



SUSPENSION RAKE

MODELS
BSR8 Hay Rake
BSR10 Hay Rake
BSR12 Hay Rake

Published 03/14 / Revised 03/17

Part No. 50074094

OPERATOR'S MANUAL



This Operator's Manual is an integral part of the safe operation of this machine and must be maintained with the unit at all times. READ, UNDERSTAND, and FOLLOW the Safety and Operation Instructions contained in this manual before operating the equipment. C01-Cover



FC-RK-0009

BUSH HOG[®]

2501 Griffin Ave.
Selma, AL 36703
334-874-2700
www.bushhog.com

Bush Hog Web Page



www.algqr.com/bwe



To the Owner/Operator/Dealer

All implements with moving parts are potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes the potential hazards and follows reasonable safety practices. The manufacturer has designed this implement to be used with all its safety equipment properly attached to minimize the chance of accidents.

BEFORE YOU START! Read the safety messages on the implement and shown in your manual. Observe the rules of safety and common sense!

For future reference, record your Bush Hog product model number and serial number.

Dealer		Telephone		Model Number	
Owner		Purchase Date:		Serial Number	

WARNING

TO AVOID SERIOUS INJURY OR DEATH:

1. READ AND UNDERSTAND OPERATOR'S MANUAL.
2. TRACTOR MUST BE EQUIPPED WITH ROLL-OVER PROTECTION (ROPS) AND SWAY CHAINS.
3. ALWAYS WEAR SAFETY GLASSES, SAFETY SHOES AND SEAT BELT FASTENED TIGHTLY.
4. STOP TRACTOR, LOCK BRAKES, AND BLOCK UP OR SUPPORT IMPLEMENT SECURELY BEFORE WORKING UNDER RAISED COMPONENTS.
5. ALLOW NO RIDERS AT ANY TIME ON TRACTOR OR IMPLEMENT. FALLING OFF CAN KILL.
6. KEEP BYSTANDERS CLEAR OF MOVING PARTS AND WORKING AREA. KEEP CHILDREN AWAY!
7. DO NOT LIFT, LOWER, OR OPERATE UNLESS EVERYONE IS CLEAR OF IMPLEMENT.
8. USE INCREASED CAUTION ON SLOPES & NEAR BANKS AND DITCHES TO PREVENT OVERTURN.
9. LOCK LIFT LEVER UP FOR TRANSPORT. HAVE SMV SIGN VISIBLE. FOLLOW LOCAL LAWS.
10. USE PARKING STAND OR BLOCK UP WHEN UNHITCHING FROM TRACTOR.

999200

WARRANTY INFORMATION:

Read and understand the complete Warranty Statement found in this Manual. Fill out the Warranty Registration Form in full and return it to within 30 Days. Make certain the Serial Number of the Machine is recorded on the Warranty Card and on the Warranty Form that you retain

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SAFETY SECTION

SAFETY

General Safety Instructions and Practices

A careful operator is the best operator. Safety is of primary importance to the manufacturer and should be to the owner/operator. Most accidents can be avoided by being aware of your equipment, your surroundings, and observing certain precautions. The first section of this manual includes a list of Safety Messages that, if followed, will help protect the operator and bystanders from injury or death. Read and understand these Safety Messages before assembling, operating or servicing this Implement. This equipment should only be operated by those persons who have read the manual, who are responsible and trained, and who know how to do so responsibly.



The Safety Alert Symbol combined with a Signal Word, as seen below, is used throughout this manual and on decals which are attached to the equipment. The Safety Alert Symbol means: "ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!" The Symbol and Signal Word are intended to warn the owner/operator of impending hazards and the degree of possible injury faced when operating this equipment.

Practice all usual and customary safe working precautions and above all---remember safety is up to YOU. Only YOU can prevent serious injury or death from unsafe practices.



Indicates an imminently hazardous situation that, if not avoided, WILL result in DEATH OR VERY SERIOUS INJURY.



Indicates an imminently hazardous situation that, if not avoided, COULD result in DEATH OR SERIOUS INJURY.



Indicates an imminently hazardous situation that, if not avoided, MAY result in MINOR INJURY.



Identifies special instructions or procedures that, if not strictly observed, could result in damage to, or destruction of the machine, attachments or the environment.

NOTE: *Identifies points of particular interest for more efficient and convenient operation or repair.* (SG-1)

READ, UNDERSTAND, and FOLLOW the following Safety Messages. Serious injury or death may occur unless care is taken to follow the warnings and instructions stated in the Safety Messages. Always use good common sense to avoid hazards. (SG-2)



Si no lee ingles, pida ayuda a alguien que si lo lea para que le traduzca las medidas de seguridad. (SG-3)



SAFETY



Engine Exhaust, some of its constituents, and certain vehicle components contain or emit chemicals known to the state of California to cause cancer and birth defects or other reproductive harm. (SG-30)



Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer, birth defects or other reproductive harm. (SG-31)

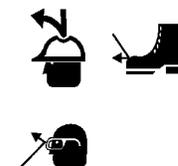
Operator Safety Instructions and Practices



Never operate the Tractor or Implement until you have read and completely understand this Manual, the Tractor Operator's Manual, and each of the Safety Messages found in the Manual or on the Tractor and Implement. Learn how to stop the tractor engine suddenly in an emergency. Never allow inexperienced or untrained personnel to operate the Tractor or Implement without supervision. Make sure the operator has fully read and understood the manuals prior to operation. (SG-4)



The operator and all support personnel should wear hard hats, safety shoes, safety glasses, and proper hearing protection at all times for protection from injury including injury from items that may be thrown by the equipment. (SG-16)



PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS! Tractors with or without an Implement attached can often be noisy enough to cause permanent hearing loss. We recommend that you always wear hearing protection if the noise in the Operator's position exceeds 80db. Noise over 85db over an extended period of time will cause severe hearing loss. Noise over 90db adjacent to the Operator over an extended period of time will cause permanent or total hearing loss. **NOTE:** *Hearing loss from loud noise [from tractors, chain saws, radios, and other such sources close to the ear] is cumulative over a lifetime without hope of natural recovery.* (SG-17)



Always read carefully and comply fully with the manufacturer's instructions when handling oil, solvents, cleansers, and any other chemical agent. (SG-22)



SAFETY

SAFETY

DANGER

Never allow children to play on or around Tractor or Implement. Children can slip or fall off the Equipment and be injured or killed. Inadvertent contact with controls can cause the Implement to shift or fall crushing themselves or others. (SG-25)

DANGER

DO NOT use drugs or alcohol immediately before or while operating the Tractor and Implement. Drugs and alcohol will affect an operator's alertness and coordination and therefore affect the operator's ability to operate the equipment safely. Before operating the Tractor or Implement, an operator on prescription or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder their ability to operate the Equipment safely. NEVER knowingly allow anyone to operate this equipment when their alertness or coordination is impaired. Serious injury or death to the operator or others could result if the operator is under the influence of drugs or alcohol. (SG-27)



WARNING

Prolonged operation may cause operator boredom and fatigue affecting safe operation. Take scheduled work breaks to help prevent these potentially impaired operating conditions. Never operate the Implement and Tractor in a fatigued or bored mental state which impairs proper and safe operation. (SG-32)

WARNING

Use extreme caution when getting onto the Implement to perform repairs, maintenance and when removing accumulated material. Only stand on solid flat surfaces to ensure good footing. Use a ladder or raised stand to access high spots which cannot be reached from ground level. Slipping and falling can cause serious injury or death. (SG-33)

WARNING

Avoid contact with hot surfaces including hydraulic oil tanks, pumps, motors, valves and hose connections. Relieve hydraulic pressure before performing maintenance or repairs. Use gloves and eye protection when servicing hot components. Contact with a hot surface or fluid can cause serious injury from burns or scalding. (SG-34)

DANGER

DO NOT operate this Implement on a Tractor that is not properly maintained. Should a mechanical or Tractor control failure occur while operating, immediately shut down the Tractor and perform repairs before resuming operation. Serious injury and possible death could occur from not maintaining this Implement and Tractor in good operating condition. (SG-36)

WARNING

Extreme caution should be used by the Tractor operator when operating near passersby. Stop raking if anyone comes within 25 feet of the Implement to prevent possible passerby injury or death from being struck from a thrown object, entanglement with the rakes, or run over. (SRK-01)

SAFETY

Equipment Operation Safety Instructions and Practices



Do not back up with this implement. Backing could damage the machine or its components. (S3PT-4)



Use extreme care when lowering or unfolding the implement's wings. Make sure no bystanders are close by or underneath the wings. Allow ample clearance around the implement when folding or unfolding the wings. Use extreme caution around buildings or overhead power lines. (S3PT-05)



There are obvious and hidden potential hazards in the operation of this Implement as in all power-driven or pulled equipment. REMEMBER! This machine is often operated in rough terrain conditions that include tall grass, weeds, gullies, holes, slopes, hidden obstructions and the like. Serious injury or even death may occur unless care is taken to assure the safety of the operator and bystanders in the area. Do not operate this machine with anyone in the immediate area. (S3PT-07)



This Implement may be wider than the Tractor. Be careful when operating or transporting this equipment to prevent the Implement from running into or striking sign posts, guard rails, concrete abutments or other solid objects. Such an impact could cause the Implement and Tractor to pivot violently resulting in loss of steering control, serious injury, or even death. Never allow the Implement to contact obstacles. (S3PT-12)



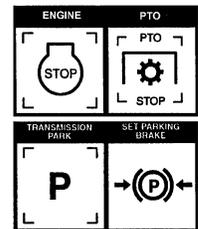
Operate this Implement only in conditions where you have clear visibility in daylight or with adequate artificial lighting. Never operate in darkness or foggy conditions where you cannot clearly see at least 100 yards in front and to the sides of the tractor and implement. Make sure that you can clearly see and identify passersby, steep slopes, ditches, drop-offs, overhead obstructions, power lines, debris and foreign objects. If you are unable to clearly see this type of items discontinue operating this equipment. (S3PT-21)



Operate this Equipment only with a Tractor equipped with an approved roll-over-protective system (ROPS). Always wear seat belts. Serious injury or even death could result from falling off the tractor--particularly during a turnover when the operator could be pinned under the ROPS. (SG-7)



BEFORE leaving the tractor seat lower the implement, set the parking brake and/or set the tractor transmission in parking gear, disengage the PTO, stop the engine, remove the key, and wait for all moving parts to stop. Place the tractor shift lever into a low range or parking gear to prevent the tractor from rolling. Never dismount a Tractor that is moving or while the engine is running. Operate the Tractor controls from the tractor seat only. (SG-9)



SAFETY

▲ DANGER

Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)



▲ DANGER

Never allow children to operate, ride on, or come close to the Tractor or Implement. Usually, 16-17 year-old children who are mature and responsible can operate the implement with adult supervision, if they have read and understand the Operator's Manuals, been trained in proper operation of the tractor and Implement, and are physically large enough to reach and operate the controls easily. (SG-11)



▲ WARNING

Do not mount or dismount the Tractor while the tractor is moving. Mount the Tractor only when the Tractor and all moving parts are completely stopped. (SG-12)



▲ DANGER

Start tractor only when properly seated in the Tractor seat. Starting a tractor in gear can result in injury or death. Read the Tractor operators manual for proper starting instructions. (SG-13)



▲ WARNING

Do not operate this Equipment with hydraulic oil or fuel leaking. Oil and fuel are explosive and their presence could present a hazard. Do not check for leaks with your hand! High-pressure oil streams from breaks in the line could penetrate the skin and cause tissue damage including gangrene. To check for a hose leak, SHUT the unit ENGINE OFF and remove all hydraulic pressure. Wear oil impenetrable gloves, safety glasses and use Cardboard to check for evidence of oil leaks. If you suspect a leak, REMOVE the HOSE and have it tested at a Dealer. If oil does penetrate the skin, have the injury treated immediately by a physician knowledgeable and skilled in this procedure. (SG-15)



▲ DANGER

Never run the Tractor engine in a closed building or without adequate ventilation. The exhaust fumes can be hazardous to your health. (SG-23)

▲ WARNING

In case of mechanical difficulty during operation, place the transmission in the park position, set the parking brake, shut down all power, including the PTO and the engine and remove the key. Wait until all rotating motion has stopped before dismounting. (SG-39)

SAFETY

WARNING

Do Not operate this equipment in areas where insects such as bees may attack you and/or cause you to lose control of the equipment. If you must enter in such areas, use a tractor with an enclosed Cab and close the windows to prevent insects from entering. If a tractor cab is not available, wear suitable clothing including head, face, and hand protection to shield you from the insects. Attacking insects can cause you to lose control of the tractor, which can result in serious injury or death to you or bystanders. Never dismount a moving tractor. (SG-40)

WARNING

Objects such as wire, cable, rope, and chain can become entangled in the rotating parts of the raking components causing mechanical damage. Entangled items caught in the rakes can sling outward possibly injuring or entangling the operator or passersby. Any objects that might become entangled in a raking component should be removed from the area before operating the rake. (SRK-02)



DANGER

DO NOT allow any person under a folded wing unless wing is securely locked up or supported. **DO NOT** approach the Implement unless the Tractor is turned off and all motion has ceased. Never work under the frame work, or any lifted component unless the implement is securely supported or blocked up. A sudden or inadvertent fall by any of these components could cause serious injury or even death. (STI-03)



SAFETY

Connection or Disconnecting Implement Safety Instructions and Practices

DANGER

Always shut the Tractor completely down, place the transmission in park, and set the parking brake before you or anyone else attempts to connect or disconnect the Implement and Tractor hitches. (S3PT-15)

WARNING

Never unhitch without using the Tongue Jack. The Tongue is very heavy. Attempting to lift the Tongue without using the Tongue Jack could cause strains or other injury. Allowing the tongue to fall suddenly and unexpectedly could result in crushing injury. Use the Tongue Jack for lifting the Implement only. Overloading the Tongue Jack can cause failure with possible serious bodily injury or even death. (STI-04)

CAUTION

On a fully-assembled unit, do not remove the Wing Retaining Strap until hoses are attached to the tractor and the Wing Cylinders are filled with oil. Lower the Wings slowly and carefully. Keep bystanders away during operations. (STI-05)

SAFETY

Transporting Safety Instructions and Practices



Be particularly careful when transporting the Implement with the Tractor. Turn curves or go up hills only at a low speed and using a gradual steering angle. Rear mounted implements move the center of gravity to the rear and remove weight from the front wheels. Make certain, by adding front ballast, that at least 20% of the tractor's weight is on the front wheels to prevent rearing up, loss of steering control or Tractor tip-over. Slow down on rough or uneven surfaces to prevent loss of steering control which could result in property damage or possible injury. Do not transport unless 3-Point lift lever is fully raised and in the latched transport position. Dropping implement in transport can cause serious damage to the tractor and/or Implement and possibly cause the operator or others to be injured or killed.

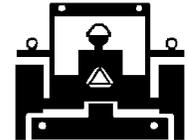
(S3PT-02)



Allow sufficient clearance for the Implement to swing outward while turning. Implements carried behind the Tractor will swing outside the tire path when making turns. Contacting a solid object while turning will cause equipment damage and possible injury. (S3PT-20)



Make certain that the "Slow Moving Vehicle" (SMV) sign is installed in such a way as to be clearly visible and legible. When transporting the Equipment use the Tractor flashing warning lights and follow all local traffic regulations. (SG-6)



SAFETY

WARNING

Transport only at speeds where you can maintain control of the equipment. Serious accidents and injuries can result from operating this equipment at high speeds. Understand the Tractor and Implement and how it handles before transporting on streets and highways. Make sure the Tractor steering and brakes are in good condition and operate properly.



Before transporting the Tractor and Implement, determine the proper transport speeds for you and the equipment. Make sure you abide by the following rules:

Test the tractor at a slow speed and increase the speed slowly. Apply the Brakes smoothly to determine the stopping characteristics of the Tractor and Implement. As you increase the speed of the Tractor the stopping distance increases. Determine the maximum transport speed not to exceed 20 mph (30 kph) for transporting this equipment.

Test the equipment at a slow speed in turns. Increase the speed through the turn only after you determine that the equipment can be operated at a higher speed. Use extreme care and reduce your speed when turning sharply to prevent the tractor and implement from turning over. Determine the maximum turning speed for you and this equipment before operating on roads or uneven ground.

Only transport the Tractor and Implement at the speeds which allow you to properly control the equipment.

Be aware of the operating conditions. Do not operate the Tractor with weak or faulty brakes or worn tires. When operating down a hill or on wet or rain slick roads, the braking distance increases: use extreme care and reduce your speed. When operating in traffic always use the Tractor's flashing warning lights and reduce your speed. Be aware of traffic around you and watch out for the other guy. (SG-19)



DANGER

Be particularly careful when transporting the Implement using the tractor. Turn curves or go up or down hills only at a low speed and at a gradual steering angle. Make certain that at least 20% of the tractor's weight is on the front wheels to maintain safe steering. Slow down on rough or uneven surfaces. (STI-01)

DANGER

When the Wings are folded for transport, the center of gravity is raised and the possibility of overturn is increased. Drive slowly and use extreme caution when turning on hillsides. Overturning the Implement could cause the Implement to overturn the Tractor and vice versa resulting in serious injury or even death. Never fold wings on a hillside...the Implement or unit may overturn. (STI-02)

WARNING

Only tow the Implement behind a properly sized and equipped Tractor which exceeds the weight of the Implement by at least 20%. DO NOT tow the Implement behind a truck or other type of vehicle. Never tow the Implement and another Implement connected in tandem. Never tow the Implement at speeds over 20 MPH. (STI-06)



SAFETY

SAFETY



Secure the Implement for transport before traveling on public roads. For pull-type Implements, secure the center axle using cylinder stops or transport pin and properly attach a safety chain between the Implement and Tractor. Secure wings in upright position on folding Implements using wing transport locks. (STI-7)



Always keep a careful lookout and use extreme care when working around overhead obstructions and electrical power lines. The Implement wing can be over 10 feet high. Never allow the Implement wing to come within 10 feet of any power line. (STI-8)



Your driving vision may be reduced or impaired by the tractor, cab, or implement. Before driving on public roadways identify any limited vision areas, and make adjustments to your operating position, mirrors, and the implement transport position so that you can clearly see the area where you will be traveling, and any traffic that may approach you. Failure to maintain adequate vision of the public roadway and traffic can result in serious injury or even death. (STI-10)

Maintenance and Service Safety Instructions and Practices



Relieve hydraulic pressure prior to doing any maintenance or repair work on the Implement. Place the Implement on the ground or securely blocked up, disengage the PTO, and turn off the tractor engine. Push and pull the Remote Cylinder lever in and out several times prior to starting any maintenance or repair work. (S3PT-09)



Keep fingers clear of adjusting holes. A sudden movement could cause injury or even amputate fingers. KEEP CHILDREN AWAY WHEN MAKING ADJUSTMENTS. (SBL-3)



Always maintain the safety signs in good readable condition. If the safety signs are missing, damaged, or unreadable, obtain and install replacement safety signs immediately. (SG-5)



Do not modify or alter this Implement. Do not permit anyone to modify or alter this Implement, any of its components or any Implement function. (SG-8)



Never work under the Implement, the framework, or any lifted component unless the Implement is securely supported or blocked up to prevent sudden or inadvertent falling which could cause serious injury or even death. (SG-14)



SAFETY



Never attempt to lubricate, adjust, or remove material from the Implement while it is in motion or while tractor engine is running. (SG-20)



Periodically inspect all moving parts for wear and replace when necessary with authorized service parts. Look for loose fasteners, worn or broken parts, and leaky or loose fittings. Make sure all pins have cotter pins and washers. Serious injury may occur from not maintaining this machine in good working order. (SG-21)



Perform service, repairs and lubrication according to the maintenance section. Ensure the unit is properly lubricated as specified in the lubrication schedule and all bolts and nuts are properly torqued. Failure to properly service, repair and maintain this Implement in good operating condition could cause component failure and possible serious injury or even death. (SG-35)



Use caution and wear protective gloves when handling sharp objects such as blades, knives, and other cutting edges. Be alert to worn component surfaces which have sharp edges. Sharp surfaces can inflict severe laceration injuries if proper hand protection is not worn. (SG-37)

Storage and Parking Safety Instructions and Practices



A rear Implement can fall if not properly supported. Always use the stand on the front hitch (if equipped) or block up securely to prevent falling and possible crushing injury and/or other injury from holding or lifting heavy components. Use the stand to stabilize the implement during storage. (S3PT-3)

SAFETY

SAFETY

PARTS INFORMATION

PARTS INFORMATION

Bush Hog products are designed utilizing specifically matched system components to ensure optimum equipment performance. These parts are made and tested to Bush Hog specifications. Non-genuine "will fit" parts do not consistently meet these specifications. The use of "will fit" parts may reduce equipment performance, void warranties, and present a safety hazard. Use genuine Bush Hog parts for economy and safety. (SPBH-2)

SEE YOUR BUSH HOG DEALER

Operator's & Parts Manuals



www.algqr.com/bpm

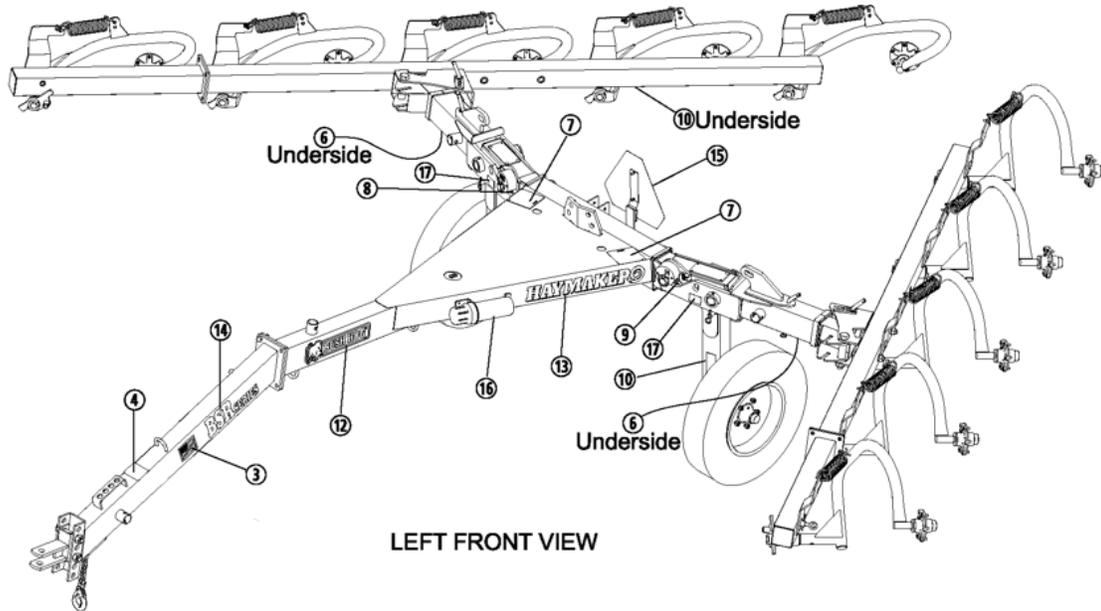
In addition to the design and configuration of this Implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the Tractor and Equipment Manuals. Pay close attention to the Safety Signs affixed to the Tractor and Equipment. (SG-18)

SAFETY

SAFETY

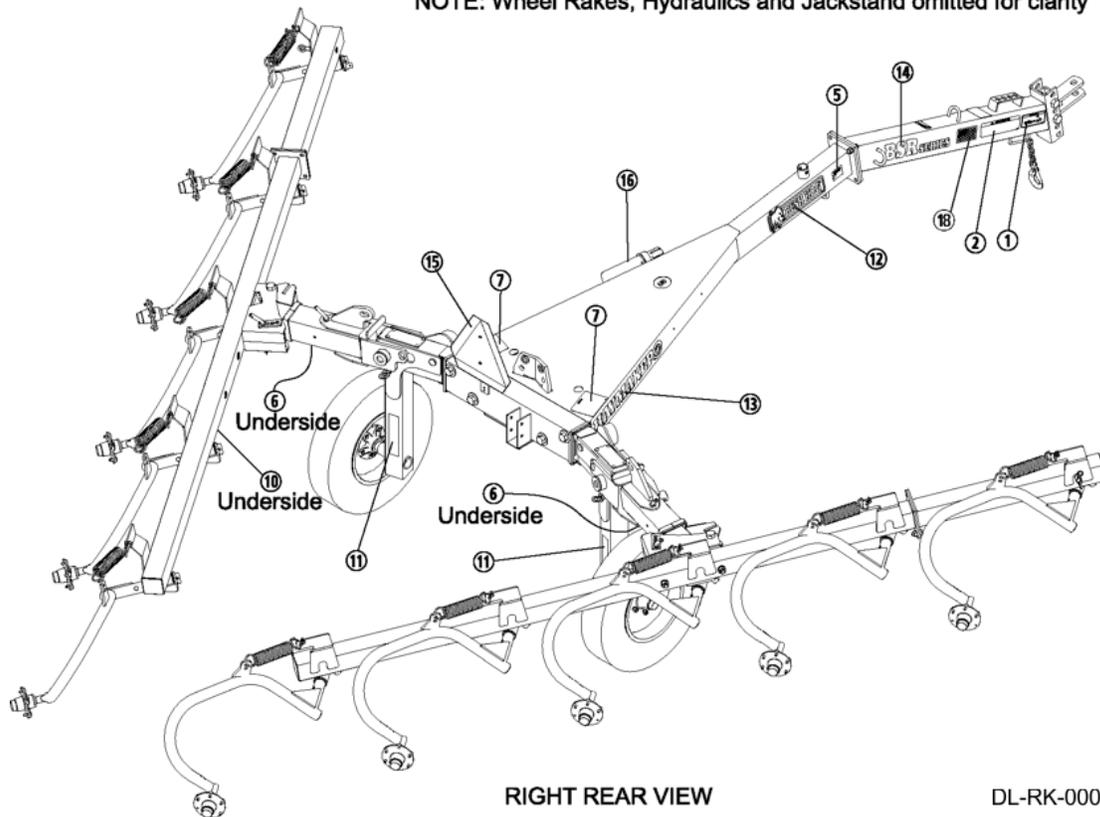
Decal Location

NOTE: Bush Hog supplies safety decals on this product to promote safe operation. Damage to the decals may occur while in shipping, use, or reconditioning. Bush Hog cares about the safety of its customers, operators, and bystanders, and will replace the safety decals on this product in the field, free of charge (Some shipping and handling charges may apply). Contact your Bush Hog dealer to order replacement decals.



LEFT FRONT VIEW

NOTE: Wheel Rakes, Hydraulics and Jackstand omitted for clarity



RIGHT REAR VIEW

DL-RK-0006

SAFETY

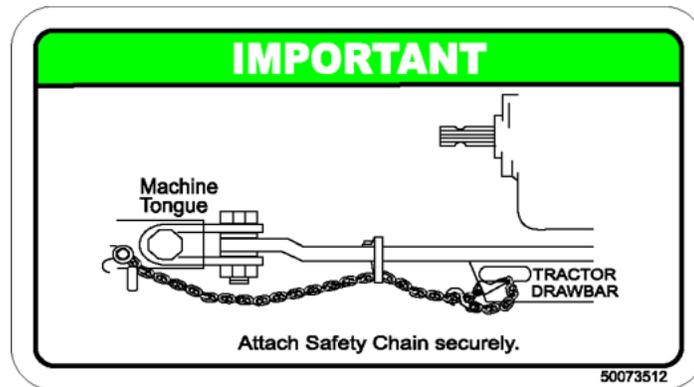
SAFETY

ITEM	PART NO.	QTY	LEVEL	DESCRIPTION
1.	50073512	1	IMPORTANT	Secure Safety Chain
2.	50073507	1	WARNING	Trailed Machine
3.	50074259	2	FLAG	Made in the USA
4.	D859	1	WARNING	Genuine Bush Hog Parts
5.	N/A	1	SER PLT	Serial Number Plate
6.	D628	2	WARNING	Crushing Hazard
7.	D617	2	WARNING	High Pressure Oil Leak
8.	50073496	1	INSTRUCT	RH Ground Pressure
9.	50073497	1	INSTRUCT	LH Ground Pressure
10.	50031212	4	REFLECT	Amber Reflector
11.	50031214	2	REFLECT	Red Reflector
12.	50065309	2	LOGO	Bush Hog Logo
13.	50073508	2	LOGO	Haymaker Logo
14.	50074260	2	LOGO	BSR Series Logo
15.	94359	1	REFLECT	SMV Symbol
16.	50035829	1	-----	Canister, Parts Manual
17.	50073511	2	IMPORTANT	Transport Latch
18.	50074094	1	-----	Operator's Manual (Inside Canister)

SAFETY

SAFETY

Decal Description



⚠ WARNING

- This trailed machine was designed and intended for on farm use only. Tow at speeds not to exceed 20 MPH. Slow down for hills, curves, rough areas and in advance of braking to prevent loss of control and possible injury or death.
- Attach Safety Chains that comply with ASAE S338.2 to both tractor and trailed machine.
- DO NOT OPERATE on public roads at night without lighting installed and operating properly which complies with ASAE S279.9 on tractor and towed machine or as required by local regulations.
- Install Slow Moving Vehicle emblem to rear of towed machine if the SMV on the tractor is not visible.
- Keep SMV emblem clean.
- Failure to follow these safety instructions and other good operating practices may cause machine damage and /or serious injury or death.

50073507

⚠ WARNING

**Non-genuine parts can fall catastrophically.
TO AVOID SERIOUS INJURY OR DEATH:**

- ONLY use genuine Bush Hog replacement parts.
- Non-genuine parts can fail creating hazardous conditions for operator and bystanders.

Contact local dealer or Bush Hog about repair parts at:

2501 Griffin Ave., Selma, AL 36701
Customer Service: 800-363-6096.
Email: contactus@bushhog.com www.algqr.com/bpm

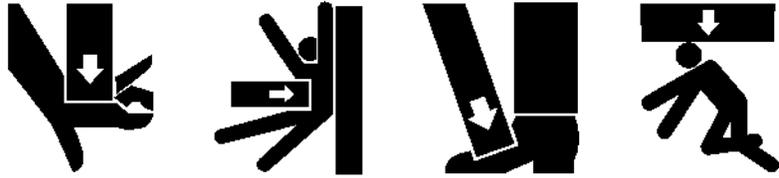


D859

SAFETY

! DANGER

CRUSHING HAZARD AND PINCH POINTS



TO AVOID SERIOUS INJURY OR DEATH:

- KEEP AWAY from moving machinery parts that can pinch, crush or fall.

D628

! WARNING



TO AVOID SERIOUS INJURY OR DEATH FROM HIGH PRESSURE HYDRAULIC OIL LEAKS PENETRATING SKIN:

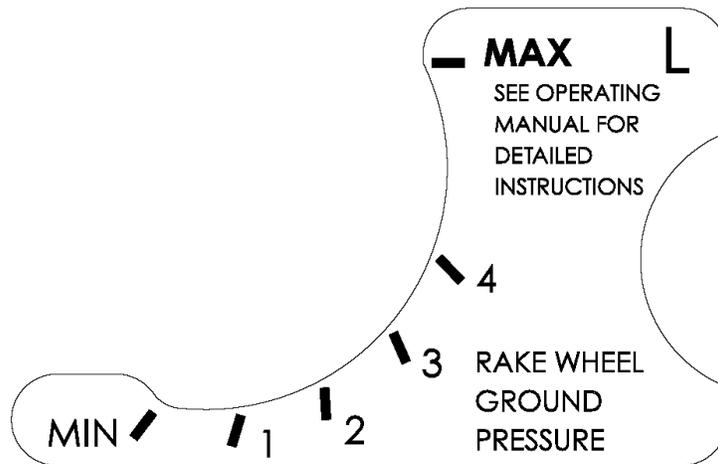
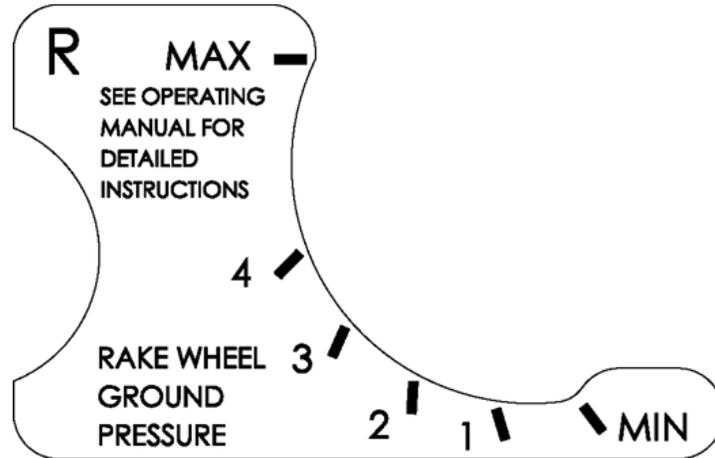
- DO NOT OPERATE equipment with oil or fuel leaks.
- KEEP all hydraulic hoses, lines and connections in good condition and tight before applying system pressure.
- Relieve hydraulic pressure before disconnecting lines or working on the system.
- REMOVE and replace hose if you suspect it leaks. Have dealer test it for leaks.

HIGH PRESSURE FLUID LEAKS CAN BE INVISIBLE. WHEN CHECKING FOR HYDRAULIC LEAKS AND WORKING AROUND HYDRAULIC SYSTEMS:

- DO NOT use hands to check for leaks.
- ALWAYS WEAR safety glasses and impenetrable gloves.
- USE paper or cardboard to search for leaks.
- KEEP hands and body AWAY from pin holes and nozzles ejecting hydraulic fluid.
- Hydraulic fluid may cause gangrene if not surgically removed immediately by a doctor familiar with this form of injury.

D617

SAFETY



IMPORTANT

TRANSPORT LATCH
Securely lock Transport
Latch before transporting
mower on roadway or
working under implement.

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SAFETY

SAFETY

Federal Laws and Regulations

This section is intended to explain in broad terms the concept and effect of federal laws and regulations concerning employer and employee equipment operators. This section is not intended as a legal interpretation of the law and should not be considered as such.

Employer-Employee Operator Regulations

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 Training Requirements

Title 29, Code of Federal Regulations Part 1928.57(a)(6). www.osha.gov

Operator instructions. At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee who operates an agricultural tractor and implements in the safe operating practices and servicing of equipment with which they are or will be involved, and of any other practices dictated by the work environment.

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.

Employer Responsibilities:

To ensure employee safety during Tractor and Implement operation, it is the employer's responsibility to:

1. Train the employee in the proper and safe operation of the Tractor and Implement.
2. Require that the employee read and fully understand the Tractor and Implement Operator's manual.
3. Permit only qualified and properly trained employees to operate the Tractor and Implement.
4. Maintain the Tractor and Implement in a safe operational condition and maintain all shields and guards on the equipment.
5. Ensure the Tractor is equipped with a functional ROPS and seat belt and require that the employee operator securely fasten the safety belt and operate with the ROPS in the raised position at all times.
6. Forbid the employee operator to carry additional riders on the Tractor or Implement.
7. Provide the required tools to maintain the Tractor and Implement in a good safe working condition and provide the necessary support devices to secure the equipment safely while performing repairs and service.
8. Require that the employee operator stop operation if bystanders or passersby come within 300 feet.

Child Labor Under 16 Years of Age

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.)

INTRODUCTION SECTION

INTRODUCTION

INTRODUCTION

This Suspension Rake is designed with care and built with quality materials by skilled workers. Proper assembly, maintenance, and operating practices, as described in this manual, will help the owner/operator get years of satisfactory service from the machine. The purpose of this manual is to familiarize, instruct, and train. The Safety Section is a MUST READ section prior to any use of the rake. The Assembly Section instructs the owner/operator in the correct assembly of the Rake using standard and optional equipment. Careful use and timely service saves extensive repairs and costly downtime losses. The Operation Section informs the owner/operator how to work the rake and explains proper procedures and safe practices prior to and during the operation of the rake. The Trouble-Shooting Guide helps diagnose difficulties with the rake and offers solutions to the problems. The Maintenance Section instructs the owner/operator of all the necessary inspection, lubrication, general maintenance needed to insure long life and trouble free operation of your rake. Safety is of primary importance to the owner/operator and to the manufacturer. The first section of this manual includes a list of Safety Messages, that, if followed, will help protect the operator and bystanders from injury or death. Many of the Safety Messages will be repeated throughout the manual. The owner/operator/dealer should know these Safety Messages before assembly and be aware of the hazards of operating this rake during assembly, use, and maintenance. The Safety Alert Symbol combined with a Signal Word, as seen below, is intended to warn the owner/operator of impending hazards and the degree of possible injury faced when operating this machine.



DANGER

Indicates an imminently hazardous situation that, if not avoided, WILL result in DEATH OR VERY SERIOUS INJURY.



WARNING

Indicates an imminently hazardous situation that, if not avoided, COULD result in DEATH OR SERIOUS INJURY.



CAUTION

Indicates an imminently hazardous situation that, if not avoided, MAY result in MINOR INJURY.

Important

Identifies special instructions or procedures that, if not strictly observed, could result in injury or damage to the machine.

INTRODUCTION



FC-RK-0010

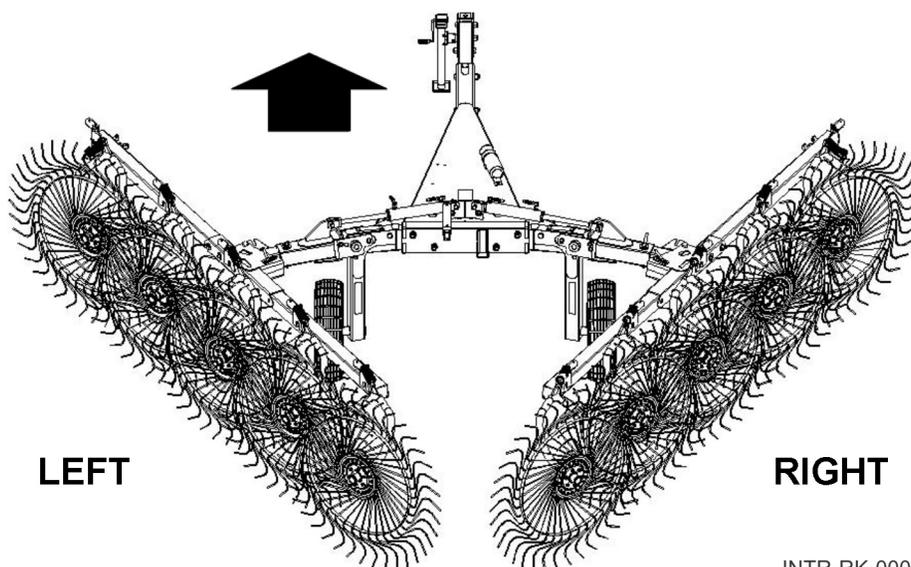
The Bush Hog Series BSR Rakes provide the best of both worlds; clean efficient raking and budget minded price. In maximum working widths of 19 ft. - BSR8, 20.7 ft. - BSR10, 24.2 ft. - BSR12 rakes make fast work of big jobs. With a reasonable amount of preventive maintenance, your rake will provide years of dependable service

Front and rear, and left and right are determined by the normal direction of travel (the same as on your automobile).

Literature Page



www.alaar.com/ble



LEFT

RIGHT

INTR-RK-0001

INTRODUCTION

Attention Owner/Operator

BEFORE OPERATING THIS MACHINE:

1. Carefully read the Operator's Manual, completely understand the Safety Messages and instructions, and know how to operate correctly both the tractor and implement.
2. Fill out the Warranty Card in full. Be sure to answer all questions, including the Serial Number of the implement. Mail within 30 days of delivery date of this implement.

NOTE: *Warranties are honored only if completed "Owner Registration and Warranty" forms are received by Alamo Group within thirty days of delivery of the implement.*

3. Record the Rake Model and Serial Numbers on the Warranty page at the front of the Operator's Manual. Keep this as part of the permanent maintenance file for the implement.



INTRODUCTION

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 judgment 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 judgment 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 judgment 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, 2501 GRIFFIN AVE., SELMA, ALABAMA 36703.



Record the model number, serial number and date

purchased. This information will be helpful to your dealer if parts or service are required.

MODEL NUMBER _____

SERIAL NUMBER _____

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

DATE OF RETAIL SALE _____

ASSEMBLY SECTION

ASSEMBLY

GENERAL INSTRUCTIONS

Assembly must be done carefully and accurately, for the safety of the person(s) doing the assembling and to ensure proper machine operation.

Assembly should be done on a flat, solid surface, using the proper tools and wearing suitable clothing, making sure that all people not involved in the assembly be kept at a safe distance.

Assemblers must provide suitable lifting mechanisms and supports for stabilizing the partially assembled units, so as to prevent them from falling and causing damage or injury.

The steps for assembly are illustrated on following pages. Depending on the experience of the assemblers and the tools available, it is not necessary that the instructions be followed in the exact order given here, but the safety precautions described above must always be followed carefully and scrupulously.

Important

Before beginning operations, read the instruction manual carefully.

WARNING

Before doing any maintenance or repair work, stop the machine at a suitable spot. Turn off the tractor engine, apply the brake, remove the key from the ignition and consult this manual.

WARNING

This is a warning to use proper accident protection when carrying out maintenance and repairs.

DANGER

Indicates an imminently hazardous situation that, if not avoided, WILL result in DEATH OR VERY SERIOUS INJURY.

WARNING

Indicated an imminently hazardous situation that, if not avoided, COULD result in DEATH or serious injury.

CAUTION

Indicates an imminently hazardous situation that, if not avoided, MAY result in MINOR INJURY.

Important

Identifies special instructions or procedures that, if not strictly observed, could result in damage to, or destruction of the machine, attachments or the environment.

WARNING

TO AVOID SERIOUS INJURY OR DEATH:

1. READ AND UNDERSTAND OPERATOR'S MANUAL.
2. TRACTOR MUST BE EQUIPPED WITH ROLL-OVER PROTECTION (ROPS) AND SWAY CHAINS.
3. ALWAYS WEAR SAFETY GLASSES, SAFETY SHOES AND SEAT BELT FASTENED TIGHTLY.
4. STOP TRACTOR, LOCK BRAKES, AND BLOCK UP OR SUPPORT IMPLEMENT SECURELY BEFORE WORKING UNDER RAISED COMPONENTS.
5. ALLOW NO RIDERS AT ANY TIME ON TRACTOR OR IMPLEMENT. FALLING OFF CAN KILL.
6. KEEP BYSTANDERS CLEAR OF MOVING PARTS AND WORKING AREA. KEEP CHILDREN AWAY!
7. DO NOT LIFT, LOWER, OR OPERATE UNLESS EVERYONE IS CLEAR OF IMPLEMENT.
8. USE INCREASED CAUTION ON SLOPES & NEAR BANKS AND DITCHES TO PREVENT OVERTURN.
9. LOCK LIFT LEVER UP FOR TRANSPORT. HAVE SMV SIGN VISIBLE. FOLLOW LOCAL LAWS.
10. USE PARKING STAND OR BLOCK UP WHEN UNHITCHING FROM TRACTOR.

999200

ASSEMBLY

DEALER SET-UP INSTRUCTIONS

The rakes are shipped from the factory are virtually completely assembled and requires minimum time to complete assembly and is ready for sale.



All assembly procedures must be performed on a hard level surface with the wheels chocked to prevent rolling during assembly. Lift the front of the mainframe assembly and securely support the mainframe in a level position.



Do not attempt to lower wings until tongue is attached to the mainframe and the tongue is attached to a tractor.

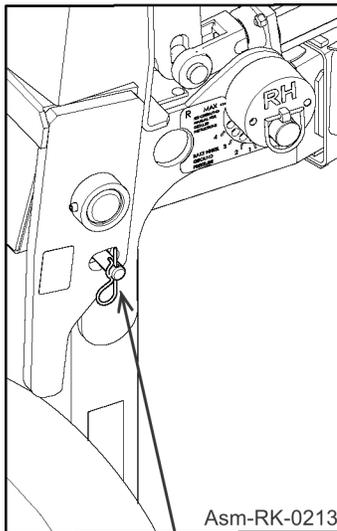


The hydraulic system is shipped from the factor dry and **MUST** be filled with hydraulic fluid before any assembly begins. The hydraulic cylinders which raise and lower the wings are double acting cylinders and must be charged in both the raised and lowered positions. **DO NOT ATTEMPT TO LOWER THE WINGS UNTIL YOU ARE SURE THE SYSTEM IS FULLY CHARGED WITH HYDRAULIC FLUID.** Always keep all bystanders away while raising and lowering wings.

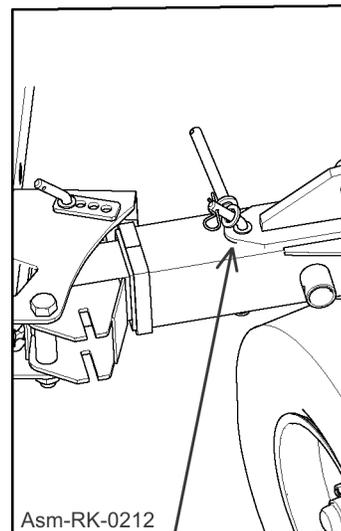
CHARGING THE HYDRAULIC SYSTEM

NOTE: To charge the hydraulic system ensure the Transport Lock Pins are secured in the locked position (as shipped from the factory)

Connect the hydraulic lines to the tractor remotes. Throttle the tractor up to 1/2 throttle and slowly cycle the hydraulic remotes several ties in both directions to fill the hydraulic system on the rake. After the hydraulic system is fully charged, remove the transport pin from one side and store the pin as indicated in the illustration Asm-RK-0212. **ENSURE ALL BYSTANDERS ARE CLEAR OF THE WINGS.** Cycle the remote to lower one wing slowly to the ground. Repeat the same procedure to lower the other wing slowly to the ground.



Transport Lock Pin
in Transport Position



Transport Lock Pin
in Stored Position

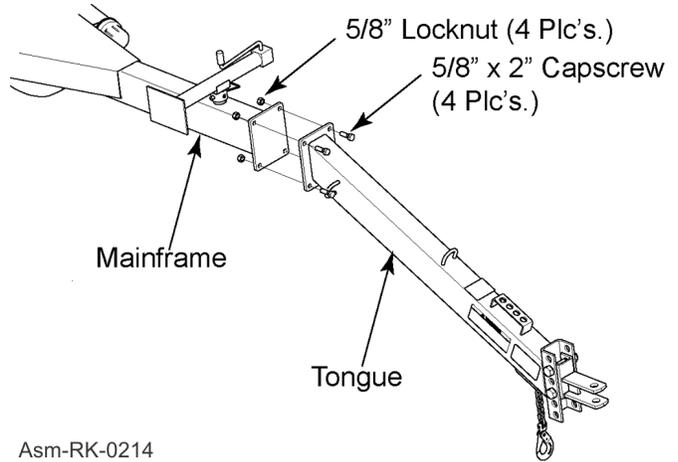
ASSEMBLY

ASSEMBLY

ATTACHING THE TONGUE

BSR8 and BSR10 Models

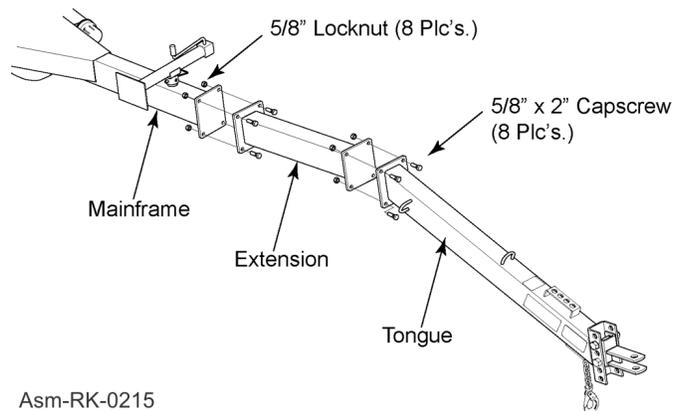
Attach the Tongue to the Mainframe using the four 5/8" x 2" capscrews and locknuts provided in bolt bag.



BSR12 Model

Attach the Tongue Extension to the Mainframe using four 5/8" x 2" Capscrews and Locknuts provided in bolt bag.

Attach the Tongue to the Tongue Extension using four 5/8" x 2" Capscrews and Locknuts provide in bolt bag.



ASSEMBLY

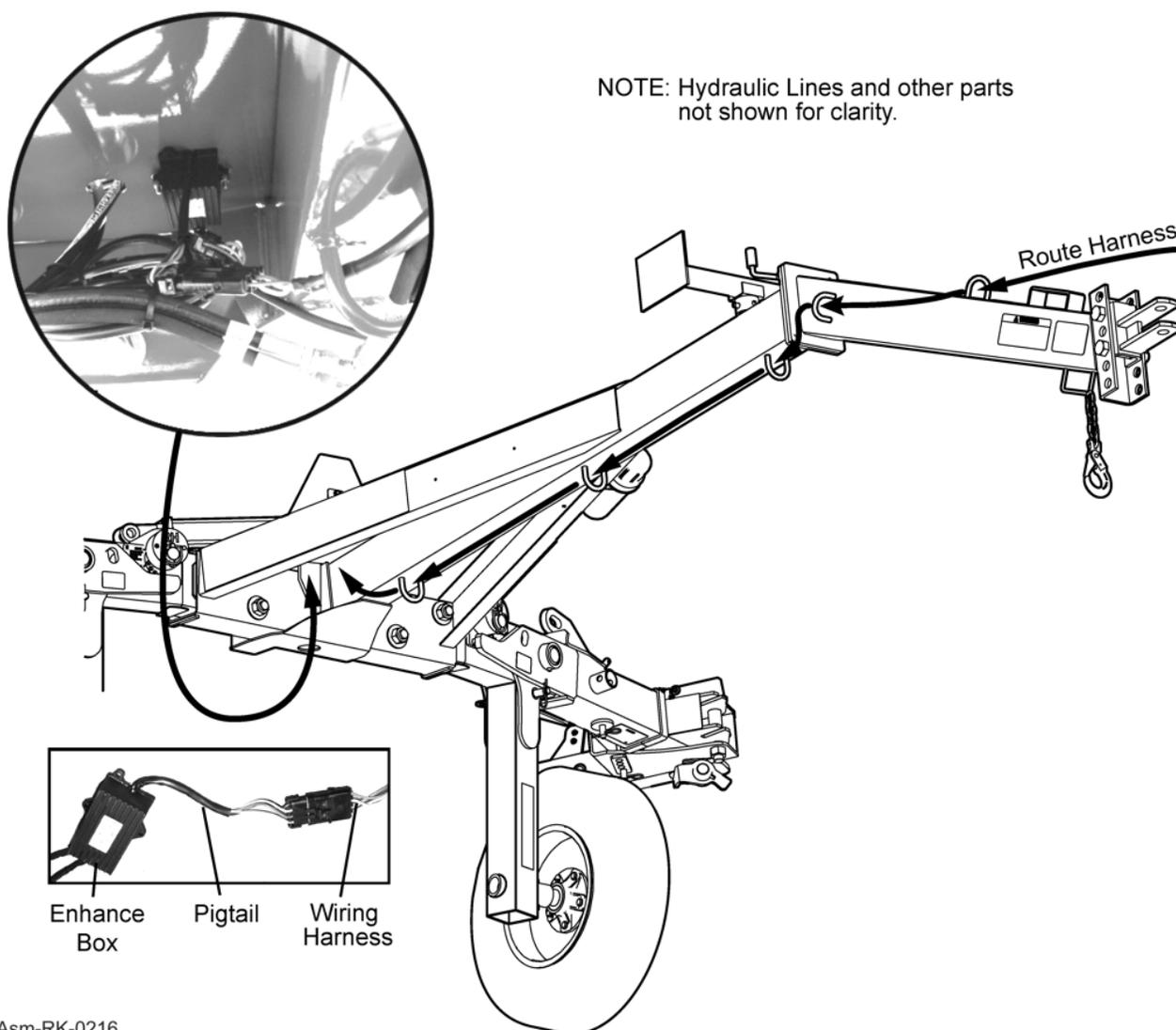
TAILLIGHT WIRING HARNESS CONNECTION

The BSR Series Hay Rake is shipped from the factory with the Taillight assemblies and Enhance Box assembled to machine. It will be necessary to install the wiring harness to the rake after the Tongue has been properly attached to the rake. The harness is tied to the hydraulic hose bundle during shipping.

1. Remove the harness from the hose bundle.
2. Take the four prong connector end of the harness and route it through the retaining loops toward the rear of the rake, starting at the front as shown in illustration.
3. Locate the Input Pigtail on the Enhance Box and plug the harness into the Pigtail.

NOTE: The Enhance Box is located on the RH side under the mainframe.

4. After installation connect the Seven Pin Plug of the harness to the tractor and test the Taillights.



Asm-RK-0216

ASSEMBLY

ASSEMBLY

RELOCATING THE WINGFRAMES ON BSR MODELS

For shipping purposes the BSR8 Models are shipped with the Wing Frames mounted to the extension arms in the forward two holes in the Wing Frame.

The Wing Frames must be relocated to the two rear mounting holes. ***This should be performed prior to attaching the Rake Wheels to the Rake Arms to reduce the amount of weight to be handled.***

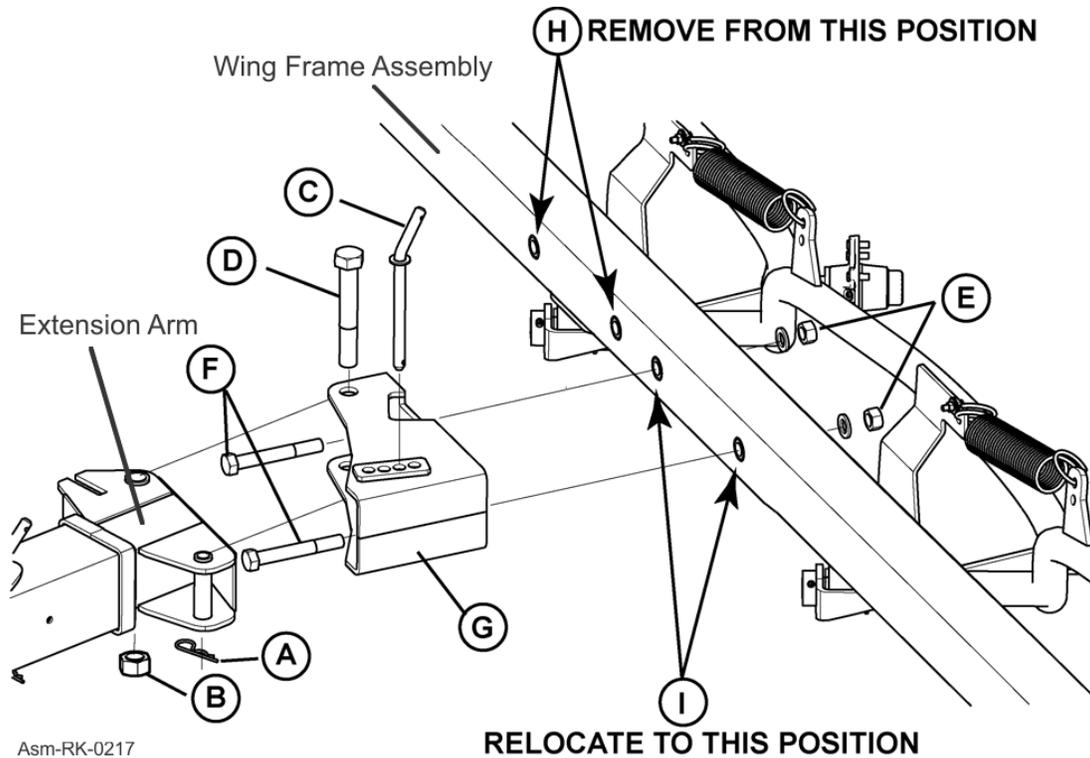
This procedure on the BSR8 will place two Rake Wheels in front of the mount location and two Rake Wheels behind the mounting location. This will balance the machine allowing for an even raking weight distribution to the Rake Wheels in field use. ***Refer to Recharging the Hydraulic System.***



The Rake Arms pose a (Pinch / Crushing) Hazard while handling the Wing Frames. If possible use an overhead lift and straps to lift and support the Wing Frame while relocating.

Procedure

1. Remove and retain the spring pin (A) and hex nut (B).
2. Remove pin (C) and capscrew (D).
3. With the Wingframe Assembly properly supported, slide the Wing Frame with Mount (G) still attached off the Extension Arm.
4. Remove hexnuts and washers (E) and pull capscrews (F) and Mount (G) from location (H).
5. Move Mount (G) to location (I), align holes, place capscrews (F) through Mount (G) and Wing Frame Assembly. Place hexnuts and washers (E) to capscrews (F) and tighten.
6. Place Win Frame with mount back on Extension Arm. Place capscrew (D) through Mount (G) and Extension Arm and hexnut (B). Re-install Pin (C) and secure with spring pin (A).



ASSEMBLY

CYLINDER LUG PLATE EXTENSION & WHEEL ARM ASSEMBLY

BSR12 MODELS

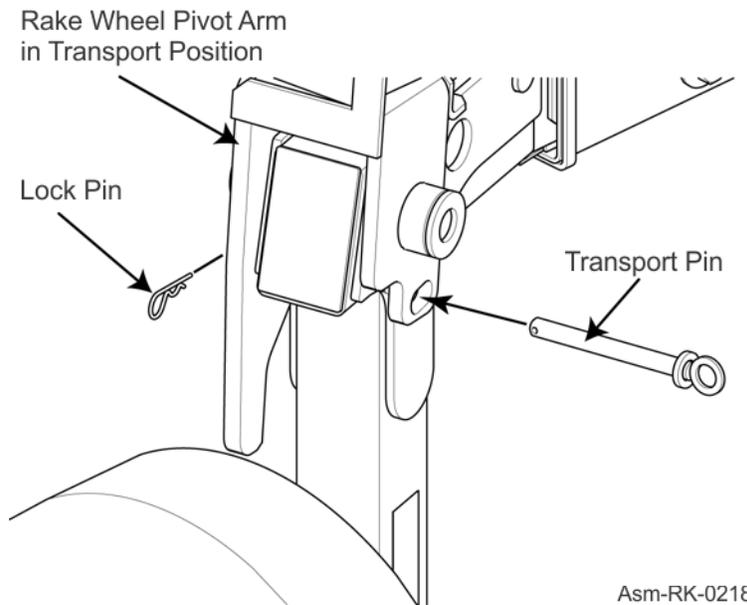
For shipping purposes the BSR12 (12 Rake Wheel Models) are shipped in the narrow position and must be expanded for proper field operation. It will require that the left hand and right hand Wheel Arm Assemblies be moved outward and a Cylinder Plate Extension be installed. Required parts for this operation are included in the box of parts shipped with the machine.



This procedure should be performed on side at a time. The machine must be on solid, level ground and the transport wheels firmly chocked with the tongue attached to the tractor to prevent the machine from rolling during this procedure.



The Rake Wheel Pivot Arms should be raised to the transport position and the Transport Pin and Lock Pin placed in the transport position. NOTE: During this procedure the Hydraulic Lift Cylinders will be detached from the mount lug of the Mainframe and will provide no support to the Rake Wheel Pivot Arms.



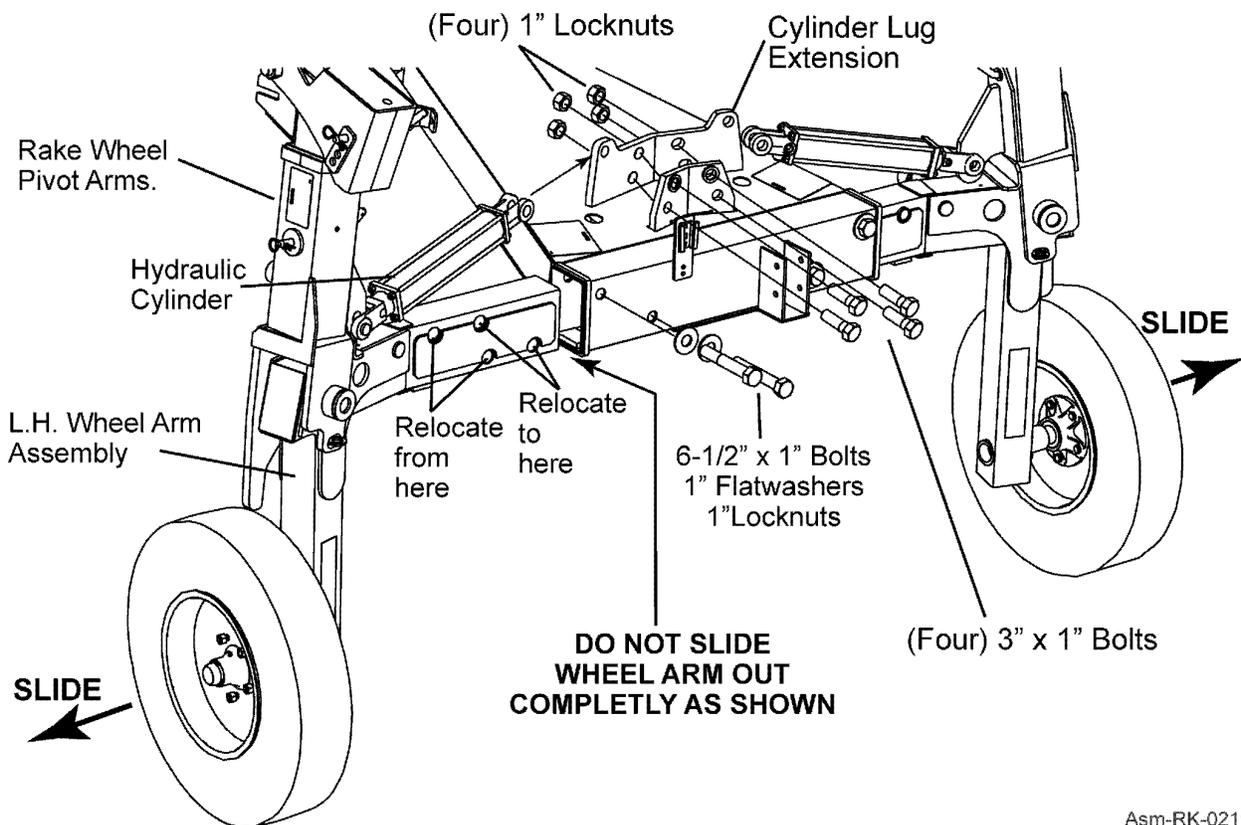
ASSEMBLY

ASSEMBLY

ASSEMBLY

RELOCATION PROCEDURE - BSR12 MODELS ONLY

1. Raise the L.H. Wheel Arm Assembly off the ground just enough so the tire clears the ground and support firmly. The lifting device should be placed under the mainframe part of the machine because the Wheel Arm Assembly will need to be slid outward slightly.
2. Detach the Lift Cylinder from the cylinder mount lug on the mainframe. It is not necessary to detach the cylinders from the Rake Wheel Pivot Arms.
3. Place the Cylinder Lug Plate Extension to the front side of the lug on the mainframe, align holes and attach with the four 1" x 3" bolts and 1" locknuts provided in kit.
4. Remove the two 6-1/2" x 1" bolts, four 1" flatwashers, and two 1" locknuts through the mainframe.
5. Slide the Wheel Arm Assembly out approximately 5" until next set of holes align. (DO NOT SLIDE COMPLETELY OUT OF MAINFRAME AS SHOWN IN ILLUSTRATION BELOW)
6. After aligning inner hole and outer holes re-install the two 1" x 6-1/2" bolts, four 1" flatwasher and two 1" locknuts through the mainframe and tighten.
7. Attach the Hydraulic Cylinder to the Cylinder Lug Extension.
8. Repeat steps 1-7 for R.H. side.



Asm-RK-0219

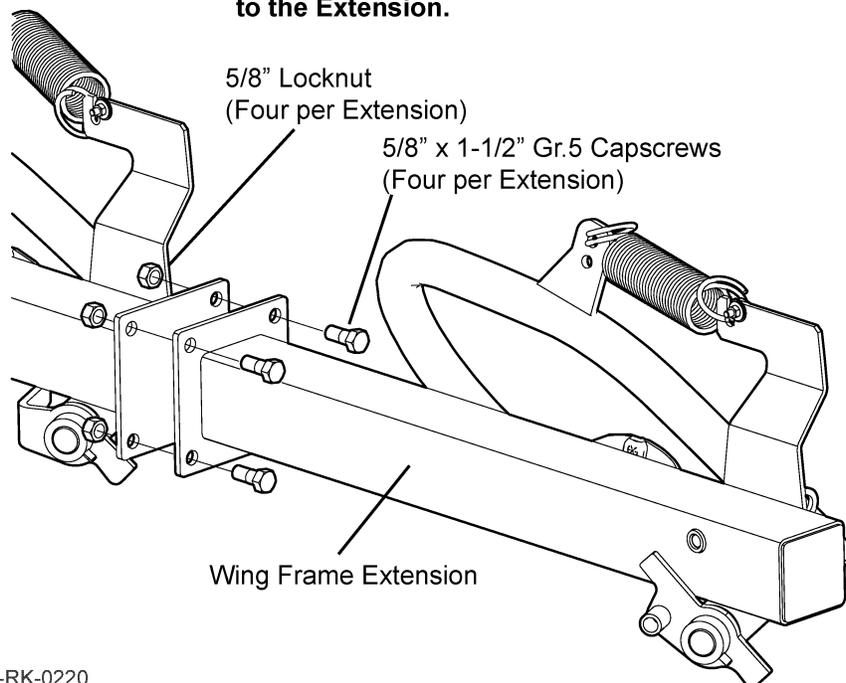
ASSEMBLY

ATTACHING THE WING FRAME EXTENSIONS BSR10 AND BSR12

For shipping purposes the Bush Hog BSR10 and BSR12 Models are shipped with the forward wing frame extensions unattached and will need to be installed. Refer to Attaching the Wing Frame Extension located on previous pages of this section.

1. Lower the wing frames to the ground.
2. Place the R.H. and L.H. Wing Frame Extensions to the front plate on the wing frames as shown in Asm-RK-20.
3. Attach with four 5/8" x 1-1/2" Gr. 5 capscrews and 5/8" locknuts (provided in Bag of Fasteners) per side. (Torque to 150 ft.lbs).

NOTE: Illustration shown is for the LH side on RHP10. RHP12 will have 2 rake arms attached to the Extension.



Asm-RK-0220

ASSEMBLY

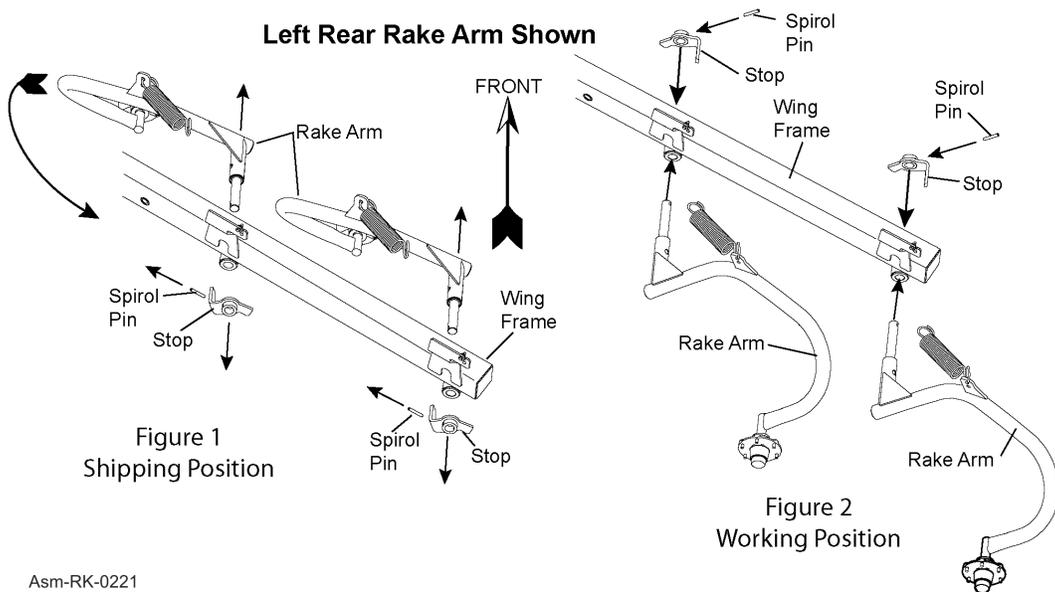
ASSEMBLY

ASSEMBLY

SETTING UP REAR RAKE ARMS FOR USE

For shipping purposes the four rear rake arms are assembled opposite from the working position and **MUST** be placed in the proper working position.

1. Remove the Spirol Pin retaining the STOP (Figure 1).
2. Remove Stop (Figure 1)
3. Slide the Rake Arms out of the pivot tubes, rotate 180° (Figure 1).
4. Replace Rake Arms in the pivot tubes on the outside of the Wing Frame (Figure 2).
5. Replace Stops on the Rake Arms to the inside of the Wing Frame and orient the same way as the front stops (Figure 2).
6. Reinstall the Spirol Pins (Figure 2).



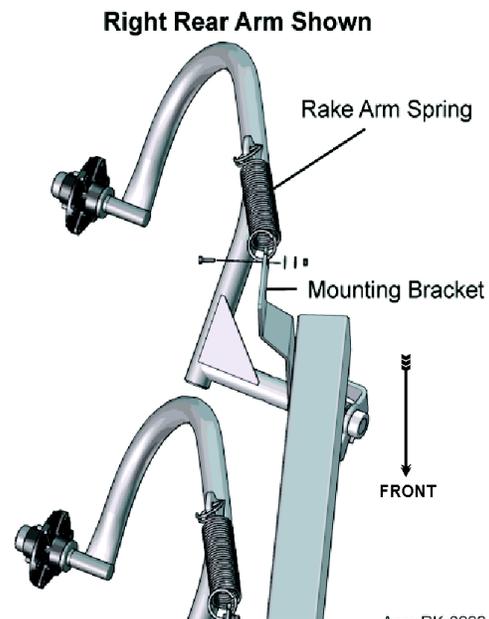
Asm-RK-0221

The back two Rake Arm Springs are shipped from the factory with the springs unattached to the wing frame assembly for shipping purposes and must be attached prior to use.

Remove the fasteners in the mounting bracket and retain for re-installation.

Extend the spring back to the slot on the mounting bracket and place in the slot.

Place the capscrew back through the hole and install the larger flatwasher to the opposite side. Place the smaller washer to the outside of the larger washer. Reinstall the hex nut and tighten.



Asm-RK-0222

ASSEMBLY

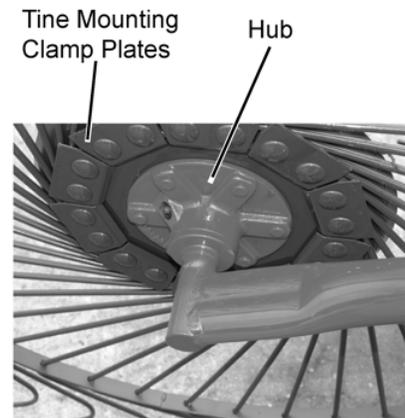
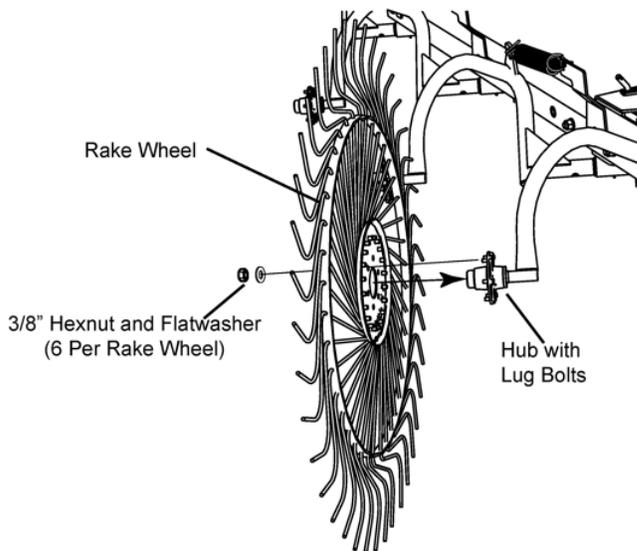
ATTACHING THE RAKE WHEELS

The Rakes are shipped from the factory with the appropriate number of rake wheels for the model stored atop the mainframe.

This procedure should be performed with the wings in the lowered position.

NOTE: DO NOT ATTEMPT TO LOWER THE WINGS UNTIL YOU ARE SURE THE SYSTEM IS FULLY CHARGED WITH HYDRAULIC FLUID. REFER TO "CHARGING THE HYDRAULIC SYSTEM".

1. Remove the nut and clamp plate holding the rake wheels to the mainframe and carefully lift the rake wheels from the mainframe.
2. The hubs have the lug bolts already in place. Align the mounting holes on the rake wheel with the lug bolts on the hub. The clamp plates holding the tines will be toward the hub. Apply a 3/8" hexnut and flatwasher (provide in bag of fasteners) to each lug bolt and tighten.

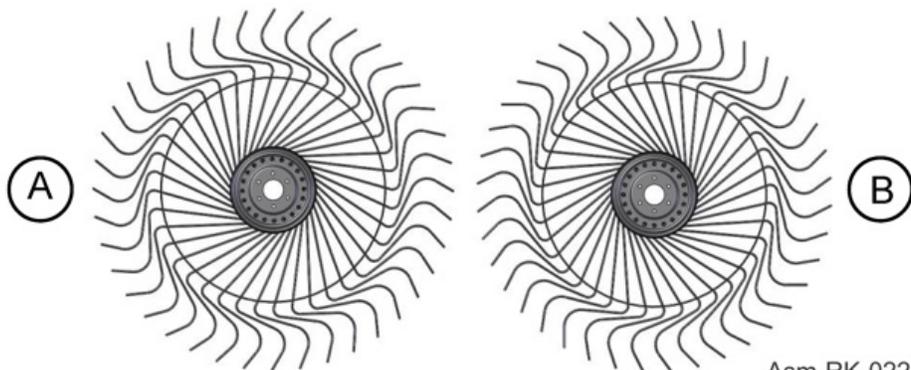


Asm-RK-0223

How to Identify Left Hand and Right Hand Wheels

Lean the rake wheels against a wall with the tine mounting clamp plates facing inward.

- A. - If the last bend in the tines curve is in a clockwise direction, it is a Left Hand Rake Wheel.
- B. - If the last bend in the tines curve is in a Counter Clockwise direction, it is a Right Hand Rake Wheel.



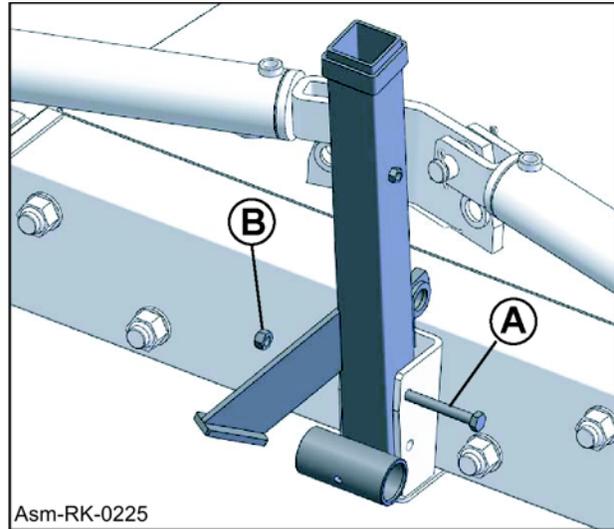
Asm-RK-0224

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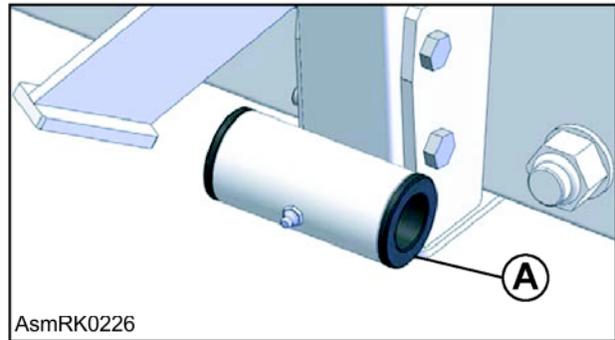
ASSEMBLY

INSTALLING OPTIONAL KICKER WHEEL KIT

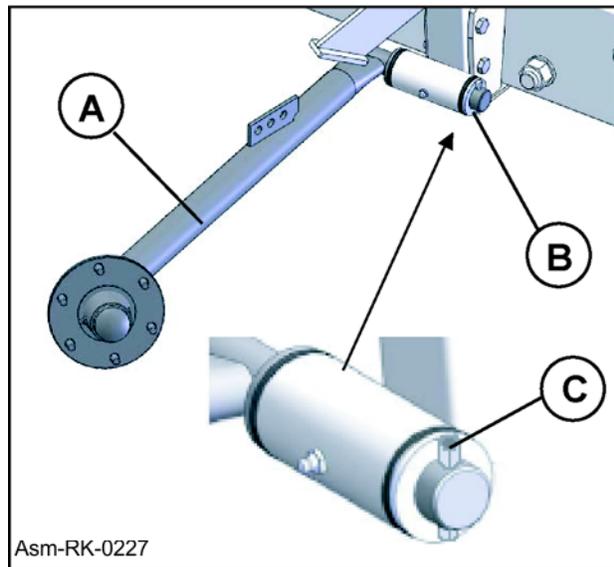
1. Install wheel support (A) and fasten with two 1/2" x 4" Gr. 5 Capscrews (B) and 1/2" Hexnuts (C).



2. Install nylon bushings (A) in mounting bracket. Seat bushings with rubber mallet.

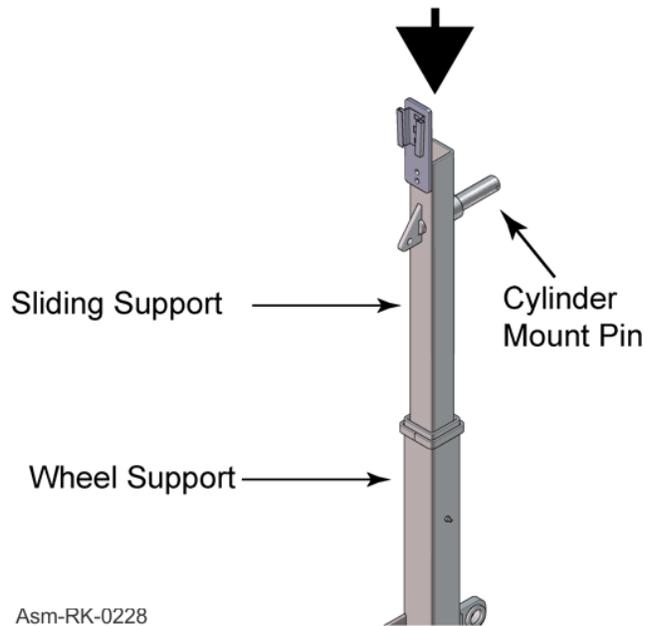


3. Install rake wheel arm (A) to mounting bracket. Fasten with 1-1/4" SAE flatwasher (B) and 3/8" x 1-1/2" spiral pin (C).

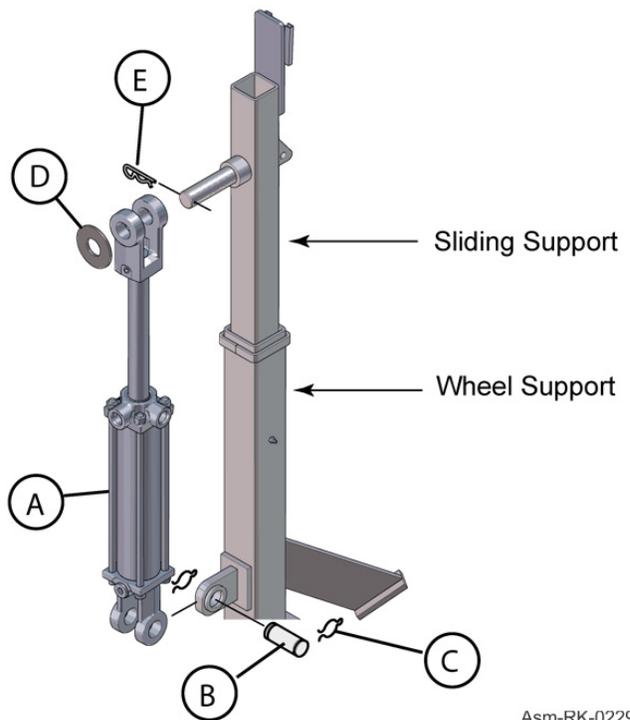


ASSEMBLY

4. Insert sliding support into the wheel support with the cylinder mount pin toward the front of the rake.



5. Attach the hydraulic cylinder (A) to the wheel support and the sliding support. Place the base end of the cylinder to the lug on the wheel support and fasten with the pin (B) and the two circlips (C). Fasten the rod end of the cylinder to the pin on the sliding support and place the 1" flatwasher (D) on pin. Place pin (E) through hole to secure.



ASSEMBLY

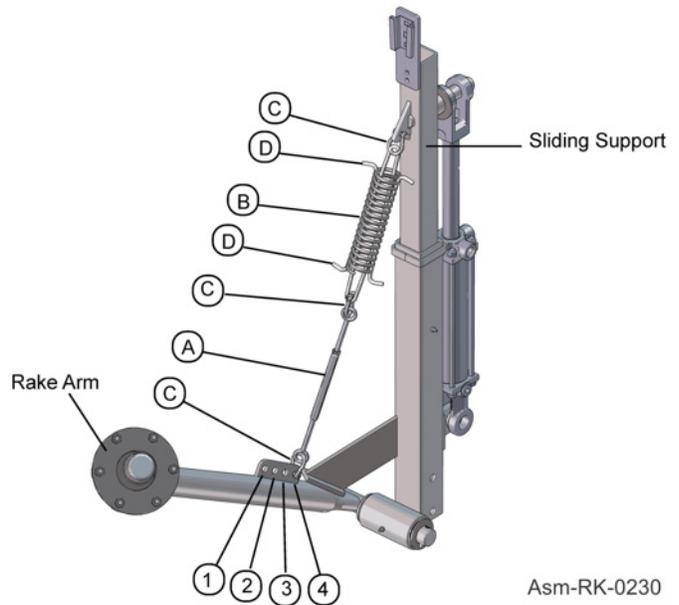
ASSEMBLY

CONNECTING THE RAKE ARM TO THE SLIDING SUPPORT

Connect the rake arm to sliding support using Turnbuckle (A), Spring (B), Shackles (C) and Spring Stays (D) in the order shown.

By moving the linkage to different hole locations you can increase or decrease the pressure of the rake wheel as needed depending on the crop and terrain conditions. Hole (1) allows for minimum pressure. Holes (2) and (3) increase intermediate pressure and hole (4) allows for maximum pressure.

Screwing the Turnbuckle (A) in and out you can also increase or decrease pressure in each hole position. The turnbuckle has 4-1/2" of adjustment.

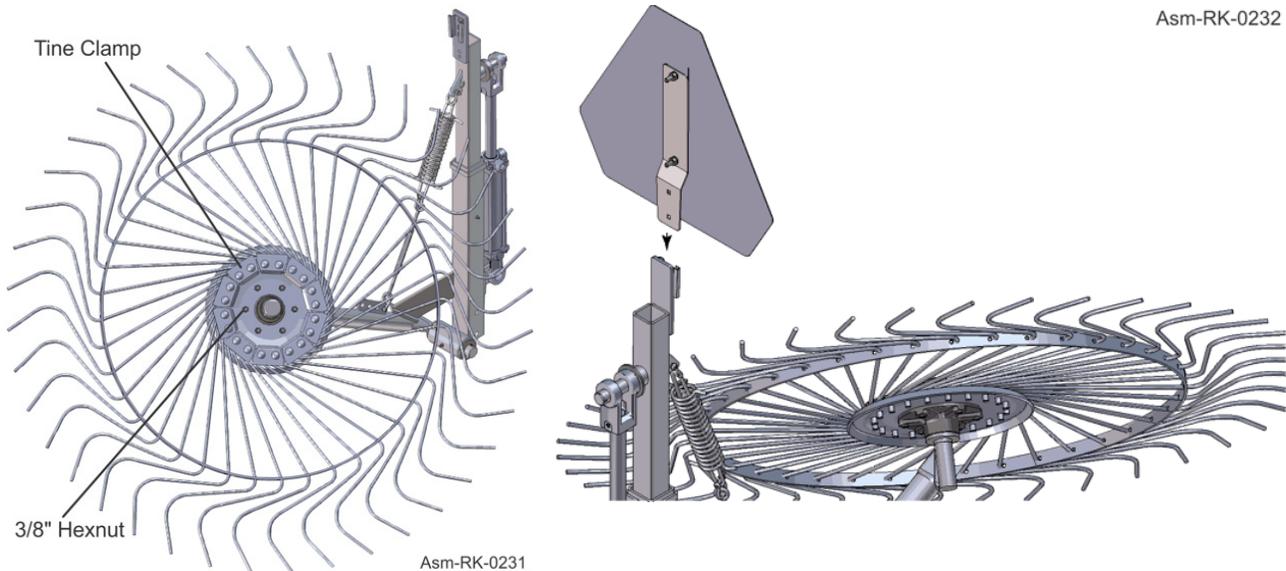


Asm-RK-0230

Install rake wheel with the tine clamps facing away from the hub. Fasten to the hub using six 3/8" hexnuts.

NOTE: If the wheel is installed incorrectly you will notice hay "Climbing Up" the rake wheel during use.

Asm-RK-0232



Asm-RK-0231

After the Kicker Wheel is assembled, move the SMV placard from the rear of the mainframe and relocate to the bracket attached to the slide tube of the kicker wheel. Asm-RK-0232

ASSEMBLY

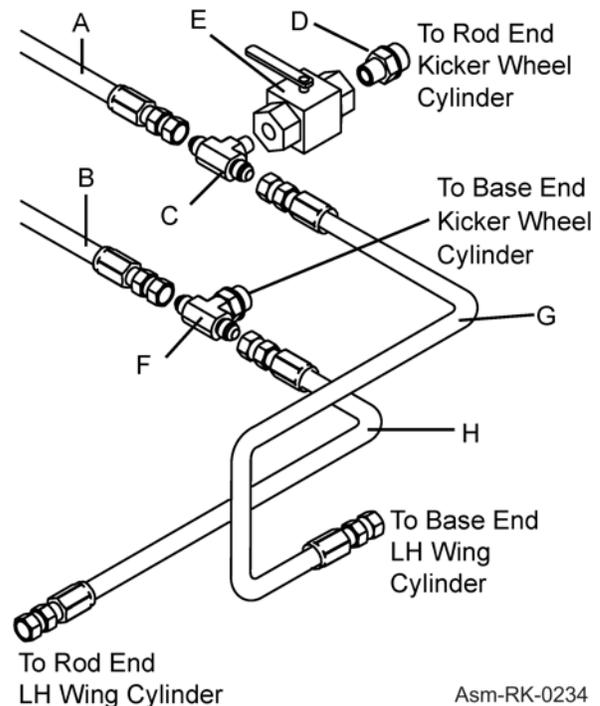
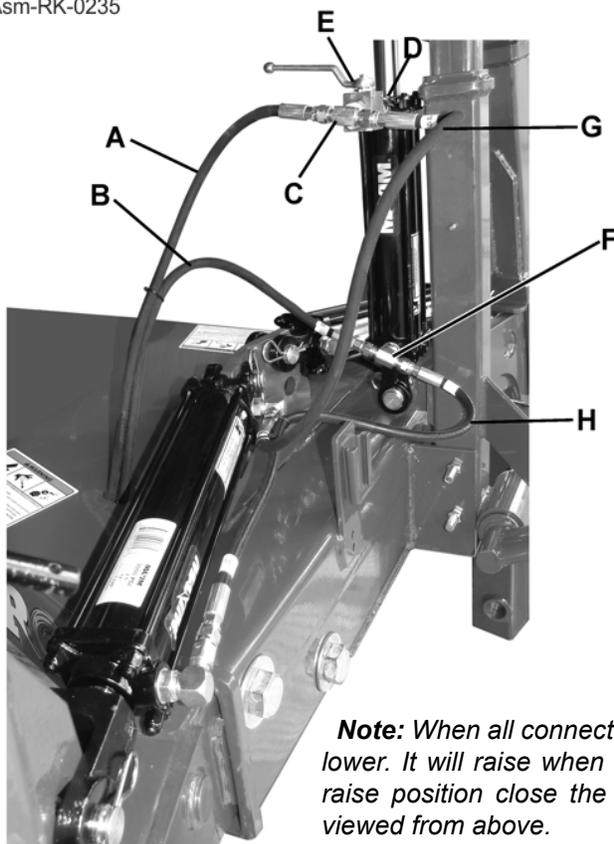
HYDRAULIC PLUMBING INSTALLATION FOR KICKER WHEEL



Before beginning this procedure, make sure all hydraulic pressure has been relieved from the Rake Hydraulic System.

1. Disconnect hydraulic hose (A) from 90° fitting on the base end of the LH wing cylinder.
2. Disconnect hydraulic hose (B) from 90° fitting on the rod end of the LH wing cylinder.
3. Install the 9/16"-18JIC male x 9/16"-18JIC male x 3/8" NOT "T" fitting (C) (use Teflon tape at this connection) to Hydraulic Ball Valve.
4. Install the (use Teflon tape at this connection) 3/8 NPT x 3/4" O-Ring boss, straight fitting (D) to the Hydraulic Ball Valve (E).
5. Install the Ball Valve using the 3/4" "O-Ring Boss" fitting in the port of the Rod End on the Kicker Wheel Cylinder.
6. Install the "T" adapter (F) "O-Ring Boss" end in the cylinder port at the Base End of the Kicker Wheel Cylinder.
7. Attach the 25" long hose to the "T" on the Ball Valve (E) and the 90° fitting on the base end of the Wing Cylinder.
8. Attach the 28" long hose (H) to the "T" adaptor in the Base End port of the Kicker Wheel Cylinder.
9. Re-attach Hydraulic Hose (A) to the "T" on the Ball Valve (E).
10. Re-attach Hydraulic Hose (B) to the "T" on the Base End of the Kicker Wheel Cylinder.
11. Tighten all fittings.

Asm-RK-0235



Note: When all connections are correct the kicker wheel will lower as the wings lower. It will raise when the wings are raised. To keep the kicker wheel in the raise position close the ball valve by rotating the lever counter-clockwise as viewed from above.

OPERATION SECTION

OPERATION

BUSH HOG BSR SERIES RAKES OPERATION INSTRUCTIONS

Bush Hog BSR Series Rakes are manufactured with quality material by skilled workers. It is the operator's responsibility to be knowledgeable of all potential operating hazards and to take every reasonable precaution to ensure oneself, others, animals, and property are not injured or damaged by the hayrake, tractor or a thrown object. Do not operate the rake if passerby, pets, livestock, or property are directly in front or to the rear of the unit.

This section of the Operator's Manual is designed to familiarize, instruct, and educate safe and proper rake use to the operator. Pictures contained in this section are intended to be used as a visual aid to assist in explaining the operation of a rake and are not necessarily of the BSR Series. Some pictures may show shields removed for purposes of clarity. NEVER OPERATE this implement without all shields in place and in good operational condition. The operator must be familiar with the rake and tractor operation and all associated safety practices before operating the rake and tractor. Proper operation of the rake, as detailed in this manual, will help ensure years of safe and satisfactory use of the rake.

IMPORTANT: To avoid rake damage, re-torque all bolts after the first 10 hours of operation.

READ AND UNDERSTAND THE ENTIRE OPERATING INSTRUCTIONS AND SAFETY SECTION OF THIS MANUAL AND THE TRACTOR MANUAL BEFORE ATTEMPTING TO USE THE TRACTOR AND IMPLEMENT. If you do not understand any of the instructions, contact your nearest authorized dealer for a full explanation. Pay close attention to all safety signs and safety messages contained in this manual and those affixed to the implement and tractor. *OPS-U- 0001*

READ, UNDERSTAND, and FOLLOW the following Safety Messages. Serious injury or death may occur unless care is taken to follow the warnings and instructions stated in the Safety Messages. Always use good common sense to avoid hazards. (SG-2)



Si no lee ingles, pida ayuda a alguien que si lo lea para que le traduzca las medidas de seguridad. (SG-3)

¡ LEA EL INSTRUCTIVO!

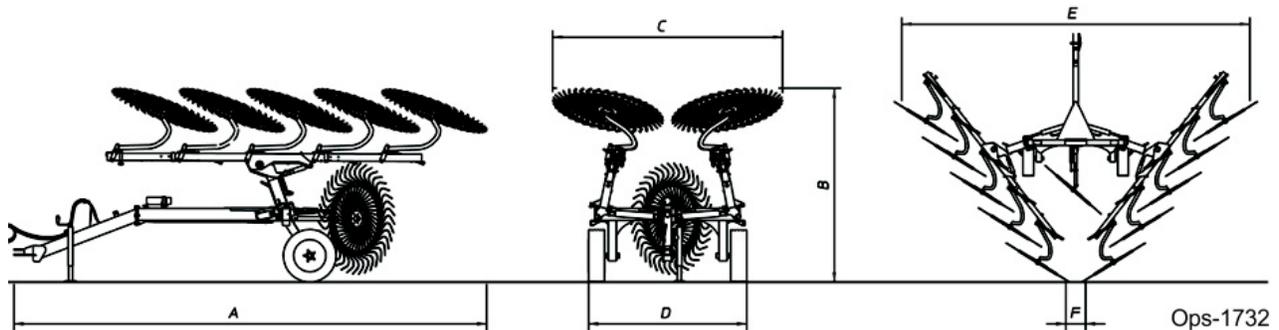


OPERATION

1. Standard Equipment and Specifications

	BSR8	BSR10	BSR12
Overall Length (A)*	20.3'	23.3'	24.6'
Minimum Transport Height (B)	8.5'	8.5'	8.5'
Transport Width (C)	11'	11'-4"	11'-6"
Width (D)	6'-6"	6'-6"	6'-6"
Minimum Working Width (E)*	16.75'	17.7'	19.75'
Maximum Working Width*	19'	20.7'	24.2'
Minimum Windrow Width (F)*	32"	32"	32"
Maximum Windrow Width*	83"	83"	83"
Weight	1950 lbs.	2100 lbs.	2450 lbs.
Tires	205-75/15	205-75/15	205-75/15
Tractor Horse Power	30 HP	30HP	50 HP

*Ratings based on actual field performance.



OPERATION

2. OPERATOR REQUIREMENTS

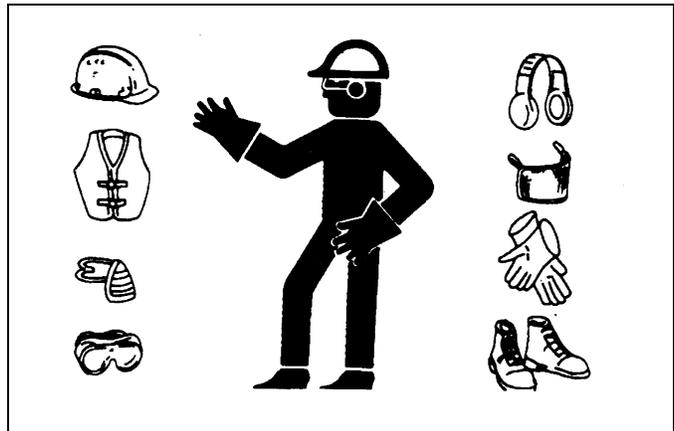
Safe operation of the unit is the responsibility of a qualified operator. A qualified operator has read and understands the implement and tractor Operator's Manuals and is experienced in implement and tractor operation and all associated safety practices. In addition to the safety messages contained in this manual, safety signs are affixed to the implement and tractor. If any part of the operation and safe use of this equipment is not completely understood, consult an authorized dealer for a complete explanation.

If the operator cannot read the manuals for themselves or does not completely understand the operation of the equipment, it is the responsibility of the supervisor to read and explain the manuals, safety practices, and operating instructions to the operator.

Safe operation of equipment requires that the operator wear approved Personal Protective Equipment (PPE) for the job conditions when attaching, operating, servicing, and repairing the equipment. PPE is designed to provide operator protection and includes the following safety wear:

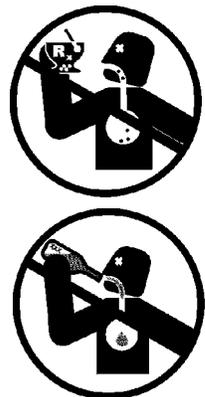
PERSONAL PROTECTIVE EQUIPMENT (PPE)

- Always Wear Safety Glasses
- Hard Hat
- Steel Toe Safety Footwear
- Gloves
- Hearing Protection
- Close Fitting Clothing
- Respirator or Filter Mask (depends on operating conditions) OPS-U- 0002



▲ DANGER

DO NOT use drugs or alcohol immediately before or while operating the Tractor and Implement. Drugs and alcohol will affect an operator's alertness and coordination and therefore affect the operator's ability to operate the equipment safely. Before operating the Tractor or Implement, an operator on prescription or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder their ability to operate the Equipment safely. NEVER knowingly allow anyone to operate this equipment when their alertness or coordination is impaired. Serious injury or death to the operator or others could result if the operator is under the influence of drugs or alcohol. (SG-27)



OPERATION

3. TRACTOR REQUIREMENTS

The tractor used to operate the implement must have the power capacity to lift, pull, and operate the Power Take Off (PTO) at the implement's rated speed while traveling at a ground speed between 2 and 5 MPH. Operating the implement with a tractor that does not meet the following requirements may cause tractor or implement damage and be a potential danger to the operator and passersby.

Tractor Requirements and Capabilities

- ASABE approved Roll-Over Protective Structure (ROPS) or ROPS cab and seat belt
- Tractor Safety Devices Slow Moving Vehicle (SMV) emblem, lighting, PTO Master Shield
- Tractor Horsepower - Minimum.....BSR8 - 30HP, BSR10 - 30HP, BSR12 - 50HP

3.1 ROPS and Seat Belt

The tractor must be equipped with a Roll-Over-Protective-Structure (ROPS) (tractor cab or roll-bar) and seat belt to protect the operator from falling off the tractor, especially during a roll over where the driver could be crushed and killed. Only operate the tractor with the ROPS in the raised position and seat belt fastened. Tractor models not equipped with a ROPS and seat belt should have these life saving features installed by an authorized dealer. *OPS-U- 0003*



Operate this Equipment only with a Tractor equipped with an approved roll-over-protective system (ROPS). Always wear seat belts. Serious injury or even death could result from falling off the tractor--particularly during a turnover when the operator could be pinned under the ROPS. (SG-7)



3.2 Tractor Safety Devices

If transporting or operating the tractor and implement near a public roadway, the tractor must be equipped with proper warning lighting and a Slow Moving Vehicle (SMV) emblem which are clearly visible from the rear of the unit. Lights and a SMV emblem must be equipped directly on implements if the visibility of the tractor warning signals are obscured.

Maintain all manufacturer equipped safety shields and guards. Always replace shields and guards that were removed for access to connect, service, or repair the tractor or implement. Never operate the tractor PTO with the PTO master shield missing or in the raised position. *OPS-U- 0004*

3.3 Tractor Horsepower

The power required to operate these implements is determined by the tractor PTO horsepower. For most operating conditions, the RHP8 and RHP10 rake requires a tractor with at least 30 HP, and the RHP12 rake requires a tractor with at least 50 HP. Operating these implements with a tractor that does not have adequate power may damage the tractor engine.

OPERATION

4. GETTING ON AND OFF THE TRACTOR

Before getting onto the tractor, the operator must read and completely understand the implement and tractor operator manuals. If any part of either manual is not completely understood, consult an authorized dealer for a complete explanation. *OPS-U- 0007*

WARNING

Do not mount or dismount the Tractor while the tractor is moving. Mount the Tractor only when the Tractor and all moving parts are completely stopped. (SG-12)



4.1 Boarding the Tractor

Use both hands and equipped handrails and steps for support when boarding the tractor. Never use control levers for support when mounting the tractor. Seat yourself in the operator's seat and secure the seat belt around you.

Never allow passengers to ride on the tractor or attached equipment. Riders can easily fall off and be seriously injured or killed from falling off and being ran over. It is the operator's responsibility to forbid all extra riders at all times. *OPS-U- 0008*

DANGER

Never allow children to operate, ride on, or come close to the Tractor or Implement. Usually, 16-17 year-old children who are mature and responsible can operate the implement with adult supervision, if they have read and understand the Operator's Manuals, been trained in proper operation of the tractor and Implement, and are physically large enough to reach and operate the controls easily. (SG-11)



DANGER

Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)



4.2 Dismounting the Tractor

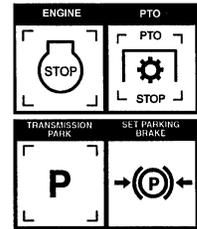
Before dismounting, park the tractor and implement on a reasonably level surface, apply the parking brake, idle the engine down, disengage the PTO, and lower the implement to the ground. Shut down the tractor engine according to the operator's manual, remove the key, and wait for all motion to completely stop. Never leave the seat until the tractor, its engine and all moving parts have come to a complete stop.

Use hand rails and steps when exiting the tractor. Be careful of your step and use extra caution when mud, ice, snow or other matter has accumulated on the steps or hand rails. Use all handrails and steps for support and never rush or jump off the tractor. *OPS-U- 0009*

OPERATION



BEFORE leaving the tractor seat lower the implement, set the parking brake and/or set the tractor transmission in parking gear, disengage the PTO, stop the engine, remove the key, and wait for all moving parts to stop. Place the tractor shift lever into a low range or parking gear to prevent the tractor from rolling. Never dismount a Tractor that is moving or while the engine is running. Operate the Tractor controls from the tractor seat only. (SG-9)



5. STARTING THE TRACTOR

The operator must have a complete understanding of the placement, function, and operational use of all tractor controls before starting the tractor. Review the tractor operator's manual and consult an authorized dealer for tractor operation instructions if needed.

Essential Tractor Controls:

- Locate the light control switch.
- Locate the engine shut off control.
- Locate the brake pedals and the clutch.
- Locate the PTO control.
- Locate the 3-point hitch control lever.
- Locate the hydraulic remote control levers.

Before starting the tractor ensure the following:

- Conduct all pre-start operation inspection and service according to the tractor operator's manual.
- Make sure all guards, shields, and other safety devices are securely in place.
- The parking brake is on.
- The PTO control lever is disengaged.
- The 3-point hitch control lever is in the lowered position.
- The hydraulic remote control levers are in the float position.
- The tractor transmission levers are in park or neutral.

Refer to the tractor owner's manual for tractor starting procedures. Only start the tractor while seated and belted in the tractor operator's seat. Never bypass the ignition switch by short circuiting the starter solenoid.

After the tractor engine is running, avoid accidental contact with the tractor transmission to prevent sudden and unexpected tractor movement. OPS-U-0028



Never run the Tractor engine in a closed building or without adequate ventilation. The exhaust fumes can be hazardous to your health. (SG-23)



Start tractor only when properly seated in the Tractor seat. Starting a tractor in gear can result in injury or death. Read the Tractor operators manual for proper starting instructions. (SG-13)



OPERATION

6. CONNECTING THE IMPLEMENT TO THE TRACTOR

Use extreme caution when connecting the implements to the tractor. The implement should be securely resting at ground level or setting on blocks. Keep hands and feet from under the units and clear of pinch points between the tractor hitch arms and implement pins. OPS-0011_B

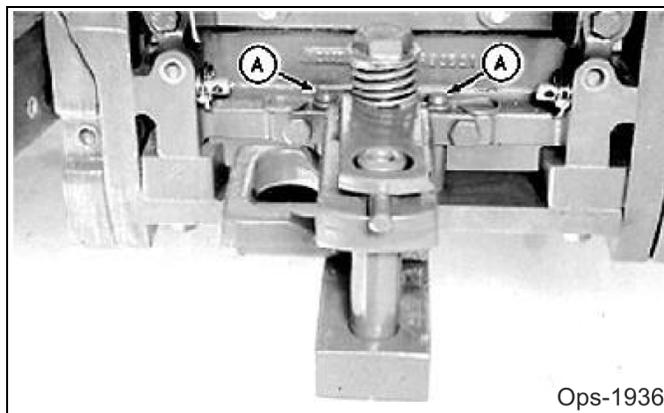


Always shut the Tractor completely down, place the transmission in park, and set the parking brake before you or anyone else attempts to connect or disconnect the Implement and Tractor hitches. (S3PT-15)

OPERATION

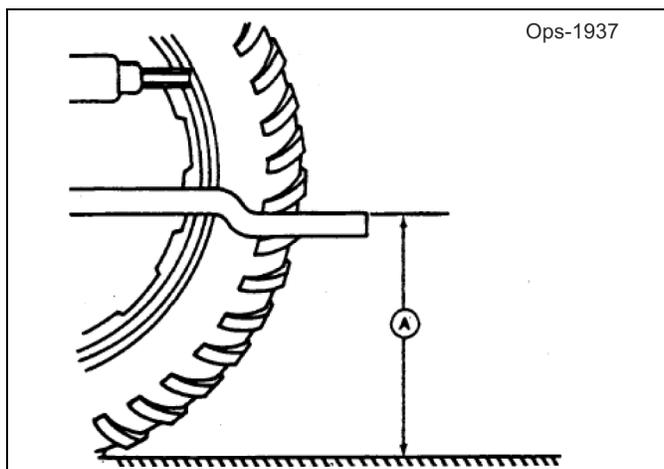
6.1 Positioning Tractor Drawbar

1. Remove locking pins (A) and move drawbar to center position.
1. Install locking pins (A).



2. Extend drawbar away from tractor as far as possible for better maneuverability when attaching, detaching, and operating in the field.
3. Remove clevis assembly, if equipped.
4. If drawbar is offset, turn drawbar so offset is down, as illustrated.

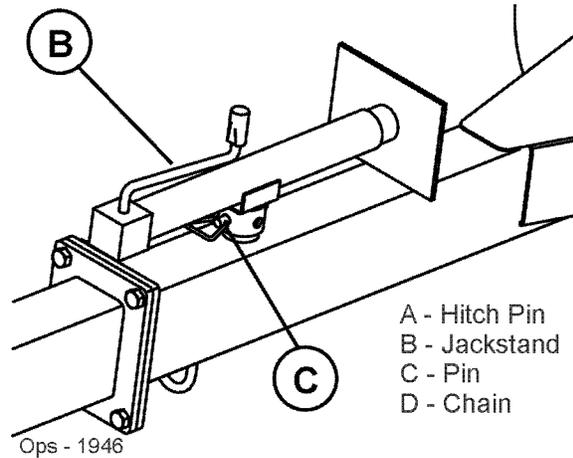
The rake can be attached to any tractor having a drawbar that conforms to ASAE-SAE standards of 330 to 559mm (13 to 22 in.) (A) from the ground.



OPERATION

6.2 Attaching Rake to Tractor Drawbar

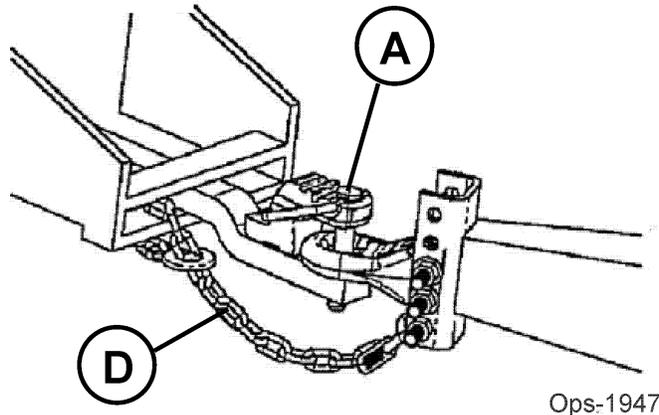
1. Tractor Drawbar has been attached.
2. Remove hitch pin.
3. Back up tractor to rake. Align hitch pin holes in tractor drawbar and rake tongue.
4. Engage tractor parking brake and/or place transmission in "Park".
5. Shut off tractor engine and remove key.
6. Install hitch pin (A). Fasten with quick-lock pin.
7. Raise jackstand (B) and fasten with pin (C).



CAUTION

A safety chain will help control drawn equipment should it accidentally separate from the drawbar. A runaway machine could cause severe injury or death to someone. Provide only enough slack in chain to permit turning, Do not use safety chain for towing.

8. Connect chain (D) to rake tongue., Route chain through loop on drawbar and connect to tractor drawbar support, Do not fasten to drawbar, Remove all slack except what is needed for turns.



IMPORTANT: Scan this QR Code with your smart phone to link to the PAMI Safe Implement Hitching Manual for more information on correctly connecting agricultural tractors to implements. Or type in your internet browser the following web address: www.algqr.com/hme Ops-0008-MISC



OPERATION

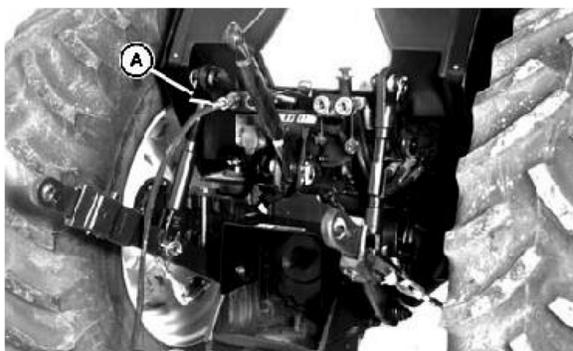
6.3 Attaching to Tractor Hydraulic System

WARNING

Do not operate this Equipment with hydraulic oil or fuel leaking. Oil and fuel are explosive and their presence could present a hazard. Do not check for leaks with your hand! High-pressure oil streams from breaks in the line could penetrate the skin and cause tissue damage including gangrene. To check for a hose leak, SHUT the unit ENGINE OFF and remove all hydraulic pressure. Wear oil impenetrable gloves, safety glasses and use Cardboard to check for evidence of oil leaks. If you suspect a leak, REMOVE the HOSE and have it tested at a Dealer. If oil does penetrate the skin, have the injury treated immediately by a physician knowledgeable and skilled in this procedure. (SG-15)



1. Push tractor SCV lever to the float position.
2. Connect hydraulic hoses (A) to tractor receptacle.
3. Put tractor SCV lever in the float position.



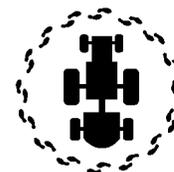
Ops-1948

7. PRE-OPERATION INSPECTION AND SERVICE

Before each use, a pre-operation inspection and service of the implement and tractor must be performed. This includes routine maintenance and scheduled lubrication, inspecting that all safety devices are equipped and functional, and performing needed repairs. DO NOT operate the unit if the pre-operation inspection reveals any condition affecting safe operation. Perform repairs and replacement of damaged and missing parts as soon as noticed. By performing a thorough pre-operation inspection and service, valuable down time and repair cost can be avoided. OPS-U-0029

WARNING

Periodically inspect all moving parts for wear and replace when necessary with authorized service parts. Look for loose fasteners, worn or broken parts, and leaky or loose fittings. Make sure all pins have cotter pins and washers. Serious injury may occur from not maintaining this machine in good working order. (SG-21)



OPERATION

7.1 Tractor Pre-Operation Inspection/Service

Refer to the tractor operator's manual to ensure a complete pre-operation inspection and scheduled service is performed according to the manufacturers recommendations. The following are some of the items that require daily service and inspection:

- Tire condition/air pressure
- Wheel lug bolts
- Steering linkage
- PTO shield
- SMV sign is clean and visible
- Tractor's lights are clean and functional
- Tractor Seat belt is in good condition
- Tractor ROPS is in good condition
- ROPS is in the raised position
- No tractor oil leaks
- Radiator free of debris
- Engine oil level and condition
- Engine coolant level and condition
- Power brake fluid level
- Power steering fluid level
- Fuel condition and level
- Sufficient lubrication at all lube points
- Air filter condition *OPS-U-0030*



OPERATION

7.2 Checking Ballast, Wheel Spacing, and Tire Inflation

Provide sufficient weight to stabilize tractor when operating on hilly land or other adverse conditions. To insure proper stability, adjust ballast, wheel spacing and tire inflation according to tractor operator's manual.

7.3 Rake Pre-Operation Inspection/Service

Before each rake use, a complete inspection and service is required to ensure the rake is in a good and safe working condition. Damaged and/or broken parts should be repaired and/or replaced immediately. To ensure the rake is ready for operation, conduct the following. *OPS-RK-0001*

The operator's manual and safety signs affixed on the unit contain important instructions on the safe and proper use of the equipment. Maintain these important safety features on the implement in good condition to ensure the information is available to the operator at all times.

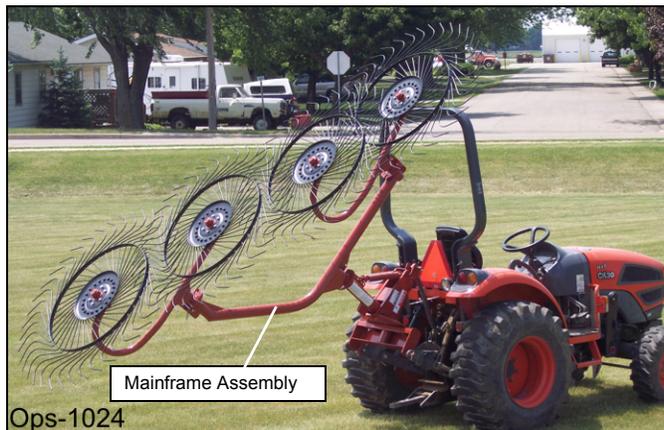
- Ensure the manual canister is secured to the equipment with the operator's manual inside.
- Ensure all safety signs are in place and legible. Replace missing, damaged, and illegible decals. *OPS-U-0011*



OPERATION

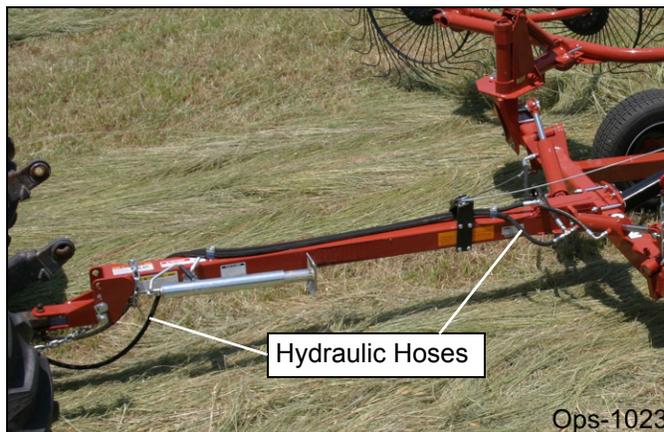
MAINFRAME ASSEMBLY

- Inspect condition of frame weldment.
- Ensure all bolts and screws are in position and are properly torqued.
- Ensure all pins are in place and fastened with screws.
- Ensure frame is properly mounted to tractor and hardware is properly installed and tightened. OPS-RK-0003



HYDRAULIC LINE INSPECTION

- Check for hydraulic leaks along hoses, cylinders and fittings. **IMPORTANT: DO NOT use your hands to check for oil leaks. Use a piece of heavy paper or cardboard to check for hydraulic oil leaks.**
- Make sure hydraulic cylinders are in good condition.
- Make sure hydraulic cylinder pins are in place and retained. OPS-RK-0002



WARNING

Do not operate this Equipment with hydraulic oil or fuel leaking. Oil and fuel are explosive and their presence could present a hazard. Do not check for leaks with your hand! High-pressure oil streams from breaks in the line could penetrate the skin and cause tissue damage including gangrene. To check for a hose leak, SHUT the unit ENGINE OFF and remove all hydraulic pressure. Wear oil impenetrable gloves, safety glasses and use Cardboard to check for evidence of oil leaks. If you suspect a leak, REMOVE the HOSE and have it tested at a Dealer. If oil does penetrate the skin, have the injury treated immediately by a physician knowledgeable and skilled in this procedure. (SG-15)



OPERATION

- Inspect teeth for looseness, breakage and excessive wear. Make sure implement is on the ground and securely blocked up. Replace damaged, worn, and missing teeth at the same time to maintain uniform tine height.
- Remove any hay or other debris which may be wrapped around the teeth.
- Inspect condition of all hardware. *OPS-RK-0004*



- Perform scheduled lubrication as detailed in the maintenance section.
- Check for corrosion in storage.
- Inspect that the 3-point hitch pins are the proper size, correctly installed, and secured to the tractor lift arms with retaining pins inserted.
- Make sure tires and wheels are in good condition. Make sure the wheel lug nuts are tight. *OPS-RK-0005*



OPERATION

OPERATION

Tractor PRE-OPERATION Inspection



Tractor ID#: _____ Make: _____

Date: _____ Shift: _____



Before conducting the inspection, make sure the tractor engine is off, all rotation has stopped and the tractor is in park with the parking brake engaged. Make sure the implement is resting on the ground or securely blocked up and all hydraulic pressure has been relieved.

OPERATION

Item	Condition at Start of Shift	Specific Comments if not O.K.
The flashing lights function properly		
The SMV Sign is clean and visible		
The tires are in good condition with proper pressure		
The wheel lug bolts are tight		
The tractor brakes are in good condition		
The steering linkage is in good condition		
There are no visible oil leaks		
The hydraulic controls function properly		
The ROPS or ROPS Cab is in good condition		
The seatbelt is in place and in good condition		
The 3-point hitch is in good condition		
The drawbar pins are securely in place		
The PTO master shield is in place		
The engine oil level is full		
The brake fluid level is full		
The power steering fluid level is full		
The fuel level is adequate		
The engine coolant fluid level is full		
The radiator is free of debris		
The air filter is in good condition		

Operator's Signature: _____

DO NOT OPERATE an UNSAFE TRACTOR or IMPLEMENT

OPERATION

HAY RAKE PRE-OPERATION Inspection



Rake ID# _____ Make _____

Date _____ Shift _____



Before conducting the inspection, make sure the Tractor engine is off, all rotation has stopped and the tractor is in park position with the parking brake engaged. Make sure the Rake arms is resting on the ground or securely blocked up and all hydraulic pressure has been relieved.

OPERATION

Item	Condition at Start of Shift	Specific Comments if not O.K.
The Operator's Manual is in the Canister on the Hay Rake		
All Safety Decals are in place and legible		
The Tongue/Hitch connection bolts & pins are tight		
There are no cracks in Tongue or Hitch		
The Tow chain is secured to the Tractor & Hay Rake		
The Rake Wheel Arm connection bolts & pins are tight		
Transport locks and retaining chains are in good condition		
Rake spokes are in good condition and securely attached to wheels		
Rake wheels are securely attached to the frame members		
The Hydraulic Cylinders are in good condition		
The Hydraulic Cylinder pins are in place & retained		
There are no leaking or damaged hoses		
There is no evidence of Hydraulic leaks		
The tires and wheel(s) are in good condition		
Wheel lug nuts are tight		

Operator's Signature: _____

DO NOT OPERATE an UNSAFE TRACTOR or IMPLEMENT

OPERATION

8. DRIVING THE TRACTOR AND IMPLEMENT

Safe tractor transport requires the operator possess a thorough knowledge of the model being operated and precautions to take while driving with an attached implement. Ensure the tractor has the capacity to handle the weight of the implement and the tractor operating controls are set for safe transport. To ensure safety while driving the tractor with an attached implement, review the following. *OPS-U- 0012*

DANGER

This Implement may be wider than the Tractor. Be careful when operating or transporting this equipment to prevent the Implement from running into or striking sign posts, guard rails, concrete abutments or other solid objects. Such an impact could cause the Implement and Tractor to pivot violently resulting in loss of steering control, serious injury, or even death. Never allow the Implement to contact obstacles. (S3PT-12)

WARNING

Transport only at speeds where you can maintain control of the equipment. Serious accidents and injuries can result from operating this equipment at high speeds. Understand the Tractor and Implement and how it handles before transporting on streets and highways. Make sure the Tractor steering and brakes are in good condition and operate properly.



Before transporting the Tractor and Implement, determine the proper transport speeds for you and the equipment. Make sure you abide by the following rules:

Test the tractor at a slow speed and increase the speed slowly. Apply the Brakes smoothly to determine the stopping characteristics of the Tractor and Implement. As you increase the speed of the Tractor the stopping distance increases. Determine the maximum transport speed not to exceed 20 mph (30 kph) for transporting this equipment.

Test the equipment at a slow speed in turns. Increase the speed through the turn only after you determine that the equipment can be operated at a higher speed. Use extreme care and reduce your speed when turning sharply to prevent the tractor and implement from turning over. Determine the maximum turning speed for you and this equipment before operating on roads or uneven ground.

Only transport the Tractor and Implement at the speeds which allow you to properly control the equipment.

Be aware of the operating conditions. Do not operate the Tractor with weak or faulty brakes or worn tires. When operating down a hill or on wet or rain slick roads, the braking distance increases: use extreme care and reduce your speed. When operating in traffic always use the Tractor's flashing warning lights and reduce your speed. Be aware of traffic around you and watch out for the other guy. (SG-19)



OPERATION

8.1 Starting the Tractor

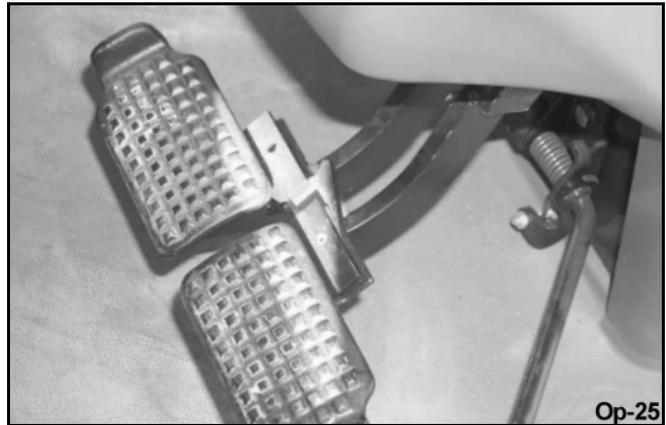
The procedure to start the tractor is model specific. Refer to the tractor operator's manual for starting procedures for your particular tractor. Consult an authorized dealer if the starting procedure is unclear. Ensure the 3-point control lever is in the lowered position and the PTO is disengaged before starting the tractor. *OPS-U-0033*



8.2 Brake and Differential Lock Setting

Make sure the tractor brakes are in good operating condition. Tractor brakes can be set to operate independently allowing single rear wheel braking action or locked together to provide simultaneous rear wheel braking. **FOR MOST DRIVING AND OPERATING CONDITIONS, THE BRAKE PEDALS SHOULD BE LOCKED TOGETHER TO PROVIDE THE MOST EFFECTIVE BRAKING ACTION.**

Always disengage the tractor differential lock when turning. When engaged the differential lock will prevent or limit the tractor from turning. During normal cutting conditions, locking the differential provides no benefit and should not be used. *OPS-U-0013*



WARNING

Be aware of the operating conditions. Do not operate the Tractor with weak or faulty brakes. When operating down a hill or on wet or rain slick roads, the braking distance increases; use extreme care and reduce your speed in these conditions. When operating in traffic, always use the Tractor's flashing warning lights and reduce your speed. Be aware of traffic around you and watch out for the other guy.

OPERATION

8.3 Driving the Tractor and Rake

Start off driving at a slow speed and gradually increase your speed while maintaining complete control of the tractor and implement. Moving slowly at first will also prevent the tractor from rearing up and loss of steering control. The tractor should never be operated at speeds that cannot be safely handled or which will prevent the operator from stopping quickly during an emergency. If the power steering or engine ceases operating, stop the tractor immediately as the tractor will be difficult to control.

Perform turns with the tractor and implement at slow speeds to determine how the tractor with an attached implement handles a turn. Determine the safe speed to maintain proper control of the tractor when making turns. When turning with a towed implement, the overall working length of the unit is increased. Allow additional clearance for the implement when turning.

To avoid overturns, drive the tractor with care and at safe speeds, especially when operating over rough ground, crossing ditches or slopes, and turning corners. Tractor wheel tread spacing should be increased when working on inclines or rough ground to reduce the possibility of tipping.

Use extreme caution when operating on steep slopes. Keep the tractor in a low gear when going downhill. **DO NOT** coast or free-wheel downhill.
OPS-RK-0006



Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)



Regulate ground speed according to crop condition, terrain, and tractor horsepower. In general, raking speeds at (5-7 mph) will produce good results. A slower ground speed may be necessary for hills or rough terrain.

For Sickle Mowed Crop: Rake in the same direction as mower travel.

For Rotary Mowed Crop: Rake in opposite direction as mower travel.

OPERATION

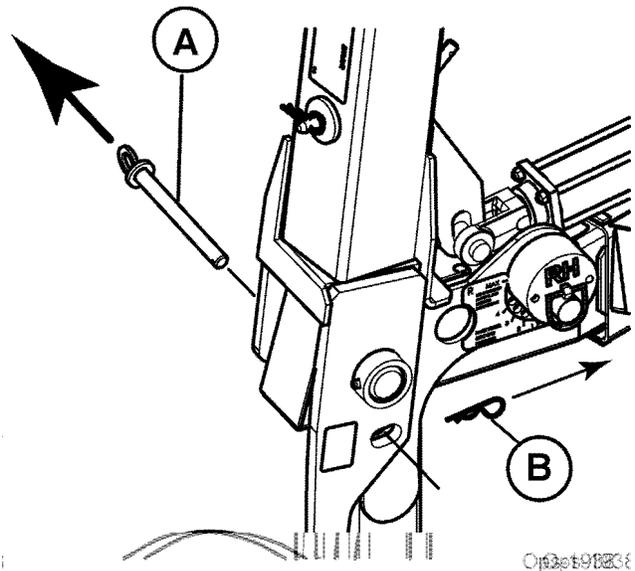
8.4 Preparing Rake for Field Operation

CAUTION

To prevent personal injury caused by unexpected movement.:

- Park machine on a level surface.
- Engage tractor parking brake and/or place transmission in "Park".
- Shut off tractor engine and remove key.

1. Park machine on level surface.
2. Remove spring-locking pins (B) and transport lock pins (A).



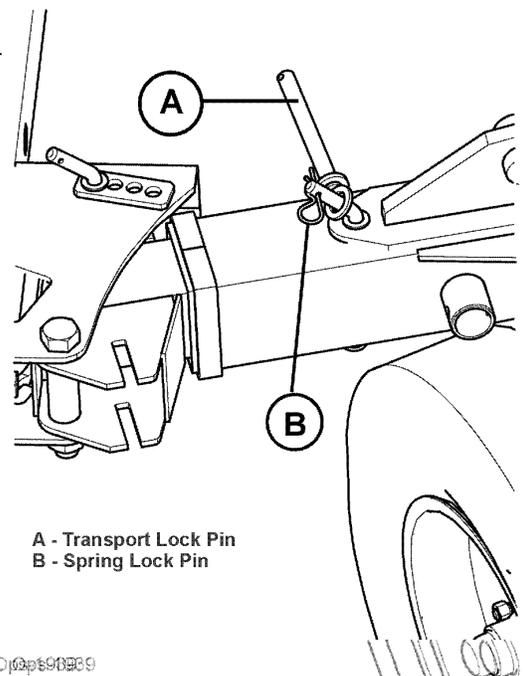
3. Put transport lock pin (A) in parking position and fasten with spring-locking pin (B). Repeat on opposite side.

NOTE: Make sure bystanders are clear of machine before lower rake wheels.

IMPORTANT: To avoid machine damage, make sure area is free from obstructions when opening rake.

4. Put tractor SCV lever in the float position.
5. Lower Rake wheels.

Rake is now ready for field use.

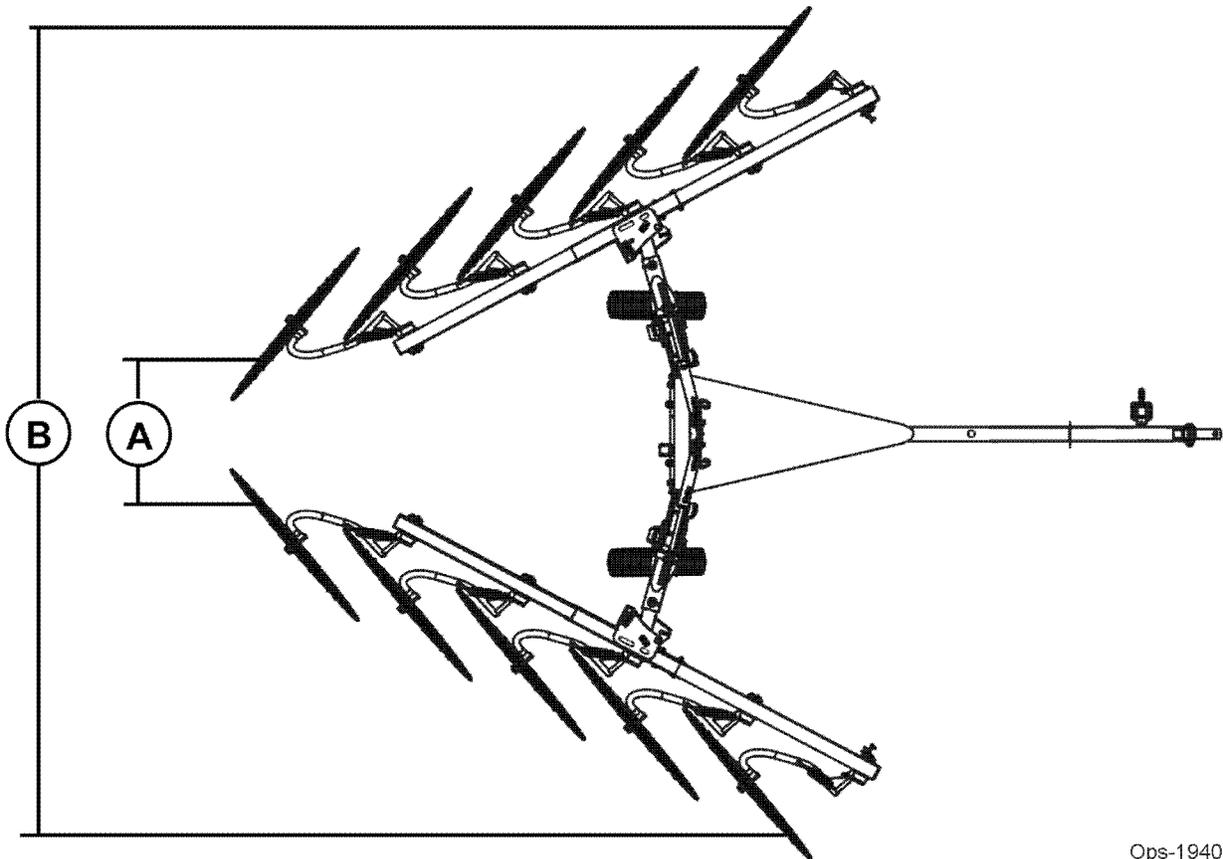


OPERATION

8.5 Setting Working Width

The working width and windrow width will vary due to the type and quantity of crop being raked. The distance between rings on rear raking wheels can be used to determine basic windrow width. Actual width will depend on crop type, volume, and raking speed. When adjusting the angle of the wing arms with pin and holes, working width will change.

NOTE: Windrow widths (A) and (B) are approximate.



Ops-1940

(A)
WINDROW WIDTHS
8 Wheel, 10 Wheel, 12 Wheel

32 inches to 83 inches

(B)
WORKING WIDTHS

8 Wheel
16.75 ft to 19 ft.

10 Wheel
17.7 ft to 20.7 ft

12 Wheel
19.75 ft to 24.2 ft

Ops-1941

OPERATION

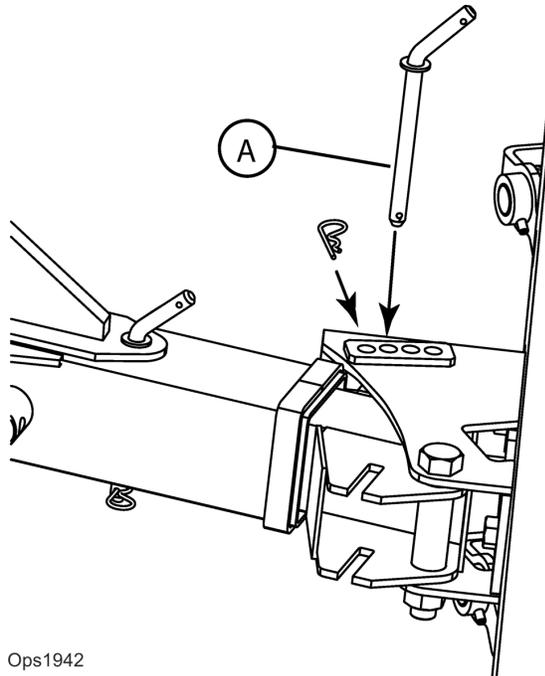
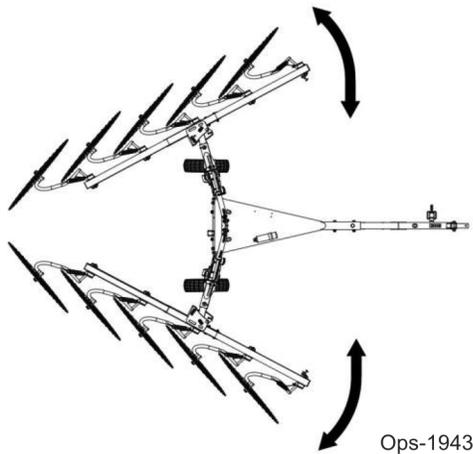
8.6 Adjusting Raking and Windrow Width

The raking width is determined by the windrow width setting and the angle of raking wheels.

To change rake wheel angle, remove spring-locking pin and lock pin (A). There are four positions to increase or decrease angle.

Changing raking width will also change the windrow width. Adjust windrow width as desired.

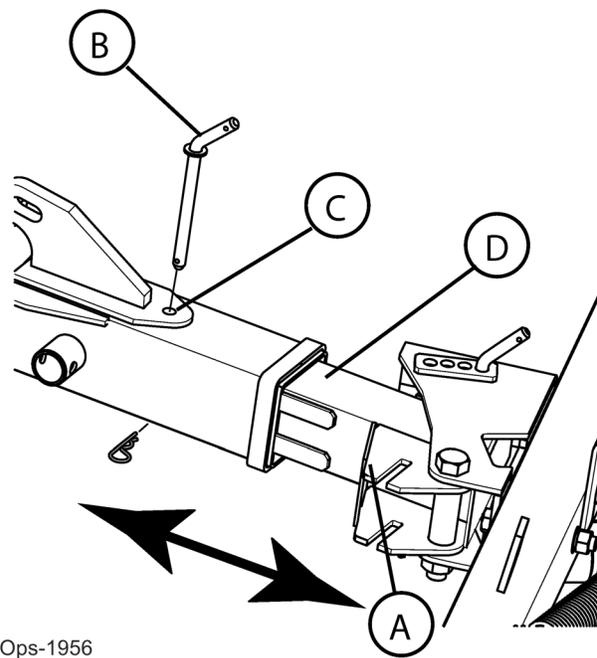
The rake can be set for windrow widths of 32 inches to 83 inches.



A windrow of proper width will result in more uniform bales. The overall windrow width should be the same size or slightly wider than the baler bale chamber.

To improve the working capacity without change the angle of the frames:

1. Take off lock-pin (B).
2. Slide frame (A) from standard position (D) to high capacity position (C).
3. Insert the lock-pin (B). Repeat on opposite side.

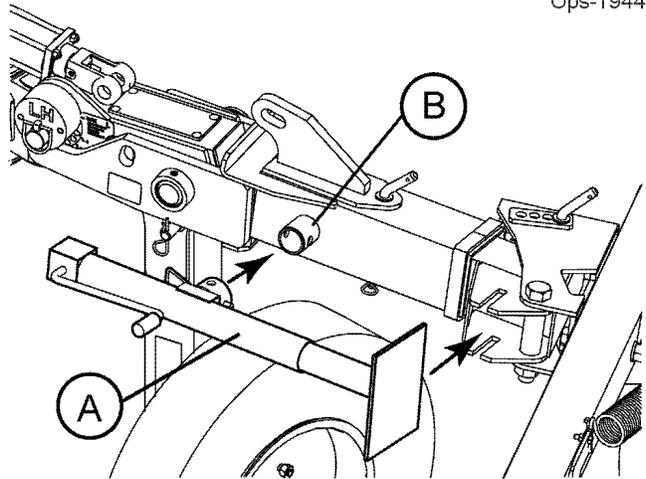


OPERATION

To operate the adjustment, you can use the jack stand that comes standard with the machine to push the frame out or pull it in.

Ops-1944

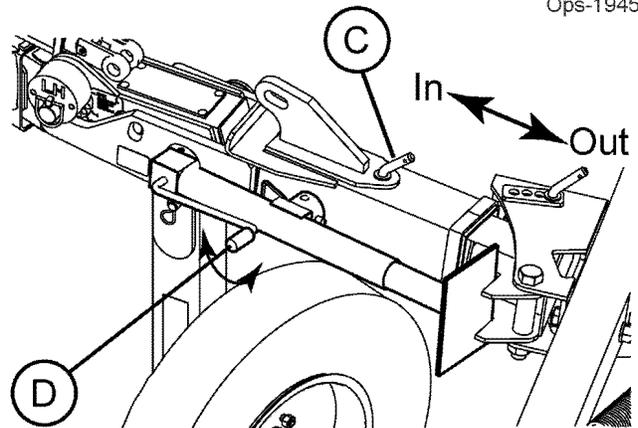
Position the jack stand (A) as shown in the picture. Be sure to pin the jack stand in place at the mount tube (B).



OPERATION

Before sliding the frame in or out be sure to remove pin (C) and replace when desired width is attained.

Ops-1945

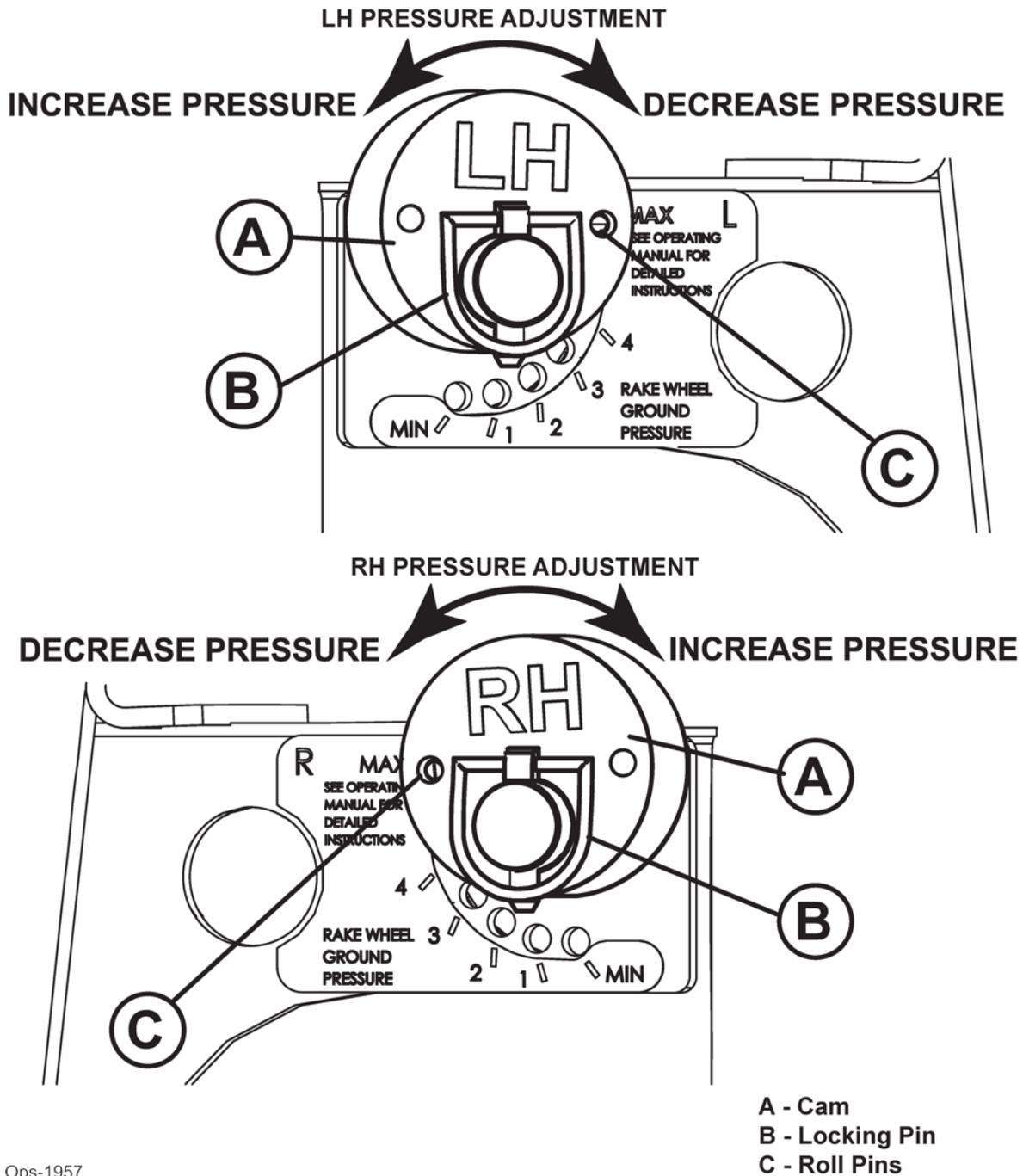


OPERATION

OPERATION

8.7 Adjusting Raking Wheel Ground Pressure

The correct ground pressure on raking wheels may vary depending on field conditions and the type and quantity of crop being raised. Ground pressure is controlled by the position of each cam on each rake wheel support assembly. The cam can be adjusted at six positions from minimum ground pressure to maximum ground pressure.



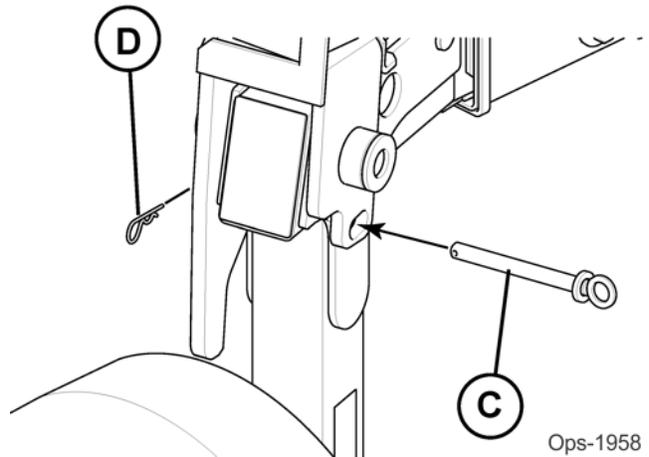
Ops-1957

OPERATION

OPERATION

8.8 Adjusting Ground Wheel Pressure

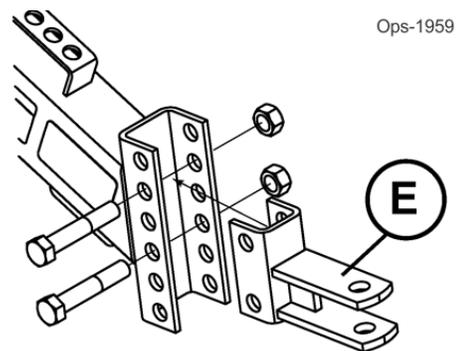
1. Park rake on level surface.
2. Engage tractor parking brake and/or place transmission in "Park".
3. Close the machine to transport position and install transport lock pin (C) through arm support brackets. Fasten with spring-locking pin (D).
4. (See Adjusting Wheel Pressure) Remove ring pin (B), pull out the Cam (A), rotate to desired hole position, push the Cam in and fix with locking pin (B).



8.9 Adjusting the Tongue Clevis

The position of the Clevis (E) will also have an effect on the ground pressure. Because tractor drawbar heights vary, the clevis should be adjusted so the wings are level to the ground. This ensures equal pressure of the rake wheels to the ground, front to back.

NOTE: The clevis (E) can also be flipped upside down from position shown for more adjustment if needed.

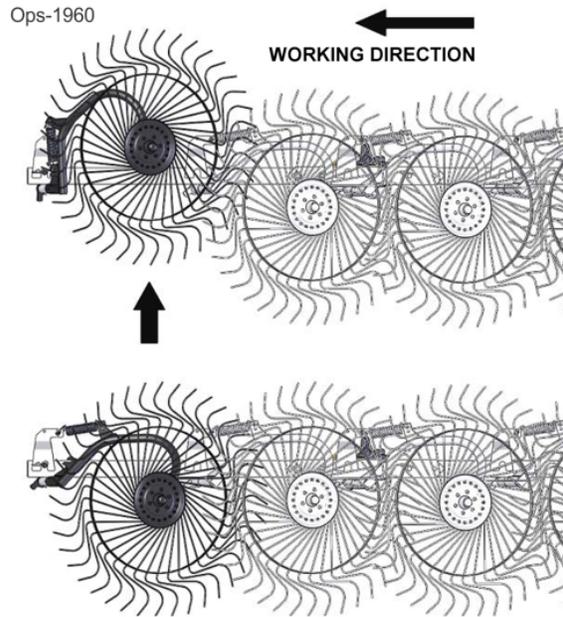


OPERATION

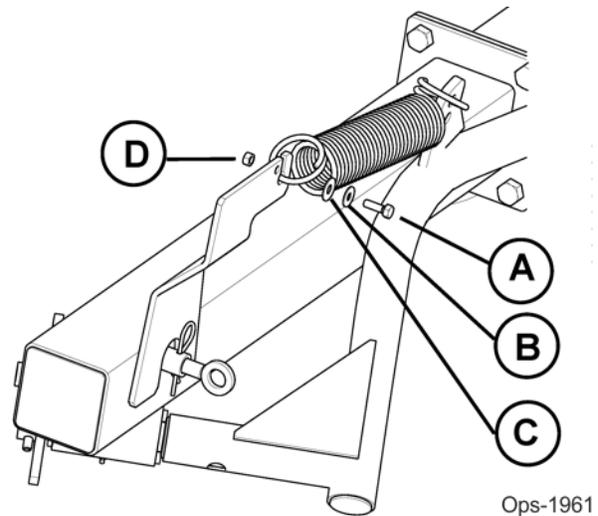
8.10 Flip-Up Raking - (Only for BSR10 & BSR12)

In the presence of large volumes of product, there is the possibility to exclude the action of the first finger wheel to reduce the working capacity or increase efficiency.

To determine this configuration, only for models BSR10 and BSR12, you can raise up the first finger wheel (FLIP-UP) and lock it in the raised position.



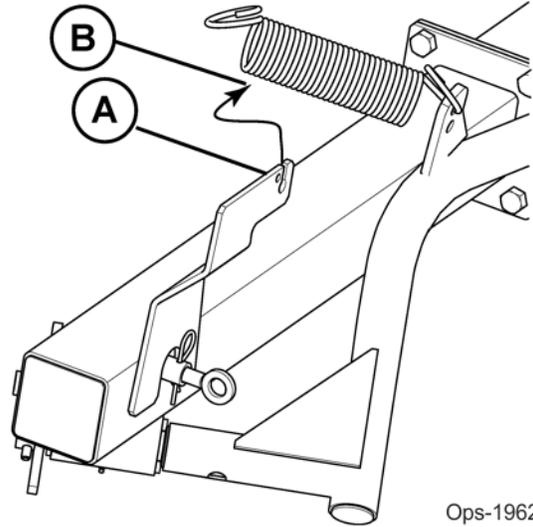
1. Remove and retain 5-16" nut (D), washers 5-16" (B) and 3/8" washer (C), 5/16"x1" bolt (A) for re-installation.



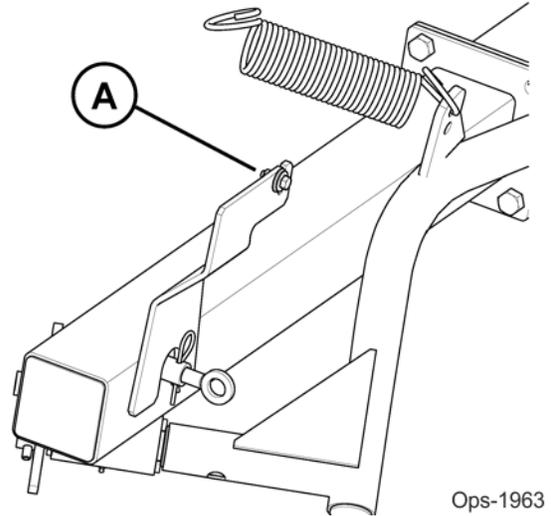
OPERATION

OPERATION

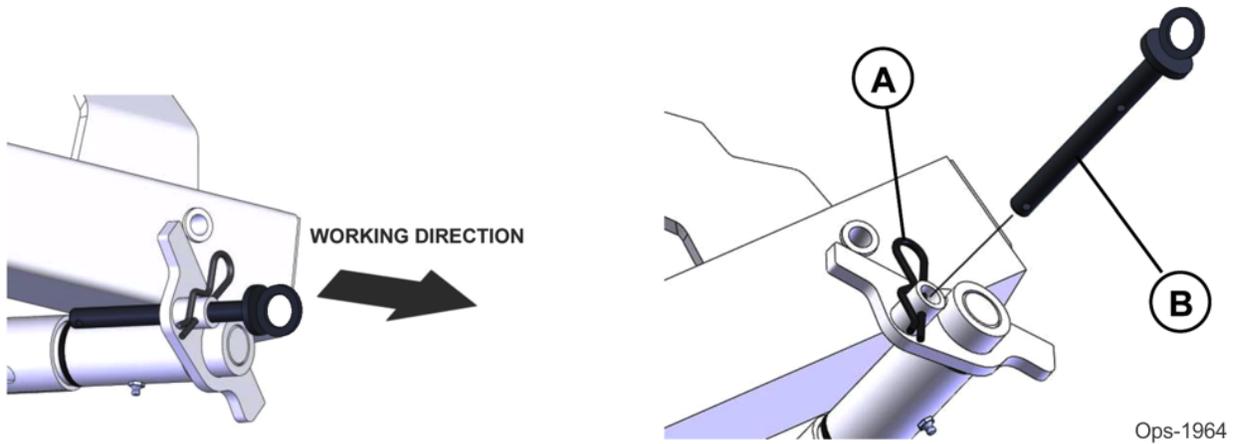
2. Move spring from position (A) and swing around to position (B) and let it hang.



3. Remount screw, washers, and nut in the same position (A).

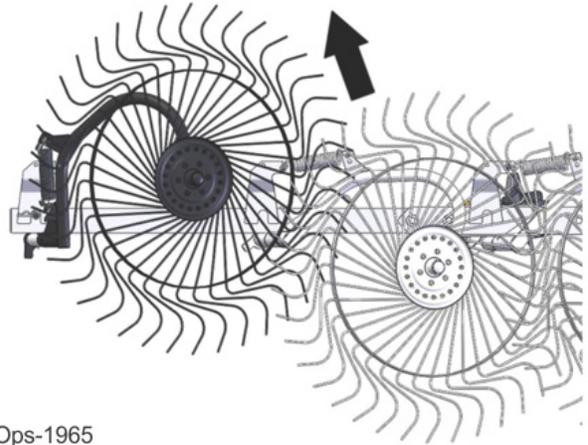


4. Remove spring lock pin (A) and lock pin (B).



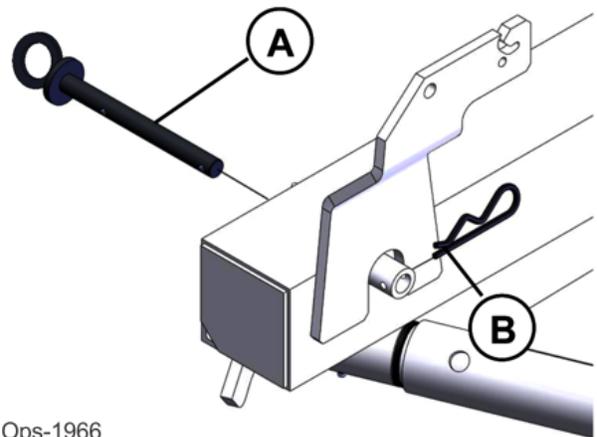
OPERATION

5. Lift up from rake to maximum position.



Ops-1965

6. Insert the lock pin (A) and spring lock pin (B).

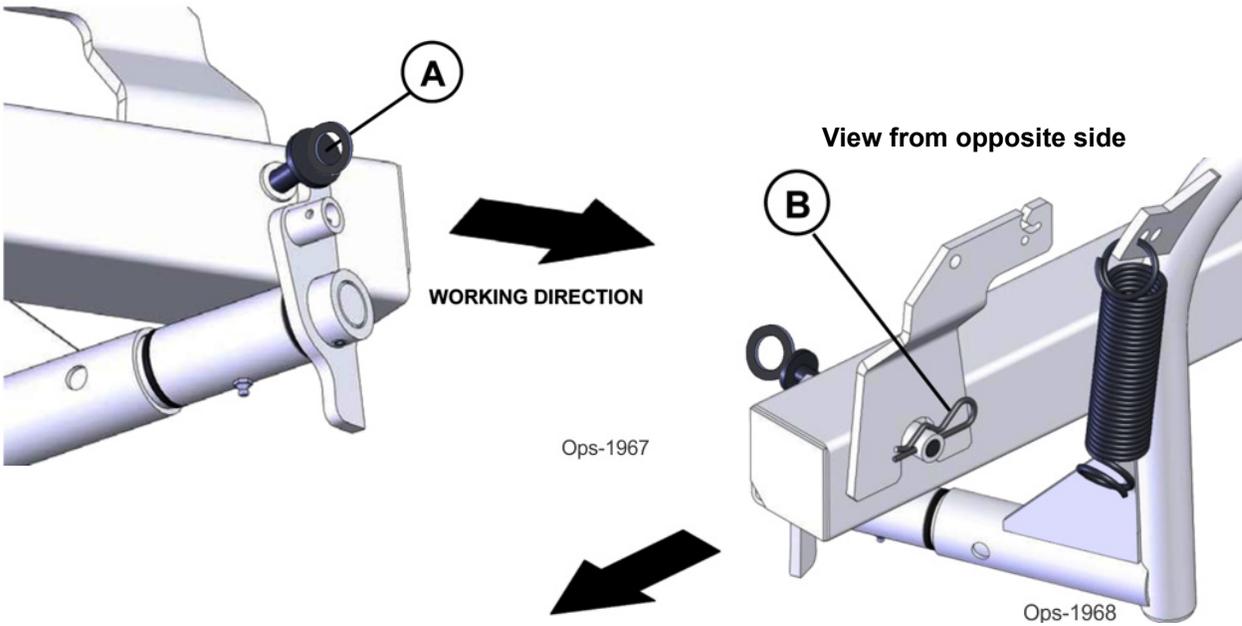


Ops-1966

OPERATION

OPERATION

OPERATION

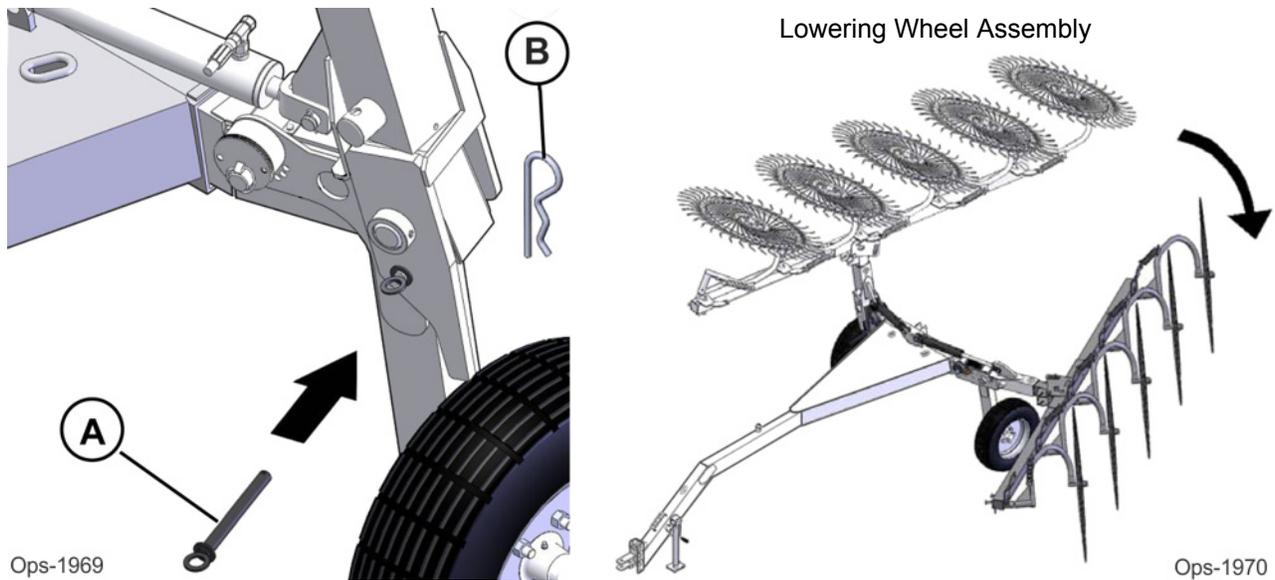


8.11 Raking a Single Windrow or Swath

1. Raise both raking wheels to maximum height.
2. Install left-hand and right-hand transport lock pins (A) Ops-1969. Fasten with spring locking pins.
3. If left-hand raking is desired, remove transport pin (A) Ops1969 from left-hand side and store as described in "Preparing Rake for Field Operation".

NOTE: Repeat process if right-hand raking is desired.

4. Lower raking wheel assembly.

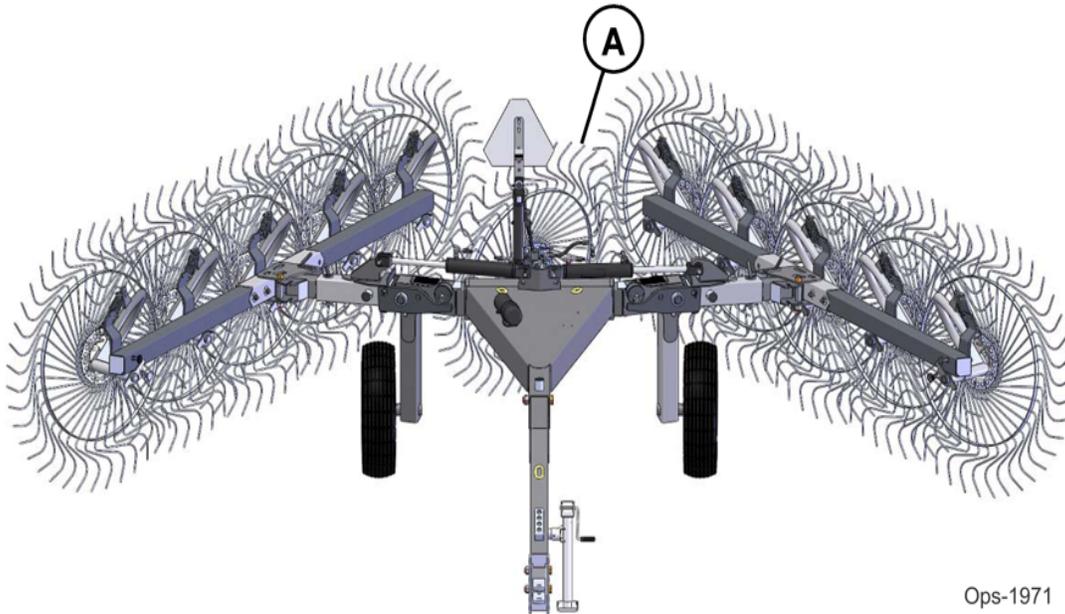


OPERATION

9. OPTIONAL ATTACHMENTS

9.1 Center Kicker Wheel (A)

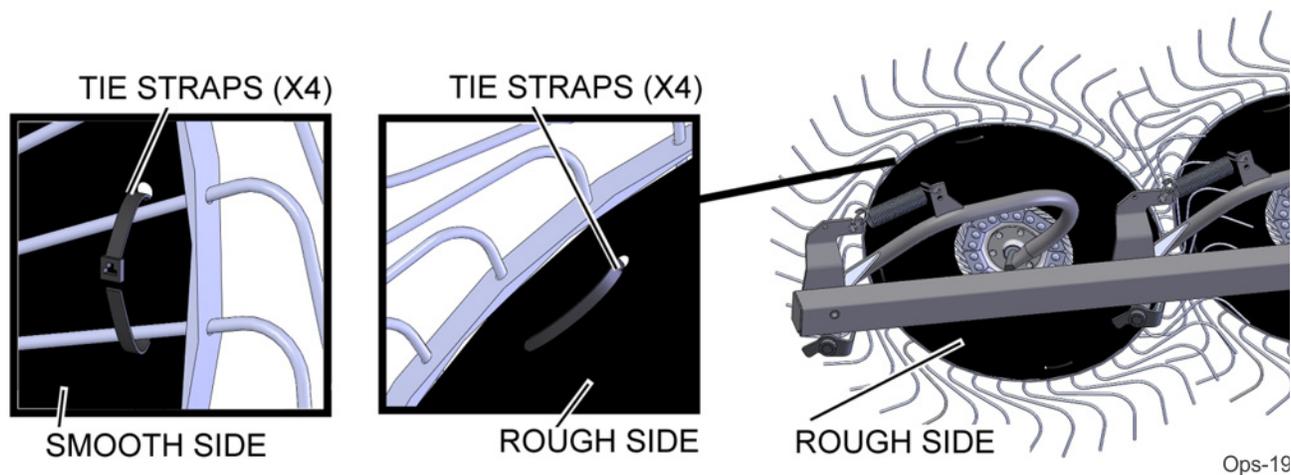
Center Kicker Wheel (A) is used to fluff center part of windrow. It can be used when raking three windrows together or after mower and tedder applications. Refer to Center Kicker Wheel Assembly Instructions in this Operator's Manual.



9.2 Wind Shield Kit

Wind Shield made of ABS plastic should be used:

- to provide smoother movement of the crop
- to help keep fine or short crops in the windrow
- to help prevent crops from sticking to the wheels
- to help block heavy cross winds from interfering while raking



OPERATION

10. OPERATING THE TRACTOR AND IMPLEMENT

THE OPERATOR MUST COMPLETELY UNDERSTAND HOW TO OPERATE THE TRACTOR AND IMPLEMENT AND ALL CONTROLS BEFORE ATTEMPTING TO OPERATE. The operator must read and understand the Safety and Operation Sections of the implement and tractor operator's manuals. These manuals must be read and explained to any operator who cannot read. Never allow someone to operate the implement and tractor without complete operating instructions.

Before starting any operation, the operator must become familiar with the area to be worked in and any obstacles and hazards contained within to ensure safety to the operator, bystanders, and equipment. Special attention should be paid to foreign debris, rough terrain, steep slopes, and passersby and animals in the area. *OPS-U-0015*

10.1 Foreign Debris Hazards

Before raking, inspect the area to make sure there are no foreign objects that the rake teeth could hit or become entangled with. Remove all foreign objects and debris. If objects are too big to remove, mark them clearly and be sure to prevent the mower blades from contacting them.

If you hit a solid object or foreign debris, stop the implement and tractor at once. Immediately idle the engine speed. Wait for all rotating motion to stop, then raise the implement and move the tractor and implement off the object. Inspect the area and remove, or mark the location of the debris. Inspect the condition of the implement and make any needed repairs immediately. Make sure the teeth are not damaged and the tines are uniform before resuming operation.

Always wear your seat belt securely fastened and only operate the tractor and mower with the ROPS in the raised position. If the tractor or implement hits a tree stump, rock, or bump, a sudden movement could throw you off of the seat and under the tractor and/or implement. The seat belt is your best protection from falling off the tractor and the ROPS provides protection from being crushed during a tractor roll-over. *OPS-RK-0007_A*

10.2 Bystanders/Passersby Precautions

If a bystander comes within 300 feet of the tractor while the rake is being operated, stop the tractor at once, and idle the engine. *OPS-RK-0016*

Stay alert and watch for trees, low hanging limbs, power lines, and other overhead obstacles and solid ground objects while you are operating. Use care to avoid hitting these items. *OPS-R-0028_A*



OPERATION

10.3 Shutting Down the Implement

Park the tractor on a level surface, place the transmission in park or neutral and apply the parking brake, lower the attached implement to the ground, shut down the engine, remove the key, and wait for all motion to come to a complete stop before exiting the tractor. OPS-BL- 0002



11. DISCONNECTING THE IMPLEMENT FROM THE TRACTOR

Before disconnecting the implement, move the implement to a level storage location and lower it to the ground. If the implement is not resting securely on the ground, block the implement up securely before attempting to disconnect it from the tractor.

Use extreme care to keep feet and hands from under the implement and clear of any pinch points caused by the tractor hitch arms and implement pins. OPS-RK-0009_A



Always shut the Tractor completely down, place the transmission in park, and set the parking brake before you or anyone else attempts to connect or disconnect the Implement and Tractor hitches. (S3PT-15)

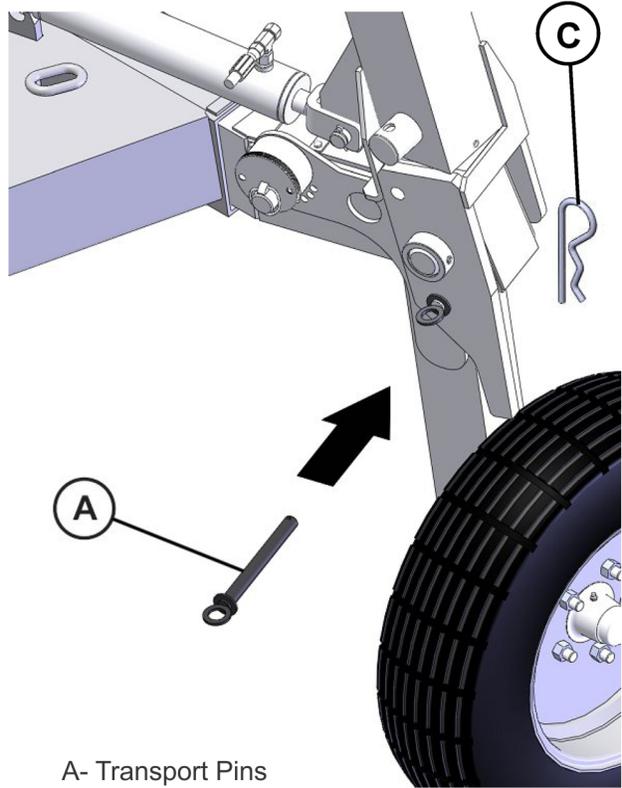


Never unhitch without using the Tongue Jack. The Tongue is very heavy. Attempting to lift the Tongue without using the Tongue Jack could cause strains or other injury. Allowing the tongue to fall suddenly and unexpectedly could result in crushing injury. Use the Tongue Jack for lifting the Implement only. Overloading the Tongue Jack can cause failure with possible serious bodily injury or even death. (STI-04)

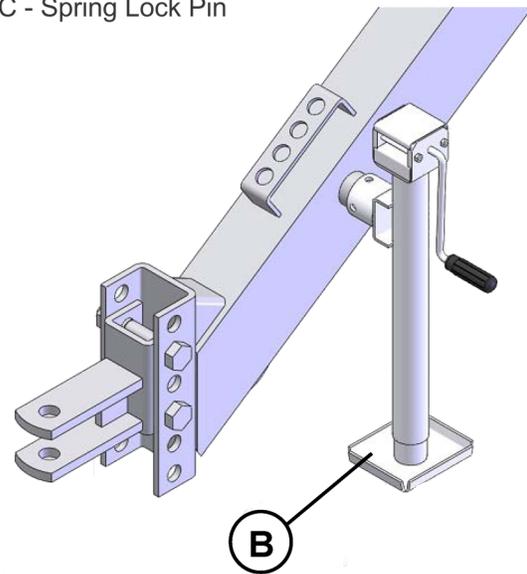
OPERATION

OPERATION

1. Park rake on level surface, or block ground wheels so machine cannot roll after detaching from tractor.
2. Lower rake wheels, or raise rake wheels.
 - If rake wheels are raised, install transport pins (A) through arm support brackets and fasten with spring-locking pins (C).
3. Engage tractor parking brake and/or place transmission in "Park".
4. Shut off tractor engine and remove key.
5. Push tractor SCV lever to the float position.
6. Lower jackstand (B) and fasten with pin.
7. Adjust rake hitch to support weight of rake on jackstand.



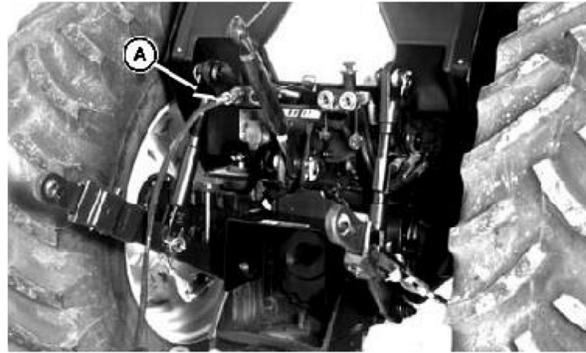
A- Transport Pins
B - Jackstand
C - Spring Lock Pin



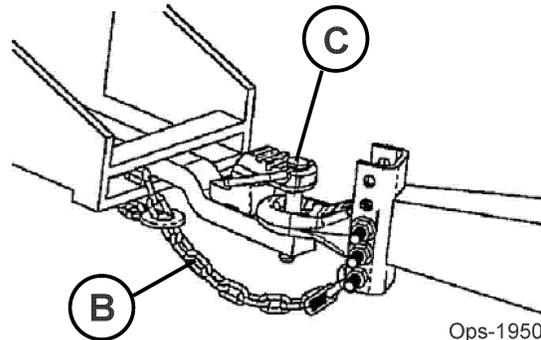
Ops-1949

OPERATION

8. Disconnect hydraulic hoses (A) from tractor receptacles.
9. Unhook safety chain (B).
10. Remove hitch pin (C)
11. Put tractor SCV lever in the neutral position.



Ops-1948



Ops-1950

RAKE STORAGE

Properly preparing and storing the implement at the end of the season is critical to maintaining its appearance and to help ensure years of dependable service. The following are suggested storage procedures:

- Thoroughly clean all debris off the implement to prevent damage from rotting hay and standing water.
- Lubricate all implement grease points and fill gearbox oil levels as detailed in the maintenance section.
- Tighten all bolts and pins to the recommended torque.
- Check the implement for worn and damaged parts. Perform repairs and make replacements immediately so that the implement will be ready for use at the start of the next season.
- Store the implement in a clean, dry place with the implement housing resting securely on blocks or at ground level.
- Keep the implement from sitting in water, dirt and other contaminants.
- Use spray touch-up enamel where necessary to prevent rust and maintain the appearance of the rake. *OPS-RK-0010*



Ops-1028

OPERATION



Never allow children to play on or around Tractor or Implement. Children can slip or fall off the Equipment and be injured or killed. Inadvertent contact with controls can cause the Implement to shift or fall crushing themselves or others. (SG-25)

12. TRANSPORTING THE TRACTOR AND IMPLEMENT

Inherent hazards of operating the tractor and implement and the possibility of accidents are not left behind when you finish working in an area. Therefore, the operator must employ good judgement and safe operation practices when transporting the tractor and implement between locations. By using good judgement and following safe transport procedures, the possibility of accidents while moving between locations can be substantially minimized. OPS-U- 0017



Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)



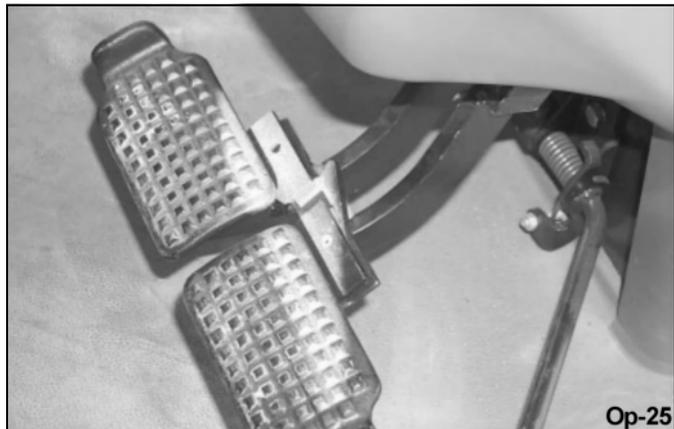
OPERATION

When transporting, only raise the rake enough to clear ground obstacles to prevent tipping, especially when traveling through rough terrain. OPS-RK-0017



Before transporting the tractor on a public roadway or boarding a trailer for transport, the tractor brake pedals should be locked together. Locking the pedals ensures that both wheels brake simultaneously while stopping, especially when making an emergency stop.

Use extreme caution and avoid hard applications of the tractor brakes when towing heavy loads at road speeds. Never tow the implement at speeds greater than 20 MPH (32 kph). OPS-U- 0018



OPERATION

12.1 Preparing Rake for Transport

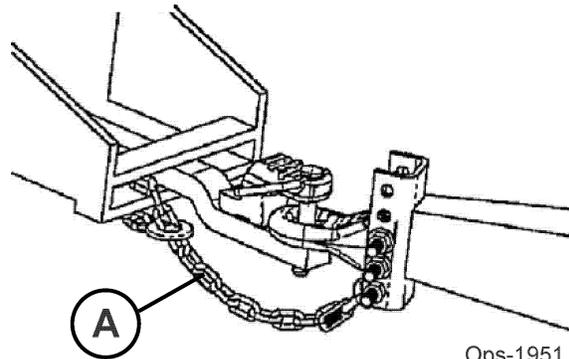
1. Park rake on level surface.
2. Engage tractor parking brake and/or place transmission in "Park".
3. Shut off tractor engine and remove key.
4. Make sure safety chain (A) is attached. Provide only enough slack in chain to permit turning.
5. Put jackstand (B) in storage position.

CAUTION: A safety chain will help control drawn equipment should it accidentally separate from the drawbar. A runaway machine could cause sever injury or death to someone. Provide only enough slack tin chain to permit turning. Do Not use safety chain for towing.

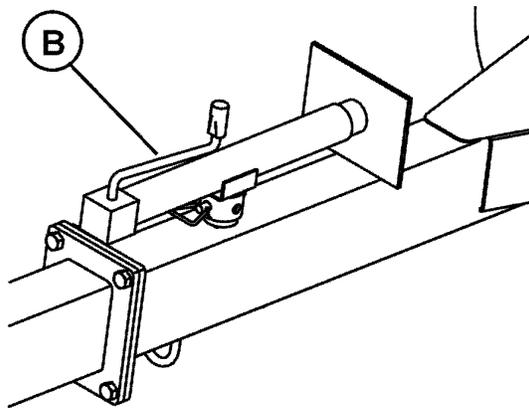
6. Be sure SMV emblem and reflectors are clean and visible.
7. Clean out any crop and chaff trapped between rake tines and frame.
8. Remove right-hand and left-hand transport lock pins (D).
9. Raise rake wheels to their maximum height.

CAUTION: To avoid bodily injury or death, install transport lock pins to prevent rake arms from dropping during transport and colliding with vehicles or other fixed objects.

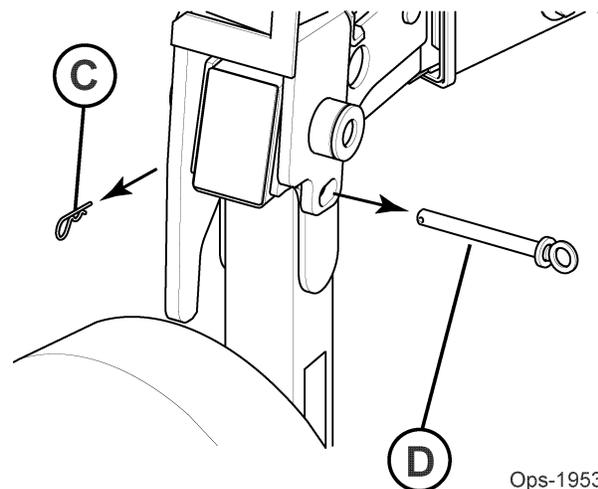
10. Install transport lock pins (D) through arm support brackets. Fasten with spring-locking pins (C).



Ops-1951



Ops-1952



Ops-1953

OPERATION

12.2 Transporting on Public Roadways

Extreme caution should be used when transporting the tractor and implement on public roadways. The tractor must be equipped with all required safety warning features including a SMV emblem and flashing warning lights to alert drivers of the tractor's presence. Remember that roadways are primarily designed for automotive drivers and most drivers will not be looking out for you, therefore, you must look out for them. Check your side view mirrors frequently and remember that vehicles will approach quickly because of the tractor's slower speed. Be extremely cautious when the piece of equipment that you are towing is wider than the tractor tire width and/or extends beyond your lane of the road. OPS-BL-0003



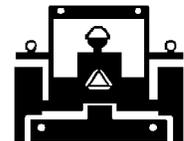
Only tow the Implement behind a properly sized and equipped Tractor which exceeds the weight of the Implement by at least 20%. DO NOT tow the Implement behind a truck or other type of vehicle. Never tow the Implement and another Implement connected in tandem. Never tow the Implement at speeds over 20 MPH. (STI-06)



Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)



Make certain that the "Slow Moving Vehicle" (SMV) sign is installed in such a way as to be clearly visible and legible. When transporting the Equipment use the Tractor flashing warning lights and follow all local traffic regulations. (SG-6)



The SMV (Slow-Moving Vehicle) emblem is universal symbol used to alert drivers of the presence of equipment traveling on roadways at a slow speed. SMV signs are a triangular bright orange with reflective red trim for both easy day and night visibility. Make sure the SMV sign is clean and visible from the rear of the unit before transporting the tractor and implement on a public roadway. Replace the SMV emblem if faded, damaged, or no longer reflective. OPS-U- 0020



Op-43

OPERATION

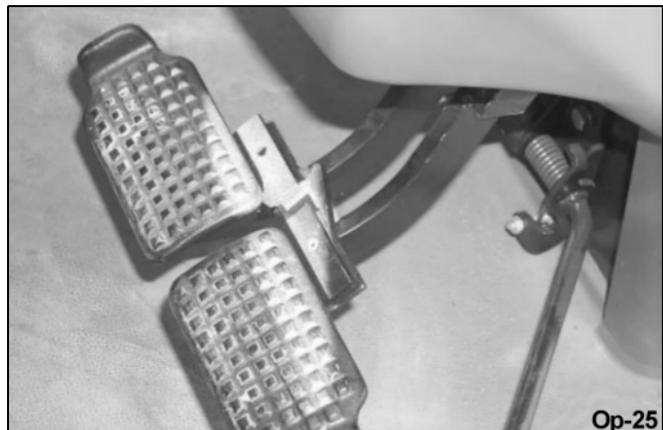
Make sure that all tractor flashing warning lights, headlights, and brake/tail lights are functioning properly before proceeding onto public roads. While newer model tractors have plenty of lighting to provide warning signals and operating lighting, most older models are only equipped with operating lights. Consult an authorized tractor dealer for lighting kits and modifications available to upgrade the lighting on older tractor models. *OPS-U- 0021*



When operating on public roads, have consideration for other road users. Pull to the side of the road occasionally to allow all following traffic to pass. Do not exceed the legal speed limit set in your country for agricultural tractors. Always stay alert when transporting the tractor and implement on public roads. Use caution and reduce speed if other vehicles or pedestrians are in the area. *OPS-B- 0022*



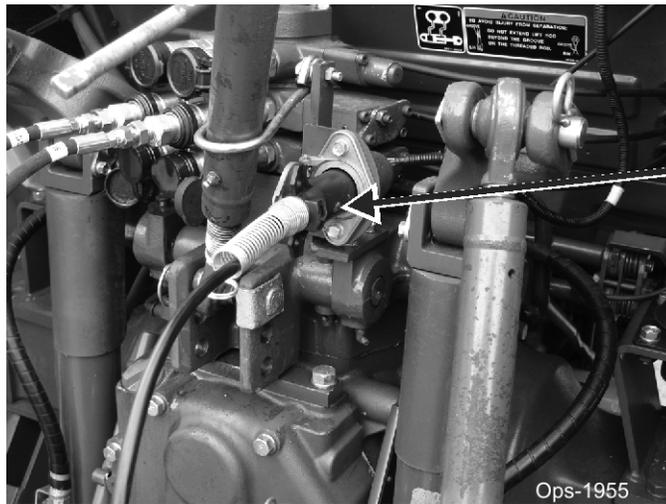
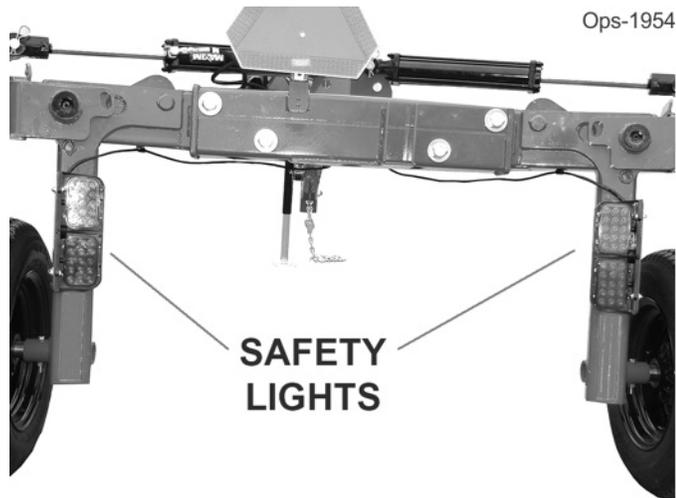
Reduce speed before turning or applying the brakes. Ensure that both brake pedals are locked together when operating on public roads. *OPS-U- 0023*



OPERATION

12.3 Safety Lights

The Bush Hog BSR Series Hay Rakes are shipped from the factory with Safety Lights installed on the rakes. The Safety Lights attach to the tractor with a 7 pin connector provided on the wiring harness. Older tractor models may not have the female connector for the harness to plug into and should be installed to the tractor by a qualified person in order for the Safety Lights to function properly with the tractor light system.



7 Pin Plug installed on the rear of tractor.

OPERATION

OPERATION

12.4 Hauling the Tractor and Implement

Before transporting a loaded tractor and implement, measure the height and width dimensions and gross weight of the complete loaded unit. Ensure that the load will be in compliance with the legal limits set for the areas that will be traveled through. *OPS-U- 0024*



Use adequately sized and rated trailers and equipment to transport the tractor and implement. Consult an authorized dealer to determine the proper equipment required. Using adequately sized chains, heavy duty straps, cables and/or binders, securely tie down both the front and rear of the tractor utilizing the proper tie down locations as specified by the tractor manufacturer. *OPS-U- 0025*



Arrange the chains so that when tightened, the chains are pulling downward and against themselves. Carefully tighten the securing chains or other fasteners using boomers or binders to apply maximum tension. Use extreme care when attaching and removing the securing devices as the extreme tension involved when released has the potential to inflict serious injury.

While hauling the tractor and implement, make occasional stops to check that the tractor and implement have not moved or shifted and that the securing chains have maintained tension. If during transport a hard braking, sharp turning, or swerving action was performed, stop at the next safe location to inspect the security of the load. *OPS-U- 0026*



OPERATION

13. TROUBLESHOOTING GUIDE

Problem	Possible Cause	Remedy
Field not cleaned well.	Rake wheels too high.	Adjust rake wheels lower to ground.
Hay is bunching.	Tips of tines collecting dirt. Incorrect ground speed. Steel burrs on tines or hoops. Ground wheels and wheel supports obstruct flow of hay.	Remove paint and dirt from tips of tines. Increase or decrease ground speed. Remove burrs. Adjust wheels and wheel supports toward center of rake.
Rake wheel hoops breaking.	Excessive ground speed. Excessive ground pressure.	Reduce ground speed. Reduce ground pressure.
Tines breaking.	Excessive ground speed. Excessive ground pressure.	Reduce ground speed. Reduce ground pressure.
Rake wheel does not turn.	Inadequate lubrication. Failed bearing.	Lubricate wheel. (See Maintenance) Replace bearing.
Poor windrow preparation.	Rake wheels too high. Broken or missing tines. Excessive ground speed. Slow ground speed. Excessive ground pressure.	Lower rake wheels. Replace tines. Reduce ground speed. Increase ground speed. Reduce ground pressure.
Rake wheels on one side do no turn.	Rake wheels too high. Broken or missing tines.	Lower rake wheels. Replace tines.

HYDRAULIC PROBLEMS

Hydraulic system inoperative.	Remote outlet valve not activated. Hose from implement not properly connected to tractor. Hydraulic oil level too low in tractor.	Open remote hydraulic outlet valve. Connect hose. Check tractor operator's manual.
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MAINTENANCE SECTION

Maintenance Section 5-1

MAINTENANCE

MAINTENANCE



Any repair work must be carried out with the machine at rest and disconnected from the tractor.



Do not carry out welding without authorization and instruction from the manufacturer.



Disconnect the machine from the tractor before any welding work. damage to battery could result.



Always use a protective mask, goggles and gloves when welding, sanding or grinding or when using a hammer or drill.



Always work on the machine out of doors. if you have to operate the machine when connected to the tractor in an enclosed area (when testing after repair or maintenance), ensure that there is sufficient ventilation so as to prevent noxious exhaust gases from accumulating.



Do not use gasoline, solvents or other flammable liquids as detergents.



Use commercial non-flammable and non-toxic solvents.



Do not use compressed air or water at high pressure to clean the machine. if this is unavoidable, then wear goggles with side protection and limit the pressure as much as possible. when the work is finished, and with the machine disconnected from the tractor, inspect and check the machine completely.

The following should be noted if the machine is scrapped:

The machine consists mainly of ferrous material which must be disposed of according to the regulations in force in the country concerned.

There is also a small amount of plastic which must be disposed of according to the regulations in force in the country concerned.

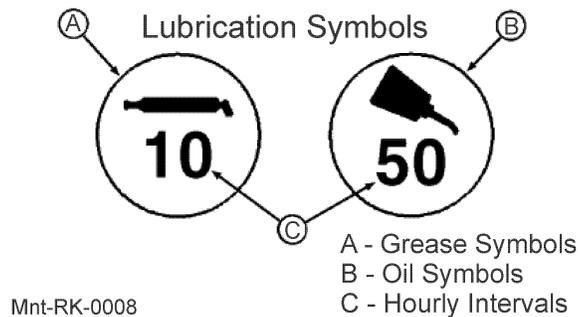
MAINTENANCE

LUBRICATION

- The recommended intervals are based on normal conditions. Severe or unusual conditions may require shorter intervals.
- Perform each lubrication and maintenance illustrated in this section at the beginning of the season and at the end of the season.
- Clean lubrication fittings before lubricating. Replace lost or broken fittings immediately. If a new fitting fails to take grease, remove and check for failure of adjoining parts.

Lubrication Symbols

1. Follow hourly (C) intervals on grease symbols (A) and oil symbols (B).
2. GREASE SYMBOL
 - (A) Lubricate with High Temp EP grease or equivalent SAE multipurpose grease (Unless otherwise specified) at hourly intervals indicated on the symbols.
3. OIL SYMBOL
 - (B) Lubricate with SAE 30 or heavier oil at hourly intervals indicated on the symbols.



Grease

Use grease, based on NLGI consistency numbers and the expected air temperature range during the service interval.

The following greases are preferred:

HD POLYUREA GREASE

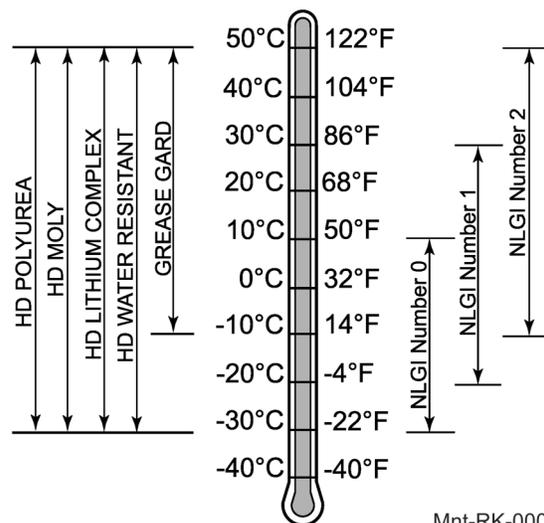
The following types of grease are also recommended:

- HD MOLY GREASE
- HD LITHIUM COMPLEX GREASE
- HD WATER RESISTANT GREASE
- GREASE-GARD

Other greases may be used if they meet the following:

NLGI Performance Classification CG-LB

IMPORTANT: Some types of grease thickener are not compatible with other.



MAINTENANCE

MAINTENANCE

Synthetic Lubricants

Conditions in certain geographical areas may require lubricant recommendations different from those printed in this manual.

Some coolants and lubricants may not be available in your location.

Consult your dealer to obtain information and recommendations.

Synthetic lubricants may be used if they meet the performance requirements as shown in the manual.

The temperature limits and service intervals shown in this manual apply to both conventional and synthetic oils.

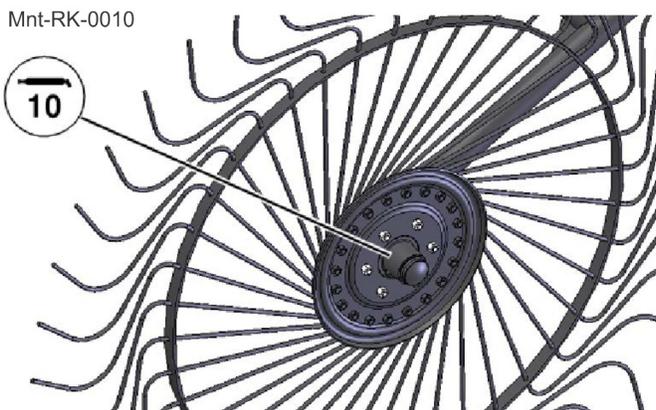
Refined base stock products may be used if the finished lubricant meets the performance requirements.

Lubricant Storage

- Your equipment can operate at top efficiency only when clean lubricants are used.
- Use clean containers to handle all lubricants.
- Whenever possible, store lubricants and containers in an area protected from dust, moisture, and other contamination.
- Make certain that all containers are properly marked to identify their contents.
- Properly dispose of all old containers and any residual lubricant they may contain.

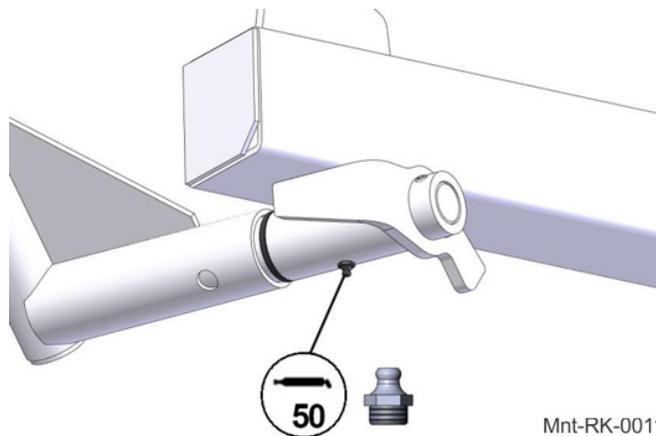
Rake Wheels

Every 10 Hours



Left-Hand & Right-Hand Finger

Every 50 Hours - Grease Lightly



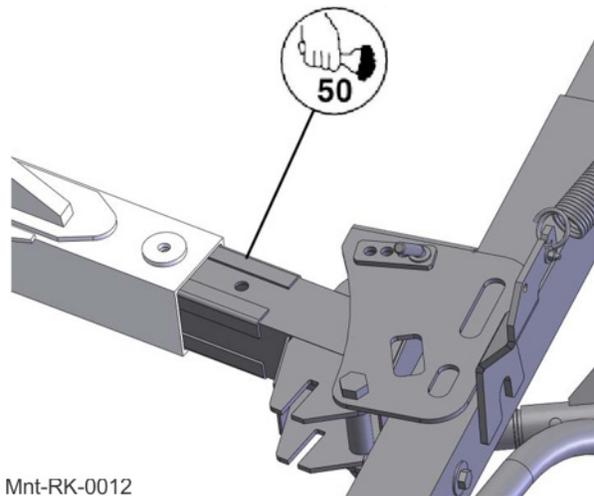
Mnt-RK-0011

MAINTENANCE

MAINTENANCE

Left-Hand and Right-Hand Pivots

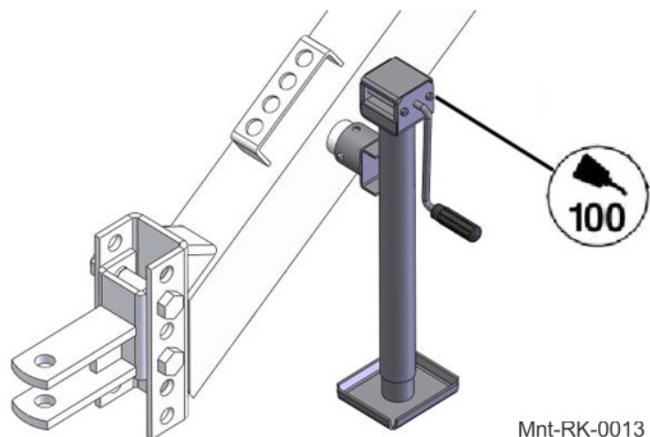
Every 50 Hours - Grease lightly



Mnt-RK-0012

Jackstand

Every 100 Hours - Oil Threads



Mnt-RK-0013

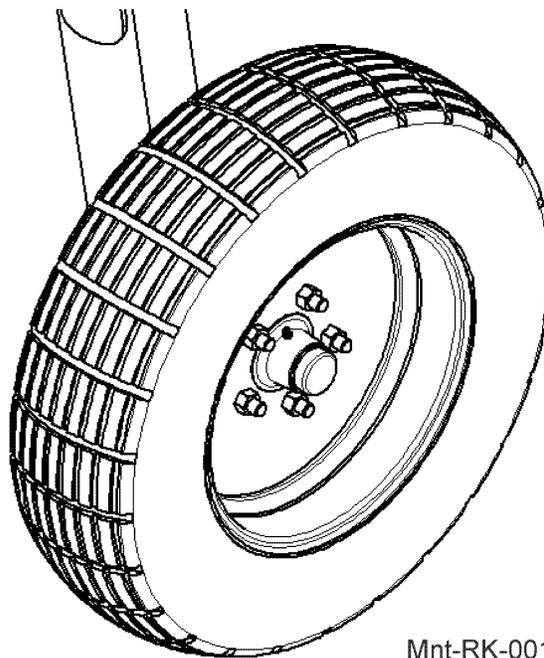
MAINTENANCE

MAINTENANCE

ANNUAL MAINTENANCE

Repack Wheel Bearings:

1. Raise one side of machine and install support stands.
2. Remove wheel.
3. Remove hub cap cotter pin, and wheel nut.
4. Remove washer, bearing, and wheel hub.
5. Remove rear seal and bearing.
6. Clean all parts in solvent and blow dry with compressed air, Replace any worn or damaged parts,
7. Pack bearings with EP Moly or an equivalent SAE multipurpose type grease, or wheel bearing grease. Coat rear seal with same grease.
8. Install rear bearing and seal.
9. Install wheel hub, front bearing, washer and nut. Tighten nut until a slight rag is felt when hub is turned. Back nut off just enough to install cotter pin in hole in spindle.
10. Install hub cap and wheel, Refer to Maintenance section for bolt torque chart.
11. Repeat procedure on other wheel.
12. Check wheel hardware torque after one hour of operation and at 50 hour intervals.



Mnt-RK-0014

PERIODIC MAINTENANCE

1. Periodically inspect rake and make necessary repairs.
2. Check frame for fatigue or cracking. Replace or repair worn or damaged parts.
3. Check decals; replace if missing or damaged.
4. Check bolts and fasteners; tighten or replace as necessary.
5. Check tire pressure. Inflate to 50 psi.
6. Check tires and rims for damage.
7. Check condition of raking wheels for loose hardware, loose bearings, and broken or bent tires.
8. Check hydraulic cylinders and hoses for leaks or damage.

MAINTENANCE

SERVICE

Servicing Tires Safely



Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment to perform the job.

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel/

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage is available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

Mnt-RK-0015



Servicing Rake Safely



Avoid serious injury from falling rake wheels during service. Make sure bystanders are clear before lowering rake wheels.

Do not service or adjust machine with rake wheels raised.

Mnt-RK-0016

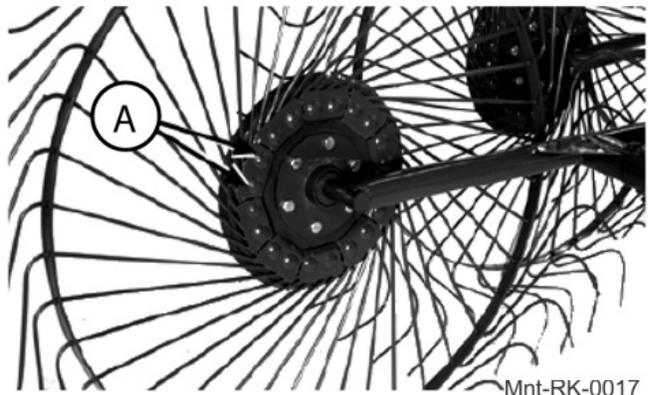


MAINTENANCE

Replacing Wheel Tines

To replace a tine:

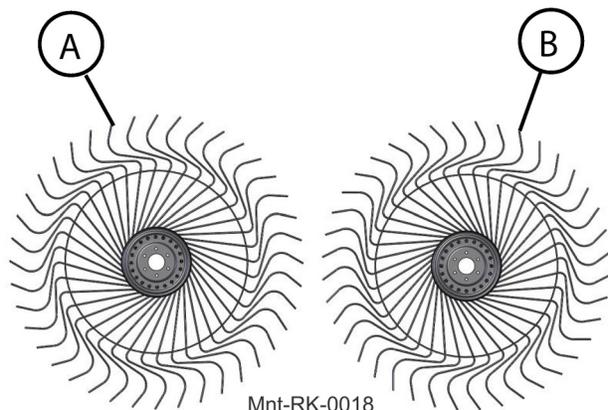
1. Remove two round-head bolts (A), nuts, clip and tine.
2. Install new tine. Fasten with clip, round-head bolts (A) and nuts.



Identifying Left-Hand and Right-Hand Rake Wheels

To identify left-hand and right-hand rake wheels:

1. Put rake wheels against a wall with tine mounting clamp plates facing inward.
2. If the last bend in the tines curve to a clockwise direction, it is left-hand rake wheel.(A).
3. If the tines curve in a counterclockwise direction, it is a right-hand rake wheel (B).



STORAGE

End of Season

To prepare your Rake for storage:

1. Clean the rake following instructions and allow it to dry. Trash and dirt will draw moisture and cause rust.
2. Thoroughly tighten all screws, bolts, nuts and hydraulic fittings.
3. Store the rake on a clean, dry surface in the down (working) position.
4. Grease the machine thoroughly and then cover it completely.
5. Apply a thin layer of grease on exposed cylinder rods to prevent rusting.
6. Check hydraulic hoses for deterioration and replace if necessary.
7. Lubricate all points and slides before storage. This prevents corrosion.
8. Repair or replace worn or broken parts
9. Paint all parts where necessary.
10. Replace damaged or missing decals.
11. List replacement parts needed and order them early.

NOTE: Now would be a good time to replace all damaged or worn parts, and have a machine in perfect condition ready for use the next season.

MAINTENANCE

Important

During extended periods of inactivity it is necessary to close the cylinders completely. This must be done in is such a way as to protect the rods from weather effects.

Beginning of Season

1. Review operator's manual and check adjustments.
2. Lubricate complete machine (See Lubrication and Maintenance Section)
3. Check air pressure in tires. Correct tire pressure is 35 psi.
4. Check all hardware for tightness.
5. If any major moving parts have been replaced make sure they run properly.

FINAL INSPECTION AND LUBRICATION

WARNING

Do not operate this Equipment with hydraulic oil or fuel leaking. Oil and fuel are explosive and their presence could present a hazard. Do not check for leaks with your hand! High-pressure oil streams from breaks in the line could penetrate the skin and cause tissue damage including gangrene. To check for a hose leak, SHUT the unit ENGINE OFF and remove all hydraulic pressure. Wear oil impenetrable gloves, safety glasses and use Cardboard to check for evidence of oil leaks. If you suspect a leak, REMOVE the HOSE and have it tested at a Dealer. If oil does penetrate the skin, have the injury treated immediately by a physician knowledgeable and skilled in this procedure. (SG-15)



MAINTENANCE

1. Attach rake to tractor (Refer to Attaching and Detaching Section in Operator's Manual)
2. Make sure rake has enough clearance to raise and lower
3. Raise and lower rake.
4. Shut off tractor. Check hydraulic system for leaks. Oil coming out of lift cylinder vent for the first few cycles is normal.
5. Lubricate entire machine. (See Lubrication and Maintenance Section in Operator's Manual)

BOLT TORQUE VALUES

Because of the severe operating conditions, correct bolt torque is very important. An improperly torqued bolt can be easily shaken loose or broken by the vibrations. When replacing bolts, always use the same grade of bolt as used originally. Use the chart as a guide to tightening all bolts. Torque values listed are for general use only.

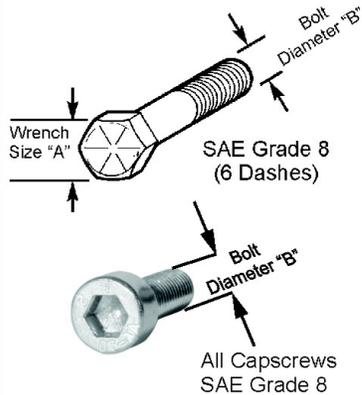
MAINTENANCE

MAINTENANCE

TORQUE SPECIFICATIONS - DRY TORQUE

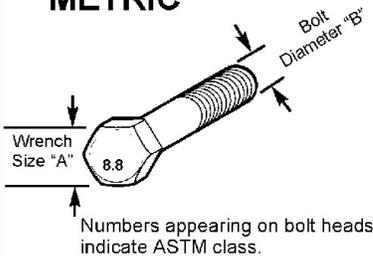
Proper torque for American fasteners.
Recommended Torque in Foot Pounds (Newton Meters).*

AMERICAN Bolt Head Markings



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



Proper torque for Metric fasteners.
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.

Mnt-B-0005



TO THE OWNER/OPERATOR/DEALER

To keep your implement running efficiently and safely, read your manual thoroughly and follow these directions and the Safety Messages in this Manual. The Table of Contents clearly identifies each section where you can easily find the information you need.

The OCCUPATIONAL SAFETY AND HEALTH ACT (1928.51 Subpart C) makes these minimum safety requirements of tractor operators:

REQUIRED OF THE OWNER:

1. Provide a Roll-Over-Protective Structure that meets the requirements of this Standard; and
2. Provide Seat belts that meet the requirements of this paragraph of this Standard and SAE J4C; and
3. Ensure that each employee uses such Seat belt while the tractor is moving; and
4. Ensure that each employee tightens the Seat belt sufficiently to confine the employee to the protected area provided by the ROPS

REQUIRED OF THE OPERATOR:

1. Securely fasten 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 the tractor manufacturer.
9. When the tractor is stopped, set brakes securely and use park lock, if available.

-
- x Keep children away from danger all day, every day...
 - x Equip tractors with rollover protection (ROPS) and keep all machinery guards in place...
 - x Please work, drive, play and live each day with care and concern for your safety and that of your family and fellow citizens.



BUSH HOG[®]

BSR SERIES HAY RAKE

BSR-SOM- 03/14
Printed U.S.A

P/N 50074094