



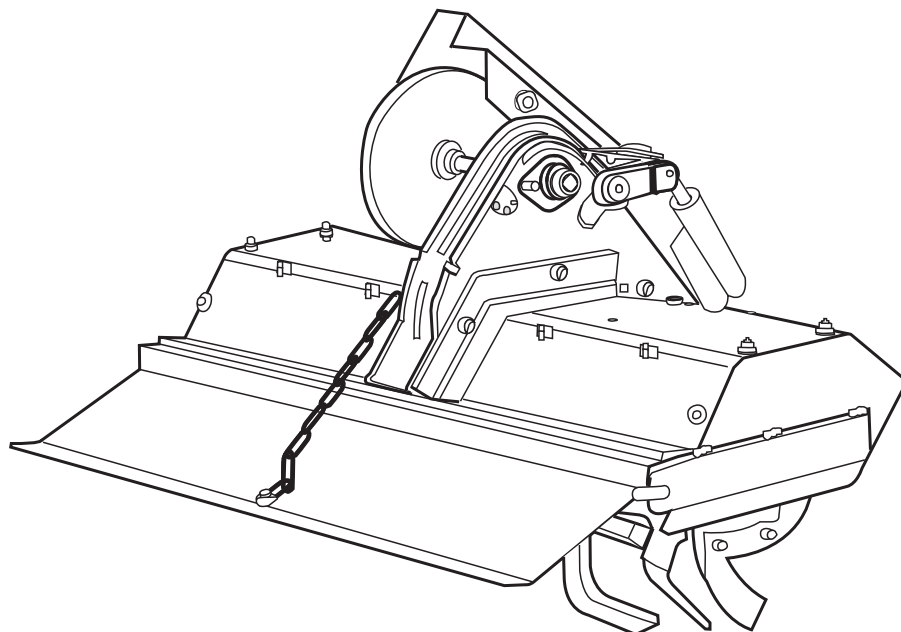
MASSEY FERGUSON

AGCO



SNAPPERTM

ATTACHMENT OPERATOR'S MANUAL



36" Rotary Tiller

36" Rotary Tiller Attachment

(for use with Conquest / 1700 / 2700, Prestige / 1800 / 2800
& Snapper YT400 and GT500 Series Garden Tractors)

Mfg. No.	Description
1695419	36" Tiller
1694151	36" Tiller



CAUTION: Read and
follow all instructions.

Manual Part No. 1723861

Revision 04

Rev. Date 06/2008

TP 100-2604-04-AT-UV


SAVE THESE INSTRUCTIONS

READ THE MANUAL

The operator's manual contains important safety information you need to be aware of **BEFORE** you operate your unit as well as **DURING** operation.

Safe operating techniques, an explanation of the product's features and controls, and maintenance information is included to help you get the most out of your equipment investment. Failure to obey the safety rules could result in loss of control of the unit, severe personal injury or death to you, or bystanders, or damage to property or equipment.

Safety Icons

The alert symbol  is used to identify safety information about hazards that can result in personal injury. A signal word (DANGER, WARNING, or CAUTION) is used with the alert symbol to indicate the likelihood and the potential severity of the injury. In addition, a hazard icon may be used to represent the type of hazard. An explanation of hazard levels and icons are as follows:

DANGER

This indicates a hazard which, if not avoided, **will result in serious injury or death.**

WARNING

This indicates a hazard which, if not avoided, **could result in serious injury or death.**

CAUTION

This indicates a hazard which, if not avoided, **might result in minor or moderate injury.**

SAFETY DECALS

This unit has been designed and manufactured to provide you with the safety and reliability you would expect from an industry leader in outdoor power equipment manufacturing.

Although reading this manual and the safety instructions it contains will provide you with the necessary basic knowledge to operate this equipment safely and effectively, we have placed several safety labels on the unit to remind you of this important information while you are operating your unit.

Parts Identification

When ordering replacement parts for your rotary tiller, be prepared to give your dealer the Mfg. No. found on the identification plate.

WARNING

You must read, understand and comply with all safety and operating instructions in this manual before attempting to set-up and operate your snowthrower.

Failure to comply with all safety and operating instructions can result in loss of machine control, serious personal injury to you and /or bystanders, and risk of equipment and property damage. The triangle in the text signifies important cautions or warnings which must be followed.

All DANGER, WARNING, CAUTION and instructional messages on your product should be carefully read and obeyed. Personal bodily injury can result when these instructions are not followed. The information is for your safety and it is important! The safety decals below are on your product.

If any decals are lost or damaged, replace them at once. See your local dealer for replacements.

These labels are easily applied and will act as a constant visual reminder to you, and others who may use the equipment, to follow the safety instructions necessary for safe, effective operation.

Read and obey all operation and warning decals.

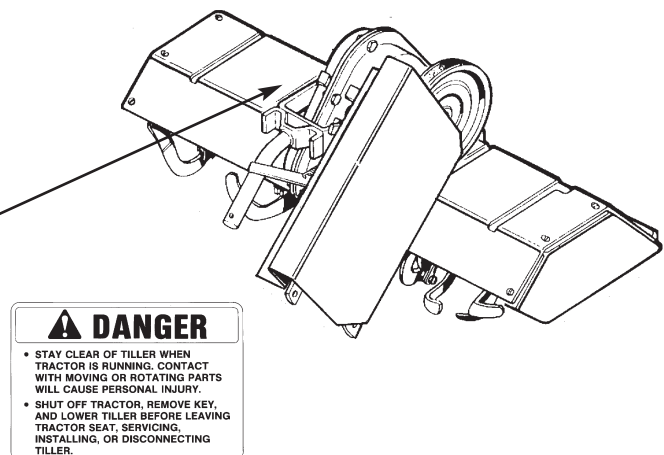


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Safety Rules & Information



Operating Safety

Congratulations on purchasing a superior-quality piece of lawn and garden equipment. Our products are designed and manufactured to meet or exceed all industry standards for safety.

Power equipment is only as safe as the operator. If it is misused, or not properly maintained, it can be dangerous! Remember, you are responsible for your safety and that of those around you.

Use common sense, and think through what you are doing. If you are not sure that the task you are about to perform can be safely done with the equipment you have chosen, ask a professional: contact your local authorized dealer.

Read the Manual

The operator's manual contains important safety information you need to be aware of **BEFORE** you operate your unit as well as **DURING** operation.

Safe operating techniques, an explanation of the product's features and controls, and maintenance information is included to help you get the most out of your equipment investment.

Be sure to completely read the Safety Rules and Information found on the following pages. Also completely read the Operation section.



Children

Tragic accidents can occur with children. Do not allow them anywhere near the area of operation. Children are often attracted to the unit and mowing activity. Never assume that children will remain where you last saw them. If there is a risk that children may enter the area where you are mowing, have another responsible adult watch them.

DO NOT GIVE CHILDREN RIDES ON THIS UNIT! This encourages them to come near the unit in the future while it is running, and they could be seriously hurt. They may then approach the unit for a ride when you are not expecting it, and you may run over them.

Reverse

Do not operate the tiller in reverse unless absolutely necessary. Always look down and behind before and while traveling in reverse even with the tiller disengaged.



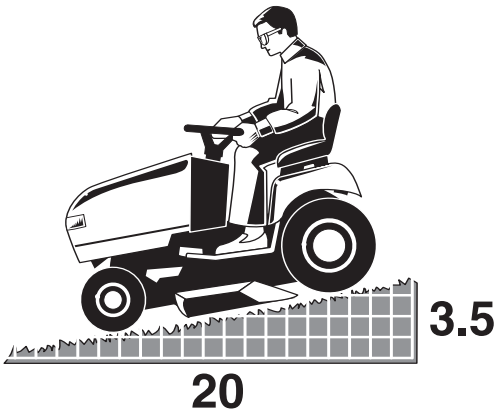
Slope Operation

You could be seriously injured or even killed if you use this unit on too steep an incline. Using the unit on a slope that is too steep or where you don't have adequate traction can cause you to lose control or roll over.

A good rule of thumb is to not operate on any slope you cannot back up (in 2-wheel drive mode). You should not operate on inclines with a slope greater than a 3.5 foot rise over a 20 foot length. Always drive up and down slopes: never cross the face.

Also note that the surface you are driving on can greatly impact stability and control. Wet grass or icy pavement can seriously affect your ability to control the unit.

If you feel unsure about operating the unit on an incline, don't do it. It's not worth the risk.

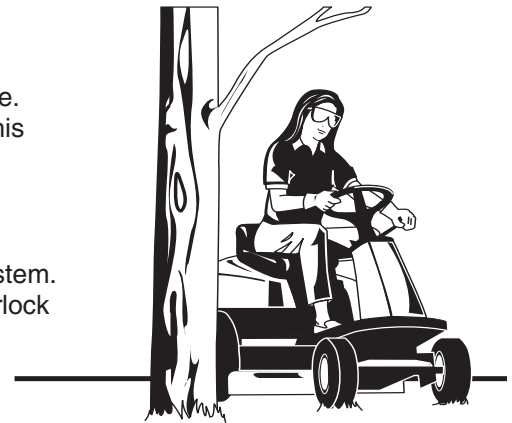


Moving Parts

This equipment has many moving parts that can injure you or someone else. However, if you are seated in the seat properly, and follow all the rules in this book, the unit is safe to operate.

Do not allow anyone near the equipment while it is running!

To help you, the operator, use this equipment safely, it is equipped with an operator-present safety system. Do NOT attempt to alter or bypass the system. See your dealer immediately if the system does not pass all the safety interlock system tests found in this manual.



Thrown Objects



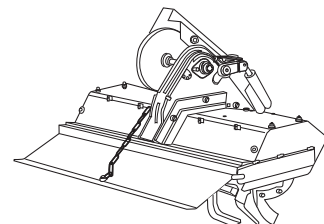
This unit has spinning mower blades. These blades can pick up and throw debris that could seriously injure a bystander. Be sure to clean up the area to be mowed BEFORE you start mowing.

Do not operate this unit without the entire grass catcher or discharge guard (deflector) in place.

Also, do not allow anyone in the area while the unit is running! If someone does enter the area, shut the unit off immediately until they leave.


Maintenance

Proper maintenance is critical to the safety and performance of your unit. Be sure to perform the maintenance procedures listed in this manual, especially periodically testing the safety system.



Safety Rules & Information



This machine is capable to amputating hands and feet and throwing objects. Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of unit, severe personal injury or death to you, or bystanders, or damage to property or equipment.  The triangle in text signifies important cautions or warnings which must be followed.

TRAINING

1. Read, understand, and follow all instructions on the machine and in the manuals before operating this unit. Be thoroughly familiar with the controls and the proper use of the equipment. Know how to stop the unit and disengage the controls quickly.
2. Never allow children to operate the equipment. Never allow adults to operate the equipment without proper instruction.
3. Keep the area of operation clear of all persons, particularly small children and pets.
4. Exercise caution to avoid slipping or falling especially when operating in reverse.

PREPARATION

1. Thoroughly inspect the area where the equipment is to be used and remove all doormat, sleds, boards, wires, and other foreign objects.
2. Disengage all clutches and shift into neutral before starting engine (motor).
3. Do not operate the equipment without wearing adequate outer garments. Wear footwear that will improve footing on slippery surfaces. Avoid loose fitting clothing that can get caught in moving parts.
4. Handle fuel with care; it is highly flammable.
 - (a) Use an approved fuel container.
 - (b) Never add fuel to a running engine or hot engine.
 - (c) Fill fuel tank outdoors with extreme care. Never fill fuel tank indoors. Replace fuel cap securely and wipe up spilled fuel.
 - (d) Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground, away from your vehicle, before filling.
 - (e) When practical, remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such on a trailer with a portable container, rather than from a gasoline dispenser nozzle.
 - (f) Keep nozzle in contact with the rim of the fuel tank or container opening at all times, until refueling is complete. Do not use a nozzle lock-open device.
 - (g) Replace gasoline cap securely and wipe up spilled fuel.
 - (h) If fuel is spilled on clothing, change clothing immediately.
5. Use extension cords and receptacles as specified by the manufacturer for all units with electric drive motors or electric starting motors.
6. Never attempt to make any adjustments while the engine (motor) is running (except when specifically recommended by the manufacturer).
7. Always wear safety glasses or eye shields during operation or while performing an adjustment or repair to protect eye from foreign objects that may be thrown from the machine.

OPERATION

1. Do not put hands or feet near or under rotating parts. Keep clear of the discharge opening at all times.
2. Exercise extreme caution when operating on or crossing gravel drives, walks, or roads. Stay alert for hidden hazards or traffic.
3. After striking a foreign object, stop the engine (motor), remove the wire from the spark plug, disconnect the cord on electric motors, thoroughly inspect the tiller for any damage, and repair the damage before restarting and operating the tiller.
4. If the unit should start to vibrate abnormally, stop the engine (motor) and check immediately for the cause. Vibration is generally a warning of trouble.
5. Stop the engine (motor) whenever you leave the operating position, before unclogging the tiller, and when making any repairs, adjustments, or inspections.
6. When cleaning, repairing, or inspecting make certain the tiller and all moving parts have stopped. Disconnect the spark plug wire and keep the wire away from the plug to prevent accidental starting.
7. Do not run the engine indoors except for starting the engine or for transporting the snowthrower in or out of the building. Open the outside doors; exhaust fumes are dangerous.
8. Exercise extreme caution when operating on slopes. Do not attempt to clear steep slopes.
9. Never operate the tiller without proper guards plates, or other safety protective devices in place and working.
10. Keep children and others away.
11. Do not overload the machine capacity by attempting to till at too fast a rate.
12. Never operate the machine at high transport speeds on slippery surfaces. Look behind and use care when operating in reverse.
13. Disengage the PTO when the tiller is transported or not in use.
14. Use only attachments and accessories approved by the manufacturer of the snowthrower (such as wheel weights, counterweights, or cabs).
15. Never operate the tiller without good visibility or light.
16. Never touch a hot engine or muffler.
17. Never operate the snowthrower near glass enclosures, automobiles, window wells, drop-offs, and the like without proper adjustment of the discharge angle.
18. Never leave a running unit unattended. Always disengage the tiller, stop engine, and remove keys.
20. Do not operate the unit while under the influence of alcohol or drugs.
21. Keep in mind the operator is responsible for accidents occurring to other people or property.
22. DO NOT wear long scarves or loose clothing that could become entangled in moving parts.
24. Make sure to remove all obstacles from the area to be cleared.

Safety Rules and Information

CHILDREN

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the unit and the operating activity. Never assume that children will remain where you last saw them.

1. Keep children out of the area and under the watchful care of another responsible adult.
2. Be alert and turn unit off if children enter the area.
3. Never allow children to operate the unit.
4. Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

SERVICE, MAINTENANCE, AND STORAGE

1. Check shear bolts and other bolts at frequent intervals for proper tightness to be sure the equipment is in safe working condition.
2. Always refer to the operator's manual for important details if the tiller is to be stored for an extended period.
4. Maintain or replace safety and instruction labels as necessary.
5. Maintain or replace safety and instruction labels as necessary.
6. Keep nuts and bolts tight and keep equipment in good condition.
7. Never tamper with safety devices. Check their proper operation regularly and make necessary repairs if they are not functioning properly.
8. Components are subject to wear, damage, and deterioration. Frequently check components and replace with manufacturer's recommended parts, when necessary.
9. Check control operation frequently. Adjust and service as required.
10. Use only factory authorized replacement parts when making repairs.
11. Always comply with factory specifications on all settings and adjustments.
12. Only authorized service locations should be utilized for major service and repair requirements.
13. Never attempt to make major repairs on this unit unless you have been properly trained. Improper service procedures can result in hazardous operation, equipment damage and voiding of manufacturer's warranty.
14. Check shear bolts and other bolts at frequent intervals for proper tightness to be sure the equipment is in safe working condition.

Initial Setup & Installation

INITIAL INSTALLATION

Note: Recommended Accessories

Rear wheel weights and front counterweights are recommended. For operation on slopes greater than 15% (8.5°), front counterweights are required. Never operate on slopes greater than 17.6% (10°).

Initial Installation Notes:

- The tiller idler pulley is wired to the tiller for shipping purposes. **USE CAUTION WHEN CUTTING THE WIRE - THE IDLER ARM IS UNDER SPRING TENSION.**
- Remove the mower deck before beginning to operate.

Replace Differential Lock Rod (Early Models Only)

1. Locate the differential lock rod (A, B, Figure 1). If the rod has no bends in it (B), replace it with the rod included. If the rod has two bends (A) it does not need to be replaced.

Modify Manual Lift Linkage (Manual Lift Models Only)

1. Place the lift lever in the attachment-raised (back) position.
2. Loosen the manual lift adjustment bolt (A, Figure 2) until the bolt can be slid out of the groove in the bulkhead.
3. Remove the pin (A, Figure 3) securing the lift link (D).
4. Remove the pivot capscrew (B) securing the lift link (D) to the lift cam (J).
5. Check the front lock plate capscrew (L, Figure 4). If the bolt is grade 5, replace with the 5/16-18 x 1 grade 8 bolt and whizlock nut provided.
6. Replace the lift link (D, Figure 3) with the new one provided (D, Figure 4). Be sure to reinstall the lift assist spring (not shown) in its original orientation.
7. Install the clevis pin (A, Figure 4) in the upper tiller hole (K) in the lift cam, through the rear hole in the lift link (D), through the spacer (I), and secure with the hair pin clip (H).
8. Reinstall the manual lift adjustment bolt (A, Figure 2) in the bulkhead.

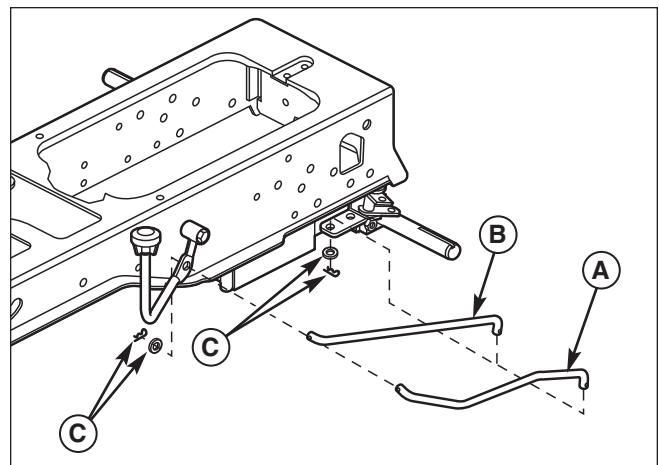


Figure 1. Replace Differential Lock Rod
A. New Differential Lock Rod
B. Old Differential Lock Rod (Discard)
C. Hair Pin Clip and Washer

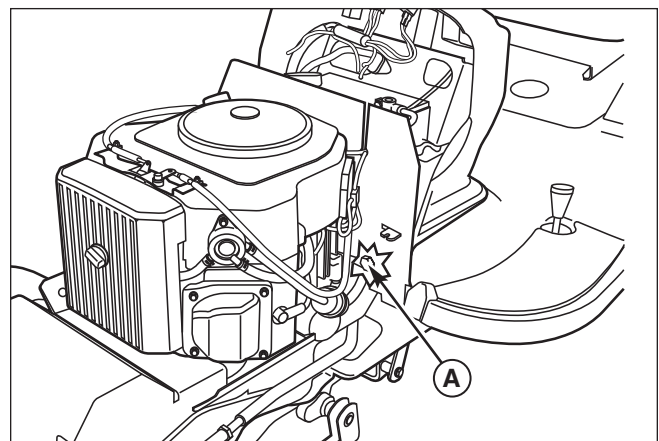


Figure 2. Manual Lift Adjustment Bolt
A. Adjustment Bolt

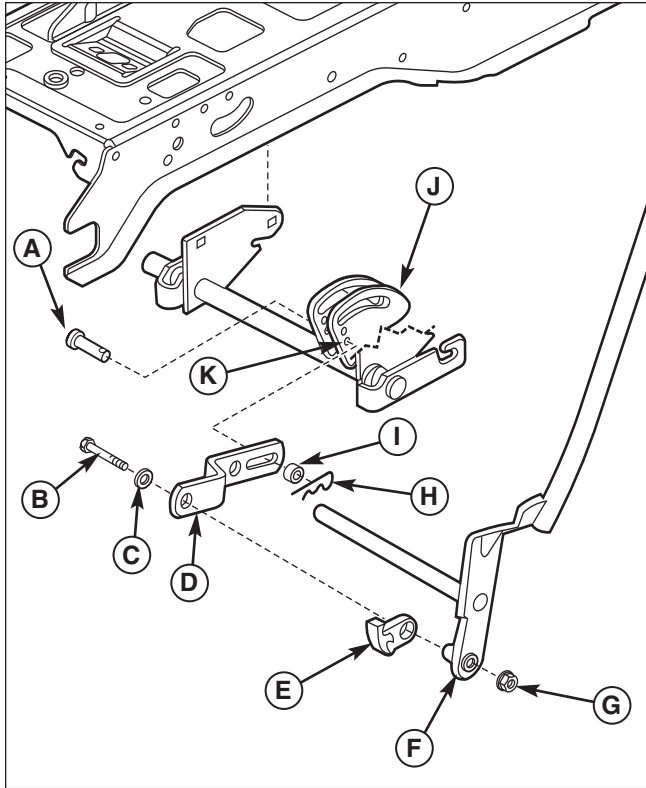


Figure 3. Lift Components - Mowing

- A. Clevis Pin
- B. 5/15-18 x 1 Capscrew (Gr. 5)
- C. Washer
- D. Lift Link (Original)
- E. Lift Lock
- F. Lift Lever
- G. Locknut
- H. Hair Pin Clip
- I. Spacer
- J. Lift Cam
- K. Mower Hole

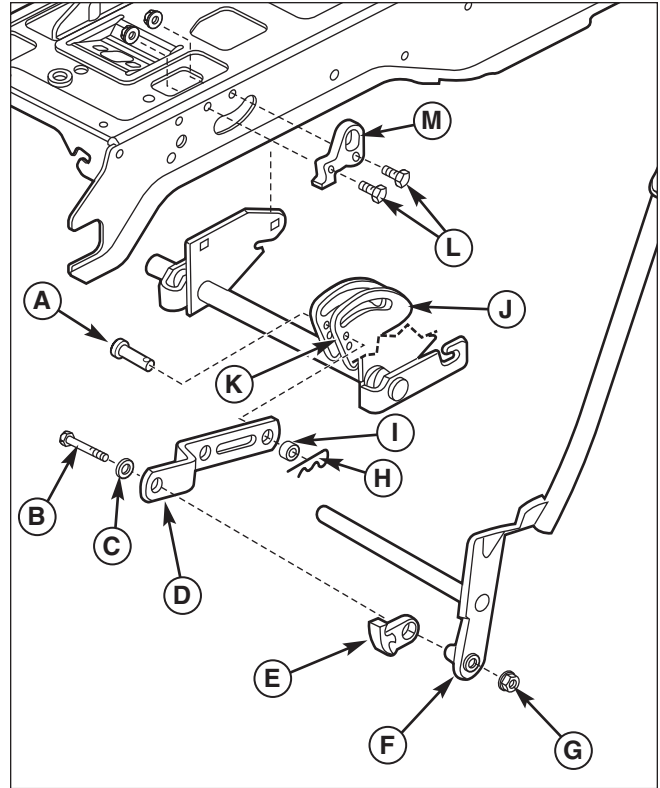


Figure 4. Lift Components - Tilling

- A. Clevis Pin
- B. 5/16-18 x 1 Capscrew (Gr. 5)
- C. Washer
- D. Lift Link (New)
- E. Lift Lock
- F. Lift Lever
- G. Locknut
- H. Hair Pin Clip
- I. Spacer
- J. Lift Cam
- K. Tiller Hole
- L. 5/16-18 x 1 Capscrew (Gr. 8) (New)
- M. Lock Plate

Initial Setup & Installation

Install the Hitches

1. Install the lower drawbar hitch (F, Figure 5) on the outside of the rear frame wrapper (E) and the hitch support (C) on the inside. Secure both to the rear frame wrapper (E) using two 5/16-18 x 1-1/4 capscrews (G) and two 5/16-18 nylock nuts (A).
2. Secure the bottom of the lower hitch (F) to the drawbar using two 1/2-13 x 1-1/2 capscrews (H), washers (I), and two 1/2-13 nylock nuts (J).
3. Secure the sides of the hitch support (C) using four 3/8-16 x 1 capscrews (D) and four 3/8-16 nylock nuts (B).

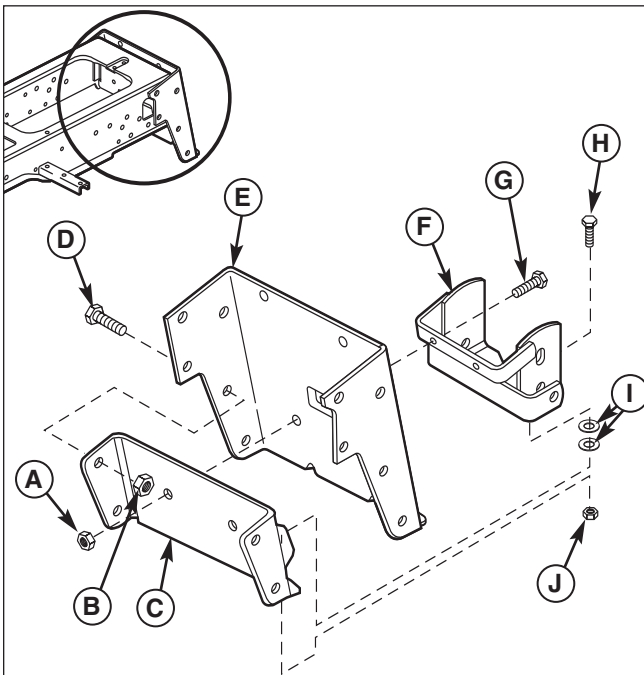


Figure 5. Hitch Support and Drawbar Installation

- A. 5/16-18 Nylock Nut
- B. 3/8-16 Nylock Nut
- C. Hitch Support
- D. 3/8-16 x 1 Capscrew
- E. Frame Wrapper
- F. Lower Hitch
- G. 5/16-18 x 1-1/4 Capscrew
- H. 1/2-13 x 1-1/2 Capscrew
- I. 1/2 Washer
- J. 1/2-13 Nylock Nut

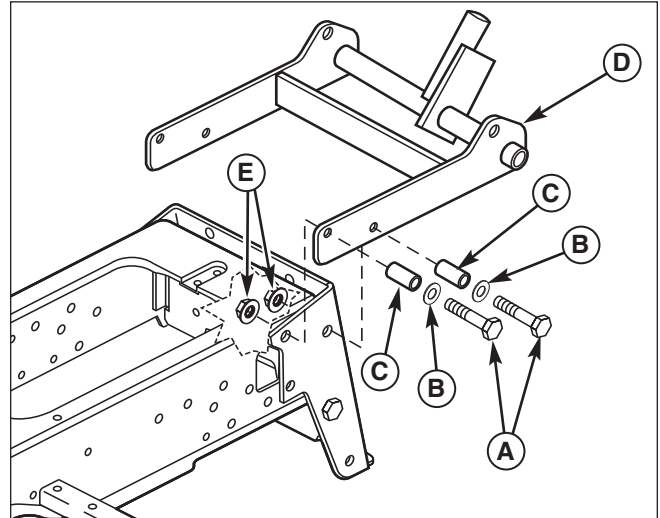


Figure 6. Rear Hitch Installation

- A. 1/2-13 x 2 Capscrew
- B. Washer
- C. Spacer
- D. Rear Hitch
- E. 1/2-13 Nylock Nut

4. Install the rear hitch (D, Figure 6) using the holes shown. Secure with four 1/2-13 x 2" capscrews (A), washers (B), spacers (C), and nylock nuts (E).

Install the Pulley Assemblies

1. Install the rear pulley assembly (D, Figure 7) into the left side of the rear hitch (C). Secure the bottom of the pulley assembly to the lower drawbar hitch (A) with pin (B).

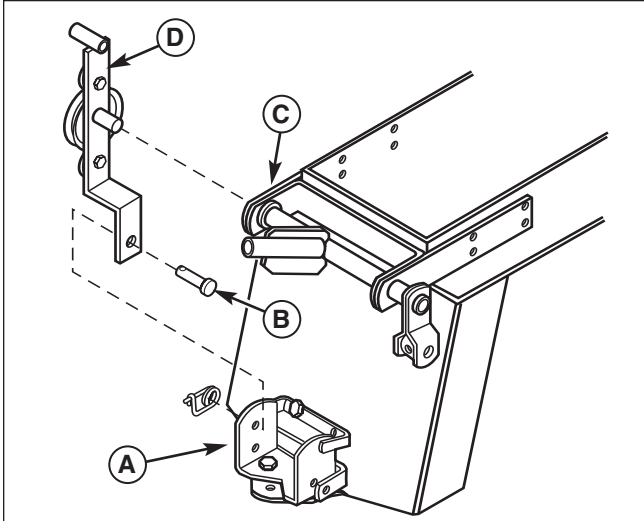


Figure 7. Rear Pulley Installation

- A. Lower Hitch
- B. Clevis Pin
- C. Upper Hitch
- D. Idler Pulley Assembly

2. Mount the front idler pulley assembly (A, Figure 8) onto the left stub (B) at the end of the lift assembly cross-shaft (C).
3. Hook the slot (D) onto the tractor frame as shown in Figure 9.

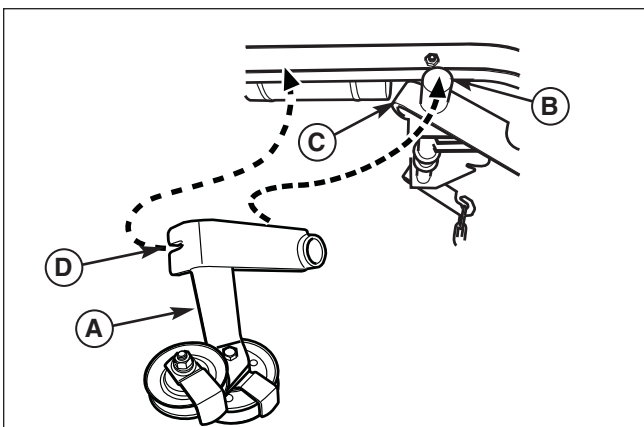


Figure 8. Front Idler Pulley Installation

- A. Idler Pulley Assembly
- B. Left Stub
- C. Lift Assembly Cross-shaft
- D. Slot

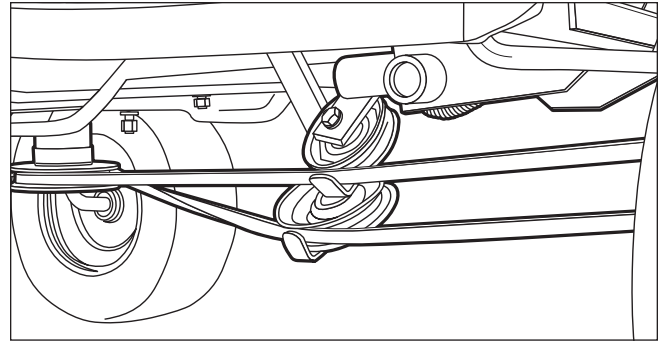


Figure 9. Front Idler Pulley Installed

Install the Rear Idler Pulley Assembly (Select Models)

1. Install the rear idler pulley (A, Figure 10) into the left side of the frame wrapper (B) using a 3/8-16 x 2-1/2 capscrew (C), 3/8 flat washer (D), spacer (E), and 3/8-16 locking flange nut (F) as shown. Tighten nut to 19.5 lb-ft (26.5 Nm).

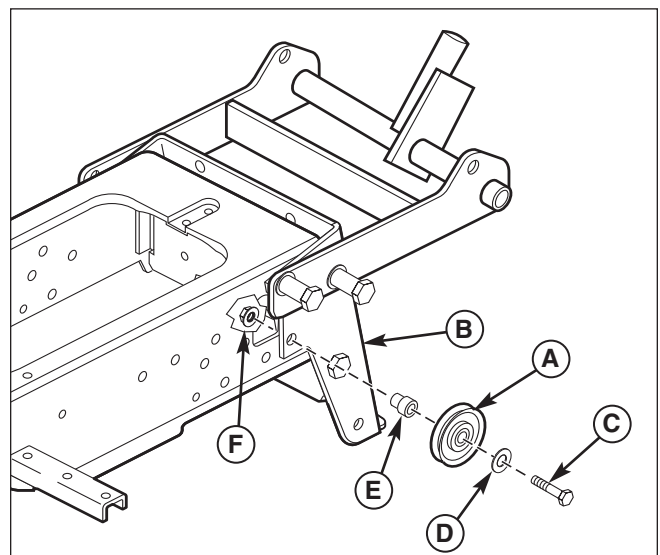


Figure 10. Rear Idler Pulley Installation

- A. Idler Pulley
- B. Frame Wrapper
- C. 3/8-16 x 2-1/2 Capscrew
- D. 3/8 Flat Washer
- E. Spacer
- F. 3/8-16 Flanged Locknut

Initial Setup & Installation

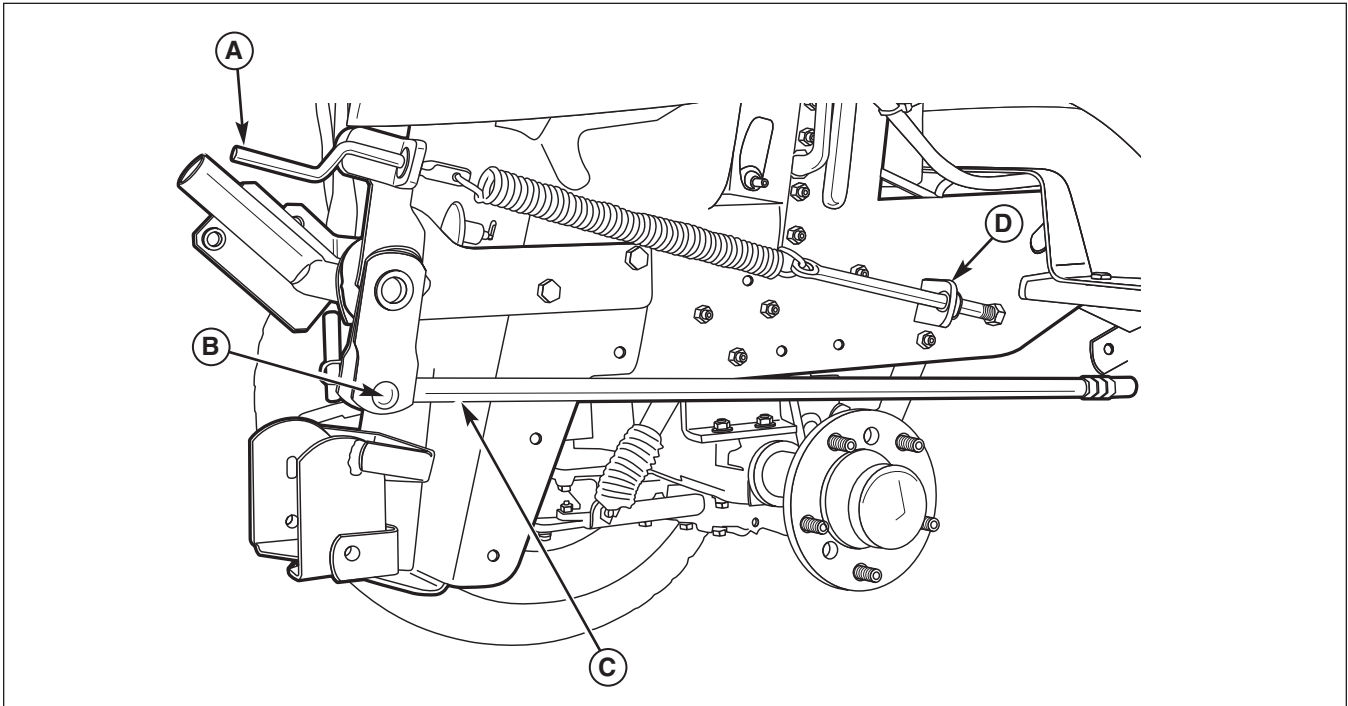


Figure 11. Lift Linkage Installation

- A. Turn Crank**
- B. Clevis Pin and Safety Clip**
- C. Lift Rod**
- D. Front Bracket**

Install the Lift Rod

1. Connect the rear of the lift rod (C, Figure 11) to the upper hitch. Secure with a clevis pin (B) and safety clip.
2. Slide the lift bracket (A, Figure 12) and lift rod assembly on the right stub at the end of the lift assembly cross-shaft. Secure with a clevis pin and hair pin clip (see Figure 12 inset).

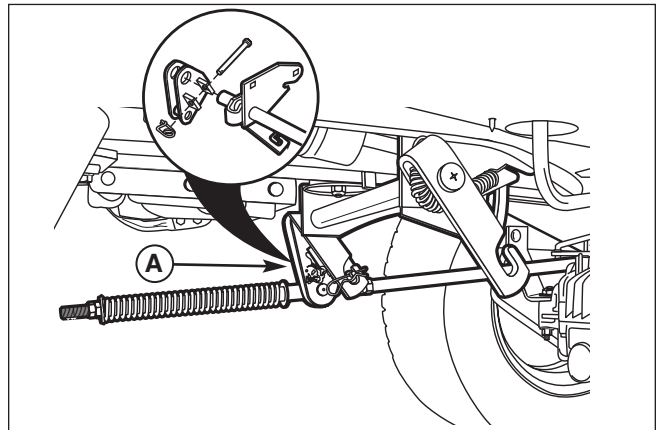


Figure 12. Lift Arm Extension Installation

- A. Lift Bracket**

MANUAL LIFT MODELS ONLY:

3. Mount the front bracket (D, Figure 11) to the frame using a 5/16-18 x 1 capscREW and nylock nut.
4. Secure the rear turn crank assembly (A, Figure 11) to the rear hitch using 3/8-16 x 1 carriage bolt and nylock nut.
5. Hook the spring to the turn crank (A) and put the threaded rod through the front bracket (D). Turn the crank until the nut is captured in the front bracket.

Install the Tiller

1. Position the tiller at the rear hitch and insert the lift bar (A, Figure 13) into the upper hitch (B). Secure with a clevis pin and safety clip.
2. Rotate the tiller upward so that the hitch arms (C) are aligned with the lower hitch (D). Secure with two clevis pins and safety clips.

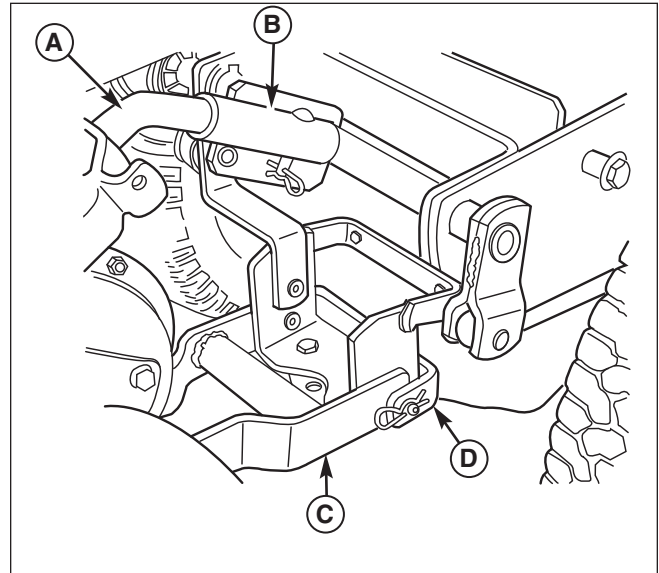


Figure 13. Tiller Installation

- A. Lift Bar
- B. Upper Hitch
- C. Hitch Arm
- D. Lower Hitch

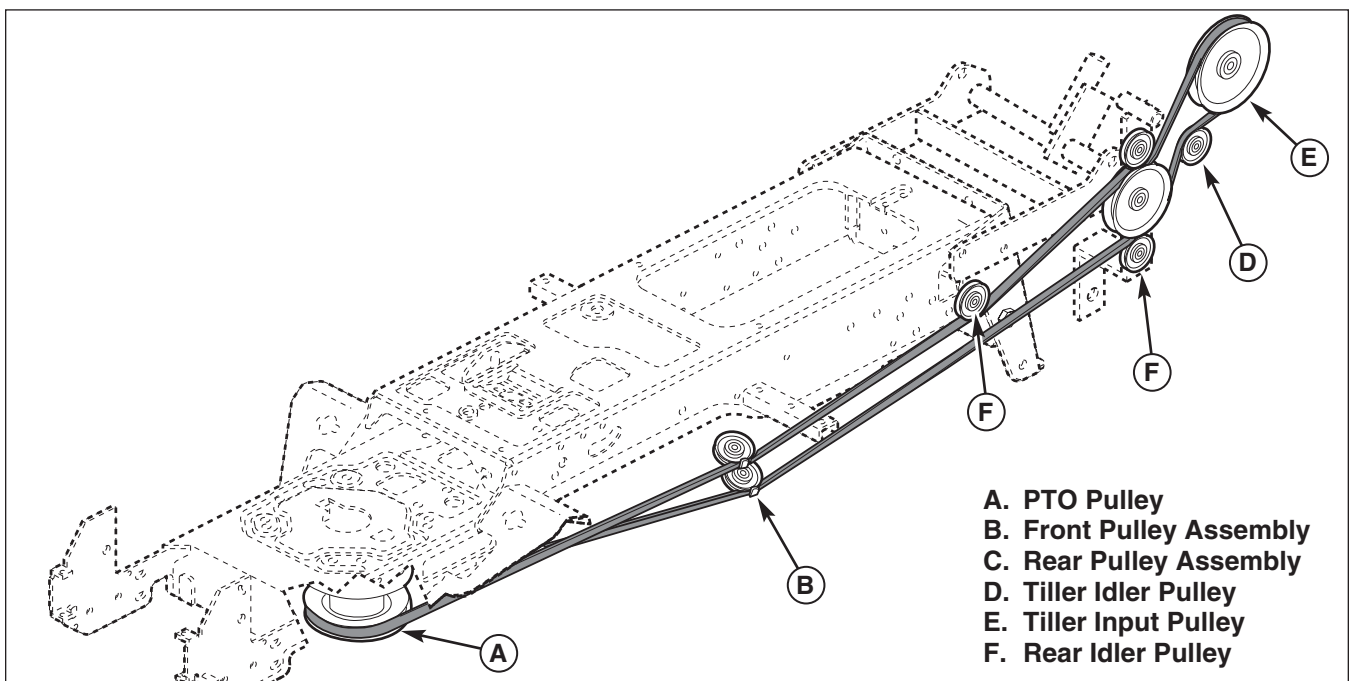


Figure 14. Belt Routing

Install the Belt

1. Remove the spring clip and pin securing the tiller belt cover. Pivot the belt cover out of the way to allow access to the tiller pulleys.
2. Install the belt on the rear pulley assembly (C, Figure 14) and tiller input pulley (E). The smaller upper and lower pulleys of the rear pulley assembly (C) should trap the belt in the middle pulley groove with the belt routed below the rear idler pulley (F) as shown.

3. Install the belt on the front pulley assembly (B) and PTO pulley (A). Adjust the front pulley assembly belt guides within 1/16" of the belt.
4. Route the belt inside the spring-loaded tiller idler pulley (D).
5. Reposition tiller belt cover and secure with the clevis pin and spring clip.

Adjustments

Perform the adjustments found in the "Toubleshooting, Adjustments, -and Service" section.

Operation

OPERATION

NOTICE

Refer to the Tractor Operator's Manual for important information concerning safely operating your tractor.

CAUTION

After striking a foreign object, stop the engine, disengage the PTO, and remove the key. Inspect the tiller for damage before starting.

The tiller may propel the tractor forward when first lowered into hard ground especially if tiller depth is set too deep or tractor ground speed is too fast.

Checks Before Starting

1. Make sure all covers and guards are in place. Make sure all nuts, bolts, clevis pins, and clips are secure.
2. The tiller must be lubricated before first use and after every four hours of operation. If required, see instructions in "Maintenance" section.
3. Clear the work area of any items that could be caught in the tiller.

Transporting

When transporting the tiller to and from the work area, the tiller should be fully raised. Adjust ground speed according to condition of the ground surface.

Turning or Backing When Tilling

Before backing up or turning, raise the tiller until it clears the ground. Otherwise, the tiller can be damaged.

The weight of the tiller will reduce the weight on the front tires. Front counterweights are recommended to restore normal turning ability.

Engine Speed and Ground Speed

Tilling should always be done with engine speed at full throttle. If ground speed is too high, slow down. Do not reduce the engine speed. Refer to the tractor "Operator's Manual" for more information on tractor operation.

WARNING

Perform the Safety System Interlock test found in your tractor Operator's Manual. If tractor does not pass the test, do not operate the tractor. See your authorized dealer. Under no circumstances should you attempt to defeat the safety system.

To prevent an explosion or fire, never store the tractor with fuel in the tank inside a building where an ignition source is present.

DANGER

OPERATING ON SLOPES CAN BE DANGEROUS

Never operate on slopes greater than 17.6 percent (10°) which is a rise of 3-1/2 feet vertically in 20 feet horizontally.

Operate the unit at a slow ground speed when driving onto a slope. Avoid using brakes to control ground speed.

When operating on slopes that are greater than 15% (8.5°) but less than 17.6 percent, use additional wheel weights or counterweights.

In addition to counter weights, use extra caution when operating on slopes. Drive UP and DOWN the slope, never across the face, use caution when changing directions, and DO NOT START OR STOP ON SLOPE.

Starting and Stopping

To start tilling, engage the tractor PTO then lower the tiller. Slowly drive forward. The tiller will work into the soil. Engage the PTO only when the tiller is out of the ground.

To stop the tiller, raise the tiller, and disengage the PTO. Raise tiller to transport position before traveling to and from the work site or storage area.

Tilling Suggestions

Plan the pattern before beginning. When the land contour permits, it is best to travel in the longest direction to minimize turning.

The tiller will dig deeper with slow ground speed. It is best to increase the depth on succeeding passes until the desired depth is reached. Making passes crossways to the previous pass usually helps break sod into fine particles. In soft, loose soil, it may be possible to till to desired depth in one pass.

Storage & Maintenance

STORAGE

Daily Storage

Note: Refer to the tractor Operator's Manual for important information concerning safely storing your tractor.

1. Allow tractor engine to cool before storing in any enclosure.
2. After jobs are completed, hose or brush down the unit to remove dirt and debris.
3. Lightly grease or oil all pivot points. Coat bare metal surfaces to prevent corrosion.

Long Term Storage

1. Use water pressure or brush to thoroughly clean the unit.
2. Paint, or lightly coat with oil, any area where paint has been worn or chipped away.
3. Thoroughly lubricate the unit.
4. Store in a dry place.

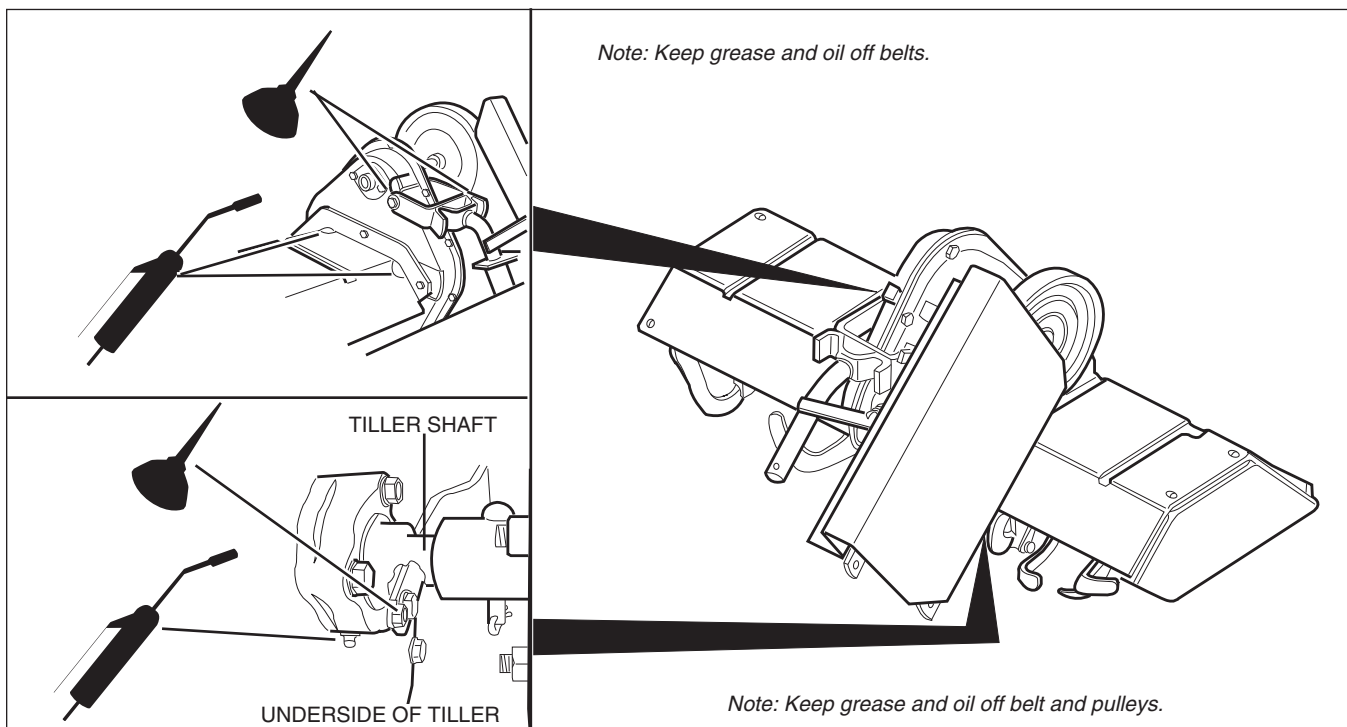
MAINTENANCE



WARNING

To avoid serious injury, perform maintenance on the tiller only when the engine is stopped, parking brake is set, and all moving parts have stopped. Always remove the ignition key before beginning maintenance or adjustments to prevent accidental starting of the engine.

Maintenance Schedule

Care Required	Schedule
Clean debris from unit.	After each use.
Lubricate unit.	Every 5 hours or at least once a year.
Check drive belt.	Every 50 hours or at least once a year.



Symbol	Use	Apply With	Procedure
	Lithium base automotive grease	Grease gun	<ol style="list-style-type: none"> 1. Wipe fitting clean with rag. 2. Apply 2 or 3 shots of grease. 3. Wipe up any excess grease.
	SAE 30 Oil	Oil can	Clean indicated area and apply 2 or 3 drops of oil.

Removal & Normal Installation

REMOVAL

1. Remove the belt from the spring-loaded tiller idler pulley (D, Figure 15).
2. Remove the belt from the PTO pulley (A, Figure 14).
3. Remove the front pulley assembly (B).
4. Remove the pin (B, Figure 16) securing the rear pulley assembly.
5. Raise the tiller.
6. **Manual Lift Models:** Release the tension on the lift assist spring (A, Figure 17). Remove the threaded rod spring (B) from the front bracket.
7. Lower the tiller.
8. Remove the lift bracket (A, Figure 18) and lift rod.
9. Detach the tiller from the rear hitches (Figure 18).
10. **Manual Lift Models:** Switch the lift link from the tilling position (D, Figure 20) to the mowing position (C).

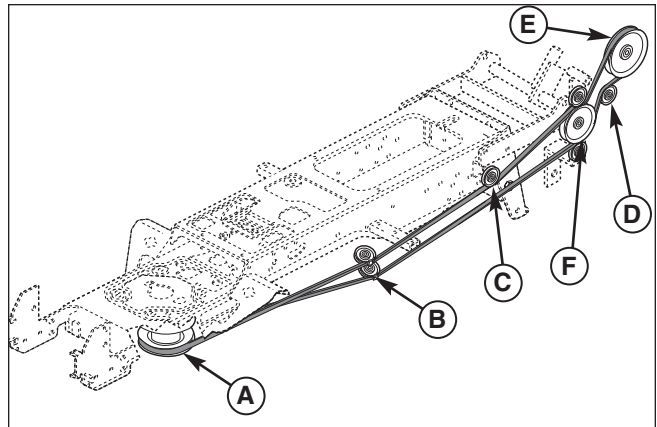


Figure 15. Belt Routing
A. PTO Pulley
B. Front Pulley Assembly
C. Rear Pulley Assembly
D. Tiller Idler Pulley
E. Tiller Input Pulley
F. Rear Idler Pulley

NORMAL INSTALLATION

1. **Manual Lift Models:** Switch the lift link from mowing position (C, Figure 20) to tilling position (D).
2. Attach the tiller to the rear hitch (see Figure 19).
3. Install the lift bracket (A, Figure 18).
4. Install the lift rod (C, Figure 17).
5. **Manual Lift Models:** Raise the tiller. Install the lift assist spring assembly (A, B, Figure 18).
6. Install the rear pulley assembly (D, Figure 16).
7. Install the front pulley assembly (B, Figure 15).
8. Route the drive belt as shown in Figure 15.
9. Perform the adjustments listed in the "Troubleshooting, Adjustments, and Service" section.

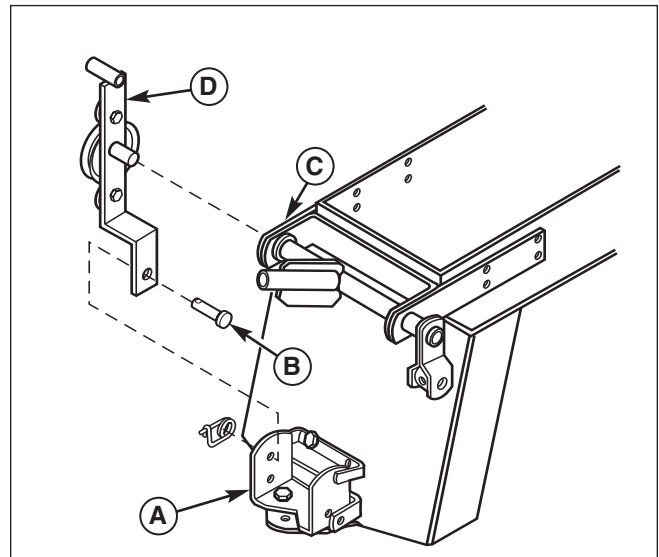


Figure 16. Install Pulley Assembly
A. Lower Hitch
B. Clevis Pin
C. Upper Hitch
D. Idler Pulley

Removal & Normal Installation

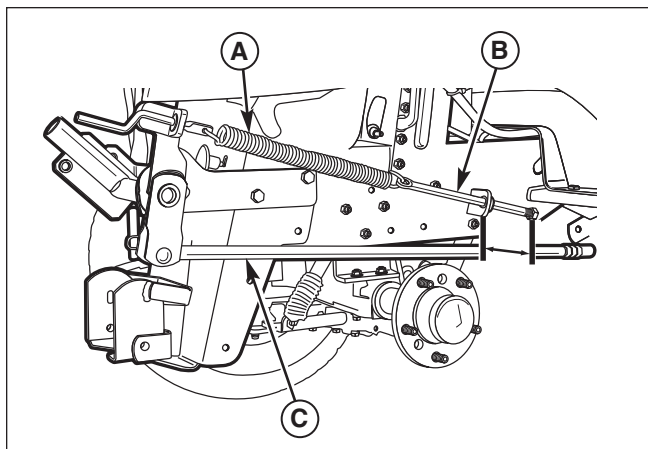


Figure 17. Lift Assist Spring

- A. Spring
- B. Threaded Rod Spring
- C. Lift Rod

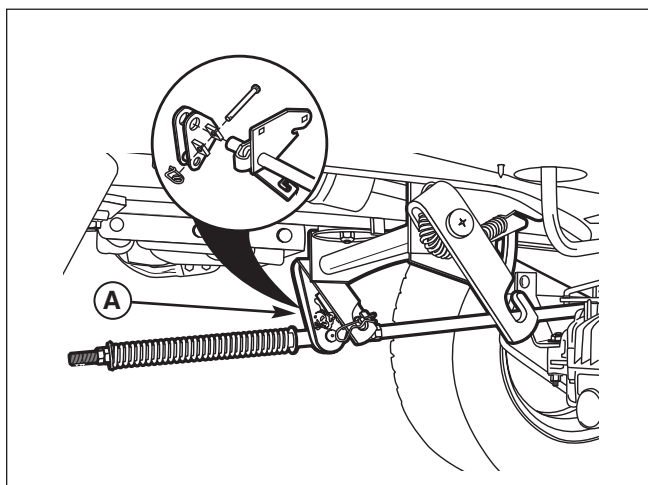


Figure 18. Lift Arm Extension

- A. Lift Bracket

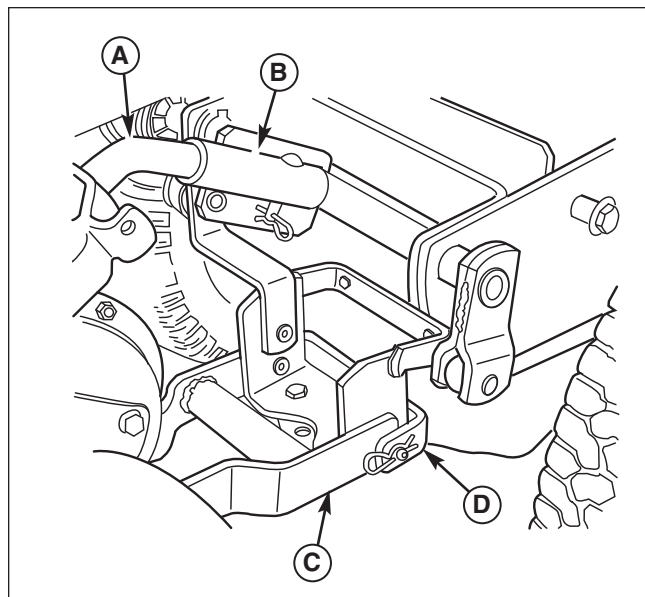


Figure 19. Tiller Assembly

- A. Lift Bar
- B. Upper Hitch
- C. Hitch Arm
- D. Lower Hitch

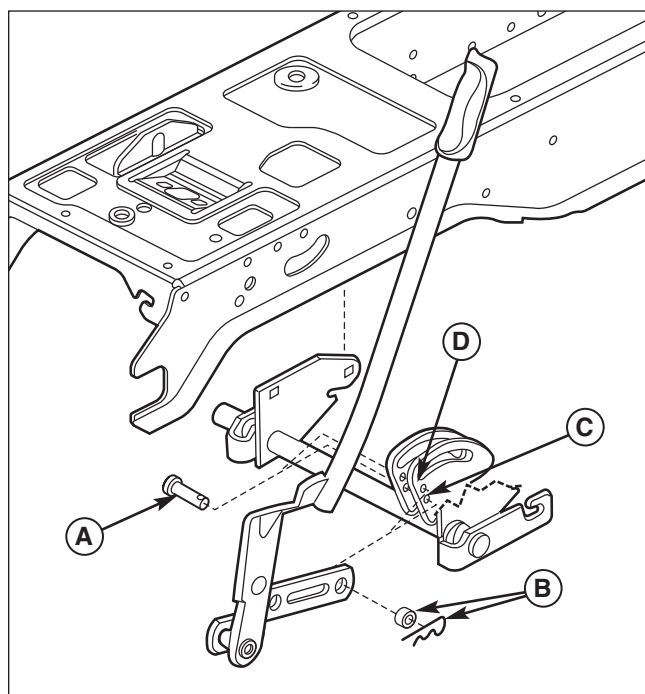


Figure 20. Lift Link Positions-Normal

- A. Clevis Pin
- B. Spacer and Hair Pin Clip
- C. Mowing Position
- D. Tilling Position

Troubleshooting, Adjustments, & Service

TROUBLESHOOTING

Troubleshooting procedures are provided in the following chart. To use these procedures, first locate the problem description that best describes the trouble that you have encountered. Check the possible causes one at a time in the order that they are listed. Correct any problems that are found and try to operate the rotary tiller again to see if you have eliminated the trouble.

WARNING

For your safety, do not try to adjust or repair the tractor or rotary tiller while the engine is running. Always remove the key from the ignition switch before beginning maintenance to prevent accidental starting.

Symptom	Problem	Solution
Rotary tiller tines do not rotate.	1. Drive belt or pulleys oily. 2. Tiller drive belt too loose. 3. Rock jammed in tiller. 4. Tiller drive belt broken.	1. Clean as required. 2. Replace belt. 3. Remove it. 4. Replace as needed.
Tills too shallow	1. Tiller depth set too low. 2. Engine RPM speed too low. 3. Tractor ground speed too fast. 4. Ground too hard.	1. Adjust the attachment lift. 2. Set engine to full speed. 3. Slow down. 4. Make several passes, tilling deeper on each pass.
Tiller leaves ground rough with large clods.	1. Ground too wet. 2. Tilling too deep in one pass. 3. Tractor ground speed too fast.	1. Wait until sod does not ball up when rolled in your hand. 2. Make several passes. 3. Slow down.
Tractor handles poorly.	1. Tractor ground speed too fast. 2. Front wheels lifting. 3. Rear wheels slip. 4. Tiller propels tractor.	1. Use slower speed, especially when running on rough or sloping surfaces. 2. Clean dirt from tiller. Use front wheel counterweights and weight carrier. 3. Use chains or wheel weights. 4. Tiller depth set too low.

TINE REPLACEMENT

When required because of wear or breakage, replace a tine as follows.

1. Remove two capscrews (A, Figure 21) and locknuts (B).
2. Remove old tine (C) from tiller.
3. Place new tine on mounting plate (D). When facing front of tiller, be sure tine curves away from mounting plate with its sharp edge facing rearward when tine nears bottom of travel.
4. Insert two capscrews (A) through tine and then through mounting plate (D). Install and tighten locknuts (B) to 30 lb-ft (40 Nm).

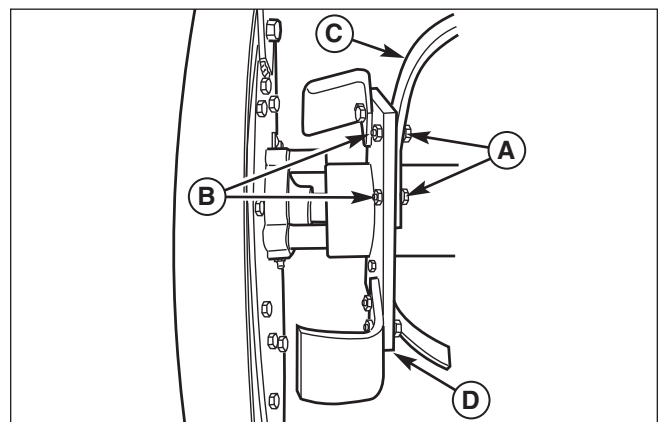


Figure 21. Tine Replacement

- A. Capscrew**
- B. Locknut**
- C. Tine**
- D. Mounting Plate**

LIFT HEIGHT ADJUSTMENT (MANUAL LIFT MODELS)

INITIAL ADJUSTMENT

1. Park the unit on level ground.
2. Turn the lift spring assist crank (A, Figure 24) until the length of threaded rod between the bracket and end of the threaded rod spring (B) and the bracket measures 6".

Note: Lubricate the crank and threaded rod with oil.

3. Fully raise the tiller.
4. Adjust the rear lift rod nuts (B, Figure 23) until the bottom tines are 5" above the ground.
5. Adjust the front lift rod nuts (A, Figure 23) until the rod spring is compressed to a length of 9".

WORKING ADJUSTMENT

The amount of lift assist can be varied based on the depth of tilling and the hardness of the soil. If more assist is desired, the turn crank (A, Figure 24) clockwise. If more downward force is needed, turn the crank counterclockwise.

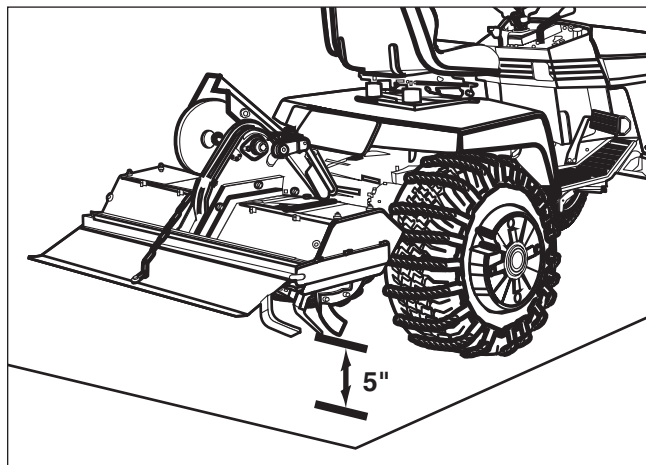


Figure 22. Lift Height Adjustment

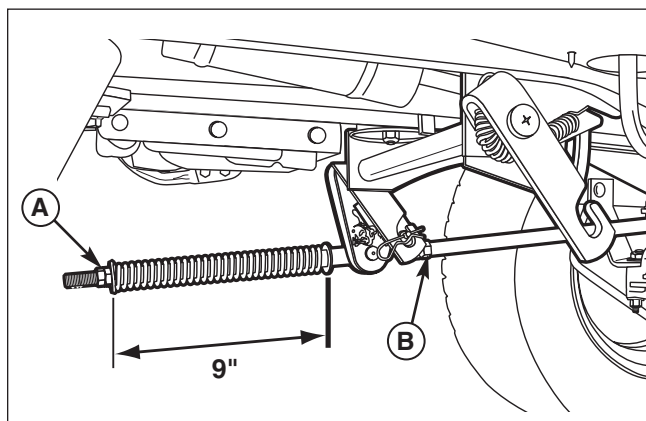


Figure 23. Lift Rod Spring Adjustment

A. Front Lift Rod Nut
B. Rear Lift Rod Nut

LIFT HEIGHT ADJUSTMENT (HYDRAULIC LIFT MODELS)

1. Park the unit on level ground.
2. Fully raise the tiller.
3. Adjust the rear lift rod nuts (B, Figure 23) until the bottom tines are 5" above the ground (Figure 22).
4. Adjust the front lift rod nuts (A, Figure 23) until the lift rod spring is compressed to a length of 9".

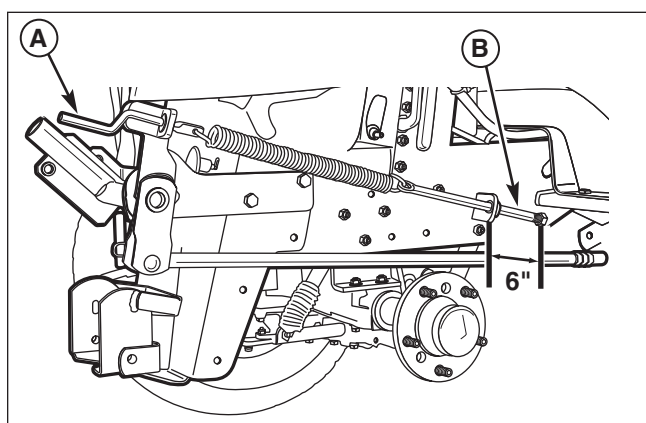


Figure 24. Lift Spring Assist Crank

A. Lift Spring Assist Crank
B. Threaded Rod Spring

Hardware Identification & Torque Specifications

Common Hardware Types

Hex Head Capscrew



Washer



Carriage Bolt



Lockwasher



Hex Nut

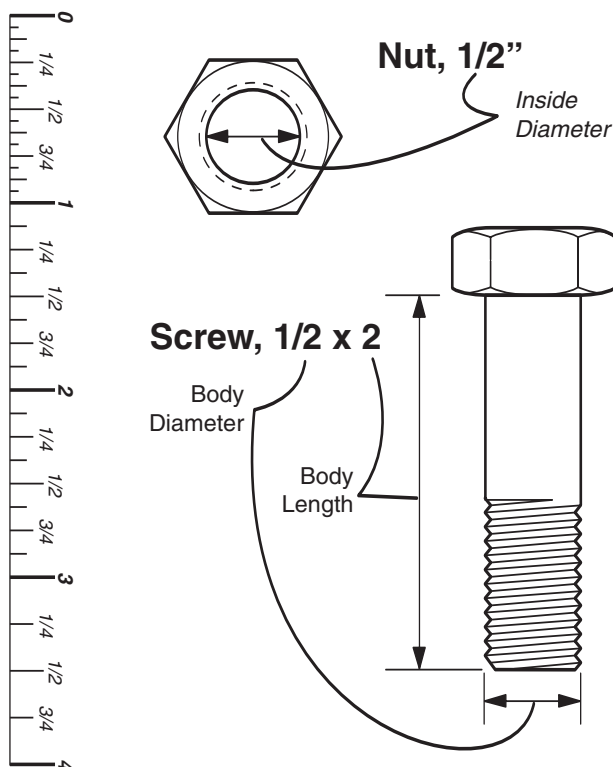


Standard Hardware Sizing

When a washer or nut is identified as **1/2"**, this is the *Nominal size*, meaning the *inside diameter* is 1/2 inch; if a second number is present it represents the *threads per inch*

When bolt or capscrew is identified as **1/2 - 16 x 2"**, this means the *Nominal size*, or *body diameter* is 1/2 inch; the second number represents the *threads per inch* (16 in this example, and the final number is the *body length* of the bolt or screw (in this example 2 inches long).

The guides and ruler furnished below are designed to help you select the appropriate hardware and tools.



Torque Specification Chart

FOR STANDARD MACHINE HARDWARE (Tolerance $\pm 20\%$)

Hardware Grade	No Marks		SAE Grade 2		SAE Grade 5		SAE Grade 8	
	in/lbs	ft/lbs	in/lbs	ft/lbs	in/lbs	ft/lbs	in/lbs	ft/lbs
8-32	19	2.1	30	3.4	41	4.6		
8-36	20	2.3	31	3.5	43	4.9		
10-24	27	3.1	43	4.9	60	6.8		
10-32	31	3.5	49	5.5	68	7.7		
1/4-20	66	7.6	8	10.9	12	16.3		
1/4-28	76	8.6	10	13.6	14	19.0		
5/16-18	11	15.0	17	23.1	25	34.0		
5/16-24	12	16.3	19	25.8	27	34.0		
3/8-16	20	27.2	30	40.8	45	61.2		
3/8-24	23	31.3	35	47.6	50	68.0		
7/16-14	30	40.8	50	68.0	70	95.2		
7/16-20	35	47.6	55	74.8	80	108.8		
1/2-13	50	68.0	75	102.0	110	149.6		
1/2-20	55	74.8	90	122.4	120	163.2		
9/16-12	65	88.4	110	149.6	150	204.0		
9/16-18	75	102.0	120	163.2	170	231.2		
5/8-11	90	122.4	150	204.0	220	299.2		
5/8-18	100	136	180	244.8	240	326.4		
3/4-10	160	217.6	260	353.6	386	525.0		
3/4-16	180	244.8	300	408.0	420	571.2		
7/8-9	140	190.4	400	544.0	600	816.0		
7/8-14	155	210.8	440	598.4	660	897.6		
1-8	220	299.2	580	788.8	900	1,244.0		
1-12	240	326.4	640	870.4	1,000	1,360.0		

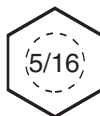
NOTES

- These torque values are to be used for all hardware excluding: locknuts, self-tapping screws, thread forming screws, sheet metal screws and socket head setscrews.
- Recommended seating torque values for locknuts:
 - for prevailing torque locknuts - use 65% of grade 5 torques.
 - for flange whizlock nuts and screws - use 135% of grade 5 torques.
- Unless otherwise noted on assembly drawings, all torque values must meet this specification.

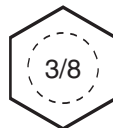
Wrench & Fastener Size Guide



1/4" Bolt or Nut
Wrench—7/16"



5/16" Bolt or Nut
Wrench—1/2"



3/8" Bolt or Nut
Wrench—9/16"



7/16" Bolt or Nut
Wrench (Bolt)—5/8"
Wrench (Nut)—11/16"



1/2" Bolt or Nut
Wrench—3/4"

NOTES

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