

ScanStone

POTATO SYSTEMS

Operator's Instruction Manual

BED TILLERS

Models

Tiger 280 - 2 & 280 - 3



EC Declaration of Conformity

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



RGS Forfar Ltd.

East Mains of Burnside, Forfar, Angus, Scotland DD8 2RX

declare that:

Equipment: **Tiger 280**

Model No.

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 principles for design - Basic terminology, methodology.

BS EN ISO 12100-2 2003 Safety of Machinery - Basic concepts, general principles for design - Technical principles 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.

Signed:-

A handwritten signature in black ink, appearing to read 'Gordon Skea', is written over a horizontal line.

Gordon Skea
Director
RGS Forfar Ltd.



at:- RGS Forfar Ltd. Forfar, Angus, UK
on:- 23th June 2010

Foreword

The ScanStone Tiger 280/2 and 280/3 machines have been designed specifically for tilling of soil and are not intended for any other use. The manufacturer shall not be liable for damage resulting from mis-usage. The user shall bear all responsibility. Intended use also comprises adherence to the operating, maintenance and servicing instructions outlined by the manufacturer.

The machine must only be used in perfect working condition, in accordance with the aforementioned intended use and with instructions outlined in the operator's handbook. Any functional disorders, especially those which may affect safety of personnel must be rectified without delay.

Following the setting up and operating instructions provided should allow the operator to achieve the best performance from the machine which should result in increased reliability. Owing to wide variations in operating conditions however, it is impossible for the manufacturer to make comprehensive statements in this publication regarding performance or methods of working.

The efficiency of the machine always depends on the suitability of the operating conditions. Working on steep inclines or land that is too wet can significantly affect the finished work.

Operators should read carefully the 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 all relevant legislation regarding health, safety and accident prevention applicable to the country in which the machine is to be used or resold.

ScanStone products are manufactured to the highest possible standards and specifications using carefully selected materials and components and in accordance with recognised safety standards.


The right to change 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 any 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 the manual should contact their dealer or ScanStone direct at the following address:-

The Service Manager,
RGS Forfar Ltd.
East Mains of Burnside, Forfar,
Angus, Scotland, DD8 2RX
tel & fax: 0044 (0) 1307 818994
e-mail:- rgssales@btconnect.com

The serial number plate is attached to the Bed Former main frame. Use the space on the sample plate below to record the serial number for future reference.

ScanStone 	
SERIAL No.	
MODEL	
YEAR	
UNLADEN WEIGHT (KG)	
DRAWBAR WEIGHT (KG)	
AXLE WEIGHT (KG)	
RGS Forfar Ltd. East Mains of Burnside, Forfar, Scotland, UK, DD8 2RX	

Warranty

ScanStone when supplying new goods guarantee subject to certain conditions that those goods are free of defects both in material and workmanship.

The following conditions apply:-

- That the machine has only been used for tilling of soil.
- That service and warranty work is carried out only by authorised ScanStone dealerships.
- That the original specification of the machine has not been altered by 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 from whom the machine was purchased, quoting the model and serial number.

This should be done immediately!

Do not operate the machine. Even though the original failure may be covered by warranty - resultant damage to the machine arising from delay in reporting the fault will not be covered.

It should be noted that items consumed during normal maintenance services, by operation of the machine and by factors over which the manufacturer has no control are not automatically warrantable.

These items include - hydraulic and lubricating oils and ground engaging parts.

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

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Part 1 Safety Precautions

Ignoring these precautions may result in serious personal injury or damage to the machine.



Warning Symbol

This symbol is used throughout the manual to draw attention to important information where particular care is required to ensure safe operation and maintenance of the machine.

General

The operator's handbook should be considered as a part of the machine and should be available for immediate use at any time during operation of the machine. Suppliers of new and second hand machines are advised to obtain documentary evidence that this manual was provided with the machine at time of sale.

Owners of machines should ensure that prior to commencement of work the operator has read and understood the operator's handbook and in particular the information regarding safety. This also applies to persons involved in setting up, maintenance and cleaning of the machine.



Reading the instructions after work has begun is too late!

Operator's should also consult the tractor handbook for information and instructions on mounting implements and other related safe working methods.

Use the machine only for the purpose for which it was designed. Do not use it for other operations without the written consent of the manufacturer.

Before starting work

- Ensure that the machine-tractor coupling is correct. Observe the horsepower ranges recommended by the manufacturer. (Check data on page 2.2 of the manual).
- Take care when coupling / uncoupling hydraulic hoses to the tractor. Hydraulic oil under pressure can damage your skin. If any fluid is injected into the skin - always seek immediate medical advice
- Do not add to or modify any part of the machine which could affect safety without the prior approval of the manufacturer. This also applies to welding work.
- Check that warning and safety decals are in good condition. Replace any which are missing or those which have become illegible.
- Check the machine to ensure all services are operational and functioning correctly.

- Inspect the field for hazards such as large boulders, poles, overhead power lines and uneven ground. Take care when working to avoid obstacles and when working in unstable conditions.
- Warn bystanders to keep clear of the machine whilst working or when raising or lowering the toolbar arms.
- Attach the PTO Driveshaft Safety Chains correctly allowing sufficient slack for the shaft during operation and turning.
- Check all Safety Guards are fitted to the implement and are in proper working order.
- Do not remove any of the Driveshaft safety devices. Safety Guards are fitted to the machine to guarantee the safety of the operator. Never operate the machine if safety guards are missing or damaged. This is particularly relevant to Driveshafts but other components such as the Front Safety Bar, Side Safety Guard and Rear Flaps also serve as safety guards. Missing or damaged guarding must be replaced with original parts and correctly fitted according to the original specifications.
- Entanglement in rotating parts of the Driveshaft can lead to serious injury or death.
- Check that the Driveshaft is rotating freely inside the protective guarding.
- Take care when connecting or disconnecting the shaft to prevent damage to the safety devices.
- Keep the splined parts of the Driveshaft clean and greased in order to guarantee smooth operation.
- Check the tractor manual, and Driveshaft instruction manual for information on correct connection of the shaft both to tractor and implement.
- A safety sticker located on the Driveshaft Guard indicates the correct rotational speed of the shaft - keep strictly to the speed indicated.
- Operators and service personnel should always wear close fitting overalls and safety boots. Loose fitting clothing, scarves and belts etc. should not be worn because of the risk of entanglement.

During work



Under no circumstances should anyone stand below the toolbar when the frame is in the raised position!

- Reduce tractor speed when working on sloping ground.
- Never leave the driving position of a moving or running tractor.
- When operating the machine on side sloping ground the tractor centre of gravity will shift 'off centre' and could in extreme circumstances lead to overturning. Check the tractor manufacturers instructions for information or maximum gradients and never exceed the allowable limits. If necessary fit the tractor with front end weights to compensate for the weight of the implement.
- Check the machine regularly during operations for signs of wear and damage especially if an obstacle is struck.
- Never raise or lower the toolbar whilst near overhead power lines.
- Do not allow children to play anywhere near the machine or on the headlands when the machine is operational.

After work

- Never park the machine or carry out maintenance work when underneath overhead power lines.
- Adhere to replacement intervals noted in the manual if applicable even if signs of wear to components are not evident.

Safe maintenance and servicing



Never attempt maintenance or servicing work on the machine when the tractor engine is running. All servicing work should be undertaken on flat, level ground with the folding toolbar frames fully lowered for additional stability.

Release any residual pressure in the hydraulic system by operating the spool valve lever in both directions.

Engage the tractor handbrake and remove the tractor ignition key!

Beware of high temperatures - Allow drive components time to cool before handling!

- If other people are involved in the setting up and maintenance of the machine, it is the operators responsibility to ensure no one approaches the machine whilst the PTO is connected with the tractor engine running.
- Allow sufficient time for all moving parts to come to a

complete standstill, switch off the tractor engine and remove the ignition key before approaching, or allowing others to approach the machine.

- Check the operator's instruction book for details of service and maintenance schedules.
- Take care when carrying out maintenance under the machine. Make sure adequate support devices are in position to prevent sudden lowering.
- After cleaning the machine check all hydraulic pipes and hoses for leaking or operational damage. Repair before putting the machine back in service.
- When servicing is complete, check all nuts and bolts loosened during repairs have been tightened satisfactorily.
- Dispose of hydraulic fluids, filters and contaminated materials safely with due consideration to the environment.
- Always use genuine ScanStone spare parts.

Servicing the Hydraulic system.



Warning - The hydraulic system works under high pressure.

- When servicing or repair work is to be carried out on the machine use only suitably qualified engineers working to the relevant hydraulic standards and codes of practice.
- Check hydraulic lines regularly for any sign of leakage. Do not tighten a leaking fitting whilst the hydraulic system is pressurised. Always de-pressurise before maintenance to hydraulic components.
- Ensure hoses are properly fitted, free from twisting and clear of moving parts of machinery.
- Always replace hoses at the first sign of damage.

Part 1

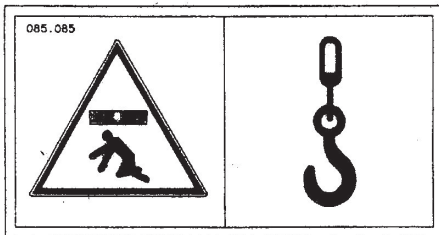
Handling of the Machine

Whenever possible the machine should be moved by means of a tractor connected to the 3 point linkage.

If no tractor is available, the machine may be lifted by attaching a suitable lifting chain or sling to the lifting point identified in Fig 1.1.

Note: If Ridging ploughs are fitted to the Tiller, it will also be necessary to attach a chain or sling to the Plough toolbar to ensure the combined equipment lifts evenly.

Check the weight of the implement, or combined weights and ensure all lifting devices, slings and suspension systems have the necessary lifting capacity and are properly attached.



Road Transportation

- Before travelling on public roads check traffic regulations relating to maximum allowable widths pertaining to the country in which the implement is to be used.
- Check also the overall height of the implement when folded and avoid using routes which pass under low bridges and overhead power lines.
- Check that the machine is free of earth, stones and clods, tools or other items of loose equipment before driving on public roads.
- Fold up the retractable frame into the transport position and secure using the Safety Bar.
- Disconnect all hoses from the tractor spool block and secure to the machine.
- When turning or at bends - take the width and load of the machine into consideration.
- When stopped - secure the machine to prevent rolling or unauthorised use.

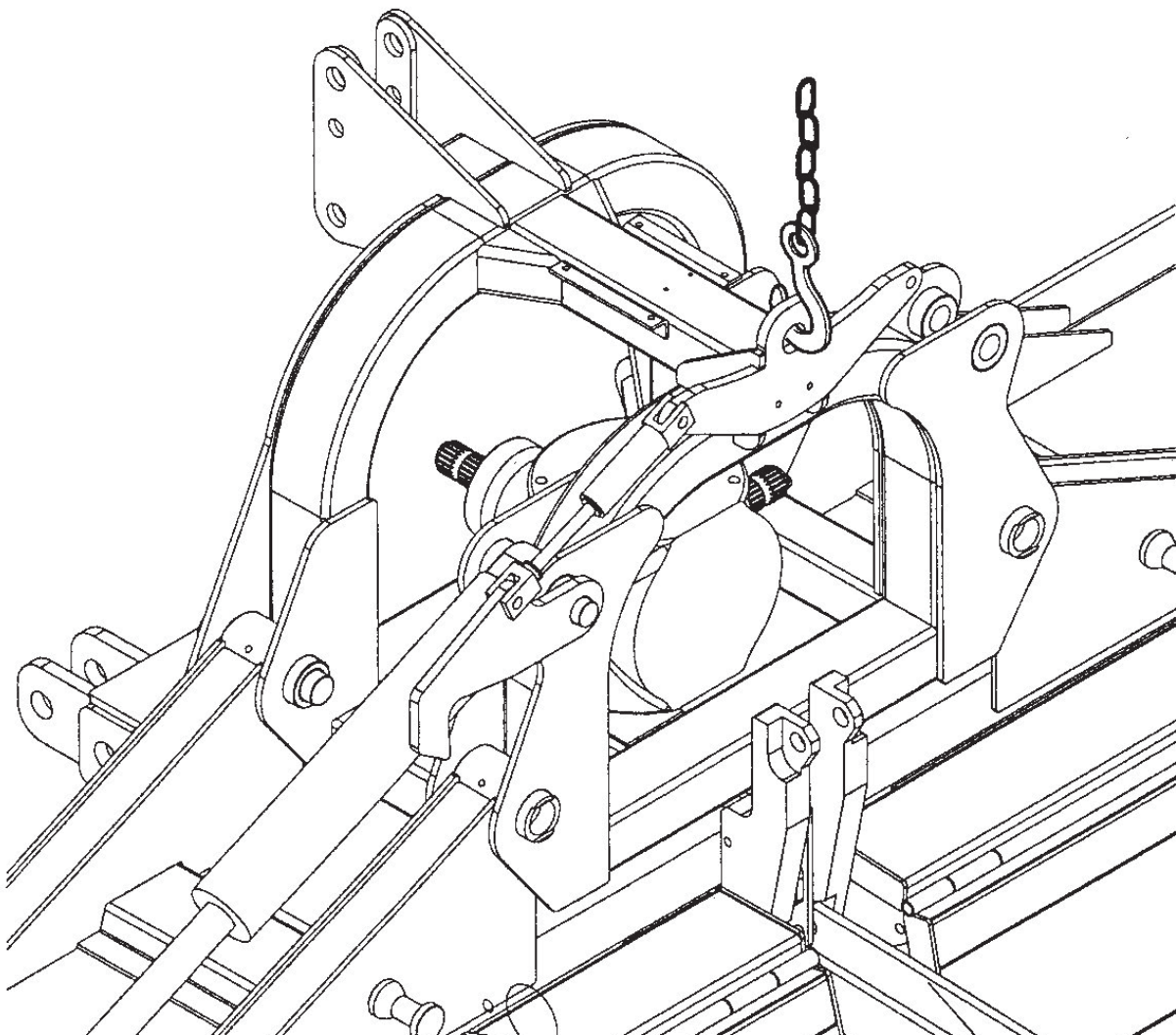


Fig 1.1

Drive Shaft Replacement

Fig 1.2

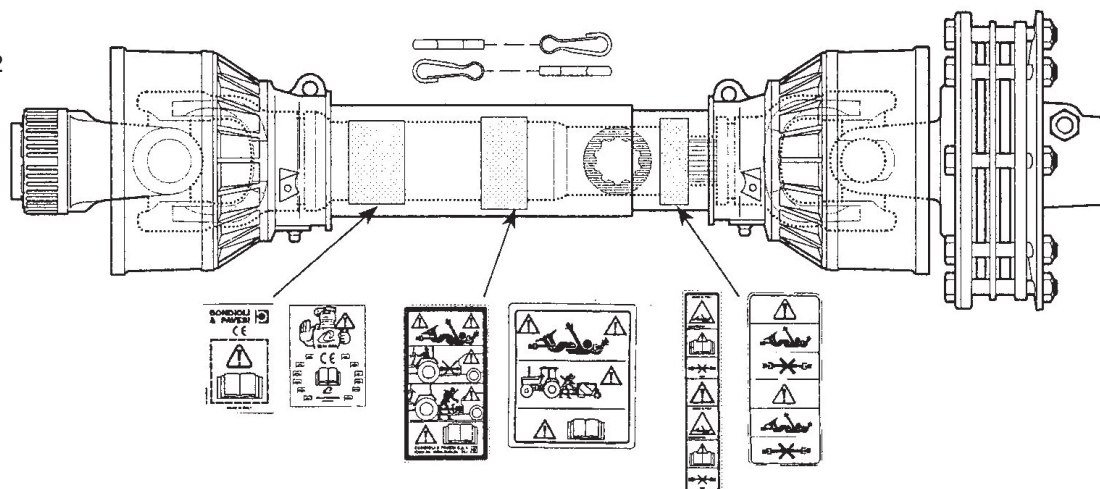
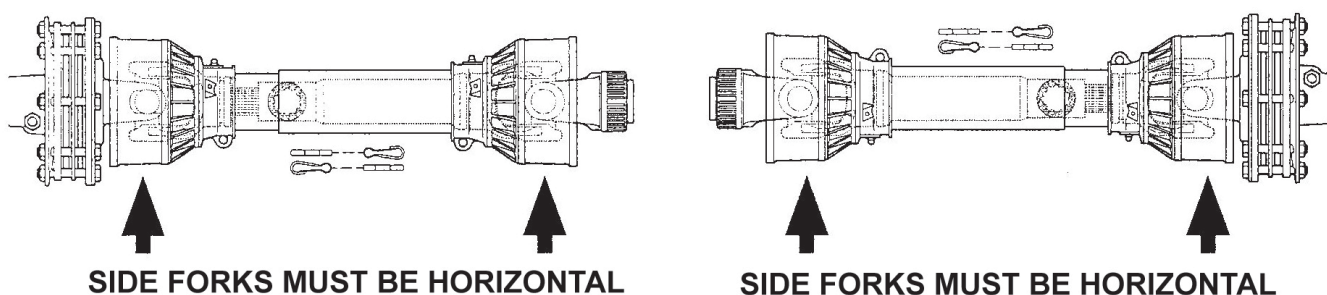


Fig 1.3

FRONT VIEW



Warning

If replacing Driveshafts make sure the Driveshafts are original and compatible in length, power capacity and torque limiters and are equipped with all necessary safety devices. The two joints allow angular adjustment up to 35° but it is advisable not to exceed 15° to 20° in angle.



Warning

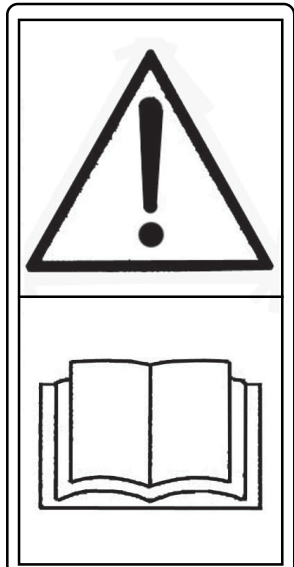
If it is necessary to disassemble or reassemble a Side Gearbox Shaft - make sure that the shafts are in perfect alignment with the two outside forks fitted horizontally at the same level, Fig 1.3. Misalignment could hamper the folding action of the arms when raised preventing the safety clamp from engaging the stop pin. The Shafts could also be damaged.

Driveshafts are equipped with safety stickers, Safety Chains, and a CE instruction manual.

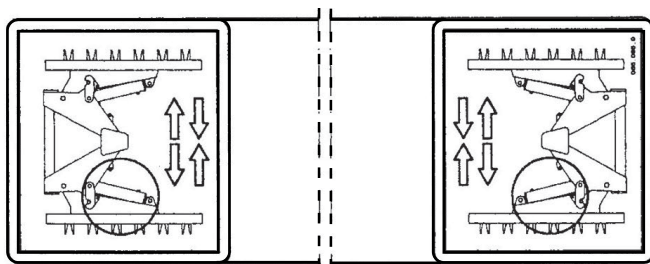
Part 1



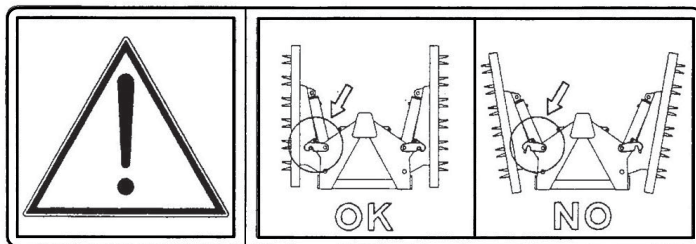
1. KEEP YOUR DISTANCE



2. WARNING! READ THE INSTRUCTION MANUAL BEFORE OPERATING THE MACHINE



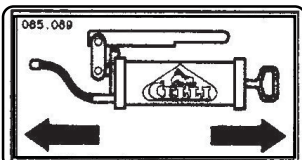
3. ENGAGE RAMS TO FOLD / UNFOLD MACHINE



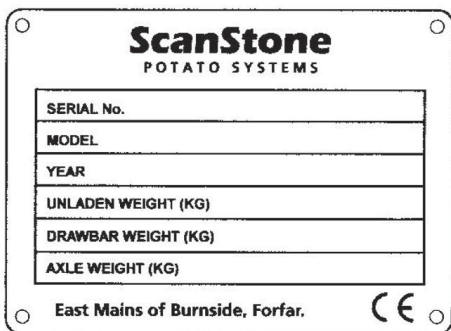
4. ENSURE LOCKING PINS ARE FULLY ENGAGED WHEN FOLDING MACHINE



5. WARNING! MACHINE LIFTING POINT



6. GREASING POINT



7. CE PLATE

		giri rpm	giri rpm	giri rpm	giri rpm
	15-30	260	14-31	230	
	16-29	284	13-32	208	
1000	18-27	340	19-26	375	
	20-25	410	17-28	310	

8. TABLE OF WORKING SPEEDS



9. CHECK OIL LEVEL



10. PTO SPEED



11. GEAR COUPLES ON MESH

Safety and Instruction Stickers



Warning

Instruction stickers on the machine are provided both for the safety of the operator and for the correct use of the machine. Before commencing work read over the information contained on the stickers and adhere to the instructions given.

Figs 1.4 and 1.5 show the instruction and/or safety stickers on the machine.

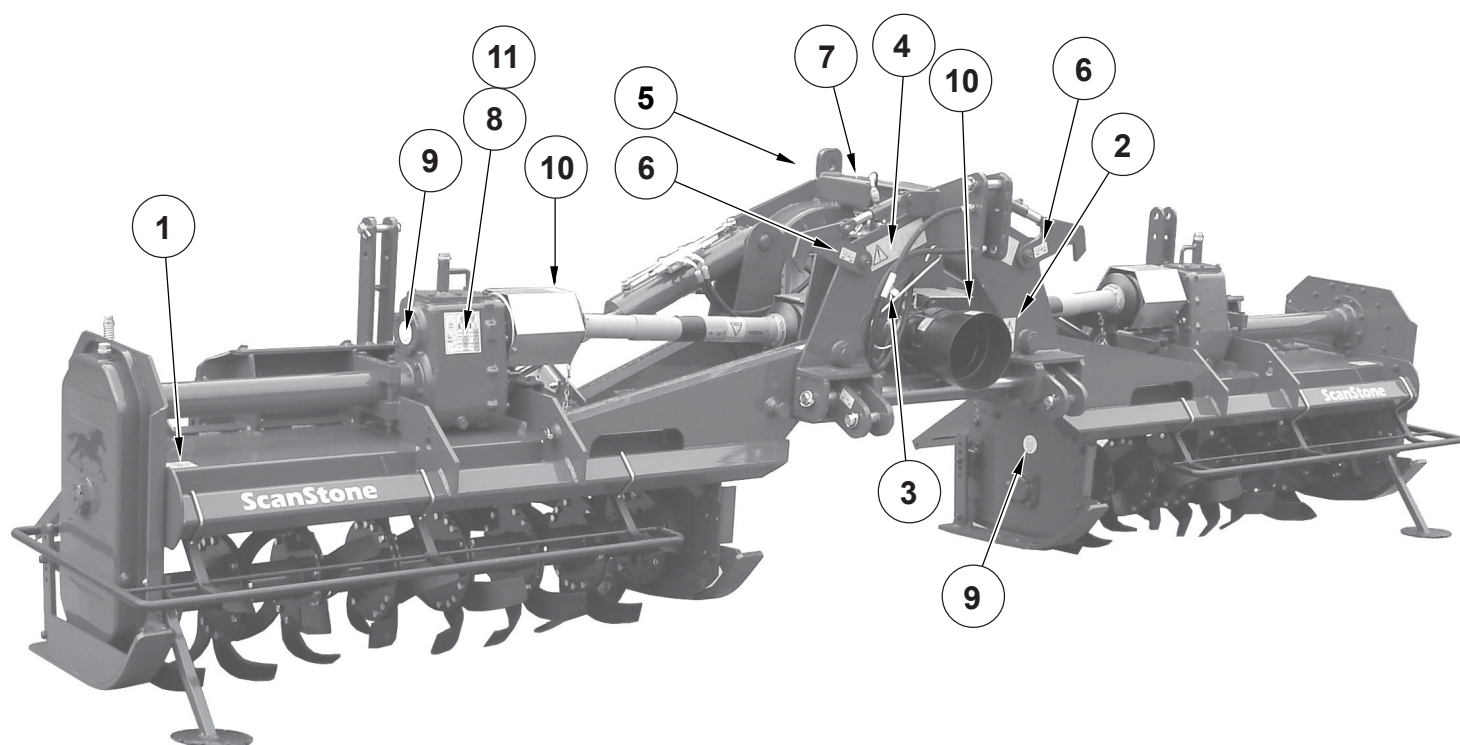


Fig 1.5

Replacement of Stickers

Replace any damage or worn stickers that have become impossible to read. Your ScanStone dealer can supply new stickers for the machine.

Part 2 Machine Overview and Specifications

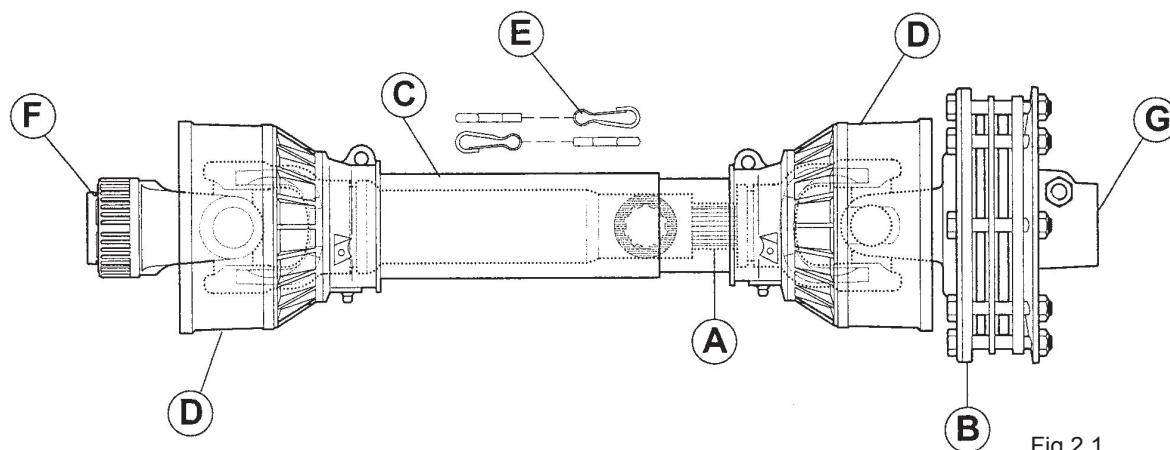


Fig 2.1



Fig 2.1: Driveshaft (above)

- A. Splined Driveshaft
- B. Safety Guard (Clutch shown)
- C. Outer Half Safety Guard
- D. Inner Half Safety Guard
- E. Safety Chain
- F. Splined Coupling (Tractor side)
- G. Splined Coupling (Implement side)

Fig 2.2

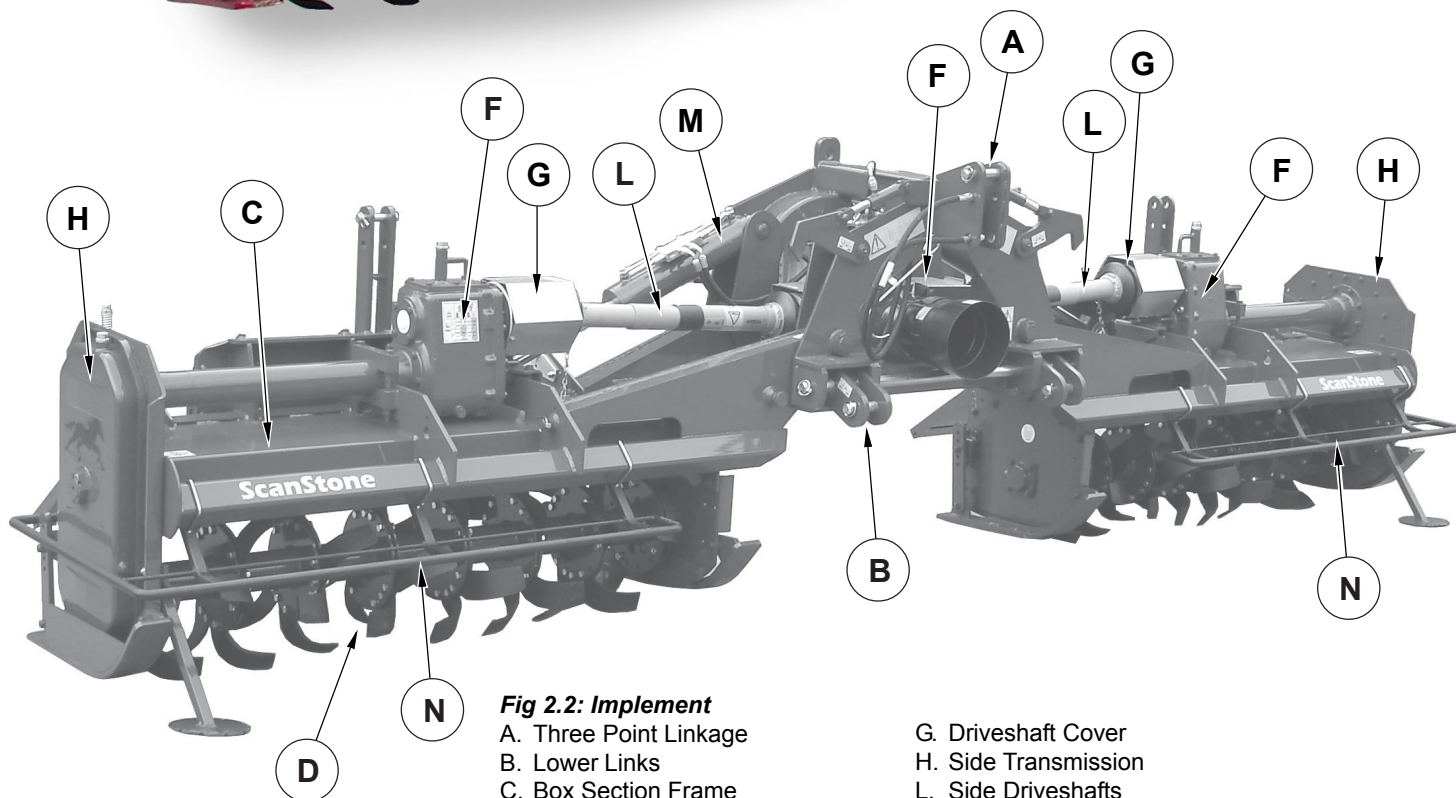


Fig 2.2: Implement

- A. Three Point Linkage
- B. Lower Links
- C. Box Section Frame
- D. Rotor
- E. Rear Flap (or Rear Cover)
- F. Side and Central Gearboxes

- G. Driveshaft Cover
- H. Side Transmission
- L. Side Driveshafts
- M. Hydraulic Lifting Arms
- N. Front Safety Guard

Maximum recommended horsepower

Minimum and maximum horsepower figures required to operate the machine are given below.

If the horsepower of your tractor is outside the recommended range - consult your tractor dealer before operating the machine.

Bed Tiller (only) **Minimum Horsepower 180 HP / 132 Kw**

Bed Tiller (only) **Maximum Horsepower 280 HP / 206 Kw**

Machine Specifications

	280-2	280-3
O/A Length	5760 mms	
O/A Width	1290 mms	
O/A Height to Headstock	1400 mms	
Weight	2600 kgs	
Working Width	5410 mms	
Working Depth	200 mms	
No. of Blades	84	106
Gearbox	2 speed for 1000 rpm PTO	
No. of Teeth 18 - 27	340 rpm	
No. of Teeth 19 - 26	375 rpm	
O/A Length with Shearbolt Ploughs	6525 mms	
O/A Width with Shearbolt Ploughs	2740 mms	
O/A Length with Auto Reset Ploughs	6525 mms	
O/A Width with Auto Reset Ploughs	3300 mms	
Weight with Shearbolt Ploughs fitted	3450 kgs	
Weight with Auto Reset Ploughs fitted	3720 kgs	
O/A Transport Height (folded with Ploughs)	3950 mms	
O/A Transport Width (folded with Ploughs)	2780 mms	

Part 3 Setting Up, Adjustment and Maintenance

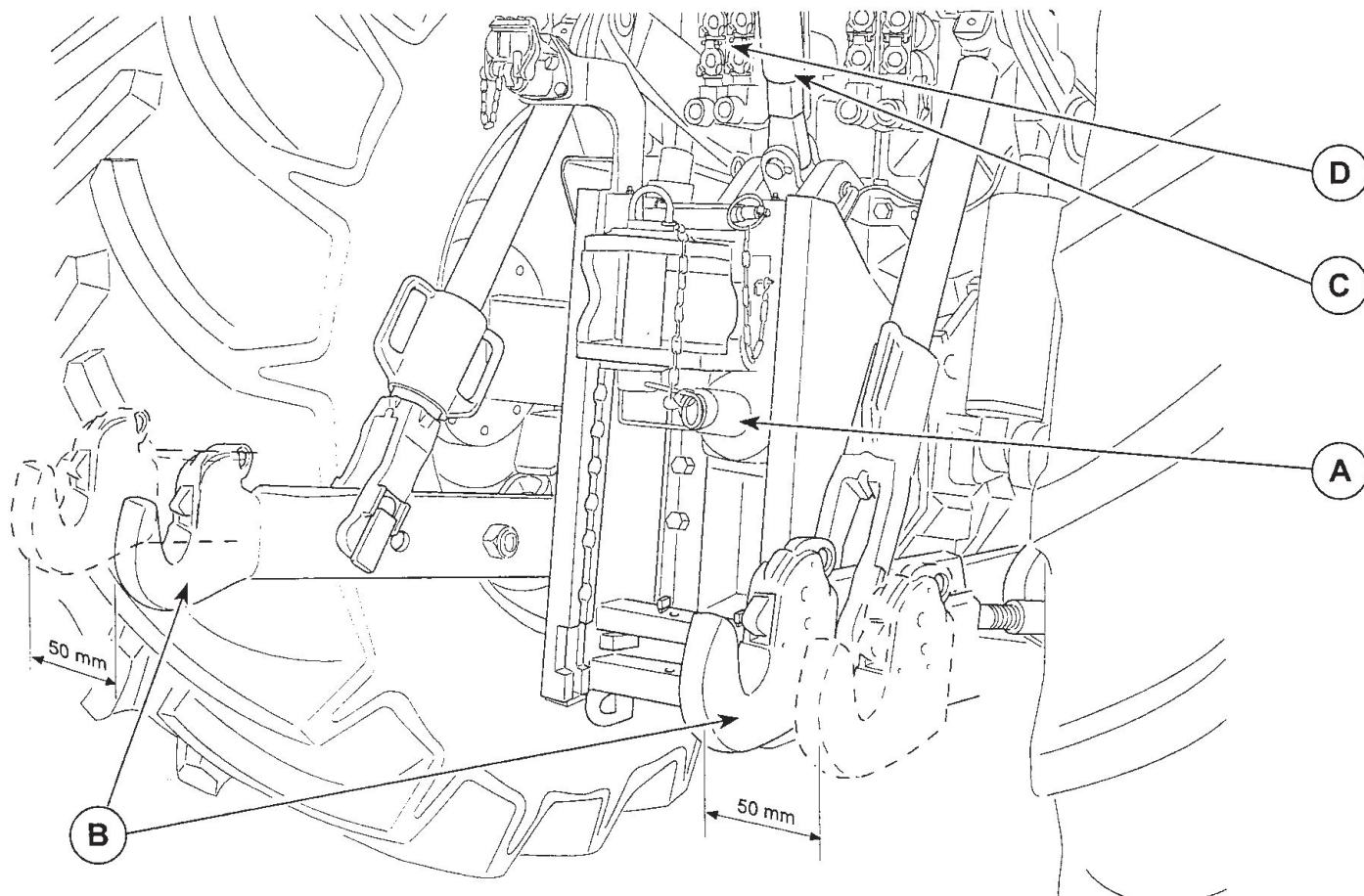


Fig 3.1

Attaching the Tiller to the Tractor



Warning

Read the warnings contained in the safety section of the manual.

Hitching operations should be conducted by the operator alone, with bystanders at a safe distance away from the danger zone between tractor and implement.

If other persons are involved - ensure that these persons are suitably experienced and that you (the operator) can communicate easily with these persons.

Before starting the hitching or unhitching operations - Check that the tractor PTO is disengaged and that no working parts on the machine are moving.

The Tiller must be unfolded and in a stable position on horizontal solid ground.

The tractor should be equipped with the following connections (Fig 3.1):-

- a. Mechanical PTO (splined shaft)
- b. Lower Hydraulic Lifting Arms
- c. Upper Hydraulic Lifting Arms
- d. Auxiliary Spool Block

Before starting the hitching operations, check that the above parts are compatible with the features of the corresponding parts of the machine.

In particular, the features of the mechanical PTO must be compatible with the Driveshaft hitch, i.e. (number of splines and diameter, rotational speed: 1000 rpm), the upper and lower arms must be compatible with the standard dimensions of the 3 point hitch of the machine and relative connecting pins.

If compatibility problems are experienced between connecting parts contact your dealer.

P.T.O. Shaft

The P.T.O. Shaft supplied with the machine is suitable for most tractors although a check should be made to ensure the length of the two shaft halves overlap by at least 1/3 of their length during operation, (Fig 3.3).

Use only the original P.T.O. shaft supplied, which is compatible in power capacity, safety devices and guarding.

Remove the Safety Guard fixed to the central gearbox.
 Connect the PTO to the Tiller gearbox splined shaft.
 Re-mount the Safety Guard in position.
 Use the hook on the Central Frame to hold the PTO Driveshaft in position.

Reverse the tractor close to the Tiller so that the Lifting Arms A are as close as possible to the machine Lower Linkages B. Stop the tractor engine and apply the parking brake.

Connect the two Lower Lifting Arms A (Fig 3.2) to the Linkages of the Tiller B.
 Connect the PTO Driveshaft to the tractor PTO coupling.
 Connect the Upper 3 point Hitch C. Adjust the Tiller frame position so that the Tiller is in a horizontal position.

Lock the Lifting Arms with the stabilisers and allow 50mm side movement to ensure the Ridger is not too rigid.

Check the Gearbox oil level before starting the machine.

Let the Tiller start rotating, put it in its working position and check the frame position again. If necessary, adjust the 3 point linkage top arm.

Ensure that the P.T.O. is securely attached to the tractor and the Tiller before operating. The tractor symbol printed on the guard indicates the tractor end of the driveline.

Attach the safety chains allowing sufficient slack for the shaft during operation and turning. Avoid using the chains to support the P.T.O. during storage.

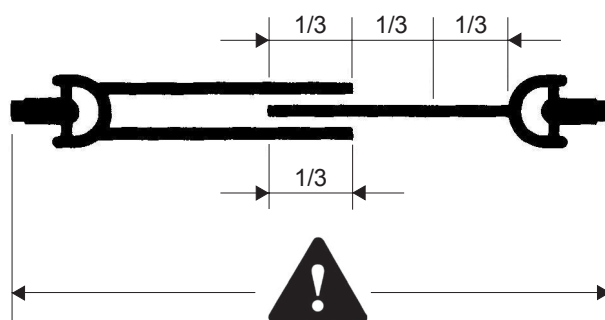


Fig 3.3

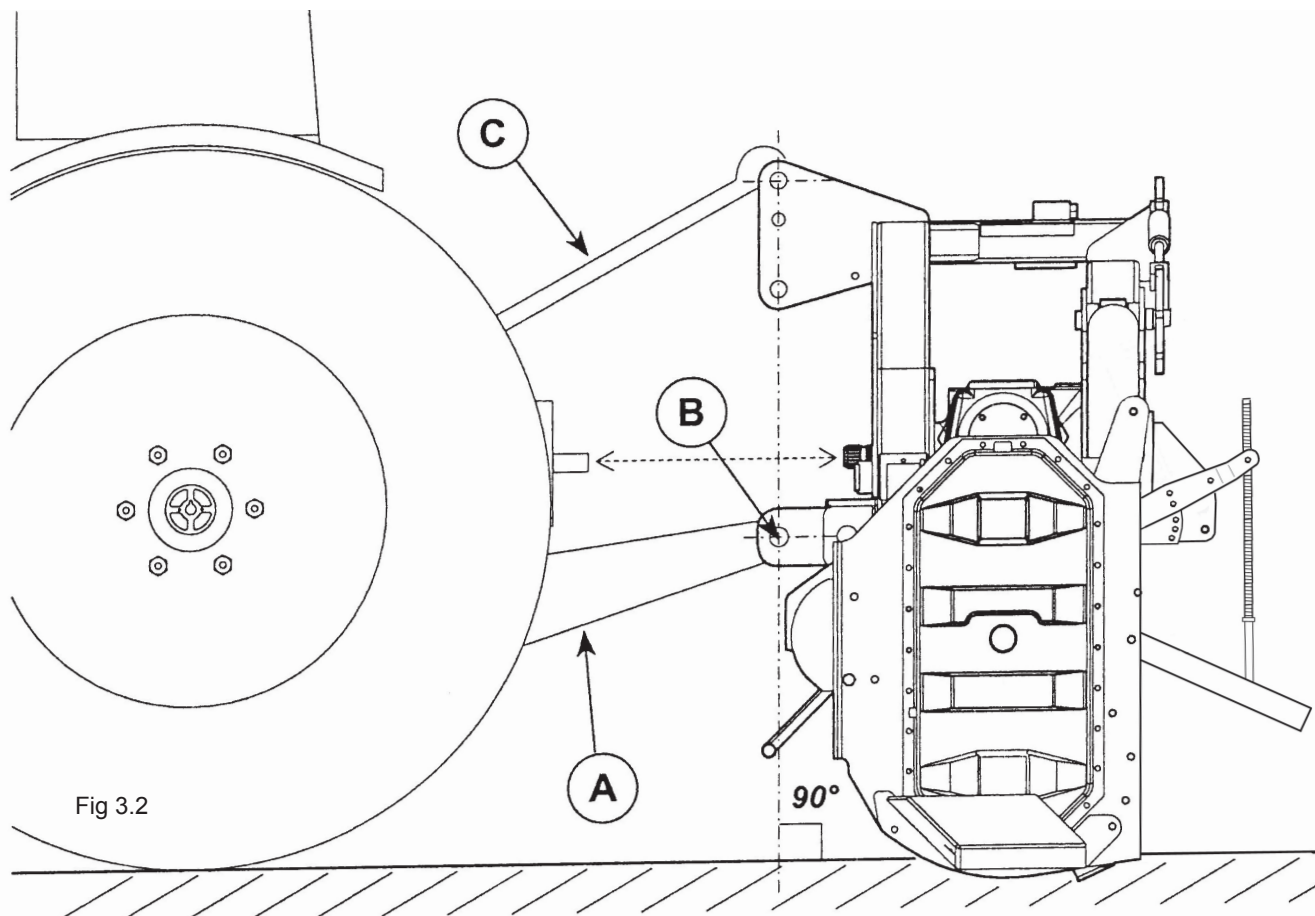


Fig 3.2

Part 3

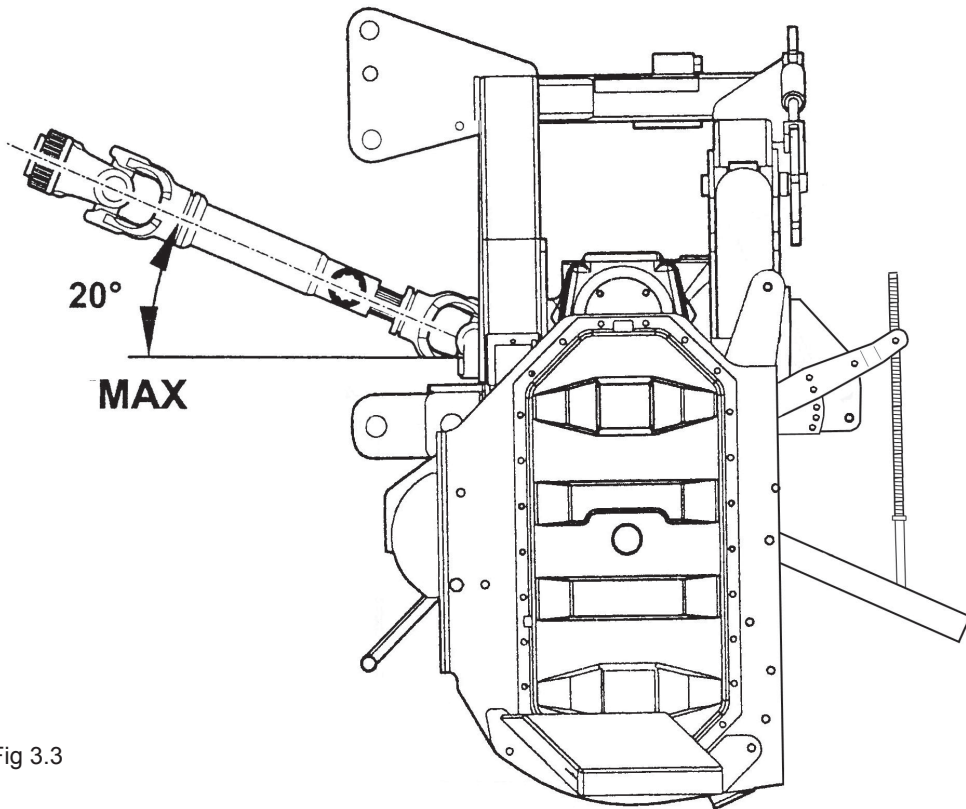


Fig 3.3

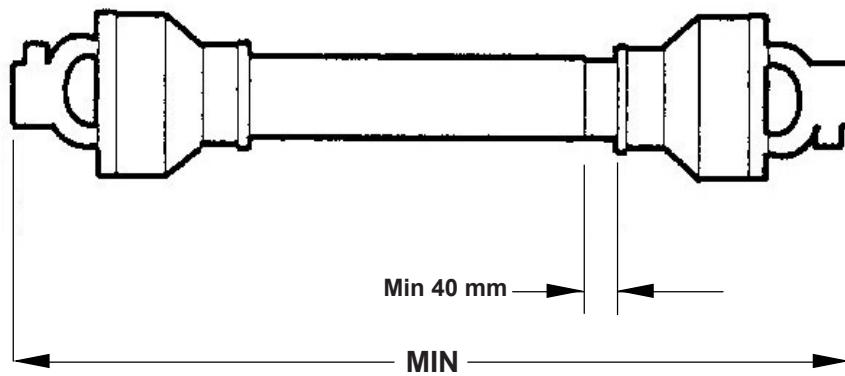


Fig 3.4

PTO Driveshaft

The working position of the PTO driveshaft should never exceed 20° in angle, Fig 3.3.

With the PTO in the working position check that a clearance of 40mm minimum is achieved between the outer half guard end and the inner half guard collar, Fig 3.4.

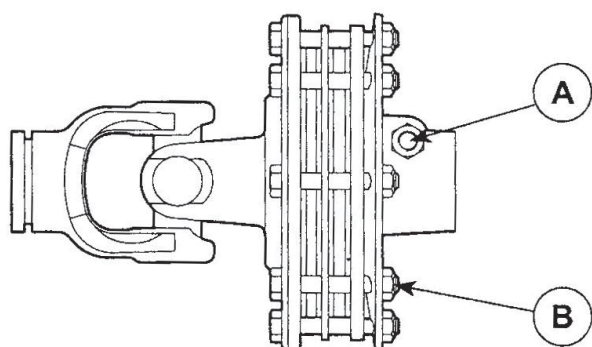


Fig 3.5

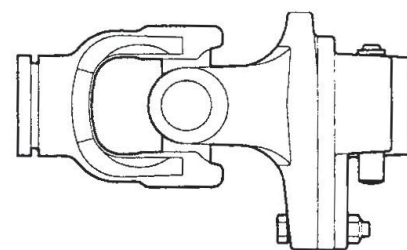


Fig 3.6

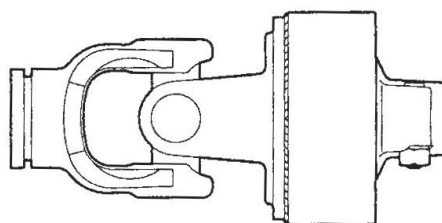


Fig 3.7



When coupling PTO Driveshafts ensure they are effectively locked in position. Check the locking pins **A** Fig 3.5, both on Tractor and Tiller ends of the shaft.

A PTO which is not properly locked could slip off and cause serious injury or damage to the machine.

The Side Gearbox Shafts are pre-set correctly to operate in average working conditions. In the event of failure the calibrations can be readjusted as follows:-

Safety Clutch (Fig 3.5)

If a clutch overheats due to slipping - Screws **B** can be tightened slightly although it should be noted that raising the intervention level of the clutch reduces the protection level of the clutch.

If it seems that the clutch never works, it is likely that the clutch discs have “stuck”. In this case, loosen the screws **B** completely, unstick the discs and replace them in the initial position. If discs are very worn or damaged, it is better to replace them according to the PTO driveshaft manual.

Safety Bolt (Fig 3.6)

The Driveshaft torque limiter is fitted with a safety shearbolt designed to snap under excessive stress. If a shearbolt is to be replaced always use an original part available from the manufacturer.

The **Automatic Limiter** (Fig 3.7) is designed to interrupt the power transmission if the torque peak value exceeds the calibration value. The drive is automatically restored when the stall torque, caused for example by an obstacle or rotor jamming, is eliminated. Calibration of the safety device is fixed. To change it, please contact your ScanStone dealer to have the torque limiter replaced.

Note: Side Gearbox Shafts with torque limiters have only one rotational direction. If both shafts are disassembled take care to place them back in their original positions.

Part 3

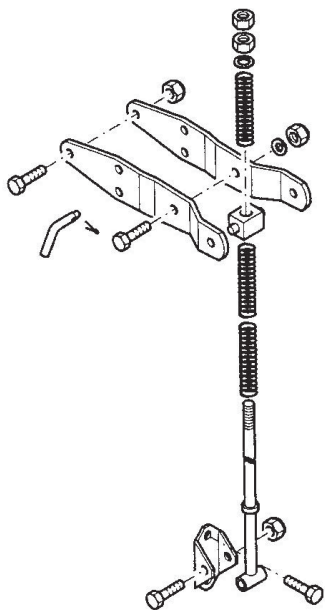


Fig 3.8

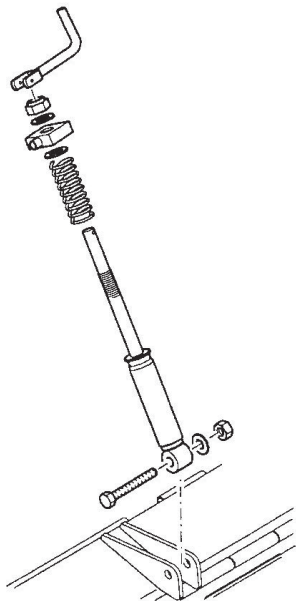


Fig 3.9

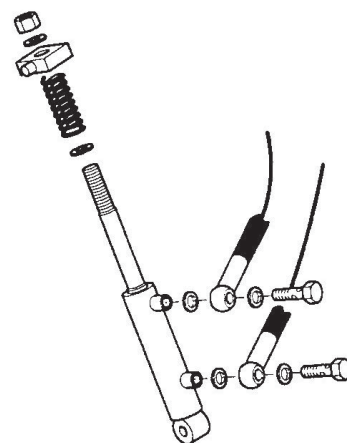


Fig 3.10

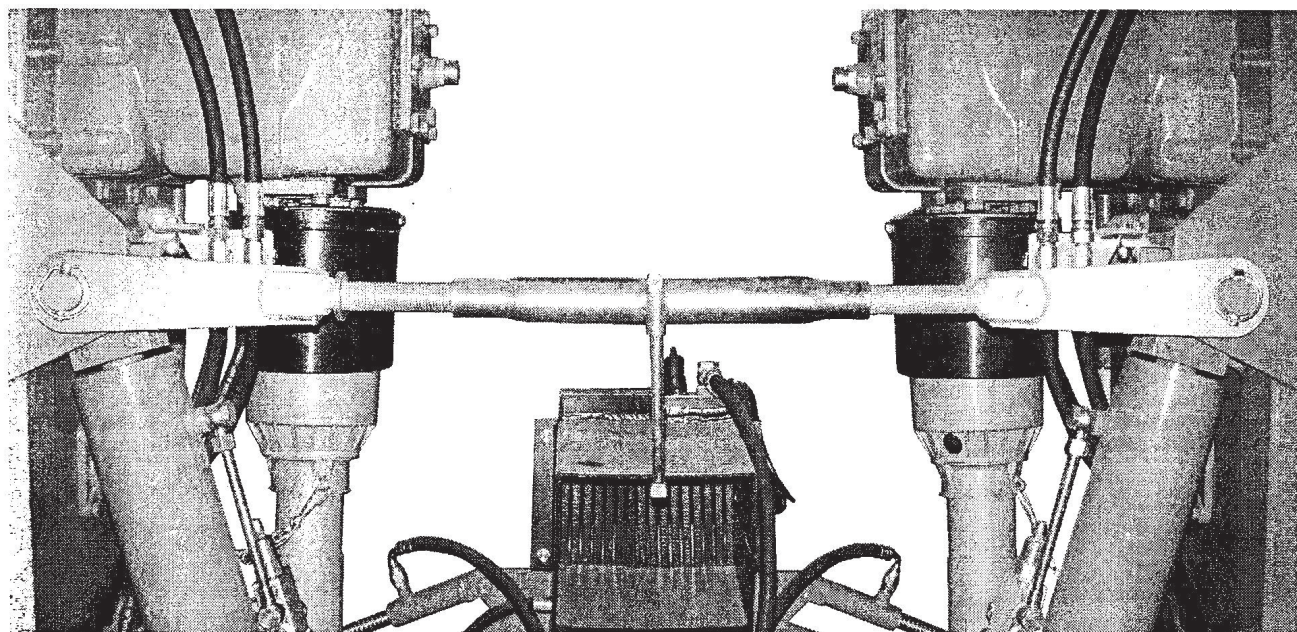


Fig 3.11

Rear Flap Adjustment

Depending on the machine configuration the Rear Flap angle can be modified by:

- alteration to the adjustment pin height, Fig 3.8.
- turning the adjustment screw, Fig 3.9.
- adjustment to the Lifting Ram height, Fig 3.10.

Road Transport

Before driving the Tiller coupled to a tractor on public roads, fold the machine and be sure that the safety latches are hooked to the pins on the machine frame.

Secure the two frames together using the safety bar and lynch pins provided, Fig 3.11.

During transport keep the Tiller in the lifted position and with the PTO driveshaft disengaged.

Never allow anyone to ride on the Tiller during operations or transportation.

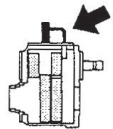
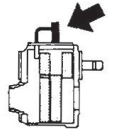
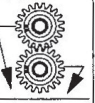

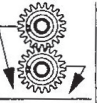




					
					
					
PTO gpm.  1000		15-30 16-29	260 284	14-31 13-32	230 208
		18-27 20-25	340 410	19-26 17-28	375 310

Fig 3.12

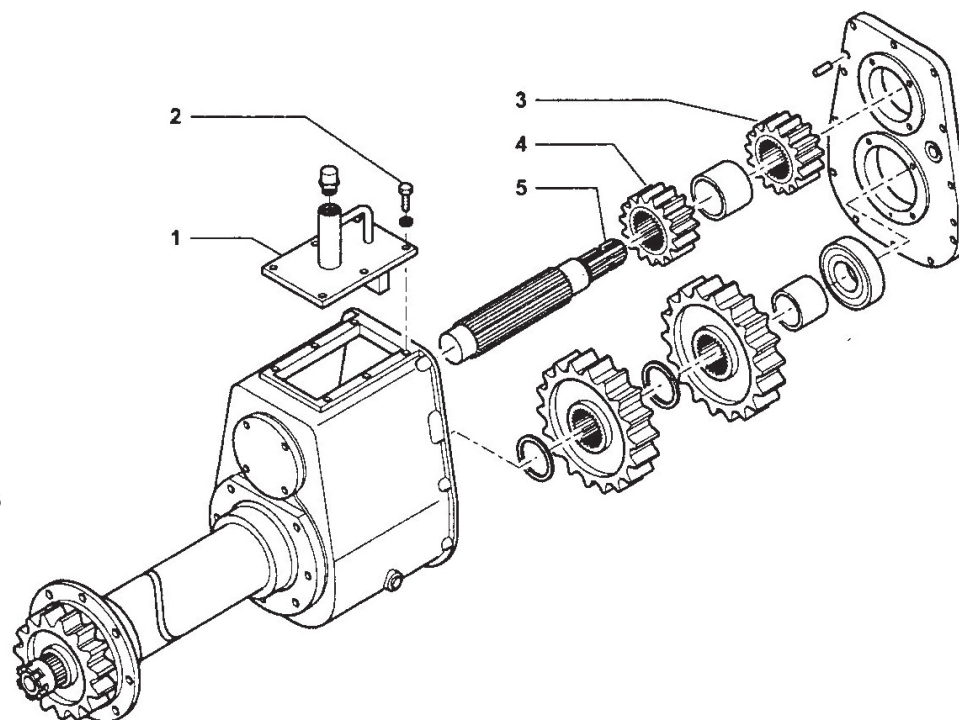


Fig 3.13

Working Speed

The type of tillage and clod break up rate depend on the working depth and on the ratio of machine rotational speed to tractor forward speed.

To improve performance the operator can adjust:

- working depth of Tiller
- tractor forward speed
- Tiller rotation speed
- Rear Flap position

In average working conditions, the recommended forward speed of the tractor should be in the range 2 - 2½ mph (3-4 Km/h).

Labels on the machine indicate all possible combinations of the gears supplied with the machine and their relative rotational speeds, Fig 3.12.

Rotational Speed

Rotor rotation speed can be modified by replacing or moving the gears in the side gearboxes.

To move gears:-

Disengage the tractor PTO, switch off the tractor engine and remove the ignition key. Apply the tractor handbrake. Remove the cover 1, Fig 3.13. by loosening the screws 2. Slide the gears 3 and 4 along the shaft 5 engaging the gear pair at rest. Rotate the cover 1 by 180° so that the gear stop (to the underside of the cover) is in the opposite position.

Part 3

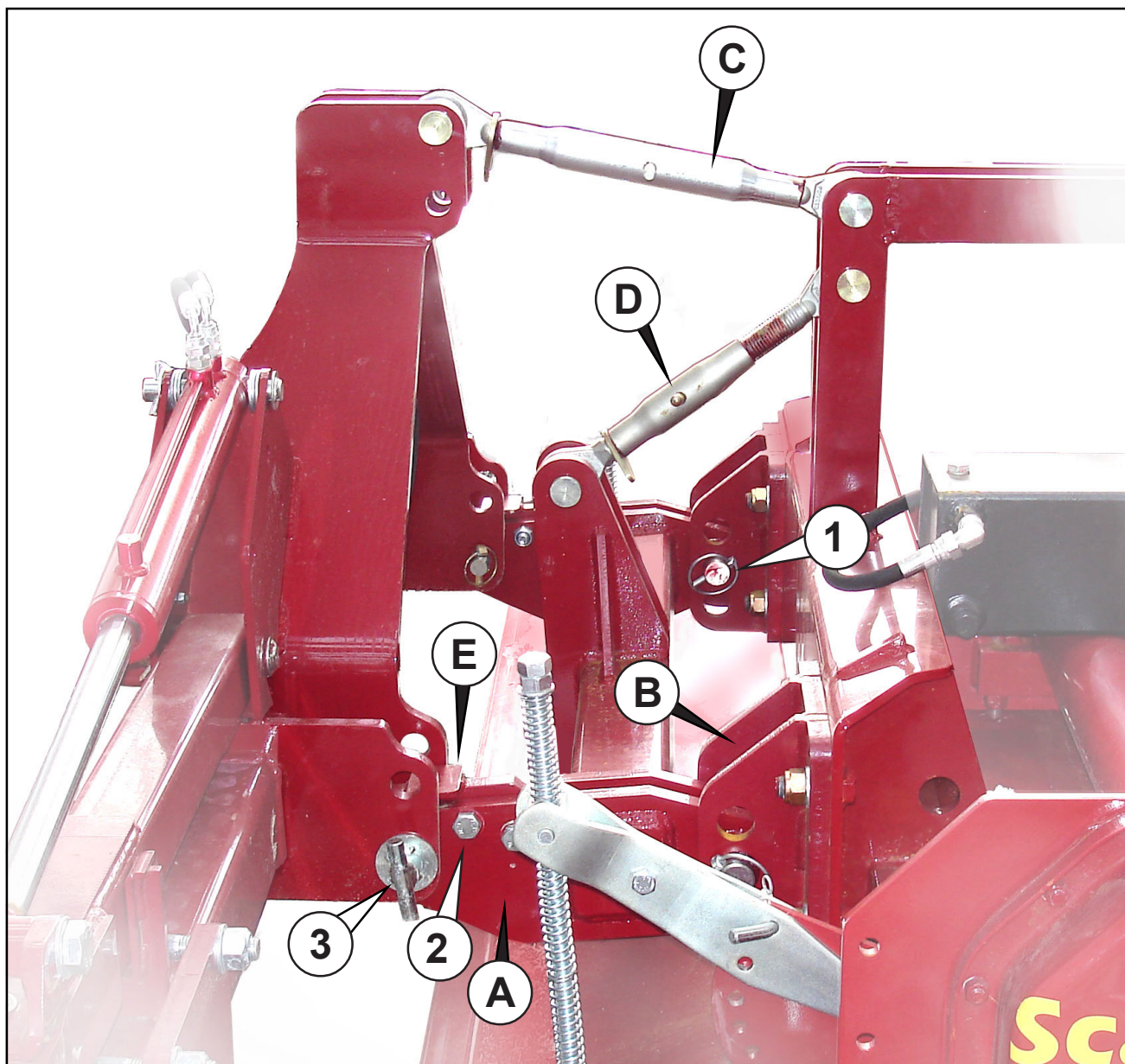


Fig 3.14

Coupling to the ScanStone Bed Maker

Before coupling to the Bed Tiller linkage kits should be fitted to the Tiller as shown, Fig 3.14.

Each kits consists of a linkage mount frame **A**, 2 mount brackets **B**, 2 top links **C** & **D**, 2 latches **E**, and all necessary pins and bolts.

Fit the pivot pins in either of the 3 height adjustment holes in the mount brackets **1**.

Remove the latch retaining bolts, and raise latches ready to mount the Bedmaker, **2**.

Mount the Bed Tiller on the tractor 3 point linkage and raise the support stands.

Fit lower link pins to the Bedmaker, in either upper or lower holes, **3**.

Reverse the mounted Tiller slowly toward the Bedmaker until in position below the Bedmaker lower link pins. Raise the Bed Tiller to engage the lower link pins and ensure they are properly seated in the linkage jaws. Re-fit the latch plate retaining bolts.

Connect the top links and adjust so that the Bedmaker is leaning back slightly.

Test run the combined unit adjusting the top links if necessary to ensure that the ridge bottom width is sufficient for stone and clod placement during separation and that the plough points are not bringing up uncultivated soil onto the ridge.

Depth Adjustable Front Discs

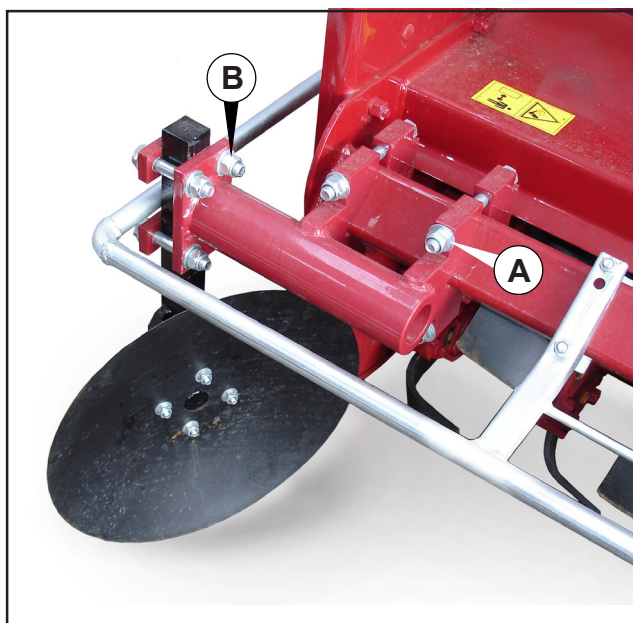


Fig 3.15

Left and right hand depth adjustable front discs are provided to protect the skid plates and to push soil into the rotor, Fig 3.15.

Disc position is adjusted by loosening off the 4 clamp bolts and sliding to new position on the toolbar frame, **A**.

Disc depth is adjusted by loosening off the 4 disc stem clamping bolts and raising or lowering as required, **B**.

A grease nipple is fitted to the stem hub. Apply one pump of grease weekly during operational periods.

Front Guards

Front Guards, Fig 3.16, may be supplied loose for ease of transportation.

Before operating the Tiller the operator must fit the Guards as follows:-

- Guards must be fitted to the front arm using the U bolts, nuts and bolts provided, **A**.
- The Guard must be aligned with the frame outer side, **B**.
- If a Guard is damaged or broken it must be replaced before using the machine.



Fig 3.16

Road Lighting Kit

The road lighting kit, Fig 3.17, consists of a tubular bar with mounted rear combination lights and triangular reflectors. Extension arms are screwed to the tiller headstock, on which the lighting bar is clamped.

The road light plug is connected to the tractor auxiliary socket.

Note: Before travelling on public roads check all lights are functioning correctly!

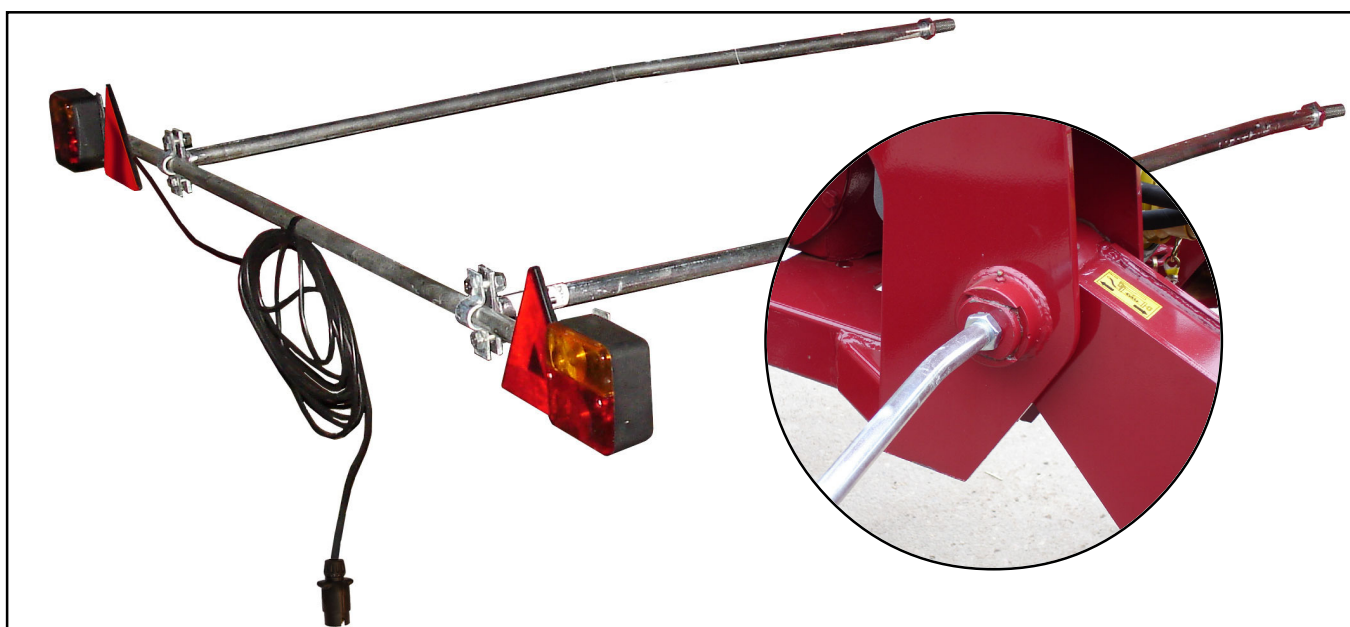


Fig 3.17

Part 3

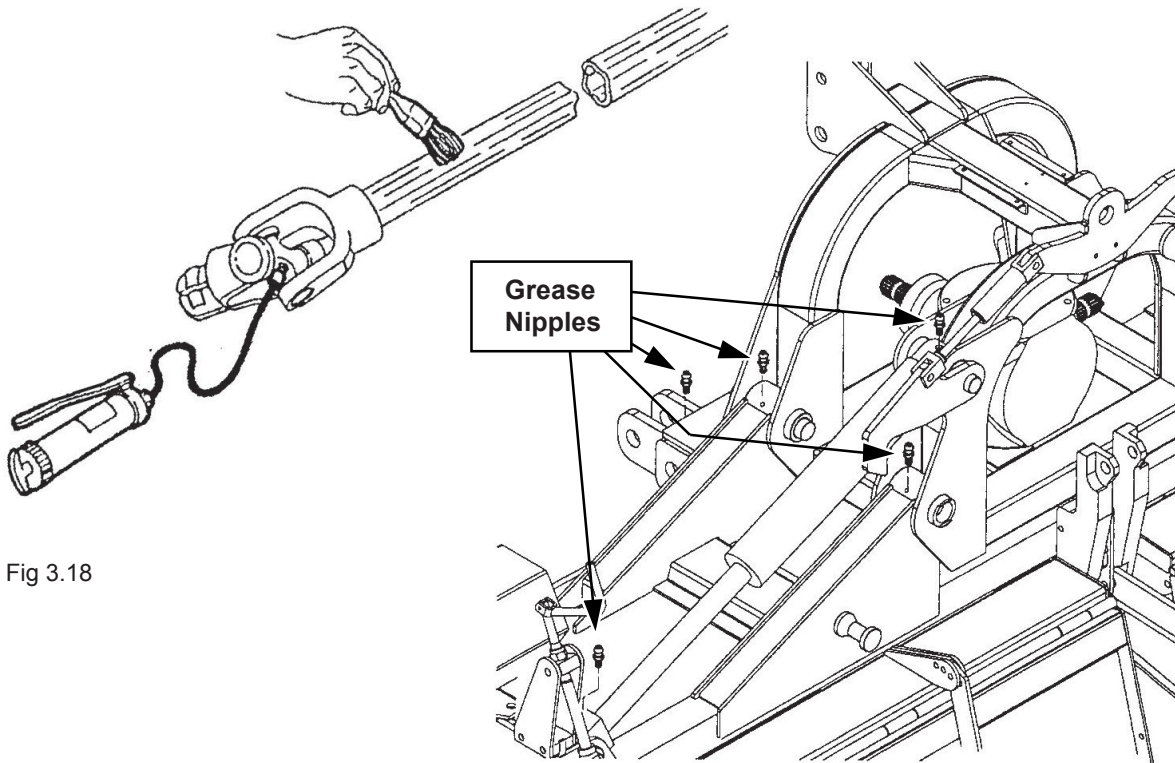


Fig 3.18

Fig 3.19

Maintenance and Cleaning

Periodic maintenance is vital to ensure the safety and efficiency of the machine.



Warning

Before performing maintenance and cleaning operations - Switch off the tractor engine and remove the ignition key!

Operator's must wear PPE (personal protective equipment) during maintenance operations.

It is advisable to wear close fitting overalls, safety boots, gloves and safety glasses.

Standard Maintenance

It is necessary to carry out a number of simple maintenance operations on a regular basis.

- Check all nuts and bolts, especially on the blades / tines.
- Replace bolts if necessary using only original spare parts.
- Check the gearbox oil level and if necessary fill up.
- Grease the two ends of the PTO driveshaft every 8 hours of operation.

Supplementary Maintenance

For any operation other than those advised in this manual consult your ScanStone dealer. Performing maintenance actions other than those noted in this manual could compromise your safety or damage the machine.

Lubrication



Warning

Before starting a new machine, check the gearbox oil level. For a perfect running-in, it is advisable to replace the gearbox oil after the first 200 hours of work and then every 500 hours.

Since used oil damages the environment and is dangerous to health, use proper protective gloves when draining oil. In case of skin contact wash immediately with soap and warm water.

Oil replacement procedures must be conducted in safe and clean conditions. In the event of leakage during maintenance clean with absorbent materials, store in suitable containers and dispose of at used oil disposal sites.

After maintenance, every dismantled part must be carefully re-assembled before starting the tractor engine.

Fig 3.20

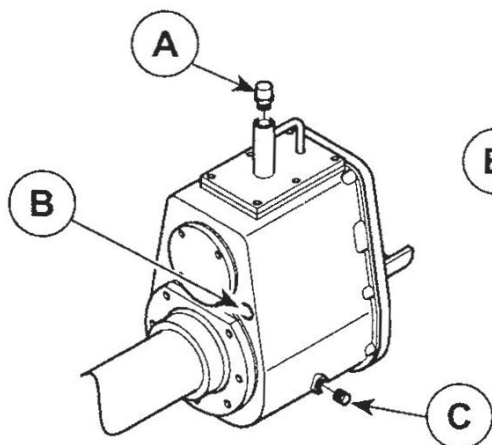


Fig 3.21

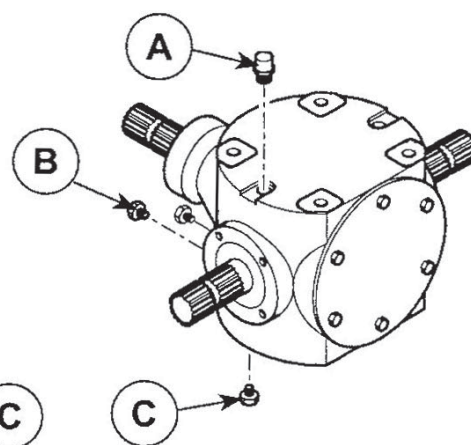
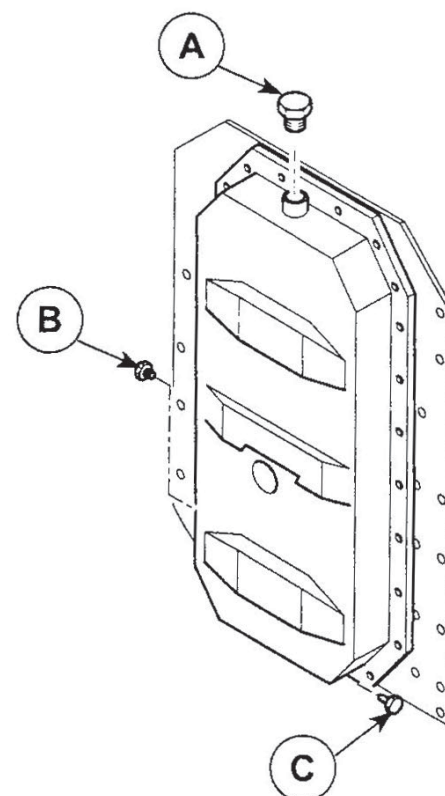


Fig 3.22



QUANTITY OF OIL IN THE GEARBOXES AND IN THE SIDE DRIVERS (litres)			
Model	Side gearbox	Central gearbox	Side drivers
280/2	7	3,6	4,5
280/3	7	3,6	4,5



Warning

Avoid touching hot parts of the machine. Wait until oil has cooled before carrying out oil changes

- **PTO Driveshaft Inner Tubes** - Fig 3.18, Before starting operations check and grease with Agip grease 30.
- **Central Pivots** - Fig 3.19, Apply grease to the Grease Nipples every 40 hours.
- On machines fitted with an optional cooling system, clean the radiator with compressed air to prevent clogging and replace the oil filter at every oil change.

Gearbox oil changes

After the first 200 hours of work change the oil in each gearbox and thereafter every 500 hours.
The recommended oil is **AGIP ROTRA MP85 W/140**

Side Gearboxes (Fig 3.20)

- For every oil change proceed as follows:-
- Remove the drain plug **C** and also the oil plug **A** to speed up the oil flow.
 - When the gearbox is empty place **C** in position again.
 - Fill the gearbox with fresh oil through **A**.
 - Check the oil level by loosening plug **B**.
The correct top up level of the gearbox should be in line with this plug.

Central Gearbox (Fig 3.21)

- Remove the drain plug **C** and also the oil plug **A** to speed up the oil flow.
- When the gearbox is empty place **C** in position again.
- Fill the gearbox with fresh oil through **A**.
- Check the oil level by loosening plug **B**.
The correct top up level of the gearbox should be in line with this plug.

Side Drive Gearboxes (Fig 3.22)

- For every oil change proceed as follows:-
- Remove the drain plug **C** and also the oil plug **A** to speed up the oil flow.
 - When the gearbox is empty place **C** in position again.
 - Fill the gearbox with fresh oil through **A**.
 - Check the oil level by loosening plug **B**.
The correct top up level of the gearbox should be in line with this plug.

When additional maintenance or inspection is requested, after removing the side cover, clean the gears and the area of contact between the side plate and the side cover.
Apply a liquid sealing compound around the side cover and re-fit.

Part 3

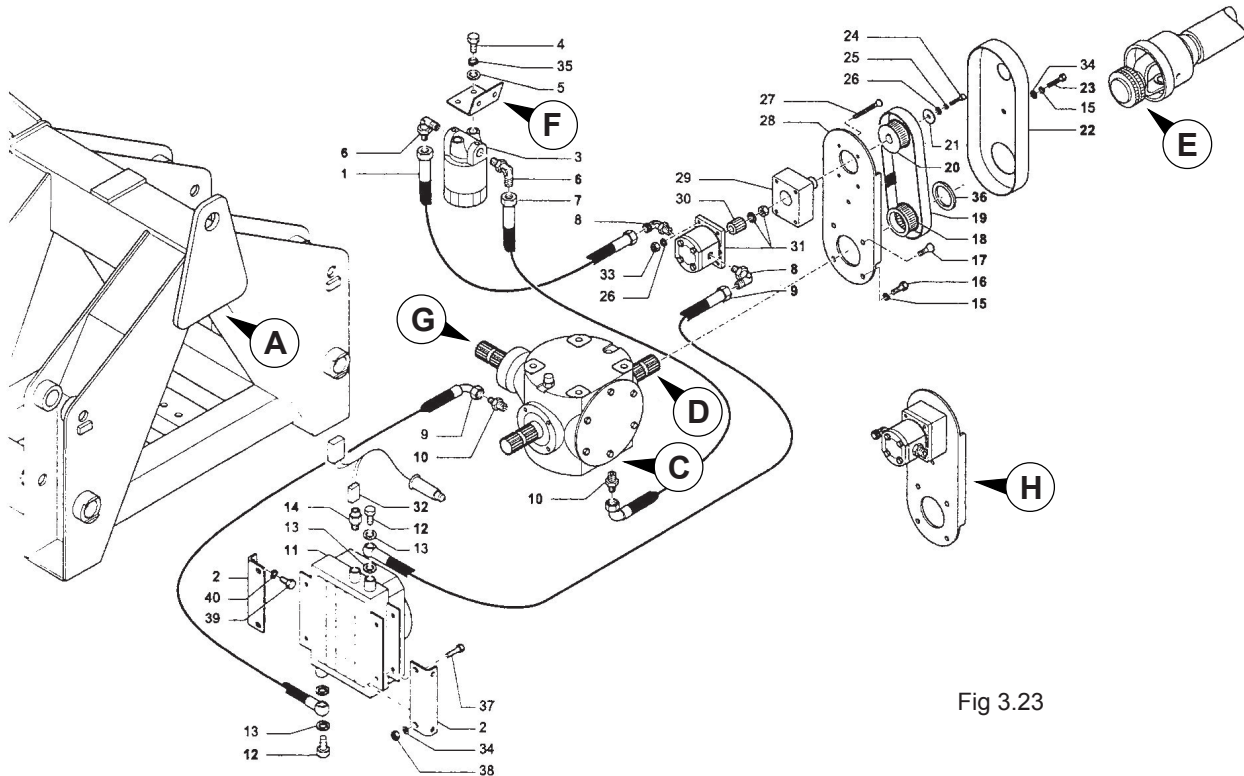


Fig 3.23

Central Gearbox Cooling Kit (Optional)

For correct assembly of the central gearbox cooling kit proceed as follows:-

- Fold up the machine ensuring the safety latches are engaged and fit the safety bar (Fig 3.11).
- Switch off the tractor engine and remove the ignition key.
- Apply the tractor handbrake.



Warning

Check also the Tiller 3-point linkages are properly attached to the tractor.

- Disconnect the central shaft from the PTO **G**, Fig 3.23.
- Loosen the oil drain plug located under the gearbox and drain oil into a suitable container.
- Replace the plug with fitting **10** position **C**.
- Screw the hose **7** (length 700mm) to the fitting on the hitch side.
- Position the hose to avoid any damage when unfolding the machine.



Warning

Remove the safety bar between the Tiller frames.

- Unfold the machine.
- Switch off the tractor engine and remove the ignition key.
- Apply the tractor handbrake.

- Remove the shaft **E** from the PTO **D**.
- Pour about 1 Kg of oil (see oil table) into the oil filter **3** before installing the fittings **6**.
- Fix the filter to the plate **F**, which is already positioned on the hitch in position **A**.
- Connect the hose **7** to the filter fitting **6**.
- Place the pre-assembly **H** and the pulley **18** on the PTO **D**.
- Tilt the pre-assembly **H** so that the belt **19** can be fitted on the pulleys **18 - 20**.
- Insert the screws **16** and **17** through the pre-assembly **H**, straighten up and secure it to the box.
- Replace the cover **22** and tighten the screw **23**.
- Insert the spacer ring **36** on the PTO **D**.
- Replace the shaft **E** making sure that the locking pin (see Fig 3.5) is correctly positioned.
- Connect the 90° end of hose **1** (length 410mm) to the pump, and the other end to the filter.
- Connect the hose **9** (length 390mm) and the fitting **8** to the side of the pump.
- Connect the opposite end of hose **9** to the upper part of the radiator using the banjo fittings **12** and **13**. Loosen the plug located on the top right hand side of PTO **G** and replace it with the fitting **10**.
- Connect the second hose **9** to the fitting **10**, (screwed to the central gearbox), and the opposite hose end to the lower part of the radiator **11**, using the banjo fittings **12** and **13**.
- Place the thermostat **14** and the power lead **32** in the radiator upper part. Then also connect the power lead to the tractor.

Part 3

Lubricants Conversion Table (Fig 3.24)

In the table below several brands of lubricants equivalent to the ones used by the manufacturer are indicated. You can choose any of the oil or grease products among those listed. In case of doubt, ask your ScanStone dealer.

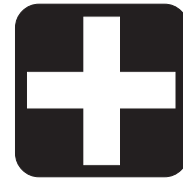
OIL AGIP ROTRA MP85W/140

	AGIP ROTRA MP 85 W/140 (BLASIA 320)		SPARTAN EP 320		REDUCT ELF SP 320
	ALPHA SP 320		EPZ 320		MOBIL GEAR 632
	MELLANA OIL 320		GIRAN 320		OMALA OIL
	ENERGOL GR-XP 320		NL GEAR COMPOUND 320		MEROPA 320

GREASE AGIP GREASE 30

	GREASE 30		BEACON 3		ROLEXA 3
	SPHEEROL APT3 SPHEEROL EPL3		JOTA 3FS		MOBIL-LEX 48
	IP ATHESIA GR3		MARSON L3 MARSON EPL3		ALVANIA GREASE R3
	GREASE LTX		DURALITH GREASE EP3		MARFAK HD3

Fig 3.24



Hose Replacement Intervals

Hoses should be replaced every 5 years even if signs of wear or damage is not apparent.

When replacing hoses always use the correct specification*:-

*SAE 100 R2 AT • DIN EN 853 2SN

SIZE	WORKING PRESSURE	MIN. BURST PRESSURE
1/4"	400 Bar (5800 psi)	1600 Bar (23200 psi)
3/8"	330 Bar (4800 psi)	1320 Bar (19150 psi)
1/2"	275 Bar (4000 psi)	1100 Bar (15950 psi)

Handling Oil & Grease

Oil and grease products used on this machine are not considered to be particularly hazardous to health unless ingested. Handle these products responsibly and in accordance with good industrial hygiene and safety practices.

Contact with skin:-

Wash skin with plenty of soap and water for several minutes. Seek medical attention if irritation develops or persists.

Contact with eyes:-

Flush eyes with plenty of water for several minutes. Seek medical attention if irritation develops or persists.

Warning: Diesel fuel or hydraulic fluid under pressure can penetrate the skin or eyes and cause serious personal injury, blindness or death. 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.

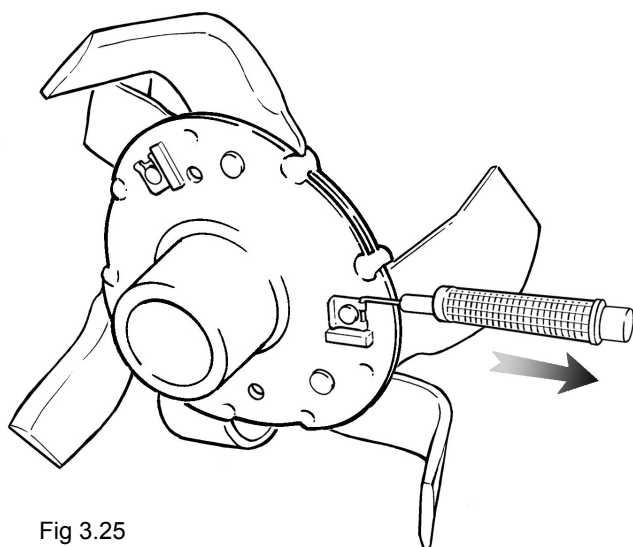


Fig 3.25

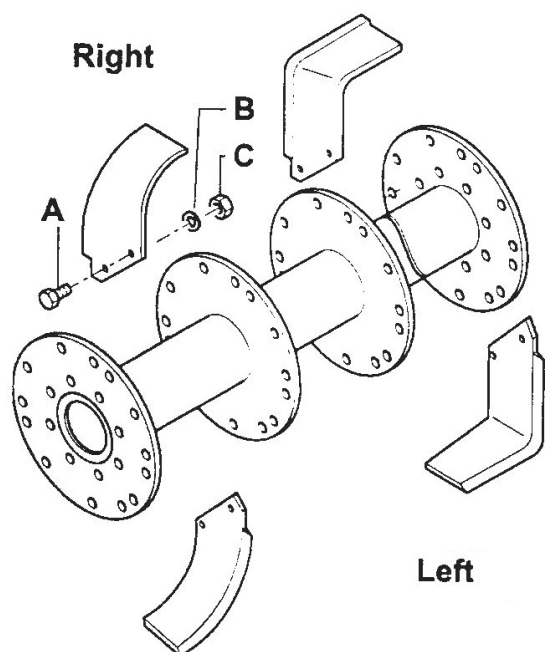


Fig 3.26

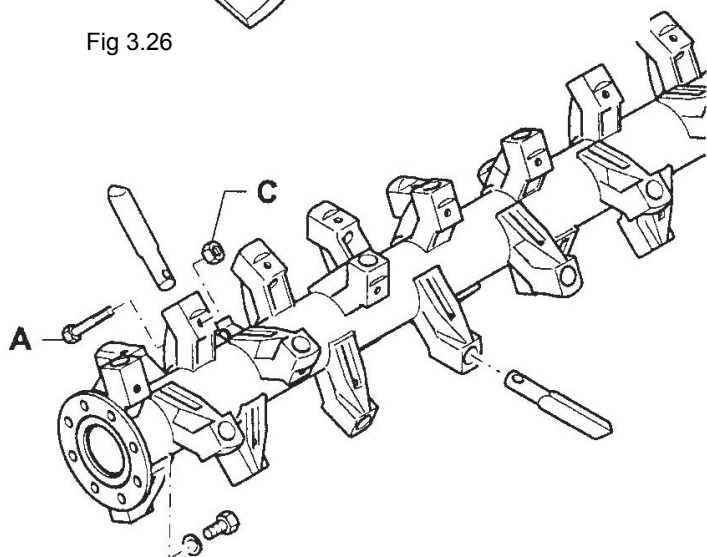


Fig 3.27

Tool Replacement

As indicated in Figs 3.25 to 3.27 the machine may be equipped with either curved blades or spikes.

Tools supplied with the machine are suitable for use in average soil conditions. In the event of bending or breakage during operations they must be replaced immediately making sure that the new blade or tine is mounted in the same position as the old one.

Blades

If one or more blades need to be replaced, we recommend that disassembly and assembly operations are carried out one blade at a time, to avoid placing them in the wrong position.

On Tillers six blades are fitted on each flange, (three facing right and three facing left).

On rotors fitted with quick release couplings, insert the special tool provided into the clip (Fig 3.25), and using fingers open the clip slightly allowing it to be pulled free. Tap bolt through flange and remove blade.

Fit new blade and re-insert pin and clip.

On rotors fitted with standard bolts (Fig 3.26) bolts **A** must have the bolt head on the blade side and the nut **B** with washer **C** on the flange side.

Tines

Replace them one by one, to avoid positioning errors, (Fig 3.27). Four tines are fitted on each flange (two right hand tines and two left hand tines), except for the head flange that has two tines (one left hand and one right hand). On the head flange the closest bolt to the rotor axis fixes directly onto the rotor support and not onto the nut as other bolts. (special bolt).

Spare Parts

When ordering spare parts from your ScanStone dealer quote the following information to assist with the correct identification of components:-

- Machine Model
- Serial number
- Item description
- Number of items

Avoid using non-original spare parts since this may cause damage to the machine or rapid wear or may compromise the safety of the operator.

Periods of Inactivity

If the machine is not used for long periods proceed as follows:-

- Store the machine on even level ground, i.e. concrete or tarmac, with parking stand down to prevent overturning.
- Store in a dry and covered environment.
- Clean the machine thoroughly.
- Clean and Lubricate all parts indicated on pages 3.9 and 3.10 of the manual.

Every effort is made to ensure the data contained in this manual is as accurate and as up to date as possible at time of going to print. Figures, descriptions, references and technical data contained in this manual are indicative and may refer to a model similar but not identical to the one being used by the operator.

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ScanStone

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