AUSPLOW

Australian designed and manufactured

EASITILL OPERATORS MANUAL

#00931

VERSION 2.3

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Contents

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1.0 SAFETY

1.1 SAFETY WARNING SYMBOLS

WHERE YOU SEE THIS SYMBOL, IT MEANS PAY ATTENTION, AS YOUR SAFETY AND OTHERS SAFETY COULD BE PLACED AT RISK.

There are 3 levels of alert used in this manual. They are:

DANGER!

This denotes an intrinsic hazard that would probably result in death or irreparable injury if proper precautions are not taken.

WARNING!

This denotes a hazard that can result in injury or death if proper precautions are not taken.

CAUTION!

This denotes a reminder to follow safety practices or to draw attention to items that, if ignored, could result in personal injury or equipment damage.

1.2 GENERAL SAFETY PRECAUTIONS

The following safety precautions should be observed before operating equipment:

- Do not operate the Easitill without first reading this manual, and
- Ensure that all operators are fully conversant with the safety and operation of the equipment.

WARNING!

- Do not allow anyone to make any adjustments to, or ride on the Easitill whilst in motion.
- Do not undertake maintenance or adjustments under an Ausplow Easitill without ensuring the tractor park brake is securely ‘ON’ and lift ram depth stops are fitted.
- Transporting Easitill when wings are folded may present an over-height hazard. Check clearance of overhead power lines and tree branches.

DANGER!

Do not stand under Easitill wings when raising or lowering wings.

1.3 TRANSPORT SAFETY

WARNING!

Do not transport an Easitill without observing the following points:

- Ensure that all towing hitch pins are secured in position,
- Safety chains must be fitted before transporting, and
- Always stow the jack correctly.

CAUTION!

- Check with local transport authorities regarding over height and width requirements for the transport of Easitill.
- Check that the tyre inflation pressure is suitable for the implement weight and speed that you wish to travel.

WARNING!

- Do not transport any Easitill over 30 km/h.
- Always transport Easitill on lift ram depth stops with wing locking pins securely in place.

1.4 NOISE PROTECTION

CAUTION!

Always wear suitable hearing protection if subjected to prolonged exposure of loud or uncomfortable noises, such as replacing wear parts using air tools.

1.5 ASSEMBLY AND MAINTENANCE SAFETY

WARNING!

- Ensure the tractor park brake is securely ‘ON’ when conducting maintenance on an Easitill when connected to a tractor.
- If the Easitill is not connected to a tractor, chock the Easitill wheels so that the machine remains stationary.

- Mounting a tyre on a rim can produce an explosion unless the proper procedures are followed. Do not attempt to mount a tyre on a rim unless you have the proper experience and training for the job. Preferably, have your Ausplow dealer or a qualified tyre repair service centre carry out these repairs.

1.6 RECOMMENDED TORQUE SETTINGS

Unless otherwise stated in the manual, the following tables outline the recommended torque settings for Bolts and U Bolts.

	Part Number #	Recommended Nm	Fitment
	#**01091** U Bolt M20x102x150mm Gal	240 with Anti-Seize	GAL Nyloc Nut, with Flat Washer
	#**03125** U Bolt M16x101x140mm ZP	100 with Anti-Seize	ZP Nut with Spring Washer
	#**05287** U Bolt M12x101x130mm ZP	70 without Anti-Seize	ZP Nut with Spring Washer
No Picture	#**05288** U Bolt M12x101x130mm ZP	65 without Anti-Seize	ZP Nut with Spring Washer

FASTENER TORQUE CHART (K=0.2; 65% PROOF LOAD)				
SIZE	TORQUE VALUE [Nm]			
	Gr 8.8	**Gr 10.9**	**Gr 12.9**	**A4-70**
M6	8	11	14	10
M8	20	28	33	12
M10	39	55	66	24
M12	68	96	116	42
M16	173	243	291	100
M20	337	474	569	197

1.7 PRECAUTIONS WHEN SERVICING HYDRAULICS

WARNING!

Escaping hydraulic fluid under pressure can penetrate the skin causing serious internal injury. Always relieve hydraulic pressure before working on the hydraulic system. Ensure that connections are tight and hoses and pipes are in a serviceable condition before applying hydraulic pressure.

CAUTION!

- Do not use bare hands to search for suspected hydraulic leaks.
- Always wear protective glasses when working on Easitill hydraulic equipment.

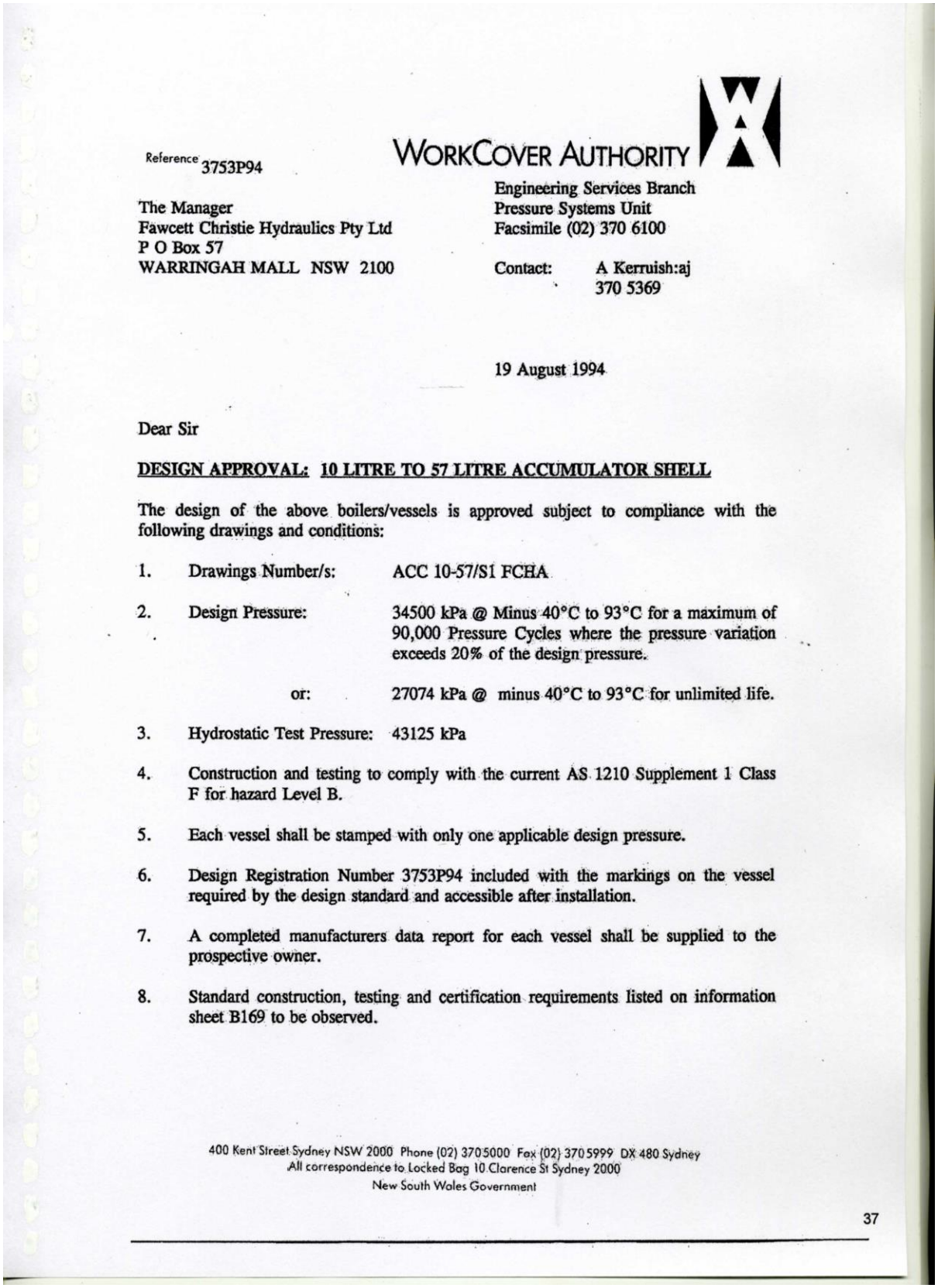
1.8 ACCUMULATOR

Hydraulic accumulators are considered to be pressure vessels. In most states, accumulators must be registered with your local OH&S authority (Work Cover, Work Safe etc.). Certificates are supplied with each bottle.

WARNING!

Each owner is responsible for ensuring that the thoroughness and frequency of inspection is carried out to ensure the continued safe operation of the pressure equipment. Currently, an external inspection is required every 2 years.

A copy of the WorkCover Authority for the accumulator is attached below.



Reference 3753P94

WORKCOVER AUTHORITY

The Manager
Fawcett Christie Hydraulics Pty Ltd
P O Box 57
WARRINGAH MALL NSW 2100

Engineering Services Branch
Pressure Systems Unit
Facsimile (02) 370 6100

Contact: A Kerruish:aj
370 5369

19 August 1994

Dear Sir

DESIGN APPROVAL: 10 LITRE TO 57 LITRE ACCUMULATOR SHELL

The design of the above boilers/vessels is approved subject to compliance with the following drawings and conditions:

1. Drawings Number/s: ACC 10-57/S1 FCHA

2. Design Pressure: 34500 kPa @ Minus 40°C to 93°C for a maximum of 90,000 Pressure Cycles where the pressure variation exceeds 20% of the design pressure.

   or: 27074 kPa @ minus 40°C to 93°C for unlimited life.

3. Hydrostatic Test Pressure: 43125 kPa

4. Construction and testing to comply with the current AS 1210 Supplement 1 Class F for hazard Level B.

5. Each vessel shall be stamped with only one applicable design pressure.

6. Design Registration Number 3753P94 included with the markings on the vessel required by the design standard and accessible after installation.

7. A completed manufacturers data report for each vessel shall be supplied to the prospective owner.

8. Standard construction, testing and certification requirements listed on information sheet B169 to be observed.

400 Kent Street Sydney NSW 2000 Phone (02) 3705000 Fax (02) 370 5999 DX 480 Sydney
All correspondence to Locked Bag 10 Clarence St Sydney 2000
New South Wales Government

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2.0 WARRANTY

2.1 GENERAL OUTLINE

Ausplow Farming System's ***machine warranty*** (hereafter referred to as Ausplow Warranty) extends 12 months from the date of original retail sale delivery and Ausplow Farming Systems will repair and / or replace parts, except ground engaging components, found to be defective in factory materials or workmanship under normal use and operation within Australia.

2.2 EXCLUSIONS

The following wear parts are not covered under Ausplow Warranty or Ausplow Parts Warranty:

- Digging blades,
- Closing tools,
- Coulter discs,
- Mud scrapers,
- Bent tines,
- Airseeder hose,
- Primary airseeder head rubber gaskets or caps,
- Liquid fertiliser tubes,
- Seal kits in Dosatron units,
- Seed and fertiliser boots, and
- Wear to tow hitches and pins.

2.3 POINT OF INSPECTION

Ausplow reserves the right of inspection before acceptance of any warranty claim, and all parts are to be returned to Ausplow's factory, Jandakot, Western Australia, freight pre-paid, unless otherwise arranged.

2.4 EXTERNAL SUPPLIERS' WARRANTIES

Bought in components may be subject to supplier's warranty.

2.5 JURISDICTION

Ausplow Warranty does not apply outside Australia. Ausplow Warranty relates to the repair to, or replacement of, defective parts during the 12 month Ausplow Warranty period and unless otherwise required by the laws of Australia and / or any applicable State or Territory thereof within Australia. Neither Ausplow, nor its authorised distributors, accept any responsibility whatsoever under Ausplow Warranty for any loss of use of equipment, loss of time, inconvenience, commercial loss, or any other direct or indirect loss, damage or injury, whatever nature.

2.6 PRODUCT MISUSE

Ausplow Warranty does not cover any injury or defect which arises out of, or is caused by, accident, fire or other casualty, misuse, overloading, exceeding the specified capacity or operating limitations, negligence, or use of parts not approved by Ausplow if such use adversely affects the performance, durability, stability, reliability or safety of the equipment or alteration or modification of any part of the equipment not approved by Ausplow.

2.7 PURCHASERS OBLIGATIONS

It is the responsibility of the purchaser to ensure that the equipment covered under Ausplow's Warranty is used and operated in the proper manner, and maintained and serviced in accordance to the recommended service and maintenance practices stated in the

operator's manual valid for the machine covered under Ausplow Warranty.

2.8 CONSEQUENTIAL LOSSES

This warranty does not extend to any consequential loss or damage howsoever caused or arising, including failure in operation or performance of the goods sold or repaired or replacement work, including replacement parts, or service performed thereon or thereto or any loss incurred for hire of unauthorised labour, supplies, substituted machinery or rented machinery or any loss or damage incurred because of a delay in seeding or for any event resulting in loss of crops livestock or other losses. Nor shall Ausplow Farming System be liable for any injury or negligence howsoever caused.

2.9 PARTS WARRANTY

Ausplow Farming System's ***parts warranty*** (hereafter referred to as Ausplow Parts Warranty) extends 90 days from the date of original retail sale and Ausplow Farming Systems will repair and / or replace parts, except ground engaging components, found to be defective in factory materials or workmanship under normal use and operation within Australia.

3.0 EASITILL HITCH CONNECTIONS

3.1 TOWING HITCH SAFETY PRECAUTIONS

CAUTION!

- The maximum towing speed for the Easitill is 30 km/h.
- Check tyre inflation pressures before transporting for any distance at high speed. For inflation pressure on all Easitills, see Section 5.5.

3.2 SAFETY CHAINS

All Easitills are fitted with safety chains to protect the machine from accidental disconnection during road transport. Please note that the chain may need to be shortened.

CAUTION!

The safety chain is only designed to protect the Easitill from accidental disconnection during road transport. The safety chain is not sized to protect the Easitill from accidental disconnection whist working in the paddock.

3.3 SAFETY CHAIN ATTACHING AND SHORTENING PROCEDURE

The following outlines procedures for attaching safety chains to Easitills.

3.3.1 Attaching the Safety Chain

- Attach the first hammerlock and one shackle to one end of the chain as shown in Figure 3.3.1,
- Attach shackle to the correct point on the Easitill as indicated in this manual,
- Identify suitable mounting points on the tractor and fit the shackle and second hammerlock without hammering in the locking collar,
- With both vehicles attached, measure the safety chain length in position, keeping it as short as possible, while ensuring that there is enough slack to allow the hitch to turn freely. Cut the chain to the correct length,
- Fit the second hammerlock to the free end of the chain ensuring that the shackle is threaded through the end of the hammerlock before locking the hammerlock pin in place in the same way as shown in Figure 3.3.1, and
- Fit and tighten the shackle.

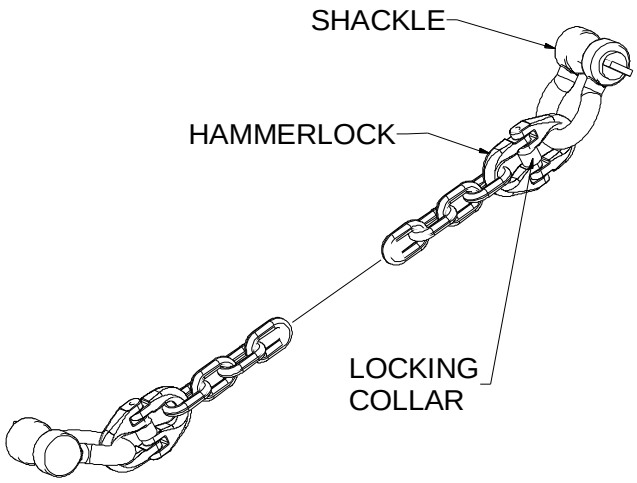


Figure 3.3.1: Safety chain showing chain and shackle attached to hammerlocks.

3.3.2 Leveling the Hitch

The drawbar tongue can be moved up and down and gives increments of 60mm with each set of holes. Half-hole increments of 30mm can be achieved by turning the hitch upside down.

To increase road transport clearance on the front row of tines, it may be necessary to lower the towing tongue on the front of the Easitill drawbar. Ensure that the towing tongue is returned back to its original position prior to the recommencement of ripping.

If problems are encountered with a low tractor hitch, this kit is available.

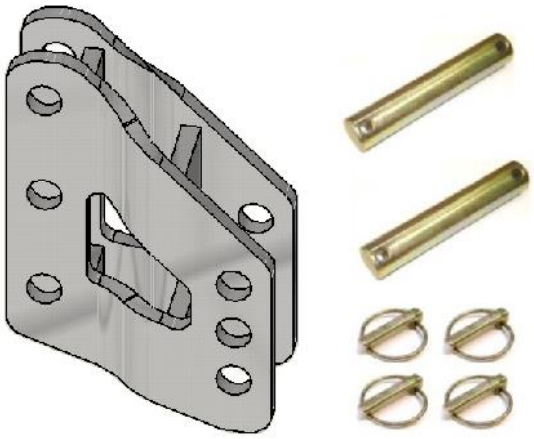


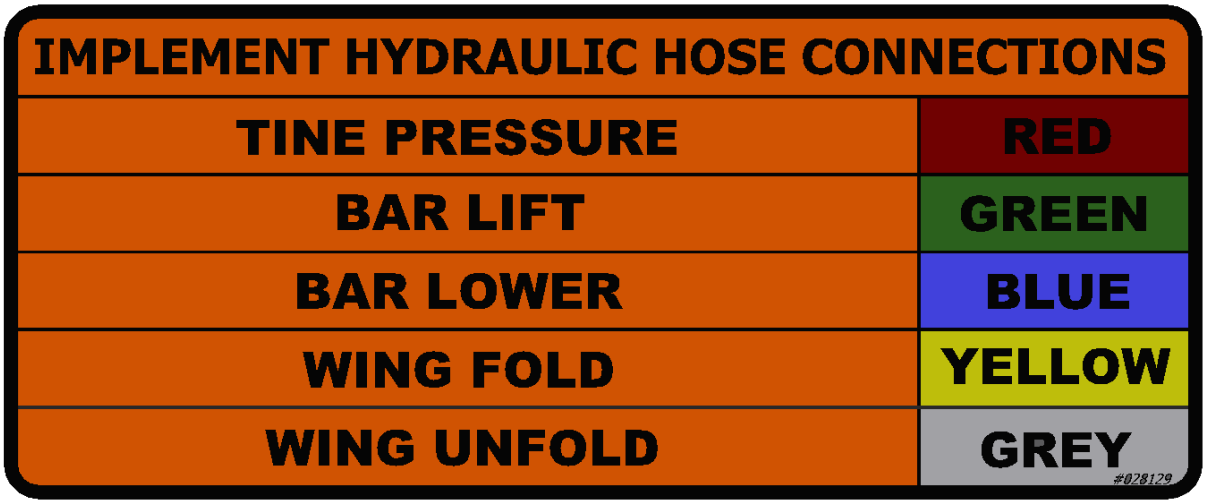
Figure 3.3.2: Low Tractor Drawbar Kit (Part # 02413)

3.3.3 Hydraulic Hitch Connections

The following table below outlines hose connections applicable to the Easitill:

FUNCTION	COLOUR	HOSE SIZE	FITTING
TINE PRESSURE	RED	½”	Standard ½” ISO Male
BAR LIFT	GREEN	½”	Standard ½” ISO Male
BAR LOWER	BLUE	½”	Standard ½” ISO Male
WING FOLD	YELLOW	½”	Standard ½” ISO Male
WING UNFOLD	GREY	½”	Standard ½” ISO Male

Table 3.3.1: Easitill Hydraulic Hoses



3.4 JACKS

3 tonne jacks are fitted to the front of all Easitills.

4.0 TRANSPORT

4.1 ROAD TRANSPORTING

CAUTION!

- Before road transporting, ensure that the wing lock pins are in position and the machine is at a suitable transport height with centre-frame lift cylinders resting on depth stops (wing lift cylinder depths stops can be used to make up the additional depths stops required).
- Centre frame tyre inflation pressure may need to be increased by 0.7Bar (10psi) to counter the weight of folded wings when road transporting long distances.

WARNING!

- The maximum recommended transport speed is 30km/h. ***Do not exceed the maximum transport speed.***
- Check height and width restrictions with local authorities before road transporting machines.

4.2 TRANSPORT WEIGHTS

The following table outlines the approximate weight of Easitills in kilograms with associated options:

EASITILL	Bar (kg)	Coulters (kg)	Total with Coulters (kg)
E460-15	3,300	700	4,000
E460-21	5,300	900	6,200
E460-23	5,400	1,000	6,400

E460-27	6,700	1,200	7,900
E460-29	6,800	1,300	8,100
E520-5	To be issued		
E520-11			
E520-23(L)	5,950	1150	7,100
E600-5	To be issued		
E600-8			
E600-20(L)	5,400	1,000	6,400

Table 4.2.1: Easitill Weights

4.3 PREPARATION FOR TRANSPORT – CHECK LIST

The following actions should be undertaken prior to transporting:

- Check tyre pressures,
- Check that safety chains are correctly fitted,
- Check the wing fold locking safety pins are correctly fitted from the rear with lynch pins visible from the front,
- Release tine circuit hydraulic pressure and leave the accumulator hydraulic line connected to the towing tractor with the lever in the float position,
- Support centre frame rams with depth stops. Use additional depth stops from wing rams if required,
- Move drawbar tongue to a lower position to improve transport clearance on the front row,
- Lift tines in the centre frame and fold back tines on wings to reduce transport width and height, and / or
- Remove the pin on the top of the turnbuckle on wings and fold wheel assemblies in to reduce transport width.

5.0 OPERATING INSTRUCTIONS

5.1 SAFETY PRECAUTIONS

WARNING!

Do not ride on the Easitill whilst moving.

CAUTION!

Transport lock pins must be fitted when transporting the bar.

5.2 LEVELLING OF THE EASITILL

5.2.1 Initial Set Up

Pictures 5.2.1 Hydraulic Ram Depth Stops (Kit #05005)

- Place 1 x 7/8” and 1 x 1” depth stop on each depth ram as shown below (as viewed from above), and

- Ensure the opening on the depth stop is facing downwards to prevent the build-up of mud or sand on the cylinder rod.

Picture 5.2.2: Hydraulic Ram Depth Stops – Fitted (Top View)

Picture 5.2.3: Hydraulic Ram Depth Stops – Fitted (Bottom View)

The opening of the depth stop should be offset to ensure the depth stop provides the best support for the ram (as seen from below looking upwards).

Spare depth stops can be placed on the hydraulic hose as shown in Picture 5.2.4. Each individual depth ram is supplied with the following depth stops from new:

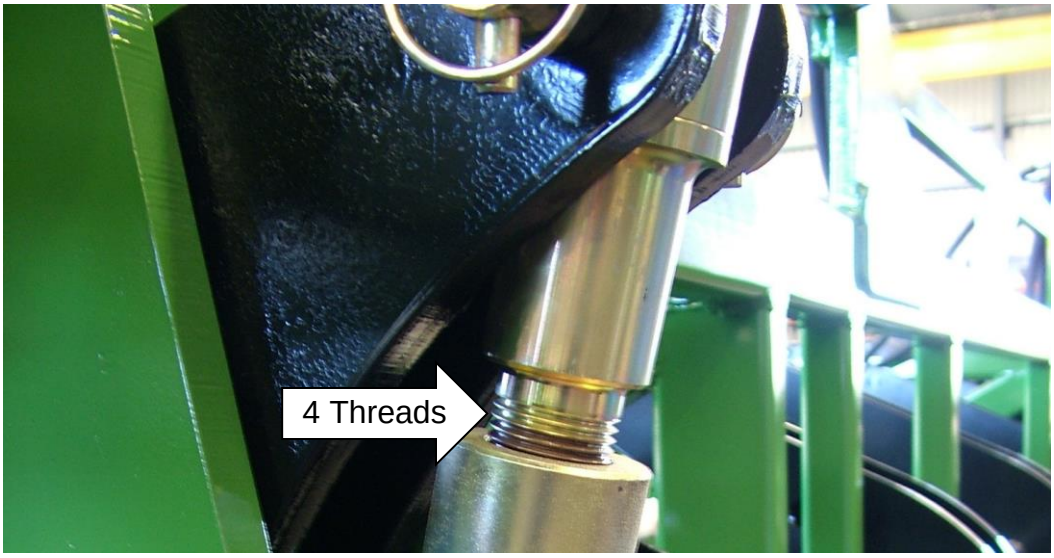
- Two of each: 7/8", 1", 1 1/4" and 1 1/2" thick,

Picture 5.2.4: Hydraulic Ram Depth Stops – Storage (Side View)

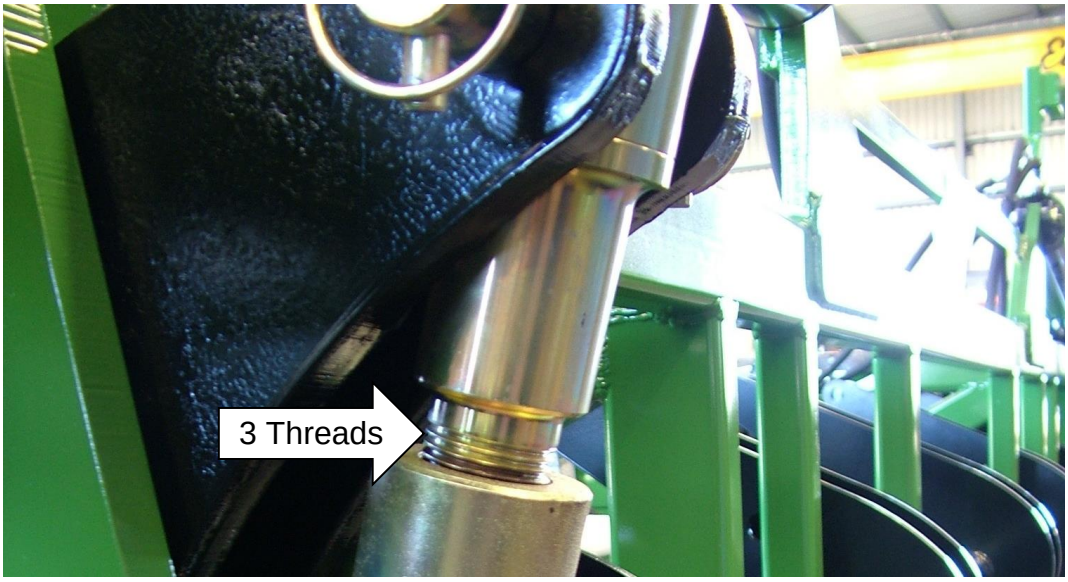
Check tyre pressures on all tyres, see Section 5.5.

Position the machine on level ground and adjust wheel cylinder rocker arm turnbuckles to obtain an initial level across the width of the bar.

The turnbuckles **on the centre frame** should have **four equal threads** showing top and bottom, see Picture 5.2.5.

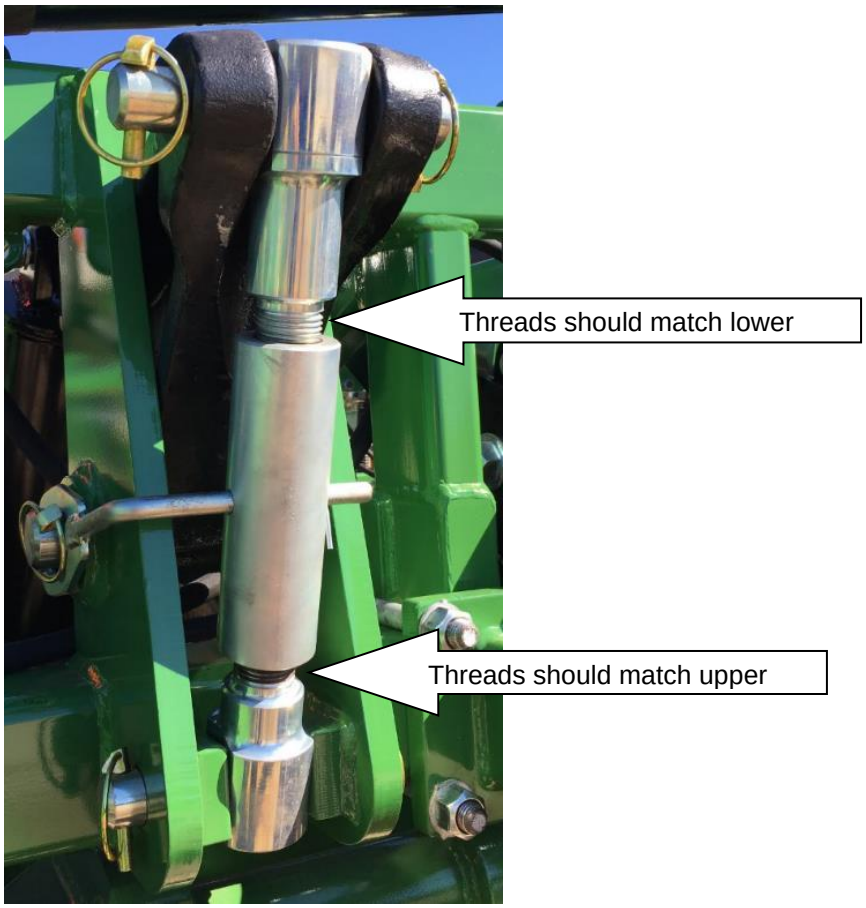


Picture 5.2.5: Initial Turnbuckle Adjustment Setting - Centre frame



Picture 5.2.6: Initial Turnbuckle Adjustment Setting - Wings

All wings should have **three equal threads** showing top and bottom, see Picture 5.2.6.



Picture 5.2.7: Initial Turnbuckle Adjustment Setting – Matching Threads

The centre frame should now be approximately 25mm higher than the wings when standing on a hard surface (i.e. concrete flooring). Always adjust turnbuckles in the following sequence:

- Centre frame first (2), then
- Outer wings (2).

The turnbuckles can only be turned with the weight taken off the wheel assemblies. This may require the bar to be lifted out of the ground, driven forward approximately 2 meters and then lowered down again on unbroken ground.

Once the tyre pressures are checked, turn buckles are set and depth stops are placed on the rams, phase the bar lift hydraulic circuit by lifting the bar until it is in the fully up position.

Hold the hydraulic lever for a further 20 seconds (on hydraulic bypass). Check that when the hydraulic lever is released, all cylinders drop by approximately 13mm (1/2”).

Final leveling should be checked when the machine is in the field under load.

This is done by checking the depth of trench (+/- 12 - 13mm (1/2”)) on the outer most tine on each of the frame sections on the rear of the bar.

5.2.2 Final Paddock Leveling

The following procedure should be used for final field leveling:

- Lower the bar into the ground whilst driving forward until all cylinders are resting on the depth stops and the blades are digging at the correct depth as shown Picture 5.2.8 and 5.2.9.

Picture 5.2.8: Correct Digging Depth

Picture 5.2.9: Correct Digging Depth

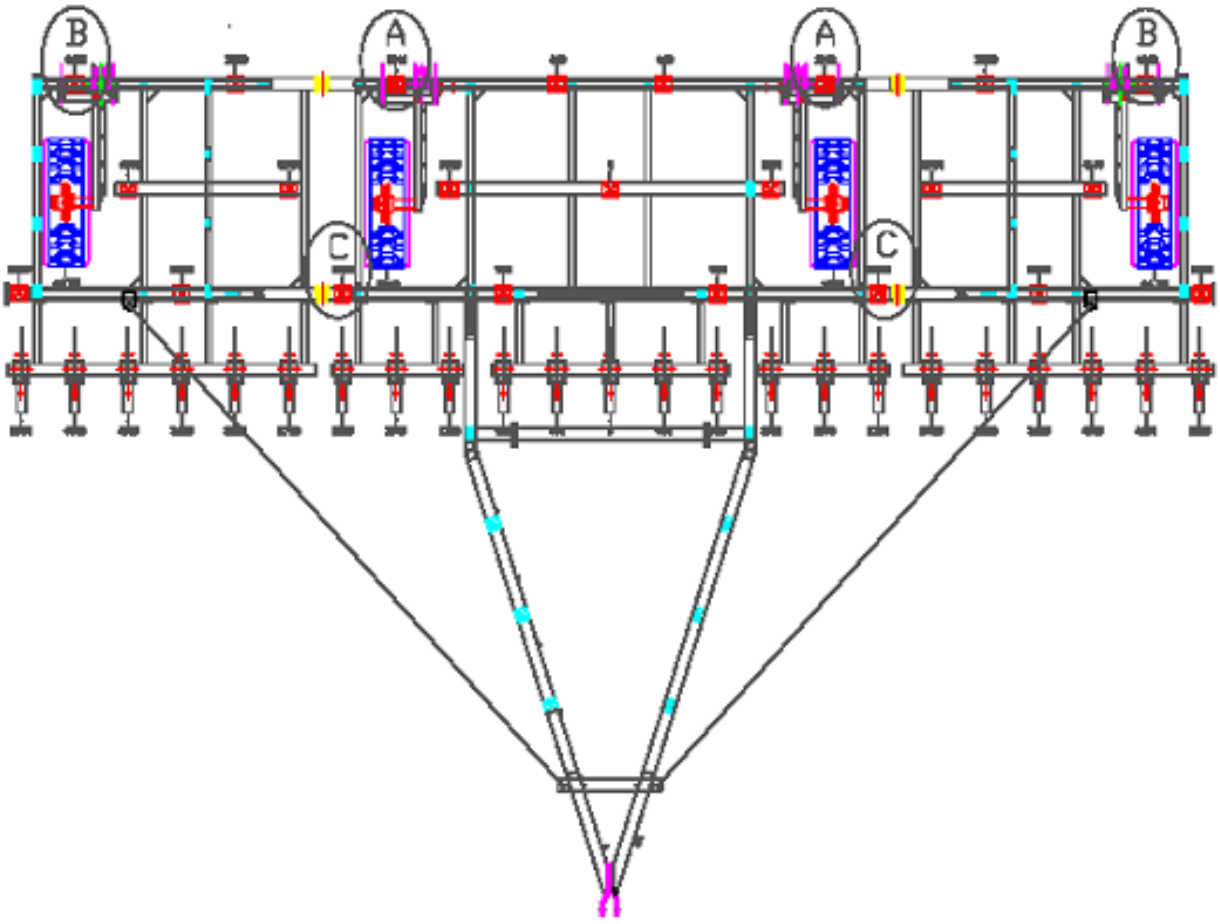
- After approximately 20 metres, stop, lift the bar and drive forward approximately 2 metres,

Picture 5.2.10: Driving Forward Allows Firm Base to Adjust Turnbuckles

- Using a rod as a gauge, push the rod into the trench to measure the digging depth using the following sequence:

- Step 1:

  Outside of centre frame – rear tool-bar (see designation ‘A’ below),



- Step 2:

  When level, drive forward and place the bar in the ground for approximately 20 metres; stop, lift the bar and drive forward a further 2-3 metres, and

- Step 3:

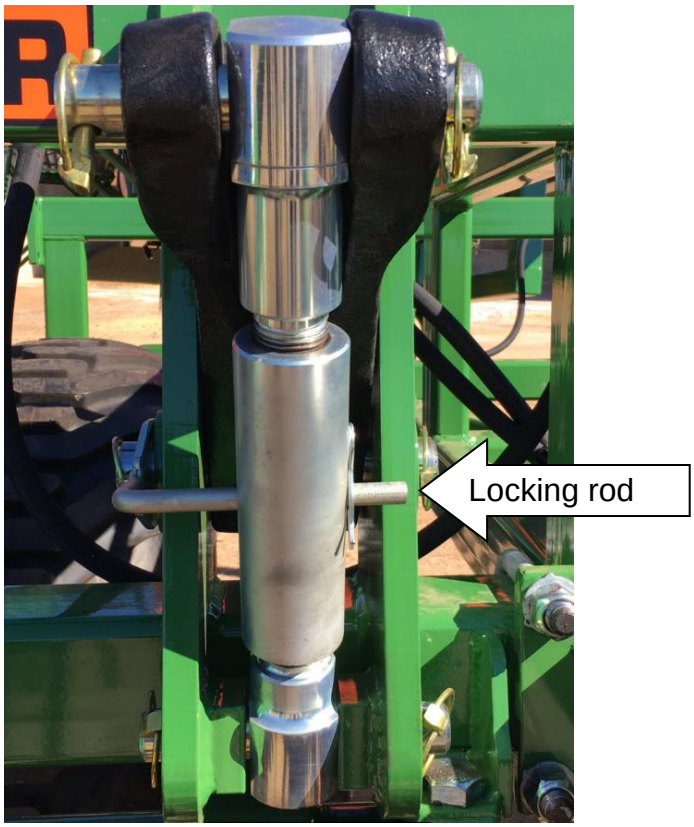
  Then check the wing on the rear tool-bar (see designation ‘B’ above).

Picture 5.2.11: Adjusting Depth Procedure – Step 2

It is essential that each section is leveled in sequence before moving onto the next section.

To adjust the level of the bar, screw the turnbuckles in or out as required. Lengthening the turnbuckle one complete turn will raise the section approximately 25mm (1”). Conversely, shortening the turnbuckle one complete turn will lower the section approximately 25mm (1”). Changes can be fine tuned in ½ turn increments.

Turnbuckle locking rods should be attached under the lynch pin on the centre rocker pin and the arm fitted into the turnbuckle hole, secured using the R-Clip. This will prevent the turnbuckle changing position during operation.



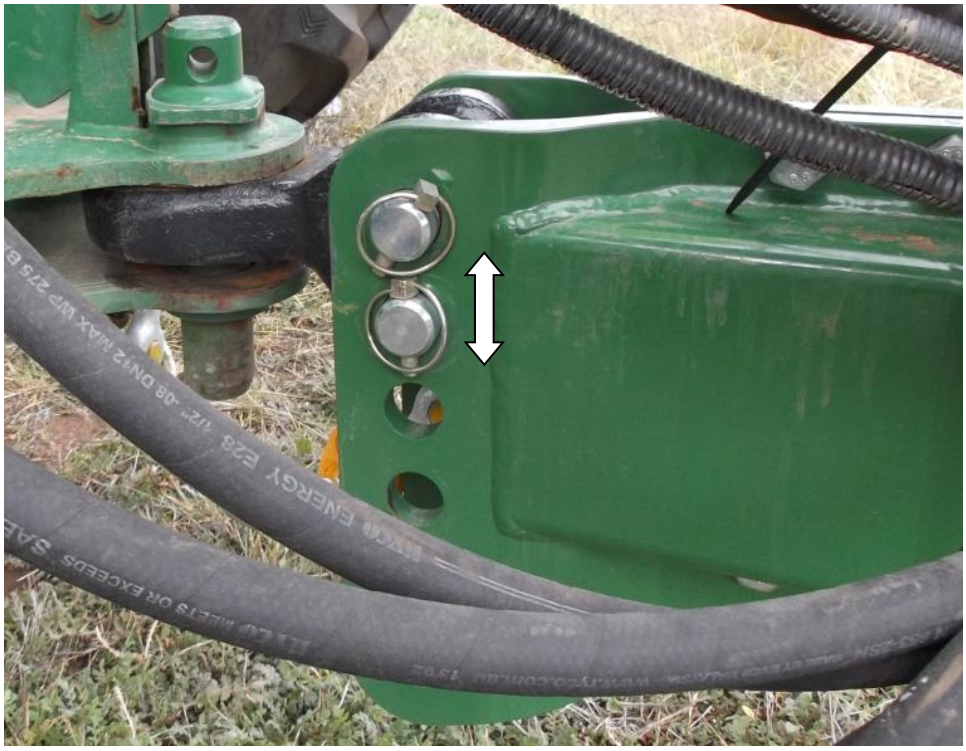
Picture 5.2.12: Locking Position for Turnbuckles

For increased transport ground clearance, turnbuckles can be adjusted further out with up to five threads showing.

The tow hitch tongue should now be moved up or down to level the machine, front to rear, when the digging depth across the width has been set. Adjustment range is increased by inverting the tongue as well as using the additional pin holes on the hitch.

The front to rear leveling is achieved by comparing the difference in digging depth between the ‘A’ and ‘C’ designated tines (see above). If the ‘C’ designated tine is digging deeper than the ‘A’ designated tine, the front of the bar is digging deeper than the back and the front of the drawbar will have to be raised.

This is achieved by lowering the drawbar tongue, see Picture 5.2.13.



Picture 5.2.13: Fore / aft Level Adjustment

The front of the drawbar has 6 holes allowing for 10 adjustment positions in sequence as follows:

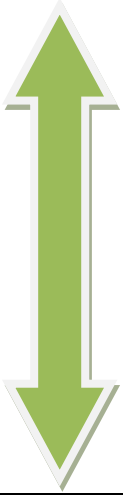
Tongue Height	Bar Depth	Holes Used (From Top)	Tongue Position
Highest Position	Front deep	1 & 2	Upper
		1 & 2	Lower
		2 & 3	Upper
		2 & 3	Lower
		3 & 4	Upper
		3 & 4	Lower
		4 & 5	Upper
		4 & 5	Lower
		5 & 6	Upper
Lowest Position	Rear deep	5 & 6	Lower

Table 5.2.1: Fore / aft Level Adjustment – Pin Hole Selection

Consider the following example:

'A' designated tines depth on the Left hand side (LHS) of the bar is 250mm (10") deep and 'C' designated tine on the LHS is 300mm (12") deep. The drawbar tongue is in the upper position and located in holes 2 & 3 (see Table 5.2.2 above highlighted in orange). The difference in digging depth is 50mm (2").

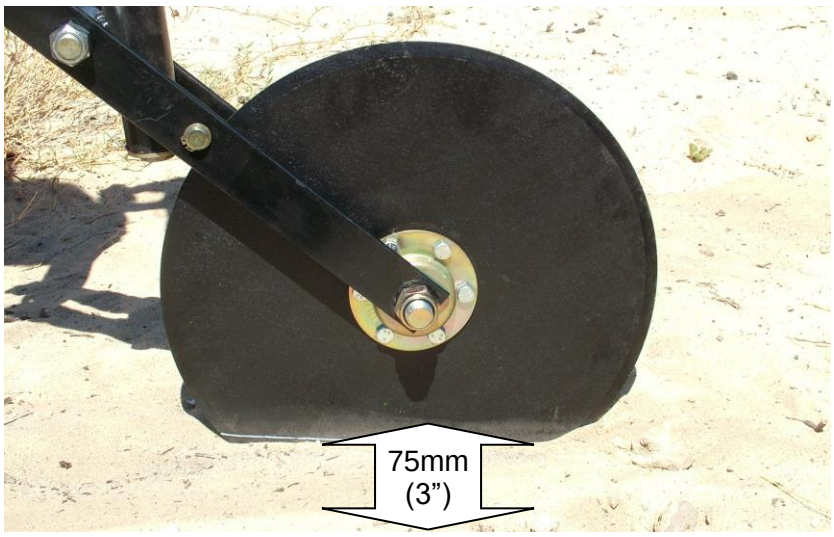
Lowering the tongue one complete hole (to positions 3 & 4) will make a 25mm (1") digging correction, front to rear. Lowering the tongue two complete holes (to positions 4 & 5) will make a 50mm (2") digging correction and would be the correct adjustment in this example.

Inverting the tongue will make a 12mm (1/2") correction.

The level should be checked again when machine is under load at digging depth by comparing the average depth of the outmost front and rear tine on the entire frame.

5.2.3 Setting Coulter Depth

Coulters affect the level of the bar and therefore coulter depth should be set prior to final paddock leveling if fitted. Ideally the coulters should be set to cut at approximately 75mm (3") in depth. If coulters are lifted out of position for any reason, the Easitill bar will require leveling both front to rear and left to right.



Picture 5.2.14: Correct Coulter Depth Setting

5.3 WING FOLD

Wings are raised and lowered by hydraulic rams. Orifice plates are fitted to the rod end of each ram cylinder to slow downward fold speed.

A relief check valve is fitted to prevent damage should an attempt be made to lower the wings before the removal of the wing transport pins.

WARNING!

- Transport lock pins must be fitted when transporting the bar
- The Easitill Deep Ripper should only be folded when the bar is stationary. Never attempt to fold wings whilst moving.

CAUTION!

Ensure wing fold cylinders are fully extended prior to the commencement of ripping. It is possible that when the wings are lowered to the ground, the fold cylinders will not allow the wings to float if not fully lowered. Hold the hydraulic lever until the circuit engages the hydraulic relief, not when the wings touch the ground.

5.4 PHASING RAM CORRECTIONS

Raising and lowering the machine is achieved using phasing rams. During operation, the machine should be raised fully to re-phase the rams approximately every hour for 20 seconds.

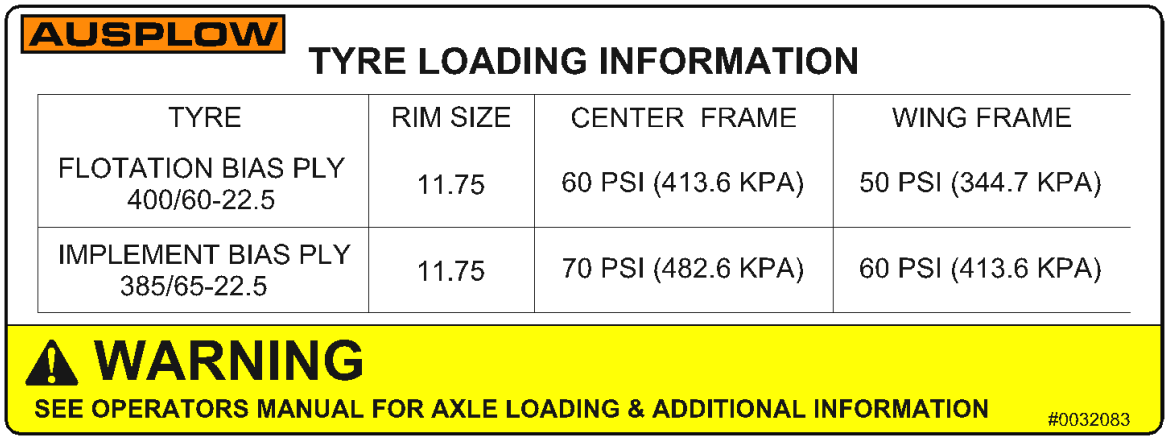
If lift cylinders are severely out of phase (usually only after storage) or prior to leveling the Easitill bar, fully raise the Easitill bar for 20 seconds until it levels, and then fully lower and hold the lever for a further 10 seconds. Repeat this process if necessary.

CAUTION!

Do not transport machine with lift cylinders fully extended as damage to the depth seals may occur. Lower lift cylinders to 20mm below the top of the stroke on depth stops (supplied) for all transport situations.

5.5 TYRE PRESSURES

The following are the recommended tyre pressures for Easitill bars:



5.6 ACCUMULATOR

5.6.1 Setting of Accumulator Pressures

Conditions	Accumulator Pressure	Hydraulic Pressure
Sand	80 Bar (1200 psi)	90 Bar (1350 psi)
Loam (Factory Setting)	80 Bar (1200 psi)	90 Bar (1350 psi)
Clay	90 Bar (1350 psi)	100 Bar (1500 psi)
Medium to Severe Rocks	Not Suitable	Not Suitable

Table 5.6.1: Suggested Accumulator Pressures

The table above outlines hydraulic and nitrogen pressures to be used in working conditions. The factory setting of the accumulator's nitrogen pressure is 80bar and can only be changed by an authorised dealer.

5.6.2 Accumulator Operation

Once the jump circuit is charged, the inlet valve should be closed to prevent oil returning through the tractor relief valve and de-pressurising the hydraulic tine system. This can occur under extreme operating conditions of if the tractor control valve does not hold pressure.

Picture 5.6.1: Accumulator Circuit Lock – Off Valve

Ensure air is removed from the hydraulic accumulator circuit by either charging and releasing pressure to the accumulator circuit several times or slightly loosening jump cylinder fittings while under pressure at the machine extremities.

CAUTION!

- Reducing circuit pressure has little effect on the tine digging force. Should digging force requiring changing, it should be done by increasing or decreasing nitrogen gas pressure and ***should only be done by Ausplow or trained service personnel.***

- It is important to maintain the correct nitrogen gas to oil pressure ratio. Oil pressure should be approximately 10% higher than gas pressure. This will ensure a constant and even load is placed on jump cylinders.

- Ensure that charge oil for the accumulator is clean. This oil remains in the system and therefore is not cleaned by the tractors hydraulic filtering system. Fouled or gritty oil can lead to premature wear of jump cylinder seals and cylinder scoring.

5.7 TURNING

It is recommended that you raise the machine for tight 90-degree turns, but it is not essential to raise the Easitill bar on contours. Lifting on corners reduces the stress on the tractor and also allows trash and roots to fall off tines.

When turning with the Easitill bar, return to an in-line position before lowering the Easitill into the digging position**.** ***If not, considerable alignment forces can cause damage to machinery.***

5.8 SETTING DIGGING DEPTH

Digging depth should be set to 300mm (12”) for 750mm shanks in most digging conditions. In light sand-plain conditions, optional 820mm shanks can be fitted to allow an additional 70mm (3”) digging depth (total of 370mm (15”)).

CAUTION!

820mm shanks should only be fitted in light sand-plain conditions. 820mm shanks should not be fitted in medium or heavy conditions or where there is a possibility of working in rocky conditions.

The digging depth is controlled and maintained by using aluminum depth stops on each wheel ram, see Section 5.2.1.

CAUTION!

Each wheel ram must have the same length or combination of depth stops for proper operation of the rams in the phasing circuit.

5.9 CHANGING BLADES

WARNING!

- When changing Dura-Blades™, the tip of the blade should not be hit with a hammer or other similar device as the tungsten may shatter. This presents a severe hazard to eyes.
- Always wear eye protection when fitting Dura-Blades.

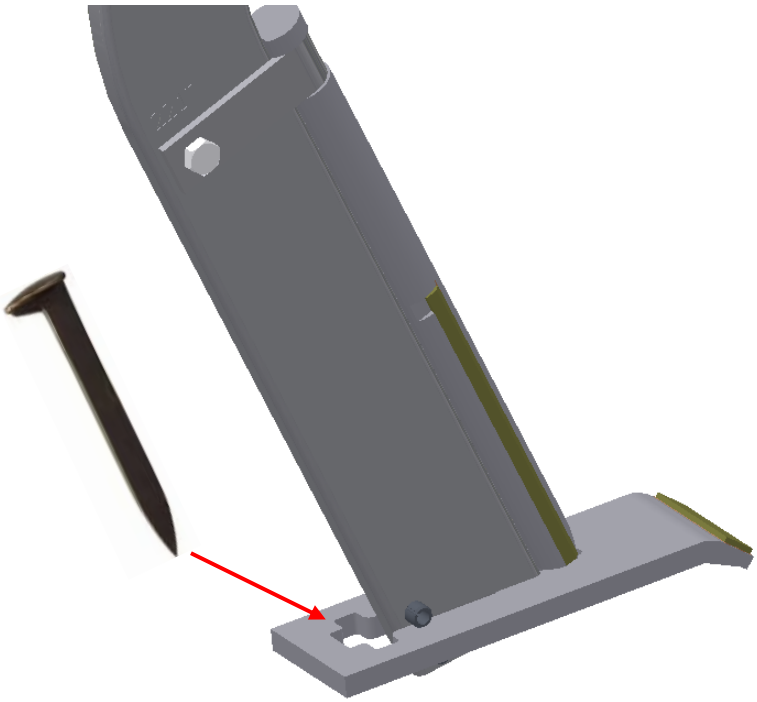
To change a Dura-blade, use the following steps:

- Install the shin guard,

Note that there are two Easitill shank guards, 750mm and 820mm. The 750mm shank guard can be fitted to the 750 and 820 shanks but only the 820mm shank guard can be fitted to the 820mm shank.

Picture 5.9.1: 750mm Shank Guard 820mm Shank Guard

- Place the new Dura-blade on the bottom of the shank and slide it back until the wedge of the Dura-blade seats firmly on the taper of the shank,
- Whilst exerting rearward hand pressure on the tip of the Dura-blade, hit the back of the shank with a large hammer to firmly engage the Dura-blade (Inertial engagement lock).



Picture 5.9.2: Alternative Method to fit the Dura Blade

An alternative method to attach the Dura blade is by using a suitable metal spike. Place the spike behind the shank and in the opening at the rear of the Dura blade, seep Picture 5.9.2.

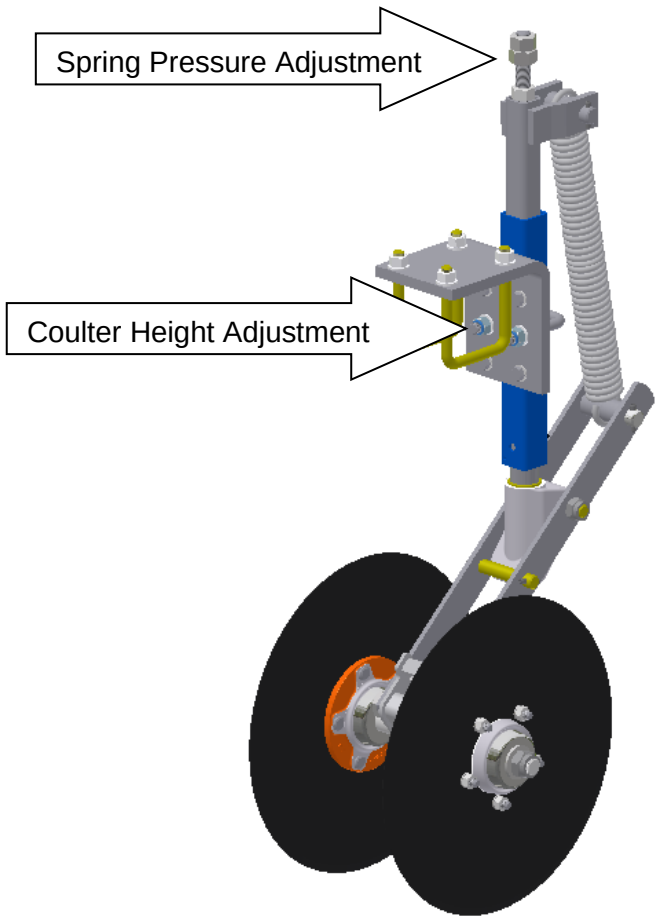
The spike is given a firm hit to engage the blade, remove the spike and repeat on other blades.

5.10 COULTER ADJUSTMENT

5.10.1 Spring Pressure

The coulter spring adjustment screw alters the downward spring pressure on the coulter disc.

Wind the screw inward to increase pressure (less thread showing) and outwards for lower pressure (more thread showing), see Picture 5.10.1.



Picture 5.10.1: Coulter Spring Pressure Adjustment

CAUTION!

Adjust spring pressure to improve either trash cutting or reduce disc wear, not cutting height.

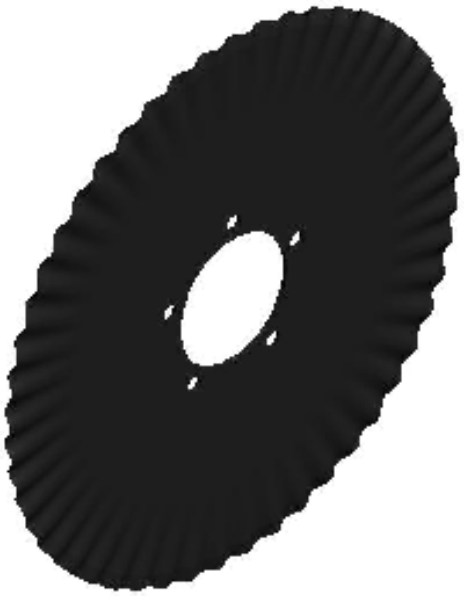
5.10.2 Coulter Height

Adjust coulter cutting height by loosening the U-clamp and sliding the coulter up or down to the desired height. Ensure that the U-clamp is straight and re-tighten nuts, see Picture 5.10.1.

Increasing coulter cutting depth decreases the cutting angle and can reduce the coulter's ability to cut surface trash. 75mm (3") is the suggested coulter cutting depth for surface trash cutting.

5.10.3 Coulter Selection

Two coulter discs are offered with the Easitill, standard flat and ripple. The standard flat disc, see Picture 5.10.1, is suitable for rocky conditions, loams and clay. The ripple disc, shown below, is better suited to sandy, light soils.



Picture 5.10.2: Ripple Disk

6.0 PADDOCK SETTINGS

CAUTION!

Additional hard-facing of the Dura-Blade™ may cause pre-heating of the blade, which in turn may damage the solder strength of the tungsten-to-blade bond.

6.1 RECOMMENDED RIPPING SPEED

Speed is ultimately determined by the size of trenches and horsepower limitations, however 7 to 8km/h is generally recommended. Slower speeds usually give a smoother finish with less soil throw.

6.2 LIFTING BAR ON CORNERS

Turning forces applied to tine components increase with digging depth, operating speed and corner turning radius.

As a general rule, the bar should be partially raised on corners up to 45° and fully raised for corners over 90°. This will reduce stress on tine components and tractor drive line components and still allow driver to control turning.

7.0 TROUBLE SHOOTING GUIDE

7.1 UNEVEN TINE SPACING

When delivered from the factory, Easitills have the tine pivot brackets fitted using a jig to ensure the correct spacing of tine brackets. Tines are also measured for straightness to within a tolerance of 13mm (1/2”). It is however, possible that two tines fitted together, one with a left bias and one with a right bias, to be up to 25mm (1”) out in spacing. This can be corrected by loosening the bolts clamping the tine pivot bracket to the frame and shifting the tine assembly to the correct position.

If the entire rear row appears to be out in one direction, this will be caused by crabbing due to incorrect leveling of the Easitill. Correct the left-to-right level of the bar prior to checking individual tine spacing.

7.2 DIGGING DEPTH VARIATIONS

The following factors can affect the digging performance of the Easitill:

7.2.1 Wind – Up

Wind-up is a combination of several factors including:

- Cable adjustment,
- Excessive tractor horsepower,
- Operating speed,
- Tractor wheel slip,
- Soil type, and
- Moisture conditions.

Wind up occurs when the front row of tines, pull in deeper and at the same time, the rear row lifts out. This generally only occurs when working in heavy country that is being worked dry. The problem is generally restricted to machines with a working width over 11m (35’).

7.2.2 Cable Tension

E460-27 and E460-29 tine machines not fitted with coulters, due to their larger wing and higher horsepower recommendation, are fitted with lower cable support brackets to counter wind-up.

Wing cables on all machines should be tight, (30mm deflection at mid cable with a 20kg weight applied) but should not be so tight as to pull the rear row of tines down, in effect reversing the effect of wind-up.

Cable tension will require rechecking after 10 and 50 hours as some initial stretching will occur.

If wind up occurs on E460-21, E460-23, E520-23 and E600-20 machines not fitted with coulters, Lower Cable Bracket Kit #11211 can be fitted to counter this.

The two primary causes of wind-up on any machine are cable tension and tractor wheel slip.

7.2.3 Turnbuckles Not Locked on Depth Wheels

If the turnbuckle locking rod is not locked, it will be free to rotate, allowing the digging depth to change, see Section 5.2 above

7.2.4 Tyre Pressures

Setting the recommended tyre pressures prior to leveling the bar and then maintaining these pressures is critical to maintaining correct digging depth control. See Section 5.5 above for correct tyre pressure settings.

7.2.5 Hydraulic Depth Phasing

All Easitill bars use a phasing hydraulic system to raise and lower the bar. The hydraulic system should be “phased” at least once per hour when working to ensure the bar remains level.

This can generally be achieved at the end of each run if ripping up and back or on a tight, 90° corner when ripping round and round.

To phase the hydraulic system, simply lift the bar fully and hold the hydraulic lever on relief for 20 seconds before lowering. Don't operate bar unless rams are closed against the depth stops.

7.2.6 Drawbar Loading

Any additional weight added to the drawbar of an Easitill is not desirable. Whilst coulters add weight to the drawbar, when the machine is working, the coulters actually apply a lifting action to the drawbar, effectively reducing "live" weight.

CAUTION!

It is not desirable to lift coulters out of the ground to reduce disc wear, as the additional weight of the coulters may induce "wind-up", see Section 7.2.1 above.

7.3 RIPPING IN ROCKY CONDITIONS

The following factors should be considered when ripping in rocky conditions:

7.3.1 Items Not Compatible

The following items should not be used or fitted:

- 820mm shanks, and
- Ripple coulter discs.

7.3.2 Items Required

The following items should be fitted to 21 and 23 tine Easitills:

- Dual accumulators.

8.0 MAINTENANCE

8.1 MACHINE INSPECTION WARNINGS

WARNING!

- Never work under an Easitill that is not supported with depth stops.
- Do not work on the underside of the Easitill unless there is a tractor connected with the hand brake ‘ON’ or the machine wheels are chocked.

8.2 CHASSIS MAINTENANCE

8.2.1 Tine Assembly – Mounting Hardware

Check tine assembly mounting hardware is secure after one hour’s operation and once per season after that. This includes:

- Tine mounting bolts,
- Tine pivot bolts,
- Shank support pin (clamps cheek plates to shank),
- Jump cylinder base pin, and
- Shank guards.

8.2.2 Main Frame– Mounting Hardware

Check machine mounting hardware after one day’s operation. This includes:

- All mounting U-bolts,
- Wheel assembly pivot bolts,
- Drawbar mounting bolts, and

- Coulter hardware.

8.2.3 Wheel Nut Tension

Check wheel nuts weekly. Ensure wheel studs have a small amount of anti-seize before tightening to 340 Nm (250 ft/lbs).

8.2.4 Daily Maintenance

- Check all hydraulic hoses for rubbing or kinking,
- Check for damage to tine assembly components including the jump cylinder seal condition. (It is acceptable for the jump cylinder to develop a dust “collar” around the end of the jump cylinder barrel), and
- Inspect jack for correct function.

8.3 TYRE PRESSURES

See Section 5.2.

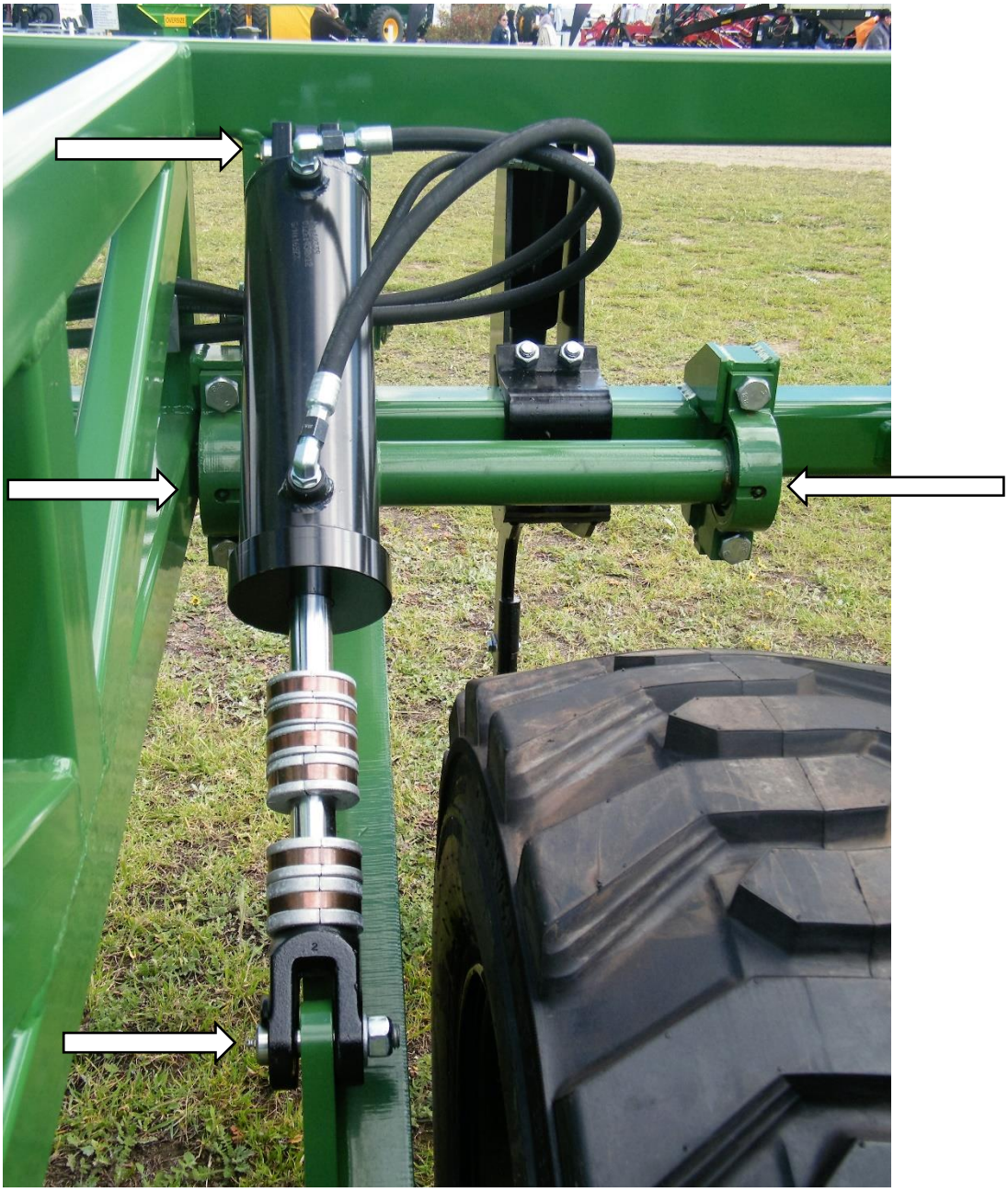
8.4 GREASING SCHEDULE

CAUTION!

- Ensure hydraulic accumulator circuit pressure is released prior to greasing all tine nipples to reduce operator strain and allow grease to circulate around the entire pin.
- Ensure weight is taken off wheel assemblies by placing tractor lift circuit in float prior to greasing. This will allow grease to fully circulate through bearing assemblies.

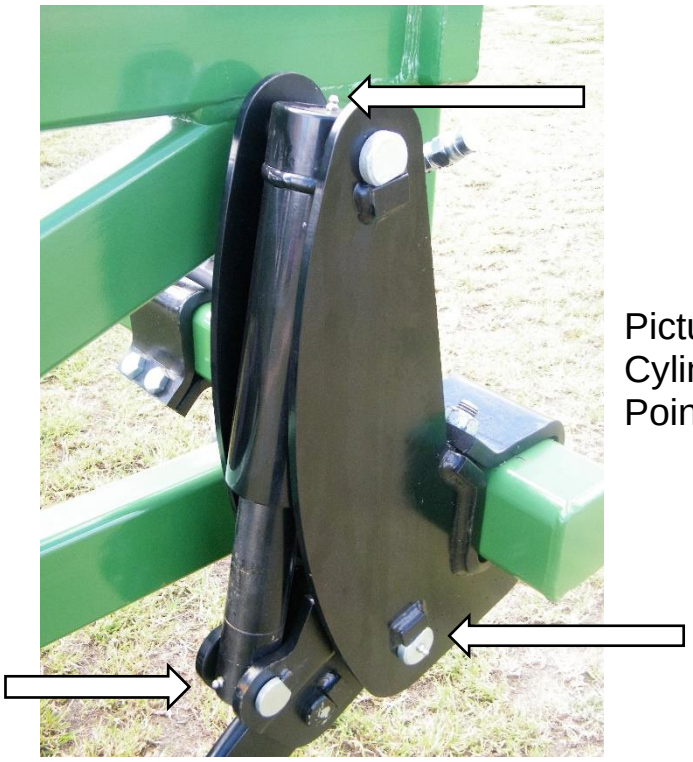
Greasing Position	Number of Points	Number of Pumps
Wheel arm pivot	2 per arm	4 - 6
Wheel Hub	1 each	4 - 6
Tine jump cylinder	2 per tine	2 - 3
Tine pivot pin	1 per tine	2 - 3
Wheel lift cylinder	2 per cylinder	2 - 3
Wing lift cylinder	2 per cylinder	2 - 3
Coulter swivel	1 per coulter	2 - 3
Coulter pivot	1 per coulter	2 - 3

Picture 8.4.1: Wheel Hub Grease Point

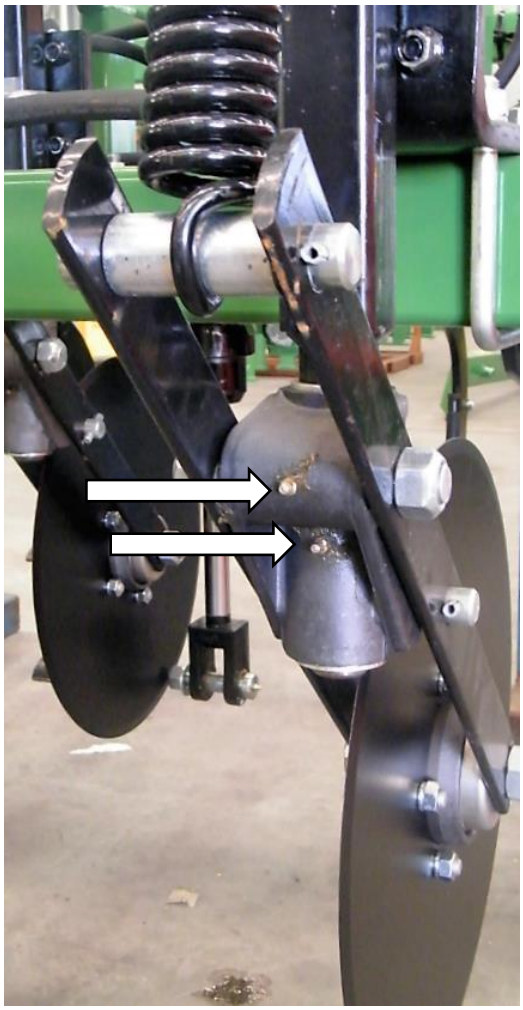


Picture 8.4.2: Wheel Arm & Wheel Lift Cylinder Grease Points

Picture 8.4.3: Wing Lift Cylinder Grease Points



Picture 8.4.4: Tine Jump Cylinder & Pivot Pin Grease Points



Picture 8.4.5: Coulter Swivel & Pivot Grease Points

8.5 TRANSPORT SPEED

The maximum permissible transport speed for all Easitills is 30km/h.

8.6 POST SEASON AND STORAGE

- Clean machine down thoroughly, paying particular attention to the lower half of the Easitill assemblies,
- Grease all grease points,
- Spray rust inhibitor or oil on Easitill tine assemblies and frames,
- Store the machine with tines just clear of the ground, supported on ram donuts, and
- Reduce accumulator hydraulic oil pressure to 15Bar (220psi).

9.0 TROUBLE SHOOTING

9.1 FLUCTUATIONS IN ACCUMULATOR OIL PRESSURE

Fluctuations in accumulator oil pressure, including a complete drop off in pressure, can be caused by:

- Low oil circuit pressure, or
- Air in the oil circuit.

To rectify, either:

- Check accumulator pressure and set as per Section 5.6.1 above, or
- Bleed hydraulic system and recharge to correct pressure.

9.2 EXCESSIVE TRENCHING

Excessive trenching can be caused by:

- Working too deep,
- Root material building up on the front of the digging blade, and / or
- The soil is too wet.

To rectify, either:

- Adjust operating depth,
- Fit coulters, and / or
- Wait for better ripping conditions.