

'H' TRAILER MODEL

OWNER'S HANDBOOK

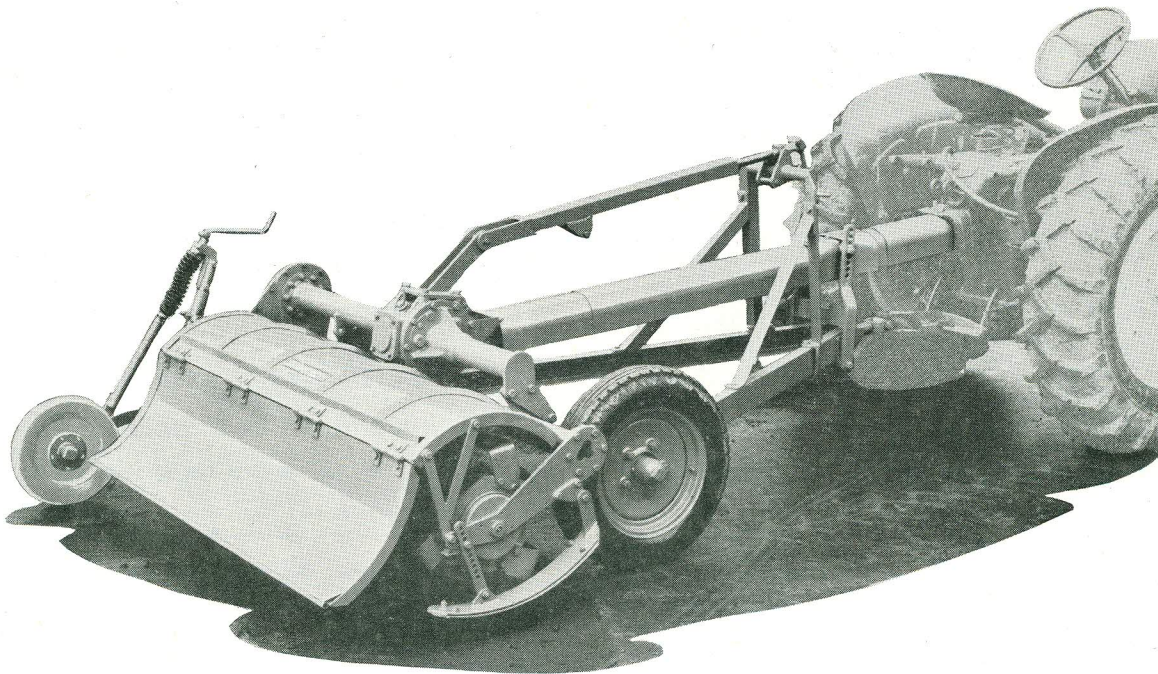


*By Appointment
to Her Majesty the Queen
Manufacturers of
Agricultural Equipment
Rotary Hoes Ltd.*

ROTARY HOES LIMITED
WEST HORNDON · ESSEX
ENGLAND

Telegraphic Address
ROTAVATOR BRENTWOOD

Telephone No.
HERONGATE 361



General Description

Fig. 1 shows a standard type machine. The user will note that the 'H' type machine consists of a triangular subframe, at the base or rear of which are two land wheels and at the front apex of the triangle is the towbar hitch for attachment to the tractor drawbar. The rotor, rotor shield gearbox, and chain drive which make up one assembly, are attached to and pivoted on the subframe wheel axle, and are free to oscillate about this axle. Thus the forward thrust of the rotor is maintained in a straight line from the rotor through the wheel axle to the hitch point on the tractor.

The oscillating movement of this assembly is controlled by a counter-balancing spring and screw built into the top carrying beam, the front end of which is attached to a support bracket fixed to the subframe. The rear end of this beam is attached to a pedestal bolted to the gearbox.

The rotor unit can be raised for transportation purposes by using the spring control screw, but it is not intended for use as a depth control. Depth of cut is controlled by the adjustable depth control wheel and a screw and handle are provided for the purpose above the wheel on the rear nearside. A depth limit skid is provided on the offside of the machine to prevent the rotor from digging too deep and clogging when the offside land wheel drops into a depression in the land.

Provision for driving the gearbox from the tractor P.T.O. is made in the form of a universal joint assembly and an expanding extension shaft which is itself universally jointed to the gearbox. The forward universal joint is supported at its rear end by a support bearing, held between two forks, pivoted from the subframe, and free to move forward or backwards according to the movement of the tractor in relation to the machine when traversing undulating ground. In addition this feature allows a wide range of tractors to be connected to the machine without the use of special adaptors.

Thus power provided by the tractor is transmitted through the universal joint and extension shaft to the gearbox, and from there by crown wheel and pinion, jackshaft sprockets and chain drive to the rotor assembly where it is transferred by the blades into useful work. A safety clutch is built into the rotor assembly to prevent damage to the operating mechanism and the tractor. Provision is made to adjust the drive chain externally.

The machine is designed to be used with tractors developing up to 65 B.H.P. on the P.T.O. shaft.

SPECIFICATIONS 'H' TYPE SERIES II TRAILER

Horse Power Range: up to 65 B.H.P. at Tractor P.T.O.
 Operating Widths according to tractor: 60", 70", 80".
 Overall Width: 60" Model 72"
 70" Model 82"
 80" Model 92"

Overall length: 11 ft. 2 ins.
 Towbar hitch to depth control wheel.
 Weight (Standard Machine)
 60" Model 1484 lbs.
 70" Model 1568 lbs.
 80" Model 1680 lbs.

Tyre Size: Land Wheel, 5.50 x 16 rubber implement.
 Tyre Pressure: 22 lbs. p.s.i.
 Number of Blades per Flange: 3 each hand.
 Total Number of Blades:

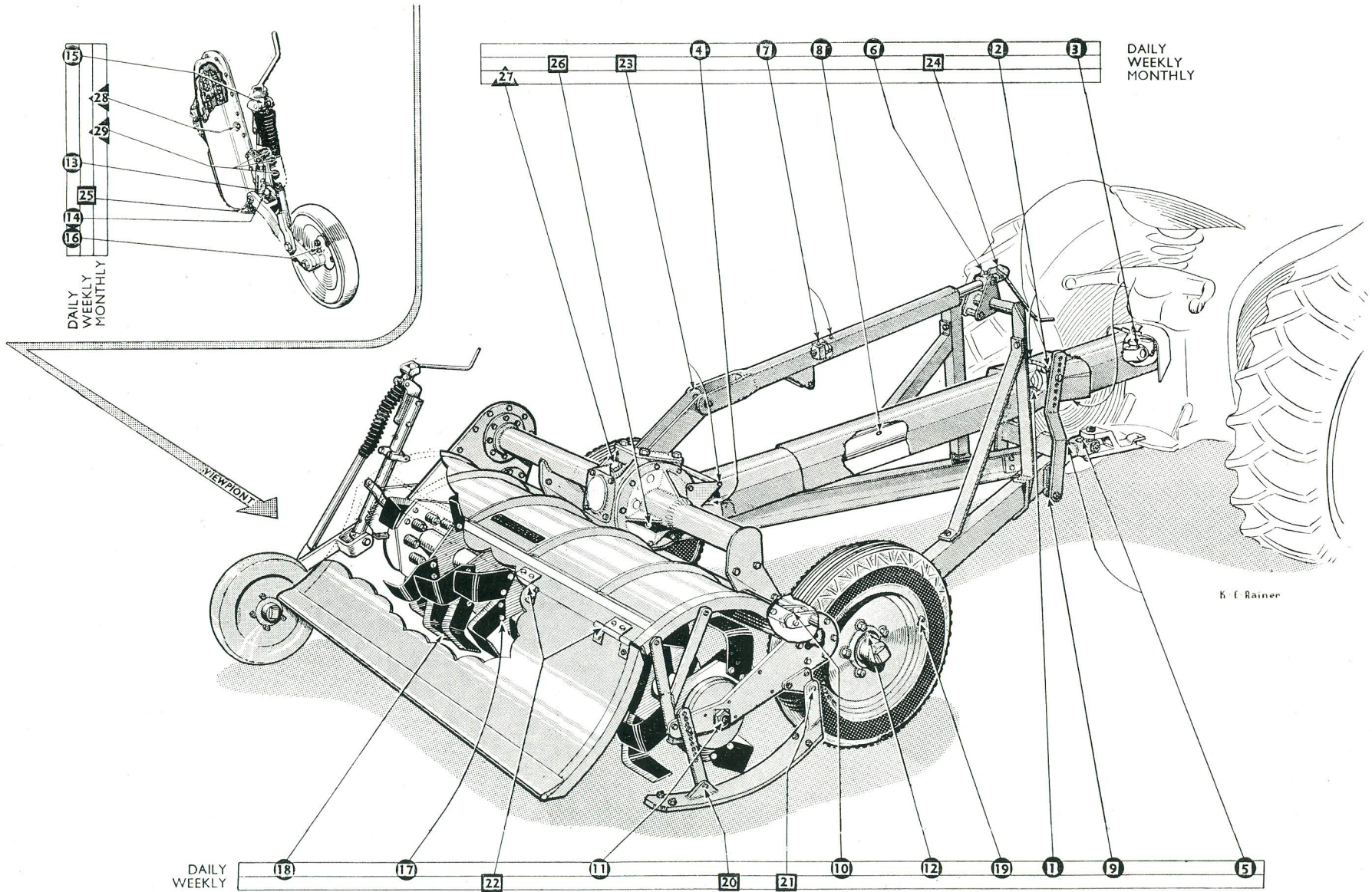
	Left Hand	Right Hand
60" Model	18	18
70" Model	21	21
80" Model	24	24

Capacities: Gearbox 2 pints
 Chaincase 2 pints

Extra Equipments:

- Dog clutch and remote control lever.
- Hydraulic lift ram.
- Depth control skids cam locked.
- Swivel type towbar hitch.
- Depth control wheel and rubber tyre 16 x 3.
- Tail board depth control.
- Adjustable rear shield flap.
- Picktine rotor and picktines.
- Two bladed rotor.

The machine Serial Number is stamped on the brass plate on the front of the gearbox, and again on the jackshaft tube.



**MAINTENANCE AND LUBRICATION GUIDE FOR THE
 "H" TRAILER**

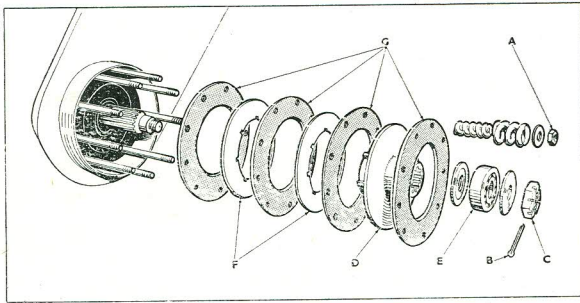


Fig. 11

the rotor. Remove the split pin (A) locking the securing nut (B) in to the centre of the clutch. Remove the plate (D) and support bearing (E), dismantle the clutch plates (F) and old clutch lining discs (G). Clean the assembly in paraffin and reassemble the clutch with the new linings. Remember that a friction disc goes on first followed by a steel plate. The discs fit on the studs and the steel plates around the studs, these are fitted alternately finishing with a friction disc. Now refit the outer steel wearing plate, the special washer bearing and securing nut and then refit the rotor and clutch springs and nuts. Remember to reset the clutch and reset again after one hour's work.

Depth control skid adjustment (Extra Equipment)

Adjustment to the skids to vary the depth of work is carried out by raising the rotor unit. Turning the lever (A) clockwise turns the eccentric pin and allows the skid adjusting bar (B) to become free, thus allowing the skid to be positioned to requirements. Select the desired notch or recess in the adjusting bar, and relock by turning lever (A) anti-clockwise. Remember to always set both skids into the same notch.

A replacement wearing plate is provided, and is replaced by removing the four securing bolts taking away the old plate and refitting the new.

Storing the machine

When it is necessary to lay the machine up during long periods between seasons, proper attention will ensure that it is ready for work once again when needed.

Clean the machine thoroughly paying attention to the underside of the shield. Complete the lubrication and maintenance sections thoroughly, and wipe off the excess oil. Change any blades which are worn out. Straighten as necessary bent blades.

Reset the safety clutch and adjust the driving chain. Replace any broken bolts and generally tighten up all round. Spray the underside of the shield, rotor and blades with a rust inhibitor, which your local Agent will supply. Smear the inside of the P.T.O. yoke with grease and the towing pin in the yoke. Wire the towing pin in yoke (they get lost). Touch up the paintwork where damaged. Block up the axle until the wheels are off the ground. If possible cover with a tarpaulin.

Make the Most of Your Rotavator

THIS section of your Handbook is based not only on long practical experience of rotary cultivation, but on tests and work done at various universities and colleges.

To give some examples: seed bed preparation and the germination of seed in seed beds prepared with our machines have been studied at Wye College, Kent; much land reclamation has been done at the farm of the University College of Wales near Aberystwyth; weed control, and the eradication of couch have been the subject of experiments at Durham University.

Research of this kind, and the day-to-day experience of owners in over a hundred countries, support the claim that this machine, when used wisely and with understanding, is one of the most valuable and versatile agricultural implements made today.

Although the following notes are based on the English system of farming, they show clearly the principles of rotary cultivation, and overseas users should find little difficulty in applying these principles to their own crops and conditions.

General

The machine takes power direct from the tractor and puts it to the land through its rotor and hoe blades. The speed of the rotor is directly related to that of the power take-off shaft and does not vary with different tractor gears. It is determined by the size of jackshaft sprocket used. Your dealer will recommend the most suitable size of sprocket for your conditions and class of work.

Type of Tilth

The type of tilth, coarse or fine, produced by the machine can, in general, be controlled. The following factors affect the type of tilth produced:

- (1) The type of soil—light or heavy.
- (2) The speed of travel of tractor and machine
- (3) The moisture content of the soil.
- (4) The position of the shield.

(1) The Effect of Soil Type

The amount of clay present in the heavier soils gives them cohesion. It is, therefore, possible to vary the type of tilth produced on a heavy soil, cloddy for autumn sowing and the winter fallow, and fine for spring sowing.

The amount of clay present in a light soil is insufficient to give cohesion to groups of particles. A fine tilth is, therefore, produced on a light soil.

(2) The Effect of Speed of Travel

The speed of travel of the tractor and machine, which can be varied, in relation to the speed of the rotor, determines the size of the slice of soil cut by the hoe blades. If the tractor is travelling

in high gear, a coarse tilth will be produced; if the tractor is travelling in low gear, a fine tilth will be produced. The operator must, therefore, use the tractor gears to obtain the type of tilth required.

(3) The Effect of Soil Moisture Content

There is a certain range of soil moisture content, which the farmer easily recognises, when the soil is in a condition which is most suitable for cultivation operations. Rotary cultivation within this range of moisture content enables the tilth required to be produced. If a soil has a high moisture content, then it "balls", if the soil is too dry then dust as well as coarser aggregates will be produced. Generally speaking, satisfactory results can be produced by rotary cultivation under wetter soil conditions than those suitable for ploughing.

(4) The Effect of the Hinged Shield

When the shield is raised, a relatively coarse tilth is produced as the slice cut is not broken by impact on the shield. With the shield lowered, a finer tilth results as the clods tend to break on hitting the shield.

The hinged shield should be folded back when the machine is being transported.

The Cultivation of Heavy Land

(a) FOR AUTUMN SOWING

In order to enable the soil to deal with the winter rainfall and in order to provide protection for the seedlings, it is generally recognised that a rough tilth is necessary for an autumn seed bed. To obtain this rough finish, the tractor should have as high a ground speed as is possible for the depth of cultivation desired. The depth of cultivation should preferably be between four and six inches. The shield of the machine should be raised.

(b) FOR SPRING SOWING

The production of tilth for a Spring bed is greatly assisted by frost action during the winter. Frost action on the maximum amount of soil is obtained when the land is left rough. In the autumn the land should be cultivated at high tractor speed with the machine shield raised. The tilth produced by the frost during the winter will be confined to the top few inches of soil. In the Spring, the weathered soil should be cultivated to a shallow depth. If a second cultivation is required it should be shallower than the first. As the surface soil in the Spring is usually friable, the tractor speed can be high. To obtain a fine finish, the shield should be lowered.

The Cultivation of Lighter Lands

To produce a tilth it is unnecessary to leave the lighter soils rough for the winter, all cultivations being carried out in the Spring. There is also little danger of producing a tilth which is too coarse

for a seed bed. The travel speed of the tractor can be high and the machine set for the full depth of cultivation desired. Two passes are generally sufficient to produce a seed bed. If the second cultivation has a depth of about two inches, it can also be used to produce a weed-free bed.

Weed Control

Weeds are of two types, annual and perennial, the perennial types being the more difficult to control.

Weeds do their greatest damage during the early stages of crop growth. The primary object should be, therefore, the production of a weed-free seed bed. Usually it is the weed seeds in the top two inches of a soil which germinate and compete with the crop in its early stages. Having obtained a tilth by means of the machine, the weed seeds should be allowed to germinate. This usually requires a period of ten to fourteen days. At the end of this period, the land should be cultivated to a depth not exceeding two inches. This cultivation will kill the young weeds and a weed-free seed bed will have been produced.

The most important perennial weeds are couch (*Agropyron repens*) on heavy land, and twitch (*Agrostis spp.*) on light land.

To eradicate couch, it is almost always necessary to have a fallow for a portion of the year. On heavy, wet clay five cultivations have been found necessary to eradicate couch. The cultivations should be given at approximately three-weekly intervals when the cut-up rhizomes have re-rooted and green leaves are appearing above ground.

Twitch eradication on light land has been successfully carried out in three passes using a similar technique to that for couch eradication.

Bracken Eradication

The main bracken rhizomes and bud stems are seldom situated more than 5-6 inches deep but there appear to be occasional rhizomes about 2-3 inches deep below the surface. The first pass should be shallow to deal with the rhizomes at 2-3 inches depth. The cut-up rhizomes will die out in two to three weeks. A second pass to a depth of 6 inches should be given at the end of this period. A third pass at the end of a further two or three weeks to a depth beyond six inches should be given to disintegrate all the remaining underground parts of the plant.

Bracken rhizomes when cut-up by the machine dry out and die very quickly. In view of this it has been suggested that the control of bracken by rotary cultivation can be carried out at any season of the year.

Rotary cultivation is also a quick and valuable method for preventing bracken from encroaching on clean land. It is only necessary to run the machine along the outer limit of the encroachment to form a "bracken break", repeating the run in future years if bracken fronds appear in the cultivated strip.

Green Manuring

The objects of green manuring are either to conserve the nitrogen in the soil during a period that is likely to be wet or to add organic matter which on decomposition will produce humus. Green manuring will have its greatest effect when the green manure crop is thoroughly mixed with the soil. This machine is the ideal implement for this purpose since in one operation it chops up the crop and incorporates it efficiently with the soil.

The Breaking Grassland

It is a well-known fact that land that has been down to grass for a number of years has an improved and more stable structure than similar land which has been under arable crops. One of the objects of ley farming is to improve soil structure during the arable portion of the rotation. The improvement in structure is closely associated with grass roots and is greatest near the soil surface where the grass roots have had their maximum development. The breaking of the ley or grassland is a most important operation. If the ley is broken too deeply, then the soil with the best structure is buried and the

benefit of the ley to the arable portion of the rotation is reduced. The ley should be broken up so that the soil with the best structure is retained near the surface and the organic matter accumulated in the soil during the ley is mixed with the soil to maintain the structure as long as possible. Both these objects can be best achieved with this machine.

The best technique is a shallow cultivation to break up the turf and mat, and allow an interval of from two to three weeks to kill the turf, and then two deeper cultivations to mix lime and fertilisers with the soil and to bring up some soil to make a mulch with the disintegrated turf. It has been shown that the turf soil mulch gives a better seed bed and germination than obtained where the turf is turned in by ploughing.

Liming

Authorities agree that lime has its greatest effect in neutralising soil acidity when it is evenly distributed on the soil surface and vertically throughout the soil depth. Investigations have shown that the machine gives the best vertical mix of materials to be incorporated with the soil. Having obtained even horizontal distribution of the lime with a lime-spreader, even distribution of lime vertically can be best obtained by rotary cultivation.

Land Reclamation

Land covered with gorse, bramble and other scrub can be reclaimed with the machine. Light machines should not be expected to carry out heavy reclamations; there are heavy duty models for this work.

The number of passes required varies with the density of the scrub and the depth of rooting. The final pass can be used to mix in lime and fertilisers and to prepare the seed bed for re-seeding. Land treated in this manner in Wales and in the Isle of Man has been fit for grazing within six weeks.

Combine Straw

If the combine straw is not to be baled, it is worth while putting it back into the land where, on decomposition, it will produce humus and assist in the maintenance of soil structure. It is preferable to spread the straw and then follow up with the machine. If no straw spreader is available, it is best to work *diagonally* across the swaths, which not only eases the task of the machine but also partially spreads the straw between the swath rows. If a crop is to be sown immediately after putting in the combine straw, the field should be dressed with 1 cwt. sulphate of ammonia per acre. This dressing provides nitrogen for the micro-organisms decomposing the straw and so prevents their competing with the crop seedlings for the available nitrogen in the soil.

Improving Soil Structure

The principal effect of incorporating farmyard manure, crop residues and other organic materials with the soil is the improvement in soil structure which results. To obtain the maximum benefit from these materials it is essential that they should be intimately mixed with the soil. Rotary cultivation makes this intimate mix certain.

Gypsum is now being used, especially on heavy land, to improve soil structure. As in the case of lime, the maximum effect of the gypsum is obtained by even horizontal and vertical distribution. The even vertical distribution, so necessary for its action in depth, can be obtained by rotary cultivation.

Other Uses

TURNING IN BRUSSEL STALKS. Use the machine to chop up and turn in the stalks of Brussels Sprouts and cabbages.

CLEARING HEDGE BOTTOMS. Clear out hedge bottoms with the machine and so increase the area under cultivation.

MUCK SPREADING, ROW CROP WORK. As you get to know the wide scope of operations for which the machine can be used, you will find many other applications. The machine will help with muckspreading, with ditch filling and the making of silage pits. It can be used for levelling and for orchard and row-crop work.