

# **BUSH HOG®**

## **MODEL 12**

### **ROTARY CUTTER**



## **Operator's Manual**

**ASSEMBLY ● OPERATION ● MAINTENANCE**

# CONGRATULATIONS!

You have invested in the best implement of its type on the market today.

The care you give your Bush Hog implement will greatly determine your satisfaction with its performance and its service life. We urge a careful study of this manual to provide you with a thorough understanding of your new implement before operating, as well as suggestions for operation and maintenance.

If your manual should become lost or destroyed, Bush Hog will be glad to provide you with a new copy. Order from Bush Hog, P. O. Box 1039, Selma, Alabama 36702-1039.

As an authorized Bush Hog dealer, we stock genuine Bush Hog parts which are manufactured with the same precision and skill as our original equipment. Our trained service personnel are well informed on methods required to service Bush Hog equipment, and are ready and able to help you.

Should you require additional information or assistance, please contact us.

YOUR AUTHORIZED  
BUSH HOG DEALER

BECAUSE BUSH HOG MAINTAINS AN ONGOING PROGRAM OF PRODUCT IMPROVEMENT, WE RESERVE THE RIGHT TO MAKE IMPROVEMENTS IN DESIGN OR CHANGES IN SPECIFICATIONS WITHOUT INCURRING ANY OBLIGATION TO INSTALL THEM ON UNITS PREVIOUSLY SOLD.

BECAUSE OF THE POSSIBILITY THAT SOME PHOTOGRAPHS IN THIS MANUAL WERE TAKEN OF PROTOTYPE MODELS, PRODUCTION MODELS MAY VARY IN SOME DETAIL. IN ADDITION, SOME PHOTOGRAPHS MAY SHOW SHIELDS REMOVED FOR PURPOSES OF CLARITY. **NEVER OPERATE** THIS IMPLEMENT WITHOUT ALL SHIELDS IN PLACE.

# MODEL 12 ROTARY CUTTERS

## TABLE OF CONTENTS

SECTION/PARA	PAGE	SECTION/PARA	PAGE
Warranty.....	2	IV.MAINTENANCE .....	10
Dealer Preparation Check List .....	3	4-1 Maintenance Check List .....	10
Safety Precautions .....	4	4-2 Lubrication .....	10
Federal Laws and Regulations.....	5	4-3 Blade Holder Assembly Removal and Installation.....	11
I. INTRODUCTION & DESCRIPTION .....	6	4-4 Blade Replacement .....	11
1-1 Introduction .....	6	4-5 Slip Clutch Operational Check .....	11
1-2 Description .....	6	4-6 Slip Clutch Adjustment.....	12
II. PREPARATION FOR USE .....	7	4-7 Gearbox Maintenance.....	12
2-1 Attaching To Tractor .....	7	4-8 Troubleshooting.....	13
III.OPERATING INSTRUCTIONS .....	9	V. ASSEMBLY .....	15
3-1 General Safety .....	9	Safety Decals .....	16
3-2 Adjusting for Work.....	9	Torque Specifications .....	17
3-2.1 Cutting Height Adjustment .....	9		
3-3 Operation .....	9		
3-4 Transporting .....	10		

## RETAIL CUSTOMER'S RESPONSIBILITY UNDER THE BUSH HOG WARRANTY

It is the Retail Customer and/or Operator's responsibility to read the Operator's Manual, to operate, lubricate, maintain and store the product in accordance with all instructions and safety procedures. Failure of the operator to read the Operator's Manual is a misuse of this equipment.

It is the Retail Customer and/or Operator's responsibility to inspect the product and to have any part(s) repaired or replaced when continued operation would cause damage or excessive wear to other parts or cause a safety hazard.

It is the Retail Customer's responsibility to deliver the product to the authorized Bush Hog Dealer, from whom he purchased it, for service or replacement of defective parts which are covered by warranty. Repairs to be submitted for warranty consideration must be made within forty-five (45) days of failure.

It is the Retail Customer's responsibility for any cost incurred by the Dealer for traveling to or hauling of the product for the purpose of performing a warranty obligation or inspection.

# BUSH HOG®

## LIMITED WARRANTY



Bush Hog warrants to the original purchaser of any new Bush Hog equipment, purchased from an authorized Bush Hog dealer, that the equipment be free from defects in material and workmanship for a period of one (1) year for non-commercial, state, and municipalities' use and ninety (90) days for commercial use from date of retail sale. The obligation of Bush Hog to the purchaser under this warranty is limited to the repair or replacement of defective parts.

Replacement or repair parts installed in the equipment covered by this limited warranty are warranted for ninety (90) days from the date of purchase of such part or to the expiration of the applicable new equipment warranty period, whichever occurs later. Warranted parts shall be provided at no cost to the user at an authorized Bush Hog dealer during regular working hours. Bush Hog reserves the right to inspect any equipment or parts which are claimed to have been defective in material or workmanship.

### DISCLAIMER OF IMPLIED WARRANTIES & CONSEQUENTIAL DAMAGES

Bush Hog's obligation under this limited warranty, to the extent allowed by law, is in lieu of all warranties, implied or expressed, **INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE** and any liability for incidental and consequential damages with respect to the sale or use of the items warranted. Such incidental and consequential damages shall include but not be limited to: transportation charges other than normal freight charges; cost of installation other than cost approved by Bush Hog; duty; taxes; charges for normal service or adjustment; loss of crops or any other loss of income; rental of substitute equipment, expenses due to loss, damage, detention or delay in the delivery of equipment or parts resulting from acts beyond the control of Bush Hog.

### THIS LIMITED WARRANTY SHALL NOT APPLY:

1. To vendor items which carry their own warranties, such as engines, tires, and tubes.
2. If the unit has been subjected to misapplication, abuse, misuse, negligence, fire or other accident.
3. If parts not made or supplied by Bush Hog have been used in connection with the unit, if, in the sole judgement of Bush Hog such use affects its performance, stability or reliability.
4. If the unit has been altered or repaired outside of an authorized Bush Hog dealership in a manner which, in the sole judgement of Bush Hog, affects its performance, stability or reliability.
5. To normal maintenance service and normal replacement items such as gearbox lubricant, hydraulic fluid, worn blades, or to normal deterioration of such things as belts and exterior finish due to use or exposure.
6. To expendable or wear items such as teeth, chains, sprockets, belts, springs and any other items that in the company's sole judgement is a wear item.

NO EMPLOYEE OR REPRESENTATIVE OF BUSH HOG IS AUTHORIZED TO CHANGE THIS LIMITED WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY UNLESS SUCH CHANGE IS MADE IN WRITING AND SIGNED BY BUSH HOG'S SERVICE MANAGER, POST OFFICE BOX 1039, SELMA, ALABAMA 36702-1039.



Record the model number, serial number and date purchased. This information will be helpful to your dealer if parts or service are required.

MAKE CERTAIN THE WARRANTY REGISTRATION CARD HAS BEEN FILED WITH BUSH HOG/  
SELMA, ALABAMA

MODEL NUMBER \_\_\_\_\_

SERIAL NUMBER \_\_\_\_\_

DATE OF RETAIL SALE \_\_\_\_\_

# DEALER PREPARATION CHECK LIST

## MODEL 12 ROTARY CUTTERS

BEFORE DELIVERING MACHINE — The following check list should be completed.  
Use the Operator's Manual as a guide.

- ☐ 1. Assembled completed.
- ☐ 2. Gearbox filled with oil.
- ☐ 3. All fittings lubricated.
- ☐ 4. All shields in place and in good condition.
- ☐ 5. All fasteners torqued to specifications given in Torque Chart.
- ☐ 6. Slip clutches have been checked for proper operation.
- ☐ 7. All decals in place and readable. (See decal page.)
- ☐ 8. Overall condition good (i.e. paint, welds)
- ☐ 9. Operators manual has been delivered to owner and he has been instructed on the safe and proper use of the cutter.
- ☐ 10. Purchaser or dealer elects to delete deflectors. (front chains)

Explanation: \_\_\_\_\_

### WARNING

For Non-Agricultural use, OSHA, ASAE, SAE and ANSI standards require the use of Chain Guards or other protective guards at all times. Bush Hog strongly recommends the use of such guards for Agricultural uses as well, to reduce the risk of property damage, serious bodily injury or even death from objects thrown out by or from contact with the cutting blades.

Dealer's  
Signature \_\_\_\_\_

Purchaser's  
Signature \_\_\_\_\_

THIS CHECKLIST TO REMAIN IN OWNER'S MANUAL —  
It is the responsibility of the dealer to complete the procedures listed  
above before delivery of this implement to the customer.

# IMPORTANT SAFETY PRECAUTIONS

**This symbol is used to call attention to safety precautions that should be followed by the operator to avoid accidents. When you see this symbol, carefully read the message that follows and heed its advice. Failure to comply with safety precautions could result in serious bodily injury.**



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 in the operation, transport, maintenance and storage of equipment. Lack of attention to safety can result in accident, personal injury, reduction of efficiency and worst of all—loss of life. Watch for safety hazards and correct deficiencies promptly. Use the following safety precautions as a general guide to safe operations when using this machine. Additional safety precautions are used throughout this manual for specific operating and maintenance procedures. Read this manual and review the safety precautions often until you know the limitations.

1. Read the Operator's Manual. Failure to read the Operator's Manual is considered a misuse of this equipment.
2. Become familiar with all the machine's controls and all the caution, warning and danger decals affixed to the machine before attempting to start or operate.
3. Before starting or operating the machine, make a walk around inspection and check for obvious defects such as loose mounting bolts and damaged components. Correct any deficiency before starting.
4. Do not allow children to operate the cutter. Do not allow adults to operate it without proper instruction.
5. Do not carry passengers.
6. Keep the area of operation clear of all persons, particularly small children and pets. The operator should cease mowing whenever anyone comes within the operating area.
7. Clear the work area of objects which might be picked up and thrown.
8. Use a piece of cardboard or wood rather than hands to search for hydraulic leaks. Escaping hydraulic oil under pressure can penetrate skin. If fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.
9. Do not operate without all guards and shields in place and in good condition.
10. Lower implement to ground, stop tractor engine, apply parking brake, and allow blades to completely stop before leaving the tractor.
11. Keep hands and feet away from blades.
12. This cutter is not to be operated along highways or in any area where people may be present unless all sides of the unit are enclosed by permanent bands, safety chains or other factory approved safety shields that are in good repair.
13. Wear personal protective equipment such as, but not limited to, protection for eyes, ears, feet, hands and head when operating or repairing the equipment. Do not wear loose clothing or jewelry that may catch on equipment moving parts.
14. When performing adjustments or maintenance on the cutter, first lower it to the ground or block it securely at a workable height.
15. Never stand between tractor and cutter while tractor is being backed to the cutter hitch.
16. Reduce speed when transporting cutter to avoid bouncing and momentary loss of steering.
17. Use tractor flashing warning lights, day or night, when transporting cutter on road or highways unless prohibited by law.
18. In the event that someone other than yourself will operate this equipment we firmly suggest that all SAFETY references be discussed prior to operation.
19. It is recommended that tractor be equipped with Rollover Protective System (ROPS) and seat belt be used in all mowing operations.

# IMPORTANT FEDERAL LAWS AND REGULATIONS\* CONCERNING EMPLOYERS, EMPLOYEES AND OPERATIONS.

\*(This section is intended to explain in broad terms the concept and effect of the following federal laws and regulations. It is not intended as a legal interpretation of the laws and should not be considered as such).

U.S. Public Law 91-596 (The Williams-Steiger Occupational and Health Act of 1970) OSHA

## **This Act Seeks:**

"...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources..."

## **DUTIES**

Sec. 5 (a) Each employer—

- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Act which are applicable to his own actions and conduct.

## **OSHA Regulations**

Current OSHA regulations state in part: "At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved." These will include (but are not limited to) instructions to:

Keep all guards in place when the machine is in operation;

Permit no riders on equipment;

Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning or unclogging the equipment, except where the machine must be running to be properly serviced or maintained, in which case the employer shall instruct employees as to all steps and procedures which are necessary to safely service or maintain the equipment.

Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine.

## **EMPLOYEE TRACTOR OPERATING INSTRUCTIONS:**

1. Securely fasten your seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going, especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly - no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by tractor manufacturers.
9. When tractor is stopped, set brakes securely and use park lock if available.

## **Child Labor Under 16 Years Old**

Some regulations specify that no one under the age of 16 may operate power machinery. It is your responsibility to know what these regulations are in your own area or situation. (Refer to U.S. Dept. of Labor, Employment Standard Administration, Wage & Home Division, Child Labor Bulletin #102.)

# SECTION I

## INTRODUCTION AND DESCRIPTION

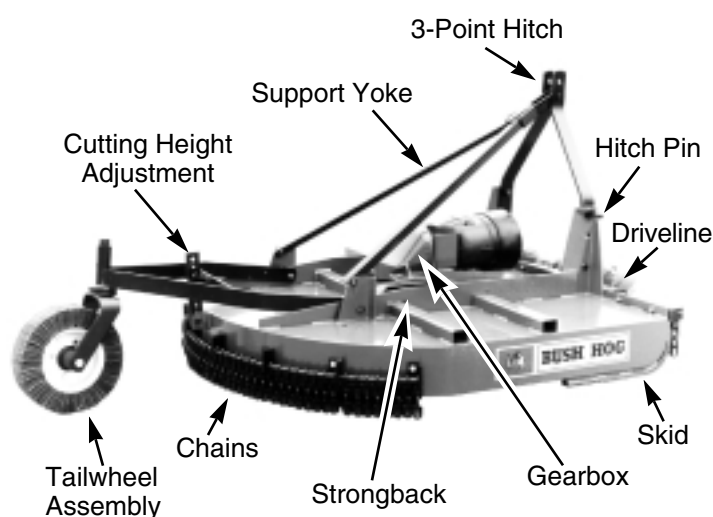
### 1-1 INTRODUCTION

We are pleased to have you as a Bush Hog customer. Your Model 12 Rotary Cutter has been carefully designed to give maximum service with minimum down time. This manual is provided to give you the necessary operating and maintenance instructions for keeping your rotary cutter in top operating condition. Please read this manual thoroughly. Understand what each control is for and how to use it. Observe all safety precautions decaled on the machine and noted throughout the manual for safe operation of implement. If any assistance or additional information is needed, contact your authorized Bush Hog dealer.

### 1-2 DESCRIPTION

Model 12 rotary cutters (Figure 1-1) are designed for medium duty applications such as grass, corn stalks and light brush. These cutters are single spindle with two free-swinging blades. Free-swinging blades reduce the shock of impact when a stationary object is hit. Additional protection is provided by a slip clutch on the gearbox input shaft. A round blade holder allows the cutter to "ride over" stumps and similar immovable objects. Model 12 cutters are attached to the tractor using 3-point Cat I standard hitches. Standard equipment includes driveline shields, clutch shields and front discharge shields (deflectors).

Figure 1-1 Major Components



NOTE: Dealer or purchaser may elect to delete front and rear discharge shields (deflectors) at their option. Refer to "WARNING" in Section 3-3.

#### NOTE

All references made to right, left, front, rear, top or bottom are as viewed facing the direction of forward travel with implement properly attached to tractor.

Table 1 Technical Specifications

<b>SERIES</b>	<b>12</b>
<b>Cutting Width</b>	60"
<b>Transport Width</b>	62-1/2"
<b>Length</b>	90-1/4"
<b>Hitch</b>	3-Point Cat I
<b>Cutting Height</b>	2" - 12"
<b>Cutting Capacity</b>	3" Diameter
<b>Driveshaft</b>	ASAE Category 4
<b>Gearbox</b>	540 RPM (65 HP)
<b>Blades</b>	1/2" x 4"
<b>Blade Tip Speed</b>	12,193 fpm
<b>Blade Holder</b>	Round
<b>Top Deck</b>	7 Ga. Steel
<b>Side Bands</b>	1/4" x 6"
<b>Minimum Tractor HP</b>	25
<b>Front &amp; Rear Deflectors</b>	Front belting is standard, front & rear chains are optional
<b>Wheels</b>	Laminated
<b>Approximate Weight (lbs.)</b>	782 lbs. *

\* - Weight includes deflector chains front. SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



## SECTION II PREPARATION FOR USE

### 2-1 ATTACHING TO TRACTOR



**NEVER STAND BETWEEN TRACTOR AND CUTTER WHILE TRACTOR IS BEING BACKED TO HITCH.**



**ADDITIONAL TRACTOR FRONT BALLAST MAY BE NEEDED FOR STABLE OPERATION AND TRANSPORT OF THE 3-POINT HITCH MOUNTED CUTTER. SEE TRACTOR OPERATOR'S MANUAL FOR RECOMMENDED WEIGHTS.**



**DO NOT USE PTO SHAFT ADAPTERS TO CHANGE SIZE OF TRACTOR PTO SHAFT. THE CORRECT DRIVELINE MUST BE USED TO MATCH TRACTOR PTO SHAFT.**

A. Insure that all bolts and hitch pins on 3-point hitch are tightened. Hitches need no further adjustment.

B. Attach cutter to tractor 3-point hitch per tractor operator's manual. Do not attach driveline at this time.

C. Raise 3-point hitch until front of cutter is approximately 1-2 inches (25-51mm) lower than rear for standard cut or until front of cutter is 1 inch (35mm) higher than rear for extra shredding. Shut down

tractor. Securely block cutter in position. For further explanation of cutter adjustment, see paragraph 3-2.

#### NOTE

**Due to the many variations in tractor / implement hitch points and corresponding differences in distances between tractor PTO shafts and implement input shafts, drivelines may need to be shortened as described in the following steps:**

D. Raise and lower cutter to determine position with shortest distance between the tractor PTO shaft and gearbox input shaft. Shut down tractor leaving cutter in position of shortest distance. **Securely block cutter in position.**

E. Pull driveline apart. Attach outer (female) section to tractor PTO shaft. Pull on driveline section to be sure that yoke locks into place.

F. Hold driveline sections parallel to each other to determine if too long. Each section should end approximately 3 inches (76mm) short of reaching universal joint shield on opposite section. If too long, measure 3 inches (76mm) back from universal joint shield and mark on opposite section. (Figure 2-3). Do this for both sections.

G. Raise and lower cutter to determine position with greatest distance between PTO shaft and gearbox input shaft. Shut down tractor leaving cutter in position of greatest distance. **Securely block cutter in position.**

Figure 2-1 3-Point Hitch

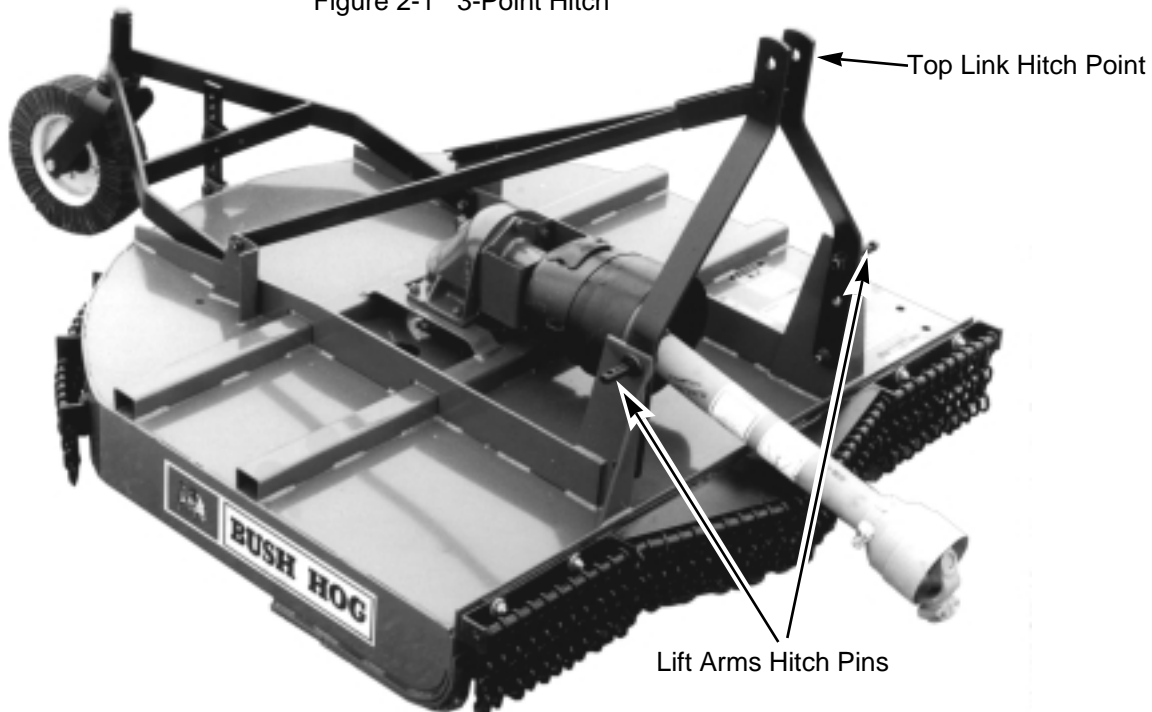
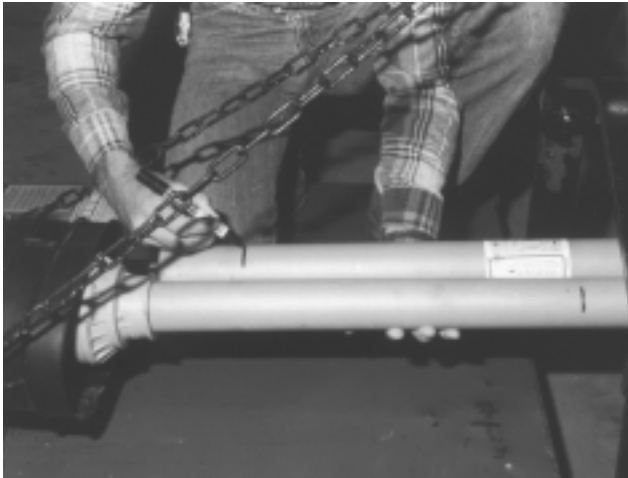
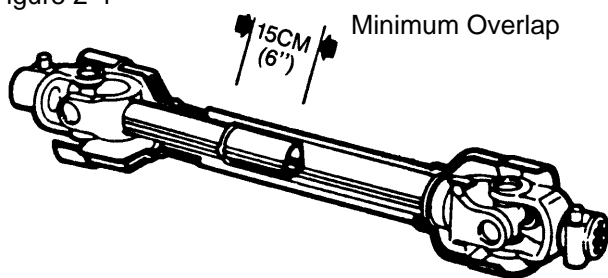


Figure 2-3



H. Hold driveline sections parallel to each other and check for minimum 6 inches (15cm) overlap. Figure 2-4). If driveline has been marked for cutting, overlap will be the distance between two marks. If driveline has less than minimum overlap, do not use. Contact authorized Bush Hog dealer.

Figure 2-4



**NOTE**

If driveline is the correct length, omit the following steps "I" through "L" and proceed to step "M".

I. Clamp driveline in a well padded vice to prevent damage to the shield. Cut off shield where marked. (Figure 2-5)

Figure 2-5



J. Using cut off section of shield as a guide, cut shaft the same amount. (Figure 2-6)

Figure 2-6



K. Repeat steps "I" and "J" to other driveline section.

L. Deburr ends of driveline sections and clean away all chips and filings. (Figure 2-7)

Figure 2-7



M. Apply multi-purpose grease to inside of outer (female) driveline section. Assemble driveline and install on tractor and cutter. Pull on each driveline section to be sure yokes lock into place. Make certain driveline shielding is in place and in good condition.

N. Adjust lower lift arm(s) to level cutter right to left. Refer to tractor operator's manual for instructions.

**NOTE**

**After attaching driveline to tractor, attach driveline shield chains from both ends of driveline shielding to stationary locations.**

## SECTION III OPERATING INSTRUCTIONS

### 3-1 GENERAL SAFETY

Only qualified people should operate this machine. Operator should wear hard hat, safety glasses and safety shoes. It is recommended that tractor be equipped with Rollover Protective Systems (ROPS) and a seat belt be used. Before beginning operation, clear work area of objects that may be picked up and thrown. Check for ditches, stumps, holes or other obstacles that could upset tractor or damage cutter. Always turn off tractor engine, set parking brake, and allow cutter blades to come to a complete stop before dismounting tractor.

### 3-2 ADJUSTING FOR WORK

The cutter should be operated at the highest position which will give desired cutting results. This will help prevent the blades from striking the ground, reducing blade wear and undue strain on the machine. For best results under heavier cutting conditions, always tilt the cutter approximately 2 inches (51mm) lower in the front. This tilt decreases horsepower requirements and increases potential ground speed. When fine shredding is desired, adjust cutter deck level or slightly lower in the rear. This will keep the foliage under cutter until thoroughly shredded. More power is required for shredding.

#### 3-2.1 CUTTING HEIGHT ADJUSTMENT



**WARNING**

**THE CUTTER CAN FALL FROM HYDRAULIC SYSTEM FAILURE. TO AVOID SERIOUS INJURY OR DEATH, SECURELY SUPPORT CUTTER BEFORE WORKING UNDERNEATH.**



**WARNING**

**AVOID PLACING HANDS, FEET OR ANY OTHER BODY PARTS BENEATH THE CUTTER WHILE MAKING HEIGHT ADJUSTMENTS.**

The cutting height may be adjusted from 2" to 12" by selecting the appropriate hole in the adjusting bracket between the tailwheel frame and deck lugs.(Figure 3-1)

- Raise cutter using 3-point lift until tailwheel lifts off ground. Turn off tractor. Block cutter in position.
- Remove adjusting bolt from bracket.
- Position tailwheel for desired cutting height.
- Replace adjusting bolt and tighten securely.

### 3-3 OPERATION

- Perform BEFORE EACH USE maintenance listed in paragraph 4-1.
- Start tractor.
- With tractor at idle speed, engage PTO drive.
- Adjust cutter to working position.

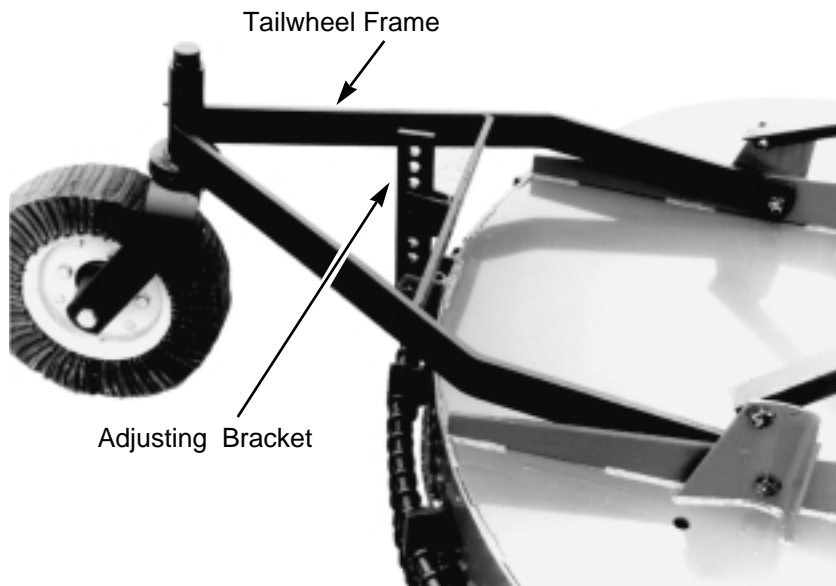


**DANGER**

**STAY CLEAR OF ROTATING DRIVELINE. DO NOT OPERATE WITHOUT DRIVELINE SHIELDS IN PLACE AND IN GOOD CONDITION. FAILURE TO HEED THESE WARNINGS MAY RESULT IN PERSONAL INJURY OR DEATH.**

- Set tractor throttle for appropriate PTO speed (540 RPM).

Figure 3-1 Tailwheel Height Adjustment





## DANGER

**ROTATING CUTTER BLADES. STAND CLEAR UNTIL ALL MOTION HAS STOPPED. TO AVOID AN ACCIDENTAL FALL FROM THE TRACTOR AND POSSIBLE INJURY BY THE MOWER, IT IS RECOMMENDED THAT THE TRACTOR BE EQUIPPED WITH ROPS (ROLLOVER PROTECTIVE SYSTEM) AND THAT A SEAT BELT BE USED BY THE OPERATOR FOR ALL MOWING OPERATIONS.**

F. Place tractor in gear and begin cutting. **Tractor forward speed should be controlled by gear selection, not engine speed.** For maximum cutting efficiency, forward speed should allow cutter to maintain a constant, maximum blade speed. Do not exceed 5 mph (8kph). If PTO drive is disengaged due to cutter stalling or tractor engine bogging, cutter must be moved to a "cut" area and tractor throttle reduced to idle before re-engaging. Always cut up and down the face of slopes, never across.



## WARNING

**ALL ROTARY CUTTERS HAVE THE ABILITY TO DISCHARGE OBJECTS AT HIGH SPEEDS WHICH COULD RESULT IN SERIOUS INJURY TO BYSTANDERS OR PASSERS-BY.**

**THEREFORE, THIS CUTTER IS NOT TO BE OPERATED ALONG HIGHWAYS OR IN ANY AREA WHERE PEOPLE MAY BE PRESENT UNLESS ALL SIDES OF THE UNIT ARE ENCLOSED BY PERMANENT BANDS, SAFETY CHAINS, OR OTHER FACTORY APPROVED SAFETY SHIELDS THAT ARE IN GOOD REPAIR. CEASE MOWING WHENEVER ANYONE COMES WITHIN THE OPERATING AREA.**

### 3-4 TRANSPORTING

When implement is transported on road or highway, day or night, use tractor flashing warning lights unless prohibited by law. A slow moving vehicle (SMV) sign must be visible from the rear by approaching vehicles. Do not exceed 15 mph (24kph) when traveling. Fully raise implement before transporting.

## SECTION IV MAINTENANCE

### 4-1 MAINTENANCE CHECK LIST

Perform scheduled maintenance as outlined below. Lower machine to ground, turn off tractor and set parking brake before doing maintenance inspections or work. Some checks may require raising machine off ground and supporting with blocks. All bolts should be torqued as recommended in the torque specifications chart unless otherwise indicated.



## WARNING

**THE CUTTER CAN FALL FROM HYDRAULIC SYSTEM FAILURE. TO AVOID SERIOUS INJURY OR DEATH, SECURELY SUPPORT CUTTER BEFORE WORKING UNDERNEATH.**

#### BEFORE EACH USE

1. Check tractor tire air pressure. Refer to tractor operator's manual.
2. Check blades and spindle to be sure that no foreign objects such as wire or steel strapping bands are wrapped around them.
3. Check blade bolts for tightness. **Tighten to 450 ft./lbs. (609 Nm).**
4. Inspect blades for wear. Replace if necessary per paragraph 4-4. **Always replace both blades on spindle with two blades equal in weight. Use only genuine Bush Hog replacement parts.**
5. Make certain driveline shields are in place and in good repair to minimize entanglement injuries to persons by rotating drivelines.
6. Make certain deflector shields (chains, belts, etc.) are in good repair to minimize injuries to persons by the discharge of the high speed thrown objects.

7. Inspect wheel(s) for wear, damage, or foreign objects. Repair or replace if necessary.
8. Perform BEFORE EACH USE lubrication per paragraph 4-2.
9. During operation, listen for abnormal sounds which might indicate loose parts, damaged bearings or other damage.

#### AFTER EACH USE

1. Clean all debris from machine especially underside of deck and affixed safety decals. Replace any missing or illegible decals.
2. Inspect cutter for worn or damaged components. Repair/replace before next use. Any replacement components installed during repair shall include the components current safety decals specified by the manufacturer to be affixed to the component.
3. Store cutter in a dry place.

### 4-2 LUBRICATION (Figure 4-1)

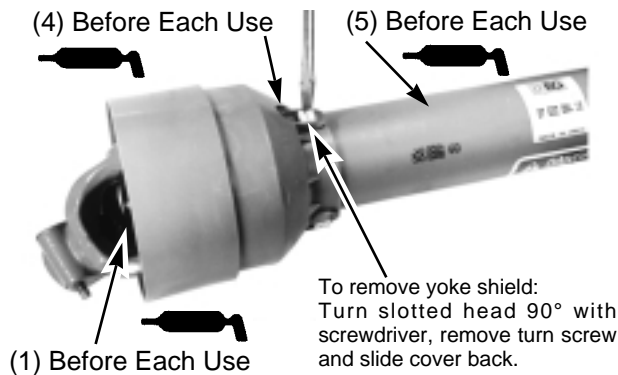
#### NOTE

The multi-purpose grease referenced in this section is an NLGI Grade 2 type grease.

#### BEFORE EACH USE

1. Driveline Universal Joints - Apply multi-purpose grease with grease gun.
2. Wheel Bearings-Apply multi-purpose grease with grease gun.
3. Wheel Pivots-Apply multi-purpose grease with grease gun.
4. Driveline Guard-Apply 2-3 shots of multi-purpose grease with grease gun to plastic fitting.

5. **PTO Driveline - Disconnect PTO driveline, pull the two sections apart, apply thin coat of multi-purpose grease to inside of outer (female) section. Reassemble sections and install. Pull each section to be sure driveline and shields are securely connected. Make certain PTO shielding is in good condition.**
6. **Gearbox - Add EP80W-90 gear oil as necessary to bring oil level to check plug on top of housing.**



#### WARNING

**THE CUTTER CAN FALL FROM HYDRAULIC SYSTEM FAILURE. TO AVOID SERIOUS INJURY OR DEATH, SECURELY SUPPORT CUTTER BEFORE WORKING UNDERNEATH.**

### 4-3 BLADE HOLDER ASSEMBLY REMOVAL AND INSTALLATION

- A. Remove the lower shaft nut and lockwasher.
- B. Wearing heavy gloves, grasp blade holder and pull off tapered shaft. If stuck, align bolt with access hole in top of cutter deck. Using sledge hammer and a piece of pipe, strike blade bar. Rotate pan to the other blade bolt and strike blade bar. Repeat until blade holder comes off. Care should be taken not to damage blade bolt threads.

#### REPLACEMENT

- A. **Replace blade holder and tighten the lower shaft nut to 600 ft./lbs. If a torque wrench is not available, the nut should be tightened with a wrench having a three foot handle, or a section of pipe over the wrench handle, if a wrench of this size is not available.**
- B. Strike the blade holder several times with a heavy hammer and retighten lower shaft nut. This should be repeated several times.

### 4-4 BLADE REPLACEMENT (Figure 4-2)

It is not necessary to remove the complete blade holder assembly to replace the blades. Blade bolts are accessible through a hole in the top of the cutter deck. Always replace both blades on a spindle using two blades having the same weight. Use only genuine Bush Hog replacement parts.

- A. Raise cutter and securely block in position.

Figure 4-1 Lubrication

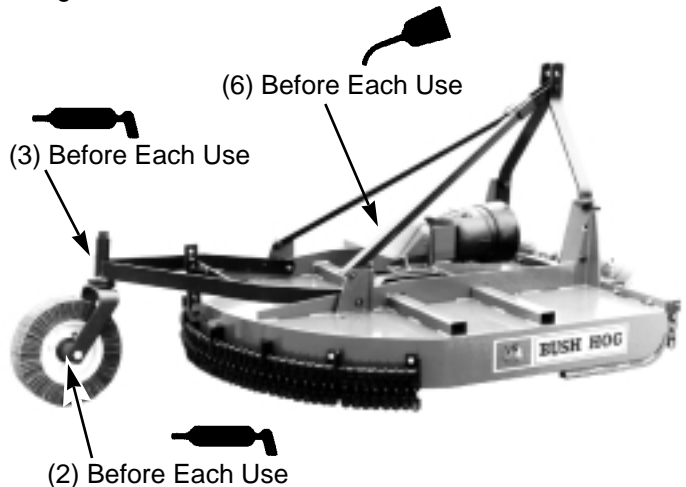
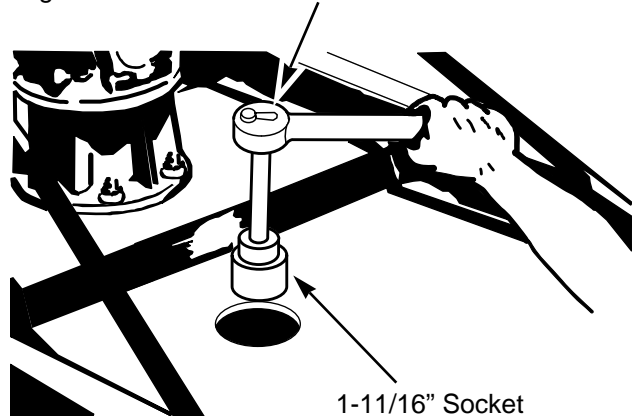


Figure 4-2 Blade Nut Removal



- B. Remove nuts from blade bolts using a 1-11/16" socket through the access hole in the deck.
- C. Inspect blade bolt shoulder for wear. Replace if necessary.

- D. Assemble new blades to blade holder using blade bolts, nuts and lockwashers. **Tighten nuts to 450 ft./lbs.** Strike blade bolt head with heavy hammer to seat, then retighten.

- E. **Check to be sure blades swing 360° freely. If blades will not swing freely, remove, locate problem, and repair. Operating cutter when blades will not swing freely will cause excessive vibration, damaging implement.**

### 4-5 SLIP CLUTCH OPERATIONAL CHECK

**After implement had been stored for 30 days or more, perform the following operational check:**

- A. Loosen eight nuts retaining clutch springs 1/3 turn or until spring can be turned with fingers.
- B. With tractor at idle speed, engage tractor PTO drive for 2-3 seconds. Clutch should slip without

turning blades. If clutch does not slip, contact your authorized Bush Hog dealer.

C. Retighten nuts to within 1/64" of original position. Initial spring length is shown in Figure 4-3.



### WARNING

**OVERTIGHTENING SPRING NUTS MAY CAUSE DAMAGE TO IMPLEMENT AND/OR TRACTOR DUE TO INCORRECT SLIP CLUTCH TORQUE SETTING. ALWAYS FOLLOW THE PROPER ADJUSTMENT PROCEDURE.**

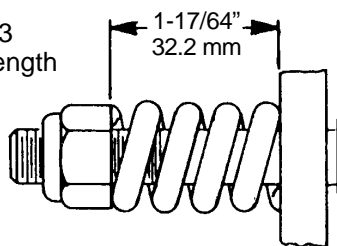
## 4-6 SLIP CLUTCH ADJUSTMENT

The slip clutch is factory preset to the correct torque for protecting implement and tractor. **Periodic adjustment is recommended**; refer to section 4-5. Should adjustment be needed, first check to be sure all spring lengths are the same. Initial spring length is shown in Figure 4-3. If necessary, adjust nut on any spring that is unequal. Adjust all eight spring retaining nuts 1/3 of a turn (2 flats on a nut) and check clutch slippage. If further adjustment is necessary, do so in 1/3 turn increments. **Adjust only to provide sufficient torque to prevent slippage under normal conditions. Occasional slippage is normal for drivetrain protection.** If satisfactory results cannot be obtained, consult your Bush Hog dealer.

### IMPORTANT

**Do not overtighten nut and cause spring to become solid as this will cause shaft to fail.**

Figure 4-3  
Spring Length



## 4-7 GEARBOX MAINTENANCE (Figure 4-4)

**OIL LEVEL** - The gearbox assembly on the Model 12 rotary cutters are shipped from the factory less oil. Use EP80-90 gear oil and fill to the plug located on the top of the gearbox. Never fill the gearbox above this level. Seals could become damaged due to expansion.

**OIL SEAL LEAKAGE** - The three main causes of oil seal failure are as follows:

1. Operating cutter for any length of time with wire or litter wrapped around the upper or lower shaft.
2. Loose bearings.
3. Worn seals. Leaky seals should be replaced as soon as possible.

**SEAL REPLACEMENT** - To replace the seals on your cutter, follow the steps outlined below:

1. Remove the blade holder and universal joint.
2. Knock out old seals.
3. Install new seals.

**BEARING ADJUSTMENT** - Loose bearings can be detected by applying pressure in an "in and out" direction on the upper and lower shafts to check for end play. To tighten the bearings, the following procedure may be used.:

1. Remove upper end housing. This provides access to both adjusting nuts.
2. If your gearbox is an earlier model with a lock-washer and a grooved adjusting nut, the lock must be bent out of the groove of the adjusting nut before adjustments can be made. In later models there is a roll pin holding the nut in place. When bearings are to be adjusted, either due to years of operation or due to replacement of gears, shaft, or bearing, the nut must be split using a cold chisel and a new nut must be used. (Figures 4-4 & 4-5)
3. Tighten the adjusting nuts until slack is taken up. **IMPORTANT:** The gears are pressed on, and this could cause the adjusting nut to appear tight when there is still slackness in the bearings.

Figure 4-4 Gearbox Internal Components

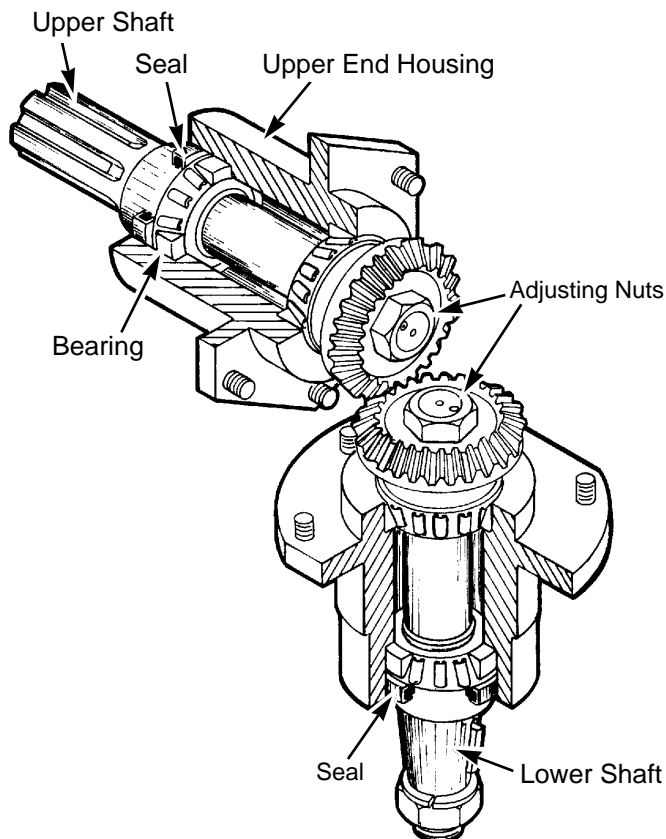
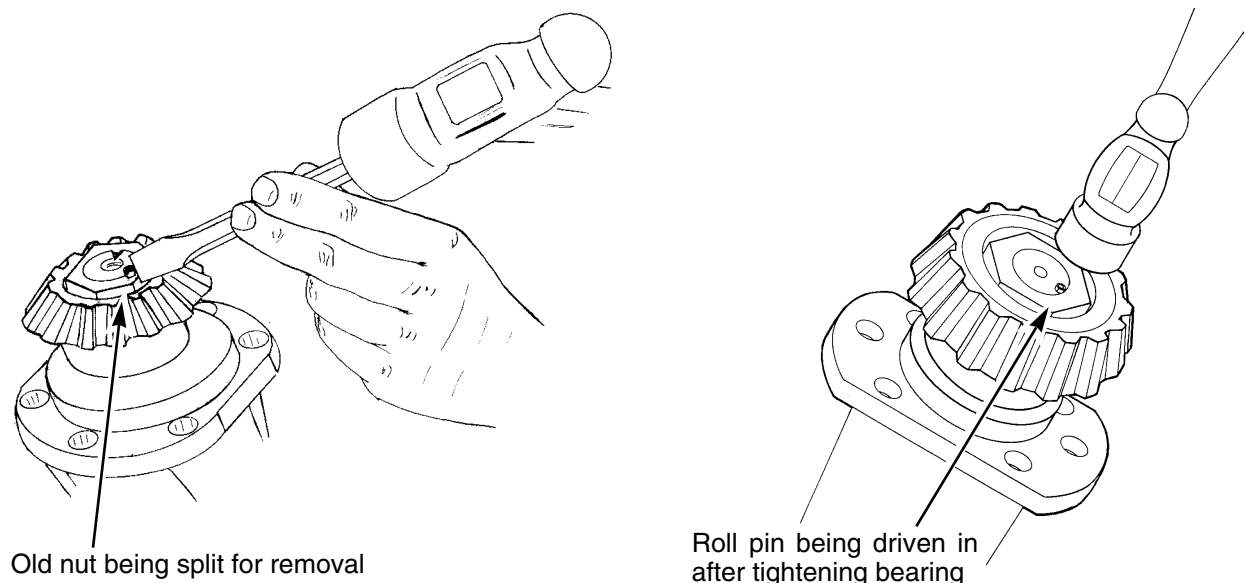


Figure 4-5 Tightening Bearings



#### 4-8 TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	REMEDY
Uneven Cut	Cutter not level side to side. Worn or bent blades.	See SECTION II Replace blades per paragraph 4-4.
Stripping or Windrowing	Possible build-up of material under cutter. Cutter not level. Worn blades.	Clean cutter. Refer to Section II. Replace per paragraph 4-4.
Noisy Cutter	Loose components. Low oil in gearboxes.	Check all bolts for tightness per paragraph 20. Check for proper oil level. Refer to paragraph 4-2.
Rapid Blade Wear (Cutting Edge)	Blade contacting the ground.	Adjust cutter to operate at a height that will eliminate ground contact.
Rapid Blade Wear (Bolt Hole)	Cutter not being operated at rated RPM speed. Too much ground speed.	Reduce ground speed. Set tractor throttle for proper PTO speed. Use lower gear.
Poor Shredding Job	Incorrect deck tilt. Excessive ground speed. Worn blades.	Adjust per paragraph 3-2. Reduce ground speed. Replace blades per paragraph 4-4.
Cutter Vibration	Cutter not being operated at rated RPM speed. Possible build up of material on blade pan. Broken blade. Blades unequal weight.	Set tractor throttle for proper PTO speed. Clean blade pan. Replace blades per paragraph 4-4. Replace blades per paragraph 4-4.

# PRE-ASSEMBLY SAFETY PRECAUTIONS



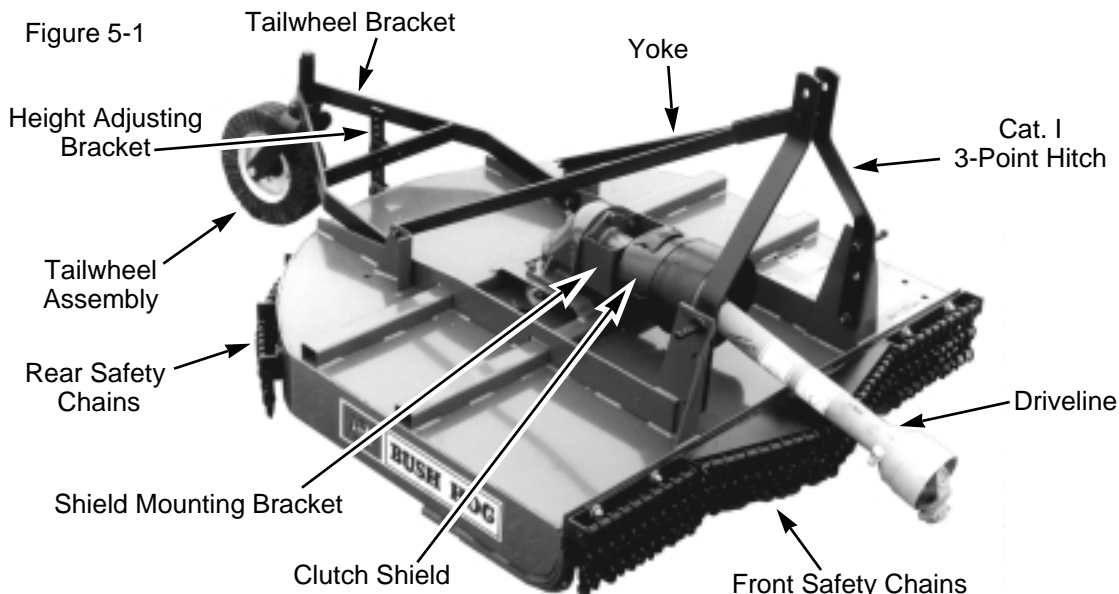
**THE FOLLOWING SAFETY PRECAUTIONS SHOULD BE THOROUGHLY UNDERSTOOD BEFORE ATTEMPTING MACHINE ASSEMBLY.**

1. Wear personal protective equipment such as, but not limited to protection for eyes, ears, feet, hands, lungs and head when assembling the equipment. Do not wear loose clothing or jewelry that may catch on equipment moving parts.
2. Do not lift heavy parts or assemblies. Use crane, jack, tackle, fork trucks or other mechanical devices.
3. Select an area for assembly that is clean and free of any debris which might cause persons working on the assembly to trip.
4. Arrange parts to be assembled neatly in the work area and have tools or other mechanical assisting devices in easy reach.
5. Inspect all parts and assemblies thoroughly and remove any sharp edges, grease, oil or dirt which might cause pieces to slip when handling.
6. Preview the assembly instructions in your operator's manual before proceeding further.
7. If the assembly instructions call for parts or assemblies to be blocked up, use only blocking material that is in good condition and is capable of handling the weight of the assembly to be blocked. Also, insure that the blocking material is on a clean, dry surface.
8. Never put hands or any other part of body under blocked up assemblies if at all possible.
9. Always wear goggles or safety glasses when hammering, grinding, or drilling metal parts.
10. If the assembly calls for welding or cutting, be sure that there are no flammable materials close at hand and that bystanders have taken necessary precautions.

**AFTER COMPLETING ANY ASSEMBLY STEP, THOROUGHLY READ THE NEXT STEP IN THE ASSEMBLY INSTRUCTIONS BEFORE PROCEEDING WITH THAT STEP.**

11. After completing assembly, thoroughly inspect the machine to be sure that all nuts, bolts, hydraulic fittings or any other fastened assemblies have been thoroughly tightened.
12. After completing assembly, be sure that all safety locking devices or guards are in place.
13. Before operating the machine, thoroughly read the operation section of this manual.
14. Before operating, read the maintenance section of this manual to be sure that any parts requiring lubrication have been properly lubricated.

**BEFORE OPERATING THE EQUIPMENT, IF YOU HAVE ANY QUESTIONS REGARDING THE PROPER ASSEMBLY OR OPERATION, CONTACT YOUR AUTHORIZED BUSH HOG DEALER OR REPRESENTATIVE.**





## SECTION V ASSEMBLY

### IMPORTANT

**Tighten all fasteners to specifications on Torque Chart unless otherwise indicated.**

### 5-1 3-POINT HITCH (Figure 5-1)

To attach the 3-point hitch to your cutter: Remove the lift pins and all bolts from the hitch. Install the A-frame struts of the assembly between the mounting brackets on the base frame. Extend the 3-point hitch yoke between the A-frame and the brackets at the rear of the machine and bolt into place. Replace lift pins and bolts at bottom of A-frame struts, then tighten all bolts and lift pins securely.

### 5-2 TAILWHEEL ASSEMBLY

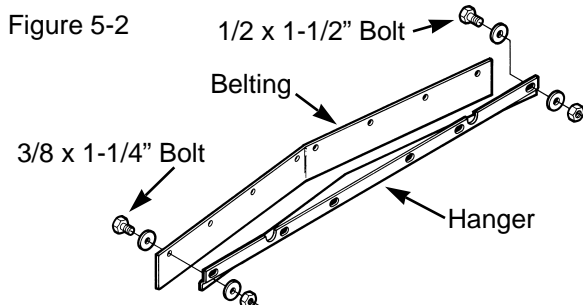
Connect your cutter to the tractor and lift it high enough for the caster wheel assembly to clear the ground. Install the tailwheel frame as shown. Insert the caster fork up through the pivot tube. Fasten in place with lock collar and roll pin. To adjust to desired cutting height, bolt end of adjusting bracket to lugs on base frame and fasten other end to tailwheel bracket using the desired adjusting hole. Tighten all bolts securely.

### 5-3 GEARBOX INPUT SHIELD

Remove four existing bolts from around input shaft in front of gearbox. Fasten metal shield bracket to gearbox using these bolts. Fasten plastic shield (with access opening to the top) to the shield bracket using four 5/16 x 3/4" bolts, flatwashers, lockwashers and nuts.

### 5-4 FRONT BELTING (Standard)

Position belting against front of hanger and fasten with (8) 3/8 x 1-1/4" bolts, flatwashers and locknuts. Position belting hanger against front lip of mainframe and fasten with (6) 1/2 x 1-1/2" bolts, flatwashers and locknuts. (Figure 5-2)



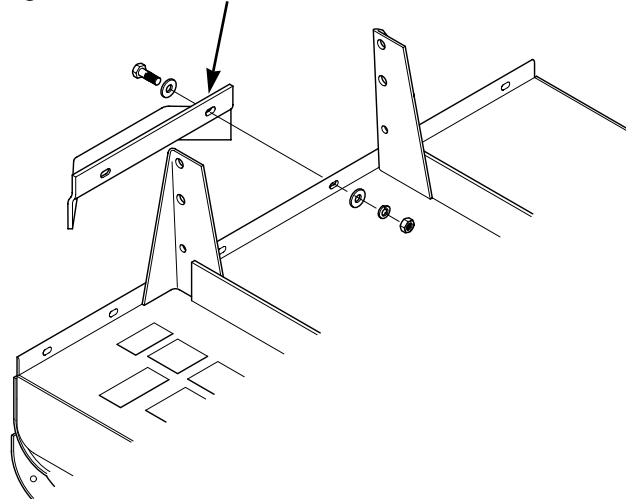
### 5-4 FRONT CHAIN GUARDS & REAR CHAIN GUARDS (Optional)

Position chain assemblies against mainframe as shown and fasten with 1/2 x 1-3/4" bolts, flatwashers, lockwashers and locknuts. (Figure 5-1)

### 5-6 FRONT GUARD ASSEMBLY (Optional)

Fasten guard to center front of mainframe using 1/2 x 1-1/2" bolts, flatwashers, lockwashers and nuts.

Figure 5-2 Front Guard



### 5-7 DRIVELINE INSTALLATION (Slip Clutch Optional)

A. Remove clamp bolts from spline end of clutch. Remove inspection cover from clutch shield.

B. Slide clutch onto gearbox input shaft aligning bolt holes with slot in input shaft. Fasten with clamp bolts, lockwashers and nuts. **Torque to 30 ft./lbs.**

C. **Loosen eight nuts retaining clutch springs 1/3 turn or until spring can be turned with fingers.**

D. **With tractor at idle speed, engage tractor PTO drive 2-3 seconds. Clutch should slip without turning blades.**

E. **Retighten nuts to original position.** If adjustment is necessary, refer to Section 4-6.



### WARNING

**OVER-TIGHTENING SPRING NUTS MAY CAUSE DAMAGE TO IMPLEMENT AND/OR TRACTOR DUE TO INCORRECT SLIP CLUTCH TORQUE SETTING. ALWAYS FOLLOW THE PROPER ADJUSTMENT PROCEDURE.**

### IMPORTANT

Before operation, fill gearbox with EP80W-90 gear oil to check plug on rear of gearbox. Allow time for oil to seep through bearings into lower housing, then recheck oil level. Insure that vent hole in fill plug is open to allow pressure to escape from gearbox during operation.

# SAFETY DECALS

To promote safe operation, Bush Hog supplies safety decals on all products manufactured. Because damage can occur to safety decals either through shipment, use or reconditioning, Bush Hog will, upon request, provide safety decals for any of our products in the field at no charge. Contact your authorized Bush Hog dealer for more information.

**! DANGER**

**KEEP AWAY - ROTATING BLADES**

TO AVOID SERIOUS INJURY OR DEATH FROM BLADE CONTACT:

- LOWER IMPLEMENT, STOP ENGINE AND PTO, ALLOW ALL MOVING PARTS TO STOP, AND REMOVE KEY BEFORE DISMOUNTING FROM TRACTOR.
- ALLOW NO RIDERS ON TRACTOR OR MOWER.
- KEEP ALL PERSONS CLEAR OF OPERATING MOWER AND MOWING AREA.
- KEEP CLEAR OF ROTATING BLADES, PARTS, AND DRIVELINES.

**PREVENT FALL OFF INTO ROTATING BLADES**

TO PREVENT ACCIDENTAL FALL OFF FROM TRACTOR AND SERIOUS INJURY OR DEATH FROM RUN OVER OR ROLLOVER BY TRACTOR OR MOWER:

- USE ROPS (ROLLOVER PROTECTIVE STRUCTURES) AND SEAT BELT EQUIPPED TRACTORS FOR MOWING OPERATIONS.
- BUCKLE UP SEAT BELT.
- KEEP ALERT FOR STUMPS, HOLES, RUTS AND UNEVEN TERRAIN.

**! WARNING**

**ROTARY CUTTERS CAN DISCHARGE OBJECTS SEVERAL HUNDREDS OF FEET. TO AVOID SERIOUS INJURY OR DEATH TO BYSTANDERS FROM THROWN OBJECTS:**

- CLEAR MOWING AREA OF VISIBLE DEBRIS AND USE EXTRA CAUTION WHERE ROCKS OR DEBRIS MAY BE PRESENT.
- DO NOT OPERATE CUTTER ALONG ROADWAYS OR IN THE VICINITY OF OTHER PERSONS WITHOUT ENCLOSED SIDES, PERMANENT BANDS, BELTING, HIGHWAY CHAINS OR OTHER FACTORY APPROVED DISCHARGE SHIELDS IN PLACE AND IN GOOD WORKING ORDER.
- KEEP ALL PERSONS WELL CLEAR OF MOWER WHEN IN OPERATION.

**! CAUTION**

THIS IMPLEMENT IS DESIGNED TO OPERATE AT 540 RPM MAXIMUM TRACTOR PTO SPEED.

ALL DRIVE LINE SHIELDS MUST BE KEPT IN PLACE.

50029417

**! WARNING**

**TO AVOID SERIOUS INJURY OR DEATH:**

- READ OPERATOR'S MANUAL BEFORE OPERATING AND FOLLOW ALL PRECAUTIONS. (CONTACT DEALER FOR MANUAL)
- KEEP SHIELDS AND GUARDS IN PLACE. KEEP CLEAR OF DRIVES AND BELTS.
- LOWER IMPLEMENT, STOP ENGINE AND PTO, ALLOW ALL MOVING PARTS TO STOP, AND REMOVE KEY BEFORE DISMOUNTING FROM TRACTOR.
- KNOW HOW TO STOP TRACTOR AND EQUIPMENT QUICKLY IN AN EMERGENCY.
- ALLOW NO CHILDREN OR UNQUALIFIED PERSONS TO OPERATE EQUIPMENT.
- BE CAREFUL ON UNEVEN TERRAIN. DECREASE SPEED WHEN TURNING.
- DO NOT OPERATE MOWER IN TRANSPORT POSITION.

**! WARNING**

**IMPLEMENT CAN FALL FROM HYDRAULIC SYSTEM RELEASE. TO AVOID SERIOUS INJURY OR DEATH:**

- SHUT OFF TRACTOR ENGINE, REMOVE KEY, SECURE TRACTOR PARKING BRAKE AND BLOCK UP OR SECURELY SUPPORT IMPLEMENT BEFORE WORKING UNDERNEATH.
- PURGE ALL AIR FROM HYDRAULIC SYSTEM BEFORE ATTEMPTING TO RAISE OR LOWER THIS IMPLEMENT.
- STAND CLEAR IF LOWERING OR RAISING IMPLEMENT.
- DO NOT USE HAND OR SKIN TO CHECK FOR HYDRAULIC LEAKS. USE CARDBOARD OR WOOD.
- HIGH PRESSURE OIL LEAKS CAN PENETRATE SKIN CAUSING SERIOUS INJURY AND GANGRENE. CONSULT A PHYSICIAN IMMEDIATELY.
- LOWER THE IMPLEMENT AND RELEASE HYDRAULIC PRESSURE BEFORE LOOSENING FITTINGS.
- REFER TO OWNER'S MANUAL FOR DETAILS.

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**! DANGER**

**KEEP AWAY - ROTATING BLADES**

TO AVOID SERIOUS INJURY OR DEATH FROM BLADE CONTACT:

- LOWER IMPLEMENT, STOP ENGINE AND PTO, ALLOW ALL MOVING PARTS TO STOP, AND REMOVE KEY BEFORE DISMOUNTING FROM TRACTOR.
- ALLOW NO RIDERS ON TRACTOR OR MOWER.
- KEEP ALL PERSONS CLEAR OF OPERATING MOWER AND MOWING AREA.
- KEEP CLEAR OF ROTATING BLADES, PARTS, AND DRIVELINES.

**PREVENT FALL OFF INTO ROTATING BLADES**

TO PREVENT ACCIDENTAL FALL OFF FROM TRACTOR AND SERIOUS INJURY OR DEATH FROM RUN OVER OR ROLLOVER BY TRACTOR OR MOWER:

- USE ROPS (ROLLOVER PROTECTIVE STRUCTURES) AND SEAT BELT EQUIPPED TRACTORS FOR MOWING OPERATIONS.
- BUCKLE UP SEAT BELT.
- KEEP ALERT FOR STUMPS, HOLES, RUTS AND UNEVEN TERRAIN.

**! WARNING**

**ROTARY CUTTERS CAN DISCHARGE OBJECTS SEVERAL HUNDREDS OF FEET. TO AVOID SERIOUS INJURY OR DEATH TO BYSTANDERS FROM THROWN OBJECTS:**

- CLEAR MOWING AREA OF VISIBLE DEBRIS AND USE EXTRA CAUTION WHERE ROCKS OR DEBRIS MAY BE PRESENT.
- DO NOT OPERATE CUTTER ALONG ROADWAYS OR IN THE VICINITY OF OTHER PERSONS WITHOUT ENCLOSED SIDES, PERMANENT BANDS, BELTING, HIGHWAY CHAINS OR OTHER FACTORY APPROVED DISCHARGE SHIELDS IN PLACE AND IN GOOD WORKING ORDER.
- KEEP ALL PERSONS WELL CLEAR OF MOWER WHEN IN OPERATION.

**! CAUTION**

THIS IMPLEMENT IS DESIGNED TO OPERATE AT 1000 RPM MAXIMUM TRACTOR PTO SPEED.

ALL DRIVE LINE SHIELDS MUST BE KEPT IN PLACE.

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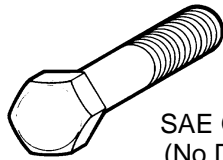
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# TORQUE SPECIFICATIONS

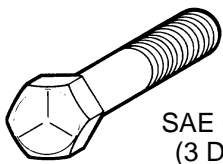
Proper torque for American fasteners used on Bush Hog equipment.  
Recommended Torque in Foot Pounds (Newton Meters).\*

## AMERICAN

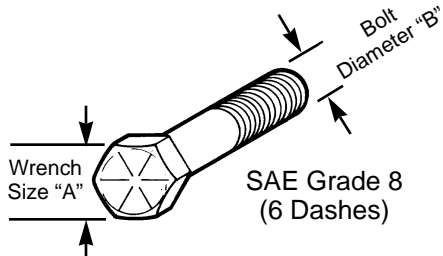
Bolt Head Markings



SAE Grade 2  
(No Dashes)



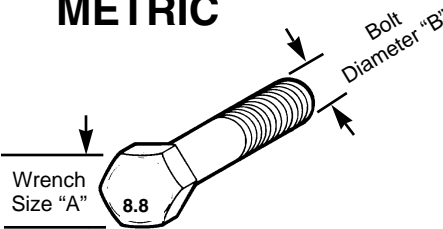
SAE Grade 5  
(3 Dashes)



SAE Grade 8  
(6 Dashes)

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 - 28 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 (402)	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



Numbers appearing on bolt heads  
indicate ASTM class.

Proper torque for metric fasteners used on Bush Hog equipment.  
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)
41	27		821 (1112)		1138 (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.



**BUSH HOG<sup>®</sup>, L.L.C.**

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