

ROTARY TILLER

OPERATION AND ASSEMBLY MANUAL

INTRODUCTION

TO THE OWNER:

Read this manual before operating your equipment. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all adjustments and operating procedures before attempting to operate the equipment. Replacement manuals can be obtained from your selling dealer.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Please observe all safety information in this manual and safety decals on the equipment.

Use only genuine service parts. Substitute parts will void the warranty and may not meet the required standards for safe and satisfactory operation.

Throughout this manual, the term IMPORTANT is used to indicate that failure to observe procedures can cause damage to equipment. The terms CAUTION, WARNING and DANGER are used in conjunction with the Safety-Alert Symbol, (a triangle with an exclamation mark), to indicate the degree of hazard for items of personal safety.



This Safety-Alert Symbol indicates a hazard and means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



DANGER

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.



WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed.



CAUTION

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.

IMPORTANT

Indicates that failure to observe can cause damage to equipment.

NOTE

Indicates helpful information.

IT IS THE PURCHASER AND/OR OPERATOR'S RESPONSIBILITY TO....

Read and understand the information contained in this manual.

Operate, lubricate, assemble and maintain the equipment in accordance with all instructions and safety procedures in this manual.

Inspect the equipment and replace or repair any parts that are damaged or worn which under continued operation would cause damage, wear to other parts, or cause a safety hazard.

Return the equipment or parts to the authorized dealer, from where it was purchased, for service or replacement of defective parts that are covered by warranty. (Manufacturer may inspect equipment or parts before warranty claims are honored.)

Pay all costs incurred by the dealer for traveling to or transporting the equipment for warranty inspection and or claims.

| | |
|---------------------------------------|-------|
| Safety | 4-7 |
| Safety & Instruction Decals | 8-9 |
| Assembly & Setup | 10-13 |
| Reversing Tiller Tines/Direction..... | 14-15 |
| Attaching | 16 |
| Sizing PTO | 16-17 |
| Operating & Maintenance..... | 18 |
| Storage | 19 |
| Parts | 19-23 |
| Torque Specifications | 24 |
| Notes | 25 |
| Warranty..... | 26-27 |

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. We reserve the right to make changes at any time without notice.

TO THE PURCHASER:

This manual contains valuable information about your new Rotary Tiller. It has been carefully prepared to give you helpful suggestions for operating, adjusting, servicing and ordering repair parts.

Keep this manual in a convenient place for quick and easy reference. Study it carefully. You have purchased a dependable and sturdy tiller, but only by proper care and operation can you expect to receive the service and long life designed and built into it.

Sometime in the future your tiller may need new parts to replace those that are worn or broken. If so, go to your dealer and provide him with the model and part number.

CUSTOMER INFORMATION

Name _____

Purchased From _____

Date Purchased _____

Model No. _____

Serial No. _____

TRAINING

Safety is a primary concern in the design and manufacturing of our product. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator or bystander.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of this equipment.

It has been said, "The best safety device is an informed, careful operator." We ask you to be that kind of operator. It is the operator's responsibility to read and understand all safety and operating instructions in the manual and to follow them. Accidents can be avoided.

Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your tractor, before assembly or operating, to acquaint yourself with the machines. If this machine is used by any person other than you, or is loaned or rented, it is the rotary tiller owner's responsibility to make certain that the owner's manual be available to the operator prior to operating and that the operator:

- 1.) Reads and understands the operator's manuals.
- 2.) Is instructed in safe and proper use.

Know your controls and how to stop the tractor, engine, and tiller quickly in an emergency. Read this manual and the one provided with your tractor.

Train all new personnel and review instructions frequently with existing workers. Be certain only a properly trained and physically able person will operate the machinery. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death. If the elderly are assisting with farm work, their physical limitations need to be recognized and accommodated.

PREPARATION

Never operate the tractor and tiller until you have read and completely understand this manual, the Tractor Operator's Manual, and each of the safety messages found on the safety signs on the tractor and tiller.

Personal protection equipment including hardhat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintenance, repairing, removal, or moving the implement. Do not allow long hair, loose fitting clothing, or jewelry to be around equipment.

PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS! Tractors with or without tillers attached can often be noisy enough to cause permanent, partial hearing loss. We recommend that you wear hearing protection on a fulltime basis if the noise in the operator's position exceeds 80 db. Noise over 80 db on a long-term basis can cause severe hearing loss. Noise over 90 db adjacent to the operator over a long-term basis may cause permanent, total hearing loss.

NOTE: Hearing loss from loud noise (from tractors, chain saws, radios, and other such sources close to the ear) is cumulative over a lifetime without hope of natural recovery.

Operate the tiller only with a tractor equipped with an approved Roll-Over-Protective System (ROPS). Always wear your seat belt. Serious injury or even death could result from falling off the tractor — particularly during a turnover when the operator could be pinned under the ROPS or the tractor.

Clear area to be tilled of stones, branches or other debris that might be thrown or entangled in the tiller, causing injury or damage.

Operate only in daylight or good artificial light.

Ensure tiller is properly mounted, adjusted and in good operating condition.

Ensure that all safety shielding and safety signs are properly installed and in good condition.

STARTING AND STOPPING

Check the tractor master shield over the PTO (power take off) stub shaft. Make sure it is in good condition and fastened securely to the tractor. Purchase a new shield if old shield is damaged or missing.

All tractors that are not equipped with a "live" power takeoff (PTO) need to be equipped with an over-running PTO clutch. These are available through most farm equipment stores.

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NOTE: The addition of an over-running PTO clutch may change the length of the PTO driveline required. Pay extra attention to the instructions on the PTO Driveline Installation. Be sure that the driveline system guarding is adequate.

Tiller operating power is supplied from the tractor PTO. Refer to your tractor manual for PTO engagement and disengagement instructions. Know how to stop tractor and tiller quickly in case of an emergency.

When engaging PTO, the engine RPM should always be at idle speed. Once engaged and ready to start tilling, raise PTO speed to 540-RPM and maintain throughout tilling operation.

OPERATION

The use of this equipment is subject to certain hazards that cannot be protected against by the mechanical means or product design. All operators of this equipment must read and understand this entire manual, paying particular attention to safety and operating instructions, prior to using. If there is something in this manual you do not understand, ask your supervisor, or your dealer, to explain it to you.

Most accidents occur because of neglect or carelessness. Keep all helpers and bystanders at least several hundred feet from an operating rotary tiller. Only properly trained people should operate this machine.

When machine is operated in populated areas where thrown objects could injure persons or property, operation must be stopped when anyone comes within several hundred feet.

The majority of the accidents involve entanglement on the driveline, injury of bystanders by the objects thrown by the rotating tines, and operators being knocked off the tractor by low hanging limbs and then being run over by the tiller. Accidents are most likely to occur with machines that are loaned or rented to someone who has not read the owner's manual and is not familiar with a rotary tiller.

The rotary tiller is designed for use only on tractors with the power takeoff (PTO) turning at 540-RPM.

Install and secure all guards and shields before starting or operating. The tiller tines, driveline guards and tractor shields should be used and maintained in good working condition.

They should be inspected carefully, at least daily, for missing or broken chain links, shields, or guards. (Worn items must be replaced at once to reduce possibility of injury.)

Disengage power takeoff (PTO) and place transmission in neutral before attempting to start engine.

Many varied objects, such as wire, cable, rope, or chains, can become entangled in the operating parts of the tiller. These items could then swing outside the housing at greater velocities than the tines. Such a situation is extremely hazardous. Inspect the cutting area for such objects before tilling. Remove any like objects from the site.

Never allow the tilling tines to contact such items. Never assume an area is clear. Always Check!

Always stop the tractor, disengage PTO, set brake, shut off the tractor engine, remove the ignition key, lower implement to the ground and allow rotating pieces to come to a complete stop before dismounting tractor. Never leave equipment unattended with the tractor running.

Never place hands or feet under tiller with tractor engine running or before you are sure all motion has stopped. Stay clear of all moving parts.

Do not reach or place any part of your body under equipment until it is blocked securely.

Do not allow riders on the rotary tiller or tractor at anytime. There is no safe place for any riders.

Do not operate unless all personnel, livestock, and pets are several hundred feet away to prevent injury by thrown objects.

Never operate tractor and rotary tiller under trees with low hanging limbs. Operators can be knocked off the tractor and then run over by the rotating tines.

The rotating parts of this machine have been designed and tested for rugged use. However, they could fail upon impact with heavy, solid objects such as steel guardrails and concrete abutment. Such impact could cause the broken objects to be thrown outward at very high velocities. To reduce the possibility of property damage, serious injury, or even death, never allow the tilling tines to contact such obstacles.

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Stop rotary tiller and tractor immediately upon striking an obstruction. Turn engine off, remove key, inspect and repair any damage before resuming operation.

Stay alert for uneven terrain, holes, rocks, and roots and other hidden hazards. Keep away from drop-offs and hazards that could cause roll over. Use extreme care and maintain minimum ground speed when transporting or operating on hillsides, over rough ground and when operating close to ditches or fences. Be careful and slow down when turning sharp corners and changing direction on slopes. Do not start or stop suddenly on slopes. Avoid operation on steep slopes. In extremely uneven terrain, rear wheels weights, front tractor weight, and/or tire ballast should be used to improve stability.

Pass rotary tiller diagonally through sharp dips and avoid sharp drops to prevent "hanging up" tractor and rotary tiller. Practice will improve your skills in maneuvering on rough terrain. Always cut down slopes, never across the face. Always check tractor manual for proper use on slopes.

When using a unit, a minimum 20% of tractor and equipment weight must be on tractor front wheels. Without this weight, tractor could tip over, causing personal injury or death. The weight may be attained with a front end loader, front wheel weights, ballast in the tires or front tractor weights. When attaining a minimum 20% of tractor and equipment weight on the front wheels, you must not exceed the ROPS weight certification. Weigh the tractor and equipment. Do not guess or estimate!

TRANSPORTATION

Comply with state and local laws governing highway safety and movement of farm machinery on public roads.

The use of flashing amber lights is acceptable in most localities. However, some localities prohibit their use. Local laws should be checked for all lighting and marking requirements.

At all times, when driving the tractor and equipment on the road or highway under 20 mph (32 kph) use flashing amber warning lights and a slow moving vehicle (SMV) identification emblem. Do not exceed 20 mph (32 kph). Reduce speed on rough roads and surfaces.

Plan your route to avoid heavy traffic.

Always install transport locks, pins or brackets before transporting.

Do not drink and drive.

Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc. Watch for traffic when operating near or crossing roadways.

Turn curves or go up or down hills only at a low speed and at a gradual steering angle. Make certain that a least 20% of the tractor's weight is on the front wheels to maintain safe steerage. Slow down on rough or uneven surface. Always check tractor manual for proper use on slopes.

Use extreme care and maintain minimum ground and when operating close to ditches or fences. Be careful when turning sharp corners.

Never allow riders on either tractor or tiller.

MAINTENANCE

Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.

Follow good shop practices.

Keep service area clean and dry

Be sure electrical outlets and tools are properly grounded

Use adequate light for the job at hand.

Make sure there is plenty of ventilation. Never operate the engine of the towing vehicle in a closed building. The exhaust fumes may cause asphyxiation.

Before working on this machine, disengage the PTO, shut off the engine, set the brakes, and remove the ignition keys.

Be certain all moving parts on attachments have come to a complete stop before attempting to perform maintenance.

Never work under equipment unless it is blocked securely.

Always use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance.

Frequently check tiller tines. They should be sharp, free of nicks and cracks and securely fastened.

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Periodically tighten all bolts, nuts, and screws and check that all cotter pins are properly installed to ensure unit is in safe condition.

When completing a maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.

After servicing, be sure all tools, parts and service equipment are removed from tiller.

Do not allow debris, grease or oil to build up on any deck or platform.

When replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications.

The manufacturer will not be responsible for injuries or damages caused by use of unapproved parts and/or accessories.

A fire extinguisher and the first aid kit should be kept readily accessible while performing maintenance on this equipment.

STORAGE

Following operation, or when unhooking the tiller, stop the tractor, set the brakes, disengage the PTO, shut off the engine and remove the ignition keys.

Store the unit in an area away from human activity.

Do not park equipment where it can be exposed to direct contact to livestock for long periods of time. Damage and livestock injury could result.

Make sure all parked machines are on a hard, level surface and engage all safety devices.

EQUIPMENT SAFETY GUIDELINES

Safety of the operator and bystanders is one of the main concerns in designing and developing a tiller. However, every year accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions and insist those working with you, or for you, follow them.

In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, equipment should never be operated in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace the shield prior to use.

Replace any safety sign that is not readable or missing. Location of such safety signs are indicated in this manual.

Never use alcoholic beverages or drugs that can hinder alertness or coordination while operating this equipment. Consult your doctor about operating this machine while taking prescription medications.

Under no circumstances should children under the age of 18 be allowed to work with this equipment. Do not allow persons to operate or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and how it works. Review the safety instructions with all users annually.

This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible, properly trained and physically able person familiar with farm machinery and trained in this equipment's operations. If the elderly are assisting with farm work, their physical limitations need to be recognized and accommodated.

Use a tractor equipped with a Roll Over Protective System and seat belts. (ROPS)

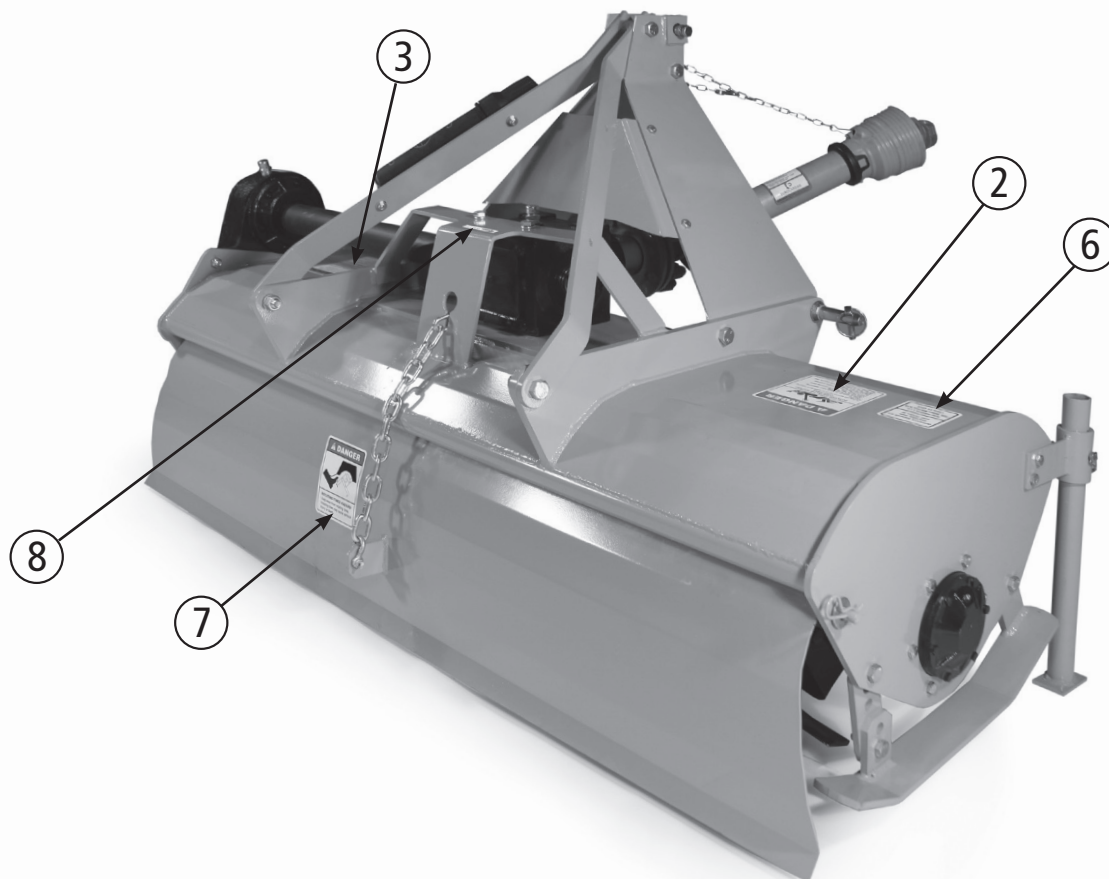
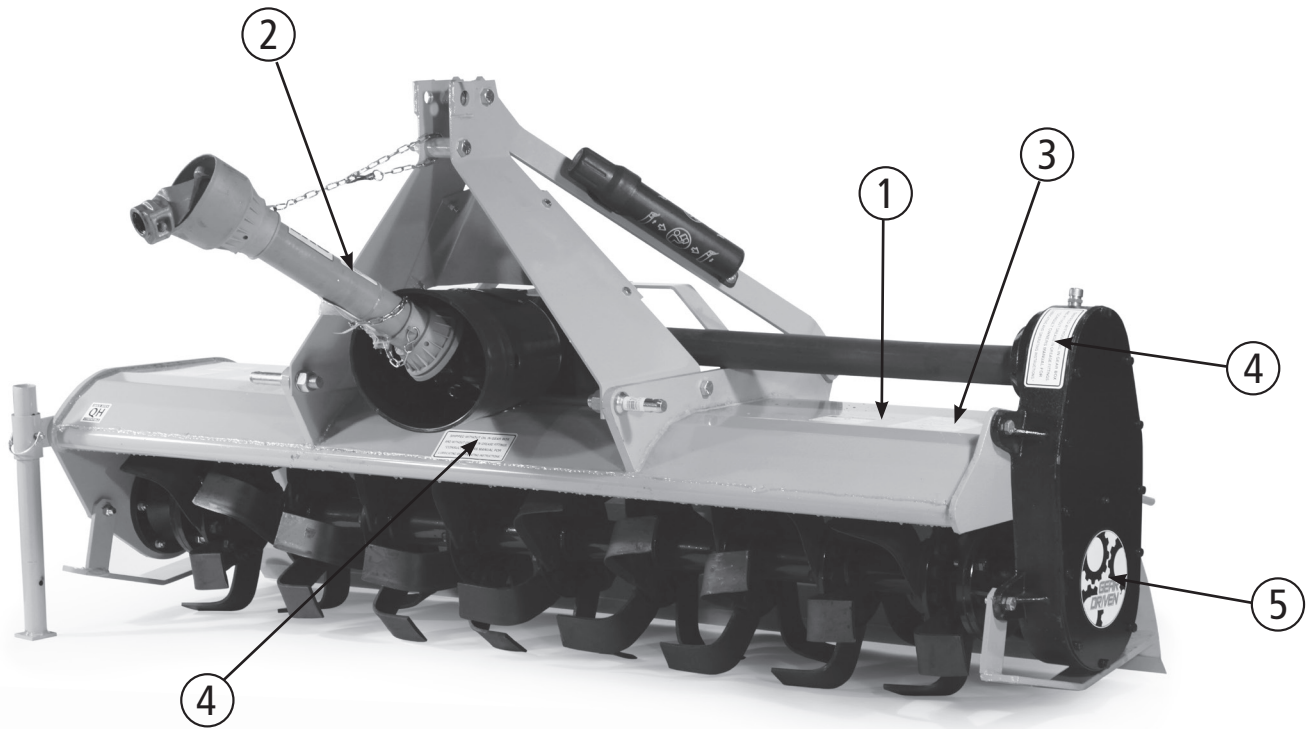
Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question- DON'T TRY IT.

Do not modify the equipment in any way. Unauthorized modification could result in serious injury or death and may impair the function and life of the equipment.

In addition to the design and the confirmation of this implement, including safety signs and safety equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to safety messages and operation instruction in each of the appropriate sections of the tractor and tiller manuals. Pay close attention to the safety signs affixed to the tractor and the tiller.

SAFETY AND INSTRUCTION DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
Replace Immediately if Damaged!



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Replace Immediately if Damaged!



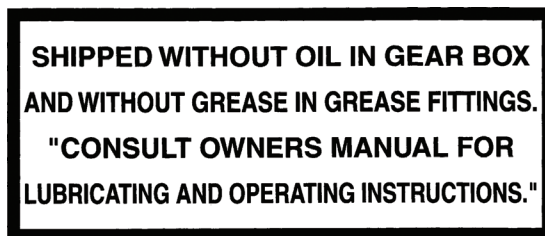
① **WARNING INJURY**



② **ENTANGLEMENT**



③ **CRUSH POINT**



④ **LUBRICATION NOTICE**



⑤ **GEAR DRIVEN**



⑥ **MODEL #**



⑦ **ROTATING TINES**

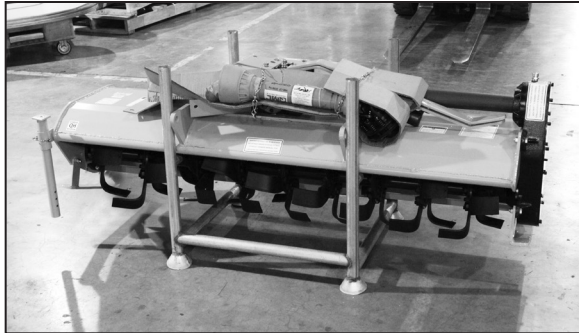


⑧ **LIFT HERE**

ASSEMBLY AND SETUP

ASSEMBLING

Tools Needed: Socket & wrench sizes are 9/16", 3/4", 15/16", and 1-1/4". Impact wrench preferred.



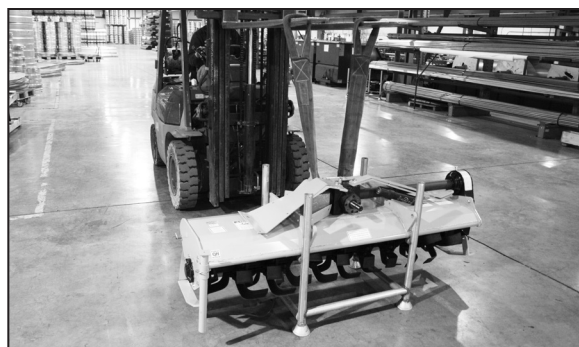
1. With rotary tiller still in rack, set on a level spot for assembly of tiller.



2. Insert an adequately rated lifting strap in gearbox mounting frame.



3. Remove PTO shaft.



4. Slowly lift tiller from shipping rack.



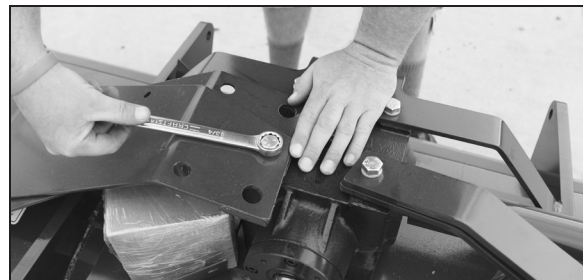
5. Before setting on level ground, remove pin from kick stand and adjust so the tiller sits level for assembly.



6. Remove the tie straps from the skids on both sides of the tiller and the PTO shield from the top.

7. Place on level ground for assembly.

8. Remove lift strap.



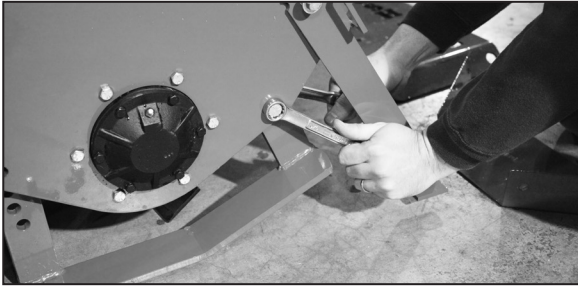
9. Remove "A"-arm plates and rear braces with 3/4" wrench and discard bolts.



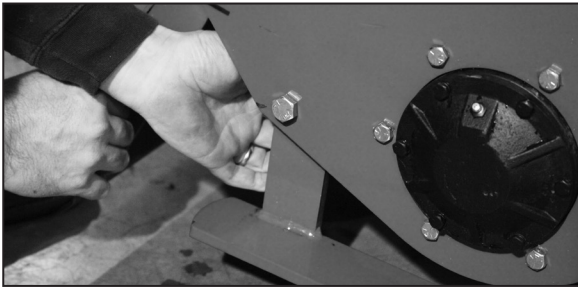
10. Remove boxed hardware, PTO shield, and two (2) bushings.

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11. Loosen front skid plate bolt on both sides.



12. Insert 1/2" x 1-1/2" bolt and lock nut into back adjustment holes. Fully tighten.

NOTE: Hand tighten all bolts until otherwise directed in these instructions.



13. Attach "A"-arm plate to the front of the tiller deck bracing using Category 1 pins and provided 5/8" x 2" hex bolt.

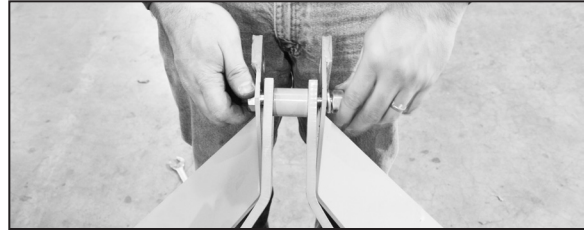


14. Repeat for opposite side.



15. Attach the rounded end of the brace to the outside of the rear tiller deck bracing using provided 5/8" x 2" hex bolt.

16. Repeat for opposite side.



17. Attach the square end of the rear brace to the inside "A"-arm plates using 1-1/2" spacer and 5/8" x 4" hex bolt.

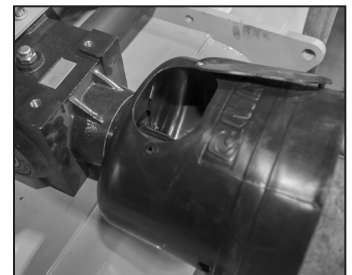


18. Assemble 5/8" x 4" hex bolt and 2-1/4" spacer.



19. Attach PTO shield to the "A"-arm plates using 1/4" x 3/4" hex bolt.

20. Fully tighten all bolts.



21. Install PTO guard using four (4) 1/4" x 3/4" bolts and washers. Make sure opening on PTO guard is on the top. Finally, install PTO driveline.

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ASSEMBLY AND SETUP

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22. Remove bolt from PTO shaft. Slide PTO shaft onto gearbox and reinstall bolt through opening in PTO shaft guard.
23. Assembly of your rotary tiller is now complete. Please read next section of this manual for filling remaining unit with oil and lubricating instructions.

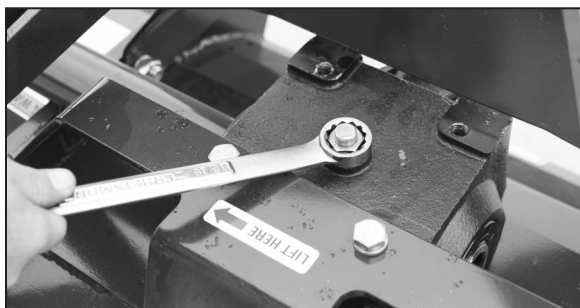
BEFORE PUTTING ROTARY TILLER INTO SERVICE

IMPORTANT: This tiller was shipped without oil in gearboxes and without grease in grease fittings. UNIT MUST BE SERVICED BEFORE USING.

NOTE: Fill gearbox using 90 W gear oil (type GL5-85W 140 or Triple Zero Grease; which can be poured, and has "EP" i.e. "Extreme Pressure" additives).

NOTE: For all grease fittings use Type grade II tube grease.

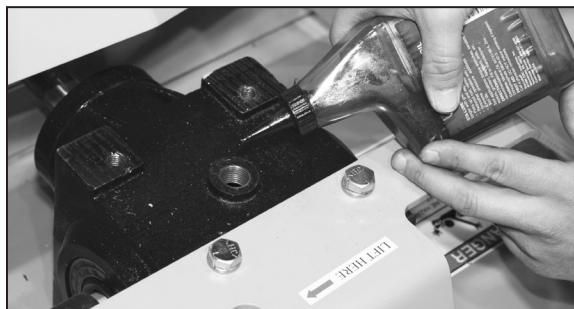
1. Place rotary tiller so that the deck is secure and level.



2. Using $\frac{7}{8}$ " wrench, remove $\frac{1}{2}$ " vented pipe plug located on front of gearbox above PTO shaft.



3. Remove check plug located at back of gearbox.



4. Fill gearbox in front using specified gear oil until oil begins to overflow from check plug hole in rear. (holds ~1-1/2 quarts) Safety glasses are recommended when filling gearbox with oil.



CAUTION

DO NOT overfill gearbox. This could cause damage to oil seals and can cause permanent damage to the gearbox. This issue will not be covered under warranty.

5. Replace and tighten the check plug.



6. Replace and tighten the $\frac{1}{2}$ " vented pipe plug and clean away any excess oil.

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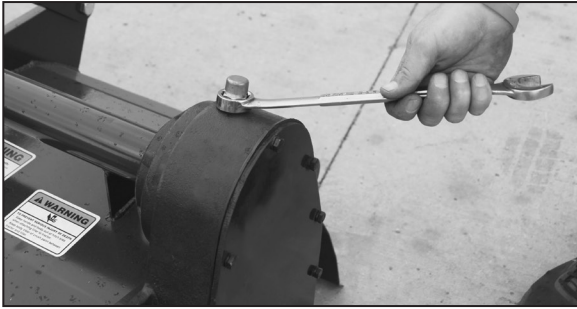


Figure C

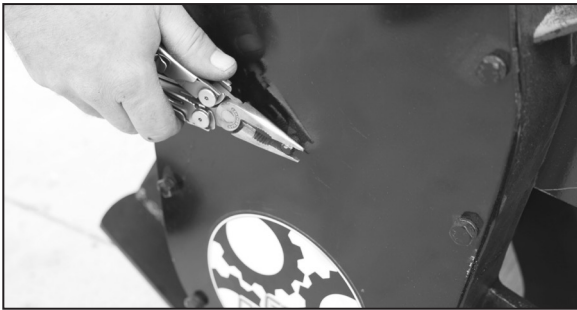


Figure D

7. Using $7/8$ " wrench, remove $1/2$ " pipe plug located at top of side gearbox (Figure C) and the $1/8$ " check plug located on side of the side gearbox (Figure D).

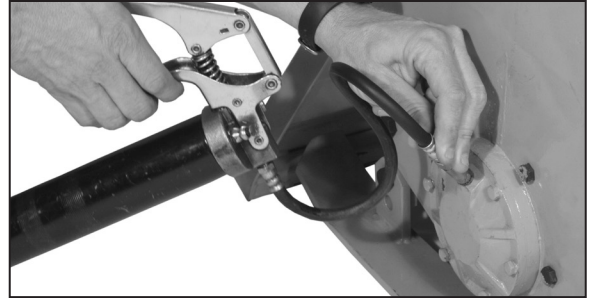


8. Fill side gearbox using specified gear oil until the oil begins to overflow from the check plug hole. (Holds ~2-1/2 quarts)

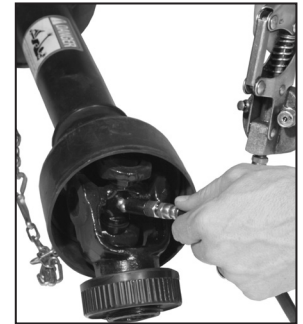
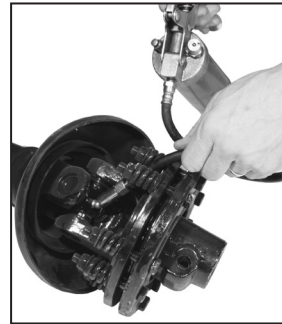


DO NOT overfill gearbox (Refer to step 8 and figure D). This could cause damage to oil seals and can cause permanent damage to the gearbox. This issue will not be covered under warranty.

9. Replace and tighten the $1/2$ " vented pipe plug and the $1/8$ " check plug. Clean away any excess oil.



10. Grease the grease fitting on the "out-board hub".



11. Grease the two (2) grease fittings on the PTO universal joints.



12. Grease the two (2) grease fittings on the PTO safety shield.

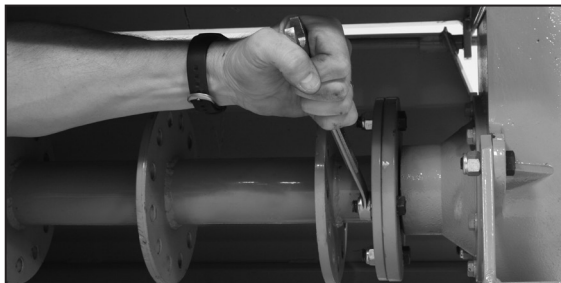


13. Separate the PTO shaft and grease the inner surface.

REVERSING TILLER/TINES DIRECTION

REVERSING TILLER/TINES DIRECTION

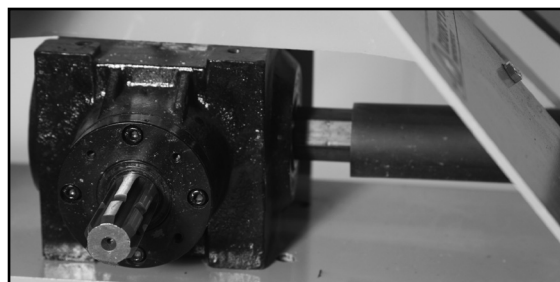
1. Unhook tiller from tractor.
2. Make sure tiller is securely blocked and leveled.
3. Remove PTO shaft from tiller.
4. You **must** reverse tines on the tiller before reverse operation.



5. To reverse tine direction, remove four (4) bolts in each end of tine carrier.
6. Carefully drop out tine set and turn 180° and place in front of the tiller. Before reattaching the tines, remove gearbox.

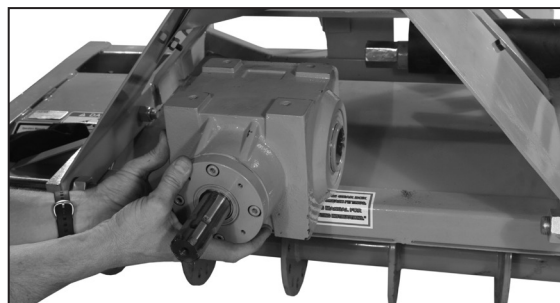


7. Loosen and remove a total of (6) bolts, (2) on top of gear box and (4) underneath.



8. Slide gearbox to left approximately 5". Side keyshaft should drop out of gearbox on right hand side.

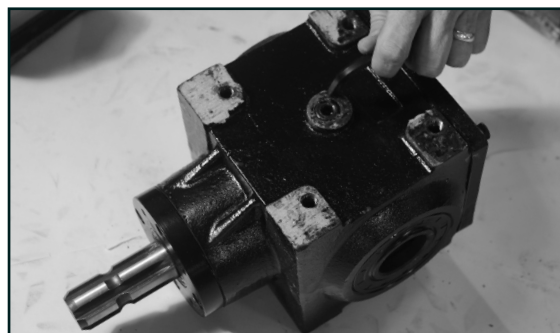
NOTE: If keyshaft does not come out of gearbox, simply slide keyshaft out of side gearbox first and then remove it from main gearbox.



9. Slide gearbox forward and out.



10. Remove fill plug from top of gear box.



11. Remove flat plug from bottom of gear box. Switch the fill plug from top of gearbox to bottom and flat plug from bottom to top.

REVERSING TILLER/TINES DIRECTION



**Gearbox is extremely heavy.
Handle with care.**



12. On the side opposite where key shaft was inserted, find washer held in by snap ring.



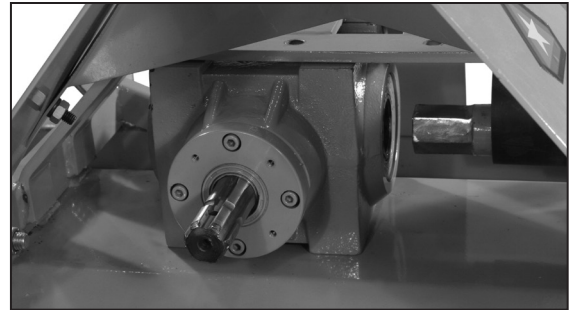
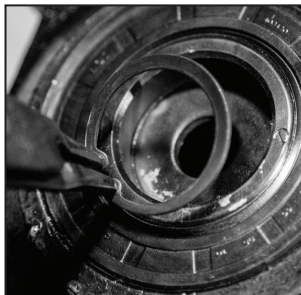
13. Using snap ring pliers, carefully remove snap ring.



14. Remove washer from key shaft hole as well.



15. Put washer and snap ring back into the hole where the key shaft was just removed.



16. Flip gearbox over and re-insert into frame.

17. Slide key shaft into the now freed up key shaft hole on opposite side of the gearbox.

18. Slide gearbox back to center of tiller.

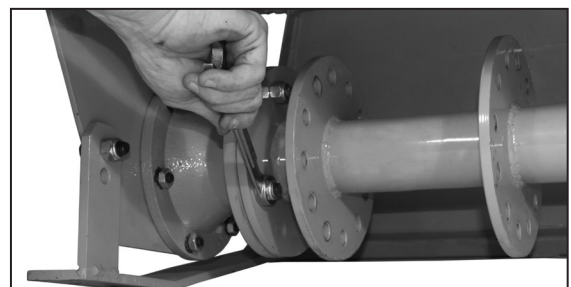
19. Reinsert 6 bolts (2 top, 4 bottom). Do not tighten until all 6 are successfully started.

20. Once key shaft is successfully reinserted and all 6 bolts are started by hand, tighten all 6 bolts on gearbox.



WARNING

Do not tighten any of the six gearbox bolts until all six have been threaded and started, then tighten.



21. Carefully reattach to each hub.

NOTE: Instructions partially made with tines removed for instructional clarity only.



WARNING

Tine set is heavy and contains sharp edges. Handle carefully!

21. Your tiller unit should now turn and till with reverse direction.

ATTACHING TO TRACTOR



Never stand between tractor and rotary tiller while backing up tractor to the hitch.

1. Place tiller and tractor on level ground.
2. Back tractor into position by lining up lift arms and Category I pins on the tiller. Attach lift arms to Category I pins and secure with lynch pins.
3. Attach top link using Category I lift pin and lynch pin.
4. Attach PTO driveline and secure anti-rotation chains.
5. Once everything is securely attached, raise tiller off the ground and adjust the top link so the tiller sets level from front to back.
6. Determine if the PTO shaft needs to be shortened.

IMPORTANT: A driveline that is too long to fit between tractor and tiller will bottom out causing structural damage to the tractor and tiller.

Always check driveline collapsible length during initial setup, when connecting to a different tractor and when alternating between using a quick hitch and a standard 3-point hitch. More than one driveline may be required to fit all applications.

Refer to Figure 1

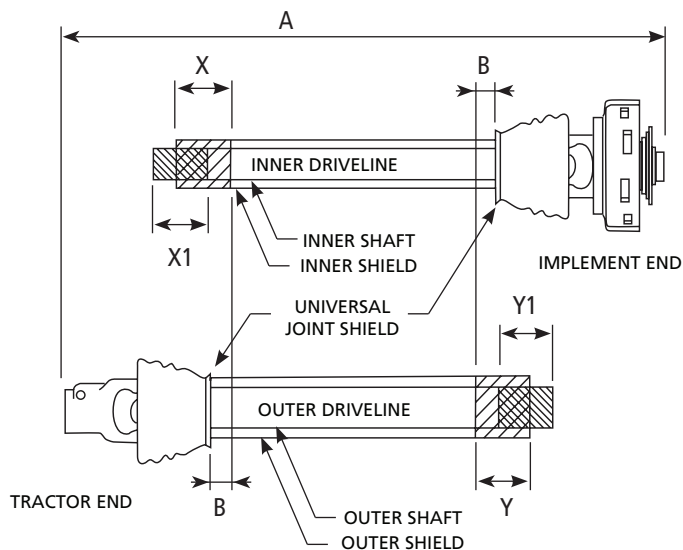
7. Make sure driveline is properly installed and level before checking driveline collapsible length.
8. With driveline level, measure 1" ("B" dimension) back from universal joint shield to end of outer driveline shield as shown in Figure 1. If measurement is less than 1", then shorten driveline using instructions provided in section "Sizing The PTO Shaft".

SIZING THE PTO SHAFT

Refer to Figure 1

1. Un-hook driveline from tractor PTO shaft and pull outer and inner drivelines apart.
2. Reattach outer driveline to tractor PTO shaft. Pull on inner and outer drivelines to be sure universal joints are properly secured.

3. Hold inner and outer drivelines parallel to each other:
 - a. Measure 1" ("B" dimension) back from outer driveline universal joint shield to make a mark at this location on the inner driveline shield.
 - b. Measure 1" ("B" dimension) back from the inner driveline universal joint shield and make a mark at this location on the outer driveline shield.
4. Remove driveline from tractor and gearbox shafts.
5. Measure from end of inner shield to scribed mark ("X" dimension). Cut off inner shield at the mark. Cut same amount off the inner shaft ("X1" dimension).
6. Measure from end of outer shield to scribed mark ("Y" dimension). Cut off outer shield at the mark. Cut same amount off the outer shaft ("Y1" dimension).
7. Remove all burrs and cuttings.
8. Continue with "Check Driveline Maximum Length".



Driveline Shortening
Figure 1

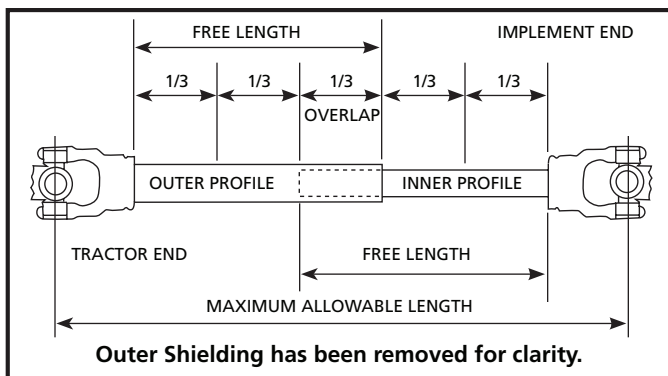
CHECK DRIVELINE MAXIMUM LENGTH

Refer to Figure 2

Make sure driveline collapsible length is acceptable. If needed, refer to "Attaching To Tractor".

The driveline maximum allowable length must, when fully extended, have a minimum overlap of the profile tubes by not less than 1/3 the free length with both inner and outer profile tubes being of equal length.

1. Apply multi-purpose grease to the inside of the outer shaft and reassemble the driveline.
2. Assemble the two driveline profiles together with just 1/3 overlapping of the profile tubes as shown below. Once assembled, measure and record the maximum allowable length for future reference.



Driveline Maximum Extended Length

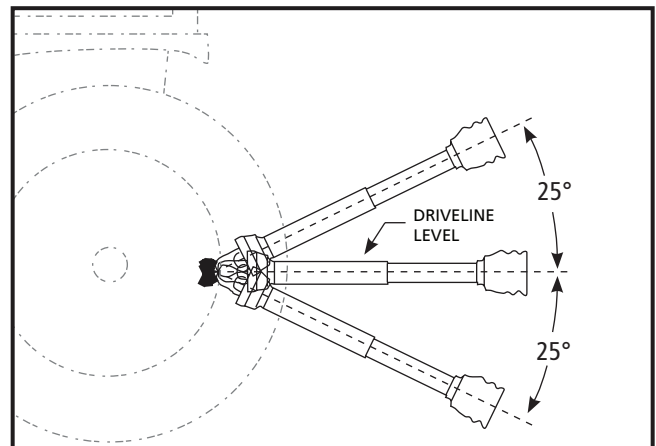
Figure 2

3. Attach inner driveline yoke to the tiller gearbox shaft. Attach outer driveline yoke to the tractor's PTO shaft.
4. Move yoke ends of driveline back and forth to insure they are secured to the tractor and tiller shafts. Reattach any end that is loose.

IMPORTANT: Small chains are supplied with the driveline. They must be attached to the inner and outer driveline shields and to the tiller and tractor to restrict shield rotation.

5. Hook driveline safety chain on the tractor end of driveline to tiller frame. Re-latch safety chain to the driveline shield.
6. Hook driveline safety chain on the Rotary Tiller end of driveline to the tiller frame. Re-latch safety chain to driveline shield.

7. Start tractor and raise Rotary Tiller just enough to remove support blocks.
8. Slowly engage tractor hydraulic 3-point control lever to lower the tiller while checking for sufficient drawbar clearance. Move drawbar ahead, aside or remove if required.
9. Raise and lower implement to find maximum extended driveline length. Check to make certain the driveline does not exceed maximum allowable length recorded in step 2.
10. If needed, set tractor 3-point lift height to stop driveline from exceeding maximum allowable length.
11. Continue with "Check Driveline Maximum Angle" below.



Check Driveline Maximum Angle

Figure 3

CHECK DRIVELINE MAXIMUM ANGLE

Refer to Figure 3

IMPORTANT: To avoid premature driveline breakdown, do not exceed an angle of 25° up or down with the driveline while driveline is rotating. If needed, set tractor 3-point lift lever to limit driveline angle at a maximum of 25° up.

1. Raise and lower implement to find maximum driveline angle. Check to make certain the driveline does not exceed 25° up or down.
2. If needed, set tractor 3-point lift height to keep driveline from exceeding 25° up.

OPERATING INSTRUCTIONS

1. Before each use perform the maintenance described in maintenance section on this page.
2. Read, understand, and follow the safety information on training, preparation, starting and stopping, operation, transportation, maintenance and storage at the beginning of this manual (pages 4 thru 7).
3. With the rotary tiller positioned on level ground, adjust the tractor lift arms so that when lifted, the rotor bar remains parallel to the ground.
4. With the rotary tiller attached to the tractor, raise and support the tiller with suitable blocks. Adjust the skids, located on the sides of the tiller. The adjustment bolts for both right and left sides should be positioned in the same adjustment hole. This allows the tiller to till the same depth on each side. Adjust the back plate, with regulating chain, until the desired mulching effect is found.

NOTE: Never attempt to adjust the rotary tiller while the tractor is running.

5. Raise the tiller and remove the blocks. Lower the tiller to the ground.
6. With the tractor at idle RPM and the tiller lifted off of the ground, engage PTO and slowly advance throttle to 540 PTO RPM.

NOTE: Rotary tiller is designed to run at 540 PTO RPM only.

7. Select a low gear for the tractor and begin to move forward. Tractor ground speed is to be controlled by gear selection only and not engine speed. As the tractor moves forward, slowly lower the tiller down. Allow the tiller tines to gradually engage the ground.

NOTE: Do not allow the tractor engine or rotary tiller to bog down or stall. This causes undue wear and tear on the tiller and tractor. If this continues to happen reduce ground speed and raise tilling depth of rotary tiller. Never attempt to remove objects from the rotor bar until the tractor has been shut down and the tiller tines have completely stopped.



Never travel at a fast ground speed while using the tiller, this could damage it. Never attempt to turn the tractor or travel in reverse with the PTO engaged and the tiller in the ground. Always raise the tiller out of the ground when backing up or attempting to turn. Failure to do so may cause damage to the tiller.

8. After each use clean all debris from the tiller tines. Replace any missing or illegible safety decals. Inspect for any damaged or worn parts and replace before next use. Store rotary tiller in a dry environment.

MAINTENANCE

1. Periodically check and maintain proper gear oil level.
2. Every 8 hours, grease: (1) "out-board hub", (2) PTO shaft universal joints, (3) PTO shaft safety shield and (4) PTO telescoping surface.

NOTE: Use only a grade Type II tube grease. Do not grease the slip clutch assembly.

3. Before each use check to make sure all safety shields are installed and working properly.
4. Check tiller tines for cracks and breaks before every use.
5. Periodically check all nuts and bolts to insure they are tight and secure.
6. Periodically loosen torque spring bolts and allow slip clutch to slip for approximately two (2) revolutions. Loosen the bolts until the springs lose contact with the flange yoke. This ensures that the slip clutch is not in a "locked" position.
7. Make sure that the clutch slips.
8. To retighten the slip clutch, tighten the torque spring bolts until the nut makes contact with the flange yoke and further tighten one and a half turns (1 1/2). This is a good starting point, further adjustments may need to be made based on soil conditions.

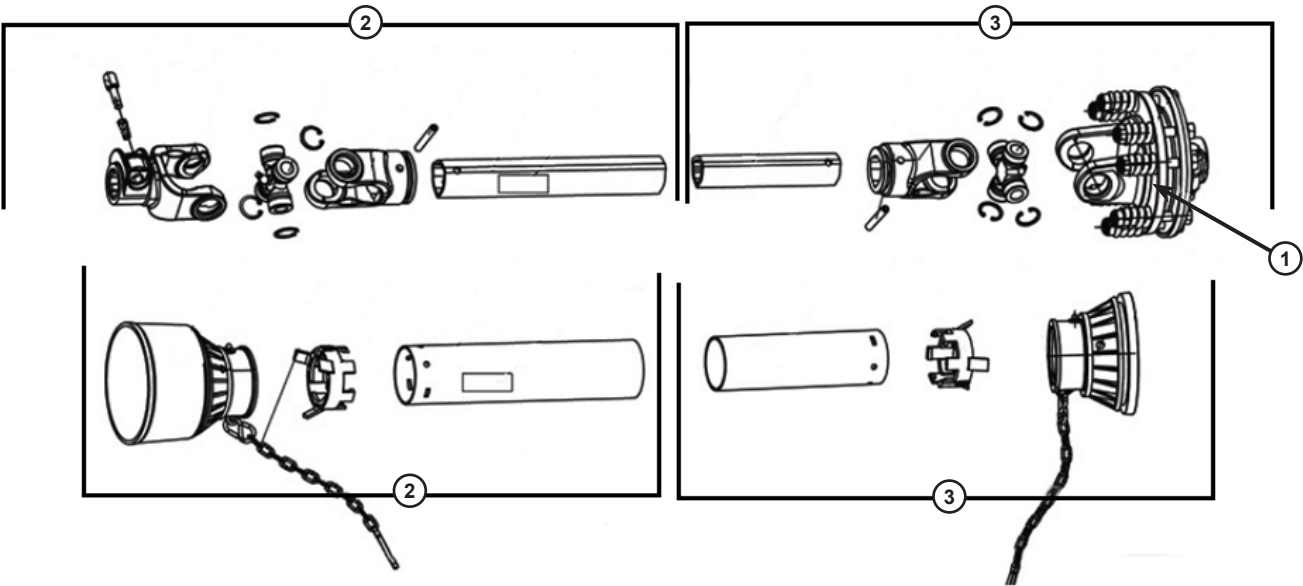
NOTE: Do not over or under tighten slip clutch assembly or damage may occur.

STORAGE

IMPORTANT: When the unit is going to be stored for an extended amount of time please perform the following steps to keep the oil seals from deteriorating.

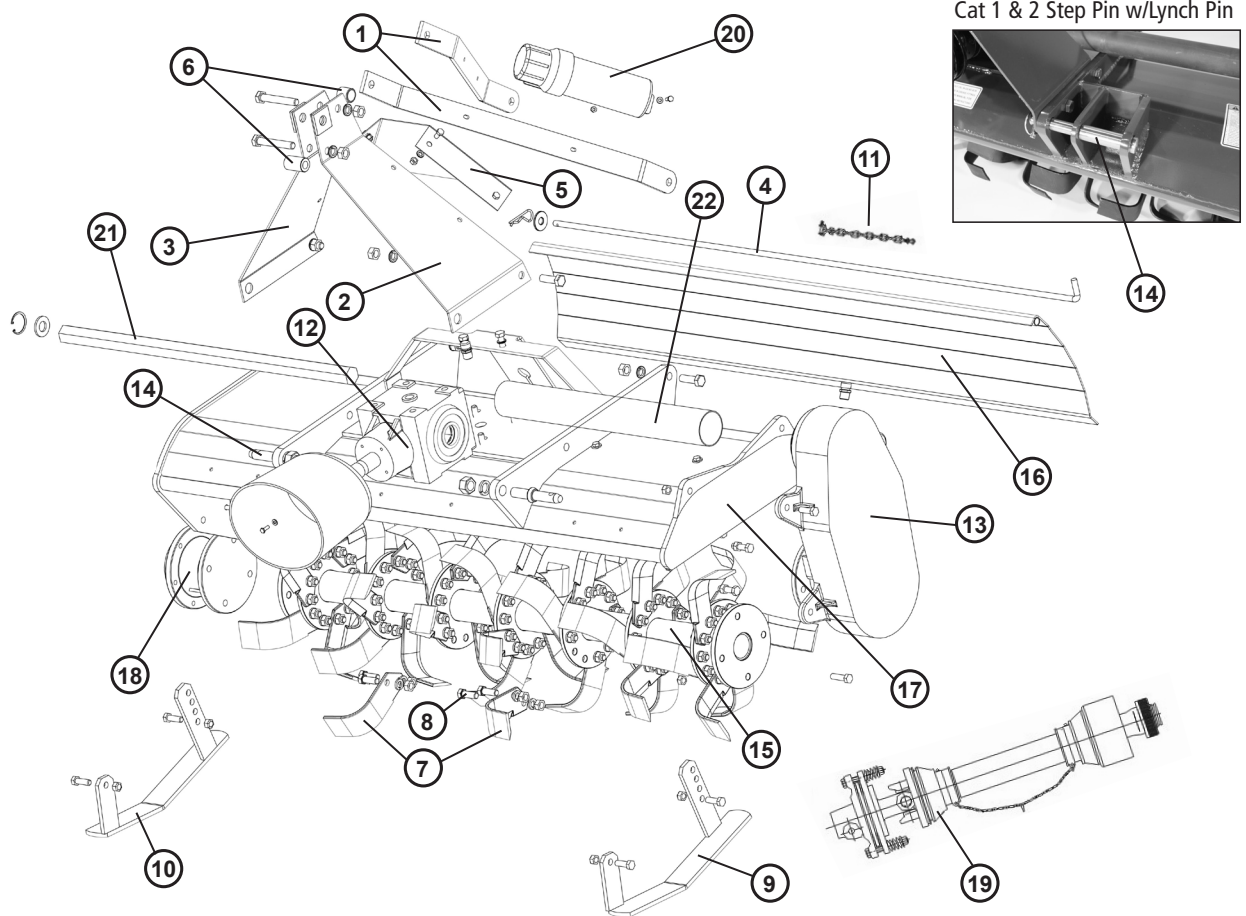
- Spray shaft extensions with a suitable dry film or similar preservative
- Pack grease around seal to prevent drying and cracking
- Fill the gearbox with enough oil so that it covers the top of the input seal
- Remove the breather and replace with an airtight plug
- Remember to drain the oil back to the correct level before using again

PARTS



PTO Driveline Parts List
RT4, RT5, RT6 & RT7

| Item Number | Part Number | Description |
|-------------|-------------|--------------------------------------|
| 1 | FF0.3 | Friction Disk (2pk) |
| 2 | T12TPTO | Tractor 1/2 PTO (includes #22 & 24) |
| 3 | I12YPTO | Implement 1/2 PTO (includes #23 &25) |



Rotary Tiller Parts List RT4, RT5, RT6, & RT7

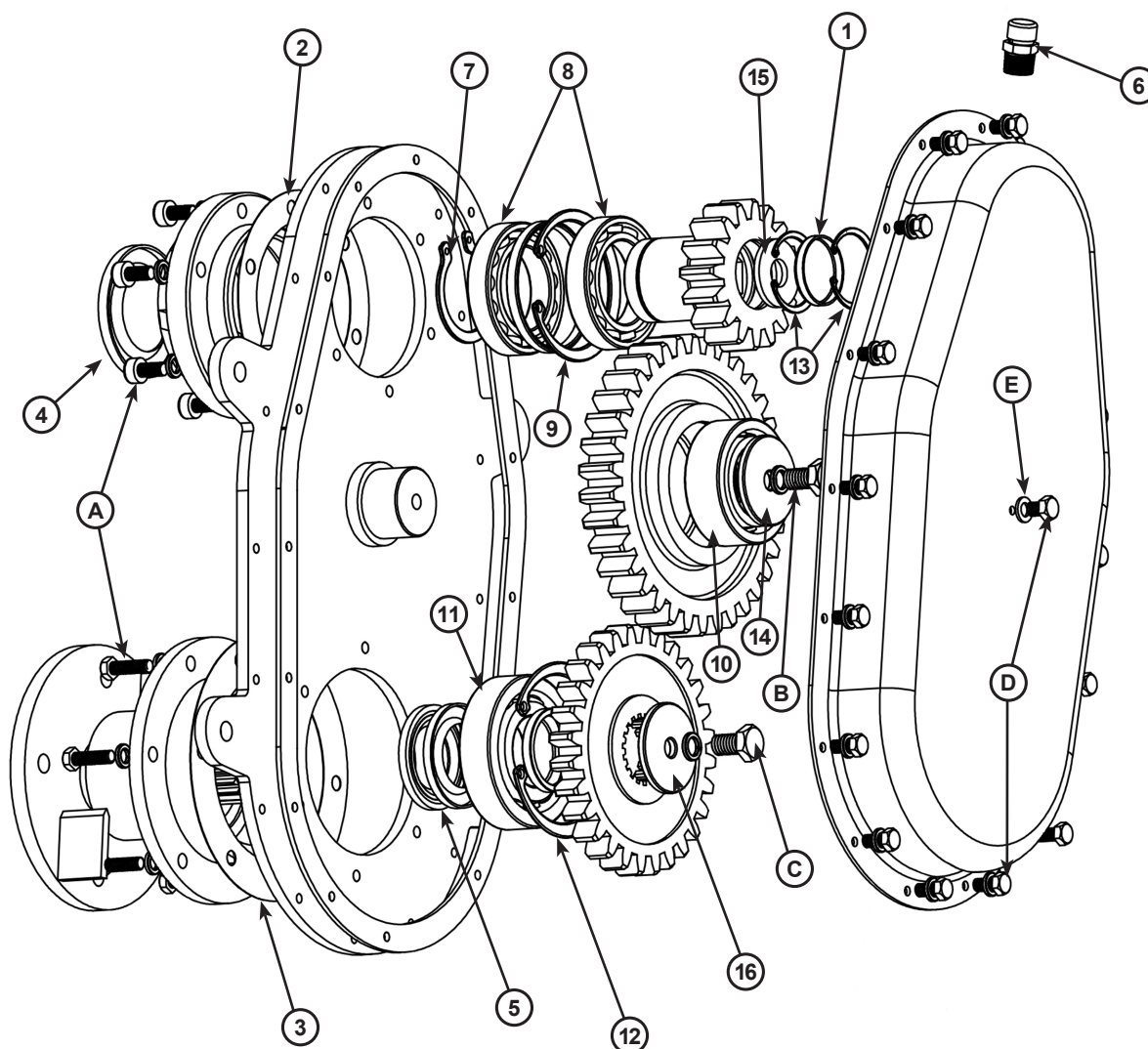
| Item Number | Part Number | Description |
|-------------|-------------|--|
| 1 | 7TBSWH | Backstrap w/ Hardware (4', 5', 6', & 7') |
| 2 | STTLHLAWH | Left Hand Lift Arm w/ Hardware (4', 5', & 6') |
| 2a | 7TLHLAWH | Left Hand Lift Arm w/ Hardware (7') |
| 3 | STTRHLAWH | Right Hand Lift Arm w/ Hardware 4', 5', & 6') |
| 3a | 7TRHLAWH | Right Hand Lift Arm w/ Hardware (7') |
| 4 | P-P1805 | Round Steel w/ Hardware (4') |
| 4a | P-P1905 | Round Steel w/ Hardware (5') |
| 4b | P-P2005 | Round Steel w/ Hardware (6') |
| 4c | 7RSWH | Round Steel w/ Hardware (7') |
| 5 | 7TFGPWH | Front Guard Plate w/ Hardware (4', 5', 6', & 7') |
| 6 | P-P1823 | Top Link Spacer |
| 6a | P-P1833 | Back Strap Spacer |
| 7 | 9000012 | Right Hand Tine Package w/ Hardware |
| 7a | 9000013 | Left hand Tine Package w/ Hardware |

(continued on next page)

(continued from previous page)

| Item Number | Part Number | Description |
|-------------|-------------|--|
| 8 | P-P1813 | Tine Bolt Package (72 pcs) (4') |
| 8a | P-P1814 | Tine Bolt Package (84 pcs) (5') |
| 8b | P-P1815 | Tine Bolt Package (108 pcs) (6') |
| 8c | 7TTBP | Tine Bolt Package (132 pcs) (7') |
| 9,10 | 2000112 | Universal Skid Shoe w/ Hardware (4', 5', & 6' works as right or left hand) |
| 9a | 7TLHSSWH | Left Hand Skid Shoe w/ Hardware (7') |
| 10a | 7TRHSSWH | Right Hand Skid Shoe w/ Hardware (Yellow) (7') |
| 11 | P-P1826 | 16 Link Chain (18" long) |
| 11a | P-P1827 | 1/4" Chain Shackle |
| 12 | 9000014 | Tiller Top Gearbox Assembly w/ Hardware |
| 13 | 9000015 | Tiller Side Gearbox Assembly w/ Hardware |
| 14 | P-P1331 | Tiller Lift Pins CAT 1 |
| 14a | 7TC12SPWLP | 7' Tiller Cat #1 & 2 Step Pin w/Lynch Pin |
| 15 | 9000016 | Rotor Assembly w/ Hardware (4') |
| 15a | 9000017 | Rotor Assembly w/ Hardware (5') |
| 15b | 9000018 | Rotor Assembly w/ Hardware (6') |
| 15c | 7TRAWH | Rotor Assembly w/ Hardware (7') |

| Item Number | Part Number | Description |
|-------------|-------------|---|
| 16 | 4STTRGA | Rear Guards Assembly (4') |
| 16a | 5STTRGA | Rear Guards Assembly (5') |
| 16b | 6STTRGA | Rear Guards Assembly (6') |
| 16c | 7TRGA | Rear Guards Assembly (7') |
| 17 | 4STTFA | Frame Assembly (4') |
| 17a | 5STTFA | Frame Assembly (5') |
| 17b | 6STTFA | Frame Assembly (6') |
| 17c | 7TFA | Frame Assembly (7') |
| 18 | 9000019 | Tiller Outboard Hub Assembly w/ Hardware |
| 19 | 4-30QDTL | Tiller 4# PTO Shaft w/ Clutch Plates |
| 19a | I12TTPO | Implement Half Tiller PTO Shaft |
| 19b | T12TPTO | Tractor Half Tiller PTO Shaft |
| 19c | FF0.3 | PTO Shaft Friction Discs (2pk) |
| 20 | P-P1870 | Tiller Manual Holder w/ Hardware |
| 21 | P-P1825 | Hexagon Drive Shaft (4') |
| 21a | P-P1903 | Hexagon Drive Shaft (5') |
| 21b | P-P2003 | Hexagon Drive Shaft (6') |
| 21c | 7THS | Hexagon Drive Shaft (7') |
| 22 | P-P1824 | Driveline Shaft Guard (4') |
| 22a | P-P1902 | Driveline Shaft Guard (5') |
| 22b | P-P2002 | Driveline Shaft Guard (6') |
| 22c | TA5 | Driveline Shaft Guard (7') |
| 23 | STTHP | Hardware Pack (4', 5', & 6') (Not Shown) |
| 23a | 7STHP | Hardware Pack (7') (Not Shown) |
| 24 | 7TSWH | Tiller Stand w/ Hardware Pack (4', 5', 6' & 7') (Not Shown) |

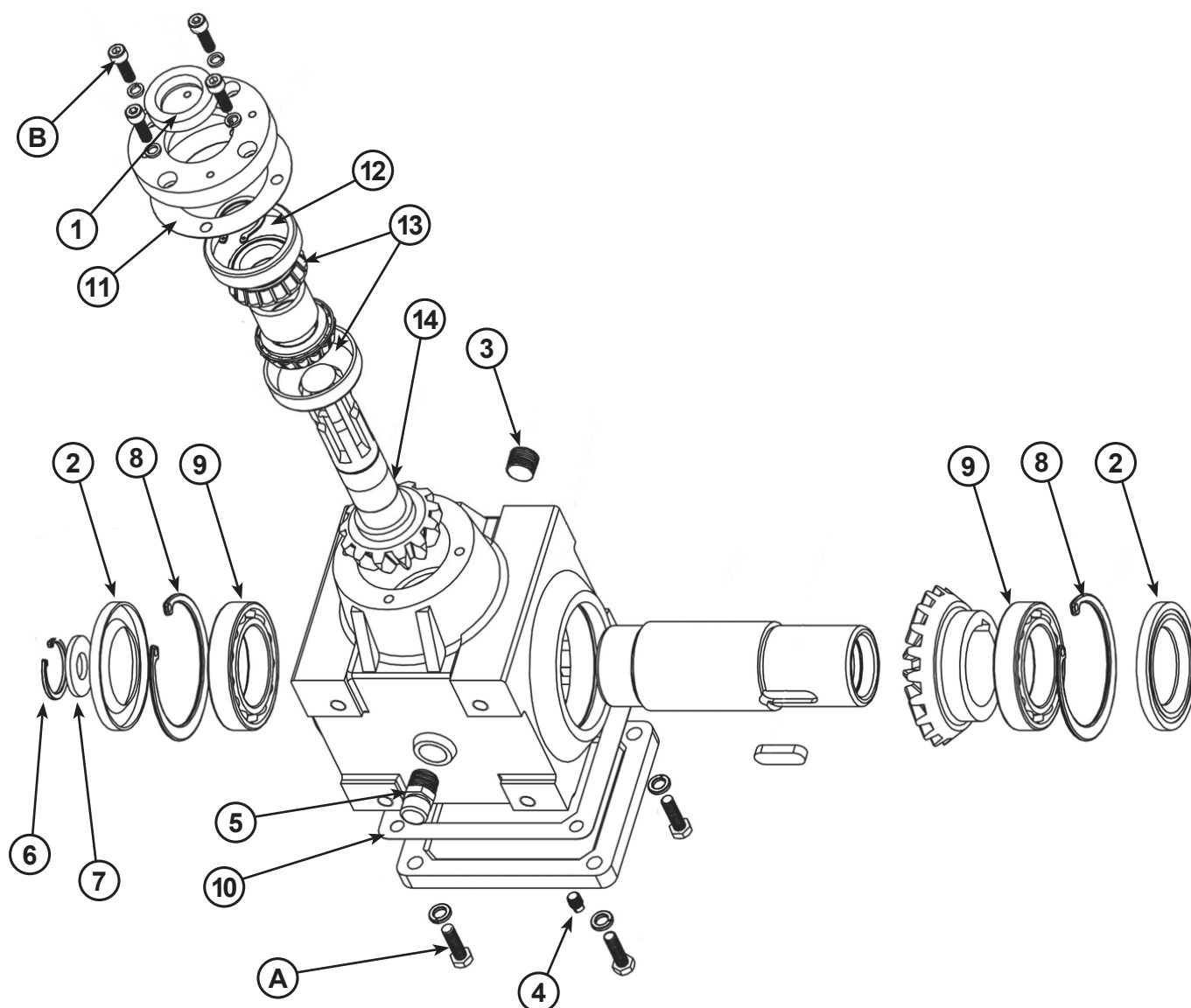


Side Gearbox (9000015) Parts List

RT4, RT5, RT6, & RT7

| Item Number | Part Number | Description |
|-------------|-------------|----------------------------|
| 1 | H-C0245 | Side Gearbox Sealed Cap |
| 2 | 2000016 | Side Gearbox Gasket-Input |
| 3 | 2000018 | Side Gearbox Gasket-Output |
| 4 | S-212 | Input Seal |
| 5 | S-211 | Output Seal |
| 6 | S-502 | Vent Plug |
| 7 | S-411 | Retaining Ring |
| 8 | S-124 | Bearing |
| 9 | S-406 | Retaining Ring |
| 10 | S-126 | Bearing |
| 11 | S-133 | Bearing |
| 12 | S-410 | Retaining Ring |

| Item Number | Part Number | Description |
|-------------|-------------|--|
| 13 | S-412 | Retaining Ring |
| 14 | H-C0253 | Washer |
| 15 | H-C0216 | Washer |
| 16 | H-C0255 | Washer |
| A | Non-Service | 3/8"-16x1" hex bolt w/ 3/8" split lock washer |
| B | Non-Service | 3/8"-16x25mm" hex bolt w/ 3/8" split lock washer |
| C | Non-Service | 1/2"-13x1.25" hex bolt w/ 1/2" split lock washer |
| D | Non-Service | 3/8"-16x17mm hex bolt w/ 3/8" flat washer |
| E | Non-Service | M10 rubber seal washer |



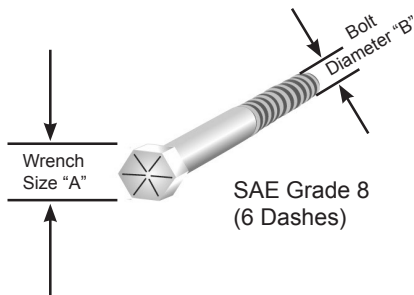
Top Gearbox (9000014) Parts List

RT4, RT5, RT6, & RT7

| Item Number | Part Number | Description |
|-------------|-------------|--------------------|
| 1 | S-201 | Seal |
| 2 | S-209 | Seal |
| 3 | S-504 | Pipe Plug-Inner 6f |
| 4 | H-503 | Pipe Plug-Sq.Head |
| 5 | S-502 | Vent Plug |
| 6 | S-407 | Retaining Ring |
| 7 | 1G150-45 | Washer |
| 8 | S-406 | Retaining Ring |
| 9 | S-124 | Bearing |
| 10 | H-C0143 | Gasket (rectangle) |

| Item Number | Part Number | Description |
|-------------|-------------|---|
| 11 | H-C0141 | Gasket |
| 12 | S-403 | Retaining Ring |
| 13 | S-123 | Bearing |
| 14 | H-C0125 | Input Shaft |
| A | Non-Service | 3/8"-16 x 1" bolt with 3/8" split lock washer |
| B | Non-Service | M8 x 25 metric hex socket screw w/ M8 split lock washer |

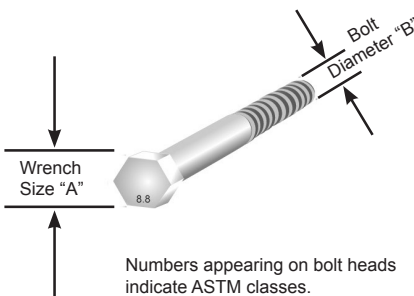
AMERICAN Bolt Head Markings



Proper torque for American fasteners used on manufactured implement.
Recommended Torque in Foot Pounds (Newton Meters).*

| WRENCH SIZE(IN.)"A" | BOLT DIAMETER (IN.)"B" AND THREAD SIZE | SAE GRADE 2 | SAE GRADE 5 | SAE GRADE 8 |
|---------------------|--|-------------|-------------|-------------|
| 7/16 | 1/4 -20 UNC | 6 (7) | 8 (11) | 12 (16) |
| 7/16 | 1/4 - 24 UNF | 6 (8) | 10 (13) | 14 (18) |
| 1/2 | 5/16 -18 UNC | 11 (15) | 17 (23) | 25 (33) |
| 1/2 | 5/16 - 24 UNF | 13 (17) | 19 (26) | 27 (37) |
| 9/16 | 3/8 - 16 UNC | 20 (27) | 31 (42) | 44 (60) |
| 9/16 | 3/8 -24 UNF | 23 (31) | 35 (47) | 49 (66) |
| 5/8 | 7/16 -14 UNC | 32 (43) | 49 (66) | 70 (95) |
| 5/8 | 7/16 - 20 UNF | 36 (49) | 55 (75) | 78 (106) |
| 3/4 | 1/2 - 13 UNC | 49 (66) | 76 (103) | 106 (144) |
| 3/4 | 1/2 - 20 UNF | 55 (75) | 85 (115) | 120 (163) |
| 7/8 | 9/16 -12 UNC | 70 (95) | 109 (148) | 153 (207) |
| 7/8 | 9/16 - 18 UNF | 79 (107) | 122 (165) | 172 (233) |
| 15/16 | 5/8 - 11 UNC | 97 (131) | 150 (203) | 212 (287) |
| 15/16 | 5/8 - 18 UNF | 110 (149) | 170 (230) | 240 (325) |
| 1-1/8 | 3/4 - 10 UNC | 144(195) | 266 (360) | 376 (509) |
| 1-1/8 | 3/4 - 16 UNF | 192 (260) | 297 (406) | 420 (569) |
| 1-5/16 | 7/8 - 9 UNC | 166 (225) | 430 (583) | 606 (821) |
| 1-5/16 | 7/8 - 14 UNF | 184 (249) | 474 (642) | 668 (905) |
| 1-1/2 | 1-8 UNC | 250 (339) | 644 (873) | 909 (1232) |
| 1-1/2 | 1 - 12 UNF | 274 (371) | 705 (955) | 995 (1348) |
| 1-1/2 | 1-14 UNF | 280 (379) | 721 (977) | 1019 (1381) |
| 1-11/16 | 1-1/8 - 7 UNC | 354 (480) | 795 (1077) | 1288 (1745) |
| 1-11/16 | 1-1/8 -12 UNF | 397 (538) | 890 (1206) | 1444 (1957) |
| 1-7/8 | 1-1/4 - 7 UNC | 500 (678) | 1120 (1518) | 1817 (2462) |
| 1-7/8 | 1-1/4 - 12 UNF | 553 (749) | 1241 (1682) | 2013 (2728) |
| 2-1/16 | 1-3/8 - 6 UNC | 655 (887) | 1470 (1992) | 2382 (3228) |
| 2-1/16 | 1-3/8 -12 UNF | 746 (1011) | 1672 (2266) | 2712 (3675) |
| 2-1/4 | 1-1/2 - 6 UNC | 870 (1179) | 1950 (2642) | 3161 (4283) |
| 2-1/4 | 1-1/2 - 12 UNF | 979 (1327) | 2194 (2973) | 3557 (4820) |

METRIC



Proper torque for metric fasteners used on manufacturer implement.
Recommended Torque in Foot Pounds (Newton Meters).*

| WRENCH SIZE (mm) "A" | BOLT DIA. (mm) "B" | ASTM 4.6 | ASTM 8.8 | ASTM 9.8 | ASTM 10.9 |
|----------------------|--------------------|-----------|-------------|-----------|------------|
| 8 | 5 | 1.8 (2.4) | | 5.1 (6.9) | 6.5 (8.8) |
| 10 | 6 | 3 (4) | | 8.7 (12) | 11.1 (15) |
| 13 | 8 | 7.3 (10) | | 21.1 (29) | 27 (37) |
| 16 | 10 | 14.5 (20) | | 42 (57) | 53 (72) |
| 18 | 12 | 25 (34) | 74 (100) | 73 (99) | 93 (126) |
| 21 | 14 | 40 (54) | 118 (160) | 116 (157) | 148 (201) |
| 24 | 16 | 62 (84) | 167 (226) | 181 (245) | 230 (312) |
| 30 | 20 | 122 (165) | 325 (440) | | 449 (608) |
| 33 | 22 | | 443 (600) | | 611 (828) |
| 36 | 24 | 211 (286) | 563 (763) | | 778 (1054) |
| 31 | 27 | | 821 (1112) | | 138(1542) |
| 46 | 30 | 418 (566) | 1119 (1516) | | 1547(2096) |

*Use 75% of the specified torque value for plated fasteners. Use 85% of the specified torque values for lubricated fasteners.

MANUFACTURER'S LIMITED WARRANTY

Manufacturer warrants to the original purchaser that the purchased product is free from defects in material and workmanship for a period of one (1) year commencing on the date of original purchase, as evidenced by the original receipt, and will, at its option, repair, replace, or issue credit for any product or part found to be defective.

This limited warranty shall only apply if this product has been operated and maintained in accordance with the Operator's Manual furnished with the product, and has not been subject to misuse, abuse, commercial or industrial use, neglect, improper maintenance, alteration or accident, or which has been used for a purpose for which the product was not designed. Damage resulting from the installation or use of any part, accessory, or attachment not approved by manufacturer, for use with the product covered by the owner's manual, shall void the warranty as to any resulting damage. This limited warranty is extended solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this warranty does not transfer to the third party in any manner.

HOW TO MAKE A CLAIM:

To obtain warranty service through a local authorized dealer a customer must present the following within thirty (30) days of product failure:

1. Proof of purchase within one (1) year of purchase date.
2. Photographs of or return of the actual product in question.

After receipt of the above information, if the product is alleged to be defective, manufacturer will process the claim and issue a Return Manufacturers Authorization number (RMA). Once a RMA number is issued, manufacturer will pick up the product from the authorized dealer and return to its facility for inspection. Manufacturer will replace, repair, or issue credit for any product, upon examination by manufacturer at manufacturer's facility, determined to be defective due to defects in material and workmanship.

WARRANTY DISCLAIMER:

This limited warranty is in lieu of, and manufacturer disclaims and excludes any express and implied warranties with respect to the product including, without limitation, merchantability and fitness for a particular purpose. No other express warranty, whether written or oral, given by any person or entity, including a dealer or retailer, with respect to any product, shall bind manufacturer.

Manufacturer's exclusive liability for breach of the limited warranty, as set forth above, on the product shall be to repair or replace the product within the warranty period in accordance with the terms of this limited warranty. The choice of remedy shall belong solely to manufacturer. In no event shall manufacturer be liable for any loss or damages of any other kind, whether direct, incidental, consequential including lost profits, exemplary, special or otherwise, including without limitation, expenses incurred for substitute or replacement product or for rental expenses to temporarily replace a warranted product. Under no circumstance shall recovery, of any kind, be greater than the amount of the purchase price of the product purchased. Customer assumes all risk and liability for loss, damage, or injury to customer or customer's property and/or the property of others arising out of the misuse or inability to use the product.

LEGAL RIGHTS:

This limited warranty gives you specific legal rights, and you may also have other rights which may vary from state to state. Some states do not allow any limitation on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you.

KEEP FOR YOUR RECORDS

Record the model number, serial number, and the date of purchase with original sales receipt. This information will be helpful to your dealer if parts or service are required.

MODEL NUMBER _____

SERIAL NUMBER _____

DATE OF PURCHASE _____

DEALER _____

