

***AITCHISON
GRASSFARMER
3014 & 3018
DRILLS***

GRASSFARMER

REESE ENGINEERING LTD
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PALMERSTON NORTH, 4414,
NEW ZEALAND
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www.reeseagri.com



Introduction

Dear Valued Owner,

Congratulations, you have just made an excellent investment.

Your new Aitchison drill has been designed and engineered to give years of dependable service. Every consideration has been taken to incorporate the latest technology, thus ensuring optimum seeding is achieved. Aitchison Drills provide the optimum agronomic environment, ensuring proper seedling germination, leading to superior crops and thus greater revenue earning potential.

It has often been said: ~~when~~ when all else fails-read the operator's manual+and to ensure you get the best from your new Aitchison drill it is very important that you thoroughly read through the entire contents of the manual. Please also pay attention to the maintenance recommendations, understand the calibration system and consider the design features and their specific functionality.

Your local dealer carries an extensive range of genuine Aitchison spare parts and consumables that also have been engineered to provide long service and life. It is important that only genuine parts are used on your drill.

Thank you for making your investment in our expertise.

Yours Sincerely,

Ross Simpson

**Director
Reese Agri**



WARNING

THE OPERATION AND ADJUSTMENT OF THE REESE MACHINE REQUIRES A COMPLETE KNOWLEDGE OF THE CONTENTS OF THIS HANDBOOK. TO VOID PERSONAL INJURY PLEASE ENSURE THAT ALL PERSONNEL ARE THOROUGHLY CONVERSANT WITH ALL DETAILS BEFORE COMMENCEMENT OF OPERATION OR MAINTENANCE.

COMPLETE AND RETURN WARRANTY REGISTRATION TO ENSURE VALIDATION.

IN THE USA RETURN TO: REESE EQUIPMENT INC, PO BOX 20188, LOUISVILLE, KY 40220-0188.
IN AUSTRALIA AND NZ RETURN TO: REESE ENGINEERING LTD, PO BOX 5056, PALMERSTON NORTH,
NEW ZEALAND

WARRANTY

REESE warrants that the Machine delivered shall conform to the specifications set out in this Handbook.

REESE makes no warranty of saleability or fitness for a particular use, nor is there any other express or implied warranty.

Subject to such other conditions, warranties, and/or undertakings which may apply from time to time under any applicable law, REESE warrants with respect to each new AITCHISON Machine sold by its accredited agents, that for a period of twelve months from the dates of original retail sale, REESE will repair or replace free of charge any part found to be defective in factory materials or workmanship under normal use and operation within the United States of America, Canada, Australia and New Zealand provided that;

1. The Machine

- (a) has been properly assembled and adjusted
- (b) has been properly used and operated within the capacity and operating limitations specified by the manufacturer thereof, and
- (c) has been properly maintained and cared for.

2. This Warranty applies to direct purchase from an authorized AITCHISON dealer. If any defect or fault shall arise such purchaser must return the defective work or Machine to an authorized AITCHISON Dealer within ten working days of such defect or fault arising.

3. In the event of the purchaser attempting to repair or replace the work or product without prior written consent of an authorized AITCHISON Distributor this guarantee shall become void. REESE may replace or repair any damaged product or work at its discretion.

4. In respect of such Machine this warranty does not apply to

- (d) misuses or carelessness in handling,
- (e) Non-compliance to REESE's operating and maintenance instruction,
- (f) Unauthorized repairs or alterations,
- (g) Consequential damage resulting from misuse or initial faults,
- (h) Parts subjected to wear or damage as a result of normal operation i.e.
 - i. Sponge pads and discs
 - ii. Tines and boots
 - iii. Discs
 - iv. Tyres
 - v. Hydraulic components

5. Any disputes in relation to this contract or product shall be governed by New Zealand law and shall be determined in New Zealand court.

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TECHNICAL SPECIFICATIONS: Grassfarmer 3014 Series

Specifications	3014	3014C	3014D
Overall Width	2720mm (8ø11ö)	2720mm (8ø11ö)	2720mm (8ø11ö)
Overall Height	1550mm (5ø0ö)	1550mm (5ø0ö)	1550mm (5ø0ö)
Overall Length	1925mm (6ø4ö)	2250mm (7ø5ö)	1925mm (6ø4ö)
Weight Empty	540kg	735kg	800kg
Seed Hopper Capacity	280lt (7.5 bu) US	280lt (7.5 bu) US	280lt (7.5 bu) US
Sowing Width	2.1m (6ø11ö)	2.1m (6ø11ö)	2.1m (6ø11ö)
No. Tines	14	14	14 Disc
Row Spacing	150mm (6ö)	150mm (6ö)	150mm (6ö)
Shipping Size			
Overall Width	2310mm Crated	2310mm Crated	2300mm on Skid
Overall Height	1150mm Crated	1230mm Crated	1565mm on Skid
Opener Length	965mm Crated	1150mm Crated	1000mm on Skid

TECHNICAL SPECIFICATIONS: Grassfarmer 3018 Series

Specifications	3018	3018C	3018D
Overall Width	3320mm (10ø11ö)	3320mm (10ø11ö)	3320mm (10ø11ö)
Overall Height	1550mm (5ø0ö)	1550mm (5ø0ö)	1550mm (5ø0ö)
Overall Length	1925mm (6ø4ö)	2250mm (7ø5ö)	1925mm (6ø4ö)
Weight Empty	625kg	875kg	950kg
Seed Hopper Capacity	365lt (10 bu) US	365lt (10 bu) US	365lt (10 bu) US
Sowing Width	2.7m (8ø10ö)	2.7m (8ø10ö)	2.7m (8ø10ö)
No. Tines	18	18	18 Disc
Row Spacings	150mm (6ö)	150mm (6ö)	150mm (6ö)
Shipping Size			
Overall Width	2910mm Crated	2910mm Crated	2900mm on Skid
Overall Height	1150mm Crated	1230mm Crated	1565mm on Skid
Overall Length	965mm Crated	1150mm Crated	1000mm on Skid

TO THE OWNER AND OPERATOR

Your Aitchison Drill was carefully designed and manufactured to give you years of dependable service. To keep it running efficiently, read and follow the instructions in this operator's manual. Any questions you may have that are not covered in this manual should be referred to your dealer:

Dealers Name: _____

Address: _____

Phone No: Business: _____ Private: _____

Date of Purchase: _____

Model: _____ Serial Number: _____

The warranty card on your Grassfarmer Drill is included with this manual. Please ensure that the registration card is correctly filled in.

The owner must ensure the dealer, upon delivery of the machine, has completed the **WARRANTY REGISTRATION CARD**. This must be signed by the owner and returned to the factory promptly. **Failure to carry out this function could nullify warranty claim opportunities against the factory in the future.** Warranty claims will only be accepted for registered products.

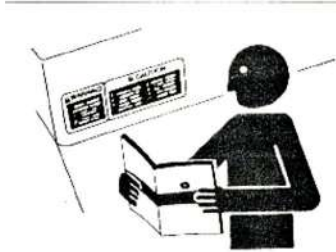
When ordering spare parts, quote the model and serial number of the drill and use the Aitchison part number given in the parts section. Reference to the right hand and left hand is taken from behind in the direction of travel.

SAFETY FIRST

Keep all covers in place when using the drill.
Stop the drill before making adjustments.
Lower the drill to the ground or put on props when working around the machine.
Tighten all nuts and bolts after initial use.

FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual and on your machine safety signs. Replace missing or damaged safety signs, these can be ordered from your local Aitchison dealer.



Learn how to operate the machine and how to use controls properly. Do not let anyone operate it without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your Aitchison dealer.

OPERATE YOUR MACHINE SAFELY

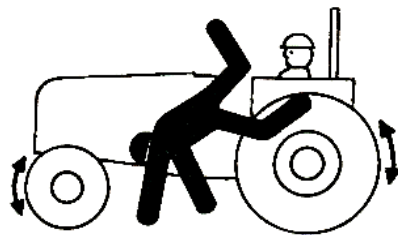
Be careful when operating machine to avoid injury.

Serious injury or death can result from contact with electric lines. Use care when moving or operating the machine near electric lines to avoid contact.



Be careful when operating on hillsides, tractor can tip sideways if it strikes a hole, ditch or other irregularity.

Permit only one person, the operator, on tractor platform while tractor and planter are in operation. Keep riders off. They are subject to injury such as being struck by foreign object and being thrown off the machine. They also obstruct the operators view.

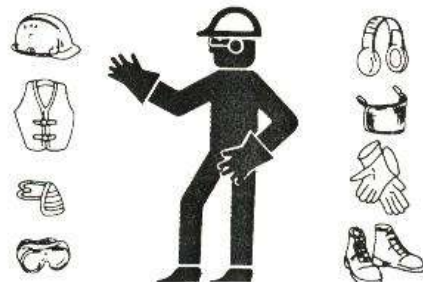


WEAR PROTECTIVE GEAR

Wear close fitting clothes and safety equipment appropriate to the job.

Wear suitable hearing protective device as prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear safety gloves when working with discs as they can have sharp edges.

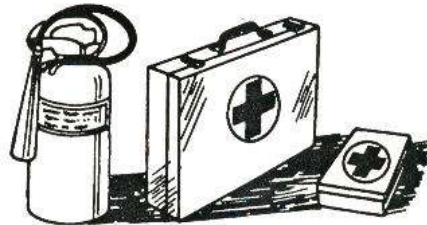


Operating equipment safely requires the full attention of the operator. Do not wear radio headphones while operating machine.

BE SAFE WITH CHEMICALS

Direct exposure to agricultural and hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with Aitchison equipment include such items as lubricants, coolants, fertilizer, paint and adhesives. If in doubt, contact your local Aitchison dealer for information about chemical safety and first aid procedures.

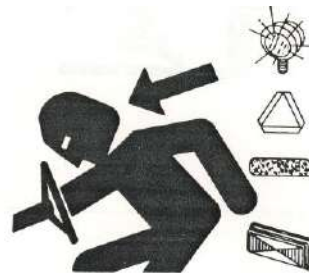
Keep a fire extinguisher and first aid kit handy



When disposing of chemicals, make sure hoppers are properly washed to get rid of any chemical residue and that any chemicals are disposed of in an approved manner. Follow instructions of chemical manufacturers for disposal methods.

USE SAFETY LIGHT AND DEVICES

Slow moving tractors and equipment can create a hazard when driven on public roads. They are difficult to see, especially at night. This could lead to personal injury or death if a collision with a vehicle occurs.



Whenever driving on public roads, use flashing warning lights. Provide extra lighting at night on machine and tractor. An implement safety lighting kit is available from Aitchison Industries.

TRANSPORT SAFELY

Do not exceed transport speed for machine; see your local Aitchison dealer. Never transport at any speed which does not permit adequate control of steering and stopping.

Reduce speed over rough ground

For safe transport, tractor must weigh more than machine

REDUCE SPEED WHEN TOWING LOADS

Braking to stop towed loads from transport speeds can cause the towed load to swerve and upset. Reduce speed if towed load weighs more than the tractor and is not equipped with brakes.



Use additional caution when towing loads under adverse surface conditions, when turning and on road marking lines.

PRACTICE SAFE MAINTENANCE

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service or adjust machine while it is moving. Keep hands, feet and clothing from power driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

Remove paint before welding or heating. Avoid potentially toxic fumes and dust when sanding, repainting or welding. Do all work outside in a well-ventilated area. Dispose of paint and solvent properly.



Avoid heating near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame, which could result in severe burns to yourself and bystanders.

Avoid high-pressure fluids. Escaping fluid under pressure can cause injury. Relieve pressure before disconnecting hydraulic or other lines.

DISPOSE OF WASTE PROPERLY

Improper disposing of waste can threaten the environment and ecology. Use leak-proof equipment when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.



Do not pour waste onto the ground, down a drain, or into any water source. Use the manufacturer’s directions on the correct way to recycle or dispose of waste.

GENERAL OPERATION IN THE FIELD

When the drill is in work in the field, adjust the top link to make the frame level and the sway chains to give 75-100mm (3-4") lateral movement. The tractor hydraulics should be set to allow the drill to float over the terrain unimpeded by the movement of the tractor. Adjust the depth wheels evenly on both sides to give the required opener penetration. In extremely hard conditions it is permissible to weigh the front of the drill to aid penetration.

The drill should always be moving forward when lowered or raised from work. Avoid stopping and never reverse with drill in work. These precautions will avoid blocking outlets; however make periodic checks for blockages while drilling.

The speed of travel is governed by the conditions e.g. if the ground is rough the drill may tend to bounce which would necessitate a lower speed. In optimum conditions 8 km/h (5 mph) may be maintained.

Always lift the drill out of the ground before turning sharp corners as this will protect the tines and openers and stop the turf from ripping.

Under no circumstances should the tractor wheels be allowed to slip excessively as this will break the turf and the following tines will tear up the ground. If slippage is a problem, use a tractor with more traction or wait for the ground to be in better condition. Towing chains or bar harrows behind the drill is very beneficial as this will crumble the groove and help to cover the seed.

PASTURELAND FARMING WITH YOUR GRASSFARMER

Continuous reaping of grasses either by machine or animal will eventually lead to their degeneration. Desired species of grasses and legumes will weaken and their ability to survive adverse climatic conditions will be diminished. Undesirable species of grasses and weeds will eventually tend to dominate, or pasture may simply thin out with minimal plant populations. Of course conditions that cause pasture degenerations vary from location to location, and from country to country, but one can assume that every pasture can be improved no matter where its location.

MANAGEMENT CONSIDERATIONS

In describing the technique for sowing seeds into uncultivated soils, we should clarify the terminology. It is most common to refer to CONSERVATION TILLAGE (or CT) but it may be called SOD-SEEDING in Australia, or DIRECT DRILLING in UK or even NO-TILL SEEDING in North America. Wherever it is practical, successful conservation tillage requires well considered, and thorough preparation, integrated with a whole farm management program.

The cropping rotation, optimum sowing dates and grazing fertilization program will depend on the seasonal vegetation or weed spectrum, paddock history, soil type, fertility and drainage, and many other factors.

Here is a checklist that should be followed for any CT program (courtesy of Monsanto NZ Ltd):

1. Check that the soil pH is around 6.0.
2. Check soil fertility levels for fertiliser requirement.
3. Ensure your spray boom has a marking system and is fully operational.
4. Establish optimum time for planting.
5. Check and control weeds present, before and during crop establishment.
6. Check and control insect and slug infestation before and during plant establishment.
7. Ensure soil conditions are suitable for drilling.
8. Inspect the crop regularly after planting.

Experience has shown that farmers new to CT often have crop failures on the first occasion, but as their skills and understanding of the technique improve, so do their crop results.

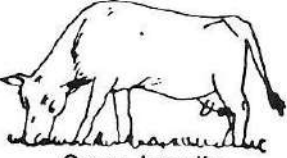
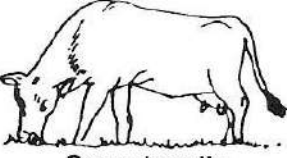
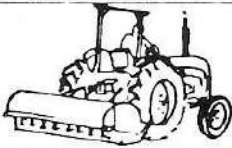



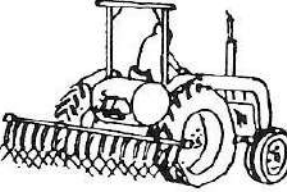
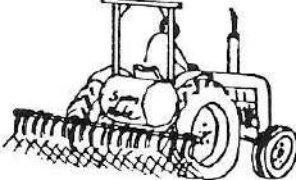
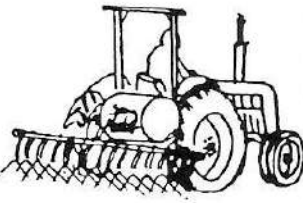
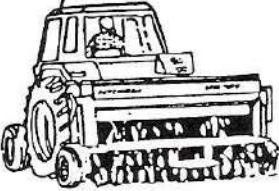


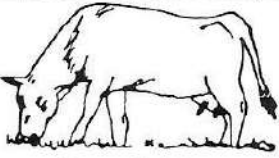
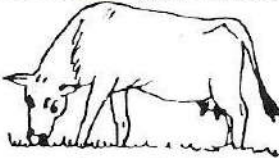
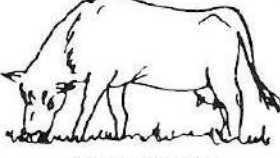
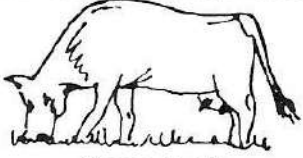
TECHNIQUES AND TIMING FOR PASTURE RENOVATION

There are two basic techniques for pasture renovation, i.e. rejuvenation and renewal. Rejuvenation is the most efficient technique and involves sowing the seeds of new and virile pasture grasses and legumes direct into existing pasture without causing loss of production due to cultivation. This technique is especially beneficial in the situation where a pasture is ~~running out~~ and to gain production for winter or the following season an Annual or Bi-Annual grass is planted. This technique is known as ~~stitching in~~ Renewal involves a total herbage control system, i.e. spray off old pasture with a wide spectrum herbicide before drilling.

Local knowledge is invaluable when determining which techniques to use and when to use them. The best time for pasture renovation will vary by region, and is largely governed by the temperature and weather that follow. In temperate climates with mild winters the autumn is best and tropical climates the spring is the best time when the tropical grasses have not recovered from their winter dormancy. In arid climates the time is directly before or after summer rains.

The basic requirement for seed germination is a warm moist seed bed. The aim should be to sow the seed at a time when there is sufficient moisture for quick germination, and little likelihood for later drought. The Aitchison opener/coulter however will promote germination in much drier soils than any other known coulter when used correctly.

SIMPLE RULES TO FOLLOW FOR SUCCESSFUL PASTURE RENOVATION

	TEMPERATE PASTURELAND		TROPICAL PASTURELAND	ARID PASTURELAND
	REJUVENATION	RENEWAL		
TIME ↓	Autumn or spring	Autumn	Spring	Before or after monsoonal rain
1.	 Graze heavily	 Graze heavily	 * Mow with flail type mower	
2.		 Allow 1 week to recover	 Allow 3 days to recover	
3.	 Seed with Seedmatic	 Spray with total spectrum herbicide. Include insecticide	 Spray for insects. Can use light herbicide rate to control competition	
4.	 Spray for insects and watch for withholding period requirements	 Seed with Seedmatic	 Seed with Seedmatic	 Seed with Seedmatic
5.	 Graze lightly	 Graze lightly	 Graze lightly	 Graze lightly

* An application of a total spectrum herbicide may replace mowing if the ground cover is short. Sowing must be done within 10 days.

MICRO INSECTICIDE GRANULES IN PASTURES

In New Zealand where grass grub is a problem, excellent control has been attained with the use of Gesapon, Dasanit, Dysiston, Mocap, and Lindane in control of this pasture destroyer. Normal rates applied on the pasture surface can be as high as 30 kg/ha (26 lb/acre) but when sown in the soil and hence away from neutralizing effect sunlight, rates as low as four and five kg/ha can be used. If unexposed to sunlight these chemicals can remain effective in the soil as long as three months, thus killing generations of pupae as they emerge. Also, withholding of livestock after treatment is not necessary. Both these factors are important features with the Grassfarmer.

Watch for slugs. Slugs like the moist groove produced by the wing blade opener. If slugs become a problem (eating seeds or seedlings underground), a suitable pellet should be used.

DIRECT SEEDING OF FEED CROPS AND ARABLE CROPS WITH YOUR GRASSFARMER

We are not in a position to give total formal recommended seeding rates, chemical usage and fertiliser recommendations because of circumstance that the Grassfarmer will be used in will be so varied and diverse that some misunderstanding can occur.

Refer to the checklist and ALWAYS confirm with known successful CT operators as well as your local seed specialist and chemical company representatives. Remember that with this technique the environment is not as predictable as with cultivated soils, and take the precaution of using insecticide or increased fertiliser if there should be any element of doubt.

Seeding programs are wide and varied and it is best to look at rotation that starts with a legume or feed crop followed by a grain crop, followed by another feed crop and so on. Heavy pasture into grain is always disappointing, but grain after legume or brassica is outstanding.

Here are just a few possibilities:

Brassicas, Turnips, Swedes, Legumes . Can be sown early spring (for winter feed) or again in autumn for later winter early spring feed. The technique is to blanket spray the entire area and ensure that seeding depths are shallow. A light bar harrow pulled over the seeding areas is beneficial. Use fertiliser and see your chemical company specialist with regard to the correct insecticide to use.

Winter Feed Oats . This can be seeded direct into pasture in early autumn. Herbage control can be carried out also if necessary.

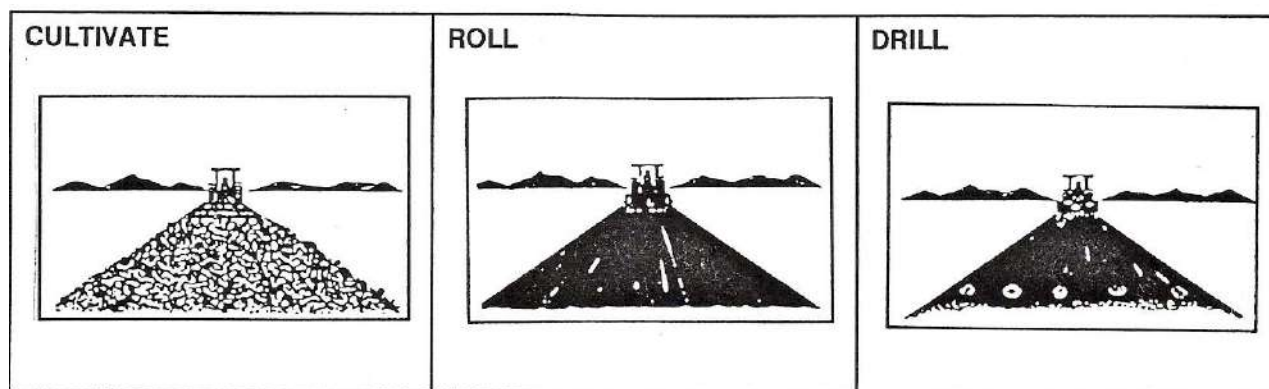
Wheat and Barley . Direct seeding in early spring or autumn depending on variety. Always spray out pasture with approved herbicide (may not be necessary after brassica). Always sow with fertiliser.

Lucerne, Alfalfa . Sow in early spring after spraying out entire area with Roundup or similar herbicide. It is always a good idea to do a soil test to ensure that the solid pH is satisfactory for plant establishment. Also it is necessary to ensure that the seeds are treated with inoculants to guarantee their germination and nodulation. Apply fertiliser and ensure that spraying and baiting for insects is carried out . particularly for control of slugs and spring snails.

Green-feed Maize . Carry out in early spring and the same rules apply as with wheat, barley and oats. You may wish to seed in 30 or 45 cm (12+or 18+) rows and the technique for achieving that is shown under the section **SPECIAL PURPOSE SEEDING** shown later in this booklet.

SOWING IN CULTIVATED SOILS

As this is a tined implement with a direct drill type opener, it is important to treat all seed beds as you would a pasture. With a conventional drill one works up the soil into a fine seedbed so that a broad boot type coulter will pass through leaving the seed behind the soil tilth. With the Grassfarmer, cultivate the soil to destroy existing vegetation but before seeding, roll the seedbed thoroughly and then drill the seeds required into this rolled seedbed. Good germination results will occur.



We recommend that a chain harrow be towed behind the seed drill or roll the field after seeding has been completed.

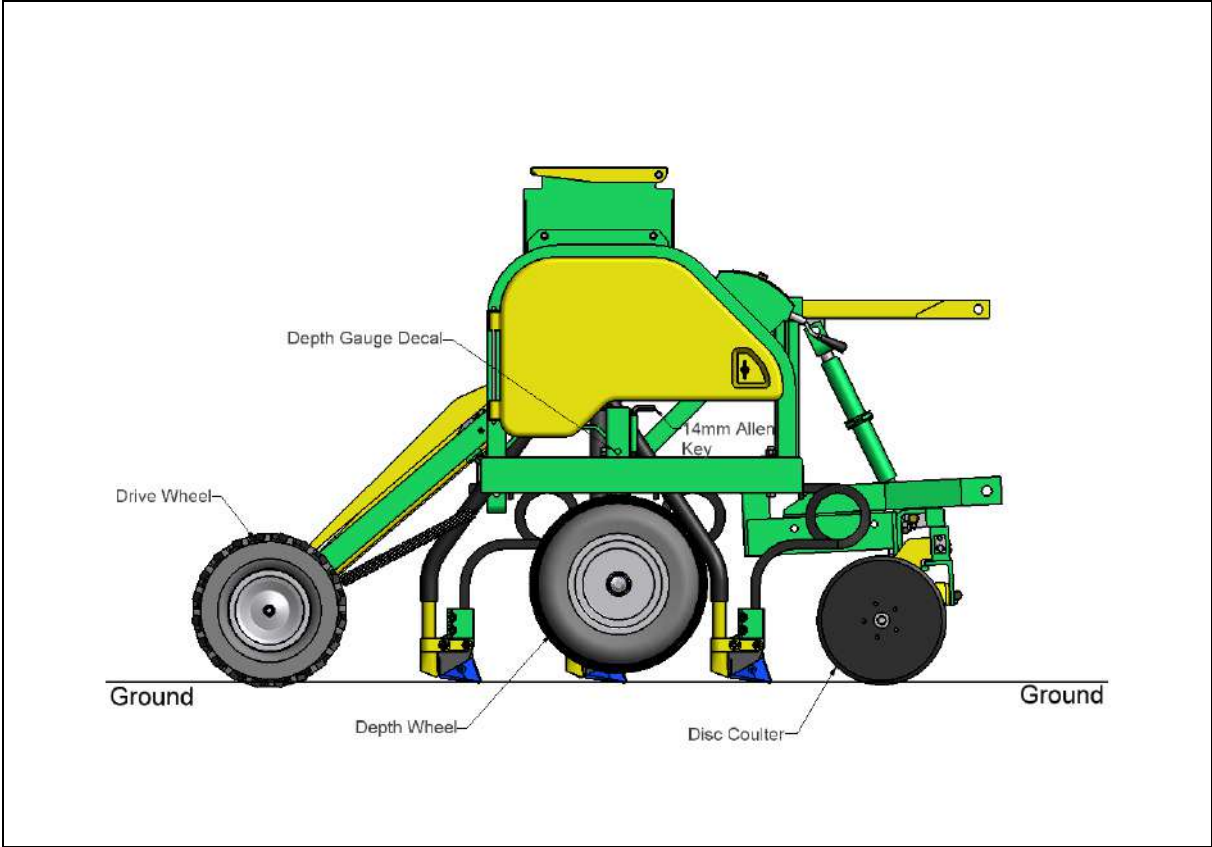
SETTING UP THE GRASSFARMER FOR USE

Connecting drill to tractor

Connect the Grassfarmer drill to the rear 3-point linkage of you tractor. Adjust the tractors top link arm so the drill frame is sitting parallel with the ground. Adjust the tractors sway chains to give 75-100mm lateral movement. The tractors hydraulics should be set to allow the drill to float over the terrain unimpeded by the movement of the tractor.

Set the depth wheels.

With the seed drill sitting on hard flat ground, the depth wheels should be 10-50mm clear of the ground pending on your desired seeding depth. There is a depth gauge decal at the top of each depth leg, check that both depth legs are set at the same height. Use the attached 14mm Allen Key to tighten/lock the depth legs at their desired height.



When the drill is in work, the best way to check your seeding depth is to have a scratch around in the seed slots behind the drill and check where the seeds are placed in the soil. Make the appropriate adjustments as needed.

We recommend that a chain harrow be towed behind the Grassfarmer to help cover the seed slots. This will help prevent bird strike and aid in seed germination.

DISC COULTER KITSET

The Disc Coulters are designed to help cut trash/residue or stubble that may be present in the field. This trash/residue or stubble is cut into short lengths by the Disc Coulters, allowing the trash/residue or stubble to flow better past the Seed Openers with fewer blockages. The Disc Coulters will also help prevent surface tearing in existing pastures when under sowing.

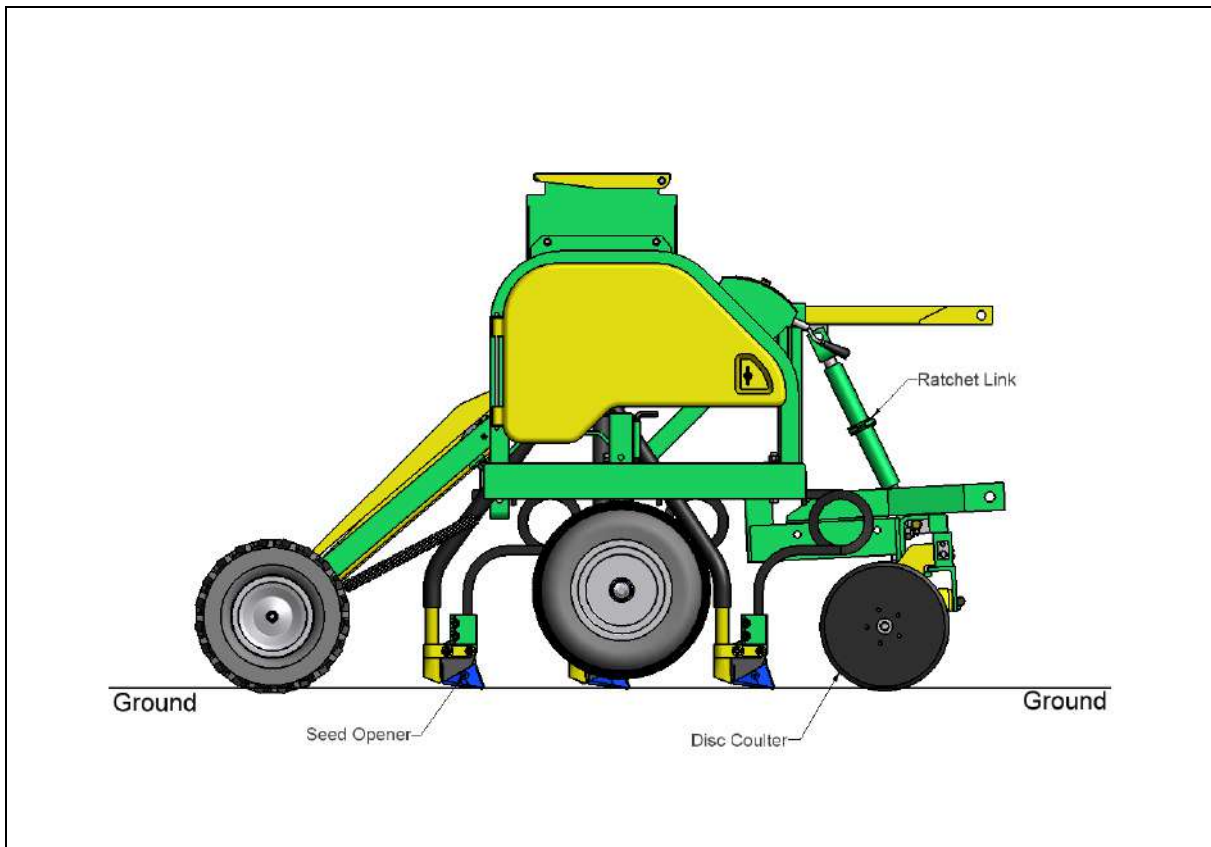
Setting up the Disc Coulters Kit

If your Grassfarmer drill has a Disc Coulters Kit, it is important that this is adjusted correctly to get the best performance from your drill.

The Disc Coulters are usually set to the same depth as the Seed Openers or slightly shallower pending on ground conditions. To adjust the depth of the Disc Coulters turn the Ratchet Link attached.

In very hard ground conditions the Disc Coulters may hold-up the drill preventing the Seed Openers being at the correct depth, if this occurs reduce the depth of the Disc Coulters.

In very soft/damp ground the Disc Coulters may roll up a strip of turf, if this occurs reduce the depth of the Disc Coulters.

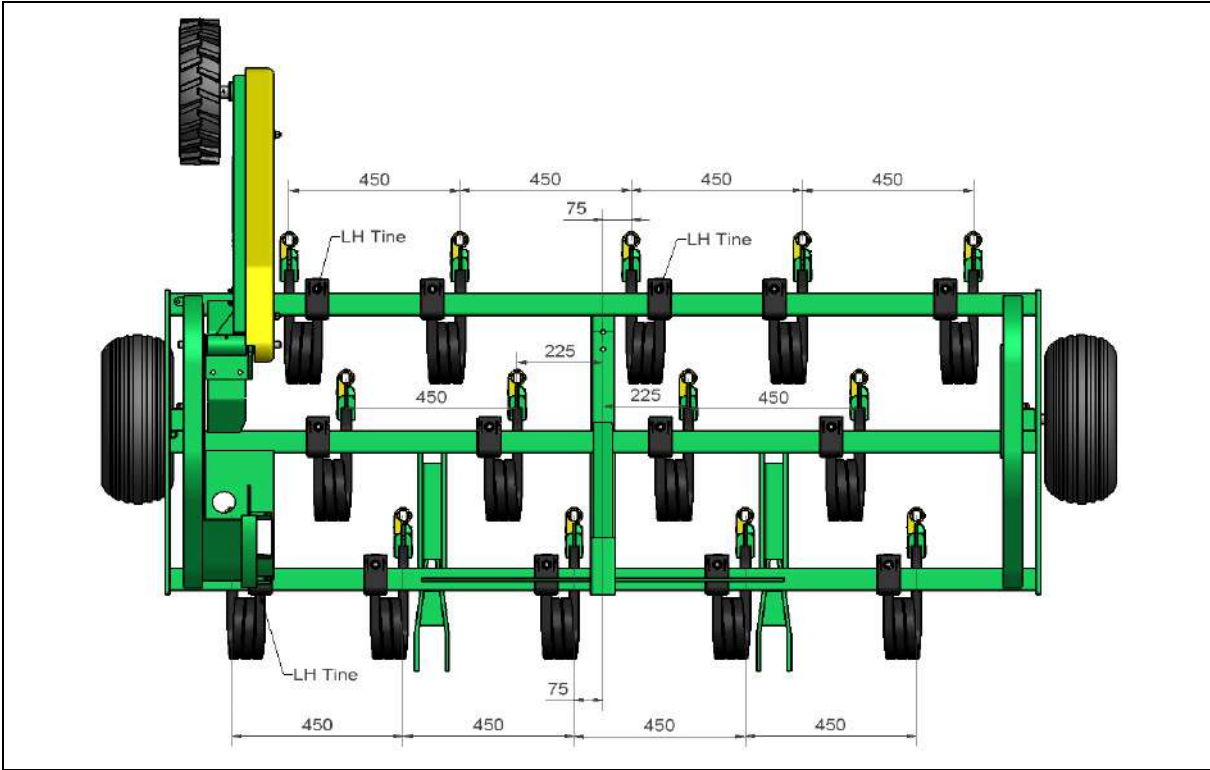


TINE ALIGNMENT

To get the best from your Disc Coulters kit check that the Seed Openers are tracking in the slots created by the Disc Openers. Failure to do so will result in severe tearing of your pasture. To make these adjustments loosen the top Tine Clamp and slide the Tine along the main frame tool bar until alignment is achieved.

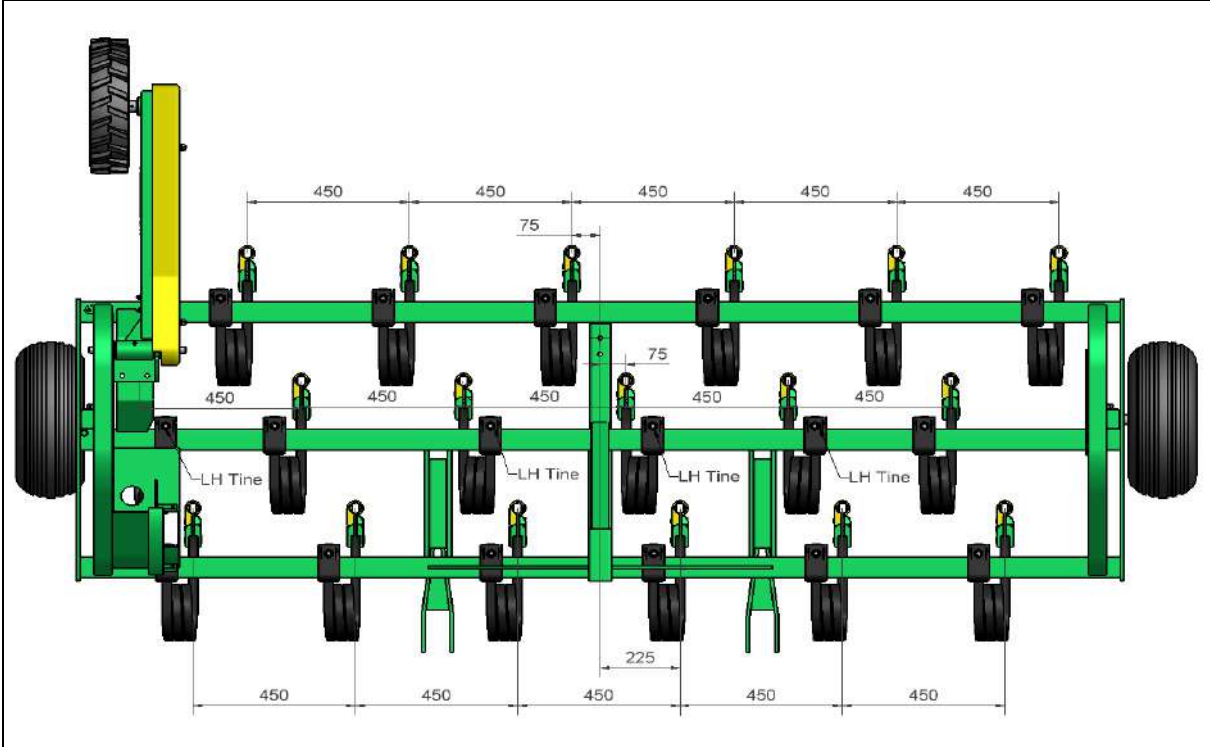
TINE PLACEMENT

Grassfarmer 3014 Tine Placement



The 3014 and 3014C Grassfarmer has 11 Right Hand and 3 Left Hand Tines as shown above.

Grassfarmer 3018 Tine Placement



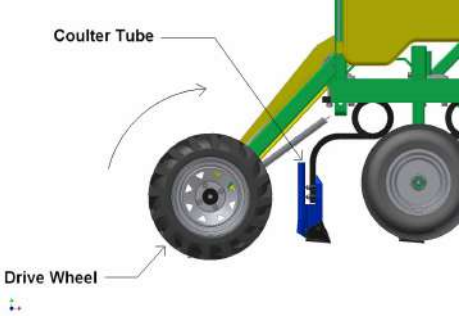
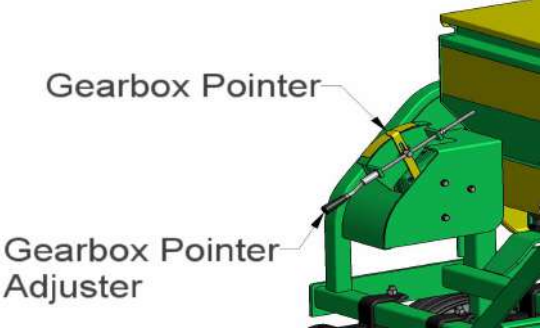
The 3018 and 3018C Grassfarmer has 14 Right Hand and 4 Left Hand Tines as shown above.

CALIBRATING THE DRILL TO CHECK THE SOWING RATE

NOTE: When new the Seed Pads may have a white powder (chalk dust) on them. This is to prevent them from sticking together during manufacturing. This chalk dust will impede your seeding rate until it has been removed or until it dissipates. This can be done by hand, or over time by using the seed drill.

By Hand: This can be achieved by sliding the Seed Pad away from the Metering Unit and dusted off with compressed air.

Dissipates: Simply using the Seed Drill. (The seeding rate will slowly increase as the chalk dust dissipates. (Usually within the first hour of use.) **RE-CALIBRATE.**

<p>(1) Prime:</p> <p>Place seed in the hopper over any 4 adjoining outlets. Rotate Drive Wheel until a steady flow of seed can be witnessed falling from the seed outlets.</p> <p>Set the Gearbox pointer in the appropriate position for you desired seed sowing rate. (See Seed Chart under hopper lid.)</p>	<p>(2) Seed Catchment:</p> <p>Place bags or containers under the 4 appropriate Seeder Openers to catch the metered seed.</p> <p>Another method is to pull the black seed dropper hose off the 4 appropriate Coulter Tubes and place them in a bag or container.</p>
<p>(3) Seed Metering:</p>  <p>Rotate the Drive Wheel 30 Times.</p>	<p>(4) Weigh Seed:</p> <p>Catch and weigh the total amount metered through the 4 metering units. (in grams).</p> <p>NOTE: Remember TARE+scales before weighing; for the weight of the bag or container.</p>
<p>(5) Conversion:</p> <p>Divide the weight measured by 3 to establish kilograms per hectare.</p> <p>ie: 45 grams / 3 = 15kg/ha</p>	<p>(6) Check:</p>  <p>If above or below the desired rate, make the necessary adjustment via the Gearbox Pointer Adjuster. RECALIBRATE</p>

LAYMANS GUIDE TO SEEDING VARIANCE

The Aitchison Sponge Seed Delivery System is a highly accurate, consistent and gentle method for delivery of seeds. We are pleased you chose to make use of our technology. To get started, we have created the attached seed charts. They are guides that will in many cases allow you to start with reasonable accuracy.

Along with these charts you will also need to know how to compensate for variations in seeds. We are fortunate to have many companies that are constantly providing new seed; however, this also makes any seed chart a GUIDE ONLY. Use the rules listed below when suitable, and when you need more accuracy consider the following.

The seed count may be different; the coatings on the seed may be different; the humidity can be different; the seed size due to cultivars may be different; the moisture content of the seeds may be different; the seed may be husked or still have its beard; and other differences which would affect the seeding rate.

Example

A temperate chart was calibrated for Ryegrass. Line 1 on Range 1 was calibrated at an ambient temperature of 64°F (18°C). Moisture content of the seed was 14%. The 1000 seed count was 0.07 ounce (2 grams) and the seeds were approx ¼" long (6.6mm) by 1/16" wide (1.5mm). There were no coatings or dressings and was cleaned of gin trash.

Note also that all seeds used on original chart were uncoated.

As it is unlikely your sample will directly match the above we suggest calibration at all times. Below are some general guidelines on what influences will affect you seeding.

SEED SIZE: Small seeds flow faster

SEED COATING: Fungicides that are dull and sticky will slow seeding rates.

TEMPERATURE: Cold will slow seeding rates, heat will increase.

HUMIDITY: High humidity slows sowing rates, dry increase sowing rates.

SEED MIXTURE: Sowing small round seeds with flat long seeds, i.e. ryegrass and clover, the rate will be increased significantly.

WHEEL DIAMETER: On cultivated soil slippage will reduce sowing rate.

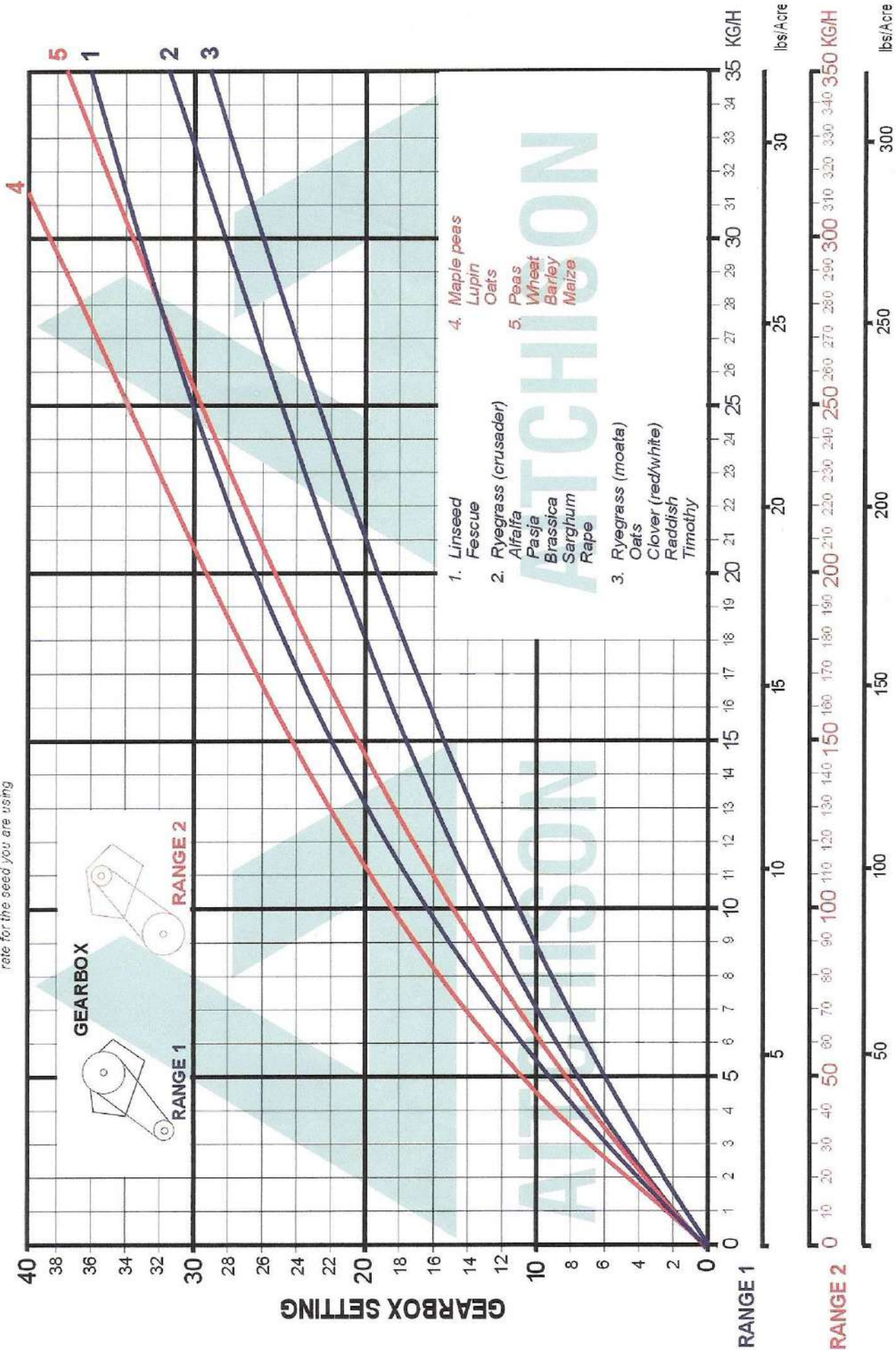
RECORD PREVIOUS RESULTS: Keep a note book and record for future reference, mixtures, conditions and setting chosen.

Think in four quarters not the whole paddock. When the hopper runs out (1/4 paddock) check your rate back from the area covered.

ALWAYS CALIBRATE BEFORE SEEDING!!!

TEMPERATE SEEDS

NOTE: This chart is a **GUIDE ONLY** and different seed lines within a species can have markedly different results. Therefore calibration is recommended as the only truly accurate way of obtaining the desired sowing rate for the seed you are using



SOWING RATE

lbs/Acre

RANGE 2

RANGE 1

There are a number of seeds that are difficult to sow due to their physical shape and weight.

These include:

- Prairie Grass
- Buffel Grass
- Callida Rhodes Grass
- Unclipped oats

If seeds adhere to the sponge pad, fit the oat wiper (Part # A2366). If there are problems with large seeds failing to pick up with the sponge it will be necessary to fit the bean spacers (Part # A2365-01) which space out the pads leaving a greater surface to pick up seed.

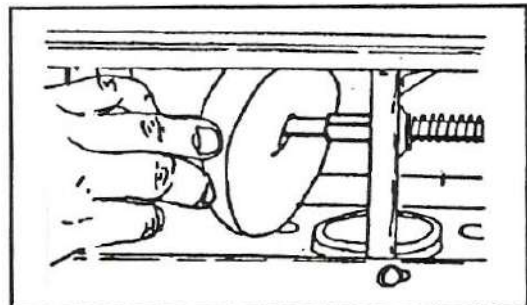
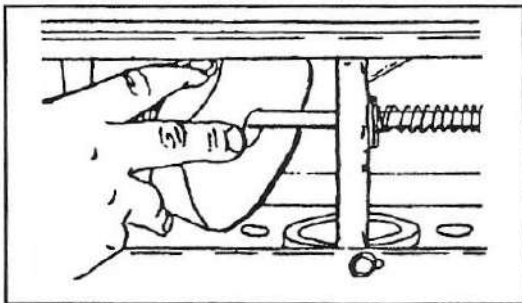
OAT WIPER AND BEAN SPACER

Bean Spacer (Optional)

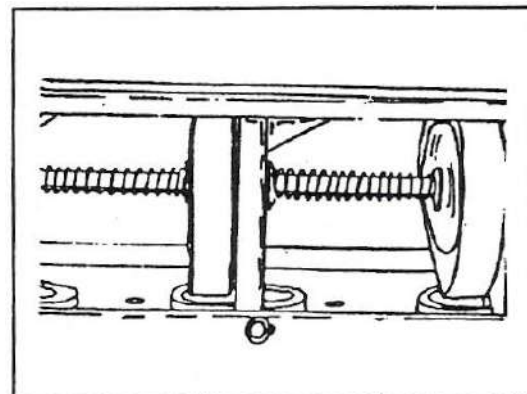
When sowing large smooth seeds such as beans markedly improved seeding performance is achieved by fitting spacers between the sponge and the seeder casting. This in effect moves the sponge away from the seeder casting and allows for better entry of the seeds into the sponge. A better pick up is attained and seeding consistency is improved.

Also to decrease the advent of intermittency and improve seed spacing it is advisable to use the seeder agitator set on maximum spring pressure.

To fit the spacers follow these instructions:



1. Pull the sponge away from the seeder casting.
2. Fit the Bean Spacer between the sponge pad and the seeder unit.
3. Allow the sponge pad to return to the seeding position with approx 3mm (1/32") between the sponge pad and seeder unit.



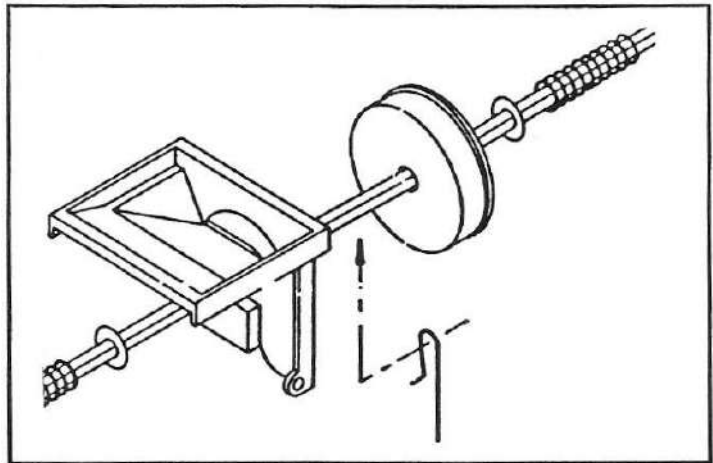
WARNING: When the bean spacers are fitted always go back and recalibrate the drill.

If small seeds need to be sown (i.e. grass seed, brassicas) or small grains (i.e. wheat) always remove the spacers and store in a safe place.

OAT WIPER (Optional)

The oat wiper is an optional extra that is designed to wipe clean the sponge pad if heavily awned seeds are not being sown. These will tend to collect on the pad and as the build-up increases inaccuracies in the seeding rates will occur.

To fit the wiper, remove the front panel from seed box. Pull the sponge pad away from the seeder assembly and place the wiper on the centre shaft BETWEEN the pad and the casting. The wiper works in such a way that it presents a flexible edge on the oats and in effect ~~wipes~~wipes the seeds that may be sticking to the pads on each rotation.



Fit the Oat Wiper between the sponge pad and the seeder unit.

RODENT DANGER

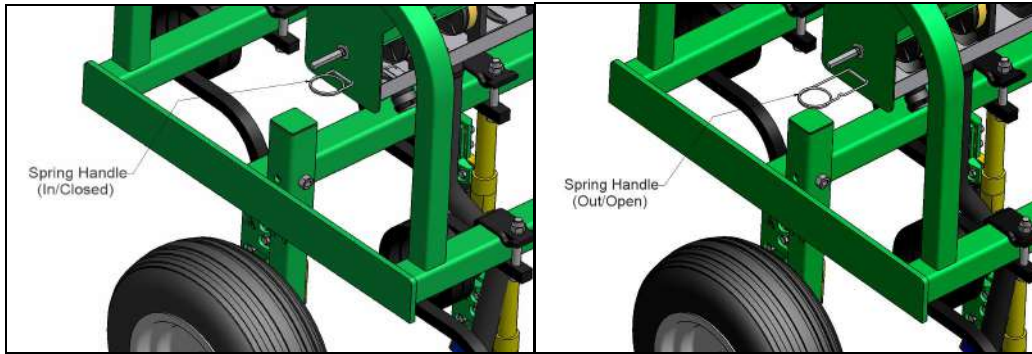
The sponge seed mechanism is unique . it has great capacity to sow seed consistently and accurately. However, if seeds are left in the hopper over the winter months rats and mice will find an entry point into the hopper by chewing through the sponge pad to reach the seeds. The simple solution therefore is to **remove the seeds.**

BLANKOFF TRAY

Your Grassfarmer drill is equipped with a %Blankoff Tray+. This blankoff tray is located under the seed hopper, between the seeder units and the seed dropper hose. The purpose of this blankoff tray is to help prevent rodent damage to the sponge pads.

Located at the no-drive end (LH side of drill) is the spring handle, this handle slides and locks the blankoff tray, **in/closed** and **out/open**.

The blankoff tray should be open when planting seeds, then slid closed when the drill is not in use to prevent rodents from climbing up the seed dropper hoses.



Blankoff Tray CLOSED; Spring Handle IN.

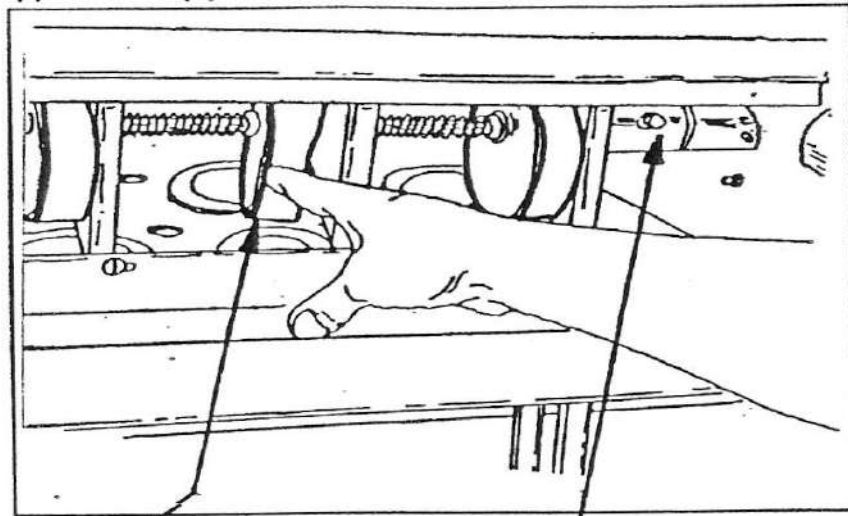
Blankoff Tray OPEN; Spring Handle OUT.

To give added protection, sponge pads can be treated with any strongly odoured insecticide powder . DIASINIT, LINDANE, MALATHION, and THIMET.

Note: Rodent repellent can also be ordered from Aitchison's via your local dealer (Part # 9341).

REMOVAL OF SEED FROM HOPPER

There is probably no easier drill to clean than this Aitchison Drill. Remove the front/rear panel by way of wing nuts and manually move the sponge pads away from the seeder casting. Any remaining seeds within the hopper will simply fall out. A small brush can be used to sweep any remaining seeds from the hopper.



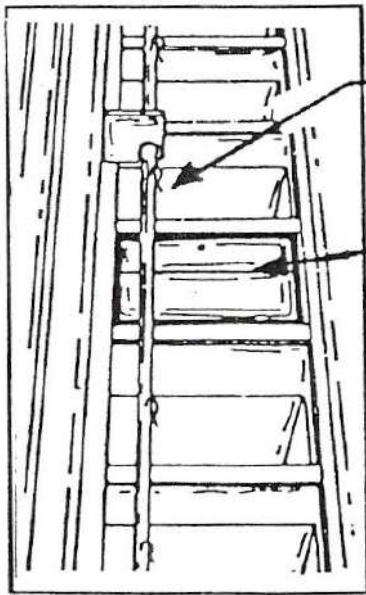
Push pads away to clean out seeds. To remove pads, loosen this setscrew and move shaft to the left.

SPECIAL PURPOSE SEEDING

If the quantity of seed is too small to accurately weigh then collect the seed from 8 outlets and halve the result before applying the general formulae.

Using Blank Off Plates

If the blank off plates are used . this drill is calculated for rates of 150mm (6+) spacing. Blank off plates can be used if wider rows are required. These are fitted by removing the clip agitator pin and fitting a plate (see illustration). These are simple to make using a square of stiff plastic or plywood.



Remove Røclip

Insert blank-off plate here

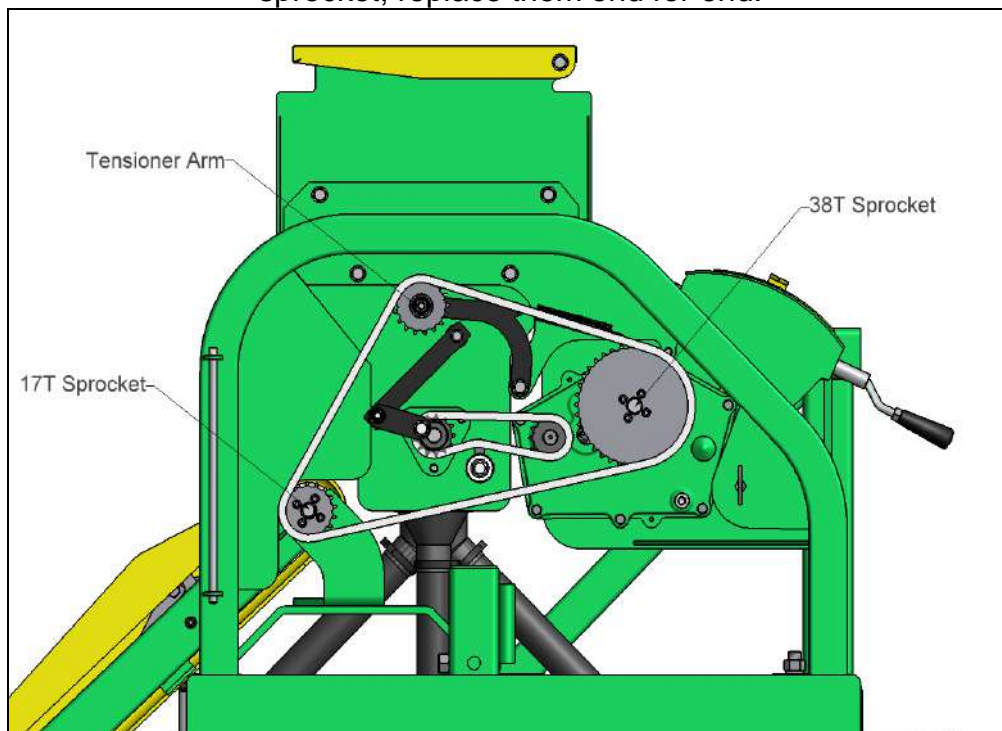
Blank off plates are inserted on each alternative seeder outlet.

For calculating your seeding rates:

- If every **second row** is blanked off (300mm (12+) spacing) catch seed from four outlets and divide by 6 (not 3).
- If every **second and third row** are blanked off (450mm (18+) spacing) catch seed from four outlets and divide by 9 (not 3)

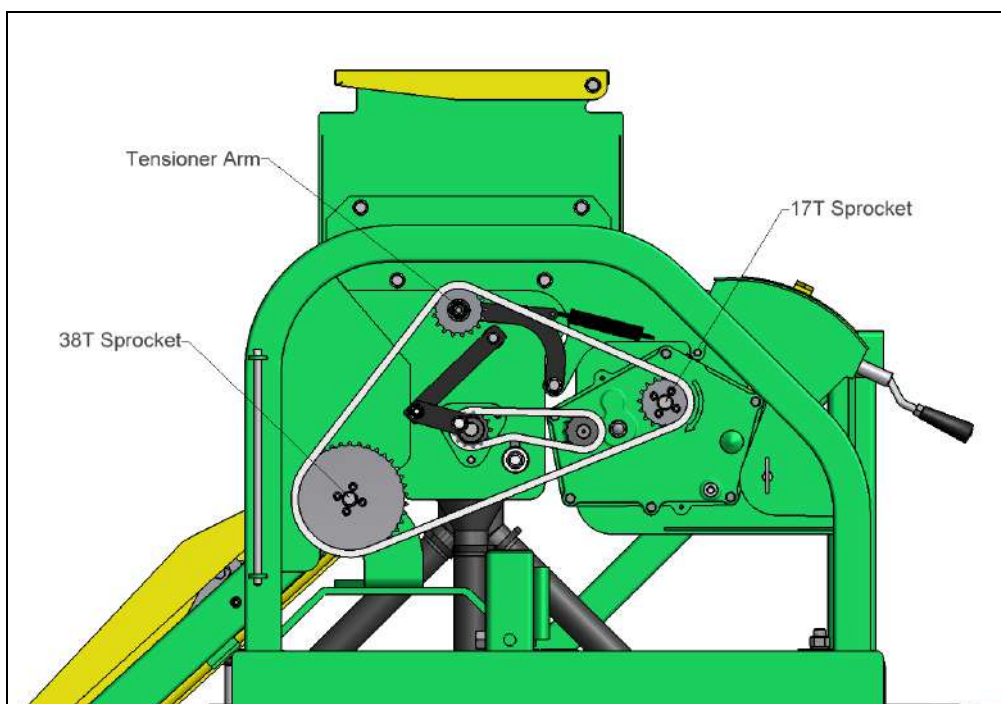
CHANGING THE GEARBOX RATIO: Range 1 – Range 2

To change range: use a 5mm Hex Key to remove the 4 Cap Screws in each sprocket; replace them end for end.



RANGE 1

Range 1 . Ratio for low seeding rates and small seeds.



RANGE 2

Range 2 . Ratio for high seeding rates and big seeds.

GENERAL MAINTENANCE

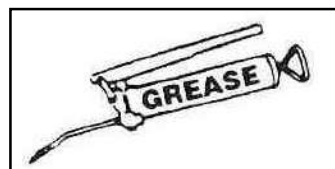
LUBRICATION

The gearbox should be kept filled to the sight glass though top-ups should seldom be necessary. The oils recommended are: BP Vanellus DD50 (GL1 90.), TOTAL Carter (EP 220) or equivalent.

NOTE: Do not us a hypoid type of oil, as damage will occur.

Machines Grease Points:

- 1 per Disc Coulter Pod assembly.
- Drive Leg assembly.
- Seed Shaft drive.



Greasing location points are labelled on the drill with the %Grease+sticker (shown above). Chains should be kept lubricated and should be removed at least once each season and thoroughly cleaned and oiled.

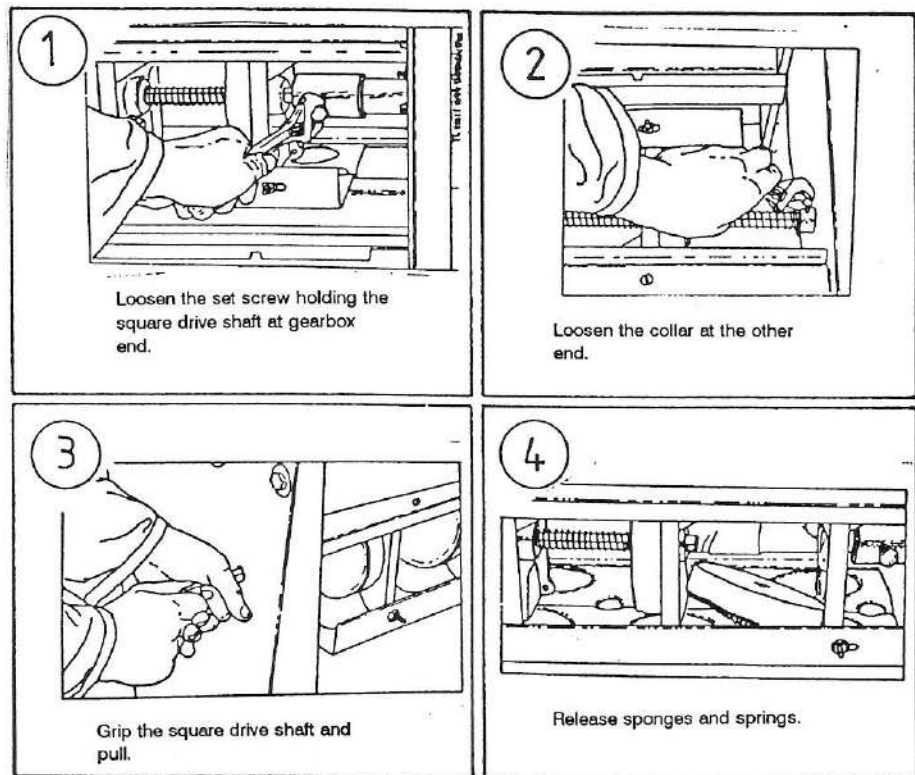
CARE OF THE SPONGE PADS

The sponge feeds are easily accessible for maintenance and cleaning by removing the inspection panel at the bottom of the seed hopper. The seed hopper should be cleaned thoroughly after use as vermin show little respect for a sponge pad if there is seed behind it.

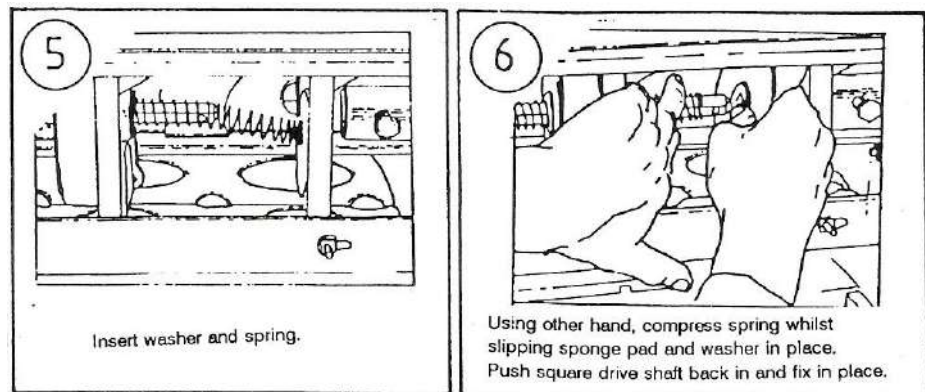
To empty the hopper of seed, push the pads away from the seeder units to let the seed fall through. Do not leave seed lodged between the pad and seeder unit, as this will distort the pad giving erratic sowing. The sponge pads are replaced as shown below.

REPLACEMENT OF SPONGE PADS

Removing:

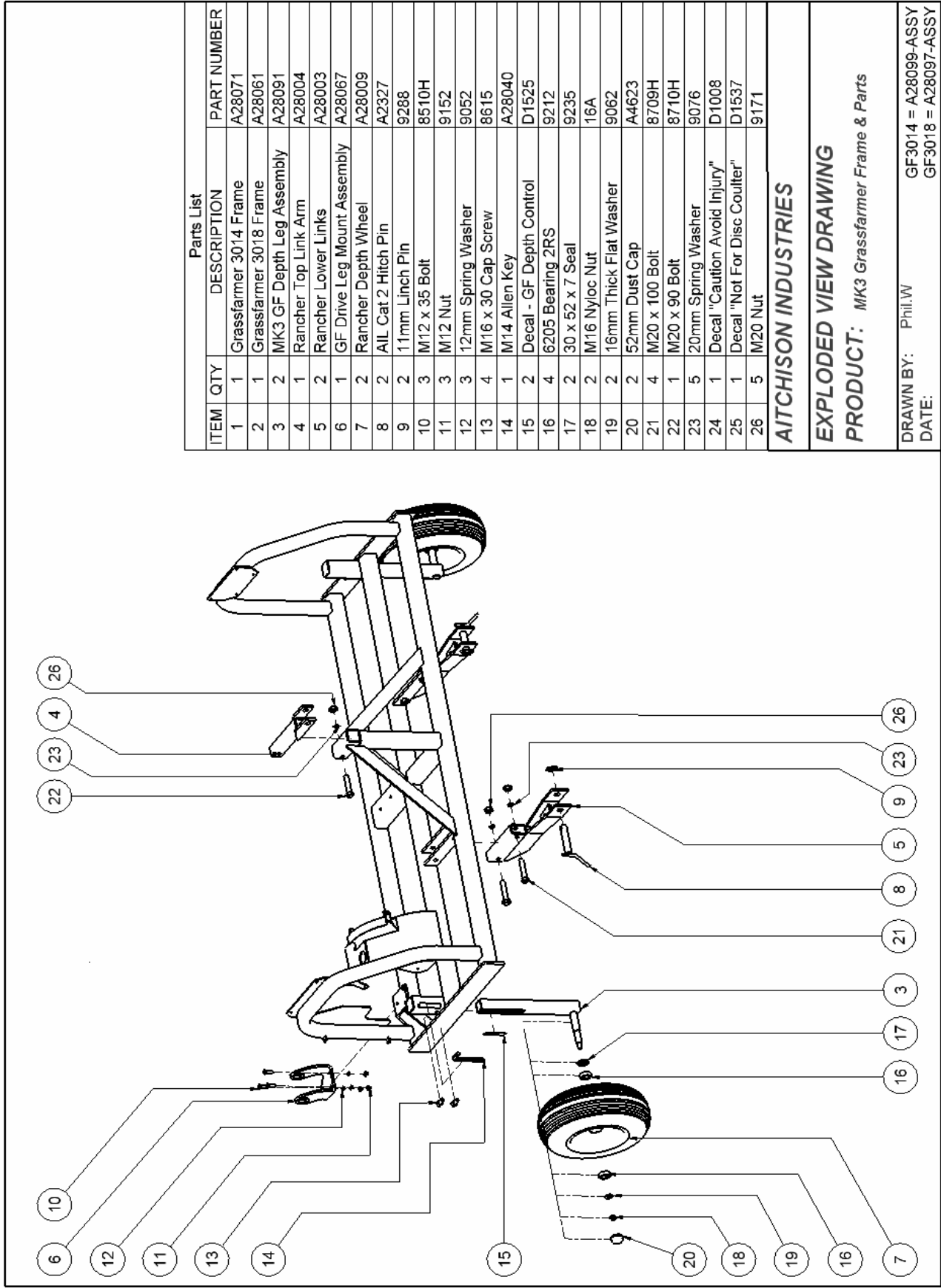


Inserting:



SEASONAL STORAGE

The drill should be thoroughly cleaned and lubricated and stored out of the weather. Look for any unusual wear and remedy the cause. If this requires parts it is best to order them well in advance of the next sowing season. Check all nuts and bolts for tightness. Adjust the depth wheels so the weight of the drill is on the tines and not on the tyres.



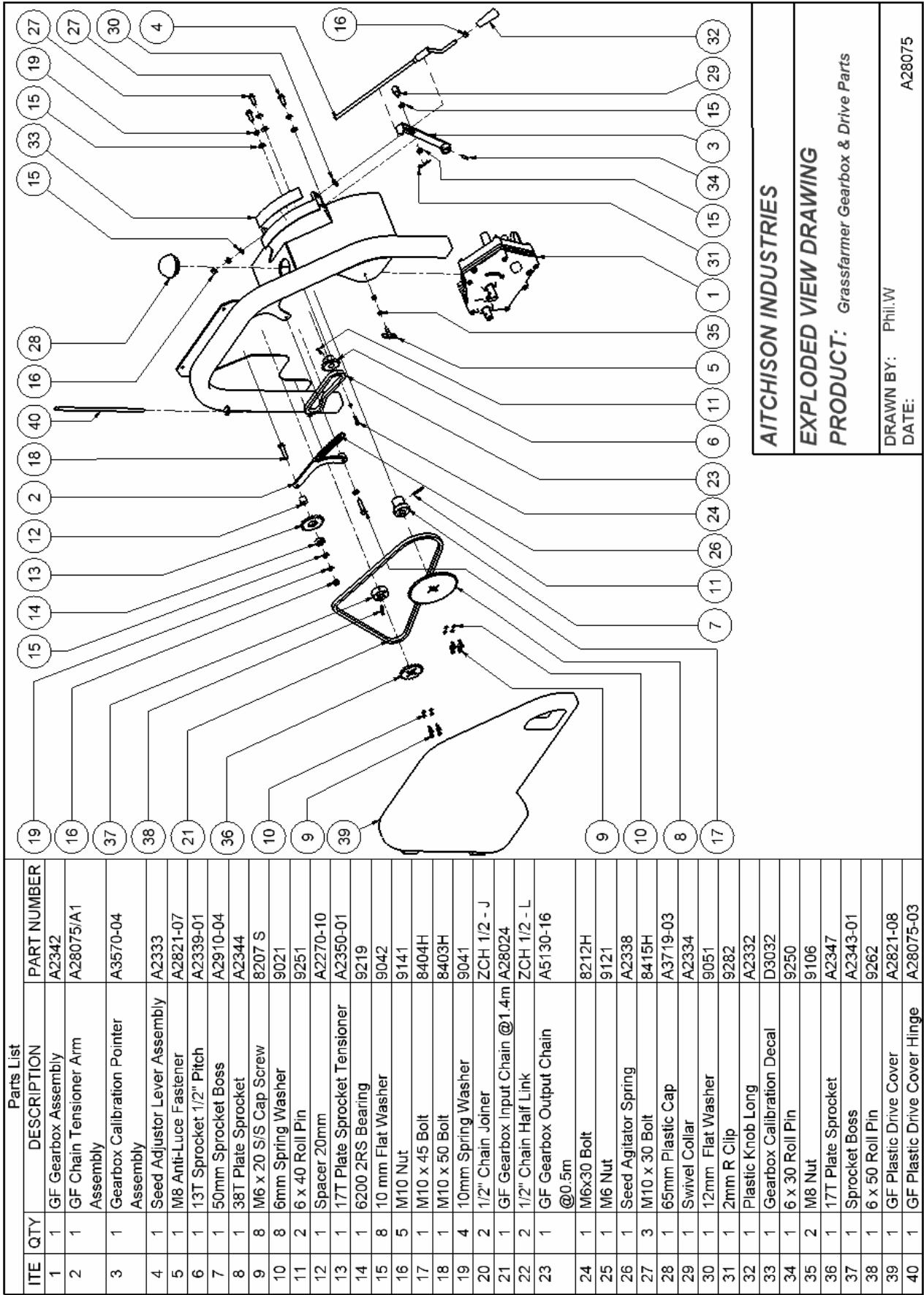
Parts List			
ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Grassfarmer 3014 Frame	A28071
2	1	Grassfarmer 3018 Frame	A28061
3	2	MK3 GF Depth Leg Assembly	A28091
4	1	Rancher Top Link Arm	A28004
5	2	Rancher Lower Links	A28003
6	1	GF Drive Leg Mount Assembly	A28067
7	2	Rancher Depth Wheel	A28009
8	2	AIL Cat 2 Hitch Pin	A2327
9	2	11mm Linch Pin	9288
10	3	M12 x 35 Bolt	8510H
11	3	M12 Nut	9152
12	3	12mm Spring Washer	9052
13	4	M16 x 30 Cap Screw	8615
14	1	M14 Allen Key	A28040
15	2	Decal - GF Depth Control	D1525
16	4	6205 Bearing 2RS	9212
17	2	30 x 52 x 7 Seal	9235
18	2	M16 Nyloc Nut	16A
19	2	16mm Thick Flat Washer	9062
20	2	52mm Dust Cap	A4623
21	4	M20 x 100 Bolt	8709H
22	1	M20 x 90 Bolt	8710H
23	5	20mm Spring Washer	9076
24	1	Decal "Caution Avoid Injury"	D1008
25	1	Decal "Not For Disc Coultter"	D1537
26	5	M20 Nut	9171

AITCHISON INDUSTRIES

EXPLODED VIEW DRAWING

PRODUCT: MK3 Grassfarmer Frame & Parts

DRAWN BY: Phil.W
 DATE:
 GF3014 = A28099-ASSY
 GF3018 = A28097-ASSY



Parts List			PART NUMBER
ITE	QTY	DESCRIPTION	
1	1	GF Gearbox Assembly	A2342
2	1	GF Chain Tensioner Arm Assembly	A28075/A1
3	1	Gearbox Calibration Pointer Assembly	A3570-04
4	1	Seed Adjustor Lever Assembly	A2333
5	1	M8 Anti-Luce Fastener	A2821-07
6	1	13T Sprocket 1/2" Pitch	A2339-01
7	1	50mm Sprocket Boss	A2910-04
8	1	38T Plate Sprocket	A2344
9	8	M6 x 20 S/S Cap Screw	8207 S
10	8	6mm Spring Washer	9021
11	2	6 x 40 Roll Pin	9251
12	1	Spacer 20mm	A2270-10
13	1	17T Plate Sprocket Tensioner	A2350-01
14	1	6200 2RS Bearing	9219
15	8	10 mm Flat Washer	9042
16	5	M10 Nut	9141
17	1	M10 x 45 Bolt	8404H
18	1	M10 x 50 Bolt	8403H
19	4	10mm Spring Washer	9041
20	2	1/2" Chain Joiner	ZCH 1/2 - J
21	1	GF Gearbox Input Chain @1.4m	A28024
22	2	1/2" Chain Half Link	ZCH 1/2 - L
23	1	GF Gearbox Output Chain @0.5m	A5130-16
24	1	M6x30 Bolt	8212H
25	1	M6 Nut	9121
26	1	Seed Agitator Spring	A2338
27	3	M10 x 30 Bolt	8415H
28	1	65mm Plastic Cap	A3719-03
29	1	Swivel Collar	A2334
30	1	12mm Flat Washer	9051
31	1	2mm R Clip	9282
32	1	Plastic Knob Long	A2332
33	1	Gearbox Calibration Decal	D3032
34	1	6 x 30 Roll Pin	9250
35	2	M8 Nut	9106
36	1	17T Plate Sprocket	A2347
37	1	Sprocket Boss	A2343-01
38	1	6 x 50 Roll Pin	9262
39	1	GF Plastic Drive Cover	A2821-08
40	1	GF Plastic Drive Cover Hinge	A28075-03

AITCHISON INDUSTRIES

EXPLODED VIEW DRAWING

PRODUCT: Grassfarmer Gearbox & Drive Parts

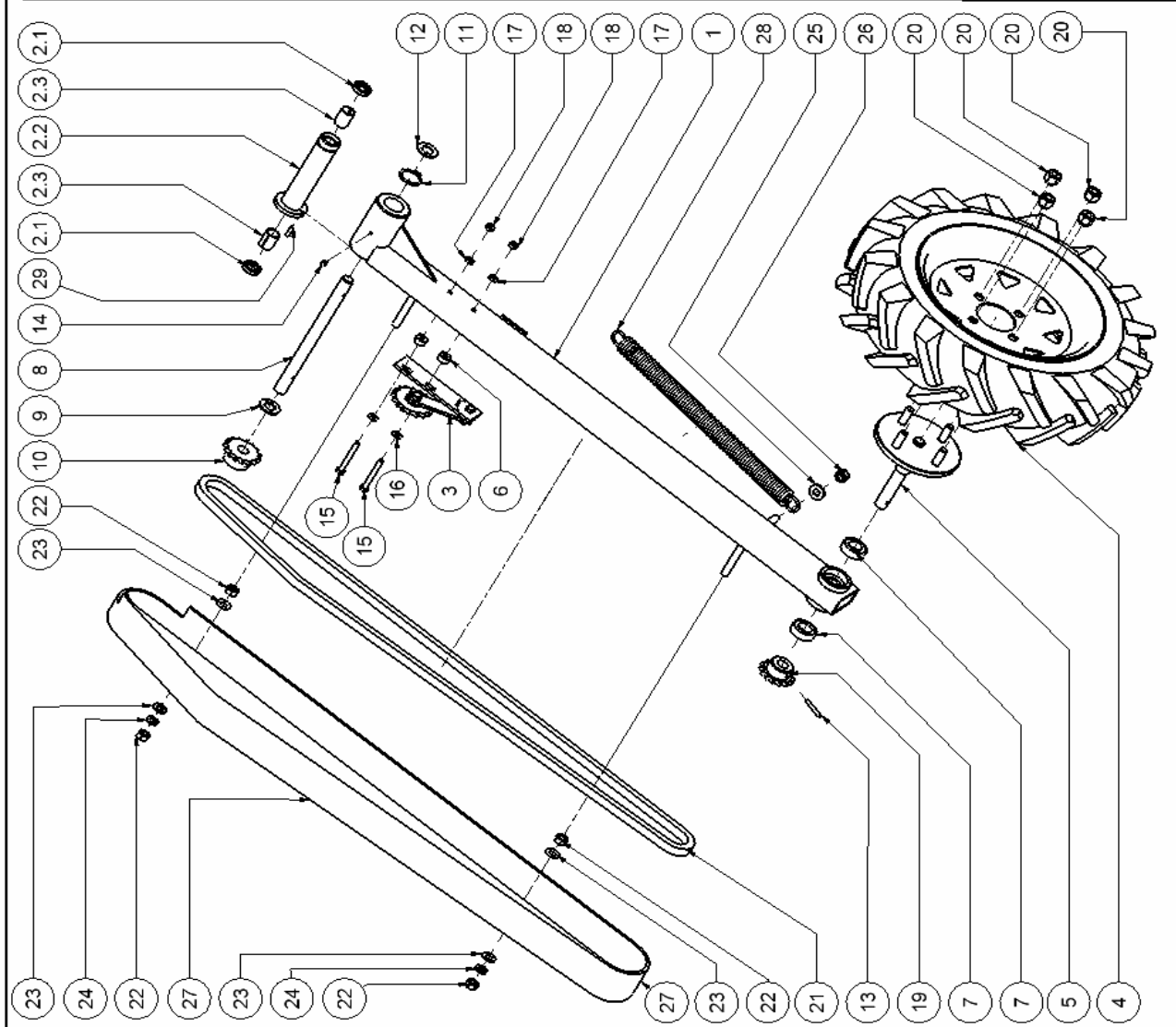
DRAWN BY: Phil.W
DATE:

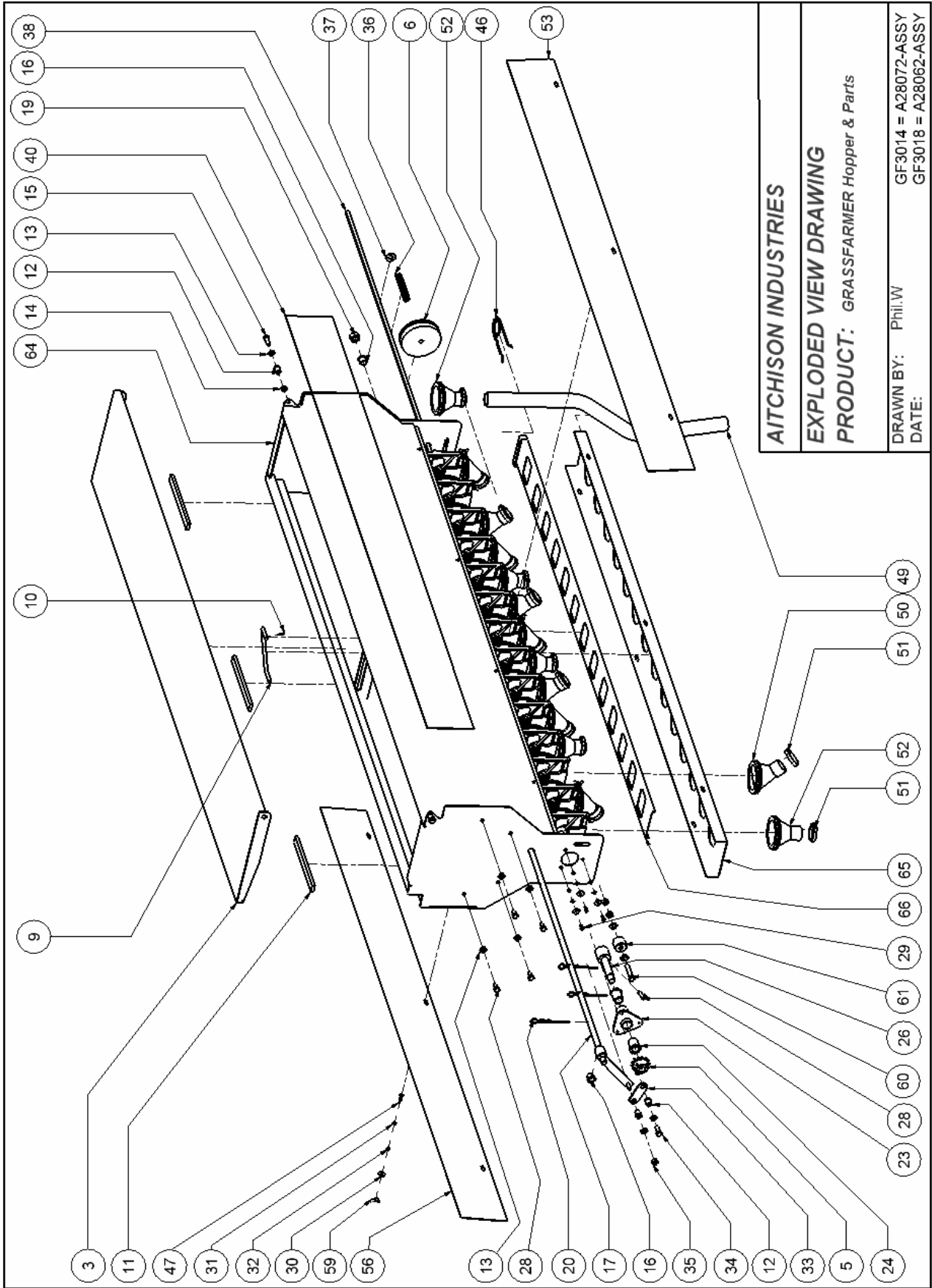
A28075

ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Drive Leg	A28005
2	1	Drive Depth leg Knuckle	A2314
2.1	2	Seal 20x30x7	9229
2.2	1	Drive Leg Pivot Pin	A2314-04
2.3	2	MB 2030 DU Glacier Bush	A2314-03
3	1	Chain Tensioner 1/2" Floating	A2350
4	1	400 x 12" Trac Grip Wheel	A28904-03
5	1	MK3 GF Drive Wheel Axle Assembly	A28904
6	2	Spacer 10mm	A2270-11
7	2	6004 Bearing 2RS	9227
8	1	Rancher 20mm Lay Shaft	A28007
9	1	20mm x 3 Flat Washer ZP	9070
10	1	15T Sprocket 1/2" Pitch	A28010
11	1	35mm External Circlip	9242
12	1	20mm Flat Washer	9074
13	2	6 x 40 Roll Pin	9251
14	1	M6 Grease Nipple Straight	9323
15	2	M8 x 65 Bolt	8315H
16	2	8mm Flat Washer	9031
17	2	8mm Spring Washer	9030
18	2	M8 Nut	9106
19	1	14T Sprocket 1/2" Pitch 20mm Bore	A28904-04
20	4	1/2" Wheel Nut	TR082030-05
21	1	MK3 GF Drive Leg Chain @2.165m	A28904-05
22	4	M12 Nut	9152
23	4	12mm Flat Washer	9051
24	2	12mm Spring Washer	9052
25	1	12mm HD Flat Washer	9054
26	1	M12 Nyloc Nut	9151
27	1	GF Plastic Drive Leg Cover	A2821-01
28	1	Spring Rancher Rear Drive Leg	A28005-08
29	1	6 x 20 Roll Pin	9269

AITCHISON INDUSTRIES
EXPLODED VIEW DRAWING
PRODUCT: MK3 Grassfarmer Drive Leg Parts

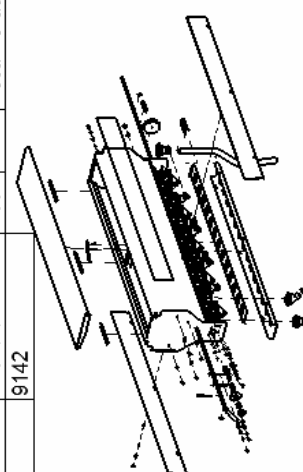
DRAWN BY: Phil.W
DATE:
A28904-ASSY





Parts List		Parts List	
ITEM	QTY	DESCRIPTION	PART NUMBER
2	1	GF 18Run Hopper Assembly (NOT SHOWN)	A28062
3	1	GF 14Run Lid Assembly	A28088
4	1	GF 18Run Lid Assembly (NOT SHOWN)	A28068
5	1	13T Sprocket - Agitator Boss	A28025
6	14	Sponge Pad & Disc (GF2018 = 18)	A2364
8	1	GF 18Run Seed Blank Off Tray Assembly (NOT SHOWN)	A28069
9	1	Lid Stay	A2354
10	1	3 x 20 Roll Pin	9267
11	3	Buffer Pad	A2375
12	4	S 206 M Plastic Bush	A2355
13	12	10mm Flat Washer	9042
14	2	M10 Nut	9141
15	2	M10 x 35 Bolt	8402H
16	4	S 210 M Plastic Bush (GF2018 = 5)	A2357
17	1	GF 14Run Agitator Shaft	A28017
18	1	GF 18Run Agitator Shaft (NOT SHOWN)	A28062-21
19	1	16mm Locking Collar	A2360
20	14	Agitator Shart R Clip (GF2018 = 18)	A2359
21	1	Agitator Boss	A28034-02
22	1	Agitator Arm	A28034-01
23	1	Seed Shaft Drive Mount	A2337
24	2	S 15 Plastic Bush	A2352
25	1	M6 Stright Grease Nipple	9323
26	1	Seed Shaft Axle	A2361
27	1	6 x 40 Roll Pin	9251
28	9	M10 x 25 Bolt	8418H
29	3	M6x20 Bolt	8205H
30	9	6mm Fender Washer (GF2018 = 11)	9022
31	9	6mm Spring Washer (GF2018 = 11)	9021
32	9	M6 Nut (GF2018 = 11)	9121
33	1	Agitator Link	A28008
34	2	Agitator Link Bolt	A2618-04
35	1	M10 Nyloc Nut	9142

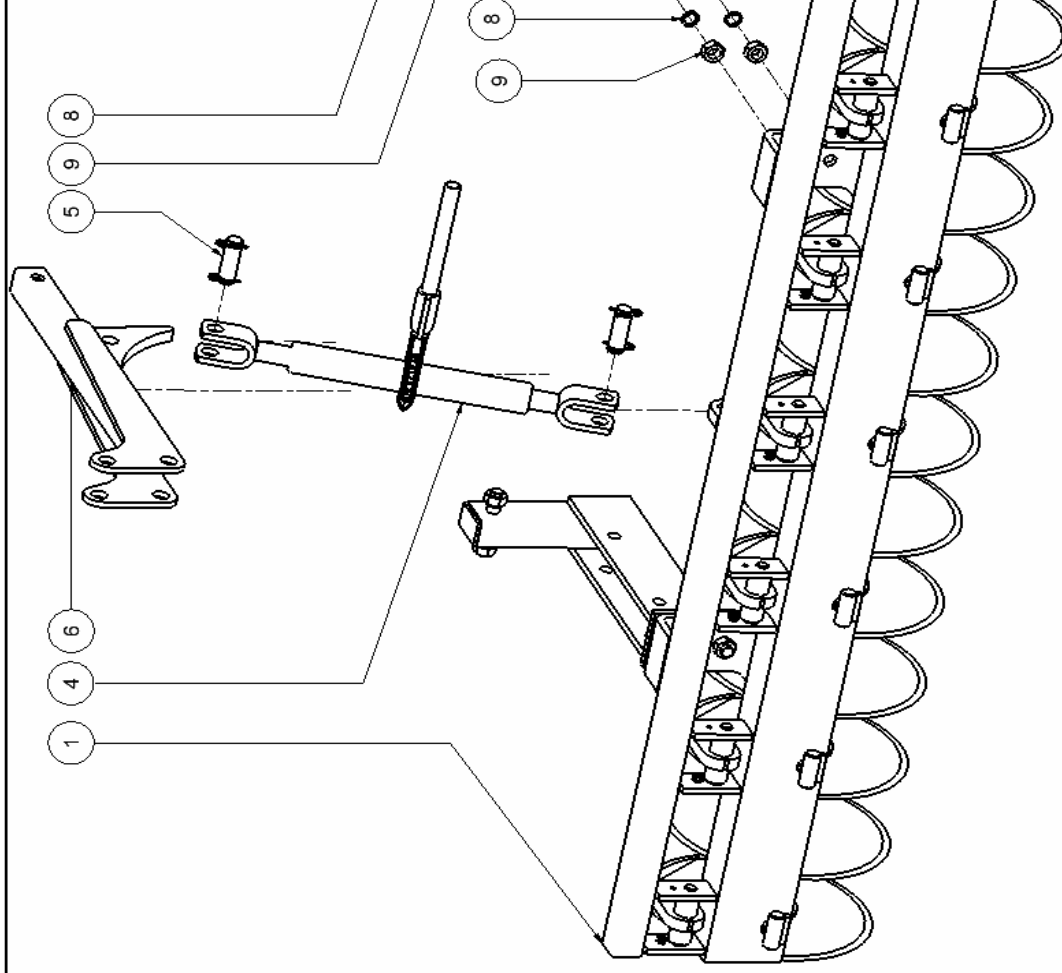
Parts List		Parts List	
ITEM	QTY	DESCRIPTION	PART NUMBER
36	14	Seed Pad Spring	(GF2018 = 18)
37	14	9/16" x 1 1/4" 16G ZP Washer	(GF2018 = 18)
38	1	GF 14Run Seed Shaft	A28018
39	1	GF 18Run Seed Shaft (NOT SHOWN)	A28062-22
40	2	2.5M Yellow Panel Decal	D1509
41	2	3.0M Yellow Panel Decal (NOT SHOWN)	D1513
42	8	10mm Spring Washer	9041
44	1	GF 18Run Seed Tray Drive End (NOT SHOWN)	A28062-23
45	1	GF 18Run Seed Tray N-Drive (NOT SHOWN)	A28062-24
46	1	Seed Blank Off Tray Lock	A28062-25
47	6	M6 x 25 Bolt (GF2018 = 8)	8213H
48	6	6mm Flat Washer (GF2018 = 8)	9023
49	1	35mm Seed Dropper Hose per/m	A2384-01
50	10	Seed Cup Angled (GF2018 = 12)	A2369
51	14	35mm Cray Clip (GF2018 = 18)	A2370
52	4	Seed Cup Straight (GF2018 = 6)	A2368
53	1	GF 14Run Front Inspection Panel	A28072-26
54	1	GF 18Run RH Front Inspection Panel (NOT SHOWN)	A28062-26
55	1	GF 18Run LH Front Inspection Panel (NOT SHOWN)	A28062-27
56	1	GF 14Run Rear Inspection Panel	A28072-27
57	1	GF 18Run RH Rear Inspection Panel (NOT SHOWN)	A28062-28
58	1	GF 18Run LH Rear Inspection Panel (NOT SHOWN)	A28062-29
59	6	M6 Wingnut (GF2018 = 8)	9108
60	1	M12 x 65 Bolt	8507H
61	1	Nylon Tensioner Roller	A2336-04
62	2	M12 Nut	9152
62	2	12mm Flat Washer	9051
63	14	Oat Wiper (NOT SHOWN) (GF2018 = 18)	A2366
64	1	GF 14Run Hopper Assembly	A28072
66	1	GF 14Run Seed Blankoff Tray Assembly	A28089
65	1	GF 14Run Seed Tray	A28072-23
66	1	Decal "Grassfarmer"	D1539



AITCHISON INDUSTRIES
EXPLODED VIEW DRAWING
PRODUCT: GRASSFARMER Hopper & Parts

DRAWN BY: Phil.W
 DATE:
 GF3014 = A28072-ASSY
 GF3018 = A28062-ASSY

Parts List			
ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	GF 14Run Disc Coupler Beam Assembly	A28076
2	7	150mm 14" Disc Pod Assembly	A28081
3	2	GF Disc Coupler Mount Arm Assembly	A28070
4	1	Ratchet Link	A23127
5	2	Ratchet Link Pin & Clip	A2646 / A2647
6	1	GF Top Link Assembly	A28115
7	4	M20 x 50 Bolt	8711H
8	6	20mm Spring Washer	9076
9	6	M20 Nut	9171
10	2	M20 x 100 Bolt	8709H



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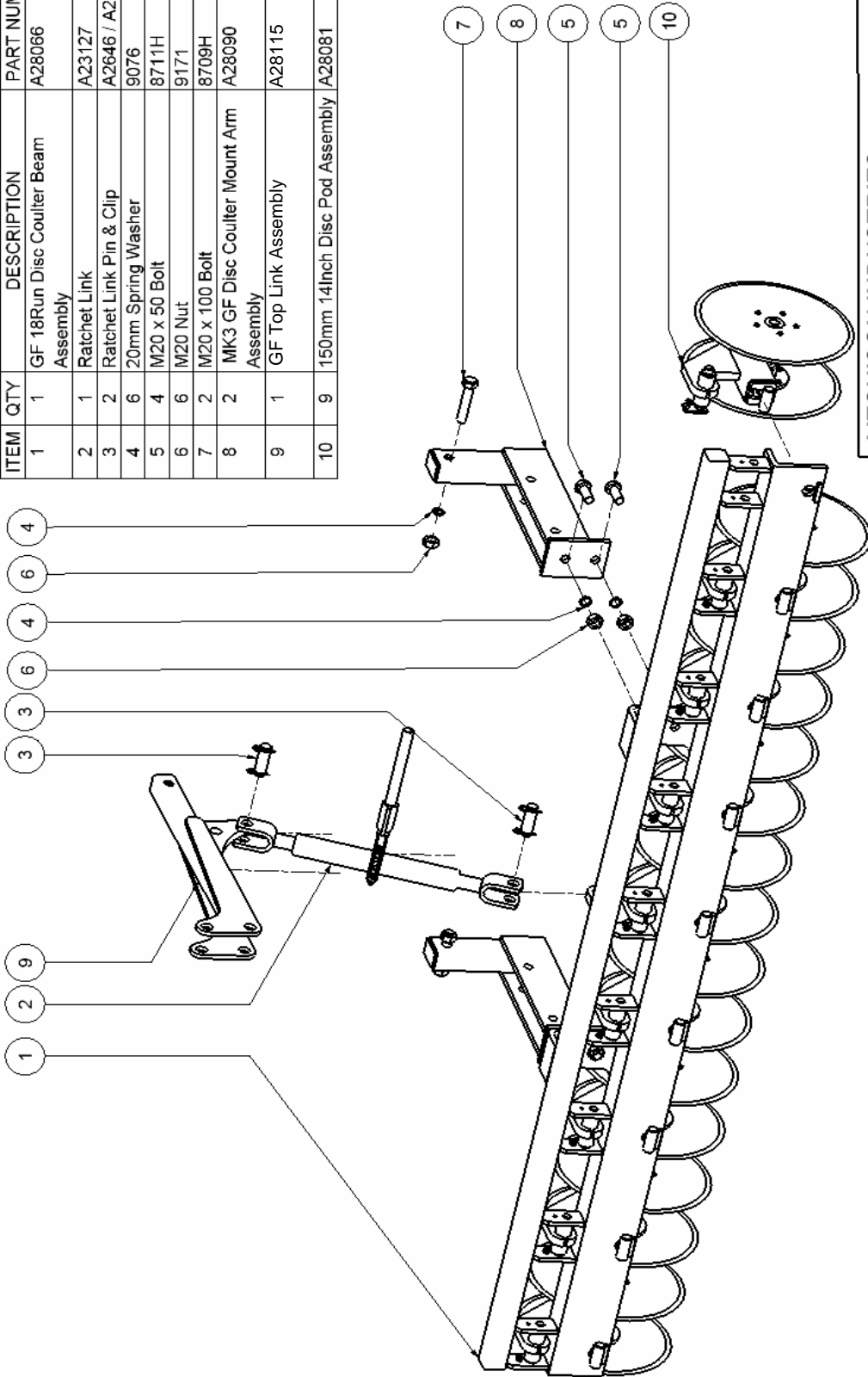
EXPLODED VIEW DRAWING

PRODUCT: MK3 GF 14Run Disc Coupler Kit

DRAWN BY: Phil.W
DATE: 21/10/2009

A28100-ASSY

Parts List			
ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	GF 18Run Disc Coupler Beam Assembly	A28066
2	1	Ratchet Link	A23127
3	2	Ratchet Link Pin & Clip	A2646 / A2647
4	6	20mm Spring Washer	9076
5	4	M20 x 50 Bolt	8711H
6	6	M20 Nut	9171
7	2	M20 x 100 Bolt	8709H
8	2	MK3 GF Disc Coupler Mount Arm Assembly	A28090
9	1	GF Top Link Assembly	A28115
10	9	150mm 14Inch Disc Pod Assembly	A28081



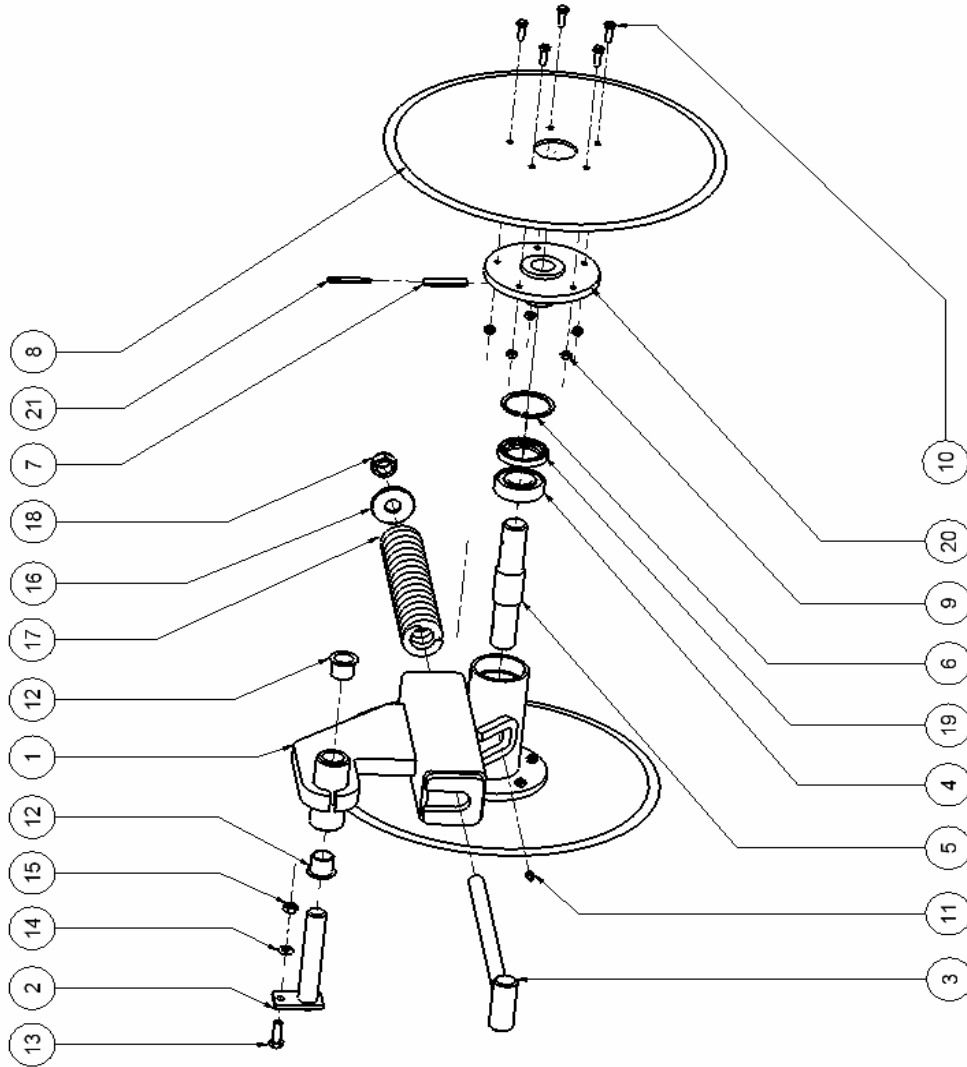
AITCHISON INDUSTRIES

EXPLODED VIEW DRAWING

PRODUCT: MK3 GF 18Run Disc Coupler Kit

DRAWN BY: Phil.W
DATE:

A28098-ASSY



Parts List

ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	150mm Disc Mounting Pod	A28081/A1
2	1	Disc Pod Pivot Pin Assembly	A24982
3	1	Threaded T Rod	A23120
4	2	6205 Bearing	9212
5	1	150mm Disc Axle Stepped	A24983
6	2	52mm Internal Circlip	32
7	2	8 x 45 Roll Pin	9266
8	2	14" 5 Stud Disc (Plane)	A3022-04
9	10	M6 Nylock Nut	9109
10	10	M6x20 Bolt	8205H
11	1	M6 Stright Grease Nipple	9323
12	2	FMB 2021.5DU	A3710-52
13	1	M8 x 25 Bolt	8305H
14	1	8mm Spring Washer	9030
15	1	M8 Nut	9106
16	1	Spring Retainer Washer	A23123
17	1	Disc Coupler Spring	A23122
18	1	M16 Nyloc Nut	16A
19	2	35 x 52 x 8 Seal	A28046-14
20	2	Disc Mounting Flange	A28081-02
21	2	5 x 45 Roll Pin	9254

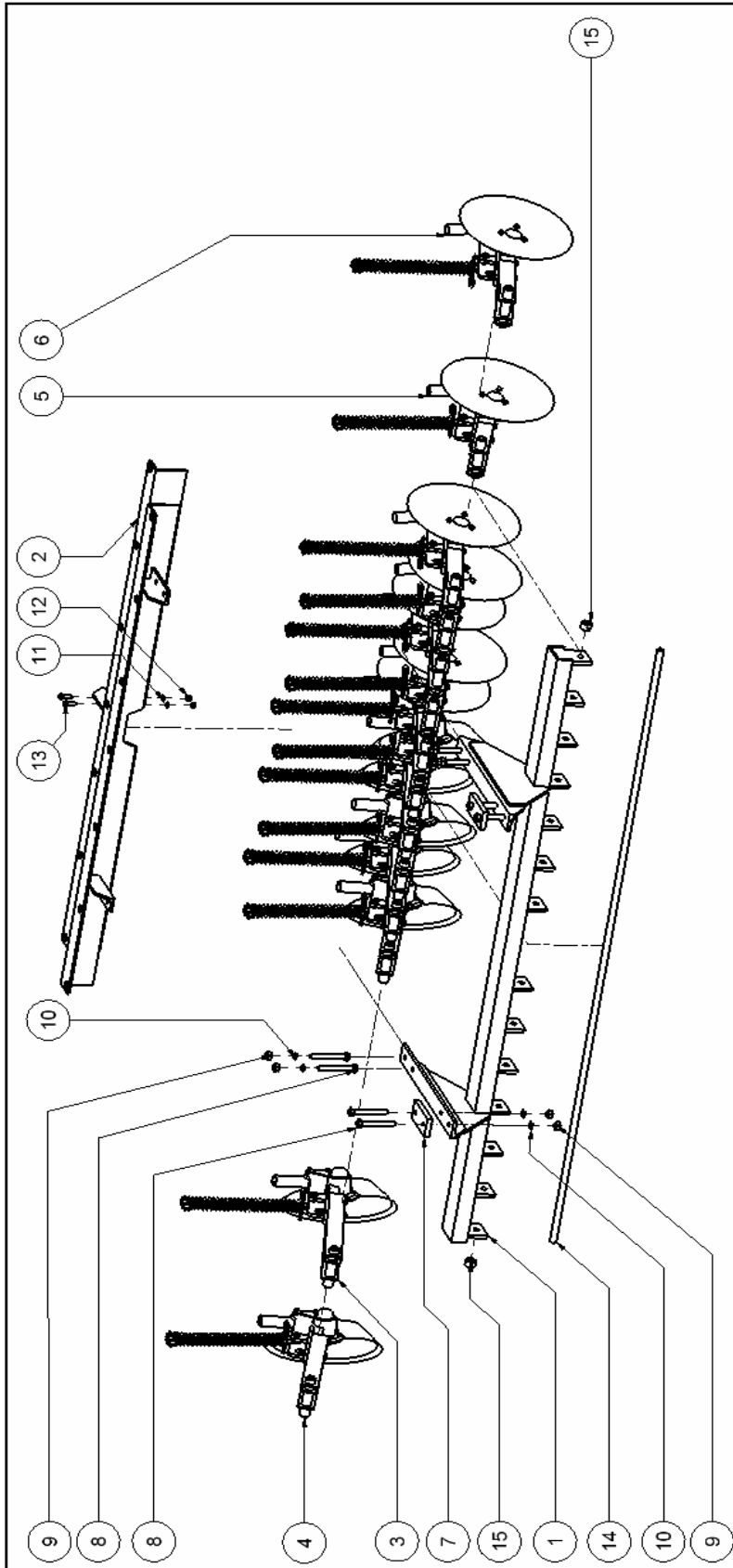
AITCHISON INDUSTRIES

EXPLODED VIEW DRAWING

PRODUCT: 150mm 14" Disc Pod Assembly

DRAWN BY: Phil
DATE:

A28081



Parts List			
ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	MK3 GF 14Run Dragarm Mount Assembly	A28101
2	1	GF 14Run Press Beam Assembly	A2855
3	3	GF Long Dragarm RH Assembly	A28103
4	4	GF Short Dragarm RH Assembly	A28104
5	3	GF Short Dragarm LH Assembly	A28106
6	4	GF Long Dragarm LH Assembly	A28105
7	2	GF Dragarm Mount Clamp	A2853-02
8	8	M16 x 110 Bolt	8612H
9	8	M16 Nut	9161
10	8	16mm Spring Washer	9061
11	2	12mm Spring Washer	9052
12	2	M12 Nut	9152
13	2	M12 x 30 Bolt	8523H
14	1	GF 14Run Dragarm Pivot Shaft	A2853-01
15	2	20mm Shaft Collar	A2324

AITCHISON INDUSTRIES

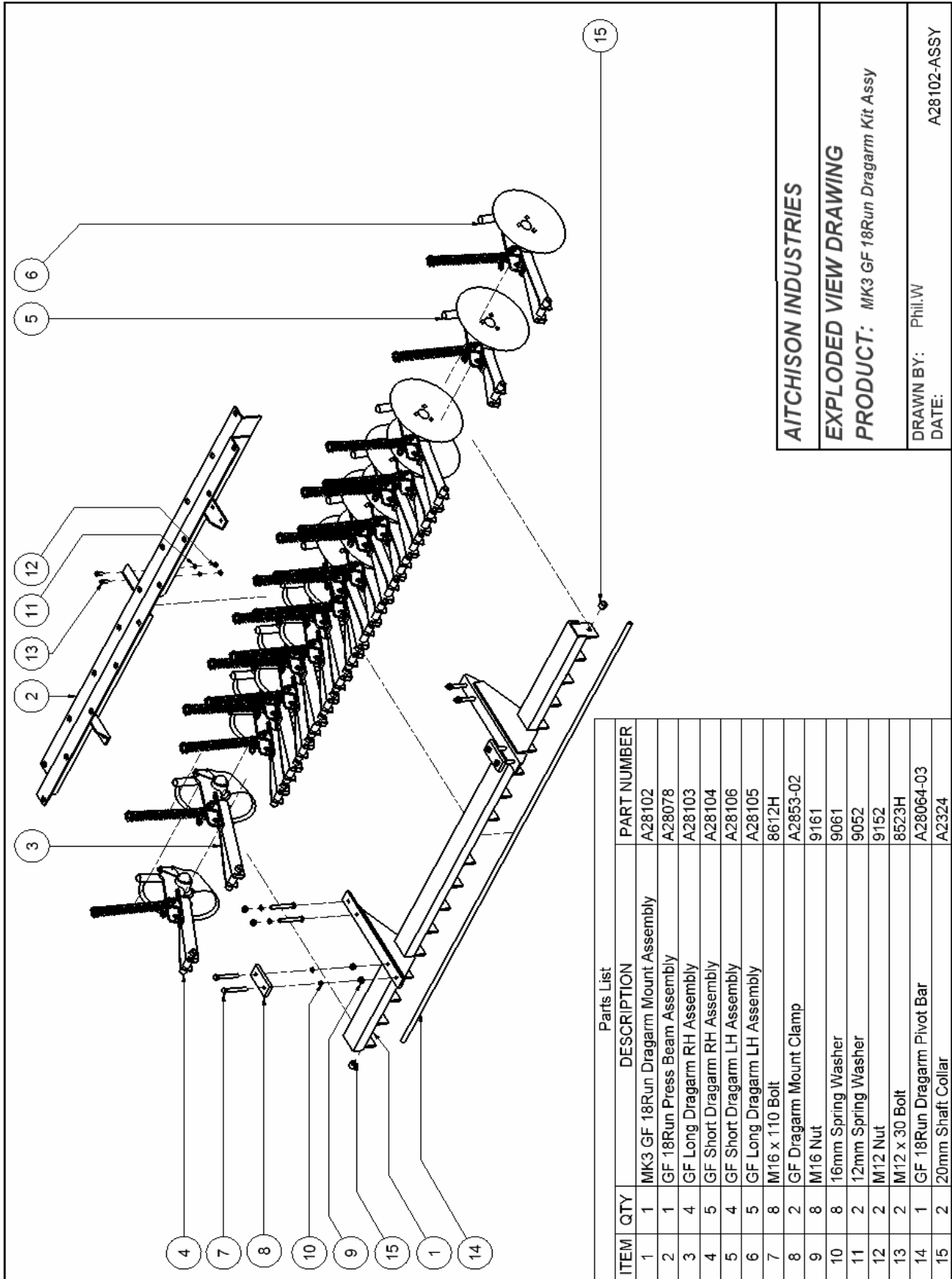
EXPLODED VIEW DRAWING

PRODUCT: MK3 GF 14Run Dragarm Kit Assy

DRAWN BY: Phil.W

DATE:

A28101-ASSY



Parts List

ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	MK3 GF 18Run Dragarm Mount Assembly	A28102
2	1	GF 18Run Press Beam Assembly	A28078
3	4	GF Long Dragarm RH Assembly	A28103
4	5	GF Short Dragarm RH Assembly	A28104
5	4	GF Short Dragarm LH Assembly	A28106
6	5	GF Long Dragarm LH Assembly	A28105
7	8	M16 x 110 Bolt	8612H
8	2	GF Dragarm Mount Clamp	A2853-02
9	8	M16 Nut	9161
10	8	16mm Spring Washer	9061
11	2	12mm Spring Washer	9052
12	2	M12 Nut	9152
13	2	M12 x 30 Bolt	8523H
14	1	GF 18Run Dragarm Pivot Bar	A28064-03
15	2	20mm Shaft Collar	A2324

AITCHISON INDUSTRIES

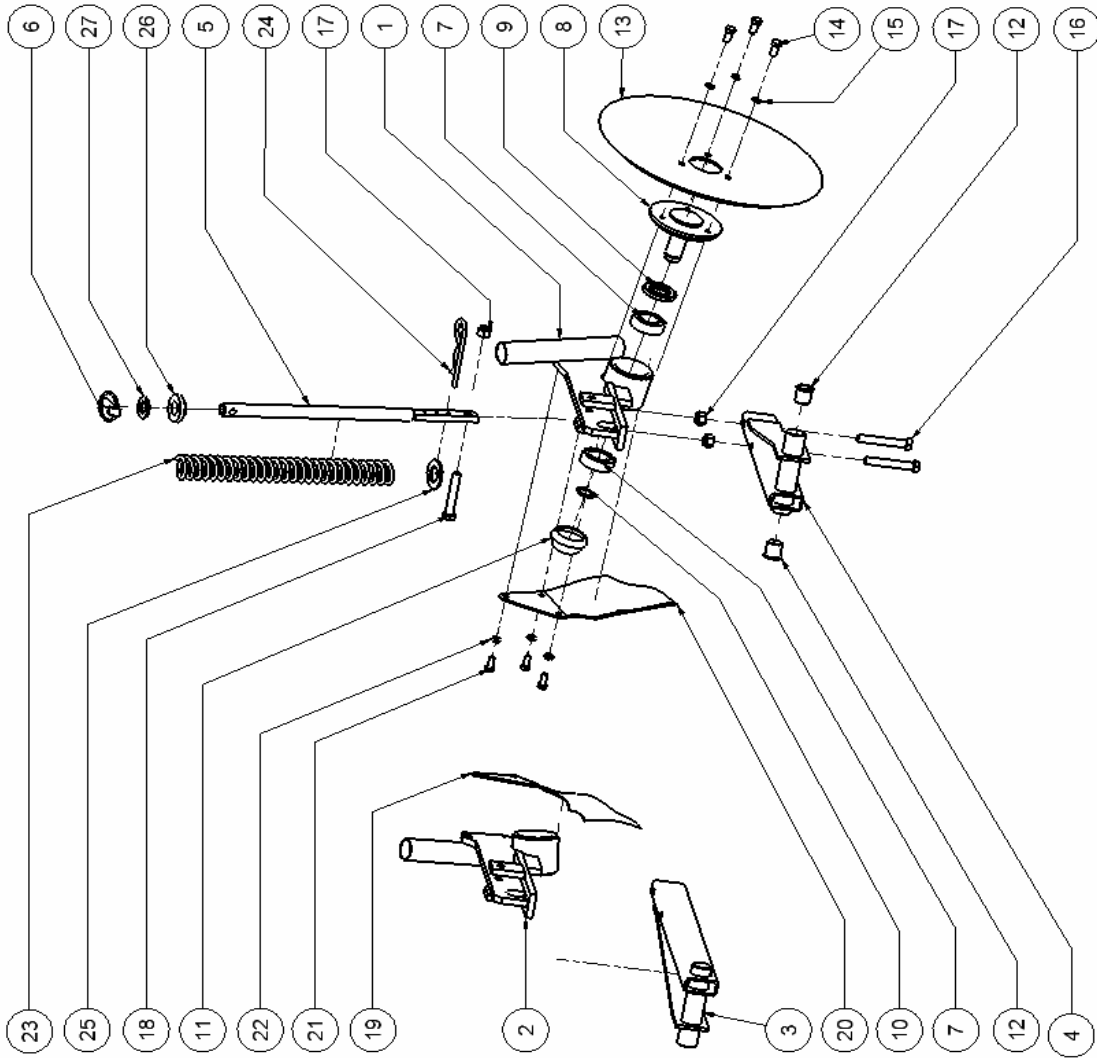
EXPLODED VIEW DRAWING

PRODUCT: MK3 GF 18Run Dragarm Kit Assy

DRAWN BY: Phil.W

DATE:

A28102-ASSY



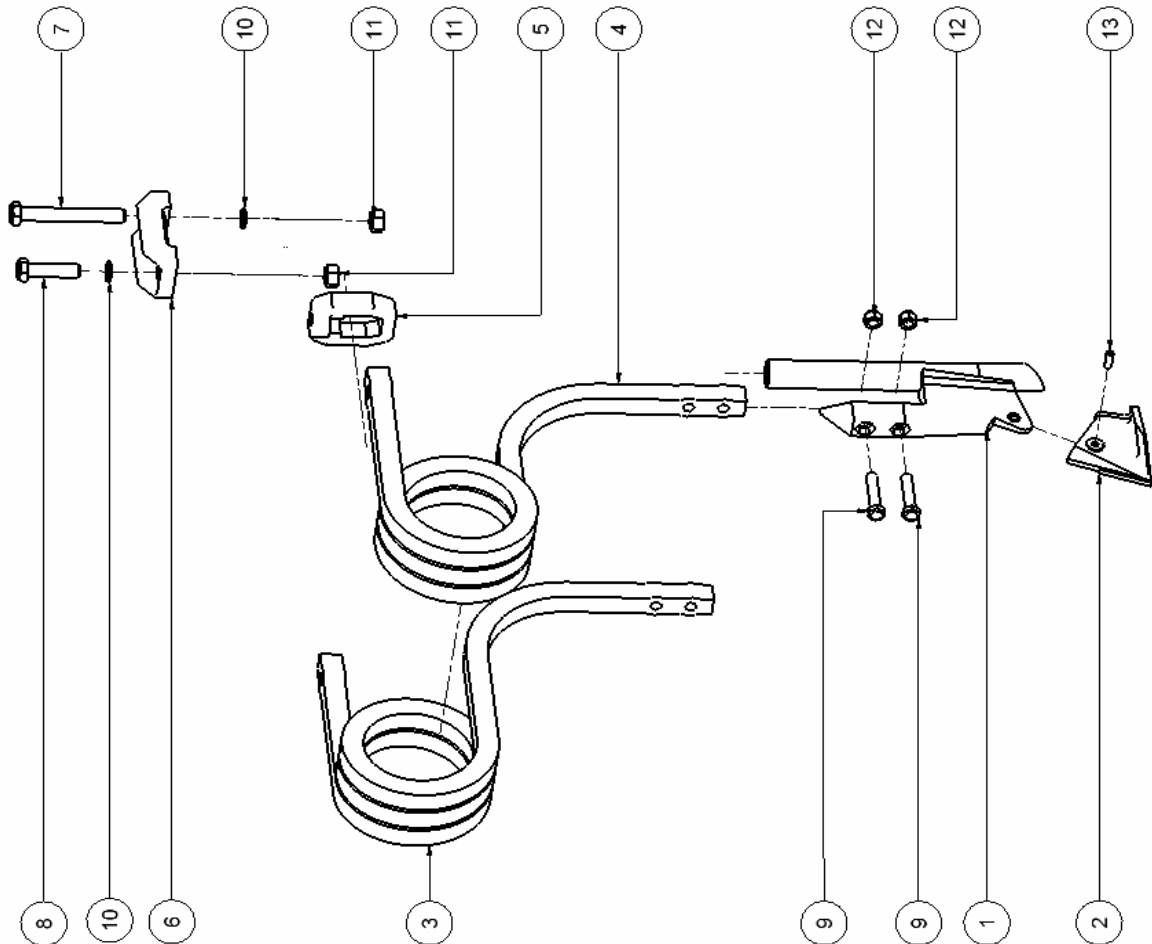
Parts List			
ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	GF Disc Carrier LH	A2852L
2	1	GF Disc Carrier RH	A2852R
3	1	Drag Arm Long	A23201
4	1	Drag Arm Short	A23204
5	1	MK3 Drag Arm Push Rod	A28107
6	1	11mm Linch Pin	9288
7	2	6205 Bearing 2RS	9212
8	1	Disc Axle	A23195
9	1	30 x 52 x 7 Seal	9235
10	1	25mm External Circlip	9244
11	1	52mm Cap	A4623
12	2	S 3/12M Plastic Bush	A23202
13	1	14" Concave Fatback Disc	A23194
14	3	3/8 x 3/4 UNF Bolt	8525
15	3	3/8 Spring Washer	9043
16	2	M12x 75 Bolt	8525H
17	3	M12 Nyloc Nut	9151
18	1	M12 x 70 Bolt	8526H
19	1	Seed Shield RH	A23196
20	1	Seed Shield LH	A23199
21	3	M8 x 20 Bolt	8311H
22	3	8mm Spring Washer	9030
23	1	3000 Dragarm Spring	A23210
24	1	5mm R Clip	9289
25	1	1" Thick Flat Washer	9075
26	1	Drag Arm Push Rod Bush	A23211-01
27	1	20mm x 3 Flat Washer	9070

AITCHISON INDUSTRIES

EXPLODED VIEW DRAWING

PRODUCT: MK3 GRASSFARMER Dragarm Parts

DRAWN BY: Phil.W RH Long: A28103. RH Short: A28104.
 DATE: LH Long: A28105. LH Short: A28106.



Parts List			PART NUMBER
ITEM	QTY	DESCRIPTION	
1	1	MK3 Seed Only Coultter Assembly	A28093
2	1	MK3 Replacable Boot	A3895
3	1	MK3 25mm RH-DC Tine	A3892L
4	1	MK3 25mm LH-DC Tine	A3892R
5	1	MK3 Tine Clamp Casting	A3896
6	1	65mm Saddle Clamp	A3897
7	1	M16 x 120 Bolt	8610H
8	1	M16 x 60 Bolt	8604H
9	2	M12 x 60 Bolt	8528H
10	2	16mm Spring Washer	9061
11	2	M16 Nut	9161
12	2	M12 Nyloc Nut	9151
13	1	8 x 25 Roll Pin	9265

AITCHISON INDUSTRIES

EXPLODED VIEW DRAWING

PRODUCT: MK3 Grassfarmer Tine Assembly Parts

DRAWN BY: Phil.W MK3 Tine Assy LH: A28092L-ASSY
DATE: MK3 Tine Assy RH: A28092R-ASSY