



# BUSH HOG®

# FWR

## BI-FOLD RAKE

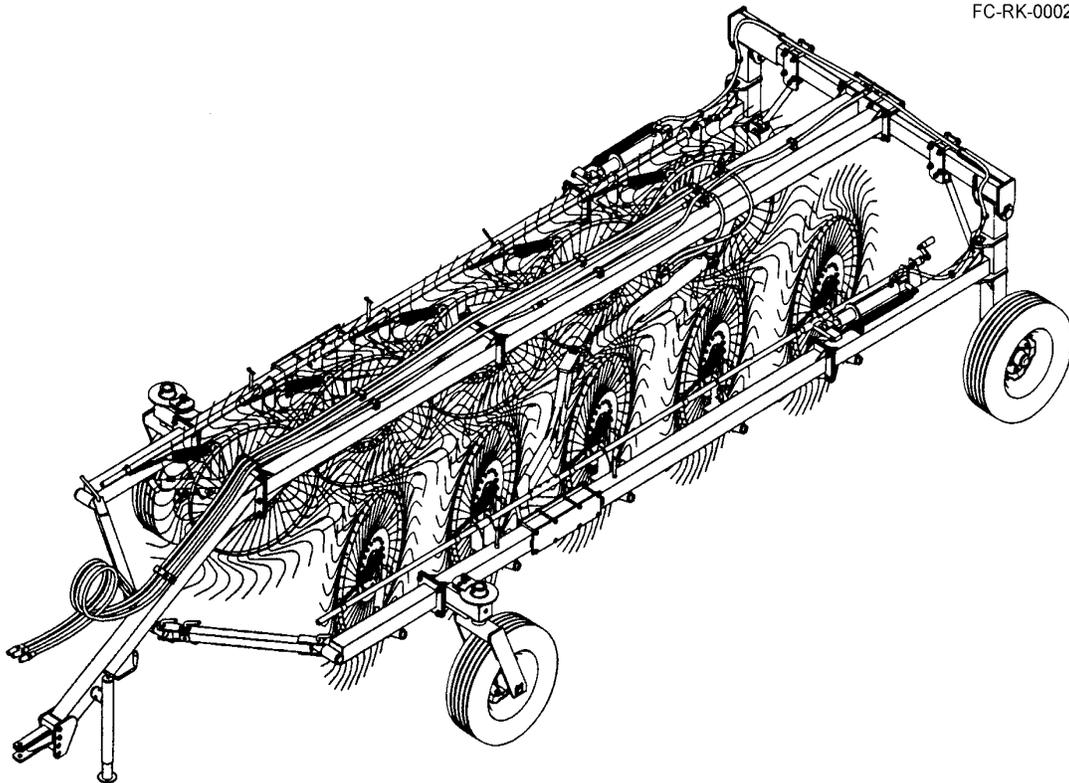
Published 09/10

Part No. 50068776C

## 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*



### BUSH HOG®

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



## 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!

# **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.

599200

### 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 Section 1-1

# 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)

¡ LEA EL INSTRUCTIVO!



# 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)

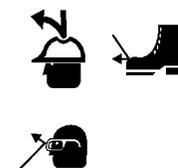
## Operator Safety Instructions and Practices



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



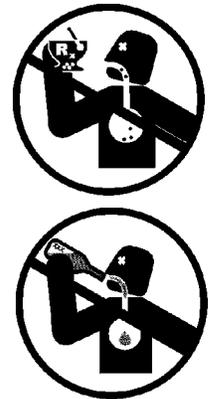
KEEP AWAY FROM ROTATING ELEMENTS to prevent entanglement and possible serious injury or death. (SG-24)



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



NEVER 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)



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)



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)



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)



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)



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

SAFETY

## Equipment Operation Safety Instructions and Practices



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



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)



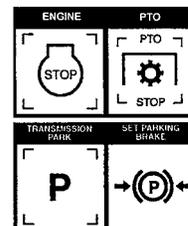
Operate this Implement only in conditions where you have clear visibility in daylight or with adequate artificial lighting. Never operate in darkness or foggy conditions where you cannot clearly see at least 100 yards in front and to the sides of the tractor and implement. Make sure that you can clearly 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, always 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)



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



# SAFETY

**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**

## **Connecting 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)

# SAFETY

## Transporting Safety Instructions and Practices

**WARNING**

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.

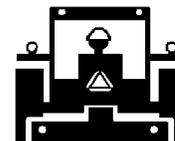
(S3PT-02)

**WARNING**

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)

**WARNING**

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)

## **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)



## **WARNING**

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)

SAFETY

# SAFETY



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



Make sure the PTO shield, integral driveline shields, and input shields are installed when using PTO-driven equipment. Always replace any shield if it is damaged or missing. (S3PT-8)



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)



Always disconnect the main PTO Driveline from the Tractor before performing service on the Implement. Never work on the Implement with the tractor PTO driveline connected and running. Rotating Parts, Blades or Drivelines could turn without warning and cause immediate entanglement, injury or death. (S3PT-11)



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)

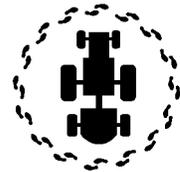


Never attempt to lubricate, adjust, or remove material from the Implement while it is in motion or while tractor engine is running. (SG-20)

# SAFETY

## **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)



## **WARNING**

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)

## **WARNING**

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)

## 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**

## **Concluding Safety Instructions and Practices**

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

**SAFETY**

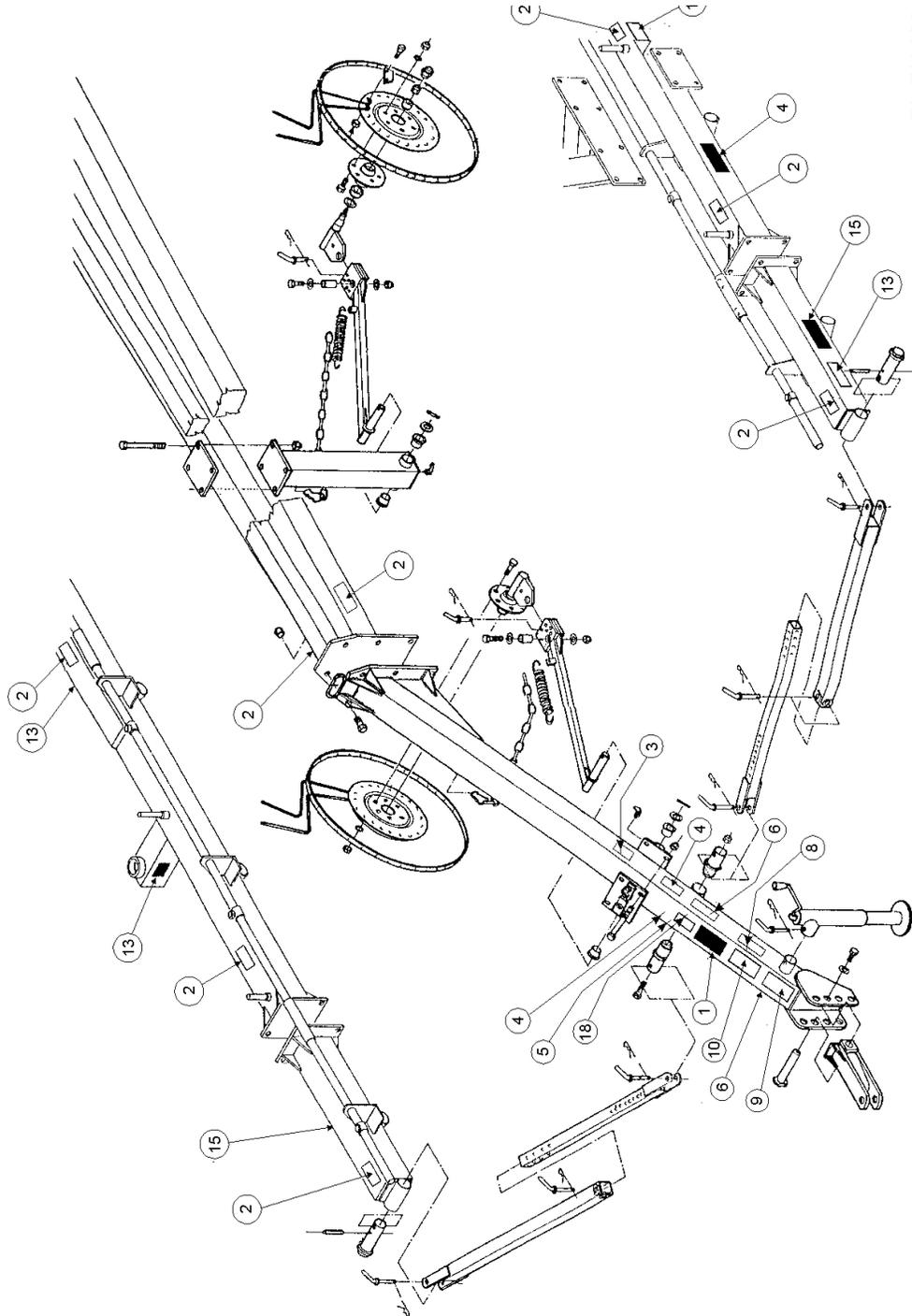
ITEM	PART NO.	FWR817 QTY	FWR1020 QTY	FWR1223 QTY	TYPE	DESCRIPTION
1.	00725746	1	1	1	PELIGRO	Get Manual Translated
2.	02962765	10	14	14	DANGER	Multi-Hazard Pinch Point
3.	5W119	1	1	1	WARNING	Tow Speed
4.	3668308	2	2	2	WARNING	Transport Lock
5.	999200	1	1	1	WARNING	To Avoid Serious Injury
6.	00756059	5	5	5	WARNING	Oil Leak Detection
7.	2458315	2	2	2	WARNING	Stored Energy
8.	00786980	1	1	1	IMPORTANT	Genuine Bush Hog Parts
9.	999001	1	1	1	CAUTION	Tractor Rearing Up
10.	00763977	1	1	1	INSTRUCT	Notice to Owner
11.	03200347	*	*	*	REFLECT	SMV Emblem
12.	1458392	4	4	4	REFLECT	Red Reflector
13.	1458393	6	6	6	REFLECT	Yellow Reflector
14.	1458398	2	2	2	REFLECT	Orange Reflector
15.	50065309	4	4	4	LOGO	Bush Hog
16.	50068844	2	2	2	LOGO	Model Name FWR
17.	NFS	1	1	1	SER PLT	Serial Plate
18.	00776031	1	1	1	_____	Canister
19.	50068776C	1	1	1	MANUAL	Operator's Manual
20.	10058000	3	3	3	_____	Bolt
21.	00024100	3	3	3	_____	Flatwasher
22.	02959924	3	3	3	_____	Locknut

\* -Furnished by tractor manufacturer.

# 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.

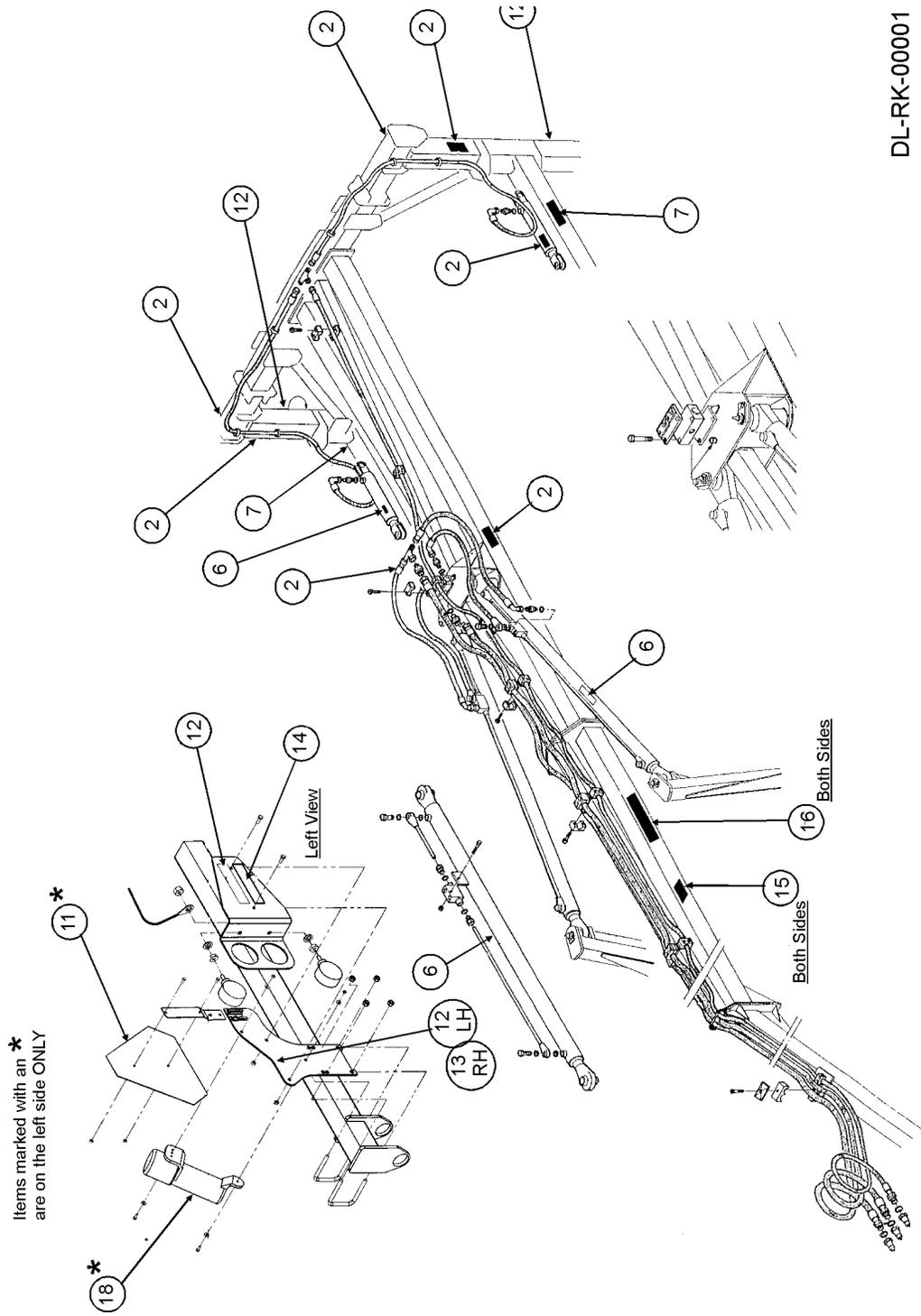


DL-RK-0004

**SAFETY**

# SAFETY

**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.



DL-RK-00001

# SAFETY

SAFETY

## Decal Description

Peligro Translation, If you do not know how to read English, please find someone who knows how to read English.

P/N 00725746



DANGER! Crushing and Pinch Points.

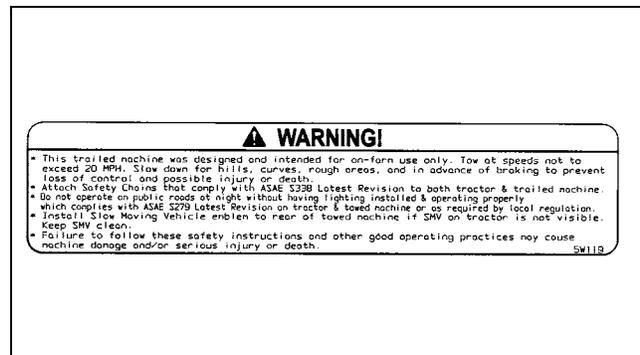
Moving machinery parts can pinch or crush or fall-which may cause injury or death.

P/N 02962765



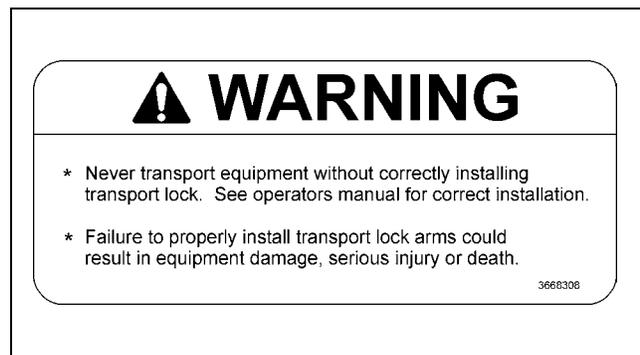
WARNING! Speed Restriction.

P/N 5W119



WARNING! Transport.

P/N 3668308



# SAFETY

WARNING!- Multiple Hazard and General Safety



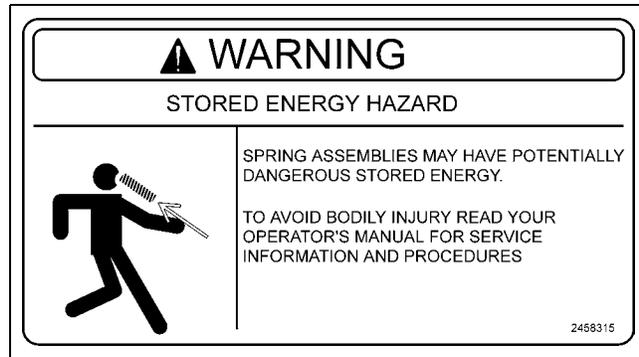
P/N 999200

WARNING! Never use your hand to check for oil leaks. Always use paper or cardboard.



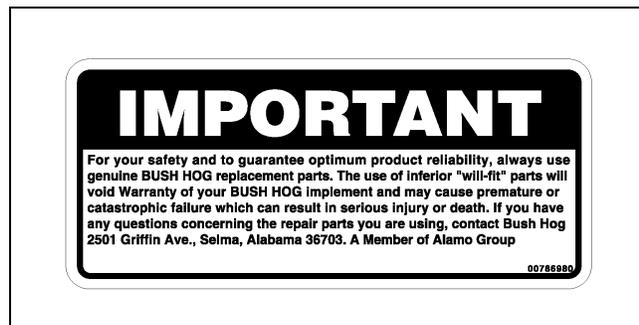
P/N 00756059

WARNING-Stored Energy Hazard



P/N 2458315

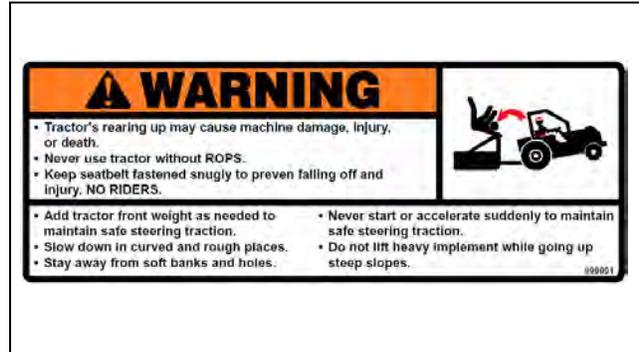
For safety and to guarantee optimum product reliability always use genuine Bush Hog replacement parts.



P/N 00786980

# SAFETY

WARNING! Tractor rearing



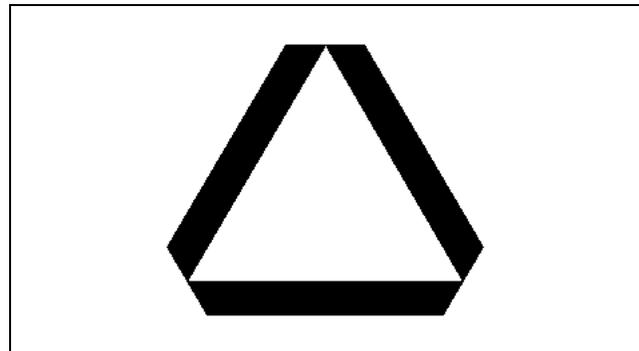
P/N 999001

Operator's Manual (with repair parts) and warranty was attached to this implement during final inspection.



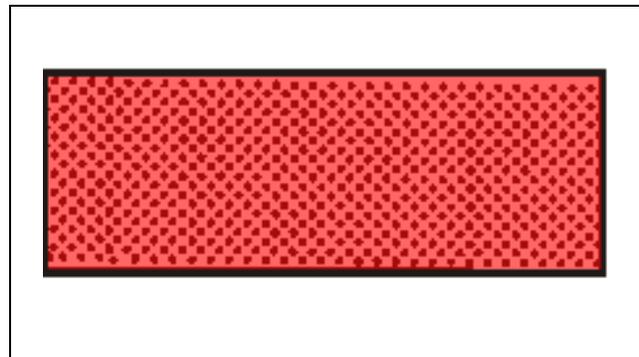
P/N 00763977

Slow Moving Vehicle Decal. Keep SMV reflector clean and visible. DO NOT transport or operate without the SMV.



P/N 03200347

Red Reflector. Keep reflectors clean and visible.



P/N 1458392

**SAFETY**

# SAFETY

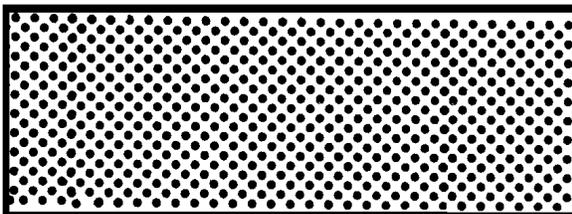
SAFETY

Amber Reflector. Keep reflectors clean and visible.



P/N 1458393

Orange Reflector. Keep reflectors clean and visible.



P/N 1458398

Logo Product Name: Bush Hog (14.85")



P/N 50065309

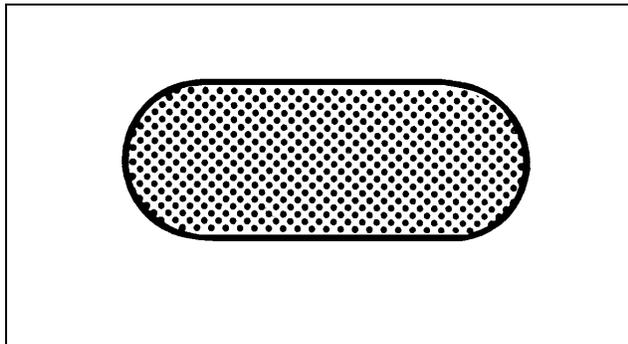
WARNING! Pinch Points



P/N 02962764

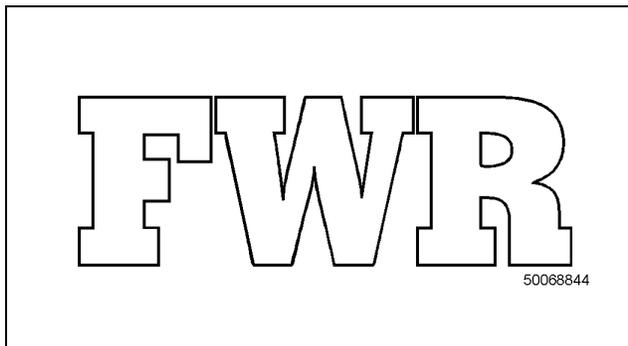
# SAFETY

Yellow Reflectors



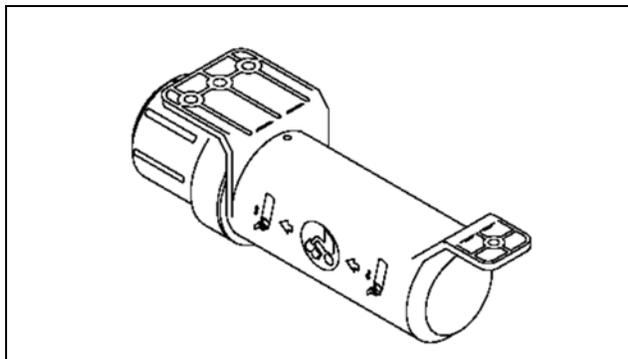
P/N 2738333

MODEL NAME - FWR



P/N 50068844

Read Operator's Manual! The operator's manual is located inside this canister. If the manual is missing order one from your dealer.



P/N 00776031

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](http://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 25 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 Section 2-1

# INTRODUCTION

## INTRODUCTION

This Bi-Fold 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. The Parts Listing section is designed to familiarize the owner/operator with replaceable parts on the 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.



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**.

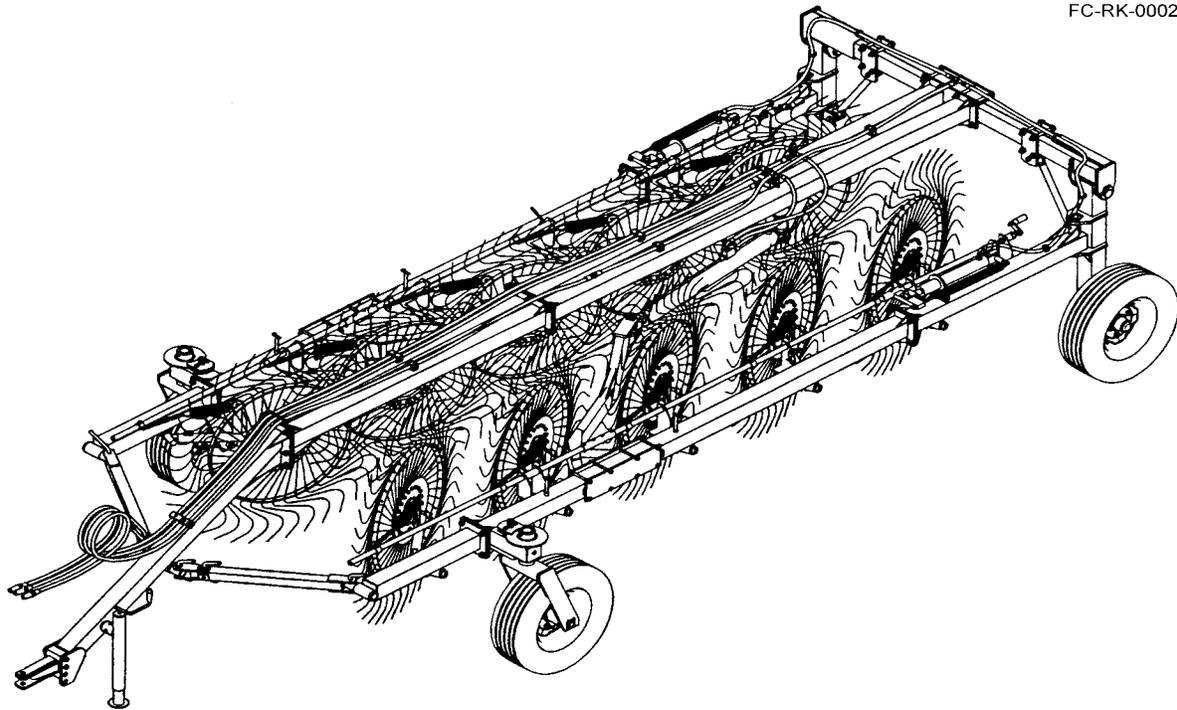


Indicates an imminently hazardous situation that, if not avoided, **MAY** result in **MINOR INJURY**.

**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.

# INTRODUCTION



INTRODUCTION

The FWR rake is gentle on your hay, producing a light “fluffy” windrow ideal for baling, without “roping” the crop material. The adjustable windrow width allows you to match the windrow size to the pickup of your baler, increasing the efficiency of the baling process. All of these standard features, including adjustable working width, adjustable windrow width, hydraulics, and jack stand combine to make the FWR wheel rake the right choice for your raking needs. With a reasonable amount of preventive maintenance, your rake will provide years of dependable service.

The front, rear, left, and right are determined by the normal direction of travel, the same as driving an automobile.

# 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 mower.
2. Fill out the Warranty Card in full. Be sure to answer all questions, including the Serial Number of the Mower. 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 Mower 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 Mower.

# IMPORTANT

**For your safety and to guarantee optimum product reliability, always use genuine BUSH HOG replacement parts. The use of inferior "will-fit" parts will void Warranty of your BUSH HOG implement and may cause premature or catastrophic failure which can result in serious injury or death. If you have any questions concerning the repair parts you are using, contact Bush Hog 2501 Griffin Ave., Selma, Alabama 36703. A Member of Alamo Group**

00786980

# **ASSEMBLY SECTION**

Assembly Section 3-1

# ASSEMBLY

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 in following. 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

These signs and symbols give information to the operator on how to make the best use of the machine so as to prolong life, avoid damage, optimize work and, above all, to avoid injury

## WARNING

Before beginning operations, read the instruction manual carefully.

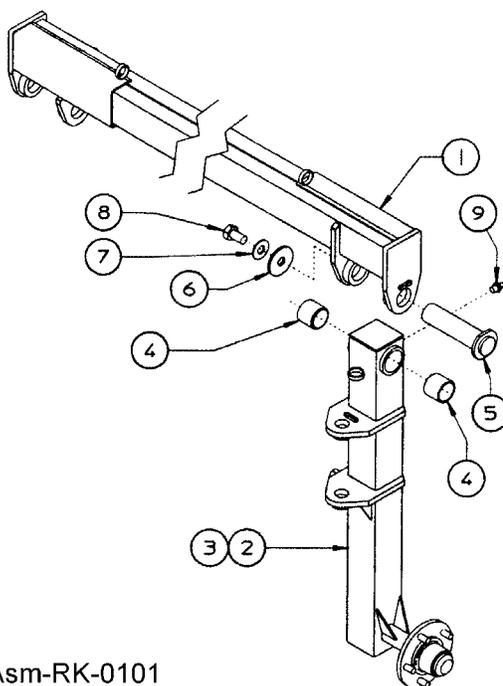
## WARNING

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.

## ASSEMBLY INSTRUCTIONS

In the steps for assembly, we will use the terms "RH part" and "LH part". This distinction is conventionally made looking at the machine from the rear. For the purpose of simplification, we will illustrate machine assembly for one side only; since the machine is symmetrical, each operation must be done on both sides.

1. Press two bushings (4) into either side of pivot tube or rear wheel uprights (3) and (2); bushings are 2 x 2-3/8". Seat bushings fully. Attach the LH and RH wheel supports (2) and (3) to the rear cross members using two 2 x 7-1/2" pins (5). Secure pins by installing M22 x 50mm bolts (8) with flatwashers (6) and 22mm lockwashers (7).

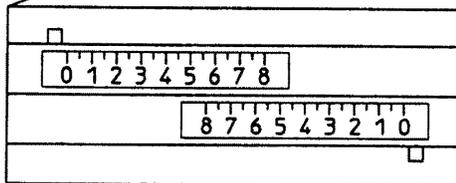
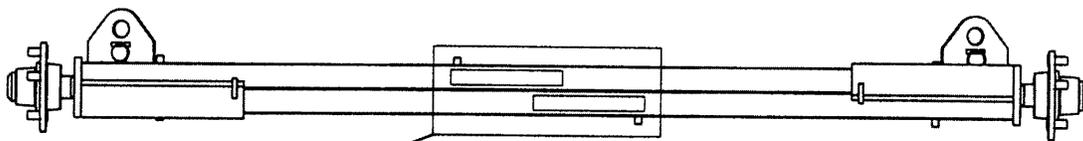
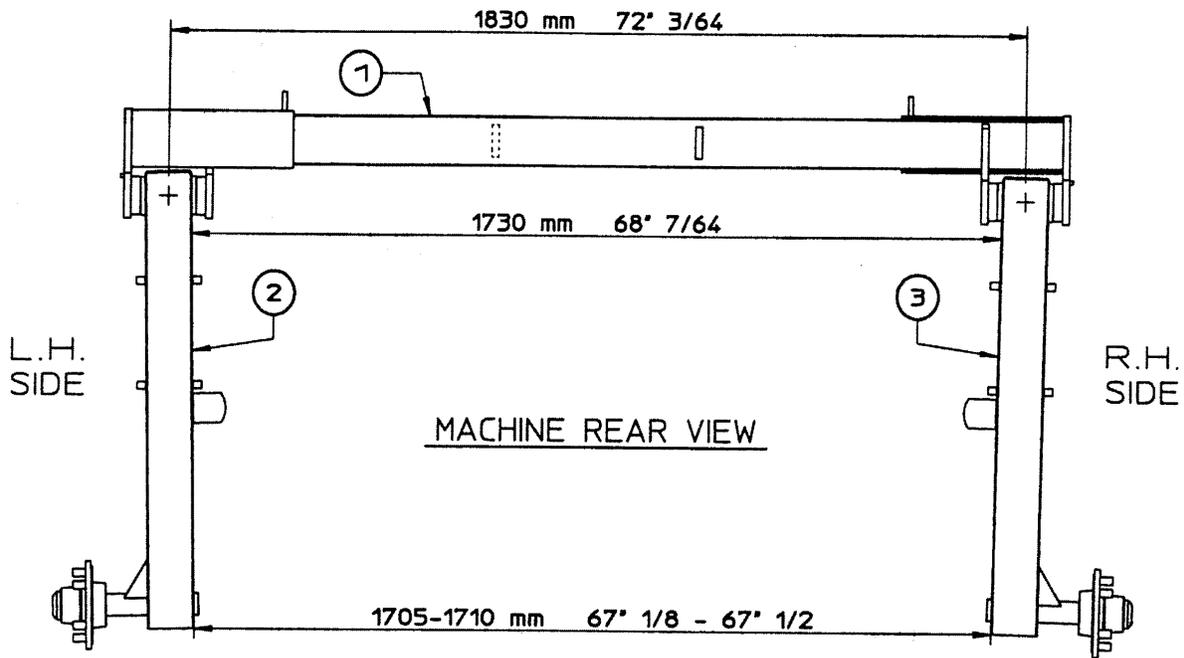


Asm-RK-0101

# ASSEMBLY

ASSEMBLY

- For correct assembly, the RH support (3) and the LH support (2) must lean in slightly towards the center of the machine. After assembly, the arm width should match measurements shown, (minimum width). At this point, before moving on to the next step, keep in mind that the assembly is unstable and therefore, it is recommended that extreme caution be used.



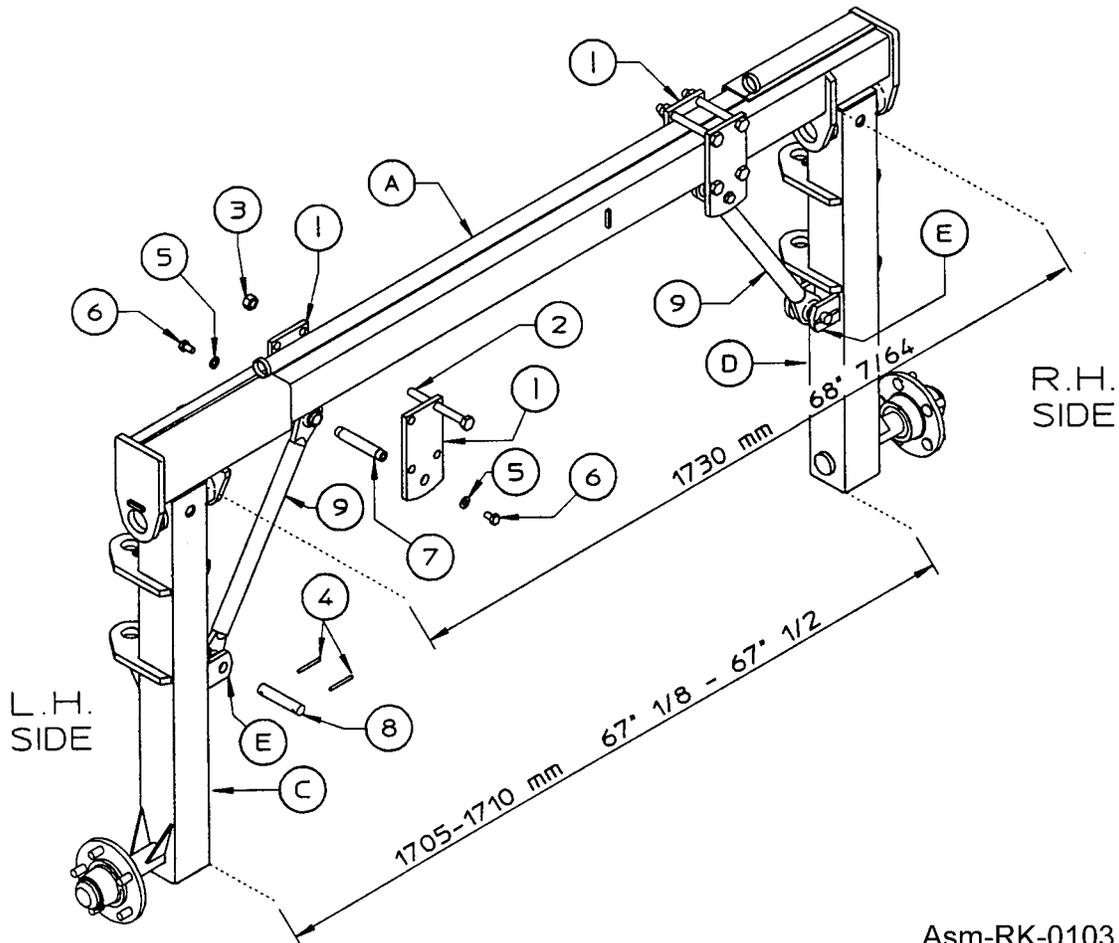
Asm-RK-0102

# ASSEMBLY

## ASSEMBLY

3. Attach plates (1) to cross member (A).

A. Insert M16 x 150mm bolts (2) in the two upper holes of plates (1). Fasten bolts (2) with M16 nuts (3) without fully tightening them, so that plates (1) are straddling cross member (A).



Asm-RK-0103

B. Insert 7/8" x 4" pin (7) in one of the joints of the rod (9).

C. Insert pin 7/8' x 4" pin (7), supporting tie rod (9), between plates (1).

D. Now insert M16 x 150mm bolts (2) in the lower holes of plates (1). Fasten with M16 nuts (3), without full tightening.

E. At this point, insert the other joints of tie rod (9) between the welded plates (E) [LH support (C) and RH support (D) and fasten with the pins (8) and M5 x 36mm roll pin (4)].

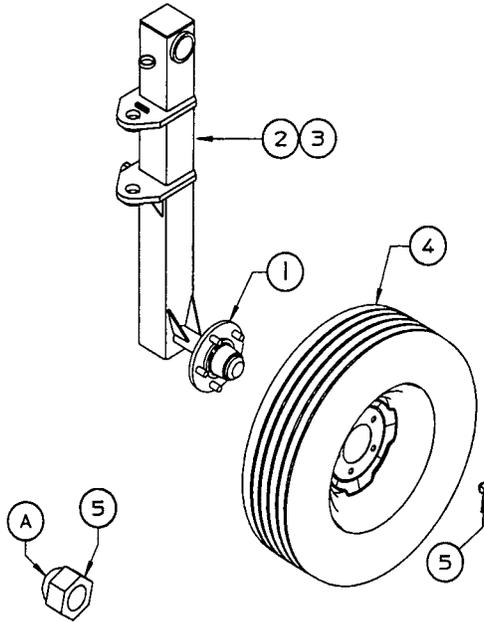
F. Check the plates and tie rods are in the correct position, and then fasten 7/8" x 4" pins (7) to plates (1) using 12mm flashwashers (5) and M12 x 20mm bolts (6).

G. Securely fasten plates (1) by fully tightening M16 nuts (3).

# ASSEMBLY

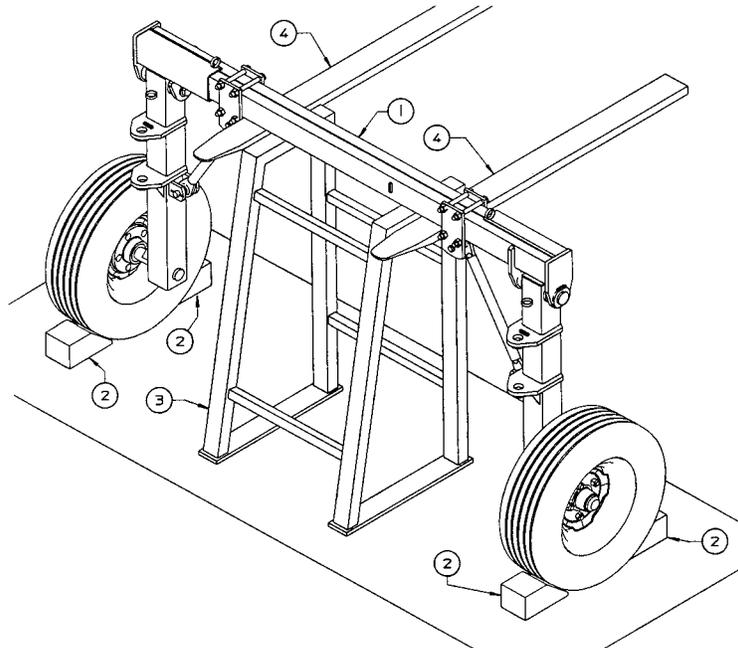
## Mounting Wheels

1. Mount wheels (4) to hubs (1) (supports 2 & 3) using lugnuts (5). Tapered side of lugnut must face wheel.



Asm-RK-0106

2. Assembly (1) must be fully stabilized. Wheels must be chocked with chocks (2) and a support (3) must be placed under the cross member. The forks (4) of a forklift may also be used to support the assembly.

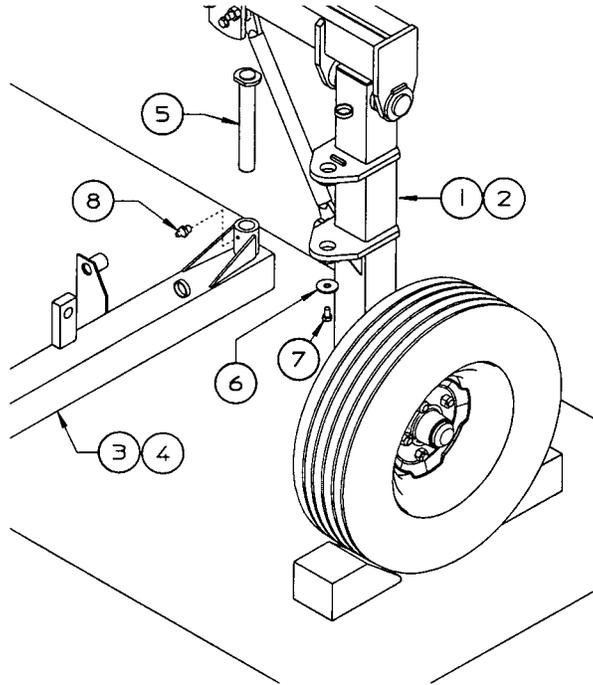


Asm-RK-0107

# ASSEMBLY

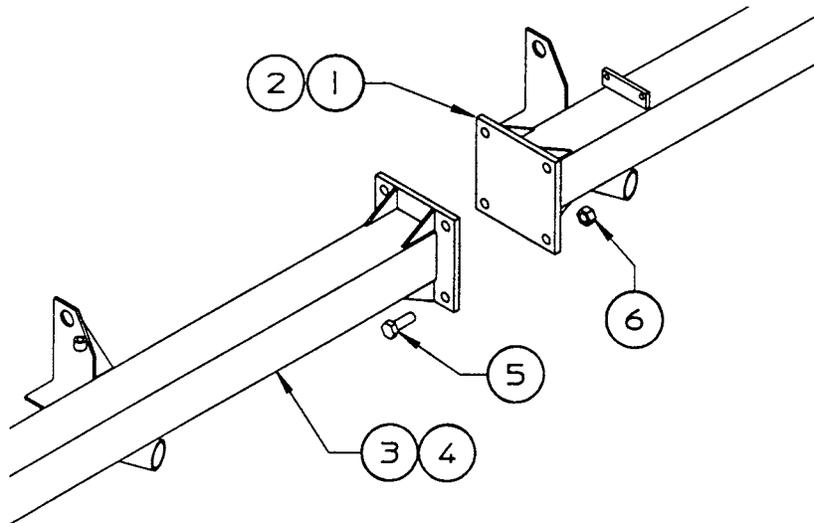
ASSEMBLY

3. Attach the rake wheel sections (3 & 4) (LH-RH) using 1-3/8" x 9-1/2" pin (5), 1-9/16" x 5/32" washer and M12 x 20mm bolt. Attach grease fitting (8) in the location shown.



Asm-RK-0108

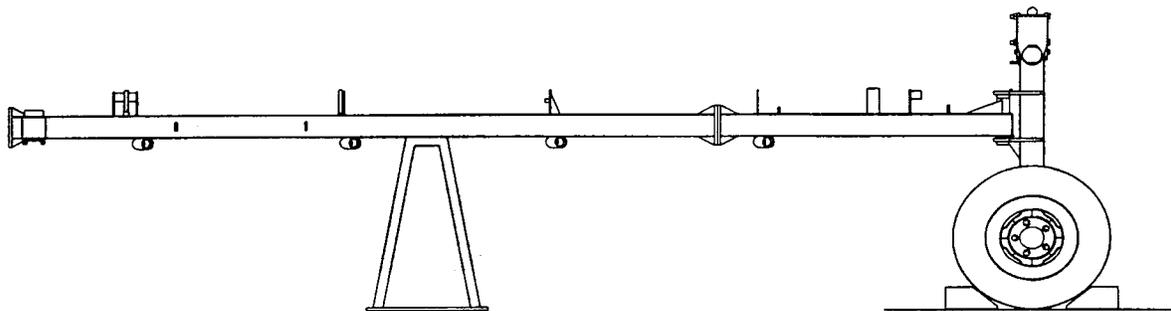
4. Attach forward sections (3 & 4) (LH-RH) to the initial sections (1 & 2) (LH-RH) using M16 x 45mm bolts (5) and M16 nuts (6).



Asm-RK-0109

# ASSEMBLY

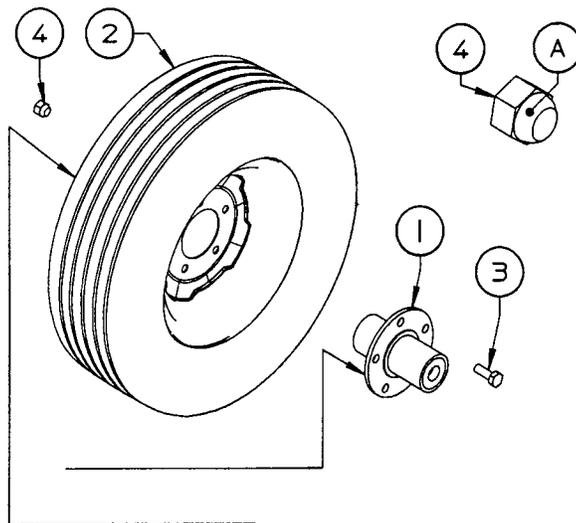
5. When reaching this point, work with great caution, as the machine is not stable.



Asm-RK-0110

ASSEMBLY

6. Attach hub (1) to wheel (2) using M16 x 45mm bolts (3) and M16 nuts (4). Be sure to follow the directions in the illustration during mounting.

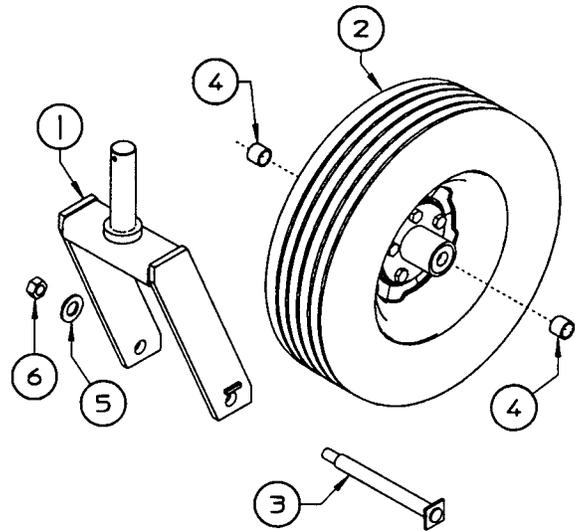


Asm-RK-0111

# ASSEMBLY

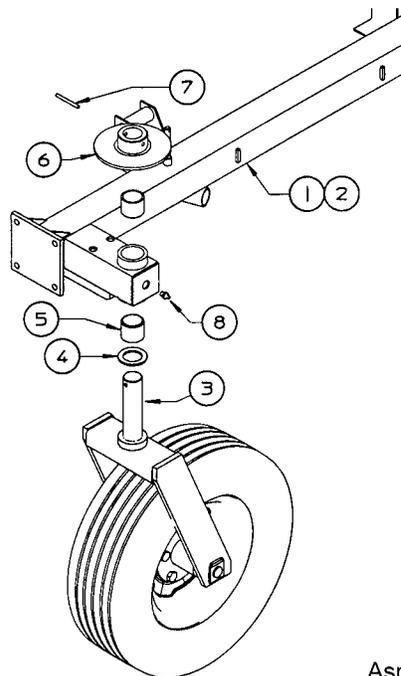
## ASSEMBLY

7. Mount wheel-hub assembly (2) on bracket (1) using 1-13/16" x 10-5/8" pin (3), 1-3/16" - 1-1/2" x 1-3/16" spacers (4), 7/8" - 2" x 5/32" flatwasher (5) and M22 nut (6).



Asm-RK-0112

8. Insert 2" ID - 2-3/8" x 2" bushings (5) in the pivot holes in sections (1 & 2) (LH-RH) shown in the illustration. Place the low-friction 2" - 3" x 3/16" washer (4) on the pin of wheel assembly (3), and insert the wheel assembly pin in the pivot hole in section (1 & 2) (LH-RH) and secure it with the flanged bushing (6) and the 13/32" x 3-5/32" roll pin (7). Attach grease nipples (8) to the correct holes of sections (1 & 2) (LH-RH) and secure it with the flanged bushings (6) and the 13/32" x 3-5/32" roll pin (7). Attach grease nipples (8) to the correct holes of sections (1 & 2) (LH-RH).

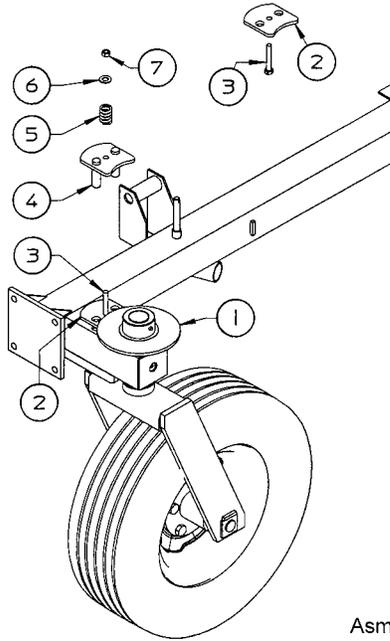


Asm-RK-0113

# ASSEMBLY

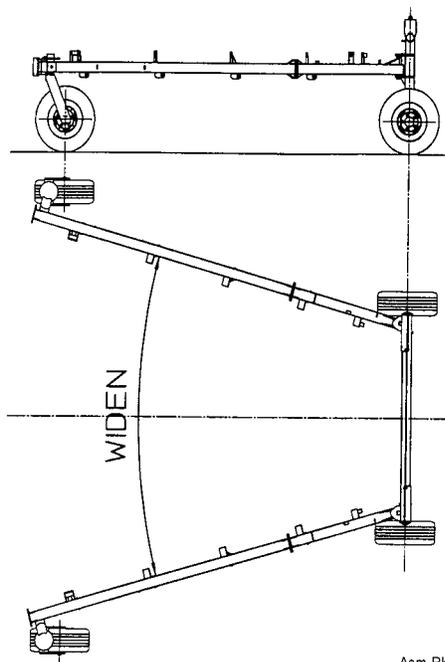
9. First, insert M12 x 90mm bolt (3) in the middle hole of lower plate (2), then place plate with M12 bolt under flange (1) as shown in illustration. Place upper plate (4) over M12 x 90mm bolt (3), followed by 1-3/16" x 1-25/32" spring (5) and 1-27/64" x 3/32" washer (6), and tighten with M12 nut.

**NOTE:** Nut 7 should be tightened so as to allow the bracket to pivot freely.



Asm-RK-0114

10. The machine is now resting on four wheels, thus, is more stable. However, caution should still be used for the remaining assembly steps. To make assembly easier, it is recommended that the machine sections be opened out.



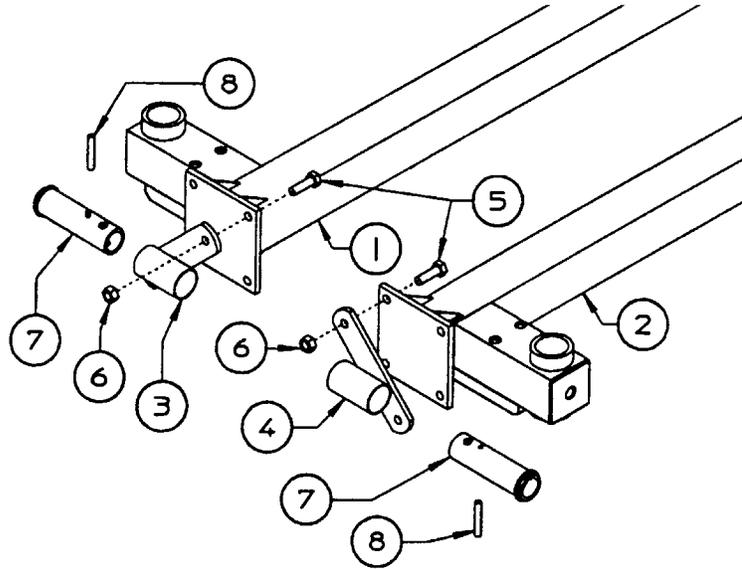
Asm-RK-0115

# ASSEMBLY

ASSEMBLY

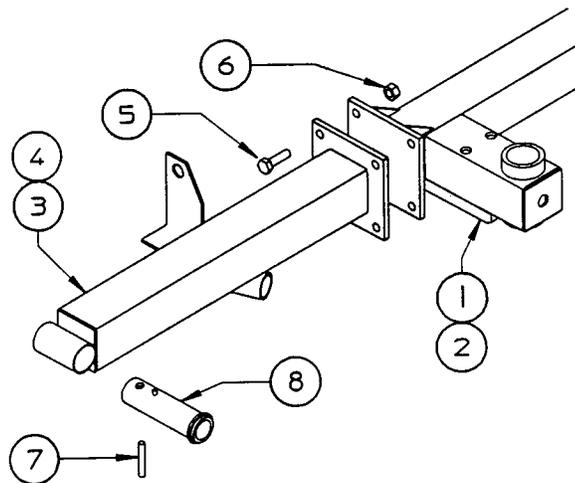
## Mounting Wheels

1. Mount attachments (3 & 4) (LH-RH) to sections 1 & 2 (LH-RH) using M16 x 45mm bolts (5) and M16 nuts (6). Insert bushings (7) in the correct openings in attachments (3 & 4) (LH-RH) and fasten in place with 5/16" x 2-3/4" roll pins (8).



Asm-RK-0116

2. **FWR10 ONLY-** Attach end sections 3 & 4 (LH-RH) to sections 1 & 2 (LH-RH) using M16 x 45mm bolt (5) and M16 nuts (6). Insert bushings (7) in the correct openings in the end sections 3 & 4 (LH-RH) and fasten in place with roll pins (8).

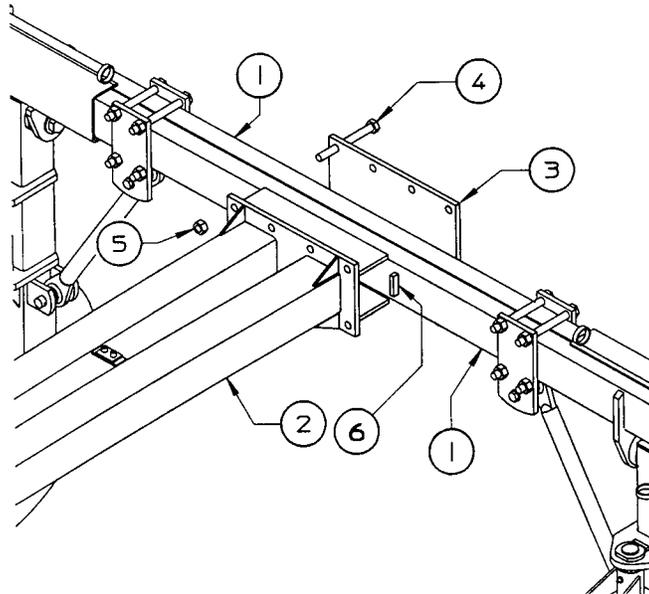


Asm-RK-0117

# ASSEMBLY

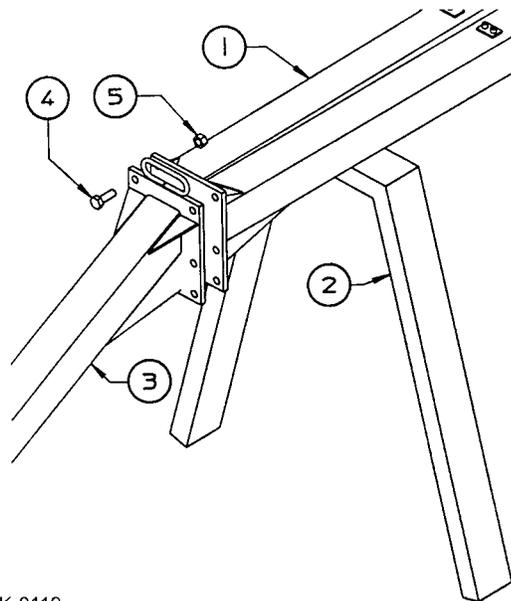
3. This operation is to be carried out with the aid of supports and a jack or hoist of suitable capacity.

**NOTE:** Assemble the drawbar (2) in the middle of the cross members (1) only when the cross members (1) are pulled in together, so the drawbar (2) and support plate (3) must be assembled between stops (6). Attach drawbar (2) to cross member assembly (1) using support plate (3), M16 X 150MM bolts (4) AND M16 nuts (5).



Asm-RK-0118

4. The rear drawbar section (1) is not stable, so it must be held either by a jack or hoist of suitable capacity or support (2) (Weight Section-145 lbs.). Attach drawbar section (3) to drawbar section (1) using M16 x 45mm bolt (4) and M16 nuts (5).

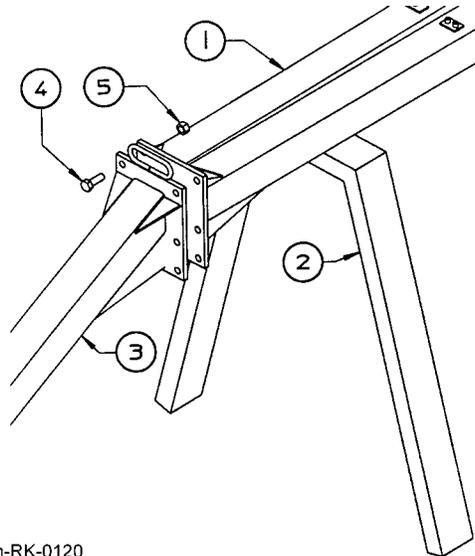


Asm-RK-0119

# ASSEMBLY

## ASSEMBLY

5. The center drawbar section (1) now connected to the rear drawbar section must rest on support (2) or be supported by a jack or hoist of suitable capacity (Drawbar Section Weight-385 lbs.). Attach the front drawbar section (3) to the center drawbar section (1) using M16 x 45mm bolts (4) and M16 nuts (5).

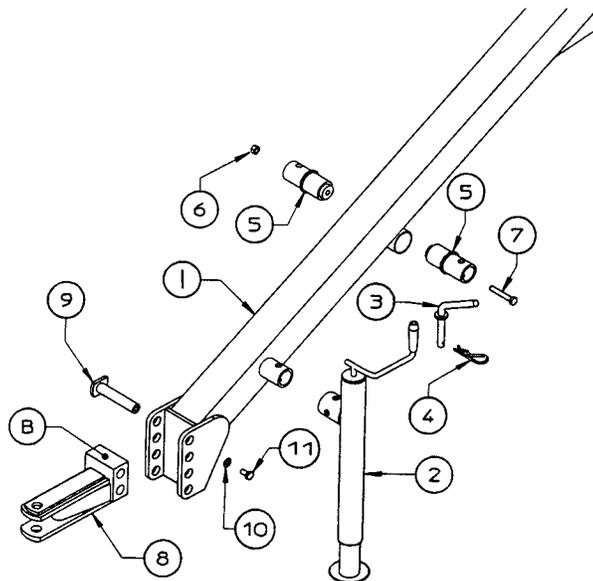


Asm-RK-0120

## Attaching Parking Stand

1. Attach the parking stand (2) to the drawbar, fastening it with pin (3) and clip (4). Insert bushing (5) in the correct holes in drawbar (1), fastening them with M12 x 60mm bolt (7) and M12 nut (6). Insert hitch (8) in the end of the drawbar and fasten with 1" x 5" pins (9), 15/32" - 1-9/16" x 5/32" washers (10) and M12 x 20mm bolts (11).

**NOTE:** Hitch (8) should be attached with flange (B) towards the top.

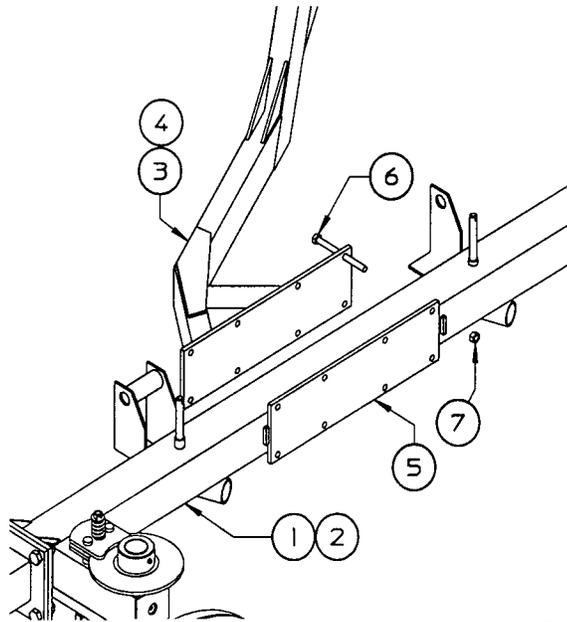


Asm-RK-0121

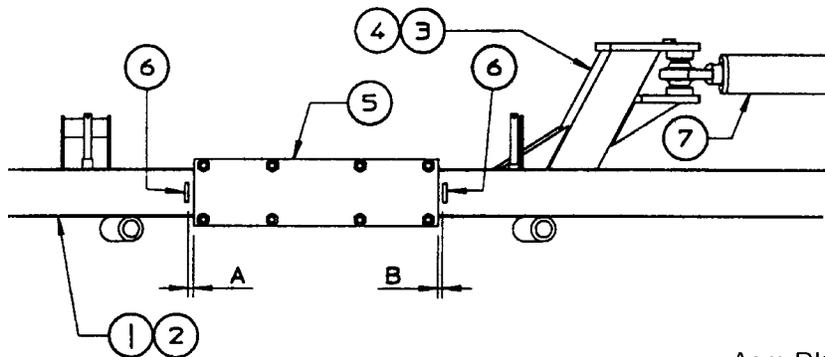
# ASSEMBLY

2. Attach arms (3 & 4) (LH-RH) and support plates (5) to sections (1 & 2) (LH-RH), fastening them with M12 x 140mm bolt (6) and M12 nuts (7). See **Figure Asm-RK-0122**.

**NOTE:** When the machine is completely closed (Cylinder 7), regulate the distances (A & B) with the stops (6) to make the wheel section (1 & 2) (LH-RH), parallel.



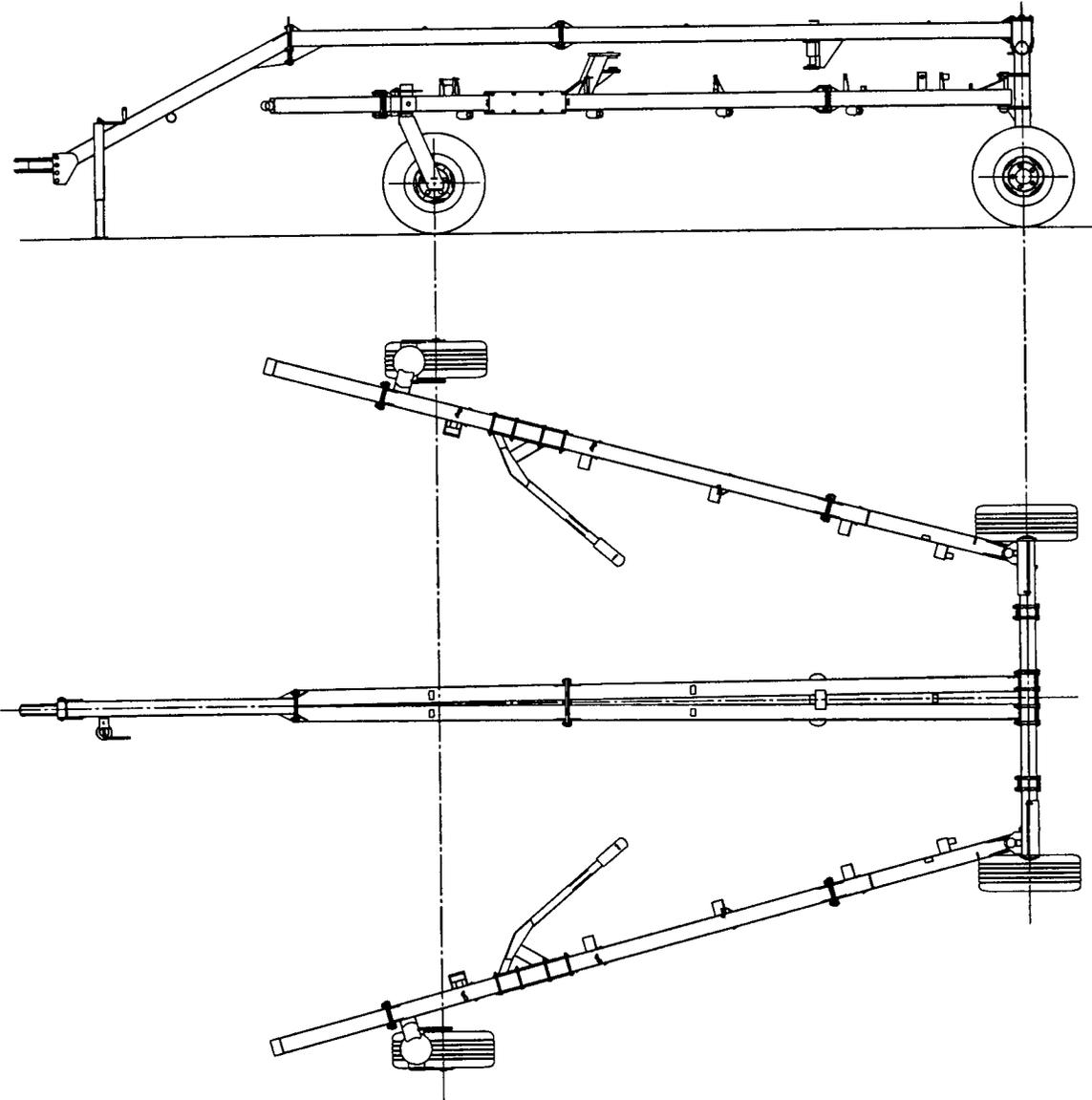
Asm-RK-0122



Asm-RK-0123

# ASSEMBLY

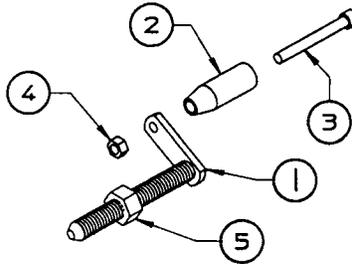
3. You have now reached this stage of the assembly. The machine is now more stable. However, caution is still recommended for the remaining assembly steps.



Asm-RK-0124

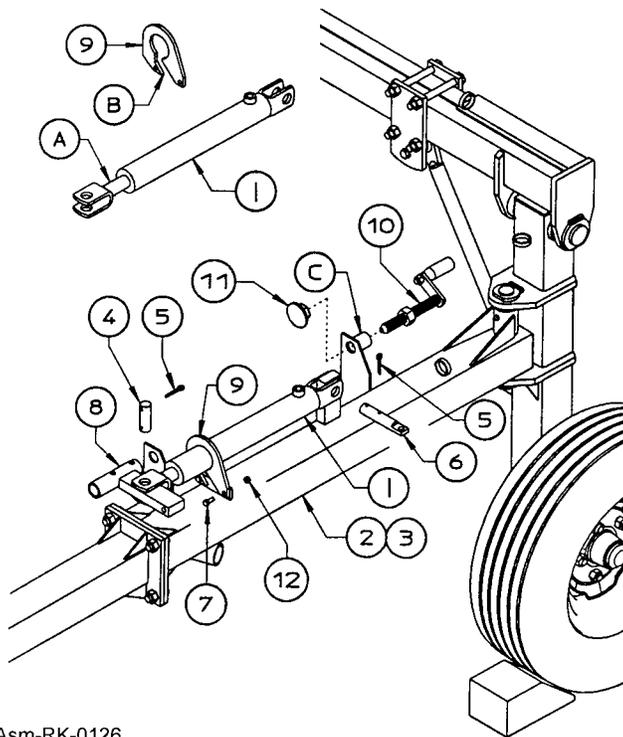
# ASSEMBLY

4. Insert M12 x 100 socket head bolt (3) in hand grip (2) and then screw it in the threaded hole in crank (1). Screw (3) should not be fully tightened, so that hand grip (2) can turn freely. Lock screw (3) in place with M12 nut (4). Fit M22 nut (5) onto the thread of crank (1).



Asm-RK-0125

5. Attach cylinder (1) to sections (2 & 3) (LH-RH) and fasten it with 1" x 5-3/16" pin (6) and split-pins (5). Fit the cylinder guides (9) to sections (2 & 3) (LH-RH) passing through point A and slot B. Fasten the cylinder guides (9) in place to sections (2 & 3) (LH-RH) with M8 x 25 screw (7) and M8 nuts (12). Connect attachments (8) to the forks on the rod end of cylinders (1), fastening them with 1" x 2-3/4" pins (4) and split pins (5). Insert crank (10) in the hole of bracket (C). Then thread the plate (11) onto crank (10).

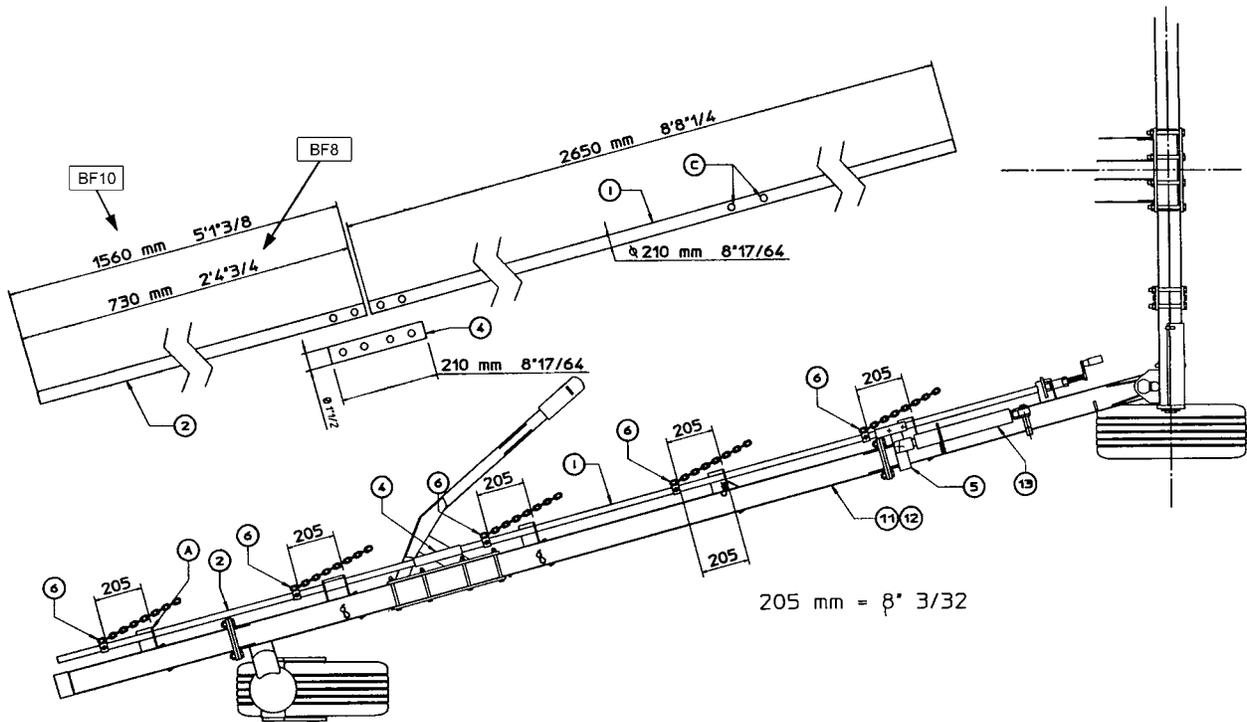


Asm-RK-0126

# ASSEMBLY

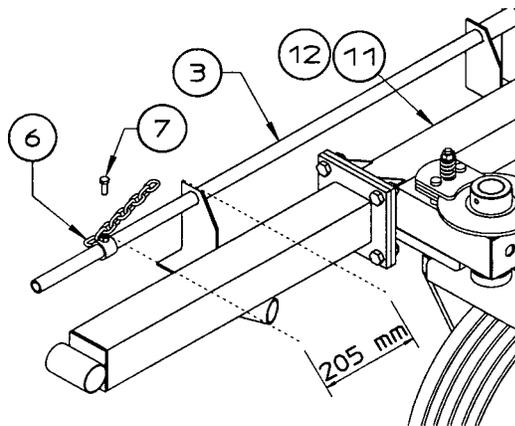
ASSEMBLY

- Attach rake wheels lifting pipes (1-2) to sections (11 & 12) (LH-RH), beginning at point A. At the same time, the chain attachments (6) should be placed in the positions shown, as well as the connectors (4). Pipes (1) must also pass through the correct opening of attachments (5) (**Figure Asm-RK-0129**). At this point, connect attachment (5) to spots (C) on pipes (1), using M8 x 50mm bolt (8) and M8 nuts (9) (**Figure Asm-RK-0129**). Fasten in the positions shown the chain attachments (6) using M10 x 25mm bolt (7) (**Figure Asm-RK-0128**).

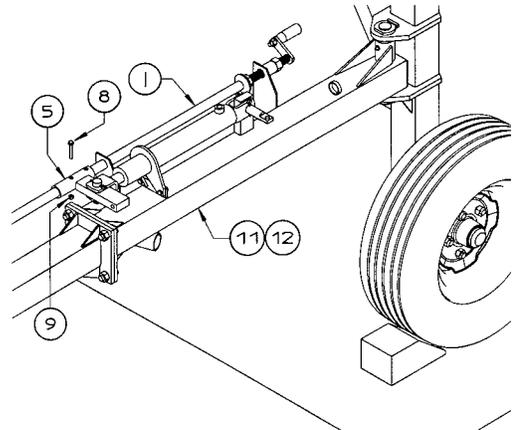


Asm-RK-0127

# ASSEMBLY



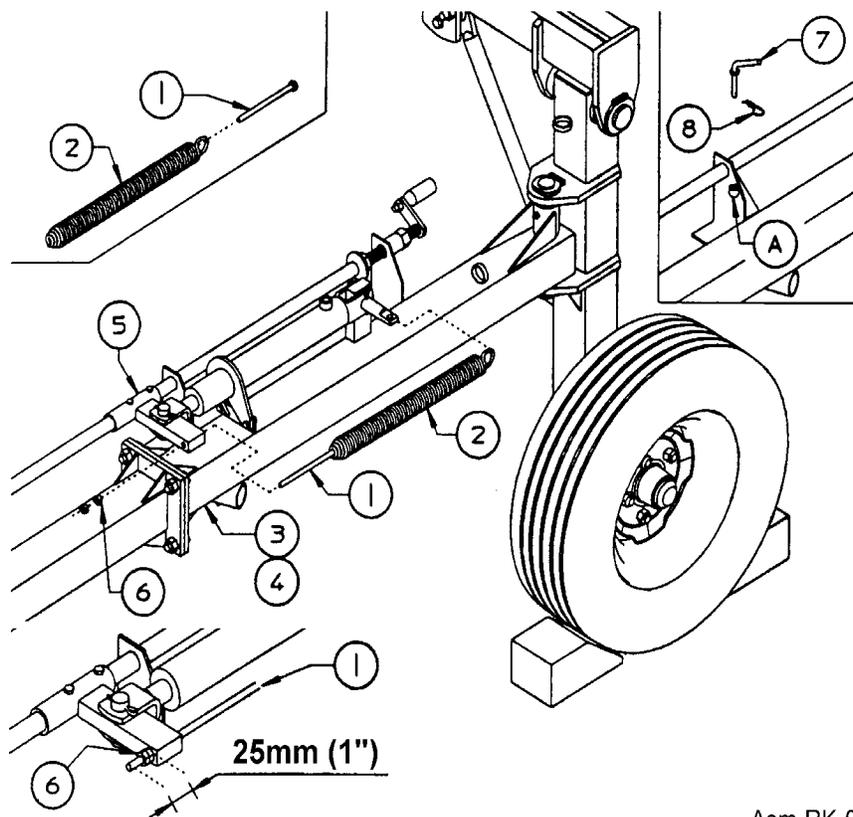
Asm-RK-0128



Asm-RK-0129

ASSEMBLY

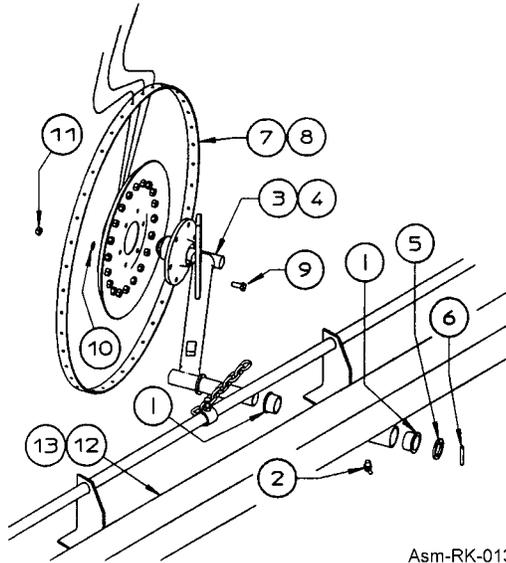
- Place bolts (1) inside springs (2). Attach spring (2) with stay bolt (1) to sections 3 & 4 (LH-RH) and attachments (5) as shown, fastening the spring bolt assembly in place with the M10 nuts (6). Fasten stay bolts (1) with nuts (6) so that they extend 25mm (1") from attachment (5) as shown. Insert pins (7) in the correct holes (A), and fasten with 1/8" clip 8.



Asm-RK-0130

# ASSEMBLY

- Attach 1-3/8" - 1-11/16" x 1" bushings (1) and grease fittings (2) to rake wheels sections (12 & 13) (LH-RH) as shown. Attach rake wheel brackets (3 & 4) (LH-RH) to sections (12 & 13) (LH-RH) and fasten with 1-3/8" - 2" x 3/16" washers (5) and springs pins (6). Mount rake wheels (7 & 8) (LH-RH) to rake wheel arms (3 & 4) (LH-RH) and fasten with M10 x 25mm bolt (9), 27/64" - 11/16" x 3/32" washers (10) and M10 nuts (11).

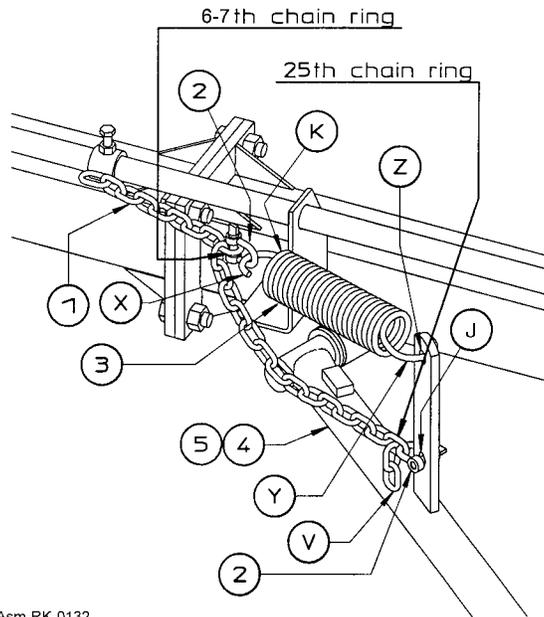


Asm-RK-0131

**NOTE:** The spring hook X is more closed tighter than spring hook Y.

- Hook the 6-7th link of chain (1) on fork assembly (2) and then hook it on hook X of spring (3). Hook the 25th link of chain (1) (5th from the end) on for assembly (2) and link it into hole J of arms 4 & 5. Hook Y of spring (3) must also be hooked into hole Z of arms 4 & 5. (RH-LH)

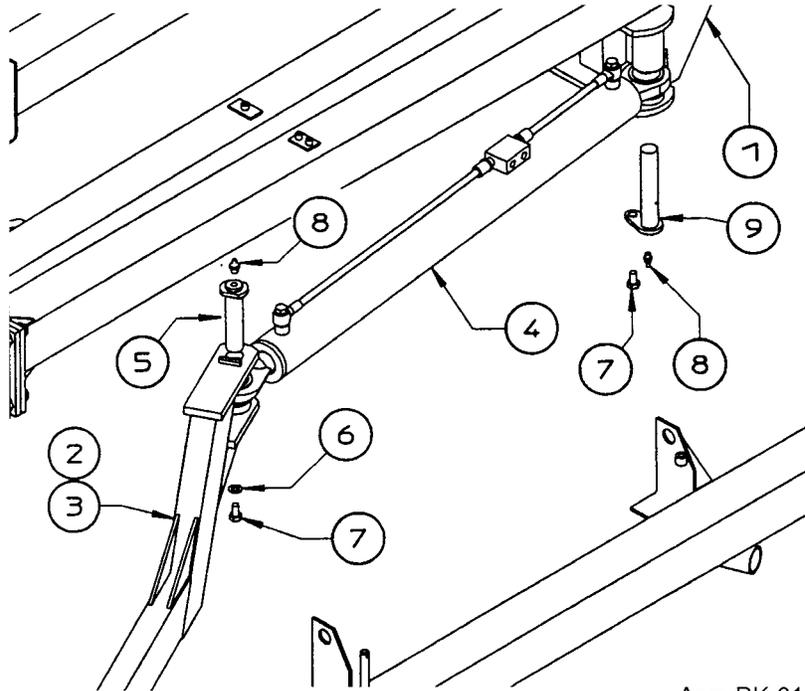
**NOTE:** Information provided is standard regulation for chain 1.



Asm-RK-0132

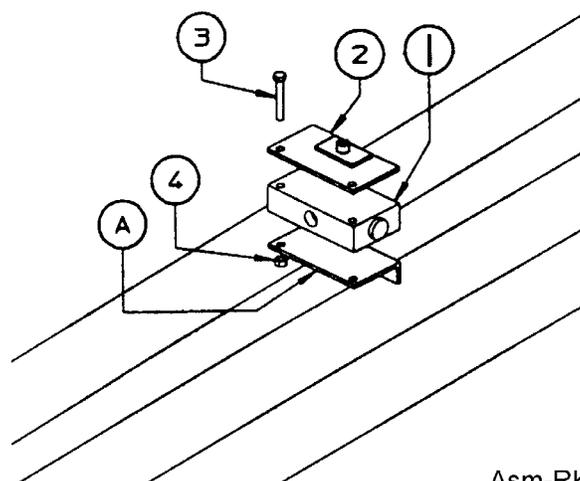
# ASSEMBLY

10. Fit cylinders (4) into the correct plates on drawbar (1) and fixed arms (2 & 3) (LH-RH). Fasten cylinders (4) to drawbar (1) with 1-3/16" x 6-3/8" pins (9) and M12 x 20mm screw (7). Attach grease fittings (8) to pins (9). Fasten cylinders (4) to fixed arms (2 & 3) (LH-RH) with 1-3/16" x 4-13/16" pins (5), 15/32" - 1-9/16" x 5/32" washers (6) and M12 x 20mm bolts (7). Attach grease fittings (8) to pins (5).



Asm-RK-0133

11. Fit the flow divider (1) and the hose collar plate (2) to support (A) on the drawbar. Fasten in place with M6 x 60mm bolt (3) and M6 nuts (4).



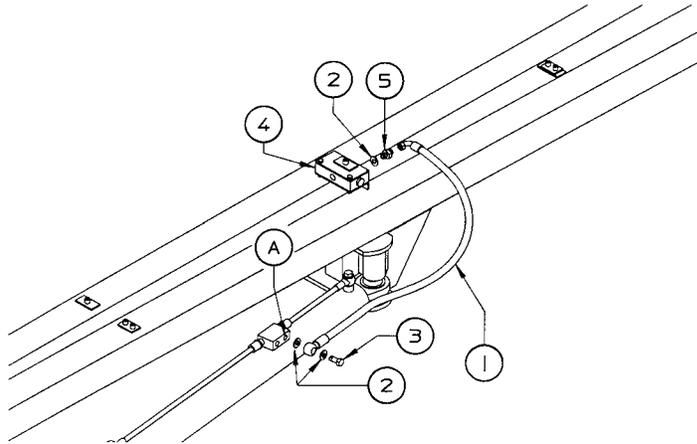
Asm-RK-0134

# ASSEMBLY

ASSEMBLY

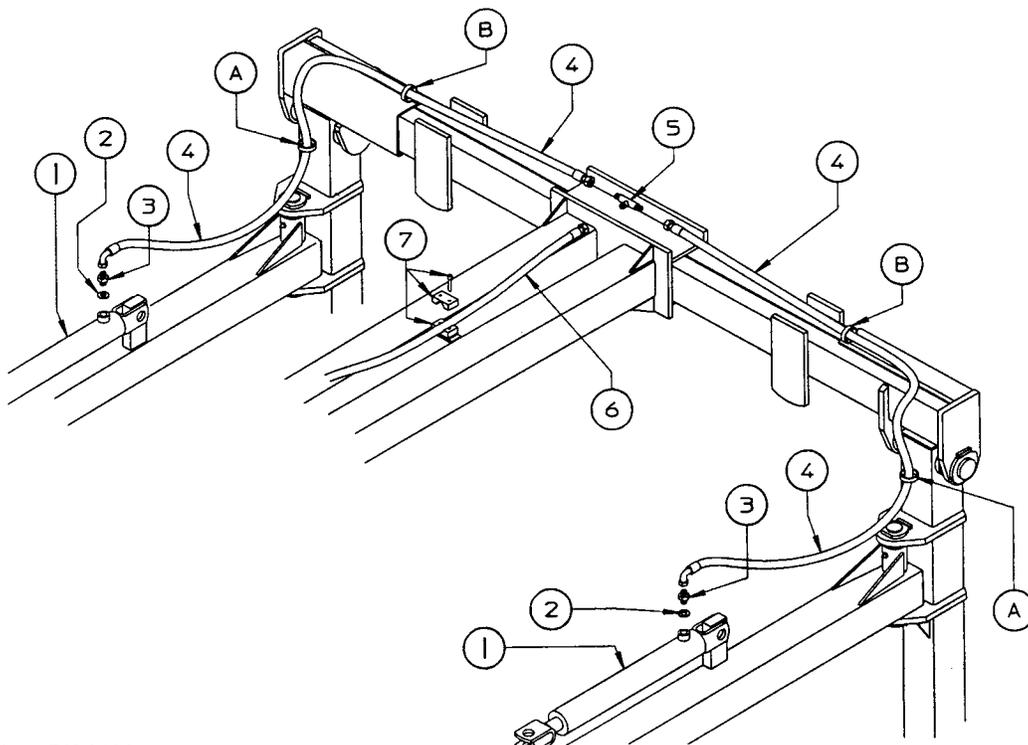
## Connecting Hoses

1. Attach the eye of hose (1) to hole (A) of the cylinder valve and fasten it with 3/8" washer (2) and hydraulic fitting (3). Attach washer (2) and hydraulic fitting (5) to the rear of flow divider (4). Connect the curved end of hose (1) to hydraulic fitting (5). Repeat this step to the other side.



2. Attach 3/8" washers (2) and hydraulic fittings (3) to cylinders (1). Connect the curved end of 3/8" x 6'9-3/32" hoses (4) to 3/8" hydraulic fittings (3). Pass hoses (4) through rings A & B and connect to "T" connector (5) at the center of the machine.

**NOTE:** Hose (6) will also be in the next few steps.



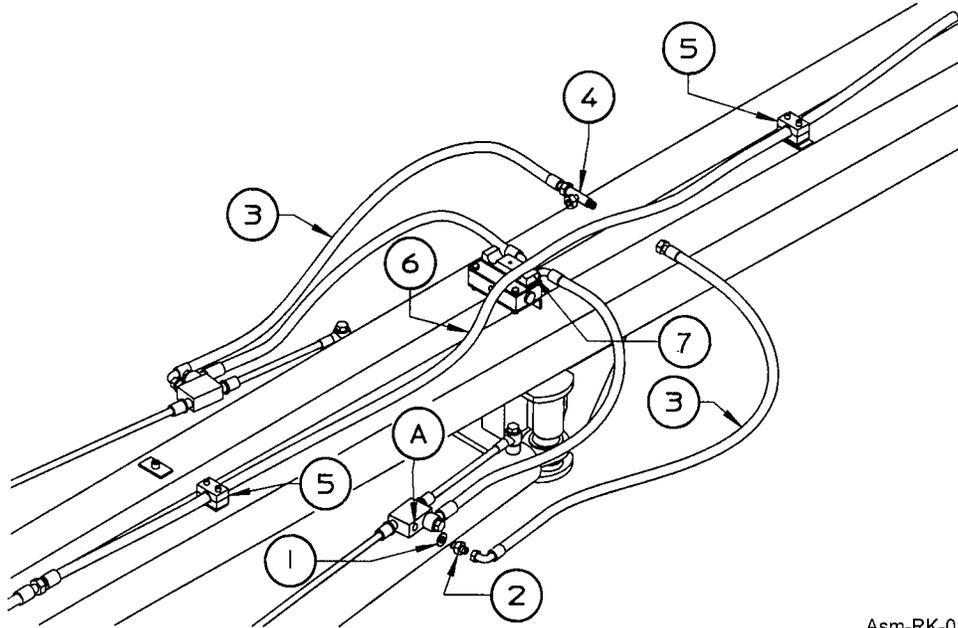
Asm-RK-0136

FWR 09/10

Assembly Section 3-20

# ASSEMBLY

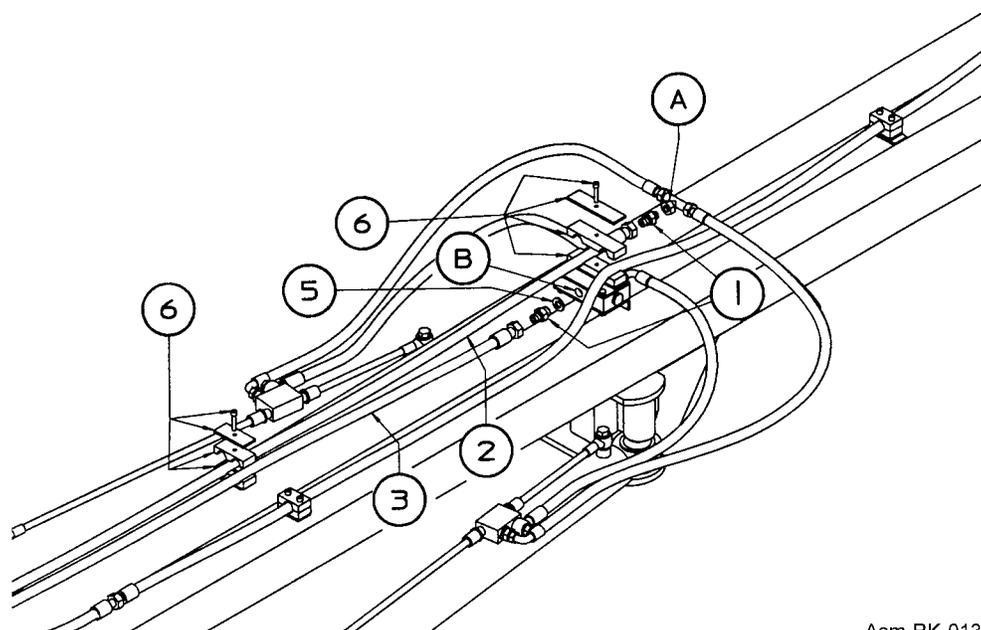
3. Continue to secure hose (6) with collars (5). Attach washer (1) and fitting (2) to hole A in cylinder valve. Connect the curve end of hose (3) to hydraulic fitting (2). Join hose (3) to "T" connector (4) at the center of the machine.



Asm-RK-0137

4. Screw hydraulic fitting (1) into hole A of the "T" connector. Screw hose (2) onto hydraulic fitting (1). Secure hose (2) in place with collars (4). Screw hydraulic fitting (1) and 3/8" washer (5) into hole (B) of the flow divider. Screw hose (3) onto hydraulic fitting (1) and secure in place with hose collar (4).

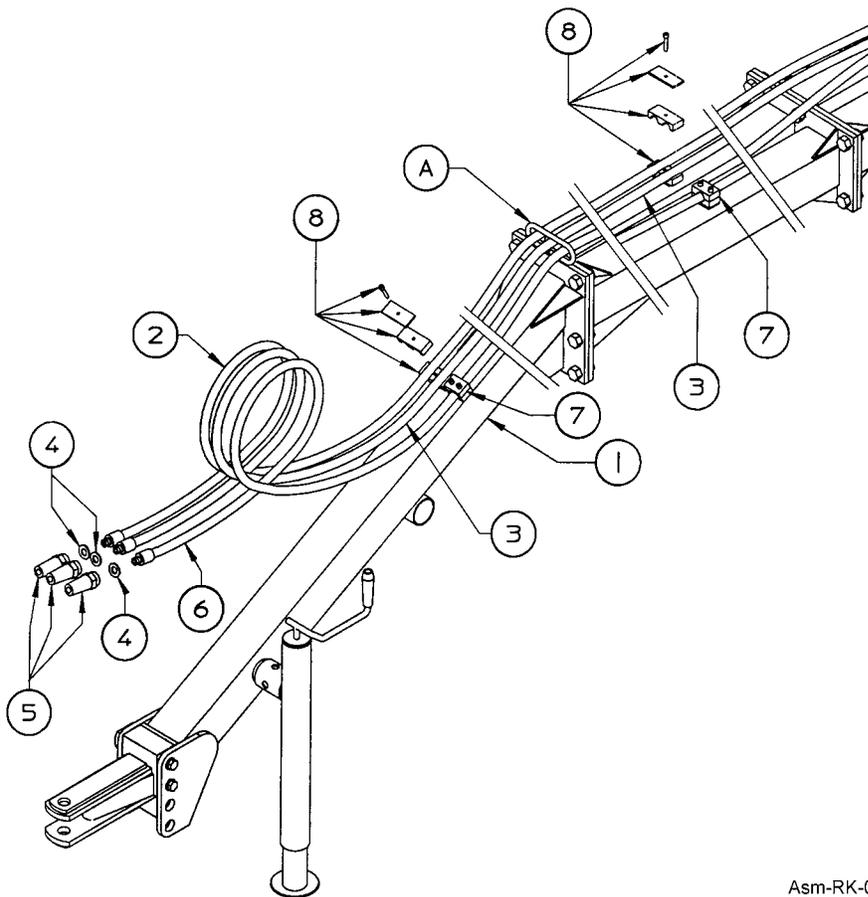
**NOTE:** Hoses (2 & 3) will also be in the next step.



Asm-RK-0138

# ASSEMBLY

5. Pass hose (2, 3, 6) through loop (A) on drawbar (1). Secure hose (6) in the correct place with hose collars (9). Secure hoses (2, 3, 6) in the correct places with hose collars (7) and with double hose collar (8). Attach washers (4) and quick-release couplings (5) to the ends of hoses (2, 3, 6).



Asm-RK-0139

ASSEMBLY

# ASSEMBLY

## Central Wheel Kit (Optional)

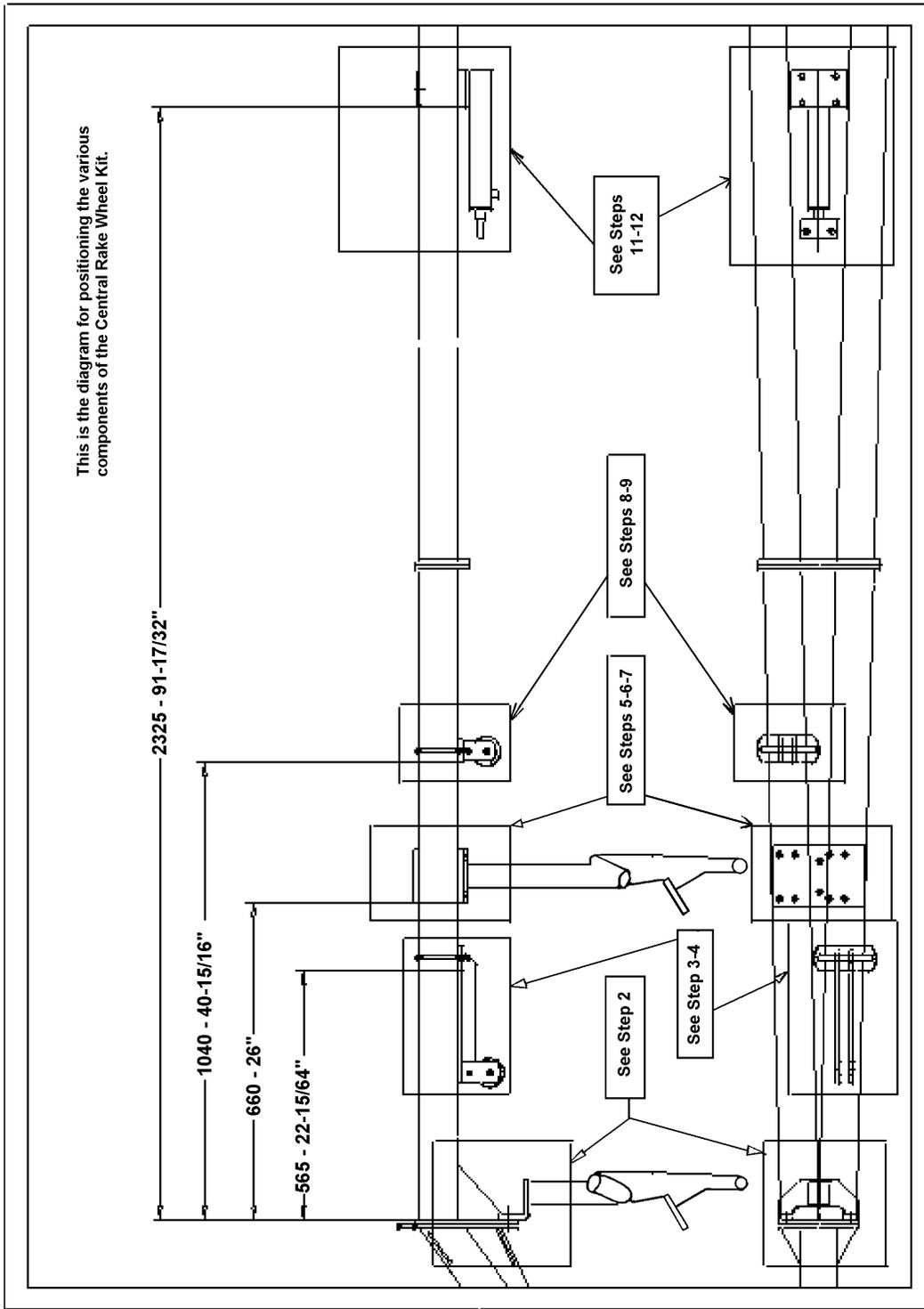
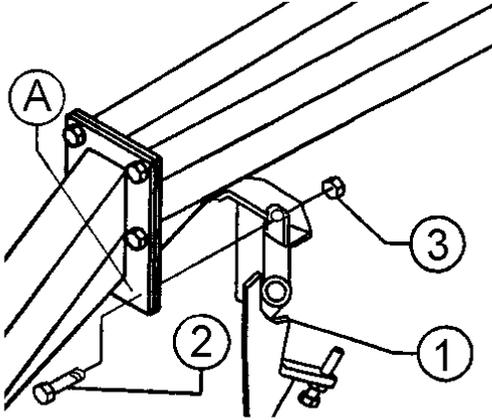


Figure 1

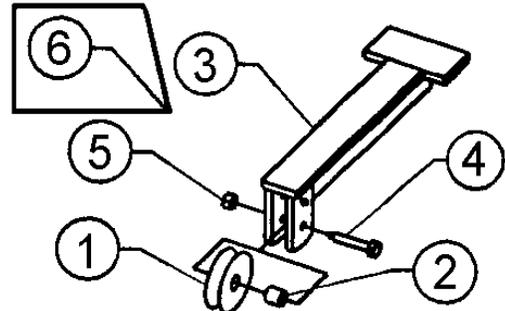
ASSEMBLY

# ASSEMBLY

1. Remove the two screws at position A. Attach support (1) to plate front drawbar using screws (2) and nuts (3).

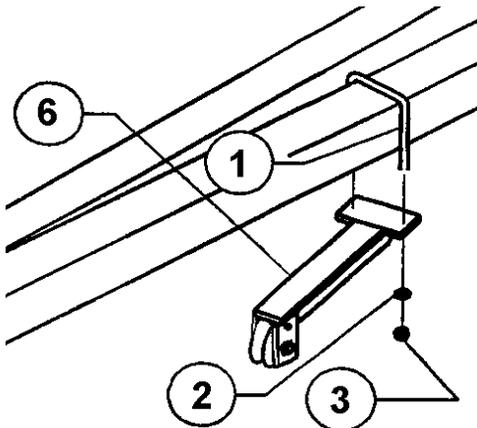


Asm-RK-0141

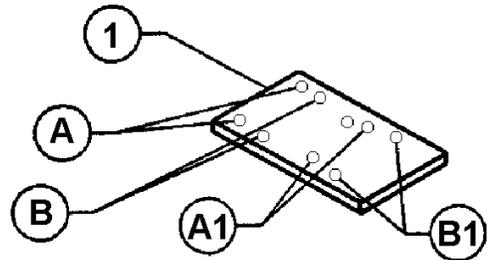


Asm-RK-0142

2. Mount pulley (1) and bushing (2) into bracket (3) using special screws (4) and nuts (5). (**Figure Asm-RK-0142**)
3. Place the pulley support (6) against the lower part of the drawbar and fasten it with U-Bolt (1), washers (2) and nuts (3). (**Figure Asm-RK-0143**) For positioning, see Figure 1.



Asm-RK-0143

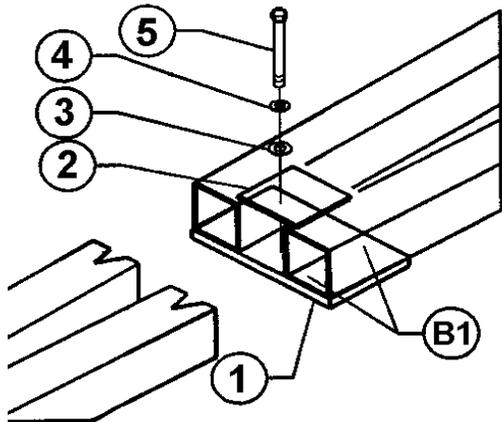


Asm-RK-0144

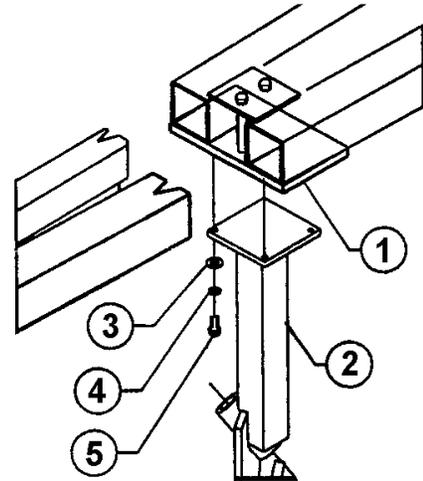
4. Place (1) has the (A-A1) and (B-B1) pairs of holes that allow adjustment of the rake wheel position (**Figure Asm-RK-0144**). We recommend fastening support (2) in **Figure Asm-RK-0146** to the (B-B1) pairs of holes.

# ASSEMBLY

5. Place plate (1) against the lower part of the drawbar and fasten it with counterplate (2), washers (3 & 4) and screws (5). **Figure Asm-RK-0145.** (For positioning, see Figure 1.)

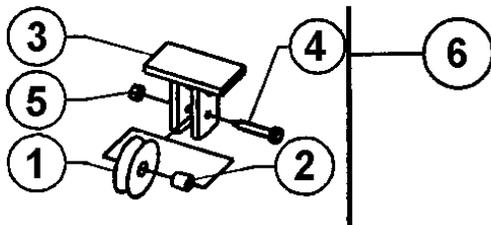


Asm-RK-0145

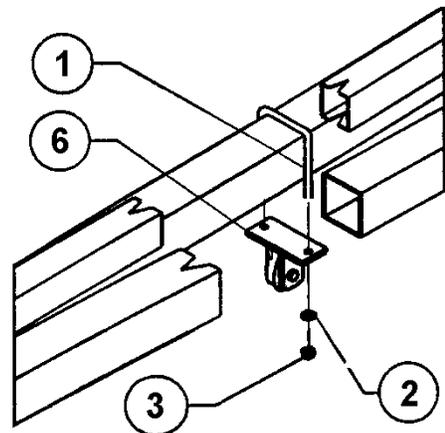


Asm-RK-0146

6. Attach support (2) to plate (1) using washers (3 & 4) and screws (5). **(Figure Asm-RK-0146)**
7. Mount pulley (1) and bushing (2) into bracket (3) using special screws (4) and nuts (5). **Figure Asm-RK-0147.**
8. Place the pulley support (6) against the lower part of the drawbar and fasten it with U-bolt (1), washers (2) and nuts (3). **(Figure Asm-RK-0148)** (For positioning, see Figure 1.)



Asm-RK-0147

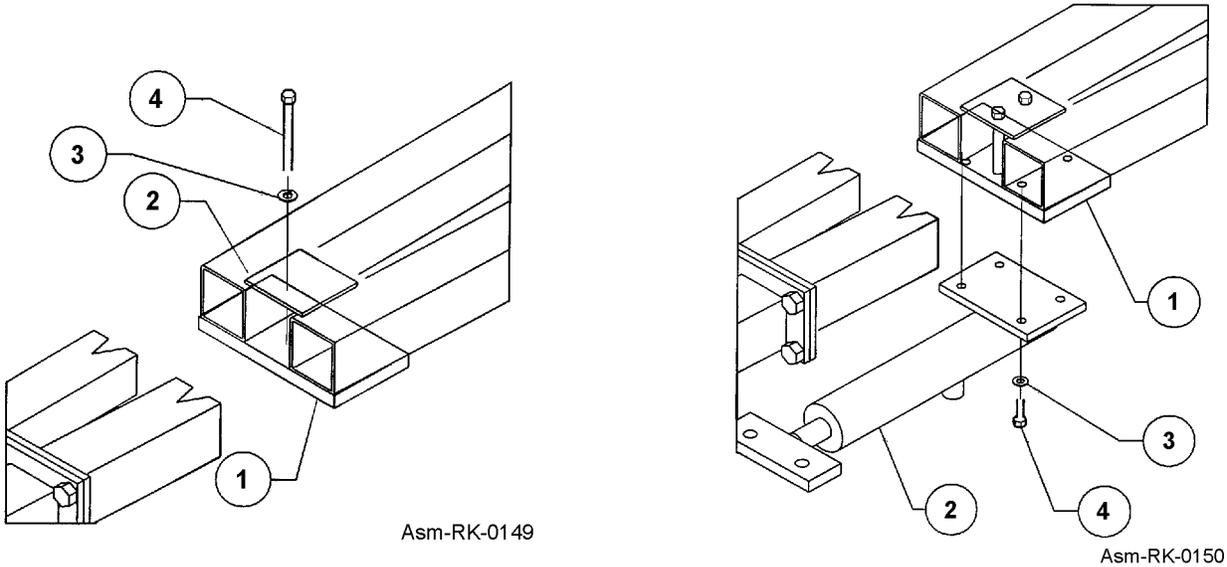


Asm-RK-0148

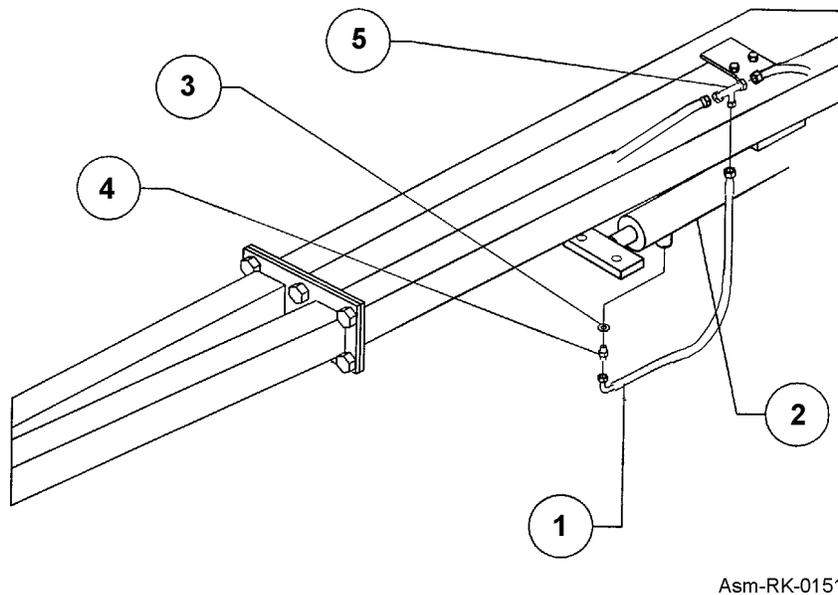
# ASSEMBLY

ASSEMBLY

- Place plate (1) against the lower part of the drawbar and fasten it with counterplate (2), washers (3) and screws (4). **Figure Asm-RK-0148.** (For positioning, see Figure 1.)

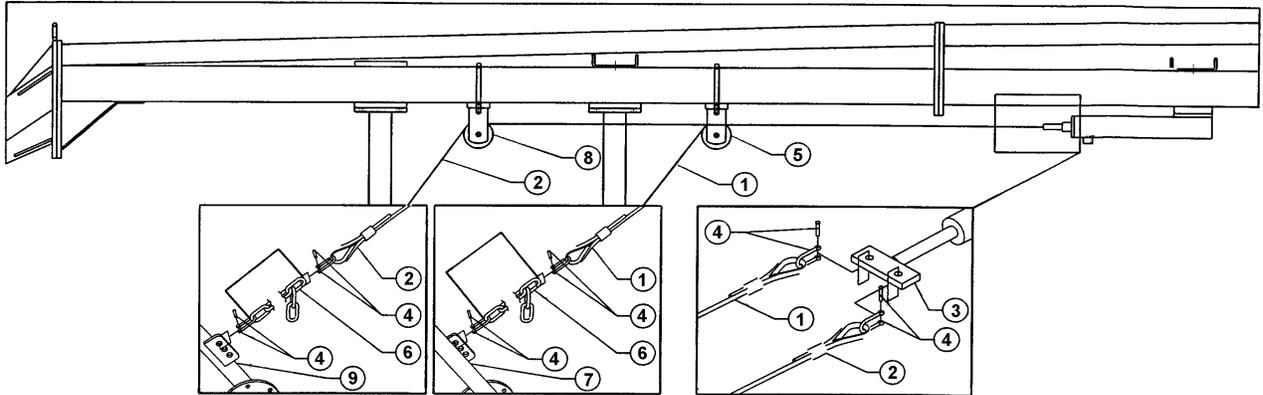


- Fasten cylinder (2) to plate (1) using washers (3) and screws (4). **Figure Asm-RK-0150.**
- Fasten hose (1) to cylinder (2) using copper washer (3) and fitting (4).
- Connect "T" Connector (5) between the two hoses as shown in **Figure Asm-RK-0151.** Connect the hose (1) to "T" Connector (5).



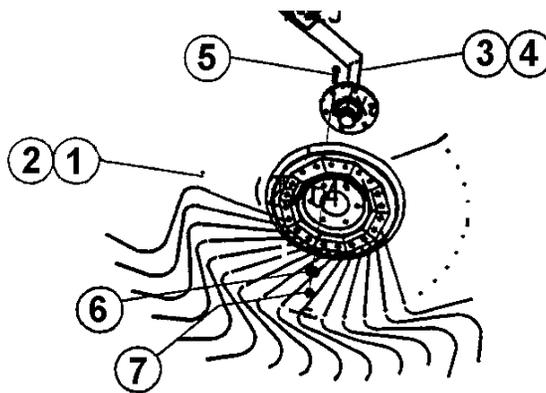
# ASSEMBLY

13. Fit cables (1) and (2) to cylinder (3) by using clamps (4). Insert cable (1) on pulley support (5). Fit chain (6) to rear wheel support (7) by using clamp (4). Connect the chain (6) to cable (1) by using clamp (4). Insert cable (2) on pulley support (8). Fit chain (6) to front wheel support (9) by using clamp (4). Connect to chain (6) to cable (2) by using clamp (4).



Asm-RK-0152

14. Mount rake wheels (1) and (2) to rake wheel arms (3) and (4) and fasten with screw (5), washer (6) and nut (7).



Asm-RK-0153

# ASSEMBLY

## Mounting Rear Hydraulic Kit

(To open one side only)

1. Remove screws (1) and (2), together with their respective collars (3) and (4), in order to be able to move hoses (5 & 6).

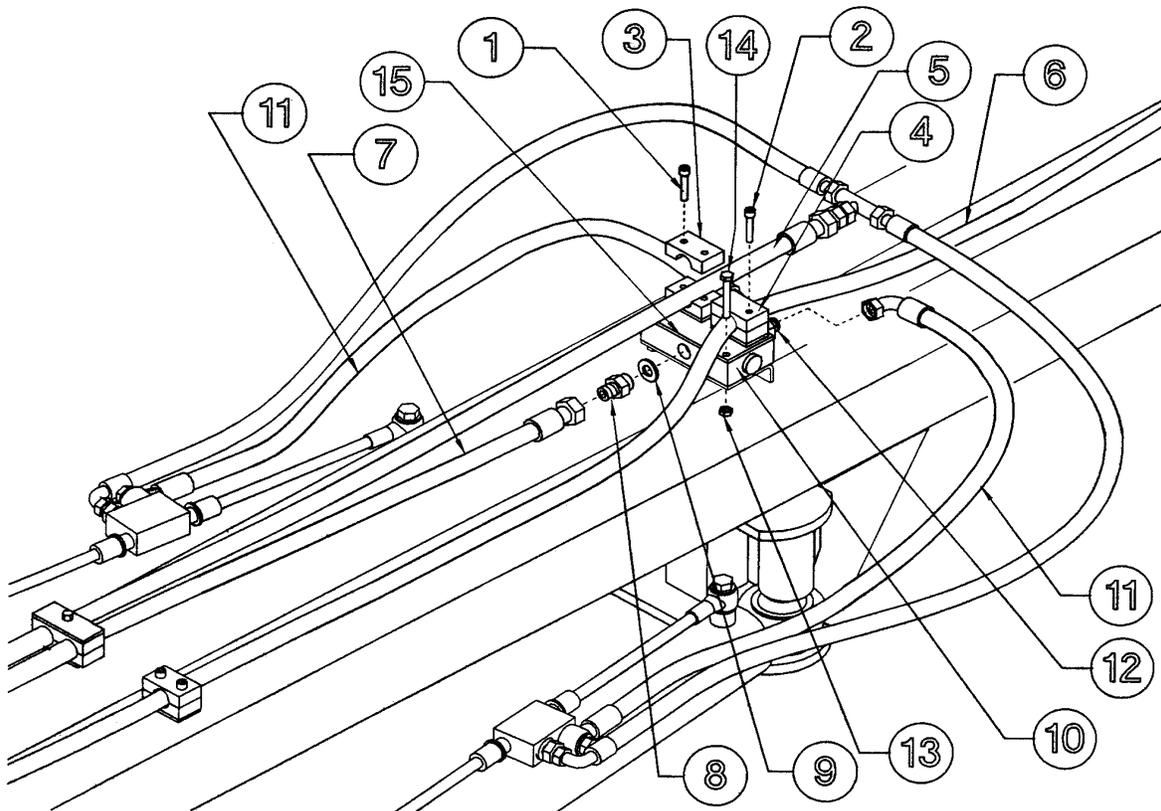
**NOTE:** Screws (1 & 2) and collars (3 & 4) will be used again. R

Remove hose (7) and nipple (8). Remove nipple (8) and washer (9) from the flow divider (10).

**NOTE:** Nipple (8) and washer (9) will be used again.

Remove hoses (11) from nipples (12). Remove nuts (13) and screws (14) and take out the hose stop plate (15) together with the flow divider (10).

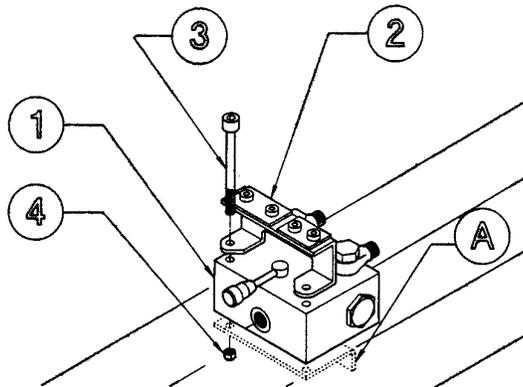
**NOTE:** If there is not enough room in which to move the kit, remove the hoses stop collars at Point A and B also.



Asm-RK-0154

# ASSEMBLY

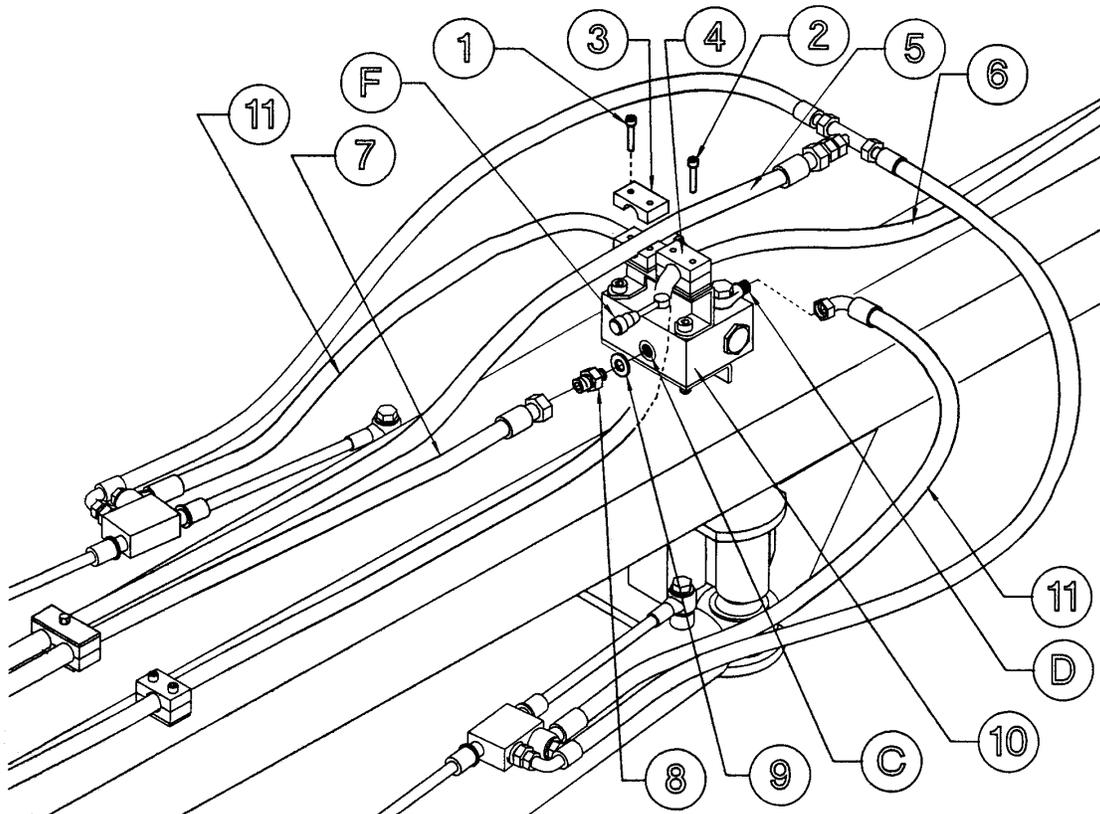
2. Attach valve (1) and plate (2) to support (A) with bolts (3) and nuts (4).



Asm-RK-0155

3. Place washer (9) and nipple (8) into hole (C) of valve (10). Place the hose (7) to nipple (8). Fasten hose (11) to connector (D) of valve (10). Mount the hose stop collars (3 & 4), together with their respective hoses (5 & 6), on support (E) and then use screws (1 & 2) to fasten all the pieces into position. If the hose stop collars have been removed, replace them into position at points (A & B).

**NOTE:** Place the hoses so that the lever (F) is easily accessible.



# ASSEMBLY

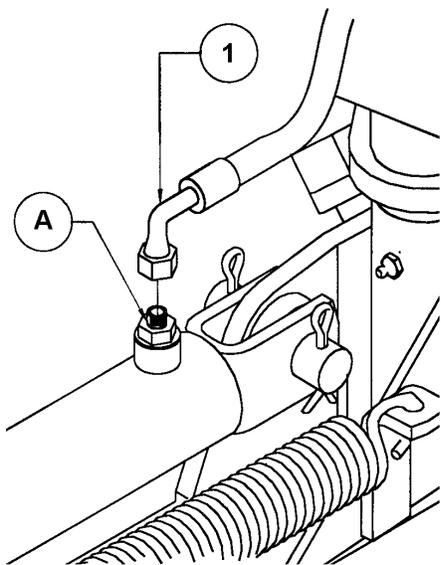
4. Remove hose (1) from nipple (A). **(Figure Asm-RK-0157)**

*NOTE: Repeat the same operation for both wheel lift cylinders of the machine.*

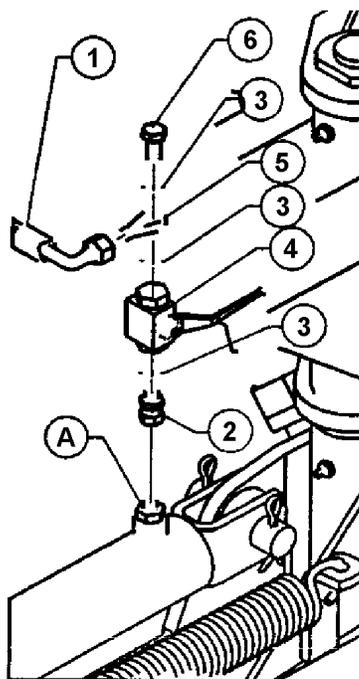
5. Place connector (2) and washers (3) and valve (4) and fittings (5) and hose (1) into fitting (A). **(Figure Asm-RK-0158)**

*NOTE: Repeat the same operation for both wheel lift cylinders of the machine.*

ASSEMBLY



Asm-RK-0157



Asm-RK-0158

# ASSEMBLY

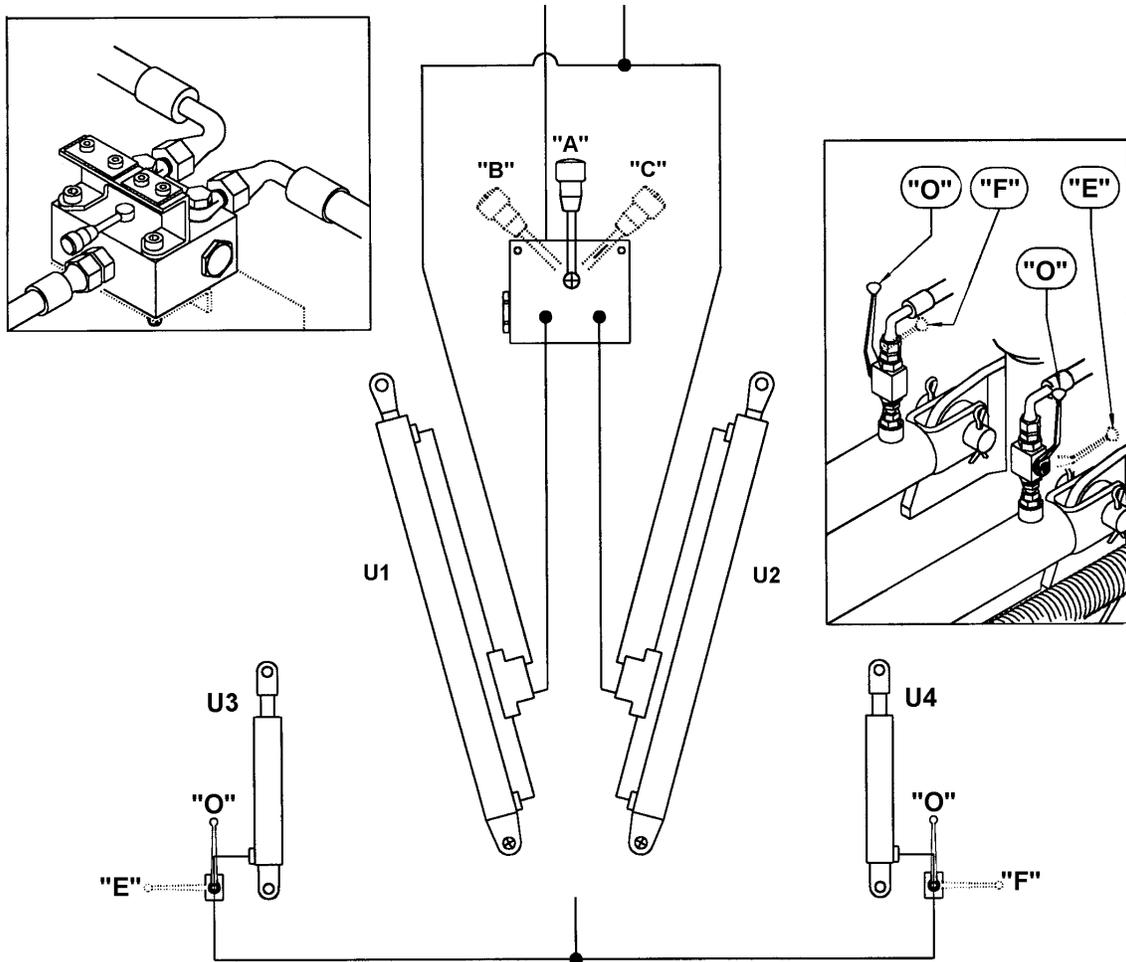
## Kit Operation Diagram

(Diagram Showing How the Kit Operates to Open the Machine on One Side Only)

**Lever in Position A:** Both Cylinders U1/U2 are in operation

**Lever in Position B:** Only Cylinder U2 is in operation

**Lever in Position C:** Only Cylinder U1 is in operation



Asm-RK-0159

**Lever in Position O:** Both Cylinders U3/U4 are in operation

**Lever of Cylinder U3 in Position E and Lever of Cylinder U4 in Position O:** Only Cylinder U4 is in operation

**Lever of Cylinder U4 in Position F and Lever of Cylinder U3 in Position O:** Only Cylinder U3 is in operation



# OPERATION SECTION

Operation Section 4-1

# OPERATION

## FWR BI-FOLD RAKE OPERATION INSTRUCTIONS

Bush Hog FWR Bi-fold 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 hay rake, tractor, or a thrown object. Do not operate the rake if passersby, pets, livestock, or property are directly in front or to the rear of the unit.

This section is designed to familiarize, instruct, and educate safe and proper rake use to the operator. Pictures in this section are for the purpose of explaining the operation of a rake and are not necessarily of a FWR rake. 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 rake and tractor operation and all associated safety practices before operating the rake and tractor. Proper operation of the FWR rake, as detailed in this manual, will help ensure years of safe and satisfactory use of the implement.

**IMPORTANT:** To avoid rake damage, retorque 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)

**SAFETY INSTRUCTIONS**



**PELIGRO**

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

	<u>FWR8</u>	<u>FWR10</u>	<u>FWR12</u>
Number of Wheels	8	10	12
Adjustable Windrow Width	3'-6'	3'-6'	3'-6'
Overall Length	21'10"	21'10"	21'10"
Working Width	17'5"	20'4"	23'3"
Transport Width	8'3"	8'3"	8'3"
Tire Size	195/65R15	195/65R15	195/65R15
Operating Speed	Up to 14 MPH	Up to 14 MPH	Up to 14 MPH
Minimum HP required	30 HP	30 HP	30 HP
Approx. Weight (lbs.)	2685	3015	3050

\*Ratings based on actual field performance.

# OPERATION

## 2. OPERATOR REQUIREMENTS

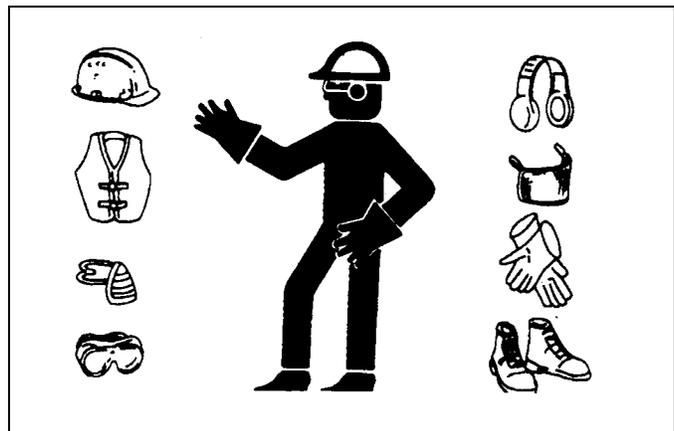
Safe operation of the unit is the responsibility of a qualified operator. A qualified operator has read and understands the implement and tractor Operator's Manuals and is experienced in implement and tractor operation and all associated safety practices. In addition to the safety messages contained 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**

NEVER 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 ..... 30 HP
- Hitch ..... 3-Point

### **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 model 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 horsepower required to operate the rake depends on many factors including type of vegetation to be raked, terrain condition, operator experience, and condition of the implement and tractor. For most raking condition, the FWR rakes require a tractor with at least 30 HP. Operating the implement 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

## 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 lever.
- 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 neutral 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

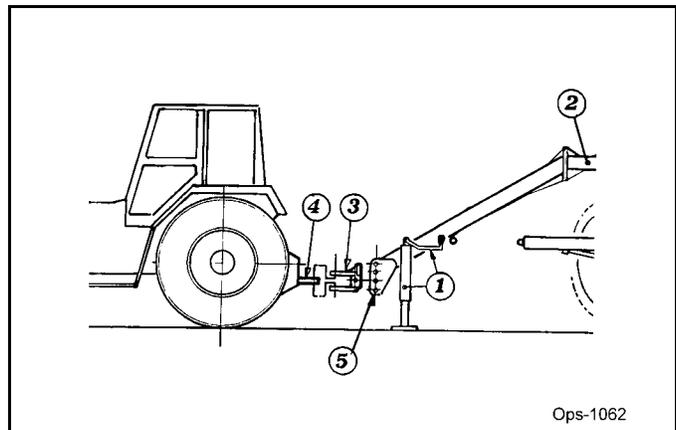
Use extreme caution when connecting the implement to the tractor. The implement should be securely resting at ground level or setting on blocks. Keep hands and feet from under the implement and clear of pinch points between the tractor hitch arms and implement pins. OPS-U-0038



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)

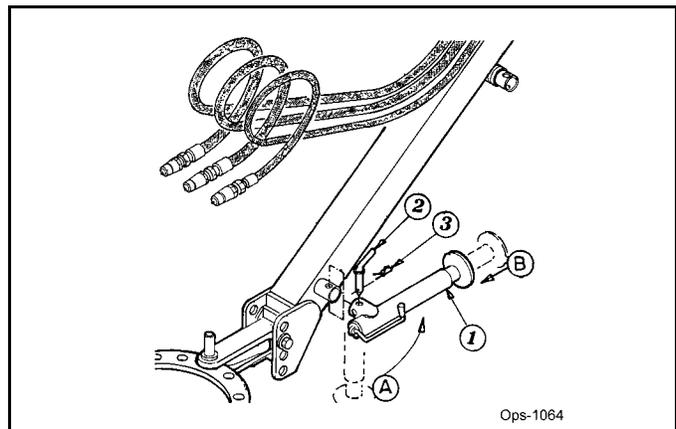
### 6.1 Connecting the Bi-Fold Rake to the Tractor

1. To connect the machine to the tractor, first, it is necessary to raise or lower parking stand (1) so that drawbar (2) is parallel to the ground. Back the tractor up to the machine and look to see if hitch (3) is aligned with tractor hitch (4). If hitch (3) is much higher or lower than tractor hitch (4), it is necessary to change the position of hitch (3) by choosing the holes in plate (5) which give the best alignment. At this point, connect hitch (3) to tractor hitch (4) using a suitable pin with retaining clip. Lower jackstand until weight is on tractor drawbar. (Figure Ops-1062)



Ops-1062

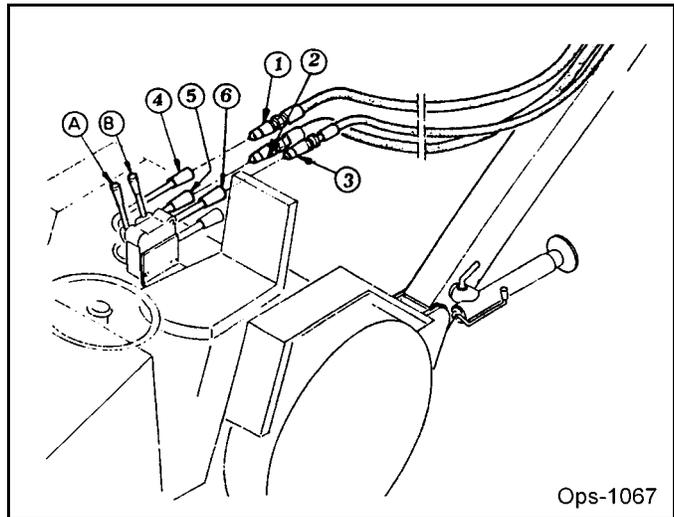
2. Parking stand (1) should be lowered and rotated in the position indicated by arrow (A). This is done by removing clip (3) and pin (2) and moving stand (1) out of the parking position. Next, turn the parking stand crank to retract the base of the stand, as indicated by arrow B. Fasten parking stand (1) into the transport position using pin (2) and clip (3). (Figure Ops-1064)



Ops-1064

# OPERATION

3. The quick-release couplings of hoses (1, 2, 3) should be attached to the relative tractor couplings (4, 5, 6). The movements of the machine are now controlled by operating lever (A & B). Hoses (1 & 2), connected to couplings (4 & 5), control the cylinders for opening the machine. Hose (3) connected to coupling (6), controls the cylinders for lifting the rake wheels. It is recommended that all movements be repeated a few times to eliminate air from system. The machine is now ready for operation.



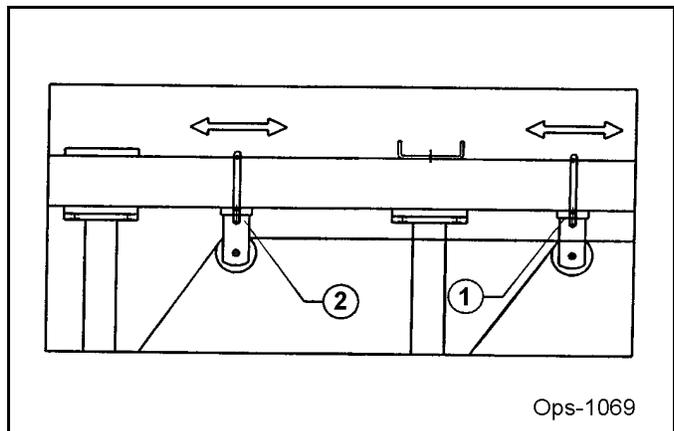
OPERATION

## 7. SETTING THE IMPLEMENT

### 7.1 Adjustment for Machine Use

So far we have described how to assemble the standard kit for the Central Wheel Rake. Should the operator feel the operational results unsatisfactory, the following is a description of where adjustments can be made.

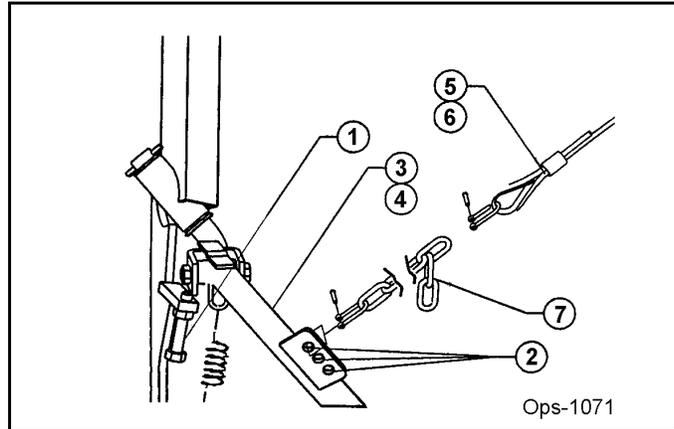
1. In order to improve lift, the rake wheels can be moved backwards or forwards changing position using the pulley supports (1 & 2).



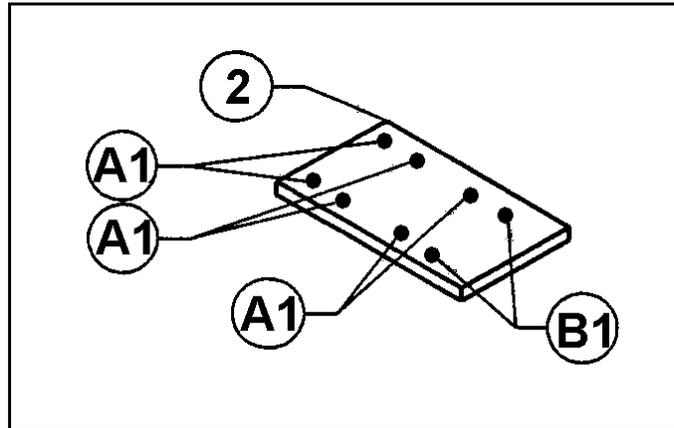
# OPERATION

## OPERATION

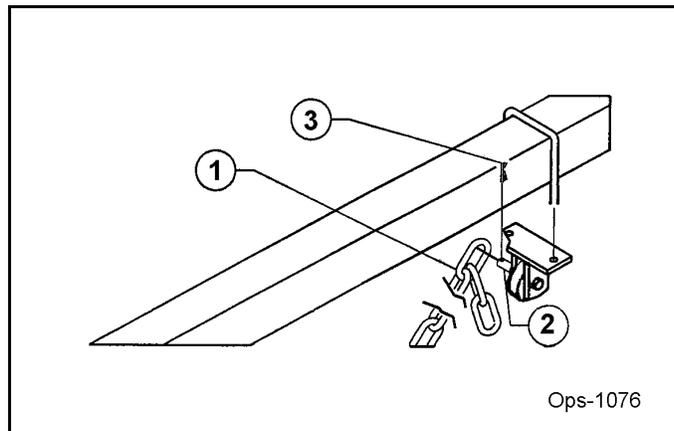
2. The adjusting screw (1) can be used to improve both lift and/or pressure of the rake wheels on the ground. Either of the holes in the arms (2 or 3) (front-rear) can be used and a different link in chain (7) can be attached to cables (5-6) (front-rear).



3. In order to decrease interference between the side-delivery rake wheels, various positions can be selected to fasten the rake wheel holder supports.



4. In order insure that the rake wheels are not lowered during transport, hook chain (1) to pin (2) and block the cotter pin (3).

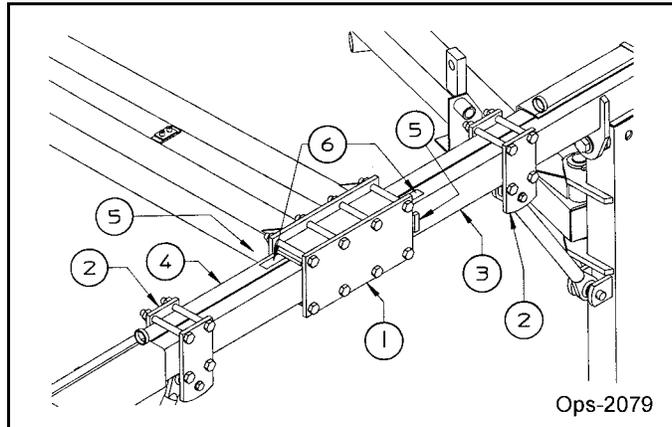


# OPERATION

## 7.2 Swath Adjustment

Loosen all screws which fasten the plates (2) and the counter (91). Pull out the cross members (3 & 4) paying attention on ledges (5) welded on cross member (3 & 4). The distances must be read from Label 6. The distances of cross members (3 & 4) must be the same. Once adjustments are made, fasten all screws of plates (2) and counterplate (1).

**NOTE:** Cross members (3 & 4) must be opened the same amount to insure the drawbar stays in the center of the machine.



## 8. 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



Always disconnect the main PTO Driveline from the Tractor before performing service on the Implement. Never work on the Implement with the tractor PTO driveline connected and running. Rotating Parts, Blades or Drivelines could turn without warning and cause immediate entanglement, injury or death. (S3PT-11)



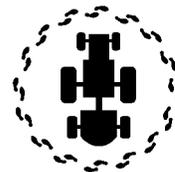
Never work under the Implement, the framework, or any lifted component unless the Implement is securely supported or blocked up to prevent sudden or inadvertent falling which could cause serious injury or even death. (SG-14)



# OPERATION

## **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)



## **8.1 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*



## **8.2 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*

# OPERATION

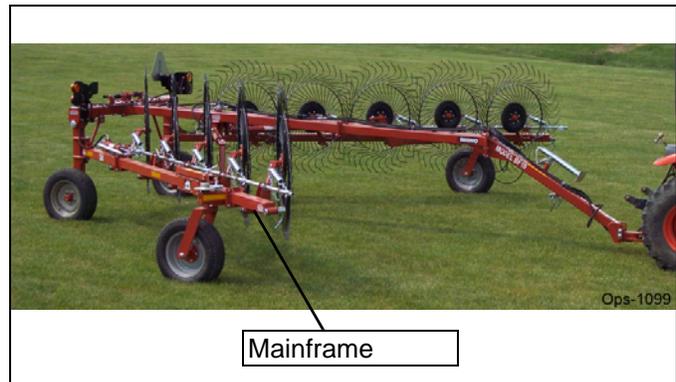
The operator's manual and safety signs affixed on the unit contain important instructions on the safe and proper use of the equipment. Maintain these important safety features on the implement in good condition to ensure the information is available to the operator at all times.

- 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*



## 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\_A*



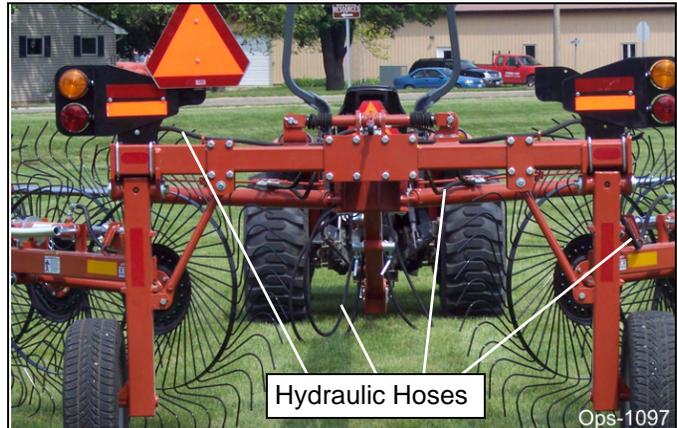
- Inspect teeth for looseness, breakage and excessive wear. Make sure implement is on the ground and securely blocked up. Replace damaged, worn, and missing teeth at the same time to maintain uniform tine height.
- Remove any hay or other debris which may be wrapped around the teeth.
- Inspect condition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



# OPERATION

## 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-0013



### **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)



- 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 wheel are in good condition. Make sure the wheel lug nuts are tight. OPS-RK-0005



# 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.**

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 ROBS 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**

# 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.
REAR RAKE OR BOX RAKE		
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		
There are no cracks in Loader Arms or Mounts		
The Tow chain is secured to the Tractor & Hay Rake		
The Wing 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

## **9. 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*



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



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

## **9.1 Starting the Tractor**

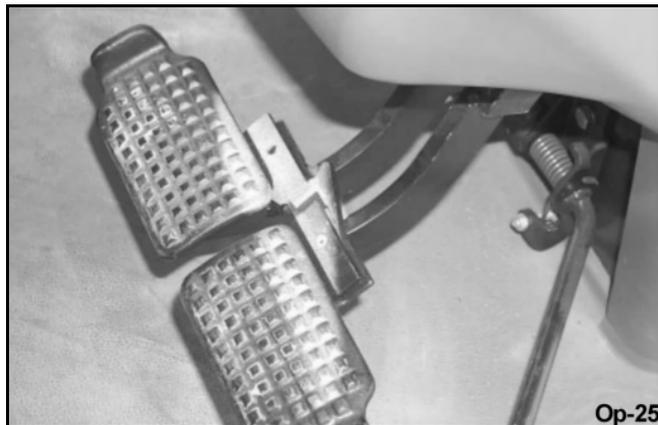
The procedure to start the tractor is model specific. Refer to the tractor operator's manual for starting procedures for your particular tractor. Consult an authorized dealer if the starting procedure is unclear. Ensure the 3-point control lever is in the lowered position and the PTO is disengaged before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



## **9.2 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

## **9.3 Driving the Tractor and Implement**

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*



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*

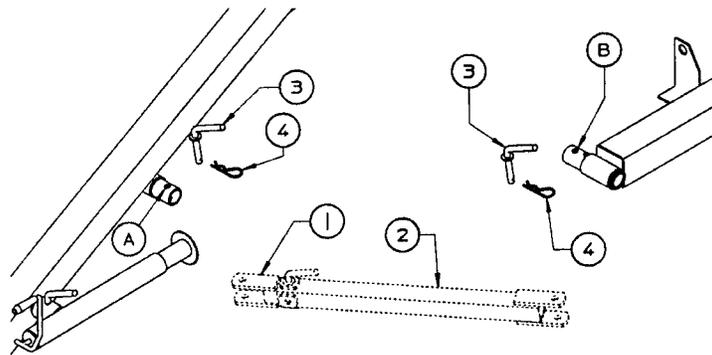
# OPERATION

## 10.1 Field Operation

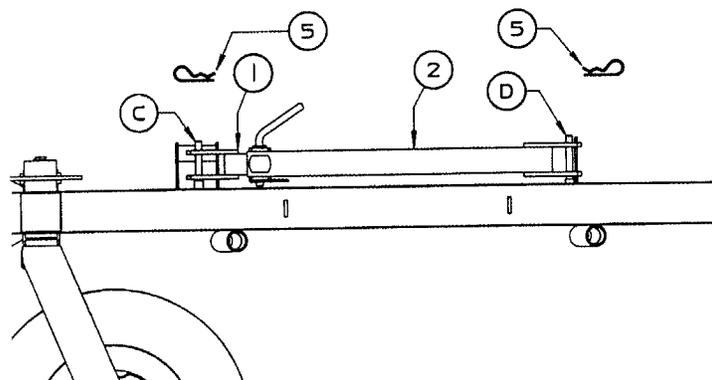
The first thing to be done in the field is to remove transport arms 1 & 2, replacing pins (3) and holes A & B and fastening them with clips (4). The transport arm assemblies are to be placed over pins C & D on the rake wheel sections as shown. Fasten the transport arms to pins C & D with clips (5).

By operating the opening cylinders (**Figure Asm-RK-0133, Assembly Section 3-19**), the machine is opened to fully open position. If work must be done on particularly uneven ground, do not operate in the fully open position. Open the machine so that the working width is at most 3" narrower than the fully opened position.

OPERATION



Ops-1086

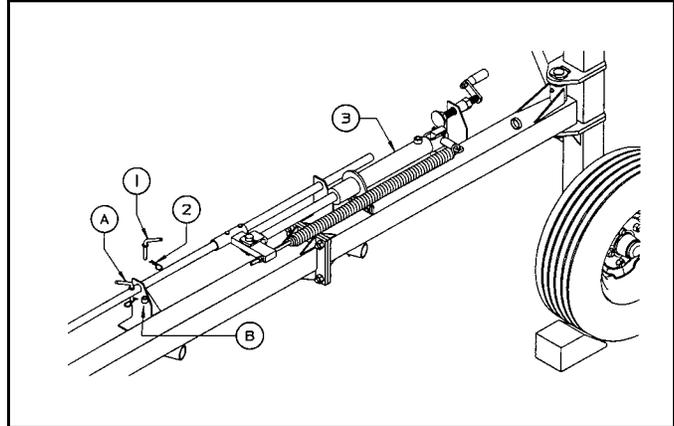


Ops-1087

# OPERATION

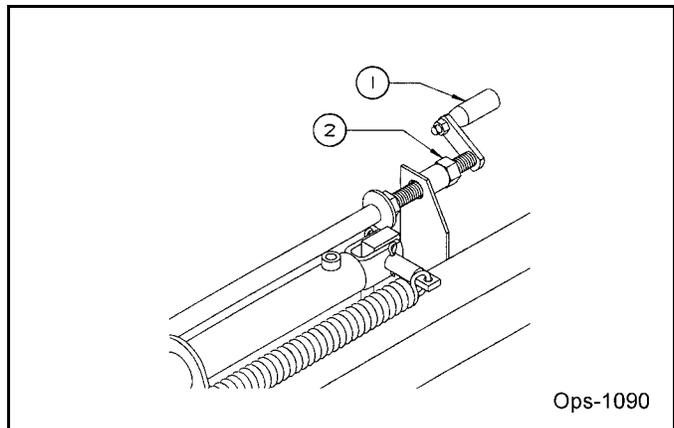
## **10.2 Lowering Rake Wheels**

Remove clip (2) and pin (1) from position A, and fasten them in position B. Operate cylinders (3) to lower the rake wheels.



## **10.3 Adjusting Wheel Pressure**

Adjust rake wheel pressure on the ground by turning crank 1. Normally, the rake tines should brush the ground. When properly adjusted, tighten nut (2) to lock the screw of lever (1) in place.



# OPERATION

## **10.4 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 and disengage the PTO. 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*

## **10.5 Bystanders/Passersby Precautions**

If a bystander comes within 300 feet of the tractor while the mower is being operated, stop the tractor at once, idle the engine and disengage the PTO. Do not engage the PTO again until all bystanders are well past the 300 foot distance. *OPS-R-0024*

## **10.6 Engaging the Power Take Off (PTO)**

Before engaging the PTO, make certain that the area is clear of bystanders and passersby. The implement must be completely lowered and the deck positioned at a safe operating height. NEVER engage the PTO with the implement in the raised position.

Set the tractor engine speed at approximately 1,000 RPM before engaging the PTO. Shift the PTO control to the on position, and slowly increase the engine speed until the PTO is operating at the rated speed. If you hear unusual noises or see or feel abnormal vibrations, disengage the PTO immediately. Inspect the implement to determine the cause of the noise or vibration and repair the abnormality. *OPS-U-0027*

## **10.7 PTO RPM and Ground Speed**

Ground speed for raking will depend upon the height, type, and density of vegetation to be raked. Recommended speed for efficient rake performance is between 2 and 5 mph(3-8 kph). Operate the rake at its full rated speed to maintain tine speed for a clean raking. Refer to the tractor operator's manual or the tractor instrument panel for the engine speed and gear to provide the required PTO and desired ground speed. Make sure that the rake is operating at its full rated speed before entering the vegetation to be raked. If it becomes necessary to temporarily regulate engine speed, increase or decrease the throttle gradually.

Ground speed is achieved by transmission gear selection and not by the engine operating speed. The operator may be required to experiment with several gear range combinations to determine the best gear and range which provides the most ideal performance from the implement and most efficient tractor operation. As the severity of raking conditions increase, the ground speed should be decreased by selecting a lower gear to maintain the proper operating PTO speed. *OPS-RK-0008*

# OPERATION

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



## **10.8 Shutting Down the Implement**

To shut down attached mower head, first bring the tractor to a complete stop. Decrease engine RPM to idle then disengage cutterhead. The mower head will come to a complete stop within a suitable amount of time. Do not engage or disengage the cutterheads at a high RPM unless there is an emergency situation.



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-U- 0016



# OPERATION

## 11. DISCONNECTING THE IMPLEMENT FROM THE TRACTOR

Before disconnecting the implement, the PTO must be disengaged and tire wheel rotation at a complete stop. 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



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

## 12. 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-0014*



OPERATION



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



## 13. 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*

# OPERATION

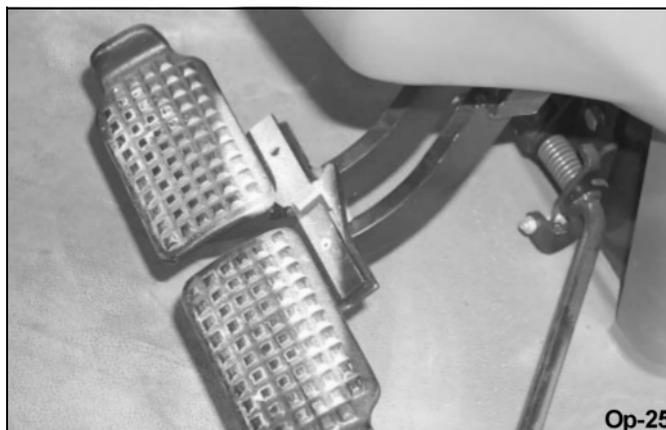
## OPERATION

Before transporting the tractor and implement, idle the tractor engine, disengage the PTO and wait for all moving parts to come to a complete stop. Once all implement parts are completely stopped, raise the implement to transport height. *OPS-RK-0011*



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 (25 kph). *OPS-U-0018*



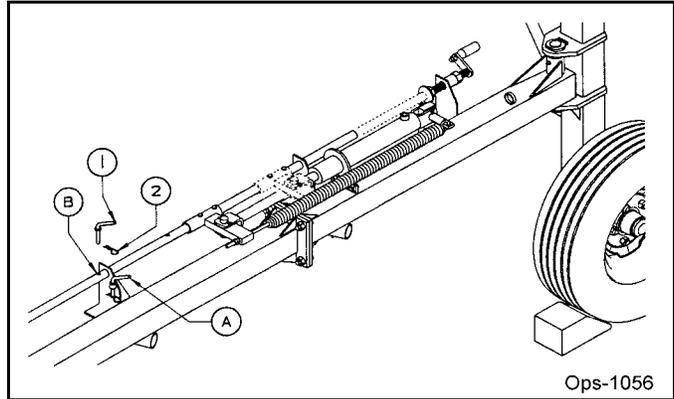
# OPERATION

## 13.1 Transporting



Never transport equipment without correctly installing transport lock. Failure to correctly install transport lock arms could result in equipment damage, serious injury or death.

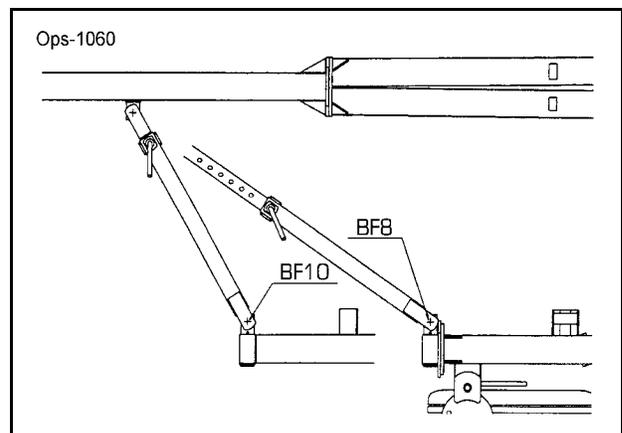
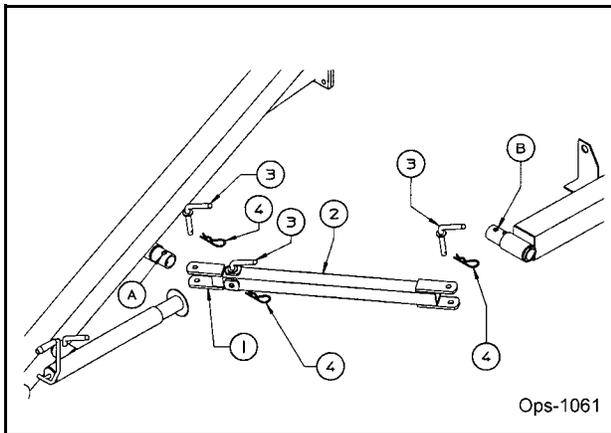
During transport, it is necessary to move pin (1) and clip from position A to position B. This removes the load from the rake wheel lifting cylinders.



OPERATION

At this point, it is necessary to attach the transport arms. Insert arm 1 in arm 2, and lock in place with pin (3) and clip (4). The transport assembly is then attached by placing the fork of arm (1) on attachment (A) of the drawbar and the fork or arm (2) on the rake wheel section. Fasten with pins (3) and clips (4).

The row of holes on the arms is for when the rear axle is widened. Under no circumstances should the cylinders be operated while the transport arms are attached. The machine is now ready to be transported to the work site.



# OPERATION

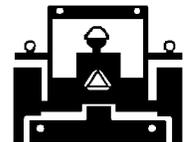
## 13.2 Transporting on Public Roadways

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.

Make sure that a proper size safety tow chain is secured between the tractor and implement before entering a public road. OPS-U- 0019



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



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

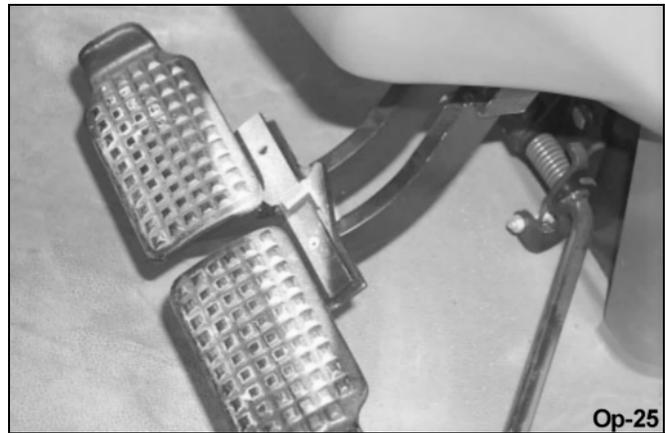


# OPERATION

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-U-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



## **13.3 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



# OPERATION

## OPERATION

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

## 14. TROUBLESHOOTING GUIDE

<b>Problem</b>	<b>Possible Cause</b>	<b>Remedy</b>
Hay carrying over on the wheels	Teeth not polished. Mud collected on tine ends.	Operate rake on gravel surface for a short distance. Dew on hay, wait until dry. Do not run in soft, wet ground.
Tooth Breakage	Backing with teeth in contact with ground. Too much of rake weight on wheels. Corrosion in storage.	Avoid backing with teeth on ground. Raise the 3-point hitch slightly. Coat teeth with grease or oil during storage.
Rake missing hay	Wheels running too fast. Wheels not pitched back enough. Teeth missing or worn.	Adjust angle at sector plate. Pitch wheels back by adjusting 3-point top link. Replace teeth. It is best to replace all teeth at the same time to maintain uniform tine height.
Rake wheels bounce excessively	Wheels have too little ground weight.	Lower 3-point hitch.
Bent teeth	Backing with wheels down. Excessive speed on rough terrain. Narrow or deep ditches or furrows, rocky ground. Too much weight on wheels.	Avoid backing with teeth down. Reduce speed. Avoid or cross slowly. Raise 3-point slightly.



# **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.

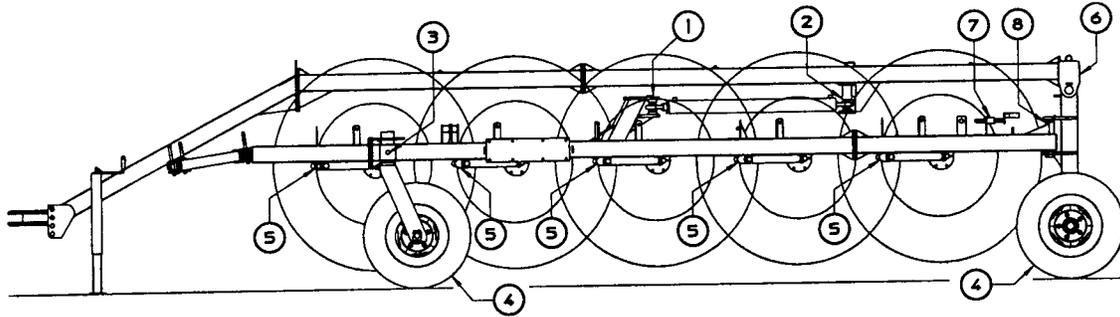
There is also a small amount of plastic which must be disposed of according to the regulations in force in the country concerned.

# MAINTENANCE

MAINTENANCE

## LUBRICATION

At this point, the machine is completely assembled. Before testing for operation, it is necessary to lubricate and check the movement of all parts. This diagram gives the maintenance program, to be carried out in its entirety the first time and subsequently according to the schedule as shown.



Mnt-RK-0002

ITEM	QTY	OPERATION	EVERY X HOURS	NOTES	DESCRIPTION
1	2	Lubricate	16	-----	Opening Cylinder Head Joint
2	2	Lubricate	16	-----	Opening Cylinder Foot Joints
3	2	Lubricate	8	-----	Front Wheel Support Joints
4	4	Check Pressure	A	-----	Tires
5	8-10	Lubricate	25	-----	Rake Wheel Bracket Joints
6	2	Lubricate	25	-----	Rear Wheel Supports
7	2	Clean and Lubricate	A	Brush	Crank Screws
8	8	Lubricate	8	-----	Rake Wheel Section Joints

A = EVERYTIME THE PART IS USED

### IMPORTANT

General checking of bolts, retaining pins and split pins to be carried out initially after the first 8 hours of use. Subsequently every 50 hours and whenever the machine is parked for extended periods.

# MAINTENANCE

## STORAGE

To prepare your Rake for storage:

1. Clean the rake following instructions and allow it to dry.
2. Thoroughly tighten all screws and bolts.
3. Store the rake on a clean, dry surface in the down (working) position.
4. Grease the machine thoroughly and then cover it completely and store in a dry place.
5. Lubricate all points and slides before storage. This prevents corrosion.

**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.

**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.

The rods remaining outside the cylinder (whatever reason may be) must be carefully protected with a grease layer.

## 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 this chart as a guide to tightening all bolts. Torque values listed are for general use only.

Bolt Diameter	 Head Marking Three Lines Grade Five	 Head Marking Six Lines Grade Eight
	Pound - Foot Value Dry	Pound - Foot Value Dry
1/4"	7	10
5/16"	15	22
3/8"	26	39
7/16"	42	60
1/2"	64	88
9/16"	100	134
5/8"	128	180
3/4"	227	320
7/8"	365	515
1"	547	772

To get Newton-Meters multiply pound-foot of torque by 1.356

Bolt Diameter	 Head Marking 4.6	 Head Marking 8.8 or 9.8	 Head Marking 10.9	 Head Marking 12.9
	Pound - Foot Value Dry	Pound - Foot Value Dry	Pound - Foot Value Dry	Pound - Foot Value Dry
6mm	3	7	9	10
8mm	6.2	16	23	24
10mm	12	32	45	47
12mm	21	55	79	81
14mm	34	88	126	130
16mm	53	137	196	202
18mm	73	189	270	279
20mm	104	267	382	394
22mm	141	364	520	537
24mm	179	461	660	680
27mm	262	676	968	998
30mm	355	917	1312	1353

Mnt-B-0005



# LIMITED WARRANTY



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

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

## DISCLAIMER OF IMPLIED WARRANTIES & CONSEQUENTIAL DAMAGES

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

### THIS LIMITED WARRANTY SHALL NOT APPLY:

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

NO EMPLOYEE OR REPRESENTATIVE OF BUSH HOG IS AUTHORIZED TO CHANGE THIS LIMITED WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY UNLESS SUCH CHANGE IS MADE IN WRITING AND SIGNED BY BUSH HOG'S SERVICE MANAGER, 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 \_\_\_\_\_  
DATE OF RETAIL SALE \_\_\_\_\_

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



## 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<sup>®</sup>**

**FWR  
BI-FOLD RAKE**

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FWR-SOM-09/10

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