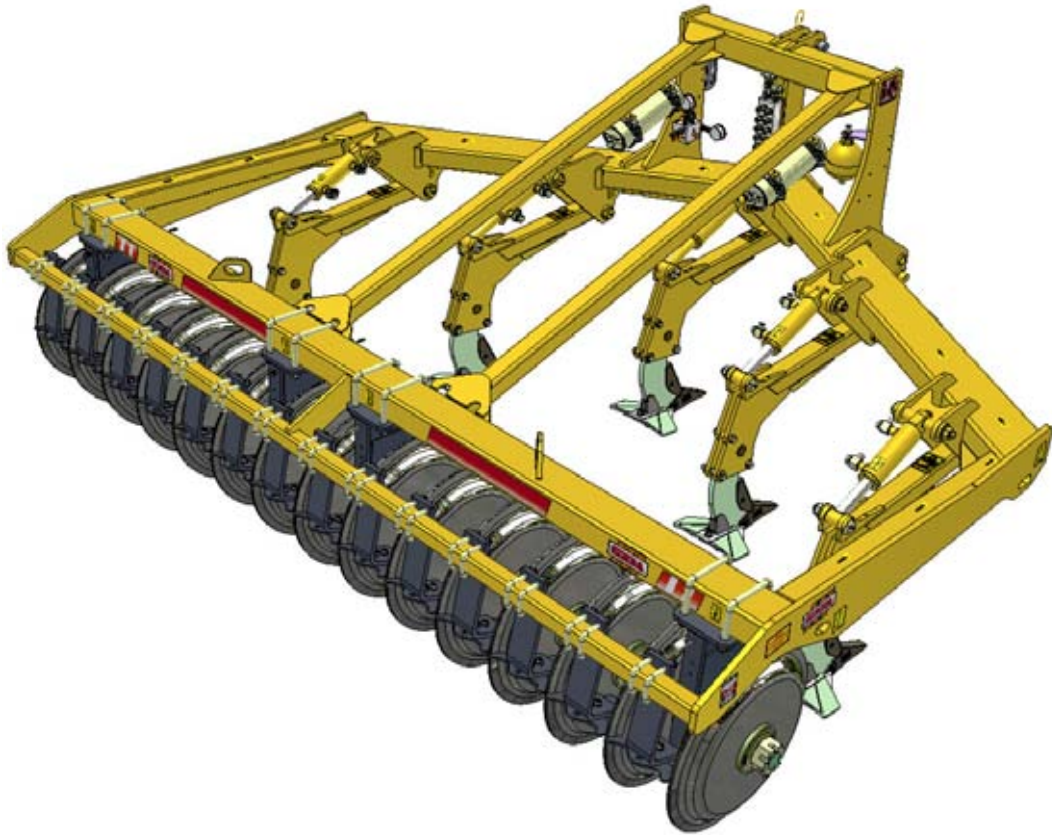


From Serial No. 18007975

**HYDRAULIC RESET
FLATLINER**

P16229 21/05/08



DECLARATION OF CONFORMITY

Simba International Limited hereby declare that the Product described in this Operators Manual, and defined by the Serial Number Plate attached to the Chassis of the Machine (a part copy of which is detailed overleaf and must be completed indicating the relevant machine details), conforms with the following Directives and Regulations, and has been certified accordingly.

EC Machinery Directive 89/392/EEC, as amended by 91/3688/EEC, 93/44/EEC, and 93/688/EEC.

In order to fulfill the requirements of health and safety described in the EC Directive, the following standards and technical specifications have been taken into account:

EN 292 - 1
EN 292 - 2

THE MANUFACTURER

Simba International Limited
Woodbridge Road
SLEAFORD
Lincolnshire
NG34 7EW
England

Telephone 01529 304654.

CERTIFIED ON BEHALF OF SIMBA INTERNATIONAL LIMITED.

Rod Daffern
Chairman
Simba International Limited



WARRANTY **TERMS AND CONDITIONS**

In this warranty Simba International Ltd., is referred to as “the Company”.

1. Subject to the provisions of this warranty the Company warrants each new machine sold by it to be sold free from any defect in material or workmanship for a period of 12 months from date of installation with the end-user.

Some specific items have additional warranty over and above the standard 12 months. Details of these can be obtained upon request directly from the distributor or Simba International Ltd.

2. If the machine or part thereof supplied by the Company is not in accordance with the warranty given in clause 1 the Company will at its option:
 - (a) make good the machine or part thereof at the Company's expense, or
 - (b) make an allowance to the purchaser against the purchase price of the machine or part thereof, or
 - (c) accept the return of the machine and at the buyers option either:
 - I) repay or allow the buyer the invoice price of the machine or part thereof, or
 - II) replace the machine or part thereof as is reasonably practical.
3. This warranty shall not oblige the Company to make any payment in respect of loss of profit or other consequential loss or contingent liability of the Purchaser alleged to arise from any defect in the machine or impose any liability on the Company other than that contained in clause 2.
4. Any claim under this warranty must be notified to the Company in writing specifying the matters complained of within 14 days from the date of repair.
5. Any claim under this warranty must be made by the original purchaser of the machine and is not assignable to any third party.
6. If the purchaser hires out the machine to any third party the warranty shall apply only to matters notified to the Company in writing within 90 days of the date of delivery and clause 1 shall be read as if the period of 90 days were substituted for the period of 12 months.
7. The warranty will cease to apply if:
 - (a) any parts not made, supplied or approved in writing by the Company are fitted to the machine or
 - (b) any repair is carried out to the machine other than by or with the express written approval of the Company or
 - (c) any alterations not expressly authorized by the Company in writing are made to the machine or
 - (d) the machine is damaged by accident or
 - (e) the machine is abused or overloaded or used for a purpose or load beyond its design capabilities, or used in conjunction with a tractor whose power output capability exceeds the stated implement power requirement by more than 40%. For the purpose of these terms and conditions, “stated implement power requirement” refers to wheeled tractors unless specifically stated. These power requirements should be reduced by 20% when used in conjunction with tracked tractors.
 - (f) the machine is operated as part of a ‘cultivation train’ where more than one implement is being towed, without the express written approval of Simba International Ltd.
 - (g) any maintenance is not carried out in accordance with the service schedules in the operator's manual.
 - (h) the Installation and Warranty Registration Certificate is not received by Simba International Ltd., Service Dept., Woodbridge Road, Sleaford, Lincolnshire, England, NG34 7EW, within 7 days of installing a new machine.

Machine Identification

Enter the relevant data in the following list upon acceptance of the machine:

Serial Number	
Type of Machine	
Machine Width	
Year of Construction	
Delivery Date	
First Operation	
Accessories	

Operating Instructions/Spare Parts List: May 2008

Dealer Address: Name:
 Street:
 Place:
 Tel.:

Dealer's Customer No.:

SIMBA Address: SIMBA
 Woodbridge Road Ind. Est.
 Sleaford
 Lincolnshire
 NG34 7EW

Tel.: 01529 304654
Fax: 01529 413468
E-Mail: simba.international@simba.co.uk

SIMBA Customer No.:

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Introduction

Foreword

Make sure you have read and follow the Operating Instructions carefully before using the machine. By doing so, you will avoid accidents, reduce repair costs and downtime and increase the reliability and service life of your machine. Pay attention to the safety instructions!

SIMBA will not accept any responsibility for any damage or malfunctions resulting from failure to comply with the Operating Instructions.

These Operating Instructions will assist you in getting to know your machine and in using it correctly for its intended purposes. First, you are given general instructions in handling the machine. This is followed by sections on servicing, maintenance and the action to be taken should a malfunction occur.

These operating instructions are to be read and followed by all persons working on or with the machine, e.g.:

- Operation (including preparation, remedying of faults in the operating sequence and servicing).
- Maintenance (maintenance and inspection)
- Transportation.

Together with the Operating Instructions, you receive a Spare Parts List and a Machine Registration form. Field service technicians will instruct you in the operation and servicing of your machine. Following this, the Machine Registration form is to be returned to SIMBA. This confirms your formal acceptance of the machine. The warranty period begins on the date of delivery.



We reserve the right to alter illustrations as well as technical data and weights contained in these Operating Instructions for the purpose of improving the Hydraulic Reset Flatliner.

Warranty Guidelines

1. The period of liability for material defects (warranty) relating to our products is 12 months. In the case of written deviations from the statutory provisions, these agreements shall apply.

They shall become effective upon installation of the machine with the end customer. All wear parts are excluded from the warranty.

2. Warranty claims must be submitted to the SIMBA Customer Service Department in Sleaford via your dealer. It is only possible to process claims which have been correctly completed and submitted no later than 14 days after the date of repair.

3. In the case of deliveries made under the warranty which are subject to the return of the old parts, the old parts must be returned to SIMBA within 28 days after the damage occurred.

4. In the case of deliveries made under the warranty which are not subject to the return of the old parts, these parts must be kept for the purpose of further decisions for a period of 3 months after receipt of the warranty claim.

5. Warranty repairs to be carried out by outside companies, or repairs which are expected to take more than 10 working hours, must be agreed upon in advance with the Customer Service Department.

1. Safety Data

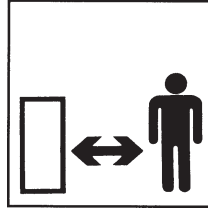
The following warnings and safety instructions apply to all sections of these Operating Instructions.

1.1 Safety Symbols

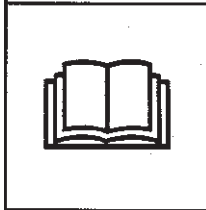
On the machine



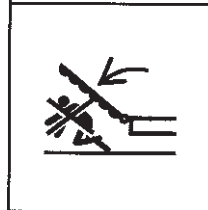
Parts may fly off during operation. Keep a safe distance away from the machine!



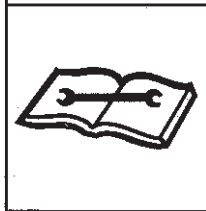
Read and observe the Operating Instructions before starting up the machine!



Keep clear of the working range of foldable machine components!



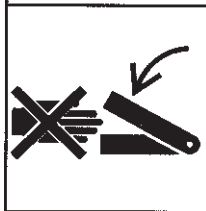
Watch out for escaping pressurised fluids! Follow the instructions in the Operating Instructions!



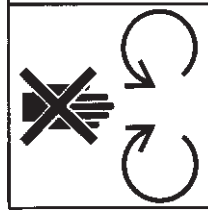
No passengers are allowed on the machine!



Never reach into areas where there is a danger of being crushed by moving parts!



Never reach into any revolving parts!





Refer to Operating Instructions before attempting maintenance.

Operating Instructions:

The Operating Instructions distinguish between three different types of warning and safety instructions. The following graphic symbols are used:



Important!



Risk of injury!



Risk of fatal and serious injuries!

It is important that all the safety instructions contained in these Operating Instructions and all the warning signs on the machine are read carefully.

Ensure that the warning signs are legible. Replace any signs that are missing or damaged.

These instructions must be followed in order to prevent accidents. Inform other users of the warnings and safety instructions.

Do not carry out any operations which may affect safe use of the machine.

1.2 Use for the Intended Purpose

The SIMBA Hydraulic Reset Flatliner is built using the latest technology and in accordance with the relevant recognised safety regulations. However, risks of injury for the operator or third parties and impairment of the machine or other tangible assets can arise during use.

The machine is only to be operated when in a technically perfect condition and for the intended purpose, taking into consideration safety and risks and following the Operating Instructions. In particular, faults that can impair safety are to be remedied immediately.

Original parts and accessories from SIMBA have been specially designed for this machine. Spare parts and accessories not supplied by us have not been tested or authorised. Installation or use of non-original SIMBA products may have a detrimental effect on specific design features of the machine and affect the safety of machine operators and the machine itself. SIMBA will accept no liability for damage resulting from the use of non-original parts or accessories.

The SIMBA Hydraulic Reset Flatliner is designed solely as a cultivation implement. Use for any other purpose, e.g., as a means of transport, will be deemed to be improper use. SIMBA will accept no liability for damage resulting from improper use. The risk will be borne solely by the operator.

1.3 Operational Safety

The machine is to be put in operation only after instruction has been provided by an employee of the authorised dealer or an employee of SIMBA. The "Machine Registration" form is to be completed and returned to SIMBA.

All protective and safety equipment, such as removable protective equipment, must be in place and functioning reliably before the machine is put in use.



Check screws and bolts regularly for tightness and retighten if necessary.



In the event of malfunctions, stop and secure the machine immediately.



Ensure that any faults are remedied immediately.

1.3.1 No Liability for Consequential Damage

The Hydraulic Reset Flatliner has been manufactured by SIMBA with great care. However, problems may still occur when it is used for the intended purpose. This may include:

- Worn wearing parts.
- Damage caused by external factors.
- Incorrect driving speeds.
- Incorrect setting of the unit (incorrect attachment, non-adherence to the Setting instructions).



Therefore, it is crucial to always check your machine before and during operation for correct operation.

Compensation claims for damage which has not occurred to the machine is excluded. This includes any consequential damage resulting from incorrect operation.

1.4 Road Traffic Safety

When driving on public roads, tracks and areas, it is important to observe the relevant road traffic laws as well as the specific regulations relating to this machine.



Pay attention to the permitted axle loads, tyre carrying capacity, and total weight in order to maintain adequate braking and steerability.



Passengers on the machine are strictly forbidden!

1.5 Accident Prevention

In addition to the Operating Instructions, it is important to observe the accident prevention regulations specified by agricultural trade associations.

1.5.1 Hitching-up the machine

There is a risk of injury when hitching/unhitching the machine. Observe the following:

- Secure the machine against rolling.
- Take special care when reversing the tractor!
- There is a risk of being crushed between the machine and the tractor!
- Park the machine on firm, level ground.

1.5.2 On the Hydraulic System

Do not connect the hydraulic lines to the tractor until both hydraulic systems (machine and tractor) are depressurised.

The hydraulic system and accumulator are pressurised. Check all lines, pipes, and screw connections regularly for leaks and any recognisable external damage.

Only use appropriate aids when checking for leaks. Repair any damage immediately. Spurting oil can cause injuries and fires!

In case of injury, contact a doctor immediately.

The socket and plugs for the hydraulic connections between the tractor and the machine should be colour-coded in order to avoid incorrect use.

1.5.3 Changing Equipment

- Secure the machine to prevent it from accidentally rolling away!
- Use suitable supports to secure any raised frame sections suspended above you!
- Caution! Risk of injury due to projecting parts!
- Use the ladders to climb on to the machine.



Never climb on to rotating parts such as the roll unit. These parts may rotate causing you to slip and suffer serious injury!

1.5.4 During Operation

Ensure that the working range and the area around the machine are clear (children!) before operating the machine.

Always ensure adequate visibility!

Do not stand on the machine while it is in operation!

Operators must have a valid driving licence in order to drive on public roads. In the operating area, the operator is responsible for third parties.

The person in charge must:

- provide the operator with a copy of the Operating Instructions, and
- ensure that the operator has read and understood the instructions.
- make sure that the operator is aware of the specific regulations relating to the machine when driving on public roads.

1.6 Servicing & Maintenance

Ensure that regular checks and inspections are always carried out within the periods required by law or specified in these Operating Instructions.

When carrying out service and maintenance work always:

- switch off the tractor engine and remove the ignition key.
- wait until all the machine parts have stopped moving.
- depressurize the hydraulic system.

Prior to performing maintenance and servicing work, ensure that the machine is positioned on solid, level ground and is secured to prevent it rolling away. Do not use any parts to climb on to the machine unless they are specifically designed for this purpose.

Before cleaning the machine with water, steam jets (high-pressure cleaning apparatus) or other cleaning agents, cover all openings into which, for reasons of safety or operation, no water, steam or cleaning agents are to penetrate (bearings, for instance).

Next, check all hydraulic lines for leaks, loose connections, chafe marks and damage. Remedy any deficiencies immediately!

Lubricate all the lubricating points to force out any trapped water.

When carrying out servicing and maintenance work, retighten any loose screw connections.

1.7 Operating Areas

The operating areas include the 3 point linkage, hydraulic connections and depth adjustment equipment as well as all operating points requiring maintenance.

All operating areas will be specified and described in detail in the following chapters on servicing and maintenance.

Observe all safety regulations included in the Section dealing with Safety, and in the subsequent sections.

1.8 Authorised Operators

Only those persons who have been authorised and instructed by the operator may operate the machine. The operator must be at least 16 years of age.

1.9 Protective Equipment

For operation and maintenance, you require:

- Tight fitting clothing.
- Strong protective gloves (to provide protection against sharp-edged machine components).
- Protective goggles (to stop dirt getting into your eyes).

2. Transportation and Installation

Transportation and initial installation of the machine are described in this chapter.

2.1 Delivery

The machine is normally delivered, fully assembled, on a (low-bed) truck.

- The machine can be lifted off with a crane, fork-lift truck, or other suitable lifting equipment.



When doing so, the weights (see Technical Data), the centre of gravity and the attachment points on the machine are to be taken into account.



Depending on the lifting gear, attachment is only to be at appropriate points on the frame (identified by stickers).

- The machine can be hitched to a tractor and driven off a low-loader.

2.2 Transportation

The Hydraulic Reset Flatliner can be transported on public roads by hitching it up to a tractor or on a low-bed truck.

- It is important to observe the permitted dimensions and weights when transporting the machine.
- Use suitable lifting gear, e.g. a fork-lift truck.
- If the machine is transported on a trailer or a flat-bed truck, it must be secured using straps or other devices.
- Before transporting the machine on public roads, it must be adjusted to its transportation position and the stipulations relating to road transportation fulfilled.
- The maximum permissible speed is 25 km /h.

2.3 Installation

When carrying out installation and maintenance work there is a higher risk of injury. It is important that you familiarise yourself with the machine and read the Operating Instructions beforehand.

Operator instruction and initial installation of the machine are carried out by our service technicians or authorised distributors.

The machine must not be used in any way beforehand! The machine can only be released for operation after instructions have been provided by our service technicians or authorised distributors.

- If any modules or parts have been removed for transportation, these shall be mounted by our service technicians/authorised dealers before the instruction takes place.
- Check all important screw connections!
- Lubricate all nipples and joints!
- Check all hydraulic connections and lines (if applicable) for damage.

2.5 When driving on the road

When driving on the road the machine must be converted to the transportation position.



There is a risk of injury on specially sharpened edges and when making adjustments on the machine.



When driving on the road, raise the machine completely to prevent the working elements dragging on the ground.

2.6 Hitching-up the machine



When hitching-up the machine, ensure that no-one is between the tractor and the machine.

1. Couple up to tractor linkage, the normal setting is with the lower link arms in the lowest hitch setting, and the top link in the highest setting for maximum rear roller stability.
2. Couple the two main circuit lines to one double acting service. This will control the tines.
3. Couple the third pipe (having a one way check valve adjacent to the manifold) to a second service, ensuring this is set to float or lower. This line requires a free flow return to the tractor, as it allows oil to return to the tractor in the event of circuit failure through overload. If a free flow return or float is not available, route this line direct to the tractor oil tank, to ensure oil can return unimpeded.

2.7 Parking the machine

In order to avoid damage as a result of moisture, the machine should be parked, if possible, indoors or under cover.



When manoeuvring the machine, pay attention to your surroundings. Ensure that nobody is in the manoeuvring area (watch for children!).

- Park the machine on level and solid ground. Lower the machine so that it is supported on the tines.
- Unhitch the machine and disconnect the hydraulic lines.

3. Technical Data

	3m 3 Tine	3m 5 Tine	3.5m 5 Tine	4.0m 5 Tine
Transport Width	3060mm	3060mm	3530mm	3990mm
Working Width	2900mm	2900mm	3400mm	3850mm
Length	2530mm	2530mm	2725mm	2950mm
Weight	1735kg	1990kg	2200kg	2350kg
Tine Spacing	1000mm	600mm	700mm	800mm
Tractor Power Required (H.P.)*	110/130	130/150	130/150	140/160

* It is important to correctly match your implement to your tractor for optimum performance. Two power ratings are listed above. The lower HP figure relates to tracked tractors, the higher HP figure relates to wheeled tractors.

4. Adjustment/Operation

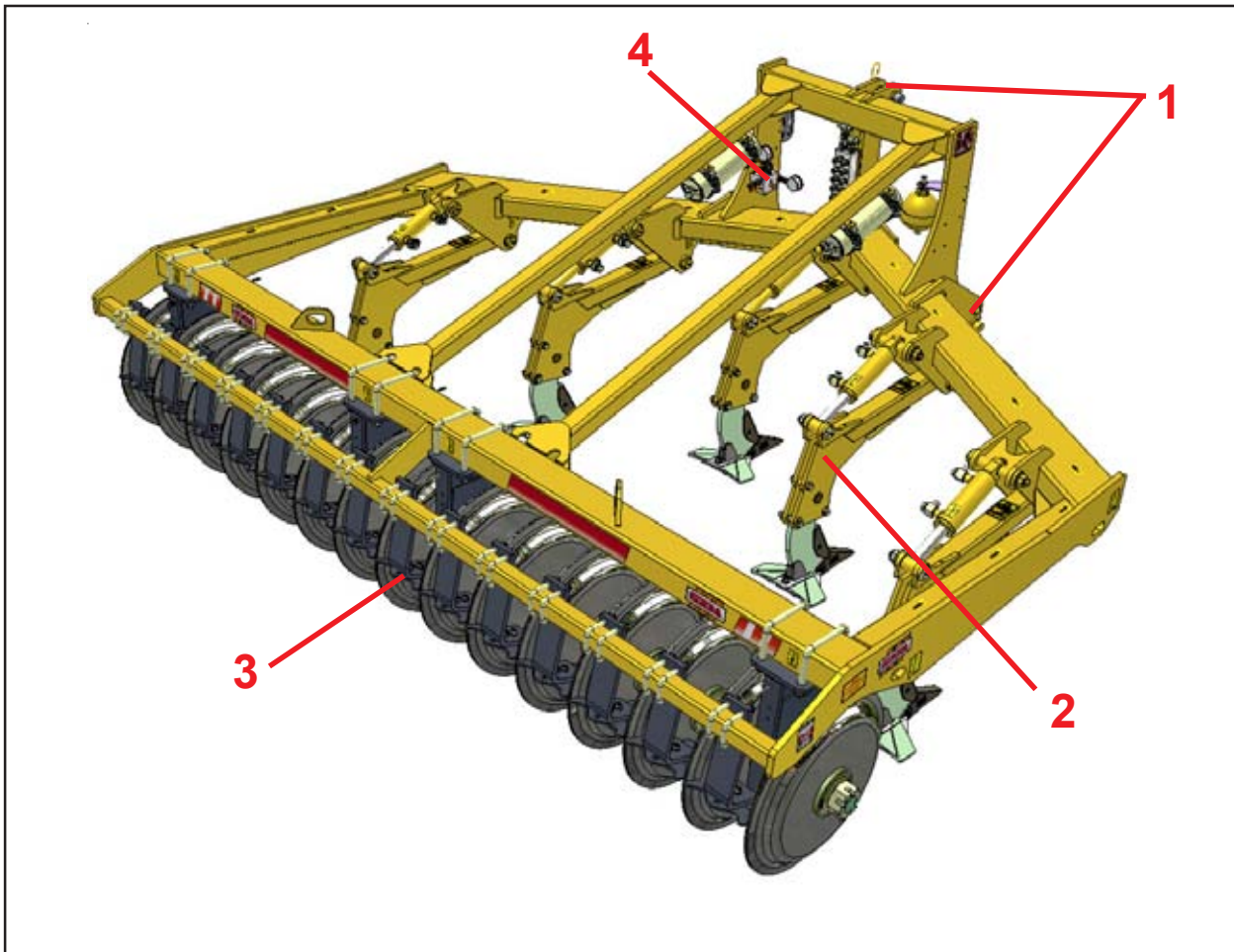


Fig. 4.01: Hydraulic Reset Flatliner

4.1 Description

1. 3 Point Linkage
2. Tine Arms
3. Rear Roll
4. Hydraulic Control Block (

The Simba Hydraulic Reset Flatliner is a fully mounted 3 or 5 tine V frame type configuration soil loosener, designed to operate to maximum depth of 300mm (12 inches). The 20mm thick high tensile steel tine shanks are fitted with replaceable cast sub surface wearing points and wings specially designed to keep draught to a minimum and penetration to maximum.

A Double Disc rear roll is fitted to all models for use both to reduce and consolidate soil and to control the working depth of machine.

4.2 Tines

The Hydraulic Reset Flatliner is fitted with with Pro-Lift tines and points. The tines are arranged in a 'V' frame to give lower draft requirements and the ability to work progressively deeper. Each tine is held hydraulically in work allowing a fast, responsive trip and re-setting action on the move.

Different wings are available to suit the soil conditions and optimise the performance of the machine.

Tine depth is achieved by moving the tines up and down in the adjustable clamps.

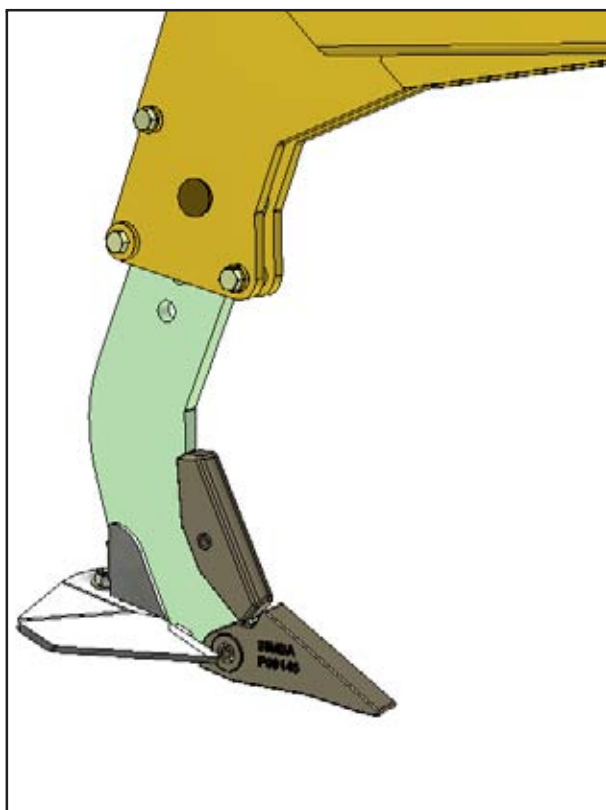


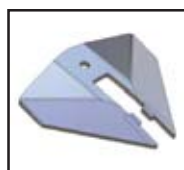
Fig. 4.02: Trip Reset Tine

4.3 Pro-Lift Wings



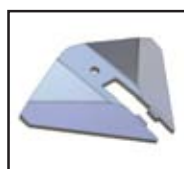
Standard Wing P09060

- Maximum soil disturbance with minimum draft requirement under normal circumstances.
- Wing angle reduces wear rates on leg.



Extra Lift Wing P10392

- Increased lift height and rake angle creates greater soil disturbance on all soil types especially in moister conditions.
- Lower relative distance between edge of wing and point reduces draft requirement.
- Has ability to work at lower depths with no decrease in soil disturbance or risk of smear.



Extra Wide Wing P10411

- Improved lateral shatter in moist/wet soils, or non-cohesive soils.
- Ideal for deep vegetable applications under light/medium soils.



Wear Shroud P11181

- Wear plate to take soil abrasion so lower trailing edge of tine does not wear.

4.4 Double Disc Roller

The standard DD600 roller is made up of individual Double Disc (patented) Ring segments.

The DD rings are designed to consolidate the soil whilst cutting and crushing any clods.

Even in heavy, wet soils it can easily be operated with minimal blockages occurring.



Fig. 4.03: Double Disc Roll

4.5 Operation

During work the Hydraulic Reset Flatliner should run reasonably level to achieve consistent working effect of all tines. It is important to set the machine up correctly in order to achieve an efficient and worthwhile operation. Although the Hydraulic Reset Flatliner can work down to 300mm (12 inches) this does not mean that running at this depth is always worthwhile, taking time to identify where there is a problem in soil profile and working to the minimum depth to eliminate this could save a lot of otherwise wasted diesel and time. It is also very important not

to operate below critical depth of the tine, this is where the tine no longer produces upward movement of soil and effectively behaves as a mole plough, therefore not producing the shattering effect desired.

In work it is permissible to use the tine circuit to raise the tines if draft requires reduction, allowing the mainframe to remain fully lowered keeping the surface pressing effect at its maximum. As such, set the linkage to minimum draft control, fully down.

The roll unit serves two functions; it conserves soil moisture, breaking up any clods left by the tines and limits the operating depth of the machine. The pressure that may be exerted upon the clods by the roll is limited by the weight of the implement and the downward tine thrust. This downward thrust can be increased by fitting wider wings, or slightly increasing the angle of the points and wings (using the tractor linkage), and by minimising any draft control setting on the tractor. This is the first area to be investigated if more roll pressure should be required. Draft control can also inhibit initial penetration if the implement is lowered too quickly on the move into work. The rapid increase in draft is sensed by the tractor, which then inhibits further penetration. The solution is to gradually lead the implement into work, thereby not imposing a rapid increase in pulling force.

When off hitching, adjust the tine height to support the mainframe evenly between tine points and rear roller for maximum stability. Operate both circuits in float prior to decoupling.

4.6 Work Instructions

Driving speed

The Hydraulic Reset Flatliner can be driven at speeds of up to 15 kph.

This depends on the field conditions (type of soil, surface trash, etc.).

Drive more slowly if the conditions are difficult.

Turning:



Before turning, the machine should be eased out of work while driving. Likewise, it should be eased back into work once the turn has been completed.

Parking the Machine

In order to avoid damage as a result of moisture, the machine should be parked, if possible, indoors or under cover.



When manoeuvring the machine, pay attention to your surroundings. Ensure that nobody (children!) is in the manoeuvring area.

- Park the machine on level and solid ground. Lower the machine so that it is supported on the tines.
- Unhitch the machine and disconnect the hydraulic lines.

4.7 Checks

The working quality depends on the adjustments and checks made prior to and during work, as well as on regular servicing and maintenance of the machine.

Before beginning work it is therefore important to carry out any necessary servicing and to lubricate the machine as required.

Checks prior to, and during work:

- Is the machine correctly hitched up and the coupling device locked?
- Have the hydraulic lines (if applicable) been connected according to the colour coding?
- Is the machine in a level operating position and the working depth set correctly?

Working Elements

- Are the tines and other cultivation tools in a serviceable condition?
- Are the scrapers still operable, so that the rolls do not jam?

5. Servicing and Maintenance



Follow the safety instructions for servicing and maintenance.

5.1 Servicing

Your machine has been designed and constructed for maximum performance, operational efficiency and operator friendliness under a wide variety of operating conditions.

Prior to delivery, your machine has been checked at the factory and by your authorised dealer to ensure that you receive a machine in optimum condition.



To ensure trouble-free operation, it is important that servicing and maintenance work is performed at the recommended intervals.

5.2 Cleaning

In order to ensure that the machine is always in operating condition and to achieve optimum performance, perform the cleaning and servicing work at regular intervals.

Avoid cleaning the roll bearings with a high-pressure hose or a direct water jet. The housing, screwed connections and ball bearings are not watertight.

5.3 Preparation for Storage

If you need to store the machine for a longer period, observe the following points:

- Park the machine undercover if possible.
- Protect the roll against rust. If you need to spray the roll with oil, use light biologically degradable oils, e.g. rape oil.

5.4 Changing Tine Points and Wings

When changing the tine points and wings it is important to observe safe working practices.



Do not attempt to assist fitting tine points with a steel headed hammer, as this can lead to splintering of the metal due to it's hardness, which can cause injury. If tine fitting requires assistance, a copper/hide mallet should be used. Wear eye protection.

5.5 Double Disc Axles

The axles on this roller are tensioned by the main axle through the centre of the rings and bearings.



Specialist equipment is required for the disassembly of Double Disc axles. Please consult your dealer under any circumstances that require disassembly of these axles.

Maintenance of these rollers is limited to daily greasing of the bearings to flush out dirt, and regular inspection to ensure the assemblies are tight, and scrapers are correctly set. The axles can be tightened provided the bearing pillar 'U' bolts are loosened to avoid preloading the bearings as they move sideways to each other. Ensure the bearing pillars are re-tightened to the mainframe after this.

5.6 Hydraulics



A low oil flow should be used, i.e., tractor tickover or low flow selected.



Exercise extreme care when checking the valve or circuits, and *under no circumstances* attempt to adjust or loosen fittings without prior reference to your authorised Simba dealer, and detailed maintenance instructions.



The hydraulic circuit contains specialised fittings which should not be tampered with under any circumstances. Do not attempt to modify hose routings or hose clamping arrangements, doing so may cause serious damage to the machine and/or injury.

5.7 Specific Instructions Relating to Trip Reset Tine Hydraulics



Please refer to page 80 when referring to these instructions.

The circuit allows for the tines to be pressurised down into work, whereupon a relief valve (**REF. X**) limits this applied tractor down pressure to a value less than the main system accumulators (80b x 2 litre). This allows tines to trip in work, the oil being absorbed by the main accumulator. A secondary (rod side) accumulator ensures this side of the cylinder is maintained full of oil to minimise cavitation and seal damage. A pre charge valve (**REF. Z**) restricts return rod side oil flow to the tractor as the tines are pressurised down to ensure this secondary circuit is charged.

In operation, oil is locked in the cylinder circuit at a pressure determined by the relief valves 90-120 bar full bore side (**REF. X**) and 20 to 60 bar rod side (**REF. Z**). This occurs at all times, even with the circuit in float at the tractor, provided the tines are fully down. For extremely stony conditions, adjust the valve (**REF. X**) to read 90 bar on the gauge as the tines are pressured down. For heavy soils with little stone where compaction is present it is possible to increase this pressure to 120 bar.

To de-pressurise the circuit, identify and adjust the following valves on the Tine Control Manifold (P09078).

All valves can be identified by stamped codes adjacent to each valve (identified on the drawing on page 80 and the references contained in this procedure).

- Set tractor hydraulics to neutral, machine raised.
- Adjust pre charge valve (**REF. Z**) fully clockwise. If necessary, note the number of turns that it takes for the system to be reset.
- Adjust relief (**REF. X**) fully anticlockwise. If necessary, note the number of turns that it takes for the system to be reset.
- Set tank return line circuit to float or down to return oil to tractor.
- Set main system to float, or allow oil pressure to be released in both directions.
- Refer to pressure gauges on machine. Ensure both read zero before attempting any maintenance. Repeat the above procedure until both gauges read zero in all circumstances.

Follow detailed setting sequence on page 24 to reset the system prior to returning to work, or alternatively revert the above valves back to their original setting (number of turns).

5.7.1 Valve Setting Sequence - Factory Setting (Read in conjunction with page 80)

1. Raise machine, to ensure tines are fully clear of the ground at depth.
2. Adjust reliefs (**REF. X**), (**REF. T**) and precharge valve (**REF. Z**) all clockwise fully.
3. Adjust flow control (**REF. Y**) fully anti clockwise, then clockwise 1½ turns. cylinder pressure between 40-60 bar rod pressure for working in hard, stone free conditions.
4. Raise tines, then pressure fully down. Set failsafe (**REF. T**) to between 190-220 bar. If available pressure is insufficient to achieve this, set to ½ turn clockwise above that where valve relieves at tractor maximum pressure.



If tines do not relieve under severe overload, this valve should be reduced (anti-clockwise) until this occurs in work, otherwise damage may occur.

5. Pressure tines down, and set accumulator relief (**REF. X**) to 90 bar as tines are lowered.
6. Adjust precharge valve (**REF. Z**) 1/8 turn anti clockwise.
7. Pressure tines down and check cylinder pressure reads 90 bar and the corresponding rod pressure reads between 20-40 bar (achieved by adjusting precharge valve (**REF. Z**)).
8. Put main circuit in float, check above pressures are maintained at least at the lower values indicated.

5.7.2 Valve Adjustment - To Suit Field Conditions (Read in conjunction with page 80)

(a) Normal / Stony conditions

To avoid damage to tines and chassis in severe stone conditions reduce accumulator relief (**REF. X**) as tines are held in 'lower' to read 90 bar.

(b) Hard, stone free conditions

It is permissible to increase gauge pressure for accumulator relief (**REF. X**) as tines are held in 'lower' to read up to 120 bar with a

5.8 Operator Support

If you have a problem, please contact Your dealer. They will endeavour to solve any problems which may occur and provide you with support at all times.

In order to enable your dealer to deal with problems as quickly as possible, it helps if you can provide them with the following data. Always state the

- Customer Number
- Name and Address
- Machine Model
- Date of Purchase and Operating Hours
- Type of Problem

5.9 Maintenance Intervals

Apart from daily maintenance, the maintenance intervals are based on the number of operating hours and time data.

Keep a record of your operating hours to ensure that the specified maintenance intervals are adhered to as closely as possible.

Never use a machine that is due for maintenance. Ensure that all deficiencies found during regular checks are remedied immediately.



Avoid sharp-edged and pointed parts (tine points, etc.) when working on the machine.



Place the machine on suitable supports when working underneath! Do not work under a machine which is not supported!

5.10 Maintenance Overview

Hydraulic Reset Flatliner Maintenance Overview			
After first operation	Instructions	Interval	Note
Check all screw, bolt and plug connections	Check they are firmly seated. Tighten / Secure if necessary	---	---
Lubricate machine	See overview of lubricating points	---	Page 27
During operation			
Check all screw, bolt and plug connections	Check they are firmly seated. Tighten / Secure if necessary	daily	---
Lubricate machine	See overview of lubricating points	---	Page 27
Linkage	Check pins are firmly secured	daily	---
Hydraulic system and components	Check seals, signs of crushing/wear, function and condition	daily	Page 23
Pro-Lift tines, points and wings.	Check condition, mountings, smooth operation and settings	daily	Page 22
Roll bearings	Check condition, mountings and smooth operation	daily	Page 22
Double Disc roll elements	Check condition and ensure they are firmly secured	daily	Page 22
Safety devices	Check condition and function	daily	---
After season			
Check all screw, bolt and plug connections	Check they are firmly seated. Tighten / Secure if necessary	---	---
Lubricate machine	See overview of lubricating points	---	Page 27
Toplinks / Bolts / Hydraulic Cylinders	Grease any exposed threads / rods	---	---
Entire machine	Carry out cleaning and maintenance	---	---
Spray Double Disc roll with oil	Use biological oil if possible	---	---
After 4 years			
Hydraulic pipes	Replace	MRL Anh I	EN 1533

5.11 Overview of Lubricating Points

Hydraulic Reset Flatliner Lubrication Points	Interval	Diag. No.
Tine Pivots	50 Hours	5.01
DD600 Roll Bearings	10 Hours	5.02

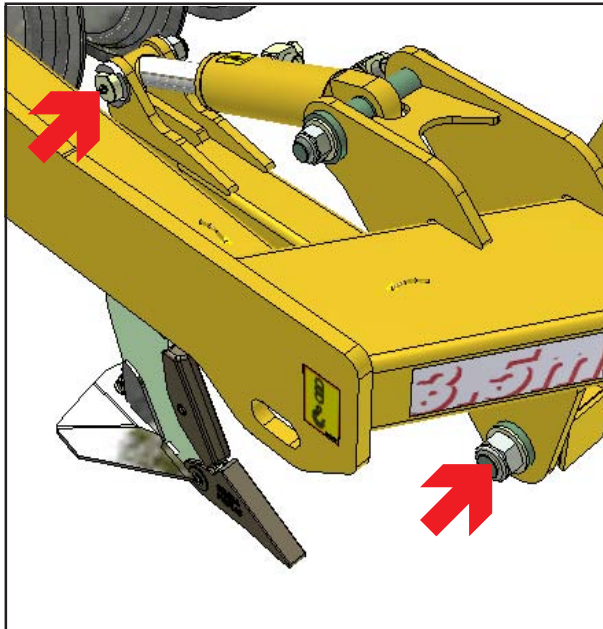


Fig. 5.01: Tine Pivot Grease Points

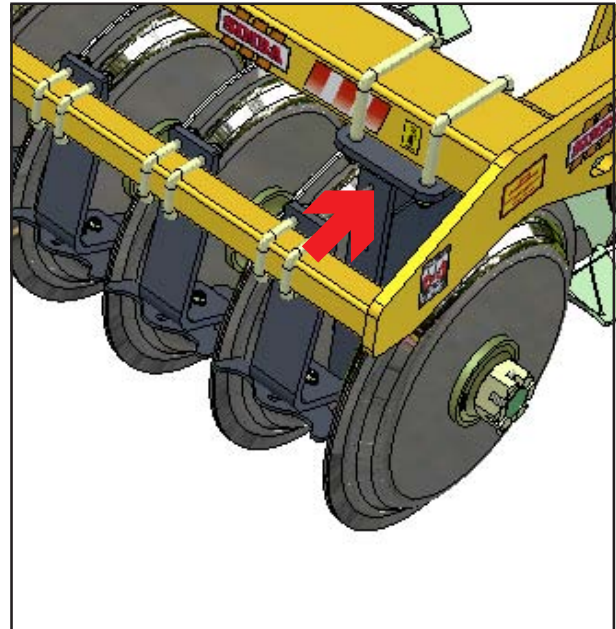


Fig. 5.02: DD Roll Grease Points

5.12 Lubricating the Machine

Please read the section entitled "Using Lubricants" carefully before lubricating the machine.

The machine must be lubricated regularly in order for it to remain serviceable. Regular lubrication also contributes towards extending the service life of your machine.

The recommended lubricating intervals are specified in "Inspection" and "Maintenance Intervals".

After it has been washed using a high-pressure hose or steam cleaned, the machine should always be lubricated using a grease gun. Ensure that the universal joints and splined shafts are lubricated regularly.

5.13 Handling of Lubricants

Please ensure that you read the following instructions as well as the relevant information. This also applies to any of your employees who handle lubricants.

Hygiene

Lubricants do not present a health hazard provided they are used for their specified purpose.

In the case of prolonged skin contact, lubricants - especially low-viscosity oils - may remove the natural layer of fat contained in the skin, resulting in dryness and possible irritation.

It is important to take extreme care when handling waste oil as it may contain other irritants.

Vapours given off by cleaning agents and oils are also a potential health hazard.

You should therefore not carry any oily cloths around. Change soiled work clothing as soon as possible.

Always exercise extreme care and observe the recommended hygiene rules when handling mineral oil products. Details of these handling regulations can be found in information provided by the health authorities.

Storage and Handling

- Always store lubricants where they cannot be accessed by children.
- Never store lubricants in open or unlabelled containers.

Fresh Oil:

- Apart from taking the usual care and observing hygiene rules, there is no need to take any special precautions when handling fresh oil.

Waste Oil:

- Waste oil can contain harmful contaminants which may cause skin cancer, allergies and other illnesses.



Oil is a toxic substance. Should you swallow any oil, do not try to vomit. Contact a doctor immediately.



Protect your hands with barrier cream or wear gloves to avoid contact with the skin. Wash off any traces of oil thoroughly with soap and hot water.

- Wash your skin thoroughly with soap and water.
- Use special cleaning agents to clean any dirt off your hands.
- Never wash oil residue from your skin with petrol, diesel fuel or paraffin.
- Avoid skin contact with any oily clothing.
- Do not keep any oily rags in your pockets.
- Wash soiled clothing before wearing it again.
- Ensure that any oily footwear is disposed of in the proper manner.

Measures in case of injury through oil

Eyes:

Should any oil be splashed into your eyes, rinse with water for 15 minutes. If the eye is still irritated, contact a doctor immediately

If oil is swallowed:

If oil is swallowed, it is important not to induce vomiting. Contact a doctor immediately.

Skin irritation caused by oil:

In case of prolonged skin contact, wash off the oil with soap and water.

Oil Spills

Use either sand or a suitable granular absorbent to soak up any spilt oil. Dispose of the oil-contaminated absorbent in the proper manner.

Oil Fires

Never use water to extinguish an oil fire. The oil will float on the water causing the fire to spread.

Burning oil-lubricant must be extinguished using a carbon dioxide powder or foam extinguisher. Always wear respiratory equipment when dealing with fires of this type.

Waste Oil Disposal

Oil-contaminated waste and used oil must be disposed of in accordance with current legislation.

Waste oil must be collected and disposed of in accordance with local regulations. Never pour used oil into unsealed sewage systems or drains or onto the ground.

5.14 Lubricants & Hydraulic Oil

Hydraulic System

The hydraulic fluid from the tractor is mixed with the hydraulic fluid from the machine.

The supplied machine hydraulic system contains Total AZOLLA ZS 32 oil.

Lubricants

The lubricating points on the machine can be lubricated with multigrade lubricating grease as specified in DIN 51825 KP/2K - 40.

6. Faults and Remedies

Hydraulic Reset Flatliner		
Fault	Possible cause	Remedy
DD roller does not turn	Bearing seized	Replace bearing
	Scraper misaligned	Re-align scraper
Surface finish is uneven and cloddy	Not enough roll pressure	Reduce draft control
	Wings too aggressive	Fit different wings, either narrower wings or wings with a shallower rake (see page 19)
	Running nose down	Level frame
	Working too shallow	Increase tine depth
All ground not being moved by tines	Working too shallow	Increase tine depth
	Wings not aggressive enough	Fit wider wings