

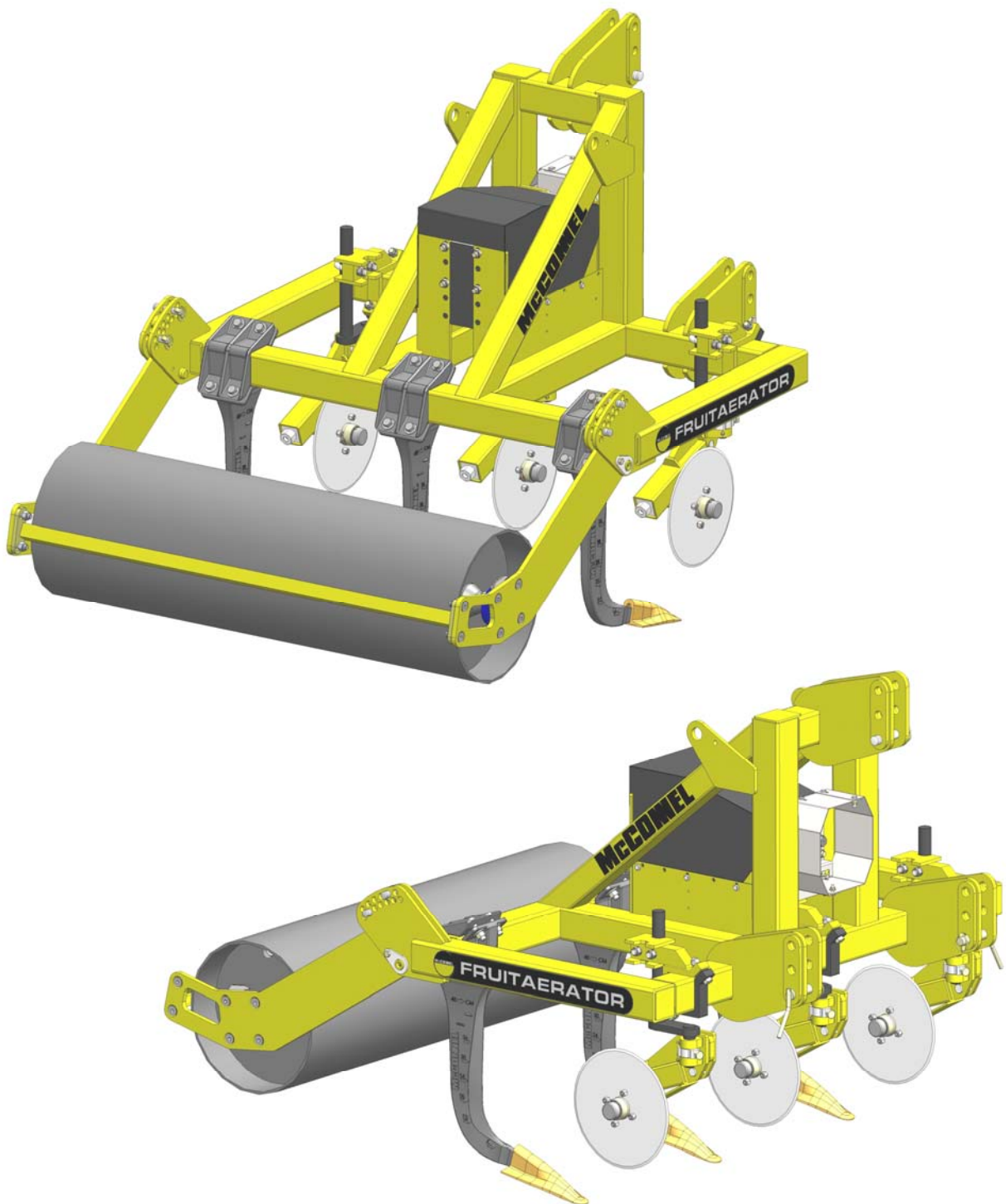
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FRUITAERATOR

Orchard & Vineyard Deep Soil Cultivator



Operator Manual



IMPORTANT

VERIFICATION OF WARRANTY REGISTRATION



DEALER WARRANTY INFORMATION & REGISTRATION VERIFICATION

It is imperative that the selling dealer registers this machine with McConnel Limited before delivery to the end user – failure to do so may affect the validity of the machine warranty.

To register machines go to the McConnel Limited web site at www.mcconnel.com, log onto 'Dealer Inside' and select the 'Machine Registration button' which can be found in the Service Section of the site. Confirm to the customer that the machine has been registered in the section below.

Should you experience any problems registering a machine in this manner please contact the McConnel Service Department on 01584 875848.

Registration Verification

Dealer Name:
Dealer Address:
Customer Name:
Date of Warranty Registration:/...../..... Dealer Signature:

NOTE TO CUSTOMER / OWNER

Please ensure that the above section above has been completed and signed by the selling dealer to verify that your machine has been registered with McConnel Limited.

IMPORTANT: During the initial 'bedding in' period of a new machine it is the customer's responsibility to regularly inspect all nuts, bolts and hose connections for tightness and re-tighten if required. New hydraulic connections occasionally weep small amounts of oil as the seals and joints settle in – where this occurs it can be cured by re-tightening the connection – *refer to torque settings chart below*. The tasks stated above should be performed on an hourly basis during the first day of work and at least daily thereafter as part of the machines general maintenance procedure.

CAUTION: DO NOT OVER TORQUE HYDRAULIC FITTINGS AND HOSES

TORQUE SETTINGS FOR HYDRAULIC FITTINGS

HYDRAULIC HOSE ENDS		
BSP	Setting	Metric
1/4"	18 Nm	19 mm
3/8"	31 Nm	22 mm
1/2"	49 Nm	27 mm
5/8"	60 Nm	30 mm
3/4"	80 Nm	32 mm
1"	125 Nm	41 mm
1.1/4"	190 Nm	50 mm
1.1/2"	250 Nm	55 mm
2"	420 Nm	70 mm

PORT ADAPTORS WITH BONDED SEALS		
BSP	Setting	Metric
1/4"	34 Nm	19 mm
3/8"	47 Nm	22 mm
1/2"	102 Nm	27 mm
5/8"	122 Nm	30 mm
3/4"	149 Nm	32 mm
1"	203 Nm	41 mm
1.1/4"	305 Nm	50 mm
1.1/2"	305 Nm	55 mm
2"	400 Nm	70 mm

WARRANTY POLICY

WARRANTY REGISTRATION

All machines must be registered, by the selling dealer with McConnel Ltd, before delivery to the end user. On receipt of the goods it is the buyer's responsibility to check that the Verification of Warranty Registration in the Operator's Manual has been completed by the selling dealer.

1. LIMITED WARRANTIES

- 1.01. *All mounted machines supplied by McConnel Ltd are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months, unless a different period is specified.
All Self Propelled Machines supplied by McConnel Ltd are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months or 1500 hours. Engine warranty will be specific to the Manufacturer of that unit.*
- 1.02. *All spare parts supplied by McConnel Ltd and purchased by the end user are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 6 months. All parts warranty claims must be supported by a copy of the failed part invoice to the end user. We cannot consider claims for which sales invoices are not available.*
- 1.03. *The warranty offered by McConnel Ltd is limited to the making good by repair or replacement for the purchaser any part or parts found, upon examination at its factory, to be defective under normal use and service due to defects in material or workmanship. Returned parts must be complete and unexamined. Pack the component(s) carefully so that any transit damage is avoided. All ports on hydraulic items should be drained of oil and securely plugged to prevent seepage and foreign body ingress. Certain other components, electrical items for example, may require particular care when packing to avoid damage in transit.*
- 1.04. *This warranty does not extend to any product from which McConnel Ltd's serial number plate has been removed or altered.*
- 1.05. *The warranty policy is valid for machines registered in line with the terms and conditions detailed and on the basis that the machines do not extend a period of 24 months or greater since their original purchase date, that is the original invoice date from McConnel Limited.
Machines that are held in stock for more than 24 months cannot be registered for warranty.*
- 1.06. *This warranty does not apply to any part of the goods, which has been subjected to improper or abnormal use, negligence, alteration, modification, fitment of non-genuine parts, accident damage, or damage resulting from contact with overhead power lines, damage caused by foreign objects (e.g. stones, iron, material other than vegetation), failure due to lack of maintenance, use of incorrect oil or lubricants, contamination of the oil, or which has served its normal life. This warranty does not apply to any expendable items such as blades, belts, clutch linings, filter elements, flails, flap kits, skids, soil engaging parts, shields, guards, wear pads, pneumatic tyres or tracks.*
- 1.07. *Temporary repairs and consequential loss - i.e. oil, downtime and associated parts are specifically excluded from the warranty.*
- 1.08. *Warranty on hoses is limited to 12 months and does not include hoses which have suffered external damage. Only complete hoses may be returned under warranty, any which have been cut or repaired will be rejected.*
- 1.09. *Machines must be repaired immediately a problem arises. Continued use of the machine after a problem has occurred can result in further component failures, for which McConnel Ltd cannot be held liable, and may have safety implications.*
- 1.10. *If in exceptional circumstances a non McConnel Ltd part is used to effect a repair, warranty reimbursement will be at no more than McConnel Ltd's standard dealer cost for the genuine part.*

- 1.11. *Except as provided herein, no employee, agent, dealer or other person is authorised to give any warranties of any nature on behalf of McConnell Ltd.*
- 1.12. *For machine warranty periods in excess of 12 months the following additional exclusions shall apply:*
 - 1.12.1. *Hoses, exposed pipes and hydraulic tank breathers.*
 - 1.12.2. *Filters.*
 - 1.12.3. *Rubber mountings.*
 - 1.12.4. *External electric wiring.*
 - 1.12.5. *Bearings and seals*
 - 1.12.6. *External Cables, Linkages*
 - 1.12.7. *Loose/Corroded Connections, Light Units, LED's*
 - 1.12.8. *Comfort items such as Operator Seat, Ventilation, Audio Equipment*
- 1.13. *All service work, particularly filter changes, must be carried out in accordance with the manufacturer's service schedule. Failure to comply will invalidate the warranty. In the event of a claim, proof of the service work being carried out may be required.*
- 1.14. *Repeat or additional repairs resulting from incorrect diagnosis or poor quality previous repair work are excluded from warranty.*

NB Warranty cover will be invalid if any non-genuine parts have been fitted or used. Use of non-genuine parts may seriously affect the machine's performance and safety. McConnell Ltd cannot be held responsible for any failures or safety implications that arise due to the use of non-genuine parts.

2. REMEDIES AND PROCEDURES

- 2.01. *The warranty is not effective unless the Selling Dealer registers the machine, via the McConnell web site and confirms the registration to the purchaser by completing the confirmation form in the operator's manual.*
- 2.02. *Any fault must be reported to an authorised McConnell Ltd dealer as soon as it occurs. Continued use of a machine, after a fault has occurred, can result in further component failure for which McConnell Ltd cannot be held liable.*
- 2.03. *Repairs should be undertaken within two days of the failure. Claims submitted for repairs undertaken more than 2 weeks after a failure has occurred, or 2 days after the parts were supplied will be rejected, unless the delay has been authorised by McConnell Ltd. Please note that failure by the customer to release the machine for repair will not be accepted as a reason for delay in repair or submitting warranty claims.*
- 2.04. *All claims must be submitted, by an authorised McConnell Ltd Service Dealer, within 30 days of the date of repair.*
- 2.05. *Following examination of the claim and parts, McConnell Ltd will pay, at their discretion, for any valid claim the invoiced cost of any parts supplied by McConnell Ltd and appropriate labour and mileage allowances if applicable.*
- 2.06. *The submission of a claim is not a guarantee of payment.*
- 2.07. *Any decision reached by McConnell Ltd. is final.*

3. LIMITATION OF LIABILITY

- 3.01. *McConnell Ltd disclaims any express (except as set forth herein) and implied warranties with respect to the goods including, but not limited to, merchantability and fitness for a particular purpose.*
- 3.02. *McConnell Ltd makes no warranty as to the design, capability, capacity or suitability for use of the goods.*
- 3.03. *Except as provided herein, McConnell Ltd shall have no liability or responsibility to the purchaser or any other person or entity with respect to any liability, loss, or damage caused or alleged to be caused directly or indirectly by the goods including, but not limited to, any indirect, special, consequential, or incidental damages resulting from the use or operation of the goods or any breach of this warranty. Notwithstanding the above limitations and warranties, the manufacturer's liability hereunder for damages incurred by the purchaser or others shall not exceed the price of the goods.*
- 3.04. *No action arising out of any claimed breach of this warranty or transactions under this warranty may be brought more than one (1) year after the cause of the action has occurred.*

4. MISCELLANEOUS

- 4.01. McConnel Ltd may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.*
- 4.02. If any provision of this limited warranty shall violate any applicable law and is held to be unenforceable, then the invalidity of such provision shall not invalidate any other provisions herein.*
- 4.03. Applicable law may provide rights and benefits to the purchaser in addition to those provided herein.*

McConnel Limited



DECLARATION OF CONFORMITY

Conforming to EU Machinery Directive 2006/42/EC

We,

McCONNEL LIMITED, Temeside Works, Ludlow, Shropshire SY8 1JL, UK

Hereby declare that:

The Product; *Tractor Mounted Cultivator*

Product Code; *SH20*

Serial No. & Date Type

Manufactured in; *United Kingdom*

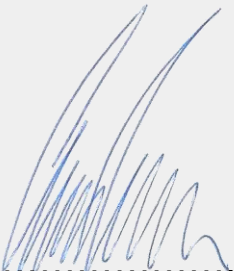
Complies with the required provisions of the Machinery Directive 2006/42/EC
The machinery directive is supported by the following harmonized standards;

- BS EN ISO 12100 (2010) Safety of machinery – General principles for design – Risk assessment and risk reduction.
- BS EN 349 (1993) + A1 (2008) Safety of machinery - Minimum distances to avoid the entrapment with human body parts.
- BS EN ISO 14120 (2015) Safety of machinery - Guards general requirements for the design and construction of fixed and movable guards.
- BS EN 4413 (2010) Hydraulic fluid power. Safety requirements for systems and their components.

McCONNEL LIMITED operates an ISO 9001:2008 quality management system, certificate number: FM25970.

This system is continually assessed by the;

British Standards Institution (BSI), Beech House, Milton Keynes, MK14 6ES, UK
BSI is accredited by UK Accreditation Service, accreditation number: UKAS 003.
The EC declaration only applies if the machine stated above is used in accordance with the operating instructions.

Signed  *Responsible Person*
CHRISTIAN DAVIES on behalf of McCONNEL LIMITED

Status: *General Manager*

Date: *January 2018*

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GENERAL INFORMATION

Read this manual before fitting or operating the machine. Whenever any doubt exists contact your dealer or the McConnell Service Department for assistance.

Use only 'McConnel Genuine Parts' on McConnel equipment and machinery

DEFINITIONS - The following definitions apply throughout this manual:

WARNING:

An operating procedure, technique etc., which can result in personal injury or loss of life if not observed carefully.

CAUTION:

An operating procedure, technique etc., which can result in the damage of either machine or equipment if not observed carefully.

NOTE:

An operating procedure, technique etc., which is considered essential to emphasise.

LEFT AND RIGHT HAND:

This term is applicable to the machine when fitted to the tractor and viewed from the rear. This also applies to tractor references.

Note: The illustrations in this manual are for instructional purposes only and may on occasion not show some components in their entirety. In some instances an illustration may appear slightly different to that of your particular model but the general procedure will be the same. E&OA.

MACHINE & DEALER INFORMATION

Record the Serial Number of your machine on this page and always quote this number when ordering parts. Whenever information concerning the machine is requested remember also to state the make and model of tractor to which the machine is fitted.

Machine Serial Number:	Installation Date:
Machine Model details:	
Dealer Name:	
Dealer Address:	
Dealer Telephone No:	
Dealer Email Address:	

SPECIFICATIONS

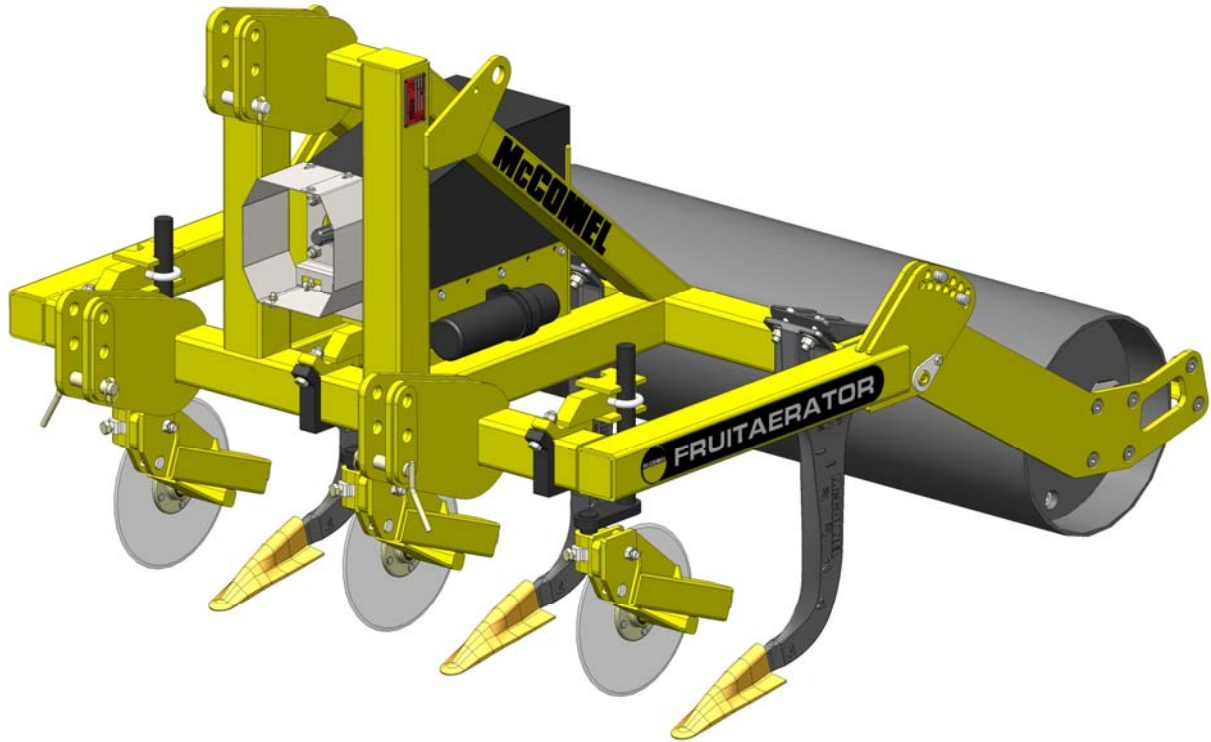
Fruitaerator Models

- Rear Mounted
- Available in 1.6M & 1.8M working widths
- 540RPM vibrator unit
- Choice of points for shallow or deep cultivating
- Choice of 2 or 3 leg builds
- 600mm (24") fixed legs
- Depth adjusting rear roller c/w scraper
- Optional hydraulically adjustable roller

INTRODUCTION

McConel Fruitaerators are three-point linkage mounted multi-purpose cultivators for use in orchards, vineyards and fruit farms where deep soil cultivation is required between rows of crops.

Available in widths of 1.6m or 1.8m machines are equipped with spring loaded grass discs, a power driven vibrator unit and height adjustable rear roller for depth control. A hydraulically operated rear roller is available as an option.



Machine Specifications

Specification	1.6M	1.8M
Mounting Position	<i>Rear</i>	<i>Rear</i>
Mounting Type	<i>3-Point Linkage</i>	<i>3-Point Linkage</i>
Vibrator Pack	<i>Standard</i>	<i>Standard</i>
PTO Speed (RPM)	<i>540</i>	<i>540</i>
Number of Discs	<i>2 or 3</i>	<i>2</i>
Number of Legs	<i>2 or 3</i>	<i>2</i>
Rear Roller c/w Scraper	<i>Standard</i>	<i>Standard</i>
Hydraulically Rear Roller c/w Scraper	<i>Optional</i>	<i>Optional</i>

Construction

The combination of the clamp and shank and the clamp plate permits the rigid attachment of the shank to the toolbar using high tensile steel bolts and nuts; in the event of an immovable underground obstruction being encountered, as a safety feature, the thread of the nuts strip allowing the shank to 'swing' back.

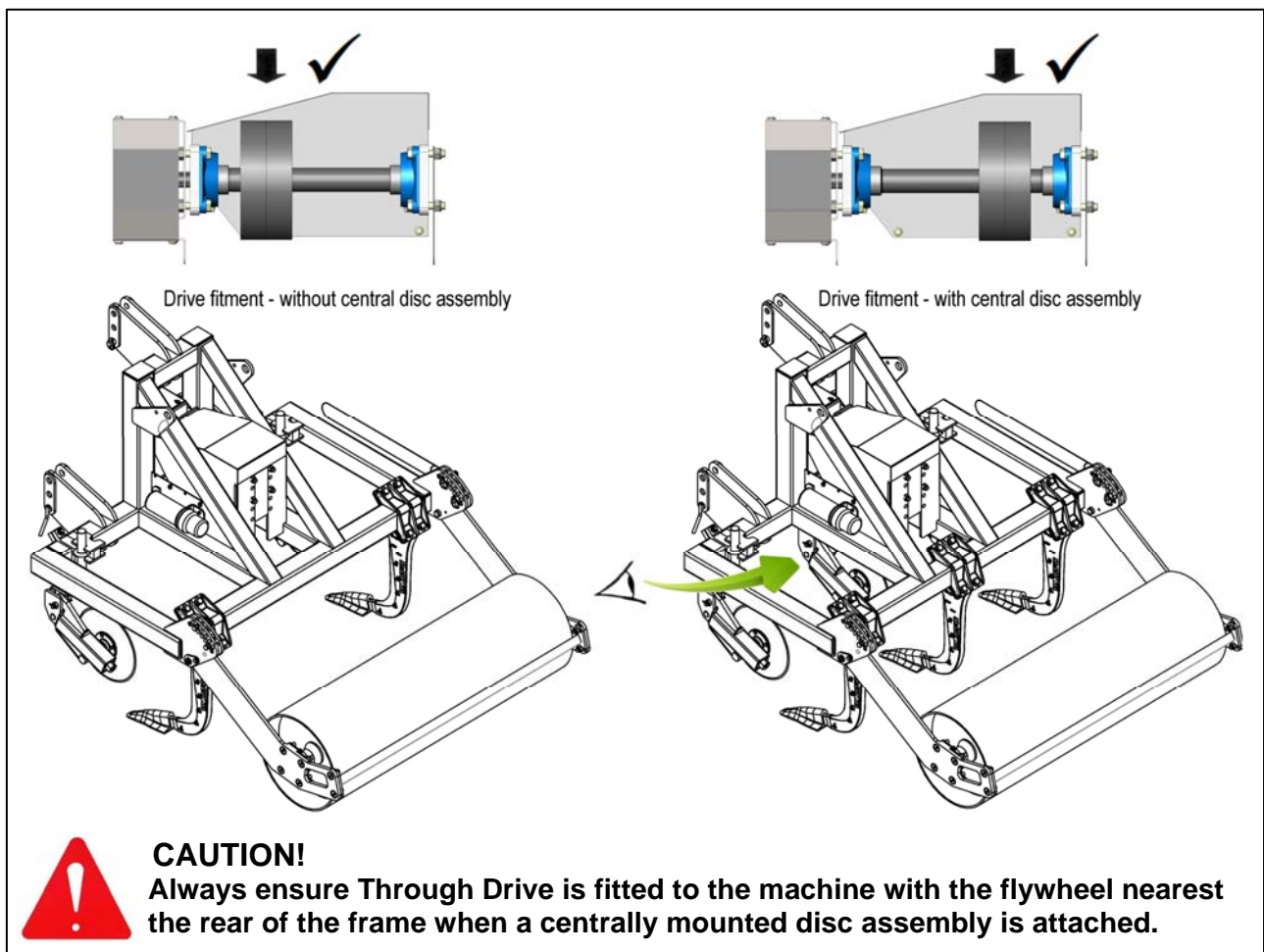
Leg Shanks & Points

Machines feature 24" clamp type shanks fitted with longlife 'knock on' type points.

Vibrator Unit

On all machines vibrator units are fitted as standard and are bolted to the flange plates.

IMPORTANT: On builds where a disc assembly is fitted in the centre of the frame directly below the through drive, the through drive assembly must be fitted with the flywheel nearest the rear of the frame to avoid the components colliding during operation - failure to observe this will result in damage to components.





This machine has the potential to be extremely dangerous - in the wrong hands it can kill or maim; It is therefore imperative that both owner and operator of the machine reads and understands the following section to ensure they are fully aware of the dangers that do, or may exist, and their responsibilities surrounding the use and operation of the machine.

When the machine is not in use it should be lowered to rest on the ground. In the event of any fault being detected with the machine's operation it must be stopped immediately and not used again until the fault has been corrected by a qualified technician.

- ▲ ALWAYS ensure all operators have read and understood the operation and safety information in the manual before using the machine.
- ▲ ALWAYS inspect the work area for possible dangers or risk before starting work.
- ▲ ALWAYS ensure all guards are in place and are kept in good condition – they are there for your protection and the safety of others.
- ▲ ALWAYS keep clear of any moving or rotating components.
- ▲ ALWAYS ensure that nuts holding the shanks to the machine frame are on the underside.
- ▲ ALWAYS stop a working machine when other people enter a work area and only restart when the area is clear of any risk.
- ▲ ALWAYS wear protective eye shields when striking points and use hammer supplied.
- ▲ ALWAYS be alert; if any help is being given during the coupling or uncoupling of machines or any other equipment ensure the assistant is kept clear of risk of entrapment.
- ▲ NEVER wear loose or flapping clothing near a working machine
- ▲ NEVER permit anyone to ride on the machine, whether in transport or in work.
- ▲ NEVER approach a working machine or attempt any kind of maintenance on a working machine.
- ▲ NEVER work under a machine that is unsupported or raised on the tractors hydraulic lift – always use suitable substantial supports placed under the machine on a firm level work area.
- ▲ NEVER allow bystanders near a working machine – ensure they remain at a safe distance from the machine.
- ▲ NEVER permit children to play on a machine even when removed from the tractor and stored.

FITTING

Tractor Power Requirements

It is impossible to give any hard and fast figures on horsepower requirements as ground conditions and soil types can vary enormously; as a general rule requirement is in the region of approximately 35HP per leg.

A marked increase in the draft requirement will be necessary under moist conditions when the vibrations are more readily absorbed by the damp soil.

Front End Weight

It may be found to advantageous to apply front-end weight to some smaller and medium powered tractors. The amount of weight necessary can only be determined by local circumstances. It should be borne in mind that any tendency of the tractor to rise on the front end will produce a corresponding lowering of hitch points and in doing so, the angle of penetration of the shanks is further increased.

Tractor Linkage

It is essential that only the correct linkage arms for each particular tractor are used with the Fruitaerator. The arms have been properly matched with the horsepower of the tractor and should be more than 'just' adequate. Nothing on the Fruitaerator offers protection against the failure of unmatched, repaired, badly worn, weak or below category tractor linkage.

Failure of either of the tractor's draft links can cause the tractor to run away from one end of the implement or in the case of the top link, the implement to tip forwards. The result could mean that the PTO shaft assumes an impossible angle that may bend it or tear out the yokes or their bearings. Even the PTO stub shaft in the tractor and the drive spline of the vibrator unit could be damaged.

Under no circumstances should tractors operate in tandem to gain extra traction. It is far more practicable to make two or three passes over the ground with one tractor while increasing the depth on each pass.

Stabilizers

The implement must be capable of some side-to-side movement in relation to the tractor therefore stabilizer chains or sway bars must be adjusted to allow for this. They should however be tightened up to prevent side sway when traveling on the highway. In field operations stabilizer bars that hold the implement rigid should not be used.

Draft Control

Use of draft control is beneficial to traction in reducing wheel slip thereby also reducing tyre wear and saving fuel. *Refer to individual tractors instruction book for detailed guidance on the best location for top link fitting.*

For mounting the cultivator on linkage behind crawler tractors, the draft links should be allowed to 'float' - *provision for this is usually made in the hydraulic control valve.*

Do not use position control for regulation of depth. This should be done with the aid of depth wheels or rear roller.

Power Take Off Drive (PTO)

Tractor PTO shaft heights can vary between 37cms to 81cms (14"-31") and although the standard drive shaft length supplied will suit the majority of tractors, a careful check should be made to ascertain that in the shortest possible position it must not be allowed to 'bottom out', - a *minimum of 31mm (1/2") clearance must be maintained*. Both driving and driven members should be shortened with a hacksaw by the same amount, care being taken not to cut off more than necessary on either section. A minimum engagement of 150mm (6") is required – see *below*.

PTO Drive Shaft Installation

The PTO driveshaft attaches between the tractor and the machine gearbox to transfer the power required to the run and operate the machine – it is important to achieve the correct shaft length to avoid risk of it 'bottoming out' when raising or lowering the machine.

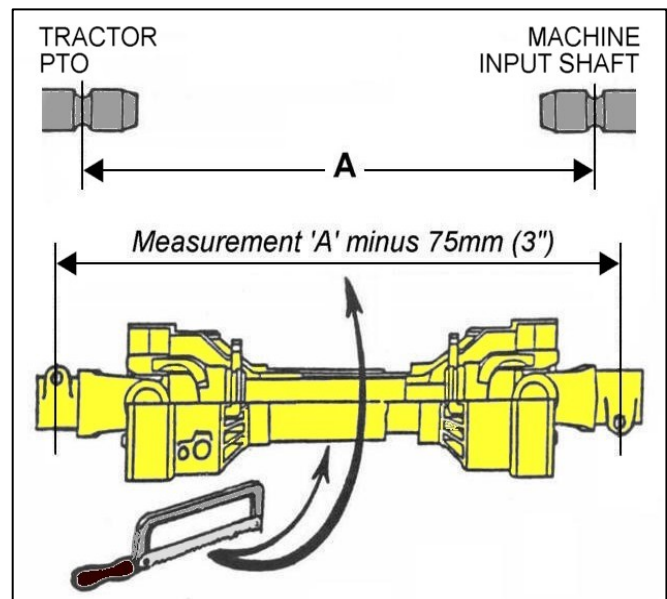
The procedure for measuring and cutting the shaft is as follows:

Measuring the PTO Shaft

With the machine attached to the tractor in the working position measure the horizontal distance 'A' from the tractor's PTO to the input shaft on the machines gearbox and subtract 75mm (3") – *this figure is the required shaft length*.

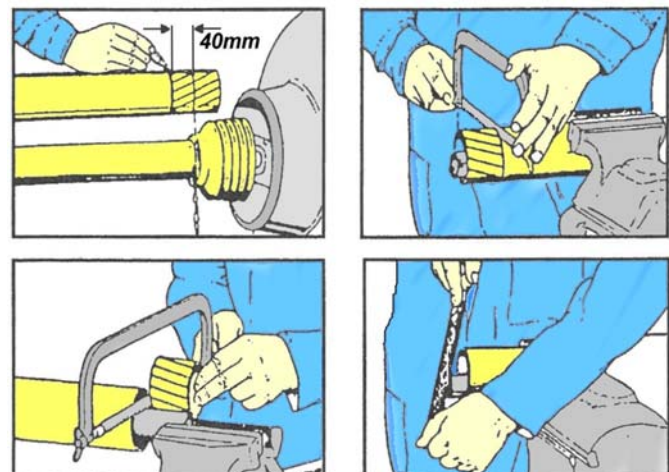
Place the fully closed PTO shaft on the ground and measure its overall length, if the shaft is shorter than the required length you can use it without the need to shorten - *providing it allows for a minimum 150mm (6") overlap when fitted*.

If the shaft is longer subtract the required shaft length plus an additional 75mm (3") - *the resulting figure is the excess length that will need to be removed from each half of the shaft*.



Cutting the PTO Shaft

Separate the two halves and using the measurement obtained above shorten both the plastic guarding and the inner steel profile tubes of each shaft by this same amount. De-burr the cut tubes with a file to remove rough or sharp edges and thoroughly clean to remove swarf before greasing, assembling and fitting the shaft.



PTO Maintenance

To increase the working life of the PTO shaft it should be periodically checked, cleaned and lubricated.

NOTE: *For subsequent use with different tractors the shaft should be measured again to check suitability ensuring correct shaft overlap is retained.*

PTO Angle

The angle of operation of universal drive shafts has recommended limits. On tractors with low PTO output shafts the angle becomes acute when the implement is lifted to its maximum travel. This should not present a hazard as the PTO drive should be disengaged before lifting the implement clear of the ground or alternatively the lift height should be restricted.

The vibrator unit on current machines is bolted to two flange plates. The vibrator can be adjusted vertically by selecting the most suitable holes in the plates, which give the minimum deflection of the shaft when in operation. It should be noted that the rear cover plate on the through drive unit can be turned over to increase the adjustment range.

Attaching Machine to Tractor

Attachment of the machine should be performed on a firm level site.

With the rear of the tractor positioned squarely and centrally up to the machine, attach the frame of the Fruitaerator to the tractor's three-point linkage with the pins and lynch pins provided; select the highest hole position possible ensuring that it also provides suitable clearance under the machine when it is raised for turning and for transportation.

On machines that feature 'bolt on' linkage brackets, the brackets can be turned over to achieve the optimum mounting position.

Ideally, the draft links should be horizontal or below the horizontal when the machine is in work; this is to give adequate top link force for draft control.

Rear Roller

The rear roller which is height adjustable is used to set the required working depth of the machine. Depending on the machine specification the roller will either be manually adjustable using a selected hole positions and lock pins or automatically adjustable via a hydraulic lift ram operated from the driving position in the cab.

Points

The points used on the machines are longlife 'knock on' type points. New machines these will arrive with the legs pre-assembled on the machine with the points attached.

When points become excessively worn, damaged or lost they must be replaced immediately, never attempt to continue using the machine without points on the legs.

Replacing points requires the use of a special long handled hammer which is supplied with new machines, the head of the hammer is made of mild steel so there is little likelihood of chipping the hardened steel point when striking it for removal or when fitting. As an added precaution eye shields are also supplied with the machines; when fitting these types of points protective eye shields must always be worn.

The procedure of fitting points is as follows;

Check that the new point socket is empty of any form of debris. The point must be tapped firmly onto the Fruitaerator shank foot until the indentations in the point socket engages the raised 'pips' cast on the sides of the shank.

If, by using reasonable force, the point will not engage far enough onto the shank foot, it is permissible to grind the corners of the shank until sufficient engagement is obtained. Care should be taken not to over grind, which would result in a loose fit and possible loss of the point when working.

When fitting points to legs that are already fixed to the machine, stand to the rear or to one side of the frame when using the hammer, do not crouch beneath the frame.

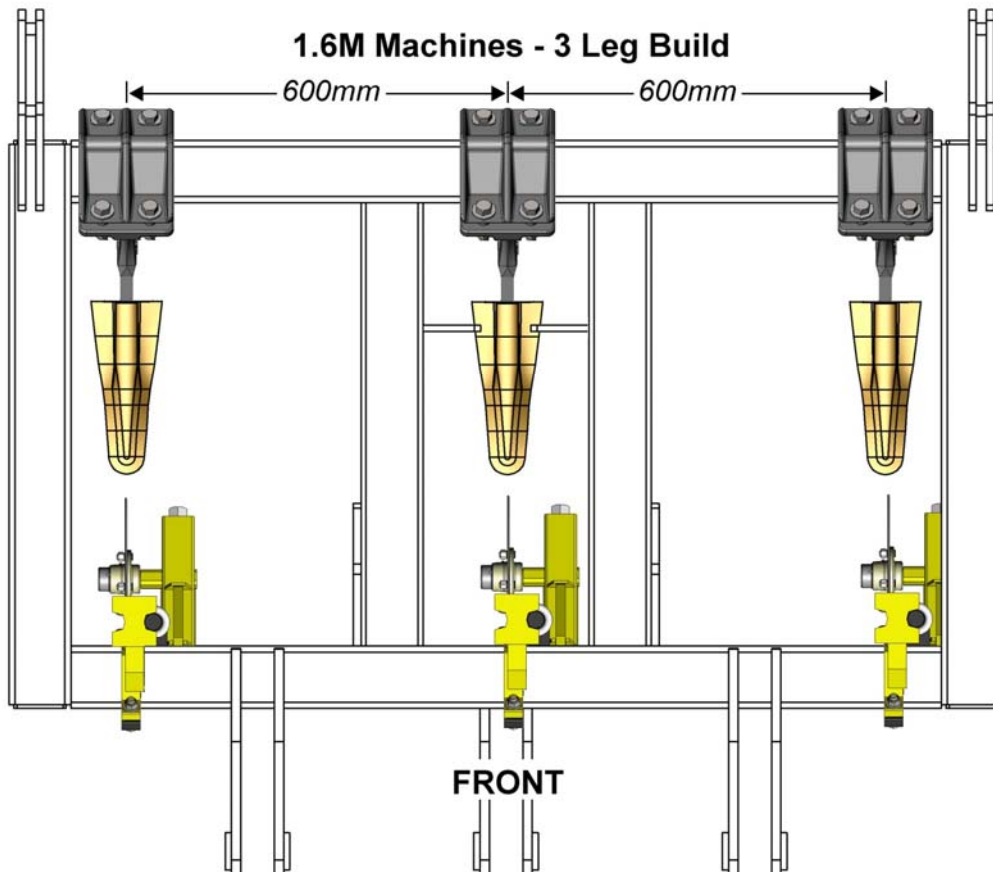
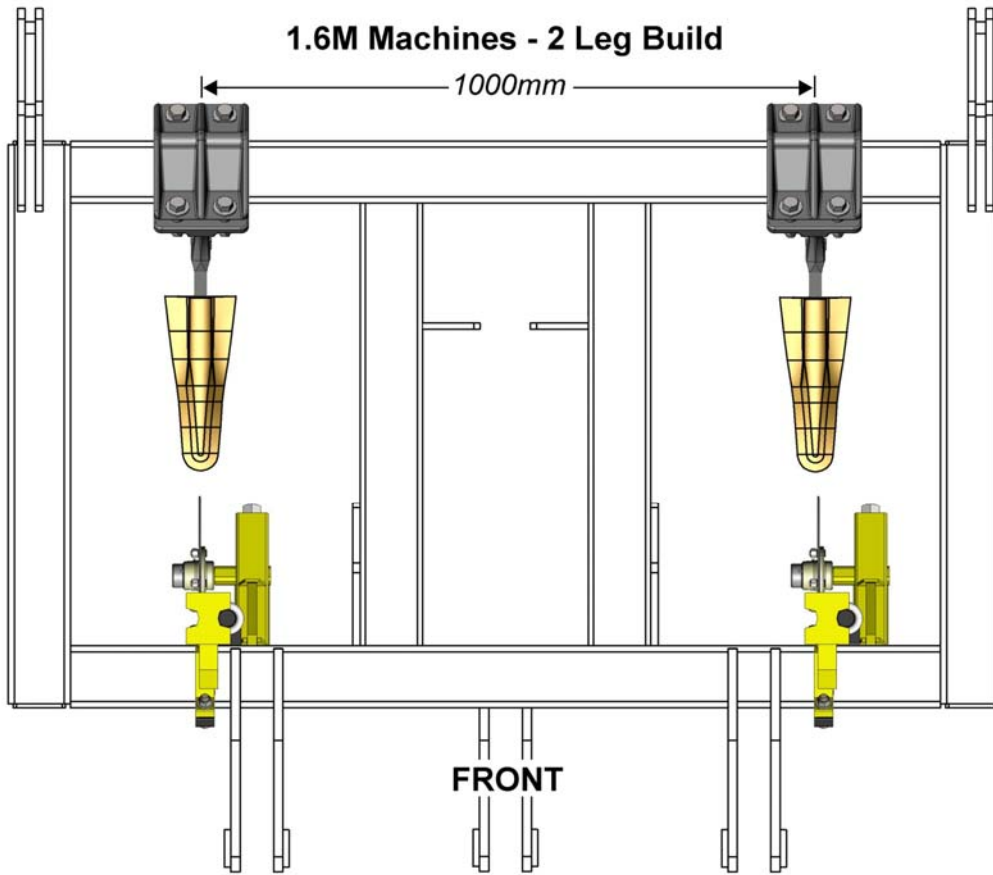


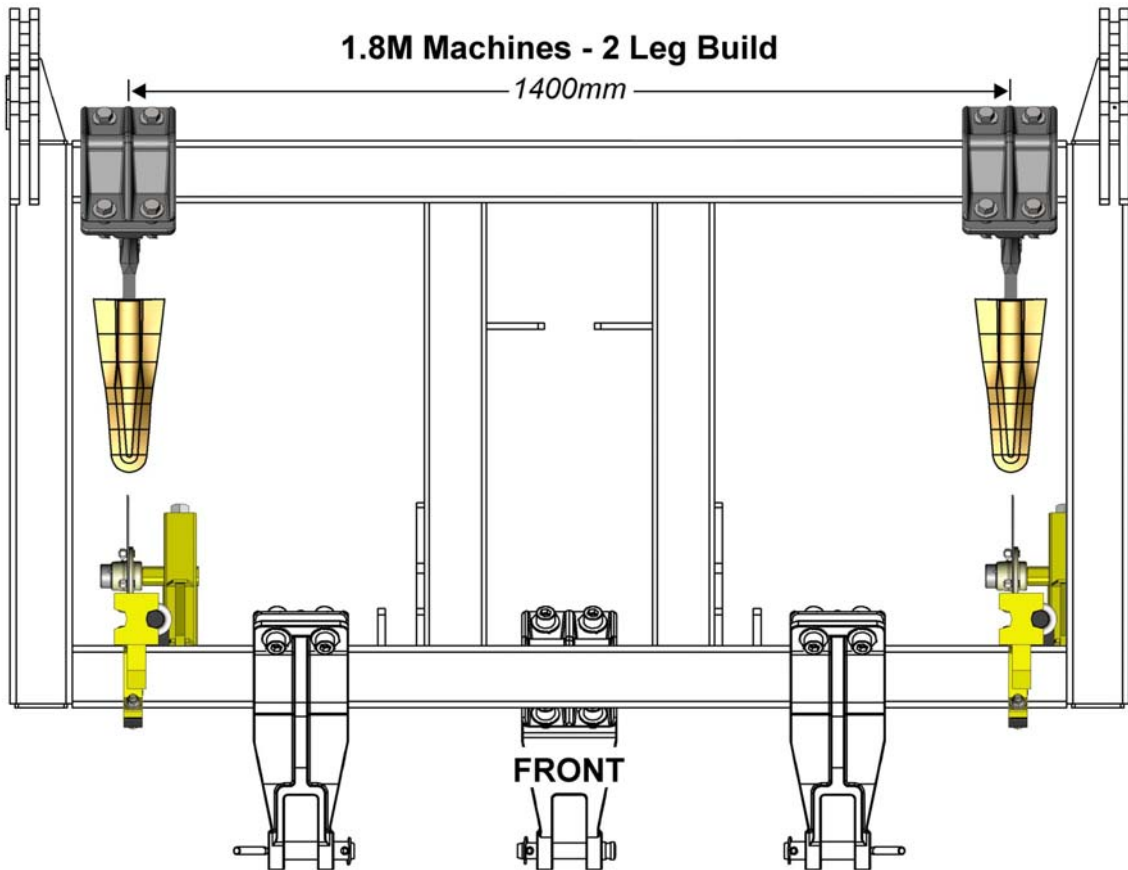
WARNING!

Always ensure protective eye shield are worn when 'knocking' points onto shanks. Only use the special hammer supplied for the fitting of points.

Leg & Disc Positions

The illustrations below show the recommended leg positions for the various builds; discs assemblies are mounted on the front toolbar directly in line with the point of the leg assemblies that are mounted on the rear toolbar.





Leg Assemblies

The leg assemblies are fitted to the toolbar in the required position and the nuts tightened evenly and diagonally to a torque setting of 225-255 ft.lbs (305-350Nm). Bolts must be fitted uppermost with the nuts fitted underneath the brackets.

Part numbers for replacement fixings are;

Bolt: Part No. 0200020 (4 x per leg)

Washer: Part No. 1065077 (8 x per leg)

Nut: Part No. 0111006 (4 x per leg)



WARNING!

Ensure attachment bolts are fitted uppermost on leg assemblies with nuts fitted underneath the brackets.



CAUTION! Use 'Genuine McConnell Parts' when replacing leg fixings they are made from special grade materials specific to the design requirement of the machine for protection of components.

PTO Connection

When connect up the PTO shaft ensure that it does not bottom out in any position.

OPERATION

Speed

When first putting the Fruitaerator into operation the tractor's forward speed should be limited to less than 3mph (5kph) with the engine speed adjusted to give a PTO shaft speed of 540RPM. Forward speed can be gradually increased later as experience with the machine is gained.

The points should be on or in the ground before the PTO is engaged and similarly should be disengaged before lifting the points out of the ground. On tractors that share a common drive to both the hydraulic lift and PTO the engine speed should be reduced to a minimum and the machine lifted only as far as is necessary.

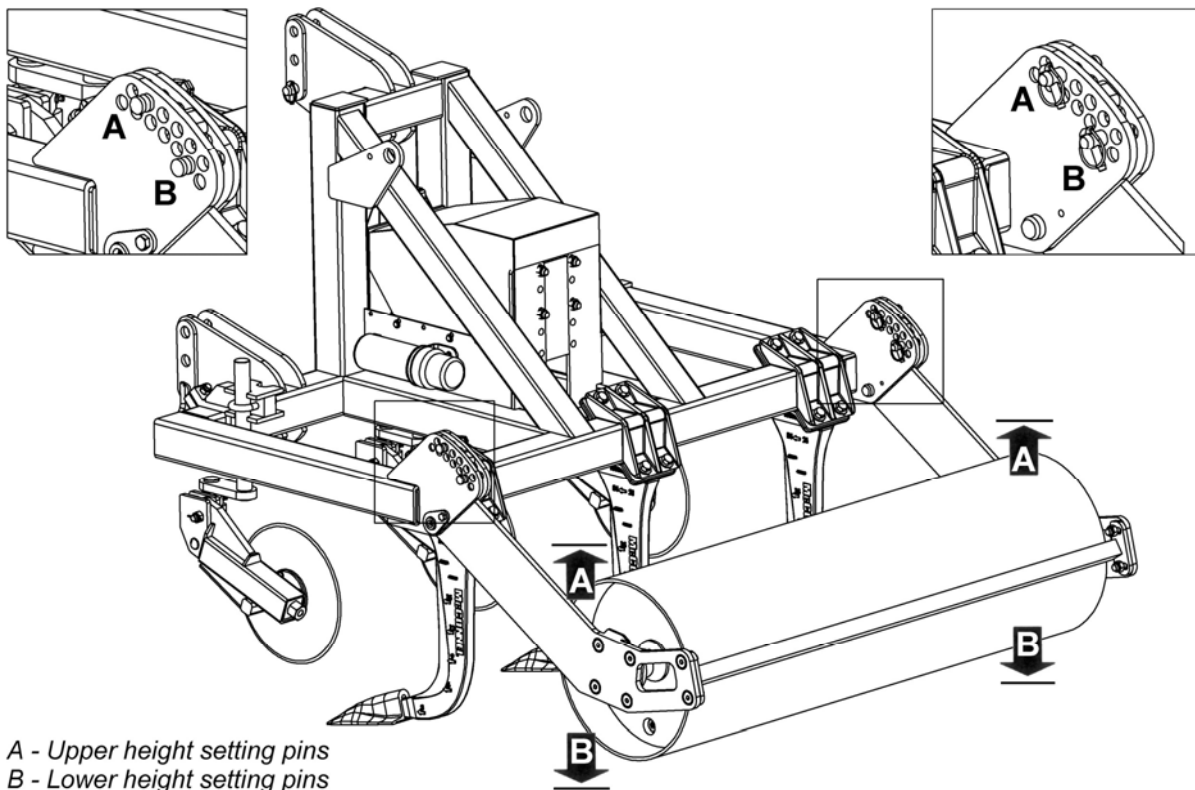
Depth Control

The working depth of the machine is determined and regulated by the height at which the rear roller is set. On machines with a manual rear roller the depth setting is regulated by the position of the roller locking pins, on machines with hydraulically operated rear roller the depth setting is regulated by a hydraulic ram.

To achieve maximum depth with a lower draft requirement it is possible where necessary to make more than one pass over the ground increasing the depth each time.

Roller Height Setting – Machines with Manual Roller

A selection of holes in the roller bracket attachment points on each side of the frame allows for a choice of height settings at which to set the roller. After selecting the desired height the 'dog legged' roller brackets are locked in position with the pins and lynch pins provided. Pin position 'A' indicated in the illustration below regulates the upper height and pin position 'B' the lower height. Ensure at all times that matching hole positions are selected on each side of the machine.



A - Upper height setting pins
B - Lower height setting pins

NOTE: It is advisable during transportation of the machine that the roller is locked 'tight' in position to avoid risk of the roller bouncing when traveling over rough terrain – this will reduce stress on components and increase stability of the carrying vehicle.

In setting the depth, it may be an advantage to remove the roller's upper locking pins before then drawing the points into the earth to the depth required - without engaging the PTO drive. Once the required depth is achieved the rollers upper locking pins can then be replaced to set that depth setting.

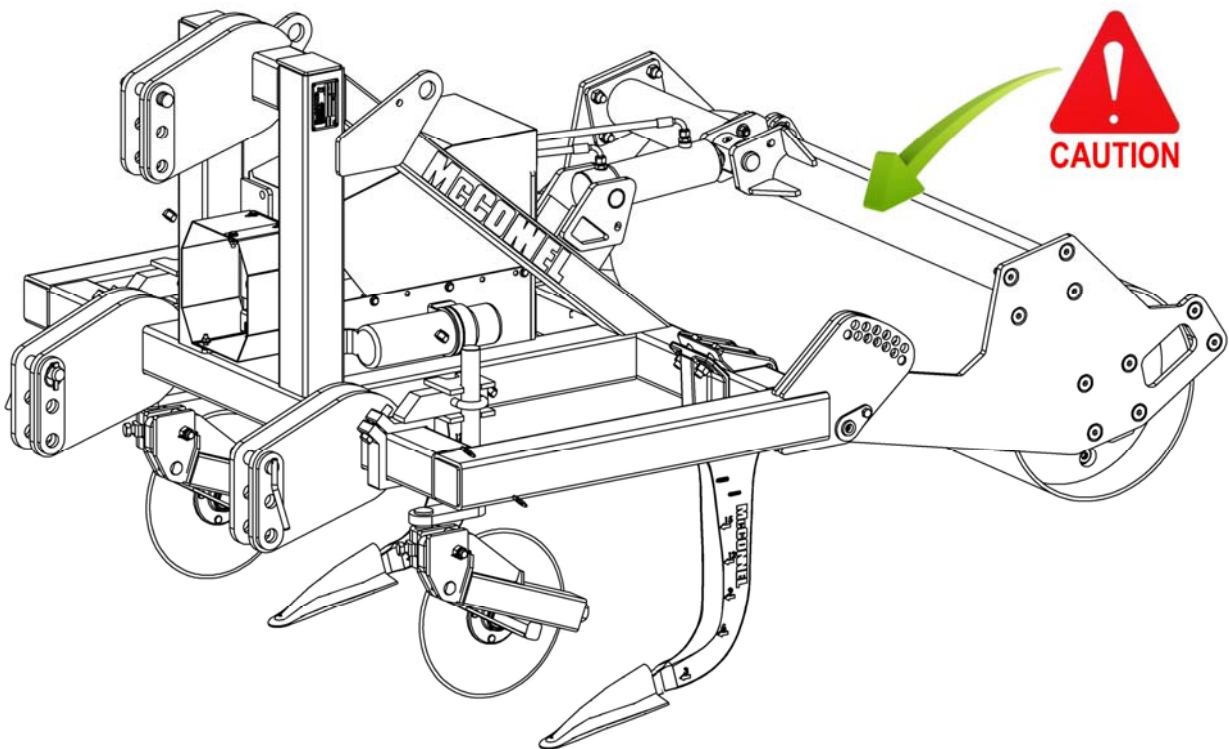
Calibration marks are cast into the sides of the shanks (centimeters on one side and inches on the other) to assist the operator in achieving a more precise depth indication; these indicators should be treated as an approximation as the actual depth figure will reduce as the leading edge of the points become worn.

When choosing the holes for the adjustment pins, select the nearest one, shallower, than the depth required; the normal action of the point is to pull in deeper. The roller will exert a positive, but not heavy pressure to hold the point from penetrating further.

Roller Height Setting – Machines with Hydraulic Roller

On machines that feature a hydraulically operated rear roller the hydraulic ram should be operated to position the roller at a height that will provide the desired working depth.

The hydraulic roller ram must only be operated when the machine is raised and the legs are clear of the ground, or in work when the machine is travelling forwards with the legs in the ground; do not attempt to adjust the roller height with the machine in the ground whilst the unit is stationary.



CAUTION!



Never attempt to operate the hydraulic roller when the machine is stationary with the legs in the ground; failure to observe this will result in undue stress and/or damage to linkage points and/or hydraulic components.

Leg Shanks

Shanks are made from extremely tough abrasive resistant steel and are subjected to a special heat treatment during manufacture. Do not attempt to hard face or otherwise weld the shank as this will destroy the shank's properties. Owners are reminded that no warranty can be entertained on shanks that show evidence of welding.



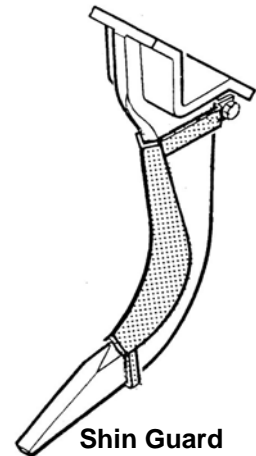
CAUTION!

Do not attempt to hard face or otherwise weld the shank; this will destroy the shank's properties.

Shin Guards (Option)

Shin guards, which can be supplied as an option, can be strapped to the leading edge of the shank and are easily fitted or removed after releasing the point and removing the nut and bolt that secures them at the top of the shank.

Shin guards are made of special hard steel that will readily accept hard-face welding reinforcement.



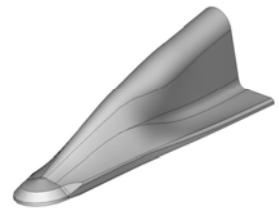
Point Selection & Identification

Longlife Points (Narrow)

These are the normal choice for deep cultivation; *points will lift and shatter the soil structure with low draft and minimum mixing.*

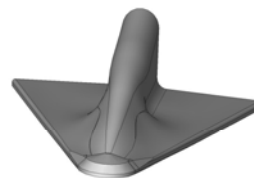


Longlife Point

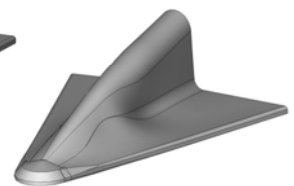


Delta Points (Wide)

Wide points will break up a bigger area of ground: *particularly useful for shallow cultivations.*



Delta Point



Working Depth

The depth to which the Fruitaerator can best be used depends entirely on soil type and moisture content, the combination of these factors produces a critical depth, below this depth less soil is loosened and the tractor draught force is considerably greater. Down to the critical depth the breakout pattern is similar to figure 1. Below the critical depth figure 2 applies. This can often be recognised from the surface but is very clearly seen by digging the profile.

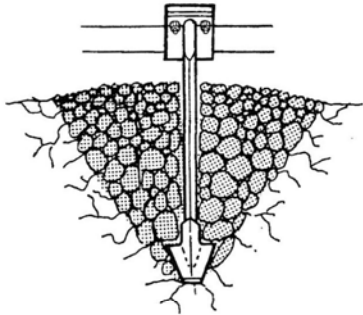


Fig.1

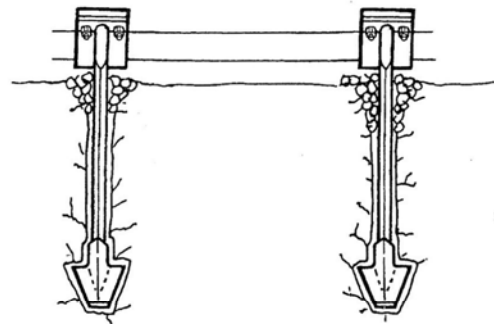


Fig.2

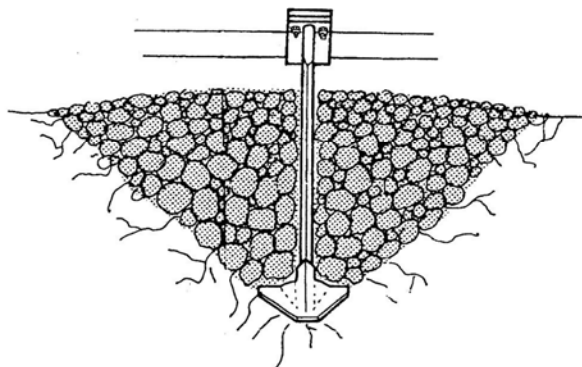


Fig.3

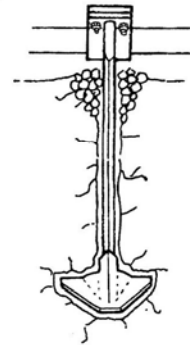


Fig.4

Figure 1 is the pattern produced by the narrow points and figure 3 is the pattern of the wide points – the wide points produce a much greater loosened area.

Figure 4 shows the wide point working below the critical depth. This critical depth with the wide points may be lower than for the narrow points.

The reason for this critical depth is that in for example figure 3 the soil has been loosened upwards because that is the direction of least resistance. In figure 4 the resistance to upwards movement is greater and it is easier for the soil to compact sideways than to loosen upwards. The very small amount of loosened soil at the top of the tine is because the loosening has been done by only the width of the shank. The sides of the compacted channel may be smeared and it is obvious that this is a very detrimental condition in which to leave the soil.

Leg Spacing

The leg spacing is related to the working depth for each type of point. With the narrow points the spacing should ideally be 1.2 - 1.5 times the depth. This gives the least draught force and most even surface finish, as shown in figure 5 below, with complete breakup of the soil profile.

Figure 6 shows that if the legs are too far apart it would produce an incomplete breakup. With the wide points the spacing can be 2 - 2.2 times the working depth as shown in figure 7.

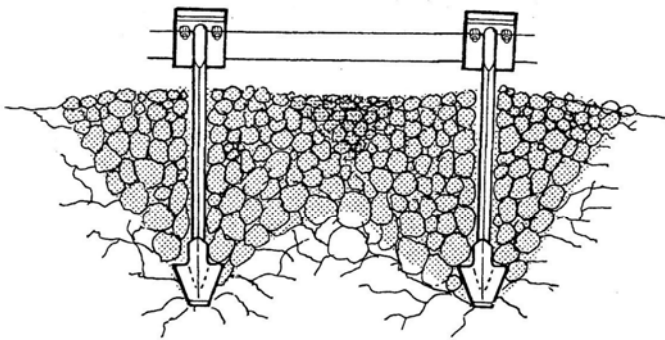


Fig.5

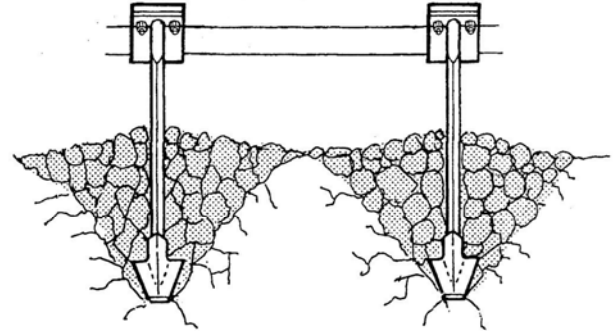


Fig.6

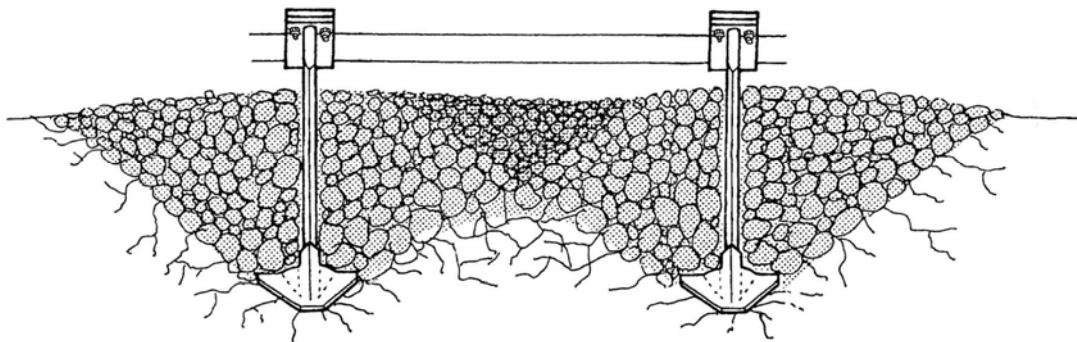


Fig.7

Re-compaction

Loosened soil is extremely prone to re-compaction by subsequent traffic, especially in wet conditions. In situations on wider strips of land where it is necessary to make more than one pass over the ground at increasing working depths it is advisable to leave an undisturbed strip of ground in the centre so that on the return bout the tractor wheels can be positioned on the unmoved strip to complete the cultivation on a straddle and overlap principle.

Underground Obstructions

If a point becomes jammed in a root or rock, slow operation of the vibrator unit whilst alternatively attempting to raise and lower the frame can sometimes free it. Should this fail, engage reverse gear and with the vibrator unit still operating back-up slightly. This will usually release the shank but a check should be made immediately to ensure that the point has not remained embedded in the obstruction.

Fail-Safe Protection

Most types of 'fail-safe' arrangement on agricultural machinery such as shear bolts, pins, slip clutches etc., are designed to protect the implement in the event of overloading or striking an obstruction. On the Fruitaerator however, the 'fail-safe' is designed to protect the tractor. The two top bolts and nuts securing the legs to the frame are designed to 'fail' if a really solid obstruction is met.

It is vital that only 'Genuine McConnell Parts' are used for the replacement of bolts and nuts, as they are of special grades specific to the design requirement. In action the threads of the two upper nuts will shear off, the leg assembly can then twist around the toolbar. To release, the leg should be swung back into its normal position and the upper nuts, bolts and washers replaced. **Fit bolts downwards with nuts underneath.**

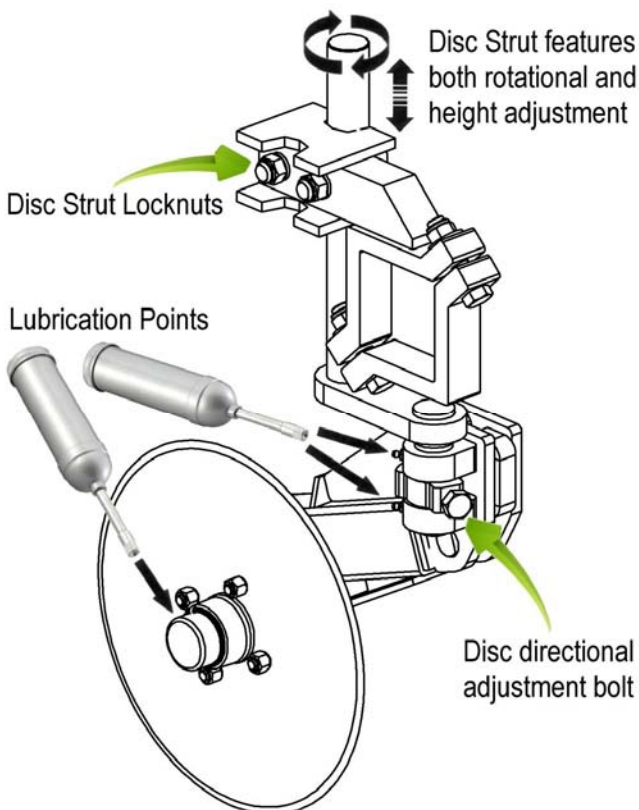
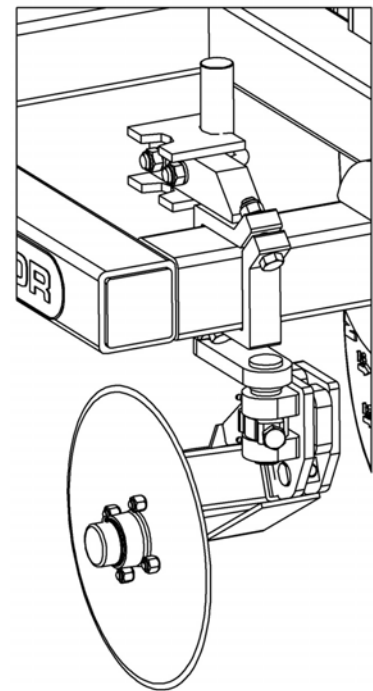
There is a possibility that the nuts will fail if the bolts are loose, if the hardened steel clip washers are omitted from the top of the clamp plates or if the forward speed is excessive in rough ground.

It is vital that only the correct nuts and bolts are used; they should be checked regularly and retightened. Only an accurate and tight fit of the clamps on the toolbars provides the ideal transmission of vibration to the points. On initial start up all nuts and bolts should be checked for tightness after one hour's operation or in the case of very rough ground, after the first fifteen minutes. Nuts should be tightened uniformly to a torque figure of 225-255 ft.lbs (305-350Nm). Avoid over tightening as the thread within the nuts could become weakened and strip.

Turf Discs

Spring loaded disc assemblies are fitted to the front toolbar of the machine directly in front of each leg; the purpose of the discs is to slice the turf ahead of the shank so that surface disturbance is kept to a minimum; the rear roller will in turn even out the surface.

The disc assemblies can be fully adjusted in order to achieve the required position, height and cutting depth/pressure.



Disc Direction Adjustment

The design of the disc assembly permits the disc to swivel by 35°; this allows for a modicum of flexibility to protect the assembly if minor changes in direction are made whilst working.

On initial set-up, once the disc position and height have been set, the disc directional adjustment should be set to its mid-point; this ensure an equal amount of swivel is available in each direction.

MAINTENANCE

Service and Maintenance

Maintenance of the Fruitaerator is basically limited to annual cleaning of the machine and regular lubrication of grease points on the roller and disc assemblies.

Grease points are located on the disc bearings, disc swivel, roller bearings and roller brackets; these should all be lubricated on a daily basis prior to work and before storage of the machine.

Power Take Off Shaft

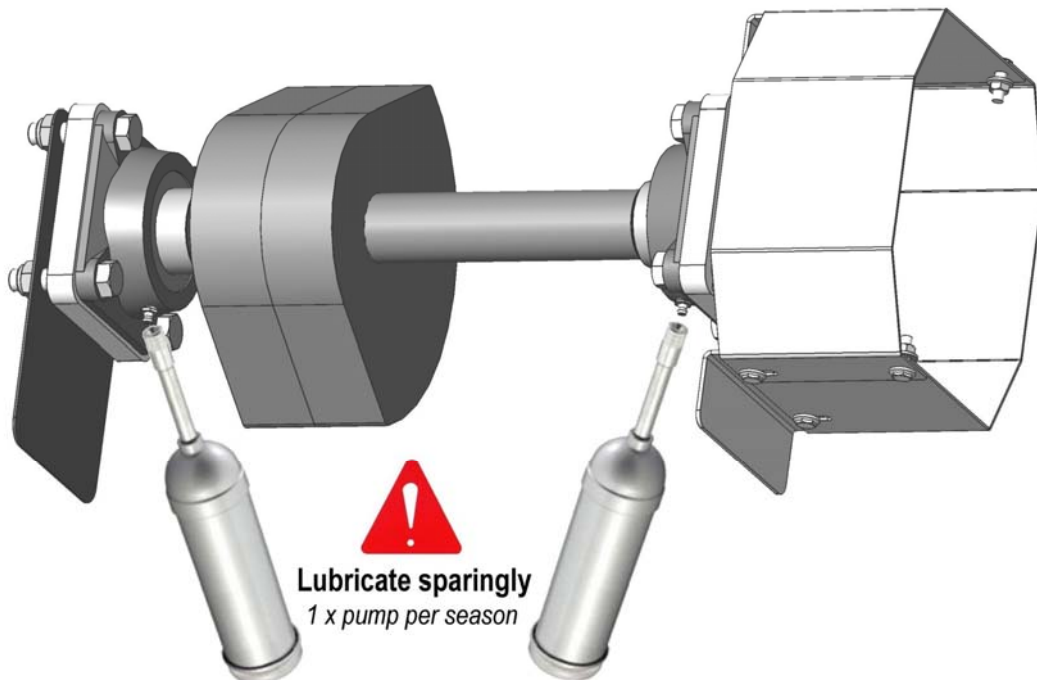
The PTO drive shaft and its guarding should be regularly examined to ensure that it is in good condition. The two halves of the plastic guard should be checked on a daily basis to ensure that they spin freely on the shaft. Ensure that all PTO shaft guards are fitted with torque chains to stop them from spinning with the shaft. Lubricate the shaft as indicated in the individual shaft leaflet provided with this component.

Vibrator Unit

This unit is used on all machines. The vibrator weight is carried by a shaft mounted in 'self-aligning' sealed ball bearings at each end. The bearings are housed in cast blocks in which the grease fitting is located. Grease passes into an annulus machined in the block from where it is forced into the bearing through a hole in the periphery of the outer race bearing.



CAUTION! It is of the greatest importance that these bearings are greased very sparingly. Excessive grease will blow out the seals and allow dust and dirt to enter the bearing and damage it. Once per season using a single stroke from a small push type domestic grease gun should be sufficient.



CAUTION! Regularly check the tightness of the through drive mounting bolts. Any movement can elongate the bolt holes and damage the bearing blocks. Tighten to a torque of 200 ft.lbs (275Nm).



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