



# Roots & Grains Feeder

No. 1883

Instruction Manual  
& Operating Guide



# EC Declaration of Conformity

in accordance with BS EN ISO/IEC 17050-1:2004



David Ritchie (Implements) Ltd.,  
Carseview Road, Forfar, Scotland DD8 3BT

declare that:

Equipment: ..... **Roots and Grains Feeder** .....  
Model No: ..... **1883** .....  
Serial No: .....

in accordance with the following directive:

**2006/42/EC** Conforms with the essential requirements of the Machinery Directive  
and its amending directives

has been designed and manufactured to the following specifications:

**BS EN ISO 12100 -1: 2003 Safety of Machinery** - Basic concepts, general principals for design - Basic terminology, methodology.

**BS EN ISO 12100 -2: 2003 Safety of Machinery** - Basic concepts, general principals for design - technical principals and specifications.

**BS EN 982: 1996**  
Safety of machinery. Safety requirements for fluid power systems and their components - Hydraulics

**BS EN ISO 4254-1:2009**  
Agricultural machinery - Safety - Part 1: General requirements

**BS EN ISO 13857:2008**  
Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs.

**BS EN ISO 14121-1: 2007**  
Safety of machinery - Risk assessment - Part 1: Principles

Signed:-

Robert Ritchie Al agr E  
Agricultural Sales Director

at:- David Ritchie Implements Ltd. Forfar, UK  
on:- 5th January 2011

# Contents

## Roots and Grains Feeder:-

	Pages
Foreword .....	4
Warranty .....	5
Intended Use .....	5
Safety .....	6, 7
Machine Overview and Specifications .....	8, 9
Handling of the machine .....	9
Attaching to Tractor .....	10
Loading .....	11
Feeding .....	11
Removal of Stones .....	11
Blockages .....	11
Adjustments .....	12
Optimising Performance .....	13
Optional Hydraulic Shutter .....	14 - 16
Optional Forklift Frame .....	16
Maintenance and Servicing .....	17, 18
Spare Parts .....	19



## Foreword

The Ritchie Roots and Grains Feeder has been designed for feeding all types of root crops and grains and is not intended for any other use.

David Ritchie Implements shall not be liable for damage resulting from inappropriate use of the machine. The user shall bear all responsibility.

Intended use also comprises adherence to the operating, maintenance and servicing instructions contained in this manual.

The machine must only be used in perfect working condition. Any functional disorders, especially those which affect the health and safety of personnel must be rectified immediately.

The Roots and Grains Feeder must only be used by an experienced, competent operator who has been trained in the safe use of the machine, who has read the operator's instruction manual and who is aware of the potential risks involved in working with the machine.

Following the setting up, operating and maintenance instructions contained in the

manual should allow the operator to achieve the best performance from the machine, resulting in increased reliability.

Operators should read carefully all safety notes contained within the manual prior to using the machine in order to help avoid dangerous situations, expensive repairs and prolonged downtime. In addition operator's should also read any relevant legislation regarding health and safety and accident prevention applicable to the country in which the machine is to be used.

The right to alter specifications, equipment and maintenance instructions at any time, without notice is reserved as part of our policy of continuous development and improvement.

No liability can be accepted for inaccuracies or omissions in this manual, although every possible care has been taken to make it as complete and accurate as possible.

Owners who encounter a problem not covered in this manual should contact David Ritchie Implements Ltd. at the address given on the rear cover of the manual.



## Warranty

The machine should be checked over at time of delivery for transport damage. Check also that the specification is complete and that the data plate contains the serial number of the machine. All claims must be delivered to the manufacturer in written form within 48 hours.

David Ritchie Implements Ltd. guarantee subject to certain conditions that the goods supplied will be free of defects both in material and workmanship.

The following conditions apply:-

- The machine should only be used for the purpose indicated in this manual.
- Service and warranty work is carried out only by authorised Ritchie dealers.
- The original specification of the machine has not been subject to unauthorised modification.

Correct operation of the machine and regular maintenance will help to prevent breakdowns. If however operating trouble is experienced during the warranty period the following actions should be adopted:-

Notify the dealer immediately from whom the machine was purchased, quoting the model and serial number.

Do not operated the machine. Damage resulting from failure to report a fault may not be covered by warranty.

The manufacturer cannot accept liability for damage to machines or third party through operational negligence.

## Important



This machine has been fitted with a Cross Line Relief Valve which is pre-set on assembly. The valve is fitted to protect the motor when fitted to a power source which has high relief valve pressure. Any adjustment made to this valve without prior written permission from David Ritchie (Implements) Ltd. will invalidate the warranty.

## Intended Use

The Ritchie **Roots and Grains Feeder** is designed for feeding all types of root crops and grains up to a capacity of 1 m<sup>3</sup> or 1000kg in weight.

The machine is designed to be mounted on a tractor with category 2 - 3 point linkage. The tractor must be capable of delivering a minimum hydraulic flow rate of 30 litres per minute at a pressure of 142 bar (2100 psi).

Alternatively, the machine can be mounted on a telehandler or heavy duty front end loader. The machine is designed to be used by a single operator only (tractor driver).

The machine can be used both out of doors and in live stock buildings where conditions of free movement and sufficient ventilation exist to ensure the safety of persons and animals.

The feed can be discharged directly onto the ground or into feeding troughs or feeding passages.

The machine should be used on firm ground. Sloping ground exceeding 8° in inclination should be avoided to minimise the risk of toppling over.

## Inappropriate Use

The machine must not be used for purposes other than those indicated in this manual.

The machine must not be used for loading, transportation or feeding of other materials other than those mentioned in this manual.

# Safety Information

**Please read these instructions carefully. Ignoring these instructions could result in serious personal injury or damage to the machine.**

These instructions apply to all personnel involved with the operation, maintenance and servicing of the machine.

## General

The machine must only be used by an experienced, competent operator who has been trained in the safe use of the machine.

The operator should consult the tractor handbook for information and instruction on mounting implements and other safety issues.

Only operate this machine from the tractor seat (work station).

Never allow personnel to ride on the machine.

Do not modify any part of the machine which could affect safety. Any modifications or additions to the machine should be approved by the manufacturer. This also applies to welding work.

Do not adjust the cross line relief valve which is fitted to protect the motor without written permission from David Ritchie (Implements) Ltd.

Check all safety decals on the machine are in good condition and that their meaning is understood.

Always test the machine prior to operation to ensure services function correctly. Do not use the machine if a malfunction occurs.

Do not stand in the area between tractor and implement or allow others to enter this area.

Warn bystanders to keep clear of the machine whilst operational.

Tractors must be equipped with front weights to provide a front axle weight of at least 20% of the tractor mass.

## Before and During Operation

**Never leave the tractor cab while the machine is running. Always lower the machine to the ground, switch off the tractor engine and remove the ignition key before approaching the working zone of the machine.**

The same applies for downtime and standstills.

Take particular care when mounting the implement to the tractor. Always position the machine on flat level concrete or tarmac.

Never work on ground exceeding 8° in inclination.

Take care when coupling / uncoupling the hydraulic hoses to the tractor. Hydraulic oil under pressure can damage your skin.

Always seek immediate medical advice in such circumstances.

**Warning:** Hydraulic fluid under pressure can penetrate the skin or eyes and cause serious personal injury or blindness. Fluid leaks, under pressure, may not be visible. Use a piece of cardboard or wood to find leaks. DO NOT use your bare hand. Wear safety goggles for eye protection. If any fluid is injected into the skin, it MUST be surgically removed within a few hours by a doctor familiar with this type of injury.



## Blockages

**Under no circumstances should the operator attempt to clear a blockage by hand unless the tractor engine is stopped and the ignition key removed. The operator should also ensure that any residual pressure in the hydraulic system is released by operating the spool valve levers in both directions.**

## Servicing and Maintenance

Only use suitably qualified engineers working to the relevant standards and codes of practice when repair work to the hydraulic system is to be undertaken.

Never attempt maintenance or servicing work on the machine when the tractor engine is running. All maintenance and servicing work should be undertaken with the machine lowered to the ground. Release any residual hydraulic pressure to the system by operating the spool valves in both directions.

**Switch off the tractor engine and remove the ignition key!**

After cleaning the machine check all hydraulic hoses for leaking or operational damage. Damaged hoses should be replaced immediately.

If servicing work is required to the underside of the machine always provide adequate support devices to prevent sudden dropping.

Adhere to replacement intervals noted in the manual even if signs of wear to component parts is not evident.

After servicing is complete check all nuts and bolts have been tightened satisfactorily.

Dispose of used oils carefully with due consideration to the environment.

## Transportation and Storage

Before transportation of the machine adjust the lower link stabiliser chains to reduce side swing to the minimum.

Before travelling on public roads ensure the machine is free of loose material and equipment.

When turning or at bends take the width and load of the machine into consideration.

Road speed should not exceed 10 m.p.h. (15 km/h).

When stopped, always use the parking brake.

Whenever possible use the tractor to lift the implement. Alternatively sling points may be used for lifting the machine by forklift. These are identified by decals described in this manual, together with lifting instructions.

After work, lower the bucket to the ground before unhitching from the tractor.

When storing the machine - clean thoroughly. Position the machine indoors on flat level concrete or tarmac where it presents no hazard to people or animals.



# Machine Overview

The **Ritchie Roots and Grain Feeder** is a hydraulically driven unit designed for rear or telescopic forklift mounting. Designed for feeding all types of root crops and grains.

A manually operated stone trap is incorporated to eject stones when feeding a root crop.

The implement features a full length trash flap under the auger. Agitator wheels are supplied to prevent grain bridging and to ensure a free flow of grain into the trough.

An optional forklift frame has been designed for use with modern telescopic or heavy duty front loaders.

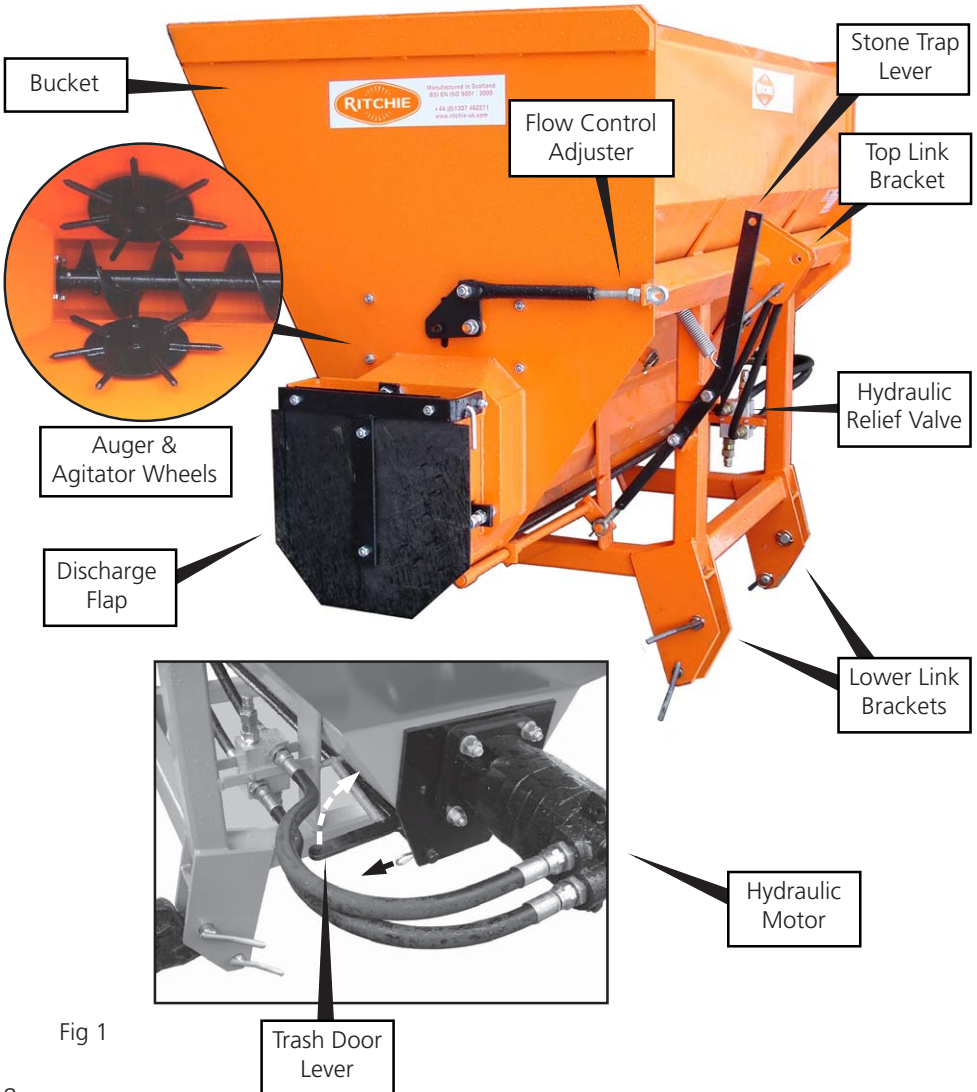


Fig 1



# Roots & Grain Feeder Specification

Overall Length (in filling position) .....	1720mm
Overall Width (in filling position) .....	2120mm
Overall Height (in filling position) .....	1000mm
Width at face of Bucket .....	1830mm
Unladen Mass .....	480kgs
Motor size .....	625cc
Hydraulic Couplings .....	1/2" Male Q.R. Couplings
Hydraulic Hose Ratings (motor) .....	1/2" SAE. 100 R2T
Hydraulic Hose Rating (Top Link Ram) .....	3/8" SAE. 100 R2T
Cross Line relief Valve Pressure .....	190 Bar
Oil Fill capacity .....	5 Litres
Bucket capacity .....	1 m <sup>3</sup>
Auger Flight Diameter .....	230mm

## Tractor Requirements

One Double Acting Spool Valve	
One Single Acting Spool Valve	
Minimum Oil Flow .....	30 Litres/Minute
Minimum Oil Pressure .....	142 Bar

## Handling of the Machine

Whenever possible the tractor should be used to lift the machine.  
Alternatively a sling point may be used for lifting the machine by forklift.  
This point is identified by a decal positioned on the machine, (see Fig 2).

Before lifting secure the quick release hoses to the implement framework to prevent them from trailing on the ground.


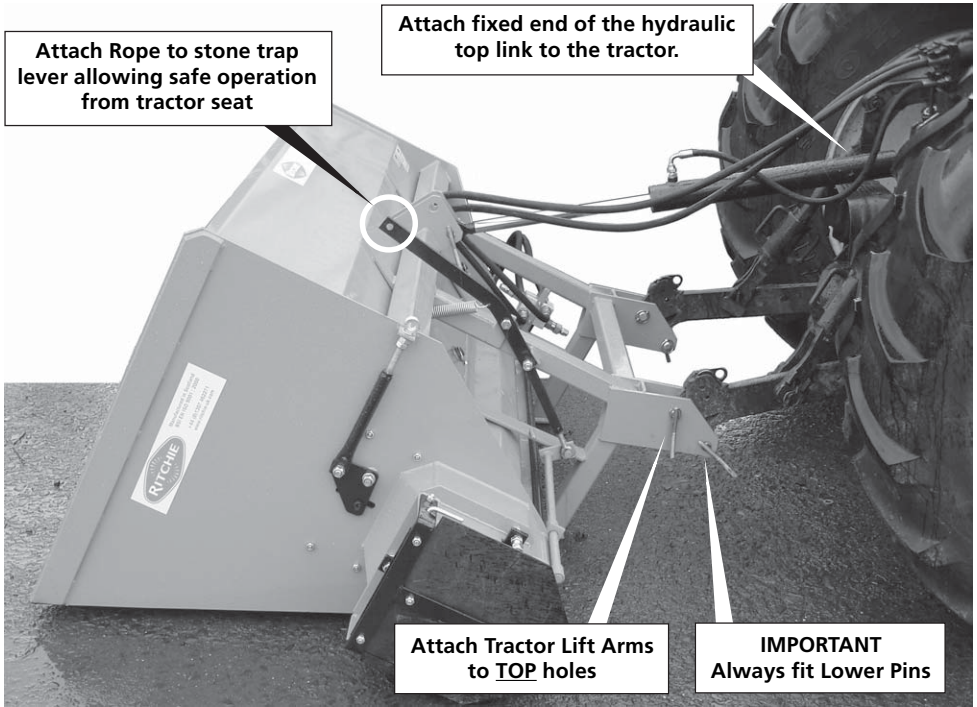
 **Ensure lifting equipment has a minimum lifting capacity of 500kg.**



Fig 2

The required safety factors for maximum working loads are 1.25 static, and 1.1 dynamic.

## Attaching to the tractor



### Important

**Ensure that the tractor lift arms are attached to the top hole of the lower linkage assembly.**

**Ensure that the lower pins are fitted. These act as a brake on the under side of the tractor lift arms to prevent the feeder from tipping over-centre when loading.**

Connect the two hydraulic supply lines to a double acting valve on the tractor. Run the system to 'bleed off' any air and check the auger rotation is correct for the

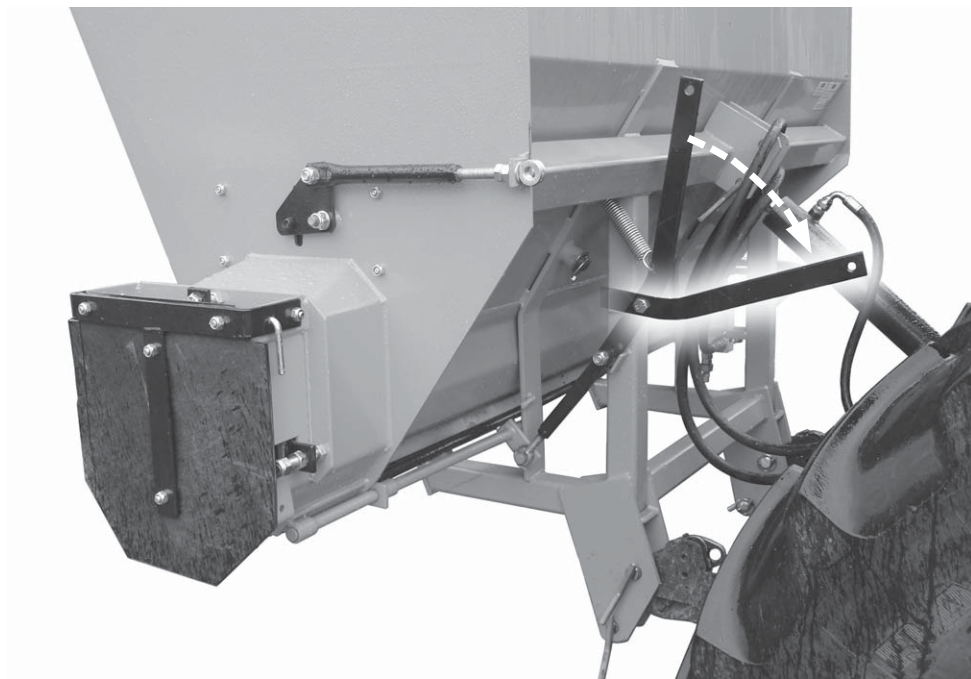
desired movement of the spool valve lever in the tractor cab. Rotate the supply hoses if required. Fit the hydraulic top link and attach the hydraulic hose to a single acting valve and operate to 'bleed off' any air.

**Remove the discharge flap locking pin.** (see page 7)

**When feeding roots, the agitator wheels must be removed as premature wear of the auger may occur.**

Attach a rope to the stone trap linkage hand lever (circled above) - ensuring sufficient length to reach the tractor cab. This will allow safe operation of the lever from the tractor seat.





## Loading

Tip and lower the bucket using the hydraulic top link and lower lift arms so that the bucket lies parallel with the surface.

**Keep the base of the bucket above the floor surface or premature wear of the face plate may occur.**

Reverse into the fodder, crowding the hydraulic top link simultaneously.

## Feeding

Set the tractor engine speed to approximately 'pto revs'. Select an appropriate forward gear and operate the double acting spool valve to process and discharge the load.

**Only operate this machine from the tractor seat and ensure no-one is in close proximity when in operation.**

## Removal of stones

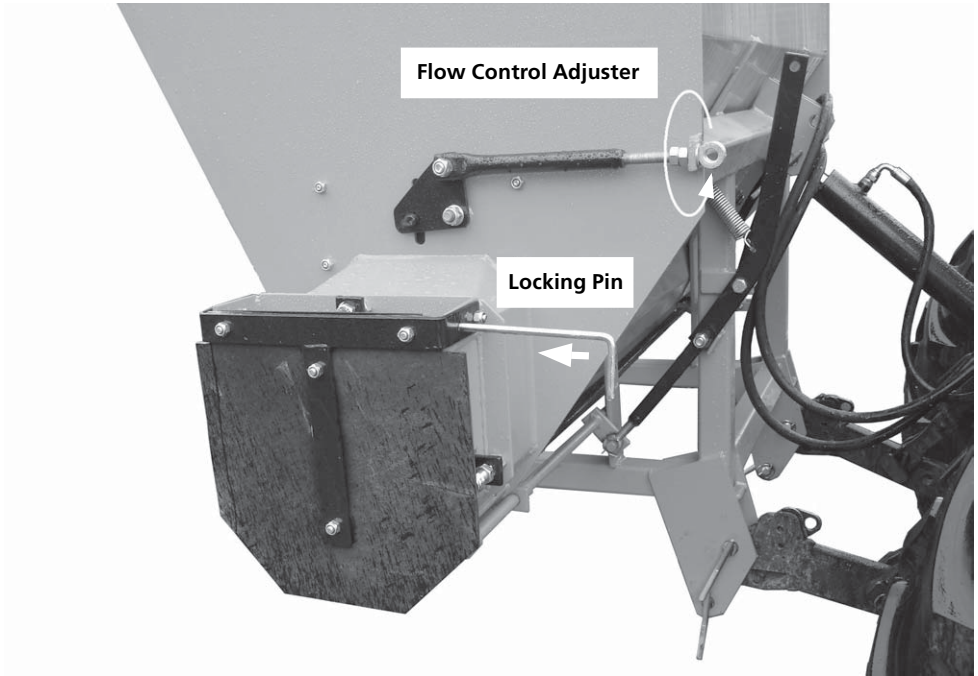
When feeding roots, stones may be encountered. Should this happen, the hydraulic relief valve will blow on either the tractor or the Roots & Grains feeder.

At this stage; **only from the tractor seat** activate the hand lever to open the stone trap and reverse the auger. The stone will fall through the opening along with some trash. Release the lever and the door will automatically lock allowing you to continue feeding.



## Blockages

**As stated in the safety instructions - Under no circumstances should the operator attempt to clear a blockage by hand unless the tractor engine is stopped and the ignition key removed. The operator should also ensure that any residual pressure in the hydraulic system is released by operating the spool valve levers in both directions.**



## Adjustments

To avoid spillage of grains when transporting over a distance, the locking pin can be used to secure the discharge flap.

**This pin must be removed before feeding.**

An internal shutter is incorporated to assist with the flow control of various foodstuffs. The shutter is operable externally and enables the operator to set at an optimum opening to suit the fodder being processed.



Before making any adjustments, when attached to a tractor, ensure there is no residual pressure in the system by turning off the tractor engine and working the spool valve lever for the motor in both directions.

An optional hydraulic shutter is available, if required (see pages 14-16).

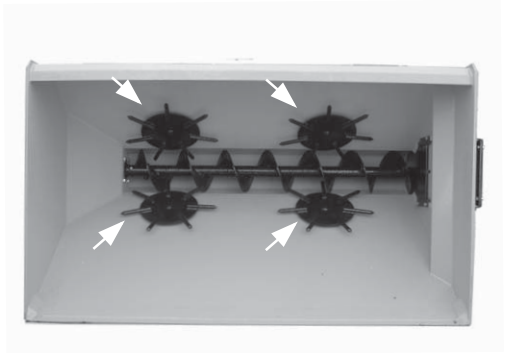


## Optimising Performance

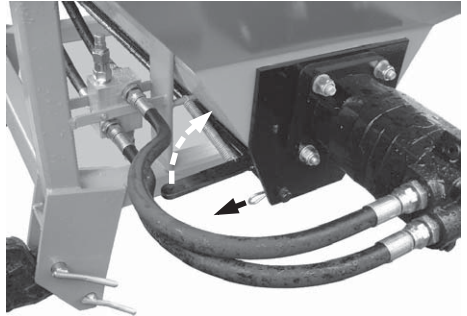
- The agitator wheels must be removed when feeding roots, but are strongly recommended when feeding wet grains to prevent bridging.

To remove wheels: Remove R-Pins and washers (accessible on outside of bucket) from ends of wheel shafts.

Lower bucket to ground level allowing wheels to be lifted out.



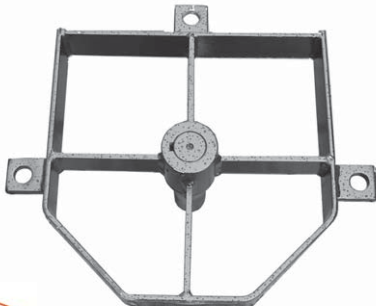
- For a cleaner sample if feeding dirty roots, run the machine with the trash door open.



- It is possible to reduce the cut root size by adding a secondary cutter



- A 4 spoke end cutter is available when feeding grains only.



## Optional Equipment

### Hydraulic Shutter (option)

The Hydraulic Shutter **1883-500** is a bolt on option which is located at the discharge end of the feeder.

The shutter operates vertically and when in the closed position stops spillage of feedstuffs from the roots and grains feeder.

The shutter is connected hydraulically to the drive motor enabling automatic operation.

The standard kit consists of hydraulic shutter assembly, 4 spoke cutter, hoses and tee pieces. This kit is suitable for feeding grains (only). If roots are to be fed as well as grains a vertical cutter is supplied in lieu of the 4 spoke cutter.

*To fit the hydraulic shutter:-*

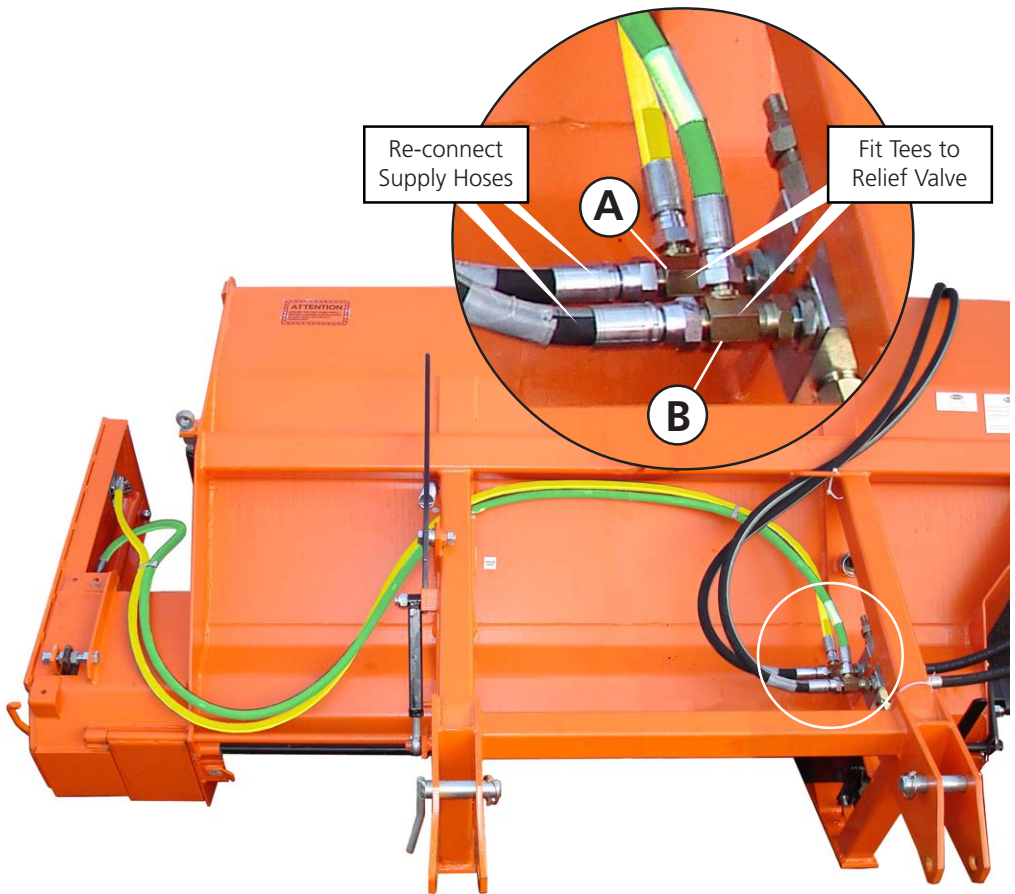
**Switch off the tractor engine and remove the ignition key!** Release any residual hydraulic pressure to the system by operating the spool valves in both directions.

Remove the discharge flap assembly and existing cutter from the end of the auger.

Fit the hydraulic shutter c/w cutter to the feeder discharge and secure with nyloc nuts.

**Note:** Ensure that the head is adjusted to give a minimal clearance between the cutter head and the end of the auger when tightened.





Detach the supply hoses from the hydraulic relief valve and fit tee pieces as shown above. Re-fit the supply hoses to the tees.

Route hoses from the hydraulic shutter ram to the relief valve as shown using cable ties where appropriate to secure hoses to side of unit.

Take care to ensure hose from ram (end) is routed to tee at position A on relief valve, and the hose from piston end of ram is routed to tee at position B.

**Note:** Hoses are coloured green and yellow in the figure above for clarity.

When hydraulic fittings have been tightened start up the tractor engine and charge the system with oil by operating the spool valve lever a few times to bleed of any air in the hoses.

Check system for leaks -

**Note:** Use a piece of cardboard or wood to find leaks. **DO NOT** use your bare hand. Wear safety goggles for eye protection.



**If a leak is discovered - switch off the tractor engine and release any residual pressure in the system before attempting to tighten a hydraulic fitting.**

**Note:** The hydraulic shutter will not open or close until the bucket has been filled, as the mechanisms rely on pressure exerted on the auger by the loaded feedstuffs.

### To operate the Hydraulic Shutter -

Load the bucket as described on page 11 and transport the unit to the location where feeding is to take place.

Set the tractor engine speed to approximately 'pto revs'. Select an appropriate forward gear and operate the double acting spool valve to engage the auger and raise the hydraulic shutter. The load will be processed and discharged.

The shutter door will close automatically when the auger is put into reverse by moving the spool lever in the opposite direction.

**Only operate this machine from the tractor seat and ensure no-one is in close proximity when in operation.**

**Note:** A visual indicator is provided to enable the operator to check the shutter door position from the tractor seat.

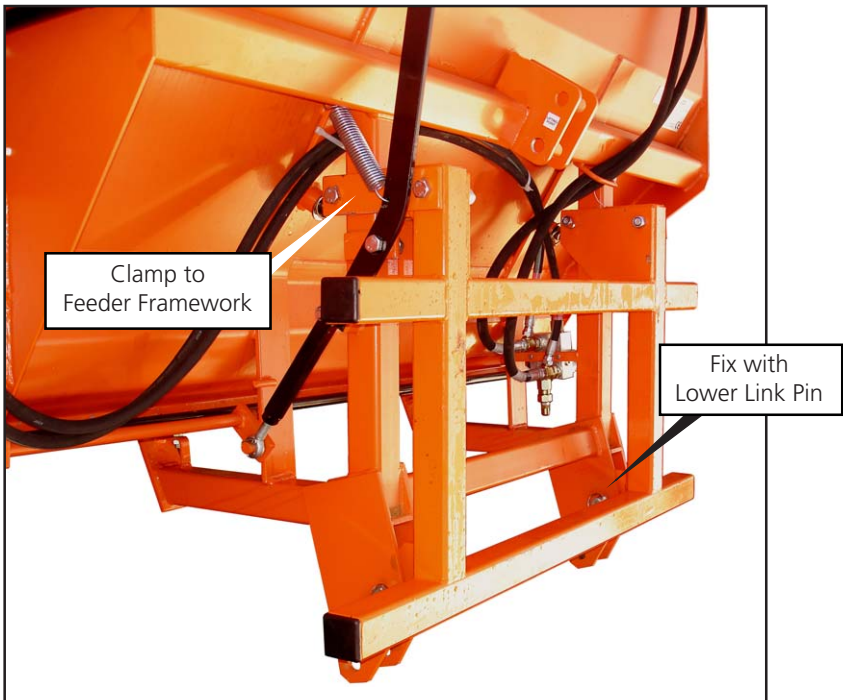
### Forklift Frame (option)

The Forklift frame **1884** is an easy bolt/pin-on option which allows easy attachment of appropriate quick release brackets for modern telescopic or heavy duty front loaders.

Ritchie dealers can provide the necessary quick release brackets to suit the type of handler to be used.

*To fit the forklift frame:-*

Fit the bottom end of the forklift frame to the lower link brackets and secure with pins. Raise the frame into position and secure to the feeder framework using the clamp plates and bolts provided.





# Maintenance and Servicing



Before attempting any maintenance turn off the tractor engine and release any residual hydraulic pressure by operating the spool valve lever in both directions.

If service is required to the underside of the machine ensure adequate supporting devices are in place to prevent sudden dropping of the machine.

If the machine is to be lifted during maintenance use the lifting point noted on page 9 of this manual.

When replacing equipment on the machine always use original spare parts.



# Maintenance and Servicing (continued)

## Lubrication

When the agitator wheels are fitted, the bushes must be greased once per week.

A grease nipple is located at the end of the cutter and must also be greased weekly when in operation.

## Stone trap Linkage



**Particular care must be taken to lubricate the stone trap linkage to ensure safe operation from the tractor seat.**

## Cleaning

When washing out, open the bottom trash trap to allow for easier cleaning.

Remove the cutter head if required for removal of any build up on the inside of the blades.

**Do not attempt to run the machine if the cutter head is removed.**

## Cutter Set up

When replacing the cutter head, ensure that the head is adjusted to give a minimal clearance between the cutter head and the end of the auger when tightened.

## Hydraulic System Check

The hydraulic system should be checked for leaks prior to each use of the machine.

**Read safety instructions on (page 6 and 7).**

The hoses on the machine must be replaced every 5 years even if signs of wear or damage is not apparent.

<b>Hose Rating - SAE 100 R2 AT • DIN EN 853 2SN</b>	
Working Pressure -	330 bar (4800 psi)
Min. Burst Pressure -	1320 bar (19150 psi)

## Hose Replacement

It is advisable to wear eye protection when replacing hoses or when working on the hydraulic system.

Before replacing hoses - release any residual pressure in the hydraulic system by operating the tractor spool valves in both directions.

Place a suitable container below the hose to allow the hydraulic oil to be drained.

Detach and drain the first hose end followed by the opposite end to ensure any remaining oil is drained completely.

Repeat procedure for all hoses to be replaced.

With hose ends reconnected, charge the system with oil via the tractor spool valves putting the service through a few cycles to allow the tractor hydraulic system to bleed out any trapped air.

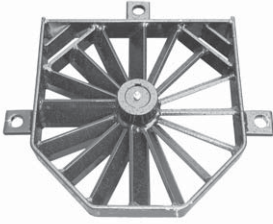
Always dispose of oil responsibly with due consideration to the environment.

## Disassembly (at end of service life)

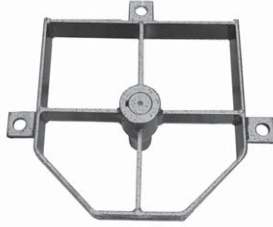
Careful maintenance and adherence to the instructions contained in this manual should ensure many years of trouble free service.

At the time of decommissioning the machine however or replacing parts on the machine - all waste metals, rubber, plastics and used oils should be delivered to suitable recycling centres.

## Parts



**Primary Cutter**  
*Part No. 1883 - 80*



**4 Spoke Cutter**  
*Part No. 1883 - 513*



**Stone Trap Spring**  
**Trash Door Spring**  
*Part No. 1883 - 100*



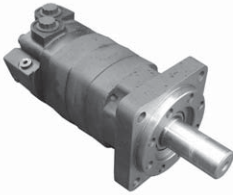
**Secondary Cutter**  
*Part No. 1883 - 220*



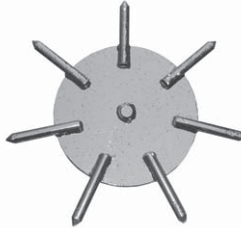
**Vertical Cutter**  
*Part No. 1883 - 250*



**Discharge Flap Assembly**  
*Part No. 1883 - 79*



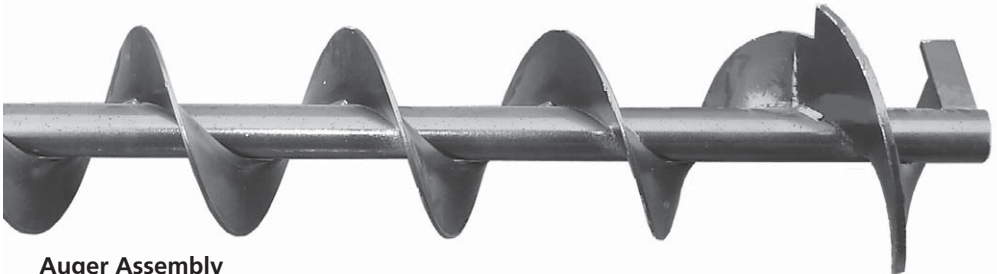
**Hydraulic Motor**  
**Shaft Seal kit**  
**Rear Seal kit**



**Agitator Wheel**  
*Part No. 1883 - 33*



**End Bushes (2 per machine)**  
*Part No. 1900 - 111*



**Auger Assembly**  
*Part No. 1883 - 111*





*the perfect partner*

**David Ritchie (Implements) Ltd,**  
Carseview Road, Forfar, Scotland, DD8 3BT  
Tel: 01307 462271 fax: 01307 464081  
e-mail: [agrisales@ritchie-uk.com](mailto:agrisales@ritchie-uk.com)  
[www.ritchie-uk.com](http://www.ritchie-uk.com)