

CUSTOMER PREPARATION CHECKLIST

ROTARY TILLER

The following checklist should be completed using this Operator Manual for reference.

- □ Assemble Three-Point A-Frame
- □ Check Fluid levels in Gearboxes.
- □ Lubricate all fittings.
- □ Ensure all shields are secured and in good condition.
- □ Ensure all fasteners are secured.
- □ Ensure all Slip clutches have been checked for proper operation.
- □ Operators have read Owners Manual and understands the safe and proper use of the implement.
- □ I understand that unauthorized alteration voids the warranty.



WARNING

OSHA, ASABE, SAE and ANSI standards require the use of protective guards at all times for non-agricultural use. ABI strongly recommends that such guards should be used for Agricultural uses as well, to minimize risk of property damage, serious bodily injury or even death from thrown object hazards or by contacting rotating parts, i.e. driveline, implement tines.

Model Number:

Serial Number:

(Serial Number Plate location is shown on page 8)

Do not remove this checklist from the Operator's Manual.

It is the responsibility of the owner to complete the procedures listed above.

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Welcome

ABI Innovations would like to thank you for choosing the best built rotary tiller on the market today. With proper care and maintenance your tiller will last for years to come.

The rotary tiller is designed as a non-commercial soil preparation implement. The primary desired use is for preparing a seed bed. (See Tractor Requirements on page 8)

Your rotary tiller is designed for applications such as landscaping, gardening and light commercial use.

ABI Innovations maintains an ongoing program of continuous product improvement. Therefore, ABI reserves the right to make improvements in design or specification changes without incurring any obligation to replace said items on units previously sold.

There is a possibility that some illustrations in our manuals were of prototype models, design of production models may vary in detail from those shown in our manuals.

IMPORTANT: Some photographs or illustrations may show safety shields removed for purposes of clarity. DO NOT OPERATE THIS TILLER WITHOUT ALL SAFETY SHIELDS IN PLACE!

REMEMBER SAFETY FIRST!

Be Alert - Eliminate unsafe habits and risky behavior, recognize hazards as they exist and read and follow the Operator's Manual for your ABI Rotary Tiller and your tractor!



Getting Started

This manual provides information necessary to effectively and safely operate your rotary tiller. This manual also provides manufacturers recommendation of proper use and maintenance of the implement.

The information presented in this operator's manual is applicable only to the make and model of the rotary tiller at time of purchase. See your authorized dealer or manufacturer for any needed additional information.

Terminology

"Right" or "Left" as used in this manual is determined by facing forward in the direction the machine will operate while in use unless otherwise stated.

"NOTE:" provides the operator a brief summary of information that will assist in operating the implement.

"*IMPORTANT:*" denotes that the following content has significance in the operation or maintenance of the implement.

Owner Assistance

Please contact your ABI Innovations Dealer if you have any questions regarding your ABI Rotary Tiller, need repairs, or to order replacement parts.

The parts on your rotary tiller have been specifically designed and should only be replaced with approved ABI Innovations parts.

Customer Service

ABI Innovations wants you to be satisfied with your new ABI Rotary Tiller. If for any reason you do not understand any part of this manual or are not satisfied with the service required, the following actions are suggested:

Contact our Customer Service Department: Our online support centers are available to you 24/7 and fill out our Help Desk form (We will respond within 24 hours; usually much more quickly.) Or you may contact our Customer Service by calling our toll free number 877-788-7253 ext. 208 during our normal business hours (Monday and Friday 8 am to 5 pm EST, Tuesday – Thursday 8 am to 7 pm EST). After hours or weekend support, simply leave a voice message for a specialist. He or she will be automatically notified to call you back promptly. Select Specialist. (Excluding Holidays)

For further assistance: contact our Online Support via web: http://www.abiabsolute.com/support/index.html. Or you may contact us in writing at:

> Absolute Innovations, Inc. 1320 Third Street Osceola, IN 46561

Online Support via web: http://www.abiabsolute.com/support/index.html

Safety

For the Safe Operation of Your ABI Rotary Tiller:



Owner and operator's responsibilities are to read and understand the Operator's Manual before operating the tiller! This alert symbol found throughout this manual is to call your attention to the extra safety precautions within the instruction. All safety symbols are designed to ensure safe operation of your tiller. Your safety and the safety of others depends upon your being alert, informed and properly trained while operating, transporting, storing and performing maintenance. Failure to understand and follow the instructions included in the Operator's Manual may result in serious injury or death.

Your Operator's Manual contains the "Safety Label" decals that have been installed on your rotary tiller to warn you of certain potential hazards that exist. These safety decals are <u>not substitutes</u> for reading and understanding this Operator's Manual.

Do not allow anyone to operate this equipment who has not fully read and comprehended this manual and who has not been properly trained in the safe operation of the equipment.

- Operator should understand all functions of the tractor and implement.
- Do not attempt to operate implement from the ground or from the back of the tractor; operate implement from the driver's seat only.
- Inspect all guards and shields to ensure that these are in place, in good condition, and secured before operating the implement.
 DO NOT OPERATE if these are missing or not in operating condition!
- Always follow the proper shut down procedure for both the implement and the tractor any time you have to leave them unattended.
- Dismounting while a tractor is moving could cause serious injury or death.
- Never allow anyone to stand between the tractor and implement while an operator is backing up to the implement as this may cause serious injury or death. It is very easy for an operator's foot to slip from the clutch or the brake setting tractor into motion.
- Keep hands, feet, hair, jewelry, and clothing away from equipment to avoid entanglement with power-driven parts.
- Watch out for obstacles such as bushes, fencing, trees, power lines, etc., when raising implement.
- Clear the work area of all bystanders, children, pets, livestock during operation. Livestock and pets are easily injured by flying debris.
- Avoid sharp turns as this may cause implement to ride up on the tractor's wheels that may result in serious injury and damage your equipment.
- Your implement is not designed to carry passengers No Riders!



SIGNAL WORDS:

The appropriate signal word for each identified hazard has been selected using the following guidelines: ¹

DANGER Indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations, typically for machine components that, for functional purposes cannot be guarded. ¹

CAUTION Indicates an imminently hazardous situation, which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. ¹

WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.¹



Personal Protective Equipment

- Do not wear loose fitting clothing, dangling jewelry, long hair should be tied back to avoid entanglement.
- Wear steel-toe boots or other appropriate footwear. Soft cloth shoes or sandals are not safe around any type of equipment.
- Wear hearing protection such as earplugs or other devices that will minimize sounds, but will not interfere with your ability to hear traffic or other noises that may alert you to potential hazards.
- Do not operate any machinery while talking on a cell phone or using other portable devices such as MP3 players, as these are considered distractions. Operating any farm equipment requires the operator's full attention.

Emergency Preparedness

- Keep a fire extinguisher on your tractor and check the expiration date periodically!
- Keep a well stocked first aid kit on your tractor.
- Save In Case of Emergency (I.C.E) numbers on your cell phone (including doctors, hospital and 911 services).
- Keep I.C.E. numbers next to a home or office phone.



No Passengers Allowed!

- Passengers may obstruct the operator's view that may result in an accident.
- This implement is not designed to carry passengers, doing so may cause failure in the PTO driveline or other malfunctions that may result in serious injury or death.



Shutdown and Storage

- Disengage PTO driveline before inspecting, working around the driveline or during shutdown.
- Lower machine to ground, put tractor in park, turn off engine, and remove the key.
- Detach and store implements in an area where children normally do not play.
- Secure implement by using blocks and/or supports.

Equipment Safety Guidelines

- Revi
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 If the
 This
- Review safety instructions for both the tractor and this implement annually.
 - Never exceed the limits of the tractor or the implement.
 - If the ability to accomplish the job or to operate safely is in question, DO NOT TRY IT!
 - This equipment is dangerous to children and those unfamiliar with it's operation. DO NOT ALLOW children to operate or play on the equipment.
 - Operator should be an adult who is familiar with operating the tractor and the implement.
 - Operator should be physically and mentally fit before operating machinery. Fatigue, stress, medications, alcohol and drugs may impair the ability to focus on safe farm machinery operation.
 - Check all equipment before operating this implement.
 - Refer to the tractor's operator manual for additional safety information (such as hydraulic pressure, tire safety, etc.)
 - Check all safety decals and/or signs if any of these have been damaged, illegible, removed or parts replaced without these decals, new decals must be reapplied. Contact your local ABI Dealer or our office to order replacements.

Safety

Transportation

A high percentage of fatalities and injuries involve farm equipment on roads and highways. It is very important to use common sense while operating equipment and vehicles.

- 1. Plan your route.
- Be aware of surface conditions, visibility, pedestrian and vehicular traffic, curves, on-ramps and intersections.
- Safest time to transport farm equipment on public roads is between sunrise and sunset.
- 4. Ensure that the hitches are properly secured and fastened.
- 5. Use the Slowing Moving Vehicle (SMV) emblem, if required by your local and state laws, properly attached and visible.
- Comply with state and local laws.
- Perform a safety inspection on the tractor and correct any hazards before you begin operating equipment.
- Use approved lighting, flags, and necessary warning devices on your farm equipment to protect operator from other vehicles on the highway.
- Inspect all warning lights and turn signals; be sure these are operational. If necessary you may need to purchase accessory lighting devices that are available through your tractor dealership or farm equipment store.
- Use the safety devices that are installed on your tractor such as ROPS, and seat belts. Never modify any safety device that has been provided with your equipment.
- Reduce speed if towed load is not equipped with brakes.
- Keep the brake pedals locked together at all times and make sure the brakes are properly adjusted.
- 20 MPH is the maximum transport speed for towed implements without brake devices. DO NOT EXCEED.
- If your tow weight is double the weight of the tractor do not exceed 10 mph.
- If towed weight is more than double the weight of the tractor do not operate the equipment; select a larger tractor.
- Operator must have control of steering and braking at all times. Slow down if your travel speed affects handling of farm equipment.
- Slow down for turns and curves and avoid sudden uphill turns.
- Sudden braking may cause loss of control over the implement.
- Never travel at a speed which does not allow adequate control of steering or lessens the ability to stop. Some rough terrain may require a slower speed.



Maintenance and Your Safety

Read and understand the Operator's Manual before performing any maintenance. If you are unfamiliar with performing maintenance then enlist someone with experience to assist you.

- Wear appropriate protective clothing such as steel-toe boots, eye protection, gloves, etc.
- Work in a clean dry area.
- Buildings should have adequate ventilation for the starting, running, and stopping of machinery while performing maintenance and/or repairs.
- Park the tractor and implement on level ground, disconnect the PTO and remove the key.
- Allow your equipment to cool completely this may take over an hour.
- Raise or lower the implement to the height needed to perform maintenance or repairs. Blocks and/or jacks should be used to prevent machinery from moving or falling.
- Never attempt to grease or oil implement while in operation.
- Perform routine maintenance regularly and in accordance with the Operator Manual.
- Inspect your implement before and after each use; any worn or broken parts should be replaced immediately. Repair in accordance with the Operator Manual.
- Clean your implement after every use; and wipe away any excess grease or oil that may have accumulated.
- Check brakes, safety chains, blades, pins and clevis for wear, breaks, missing parts or cracks.



Safety

Safety Labels

Your tiller comes equipped with all safety labels in place. They were designed to help you safely operate your tiller.

- 1. Read and follow their directions.
- 2. Keep all safety labels clean and legible.
- 3. Replace all damaged or missing labels. To order new labels go to your nearest ABI Innovations dealer.
- 4. Some new equipment installed during repair requires safety labels to be affixed to the replaced component as specified by ABI. When ordering new components make sure the correct safety labels are included in the request.
- 5. Refer to this section for proper label placement.

To install new labels:

- 1. Clean the area the label is to be placed.
- 2. Spray soapy water on the surface where the label is to be placed.
- 3. Wipe the surface dry.
- 4. Peel backing from label.
- 5. Press firmly onto the surface.

Use a small straight edge plastic (credit card) to squeeze out air bubbles working from the center out towards the sides.



Section 1: Set-Up Requirements

This unit is shipped completely assembled. Carefully follow instructions for final assembly. Hitch clevises and lock pins are sold separately.

Tractor Requirements

This implement is designed with a 3-Point category I and II hitch. Horse power rating of the tractor should not exceed the PTO rating of the gearbox.

Model	Width	Recommended Maximum HP
RTX400	4'	40
RTX500	5'	75
RTX600	6'	100

Three-Point Hitch

See Chart below for Tractor Categories and Three-Point Standards

The stabilizing arms are the 2-steel or cast arms that extend rearward and provide the lift and are the pull-point for the implement (referred to as lower link). The Upper Link is the 3rd mounting point and extends from a top middle position at the rear of the tractor. Comparatively little rearward force is applied from the top link.

The implement has been designed for front to back flotation while moving on uneven terrain. Adjust the tractor's top link to place the upper hitch vertically above the lower lifting arms.

Tractor Hook-Up

- 1. If your tractor has a multi-speed PTO, be certain that the PTO is set for 540 RPM.
- Back tractor up to implement until lower 3-point links are aligned with the hitch clevises on your implement. Always stop the tractor, set the brake, shut off engine and remove the key before dismounting from tractor.
- Secure tractor's 3-point lower links to the lower hitch clevises using 7/8" hitch pins. Be sure to use appropriate hitch pins for your hitch category. Refer to "Tractor Categories and Three-Point Hitch Specification" table below.
- 4. Secure the tractor's top link to the implement's top hitch using a 3/4" hitch pin (supplied by customer). Adjust the tractor top link in order to level the implement.
- 5. Start tractor engine and lift implement from the ground about 12-14 inches. Turn off the tractor.
- 6. Adjust the tractor's 3-point hitch lift height so that the implement is not lifted more than 14" off the ground while the PTO Driveline is attached to implement to prevent damage to the driveline.
- Install the stabilizer arms, anti-sway blocks or chains, refer to your tractor's operating manual to limit side sway of hitch. Side to side oscillation of about 2 inches is recommended.
- 8. Level the implement at the sides by adjusting the tractor lift links.
- 9. The tines must be the same height from the ground on both sides of the implement.
- 10. Mount the driveline to determine if this needs to be adjusted.
- 11. Carefully raise and lower the implement to ensure that tractor's tires, drawbars, and other equipment on the tractor do not come into contact with the implement's frame or PTO Driveline.
- 12. Use the lift control limiting stop on the tractor control lever to limit the upward travel of the lever so the lift cannot be raised high enough to cause contact between the drive shaft shield and front shielding.

Category	Hitch Pin Size			Lower Hitch Spacing		Horsepower Rating			
Oalegoly	Lower	Link	Upper	Link	(Opi	(Spread)			
	Inches	Metric	Inches	Metric	Inches	Metric	HP	kW	
Ι	3/4"	19mm	7/8"	22.4mm	26"	718mm	Up to 45	Up to 35	
II	1"	25.5mm	1-1/8"	28.7mm	32"	870mm	Up to 100	Up to 75	
III	1-1/4"	31.75mm	1-7/16"	37.4mm	38"	1010mm	Up to 225	Up to 168	

³Tractor Categories and Three-Point Hitch Specifications

Section 1: Set-Up Requirements

Driveline Installation

Refer to Figure 1-1 Coupling

Your rotary tiller driveline is connected with a push pin coupling to the tractor and a pull collar with slip clutch attached to the gearbox on the implement. To minimize torque on the driveline when starting up, remember to always engage the PTO at a low engine RPM.

Note: If your ABI implement is equipped with a friction clutch; then it must go through a "run-in" operation prior to initial use and after long periods of inactivity. (Refer to Slip Clutch Specifications on page 13) ABI does not recommend modifications to our products. If it is necessary to shorten the driveshaft, we recommend that you contact your implement dealer for service.



CALITION

Tractor PTO shield and all implement guards must be in place at all times during operation!



DANGER

ABI advises against the use of PTO adapters as these may defeat the purpose of the master shield on your tractor. PTO adapters create an unguarded shaft area between the tractor and the driveline guards that may cause entanglement that may result in serious injury or death.

DANGER

Do not attempt to operate your PTO driveline while it is unguarded as this may cause entanglement that can result in serious injury or death.

IMPORTANT: If you are switching tractors or going to use a quick connect hitch then you will need to check the driveline maximum and minimum lengths to ensure the safe operation of your equipment. You may find it necessary to use different drivelines.

IMPORTANT: Before connecting the PTO Drivelines, clean and lubricate driveline connection points. When checking PTO driveline minimum length, it is important to have the tractor's PTO driveline level with the implement's gearbox shaft. Engage the tractor's hydraulic 3point to raise or lower the lower arms until the implement's gearbox shaft is level with the tractor's PTO Shaft.

PTO Driveline:

Refer to Figures 1-2 to determine minimum and maximum operating lengths on page 11.

The PTO driveline minimum and maximum lengths must be checked prior to initial use or when using a different tractor or adding a quick connect hitch and to ensure that the driveline is compatible with all work conditions required by your ABI implement.

When fully extended the driveline must have a minimum overlap of the inner and outer shafts by not less than 1/3 the free length with both inner and outer shafts being of equal length or not less than a 6" (76mm) overlap.

Telescoping drivelines will have a variant in lengths due to changes in the vertical angle of +20° due to uneven terrain or raising implement for transport. It is very important not to operate your driveline with less than the 1/3 free length or 6" (76mm) overlap as this may cause your driveline to detach while in operation and pose a safety hazard to the operator and possible damage to the tractor and implement.

- Attach implement to your tractor. 1.
- 2. Adjust tractor top link until the implement gearbox input shaft is level with tractor input shaft.
- 3 Place tractor gear selector into park, turn engine off, set park brake and remove key.
- 4. Securely block implement in this position.
- 5. Attach the PTO driveline to the implement's shaft by sliding the Slip clutch end of driveline over the splined input shaft of the gearbox. Secure with driveline yoke locking device.
- 6. Slide the opposite driveline yoke end over the tractor's splined driveline shaft. Secure with driveline yoke locking device. The driveline will require shortening if it is too long to fit between the tractor and implement continue with Driveline Adjustment. If the PTO driveline fits the tractor and implement continue with Slip Clutch Set-up Requirements.

Determine your operating lengths:

- 1. Pull drive halves apart until fully extended, just before coming apart. Record this measurement as A and subtract 6" (76mm) and record as C measurement in your operator's manual.
- 2. Push the driveline halves together. Record this measurement as B and add 1" (25.4 mm) and record as D measurement in your operator's manual.

IMPORTANT. Never operate equipment with driveline extended beyond measurement C. Never operate equipment with driveline collapsed to less than measurement D.

IMPORTANT: Before you begin the driveline adjustments; ABI strongly recommends that you request your dealer to fit your driveline to your equipment.

Driveline Adjustment

Refer to Figures 1-2, for Minimum and Maximum Lengths.

IMPORTANT: Adjusting the PTO Driveline requires that all cuts be made equally to the inner/outer guards and the inner/outer shafts.

- Remove the PTO driveline from the tractor's splined output shaft and the implement's splined gearbox.
- 2. Pull the inner and outer shafts apart.
- 3. Remove the PTO shields (guarding).
- Attach the implement's inner cylinder to the implement's gearbox shaft.
- 5. Pull on the implement's PTO driveline to ensure that it is securely attached.
- 6. Attach the tractor's output shaft to the tractor's gearbox shaft.
- Pull on the tractor's PTO driveline to ensure that it is securely attached.
- 8. Raise and lower implement to find the shortest operating distance between the gearbox input shaft and tractor's output shaft.
- 9. Hold both halves parallel to each other in the shortest operating distance and mark them.
- 10. Measure the marks made in Step 9 and record them to shorten the outer and inner guards equally.
- 11. Raise and lower implement to find the maximum operating distance between the gearbox input shaft and tractor's output shaft.
- 12. Hold both halves parallel to each other in the maximum operating distance and mark them.
- Check that the driveline has a minimum of 6" (152.4mm) overlap or 1/3 the total length of the driveline.
- 14. Measure the marks made in Step 13 and record them.

Y1 = Inner Driveline Cylinder

- Disconnect the implement inner cylinder from the implement's gearbox shaft.
- 16. Disconnect the tractor's output shaft from the tractor's gearbox shaft.
- 17. Securely clamp the implement driveline guard shield section in a vise and cut off the guard at mark. File off any burrs. Repeat this step for the tractor driveline guard shield. Use one of these sections to create a cutting guide for the shaft and cylinder.
- Use a padded vise to securely clamp the implement cylinder. Do not over-tighten or damage the cylinder may occur.

- 19. Using the guard guide, mark the cylinder and cut. File any burrs and clean off filings. Do not round the ends of the cylinder when filing.
- 20. Repeat steps 12 and 13 to shorten the tractor driveline shaft.
- 21. Apply grease to the inner shaft.
- 22. Reassemble the driveshaft, and securely attach the driveline guard and reattach the PTO driveline to the tractor and implement. Make sure that these are securely attached before attempting to engage the PTO driveline.
- 23. The driveline should now be moved back and forth to insure that both ends are secured to the tractor and implement. Reattach any end that is loose.
- 24. Hook driveline safety chain in the hole in the inner driveline guard. Attach the other end to the implement's main frame.
- 25. Hook driveline safety chain in the hole in the outer driveline guard and attach the other end to the tractor main frame.
- 26. Start tractor and raise implement just enough to remove blocks used to support the implement frame.
- Slowly engage tractor's hydraulic 3-point to lower the implement. Check for sufficient drawbar clearance. Move drawbar ahead, aside or remove if required to eliminate binding.
- Check to make certain that the driveline overall length does not extend beyond the maximum recorded length as in Step 14.

CAUTION

Incorrectly fitted safety chains will result in excessive tension causing the safety hook to open on the protection side. If this occurs it is necessary to replace damaged hook with an

original one. This chain must be attached to the inner driveline shield and to the implement to restrict shield rotation.

Measurements:





Figure 1-2 Checking Minimum and Maximum Lengths

Section 1: Set-Up Requirements

Slip Clutch Specifications

Refer to Figure 1-3 & 1-4 below:

- Before first use, or after a long storage, loosen all eight (8) compression nuts on clutch assembly. (Additional information can be found in Section 2: Adjustments; Fig 2-1a)
- Tighten each compression nut until the friction discs are snug.
- Tighten each compression nut another 1/4 turn.
- Run the driveline at a low idle, under load, to slip the clutch until it starts to smoke. This will remove the dirt, corrosion and surface gloss from the clutch plate faces.
- Tighten each compression nut another 1/2 turn to set the clutch plate pressure. Normally the clutch will slip at a 20% higher torque after the "run-in" than before.
- Check the temperature of the clutch after running for 20 minutes and after every 8 hours of operation. If the clutch is hot to the touch or smokes during operation, reset the compression nuts or the clutch plates will burn up and fail.
- If slippage continues, tighten the compression nuts in 1/4 turn increments and observe results during operation.
- The clutch should be set so it does not slip during regular operation. It should slip only when the unit is overloaded from heavy tilling or when striking an obstruction. If it is set at too high a torque to slip, components will fail.

Gear Box Oil Requirements

Refer to Figures 1-3 Top Gearbox & 1-5 Side Gearbox below:

Before putting rotary tiller into service:

IMPORTANT: Manufacturer Lubricant Recommendations:

- <u>Top Gearbox</u> uses Multi-Purpose Gear Oil (ie: S.A.E. 80w/90 or S.A.E. 85w/140 Multi-purpose gear oil.)
- <u>Side Gearbox</u> uses 00EP Flowable Grease available at your local tractor dealer or from ABI Innovations.
- For all Grease Fittings use TYPE/Grade II tube grease.
- Place Implement so that the deck is secure and level.
- Remove 1/2" Pipe Plug (located at top of gearbox and 1/8" pipe plug (located at lower 1/3 of gearbox) and clean away any excess oil.
- Check all bolts and nuts to insure they are tight and secure.





CAUTION:

Figure 1-3 Slip Clutch & Gear Box We recommend Pure Guard 85/140 Gear Oil

DO NOT overfill gearboxes. This could cause damage to oil seals, and can cause permanent damage to the gearbox.

Slip Clutch

AB

Fill

Gear

Box



Figure 1-4 Slip Clutch Assembly Components

- 1 Compression Bolt & Nut (Quantity 8)
- 2 Spring (Quantity 8)
- 3 Implement Flange Yoke
- 4 Bushing

Fluid Level

- 5 Friction Disc (Linings) (2-Plate has 2 Friction Discs)
- 6 Thrust Plate (n/a)
- 7 Inner Pressure Plate
- 8 Driveline Flange Yoke
- 9 Locking Bolt, Washer & Nut
- 10 Outer Pressure Plate

Section 2: Adjustments Slip Clutch Adjustment

Figure 2-1a—Slip Clutch Adjustment and

Figure 2-1b Spring Compression.

The slip clutch is designed to slip, protecting the gearbox and drivelines, should the implement strike an obstruction. A new slip clutch or one that has been stored over the winter may seize. Before operating, make sure it will slip by:

- 1. Make sure tractor engine is turned off and key is removed.
- Loosen the eight nuts retaining the springs by a 1/3 to 1/4 turn or until you can turn the springs.
- 3. With tractor at idle speed, engage the tractor's PTO drive for 2 to 3 seconds. If the clutch slips without turning tines skip to step 4. If the clutch does not slip freely, either disassemble and clean the clutch face plates, yoke and plate and clutch hub—reassemble the clutch and test again. If clutch continues to slip even though the springs are compressed to the proper length, then check the friction disc for excessive wear. Discs are 1/8" when new, if discs are less than 1/16" then replace with new discs. Contact your local authorized ABI dealer for further assistance.
- Tighten each of the eight nuts until the springs are compressed to the necessary tightness. Ensure that all compression bolts are set to the same compression depth.
- Check all spring lengths are the same (H); adjust nut on any spring that is unequal in length. Refer to Figure 2-1b—Spring Compression.

Important: Failure to retighten nuts may cause damage to implement and/or tractor due to improper slip clutch torque setting!

Note: Adjustment of the slip clutch is to provide only enough torque to prevent slippage under normal operating conditions. Occasional slippage is normal and provides protection to the driveline. If you are not satisfied with your results please contact your local authorized ABI dealer for further assistance.



Figure 2-1a Slip Clutch Adjustment

Figure 2-1b—Spring Compression



You may measure the height of spring and nut using a sliding caliper record this measurement and adjust remaining springs to the same height.

Leg Stand Assembly

- 1. Insert leg stand into leg stand holder on end of implement frame.
- 2. The upper hole is used for parking the implement and the bottom hole is used while implement is in operation.

Skid Shoe Adjustment

Refer to Figure 2-2

The skid shoes can be raised or lowered for the desired depth for tilling:

- 1. Raise the implement off the ground and securely block implement up in this position.
- 2. Loosen the pivot bolt on front of shoe. (1)
- Remove adjusting bolt, lock washer, and nut (3,4 and 5) on rear of shoe (2).
- 4. Adjust skid shoe to desired height by pivoting skid shoe up or down to the desired height.
- 5. Re-attach the bolt, lock washer, and nut and tighten.
- 6. Tighten pivot bolt.
- 7. Repeat Steps 1-6 for the other skid shoe.

IMPORTANT: Both skid shoes must adjusted to the same height.



Figure 2-2 Skid Shoe Adjustment

Rear Deflector Adjustment

Refer to Figure 2-3

The rear deflector can be adjusted by raising or lowering the chain length:

- 1. To produce finer textured soil, adjust shield closer to the ground.
- 2. To produce a coarser textured soil, adjust shield higher from the ground.



Figure 2-3 Rear Deflector Adjustment

Section 3: Operating Instructions

Operating Check List

Hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training involved in the operation, transport, maintenance and storage of the rotary tiller. Therefore, it is absolutely essential that no one operates the tiller without first having read, fully understood and become totally familiar with the Operator's manual. Make sure the operator has paid particular attention to:

- Safety, pages 5-8
- Section 1: Set-Up Requirements, pages 9-12
- Section 2: Adjustments, page 13
- Section 3: Operating instructions, pages 14-17

Also make sure the operator has completed the Operating Checklist below before using the tiller:

- Read and follow the "Safety" section starting on page 5 carefully.
- Read all of the "Operating Instructions" section on pages 14 - 18.
- Review your tractor's operating instructions.
- Check the tiller initially and periodically for loose bolts & pins using П the "Torque Values Chart" in the "Appendix" section on page 27.
- Make sure all guards and shields are in place.
- П Check initially and periodically for loose bolts, pins and chains (if applicable).
- Know your controls and how to stop tractor, engine and PTO quickly in an emergency.

IMPORTANT: Children SHOULD NOT be allowed to operate the rotary tiller.

Inspection Procedures

Make the following inspections with tiller attached to a tractor and PTO disengaged and completely stopped:

- 1. Inspect tractor safety equipment to make sure it is in good working condition.
- Carefully raise and lower implement to ensure that the drawbar, 2. tires, and other equipment on the tractor do not contact implement frame or PTO driveline.
- Check that all hardware is properly installed. 3.
- With implement deck resting on solid supports, PTO disengaged 4 and completely stopped, check that the tines are sharp and secure and properly positioned.
- Check PTO guards to make certain they are in good working condi-5. tion and in place.
- Remove solid supports from under the deck and verify implement's 6. front to rear and top link alignments,
- 7. Check that skid heights are the same on both sides.
- 8. Lubricate all grease fitting locations. Make sure PTO shaft slip joint is lubricated.
- Check to be sure gear lube runs out the small check plug on side 9. of the top gearbox and drive train gearbox.
- 10. Reconnect tractor driveline to implement. Make sure that the drive-

line operates freely and is seated firmly in the tractor PTO shaft's spline groove.

- 11. Set tractor PTO shaft and transmission into neutral before starting engine.
- 12. Set tractor throttle select lever to 540 RPM.
- 13. The remaining inspections are made by engaging the PTO to check for vibrations.

IMPORTANT: Stop PTO immediately if vibration continues after a few revolutions during start-up and anytime it occurs thereafter. Wait for PTO to come to a complete stop before dismounting from tractor. Make necessary repairs and adjustments before continuing on.

- Start tractor, set throttle to idle or slightly above idle and slowly engage PTO. Initial start-up vibration is normal and should stop after a few revolutions. Stop PTO rotation immediately if vibration continues.
- Once the implement is running smoothly, increase tractor throttle to • 540 RPM. Stop PTO immediately if vibration occurs.

IMPORTANT: Do not exceed RPM rating. Excessive engine speed will cause damage to the power train components.

Transporting



CAUTION

When travelling on public roads at night or during the day, use accessory lights and devices for adequate warning to operators or other vehicles. Comply with federal, state, and local laws.

IMPORTANT: Always disengage the tractor's PTO before raising the tiller to transport position.

- 1 Make sure driveline does not contact tractor or tiller when raising tiller to transport position. If it is necessary to lift tiller above 14"; always disconnect the tractor PTO driveline first.
- Reduce tractor ground speed when turning, lift tiller and allow 2. enough clearance so tiller does not contact obstacles such as buildings, trees or fences.
- 3. Limit transport speed to 20 mph. Transport only with a farm tractor of sufficient size and horse power.
- When traveling on roadways, transport in such a way that faster 4. moving vehicles may pass you safely.
- Sudden braking can cause a towed load to swerve and upset. 5. Reduce speed if towed load is not equipped with brakes.
- 6. Shift tractor to a lower gear and use extra care when traveling over rough terrain.



Section 3: Operating Instructions

Un-hooking the Rotary Tiller

Unhook rotary tiller from the tractor as follows:

- 1. Park tiller on a level solid hard surface.
- 2. Lower tiller to level ground or onto stable support blocks.
- 3. Disengage power to the driveline.
- 4. Engage tractor park brake, shut down, and remove key before dismounting from tractor.
- 5. Disconnect driveline from tractor PTO shaft.
- 6. Un-hook 3-point connectors from tractor.
- Reinstall hitch pins, lynch pins and hairpin cotters in tiller hitch for storage.
- 8. Connect driveline safety chains together.
- 9. Rotate driveline and place driveline into the grooved storage bracket.

Tilling Instructions

- Do not engage tractor PTO while hooking-up and unhooking the driveline or while someone is standing near the driveline. A person's body and/or clothing can become entangled in the driveline resulting in serious injury or dearth.
- Tractor PTO shield, gearbox shield, and driveline shield must be secured in place while operating the tiller to avoid injury or death from entanglement in rotating drivelines.
- Damaged drivelines can break apart while rotating at high speeds causing serious injury or death. Always remove rotary tiller from service until damaged drivelines are repaired or replaced.
- It is strongly recommended to use added caution while tilling along highways or in an area where people may be present!
- Do not till on steep inclines. The tractor and tiller could flip over causing damage to the equipment, bodily injury or death!
- Never carry a passenger on the tiller. A rider can fall and be run over by the tiller or tractor causing serious injury or death.
- Do not use tiller to lift or carry objects. Lifting and/or carrying objects can result in damage to the tiller, serious bodily injury or death.
- Never operate the tiller while in the raised position. The tiller can discharge objects at high speeds resulting in serious injury or death.
- Do not use the deck as a working platform. The deck is not properly designed or guarded for this use. Using deck as a working platform can cause serious injury or death.
- Do not reverse while tiller is engaged. If it is necessary, disengage the PTO drive, lift the tiller from the soil and make sure that the area to the rear is clear before backing.
- Never lift the tiller more than 14 inches from the ground with the PTO engaged or the driveline could break and cause injury or death.

WARNING

Always disengage PTO, set parking brake, shut tractor engine off, remove switch key and wait for tines to come to a complete stop before dismounting from tractor.

CAUTION

Do not exceed rated tilling capacity of your tiller! See Specifications & Capacities on page 19 for specified tilling capacity. Using this tiller for any other work can damage the drive components, tines, and deck components!

Do not over speed PTO or machine damage may result. This tiller is designed to be used only with a tractor having a 540 RPM rear PTO.

Rotary tillers are designed to prepare ground for seedbeds or planting preparation and applications in landscaping, gardens, nurseries, and light commercial use.

Tillers are not generally suitable for stony soils. A few small stones are usually acceptable, however, stones that are larger than 2-1/2" should be removed to prevent damage to the tines and tiller itself.

Tilling in heavy wet soil is not advisable as soil will build up in the tines, cause loss of horsepower, and may strain the driveline, and will not produce a consistent soil texture.

Before Tilling:

- Thoroughly inspect and clear the area to be tilled for debris and unforeseen objects such as rocks, branches, etc. Mark any potential hazards.
- 2. Check for ditches, stumps, holes, or other obstacles that may upset the tractor or damage the tiller.
- 3. Check that no one enters the area of operation.
- 4. Always work at a safe distance from roads, populated areas or places.
- 5. Mow tall weeds and grass before tilling.
- 6. Check all tiller tines, bolts and nuts are tight.
- 7. Ensure all guards and shields are in place and secure.
- 8. Operate with 540 RPM PTO tractor.

General Operating Instructions

It is important that you understand the Operator's manual, completed the Operator's Checklist, properly attached tiller to your tractor, made leveling adjustments, and preset your tilling height before beginning a running operational safety check on your rotary tiller.

Perform an operational safety check by starting up the tiller. It is important that at any time during this safety check you detect a malfunction in either the tiller or tractor that you immediately shut the tractor off, remove it's key, and make necessary repairs and/or adjustments before continuing on.

Section 3: Operating Instructions

General Operating Instructions (cont.)

It is important that you understand the Operator's manual, completed the Operator's Checklist, properly attached tiller to your tractor, made leveling adjustments, and preset your tilling height before beginning a running operational safety check on your rotary tiller.

Perform an operational safety check by starting up the tiller. It is important that at any time during this safety check you detect a malfunction in either the tiller or tractor that you immediately shut the tractor off, remove it's key, and make necessary repairs and/or adjustments before continuing on.

Before starting the tractor ensure the park brake is engaged, the PTO is disengaged, and the tiller is resting on the ground.

NOTE: Do not allow the tiller to drop violently on the ground. Lower it slowly to allow the knives to gradually cut into the soil. Violent impacts would strongly stress all machine components and could cause serious damage to the rotary tiller.

Start the tractor and set the engine throttle speed at low idle. Raise the tiller with the tractor's rear hydraulic lift control lever to transport position making sure that the PTO shaft does not bind and does not contact the tiller frame.

WARNING

A heavy load can cause instability in driving a tractor. Make sure the front of the tractor is properly counter-balanced with weights. An unstable tractor could steer badly and possibly tip over, causing injury or death.

Lower the tiller to the ground and at a low engine speed engage the PTO. If everything is running smoothly at a low idle, slowly raise the tiller to transport height checking for bind or chatter in the driveline.

Lower the tiller to the ground and increase the tractor's engine RPM until it reaches 540 RPM. If everything is still running smoothly, once more raise the tiller to transport height to check for driveline bind or chatter. Lower the tiller to the ground, return the engine to a low idle, and disengage the PTO. Position the adjustable stop on the tractor's hydraulic lift lever so the tiller can be consistently returned to the same tilling and transport height.

It is important that you inspect the area where you will be tilling and clear it of safety hazards and foreign objects either before or after you arrive at the tilling site. Never assume the area is clear. Till only in areas that you are familiar with and are free of debris and unseen objects. Extremely tall grass should be cut twice to detect potential hazards before tilling.

In the event you do strike an object disengage the PTO, stop the tiller and tractor immediately to inspect and make necessary repairs to the tiller before resuming operation.

Transporting

On roadways transport in such a manner that faster moving vehicles can easily see you and pass you safely. Reduce your speed when traveling over rough and hilly terrain. Avoid quick or sharp steering corrections. Take extra care to insure that the tiller doesn't come into contact with obstacles such as trees, buildings or fences.

Use accessory lights and appropriate reflective devices to provide adequate warning to pedestrians and other vehicle operators when traveling on public roads and in the dark of night. Comply with all local, state and federal laws.

Always inspect a new area and develop a safe plan before tilling.

You will need to maintain 540 RPM PTO speed. Travel speed will vary depending upon:

- Type of soil and soil moisture.
- Crop residue or growth
- Depth of operation

These factors will determine your tractor's working speed to achieve the desired soil texture. Adjust settings until you are able to achieve an optimal working combination.

The lower the ground speed when tilling the more soil will be crumbled. Dense ground cover will create the need to slow down even more.

Avoid very low tilling heights especially on extremely uneven terrain. Avoid sharp drops and cross diagonally through dips to prevent hanging up the tractor and tiller. Slow down in turns. Remember to look back often.

Never engage rotary tiller tines in full raised position. Lower tiller to within 3-4" off the ground. Then engage the PTO. Failure to do so may cause damage to the tiller's PTO shaft.

Now that you are prepared and well briefed you may begin tilling. Begin tilling by doing the following:

- Reducing the tractor's engine RPM.
- Make sure the tiller is within 3-4" from the ground in tilling position.
- Engage the PTO
- Raise the engine RPM to the appropriate PTO speed
- Slowly lower the tiller to the ground allowing the tines to break into the soil.
- Begin tilling at a slow speed first and then shift up until desired speed/texture is achieved.
- Tiller should be operated with the tiller deck level to the ground.
- After 50 feet, stop and check if the tiller is still in the ground.
- Do not engage PTO while tiller is in the fully raised or lowered positions.
- Periodically disengage the PTO, turn off tractor, remove ignition key and check for foreign objects wrapped around the rotor shaft. Block tiller deck up before removing objects.
- Frequently inspect the tiller for loose bolts and nuts. Tighten any loose bolts and nuts to maintain safe, dependable equipment.

Use your 3-point hitch or Quick-Hitch to lift your tiller into transport position while making turns and to reverse direction. Try increasing or decreasing ground speed to determine the effect on quality of soil. With a little practice you will be pleased with what you and your rotary tiller can do.

Whether you are done tilling, need to take a break, or just need to make a few adjustments to the tiller, remember to always do the following:

- Reduce the tractor's engine RPM
- Disengage the PTO
- Stop on level ground
- Set the park brake
- Turn off the engine and remove the key
- Stay on the tractor until the tiller tines have come to a complete stop

Section 4: Maintenance

Service

Proper servicing and adjustment is the key to the long life of any tiller. With careful inspection and routine maintenance, you can avoid costly down time and repair. Do not get under the machine to make measurements or adjustments without securely blocking tiller first.

DANGER

Always disengage main driveline from tractor PTO before servicing the underside of the tiller deck. Tiller can be engaged if tractor is started resulting in damage to the equipment and serious injury and/or death.

- 1. Check all bolts after each use
- Replace any worn, damaged or illegible safety labels by obtaining new labels from your ABI Dealer.
- Before you add oil to the gearboxes, it is important that the fill plug area be wiped clean before removing plugs. Debris mixed into the lubricants will rapidly wear the parts and destroy bearings and gears. Oil levels must be checked when tiller is on a level surface.

If your tiller is operating in a heavy duty working capacity then maintenance operations may need to be performed more frequently.



WARNING

Always secure tiller deck in the up position with solid supports before servicing the underside of the tiller. Never work under equipment supported by hydraulics. Hydraulics can drop equipment if controls are actuated or if hydraulic lines burst. Either situations can drop the tiller instantly even when power to the hydraulics is shut off.

Maintenance Schedule:

Every 8 Hours of Service:

- Grease the support of the rotor.
- Grease the "U" joints of the PTO driveline
- Check the bolts that connect the tines to the rotor.

Every 50 Hours of Service:

- Change the first oil fill in both gear boxes after the initial 50 hours of service. After this point, oil should be changed after every 250 hours of service.
- Check tines for wear or damage. Replace if necessary. Never try to straighten out a bent tine.
- Disconnect and clean the PTO driveline. Cover the sliding parts with grease before reassembling. See Driveline Maintenance on page 17 for additional servicing instructions.

Every 250 Hours of Service:

Change oil in both gearboxes.

Driveline Maintenance:

Refer to Figure 4-1

Lubricate the driveline parts before each use. This may need to be done during use depending upon the number of operating hours and

conditions of use, i.e. extremely dusty conditions may require a higher frequency of lubrication. Also, clean and lubricate the driveline before storing at the end of each seasonal use.

Recommended hourly usage is approximately 8 in normal conditions. Constant angle applications or use in extremely dusty conditions may require a lube interval of 4 hours.



Fig 4-1 Driveline Lubrication

Lubricating

Lubricate all fittings with a good quality lithium soap compatible with E.P. Grease meeting the N.L.G.I. #2 Specifications and containing no more than 1% Molybdenum Disulfide.

Refer to Gear Box Requirements on pages 12 for lubricating instructions.

Components			Hourly Usage
U-Joints	(B)		8 Hours
Cross (aka Spider)	(B)	4 to 6 lever pumps	8 Hours
Guard Bearings / Bush- ings (B)			8 Hours
Telescoping Profile Tubes	(B)	Multi-purpose grease 8 to 10 lever pumps	20 Hours
Outer Tube Coupler (A)		Multi-purpose grease	Before
Inner Tube Coupler	(C)		Each Use

While greasing driveline shaft with the internal greasing system, use the special nipple that can be reached through the guard's hole. Grease slowly, giving time for the grease to flow along the tubes. Internal rotating guard bushings should be lubricated upon replacement.

Section 4: Maintenance

Tine Replacement Refer to Figure 4-2 below.

Always inspect tilling tines before each use. Make certain these are properly installed and are in good working condition. Replace any tine that is damaged, blunt, worn, bent or excessively nicked, or liable to break during work.

Use heavy leather gloves when sharpening or replacing tines.

Note: We highly recommend using Priefert's replacement tines to ensure quality and durability. However, for your convenience you may interchange these tines with those made by other popular manufacturers. Keep in mind when ordering new tines that your tiller has both "left" and "right" tines.

- 1. Remove the damaged tine by unscrewing bolts and fitting new tines in place.
- 2. Ensure that the new tine is mounted in the same position as the one that was removed.
- 3. If more than one tine must be replaced, change one tine at a time to prevent possible positioning errors.
- 4. The sharp edge of the tine must point in the same direction as that in which the rotor turns.
- 5. The bolts that attach tines to the rotor flange must be installed with the bolt head on the tine side and washer and nut on the flange side.



Parking & Storage

Clean, inspect, service and make necessary repairs to your rotary tiller before storing for long periods of time or at the end of the season. This will ensure that your tiller will be ready to use the next time you hook it up.

- Check tines for wear and replace if necessary.
- Scrape off compacted dirt and then wash surfaces thoroughly with a garden hose.
- Inspect for loose, damaged or missing parts and replace if needed.
- Lubricate as noted, sand areas where paint is chipped and apply touch-up paint or an oil coating to prevent rust.
- Drain and refill gearboxes. Be sure to replace all oil plugs.

To Park or Store:

- Park the tiller on a level solid surface.
- Disengage PTO driveline
- Shut off the tractor engine and engage parking brake.
- Adjust support stand to highest hole to maintain proper tiller height.
- Disconnect PTO driveline and un-hook tiller from tractor.
- Store driveline in the driveline groove.
- Always store your rotary tiller in a safe place away from children or livestock.

Notes:



Section 5: Specifications

	RTX400	RTX500	RTX600	
Tilling Width	48"	60"	72"	
Overall Width	57"	65"	80"	
Overall Depth	26-1/2"	26-1/2"	26-1/2"	
Weight	605 lbs	688 lbs	709 lbs	
Number of Flanges	6	7	9	
Number of Tines per Flange	6	6	6	
Top Gearbox	33-57 HP input at	540 RPM 1.46:1 ratio, Cast iron housing, strai	ght bevel gears	
Top Gearbox Lubrication	Gear Lube 85-140 EP; Capacity 50 oz.			
Side Gearbox	39 - 76 HP ; 1.75:1 ratio			
Side Gearbox Lubrication	EP 00 or 000 Flowable Grease; Capacity 63 oz.			
Rotor Swing Diameter	16-1/4"			
Rotor Shaft Speed		210 RPM AT 540 RPM PTO		
Recommended Maximum PTO HP	20 HP-35 HP	25 HP - 40 HP	35 HP - 55 HP	
Tilling Depth	1-3/4" TO 6	5-1/2" max with multiple passes in unobstructe	d terrain	
Tilling Capacity	Mixing in fertilizers, removing unwanted sod, preparing seedbeds or preparing soil for planting			
Skids	3/8" x 2" Bolt-on adjustable height (replaceable)			
Driveline		Shielded Series 5 PTO		
Driveline Safety Protection	Slip Clutch			
Hitch Type	Category I			
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE				

Maintenance Record

Decals

Part Number	RTX400	RTX500	RTX600	Description
D125	1	1	1	Notice of Alteration/Modification Decal
D133	1	1	1	Danger - Rotating Driveline Hazard Decal
D201	4	4	4	Warning Pinch Point Decals
D225	1	1	1	No Riders Decals
D240	1	1	1	Danger - Rotating Tines Hazard Decal
D310	3	3	3	Warning Stay Clear of Rotating Parts Decal
D400	2	2	2	Lubricate Gear Box Decals
M100	1	1	1	Warning - Prevent Serious Injury Decal
DSMALLabi	3	3	3	abi Logo Decal (Not Shown)
DTINYabi	1	1	1	abi Logo Decal (Not Shown)







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Parts List

\boxtimes	Item Number	Description	Qty
1	DOCCAN-L	DOCUMENT CANISTER 3-1/2"	1 EA
NV	GREASE-00	FLOWABLE GREASE, ALVANIA	1 GAL
2	PIKSRTX	PI TILLER SQ KICK STAND	1 EA
3	RTDRIVE	PTO DRIVE SHAFT, ROTORY	1 EA
4	RTG500-V2	PI TILLER RTX500 SHAFT (cover)	1 EA
5	RTGEAR-HUB	GEARBOX OUT HUB ROTARY	1 EA
6	RTGEAR-IN	GEARBOX IN FOR ROTARY	1 EA
7	RTGEAR-SIDE	GEARBOX SIDE FOR ROTARY	1 EA
8	RTX500DA	PI TILLER 5' DRUM ASSY (with Tines)	1 EA
9	RTX500D	PI TILLER 5' DRUM (without Tines)	1 EA
10	TINE-RTR	ROTARY TILLER TINE RIGHT	21 EA
11	TINE-RTL	ROTARY TILLER TINE LEFT	21 EA
NV	RTX500HSW	PI RTX 500 HEX SHAFT (inside)	1 EA
13	RTX500SV2-P	PI TILLER 5' SKIN V2	1 EA
14	RTX500TGV2-P	PI TILLER 5' TAIL GATE V2	1 EA
NV	RTXGC	PI TILLER GRASS CUTTER	2 EA
16	RTXHBRACE	PI TILLER HITCH BRACE	1 PC
17	RTXHITCHL	PI TILLER HITCH LEFT	1 EA
18	RTXHITCHR	PI TILLER HITCH RIGHT	1 EA
19	RTXHSPACER	PI TILLER HITCH SPACER	1 EA
20	RTXSKIDHA	PI TILLER SKID HEIGHT ADJUST	2 EA
21	RTXSKIDL	PI TILLER SKID LEFT	1 EA
22	RTXSKIDR	PI TILLER SKID RIGHT	1 EA
23	RTXTGC	PI TILLER TAIL GATE CHAIN	1 EA
24	S1005.00006PI	SHEET 10GA 5" X 6"	1 PC

Hard	ware		
*	FB061.00ZPG5	BOLT 3/8 X 1 G5 ZP	16 EA
*	FB061.50ZPG5	BOLT 3/8 X 1 1/2 G5 ZP REP	1 EA
*	FB081.50ZPG5	BOLT 1/2 X 1-1/2 G5 ZP	25 EA
*	FB081.50ZPG5SHLD	BOLT 1/2 X 1-1/2 SHLDR	2 EA
*	FB082.50ZPG5	BOLT 1/2 X 2-1/2 G5 ZP	2 EA
*	FB083.50ZPG5	BOLT 1/2 X 3 1/2 G5 ZP	2 EA
*	FB091.50ZPG5	BOLT 9/16 X 1-1/2 G5 ZP FINE18	84 EA
*	FM051.375	PTO PIN 5/16 X 1 3/8 EFFECT	1 EA
*	FM052.25PTO	FASTR 5/16 X 2 1/2 ZP PTO PIN	1 EA
*	FN06ASLN	FASTENER NUT 3/8 ASLN	17 EA
*	FN08ASLN	NUT 1/2 ZP ALL ST LOCK HEX	27 EA
*	FN09	NUT 9/16 ZP	84 EA
*	FR02	POP-RIVET 1/8 X 1/8 AL REP	2 EA
*	FW06	FLATWASHER 3/8 ZP USS	12 EA
*	FW08LOCK	WASHER 1/2 ZP LOCKING	4 EA
*	FW08SAE	FLATWASHER 1/2 ZP SAE	2 EA
*	FW09LOCK	WASHER 9/16 ZP LOCKING	84 EA

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Parts List

\boxtimes	Item Number	Description	Qty
1	DOCCAN-L	DOCUMENT CANISTER 3-1/2"	1 EA
NV	GREASE-00	FLOWABLE GREASE, ALVANIA	1 GAL
2	PIKSRTX	PI TILLER SQ KICK STAND	1 EA
3	RTDRIVE	PTO DRIVE SHAFT, ROTARY	1 EA
4	RTG600-V2	PI TILLER RTX600 SHAFT (cover)	1 EA
5	RTGEAR-HUB	GEARBOX OUT HUB ROTARY	1 EA
6	RTGEAR-IN	GEARBOX IN FOR ROTARY	1 EA
7	RTGEAR-SIDE	GEARBOX SIDE FOR ROTARY	1 EA
8	RTX600DA	PI TILLER 6' DRUM ASSY (with Tines)	1 EA
9	RTX600DM	PI TILLER 6' DRUM (without Tines)	1 EA
10	TINE-RTR	ROTARY TILLER TINE RIGHT	27 EA
11	TINE-RTL	ROTARY TILLER TINE LEFT	27 EA
NV	RTX600HSW	PI RTX 600 HEX SHAFT (inside)	1 EA
13	RTX600SV2-P	PI TILLER 6' SKIN V2	1 EA
14	RTX600TGV2-P	PI TILLER 6' TAIL GATE V2	1 EA
NV	RTXGC	PI TILLER GRASS CUTTER	2 EA
16	RTXHBRACE	PI TILLER HITCH BRACE	1 PC
17	RTXHITCHL	PI TILLER HITCH LEFT	1 EA
18	RTXHITCHR	PI TILLER HITCH RIGHT	1 EA
19	RTXHSPACER	PI TILLER HITCH SPACER	1 EA
20	RTXSKIDHA	PI TILLER SKID HEIGHT ADJUST	2 EA
21	RTXSKIDL	PI TILLER SKID LEFT	1 EA
22	RTXSKIDR	PI TILLER SKID RIGHT	1 EA
23	RTXTGC	PI TILLER TAIL GATE CHAIN	1 EA
24	S1005.00006PI	SHEET 10GA 5" X 6"	1 PC

Hard	Hardware				
*	FB061.00ZPG5	BOLT 3/8 X 1 G5 ZP	16 EA		
*	FB061.50ZPG5	BOLT 3/8 X 1 1/2 G5 ZP REP	1 EA		
*	FB081.50ZPG5	BOLT 1/2 X 1-1/2 G5 ZP	25 EA		
*	FB081.50ZPG5SHLD	BOLT 1/2 X 1-1/2 SHLDR	2 EA		
*	FB082.50ZPG5	BOLT 1/2 X 2-1/2 G5 ZP	2 EA		
*	FB083.50ZPG5	BOLT 1/2 X 3 1/2 G5 ZP	2 EA		
*	FB091.50ZPG5	BOLT 9/16 X 1-1/2 G5 ZP FINE18	108 EA		
*	FM051.375	PTO PIN 5/16 X 1 3/8 EFFECT	1 EA		
*	FM052.25PTO	FASTR 5/16 X 2 1/2 ZP PTO PIN	1 EA		
*	FN06ASLN	FASTENER NUT 3/8 ASLN	17 EA		
*	FN08ASLN	NUT 1/2 ZP ALL ST LOCK HEX	27 EA		
*	FN09	NUT 9/16 ZP	108 EA		
*	FR02	POP-RIVET 1/8 X 1/8 AL REP	2 EA		
*	FW06	FLATWASHER 3/8 ZP USS	12 EA		
*	FW08LOCK	WASHER 1/2 ZP LOCKING	4 EA		
*	FW08SAE	FLATWASHER 1/2 ZP SAE	2 EA		
*	FW09LOCK	WASHER 9/16 ZP LOCKING	108 EA		
*	FW14USS	FLAT WASHER 7/8" ZP USS	1 EA		

PL_ABI-RTX600-090113 Priefert reserves the right to revise or modify equipment or implements at its discretion, which may alter the listed part numbers. Manufacturer has made every attempt to verify the correctness of this list at the time of its release; your product may vary.

Troubleshooting Drivelines

<u>Problem</u>	<u>Common Cause(s)</u>	Remedy
Wear of universal joint connection points	Excessive Working Angle	 Reduce working angle. Make wide turns when possible. Tight turns - disengage PTO and raise tiller into transport position.
Bent/Twisted universal joint connection points	Excessive Torque Peak or Shock Load	 Avoid overloading and engaging drive under load Check PTO clearances with Tractor drawbar, etc.
Cross Arms Broken	Excessive Torque Peak or Shock Load	Avoid overloading and engaging drive under load.
Accelerated Wear of Cross Arms	Excessive Load	 Do not exceed the speed or power limits indicated in this manual. Insufficient Lubrication.
Separated Telescoping Tubes	Excessive Extension of Driveline	Avoid excessive extension of driveline.Check extension of drawbar hitch according to this manual.
Deformation of Telescoping Tubes	Excessive Torque Peak or Shock Load	 Avoid overloading and engaging drive under load. Check function of torque limiter. Check that driveline does not come into contact with tractor or tiller components during movements.
Accelerated Wear of Telescoping Tubes	Insufficient Lubrication	 Follow maintenance instructions on page 20. Insufficient Tube Overlap - Refer to Driveline Installation, pages 9-11.
Accelerated Wear of Shield Bearing	Insufficient Lubrication	Follow maintenance instructions on page 20.
PTO Vibrates	 Worn Universal Joint. PTO Driveline Bent. PTO driveline hitting front of tiller or swinging drawbar. 	 Replace Universal Joint. Replace PTO Driveline. Adjust machine lift height and/or remove drawbar.

Troubleshooting Gearbox

Problem	<u>Common Cause(s)</u>	<u>Remedy</u>
Gearbox Overheating	 Low on lubricant. Improper type of lubricant. Excessive trash build-up around gearbox. 	Fill to proper level.Replace with proper lubricant.Remove Trash.
Gearbox Noisy	 Rough Gears. Worn Bearings. Low oil in gearbox. May be normal when new. 	 Run in or change gears. Replace bearing. Check level and add oil. Allow for initial break-in.
Gearbox Leaking	 Damaged oil seal. Bent shaft. Shaft rough in oil seal area. Oil seal installed wrong. Oil seal not sealing in housing. Oil level too high. Hole in gearbox. Gasket damaged. Bolts loose. Improper type of lubricant. 	 Replace seal. Replace oil seal and shaft. Replace or repair shaft. Replace seal. Replace seal or use a sealant on outside diameter of seal. Drain oil to proper level. Replace gearbox Replace gasket. Tighten bolts. Replace with proper lubricant.
Gearbox Clicking	Gearbox gear tooth damaged.	Replace damaged gear.

Troubleshooting Tiller

Soil texture too coarse	 Tail gate set too high. Skid shoes adjusted too high Ground speed too fast. PTO speed too low. Soil too wet. Tail and another law. 	 Lower tail gate. Lower skid shoe. Decrease ground speed. Increase PTO speed to 540. Allow time for soil to dry.
Soil texture too fine	 Fall gate set too low. Skid shoes adjusted too low Ground speed too slow. 	 Raise fail gate. Heighten skid shoes. Increase ground speed.
Uneven till depth	Side skids adjusted at different heights.	Adjust skid shoes to same height.
Tiller skips or leaves residue	Badly worn or bent tines.Ground speed too fast for soil conditions.Slip Clutch slipping.	Replace worn or bent tines.Reduce ground speed.Reduce load.
Soil balling in tines	 Worn or bent tines. Tines incorrectly installed. Rear tail gate too low. Ground speed too fast for soil conditions. Soil too wet. 	 Replace worn or bent tines. Reinstall tines. Raise tail gate setting. Reduce ground speed. Allow time for soil to dry.
Overheated rotor	Grass or soil accumulated on ends of rotor.No lubrication in side gear box or tiller shaft.	Clean rotor of debris.Check gear oil in side gear box, lubricate router side bearings.
Frequent clogging of Tines	Grass or weeds too tall.Soil too wet.Ground speed too fast.	Cut grass or weeds before tilling.Allow time for soil to dry.Reduce ground speed.
Intermittent clicking noise	Loose parts.Gearbox gear damaged.	Check all bolts and nuts are properly tightened.Replace damaged gear(s).
Excessive vibration or tiller skipping over ground.	 PTO speed not set at 540 RPM. Worn or broken tines. Excessive debris wrapped on rotor. Tines incorrectly mounted - tines on backwards. Damaged or bent rotor or tiller shaft. 	 Set tractor's PTO lever to 540 RPM. Replace tines. Mow grass or weeds. May need to defoliate or burn before tilling. Reinstall tines. Replace rotors or tiller shaft. Do not operate tiller if shaft is bent or damaged.
Tiller not penetrating ground or tilling depth insufficient	 Tines installed incorrectly. Skid shoes not adjusted properly. Tractor carrying tiller. Ground too hard. 	 Reinstall tines correctly. Adjust skid shoe height. Lower 3-point arms. Raise tiller skid shoes and tail gate for shallower penetration. Lower shoes and tail gate for each additional pass until desired results are achieved. Reduce tractor speed. Wait for rain.
	 Insufficient power. Tiller propels tractor forward and climbs out of ground. Tall grasses or weeds wrapped around rotor. Worn or bent tines. Tiller is not level Excessive ground speed. 	 Increase tractor engine RPM. Tractor is too small - use a larger tractor or add weights. Cut grasses and weeds. In some instances burning or defoliating is necessary. Replace tines. Adjust top link on 3-point hitch to level tiller. Reduce ground speed.
Tiller shaft will not turn.	 PTO not engaged. Broken gears. Driveline shear bolt sheared. Clutch slipping. Rock or stump wedged between tines and housing. 	 Engage PTO. Replace broken gears or replace side gearbox. Replace shear bolt. Check minimum maximum driveline length. Check clearance of driveline with tractor and tiller, remove drawbar. Reduce load, slow forward speed. Adjust clutch. Clear blockage and remove any material caught within housing and/or rotor.

Limited Warranties:

Absolute Innovations, Inc. (ABI) 1320 Third Street, Osceola, IN 46561, warrants for one (1) year from the purchase date to the original non-commercial, governmental, or municipal purchaser ("Purchaser") and warrants for six (6) months to the original commercial or industrial purchaser ("Purchaser") that the product purchased are free from defects in material or workmanship. ABI will replace or repair, free of charge to the original purchaser any part(s) found, upon examination at our factory, to be defective under normal use and service due to defects in material or workmanship, provided that the original purchaser:

- a. a. Notifies ABI in writing of any defect in material or workmanship within the above specified warranty period.
- b. b. Returns must be routed through an authorized ABI dealer or distributor from whom the purchase was made.
- c. c. Purchaser is responsible for cost of shipping.

In no event will ABI be held liable under this warranty unless written notice is received and failure must have occurred within the warranty period. Genuine ABI replacement parts and components will be warranted for 90 days from date of purchase, or the remainder of the original equipment warranty period, whichever is longer.

This limited warranty does not apply to any part of the product which has been subjected to improper or unintended use, negligence, alteration, modification, or accident, damaged due to lack of maintenance or use of wrong oil or lubricants, or repairs that have been made with parts other than those obtainable through ABI Innovations, or which has served its usual life. This limited warranty does not apply to any expendable item such as blades, shields, guards, or pneumatic tires, or other trade accessories since these items are warranted separately by their respective manufacturers, except as specifically noted in your Operator's Manual.

Except as provided herein, no employee, agent, Dealer, or other person is authorized to give any warranties of any nature on behalf of ABI. Only ABI Innovations is authorized to make any representation to the purchaser concerning "normal" use and service for its product as described in the Operator's Manual, or in authorized printed materials or stickers affixed to the product.

If after examination of the product and/or part(s) in question; ABI finds them to be defective under standard use and service due to defects in material or workmanship,

ABI will:

- 1. 1. Repair or replace the defective product or part(s); if ABI has made several reasonable number of attempts in repairing the product and/or part(s) to conform to the warranty; then
- 2. 2. ABI will replace part(s) or product.
- 3. 3. Purchaser is responsible for any labor charges exceeding a reasonable amount as determined by ABI and for returning product and/or part(s) to the Dealer, whether or not the claim is approved. Purchaser is responsible for the transportation cost for the product or part(s) from the Dealer to the factory.

The choice of remedy shall belong to ABI Innovations. Repair or replacement are the only remedies against ABI under this limited warranty.

Limitation of Liability:

- 1. 1. ABI disclaims any express (except as set forth herein) and implied warranties with respect to the product including, but not limited to, merchantability and fitness for a particular purpose.
- 2. 2. ABI makes no warranty as to the design, capability, capacity, or suitability for use of the product.
- 3. 3. This warranty shall not be interpreted to render us liable for injury or damages of any kind or nature to person or property. ABI will not be liable for any special, incidental or consequential damages based upon breach of warranty, breach of contract, negligence, strict tort liability, or any other legal theory. Such damages include but are not limited to loss of crops, loss of savings or revenue, cost of capital, loss of use of equipment, facilities or services, down time, expense or loss incurred for labor, supplies, substitute machinery, rental, and claims of third parties including customers, and injury to property.

Supplementary:

- 1. 1. Proper venue for any lawsuits arising from or related to this limited warranty shall be only in St. Joseph County, Indiana.
- 2. 2. ABI may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.
- 3. 3. If any provision of this limited warranty violates any applicable law and is held unenforceable, then the invalidity of such provision shall not invalidate any other provisions.
- 4. 4. Applicable law may provide rights and benefits to purchaser in addition to those herein.

References

¹·Sentry Insurance, FEMA, *Owner's and Operators Manuals for Farm Equipment*, Sentry Insurance, Stevens Point, WI, revised Management Bulletin No. 112, 90-42; March 2007, pp S-2.

² Sentry Insurance, FEMA, Safety Signs for Farm Equipment, Sentry Insurance, Stevens Point, WI, 90-34, October 2006, pps 1-20.

³ American Society of Agricultural and Biological Engineers, ASABE, *Three-Point Free-Link Attachment for Hitching Tillers*, ASAE S217.12 DEC2001 (ISO 730-1:1994) (R2007), Printed ASABE, St. Joseph, MO. pps 1-10.

⁴ International Standardization Organization (ISO), ISO 11684, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment - Safety Signs and hazard pictorials -* General purpose, Printed in Switzerland, ISO 11684:1995(E),

⁵ International Standardization Organization (ISO), ISO 17101, Agricultural machinery - Rotary and Flail mowers - Thrown-object test and acceptance, Printed in Switzerland, ISO 17101:2004(E),

⁶ Occupational Safety and Health Administration (OSHA), *Safety for Agricultural Equipment,* 29 CFR 1928.57, http://www.osha.gov/pls/oshaweb/ owadisp.show_document?p_table=STANDARDS&p_id=10958.

⁷ Tractor and Machinery Association of Australia (TMA), OHS Guidelines For Agricultural Machinery, Maddock Lonie & Chisholm, Melbourne Victoria, Australia, Fourth Edition, 2003, pps 1-57.

Suggested References

ABI assumes no liability for the use or misuse of information provided in the following references:

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