



2900 Double-Fold Field Cultivator

Kongsilde
2900 Series



*Model may not be exactly as shown.
Kongsilde reserves the right to make changes to product designs and specifications without notice or obligation to rework.
Levelling attachments pictured on above unit sold separately.
See your local Kongsilde representative for current product specifications and options.

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INTRODUCTION

This manual has been developed to assist you in operating and servicing your new Kongskilde product. Read it carefully: it will provide you with information that will enable you to obtain years of dependable service.

Before attempting to operate this equipment, read, and understand this manual fully and follow all safety precautions. In addition, make sure that every individual who operates or works with this equipment is familiar with these instructions. Observation of these safety precautions will make your farm a safer place to work.



READ THE OWNERS MANUAL BEFORE OPERATING OR SERVICING THE MACHINE

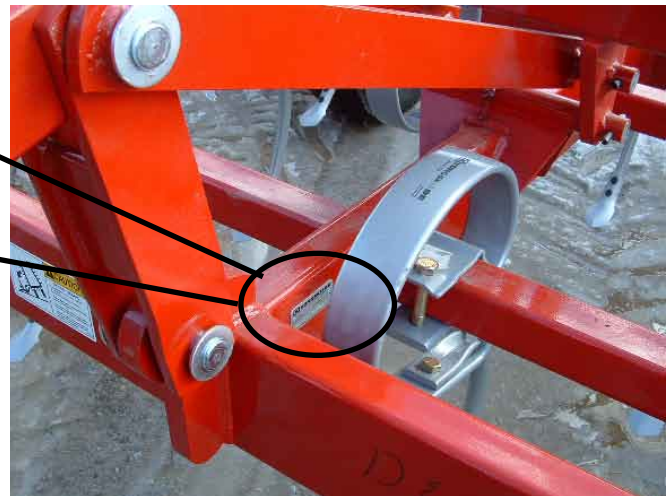
Machine Identification

The machine manufacturer along with the model and serial number are provided on the metal Serial Number Plate located on the front frame weldment of the centre section.

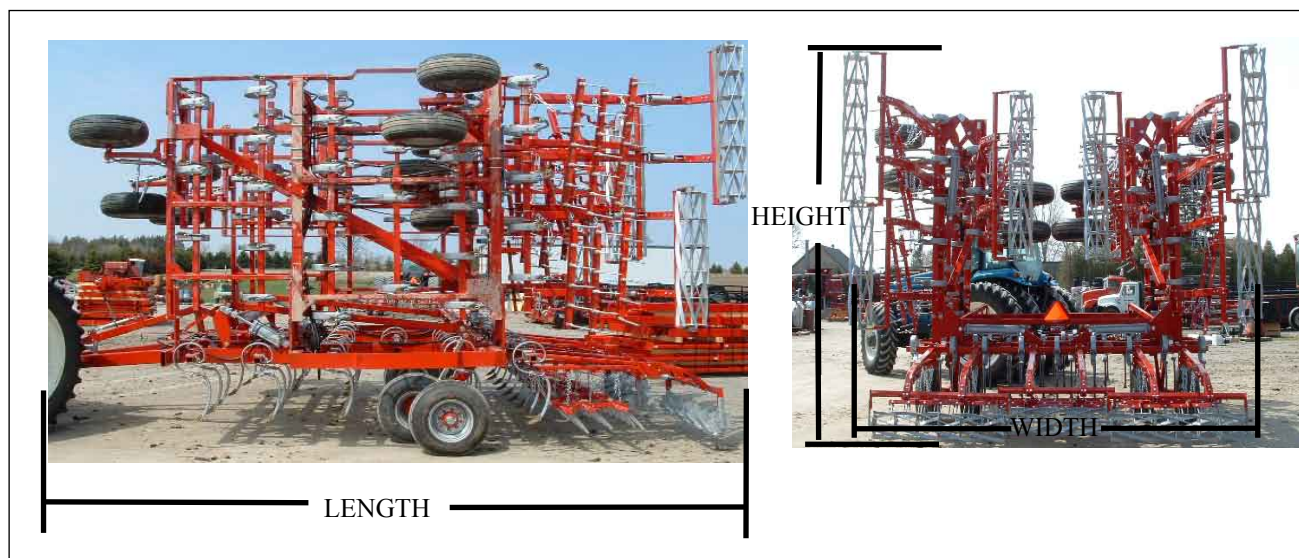
The CE Label is also affixed near the serial number plate in accordance with the CE Declaration Certificate.

Please record the model and serial number of the machine on the registration form provided in the front of the book and have it ready for reference when making inquiries regarding spare parts or service information.

If you did not receive a warranty registration form, contact your dealer and they will obtain one for you. It is important that the warranty registration be completed and returned to Kongskilde to validate the warranty protection period.



Technical Data



T e c h n i c a l S p e c i f i c a t i o n s

Type	2800 - 10	2800 - 11	2800 - 12	2800 - 13	2800 - 14	2800 - 15
Working Width ft/cm	33'2"/1010	36'5"/1110	39'8"/1210	43'0"/1310	46'3"/1410	49'7"/1510
Transport Width ft/cm	16'4/90	16'4/90	16'4/90	16'4/90	16'4/90	16'4/90
Transport Height ft/cm	11'2"/340	11'2"/340	12'9"/390	12'9"/390	14'6"/440	14'6"/440
Inside Wing ft/cm	6'7"/200	6'7"/200	8'2"/250	8'2"/250	9'8"/300	9'8"/300
Outside Wing ft/cm	3'3"/100	4'11"/150	4'11"/150	6'7"/200	6'7"/200	8'2"/250
No of Tines						
6"/16cm Spacing	65	71	77	83	89	95
4"/10cm Spacing	101	111	121	131	141	151
Wheels						
Center Frame 11 x 15 - 12 Ply 8 Bolt	4	4	4	4	4	4
Wing 9.5 x 15 - 12 Ply 6 Bolt	4 + 2-8Ply	8	8	8	8	8
Gauge Wheel 9.5 x 15 - 8 Ply 6 Bolt	2	4	4	4	4	4
Weight - Vibro Till (lbs)	11700	12500	13300	14200	15000	15800
On 4"/10cm Tine Spacing						
Weight - Combi Harrows (lbs)	2665	2800	2930	3060	3200	3300
Weight - Double SS Roller (lbs)	2680	2980	3280	3580	3880	4180
Weight - 5 bar Drag Harrow (lbs)	1680	1830	1980	2130	2280	2430
Weight - Spike Leveller (lbs)	525	550	570	590	610	630
Appr. Hp*	210-250	230-280	250-300	270-320	290-340	310-360

Note: Suggested hp requirements are base on average conditions. Actual requirements depend on working speed and soil condition.

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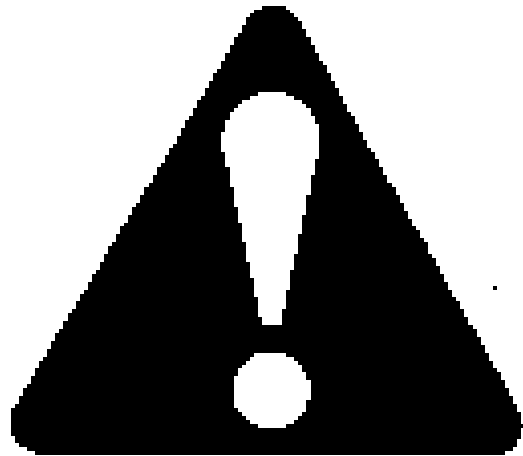
SAFETY ALERT SYMBOL:

This safety symbol, is used to call your attention to instructions concerning the personal safety of the owner or operator.

WARNING! Do not operate this machine unless you have read and understood the instructions and safety information in the Kongskilde Operator's Manual.

Failure to follow the instructions for safe operation of the equipment could result in serious injury or death. Proper care and operation of this implement is your responsibility.

Contact your dealer or Kongskilde for replacement manuals, safety decals and replacement parts.



SAFETY KEY WORDS & ALERTS:

The key words - DANGER, WARNING and CAUTION used alone or in combination with the Safety Hazard Alert Symbol in this Operators Manual and on Safety Decals located on the framework of the machine, are used to identify hazards on or near the implement.

Safety Instructions indicate procedures which must be followed to avoid hazards.

Hazard Alerts are identified by the key word, and the symbol:

DANGER - An immediate hazard which **WILL** result in severe personal injury or death if the proper precautions are not taken.

WARNING - A potential hazard or unsafe practice which **COULD** result in serious personal injury or death if the proper precautions are not taken.

CAUTION - A potential hazard or unsafe practice which **COULD** result in personal injury or in product or property damage if the proper precautions are not taken.

SAFETY DECALS:

Safety Decal Locations:

Safety Decals are located on the framework of the implement. The specific locations are chosen to provide optimal visibility to the operator or bystanders. In the case of hidden or obstructed hazards or safety precautions, the decals may be located on or near the hazard, or other convenient locations near hook-up points, adjustment devices or service points frequently visited by the operator.

Please read and obey all safety decals on the machine. Ensure they are kept clean and in good condition. Kongskilde is committed to safety and provides replacement safety decals and operator manuals at no charge if they become lost, damaged or illegible.

Each safety decal is identified by a part number, and are available through your Kongskilde Dealer.



IMPORTANT NOTICE:

Kongskilde cannot anticipate every possible circumstance that might involve a hazard with this product. The hazard alerts and safety instructions in this publication and on the product are therefore not all inclusive. If a tool, procedure, work method or operating technique not specifically recommended by Kongskilde is used, you must satisfy yourself that it is safe for you and others. You must ensure that the implement will not be damaged or made unsafe by the operation, maintenance or repair procedures you choose.

Kongskilde will not be held responsible for any unauthorized modifications made to this product and will immediately void the warranty coverage.

PRODUCT SAFETY PRECAUTIONS



Make certain all safety decals, reflectors and SMV signs are applied to your machine. Refer to your local governmental regulations for more information on proper procedures and markings for safe road transport in your area.



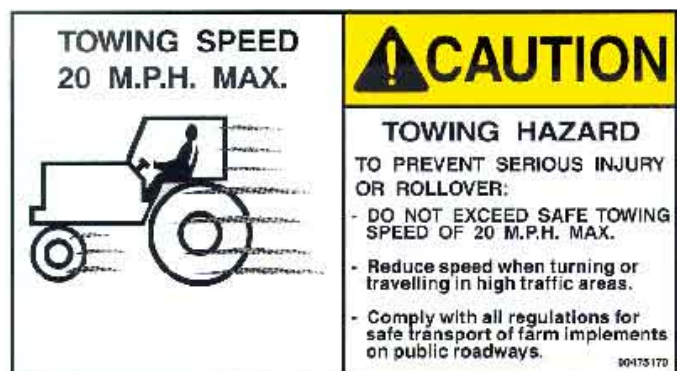
Do not transport over 32 kmh (20 M.P.H.) Reduce speed in adverse weather, when turning or travelling on inclines or uneven ground. Always start and stop slowly..



DANGER! Watch for wires. Take care when transporting, folding or unfolding the implement around power lines. Serious injury or death to the operator or bystanders will result through direct or indirect contact with power lines.



IMPORTANT NOTE: This unit has a narrow transport width and a high centre of gravity which may pose a tipping hazard when folded for transport.

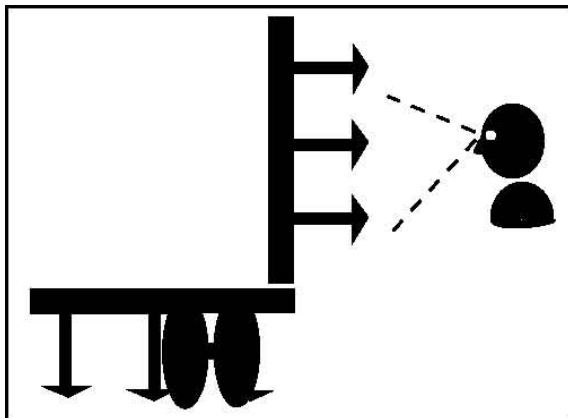




The operator is responsible at all times to comply with the local government regulations and insure the safe transport of the implement when transporting large or oversized implements on public or private roadways. Careful consideration must be given in order to prevent accidents with other vehicles and avoid coming in contact with obstacles such as: bridges, tunnels, overpasses, guard rails, road signs, traffic lights, power lines, public utilities, and other structures that may be encountered along the chosen route. In some jurisdictions the operator may be required to obtain special permits or arrange for escorts before transporting oversized equipment. Kongskilde is not liable for personal or property damage caused by inappropriate, unauthorized or unsafe transport or operation of equipment.



Never unfold when there are bystanders in the area of the wing fall zone. Be certain all persons are clear of working area in and around the machine whenever folding, unfolding, raising or lowering the machinery or in any way using the hydraulic system.



Be alert when walking around the machinery in the folded transport position to avoid walking into the point of a shank or sweep. Severe head or body injury could result.



Make sure that the tractor is shifted into park before getting out to remove transport locks and wing fold lock pins. Never remove wing lock pins or wheel transport locks when the implement is sitting on uneven ground where tipping could occur.



Never remove transport lockout devices or unfold the unit unless cylinders are completely full of oil. Failure to properly charge the folding hydraulics with oil could allow the wings to free fall when unfolding, causing damage to the equipment and possible injury to the operator or bystanders. Never fold the cultivator wings by any mechanical method! Always charge the hydraulic system first and use it to fold and unfold the wings. Stand clear of the machine and watch for overhead hazards or objects in the wing-fall zone when folding and unfolding.



SAFETY DEVICES FOR Folding and Transporting Implements:



WHEEL LOCK FOR TRANSPORT CYLINDERS

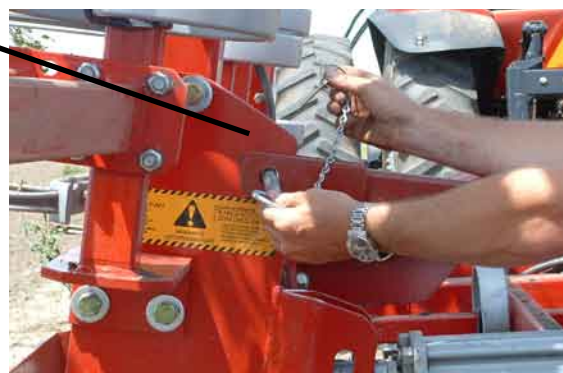
Insert a safety lock over the centre section master cylinder rod and fasten the pins. Slowly ease the cultivator down until the wheel lock is wedged firmly in place.

When cultivating the safety lock should be stored in the tractor box or in a place that will not interfere with the safe operation of the equipment.



MECHANICAL WING LOCKS FOR SAFE TRANSPORT

When the wings are raised and folded for transport, the mechanical system locks wings in transport position with the wing fold anchor shown. Proper use of the wing fold anchor will prevent the wings from falling uncontrollably during transport if a problem occurs with the hydraulic system.



MAINTENANCE & LUBRICATION



Use extreme caution around suspected hydraulic leaks or damaged hose lines. Hydraulic fluid under pressure can be extremely dangerous. Always wear hand and eye protection. Always lower the cultivator to the ground and release hydraulic pressure before performing maintenance to the hydraulic system.



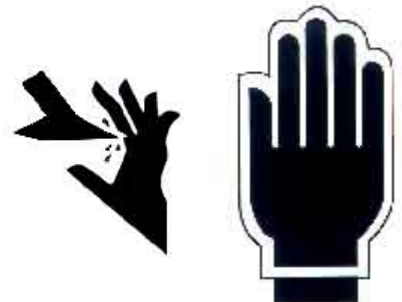
Take care to keep the floor area clean when performing maintenance to the machine. Help protect our environment and prevent injuries from falls by cleaning up any spilled or leaking fluids with absorbant products. Take care to dispose of contaminated rags or absorbants in accordance with your local environmental regulations. Put away tools and roll up any air lines or electrical cords that were used when making repairs to the equipment and dispose of scrap materials or worn out parts in an appropriate manner.



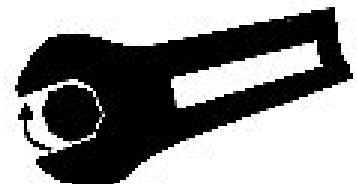
Never crawl under the machine to make repairs or adjustments or replace tines and shares, etc... unless you have properly blocked and supported the cultivator frame. The cultivator must be secured in a fixed position in order to prevent it from moving or falling before making any attempt to work underneath. Use suitable shop stands or lifting devices that can support the entire weight of the implement. Never use cement blocks, bricks, hollow tiles or other props that may crumble or collapse under continuous load.



Wear gloves when changing shares or removing share bolts as the edges can become extremely sharp when worn.



Regularly check all nuts and bolts for tightness and secure if loose. Replace worn out or damaged machine components. Establish a good routine for regular inspection, lubrication and maintenance in order to keep the machine in good operating condition.



Refer to the section on "Safety Precautions" and make sure that all persons working with the implement have been instructed on the safe operation of the unit before performing any maintenance operations in and around the working areas of the machine. Make sure that the implement has been secured properly using the lock out devices supplied and/or ensure that all reasonable precautions have been taken to ensure that maintenance can be conducted in a safe manner by service personnel.

1. Lubricate the pivoting linkages, wing fold hinges and other wear points regularly.



3. Inspect the wheel arm pivot points and linkages regularly for signs of excessive wear.



2. Grease the wheel bearings, hubs and tandem arm pivots weekly, especially before road transport. Bearing lubrication is recommended more frequently depending on the acreage worked or amounts of road travel involved.



4. Regularly check the condition of the tires and rims and always maintain proper tire inflation. Tire service should be undertaken by an authorized tire service professional.



5. Check all nuts and bolts, especially the tine clamp bolts, after the first few hours of operation and secure if loose. Inspect the shares daily and replace worn ones.



Never crawl under the machine to change shares or perform other maintenance unless the frame is blocked to keep it from falling in the event of accidental operation or failure of the hydraulic system.



6. Check all wheel bolts and secure transport locks before transporting. Wheel bolts should be checked again after the first few hours of use, after the first day and after the first week of use.



7. Occasionally check the condition of the pivot pin connections and other moving linkages for excessive wear. Replace excessively worn pins and linkages.



8. Frequently check the hydraulic system for leaks. Tighten any leaking fittings and carefully inspect the hydraulic lines and replace any worn or damaged hoses. Caution: Hydraulic oil under pressure can be extremely dangerous.



9. The cultivators hydraulic system is a rephasing type system where the movement of the larger centre section Master Cylinder controls the movement of the smaller wing wheel cylinders connected in series. It is a very reliable system but can be difficult to troubleshoot if one of the hose connections are wrong or an internal leak develops in one or more of the cylinders. For these and other problems, please refer to the hydraulic trouble shooting guide in the back of the booklet.

10. After making repairs to the hydraulic system please follow these additional instructions in order to remove air from the wheel cylinders and hydraulic lines:

A) Activate cylinders through two full cycles of extension and retraction.

B) Extend cylinders completely and hold lever while relief valve squeals for a minimum of 30 seconds.

C) Activate cylinders to full extension and retraction, they should now move in unison. If the cylinders do not move in and out smoothly repeat step B, as there may still be some air in the lines.

Note: If wheels do not work in unison, refer to the layout diagrams for the hydraulics. Carefully check to make sure that the hose connections & cylinder locations on the cultivator match the hydraulic assembly diagrams provided.



11. The cultivator should never be assembled and placed in the folded position without first charging the hydraulic system, but never assume this has been done! Even on a new machine, leaks can occur from improperly assembled hydraulic components and the folding system could have lost enough oil to allow the wings to free fall to the ground when the unit is unfolded.

If you suspect there is a problem with the wing fold system...



DO NOT USE THE HYDRAULICS TO LOWER THE WINGS!

If the wings are in the folded position with uncharged cylinders or you have discovered a leak in the folding system, the wings should be lowered to the ground in a safe manner. Be sure the wing is supported during the entire lowering process. The use of a crane is suggested.


12. Remove clevis pins from the cylinder rods. Hold or block the wing fold cylinders in an upright position so that the rods can be extended and retracted several times to fill the cylinders with oil and remove all the air from the hydraulic lines. Replace clevis pins and check to make sure all connections are correct and secure. The hydraulic system can now be operated safely to fold and unfold the cultivator.



PARKING THE CULTIVATOR

1. When not in use, park the cultivator on level areas only. Install the wheel locks and wing fold lock pins and release all hydraulic pressure before disconnecting the hydraulic lines from the tractor. Lower the tongue jack so the hitch does not drop suddenly when the cultivator is unhooked from the tractor. If the unit will be parked outside for an extended period of time, wash the cultivator to remove dirt and debris and make any needed repairs. Remove the wheel locks and lower the cultivator down to rest on the tines. Fully retract the wheel cylinders so that the cylinder rods will not be exposed to the elements during the winter months.



2. When parking the unit in the transport position, ensure that the unit is stable by blocking the wheels to prevent the unit from rolling when disconnected from the tractor.
3.  **IMPORTANT NOTE:** Depending on the type of optional levelling attachment used, the cultivator may be back heavy and therefore the tongue will fly up when disconnected from the tractor unless the optional rear jack is used. In order to keep the cultivator level when parked and prevent possible injury, when removing the draw pin, be sure to lower the optional rear jack before disconnecting from the tractor.



OPERATING INSTRUCTIONS

1. When hooking to the tractor always use an approved draw pin. Secure the draw pin in place with a safety pin (or other locking device). The tractor and cultivator should also be connected together with an approved safety chain.



2. Make sure that the hitch jack or optional rear jack is raised before moving the cultivator.



3. Connect the cultivator's hydraulic lines to the tractor. Note that the 3/8" lines activate the wing fold hydraulics and the 1/2" lines activate the wheel lift hydraulics.



4. Extend the master wheel lift cylinder and remove transport lock from the centre wheel cylinder rod.



5. Remove the wing lock pins and activate the hydraulics to lower the wings. Check to see that no observers or obstructions are in the path of the wings!



6. For proper field operation the wing fold cylinders must be fully extended to allow the wings to float. The cylinder rod pin should be centred in the slot in the float position.



7. Level the cultivator for the tractor draw bar height and set the working depth by following the procedure outlined later in this manual under Operating Adjustments.



8. Periodically lift the machine completely out of the ground (or when turning at the end of the field). Fully extend the cylinders and hold the remote lever briefly. This rephases the wheel cylinders and keeps the wings at a uniform working depth with the centre section.



9. Try to avoid making sharp turns when working the soil. Turning with the tines in the ground can cause high stress levels in the cultivator frame and twists the tines, causing premature failure. Sharp turns are especially stressful on the wide wing fold models, as the wing on the inside of the turn may actually try to move backwards in the soil! Lifting the cultivator helps to reduce stress on the cultivator tines and framework.



FIELD LEVELLING PROCEDURE OVERVIEW

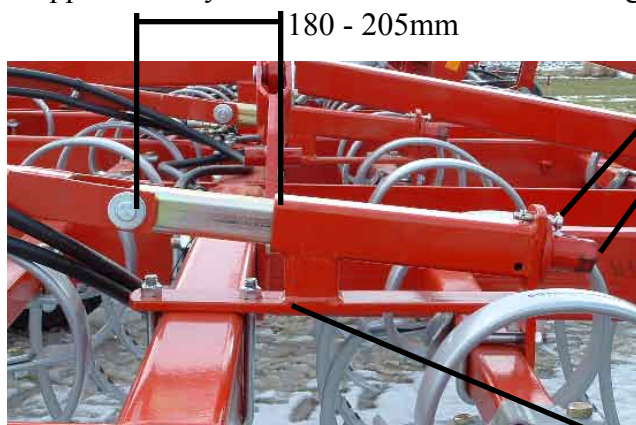
1. Set the working depth of the cultivator as described in step 4 of the operating adjustments.
2. Cultivate a short distance and stop. Level the cultivator in the fore aft direction using the procedure in step 3, of the operating adjustments.
3. Adjust the wheel cylinder towers on the wings according to step 2 in the operating adjustments in order to level the wings from side to side with the centre section.
4. Repeat step 2 & 3 until you are satisfied that all the tines are working the soil at a uniform depth.
5. Set the height of the gauge wheels in order to distribute the load evenly across the front of the cultivator and to help maintain cultivating depth accuracy. See step 6 of the operating adjustments.
NOTE: The gauge wheels should not be used to set the working depth of the tines nor are they designed to carry the weight of the machine. They are provided to ensure depth accuracy is maintained in uneven field conditions and should only have light contact with the surface of the ground.
6. Use the Mechanical Stroke Control on the master cylinder, according to step 5 in the operating adjustments, whenever you need to adjust the working depth of the cultivator from the original mechanical depth setting of the wheel tower sliders. Remember to re-adjust the gauge wheels after changing the working depth setting of the machine.



1. Before the machine can be used in the field some basic adjustments need to be made in order to level the machine from side to side and front to back. The first step is to make sure that the centre section is level and that both centre section wheel arm links are set at the same length. The adjustable wheel link provides adjustment for the working depth and road clearance depending on the type (and height) of the tine that is installed on your cultivator. This should have been done during set up, but it is important to verify that both wheel arm links are adjusted equally so that the centre section will work level from side to side within the depth range for tine option you have chosen.



2. Adjust the wing wheel sliders in order to make the cultivator wings run level from side to side with the centre frame. Other "fine tuning" adjustments can be made later when you get to the field. When the wheel cylinders are fully retracted, adjust each wheel tower slider by removing the clip pin and turning the threaded adjuster with a 1 1/2" - 38mm socket or box end wrench. We suggest that the sliders be adjusted to an initial setting of 180 - 205mm. (NOTE: A 25mm change in the slider adjustment makes approximately 80mm difference in the working depth).



Remove lock pin to make adjustments.

Turn the adjustment casting to move the slider in or out as needed so the wing wheel is running level and at the same depth as the center section from side to side. Be sure to set both wing wheel sliders the same by measuring the extended length of the slider.



Note how the cultivator wings in this photograph are running higher than the center section. Therefore the wheel adjuster should be lengthened to lower the wing wheels and make the wings level with the centre frame.

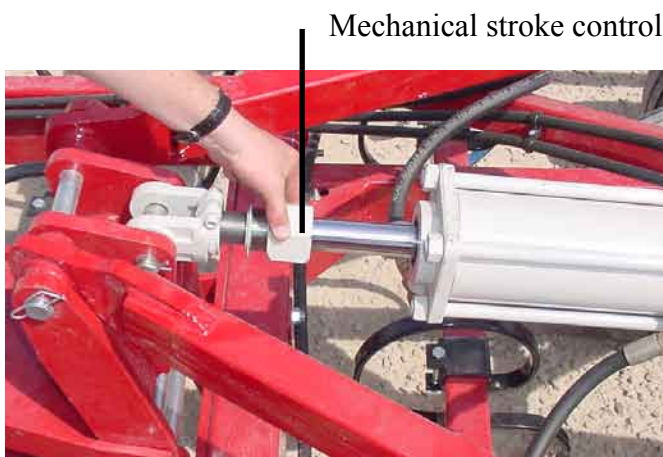
3. Once the cultivator is set level side to side, the machine must be adjusted to run level from front to back. This "fore & aft" leveling is accomplished by adjusting the top link of the hitch in or out by turning the turnbuckle adjuster located on the hitch, adjust the top link as required to bring the front row of tines level with the tines on the back. The adjustment of the working depth and setting of the gauge wheels will also have an influence on the before and after levelness of the machine and you will have to "fine tune" this setting as well when you begin working in the field. The front and rear tines should be working the soil to the same depth.



Turn the Turnbuckle to lengthen or shorten the top link as needed so the machine is running level from front to back.



4. After following the previous steps to level the machine, the initial working depth of the tines can be set. This is accomplished by adjusting the mechanical stroke control on the centre section master cylinder out until you are cultivating at the desired depth. The wheel tower sliders and gauge wheels can then be fine tuned so that the wings work level and at the same depth as the centre section.



5. In order change the working depth of the tines, simply adjust the mechanical stroke control on the master cylinder in or out to "shallow up" or deepen the cultivator from the original depth setting. It should not be necessary to readjust the wheel tower sliders, however you will need to reset the gauge wheels. It is important to note that the mechanical depth stop will not compensate for a poor job of levelling the machine if the initial mechanical adjustments have not been set properly.



6. The gauge wheels should be adjusted equally to evenly distribute the load across the front of the cultivator and help to maintain fore and aft levelness. The gauge wheels can be adjusted up or down as required by means of the ratchet turnbuckle. Use a tape measure to set each wheel the same.



Insert handle and flip lever up or down to make adjustments.

Adjust turnbuckle in or out to raise or lower the gauge wheels as required. Set both wheels the same by measuring the length of the turnbuckle from pin to pin.

Adjust the gauge wheel to keep the front corner of wing from diving or digging in too deep. Gauge wheels are not to be used to set the working depth and carry the load of the wings. They should only have light contact with the ground to help maintain depth accuracy and keep the corners of the wings from dipping down in tough field conditions.

7. Take care to secure the wheel adjustments by snapping the clip pins back into the "locked" position. This will keep the machine from going out of adjustment when working in the field.



HYDRAULIC TROUBLE SHOOTING CHART

Problem	Cause	Remedy
1) Cultivator cylinders do not work in unison. Cylinders seem spongy.	Air in System	Raise cultivator to highest transport position. Hold the hydraulic lever on the tractor in the "raise" position for approx. 30 seconds. Flow passes through the cylinder bypass ports to flush air out of the system.
2) Wing cylinder contracts when master extends.	Hose connections wrong.	Check circuit according to the hose layout diagram.
3) Wing cylinders stroke further than master cylinder when retracting wings too deep, or: One wing cylinder will not retract fully when all others are retracted.	a) Wrong hose connections. b) Cylinder sizes or locations wrong.	Check circuit according to the hose layout diagram. Check cylinder locations and sizes according to hydraulic layout diagram.
4) One section of cultivator settles down in use.	a) System not being rephased. b) External leak from cylinder, hose or fitting. c) Internal leak in cylinder.	When the cylinders are extended fully each cylinder bypasses a small amount of oil to allow other cylinders to catch up. This rephasing is done each time the cultivator is raised fully to the top and must be done periodically and is recommended at each end of the field. Repair leaking component. Install new cylinder seal kit in the wing cylinder that settles.
5) Entire cultivator settles.	a) Tractor valve leaking back.	To check, remove hose from the tractor when cultivator is raised. This eliminates the tractor valve from the circuit. CAUTION: Make certain your tractor connections safely allow this operation.

Problem	Cause	Remedy
5) Entire cultivator settles.	b) External leak.	Repair leaking component.
	c) Wing cylinder and master cylinder leaking internally.	Install new cylinder seal kits.
6) Cultivator settles in transport or while parked.	Not using the transport lock.	The hydraulic system is not intended to hold the cultivator up permanently. A slow settling when not in use is normal.
7) Cylinders will not rephase.	a) Dirt blocking bypass ports in cylinder.	Air pressure can be used to determine which cylinder will not bypass when extended.
	b) Faulty cylinder.	Rephasing cylinder and repair parts must be used in this service.
8) Air returns to system causing problems 1, 4, 5 to recur.	a) Air entering system.	Check tractor oil level. Check tractor hydraulic pump. See item 7.
	b) See item 7.	Note: A mixture of oil and air forms a foam which may give unexpected results. It may take a few hours use before all foam is expelled.
9) Centre section is not level or goes out of level in use.	a) A frame or wheel link bolt or pin bent or broken.	Replace broken bolt.
	b) A frame or wheel linkage bent.	See Dealer for instructions on straightening or replacement of bent parts.
	c) Wheel links were not set in the same hole.	Always adjust wheel towers the same.
10) Both centre section and one wing settle together. Remaining wing raises or stays at the top.	Internal leak in the master cylinder.	Install new cylinder seal kit.

DISPOSAL, SALVAGE AND RECYCLING OF WORN OUT MACHINES OR MACHINE PARTS:

- 1) The disposal of hydraulic lines, cylinders or oils must be performed in accordance with the current regulations for your area.
- 2) The disposal of metal parts does not require any special procedure, however proper dismantling and scrapping of worn out metal parts is recommended.
- 3) The disposal of all other parts and materials such as tires or other rubber and plastic parts must comply with current regulations.
- 4) The use of local recycling programs and / or disposal of this unit through an authorized salvage company is recommended.