

From Serial No. 12682



P15061 30/11/06



**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  
NG34 7EW  
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: November 2006

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

Dealer's Customer No.: .....

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

Tel.:            01529 304654  
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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 Solo.

### 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

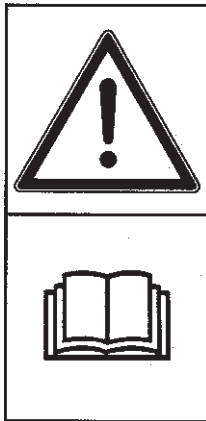
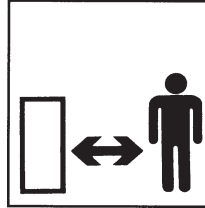
The following warnings and safety instructions apply to all sections of these Operating Instructions.

## 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 Solo 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 Solo 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 Solo has been manufactured by SIMBA with great care. However, problems may still occur when it is used for the intended purpose. These 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 and adequate application accuracy.

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!



Max. road transport speed 16mph (25km/h).

## 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.



Any hydraulic system containing an accumulator can remain under pressure permanently (even after following manual depressurisation procedures with a tractor / implement combination). It is therefore important to 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!



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 drawbar, 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.

- The machine can be lifted off with a crane or other suitable lifting equipment.
- The machine should be hitched to a tractor and driven off a low-loader.

### 2.2 Transportation

The Solo can be transported on public roads by hitching it up to a tractor or on a low-loader.

- It is important to observe the permitted dimensions and weights when transporting the machine.
- If the machine is transported on a trailer or a low-loader, 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 for damage.

## 2.4 Hitching Up

### 2.4.1 Hitching up a Tractor to the Solo / Preparing for Transport



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



When the Solo is parked for extended periods of time it should ideally be left in the unfolded, i.e. work, position for stability, safety and ease of access for maintenance. However, parking the Solo in the folded position (using the parking pins provided) is acceptable in the normal course of operation.



#### **Tractor Oil Flow Adjustment:**

As a general rule the tractor oil flow rate should be set in the lowest setting before starting. This can then be increased to allow the desired rate of operation as applicable. This will minimise excessive oil flow and consequent power usage and heat generation.

4. Carefully operate the hydraulics to lower the drawbar and tilt the Solo onto the road transport wheels. Fully extend the drawbar cylinder and lift axle cylinder and add in the requisite amount of shims for road transport.
  5. Ensure that the wing transport pins are fitted.
  6. If the machine is already folded it is now ready for transport. If the machine is unfolded then operate the fold circuit and fit the wing transport pins. Refer to 2.5.2.
1. Ensure the tractor hydraulics are depressurised and in the locked or closed (not float) setting.
  2. Couple the hydraulic hoses to the tractor ensuring that the two wing hoses (yellow) are together, the two drawbar cylinder hoses (red) are together and the trip-reset tine hoses (green) - if applicable - are together.
  3. Connect the tractor to the drawbar using the hydraulics to raise or lower the height of the shackle.



## 2.5 Folding and Unfolding

### 2.5.1 Unfolding into the Work Position

1. Raise the machine enough to facilitate easy removal of shims from the lift axle rams.
2. Remove the requisite amount of shims from the lift axle rams - normally one 50mm silver shim will be left in place.
3. Lower the machine to a height where it is comfortable to reach the disc gang locking and adjustment handles. Ensure gangs are clear of the ground.
4. Unlock the front and rear disc gangs, rotate them round and lock securely in the desired working position. On 380 models, move and lock the tine beams into the work position.
5. Swing the right hand side coulter coverer into the work position.
6. Remove transport pins from press roll unit.
7. Fully raise the machine.
8. Unfold the press unit.
9. Pressure the tines down into the work position (hydraulic tine models only).
10. Lower the machine into work.

### 2.5.2 Folding into the Transport Position

1. Fully raise the machine.
2. Pressure the tines into the fully raised position (hydraulic tine models only).
3. Fold the press unit.
4. Lower the machine to a height where it is comfortable to reach the disc gang locking and adjustment handles. Ensure gangs are clear of the ground.
5. Fit transport pins to the press roll unit.
6. Swing the right hand side coulter coverer into the transport position and secure with the locking collar.
7. Unlock the front and rear disc gangs, rotate them round and lock securely in the transport position.
8. Add the requisite amount of shims to the lift axle rams to give a transport height of 250-300mm.
9. Lower the machine onto the shims to give a road transport height of 250-300mm.



Road transport speed should not exceed 16mph (25kmh).

## 2.6 Trailing Implements

### 2.6.1 Hitching a Press Roll to the Solo (Not applicable for machines with rear roll)



Maximum rear drawbar vertical loading - 650kg

1. Raise Machine to remove shims from the lift axle to allow rear drawbar to be raised/lowered.
2. Reverse the Solo up to the press roll, ensuring that the drawbars are correctly aligned allowing a slight clearance to enable the machines to be coupled together.
3. Lower the Solo to the ground.
4. Attach the hydraulic hoses between the Solo and the press roll.
5. Open the taps on the press roll drawbar.
6. Raise the press roll drawbar to approximately 300mm above the Solo drawbar clevis.
7. Close the press roll drawbar taps.
8. Raise/lower the Solo to the same height as the press roll drawbar, then reverse the Solo to couple the two machines together.
9. Open the taps on the press roll drawbar.
10. Fully raise both machines into the road transport position.
11. Close the taps on the press roll drawbar.

## 2.7 When driving on the road

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



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

## 2.8 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.
- Raise the machine and remove shims from the lift axle and drawbar cylinders.
- Lower the machine to the ground, ensuring that it is stable.



When parking, ensure that no load is carried by the Terra-Grip tines (if fitted). This can lead to breakage of the points.

- Remove the drawbar pin and drive forward slowly until hitch is clear of tractor drawbar.
- Lower the drawbar to the ground.
- Switch off the tractor.
- Disconnect hydraulic lines from the tractor.

### 3. Technical Data Solo

	<b>330</b> MID ROLL	<b>330R</b> REAR ROLL	<b>380</b> MID ROLL	<b>380R</b> REAR ROLL
<b>Working Width</b>	3300mm	3300mm	3800mm	3800mm
<b>Transport Width</b>	2950mm	2950mm	2950mm	2950mm
<b>Transport Height</b>	3000mm	3000mm	3250mm	3250mm
<b>Length</b>	9050mm	9050mm	9150mm	9150mm
<b>Weight with Pro-Lift tines</b>	6050kg	6230kg	N/A	N/A
<b>Weight with ST tines</b>	6250kg	6250kg	6900kg	6900kg
<b>Tractor Power Required (H.P.)* with Pro-Lift tines</b>	270-300	240-270	N/A	N/A
<b>Tractor Power Required (H.P.)* with ST tines</b>	200-240	180-220	240-270	220-250

\* It is important to correctly match your implement to your tractor for optimum performance.

## 4. Adjustment/Operation

### 4.1 Description



Fig. 4.01: Simba Solo (Solo 330 ST R model shown)

1. Drawbar
2. Front Discs
3. Coulter Covers
4. Tine Beam
5. Rear Discs
6. DD600 Roll
7. Roll Depth Adjuster
8. Transport Wheels
9. Disc Angle Locking Units

The **SIMBA Solo** is an amalgamation of time proven, successful Simba design components brought together to form this important development. The Solo has been designed and produced in conjunction with the Simba **ECotillage™** system to provide a one pass mix with a fissured layer at disc depth for through drainage and root access to lower horizons. This enables rapid drainage and access after rain, creating a greater effective capacity for moisture compared to ploughing for the same effective total depth of cultivation.

In principle, the machine is a tandem disc with trip reset Pro-Lift tines or Terra-Grip tines, designed for low draft, high speed operations. The addition of an integral roller ahead of the rear gang, or a rear mounted roll, enables more effective cultivation in one pass. The leading set of disc blades cultivate the top horizon, minimising clod formation and reducing tine loadings and blockage. This starts the 'top down' cultivation process, retaining weathered tilth in the surface level for stale seedbed purposes. The trip reset tines follow the disc blades to shatter at depth retaining the surface intact to work as an **ECotillage™** stale seedbed. This eliminates the problem of 'wet years' in non-plough based terms. The key to the Solo's success is the lower draft tine point and wing which maintain shatter across the full width of cultivation. The mid/rear roll or trailing press then consolidates the surface, cracks any clods and firms the soil profile before/after the rear gang completes mixing to depth. The corrugated top and shattered lower horizons are left fully weatherproof to any conditions between cultivation and drilling whilst retaining moisture below the surface for rapid straw breakdown and optimum establishment of the next crop.

## 4.2 Solo Designations

Solo **380** **ST** **R**  
 1 2 3

1. This number refers to the working width of the machine.
2. The 'ST' stands for Shallow Tine. If a machine is fitted with Terragrip tines it is given this designation. If a machine is fitted with hydraulic reset Pro-Lift tines these letters will be absent from the designation.
3. The 'R' refers to the Rear roll format of the machine. If no 'R' is present in the designation then the machine is set up in the mid-roll format.

Examples:

Solo 380 ST - This is a 3.8m wide machine, with Terragrip tines in the mid-roll configuration.

Solo 330 R - This is a 3.3m wide machine, with hydraulic trip-reset tines in the rear roll configuration.

### 4.3 Disc Gangs

As with any disc combination the angle of the disc gangs is dependant on the type of operation being carried out in terms of the degree of soil movement required. The nearer the disc gang is to minimum angle, the lower the degree of both soil movement and penetration that will be achieved. The main consideration once the discs are working is to ensure that they are leaving a level surface with no ridging or trenching either to the outside or in the centre and are working with equal effect across the width of each group of gangs. In some cases it may be necessary to replace the outer blade on the rear gangs for one of a smaller diameter to return less soil, thereby reducing any trough. It is permissible to use the Coulter Coverer unit without the scraper “knife” attached in conditions where it may run clearer without it.

It is widely accepted through field experience that a progressive discing effect will achieve better results under normal circumstances than a more aggressive approach.

Gang angling is set / altered using the pivoting adjuster units. Ensure that the gang angles are mirrored across the machine (for example if the right hand front gang is set at “3” then the left hand front gang should be set at “3” also). Front to rear gang angles may differ as required.

Position 1 on the gangs = minimum angle,  
position 5 = maximum angle.

The Solo should be run level; the rear discs are set lower and will work deeper than the front.



Fig. 4.02: Front Disc Gang



Fig. 4.03: Disc Gang Angling / Locking

## 4.4 Coulter Coverer

The coulter coverers are located at the ends of the front disc gangs. These units are designed to stop the throw of soil beyond the cultivating width of the machine. The coverer on the right hand side of the machine has a transport and work setting. To change between the two, the collar should be lifted and the coverer arm rotated. The collar can then be lowered to lock the arm in position (see *Fig. 4.04* below).



*Fig. 4.04: RH Coulter Coverer (shown in transport position).*

## 4.5 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.

The rear DD roller carries a proportion of the machine's weight to ensure consolidation. It also regulates the depth of the machine. The corrugated surface left by the roller is weatherproof both for wet or dry situations.

The DD roll can be positioned at the rear of the machine (rear roll) or between the tine beam and rear disc gang (mid-roll).



*Fig. 4.05: DD600 Roll*

## 4.6 Terra-Grip Tines

Terra-Grip tines have a robust, basic construction and are suitable for all soil types.

The spring-loaded auto-reset system with a 500kg trip force on each tine prevents damage to the tines and tine brackets.

When the auto reset system is activated an initial progressive phase holds the tine in the ground in a steady position until the trip point is reached. In the subsequent spring compression phase the tine is raised gently and rapidly to a maximum height of 230mm.

The tines can be fitted with a selection of points depending on application and have 6 depth settings in 25mm increments.

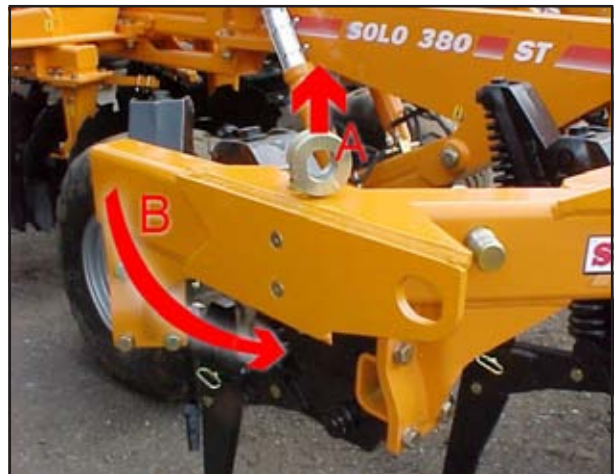
The clip-on points are attached to the tine with a quick release mechanism. A wedge shaped bracket is bolted on to the tine and a hammer is used to force the coulter on/off the taper using the removal tool provided to disengage the quick release system.

The quick release mechanism makes it possible to change the points quickly and easily without having to use any other tools. The quick release system consists of a wedge, plunger and a rubber spring.

On 380 models the tine beam has two settings, work and transport. In order to change between the two remove the locking handle (A on *Fig. 4.07*) and swing the gang round (B). The locking handle can then be wound onto the protruding bolt in order to tighten the assembly for work.



*Fig. 4.06: Terra-Grip Tines*



*Fig. 4.07: Folding Tine Beam on 380 Models*



## 4.7 Pro-Lift Tines

The arrangement of the toolbars in a 'V' frame gives lower draught requirements and maximises the loosening effect of each tine.

The depth of the subsurface tines can be altered by moving the tines vertically relative to disc depth in their respective clamps using the 4 holes in the leg. Altering the drawbar and lift circuit depth will also affect subsoiling depth as well as discing depth.

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

It is important to set the machine up correctly in order to achieve an efficient and worthwhile operation. Although the Solo can work down to around 350mm (14") this does not mean that running at this depth is always worthwhile, taking time to identify where there is a problem in the soil profile and working to the minimum depth required will save a lot of otherwise wasted fuel and time. It is also very important not to operate below the 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.

If the tines are operating below their critical depth, this is indicated by a reduced (minimal) heave/shattering effect coupled with an extremely high draft requirement. Under these circumstances either reduce tine depth, increase the front disc depth to alleviate the problem or change the type of wings.



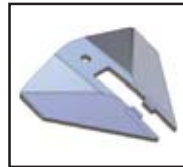
Pro-Lift tines are not available on Solo 380 models.

## 4.8 Pro-Lift Wings



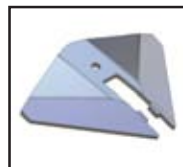
**Standard Wing**  
**P09060**

- 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.
- Effectively increases critical tine depth.



**Extra Wide Wing**  
**P10411**

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

## 4.9 Work Settings

In work the wing cylinders should be fully extended. A simple pressurised hydraulic circuit automatically sets itself as the wings are unfolded.

Optimum performance has been found to be achieved when the press roll rings have worn away the painted finish leaving a smooth shiny surface. When the press roll rings are new or rusty, soil may tend to pick up on the surface and blockage may occur, this will reduce when the rings are shiny again.

The Solo should be run with the chassis level by extending the drawbar cylinder to the necessary position and adding shims as appropriate. In practice it is possible to use the Solo on ground conditions that are unsuitable to achieve the desired effect, and it is usually possible to operate without regular blockage under such unsuitable conditions, assuming that the axles are tight and rings smooth. As such, especially under wet conditions, it is advisable to check on the cultivation effect of the Solo.

Generally a forward speed of 5-7 mph (8-11 kph) will achieve optimum results, maximising inversion and burial. Speeds in excess of those stated above will tend to give a deterioration in the quality of the work. This may be seen as a ridge and trough effect across the work surface due to soil being thrown too far by the leading discs, the rear discs then are unable to turn enough soil back.

In normal operation the machine should be hydraulically drawn onto the drawbar shims, however, it is permissible to operate the lift circuit in float in order to allow the implement to follow contours as the tractor drawbar drops (eg. over the brow of a hill).

### General Rules when Setting the Solo

- The drawbar cylinder setting and the roll depth setting work on a 2:1 ratio. For example; if 50mm of shims are added into the drawbar cylinder then 25mm of shims should be added into the roll depth control rod in order to keep the machine level.
- The roll depth control rod works on a 1:1 ratio. If 25mm of shims are added into the depth control rod this will result in the machine running 25mm deeper.

## 4.10 Starting Settings

This page details the recommended starting settings for the Solo. These settings can then be used as a base for further adjustment in order to get the optimum performance from your machine.

Ensure all settings from the left and right hand sides of the machine mirror each other.

### Disc Angles

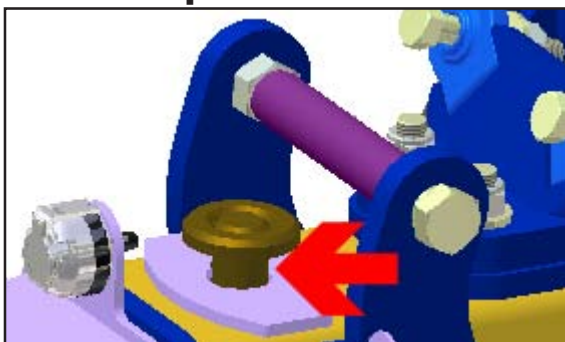
Front Disc Gangs:



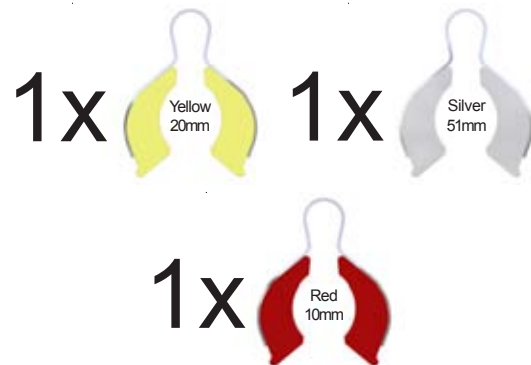
Rear Disc Gangs:



### Roll Depth



### Drawbar Cylinder



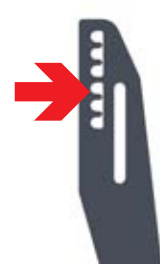
The drawbar cylinder shim settings are subject to the tractor drawbar height. As such, the shim settings shown above are intended as a suggestion only. The machine should be set to run with the chassis level.

### Tines

Pro-Lift



Terra-Grip



## 4.11 Depth Control

Working depth can be set by mid or rear roll and/or by transport wheels. Under normal conditions the weight of the machine will be carried on the roll and the drawbar of the tractor, with the main lift wheels either fully up or floating. Depth is set using the depth control rod situated on the roll unit with shims added and removed as appropriate. This is achieved by raising the machine so that the roll is clear of the ground and operating the roll hydraulics until the wings just start to fold. In this position it is possible for shims to be added/removed from the depth control rod. The roll can then be pressured back down and the machine can continue to work. The front to rear pitch of the machine should be adjusted as appropriate to compensate for changes in working depth by adjusting the amount of shims on the drawbar cylinder. Some conditions or finished effects may dictate that depth control is carried out using both the roll and the lift wheels.

### With a Mid Roll / Rear Roll

Use roll depth adjuster/hydraulic cylinder to set machine working depth - ensure wheels are lifted clear of or just touching soil. Use shims on drawbar cylinders to set chassis pitch level. Machine can be run in float to contour follow.

### With the Transport Wheels

Use shims on lift cylinders to set machine depth and shims on drawbar cylinders for pitch. Balance the weight on wheels and roll if they are to be used together for depth control.

## 4.12 Work Instructions

### Driving speed

The Solo can be driven at speeds of up to 12 km/h.

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

Drive more slowly if the conditions are difficult or a firmer finish is required.

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.

## 4.13 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.
- Raise the machine and remove shims from the lift axle and drawbar cylinders.
- Lower the machine to the ground, ensuring that it is stable.



When parking, ensure that no load is carried by the Terra-Grip tines (if fitted). This can lead to breakage of the points.

- Remove the drawbar pin and drive forward slowly until hitch is clear of tractor drawbar.
- Lower the drawbar to the ground.
- Switch off the tractor.
- Disconnect hydraulic lines from the tractor.

## 4.14 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 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 discs 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 / disc bearings with a high- pressure hose or a direct water jet. The housing, screwed connections and ball bearings are not watertight.

### 5.3 Tightening Disc Axles

1. Loosen the bearing mounting bolts on one pillar. This is to allow the bearing to move slightly when tightening the axle. This ensures that the bearings are not preloaded, which could lead to early failure.



When the axle needs tightening again, loosen the bearing that was not loosened the previous time.

2. Undo and remove the locking plate bolt and plate.
3. Loosen axle slightly and spin discs relative to each other / spools and bearings.
4. Fit one of the disc axle spanners onto the nut at the opposite end of the gang that is being tightened. The spanner should be jammed onto the ground to prevent it from slipping when the axle is tightened. Ensure the security of this spanner is maintained as the axle is tightened / loosened. Injury can occur if this spanner is unattended and slips free,
5. Tighten the axle. Continue to tighten the axle until the locking plate can be refitted. **DO NOT** back the nut off to allow the plate to be fitted.
6. Refit and tighten the locking plate bolt.
7. Tighten the bearing bolts.

### 5.4 Terra-Grip Tine Beams

A pair of shims located within the tine beam on 380 models are there to retain the tightness while the machine is in the work position. These shims create a fulcrum which, when the lock bolt is tightened, locks the the wing securely in position by removing clearances in the pivot. The amount of shims can be varied to give a gap of 2-3mm at the point indicated in *Fig. 5.02* before tightening the lock bolt (which will close the gap).



Fig. 5.01: Inner Tine Beam Shims



Fig. 5.02: Tightening the Tine Beam

## 5.5 Terra-Grip Tine Points



When changing points on Terra-Grip tines extreme care should be taken. Wear goggles at all times when changing tine points.

## 5.6 Pro-Lift Tines

When fitting new tine points, ensure all rough or square edges on the mating faces of the legs are removed prior to fitting the new tips (if necessary).

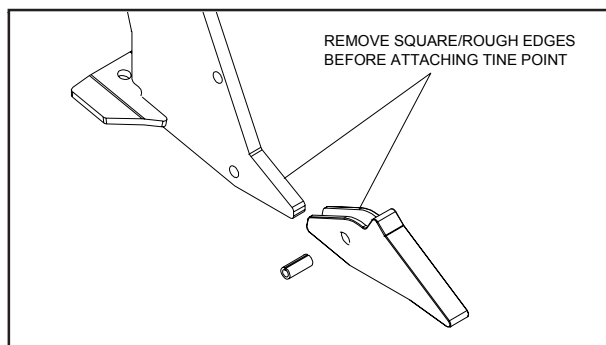


Fig. 5.03: Fitting Pro-Lift Tine Points



Do not attempt to assist fitting tine point with a steel headed hammer, as this can lead to splintering of the metal due to its hardness, which can cause injury. If tine fitting requires assistance, a copper/hide mallet should be used. Goggles should be worn.

## 5.7 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.

## 5.8 Roll Wing Shims

A set of shims are located on the ends of the wings. These can be added to / subtracted from in order to ensure that the roll runs level when pressured down in work.



Fig. 5.04: Roll Wing Shims

## 5.9 Hydraulics



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



The wing circuit is controlled by an overcentre valve contained within the manifold block which positively locks oil flow until pressurised by the tractor. System pressure can be retained in the circuit **even after depressurisation** of the tractor quick release couplings.



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.

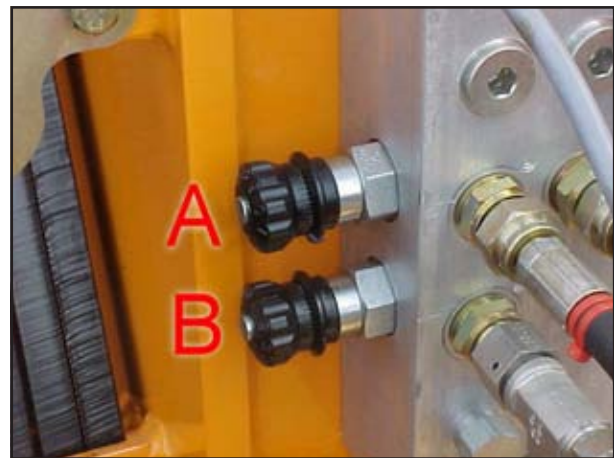
### 5.9.1 Drawbar & Axle Phasing

The following procedure allows a greater degree of control when raising/lowering and levelling the machine (front to rear). For minimum heat build up in hydraulic fittings (due to raised oil temperatures through the restricted fittings) the tractor flow rate should be set in it's lowest setting.

The restrictor A in *Fig. 5.05* can be used to slow oil from the drawbar cylinder when raising the machine.

The restrictor B in *Fig. 5.05* can be used to slow oil from the axle cylinder when lowering the machine.

A combination of the restriction instructions above should be used to raise and lower approximately parallel to the ground.



*Fig. 5.05: Drawbar & Axle Phasing*



## 5.9.2 Pro-Lift Trip-Reset Tine Hydraulics

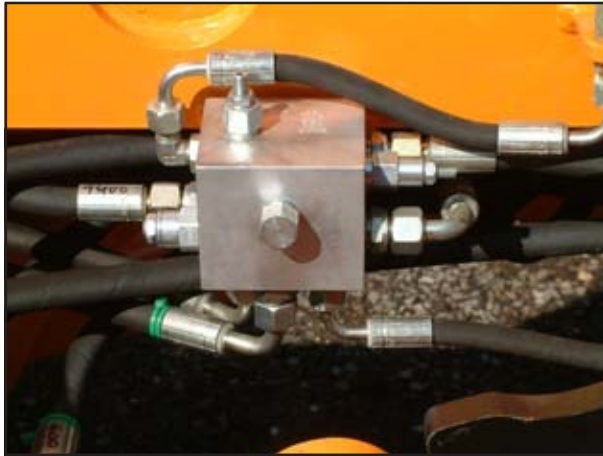


Fig. 5.06: Pro-Lift Tine Hydraulic Manifold

The circuit allows for the tines to be pressurised down into work, whereupon a relief valve limits this applied tractor down pressure to a value less than the main system accumulator (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 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 and 20 to 60 bar rod side. 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 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.

If the tine circuit should need setting the following procedure should be followed (an assistant will be required):

- 1 First locate the manifold block; it is located on the left hand side of the machine attached to the main chassis, just behind the wing that supports the trip reset tines.
- 2 With the valve block directly in front of you, undo the lock nut on the valve on the top face of the block. Using a 4mm allen key turn the valve all the way clockwise, then turn it anticlockwise 2 full turns.
- 3 Locate the valve on the front face of the block (the one facing the rear of the tractor) and undo the lock nut then turn the valve all the way clockwise.
- 4 Locate the valve on the rear face of the block (facing the rear of the machine) and undo the lock nut then turn the valve all the way anticlockwise.
- 5 Start the tractor and put the spool lever that controls the tines in to the float position. Both the gauges will go to zero and the tines will go down. This indicates that system is depressurised.
- 6 Now get your assistant to pressure the tines down. Whilst they are being pressured down, turn the valve on the rear face of the block slowly clockwise. The pressure on the lower gauge will start to rise. Turn the valve until you reach approximately 80 to 90 bar (the pressure on the upper gauge will now be reading approximately 10 to 15 bar). Lock off all the valves. The tine circuit is now set.

### 5.9.3 2 Litre Accumulators

The manufacturers of this part recommend that the pressure of the nitrogen pre-charge is checked annually (seasonally). The recognised procedure for testing the nitrogen pressure uses specialised test equipment. In instances where this equipment is not available the following procedure should be used.

1. Attach the Solo 330 to a tractor and attach the lift and tine circuits.
2. Raise the machine clear of a firm surface. Function the tine circuit, noting the pressures registered on the gauges when the tines are pressured down. The following settings are normal.

Soil Type Setting	Cyl. Gauge	Rod Gauge
Normal	90 bar	20-40 bar
Hard / Stone Free	120 bar	40-60 bar

3. Remove three tines from the machine leaving one of the inner tines in the deepest work setting.
4. Lower the machine carefully. The aim is to cause the remaining tine to trip and note the change in cylinder gauge pressure. The cylinder gauge should show a rise indicated in the table below.

Soil Type Setting	Starting Cyl. Pressure	Pressure Rise
Normal	90 bar	15-20 bar
Hard / Stone Free	120 bar	35-40 bar

5. If less than full tine trip is achieved or a pressure rise of greater than 55 bar is indicated then the 2 litre accumulator should be recharged to 80 bar nitrogen pressure or replaced with a correctly charged accumulator.

It is important that this procedure is carried out to avoid damage to the machine. In a situation where nitrogen pressure has dropped there will be no indication in normal work as the void usually filled with nitrogen will become filled with oil and the gauges will register no change in working pressure.

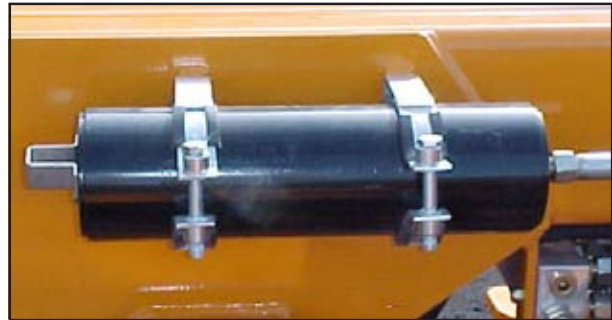


Fig. 5.07: 2 Litre Accumulator

### 5.9.4 Roll Hydraulics



Tampering with a pressurised hydraulic system is extremely dangerous.



Pressure may be retained in the roll circuit between the valve and the cylinders. Although it shouldn't be necessary to remove the fittings between the valve and the cylinders, the de-pressurisation procedure should be followed before doing so.

#### De-pressurisation Procedure for Roll Hydraulics

To de-pressurise the circuit, identify and adjust the following valves on the roll valve block.

All valves can be identified by stamped codes adjacent to each valve.

1. Set tractor hydraulics to neutral, machine lowered and unfolded.
2. Adjust Over Centre valve (1) fully clockwise.
3. Adjust Over Centre valve (2) fully clockwise.
4. Set main system to float, or allow oil pressure to be released in both directions.



The manifold may need de-pressurising after being subjected to high oil flow.

### Roll Hydraulics Setting Procedure - Factory settings

The following table outlines the re-setting of the roll hydraulics back to factory settings. Each number below corresponds to the relevant valve on the hydraulic block located near the roll section of the machine.

Valve #	Function	Setting Procedure
1	Over Centre Valve for locking wings down in work	Adjust the valve all the way out (anti-clockwise) then a half turn in (clockwise).
2	Over Centre Valve for holding wings safely during unfolding	Adjust the valve all the way anti-clockwise then check by unfolding the wings to a 45° angle and putting the hydraulics into float. The wings will now be locked. Slowly turn the valve clockwise until the wings start to lower. At this point stop the wings lowering by slowly turning the valve anti-clockwise. When the wings have stopped lowering turn the valve one full turn anti-clockwise and lock it off.
3	Relief Valve - Unfolding	Set to 80 bar
4	Relief Valve - Folding	Set to 150 bar

## 5.10 Changing Roll Configuration

The following procedures outline changing the configuration of the roll from the mid mounted position to the rear position and vice versa.



Extreme care should be exercised while performing this operation and all Health & Safety guidelines present in this manual should be adhered to.

### Mid-Roll to Rear Roll

1. Unfold the press unit (all other working elements should remain in the transport position).
2. Remove the depth control rod and the shim storage tie rod (items 17&19 on Page 128).
3. Put the wing circuit into float .
4. Remove the 6 nuts on the rampoint unit and the 2 outer cylinder bolts.
5. Disconnect the hydraulic hose on the valve block (at ports F01 & F11) and at the junction in the pipes. Remove and stow this hose (in the toolbox).



Pressure may be retained in the circuit between the valve and the cylinders. Although it shouldn't be necessary to remove the fittings between the valve and the cylinders, the de-pressurisation procedure (page 35) should be followed before doing so.

6. Remove the bolts from the lift cylinders on the carriage unit and lower the roll unit to the ground.
7. Fully raise the machine and put the maximum amount of shims into the lift axle rams.
8. Open the drawbar taps and lower the machine until the front gangs are just clear of the ground so that the rear gangs can clear the roll unit.
9. Drive the machine forward until the back gang is clear of the roll unit.
10. Raise the machine, take out the lift axle shims before lowering the machine again.
11. Remove the 4 bolts on the rear gang mounting unit (as seen on Page 86).
12. Close the drawbar cylinder taps.
13. Carefully raise the machine until the gang unit is clear of the mounting plate.
14. Reverse the machine through the rear gang hole and bolt the rear gang and chassis support (see Page 76) loosely into position.
15. Raise the machine and place the rear gangs into the minimum angle setting.
16. Remove the rear drawbar.
17. Remove wear pads for the roll carriage from the mid-mount position to the rear position (item 31 on Page 66).
18. Raise the roll carriage unit to the mounting plate at the back of the machine and attach along with chassis support unit. Tighten the bolts left loose in 14.
19. Re-insert the depth rod and the shim storage bar.
20. Bolt on the top cylinder plate.
21. Lift the carriage unit and attach the rams to the top.
22. Re-route hoses as per revised piping for mid/rear roll configuration. Utilise the the hoses that were not removed (P13639 (3/8" 1650mm long)). Take care whilst reconnecting the hoses to the valve to put the twin cable-tied hose into port F01 (rod side) and the single cable-tied hose into port F11 (cylinder side).

## Rear Roll to Mid Roll

1. Unfold the press unit (all other working elements should remain in the transport position).
2. Remove the depth control rod and the shim storage tie rod (items 17&19 on Page 128).
3. Put the wing circuit into float.
4. Remove the 6 nuts on the rampoint unit and the 2 outer rampoint bolts (fold cylinders).
5. Disconnect the hydraulic hoses on the valve block (at ports F01 & F11).



Pressure may be retained in the circuit between the valve and the cylinders. Although it shouldn't be necessary to remove the fittings between the valve and the cylinders, the de-pressurisation procedure (page 35) should be followed before doing so.

7. Remove the bolts from the lift (rotate) cylinders on the carriage unit and lower the upper roll carriage unit to the ground.
8. Remove the chassis support unit and reattach the disc gang for safety.
9. Remove the remaining (rear) lower roll carriage bolts and lower the roll to the ground.
10. Remove wear pads for the roll carriage from the rear position to the mid-mount position (item 31 on Page 66).
11. Remove the bolts on the rear gang mounting unit (as seen on Page 86).
12. Close the drawbar cylinder taps.
13. Carefully raise the machine until the gang unit is clear of the mounting plate.
14. Drive forwards so the machine passes through the rear gang hole and bolt into position.
15. Raise the machine and place the rear gangs into the transport angle setting.
16. Fully raise the machine and put the maximum amount of shims into the lift axle rams.
17. Open the drawbar taps and lower the machine until the front gangs are just clear of the ground so that the rear gangs can clear the roll unit.
18. Reverse the machine until the back gang is clear of the roll unit.
19. Raise the machine, take out the lift axle shims before lowering the machine again.
20. Raise the roll carriage unit to the mounting plate at the mid-mount position of the machine.
21. Re-insert the depth rod and the shim storage bar.
22. Bolt on the top cylinder plate.
23. Lift the carriage unit and attach the rams to the top.
24. Re-route hoses as per revised piping for mid/rear roll configuration. Utilise the the hoses from the toolbox (P13640 (3/8" 1450mm long)) between the junction and the valve to bridge the gap. Take care whilst reconnecting the hoses to the valve to put the twin cable-tied hose into port F01 (rod side) and the single cable-tied hose into port F11 (cylinder side).
25. Fit the rear drawbar (see page 70).

## 5.11 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 / discs against rust. If you need to spray the implements with oil, use light biologically degradable oils, e.g. rape oil.



Cover any rubber sections before using oil sprays. These sections must not be oiled.

Remove any traces of oil with a suitable cleaning agent.

## 5.12 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
- Serial Number of Machine
- Date of Purchase and Operating Hours
- Type of Problem

## 5.13 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 (disc blades, 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!

## 5.14 Maintenance Overview

Solo 330/380 Maintenance Overview			
	Instructions	Interval	Note
After first operation			
Check all screw, bolt and plug connections	Check they are firmly seated. Tighten / Secure if necessary	---	---
Check wheel studs for tightness	Check on delivery and before transporting the machine	---	---
Lubricate machine	See overview of lubricating points	---	Page 40
During operation			
Lubricate machine	See overview of lubricating points	---	Page 40
Wheel studs	Check tightness before transporting the machine	daily	---
Disc Angle Locks, Working Depth	Check setting and ensure they are firmly secured	daily	Page 24
Hydraulic system and components	Check seals, signs of crushing/wear, function and condition	daily	Page 32
Disc Axle Bearings	Check condition, mountings and smooth operation	daily	Pages 22, 30
Roll Axle bearings	Check condition, mountings and smooth operation	daily	Pages 23, 31
Double Disc roller ring segments	Check condition and ensure they are firmly secured	daily	Pages 22, 30
Safety devices (Transport Pins)	Check condition and function	daily	---
After season			
Lubricate machine	See overview of lubricating points	---	Page 40
Bolts / Lock Bolts	Grease any exposed threads	---	---
Gang pivots	Remove caps & tighten nuts, then back off the nut one flat to ensure smooth operation. Replace cap	---	---
Entire machine	Carry out cleaning and maintenance	---	---
Spray Double Disc roll with oil	Use biological oil if possible - cover rubber elements	---	---
After 4 years			
Hydraulic pipes	Replace	MRL Anh I	EN 1533

## 5.15 Overview of Lubricating Points

Solo lubrication points	Interval	Diag. No.
DD Roll Bearings	Daily	5.08
Disc Bearings	Daily	5.09
Coulter Coverers	Daily	5.10
Gang Pivots	50 Hours	5.11
Pro-Lift Time Arms	50 Hours	5.12
Disc Angle Locking Handles	50 Hours	5.13
Wheel Bearings	50 Hours	5.14
Transport Axle Pivot	50 Hours	5.15
Roll Carriage Pivot	50 Hours	5.16
Wing Pivots	50 Hours	5.17
Drawbar Pivot	50 Hours	5.18



Fig. 5.08: DD Roll Grease Points



Fig. 5.09: Disc Axle Grease Points



Fig. 5.10: Coulter Coverer Grease Points



Fig. 5.11: Gang Pivot Grease Points



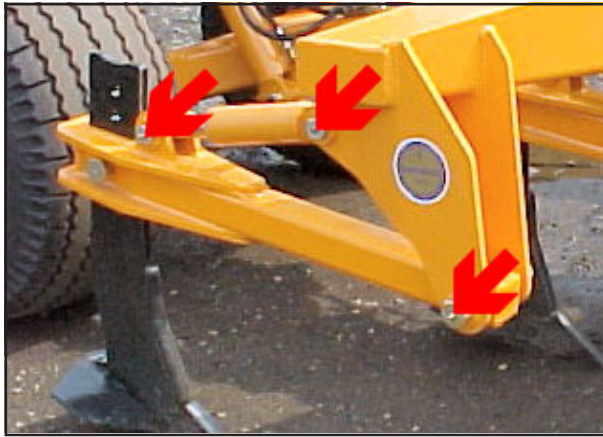


Fig. 5.12: Pro-Lift Tine Arm Grease Points

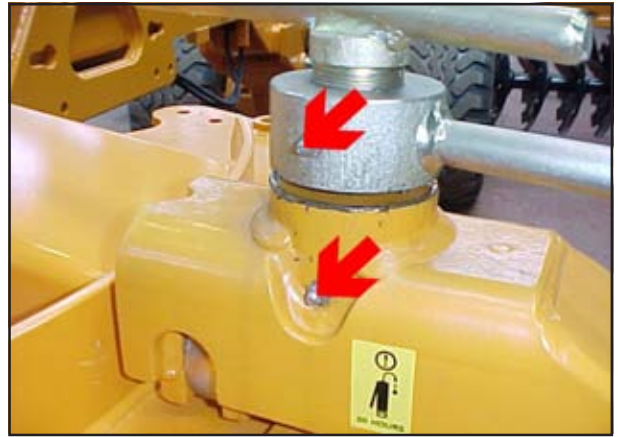


Fig. 5.13: Disc Angle Lock Grease Points



Fig. 5.14: Wheel Hub Grease Points



Fig. 5.15: Transport Axle Pivot Grease Point



Fig. 5.16: Roll Carriage Pivot Grease Points

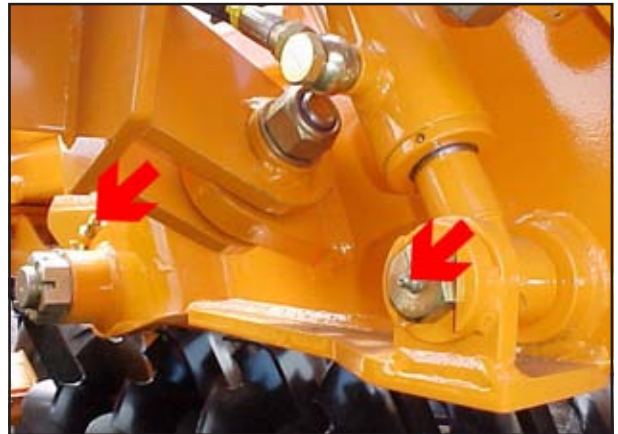


Fig. 5.17: Wing Pivot Grease Points



Fig. 5.18: Drawbar Pivot Grease Point

## 5.16 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.

## 5.17 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.

### Attention!

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.

## **5.18 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**

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

## 6. Faults and Remedies

Solo 330/380 Troubleshooting		
Fault	Possible cause	Remedy
Machine pulls to one side	Discs set unevenly	Adjust each pair of disc gangs
	Tines set unevenly	Adjust tine depth
	Roll blocked	Unblock roll
Machine not running level front to rear (if not deliberate)	Machine set incorrectly	Adjust drawbar shims to compensate or if nose diving decrease mid/rear roll pressure.
Transport wheels fail to lift machine	Tractor relief valve operating tractor hydraulics worn	Decrease flow rate
Discs fail to penetrate	More depth needed	Adjust depth control
	Gang angle too little	Check gang settings and increase gang angle if appropriate
	Blades worn	Replace blades
Disc gang uneven working depth side to side		Adjust depth control unit on roll / shims in drawbar cylinders
Machine pulling up clods	Chassis running nose down	Add shims to drawbar cylinder
Rear disc dragging up wet soil	Chassis running tail low	Remove shims from drawbar cylinder
Ridge is formed between gangs in work	Gang angle too severe	Adjust gang angle and / or operating depth
	Speed too high	Adjust forward speed
Trough is formed between gangs in work	Gang angle too little	Adjust gang angle and / or operating depth
	Speed too low	Adjust forward speed