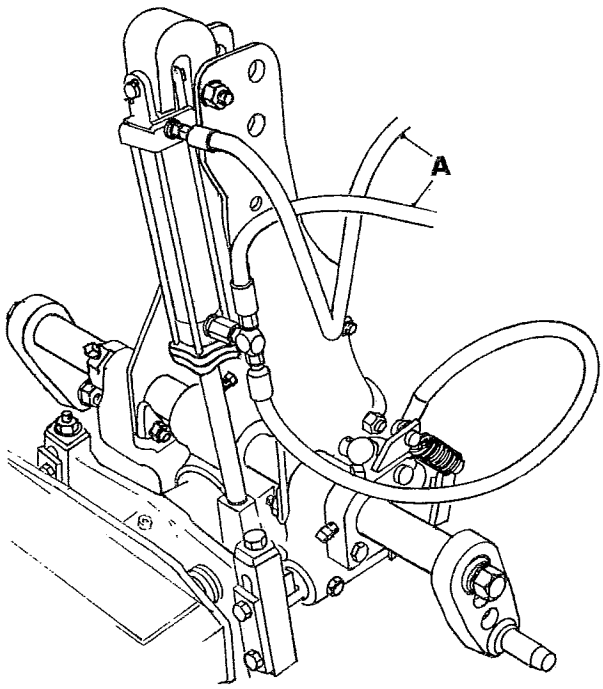


Fig. 2

To operate the hydraulic reversing head move the lever of the spool valve forwards or backwards from the neutral or locked position. This will disengage the plunger from the plunger casting. The reversing ram will then close, turning the plough to the horizontal position. **Quickly move the lever of the spool valve to its full travel in the opposite direction.** Keep the valve open until the plunger is re-engaged, then return the lever to the neutral position.

No adjustments are necessary to the hydraulic reversing mechanism.

For plough balance adjustment see paragraph 16.

7. LIFTING AND LOWERING

This is controlled by the lever operating the hydraulic system.

Details for operating the mechanism are given in the Tractor Operators Manual. It is recommended that draught control position is selected where the tractor has the alternative positions of draught or depth control on the hydraulic system.

8. CHECK CHAINS

Where adjustment is provided the chains should be adjusted so that they are slack when in work but at the same time short enough to prevent the plough or lower links swinging excessively and fouling the tractor wheels when in the lifted position.

9. DISC COULTERS (Fig. 3)

No work should be attempted with the plough in the raised position. Either suitably suport plough in the raised position or lower it to the ground.

Disc coulters should be used whenever possible as the ploughing will be greatly improved. The plough will also be easier to pull, the wear on the mouldboards and shares will be less and there will be less build-up of trash.

It is advisable to set the discs as accurately as possible before commencing to plough but final adjustments will need to be made after it can be seen how they are operating.

In normal conditions a disc coulter should be set with its centre above the point of the share.

Slacken nut 'A' and slide disc coulter along the arm to the correct position. Tighten nut. The stalk casting has a cast indent at its top and the serrated washer has two cast indents 180° apart. These enable each disc to be set the same amount.

In hard conditions raise the disc coulter and move to the rear of the plough. The underside of the hub should be clear of the ground at working depth.

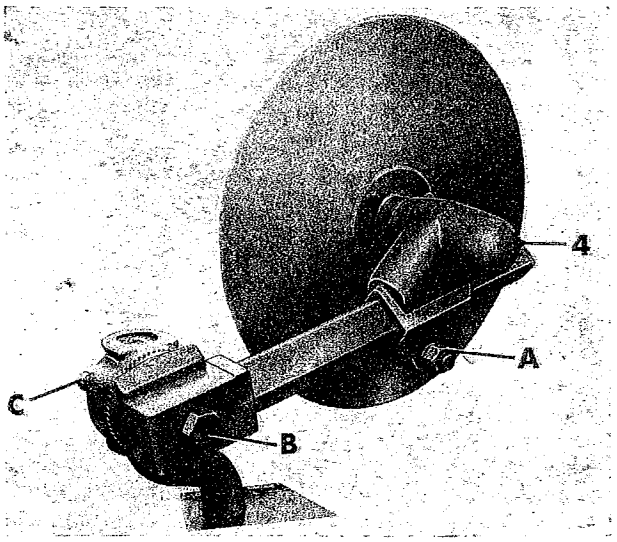


Fig. 3

(a) Vertical Adjustment

Slacken bolt 'B' and move the coulter arm up or down as required. For deep ploughing raise the disc. Tighten bolt.

(b) Lateral Adjustment

Slacken stalk clamp nuts and rotate the stalk to the position required. About 12 mm ($\frac{1}{2}$ in) should be allowed between the landside of the share and the disc when it is held parallel to the plough frame.

(c) Side Movement

The stop collar 'C' should be set so that the coulter arm has an equal amount of movement on either side of its working position.

If skim coulters are fitted, the stop collar 'C' should be set so that the discs are only allowed to move approximately 36 mm ($1\frac{1}{2}$ in) from the skim coulter.

When adjustments have been carried out see that all nuts are tightened.

10. SKIM COULTERS (Fig. 4)

(a) NC and SN (Fig. 4)

These should be set just deep enough to ensure that all rubbish is buried. They should be set at not too abrupt an angle and with the point as close as possible to the disc but not touching it.

Finer adjustments are provided by loosening nuts 'A' and moving the skim body round, or up and down the stalk as required.

The stalk can be swivelled by means of the eye-bolt 'B' to bring the skim nearer to or further from, the disc as required. Before adjusting eyebolt loosen nuts 'C'.

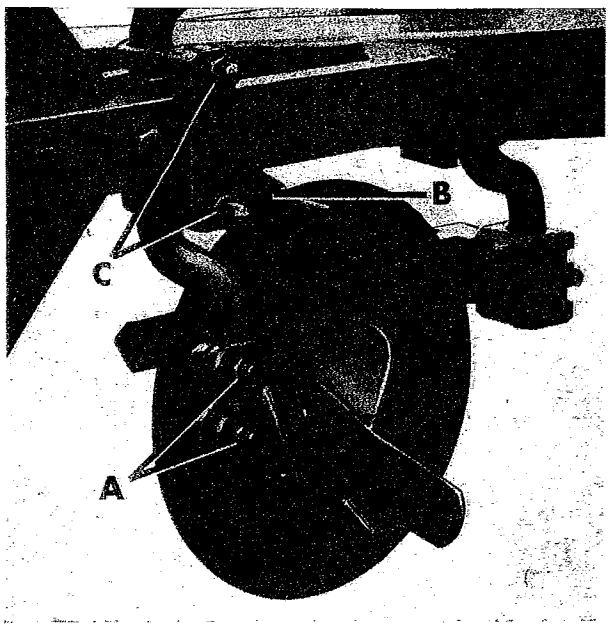


Fig. 4

(b) **WR (Wrap round)** (Fig. 5)

Fore and aft and vertical adjustments are obtained by loosening the setscrew 'A' and adjusting as required.

Lateral adjustment is made by loosening the same setscrew and repositioning the packer 'B'. Re-tighten setscrew.

It is recommended that the skim is set to work 22 mm ($\frac{7}{8}$ in) wider than the cut of the plough. The wrap round skim should always be used in conjunction with sword landside.

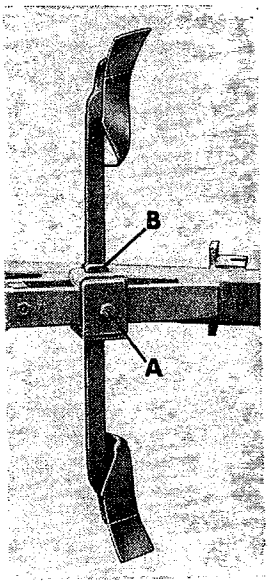


Fig. 5

11. SIDESHIFT (Fig. 6)

The sideshift incorporated in the plough gives an alternative position for the head in relation to the frame. This provides a difference of 100 mm (4 in) in the tractor wheel settings allowing for 1.524 m (60 in) centres to be used instead of 1.626 m (64 in) or 1.727 m (68 in) as shown in paragraph 2.

To convert to the offset position, uncouple the plough from the tractor. **Support the main frame safely but do not support the head, and ensure that with a mechanical reversing head it is in the locked position.**

Refer to upper illustration (Fig. 6).

Remove bolts from position 'A' and 'C' and the plugs from position 'D'. Unscrew nut 'F' on the eyebolt approximately 50 mm (2 in) and move spindle 'H' so that the screwed inserts 'E' can be removed from holes at position 'C'.

Move spindle back to its original position.

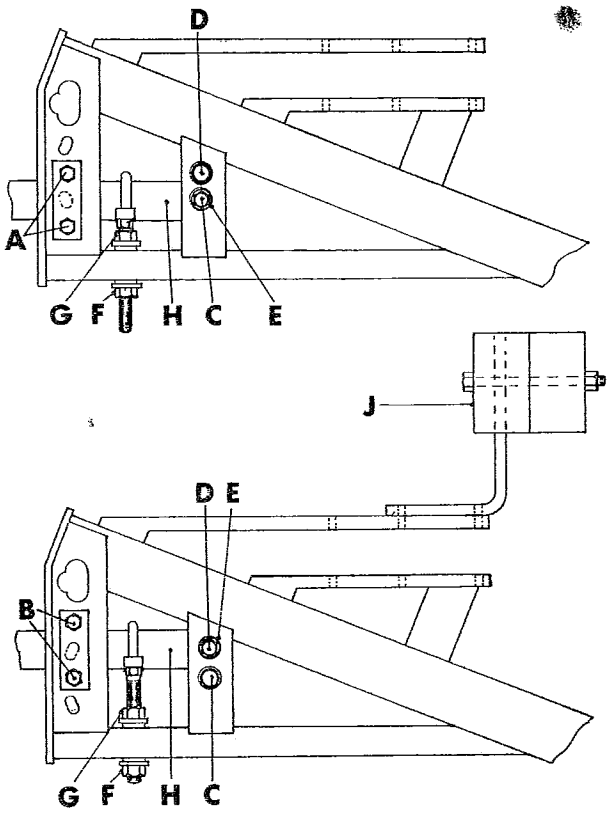


Fig. 6

Refer to lower illustration (Fig. 6).
Fit screwed inserts 'E' into holes 'D' ensuring that there is sufficient clearance for the spindle to pass between them.

Move the spindle to line up with holes 'D' and fit bolts into positions 'B' and 'D'. Tighten nuts 'F' and 'G' on eyebolt, then tighten nuts at 'B' and 'D'.

Fit plugs into holes at 'C'.
Before commencing work, balance plough as directed in paragraph 17.

Note : Balance weights 'J' must be fitted to plough with mechanical reversing head when used in the offset position.

Balance weights are not required with hydraulic reversing head.

12. PUTTING THE PLOUGH TO WORK

It is important to see that the rear wheels of the tractor are not in a low spot on the headlands when reversing the plough. The distance from the underside of the point of the front share to the ground when fully raised should not be less than 381 mm (15 in).

The plough bodies swing under when reversing and damage to the mouldboards may result if they are allowed to strike the ground.

Under no circumstances should the plough be lowered to the ground with the mouldboards reversed to the halfway position.

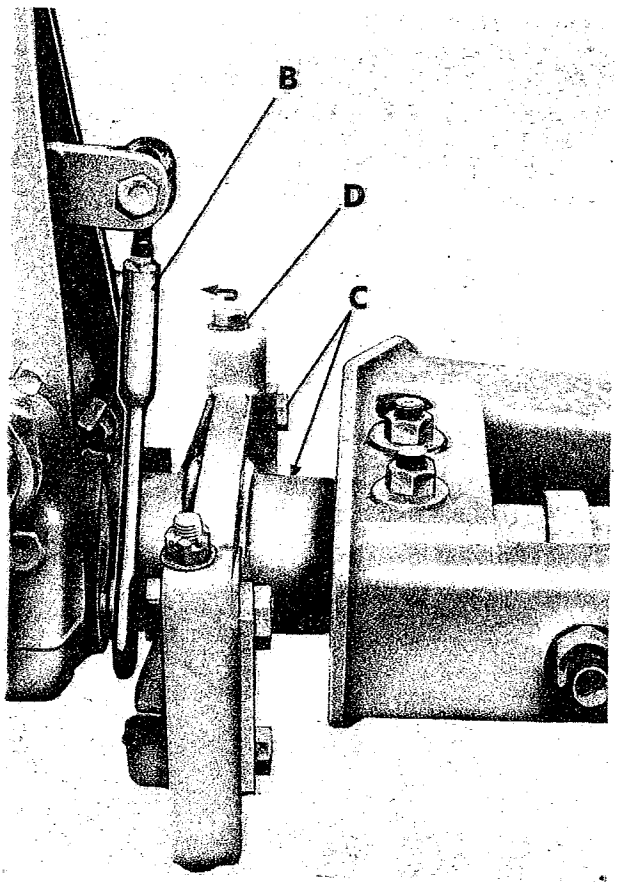


Fig. 7

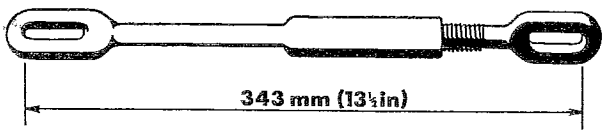


Fig. 7a

For ploughs with mechanical reversing head only

Raise the plough, and while seated on the tractor pull the lever 'A' (Fig. 1) towards you.

When the plough starts to rotate release the lever immediately.

If it is found that the plough reverses too quickly the connecting rod 'B' (Fig. 7) should be lengthened (Fig. 7a).

As an initial setting the rod should be 343 mm (13½ in) between the inside ends of the loops.

The rod should then be adjusted half a turn at a time until the plough just turns over and locks in position.

This adjustment should not be regarded as a means for making the plough reverse if any quantity of material builds up on it during work.

Under no circumstances should the connecting rod be adjusted too short so that a tension load is imposed on it in work.

When the plough is working in the ground the rod should be slightly slack.

It is advisable at this stage to check all discs, skims and tailpieces for correct positioning and adjust if necessary.

Rotate the bodies to plough right hand first, and level the plough ensuring that the first furrow is cutting the required width. Now adjust the tractor upper link so that the heel of the rear landside is lightly marking the furrow bottom.

On completion of the first right hand run lift the plough and reverse the bodies to allow left hand ploughing on the return.

Level the plough as for right hand work (see paragraphs 13, 14 and 16).

The plough should be running level and working at an even depth on both right hand and left hand bodies.

13. LEVELLING THE PLOUGH (Fig. 7)

Independent wing adjustment is provided for levelling each set of bodies to give a vertical furrow wall and equally sized furrows.

To raise the right hand wing :

Loosen setscrews 'C' and turn the wing adjusting bolt 'D' as indicated by the arrow.

To lower the right hand wing :

Turn bolt 'D' in the opposite direction to that indicated.

To raise and lower the left hand wing :

A similar procedure is adopted for the left hand bodies using the setscrews and adjusting bolt opposite to those used for the right hand bodies.

Tighten setscrews.

14. ADJUSTING BODY PITCH

(a) **Share Bodies** (Fig. 8)

The pitch on the right hand body is controlled by the length of the tractor upper link. It should be adjusted immediately the working depth has been reached so that the heel of the rear landside is lightly marking the furrow bottom.

When the upper link has been set for right hand ploughing the same setting should be correct for left hand ploughing. If this is not so a check should be made that the pitch on the left hand bodies (which is adjustable) is the same as on the right hand bodies.

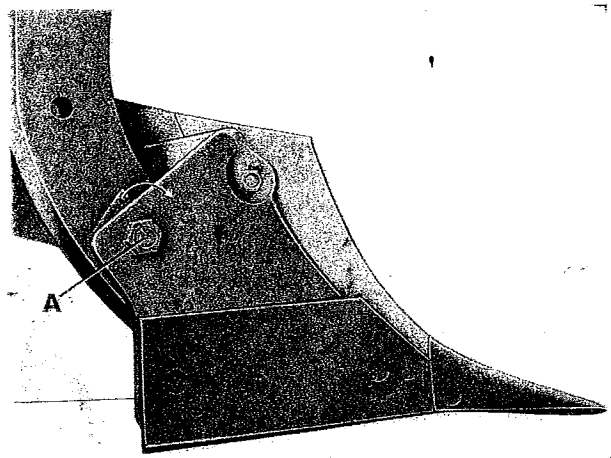


Fig. 8

To adjust, slacken the bolts holding the left hand bodies to the legs.

To decrease the pitch, turn the head of the eccentric bolt 'A' in the direction of the arrow and vice versa if more pitch is required.

Tighten the bolts.

Finally re-check the pitch to ensure no movement has taken place whilst tightening.

(b) **Bar point Bodies**

On bar point bodies the pitch is adjusted by extending or retracting the bar point. An eccentric bolt is not fitted to these bodies.

The bar point is provided with a series of recesses to enable it, when worn, to be either moved forward or turned over so that the correct pitch is maintained.

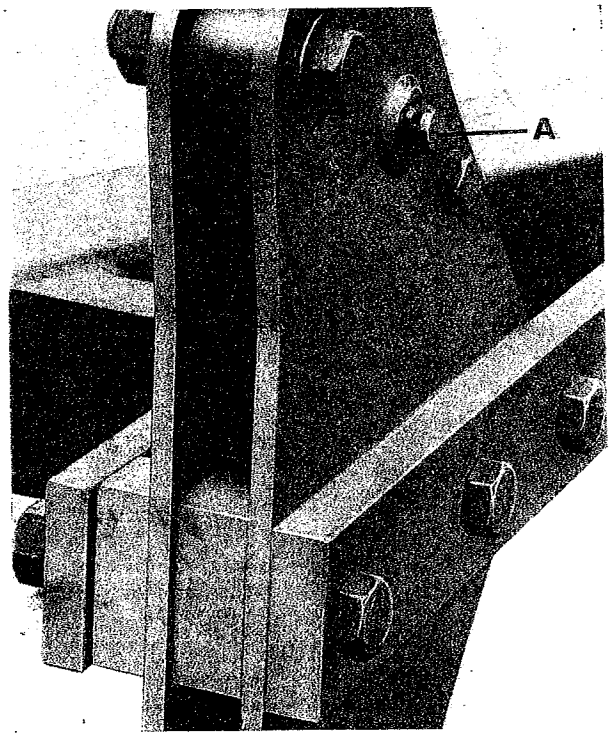
WARNING - **NEVER PUSH THE BAR OUT FURTHER THAN 125 mm (5 in) FROM THE POINT OF THE BAR TO THE FRONT EDGE OF THE SHARE BOX FOR THIS WILL LEAD TO EITHER BENDING OF THE POINT OR BREAKING OF THE BOX.**

15. WIDTH OF CUT (Fig. 9)

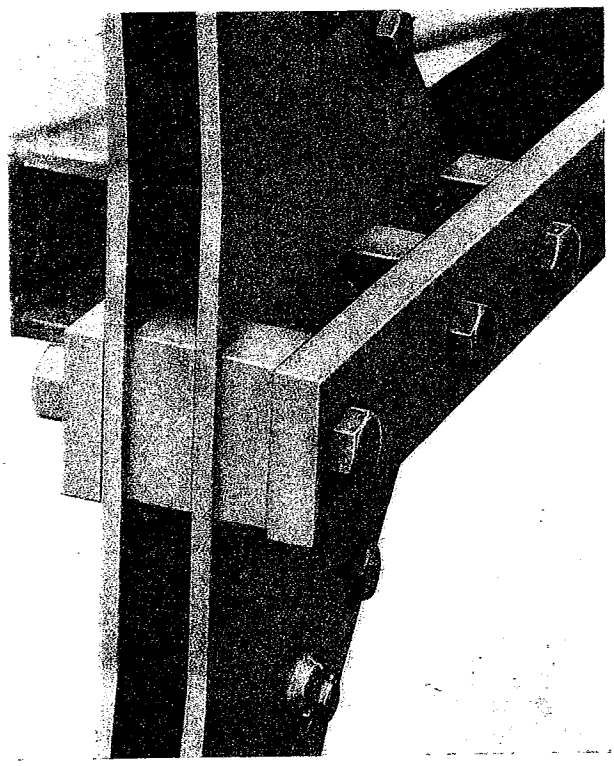
The plough can be used with either 356 mm (14 in) or 406 mm (16 in) width of cut. Fig. 9 shows the position of the legs and packers for 356 mm (14 in) work. To convert to 406 mm (16 in) width of cut remove the legs and bodies complete from the frame. Place the front set in the rear position and the rear set in the front position.

Change the landsides so that the long landside is fitted to the rear body.

Alter tractor wheel centres to the recommendations in paragraph 2.



REAR LEG



FRONT LEG

Fig. 9

16. FRONT FURROW ADJUSTMENT (Fig. 6)

To increase the width of cut of the right hand front body loosen bolts 'A'. Slacken nut 'F' and tighten nut 'G'. To decrease the width of cut of the right hand front body turn nuts 'F' and 'G' in opposite direction to above.

After adjusting make sure that nuts 'F' and 'G' and bolts 'A' are fully tightened. Having obtained the correct front furrow width for right hand work no further adjustment is necessary for left hand work.

17. PLOUGH BALANCE (Fig. 6)

In order to maintain trouble free reversing of the plough it is essential that it is correctly balanced and turns at an equal speed in both directions.

Raise the plough on the tractor hydraulics, reverse in the normal manner and then pull the trip lever again and allow the plough to rest in the half turned position with the bodies facing downwards. If the balance is correct it will remain horizontal on level ground.

If the plough lays to the left correct the balance by slackening off the through bolt 'C' and backing off the adjusting screw 'E'. Screw in the adjusting screw on the other side of the plough until it maintains a true horizontal position.

Tighten the first adjusting screw and re-tighten the through bolt.

18. SHEAR BOLTS (Fig. 10)

Shear bolts can be supplied in kit form as an alternative extra. Should a body strike an obstruction the shear bolt will break allowing the body and leg to swing back thus avoiding damage.

To fit the shear bolt kit raise the plough to give a clearance of 305 mm (12 in) between the ground and share point. **Support the plough.**

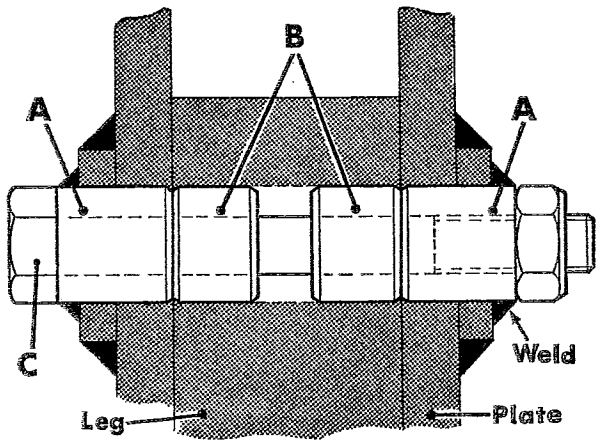


Fig. 10

Remove the 20 mm bolt (not the pivot bolt) which supports the leg. Swing the body away leaving the hole in the leg to take the shear bolt exposed.

The body must be supported for safety.

Assemble the two outer bushes 'A' ensuring that the inside faces of the bushes fit flush to the inside face of the leg plates. Tackweld bush in position as shown.

Press leg bushes 'B' into position.
Swing body back into position and fit shear bolt and nut.

Fit $\frac{5}{8}$ in x $3\frac{1}{4}$ in bolt and Nyloc nut. Ensure nut on pivot bolt is tight.

It is recommended that spare shear bolts (A100418) and nuts (A133110) are kept in the tractor toolbox to avoid delay in case of breakage.

19. TRIP LEGS

Safety release legs (Fig. 11) can be fitted in place of the standard legs and are recommended for working in abnormal conditions — for instance, when ploughing land embedded with boulders, roots etc. On striking an obstruction the legs swing back (Fig. 11a) to release the body which is afterwards reset by backing the tractor.

To adjust the trip resistance raise the locking cam with a $1\frac{1}{8}$ in spanner (Fig. 11b), and rotate the spring guide. Turning the spring guide clockwise tightens the spring and increases the trip resistance. Make adjustments in a series of two or three turns at a time.

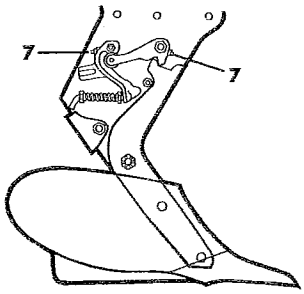


Fig. 11
Work position

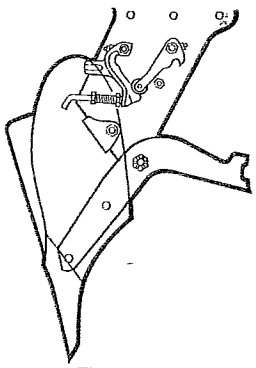


Fig. 11a
Release position

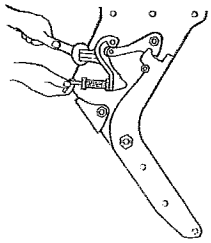


Fig. 11b

20. DEPTH WHEEL (Fig. 12)

Supplied for use with tractors not fitted with draught control or any form of preset linkage and fitted to the rear of the beam with the right hand bodies in the "down" position. The bracket must be fitted so that the hole for the locking pin 'A' is to the rear of the plough.

Fig. 12 shows the position of the pin 'A' when the wheel is used to control the depth of work when ploughing.

To adjust, loosen setscrew 'B' and raise or lower the wheel to obtain the depth required, when adjusted tighten the setscrew.

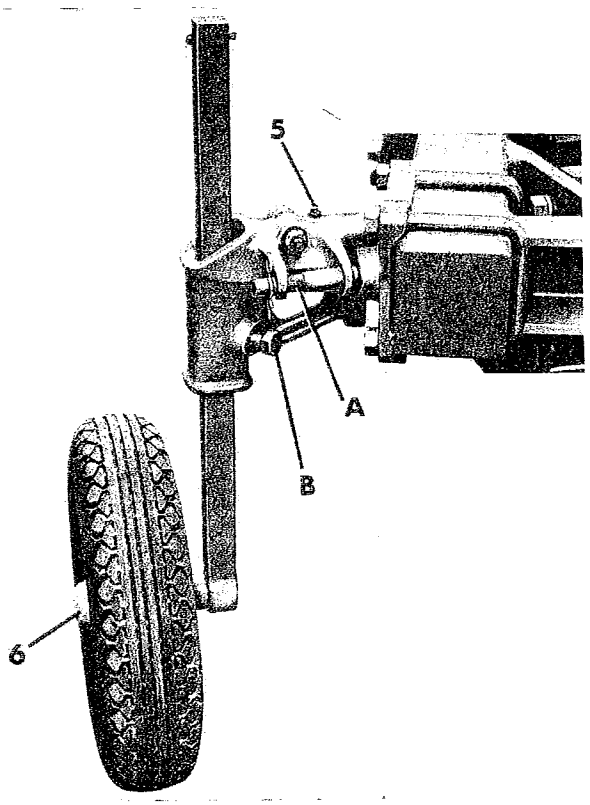


Fig. 12

No other adjustment is required as the wheel will swing over when the plough is reversed to take up the correct position when ploughing the opposite hand.

The tyre should be inflated to a pressure of 4.1 bar (60 lbf/in^2). This should be checked every 40 working hours.

21. TRANSPORT (Mechanical reversing head)

On completion of ploughing and prior to transporting over any appreciable distance, lift the plough at the headland and rotate the bodies.

This will ensure that the reversing mechanism is in the "unloaded" position thereby eliminating any possible strain.

Failure to do this may cause unnecessary breakages.

22. MAINTENANCE

After the first hour of work all bolts, setscrews etc., should be checked for tightness.

A periodical inspection and tightening of all bolts, nuts ets., will materially assist in maintaining the plough in good condition.

To ensure long life and good results attention should be given to the following points :

Lubricate all bearings etc. (see paragraph 4).

It is advisable for the coulters and mouldboards etc., to be brushed over with oil at the end of each day's work to prevent corrosion.

Used engine or gear oil is suitable for this purpose.

Do not continue working the plough with worn and broken parts. Such parts should be replaced at the first opportunity.

The use of non-genuine spare parts will nullify any warranty on the implement.

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